

PROJECT MANUAL FOR THE

# South Jordan Middle School Parking Lot Addition JSD Project #24KP14

10245 S 2700 W, South Jordan, UT 84095



**JORDAN**  
SCHOOL DISTRICT

7905 S. Redwood Rd., WEST JORDAN, UTAH 84088

**Bid Set January 22, 2024**

Naylor Wentworth Lund Project #136.020



naylor wentworth lund  
a r c h i t e c t s

# South Jordan Middle School Parking Addition/Remodel PROJECT MANUAL INDEX

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# **AMERICAN PUBLIC WORKS ASSOCIATION TECHNICAL SPECIFICATIONS**

## **INCLUSION DOCUMENT**

The Technical Specification and Standard Plan Document that shall govern this Project are listed below:

**American Public Works (APWA)  
Manual of Standard Specifications and Manual of Standard Plans 2017 Edition**

**The American Public Works Association (APWA), Manual of Standard Specifications and Standard Plans (2017 Edition) Documents shall govern this Project as if they were printed and included in their entirety in the Project Manual. They are made a part of this Project by this reference.**

The Divisions listed below are the Divisions that apply to this Project. See the Table of Contents within the Manual for the appropriate Sections within each Division.

**The APWA Manual of Standard Specifications and Plans should be used in the preparation of the Bid for this Project. It is the Bidders responsibility to utilize these Documents and to know and understand them as they apply to this Project and to include in their Bid any costs associated with complying with the provisions provided therein.**

**It shall be required that these Documents be on site at all times during Construction.**

The APWA Manual is available at the following locations which are listed below:

- **For Purchase at:  
Utah LTAP Center  
Utah State University  
8205 Old Main Hill  
Logan, Utah 84322-8205  
Phone Number (800) 822-8878 or (435) 797-2931**

**(End Document)**

**AMERICAN PUBLIC WORKS ASSOCIATION  
TECHNICAL SPECIFICATIONS**

**INCLUSION DOCUMENT**

The Technical Specification and Standard Plan Document that shall govern this Project are listed below:

**South Jordan City**

**South Jordan City Standards and Specifications associate with South Jordan City Public Improvements. They are made a part of this Project by this reference.**

**Plans should be used in the preparation of the Bid for this Project. It is the Bidders responsibility to utilize these Documents and to know and understand them as they apply to this Project and to include in their Bid any costs associated with complying with the provisions provided therein.**

**It shall be required that these Documents be on site at all times during Construction.**

**(End Document)**

**OWNER**

Name: Jordan School District  
Attention: Ian Roberts  
Address: 7905 South Redwood Road, West Jordan, Utah 84084  
Phone: (801) 567-8701

**ARCHITECT**

Name: Naylor Wentworth Lund Architects  
Attention: Richard Judkins, AIA  
Address: 723 West Pacific Ave #101, Salt Lake City, Utah 84104  
Phone: (801) 355-5959

**CIVIL ENGINEER**

Name: Ensign Engineers  
Attention: Brent Morgan  
Address: 45 Sego Lily Drive, Ste 500, Sandy, Utah 84070  
Phone (801) 255-0529

**ELECTRICAL ENGINEER**

Name: BNA Consulting Engineers  
Attention: Drayton Bailey  
Address: 4224 Lake Park Blvd., Ste 275, West Valley City, Utah 84120  
Phone: (801) 523-2196

**LANDSCAPE DESIGNER**

Name: ArcSitio Design, Inc.  
Attention: Richard Gilbert  
Address: 1058 E 2100 S, Salt Lake City, Utah 84106  
Phone: (801) 487-4923

**END OF SECTION 00 0103**

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SECTION 00 0104

NOTICE TO CONTRACTORS

**1.01 SALES TAX**

- A. Beginning January 1, 1996, the State of Utah provided an exemption from sales tax for construction materials purchased for public education. The exemption applies to all construction materials purchased by or on behalf of institutions of the public education system, provided the construction materials are clearly identified and installed or converted to real property which is owned by the public education institution.
- B. It is the intent of the Owner to take advantage of the tax exemption on all construction material used in the WJHS Parking Lots Replacement. The Owner can take advantage of this exemption by structuring its agreements with its Contractors and suppliers so that title to construction material passes from the supplier to the Owner or the Contractor (on behalf of the Owner) upon delivery to the construction site after this date.

**1.02 COMPLIANCE WITH LABOR LAWS**

- A. All Contractors shall comply with all applicable Laws and Regulations relating to labor on Public Works in the State of Utah, including *U.S. Code Title 8 USC Sec.1324a. Utah Code Title 34 Chapter 30 and Title 13 Chapter 47.*
- B. Specific References
  - 1. The following references are included herein so that the Contractor shall be aware of specific requirements of these sections. Other Law sections are not shown herein, but this in no way relieves the Contractor of His obligation to comply with all Federal, State, and Local Labor Laws.
    - a. ***U.S. Code Title 8 USC Sec. 1324a Unlawful Employment*** (1)(A) It is unlawful for a person or other entity - to hire, or to recruit or refer for a fee, for employment in the United States an alien knowing the alien is an unauthorized alien. (2) ***Continuing Employment*** - It is unlawful for a person or other entity, after hiring an alien for employment in accordance with paragraph (1) to continue to employ the alien in the United States knowing the alien is (or has become) an unauthorized alien with respect to such employment. (4) ***Use of Labor Through Contract*** - For purposes of this section, a person or other entity who uses a contract, subcontract, or exchange, entered into, renegotiated, or extended after November 6, 1986, to obtain the labor of an alien in the United States knowing that the alien is an unauthorized alien (as defined in subsection (h)(3) of this section) with respect to performing such labor, shall be considered to have hired the alien for employment in the United States in violation of paragraph (1)(A).
    - b. ***Ut Code 34-30-1. Citizens to be given preference*** - In employing workmen in the construction of public works by the state or any county or municipality, **or by persons contracting with** the state or any county or municipality, preferences shall be given citizens of the United States, or those having declared their intention of becoming citizens. In each contract for the construction of public works a provision shall be inserted to the effect that, if the provisions of this section are not complied with, **the contract shall be void.**

- c. **Ut Code 34-30-8. Forty-hour Work Week** - Overtime at one and one-half regular rate. Forty hours shall constitute a working week on all works and undertakings carried on by the state, county, or municipal governments, or by any officer of the state or of any county or municipal government. Any persons, corporation, firm, contractor, agent, manager, or foreman, who shall require or contract with any person to work upon such works or undertakings longer than 40 hours in one week shall pay such employees at a rate not less than one and one-half times the regular rate at which he is employed. (Piece work rates have to be greater than or equal to minimum wage and one and one-half times minimum wage for hours worked over 40; minimum wage laws still apply.)
- d. **Ut Code 34-30-9. Violation of Chapter** - Failure to keep or produce records - Misdemeanor. Any officer, agent or representative of the state, or of any political subdivision, district, or municipality of it who shall violate, or omit to comply with any of the provisions of this chapter, and any contractor or subcontractor, or agent or representative thereof, doing such public work, who shall neglect to keep, or cause to be kept, an accurate record of the names, occupation and actual wages paid to each laborer, workman and mechanic employed by him, in connection with this public work or who shall refuse to allow access to same at any reasonable hour to any person authorized to inspect same under this chapter shall be guilty of a misdemeanor.
- e. **Ut Code 13-47-201. Verification required for new hires.** (1) A private employer who employs 15 or more employees as of July 1, 2010, may not hire a new employee on or after July 1, 2010, unless the private employer: (a) is registered with the status verification system to verify the federal legal working status of any new employee; and (b) uses the status verification system to verify the federal legal working status of the new employee in accordance with the requirements of the status verification system. (2) This section does not apply to a private employer of a foreign national if the foreign national holds a visa issued in response to a petition by the private employer that is classified as H-2A or H-2B.

### 1.03 EMPLOYEE DRUG TESTING

- A. Effective July 1, 2010, a state public procurement unit may not enter into a state construction contract unless the contractor has and will maintain a drug and alcohol testing policy during the period of the state construction contract that applies to the covered individuals hired by the contractor. Refer to Utah Code - Title 63G, Chapter 6, Section 604: **(63G-6-604: Drug and alcohol testing required for state construction contracts)**. Therefore, the successful Contractor and all subcontractors working on the WJHS Parking Lots Replacement must show that they have a mandatory drug and alcohol testing policy for their company.

### 1.04 SUBSTANTIAL COMPLETION TIME

- A. It is agreed by the parties to the contract that if the contractor shall fail to complete his work on or before the date set for substantial completion, or extension thereof granted by the owner, damage will be sustained by the owner and that it is, and will be, impracticable and extremely difficult to fix the actual damage with the owner will sustain in the event of and by reason of such delays. It is, therefore, agreed that the contractor will pay the owner **liquidated damages** in the sum of \$1000 per calendar day, for each day the contractor shall be in default. The contractor agrees that any sums which; may be due the owner as liquidated damages, may be deducted from any monies due, or to become due, the contractor under the contract or may be collected from the contractor's surety.
  - 1. Refer to Owner's bid platform solicitation for the date of substantial completion.

### 1.05 MANUFACTURERS AND PRODUCTS

- A. This specification was prepared under the direction of the Owner with regard to adhering to their established standards. Although the items are the Owner's preferred choice, suppliers may bid other manufacturers as proposed substitutions for the Owner's review. The use of brand names in this specification manual is not intended to limit bidding competition, but to establish a level of quality, performance and characteristics desired.
- B. **Deadline for Proposed Substitution Requests will be 72 hours prior to Bid Date/Time. Refer to Section 01 6000 - Product Requirements.**
- C. Note that substitutions for specified/approved products/manufacturers **will not** be reviewed if submitted as a part of submittal process.
- D. Manufacturer's other than Basis of Design Manufacturers shall provide products or systems that meet or exceed Basis of Design products or systems. No change order shall be issued solely based on bid product or system not meeting Basis of Design and being rejected through submittal process.

### 1.06 PRE-BID WALK THROUGH

- A. The Owner will be conducting a pre-bid walk through tour, to review existing conditions and accept questions for bidding purposes.
  - 1. Date of walk through: Refer to the Owner's bid platform solicitation for the date of the walk through.

### END OF NOTICE TO CONTRACTORS

**SECTION 00 1050**

**ADVERTISEMENT FOR BIDS**

**1.01 BID PROPOSALS**

- A. Bids will be received as listed on Owner's bid platform website.

**1.02 OWNER**

- A. Name: Jordan School District
- B. Address: 7905 S. Redwood Road, West Jordan, Utah 84088

**1.03 PROJECT**

- A. Name: South Jordan Middle School Parking Lot Addition/Remodel
- B. Address: 10245 S 2700 W, South Jordan, Utah
- C. Project Description:
  - 1. Refer to Section 01 1000 for Summary of Work.

**1.04 ARCHITECT**

- A. Naylor Wentworth Lund Architects
- B. 723 West Pacific Ave #101, Salt Lake City, Utah 84104

**1.05 BID FORM**

- A. Bids will be submitted through Owner's bid platform website.

**1.06 PERFORMANCE AND PAYMENT BONDS**

- A. The successful bidder shall be required to furnish the Owner with the following:
  - 1. AIA Documents A312 - Performance Bond and Payment Bond, each to the amount of 100 percent of the contract amount.

**1.07 CONTRACTOR'S LIABILITY INSURANCE**

- A. Refer to Section 00 7300 - Supplementary General Conditions.
- B. Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work. These certificates and the insurance policies required by this paragraph shall contain a provision that coverages afforded under the policies will not be cancelled or allowed to expire until at least 30 days after written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.
- C. The Insurance Policy shall hold harmless the Owner and the Architect.

**1.08 PRE-BID WALK THROUGH**

- A. The Owner will conduct a pre-bid walk through tour to review existing conditions and accept questions for bidding purposes.
  - 1. Refer to Owner's bid platform website for date of walk through.

# DRAFT AIA® Document A701® - 2018

## Instructions to Bidders

for the following Project:

(Name, location, and detailed description)

«South Jordan Middle School Parking Lot Addition and Remodel»  
«10245 South 2700 West  
South Jordan, UT 84095»  
«↔»

### THE OWNER:

(Name, legal status, address, and other information)

«Jordan School District»«↔»  
«7905 S. Redwood Road  
West Jordan, UT 84088»  
«↔»  
«↔»

### THE ARCHITECT:

(Name, legal status, address, and other information)

«Naylor Wentworth Lund Architects»«↔»  
«723 W. Pacific Ave, Suite 101»  
«Salt Lake City, UT 84104»  
«↔»

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

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

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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## ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)*

« »

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper

documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

### § 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids. *(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)*

« »

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

### § 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

#### § 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

**§ 3.4 Addenda**

**§ 3.4.1** Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)*

« »

**§ 3.4.2** Addenda will be available where Bidding Documents are on file.

**§ 3.4.3** Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

**§ 3.4.4** Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

**ARTICLE 4 BIDDING PROCEDURES**

**§ 4.1 Preparation of Bids**

**§ 4.1.1** Bids shall be submitted on the forms included with or identified in the Bidding Documents.

**§ 4.1.2** All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

**§ 4.1.3** Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

**§ 4.1.4** Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

**§ 4.1.5** All requested Alternates shall be bid. If no change in the Base Bid is required, enter “No Change” or as required by the bid form.

**§ 4.1.6** Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder’s refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

**§ 4.1.7** Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent’s authority to bind the Bidder.

**§ 4.1.8** A Bidder shall incur all costs associated with the preparation of its Bid.

**§ 4.2 Bid Security**

**§ 4.2.1** Each Bid shall be accompanied by the following bid security:

*(Insert the form and amount of bid security.)*

« »

**§ 4.2.2** The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

**§ 4.2.3** If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall



affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning « » days after the opening of Bids, withdraw its Bid and request the return of its bid security.

### § 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

*(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)*

« »

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

### § 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

*(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)*

« »

## ARTICLE 5 CONSIDERATION OF BIDS

### § 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

### § 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

### **§ 5.3 Acceptance of Bid (Award)**

**§ 5.3.1** It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

**§ 5.3.2** Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **ARTICLE 6 POST-BID INFORMATION**

### **§ 6.1 Contractor's Qualification Statement**

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

### **§ 6.2 Owner's Financial Capability**

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

### **§ 6.3 Submittals**

**§ 6.3.1** After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

**§ 6.3.2** The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

**§ 6.3.3** Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

**§ 6.3.4** Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

## **ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND**

### **§ 7.1 Bond Requirements**

**§ 7.1.1** If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

**§ 7.1.2** If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

*(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)*

« »

**§ 7.2 Time of Delivery and Form of Bonds**

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

**ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS**

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*

« »

- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*

« »

- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*

« »

- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
*(Insert the date of the E203-2013.)*

« »

- .5 Drawings

Number	Title	Date

- .6 Specifications

Section	Title	Date	Pages

.7 Addenda:

Number	Date	Pages

.8 Other Exhibits:

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

[  ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:  
*(Insert the date of the E204-2017.)*

[  ] The Sustainability Plan:

Title	Date	Pages

[  ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents listed below:

*(List here any additional documents that are intended to form part of the Proposed Contract Documents.)*

**1.09 COMPLETION TIME**

- A. It is agreed by the parties to the contract that if the Contractor shall fail to complete his work on or before the date set for substantial completion, or extension thereof granted by the Owner, damage will be sustained by the Owner and that it is, and will be, impracticable and extremely difficult to fix the actual damage with the Owner will sustain in the event of and by reason of such delays. It is, therefore, agreed that the Contractor will pay the Owner liquidated damages in the sum of \$1000 per calendar day, for each day the Contractor shall be in default. The Contractor agrees that any sums which; may be due the Owner as liquidated damages, may be deducted from any monies due, or to become due, the Contractor under the contract or may be collected from the Contractor's Surety.

1. Refer to Owner's bid platform website for date of Substantial Completion.

**1.10 DRAWINGS AND SPECIFICATIONS**

- A. Can be obtained from the Owner's bid platform website.

**END OF ADVERTISEMENT FOR BIDS**

**SUPPLEMENTARY INSTRUCTIONS TO BIDDERS**

**THE PROVISIONS CONTAINED HEREIN SHALL DELETE, MODIFY AND SUPPLEMENT THE PROVISIONS CONTAINED IN THE INSTRUCTIONS TO BIDDERS, AIA DOCUMENT A701, 2018 EDITION. WHERE A PORTION OF THE INSTRUCTIONS TO BIDDERS IS MODIFIED OR DELETED BY THESE SUPPLEMENTARY INSTRUCTIONS, THE REMAINING UNALTERED PORTIONS OF THE INSTRUCTIONS TO BIDDERS SHALL REMAIN IN AS IS.**

**ARTICLE 2 BIDDER'S REPRESENTATIONS**

2.1 Bidder's Representations

Add New Subparagraph 2.1.5 as follows:

2.1.5 This bid has been arrived at independently, without consultation, communication or agreement as to any matter relating to this bid with any other bidder or with any competitor.

**ARTICLE 3 BIDDING DOCUMENTS**

3.2 Interpretation or Correction of Bidding Documents

Add New Sentence to Subparagraph 3.2.2 as follows:

3.2.2 After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the Work to be done.

3.2.4 Should discrepancies or conflicts appear in the drawings or specifications which are not cleared up by the addenda, it will be assumed that the Contractor or Subcontractor has bid the project using the most expensive method shown on the drawings and as well as the most expensive material in the specifications.

3.2.5 It shall be the responsibility of each bidder to ascertain that he is in possession of a complete set of Contract Documents by comparing page numbers against indexes. Each bidder is responsible to review all Construction Documents such as drawings, specifications, addenda, etc.

3.3 Substitutions

Add New Subparagraph 3.3.2.1 as follows:

3.3.2.1 Unless listed in the Project Manual as an accepted substitution in specific section, amount for substitution whether addition or deduction from Base Bid amount shall be shown on the Bid Form where indicated.

1) Requests for Substitutons during the bidding period: Refer to Section 01 6000 Product Requirements

3.4 Addenda

Modify Subparagraph 3.4.1 as follows:

3.4.1 Addenda will posted on the Owner's bid platform website.

Omit Subparagraph 3.4.3 in its entirety.

**ARTICLE 4 BIDDING PROCEDURES**

4.1 Preparation of Bids

Modify Subparagraph 4.1.1 as follows:

4.1.1 Bids shall be submitted on forms identical to the forms included with the bidding documents. Only one copy of the bid is to be submitted.

Add New Subparagraph 4.1.8 as follows:

4.1.8 Beginning January 1, 1996, the State of Utah provided an exemption from sales tax for construction materials purchased for public education. The exemption applies to all construction materials purchased by or on behalf of institutions of the public education system, provided the construction materials are clearly identified and installed or converted to real property which is owned by the public education institution. It is the intent of the Jordan School District to take advantage of the tax exemption on all construction material used in the Project. The School District can take advantage of this exemption by structuring its agreements with its Contractor and Suppliers so that title to construction material passes from the supplier to the School District or the Contractor (on behalf of the School District) upon delivery to the construction site after January 1, 1996.

**4.2 Bid Security**

Add New Subparagraph 4.2.4 as follows:

4.2.4 Each bid shall be accompanied by a Certified or Cashier's Check or Bid Bond (AIA Document A310) for five percent (5%) of the amount of the bid, made payable to the order of Board of Education, Jordan School District. The check or bond shall be in the form shown in the specifications and to be given as a guarantee that the bidder will enter into the contract if awarded to him and will be declared forfeited if the successful bidder refuses to enter into said contract after being requested to do so by the said board within a period of sixty (60) days.

**4.3 Submission of Bids**

Add new Subparagraph 4.3.5 as follows:

4.3.5 All applicable laws, ordinances, and the rules and regulations of all Authorities Having Jurisdiction over construction of the Project shall apply to the Contract through-out.

**4.4 Modification or Withdrawal of Bid**

Modify Subparagraph 4.4.1 as follows:

4.4.1 No bidder may withdraw a bid within 60 days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

**ARTICLE 5 CONSIDERATION OF BIDS**

**5.2 Rejection of Bids**

Add new Subparagraph 5.2.2 as follows:

5.2.2 The General Contractor may make such investigations as deemed necessary to determine the ability of the bidder to perform the Work and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of such bidder, fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the agreement and to complete the Work contemplated therein.

**5.3 Acceptance of Bids (Award)**

Substitute the words "minor defects" for the word "irregularities" in Subparagraph 5.3.1.

Modify Subparagraph 5.3.2 as follows:

5.3.2 The owner shall have the right to accept alternates in the sequence listed and to determine the low bidder on the basis of the sum of the base bid and the alternates accepted.

**ARTICLE 7 PERFORMANCE AND PAYMENT BOND**

**7.1 Bond Requirements**

Modify Subparagraph 7.1.1 as follows:

7.1.1 Prior to execution of the Contract, the bidder shall furnish bonds covering the faithful performance of the Contract and the payments of all obligations arising there under in such form and amount as the Owner may prescribe.

**7.2 Time of Delivery and Form of Bonds**

Modify Subparagraph 7.2.1 as follows:

7.2.1 The party to whom the Contract is awarded will be required to execute the agreement within ten (10) calendar days from the date when Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary agreement and bond forms.

**ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

Modify existing Paragraph as follows:

Contractors shall be aware that the agreement for the work shall be written as a change order to the General Contractor's contract and they will be bound to their requirements for schedule, payments, etc.

**END OF SUPPLEMENTARY INSTRUCTIONS TO BIDDERS**





# AIA<sup>®</sup> Document A101<sup>™</sup> – 2017

## *Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum*

AGREEMENT made as of the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_  
(In words, indicate day, month and year.)

BETWEEN the Owner:  
(Name, legal status, address and other information)

and the Contractor:  
(Name, legal status, address and other information)

for the following Project:  
(Name, location and detailed description)

The Architect:  
(Name, legal status, address and other information)

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

The parties should complete A101<sup>™</sup>-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement.

AIA Document A201<sup>™</sup>-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

The Owner and Contractor agree as follows.

Init.

## TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

## EXHIBIT A INSURANCE AND BONDS

### ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

### ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

### ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

*(Check one of the following boxes.)*

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

#### § 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

*(Check one of the following boxes and complete the necessary information.)*

- Not later than ( ) calendar days from the date of commencement of the Work.

By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
-----------------	-----------------------------

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

#### ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ( \$ ), subject to additions and deductions as provided in the Contract Documents.

#### § 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
------	-------	---------------------------

§ 4.3 Allowances, if any, included in the Contract Sum:  
(Identify each allowance.)

Item	Price
------	-------

§ 4.4 Unit prices, if any:  
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
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§ 4.5 Liquidated damages, if any:  
(Insert terms and conditions for liquidated damages, if any.)

§ 4.6 Other:  
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the        day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the        day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than        (    ) days after the Architect receives the Application for Payment.

*(Federal, state or local laws may require payment within a certain period of time.)*

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

### § 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

§ 5.1.7.1.1 The following items are not subject to retainage:  
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:  
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:  
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

## § 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

## § 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

\_\_\_\_\_ % \_\_\_\_\_

## ARTICLE 6 DISPUTE RESOLUTION

### § 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

## § 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

- Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- Litigation in a court of competent jurisdiction
- Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

## ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

## ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

*(Name, address, email address, and other information)*

§ 8.3 The Contractor’s representative:

*(Name, address, email address, and other information)*

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

*(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
*(Insert the date of the E203-2013 incorporated into this Agreement.)*

.5 Drawings

Number	Title	Date
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.6 Specifications

Section	Title	Date	Pages
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.7 Addenda, if any:

Number	Date	Pages
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Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

- AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:  
*(Insert the date of the E204-2017 incorporated into this Agreement.)*

The Sustainability Plan:

Title	Date	Pages
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Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents, if any, listed below:

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

This Agreement entered into as of the day and year first written above.

\_\_\_\_\_  
OWNER (Signature)

\_\_\_\_\_  
CONTRACTOR (Signature)

\_\_\_\_\_  
(Printed name and title)

\_\_\_\_\_  
(Printed name and title)





# AIA Document A101™ – 2017 Exhibit A

## Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_

*(In words, indicate day, month and year.)*

for the following PROJECT:

*(Name and location or address)*

THE OWNER:

*(Name, legal status and address)*

THE CONTRACTOR:

*(Name, legal status and address)*

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

This document is intended to be used in conjunction with AIA Document A201™–2017, General Conditions of the Contract for Construction. Article 11 of A201™–2017 contains additional insurance provisions.

### TABLE OF ARTICLES

- A.1 GENERAL
- A.2 OWNER’S INSURANCE
- A.3 CONTRACTOR’S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

#### ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

#### ARTICLE A.2 OWNER’S INSURANCE

##### § A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor’s request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

##### § A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner’s usual general liability insurance.

##### § A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk “all-risks” completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner’s

property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

**§ A.2.3.1.1 Causes of Loss.** The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

*(Indicate below the cause of loss and any applicable sub-limit.)*

Cause of Loss	Sub-Limit
---------------	-----------

**§ A.2.3.1.2 Specific Required Coverages.** The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

Coverage	Sub-Limit
----------	-----------

**§ A.2.3.1.3** Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

**§ A.2.3.1.4 Deductibles and Self-Insured Retentions.** If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

**§ A.2.3.2 Occupancy or Use Prior to Substantial Completion.** The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

**§ A.2.3.3 Insurance for Existing Structures**

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

**§ A.2.4 Optional Extended Property Insurance.**

The Owner shall purchase and maintain the insurance selected and described below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)*

- § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.
- § A.2.4.2 Ordinance or Law Insurance, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.
- § A.2.4.3 Expediting Cost Insurance, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.
- § A.2.4.4 Extra Expense Insurance, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.
- § A.2.4.5 Civil Authority Insurance, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.
- § A.2.4.6 Ingress/Egress Insurance, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.
- § A.2.4.7 Soft Costs Insurance, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

#### § A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)*

- § A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information.  
*(Indicate applicable limits of coverage or other conditions in the fill point below.)*

- § A.2.5.2 Other Insurance  
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage

Limits

## ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

### § A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

### § A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

*(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

### § A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than \_\_\_\_\_ ( \$ ) each occurrence, \_\_\_\_\_ ( \$ ) general aggregate, and \_\_\_\_\_ ( \$ ) aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to, or destruction of, tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the work involves such hazards.
- .11 Claims related to explosion, collapse, and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than \_\_\_\_\_ ( \$\_\_ ) each accident, \_\_\_\_\_ ( \$\_\_ ) each employee, and \_\_\_\_\_ ( \$\_\_ ) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

*(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)*

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

*(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)*

- § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below.

*(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

- § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate, for Work within fifty (50) feet of railroad property.
- § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than \_\_\_\_\_ ( \$\_\_ ) per claim and \_\_\_\_\_ ( \$\_\_ ) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.
- § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.
- § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.
- § A.3.3.2.6 Other Insurance  
*(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)*

Coverage

Limits

**§ A.3.4 Performance Bond and Payment Bond**

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:

*(Specify type and penal sum of bonds.)*

Type	Penal Sum (\$0.00)
Payment Bond	
Performance Bond	

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

**ARTICLE A.4 SPECIAL TERMS AND CONDITIONS**

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

Sample



**AIA**<sup>®</sup>

# Document A310<sup>™</sup> – 2010

## Bid Bond

**CONTRACTOR:**  
*(Name, legal status and address)*

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

**OWNER:**  
*(Name, legal status and address)*

**BOND AMOUNT:**

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

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

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

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

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

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

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
*(Contractor as Principal)* *(Seal)*  
*(Witness)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Surety)* *(Seal)*  
*(Witness)*

\_\_\_\_\_  
*(Title)*

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**





**AIA**<sup>®</sup>

# Document A312<sup>™</sup> – 2010

## Payment Bond

**CONTRACTOR:**  
*(Name, legal status and address)*

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

**OWNER:**  
*(Name, legal status and address)*

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

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

**CONSTRUCTION CONTRACT**  
Date:

Amount:

Description:  
*(Name and location)*

**BOND**  
Date:  
*(Not earlier than Construction Contract Date)*

Amount:

Modifications to this Bond:     None     See Section 18

**CONTRACTOR AS PRINCIPAL**                      **SURETY**  
Company:                      *(Corporate Seal)*    Company:                      *(Corporate Seal)*

Signature: \_\_\_\_\_                      Signature: \_\_\_\_\_  
Name    Name  
and Title:    and Title:  
*(Any additional signatures appear on the last page of this Payment Bond.)*

*(FOR INFORMATION ONLY — Name, address and telephone)*  
**AGENT or BROKER:**                      **OWNER'S REPRESENTATIVE:**  
*(Architect, Engineer or other party:)*

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

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

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### § 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

Sample

*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

CONTRACTOR AS PRINCIPAL

SURETY

Company:

*(Corporate Seal)*

Company:

*(Corporate Seal)*

Signature: \_\_\_\_\_

Name and Title:

Address

Signature: \_\_\_\_\_

Name and Title:

Address



# AIA Document A201® – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:  
*(Name and location or address)*

THE OWNER:  
*(Name, legal status and address)*

THE ARCHITECT:  
*(Name, legal status and address)*

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

#### § 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

#### § 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

#### § 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### § 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

#### § 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### § 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### § 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

### § 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining

provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

**§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.**

**§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.**

### **§ 1.3 Capitalization**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

### **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

### **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

### **§ 1.8 Building Information Models Use and Reliance**

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building

information model, and each of their agents and employees.

## ARTICLE 2 OWNER

### § 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

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

### § 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### § 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the

site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

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

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

#### § 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

#### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

#### § 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's



capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

### § 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### § 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes

remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### § 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

### § 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### § 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

- 3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### § 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### § 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### § 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

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

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the

time and in the form specified by the Architect.

### § 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

### § 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### § 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

### § 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

### § 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

### § 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

### § 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### § 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under

Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### § 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the

Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

### § 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

### § 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

## ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

### § 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate



Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

## § 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

## § 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### § 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

### § 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The

Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

### ARTICLE 8 TIME

#### § 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

#### § 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

#### § 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

### ARTICLE 9 PAYMENTS AND COMPLETION

#### § 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable

by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

## § 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

## § 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

## § 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The

foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

### § 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

### § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers

to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

#### § 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

#### § 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

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

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

#### § 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

#### § 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not

constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

### § 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.



### § 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

### § 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

### § 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

## ARTICLE 11 INSURANCE AND BONDS

### § 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the

endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

## § 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

## § 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The

Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

#### § 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

#### § 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

### ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

#### § 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

#### § 12.2 Correction of Work

##### § 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the

Contractor's expense.

### § 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### § 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

### § 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

### § 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

### § 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

## § 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

## § 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

#### § 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

### ARTICLE 15 CLAIMS AND DISPUTES

#### § 15.1 Claims

##### § 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

##### § 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

##### § 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

##### § 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

##### § 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

##### § 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section

15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

#### § 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

#### § 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.



§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### § 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly

consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**§ 15.4.4 Consolidation or Joinder**

**§ 15.4.4.1** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 15.4.4.2** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

Sample

**ARCHITECT'S SUPPLEMENTARY GENERAL CONDITIONS**

**THE FOLLOWING SUPPLEMENTS MODIFY THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, AIA DOCUMENT A201, 2017 EDITION. WHERE A PORTION OF THE GENERAL CONDITIONS IS MODIFIED OR DELETED BY THESE SUPPLEMENTARY CONDITIONS, THE REMAINING UNALTERED PORTIONS OF THE GENERAL CONDITIONS SHALL REMAIN IN AS IS.**

**ARTICLE 1 GENERAL PROVISIONS**

1.1 Basic Definitions

Add to Subparagraph 1.1.4 - The Project as follows:

1.1.4 The project is more completely defined under Section 01 1000, Summary of the Work.

1.2 Correlation and Intent of the Contract Documents

Add to Subparagraph 1.2.1 as follows:

1.2.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

- 1) The Agreement.
- 2) Addenda, with those of later date having precedence over those of earlier date.
- 3) The Supplementary Conditions.
- 4) The General Conditions of the Contract for Construction.
- 5) Drawings and Specifications.

In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

The Contractor shall not 'scale' the Contract Document drawings to define dimensions or locations of building walls, columns, etc. Review dimensioned drawings to define required locations, if not indicated, coordinate and review with the Architect prior to continuing construction.

Add new Subparagraph 1.2.4 as follows:

1.2.4 The omission of minor details of construction, installation, material or other essential items of usual or standard construction from the drawings or specifications shall not relieve the Contractor from furnishing the same in place complete. Such omission shall not entitle this Contractor to make claims for extras on material or labor.

**ARTICLE 2 OWNER**

2.2 Information and Services Required of the Owner

Delete Subparagraph 2.2.5. and substitute the following:

2.2.5 The Architect will furnish to the General Contractor a complete set of electronic format construction documents (drawings and specifications) for the project. It will then be the General Contractors responsibility to distribute said documents, either electronic or hard copy to his Subcontractors that will be necessary for the execution of the work.

**ARTICLE 3 CONTRACTOR**

3.6 Taxes

Delete Subparagraph 3.6.1 and substitute the following:

3.6.1 Beginning January 1, 1996, the State of Utah provided an exemption from sales tax for construction materials purchased for public education. The exemption applies to all construction materials purchased by or on behalf of institutions of the public education system, provided the construction materials are clearly identified and installed or converted to real property which is owned by the public education institution. It is the intent of the Owner to take advantage of the tax exemption on all construction material used in the WJHS Parking Lots Replacement. The Owner can take advantage of this exemption by structuring its agreements with its Contractor and suppliers so that title to construction material passes from the supplier to the Owner or the Contractor (on behalf of the Owner) upon delivery to the construction site after January 1, 1996. Tax exempt form TC-721 must be used by the vendors when purchasing construction materials. The Owner will provide a Form TC-721, signed by the Owner Director of Purchasing, or designee, authorizing the exemption of sales tax on material purchases for the Contractor's use in purchasing materials. Refer to State Tax Commission, Publication 35, Rev. 6/96 or Tax Bulletin 16-96.

### 3.7 Permits, Fees, Notices and Compliance with Laws

Delete Subparagraph 3.7.1 and substitute the following:

3.7.1 The Contractor shall secure and the Owner shall pay for any permits, fees and inspections required by work included in this Contract. All licensing shall be secured and paid for by the Contractor.

Modify Subparagraph 3.7.4 as follows:

3.7.4 Three (3) days in lieu of twenty-one (21) days.

Modify Subparagraph 3.7.5 as follows:

3.7.5 Amend the first sentence in this subparagraph to read, "If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, wetlands or hazardous waste deposits not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect."

### 3.8 Allowances

Modify Subparagraph 3.8.2.1 as follows:

.1 Allowances shall cover the total cost to the Contractor of materials and equipment delivered to the site, labor, installation costs, overhead and profit, other expenses contemplated, and all required taxes (if any) less applicable trade discounts.

Omit Subparagraph 3.8.2.2.

No changes to Subparagraph 3.8.2.3.

Add Subparagraph 3.8.2.4 as follows:

.4 At closeout of contract, funds remaining in Contingency Allowance will be credited to the Owner by Change Order.

### 3.10 Contractor's Construction Schedules

Modify Subparagraph 3.9.1 as follows:

3.10.1 In the first sentence change the word "promptly" to "within seven days of Owner/Architect acceptance of Subcontractor List".

Add new Subparagraph 3.9.1.1 as follows:

.1 The Contractor shall show this information in the form of either C.P.M. or bar graph.

Modify Subparagraph 3.9.2 as follows:

3.10.2 In the first sentence change the word "promptly" to "within seven (7) days of Owner/Architect acceptance of Subcontractor List".

3.10.2 Substitute the words, "Architect's Review," for "Architect's Approval," in this paragraph.

**3.11 Documents and Samples at the Site**

Add new Subparagraph 3.11.1 as follows:

3.11.1 The Contractor shall also be responsible for providing a work table and dedicated set of documents with addenda, change orders, etc. for use only by the special inspector.

**3.12 Shop Drawings, Product Data and Samples**

Modify Subparagraph 3.12.8 as follows:

3.12.8 Substitute the words, "Architect's Review," for "Architect's Approval," in this paragraph.

**ARTICLE 4 ARCHITECT**

**4.2 Administration of the Contract**

Modify Subparagraph 4.2.7 as follows:

4.2.7 Omit the words, "and approve" and add "and review" in the first sentence in this subparagraph.

4.2.7 Amend the last sentence in this subparagraph to read, "The Architect's review of a specific item shall not indicate approval of the item or the assembly of which the item is a component."

**ARTICLE 5 SUBCONTRACTORS**

**5.2 Award of Subcontracts and other Contracts for Portions of the Work**

Revise Subparagraph 5.2.1 as follows:

5.2.1 No later than twenty-four (24) hours after the date of commencement, the Contractor shall furnish in writing to the Owner, through the Architect, the names of persons or entities proposed as manufacturers for each of the products identified in the General Requirements (Division 1 of the Specifications) and, where applicable, the name of the installing Subcontractor. Coordinate with Section 9.2.

Modify Subparagraph 5.2.4 as follows:

5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected without written notification and acceptance of the Owner and Architect.

**ARTICLE 6**

**CONSTRUCTION BY THE OWNER OR BY SEPARATE CONTRACTORS**

No modifications.

**ARTICLE 7 CHANGES IN THE WORK**

**7.3 Construction Change Directives**

Add new Subparagraph 7.3.7.6 as follows:

7.3.7.6 Refer to Section 01 2000 - Price and Payment Procedures, for allowed profit and overhead.

**ARTICLE 8 TIME**

**8.2 Progress and Completion**

Add new Subparagraph 8.2.4 as follows:

8.2.4 Substantial completion of the Work shall be achieved as stipulated on Owner's bid platform and in Owner/Contractor Agreement..

## ARTICLE 9 PAYMENTS AND COMPLETION

### 9.3 Applications for Payment

Add the following sentence to Subparagraph 9.3.1:

9.3.1 The form of Application for Payment shall be notarized AIA Documents G702 Application and Certificate for Payment and G703 Continuation Sheet.

Add new Subparagraph 9.3.1.3 as follows:

9.3.1.3 Until the Work is one hundred percent (100%) complete, the Owner shall pay ninety-five percent (95%) of the amount due the Contractor on account of progress payments.

### 9.6 Progress Payments

Modify Subparagraph 9.6.1 to read as follows:

9.6.1 Notice of extended payment provision. Application and certification for payment received by the fifth day of the month shall be reviewed and accepted or rejected by the tenth day of the month.

This Contract shall allow the Owner to make payment within thirty (30) days after acceptance of billings.

Delete Subparagraph 9.6.7 and substitute the following:

9.6.7 Upon the written request of the Contractor, made within ten days after the execution of the Contract. An escrow account shall be established in a financial institution chosen by the Contractor and approved by the Owner.

Add new Subparagraphs 9.6.8 through 9.6.12 as follows:

9.6.8 The escrow agreement shall provide that the financial institution will act as escrow agent, will pay interest on funds deposited in such account in accordance with the provisions of the escrow agreement and will disburse funds from the account upon the direction of the Owner as set forth below. Compensation to the escrow agent for establishing and maintaining the escrow account shall be paid from interest accrued in the escrow account.

9.6.9 As each progress payment is made, the retainage with respect to that payment shall be deposited by the Owner in the escrow account.

9.6.10 The interest earned on funds in the account shall accrue for the benefit of the Contractor until the completion date named in the Construction Contract or the expiration of any authorized extension of such date. Interest earned after such date shall accrue for the benefit of the Owner. Cost of compensation to the escrow agent paid out of interest earned shall be borne by the Contractor.

9.6.11 When the Contractor has fulfilled all of the requirements of the Contract providing for the reduction of retained funds, the escrow agent shall release to the Contractor one-half of the accrued funds but none of the interest thereon. When the Work has been fully completed in a satisfactory manner and the Architect has issued a final Certificate for Payment, the escrow agent shall pay to the Contractor the full amount of funds remaining in the account, including net balance of the interest paid to the account, less any interest that may have accrued for the benefit of the Owner, which thereupon shall be paid to the Owner.

9.6.12 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor, the escrow agent shall make payment to the Contractor as provided in Subparagraph 9.10.3.

### 9.8 Substantial Completion

Add the following sentence to Subparagraph 9.8.5:

9.8.5 The payment shall be sufficient to increase the total payments to 100 percent of the Contract Sum, less such amounts the Architect shall determine for incomplete Work and unsettled claims.

**ADD NEW PARAGRAPH 9.11 AS FOLLOWS:**

**9.11 Liquidated Damages**

9.11.1 The Contractor and the Contractor's surety shall be liable for and shall pay the Owner the sums hereinafter stipulated as **liquidated damages** for each calendar day of delay until the Work is substantially complete: **\$1000.**

b. 9.11.2 Should the Contractor fail to complete the Work within the time agreed upon in the Contract Documents, or within such additional time as may have been allowed by extension, there shall be deducted from any moneys due or that may become due the Contractor the sum as stated in paragraph 9.11.1. Such sum is fixed and agreed upon by the Owner and Contractor as liquidated damages due the Owner by reason of inconvenience and added costs of administration, engineering, and supervision resulting from the Contractor's default, and not as a penalty.

9.11.2 Should the Contractor fail to complete the Work within the time agreed upon in the Contract Documents, or within such additional time as may have been allowed by extension, there shall be deducted from any moneys due or that may become due the Contractor the sum as stated in paragraph 9.11.1. Such sum is fixed and agreed upon by the Owner and Contractor as liquidated damages due the Owner by reason of inconvenience and added costs of administration, engineering, and supervision resulting from the Contractor's default, and not as a penalty.

9.11.3 Permitting the Contractor to continue and finish the Work or any part of the Work after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner of any of his rights under the Agreement.

**ARTICLE 10**

**PROTECTION OF PERSONS AND PROPERTY**

No modifications.

**ARTICLE 11 INSURANCE AND BONDS**

**INSURANCE AND BONDS (VERIFY AMOUNTS FOR EACH PROJECT WITH OWNER)**

In addition to the insurance required under Article 11, the Contractor shall effect and maintain the following insurance:

<u>COVERAGE</u>	<u>HAZARDS</u>	<u>LIMITS OF LIABILITY</u>
Liability	Other than auto	\$1,000,000 each occurrence
		\$1,000,000 aggregate
Property Damage	Other than auto	\$1,000,000 aggregate
Bodily Injury	Automobile	\$1,000,000 each person
		\$1,000,000 aggregate
Property Damage	Automobile	\$500,000 each occurrence
		\$1,000,000 annual aggregate

The above policy shall name the Owner and the Architect as additional insured.

Reference is made to Paragraph 3.18, Indemnification, of AIA Document A201.

Contractor shall furnish the Owner with certificates of insurance complying with all requirements. The certificates shall be signed by a person authorized to bind coverage on the insurer's behalf. Coverage on a claims-made basis will not be acceptable.

11.3 Property Insurance

Delete Subparagraph 11.3.1.4 and substitute the following:

11.3.1.4 The Contractor shall provide insurance coverage for portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.

11.4 Performance Bond and Payment Bond

Delete Subparagraph 11.4.1 and substitute the following:

11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment obligations arising there under. Costs of bonds shall be included in the Contractor's bid. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into.

11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

**ARTICLE 12**

**UNCOVERING AND CORRECTION OF WORK**

No modifications.

**ARTICLE 13 MISCELLANEOUS PROVISIONS**

**13.5 Tests and Inspections**

**Modify Subparagraph 13.5.1 as follows:**

13.5.1 Substitute the words, "review or reviews," wherever the words, "approve, approval, or approvals," occur in this paragraph.

**ADD NEW PARAGRAPH 13.8 AS FOLLOWS:**

**13.8 Equal Opportunity**

13.8.1 The Contractor shall maintain policies of employment as follows:

.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

**ADD NEW PARAGRAPH 13.9 AS FOLLOWS:**

**13.9 Compliance with Labor Laws**

13.9.1 The Contractor and the Contractor's Subcontractors shall comply with all applicable Laws and Regulations relating to labor on Public Works in the State of Utah, including *U.S. Code Title 8 USC Sec. 1324a, Utah Code Title 34 Chapter 30 and Title 13 Chapter 47*:

13.9.2 The following references are included herein so that the Contractor shall be aware of specific requirements of these sections. Other Law sections are not shown herein, but this in no way relieves the Contractor of His obligation to comply with all Federal, State, and Local Labor Laws.



.1 **U.S. Code Title 8 USC Sec. 1324a Unlawful Employment** (1)(A) It is unlawful for a person or other entity - to hire, or to recruit or refer for a fee, for employment in the United States an alien knowing the alien in an unauthorized alien. (2) **Continuing Employment** - It is unlawful for a person or other entity, after hiring an alien for employment in accordance with paragraph (1) to continue to employ the alien in the United States knowing the alien in (or has become) an unauthorized alien with respect to such employment. (4) **Use of labor through contract** - For purposes of this section, a person or other entity who uses a contract, subcontract, or exchange, entered into, renegotiated, or extended after November 6, 1986, to obtain the labor of an alien in the United States knowing that the alien is an unauthorized alien (as defined in subsection (h)(3) in this section) with respect to performing such labor, shall be considered to have hired the alien for employment in the United States in violation of paragraph (1)(A).

.2 **Ut Code 34-30-1. Citizens to be given preference** - In employing workmen in the construction of public works by the state or any county or municipality, or by persons contracting with the state or any county or municipality, preference shall be give to citizens of the United States, or those having declared their intention of becoming citizens. In each contract for the construction of public works a provision shall be inserted to the effect that, if the provisions of this section are not complied with, the contract shall be void.

.3 **Ut Code 34-30-8. Forty-hour work week** - Forty hours shall constitute a working week on all works and undertakings carried on by the state, county, or municipal governments, or by any officer of the state or of any county or municipal government. Any persons, corporation, firm, contractor, agent, manager, or foreman, who shall require contract with any person to work upon such works or undertakings longer than 40 hours in one week shall pay such employees at at rate not less than one and one-half times the regular rate at which he is employed. (Piece work rates have to by greater than or equal to minimum wage and one and one-half times minimum wage for hours worked over 40; Minimum wage and overtime laws still apply).

.4 **Ut Code 34-30-9. Violation of chapter** - Any officer, agent, or representative if the state or of any political subdivision, district or municipality of it who shall violate, or omit to comply with any of the provisions of this chapter, and any contractor or subcontractor, or agent or representative thereof, doing such public work, who shall neglect to keep, or cause to be kept, an accurate record of the names, occupation and actual wages paid to each laborer, workman and mechanic employed by him, in connection with this public work or who shall refuse to allow access to same at any reasonable hour to any person authorized to inspect same under this chapter shall be guilty of a misdemeanor.

.5 **Ut Code 13-47-201. Verification required for new hires** - (1) A private employer who employs 15 or more employees as of July 1, 2010, may not hire a new employee on or after July 1, 2010, unless the private employer: (a) is registered with a status verification system to verify the federal legal working status of any new employee; and (b) uses the status verification system to verify the federal legal working status of the new employee in accordance with the requirements of the status verification system. (2) This section does not apply to a private employer of a foreign national if the foreign national holds a visa issued in response to a petition by the private employer that is classified as H-2A or H-2B.

## **ARTICLE 15 CLAIMS AND DISPUTES**

### **15.1 Claims**

Add this sentence to the end of Subparagraph 15.1.1:

15.1.1 A claim must contain the following explicit language in order to be recognized as a "Claim": **"THIS IS A CLAIM AS DEFINED BY CLAUSE 15.1.1 OF AIA DOCUMENT A201."**

Modify Subparagraph 15.1.2 as follows:

15.1.2 Substitute 10 days for 21 days, where the latter occurs in this subparagraph.

**ADD NEW PARAGRAPH 15.5 AS FOLLOWS:**

**15.5 Time Limits on Claims**

15.5.1 For time limits on claims, refer to Section 13.7.

**END OF SUPPLEMENTARY GENERAL CONDITIONS**

SECTION 00 7350

NOTICE TO PROCEED

**PROJECT:** South Jordan Middle School Parking Lot  
Addition/Remodel

**PROJECT ADDRESS:** 10245 S. 2700 W., South Jordan, UT

**DATE:** \_\_\_\_\_

**NOTICE:**

**YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE WITH THE  
FORM OF AGREEMENT DATED [\_\_\_\_\_] , ON OR BEFORE  
[\_\_\_\_\_] , AND YOU ARE TO COMPLETE THE WORK ON OR BEFORE  
[\_\_\_\_\_].**

**CERTIFIED BY:**

\_\_\_\_\_  
Owner's Name

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature

**RECEIPT OF THE ABOVE NOTICE TO PROCEED IS HEREBY ACKNOWLEDGED BY:**

\_\_\_\_\_  
Firm Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**END OF NOTICE TO PROCEED**



Utah State Tax Commission  
**Exemption Certificate for Governments & Schools**  
 (Sales, Use, Tourism and Motor Vehicle Rental Tax)

**TC-721G**  
Rev. 3/16

Name of institution claiming exemption (purchaser)		Telephone Number	
Street Address	City	State	ZIP Code
Authorized Signature	Name (please print)	Title	
<b>Name of Seller or Supplier:</b>		Date	

SAMPLE

The person signing this certificate **MUST** check the applicable box showing the basis for which the exemption is being claimed.

Email questions to [taxmaster@utah.gov](mailto:taxmaster@utah.gov). You may also write or visit the Tax Commission at 210 N 1950 W, Salt Lake City, UT 84134, or call 801-297-2200 or toll free 1-800-662-4335.

**DO NOT SEND THIS CERTIFICATE TO THE TAX COMMISSION**  
 Keep it with your records in case of an audit.

**UNITED STATES GOVERNMENT OR NATIVE AMERICAN TRIBE**  
 I certify the tangible personal property or services purchased are to be paid directly with funds from the entity noted on this form and will be used in the exercise of essential governmental or tribal functions.  
**NOTE:** Includes sales of tangible personal property to federally chartered credit unions. "Directly" does not include per diem, entity advances, or government reimbursements for employee credit card purchases.

**CONSTRUCTION MATERIALS PURCHASED FOR SCHOOLS OR PUBLIC TRANSIT DISTRICTS**  
 I certify the construction materials purchased are on behalf of a public elementary or secondary school, or public transit district. I further certify the purchased construction materials will be installed or converted into real property owned by the school or public transit district.

Name of school or public transit district: \_\_\_\_\_  
 Name of project: \_\_\_\_\_

**FOREIGN DIPLOMAT**  
 I certify the purchases are authorized by a diplomatic tax exemption card issued by the United States.  
 Foreign diplomat number: \_\_\_\_\_

**UTAH LOCAL GOVERNMENTS AND PUBLIC ELEMENTARY AND SECONDARY SCHOOLS**  
**Sales Tax License No.** \_\_\_\_\_  
 I certify the tangible personal property or services purchased are to be paid directly with funds from the entity noted on this form and will be used in the exercise of that entity's essential functions. For construction materials, if the purchaser is a Utah local government, these construction materials will be installed or converted into real property by employees of this government entity.  
**CAUTION:** This exemption does not apply to government or educational entities of other states and is not valid for lodging-related purchases.

**UTAH STATE GOVERNMENT**  
**Sales Tax License No.** \_\_\_\_\_  
 I certify the tangible personal property or services purchased are to be paid directly with funds from the entity noted on this form and will be used in the exercise of its essential functions. For construction materials, they will be installed or converted into real property by employees of this government entity.  
**CAUTION:** This exemption does not apply to other states and is not valid for lodging-related purchases.

