

CONTRACT DOCUMENTS FOR

**SERWTP FILTER GALLERY &
ACTIFLO BUILDING IMPROVEMENTS**

VOLUME 1 OF 3

PROJECT #: 4324

AUGUST 2026

OWNER

Jordan Valley Water Conservancy District
8215 South 1300 West
West Jordan, Utah
(801) 565-4300
Project Manager: Adam Cossey

ENGINEER

McNeil Engineering
8610 South Sandy Parkway
Sandy, Utah 84070
Telephone: (801) 255-7700
Project Manager: Carl Greene, AIA

TABLE OF CONTENTS

VOLUME 1 of 3

<u>Bidding Documents</u>	<u>Page</u>
Notice Inviting Bids.....	A-1
Instructions to Bidders.....	B-1
Bid	C-1
Bid Bond.....	D-1
Information Required of Bidder	E-1
 <u>Contract Documents</u>	
Agreement.....	F-1
Performance Bond	G-1
Payment Bond.....	H-1
Notice of Award	I-1
Notice to Proceed.....	J-1
Payment Application and Certificate.....	K-1
Change Order	L-1
Contractor's Certificate of Substantial Completion	M-1
Contractor's Certificate of Final Completion	N-1
Consent of Surety for Final Payment.....	O-1
Affidavit of Payment	P-1

GENERAL CONDITIONS OF THE CONTRACT

Article

1 - Definitions	1-1
2 - Preliminary Matters	2-1
3 - Contract Documents: Intent, Amending, Reuse	3-1
4 - Availability of Land; Physical Conditions: Reference Points.....	4-1
5 - Bonds and Insurance	5-1
6 - Contractor's Responsibilities	6-1
7 - Other Work.....	7-1
8 - Owner's Responsibilities	8-1
9 - Engineer's Status During Construction	9-1
10 - Changes in the Work.....	10-1
11 - Change of Contract Price	11-1
12 - Change of Contract Time	12-1
13 - Warranty and Guarantee; Tests and Inspections; Correction, Removal, Or Acceptance of Defective Work	13-1
14 - Payments to Contractor, Liquidated Damages and Completion.....	14-1

GENERAL CONDITIONS OF THE CONTRACT

15 - Suspension of Work and Termination	15-1
16 - Miscellaneous	16-1

SUPPLEMENTAL GENERAL CONDITIONS

<u>Article</u>	<u>Page</u>
17 - General	17-1
18 - Amounts of Liquidated Damages, Bonds, and Insurance	18-1
19 - Physical Conditions and Weather Delays	19-1
20 - Subcontract Limitations.....	20-1
21 - Miscellaneous	21-1

TECHNICAL SPECIFICATIONS

DIVISION 01 - GENERAL REQUIREMENTS

01 1100	SUMMARY OF WORK
01 1200	MULTIPLE CONTRACT SUMMARY
01 1400	WORK RESTRICTIONS
01 2100	ALLOWANCES
01 2200	UNIT PRICES
01 2900	PAYMENT PROCEDURES
01 3100	PROJECT MANAGEMENT AND COORDINATION
01 3200	CONSTRUCTION PROGRESS DOCUMENTATION
01 3300	SUBMITTAL PROCEDURES
01 3500	SPECIAL PROCEDURES
01 4000	QUALITY REQUIREMENTS
01 4200	REFERENCES
01 4301	QUALITY ASSURANCE QUALIFICATIONS
01 4523	TESTING AND INSPECTING SERVICES
01 5100	TEMPORARY UTILITIES
01 5200	CONSTRUCTION FACILITIES
01 5400	CONSTRUCTION AIDS
01 5500	VEHICULAR ACCESS AND PARKING
01 5600	TEMPORARY BARRIERS AND ENCLOSURES
01 5700	TEMPORARY CONTROLS
01 5800	PROJECT IDENTIFICATION
01 6100	COMMON PRODUCT REQUIREMENTS
01 6200	PRODUCT OPTIONS
01 6600	PRODUCT DELIVERY STORAGE AND HANDLING REQUIREMENTS
01 7100	EXAMINATION AND PREPARATION
01 7300	EXECUTION

01 7400 CLEANING AND WASTE MANAGEMENT
01 7700 CLOSEOUT PROCEDURES
01 7800 CLOSEOUT SUBMITTALS

DIVISION 03 - CONCRETE

03 3000 IN PLACE CONCRETE

DIVISION 05 - METALS

05 5213 PIPE AND TUBE RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 0573 PRESERVATIVE WOOD TREATMENT
06 1011 WOOD FASTENINGS
06 1100 WOOD FRAMING
06 1636 WOOD PANEL PRODUCT SHEATHING

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 4100 PREFORMED METAL STANDING SEAM ROOFING
07 9213 ELASTOMERIC JOINT SEALANT

DIVISION 08 - OPENINGS

08 4113 ALUMINUM FRAMED ENTRANCES AND STOREFRONTS
08 8100 GLASS GLAZING

DIVISION 09 - FINISHES

09 9001 COMMON PAINTING AND COATING REQUIREMENTS
09 9113 EXTERIOR PAINTING

DIVISION 31 - EARTHWORK

31 0501 COMMON EARTHWORK REQUIREMENTS
31 2213 ROUGH GRADING
31 2216 FINE GRADING
31 2316 EXCAVATION
31 2323 FILL

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 1216 ASPHALT PAVING SUPERPAVE METHOD
32 9223 SODDING

DIVISION 33 - UTILITIES

33 0506 POLYETHYLENE PIPE
33 4116 SITE STORM UTILITY DRAINAGE PIPING

VOLUME 2 OF 3 - DRAWINGS

ACTIFLO BUILDING REROOF

VOLUME 3 OF 3 - DRAWINGS

FILTER GALLERY BUILDING IMPROVEMENTS

END OF SECTION

NOTICE INVITING BIDS

PROJECT NAME: SERWTP Filter Gallery & Actiflo Building Improvements

DESCRIPTION OF WORK: Work under this contract includes improvements to the Filter Gallery Building and Actiflo Building at the Southeast Regional Water Treatment Plant (SERWTP). The improvements include replacement of siding, soffit, gutters, modification to existing storefront and clear story systems, drywall repair, and additional items listed within the contract documents.

DISTRICT WEB SITE AND PLANHOLDERS LIST: Prospective bidders must register at the District's web site (www.jvwcd.gov) under "Engineering Projects". Prospective bidders are required to check the District's web site for any addenda prior to submitting a responsive bid. The District's web site will be used to publish updated information relative to the project, including a planholders list.

RECEIPT OF BIDS: Sealed bids will be received at the administration office of the Jordan Valley Water Conservancy District, Owner of the Work, located at 8215 South 1300 West, West Jordan, Utah 84088, until **2:00 PM on Tuesday, August 25, 2026**, for construction of the "SERWTP Filter Gallery & Actiflo Building Improvements". Electronic bids may also be submitted in adobe .pdf format to ellisad@jvwcd.gov. **JVWCD suggests that electronic bids be submitted 15 minutes prior to the bid opening deadline, to allow for verification of delivery.** A public bid opening will be held at the bid due time, attendance is not required. Bid results will be posted to the District's website within 24 hours of the bid opening.

OBTAINING CONTRACT DOCUMENTS: The Contract Documents are entitled, "SERWTP Filter Gallery & Actiflo Building Improvements". All Contract Documents may be obtained, online at www.jvwcd.gov under "Engineering Projects".

SITE OF WORK: The work is located at 11574 South Wyndcastle Drive, Sandy, Utah.

PRE-BID SITE VISIT: A non-mandatory pre-bid visit will be held at **1:00 PM on Thursday, August 13, 2026**, at the site of work, 11574 South Wyndcastle Drive, Sandy, Utah. It is recommended that Bidders attend to see the existing facilities and ask questions regarding the project.

COMPLETION OF WORK: All work shall be Substantially Complete within 365 calendar days from the date of the Notice to Proceed.

AWARD OF CONTRACT: An Award of Contract, if it were awarded, will be made within 60 calendar days of the opening of bids.

NOTICE TO PROCEED: A Notice to Proceed, if it were issued, will be made within 60 calendar days of the Notice of Award.

BID SECURITY: Each bid shall be accompanied by a certified or cashier's check, money order or bid bond in the amount of five percent of the total bid price payable to the Jordan Valley Water Conservancy District as a guarantee that the bidder, if its bid is accepted,

NOTICE INVITING BIDS

will promptly execute the contract, provide evidence of worker's compensation insurance, and furnish a satisfactory faithful performance bond in the amount of 100 percent of the total bid price and a payment bond in the amount of 100 percent of the total bid price.

ADDRESS AND MARKING OF BID: The envelope enclosing the bid shall be sealed and addressed to the Jordan Valley Water Conservancy District and delivered or mailed to 8215 South 1300 West, West Jordan, Utah 84088. The envelope shall be plainly marked in the upper left-hand corner with the name and address of the bidder and shall bear the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids. The certified or cashier's check, money order, or bidder's bond shall be enclosed in the same envelope with the bid. Electronic bids shall be submitted to the engineering administrative assistant, ellisad@jvwcd.gov as an email attachment with the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids in the subject line of the email.

PROJECT ADMINISTRATION: All questions relative to this project prior to the opening of bids shall be directed to the Engineer for the project. It shall be understood, however, that no interpretations of the specifications will be made by telephone, nor will any "or equal" products be considered for approval prior to award of contract.

ENGINEER

McNeil Engineering
8610 South Sandy Parkway, Suite 200
Sandy, Utah 84070
801-255-7700
Project Manager: Carl Green, AIA
Email: carl@mcneileng.com

OWNER'S RIGHTS RESERVED: The Owner reserves the right to reject any or all bids, to waive any informality in a bid, and to make awards in the interest of the Owner.

OWNER

Jordan Valley Water Conservancy District
8215 South 1300 West
West Jordan, Utah 84088
(801) 565-4300
Project Manager: Adam Cossey, P.E.
Email: AdamC@jvwcd.gov

JORDAN VALLEY WATER CONSERVANCY DISTRICT

INSTRUCTIONS TO BIDDERS

FORM OF BID: The bid shall be made on the bidding schedule(s) bound herein. The bid shall be enclosed in a sealed envelope bearing the name of the bidder and name of the project. In the event there is more than one bidding schedule, the bidder may bid on any individual schedule or on any combination of schedules.

BID APPURTENANCES: Bidders must provide bid appurtenances including Information required of bidder and experience reference projects. Bids not including the required information may be deemed non-responsive.

DELIVERY OF BID: The bid shall be delivered by the time and to the place stipulated in the Notice Inviting Bids. It is the bidder's sole responsibility to see that his bid is received in proper time.

WITHDRAWAL OF BIDS: Bids shall be unconditionally accepted without alteration or correction, excepting that bidder may by means of written request, signed by the bidder or his properly authorized representative withdraw his bid. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of bids prior to the scheduled closing time for receipt of bids.

OPENING OF BIDS: The bids will be publicly opened and read at the time and place stipulated in the Notice Inviting Bids. According to state law, total bid amounts for each bidder will be posted to the District's website within 24 hours following receipt of the bids.

MODIFICATIONS AND ALTERNATIVE BIDS: Unauthorized conditions, limitations, or provisions attached to a bid may render it non-responsive and may cause its rejection. The completed bid forms shall be without interlineations, alterations, or erasures. Alternative bids will not be considered unless called for. Oral, telegraphic, or telephonic bids or modifications will not be considered.

DISCREPANCIES IN BIDS: In the event there is more than one bid item in a bidding schedule, the bidder shall furnish a price for all bid items in the schedule; failure to do so may render the bid non-responsive and subject to rejection. In the event there are unit price bid items in a bidding schedule and the "amount" indicated for a unit price bid item does not equal the product of the unit price and quantity, the unit price shall govern and the "amount" will be corrected accordingly, and the Contractor shall be bound by said Correction. In the event there is more than one bid item in a bidding schedule and the total indicated for the schedule does not agree with the sum of the prices bid on the individual items, the prices bid on the individual items shall govern and the total for the schedule will be corrected accordingly, and the Contractor shall be bound by said correction.

BID SECURITY: Each bid shall be accompanied by a certified or cashier's check or approved bid bond in the amount stated in the Notice Inviting Bids. Said check or bond shall be made payable to the Owner and shall be given as a guarantee that the bidder, if awarded the work, will enter into a contract within 10 calendar days after receipt of the contract from the Owner, and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond; each of said bonds to be in the amount stated in the Notice

INSTRUCTIONS TO BIDDERS

Inviting Bids. In case the apparent low bidder refuses or fails to enter into such contract or fails to provide the required insurance and insurance certificates, the check or bid bond, as the case may be, shall be forfeited to the Owner. If the bidder elects to furnish a bid bond as his bid guarantee, he shall use the bid bond bound herein, or one conforming substantially to it in form.

BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE

It is the responsibility of each Bidder before submitting a Bid to:

1. Examine Contract Documents thoroughly.
2. Visit the site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the work.
3. Consider federal, state and local laws and regulations that may affect cost, progress, and performance of furnishing of the work.
4. Study and carefully correlate the Bidder's observations with the Contract Documents.
5. Notify the Engineer of all conflicts, errors, or discrepancies in the Contract Documents.

Reference is made to the Supplemental General Conditions for identification of:

1. Those reports of exploration and tests of subsurface conditions at the site, which have been utilized by the Engineer in the preparation of the Contract Documents.
2. Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except underground utilities as defined in Article 1 of the General Conditions) which are at or contiguous to the site and which were utilized by the Engineer in the preparation of the Contract Documents. Copies of such reports and drawings are available for inspection at the office of the Owner.

Information and data reflected in the Contract Documents with respect to underground facilities at/or contiguous to the site are based upon information and data furnished to the Owner and the Engineer by the owners of such underground facilities or others, and the Owner does not assume any responsibility for the accuracy or completeness thereof including any damages whatsoever that may be incurred by the Bidder or the Contractor through his reliance thereon unless it is expressly provided otherwise in the Supplemental General Conditions and/or the Technical Specifications.

Before submitting a bid, the bidder shall conduct such examination, investigations, studies and tests as are necessary to satisfy himself as to: the nature and location of the physical

INSTRUCTIONS TO BIDDERS

conditions (surface, subsurface and underground facilities), the general and local conditions particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, availability of utilities, local weather conditions, the character of equipment and facilities required preliminary to and during the prosecution of the work; any and all other conditions that may in any way affect the cost, progress, performance or furnishing of materials in accordance with the Contract Documents. All

such examination, investigation, studies, tests and the like shall be at the Bidder's expense.

Upon reasonable request in advance, the Owner shall provide each Bidder access to the site to conduct such explorations, examination, investigation and tests as each Bidder may determine necessary for the submission of a Bid. The Bidder shall fill all holes, clean and restore the site to its former condition upon the completion of such activities.

The submission of a bid hereunder shall be considered prima facie evidence that the Bidder has made such examination as is set forth in the above paragraph and is knowledgeable as to the location and site conditions surrounding the work and the conditions to be encountered in performing the work and as to the requirements, conditions and terms of the Contract and Contract Documents.

The Owner assumes no responsibility for any understanding or representations made by any of its officers or agents during or prior to the execution of this Contract, for information contained in any reports, subsurface studies, or other information which may be made available for the Contractor's information and which are not included as Contract Documents, for any understanding or representations by the Owner or by others which are not expressly stated in the Contract Documents which liability is not expressly assumed by the Owner or its representatives or Engineer in the Contract Documents. Such information shall be deemed to be for the information of the Contractor and the Contractor shall have the obligation of evaluating any such information as to its accuracy and effect the Owner will not be liable or responsible for any such information or any conclusions that may be drawn there from by the Contractor.

The lands upon which the work is to be performed, right-of-ways and easements for access thereto together with other lands designated for use by the Contractor in performing the work are identified in the Contract Documents. All additional lands and access thereto that are required for temporary construction facilities or storage of materials and equipment are to be provided by the Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by the Owner unless otherwise provided in the Contract Documents.

The submission of a Bid shall constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of this Article, and that without exception the Bid is premised upon performing and furnishing the work required by the Contract Documents in compliance with such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents; and that such means, methods, techniques, sequences or procedures

INSTRUCTIONS TO BIDDERS

described in the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing the work.

QUANTITIES OF WORK: The quantities of work or material stated in the Bid Schedule are supplied only to give an indication of the general scope of the work; the Owner does not expressly or by implication agree that the actual amount of work or material will correspond therewith. The Owner reserves the right after award of the Contract to increase or decrease the quantities of any unit price item of the work by an amount up to and including 25 percent of the quantity of any bid item, or to omit portions of such work as may be deemed necessary or expedient by the Engineer or Owner, without a change in the unit price. Such right to revise and omit shall include the right to delete any bid item in its entirety, or to add additional bid items in quantities up to and including an aggregate total amount not to exceed 25 percent of the total amount of the Contract.

The Bidders nor the ultimate Contractor on the Project shall at any time after the submittal of a bid make or have any claim for damages or anticipated profits or loss of profit or otherwise because of any difference between the quantities of work actually done and material furnished and those stated in said unit price items of the Bid.

COMPETENCY OF BIDDERS: In selecting the lowest responsible Bidder, consideration will be given to the general competency of the Bidder for the performance of the work covered by the Bid. To this end, each bid shall be supported by a statement of the bidder's experience as of recent date on the form entitled "Information Required of Bidder," bound herein. No bid for the work will be accepted from a contractor who does not hold an active Contractor's license in good standing applicable to the type of work bid upon at the time of opening bids.

After an award of the contract no substitution of the Project Manager or Project Superintendent will be allowed without the written approval by the Owner.

DISQUALIFICATION OF BIDDERS: More than one bid from an individual, firm partnership, corporation, or association under the same or different names will not be considered. Reasonable grounds for believing that any bidder is interested in more than one bid for the work contemplated will cause the rejection of all bids in which such bidder is interested. If there is reason for believing that collusion exists among the bidders, all bids will be rejected.

RETURN OF BID GUARANTEE: Within 10 calendar days after award of the contract, the Owner will return the bid guarantees accompanying such of the bids as are not considered in making the award. All other bid guarantees will be held until a Notice to Proceed has been issued and accepted. They will then be returned to the respective bidders whose bids they accompany.

EVALUATION OF BIDS: In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid or prior to the Notice of Award. In evaluating whether a

INSTRUCTIONS TO BIDDERS

Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents. Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

AWARD OF CONTRACT: Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unqualified, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

If Owner awards a contract for the Work, such award shall be to the qualified Bidder submitting the lowest responsive Bid. Any such award will be made by written notice and within 60 calendar days after opening of the bids, unless a different waiting period is expressly allowed in the Notice Inviting Bids. The Owner intends to award a single contract for construction of the Project. Individual schedules will not be awarded separately.

EXECUTION OF CONTRACT: The Bidder to whom the award is made shall secure all insurance and shall furnish all certificates and bonds required by the specifications within ten calendar days after receipt of the Notice of Award from the Owner. The Bidder to whom the award is made shall execute a written contract with the Owner on the form of agreement provided within ten calendar days after receipt of the Agreement from the Owner. Failure or refusal to enter into a contract as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the bid guarantee. If the successful bidder refuses or fails to execute the contract, the Owner may award the contract to the second lowest responsible bidder, or reject all bids and re-advertise the project for rebidding. If the second lowest responsible bidder refuses or fails to execute the contract, the Owner may award the contract to the third lowest responsible bidder. On the failure or refusal of such second or third lowest bidder to execute the contract, each such bidder's guarantees shall be likewise forfeited to the Owner.

ISSUANCE OF NOTICE TO PROCEED: The Owner intends to execute the Agreement and issue the Notice to Proceed specifying the Project start date within ten calendar days after its receipt of the executed Agreement, Purchase Order Assignment(s), (if applicable), bonds and insurance certificates from the successful bidder. If the Contract Time is expressed as a specific completion date in the Notice Inviting Bids and paragraph 3.1 of the Agreement rather than a specific number of successive days following the start date identified in the Notice to Proceed, then any delay by the Owner beyond the ten days in issuing the Notice to Proceed shall extend the completion date by the number of days

INSTRUCTIONS TO BIDDERS

of the delay.

LICENSES: Contractor must be licensed as a business qualified to do business within the state of Utah prior to issuance of a Notice of Award. Contractor must hold a current contractor's license with classifications appropriate to the work being contracted.

STATE REGISTRY: The Contractor shall register the project, if awarded, on the State of Utah Construction Registry prior to the commencement of the work.

BID

BID TO: JORDAN VALLEY WATER CONSERVANCY DISTRICT

The undersigned Bidder hereby proposes to furnish all plant machinery, labor, services, materials, equipment, tools, supplies, transportation, utilities, and all other items and facilities necessary to perform all work required under the Bidding Schedule of the Owner's Contract Documents entitled "SERWTP Filter Gallery & Actiflo Building Improvements" drawings and all addenda issued by said Owner prior to opening of the bids.

Addenda, if issued, are only delivered by e-mail to those on Owner's website (jvwcd.gov) Plan Holders List.

The undersigned bidder acknowledges receipt of the following addenda:

<u>No.</u>	<u>Date Received</u>	<u>No.</u>	<u>Date Received</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Bidder agrees that, within 10 calendar days after receipt of Notice of Award from Owner, he will execute the Agreement in the required form, of which the Notice Inviting Bids, Instructions to Bidders, Bid, Information Required of Bidder, Technical Specifications, Drawings, and all addenda issued by Owner prior to the opening of bids, are a part, and will secure the required insurance and bonds and furnish the required insurance certificates; and that upon failure to do so within said time, then the bid guarantee furnished by Bidder shall be forfeited to Owner as liquidated damages for such failure; provided, that if Bidder shall execute the Agreement, secure the required insurance and bonds, and furnish the required insurance certificates within said time, his check, if furnished, shall be returned to him within five days thereafter, and the bid bond, if furnished, shall become void. It is further understood that this bid may not be withdrawn for a period of 45 days after the date set for the opening thereof, unless otherwise required by law.

Dated: _____

Bidder: _____

By: _____
(Signature)

Title: _____

Bidder further agrees to complete all work required within the time stipulated in the Contract Documents, and to accept in full payment therefore the price(s) named in the above-mentioned Bidding Schedule(s).

BID

BID SCHEDULE

Item No.	ITEM	QTY	UNIT	UNIT COST	TOTAL
ACTIFLO BUILDING					
1	Remove existing fascia, drip edge, termination metal, etc. where new roofing occurs	395	Lin Ft	\$	\$
2	Remove existing concrete tile roofing, penetration flashing, felts etc. where new roofing occurs	7,910	Sq Ft	\$	\$
3	Remove existing skylights	2	Ea	\$	\$
4	Remove existing storefront windows	6	Ea	\$	\$
5	Saw cut and remove and replace existing hardscape where bubbler and storm drain system occur	160	Sq Ft	\$	\$
6	Install new 24 ga. pre-finished metal rain gutter per plan and spec	330	Lin Ft	\$	\$
7	Install new 24 ga. pre-finished metal downspouts per plan and spec	45	Lin Ft	\$	\$
8	Install new bubbler for storm water per plan and spec	2	Ea	\$	\$
9	Install new SDR-35 storm drain per plan and spec	160	Lin Ft	\$	\$
10	Install new standing seam metal roofing system per plan and spec	7,905	Sq Ft	\$	\$
11	Install new 24 ga. Pre-finished drip edge metal	395	Lin Ft	\$	\$
12	Install new 12" strip of secondary underlayment per plan and spec	395	Lin Ft	\$	\$
13	Install new 9" strip of secondary underlayment per plan and spec	110	Lin Ft	\$	\$
14	Install new 24 ga. Pre-finished metal valleys per plan and spec	110	Lin Ft	\$	\$
15	Install new 24 ga. pre-finished metal fascia per plan and spec	395	Lin Ft	\$	\$
16	Install new roof hatch per plan and spec	2	Ea	\$	\$
17	Install new vertical corrugated metal siding per plan and spec	645	Sq Ft	\$	\$
18	Install new storefront windows per plan and spec	6	Ea	\$	\$
19	Install galvanized metal pipe jack flashings per plan and spec	1	Ea	\$	\$
ACTIFLO BLDG. SUBTOTAL:					\$

BID

Item No.	ITEM	QTY	UNIT	UNIT COST	TOTAL
FILTER GALLERY BUILDING					
1	Remove existing shingles roofing system per plan	1	Lump Sum		\$
2	Remove existing metal cladding in locations where new metal cladding will be installed	1,865	Sq Ft	\$	\$
3	Remove existing fascia system in locations where new fascia will be installed	475	Lin Ft	\$	\$
4	Remove existing storefront window system in locations where new storefront windows will be installed	10	Ea	\$	\$
5	Remove existing gypsum ceiling in locations where damaged	295	Sq Ft	\$	\$
6	Remove metal parapet wall caps in locations where new metal parapet will be installed	85	Lin Ft	\$	\$
7	Remove existing landscaping where bubbler and storm drain system occurs	90	Lin Ft	\$	\$
8	Repair existing shingle roof per plan and spec	1	Lump Sum		\$
9	Install new metal cladding per plan and spec	1,865	Sq Ft	\$	\$
10	Install new metal fascia per plan and spec	475	Lin Ft	\$	\$
11	Install new storefront windows per plan and spec	10	Ea	\$	\$
12	Install new 24 ga. pre-finished metal drip edge per plan and spec	475	Lin Ft	\$	\$
13	Install new powder coated steel bar & prefabricated panel guardrail per plan and spec	45	Lin Ft	\$	\$
14	Install new bubble-up boxes per plan and spec	6	Ea	\$	\$
15	Install new 8" SDR-35 storm drain pipe per plan and spec	90	Lin Ft	\$	\$
16	Install new gypsum board ceiling per plan and spec	295	Sq Ft	\$	\$
17	Install new pendant light fixture per plan and spec	15	Ea	\$	\$
18	Install new 24 ga. Pre-finished metal parapet wall caps per plan and spec	85	Lin Ft	\$	\$

BID

Item No.	ITEM	QTY	UNIT	UNIT COST	TOTAL
19	Install galvanized metal pipe jack flashings per plan and spec	1	Ea	\$	\$
FILTER GALLERY SUBTOTAL:					\$
GENERAL CONDITIONS					
1	General Conditions	1	Lump Sum		\$
2	Contractor's Supervision	1	Lump Sum		\$
3	Payment & Performance Bonds and Insurance	1	Lump Sum		\$
4	Project mobilization	1	Lump Sum		\$
5	Pedestrian safety	1	Lump Sum		\$
6	Temporary Construction Fencing	1	Lump Sum		\$
GENERAL CONDITIONS SUBTOTAL:					\$

BID SCHEDULE TOTAL \$ _____
(Actiflo Bldg. + Filter Gallery + General Conditions): _____

Bidder agrees to accept as full payment for Work proposed with the Bidding Documents based upon the undersigned's own estimate of quantities and costs and including sales, consumer, use, other taxes, and overhead and profit.

Bidder (Company name): _____

By: _____ Dated: _____
(Signature)

Name: _____ Title: _____

ATTACHMENTS TO THIS BID

The following documents are attached to and made a condition of this Bid:

1. Required Bid security in the form of Bid Bond.
2. Information Required of Bidder.

BID BOND

KNOW ALL MEN BY THESE PRESENTS,

That _____
as Principal, and _____
as Surety, are held and firmly bound unto the Jordan Valley Water Conservancy District
(hereinafter called "Owner") in the sum of _____
dollars, (not less than five percent of the total amount of the bid) for the payment of which
sum, will and truly to be made, we bind ourselves, our heirs, executors, administrators,
successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has submitted a bid to Owner to perform all work required under
the bidding Schedule of the Owner's Contract Documents entitled "SERWTP Filter Gallery
& Actiflo Building Improvements", (hereafter called the "Project").

NOW THEREFORE, if Principal is awarded Contract by Owner for the Construction of the
Project and, within the time and in the manner required under the heading "Instructions
to Bidders" enters into the written contract entitled "Agreement" bound with said Contract
Documents, furnishes the required certificates of insurance, and furnishes the required
Performance Bond and Payment Bond within 10 calendar days after receipt of such
contract from Owner, then this obligation shall be null and void, otherwise it shall remain
in full force and effect. In the event suit is brought upon this bond by Owner and judgment
is recovered, Surety shall pay all costs incurred by Owner in such suit, including a
reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this ____ day of _____, 20__.

By: _____ By: _____

President

Its: _____ Its: _____

(SEAL)

(SEAL)

INFORMATION REQUIRED OF BIDDER

The Bidder shall furnish the following information. Failure to comply with this requirement may render the Bid non-responsive and subject to rejection. Additional sheets shall be attached as required.

1. Contractor's name: _____
2. Contractor's address: _____

Contractor's Primary Contact: _____

Email address of Contractor's primary contact: _____

Contractor's telephone number: _____

3. **Contractor must be qualified and licensed to do business in Utah.**

Utah Department of Commerce Information

Business Entity Number: _____

Delinquent Date: _____

4. **Contractor must hold a current contractor's license, classification appropriate for this work.**

Contractor's Utah License Number: _____

Expiration Date: _____

Primary Classification: _____

Supplemental Classification held, if any: _____

5. **Key Personnel Qualifications and Experience**

List key personnel here and provide detailed information in Attachments A and B. More than one Project Manager and/or Project Superintendent may be proposed. Only personnel approved by the Owner will be allowed in the key positions.

Project Manager A: _____

Project Manager (Alternate 1): _____

Project Manager (Alternate 2): _____

Project Manager shall have:

- At least five (5) years' construction experience.
- Two (2) projects with the installation of standing seam metal roof of similar size.

INFORMATION REQUIRED OF BIDDER

Project Superintendent A: _____

Project Superintendent (Alternate 1): _____

Project Superintendent (Alternate 2): _____

Project Superintendent shall have:

- At least ten (10) years' construction experience.
- Two (2) projects with the installation of standing seam metal roof of similar size.
- One (1) project with the installation of a storefront window system.

Note: A past project may be used to satisfy multiple requirements.

6. **Previous Contractor Project Experience**

Past project experience shall be provided for each requirement. The Owner shall be entitled to contact each, and every reference listed by the contractor. The Contractor, by submitting a bid, expressly agrees that any information concerning the CONTRACTORS in possession of said entities and references may be made available to the owner.

Provide the information identified in Attachment C for each project which meets the minimum requirements listed below:

Requirements:

Contractor shall have successfully completed at least three (3) projects which include the installation of standing seam metal roof of similar size to this project and at minimum two (2) project with the installation of a storefront window system.

Note: One project may be used to satisfy multiple requirements.

7. Number of persons employed full-time by the firm: _____

8. Name of person who inspected site of proposed work for your firm:

Name: _____

Date of Inspection: _____

INFORMATION REQUIRED OF BIDDER

9. Surety company who will provide the required bonds on this contract:

Agent's Name: _____

Telephone: _____

10. Workers Compensation Insurance Policy #: _____

INFORMATION REQUIRED OF BIDDER

ATTACHMENT A

(Copy as necessary – recommended to provide more projects than required)

Project Manager Data Sheet

Name: _____

Years experienced as Project Manager: _____

Years of prior experience: _____ Positions: _____

Qualifying Project #1: _____

Project Summary: _____

Roof size (sq-ft): _____ Roof Material: _____

Year Completed: _____

Total Cost: _____

Owner: _____

Owner Contact Person: _____ Telephone: _____

Qualifying Project #2: _____

Project Summary: _____

Roof size (sq-ft): _____ Roof Material: _____

Year Completed: _____

Total Cost: _____

Owner: _____

Owner Contact Person: _____ Telephone: _____

INFORMATION REQUIRED OF BIDDER

ATTACHMENT B

(Copy as necessary – recommended to provide more projects than required)

Superintendent Data Sheet

Name: _____

Years experienced as Superintendent: _____

Years of prior experience: _____ Positions: _____

Qualifying Project #1: _____

Project Summary: _____

Roof size (sq-ft): _____ Roof Material: _____

Year Completed: _____

Total Cost: _____

Owner: _____

Owner Contact Person: _____ Telephone: _____

Qualifying Project #2: _____

Project Summary: _____

Roof size (sq-ft): _____ Roof Material: _____

Year Completed: _____

Total Cost: _____

Owner: _____

Owner Contact Person: _____ Telephone: _____

Qualifying Project #3: _____

Project Summary: _____

Storefront Window System size (sq-ft): _____

Year Completed: _____

Total Cost: _____

Owner: _____

Owner Contact Person: _____ Telephone: _____

INFORMATION REQUIRED OF BIDDER

ATTACHMENT C

(Copy as necessary – recommended to provide more projects than required)

Contractor Project Experience Summary

Project Name: _____

Project Location: _____

Project Manager: _____

Project Superintendent: _____

Project Description: _____

Roof size (sq-ft) ([min. three projects](#)): _____

Roof material: _____

Storefront Window System size (sq-ft) ([min. two projects](#)): _____

Date Bid: _____ Date Completed: _____

Contract bid price: _____ Contract final price: _____

Contract duration at bid: _____ Final contract duration: _____

Owner's contact information: _____

AGREEMENT

An Agreement made as of the _____ day of _____, 20____, by and between the Jordan Valley Water Conservancy District, a Utah special district ("OWNER"), and _____, a _____ corporation qualified to do business and doing business in the State of Utah ("CONTRACTOR").

TERMS:

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE I WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents for the _____. The description is as follows:

Furnishing all labor, services, materials, equipment, and supplies except for such materials, equipment, and services as may be stipulated in the Contract Documents to be furnished by the OWNER; furnishing and removing all plant machinery, temporary structures, tools, supplies, transportation, utilities, and all other items, facilities and equipment, and to do everything required by this Agreement and the Contract Documents; accepting all responsibility for and paying for all loss and damage arising out of the nature of the Work aforesaid, or from the action of the elements, or from any unforeseen difficulties which may arise during the prosecution of the Work until its acceptance by OWNER, and for all risks of every description connected with the Work; also for all expenses resulting from the suspension or discontinuance of work, except as in the Contract Documents are expressly stipulated to be borne by OWNER.

ARTICLE II ENGINEER

The Project has been designed by the OWNER. The OWNER will assume all duties and responsibilities and have the rights and authority assigned to the ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

[ALTERNATE PARAGRAPH] The Project has been designed by _____, a _____ corporation qualified to do business and doing business in the State of Utah, who is hereinafter called "ENGINEER" and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE III CONTRACT TIME

- 3.1 The Work shall be complete, in accordance with paragraphs 14.08 and 14.09 of the General Conditions, on or before _____.
- 3.2 Liquidated Damages: OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that the OWNER will suffer financial loss if the Work is not completed within the time specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the OWNER if the Work is not completed on time. Accordingly, instead of requiring any proof of loss, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR will pay OWNER the amount specified in Article 14.07 of the General Conditions and in Article 18.01 of the Supplementary General Conditions for each day that expires after the time specified in paragraph 3.1 for completion until the Work is substantially complete. And, after Substantial Completion if CONTRACTOR neglects, refuses or fails to complete the remaining Work within forty-five (45) days or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER the amount specified in Article 14.07 of the General Conditions and in Article 18.01 of the Supplemental General Conditions for each day that expires after the forty-five (45) days until readiness for final payment.

ARTICLE IV CONTRACT PRICE

All payments to the Contractor shall be made in accordance with the Contract Documents. OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents in the current funds, those prices stated in the approved Bid Schedule as named in the Notice of Award.

ARTICLE V PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by the ENGINEER as provided in the General Conditions.

- 5.1 Progress Payments: OWNER shall make progress payments on account of the Contract Price based on CONTRACTOR's Applications for Payment as recommended by ENGINEER, monthly. All progress payments will be based on the progress of the Work measured by the schedule of values established

in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Conditions.

- 5.2 Final Payment: Upon completion and acceptance of the Work in accordance with Article 14 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in Article 14.

ARTICLE VI INTEREST

All monies not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of twelve percent (12%) per annum.

ARTICLE VII CONTRACTOR'S REPRESENTATION

To induce OWNER to enter into the Agreement, CONTRACTOR makes the following representations:

- 7.1 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 7.2 CONTRACTOR has studied all exploration reports and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary General Conditions, as provided in paragraph 4.02 of the General Conditions, and accepts the Technical Data contained in such reports and drawings upon which CONTRACTOR is entitled to rely.
- 7.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.02 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

- 7.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities.
- 7.5 CONTRACTOR has correlated the results of all observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents.
- 7.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors, or discrepancies that are discovered in the Contract Documents, and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

ARTICLE VIII CONTRACT DOCUMENTS

The Contract Documents for the _____, which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work, consist of the following:

- 8.1 This Agreement;
- 8.2 Performance and Payment Bonds;
- 8.3 Notice of Award;
- 8.4 Notice to Proceed;
- 8.5 General Conditions;
- 8.6 Supplemental General Conditions;
- 8.7 Notice Inviting Bids;
- 8.8 Instructions to Bidders;
- 8.9 Information Required of Bidder;
- 8.10 Technical Specifications;
- 8.11 Drawings - Sheets number one through _____;
- 8.12 Addendum number one through _____; and,
- 8.13 CONTRACTOR's Bid, including all schedules and explanatory attachments, attached as Exhibit A.

The CONTRACTOR (1) acknowledges that he has received a copy of each document specified above, (2) acknowledges that he has read and understands each document specified above, and (3) agrees to every term, condition and contract obligation set forth in each document specified above.

There are no Contract Documents other than those listed above in Article 8. The Contract Documents may only be amended, modified, or supplemented as provided in paragraphs 3.03 of the General Conditions.

ARTICLE IX
FEDERAL REQUIREMENTS

The CONTRACTOR shall comply with federal regulations as stated in the Supplemental General Conditions, Article 21.

ARTICLE X
MISCELLANEOUS

- 10.1 Terms used in this Agreement that are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 10.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 10.3 In the event any legal action or other proceeding is brought for the enforcement of this Agreement and/or the Contract Documents, or damages, because of an alleged dispute, breach, default or misrepresentation in connection with any of the provisions thereof, the successful or prevailing party shall be entitled to recover reasonable attorneys' fees and other costs incurred in the action or proceeding, in addition to any other relief to which it may be entitled.
- 10.4 Any notice to be given hereunder shall be deemed given when sent by registered or certified mail, postage prepaid, to the parties at their respective addresses stated below or at any other address when notice of such change of address has been given as provided in this Article 10.4.

[SIGNATURE PAGE TO FOLLOW]

“OWNER”:

Jordan Valley Water Conservancy District
8215 South 1300 West
West Jordan, Utah 84088

“CONTRACTOR”

Name
Address
City, State Zip

Utah Contractor License No. 0000

Utah Business Entity No. 0000

By: Jacob C. Young
Its: General Manager/CEO

By: Name
Its: Title

EXHIBIT A
CONTRACTOR'S BID

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS,

That _____, as Contractor, and as Surety, are held firmly bound unto the Jordan Valley Water Conservancy District hereinafter called "Owner," in the sum of \$_____ for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has been awarded and is about to enter into the annexed Agreement with Owner to perform all work required under the Bidding Schedule(s) of the Owner's Contract Documents entitled "SERWTP Filter Gallery & Actiflo Building Improvements".

NOW THEREFORE, if Contractor shall perform all the requirements of the Agreement required to be performed on his part, at the times and in the manner specified therein, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

PROVIDED, that any alterations in the work to be done or the materials to be furnished, or changes in the time of completion, which may be made pursuant to the terms of the Agreement, shall not in any way release Contractor or Surety thereunder, nor shall any extensions of the time granted under the provisions of the Agreement release either the Contractor or Surety, and notice of such alterations or extensions of the work, materials or time to complete made under the Agreement is hereby waived by Surety. This Bond is furnished in compliance and in accordance with 14-1-18, Utah Code Ann., as amended, and 63-56-38 Utah Code Ann., as amended.

SIGNED AND SEALED, this _____ day of _____, 20__.

By: _____ By: _____

Its: _____ Its: _____

(SEAL)

(SEAL)

(SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY)

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS,

That _____ as Contractor, and as Surety, are held firmly bound unto the Jordan Valley Water Conservancy District hereinafter called "Owner," in the sum of \$_____ for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has been awarded and is about to enter into the annexed Agreement with Owner to perform all work required under the Bidding Schedule(s) of the Owner's Contract Documents entitled, "SERWTP Filter Gallery & Actiflo Building Improvements".

NOW THEREFORE, if said Contractor, or subcontractor, fails to pay for any materials, equipment, or other supplies, or for rental of same, used in connection with the performance of work contracted to be done, or for amounts due under applicable State law for any work or labor thereon, said Surety will pay for the same in an amount not exceeding the sum specified above, and, in the event suit is brought upon this bond, a reasonable attorney's fee to be fixed by the court. This bond shall inure to the benefit of any persons, companies, or corporations entitled to file claims under applicable State law.

PROVIDED, that any alterations in the work to be done or the materials to be furnished, or changes in the time of completion, which may be made pursuant to the terms of the Agreement, shall not in any way release Contractor or Surety thereunder, nor shall any extensions of time granted under the provisions of said contract release either Contractor or the Surety, and notice of such alterations or extensions of the work, materials or time to complete made under the Agreement is hereby waived by Surety. This bond is furnished in compliance and in accordance with 14-1-18 and 19 Utah Code Ann., as amended, and 63-56-38 Utah Code Ann., as amended.

SIGNED AND SEALED, this _____ day of _____, 20____.

By: _____

By: _____

Its:

Its:

(SEAL)

(SEAL)

(SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY)

NOTICE OF AWARD

To: [Insert Contractor's Name and Address]

Re: SERWTP Filter Gallery & Actiflo Building Improvements

You are hereby notified that the OWNER has accepted your bid for the above referenced project in the amount of \$_____.

Furnish the required Contractor's Performance Bond, Payment Bond and Certificates of Insurance within ten calendar days from the date of this notice to you. An acknowledged copy of this Notice of Award, together with all future correspondence regarding this project, shall be sent to the District's Project Manager: Adam Cossey

When the Agreement is provided, sign and return it within ten calendar days from receipt of the agreement.

Dated this ____ day of _____, 20__.

Shane Swensen, P.E.
Director of Engineering & Water Development

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by:

This ____ day of _____, 20__.

Signature: _____

Printed Name: _____

Title: _____

NOTICE TO PROCEED

To: [Insert Contractor's Name and Address]

Re: SERWTP Filter Gallery & Actiflo Building Improvements

You are hereby notified to commence work in accordance with the Agreement dated _____, and you are to complete the work by, _____.

An acknowledged copy of this Notice to Proceed should be returned to the Owner,
Attention: Adam Cossey, Senior Engineer.

Dated this _____ day of _____.

Travis P. Christensen, P.E.
Engineering Group Leader

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by:

This _____ day of _____, 20____.

Signature: _____

Printed Name: _____

Title: _____

JORDAN VALLEY WATER CONSERVANCY DISTRICT

PAYMENT APPLICATION AND CERTIFICATE No. _____ **DATE:** _____

SHEET _____ OF _____

PERIOD FROM _____ TO _____, 20__

PROJECT: SERWTP Filter Gallery & Actiflo Building Improvements

JVWCD PROJECT NO.: 4324

CONTRACTOR: _____

ADDRESS: _____

ENGINEER:

JVWCD _____

1. ORIGINAL CONTRACT PRICE:..... \$ _____
2. NET CHANGE ORDERS APPROVED TO DATE: \$ _____
 (Attach Summary Sheet)
3. REVISED CONTRACT AMOUNT: \$ _____
 (Sum of Lines 1 & 2)
4. TOTAL VALUE OF WORK COMPLETED TO DATE \$ _____
 (Attached Payment Breakdown)
5. PERCENT PROJECT COMPLETE: %
 (Divide Line 4 by 3 and multiply by 100)
6. LESS AMOUNT RETAINED (5%) \$ _____
7. MATERIALS ON HAND..... \$ _____
 (95% of Value, Listing Attached)
8. SUBTOTAL (Sum of Lines 4, Line 6 and Line 7) \$ _____
9. LESS PREVIOUS PAYMENTS \$ _____
10. CURRENT PAYMENT DUE: \$ _____
 (Line 8 & 9)

JORDAN VALLEY WATER CONSERVANCY DISTRICT

Payment Application and Certificate No _____ SHEET _____ OF _____

CONTRACTOR'S Certification:

The undersigned CONTRACTOR certifies that: (1) all previous progress payments received from OWNER on account of work done under the Contract referred to herein have been applied to discharge in full all obligations of CONTRACTOR incurred in connection with work covered by prior Applications for Payment numbered 1 through _____ inclusive; and, (2) title to all materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all liens, claims, security interests and encumbrances (except such as covered by bond acceptable to OWNER).

Dated: _____ CONTRACTOR: _____

By: _____

Engineer's Recommendation:

This Application (with accompanying documentation) meets the requirements of the Contract Documents and payment of the amount due this application is recommended.

ENGINEER

Dated: _____
_____ Project Representative

Dated: _____
_____ Project Manager

JORDAN VALLEY WATER CONSERVANCY DISTRICT

CHANGE ORDER

Change Order No. _____

Date: _____

Page ____ of ____

PROJECT NAME: SERWTP Filter Gallery & Actiflo Building Improvements

PROJECT NUMBER: 4324

CONTRACTOR: _____

CONTRACT DATE: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

1)

2)

3)

Total Change to CONTRACT PRICE: \$

Original CONTRACT PRICE: \$

Current CONTRACT PRICE adjusted by previous CHANGE ORDER(S)..... \$

The new CONTRACT PRICE including this CHANGE ORDER will be \$

The CONTRACT TIME will be increased by _____ calendar days.

The date for Substantial Completion will be _____, 20____.

The Contractor agrees to furnish all labor and materials and perform all work as necessary to complete the change order items for the price named herein, which includes all supervision and miscellaneous costs. This change order constitutes full and mutual accord and satisfaction for all time and all costs related to this change. By acceptance of this change order the Contractor agrees that the change order represents an equitable adjustment to the Contract, and further agrees to waive all right to file a claim arising out of or as a result of this change. This document will become a supplement to the Contract, and all provisions will apply hereto, upon approval by the Owner.

JORDAN VALLEY WATER CONSERVANCY DISTRICT

CHANGE ORDER (CONTINUED)

Change Order No. _____

Date:

Page of

Recommended:

Engineer – McNeil Engineering

Date _____

Accepted:

Contractor –

Date _____

Approved:

Owner - Jordan Valley Water Conservancy District

Date _____

JORDAN VALLEY WATER CONSERVANCY DISTRICT

**CONTRACTOR'S CERTIFICATE
OF
SUBSTANTIAL COMPLETION**

OWNER

ENGINEER

TO: Jordan Valley Water Conservancy District
8215 South 1300 West
West Jordan, Utah 84088-0070

McNeil Engineering
8610 South Sandy Parkway
Sandy, Utah 84070

PROJECT: SERWTP Filter Gallery & Actiflo Building Improvements

ATTENTION: _____

FROM: _____
Firm or Corporation

This is to certify that I, _____ am an authorized official of working in the capacity of _____ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been substantially performed and all materials used and installed to date are in accordance with, and in conformity to, the contract drawings and specifications. A list of all incomplete work is attached.

The Contractor hereby releases the Owner and its agents from all claims of and liability to the Contractor for anything done or furnished for or relating to the work, as further provided in Article 14.08B of the General Conditions, except demands against the Owner for the remainder of progress payments retained to date, and unresolved written claims prior to this date.

The contract work is now substantially complete, ready for its intended use, and ready for your inspection. You are requested to issue a Certificate of Substantial Completion.

SIGNATURE: _____

DATE: _____

JORDAN VALLEY WATER CONSERVANCY DISTRICT

**CONTRACTOR'S CERTIFICATE
OF
FINAL COMPLETION**

OWNER

ENGINEER

TO: Jordan Valley Water Conservancy District
8215 South 1300 West
West Jordan, Utah 84088-0070

McNeil Engineering
8610 South Sandy Parkway
Sandy, Utah 84070

PROJECT: SERWTP Filter Gallery & Actiflo Building Improvements

ATTENTION: Project Representative: _____

FROM: _____
Firm or Corporation

This is to certify that I, _____ am an authorized official
of _____ working in the capacity
of _____ and have been properly authorized by
said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been performed and all materials used and installed to date are in accordance with, and in conformity to, the contract drawings and specifications.

The Contract work is now complete in all parts and requirements, excepting the attached list of minor deficiencies and the reasons for each being incomplete to date, for which exemption from final payment requirements is requested in conformance to Article 14.09A of the General Conditions of our Contract (if no exemptions requested, write "none") _____. The work is now ready for your final inspection. The following items required from the Contractor prior to application for final payment (such as O & M Manuals, guarantees, record drawings, etc.) are submitted herewith, if any:

JORDAN VALLEY WATER CONSERVANCY DISTRICT

I understand that neither the issuance by the Engineer of a Notice of Completion, nor the acceptance thereof by the Owner, shall operate as a bar or claim against the Contractor under the terms of the guarantee provisions of the Contract Documents.

SIGNATURE: _____

DATE: _____

JORDAN VALLEY WATER CONSERVANCY DISTRICT

CONSENT OF SURETY FOR FINAL PAYMENT

PROJECT NAME: SERWTP Filter Gallery & Actiflo Building Improvements

LOCATION: _____

TYPE OF CONTRACT: _____

AMOUNT OF CONTRACT: _____

In accordance with the provisions of the above-named contract between the Owner and the Contractor, the following named surety:

on the Payment Bond of the following named Contractor:

hereby approves of final payment to the Contractor, and further agrees that said final payment to the Contractor shall not relieve the Surety Company named herein of any of its obligations to the following named Owner (as set forth in said Surety company's bond):

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand and seal this day of _____, 20____.

(Name of Surety Company)

(Signature of Authorized Representative)

(Name of Authorized Representatives)

(Title)

JORDAN VALLEY WATER CONSERVANCY DISTRICT

AFFIDAVIT OF PAYMENT

To All Whom It May Concern:

WHEREAS, the undersigned has been employed by the Jordan Valley Water Conservancy District to furnish labor and materials under a contract dated _____ for the project entitled "SERWTP Filter Gallery & Actiflo Building Improvements", in the County of Salt Lake, State of Utah, of which Jordan Valley Water Conservancy District is the Owner.

NOW, THEREFORE, this _____ day of _____, 20____, the undersigned, as the Contractor for the above-named Contract pursuant to the Conditions of the Contract hereby certifies that, except as listed below, he has paid in full or has otherwise satisfied all obligations 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 his property might in any way be held responsible.

EXCEPTIONS: (If none, write "None". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each Exception.)

Contractor (Name of sole ownership,
corporation or partnership)

(affix corporate seal here)

(Signature of Authorized Representative)

Title: _____

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated:

Addenda - Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the Contract Documents.

Agreement - The written contract between the OWNER and the CONTRACTOR for the performance of the WORK pursuant to the Contract Documents. Documents incorporated into the contract by reference become part of the contract and of the Agreement.

Application for Payment - The form furnished by the ENGINEER and completed by the CONTRACTOR to request progress or final payment including supporting documentation to substantiate the amounts for which payment is requested.

Bonds - Performance, and Payment Bonds and other instruments which protect against loss due to inability or refusal of the CONTRACTOR to perform pursuant to the Contract Documents.

Change Order - A document recommended by the ENGINEER, which is signed by the CONTRACTOR and the OWNER and authorizes an addition, deletion, or revision in the WORK, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

Contract Documents - Information and Instructions, forms (including the Schedule of Prices and all required certificates and affidavits), Agreement, Performance Bond, Payment Bond, General Conditions, Supplemental General Conditions, Technical Specifications, Drawings and all Addenda and Change Orders executed pursuant to the provisions of the Contract Documents.

Contract Price - The total monies payable by the OWNER to the CONTRACTOR under the terms and conditions of the Contract Documents.

Contract Time - The number of successive Days stated in the Contract Documents for the completion of the WORK. The Contract Time begins to run on the date specified in the Notice to Proceed.

CONTRACTOR - The person, firm, or corporation with whom the OWNER has executed the Agreement.

Cost Proposal - The offer or proposal of the pipeline installation subcontractor to the CONTRACTOR to provide the work required under these Contract Documents.

Day - A calendar day of 24 hours measured from midnight to the next midnight.

Defective Work - Work that: is unsatisfactory, faulty, or deficient; does not conform to the Contract Documents; does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; has been damaged prior to the ENGINEERS's recommendation of final payment.

Drawings - The drawings, plans, maps, profiles, diagrams, and other graphic representations which show the character, location, nature, extent, and scope of the WORK.

Effective date of the Agreement - The date indicated in the Agreement on which it was executed, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

ENGINEER - The person, firm, or corporation named as such in the Contract Documents.

Field Order - A written order issued by the ENGINEER which may or may not involve a change in the WORK.

Laws and Regulations; Laws or Regulations - Laws, rules, regulations, ordinances, codes, and/or orders promulgated by a lawfully constituted body authorized to issue such Laws and Regulations.

Notice of Award - The OWNER's written notice to the apparent successful Bidder stating that upon compliance with the conditions precedent enumerated therein by the apparent successful Bidder within the time specified, the OWNER will enter into the Agreement.

Notice to Proceed - The OWNER's written notice to the CONTRACTOR authorizing the CONTRACTOR to proceed with the work and establishing the date of commencement of the Contract Time.

OWNER - The Jordan Valley Water Conservancy District.

Partial Utilization - Placing a portion of the WORK in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion of the WORK.

Project - A unit of total construction of which the WORK to be provided under the Contract Documents, may be the whole, or a part thereof.

Project Representative - The authorized representative of the ENGINEER who is assigned to the site or any part thereof.

Proposer - Any person, firm or corporation submitting a proposal for the work.

Schedule of Prices - The offer or proposal of the CONTRACTOR setting forth the price or prices for the work to be performed.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of WORK and all illustrations, brochures, standard schedules, performance charts, instruction, and diagrams to illustrate material or equipment for some portion of the WORK.

Specifications - (Same definition as for Technical Specifications hereinafter).

Subcontractor - An individual, firm, or corporation having a direct contract with the CONTRACTOR or with any other Subcontractor for the performance of a part of the WORK at the site.

Substantial Completion - That state of construction when the WORK has progressed to the point where, in the opinion of the ENGINEER as evidenced by the Certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the WORK can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to any work refer to substantial completion thereof.

Supplementary General Conditions - The part of the Contract Documents which make additions, deletions, or revisions to these General Conditions.

Supplier - A manufacturer, fabricator, supplier, distributor, materialman, or vendor.

Technical Data - The factual information contained in reports describing physical conditions, including exploration method, plans, logs, laboratory test methods and factual data. Technical Data does not include conclusions, interpretations, interpolations, extrapolations or opinions contained in reports or reached by the CONTRACTOR.

Technical Specifications - Those portions of the Contract Documents consisting of the written technical descriptions of products and execution of the WORK.

Underground Utilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments and any encasements containing such facilities which have been installed under ground to furnish any of the following services or

materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic, or other control systems.

WORK - The entire construction required to be furnished under the Contract Documents. WORK is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

GENERAL CONDITIONS

ARTICLE 2 - PRELIMINARY MATTERS

2.01 DELIVERY OF BONDS/INSURANCE CERTIFICATES

- A. The CONTRACTOR shall deliver to the OWNER the Agreement, Bonds, Insurance Policies and Certificates required by the Contract Documents within ten (10) days after receiving the Notice of Award from the OWNER.

2.02 COPIES OF DOCUMENTS

- A. The OWNER shall furnish the CONTRACTOR 5 copies of the Contract Documents, together with 5 sets of full-scale Drawings. Additional quantities of the Contract Documents will be furnished at reproduction cost.

2.03 STARTING THE PROJECT

- A. The CONTRACTOR shall begin construction of the WORK within 10 days after the commencement date stated in the Notice to Proceed, but shall not commence construction prior to the commencement date.

2.04 BEFORE STARTING CONSTRUCTION

- A. Before undertaking each part of the WORK, the CONTRACTOR shall carefully study and compare the Contract Documents to check and verify pertinent figures and dimensions shown thereon with all applicable field measurements. The CONTRACTOR shall promptly report in writing to the ENGINEER any conflict, error, or discrepancy which the CONTRACTOR may discover and shall obtain a written interpretation or clarification from the ENGINEER before proceeding with any work affected thereby.
- B. The CONTRACTOR shall submit to the ENGINEER for review those documents called for in each section of the Technical Specifications.

2.05 PRECONSTRUCTION CONFERENCE

- A. The CONTRACTOR shall attend a preconstruction conference with the OWNER, the ENGINEER and others as appropriate to discuss the construction of the WORK in accordance with the Contract Documents.

GENERAL CONDITIONS

2.06 FINALIZING SCHEDULES

- A. At least 7 days before the CONTRACTOR's submittal of its first Application for Payment, the CONTRACTOR, the ENGINEER, and others as appropriate will meet to finalize the schedules submitted in accordance with the Technical Specifications.

GENERAL CONDITIONS

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 INTENT

- A. The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the WORK. The Contract Documents are complementary, what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.
- B. It is the intent of the Contract Documents to describe the WORK, functionally complete, to be constructed in accordance with the Contract Documents. All work, materials, or equipment that may be reasonably inferred from the Contract Documents as being required to produce the completed work shall be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe work, materials, or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals, or codes or any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the OWNER, the CONTRACTOR, or the ENGINEER or any of their consultants, agents, or employees from those set forth in the Contract Documents.
- C. If, during the performance of the WORK, the CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, the CONTRACTOR shall immediately report it to the ENGINEER in writing and before proceeding with the work affected thereby. The ENGINEER shall then make a written interpretation, clarification, or correction from the ENGINEER.

GENERAL CONDITIONS

3.02 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

A. In resolving conflicts resulting from conflicts, errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Change Orders
2. Agreement
3. Addenda
4. Contractor's Bid (Bid Form)
5. Supplemental General Conditions
6. Notice Inviting Bids
7. Instructions to Bidders
8. General Conditions
9. Technical Specifications
10. Referenced Standard Specifications
11. Drawings

B. With reference to the Drawings the order of precedence is as follows:

1. Figures govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda/change order drawings govern over general drawings
4. Contract Drawings govern over standard drawings

3.03 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS

A. The Contract Documents may be amended by a Change Order (pursuant to Article 10) to provide for additions, deletions or revisions in the WORK or to modify terms and conditions.

GENERAL CONDITIONS

3.04 REUSE OF DOCUMENTS

- A. Neither the CONTRACTOR, Subcontractor, Supplier, nor any other person or organization performing any of the WORK under a contract with the OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Technical Specifications, or other documents used on the WORK, and they shall not reuse any of them on the extensions of the Project or any other project without written consent.

GENERAL CONDITIONS

ARTICLE 4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS: REFERENCE POINTS

4.01 AVAILABILITY OF LANDS

- A. The OWNER shall furnish the lands, rights-of-way and easements upon which the WORK is to be performed and for access thereto, together with other lands designated for the use of the CONTRACTOR in the Contract Documents. Easements for permanent structures or permanent changes in existing major facilities will be obtained and paid for by the OWNER, unless otherwise provided in the Contract Documents. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or rights-of-way provided. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. The CONTRACTOR shall not enter upon nor use any property not under the control of the OWNER until a written temporary construction easement agreement has been executed by the CONTRACTOR and the property owner, and a copy of the easement furnished to the ENGINEER prior to its use. Neither the OWNER nor the ENGINEER shall be liable for any claims or damages resulting from the CONTRACTOR's unauthorized trespass or use of any properties.

4.02 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES

- A. Explorations and Reports: The paragraph entitled "Physical Conditions" of the Supplementary General Conditions identifies exploration reports and subsurface conditions tests at the site that have been utilized by the ENGINEER in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the Technical Data contained in these reports. The CONTRACTOR is responsible for the interpretation, extrapolation or interpolation of all technical as well as nontechnical data and its reliance on the completeness, opinions and interpretation of the reports.
- B. Existing Structures: The paragraph entitled "Physical Conditions" of the Supplementary General Conditions identifies the drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Utilities referred to in Paragraph 4.04 herein) which are at or contiguous to the site that have been utilized by the ENGINEER in the preparation of the Contract Documents. The CONTRACTOR is responsible for the interpretation, extrapolation or interpolation of all technical as well as nontechnical data and its reliance on the completeness, opinions and interpretation of the reports.