**HEBER VALLEY HISTORIC RAILROAD**  
 I certify these purchases and sales are by the Heber Valley Historic Railroad Authority or its operators and are related to the operation and maintenance of the Heber Valley Historic Railroad.

To be valid this certificate must be filled in completely, including a check mark in the proper box.

**A sales tax license number is required only where indicated.**

Please sign, date and, if applicable, include your license or exemption number.

**NOTE TO SELLER:** Keep this certificate on file since it must be available for audit review.

**NOTE TO PURCHASER:** Keep a copy of this certificate for your records. You must notify the seller of cancellation, modification, or limitation of the exemption you have claimed.

If you need an accommodation under the Americans with Disabilities Act, email [taxada@utah.gov](mailto:taxada@utah.gov), or call 801-297-3811 or TDD 801-297-2020. Please allow three working days for a response.

SECTION 01 1000

SUMMARY

**PART 1 GENERAL**

**1.01 PROJECT**

- A. Project Name: South Jordan Middle School Parking Lot Addition/Remodel
- B. Owner's Name: Jordan School District.
- C. Architect's Name: Naylor Wentworth Lund Architects
- D. Additional Project contact information is specified in Section 00 0103 - Project Directory.
- E. The Project consists of the demolition of existing parking lot / landscape improvements and replacement with new parking lot base material, concrete curbs, gutters & paving, lighting, and subsequent utility work, as shown in the Contract Documents prepared by Ensign Engineers, Naylor Wentworth Lund Architects, ArcSitio landscape design, and BNA Consulting Engineers.

**1.02 CONTRACT DESCRIPTION**

- A. Contract Type: A single prime contract based on a Stipulated Price as described in the Standard Form of Agreement Between Owner and General Contractor.

**1.03 DESCRIPTION OF DEMOLITION WORK**

- A. Scope of demolition and removal work is indicated on drawings and specified in:
  - 1. 02 1000 Site Preparation.

**1.04 WORK BY OWNER**

- A. None.

**1.05 OWNER OCCUPANCY**

- A. Owner intends to continue to occupy adjacent portions of the site and the entire existing building during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

**1.06 CONTRACTOR USE OF SITE AND PREMISES**

- A. Construction Operations are limited to areas immediately surrounding the area of work and as allowed by Owner
- B. Arrange use of site and premises to allow:
  - 1. Owner occupancy.
  - 2. Use of site and premises by the public.
- C. Provide access to and from site as required by law and by Owner:
  - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
  - 2. Do not obstruct public roadways, sidewalks, or other public ways without permit.
- D. Time Restrictions:
  - 1. Limit conduct of the hours dictated by the Authority Having Jurisdiction Ordinances.
  - 2. Limit conduct of especially noisy/disruptive work to hours approved by Owner.

- E. Utility Outages and Shutdown:
  - 1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
  - 2. Limit shutdown of utility service to hours approved by Owner.
  - 3. Prevent accidental disruption of utility services to other facilities.

**1.07 WORK SEQUENCE**

- A. Coordinate construction schedule and operations with Owner.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 1000**

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.
- F. Samples of AIA documents required are included and follow this Section:
  - 1. AIA G702 Application and Certificate for Payment.
  - 2. AIA G703 Continuation Sheet.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 7200 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- B. AIA Document A101 - Standard Form of Agreement Between Owner and Contractor: Contract Sum, retainages, and payment period.
- C. AIA Document A201 - General Conditions and Document 00 7300 - Supplementary General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- D. Section 01 2100 - Allowances: Payment procedures relating to allowances.
- E. Section 01 2200 - Unit Prices: Monetary values of unit prices; Payment and modification procedures relating to unit prices.
- F. Section 01 7800 - Closeout Submittals: Project record documents.

**1.03 SCHEDULE OF VALUES**

- A. Form to be used: AIA G703.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values within 7 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.
- F. Include a separate line item the amount of each Allowance specified in Section 01 2100, Allowances.
- G. Revise schedule to list approved Contingency Authorization amounts from the Construction Contingency Allowance, with each Application For Payment.

**1.04 APPLICATIONS FOR PROGRESS PAYMENTS**

- A. Payment Period: Submit at intervals stipulated in the Agreement. (Normally 1 per month).
- B. Form to be used: AIA G702 and G703.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. For each item, provide a column for listing each of the following:
  - 1. Item Number.

2. Description of work.
  3. Scheduled Values.
  4. Previous Applications.
  5. Work in Place and Stored Materials under this Application.
  6. Authorized Change Orders (Contingency Authorization).
  7. Total Completed and Stored to Date of Application.
  8. Percentage of Completion.
  9. Balance to Finish.
  10. Retainage (5 percent).
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- H. List each authorized Change Order as a separate line item, listing Allowance Authorization number and dollar amount as for an original item of work.
- I. Submit one electronic copy of each Application for Payment with a notarized signature.
- J. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.
- K. Contractor, nor subcontractor will be allowed to bill over 90 percent of the contract amount until closeout documents have been submitted. This is irrespective of retention being held.
- L. The Contract shall allow the Owner to make payment with 30 days after acceptance of all billings.

#### **1.05 MODIFICATION PROCEDURES**

- A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.
- B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
- C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
- D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change . Contractor shall prepare and submit a fixed price quotation within 7 days.
- E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 6000.
- F. Computation of Change in Contract Amount: Costs for all changes shall be fully documented at each level for evaluation. Provide the following data:
1. Quantities of materials, labor, and equipment and unit prices for each.
  2. Insurance, and bonds, if any. DO NOT INCLUDE SALES TAX.
  3. Predetermined unit prices if applicable.
  4. For Time and Material work:
    - a. Dates and times work was performed and by whom.
    - b. Time records and wage reports.
    - c. Invoices and receipts for products, equipment, and subcontracts, similarly documented.



5. Overhead and profit: See paragraph G for maximums.
6. Justification for any change in Contract Time.
7. Credit for deletions from contract, similarly documented.
- G. Allowable Mark-Up:
  1. The Contractor shall be limited to the following maximum mark-ups on any change order under \$5,000.00:
    - a. Subcontractor (limited to a single (1) level of mark-up): 15 percent
      - 1) or GC self performed work
    - b. General Contractor - Profit and Overhead: 7 percent
      - 1) Not applied in addition to self performed work
    - c. General Contractor - Bonding: 1 percent
  2. The Contractor shall be limited the following maximum mark-ups on any change order equal to or exceeding \$5,000.00:
    - a. Subcontractor (limited to a single (1) level mark-up): 10 percent
      - 1) or GC self performed work
    - b. General Contractor - Profit and Overhead
      - 1) 15 percent of first \$5,000 and 5 percent of remainder over \$5,000.
    - c. General Contractor - Bonding: 1 percent
- H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- K. Promptly enter changes in Project Record Documents.

#### **1.06 APPLICATION FOR FINAL PAYMENT**

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
  1. All closeout procedures specified in Section 01 7000.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

#### **END OF SECTION 01 2000**



## Application and Certificate for Payment

TO OWNER:	PROJECT:	APPLICATION NO:	<u>Distribution to:</u>
		PERIOD TO:	OWNER <input type="checkbox"/>
FROM CONTRACTOR:	VIA ARCHITECT:	CONTRACT FOR:	ARCHITECT <input type="checkbox"/>
		CONTRACT DATE:	CONTRACTOR <input type="checkbox"/>
		PROJECT NOS: _____ / _____ /	FIELD <input type="checkbox"/>
			OTHER <input type="checkbox"/>

### CONTRACTOR'S APPLICATION FOR PAYMENT

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

1. ORIGINAL CONTRACT SUM ..... \$ \_\_\_\_\_

2. NET CHANGE BY CHANGE ORDERS ..... \$ \_\_\_\_\_

3. CONTRACT SUM TO DATE (Line 1 ± 2) ..... \$ \_\_\_\_\_

4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) ..... \$ \_\_\_\_\_

5. RETAINAGE:

a. \_\_\_\_\_% of Completed Work  
(Columns D + E on G703) ..... \$ \_\_\_\_\_

b. \_\_\_\_\_% of Stored Material  
(Column F on G703) ..... \$ \_\_\_\_\_

Total Retainage (Lines 5a + 5b, or Total in Column I of G703)..... \$ \_\_\_\_\_

6. TOTAL EARNED LESS RETAINAGE ..... \$ \_\_\_\_\_  
(Line 4 minus Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ..... \$ \_\_\_\_\_  
(Line 6 from prior Certificate)

8. CURRENT PAYMENT DUE ..... \$  

9. BALANCE TO FINISH, INCLUDING RETAINAGE ..... \$ \_\_\_\_\_  
(Line 3 minus Line 6)

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$ _____	\$ _____
Total approved this month	\$ _____	\$ _____
<b>TOTAL</b>	<b>\$ _____</b>	<b>\$ _____</b>
<b>NET CHANGES by Change Order</b>	<b>\$ _____</b>	

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

CONTRACTOR:

By: \_\_\_\_\_ Date: \_\_\_\_\_

State of: \_\_\_\_\_

County of: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_

Notary Public: \_\_\_\_\_

My commission expires: \_\_\_\_\_

### ARCHITECT'S CERTIFICATE FOR PAYMENT

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

AMOUNT CERTIFIED ..... \$ \_\_\_\_\_

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

ARCHITECT:

By: \_\_\_\_\_ Date: \_\_\_\_\_

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

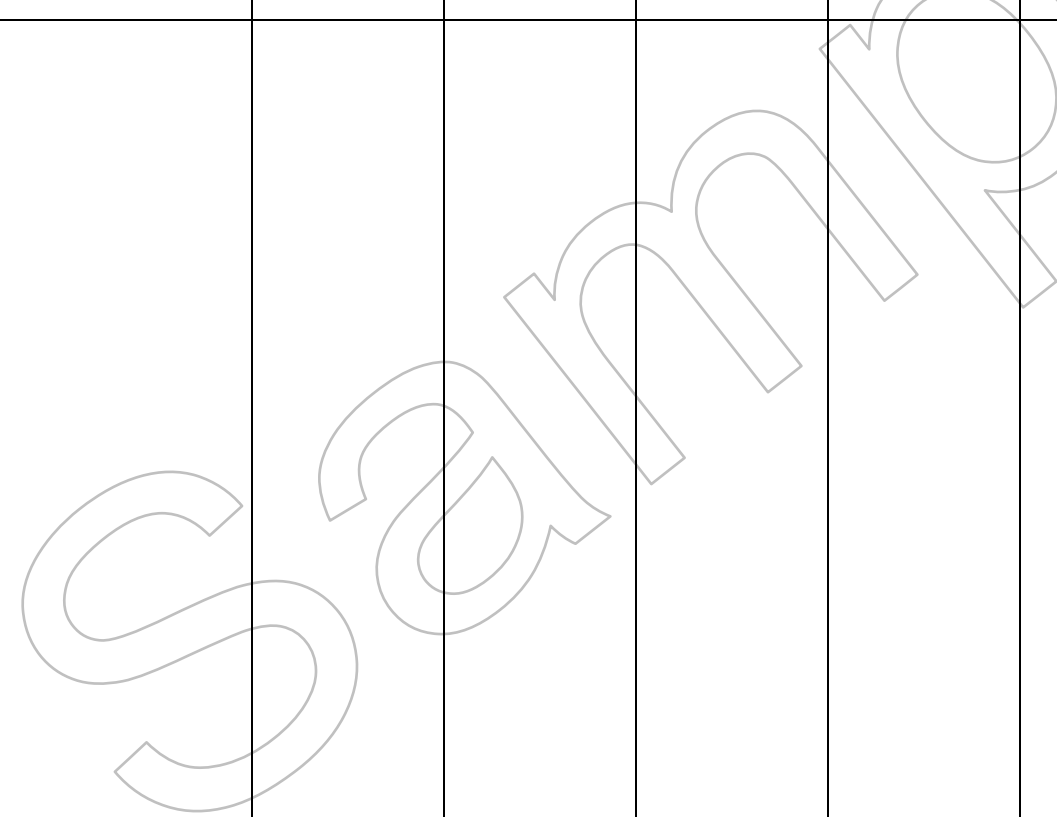
**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**



## Continuation Sheet

AIA Document G702™–1992, Application and Certificate for Payment, or G732™–2009, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor’s signed certification is attached.  
 In tabulations below, amounts are in US dollars.  
 Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:  
 APPLICATION DATE:  
 PERIOD TO:  
 ARCHITECT’S PROJECT NO:

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED <i>(Not in D or E)</i>	G		H BALANCE TO FINISH <i>(C – G)</i>	I RETAINAGE <i>(If variable rate)</i>
			FROM PREVIOUS APPLICATION <i>(D + E)</i>	THIS PERIOD		TOTAL COMPLETED AND STORED TO DATE <i>(D+E+F)</i>	% <i>(G ÷ C)</i>		
									
GRAND TOTAL									

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**



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**SECTION 01 2100**

**ALLOWANCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Contingency allowance.
- B. Payment and modification procedures relating to allowances.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

**1.03 CONTINGENCY ALLOWANCE**

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance. Do not include profit, overhead and bonding on this amount in the overall stipulated bid amount.
- B. Funds will be drawn from the Contingency Allowance only by an Authorized Contingency withdrawal or Change Order.
- C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

**1.04 ALLOWANCES SCHEDULE**

- A. Construction Contingency Allowance: Include the stipulated sum/price of \$150,000.00 for use upon Owner's instructions/authorization. This shall be included in the contractor's bid amount.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 2100**



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**SECTION 01 2200**

**UNIT PRICES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- C. Defect assessment and non-payment for rejected work.

**1.02 COSTS INCLUDED**

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, fees, services, and incidentals; application, or installation of an item of the Work; overhead, profit, and bond.

**1.03 UNIT QUANTITIES SPECIFIED**

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

**1.04 MEASUREMENT OF QUANTITIES**

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect and South Sanpete School District.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- E. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- F. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

**1.05 PAYMENT**

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
  - 1. Products wasted or disposed of in a manner that is not acceptable.
  - 2. Products determined as unacceptable before or after placement.
  - 3. Products not completely unloaded from the transporting vehicle.
  - 4. Products placed beyond the lines and levels of the required Work.
  - 5. Products remaining on hand after completion of the Work.
  - 6. Loading, hauling, and disposing of rejected Products.

## 1.06 DEFECT ASSESSMENT

- A. Installed Work, or portions of the Work, not complying with specified requirements will be required to be removed and replaced at no additional cost to the Owner.

## 1.07 SCHEDULE OF UNIT PRICES

- A. **ITEM #1A (Subbase Mediation Option-1):** Provide a unit cost to remove areas encountered as soft spots in the base & substructure of the parking lot areas and replace subbase materials in these areas. From the point of excavation for project subgrade required, remove an additional 18.0 inches of unsuitable soils from the soft spot area. Once additional removal is completed, stabilizing fill (coarse, angular cobbles and gravels with limited fines with a particle size of at least 3.0 inches and not exceeding a particle size of 6.0 inches) may be dumped in loose in 15.0-inch lifts and compacted by pressing a hoe bucket on the surface at least twice. The process shall be repeated until firm. Unyielding separation fabric (Mirafi 140N or prior approved equal) must be placed overlying the stabilizing fill prior to the placement of the road base asphalt sequence.

1. Unit of Measure: Per Square Foot.
2. Alternate Fabric materials that are equal to those listed will be allowed. Refer to Section 01 6000, Product Requirements, for procedures on product substitution. Approval is required prior to bid.

- B. **ITEM #1B (Subbase Mediation Option-2):** Provide a unit cost to remove areas encountered as soft spots in the base & substructure of the parking lot areas and replace subbase materials in these areas. From the point of excavation for project subgrade required, remove an additional 18.0-inches of unsuitable soils from the soft spot area. Following the removal, a separation fabric (Mirafi 140N or prior approved equal) shall be placed directly on the exposed subgrade followed by placement of a type 2 geogrid (Tensar BX1200 or prior approved equal) directly on the separation fabric. After the proper installation of geotextiles, aggregate base coarse may be placed in 8.0-inch lifts and compacted to the requirements for structural fill.

1. Unit of Measure: Per Square Foot.
2. Alternate Fabric and Geogrid materials that are equal to those listed will be allowed. Refer to Section 01 6000, Product Requirements, for procedures on product substitution. Approval is required prior to bid.

- C. **ITEM #2 ADDITIONAL UNDERGROUND STORM WATER DETENTION SYSTEM VOLUME:** Provide a unit cost to increase the size of the Underground Storm Water Detention System detailed on the Civil Drawings. The increase in size is anticipated to be a minimum of 1000 cubic feet to 8000 cubic feet maximum size. The materials used shall be as identified on the Civil Drawings.

1. Unit of Measure: Per Cubic Foot.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION - NOT USED

## END OF SECTION 01 2200

**SECTION 01 2300**

**ALTERNATES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Description of Alternates.
- B. Procedures for pricing Alternates.
- C. Documentation of changes to Contract Sum and Contract Time.

**1.02 RELATED REQUIREMENTS**

- A. AIA Document A701 - Instructions to Bidders: Instructions for preparation of pricing for alternatives.
- B. AIA Document A101 - Owner-Contractor Agreement: Incorporating monetary value of accepted alternatives.

**1.03 COSTS INCLUDED**

- A. Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation (import and export), services and incidentals; off-site waste (inclusive of fees), application or installation of an item of Work, including overhead, profit and bonding.

**1.04 ACCEPTANCE OF ALTERNATES**

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

**1.05 SCHEDULE OF ALTERNATES**

- A. Alternate#1: All materials associated with the installation of the school monument sign, to include but not limited to: Concrete monument sign, footings and foundation walls; electrical wiring and fiber optics lines; other items associated with the monument sign as identified in the construction bid documents.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 2300**

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**SECTION 01 3000**

**ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Electronic document submittal.
- C. Preconstruction meeting
- D. Progress meetings.
- E. One year warranty inspection meeting.
- F. Submittals for review, information, and project closeout.
- G. Number of copies of submittals.
- H. Requests for Information (RFI) procedures.
- I. Submittal procedures.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 3216 - Construction Progress Schedule: Form, content, and administration of schedules.
- B. Section 01 6000 - Product Requirements: General product requirements.
- C. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
- D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

**1.03 GENERAL ADMINISTRATIVE REQUIREMENTS**

- A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to Architect:
  - 1. Requests for Interpretation (RFI).
  - 2. Requests for substitution.
  - 3. Shop drawings, product data, and samples.
  - 4. Test and inspection reports.
  - 5. Design data.
  - 6. Manufacturer's instructions and field reports.
  - 7. Applications for payment and change order requests.
  - 8. Progress schedules.
  - 9. Correction Punch List and Final Correction Punch List for Substantial Completion.
  - 10. Closeout submittals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 ELECTRONIC DOCUMENT SUBMITTAL**

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format.

1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
2. Project Manager/General Contractor and Architect are required to use this method.
3. It is Contractor's and Subcontractor's responsibility to submit documents in PDF format.
4. Users need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, [www.adobe.com](http://www.adobe.com), or Bluebeam PDF Revu, [www.bluebeam.com](http://www.bluebeam.com) or similar software).
5. Paper document transmittals will not be reviewed.
6. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

### **3.02 PRECONSTRUCTION MEETING**

- A. The Contractor will schedule a meeting after Notice of Award.
- B. Attendance Required:
  1. Owner Representative.
  2. Architect/Civil Engineer.
  3. General Contractor.
  4. Subcontractors deemed of major importance by the Owner/Architect/Engineer.
- C. Agenda:
  1. Execution of Owner-Contractor Agreement.
  2. Submission of executed bonds and insurance certificates.
  3. Confirmation of complete Contract Documents.
  4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
  5. Submission of initial Submittal schedule.
  6. Designation of personnel representing the parties to Contract and Owner/Architect/Engineers.
  7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
  8. Tentative construction scheduling.
  9. Scheduling activities of Owner's Testing Agencies.
  10. Critical work sequencing.
  11. Procedures for processing Applications for Payment.
  12. Preparation of record documents.
  13. Use of the premises.
  14. Office, work and storage areas.
  15. Equipment deliveries and priorities.
  16. Security.
  17. Housekeeping.
  18. Working hours.
  19. Specific instructions from the Owner.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### **3.03 PROGRESS MEETINGS**

- A. Schedule and administer meetings throughout progress of the Work at maximum of weekly intervals.

- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner Representative, Architect, Engineers, and Inspectors as appropriate to agenda topics for each meeting.
- D. Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Review of work progress.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems that impede, or will impede, planned progress.
  - 5. Review of submittals schedule and status of submittals.
  - 6. Review of RFIs log and status of responses.
  - 7. Review of off-site fabrication and delivery schedules.
  - 8. Maintenance of progress schedule.
  - 9. Corrective measures to regain projected schedules.
  - 10. Planned progress during succeeding work period.
  - 11. Coordination of projected progress.
  - 12. Maintenance of quality and work standards.
  - 13. Effect of proposed changes on progress schedule and coordination.
  - 14. Other business relating to work.
- E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

#### **3.04 ONE YEAR WARRANTY INSPECTION (MANDATORY)**

- A. The Contractor will be required to visit the site one year after Substantial Completion with the assigned representative of the Jordan School District and the Architect to review warranty issues. A warranty punch list will be issued and the General Contractor will be responsible to complete these warranty items. Additional inspections will take place as required.

#### **3.05 CONSTRUCTION PROGRESS SCHEDULE- SEE SECTION 01 3216**

#### **3.06 REQUESTS FOR INFORMATION (RFI)**

- A. Definition: A request seeking one of the following:
  - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
  - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
  - 1. Prepare a separate RFI for each specific item.
    - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
  - 2. Prepare in a format and with content acceptable to Owner/Architect.
  - 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- C. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
  - 1. Official Project name and number, and any additional required identifiers established in Contract Documents.



2. Owner's, Architect's, and Contractor's names.
  3. Discrete and consecutive RFI number, and descriptive subject/title.
  4. Issue date, and requested reply date. (Although every effort will be made to answer RFI's quickly, allow for up to 7 business days for the design team's response).
  5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
  6. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- D. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

### **3.07 SUBMITTALS FOR REVIEW**

- A. When the following are specified in individual sections, submit them for review:
  1. Product data.
  2. Shop drawings.
  3. Samples for selection.
  4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Provide Bookmarks for each listing.
- D. Do not submit MSDS info.
- E. Samples will be reviewed for aesthetic, color, or finish selection.
- F. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.
- G. Note that substitutions for specified/approved products/manufacturers will not be reviewed if submitted as a part of submittal process.

### **3.08 SUBMITTALS FOR INFORMATION**

- A. When the following are specified in individual sections, submit them for information:
  1. Design data.
  2. Certificates.
  3. Test reports.
  4. Inspection reports.
  5. Manufacturer's instructions.
  6. Manufacturer's field reports.
  7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

### **3.09 SUBMITTALS FOR PROJECT CLOSEOUT**

- A. Submit Correction Punch List prior to Substantial Completion.
- B. Submit Final Correction Punch List prior to Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
  1. Project record documents.
  2. Operation and maintenance data.
  3. Warranties/Guarantees.

4. Bonds.
  5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

### 3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Extra Copies at Project Closeout: See Section 01 7800.
- C. Samples: Submit the number specified in individual specification sections, one of which will be retained by Architect.
  1. After review, produce duplicates.
  2. Retained samples will not be returned to Contractor unless specifically so stated.

### 3.11 SUBMITTAL PROCEDURES

- A. General Requirements:
  1. Use a separate transmittal for each item.
  2. Organize and number submittals by spec section. For example, in AA AAAA-BB-CC, the 'A's represent spec section; the 'B's represent sequence number. If more than one submittal is required for each spec section, (i.e. Casework for phase-1, phase-2, etc.), 'C's represent Revision number if submittal has to be resubmitted (wrong or incomplete information). Submittals can be broken up (example: 06 4100-01-00); this may be preferred for some sections. Submit items under their spec section number only. This applies particularly to electrical and mechanical. If a sub is supplying items from multiple sections, they should be submitted as separate submittals.
    - a. Notwithstanding the requirement to submit each specification section separately, mechanical and electrical submittals should be submitted as complete divisions.
  3. Identify: Project, Contractor, subcontractor or supplier, pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
  4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
    - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
  5. Send submittals in electronic format via email to the designated Architect's representative.
  6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
  7. Provide space for Contractor and Architect review stamps.
  8. Submittals not requested will be recognized, and will be returned "Not Reviewed".
  9. Incomplete submittals will be rejected and will not be reviewed.
- B. Product Data Procedures:
  1. Submit only information required by individual specification sections.
  2. Collect required information into a single submittal.
  3. DO NOT submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
  1. Shop Drawings: Shop drawings must be reviewed and stamped by the Prime Contractor prior to submittal to the Architect. (If the stamp is missing or if it is obvious shop drawings have not been reviewed by the Prime Contractor, they will be returned for re-submittal unchecked by the Architect).
  2. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.

3. Do not reproduce Contract Documents to create shop drawings.
  4. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
  2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
  3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval. Provide separate submittal page for each item image.

### **3.12 SUBMITTAL REVIEW**

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- C. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
    - a. "No Exception Taken" - No further action is required from Contractor.
    - b. "Make Noted Corrections" - No further action is required from Contractor.
  2. Not Authorizing fabrication, delivery, and installation:
    - a. "Revise and Resubmit" - Further action is required from Contractor.
      - 1) Resubmit revised item, with review notations acknowledged and incorporated.
    - b. "Rejected" - Further action is required from Contractor.
      - 1) Submit item complying with requirements of Contract Documents.
- D. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
    - a. "Received" - To notify the Contractor that the submittal has been received for record only.
  2. Items for which action was taken:
    - a. "No Exception Taken" - No further action is required from Contractor.
    - b. "Make Noted Corrections" - Further action is required from Contractor.
    - c. "Revise and Resubmit" - Further action is required from Contractor.
    - d. "Rejected" - Further action is required from Contractor.

**END OF SECTION 01 3000**

**SECTION 01 3216**

**CONSTRUCTION PROGRESS SCHEDULE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

**1.02 RELATED SECTIONS**

- A. Section 01 1000 - Summary: Work sequence.

**1.03 SUBMITTALS**

- A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
  - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

**1.04 QUALITY ASSURANCE**

- A. Contractor's Administrative Personnel: Three years' minimum experience using and monitoring CPM schedules on comparable projects.

**1.05 SCHEDULE FORMAT**

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Scale and Spacing: To allow for notations and revisions.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PRELIMINARY SCHEDULE**

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

**3.02 CONTENT**

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- D. Coordinate content with schedule of values specified in Section 01 2000 - Price and Payment Procedures.
- E. Provide legend for symbols and abbreviations used.

### **3.03 BAR CHARTS**

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

### **3.04 REVIEW AND EVALUATION OF SCHEDULE**

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

### **3.05 UPDATING SCHEDULE**

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date, with projected completion date of each activity.
- C. Update diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.

### **3.06 DISTRIBUTION OF SCHEDULE**

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

**END OF SECTION 01 3216**

**SECTION 01 4000**

**QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submittals.
- B. References and standards.
- C. Testing and inspection agencies and services.
- D. Control of installation.
- E. Mock-ups.
- F. Tolerances.
- G. Manufacturers' field services.
- H. Defect assessment.

**1.02 RELATED REQUIREMENTS**

- A. AIA Document A201 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.
- C. Section 01 6000 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants 2008 (Reapproved 2019).
- B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation 2017.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry 2022a.
- D. 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 2019.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2021.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2021.
- G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components 2016.
- H. IAS AC89 - Accreditation Criteria for Testing Laboratories 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
  - 1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and specifications section.

- f. Location in the Project.
  - g. Type of test/inspection.
  - h. Date of test/inspection.
  - i. Results of test/inspection.
  - j. Compliance with Contract Documents.
  - k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
  2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Architect for information.
  2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

#### **1.05 TESTING AND INSPECTION AGENCIES AND SERVICES**

- A. Owner will employ and pay for services of an independent testing agency to perform specified testing.
- B. Contractor shall be responsible to schedule all specified testing and inspection.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION**

#### **3.01 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

### **3.02 MOCK-UPS**

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Perform tests under provisions identified in this section and identified in the respective product specification sections.
- D. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- E. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
- F. Use accepted mock-ups as a comparison standard for the remaining Work.
- G. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

### **3.03 TOLERANCES**

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

### **3.04 TESTING AND INSPECTION**

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
  - 1. Test samples of mixes submitted by Contractor.
  - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
  - 3. Perform specified sampling and testing of products in accordance with specified standards.
  - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
  - 5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
  - 6. Perform additional tests and inspections required by Architect.
  - 7. Attend preconstruction meetings and progress meetings.
  - 8. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
  - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Agency may not approve or accept any portion of the Work.
  - 3. Agency may not assume any duties of Contractor.
  - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
  - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
  - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.



3. Provide incidental labor and facilities:
  - a. To provide access to Work to be tested/inspected.
  - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
  - c. To facilitate tests/inspections.
  - d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

### **3.05 MANUFACTURERS' FIELD SERVICES**

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

### **3.06 DEFECT ASSESSMENT**

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect and Owner, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

**END OF SECTION 01 4000**

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Temporary telecommunications services.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Waste removal facilities and services.
- G. Field offices.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 5100 - Temporary Utilities.

**1.03 TEMPORARY UTILITIES - SEE SECTION 01 5100**

- A. Provide and pay for all electrical power and water required for construction purposes.

**1.04 TELECOMMUNICATIONS SERVICES**

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Ensure that telecommunications services include:
  - 1. Windows-based personal computer dedicated to project communications, with necessary software and printer.
  - 2. Telephone Lines: One line, minimum (cellular phone).
  - 3. Internet Connections: Continuous highest speed available.
  - 4. Printer: Ability to print on site.

**1.05 TEMPORARY SANITARY FACILITIES**

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.
- C. At end of construction, return facilities to same or better condition as originally found.

**1.06 BARRIERS**

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

**1.07 FENCING (IF REQUIRED)**

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

**1.08 SECURITY**

- A. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft, as required.

**1.09 VEHICULAR ACCESS AND PARKING**

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Designated existing on-site roads may be used for construction traffic.
- F. Existing parking areas located on site may be used for construction parking, as approved by the Owner.

**1.10 WASTE REMOVAL**

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site weekly.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

**1.11 FIELD OFFICES, JOB TRAILERS, AND MATERIAL STOCKPILE AREA**

- A. Coordinate with Governing Authorities, Owner, and neighboring properties.
- B. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- C. Provide space for Project meetings, with table and chairs to accommodate 12 persons minimum.
- D. Locate offices a minimum distance of 20 feet from existing and new structures.

**1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 5000**

**TEMPORARY EROSION AND SEDIMENT CONTROL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Performance bond.
- E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.
- F. Coordinate submittal of the S.W.P.P.P. with the owner.

**1.02 RELATED REQUIREMENTS**

- A. Section 32 1123 - Aggregate Base Courses: Temporary and permanent roadways.

**1.03 REFERENCE STANDARDS**

- A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc-Type Apparatus 2014 (Reapproved 2018).
- B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity 2017.
- C. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity. 1999a (Reapproved 2014).
- D. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles 2015.
- E. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles 2015a.
- F. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile 2020.
- G. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples 2017 (Reapproved 2021).
- H. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit Current Edition.
- I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service 2015.

**1.04 PERFORMANCE REQUIREMENTS**

- A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
- B. Comply with requirements of State of Utah Erosion and Sedimentation Control Manual.
- C. Runoff Calculation Standard for Urban Areas: USDA TR-55.
- D. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

1. Obtain and pay for permits and provide security required by authority having jurisdiction.
2. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
- F. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
- G. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- H. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
  1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
  2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
- I. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
  1. Control movement of sediment and soil from temporary stockpiles of soil.
  2. Prevent development of ruts due to equipment and vehicular traffic.
  3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- J. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
  1. Prevent windblown soil from leaving the project site.
  2. Prevent tracking of mud onto public roads outside site.
  3. Prevent mud and sediment from flowing onto sidewalks and pavements.
  4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- K. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
  1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
  2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- L. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
  1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- M. Open Water: Prevent standing water that could become stagnant.
- N. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Erosion and Sedimentation Control Plan:
  1. Submit within 2 weeks after Notice to Proceed.
  2. Include:

- a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
  - b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
  - c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
  - d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
  - e. Other information required by law.
  - f. Format required by law is acceptable, provided any additional information specified is also included.
3. Obtain the approval of the Plan by authorities having jurisdiction.
  4. Obtain the approval of the Plan by Owner.
- C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
- E. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Mulch: Use one of the following:
1. Straw or hay.
  2. Wood waste, chips, or bark.
  3. Erosion control matting or netting.
  4. Cutback asphalt.
  5. Polyethylene film, where specifically indicated only.
- B. Bales: Air dry, rectangular straw bales.
1. Cross Section: 14 by 18 inches, minimum.
  2. Bindings: Wire or string, around long dimension.
- C. Bale Stakes: One of the following, minimum 3 feet long:
1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
  2. Wood, 2 by 2 inches in cross section.
- D. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
  2. Permittivity:  $0.05 \text{ sec}^{-1}$ , minimum, when tested in accordance with ASTM D4491/D4491M.
  3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
  4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
  5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
  6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.

7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
8. Manufacturers:
  - a. TenCate: [www.tencate.com](http://www.tencate.com).
  - b. North American Green: [www.nagreen.com](http://www.nagreen.com).
  - c. Propex Geosynthetics: [www.geotextile.com](http://www.geotextile.com).
  - d. Substitutions: See Section 01 6000 - Product Requirements.
- E. Silt Fence Posts: One of the following, minimum 5 feet long:
  1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
  2. Softwood, 4 by 4 inches in cross section.
  3. Hardwood, 2 by 2 inches in cross section.
- F. Gravel: See Section 32 1123 for aggregate.
- G. Concrete: See Section 03 3000.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

#### **3.02 PREPARATION**

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

#### **3.03 SCOPE OF PREVENTIVE MEASURES**

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
  1. Width: As required; 20 feet, minimum.
  2. Length: 50 feet, minimum.
  3. Provide at each construction entrance from public right-of-way.
  4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- C. Linear Sediment Barriers: Made of silt fences.
  1. Provide linear sediment barriers:
    - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
    - b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
    - c. Along the toe of cut slopes and fill slopes.
    - d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.
    - e. Across the entrances to culverts that receive runoff from disturbed areas.
  2. Space sediment barriers with the following maximum slope length upslope from barrier:
    - a. Slope of Less Than 2 Percent: 100 feet.
    - b. Slope Between 2 and 5 Percent: 75 feet.
    - c. Slope Between 5 and 10 Percent: 50 feet.
    - d. Slope Between 10 and 20 Percent: 25 feet.
    - e. Slope Over 20 Percent: 15 feet.
- D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:

1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1 1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
2. Straw bale row blocking entire inlet face area; anchor into pavement.
- E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.
- G. Soil Stockpiles: Protect using one of the following measures:
  1. Cover with polyethylene film, secured by placing soil on outer edges.
  2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
  1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
  2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

### 3.04 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
  1. Excavate minimum of 6 inches.
  2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
  3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.
- B. Silt Fences:
  1. Store and handle fabric in accordance with ASTM D4873/D4873M.
  2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
  3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
  4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
  5. Install with top of fabric at nominal height and embedment as specified.
  6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
  7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
  8. Fasten fabric to wood posts using one of the following:
    - a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gauge, 0.083 inch shank diameter.
    - b. Five staples per post with at least 17 gauge, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
  9. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
  10. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.
- C. Straw Bale Rows:
  1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
  2. Install bales so that bindings are not in contact with the ground.
  3. Embed bales at least 4 inches in the ground.



4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
  5. Fill gaps between ends of bales with loose straw wedged tightly.
  6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- D. Mulching Over Large Areas:
1. Dry Straw and Hay: Apply 2 1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
  2. Wood Waste: Apply 6 to 9 tons per acre.
  3. Asphalt: Apply at 1200 gallons per acre.
  4. Erosion Control Matting: Comply with manufacturer's instructions.
- E. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches depth.
  2. Wood Waste: Apply 2 to 3 inches depth.
  3. Asphalt: Apply 1/4 gallon per square yard.
  4. Erosion Control Matting: Comply with manufacturer's instructions.

### **3.05 MAINTENANCE**

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
  2. Remove silt deposits that exceed one-third of the height of the fence.
  3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Straw Bale Rows:
1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
  2. Remove silt deposits that exceed one-half of the height of the bales.
  3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on site.
- F. Place sediment in appropriate locations on site; do not remove from site.

### **3.06 CLEAN UP**

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

**END OF SECTION 01 5713**

**SECTION 01 6000**

**PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary: Lists of products to be removed from existing building, if applicable.
- B. Section 01 4000 - Quality Requirements: Product quality monitoring.
- C. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

**1.03 REFERENCE STANDARDS**

**1.04 SUBMITTALS**

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
  - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

**PART 2 PRODUCTS**

**2.01 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
  - 1. Made using or containing CFC's or HCFC's.
  - 2. Containing lead, cadmium, or asbestos.
- C. Where other criteria are met, Contractor shall give preference to products that:
  - 1. Are extracted, harvested, and/or manufactured closer to the location of the project.
  - 2. Have longer documented life span under normal use.
  - 3. Result in less construction waste. See Section 01 7419
- D. Provide all Finish Material Products used in any individual system from the same manufacturer; no exceptions.

**2.02 PRODUCT OPTIONS**

- A. In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

- B. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- C. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- D. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer or product not named.
- E. Manufacturer's other than Basis of Design Manufacturers shall provide products or systems that meet or exceed Basis of Design products or systems. No change order shall be issued solely based on bid product or system not meeting Basis of Design and being rejected through submittal process.
- F. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

### **2.03 COMPARABLE PRODUCTS**

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

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION PROCEDURES FOR APPROVAL PRIOR TO BIDDING**

- A. Architect will only consider requests for proposed substitutions made prior to 72 hours of bid time.
- B. Proposed substitutions may be considered after this date when a product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. A request for substitution constitutes a representation that the submitter:
  - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
  - 2. Agrees to provide the same warranty for the substitution as for the specified product.
  - 3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives claims for additional costs or time extension that may subsequently become apparent.

5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- E. Proposed substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Proposed Substitution Submittal Procedure:
  1. Submit one electronic copy of request for substitution for consideration. Limit each request to one proposed substitution.
  2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
  3. Architect will notify Contractor in writing of decision to accept or reject request.

### **3.02 TRANSPORTATION AND HANDLING**

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

### **3.03 STORAGE AND PROTECTION**

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide off-site storage and protection when site does not permit on-site storage or protection.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- K. Prevent contact with material that may cause corrosion, discoloration, or staining.
- L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

- M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION 01 6000**

SECTION 01 7000

EXECUTION AND CLOSEOUT REQUIREMENTS

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- H. General requirements for maintenance service.
- I. Samples for AIA documents required are included and follow this Section:
  - 1. AIA G704 Certificate for Substantial Completion.
  - 2. AIA G706 Contractor's Affidavit of Payment of Debts and Claims.
  - 3. AIA G706A Contractor's Affidavit of Release of Liens.
  - 4. AIA G707 Consent of Surety Company to Final Payment.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
- E. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.
- F. Section 01 5713 - Temporary Erosion and Sediment Control: Additional erosion and sedimentation control requirements.
- G. Section 01 7419 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- H. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, guaranties, warranties and bonds.
- I. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- J. Individual Product Specification Sections:
  - 1. Advance notification to other sections of openings required in work of those sections.

**1.03 REFERENCE STANDARDS**

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.

1. On request, submit documentation verifying accuracy of survey work.
  2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
  3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
1. Structural integrity of any element of Project.
  2. Integrity of weather exposed or moisture resistant element.
  3. Efficiency, maintenance, or safety of any operational element.
  4. Visual qualities of sight exposed elements.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

#### **1.05 QUALIFICATIONS**

- A. For demolition work, employ a firm specializing in the type of work required.
1. Minimum of 3 years of documented experience.
- B. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,
- C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

#### **1.06 PROJECT CONDITIONS**

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
1. Minimize amount of bare soil exposed at one time.
  2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
  3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
  4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- H. Pest and Rodent Control: Provide methods, means, and facilities to:
1. Prevent pests and insects from damaging the work.
  2. Prevent rodents from accessing or invading premises.

- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

### **1.07 COORDINATION**

- A. See Section 01 1000 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## **PART 2 PRODUCTS**

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Examine and verify specific conditions described in individual specification sections.
- C. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- D. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### **3.02 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.

### **3.03 PREINSTALLATION MEETINGS**

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect/Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  1. Review conditions of examination, preparation and installation procedures.
  2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### **3.04 LAYING OUT THE WORK**

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect/Engineer of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that established by Owner provided survey.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.



- F. Promptly report to Architect/Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.
- H. Utilize recognized engineering survey practices.
- I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
- K. Periodically verify layouts by same means.
- L. Maintain a complete and accurate log of control and survey work as it progresses.

### **3.05 GENERAL INSTALLATION REQUIREMENTS**

- A. Provide or Install means Contractor shall: Furnish all labor, materials, equipment, tools and services required to fully complete installation of specified work as is indicated on the drawings and/or specifications.
- B. Install products as specified in individual sections, in accordance with manufacturer's printed instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- C. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- D. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- E. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- F. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- G. Make neat transitions between different surfaces, maintaining texture and appearance.

### **3.06 CUTTING AND PATCHING**

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
  - 1. Complete the work.
  - 2. Repair new work damaged by subsequent work.
  - 3. Remove samples of installed work for testing when requested.
  - 4. Remove and replace defective and non-complying work.
- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- D. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- E. Restore work with new products in accordance with requirements of Contract Documents.

### **3.07 PROGRESS CLEANING**

- A. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

### **3.08 PROTECTION OF INSTALLED WORK**

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.

- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Prohibit traffic from landscaped areas.
- E. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

**3.09 FINAL CLEANING**

- A. Clean site; sweep paved areas, rake clean landscaped surfaces.
- B. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

**END OF SECTION 01 7000**

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# AIA<sup>®</sup> Document G704<sup>™</sup> – 2017

## Certificate of Substantial Completion

PROJECT: *(name and address)*

CONTRACT INFORMATION:

Contract For:  
Date:

CERTIFICATE INFORMATION:

Certificate Number:  
Date:

OWNER: *(name and address)*

ARCHITECT: *(name and address)*

CONTRACTOR: *(name and address)*

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

*(Identify the Work, or portion thereof, that is substantially complete.)*

\_\_\_\_\_  
ARCHITECT *(Firm Name)*

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
PRINTED NAME AND TITLE

\_\_\_\_\_  
DATE OF SUBSTANTIAL COMPLETION

### WARRANTIES

The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

*(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)*

### WORK TO BE COMPLETED OR CORRECTED

A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:

*(Identify the list of Work to be completed or corrected.)*

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

Cost estimate of Work to be completed or corrected: \$

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:

*(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)*

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

\_\_\_\_\_  
CONTRACTOR *(Firm Name)*

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
PRINTED NAME AND TITLE

\_\_\_\_\_  
DATE

\_\_\_\_\_  
OWNER *(Firm Name)*

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
PRINTED NAME AND TITLE

\_\_\_\_\_  
DATE





# AIA<sup>®</sup> Document G706<sup>™</sup> – 1994

## Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER

CONTRACT FOR:

ARCHITECT

CONTRACTOR

TO OWNER: *(Name and address)*

CONTRACT DATED:

SURETY

OTHER

STATE OF:

COUNTY OF:

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

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

CONTRACTOR: *(Name and address)*

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

Indicate attachment:  Yes  No

BY:

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

*(Signature of authorized representative)*

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof
3. Contractor's Affidavit of Release of Liens (AIA Document G706A<sup>™</sup>)

*(Printed name and title)*

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

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**AIA**<sup>®</sup>

# Document G706A<sup>™</sup> – 1994

## Contractor's Affidavit of Release of Liens

PROJECT: <i>(Name and address)</i>	ARCHITECT'S PROJECT NUMBER:	OWNER <input type="checkbox"/>
	CONTRACT FOR:	ARCHITECT <input type="checkbox"/>
		CONTRACTOR <input type="checkbox"/>
TO OWNER: <i>(Name and address)</i>	CONTRACT DATED:	SURETY <input type="checkbox"/>
		OTHER <input type="checkbox"/>

STATE OF:  
 COUNTY OF:

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

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

\_\_\_\_\_  
*(Signature of authorized representative)*

\_\_\_\_\_  
*(Printed name and title)*

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**







# AIA<sup>®</sup> Document G707<sup>™</sup> – 1994

## Consent of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER

CONTRACT FOR:

ARCHITECT

CONTRACTOR

TO OWNER: *(Name and address)*

CONTRACT DATED:

SURETY

OTHER

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

on bond of  
*(Insert name and address of Contractor)*

, SURETY,

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

, CONTRACTOR,

as set forth in said Surety's bond.

, OWNER,

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

\_\_\_\_\_  
*(Surety)*

\_\_\_\_\_  
*(Signature of authorized representative)*

Attest:  
*(Seal)*

\_\_\_\_\_  
*(Printed name and title)*

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**



**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

**PART 1 GENERAL**

**1.01 WASTE MANAGEMENT REQUIREMENTS**

- A. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- B. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- C. Methods of trash/waste disposal that are not acceptable are:
  - 1. Burning on the project site.
  - 2. Burying on the project site.
  - 3. Dumping or burying on other property, public or private.
  - 4. Other illegal dumping or burying.
- D. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

**1.02 DEFINITIONS**

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating, and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

### **1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
  - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
  - 2. Submit Report on a form acceptable to Owner.
  - 3. Landfill Disposal: Include the following information:
    - a. Identification of material.
    - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
    - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
  - 4. Incinerator Disposal: Include the following information:
    - a. Identification of material.
    - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
    - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
  - 5. Recycled and Salvaged Materials: Include the following information for each:
    - a. Identification of material, including those retrieved by installer for use on other projects.
    - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
    - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
    - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
  - 6. Material Reused on Project: Include the following information for each:
    - a. Identification of material and how it was used in the project.
    - b. Amount, in tons or cubic yards.
    - c. Include weight tickets as evidence of quantity.
  - 7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

**PART 2 PRODUCTS**

**2.01 NOT USED**

**PART 3 EXECUTION**

**3.01 WASTE MANAGEMENT PROCEDURES**

- A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

**END OF SECTION 01 7419**



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**SECTION 01 7800**

**CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties, guarantees, and bonds.
  - 1. Form of Guarantee/Warranty follows as:
    - a. Section 01 7801 - Form of Guarantee/Warranty.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Section 01 7801 - Form of Guarantee/Warranty
- E. Individual Product Sections: Warranties/Guaranties required for specific products or Work.

**1.03 SUBMITTALS**

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
  - 1. Submit a PDF file of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return with comments.
  - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
  - 3. Submit a PDF file of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
  - 4. Submit two hard copy sets and one set on USB storage device of revised final documents in final form within 10 days after final inspection.
- C. Warranties, Guaranties, and Bonds:
  - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
  - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
  - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.

SECTION 01 7801  
FORM OF GUARANTEE/WARRANTY

**PROJECT INFORMATION**

Project Name: South Jordan Middle School Parking Lot Addition/Remodel  
Project Address: 10245 S. 2700 W., South Jordan, Utah  
Owner: Jordan School District.  
Owner's Address: 7905 S. Redwood Road, West Jordan, Utah

**CONTRACTOR**

Contractor Name: \_\_\_\_\_

Contractor's Address: \_\_\_\_\_

\_\_\_\_\_

**GUARANTEE/WARRANTY**

Date: \_\_\_\_\_

Know all persons by these present that, in consideration of my (our) having been awarded the Contract for complete furnishing and installation of: (List specific sections and extent of work.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

In conformity with the drawings and specifications prepared by Naylor Wentworth Lund Architects, 723 West Pacific Ave, Salt Lake City, Utah 84104

We do hereby agree to return to the project with three (3) working days upon notification by the Owner that materials and/or workmanship has proven faulty and to repair, replace or otherwise make good to the full satisfaction of the Owner and/or Architect all such work (including adjacent work disturbed in completing required work under this warranty) without cost to the Owner.

This agreement shall remain in full force and effect until \_\_\_\_\_year(s) from date of Substantial Completion established for the project by the Architect on the Certificate of Substantial Completion.

\_\_\_\_\_

Authorized Signature

\_\_\_\_\_

Title

\_\_\_\_\_

Contractor

2. Specifications.
  3. Addenda.
  4. Change Orders and other modifications to the Contract.
  5. Reviewed shop drawings, product data, and samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  2. Field changes of dimension and detail.
  3. Details not on original Contract drawings.

### **3.02 OPERATION AND MAINTENANCE DATA**

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### **3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For each product, applied material, and finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
  2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

### **3.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

- C. Binders: Commercial quality, 8 1/2 by 11 inch three D side ring binders with durable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible person.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
  - 1. Tabs to organized by Section Number.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the Section Number on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

### **3.05 WARRANTIES, GUARANTIES, AND BONDS**

- A. Each Subcontractor to submit form found in Section 01 7801 - Form of Guarantee/Warranty
- B. Minimum Guarantee/Warranty period to be One (1) unless otherwise stated in Sections.
- C. Obtain warranties, guaranties, and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- D. Verify that documents are in proper form, contain full information, and are notarized.
- E. Co-execute submittals when required.
- F. Retain warranties and bonds until time specified for submittal.
- G. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- H. Manual: Bind in commercial quality 8 1/2 by 11 inch three D side ring binders with durable plastic covers.
- I. Cover: Identify each binder with typed or printed title WARRANTIES, GUARANTIES, AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- J. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- K. Separate each warranty, guarantee, or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

**END OF SECTION 01 7800**

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**SECTION 03 3000**

**CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Work included: Provide all labor, materials, equipment, fabrication, incidentals, transportation, placing and supervision necessary to complete all cast-in-place concrete work, its finishing, and all related work called for by the Contract Drawings and/or Specifications, or reasonably inferable from either or both, as needed for a complete and proper installation. Including but not limited to the following described items:
- B. Concrete for site Monument Sign.
- C. Architectural Exposed Concrete.
- D. Concrete for Fence Posts.
- E. Concrete curing.
- F. Provide as a separate cost as part of Bid Alternate No. 1.
- G. Do not include sales tax, refer to 00 0104 - Notice to Contractors.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 2300 – Bid Alternates
- B. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.
- C. Section 03 2000 - Reinforcing.
- D. Section 07 1900 – Exterior Water Repellents and Graffiti Resistant Sealers.
- E. Section 32 3113 – Chan Link Fences.
- F. Section 32 3119 – Decorative Metal Fences.
- G. Division 32 – Exterior Improvements - Concrete Paving for sidewalks, curbs, and gutters.
- H. Division 26: Electrical items for casting into concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).
- B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete 1998 (Reapproved 2004).
- C. ACI 301 - Specifications for Concrete Construction 2020.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).
- F. ACI 305R - Guide to Hot Weather Concreting 2020.
- G. ACI 306R - Guide to Cold Weather Concreting 2016.
- H. ACI 308R - Guide to External Curing of Concrete 2016.
- I. ACI 318 - Building Code Requirements for Structural Concrete 2019, with Errata (2021).
- J. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.
- K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.
- L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2021b.
- M. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.
- N. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete 2020.
- O. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).