GENERAL CONDITIONS

4.03 DIFFERING SITE CONDITIONS

- A. The CONTRACTOR shall notify the ENGINEER upon encountering any of the following unforeseen conditions, hereinafter called "differing site conditions," during the prosecution of the WORK. The CONTRACTOR's notice to the ENGINEER shall be in writing and delivered before the differing site conditions are disturbed, but in no event later than 14 days after their discovery.
 - 1. Subsurface or latent physical conditions at the site of the WORK differing materially from those indicated, described, or delineated in the Contract Documents including those reports and documents discussed in Paragraph 4.02; and
 - 2. Physical conditions at the site of the WORK of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents including those reports and documents discussed in Paragraph 4.02.
- B. The ENGINEER will review the alleged differing site conditions, determine the necessity of obtaining additional explorations or tests with respect to verifying their existence and extent and advise the OWNER in writing of the ENGINEER's findings and conclusions.
- C. If the OWNER concludes that because of newly discovered conditions a change in the Contract Documents is required, a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the differing site conditions.
- D. In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to the differing site conditions. If the OWNER and the CONTRACTOR are unable to agree as to the amount or length of the Change Order, a claim may be made as provided in Articles 11 and 12.
- E. The CONTRACTOR's failure to give written notice of differing site conditions within 14 days of their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith, whether direct or consequential in nature.

GENERAL CONDITIONS

4.04 PHYSICAL CONDITIONS - UNDERGROUND UTILITIES

- A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Utilities at or contiguous to the site are based on information and data furnished to the OWNER or the ENGINEER by the owners of Underground Utilities or by others. Unless it is expressly provided in the Supplementary General Conditions and/or the Section entitled "Protection and Restoration of Existing Facilities" of the Technical Specifications, the OWNER and the ENGINEER shall not be responsible for the accuracy or completeness of any Underground Utilities information or data. The CONTRACTOR's responsibility relating to underground utilities are: review and check all information and data, locate all Underground Utilities shown or indicated in the Contract Documents, coordinate the WORK with the owners of Underground Utilities during construction, the safeguard and protect the of Underground Utilities, and repair any damage to Underground Utilities resulting from the WORK. The cost of all these activities will be considered as having been included in the Contact Price.
- B. Not Shown or Indicated: If an Underground Utility not shown or indicated in the Contract Documents is uncovered or revealed at or contiguous to the site and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall give written notice to the OWNER of that utility and the ENGINEER, specifying the location of the utility in question.

4.05 REFERENCE POINTS

- A. The ENGINEER will provide one bench mark, near or on the site of the WORK, and will provide two points near or on the site to establish a base line for use by the ENGINEER for alignment control. Unless otherwise specified in the Technical Specifications, the CONTRACTOR shall furnish all other lines, grades, and bench marks required for proper execution of the WORK.
- B. The CONTRACTOR shall preserve all bench marks, stakes, and other survey marks. In case of their removal or destruction by its own employees or by its subcontractor's employees, the CONTRACTOR shall be responsible for the accurate replacement of reference points by professionally qualified personnel at no additional cost to the OWNER.

GENERAL CONDITIONS

ARTICLE 5 - BONDS AND INSURANCE

5.01 PERFORMANCE AND OTHER BONDS

- A. The CONTRACTOR shall furnish Performance and Payment Bonds, each in the amount set forth in the Supplementary General Conditions as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents. All insurance companies, sureties, and bond companies shall have an AM Best rating of A- or better, with a Financial Size Category of XII or better. Sureties shall also be listed on the Department of the Treasury's Circular 570, with an acceptable underwriting limitation limit. The Performance Bond shall remain in effect at least until one year after the date of Notice of Completion, except as otherwise provided by Law or Regulation or by the Contract Documents. After the ENGINEER issues the Notice of Completion, the amount of the Performance Bond may be reduced to 10 percent of the Contract Price, or \$1,000, whichever is greater. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions.
- B. If the surety on any Bond furnished by the CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days after written approval by the OWNER of a substitute Bond and Surety substitute the approved Bond and Surety.

5.02 INSURANCE

- A. The CONTRACTOR shall purchase and maintain the insurance required under this paragraph. All insurance companies, sureties, and bond companies shall have an AM Best rating of A- or better, with a Financial Size Category of XII or better. Sureties shall also be listed on the Department of the Treasury's Circular 570, with an acceptable underwriting limitation limit. This insurance shall include the specific coverages set out herein and be written for not less than the limits of liability and coverages provided in the Supplementary General Conditions, or required by law, whichever is greater. The CONTRACTOR's liabilities under the Agreement shall not be deemed limited in any way to the insurance coverage required.
- B. The CONTRACTOR shall furnish the OWNER and ENGINEER with certificates indicating the type, amount, class of operations covered, effective dates and expiration dates of all policies. All insurance policies purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 30 days' prior written

GENERAL CONDITIONS

notice has been given to the OWNER by certified mail. All insurance shall remain in effect until the ENGINEER issues the Notice of Completion and at all times thereafter when the CONTRACTOR may be correcting, removing, or replacing defective work in accordance with Paragraph 13.06 or completing punch list items required by the Notice of Completion. In addition, the insurance required herein (except for Worker's Compensation and Employer's Liability) shall name the OWNER, the ENGINEER, and their officers, agents, and employees as "additional insured" under the policies.

1. Workers' Compensation and Employer's Liability: This insurance shall protect the CONTRACTOR against all claims under applicable state workers' compensation laws. The CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" endorsement. The CONTRACTOR shall require each subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in the WORK unless its employees are covered by the protection afforded by the CONTRACTOR's Workers' Compensation Insurance. In the event a class of employees is not protected under the Workers' Compensation Statute, the CONTRACTOR or Subcontractor, as the case may be, shall provide adequate employer's liability insurance for the protection of its employees not protected under the statute.
2. Comprehensive General Liability: This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims arising from injuries to persons other than its employees and damage to property of the OWNER or others arising out of any act or omission of the CONTRACTOR or its agents, employees or subcontractors. The policy shall include the following endorsements: (1) Protective Liability endorsement to insure the contractual liability assumed by the CONTRACTOR under the indemnification provisions in these General Conditions; (2) Broad Form Property Damage endorsement; (3) Personal Injury endorsement to cover personal injury liability for intangible harm. The Comprehensive General Liability coverage shall contain no exclusion relative to blasting, explosion, collapse of building, or damage to underground structures.
3. Comprehensive Automobile Liability: This insurance shall be written in comprehensive form. The policy shall protect the CONTRACTOR against all claims for injuries to employees, members of the public and

GENERAL CONDITIONS

damage to property of others arising from the use of CONTRACTOR's motor vehicles, whether they are owned, non-owned, or hired, and whether used or operated on or off the site. The motor vehicle insurance required under this paragraph shall include: (a) motor vehicle liability coverage; (b) personal injury protection coverage and benefits; and (c) uninsured motor vehicle coverage.

4. Subcontractor's Insurance: The CONTRACTOR shall require each of its subcontractors to procure and to maintain Comprehensive General Liability Insurance and Comprehensive Automobile Liability Insurance of the type and in the amounts specified in the Supplementary General Conditions or insure the activities of its subcontractors in the CONTRACTOR's own policy, in like amount.
5. Builder's Risk: This insurance shall be of the "all risk" type, shall be written in completed value form, and shall protect the CONTRACTOR, the OWNER, and the ENGINEER against damage to buildings, structures, materials and equipment. The amount of this insurance shall not be less than the insurable value of the WORK at completion. Builder's risk insurance shall provide for losses to be payable to the CONTRACTOR, the OWNER, and the ENGINEER as their interests may appear. The policy shall contain a provision that in the event of payment for any loss under the coverage provided, the insurance company shall have no rights of recovery against the CONTRACTOR, the OWNER, and the ENGINEER. The Builder's Risk policy shall insure against all risks of direct physical loss or damage to property from any external cause including flood and earthquake. Allowable exclusions, if any, shall be as specified in the Supplementary General Conditions.

GENERAL CONDITIONS

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 SUPERVISION AND SUPERINTENDENCE

- A. The CONTRACTOR shall supervise and direct the WORK competently and efficiently, devoting the attention and applying the skills and expertise necessary to perform the WORK in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incidental thereto. The CONTRACTOR shall be responsible to see that the finished WORK complies accurately with the Contract Documents.
- B. The CONTRACTOR shall employ the Superintendent named in "Information Required of Bidder" on the work site at all times during the progress of the WORK. The superintendent shall not be replaced without the OWNER's written consent. The superintendent will be the CONTRACTOR's representative at the site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall issue all its communications to the OWNER through the ENGINEER.
- C. The CONTRACTOR's superintendent shall be present at the site of the WORK at all times while work is in progress. Failure to observe this requirement shall be considered suspension of the WORK by the CONTRACTOR until the superintendent is again present at the site.

6.02 LABOR, MATERIALS, AND EQUIPMENT

- A. The CONTRACTOR shall provide skilled, competent and suitably qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. When required in writing by the OWNER or ENGINEER, the CONTRACTOR or any subcontractor shall discharge any person who is, in the opinion of the OWNER or ENGINEER, incompetent, disorderly, or otherwise unsatisfactory and shall not again employ the discharged person on the WORK without the consent of the OWNER or ENGINEER. The CONTRACTOR shall at all times maintain good discipline and order at the site.
- B. Except in connection with the safety or protection of persons the WORK, or property at the site or adjacent thereto, all work at the site shall be performed during regular working hours, and the CONTRACTOR will not permit overtime work or the performance of work on Saturday, Sunday or any legal holiday without the OWNER's written consent given after prior written notice

GENERAL CONDITIONS

to the ENGINEER. Except as otherwise provided in this Paragraph, the CONTRACTOR shall receive no additional compensation for overtime work, i.e., work in excess of 8 hours in any one calendar day or 40 hours in any one calendar week, even though such overtime work may be required under emergency conditions and may be ordered by the ENGINEER in writing. Additional compensation will be paid the CONTRACTOR for overtime work in the event extra work is ordered by the ENGINEER and the Change Order specifically authorizes the use of overtime work, but only to the extent that the CONTRACTOR pays overtime wages on a regular basis being paid by for overtime work of a similar nature in the same locality.

- C. All costs of inspection and testing performed during overtime work approved solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The OWNER shall have the authority to deduct the costs of all inspection and testing from any partial payments otherwise due to the CONTRACTOR.
- D. Unless otherwise specified in the Contract Documents, the CONTRACTOR shall furnish, erect, maintain and remove the construction plant, and temporary works and assume full responsibility for all materials, equipment, labor, transportation, construction equipment, machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities and all other facilities and incidentals necessary for the furnishing, performance testing, start-up and completion of the WORK.
- E. All materials and equipment incorporated into the WORK shall be of new and good quality, except as otherwise provided in the Contract Documents. If required by the ENGINEER, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. The CONTRACTOR shall apply, install, connect, erect, use, clean, and condition all material and equipment in accordance with the instructions of the manufacturer and Supplier except as otherwise provided in the Contract Documents.

6.03 ADJUSTING PROGRESS SCHEDULE

- A. The CONTRACTOR shall submit any adjustments in the progress schedule to the ENGINEER for acceptance in accordance with the provisions for "Contractor Submittals" in the Technical Specifications.

GENERAL CONDITIONS

6.04 SUBSTITUTES OR "OR-EQUAL" ITEMS

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below:
1. "Or-Equal" Items: If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.04.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment ENGINEER determines that: (i) it is a least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;
 - b. CONTRACTOR certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Document.
 2. Substitute Items
 - a. If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under paragraph 6.04.A.1, it will be considered a proposed substitute item.
 - b. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or

GENERAL CONDITIONS

equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR.

- c. The procedure for review by ENGINEER will be as set forth in paragraph 6.04.A.2.d, as supplemented in the Technical Specifications and as ENGINEER may decide is appropriate under the circumstances.
 - d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item, and whether or not incorporation or use of the substitute item is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.
- B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in

GENERAL CONDITIONS

ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.04.A.2.

- C. Engineer's Evaluation: ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.04.A and 6.04.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." ENGINEER will advise CONTRACTOR in writing of any negative determination.
- D. Special Guarantee: OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.
- E. ENGINEER's Cost Reimbursement: ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.04.A.2 and 6.04.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluation each such proposed substitute.
- F. CONTRACTOR's EXPENSE: CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

6.05 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- A. The CONTRACTOR shall be responsible to the OWNER and the ENGINEER for the acts and omissions of its subcontractors and their employees to the same extent as the CONTRACTOR is responsible for the acts and omissions of its own employees. Nothing contained in this paragraph shall create any contractual relationship between any subcontractor and the OWNER or the ENGINEER nor relieve the CONTRACTOR of any liability or obligation under the Agreement.

6.06 PERMITS

GENERAL CONDITIONS

- A. Unless otherwise provided in the Supplementary General Conditions, the CONTRACTOR shall obtain and pay for all construction permits and licenses from the agencies having jurisdiction, including furnishing the insurance and bonds required by such agencies. The costs incurred by the CONTRACTOR in compliance with this paragraph shall not be made the basis for claims for additional compensation. The OWNER shall assist the CONTRACTOR, when necessary, in obtaining such permits and licenses. The CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the WORK, which are applicable at the time of opening of Bids, including all utility connection charges for utilities required by the WORK.
- B. The CONTRACTOR shall pay all license fees and royalties and assume all costs when any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others when issued in the construction of the WORK or incorporated into the WORK. If a particular invention, design, process, product, or device is specified in the Contract Documents for incorporation into or use in the construction of the WORK and if to the actual knowledge of the OWNER or the ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of these rights shall be disclosed by the OWNER in the Contract Documents. The CONTRACTOR shall indemnify, defend and hold harmless the OWNER and the ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses (including attorneys' fees and court costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product, or device not specified in the Contract Documents.

6.07 LAWS AND REGULATIONS

- A. The CONTRACTOR shall observe and comply with all federal, state, and local laws, ordinances, codes, orders, and regulations which in any manner affect those engaged or employed on the WORK, the materials used in the WORK, or the conduct of the WORK. If any discrepancy or inconsistency should be discovered in the Contract Documents in relation to any law, ordinance, code, order, or regulations, the CONTRACTOR shall report the same in writing to the ENGINEER. The CONTRACTOR shall indemnify, defend and hold harmless the OWNER, the ENGINEER and their officers, agents, and employees against all claims and from violation of any law, ordinance, code, order, or regulation, whether by CONTRACTOR or by its employees or subcontractors. Any particular law or regulation specified or

GENERAL CONDITIONS

referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of federal, state, and local laws and regulations. Where an individual State act on occupational safety and health standards has been approved by Federal authority, then the provision of said State act shall control.

6.08 EQUAL OPPORTUNITY

- A. The Contractor agrees to abide by: the provisions of Title VII of the Civil Rights Act of 1964 (42USC § § 2000e et seq.), which prohibits discrimination against any employee or applicant for employment on the basis of race, religion, color, or national origin; Executive Order No. 11246, as amended, which prohibits discrimination on the basis of sex; 45 CFR 90, which prohibits discrimination on the basis of age; Section 504 of the Rehabilitation Act of 1973, (42 USC § 794), which prohibits discrimination on the basis of handicap; Utah Executive Order dated June 30, 1989, which prohibits sexual harassment in the workplace; and the Americans with Disabilities Act (42 USC § § 12111 et seq.), which prohibits discrimination against qualified employees and applicants with a disability.

GENERAL CONDITIONS

6.09 TAXES

- A. The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by the CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the WORK.

6.10 USE OF PREMISES

- A. The CONTRACTOR shall confine construction equipment, stored materials and equipment, and other operations of workers to (1) the Project site, (2) the land and areas identified for the CONTRACTOR's use in the Contract Documents, and (3) other lands whose use is acquired by Laws and Regulations, rights-of-way, permits, and easements. The CONTRACTOR shall be fully responsible to the owner and occupant of such lands for any damage to the lands or areas contiguous thereto, resulting from the performance of the WORK or otherwise. Should any claim be made against the OWNER or the ENGINEER by owner or occupant of lands because of the performance of the WORK, the CONTRACTOR shall promptly settle the claim by agreement, or resolve the claim through litigation. The CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify, defend, and hold the OWNER and the ENGINEER harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of engineers, architects, attorneys, and other professionals and court costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any owner or occupant of land against the OWNER or the ENGINEER to the extent the claim is based or arises out of the CONTRACTOR's performance of the WORK.

6.11 SAFETY AND PROTECTION

- A. The CONTRACTOR shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. All employees on the WORK and other persons and organizations who may be affected thereby.
 - 2. All the WORK and materials and equipment to be incorporated therein, whether in storage on or off the site; and

GENERAL CONDITIONS

3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
- B. The CONTRACTOR shall comply with all applicable Laws and Regulations (whether referred to herein or not) of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Unless the CONTRACTOR otherwise designates in writing a different individual as the responsible individual, the CONTRACTOR's superintendent shall be CONTRACTOR's representative at the site whose duty shall be the prevention of accidents.

6.12 SHOP DRAWINGS AND SAMPLES

- A. After checking and verifying all field measurements and after complying with the applicable procedures specified in the Technical Specifications, the CONTRACTOR shall submit all shop drawings to the ENGINEER for review and approval in accordance with the approved schedule for shop drawings submittals specified in the Technical Specifications.
- B. The CONTRACTOR shall also submit to the ENGINEER for review and approval all samples in accordance with the approved schedule of sample submittals specified in the Technical Specifications.
- C. Before submitting shop drawings or samples, the CONTRACTOR shall determine and verify all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and review or coordinate each shop drawing or sample with other shop drawings and samples and with the requirements of the WORK and the Contract Documents.

GENERAL CONDITIONS

6.13 CONTINUING THE WORK

- A. The CONTRACTOR shall carry on the WORK and adhere to the progress schedule during all disputes or disagreements with the OWNER. No work shall be delayed or postponed pending resolution of any dispute or disagreement, except as the CONTRACTOR and the OWNER may otherwise mutually agree in writing.

6.14 INDEMNIFICATION

- A. To the fullest extent permitted by Laws and Regulations, the CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the ENGINEER, and their officers, agents, and employees, against and from all claims and liability arising under or by reason of the Agreement or any performance of the WORK, but not from the sole negligence or willful misconduct of the OWNER and/or the ENGINEER. Such indemnification by the CONTRACTOR shall include but not be limited to the following:
 - 1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR or its agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR or its agents;
 - 2. Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree, whether by the CONTRACTOR or its agents;
 - 3. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its agents, or the OWNER in the performance of this Agreement of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specifically stipulated in this Agreement.
 - 4. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the OWNER or any other parties by the CONTRACTOR or its agents;
 - 5. Liabilities or claims arising directly or indirectly from the willful misconduct of the CONTRACTOR or its agents; and,

GENERAL CONDITIONS

- 6. Liabilities or claims arising directly or indirectly from any breach of the obligations assumed herein by the CONTRACTOR.
- B. The CONTRACTOR shall reimburse the OWNER, and the ENGINEER for all costs and expense, (including but not limited to fees and charges of engineers, architects, attorneys, and other professional and court costs) incurred by the OWNER, and the ENGINEER in enforcing the provisions of this Paragraph.
- C. The indemnification obligation under this Paragraph shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any such subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

6.15 CONTRACTOR'S DAILY REPORTS

- A. The CONTRACTOR shall complete a daily report indicating manpower, major equipment, subcontractors, weather conditions, etc., involved in the performance of the WORK. The daily report shall be completed on forms prepared by the CONTRACTOR and acceptable to the ENGINEER, and shall be submitted to the ENGINEER at the conclusion of each work day.

6.16 ASSIGNMENT OF CONTRACT

- A. The CONTRACTOR shall not assign, sublet, sell, transfer, or otherwise dispose of the Agreement or any portion thereof, or its right, title, or interest therein, or obligations thereunder, without the written consent of the OWNER except as imposed by law. If the CONTRACTOR violates this provision, the Agreement may be terminated at the option of the OWNER. In such event, the OWNER shall be relieved of all liability and obligations to the CONTRACTOR and to its assignee or transferee, growing out of such termination.

GENERAL CONDITIONS

ARTICLE 7 - OTHER WORK

7.01 RELATED WORK

- A. The OWNER may perform other work related to the Project at the site by the OWNER's own forces, have other work performed by utility owners, or let other direct contracts for the performance of the other work which may contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to commencing any other work.
- B. The CONTRACTOR shall afford each utility owner and other contractor who is a party to a direct contract (or the OWNER, if the OWNER is performing the additional work with the OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of the other work. The CONTRACTOR shall properly connect and coordinate the WORK with the other work. The CONTRACTOR shall do all cutting, fitting, and patching of the WORK that may be required to make its several parts come together properly and integrate with the other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and shall only cut or alter their work with the written consent of the ENGINEER and the others whose work will be affected.
- C. If the proper execution or results of any part of the CONTRACTOR's work depends upon the integration of work with the completion of other work by any other contractor or utility owner (or the OWNER), the CONTRACTOR shall inspect and report to the ENGINEER in writing all delays, defects, or deficiencies in the other work that renders it unavailable or unsuitable for proper integration with the CONTRACTOR's work. Except for the results or effects of latent or nonapparent defects and deficiencies in the other work, the CONTRACTOR's failure to report will constitute an acceptance of the other work as fit and proper for integration with the CONTRACTOR's work and as a waiver of any claim for additional time or compensation associated with the integration of the CONTRACTOR's work with the other work.

GENERAL CONDITIONS

7.02 COORDINATION

- A. If the OWNER contracts with others for the performance of other work on the Project at the site, a coordinator will be identified to the extent that the coordinator can be identified at this time, in the Supplementary General Conditions and delegated the authority and responsibility for coordination of the activities among the various contractors. The specific matters over which the coordinator has authority and the extent of the coordinator's authority and responsibility will be itemized in the Supplementary General Conditions or in a notice to the CONTRACTOR at such time as the identity of the coordinator is determined.

GENERAL CONDITIONS

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 COMMUNICATIONS

- A. The OWNER shall issue all its communications to the CONTRACTOR through the ENGINEER.

8.02 PAYMENTS

- A. The OWNER shall make payments to the CONTRACTOR as provided in Paragraphs 14.05 and 14.09.

8.03 LANDS, EASEMENTS, AND SURVEYS

- A. The OWNER's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. The OWNER shall identify and make available to the CONTRACTOR copies of exploration reports and subsurface conditions tests at the site and in existing structures which have been utilized by the ENGINEER in preparing the Drawings and Technical Specifications as set forth in Paragraph 4.02

8.04 CHANGE ORDERS

- A. The OWNER shall execute approved Change Orders for the conditions described in Paragraph 10.01D.

8.05 INSPECTIONS AND TESTS

- A. The OWNER's responsibility with respect to inspection, tests, and approvals is set forth in Paragraph 13.03B.

8.06 SUSPENSION OF WORK

- A. In connection with the OWNER's right to stop work or suspend work, see Paragraphs 13.04 and 15.01. Paragraphs 15.02 and 15.03 deal with the OWNER's right to terminate services of the CONTRACTOR under certain circumstances.

GENERAL CONDITIONS

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 OWNER'S REPRESENTATIVE

- A. The ENGINEER will be the OWNER's representative during the construction period. The duties, responsibilities and the limitations of authority of the ENGINEER as the OWNER's representative during construction are set forth in a separate agreement with the OWNER and are summarized hereafter.

9.02 VISITS TO SITE

- A. The ENGINEER will make visits to the site during construction to observe and inspect the progress and quality of the WORK and to determine, in general if the WORK is proceeding in accordance with the Contract Documents.

9.03 PROJECT REPRESENTATION

- A. The ENGINEER will furnish a Project Representative to observe and inspect the performance of the WORK. The Project Representative and/or other authorized agents of the Engineer shall serve as the chief Owner/Engineer contact(s) with the Contractor during the construction phase. All submittals shall be delivered to and communications between the Engineer and the Contractor shall be handled by the Project Representative and/or other authorized agents. The Project Representative shall be the chief authorized representative of the Owner and the Engineer at the site of the work in all on-site relations with the Contractor.

9.04 CLARIFICATIONS AND INTERPRETATIONS

- A. The ENGINEER will issue with reasonable promptness written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as the ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

9.05 AUTHORIZED VARIATIONS IN WORK

- A. The ENGINEER may authorize minor variation in the WORK as described in the Contract Documents when such variations do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These variations shall be accomplished by issuing a Field Order. The issuance of a Field Order requires the CONTRACTOR to perform the work described in the order promptly. If the

GENERAL CONDITIONS

CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and parties are unable to agree as the amount or extent thereof, the CONTRACTOR may make a claim therefor as provided in Article 11 or 12.

9.06 REJECTION OF DEFECTIVE WORK

- A. The ENGINEER is authorized to reject work which the ENGINEER believes to be defective and require special inspection or testing of the WORK as provided in Paragraph 13.03G, whether or not the WORK is fabricated, installed, or completed.

9.07 CONTRACTOR SUBMITTALS, CHANGE ORDERS, AND PAYMENTS

- A. The ENGINEER will review for approval all Contractor submittals, including shop drawings, samples, substitutes, and "or equal" items, etc., in accordance with the procedures set forth in the Technical Specifications.
- B. In connection with the ENGINEER's responsibilities as to Change Orders, see Articles 10, 11, and 12.
- C. In connection with the ENGINEER's responsibilities with respect to Applications for Payment, see Article 14.

9.08 DECISIONS ON DISPUTES

- A. All claims, disputes, and other matters concerning the acceptability of the WORK, the interpretation of the requirements of the Contract Documents pertaining to the performance of the WORK, and claims for changes in the Contract Price or Contract Time under Articles 11 and 12 will be referred to the ENGINEER in writing with a request for formal decision in accordance with this paragraph. The ENGINEER will render a decision in writing within 30 days of receipt of the request. Written notice of each claim, dispute, or other matter will be delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 30 days) after the occurrence of the event. Written supporting data will be submitted to the ENGINEER with the written claim unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.
- B. When reviewing the claim or dispute, the ENGINEER will not show partiality to the OWNER or the CONTRACTOR and will incur no liability in connection with any interpretation or decision rendered in good faith. The ENGINEER's rendering of a decision with respect to any claim, dispute, or other matter (except any which have been waived by the making or acceptance of final

GENERAL CONDITIONS

payment as provided in Paragraph 14.12) shall be a condition precedent to the OWNER's or the CONTRACTOR's exercise of their rights or remedies under the Contract Documents or by Law or Regulations with respect to the claim, dispute, or other matter.

9.09 LIMITATION ON ENGINEER'S RESPONSIBILITIES

- A. Neither the ENGINEER's authority to act pursuant to its agreement with the OWNER, nor the description of that authority under this Article 9, nor any other description of the ENGINEER's responsibility in the Contract Documents, nor any decision made by the ENGINEER in good faith either to exercise or not exercise its authority, shall give rise to any duty or responsibility on the part of the ENGINEER to the CONTRACTOR, any Subcontractor, any Supplier, any surety or any other person or organization performing any part of the WORK.
- B. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review, or judgement of the ENGINEER as to the WORK, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the WORK for compliance with the Contract Documents, unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to the ENGINEER any duty or authority to supervise or direct the performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of its agreement with the OWNER.
- C. The ENGINEER will not be responsible for the CONTRACTOR's means, methods, techniques, sequences, or procedures of construction not specified in the Contract Documents or the safety precautions and programs incident thereto.
- D. The ENGINEER will not be responsible for the acts or omissions of the CONTRACTOR nor of any subcontractor, supplier, or any other person or organization performing any of the WORK to the extent that such acts or omissions are not reasonably discoverable considering the level of observation and inspection required by the ENGINEER's agreement with the OWNER.

GENERAL CONDITIONS

ARTICLE 10 - CHANGES IN THE WORK

10.01 GENERAL

- A. Without invalidating the Agreement and without notice to any surety, the OWNER may at any time or from time to time, order additions, deletions, or revisions in the WORK; these will be authorized by a written Field Order and/or a Change Order issued by the ENGINEER. Upon receipt of any of these documents, the CONTRACTOR shall promptly proceed with the work involved pursuant to the applicable conditions of the Contract Documents.
- B. If the OWNER and the CONTRACTOR are unable to agree upon the increase or decrease in the Contract Price or an extension or shortening of the Contract Time, if any, that should be allowed as a result of a Field Order, a claim may be made therefor as provided in Articles 11 or 12.
- C. The CONTRACTOR shall not be entitled to an increase in the Contract Price nor an extension of the Contract Time with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented by Change Order, except in the case of an emergency and except in the case of uncovering work provided in the Paragraph 13.03G.
- D. The OWNER and the CONTRACTOR shall execute appropriate Change Orders covering:
 - 1. Changes in the WORK which are ordered by the OWNER pursuant to Paragraph 10.01A;
 - 2. Changes required because of acceptance of defective work under Paragraph 13.06;
 - 3. Changes in the Contract Price or Contract Time which are agreed to by the parties; or
 - 4. Any other changes agreed to by the parties.
- E. If the provisions of any Bond require notice of any change to be given to a surety, the giving of these notices will be the CONTRACTOR's responsibility. The CONTRACTOR shall provide for the amount of each applicable Bond to be adjusted accordingly.

GENERAL CONDITIONS

10.02 ALLOWABLE QUANTITY VARIATIONS

- A. Whenever a unit price and quantity have been established for a bid item in the Contract Documents, the quantity stated may be increased or decreased to a maximum of 25 percent with no change in the unit price. An adjustment in the quantity in excess of 25 percent will be sufficient to justify a change in the unit price. Changes in the quantity of all bid items established in the Contract Documents, regardless of whether the changes are more or less than 25 percent and at the unit price established in the Contract Documents or adjusted otherwise, shall be documented by Change Orders.
- B. In the event a part of the WORK is to be entirely eliminated and no lump sum or unit price is named in the Contract Documents to cover the eliminated work, the price of the eliminated work shall be agreed upon in writing by the OWNER and the CONTRACTOR. If the OWNER and the CONTRACTOR fail to agree upon the price of the eliminated work, the price shall be determined in accordance with the provisions of Article 11.

GENERAL CONDITIONS

ARTICLE 11 - CHANGE OF CONTRACT PRICE

11.01 GENERAL

- A. The Contract Price constitutes the total compensation payable to the CONTRACTOR for performing the WORK. Except as directed by Change Orders, all duties, responsibilities, and obligations assigned to or undertaken by the CONTRACTOR shall be at its expense without change in the Contract Price.
- B. The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 30 days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered with the claim, unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim, and shall be accompanied by the CONTRACTOR's written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of the occurrence of the event. If the OWNER and the CONTRACTOR cannot otherwise agree on the amount involved, all claims for adjustment in the Contract Price shall be determined by the ENGINEER in accordance with Paragraph 9.08A. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this Paragraph 11.01B.
- C. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:
 - 1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.
 - 2. By mutual acceptance of a lump sum, which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.
 - 3. On the basis of the cost of work (determined as provided in Paragraphs 11.02 and 11.03) plus a CONTRACTOR's fee for overhead and profit (determined as provided in Paragraph 11.04).

GENERAL CONDITIONS

11.02 COST OF WORK (BASED ON TIME AND MATERIALS)

- A. General: The term "cost of work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR for labor, materials, and equipment in the proper performance of work. Except as otherwise may be agreed to in writing by the OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project.
- B. Labor: The cost of labor used in performing work by the CONTRACTOR, a subcontractor, or other forces will be the sum of the following:
1. The actual wages paid plus any employer payments to, or on behalf of workers for fringe benefits including health and welfare, pension, vacation, and similar purposes. The cost of labor may include the rates paid to foremen when determined by the ENGINEER that the services of foremen do not constitute a part of the overhead allowance.
 2. All payments imposed by state and federal laws including, but not limited to, compensation insurance, and social security payments.
 3. The amount paid for subsistence and travel required by collective bargaining agreements, or in accordance with the regular practice of the employer.

At the beginning of the extra work and as later requested by the ENGINEER, the CONTRACTOR shall furnish the ENGINEER proof of labor compensation rates being paid.

- C. Materials: The cost of materials used in performing work will be the cost to the purchaser, whether CONTRACTOR or subcontractor, from the supplier thereof, except as the following are applicable:
1. Trade discounts available to the purchase shall be credited to the OWNER notwithstanding the fact that such discounts may not have been taken by the CONTRACTOR.
 2. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the ENGINEER. Markup except for actual costs incurred in the handling of such materials will not be allowed.

GENERAL CONDITIONS

3. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from these sources on extra work items or current wholesale price for the materials delivered to the work site, whichever is lower.
 4. If in the opinion of the ENGINEER the cost of material is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of the material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned, delivered to the work site less trade discount. The OWNER reserves the right to furnish materials for the extra work and no claim shall be made by the CONTRACTOR for costs and profit on such materials.
- D. Equipment: The CONTRACTOR will be paid for the use of equipment at the rental rate listed for the equipment specified in the Supplementary General Conditions. The rental rate will be used to compute payments for equipment whether the equipment is under the CONTRACTOR's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment shall be the rate resulting in the least total cost to the Owner for the total period of use. If it is deemed necessary by the CONTRACTOR to use equipment not listed in the Supplementary General Conditions an equitable rental rate for the equipment will be established by the ENGINEER. The CONTRACTOR may furnish cost data which might assist the ENGINEER in the establishing the rental rate.
1. All equipment shall, in the opinion of the ENGINEER, be in good working condition and suitable for the purpose for which the equipment is to be used.
 2. Before construction equipment is used on the extra work, the CONTRACTOR shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the ENGINEER, in duplicate, a description of the equipment and its identifying number.
 3. Unless otherwise specified, manufacturers' ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
 4. Individual pieces of equipment or tools having a replacement value of \$100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore.

GENERAL CONDITIONS

5. Rental time will not be allowed while equipment is inoperative due to breakdowns.
- E. Equipment on the Work: The rental time to be paid for equipment used on the WORK shall be the time the equipment is in productive operation on the extra work being performed and, in addition, shall include the time required to move the equipment to the location of the extra work and return it to the original location or to another location that requires no more moving time than that required to return it to its original location. Moving time will not be paid if the equipment is used on other than the extra work, even though located at the site of the extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power. However, no payment will be made for loading and transporting costs when the equipment is used on other than the extra work even though located at the site of the extra work. The following shall be used in computing the rental time of equipment on the WORK.
1. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation.
 2. When daily rates are listed, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation. When owner-operated equipment is used to perform extra work to be paid for on a time and materials basis, the CONTRACTOR will be paid for the equipment and operator, as set forth in Paragraph (3), (4), and (5), following.
 3. Payment for the equipment will be made in accordance with the provisions in Paragraph 11.02D, herein.
 4. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the CONTRACTOR to other workers operating similar equipment already on the WORK, or in the absence of such labor, established by collective bargaining agreements for the type of workmen and location of the extra work, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein in accordance with the provisions of Paragraph 11.02B, herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all payments made to on behalf of workers other than actual wages.

GENERAL CONDITIONS

5. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Paragraph 11.04, herein.

11.03 SPECIAL SERVICES

- A. Special work or services are defined as that work characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry. The following may be considered by the ENGINEER in making estimates for payment for special services:
 1. When the ENGINEER and the CONTRACTOR, by agreement, determine that a special service or work is required which cannot be performed by the forces of the CONTRACTOR or those of any of its subcontractors, the special service or work may be performed by an entity especially skilled in the work to be performed. After validation of invoices and termination of market values by the ENGINEER, invoices for special services or work based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental cost.
 2. When the CONTRACTOR is required to perform work necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the job site, the charges for that portion of the work performed at the off-site facility may by agreement, be accepted as a special service and accordingly, the invoices from the work may be accepted without detailed itemization.
 3. All invoices for special services will be adjusted by deducting all trade discounts offered or available, whether the discounts were taken or not. In lieu of the allowances for overhead and profit specified in Paragraph 11.04, herein, an allowance of 5 percent will be added to invoices for special services.
- B. All work performed hereunder shall be subject to all of the provisions of the Contract Documents and the CONTRACTOR's sureties shall be bound with reference hereto as under the original Agreement. Copies of all amendments to surety bonds or supplemental surety bonds shall be submitted to the OWNER for review prior to the performance of any work hereunder.

GENERAL CONDITIONS

11.04 CONTRACTOR'S FEE

- A. WORK ordered on the basis of time and materials will be paid for at the actual necessary cost as determined by the ENGINEER, plus allowances for overhead and profit. For extra work involving a combination of increases and decreases in the WORK the actual necessary cost will be the arithmetic sum of the additive and deductive costs. The allowance for overhead and profit shall include full compensation for superintendence, bond and insurance premiums, taxes, office expenses, and all other items of expense or cost not included in the cost of labor, materials, or equipment provided for under Paragraphs 11.02B, C, and D, herein including extended overhead and home office overhead. The allowance for overhead and profit will be made in accordance with the following schedule:

ACTUAL NECESSARY COST OVERHEAD AND PROFIT ALLOWANCE

Labor 10 percent

Materials 10 percent

Equipment 10 percent

- B. It is understood that labor, materials, and equipment may be furnished by the CONTRACTOR or by the subcontractor, the allowance specified herein shall be applied to the labor, materials, and equipment costs of the subcontractor, to which the CONTRACTOR may add 5 percent of the subcontractor's total cost for the extra work. Regardless of the number of hierarchical tiers of subcontractors, the 5 percent increase above the subcontractor's total cost which includes the allowances for overhead and profit specified herein may be applied one time only for each separate work transaction.

GENERAL CONDITIONS

ARTICLE 12 - CHANGE OF CONTRACT TIME

12.01 GENERAL

- A. The Contract Time may only be changed by a Change Order. Any claim for an extension of the Contract time shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 30 days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 30 days after such occurrence (unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the ENGINEER in accordance with Paragraph 9.08 if the OWNER and the CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this Paragraph 12.01A.
- B. The Contract Time will be extended in an amount equal to time lost if the CONTRACTOR makes a claim as provided in Paragraph 12.01A and the ENGINEER determines that the delay was caused by events beyond the control of the CONTRACTOR. Examples of events beyond the control of the CONTRACTOR include acts or neglect by the OWNER or others performing additional work as contemplated by Article 7, or by acts of God or of the public enemy, fire, floods, epidemics, quarantine restrictions, strikes, labor disputes, sabotage, or freight embargoes.
- C. All time limits stated in the Contract Documents are of the essence.
- D. None of the aforesaid time extensions shall entitle the CONTRACTOR to any adjustment in the Contract Price or any damages for delay. Furthermore, the CONTRACTOR hereby indemnifies and holds harmless the OWNER and ENGINEER, their officers, agents and employees from and against all claims, damages, losses and expenses (including lost property and attorney's fees) arising out of or resulting from the temporary suspension of work whether for the OWNER's convenience as defined in Article 15.01 (a) or for whatever other reasons including the stoppage of work by the ENGINEER for the CONTRACTOR's failure to comply with any order issued by the ENGINEER.

GENERAL CONDITIONS

12.02 EXTENSIONS OF THE TIME FOR DELAY DUE TO INCLEMENT WEATHER

- A. "Inclement weather" is any weather condition or conditions resulting immediately therefrom, causing the CONTRACTOR to suspend construction operations or preventing the CONTRACTOR from proceeding with at least 75 percent of the normal labor and equipment force engaged on the WORK.
- B. Should the CONTRACTOR prepare to begin work at the regular starting time at the beginning of any regular work shift on any day on which inclement weather, or its effects on the condition of the WORK prevents work from beginning at the usual starting time and the crew is dismissed as a result thereof, the CONTRACTOR will not be charged for a working day whether or not conditions change thereafter during the day and the major portion of the day could be considered to be suitable for construction operations.
- C. The CONTRACTOR shall base its construction schedule upon the inclusion of the number of days of inclement weather specified in the paragraph entitled "Inclement weather delays" of the Supplementary General Conditions. No extension of the Contract Time due to inclement weather will be considered until after the stated number of days of inclement weather has been reached. However, no reduction in Contract Time will be made if the number of inclement weather days is not reached.

12.03 EXTENSIONS OF TIME FOR OTHER DELAYS

- A. If the CONTRACTOR is delayed in completion of the WORK beyond the time named in the Contract Documents for the completion of the WORK, by acts of God or of the public enemy, fire, floods, epidemics, quarantine restrictions, strikes, labor disputes, industry-wide shortage of raw materials, sabotage or freight embargoes, the CONTRACTOR shall be entitled to an adjustment in the Contract Time. No such adjustment will be made unless the CONTRACTOR shall notify the ENGINEER in writing of the causes of delay within 15 calendar days from the beginning of any such delay. The ENGINEER shall ascertain the facts and the extent of the delay. No adjustment in time shall be made for delays resulting from noncompliance with the Contract, accidents, failure on the part of the CONTRACTOR to carry out the provisions of the Contract including failure to provide materials, equipment or workmanship meeting the requirements of the Contract Documents; the occurrence of such events shall not relieve the CONTRACTOR from the necessity of maintaining the required progress.
- B. In the event that Contract completion is delayed beyond the Contract Time named in the Specifications by reason of shortages of raw materials required for CONTRACTOR-furnished items, the CONTRACTOR shall be entitled to

GENERAL CONDITIONS

an adjustment in the Contract Time in like manner as if the WORK had been suspended for the convenience and benefit of the OWNER; provided, however, that the CONTRACTOR shall furnish documentation acceptable to the OWNER and ENGINEER that he placed or attempted to place firm orders with suppliers at a reasonable time in advance of the required date of delivery of the items in question, that such shortages shall have developed following the date such orders were placed or attempts made to place same, that said shortages are general throughout the affected industry, that said shortages are shortages of raw materials required to manufacture CONTRACTOR-furnished items and not simply failure of CONTRACTOR's suppliers to manufacture, assemble or ship items on time, and that the CONTRACTOR shall, to the degree possible, have made revisions in the sequence of his operations, within the terms of the Contract, to offset the expected delay. The CONTRACTOR shall notify the ENGINEER, in writing, concerning the cause of delay, within 15 calendar days of the beginning of such delay. The validity of any claim by the CONTRACTOR to an adjustment in the Contract Time shall be determined by the OWNER acting through the ENGINEER, and his findings thereon shall be based on the ENGINEER's knowledge and observations of the events involved and documentation submitted by the CONTRACTOR, showing all applicable facts relative to the foregoing provisions. Only the physical shortage of raw materials will be considered under these provisions as a cause for adjustment of time and no consideration will be given to any claim that items could not be obtained at a reasonable, practical, or economical cost or price, unless it is shown to the satisfaction of the OWNER that such items could have been obtained only at exorbitant prices entirely out of line with current rates taking into account the quantities involved and the usual practices in obtaining such quantities.

- C. If the CONTRACTOR is delayed in completion of the WORK by reason of changes made under the provisions of Article 10 or changed conditions as provided under Article 4.03, or by failure of the OWNER to acquire or clear right-of-way as provided under Article 15.01, or by any act of the ENGINEER or of the OWNER, not contemplated by the Contract, an adjustment in the Contract time will be made by the OWNER in like manner as if the WORK had been suspended for the convenience and benefit of the OWNER, except, that if the WORK is increased as a result of changes, the OWNER, at his sole discretion, may grant an adjustment in the number of calendar days for completion of the Contract. In the event of such delay, the CONTRACTOR shall notify the ENGINEER in writing of the causes of delay within 15 calendar days from the beginning of any such delay.

GENERAL CONDITIONS

ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

13.01 WARRANTY, GUARANTEE AND MAINTENANCE PERIOD

- A. The CONTRACTOR warrants and guarantees to the OWNER and the ENGINEER that all work, equipment, materials and workmanship are in accordance with the Contract Documents and are not defective. Prompt notice of defects discovered by the OWNER or ENGINEER shall be given to the CONTRACTOR. All defective work, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13.
- B. If within one (1) year after the date of Final Completion, as set by the Engineer's Notice of Completion, or a longer period of time prescribed by Laws or Regulations or by the terms of any applicable special guarantee or specific provisions of the Contract Documents, any work is found to be defective, the OWNER shall notify the CONTRACTOR in writing and the CONTRACTOR shall promptly, without cost to the OWNER and in accordance with the OWNER's written notification, either correct the defective work, or, if it has been rejected by the OWNER, remove it from the site and replace it with non-defective work. In the event the CONTRACTOR does not promptly comply with the notification, or in an emergency where delay would cause serious risk of loss or damage, the OWNER may have the defective work corrected or rejected work removed and replaced. All direct, indirect, and consequential costs of the removal and replacement including but not limited to fees and charges of engineers, architects, attorneys and other professionals will be paid by the CONTRACTOR. This paragraph shall not be construed to limit nor diminish the CONTRACTOR's absolute guarantee to complete the WORK in accordance with the Contract Documents.

13.02 ACCESS TO WORK

- A. The ENGINEER, other representatives of the OWNER, testing agencies, and governmental agencies with jurisdictional interests shall have access to the work at reasonable times for their observation, inspections, and testing. The CONTRACTOR shall provide proper and safe conditions for their access.

GENERAL CONDITIONS

13.03 TESTS AND INSPECTIONS

- A. The CONTRACTOR shall give the ENGINEER timely notice of readiness of the WORK for all required inspections, tests, or approvals.
- B. If Laws or Regulations of any public body other than the OWNER, with jurisdiction over the WORK require any work to be specifically inspected, tested, or approved, the CONTRACTOR shall pay all costs in connection therewith. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the OWNER's or the ENGINEER's acceptance of a Supplier of materials or equipment proposed as a substitution or-equal to be incorporated in the WORK and of materials or equipment submitted for review prior to the CONTRACTOR's purchase for incorporation in the WORK. The cost of all inspections, tests, and approvals with the exception of the above which are required by the Contract Documents shall be paid by the OWNER (unless otherwise specified).
- C. The ENGINEER will make, or have made, such inspections and test as the ENGINEER deems necessary to see that the WORK is being accomplished in accordance with the requirements of the Contract Documents. The Contractor without additional cost to the OWNER, shall provide the labor and equipment necessary to make the WORK available for inspections. Unless otherwise specified in the Supplementary General Conditions or the OWNER-ENGINEER Agreement, all other costs of inspection and testing will be borne by the OWNER. In the event the inspections or tests reveal non-compliance with the requirements of the Contract Documents, the CONTRACTOR shall bear the cost of corrective measures deemed necessary by the ENGINEER, as well as the cost of subsequent re-inspection and retesting. Neither observations by the ENGINEER nor inspections, tests, or approvals by others shall relieve the CONTRACTOR from the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.
- D. All inspections, tests, or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by properly licensed organizations selected by the OWNER.

GENERAL CONDITIONS

- E. If any work (including the work of others) that is to be inspected, tested, or approved is covered without the ENGINEER's written authorization, it must, if requested by the ENGINEER, be uncovered for testing, inspection, and observation. The uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR timely notified the ENGINEER of the CONTRACTOR's intention to cover the same and the ENGINEER failed to act with reasonable promptness in response to the notice.
- F. In any work is covered contrary to the written request of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for the ENGINEER's observation and replaced at the CONTRACTOR's expense.
- G. If the ENGINEER considers it necessary or advisable that covered work be observed, inspected or tested by the ENGINEER or others, the ENGINEER shall direct the CONTRACTOR to uncover, expose, or otherwise make available for observation, inspection, or testing that portion of the work in question. The CONTRACTOR shall comply with the ENGINEER's direction and furnish all necessary labor, material, and equipment. If found the work is defective, the CONTRACTOR shall bear all direct, indirect and consequential costs of uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction of the work, including but not limited to fees and charges for engineers, architects, attorneys, and other professionals. However, if the work is not defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both. The increase in Contract Time and Contract Price shall be the CONTRACTOR's actual time and costs directly attributable to uncovering and exposing the work. If the parties are unable to agree as to the amount or extent of the changes, the CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

13.04 OWNER MAY STOP THE WORK

- A. If the WORK is defective, or the CONTRACTOR fails to perform work in such a way that the completed WORK will conform to the Contract Documents, the OWNER may order the CONTRACTOR to stop the WORK, or any portion thereof, until the cause for the order has been eliminated. This right of the OWNER to stop the WORK shall not give rise to any duty on the part of the OWNER to exercise this right for the benefit of the CONTRACTOR or any other party.

13.05 CORRECTION OR REMOVAL OF DEFECTIVE WORK

- A. When directed by the ENGINEER, the CONTRACTOR shall promptly correct all defective work, whether or not fabricated, installed, or completed, or, if the

GENERAL CONDITIONS

work has been rejected by the ENGINEER, remove it from the site and replace it with non-defective work. The CONTRACTOR shall bear all direct, indirect and consequential costs of correction or removal, including but not limited to fees and charges of engineers, architects, attorneys, and other professionals made necessary thereby.

13.06 ACCEPTANCE OF DEFECTIVE WORK

- A. If, instead of requiring correction or removal and replacement of defective work, the OWNER prefers to accept the work, the OWNER may do so. The CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to the OWNER's evaluation of and determination to accept the defective work. If any acceptance of defective work occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK, and the OWNER shall be entitled to an appropriate decrease in the Contract Price.

GENERAL CONDITIONS

ARTICLE 14 - PAYMENTS TO CONTRACTOR, LIQUIDATED DAMAGES AND COMPLETION

14.01 SCHEDULE OF VALUES (LUMP SUM PRICE BREAKDOWN)

- A. The schedule of values or lump sum price breakdown established as provided in the Technical Specifications shall serve as the basis for progress payments and will be incorporated into the form of Application for Payment included in the Contract Documents.

14.02 UNIT PRICE BID SCHEDULE

- A. Progress payments for unit price work will be based on the number of units completed.

14.03 APPLICATION FOR PROGRESS PAYMENT

- A. Unless otherwise prescribed by the Owner, on the 25th of each month, the CONTRACTOR shall submit to the ENGINEER for review and approval, an Application for Payment completed and signed by the CONTRACTOR covering the WORK completed as of the date of the Application and accompanied by such supporting documentation as required by the Contract Documents.
- B. The Application for Payment shall identify, as a sub-total, the amount of the CONTRACTOR's Total Earnings to Date, plus the Value of Materials at the Site which have not yet been incorporated in the WORK, and less a deductive adjustment for materials installed which were not previously incorporated in the WORK, but for which payment was allowed under the provisions of payment for Materials Stored at the Site but not yet incorporated in the WORK.
- C. The Net Payment Due to the CONTRACTOR shall be the above-mentioned sub-total, from which shall be deducted the retainage amount and the total amount of all previous payments made to the CONTRACTOR.
- D. The OWNER may withhold and retain 5% of each approved progress payment to the CONTRACTOR. The total retention proceeds withheld shall not exceed 5% of the total construction price. All retention proceeds shall be placed by the OWNER in an interest-bearing account. The interest accrued shall be for the benefit of the CONTRACTOR and its subcontractors, and it shall be paid after the WORK has been completed and accepted by the OWNER. CONTRACTOR shall ensure that any interest accrued on the

GENERAL CONDITIONS

retainage is distributed by the CONTRACTOR to its subcontractors on a pro rata basis.

- E. Any retention proceeds withheld, and any accrued interest, shall be released by the OWNER pursuant to an Application for Payment from the CONTRACTOR within 45 days from the later of:
1. the date the OWNER receives the final Application for Payment from the CONTRACTOR;
 2. the date that a certificate of occupancy or final acceptance notice is issued to:
 - (a) the Contractor who obtained the building permit from the building inspector or from a public agency;
 - (b) the OWNER; or
 - (c) the ENGINEER.
 3. the date the CONTRACTOR accepts final payment for the Work; or
 4. the date that a public agency or building inspector having authority to issue its own certificate of occupancy does not issue the certificate but permits partial or complete occupancy of a newly constructed or remodeled building; provided, however, that if only partial occupancy of a building is permitted, any retention proceeds withheld and retained, and any accrued interest, shall be partially released in direct proportion to the value of the part of the building occupied.

Each Application for Payment from the CONTRACTOR shall include documentation of lien releases or waivers.

- F. Notwithstanding any other provision in this Article to the contrary,
1. If the CONTRACTOR is in default or breach of the terms and conditions of the Contract Documents, the OWNER may withhold from payment to the CONTRACTOR for so long as reasonably necessary an amount necessary to cure the breach or default of the CONTRACTOR; or
 2. If the WORK or a portion of the WORK has been substantially completed, the OWNER may retain until completion up to twice the

GENERAL CONDITIONS

fair market value of the WORK of the CONTRACTOR that has not been completed:

- (a) in accordance with the Contract Documents; or
- (b) in the absence of applicable provisions in the Contract Documents to generally accepted craft standards.

- 3. If the OWNER refuses payment under subparagraphs (F)(i) or (ii), it shall describe in writing within 45 days of withholding such amounts what portion of the WORK was not completed according to the standards specified in the Contract Documents.

G. The CONTRACTOR shall distribute retention proceeds as outlined below:

- 1. Except as provided in Paragraph 14.03.G.2, below, if the CONTRACTOR receives retention proceeds, it shall pay each of its subcontractors from whom retention has been withheld each subcontractor's share of the retention received within ten days from the day that all or any portion of the retention proceeds is received from the OWNER.
- 2. Notwithstanding Paragraph 14.03.G.1, above, if a retention payment received by the CONTRACTOR is specifically designated for a particular subcontractor, payment of the retention shall be made to the designated subcontractor.

H. Except as otherwise provided in the Supplementary General Conditions, the value of materials stored at the site shall be valued at 95 percent of the value of the materials. This amount shall be based upon the value of all acceptable materials and equipment stored at the site or at another location agreed to in writing by the OWNER; provided, each individual item has a value of more than \$5,000 and will become a permanent part of the WORK. The Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that the CONTRACTOR has received the materials and equipment free and clear of all liens, charges, security interests, and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the OWNER's interest therein, all of which will be satisfactory to the OWNER.

GENERAL CONDITIONS

14.04 CONTRACTOR'S WARRANTY OF TITLE

- A. The CONTRACTOR warrants and guarantees that title to all work, materials, and equipment covered by an Application for Payment, whether incorporated in the WORK or not, will pass to the OWNER no later than the time of final payment free and clear of all liens.

14.05 REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT

- A. The ENGINEER will, within 7 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to the OWNER, or return the Application to the CONTRACTOR indicating in writing the ENGINEER's reasons for refusing to recommend payment. In the later case, the CONTRACTOR may make the necessary corrections and resubmit the Application. Thirty days after presentation of the Application for Payment with the ENGINEER's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.05B) become due and when due will be paid by the OWNER to the CONTRACTOR.
- B. The OWNER may refuse to make payment of the full amount recommended by the ENGINEER to compensate for claims made by the OWNER on account of the CONTRACTOR's performance of the WORK or other items entitling the OWNER to a credit against the amount recommended, but the OWNER must give the CONTRACTOR written notice within 7 days (with a copy to the ENGINEER) stating the reasons for such action.

14.06 PARTIAL UTILIZATION

- A. The OWNER may utilize or place into service any item of equipment or other usable portion of the WORK at any time prior to completion of the WORK. The OWNER shall notify the CONTRACTOR in writing of its intent to exercise this right. The notice will identify the equipment or specific portion or portions of the WORK to be utilized or otherwise placed into service.
- B. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all items or portions of the WORK to be partially utilized shall be borne by the CONTRACTOR. Upon the issuance of a notice of partial utilization, the ENGINEER will deliver to the OWNER and the CONTRACTOR a written recommendation as to division of responsibilities between the OWNER and the CONTRACTOR with respect to security, operation, safety, maintenance,

GENERAL CONDITIONS

heat, utilities and insurance. Upon the OWNER's acceptance of these recommendations, the ENGINEER's aforesaid recommendation will be binding on the OWNER and the CONTRACTOR until final payment.

- C. The CONTRACTOR shall retain full responsibility for satisfactory completion of the WORK, regardless of whether a portion thereof has been partially utilized by the OWNER and the CONTRACTOR's one year correction period shall commence only after the date of Final Completion for the WORK.

14.07 LIQUIDATED DAMAGES

- A. The CONTRACTOR shall pay to the OWNER the amount specified in the Supplemental General Conditions, not as a penalty but as liquidated damages, if he fails to complete the WORK or specified parts of the WORK within the time or times agreed upon. The periods for which these damages shall be paid shall be the number of Days from the agreed date or Contract Time as contained in the Agreement, or from the date of termination of any extension of time approved by the OWNER, to the date or dates on which the ENGINEER certifies Substantial Completion of WORK or specified parts of the WORK as provided in Article 14.08, herein. The OWNER may deduct the amount of said damages from any monies due or to become due the CONTRACTOR. After Substantial Completion, if the CONTRACTOR fails to complete the remaining WORK within 45 days or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER the amount stated in the Supplemental General Conditions as liquidated damages for each day that expires after the 45 days until readiness for final payment.
- B. The said amount is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would sustain; and said amount is agreed to be the amount of damages which the OWNER would sustain. Said damages are not in lieu of but in addition to other actual or consequential damages to which the OWNER may be entitled.
- C. All times specified in the Contract Documents are hereby declared to be of the essence.

14.08 SUBSTANTIAL COMPLETION

- A. When the CONTRACTOR considers the WORK ready for its intended use, and the CONTRACTOR has delivered to the ENGINEER all maintenance and operating instructions, schedules, guarantees, bonds, certificates of

GENERAL CONDITIONS

inspection, marked-up record documents and other documents, all as required by the Contract Documents, the CONTRACTOR may notify the OWNER and the ENGINEER in writing that the WORK is substantially complete and request that the ENGINEER prepare a Certificate of Substantial Completion. Within a reasonable time thereafter, the OWNER, the CONTRACTOR, and the ENGINEER shall make an inspection of the WORK to determine the status of completion. If the ENGINEER does not consider the WORK substantially complete, the ENGINEER will notify the OWNER and CONTRACTOR in writing giving the reasons therefor. If the ENGINEER considers the WORK substantially complete, the ENGINEER will prepare and deliver to the OWNER for its execution the Certificate of Substantial Completion signed by the ENGINEER and CONTRACTOR, which shall fix the date of Substantial Completion.

- B. The Certificate of Substantial Completion shall be a release by the CONTRACTOR of the OWNER and its agents from all claims and liability to the CONTRACTOR for anything done or furnished for, or relating to, the WORK or for any act or neglect of the OWNER or of any person relating to or affecting the WORK, to the date of Substantial Completion, except demands against the OWNER for the remainder of the amounts kept or retained from progress payments and excepting pending, unresolved claims filed in writing prior to the date of Substantial Completion. At the time of delivery of the Certificate of Substantial Completion, the ENGINEER will deliver to the OWNER and the CONTRACTOR, if applicable, a written recommendation as to division of responsibilities between the OWNER and the CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities and insurance. Upon the OWNER's acceptance of these recommendations, the ENGINEER's recommendation will be binding on the OWNER and the CONTRACTOR until final payment.
- C. The OWNER, upon written notice to the CONTRACTOR, shall have the right to exclude the CONTRACTOR from the WORK after the date of Substantial Completion, and complete all or portions of the WORK at the CONTRACTOR's expense.

GENERAL CONDITIONS

14.09 COMPLETION AND FINAL PAYMENT

- A. Upon written certification from the CONTRACTOR that the WORK is complete (if a Certificate of Substantial Completion has been issued this certification must occur within 45 days of that date), the ENGINEER will make a final inspection with the OWNER and the CONTRACTOR. If the OWNER and ENGINEER do not consider the WORK complete, the ENGINEER will notify the OWNER and the CONTRACTOR in writing of all particulars in which this inspection reveals that the WORK is incomplete or defective. The CONTRACTOR shall immediately take the measures necessary to remedy these deficiencies. If the ENGINEER and OWNER consider the WORK complete, the CONTRACTOR may proceed to file its application for final payment pursuant to this Article. At the request of the CONTRACTOR, the ENGINEER may recommend to the OWNER that certain minor deficiencies in the WORK that do not prevent the entire WORK from being used by the OWNER for its intended use, and the completion of which will be unavoidably delayed due to no fault of the CONTRACTOR, be exempted from being completed prerequisite to final payment. These outstanding items of pickup work, or "punch list items", shall be listed on the ENGINEER's Notice of Completion, together with the recommended time limits for their completion, and extended warranty requirements for those items and the value of such items.
- B. After the issuance of the Notice of Completion and after the CONTRACTOR has completed corrections that have not been exempted to the satisfaction of the ENGINEER and delivered to the ENGINEER all required additions and modifications to maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, marked-up record documents and other documents, all as required by the Contract Documents; and after the ENGINEER has indicated that the WORK is acceptable, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final application for payment shall be accompanied by all documentation called for in the Contract Documents and other data and schedules as the OWNER or ENGINEER may reasonably require, including an affidavit of the CONTRACTOR that all labor, services, material, equipment and other indebtedness connected with the WORK for which the OWNER or his property might in any way be responsible, have been paid or otherwise satisfied, and a consent of the payment bond surety to final payment, all in forms approved by the OWNER.

GENERAL CONDITIONS

14.10 FINAL APPLICATION FOR PAYMENT

- A. If, on the basis of the ENGINEER's observation of the WORK during construction and final inspection, and the ENGINEER's review of the final application for payment and accompanying documentation, all as required by the Contract Documents, the ENGINEER is satisfied that the WORK has been completed and the CONTRACTOR has fulfilled all of his obligations under the Contract Documents, the ENGINEER will, within ten days after receipt of the final application for payment, indicate in writing his recommendation of payment and present the application to the OWNER for payment. Thereupon, the ENGINEER will give written notice to the OWNER and the CONTRACTOR that the WORK is acceptable by executing the ENGINEER's Notice of Completion. Otherwise, the ENGINEER will return the application to the CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case the CONTRACTOR shall make the necessary corrections and resubmit the application.
- B. Within 45 calendar days after the ENGINEER's filing of the Notice of Completion, the OWNER will make final payment including all deducted retainage (except as noted below) to the CONTRACTOR. The OWNER's remittance of final payment shall be the OWNER's acceptance of the WORK if formal acceptance of the WORK is not indicated otherwise. The final payment shall be that amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract, including the following items:
 - 1. Liquidated damages, as applicable.
 - 2. All amounts retained by the OWNER under Paragraph 14.03(F).

14.11 CONTRACTOR'S CONTINUING OBLIGATIONS

- A. The CONTRACTOR's obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the ENGINEER, nor the issuance of a Certificate of Substantial Completion or Notice of Completion, nor payment by the OWNER to the CONTRACTOR under the Contract Documents, nor any use or occupancy of the WORK or any part thereof by the OWNER, nor any act of acceptance by the OWNER nor any failure to do so, nor any review of a shop drawing or sample submittal, will constitute an acceptance of work or materials not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.

GENERAL CONDITIONS

14.12 FINAL PAYMENT TERMINATES LIABILITY OF OWNER

- A. Final payment is defined as the last progress payment made to the CONTRACTOR for earned funds, less deductions listed in Paragraph 14.10B herein. The acceptance by the CONTRACTOR of the final payment referred to in Paragraph 14.10 herein, shall be a release of the OWNER and its agents from all claims of liability to the CONTRACTOR for anything done or furnished for, or relating to, the work or for any act or neglect of the OWNER or of any person relating to or affecting the work, except demands against the OWNER for the remainder, if any, of the amounts kept or retained under the provisions of Paragraph 14.10 herein; and excepting pending, unresolved claims filed prior to the date of the Certificate of Substantial Completion.

GENERAL CONDITIONS

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 SUSPENSION OF WORK BY OWNER

- A. The OWNER acting through the ENGINEER may, by written notice to the Contractor, temporarily suspend the WORK, in whole or in part, for a period or periods of time, but not to exceed 90 days, for the convenience and benefit of the OWNER upon the occurrence of any one or more of the following: (1) unsuitable weather; (2) delay in delivery of OWNER- furnished equipment or materials, or such other conditions as are considered unfavorable for prosecution of the work; (3) Shortfall in construction funds; (4) Constraints imposed by public entities, public utilities, property owners or legal proceedings; (5) Failure or delay in acquisition of easements or right-of-way by the OWNER; or (6) Other conditions which, in the opinion of the OWNER, warrant a delay in the WORK. Suspended WORK shall be resumed by the CONTRACTOR within 10 calendar days of receipt from the ENGINEER of written notice to proceed. Whenever the OWNER temporarily suspends work for any conditions enumerated in this Article 15.01 A, the CONTRACTOR shall be entitled to an adjustment in the Contract Time as specified in Article 12.03 C.
- B. The suspension of work shall be effective upon receipt by the Contractor of the written order suspending the work and shall be terminated upon receipt by the Contractor of the written order terminating the suspension.
- C. The CONTRACTOR hereby indemnifies and holds harmless the OWNER and ENGINEER, their officers, agents and employees, from and against all claims, damages, losses and expenses, including lost profits and attorney's fees, arising out of or resulting from the temporary suspension of the WORK, whether for the OWNER's convenience described in this Article or for whatever other reasons, including the stoppage of work by the ENGINEER for the CONTRACTOR's failure to comply with any order issued by the ENGINEER.

15.02 TERMINATION OF AGREEMENT BY OWNER (CONTRACTOR DEFAULT)

- A. In the event of default by the CONTRACTOR, the OWNER may give written notice to the CONTRACTOR of OWNER's intent to terminate the Agreement. The notice shall state the event of default and the time allowed to remedy the default. It shall be considered a default by the CONTRACTOR whenever the CONTRACTOR shall: (1) declare bankruptcy, become insolvent, or assign its assets for the benefit of its creditors; (2) fail to provide materials or workmanship meeting the requirements of the Contract Documents; (3) disregard or violate provisions of the Contract Documents or ENGINEER's

GENERAL CONDITIONS

instructions, (4) fail to prosecute the WORK according to the approved progress schedule; or, (5) fail to provide a qualified superintendent, competent workmen, or materials or equipment meeting the requirements of the Contract Documents. If the CONTRACTOR fails to remedy the conditions constituting default within the time allowed, the OWNER may then issue a Notice of Termination.

- B. In the event the Agreement is terminated in accordance with Paragraph 15.02A, the OWNER may take possession of the WORK and may complete the WORK by whatever method or means the OWNER may select. The cost of completing the WORK shall be deducted from the balance which would have been due the CONTRACTOR had the Agreement not been terminated and the WORK completed in accordance with the Contract Documents. If such cost exceeds the balance which would have been due, the CONTRACTOR shall pay the excess amount to the OWNER. If such cost is less than the balance which would have been due, the CONTRACTOR shall have no claim to the difference.

15.03 TERMINATION OF AGREEMENT BY OWNER (FOR CONVENIENCE)

- A. The OWNER may terminate the Agreement at any time if it is found that reasons beyond the control of either the OWNER or CONTRACTOR make it impossible or against the OWNER's interests to complete the WORK. In such a case, the CONTRACTOR shall have no claims against the OWNER except: (1) for the value of the work, as determined by the engineer, performed by the Contractor up to the date the Agreement is terminated; and, (2) for the cost of materials and equipment on hand, in transit, or on definite commitment, as of the date the Agreement is terminated, which would be needed in the WORK and which meet the requirements of the Contract Documents. The value of work performed and the cost of materials and equipment delivered to the site, as mentioned above, shall be determined by the ENGINEER in accordance with the procedure prescribed from making the final application for payment and final payment under Paragraphs 14.09 and 14.10.

15.04 TERMINATION OF AGREEMENT BY CONTRACTOR

- A. The CONTRACTOR may terminate the Agreement upon 10 days written notice to the OWNER, whenever: (1) the WORK has been suspended under the provisions of Paragraph 15.01, for more than 90 consecutive days through no fault or negligence of the CONTRACTOR, and notice to resume work or to terminate the agreement has not been received from the OWNER within this time period; or, (2) the OWNER should fail to pay the

GENERAL CONDITIONS

CONTRACTOR any monies due him in accordance with the terms or the Contract Documents and within 60 days after presentation to the OWNER by the CONTRACTOR of a request therefor, unless within said 10-day period the OWNER shall have remedied the condition upon which the payment delay was based. In the event of such termination, the CONTRACTOR shall have no claims against the OWNER except for those claims specifically enumerated in Paragraph 15.03, and as determined in Accordance with the requirements of that paragraph.

GENERAL CONDITIONS

ARTICLE 16 - MISCELLANEOUS

16.01 GIVING NOTICE

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

16.02 TITLE TO MATERIALS FOUND ON THE WORK

- A. The OWNER reserves the right to retain title to all soils, stone, sand, gravel, and other materials developed and obtained from excavations and other operations connected with the WORK. Unless otherwise specified in the Contract Documents, neither the CONTRACTOR nor any subcontractor shall have any right, title, or interest in or to any such materials. The CONTRACTOR will be permitted to use in the WORK, without charge, any such materials which meet the requirements of the Contract Documents.

16.03 RIGHT TO AUDIT

- A. If the CONTRACTOR submits a claim to the OWNER for additional compensation, the OWNER shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the CONTRACTOR's books. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which the claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR's plants, or such parts thereof, as may be or have been engaged in the performance of the WORK. The CONTRACTOR further agrees that the right to audit encompasses all subcontracts and is binding upon subcontractors. The right to examine and inspect herein provided for shall be exercisable through such representatives as the OWNER deems desirable during the CONTRACTOR's normal business hours at the office of the CONTRACTOR. The CONTRACTOR shall make available to the OWNER for auditing, all relevant accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the OWNER.

16.04 ASBESTOS

- A. If the CONTRACTOR during the course of work observes the existence of asbestos in any structure or building, the CONTRACTOR shall promptly notify the OWNER and the ENGINEER. The OWNER shall consult with the ENGINEER regarding removal or encapsulation of the asbestos material and the CONTRACTOR shall not perform any work pertinent to the asbestos material prior to receipt or special instruction from the OWNER through the ENGINEER.

SUPPLEMENTAL GENERAL CONDITIONS

SUPPLEMENTAL GENERAL CONDITIONS

ARTICLE 17 - GENERAL

17.01 GENERAL

1. These Supplemental General Conditions amend or supplement the General Conditions of the Contract and any other provisions of the Contract Documents as indicated herein. All provisions which are not so amended or supplemented remain in full force and effect.
2. The terms used in these Supplemental General Conditions which are defined in the General Conditions of the Contract have the meanings assigned to them in the General Conditions of the Contract herein.

17.02 SUPPLEMENTAL DEFINITIONS

1. ENGINEER

The "Engineer" is

McNeil Engineering
8610 South Sandy Parkway, Suite 200
Sandy, UT 84070
Office: (801) 255-7700
Contact: Carl Greene, AIA
Email: carl@mcneileng.com

17.03 TESTING COSTS

Paragraph 13.03 of the General Conditions is amended as follows: the CONTRACTOR shall pay all testing costs. The Owner reserves the right to have additional tests performed by a testing organization selected by the OWNER and at the OWNER's expense.

SUPPLEMENTAL GENERAL CONDITIONS

ARTICLE 18 - AMOUNTS OF LIQUIDATED DAMAGES, BONDS AND INSURANCE

18.01 AMOUNT OF LIQUIDATED DAMAGES

- A. As provided in Article 14.07 of the General Conditions, the Contractor shall pay to the Owner as liquidated damages the amount of \$500 for each calendar day's delay beyond the Contract Time for substantial completion, liquidated damages shall apply to each site stipulated in the Contract Documents. The Contractor shall pay to the Owner as liquidated damages the amount of \$200 for each calendar day's delay beyond 45 calendar days from the date of substantial Completion until the Engineer issues the Notice of Final Completion.

18.02 PERFORMANCE AND OTHER BOND AMOUNTS

- A. The CONTRACTOR shall furnish a satisfactory Performance Bond in the amount of 100 percent of the Contract Price and a satisfactory Payment Bond in the amount of 100 percent of the Contract Price.

18.03 INSURANCE AMOUNTS

The limits of liability for the insurance required by Paragraph 5.02 of the General Conditions shall provide for not less than the following amounts or greater where required by Laws and Regulations:

- A. Workers' Compensation under Paragraph 5.02B.1 of the General Conditions:

1. State: Utah Statutory

- B. Comprehensive General Liability: (under Paragraph 5.02B.2 of the General Conditions):

1. Bodily Injury (including completed operations and products liability):

<u>\$ 500,000</u>	Each Occurrence
<u>\$ 1,000,000</u>	Annual Aggregate

Property Damage:

<u>\$ 500,000</u>	Each Occurrence
<u>\$ 1,000,000</u>	Annual Aggregate
or a combined single limit of	<u>\$1,000,000</u>

SUPPLEMENTAL GENERAL CONDITIONS

2. Property Damage liability insurance including, Explosion, Collapse and Underground coverages, where applicable.

3. Personal Injury, with employment exclusion deleted

\$ 1,000,000

Annual Aggregate

C. Comprehensive Automobile Liability: (Under Paragraph 5.02B.3 of the General Conditions:)

1. Bodily Injury

\$ 500,000

Each Person

\$ 1,000,000

Each Occurrence

2. Property Damage:

\$ 500,000

Each Occurrence

or combined single limit of

\$1,000,000

D. Builders Risk: Not required.

SUPPLEMENTAL GENERAL CONDITIONS

ARTICLE 19 - PHYSICAL CONDITIONS AND WEATHER DELAYS

19.01 INCLEMENT WEATHER DELAYS

- A. The Contractor's construction schedule shall be based upon the inclusion of at least ten (10) day(s) of inclement weather delays. Reference Article 12, paragraph 12.02 of the General Conditions for additional requirements.

SUPPLEMENTAL GENERAL CONDITIONS

ARTICLE 20 - SUBCONTRACT LIMITATIONS

20.01 SUBCONTRACT LIMITATIONS

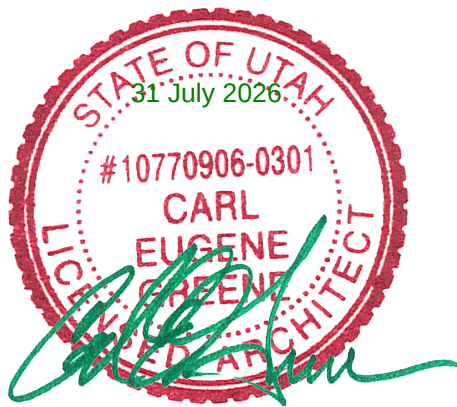
- A. In addition to the provisions of Paragraph 6.05 of the General Conditions, the CONTRACTOR shall perform not less than 20 percent of the WORK with its own forces (i.e., without subcontracting). The 20 percent requirement shall be understood to refer to the WORK, the value of which totals not less than 20 percent of the Contract Price.

SUPPLEMENTAL GENERAL CONDITIONS

ARTICLE 21 - MISCELLANEOUS

21.01 PATENTS AND COPYRIGHTS

The Contractor shall indemnify and save harmless the Owner, the Engineer, and their officers, agents, and employees, against all claims or liability arising from the use of any patented or copyrighted design, device, material, or process by the Contractor or any of his subcontractors in the performance of the work.



PROJECT MANUAL

DATE: AUGUST 2026

SERWTP FILTER GALLERY & ACTIFLO BUILDING IMPROVEMENTS AND RE-ROOF

11574 Wyndcastle Dr.
Sandy, Utah

JORDAN VALLEY WATER CONSERVANCY DISTRICT



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TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00 0000 COVER PAGE

DIVISION 01 - GENERAL REQUIREMENTS

01 1100 SUMMARY OF WORK
01 1200 MULTIPLE CONTRACT SUMMARY
01 1400 WORK RESTRICTIONS
01 2100 ALLOWANCES
01 2200 UNIT PRICES
01 2300 ALTERNATES
01 2900 PAYMENT PROCEDURES
01 3100 PROJECT MANAGEMENT AND COORDINATION
01 3200 CONSTRUCTION PROGRESS DOCUMENTATION
01 3300 SUBMITTAL PROCEDURES
01 3500 SPECIAL PROCEDURES
01 4000 QUALITY REQUIREMENTS
01 4200 REFERENCES
01 4301 QUALITY ASSURANCE - QUALIFICATIONS
01 4523 TESTING AND INSPECTING SERVICES
01 5100 TEMPORARY UTILITIES
01 5200 CONSTRUCTION FACILITIES
01 5400 CONSTRUCTION AIDS
01 5500 VEHICULAR ACCESS AND PARKING
01 5600 TEMPORARY BARRIERS AND ENCLOSURES
01 5700 TEMPORARY CONTROLS
01 5800 PROJECT IDENTIFICATION
01 6100 COMMON PRODUCT REQUIREMENTS
01 6200 PRODUCT OPTIONS
**01 6600 PRODUCT DELIVERY, STORAGE,
AND HANDLING REQUIREMENTS**
01 7100 EXAMINATION AND PREPARATION
01 7300 EXECUTION
01 7400 CLEANING AND WASTE MANAGEMENT
01 7700 CLOSEOUT PROCEDURES
01 7800 CLOSEOUT SUBMITTALS

DIVISION 05 - METALS

05 5213 PIPE AND TUBE RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 0573 PRESERVATIVE WOOD TREATMENT
06 1011 WOOD FASTENINGS

06 1100	WOOD FRAMING
06 1636	WOOD PANEL PRODUCT SHEATHING
DIVISION 07 - THERMAL AND MOISTURE PROTECTION	
07 3113	ASPHALT SHINGLES
07 4100	PREFORMED METAL STANDING SEAM ROOFING
07 9213	ELASTOMERIC JOINT SEALANTS
DIVISION 08 - OPENINGS	
08 4113	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
08 8100	GLASS GLAZING
DIVISION 09 - FINISHES	
09 9001	COMMON PAINTING AND COATING REQUIREMENTS
09 9113	EXTERIOR PAINTING
DIVISION 31 - EARTHWORK	
31 0501	COMMON EARTHWORK REQUIREMENTS
31 2213	ROUGH GRADING
31 2216	FINE GRADING
31 2316	EXCAVATION
31 2323	FILL
DIVISION 32 - EXTERIOR IMPROVEMENTS	
32 9223	SODDING
DIVISION 33 - UTILITIES	
33 0506	POLYETHYLENE PIPE
33 4116	SITE STORM UTILITY DRAINAGE PIPING

**SECTION 01 1100
SUMMARY OF WORK**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements Summary of Work requirements.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Provisions contained in Division 01 apply to Sections of Divisions 02 through 49 of Specifications. Instructions contained in Specifications are directed to Contractor. Unless specifically provided otherwise, obligations set forth in Contract Documents are obligations of Contractor.
- B. Contractor shall furnish total labor, materials, equipment, and services necessary to perform The Work in accordance with Contract Documents.

END OF SECTION

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**SECTION 01 1200
MULTIPLE CONTRACT SUMMARY**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
1. Administrative and procedural requirements for Multiple Contracts.

1.02 SUMMARY OF CONTRACTS

- A. Owner may issue separate contracts for operations scheduled to precede and be substantially completed before beginning of The Work under this Contract.
1. Contractor will be given written notice from such contractors of any revisions to scheduled completion of their work at least 30 days in advance. Owner will reimburse Contractor for expenses incurred by Contractor by failure to be properly notified.
- B. Owner has issued or will issue separate contracts for operations scheduled to be completed between Notice to Proceed and Substantial Completion.
1. General:
 - a. Schedule performance of work covered by such separate contracts in Contractor's Construction Schedule so as to avoid delays in Substantial Completion. Give written notice to such contractors and to Owner of any revisions to scheduled delivery and work dates at least 90 days in advance.
 - b. Complete work necessary to accommodate items provided under such separate contracts before scheduled date for performance of such work. Contractor will be back charged for actual expenses incurred by Owner for failure to timely complete such work including, but not limited to, cost of crews during downtime or for call backs and costs to correct substrate deficiencies.
 - c. Store and protect completed work provided under separate contracts until date of Substantial Completion.
 2. Testing and Inspection. See Section 01 4523 "Testing and Inspection" for testing and inspection, and testing laboratory services for materials, products, and construction methods:
 - a. Aggregate Base. See Section 31 1123.
 - b. Asphalt Paving Repair – Full Depth Patch: See Section 32 0118.
 - c. Concrete. See Section 03 3111.
 - d. Concrete Moisture Vapor Emission and Alkalinity level. See Section 09 0503, Section 09 6466, Section 09 6519, and Section 09 6567.
 - e. Fill / Engineering Fill. See Section 31 2323.
 - f. Headed Concrete Anchor Studs / Deformed Bar Anchors. See Section 03 1511.
 - g. Masonry (Non-structural). Tests and inspections is not required. See Section 04 0501 'Common Masonry Requirements'.
 - h. Masonry (Structural). Tests and inspections are required as specified in Sections under Heading 04 2000 'Unit Masonry'. For administrative requirements, see Section 04 0501 'Common Masonry Requirements'.
 - i. Wood Panel Product Sheathing. See Section 06 1636.
- C. Owner has issued or will issue separate contracts for operations normally scheduled to follow Substantial Completion.
1. General:
 - a. Give written notice to such contractors and to Owner of any revisions of scheduled date of Substantial Completion at least 90 days in advance. Contractor will be back charged for actual expenses incurred by Owner for failure to accurately report date of Substantial Completion.
 - b. Complete work necessary to accommodate items provided under such separate contracts before Substantial Completion. Contractor will be back charged for actual

expenses incurred by Owner for failure to complete such work before Substantial Completion.

2. Furnishings.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

**SECTION 01 1400
WORK RESTRICTIONS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Work Restrictions.

1.02 PROJECT CONDITIONS

- A. During construction period, Contractor will have use of premises for construction operations. Contractor will ensure that Contractor, its employees, subcontractors, and their employees comply with following requirements:
 - 1. Confine operations to areas within Contract limits shown on Drawings. Do not disturb portions of site beyond Contract limits.
 - 2. Do not allow alcoholic beverages, illegal drugs, or persons under their influence on Project site.
 - 3. Do not allow use of tobacco in any form on Project Site.
 - 4. Do not allow pornographic or other indecent materials on site.
 - 5. Do not allow work on Project site on Sundays except for emergency work.
 - 6. Refrain from using profanity or being discourteous or uncivil to others on Project Site or while performing The Work.
 - 7. Wear shirts with sleeves, wear shoes, and refrain from wearing immodest, offensive, or obnoxious clothing, while on Project Site.
 - 8. Do not allow playing of obnoxious and loud music on Project Site. Do not allow playing of any music within existing facilities.
 - 9. Do not build fires on Project Site.
 - 10. Do not allow weapons on Project Site, except those carried by law enforcement officers or other uniformed security personnel who have been retained by Owner or Contractor to provide security services.
- B. Existing Facilities:
 - 1. Reasonably accommodate use of existing facilities by Owner.
- C. Do not load or permit any part of the structure to be loaded with a weight that will endanger its safety. Questions of structural loading as part of construction means and methods shall be addressed by a licensed structural engineer engaged by Contractor, subject to the review by Architect.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

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**SECTION 01 2100
ALLOWANCES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements to prepare and process Allowances.

1.02 CASH ALLOWANCES

- A. Include following Allowances in bid:
 - 1. Division 06 16 00 - Sheathing
 - a. Allowance to replace 1,600 SF of damaged plywood.
- B. If actual purchase price differs from Allowance, change order will be issued adjusting Contract Sum by amount of difference.
- C. Actual purchase price is actual amount paid by Contractor, including applicable sales and use taxes, before taking into account cash discounts for prompt payment.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

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**SECTION 01 2200
UNIT PRICES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Unit Prices.

1.02 UNIT PRICE MEASUREMENT

- A. Unit prices listed by Contractor on Bid Form will be used to price changes to Contract Sum. Such unit prices include all labor, material, equipment, overhead, profit, and taxes.
- B. Unit Price Measurement:
 - 1. Keep daily log of each Unit Price item which includes:
 - a. A description of Unit Price Item.
 - b. Quantity.
 - c. Date.
 - d. Time of Day with place for AM and PM.
 - e. Signature of person preparing log.
 - 2. Submit copy of log to Architect with daily construction reports.

1.03 UNIT PRICE PAYMENT

- A. Contract Sum will be adjusted by change order to reflect variance, if any, of actual quantities from amount included in base bid for each Unit Price.

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**SECTION 01 2900
PAYMENT PROCEDURES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements to prepare and process Applications for Payments.

1.02 PAYMENT REQUESTS

- A. Use Payment Request forms provided by Owner.
- B. Each Payment Request will be consistent with previous requests and payments certified by Architect and paid for by Owner.
- C. Request Preparation:
 - 1. Complete every entry on Payment Request form.
 - 2. Entries will match data on approved schedule of values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
 - 3. Submit signed Payment Request to Architect with current Construction Schedule.
- D. Provide following submittals before or with submittal of Initial Payment Request:
 - 1. List of Subcontractors.
 - 2. Initial progress report.
 - 3. Contractor's Construction Schedule.
 - 4. Submittal Schedule.
- E. Provide Affidavit of Contractor and Consent of Surety with Payment Request following Substantial Completion.

1.03 SCHEDULE OF VALUES

- A. Submit schedule of values on Owner's standard form to Architect 20 days minimum before submission of Initial Payment Request as a necessary condition before payment will be processed. Coordinate preparation of schedule of values with preparation of Contractor's Construction Schedule. Correlate line items in Schedule of Values with other required administrative schedules and forms, including:
 - 1. Contractor's Construction Schedule.
 - 2. Payment Request form.
 - 3. Schedule of Allowances.
 - 4. Schedule of Alternates.

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**SECTION 01 3100
PROJECT MANAGEMENT AND COORDINATION**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Project Management and Coordination on Projects.

1.02 PROJECT COORDINATION

- A. This Project designation will be included on documents generated for Project by Contractor and Subcontractors, or be present on a cover letter accompanying such documents.
- B. Project designation for this Project is???Insert Project Designation???
- C. This Project designation will be included on documents generated for Project by Contractor and Subcontractors, or be present on a cover letter accompanying such documents.

1.03 MULTIPLE CONTRACT COORDINATION

- A. Contractor shall be responsible for accurately maintaining and reporting schedule of The Work from Notice to Proceed to date of Substantial Completion.
- B. Contractor shall be responsible for providing Temporary Facilities And Controls for those who perform work on Project from Notice to Proceed to date of Substantial Completion.
- C. Contractor shall be responsible for providing Construction Waste Management And Disposal services for those who perform work on Project from Notice to Proceed to date of Substantial Completion.
- D. Contractor shall be responsible for Final Cleaning for entire Project.

1.04 PROJECT MEETINGS AND CONFERENCES

- A. Preconstruction Conference:
 - 1. Attend preconstruction conference and organizational meeting scheduled by Architect at Project site or other convenient location.
 - 2. Be prepared to discuss items of significance that could affect progress, including such topics as:
 - a. Construction schedule.
 - b. Critical Work sequencing.
 - c. Current problems.
 - d. Designation of responsible personnel.
 - e. Distribution of Contract Documents.
 - f. Equipment deliveries and priorities.
 - g. General schedule of inspections by Architect and its consultants.
 - h. General inspection of tests.
 - i. Office, work, and storage areas.
 - j. Preparation of record documents and O & M manuals.
 - k. Procedures for processing interpretations and Modifications.
 - l. Procedures for processing Payment Requests.
 - m. Project cleanup.
 - n. Security.
 - o. Status of permits.
 - p. Submittal of Product Data, Shop Drawings, Samples, Quality Assurance / Control submittals.
 - q. Use of the premises.
 - r. Work restrictions.
 - s. Working hours.

3. Architect will record minutes of meetings and distribute copies to Owner and Contractor within three (3) working days.
- B. Progress Meetings:
1. Attend progress meetings at Project site at regularly scheduled intervals determined by Architect, at least once a month.
 2. Progress meetings will be open to Owner, Architect, Subcontractors, and anyone invited by Owner, Architect, and Contractor.
 3. Be prepared to discuss items of significance that could affect progress, including following:
 - a. Progress since last meeting.
 - b. Whether Contractor is on schedule.
 - c. Activities required to complete Project within Contract Time.
 - d. Labor and materials provided under separate contracts.
 - e. Off-site fabrication problems.
 - f. Access.
 - g. Site use.
 - h. Temporary facilities and services.
 - i. Hours of work.
 - j. Hazards and risks.
 - k. Project cleanup.
 - l. Quality and Work standards.
 - m. Status of pending modifications.
 - n. Documentation of information for Payment Requests.
 - o. Maintenance of Project records.
 4. Architect will prepare minutes of progress meetings and distribute copies of minutes to Owner and Contractor within three (3) working days.
- C. Pre-Installation Conferences:
1. Attend pre-installation conferences specified in Contract Document.
 - a. If possible, schedule these conferences on same day as regularly scheduled Progress Meetings. If this is not possible, coordinate scheduling with Architect.
 - b. Request input from attendees in preparing agenda.
 2. Be prepared to discuss following items:
 - a. Requirements of Contract Documents.
 - b. Completed work necessary for installation of items or systems.
 - c. Conditions not in compliance with installation requirements.
 - d. Installation and inspection schedule.
 - e. Coordination between trades.
 - f. Space and access limitations.
 - g. Testing.
 3. Architect will prepare meeting minutes and distribute minutes to Owner and Contractor within three (3) working days.

**SECTION 01 3200
CONSTRUCTION PROGRESS DOCUMENTATION**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
1. Administrative and procedural requirements for documenting the progress of construction during performance of the Work.

1.02 SCHEDULING OF WORK

- A. Bar Chart Schedule:
1. Submit horizontal bar chart schedule before Preconstruction Conference. Provide separate time bar for each construction activity listed on Owner's payment request form. Within each time bar, show estimated completion percentage. Provide continuous vertical line to identify first working day of each week. Show each activity in chronological sequence. Show graphically sequences necessary for completion of related portions of The Work. As The Work progresses, place contrasting mark in each bar to indicate actual completion.
 2. Provide copies of schedule for Architect and Owner and post copy in field office.
 3. Revise schedule monthly. Send copy of revised schedule to Owner and Architect and post copy in field office.
 4. Project Management Software Programs:
 - a. Any software project management program capable of Bar Chart Scheduling for projects of equal size and complexity is approved by Contractor and approved by Owner's Project Manager.
- B. Network Analysis Schedule:
1. General Requirements:
 - a. Submit and maintain Critical Path Method (CPM) schedule for the Work. Computerized network diagram will serve as 'Master Construction Schedule' for Project, giving mathematical analysis (printout) of that network, which verifies and validates logic and planning and defines critical path. Display accepted schedule in site construction office at all times.
 - b. Utilize CPM schedule for planning, organizing, and directing the Work, for reporting progress, and for requesting payment for work completed. Review schedule each month in progress meeting.
 - c. Clearly explain abbreviations used in CPM schedules in legend of symbols, either separate or attached.
 - d. Project Management Software Programs:
 - 1) Any software project management program capable of CPM Scheduling for projects of equal size and complexity is approved by Contractor and approved by Owner's Project Manager.
 2. Schedule Requirements:
 - a. CPM schedule will clearly show sequential interdependencies, with activity duration and float clearly represented. Sequence(s) of activities with no float will be clearly identified as Critical Path(s).
 - b. Scheduling system will be capable of baseline comparison analysis. Upon development and acceptance of schedule, 'freeze' initial schedule as baseline schedule. As work progresses, provide graphics displaying actual progress bars versus baseline or target bars.
 - c. Activity durations will be in workdays.
 - d. Activity Content:
 - 1) CPM schedule will include but not be limited to following activities as they apply to Project.

- (a) Construction tasks (Maximum 20 day duration for any activity).
 - (b) Shop drawings submittal and approval process.
 - (c) Ordering, fabrication, and delivery of major materials and equipment.
 - (d) Checkout, start-up, and test and balance of major equipment.
 - (e) Submittals of record drawings and maintenance manuals.
 - (f) Cleanup and punch out tasks.
 - (g) Critical coordination activities required to insure timely support and inspections.
 - (h) Owner purchased/installed items and Owner's separate contract work.
 - (i) Pre-final, final inspections and substantial completion.
 - (j) Final payment.
 - (k) Owner occupancy.
- 2) Schedule submittal activities to allow sufficient time for work to be procured and installed, even if submittal is unacceptable and re-submittal is required.
- 3. Submittals:
 - a. Submit initial submittal, complete revisions, and periodic reports in three hard copies, one reproducible and two prints or plots, and one copy on CD or removable drive.
 - b. Submit completed network program consisting of PERT, GANTT, and mathematical analysis prior to preconstruction meeting.
 - c. Review development status of network CPM schedule with Owner and Architect during preparation period.
- 4. Report Formats:
 - a. Standard set of reports submitted each month including initial submittals will consist of following:
 - 1) Graphics:
 - (a) GANTT chart of entire project. Progress bar chart will include target or baseline comparison bars. Bar positions will be early start / early finish with float clearly defined.
 - (b) Time-scaled logic diagram or time-scaled network, also called PERT chart, with critical path clearly defined.
 - (c) PERT and GANTT charts will include tabulation of each activity. Furnish following information for each activity on PERT and GANTT charts. Sequencing of columns on GANTT chart will match following:
 - (d) GANTT Chart Column Layout:
 - (1) Activity / Task Description.
 - (2) Estimated duration of activity / task.
 - (3) Start status.
 - (4) Status.
 - (5) Start date by calendar date.
 - (6) End date by calendar date.
 - (7) Latest start date by calendar date.
 - (8) Latest end date by calendar date.
 - (9) Total slack or float time in calendar days.
 - (10) Percentage of activity achieved.
 - (e) Program or means used in making mathematical computation will compile total value of completed and partially completed activities. Program will also accept revised completion dates as modified by Change Order time adjustments and accompanying recomputations of float dates.
 - (f) PERT Chart Box Layout:
 - (1) Task / Activity Name.
 - (2) Duration.
 - (3) Start Date.

- (4) End Date.
 - (5) Status (critical task).
 - b. Graphics outlined above will comply with following criteria unless noted otherwise:
 - 1) Sheet size of diagram will be 24 by 36 inches minimum and time scaled in weeks unless approved otherwise.
 - 2) On each page include title block containing as minimum following information:
 - (a) Project Title.
 - (b) Project Number.
 - (c) Contractor's Business Name.
 - (d) Date of Submittal and/or Revision.
 - (e) Progress Computation Date.
 - (f) Legend of Symbols and Abbreviations as applicable.
 - 3) Prepare and submit to Architect upon request additional charts, reports, and current copy on disk of Project program.
- 5. CPM Schedule Implementation And Monitoring:
 - a. Where Contractor is shown to be behind schedule, provide accompanying written summary, cause, and explanation of planned remedial action.
 - 1) CPM schedules will reflect those instances, Modifications or other alterations to schedule, which have impact on final completion or interim target dates within schedule.
 - 2) Owner may withhold payments or portions of payments upon failure to maintain scheduled progress of the Work as shown on accepted CPM schedule.
 - b. Float time belongs to Project, not to Contractor or to Owner, and may be utilized by both parties.
- 6. Schedule Changes And Updates:
 - a. Update CPM Schedule prior to each submittal to Owner and Architect. Correlate Schedule of Values graphically with CPM schedule for evaluation of monthly Payment Request.
 - b. Include additional activities added to CPM schedule by Contractor submitted schedule charts. It is Owner's intent that Project be managed and operated by CPM schedule.
- C. Daily Construction Reports:
 - 1. Prepare daily reports of operations at Project including at least following information:
 - a. List of Subcontractors at site.
 - b. Approximate count of personnel at site by trade.
 - c. High and low temperatures, general weather conditions.
 - d. Major items of equipment on site.
 - e. Materials, equipment, or Owner-furnished items arriving at or leaving site.
 - f. Accidents and unusual events.
 - g. Site or structure damage by water, frost, wind, or other causes.
 - h. Meetings, conferences, and significant decisions.
 - i. Visitors to the job including meeting attendees.
 - j. Stoppages, delays, shortages, losses.
 - k. Any tests made and their result if known.
 - l. Meter readings and similar recordings.
 - m. Emergency procedures.
 - n. Orders and requests of governing authorities.
 - o. Modifications received, carried out.
 - p. Services connected, disconnected.
 - q. Equipment or system tests and start-ups.
 - r. Brief summary of work accomplished that day.
 - s. Signature of person preparing report.

2. Submit daily reports to Architect at least weekly.
3. Maintain copies of daily reports at field office.

SECTION 01 3300 SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Submittal Procedures.
- B. Related Requirements:
 - 1. Section 01 7800: 'Closeout Submittals' for administrative and procedural requirements for closeout submittals.

1.02 SUBMITTAL SCHEDULE

- A. Furnish submittal schedule within 20 days after receipt of Notice to Proceed, listing items specified to be furnished for review to Architect including product data, shop drawings, samples, and Informational submittals.
 - 1. Coordinate submittal schedule with Contractor's construction schedule.
 - 2. Enclose the following information for each item:
 - a. Scheduled date for first submittal.
 - b. Related Section number.
 - c. Submittal category.
 - d. Name of Subcontractor.
 - e. Description of part of the Work covered.
 - f. Scheduled date for resubmittal.
 - g. Scheduled date for Architect's final release or approval.
- B. Print and distribute copies to Architect and Owner and post copy in field office. When revisions are made, distribute to same parties and post in same location.
- C. Revise schedule monthly. Send copy of revised schedule to Owner and Architect and post copy in field office.

1.03 SUBMITTAL PROCEDURES

- A. Coordination:
 - 1. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently before performance of related construction activities to avoid delay.
 - a. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - b. Coordinate transmittal of different types of submittals required for related elements of The Work so processing will not be delayed by need to review submittals concurrently for coordination. Architect reserves right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - 2. Processing Time:
 - a. Allow sufficient review time so installation will not be delayed by time required to process submittals, including time for resubmittals.
 - 1) Allow 21 days for initial review. Allow additional time if processing must be delayed allowing coordination with subsequent submittals. Architect will promptly advise Contractor when submittal being processed must be delayed for coordination.
 - 2) If an intermediate submittal is necessary, process same as initial submittal.
 - 3) Allow 10 days for reprocessing each submittal.
 - 4) No extension of Contract Time will be authorized because of failure to transmit submittals to Architect in sufficient time before work is to be performed to allow processing.
 - 3. Identification:

- a. Place permanent label or title block on each submittal for identification. Include name of entity that prepared each submittal on label or title block.
 - 1) Provide space approximately 4 by 5 inches on label or beside title block on Shop Drawings to record Contractor's review and approval markings and action taken.
 - 2) Include 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) Number and title of appropriate Specification Section.
 - (i) Drawing number and detail references, as appropriate.
4. Transmittal:
 - a. Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using transmittal letter. On transmittal, record relevant information and requests for data. Include Contractor's certification that information complies with Contract Document requirements, or, on form or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations.
 - b. Submittals received from sources other than Contractor or not marked with Contractor's approval will be returned without action.

1.04 ACTION SUBMITTALS

- A. Product Data:
 1. Submit Product Data, as required by individual Sections of Specifications.
 2. Mark each copy of each set of submittals to show choices and options used on Project. Where printed Product Data includes information on products that are not required for Project, mark copies to indicate information relating to Project.
 3. Certify that proposed product complies with requirements of Contract Documents. List any deviations from those requirements on form or separate sheet.
 4. Submit five copies of each required submittal unless otherwise required. Architect will return three copies marked with action taken and with corrections or modifications required.
 5. Submit electronic files PDF: Architect will return a PDF copy marked with action taken and with corrections or modifications required.
- B. Shop Drawings:
 1. Submit newly prepared graphic data to accurate scale. Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 36 by 48 inches (915 by 1 200 mm). Highlight, encircle, or otherwise show deviations from Contract Documents. Include following information as a minimum:
 - a. Dimensions.
 - b. Identification of products and materials included.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 2. Do not reproduce Contract Documents or copy standard information as basis of Shop Drawings. Standard printed information prepared without specific reference to Project is not acceptable as Shop Drawings.
 3. Review and designate (stamp) approval of shop drawings. Unless otherwise specified, submit to Architect six copies of shop drawings required by Contract Documents. Shop

drawings not required by Contract Documents, but requested by Contractor or supplied by Subcontractor, need not be submitted to Architect for review.

C. Samples:

1. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
 - a. Mount, display, or package Samples to ease review of qualities specified. Prepare Samples to match samples provided by Architect, if applicable. Include following:
 - 1) Generic description of Sample.
 - 2) Sample source.
 - 3) Product name or name of manufacturer.
 - 4) Compliance with recognized standards.
 - 5) Availability and delivery time.
2. Submit Samples for review of kind, color, pattern, and texture, for final check of these characteristics with other elements, and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
 - a. Where variations in color, pattern, texture or other characteristics are inherent in material or product represented, submit set of three samples minimum that show approximate limits of variations.
 - b. Refer to other specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
 - c. Refer to other Sections for Samples to be returned to Contractor for incorporation into The Work. Such Samples shall be undamaged at time of use. On transmittal, indicate special requests regarding disposition of Sample submittals.
3. Where Samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit full set of choices for material or product. Preliminary submittals will be reviewed and returned with Architect's mark indicating selection and other action.
4. Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit three sets. One will be returned marked with action taken.
5. Samples, as accepted and returned by Architect, will be used for quality comparisons throughout course of construction.
 - a. Unless noncompliance with Contract Documents is observed, submittal may serve as final submittal.
 - b. Sample sets may be used to obtain final acceptance of construction associated with each set.

1.05 INFORMATIONAL SUBMITTALS

- A. Informational submittals are design data, test reports, certificates, manufacturer's instructions, manufacturer's field reports, and other documentary data affirming quality of products and installations. Submit five copies of each required submittal unless otherwise required. Architect will return three copies marked with action taken and with corrections or modifications required. or Submit electronic files: PDF. Architect will return a PDF copy marked with action taken and with corrections or modifications required.
1. Certificates: Describe certificates intended to document affirmations by Contractor or others that the work is in accordance with the Contract Documents, but do not repeat provisions of Parts 2 or 3.
 2. Delegated Design Submittals / Design Data: Describe submittals intended to demonstrate design work prepared by Contractor's licensed professionals.
 3. Test And Evaluation Reports: Describe submittal of test reports or evaluation service reports intended to document required tests.

4. Manufacturer Instructions: Describe submittals intended to document manufacturer instructions.
5. Source Quality Control Submittals: Describe submittal of source quality control documentation.
6. Field Quality Control Submittals: Describe submittal of field quality control documentation.
7. Manufacturer Reports: Describe submittal of Manufacturer reports as documentation of manufacturer activities.
8. Special Procedure Submittals: Describe submittals intended to document special procedures. An example would be construction staging or phasing for remodeling an existing facility while keeping it in operation. While the Contractor would normally be responsible for managing this, submittal of his plan as documentation could be specified.
9. Qualification Statements: Describe submittals intended to document qualifications of entities employed by Contractor.

1.06 CLOSEOUT SUBMITTALS

- A. This title groups submittals that occur during project closeout. Coordinate with section 01 7800 Closeout Submittals.
 1. As Built Record Drawings as defined in the Agreement.
 2. Project Manual: Complete Project Manual including Addenda and Modifications as defined in General Conditions.
 3. Maintenance Contracts: Describe submittal of the maintenance contract specific to the Section.
 4. Operations & Maintenance Data: Describe submittal of operation and maintenance data necessary for products of the Section.
 5. Warranty Documentation: Describe submittal of final executed warranty document specific to the Section.
 6. Record Documentation: Describe submittal of record documentation specific to the Section.
 7. Software: Describe submittal system software and programming software specific to the Section.

1.07 MAINTENANCE MATERIAL SUBMITTALS

- A. This title groups maintenance material required submittals specific to the Section. Items may be provided at completion of Work or submitted with section 01 7800 Closeout Submittals:
 1. Spare Parts: Describe spare parts necessary for Owner's use in facility operation and maintenance. 'Parts' are generally understood to be items such as filters, motor drive belts, lamps, and other similar manufactured items that require only simple replacement.
 2. Extra Stock Materials: Describe extra stock materials to be provided for Owner's use in facility operation and maintenance. Extra stock materials are generally understood to be items such as ceiling tiles, flooring, paint etc.
 3. Tools:
 - a. Describe tools to be provided for Owner's use in facility operation and maintenance. Tools are generally understood to be wrenches, gauges, circuit setters, etc, required for proper operation or maintenance of a system.

**SECTION 01 3500
SPECIAL PROCEDURES**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.02 SUMMARY

- A. Section Includes But is Not Limited To:
1. Administrative and procedural requirements for Special Procedures.

1.03 REFERENCES

- A. Association Publications:
1. U.S. Department of Labor, Occupational Safety and Health Administration:
 - a. 29 CFR 1926 OSHA, 'Construction Industry Regulations' (January 2014 or latest version).
 - 1) 29 CFR 1926.20, 'General Safety And Health Provisions'.
 - 2) 29 CFR 1926.352, 'Fire Prevention'.
 - 3) 29 CFR 1926.500, 'Fall Protection'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Acceleration of Work:
1. Complete The Work in accordance with Construction Schedule. If Contractor falls behind schedule, take such actions as are necessary, at no additional expense to Owner, to bring progress of The Work back in accordance with schedule.
 2. Owner may request proposal for completion of The Work at date earlier than expiration of Contract Time:
 - a. Promptly provide requested proposal showing cost of such acceleration of The Work. Consult with Owner and Architect regarding possible options to decrease cost of such acceleration.
 - b. If Owner determines to order acceleration of The Work, change in Contract Sum and Contract Time resulting from acceleration will be included in a Change Order.

1.05 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
1. Meet regulations of 29 CFR 1926 OSHA, 'Construction Industry Regulations'.
 2. Owner's Safety Requirements:
 - a. Personal Protection:
 - 1) Contractor shall ensure:
 - (a) Positive means of fall protection, such as guardrails system, safety net system, personal fall arrest system, etc, is provided to employees whenever exposed to a fall 6 feet or more above a lower level.
 - (b) Personnel working on Project shall wear hard hats and safety glasses as required by regulation and hazard.
 - (c) Personnel working on Project shall wear long or short sleeve shirts, long pants, and hard-toed boots or other sturdy shoes appropriate to type and phase of work being performed.
 - b. Contractor Tools And Equipment:
 - 1) Contractor shall ensure:
 - (a) Tools and equipment are in good working condition, well maintained, and have necessary guards in place.
 - (b) Ground Fault Circuit Interrupters (GFCI) is utilized on power cords and tools.
 - (c) Scaffolding and man lifts are in good working condition, erected and maintained as required by governmental regulations.

- (d) Ladders are in good condition, well maintained, used as specified by Manufacturer, and secured as required.
- c. Miscellaneous:
 - 1) Contractor shall ensure:
 - (a) Protection is provided on protruding rebar and other similar objects.
 - (b) General Contractor Superintendent has completed the OSHA 10-hour construction outreach training course or equivalent.
 - (c) Implementation and administration of safety program on Project.
 - (d) Material Safety Data Sheets (MSDS) are provided for substances or materials for which an MSDS is required by governmental regulations before bringing on site.
 - (e) Consistent safety training is provided to employees on Project.
 - (f) Implement and coordinate Lockout / Tagout procedures with Owner's Representative as required.
 - 2) Report accidents involving injury to employees on Project that require off-site medical treatment to Owner's designated representative.
- d. Hot Work Permit:
 - 1) Permit shall document that fire prevention and protection requirements in 29 CFR 1926.352, 'Fire Prevention' have been implemented prior to beginning hot work operations.
 - 2) Required for doing hot work involving open flames or producing heat or sparks such as:
 - (a) Brazing.
 - (b) Cutting.
 - (c) Grinding.
 - (d) Soldering.
 - (e) Thawing pipe.
 - (f) Torch applied roofing.
 - (g) Welding.

SECTION 01 4000 QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Related Requirements:
 - 1. Section 01 3100: 'Project Management and Coordination' for Pre-Installation Conferences for testing and inspection.
 - 2. Section 01 3200: 'Construction Progress Documentation' for developing a schedule of required tests and inspections.
 - 3. Section 01 3300: 'Submittal Procedures'.
 - 4. Section 01 4301: 'Quality Assurance – Qualifications' establishes minimum qualification levels required.
 - 5. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 6. Section 01 7300: 'Executions' for cutting and patching for repair and restoration of construction disturbed by testing and inspecting activities.
 - 7. Divisions 01 thru 49 establish responsibility for providing specific testing and inspections.

1.03 REFERENCES

- A. Definitions:
 - 1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
 - 2. Approved: To authorize, endorse, validate, confirm, or agree to.
 - 3. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with requirements indicated; and having complied with requirements of authorities having jurisdiction.
 - 4. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a construction operation, including installation, erection, application, and similar operations.
 - a. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of corresponding generic name.
 - 5. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish standard by which the Work will be judged.
 - 6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.

7. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
 8. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
 9. Service Provider: Agency or firm qualified to perform required tests and inspections.
 10. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.
 11. Testing Agency: Entity engaged to perform specific tests, inspections, or both.
 12. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.
 13. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.
- B. Reference Standards:
1. International Code Council (IBC) (2015 or most recent edition adopted by AHJ):
 - a. IBC Chapter 17, 'Structural Tests and Special Inspections'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Conflicting Requirements:
1. General:
 - a. If compliance with two or more standards is specified and standards establish different or conflicting requirements for minimum quantities or quality levels, comply with most stringent requirement.
 - b. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
 2. Minimum Quantity or Quality Levels:
 - a. Quantity or quality level shown or specified shall be minimum provided or performed.
 - b. Actual installation may comply exactly with minimum quantity or quality specified, or it may exceed minimum within reasonable limits.
 - c. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for context of requirements.
 - d. Refer uncertainties to Architect for decision before proceeding.
- B. Coordination:
1. Coordinate sequence of activities to accommodate required quality assurance and quality control services with minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
- C. Scheduling:
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.05 QUALITY ASSURANCE

- A. Testing and inspecting services are used to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
1. Specific quality assurance and quality control requirements for individual construction activities are specified in Sections that specify those activities and Section 01 4523. 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 control procedures that facilitate compliance with Contract Document requirements.
 3. Requirements for Contractor to provide quality assurance and quality control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- B. Quality Assurance Services:

1. Activities, actions, and procedures performed before and during execution of the Work to verify compliance and guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
 2. Owner or Owner's designated representative(s) will perform quality assurance to verify compliance with Contract Documents.
- C. Activities performed by Owner's Quality Assurance Testing Agency include, but are not limited to following:
1. Individual Sections in Division 01 through Division 49:
 - a. Pre-Installation Conference agenda review items for:
 - 1) Schedule requirements.
 - 2) Testing and inspection requirements:
 - 3) Requirements and frequency of testing and inspections.
 - 4) Mock-up or sample requirements.
 - 5) Submittals requirements.
 - b. Quality Assurance personal qualifications.
 - 1) Qualification documentation including certificates if required.
 - c. Non-Conforming Work:
 - 1) Prepare non-compliance log to track non-compliant testing or inspections.
 2. Weekly Activities:
 - a. Summarize and track any non-compliance issues.
 - b. Provide summary report of previous week's performed Work.
 - c. Visit contractors periodically to find out if they have any concerns with Quality Assurance inspectors and check on any schedule changes.
 - d. Visit Owner's Representatives periodically to find out if they have any concerns with how project is progressing.
- D. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with following requirements, using materials indicated for completed Work:
1. Coordinate with individual section in Division 01 through Division 49 if there are any additional requirements or modification to these requirements:
 - a. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - b. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - c. Demonstrate proposed range of aesthetic effects and workmanship.
 - d. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - 1) Allow seven days for initial review and each re-review of each mockup.
 - e. Maintain mockups during construction in undisturbed condition as standard for judging completed Work.
 - 1) Demolish and remove mockups when directed, unless otherwise indicated.

1.06 QUALITY CONTROL

- A. Quality Control Services:
1. Quality Control will be sole responsibility of Contractor.
 - a. 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 performed by Contractor:
 - 1) They do not include inspections, tests or related actions performed by Architect, Owner, governing authorities or independent agencies hired by Owner or Architect.
 - 2) Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.

- b. Where services are indicated as Contractor's responsibility, engage a qualified Testing Agency to perform these quality control services.
 - 1) Contractor shall not employ same testing entity engaged by Owner, without Owner's written approval.
- B. Manufacturer's Field Services: Where indicated, engage factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 3300: 'Submittal Procedures'.
- C. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality control services, and provide reasonable auxiliary services as requested. Notify Testing Agency sufficiently in advance of operations to permit assignment of personnel. Provide 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 Testing 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 quality control by Testing Agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections:
 - 1. Civil And Structural Testing:
 - a. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services'. Quality Control is sole responsibility of Contractor:
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
 - (a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
 - 2) Contractor bears full responsible for compliance with all contract requirements and quality control on project and will be responsible for quality of asphalt mixture and asphalt installation.
 - b. Weekly Activities:
 - 1) Ensure that non-compliance log is current.
 - 2) Provide summary reports of performed Work.

PART 3 EXECUTION

2.01 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
 - 2. Comply with Contract Document requirements for Section 01 7300 'Execution' for cutting and patching.
- B. Protect construction exposed by or for Quality Assurance and Quality Control activities.
- C. Repair and protection are Contractor's responsibility, regardless of assignment of responsibility for Quality Assurance and Quality Control Services.

SECTION 01 4200 REFERENCES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes But is Not Limited To:

1. Reference standards, definitions, specification format, and industry standards.

1.02 REFERENCES

A. Definitions:

1. Approved: The term "approved," when used to convey Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
2. Directed: The term "directed" is a command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," and "permitted" have the same meaning as "directed."
3. Experienced: The term "experienced," when used with an entity, means having successfully completed a minimum of ten previous projects similar in size and scope to this Project; being familiar with the special requirements indicated, and having complied with requirements of authority having jurisdiction.
4. Furnish: The term "furnish" means supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
5. General: Basic Contract definitions are included in the Conditions of the Contract.
6. Indicated: The term "indicated" refers to requirements expressed by graphic representations, or in written form on Drawings, in Specifications, and in other Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
7. Install: The term "install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
8. Installer: An "Installer" is the Contractor, or another entity engaged by the Contractor, as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
9. Project Site: The term "Project site" means the space available for performing construction activities. The extent of the Project site is shown on the Drawings and may not be identical with the description of the land on which the Project is to be built.
10. Provide: The term "provide" means to furnish and install, complete and ready for the intended use.
11. Regulations: The term "regulations" includes 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.
12. Submitted: The terms "submitted," "reported," "satisfactory" and similar words and phrases means submitted to Architect, reported to Architect and similar phrases.
13. Testing Agencies: A "testing agency" is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, or to report on and, if required, to interpret results of those inspections or tests.
14. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

B. References Standards:

1. Specification Format: Specifications will follow MasterFormat™ 2004 for organizing numbers and titles. (The Construction Specifications Institute, Project Resource Manual/CSI Manual of Practice, 5th Edition. New York, McGraw-Hill, 2005).

- a. Specification Identifications:
 - 1) The Specifications use section numbers and titles to help cross referencing in the Contract Documents.
 - 2) Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
- b. Specification Language:
 - 1) Specifications should be prepared, with concern and respect for their legal status. Specifications should be Clear, Concise, Correct and Complete.
 - 2) Streamlining: Streamlining is used to list products, materials, reference standards, and other itemized specifications. This technique places the subject first and provides keywords for quick reference
- c. Sentence Structure:
 - 1) Specifications to be written in the "Imperative Mood".
 - (a) The verb that clearly defines the action becomes the first word in the sentence.
 - (b) The imperative sentence is concise and readily understandable.
 - 2) Streamlining is used to list products, materials, reference standards, and other itemized specifications. This technique places the subject first and provides keywords for quick reference.
- d. Abbreviated Language:
 - 1) Abbreviations should be used only on drawings and schedules where space is limited.
 - 2) Abbreviations with multiple meanings should be avoided, unless used in different disciplines where their meaning is clear from the context in which they are used.
 - 3) Abbreviations should be limited to five or fewer letters
 - (a) The verb that clearly defines the action becomes the first word in the sentence.
- e. Symbols:
 - 1) Caution should apply to symbols substituted for words or terms.
- f. Numbers:
 - 1) The use of Arabic numerals rather than words for numbers is recommended.
- C. Industry Standards:
 - 1. Except where Contract Documents specify otherwise, construction industry standards will apply and are made a part of Contract Documents by reference.
 - 2. Where compliance with two or more standards is specified and standards apparently establish different or conflicting requirements for minimum quantities or quality levels, refer to Architect for decision before proceeding. Quantity or quality level shown or specified will be minimum provided or performed. Actual installation may comply exactly with minimum quantity or quality specified, or it may exceed minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for context of requirements. Refer uncertainties to Architect for decision before proceeding.
 - 3. Each entity engaged in construction on Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with Contract Documents. Where copies of standards are needed for performance of a required construction activity, Contractor will obtain copies directly from publication source.
 - 4. Trade Association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean association names. Names and addresses are subject to change and are believed

to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

AABC	Associated Air Balance Council	Washington	DC	(202) 737-0202	www.aabchq.com
AAMA	American Architectural Manufacturers Association	Schaumburg	IL	(847) 303-5664	www.aamanet.org
AASHTO	American Association of State Highway & Transportation Officials	Washington	DC	(202) 624-5800	www.aashto.org
AAMA	American Architectural Manufacturers Association	Schaumburg	IL	(847) 303-5774	www.aamanet.org
AASHTO	American association of State Highways and Transportation Officials	Washington	DC		www.transportation.org www.aashto.org
ACI	American Concrete Institute International	Farmington Hills	MI	(248) 848-3700	www.aci-int.org
AGA	American Gas Association	Washington	DC	(202) 824-7000	www.aga.org
AHRI	Air Conditioning Heating & Refrigeration Institute	Arlington	VA	(703) 524-8800	www.ari.org
AIA	American Institution of Architects	Washington	DC	(202) 626-7300	www.aia.org
AISC	American Institute of Steel Construction	Chicago	IL	(312) 670-2400	www.aisc.org
AISI	American Iron & Steel Institute	Washington	DC	(202) 452-7100	www.steel.org
AITC	American Institution of Timber Construction	Englewood	CO	(303) 792-9559	www.aitc-glulam.org
AMCA	Air Movement & Control Association International	Arlington Heights	IL	(847) 394-0150	www.amca.org
ANSI	American National Standards Institute	New York	NY	(212) 642-4900	www.ansi.org
APA	APA-Engineered Wood Association	Tacoma	WA	(253) 565-6600	www.apawood.org
API	American Petroleum Institute	Washington	DC	(202) 682-8000	www.api.org
AQMD	South Coast Air Quality Management District	Diamond Bar	CA	(909) 396-2000	www.aqmd.gov
ASHRAE	American Society of Heating, Refrigerating, & Air-Conditioning Engineers	Atlanta	GA	(404) 636-8400	www.ashrae.org

ASME	American Society of Mechanical Engineers International	New York	NY	(800) 843-2763	www.asme.org
ASTM	ASTM International	West Conshohocken	PA	(610) 832-9500	www.astm.org
AWI	Architectural Woodwork Institute	Potomac Falls	VA	(571) 323-3636	www.awinet.org
AWPA	American Wood Protection Association	Birmingham	AL	(205) 733-4077	www.awpa.com
AWS	American Welding Society	Miami	FL	(800) 443-9353	www.aws.org
AWWA	American Water Works Assoc	Denver	CO	(303) 794-7711	www.awwa.org
BHMA	Builders Hardware Manufacturers Association	New York	NY	(212) 297-2122	www.buildershardware.com
BIA	Brick Industry Association	Reston	VA	(703) 620-0010	www.bia.org
CFI	International Certified Floorcovering Installers, Inc.	Kansas City	MO	(816) 231-4646	www.cfi-installers.org
CRI	Carpet & Rug Institution	Dalton	GA	(706) 278-3176	www.carpet-rug.com
CRSI	Concrete Reinforcing Steel Institute	Schaumburg	IL	(847) 517-1200	www.crsi.org
CISPI	Cast Iron Soil Pipe Institute	Chattanooga	TN	(423) 892-0137	www.cispi.org
DHI	Door & Hardware Institute	Chantilly	VA	(703) 222-2010	www.dhi.org
DIPRA	Ductile Iron Pipe Research Association.	Birmingham	AL	(205) 402-8700	www.dipra.org
EIMA	EIFS Industry Members Association	Morrow	GA	(800) 294-3462	www.eima.com
FM	FM Global	Johnston	RI	(401) 275-3000	www.fmglobal.com
FSC	Forest Stewardship Council	Bonn, Germany		+49 (0) 228 367 66 0	www.fsc.org
GA	Gypsum Association	Hyattsville	MD	(301) 277-8686	www.gypsum.org
GS	Green Seal	Washington	DC	(202) 872-6400	www.greenseal.org
HPVA	Hardwood Plywood & Veneer Association	Reston	VA	(703) 435-2900	www.hpva.org
ICC	International Code Council	Washington	DC	(888) 422-7233	www.iccsafe.org

ICC-ES	ICC Evaluation Service	Whittier	CA	(562) 699-0543	www.icc-es.org
ICBO	International Conference of Building Officials				(See ICC)
ISO	International Organization for Standardization	Geneva, Switzerland			www.iso.org
ISSA	International Slurry Surfacing Association	Annapolis	MD	(410) 267-0023	www.slurry.org
KCMA	Kitchen Cabinet Manufacturers Association	Reston	VA	(703) 264-1690	www.kcma.org
LPI	Lightning Protection Institute	Maryville	MO	(800) 488-6864	www.lightning.org
MFMA	Maple Flooring Manufacturers' Association	Deerfield	IL	(888) 480-9138	www.maplefloor.org
MSS	Manufacturer's Standardization Society of The Valve and Fittings Industry	Vienna	VA	(703) 281-6613	www.mss-hq.com
NAAMM	National Association of Architectural Metal Manufacturers	Glen Ellyn	IL	(630) 942-6591	www.naamm.org
NEC	National Electric Code	(from NFPA).			
NEMA	National Electrical Manufacturer's Association	Rosslyn	VA	(703) 841-3200	www.nema.org
NFPA	National Fire Protection Association	Quincy	MA	(800) 344-3555	www.nfpa.org
NFRC	National Fenestration Rating Council	Greenbelt	MD	(301) 589-1776	www.nfrc.org
NSF	NSF International	Ann Arbor	MI	(734) 769-8010	www.nsf.org
PCA	Portland Cement Association	Skokie	IL	(847) 966-6200	www.cement.org
PCI	Precast / Prestressed Concrete Institute	Chicago	IL	(312) 786-0300	www.pci.org
PEI	Porcelain Enamel Institute	Norcross	GA	(770) 676-9366	www.porcelainenamel.com

RFCI	Resilient Floor Covering Institute	LaGrange	GA	(706) 882-3833	www.rfci.com
SCTE	Society of Cable Telecommunications Engineers	Exton	PA	(800) 542-5040	www.scte.org
SDI	Steel Deck Institute	Fox River Grove	IL	(847) 458-4647	www.sdi.org
SDI	Steel Door Institute	Westlake	OH	(440) 899-0010	www.steeldoor.org
SIGMA	Sealed Insulating Glass Manufacturer's Association	Chicago	IL	(312) 644-6610	www.arcat.com
SJI	Steel Joist Institute	Myrtle Beach	SC	(843) 293-1995	www.steeljoist.org
SMACNA	Sheet Metal & Air Conditioning Contractors National Association	Chantilly	VA	(703) 803-2980	www.smacna.org
SPIB	Southern Pine Inspection Bureau	Pensacola	FL	(850) 434-2611	www.spib.org
SSMA	Steel Stud Manufacturer's Association	Glen Ellyn	IL	(630) 942-6592	www.ssma.com
TCNA	Tile Council of North America	Anderson	SC	(864) 646-8453	www.tileusa.com
TPI	Truss Plate Institute	Alexandria	VA	(703) 683-1010	www.tpinst.org
TPI	Turfgrass Producers International (formally American Sod Producers Association)	East Dundee	IL	(847) 649-5555	www.turfgrasssod.org
UL	Underwriters Laboratories	Camas	WA	(877) 854-3577	www.ul.com
WDMA	Window and Door Manufacturer's Association	Chicago	IL	(312) 321-6802	www.nwwda.org
WWPA	Western Wood Products Association	Portland	OR	(503) 224-3930	www.wwpa.org

D. Federal Government Agencies:

- Names and titles of federal government standard or specification producing agencies are often abbreviated. Following acronyms or abbreviations referenced in Contract Documents represent names of standard or specification producing agencies of federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

CS	COMMERCIAL STANDARD (U S DEPARTMENT OF COMMERCE)	WASHINGTON	DC	(202) 512-0000	WWW.DOC.GOV
EPA	ENVIRONMENTAL PROTECTION AGENCY	WASHINGTON	DC	(202) 272-0167	WWW.EPA.GOV
FCC	FEDERAL COMMUNICATIONS COMMISSION	WASHINGTON	DC	(888) 225-5322	WWW.FCC.GOV
FS	FEDERAL SPECIFICATIONS UNIT (AVAILABLE FROM GSA)	WASHINGTON	DC	(202) 619-8925	WWW.GSA.GOV
MIL	MILITARY STANDARDIZATION DOCUMENTS (U S DEPARTMENT OF DEFENSE)	PHILADELPHIA	PA	(215) 697-2179	WWW.DOD.GOV
NIST	NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, TECHNOLOGY ADMINISTRATION (US DEPARTMENT OF COMMERCE)	GAITHERSBURG	MD	(301) 975-4500	WWW.TS.NIST.GOV
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (U S DEPARTMENT OF LABOR)	WASHINGTON	DC	202) 219-8148	WWW.OSHA.GOV
PS	PRODUCT STANDARD OF NBS (U S DEPARTMENT OF COMMERCE)	WASHINGTON	DC	(202) 512-1800	WWW.DOC.GOV

E. Governing Regulations / Authorities:

1. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.
2. Obtain copies of regulations required to be retained at Project Site, available for reference by parties who have a reasonable need for such reference.