- P. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete 2019.
- Q. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete 2017a.
- R. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019.
- S. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2019.
- T. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete 2020a.
- U. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.
- V. ASTM C1202 - Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration 2019.
- W. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete 2019.
- X. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete 2018.
- Y. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2018.
- Z. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers 2020.
- AA. ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric) 2014.
- BB. 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 2018a.
- CC. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.
- DD. COE CRD-C 48 - Handbook for Concrete and Cement Standard Test Method for Water Permeability of Concrete 1992.
- EE. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop 1974.
- FF. NSF 61 - Drinking Water System Components - Health Effects 2021.
- GG. NSF 372 - Drinking Water System Components - Lead Content 2020.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.
  - 1. Topics for discussion may include: Design mixture, placement schedule, placement/forming methods, tolerances, curing method, and protection.
  - 2. Record, type, and distribute meeting minutes within 5 days of the meeting to all concerned parties, including but not limited to the Owner's Representative, Architect, and all attendees.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. 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 sealer.
- C. Mix Design: Submit proposed concrete mix design.
  - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.

2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
  3. Indicate proposed mix design complies with admixture manufacturer's written recommendations.
- D. Test Reports: Submit report for each test or series of tests specified.
- E. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- F. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of Portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

### **1.06 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Contractor shall guarantee his/her work for a period of One (1) year(s) from date of Substantial Completion. Guarantee form will be found in Section 01 7800.

## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Comply with requirements of Section 03 1000.
- B. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
1. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
  2. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

### **2.02 REINFORCEMENT MATERIALS**

- A. Comply with the requirements of Section 03 2000.

### **2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C150/C150M, Type I/II Portland type.
1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
1. Acquire aggregates for entire project from same source.
- C. Lightweight Aggregate: ASTM C330/C330M.
- D. Fly Ash: ASTM C618, Class F.
- E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

### **2.04 ADMIXTURES**

- A. Chemical Admixture:



1. Manufacturers:
  - a. Sika Corporation: [www.sikaconstruction.com](http://www.sikaconstruction.com)
  - b. GCP Applied Technologies; [www.gcpat.com](http://www.gcpat.com)
  - c. Master Builders Solutions US LLC: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - d. Euclid Chemical Company: [www.euclidchemical.com](http://www.euclidchemical.com)
  - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Do not use chemicals that will result in soluble chloride ions in excess of 0.05 percent by weight of cement.
- C. All admixtures to come from same manufacturer. Verify that admixtures are compatible.
- D. Air Entrainment Admixture: ASTM C260/C260M.
  1. Ensure that certification attesting to compliance with ASTM C260/C260M is furnished.
  2. Ensure that all exterior concrete flatwork, curbs and gutters, and catch basins have an air-entraining agent.
  3. Manufacturers:
    - a. "Airalon 3000" manufactured by Grace Construction Products.
    - b. "MasterAir" Series manufactured by Master Builders Solutions US LLC.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- E. Water Reducing (set controlling) Admixtures:
  1. Adjust concrete to produce the required rate of hardening for varied climatic and job site conditions.
  2. Ensure that admixture does not reduce the amount of cement required. Amounts as accepted by Architect/Engineer. Do not use calcium chloride or admixtures that contain calcium chloride.
  3. Ensure that Field Service, a qualified concrete technician employed by the manufacturer, is available upon request to assist in proportioning concrete materials for optimum use, and to advise on proper use of the admixture and adjustment of concrete mix proportions to meet the jobsite and climatic conditions.
  4. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
    - a. Approval in writing required from Architect.
  5. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
    - a. Under 40 degrees F ambient temperature - Accelerate (Approval in writing required from Architect).
  6. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
    - a. Over 80 degrees F ambient temperature - Retard.
  7. Water Reducing Admixture: ASTM C494/C494M Type A.
    - a. Between 40 degrees F and 80 degrees F ambient temperature - Normal rate of hardening.
  8. Shrinkage Reducing Admixture:
    - a. ASTM C494/C494M, Type S.
    - b. Products:
      - 1) GCP Applied Technologies; Eclipse 4500: [www.gcpat.com](http://www.gcpat.com).
      - 2) Substitutions: See Section 01 6000 - Product Requirements.
  9. Waterproofing Admixture: Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.
    - a. Admixture Composition: Crystalline, functioning by growth of crystals in capillary pores.
    - b. Admixture Composition: Hydrophobic polymer waterproofing and corrosion inhibitor, functioning by closing concrete pores and chemical bonding.
    - c. Permeability of Cured Concrete: No measurable leakage when tested in accordance with COE CRD-C 48 at 200 psi; provide test reports.

- d. 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
- e. Products:
  - 1) ConShield Technologies, Inc; Crystal X: [www.conshield.com](http://www.conshield.com).
  - 2) MasterLife 300 Series; Master Builders Solutions US LLC: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - 3) W. R. Meadows, Inc; ADI-CON CW Plus: [www.wrmeadows.com](http://www.wrmeadows.com).
  - 4) Substitutions: See Section 01 6000 - Product Requirements.

## 2.05 BONDING AND JOINTING PRODUCTS

- A. Epoxy Bonding System:
  1. Complying with ASTM C881/C881M and of Type required for specific application and moisture insensitive.
  2. Products:
    - a. Euclid Chemical Company; DURAL FAST SET LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## 2.06 CURING MATERIALS

- A. Evaporation Retarder: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
  1. Manufacturers:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com](http://www.daytonsuperior.com).
    - b. Euclid Chemical Company; EUCOBAR: [www.euclidchemical.com](http://www.euclidchemical.com).
    - c. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: [www.specchemllc.com](http://www.specchemllc.com).
    - d. W. R. Meadows, Inc; Evapre or Evapre-RTU: [www.wrmeadows.com](http://www.wrmeadows.com).
    - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Curing Compound, Non-dissipating: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C309.
  1. Vehicle: Water-based.
  2. Gloss: Low.
  3. Solids by Mass: 15 percent, minimum.
  4. VOC Content: OTC compliant.
  5. Products:
    - a. Kaufman Products Inc; Krystal 15 Emulsion: [www.kaufmanproducts.net](http://www.kaufmanproducts.net).
    - b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Dress & Seal WB: [www.lmcc.com](http://www.lmcc.com).
    - c. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Dress & Seal WB 30: [www.lmcc.com](http://www.lmcc.com).
    - d. The QUIKRETE Companies; QUIKRETE® Acrylic Concrete Cure & Seal : [www.quikrete.com](http://www.quikrete.com)
    - e. W. R. Meadows, Inc; VOCOMP-20: [www.wrmeadows.com](http://www.wrmeadows.com).
    - f. Substitutions: See Section 01 6000 - Product Requirements.
- C. Water: Potable, not detrimental to concrete.

## 2.07 CONCRETE MIX DESIGN

- A. General Concrete Mix Requirements:

1. Obtain design of concrete mixes, including recommended amounts of admixture and water to be used in the mixes, from a qualified independent testing laboratory or agency, or from a mill or ready-mix plant properly equipped to design concrete mixes. A professional engineer currently registered as a civil or structural engineer in the State of Utah will perform and certify the design. Contractor shall ensure that the laboratory, agency, mill, or ready-mix plant used meets applicable requirements of ASTM E329. Contractor shall pay costs of obtaining the mix designs.
2. Ensure that selection of mix proportions conforms to the applicable requirements of ACI 211.1 and ACI 211.2. Ensure that concrete complies with ACI 301 and ACI 318, as applicable. Ensure that mix designs will produce concrete suited for proper placement and finishing.
3. Indicate brands, types and quantities of admixtures included in mix designs. If fly ash is proposed, identify it as such (e.g., "fly ash"), and identify the percentage of cement replacement in the mix design.
4. Ensure that mix designs indicate the location of the mix.
5. Ensure that fly ash does not exceed 20 percent in mix designs with replacement of Portland cement by weight with fly ash.
6. Ensure that mix design for architectural concrete and formed concrete that will be exposed to the public includes 10 percent minimum replacement of the cement with fly ash along with a plasticizing admixture, conforming with ASTM C1017, to provide a dense and plastic concrete mix that completely fills out the forms and form detail without air holes and rock pockets.
7. Ensure that mix designs of exterior concrete include air entrainment by total volume of concrete: 4 to 6 percent for 1 1/2 inch maximum size coarse aggregate; 5 to 7 percent for 3/4 or 1 inch maximum size coarse aggregate in accordance with ASTM C173/C173M.
8. Ensure that aggregates conform to Standard Specifications for Concrete Aggregates ASTM C33.
9. Ensure that calcium chloride or other materials containing chlorides are corrosive to reinforcing steel are not used as an admixture in post-tensioned concrete.
10. Concrete Strength: Establish required average strength for concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
11. Drying Shrinkage of Concrete: Establish required "Drying Shrinkage" for concrete on the basis of field experience or trial mixtures, as specified in ASTM C157 and ASTM C490.
- B. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
  1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.
- C. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
  1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- E. Concrete:
  1. Monument Sign - Normal Weight Concrete: as indicated on the drawings.
  2. Fence Posts - Normal Weight Concrete, 3000 psi.
- F. It is Contractors responsibility to recommend adjustments to mix design to meet specification requirements, based on job site conditions.
  1. Maximum Aggregate Size: 3/4 inch.

## 2.08 MIXING

- A. Ensure that concrete is ready-mixed batched, mixed, and transported in accordance with ASTM C94/C94M, "Specifications For Ready-Mixed Concrete," unless a higher standard is called for.
  - 1. Ensure that plant equipment and facilities conform to the "Checklist For Certification of Ready Mixed Concrete Production Facilities" of the National Ready-Mixed Concrete Association.
- B. For each load of concrete delivered, ensure that a delivery ticket is submitted that shows the following information:
  - 1. Number of cubic yards.
  - 2. The exact amount of cement and fly ash (if allowed); this can be indicated either by weight or quantity.
  - 3. The amount of mixing water including free moisture in aggregates; this can be indicated either by weight or quantity.
  - 4. Amount of slump in inches.
  - 5. Type of cement.
  - 6. Amount of air entrainment when delivered at job site.
  - 7. Do aggregates meet ASTM specified - yes or no. Indicate maximum size aggregate.
  - 8. Amount and brand (or ASTM) of admixture other than air entraining agent (if any) previously accepted in writing by Architect.
- C. Contractor shall ensure that delivery tickets are given to the Job Superintendent or Foreman; Job Superintendent and Foreman shall see that tickets are delivered to the Architect and Testing Contractor once a week. Note exact location of concrete on job.
- D. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### 3.02 PREPARATION

- A. Verify that forms are clean and free of rust before applying release agent.
- B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

### 3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. The Soils Engineer shall determine the moisture content of the base material prior to placing the concrete and shall make the final determination as to whether the moisture content of the base material is appropriate for concrete placement.
- C. Notify Architect not less than 24 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts and conduits will not be disturbed during concrete placement.

### 3.04 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, not more than 24 hours after form removal.

### **3.05 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  - 1. Normal concrete: Not less than seven days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

### **3.06 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

### **3.07 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 conforming to required lines, details, dimensions, tolerances, visual appearance or specified requirements as determined by the Architect and Owner.
- C. Repair or replacement of defective concrete will be determined by the Architect. Contractor shall bear the cost of additional testing 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.

### **3.08 PROTECTION**

- A. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.
- B. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

**END OF SECTION 03 3000**

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**SECTION 03 2000**

**REINFORCING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Furnish all labor, materials, equipment, tools and services required to fully complete all Reinforcing work as required by the Drawings and/or specified herein including, but not limited to, the following described items.
- B. Reinforcing steel for cast-in-place concrete Monument Sign.
- C. Supports and accessories for steel reinforcement.
- D. Provide as a separate cost as part of Bid Alternate No. 1.
- E. Do not include sales tax, refer to 00 0104 - Notice to Contractors.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 2300 – Bid Alternates
- B. Section 03 1000 - Concrete Forming and Accessories for Monument Sign.
- C. Section 03 3000 - Cast-in-Place Concrete for Monument Sign.
- D. Division 32 – Exterior Improvements, for site concrete and forming and accessories.

**1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Concrete Construction 2020.
- B. ACI SP-66 - ACI Detailing Manual 2004.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2020.
- D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2018a.
- E. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- F. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars 2018, with Amendment (2020).
- G. CRSI (DA4) - Manual of Standard Practice 2009.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301.
  - 1. Maintain one copy of each document on project site.
- B. Provide Architect with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- C. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.

**PART 2 PRODUCTS**

**2.01 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
- B. Stirrup Steel: ASTM A1064/A1064M steel wire, unfinished.
- C. Reinforcement Accessories:
  - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
  - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

**2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is not permitted.
- C. Locate reinforcing splices not indicated on drawings at point of minimum stress.

**PART 3 EXECUTION**

**3.01 PLACEMENT**

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Accommodate/coordinate placement of conduits.
- C. Comply with applicable code for concrete cover over reinforcement.

**3.02 FIELD QUALITY CONTROL**

- A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

**END OF SECTION 03 2000**



**SECTION 03 3000**

**CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Work included: Provide all labor, materials, equipment, fabrication, incidentals, transportation, placing and supervision necessary to complete all cast-in-place concrete work, its finishing, and all related work called for by the Contract Drawings and/or Specifications, or reasonably inferable from either or both, as needed for a complete and proper installation. Including but not limited to the following described items:
- B. Concrete for site Monument Sign.
- C. Architectural Exposed Concrete.
- D. Concrete for Site Signage and Fence Posts.
- E. Concrete curing.
- F. Provide as a separate cost as part of Bid Alternate No. 1.
- G. Do not include sales tax, refer to 00 0104 - Notice to Contractors.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 2300 – Bid Alternates
- B. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.
- C. Section 03 2000 - Reinforcing.
- D. Section 07 1900 – Exterior Water Repellents and Graffiti Resistant Sealers.
- E. Section 32 3113 – Chan Link Fences.
- F. Section 32 3119 – Decorative Metal Fences.
- G. Division 32 – Exterior Improvements - Concrete Paving for sidewalks, curbs, and gutters.
- H. Division 26: Electrical items for casting into concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).
- B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete 1998 (Reapproved 2004).
- C. ACI 301 - Specifications for Concrete Construction 2020.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).
- F. ACI 305R - Guide to Hot Weather Concreting 2020.
- G. ACI 306R - Guide to Cold Weather Concreting 2016.
- H. ACI 308R - Guide to External Curing of Concrete 2016.
- I. ACI 318 - Building Code Requirements for Structural Concrete 2019, with Errata (2021).
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- V. ASTM C1202 - Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration 2019.
- W. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete 2019.
- X. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete 2018.
- Y. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2018.
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- CC. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.
- DD. COE CRD-C 48 - Handbook for Concrete and Cement Standard Test Method for Water Permeability of Concrete 1992.
- EE. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop 1974.
- FF. NSF 61 - Drinking Water System Components - Health Effects 2021.
- GG. NSF 372 - Drinking Water System Components - Lead Content 2020.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.
  - 1. Topics for discussion may include: Design mixture, placement schedule, placement/forming methods, tolerances, curing method, and protection.
  - 2. Record, type, and distribute meeting minutes within 5 days of the meeting to all concerned parties, including but not limited to the Owner's Representative, Architect, and all attendees.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. 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 sealer.
- C. Mix Design: Submit proposed concrete mix design.
  - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.

2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
  3. Indicate proposed mix design complies with admixture manufacturer's written recommendations.
- D. Test Reports: Submit report for each test or series of tests specified.
- E. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- F. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of Portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

### **1.06 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Contractor shall guarantee his/her work for a period of One (1) year(s) from date of Substantial Completion. Guarantee form will be found in Section 01 7800.

## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Comply with requirements of Section 03 1000.
- B. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
1. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
  2. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

### **2.02 REINFORCEMENT MATERIALS**

- A. Comply with the requirements of Section 03 2000.

### **2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C150/C150M, Type I/II Portland type.
1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
1. Acquire aggregates for entire project from same source.
- C. Lightweight Aggregate: ASTM C330/C330M.
- D. Fly Ash: ASTM C618, Class F.
- E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

### **2.04 ADMIXTURES**

- A. Chemical Admixture:

1. Manufacturers:
  - a. Sika Corporation: [www.sikaconstruction.com](http://www.sikaconstruction.com)
  - b. GCP Applied Technologies; [www.gcpat.com](http://www.gcpat.com)
  - c. Master Builders Solutions US LLC: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - d. Euclid Chemical Company: [www.euclidchemical.com](http://www.euclidchemical.com)
  - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Do not use chemicals that will result in soluble chloride ions in excess of 0.05 percent by weight of cement.
- C. All admixtures to come from same manufacturer. Verify that admixtures are compatible.
- D. Air Entrainment Admixture: ASTM C260/C260M.
  1. Ensure that certification attesting to compliance with ASTM C260/C260M is furnished.
  2. Ensure that all exterior concrete flatwork, curbs and gutters, and catch basins have an air-entraining agent.
  3. Manufacturers:
    - a. "Airalon 3000" manufactured by Grace Construction Products.
    - b. "MasterAir" Series manufactured by Master Builders Solutions US LLC.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- E. Water Reducing (set controlling) Admixtures:
  1. Adjust concrete to produce the required rate of hardening for varied climatic and job site conditions.
  2. Ensure that admixture does not reduce the amount of cement required. Amounts as accepted by Architect/Engineer. Do not use calcium chloride or admixtures that contain calcium chloride.
  3. Ensure that Field Service, a qualified concrete technician employed by the manufacturer, is available upon request to assist in proportioning concrete materials for optimum use, and to advise on proper use of the admixture and adjustment of concrete mix proportions to meet the jobsite and climatic conditions.
  4. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
    - a. Approval in writing required from Architect.
  5. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
    - a. Under 40 degrees F ambient temperature - Accelerate (Approval in writing required from Architect).
  6. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
    - a. Over 80 degrees F ambient temperature - Retard.
  7. Water Reducing Admixture: ASTM C494/C494M Type A.
    - a. Between 40 degrees F and 80 degrees F ambient temperature - Normal rate of hardening.
  8. Shrinkage Reducing Admixture:
    - a. ASTM C494/C494M, Type S.
    - b. Products:
      - 1) GCP Applied Technologies; Eclipse 4500: [www.gcpat.com](http://www.gcpat.com).
      - 2) Substitutions: See Section 01 6000 - Product Requirements.
  9. Waterproofing Admixture: Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.
    - a. Admixture Composition: Crystalline, functioning by growth of crystals in capillary pores.
    - b. Admixture Composition: Hydrophobic polymer waterproofing and corrosion inhibitor, functioning by closing concrete pores and chemical bonding.
    - c. Permeability of Cured Concrete: No measurable leakage when tested in accordance with COE CRD-C 48 at 200 psi; provide test reports.

- d. 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
- e. Products:
  - 1) ConShield Technologies, Inc; Crystal X: [www.conshield.com](http://www.conshield.com).
  - 2) MasterLife 300 Series; Master Builders Solutions US LLC: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - 3) W. R. Meadows, Inc; ADI-CON CW Plus: [www.wrmeadows.com](http://www.wrmeadows.com).
  - 4) Substitutions: See Section 01 6000 - Product Requirements.

## 2.05 BONDING AND JOINTING PRODUCTS

- A. Epoxy Bonding System:
  - 1. Complying with ASTM C881/C881M and of Type required for specific application and moisture insensitive.
  - 2. Products:
    - a. Euclid Chemical Company; DURAL FAST SET LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## 2.06 CURING MATERIALS

- A. Evaporation Retarder: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
  - 1. Manufacturers:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com](http://www.daytonsuperior.com).
    - b. Euclid Chemical Company; EUCOBAR: [www.euclidchemical.com](http://www.euclidchemical.com).
    - c. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: [www.specchemllc.com](http://www.specchemllc.com).
    - d. W. R. Meadows, Inc; Evapre or Evapre-RTU: [www.wrmeadows.com](http://www.wrmeadows.com).
    - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Curing Compound, Non-dissipating: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C309.
  - 1. Vehicle: Water-based.
  - 2. Gloss: Low.
  - 3. Solids by Mass: 15 percent, minimum.
  - 4. VOC Content: OTC compliant.
  - 5. Products:
    - a. Kaufman Products Inc; Krystal 15 Emulsion: [www.kaufmanproducts.net](http://www.kaufmanproducts.net).
    - b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Dress & Seal WB: [www.lmcc.com](http://www.lmcc.com).
    - c. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Dress & Seal WB 30: [www.lmcc.com](http://www.lmcc.com).
    - d. The QUIKRETE Companies; QUIKRETE® Acrylic Concrete Cure & Seal : [www.quikrete.com](http://www.quikrete.com)
    - e. W. R. Meadows, Inc; VOCOMP-20: [www.wrmeadows.com](http://www.wrmeadows.com).
    - f. Substitutions: See Section 01 6000 - Product Requirements.
- C. Water: Potable, not detrimental to concrete.

## 2.07 CONCRETE MIX DESIGN

- A. General Concrete Mix Requirements:

1. Obtain design of concrete mixes, including recommended amounts of admixture and water to be used in the mixes, from a qualified independent testing laboratory or agency, or from a mill or ready-mix plant properly equipped to design concrete mixes. A professional engineer currently registered as a civil or structural engineer in the State of Utah will perform and certify the design. Contractor shall ensure that the laboratory, agency, mill, or ready-mix plant used meets applicable requirements of ASTM E329. Contractor shall pay costs of obtaining the mix designs.
2. Ensure that selection of mix proportions conforms to the applicable requirements of ACI 211.1 and ACI 211.2. Ensure that concrete complies with ACI 301 and ACI 318, as applicable. Ensure that mix designs will produce concrete suited for proper placement and finishing.
3. Indicate brands, types and quantities of admixtures included in mix designs. If fly ash is proposed, identify it as such (e.g., "fly ash"), and identify the percentage of cement replacement in the mix design.
4. Ensure that mix designs indicate the location of the mix.
5. Ensure that fly ash does not exceed 20 percent in mix designs with replacement of Portland cement by weight with fly ash.
6. Ensure that mix design for architectural concrete and formed concrete that will be exposed to the public includes 10 percent minimum replacement of the cement with fly ash along with a plasticizing admixture, conforming with ASTM C1017, to provide a dense and plastic concrete mix that completely fills out the forms and form detail without air holes and rock pockets.
7. Ensure that mix designs of exterior concrete include air entrainment by total volume of concrete: 4 to 6 percent for 1 1/2 inch maximum size coarse aggregate; 5 to 7 percent for 3/4 or 1 inch maximum size coarse aggregate in accordance with ASTM C173/C173M.
8. Ensure that aggregates conform to Standard Specifications for Concrete Aggregates ASTM C33.
9. Ensure that calcium chloride or other materials containing chlorides are corrosive to reinforcing steel are not used as an admixture in post-tensioned concrete.
10. Concrete Strength: Establish required average strength for concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
11. Drying Shrinkage of Concrete: Establish required "Drying Shrinkage" for concrete on the basis of field experience or trial mixtures, as specified in ASTM C157 and ASTM C490.
- B. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
  1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.
- C. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
  1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- E. Concrete:
  1. Monument Sign - Normal Weight Concrete: as indicated on the drawings.
  2. Sign and Fence Posts - Normal Weight Concrete, 3000 psi.
- F. It is Contractors responsibility to recommend adjustments to mix design to meet specification requirements, based on job site conditions.
  1. Maximum Aggregate Size: 3/4 inch.

## 2.08 MIXING

- A. Ensure that concrete is ready-mixed batched, mixed, and transported in accordance with ASTM C94/C94M, "Specifications For Ready-Mixed Concrete," unless a higher standard is called for.
  - 1. Ensure that plant equipment and facilities conform to the "Checklist For Certification of Ready Mixed Concrete Production Facilities" of the National Ready-Mixed Concrete Association.
- B. For each load of concrete delivered, ensure that a delivery ticket is submitted that shows the following information:
  - 1. Number of cubic yards.
  - 2. The exact amount of cement and fly ash (if allowed); this can be indicated either by weight or quantity.
  - 3. The amount of mixing water including free moisture in aggregates; this can be indicated either by weight or quantity.
  - 4. Amount of slump in inches.
  - 5. Type of cement.
  - 6. Amount of air entrainment when delivered at job site.
  - 7. Do aggregates meet ASTM specified - yes or no. Indicate maximum size aggregate.
  - 8. Amount and brand (or ASTM) of admixture other than air entraining agent (if any) previously accepted in writing by Architect.
- C. Contractor shall ensure that delivery tickets are given to the Job Superintendent or Foreman; Job Superintendent and Foreman shall see that tickets are delivered to the Architect and Testing Contractor once a week. Note exact location of concrete on job.
- D. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### 3.02 PREPARATION

- A. Verify that forms are clean and free of rust before applying release agent.
- B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

### 3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. The Soils Engineer shall determine the moisture content of the base material prior to placing the concrete and shall make the final determination as to whether the moisture content of the base material is appropriate for concrete placement.
- C. Notify Architect not less than 24 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts and conduits will not be disturbed during concrete placement.

### 3.04 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, not more than 24 hours after form removal.

### **3.05 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  - 1. Normal concrete: Not less than seven days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

### **3.06 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

### **3.07 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 conforming to required lines, details, dimensions, tolerances, visual appearance or specified requirements as determined by the Architect and Owner.
- C. Repair or replacement of defective concrete will be determined by the Architect. Contractor shall bear the cost of additional testing 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.

### **3.08 PROTECTION**

- A. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.
- B. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

**END OF SECTION 03 3000**



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SECTION 07 1900

EXTERIOR WATER REPELLENTS AND GRAFFITI RESISTANT SEALERS

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Water Repellent and Sealer work as is indicated on the drawings and/or specified herein including, but not limited to, the following items.
- B. Surfaces to be treated: exterior architectural concrete.
  - 1. Water repellents.
  - 2. Combination water repellent and anti-graffiti sealer.
- C. Surface preparation.
- D. Provide as a separate cost as part of Bid Alternate No. 1.
- E. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 2300 – Bid Alternates.
- B. Section 03 3000 – Cast in Place Concrete
- C. Division 32 – Exterior Site Improvements - Site Concrete: Exterior horizontal concrete surface sealer.

**1.03 REFERENCE STANDARDS**

- A. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units 2022a.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings 2005 (Reapproved 2018).
- C. ASTM D5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes, and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments 1991 (Reapproved 2022).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a meeting at least one week prior to starting work; require attendance of affected installers; invite Architect and Owner.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, details of tests performed, limitations, and chemical composition.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Field Reports: Report whether manufacturer's best practices are being followed; if not, state corrective recommendations. Email report to Architect the same day as inspection occurs; mail report on manufacturer's letterhead to Architect within 2 days after inspection.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements for additional provisions.
  - 2. Extra Water Repellent Material: Two gallons of the each type installed.

## 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with minimum three years of documented experience
- C. Owner reserves the right to provide continuous independent inspection of surface preparation and application of water repellent.

## 1.07 MOCK-UPS

- A. If requested by Architect/Owner, prepare representative surface 36 by 36 inches in size using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
  - 1. Conduct RILEM test on cured field sample. Allow product to fully cure 5 to 7 days before testing. Adjust application until required repellent performance is achieved.
- B. Manufacturer's representative will review technical aspects; surface preparation, application, and workmanship.
- C. Obtain Architect's written approval of field sample before start of material application, including approval of aesthetics, color, texture, and appearance.
- D. Locate where directed.
- E. Mock-up may remain as part of work.

## 1.08 FIELD CONDITIONS

- A. Protect liquid materials from freezing.
- B. Do not apply water repellent/sealers when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.
- C. Do not apply water repellents/sealers when wind velocity is higher than 15 mph.

## 1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store in unopened containers in a cool, dry area. Keep material from freezing in the container; do not store below 35 degrees F (2 degrees C) or above 100 degrees F (38 degrees C).

## 1.10 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer shall warrant respective products applied in accordance with manufacturer's specifications for a period of 5 years from date of Substantial Completion, against water intrusion due to material failure. When notified of such conditions, in writing, by the Owner, the manufacturer shall provide materials, and the applicator shall provide the labor to correct said deficiencies promptly and without inconvenience or cost to the Owner.
- C. The Contractor shall guarantee his work for a period of One (1) year(s) from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents:
  - 1. BASF Construction Chemicals: [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
  - 2. Concrete Sealers USA: [www.concretesealersusa.com](http://www.concretesealersusa.com).
  - 3. Dayton Superior Corporation: [www.daytonsuperior.com](http://www.daytonsuperior.com).

4. Evonik Corporation: [www.evonik.com](http://www.evonik.com).
5. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
6. PROSOCO, Inc: [www.prosoco.com](http://www.prosoco.com).
7. The QUIKRETE Companies: [www.quikrete.com](http://www.quikrete.com).
8. Rust-Oleum Corporation; OKON S-20 Penetrating Silane-Siloxane Water Repellent Sealer : [www.rustoleum.com](http://www.rustoleum.com).
9. Sherwin-Williams Company: [www.sherwin-williams.com](http://www.sherwin-williams.com).
10. Rainguard International: [www.rainguard.com](http://www.rainguard.com).
11. L&M Construction Chemicals, Inc.: [www.lmcc.com](http://www.lmcc.com).
12. Substitutions: See Section 01 6000 - Product Requirements.

## 2.02 MATERIALS

- A. Water Repellent - Exterior concrete surfaces. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
1. Applications: Vertical surfaces and non-traffic horizontal surfaces.
  2. Number of Coats: Two.
  3. VOC Content: Less than 600 g/L, when tested in accordance with ASTM D3960 or ASTM D5095.
  4. Moisture Absorption When Applied to Masonry: Five percent, maximum, when tested in accordance with ASTM C140/C140M using masonry sample completely coated with water repellent.
  5. Maintains dry appearance when wetted.
  6. Water-based siloxane, silane, or blend that reacts chemically with concrete and masonry.
    - a. Manufacturers:
      - 1) BASF Construction Chemicals; MasterProtect H 185 .
      - 2) Pecora Corporation.
      - 3) PROSOCO, Inc; Sure Klean Weather Seal H40: [www.prosoco.com](http://www.prosoco.com).
      - 4) Sherwin-Williams Company; Loxon 7 Percent Siloxane, with VOC of Zero g/L: [www.sherwin-williams.com](http://www.sherwin-williams.com).
      - 5) Okon, Inc.; Product - OKON S-40: [www.okoninc.com](http://www.okoninc.com).
      - 6) Substitutions: See Section 01 6000 - Product Requirements.
- B. Water Repellent and Graffiti-Resistant Sealer (Monument Sign): Combination water repellent and graffiti-resistant sealer, colorless, non-yellowing, non-sacrificial, penetrating, water-vapor-permeable formulated to weatherproof concrete block and other porous masonry materials and protect treated surfaces from repeated graffiti attacks without altering the natural appearance.
1. Acceptable Products:
    - a. PROSOCO; Sure Klean Weather Seal Blok-Guard & Graffiti Control Ultra.
    - b. Rainguard International; Micro-Seal with anti-graffiti.
    - c. Substitutions: See Section 01 6000 - Product Requirements.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify joint sealants are installed and cured.
- C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

### 3.02 PREPARATION

- A. Protection of Adjacent Work:
  - 1. Protect adjacent landscaping, property, and vehicles from drips and overspray.
  - 2. Protect adjacent surfaces not intended to receive sealer.
- B. Prepare surfaces to be coated as recommended by manufacturer for best results.
- C. Do not start work until masonry mortar and concrete substrate is cured a minimum of 60 days.
- D. Remove loose particles and foreign matter.
- E. Remove oil and foreign substances with a chemical solvent that will not affect sealer.
- F. Scrub and rinse surfaces with water and let dry.
- G. Allow surfaces to dry completely to degree recommended by sealer manufacturer before starting coating work.

### 3.03 APPLICATION

- A. Apply in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.
- B. Apply at rate recommended by manufacturer, continuously over entire surface.
- C. Apply two coats, minimum.
- D. Remove sealer from unintended surfaces immediately by a method instructed by water repellent manufacturer.
- E. Provide manufacturer's field service representative to inspect preparation and application work continuously during entire application period to ensure that manufacturer's best practices for preparation and application are being followed.

### 3.04 FINAL CLEANING

- A. Clean site of all unused sealer, residues, rinse water, wastes, and effluents in accordance with environmental regulations.
- B. Remove and dispose of all materials used to protect surrounding areas and non-masonry surfaces, following completion of the Work of this Section.
- C. Repair, restore, or replace to the satisfaction of the Architect, all materials, landscaping, and non-masonry surfaces damaged by exposure to sealer.

### END OF SECTION 07 1900

**SECTION 10 1400**

**BUILDING AND SITE SIGNAGE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Furnish all labor, materials, equipment, tools and services required to fully complete all Building Signage work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
- B. Dimensional Letter signs.
- C. Site Signage.
- D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.
- E. Furnish price as a part of Alternate No. 1, Refer to Section 01 2300 - Alternates.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 2300 – Bid Alternates
- B. Section 03 3000 – Cast in Place Concrete for site signage posts.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
- C. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics 2020.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- E. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- F. ASTM E2072 - Standard Specification for Photoluminescent (Phosphorescent) Safety Markings 2014.
- G. UL 1994 - Luminous Egress Path Marking Systems Current Edition, Including All Revisions.
- H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.
- I. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data:
  - 1. Manufacturer's printed product literature for each type of site sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
  - 2. Manufacturer's printed product literature for each type of building identification letter, indicating heights, dimensional size, font style, material, and finish.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including other text to be applied, sign and letter sizes, fonts, and colors.
  - 1. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit one sample, 12" x 12" of each type of each size of Dimensional Letter, illustrating font and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

- F. Verification Samples: Submit samples showing colors specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package signs as required to prevent damage before installation.

### **1.07 GUARANTEE**

- A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
- B. Manufacturer shall provide 2 year warranty against material and manufacturing defects.

### **1.08**

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Flat Signs:
  - 1. Best Sign Systems, Inc.: [www.bestsigns.com](http://www.bestsigns.com).
  - 2. Cosco Industries: [www.coscoarchitecturalsigns.com](http://www.coscoarchitecturalsigns.com).
  - 3. Inpro: [www.inprocorp.com](http://www.inprocorp.com).
  - 4. Mohawk Sign Systems, Inc.: [www.mohawksign.com](http://www.mohawksign.com).
  - 5. Seton Identification Products: [www.seton.com](http://www.seton.com).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
  
- B. Dimensional Letter Signs:
  - 1. A.R.K. Ramos Architectural Signage Systems Cast Aluminum Letters: [www.arkramos.com/#sle](http://www.arkramos.com/#sle).
  - 2. Cosco Industries Cast Aluminum Letters: [www.coscoarchitecturalsigns.com/#sle](http://www.coscoarchitecturalsigns.com/#sle).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 SITE SIGNAGE**

- A. General:
  - 1. All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Materials:
  - 1. Exterior Steel Panels:
    - a. Panel Construction: 16 gage electro-galvanized paintlock steel, ASTM A 591.
    - b. Corner Condition: Round 1/2 inch (13 mm) diameter corner.
    - c. Mounting: Post Mounted.
  - 2. Sign Posts:
    - a. Post: Galvanized 2 inch (50 mm) square x 12 gage steel tube with 7/16 inch (11 mm) holes at 1 inch (25 mm) on center.
    - b. Ground Anchor Sleeve: Galvanized 2 1/2 inch (64 mm) square x 12 gage sleeve.
- C. Signage Types:
  - 1. ADA Signage and Parking Signage with Pictograms:

- a. Text/Pictogram Placement: Centered.
- b. Size/Shape: Varies, refer to drawings.
- c. Context of Text/Pictograms: Exact verbiage/pictograms will be supplied at time of shop drawing submittal. Contractor shall coordinate with Owner/Architect.
  - 1) "Reserved Parking Only".
  - 2) "Reserved Parking Only - Van Accessible Parking Only".
2. Site Traffic Signs (As identified on Civil Drawings)
  - a. "Stop".
  - b. "Bus Only"
  - c. Locations: As shown on Civil Drawings.
- D. Finishes:
  1. Panel: One (1) coat of metal primer and Two (2) coats of synthetic automotive enamel.
    - a. Colors:
      - 1) ADA Signage: Standard Blue.
      - 2) Traffic Signs: MUTCD Standards
  2. ADA Signage Text and Graphics: Two (2) coats of bulletin paint.
    - a. Font: ADA Standard.
    - b. Color: ADA Standard.
  3. Traffic Signage Text and Graphics: Two (2) coats of bulletin paint.
    - a. Font: MUTCD Standard.
    - b. Color: MUTCD Standard.

### 2.03 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

### 2.04 DIMENSIONAL LETTERS

- A. Metal Letters:
  1. Metal: Aluminum casting.
  2. Metal Thickness: 1/8 inch minimum.
  3. Letter Height: As indicated on the drawings.
  4. Text and Typeface:
    - a. Character Font: Gemini Helvetica (Helvetica Bold).
    - b. Character Case: Upper case only.
  5. Finish: Clear Anodized, Brushed, satin.
  6. Mounting: Screw attached trough back of Metal Mounting Plate.
- B. Mounting Plate:
  1. Metal: 1/2" Aluminum Plate.
  2. Finish: Kynar Painted Finish, color as selected by Architect.

### 2.05 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Exposed Screws: Stainless steel.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.



- B. Complete all finishing operations, including painting, before beginning installation of signage systems.
- C. Surfaces shall be dry and free from dirt, grease and loose paint.
- D.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

**END OF SECTION 10 1400**

**SECTION 31 0513  
COMMON FILL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Common fill materials.

**1.02 REFERENCES**

- A. ASTM C 136: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D 1883: Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils.
- C. ASTM D 2487: Standard Test Method for Classification of Soils for Engineering Purposes.
- D. ASTM D 2844: Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils.
- E. ASTM D 3282: Standard Practice for Classification of Soils and Soil- Aggregate Mixtures for Highway Construction Purposes.
- F. ASTM D 3740: Standard Recommended Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

**1.03 SUBMITTALS**

- A. Prior to delivering material to site, identify:
  - 1. Name of Supplier and source
  - 2. Gradation of common fill material
- B. If a change in source of material is required, submit name of Supplier, source and gradation analysis of material prior to delivery to site.

**1.04 QUALITY ASSURANCE**

- A. Use a laboratory that follows and complies with Section 01 45 00 and ASTM D 3740.
- B. Reject common fill products that do not meet requirements of this section.
- C. Remove any product found defective after installation and install acceptable product at no additional cost to OWNER.

**1.05 ACCEPTANCE**

- A. General:
  - 1. Acceptance is by Lot. One Lot is one day's production.
  - 2. Dispute resolution; Section 01 35 10.
- B. Roadway Backfill: Sub-lot size is 5,000 tons.

**PART 2 PRODUCTS**

**2.01 BORROW**

- A. Classifications A-1-a through A-4, ASTM D 3282.

**2.02 GRANULAR BORROW**

- A. Classifications A-1-a, A-1-b, A-2-4, or A-3, ASTM D 3282.



ENGINEERING • GEOTECHNICAL • ENVIRONMENTAL (ESA I & II) •  
MATERIALS TESTING • SPECIAL INSPECTIONS •  
ORGANIC CHEMISTRY • PAVEMENT  
DESIGN • GEOLOGY

## GEOTECHNICAL ENGINEERING STUDY

# South Jordan Middle School Parking Lot Replacement

10245 South 2700 West  
South Jordan, Utah  
**CMT PROJECT NO. 21375**

FOR:  
**Jordan School District**  
7905 South Redwood Road  
West Jordan, Utah 84088

December 20, 2023

December 20, 2023

Mr. Ian Roberts  
Jordan School District  
7905 South Redwood Road  
West Jordan, Utah 84088

Subject: Geotechnical Engineering Study  
South Jordan Middle School Parking Lot Replacement  
10245 South 2700 West  
South Jordan, Utah  
CMT Project Number: 21375

Mr. Roberts:

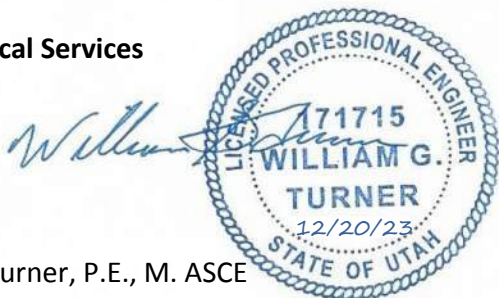
Submitted herewith is the report of our geotechnical engineering study for the subject site. This report contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. It also contains recommendations to aid in the design and construction of the earth related phases of this project.

On December 8, 2023, a CMT Technical Services (CMT) staff professional was on-site and observed the drilling of 11 bore holes extending to a depth of about 6.5 feet below the existing ground surface. Soil samples were obtained during the field operations and subsequently transported to our laboratory for further testing and observation.

The results of our field explorations, laboratory testing and engineering analyses indicate the existing road base materials appear to be thick enough and can likely remain in place, but should be proof-rolled to identify soft spots.

We appreciate the opportunity to work with you at this stage of the project. CMT offers a full range of Geotechnical Engineering, Geological, Material Testing, Special Inspection services, and Phase I and II Environmental Site Assessments. With offices throughout Utah, Idaho, Arizona, Colorado and Texas, our staff is capable of efficiently serving your project needs. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-492-4132.

Sincerely,  
CMT Technical Services



William G. Turner, P.E., M. ASCE  
Senior Geotechnical Engineer

Reviewed by:

A handwritten signature in blue ink, appearing to read "Jeffrey J. Egbert".

Jeffrey J. Egbert, P.E., LEED A.P., M. ASCE  
Senior Geotechnical Engineer

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### APPENDIX

**Figure 1:** Site Map

**Figures 2-12:** Bore Hole Logs

**Figure 13:** Key to Symbols

**Figures 14-24:** DCP Test Data

## **1.0 INTRODUCTION**

### **1.1 General**

CMT Technical Services (CMT) was retained to conduct a geotechnical subsurface study for the proposed parking lot replacement at the South Jordan Middle School. The site is situated on the east side of 2700 West Street at 10245 South in South Jordan, Utah, as shown in the **Vicinity Map** below.



**VICINITY MAP**

### **1.2 Objectives, Scope and Authorization**

The objectives and scope of our study were planned in discussions between Mr. Ian Roberts of Jordan School District, and Mr. Bill Turner of CMT. In general, the objectives of this study were to define and evaluate the subsurface soil (and possibly groundwater) conditions at the site and provide appropriate earthwork and pavement recommendations to be utilized in the design and construction of the proposed parking lot replacement.

In accomplishing these objectives, our scope of work has included performing field exploration, which consisted of the drilling/logging/sampling of 11 bore holes, performing dynamic cone penetration tests in each bore hole,

performing laboratory testing on representative samples of the subsurface soils collected in the bore holes, and conducting an office program, which consisted of correlating available data, performing engineering analyses, and preparing this summary report. This scope of work was authorized by returning a signed copy of our proposal dated November 16, 2023, and executed on November 17, 2023.

### **1.3 Description of Proposed Construction**

We understand that the proposed construction consists of removing the existing parking lot and drive pavements at the site and replacing with new asphalt pavement. We also understand that pavements at the site will include light-duty parking areas and heavy-duty drive/bus lanes. We project traffic will consist of mostly automobiles and light trucks in light-duty parking areas, and up to 10 buses per day, one or two daily medium-weight delivery trucks, a weekly garbage truck, and a monthly fire truck.

We anticipate that site development will not require changing the existing grade by more than 1 to 2 feet. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

### **1.4 Executive Summary**

The most significant geotechnical aspects regarding site development include the following:

1. We encountered about 4 inches of asphalt surfacing fairly consistently at the bore hole locations, underlain by approximately 12 to 18 inches of road base; overall, the road base appears to be competent and can likely remain in place.
2. Subsurface soils encountered below the asphalt and road base consisted primarily of CLAY (CL), with GRAVEL (GM, GP-GM) encountered below the clay at a couple of locations, while groundwater was not encountered.
3. New pavement should consist of at least 3 inches of asphalt in light-duty areas and 5 inches of asphalt in heavy-duty areas, placed after proof-rolling the existing road base and repairing/replacing soft spots.

CMT must assess that any debris, disturbed or unsuitable soils have been removed and that suitable soils have been encountered prior to re-placing soft spots and placing new pavement. In the following sections, detailed discussions pertaining to the site are provided, including subsurface descriptions, earthwork, and pavements.

## **2.0 FIELD EXPLORATION**

### **2.1 General**

In order to define and evaluate the subsurface soil and groundwater conditions, 11 bore holes were drilled at the site to a depth of approximately 6.5 feet below the existing ground surface. Locations of the bore holes are shown on **Figure 1, Site Plan**, included in the Appendix. The field exploration was performed under the supervision of an experienced member of our geotechnical staff.

Samples of the subsurface soils encountered in the bore holes were collected at varying depths through the hollow stem drill augers. Relatively undisturbed samples of the subsurface soils were obtained by driving a split-spoon sampler with 2.5-inch outside diameter rings/liners into the undisturbed soils below the drill augers. Disturbed samples were collected utilizing a standard split spoon sampler. This standard split spoon sampler was driven 18 inches into the soils below the drill augers using a 140-pound hammer free-falling a distance of 30 inches. The number of hammer blows needed for each 6-inch interval was recorded. The sum of the hammer blows for the final 12 inches of penetration is known as a standard penetration test and this 'blow count' was recorded on the bore hole logs. The blow count provides a reasonable approximation of the relative density of granular soils, but only a limited indication of the relative consistency of fine-grained soils because the consistency of these soils is significantly influenced by the moisture content.

The subsurface soils encountered in the bore holes were classified in the field based upon visual and textural examination, logged and described in general accordance with ASTM<sup>1</sup> D-2488. These field classifications were supplemented by subsequent examination and testing of select samples in our laboratory. Logs of the bore holes, including a description of the soil strata encountered, is presented on each individual Bore Hole Log, **Figures 2 through 12**, included in the Appendix. Sampling information and other pertinent data and observations are also included on the logs. In addition, a Key to Symbols defining the terms and symbols used on the logs is provided as **Figure 13** in the Appendix.

## **2.2 Dynamic Cone Penetration Testing**

The dynamic cone penetrometer (DCP) testing was performed at each of the 11 bore hole locations (after removing the asphalt surfacing) by driving a cone apparatus into the ground using a 17-pound hammer and measuring the distance of penetration versus a set number of blows. These values were then correlated to the California Bearing Ratio value, which can then also be correlated to bearing capacity of the soils. The DCP test results are presented on **Figures 14 through 24** included in the Appendix.

## **3.0 LABORATORY TESTING**

Selected samples of the subsurface soils were subjected to various laboratory tests to assess pertinent engineering properties, as follows:

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Dry Density, ASTM D-2937, Dry unit weight representing field conditions
3. Atterberg Limits, ASTM D-4318, Plasticity and workability
4. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis

Laboratory test results are presented on the bore hole logs (**Figures 2 through 12**) and in the following **Lab Summary Table**:

---

<sup>1</sup> American Society for Testing and Materials



**LAB SUMMARY TABLE**

BORE HOLE	DEPTH (feet)	SOIL CLASS	SAMPLE TYPE	MOISTURE CONTENT(%)	DRY DENSITY (pcf)	GRADATION			ATTERBERG LIMITS		
						GRAV.	SAND	FINES	LL	PL	PI
B-1	2.5	CL	SPT	27		1	4	95			
B-2	2.5	CL	SPT	28					44	21	23
	5	CL	SPT	26		1	5	94			
B-3	2.5	CL	Rings	31	91						
B-4	2.5	CL	SPT	21					45	19	26
B-5	2.5	CL	Rings	30	89						
B-6	5	GP-GM	SPT	3		54	38	8			
B-7	2.5	CL	SPT	27		1	6	93			
B-8	5	CL	SPT	27					41	20	21
B-9	5	CL	SPT	25		0	4	96			
B-10	2.5	CL	SPT	30					34	20	14
B-11	2.5	CL	SPT	35		0	2	98			

**4.0 SITE CONDITIONS**

**4.1 Surface Conditions**

The site is currently being used as the parking lot for the South Jordan Middle School. The existing asphalt pavement at the site ranges from fair to poor condition, with much of the parking lot exhibiting “block” cracking (large-spaced cracks) but with some areas (mainly at entrances and the main drive lanes) exhibiting significant “alligator” cracking or failure of the asphalt surfacing. Based upon aerial photos dating back to 1997 that are readily available on the internet, the parking lot was present at that time and appears to have gradually exhibited increased cracking since then. Overall, the site is relatively flat with a slight slope downward to the east. The parking lot is bordered on the north by a lawn/landscaped area, on the east by the existing middle school building, on the south by existing single-family residences, and on the west by 2700 West Street (see **Vicinity Map** in **Section 1.1** above).

**4.2 Subsurface Soils**

At the locations of the bore holes, we encountered approximately 4 inches of asphalt at the surface overlying approximately 12 to 18 inches of road base. We observed natural soils beneath the asphalt/road base that primarily consisting of CLAY (CL), with Silty to Sandy GRAVEL (GM to GP-GM) below the clay within bore holes B-4 and B-6, extending to the maximum depth penetrated of approximately 6.5 feet.

The clay soils were moist, brown to grayish brown in color, and very soft to stiff in consistency. The natural gravel soils were slightly moist to moist, brown in color, and medium dense based on the blow counts in the bore holes.

For a more descriptive interpretation of subsurface conditions, please refer to the bore hole logs, **Figures 2 through 12**, which graphically represent the subsurface conditions encountered. The lines designating the

interface between soil types on the logs generally represent approximate boundaries; in situ, the transition between soil types may be gradual.

### **4.3 Groundwater**

Groundwater was not encountered at the time of our field explorations to the maximum depth explored of about 6.5 feet below the existing ground surface. We anticipate that groundwater will not affect proposed construction.

Groundwater levels can fluctuate seasonally. Numerous other factors such as heavy precipitation, irrigation of neighboring land, and other unforeseen factors, may also influence ground water elevations at the site. The detailed evaluation of these and other factors, which may be responsible for ground water fluctuations, is beyond the scope of this study.

### **4.4 Site Subsurface Variations**

Based on the results of the subsurface explorations and our experience, some variations in the continuity and nature of subsurface conditions should be anticipated. Due to the heterogeneous characteristics of natural soils, care should be taken in interpolating or extrapolating subsurface conditions between or beyond the exploratory locations.

## **5.0 SITE PREPARATION AND GRADING**

### **5.1 General**

We understand that the existing asphalt pavement will be removed. If desired, the existing asphalt pavement could be milled and used as sub-base material or as site-grading fill at this site or off-site. The existing road base materials can remain in place but must be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If excessively soft or loose soils are encountered, they must be removed (up to a maximum depth of 2 feet) and stabilized as discussed below in **Section 5.6**. It has been our experience that soils immediately beneath asphalt surfacing can be very moist to saturated, and some time may be needed to allow the road base to dry out before the proof-rolling is performed. Based upon the conditions observed in the borings, the existing asphalt is about 4 inches thick, but could vary throughout the parking lot area.

### **5.2 Temporary Excavations**

Excavations deeper than 1 to 2 feet are not anticipated at the site. Groundwater was not encountered within the depths explored, about 6.5 feet at the time of our field explorations, and thus is not anticipated to affect excavations.

The natural soils encountered at this site predominantly consisted of clay. In clayey (cohesive) soils, temporary construction excavations not exceeding 4 feet in depth may be constructed with near-vertical side slopes. Temporary excavations up to 8 feet deep, above or below groundwater, may be constructed with side slopes no steeper than one-half horizontal to one vertical (0.5H:1V).