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SECTION 01 4301
QUALITY ASSURANCE QUALIFICATIONS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- B. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

1.02 SUMMARY

- A. Related Documents:
 - 1. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Requirements:
 - 1. Section 01 4000: 'Quality Requirements' includes administrative and procedural requirements for quality assurance and quality control.
 - 2. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.

1.03 REFERENCES

- A. Definitions:
 - 1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
 - 2. 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.
 - 3. Testing Agency: Entity engaged to perform specific tests, inspections, or both.
 - 4. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.
- B. Reference Standards:
 - 1. ASTM International:
 - a. ASTM E329-18, 'Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.'

1.04 QUALIFICATIONS

- A. Qualifications: Qualifications paragraphs in this Article establish minimum qualification levels required; individual Specification Sections specify additional requirements:
 - 1. Manufacturers / Distributors / Fabricator / Suppliers / Installers Qualifications: Firm experienced in producing products similar to those indicated for this Project and with record of successful in-service performance, as well as sufficient production capacity to produce required units.
 - a. Owner established Relationships:
 - 1) Where heading 'Category One, Two, or Three Approved' Manufacturers / Suppliers / Distributors / Installers' is used to identify list Owner established Relationships, Owner has established relationships that extend beyond requirements of this Project.
 - 2) No other Manufacturers / Suppliers / Distributors / Installers will be acceptable.
 - 3) Follow specified procedures to preserve relationships between Owner and specified Manufacturers / Suppliers / Distributors / Installers and advantages that accrue to Owner from those relationships.
 - 4) Following areas of the Work have restrictions on sub-bids by Contractor:

- (a) Aluminum-Framed Entrances And Storefronts, Section 08 4113: Category Three Approved, no other Manufacturer / Installers accepted.
 - (b) Asphalt Shingles, Section 07 3113: Category Three Approved, no other Manufacturer / Installers accepted.
 - (c) Wood Framing, Division 06 'Wood', Category Three Approved, no other Supplier accepted for USA Projects Only except approved Supplier:
 - (1) Wood Framing, Section 06 1100.
 - (2) Wood-Panel Product Sheathing, Section 06 1636.
- b. Approved:
 - 1) Where heading 'Approved Suppliers / Distributors / Installers / Applicators / Fabricators' is used to identify list of specified suppliers / distributors / installers / applicators / fabricators, use only listed suppliers / installers / fabricators.
 - 2) No substitutions will be allowed.
- c. Acceptable Suppliers / Installers:
 - 1) Where heading 'Acceptable Suppliers / Installers / Fabricators' is used, qualifications as specified in Quality Assurance in Part 1 of individual sections will be used to determine requirements of those that will be acceptable to be used on Project. Lists for acceptable installers can include additional installers that may be approved before bidding or by addendum.
- 2. Factory-Authorized Service Representative Qualifications:
 - a. 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.
- 3. 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.
- 4. 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.
- 5. Manufacturer's Field Services Qualifications:
 - a. Experienced authorized representative of manufacturer to inspect field-assembled components and equipment installation, including service connections.
- 6. 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 kind indicated. Engineering services are defined as those performed for installations of system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- 7. Specialists:
 - a. Certain sections of Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations.
 - b. Specialists shall satisfy qualification requirements indicated and shall be engaged for activities indicated.
 - c. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- 8. Testing Agency Qualifications:
 - a. Independent Testing Agency with experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1) Testing Laboratory:
 - (a) AASHTO Materials Reference Laboratory (AMRL) Accreditation Program.

- (b) Cement and Concrete Reference Laboratory (CCRL).
- (c) Nationally Recognized Testing Laboratory (NRTL): Nationally recognized testing laboratory according to 29 CFR 1910.7.
- (d) National Voluntary Laboratory (NVLAP): Testing Agency accredited according to National Institute of Standards and Technology (NIST) Technology Administration, U. S. Department of Commerce Accreditation Program.

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**SECTION 01 4523
TESTING AND INSPECTING SERVICES**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- B. ASTM C138/C138M - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete; 2024a.
- C. ASTM C805/C805M - Standard Test Method for Rebound Number of Hardened Concrete; 2025.
- D. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry; 2026.
- E. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).
- F. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2026.
- G. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2025.
- H. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
- I. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.
- J. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2026.
- K. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.02 RELATED DOCUMENTS

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

1.03 SUMMARY

- A. This Section includes testing, inspections, special testing, special inspections, and testing laboratory services for materials, products, and construction methods as specified hereafter for the Work.
- B. Specified tests, inspections, and related actions do not limit Contractor's quality control procedures to fully comply with Contract Document requirements in all regards.
- C. Costs: Costs of initial services for testing and inspection personnel will be paid by Owner unless otherwise noted.
 - 1. If initial tests indicate non-compliance with contract document requirements, any subsequent testing will be performed by same personnel and paid for by Contractor.
- D. Related Requirements:
 - 1. Section 01 4000: 'Quality Requirements' includes administrative and procedural requirements for quality assurance and quality control.
 - 2. Section 01 4301: 'Quality Assurance – Qualifications' establishes minimum qualification levels required.
 - 3. Division 01 through Division 49 establish responsibility for providing specific testing and inspections and Field Tests and Inspections.

1.04 REFERENCES

- A. Association Publications:
 - 1. Council of American Structural Engineers. CASE Form 101: Statement of Special Inspections. Washington, DC: CASE, 2001. (c/o American Council of Engineering Companies, 1015 15th St., NW, Washington, DC 20005; 202-347-7474; www.acec.org).

2. International Code Council (IBC):
 - a. IBC Chapter 17, 'Structural Tests and Special Inspections'.
- B. Definitions:
 1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
 2. Approved: To authorize, endorse, validate, confirm, or agree to.
 3. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
 4. Inspection/Special Inspection:
 - a. Inspection: Not required by code provisions but may be required by Contract Documents.
 - b. Special Inspection: Inspection required of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and reference standards (required by code provisions and by Contract Documents).
 - c. Special Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
 - d. Special Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.
 5. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation. They are not samples. Approved mockups establish standard by which the Work will be judged.
 6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.
 7. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
 8. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.
 9. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.
 10. Special Inspection: See Inspection.
 11. Special Inspector: Certified individual or firm that implements special inspection program for project.
 12. Special Test: See Test.
 13. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship:
 - a. Test: Not required by code provisions but may be required by Contract Documents.
 - b. Special Test: Required by code provisions and by Contract Documents.
 14. Testing Agency: Entity engaged to perform specific tests, inspections, or both.
 15. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.
 16. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.
- C. Reference Standards:

1. ASTM International:
 - a. ASTM C42/C42M-18, 'Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete'.
 - b. ASTM C138/C138M-17a, 'Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete'.
 - c. ASTM C597-16, 'Standard Test Method for Pulse Velocity Through Concrete'.
 - d. ASTM C803/C803M-18, 'Standard Test Method for Penetration Resistance of Hardened Concrete'.
 - e. ASTM C805/C805M-13a, 'Standard Test Method for Rebound Number of Hardened Concrete'.
 - f. ASTM C1019-18, 'Standard Test Method for Sampling and Testing Grout'.
 - g. ASTM C1021-08(2014), 'Standard Practice for Laboratories Engaged in Testing of Building Sealants'.
 - h. ASTM C1077-17, 'Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation'.
 - i. ASTM C1093-15a, 'Standard Practice for Accreditation of Testing Agencies for Masonry'.
 - j. ASTM E329-18: 'Standard Specification for Agencies Engaged in Construction Inspection and/or Testing'.
 - k. ASTM E488-18, 'Standard Test Methods for Strength of Anchors in Concrete Elements'.
 - l. ASTM E543-15, 'Standard Specification for Agencies Performing Nondestructive Testing'.
 - m. ASTM E587-15, 'Standard Practice for Ultrasonic Angle-Beam Examination by the Contact Method'.
 - n. ASTM E1212-17, 'Standard Practice for Quality Management Systems for Nondestructive Testing Agencies'.
 - o. ASTM F2170-18, 'Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes'.
2. Code of Federal Regulations:
 - a. 29 CFR 1910, Subpart A, Section 1910.7, 'Definition and Requirements for a Nationally Recognized Testing Laboratory'.
3. International Code Council Code (IBC) (2018 or most recent edition adopted by AHJ):
 - a. IBC Chapter 17, 'Special Inspections And Tests'.
 - 1) Section 1704, 'Special Inspections And Tests, Contractor Responsibility And Structural Observations'.
 - 2) Section 1705, 'Required Special Inspection And Tests'.
 - (a) Section 1705.2, 'Steel Construction'.

1.05 SUBMITTALS

- A. Informational Submittals:
 1. General: Additional submittal requirements are specified in Individual Sections in Division 01 through Division 50.
 2. Certificates:
 - a. Testing Agency will submit certified written report of each inspection, test, or similar service.
 3. Tests and Evaluation Reports:
 - a. Testing Agency or Agencies will prepare logs, test reports, and certificates applicable to specific tests and inspections and deliver copies (or electronic record) distributed as follows:
 - 1) 1 copy to Owner's Representative.
 - 2) 1 copy to Architect.
 - 3) 1 copy to Consulting Engineers (Engineer of Record).
 - 4) 1 copy to General Contractor.

- 5) 1 copy to Authorities Having Jurisdiction (if required).
- b. Other tests, certificates, and similar documents will be obtained by Contractor and delivered to Owner's Representative and Architect in such time as not to delay progress of the Work or final payment therefore.
- c. Submittal Format:
 - 1) Schedule of Tests and Inspections: Prepare in tabular form and include following:
 - (a) Specification Section number and title.
 - (b) Description of test and inspection.
 - (c) Identification of applicable standards.
 - (d) Identification of test and inspection methods.
 - (e) Number of tests and inspections required.
 - (f) Time schedule or time span for tests and inspections.
 - (g) Entity responsible for performing tests and inspections.
 - (h) Requirements for obtaining samples.
 - 2) Certified written reports of each inspection, test, or similar service will include, but not be limited:
 - (a) Date of issue.
 - (b) Project title and number.
 - (c) Name, address, and telephone number of Testing Agency.
 - (d) Dates and locations of samples and tests or inspections.
 - (e) Names of individuals making tests and inspections.
 - (f) Description of the Work and test and inspection method.
 - (g) Identification of product and Specification Section.
 - (h) Complete test or inspection data.
 - (i) Test and inspection results and an interpretation of test results.
 - (j) Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - (k) Comments or professional opinion on whether tested or inspected Work complies with Contract Document requirements.
 - (l) Name and signature of laboratory inspector.
 - (m) Recommendations on retesting and re-inspecting.
4. Source Quality Control Submittals:
 - a. Testing Agency will submit following prior to commencing the Work:
 - 1) Qualifications of Testing Agency management and personnel designated to project.
 - 2) Testing Agency 'Written Practice for Quality Assurance'.
 - 3) Qualification records for Inspector and non-destructive testing technicians designated for project.
 - 4) Testing Agency non-destructive testing procedures, equipment calibration records, and personnel training records.
 - 5) Testing Agency Quality Control Plan for monitoring and control of testing operations.
 - 6) Welding Inspection Procedures (Structural Steel testing).
 - 7) Bolting Inspection Procedures (Structural Steel testing).
 - 8) Shear Connector Stud Inspection Procedures (Structural Steel testing).
 - 9) Seismic Connections Inspection Procedures (Structural Steel testing).

1.06 QUALITY ASSURANCE

- A. Owner or Owner's designated representative(s) will perform quality assurance. Owner's quality assurance procedures may include observations, inspections, testing, verification, monitoring and any other procedures deemed necessary by Owner to verify compliance with Contract Documents.

- B. Owner will employ independent Testing Agencies to perform certain specified testing, as Owner deems necessary.
- C. Certification:
 - 1. Product producers and associations, which have instituted approved systems of quality control and which have been approved by document approval agencies, are not required to have further testing.
 - 2. Concrete mixing plants, plants producing fabricated concrete and wood or plywood products certified by agency, lumber, plywood grade marked by approved associates, and materials or equipment bearing underwriters' laboratory labels require no further testing and inspection.
- D. Written Practice for Quality Assurance:
 - 1. Testing Agency will maintain written practice for selection and administration of inspection personnel, describing training, experience, and examination requirements for qualification and certification of inspection personnel.
 - 2. Written practice will describe testing agency procedures for determining acceptability of structure in accordance with applicable codes, standards, and specifications.
 - 3. Written practice will describe Testing Agency inspection procedures, including general inspection, material controls, visual welding inspection, and bolting inspection.

1.07 QUALITY CONTROL

- A. Quality Control will be sole responsibility of Contractor. Contractor will be responsible for testing and inspections, coordination, start-up, operational checkout, and commissioning of all items of the Work included in Project. All costs for these services will be included in Contractor's cost of the Work.
- B. Contractor will assign one (1) employee to be responsible for Quality Control. This individual may have other responsibilities and may be Contractor's Project superintendent or Contractor's Project Manager.
- C. Notify results of all Testing and Inspection performed by Contractor's independent Testing Agencies to Architect and Owner's Representative within twenty four (24) hours of test or inspection having been performed.
 - 1. Testing and Inspection Reports will be distributed as follows:
 - a. 1 copy to Owner's Representative.
 - b. 1 copy to Architect.
 - c. 1 copy to Consulting Engineer(s) (Engineer of Record).
 - d. 1 copy to Authorities Having Jurisdiction (if required).
- D. Contractor's Responsibility:
 - 1. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents.
 - 2. Tests and inspections that are not explicitly assigned to Owner are responsibility of Contractor.
 - 3. Cooperate with Testing Agency(s) performing required inspections, tests, and similar services and provide reasonable auxiliary services as requested. Notify Testing Agency before operations to allow assignment of personnel. Auxiliary services required include but are not limited to:
 - a. Providing access to the Work and furnishing incidental labor, equipment, and facilities deemed necessary by Testing Agency to facilitate inspections and tests at no additional cost to Owner.
 - b. Taking adequate quantities of representative samples of materials that require testing or helping Testing Agency in taking samples.
 - c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.

- d. Providing Testing Agency with preliminary design mix proposed for use for materials mixes that require control by Testing Agency.
- 4. Contractor will integrate Owner's independent Testing Agency services within Baseline Project Schedule and with other Project activities.
- 5. For any requested inspection, Contractor will complete prior inspections to ensure that items are ready for inspection.
- 6. All Work is subject to testing and inspection and verification of correct operation prior to 100% payment to Contractor of line item(s) pertaining to that aspect of the Work.
- 7. For Mechanical Equipment, inspection and documented approval of individual equipment and/or system(s) must be accomplished prior to requesting Substantial Completion Inspection for any area affected by said equipment and/or system:
 - a. Contractor will perform thorough checkout of operations with manufacturer's representatives prior to requesting formal inspection by Owner.
 - b. Contractor must notify Owner's Representative, in advance, as to when manufacturer's representative is scheduled to arrive at Site.
- 8. Comply:
 - a. Upon completion of Testing Agency's inspection, testing, sample-taking, and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.
 - b. Comply with Contract Documents in making such repairs.
- 9. Data: Furnish records, drawings, certificates, and similar data as may be required by testing and inspection personnel to assure compliance with Contract Documents.
- 10. Defective Work (Non-Conforming Work): Non-conforming Work as covered in General Conditions applies, but is not limited to following requirements:
 - a. Where results of inspections, tests, or similar services show that the Work does not comply with Contract Document requirements, correct deficiencies in the Work promptly to avoid Work delays.
 - b. Where testing personnel take cores or cut-outs to verify compliance, repair prior to acceptance.
 - c. Contractor responsible for any and all costs incurred resulting from inspection that was scheduled prematurely or retesting due to failed tests.
 - d. Remove and replace any Work found defective or not complying with contract document requirements at no additional cost to Owner.
 - e. Should test return unacceptable results, Contractor will bear all costs of retesting and re-inspection as well as cost of all material consumed by testing, and replacement of unsatisfactory material and/or workmanship.
- 11. Protection:
 - a. Protect construction exposed by or for quality assurance and quality control service activities, and protect repaired construction.
- 12. Scheduling: Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities:
 - a. Schedule testing and inspections in advance so as not to delay the Work and to eliminate any need to uncover Work for testing or inspection.
 - b. Notify Testing Agency and Architect as noted in Sections in Division 01 through Division 50 prior to any time required for such services.
 - c. Incorporate adequate time for performance of all inspections and correction of noted deficiencies.
 - d. Schedule sequence of activities to accommodate required services with minimum of delay.
 - e. Schedule sequence of activities to avoid necessity of removing and replacing construction to accommodate testing and inspections
- 13. Test and Inspection Log:
 - a. Provide system of tracking all field reports, describing items noted, and resolution of each item. Prepare record of tests and inspections. Include 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 inspector conducting test or inspection.
- b. Maintain log at Project site:
 - 1) Post changes and modifications as they occur.
 - 2) Provide access to test and inspection log for Architect's reference during normal working hours.

1.08 TESTING AND INSPECTIONS - GENERAL

- A. Testing specifically identified to be conducted by Owner, will be performed by an independent entity and will be arranged and paid for by Owner.
- B. Individual Sections in Division 01 through Division 49 indicate if Owner will provide testing and inspection of the Work of that Section.
- C. Tests include but not limited to those described in detail in 'Field Quality Control' in Part 3 of Individual Sections in Divisions 01 through Division 49.
- D. Owner may engage additional consultants for testing, air balancing, commissioning, or other special services:
 1. Activities of any such Owner consultants are in addition to Contractor testing of materials or systems necessary to prove that performance is in compliance with Contract requirements.
 2. Contractor must cooperate with persons and firms engaged in these activities.
- E. Taking Specimens:
 1. Except as may be specifically otherwise approved by Architect, only testing laboratory shall secure, handle, transport, or store any samples and specimens for testing.
- F. Scheduling Testing Agency:
 1. Contractor will coordinate the Work and facilitate timeliness of such testing and inspecting services so as not to delay the Work.
 2. Contractor will notify Testing Agency and Architect to schedule tests and / or inspections.
- G. For 'building-wide' and/or life safety systems, such as emergency lighting, emergency power uninterruptible power supply systems, fire alarm, fire sprinkler systems, smoke evacuation systems, toxic gas monitoring, capturer exhaust systems, etc. formal start-up inspection will be completed prior to requesting Substantial Completion Inspection for any area of Project:
 1. Manufacturer's representatives and installing contractor will demonstrate both operation and compliance to Owner's agents and consultants. If coordinated and scheduled appropriately by Contractor, these equipment and/or systems inspections may also serve to provide required Owner training, if approved in advance by Owner.
 2. Contractor responsible for requesting that Architect arrange for inspection of materials, equipment, and work prior to assembly or enclosure that would make materials, equipment, or work inaccessible for inspection and at other times as may be required.

1.09 TESTING AGENCY SERVICES AND RESPONSIBILITIES

- A. Testing Agency, including independent testing laboratories, will be licensed and authorized to operate in jurisdiction in which Project is located.
 1. Approved Testing Agency Qualifications: Requirements of Section 01 4301 apply.
- B. Testing and Inspection Services:
 1. Testing Agency will not release, revoke, alter, or increase Contract Document requirements or approve or accept any portion of the Work.
 2. Testing Agency will not give direction or instruction to Contractor.
 3. Testing Agency will have full authority to see that the Work is performed in strict accordance with requirements of Contract Documents and directions of Owner's Representative and/or Architect.

4. Testing Agency will not provide additional testing and inspection services beyond scope of Work without prior approval of Owner's Representative and / or Architect.
- C. Excavation Support and Protection:
1. Anchor tie-back System:
 - a. Observe and record proof tests.
 2. Soil Nail Systems:
 - a. Observe and record proof tests.
 - b. Observe drilling for changes in soil type, hole diameter, length, and cleanliness.
 - c. Periodically observe placement of drainage materials, reinforcing, and shotcrete.
 - d. Review compressive strength test results of grout and shotcrete.
- D. Testing Agency Duties:
1. Independent Testing Agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual specification Sections will cooperate with Architect and Contractor in performance of its duties and will provide qualified personnel to perform required inspections and tests.
 2. Testing Agency will test or obtain certificates of tests of materials and methods of construction, as described herein or elsewhere in technical specification.
 3. Testing Agency will provide management, personnel, equipment, and services necessary to perform testing functions as outlined in this section.
 4. Testing Agency must have experience and capability to conduct testing and inspecting indicated by ASTM standards and that specializes in types of tests and inspections to be performed.
 5. Testing Agency will comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, ASTM C1093, ASTM D3666, ASTM D3740, and other relevant ASTM standards.
 6. Testing Agency must calibrate all testing equipment at reasonable intervals (minimum yearly) with accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
 7. Welding Procedure Review: Testing Agency will provide review and approval or rejection of all welding procedures to be used and will verify compliance with all reference standard requirements.
- E. Testing and Inspection Reports:
1. Conduct and interpret tests and inspections and state in each report whether tested and inspected the Work complies with or deviates from requirements.
 2. Laboratory Reports: Testing Agency will furnish reports of materials and construction as required, including:
 - a. Description of method of test.
 - b. Identification of sample and portion of the Work tested.
 - 1) Description of location in the Work of sample.
 - 2) Time and date when sample was obtained.
 - 3) Weather and climatic conditions at time when sample was obtained.
 - c. Evaluation of results of tests including recommendations for action.
 3. Inspection Reports:
 - a. Testing Agency will furnish 'Inspection at Site' reports for each site visit documenting activities, observations, and inspections.
 - b. Include notation of weather and climatic conditions, time and date conditions and status of the Work, actions taken, and recommendations or evaluation of the Work.
 4. Reporting Testing and Inspection (Conforming Work):
 - a. Submit testing and inspection reports as required within twenty four (24) hours of test or inspection having been performed.
 5. Reporting Testing and Inspection Defective Work (Non-Conforming Work):

- a. Testing Agency, upon determination of irregularities, deficiencies observed or test failure(s) observed in the Work during performance of its services of test or inspection having been performed, will:
 - 1) Verbally notify results to Architect, Contractor, and Owner's Representative within one hour of test or inspection having been performed (if Defective Work (Non-Conforming Work) is incorporated into project).
 - 2) Submit written inspection report and test results as required within twenty four (24) hours of test or inspection having been performed.
 - b. Prepare non-compliance log to track non-compliant testing or inspections.
- 6. Final Report:
 - a. Submit final report of tests and inspections at Substantial Completion, which identify unresolved deficiencies.

1.10 ARCHITECT'S RESPONSIBILITIES

- A. Architect Duties:
 - 1. Notify Owner's Representative before each test and/or inspection.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Field Tests And Inspections:
 - 1. Field Tests and Inspections requirements are described in 'Field Quality Control' of individual Sections in Division 01 through Division 49.

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**SECTION 01 5100
TEMPORARY UTILITIES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Temporary Utilities.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Where necessary, engage appropriate local utility companies to install temporary service or connect to existing service. Where utility company provides only part of service, provide remainder with matching, compatible materials and equipment. Comply with utility company's recommendations.
 - 1. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction.
 - 2. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
 - 3. Arrange with utility company and existing users for time when service can be interrupted, where necessary, to make connections for temporary services.
 - 4. Provide adequate capacity at each stage of construction. Before temporary utility availability, provide trucked-in services.
 - 5. Obtain construction easements necessary to bring temporary and/or permanent utilities to site.
 - 6. Use qualified personnel for installation and maintenance of temporary facilities. Locate temporary utilities where they will serve Project adequately and result in minimum interference with the Work of Owner or other Contractors on Project Site. Relocate and modify temporary utilities as required.
 - 7. Pay cost and use charges for temporary and permanent utilities until Substantial Completion has been granted by Owner.
- B. Prepare schedule indicating dates for implementation and termination of each temporary utility. At earliest feasible time, change over from use of temporary service to use of permanent service.
- C. Keep temporary utilities clean and neat in appearance. Operate in safe and efficient manner. Take necessary fire prevention measures. Do not overload utilities, or allow them to interfere with progress of The Work. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on Project site.
- D. Limit availability of temporary utilities to essential and intended uses to reduce waste and abuse.
- E. Maintain temporary utilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- F. Remove each temporary utility and control when need has ended, or when replaced by permanent utility, but not later than Substantial Completion. Complete permanent construction that may have been delayed because of interference with temporary utility. Repair damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that make up temporary utilities are property of Contractor.
 - 2. By Substantial Completion, clean and renovate permanent utilities used during construction period, including but not limited to:
 - a. Replace air filters and clean inside of ductwork and housings.

- b. Replace significantly worn parts and parts subjected to unusual operating conditions.
- c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

1.03 TEMPORARY ELECTRIC POWER

- A. Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period.

1.04 TEMPORARY FIRE PROTECTION

- A. Install and maintain temporary fire protection facilities of types needed to protect against predictable and controllable fire losses. At a minimum, provide and maintain in working order two Standard UL Labeled ABC all-purpose 10 lb fire extinguishers. Do not incorporate these extinguishers into final Project.
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for fighting fires.
 - 4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
 - 5. At earliest feasible date in each area of Project, complete installation of permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

1.05 HEATING, COOLING, AND VENTILATING:

- A. Install and operate temporary heating, cooling, and ventilating units including fuel, temporary piping, fittings, wiring, and connections necessary to provide environmental conditions specified for various portions of the Work. Coordinate ventilation requirements to produce ambient conditions required and reduce consumption of energy.
- B. Repair damage to building and contents caused by cold, heat, dampness, and/or heating, cooling, and ventilating equipment. Select equipment that will not have harmful effect on completed installations or on elements being installed.
- C. Maintain safe conditions for use of temporary heating, cooling, and ventilating systems including, but not limited to, following requirements:
 - 1. Operate equipment according to equipment manufacturer's instructions.
 - 2. Provide fresh air ventilation required by equipment manufacturer.
 - 3. Keep temperature of fuel containers stabilized.
 - 4. Secure fuel containers from overturning.
 - 5. Operate equipment away from combustible materials.
- D. Permanent mechanical system may be operated subject to following conditions:
 - 1. Do not operate system when work causing air-borne dust is occurring or when dust caused by such work is present without installation of temporary filtering system approved by Architect.
 - 2. Operate system at no cost to Owner, including cost of fuel.
 - 3. Assume all responsibility and risk for operation of system.
 - 4. Return permanent mechanical equipment to 'like-new' condition for Substantial Completion Inspection.

1.06 TEMPORARY LIGHTING

- A. Install and operate temporary lighting that will provide adequate illumination for construction operations and traffic conditions.

1.07 TEMPORARY TELEPHONES

- A. Provide temporary telephone service for all personnel engaged in construction activities, throughout construction period.

- B. Contractor will pay for Local calls. Party making call will pay for long-distance and toll calls.
- C. At each telephone, post list of important telephone numbers.

1.08 TEMPORARY WATER SERVICE

- A. Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.

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**SECTION 01 5200
CONSTRUCTION FACILITIES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Construction Facilities.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Prepare schedule indicating dates for implementation and termination of each temporary facility.
- B. Keep temporary facilities clean and neat in appearance. Operate in safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or allow them to interfere with progress of The Work. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on Project site.
- C. Maintain facilities in good operating condition until removal.
- D. Remove each temporary facility when need has ended, or when replaced by authorized use of permanent facility, or by Substantial Completion. Complete 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 make up temporary facilities are property of Contractor.
 - 2. By Substantial Completion, clean and renovate permanent facilities used during construction period.

1.03 FIELD OFFICES

- A. Provide and maintain insulated, weather tight temporary office of sufficient size to accommodate Contractor's personnel at Project site and for use by Owner, Architect and Subcontractors.
 - 1. Keep office clean and orderly.
 - 2. Heat and cool office as needed.
 - 3. Furnish office with locking door, light(s), table(s), bench(es), rack(s) for drawings, and telephone.
 - 4. Make office available for progress meetings.
 - 5. Provide an operable fire extinguisher in facility.
 - 6. Provide hardhats for Owner's Representatives for site visits.
- B. If Owner agrees to permit removal of temporary office before Substantial Completion, Contractor may use a room as an office after temporary office is removed. Equip room as specified above and restore to 'like-new' condition before Substantial Completion.

1.04 SANITARY FACILITIES

- A. Provide temporary sanitary toilet. Service and maintain temporary toilet in a clean, sanitary condition.

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**SECTION 01 5400
CONSTRUCTION AIDS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Construction Aids.

1.02 SCAFFOLDING, PLATFORMS, STAIRS, ETC

- A. Furnish and maintain equipment such as temporary stairs, ladders, ramps, platforms, scaffolds, hoists, runways, derricks, chutes, and elevators as required for proper execution of The Work.
- B. Apparatus, equipment, and construction shall meet requirements of applicable laws and safety regulations.

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**SECTION 01 5500
VEHICULAR ACCESS AND PARKING**

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes But is Not Limited To:

1. Administrative and procedural requirements for Vehicular Access and Parking.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 TEMPORARY ACCESS ROADS

3.02 HAUL ROUTES

3.03 TEMPORARY PARKING AREAS

3.04 TEMPORARY ROADS

3.05 TRAFFIC CONTROL

3.06 STAGING AREAS

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**SECTION 01 5600
TEMPORARY BARRIERS AND ENCLOSURES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Temporary Barriers and Enclosures.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Protection Of Existing Improvements: Protect streets, private roads, and sidewalks, including overhead protection where required. Repair damage to existing improvements caused by construction activities.
- B. Protection Of Adjacent Property: Provide necessary protection for adjacent property and lateral support thereof.
- C. Proprietary Camera Services: In its absolute discretion, and with or without notice to Contractor, Owner may provide from time to time, but is not obligated to provide, one or more cameras on or about Project site and/or signage or notices of the same:
 - 1. If provided by Owner, such camera(s) and/or signage and notices are solely for Owner's benefit and convenience and shall not be for benefit of Contractor, Subcontractor(s) or for any third person.
 - 2. Owner shall have no liability, obligation, or responsibility to Contractor, Subcontractors, or any third person relative to such camera(s), signage, or notices, or absence of camera(s), signage, or notices, including without limitation, installation, maintenance, operation, repair, testing, functionality, capacity, recording, monitoring, posting, etc., of the same (hereafter 'Proprietary Camera Services').
 - 3. Contractor, with Owner's prior consent (which shall not be unreasonably withheld), may relocate such camera(s), signage, or notices as necessary to not unreasonably, materially and physically interfere with work at Project Site.
 - 4. Contractor's obligations under Contract Documents, including but not limited to, Contractor's obligation for security of Project Site, are not modified by Owner's opportunity to provide, actually providing, or not providing Proprietary Camera Services and/or signage or notices regarding the same.
 - 5. This Specification Section does not preclude Contractor from providing its own camera(s), signage, or notices pursuant to terms and conditions of this Agreement. Neither does this Section reduce, expand or modify any other right or obligation of Owner pursuant to terms of this Agreement.

1.03 TEMPORARY AIR BARRIERS

1.04 TEMPORARY DUST BARRIERS

1.05 TEMPORARY NOISE BARRIERS

1.06 TEMPORARY BARRICADES

- A. Comply with standards and code requirements in erecting barricades, warning signs, and lights.
- B. Take necessary precautions to protect persons, including members of the public, from injury or harm.

1.07 TEMPORARY FENCING

- A. Before construction begins, install 6 foot high enclosure fence with lockable entrance gates. Locate where shown on Drawings. If not shown on Drawings, enclose entire site or portion sufficient to accommodate construction operations.

1.08 TEMPORARY SECURITY BARRIERS

- A. Install temporary enclosures of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and other violations of security.

- B. Secure materials and equipment stored on site.
- C. Secure building at the end of each work day.
- D. Maintain exterior building security until Substantial Completion.

1.09 TEMPORARY TREE AND PLANT PROTECTION

- A. Protection:
 - 1. Before commencing site work, build and maintain protective fencing around existing trees and vegetation as shown on the drawings.
 - 2. Individual trees will have protective fencing built beyond drip line.
 - 3. Build protective fencing around groups of trees and other vegetation as indicated on Drawings.
 - 4. Keep areas within protective fencing undisturbed and do not use for any purpose.
- B. Maintenance:
 - 1. Maintain existing tree, shrubs, and vegetation as indicated in Contract Documents:
 - a. Remove and replace vegetation that dies or is damaged beyond repair due to construction activities.
 - b. Damage to any tree, shrub, or vegetation that has been indicated to remain and be protected, will have a cost associated with it. This includes branches, trunk and root systems:
 - 1) Trees: \$1,000.00.
 - 2) Shrubs: \$ 100.00.
 - 3) Vegetation: \$ 50.00.
- C. Pruning:
 - 1. Provide a qualified Tree Service Firm if pruning is required:
 - a. Coordinate with authorities having jurisdiction.
 - b. Coordinate with Owner and Architect on site before pruning is to begin.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

**SECTION 01 5700
TEMPORARY CONTROLS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Temporary Controls.

1.02 TEMPORARY EROSION AND SEDIMENT CONTROL

- A. Take precautions necessary to prevent erosion and transportation of soil downstream, to adjacent properties, and into on-site or off-site drainage systems.
- B. Develop, install, and maintain an erosion control plan if required by law.
- C. Repair and correct damage caused by erosion.

1.03 TEMPORARY ENVIRONMENTAL CONTROLS

- A. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and reduce possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result:
 - 1. Avoid use of tools and equipment that produce harmful noise.
 - 2. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near site.
- B. Provide protection against weather (rain, winds, storms, frost, or heat) to maintain all work, materials, apparatus, and fixtures free from injury or damage.
- C. Protect excavation, trenches, and building from damage from rain water, spring water, ground water, backing up of drains or sewers, and all other water:
 - 1. For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with requirements of applicable local regulations. Where feasible, use permanent facilities.
 - 2. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
- D. Comply with governing ordinances relating to weed control and removal.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

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**SECTION 01 5800
PROJECT IDENTIFICATION**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Project Identification.

1.02 TEMPORARY PROJECT SIGNAGE

- A. Contractor may, at its option, erect a temporary project identification sign.
 - 1. Sign may be free-standing or attached to temporary field office or storage shed.
 - 2. No other signs or advertisements are allowed on building site.
- B. Contractor will erect a temporary project identification sign.
 - 1. Sign may be free-standing or attached to temporary field office or storage shed. No other signs or advertisements are allowed on building site.
 - 2. Owner reserves right to remove and/or take possession of any project identification sign.
- C. Provide a temporary project Identification sign:
 - 1. Sign may be free-standing or attached to temporary field office or storage shed.
 - 2. No other signs or advertisements are allowed on building site.
 - 3. Sign will be no larger than 4 feet by 8 feet and include following information:
 - a. Project Name as shown in Contract Documents.
 - b. Contractor's name.
 - c. Architectural firm name.
 - 4. Owner reserves the right to remove and/or take possession of any project identification sign.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

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**SECTION 01 6100
COMMON PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Common Product Requirements.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Provide products that comply with Contract Documents, that are undamaged, and, unless otherwise indicated, new and unused at time of installation. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and for intended use and effect.
- B. Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on surfaces of products that will be exposed to view in occupied spaces or on building exterior.
 - 1. Locate required product labels and stamps on concealed surface or, where required for observation after installation, on accessible surface that is not conspicuous.
 - 2. Provide permanent nameplates on items of service-connected or power-operated equipment. Locate on easily accessible surface that is inconspicuous in occupied spaces. Nameplate will contain following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
- C. Where specifications describe a product or assembly by specifying exact characteristics required, with or without use of brand or trade name, provide product or assembly that provides specified characteristics and otherwise complies with Contract requirements.
- D. Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by manufacturer for application described. General overall performance of product is implied where product is specified for specific application. Manufacturer's recommendations may be contained in published product literature, or by manufacturer's certification of performance.
- E. Where specifications only require compliance with an imposed code, standard, or regulation, select product that complies with standards, codes or regulations specified.
- F. Where Specifications require matching an established Sample, Architect's decision will be final on whether proposed product matches satisfactorily. Where no product available within specified category matches satisfactorily nor complies with other specified requirements, refer to Architect.
- G. Where specified product requirements include phrase ` . . . as selected from manufacturer's standard colors, patterns, textures . . . ' or similar phrase, select product and manufacturer that comply with other specified requirements. Architect will select color, pattern, and texture from product line selected.
- H. Refer to individual Specification Sections and Allowance provisions in Division 01 for allowances that control product selection, and for procedures required for processing such selections.
- I. Remove and replace products and materials not specified in Contract Documents but installed in the Work with specified products and materials at no additional cost to Owner and for no increase in Contract time.
- J. Informational Submittals:
 - 1. Sustainable Design Submittals:

- a. Submit five copies of each required submittal unless otherwise required. Architect will return three copies marked with action taken and with corrections or modifications required.
- b. Submit electronic files: PDF. Architect will return a PDF copy marked with action taken and with corrections or modifications required.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

SECTION 01 6200 PRODUCT OPTIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Product Options.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Product Selection:
 - 1. When option of selecting between two or more products is given, product selected will be compatible with products previously selected, even if previously selected products were also options.
 - a. Regional materials.
- B. Non-Conforming Work:
 - 1. Non-conforming work as covered in Article 12.3 of General Conditions applies, but is not limited, to use of non-specified products or manufacturers.
- C. Product selection is governed by Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include:
 - 1. Substitutions And Equal Products:
 - a. Generally speaking, substitutions for specified products and systems, as defined in the Uniform Commercial Code, are not acceptable. However, equal products may be approved upon compliance with Contract Document requirements.
 - b. Approved Products / Manufacturers / Suppliers / Distributors / Fabricators / Installers:
 - 1) Category One:
 - (a) Owner has established 'Relationships' that extend beyond requirements of this Project. No substitutions or equal products will be allowed on this Project.
 - (b) Specification Sections specify Owner Furnished and Owner Installed Manufacturers or Products.
 - (c) Follow specified procedures to preserve relationships between Owner and specified manufacturers / suppliers and advantages that accrue to Owner from those relationships.
 - 2) Category Two:
 - (a) Owner has established 'Relationships' that contain provisions extending beyond requirements of this Project. No substitutions or equal products will be allowed on this Project.
 - (b) Specification Sections specify Owner Furnished and Contractor Installed Manufacturers, Suppliers, Distributors or Products.
 - (c) Follow specified procedures to preserve relationships between Owner and specified manufacturers / suppliers and advantages that accrue to Owner from those relationships.
 - 3) Category Three:
 - (a) Owner has established 'Relationships' that contain provisions extending beyond requirements of this Project. Use these products to preserve advantages that accrue to Owner from those programs. No substitutions or equal products will be allowed on this Project.
 - (b) Specification Sections specify Contractor Furnished and Contractor Installed Manufacturers, Suppliers, Distributors, Fabricators or Products.
 - 4) Category Four:
 - (a) Provide only specified products available from manufacturers listed. No substitutions, private-labeled, or equal products, or mixing of manufacturers' products is allowed on this Project.

- (b) In Sections where lists recapitulating Manufacturers previously mentioned in Section are included under heading 'Manufacturers' or 'Approved Manufacturers', this is intended as a convenience to Contractor as a listing of contact information only. It is not intended that all manufacturers in list may provide products where specific products and manufacturers are listed elsewhere in Section.
- c. Acceptable Products / Manufacturers / Suppliers / Installers:
 - 1) Type One: Use specified products / manufacturers unless approval to use other products / manufacturers has been obtained from Architect by Addendum.
 - 2) Type Two: Use specified products / manufacturers unless approval to use other products and manufacturers has been obtained from Architect in writing before installing or applying unlisted or private-labeled products.
 - 3) Use 'Equal Product Approval Request Form' to request approval of equal products, manufacturers, or suppliers before bidding or before installation, as noted in individual Sections.
- d. Quality / Performance Standard Products / Manufacturers:
 - 1) Class One: Use specified product / manufacturer or equal product from specified manufacturers only.
 - 2) Class Two: Use specified product / manufacturer or equal product from any manufacturer.
 - 3) Products / manufacturers used shall conform to Contract Document requirements.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

SECTION 01 6600
PRODUCT DELIVERY STORAGE AND HANDLING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Product Delivery, Storage, and Handling Requirements.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Deliver, store, and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1.03 DELIVERY AND ACCEPTANCE REQUIREMENTS

- A. Schedule delivery to reduce long-term storage at site and to prevent overcrowding of construction spaces.
- B. 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.
- C. Deliver products to site in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- D. Inspect products upon delivery to ensure compliance with Contract Documents, and to ensure that products are undamaged and properly protected.

1.04 STORAGE AND HANDLING REQUIREMENTS

- A. Store products at site in manner that will simplify inspection and measurement of quantity or counting of units.
- B. Store heavy materials away from Project structure so supporting construction will not be endangered.
- C. Store products subject to damage by elements above ground, under cover in weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

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**SECTION 01 7100
EXAMINATION AND PREPARATION**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural for Examination And Preparation of the Work.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 MOBILIZATION

3.02 ACCEPTANCE OF EXISTING CONDITIONS

3.03 FIELD ENGINEERING

- A. Construction Layout:
 - 1. Stake location and elevations of:
 - a. Building slabs and utility / mechanical pads.
 - b. Miscellaneous Cast-in-Place Concrete elements.
 - c. Catch basins, curb inlets, and other site drainage elements.
- B. Construction Surveying:
 - 1. Submit stamped and certified survey, performed by surveyor licensed by AHJ, showing compliance with Contract Documents for:
 - a. Building locations and elevations of footings, building slabs, and utility / mechanical pads.
 - b. Locations and elevations of Miscellaneous Cast-in-Place Concrete elements.
 - c. Locations and elevations of catch basins, curb inlets, and other site drainage elements.
 - d. Elevations of rough grading.
 - 2. Do not place construction materials before Architect's approval of survey.

3.04 PROTECTION OF ADJACENT CONSTRUCTION

- A. Protect adjacent properties and constructions.

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SECTION 01 7300 EXECUTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for governing Execution of the Work.

1.02 COMMON INSTALLATION PROVISIONS

- A. Manufacturer's Instructions: Comply with Manufacturer's installation instructions and recommendations to extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents. Notify Architect of conflicts between Manufacturer's installation instructions and Contract Document requirements.
- B. Provide attachment and connection devices and methods necessary for securing Work. Secure work true to line and level. Anchor each product securely in place, accurately located, and aligned with other Work. Allow for expansion and building movement.
- C. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain best visual effect. Refer questionable choices to Architect for final decision.
- D. Install each component during weather conditions and Project status that will ensure best possible results. Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.
- E. Coordinate temporary enclosures with required inspections and tests, to reduce necessity of uncovering completed construction for that purpose.
- F. Mounting Heights: Where mounting heights are not shown, install individual components at standard mounting heights recognized within the industry or local codes for that application. Refer questionable mounting height decisions to Architect for final decision.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

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**SECTION 01 7400
CLEANING AND WASTE MANAGEMENT**

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Administrative and procedural requirements for Cleaning and Waste Management as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 01 1200: Coordination of responsibilities for waste management.
 - 2. Section 01 6400: Waste removal of Owner furnished products.
 - 3. In addition to standards described in this section, comply with all requirements for cleaning-up as described in various other Sections of these Specifications.

1.02 REFERENCES

- A. Definitions:
 - 1. Asphalt Pavement, Brick, and Concrete (ABC) Rubble: Rubble that contains only weathered (cured) asphalt pavement, clay bricks and attached mortar normally used in construction, or concrete that may contain rebar. The rubble shall not be mixed with, or contaminated by, another waster or debris.
 - 2. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
 - 3. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
 - 4. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
 - 5. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
 - 6. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
 - 7. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 PROGRESS CLEANING

- A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning.
- B. Keep premises broom clean during progress of the Work.
- C. Keep site and adjoining streets reasonably clean. If necessary, sprinkle rubbish and debris with water to suppress dust.
- D. During handling and installation, protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from soiling, damage, or deterioration until Substantial Completion.
- E. Clean and maintain completed construction as frequently as necessary throughout construction period. Adjust and lubricate operable components to ensure ability to operate without damaging effects.
- F. Organ Chamber:
 - 1. Clean debris from inside Organ Chamber and leave dust free before organ speakers are installed.

- G. Supervise construction activities to ensure that no part of construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.
- H. Before and during application of painting materials, clear area where such work is in progress of debris, rubbish, and building materials that may cause dust. Sweep floors and vacuum as required and take all possible steps to keep area dust free.
- I. Clean exposed surfaces and protect as necessary to avoid damage and deterioration.
- J. Place extra materials of value remaining after completion of associated work have become Owner's property as directed by Owner or Architect.
- K. Construction Waste Management And Disposal:
 - 1. Remove waste materials and rubbish caused by employees, Subcontractors, and contractors under separate contract with Owner and dispose of legally. Remove unsuitable or damaged materials and debris from building and from property.
 - a. Provide adequate waste receptacles and dispose of materials when full.
 - b. Properly store volatile waste and remove daily.
 - c. Do not deposit waste into storm drains, sanitary sewers, streams, or waterways. Do not discharge volatile, harmful, or dangerous materials into drainage systems.
 - 2. Do not burn waste materials or build fires on site. Do not bury debris or excess materials on Owner's property.

3.02 FINAL CLEANING

- A. Immediately before Substantial Completion, thoroughly clean building and area where The Work was performed. Remove all rubbish from under and about building, landscaped areas and parking lot and leave building and Project Site ready for occupancy by Owner.
- B. Comply with individual manufacturer's cleaning instructions.
- C. Clean each surface or unit to condition expected in normal, commercial building cleaning and maintenance program, including but not limited to:
 - 1. Interior Cleaning:
 - a. Clean inside glazing, exercising care not to scratch glass.
 - b. Remove marks, stains, fingerprints and dirt.
 - c. Clean and polish woodwork and finish hardware.
 - d. Remove labels that are not permanent labels.
 - e. Clean plumbing fixtures and tile work. Remove spots, soil or paint.
 - f. Clean surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean light fixtures and lamps.
 - g. Clean other fixtures and equipment and remove stains, paint, dirt, and dust.
 - h. Remove temporary floor protection and clean floors.
 - 2. Exterior Cleaning:
 - a. Clean outside glazing, exercising care not to scratch glass.
 - b. Remove marks, stains, and dirt from exterior surfaces.
 - c. Clean and polish finish hardware.
 - d. Remove temporary protection systems.
 - e. Clean dirt, mud, and other foreign material from paving, sidewalks, and gutters.
 - f. Clean drop inlets, through-curb drains, and other drainage structures.
 - g. Remove trash, debris, and foreign material from landscaped areas.

SECTION 01 7700 CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Closeout Procedures.

1.02 GENERAL

- A. Closeout process consists of three specific project closeout inspections. Contractor shall plan sufficient time in construction schedule to allow for required inspections before expiration of Contract Time.
- B. Contractor shall conduct his own inspections of The Work and shall not request closeout inspections until The Work of the contract is reasonably complete and correction of obvious defects or omissions are complete or imminent.
- C. Date of Substantial Completion shall not occur until completion of construction work, unless agreed to by Architect and included on Certificate of Substantial Completion.

1.03 PRELIMINARY CLOSEOUT REVIEW

- A. When Architect, Owner and Contractor agree that project is ready for closeout, Pre-Substantial Inspection shall be scheduled. Preparation of floor substrate to receive carpeting and any work which could conceivably damage or stain carpet must be completed, as carpet installation will be scheduled immediately following this inspection.
- B. Prior to this inspection, completed test and evaluation reports for HVAC system and font, where one occurs, are to be provided to Project Manager, Architect, and applicable consultants.
- C. Architect and his appropriate consultants, together with Contractor and mechanical, plumbing, fire protection, and electrical sub-contractors shall conduct a space by space and exterior inspection to review materials and workmanship and to demonstrate that systems and equipment are operational.
 - 1. Punch list of items requiring completion and correction will be created.
 - 2. Time frame for completion of punch list items will be established, and date for Substantial Completion Inspection shall be set.

1.04 SUBSTANTIAL COMPLETION INSPECTION

- A. When Architect, Owner and Contractor agree that project is ready for Substantial Completion, an inspection is held. Punch list created at Pre-Substantial Inspection is to be substantially complete.
- B. Prior to this inspection, Contractor shall discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups and similar elements.
- C. Architect, Owner and Contractor review completion of punch list items. When Owner and Architect confirm that Contractor has achieved Substantial Completion of The Work, Owner, Architect and Contractor will execute Certificate of Substantial Completion that contains:
 - 1. Date of Substantial Completion.
 - 2. Punch List Work not yet completed, including seasonal and long lead items.
 - 3. Amount to be withheld for completion of Punch List Work.
 - 4. Time period for completion of Punch List Work.
 - 5. Amount of liquidated damages set forth in Supplementary Conditions to be assessed if Contractor fails to complete Punch List Work within time set forth in Certificate.
- D. Contractor shall present Closeout Submittals to Architect and place tools, spare parts, extra stock, and similar items required by Contract Documents in locations as directed by Facilities Manager.

1.05 FINAL ACCEPTANCE MEETING

- A. When punch list items except for any seasonal items or long lead items which will not prohibit occupancy are completed, Final Acceptance Meeting is held.
- B. Owner, Architect and Contractor execute Owner's Project Closeout - Final Acceptance form, and verify:
 - 1. All seasonal and long lead items not prohibiting occupancy, if any, are identified, with committed to completion date and amount to be withheld until completion.
 - 2. Owner's maintenance personnel have been instructed on all system operation and maintenance as required by the Contract Documents.
 - 3. Final cleaning requirements have been completed.
- C. If applicable, once any seasonal and long lead items are completed, Closeout Inspection is held where Owner and Architect verify that The Work has been satisfactorily completed, and Owner, Architect and Contractor execute Closeout portion of the Project Closeout - Final Acceptance form.
- D. When Owner and Architect confirm that The Work is satisfactorily completed, Architect will authorize final payment.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

SECTION 01 7800 CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes But is Not Limited To:
 - 1. Administrative and procedural requirements for Closeout Submittals.
- B. Related Requirements:
 - 1. Section 01 3300: 'Submittal Procedures' for administrative and procedural requirements for submittal procedures.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Project Record Documents:
 - 1. Do not use record documents for construction purposes:
 - a. Protect from deterioration and loss in secure, fire-resistive location.
 - b. Provide access to record documents for Architect's reference during normal working hours.
 - 2. Maintain clean, undamaged set of Drawings:
 - a. Mark set to show actual installation where installation varies from the Work as originally shown.
 - b. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - c. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
 - d. Mark new information that is important to Owner, but was not shown on Drawings.
 - e. Note related Change Order numbers where applicable.
- B. As Built Record Drawings:
 - 1. As required in agreement with the Owner:
 - a. Architect will provide two full-size sets of prints of the As Built Record Drawings to the Facilities Management Office, printed from the updated AutoCAD drawing files or updated Revit model files, as specified by Owner, that have been modified to show actual dimensions and location of equipment, material, utility lines, and other work as actually constructed, based upon information provided by Contractor. Architect will submit updated As Built Record Drawings in PDF (ISO32000 format) to Owner.
 - b. Architect will submit following:
 - 1) Updated AutoCAD as built record drawing files with associated plot style tables or Revit as built record model files, as specified by Owner.
 - 2) Revit Model O&M lifecycle requirements to be tracked by Facility Manager.

1.03 CLOSEOUT SUBMITTALS

- A. Operations And Maintenance Manual:
 - 1. General:
 - a. Include closeout submittal documentation as required by Contract Documentation.
 - b. Include workmanship bonds, final certifications, equipment check-out sheets, and similar documents.
 - c. Releases enabling Owner unrestricted use of The Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - d. Include Project photographs, damage or settlement survey, and similar record information required by Contract Documents.
 - e. Submittal Format:
 - 1) Digital copies unless otherwise noted, required for each individual specification section that include 'Closeout Submittals'.

- 2) Include only closeout submittals as defined in individual specification section as required in Contract Documents.
2. Project Manual:
 - a. Copy of complete Project Manual including Addenda, Modifications as defined in General Conditions, and other interpretations issued during construction:
 - 1) Mark these documents to show variations in actual Work performed in comparison with text of specifications and Modifications.
 - 2) Show substitutions, selection of options, and similar information, particularly on elements that are concealed or cannot otherwise be readily discerned later by direct observation.
3. Maintenance Contracts:
 - a. Digital format only.
4. Operations and Maintenance Data:
 - a. Digital format only:
 - 1) Cleaning instructions.
 - 2) Maintenance instructions.
 - 3) Operations instructions.
 - 4) Equipment list.
 - 5) Parts list.
5. Warranty Documentation:
 - a. Digital format of final, executed warranties.
6. Record Documentation:
 - a. Digital format only.
 - 1) Certifications.
 - 2) Color and pattern selections.
 - 3) Design Data.
 - 4) Geotechnical Evaluation Reports (soils reports).
 - 5) Manufacture Reports.
 - 6) Manufacturer's literature or cut sheets.
 - 7) Shop Drawings.
 - 8) Source Quality Control.
 - 9) Special Procedures.
 - 10) Testing and Inspection Agency Reports.
 - 11) Testing and Inspection Reports.

1.04 MAINTENANCE MATERIAL SUBMITTALS

- A. Submit item(s) required by Section 01 3300 'Submittal Procedures' and as defined in individual specification section if required in Contract Documents. Items may be provided at completion of Work or with Closeout Submittals.

1.05 WARRANTIES

- A. When written guarantees beyond one (1) year after substantial completion are required by Contract Documents, secure such guarantees and warranties properly addressed and signed in favor of Owner. Include these documents in Operations & Maintenance Manual(s) specified above.
- B. Delivery of guarantees and warranties will not relieve Contractor from obligations assumed under other provisions of Contract Documents.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

**SECTION 02 4113
SELECTIVE SITE DEMOLITION**

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Demolish and remove portions of existing site facilities as described in Contract Documents.
- B. Related Requirements:
 - 1. New and replacement work specified in appropriate specification Sections.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Scheduling:
 - 1. Include on Construction Schedule specified in Section 01 3200 detailed sequence of individual site demolition operations.

1.03 SUBMITTALS

- A. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Identify abandoned utility and service lines and capping locations on record drawings.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

3.02 PREPARATION

- A. Notify corporations, companies, individuals, and local authorities owning conduits running to property.
 - 1. Protect and maintain conduits, drains, sewers, pipes, and wires that are to remain on the property.

3.03 PERFORMANCE

- A. Execute work in orderly and careful manner, with due consideration for neighbors and the public.
- B. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work. Coordinate with Owner for equipment and materials to be removed by Owner.
- C. Concrete And Paving Removal:
 - 1. Saw cut joints between material to be removed and material to remain to full depth.
 - 2. Hand-excavate trench 12 inches wide and 16 inches deep along concrete or paving to be removed. Cut roots encountered with saw, axe, or pruner. Do not cut roots with excavating equipment. Remove roots under concrete and paving to be replaced down to 12 inches below finish grade.

3.04 CLEANING

- A. Keep streets and roads reasonably clean, and sweep daily.
- B. Sprinkle demolition rubbish and debris as necessary to lay dust.
- C. Promptly remove demolition materials, rubbish, and debris from property.

END OF SECTION

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**SECTION 02 4119
SELECTIVE STRUCTURE DEMOLITION**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.
- B. Related Requirements:

1.03 REFERENCES

- A. Reference Standards:
 - 1. National Fire Protection Association / American National Standards Institute:
 - a. NFPA 241, 'Standard for Safeguarding Construction, Alteration, and Demolition Operations', 2013 Edition.
 - 2. American Society of Safety Engineers:
 - a. ASSE A10.6-2006, 'Safety Requirements for Demolition Operations'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Storage or sale of removed items or materials will not be permitted on-site.
- B. Pre-Installation Conference:
 - 1. Before beginning Selective Demolition work, in addition to requirements of Section 01 3100, meet on site to confirm work to be demolished, items to be salvaged or reused, and coordination with Owner.
- C. Scheduling:
 - 1. Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, on Schedule specified in Section 01 3200.

1.05 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
 - 1. Comply with governing EPA notification regulations before beginning selective demolition.
 - 2. Comply with hauling and disposal regulations of authorities having jurisdiction.
 - 3. Standards: Comply with ANSI A10.6 and NFPA 241.

1.06 FIELD CONDITIONS

- A. Existing Conditions:
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification Of Conditions:
 - 1. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
 - a. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- B. Evaluation And Assessment:
 - 1. Hazardous Materials:

- a. It is not expected that hazardous materials will be encountered in the Work. Identified hazardous materials will be removed by Owner before start of the Work.
 - b. If materials suspected of containing hazardous materials are encountered, do not disturb and immediately notify Architect.
2. Inventory and record condition of items to be removed and reinstalled and items to be removed and salvaged.
3. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect.
4. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
5. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 PREPARATION

- A. Temporary Facilities:
 1. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 2. Maintain fire-protection facilities in service during selective demolition operations.
- B. Temporary Shoring:
 1. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 2. Strengthen or add new supports when required during progress of selective demolition.
- C. Utility Services:
 1. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
 2. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - a. Arrange to shut off indicated utilities with utility companies.
 - b. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.03 SELECTIVE DEMOLITION

- A. General:
 1. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 2. Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - a. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - b. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

- c. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - d. Maintain adequate ventilation when using cutting torches.
 - e. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - f. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - g. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - h. Dispose of demolished items and materials promptly.
- B. Selective Demolition Procedures For Specific Materials:
 - 1. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
 - 2. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
 - 3. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- C. Removed and Salvaged Items:
 - 1. 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 during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.
 - a. Clean salvaged items as directed by Owner.
 - b. Pack or crate items after cleaning. Identify contents of containers.
 - c. Store items in a secure area until delivery to Owner.
 - d. Transport items to Owner's storage area designated by Owner.
 - e. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain:
 - 1. Protect construction indicated to remain against damage and soiling during selective demolition.
 - 2. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.04 CLEANING

- A. General:
 - 1. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.
 - 2. Return adjacent areas to condition existing before selective demolition operations began.
- B. Waste Management:
 - 1. Disposal of Demolished Materials:

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

END OF SECTION

SECTION 03 3000 IN PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Concrete anchors
- C. Concrete reinforcement.
- D. Joint devices associated with concrete work.
- E. Concrete curing.

1.02 RELATED REQUIREMENTS

- A. Section 03 3517 - Concrete Sealer Finishing
- B. Section 03 4500-Precast Concrete Specialties
- C. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- D. Section 33 1416 - Site Water Utility Distribution Piping for installation of sleeves for piping penetrating interior concrete slabs on grade.

1.03 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary; 2025.
- B. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- C. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- D. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- E. ACI PRC-308 - Curing of Concrete—Guide; 2026.
- F. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- G. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials and Commentary; 2010 (Reapproved 2015).
- H. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- I. ANSI/NFSI B101.1 - Test Method for Measuring the Wet SCOF of Hard-Surface Walkways; 2022.
- J. ANSI/NFSI B101.3 - Test Method for Measuring the Wet DCOF of Hard Surface Walkways; 2022.
- K. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2024.
- L. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- M. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.
- N. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2022.
- O. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- P. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
- Q. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
- R. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2026a.

- S. ASTM C143/C143M - Standard Test Method for Slump of Concrete; 2026a.
- T. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- U. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- V. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2026.
- W. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.
- X. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2025.
- Y. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.
- Z. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.
- AA. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2025a.
- BB. ASTM C779/C779M - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces; 2019.
- CC. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2023.
- DD. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2024.
- EE. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2026.
- FF. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- GG. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.
- HH. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2025.
- II. ASTM C1582/C1582M - Standard Specification for Admixtures to Inhibit Chloride-Induced Corrosion of Reinforcing Steel in Concrete; 2024.
- JJ. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- KK. ASTM D471 - Standard Test Method for Rubber Property--Effect of Liquids; 2016a (Reapproved 2021).
- LL. ASTM D523 - Standard Test Method for Specular Gloss; 2025.
- MM. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 2011 (Reapproved 2022).
- NN. ASTM D1709 - Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method; 2024.
- OO. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.
- PP. ASTM D1752 - Standard Specification for Preformed Sponge Rubber, Cork, and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2018 (Reapproved 2023).
- QQ. ASTM D2103 - Standard Specification for Polyethylene Film; 2023a.
- RR. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2021.

- SS. ASTM D5767 - Standard Test Method for Instrumental Measurement of Distinctness-of-Image (DOI) Gloss of Coated Surfaces; 2018 (Reapproved 2023).
- TT. ASTM D8139 - Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction; 2023.
- UU. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- VV. 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).
- WW. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.
- XX. 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.
- YY. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).
- ZZ. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
- AAA. 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.
- BBB. COE CRD-C 48 - Handbook for Concrete and Cement Standard Test Method for Water Permeability of Concrete; 1992.
- CCC. COE CRD-C 513 - Handbook for Concrete and Cement Corps of Engineers Specifications for Rubber Waterstops; 1974.
- DDD. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop; 1974.
- EEE. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
- FFF. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.
- GGG. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2021, with Editorial Revision (2022).
- HHH. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.
- III. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- JJJ. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- KKK. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2021a.
- LLL. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.
- MMM. ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric); 2014.
- NNN. COE CRD-C 621 - Handbook for Concrete and Cement Standard Specification for Packaged, Dry; 1997.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
 2. For chemical-resistant waterstops, provide data on ASTM D471 test results.
 3. Printed application instructions for form release agents.
- B. 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.
- C. Shop Drawings:
1. Show dimensioned locations of anchor bolts for hold-down anchors and columns.
 2. Show reinforcement and all necessary bending diagrams and reinforcing steel list, and construction joint locations.
 3. Provide bar schedules and bending details.
 4. Show all formwork for concrete surfaces which are to remain exposed in the finished work.
 5. Joint layout plan for control and expansion joints for sidewalks, curbs, and gutters for written approval before starting work on this Section.
- D. Samples: Submit samples of underslab vapor retarder to be used.
- E. Ready-Mix Supplier:
1. Require mix plant to furnish delivery ticket for each batch of concrete. Keep delivery tickets at job-site for use of Owner or its representatives. Tickets shall show following:
 - a. Name of ready-mix batch plant.
 - b. Serial number of ticket.
 - c. Date and truck number.
 - d. Name of Contractor.
 - e. Name and location of Project.
 - f. Specific class or designation of concrete conforming to that used in Contract Documents.
 - g. Amount of concrete.
 - h. Amount and type of cement.
 - i. Total water content allowed by mix design.
 - j. Amount of water added at plant.
 - k. Sizes and weights of sand and aggregate.
 - l. Time loaded.
 - m. Type, name, manufacturer, and amount of admixtures used.
 2. Provide certificates with supporting testing reports verifying compliance with Contract Document requirements and that materials provided are from single source for following:
 - a. Cement.
 - b. Aggregate.
 - c. Fly Ash.
- F. Test Reports: Submit report for each test or series of tests specified.
- G. Manufacturer's Installation Instructions: For concrete accessories and form release agents, indicate installation procedures and interface required with adjacent construction.
- H. Manufacturer's Reports:
1. Provide Manufacturer's performance and testing data for following:
 - a. Each admixture used.
- I. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
- J. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:

- a. Record Documentation:
 - 1) Pour Reports:
 - (a) Provide report that records following information:
 - (1) Date and time of start of pour, Date and time of end of pour, and Date and time of end of finishing procedures.
 - (2) Temperature at start of pour, Temperature at end of Pour, and Maximum temperature during performance of finishing procedures.
 - (3) Wind speed at start of pour, Wind speed at end of pour, and Maximum wind speed during performance of finishing procedures.
 - (4) Humidity at start of pour, Humidity at end of pour, and High and low humidity during performance of finishing procedures.
 - (5) Cloud cover at start of pour, Cloud cover at end of pour, and High and low cloud cover during performance of finishing procedures.
 - (6) Screeding method and equipment used.
 - (7) Saw cut method and equipment used.
 - 2) Testing and Inspection Reports:
 - (a) Testing Agency Testing and Inspecting Reports of concrete.
 - 3) Warranty. Submit rapid concrete drying or MVRA manufacturer warranties for concrete moisture vapor emission induced flooring failure and adhesion; ensure both have been completed in project's name and registered with manufacturer.
 - (a) Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of concrete. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
 - (b) Provide stand-alone adhesion warranty matching duration of flooring adhesive or primer manufacturer's material defect warranty.
- K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 DEFINITIONS

- A. Cold Weather, as referred to in this Section, is four (4) hours with ambient temperature below 40 degrees Fahrenheit in twenty-four (24) hour period.
- B. Floor Flatness (FF): Rate of change in elevation of floor over 12 inches section.
- C. Floor Levelness (FL): Measures difference in elevation between two points which are 10 feet apart.
- D. Hot Weather, as referred to in this Section, is ambient air temperature above 100 degrees Fahrenheit or ambient air temperature above 90 degrees Fahrenheit with wind velocity 8 mph or greater.

1.06 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
 - 1. Maintain one copy of each document on site.
- B. Qualifications: Requirements of Section 01 4000 applies, but is not limited to following:
 - 1. Installers and Installation Supervisor:
 - a. ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
 - b. Certification for National Ready Mixed Concrete Association (NRMCA).
 - 2. Ready-Mix Supplier:
 - a. Comply with ASTM C94/C94M requirements and be certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities".
 - 3. Testing Agencies:
 - a. Independent agency qualified according to ASTM C1077 and ASTM E329.

- 1) Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technicians, Grade I according to ACI CP-1 or equivalent certification program.
 - 2) Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be ACI-certified Concrete Laboratory Testing Technician - Grade II.
- C. Testing and Inspection:
1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
 2. Owner will provide Testing and Inspection on concrete:
 - a. Owner will employ testing agencies to perform testing and inspection on concrete as specified in Field Quality Control in Part 3 of this specification:
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
- D. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- E. Follow recommendations of ACI PRC-306 when concreting during cold weather.
- F. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.
- G. MANDATORY Pre-Installation Conference:
1. Agenda items, review following:
 - a. Review Section 01 4000 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
 - 1) Review requirements and frequency of testing and inspections.
 - b. Set up concrete placement pour card system and verify that all relevant trades have signed off prior to concrete placement.
 - c. Obtaining trade sign-offs on each pour card will be responsibility of General Contractor's foreman or whoever is in charge of ordering concrete.
 - d. Pour cards will be turned in to Quality Assurance representative after the work has been completed so that they can be reviewed and filed.
 - e. Review installation scheduling, coordination, placement of building concrete, and placement of items installed in and under concrete.
 - f. Review installation scheduling, coordination and placement of site concrete and of items installed in concrete.
 - g. Review "Verification of Conditions" requirements.
 - h. Review requirements for preparation of subgrade and aggregate base requirements.
 - i. Review formwork requirements.
 - j. Review approved mix design requirements, mix designs and use of admixtures.
 - k. Review reinforcing bar submittals.
 - l. Review installation schedule and placement of reinforcing bars.
 - m. Review placement, finishing, and curing of concrete, including cold and hot weather requirements.
 - n. Review joint layout plan for control and expansion joints, fillers for sidewalks, curbs, and gutters:
 - 1) Review jointing requirements.
 - 2) Joint layout for concrete paving is specified in Section 32 1313.
 - o. Review smooth rubbed concrete finish procedures and requirements (applied immediately after removing concrete formwork while concrete is "green").
 - p. Review layout plan, scheduling, coordination, and placement requirements of detectable warning panels.

- q. Review concrete slab tolerances and corrective measures if tolerances not met.
- r. Review safety issues.
- H. Scheduling:
 - 1. Notify Testing Agency and Architect twenty-four (24) hours minimum before placing concrete.
 - 2. Schedule pre-installation conference prior to installation of anchors, dowels, inserts, and block outs in foundation walls and slabs.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Slabs with Porosity Inhibiting Admixture (PIA) or Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
 - 1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
- C. Moisture Emission-Reducing Curing and Sealing Compound, Membrane-Forming: Provide warranty to cover cost of flooring delamination failures for 10 years.
 - 1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.
- D. Moisture Emission-Reducing Curing and Sealing Compound, Penetrating: Provide non-prorated warranty to cover cost of flooring delamination failures for 20 years.
 - 1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

PART 2 PRODUCTS

2.01 CONCRETE 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 Facing for Exposed Finish Concrete: Steel.
 - 3. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
 - a. Vertical earth cuts may be used for footings provided the footing width and length are 6" wider and longer than scheduled.
 - 4. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 5. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 CONCRETE ANCHORS

- A. General:
 - 1. Use hot-dipped galvanized or stainless steel with matching nuts and washers in exterior and moist interior applications unless indicated otherwise on Contract Drawings.
 - a. Install hot-dipped or stainless steel anchor bolts to attach wood sill plates to foundation with 1/4 inch by 3 inch x 3 inch minimum adjustable plate washers and standard cut washers between wood sill plates and nuts.
 - b. Nut: Conform to requirements of ASTM A563, Grade A, Hex.

- c. Conform to requirements of ASTM F3125/F3125M for chemical, physical and mechanical requirements for quenched and tempered bolts manufactured from steel and alloy steel.
- 2. Threaded rod for adhesive anchors and cast-in anchors:
 - a. Conform to requirements of ASTM A307, Grade A or ASTM F1554 Grade 36 unless indicated otherwise on Contract Drawings.
- 3. Cast-In-Place Anchor Bolts:
 - a. J-Bolts:
 - 1) Non-headed type threaded 2 inches minimum conforming to requirements of ASTM F1554, Grade A.
 - 2) Anchor hook to project 2 inches minimum including bolt diameter.
 - b. Headed Bolts:
 - 1) Headed type threaded 2 inches minimum conforming to requirements of ASTM F1554, Grade A.
- 4. Headed Concrete Anchor Studs:
 - a. Composed of low carbon steel meeting requirements of ASTM A108.
 - b. Tensile Strength: 61,000 psi minimum.
 - c. Yield Strength: 49,000 psi minimum.
- 5. Deformed Bar Anchors:
 - a. Manufactured in accordance with requirements of ASTM A1064/A1064M.
 - b. Tensile Strength: 80,000 psi minimum.
 - c. Yield Strength: 70,000 psi minimum.
- 6. Reinforcing Bars:
 - a. Composed of deformed carbon steel meeting requirements of ASTM A615/A615M, Grade 60 (field bent bars may be Grade 40)
- 7. Adhesive Anchors:
 - a. Products shall have current ESR conforming to current ICC Acceptance Criteria ICC-ES AC308 for concrete.
 - b. Rod diameter and embedment length as indicated on Contract Drawings.
 - c. Acceptable Products:
 - 1) HIT-RE 500V3 with SafeSet Epoxy Adhesive by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.
 - 2) Pure 110+ by DeWalt Anchors & Fasteners, Towson, MD, www.anchors.dewalt.com.
 - 3) SET-3G Epoxy by Simpson Strong-Tie Co., Pleasanton, CA www.strongtie.com.com.
 - 4) Equal as approved by Architect before installation. See Section 01 6000.
- 8. Expansion Anchors:
 - a. Products shall have current ESR conforming to current ICC Acceptance Criteria ICC-ES AC193 for concrete.
 - b. Acceptable Products:
 - 1) KWIK Bolt TZ2 Expansion Anchor by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.
 - 2) Power-Stud +SD2 by DeWalt Anchors & Fasteners, Brewster, NY, www.ancors.dewalt.com.
 - 3) Strong-Bolt 2 by Simpson Strong-Tie Co., Pleasanton, CA www.strongtie.com.
 - 4) Equal as approved by Architect before installation. See Section 01 6000.
- 9. Screw Anchors:
 - a. Provide anchors with length identification markings conforming to ICC Acceptance Criteria ICC-ES AC193 for concrete.
 - b. Type Two Acceptable Products:
 - 1) KWIK KH-EZ by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.

- 2) Screw-Bolt+ by DeWalt Anchors & Fasteners Inc., Towson, MD, www.anchors.dewalt.com.
- 3) Titen HD by Simpson Strong Tie Co, Pleasanton, CA www.strongtie.com.
- 4) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6000.

2.03 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 60,000 psi, except dowels that are to be field bent, Grade 40 minimum.
 1. Type: Deformed billet-steel bars.
 2. Finish: Unfinished, unless otherwise indicated.
 3. Bars shall be free of heavy rust scales and flakes, or other bond-reducing coatings.
- B. Epoxy Coated Reinforcement Steel Bars:
 1. Bars shall have grade identification marks and conform to ASTM A615/A615M with coating conforming to ASTM A775/A775M and comply with requirements of ACI 318.21.2.5:
 - a. Bar supports shall be completely coated with epoxy or vinyl, compatible with both concrete and epoxy coating on bars. Coating shall be at least 1/8 inch thick at tips.
 - b. Tie wire shall be nylon coated.
 2. Actual yield strength based on mill tests does not exceed specified yield strength by more than 18,000 psi and Ratio of actual ultimate stress (at breaking point) to actual tensile yield stress shall not be less than 1.25.
 - a. Grade 60 minimum, except dowels that are to be field bent, Grade 40 minimum.
 3. Bars shall be deformed type.
 4. Bars shall be free of heavy rust scales and flakes, or other bond-reducing coatings.
- C. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
 1. Form: Coiled Rolls.
 2. WWR Style: 6 x 6 - W1.4 x W1.4..
- D. Reinforcement Accessories:
 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 2. Bar Supports:
 - a. Concrete masonry units or bricks are not acceptable.
 - b. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
 - c. Acceptable Products:
 - 1) Concrete 'dobies' or blocks wired to reinforcing.
 - 2) Manufactured chairs with 4 sq inch bearing surface on sub-grade, or other feature to prevent chair from being pushed into sub-grade or damaging vapor retarder under slabs on grade.
 3. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 4. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.04 CONCRETE MATERIALS

- A. Performance:
 1. Design Criteria: Conform to requirements of ASTM C94/C94M unless specified otherwise:
 2. Capacities:
 - a. For testing purposes, following concrete strengths are required:
 - 1) At 7 days: 70 percent minimum of 28 day strengths.
 - 2) At 28 days: 100 percent minimum of 28 day strengths.
- B. Cement: ASTM C595, Type IL - Normal Portland type.

1. Acquire cement for entire project from same source.
- C. Concrete mix design: Submit mix designs to meet following requirements:
1. General Purpose Footings and Exterior Concrete:
 - a. For general purpose for footings and for exterior concrete (excluding concrete paving, curbs, gutters and waterways) where not subject to freeze/thaw cycles and deicing salts or where higher strength is needed due to soil conditions and as otherwise required by the contract drawings.
 - b. 3000 psi minimum at twenty-eight (28) days.
 - c. Water / Cementitious Material: 0.45 to 0.50 by weight.
 2. Unexposed Interior Concrete:
 - a. 3500 psi minimum at twenty-eight (28) days.
 - b. Water / Cementitious Material: 0.45 maximum by weight.
 3. Exterior Concrete:
 - a. For exterior concrete paving, curbs, gutters, and waterways not exposed to freeze/thaw cycles and deicing salts and as otherwise required by the contract drawings.
 - b. 4000 psi minimum at twenty-eight (28) days.
 - c. Water / Cementitious Material: 0.45 maximum by weight.
 - d. For concrete paving, use mix design based upon use of 1-1/2 inches coarse aggregate (about 15 percent).
 4. Exterior Concrete Exposed to Freeze/Thaw:
 - a. For exterior concrete exposed to freeze/thaw cycles and deicing salts or where soils are "corrosive" and as otherwise required by the contract drawings.
 - b. 4500 psi minimum at twenty-eight (28) days.
 - c. Water / Cementitious Material: 0.40 maximum by weight.
 - d. Use twenty-five (25) percent Class F fly ash as part of cementitious material.
 - e. Mix Type E should be used for all exterior concrete exposed to freeze/thaw cycles and deicing salts, unless dictated otherwise by site conditions.
 - f. For concrete paving, use mix design based upon use of 1-1/2 inches coarse aggregate (about 15 percent).
 5. Self-Consolidating Concrete (SCC):
 - a. Rarely used optional mix type.
 - b. Self-consolidating concrete may be used for all architectural concrete, heavily reinforced concrete, concrete for structural repairs, and other members as described in contract documents.
 - c. 4000 psi minimum at twenty-eight (28) days.
 - d. All self-consolidating concrete shall contain high-range water-reducing admixture and viscosity-modifying admixture where required.
 - e. Minimum flow of 20 inches - 30 inches or as required by successful test placement.
 - f. Workability, pump ability, finish ability, and setting time of mix design shall be verified with successful test placement onsite.
 - g. Viscosity Modifying Admixture (VMA) shall be used to optimize viscosity of Self-Consolidating Concrete (SCC) at dosage rates per manufacturer's recommendation.
 6. Air Entrainment: Six (6) percent, plus or minus 1-1/2 percent for exterior concrete and foundation walls exposed to freeze/thaw cycles.
 7. Do not add water any time during mixing cycle above amount required to meet specified water / cement ratio. No reduction in amount of cementitious material is allowed.
 8. Mix design strengths specified are a minimum due to exposure to sulfates, chlorides, freeze/thaw, water, etc. Refer to the structural drawings for additional concrete strength requirements. The most stringent requirements should be met.
- D. Slump:
1. 4 inch slump maximum before addition of high range water reducer.
 2. 8 inch slump maximum with use of high range water reducer.

3. Slump not required for Mix Type G.
- E. General:
 1. Submit a letter on quarry's letterhead that certifies all aggregate for concrete complies with the requirements of this section. Material certificates which are submitted shall be signed by both the materials producer and the contractor, certifying that materials comply with or exceed requirements specified herein to the Architect, Civil and Structural Engineering Consultant and the Independent Testing Laboratory for review and approval.
 2. Aggregates for all concrete shall come from a quarry that is DOT approved and meets or exceeds durability Class I aggregate. The quarry shall submit a letter to Engineer that certifies that all aggregate complies with DOT requirements for durability. Aggregate not meeting DOT durability requirements shall not be used.
- F. Fine and Coarse Aggregates: ASTM C33/C33M.
 1. Acquire aggregates for entire project from same source.
- G. Fly Ash: ASTM C618, Class C or F.
 1. Not to exceed twenty-five (25) percent of weight of cementitious materials.
- H. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.05 ADMIXTURES

- A. No admixture shall contain calcium chloride nor shall calcium chloride be used as an admixture. All chemical admixtures used shall be from same manufacturer and compatible with each other.
 1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Mix design shall show proposed admixtures, amount, usage instructions, and justification for proposed use. Do not use any admixtures without Architect's written approval.
 1. Chemical accelerator or retarder may be used if necessary to meet environmental conditions and construction schedules.
- C. Alkali-Silica Reactivity Inhibiting Admixture:
 1. Specially formulated lithium nitrate admixture for prevention of alkali-silica reactivity (ASR) in concrete. Admixture must have test data indicating conformance to ASTM C1293.
 2. Manufacturer: As approved by Architect before use. See Section 01 6000.
- D. Viscosity Modifying Admixture (VMA):
 1. Liquid admixture used to optimize viscosity of Self-Consolidating Concrete (SCC). Subject to compliance with requirements, provide following at dosage rates per manufacturer's recommendations.
 2. Manufacturer: As approved by Architect before use. See Section 01 6000.
- E. Air Entraining Admixture: ASTM C260/C260M.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- F. High Range Water Reducing Admixture: ASTM C494/C494 Type F.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- G. High Range Water Reducing and Retarding Admixture (Superplasticizer): ASTM C494/C494M Type G.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- H. Water Reducing Admixture: ASTM C494/C494M Type A.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- I. Water Reducing and Accelerating Admixture: ASTM C494/C494 Type E.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- J. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- K. Accelerating Admixture: ASTM C494/C494M Type C.
 1. Manufacturer: As approved by Architect before use. See Section 01 6000.

- L. Retarding Admixture: ASTM C494/C494M Type B.
 - 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- M. Shrinkage Reducing Admixture: ASTM C494/C494M Type S.
 - 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- N. Non-Chloride, Non-Corrosive Accelerating Admixture: ASTM C494/C494M Type C or E.
 - 1. Manufacturer: As approved by Architect before use. See Section 01 6000.
- O. Corrosion Inhibiting Admixture: ASTM C494/C494M Type C and ASTM C1582/C1582M.
 - 1. Liquid admixture to inhibit corrosion of steel reinforcement in concrete by introducing proper amount of anodic inhibitor. Admixture shall contain thirty (30) percent calcium nitrite solution and shall be used where called for in specifications or on drawings.
 - 2. Manufacturer: As approved by Architect before use. See Section 01 6000.
- P. Moisture Vapor Reduction Admixture (MVRA):
 - 1. Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission with no adverse effect on concrete properties or finish flooring.
 - 2. Manufacturer: As approved by Architect before use. See Section 01 6000.
- Q. Waterproofing Admixture:
 - 1. Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.
 - 2. Admixture Composition: Crystalline, functioning by growth of crystals in capillary pores.
 - 3. Admixture Composition: Hydrophobic polymer waterproofing and corrosion inhibitor, functioning by closing concrete pores and chemical bonding.
 - 4. Permeability of Cured Concrete: No measurable leakage when tested in accordance with COE CRD-C 48 at 200 psi; provide test reports.
 - 5. Potable Water Contact Approval: National Science Foundation (NSF) certification for use on structures holding potable water, based on testing in accordance with NSF 61 and NSF 372.
 - 6. Manufacturer: As approved by Architect before use. See Section 01 6000.

2.06 ACCESSORY MATERIALS

- A. Underslab 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. Thickness: 15 mil minimum
 - 3. Water Vapor Permeance: ASTM E96, Metath A, Perm 0.01
 - 4. Puncture Resistance: ASTM D1709
 - 5. Installation: Comply with ASTM E1643
 - 6. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
 - 7. Manufacturer: As approved by Architect before use. See Section 01 6000.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Grout: Comply with ASTM C1107/C1107M.
 - 2. Meet following requirements:
 - a. ASTM C1107/C1107M, Type B or Type C.
 - b. Corps and Engineers CRD C-621.
 - c. Compressive strength of 6000 psi minimum.
 - 3. Manufacturers: As approved by Architect before use. See Section 01 6000.

2.07 BONDING AND JOINTING PRODUCTS

- A. Bonding Agents:

1. Manufacturers: As approved by Architect before use. See Section 01 6000.
- B. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
 1. Manufacturers: As approved by Architect before use. See Section 01 6000.
- C. Waterstops (Contractor Option):
 1. Waterstops: PVC, complying with COE CRD-C 572.
 - a. Configuration: As indicated on drawings.
 - b. Size: As indicated on drawings.
 - c. Manufacturers: As approved by Architect before use. See Section 01 6000.
 2. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.
 - a. Configuration: As indicated on drawings.
 - b. Size: As indicated on drawings.
 - c. Manufacturers: As approved by Architect before use. See Section 01 6000.
- D. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
 1. Material: ASTM D1751, cellulose fiber.
 2. Manufacturers: As approved by Architect before use. See Section 01 6000.
- E. Expansion Joint Filler:
 1. Expansion Joint Filler Material:
 - a. Design Criteria:
 - 1) Resilient, flexible, non-extruding, expansion-contraction joint filler meeting requirements of ASTM D1751 or ASTM D8139.
 - 2) 1/2 inch thick.
 - 3) Resilience:
 - (a) When compressed to half of original thickness, recover to minimum of seventy (70) percent of original thickness.
 - b. Manufacturers: As approved by Architect before use. See Section 01 6000.
- F. Finishing Material (Exposed Vertical Faces of Foundation and Retaining Walls):
 1. Do not apply finishing material (parge coat) to foundation or retaining walls.
- G. Slab Contraction Joint Device (if used): Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.
 1. Manufacturers: As approved by Architect before use. See Section 01 6000.
- H. Slab Construction Joint Devices (if used and required by contract drawings): Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
 1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
 - a. Height: To suit slab thickness.
 - b. Manufacturers: As approved by Architect before use. See Section 01 6000.
 2. Dowel Sleeves: Plastic sleeve for smooth, round, steel load-transfer dowels.
 - a. Manufacturers: As approved by Architect before use. See Section 01 6000.

2.08 CURING MATERIALS

- A. Membrane Curing:
 1. Clear water-based, ready-to use membrane curing agent that cures freshly placed concrete, forming effective barrier against moisture loss from concrete surface.
 2. Design Criteria:
 - a. Exterior Concrete:
 - 1) Dissipating or non-dissipating membrane curing agent.
 - b. Interior Concrete:
 - 1) Dissipating membrane curing agent only.

- 2) Gradually dissipate after twenty-eight (28) days without leaving stain or discoloring concrete surface.
- c. VOC-compliant compound.
- d. Meet requirements of ASTM C309 and AASHTO M 148, Type 1 or 1-D, Class B.
- e. Maintain ninety-five (95) percent of mix water present in concrete mass after application.
3. Horizontal and Vertical Cast-In-Place Structural Concrete:
 - a. Acceptable Products.
 - 1) Exterior Concrete:
 - (a) Clear Cure J7WB by Dayton Superior Corporation, Miamisburg, OH www.daytonsuperior.com.
 - (b) Clear Water Resin by Right Point, Dekalb, IL www.rightpointe.com.
 - (c) L&M Cure R by L&M Construction Chemicals, Inc. Omaha, NE www.lmcc.com.
 - (d) VOCOMP 20 (do not use when concrete sealer will be applied in areas of freeze/thaw and deicer salts) by W.R. Meadows, Inc. Hampshire, IL www.wrmeadows.com.
 - (e) 1100-Clear by W. R. Meadows, Inc. Hampshire, IL www.wrmeadows.com.
 - (f) Equal as approved by Architect before use. See Section 01 67000
- B. Water Curing:
 1. Required Locations:
 - a. Used on concrete surfaces in Process Area, Process Area Custodial Room, and Yard Sales Area only.
 - b. Used on concrete surfaces in areas as shown in Contract Documents.
 2. Water-Curing Materials:
 - a. Type Two Acceptable Products:
 - 1) Absorptive Cover: Meet requirements of AASHTO M 182, Class 2 burlap cloth made from jute or kenaf and weighing minimum of 9 oz per sq yd (305 grams per sq m) when dry.
 - 2) Moisture-Retaining Cover: White, opaque membrane meeting requirements of ASTM C171 minimum.
 - 3) Equals as approved by Architect before using. See Section 01 6000.

2.09 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 and before concrete is placed.
 1. Notify Architect of incorrect dimensions or spot elevations in writing.
 2. Do not place concrete until corrections are made and verified.
- B. Detectable Warning Panels:
 1. Examine substrate and verify substrate is suitable for installation of detectable warning panels:
 - a. Notify Architect of unsuitable conditions in writing.
 - b. Do not install detectable warning panels over unsuitable conditions.
 - c. 3) Commencement of Work by installer is considered acceptance of substrate.

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. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Concrete Mixing:
 - 1. General:
 - a. All concrete shall be machine mixed.
 - b. Water gauge shall be provided to deliver exact predetermined amount of water for each batch.
 - c. Reliable system must be employed to insure that no less than predetermined amount of cement goes into each batch.
 - d. Re-tempering partly set concrete will not be permitted.
 - 2. Transit Mix:
 - a. Transit mix concrete may be used provided it conforms to Specifications and tests herein described and ASTM C94/C94M.
 - b. Central plant producing concrete and equipment transporting it are suitable for production and transportation of controlled concrete and plant is currently approved by local state DOT.
 - c. Maximum elapsed time between time of introduction of water and placing shall be one (1) hour.
 - d. Minimum time of mixing shall be one (1) minute per cubic yard after all material, including water, has been placed in drum, and drum shall be reversed for an additional two (2) minutes.
 - e. Mixing water shall be added only in presence of Inspecting Engineer or inspector employed by Testing Agency.
 - f. Trucks shall not be overloaded in excess of rated capacity as recommended by manufacturer.
 - 3. Cold Weather Concreting Procedures:
 - a. General Requirements:
 - 1) Materials and equipment required for heating and protection of concrete shall be approved and available at Project site before beginning cold weather concreting.
 - 2) Forms, reinforcement, metallic embedments, and fillers shall be free from snow, ice, and frost. Surfaces that will be in contact with newly placed concrete, including subgrade materials, shall be 35 degrees Fahrenheit minimum at time of concrete placement.
 - 3) Thaw sub-grade 6 inches deep minimum before beginning concrete placement. If necessary, re-compact thawed material.
 - 4) Use no frozen materials or materials containing ice.
 - 5) See ACI 306.1 'Standard Specification for Cold Weather Concreting' for additional requirements.
 - 4. Hot Weather Concreting Procedures:
 - a. General:
 - 1) Maximum concrete temperature allowed is 90 degrees Fahrenheit in hot weather.
 - 2) Cool aggregate and subgrades by sprinkling.
 - 3) Avoid cement over 140 degrees Fahrenheit.
 - 4) Use cold mixing water or ice.
 - 5) Use fog spray or evaporation retardant to lessen rapid evaporation from concrete surface.

- 6) See ACI 305.1 'Specification for Hot Weather Concreting' for additional requirements.
- E. Surface Preparation:
1. Earthwork Preparation:
 - a. Aggregate base and subgrade:
 - 1) Prepare aggregate base as specified in Section 312323.
 - 2) Prepare natural soil subgrade as specified in Section 31 2200.
 - 3) Prepare fill subgrade as specified in Section 31 2323.
 2. Concrete Slab Thickness:
 - a. Increase thickness of concrete beneath detectable warning panels one inch 0.98 inch
 3. Inserts, bolts, boxes, templates, pipes, conduits, and other accessories required by Divisions 22, 23, and 26 shall be installed and inspected before placing concrete.
 4. Install inserts, bolts, boxes, templates, pipes, conduits, and other accessories furnished under other Sections to be installed as part of work of this Section:
 - a. Tie anchor bolts for hold-down anchors and columns securely to reinforcing steel.
- F. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
1. Use latex bonding agent only for non-load-bearing applications.
- G. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.
- H. 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.
- I. Removal:
1. Remove water and debris from space to be placed.
 2. Vapor Retarder Over Aggregate Base: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.

3.03 INSTALLATION OF FORMWORK

- A. Forms:
1. Assemble forms so forms are sufficiently tight to prevent leakage.
 2. Properly brace and tie forms.
 3. Provide temporary cleanouts at base of tall forms if used to facilitate cleaning and inspection.
 4. Make proper form adjustments before, during, and after concreting.
 5. Use new forms, or used forms that have been cleaned of loose concrete and other debris from previous concreting and repaired to proper condition. Use APA Plyform B-B Class I, or APA HDO Plyform B-B Class I, on exposed to view concrete that do not receive a smooth rubbed finish.
 6. Use metal cold joint forms when unable to place concrete for footings, foundations, and slabs in continuous pours.
 7. Provide beveled 2 inch by 4 inch keys where shown on Contract Drawings for tall or heavily loaded walls.
- B. Accessories:
1. General:
 - a. Provide for installation of inserts, templates, fastening devices, sleeves, and other accessories to be set in concrete before placing.
 - b. Position anchor bolts for hold-down anchors and columns and securely tie in place before placing concrete.

2. Form Release / Finish Agents:
 - a. Film thickness shall be no thicker than as recommended by Manufacturer.
 - b. Allow no release / finish agent on reinforcing steel or footings.
3. Expansion Joints:
 - a. Install at joints between floor slab and foundation wall where shown on Drawings.
- C. Form Removal (Slab on Grade):
 1. Removal of forms can usually be accomplished in twelve (12) to twenty-four (24) hours.
 2. If temperature is below 50 degrees Fahrenheit or if concrete (stairs, beams, etc) depends on forms for structural support, leave forms intact for sufficient period for concrete to reach adequate strength.
 3. For exposed to view surfaces that receive a smooth rubbed finish, remove forms while concrete is still "green".
 4. Metal bars or prys should not be used. Use wood wedges, tapping gradually when necessary.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI PRC-304.
- B. Notify Architect not less than 24 hours prior to commencement of placement operations.
- C. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- D. General:
 1. Place as soon after mixing as possible.
 2. Deposit as nearly as possible in final position.
 3. No concrete shall be deposited in water.
 4. Placing of concrete shall be continuous until panel or section is complete.
 5. Compact concrete in forms by vibrating and other means where required.
 - a. Thoroughly consolidate concrete around reinforcing bars (Consolidation not required in concrete around reinforcing bars with Mix Type G).
 - b. Use and type of vibrators shall conform to ACI 309.
 6. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any degree into landscaped areas.
 7. Consolidate concrete thoroughly.
 8. Do not embed aluminum in concrete.
 9. Do not use contaminated, deteriorated, or re-tempered concrete.
 10. Avoid accumulation of hardened concrete.
 11. Dusting with cement not permitted.
- E. Exterior Slabs:
 1. For continuous placing and where shown on Drawings, saw cut one inch 0.98 inch deep control joints before shrinkage occurs 2 inches at 6 inch slabs) (1.97 inch at 150 mm slabs).
- F. Miscellaneous Concrete Elements:
 1. Detectable Warning Panels:
 - a. Follow Manufacturer's recommendations on following:
 - 1) Temperature requirements.
 - 2) Expansion and control joint requirements.
 - 3) Installation of panels.
 - 4) Curing of panels.
 2. Mow Strips and Aprons:
 - a. Aggregate base not necessary under mow strips and aprons.
 - b. Form and cast mow strips in place.
 - c. Elevations:

- 1) Refer to Section 32 9122-Topsoil Grading for relation of finish grades to top of mow strip elevations.
- 2) Refer to Civil Drawings for top of apron elevations.
- d. Compact topsoil underneath mow strips and aprons to density of undisturbed earth.
3. Sidewalks:
 - a. Slope with cross slope of 1/8 to 1/4 inch per ft (3 to 0.24 inch per 11.81 inch) (one to two percent) in direction of intended drainage.
 - b. Slope away from building 1/8 to 1/4 inch per ft (3 to 0.24 inch per 11.81 inch) (one to two percent) minimum.
 - c. Concrete walks shall be screeded to bring surface to grades and lines as indicated.
 - d. Surface shall be floated with wood float with no coarse aggregate showing and then given broom finish before concrete sets.
- G. Vertical Surfaces:
 1. Immediately after removing forms, remove joints, marks, bellies, projections, loose materials, and cut back metal ties from surfaces to be exposed.
 2. Point up voids with cement mortar, 1:2 mix, and rub exposed surface with carborundum to smooth, even surface matching surrounding undamaged area.
- H. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- I. 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.

3.05 SLAB JOINTING

- A. Locate joints as indicated on drawings
 1. Concrete Control Joints on Center Spacing.
 - a. Sidewalks: 4-6 feet
 - b. Curbs and Gutters: 10 feet
 - c. Mow Strips: 3-5 feet.
 - d. Flat Drainage Structures: 10 feet.
 - e. Retaining Walls with guardrails: Align with posts.
 - f. Retaining Walls with Fencing: Align with posts.
 2. Concrete Expansion Joint (isolation) Joints on Center Spacing.
 - a. Sidewalks, Curbs and Gutters: 40-100 feet
 - b. Mow Strips and Aprons: 20-40 feet.
 - c. Flat Drainage Structures: 50 feet.
 - d. Retaining Walls with guardrails: 36 feet.
 - e. Retaining Walls with Fencing: 50 feet.
- 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.
 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- E. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- F. Contraction Joint Devices: Use preformed joint device, with top set flush with top of slab.

- G. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.
- H. Seal expansion joints as specified in Section 07 9200 for following areas:
 - 1. Between entryway slabs and building foundations.
 - 2. Between sidewalks and building foundations.
 - 3. Concrete retaining walls.
 - 4. Within curbs and gutters.
 - 5. Within flat drainage structures and at joints between flat drainage structures and other concrete elements.
- I. Expansion joints are not required to be sealed for following areas:
 - 1. Within aprons and where apron abuts sidewalks.
 - 2. Within mow strips and where mow strip abuts building foundation and sidewalks.
 - 3. Within sidewalks.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for compliance with specified tolerances.
- B. Correct the slab surface if tolerances are less than specified.
- C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- D. 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 or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, immediately after form removal.

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.
 - 2. High early strength concrete: Not less than four days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
 - 1. 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 membrane curing, water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - 2. Slabs and Floors To Receive Adhesive-Applied Flooring: Membrane Cure. 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.
 - 3. Slabs and Floors to Receive Polished Finish: Water cure
 - 4. Final Curing: Begin after initial curing but before surface is dry.

- a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
- b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.09 POST INSTALLED ANCHORS

- A. General:
 - 1. Drill holes with rotary impact hammer drills using carbide-tipped bits.
 - 2. Unless otherwise shown on Drawings, drill holes perpendicular to concrete surface.
 - 3. Perform anchor installation in accordance with Manufacturer's published instructions.
- B. Adhesive Anchors:
 - 1. Clean holes in accordance with Manufacturer's published instructions before installation of adhesive:
 - a. Follow Manufacturer's recommendations to ensure proper mixing of adhesive components.
 - 2. Adhesive:
 - a. Inject adhesive into holes proceeding from bottom of hole and progressing toward surface so as to avoid introduction of air pockets into adhesive.
 - b. Inject sufficient adhesive into hole to ensure that annular gap is filled to surface.
 - c. Remove excess adhesive from surface and threads of anchor as necessary.
 - 3. Shim anchors with suitable device to center anchor in hole. Do not disturb or load anchors before Manufacturer's specified cure time has elapsed.
 - 4. Temperature:
 - a. Observe Manufacturer's recommendations with respect to installation temperatures for adhesive anchors.
 - b. Base material temperatures must be maintained above minimum temperatures allowed by Manufacturer for full required epoxy cure time.
- C. Expansion Anchors:
 - 1. Protect threads from damage during anchor installation and prior to use.
 - 2. Set anchors to Manufacturer's recommended torque, using a torque wrench. Following attainment of ten (10) percent of specified torque, one hundred (100) percent of specified torque shall be reached within 7 or fewer complete turns of nut. If specified torque is not achieved within required number of turns, remove and replace anchor, unless otherwise directed by Architect.
- D. Screw Anchors:
 - 1. Protect threads from damage during anchor installation and prior to use.
 - 2. Set anchor flush, collared.
 - 3. Do not exceed Manufacturer's maximum allowed torque when seating anchor.

3.10 NON-SHRINK GROUTING

- A. Surface Preparation:
 - 1. Prepare concrete surfaces in accordance with Manufacturer's written instructions:
 - 2. Remove all loose materials.
 - 3. Clean surface of any substance that could interfere with bond on material including dirt, paint, tar, asphalt, wax, oil, grease, latex compounds, form release agents, laitance, loose toppings, foreign substances and any other residues.
 - 4. Saturate area to be grouted with water in accordance with Manufacturer's written instructions.
- B. Mixing:
 - 1. Mix grout in accordance with Manufacturer's written instructions.
 - 2. Add mix water in amount in accordance with Manufacturer's written instructions to provide required placing consistency.
 - 3. Do not add water in amount that will cause bleeding or segregation of mixed grout.

4. Do not add any sand, cement, admixtures, or fluidifiers to grout.
- C. Placement:
 1. Place grout in accordance with Manufacturer's written instruction including but not limited to the following:
 - a. Proper curing is required.
 - b. Use cold weather or hot weather grouting procedures in accordance with Manufacturer's written instructions, as temperature dictates:
 - 1) Do not use at temperatures that may cause premature freezing.
 - 2) Do not allow to freeze until 4000 psi is attained.
 - c. Employ cold weather or hot weather grouting practices as temperatures dictates.
 2. Completely eliminate air pockets and provide full contact between grout and item being grouted. Do not exceed Manufacturer's recommended thickness.
- D. Curing:
 1. Cure grout in accordance with Manufacturer's written instructions or ACI curing practices.
 2. Wet cure grout until forms are removed.
 3. Seal grout surfaces after forms are removed as recommended by Manufacturer.
- E. Keep grout surfaces wet after curing compound has dried for as long as recommended by Manufacture.
- F. Protect placed grout from freezing until minimum strength of 4000 psi is reached.
- G. Protect placed grout from damage during construction.

3.11 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Quality Control is sole responsibility of Contractor.
 1. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
 - a. Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
- C. Provide free access to concrete operations at project site and cooperate with appointed firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- E. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- F. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- G. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- H. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
- I. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.
- J. Permeability Test: Test concrete with waterproofing admixture according to COE CRD-C 48.
- K. Precast Concrete:
 1. Testing Agency shall provide inspection including following:
 - a. Review all precast plant test reports.

- b. Provide inspection of all precast during construction, transportation, and erection, verifying precast is undamaged, and installed in accordance with requirements of Contract Documents.
 - c. Provide inspection of precast concrete anchorages to other components of structure.
- L. Expansion Anchors / Adhesive Anchors / Screw Anchors:
 - 1. Certified Inspector from Testing Agency shall verify procedures used for installation of all concrete anchors and monitor their installation for compliance with Manufacturer's requirements.
 - 2. Inspections:
 - a. Inspections shall include required verification and inspection of anchors as referenced in IBC Table 1704.4 and in accordance with most current version of ACI 318 or ACI 318M and applicable ASTM material standards that:
 - 1) The correct rod/anchor is used; size and type.
 - 2) The correct hole size is used and prepared per Manufacturer's instructions.
 - 3) That climactic conditions, and concrete temperature, allow for the anchors' installation and use.
 - 4) Proper hole cleaning equipment, per Manufacturer's instructions, is used.
 - 5) Torque applied to anchors does not exceed Manufacturer's allowable limits.
 - (a) Torque applied to anchors is per Manufacturer's instructions.

3.12 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.

3.13 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.
- B. Protect installed products from damage during construction.

**SECTION 05 5213
PIPE AND TUBE RAILINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Free-standing railings at walkways.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 09 9123 - Interior Painting: Paint finish.

1.03 DEFINITIONS

- A. Galvanized: To coat iron or steel with zinc for protection from rust and corrosion.
- B. Non-shrink Grout: Structural grout used for filling voids between elements that is formulated with cement, fine aggregates and admixtures. Admixtures are used to provide expansive properties of the material during curing. This expansion counteracts the natural tendency of cement grouts to shrink during curing.
- C. Peened: Nonslip textured gripping surface that is much easier to hold on to.

1.04 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- D. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- E. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- F. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- G. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- H. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- I. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.

1.05 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- B. Designer's Qualification Statement.

1.06 DELIVERY, STORAGE AND HANDING

- A. Storage and Handling Requirements:
 - 1. Store handrails and railing systems in clean, dry location, away from uncured concrete and masonry, and protected against damage.
 - 2. Cover with waterproof paper, tarpaulin, or polyethylene sheeting. Allow for air circulation inside covering.

1.07 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Fabricator Qualifications:
 - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM

- A. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, black finish.
- B. 1-1/2 inch outside diameter.
- C. Pipe Sleeves:
 - 1. 2 inch diameter by 6 to 9 inches long non-magnetic stainless steel with cross-section shape and dimension to allow 1/2 inch minimum of grout around perimeter of pipe or tube.
 - 2. Provide with fully welded steel plate forming bottom closure.
- D. Brackets, Flanges, Fittings, And Anchors:
 - 1. Provide standard wall brackets, flanges, miscellaneous fittings, and anchors for connection of handrails and railings to other construction.
 - 2. Provide inserts and other anchorage devices for connecting handrails and railing systems to concrete or masonry work.
- E. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- F. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- G. Exposed Fasteners: No exposed bolts or screws.
- H. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
- I. Cap pipe ends of floor / ground mounted handrails and exterior handrails.
- J. After fabrication, shop prime metal to be painted.

2.03 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
 - 3. 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.

2.04 ACCESSORIES

- A. Rail Setting Grout:
 - 1. Commercial nonshrink grout conforming to requirements of ASTM C1107/C1107M, Type B or Type C.

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. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Coring of concrete for installation of balusters is acceptable.
- F. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- G. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- H. Touch up field welds to match pre-finished material.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

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**SECTION 06 0573
PRESERVATIVE WOOD TREATMENT**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AWP A U1 - Use Category System: User Specification for Treated Wood; 2025.

1.02 SUMMARY

- A. Includes But Not Limited To:
1. Quality of wood preservative treatment where specified.
- B. Related Requirements:
1. Section 06 1100:
 - a. Characteristics of wood to be pressure-treated.
 - b. Furnishing and installing of pressure-treated wood.

1.03 REFERENCES

- A. Definitions:
1. Preservative-Treated Wood: Wood exposed to high levels of moisture or heat susceptible to decay by fungus and other organisms, and to insect attack. The damage caused by decay or insects can jeopardize the performance of the wood members so as to reduce the performance below that required. Preservative treatment requires pressure-treatment process to achieve depth of penetration of preservative into wood to verify that the wood will be resistant to decay and insects over time.
 2. Treated Wood: Wood impregnated under pressure with compounds that reduce its susceptibility to flame spread or to deterioration caused by fungi, insects, or marine bores.
- B. Reference Standards:
1. American Wood Protection Association:
 - a. AWP A N1-06, 'All Millwork Products - Preservative Treatment by Nonpressure Process'.
 - b. AWP A P5-10, 'Standard For Waterborne Preservatives'.
 - c. AWP A P22-10, 'Standard For Ammoniacal Copper Zinc Arsenate (ACZA)'.
 - d. AWP A P51-10, 'Standard for Zinc Borate (ZB)'.
 - e. AWP A T1-12, 'Use Category System: Processing and Treatment Standard For Treated Wood'.
 - f. AWP A U1-12, 'Use Category System: User Specification For Treated Wood'.
 2. International Building Code (IBC) (2018 or most recent edition adopted by AHJ):
 - a. Chapter 23, 'Wood':
 - 1) Section 2300, 'Minimum Standards and Quality':
 - (a) 2303.1, 'General':
 - (1) 2303.1.8, 'Preservative-Treated Wood'.
 - 2) Section 2400, 'General Construction Requirements':
 - (a) 2304.11, 'Protection Against Decay and Termites':
 - (1) 2311.2, 'Wood Used Above Ground'.
 - (2) 2311.4, 'Wood In Contact With The Ground'.

1.04 SUBMITTALS

- A. Informational Submittals:
1. Certificate: Certificate of pressure treatment showing compliance with specification requirements and including information required under IBC Section 2303.1.8.1, 'Identification'.

PART 2 PRODUCTS

2.01 SYSTEMS

- A. Manufacturers:

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118

06 0573

PRESERVATIVE WOOD
TREATMENT

1. Type One Acceptable Manufacturers:
 - a. Arch Wood Protection Inc, Atlanta, GA www.wolmanizedwood.com.
 - b. Hoover Treated Wood Products, Thomson, GA www.frtw.com.
 - c. Osmose Inc, Griffin, GA www.osmose.com.
 - d. U S Borax Inc, Valencia, CA www.borax.com/wood.
 - e. Viance LLC, Charlotte, NC www.treatedwood.com.
 - f. Equal as approved by Architect before bidding. See Section 01 6200.
- B. Performance:
 1. Framing lumber grade and species shall be as specified in Section 06 1100 for particular use.
 2. Interior Wood In Contact With Concrete or Masonry:
 - a. Preservatives:
 - 1) Disodium octoborate tetrahydrate (DOT / SBX) meeting requirements of AWWA U1 and with retention of 0.25 lbs per cu ft (4 kg per cu meter).
 - 2) Zinc borate meeting requirements of AWWA U1 and with retention of 0.17 lbs per cu ft (2.7 kg per cu meter).
 - 3) CCA-C (47.5 percent chromium trioxide, 18.5 percent copper oxide and 34 percent arsenic pentoxide) by Koppers Performance Chemicals, Griffin, Georgia, <http://www.koppersperformancechemicals.com/> (0.25 lb/cu ft minimum retention).
 - 4) DURA-GUARD by Hoover Treated Wood Products, Thomson, GA www.frtw.com (.40 lb/cu ft minimum retention).
 - b. Lumber: Treat in accordance with AWWA U1.
 - c. Millwork: Treat in accordance with AWWA N1 and dry after treatment.
 3. Exterior Wood Continuously Exposed To Weather:
 - a. Preservatives: Waterborne preservatives meeting requirements of AWWA U1 with retention levels as required by AWWA U1 for specific application.
 - b. Lumber: Treat in accordance with AWWA U1.

PART 3 EXECUTION: NOT USED

**SECTION 06 1011
WOOD FASTENINGS**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Quality of wood fastening methods and materials used for Rough Carpentry unless specified otherwise.
- B. Related Requirements:
 - 1. Section 03 1511: 'Concrete Anchors and Inserts' for Quality of Anchors and Inserts.
 - 2. Section 05 0523: 'Metal Fastenings' for Quality of bolts used for Rough Carpentry.
 - 3. Furnishing and installing of other fasteners are specified in individual Sections where installed.

1.03 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM A153/A153M-16a, 'Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware'.
 - b. ASTM D3498-18, 'Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems'.
 - c. ASTM F1667-18a, 'Standard Specification for Driven Fasteners: Nails, Spikes, and Staples'.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's literature on framing anchors and powder actuated fasteners.
 - 2. Shop Drawings:
 - a. Submit diameter and lengths of fasteners proposed for use on Project. If length or diameter of proposed fasteners differ from specified fasteners, also include technical and engineering data for proposed fasteners including, but not limited to:
 - 1) Adjusted fastener spacing where using proposed fasteners and,
 - 2) Adjusted number of fasteners necessary to provide connection capacity equivalent to specified fasteners.
 - b. Submit on powder-actuated fasteners other than those specified in Contract Documents showing design criteria equivalents at each application.
 - c. Show type, quantity, and installation location of framing anchors. Where necessary, reference Drawing details, etc, for installation locations.

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

- A. Description:
 - 1. Nail Terminology:
 - a. When following nail terms are used in relation to this Project, following lengths and diameters will be understood. Refer to nails of other dimensions by actual length and diameter, not by one of listed terms:

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Nail Term	Length	Diameter	Length	Diameter
8d Box	2-1/2 inches	0.113 inch	2.5 inch	0.11 inch
8d Common	2-1/2 inches	0.131 inch	63.5 mm	0.13 inch
10d Box	3 inches	0.128 inch	3 inch	0.13 inch
10d Common	3 inches	0.148 inch	76.2 mm	0.15 inch
16d Box	3-1/2 inches	0.135 inch	3.5 inch	0.13 inch
16d Sinker	3-1/4 inches	0.148 inch	3.25 inch	3.759 mm
16d Common	3-1/2 inches	0.162 inch	88.9 mm	0.16 inch

B. Materials:

1. Wood fastener list:
 - a. Provide VMR Suppliers with wood fastener list.
2. Fasteners:
 - a. General:
 - 1) Fasteners for preservative treated and fire-retardant-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronzed, or copper. Coating weights for zinc-coated fasteners shall be in accordance with ASTM A153/A153M.
 - b. Nails:
 - 1) Meet requirements of ASTM F1667.
 - 2) Unless noted otherwise, nails listed on Drawings or in Specifications shall be common nail diameter, except 16d nails, which shall be box diameter.
 - c. Wood Screws:
 - 1) SDS Screws:
 - (a) Category Four Approved Products. See Section 01 6200 for definitions of categories.
 - (1) SDS Screws by Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
 - 2) All Other: Standard type and make for job requirements.
 - d. Powder-Actuated Fasteners:
 - 1) Type One Quality Standard: Hilti X-DNI 62P8.
 - 2) Manufacturers:
 - (a) Hilti, Tulsa, OK www.us.hilti.com.
 - (b) Redhead Division of ITW, Wood Dale, IL www.itw-redhead.com and Markham, ON www.itwconstruction.ca.
 - (c) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.
3. Adhesives:
 - a. Construction Mastics:
 - 1) Meet requirements of 'APA-The Engineered Wood Association' Specification AFG-01 or ASTM D3498.
 - 2) Use phenol-resorcinol type for use on pressure treated wood products.
4. Framing Anchors:
 - a. Framing anchors and associated fasteners in contact with preservative hot dipped zinc-coated galvanized steel or stainless steel. Do not use stainless steel items with galvanized items.
 - b. Type Two Acceptable Products:
 - 1) KC Metals Inc, San Jose, CA www.kcmetals.com.
 - 2) Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
 - 3) United Steel Products Co Inc (USP), Montgomery, MN www.uspconnectors.com.

- 4) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.

PART 3 EXECUTION

3.01 ERECTION

- A. Secure one Manufacturer approved fastener in each hole of framing anchor that bears on framing member unless approved otherwise in writing by Architect.
- B. Provide washers with bolt heads and with nuts bearing on wood.

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SECTION 06 1100 WOOD FRAMING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. PS 20 - American Softwood Lumber Standard; 2025.
- B. TPI DSB-89 - Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses; 1989.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install wood framing and blocking as described in Contract Documents.
- B. Products Installed But Not Furnished Under This Section:
 - 1. Glue-laminated structural units.
 - 2. Roof related blocking, wood nailers, and curbs.
 - 3. Wood panel product sheathing.
- C. Related Requirements:
 - 1. Section 06 0573: 'Preservative Wood Treatment' for quality of preservative wood treatment.
 - 2. Section 06 1636: 'Wood Panel Product Sheathing' for:
 - a. Pre-installation conference held jointly with Section 06 1100.
 - 3. Sections in Division 07: Roofing membranes for related blocking, wood nailers, and curbs.
 - 4. Section 08 4113: 'Aluminum-Framed Entrances And Storefronts':
 - a. Pre-installation conference held jointly with Section 06 1100.

1.03 REFERENCES

- A. Association Publications:
 - 1. American Lumber Standard Committee (ALSC) (Maintains NIST standard):
 - a. Voluntary Product Standard:
 - 1) PS 20-15, 'American Softwood Lumber Standard'.
 - 2. National Institute of Standards and Technology (NIST), U. S. Department of Commerce:
 - a. Voluntary Product Standard DOC PS 20-15, 'American Softwood Lumber Standard'.
- B. Reference Standards:
 - 1. Truss Plate Institute / Structural Building Components Association:
 - a. TPI / SBCA. 'Building Component Safety Information BCSI 2013, 'Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in MANDATORY pre-installation conference held jointly with Section 06 1636.
 - a. Schedule pre-installation conference immediately before beginning framing work.
 - b. In addition to agenda items specified in Section 01 3100, review following:
 - 1) Equipment and gypsum board blocking in wood framed walls.
 - 2) Operable partition headers.
 - 3) Rough opening.
 - 4) Shear walls and struts.
 - 5) Nails and nailing requirements.
 - 6) Truss installation.
 - 7) Connections.
 - 2. Participate in pre-installation conference held jointly with Section 08 4113.

- a. Schedule pre-installation conference for one (1) week before scheduled installation of storefront system.
- b. In addition to agenda items specified in Section 01 3100, review following:
 - 1) Rough opening requirements.

1.05 SUBMITTALS

- A. Informational Submittals:
 - 1. Test And Evaluation Reports:
 - a. Technical and engineering data on nails to be set by nailing guns for Architect's approval of types proposed to be used as equivalents to specified hand set nails and adjusted number and spacing of pneumatically-driven nails to provide equivalent connection capacity.
 - 2. Manufacturer Instructions:
 - a. Copies of pamphlets specified in REFERENCE Article. After Architect's examination, keep pamphlets on Project site with approved shop drawings. Pamphlets may be obtained from Truss Plate Institute, Wood Truss Council of America, or from Truss Fabricator.
 - 3. Qualification Statements:
 - a. Alternate Supplier(s):
 - 1) Provide name and contact information.
 - 2) Provide Qualification documentation as requested.

1.06 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Suppliers:
 - a. Licensed by American or Canadian Institute of Timber Construction, or American Wood Systems.
 - b. Category Three Approved Suppliers Approved Supplier(s):
 - 1) Approval subject to agreement process approval.
 - c. Alternate Supplier(s):
 - 1) Fabricator Firm specializing in performing work of this section:
 - (a) Firm experience in supplying products indicated for this Project.
 - (b) Financial stability.
 - (c) Sufficient production capacity to produce required units.
 - (d) Comply with specifications and Contract Documents.
 - (e) Agree to complete reporting documents, including: Agree to provide total costs to the Church including breakdown costs of millwork.
 - 2) Submit documentation to Architect or Owner.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 - 1. Protect lumber and sheathing and keep under cover in transit and at job site.
 - 2. Do not deliver material unduly long before it is required.
- B. Storage And Handling Requirements:
 - 1. Store lumber and sheathing on level racks and keep free of ground to avoid warping.
 - 2. Stack to insure proper ventilation and drainage.
 - 3. Handle and store wood trusses in accordance with ANSI / WTCA Booklet BSCI except trusses may be unloaded by dumping if trusses are shipped horizontally, are rolled off low profile roller bed trailer, and no part of any truss is required to drop more than 18 inches.