For gravelly (cohesionless) soils, temporary construction excavations not exceeding 4 feet in depth should be no steeper than one-half horizontal to one vertical (0.5H:1V). For excavations up to 8 feet and above groundwater, side slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult to maintain and will require very flat side slopes and/or shoring, bracing and dewatering.

All excavations must be inspected periodically by qualified personnel. If any signs of instability or excessive sloughing are noted, immediate remedial action must be initiated. All excavations should be made following OSHA safety guidelines.

**5.3 Fill Material**

Following are our recommendations for the various fill types we anticipate will be used at this site:

FILL MATERIAL TYPE	DESCRIPTION   RECOMMENDED SPECIFICATION
Structural Fill	Placed below structures, flatwork and pavement. Well-graded sand/gravel mixture, with maximum particle size of 4 inches, a minimum 70% passing 3/4-inch sieve, a maximum 20% passing the No. 200 sieve, and a maximum Plasticity Index of 10.
Stabilization Fill	Placed to stabilize soft areas prior to placing structural fill and/or site grading fill. Coarse angular gravels and cobbles 1 inch to 8 inches in size. May also use 1.5- to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i, or equivalent (see <b>Section 6.6</b> ).

On-site clay soils are not suitable for use as structural fill but may be used as non-structural fill. Note that these clay soils are moisture-sensitive, which means they are inherently more difficult to work with in proper moisture conditioning (they are very sensitive to changes in moisture content), requiring very close moisture control during placement and compaction. This will be very difficult, if not impossible, during wet and cold periods of the year.

All fill material should be approved by a CMT geotechnical engineer prior to placement.

**5.4 Fill Placement and Compaction**

The various types of compaction equipment available have their limitations as to the maximum lift thickness that can be compacted. For example, hand operated equipment is limited to lifts of about 4 inches and most “trench compactors” have a maximum, consistent compaction depth of about 6 inches. Large rollers, depending on soil and moisture conditions, can achieve compaction at 8 to 12 inches. The full thickness of each lift should

be compacted to at least the following percentages of the maximum dry density as determined by ASTM D-1557 (or AASHTO<sup>2</sup> T-180) in accordance with the following recommendations:

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
Beneath an area extending at least 4 feet beyond the perimeter of structures, and below flatwork and pavement (applies to structural fill and site grading fill) extending at least 2 feet beyond the perimeter	0 to 5	95
Site grading fill outside area defined above	0 to 5	92
Utility trenches within structural areas	--	96
Roadbase and subbase	-	96
Non-structural fill	0 to 5	90

Structural fills greater than about 2 feet thick are not anticipated at the site. For best compaction results, we recommend that the moisture content for structural fill/backfill be within 2% of optimum. Field density tests should be performed on each lift as necessary to verify that proper compaction is being achieved.

**5.5 Utility Trenches**

For the bedding zone around the utility, we recommend utilizing sand bedding fill material that meets current APWA<sup>3</sup> requirements.

All utility trench backfill material below structurally loaded facilities (foundations, floor slabs, flatwork, parking lots/drive areas, etc.) should be placed at the same density requirements established for structural fill in the previous section.

Most utility companies and local governments are requiring Type A-1a or A-1b (AASHTO Designation) soils (sand/gravel soils with limited fines) be used as backfill over utilities within public rights of way, and the backfill be compacted over the full depth above the bedding zone to at least 96% of the maximum dry density as determined by AASHTO T-180 (ASTM D-1557).

Where the utility does not underlie structurally loaded facilities and public rights of way, on-site fill and natural soils may be utilized as trench backfill above the bedding layer, provided they are properly moisture conditioned and compacted to the minimum requirements stated above in **Section 6.4**.

<sup>2</sup> American Association of State Highway and Transportation Officials

<sup>3</sup> American Public Works Association

**5.6 Stabilization**

The natural clay soils at this site will likely be susceptible to rutting and pumping. The likelihood of disturbance or rutting and/or pumping of the existing natural soils is a function of the soil moisture content, the load applied to the surface, as well as the frequency of the load. Consequently, rutting and pumping can be minimized by avoiding concentrated traffic, minimizing the load applied to the surface by using lighter equipment and/or partial loads, by working in drier times of the year, or by providing a working surface for the equipment. Rubber-tired equipment particularly, because of high pressures, promotes instability in moist/wet, soft soils.

If rutting or pumping occurs, traffic should be stopped and the disturbed soils should be removed and replaced with stabilization material. Typically, a minimum of 18 inches of the disturbed soils must be removed to be effective. However, deeper removal is sometimes required.

To stabilize soft subgrade conditions (if encountered), a mixture of coarse, clean, angular gravels and cobbles and/or 1.5- to 2.0-inch clean gravel should be utilized. Often the amount of gravelly material can be reduced with the use of a geotextile fabric such as Mirafi RS280i, or equivalent. Its use will also help avoid mixing of the subgrade soils with the gravelly material. After excavating the soft/disturbed soils, the fabric should be spread across the bottom of the excavation and up the sides a minimum of 18 inches. Otherwise, it should be placed in accordance with the manufacturer’s recommendation, including proper overlaps. The gravel material can then be placed over the fabric in compacted lifts as described above.

**6.0 PAVEMENTS**

All pavement areas must be prepared as discussed above in **Section 6.1**. Under no circumstances shall pavements be established over topsoil, undocumented fills (if encountered), loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

Dynamic cone penetration (DCP) testing was performed at each bore hole location (see attached **Figures 14 to 24**). The correlated California Bearing Ratio (CBR) values obtained from the DCP below the road base ranged from 1 to 8, with an average of about 3. Thus, our pavement design is based on a CBR of 3 for the natural clay soils. Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for the given ESAL's (18-kip equivalent single-axle loads) per day:

MATERIAL	PAVEMENT SECTION THICKNESS (inches)	
	PARKING AREAS (3 ESAL's per day)	DRIVE LANES (13 ESAL'S per day)
Asphalt	3	5
Road-Base*	13	11
Total Thickness	16	16

\*Existing/in-place

The total thickness of asphalt and road base approximately matches the existing combined thickness. We recommend that the 1 inch of road base be placed and compacted on top of the existing road base in the parking areas after proof-rolling, but the 1 inch of road base be removed in the drive lane areas prior to proof-rolling.

Untreated base course (UTBC) should conform to city specifications, or to 1-inch-minus UDOT specifications for A-1-a/NP, and have a minimum CBR value of 70%. Roadbase and subbase material should be compacted as recommended above in **Section 6.4**. Asphalt material generally should conform to APWA requirements, having a ½-inch maximum aggregate size, a 75-gradation Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder.

## **7.0 QUALITY CONTROL**

We recommend that CMT be retained as part of a comprehensive quality control testing and observation program. With CMT onsite we can help facilitate implementation of our recommendations and address, in a timely manner, any subsurface conditions encountered which vary from those described in this report. Without such a program CMT cannot be responsible for application of our recommendations to subsurface conditions which may vary from those described herein. This program may include, but not necessarily be limited to, the following:

### **7.1 Field Observations**

Observations should be completed during all phases of construction such as site preparation, foundation excavation, structural fill placement and concrete placement.

### **7.2 Fill Compaction**

Compaction testing by CMT is required for all structural supporting fill materials. Maximum Dry Density (Modified Proctor, ASTM D-1557) tests should be requested by the contractor immediately after delivery of any fill materials. The maximum density information should then be used for field density tests on each lift as necessary to ensure that the required compaction is being achieved.

### **7.3 Excavations**

All excavation procedures and processes should be observed by a geotechnical engineer from CMT or his representative. In addition, for the recommendations in this report to be valid, all backfill and structural fill placed in trenches and all pavements should be density tested by CMT. We recommend that freshly mixed concrete be tested by CMT in accordance with ASTM designations.

## **8.0 LIMITATIONS**

The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only

at the specific location at the particular time designated on the logs. Soil and ground water conditions may differ from conditions encountered at the actual exploration locations. The nature and extent of any variation in the explorations may not become evident until during the course of construction. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation.

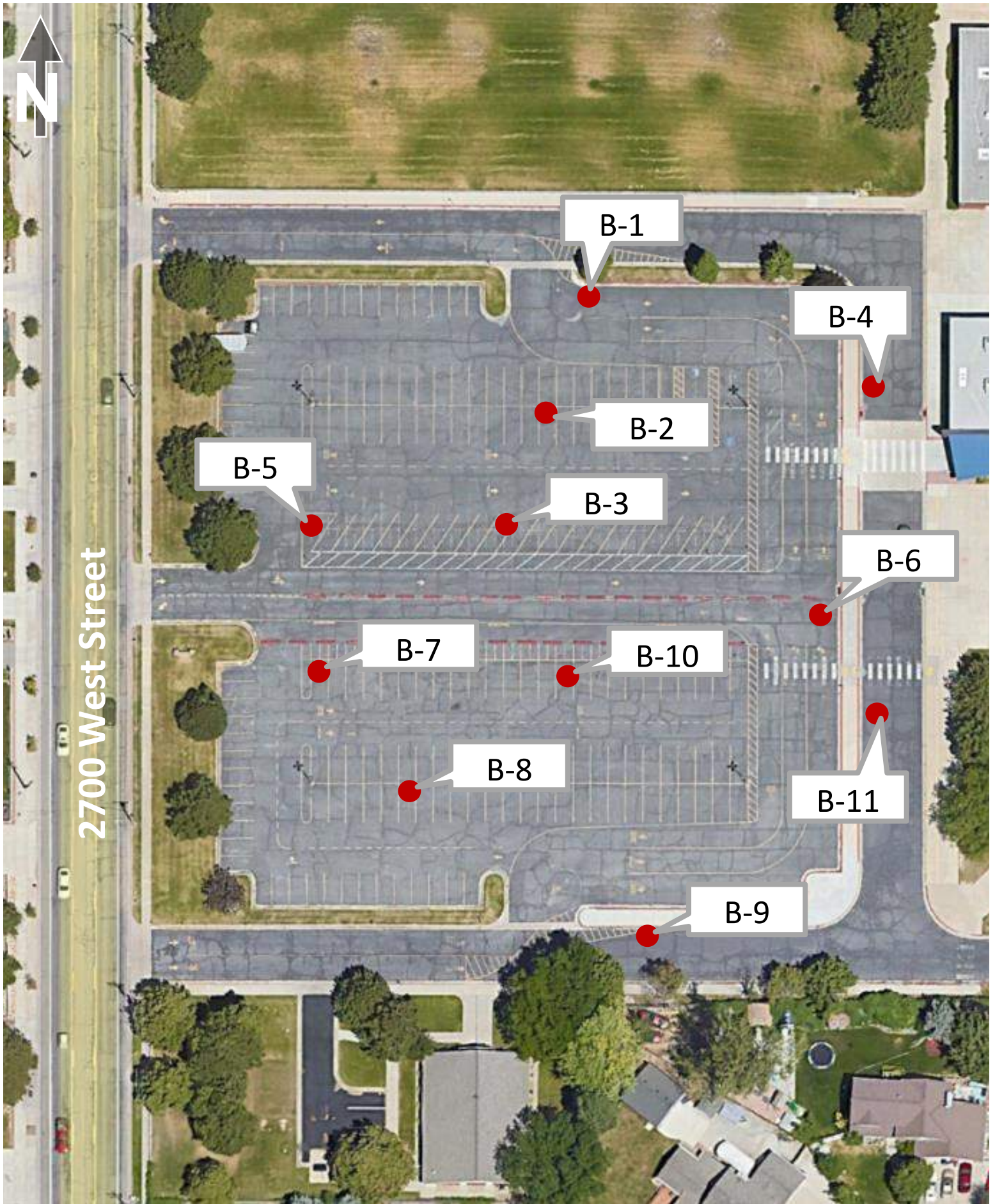
Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at (801) 492-4132. To schedule materials testing, please call (801) 381-5141.

**APPENDIX**

SUPPORTING  
DOCUMENTATION





S.J. Middle School Parking Lot Replacement

10245 South 2700 West, South Jordan, Utah

**CMT** TECHNICAL SERVICES

Site Map

Date: 8-Dec-23

Job # 21375

Figure:

1

# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-1

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg			
					Total					Gravel %	Sand %	Fines %	LL	PL	PI	
0		4" Asphalt														
		FILL: 12" Road Base														
		Brown CLAY (CL), trace sand and gravel														
		moist, soft														
4				1	0 2 1	3	27			1	4	95				
		grades with some oxidation														
				2	1 1 1	2										
		END AT 6.5'														
8																
12																
16																
20																
24																
28																

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56516°, -111.95685°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

# 2

# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-2

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg			
					Total					Gravel %	Sand %	Fines %	LL	PL	PI	
0		4" Asphalt														
		FILL: 12" Road Base														
		Brown CLAY (CL), trace sand and gravel	moist, soft													
4				3	3	1	2	28					44	21	23	
		grades with some fine sand	medium stiff													
				4	1	2	4	26		1	5	94				
		END AT 6.5'														
8																
12																
16																
20																
24																
28																

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56499°, -111.95693°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

# 3



# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-3




10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total					Gravel %	Sand %	Fines %	LL	PL	PI
0		4" Asphalt													
		FILL: 12" Road Base													
		Brown CLAY (CL), trace sand and gravel	moist, soft												
4				5	2	1	2	31	91						
		grades with some fine sand	very soft												
				6	0	0	1								
		END AT 6.5'													
8															
12															
16															
20															
24															
28															

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56483°, -111.957°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1



Figure:

# 4

# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-4




10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg			
					Total					Gravel %	Sand %	Fines %	LL	PL	PI	
0		4" Asphalt FILL: 18" Road Base														
4		Brown CLAY (CL), trace sand and gravel moist, stiff		7	3 5 6	11	21						45	19	26	
		Brown Silty GRAVEL with sand (GM) very moist, medium dense		8	4 6 12	18										
8		END AT 6.5'														
12																
16																
20																
24																
28																

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56503°, -111.95632°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1



Figure:

# 5

# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-5

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg			
					Total					Gravel %	Sand %	Fines %	LL	PL	PI	
0		4" Asphalt														
		FILL: 12" Road Base														
		Brown CLAY (CL), trace sand and gravel	moist, soft													
4				9	2	3	5	30	89							
					2											
		grades with some sand	very soft													
				10	1	0	0									
					0											
		END AT 6.5'														
8																
12																
16																
20																
24																
28																

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56483°, -111.95737°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1



Figure:

# 6

# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-6





10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total					Gravel %	Sand %	Fines %	LL	PL	PI
0		4" Asphalt													
		FILL: 12" Road Base													
		Brown CLAY (CL), trace sand and gravel moist, medium stiff													
4				11	2 3 3	6									
		Brown Sandy GRAVEL with silt (GP-GM) slightly moist, medium dense													
				12	8 10 13	23	3		54	38	8				
		END AT 6.5'													
8															
12															
16															
20															
24															
28															

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.5647°, -111.95642°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

# 7



# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-7

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total					Gravel %	Sand %	Fines %	LL	PL	PI
0		4" Asphalt													
		FILL: 12" Road Base													
		Brown CLAY (CL), some sand, trace gravel													
		moist, very soft													
4				13	2	1	1	27		1	6	93			
		grades light brown with oxidation													
		soft													
		END AT 6.5'													
8															
12															
16															
20															
24															
28															

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56462°, -111.95735°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1



Figure:

# 8



# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-8

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density (pcf)	Gradation			Atterberg		
					Total					Gravel %	Sand %	Fines %	LL	PL	PI
0		4" Asphalt													
		FILL: 12" Road Base													
		Brown CLAY (CL), some sand, trace gravel													
		moist, soft													
4				15	2	1	3								
					2										
				16	1	2	3	27				41	20	21	
					1										
		END AT 6.5'													
8															
12															
16															
20															
24															
28															

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56446°, -111.95718°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

# 9

# South Jordan Middle School Parking Lot Replacement Bore Hole Log

# B-9

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg			
					Total					Gravel %	Sand %	Fines %	LL	PL	PI	
0		4" Asphalt														
		FILL: 12" Road Base														
		Brown CLAY (CL), trace sand														
		moist, medium stiff														
4				17	2	1	4									
					3											
				18	3	3	5	25		0	4	96				
					2											
		END AT 6.5'														
8																
12																
16																
20																
24																
28																

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56425°, -111.95674°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

# 10



# South Jordan Middle School Parking Lot Replacement

# Bore Hole Log

# B-10

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)			Moisture (%)	Dry Density(pcf)	Gradation			Atterberg			
					Total					Gravel %	Sand %	Fines %	LL	PL	PI	
0		4" Asphalt														
		FILL: 12" Road Base														
		Brown CLAY (CL), trace sand														
		moist, soft														
4				19	3	1	2	30					34	20	14	
		grades grayish brown with some sand														
				20	2	1	2									
		END AT 6.5'														
8																
12																
16																
20																
24																
28																

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56462°, -111.95689°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

# 11



# South Jordan Middle School Parking Lot Replacement Bore Hole Log B-11

10245 South 2700 West, South Jordan, Utah

Total Depth: 6.5'

Date: 12/8/23

Water Depth: (see Remarks)

Job #: 21375

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total				Gravel %	Sand %	Fines %	LL	PL	PI
0		4" Asphalt												
		FILL: 12" Road Base												
		Brown CLAY (CL), trace sand												
		moist, soft												
4				21	1 0 2	2	35		0	2	98			
		grades with some gravel												
		END AT 6.5'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.56456°, -111.95633°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Steve Laird

Page: 1 of 1

Figure:

12



①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows(N) Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel % Sand % Fines %	Atterberg LL PL PI	

**COLUMN DESCRIPTIONS**

- ① **Depth (ft.):** Depth (feet) below the ground surface (including groundwater depth - see below right).
- ② **Graphic Log:** Graphic depicting type of soil encountered (see ② below).
- ③ **Soil Description:** Description of soils, including Unified Soil Classification Symbol (see below).
- ④ **Sample Type:** Type of soil sample collected; sampler symbols are explained below-right.
- ⑤ **Sample #:** Consecutive numbering of soil samples collected during field exploration.
- ⑥ **Blows:** Number of blows to advance sampler in 6" increments, using a 140-lb hammer with 30" drop.
- ⑦ **Total Blows:** Number of blows to advance sampler the 2nd and 3rd 6" increments.
- ⑧ **Moisture (%):** Water content of soil sample measured in laboratory (percentage of dry weight).
- ⑨ **Dry Density (pcf):** The dry density of a soil measured in laboratory (pounds per cubic foot).
- ⑩ **Gradation:** Percentages of Gravel, Sand and Fines (Silt/Clay), from lab test results of soil passing No. 4 and No. 200 sieves.
- ⑪ **Atterberg:** Individual descriptions of Atterberg Tests are as follows:
  - LL = Liquid Limit (%):** Water content at which a soil changes from plastic to liquid behavior.
  - PL = Plastic Limit (%):** Water content at which a soil changes from liquid to plastic behavior.
  - PI = Plasticity Index (%):** Range of water content at which a soil exhibits plastic properties (= Liquid Limit - Plastic Limit).

STRATIFICATION		MODIFIERS	MOISTURE CONTENT
Description	Thickness	Trace	
Seam	Up to ½ inch	<5%	<b>Dry:</b> Absence of moisture, dusty, dry to the touch.
Lense	Up to 12 inches	<b>Some</b>	<b>Moist:</b> Damp / moist to the touch, but no visible water.
Layer	Greater than 12 in.	5-12%	<b>Saturated:</b> Visible water, usually soil below groundwater.
Occasional	1 or less per foot	<b>With</b>	
Frequent	More than 1 per foot	> 12%	

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)	MAJOR DIVISIONS		USCS SYMBOLS	②	TYPICAL DESCRIPTIONS	
	<b>COARSE-GRAINED SOILS</b> More than 50% of material is larger than No. 200 sieve size.	<b>GRAVELS</b> The coarse fraction retained on No. 4 sieve.	<b>CLEAN GRAVELS</b> ( < 5% fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
<b>GRAVELS WITH FINES</b> ( ≥ 12% fines)			GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines	
			GM		Silty Gravels, Gravel-Sand-Silt Mixtures	
<b>SANDS</b> The coarse fraction passing through No. 4 sieve.		<b>CLEAN SANDS</b> ( < 5% fines)	GC		Clayey Gravels, Gravel-Sand-Clay Mixtures	
			SW		Well-Graded Sands, Gravelly Sands, Little or No Fines	
		<b>SANDS WITH FINES</b> ( ≥ 12% fines)	SP		Poorly-Graded Sands, Gravelly Sands, Little or No Fines	
SM			Silty Sands, Sand-Silt Mixtures			
SC			Clayey Sands, Sand-Clay Mixtures			
<b>FINE-GRAINED SOILS</b> More than 50% of material is smaller than No. 200 sieve size.	<b>SILTS AND CLAYS</b> Liquid Limit less than 50%		ML		Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands or Clayey Silts with Slight	
			CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean	
			OL		Organic Silts and Organic Silty Clays of Low Plasticity	
	<b>SILTS AND CLAYS</b> Liquid Limit greater than 50%			MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils with Plasticity (Elastic Silts)
				CH		Inorganic Clays of High Plasticity, Fat Clays
				OH		Organic Silts and Organic Clays of Medium to High Plasticity
<b>HIGHLY ORGANIC SOILS</b>			PT		Peat, Humus, Swamp Soils with High Organic Contents	

- SAMPLER SYMBOLS**
- Block Sample
  - Bulk/Bag Sample
  - Modified California Sampler
  - 3.5" OD, 2.42" ID
  - D&M Sampler
  - Rock Core
  - Standard
  - Penetration Split Spoon Sampler
  - Thin Wall (Shelby Tube)
- WATER SYMBOL**
- Encountered Water Level
  - Measured Water Level
- (see Remarks on Logs)

Note: Dual Symbols are used to indicate borderline soil classifications (i.e. GP-GM, SC-SM, etc.).

1. The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
2. The subsurface conditions represented on the logs are for the locations specified. Caution should be exercised if interpolating between or extrapolating beyond the exploration locations.
3. The information presented on each log is subject to the limitations, conclusions, and recommendations presented in this report.

Figure:

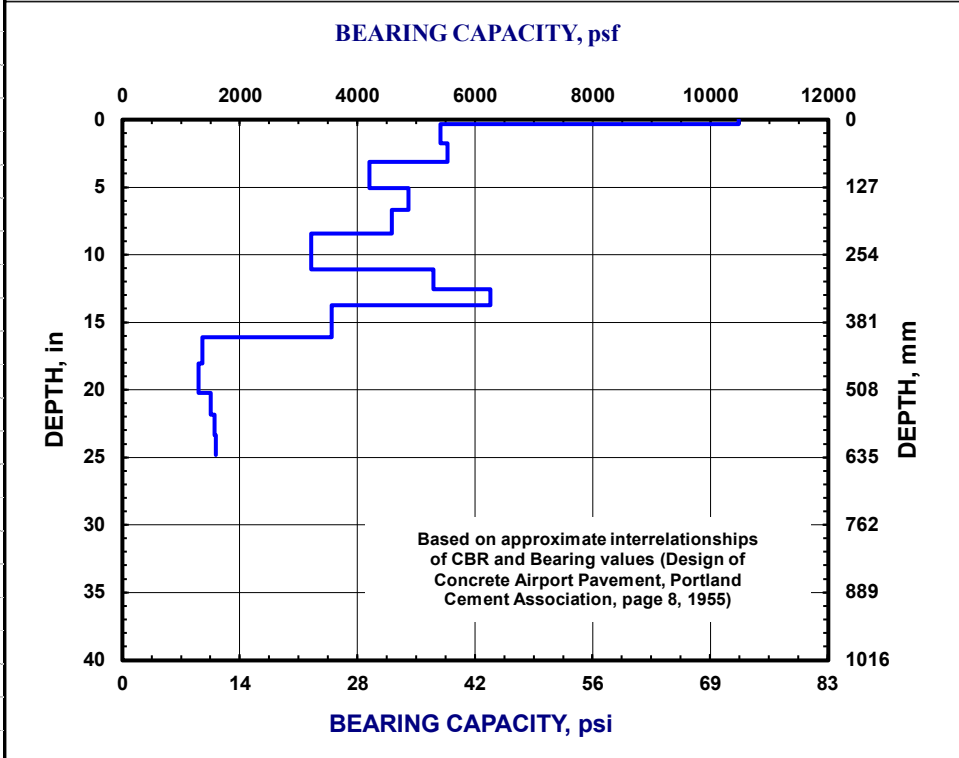
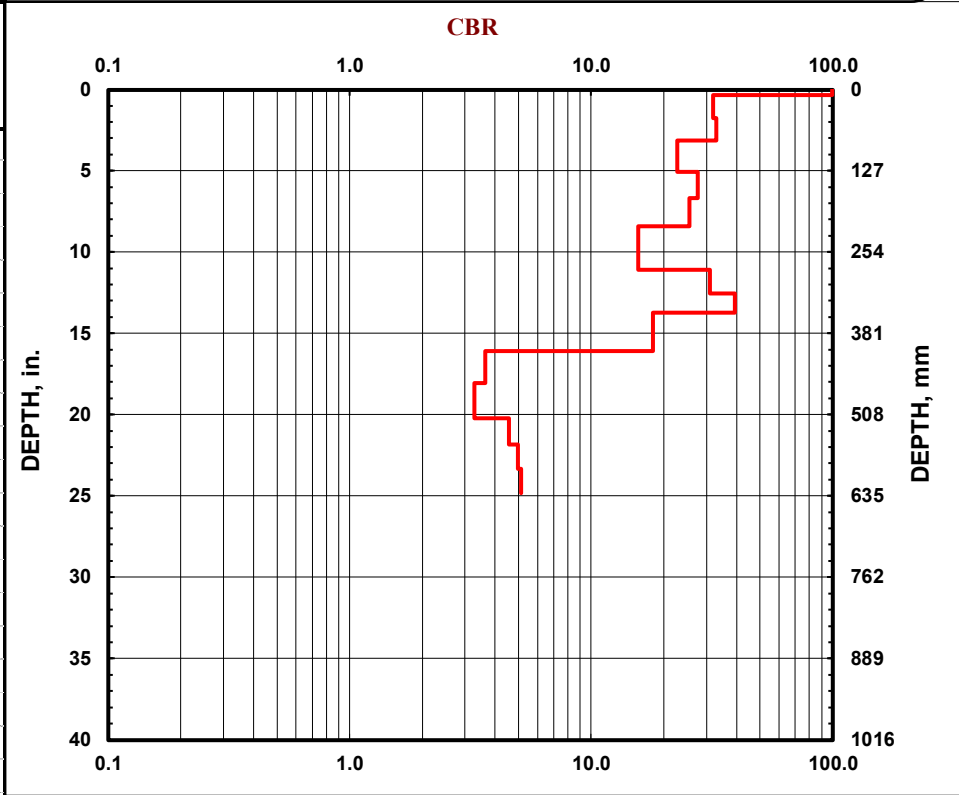
# DCP TEST DATA

Project: <u>South Jordan M.S.</u>	Date: <u>8-Dec-23</u>
Location: <u>B-1</u>	Soil Type(s): <u>CL</u>

Hammer <input type="radio"/> 10.1 lbs. <input checked="" type="radio"/> 17.6 lbs. <input type="radio"/> Both hammers used	Soil Type <input type="radio"/> CH <input checked="" type="radio"/> CL <input type="radio"/> All other soils
--	---

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
0	9	1
5	45	1
5	80	1
5	129	1
5	170	1
5	214	1
5	282	1
5	319	1
5	349	1
5	409	1
1	459	1
1	514	1
1	555	1
1	593	1
1	630	1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
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		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1



# DCP TEST DATA

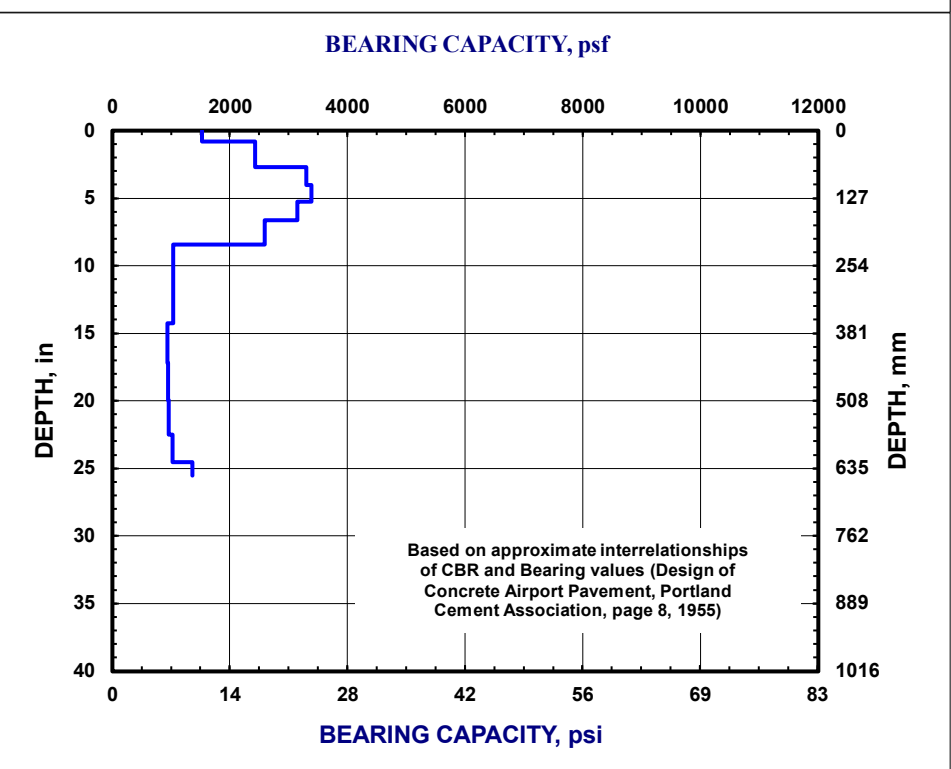
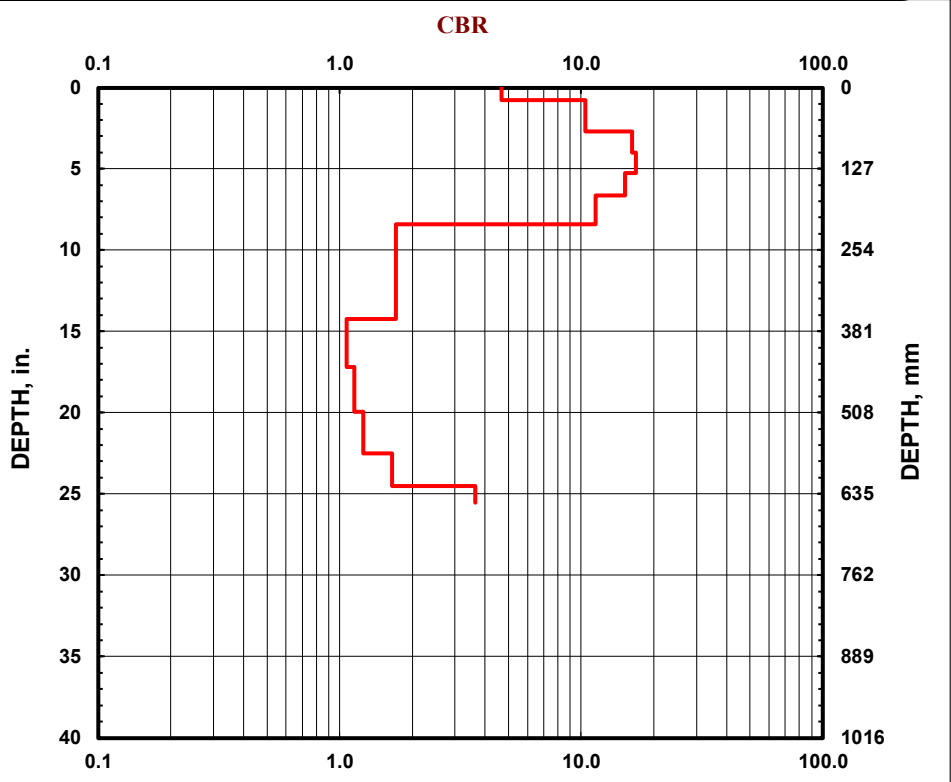
Project: South Jordan M.S.  
 Location: B-2

Date: 8-Dec-23  
 Soil Type(s): CL

- Hammer**  
 10.1 lbs.  
 17.6 lbs.  
 Both hammers used

- Soil Type**  
 CH  
 CL  
 All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	20	2
5	69	2
5	102	2
5	134	2
5	169	2
5	214	2
3	362	2
1	437	2
1	507	2
1	572	2
1	623	2
1	648	2
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# DCP TEST DATA

<b>Project:</b> <u>South Jordan M.S.</u>	<b>Date:</b> <u>8-Dec-23</u>
<b>Location:</b> <u>B-4</u>	<b>Soil Type(s):</b> <u>CL</u>

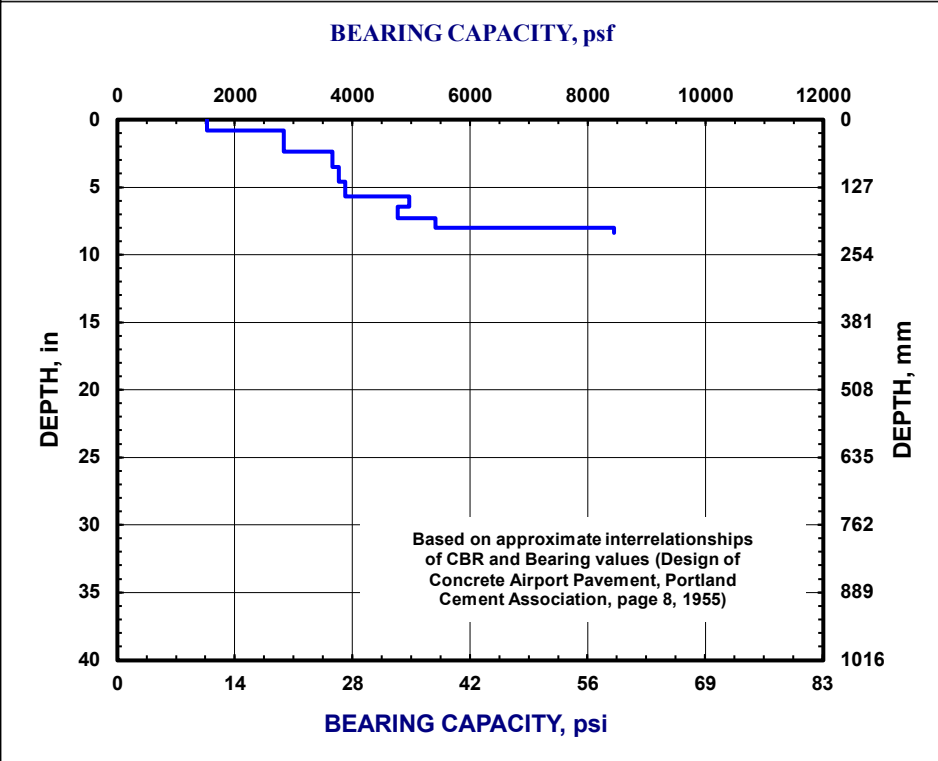
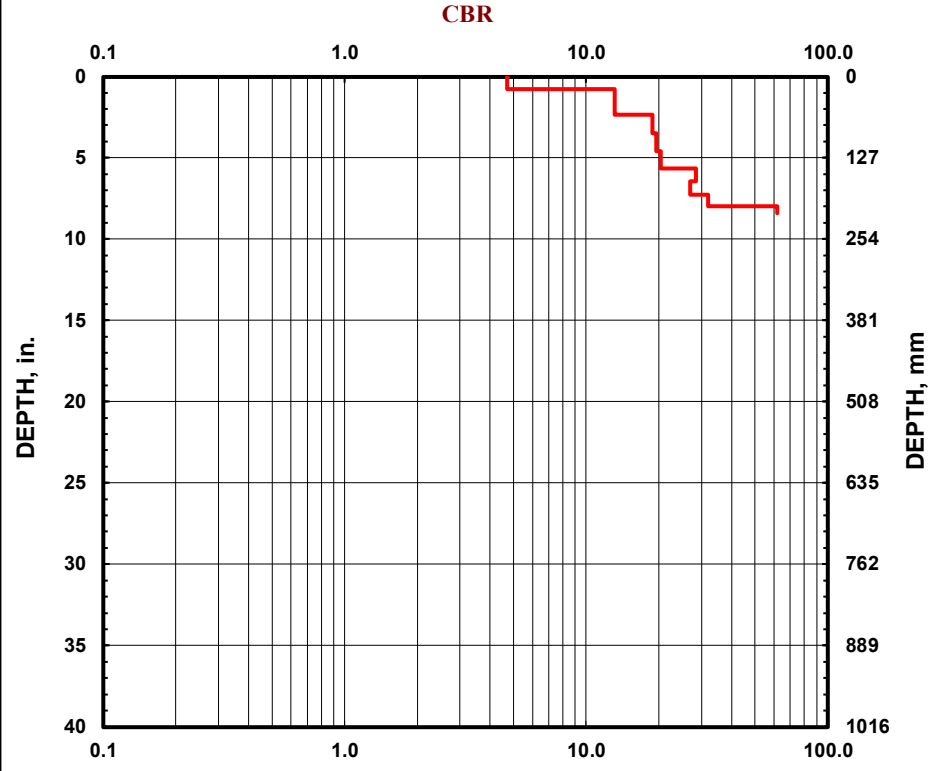
**Hammer**

- 10.1 lbs.
- 17.6 lbs.
- Both hammers used

**Soil Type**

- CH
- CL
- All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer	
0	0	2	
1	20	2	
5	60	2	
5	89	2	
5	117	2	
5	144	2	
5	164	2	
5	185	2	
5	203	2	
5	213	2	
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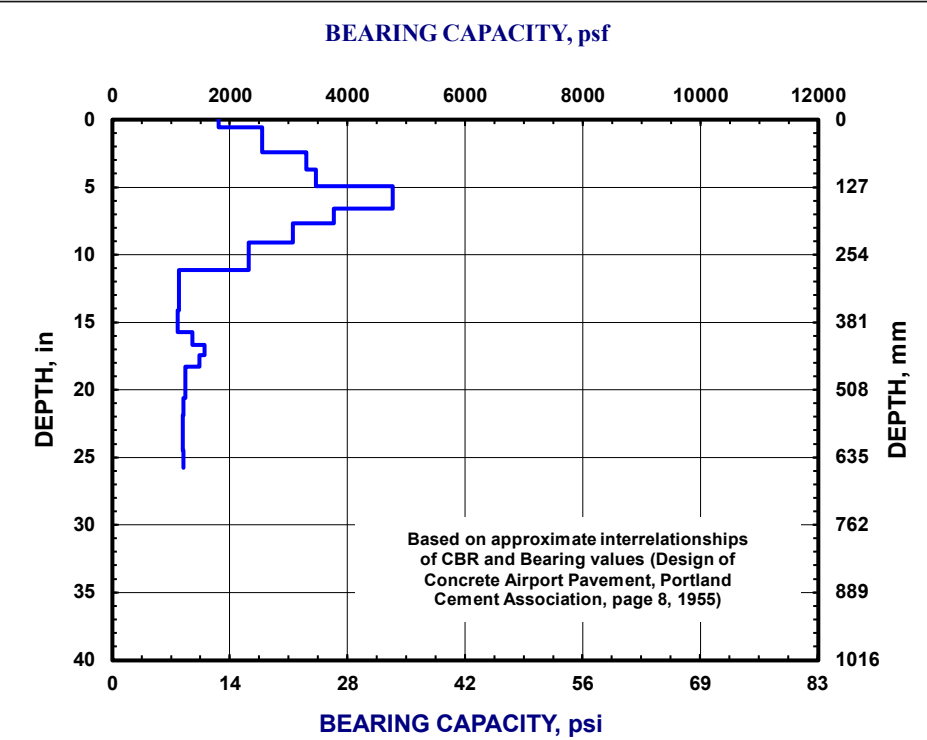
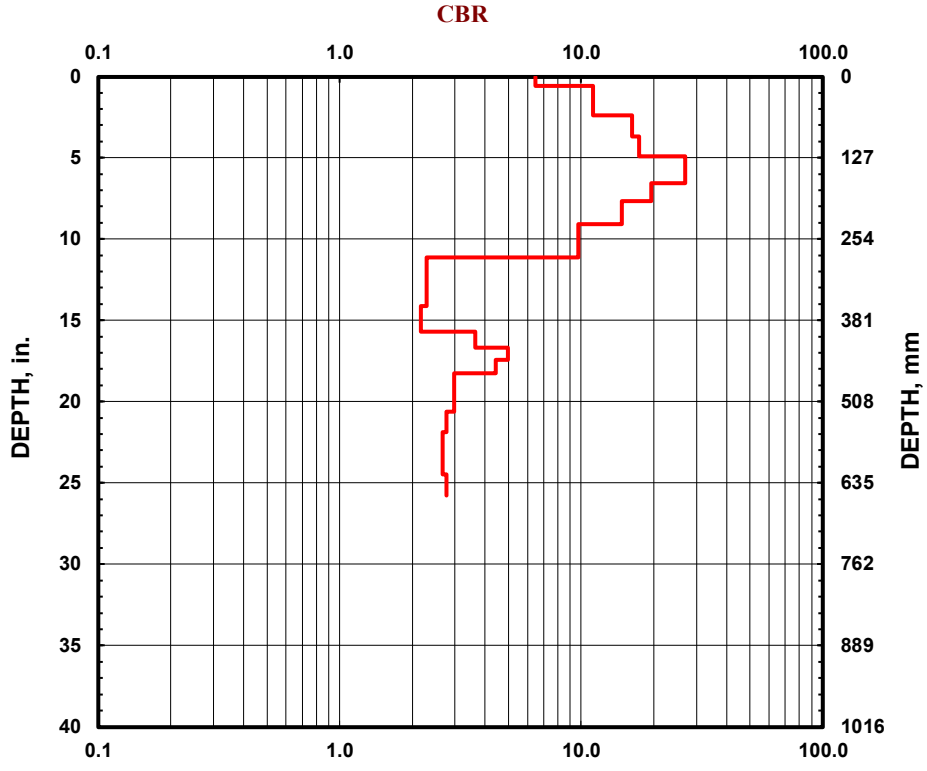
Project: South Jordan M.S.  
Location: B-5

Date: 8-Dec-23  
Soil Type(s): CL

Hammer  
 10.1 lbs.  
 17.6 lbs.  
 Both hammers used

Soil Type  
 CH  
 CL  
 All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	15	2
5	61	2
5	94	2
5	125	2
5	146	2
5	167	2
5	195	2
5	231	2
5	283	2
2	359	2
1	399	2
1	424	2
1	443	2
1	464	2
1	494	2
1	524	2
1	556	2
1	589	2
1	622	2
1	654	2
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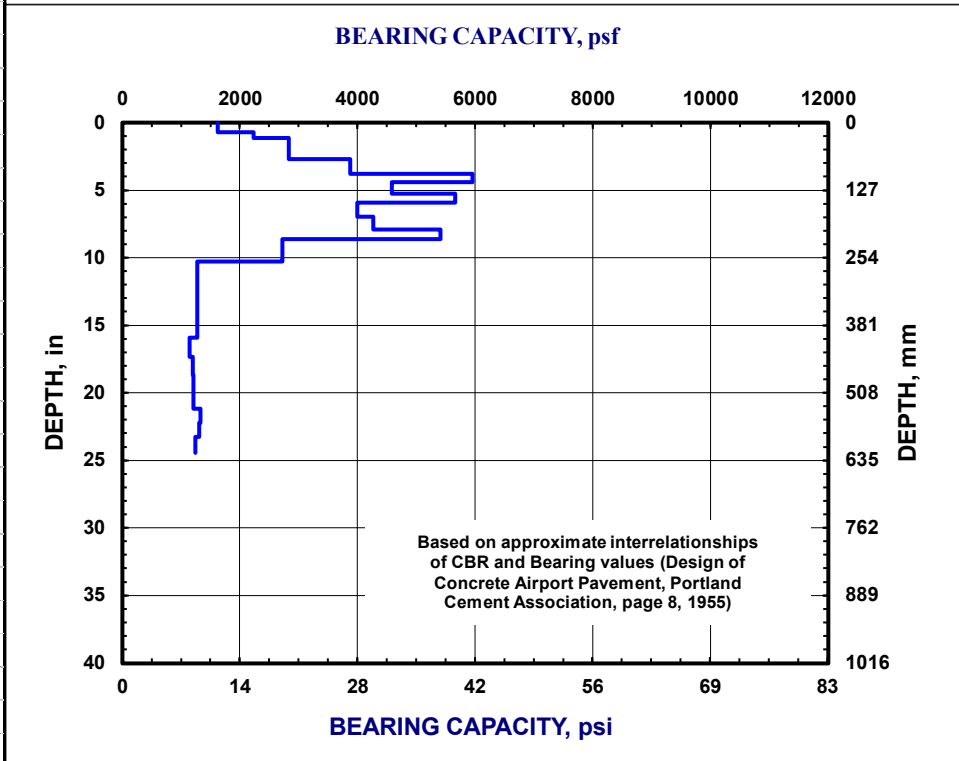
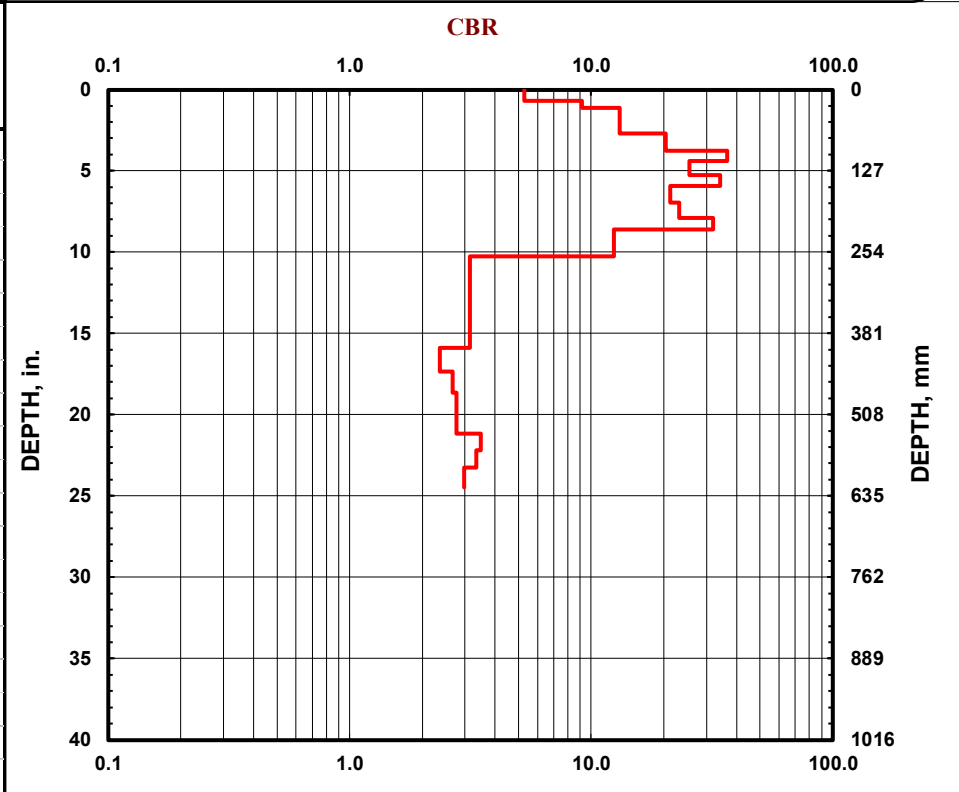
**Project:** South Jordan M.S.  
**Location:** B-7

**Date:** 8-Dec-23  
**Soil Type(s):** CL

Hammer  
 10.1 lbs.  
 17.6 lbs.  
 Both hammers used

Soil Type  
 CH  
 CL  
 All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	18	2
1	29	2
5	69	2
5	96	2
5	112	2
5	134	2
5	151	2
5	177	2
5	201	2
5	219	2
5	261	2
5	404	2
1	441	2
1	474	2
1	506	2
1	538	2
1	564	2
1	591	2
1	621	2
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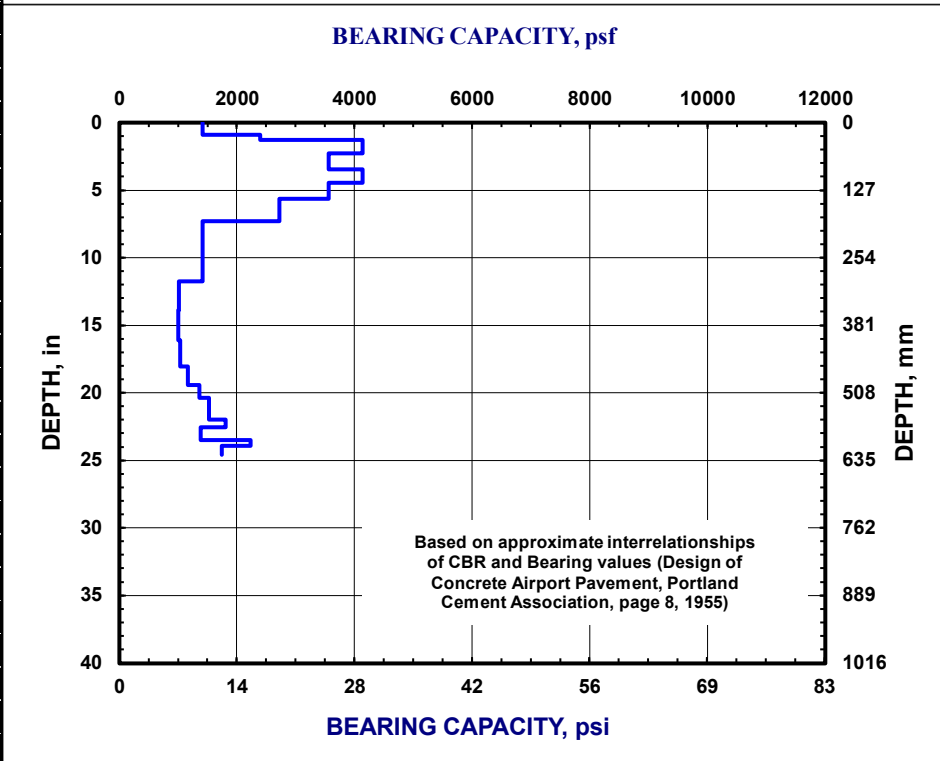
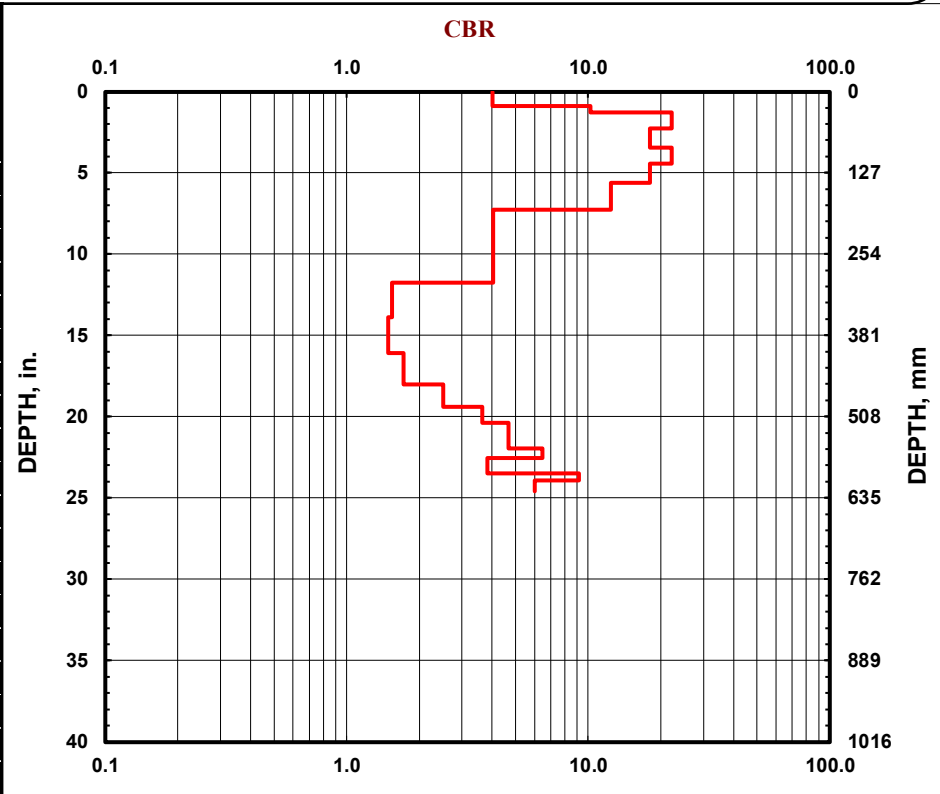
# DCP TEST DATA