PART 2 PRODUCTS

2.01 SUPPLIERS

- A. Suppliers:

1. Category Three Approved Suppliers. See Section 01 6200 for definitions of Categories and Section 01 4301 for Qualification Requirements:
 - a. BMC, West Jordan, UT. www.BuildWithBMC.com. Contact Par Palmer:
 - 1) Office: (801) 224-0541.
 - 2) Mobile: (801) 376-9853.
 - 3) E-Mail: Par.Palmer@BuildWithBMC.com or www.BuildWithBMC.com.
 - b. J. M. Thomas Forest Products, Ogden, UT. www.thomasforest.com. Contact Tom Karren:
 - 1) Office: (800) 962-8780.
 - 2) FAX: 801-782-9652.
 - 3) E-Mail: tom@thomasforest.com.
 - c. Shelter Products, Inc., Portland, OR www.shelter-products.com. Contact Mike Running:
 - 1) Office: (800) 662-3612.
 - 2) Cell: NA.
 - 3) FAX: (503) 238-2663.
 - 4) E-Mail: mrunning@shelter-products.com.

2.02 MATERIALS

- A. Wood Framing List:
 1. Provide Category Three Approved Suppliers with wood framing list.
- B. Dimension Lumber:
 1. Design Criteria:
 - a. Meet requirements of PS 20 and National Grading Rules for softwood dimension lumber.
 - b. Bear grade stamp of WWSA, SPIB, or other association recognized by American Lumber Standards Committee identifying species of lumber by grade mark or by Certificate of Inspection.
 - c. Lumber 2 inches or less in nominal thickness shall not exceed 19 percent in moisture content at time of fabrication and installation and be stamped 'S-DRY', 'K-D', or 'MC15'.
 - d. Preservative Treated Plates / Sills:
 - 1) 2x4 1.5 inch by 2.52 inch): Standard and better Douglas Fir, Southern Pine, or HemFir, or StrandGuard by iLevel by Weyerhaeuser Boise, ID www.ilevel.com. (LSL 1.3 E)
 - 2) 2x6 1.5 inch by 5.51 inch) And Wider: No. 2 or or MSR 1650f - 1.5e Douglas Fir, Southern Pine, HemFir, or StrandGuard by iLevel by Weyerhaeuser, Boise, ID www.ilevel.com. (LSL 1.3 E).
- C. Lumber Ledgers:
 1. Design Criteria:
 - a. No. 2 Douglas Fir-Larch, or Southern Pine.
- D. See Contract Drawings for additional requirements.

2.03 ACCESSORIES

- A. Blocking:
 1. Sound lumber without splits, warps, wane, loose knots, or knots larger than 1/2 inch.
- B. Furring Strips:
 1. Utility or better.
- C. Sill Sealer:
 1. Closed-cell polyethylene foam, 1/4 inch thick by width of plate.

PART 3 EXECUTION

3.01 INSTALLERS

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126

06 1100
WOOD FRAMING

- A. Approved Installers. See Section 01 4301.
- B. Installers shall be pre-approved and included in Contract Documents by Addendum.

3.02 INSTALLATION

- A. General:
 - 1. Use preservative treated wood for wood members in contact with concrete or masonry, including wall, sill, and ledger plates, door and window subframes and bucks, etc.
- B. Interface With Other Work:
 - 1. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties. Do not allow installation of gypsum board until required blocking is in place.
 - 2. Where manufactured items are to be installed in framing, provide rough openings of dimensions within tolerances required by manufacturers of such items. Confirm dimensions where not shown on Contract Drawings.
- C. Tolerances:
 - 1. Walls:
 - a. 1/4 inch in 20 feet, non-cumulative in length of wall.
 - b. 1/8 inch in 10 feet with 1/4 inch maximum in height of wall.
 - c. Distances between parallel walls shall be 1/4 inch maximum along length and height of wall.
- D. Floors:
 - 1. Place with crown side up.
 - 2. Provide accurately fitted header and trimmer joists of same size as regular joists around floor openings, unless detailed otherwise, and support by steel joist hangers.
 - 3. Double joists under partitions that parallel run of joists.
- E. Walls:
 - 1. Openings: Single, bearing stud supporting header and one adjacent (king) stud continuous between top and bottom plates, unless shown otherwise.
 - 2. Corners And Partition Intersections: Triple studs.
 - 3. Top Plates In Bearing Partitions: Doubled or tripled and lapped. Stagger joints at least 48 inches.
 - 4. Stud Walls To Masonry. Use one of the following methods:
 - a. Connect with 1/2 inch machine bolts 6 inches from top, 6 inches from bottom, and 48 inches maximum on center. Use three bolts minimum in height of 6 foot or higher wall.
 - b. Secure wood to masonry using continuous 1/4 inch minimum bead of construction adhesive and powder actuated fasteners installed at 32 inches on center minimum.
 - 5. Sill Plates:
 - a. Shear Walls And Bearing Walls:
 - 1) Provide specified anchor 12 inches maximum and 4 inches minimum from each end of each plate.
 - 2) Shear Walls: Fasten with anchor bolts embedded in concrete or with screw anchors.
 - 3) Bearing Walls: Fasten with anchor bolts embedded in concrete, or with screw anchors or expansion bolts in drilled holes.
 - b. Non-Structural Walls: Fasten with powder actuated fasteners.
 - c. In addition to requirements of paragraphs 'a' and 'b' above, set sill plates of interior walls measuring less than 36 inches in length in solid bed of specified construction adhesive, except where sill sealer is used.
 - d. Install specified seal sealer under sill plates of exterior walls of main building and of acoustically insulated interior walls.
 - e. Masonry Wall Plates:

- 1) Anchor 2x6 and 2x8 wall plates to top of block walls with 5/8 inch diameter anchor bolts at 32 inches on center unless noted otherwise.
- 2) Set plates on masonry bearing walls true and level to provide full bearing. Use mortar as specified in Division 04 for leveling if leveling is required.

6. Nailing:

a. Stud to plate (coordinate with Contract Drawings):

2 by 4 inch nominal	38 by 3.5 inch	End nail, two 16d OR toe nail, four 8d
2 by 6 inch nominal	38 by 5.51 inch	End nail, three 16d OR toe nail, four 8d
2 by 8 inch nominal	38 by 7.24 inch	End nail, four 16d OR toe nail, six 8d
2 by 10 inch nominal	38 by 9.25 inch	End nail, five 16d OR toe nail, six 8d
1-3/4 by 5-1/2 inch LVL	44 by 140 mm LVL	End nail, three 16d OR toe nail, four 8d
1-3/4 by 7-1/4 inch LVL	44 by 184 mm LVL	End nail, four 16d OR toe nail, six 8d
1-3/4 by 9-1/4 inch LVL	44 by 235 mm LVL	End nail, five 16d OR toe nail, six 8d
1-3/4 by 11-1/4 inch LVL	44 by 11.26 inch LVL	End nail, six 16d OR toe nail eight 8d

- b. Top plates: Spiked together, 16d, 16 inches on center.
- c. Top plates: Laps, lap members 48 inches minimum and nail with 16d nails 4 inches on center
- d. Top plates: Intersections, three 16d.
- e. Backing And Blocking: Three 8d, each end.
- f. Corner studs and angles: 16d, 16 inches on center.

F. Accessory / Equipment Mounting And Standing & Running Trim Blocking (nailers) for Metal Framing:

1. Furnish and install blocking in wood framing required for hardware, specialties, equipment, accessories, and mechanical and electrical items, etc.
2. Attach blocking not installed with clips with two fasteners in each end of each piece of blocking.

G. Furring Strips:

1. On Wood or Steel: Nail or screw as required to secure firmly.
 - a. Ceiling:
 - 1) Attach furring strips to the underside of structural elements with #8 wood screws, of length to penetrate wood framing 1 inch minimum.
2. On Concrete or Masonry:
 - a. Back up furring strips on exterior walls or walls in contact with earth with 15 lb (6.8 kg) felt strip.
 - b. Nail at 12 inches on center maximum.

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SECTION 06 1636
WOOD PANEL PRODUCT SHEATHING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. PS 1 - Structural Plywood; 2023.
- B. PS 2 - Performance Standard for Wood Structural Panels; 2019.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install wood panel product sheathing required for walls, roofs, and floors as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 01 1200: 'Multiple Contracts Summary'.
 - 2. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 3. Section 06 1100: 'Wood Framing' for:
 - a. Pre-installation conference held jointly with Section 06 1636.
- C. Related Requirements:
 - 1. Section 01 0000: 'General Requirements':
 - a. Section 01 1200: 'Multiple Contracts Summary'.
 - b. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 2. Section 06 1100: 'Wood Framing' for:
 - a. Pre-installation conference held jointly with Section 06 1636.

1.03 REFERENCES

- A. Association Publications:
 - 1. National Institute of Standards and Technology (NIST), U. S. Department of Commerce:
 - a. Voluntary Product Standard DOC PS 1-09. 'Structural Plywood'.
 - b. Voluntary Product Standard DOC PS 2-04. 'Performance Standard for Wood-Based Structural-Use Panels'.
 - 2. The Engineered Wood Association (APA), Tacoma, WA www.apawood.org.
 - a. Performance Rated Panels, 'Product Guide' (for products bearing the APA trademark) December 2011.
 - b. Voluntary Product Standard:
 - 1) PS 1-09. 'Structural Plywood'.
 - 2) PS 2-04. 'Performance Standard for Wood-Based Structural-Use Panels'.
 - c. PRP-108 'Performance Standards and Policies for Structural-Use Panels'.
 - 3. TECO, Cottage Grove, WI www.tecotested.com.
 - a. TECO PRP-133: ('Fire Rated Assemblies – OSB substitution for plywood in UL fire-rated assemblies that specify plywood).
- B. Reference Standards:
 - 1. International Code Council (IBC) (2018 or latest AHJ approved edition):
 - a. IBC Chapter 17, 'Special Inspections And Tests'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in pre-installation conference as specified in Section 06 1100.
 - 2. In addition to agenda items specified in Section 01 3100 and Section 06 1100, review following:
 - a. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control inspection required of this section.

- B. Scheduling:
 - 1. Notify Testing Agency and Architect twenty-four (24) hours minimum before placing sheathing.

1.05 SUBMITTALS

- A. Informational Submittals:
 - 1. Qualification Statements:
 - a. Alternate Supplier(s):
 - 1) Provide name and contact information.
 - 2) Provide Qualification documentation as requested.
- B. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Testing and Inspection Reports:
 - (a) Testing Agency Inspection Reports of sheathing.

1.06 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Suppliers:
 - a. Licensed by American or Canadian Institute of Timber Construction, or American Wood Systems.
 - b. Category Three Approved Supplier(s):
 - 1) Approval subject to agreement process approval.
 - c. Alternate Supplier(s):
 - 1) Fabricator Firm specializing in performing work of this section:
 - (a) Firm experience in supplying products indicated for this Project.
 - (b) Financial stability.
 - (c) Sufficient production capacity to produce required units.
 - (d) Comply with specifications and Contract Documents.
 - (e) Agree to complete reporting documents, including: Agree to provide total costs to the Church including breakdown costs of millwork.
 - 2) Submit documentation to Architect or Owner.
- B. Testing and Inspection:
 - 1. Owner will provide Testing and Inspection for inspection of sheathing:
 - a. Owner will employ testing agencies to perform inspection for sheathing as specified in Field Quality Control in Part 3 of this specification.
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
 - 2) See Section 01 1200: 'Multiple Contract Summary'.
 - b. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control.
 - 1) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 - 1. Do not deliver material unduly long before it is required.
 - 2. Protect sheathing and keep under cover in transit and at job site.
- B. Storage And Handling Requirements:
 - 1. Store sheathing on level racks and keep free of ground.

2. Stack to insure proper ventilation and drainage.

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

- A. Suppliers:
1. Category Three Approved Suppliers. See Section 01 6200 for definitions of Categories and Section 01 4301 for Qualification Requirements:
 - a. BMC, West Jordan, UT. www.BuildWithBMC.com. Contact Par Palmer:
 - 1) Office: (801) 224-0541.
 - 2) Mobile: (801) 376-9853.
 - 3) E-Mail: Par.Palmer@BuildWithBMC.com or www.BuildWithBMC.com.
 - b. J. M. Thomas Forest Products, Ogden, UT. www.thomasforest.com. Contact Tom Karren:
 - 1) Office: (800) 962-8780.
 - 2) FAX: 801-782-9652.
 - 3) E-Mail: tom@thomasforest.com.
 - c. Shelter Products, Inc., Portland, OR www.shelter-products.com. Contact Mike Running:
 - 1) Office: (800) 662-3612.
 - 2) Cell: NA.
 - 3) FAX: (503) 238-2663.
 - 4) E-Mail: mrunning@shelter-products.com.
 - d. Alternate Supplier:

2.02 MATERIALS

- A. Performance:
1. Design Criteria:
 - a. Meet requirements of PS 1, PS 2, or PRP-133 (TECO). Except where plywood is specifically indicated on Contract Drawings, oriented strand board (OSB) is acceptable.
 - b. Fire-Retardant as specified in Section 06 0573 applied to roof sheathing and wall sheathing above top plate that is part of attic space if shown on Contract Drawings.
 2. Wood framing list:
 - a. Provide Category Three Approved Suppliers with wood framing list.
 3. Sheathing:
 - a. Sheathing shall bear grade stamp from American Plywood Association (APA) or equal grading organization.
 - b. Sheathing shall not exceed 18 percent moisture content when fabricated or more than 19 percent when installed in Project.
 - c. Sheathing 23/32 inch thick and thicker used for single-layer subflooring shall be tongue and groove.
 - d. Sheathing used for same purpose shall be of same thickness. In all cases, thickness specified is minimum required regardless of span rating.
 - e. Minimum span ratings for given thicknesses shall be as follows:

Thickness	Span Rating
3/8 inch	24 / 0
7/16 inch nominal	24 / 16
15/32 inch actual	32 / 16
1/2 inch nominal	32 / 16
19/32 inch actual	40 / 20

5/8 inch nominal	40 / 20
23/32 inch actual	48 / 24
3/4 inch nominal	48 / 24

2.03 ACCESSORIES

A. Nails:

1. As indicated on Contract Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:

1. Top of nail heads shall be flush with sheathing surface.
2. Use of edge clips to provide spacing between sheathing panels is acceptable.

B. Wall Sheathing:

1. Spacing:
 - a. Provide 1/8 inch space between sheets at end and edge joints.
2. Edge Bearing And Blocking:
 - a. Panel edges shall bear on framing members and butt along their center lines.
 - b. Back block panel edges, which do not bear on framing members, with 2 inch nominal (1.77 inch) framing.
3. Nail Spacing:
 - a. As indicated on Contract Drawings.
 - b. Place nails not less than 3/8 inch in from edge.
4. Thickness:
 - a. As indicated on Contract Drawings.
5. Do not install any piece of wall sheathing with shortest dimension of less than 12 inches.

C. Roof Sheathing:

1. Placing:
 - a. Lay face grain at right angles to supports. Provide blocking for support if framing turns at roof overhang.
 - b. Provide 1/8 inch space between sheets at end and side joints.
 - c. Stagger panel end joints.
 - d. Sheathing shall be continuous of two spans minimum.
2. Edge Bearing and Blocking:
 - a. As indicated on Contract Drawings.
3. Nail Spacing:
 - a. As indicated on Contract Drawings.
 - b. Place nails at least 3/8 inch in from edge.
4. Thickness:
 - a. As indicated on Contract Drawings.
5. Do not install any piece of roof sheathing with shortest dimension of less than 24 inches unless support is provided under all edges.

D. Floor Sheathing:

1. Floor Sheathing: 1 Layer Subflooring (floors accessible to public).
 - a. Apply bead of glue to structural supports. Lay face grain / strength axis across supports and with panel continuous over two supports minimum.
 - b. Allow expansion gap of at least 1/2 inch at walls.
 - c. Tongue and Groove.
 - d. Nail Spacing.
 - 1) As indicated on Contract Drawings.
 - e. Thickness:
 - 1) As indicated on Contract Drawings.

- f. Do not install any piece of bottom layer floor sheathing with shortest dimension of less than 24 inches.
- 2. Subflooring: 2 Layers Subflooring.
 - a. Bottom layer:
 - 1) Glue subflooring layers together along lines of structural supports.
 - 2) Leave 1/32 inch gap at side and end joints.
 - 3) Nail as per floor sheathing nailing requirements.
 - 4) Thickness:
 - (a) 19/32 inch actual (0.59 inch) minimum thickness, except where specifically noted otherwise.
 - 5) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches.
 - b. Top layer:
 - 1) Stagger joints of second layer subflooring so they do not line up with joints of first layer subflooring, but do align with intermediate structural member (for example, align with field nailing of bottom subflooring layer).
 - 2) Glue subflooring layers together along lines of structural supports.
 - 3) Leave 1/32 inch gap at side and end joints.
 - 4) Nail at 6 inch centers on ends and 12 inch centers on intermediate structural members.
 - 5) Thickness:
 - (a) 19/32 inch actual (0.59 inch) minimum thickness, except where specifically noted otherwise.
 - 6) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches.

3.02 FIELD QUALITY CONTROL

- A. Field Inspections:
 - 1. Sheathing:
 - a. General:
 - 1) Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
 - 2) Quality Control is sole responsibility of Contractor as specified in Section 01 4523 'Testing And Inspection Services'.
 - b. For walls and roof areas where nail spacing is 4 inches and less on center, Inspector shall verify wood panel sheathing, grade, thickness and nominal size of framing members, adjoining panel edges, nail size and spacing, bolting and other fastening of other components.

3.03 PROTECTION

- A. Protect roof sheathing from moisture until roofing is installed.

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SECTION 07 4100
PREFORMED METAL STANDING SEAM ROOFING

PART 1 - GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2022.
- B. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2025.
- C. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2023.
- D. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- E. UL 2218 - Standard for Impact Resistance of Prepared Roof Covering Materials; Current Edition, Including All Revisions.

1.02 1.1 DESCRIPTION OF WORK

- A. This section covers the pre-finished, pre-fabricated Architectural standing seam roof system. All metal trim, accessories, fasteners, insulation and sealants indicated on the drawings as part of this section.
- B. Drawings and general provisions of the Contract, including general and Supplementary Conditions and Division 01 Specifications, apply to this section.
- C. Related Work Specified Elsewhere
 - 1. Roof Deck structural steel, flat roof systems, perimeter edge systems. Roof hatches, firestopping not included in this section.

1.2 SUMMARY

- A. Section Includes
 - 1. Factory formed Standing Seam metal roof panels
- B. Related work specified elsewhere. (Note: select from the below or add appropriate sections)
 - 1. Section 07600 - Flashing and Sheet Metal

1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal, and accessories necessary for a complete weathertight roofing system.
- B. References:
 - 1. American Society for Testing and Materials (ASTM)
 - a. ASTM A 653: Steel Sheet, Zinc Coated by the Hot Dip Process
 - b. ASTM A 792: Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process
 - c. ASTM B 209: Aluminum and Aluminum Alloy Sheet and Plate
 - d. ASTM B370 Standard Specification for Copper Sheet and Strip for Building Construction
 - 2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 - a. SMACNA Architectural Sheet Metal Manual, 1993 edition
 - 3. American Iron and Steel Institute (AISI)
 - a. AISI Cold Formed Steel Design Manual
 - 4. Aluminum Association
 - a. Aluminum Design Manual
 - 5. Metal Construction Association
 - a. Preformed metal Wall Guidelines
 - 6. Code References
 - a. ASCE, Minimum Loads for Buildings and Other Structures

- b. BOCA National Building Codes
- c. UBC Uniform Building Code
- d. SBC Standard Building Code

1.4 QUALITY ASSURANCE

- A. Manufacturer and erector shall demonstrate experience of a minimum of five (5) years in this type of project.
- B. Panels shall be factory-produced only. No portable, installer-owned or installer-rented machines will be permitted.

1.5 SUBSTITUTIONS

- A. The material, products and equipment specified in this section establish a standard for required function, dimension, appearance and quality to be met by any proposed substitution.

1.6 SYSTEM DESCRIPTION

- A. Material to comply with:
 - 1. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

1.6 ROOF SYSTEM PERFORMANCE TESTING

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation or other defects in construction.
- B. Roof System shall be designed to meet Standard Building Code Wind Load requirements.
- C. Panels to meet:
 - 1. Water Penetration: When tested per ASTM E-283/1680 and ASTM E331/1646 there shall be no uncontrolled water penetration or air infiltration through the panel joints.
 - 2. Roof System shall be designed to meet a UL Class 90 wind uplift in accordance with UL standard 580 and panel system shall be ASTM 1592 Tested and approved
 - 3. UL 2218 - Impact Resistance rated

1.7 WARRANTIES

- A. Weathertight warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. Warranty Period: 20 Years from date of Substantial Completion
- B. Finish warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace standing seam metal roof panels that show evidence of deterioration of factory-applied finish within specified warranty period.
 - 1. Exposed Panels Finish - deterioration includes the following:
 - a. Color fading more than 5 hunter units when tested according to ASTM D2244
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214
 - c. Cracking, checking, peeling or failure of a paint to adhere to a bare metal.
 - 2. Warranty Period: 20 Years from the date of substantial completion
- C. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight condition.

1.8 SUBMITTALS

- A. Furnish detailed drawings showing profile and gauge of exterior sheets, location and type of fasteners, location, gauges, shape and method of attachment of all trim locations and types of sealants, and any other details as may be required for a weather-tight installation.
- B. Provide finish samples of all colors specified.
- C. Shop drawings: Show fabrication and installation layouts of metal roof panels, metal wall panels or metal soffit panels, details of edge conditions, side-seam joints, panel profiles, corners,

anchorage, trim, flashings, closures and accessories, and special details. Distinguish between factory and field-assembled work

- D. Coordination Drawings: Roof plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installer of the items involved:
 - 1. Roof panels and attachments
 - 2. Metal trusses, bracings and supports
 - 3. Roof-mounted items including snow guards and items mounted on roof curbs.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Ordering: Comply with manufacturer's ordering instruction and lead time requirements to avoid construction delays.
- B. Deliver components, sheets, metal roof panels and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- C. Unload, store and erect metal roof panels in a manner to prevent bending, warping, twisting and surface damage.
- D. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting or other surface damage.
- E. Protect strippable protective coating on any metal coated product from exposure to sunlight and high humidity, except to the extent necessary for material installation.

1.10 PROJECT CONDITIONS

- A. Weather Limitations: proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.11 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim and construction of decks, parapet walls and other adjoining work to provide a leakproof, secure and noncorrosive installation.

PART 2 - PRODUCTS

13.012.1 PANEL DESIGN

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates and accessories required for a weathertight installation.
- B. Roof panels shall be standing seam Tite-Loc Plus in 16" widths with 2" high seams that are mechanically seamed together @ 180 degrees.
- C. Panels to be produced with Factory supplied hot melt mastic in the seams.
- D. Panels to be designed for attachment with concealed fastener clips, spaced as required by the manufacturer to provide for both positive and negative design loads, while allowing for the expansion and contraction of the entire roof system resulting from variations in temperature.
- E. Forming: Use continuous end rolling method. No end laps on panels. No portable rollforming machines will be permitted on this project, no installer-owned or installer-rented machines will be permitted. It is the intent of the Architect to provide Factory-Manufactured panel systems only for this project.

2.2 ACCEPTABLE MANUFACTURERS

- A. This project is detailed around the roofing product of Petersen Aluminum Corporation, Tite-Loc Plus.
- B. Equal as approved by Architect prior to bidding.

2.3 MATERIALS AND FINISHES

- A. Preformed roofing panels shall be fabricated of 24 GA Steel
- B. Color shall be *Standard Pac-Clad Finish
- C. Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating with a top side film thickness of 0.70 to 0.90 mil over a 0.25 to 0.3 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil, to meet AAMA 621. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesions, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.
- D. If Strippable coating to be applied on the pre-finished panels to the top side to protect the finish during fabrication, shipping and handling, film shall be removed before installation.
- E. Trim: Trim shall be fabricated of the same material and finish to match the profile, and will be press broken in lengths of 10 to 12 feet. Trim shall be formed only by the manufacturer of their approved dealer. Trim to be erected in overlapped condition. Use lap strips only as indicated on drawings. Miter conditions shall be factory welded material to match the sheeting.
- F. Closures: use composition or metal profiled closures at the top of each elevation to close ends of the panels. Metal closures to be made in the same material and finish as face sheet.
- G. Fasteners: Fasteners shall be of type, material, size, corrosion resistance, holding power and other properties required to fasten miscellaneous framing members to substrates.
- H. Substrate shall be Plywood
- I. Roofing Underlayment
 - 1. On all surfaces to be covered with roofing material, furnish and install a 40 mil "Peel & Stick membrane", required as outlined by metal panel manufacturer. Membrane to be a minimum of 40 mil thickness, smooth, non-granular, high temperature. Basis of design: Carlisle WIP 300 HT High Temperature Protection Self Adhering Roofing Underlayment. Other acceptable manufacturers include:
 - a. W.R Grace "Ice & water Shield"
 - b. Interwrap Titanium PSU-30
 - c. Carlisle CCW WIP 300HT
 - d. Interwrap Titanium PSU
 - e. Tamko TW Tile and Metal Underlayment
 - 2. Underlayment shall be laid in horizontal layers with joints lapped toward the eaves a minimum of 6", and well secured along laps and at ends as necessary to properly hold the felt in place. All underlayment shall be preserved unbroken and whole.
 - 3. Peel and Stick Underlayment shall lap all hips and ridges at least 12" to form double thickness and shall be lapped 6" over the metal of any valley or built-in gutters and shall be installed as required by the Standing Seam Panel Manufacturer to attain the desired 20 Year Weathertightness Warranty.
- J. Sealants
 - 1. Provide two-part polysulfide class B non-sag type for vertical and horizontal joints or
 - 2. one part polysulfide not containing pitch or phenolic extenders or
 - 3. Exterior grade silicone sealant recommended by roofing manufacturer or
 - 4. One part non-sag, gun grade exterior type polyurethane recommended by the roofing manufacturer.

2.4 FABRICATION

- A. Comply with dimensions, profile limitations, gauges and fabrication details shown and if not shown, provide manufacturer's standard product fabrication.
- B. Fabricate components of the system in factory, ready for field assembly.
- C. Fabricate components and assemble units to comply with fire performance requirements specified.
- D. Apply specified finishes in conformance with manufacturer's standard, and according to manufacturer's instructions.

PART 3 - EXECUTION

17.01 3.1 INSPECTION

- A. Examine alignment of structural steel and related supports, primary and secondary roof framing, solid roof sheathing, prior to installation.
- B. For the record, prepare written report, endorsed by installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FASTENERS

- A. Secure units to supports
- B. Place fasteners as indicated in manufacturer's standards.

3.3 INSTALLATION

- A. Panels shall be installed plumb and true in a proper alignment and in relation to the structural framing. The erector must have at least five years successful experience with similar applications.
- B. Install metal panels, fasteners, trim and related sealants in accordance with approved shop drawings and as may be required for a weather-tight installation.
- C. Remove all strippable coating and provide a dry-wipe down cleaning of the panels as they are erected.

3.4 DAMAGED MATERIAL

- A. Upon determination of responsibility, repair or replace damaged metal panels and trim to the satisfaction of the Architect and Owner.

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**SECTION 07 9213
ELASTOMERIC JOINT SEALANTS**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- C. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install sealants not specified to be furnished and installed under other Sections.
 - 2. Quality of sealants to be used on Project not specified elsewhere, including submittal, material, and installation requirements.
- B. Related Requirements:
 - 1. Removing existing sealants specified in Sections where work required.
 - 2. Furnishing and installing of sealants is specified in Sections specifying work to receive new sealants.

1.03 REFERENCES

- A. Definitions:
 - 1. Sealant Types and Classifications:
 - a. ASTM Specifications:
 - 1) Type:
 - (a) Type S: Single-component sealant.
 - (b) Type M: Multi-component sealant.
 - 2) Grade:
 - (a) Grade P: Pourable or self-leveling sealant used for horizontal traffic joints.
 - (b) Grade NS: Non-sag or gunnable sealant used for vertical and non-traffic joints.
 - 3) Classes: Represent movement capability in percent of joint width.
 - (a) Class 100/50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand of at least 100 percent increase and decrease of at least 50 percent of joint width as measured at time of application.
 - (b) Class 50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 50 percent of joint width as measured at time of application.
 - (c) Class 25: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 25 percent of joint width as measured at time of application.
 - (d) Class 12: Sealant that, when tested for adhesion and cohesion under cyclic movement shall withstand increase and decrease of at least 12 percent of joint width as measured at time of application.
 - 4) Use:
 - (a) T (Traffic): Sealant designed for use in joints in pedestrian and vehicular traffic areas such as walkways, plazas, decks and parking garages.
 - (b) NT (Non-Traffic): Sealant designed for use in joints in non-traffic areas.
 - (c) I (Immersion): Sealant that meets bond requirements when tested by immersion (Immersion rated sealant applications require primer).

- (d) M (Mortar): Sealant that meets bond requirements when tested on mortar specimens.
 - (e) G (Glass): Sealant that meets bond requirements when tested on glass specimens.
 - (f) A (Aluminum): Sealant that meets bond requirements when tested on aluminum specimens.
 - (g) O (Other): Sealant that meets bond requirements when tested on substrates other than standard substrates, being glass, aluminum, mortar.
 - 2. Silicone: Any member of family of polymeric products whose molecular backbone is made up of alternating silicon and oxygen atoms and which has pendant hydrocarbon groups attached to silicon atoms. Used primarily as a sealant. Offers excellent resistance to water and large variations in temperature (minus 100 degrees Fahrenheit to + 600 degrees Fahrenheit) (minus 163.94 degrees Fahrenheit to + 600.8 degrees Fahrenheit).
- B. Reference Standards:
- 1. ASTM International:
 - a. ASTM C920-14a, 'Standard Specification for Elastomeric Joint Sealants'.
 - b. ASTM C1193-16, 'Standard Guide for Use of Joint Sealants'.
 - c. ASTM C1330-18, 'Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants'.
 - d. ASTM C1481-12(2017) 'Standard Guide for Use of Joint Sealants with Exterior Insulation & Finish Systems (EIFS)'.
 - e. ASTM D5893/D5893M-16, 'Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Scheduling:
 - 1. Schedule work so waterproofing, water repellents and preservative finishes are installed after sealants, unless sealant manufacturer approves otherwise in writing.
 - 2. Ensure sealants are cured before covering with other materials.

1.05 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - b. Manufacturer's literature for each Product.
 - c. Schedule showing joints requiring sealants. Show also backing and primer to be used.
- B. Informational Submittals:
 - 1. Certificates:
 - a. Manufacturer's Certificate:
 - 1) Certify products are suitable for intended use and products meet or exceed specified requirements.
 - 2) Certificate from Manufacturer indicating date of manufacture.
 - 2. Manufacturers' Instructions:
 - a. Manufacturer's installation recommendations for each Product.
 - b. Manufacturer's installation for completing sealant intersections when different materials are joined.
 - c. Manufacturer's installation for removing existing sealants and preparing joints for new sealant.

1.06 QUALITY ASSURANCE

- A. Qualifications:

1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten (10) years documented experience.
2. Applicator Qualifications:
 - a. Company specializing in performing work of this section.
 - b. Provide if requested, reference of projects with minimum three (3) years documented experience, minimum three (3) successfully completed projects of similar scope and complexity, and approved by manufacturer.
 - c. Designate one (1) individual as project foreman who shall be on site at all times during installation.
- B. Preconstruction Testing:
 1. Pre-construction testing is not required when sealant manufacturer can furnish data acceptable to Architect based on previous testing for materials matching those of the Work.
- C. Mockups:
 1. Provide mockups including sealant and joint accessories to illustrate installation quality and color if requested by Architect or Project Manager.
 - a. Incorporate accepted mockup as part of Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements:
 1. Deliver and keep in original containers until ready for use.
 2. Inspect for damage or deteriorated materials.
- B. Storage and Handling Requirements:
 1. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDS).
 2. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
 3. Store in a cool dry location, but never under 40 degrees Fahrenheit or subjected to sustained temperatures exceeding 90 degrees Fahrenheit or as per Manufacturer's written recommendations.
 4. Do not use sealants that have exceeded shelf life of product.

1.08 FIELD CONDITIONS

- A. Ambient Conditions:
 1. Do not install sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.
 2. Follow Manufacturer's temperature recommendations for installing sealants.

1.09 WARRANTY

- A. Manufacturer Warranty:
 1. Signed warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of three (3) years from date of Substantial Completion.
 - a. Manufacturer's standard warranty covering sealant materials.
 - b. Applicator's standard warranty covering workmanship.

PART 2 PRODUCTS

2.01 SYSTEMS

- A. Manufacturers:
 1. Manufacturer Contact List:
 - a. Dow Corning Corp., Midland, MI www.dowcorning.com.
 - b. Franklin International, Inc. Columbus, OH www.titebond.com.
 - c. GE Sealants & Adhesives (see Momentive Performance Materials Inc.).
 - d. Laticrete International Inc., Bethany, CT www.laticrete.com.

- e. Momentive Performance Materials Inc. (formally GE Sealants & Adhesives), Huntersville, NC www.ge.com/silicones.
- f. Sherwin-Williams, Cleveland, OH www.sherwin-williams.com.
- g. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com or Sika Canada Inc, Pointe Claire, QC www.sika.ca.
- h. Tremco, Beachwood, OH www.tremcosealants.com or Tremco Ltd, Toronto, ON (800) 363-3213.

B. Materials:

1. Design Criteria:

- a. Compliance: Meet or exceed requirements of these standards:
 - 1) ASTM C920: Elastomeric joint sealant performance standard.
 - 2) ASTM D5893/D5893M: Silicone Joint Sealant for Concrete Pavements.
- b. Comply with Manufacturer's ambient condition requirements.
- c. Sealants must meet Manufacturer's shelf-life requirements.
- d. Sealants must adhere to and be compatible with specified substrates.
- e. Sealants shall be stable when exposed to UV, joint movements, and environment prevailing at project location.
- f. Primers (Concrete, stone, masonry, and other nonporous surfaces typically do not require a primer. Aluminum and other nonporous surfaces except glass require use of a primer. Installer Option to use Adhesion Test to determine if primer is required or use primer called out in related sections):
 - 1) Adhesion Test:
 - (a) Apply silicone sealant to small area and perform adhesion test to determine if primer is required to achieve adequate adhesion. If necessary, apply primer at rate and in accordance with Manufacturer's instructions. See 'Field Quality Control' in Part 3 of this specification for Adhesive Test.
 - 2) If Primer required, shall not stain and shall be compatible with substrates.
 - 3) Allow primer to dry before applying sealant.

2. Sealants At Exterior Building Elements:

- a. Description:
 - 1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
 - (a) Aluminum entrance perimeters and thresholds.
 - (b) Columns.
 - (c) Connections.
 - (d) Curtainwalls.
 - (e) Door frames.
 - (f) Joints and cracks around windows.
 - (g) Louvers.
 - (h) Masonry.
 - (i) Parapet caps.
 - (j) Wall penetrations.
 - (k) Other joints necessary to seal off building from outside air and moisture.
- b. Design Criteria:
 - 1) Meet following standards for Sealant:
 - (a) ASTM C920: Type S, Grade NS, Class 50 Use NT, M, G, A.
 - 2) Limitations:
 - (a) Do not use below-grade applications.
 - (b) Do not use on surfaces that are continuously immersed or in contact with water.
 - (c) Do not use on wet, damp, frozen or contaminated surfaces.
 - (d) Do not use on building materials that bleed oils, plasticizers or solvents, green or partially vulcanized rubber gaskets or tapes.

- 3) Color:
 - (a) Architect to select from Manufacturer's standard colors.
 - (b) Match building elements instead of window (do not use white that shows dirt easily).
- c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Dow Corning:
 - (a) Primer: 1200 Prime Coat.
 - (b) Sealant: 791 Silicone Weatherproofing Sealant.
 - 2) Momentive Performance Materials (formerly, GE Sealants & Adhesives):
 - (a) Primer: SS4044 Primer.
 - (b) Sealant: GE SCS2000 SilPruf Silicone Sealant & Adhesive.
 - 3) Tremco:
 - (a) Primer:
 - (1) Metal surface: No. 20 primer.
 - (2) Porous surfaces: No. 23 primer.
 - (b) Sealant: Spectrum 1 Silicone Sealant.
3. Sealants At Exterior Sheet Metal And Miscellaneous:
 - a. Description:
 - 1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
 - (a) Flashings.
 - (b) Gutters.
 - (c) Penetrations in soffits and fascias.
 - (d) Roof vents and flues.
 - (e) Lightning protection components.
 - b. Design Criteria:
 - 1) Meet following standards for Sealant:
 - (a) ASTM C920: Type S Grade NS, Class 25 (min) Use NT, M, G, A and O.
 - 2) Limitations:
 - (a) Do not use below-grade applications.
 - (b) Do not use on surfaces that are continuously immersed or in contact with water.
 - (c) Do not use on wet, damp, frozen or contaminated surfaces.
 - (d) Do not use on building materials that bleed oils, plasticizers or solvents, green or partially vulcanized rubber gaskets or tapes.
 - c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Dow Corning: 790 Silicone Building Sealant.
 - 2) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2350 Silicone Elastomeric Sealant.
 - 3) Tremco: Tremsil 600 Silicone Sealant.
4. Sealants At Expansion Joints in Exterior Concrete (Aprons, Entryway Slabs, Mowstrips, Retaining Walls, Sidewalks):
 - a. Expansion Joints:
 - 1) Design Criteria:
 - (a) Meet following standards for Sealant:
 - (1) ASTM C920: Type S, Grade NS, Class 100/50 Use T, NT, M, G, A, and O.
 - 2) Sealant required at expansion for following areas:
 - (a) Between entryway slabs and building foundations.
 - (b) Between sidewalks and building foundations.
 - (c) Miscellaneous vertical applications.

- 3) Sealant NOT required at expansion joints for following areas:
 - (a) Within aprons and where aprons abut building foundations and sidewalks.
 - (b) Within mowstrips and where mowstrips abut building foundations and sidewalks.
 - (c) Within sidewalks.
- 4) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - (a) Dow Corning:
 - (1) Primer: 1200 Prime Coat.
 - (2) Sealant: 790 Silicone Building Sealant.
 - (b) Sika:
 - (1) Primer: Sikasil Primer-2100.
 - (2) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.
- b. Penetrations thru Concrete Walls:
 - 1) Design Criteria:
 - (a) Meet following standards for Sealant:
 - (1) ASTM C920: Type S, Grade NS, Class 100/50 Use T, NT, M, G, A, and O.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - (a) Dow Corning:
 - (1) Primer: 1200 Prime Coat.
 - (2) Sealant: 790 Silicone Building Sealant.
 - (b) Sika:
 - (1) Primer: Sikasil Primer-2100.
 - (2) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.
5. Sealants At Control Joints in Exterior Concrete (Aprons, Entryway Slabs, Mowstrips, Retaining Walls, Sidewalks):
 - a. Control Joints:
 - 1) Design Criteria:
 - (a) Meet following standards for Sealant:
 - (1) ASTM C920, Type S, Grade P, Class 100/50; Use T, M, G, A, O.
 - 2) Sealant required at control joints in following areas:
 - (a) Retaining walls.
 - (b) Miscellaneous vertical applications.
 - 3) Sealant is NOT required at control joints, unless needed to protect moisture sensitive soils or by Contract Drawings, in following areas:
 - (a) Within aprons.
 - (b) Within mowstrips.
 - (c) Within sidewalks.
 - (d) Within entryway slabs.
 - 4) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - (a) Dow Corning:
 - (1) Primer: 1200 Prime Coat.
 - (2) Sealant: 890-SL Silicone Building Sealant.
 - (b) Sika:
 - (1) Primer: Primer: Sikasil Primer-2100.
 - (2) Sealant: Sikasil-728 SL Self-leveling Silicone Sealant.
6. Sealants At Exterior Concrete Waterways – Flat Drainage Structures (Waterways):
 - a. Expansion Joints and Control Joints:
 - 1) Description:

- (a) One component (part) self-leveling silicon material that cures to ultra-low modulus silicone rubber upon exposure to atmospheric moisture.
 - (b) Cured silicone rubber remains flexible over entire temperature range expected in pavement applications.
 - 2) Design Criteria:
 - (a) Sealant is required at following areas:
 - (1) Within flat drainage structures and at joints between flat drainage structures and other concrete elements.
 - (b) Meet following standards for Sealant: Self-leveling: ASTM D-5893; ASTM C920, Type S, Grade P, Class 100/50; Use T, M, G, A, O.
 - 3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - (a) Dow Corning:
 - (1) Primer: 1200 Prime Coat.
 - (2) Sealant: 890-SL Silicone Building Sealant.
 - (b) Sika:
 - (1) Primer: Primer: Sikasil Primer-2100.
 - (2) Sealant: Sikasil-728 SL Self-leveling Silicone Sealant.
- 7. Sealants At Curbs And Gutters:
 - a. Expansion Joints and Control Joints:
 - 1) Description:
 - (a) Effective for sealing transverse contraction and expansion joints, longitudinal, center line and shoulder joints in Portland cement concrete.
 - (b) One component (part) non-sag silicone material that cures to low modulus, silicone rubber upon exposure to atmospheric moisture. May be applied over wide temperature range.
 - 2) Design Criteria:
 - (a) Expansion joint sealant is required in following areas:
 - (1) Within curbs and gutters at approved layout locations.
 - (b) Meet following standards for Sealant: Non-sag: ASTM C920: Type S, Grade NS, Class 100/50, Use T, NT.
 - 3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - (a) Dow Corning:
 - (1) Primer: 1200 Prime Coat.
 - (2) Sealant: 888 Silicone Joint Sealant.
 - (b) Sika:
 - (1) Primer: Primer: Sikasil Primer-2100.
 - (2) Sikasil-728 NS Non-Sag Silicone Sealant.
- 8. General Interior Sealants:
 - a. General:
 - 1) Inside jambs and heads of exterior door frames.
 - 2) Both sides of interior door frames.
 - 3) Inside perimeters of windows.
 - 4) Miscellaneous gaps between substrates.
 - b. Design Criteria:
 - 1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
 - 2) 100 percent silicone sealant.
 - c. Non-Paintable Sealant (Installer Option A):
 - 1) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
 - (a) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
 - (b) Laticrete: Latasil Silicone Sealant.

- (c) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2800 SilGlaze II Silicone Sealant.
- (d) Sherwin Williams: White Lightning Silicone Ultra Low Odor Window and Door Sealant.
- (e) Tremco: Tremsil 200 Silicone Sealant.
- (f) Franklin International: Titebond 2601 (White) 2611 (Clear) 100% Silicone Sealant.
- d. Paintable Sealant (Installer Option B):
 - 1) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
 - (a) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS7000 Paintable Silicone Sealant.

2.02 ACCESSORIES

- A. Bond Breaker Tape:
 - 1. Pressure sensitive tape as by Sealant Manufacturer to suit application.
 - 2. Provide tape to prevent adhesion to joint fillers or joint surfaces at back of joint and allow sealant movement.
- B. Joint Backing:
 - 1. Comply with ASTM C1330.
 - 2. Flexible closed cell, non-gassing polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.
 - 3. Oversized 25 to 50 percent larger than joint width.
- C. Joint Cleaner:
 - 1. Non-corrosive and non-staining type as recommended by Sealant Manufacturer, compatible with joint forming materials.
- D. Masking Tape:
 - 1. Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification Of Conditions:
 - 1. Examine substrate surfaces and joint openings are ready to receive Work.
 - a. Verify each sealant is compatible for use with joint substrates.
 - b. Verify joint surfaces are clean and dry.
 - c. Ensure concrete surfaces are fully cured.
 - 2. Sealants provided shall meet Manufacturer's shelf-life requirements.
 - 3. Notify Architect of unsuitable conditions in writing.
 - a. Do not proceed until unsatisfactory conditions are corrected.
 - 4. Commencement of Work by installer is considered acceptance of substrate.

3.02 PREPARATION

- A. Surface Preparation:
 - 1. Remove existing joint sealant materials where specified.
 - a. Clean joint surfaces of residual sealant and other contaminants capable of affecting sealant bond to joint surface using manufacturer's recommended joint preparation methods.
 - b. Repair deteriorated or damaged substrates as recommended by Sealant Manufacturer to provide suitable substrate. Allow patching materials to cure.
 - 2. Surfaces shall be clean, dry, free of dust, oil, grease, dew, frost or incompatible sealers, paints or coatings that may interfere with adhesion. Prepare substrates in accordance with Manufacturer's instructions:

- a. Porous surfaces: Clean by mechanical methods to expose sound surface free of contamination and laitance followed by blasting with oil-free compressed air.
- b. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C1193. Allow solvent to evaporate prior to sealant application.
- c. High-pressure water cleaning: Exercise care that water does not enter through failed joints.
- d. Primers:
 - 1) Primers enhance adhesion ability.
 - 2) Use of primers is not a substitution for poor joint preparation.
 - 3) Primers should be used always in horizontal application where there is ponding water.
- 3. Field test joints in inconspicuous location.
 - a. Verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.
 - b. When test indicates sealant adhesion failure, modify joint preparation primer, or both and retest until joint passes sealant adhesion test.
- 4. Masking: Apply masking tape as required to protect adjacent surfaces and to ensure straight bead line and facilitate cleaning.
- B. Joints:
 - 1. Prepare joints in accordance with ASTM C1193.
 - a. Clean joint surfaces of contaminants capable of affecting sealant bond to joint surface using Manufacturer's recommended instructions for joint preparation methods.
 - b. Remove dirt, dust, oils, wax, paints, and contamination capable of affecting primer and sealant bond.
 - c. Clean concrete joint surfaces to remove curing agents and form release agents.
- C. Protection:
 - 1. Protect elements surrounding the Work of this section from damage or disfiguration.

3.03 APPLICATION

- A. General:
 - 1. Apply silicone sealant in accordance with Manufacturer's instructions.
 - 2. Do not use damaged or deteriorated materials.
 - 3. Install primer and sealants in accordance with ASTM C1193 and Manufacturer's instructions.
 - 4. Apply primer where required for sealant adhesion.
 - 5. Install sealants immediately after joint preparation.
 - 6. Do not use silicone sealant as per the following:
 - a. Apply caulking/sealant at temperatures below 40 degrees Fahrenheit.
 - b. Below-grade applications.
 - c. Brass and copper surfaces.
 - d. Materials bleeding oils, plasticizers, and solvents.
 - e. Structural glazing and adhesive.
 - f. Surfaces to be immersed in water for prolonged time.
- B. Joint Backing:
 - 1. Install joint backing to maintain sealant joint ratios recommended by Manufacturer.
 - 2. Install without gaps, twisting, stretching, or puncturing backing material. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.
 - 3. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than 3/8 inch deep.
- C. Bond Breaker:
 - 1. Install bond breaker where joint backing is not used or where backing is not feasible.

- a. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.
- D. Sealant:
 - 1. Apply sealant with hand-caulking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
 - 2. Fill joint opening to full and proper configuration.
 - 3. Apply in continuous operation.
 - 4. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction, i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
 - 5. Depth of sealant bite shall be 1/4 inch minimum and 1/2 inch maximum, but never more than one half or less than one fourth joint width.
- E. Caulk gaps between painted or coated substrates and unfinished or pre-finished substrates. Caulk gaps larger than 3/16 inch between painted or coated substrates.

3.04 TOLERANCES

- A. Provide joint tolerances in accordance with Manufacturer's printed instructions.

3.05 FIELD QUALITY CONTROL

- A. Adhesion Test (Installer Option to use adhesion test to determine if primer is required).
 - 1. Perform adhesion tests in accordance with Manufacturer's instructions and ASTM C1193, Method A, Field-Applied Sealant joint Hand-Pull Tab:
 - a. Perform five (5) tests for first 1,000 linear feet 328.08 yards of applied silicone sealant and one (1) test for each 1,000 linear feet (300 meters) seal thereafter or perform one (1) test per floor per building elevation minimum.
 - b. For sealants applied between dissimilar materials, test both sides of joints.
 - 2. Sealants failing adhesion test shall be removed, substrates cleaned, sealants re-installed, and re-testing performed.
 - 3. Maintain test log and submit report to Architect indicating tests, locations, dates, results, and remedial actions.

3.06 CLEANING

- A. Remove masking tape and excess sealant.
- B. Clean adjacent materials, which have been soiled, immediately (before setting) as recommended by Manufacturer.
- C. Waste Management: Dispose of products in accordance with manufacturer's recommendation.

END OF SECTION

SECTION 08 4113
ALUMINUM FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- C. AAMA SFM-1 - Aluminum Storefront and Entrance Manual; 2014.
- D. ANSI 117 - Standard Specification for Structural Glued Laminated Timber of Softwood Species; 2025.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).
- G. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- H. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- I. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2023.
- J. 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).
- K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- L. BHMA A156.19 - Power Assist and Low Energy Power Operated Swinging Doors; 2019.
- M. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install aluminum storefront window systems, including hardware, glazing, and caulking, as described in Contract Documents and including the following:
- B. Related Requirements:
 - 1. Section 01 1100: 'Summary Of Work' for cores for High Security Cylinders are excluded from Contract and provided by Owner. This specification establishes quality of materials and installation of those items for information of Contractor, Architect, and Owner's Representatives.
 - 2. Section 06 1100: 'Wood Framing':
 - a. Pre-installation conference held jointly with Section 08 4113.
 - 3. Section 07 9213: 'Elastomeric Joint Sealant' for quality of sealants.
 - 4. Section 08 8100: 'Glass Glazing' for quality of glass glazing.

1.03 REFERENCES

- A. Association Publications:
 - 1. American Architectural Manufacturers Association (AAMA):
 - a. AAMA 501-15, 'Methods of Test for Exterior Walls'.
 - b. AAMA 609 & 610-15, 'Cleaning and Maintenance Guide for Architecturally Finished Aluminum' (combined documents).
 - c. AAMA SFM-1-14, 'Aluminum Store Front and Entrance Manual'.

- d. AAMA 611-14, 'Voluntary Standards for Anodized Architectural Aluminum'.
 - e. AAMA 2605-17a, 'Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels'.
- B. Definitions:
- 1. Four Wind Zones (Florida Building Code):
 - a. Special Protection Zone.
 - b. High Velocity Hurricane Zone (HVHZ): Miami-Dade and Broward counties.
 - c. Wind-Borne Debris Region.
 - d. Panhandle Protection Provision Zone.
 - 2. Glass Surface:
 - a. Insulated glass unit:
 - 1) Surface 1: Exterior surface of outer lite.
 - 2) Surface 2: Interspace-facing surface of outer lite.
 - 3) Surface 3: Interspace-facing surface of inner lite.
 - 4) Surface 4: Interior surface of inner lite.
 - b. Monolithic glass:
 - 1) Surface 1: Exterior surface.
 - 2) Surface 2: Interior surface.
- C. Reference Standards:
- 1. ASTM International:
 - a. ASTM B221-14, 'Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes'.
 - b. ASTM B456-17, 'Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium'.
 - c. ASTM B633-15, 'Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel'.
 - d. ASTM C920-18, 'Standard Specification for Elastomeric Joint Sealants'.
 - e. ASTM C1184-18, 'Standard Specification for Structural Silicone Sealants'.
 - f. ASTM E283-04(2012), 'Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen'.
 - g. ASTM E330/E330M-14, 'Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference'.
 - h. ASTM E331-00(2016), 'Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference'.
 - 2. International Building Code (IBC) (2018 or most recent edition adopted by AHJ):
 - a. Chapter 16, 'Structural Design'.
 - 1) Section 1609 'Wind Loads'.
 - 3. International Code Council / American National Standards Institute:
 - a. ICC / ANSI A117.1-2009, 'Accessible and Usable Buildings and Facilities'.
 - 4. National Fenestration Rating Council (NFRC):
 - a. NFRC 100-2017, 'Procedure for Determining Fenestration Product U-factors'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
- 1. Participate in MANDATORY pre-installation conference as specified in Section 06 1100.
 - a. Schedule pre-installation conference one (1) week before scheduled installation of storefront system.
 - b. In addition to requirements of Section 01 3100, review following:

- 1) Review rough opening requirements:
 - (a) Make certain rough openings are within tolerances required for installation of factory-fabricated frames.
 - (b) These dimensions have been agreed upon between Owner and Manufacturer and are shown on Standard Plan Drawings.
- 2) Review rough opening requirements:
 - (a) Existing Building:
 - (1) Field verify rough openings before fabrication of storefront systems.
- 3) Review delivery, storage, and handling requirements.
- 4) Review 'Protection' responsibilities.
- 5) Review 'Cleaning' responsibilities.

1.05 SUBMITTALS

- A. Action Submittals:
 1. Product Data:
 - a. Manufacturer's literature.
 - b. Color and finish.
 2. Shop Drawings:
 - a. Clearly mark components to identify their location in Project.
 - b. Show locations, sizes, etc, of hardware reinforcing.
 - c. Show wind loads and engineering for Project conditions.
- B. Informational Submittals:
 1. Qualification Statement:
 - a. Installer:
 - 1) Provide Qualification documentation if requested by Architect or Owner.
- C. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Operations and Maintenance Data:
 - 1) Maintenance, adjustment, and repair instructions.
 - b. Warranty Documentation:
 - 1) Final, executed copy of Warranty.
 - (a) Storefront warranty.
 - c. Record Documentation:
 - 1) Manufacturers documentation:
 - (a) Color and finish selections.
 - (b) Parts lists.

1.06 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
 1. Storefront System Performance Requirements:
 - a. Provide test reports from AAMA accredited laboratories certifying performances if requested:
 - 1) Air Leakage: Meet requirements of ASTM E283.
 - 2) Limit air leakage through assembly to 0.06 CFM/min/sq ft (.00003 m3/sm2) of wall area at 6.24 PSF (300 Pa) as measured in accordance with ASTM E283.
 - 3) Water Resistance: No water leakage when measured in accordance with ASTM E331 with static test pressure of 8PSF (384 Pa) as defined by AAMA 501.
 - 4) Dynamic Water Resistance: No water leakage, when measured in accordance with AAMA 501 with dynamic test pressure of 8 PSF (384 Pa).
 - 5) Limit mullion wind load deflection of L/175 with full recovery of glazing materials, when measured in accordance with ASTM E330/E330M.

- 6) System shall not deflect more than 1/8 inch at center point, or 1/16 inch at enter point of horizontal member, once dead load points have been established.
 - 7) System shall accommodate expansion and contraction movement due to surface temperature differential of 180 degrees Fahrenheit.
 - 8) Seismic testing shall conform to AAMA recommended static test method for evaluating performance of curtain walls and storefront wall systems due to horizontal displacements associated with seismic movements and building sway.
2. Provide wind load and impact testing by testing laboratory when required by local codes and jurisdictions:
- B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
1. Manufacturer Qualifications:
 - a. Provide storefront systems produced by firm experienced in manufacturing systems that are similar to those indicated for this project and have record of successful in-service performance.
 2. Fabricator Qualifications:
 - a. Provide storefront systems fabricated by a firm experienced in producing systems that are similar to those indicated for this Project, and have record of successful in-service performance.
 - b. Fabricator shall have sufficient production capacity to produce components required without causing delay in progress of the Work.
 3. Installer Qualifications:
 - a. Minimum three (3) years experience in storefront installations.
 - b. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
 - c. Upon request, submit documentation.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
1. Deliver all parts of storefront together, in original, unopened packages with labels intact to Project at same time.
- B. Storage And Handling Requirements:
1. Store in clean, dry location, indoors in Manufacturer's unopened packaging until ready for installation and in accordance with Manufacturer's instructions.
 2. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.
 3. Protect materials and finish from damage during storage, handling and installation.

1.08 WARRANTY

- A. Manufacturer Warranty:
1. Storefront:
 - a. Manufacturer's Warranty to be free of defects in material and workmanship.
 - b. Manufacturer's Warranty against deterioration or fading.

PART 2 PRODUCTS

2.01 ASSEMBLIES

- A. Manufacturers:
1. Category Three Approved Manufacturers. See Section 01 6200 for definitions of Categories:
 - a. Arcadia Inc., Vernon CA www.arcadiainc.com.
 - 1) Contact Information: Ken Martinek, (602) 734-5327 kmartinek@arcadiainc.com.
 - b. Kawneer North America, Norcross, GA, www.kawneer.com/kawneer/north_america.
 - 1) Contact Information: Bart Daniels cell (385) 214-4650 bart.daniels@alcoa.com.

- B. General:
 - 1. In addition to requirements shown or specified, comply with:
 - a. Applicable provisions of AAMA SFM-1, 'Aluminum Store Front and Entrance Manual' for design, materials, fabrication and installation of component parts.
- C. Design Criteria:
 - 1. Storefront System suitable for outside or inside glazing.
- D. Materials:
 - 1. Framing Components and Accessories:
 - a. Aluminum Extrusions:
 - 1) 6063-T6 aluminum alloy or meet requirements of ASTM B221, alloy GS 10a T6.
 - 2) Anchors, Clips, and Accessories:
 - (a) Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated (properly isolated steel from aluminum).
 - 3) Fasteners:
 - (a) Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
 - 4) Glazing Gasket:
 - (a) Compression-type design with replaceable extruded EPDM rubber.
 - 5) Reinforcing Members:
 - (a) Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 - (b) Mullion:
 - (1) Steel reinforced or heavy duty as necessary to prevent lateral flexing of mullion.
 - 6) Sealant:
 - (a) Structural Sealant meeting requirements of ASTM C1184 for fabrication within storefront system:
 - (1) Permanently elastic, non-shrinking, and non-migrating type for joint size and movement.
 - (2) Single-component neutral-curing silicone formulation compatible with system components specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in aluminum-framed systems indicated.
 - (3) Color: Black.
 - (b) Joint Sealants used at perimeter of storefront framing system: Elastomeric Sealant as specified in Section 07 9213.
 - (c) Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when required by local codes or AHJ.
 - 7) Tolerances:
 - (a) Tolerances for wall thickness and other cross-sectional dimensions of storefront members in compliance with AA Aluminum Standards and Data.
 - b. Storefront Framing System:
 - 1) Brackets and Reinforcements:
 - (a) Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.
 - 2) Fasteners and Accessories:

- (a) Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
 - 3) Perimeter Anchors:
 - (a) When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - c. Finish:
 - 1) Match existing.
 - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Non-Thermal, 2 inch Sightline:
 - (a) Double Glazed:
 - (1) AG451 by Arcadia.
 - (2) Trifab VG 451 by Kawneer.
 - e. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Non-Thermal:
 - (a) Double Glazed:
 - (1) IP2551 by Arcadia.
 - (2) IR 501 by Kawneer.
- 2. Glazing:
 - a. Glazing as specified in Section 08 8100: 'Glass Glazing'.
 - b. Glazing Gaskets:
 - 1) Compression-type design with replaceable extruded EPDM rubber.
 - c. Spacers and Setting Blocks: Elastomeric.
 - d. Bond-Breaker (Sealer) Tape: Standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
 - e. Glazing Sealant:
 - 1) Structural Sealant meeting requirements of ASTM C1184:
 - (a) Permanently elastic, non-shrinking, and non-migrating type for joint size and movement.
 - (b) Single-component neutral-curing silicone formulation compatible with system components specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in aluminum-framed systems indicated.
 - (c) Color: Black.
 - 2) Weather Sealant:
 - (a) ASTM C920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weather seal sealant, and aluminum-framed-system manufacturers for this use.
 - (b) Color: Match structural sealant.
 - 3) Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when required by local codes or AHJ.
- E. Fabrication:
 - 1. Construction shall meet Manufacturer's recommendations.
 - 2. Fabricate components that, when assembled, have following characteristics:
 - a. Profiles sharp, straight, and free of defects or deformations.
 - b. Accurately fit joints; make joints flush, hairline and weatherproof.
 - c. Means to drain water passing joints, condensation within framing members, and moisture migrating within system to exterior.
 - d. Physical and thermal isolation of glazing from framing members.