<b>Project:</b>	<u>South Jordan M.S.</u>	<b>Date:</b>	<u>8-Dec-23</u>
<b>Location:</b>	<u>B-8</u>	<b>Soil Type(s):</b>	<u>CL</u>

<b>Hammer</b>		<b>Soil Type</b>	
<input type="radio"/>	10.1 lbs.	<input type="radio"/>	CH
<input checked="" type="radio"/>	17.6 lbs.	<input checked="" type="radio"/>	CL
<input type="radio"/>	Both hammers used	<input type="radio"/>	All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	23	2
1	33	2
5	58	2
5	88	2
5	113	2
5	143	2
5	185	2
5	299	2
1	353	2
1	409	2
1	458	2
1	493	2
1	518	2
1	538	2
1	558	2
1	573	2
1	597	2
1	608	2
1	624	2
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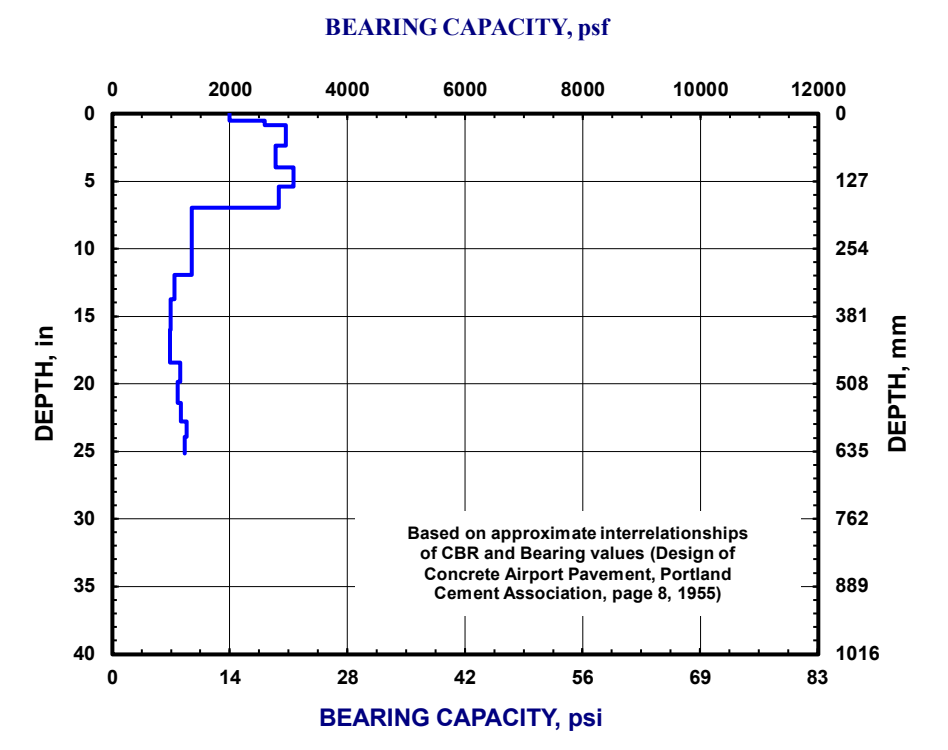
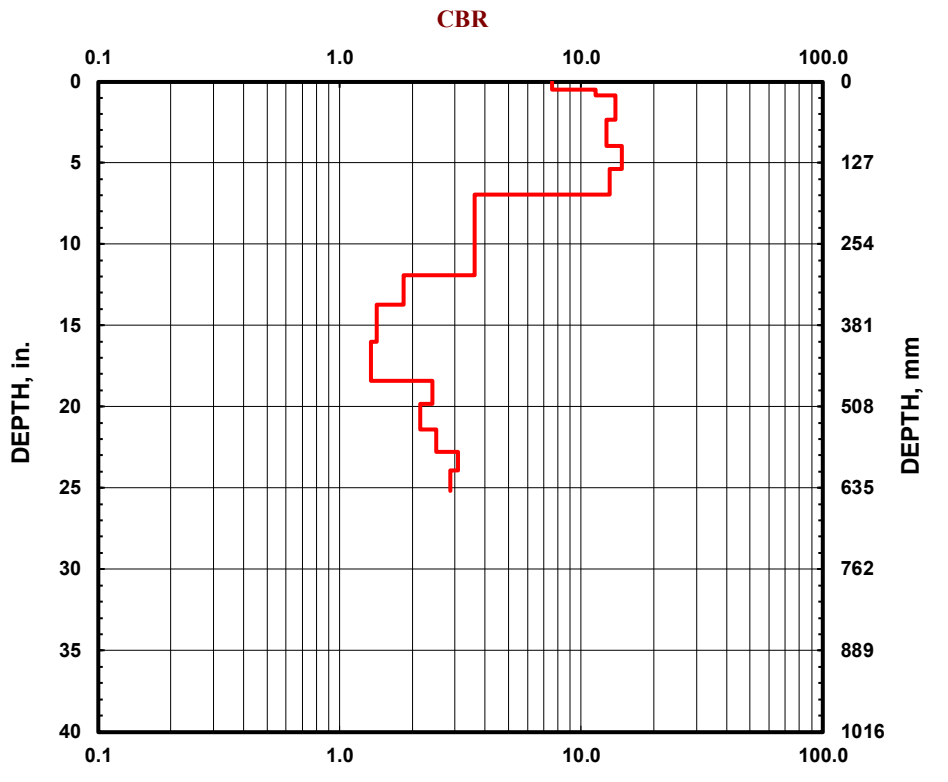
**Project:** South Jordan M.S.  
**Location:** B-9

**Date:** 8-Dec-23  
**Soil Type(s):** CL

**Hammer**  
 10.1 lbs.  
 17.6 lbs.  
 Both hammers used

**Soil Type**  
 CH  
 CL  
 All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	13	2
1	22	2
5	60	2
5	101	2
5	137	2
5	177	2
5	303	2
1	349	2
1	407	2
1	468	2
1	504	2
1	544	2
1	579	2
1	608	2
1	639	2
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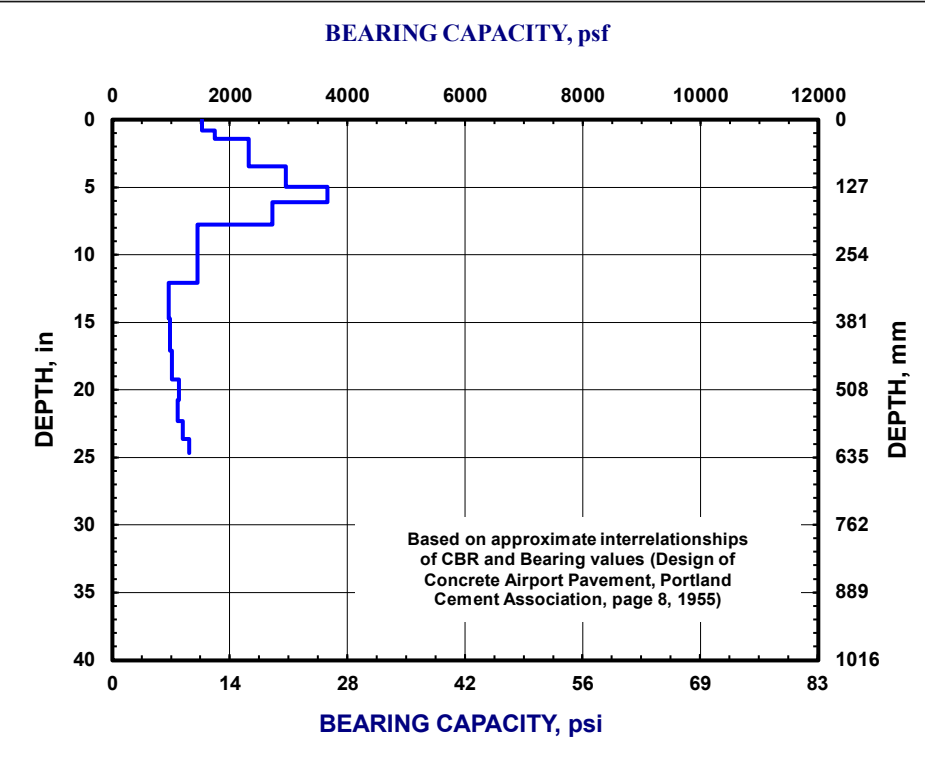
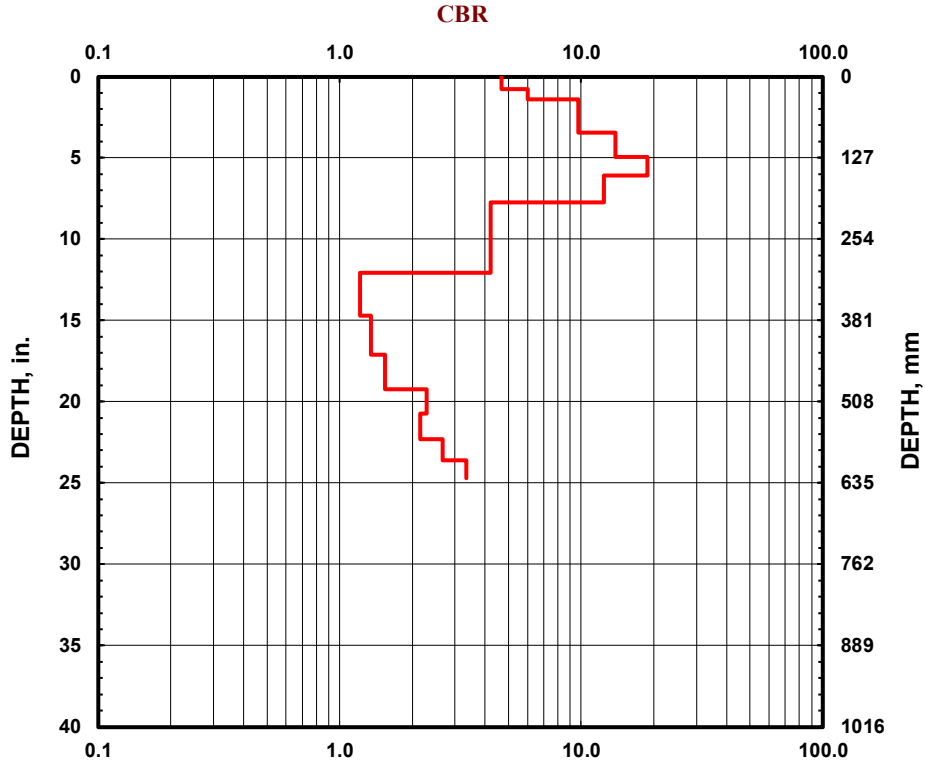
**Project:** South Jordan M.S.  
**Location:** B-10

**Date:** 8-Dec-23  
**Soil Type(s):** CL

**Hammer**  
 10.1 lbs.  
 17.6 lbs.  
 Both hammers used

**Soil Type**  
 CH  
 CL  
 All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	20	2
1	36	2
5	88	2
5	126	2
5	155	2
5	197	2
5	307	2
1	374	2
1	435	2
1	489	2
1	527	2
1	567	2
1	600	2
1	627	2
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# DCP TEST DATA

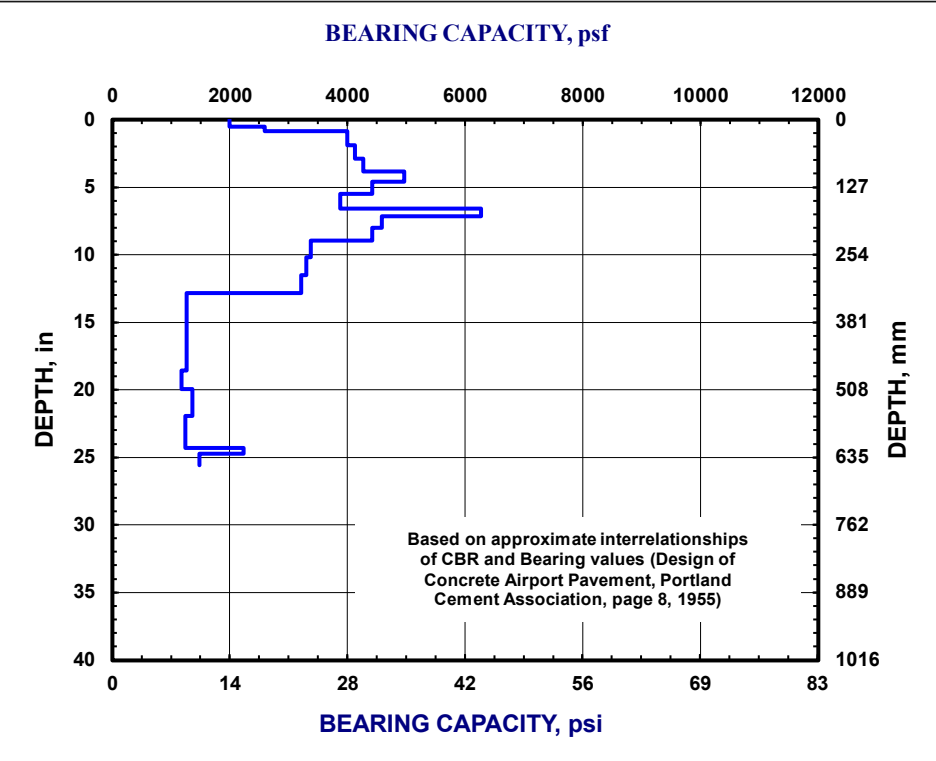
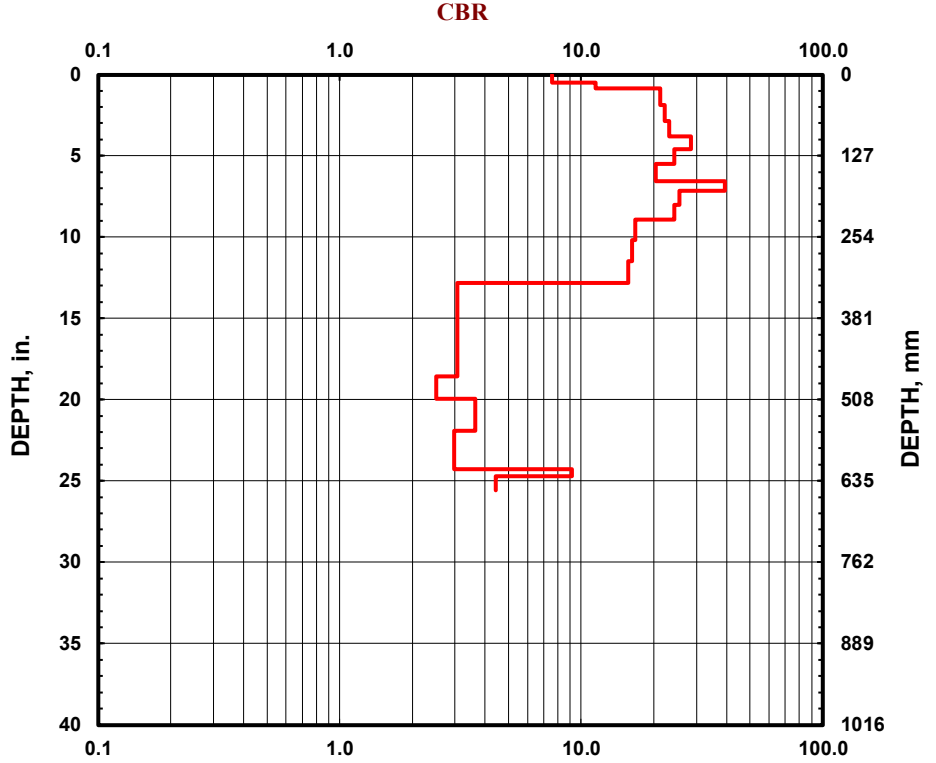
Project: South Jordan M.S.  
 Location: B-11

Date: 8-Dec-23  
 Soil Type(s): CL

- Hammer
- 10.1 lbs.
  - 17.6 lbs.
  - Both hammers used

- Soil Type
- CH
  - CL
  - All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	13	2
1	22	2
5	48	2
5	73	2
5	97	2
5	117	2
5	140	2
5	167	2
5	182	2
5	204	2
5	227	2
5	259	2
5	292	2
5	326	2
5	472	2
1	507	2
1	532	2
1	557	2
1	587	2
1	617	2
1	628	2
1	649	2
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- B. Material meets design CBR-value (ASTM D 1883) or R value (ASTM D 2844) for suitability of source, not for project control testing.

**2.03 GRANULAR BACKFILL BORROW**

- A. Classification A-1, ASTM D 3282.
- B. Well graded.
- C. Particle size; 2 inch maximum.
- D. Material meets design CBR-value (ASTM D 1883) or R value (ASTM D 2844) for suitability of source, not for project control testing.

**2.04 NATIVE**

- A. When allowed by ENGINEER, material obtained from Excavations may be used as fill, provided organic material, rubbish, debris, and other objectionable materials are removed and CONTRACTOR has submitted the appropriate Proctor data (see Section 33 05 05).

**2.05 CLAY**

- A. Classification CL, CL-ML, or ML, ASTM D 2487.
- B. Free of organic matter, frozen material, debris, rocks, and deleterious materials.
- C. Homogeneous, relatively uniform.

**2.06 SAND**

- A. Friable river or bank aggregate, free of loam and organic matter. Graded as follows.

Percent Passing Sieve	by Weight
3/8	100
100	1 – 10

**2.07 GRAVEL**

- A. Material: Rock, stone, or other high quality mineral particle or combination.
- B. Gradation: ASTM D 448 narrow band.
  - 1. Sewer Rock.

ASTM Nominal Size	Size No.
3.5 to 1.5"	1
2.5 to 1.5"	2
2 to 1"	3
1.5 to 3/4"	4
1 to 1/2"	5

- 2. Pea Gravel

Nominal Size	ASTM Size No.
3/4 to 3/8"	6
1/2 to No. 4	7
3/8 to No. 8	8

No. 4 to No. 16	9
No. 4 (screenings)	10

**2.08 TOPSOIL**

A. Chemical Characteristics:

1. Acidity/alkalinity range: pH 5.5 to 7.7
2. Soluble Salts: Less than 2.0 mmhos/cm.
3. Sodium Absorption Ratio (SAR): less than 3.0
4. Nitrogen (NO<sub>3</sub>N): 48 ppm minimum
5. Phosphorus (P): 11 ppm minimum
6. Potash (K): 130 ppm minimum
7. Iron (Fe): 5.0 ppm minimum

B. Physical Characteristics:

1. Fertile, loose, friable.
2. Containing more than 2 percent organic matter.
3. Free of weeds, subsoil, lumps or clods of hard earth, plants or their roots, sticks, toxic minerals, chemicals and stones greater than 1-1/2 inch diameter.
4. Composition.

Material	Percent Passing
Sand	15 – 60
Silt	10 – 70
Clay	5 – 30

**2.09 SOURCE QUALITY CONTROL**

- A. Verify gradation, ASTM C 136.
- B. Select Samples on a random location and time basis.
- C. If tests indicate materials do not meet specified requirements, change materials and retest at no additional cost to OWNER.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Trenches, Section 33 05 20.
- B. Structures or landscaping, Section 31 23 23.
- C. Pavements, Section 32 05 10.

**END OF SECTION 31 0513**

**South Jordan Middle School  
Parking Lot Addition/Remodel  
South Jordan, Utah**

**Jordan School District  
West Jordan, Utah**

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**SECTION 31 1000  
SELECTIVE SITE DEMOLITION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Demolition of structural and utility items on site.
- B. Salvage.

**1.02 PAYMENT PROCEDURES**

- A. Payment for structures or obstructions which are not designated for removal and disposal in the Bidding Documents, and which cannot be removed with equipment reasonably expected to be used in the work without cutting, drilling, or blasting, will be paid for by Change Order.
- B. Backfilling depressions left because of demolition work will not be measured or paid for separately except as provided in the preceding paragraph.

**1.03 RELATED WORK**

- A. Demolition of Pavements, sidewalks, Driveway Approaches, curbs, gutters, Section 02 41 14.
- B. Existing pipelines not to be salvaged are considered a part of excavation work, Section 31 23 16.
- C. For use of explosives in the Work; Section 31 23 17.

**1.04 SITE CONDITIONS**

- A. Protect structures to be removed and their contents from vandalism and theft.
- B. Repair or replace damaged trees and shrubs at no additional cost to OWNER.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Review all work procedures with ENGINEER.
- B. Locate and preserve all active utilities which are to remain in service.

**3.02 PROTECTION**

- A. Avoid or minimize damage to tree roots. Roots provide anchorage, storage of energy, and absorption and conduction of water and mineral elements. Loss of root connection affects health and stability of tree and safety of people and property.
- B. Provide certified arborist observation of root cuts larger than 4 inches diameter. Notify ENGINEER of such root cut.

**3.03 STRUCTURE DEMOLITION**

- A. Remove structures and incidentals such as but not limited to foundations, sidewalks, Pavement slabs, fences and outbuildings.
- B. Remove foundation walls at least 2 feet below the finished grade or 2 feet below the natural ground surface. Remove floor slab or break it into pieces no larger than 3 feet square.
- C. Backfilling and compaction of Excavations for structures, Section 31 23 23.

- D. Building components, Section 02 41 19.

**3.04 PIPELINE DEMOLITION**

- A. Salvaging Pipe: Do not damage.
- B. Plugs: Plug disconnected pipe lines near the right-of-way line with a water-tight concrete plug extending into the remaining pipe at least 2 feet.
- C. Service Laterals: Excavate and shut off the corporation stop. Disconnect.

**3.05 BRIDGE AND ABUTMENT DEMOLITION**

- A. Remove existing bridges and abutments indicated.
- B. Remove structures so that no remaining portion is closer than 3 feet to any water course or closer than 2 feet to the Subgrade and Embankment surface, or within 2 feet of the natural ground surface.
- C. Remove structures so that compacted backfill can be provided as required in backfilling operation, Section 31 23 23.

**3.06 BURIED FUEL TANK DEMOLITION**

- A. Remove buried fuel storage tanks and dispose of tank contents in accordance with Laws and Regulations.
- B. Do not spill fuel on Subgrade.
- C. Comply with the local authority having jurisdiction over fuel tank removals.

**3.07 MISCELLANEOUS DEMOLITION**

- A. Remove miscellaneous structures and obstructions or cover them with backfill if the result meets the following requirements.
  - 1. Backfill is stable.
  - 2. Burial does not interfere with construction.
  - 3. Permission to do so is obtained from the ENGINEER.
  - 4. No remaining portion is within 2 feet of the final ground surface contours.

**3.08 SALVAGE**

- A. Salvage designated equipment and materials.
- B. All other salvageable materials become the property of the CONTRACTOR unless such materials are not owned by OWNER or OWNER requests such materials be returned to them.

**END OF SECTION 31 1000**

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**SECTION 31 1010  
PAVEMENT REMOVAL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Removal of roadway Pavement.
- B. Milling roadway Pavement.
- C. Removal of curb, gutter, sidewalk, Driveway Approach, waterway, or similar flatwork.
- D. Disposal of removed materials.

**1.02 RELATED WORK**

- A. Demolition of structures and utilities.

**1.03 DEFINITIONS**

- A. ADA: Americans with Disabilities Act.

**1.04 SUBMITTALS**

- A. Traffic control plan, Section 01 55 26.

**1.05 SITE CONDITIONS**

- A. Control dust, Section 01 57 00.

**PART 2 PRODUCTS – NOT USED**

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. General
  - 1. Coordinate utility location, Section 01 31 13.
  - 2. Preserve all active utilities.
  - 3. Notify neighborhood of day and time of operation.
  - 4. Make sure invert covers are properly installed in storm drain and sanitary sewer systems, Section 01 71 13.
  - 5. Mark existing utilities on redline drawings.
- B. Traffic Control: Provide worker and public safety, Section 01 55 26.
- C. Tree Roots:
  - 1. Avoid or minimize damage to tree roots. Roots provide anchorage, storage of energy, and absorption and conduction of water and mineral elements. Loss of root connection affects health and stability of tree and safety of people and property.
  - 2. Provide certified arborist observation of root cuts larger than 4 inches diameter. Notify ENGINEER of such root cut.
- D. Existing Surfaces:
  - 1. Do not damage adjacent concrete surfaces that are not scheduled for removal.
  - 2. Use rubber cleats or Pavement pads when operating backhoes, outriggers, track equipment, or any other equipment on or crossing paved surfaces.
  - 3. Restore paved surfaces that are damaged by removal operations at no additional

cost to the OWNER. Match the existing Pavement surface plus 1 inch.

**3.02 SAW-CUT PEDESTRIAN TRIP HAZARDS**

- A. Make saw cuts 1:8 slope measured to grade.
- B. Eliminate trip hazards across the full width of the hazard.

**3.03 SAW-CUT CURB HORIZONTALLY**

- A. Saw cut curbs for ADA ramps at 1:12 slope. No trip hazard at gutter flow line.
- B. Saw cut curbs for flares:
  - 1. 1:4 slope measured to grade, or
  - 2. 1:12 slope measured horizontally when complying with ADA.

**3.04 REMOVE PORTLAND CEMENT CONCRETE**

- A. Remove concrete to the nearest expansion joint or vertical saw cut.
- B. Make concrete cuts straight, vertical to the surface, true, full depth.
- C. DO NOT use machine mounted impact hammers.

**3.05 REMOVE ASPHALT CONCRETE**

- A. Saw cut full depth and remove pavement.
- B. When asphalt concrete overlays Portland cement concrete pavements do not use a machine mounted impact hammer.

**3.06 MILLING**

- A. Machine:
  - 1. Equipped to prevent air pollution.
  - 2. Equipped with a system to control slope of mill cut.
- B. Tolerances:
  - 1. Milling Depth: As indicated plus or minus 10 percent not uniformly high or uniformly low.
  - 2. Striation Texture: Uniform, discontinuous, longitudinal, 3/16 inch deep maximum, 3/4 inch center to center.
  - 3. Smoothness: Plus or minus 5/16 inch in 25 feet.
  - 4. Cross Slope: Plus or minus 1/4 inch in 10 feet.
- C. Performance:
  - 1. Lower utility frames, covers, and other Street Fixtures.
  - 2. Mill surfaces to the depth shown on the Drawings or indicated by ENGINEER. Do not disfigure adjacent work or existing surface improvements.
  - 3. If milling exposes smooth underlying Pavement surfaces, mill the smooth surfaces to make them rough.
  - 4. Mill off material if it ponds water or if it has been damaged by water.
  - 5. Where vehicles or pedestrians must pass over milled edges provide safe temporary ramps suitable to speed of user vehicles (or suitable for wheel chair user needs).
  - 6. Remove excess material and clean milled surfaces.
  - 7. If work equipment is removed from the milling site and milled surface awaits further work, provide appropriate traffic control and cleaning.

**3.07 GRINDING**

- A. Machine:



1. Cutting head 36 inches wide minimum.
2. 50 to 60 diamond blades per foot of head.

**B. Preparation:**

1. Control traffic.
2. Provide water truck, waste truck, and other support machinery.
3. Mark areas to be ground.

**END OF SECTION 31 1010**

**South Jordan Middle School  
Parking Lot Addition/Remodel  
South Jordan, Utah**

**Jordan School District  
West Jordan, Utah**

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**SECTION 31 1100  
SITE CLEARING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Removal of trees, stumps, roots, and tree debris.
- B. Clearing site of plant life, root systems and shrubs.
- C. Removal of fences, fence posts, mail box posts, and miscellany.

**1.02 REFERENCES**

- A. NAA: Pruning Standards for Shade Trees.
- B. Utah Shade Tree Pruning Standards.

**1.03 QUALITY ASSURANCE**

- A. Provide at least one person, who is familiar with NAA pruning standards for the type of tree involved, to be present during tree pruning operations.

**1.04 SITE CONDITIONS**

- A. Repair or replace damaged trees and shrubs at no additional cost to OWNER.

**1.05 PROTECTION**

- A. Protect roots and branches of trees to remain.
- B. Construct temporary barricading at tree's approximated drip line. Place continuous barricades at least 3 feet high.
- C. When setting posts, avoid damaging tree roots.
- D. Do not permit heavy equipment or stockpiling of materials or debris within the barricaded area, or permit earth surface to be changed.
- E. Provide water and fertilizer to maintain existing trees.

**PART 2 PRODUCTS**

**2.01 STUMP TREATMENT SOLUTION**

- A. Formulated to kill existing vegetation.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. The Drawings do not purport to show all trees and shrubs existing on site.
- B. Verify with ENGINEER which plantings are to be removed or to remain.
- C. Tree root inspection:
  - 1. Assist ENGINEER by removing and replacing existing surface improvements.
  - 2. Cost of removals and replacements will be paid for using existing payment prices, or if none, then by using Modification prices.

**3.02 PREPARATION**

- A. Locate utilities. Preserve utilities that are to remain in service.
- B. Review work procedures with ENGINEER.
- C. Schedule work carefully with consideration for property owners and general public.
- D. Before starting, arrange for the disconnection of all utility services that are to be removed or which interfere with work.

**3.03 SITE CLEARING**

- A. Remove all vegetation to outside Excavation, fill slope lines, and limits of slope rounding.
- B. Remove fences, posts, appurtenances, and miscellaneous objects.

**3.04 TREE REMOVAL**

- A. Remove branches, limbs, and debris.
- B. Remove stumps and roots to 18 inches below proposed grade.
- C. For stumps larger than 6 inches caliper remove and treat as follows:
  - 1. Remove chips and debris from around remaining stump.
  - 2. Apply stump treatment solution in accordance with manufacturer's recommendations.
  - 3. Do not allow chemical solution to mist, drip, drift, or splash onto adjacent ground surfaces or desirable vegetation.
  - 4. Replace any existing vegetation damaged or killed through improper use of chemical at no additional cost to OWNER.

**END OF SECTION 31 1100**

**SECTION 31 2316  
EXCAVATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Excavation and disposal of excavated materials.
- B. Protection of existing facilities, utilities, and structures affected by excavation.

**1.02 DEFINITIONS**

- A. Extra Excavation: Upper limit of Excavation is proposed excavation limit. Lower and lateral limits are as authorized by ENGINEER.
- B. Classified Excavation: The excavation of specified materials.
- C. Incidental Excavation: Excavation done for CONTRACTOR's benefit, excavation error, dewatering of Excavation, slough, or over-break.
- D. Unclassified Excavation: The excavation of all materials encountered regardless of the nature, size, or manner in which they are removed. Presence of isolated boulders or Rock fragments will not be sufficient cause to change classification of surrounding materials.

**1.03 STORAGE AND HANDLING**

- A. Stockpile excavated material to cause a minimum of inconvenience to public and provide for emergency services as necessary.
- B. Provide free access to all existing fire hydrants, water and gas valves, and meters.
- C. Provide free flow of storm water in all gutters, conduits, and natural water courses.
- D. Utilize traffic control signs, markers, and procedures in product storage and handling activities.
- E. Promptly remove other material from site.

**1.04 SITE CONDITIONS**

- A. Prior to excavation, photograph existing surfaces along which work may take place in order to determine, after construction is completed, whether any damage to existing improvements occurred prior to construction operations. Refer to construction photograph requirements, Section 01 78 39.
- B. Perform Incidental Excavation at no additional cost to OWNER.

**PART 2 PRODUCTS**

**2.01 MATERIALS FOR OVER EXCAVATED AREAS**

- A. Common fill, Section 31 05 13.
- B. Crushed aggregate base, Section 32 11 23.
- C. Stabilization fill, crushed aggregate base or common fill with maximum rectilinear particle size of 2 inches.
- D. Stabilization fabric, Section 31 05 19.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Use white paint and mark the proposed Excavation.

- B. Call the one-call center and wait the required amount of time. Colors of one-call center marks indicate the following.
  - 1. White: Proposed Excavation
  - 2. Pink: Temporary survey markings
  - 3. Red: Electric power lines, cables, conduit and lighting cables
  - 4. Yellow: Gas, oil, steam, Petroleum or gaseous materials
  - 5. Orange: Communications, alarm, signal, cables or conduits.
  - 6. Blue: Potable water.
  - 7. Purple: Reclaimed Water, irrigation and slurry lines
  - 8. Green: Sewer and storm drain lines

### **3.02 PROTECTION**

- A. Identify required lines, grades, contours, and benchmarks, Section 01 71 23.
- B. Pothole, expose or otherwise locate utilities as necessary to give utility company at least 4 days' notice to protect, preserve, or relocate a utility that interferes with or may be damaged by excavation work.
- C. Where utilities or structures conflict with design grades, report conflict to the appropriate utility company and ENGINEER 14 days prior to the initiation of work within the conflict area.
- D. For temporary controls, refer to Section 01 57 00.
- E. Support and protect from damage any existing facility and structure that exists in, passes through, or passes under the site.
- F. No Contract Time extension shall be granted and no additional compensation shall be made if CONTRACTOR fails to pothole and identify buried utilities or structures which conflict with the Work.

### **3.03 TOPSOIL**

- A. Excavate topsoil only to depth that will preserve topsoil quality. B. Do not mix topsoil with subsoil during stockpiling or spreading.

### **3.04 LANDSCAPE SPRINKLER SYSTEMS**

- A. Protect existing landscape sprinkler systems.
- B. When disturbance of existing sprinkler system is required, interrupt and repair system so operation of system is maintained.

### **3.05 SHORING**

- A. Slope, shore, sheet, brace or otherwise support Excavations over 4 feet deep, Section 31 41 00.
- B. When soil conditions are unstable, Excavations shallower than 4 feet deep must also be sloped, supported or shored.

### **3.06 DEWATERING**

- A. Keep Excavation free from surface and ground water.
- B. If ground water table is in the intended construction operations, dewater Excavations.
- C. If there are no olfactory or visual indications of contamination in the water, discharge according to requirements of Federal, State or local agency having jurisdiction.
- D. If any evidence of contamination in the water, based on olfactory or visual indications, cease excavation work until potential risks are evaluated. During evaluation, handle water as a contaminated material.

- E. Pay for damages and costs resulting from dewatering operations.

### **3.07 GENERAL EXCAVATION REQUIREMENTS**

- A. Excavate topsoil from areas to be re-landscaped or regraded and other marked areas.
- B. Excavate site to line and grade indicated.
- C. Carefully excavate soils in vicinity of buried utility marks placed by the one-call center.
- D. Where soil has been softened or eroded by flooding or hardened by drying during unfavorable weather, rework all damaged areas or replace with approved material at no additional cost to OWNER.
- E. Notify ENGINEER of unexpected subsurface conditions.
- F. Underpin adjacent structure, service utilities and pipe chases that may be damaged by Excavation work.
- G. Protect Excavation walls as required. If conditions permit, slope Excavation Sides to maintain a safe and clean working area. Remove loose materials.
- H. Where ENGINEER deems Subgrade material to be susceptible to frost heave or otherwise unsatisfactory, excavate additional depth.

### **3.08 ROADWAY EXCAVATION**

- A. In advance of setting line and grade stakes, clean Subgrade area of brush, weeds, vegetation, grass, and debris. Drain all depressions or ruts that contain water.
- B. Backfill and compact over excavation, Section 33 05 05.

### **3.09 STRUCTURAL AND LANDSCAPE EXCAVATION**

- A. Provide Shoring, cribs, cofferdams, caissons, pumping, bailing, draining, sheathing, bracing, and related items.
- B. For piling work, coordinate special requirements for piling. Protect Excavation walls.
- C. If conditions permit, slope Excavation Sides as excavation progress. Maintain a safe and clean working area.
- D. Support Excavations. Do not interfere with the bearing of adjacent foundations, pipelines, etc.

### **3.10 TRENCH EXCAVATION**

- A. Grade bottom of Trenches to provide uniform bearing surface.
- B. If necessary, make bellholes and depressions required to complete joining of pipe or box.
- C. Limit width of Trench excavations to the dimensions suitable for worker access per pipe manufacturer's recommendation. Provide enough space for compaction equipment. Notify ENGINEER if excavation operations exceed any indicated line and grade limits.
- D. In public thoroughfares and regardless of Trench depth, limit length of open Trenches to 200 lineal feet day or night. Provide barricading, Section 01 55 26. Protect Trenches overnight.

### **3.11 EXTRA EXCAVATION**

- A. If unstable material is encountered at the bottom or face of any Excavation, do not perform extra excavation without written consent.
- B. Correct excavations beyond the specified lines and grades by filling and compacting the resulting voids with acceptable fill.
- C. Volume of Excavation within any specified pay limit will be determined by the method of average-end-areas in the original position.

**3.12 TOLERANCE**

A. Grading: Top surface of Subgrade = plus or minus 1 inch.

**END OF SECTION 31 2316**

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**SECTION 31 2326  
COMPACTION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Compaction of granular fill materials.

**1.02 REFERENCES**

- A. ASTM D 698: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
- B. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
- C. ASTM D 2216: Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.
- D. ASTM D 2922: Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D 3017: Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- F. ASTM D 3282: Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
- G. ASTM D 3740: Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

**1.03 DEFINITIONS**

- A. A-1 Soil: Defined in ASTM D 3282.
- B. Modified Proctor Density: The maximum laboratory density, as defined in and determined by ASTM D 1557 using procedure A, B or C as applicable.
- C. Relative Density (or Relative Compaction): The ratio of field dry density to the maximum laboratory density expressed as a percentage.
- D. Standard Proctor Density: The maximum laboratory density, as defined in and determined by ASTM D 698 using procedure A, B or C as applicable.

**1.04 QUALITY ASSURANCE**

- A. Use a laboratory that follows and complies with ASTM D 3740.

**PART 2 PRODUCTS – NOT USED**

**PART 3 EXECUTION**

**3.01 COMPACTION**

- A. Moisten or dewater backfill material to obtain optimum moisture for compaction.
- B. Correct deficient compaction conditions. Replace or repair materials and damaged facilities.
- C. When no density compactivity effort is specified, compact the entire area to eliminate unstable zones.

**3.02 FIELD QUALITY CONTROL**

- A. Testing: Perform control testing of materials. Perform additional testing at no additional cost to OWNER.
  - 1. Because of changes in source of materials or proportions requested by CONTRACTOR.
  - 2. Because of Failure of materials to meet specification requirements.
  - 3. For other testing services needed or required by CONTRACTOR.
- B. Report: For each material tested, record the following.
  - 1. Vertical and horizontal location of the test.
  - 2. Optimum laboratory moisture content.
  - 3. Field moisture content.
  - 4. Maximum laboratory dry density.
  - 5. Field density.
  - 6. Percent compaction results.
  - 7. Certification of test results by testing agency.
- C. Optimum Soil Density: Use ASTM D 2216 and the following industry standards.
  - 1. For A-1 Soils: Use test method C of ASTM D 1557 (Modified Proctor)
  - 2. For All Other Soils: Use test method C of ASTM D 698 (Standard Proctor).
- D. Field Density:
  - 1. Use ASTM D 3017 and test method C of ASTM D 2922 for shallow depth nuclear testing.
  - 2. No density determinations are required on any material containing more than 65 percent material retained on the number 10 sieve or more than 60 percent material retained on the number 4 sieve. In lieu of reporting densities in such cases, report the sieve analysis to document the material type.

**END OF SECTION 31 2326**

SECTION 31 2500  
EROSION AND SEDIMENTATION CONTROL

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Erosion control and slope protection facilities including blankets or mulches.
- B. Construction of drainage facilities to protect work area.

**1.02 SUBMITTALS**

- A. Submit prior to using:
  - 1. Sample of blanket or geotextile materials.
  - 2. Mulch formula.
  - 3. Grass mixture listing.
  - 4. Plant list.
  - 5. Geotextile manufacturer's certification.
- B. Application rate of fiber mulches recommended by tackifier manufacturer.

**1.03 DELIVERY, STORAGE AND HANDLING**

- A. Deliver seed in original containers with certified germination test results showing analysis of seed mixture, percentage of pure seed, year of production, and date of packaging. Damaged packages are not acceptable. Store seed free of moisture.
- B. Deliver fertilizer in waterproof bags showing weight, chemical composition and name of manufacturer.
- C. Deliver blanket in original wrapping showing name of manufacturer and product weight.
- D. Deliver plant materials immediately prior to placement.
- E. Replace plant when original root protection system (burlap bag wrap of earth ball, plastic container with special plant bedder, etc.) has been broken or displaced prior to planting.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Riprap.
- B. Blankets: Uniform open weave jute, wood fiber, biodegradable or photodegradable synthetic fiber matting.
- C. Geotextiles.
- D. Erosion Control Vegetation Mats: Permanent three dimensional mats which allow for revegetation where high water flows are expected.
- E. Fiber Mulches: Straw, hay, wood or paper free from weeds or foreign matter detrimental to plant life.
- F. Mulch Binder: Vegetable based gel tackifier with growth stimulant.
- G. Topsoil and Fertilizer.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Remove foreign materials, roots, rocks, and debris.
- B. Grade to eliminate rough spots, and ponding areas.
- C. Grade soil to drain perimeter water away from protected areas.

- D. As applicable.
  - 1. Temporary controls.
  - 2. Grass.

**3.02 SLOPE PROTECTION BLANKET**

- A. Cover seeded slopes where grade is greater than 3 horizontal to 1 vertical with blanket. Roll down over slopes carefully and loosely without stretching or pulling.
- B. Lay blanket smoothly on prepared soil surface. Bury top end of each section in a narrow Trench. Leave 24 inches overlap from top roll over bottom roll. Leave 12 inches overlap over adjacent section.
- C. Toe-in top end of each section in narrow Trench at least 12 inches deep. Toe-wrap fabric at bottom of slope.
- D. Staple loosely the outside edges and overlaps.
- E. In ditches, lay matting in upstream direction. Overlap and staple ends 6 inches with upstream section on top.
- F. If natural drainage water traverses protected or controlled area; construct a channel or riprap according to Drawings.
- G. Lightly dress slopes with topsoil to ensure close contact between cover and soil.
- H. Present alternative methods of protection for approval prior to starting any work.

**3.03 GEOTEXTILE**

- A. Placement per drawings.

**3.04 MULCHES**

- A. Apply mulches at the rate indicated.
- B. When installed with a tackifier, apply at the rate recommended by the tackifier supplier.

**3.05 SURFACE COVER**

- A. Grass, Per Landscape Specifications
- B. Ground cover, Per Landscape Specifications

**3.06 MAINTENANCE**

- A. Maintain surfaces and supply additional topsoil where necessary, including areas affected by erosion.
- B. Protect and repair geotextiles.
- C. Keep surface of soil damp only as necessary for seed germination.
- D. Apply water slowly so surface of soil will not puddle and crust.
- E. Replant damaged grass areas showing root growth Failure, deterioration, bare or thin spots, and eroded areas.
- F. Re-fertilize 60 days after planting.
- G. Remove weeds that are over 3 inches high.

**END OF SECTION 31 2500**

**SECTION 32 1123  
CRUSHED AGGREGATE BASE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Treated or untreated base course requirements.

**1.02 REFERENCES**

- A. ASTM C 29: Standard Test Method for Unit Weight and Voids in Aggregate.
- B. ASTM C 131: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C. ASTM C 136: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- D. ASTM D 75: Standard Practice for Sampling Aggregates.
- E. ASTM D 448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
- F. ASTM D 1883: Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils.
- G. ASTM D 2419: Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- H. ASTM D 3665: Standard Practice for Random Sampling of Construction Materials.
- I. ASTM D 3740: Standard Recommended Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- J. ASTM D 4318: Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- K. ASTM D 5821: Standard Test Method for determining the percentage of Fractured Particles in Coarse Aggregate.

**1.03 DEFINITIONS**

- A. Aggregate Grading Band: Allowable deviation from Target Gradation Curve based upon the number of gradation tests in a Lot. It is possible that gradation for any sieve may lie outside of its respective Master Grading Band limits.
- B. Master Grading Band: Gradation limits allowed for various sieve sizes ranging from the maximum size sieve to the No. 200 sieve.
- C. Mean of Deviations: The sum of the absolute values of the variance between each screen target value and each measured value divided by the number of tests in the Lot.
- D. Target Gradation Curve: A smooth locus of points within the limits of the Master Grading Band.

**1.04 SUBMITTALS**

- A. Name of Supplier and aggregate source.
- B. Target Gradation Curve.

**1.05 QUALITY ASSURANCE**

- A. Use a laboratory that follows and complies with Section 01 45 00 and ASTM D 3740.

**1.06 ACCEPTANCE**

A. General:

1. Defective work, Section 01 29 00.
2. Dispute resolution, Section 01 45 00.

B. Treated or Untreated Base Course: Lot size is one day's production. Sub-lot size is 500 tons.

1. ENGINEER is not obligated to accept changes in Target after any material is delivered to site.
2. Lot is acceptable if gradation test deviations are within pay factor 1.00 limits. At ENGINEER's discretion, a Lot with a sub-lot test deviation greater than pay factor 0.70 limits may stay in place at 50 percent cost.

Table 1- Pay Factors for Price Determination						
Criteria	Pay Factor	Mean of Deviations of Acceptance Tests From the Target Gradation Curve Expressed in Percentage Points				
		1 Sample	2 Samples	3 Samples	4 Samples	5 or More Samples
1/2" Sieve	1.00	0 – 15	0.0 – 12.1	0.0 – 10.8	0.0 – 10.0	0.0 – 9.5
	0.95	16 – 17	12.2 – 13.9	10.9 – 12.4	10.1 – 11.5	9.6 – 11.
	0.90	18 – 19	14.0 – 15.1	12.5 – 13.5	11.6 – 12.5	11.1 – 11.9
	0.80	20 – 21	15.2 – 17.2	13.6 – 15.3	12.6 – 14.2	12. – 13.5
	0.70	22 – 23	17.3 – 18.8	15.4 – 16.7	14.3 – 15.5	13.6 – 14.7
3/8" Sieve	1.00	0 – 15	0.0 – 11.5	0.0 – 9.8	0.0 – 8.8	0.0 – 8.0
	0.95	16 – 17	11.6 – 13.2	9.9 – 11.3	8.9 – 10.1	8.1 – 9.2
	0.90	18 – 19	13.3 – 14.4	11.4 – 12.3	10.2 – 11	9.3 – 10.0
	0.80	20 – 21	14.5 – 16.3	12.4 – 13.9	11.1 – 12.5	10.1 – 22.4
	0.70	22 – 23	16.4 – 17.9	14.0 – 15.2	12.6 – 13.6	11.5 – 12.4
No. 4 Sieve	1.00	0 – 14	0.0 – 10.5	0.0 – 8.8	0.0 – 7.8	0.0 – 7.0
	0.95	15 – 17	10.6 – 12.1	8.9 – 10.1	7.9 – 9.0	7.1 – 8.0
	0.90	18	12.2 – 13.1	10.2 – 11	9.1 – 9.8	8.1 – 8.7
	0.80	19 – 20	13.2 – 14.9	11.1 – 12.5	9.9 – 11.1	8.8 – 10.0
	0.70	21 – 22	15.0 – 16.3	12.6 – 13.6	11.2 – 12.1	10.1 – 10.8
No. 16 Sieve	1.00	0 – 11	0.0 – 8.2	0.0 – 6.9	0.0 – 6.2	0.0 – 5.6
	0.95	12 – 13	8.3 – 9.4	7.0 – 7.9	6.3 – 7.1	5.7 – 6.4
	0.90	14	9.5 – 10.3	8.0 – 8.6	7.2 – 7.8	6.5 – 7.0
	0.80	15 – 16	10.4 – 11.6	8.7 – 9.8	7.9 – 8.8	7.1 – 8.0
	0.70	17	11.7 – 12.7	9.9 – 10.7	8.9 – 9.6	8.1 – 8.7
No. 50 Sieve	1.00	0 – 9	0.0 – 7.0	0.0 – 6.1	0.0 – 5.5	0.0 – 5.2
	0.95	10	7.1 – 8.0	6.2 – 7.0	5.6 – 6.3	5.3 – 6.0
	0.90	11	8.1 – 8.8	7.1 – 7.6	6.4 – 6.9	6.1 – 6.5
	0.80	12 – 13	8.9 – 10.0	7.7 – 8.7	7.0 – 7.8	6.6 – 7.4
	0.70	14	10.1 – 10.9	8.8 – 9.5	7.9 – 8.5	7.5 – 8.1
No. 200 Sieve	1.00	0 – 4.5	0.0 – 3.4	0.0 – 2.9	0.0 – 2.5	0.0 – 2.3
	0.95	4.6 – 5.2	3.5 – 3.9	3.0 – 3.3	2.6 – 2.9	2.4 – 2.6
	0.90	5.3 – 5.6	4.0 – 4.3	3.4 – 3.6	3.0 – 3.1	2.7 – 2.9
	0.80	5.7 – 6.4	4.4 – 4.9	3.7 – 4.1	3.2 – 3.6	3.0 – 3.3
	0.70	6.5 – 7.0	4.9 – 5.3	4.2 – 4.5	3.7 – 3.9	3.5 – 3.6

3. Suitability of Source: Meet Table 2 properties. A reduction in aggregate class will be accepted providing any costs for difference in excavation, backfill, and alternate design for CBR does not increase the Contract Price.

## PART 2 PRODUCTS

### 2.01 UNTREATED BASE COURSE

- A. Material: Crushed rock, gravel, sand or other high quality mineral particle, or combination.

Table 2 – Properties					
Physical Property	Units	Aggregate Class			ASTM Test
		A	B	C	
Dry Rodded Unit Weight, min.	lb/ft <sup>3</sup>	75			C 29
Liquid Limit, max.		25			D 4318
Plastic Index, max.		0	0	6	D 4318
Sand Equivalent, min.	percent	35			D 2419
Wear (hardness), max.	percent	50			C 131
Gradation		Table 3			C 136
Two Fractured Faces, min.	percent	90	50	50	D 5821
CBR, min.	percent	70	55	40	D 1883

NOTES

- (a) Liquid limit, plastic limit, sand equivalent: Passing No. 40 sieve.
- (b) Wear: Retained on No. 8 sieve.
- (c) CBR: Use a 10 lb surcharge measured at 0.20 inch penetration at 95 percent of modified Proctor.
- (d) Faces: Retained on No. 4 sieve.

Table 3 – Gradation			
US Sieve Size	Master Grading Bands Limits		
	Grade 1-1/2	Grade 1	Grade 3/4
2"	–	–	–
1-1/2"	100	–	–
1"	–	100	–
3/4 "	81 – 91	–	100
1/2 "	67 – 77	79 – 91	–
3/8"	–	–	78 – 92
No. 4	43 – 53	49 – 61	55 – 67
No. 16	23 – 29	27 – 35	28 – 38
No. 200	6 – 10	7 – 11	

### 2.02 ASPHALT TREATED BASE COURSE

- A. Meet requirements of this Section Article 2.1 and the following.
  1. Sand equivalent and fractured face measured after asphalt residue is burned off.

2. Plasticity and wear requirements apply to virgin aggregate portion only.
  3. Allowable asphalt content is controlled by CBR.
- B. If aggregate contains RAP.
- a. Screen crushed RAP to remove debris.
  - b. Mechanically blend virgin and RAP aggregates. Do not use windrows for blending.

## **2.02 SOURCE QUALITY CONTROL**

- A. Sample, ASTM D 75 on a random basis, ASTM D 3665.
- B. Reject crushed aggregate base products that do not meet requirements of this Section.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Trenches, Section 33 05 20.
- B. Structures, Section 31 23 23.
- C. Landscaping, Section 32 91 19.
- D. Backfilling Roadways, Section 32 05 10.

### **3.02 FIELD QUALITY CONTROL**

- A. Remove any product found defective after installation and install acceptable product at no additional cost to the OWNER.

**END OF SECTION 31 1123**



**SECTION 32 1203  
PAVING ASPHALTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Performance graded asphalt, asphalt cement, cutback asphalt, emulsified asphalt, recycle asphalt, and crack patch asphalt.
- B. Requirements for accepting non-complying paving asphalts.

**1.02 REFERENCES**

- A. ASTM D 113: Standard Test Method for Ductility of Bituminous Materials.
- B. ASTM D 977: Standard Specification for Emulsified Asphalt.
- C. ASTM D 2026: Standard Specification for Cutback Asphalt (Slow- Curing Type).
- D. ASTM D 2027: Standard Specification for Cutback Asphalt (Medium- Curing Type).
- E. ASTM D 2028: Standard Specification for Cutback Asphalt (Rapid- Curing type).
- F. ASTM D 2397: Standard Specification for Cationic Emulsified Asphalt.
- G. ASTM D 3381: Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
- H. ASTM D 4552: Standard Practice for Classifying Hot-Mix Recycling Agents.
- I. ASTM D 5710: Standard Specification for Trinidad Lake Modified Asphalt.
- J. ASTM D 6373: Standard Specification for Performance Graded Asphalt Binder.

**1.03 SUBMITTALS**

- A. Submit bill of lading for each shipment of paving asphalt from vendor. Identify the following.
  - 1. Source of product (manufacturer);
  - 2. Type and grade of asphalt, And
  - 3. Type and amount of additives in the product.

**1.04 QUALITY ASSURANCE**

- A. Reject paving asphalts which are not uniform in appearance and consistency or which foam when heated to mixing temperature.
- B. Do not use storage containers contaminated with other types or grades of Petroleum products.
- C. Do not use Petroleum product that does not comply with contract requirements.

**1.05 ACCEPTANCE**

- A. General:
  - 1. Acceptance is by Lot. One Lot is one day's production.
  - 2. If non-complying material has been installed and no price for the material is specified, apply price adjustment against cost of work requiring material as part of its installation.
- B. Performance Graded Asphalt Binder (PGAB): Sub-lot size is 20,000 gallons. Collect sub-lot Sample randomly from oil storage unit.
  - 1. Refer to limits identified in Section 209 of UDOT's "Manual of Instruction Part 8 Materials". Pay factors are as follows.
    - a. If none of the critical properties are outside rejection limit a composite price adjustment of 25 percent or less is allowed.

- b. If one or more of the critical properties falls outside the rejection limit or if a composite price adjustment is more than 25 percent, paving asphalt will be rejected.
- C. Asphalt Cement (AC) Binder: Sub-lot size is 20,000 gallons. Collect sub-lot Sample randomly from oil storage unit.
  - 1. Ductility: Meet this Section's requirements, or
  - 2. Viscosity or Penetration: Meet graphics published in Section 955 of UDOT's "Manual of Instructions, Part 8 Materials".
    - a. Lot may be accepted using the published graphics. If price adjustment exceeds 30 percent, reject paving asphalt, or
    - b. If allowed to remain after placement, price adjustment will be 50 percent.
- D. Cut-back Binder: Meet this Section's requirements for ductility.
- E. Trinidad Lake Modified Asphalt: Supplier's certificate for ASTM compliance.
- F. Emulsified Asphalt: Supplier's certificate for ASTM compliance.
- G. Recycle Asphalt: Identity of source (asphalt cement or tar products).
- H. Crack Patch: Meet material requirements.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE GRADE ASPHALT BINDER (PGAB)**

- A. Petroleum asphalt that complies with ASTM D 6373. Blending the paving asphalt with polymers or natural asphalts is CONTRACTOR's choice.

### **2.02 ASPHALT CEMENT (AC)**

- A. Petroleum asphalt that complies with Table 2 of ASTM D 3381 except as follows:
  - 1. Replace ductility at 77 deg. F. (25 deg. C.) with ductility at 39.2 deg. F. (4 deg. C.). Use the following values.
    - AC-5: greater than 25.
    - AC-10: greater than 15.
    - AC-20: greater than 5.
  - 2. Delete the loss on heating requirement on residue from "Thin-Film Oven Test".
- B. AC-5 Latex Additive: Anionic emulsion of butadiene-styrene low- temperature copolymer consisting of 2 percent by weight (solids basis), stabilized with fatty-acid soap for storage stability.

### **2.03 TRINIDAD LAKE MODIFIED ASPHALT (TLA)**

- A. Petroleum asphalt that complies with ASTM D 5710 (a blend of natural asphalts).

### **2.04 SLOW CURE CUT-BACK ASPHALT (SC)**

- A. Petroleum asphalt that complies with ASTM D 2026 (fluxed with a light oil) except if penetration of residue is more than 200 and its ductility at 77 deg. F (25 deg. C) is less than 100 cm., the material will be acceptable if the ductility at 59 deg. F. (15 deg. C) is greater than 100.

### **2.05 MEDIUM CURE CUT-BACK ASPHALT (MC)**

- A. Petroleum asphalt that complies with ASTM D 2027 (fluxed or blended with a kerosene-type solvent, non-foaming when heated to application temperature) except if penetration of

residue is more than 200 and its ductility at 77 deg. F. (25 deg. C) is less than 100 cm., the material will be acceptable if the ductility at 59 deg. F. (15 deg. C) is greater than 100.

**2.06 RAPID CURE CUT-BACK ASPHALT (RC)**

- A. Petroleum that complies with ASTM D 2028 asphalt (fluxed or blended with a naphtha-solvent, non-foaming when heated to application temperature).

**2.07 EMULSIFIED ASPHALT**

- A. Petroleum asphalt uniformly emulsified with water, homogeneous throughout, and when stored, shows no separation within 30 days after delivery. Frozen emulsions not accepted.
  - 1. Anionic, ASTM D 977 (breaks by evaporation).
  - 2. Cationic, ASTM D 2397 (breaks chemically).

**2.08 RECYCLE ASPHALT (RA)**

- A. Petroleum asphalt that complies with ASTM D 4552 (homogeneous, free-flowing at pumping temperature made from maltene fractions of asphalt cement for surface revitalization or from tar products to make Pavements resistant to fuel spillage).
  - 1. RA-1, RA-5, RA-25 or RA-75 for recycling RAP when less than 30 percent virgin aggregate is added.
  - 2. RA-250 or RA-500 when more than 30 percent virgin aggregate is added to the RAP.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Tack coat, Section 32 12 14.
- B. Prime Coat, Section 32 12 13.

**END OF SECTION 32 1203**

**South Jordan Middle School  
Parking Lot Addition/Remodel  
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West Jordan, Utah**

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**SECTION 32 1205  
ASPHALT CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Composition of asphalt - aggregate mix.
- B. This specification does not apply to polymer modified asphalt concrete.

**1.02 REFERENCES**

- A. AI Manual Series No. 2: Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
- B. AASHTO T 324: Hamburg Wheel-track Testing of Compacted Hot- Mix Asphalt (HMA).
- C. ASTM C 29: Standard Test Method for Unit Weight and Voids in Aggregate.
- D. ASTM C 88: Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- E. ASTM C 117: Standard Test Method for Materials Finer Than 0.075mm (No. 200) Sieve in Mineral Aggregates by Washing.
- F. ASTM C 131: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- G. ASTM C 136: Standard Method for Sieve Analysis of Fine and Coarse Aggregate.
- H. ASTM C 142: Standard Test Method for Clay Lumps and Friable Particles in Aggregates.
- I. ASTM D 75: Standard Practice for Sampling Aggregates.
- J. ASTM D 140: Standard Practice for Sampling Bituminous Materials.
- K. ASTM D 242: Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
- L. ASTM D 979: Standard Methods for Sampling Bituminous Paving Mixtures.
- M. ASTM D 2419: Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- N. ASTM D 3203: Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- O. ASTM D 3381: Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
- P. ASTM D 3515: Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
- Q. ASTM D 3665: Standard Practice for Random Sampling of Construction Materials.
- R. ASTM D 3666: Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.
- S. ASTM D 4318: Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- T. ASTM D 4552: Standard Practice for Classifying Hot-Mix Recycling Agents.
- U. ASTM D 4791: Standard Test Method for Flat or Elongated Particles in Coarse Aggregate.
- V. ASTM D 4867: Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures.
- W. ASTM D 5444: Standard Test Method for Mechanical Size Analysis of Extracted Aggregate.
- X. ASTM D 5581: Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6-jnch\_Diameter Specimen)
- Y. ASTM D 5821: Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
- Z. ASTM D 6307: Standard Test Method for Determining Asphalt Content of Hot-Mix Asphalt by Ignition Method.
- AA. ASTM D 6373: Standard Specification for Performance Graded Asphalt Binder.

### 1.03 DEFINITIONS

- A. Asphalt-Aggregate Designator: Alpha-numeric code that indicates type and grade of asphalt, and type and grade of aggregate in an asphalt-aggregate mix. For example;
  - 1. "AC-20-DM-3/4" means asphalt-aggregate mix shall be composed of AC-20 type and grade asphalt cement and DM-3/4 type and grade aggregate.
  - 2. "RA-1-DM-1" means asphalt-aggregate mix shall be composed of RA-1 type and grade asphalt recycling agent and DM-1 type and grade aggregate.
  - 3. "RS-1-SS-II" means asphalt-aggregate mix shall be composed of RS-1 type and grade asphalt emulsion and SS-II type and grade aggregate.
- B. Mean of Deviations: Defined in Section 32 11 23.

### 1.04 SUBMITTALS

- A. Quality Assurance: Submit names, certification levels, and years of experience of testing agency's field technicians that are assigned to the Work. Verify laboratory complies with ASTM standards.
- B. Mix Design: Submit.
  - 1. Date of mix design. If older than 365 days, recertify mix design.
  - 2. Asphalt cement source, type and chemical composition.
  - 3. Aggregate gradation target.
  - 4. Asphalt cement target, dust to asphalt ratio, moisture sensitivity (tensile strength) stability, flow and voids in the bituminous mix.
  - 5. Paving asphalt grade if RAP is used in the mix.
  - 6. RAP, mineral filler, antistripping, and recycle agent percentages.
- C. Pre-approved mix design, submit name and address of Supplier.
- D. Before changing mix design, submit a new design and give ENGINEER 10 days to evaluate the changes.
- E. Source Quality Control Inspections and Testing Report: If requested, submit report describing CONTRACTOR's and Supplier's quality control activities and test results.

### 1.05 QUALITY ASSURANCE

- A. Use a laboratory that follows and complies with ASTM D 3666.
- B. Do not change aggregate source or paving asphalt source without ENGINEER's written approval. Do not use non-complying sources.

### 1.06 ACCEPTANCE

- A. General:
  - 1. Acceptance is by Lot. One Lot is one day's production.
  - 2. If non-complying material has been installed and no price for the material is specified, apply price adjustment against cost of work requiring material as part of its installation.
- B. Installation: Accepted as specified in Section 32 12 16.
- C. Materials:
  - 1. At the Source:
    - a. Aggregate: Verify gradation. Collect sample from conveyor belt or stockpile if belt is not accessible.
    - b. Paving Asphalt: See Section 32 12 03 provisions.
    - c. Mix: 325 deg. F. maximum in transport vehicle.

2. At the Site:
  - a. One sub-lot is 500 tons.
  - b. Sampling: Two random samples per sub-lot. Location as follows.
    1. Behind paver before compaction, or
    2. Where sub-lot exhibits non-uniform appearance.
3. At the Laboratory:
  - a. Air Voids:
    1. Basis of evaluation is laboratory compacted samples (not field compacted samples).
    2. If test results are not within this Section's limits, options include correction of production procedures or alternate mix design acceptable to ENGINEER.
  - b. Dust to asphalt ratio.
  - c. Asphalt Content, Aggregate Gradation: Lot is acceptable if test deviations are within pay factor 1.00 limits. At ENGINEER's discretion, a Lot with a sub-lot test deviation greater than pay factor 0.85 limits may stay in place at 50 percent cost.

<b>Table 1 – Pay Factors for Non-complying Materials</b>						
<b>Criteria</b>	<b>Pay Factor</b>	<b>Range of Mean of Deviations of Tests Results from the Design Mix Target in Percentage Points</b>				
		<b>500 Tons</b>	<b>1,000 Tons</b>	<b>1,500 Tons</b>	<b>2,000 Tons</b>	<b>≥2,500 Tons</b>
Asphalt Content	1.00	0.00–0.70	0.00–0.54	0.00–0.46	0.00–0.41	0.00–0.38
	0.975	0.71–0.80	0.55–0.61	0.47–0.52	0.42–0.46	0.39–0.43
	0.95	0.81–0.90	0.62–0.68	0.53–0.58	0.47–0.52	0.44–0.47
	0.90	0.91–1.00	0.69–0.75	0.59–0.64	0.53–0.56	0.48–0.52
	0.85	1.01–1.10	0.76–0.82	0.65–0.69	0.57–0.61	0.53–0.56
1/2" and larger Sieve	1.00	0.0–10.9	0.0–7.3	0.0–6.5	0.0–5.6	0.0–5.2
	0.975	11.0–12.9	7.4–8.3	6.4–7.1	5.7–6.3	5.3–5.8
	0.95	13.0–13.9	8.4–9.3	7.2–7.9	6.4–7.0	5.9–6.4
	0.90	14.0–14.9	9.4– 10.3	8.0–8.7	7.1–7.7	6.5–7.1
	0.85	15.0–16.0	10.4–11.3	8.8–9.5	7.8–8.4	7.2–7.7
3/8" Sieve	1.00	0.0–9.9	0.0–6.9	0.0–5.9	0.0–5.3	0.0–4.9
	0.975	10.0–10.9	7.0–7.8	6.0–6.6	5.4–6.9	5.0–5.5
	0.95	11.0–11.9	7.9–8.7	6.7–7.3	6.0–6.6	5.6–6.1
	0.90	12.0–13.9	8.8–9.6	7.4–8.0	6.7–7.2	6.2–6.6
	0.85	14.0–15.0	9.7–10.5	8.1–8.9	7.3–7.9	6.7–7.2
No. 4 Sieve	1.00	0.0–9.9	0.0–6.7	0.0–5.7	0.0–5.2	0.0–4.8
	0.975	10.0–11.0	6.8–7.6	5.8–6.3	5.3–5.8	4.9–5.4
	0.95	11.1–11.9	7.7–8.5	6.4–6.9	5.9–6.4	5.5–5.9
	0.90	12.0–12.9	8.6–9.4	7.0–7.5	6.5–7.0	6.0–6.5
	0.85	13.0–14.0	9.5–10.2	7.6–8.0	7.1–7.6	6.6–7.0
No. 8 Sieve	1.00	0.0–7.9	0.0–5.6	0.0–4.8	0.0–4.3	0.0–4.0
	0.975	8.0–8.9	5.7–6.3	4.9–5.4	4.4–4.8	4.1–4.5
	0.95	9.0–9.9	6.4–7.0	5.5–6.0	4.9–5.3	4.6–4.9
	0.90	10.0–10.9	7.1–7.7	6.1–6.6	5.4–5.8	5.0–5.4
	0.85	11.0–12.0	7.8–8.5	6.7–7.2	5.9–6.4	5.5–5.8

No. 16 Sieve	1.00	0.0–7.9	0.0–5.2	0.0–4.6	0.0–4.2	0.0–3.9
	0.975	8.0–8.9	5.3–5.8	4.7–5.1	4.3–4.6	4.0–4.3
	0.95	9.0–9.9	5.9–6.4	5.2–5.6	4.7–5.1	4.4–4.7
	0.90	10.0–10.9	6.5–7.0	5.7–6.1	5.2–5.5	4.8–5.1
	0.85	11.0–12.0	7.1–7.6	6.2–6.6	5.6–5.9	5.2–5.4
No. 50 Sieve	1.00	0.0–6.9	0.0–4.3	0.0–3.8	0.0–3.4	0.0–3.2
	0.975	7.0–7.9	4.4–4.8	3.9–4.1	3.5–3.8	3.3–3.5
	0.95	8.0–8.9	4.9–5.3	4.2–4.5	3.9–4.1	3.6–3.8
	0.90	9.0–9.9	5.4–5.8	4.6–4.9	4.2–4.4	3.9–4.1
	0.85	10.0–11.0	5.9–6.4	5.0–5.5	4.5–4.9	4.2–4.5
No. 200 Sieve	1.00	0.0–3.0	0.0–2.4	0.0–2.0	0.0–1.8	0.0–1.7
	0.975	3.1–3.5	2.5–2.7	2.1–2.2	1.9–2.0	1.8–1.9
	0.95	3.6–4.0	2.8–3.0	2.3–2.4	2.1–2.2	2.0–2.1
	0.90	4.1–4.5	3.1–3.3	2.5–2.7	2.3–2.4	2.2–2.3
	0.85	4.6–5.0	3.4–3.6	2.8–3.0	2.5–2.6	2.4–2.5
NOTES (a) Test paving asphalt content using a burn-off oven, ASTM D 6307. (b) Determine aggregate gradation by extraction, ASTM D 5444.						

## PART 2 PRODUCTS

### 2.01 PAVING ASPHALT

A. Asphalt Cement: Section 32 12 03. Substitutes for asphalt cement are as follows.

ASTM D 3381	ASTM D 6373
AC 10	PG 64-22 or PG 70-28
AC 20	PG 70-28

B. Recycle Asphalt: Section 32 01 16.

### 2.02 AGGREGATE

A. Material: Clean, hard, durable, angular, sound, consisting of crushed stone, crushed gravel, slag, sand, or combination.

B. Source: Use the following requirements to determine suitability of aggregate source and not for project control.

1. Coarse Aggregate:

- a. Angularity (fractured faces), ASTM D 5821: 50 percent maximum by weight of particles with at least 2 fractured faces.
- b. Hardness (toughness), ASTM C 131: 40 percent minimum wear of aggregate retained above the No. 4 sieve unless specific aggregates having higher values are known to be satisfactory.
- c. Flat or Elongated Particles, ASTM D 4791: 20 percent maximum retained above 3/8 inch sieve has a 3:1 length to width ratio.

2. Fine Aggregate:

- a. Friable Particles, ASTM C 142: 2 percent maximum passing No. 4 sieve.
- b. Plasticity, ASTM D 4318: Aggregate passing No. 40 sieve is non-plastic even when filler material is added to the aggregate.
  1. Liquid limit: Less than 25.
  2. Plastic limit: Less than 6.



**2.03 ADMIXTURES**

- A. Reclaimed Asphalt Pavement (RAP) Aggregate: Restrictions include.
  - 1. 15 percent by weight maximum providing grading and voids in the bituminous mix are met.
  - 2. Greater than 15 percent requires separate mix design.
- B. Mineral Filler: ASTM D 242.
- C. Recycle Agent: ASTM D 4552.
- D. Antistrip: Heat stable cement slurry or lime slurry.

**2.04 MIX DESIGN**

- A. Selection of Materials:
  - 1. Paving Asphalt, Section 32 12 03:
    - a. AC-10 or AC-20: Light traffic pavement.
    - b. AC-20: Medium traffic pavement.
    - c. RA: For hot-laid recycled asphalt pavement. Choice by CONTRACTOR.
  - 2. Aggregate: This Section Article 2.2.
- B. Selection of Design Aggregate Structure:
  - 1. Gradation: Maximum particle size is 1/2 compacted lift thickness.
    - a. Target Gradation Curve must lie within one of the Master Grading Bands in the following table, or
    - b. If acceptable to ENGINEER, use fractionated proportioning to select or adjust gradation.

Table 2 – Master Grading Bands							
Sieve Size	Dense				Open	Friction	
	DM-1	DM-3/4N	DM-3/4	DM-1/2	OM-1/2	FM-1	FM-2
1 inch	100						
3/4 inch		100	100			100	
1/2 inch	75 – 91	74 – 99		100	100	90 – 100	100
3/8 inch		69 – 91	75 – 91		93 – 100	60 – 100	90 – 100
No. 4	47 – 61	49 – 65	46 – 62	60 – 80	36 – 44	15 – 40	30 – 50
No. 8		33 – 47			14 – 21	4 – 12	5 – 15
No. 16	23 – 33	21 – 35	22 – 34	28 – 42			
No. 50	12 – 22	6 – 18	11 – 23	11 – 23			
No.200	3 – 7	2 – 6	3 – 7	3 – 7	2 – 4	2 – 5	2 – 5

NOTES

- (a) Gradation expressed in percent passing by weight, ASTM C 136.
- (b) It is assumed fine and coarse aggregate have same bulk specific gravity.
- (c) Friction Mixture: See ASTM D 3515.
- (d) DM -3/4N is 100% crushed.
- (e) Percentage of fines passing No. 200 sieve determined by washing, ASTM C 117.

- 2. Aggregate Blend:
  - a. Dry-rodded Unit Weight, ASTM C 29: 75 pounds per cubic foot minimum.
  - b. Weight Loss (soundness), ASTM C 88: 16 percent maximum using sodium sulfate.

- c. Clay Content (cleanliness), ASTM D 2419: Sand equivalent value after going through the dryer or prior to the drum mixer.
  - 1. 45 percent minimum if Medium Traffic Classification.
  - 2. 60 percent minimum if Heavy Traffic Classification. The sand equivalent requirement is waived for the RAP aggregate but applies to the remainder of the aggregate blend.
- C. Selection of Admixture: CONTRACTOR's choice.
  - 1. RAP: Adjust paving asphalt grade to account for RAP binder viscosity.
  - 2. Cement or Hydrated Lime: Add if mix is moisture sensitive.
- D. Selection of Mix Properties: Use AI Manual Series No. 2 procedure for stability, flow and voids.

**Table 3 – Stability, Flow, Voids Limits**

Criteria	Traffic Classifications			
	Light	Medium	Heavy	
Number of compaction blows each end of specimen	50	75	112	
Stability, lbs., minimum	750	1200	1800	
Flow, in 0.01 inch units	10 – 18	10 – 18	10 – 18	
Voids in Mineral Aggregate (VMA), percent minimum				
	1" nominal maximum particle size	13	13	13
	3/4" nominal maximum particle size	14	14	14
	1/2" nominal maximum particle size	15	15	15
3/8" nominal maximum particle size	16.5	16.5	16.5	
Voids in Bituminous Mix, percent	3 – 5	3 – 5	3 – 5	

**NOTES**

- (a) Traffic Classifications:
  - Light: (ESAL <104 per year)
    - Class I: Parking lots, Driveways, light traffic residential streets, light traffic farm roads.
  - Medium: (ESAL between 104 and 106 per year)
    - Class II: Residential streets, rural farm and residential roads.
    - Class III: Urban minor collector streets, rural minor collector roads.
  - Heavy: (ESAL >106 per year)
    - Class IV: Urban minor arterial and light industrial and light industrial streets, rural major collector and minor arterial highways.
    - Class V: Urban major arterial and heavy industrial streets, freeways, expressways, arterial highways, rural interstate and other principal arterial highways.
- (b) Stability, Flow, Voids: ASTM D 5581.
- (c) VMA: ASTM D 3203
- (d) Nominal maximum particle size is the largest sieve size listed in this Section upon which any material is retained.

- 1. Stability, Flow Voids: If traffic classification is not specified elsewhere, use Medium Traffic Classification.
- 2. Dust to Asphalt Ratio: 0.8 to 1.6.
- 3. Moisture Sensitivity, ASTM D 4867: Tensile strength ratio less than 0.80 using freeze-thaw conditioning. Test specimen shall be 150 mm in diameter and 95 mm in height and compacted at 7 percent plus or minus 1 percent air voids)
- 4. Rut Susceptibility, AASHTO T 324: Maximum rut depth is 10 mm at 20,000 passes.

**2.05 SOURCE QUALITY CONTROL**

- A. General: Collect samples, ASTM D 3665. Do not change sampling points.
  - 1. Aggregate sampling, ASTM D 75.
  - 2. Paving asphalt sampling, ASTM D 140. Test for viscosity and penetration.
- B. Asphalt-Aggregate Mix: Sample, ASTM D 979. Test for the following.
  - 1. Air voids, ASTM D 3203 or ASTM D 5581.
  - 2. Paving asphalt content, ASTM D 6307.
  - 3. Aggregate gradation, ASTM D 5444.
  - 4. Tensile strength of bitumen-aggregate mixtures, ASTM D 4867.
- C. Mixing Plant: ASTM D 3515.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Roadway paving, Section 32 12 17.
- B. Cold-Mix Asphalt Paving, Section 33 05 25.

**END OF SECTION 32 1205**

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SECTION 32 1214  
TACK COAT

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Application of asphaltic material to existing asphalt concrete or Portland cement concrete surfaces preparatory to placing an asphalt concrete Pavement.

**1.02 SUBMITTALS**

- A. Certificate showing asphaltic material complies with Section 32 12 03.
  - 1. Identify water/asphalt dilution ratio.
  - 2. Identify tack coat application rate.
- B. Identify asphalt material recommended by fabric manufacturer.

**1.03 WEATHER**

- A. Apply tack coat only when air and roadbed temperatures in the shade are greater than 40 deg. F. The temperature restrictions may be waived only upon written authorization from ENGINEER.
- B. Do not apply tack coat during rain, fog, dust, or other unsuitable weather. Do not apply coat to wet surfaces.

**1.04 NOTICE**

- A. Send written notice to residents or business owners 24 hours prior to applying coat.

**PART 2 PRODUCTS**

**2.01 ASPHALT MATERIAL**

- A. Select from the following.
  - 1. Emulsified Asphalt: Grade MS-1, SS-1 or SS-1h, Section 32 12 03.
  - 2. Cationic Emulsified Asphalt: Grade CSS-1 or CSS-1h, Section 32 12 03.
  - 3. Rapid Cure Cutback Asphalt: Grade RC-70, Section 32 12 03.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Select and advise ENGINEER of the type of tack material to be used.
- B. Clean the surface to be treated free of dust and other foreign material. If flushed, allow surface to dry. If leaves from trees, blow clean.
- C. Provide surface for pedestrian access across tack coat.
- D. Prevent pedestrians, vehicles, pets, etc., access to tack surfaces.

**3.02 APPLICATION**

- A. General:
  - 1. Triple coverage by spray bar required. Stop application if any nozzle is not working properly.

2. Apply tack only to area covered with asphalt concrete in the same day.
- B. Application rate: Typically as follows.
1. Emulsions, 0.05 to 0.15 gallons per square yard.
  2. Cutback, CONTRACTOR's choice.
- C. Tack Substrate for Fabric Application: Comply with manufacturer's recommendation. If none, then as follows.
1. Dry Pavement surface, 0.20 to 0.30 gallons per square yard. Within street intersections, on steep grades and in zones where vehicle speed changes are commonplace reduce the application rate to no less than 0.20 gallons per square yard.
  2. Heavy duty fabrics, 0.30 to 0.40 gallons per square yard.

### **3.03 PROTECTION**

- A. Protect all surfaces exposed to public view from being spattered or marred. Remove any spattering, over-coating, or marring.
- B. Do not discharge bituminous material into borrow pits or gutters.

### **3.04 OPENING TO TRAFFIC AND MAINTENANCE**

- A. Do not permit traffic to travel over the tacked surface until bituminous tack coat has cured or is not picked up by traffic.
- B. If detours cannot be provided, restrict operations to a width suitable at least for one-way traffic over the remaining portion of the road.
- C. If one-way traffic is provided, control traffic appropriately.

**END OF SECTION 32 1214**

**SECTION 32 1216  
PLANT MIX - ASPHALT PAVING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Place Superpave or plant-mix asphalt concrete in base, leveling and surface courses, or overlay.

**1.02 REFERENCES**

- A. AASHTO T 324: Hamburg Wheel-track Testing of Compacted Hot- Mix Asphalt (HMA).
- B. ASTM D 979: Standard Practice for Sampling Bituminous Paving Mixtures.
- C. ASTM D 2041: Standard Test Method for Theoretical Maximum Specific Gravity of Bituminous Paving Mixtures.
- D. ASTM D 3549: Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
- E. ASTM D 3665: Standard Practice for Random Sampling of Construction Materials.
- F. ASTM E 950: Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference.
- G. ASTM E 1274: Standard Test Method for Measuring Pavement Roughness Using a Profilograph.

**1.03 SUBMITTALS**

- A. Before Delivery:
  - 1. Traffic control plan, Section 01 55 26.
  - 2. Type and number of rollers.
  - 3. Manufacturer's certificate of compliance for paving geotextiles, Refer to Section 31 05 19.
  - 4. Location and name of asphalt concrete production facility.
  - 5. Proof of profilograph and profilograph operator certification.
- B. At Delivery: Supply batch ticket identifying.
  - 1. Serial number of ticket.
  - 2. Date and truck number.
  - 3. Job name, location, and mix identification.
  - 4. Type, grade, and weight of asphalt.
  - 5. Type, grade, and weight of aggregate.
  - 6. Mix design method.
- C. After Delivery:
  - 1. Profile deviation report.
  - 2. Profile roughness index report.
  - 3. Quality Control Inspections and Testing Report: Upon ENGINEER's request, submit report describing source and field quality control activities and test results performed by CONTRACTOR and CONTRACTOR's Suppliers.

**1.04 QUALITY ASSURANCE**

- A. Do not change asphalt or aggregate sources until ENGINEER accepts new source and new mix design.
- B. Reject product and work that does not meet requirements of this Section.
- C. Remove product found defective after installation and install acceptable product at no

additional cost to OWNER.

- D. Foreman of paving crew has completed at least three (3) projects of similar size and nature.

**1.05 WEATHER**

- A. Do not pave until air temperature is 45 deg F. and rising.
- B. Cease paving if air temperature falls below 50 deg F.
- C. Do not pave if surface is wet or weather is unsuitable.
- D. Do not pave if wind or ground cools mix material before compaction.

**1.06 NOTICE**

- A. Send written notice to residents and businesses within affected area at least 3 days before start of paving.
- B. Indicate paving time and when new surface can be used.
- C. Warn of potential vehicle tow away and other construction issues affecting neighborhood.
- D. Should work not occur on specified day, send a new notice.

**1.07 ACCEPTANCE**

- A. General:
  - 1. Acceptance is by Lot. Lot size is specified below.
  - 2. Opening a paved surface to traffic does not constitute acceptance.
- B. Mix: Accepted as specified in Section 32 12 05, or Section 32 12 06.
- C. Installation:
  - 1. Mix Temperature:
    - a. Reject mixes exceeding 325 deg F. in transport vehicle.
    - b. Dispose of cold mix in paver hopper as thin spread underlay.
  - 2. Compaction and Thickness:
    - a. Lot size is 1,000 square yards or part thereof.
    - b. Verify with at least 2 tests per Lot.
    - c. Select test locations by ASTM D 3665 and sample per ASTM D 979 after compaction.
    - d. Compaction determinations are full core depth or overlay depth in overlay construction.
    - e. Thickness measurement will not apply in overlay construction.
    - f. Based upon core samples, compaction and thickness is acceptable if test deviations are within pay factor 1.00 limits. At ENGINEER's discretion, a Lot with a sub-lot test deviation greater than Reject may stay in place at 50 percent cost.

Table 1 – Compaction Pay Factors		
Pay Factor	Density, in Percent (ASTM D 2041)	
	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**

- (a) At CONTRACTOR's discretion and expense, do Hamburg wheel track test (AASHTO T 324) on 3 additional random core samples from a non-complying sub-lot. The sub-lot will be accepted if average rut depth is less than 10 mm at 20,000 passes.

<b>Table 2 – Thickness Pay Factor</b>	
<b>Pay Factors</b>	<b>Thickness Deficiency, in Inches (ASTM D 3549)</b>
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

3. Grade, Cross Slope: Verify tolerance is not exceeded.
4. Roughness: Verify “must grind” bumps are removed and tolerance for profile roughness index is not exceeded.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Asphalt concrete, Section 32 12 05.
- B. Tack coat, Section 32 12 14.

**PART 3 EXECUTION**

**3.01 CONSTRUCTION EQUIPMENT**

- A. Lay Down Machine: Use track equipment when operating on fabrics, geogrids or Pavement mats hotter than 180 deg. F.
- B. Compactors: Steel wheel static or vibratory. Use pneumatic tire roller for intermediate rolling only.

**3.02 PREPARATION**

- A. General:
  1. Coordinate utility location. Contact utility companies and other agencies, for dangerous concentration of combustible, flammable, or explosive matter.
  2. Lower Street Fixtures if paving machine is not capable of passing over the fixtures.
  3. Remove vegetation from cracks, edges and joints. Sweep surface clean. Blow cracks clean. Remove leaves.
  4. Fill cracks and fix Potholes, Section 32 01 17.
  5. Stabilize concrete Subgrade slabs.
- B. Trees, Plants, Ground Cover:
  1. Protect trees, plants and other ground cover from damage.
  2. Prune trees, Section 32 01 93 to allow equipment passage underneath. Repair tree

damage at no additional cost to OWNER.

- C. Traffic Control:
  - 1. Provide worker and public safety, Section 01 55 26.
  - 2. Apply temporary traffic and lane marking tape or paint after layout has been verified with ENGINEER.
- D. Aggregate Base Course:
  - 1. Verify base course is placed to grade and compacted.
  - 2. If indicated, follow Section 31 25 00 for herbicide treatment or Section 32 12 13 for prime coat.
- E. Tack Coat: Apply tack coat, Section 32 12 14 if inlay or subbase Pavement surface is dirty or older than 24 hours.

**3.03 TEMPORARY SURFACING**

- A. Place, roll, maintain, remove and dispose of temporary surfaces.
- B. In sidewalk areas construct temporary Pavements at least 1 inch thick and in all other areas at least 2 inches thick. At major intersections and other critical locations a greater thickness may be required.

**3.04 PLACE PAVING FABRIC**

- A. Section 31 05 19.

**3.05 PLACE PAVEMENT MIXTURE**

- A. General:
  - 1. Provide continuous forward movement such that minimum temperature 10 feet behind paver is as follows.

Table 3 – Minimum Temperature, Degrees F.						
Air Temperature Deg F.	Compacted Mat Thickness					
	3/4"	1"	1-1/2"	2"	3"	4"+
45 – 50	–	–	–	–	280	265
50 - 59	–	–	–	280	270	255
60 - 69	–	–	285	275	265	250
70 - 79	285	285	280	270	265	250
80 - 89	280	275	270	265	260	250
90 +	275	270	265	260	250	250

- 2. Do not leave unsafe butt joints if paving operation stops.
  - 3. Barricade or eliminate fall off edges.
- B. Overlays or Subsequent Lifts:
  - 1. Allow new base Pavement or new inlay Pavement to harden (cure) prior to placing overlays.
  - 2. Apply tack coat per Section 32 12 14 if inlay or sub-base pavement surface is dirty or older than 24 hours.
- C. Irregular Areas: Handwork is acceptable if specified grades, slopes, compaction and smoothness is achieved.
- D. Compaction:
  - 1. Do not over compact or under compact.

2. Complete compaction before temperature drops to 180 deg. F.
- E. Joints:
1. Construct joints to have same texture, density and smoothness as other sections of new Pavement course.
  2. Clean contact surfaces and apply tack coat. Ensure continuous bond between old and new Pavements, or between successive day's work.
  3. Offset longitudinal joints a minimum of 12 inches in succeeding courses and at least 6 feet transversely to avoid a vertical joint through more than one course. In the top course restrict longitudinal joint to 1 foot either side of lane lines.
  4. Prevent traffic, including construction traffic, from crossing vertical edges. Apply tack coat to vertical edges prior to making another pass with the paver if the mix has cooled to 90 deg. F.

**3.06 TOLERANCES**

- A. Compaction: 94 percent plus or minus 2 percent of theoretical maximum specific gravity, ASTM D 2041 (Rice Method).
- B. Lift Thickness:
  1. Not less than 2 times the maximum aggregate size in compacted asphalt concrete mixes.
  2. Not less than 4 times the nominal maximum aggregate size in compacted SUPERPAVE mixes.
  3. Not more than limits established by pneumatic or vibratory compactor equipment manufacturer.
- C. Grade: 1/8 inch in 10 feet parallel to centerline.
- D. Cross Slope: 1/4 inch in 10 feet perpendicular to centerline except at cross section grade breaks.
- E. Roughness:

<b>Table 4 – Roughness Tolerance</b>						
<b>Speed and Traffic Class</b>		<b>Profile Roughness Index, (PRI) Inches / Mile</b>				<b>Profile Deviation Inches/25 feet Maximum</b>
		<b>IRI</b>		<b>PI</b>		
		<b>Min</b>	<b>Max</b>	<b>Min</b>	<b>Max</b>	
0 to 29 mph	I or II	–	–	–	–	0.4
	III or IV	129	177	46	66	0.4
30 to 44 mph	I or II	90	115	35	50	0.4
	III or IV	70	90	21	35	0.4
45 mph +	All Classes	–	70	–	21	0.3
NOTES (a) Use a zero blanking band. (b) As a minimum, trace right wheel path in direction of travel (c) Traffic class is defined in Table 3 of Section 32 12 05. (d) IRI (International Roughness Index), ASTM E 950 (e) PI (Profile Index), ASTM E 1274.						

1. Profile Deviation: Begin traces 50 feet before edge of new pavement and end traces

50 feet after edge of new pavement. Areas exceeding profile deviation tolerance are “must grind” areas.

2. Profile Roughness Index: (PRI)
  - a. Lot is 0.1 lane mile (528 feet long one lane wide). Add segments shorter than 250 feet to preceding Lot. Treat partial segments longer than 250 feet as a Lot.
  - b. Exclude from the Lot are turn lanes, parking lanes, medians, Street Fixtures, crowns of intersecting streets, bridge decks, grades greater than 8 percent, and vertical curves less than 1,000 feet radius (including super-elevation transitions).

### **3.07 PROTECTION AND REPAIR**

- A. General: All expenses are at no cost to OWNER.
- B. Protection.
  1. Protect all structures, including curb, gutter, sidewalks, guard rails and guide posts.
  2. Remove spatter, over-coat, or mar.
  3. Do not discharge bituminous materials into borrow pits or gutters.
  4. Protect hot pavement from traffic until mixture has cooled enough not to become marked.
  5. Protect neighborhood, storm drains and down-stream fish habitat.
- C. Repair.
  1. Corrective Action for Profile Deviations (“Must Grinds”): Grinding is acceptable, Section 02 41 14. Apply Section 32 12 03 cationic or anionic emulsion and sand friction blotter over grind areas.
  2. Corrective Action for Profile Roughness Index: Grinding is acceptable. Skin patch for depressions is not acceptable. Raise depressions by milling and inlay. Re-profile corrected segments to verify index meets tolerance. Apply a Section 32 12 03 cationic or anionic emulsion and sand friction blotter over grind areas.
  3. When thickness is deficient, place additional material over deficient areas. DO NOT skin patch. Mill for inlay if necessary.
  4. Defective Joints, Seams, Edges: Repair.
  5. Unacceptable Paving: Remove and replace.

**END OF SECTION 32 1216**

**SECTION 32 1313  
CONCRETE PAVING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete base course and concrete surface course.
- B. Concrete product is not specified in this Section. Refer to Section 03 30 04.

**1.02 REFERENCES**

- A. ACI 305: Hot Weather Concreting.
- B. ACI 306: Cold Weather Concreting.
- C. APWA Plan No. 261: Manual of Standard Plans for Concrete Pavement Joints.
- D. ASTM A 307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- E. ASTM C 39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- F. ASTM C 78: Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
- G. ASTM C 150: Standard Specification for Portland Cement.
- H. ASTM C 172: Standard Method of Sampling Freshly Mixed Concrete.
- I. ASTM D 3549: Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
- J. ASTM D 5249: Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement and Asphalt Joints.
- K. ASTM E 950: Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference.
- L. ASTM E 1274: Standard Test Method for Measuring Pavement Roughness Using a Profilograph.

**1.03 SUBMITTALS**

- A. Before delivery.
  - 1. Traffic control plan.
  - 2. Joint layout plan.
  - 3. Curing plan. Describe method to prevent excessive concrete temperatures and water evaporation that could impair strength or serviceability of the concrete. Refer to ACI 305.
  - 4. Proof of finisher's ACI certification.
  - 5. Make and model name of paving machine.
  - 6. Concrete mix design and number, Section 03 30 04.
  - 7. Proof of profilograph calibration and profilograph operator certification.
  - 8. Manufacturer's recommended installation procedures for joint sealing material which, when accepted by ENGINEER, will become the basis for accepting or rejecting actual installation procedures used in the Work.
- B. At Delivery: Batch ticket, Section 03 30 10. C. After delivery.
  - 1. Profile deviation report.
  - 2. Ride index report.
  - 3. Upon ENGINEER's request, submit a written quality control inspections and testing report describing source and field quality control activities and test results performed

by CONTRACTOR and CONTRACTOR's Supplier.

**1.04 QUALITY ASSURANCE**

- A. Do not change concrete Supplier until ENGINEER accepts new source and new mix design.
- B. Reject product that does not meet requirements of Section 03 30 04.
- C. Remove product found defective after installation and install acceptable product at no additional cost to OWNER.
- D. Foreman of paving crew has completed at least three (3) projects of similar size and nature.

**1.05 WEATHER**

- A. Hot weather, ACI 305.
- B. Cold weather, ACI 306.

**1.06 NOTICE**

- A. Send written notice to residents and businesses within affected area at least 3 days before start of paving.
- B. Indicate paving time and when new surface can be used.
- C. Warn of potential vehicle tow away and other construction issues affecting neighborhood.
- D. Should work not occur on specified day, send a new notice.

**1.07 ACCEPTANCE**

- A. General:
  - 1. Acceptance is by Lot. Lot size is specified below.
  - 2. If non-complying material has been installed and no price for the material is specified, apply price adjustment against cost of work requiring material as part of its installation.
  - 3. Dispute resolution.
  - 4. Opening a paved surface to traffic does not constitute acceptance.
- B. Concrete Mix:
  - 1. Testing Frequency: Section 03 30 05. Sample per ASTM C 172.
  - 2. Temperature, Slump, Air: Lot size is 1 random batch. Reject non-complying batches until 2 consecutive batches are compliant then continue in random batch testing for acceptance.
  - 3. Strength: Lot is acceptable if strength test deviations are within pay factor 1.00 limits. At ENGINEER's discretion, a Lot with a sub-lot test deviation greater than Reject may stay in place at 50 percent cost.
    - a. Compression: ASTM C 39. Lot size is 500 square yards.

Pay Factor	PSI Below 28 day Compressive Strength
1.00	0
0.98	1 to 100
0.94	101 to 200
0.88	201 to 300
0.80	301 to 400
Reject	Greater than 400

- b. Flexural: ASTM C 78. Lot size is 750 square yard.

Pay Factor	PSI Below 28 day Flexure Strength
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1.00	0
0.95	1 to 29
0.85	30 to 60
Reject	Greater than 60

C. Installation:

1. Placement, finishing and protection, Section 03 30 10.
  - a. Verify grade, cross slope, finish and dimensions.
  - b. No standing water in curb and gutter.
2. Thickness. Lot size is 1,000 square yards.
  - a. Thickness will be determined on ASTM D 3549 cored or sawed specimens. Acceptance will be based on the average of all Lot thickness tests.

Pay Factor	Tolerance (inches less than specified thickness)
1.00	0.00 to 0.25
0.90	0.26 to 0.50
0.70	0.51 to 0.75
0.50	0.76 to 1.00

- b. When any thickness measurement is less than specified by more than 1 inch, the actual thickness of the Pavement will be determined by taking additional cores at intervals less than 10 feet parallel to the centerline in each direction from the affected location, until in each direction a core is found which is not deficient by more than 1 inch. Exploratory cores for deficient thickness will not be used in averages for price adjustments.
    - c. Payment may be made for areas deficient in thickness by more than 1 inch at 50 percent. If not, remove and replace.
    - d. Price adjustments and Pavement removal will be applied only to those areas showing the deficient thickness which is defined by an additional set of cores taken at the 100 percent pay point as determined in a straight line basis between the original cores. If the second set of cores is deficient, the area will be defined on a straight-line basis using all scores for the different pay factors.
3. Roughness: "Must grind" bumps are removed and tolerance for profile roughness index is not exceeded.

**PART 2 PRODUCTS**

**2.01 CONCRETE**

- A. Compression Design:
  1. Cast-in-place: Class 4000, Section 03 30 04.
  2. Slump per accepted mix design.
- B. Flexure Design.
  1. Tensile Strength: 650 psi per ASTM C 78.
  2. Cement Content: 6.5 bags.
  3. Water Cement Ratio: 0.44 maximum by weight (prior to pozzolan exchange), ACI 318.
  4. Entrained Air: 5 to 7 percent, ASTM C 231 (pressure).
  5. Slump per accepted mix design

**2.02 MISCELLANEOUS MATERIALS**

- A. Reinforcement: Grade 60 ksi galvanized or epoxy coated steel, Section 03 20 00.
- B. Hook Bolts: Steel, ASTM A 307 Grade A nuts and bolts, internally and externally threaded.
- C. Expansion Joint Filler: F1 sheet, Section 32 13 73.
- D. Contraction Joint Filler (Backer Rod): Type 1 round, closed cell, ASTM D 5249.
- E. Contraction Joint Sealant: HAS1, HAS4, or CAS6, Section 32 13 73.
- F. Curing Compound: Liquid membrane, Section 03 39 00.
- G. Bond Breaker: Wax based compound.
- H. Grout: Epoxy adhesive.
- I. Evaporative Reducer: Water-based mono-molecular polymer liquid at application rates recommended by the manufacturer. Not to be used as a finishing aid.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. General:
  - 1. Coordinate utility location. Contact utility companies and other agencies, for dangerous concentration of combustible, flammable, or explosive matter.
  - 2. Lower Street Fixtures if paving machine is not capable of passing over fixtures.
  - 3. Coat surface of Street Fixtures with oil to prevent bond with concrete Pavement.
  - 4. Remove sand, leaves and other objectionable materials prior to placing the paving course.
  - 5. Notify ENGINEER minimum 24 hours prior to commencement of concreting operations.
- B. Trees, Plants, Ground Cover:
  - 1. Protect trees, plants and other ground cover from damage.
  - 2. Prune trees, Section 02231 to allow equipment passage underneath. Repair tree damage at no additional cost to the OWNER.
- C. Traffic Control:
  - 1. Provide worker and public safety.
  - 2. Apply temporary traffic and lane marking tape or paint after placement layout has been verified with ENGINEER.
- D. Base Course:
  - 1. Apply herbicide treatment where necessary.
  - 2. Verify base course is placed to grade, compacted and dampened.
  - 3. If indicated, apply Tack coat, Section 02406.
- E. Cement Treated or Lean Concrete Base: Remove loose material from surface of cement treated or lean concrete base course immediately before placing concrete surface course. Moisten the surface but do not place concrete over puddled water. Apply a double coat of bond breaker prior to placing surface concrete.

#### **3.02 FORM CONSTRUCTION**

- A. Section 03 11 00.
- B. Check formwork for grade and alignment variance from the following tolerances:
  - 1. Top of forms not more than 1/4 inch from true grade.
  - 2. Vertical face on longitudinal axis not more than 1/4 inch from true line.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

#### **3.03 REINFORCEMENT PLACEMENT**

- A. Section 03 20 00.



- B. Interrupt reinforcement at expansion joints.
- C. Use load transfer bars on longitudinal construction and transverse construction joints.
- D. Use smooth dowel in expansion joints.
  
- E. Keep load transfer bars and dowels in vertical center of concrete and perpendicular to the joint during concrete placement.
- F. Position mats on bar chair supports and properly tie before any concrete is poured. Keep mats clean, free from rust, flat, and free of distortions. Straighten bends, kinks, and other irregularities or replace units before concrete placement. Provide a minimum of 2 inch overlap to adjacent mats.

### **3.04 JOINTS**

- A. General:
  - 1. Review joint layout with ENGINEER.
  - 2. Follow Section 32 13 73 requirements.
  - 3. Follow joint requirements in APWA Plan No. 261.
- B. Construction Joint: Construction joints (contact joints) (cold joints) are those made by placing concrete against cured concrete.
  - 1. The contact joint between separately laid lanes cannot deviate from a true line by more than 1/4 inch in any direction at any point.
  - 2. Tie both sides of longitudinal and transverse construction joints together with tie bars or key-way. Before placing concrete in adjoining slab, straighten tie bars to 0.1 feet of straight position.
  - 3. Do not cause edge slump when placing tie-bars or by over-working edge of slab.
- C. Contraction Joints: Contraction joints (crack control joints) are scorelines made to force crack joint locations in concrete. Keep a minimum of 3 working power saws on the Project when concrete operations are underway. Saw all joints before uncontrolled shrinkage cracking takes place. Do not tear or ravel concrete during sawing.
  - 1. Joint spacing measured in feet = twice the slab thickness measured in inches or a maximum of 15 feet.
  - 2. Joint Depth = T/3.
  - 3. Use of a mechanical control joint-void former in lieu of saw cutting or tooling is acceptable.
  - 4. Longitudinal Joints: Make longitudinal joints the same dimension as transverse joints.
  - 5. Make transverse joints across width of the Pavement full length and meet curb and gutter joints.
  - 6. Leave forms in place until paving operations are resumed on the other side of the joint.
- D. Volunteer Crack Joint:
  - 1. If a volunteer crack joints falls within 5 feet of the location of proposed contraction joint, omit the contraction joint.
  - 2. Rout volunteer crack joints to a 1-1/4 inch depth by 3/8 inch width. Clean and fill crack joint with backer rod and joint sealant.
  - 3. When crack joints occur within 2 feet of expansion or construction joints, replace panel. Use saw cuts and tie-bars or dowels in cut planes.
- E. Expansion Joints:
  - 1. If a deformed rebar is used in an expansion joint, provide sleeve for movement.
  - 2. Secure fillers to prevent movement. When butted together, do not leave voids or gaps between filler units.
  - 3. Set joint fillers full depth if no joint sealant is specified.
  - 4. Recess joint fillers if backer rods and joint sealant are specified or provide a plastic cap.