- e. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
- f. Provisions for field replacement of glazing.
- g. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- h. Framing members shall be internally reinforced and secured at head and sill as necessary for structural performance requirements and for hardware attachment.
- 3. Fabricate in factory to dimensions required to fit framed openings detailed on Contract Documents. Joints shall be tightly closed.
- 4. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- 5. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- 6. Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions.
- 7. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

PART 3 EXECUTION

3.01 INSTALLERS

- A. Performance Standard Installers: See Section 01 6200 for definitions of Categories. See Section 01 4301 and 'Quality Assurance' in Part 1 'General' for Installer Qualifications of this specification:
 - 1. General Contractor responsible for Installer(s), verification of qualifications, and performance. Contact Approved Manufacturer's Representative specified in Part 2 'Products' of this specification for potential installers if desired.

3.02 EXAMINATION

- A. Verification Of Conditions:
 - 1. Verify that framed openings comply with Contract Document requirements.
 - 2. Verify wall framing is dry, clean, sound, and free of voids and offsets, construction debris, sharp edges or anything that will prevent a successful installation of storefront system.
 - 3. Notify Architect and Owner in writing if framed openings are not as agreed upon.
 - a. Do not install storefront window frames until deficiencies in framed openings have been corrected to allow installation of standard windows.
 - b. Commencement of Work by installer is considered acceptance of substrate.

3.03 INSTALLATION

- A. General:
 - 1. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
 - 2. All installation shall be in accordance with manufacturer's published recommendations and in accordance with approved shop drawings.
 - 3. Do not install damaged components. Fit frame joints tight, free of burrs and distortion. Rigidly secure non-movement joints.
 - 4. Isolate metal surfaces in contact with incompatible metal or corrosive substrates, including wood, by applying sealer tape to prevent electrolytic action.
- B. Set plumb, square, level, and in correct alignment and securely anchor to following tolerances:
 - 1. Variation from plane: Limit to 1/8 inch in 12 feet; 1/4 inch over total length.
 - 2. Offset from Alignment: For surfaces abutting in line, limit offset to 1/16 inch.
 - 3. Offset at Corners: For surfaces meeting at corner, limit offset to 1/32 inch.
 - 4. Diagonal measurements: Limit difference between diagonal measurements to 1/8 inch.

- C. Install exterior window units with through wall sill flashing.
- D. Thresholds:
 - 1. Accurately cut thresholds to fit profile of storefront frame. Bed exterior thresholds in specified sealant at contact points with floor and make watertight.
- E. Sealants:
 - 1. Apply in accordance with Section 07 9213 'Elastomeric Joint Sealant' requirements.
 - 2. Caulk joints between frames and walls, both interior and exterior to provide weather tight installation.
- F. Glazing Characteristics:
 - 1. All Other Exterior Storefront :
 - a. Obscure interior pane with pattern on surface 3 and Clear exterior pane with Low E treatment on surface 2.

3.04 FIELD QUALITY CONTROL

- A. Field Tests And Inspections:
 - 1. Make all necessary final adjustments to attain storefront is installed properly.
- B. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
 - 1. Correct any work found defective or not complying with contract document requirements including removal and replacement of glass that has been broken, chipped, cracked, abraded, or damaged during construction period at no additional cost to the Owner.

3.05 PROTECTION

- A. During Installation:
 - 1. Installer's Responsibility:
 - a. During installation, all adjacent work shall be protected from damage.
- B. After Installation:
 - 1. General Contractor's Responsibility:
 - a. Institute protective measures required throughout remainder of construction period to ensure that aluminum storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

3.06 CLEANING

- A. General:
 - 1. Installer's Responsibility:
 - a. Follow Manufacturer's written recommendations for cleaning and maintenance or guidelines of AAMA 609 & 610 'Cleaning and Maintenance Guide for Architecturally Finished Aluminum' (combined documents). Avoid damaging protective coatings and finishes.
 - b. Clean glass and aluminum surfaces, inside and out, promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Exercise care to avoid damage to coatings.
 - c. Remove nonpermanent labels, protective films, and clean surfaces following recommended procedures.
 - 1) Do NOT remove permanent AAMA/CSA or NFRC labels.
- B. Waste Management:
 - 1. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

SECTION 08 8100 GLASS GLAZING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.
- C. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- E. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2024, with Editorial Revision (2025).
- F. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).
- H. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- I. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies; 2022.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Quality of glazing used in entries, doors, and windows.
- B. Related Requirements:
 - 1. Section 08 4113: 'Aluminum-Framed Entrances And Storefronts' for furnishing and installing of glazing in aluminum-framed storefront.

1.03 REFERENCES

- A. Definitions:
 - 1. Float Glass: Glass which has its bottom surfaces formed by floating on molten metal, top surface being gravity formed, producing high optical quality of glass with parallel surfaces and, without polishing and grinding, fire-finished brilliance of finest sheet glass.
 - 2. Glass Surface:
 - a. Insulated glass unit:
 - 1) Surface 1: Exterior surface of outer lite.
 - 2) Surface 2: Interspace-facing surface of outer lite.
 - 3) Surface 3: Interspace-facing surface of inner lite.
 - 4) Surface 4: Interior surface of inner lite.
 - b. Monolithic glass:
 - 1) Surface 1: Exterior surface.
 - 2) Surface 2: Interior surface.
 - 3. Heat-Strengthened Glass: Glass which is reheated, after forming, just below melting point and then cooled. Compressed surface is formed which increases its strength. Used for spandrel glass.
 - 4. Insulated Glass: Two pieces of glass spaced apart and hermetically sealed to form single-glazed unit with air space between. Heat transmission through this type of glass may be as low as half that without air space. Also called double glazing, double pane, insulated unit, and thermal pane.
 - 5. Laminated Glass: Two or more sheets with inner layer of transparent plastic to which glass adheres if broken. Used for overhead, safety glazing, and sound reduction.

6. Low-Emissivity Glass (Low-E): Reduces wintertime heat loss from interior with thin, almost colorless metallic coating that reflects heat back inside structure. Allows moderate solar heat gain while reducing harmful ultraviolet light in any season. Minimizes summertime air conditioning loss by reflecting radiated heat to outside. May be tempered for where safety glass is required. Available in single strength clear, gray and bronze (brown) color.
 7. Obscure Glass: Adds privacy where window coverings are impractical or undesirable. Various colors and texture patterns provide translucent or semi-opaque effect. May be tempered for use where safety glass is required.
 8. Polycarbonate: Translucent amorphous plastic noted for high impact resistance and dimensional stability over wide temperature range.
 9. Shading Coefficient: Ratio of solar heat gain passing through a glazing system to solar heat gain that occurs under the same conditions if the window was made of clear, unshaded double strength glass. Lower SC number, the better solar control efficiency of glazing system.
 10. Solar Heat Gain Coefficient (SHGC): Ratio of total solar heat passing through a given window relative to the solar heat incident on the projected window surface at normal solar incidence. (Percentage of solar energy directly transmitted or absorbed and re-radiated into a building). Lower SHGC, the better it is able to reduce heat.
 11. Solar Reflectance (R): Percent of incident solar radiation that is reflected by window film/glass system. Lower the number, the less solar radiation reflected.
 12. Spandrel Glass: Heat-strengthened float glass with colored-ceramic coating adhered to back by heat-fusing process. It has double the strength of annealed glass of same size and thickness, enabling it to withstand greater uniform loads and thermal stresses. Spandrel glass cannot be re-cut after heat-strengthening. Used as fixed opaque colored glass on buildings in front of floor slabs and columns and non-vision areas. Available in wide array of colors.
 - a. Ceramic Frit Opacification: Ceramic frit opacification consists of coating of durable, colored ceramic material that is compatible with base glass and is fire-fused into one surface of the glass during heat-treating process.
 13. Tempered Glass: Glass strengthened through process of heating, creating tensile strength that causes glass to resist breakage, yet disintegrate into small pieces if break occurs. Tempered glass is type of safety glass.
 14. U-Value: Measurement of heat transfer through film due to outdoor/indoor temperature differences. Lower U-value, less heat transfers. When using performance data, the lower U-value, better insulating qualities of window film/glass system.
 15. Visible Light Transmitted (VLT): Percent of total visible light (380-780 nanometers) that passes through glass. Lower the number, the less visible light transmitted.
- B. Reference Standards:
1. American National Standards Institute:
 - a. ANSI Z97.1-2009, 'Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test'.
 2. ASTM International:
 - a. ASTM C1036-16, 'Standard Specification for Flat Glass'.
 - b. ASTM C1048-18, 'Standard Specification for Heat-Treated Flat Glass - Kind H, Kind FT Coated and Uncoated Glass'.
 - c. ASTM C1172-14, 'Standard Specification for Laminated Architectural Flat Glass'.
 - d. ASTM C1281-16, 'Standard Specification for Preformed Tape Sealants for Glazing Applications'.
 - e. ASTM E2190-10, 'Standard Specification for Insulating Glass Unit Performance and Evaluation'.
 3. Consumer Products Safety Commission (CPSC):
 - a. 16 CFR, Part 1201 CAT 1 and 11, 'Safety Standard for Architectural Glazing Materials'.

4. National Fire Protection Association (NFPA):
 - a. NFPA 80 - 'Standard for Fire Doors and Other Opening Protectives' (2019 or most recent edition adopted by AHJ).
 - b. NFPA 252 - 'Fire Tests of Door Assemblies' (2017 or most recent edition adopted by AHJ).
 - c. NFPA 257 - 'Fire Test for Window and Glass Block Assemblies' (2017 or most recent edition adopted by AHJ).

1.04 SUBMITTALS

- A. Action Submittals:
 1. Product Data:
 - a. Manufacturer's data sheets for each glass product and glazing material.
 2. Samples:
 - a. Provide 12 inch by 12 inch sample with color required for spandrel glass.
- B. Informational Submittals:
 1. Qualification Statement:
 - a. Installer:
 - 1) Provide Qualification documentation if requested by Architect or Owner.
- C. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Warranty Documentation:
 - 1) Final, executed copy of Warranty.

1.05 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
 1. Glazing shall meet applicable requirements of Federal Consumer Product Safety Standard 16 CFR 1201.
 2. Comply with published recommendations of glass product Manufacturers and organizations, except where more stringent requirements are indicated.
 3. Glazing for Fire-Rated Door and Window Assemblies:
 - a. Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.
- B. Qualifications:
 1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
 - a. Satisfactorily completed at least three (3) installations of similar size, scope, and complexity in each of past two (2) years and be approved by glass product Manufacturer before bidding.
 - b. Upon request, submit documentation.
- C. Certifications:
 1. Labels showing strength, grade, thickness, type, and quality are required on each piece of glass.
 2. Manufacturers/Fabricators certifying products furnished comply with project requirements.
 3. Insulating-Glass Certification Program: Indicate compliance with requirements of Insulating Glass Certification Council on applicable glazing products.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 1. Follow Manufacturer's instruction for receiving, handling, and protecting glass & glazing materials to prevent breakage scratching, damage to seals, or other visible damage.
 2. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Storage And Handling Requirements:

1. Follow Manufacturer's instruction for storing and protecting glass & glazing materials.
2. Store materials protected from exposure to harmful environmental conditions and at temperatures and humidity conditions recommended by Manufacturer.
3. Protect edge damage to glass, and damage/deterioration to coating on glass.

1.07 FIELD CONDITIONS

A. Ambient Conditions:

1. Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.08 WARRANTY

A. Manufacturer Warranty:

1. Insulating Glass Warranty:
 - a. Manufacturer's standard form, signed by insulating-glass product Manufacturer/Fabricator, agreeing to replace insulating-glass units that exhibit failure of hermetic seal under normal use evidenced by obstruction of vision by dust, moisture, or film on interior surfaces of glass, for ten 10 years of date of installation.
2. Installer's Warranty:
 - a. Form acceptable to Owner, signed by glass product Installer, agreeing to replace glass products that deteriorate, or that exhibit damage or deterioration of glass or glazing products due to faulty installation, for two (2) years from date of installation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Manufacturer Contact List for Low E Glazing:
 - a. AGC Flat glass North America, Kingsport, TN www.us.agc.com.
 - b. Carlex (subsidiary of Central Glass Co., Ltd., Nashville, TN www.carlex.com.
 - c. Guardian Industries Corp., Auburn Hills, MI www.guardian.com.
 - d. Oldcastle BuildingEnvelope, Santa Monica, CA www.oldcastlebe.com.
 - e. Pilkington North America Inc., Toledo, OH www.pilkington.com.
 - f. Vitro Architectural Glass (formerly PPG glass), Cheswick, PA www.ppgglass.com or PPG Canada Ltd, Glass Division, Toronto, ON (416) 789-3331.

B. Design Criteria:

1. Glazing for Fire-Rated Door and Window Assemblies: Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.

C. Exterior Window Glazing:

1. Thickness: 1/8 inch minimum, Double Strength (Insulated Glass).
2. Glazing shall have following characteristics:
 - a. Low-Emissivity (or Low E):
 - 1) Design Criteria:
 - (a) Clear:
 - (b) Meet requirements of ASTM C1036, Type I, Class I, Quality Q3.
 - (c) Location: Surface 2.
 - 2) Type Two Low-Emissivity (or Low E) Acceptable Product:
 - (a) Performance Standard:
 - (1) 70 percent Visible Light Transmission (VLT).
 - (2) 0.29 U-value winter.
 - (3) 0.27 U-value summer.
 - (4) 0.38 Solar Heat Gain Coefficient (SHGC).
 - (5) 0.44 Shading Coefficient.

- (6) 11 percent Visible Light Reflectance.
 - (b) Quality Standard:
 - (1) Cardinal LoE³-366.
 - (2) Solarban 70 XL.
 - (3) Other low E glazing system standard with window manufacturer that meets or exceeds performance characteristics of specified glazing is acceptable as approved by Architect before bidding. See Section 01 6200.
 - 3) Acceptable Manufacturers:
 - (a) AGC.
 - (b) Guardian.
 - (c) Vitro Architectural Glass.
 - (d) Equal as approved by Architect before bidding. See Section 01 6200.
 - b. Obscure:
 - 1) Design Criteria:
 - (a) Meet requirements of ASTM C1036, Type II, Class I, Form 3, Quality Q8, Pattern - #62.
 - c. Glazing in Windows within 24 inches of Exterior Doors:
 - 1) Design Criteria:
 - (a) Tempered.
 - (b) Meet requirements of ASTM C1048, Kind FT, Condition A, Type I, Class I, Quality Q3.
- D. Storefront Glazing:
- 1. Thickness: 1/4 inch.
 - 2. Glazing shall have following characteristics:
 - a. Low-Emissivity (or Low E):
 - 1) Design Criteria:
 - (a) Clear.
 - (b) Insulated Glass: 1 inch units with 1/2 inch airspace and two (2) 1/4 inch lites.
 - (c) Meet requirements of ASTM C1036, Type I, Class I, Quality Q3.
 - (d) Location: Surface 2.
 - 2) Type Two Low-Emissivity (or Low E) Acceptable Product:
 - (a) Performance Standard:
 - (1) 64 percent Visible Light Transmission (VLT).
 - (2) 0.28 U-value winter.
 - (3) 0.26 U-value summer.
 - (4) 0.27 Solar Heat Gain Coefficient (SHGC).
 - (5) 0.32 Shading Coefficient.
 - (6) 12 percent Visible Light Reflectance.
 - (b) Quality Standard:
 - (1) Cardinal LoE³-366.
 - (2) Solarban 70 XL.
 - (3) Equal product by Acceptable Manufacturer as approved by Architect before bidding. See Section 01 6200.
 - 3) Acceptable Manufacturers:
 - (a) AGC.
 - (b) Guardian.
 - (c) Vitro Architectural Glass.
 - (d) Equal as approved by Architect before bidding. See Section 01 6200.
 - b. Obscure:
 - 1) Design Criteria:

- (a) Meet requirements of ASTM C1036, Type II, Class I, Form 3, Quality Q8, Pattern - #62.
 - c. Glazing Below Door Height:
 - 1) Design Criteria:
 - (a) Tempered.
 - (b) Meet requirements of ASTM C1048, Kind FT, Condition A, Type I, Class I, Quality Q3.
- E. Fabrication:
 - 1. Except where glass exceeds 66 inches in width, cut clear glass so any wave will run horizontally when glazed.
 - 2. Install muntins for exterior aluminum entries and aluminum windows between panes of insulating glazing units. No muntins on interior Vestibule storefront entries.
 - 3. Sealed, Insulating Glazing Units:
 - a. Double pane, sealed insulating glass units. Install at exterior windows and exterior aluminum-framed storefront.
 - b. Unit Thickness: 5/8 inch minimum, one inch (0.98 inch) maximum.
 - c. Insulated obscure units shall consist of one pane of specified obscure glass and one pane of standard glass.
 - d. Type Seal:
 - 1) Metal-to-glass bond and separated by 1/2 inch dehydrated air space.
 - 2) Use non-hardening sealants.
 - e. Category Four Approved Fabricators. See Section 01 6200 for definitions of Categories.
 - 1) Members of Sealed Insulating Glass Manufacturer's Association.

2.02 ACCESSORIES

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Glazing Tape: Butyl-based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation, complying with ASTM C1281 and AAMA 800 for application.

PART 3 EXECUTION: NOT USED

END OF SECTION

**SECTION 09 9001
COMMON PAINTING AND COATING REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Common procedures and requirements for field-applied painting and coating.
- B. Related Requirements:
 - 1. Section 05 0503: 'Shop-Applied Metal Coatings' for quality of shop priming of steel and iron.
 - 2. Section 07 9213: 'Elastomeric Joint Sealants' for quality of Elastomeric Joint Sealants.
 - 3. Sections under 09 9000 heading 'Paints and Coatings'.
 - a. Pre-Installation conferences held jointly with Section 09 9001.

1.02 REFERENCES

- A. Definitions:
 - 1. Damage Caused By Others: Damage caused by individuals other than those under direct control of Painting Applicator (MPI(a), PDCA P1.92).
 - 2. Gloss Levels:
 - a. Specified paint gloss level shall be defined as sheen rating of applied paint, in accordance with following terms and values, unless specified otherwise for a specific paint system.

Gloss Level '1'	Traditional matte finish - flat	0 to 5 units at 60 degrees to 10 units maximum at 85 degrees.
Gloss Level '2'	High side sheen flat - 'velvet-like' finish	10 units maximum at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '3'	Traditional 'eggshell-like' finish	10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '4'	'Satin-like' finish	20 to 35 units at 60 degrees and 35 units minimum at 85 degrees.
Gloss Level '5'	Traditional semi-gloss	35 to 70 units at 60 degrees.
Gloss Level '6'	Traditional gloss	70 to 85 units at 60 degrees.
Gloss Level "7"	High gloss	More than 85 units at 60 degrees.

- 3. Properly Painted Surface:
 - a. Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet minimum under normal lighting conditions and from normal viewing position (MPI(a), PDCA P1.92).
 - 4. Latent Damage: Damage or conditions beyond control of Painting Applicator caused by conditions not apparent at time of initial painting or coating work.
- B. Reference Standards:
 - 1. The latest edition of the following reference standard shall govern all painting work:
 - a. MPI(a), 'Architectural Painting Specification Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.
 - b. MPI(r), 'Maintenance Repainting Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 - 1. Schedule painting pre-installation conference after delivery of paint or coatings and before or at same time as application of field samples.
 - a. Coordinate pre-installation conferences of all related painting and coating Sections under 09 9000 heading 'Paints and Coatings'.
 - b. Schedule conference before preparation of control samples as specified in Sections under 09 9000 heading 'Paints and Coatings'.
 - 2. Review following:
 - a. Review Quality Assurance for Approval requirements.
 - b. Review Quality Assurance Field Sample requirements.
 - c. Review Submittal requirements for compliance for MPI Approved Products.
 - d. Review Design Criteria requirements.
 - e. Review Cleaning requirements.
 - f. Review painting schedule.
 - g. Review safety issues.
 - 3. Review additional agenda items from Sections under 09 9000 heading 'Paints and Coatings'.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Include following information for each painting product, arranged in same order as in Project Manual.
 - 1) Manufacturer's cut sheet for each product indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
 - 2) Provide one (1) copy of 'MPI Approved Products List' showing compliance for each MPI product specified.
 - (a) MPI Information is available from MPI Approved Products List using the following link: <http://www.paintinfo.com/mpi/approved/index.shtml>.
 - 3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.
 - 2. Samples: Provide two 4 inch by 6 inch (100 mm by 150 mm) minimum draw-down cards for each paint or coating color selected for this Project.
- B. Informational Submittals:
 - 1. Manufacturer Instructions:
 - a. Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
 - 2. Qualification Statement:
 - a. Applicator:
 - 1) Provide Qualification documentation if requested by Architect or Owner.
- C. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Manufacturer's documentation:
 - (a) Manufacturer's cut sheet for each component of each system.
 - (b) Schedule showing rooms and surfaces where each system was used.
- D. Maintenance Materials Submittals:
 - 1. Extra Stock Materials:
 - a. Provide painting materials in Manufacturer's original containers and with original labels in each color used. Label each can with color name, mixture instructions, date, and anticipated shelf life.

- b. Provide one (1) quart of each finish coat and one (1) pint of each primer and of each undercoat in each color used.

1.05 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approval:
 1. Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.
 2. Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
 3. Master Painters Institute (MPI) Standards:
 - a. Products: Comply with MPI standards indicated and listed in 'MPI Approved Products List'.
 - b. Preparation and Workmanship: Comply with requirements in 'MPI Architectural Painting Specification Manual' for products and coatings indicated.
- B. Qualifications:
 1. Applicator:
 - a. Minimum five (5) years' experience in painting installations.
 - b. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
 - c. Maintain qualified crew of painters throughout duration of the Work.
 - d. Upon request, submit documentation.
- C. Field Samples:
 1. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one (1) surface for application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.
 2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.
 3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 1. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container.
 2. Deliver amount of materials necessary to meet Project requirements in single shipment.
 3. Notify Architect two working days before delivery of coatings.
- B. Storage And Handling Requirements:
 1. Store materials in single place.
 2. Keep storage area clean and rectify any damage to area at completion of work of this Section.
 3. Maintain storage area at 55 degrees Fahrenheit minimum.

1.07 FIELD CONDITIONS

- A. Ambient Conditions:
 1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product for both interior and exterior work.
 2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted.
 - a. Inspection of painting work shall take place under same lighting conditions as application.

- b. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

PART 2 PRODUCTS

2.01 SYSTEMS

- A. Performance:
 - 1. Design Criteria:
 - a. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - b. All materials, preparation and workmanship shall conform to requirements of 'Architectural Painting Specification Manual' by Master Painters Institute (MPI).
 - c. All paint manufacturers and products used shall be as listed under Approved Product List section of MPI Painting Manual.
 - d. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
 - e. Where specified paint system does not have Premium Grade, provide Budget Grade.
 - f. Provide products of same manufacturer for each coat in coating system.
 - g. Where required to meet LEED (Leadership in Energy and Environmental Design) program requirements, use only MPI listed materials having an "L" rating designation.
 - h. Color Levels:
 - 1) Color Level II:
 - (a) Number and placement of interior and exterior paint colors and gloss levels shall be as defined by Color Level II from MPI Manual, PDCA P3-93 as modified in following paragraph.
 - (b) No more than one paint color or gloss level will be selected for same substrate within designated interior rooms or exterior areas.
- B. Materials:
 - 1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
 - 2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

PART 3 EXECUTION

3.01 APPLICATORS

- A. Approved Applicators:
 - 1. Meet Quality Assurance Applicator Qualifications as specified in Part 1 of this specification.

3.02 EXAMINATION

- A. Verification Of Conditions:
 - 1. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.
- B. Pre-Installation Testing:
 - 1. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems.
 - 2. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work.

3. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.
- C. Evaluation And Assessment:
 1. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.

3.03 PREPARATION

- A. Protection Of In-Place Conditions:
 1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
 - a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
 - b. Keep cones of ceiling speakers completely free of paint. In all cases where painting of metal speaker grilles is required, paint without grilles mounted to speakers and without grilles on ceiling.
 - c. On existing work where ceiling is to be painted, speakers and grilles are already installed, and ceiling color is not being changed, mask off metal grilles installed on ceiling speakers. If ceiling color is being changed, remove metal grilles and paint, and mask off ceiling speakers.
- B. Surface Preparation:
 1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
 2. Fill minor holes and cracks in wood surfaces to receive paint or stain.
 3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
 4. Do no exterior painting while surface is damp, unless recommended by Manufacturer, nor during rainy or frosty weather. Interior surfaces shall be dry before painting. Moisture content of materials to be painted shall be within tolerances acceptable to Paint Manufacturer.
 5. Sand woodwork smooth in direction of grain leaving no sanding marks. Clean surfaces before proceeding with stain or first coat application.

3.04 APPLICATION

- A. Interface With Other Work:
 1. Coordinate with other trades for materials and systems that require painting before installation.
 2. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.
- B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents.
- C. Apply sealant in gaps 3/16 inch and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9213.
- D. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.
- E. Touch up suction spots after application of first finish coat.
- F. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.
- G. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.

- H. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.
- I. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

3.05 FIELD QUALITY CONTROL

- A. Non-Conforming Work:
 - 1. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section.
 - 2. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.06 CLEANING

- A. General:
 - 1. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition.
- B. Waste Management:
 - 1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
 - 2. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be disposed of subject to regulations of applicable authorities having jurisdiction.
 - 3. Remove debris caused by work of paint Sections from premises and properly dispose.
 - 4. Retain cleaning water and filter out and properly dispose of sediments.

**SECTION 09 9113
EXTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.

1.02 DEFINITIONS

- A. Comply with ASTM D16 for interpretation of terms used in this section.

1.03 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- D. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 - 1. Schedule painting pre-installation conference after delivery of paint or coatings and before or at same time as application of field samples.
 - a. Coordinate pre-installation conferences of all related painting and coating Sections under 09 9000 heading 'Paints and Coatings'.
 - b. Schedule conference before preparation of control samples as specified in Sections under 09 9000 heading 'Paints and Coatings'.
 - c. Conference to be held at same time as Section 09 2116 to review gypsum board finish preparation.
 - 2. In addition to agenda items specified in Section 01 3000, review following:
 - a. Review Quality Assurance for Approval requirements.
 - b. Review Quality Assurance Field Sample requirements.
 - c. Review Submittal requirements for compliance for MPI Approved Products.
 - d. Review Design Criteria requirements.
 - e. Review Cleaning requirements.
 - f. Review painting schedule.
 - g. Review safety issues.
 - 3. Review additional agenda items from Sections under 09 9000 heading 'Paints and Coatings'.

1.05 SUBMITTALS

- A. Product Data: Provide complete list of 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 paint system(s) product is to be used in; include description of each system.
 - 4. Manufacturer's installation instructions.
 - 5. Confirmation of colors selected and that each area to be painted or coated has color selected for it.

- B. Samples: Submit two paper "draw down" samples, 4 x 6 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, submit each color in each sheen available.
- C. Closeout Submittals:
 - 1. Include following in Operations and Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Manufacturer's documentation:
 - (a) Manufacturer's cut sheet for each component of each system.
 - (b) Schedule showing rooms and surfaces where each system was used.

1.06 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience and minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
 - 1. Maintain qualified crew of painters throughout duration of the Work.
 - 2. Upon request, submit documentation.

1.07 MOCK-UPS

- A. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one (1) surface for application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.
- B. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.
- C. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

1.08 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 paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 55 degrees Fahrenheit and a maximum of 90 degrees Fahrenheit, in ventilated area, and as required by manufacturer's instructions.
- D. Deliver amount of materials necessary to meet Project requirements in single shipment.
- E. Notify Architect two working days before delivery of coatings.
- F. Store materials in single place.
- G. Keep storage area clean and rectify any damage to area at completion of work of this Section.
- H. Maintain storage area at 55 degrees Fahrenheit minimum.

1.09 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 50 degrees Fahrenheit for exterior; unless required otherwise by manufacturer's instructions.

- E. Provide lighting level of 540 Lux 50 ft candles measured mid-height at substrate surface.
 - 1. Inspection of painting work shall take place under same lighting conditions as application.
 - 2. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

PART 2 PRODUCTS

2.01 PERFORMANCE AND DESIGN CRITERIA

- A. Regulatory Agency Sustainability Approval:
 - 1. Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.
 - 2. Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
 - 3. Master Painters Institute (MPI) Standards:
 - a. Products: Comply with MPI standards indicated and listed in 'MPI Approved Products List'.
 - b. Preparation and Workmanship: Comply with requirements in 'MPI Architectural Painting Specification Manual' for products and coatings indicated.
- B. Performance:
 - 1. Design Criteria:
 - a. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - b. All materials, preparation and workmanship shall conform to requirements of 'Architectural Painting Specification Manual' by Master Painters Institute (MPI).
 - c. All paint manufacturers and products used shall be as listed under Approved Product List section of MPI Painting Manual.
 - d. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
 - e. Where specified paint system does not have Premium Grade, provide Budget Grade.
 - f. Provide products of same manufacturer for each coat in coating system.
 - g. Color Levels:
 - 1) Color Level II:
 - (a) Number and placement of interior and exterior paint colors and gloss levels shall be as defined by Color Level II from MPI Manual, PDCA P3-93 as modified in following paragraph.
 - (b) No more than one paint color or gloss level will be selected for same substrate within designated interior rooms or exterior areas.
 - 2) Color Level III:
 - (a) Number and placement of interior and exterior paint colors and gloss levels shall be Color Level III from MPI Manual, PDCA P3-93 as modified in following paragraph.
 - (b) Several paint colors or gloss levels will be selected for same substrate within designated interior rooms or exterior areas.
- C. Materials:
 - 1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
 - 2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

2.02 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Manufacturers: Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.
 - 1. New Surfaces: Use MPI(a) EXT 5.1M Waterborne Light Industrial Coating system.
 - 2. Previously Finished Surfaces: Use MPI(r) REX 5.1K Waterborne Light Industrial Coating.
- B. Exterior Ferrous Metal:
 - 1. Materials:
 - a. All paints and coatings.
 - 1) Primer Coat: MPI Product 107, 'Primer, Rust-Inhibitive, Water Based'.
 - 2) Finish Coats: MPI Product 163, 'Light Industrial Coating, Exterior, Water Based, Semi-Gloss (MPI Gloss Level 5)'.
 - b. Traffic signage:
 - 1) Primer Coat: MPI Product 107, 'Primer, Rust-Inhibitive, Water Based'.
 - 2) Finish Coats: MPI Product 163, 'Light Industrial Coating, Exterior, Water Based, Semi-Gloss (MPI Gloss Level 5)'.
 - 2. Design Criteria:
 - a. Systems specified are in addition to prime coats provided under other Sections of Project Manual.
 - b. Finish Requirements: Use MPI Premium Grade finish requirements for work of this Section.
 - c. Gloss / Sheen Level Required: Gloss Level 5.
- C. Exterior Galvanized Metal:
 - 1. Materials:
 - a. Polyurethane:
 - 1) Vinyl Wash Primer Coat: MPI Product 80: 'Primer, Vinyl Wash'.
 - 2) Finish Coats:
 - (a) Epoxy MPI Product 101: 'Primer, Epoxy, Anti-Corrosive, for Metal'.
 - (b) Polyurethane MPI Product 72: 'Polyurethane, Two-Component, Pigmented, Gloss (MPI Gloss Level 6-7)'.
 - b. Latex:
 - 1) Waterborne Primer Coat: MPI Product 134: 'Primer, Galvanized, Water Based'.
 - 2) Finish Coats: MPI Product 11: 'Latex, Exterior Semi-Gloss (MPI Gloss Level 5)'.
 - 2. Handrails And Exposed Miscellaneous Structural Steel:
 - a. New Surfaces: Use MPI(a) EXT 5.3D Pigmented Polyurethane Finish system.
 - b. Previously Finished Work: Use MPI(r) REX 5.3D Pigmented Polyurethane Finish system.
 - 3. All Other:
 - a. New Surfaces: Use MPI(a) EXT 5.3H Latex Finish system.
 - b. Previously Finished Surfaces: Use MPI(r) REX 5.3H Latex Finish system.
- D. Exterior CMU, Concrete and Stucco:
 - 1. Materials:
 - a. Block Filler, New CMU Only: MPI Product 4: 'Block Filler, Latex, Interior/Exterior'.
 - b. Finish Coats: MPI Product 10: 'Latex, Exterior Flat (MPI Gloss Level 1-2)'.
 - c. Accent Stripe: MPI Product 164: 'Light Industrial Coating, Exterior, Water Based, Gloss (MPI Gloss Level 6)'.
 - 2. Performance:
 - a. Finish Requirements:

- 1) New Surfaces: MPI Premium Grade finish requirements.
- 2) Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
- 3) Sound Existing Surfaces: MPI Custom Grade finish requirements.
- 4) Gloss / Sheen Level Required: Gloss Level 1.
- b. Concrete:
 - 1) New Surfaces: Use MPI(a) EXT 3.1A Latex Finish system.
 - 2) Previously Finished Surfaces: Use MPI(r) REX 3.1A Latex Finish system.
- c. Stucco:
 - 1) New Surfaces: Use MPI(a) EXT 3.1A Latex Finish system.
 - 2) Previously Finished Surfaces: Use MPI(r) REX 3.1A Latex Finish system.
- d. CMU:
 - 1) New Surfaces: Use MPI(a) EXT 4.2A Latex Finish system.
 - 2) Previously Finished Surfaces: Use MPI(r) REX 4.2A Latex Finish system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Protection Of In-Place Conditions:
 1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
 - a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
- B. Do not begin application of paints and finishes until substrates have been properly prepared.
- C. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- 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. Test shop-applied primer for compatibility with subsequent cover materials.
- G. Verification of Conditions:
 1. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.
- H. Pre-Installation Testing:
 1. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems.
 2. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work.
 3. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.
- I. Evaluation And Assessment:
 1. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.
- J. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Exterior Plaster and Stucco: 12 percent.
 2. Fiber Cement Siding: 12 percent.
 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

- A. Protection of In-Place Conditions:
 1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
 - a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
- B. Surface Preparation:
 1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
 2. Fill minor holes and cracks in wood surfaces to receive paint or stain.
 3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
 4. Do no exterior painting while surface is damp, unless recommended by Manufacturer, nor during rainy or frosty weather. Interior surfaces shall be dry before painting. Moisture content of materials to be painted shall be within tolerances acceptable to Paint Manufacturer.
 5. Sand woodwork smooth in direction of grain leaving no sanding marks. Clean surfaces before proceeding with stain or first coat application.
- C. Clean surfaces thoroughly and correct defects prior to application.
- D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- E. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- F. Seal surfaces that might cause bleed through or staining of topcoat.

3.03 APPLICATION

- A. Interface with Other Work:
 1. Coordinate with other trades for materials and systems that require painting before installation.
 2. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.
- B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents, including but not limited to following items.
- C. Apply sealant in gaps 3/16 inch and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9200.
- D. On wood to receive a transparent finish, putty nail holes in wood after application of stain using natural colored type to match wood stain color. Bring putty flush with adjoining surfaces.
- E. In multiple coat paint work, tint each succeeding coat with slightly lighter color, but approximating shade of final coat, so it is possible to check application of specified number of coats. Tint final coat to required color.
- F. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.
- G. Touch up suction spots after application of first finish coat.
- H. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.
- I. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.

- J. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.
- K. Finished work shall be a 'Properly Painted Surface' as defined in this Section.
- L. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- M. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
- N. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- O. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- P. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- Q. Apply each coat to uniform appearance.
- R. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.
- S. Exterior Ferrous Metal:
 - 1. New Surfaces: Clean metal to be painted of rust, mill scale, grease, oil, and welding spatters, burrs, flux, slag, and fume. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying primer coat.
 - 2. Existing Painted Surfaces:
 - a. Remove deteriorated and chalked existing paint and rust down to sound substrate by scraping or power tools.
 - b. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying primer coat.
 - c. Spot prime bare metal surfaces followed by a prime coat over entire surface to be painted.
 - d. Lightly sand entire surface.
 - e. Clean surface as recommended by Paint Manufacturer.
 - f. Apply specified finish coats.
- T. Exterior Galvanized Metal:
 - 1. New Surfaces:
 - a. Clean 'passivated' or 'stabilized' galvanized steel as specified in SSPC-SP 1.
 - b. After removal of 'passivated' or 'stabilized' coating or for surfaces without coating, clean surfaces to be painted with mineral spirits or product recommended by Paint Manufacturer. Change to clean rags or wiping cloths regularly to reduce possibility of re-contamination of surface.
 - c. Apply prime coat.
 - d. Apply finish coats.
 - 2. Existing Painted Surfaces:
 - a. Remove deteriorated and chalked existing paint and rust deposits down to sound substrate by sanding, scraping, or wire brushing.
 - b. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer.
 - c. Apply prime coat.
 - d. Apply finish coats.
 - 3. Existing Unpainted Surfaces:
 - a. Wire brush or power wash as necessary to remove 'white rust'.
 - b. Apply prime coat.
 - c. Apply finish coats.

- U. Exterior CMU, Concrete, Stucco
 - 1. New Surfaces:
 - a. On highly porous surfaces when weather is exceptionally hot and dry, it may be desirable to dampen surface before applying first coat of an emulsion paint.
 - b. Completely cover voids in masonry block.
 - c. Roll after spraying if necessary to eliminate pinholing.
 - 2. Existing Unpainted Surfaces:
 - a. Power wash surfaces to be painted.
 - b. Fill cracks with masonry crack filler.
 - c. Apply block filler and finish coat as required for new work.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.
- C. Non-Conforming Work:
 - 1. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section.
 - 2. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition.
- C. Waste Management:
 - 1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
 - 2. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be disposed of subject to regulations of applicable authorities having jurisdiction.
 - 3. Remove debris caused by work of paint Sections from premises and properly dispose.
 - 4. Retain cleaning water and filter out and properly dispose of sediments.

3.06 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

3.07 SCHEDULE OF PAINT COLORS

- A. Exterior:
 - 1. Color Quality Standards. See Section 01 6000:
 - a. Exterior Metal
 - b. Exterior CMU, Concrete
 - c. Exterior Stucco
 - d. Exterior Wood

**SECTION 31 0501
COMMON EARTHWORK REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited to:
 - 1. General procedures and requirements for earthwork.
- B. Related Requirements:
 - 1. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 - 2. Pre-Installation conferences held jointly with Section 31 0501 as described in Administrative Requirements on Part 1 of this specification section:
 - 3. Section 32 9001: 'Common Planting Requirements':
 - a. Pre-installation conference held jointly with other landscape related sections.

1.02 REFERENCES

- A. Definitions:
 - 1. Aggregate Base: Layer of granular material immediately below concrete and asphalt paving or miscellaneous site concrete (sidewalks, curbs, etc) and below interior concrete slabs on grade.
 - 2. Base: See aggregate base.
 - 3. Building Grading: sloping of grounds immediately adjacent to building. Proper grading causes water to flow away from a structure. Grading can be accomplished either with machinery or by hand.
 - 4. Compacted Fill: Placement of soils on building site placed and compacted per Contract Documents. Used to replace soils removed during excavation or to fill in low spot on building site.
 - 5. Excavation: Removal of soil from project site or cavity formed by cutting, digging or scooping on project site.
 - 6. Fine Grading (FG): Preparation of subgrade preceding placement of surfacing materials (aggregate base, asphalt or concrete paving, and topsoil) for contour of building site required. Fine Grading is conducted to ensure that earth forms and surfaces have been properly shaped and subgrade has been brought to correct elevations. It is performed after rough grading and placement of compacted fill but before placement of aggregate base or topsoil.
 - 7. Finish Grading: Completed surface elevation of landscaping areas for seeding, sodding, and planting on building site.
 - 8. Natural Grade: Undisturbed natural surface of ground.
 - 9. Rough Grading (RG): Grading, leveling, moving, removal and placement of existing or imported soil to its generally required location and elevation. Cut and fill is part of rough grading.
 - 10. Subgrade (definition varies depending upon stage of construction and context of work being performed):
 - a. Prepared natural soils on which fill, aggregate base, or topsoil is placed.
 - or
 - b. Prepared soils immediately beneath paving or topsoil.
 - 11. Topsoil Placement and Grading: Topsoil placement and finish grading work required to prepare site for installation of landscaping.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in MANDATORY pre-installation conference for common earthwork sections:
 - a. Schedule conference after completion of site clearing but before beginning grading work.
 - b. Participate in pre-installation conference held jointly with following sections:

- 1) Section 03 3111: 'Cast-In-Place Structural Concrete'.
- 2) Section 03 3713: 'Shotcrete'.
- 3) Section 31 1100: 'Clearing and Grubbing'.
- 4) Section 31 1123: 'Aggregate Base'.
- 5) Section 31 1413: 'Topsoil Stripping and Stockpiling'.
- 6) Section 31 2213: 'Rough Grading'.
- 7) Section 31 2216: 'Fine Grading'.
- 8) Section 31 2316: 'Excavation'.
- 9) Section 31 2323: 'Fill'.
- 10) Section 32 1216: 'Asphalt Paving'.
- 11) Section 32 1313: 'Concrete Paving'.
- 12) Section 32 1214: 'Pervious Concrete'.
- 13) Section 32 3213: 'Cast-In-Place Concrete Retaining Walls'.
- 14) Section 33 3313: 'Sanitary Utility Sewerage'.
- c. In addition to agenda items specified in Section 01 3100, review following:
 - 1) Review Geotechnical Evaluation Report.
 - 2) Review common earthwork schedule.
 - 3) Review protection requirements.
 - 4) Review cleaning requirements.
 - 5) Review safety issues.
 - 6) Review field tests and inspections requirements.
- d. In addition to agenda items specified above, review following. These are items that will occur before pre-installation conference for landscape sections:
 - 1) Review clearing and grubbing requirements.
 - 2) Review topsoil stripping and stockpiling requirements.
 - 3) Review landscape grading requirements.
 - 4) Review landscape finish grade tolerance requirements.
 - 5) Review landscape and plant tolerances.
 - 6) Review surface preparation of landscape and planting areas.
 - 7) Review additional agenda items as specified in related sections listed above.
2. Participate in pre-installation conference for landscape sections as specified in Section 32 9001:
 - a. Schedule pre-installation conference after completion of Fine Grading specified in Section 31 2216, but one (1) week minimum before beginning landscape work and held jointly with following sections:
 - 1) Section 32 8423: 'Underground Sprinklers'.
 - 2) Section 32 9120: 'Topsoil And Placement'.
 - 3) Section 32 9121: 'Topsoil Physical Preparation' (section included based on Topsoil Testing Report).
 - 4) Section 32 9122: 'Topsoil Grading'.
 - 5) Section 32 9219: 'Seeding'.
 - 6) Section 32 9222: 'Hydro-Seeding'.
 - 7) Section 32 9223: 'Sodding'.
 - 8) Section 32 9300: 'Plants'.
 - b. In addition to agenda items specified in Section 01 3100 and Section 32 9001, review following that these items have been installed correctly:
 - 1) Review topsoil placement requirements.
 - 2) Review topsoil surface preparation requirements.
 - 3) Review topsoil depth requirements.
 - 4) Review landscape finish grade tolerance requirements.
 - 5) Review surface preparation of landscape and planting areas.

B. Sequencing:

1. General Earthwork:
 - a. Excavation.
 - b. Rough Grading.
 - c. Fill.
 - d. Fine Grading.
 - e. Aggregate Base or Topsoil Grading.

1.04 QUALITY ASSURANCE

- A. Testing And Inspection:
 1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
 - a. Owner will employ testing agencies to perform testing and inspection as specified in Field Quality Control in Part 3 of this specification:
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
 - 2) See Section 01 1200: 'Multiple Contract Summary'.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification Of Conditions:
 1. Forty-eight (48) hours minimum before performing any work on site, contact **Blue Stakes** to arrange for utility location services.
 2. Perform minor, investigative excavations to verify location of various existing underground facilities at sufficient locations to assure that no conflict with the proposed work exists and sufficient clearance is available to avoid damage to existing facilities.
 3. Perform investigative excavating ten (10) days minimum in advance of performing any excavation or underground work.
 4. Upon discovery of conflicts or problems with existing facilities, notify Architect by phone or fax within twenty-four (24) hours. Follow telephone or fax notification with letter and diagrams indicating conflict or problem and sufficient measurements and details to evaluate problem.

3.02 PREPARATION

- A. Protection:
 1. Spillage:
 - a. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways.
 - b. Remove spillage and sweep, wash, or otherwise clean project, streets, and highways.
 2. Dust Control:
 - a. Take precautions necessary to prevent dust nuisance, both on-site and adjacent to public and private properties.
 - b. Correct or repair damage caused by dust.
 3. Existing Plants And Features:
 - a. Do not damage tops, trunks, and roots of existing trees and shrubs on site that are intended to remain.
 - b. Do not use heavy equipment within branch spread.
 - c. Interfering branches may be removed only with permission of Architect.
 - d. Do not damage other plants and features that are to remain.

3.03 REPAIR / RESTORATION

- A. Adjust existing covers, boxes, and vaults to grade.

- B. Replace broken or damaged covers, boxes, and vaults.
- C. Independently confirm size, location, and number of covers, boxes, and vaults that require adjustment.

3.04 FIELD QUALITY CONTROL

- A. Field Tests And Inspections:
 - 1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
 - a. Quality Control is sole responsibility of Contractor. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform The Work or Contractor's own Testing and Inspection services.
 - 2. Testing and inspection of earthwork operations is required.
 - 3. Field Tests and Laboratory Tests:
 - a. Owner reserves right to require additional testing to re-affirm suitability of completed work including compacted soils that have been exposed to adverse weather conditions.
 - 4. Field Inspections:
 - a. Notify Architect forty-eight (48) hours before performing excavation or fill work.
 - b. If weather, scheduling, or any other circumstance has interrupted work, notify Architect twenty-four (24) hours minimum before intended resumption of grading or compacting.
- B. Non-Conforming Work:
 - 1. If specified protection precautions are not taken or corrections and repairs not made promptly, Owner may take such steps as may be deemed necessary and deduct costs of such from monies due to Contractor. Such action or lack of action on Owner's part does not relieve Contractor from responsibility for proper protection of The Work.

SECTION 31 2213 ROUGH GRADING

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Perform rough grading work required to prepare site for construction as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 01 3100: 'Project Management and Coordination' for pre-installation conference.
 - 2. Section 03 3053: Miscellaneous Exterior Cast-In-Place Concrete.
 - 3. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 - 4. Section 31 1123: 'Aggregate Base' for aggregate base requirements.
 - 5. Section 31 1413: 'Topsoil Stripping And Stockpiling' for stripping and storing of existing topsoil.
 - 6. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 - 7. Section 31 2316: 'Excavation'.
 - 8. Section 31 2323: 'Fill' for compaction procedures and tolerances for base.
 - 9. Section 32 1216: 'Asphalt Paving'.
 - 10. Section 32 9122: 'Topsoil Grading' for preparation of topsoil and addition of amendments prior to landscaping.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in MANDATORY pre-installation conference as specified in Section 31 0501:
 - 2. In addition to agenda items specified in Section 01 3100 and Section 31 0501, review following:
 - a. Identify benchmark to be used in establishing grades and review Contract Document requirements for grades, fill materials, and topsoil.
 - b. Examine site to pre-plan procedures for making cuts, placing fills, and other necessary work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials used for fill shall be as specified for backfill in Section 31 2323 'Fill'.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification Of Conditions:
 - 1. Verify elevations of rough grading are correct before compacted fill, fine grading, aggregate base or landscape grading are placed.

3.02 PREPARATION

- A. Protection Of In-Place Conditions:
 - 1. When existing grade around existing plants to remain is higher than new finish grade, perform regrading by hand.
 - 2. Do not expose or damage shrub or tree roots.
- B. Surface Preparation:

1. Before making cuts, remove topsoil over areas to be cut and filled that were not previously removed by stripping specified in Section 31 1413 'Topsoil Stripping And Stockpiling'. Stockpile this additional topsoil with previously stripped topsoil.

3.03 PERFORMANCE

- A. Subgrade (Natural Soils):
 1. Subgrade beneath compacted fill or aggregate base under asphalt or concrete paving shall be constructed smooth and even.
- B. Special Techniques:
 1. Compact fills as specified in Section 31 2323 'Fill'.
 2. If soft spots, water, or other unusual and unforeseen conditions affecting grading requirements are encountered, stop work and notify Architect.
- C. Tolerances:
 1. Maximum variation from required grades shall be 1/10 of one foot 1.1 inch.

SECTION 31 2216 FINE GRADING

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Perform fine grading of subgrade work required to prepare site for paving finish grading and for placement of topsoil as described in Contract Documents.
 - 2. Asphalt Paving:
 - a. Prepare natural soil subgrade as described in Section 31 2213 'Rough Grading' or prepare fill subgrade as described in this specification section for asphalt paving.
- B. Related Requirements:
 - 1. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 - 2. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 3. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 - 4. Section 31 1123: 'Aggregate Base' for aggregate base requirements.
 - 5. Section 31 1413: 'Topsoil Stripping And Stockpiling' for stripping and storing of existing topsoil.
 - 6. Section 31 2213: 'Rough Grading' for grading and preparation of natural soil subgrades below fill and aggregate base materials.
 - 7. Section 31 2316: 'Excavation'.
 - 8. Section 31 2323: 'Fill' for compaction procedures and tolerances for base.
 - 9. Section 32 1216: 'Asphalt Paving' for finish grading for asphalt paving.
 - 10. Section 32 9120: 'Topsoil And Placement' for topsoil evaluation and placement required for topsoil grading.
 - 11. Section 32 9121: 'Topsoil Physical Preparation' for physical preparation of topsoil (section included based on Topsoil Testing Report).
 - 12. Section 32 9122: 'Topsoil Grading' for preparation of topsoil and addition of amendments prior to landscaping.
- C. Related Requirements:
 - 1. Section 01 0000: 'General Requirements':
 - a. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 - b. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 2. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 - c. Pre-installation conference held jointly with other common planting related sections.
 - 3. Section 31 1123: 'Aggregate Base' for aggregate base requirements.
 - 4. Section 31 1413: 'Topsoil Stripping And Stockpiling' for stripping and storing of existing topsoil.
 - 5. Section 31 2213: 'Rough Grading' for grading and preparation of natural soil subgrades below fill and aggregate base materials.
 - 6. Section 31 2316: 'Excavation'.
 - 7. Section 31 2323: 'Fill' for compaction procedures and tolerances for base.
 - 8. Section 32 1216: 'Asphalt Paving' for finish grading for asphalt paving.
 - 9. Section 32 9001: 'Common Planting Requirements'.
 - 10. Section 32 9120: 'Topsoil And Placement' for topsoil evaluation and placement required for topsoil grading.

11. Section 32 9121: 'Topsoil Physical Preparation' for physical preparation of topsoil (section included based on Topsoil Testing Report).
12. Section 32 9122: 'Topsoil Grading' for preparation of topsoil and addition of amendments prior to landscaping.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 1. Participate in MANDATORY pre-installation conference as specified in Section 31 0501 and Section 32 9001.
 2. In addition to agenda items specified in Section 01 3100 and Section 31 0501, review following:
 - a. Review backfill requirements.
 - b. Review geotechnical report.
 - c. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
 - 1) Review requirements and frequency of testing and inspections.
- B. Scheduling:
 1. Notify Testing Agency and Architect twenty-four (24) hours minimum before installation of fill / engineered fill to allow inspection.
 2. Allow special inspector to review all subgrades and excavations to determine if site has been prepared in accordance with geotechnical report prior to placing any fill, aggregate base or concrete.
 3. Allow inspection and testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after inspections and test results for previously compacted work comply with requirements.

1.03 SUBMITTALS

- A. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Testing and Inspection Reports:
 - (a) Testing Agency Testing and Inspecting Reports of fill / engineered fill.

1.04 QUALITY ASSURANCE

- A. Testing And Inspection:
 1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
 2. Owner will provide Testing and Inspection for fill / engineering fill:
 - a. Owner will employ testing agencies to perform testing and inspection for fill / engineering fill as specified in Field Quality Control in Part 3 of this specification.
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
 - 2) See Section 01 1200: 'Multiple Contract Summary'.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Protection Of In-Place Conditions: Protect utilities and site elements from damage.
- B. General:
 1. Limit use of heavy equipment to areas no closer than 6 feet from building or other permanent structures.

- C. Surface Preparation:
 - 1. Landscaping and Planting Areas:
 - a. Before grading, dig out weeds from planting areas by their roots and remove from site. Remove rocks larger than 1-1/2 inches in size and foreign matter such as building rubble, wire, cans, sticks, concrete, etc.
 - b. Remove imported paving base material present in planting areas down to natural subgrade or other material acceptable to Architect.
 - 2. Asphalt Paving:
 - a. Survey and stake parking surfaces to show grading required by Contract Documents.
 - b. Subgrade (material immediately below aggregate base):
 - 1) Compact subgrade as specified in Section 31 2213 (natural soils) and Section 31 2323 (fill).
 - 2) Subgrade to be constructed smooth and even.

3.02 PERFORMANCE

- A. Interface With Other Work: Do not commence work of this Section until grading tolerances specified in Section 31 2213 are met.
- B. General:
 - 1. Do not expose or damage existing shrub or tree roots.
- C. Tolerances:
 - 1. Site Tolerances:
 - a. Subgrade (material immediately below aggregate base):
 - 1) 0.00 inches high.
 - 2) Measure using string line from curb to curb, gutter, flat drainage structure, or grade break.
 - b. Maximum variation from required grades shall be 1/10 of one foot 1.1 inch.
 - 2. Aggregate Base (Asphalt Paving) Tolerances:
 - a. Aggregate base shall be 6 inches thick minimum after compaction, except where shown thicker on Drawings.
 - b. Measure using string line from curb to curb, gutter, flat drainage structure, or grade break.
 - 3. Slope grade away from building as specified in Section 32 9120.

3.03 FIELD QUALITY CONTROL

- A. Field Tests And Inspections:
 - 1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
 - a. Quality Control is sole responsibility of Contractor:
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
 - (a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
 - 2. Site Preparation:
 - a. Prior to placement of fill / engineered fill, inspector shall determine that site has been prepared in accordance with geotechnical report.
 - b. Footing subgrade: At footing subgrades, Certified Inspector is to verify that soils conform to geotechnical report.
 - 3. Fill / Engineered Fill:
 - a. Testing Agency shall provide testing and inspection for fine grading.
 - b. Number of tests may vary at discretion of Architect.
 - c. Testing Agency is to provide one (1) moisture-maximum density relationship test for each type of fill material.

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SECTION 31 2316 EXCAVATION

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Perform Project excavating and trenching as described in Contract Documents, except as specified below.
 - 2. Procedure and quality for excavating and trenching performed on Project under other Sections unless specifically specified otherwise.
- B. Related Requirements:
 - 1. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 - 2. Section 31 1123: 'Aggregate Base'.
 - 3. Section 31 2213: 'Rough Grading' for rough grading and preparation of natural soil subgrades below fill and aggregate base materials.
 - 4. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 - 5. Section 31 2323: 'Fill' for compaction procedures and tolerances for base.
 - 6. Performance of excavating inside and outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in MANDATORY pre-installation conference as specified in Section 31 0501:
 - 2. In addition to agenda items specified in Section 01 3100 and Section 31 0501, review following:
 - a. Review protection of existing utilities requirements.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification Of Conditions:
 - 1. Carefully examine site and available information to determine type soil to be encountered.
 - 2. Discuss problems with Architect before proceeding with work.

3.02 PREPARATION

- A. Protection of Existing Utilities:
 - 1. Protect existing utilities identified in Contract Documents during excavation.
 - 2. If existing utility lines not identified in Contract Documents are encountered, contact Architect before proceeding.

3.03 PERFORMANCE

- A. Interface With Other Work:
 - 1. Section 31 2213: 'Rough Grading' for rough grading and preparation of natural soil subgrades below fill and aggregate base materials.
 - 2. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
- B. Excavation:
 - 1. Utility Trenches:

- a. Unless otherwise indicated, excavation shall be open cut. Short sections of trench may be tunneled if pipe or duct can be safely and properly installed and backfill can be properly tamped in tunnel sections and if approved by Architect.
 - b. Excavate to proper alignment, depth, and grade. Excavate to sufficient width to allow adequate space for proper installation and inspection of utility piping.
 - c. If trenches are excavated deeper than required, backfill until trench bottom is proper depth with properly compacted native material.
 - d. Pipe 4 Inches 3.94 inch In Diameter Or Larger:
 - 1) Grade bottom of trenches to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along its length.
 - 2) Except where rock is encountered, take care not to excavate below depths indicated.
 - (a) Where rock excavations are required, excavate rock with minimum over-depth of 4 inches below required trench depths.
 - (b) Backfill over-depths in rock excavation and unauthorized over-depths with loose, granular, moist earth, thoroughly compacted.
 - 3) Whenever wet or unstable soil incapable of properly supporting pipe, as determined by Architect, occurs in bottom of trench, remove soil to depth required and backfill trench to proper grade with coarse sand, fine gravel, or other suitable material acceptable to Architect.
2. If unusual excavating conditions are encountered, stop work and notify Architect.

3.04 REPAIR / RESTORATION

- A. Repair damage to other portions of the Work resulting from work of this Section at no additional cost to Owner. On new work, arrange for damage to be repaired by original installer.

3.05 CLEANING

- A. Debris and material not necessary for Project are property of Contractor and are to be removed before completion of Project. However, if material necessary for Project is hauled away, replace with specified fill / backfill material.

**SECTION 31 2323
FILL**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012 (Reapproved 2021).
- B. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2024.
- C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)); 2012 (Reapproved 2021).
- D. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017 (Reapproved 2025).
- E. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2023.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Perform Project backfilling and compacting as described in Contract Documents, except as specified below.
 - 2. Procedure and quality for backfilling and compacting performed on Project under other Sections unless specifically specified otherwise.
- B. Related Requirements:
 - 1. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 - 2. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 3. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 - 4. Section 31 1123: 'Aggregate Base' for aggregate base requirements.
 - 5. Section 31 2213: 'Rough Grading' for grading and preparation of natural soil subgrades below fill and aggregate base materials.
 - 6. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 - 7. Section 31 2316: 'Excavation'.
 - 8. Division 32: Compaction of subgrade under walks and paving.
 - 9. Performance of backfilling and compacting inside and outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.
- C. Related Requirements:
 - 1. Section 01 0000: 'General Requirements':
 - a. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 - b. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 - 2. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 - 3. Section 31 1123: 'Aggregate Base' for aggregate base requirements.
 - 4. Section 31 1413: 'Topsoil Stripping And Stockpiling' for stripping and storing of existing topsoil.
 - 5. Section 31 2213: 'Rough Grading' for grading and preparation of natural soil subgrades below fill and aggregate base materials.

6. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
7. Section 31 2316: 'Excavation'.
8. Division 32: Compaction of subgrade under walks and paving.
9. Performance of backfilling and compacting inside and outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.

1.03 REFERENCES

- A. Reference Standards:
 1. ASTM International (Following are specifically referenced for fill and aggregate base testing):
 - a. ASTM D698-12, 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))'.
 - b. ASTM D1556/D1556M-15, 'Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method'.
 - c. ASTM D1557-12, 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))'.
 - d. ASTM D2167-15, 'Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method'.
 - e. ASTM D2487-17, 'Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)'.
 - f. ASTM D6938-17a, 'Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)'.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 1. Participate in MANDATORY pre-installation conference as specified in Section 31 0501.
- B. Sequencing:
 1. Do not backfill against bituminous dampproofing to exterior of foundation walls for twenty-four (24) hours after application of dampproofing.
 2. Before backfilling, show utility and service lines being covered on record set of Drawings. Do not backfill until utilities involved have been tested and approved by Architect and until instructed by Architect.
- C. Scheduling:
 1. Notify Testing Agency and Architect seventy-two (72) hours minimum before installation of fill / engineered fill to perform proctor and plasticity index tests on proposed fill or subgrade.
 2. Notify Testing Agency and Architect twenty-four (24) hours minimum before installation of fill / engineered fill to allow inspection.
 3. Allow special inspector to review all subgrades and excavations to determine if site has been prepared in accordance with geotechnical report prior to placing any fill (or concrete).
 4. Allow inspection and testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after inspections and test results for previously compacted work comply with requirements.

1.05 SUBMITTALS

- A. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Testing and Inspection Reports:
 - (a) Testing Agency Testing and Inspecting Reports of fill / engineered fill.