- F. Joint Sealing: Section 32 13 73.
- G. If CONTRACTOR chooses to open the roadway to construction or public traffic prior to final sawing and sealing, install backer rod in the initial (green) cut to prevent entrance of incompressibles.

### 3.05 CONCRETE PLACEMENT

- A. Section 03 30 10.
- B. At the beginning of concrete placement, test slump and air. If corrections are necessary, placement may proceed after 2 subsequent and consecutive batches pass testing.
- C. **Any delay in excess of 15 minutes from placing to start of finishing operations is cause for stopping placement work.**
- D. Do not place concrete until concrete sub base and surface course forms have been checked for line and grade. Moisten sub base if required to provide a uniform dampened condition at time of concrete placement. Do not place concrete around Manholes or other structures until they are at required finish elevation and cross-slope.
- E. Prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
- F. Do not place concrete in a longitudinal section until test specimens from the adjacent lane have attained an ASTM C 78 flexural strength (modulus of rupture) of 450 psi.
- G. Deposit and spread concrete in a continuous operation between transverse joints. If interrupted for more than 1/2 hour, place a construction joint.
- H. Place the concrete to the full width of the Pavement in a single construction operation unless indicated otherwise.

### 3.06 FINISHING

- A. Section 03 35 00.
- B. Any delay in excess of 30 minutes for completing the finishing operation is cause for stopping concrete placing to correct the difficulties.
- C. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- D. After floating, test slab for trueness with a straight edge. Distribute concrete as required to remove surface irregularities. Refloat repaired areas to provide a continuous smooth finish.
- E. Round edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool. Eliminate tool marks.
- F. Surface Texture: After floating when excess moisture or surface sheen has disappeared.
  - 1. For speed less than 45 mph: 1/16 inch deep burlap drag, turf drag, or broom.
  - 2. For speed greater than 45 mph: 1/8 inch deep groove placed 80 degrees to center line and randomly spaced between 3/8 and 1-1/2 inches.
- G. Do not remove forms for at least 24 hours after concrete has been placed. After form removal, clean ends of joints and patch any minor honeycombed areas. Remove and replace areas or sections with major defects.

### 3.07 CURING

- A. Section 03 39 00.
- B. Type II Class A or B (white pigmented) membrane forming compound applied in two directions for total white coverage on all exposed surfaces after texturing.
- C. Eliminate thermal shock of concrete by keeping cure temperature close to ground and air

temperature.

**3.08 TOLERANCES**

- A. Grade: 1/8 inch in 10 feet parallel to centerline.
- B. Cross Slope: 1/4 inch in 10 feet perpendicular to centerline except at cross section grade breaks.
- C. Thickness: Not less than 1/4 inch deficient.
- D. Roughness:

Table 1 – Roughness Tolerance						
Speed and Traffic Class		Profile Roughness Index, (PRI) Inches / Mile				Profile Deviation Inches/25 feet Maximum
		IRI		PI		
		Min	Max	Min	Max	
0 to 29 mph	I or II	–	–	–	–	0.4
	III or IV	129	177	46	66	0.4
30 to 44 mph	I or II	90	115	35	50	0.4
	III or IV	70	90	21	35	0.4
45 mph +	All Classes	–	70	–	21	0.3

**NOTES**  
 (a) Use a zero blanking band.  
 (b) As a minimum, trace right wheel path in direction of travel  
 (c) Traffic class defined in Table 3, Article 02405.  
 (d) IRI (International Roughness Index), ASTM E 950  
 (e) PI (Profile Index), ASTM E 1274.

1. Profile Deviation: Begin traces 50 feet before edge of new pavement and end traces 50 feet after edge of new pavement. Areas exceeding profile deviation tolerance are “must grind” areas.
2. Profile Roughness Index: (PRI)
  - a. Lot is 0.1 lane mile (528 feet long one lane wide). Add segments shorter than 250 feet to preceding Lot. Treat partial segments longer than 250 feet as a Lot.
  - b. Exclude from the Lot are turn lanes, parking lanes, medians, Street Fixtures, crowns of intersecting streets, bridge decks, grades greater than 8 percent, and vertical curves less than 1,000 feet radius (including super-elevation transitions).

**3.09 OPENING TO TRAFFIC**

- A. Not less than 3,000 psi compressive or 400 psi flexure strength.

**3.10 PROTECTION AND REPAIR**

- A. General: All expenses are at no cost to OWNER.
- B. Protection: Section 03 30 10 and as follows.

1. Do not allow steel wheel rollers or steel wheel vehicles on the concrete Pavement. Keep traffic and construction equipment off at least 10 days after concrete placement or until 100 percent of the design strength has been achieved and verified by either
    - a. Maturity meter.
    - b. Concrete cylinders.
  2. If construction traffic is permitted, keep Pavement clean. Remove surface stains and spillage of materials as they occur.
  3. Remove saw-cut dust immediately. Protect neighborhood, storm drains and down-stream fish habitat.
- C. Repair: Section 03 30 10.
1. Corrective Action for "Must Grinds": Grinding per Section 02 41 14 is acceptable after concrete cure.
  2. Corrective Action for Profile Roughness Index: Grinding is acceptable. Re-profile corrected segments to verify ride index meets tolerance.
  3. Corrective Action for Cracks: Consider repair options published in Guidelines by the American Concrete Pavement Association (ACPA). Do not begin corrective work until ENGINEER agrees with repair option. Drill test cores when necessary to determine magnitude. Fill holes with Portland cement concrete bonded to Pavement with epoxy adhesive.

**END OF SECTION 32 1313**

**SECTION 32 1373  
CONCRETE PAVING JOINT SEALANTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Joints and joint sealants in horizontal traffic surfaces for concrete sidewalks, curb, gutter and Pavement slabs.

**1.02 REFERENCES**

- A. ASTM C 920: Standard Specification for Elastomeric Joint Sealants.
- B. ASTM D 545: Standard Methods of Testing Preformed Expansion Joint Fillers for Concrete Construction (Nonextruding and Resilient Types).
- C. ASTM D 994: Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- D. ASTM D 1190: Standard Specification for Concrete Joint Sealer, Hot-Poured Elastic Type.
- E. ASTM D 1191: Standard Method for Testing Concrete Joint Sealers.
- F. ASTM D 1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- G. ASTM D 1752: Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- H. ASTM D 1850: Standard Specification for Concrete Joint Sealer, Cold-Application Type.
- I. ASTM D 1851: Standard Methods of Testing Concrete Joint Sealers, Cold-Application Type.
- J. ASTM D 2240: Standard Test Method for Rubber Property - Durometer Hardness.
- K. ASTM D 2628: Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
- L. ASTM D 3405: Standard Specification for Joint Sealants, Hot-Poured, For Concrete and Asphalt Pavements.
- M. ASTM D 3406: Standard Specification for Joint Sealant, Hot-Applied, Elastomeric-Type, for Portland Cement Concrete Pavements.
- N. ASTM D 3407: Standard Methods of Testing Joint Sealants, Hot-Poured, For Concrete and Asphalt Pavements.
- O. ASTM D 3408: Standard Methods of Testing Joint Sealants, Hot-Poured, Elastomeric-Type, for Portland Cement Concrete Pavements.
- P. ASTM D 3542: Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Bridges.
- Q. ASTM D 3569: Standard Specification for Joint Sealant, Hot-Applied, Elastomeric, Jet-Fuel-Resistant-Type for Portland Cement Concrete Pavements.
- R. ASTM D 3575: Standard Test Method for Flexible Cellular Materials Made from Olefin Polymers.
- S. ASTM D 3581: Standard Specification for Joint Sealant, Hot-Poured, Jet-Fuel-Resistant Type, for Portland Cement Concrete and Tar-Concrete Pavements.
- T. ASTM D 3582: Standard Methods for Testing Joint Sealant, Hot-Poured, Jet-Fuel-Resistant Type, for Portland Cement Concrete and Tar-Concrete Pavements.
- U. ASTM D 3583: Standard Methods of Testing Joint Sealant, Hot-Applied, Elastomeric-Type, for Portland Cement Concrete Pavements, or Joint Sealant, Hot-Applied, Elastomeric, Jet-Fuel-Resistant-Type, for Portland Cement Concrete Pavements.
- V. ASTM D 5249: Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement and Asphalt Joints.
- W. ASTM D 5893: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- X. FS SS-S-200: Sealants, Joint, Two Component, Jet-Fuel Resistant, Cold-Applied, for Portland Cement Concrete Pavement.

### 1.03 SYSTEM PERFORMANCES

- A. Pavement joints include longitudinal and transverse expansion joints, contraction joints, construction joints, and crack control joints.
- B. Provide joint sealants that maintain watertight and airtight continuous seals.

### 1.04 SUBMITTALS

- A. Manufacturer's certification that product was manufactured, tested and supplied per source quality control requirements specified herein, together with a report of the test results and the date each test was completed.
- B. Manufacturer's instruction for joint preparation, type of cleaning and installation.
- C. Manufacturer's Product Data and Samples for each joint sealant product required.
- D. Safety data sheets.

### 1.05 QUALITY ASSURANCE

- A. Installation of joint systems are to follow manufacturer's published directions.
- B. For cold applied joint sealant installation, use installers approved by the joint sealant Supplier.
- C. Obtain joint sealing materials from a single manufacturer for each different product required.

### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in original unopened containers or bundles with labels identifying manufacturer, product name and designation, color, expiration period for use, pot life, cure time, and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent deterioration; or damage due to moisture, high or low temperatures, contaminants, or other causes.

## PART 2 PRODUCTS

### 2.01 GENERAL

- A. Compatibility: Provide joint fillers, sealant backings, sealants, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

### 2.02 JOINT VOID – FORMER

- A. Plastic with a water stop.
- B. 1/4 depth of concrete structural section.

### 2.03 JOINT FILLER - SHEET TYPE

- A. F-1: Bituminous (asphalt or tar) mastic, ASTM D 994. Formed and encased between 2 layers of bituminous saturated felt or 2 layers of glass-fiber felt.
- B. F-2: Cane or other cellulosic fiber, ASTM D 1751. Saturated with asphalt.
- C. F-3: Granulated cork, ASTM D 1751. In an asphalt binder; encased between 2 layers of asphalt saturated felt or 2 layers of glass-fiber felt.
- D. F-4: Sponge rubber fully compressible, ASTM C 1752. With resiliency recovery rate of 90 percent minimum.
- E. F-5: Cork, ASTM C 1752. Impregnated and bound with asphalt, compressible with resiliency

recovery rate of 90 percent if not compressed more than 50 percent of original thickness.

- F. F-6: Plastic foam (for cold-applied sealants only). Preformed, compressible, resilient, non-waxing, non-extruding strips of flexible, non-gassing plastic foam; non-absorbent to water and gas; 30 lb/ft<sup>3</sup> density maximum, And of size and shape to control sealant depth and performance.

#### **2.04 JOINT FILLER - BACKER ROD, TAPE, POURED FILL TYPE**

- A. Backer material, ASTM D 5249 for cold- and hot-applied joint sealant in Portland cement concrete or asphalt Pavements joints.
  - 1. Type 1: Round rods.
  - 2. Type 2: Sheets or strips, laminated or skived.
  - 3. Type 3: Poured fills which completely fill Pavement joint.

#### **2.05 JOINT SEALANT – GENERAL**

- A. Color of exposed joint sealant indicated, or if not, as selected from manufacturer's standard colors.

#### **2.06 JOINT SEALANT - HOT-APPLIED**

- A. HAS-1: Asphalt base type, ASTM D 3405.
- B. HAS-2: Thermoplastic type, ASTM D 3581. Jet-fuel resistant without rubber unless indicated otherwise.
- C. HAS-3: Elastic type, ASTM D 1190.
- D. HAS-4: Elastomeric type, ASTM D 3406. One component, for Portland cement concrete Pavements.
- E. HAS-5: Elastomeric type, ASTM D 3569. One component, jet-fuel resistant, for Portland cement concrete Pavements.

#### **2.07 JOINT SEALANT - COLD-APPLIED**

- A. CAS-1: Elastomeric type, ASTM C 920. Chemically curing, for vehicular or pedestrian use, and types of construction other than highway and airfield Pavements and bridges and joint substrates indicated; Type S or M; Grade P or NS; Class 25; Use T, NT, M and O.
  - 1. Self-leveling.
  - 2. Shore A Hardness: 40  $\pm$  5 ASTM D 2240.
  - 3. Final cure: 4 days maximum.
  - 4. Service range: -10 to 150 deg. F.
- B. CAS-2: Mastic type, ASTM D 1850. Single or multiple component; for joints having a minimum width of 1/2 inch.
- C. CAS-3: Coal-tar modified urethane, FS SS-S-200. One part, jet fuel resistant; Type H.
- D. CAS-4: Elastomeric preformed polychloroprene type with lubricant adhesive and indicated movement ratio.
  - 1. For concrete Pavement seal, ASTM D 2628.
  - 2. For concrete bridge seals, ASTM D 3542.
- E. CAS-5: Silicone type, ASTM D 5893. Single component, non-sag or self-leveling, chemically curing sealant based on polymers of polysiloxane structure intended for use in Portland cement concrete Pavements.
- F. CAS-6: Asphalt base meeting ASTM D 3405.
- G. CAS-7: Olefin polymer, ASTM D 3575 as follows.
  - 1. Tensile elongation 255 percent plus or minus 20 percent, Suffix T.
  - 2. Tensile strength 115 psi minimum, Suffix T
  - 3. Density 2.9 plus or minus 3 lbs/cf, Suffix W, Method A

4. Water Absorption 0.025 lbs/sf maximum, Suffix L.

## 2.08 SOURCE QUALITY CONTROL

- A. Preformed Expansion Joint Fillers: Nonextruding and resilient types, ASTM D 545.
- B. Hot-Applied Joint Sealants:
  1. Elastic type used in concrete Pavements, bridges, other structures, ASTM D 1191.
  2. Bituminous type for hydraulic and asphaltic concrete Pavements, ASTM D 3407.
  3. Elastomeric type for hydraulic concrete Pavement, ASTM D 3408
- C. Jet-Fuel-Resistant Joint Sealant: Hot-applied, ASTM D 3582 and ASTM D 3583.
- D. Cold-Applied Mastic Joint Sealant: Cold-applied, ASTM D 1851.

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Remove oil, grease, wax, form-release-agents, curing compounds, bitumens, laitance and old chalking material by sandblast, or water blast as recommended by manufacturer of sealant. Maximum sand blast angle, 25 degrees plus or minus 5 degrees.
- B. Clean and dry with air blast. Do not contaminate air blast with oils or lubricants.
- C. Remove frost and moisture in concrete joint substrates before commencing sealing.
- D. Install bond breaker tape where needed or required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.

### 3.02 JOINT SEALING

- A. General:
  1. Install sealants in uniform, continuous ribbons without gaps or air pockets, with complete bonding of joint surfaces on opposite sides.
  2. Except as otherwise indicated, fill sealant rabbet flush with surface.
  3. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove so that joint will not trap moisture and dirt.
- B. Depths: Saw cut joints if necessary to provide the required sealant thickness and depth. Install sealant to depths indicated or, if not indicated, as recommended by sealant manufacturer, but within the following general limitations measured at center (thin) section of bead:
  1. For sidewalks, Pavements, and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75 percent of joint width, but not more than 5/8 inch deep nor less than 3/8 inch deep.
  2. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50 percent of joint width, but not more than 1/2 inch deep nor less than 1/4 inch deep.
  3. For joints sealed with non-elastomeric sealants and caulking compounds, fill joints full depth.
- C. Spillage: Do not allow poured sealant compound to overflow or spill onto adjoining surfaces or to migrate into voids of adjoining surfaces. Clean adjoining surfaces to eliminate evidence of spillage.
- D. Heating: Do not use overheated hot-applied sealants.
- E. Edges: Unless indicated otherwise, recess exposed edges of gasket and exposed joint fillers slightly behind adjoining surfaces so compressed units will not protrude from joints.

### 3.03 CURING AND CLEANING



- A. Cure sealants and caulking compounds per manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Clean off excess sealants or sealant smears adjacent to joints as work progresses. Use methods and cleaning materials approved by manufacturers of joint sealant and of products in which joints occur.
- C. Remove protective coating and oil from metals with solvent recommended by the sealant manufacturer.

**3.04 PROTECTION**

- A. Protect joint sealant during and after curing period from contact with contaminating substances or from damage resulting from deterioration or damage at time of Substantial Completion.
- B. If damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealant immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work at no additional cost to OWNER.

**END OF SECTION 32 1373**

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SECTION 32 1613  
DRIVEWAY, SIDEWALK, CURB, GUTTER

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete flatwork such as but not limited to waterways, waterway transition structures, sidewalks, curbs, gutters, Driveway Approaches.

**1.02 REFERENCES**

- A. American Public Works Association (Utah Chapter).
  - 1. Plan 205: Curb and Gutter.
  - 2. Plan 209: Curbs.
  - 3. Plan 211: Waterway.
  - 4. Plan 213: Waterway Transition Structure.
  - 5. Plan 215: Dip Driveway Approach.
  - 6. Plan 216: Mountable curb driveway approach.
  - 7. Plan 221: Flare Driveway Approach.
  - 8. Plan 225: Open Driveway Approach.
  - 9. Plan 229: Pipe Driveway Approach.
  - 10. Plan 231: Concrete Sidewalk.
- B. ASTM A 36: Standard Specifications for Structural Steel.
- C. ASTM C 39. Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- D. ASTM C 172: Standard Method of Sampling Freshly Mixed Concrete.

**1.03 DEFINITIONS**

- A. Driveway: A paved or unpaved vehicular thoroughfare outside of, but connected to a public road right-of-way or highway right-of-way.
- B. Driveway Approach: (1) A vehicular thoroughfare connecting a public road or highway to a driveway. (2) A concrete structure composed of sidewalk, apron and any curb and gutter abutting the apron. When an apron is built as a bridge over curb and gutter, the bridge is included in this definition.

**1.04 SUBMITTALS**

- A. Traffic control plan, Section 01 55 26.
- B. Concrete mix design, Section 03 30 04.
- C. Batch ticket, Section 03 30 10.
- D. Quality Control Inspections and Testing Report: Upon ENGINEER's request, submit a report describing source and field quality control activities and test results performed by CONTRACTOR and CONTRACTOR's Suppliers.

**1.05 NOTICE**

- A. Send written notice to residents and businesses within affected area at least 3 days before work starts.
- B. Indicate when concrete work will take place and when driveway approach can be used.
- C. Warn of potential vehicle tow away and other construction issues affecting neighborhood.
- D. Should work not occur on specified day, send a new notice.

**1.06 ACCEPTANCE**

- A. General:
  - 1. Acceptance is by Lot. One Lot is one day's production.
  - 2. If non-complying material has been installed and no price for the material is specified, apply price adjustment against cost of work requiring material as part of its installation. Section 01 29 00.
  - 3. Dispute resolution, Section 01 35 10 and Section 03 30 05.
- B. Concrete Mix:
  - 1. Testing Frequency: Section 03 30 05. Sample per ASTM C 172.
  - 2. Temperature, Slump, Air: Lot size is 1 random batch. Reject non-complying batches until 2 consecutive batches are compliant then proceed in random batch testing for acceptance.
  - 3. Strength: ASTM C 39. Lot size is 50 cubic yards. At ENGINEER's discretion, a Lot with sub-lot test deviations greater than Reject may stay in place at 50 percent cost.

Pay Factor	PSI Below 28 day Compressive Strength
0.98	1 to 100
0.94	101 to 200
0.88	201 to 300
0.80	301 to 400
Reject	Greater than 400

- C. Placement, finishing and protection, Section 03 30 10
  - 1. Verify line, grade, cross slope and finish.
  - 2. No standing water in curb and gutter.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Concrete Mix
  - 1. Cast-in-place: Class 4000, Section 03 30 04.
  - 2. Maximum slump per mix design.
- B. Reinforcement: Grade 60 ksi galvanized or epoxy coated steel per Section 03 20 00.
- C. Expansion Joint Filler: F1 sheet 1/2 inch thick per Section 32 13 73.
- D. Contraction Joint Filler (Backer Rod): Closed cell, Type 1 round Section 32 13 73.
- E. Contraction Joint Sealer: HAS1 or HAS4 hot applied per Section 32 13 73.
- F. Curing Compound: Membrane forming compound per Section 03 39 00.
- G. Plate Steel: ASTM A 36 galvanized per Section 05 05 10.

**PART 3 EXECUTION**

**3.01 CONSTRUCTION EQUIPMENT**

- A. Slip Form Machines.
  - 1. Placement must produce required cross-section, lines, grades, finish, and jointing as specified for formed concrete.
  - 2. If results are not acceptable, remove and replace work with formed concrete.

**3.02 PREPARATION**

- A. Control pedestrian and vehicular traffic, Section 01 55 26.
- B. Examine surfaces scheduled to receive concrete formwork for defects.
- C. Do not start work until defects are corrected.
- D. Check slopes on each side of the work to ensure drainage. Failure to check and verify will result in CONTRACTOR repairing any drainage deficiencies at no additional cost to OWNER.

### 3.03 LAYOUT

- A. Curb, Gutter, Curb and Gutter: Plan 205, 209, 211, 213 or as specified on the drawings.
  - 1. Line: Less than 1/2 inch variance in 10 feet and not more than 1 inch from true line at any location.
  - 2. Grade: Not more than 1/4 inch variance in 10 feet. Flood curb and gutter with water after final cure has been reached. Remove and replace any area where ponding is found.
- B. Sidewalk: Plan 231 or as specified on the drawings.
  - 1. Cross slope 2 percent.
  - 2. Landing slope 2 percent maximum in any direction.
  - 3. Ramp slope, Section 32 16 14.
- C. Driveway Approaches: Plan 215, 216, 221, 225, 229 or as specified on the drawings.

### 3.04 CONCRETE PLACEMENT

- A. Section 03 30 10.
- B. Make sure base course is uniformly damp at time of concrete placement.
- C. Obtain ENGINEER's review of base course and forms before placing concrete.
- D. Do not use methods that segregate the mix.
- E. Place concrete so time between end of placement and beginning of finishing is less than 15 minutes.
- F. Consolidate concrete with vibrator or other acceptable method. Do not use mechanical vibrators. Prevent dislocation of inserts.

### 3.05 CONTRACTION JOINTS

- A. Geometrics:
  - 1. Tooled Joints (Score Lines):
    - a. Depth =  $T/4$ . T is the depth of the concrete slab in inches.
    - b. Top radius = 1/2 inch.
  - 2. Saw Cut Joints: Saw joints before uncontrolled shrinkage cracking occurs. Do not tear or ravel concrete during sawing.
  - 3. Template Joints: 1/8 to 3/16 inch wide 1/4-depth of slab.
- B. Sidewalks.
  - 1. At intervals equal to the width of the sidewalk and transverse to the line of walk.
  - 2. Radial at curbs and walk returns.
  - 3. Place longitudinal joints in walks when width of walk in feet is greater than 2 times the walk thickness in inches. (e.g. maximum width of a 4 inch thick walk before placement of a longitudinal contraction joint is 8 feet). Make longitudinal joints parallel to, or concentric with, the lines of the walk.
  - 4. In walk returns make 1 joint radially midway between the beginning of curb returns (BCR) and end of curb returns (ECR). Match longitudinal and traverse joints with the adjacent walks.
- C. Curb, Gutter, Waterway.
  - 1. Place joints at intervals not exceeding 12 feet.
  - 2. At curb radius and walk returns make the joints radial.

3. Where integral curb and gutter is adjacent to concrete Pavement, align the joints with the Pavement joints where practical.
- D. Additional Contraction Joint Requirements: Section 32 13 73.

### **3.06 EXPANSION JOINTS**

- A. Geometrics: 1/2 inch wide full depth filler that is flush with concrete surface. Do not place seal over top of filler
- B. Sidewalks, Sidewalk Ramps.
  1. Place expansion joints to separate sidewalk from utility poles, hydrants, Manhole frames, buildings and abutting sidewalks.
  2. Place expansion joints between the sidewalk and the back of curb returns and between the sidewalk and sidewalk ramps.
  3. Do not place expansion joints in sidewalk ramp surfaces.
  4. Expansion joints are not required when using slip form method to place concrete except where sidewalk changes direction or where it joins foundation walls or structures.
- C. Curb, Gutter, Waterway.
  1. Do not place longitudinal joints in drain gutter flow-lines.
  2. Where drain gutter transitions extend beyond the curb return, place expansion joints at the ends of the drain gutter transition.
  3. Place expansion joints at beginning of curb radius (BCR) and end of curb radius (ECR).
- D. Slip Form Work: Expansion joints are not required except at BCR or ECR.
- E. Driveway Approach: Do not place expansion joints in curb returns.
- F. Street Intersection Corner: Place expansion joints at BCR and ECR.
- G. Additional Expansion Joint Requirements: Section 32 13 73.

### **3.07 FINISH**

- A. Section 03 35 00.
- B. Round edges exposed to public view to a 1/2 inch radius.
- C. Apply broom finish longitudinal to curb and gutter flowline.
- D. Apply broom finish transverse to sidewalk centerline as follows.
  1. Fine hair finish where grades are less than 6 percent.
  2. Rough hair finish where grades exceed 6 percent.
- E. Remove form marks or irregularities from finish surfaces.

### **3.08 CURING**

- A. Section 03 39 00.
- B. Type ID Class A (clear with fugitive dye) membrane forming compound. Apply total coverage in 2 directions after texturing.
- C. Eliminate thermal shock of concrete by keeping cure temperature even throughout extent and depth of concrete slab.

### **3.09 PROTECTION AND REPAIRS**

- A. General: All expenses are at no cost to OWNER.
- B. Protection: Section 03 30 10.
  1. Protect concrete work from deicing chemicals during the 28 day cure period.
  2. Immediately after placement, protect concrete from graffiti or other types of mechanical injury.
- C. Repair: Section 03 30 10.

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1. Correct all humps or depressions.
2. Secure ENGINEER's acceptance of method of correction.

**END OF SECTION 32 1613**

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**SECTION 32 1614  
CURB RAMP**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete flatwork for curb cut assemblies.

**1.02 REFERENCES**

- A. American Public Works Association (Utah Chapter).
  - 1. Plan 235: Corner Curb Cut Assembly.
  - 2. Plan 236: Tangent Curb Cut Assembly.
  - 3. Plan 237: Islands and Median.
  - 4. Plan 238: Detectable Warning Surface.
  - 5. Or as specified on the drawings.
- B. Work Zone Traffic Control Guide: Publication of the Utah LTAP Center.

**1.03 DEFINITIONS**

- A. Clear Space: A 4 feet minimum by 4 feet minimum surface located within the width of the crosswalk and adjacent to a curb cut.
- B. Cross Slope: Grade perpendicular to the direction of pedestrian travel usually expressed in percent.
- C. Running Slope: Grade parallel to the direction of pedestrian travel usually expressed in percent.
- D. Ramp: A flat surface with a maximum Running Slope of 1:12 (8.33 percent) and a maximum Cross Slope of 1:48 (2 percent) with sides perpendicular to its ends and ends parallel to each other.
- E. Curb Ramp: A Ramp that cuts through a curb.
- F. Detectable Warning Surface: A surface of truncated domes aligned in a square or radial grid pattern.
- G. Cross Width: Distance perpendicular to the direction of pedestrian travel usually expressed in lineal measure.
- H. Running Width: Distance parallel to the direction of pedestrian travel usually expressed in lineal measure.

**1.04 SUBMITTALS**

- A. Traffic control plan, Section 01 55 26.
- B. Concrete mix design, Section 03 30 04.
- C. Batch ticket, Section 03 30 10.
- D. Detectable Warning Surface product data sheet.

**1.05 ACCEPTANCE**

- A. Clear Space: Running Slope.
- B. Flow-line: No standing water, no trip hazard.
- C. Detectable Warning Surface:
  - 1. Color contrast, dome geometry, joints between units.
  - 2. Cross Width, Running Width.
- D. Curb Cut: Cross Width (appropriate to number of crosswalks served).
- E. Landing: Running Slope, Cross Slope, dimensions.

- F. Ramp: Running Slope, Cross Slope, Cross Width, transition ends.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Cast-in-place Concrete: Class 4000, Section 03 30 04.
- B. Pavers:
  - 1. Concrete, Section 32 14 13.
  - 2. Brick, Section 32 14 16.
- C. Other Materials: CONTRACTOR's choice.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Refer to Work Zone Traffic Control Guide.
- B. Refer to Plan 235, 236, 237, and 238.

### **3.02 TRAFFIC CONTROL**

- A. Provide safe passage for pedestrians and vehicles.
- B. Assist visually impaired and wheel chair users.
- C. Provide continuous access to fire hydrants.
- D. Keep passage ways free of construction materials, trash and debris.
- E. Remove graffiti immediately.

### **3.03 LAYOUT**

- A. Curb Cut excluding flare or curb radius measurement):
  - 1. Cross Width at Curb Ramp.
    - a. 4 feet minimum serving one crosswalk.
    - b. 8 feet minimum serving two or more crosswalks.
  - 2. Cross Slope at Curb Ramp: 2 percent maximum.
- B. Detectable Warning Surface:
  - 1. Running Length: 2 feet minimum.
  - 2. Cross Width:
    - a. 4 feet minimum serving one crosswalk.
    - b. 8 feet minimum serving two or more crosswalks.
  - 3. Joint Between Units: 3/16 inch maximum or manufacturer's recommendation
- C. Landing: Determine landing position and elevation so ramps that slope to and from the landing meet ramp slope requirements.
- D. Ramp:
  - 1. Do not exceed maximum slope or 15 feet length.
  - 2. It may be necessary to include a transition zone between a curb cut and ramp.
- E. Curb Wall: Set top of curb wall equal to elevation of extended lateral lines of sidewalk.

### **3.04 INSTALLATION**

- A. Pour concrete, Section 03 30 10.
- B. Install Detectable Warning Surface full length and full width across the pedestrian access route.

## **END OF SECTION 32 1614**

**SECTION 32 1723  
PAVEMENT MARKINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Paints for Pavement striping.
- B. Words and other markings in paint or plastic film.
- C. One or two-way prismatic reflectors for Pavement marking.

**1.02 REFERENCES**

- A. AASHTO M 237: Standard Specification and Recommended Practice for Epoxy Resin Adhesive for Bonding Traffic Markers to Hardened Concrete.
- B. AASHTO M 247: Standard Specification for Glass Beads Used in Traffic Paint.
- C. AASHTO M 248: Standard Specification for Ready-Mixed White and Yellow Traffic Paints.
- D. AASHTO M 249: Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form).
- E. ASTM D 638: Standard Test Method for Tensile Properties of Plastics.
- F. ASTM E 303: Standard Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
- G. FS L-S-300: Sheetting and Tape, Reflective: Nonexposed Lens.
- H. Federal Standard 141: Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling, and Testing.
- I. Federal Standard 370: Instrumental Photometric Measurements of Retroreflective Materials and Retroreflective Devices.
- J. MUTCD: Manual on Uniform Traffic Control Devices for Streets and Highways.

**1.03 SUBMITTALS**

- A. Specifications of primer to be used for tape applications.
- B. Manufacturer's affidavit certifying paint products meet or exceed material requirements of this section.
- C. Sample of prismatic reflector to be used along with manufacturer's statement of the reflector's minimum reflective area and specific intensity at the 0.2 degree observation angle.
- D. Manufacturer's recommendation for type of epoxy to be used when installing prismatic reflectors and markers.
- E. Samples of each thermoplastic or preformed plastic Pavement markings along with a statement of how the materials will be applied.

**PART 2 PRODUCTS**

**2.01 ALKYD RESIN PAINT**

- A. White or yellow Type F (Fast dry) ready-mixed, AASHTO M 248.

**2.02 THERMOPLASTIC PAINT**

- A. White or yellow, AASHTO M 249.

**2.03 GLASS BEADS**

- A. Type 1, AASHTO M 247.

**SECTION 32 3113**

**CHAIN LINK FENCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Furnish all labor, materials, equipment, tools and services required to fully complete all Chain Link Fence and Gate work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
- B. Posts, rails, and frames.
- C. Standard fence framework, fabric, and accessories.
  - 1. 72 inches (1.8 m/6 feet) high.
- D. Galvanized wire fabric.
  - 1. Standard 2 inch diamond mesh.
- E. Accessories.
- F. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete anchorage for posts.
- B. Section 32 3119 - Decorative Metal Fences.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- C. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2022).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
- E. ASTM A 702 - Standard Specification for Steel Fence Posts and Assemblies, Hot Wrought; 2006.
- F. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2023.
- H. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2023.
- I. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework; 2017a.
- J. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2016.
- K. CLFMI CLF-FIG0111 - Field Inspection Guide; 2014.
- L. CLFMI CLF-PM0610 - Product Manual; 2017.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

- C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
- D. Samples: Submit two samples of fence fabric, slat infill, 12 inch by 12 inch in size illustrating construction and colored finish.
- E. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation, and anchor bolt templates.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

### **1.06 GUARANTEE**

- A. The Contractor shall guarantee this work for a period of One (1) year(s) from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Chain Link Fences:
  - 1. Master-Halco, Inc.: [www.masterhalco.com](http://www.masterhalco.com).
  - 2. Merchants Metals: [www.merchantsmetals.com](http://www.merchantsmetals.com).
  - 3. South Western Wire: [www.southwesternwire.com](http://www.southwesternwire.com).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 INSTALLERS**

- A. Western Fence Co.: [www.westernfenceco.com](http://www.westernfenceco.com).
- B. United Fence Co.: [www.unitedfenceco.com](http://www.unitedfenceco.com).
- C. Mountain States Fence Co.: [www.ms\\_fence.com](http://www.ms_fence.com).
- D. American Fence Co.: [www.americanfence.com](http://www.americanfence.com).
- E. Allied Fence Co.: [www.alliedfence.com](http://www.alliedfence.com).
- F. Vinyl Industries: [www.Vinyli.com](http://www.Vinyli.com).
- G. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 MATERIALS**

- A. Posts, Rails, and Frames:
  - 1. ASTM F 1083 Schedule 40 hot-dipped galvanized steel pipe, welded construction.
    - a. Minimum yield strength of 30 ksi (205 MPa).
- B. ASTM A1011/A1011M Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating conforming to ASTM F1043 and ASTM F1083.
- C. Line Posts: Type I round.
- D. Terminal, Corner, Rail, and Brace Posts: Type I round.
- E. Conform to CLFMI CLF-PM0610.
- F. Wire Fabric:
  - 1. Wire Fabric: ASTM A 392 zinc coated GBW steel chain link fabric.
- G. Conform to CLFMI CLF-PM0610.
- H. Brace and Tension (Stretcher Bar) Bands: ASTM F626 galvanized pressed steel.
- I. Tension (Stretcher) Bars: ASTM F626 galvanized steel.
- J. Truss Rod: ASTM F626 galvanized steel.

- K. Concrete - Ready-mixed, complying with ASTM C 94/C 94M; normal Portland cement; 3000 psi strength at 28 days, 3 inch slump; 3/4 inch nominal size aggregate.

## 2.04 COMPONENTS

- A. Line Posts: 1.9 inch diameter.
- B. Line Posts:
  - 1. 36 to 96 inch (914 to 2438 mm) high fence: 2.38 inch (60 mm) diameter.
- C. Corner and Terminal Posts:
  - 1. 36 to 72 inch (914 to 1829 mm) high fence: 3.5 inch (89 mm).
- D. Top, Center, Bottom, and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled.
- E. Wire Fabric: 2 inch diamond mesh interwoven wire, 9 gage, 0.1144 inch thick, top selvage knuckle end closed, bottom selvage twisted tight.
- F. Brace and Tension (Stretcher Bar) Bands: 12 gage (2.67mm) pressed steel by 3/4 inch (19mm) formed to a minimum 300 degree profile curvature for post attachment. Secure bands using minimum 5/16 inch (7.94 mm) galvanized carriage bolt and nut.
- G. Tension (Stretcher) Bars: One piece length equal to 2 inches (50 mm) less than full height of fabric with a minimum cross-section of 3/16 inch by 3/4 inch (4.76 mm by 19 mm). Provide tension (stretcher) bars where chain link fabric is secured to the terminal post.
- H. Truss Rod Assembly: 5/16 inch (7.9 mm) diameter truss rod with pressed steel tightener.
- I. Tie Wire: 9 gage (3.76 mm) galvanized steel wire for attachment of fabric to line posts and rails. Tie wire per ASTM F 626.

## 2.05 ACCESSORIES

- A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
- B. Fittings: Sleeves, bands, clips, rail ends, fasteners, fittings and angled connection fittings; galvanized steel per ASTM F 626.

## 2.06 FINISHES

- A. Components (Other than Fabric) at Standard Fence Locations: Galvanized in accordance with ASTM A 123/A 123M, at 1.9 oz/sq ft.
- B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.
- C. Accessories: Same finish as framing.

## PART 3 EXECUTION

### 3.01 CHAIN LINK FRAMEWORK INSTALLATION

- A. Install framework, fabric, and accessories in accordance with ASTM F567 and manufacturer's instructions.
- B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30 degrees or more.
- C. Space line posts uniformly maximum 96 inches (2438 mm) on center.
- D. Concrete Set Posts: Excavate holes in firm, undisturbed or compacted soil. Holes shall have diameter 4 times greater than outside dimension of post, and depths approximately 6 inches (152 mm) deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36 inches (914 mm) below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post and slope to direct water away from posts.
- E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

- F. Bracing: Install horizontal brace and truss assembly at mid-height or above for fences 72 inches (1829 mm) and over at each fabric connection to the terminal post. The diagonal truss rod is installed at the point where the brace rail is attached to the terminal post and diagonally down to the bottom of the adjacent line post. Place the truss rod in tension by adjusting the turnbuckle.
- G. Top Rail: Install in lengths of 21 feet (6400 mm). Connect ends with sleeves forming a rigid connection, allow for expansion and contraction.
- H. Center Rails: Install mid rails between line posts and attach to post using rail end or line rail clamps. A center rail is required for fabric height 120 inches (3048 mm) and over.
- I. Bottom Rails: Install bottom rails between posts and attach to post using rail end or line rail clamps.

### **3.02 CHAIN LINK FABRIC INSTALLATION**

- A. Install fabric on security side, pull fabric taut; thread the tension bar through fabric and attach to terminal posts with tension bands spaced maximum of 15 inches (381 mm) on center and attach so that fabric remains in tension after pulling force is released. Install fabric so that it is 2 inches (50 mm) +/- 1 inch (25 mm) above finish grade.
- B. Secure fabric using wire ties to line posts at 15 inches (381 mm) on center and to rails and braces 24 inches (610 mm) on center, and to the tension wire using hog rings 24 inches (610 mm) on center. Tie wire shall be secured to the fabric by wrapping it two 360 degree turns around the chain link wire pickets. Cut off any excess wire and bend back so as not to protrude so as to avoid injury if a pedestrian may come in contact with the fence.

### **3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.
- C. Do not infringe on adjacent property lines.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

**END OF SECTION 32 3113**

**2.04 REFLECTIVE TAPE**

- A. Type II white or yellow with a Class 1 (pressure-sensitive) adhesive, FS L-S-300.

**2.05 REFORMED PLASTIC FILM MATERIALS**

- A. Film: A retroflective pliant polymer with white or yellow pigments selected and blended to conform to standard highway colors throughout the expected life of the film and glass beads distributed throughout its base cross-sectional area, with a reflective layer of beads bonded to the top surface and composed of the following materials.

Materials	Minimum Percent By Weight
Resin and Plasticizers	20
Pigments and Extenders	30
Graded Glass Beads	33

- 1. Type 1: Subjected to high traffic volume and severe wear conditions such as repeated shear action from crossover, encroachment on edge and channelization lines, and stop, start, or turn movements.
  - a. Class 1: Without precoated adhesive, for application with epoxy cement.
  - b. Class 2: With precoated pressure sensitive adhesive.
- 2. Type 2: Subjected to lower traffic volumes and less severe wear action such as most highway edge lines, markings on rural highways, lane lines in well-channelized areas and transverse and word/symbols subjected primarily to free rolling traffic.
  - a. Class 1: Without precoated adhesive, for application with epoxy cement.
  - b. Class 2: With precoated pressure sensitive adhesive
- B. Tensile Strength: Sample 6 x 1 x 0.06 inches at a temperature between 70 deg. F. and 80 deg. F. using a jaw speed of 10 inches to 12 inches per minute tested per ASTM D 638 requirements.
  - 1. Type 1: 150 pounds per square inch of cross-section.
  - 2. Type 2: 40 pounds per square inch of cross-section.
- C. Elongation: 75 percent minimum at break when tested per ASTM D 638 requirements using a Sample 6 x 1 x 0.06 inches at a jaw speed of 10 inches to 12 inches per minute.
- D. Skid Resistance: Initial minimum skid resistance values are 35 BPN as measured by the British Portable Skid Test, ASTM E 303 requirements.
- E. Reflectance: Minimum reflectance values at 0.2 degrees and 0.5 degrees observation angles and 86.0 degrees entrance angle as measured per the testing procedures of Federal Standard 370.

Film Type	Observation Angles			
	White		Yellow	
	0.2o	0.5o	0.2o	0.5o
Type 1: SL (mcd/sf/ft)	550	380	410	250
Type 2: SL (mcd/sf/ft)	960	760	680	510

- 1. The photometric quantity is measured in specific luminance (SL), and expressed as millicandelas per square foot per footcandle (mcd/sf/ft).



2. Use a test distance 50 feet and a Sample size of 2. x 2.5 feet.
  3. Use an angular aperture of both the photoreceptor and light projector of 6 minutes of arc.
  4. The reference center is the geometric center of the Sample, and the reference axis is taken perpendicular to the test Sample.
- F. Film Reflectivity Retention: Not more than 15 percent of the beads lost due to popout and the predominate mode of Failure is "wear down" of the beads, when subjected to 200 cycles of a Taber Abraser Simulation test using an H-18 wheel and 125 gram load.
- G. Thickness: 0.06 inch without adhesive.
- H. Effective Performance Life: The film, when applied according to the recommendations of the manufacturer, will provide a neat, durable marking that will not flow or distort due to temperature if the Pavement surface remains stable. Although reflectivity is apply wear, the pliant polymer will provide a cushioned, resilient substrate that reduces bead crushing and loss. Use a film that shows no appreciable fading, lifting, or shrinkage throughout the useful life of the marking, and shows no significant tearing, roll back, or other signs of poor adhesion.
- I. Abrasion Resistance: Use a material that when tested will not wear through to the conformable backing surface in less than 5,000 cycles when tested per Federal Standard 141, Method 6192, using a CS-17 wheel and a 1,000 gram load.
- J. Acid Resistance: Use a material that will show resistance to etching, hazing, or delamination of bead surface after exposure to a 1 percent solution of sulfuric acid.

**2.06 PRISMATIC REFLECTORS**

- A. Unless indicated otherwise, provide single lens snowplow resistant reflectors of the color indicated.
1. With a cast iron housing and acrylic prismatic reflector.
  2. With an overall size not less than 9 inches long, 5 inches wide, and 1-3/4 inch thick with a 7/16 inch maximum projection above the roadway.
  3. With a minimum reflective area of 1.6 square inches per face.
- B. Reflector Specific Intensity:

Color	Intensity at 0.2 Degree Observation Angle	
	0 Degree Entrance Angle	20 Degree Entrance Angle
White	3.	1.2
Yellow	1.8	0.72

**2.07 EPOXY ADHESIVE**

- A. Epoxy, AASHTO M 237 requirements and as recommended by the manufacturer of the reflector. Provide a minimum adhesion value of 1.1 pounds per inch width.

**PART 3 EXECUTION**

**3.01 CONSTRUCTION EQUIPMENT**

- A. Use equipment manufactured for Pavement marking. Use workers experienced in operating such equipment.
- B. Use equipment capable of applying a strip, or strips with a width tolerance of plus or minus 1/4 inch. Equip the machine with an automatic skip control giving a 10 feet long marked

- segment and a 30 feet long gap within a linear tolerance of 6 inches over that cycle.
- C. If applying glass beads, locate bead applicator directly behind and synchronized with marking applicator.
  - D. For thermoplastic paint materials, use equipment that is designed to agitate the paint to prevent scorching, discoloration, or excessive high temperatures.

### **3.02 PREPARATION**

- A. Broom or flush the surface to remove dirt, loose stones, or other foreign material immediately prior to applying.
- B. Prior to applying, mark roadway between control points established by ENGINEER. ENGINEER will establish points on tangent at least every 100 feet and at 25 feet long intervals on curves. Maintain the line within 1 inch of the established control points. ENGINEER may also designate other Pavement striping locations such as stop bars, crosswalks, zebra striping, etc.
- C. Markings that adhere to asphalt concrete or Portland cement concrete by either a pressure sensitive precoated adhesive or an epoxy cement shall mold to the Pavement contours by traffic action at normal Pavement temperatures and shall be ready for traffic immediately after application.
- D. Begin Pavement painting and marking operations not later than 24 hours after receipt of written order by ENGINEER.
- E. Apply striping and markings per MUTCD requirements.
- F. Apply all materials in accordance with manufacturer's and ENGINEER's directions.

### **3.03 APPLICATION**

- A. Apply Pavement paintings and markings only when Pavement surface is dry and air temperature is above 40 deg. F. during daylight hours.
- B. Do not apply paints and markings when rain is anticipated within 12 hours.

### **3.04 ALKYD RESIN PAINT STRIPING**

- A. Adjust Pavement striping machine to apply paint at rate recommended by paint manufacturer.
- B. Glass Bead Application Rate: 5.9 to 6.1 pounds per gallon of paint.
- C. Protect the markings until dry by placing approved guarding or warning device wherever necessary. Remove any markings not authorized or smeared or otherwise damaged, or correct as approved by ENGINEER.

### **3.05 THERMOPLASTIC PAINT STRIPING**

- A. Clean off dirt, glaze, and grease before prestriping.
- B. Prestripe the application area with a binder material that will form, when sprayed, a continuous film over the Pavement surface, and will dry rapidly and mechanically adhere to the Pavement surface. Install the material in varying widths if indicated.
- C. Extrude the thermoplastic material at a temperature of 412 plus or minus 12 deg. F. from approved equipment to produce a line 1/8 inch to 3/16 inch thick, continuous and uniform in shape, and have clean and sharp dimensions.
- D. Do not use material which produce fumes that are toxic, obnoxious, or injurious to persons or property.
- E. Apply so that finished lines have well-defined edges free of waviness.
- F. Glass Beads Application Rate: 6 pounds of glass beads to every 100 square feet of marking.

### **3.06 TAPE STRIPING**

- A. Apply Pavement marking tape as indicated or directed. ENGINEER will establish control

- points.
- B. Apply the tape only on surfaces that are dry and free of oils, grease, dust and dirt, and primed at the rate of approximately 1 quart per 60 feet with an approved primer material.
  - C. Maintain the line on established control points. Apply intermittent Pavement marking tape 24 inches long, spaced approximately 100 feet on tangents, and approximately 25 feet on curves unless otherwise directed. The ENGINEER will designate other Pavement striping locations such as stop bars, crosswalks, zebra striping, etc.
  - D. Press down the tape immediately after application until it adheres and conforms to the surface of the Pavement.
  - E. Completely remove all tape on sections where tape conflicts with revised traffic lanes prior to opening new lanes to traffic.

### **3.07 PAVEMENT MARKING FILMS**

- A. Use Pavement marking films that are capable of being applied to new, dense, and open-graded asphalt concrete wearing courses during the paving operation in accordance manufacturer's instructions, and that are capable of conforming to Pavement contours through the action of traffic at normal Pavement temperatures.
- B. Use a Pavement marking film that is capable of use for patching worn areas of the same type film.
- C. Apply before traffic is allowed on the freshly paved surface.
- D. Unless indicated otherwise, provide Type C, Class II, polymer film markings in specified widths and shapes. Provide and layout words and marking symbol configurations per MUTCD requirements and as indicated.
- E. When indicated, inlay the markings in fresh asphalt surface by a compaction roller during the paving operation.
- F. Apply all markings in accordance with manufacturer's recommendations.

### **3.08 PRISMATIC REFLECTOR INSTALLATION**

- A. Install reflectors by cutting Pavement and partially filling cut area with epoxy adhesive. Place reflector housing in the adhesive and apply pressure to properly seat. Allow epoxy to completely set before allowing traffic on markers.
- B. Install marker so that housing edges are flush with Pavement and so that the angle formed by the longitudinal axis of the marker and the adjacent Pavement stripe does not exceed 5 degrees.

### **3.09 WORDS AND OTHER MARKINGS**

- A. Wet sandblast existing or temporary Pavement markings that may be confusing. Removal of markings by high-pressure water may be used if approved by ENGINEER.
- B. Apply word markings, letters, numerals and symbols with indicated stencils and templates. In the absence of such information all stencils and templates shall be identical to those currently used by OWNER.

### **3.10 TEMPORARY PAVEMENT MARKINGS**

- A. Renew when stripes and markings have lost 50 percent of their original visual effectiveness.

**END OF SECTION 32 1723**

**South Jordan Middle School  
Parking Lot Addition/Remodel  
South Jordan, Utah**

**Jordan School District  
West Jordan, Utah**

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SECTION 32 3119

DECORATIVE METAL FENCES AND GATES

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Furnish all labor, materials, equipment, tools and services required to fully complete all Decorative Metal Fence work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
- B. Decorative steel fences.
  - 1. Mechanically Fastened.
- C. Excavation for post bases; concrete foundation for posts.
- D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

**1.02 RELATED REQUIREMENTS**

- A. Section 31 2316 - Excavation.
- B. Section 32 1613 – Driveway, Sidewalk, Curb, Gutter.

**1.03 REFERENCE STANDARDS**

- A. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- C. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus 2019.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2021b.
- F. ASTM D523 - Standard Test Method for Specular Gloss 2014 (Reapproved 2018).
- G. ASTM D714 - Standard Test Method for Evaluating Degree of Blistering of Paints 2002 (Reapproved 2017).
- H. ASTM D822/D822M - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings 2013 (Reapproved 2018).
- I. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments 2008, with Editorial Revision (2017).
- J. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates 2021.
- K. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact) 1993 (Reapproved 2010).
- L. ASTM D3359 - Standard Test Method for Rating Adhesion by Tape Test 2017.
- M. ASTM F2408 - Standard Specification for Ornamental Fences Employing Galvanized Steel Tubular Pickets 2016.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to start of work of this section; require attendance by affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.
3. Installation methods.
- C. Shop Drawings:
  1. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.
- D. Installer's Qualification Statement.
- E. Manufacturer's Warranty.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Experienced with type of construction involved and materials and techniques specified and approved by fence manufacturer.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Store materials in a manner to ensure proper ventilation and drainage. Protect against damage, weather, vandalism and theft.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. The Contractor shall guarantee this work for a period of One (1) from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
- C. Manufacturer's Finish Warranty: 10 years.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Decorative Metal Fences:
  1. Ameristar Fence Products, Inc; Product - Echelon: [ameristarfence.com](http://ameristarfence.com).
    - a. Majestic, Style.
  2. The Fortress Company; Product - Versai: [www.fortressbp.com](http://www.fortressbp.com).
    - a. Flat Top 3 Rail Panels, Style.
  3. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 FENCES - GENERAL**

- A. Fences: Complete factory-fabricated system of posts and panels, accessories, fittings, and fasteners; finished with electrodeposition coating, and having the following performance characteristics:
- B. Electro-Deposition Coating: Multi-stage pretreatment/wash with zinc phosphate, followed by epoxy primer and acrylic topcoat.
  1. Total Coating Thickness: 2 mils, minimum.
  2. Color: As selected by Architect from manufacturer's standard range.
  3. Coating Performance: Comply with general requirements of ASTM F2408.
    - a. Adhesion: ASTM D3359 (Method B); Class 3B with 90 percent or more of coating remaining in tested area.
    - b. Corrosion Resistance: ASTM B117, ASTM D714 and ASTM D1654; 1/8 inch coating loss or medium No.8 blisters after 1,500 hours.
    - c. Impact Resistance: ASTM D2794; 60 inch pounds.
    - d. Weathering Resistance: ASTM D523, ASTM D822/D822M and ASTM D2244; less than 60 percent loss of gloss.
- C. Steel: ASTM A653/A653M; tensile strength 45,000 psi, minimum.