1.06 QUALITY ASSURANCE

- A. Testing and Inspection:
 - 1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
 - 2. Owner will provide Testing and Inspection for fill / engineering fill:
 - a. Owner will employ testing agencies to perform testing and inspection for fill / engineering fill as specified in Field Quality Control in Part 3 of this specification.
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
 - 2) See Section 01 1200: 'Multiple Contract Summary'.

1.07 FIELD CONDITIONS

- A. Ambient Conditions:
 - 1. Do not perform work during unfavorable conditions as specified below:
 - a. Aggregate Base:
 - 1) Presence of free surface water.
 - 2) Over-saturated sub base materials.
 - b. Geomembrane
 - 1) Follow Manufacturers written recommendations for installation of membrane.
 - c. Geotextile:
 - 1) Follow Manufacturers written recommendations for installation of membrane.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Site Material:
 - 1. Existing excavated material on site is suitable for use as fill and backfill to meet Project requirements.
- B. Imported Fill / Backfill:
 - 1. Well graded material conforming to ASTM D2487 free from debris, organic material, frozen materials, brick, lime, concrete, and other material which would prevent adequate performance of backfill.
 - a. Under Landscaped Areas:
 - 1) Fill more than 36 inches below finish grade shall comply with soil classification groups GW, CL, GP, GM, SW, SP, or SM. Fill may not contain stones over 6 inches diameter and ninety (90) percent minimum of fill shall be smaller than 1-1/2 inch in any direction.
 - 2) Fill less than 36 inches below finish grade shall comply with soil classification groups SW, SP, SM, or SC. Fill may not contain stones larger than 1-1/2 inches in any direction and ninety (90) percent minimum of fill shall be smaller than 3/8 inch in any direction.
- C. Engineered Fill:

PART 3 EXECUTION

3.01 PREPARATION

- A. Before placing fill, aggregate base, or finish work, prepare existing subgrade as follows:
 - 1. Do not place fill or aggregate base over frozen subgrade.
 - 2. Landscape Areas:
 - a. Compact subgrade to eighty-five (85) percent relative compaction.

3.02 PERFORMANCE

- A. Interface With Other Work:
 - 1. Section 31 2213: 'Rough Grading' for rough grading and preparation of natural soil subgrades below fill and aggregate base materials.

2. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 3. Section 31 2324: 'Flowable Fill' for backfilling of piping systems and other utilities under paving'.
- B. Fill / Backfill:
1. General:
 - a. Around Buildings And Structures: Slope grade away from building as specified in Section 31 2216. Hand backfill when close to building or where damage to building might result.
 - b. Site Utilities:
 - 1) In Landscape Areas: Use backfill consisting of on-site soil.
 - 2) Under Pavement and Concrete Site Elements: Extend excavatable flowable fill / backfill to elevation of subgrade. Do not place aggregate base material until excavatable flowable fill / backfill has cured seventy-two (72) hours.
 - c. Do not use puddling or jetting to consolidate fill areas.
 2. Compacting:
 - a. Fill / Backfill And Aggregate Base:
 - 1) All fill material shall be well-graded granular material with maximum size less than 3 inch and with not more than fifteen (15) percent passing No. 200 sieve.
 - 2) Utility Trenches:
 - (a) Site:
 - (1) Place fill in 12 inch layers and moisture condition to plus or minus two (2) percent of optimum moisture content.
 - (2) Compact fill to ninety-five (95) percent minimum relative compaction to within 12 inches of finish grade.
 - (3) Compact fill above 12 inches to eighty-five (85) percent relative compaction.
 - (b) Under Slabs:
 - (1) Under Slabs: Place fill in 6 inch layers, moisture condition to plus or minus two (2) percent of optimum moisture content, and compact to ninety five (95) percent minimum relative compaction to within 4 inches of finish grade.
 - (2) Final 4 inches of fill shall be aggregate base as specified in Section 31 1123.
 - 3) Fill Slopes: Compact by rolling or using sheepsfoot roller.
 - 4) Backfill Under Footings if required by Geotechnical Evaluation Report.
 - 5) Landscape Areas:
 - (a) Compact fill to eighty-five (85) percent minimum relative compaction.
 - 6) Other Backfills: Place other fills in 12 inch layers and compact to ninety five (95) percent relative compaction.
 - 7) Loose material from compacted subgrade surface shall be immediately removed before placing compacted fill or aggregate base course.
 - b. Engineered Fill:

3.03 REPAIR / RESTORATION

- A. Repair damage to other portions of the Work resulting from work of this Section at no additional cost to Owner. On new work, arrange for damage to be repaired by original installer.

3.04 FIELD QUALITY CONTROL

- A. Field Tests and Inspections:
 1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
 - a. Quality Control is sole responsibility of Contractor:

- 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
 - (a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
2. Fill / Engineered Fill:
 - a. Testing Agency shall provide testing and inspection for fill.
 - b. Number of tests may vary at discretion of Architect.
 - c. Testing Agency is to provide one (1) moisture-maximum density relationship test for each type of fill material.
 - d. Prior to placement of engineered fill, inspector shall determine that site has been prepared in accordance with geotechnical report.
 - e. Footing subgrade: At footing subgrades Certified Inspector is to verify that soils conform to geotechnical report.
 - f. Testing Agency will test compaction of soils according to ASTM D1556/D1556M, ASTM D2167, and ASTM D6938, as applicable. Lift thicknesses shall comply with geotechnical report. Inspector shall determine that in-place dry density of engineered fill material complies with geotechnical report. Tests will be performed at following locations and frequencies:
 - 1) Paved Areas: At each compacted fill and backfill layer, at least one (1) test for every 10,000 sq. ft. (930 sq. m) or less of paved area but in no case less than three (3) tests.
 - 2) Foundation Wall/Continuous Footing Backfill: At each compacted backfill layer, at least one (1) test for each 40 linear feet (12 linear m) or less of wall length, but no fewer than two (2) tests.
 - 3) Trench Backfill: At each 12 inch compacted lift for each 100 linear feet (30.5 linear m) or less of trench length but no fewer than two (2) tests.
 - 4) Sidewalks, Curbs, Gutters, Exterior Pads: Minimum of one (1) test for each lift for each 40 linear feet (12 linear m) or one (1) test for every 5,000 sq. ft. (465 sq. m) or less of pad area but no fewer than three (3) tests.
 - g. Required verification and inspection of soils as referenced in 2015 IBC (or latest approved edition) Table 1704.7 'Required Verification And Inspection Of Soils'. Periodic and continuous inspections include:
 - 1) Verify materials below shallow foundations are adequate to achieve design bearing capacity (periodic).
 - 2) Verify excavations are extended to proper depth and have reached proper material (periodic).
 - 3) Perform classification and testing of compacted fill materials (periodic).
 - 4) Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill (continuous).
 - 5) Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly (periodic).

3.05 CLEANING

- A. Debris and material not necessary for Project are property of Contractor and are to be removed before completion of Project. However, if material necessary for Project is hauled away, replace with specified fill / backfill material.

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**SECTION 32 1216
ASPHALT PAVING SUPERPAVE METHOD**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM C131/C131M - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine; 2020.
- B. ASTM D2041/D2041M - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures; 2026.
- C. ASTM D2256/D2256M - Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method; 2021.
- D. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate; 2022.
- E. ASTM D3665 - Standard Practice for Random Sampling of Construction Materials; 2024.
- F. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install asphalt paving in driveways and parking areas as described in Contract Documents including the following, but not limited to:
 - a. Asphalt Mix Design Criteria Summary:
 - 1) Design team to site adapt and modify asphalt paving specifications to match LOCALLY available or preferred and successful mix design. Site adapt and edit accordingly, including asphalt paving thicknesses. Binder grade to be site adapted and design team to determine whether asphalt fibers will be used and contact local asphalt supplier to site adapt asphalt mix design criteria.
 - 2) Asphalt Binder: PG 58-28 (or Binder locally used by DOT)
 - 3) Nominal Maximum Size Aggregate (Nmas): 3/8 inch (9.5 mm)
 - 4) Maximum Size Aggregate: 1/2 inch (12.5 mm)
 - 5) Mix Designator (compaction effort); Ndesign: 50
 - 6) Antistrip Agent: If required by supplier's mix design (use 1 percent or greater lime slurry when required).
 - 7) Asphalt Reinforcement Fibers: Specified in Section 32 1217 as Alternate 'A'.
 - 8) Reclaimed Asphalt Pavement (RAP): Allowed up to 15 percent. Asphalt binder shall be one grade softer when more than 15 percent RAP is used.
 - 9) ROSP: Not allowed.
 - 10) Mineral Filler: Not allowed.
 - 11) Warm Mix Additive: If required by supplier's design.
 - 12) Recycle Agent: If required by supplier's design.
 - b. Design Air Voids:
 - 1) Three and one-half percent (3.5 percent).
 - c. Tack coat: Application of asphaltic material to existing asphalt concrete or Portland concrete surfaces before asphalt concrete pavement.
 - d. Blotter materials and procedures for absorbing excess asphalt as required.
 - B. Related Requirements:

1. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 2. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 3. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 4. Section 31 1123: 'Aggregate Base' for compaction of aggregate base.
 5. Section 31 2213: 'Rough Grading' for rough grading and preparation of natural soil subgrades below fill and aggregate base materials.
 6. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 7. Section 31 2323: 'Fill' for compaction procedures and tolerances for base.
 8. Section 32 0113.01: 'Asphalt Paving Surface Treatment: Penetrating Seal'.
 9. Section 32 1717: 'Asphalt Reinforcement Fibers'.
 10. Section 32 1723: 'Pavement Markings'.
- C. Related Requirements:
1. Section 01 0000: 'General Requirements':
 - a. Section 01 1200: 'Multiple Contract Summary' for multiple contracts.
 - b. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
 2. Section 31 0501: 'Common Earthwork Requirements' for:
 - a. General procedures and requirements for earthwork.
 - b. Pre-installation conference held jointly with other common earthwork related sections.
 3. Section 31 1123: 'Aggregate Base' for compaction of aggregate base.
 4. Section 31 2213: 'Rough Grading' for rough grading and preparation of natural soil subgrades below fill and aggregate base materials.
 5. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 6. Section 31 2323: 'Fill' for compaction procedures and tolerances for base.
 7. Section 32 0113.01: 'Asphalt Paving Surface Treatment: Penetrating Seal'.
 8. Section 32 1717: 'Asphalt Reinforcement Fibers'.
 9. Section 32 1723: 'Pavement Markings'.

1.03 PRICE AND PAYMENT PROCEDURES

- A. Alternates:
1. Asphalt Reinforcement Fibers are bid as Alternate 'A' as specified in Price and Payment Procedures in Part 1 of Section 32 1216. Owner's Representative will review bid and decide if asphalt reinforcing fibers will be included in Project.

1.04 REFERENCES

- A. Association Publications:
1. Asphalt Institute, 2696 Research Park Dr., Lexington, KY www.asphaltinstitute.org:
 - a. MS-2, 'Mix Design Methods' (7th Edition 2015).
- B. Definitions:
1. Aggregate: Hard inert mineral material, such as gravel, crushed rock, slag, or sand.
 - a. Coarse Aggregate: Aggregate retained on or above No. 4 0.19 inch sieve.
 - b. Coarse-Graded Aggregate: Aggregate having predominance of coarse sizes.
 - c. Dense-Graded Aggregate: Aggregate that is graded from maximum size down through filler with object of obtaining an asphalt mix with controlled void content and high stability.
 - d. Fine Aggregate: Aggregate passing No. 4 0.19 inch sieve.
 - e. Fine-Graded Aggregate: Aggregate having predominance of fine sizes.

- f. Mineral Filler: Fine mineral product at least 70 percent of which passes a No. 200 (75µm) sieve.
2. Air Voids: Total volume of small air pockets between coated aggregate particles in asphalt cement concrete (ACC); expressed as percentage of bulk volume of compacted paving mixture.
3. Anti-Stripping Agent: Chemicals added to bitumen to improve the adhesion of the bitumen to hydrophilic aggregates
4. Asphalt Binder: Asphalt cement or modified asphalt cement that binds aggregate particles into dense mass.
 - a. Asphalt Cement used in paving applications that has been classified according to the Standard Specification for Performance Graded Asphalt Binder, AASHTO Designation MP 320. It can be either unmodified or modified Asphalt Cement, as long as it complies with specifications.
5. Asphalt-Aggregate Designator: Alpha-numeric code that indicates nominal maximum size of aggregate, and type and grade of asphalt in aggregate-asphalt mix.
 - a. Example: "12.5 PG70-28" means aggregate asphalt mix shall be composed of aggregate gradation with 12.5 mm 1/2 inch nominal maximum size and performance grade asphalt binder designed to perform between temperatures of 158 degrees Fahrenheit and -28 deg C (158 degrees Fahrenheit and -18.4 degrees Fahrenheit).
6. Equivalent Single Axle Load (ESAL): Effect on pavement performance of any combination of axle loads of varying magnitude equated to number of 18,000-lb. (80-kN) single-axle loads that are required to produce an equivalent effect.
7. Maximum Size (Superpave): One sieve larger than the nominal maximum size.
8. Ndesign (Superpave): Design number of gyrations used for design of Hot Mix Asphalt (HMA).
9. Nominal Maximum Size: One sieve size larger than first sieve size retaining more than 10 percent of Sample. Nominal maximum size sieve will retain minimum of 0 and maximum of 10 percent of sample. Maximum size is one sieve size larger than nominal maximum size.
10. Performance Graded Asphalt Binder (PGAB): Asphalt binder designed to produce HMA that meets certain performance standards. Designations for performance-graded asphalt binders are prefixed with PG. Each grade designation also includes two sets of numbers that denote temperature range. This is a range of climate temperatures to which road may be exposed and still be expected to give superior performance. PG numbers do not indicate viscosity as in conventional liquid asphalt designations.
11. Pre-emergent Herbicide: Chemical that is applied before weeds emerge. It acts by killing weed seedlings and /or establishing layer of chemical on or near soil surface that is toxic to germinating seeds and young seedlings.
12. Reclaimed Asphalt Pavement (RAP): Existing asphalt mixture that has been pulverized, usually by milling, and is used like aggregate in recycling of asphalt pavements.
13. Subgrade (definition varies depending upon stage of construction and context of work being performed):
 - a. Prepared natural soils on which fill, aggregate base, or topsoil is placed.
 - or
 - b. Prepared soils immediately beneath paving.
14. Tack Coat: Very light application of liquid asphalt, or asphalt emulsion diluted with water.
- C. Reference Standards:
 1. American Association of State and Highway Transportation Officials:
 - a. AASHTO T 304-17: 'Standard Method of Test for Uncompacted Void Content of Fine Aggregate'.
 - b. AASHTO T 322-07(2016), 'Standard Method of Test for Determining the Creep Compliance and Strength of Hot-Mix Asphalt (HMA) Using the Indirect Tensile Test Device.
 2. ASTM International:

- a. ASTM C29/C29M-17a, 'Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate'.
- b. ASTM C88-18, 'Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate'.
- c. ASTM C117-17, 'Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing'.
- d. ASTM C131/C131M-14, 'Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine'.
- e. ASTM C142/C142M-17, 'Standard Test Method for Clay Lumps and Friable Particles in Aggregates'.
- f. ASTM D242/D242M-18, 'Standard Specification for Mineral Filler For Bituminous Paving Mixtures'.
- g. ASTM D977-17, 'Standard Specification for Emulsified Asphalt'.
- h. ASTM D979/D979M-15, 'Practice for Sampling Bituminous Paving Mixtures'.
- i. ASTM D2041/D2041M-11, 'Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures'.
- j. ASTM D2172/D2172M-17, 'Standard Test Methods for Quantitative Extraction of Bitumen From Bituminous Paving Mixtures'.
- k. ASTM D2256/D2256M-10(2015), 'Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method'.
- l. ASTM D2397/D2397M-17, 'Standard Specification for Cationic-Emulsified Asphalt'.
- m. ASTM D2419-14, 'Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate'.
- n. ASTM D2950/D2950M-17, 'Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods'.
- o. ASTM D3203/D3203M-17, 'Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures'.
- p. ASTM D3549/D3549M-18, 'Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens'.
- q. ASTM D3665-12(2017), 'Standard Practice for Random Sampling of Construction Materials'.
- r. ASTM D4318-17, 'Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils'.
- s. ASTM D4552/D4552M-10(2016), 'Standard Practice for Classifying Hot-Mix Recycling Agents'.
- t. ASTM D4759-11(2018), 'Standard Practice for Determining the Specification Conformance of Geosynthetics'.
- u. ASTM D4791-10, 'Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate'.
- v. ASTM D5444-15, 'Standard Method for Mechanical Size Analysis of Extracted Aggregate'.
- w. ASTM D5821-13(2017), 'Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate'.
- x. ASTM D6307-19, 'Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method'.
- y. ASTM D6932/D6932M-08(2013), 'Standard Guide for Materials and Construction of Open-Graded Friction Course Plant Mixtures'.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 1. Participate in MANDATORY pre-installation conference as specified in Section 31 0501 'Common Earthwork Requirements'.
 2. In addition to agenda items specified in Section 01 3100 'Project Management and Coordination' and Section 31 0501 'Common Earthwork Requirements', review following:

- a. Review surveying and staking of parking areas and installation of sleeves.
 - b. Review proposed aggregate base schedule.
 - c. Review rough grading elevations before placing paving fill.
 - d. Review fine grading elevations of subgrade fine grading operations before placing aggregate base and paving.
 - e. Review proposed asphalt paving schedule.
 - f. Review asphalt paving mix design.
 - g. Review pre-emergent herbicide protection of adjoining property and planting area on site requirements, schedule and application requirements.
 - h. Review schedule of mandatory asphalt paving surface treatment to be applied after placement of asphalt paving.
 - i. Review schedule of paint stripes to be applied after asphalt paving surface treatment.
 - j. Review safety issues.
 - k. Review Section 01 4523 'Testing and Inspecting Services' for administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
 - 1) Review requirements and frequency of testing and inspections.
 - 2) Review Contractor Testing Agency Qualifications.
- B. Scheduling: Notify Testing Agency and Architect twenty-four (24) hours minimum before placing asphalt paving.

1.06 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Pre-Emergent Herbicide:
 - 1) Manufacturer's published product data on pre-emergent herbicide.
- B. Informational Submittals:
 - 1. Certificates:
 - a. Require mix plant to furnish delivery/load tickets for each batch of asphalt. Keep delivery tickets at job-site for use of Owner's Representative. Tickets shall show following:
 - 1) Name of mix plant.
 - 2) Date.
 - 3) Name of contractor.
 - 4) Name and location of Project.
 - 5) Serial number of ticket.
 - 6) Asphalt mix type.
 - 7) Time loaded.
 - 8) Identity of truck.
 - b. Installer to provide Manufacturer's Certificate of Compliance stating material authenticity and properties for review and acceptance by Architect before product use.
 - 2. Design Data:
 - a. Hot Mix Asphalt:
 - 1) Design Criteria:
 - (a) Develop mix design according to current Asphalt Institute MS-2 'Asphalt Mix Design Methods' for Superpave Method.
 - (b) Submittal format:
 - (1) Design mix submittal shall follow format as indicated in current Asphalt Institute MS-2, 'Mix Design Methods.
 - 2) Mix design of asphalt paving must meet Design Criteria minimum requirements and show conformance to the following:
 - (a) Location and name of hot mix asphalt concrete production facility.

- (b) Date of mix design. If older than two (2) years, recertify mix design.
 - (c) Asphalt mix type.
 - (d) Mix design method used.
 - (e) Mix density.
 - (f) Design air voids (three and one half (3.5) percent).
 - (g) Asphalt content in percent.
 - (h) Performance grade of asphalt binder.
 - (i) Nominal maximum size of aggregate.
 - (j) Maximum size of aggregate.
 - (k) Aggregate source and gradation.
 - (l) Mix properties and design parameters.
 - (m) Temperature of mix at plant and in the field for optimum field compaction.
 - (n) Amount of recycled asphalt pavement (RAP).
 - (o) Mineral fillers, antistripping, and recycle agent percentages.
 - (p) Identify if warm mix technologies will be used and how much warm mix additive will be used.
- 3) Within thirty (30) days prior to asphalt construction, submit actual design mix to Architect, Civil Engineering Consultant of Record and Independent Testing Laboratory for review and approval.
- 3. Test And Evaluation Reports:
 - a. Hot Mix Asphalt:
 - 1) Contractor's Testing Agency copies of Field Test results to show compliance with all contract requirements and quality control for quality of asphalt mixture and asphalt installation.
 - 2) Owner's Testing Agency copies of Field Tests and Inspections used to validate or determine discrepancies with testing by Contractor.
- 4. Manufacturer Instructions:
 - a. Pre-Emergent Herbicide:
 - 1) Application instructions for pre-emergent herbicide.
- 5. Qualification Statement:
 - a. Installer:
 - 1) Provide Qualification documentation if requested by Owner's Representative.
- C. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800 'Closeout Submittals':
 - a. Record Documentation:
 - 1) Manufacturer's documentation:
 - (a) Pre-emergent herbicide documentation.
 - (b) Asphalt paving design.
 - (c) Test reports.
 - (d) Certificates from mix plant of delivery/load tickets.
 - (e) Manufacturer's Certificate of Compliance.
 - 2) Testing and Inspection Reports:
 - (a) Testing Agency Testing and Inspecting Reports of asphalt paving.

1.07 QUALITY ASSURANCE

- A. Qualifications. Requirements of Section 01 4301 'Quality Assurance - Qualifications' applies but not limited to following:
 - 1. Asphalt Paving:
 - a. Foreman of asphalt paving crew has completed at least three (3) projects of similar size and nature.
 - b. Upon request, submit documentation.
 - 2. Pre-emergent herbicide:

- a. Applicator:
 - 1) Pre-emergent herbicide shall be applied by applicator certified by State in which Project is located as an applicator of agricultural chemicals.
- B. Testing and Inspection:
 - 1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
 - 2. Owner will provide Testing and Inspection for asphalt paving:
 - a. Owner will employ testing agencies to perform testing and inspection for asphalt paving as specified in Field Quality Control in Part 3 of this specification.
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
 - 2) See Section 01 1200: 'Multiple Contract Summary'.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 - 1. Asphalt Material:
 - a. Each shipment must:
 - 1) Be uniform in appearance and consistency.
 - 2) Show no foaming when heated to specified loading temperature.
 - b. Do not supply shipments contaminated with other asphalt types or grades than those specified:
 - 1) Do not use petroleum distillate as a release agent.
 - 2. Pre-emergent herbicide:
 - a. Materials shall be delivered in original, unopened packages with labels intact.
- B. Storage And Handling Requirements:
 - 1. Pre-emergent herbicide:
 - a. Do not freeze. Store in at temperatures above 41 degrees Fahrenheit.
 - b. Follow Manufacturer's storage and handling requirements.

1.09 FIELD CONDITIONS

- A. Ambient Conditions:
 - 1. Pre-emergent herbicide:
 - a. Follow printed Manufacturers instruction for environmental hazards:
 - b. Follow printed Manufacturers instruction ambient conditions for application of product.
 - 2. Tack Coat:
 - a. Apply only when air and roadbed temperatures in shade are greater than 40 degrees Fahrenheit. Temperature restrictions may be waived only upon written authorization from Architect or Civil Engineer.
 - b. Do not apply to wet surfaces.
 - c. Do not apply when weather conditions prevent tack coat from adhering properly.
 - 3. Asphalt paving:
 - a. Do not perform work during following conditions:
 - 1) Ambient temperature is below 45 degrees Fahrenheit or will fall below 45 degrees Fahrenheit during placement.
 - 2) Temperature of aggregate base below 50 degrees Fahrenheit.
 - 3) Cold Weather Asphalt Paving Plan: If asphalt pavement is placed outside of these temperature limits or those identified in MINIMUM Temperature Degrees, a plan is required which includes:
 - (a) Haul times.
 - (b) Placement details.
 - (c) Compaction aids used in production.

- (d) Owner does not assume responsibility for asphalt when placed outside temperature limits.
- 4) Presence of free surface water or weather is unsuitable.
- 5) Wind or ground cools mix material before compaction.

PART 2 PRODUCTS

2.01 DESIGN CRITERIA

- A. General:
 - 1. Follow current Asphalt Institute MS-2 'Asphalt Mix Design Methods' for Superpave Method.
- B. Asphalt Mix:
 - 1. Asphalt Binder:
 - a. Performance Graded Asphalt Binder:
 - 1) Use performance graded asphalt binder identified under Asphalt Mix Design Criteria.
 - 2. Aggregates:
 - a. Use clean, hard, durable, angular, sound, consisting of crushed stone, crushed gravel, slag, sand, or combination.
 - b. Use nominal maximum size aggregate and maximum size aggregate per Asphalt Mix Design Criteria. Aggregate gradation to meet Table 1 - MASTER GRADING BANDS requirements:

Table 1 - MASTER GRADING BANDS			
Sieve (mm)		Nominal Maximum Aggregate Size	
		0.49 inch	0.37 inch
Control Sieves	19	100	-
	12.5	100	100
	9.5	< 90	90 – 100
	4.75	--	< 90
	2.36	28 – 58	32 – 60
	0.075	2 – 10	2 – 10
Restricted Zone	2.36	39.1	47.2
	1.18	25.6 – 31.6	31.6 – 37.6
	0.6	19.1 – 23.1	23.5 – 27.5
	0.3	15.5	18.7

NOTES:

- It is assumed fine and coarse aggregate have same bulk specific gravity.
- Gradation is expressed in percent passing by weight, ASTM C136. Percentage of fines passing 0 inch control sieve determined by washing, ASTM C117.

- c. Provide aggregate material properties to meet Table 2 – AGGREGATE PHYSICAL PROPERTIES requirements:

Table 2 –AGGREGATE PHYSICAL PROPERTIES				
Property	ASTM	ESAL	Min	Max

Coarse Aggregate (does not pass No. 4 sieve)				
Angularity (fractured faces), percent	D5821	less than 0.3	55	--
		0.3 to 3.0	75	--
		greater than 3.0	85/80	--
Wear (hardness or toughness), percent	C131/C131M	less than 0.3	--	40
		0.3 to 3.0	--	35
		greater than 3.0	--	35
Flats or elongates (3:1 length to width), percent, maximum	D4791	--	--	20
Fine Aggregate (passing No. 4 sieve)				
Angularity (uncompacted void content), percent (AASHTO T304)	--	less than 0.3	--	--
		0.3 to 3.0	40	--
		greater than 3.0	45	--
Sand equivalent, percent	D2419	less than 0.3	40	--
		0.3 to 3.0	40	--
		greater than 3.0	45	--
Friable particles, percent	C142	--	--	2
Plastic limit, maximum	Liquid limit	D4318	--	25
	Plastic limit	D4318	--	6
Notes:				
1. ESAL in millions.				
2. Angularity by weight retained above 0.35 inch sieve, with at least one fractured face. 85/80 denotes 85 percent coarse aggregate has one fractured face and 80 percent has two or more fractured faces.				
3. Wear of aggregate retained above 0.09 inch sieve unless specific aggregates have higher values are known to be satisfactory.				
4. Flats or elongates retained above 0.19 inch sieve.				
5. Friable particles passing No. 4.75 mm sieve.				
6. Plasticity, passing No. 4.75 sieve. Aggregate is no-plastic even when filler material is added to aggregate.				
Blended Physical Properties				
Dry-rodded unit weight, lb/ft ³ , minimum	C29/C29M		75	--
Weight loss (soundness), percent, maximum	C88		--	16
Clay content or cleanliness (sand equivalent), percent	D2419	less than 0.3	45	--
		more than 0.3	60	--

Notes:

1. Weight loss using sodium sulfate.
 2. Sand equivalent value is after going through dryer or before drum mixer. The sand equivalent requirement is waived for RAP aggregate but applies to remainder of aggregate blend.
 3. Friable particles of clay lumps, shale, wood, mica, and coal passing 4.75 sieve.
1. Admixture:
 - a. Antistrip: Heat stable, cement slurry, lime slurry, dry lime, or liquid antistrip:
 - 1) Add if mix is moisture sensitive as determined by 'Moisture Susceptibility' paragraph below.
 - b. Mineral Filler: Comply with requirements of ASTM D242/D242M.
 - c. Recycle Agent: Comply with requirements of ASTM D4552/D4552M.

2.02 MATERIAL

- A. Aggregate Base: Conform to applicable requirements as specified in Section 31 1123: 'Aggregate Base'.
- B. Asphalt Paving Surface Treatment:
 1. Include mandatory Asphalt Paving Surface Treatment to be applied no sooner than thirty (30) days or no later than eighteen (18) months of placing Asphalt Paving to be included with this project:
 - a. Asphalt Based Penetrating Seal as specified in Section 32 0113.01 'Asphalt Paving Surface Treatment: Asphalt Based Penetrating Seal'.
- C. Pre-Emergent Herbicide:
 1. Design Criteria:
 - a. Selective type pre-emergence control chemical containing twenty-five (25 percent) Prometon minimum for control of annual grasses and broadleaf weeds.
 - b. Non-oil based sterilant.
 - c. Labeled for under-pavement use.
 2. Type Two Acceptable Products:
 - a. Pramitol 25E Herbicide by WinField United, St Paul MN www.winfieldunited.com.
 - 1) Apply at a rate of 10 gal (37.85 liter) per 1 acre (0.4046863 hectare) conforming to application rates indicated on product label.
 - b. Equal as approved by Architect before installation. See Section 01 6200.
- D. Reclaimed Asphalt Pavement (RAP). Aggregate: Restrictions include:
 1. Allowed up to 15 percent. Asphalt binder shall be one grade softer when more than 15 percent RAP is used.
- E. Tack Coat:
 1. Emulsified asphalt meeting requirements of ASTM D977, Grade SS-1H, CQS-1H, or ASTM D2397/D2397M, Grade CSS-1H.

PART 3 EXECUTION

3.01 INSTALLERS

- A. Approved Applicators. See Section 01 4301 'Quality Assurance - Qualifications':

3.02 PREPARATION

- A. General:
 1. Aggregate base and paving must be placed before any moisture or seasonal changes occur to subgrade that would cause compaction tests previously performed to be erroneous. Re-compact and retest subgrade soils that have been left exposed to weather.

- B. Protection Of In-Place Conditions:
 - 1. Pre-emergent herbicide:
 - a. Take necessary precautions to protect adjoining property and areas designated for planting on building site.
 - b. Do not contaminate any body of water by direct application, cleaning of equipment or disposal of wastes.
 - 2. Asphalt Paving:
 - a. Protect all structures, including curb, gutter, sidewalks, guard rails and guide posts.
 - b. Protect neighborhood, storm drains and down-stream fish habitat.
- C. Surface Preparation:
 - 1. Survey and stake parking surfaces to show grading required by Contract Documents.
 - 2. Subgrade (soil below aggregate base):
 - a. Prepare natural soil subgrade as specified in Section 31 2213 'Rough Grading' or prepare fill subgrade as described in Section 31 2216 'Fine Grading'.
 - 3. Aggregate base:
 - a. Finish grade parking surface area to grades required by Contract Documents.
 - b. Compact aggregate base as specified in Section 31 1123 'Aggregate Base'.
 - c. Tolerances:
 - 1) Elevation of aggregate base shall be 0.00 inches high and no more than 1/2 inch low.
 - 2) Measure using string line from curb to curb, gutter, flat drainage structure, or grade break.
 - 4. Tack coat:
 - a. Clean surface of all materials such as mud, dirt, leaves, etc. that prevent tack from bonding to existing surfaces.
 - 1) If flushed, allow surface to dry.
 - 5. Asphalt paving:
 - a. Area shall be clean and tack coat applied before placing of asphalt paving.
 - 1) Remove all moisture, dirt, sand, leaves, and other objectionable material from prepared surface before placing asphalt.
 - 2) Locate, reference, and protect all utility covers, monuments, curb, and gutter and other components affected by asphalt paving operations.
 - 3) Allow sufficient cure time for tack coat before placing asphalt.

3.03 APPLICATION

- A. Interface With Other Work:
 - 1. Section 31 1123: 'Aggregate Base' for compaction of aggregate base.
 - 2. Section 31 2213: 'Rough Grading' for rough grading and preparation of natural soil subgrades below fill and aggregate base materials.
 - 3. Section 31 2216: 'Fine Grading' for grading of subgrade below aggregate base and topsoil.
 - 4. Section 31 2323: 'Fill' for compaction procedures and tolerances.
- B. Pre-Emergent Herbicide:
 - 1. Asphalt paving areas:
 - a. Follow Manufacturer's printed application requirements:
 - b. Apply to prepared subgrade dispersed in liquid. Concentrate shall be such that Manufacturer's full recommended amount of chemical will be applied to every 1000 sq ft (93 sq m) and liquid will penetrate minimum of 2 inches.
 - c. Application shall be no more than one (1) day before installation of aggregate base.
- C. Tack Coat:
 - 1. General:
 - a. Tack coat vertical surfaces or existing asphalt cement concrete or portland cement concrete that will be in contact with asphalt paving.

- b. Use tack coat diluted to a 2:1 (concentrate water) ratio.
- c. Use pressure distributor to apply in uniform, continuous spread.
- d. Cover all tacked surface areas with surfacing materials same day of application.
- 2. Application rate. Typically, as follows:
 - a. Emulsions, 0.08 to 0.15 gallons per sq yd (0.303 to 0.679 L per sq m) of diluted material:
 - 1) Apply sufficient to achieve ninety-five (95) percent or better coverage of existing surfaces.
 - 2) Above application rates may vary according to field conditions. Obtain approval from Civil Engineer for quantities, rate of application, temperatures, and areas to be treated before any application.

D. Asphalt Paving:

- 1. General:
 - a. Paving adjacent to cast-in-place concrete site elements shall be between 1/4 inch higher than concrete.
 - b. Surface texture of hand worked areas shall match texture of machine-laid areas.
 - c. Surface shall be uniform with no 'birdbaths'. Leave finished surfaces clean and smooth. Variations from specified grades shall not exceed 1/2 inch.
 - d. Cross Slope: 1/4 inch in 10 feet perpendicular to centerline except at cross section grade breaks.
 - e. Grade: 1/8 inch in 10 feet parallel to centerline.
 - f. Do not place on frozen aggregate base or during adverse climatic conditions such as precipitation or when roadway surface is icy or wet.
 - g. Uniformly mix materials so aggregate is thoroughly coated with asphalt.
 - h. Place at temperatures established by the mix design with self-propelled laydown machine.
 - i. Use Table 3 – MINIMUM TEMPERATURE, DEGREES as guide:

Table 3 – MINIMUM TEMPERATURE, DEGREES							
Ambient Air Temperature Deg F.	Ambient Air Temperature Deg C.	Compacted Paving Mat Thickness					
		3/4"	1"	1 1/2"	2"	3"	4" +
		0.75 inch	(0.98 inch)	(1.5 inch)	(1.97 inch)	(2.95 inch)	(3.94 inch) +
45 – 50	7 – 10	---	---	---	---	280	265
50 – 59	10 – 15	---	---	---	280	270	255
60 – 69	16 – 20	---	---	285	275	265	250
70 – 79	21 – 29	285	285	280	270	265	250
80 - 89	27 - 31	280	275	270	265	260	250
90+	32+	275	270	265	260	250	250

- j. Longitudinal bituminous joints shall be vertical and properly tack coated if cold. Transverse joints shall always be tack coated.
- 2. Compaction:
 - a. Compact asphalt paving to ninety-four (94) percent plus or minus two (2) percent of theoretical maximum specific gravity, ASTM D2041/D2041M (Rice Method - maximum theoretical density).
 - b. Roll with powered equipment capable of obtaining specified density while providing required smoothness.
 - c. Begin breakdown rolling immediately after asphalt is placed when asphalt temperature is at maximum.

- d. Complete handwork compaction concurrently with breakdown rolling.
- e. Execute compaction so visibility of joints is minimized:
- f. Complete finish rolling to improve asphalt surface as soon as possible after intermediate rolling and while asphalt paving is still warm.
- g. Do not use vibration for finish rolling.
- 3. Lift Thickness:
 - a. Preferred Method:
 - 1) For pavements 3-1/2 inch or thinner apply asphalt paving in single lift.
 - 2) For pavements greater than 3-1/2 inch, use alternate method below.
 - b. Alternate Method:
 - 1) Asphalt paving may be applied in two (2) lifts, first 2 inches thick minimum and second 1 1/2 inches thick minimum following temperature recommendations of following paragraph.
 - 2) Surface of first lift shall be clean and provide tack coat between first and second lifts.
 - 3) Provide not less than two (2) times maximum aggregate size in compacted asphalt concrete mixes.
- E. Asphalt Paving Surface Treatments:
 - 1. Apply mandatory Asphalt Paving Surface Treatment no sooner than thirty (30) days or no later than eighteen (18) months of placing Asphalt Paving to be included with this project. Do not apply prior to asphalt curing (refer to 'Asphalt, Concrete and Pervious Concrete Maintenance Guidelines'):
 - a. Asphalt Based Penetrating Seal as specified in Section 32 0113.01 'Asphalt Paving Surface Treatment: Asphalt Based Penetrating Seal'.
- F. Paint Stripes:
 - 1. Apply paint stripes after asphalt paving surface treatment has been applied to asphalt paving.

3.04 FIELD QUALITY CONTROL

- A. Field Tests And Inspections:
 - 1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
 - a. Quality Control is sole responsibility of Contractor:
 - 1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
 - (a) Testing and inspections will be responsibility of Contractor to be performed by an independent entity.
 - 2) Contractor bears full responsible for compliance with all contract requirements and quality control on project and will be responsible for quality of asphalt mixture and asphalt installation.
- B. Field Tests (Provided by Contractor):
 - 1. General:
 - a. Contractor bears full responsibility for compliance with all contract requirements and quality control on project and will be responsible for quality of asphalt mixture and asphalt installation.
 - b. Testing and Inspection Reports to be distributed as specified in Section 01 4523 'Testing And Inspection Services'.
 - 2. Compaction Tests:
 - a. Contractor to provide compaction tests of asphalt being placed to establish rolling patterns and installation procedures.

- b. Compaction tests by Contractor are independent of compaction tests being provided by Owner. See Section 01 4523 'Testing And Inspection Services'.
 - c. Asphalt paving shall be compacted to ninety-four (94) percent of Theoretical Maximum Specific Gravity (Rice) plus three (3) percent or minus two (2) percent. Determine percent compaction by ASTM D2041/D2041M.
- 3. Thickness Tests:
 - a. Determine thickness of paving being placed, no less than one (1) test per 10,000 sq. ft. (930 sq. m) of paving or portion thereof, three (3) tests minimum.
- C. Field Tests And Inspections (Provided by Owner):
 - 1. General:
 - a. Compaction tests provided by Owner will be used to validate or determine discrepancies with testing by Contractor.
 - b. Civil engineer applies pay factor for Gradation/Asphalt Content, In-Place Density. Civil engineer computes pay factor for each lot.
 - c. Opening paved surface to traffic does not constitute acceptance.
 - d. Unless required by the Owner's Representative, Testing Agency is to base compaction testing on Contractor's submitted mix design for theoretical maximum specific gravity (Rice) or Marshall specific gravity (Bulk) values.
 - e. Asphalt-aggregate mix sampling as per ASTM D979/D979M.
 - 1) Test for:
 - (a) Air voids as per ASTM D3203/D3203M.
 - (b) Asphalt binder content as per ASTM D6307.
 - (c) Aggregate gradation as per ASTM D5444.
 - f. Lot size: 10,000 sq. ft. (930 sq. m) or part thereof.
 - g. Sub lot size: 5,000 sq. ft. (465 sq. m) or part thereof.
 - 2. At Site Testing and Inspection:
 - a. Asphalt Paving:
 - 1) Testing Agency shall provide full time nuclear density testing and inspection for asphalt paving during asphalt paving operations (nuclear density testing is informational testing only and does not constitute acceptance by Owner).
 - 2) Inspection to include:
 - (a) Aggregate coating.
 - (b) Compaction control and effort required.
 - (c) Suitability of spreading and asphalt paving equipment.
 - (d) Temperature of mix as delivered and placed.
 - (1) Reject mixes exceeding 325 degrees Fahrenheit in transport vehicle as required in Non-Conforming Work below.
 - (2) Dispose of cold mix in paver hopper as thin spread underlay.
 - 3) Field Tests:
 - (a) When tested with 10 foot straight edge, surface of completed work shall not contain irregularities in excess of 1/4 inch.
 - (b) Determine percent compaction per ASTM D2950/D2950M unless other nondestructive nonnuclear methods such as sonar are used.
 - (c) Provide written nuclear density testing, or other nondestructive nonnuclear methods such as sonar, of asphalt paving at minimum rate of one (1) per 2,500 sq. ft. (232 sq. m). Select test locations by ASTM D3665 and sample per ASTM D979/D979M before compaction. Minimum of three (3) tests required.
 - (d) Compact asphalt paving to ninety-four (94) percent of Theoretical Maximum Specific Gravity (Rice) plus three (3) percent or minus two (2) percent.
 - (e) Maximum average total air voids in completed hot mix asphalt shall be eight (8) percent but more than three (3) percent as determined by ASTM D2041/D2041M.

- (f) Determine thickness of paving being placed, no less than one (1) test per 10,000 sq. ft. (930 sq. m) of paving or portion thereof, three (3) tests minimum.
3. At Laboratory Testing:
- a. General:
- 1) Provide at least one (1) laboratory test series for every 10,000 sq. ft. (930 sq. m) or part thereof (minimum of one (1) test):
 - (a) Test reports will show compliance with Contract Documents regarding type and depth of aggregate base, depth and density of asphalt paving, asphalt content, aggregate gradation, flow and stability, bulk specific gravity and maximum specific gravity.
 - (b) Reports will also give test procedures used by testing laboratory.
- b. Compaction and Final Density:
- 1) Pavement thickness and final density to be determined by results of coring. Provide one (1) core per 10,000 sq. ft. (930 sq. m) or part thereof. Minimum of three (3) tests required if under 30,000 sq. ft. (2 787 sq. m).
 - (a) Based upon core samples, compaction is acceptable if test deviations are within pay factor 1.00 limits.
 - (b) At Project Manager's discretion, after consulting with Design Team, a Lot with a sub-lot test deviation greater than Reject may stay in place at fifty (50) percent cost.
 - (c) Select test locations by ASTM D3665 and sample per ASTM D979/D979M after compaction.
- c. Compaction Pay Factor:
- 1) Based upon core samples, compaction is acceptable if test deviations are within pay factor 1.00 limits.
 - 2) At Project Manager's discretion, after consulting with design team, a Lot with a sub-lot test deviation greater than Reject may stay in place at fifty (50) percent cost.
 - 3) Average Density, in percent as shown in Table 4 – COMPACTION PAY FACTORS:

Table 4 – COMPACTION PAY FACTORS (94 percent of theoretical maximum specific gravity – Superpave (Rice) ((ASTM D2041/D2041M)) plus three (3) or minus two (2) percent)		
Pay Factor	Density, in Percent	
	Average	Lowest Test
0.70	More than 96	---
1.00	92 to 96	89 or Greater
0.90	92 to 96	Less than 89
Reject	Less than 92	---
Notes: 1. At Contractor's discretion and expense, do Hamburg wheel track test (AASHTO T 304) on 3 additional random core samples from non-complying sub-lot of 5,000 sq. ft. (465 sq. m). Sub-lot will be accepted if average rut depth is less than 0.39 inch at 20,000 passes.		

- d. Pavement Thickness:

- 1) Pavement thickness and final density to be determined by results of coring. Provide one (1) core per 10,000 sq. ft. (930 sq. m) or part thereof. Minimum of three (3) tests required if under 30,000 sq. ft. (2 787 sq. m).
 - (a) Acceptance will be based on the average of all thickness tests.
 - (b) At Project Manager's discretion, after consulting with design team, payment may be made for areas deficient in thickness by more than 0.75 inches at fifty (50) percent. If not, remove and replace at no additional cost to the Owner as shown in Table 5 – THICKNESS PAY FACTORS:

Table 5 – THICKNESS PAY FACTORS	
Pay Factors	Thickness Deficiency, in Inches (ASTM D3549/D3549M)
1.00	0.00 to 0.25
0.90	0.26 to 0.50
0.70	0.51 to 0.75
Reject	0.76 to 1.00

- e. Air Voids:
 - 1) Basis of evaluation is laboratory compacted samples (not field compacted samples).
 - 2) Air voids will be mix design target plus or minus one (1) percent.
 - 3) If test results are not within this Section's limits, options include correction of production procedures or alternate mix design acceptable to Civil Engineer.
- D. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
 1. Asphalt Paving:
 - a. Deficient asphalt paving thickness:
 - 1) Place additional material over deficient areas. Do not skin patch. Mill for inlay if necessary. Correct deficient asphalt paving thickness at no additional cost to the Owner.
 - b. Rejection and Removal of Asphalt Paving:
 - 1) Remove asphalt paving found defective after installation and install acceptable product at no additional cost to the Owner.
 - c. Removal of Asphalt Paving:
 - 1) Remove spatter, over-coat, or mar at no additional cost to the Owner.
 - 2) Remove asphalt from borrow pits or gutters at no additional cost to the Owner.
 - d. Repair of Asphalt Paving:
 - 1) Repair or replace defective joints, seams, edges at no additional cost to the Owner.

3.05 PROTECTION

- A. Tack Coat:
 1. Protect all surfaces exposed to public view from being spattered or marred. Remove any spattering, over-coating, or marring at no additional cost to Owner.
 2. Traffic:
 - a. Do not permit traffic to travel over tacked surface until tack coat has cured and dried.
- B. Asphalt Paving:
 1. Protect hot mixed asphalt (HMA) pavement from traffic until mixture has cooled enough not to become marked.

3.06 CLEANING

A. Waste Management:

1. Pre-emergent herbicide:

- a. Follow Manufacturer's recommendations for disposal of product at approved waste disposal facility.

- 1) Do not reuse empty containers.

END OF SECTION

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SECTION 32 9223 SODDING

PART 1 GENERAL

1.01 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install sodded lawn as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 32 9001: Common Planting Requirements:
 - a. Pre-installation conference held jointly with other common planting related sections.

1.02 REFERENCES

- A. Definitions:
 - 1. Crop Coefficients and Hydro-Zones: Crop coefficients (Kc) are used with ETo to estimate specific plant evapotranspiration rates. The crop coefficient is a dimensionless number (between 0 and 1.2) that is multiplied by the ETo value to arrive at a plant ET (ETc) estimate. Plants grouped by water needs, organized into one irrigation zone.
 - 2. Eco-Region Irrigation Design: A bio-regional approach to irrigation and planting design that is relevant to the geographic area for which the planting plan and irrigation system is designed. These geographic areas are defined by the Environmental Protection Agency and have been modified by the LDS church into 15 geographical areas throughout North America, and the Hawaiian Islands.
 - 3. Hardiness Zone: A hardiness zone is a more precisely geographically-defined zone within an Eco-Region in which a specific category of plant life is capable of growing, as defined by temperature hardiness, or ability to withstand the minimum temperatures of the zone. Hardiness Zones may be defined by one of two sources:
 - a. Sunset Western Garden Book Maps.
 - b. USDA Hardiness Zone Map.
 - c. Plant Hardiness zone sources shall be listed by the architect through the planting and irrigation design process.
 - 4. Hydro-Zone: Plants grouped by water needs (similar Crop Coefficients (Kc), organized into one irrigation zone.
 - 5. Reference Evapotranspiration (ETo): The total water lost from the soil (evaporation) and from the plant surface (transpiration) over some period.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in pre-installation conference as specified in Section 32 9001.

1.04 SUBMITTALS

- A. Informational Submittals:
 - 1. Certificates:
 - a. Written certification confirming sod seed mix and quality:
 - 1) Include all species used.
 - 2) Include name and contact information of supplier.
- B. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Submit one (1) copy certificate for sod seed quality and mix.
 - b. Landscape Management Plan (LMP):
 - 1) Landscape Section:
 - (a) Submit one (1) copy certificate for sod seed quality and mix.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Approval Requirements:
 - 1. Harvest, deliver, store, and handle sod in accordance with requirements of Turfgrass Producers International (TPI) (formally American Sod Producers Association) Specifications for Turfgrass Sod Materials and Transplanting / Installing.
 - 2. Schedule deliveries to coincide with topsoil operations and laying. Keep storage at job site to minimum without causing delays.
 - a. Deliver, unload, and store sod on pallets within 24 hours of being lifted.
 - b. Do not deliver small, irregular, or broken pieces of sod.
- B. Storage And Handling Requirements:
 - 1. Cut sod in pieces approximately 3/4 to one inch (19 to 0.98 inch thick. Roll or fold sod so it may be lifted and handled without breaking or tearing and without loss of soil.
 - 2. During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.
 - 3. During dry weather, protect sod from drying before installation. Water as necessary to insure vitality and to prevent excess loss of soil in handling. Sod that dries out before installation will be rejected.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Description:
 - 1. Superior sod grown from certified, high quality, seed of known origin or from plantings of certified grass seedlings or stolons:
 - a. Assure satisfactory genetic identity and purity.
 - b. Assure over-all high quality and freedom from noxious weeds or an excessive amount of other crop and weedy plants at time of harvest.
 - 2. Sod shall be composed of three varieties minimum of ???INSERT GRASS TYPE???

PART 3 EXECUTION

3.01 INSTALLATION

- A. Interface With Other Work:
 - 1. Do not commence work of this Section until work of Sections 32 9122 and 32 9300 has been completed and approved.
- B. Tolerances:
 - 1. Final grade of soil after sodding of lawn areas is complete shall be one inch 0.98 inch below top of adjacent pavement of any kind.
- C. Laying of Sod:
 - 1. Lay sod during growing season and within 48 hours of being lifted.
 - 2. Lay sod while top 6 inches of soil is damp, but not muddy. Sodding during freezing temperatures or over frozen soil is not acceptable.
 - 3. Lay sod in rows perpendicular to slope with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with a sharp knife.
 - 4. Lay sod flush with adjoining existing sodded surfaces.
 - 5. Do not sod slopes steeper than 3:1. Consult with Architect for alternate treatment.
- D. After Laying of Sod Is Complete:
 - 1. Roll horizontal surface areas in two directions perpendicular to each other.
 - 2. Repair and re-roll areas with depressions, lumps, or other irregularities. Heavy rolling to correct irregularities in grade will not be permitted.
 - 3. Water sodded areas immediately after laying sod to obtain moisture penetration through sod into top 6 inches of topsoil.

3.02 FIELD QUALITY CONTROL

- A. Field Inspection:

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SERWTP Filter Gallery &
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32 9223
Sodding

1. Sodded areas will be accepted at Project closeout if:
 - a. Sodded areas are properly established.
 - b. Sod is free of bare and dead spots and is without weeds.
 - c. No surface soil is visible when grass has been cut to height of 2 inches.
2. Sodded areas have been mowed a minimum of twice.

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**SECTION 33 0506
POLYETHYLENE PIPE**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Pipe, 75- to 250-mm (3- to 10-in.) Diameter; 2025.
- B. AASHTO M 294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter; 2025.
- C. AASHTO NTPEP - National Transportation Product Evaluation Program; Current Edition.
- D. ASME B1.1 - Unified Inch Screw Threads (UN, UNR, and UNJ Thread Forms); 2024.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- F. ASTM D2239 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter; 2025.
- G. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2026.
- H. ASTM D2657 - Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings; 2007 (Reapproved 2023).
- I. ASTM D2774 - Standard Practice for Underground Installation of Thermoplastic Pressure Piping; 2025.
- J. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing; 2024.
- K. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials; 2025.
- L. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 2014 (Reapproved 2021).
- M. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing; 2016a (Reapproved 2022).

1.02 SETION INCLUDES

- A. Polyethylene pipe, couplings, fittings, and joint materials.

1.03 REFERENCES

- A. AASHTO Standards:
 - 1. M252 Corrugated Polyethylene Drainage Pipe.
 - 2. M294 Corrugated Polyethylene Drainage Pipe 300-47.24 inch Diameter.
 - 3. MP7-97 Corrugated Polyethylene Pipe – 1350 and 59.06 inch Diameter.
 - 4. NTPEP National Transportation Product Evaluation Program.
- B. ASME Standards:
 - 1. B1.1 Unified Inch Screw Threads (UN and UNR Thread Form), Supplement.
- C. ASTM Standards:
 - 1. A307 Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 2. D2239 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter.
 - 3. D2321 Underground Installation of Flexible Thermoplastic Sewer Pipe.
 - 4. D2657 Heat Joining of Thermoplastic Pipe and Fittings.
 - 5. D2774 Underground Installation of Thermoplastic Pressure Piping.
 - 6. D3261 Butt Heat fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

7. D3350 Polyethylene Plastics Pipe and Fittings Materials.
8. F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
9. F1055 Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.

1.04 DEFINITIONS

- A. Standard Dimension Ratio (SDR): average diameter of pipe divided by the minimum wall thickness. The diameter may be either inside or outside measurement depending upon which standard is referenced.
- B. Code Designation: A rating system by the Plastic Pipe Institute for smooth wall polyethylene pipe materials. The designation PE 3408 designates the type of plastic pipe (PE), the grade (34), and the hydrostatic design stress measured in units of 100 psi at 23 deg. C.
- C. Corrugated Wall Pipe Classifications: Classifications are shown below. Types S and D have corrugations either annular or helical.
- D. Porous Corrugated Wall Pipe: Classified as follows.
 1. Type CP – This is Type C pipe with perforations.
 2. Type SP – This is Type S pipe with perforations.

1.05 SUBMITTALS

- A. Thermoplastic pipe manufacturer is compliant with AASHTO NTPEP for the diameter of pipe specified in the Contract Documents.

1.06 QUALITY ASSURANCE

- A. Evaluate pipes that show damage such as dents, cuts, cracks, breaks, fractures, or distortions. Recommend appropriate action. ENGINEER may be required CONTRACTOR provide certification by a professional engineer competent in the structural design of the pipe material for action recommended.

PART 2 PRODUCTS

2.01 SMOOTH WALL PIPE SYSTEMS

- A. Material: PE 3408 per ASTM D2239 with a minimum cell classification of 345434C per ASTM D3350.
- B. Pipe: Smooth wall inside and out with an SDR or working pressure rating indicated or accepted by ENGINEER with exterior markings as follows.
 1. ASTM Standard Number.
 2. Pipe Size.
 3. Class and profile number.
 4. Production code.
 5. Standard dimension ratio.
- C. Fittings:
 1. Resin same as pipe.
 2. Working pressure same or greater than pipe.
- D. Joints:
 1. Thermally welded butt fusion, ASTM D3261.
 2. Flanged, ASTM D2657.
 3. Ultra-high molecular weight electro-fusion tape with a polyethylene coupler meeting ASTM F1055 requirements.

2.02 CORRUGATED WALL PIPE SYSTEMS

- A. Material: Polyethylene, ASTM D3350 with a cell class as required in AASHTO M 252, AASHTO M 294 or AASHTO MP7-97.
- B. Pipe: Type S or D unless indicated elsewhere.
- C. Fittings:

1. Blow molded with cell class 335420C, ASTM D3350.
 2. Rotational molded with cell class 213320C, ASTM D3350.
 3. Shop or field remanufactured of the same material as the pipe.
- D. Joints:
1. Bell and spigot with gaskets, ASTM F477. Foam type weather stripping not allowed.
 2. Split corrugated couplings with plastic or stainless steel ties and leak resistant neoprene gasket.

2.03 NUTS AND BOLTS

- A. Carbon steel machined heavy heads, Class 2 fit, ASTM A307; Grade B, threads, ASME B1.1

PART 3 EXECUTION

3.01 INSTALLATION

- A. Assembly: Abide by manufacturer's instructions and the following. Use the more stringent provisions if there are any conflicts.
1. Gravity Systems:
 - a. Under drains and storm drains, Section 33 41 00.
- B. Burial: Comply with Section 33 05 20 and the following. Use the more stringent provisions if there are any conflicts.
1. ASTM D2321 for gravity pipe systems.
 2. Protect ferrous materials with polyethylene sheet that is at least six (6) mil thick. Tape wrap the sheet around the pipe.

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**SECTION 33 4116
SITE STORM UTILITY DRAINAGE PIPING**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Pipe, 75- to 250-mm (3- to 10-in.) Diameter; 2025.
- B. AASHTO M 294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter; 2025.
- C. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2026.
- D. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.
- E. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2020 (Reapproved 2025).
- F. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric); 2020 (Reapproved 2025).
- G. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2025.
- H. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2026.
- I. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).
- J. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2021.

1.02 SUMMARY

- A. Includes But Not Limited To:
 - 1. Perform excavating and backfilling required for work of this Section.
 - 2. Furnish and install storm drainage system using concrete pipe or PVC Polyethylene Pipe and fittings as described in Contract Documents from point of water collection to terminating point.
- B. Related Requirements:
 - 1. Section 31 2316: 'Excavation' for criteria for performance of excavation.
 - 2. Section 31 2323: 'Fill' for criteria for performance of backfill and compaction.

1.03 REFERENCES

- A. Reference Standards:
 - 1. American Association Of State Highway And Transportation Officials:
 - a. AASHTO M 252-18, 'Standard Specification for Corrugated Polyethylene Drainage Pipe'.
 - b. AASHTO M 294-18 'Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter'.
 - 2. ASTM International:
 - a. ASTM A74-17, 'Standard Specification for Cast Iron Soil Pipe and Fittings'.
 - b. ASTM C14-15a, 'Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe'.
 - c. ASTM C14M-15a, 'Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)'.
 - d. ASTM C76-19, 'Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe'.
 - e. ASTM D2321-18, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications'.

- f. ASTM D3034-16, 'Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings'.
- g. ASTM D3212-07(2013), 'Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals'.
- h. ASTM F794-03(2014), 'Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter'.
- i. ASTM F1336-15, 'Standard Specification for Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings'.

PART 2 PRODUCTS

2.01 SYSTEM

- A. Materials:
 - 1. Bedding Material: 3/8 inch crushed gravel.
 - 2. Catch Basins, Curb Inlets, Etc:
 - a. Concrete:
 - 1) Construct of 5000 psi minimum concrete.
 - 2) Include cover inlet with cast iron frame and grate as shown on Drawings.
 - b. PVC:
 - 1) Comply with requirements of ASTM D3212, ASTM F794, and ASTM F1336.
 - 2) Metal grates, Frames, and hoods shall comply with ASTM A536, Grade 70-50-05.
 - 3) Type One Acceptable Products:
 - (a) Nyloplast-ADS, Buford, GA (866) 888-8479. www.nyloplast-us.com.
 - (b) Equal as approved by Architect before bidding. See Section 01 6200.
 - 3. PVC Pipe And Fittings:
 - a. Meet requirements of ASTM D3034, SDR 35.
 - b. Fittings: Slip Joint type with elastomeric seals.
 - 4. Corrugated Polyethylene Pipe And Fittings:
 - a. Meet requirements of AASHTO M 252 or AASHTO M 294, Type S.
 - 1) Corrugated, helical or annular, exterior with smooth interior and gasketed connectors.
 - 2) Corrugated, annular, with silt and watertight joints for storm sewers.
 - 5. Subsurface Stormwater Management.
 - a. Manufacturers:
 - 1) Pipe Systems for use in non-pressure gravity flow storm water collection systems utilizing continuous outfall structure.
 - 2) Type One Acceptable Systems:
 - (a) Landmax Storm Water Management System, Hancor (Retention/Detention) Hancor, Inc. www.hancor.com.
 - (b) Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 EXECUTION

3.01 PREPARATION

- A. Excavate and backfill as specified in Section 31 2316 and Section 31 2323 with following additional requirements:
 - 1. Runs shall be as close as possible to those shown on Contract Documents.
 - 2. Excavate to required depth.
 - 3. Grade to obtain fall required.
 - 4. Remove debris from trench before laying bedding and pipe.
 - 5. Do not cut trenches near footings without consulting Architect.
 - 6. Backfill only after pipe lines have been tested, inspected, and approved by Architect/Engineer.

3.02 INSTALLATION

- A. PVC / Polyethylene Pipe:
 - 1. Install in accordance with ASTM D2321.
 - 2. Minimum cover for corrugated polyethylene pipe and fittings shall be 12 inches for H-20 load.
- B. Use jacks to make-up gasketed joints.

3.03 FIELD QUALITY CONTROL

- A. Non-Conforming Work:
 - 1. Failure to install joints properly shall be cause for rejection and replacement of piping system at no additional cost to Owner.

3.04 CLEANING

- A. Remove excess earth from site or place as directed by Architect.