1. Hot-dip galvanized; ASTM A653/A653M, G60.
- D. Fasteners: ASTM A276/A276M, Type 302 stainless steel; finished to match fence components.
  1. Self-drilling hex-head screws.
- E. Concrete: Ready-mixed, complying with ASTM C94/C94M; normal Portland cement; 3,000 psi (20 MPa) strength at 28 days, 4 inch (100 mm) slump; 3/4 inch (19 mm) maximum aggregate size.

### **2.03 MECHANICALLY FASTENED STEEL FENCE**

- A. Provide fence meeting requirements for Industrial class as defined by ASTM F2408.
- B. Fence Panels: Mechanically fastened with internal reinforcement and tamperproof fasteners; 4 feet high by 6 feet long.
  1. Panel Style: Three rail.
  2. Panel Strength: Capable of supporting 600 pound load applied at midspan without deflection.
  3. Attach panels to posts with manufacturer's standard panel brackets.
- C. Posts: Steel tube.
  1. Size: 4 inches square by 12 gage, 0.1094 inch, with manufacturer's standard cap.
  2. Post Cap: Flush plate.
- D. Rails: Manufacturer's standard, galvanized steel channel; 1-3/4 inch square by 14 gage with pre-punched picket holes.
  1. Picket Retaining Rods: 1/8 inch galvanized steel.
  2. Picket-to-Rail Intersection Seals: PVC grommets.
- E. Pickets: Steel tube.
  1. Spacing: 4.175 inch on center.
  2. Size: 1 inch square by 14 gage, 0.0747 inch
  3. Style: Flush top rail.
- F. Flexibility: Capable of following variable slope of up to 1:4.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Set fence posts in accordance with the manufacturer recommended spacing.
- C. Set posts plumb, in concrete footings with top of footing 2 inches (50 mm) above finish grade. Slope top of concrete for water runoff.
- D. When cutting rails immediately seal the exposed surfaces by:
  1. Removing metal shavings from cut area.
  2. Apply zinc-rich primer to thoroughly cover cut edge and drilled hole; allow to dry.
  3. Apply two coats of custom finish spray paint matching fence color.
  4. Failure to seal exposed surfaces in accordance with manufacturer's instructions will negate manufacturer's warranty.

**3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From Indicated Position: 1 inch.
- C. Minimum Distance from Property Line: 6 inches.

**3.05 CLEANING**

- A. Leave immediate work area neat at end of each work day.
- B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- C. Clean fence with mild household detergent and clean water rinse well.
- D. Remove mortar from exposed posts and other fencing material using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.
- E. Touch up scratched surfaces using materials recommended by manufacturer. Match touched-up paint color to factory-applied finish.

**3.06 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

**END OF SECTION 32 3119**



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**SECTION 32 8000**

**LANDSCAPE IRRIGATION SYSTEM**

**PART 1 - GENERAL**

**1.01 THE REQUIREMENT**

- A. The CONTRACTOR shall construct an automatic irrigation system, complete and operable, in accordance with the requirements of the Contract Documents.
- B. Said irrigation system shall include but not be limited to all pipes, fittings, irrigation heads, valves, connect to the existing backflow preventor assembly, automatic control valves, connect to existing the controller, valve boxes, drain valves, operating wrenches, riser assemblies, direct burial wires, electrical connections, wiring and other appurtenances, piping, connections, testing, cleaning-up, maintenance and adjustments necessary for a complete operating system, ready for immediate use upon completion. Minor items necessary for proper construction and functional operation of this system, not specifically described in the Contract Documents, shall be included as a part of the work of this Section.
- C. The Section cross references the following sections:
  - 1. Contractor Submittals
  - 2. Landscaping – 32 93000
  - 3. Mill Piping - Exposed and Buried
  - 4. Plumbing Specialties

**1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

- A. Codes: All codes, as referenced herein, are as specified in Division-1
- B. Commercial Standards.

ASTM B 3	Specification for Soft or Annealed Copper Wire
ASTM D2564	Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
AWWA C 500	Gate Valves for Water and Sewerage Systems

**1.03 PERFORMANCE REQUIREMENTS**

- A. Design 100 percent water-coverage irrigation system for all irrigated areas indicated.
- B. Location of Piping, Sprinklers and Specialties: Design location is diagrammatic and only approximate. Adjust necessary as directed or deemed necessary for symmetrical spacing to avoid plantings or obstructions such as utilities, boxes, signs, and light standards. Maintain 100 percent water coverage of areas indicated.
- C. Minimum working pressures: Ensure the irrigation system meets the minimum Critical Analysis on the Irrigation Plans. Field verifies and convey and differences to the LANDSCAPE ARCHITECT.

**1.04 1.04 CONTRACTOR SUBMITTALS**

- A. Manufacturer's literature, samples (where requested by the LANDSCAPE ARCHITECT, HERE IN REFERRED TO AS L.A.), and installation instructions shall be submitted in accordance with Division-1, "Contractor Submittals."

- B. Record Drawings: The Contractor shall maintain complete Record Drawings of the system as the project proceeds. All deviations from plan layout shall be recorded daily on field drawings. That data shall be indicated on the final "As-Built" or "Record Drawings".
1. Electronic record drawings, schedules, and notes shall be prepared by the Contractor and approved by the Landscape Architect. Electronic copies of the irrigation plan for use in developing the record drawings may be requested and secured from the landscape architect at the completion of the project for the contractors use in preparing the electronic as-built plans.
  2. In-Progress check sets of the electronic record drawings shall be paper hard copies and submitted WITH THE REDLINED FIELD SET DRAWINGS to Landscape Architect for approval prior to submitting electronic copies on CD's. Triplicate copies of all final record drawings (both electronic and hard copy formats) shall be submitted to the Landscape Architect with or prior to submittal of final billing.
  3. Each valve box location is to be referenced by distance from a minimum of two permanent locations. Gate valves, electric remote-control valves, manual valves, master valve, and all other equipment shall be indicated in the drawings. All wire routing, wire size and splices shall be indicated. Main line pipe, lateral line pipe, and wire route shall have three (3) distinctly different graphic symbols (line types). Diagrammatic location of irrigation system components is not acceptable when submitting record drawings – actual location of irrigation system equipment is required for locating in the field.
    - a. Actual routing of mainline with dimensions from fixed points.
    - b. Actual routing of control wiring with dimensions from fixed points.
    - c. Location of wire splices (must be placed in valve box and only used splices in approved locations)
    - d. Actual routing of lateral lines and head locations
    - e. Actual location of valve boxes with notes on type of valve used at each location.
    - f. Actual location of sleeves with dimensions from fixed points.
    - g. Actual location of stubbed mainlines or lateral lines (if applicable)
    - h. Actual location of sensors and associated wiring.
    - i. Provide legend of symbols/notes used on record drawings.
    - j. Any other notes as necessary to enable the owner to understand and locate irrigation system equipment in the field upon completion of the project.
- C. The Contractor shall provide copies of product specification sheets on all proposed equipment to be installed to the Owner's Representative for approval prior to the start of work, in accordance with the parameters of Division-1. Work on the irrigation system may not commence until product sheets are submitted and approved. Submittals shall be marked up to show proper sizes, flows, etc. Equipment to be included:
1. Valves: Non-Electric and Electric
    - a. Gate valve, isolation valve, quick coupler valve, master valve, manual drain valve, remote control valves,
  2. Valve Boxes
  3. Pipe, Glue and Fittings
  4. Wire and Connectors
  5. Washed Aggregate
  6. Sand
  7. Heads
  8. Irrigation Heads
  9. Drip Emitter System
  10. Valve Tags – ID Numbers

11. Pipe Indicator Tape
  12. Miscellaneous Materials
- D. Equipment for Operation: The CONTRACTOR shall supply the following equipment, in addition to what is indicated on the Drawings.
1. Two keys for locking each automatic controller door.
- E. A reduced copy of the irrigation plans shall be laminated and mounted in the controller.

#### 1.05 QUALITY ASSURANCE

- A. The system has been designed with the intent to meet all existing codes. Contractor/Installer shall verify compliance with applicable codes and install in accordance with codes and guidelines set forth by manufactures of the applicable products specified. Discrepancies shall be rectified as a part of this contract work and notes on record drawings.
- B. In addition to other inspections, as provided by the L.A. and or OWNER, the CONTRACTOR shall give at least 72-hours' notice to the L.A. for scheduling the following special inspections:
1. Layout of the system
  2. Inspection of trenches, backfilling, and equipment.
  3. Pressure tests
  4. Coverage adjustment
  5. Automatic operation
- C. The CONTRACTOR shall notify the L.A. at least 72 hours prior to performing the tests. All tests shall be performed in the presence of the District Inspector's observation. Test requirements shall be as follows:
1. After assembly and installation, all water pipes, fittings, automatic equipment, and appurtenances shall be tested at a hydrostatic pressure of 150 psi at the lowest point of the system for not less than 60 minutes.
  2. The first test shall be made in such a manner that all valves in the new water pipe irrigation lines will be tested for watertight closure. Valves may be tested in groups or singly while subjected to 150 psi water pressure for a period of not less than 60 minutes.
  3. The second test shall be made by forcing all air from the pipes with water and capping or plugging pipe risers. After the pipe risers have been plugged or capped, all line valves shall be fully opened, and the pipelines subjected to the full static water pressure for a period of not less than 120 minutes. Pressure pipelines 150 PSI).
  4. The third test required that lateral lines be tested at 100 psi for 120 minutes.
  5. The fourth test requires that all pressure lines be tested at 120 psi for 24 hours.
  6. Water lines and valves which show evidence of leakage or fail to be watertight shall be repaired or replaced. After all repairs or replacements have been made, the above-required tests shall be performed again.
  7. When the irrigation system is completed, the CONTRACTOR, in the presence of the L.A., shall perform test coverage of water afforded the lawn and planting areas. The CONTRACTOR shall furnish all material and perform all the work required to correct any inadequacies in coverage disclosed. The CONTRACTOR shall inform the L.A. of any deviation from the Drawings required due to wind, planting, soil, or site conditions that bear on proper coverage.
  8. Upon completion of each phase of the work, the CONTRACTOR shall check and adjust each irrigation head to meet the site requirements and the requirements of

the Contract Documents.

#### 1.06 EXISTING UTILITIES AND CONDITIONS

- A. Prior to cutting into the soil, the CONTRACTOR shall locate all cables, conduits, sewers, septic tanks, and other such underground utilities, and shall take proper precautions not to damage or disturb such improvements. If a conflict exists between such obstacles and the proposed work, the CONTRACTOR shall promptly notify the L.A.
- B. The CONTRACTOR shall be responsible for coordinating its work with the operation of existing utilities and new utilities on the Project. The CONTRACTOR shall notify the L.A. or its representative when utilities which are in operation require shut-off.
- C. Due to the scale of Drawings, it is not possible to indicate all offset, fittings, etc., which may be required. The CONTRACTOR shall carefully investigate the structural and finished conditions affecting all its work, and plan its work, accordingly, furnishing such fittings, etc., as may be required to meet such conditions. The Contract Documents are generally diagrammatic and indicative of the work to be installed. The work shall be installed in the most direct and workmanlike manner, so that conflicts between irrigation systems, planting, structures, piping, and etc. will be avoided.
- D. The CONTRACTOR shall verify the water pressure available at the site before installation of the system to make sure there is adequate pressure (design pressure 30 to 50 psi) to properly operate irrigation heads and valves and shall also provide pressure reducing valves if required before commencement of any work. Minor additions and adjustments of heads, piping, and circuits shall be made at no additional cost to OWNER where it is necessary to make the irrigation system operate properly.

#### 1.07 DELIVERY, STORAGE AND HANDLING OF MATERIALS

- A. Deliver piping with factory-applied marking and end caps. Maintain end caps through shipping storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.
- C. The CONTRACTOR shall be responsible for storage of materials and for damage to the WORK covered by these Contract Documents before final acceptance of its work. The CONTRACTOR shall securely cover openings into the system, and shall cover all apparatus, equipment, and appliances both before and after being set in place to prevent obstruction in the pipes and the breakage, misuse, or disfigurement of said apparatus, equipment, or appliances.

#### 1.08 SCHEDULING AND COORDINATION

- A. The CONTRACTOR shall be responsible for making arrangements for the coordination of its construction operations with all others on the job. The CONTRACTOR shall permit others engaged in work to accomplish their portion of the WORK without undue interference or delay.
- B. The CONTRACTOR shall be responsible for the scheduling and coordination of the electrical and water connections and the installation of the piping and equipment in a manner that will affect the earliest completion of the WORK in conformance with the construction progress schedules.
- C. Interruption of Water Service: Do not interrupt water service to facilities or landscape areas occupied by Owner or others unless permitted under the following conditions and

then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Owner no fewer than 2 days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without Owners' written permission
3. Maintain viability and survivability of all plant materials while new construction is underway.

#### **1.09 GUARANTEE/WARRANTY OF THE IRRIGATION SYSTEM**

- A. The CONTRACTOR shall guarantee the complete irrigation system to be free from leaks or breakage due to defective material or workmanship for a period of one year from the date of acceptance of the complete work by the OWNER and shall replace any part or parts found to be defective within the period of the guarantee without cost to the Owner. Such warrantee replacement when done which causes disturbance or damage to adjacent surfaces or materials shall also be prepared at no additional cost to Owner. A written guarantee containing the above items shall be prepared by and signed by the Contractor with triplicate copies given to the Owner (2) and Landscape Architect (1).
- B. Damage due to sabotage and/or vandalism is specifically accepted from this guarantee.
- C. Other items of the required guarantee shall be as specified in the Section 32 9300, "Landscaping"
- D. The CONTRACTOR shall repair any settling of backfilling trenches occurring during a one-year period after final acceptance without expense to the OWNER including complete restoration of all damaged planting, paving, or other improvements of any kind.
- E. The CONTRACTOR shall provide winterization of the irrigation system during the one-year guarantee period.
- F. When defective material or workmanship is discovered which will require repair or replacement, all such repair work or replacement work shall be done by the CONTRACTOR at its own expense within 24 hours after written notification is given to the CONTRACTOR by the OWNER of such required repairs. However, if the CONTRACTOR fails to comply with the requirements of the above guarantee within the 24 hours after notification is given, the OWNER shall proceed to have the repairs made by others at the CONTRACTOR'S expense.

### **PART 2 -- PRODUCTS**

#### **2.01 GENERAL**

- A. Brand names specified for materials are supplied for the purpose of describing the type, size, quality, and performance of materials in the Irrigation Schedule. The CONTRACTOR may propose other manufacturers and models, as substitutions for those other than indicated in the Irrigation Schedule, if the materials are of equal quality and performance to the L.A. for review in accordance with Division-1 "Contractor Submittals." Any proposed irrigation equipment submitted by the contractor for approval as proposed substitution shall hydraulically match the originally specified equipment in the Drawings (i.e., flow rate, precipitation rate, friction loss, etc.)
- B. The CONTRACTOR shall furnish, at no additional charge, all samples necessary for testing as outlined in the Specifications or, when requested, certified evidence of off-site testing.
- C. Equipment compatibility: automatic controllers and automatic (remote) control valves

shall be products of the same manufacturing company.

- D. The electrical point of connection for the irrigation system shall be 120-volt building electrical supply.

## 2.02 PLASTIC PIPE AND FITTINGS

- A. Pipe shall be continuously and permanently marked with the following information: manufacturer's name, nominal pipe size, PVC type, pressure rating, and extrusion date.
- B. Materials for lateral lines shall be PVC (polyvinyl chloride) SDR 21, Schedule 40, NSF approved and PVC (polyvinyl chloride) SDR 21, Class 200, NSF approved. Refer to Section 32 8000 – 2.2 – I for sizing.
- C. Materials for pressure main lines shall be PVC (polyvinyl chloride) SDR 21, Schedule 40, NSF approved and PVC (polyvinyl chloride) SDR 21, Class 200, NSF approved. Refer to Section 32 8000 – 2.2 – I for sizing.
- D. Fittings for the lateral lines shall be PVC (polyvinyl chloride) Schedule 40 piping, Type II, NSF, Schedule 80 mainline fitting up to valve as called for in the Contract Documents. Refer to Section 32 8000 – 2.2 – I for sizing.
- E. Fittings shall be Leemco Mechanical Joint Restraint System Fittings or approved equal up to valve manifolds as called for in the Contract Documents except inside valve boxes where all fitting shall be SHC 80, see Drawings. Refer to Section 32 8000 – 2.2 – I for sizing.
- F. Joint Restraint System
1. All ductile iron pipe fittings and mainline gate valves shall be restrained by the joint restraint system. Fittings shall require a 'fitting to pipe restraint' and mainline gate valves shall require a 'valve to pipe' restraint. When required by manufacturer, gasket bell ends of pipe shall require a 'pipe to pipe' restraint.
  2. Concrete thrust blocks shall not be used.
  3. Joint restraints are needed on pipe sized 3" and larger, wherever the main pipeline:
    - a. Changes any direction at tees, angles, and crosses vertical and horizontal.
    - b. Changes size at reducers.
    - c. Stops at a dead-end.
    - d. Valves at which thrust develops when closed.
  4. The size and type of joint restraint system depends on a number of factors, including pressure, pipe size, kind of soil, and type of fitting. Refer to detail table, as well as manufacturer's recommendations for proper sizing and types.
- G. Swing joint ells and nipples shall be Schedule 80 PVC or as noted on Drawings.
- H. Warning tape for the recycled water main line piping shall be 3" wide and purple in color, Pantone 522C, with the words "Caution: recycled water" imprinted in minimum 3/4-inch-high letters black in color. Imprinting shall be continuous and permanent.

I. Pipe and Fittings Table:

Size	Mainline Piping	Mainline Fittings	Lateral Piping	Lateral Fittings
1"	SCH 40	SCH 40	SCH 40	SCH 40
1-1/4"	SCH 40	SCH 40	SCH 40	SCH 40
1-1/2"	SCH 40	SCH 40	SCH 40	SCH 40
2"	SCH 40	SCH 80	SCH 40	SCH 80
2-1/2"	SCH 40	SCH 80	SCH 40	SCH 80
3"	PVC Class 200 Gasketed	Mechanical Joint Restraint System Fittings	SCH 40	SCH 80

**2.03 VALVES**

- A. Gate valve shall be as indicated on the Drawings or approved equal.
- B. Isolation valve shall be as indicated on the Drawings or approved equal.
- C. Quick coupler valve shall be as indicated on the Drawings or approved equal.
- D. Connect to the existing Master Valve or as indicated on the Drawings.
- E. Manual drain valve shall be as indicated on the Drawings or approved equal.
- F. Remote Control Valves: Remote control valves for the irrigation system shall conform to the following requirements:
  - 1. Control valves shall be plastic, for 24-volt electrically controlled solenoids for operation. They shall be of heavy-duty plastic construction with cross or slotted type wheel for operation with key, and bleed fitting.
  - 2. Control valves shall be by the same manufacturer as the controller.
  - 3. Remote control valves shall be as indicated on the Drawings or approved equal.
  - 4. All valves will be tagged with the District Landscape Maintenance Department approved tag indicating the appropriate controller and station number.

**2.04 AUTOMATIC CONTROLLER**

- A. Connect to the existing Controller or as indicated on the Drawings.

**2.05 IRRIGATION HEADS**

- A. Irrigation heads shall be the model and type shall be as indicated on the Drawings or approved equal.



- B. Rotor pop-up irrigation heads shall be as indicated on the Drawings or approved equal.

## 2.06 CONTROL WIRING

- A. Control wire shall be minimum of 14-gauge standard PE Direct Burial Copper Wire, Type UF Bearing, UL approved for direct underground burial in National Electrical Code Class II circuits, AWG sizes.
- B. Conductor of electrical conductivity shall be grade copper meeting requirement of ASTM B 3
- C. All splices shall be made with wire connectors, such as manufactured by **Rain Bird**, **Scotch Lock**, **3M DBY** or approved equal.
- D. **Flow Sensor Wiring:** Install 14 AWG PE-39 copper shielded, double jacketed wire directly from the Flow Sensor to the Irrigation Controller.

## 2.07 PVC SOLVENT CEMENT AND PRIMERS

- A. Solvent Cement shall be NSF approved and shall meet requirements of ASTM D 2564.
- B. Primer shall be NSF approved and shall be **Weld-On**, **P-70 Industrial Polychemical Service** or approved equal.

## 2.08 VALVE AND CONTROLLER VAULTS

- A. Boxes for irrigation equipment shall be heavy duty plastic **Rain Bird**, **Carson-Brooks**, complete with locking lids, or approved equal.
- B. Heavy duty plastic boxes and lids shall **MATCH** surrounding ground or rock mulch material color.

## 2.09 FLOW SENSOR

- A. Connect to existing the Flow Sensor or as indicated on the Drawings.

## 2.10 BACKFLOW ASSEMBLY

- A. Connect to existing the Backflow Assembly or as indicated on the Drawings.

## 2.11 WASHED AGGREGATE

- A. Washed aggregate stone shall be 1" x #8 washed aggregate. Washed aggregate stone shall be used under valve boxes at minimum of six inches in depth or as indicated on the Drawings.

## 2.12 DRIP EMITTERS

- A. Drip emitters shall be as indicated on the Drawings.
- B. Drip emitter flow rate and spacing shall be as indicated in the drawings. Contractor to install an indicator head at the end of each drip zone.
- C. Fittings: All drip emitter connections shall be made with approved insert fittings.

## 2.13 OTHER MATERIALS

- A. Other materials required or necessary shall be as shown and/or as required for best quality work.

## **PART 3 -- EXECUTION**

### **3.01 GENERAL**

- A. Installation of the irrigation system shall be performed after the finish grading, but prior to landscaping.
- B. All valves, fittings, heads, and piping shall be installed as indicated on the Drawings and all connections made to permit the irrigation system to function properly through its entire length.
- C. All materials and equipment shall be installed in strict accordance with the manufacturer's written instructions and recommendations and all local and state codes, laws, ordinances, and regulations.
- D. Before proceeding with the installation of any section or unit of the irrigation system, the CONTRACTOR shall check and verify the correlation between ground measurements and Drawings and shall advise the L.A. of any discrepancies.
- E. The total number of irrigation heads and circuits and size of pipes shall be not less than shown unless otherwise approved. The stated maximum spacing for each type of irrigation head shall not be exceeded.

### **3.02 EXCAVATION**

- A. Trenches shall be dug as wide and as deep as necessary to properly install the irrigation pipe.
- B. Pipe trenches shall be straight, or "snaked" slightly allowing for expansion and contraction of PVC pipe.
- C. Subsoil shall be kept separate from topsoil, where possible.
- D. Minimum pipe depths: lateral pipe serving spray heads: 18" cover, lateral pipe serving rotor or impact heads: 24" cover, and all main lines 36" cover, wire sleeving: Minimum 18" cover.
  - 1. All piping will be backfilled with clean rock free material, settled and compacted to proper finish grade. Existing trench material may be screened to meet complete rock free condition or import rock free bedding material. Embedding materials shall be 2 x the pipe diameter surrounding the pipe.
- E. A trench of sufficient width shall be provided to allow for proper tamping around the pipe.
- F. Bedding Sand – Place bedding sand around piping as indicated on the Details in the Drawings.
- G. Drain Pockets and Valve Boxes: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone. Place a sheet of asphalt-saturated felt or drain fabric at 6-8 inches below valve or drain and cover with washed gravel or crushed stone. Drawing detail may or may not reflect this directive.

### **3.03 PIPING-GENERAL**

- A. Piping shall be laid out and installed in accordance with manufacturer's printed recommendations and industry standards. Substantial support shall be provided at all points, and pipes shall be snaked slightly allowing for expansion and contraction.

- B. Minimum 1-inch vertical clearance shall be between lines crossing at angles greater than 45 degrees.
- C. Minimum 3 inches horizontal and vertical clearances shall be between all other lines.
- D. All swing or swivel joints shall provide a leak-resistant joint with freedom of movement.
- E. Teflon thread sealant 3/4-inch wide (tape or liquid) or approved equal shall be used at all threaded joints.
- F. Pipe sleeves shall be provided under all paving and where necessary for passage under finish surface material, future replacement, and for protection of PVC piping and control wire.
- G. Use ductile iron piping, fittings and spools from gate valve to backflow assembly to master valve / flow sensor assembly.
- H. Bedding Sand – Place bedding sand around piping as indicated on the Details in the Drawings.

### 3.04 PLASTIC PIPE

- A. The pipe shall be guaranteed by the manufacturer to be suitable for operation under the conditions of this installation and shall be guaranteed free from defects in workmanship and quality.
- B. The pipe shall be connected by O-ring type or by solvent-weld joints as outlined below. Joints shall be made in strict accordance with the manufacturer's printed recommendation.
- C. The plastic pipe sections shall be placed accurately to line and grade in the prepared trenches.
- D. Install piping at minimum uniform slope of 0.5 percent downward slope toward drain valves.
- E. Install piping free of sags and severe bends imposing stress on pipes.
- F. The inside of all pipes shall be clean and free from foreign matter and shall be end-reamed to remove burrs and provide full inside diameter of the line end.
- G. Pipe assembly shall have a firm, uniform bearing for the entire length of each pipeline to prevent uneven settlement. All adjustments to grade shall be made by scraping away or filling in with clean earth backfill material, well compacted under the body of the pipe. Wedging of pipes will not be permitted. The inside of all pipes shall be clean and free from foreign materials before joints are assembled.
- H. Sealant tape shall be used on all threaded joints.
- I. All pipeline open ends upon which the WORK has been stopped shall be closed at the end of each day's construction work with a suitable temporary plug to prevent entrance of any foreign materials into the assembled pipeline.
- J. Pressure piping 3 inch and larger pipe shall have gasketed ductile iron, HARCO, Leemco or approved equal (hereafter referred to only as Ductile Iron) type fittings with transition gaskets if needed, at all changes of direction tees, ells, caps, etc.

- K. Ductile Iron type fittings may have bolted end flanges and be wrapped in plastic. Bolts and nuts to be greased prior to assembly. Contractor exercising this option shall submit for approval to deviate from shown plan details.
- L. No bends other than very gradual in pipe shall be permitted. The Contractor shall use Ductile Iron elbow fittings of 90 and 45 degrees as the situation's demand.
- M. Install dielectric fittings to connect piping of dissimilar metals when conditions require it.
- N. Install PVC piping in dry weather when temperature is above 40 deg F 5 deg C. Allow joints to cure at least 24 hours at temperatures above 40 deg F 5 deg C before testing unless otherwise recommended by manufacturer.
- O. Install water regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet. Pressure regulation devices will be installed to allow the entire system including all remote-control valves and all sprinkler heads to operate at optimum pressure designated by product manufacturer. Pressure regulation devices shall include one or all of the following as field requirements deem necessary:
  - 1. pressure regulation valve at main line POC,
  - 2. pressure regulation device on/at remote control valve,
  - 3. pressure regulation device on individual sprinkler heads.
  - 4. Note brand size and locations of selected device(s) on as built record drawings.

### 3.05 VALVES

- A. Piping systems shall be supplied with valves at all points as indicated on the Drawings or specified herein so arranged to give complete regulating control throughout. Automatic control valves and gate valves, shall be as detailed in the Contract Documents or as otherwise directed by the L.A.
- B. Valves shall be the full size of the line in which they are installed, unless otherwise indicated in the Drawings.
- C. Remote control valves shall be adjusted so the most remote irrigation heads operate at the pressure recommended by the head manufacturer. Remote control valves shall be adjusted so a uniform distribution of water is applied by the irrigation heads to the planting areas for each individual valve system. A union fitting shall be provided on the discharge side of the control valve. They shall be wired to operate in the order as shown. They shall be capable of being operated manually entirely independent of the controller.
- D. Gate valves shall be line (pipeline) size, shall be installed where indicated on the Drawings.
- E. Master valve and flow sensor shall be installed as indicated in the Drawings.
- F. Control Valves: Install multiples where feasible fitted one or two in a control-valve box(es) of sufficient size to allow fully servicing and removal of valves without removing boxes.
- G. Drain Valves: Install in >12" dia. box(es) with appropriate rubber covered valve markers.
- H. Air Relief Valves: Install the air relief valve(s) at all high points and at all dead ends in the main lines as required dictated by topography encountered at time of installation.
- I. All valves will be tagged with District Landscape Maintenance Department approved tag indicating the appropriate controller and station number.

### 3.06 VALVE BOXES

- A. All remote-control irrigation valves, master valve / flow sensor assembly, gate valves, and manual drain valve assembly shall be enclosed in a heavy-duty plastic box as indicated on the Drawings and Specifications.
- B. Heavy duty plastic boxes and lids shall **MATCH** surrounding ground or rock mulch material color.
- C. Master control valve(s), Flow Control(s), etc. at the point of connection shall be housed in Jumbo Valve Boxes or vault(s) of sufficient length, width, and depth to meet servicing and maintenance requirements.
- D. Location and Arrangement: Drawings indicate diagrammatic locations and arrangements of piping systems. Install piping parallel and adjacent two walks, curbs or drives. Cluster manifolds from one to two valves in large Jumbo boxes that will still allow access and servicing of valves without having to remove the box. Locate boxes immediately next to walks or drives for servicing without getting wet when circuits are open. Locations are generally shown on plans. The Contractor shall coordinate actual placement with District Inspector and Landscape Architect and have approved prior to excavation.

### **3.07 IRRIGATION HEADS**

- A. All nozzles on irrigations shall be tightened after installation. All irrigations having an adjustment stem shall be adjusted on a lateral line for the proper radius diameter and/or flow
- B. All irrigation heads shall be set perpendicular to finished grades and at finish ground level.
- C. All irrigation heads shall be installed as detailed in the Drawings.
- D. The irrigation system shall be thoroughly flushed remove all possible foreign material prior to installation of the irrigation heads.
- E. The CONTRACTOR shall protect against re-entry of contaminated water into risers or piping. After flushing, the CONTRACTOR shall immediately install irrigation heads or cap risers until irrigation heads are installed.
- F. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries, unless otherwise indicated. Set to conform to surrounding walks, drives, curbs and grades, etc. Patterns of spray shall be accurately adjusted before the final walk through.

### **3.08 DRIP EMITTERS**

- A. Install drip emitters as indicated on drawings and as recommended by the manufacturer.

### **3.09 CONTROLLERS**

- A. The CONTRACTOR shall connect to the existing controller as indicated on the Drawings complete with required waterproof circuit breaker type disconnect switch, per manufacturer's printed recommendations.
- B. Controller location is diagrammatic, verify in the field.
- C. All local and applicable codes shall be followed in furnishing and/or connecting a 110-volt electrical service to the controller. Coordinate Electrical Plans.

- E. Adjustment of the controller shall be such that each control valve in the circuit will remain open for a readily adjustable period of 5 or less minutes to 60 minutes. Readily made field adjustments shall include a provision whereby any number of days in a week can be skipped and whereby one or more positions on the controller may be skipped. When any or all of the above adjustments have been made, the controller shall continue to operate automatically as set until further adjustments are made. Provision shall be made for conveniently resetting the start of the irrigation cycle at any time and also for advancing from one position to any other position at will.
- F. The CONTRACTOR shall properly ground the control boxes to copper ground rods driven into the ground.
- G. Timing, sequence and period will be supplied to the CONTRACTOR by the L.A. At this time, the CONTRACTOR shall adjust the controller for normal operation.
- H. The controller shall be single-phase; 120-volt (approx.) ac operated and shall contain an "On-Off" switch and fuse assembly. The controllers shall be equipped with a transformer to reduce voltage to a 24-volt system. Controller station shall be provided as indicated in the Drawings.
- I. Controller valve numbering shall follow the numbering / sequencing on the Drawings.
- J. Controller: Provide and install the specified wall mounted controller. Power and Cable to controllers to be coordinated between Irrigation contractor and electrical contractor to make system complete in conduit mounted per Division 16 electrical requirement.
- K. Installation of control cable(s) may be in the same trench(s) as irrigation piping and at least 2 inches 50 mm below or besides piping. See requirements for wire in separate conduits elsewhere. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas if irrigation piping is installed in sleeve.
- L. Provide and install "an extra common and two extra control" wires to each of the farthest manifold locations on main lines for future use by District in the event of wire failure or additional need. Location(s) may or may not be noted on drawing. Coordinate this with the Inspector and Landscape Architect at preconstruction meeting.
- M. Controller wiring at outside exposure shall be contained in steel rigid conduit. Use EMT conduit for inside installations. Sweep ell's to be used on all conduits. All work pr. Division 16 Specification.
- N. Provide and install the specified controllers, wall mounted, including an electrical gutter box of the required size to house all valve wiring and misc. equipment. The power to the controller is to be provided by the General or Electrical contractor. Mount the controllers as directed by the Owner representative. Connect the controller to the master valve, control valves and relays and make all required connections for complete operation of the system. Grounding grids per manufacturers requirements and controller signals to valves shall be fully operational prior to punch list inspection without exception.

### **3.10 WIRING AND ELECTRICAL WORK**

- A. All electrical equipment and wiring shall comply with local and state codes and shall be installed by those skilled and licensed in the trade. Unless the governing code specifies otherwise, low voltage control wire may be installed by the CONTRACTOR when code allows.
- B. All 110-volt wire shall be installed in conduit and taken from appropriate sources as

- indicated in the Drawings. CONTRACTOR shall coordinate manufacturer, installer and Electrical Drawings.
- C. All data wire shall be installed in conduit and taken from appropriate sources as indicated in the Drawings. CONTRACTOR shall coordinate manufacturer, installer and Electrical Drawings.
  - D. The CONTRACTOR shall provide low voltage, 24-volt direct burial wires. The wire size shall be as shown but shall be not less than No. 14. Where sizes are not shown, they shall be sized per wire manufacturer's sizing charts and specifications.
  - E. The CONTRACTOR shall provide all wiring, conduits, sleeves, and connection for the low voltage electrical system between controller and valves, and where else shown and necessary for a complete and operable irrigation system.
  - F. Wires shall be color coded as follows:
    - 1. Each automatic control valve shall be provided with a separate control wire running from the valve to the proper station on the controller that is controlling the valve. All control valves operated by one controller shall have common ground wire running from the control valves to controller. All wires to be direct burial P.E. and UL approved, red-lawn, white-ground, yellow-shrubs, run one extra valve wire (wire color blue) for every five valves installed with a minimum of two wires run through each group of valves of two or more. All spare wires shall be "home run" to the respective controller. End runs common.
  - G. All splices shall be moisture proof using specified electrical connectors.
  - H. Wires shall be bundled together and wrapped with electrical tape similar to PVC at 15-ft intervals. Install wire in the bottom of the main line trench maintaining 12" offset from the main line.
  - I. An expansion curl should be provided within 3 ft of each wire connection and at pull box locations. Provide three feet of extra wire in each valve box.
  - J. All conduits and sleeves necessary for running wires under concrete, walks, and paving shall be furnished and installed before said concrete, walks, and paving work is installed.
  - K. Wire shall be continuous without splices except at control valves and shall be routed in main line trench whenever possible.
  - L. All wire under paving shall be encased in PVC pipe; changes in direction under paving shall be made with sweep ells.
  - M. Provide one extra wire for every five valves. Run two extra wires to the furthest valve in both directions for each controller.
  - N. Flow Sensor Wiring: Install 14 AWG PE-39 copper shielded double jacketed wire directly from the Flow Sensor to the Irrigation Controller.
  - O. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
  - P. Provide slack/extra control wire at all change in directions.
  - Q. Provide 36" of slack wire at each remote-control valve in valve box.

- R. Remote control valve wiring shall be installed with the main line pipe where possible, taped to the underside of the mainline pipe at regular intervals.
- S. All wiring under hardscaping shall be contained in sleeving. Sweep ell's meeting inspectors approval and code to be used on all conduits.
- T. All electrical work to conform to code and District standards.

### **3.11 PIPE TRENCH BACKFILL**

- A. Obtain District Inspectors approval of depths, components, backfill procedures including compaction, lifts and materials before covering any piping or backfilling any trench.
- B. After the pipe and wires have been installed, the trenches shall be backfilled. The backfill operation must provide firm continuous support for the pipe.
- C. Backfill material shall be free of rocks and other materials that may damage the piping.
- D. Bottom of trenches shall be smooth and free of sharp rocks and other object that may damage pipe.
- E. The initial backfill shall be accomplished by carefully tamping selected material (from material excavated from the trench) under the pipe and between the pipe and the trench.
- F. The pipes shall be filled with water and pressurized during backfilling operations, if necessary, to prevent drainage to piping.
- G. The backfill shall be carefully installed around and over the pipe to approximately 10 inches of the ground surface, then water shall be allowed to flow in the trench. After this puddling operation has been completed and allowed to stand for 24 hours, the balance of the materials shall be placed in the trench to the sub-grade line (leaving room for topsoil) Rocks and other materials found in the backfill shall be removed. The backfill shall be compacted carefully and thoroughly.
- H. Couplings and fittings shall be left exposed until leakage tests have been completed.
- I. Topsoil shall be installed prior to planting.
- J. Install detectable warnings tape above mainline as indicated on the Drawings. Coordinate placement with District Inspectors.

### **3.12 LABELING AND IDENTIFYING**

- A. Equipment Name plates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic control valve on box lid. Accurate reference valves and zone location descriptions and numbers to inside of controllers.
  - 1: Text: In addition to identifying unit, distinguish between multiple units, inform Owners Operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
  - 2. Add tags to valves. Refer to Detail.

### **3.13 TESTING AND ADJUSTMENTS**

- A. Trench compaction tests: Minimum 95% compaction verified by testing service in writing. Testing service procured by Contractor through American Testing Services, Inc.(801-487-



1333) and paid for by District. Contractor to provide copies of tests to Landscape Architect and District Inspector. Scarify the top surface of compacted trenching prior to topsoil operation for proper soil bond. See Lawn Preparation sections.

- B. Engage a factory-authorized service representative to train Owner's on-site maintenance personnel to adjust, operate, and maintain controller and automatic control devices, sensors, monitors, and valves.
- C. The L.A. shall be notified by the CONTRACTOR prior to performing hydrostatic tests on the irrigation system in place. This test shall be done by the CONTRACTOR in the presence of the L.A. The test results will be acceptable to the L.A. when no leakage or loss of pressure is evident during the test period. Defects shall be detected and repaired prior to retesting.
- D. The irrigation heads shall be adjusted and balanced for optimum and uniform coverage without excessive fogging and overthrow on walks, paving, and structures. The height and elevations of risers and irrigation heads shall be adjusted.
- E. Following adjusting and balancing of the irrigation heads, an operating test of the entire system shall be performed by the CONTRACTOR in the presence of the District Inspector at normal operating pressures. The test will be considered as acceptable if the system operates in a satisfactory manner providing uniform coverage of irrigated areas for a one-week period of automatic operation with no leaks.
- F. Test and adjust controls and safety. Replace damaged and malfunctioning controls and equipment.
- G. Establish or re-establish lawn areas around each head where washing or erosion has occurred to conform to intended grades with imported soil and sod as needed. Seeding will not be permitted as a re-establishment medium on this project. Note any critical deadline requirements for completion, coordinate with General Contractor.
- H. Adjust grades surrounding all valve boxes and drain markers to account for any shifting, settling or disturbance by traffic. All boxes shall be flush with 'finish' grades and slope gradually, evenly and consistently with surrounding grades. Abrupt and uneven slopes will not be permitted, and the installation will be rejected.

### **3.14 STARTUP SERVICE**

- A. Engage a factory-authorized service representative to perform startup service at Contractor's expense. Verify that electrical wiring connection, installation, control system(s), data transmission, etc. functions and complies with manufacturer's submittal and installation requirements complete.
- B. Verify that controllers are installed, connected and operating according to the manufacturer's documents. Complete startup checks according to manufacturer's written instructions
- C. Provide comprehensive training to Custodian and other District personnel with vested interest in this project for the ongoing operation of this system to the district's satisfaction. Obtain a written sign-off of satisfactory training for Contractor files and forward a copy to Landscape Architect.

### **3.15 SUBSTANTIAL COMLETETION**

- A. When the project is substantially complete, the Contractor will make a request for an inspection. Written notice requesting such inspections shall be submitted to the District Inspector at least three (3) days prior to the anticipated inspection date. If the work is found

to not be substantially complete and the inspection has been called for prematurely the inspection will be back-charged and billed to the Contractor on an hourly basis. Note: this includes adjusting nozzles and spray pattern for underthrow or overthrow. A punch-list of the work found to be unsatisfactory will be furnished to the Contractor. After this list has been satisfactorily completed, the project can be accepted.

### 3.16 RECORD DRAWINGS

- A. The Contractor shall maintain complete Record Drawings of the system as the project proceeds. Each valve box location is to be referenced by distance from a minimum of two permanent locations. Gate valves, electric remote-control valves, manual valves, master valve, and all other equipment shall be indicated in the drawings. All wire routing, wire size and splices shall be indicated. Main line pipe, lateral line pipe, and wire route shall have three (3) distinctly different graphic symbols (line types). Diagrammatic location of irrigation system components is not acceptable when submitting record drawings – actual location of irrigation system equipment is required for locating in the field.
1. Actual routing of mainline with dimensions from fixed points.
  2. Actual routing of control wiring with dimensions from fixed points.
  3. Location of wire splices (must be placed in valve box and only used splices in approved locations)
  4. Actual routing of lateral lines and head locations
  5. Actual location of valve boxes with notes on type of valve used at each location.
  6. Actual location of sleeves with dimensions from fixed points.
  7. Actual location of stubbed mainlines or lateral lines (if applicable)
  8. Actual location of sensors and associated wiring.
  9. Provide legend of symbols/notes used on record drawings.
  10. Any other notes as necessary to enable the owner to understand and locate irrigation system equipment in the field upon completion of the project.
- B. Record Drawings shall be furnished to the L.A. at the time of the irrigation system inspection and before acceptance of the operating system by the OWNER.

**END OF SECTION**

**SECTION 32 92 00**

**LAWNS AND GRASSES**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Sodding.
  - 2. Turf renovation.

**1.03 DEFINITIONS**

- A. Finish Grade: Elevation of finished surface of planting soil for consistency with existing lawn(s) or intended grades adjacent to walks, curbs, and/or drives.
- B. Planting Soil: Existing topsoil mixed with soil amendments or imported topsoil.
- C. Sub-grade: Surface or elevation of subsoil remaining after general or previous contractor finishes completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

**1.04 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Product certificates.
- C. Contractors Planting Schedule: Indicating anticipated sodding and planting dates to meet allowed time frames for completion.
- D. Maintenance Data: Recommended procedures to be established by District for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

**1.05 QUALITY ASSURANCE**

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time foreman or supervisor on Project site when planting is in progress.
- B. Topsoil Analysis: Furnish soil analysis by a qualified soil testing laboratory showing topsoil meets ideal standards set forth in the specifications.

## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

## 1.07 FIELD CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial establishment periods to provide required maintenance from date of planting completion.
  - 1. Spring Planting: 15 March.
  - 2. Fall Planting: 15 October.
  - 3. Days considered for the establishment period must be conducive to the growth and establishment of the sod and not non-growing seasonal months.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

## PART 2 - PRODUCTS

### 2.01 TURFGRASS SOD

- A. Turfgrass Sod: fully complying with Turf Industry's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species and Supplier: Sod species shall be at least a five blend Kentucky Bluegrass and the supplier shall be Raft River Sod or approved equivalent.
  - 1. Blended sod mix from Raft River Sod shall be custom seed mix# 9270 and contain:
    - a. 29.77 percent Poa pratensis Adelphi'
    - b. 21.99 percent Poa pratensis 'Quantum Leap' or equivalent
    - c. 21.10 percent Poa pratensis 'Award'
    - d. 20.89 percent Poa pratensis 'Nuglade'
    - e. 4.86 percent Poa pratensis 'Midnight'
    - f. Submit samples AND bag tags for approval.

### 2.02 PLANTING MATERIALS

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7.5, a minimum 2% percent organic material content; free of stones 1 1/2 x 1 1/2 inch or larger in any dimension and other extraneous materials harmful to plant growth.
- B. Fertilizer
  - 1. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 2. Slow-Release Fertilizer: 30 percent nitrogen, 10 percent phosphorous, and 0 percent potassium, by weight.

### 2.03 LAWN SOIL MIX

- A. Lawn soil mix: refer to section 32 9300 - Landscaping.

### 2.04 PESTICIDES

- A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 3. Uniformly moisten excessively dry soil that is not workable, or which is dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Project Manager and replace with new planting soil.

### 3.02 LAWN PREPARATION

- A. Newly Prepared Subgrades: Loosen subgrade in applicable areas to a minimum depth of 6". Remove stones larger than 1 1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
  - 1. Apply slow release fertilizer directly to subgrade before loosening.
  - 2. Spread planting soil as needed to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
- B. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, trenching, grading, or surface soil stripping operations, prepare surface soil as follows:
  - 1. Remove existing unwanted areas of grass, vegetation, weed, or turf. Do not mix into surface soil.

2. Loosen surface soil to a depth of at least 8 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Rota-till soil to a homogeneous mixture of fine texture.
  3. Remove all stones larger than 1 1/2 inch in any dimension and sticks, roots, trash, and other extraneous matter.
  4. Legally dispose of waste material, including grass, vegetation, and unwanted turf, off Owner's property.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus .10 ft of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
- D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

### 3.03 SOD AVAILABILITY AND CONDITION

- A. The Contractor shall satisfy himself as to the existing conditions prior to any construction. The Contractor shall be fully responsible for furnishing and laying all sod required on the plans. He shall furnish new sod as specified above and lay it to completely satisfy the intent and meaning of the plans and specifications at no extra cost to the District.
- B. In the case of any discrepancy in the amount of sod to be removed or amount to be used, it shall be the contractor's responsibility to report such to the Project Manager prior to commencing the work.
- C. Any condition of the sod that shall prevent it from being lifted shall also be reported to the Project Managers. This shall not relieve the Contractor of the responsibility of removing the sod necessary to complete the project.

### 3.04 SODDING

- A. Lay sod within 24 hours of harvesting. Provide documentation stating cutting time, date and location if requested by Owner or Landscape Architect.
- B. Do not lay sod if dormant or if ground is frozen or muddy. No sod shall be stored on the site for longer than two (2) days. Sod that becomes yellow, dry, or broken, shall be removed from the site by the Contractor at his expense.
- C. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. No partial strip or pieces will be accepted. Avoid damage to soil or sod during installation.
- D. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
1. All work shall be done from boards laid on top of the prepared surface or on already laid sod. Care shall be taken to prevent foot prints or other disturbances to the prepared bed, other than absolutely necessary. Any such disturbances shall be promptly repaired so that the sod will be laid on a proper bed to insure the necessary bonding between it and the sod.
  2. Lay sod across slopes exceeding 5:1.

3. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.
- E. Saturate sod with fine water spray within two hours of planting. During first week, water multiple times daily as frequently as necessary to maintain moist soil to a minimum depth of 2" inches below sod.

### **3.05 SOD LIFTING**

- A. All sod shall be removed from areas of construction (i.e., where walks, concrete slabs, buildings, etc., will be built) prior to excavation and other operations or when sod lifting is specified.
- B. Prior to beginning to lift any large quantities of sod, the Contractor shall notify the Project Manager in sufficient time for notification of the Park Maintenance Personnel, so that they can schedule the removal of the sod from the site to lay at another park site.
- C. When the sod is to be used by the Park Maintenance Personnel, as specified on the plans, the sod pieces shall be cut by a mechanical sod cutter into uniform pieces with square comers. Individual pieces shall not exceed sixteen (16) inches wide and forty-eight (48) inches long or the current standards size of the sodding industry. All sod shall be cut to a thickness of no more than one and one-quarter (1-1/4) inches, but no less than the sodding industry standards.

### **3.06 TOP DRESSING**

- A. All areas which are sodded shall be top dressed with the top dressing specified above during or at the end of the establishment period to fill in noticeable gaps between seams. The top dressing shall be first applied by spreading it over the sod and then carefully working it into the joints with a stiff brush or mat.
- B. All sodded areas shall be thoroughly watered after the top dressing is applied. Watering must be done carefully so as to avoid puddling or washing. Further work shall be curtailed until the area is dried sufficiently to allow sodding continuance without damage to already laid sod or the prepared bed.

### **3.07 TURF RENOVATION**

- A. Renovate existing turf where indicated.
- B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
  1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
  2. Install new planting soil as required.
- C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.
- D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.
- E. Mow, de-thatch, core aerate, and rake existing turf.

- F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off District's property.
- H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.
- I. Apply soil amendments and initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.
- J. Water newly planted areas and keep moist until new turf is established.

### 3.08 TURF ESTABLISHMENT

- A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
  - 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
  - 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
  - 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
  - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  - 2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
  - 3. The Contractor shall submit a watering schedule to the Project Manager.
- C. Mow turf as soon as top growth is tall enough to cut, no higher than 3 inches. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
  - 1. Mow Kentucky bluegrass to a height of to 2 inches.
- D. Turf Post-fertilization: Apply commercial fertilizer after initial mowing and when grass is dry.
  - 1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.
- E. Begin establishment services immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
  - 1. Seeded Turf: 60 days from date of planting completion.
    - a. When initial establishment period has not elapsed before end of planting season, or if turf is not fully established, continue establishment during next planting season.
  - 2. Sodded Turf: 30 days from date of planting completion.



### **3.09 ACCEPTABLE TURF ESTABLISHMENT**

- A. The Contractor shall be responsible for all sodded and seeded areas during the Turf Establishment period. The Establishment Period shall begin at the time sodding or seeding for the entire project is completed and continues until all turf meets establishment criteria.
- B. Turf installations shall meet the following criteria as determined by the Project Manager before Acceptance of Turf and Substantial Completion will be issued in writing:
  - 1. Acceptable Seeded Turf: Turf Establishment shall be achieved when the turf is a healthy, uniform, close stand of grass, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 square foot area and bare spots not exceeding 4 by 4 inches.
  - 2. Acceptable Sodded Turf: Turf Establishment shall be achieved when the turf is healthy, well-rooted, even-colored, viable turf, free of weeds, open joints, bare areas, and surface irregularities.
- C. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory to District and Landscape Architect.
- D. Written notice requesting establishment inspection shall be submitted to the Project Manager at least three (3) days prior to the anticipated inspection date.
- E. Maintenance Guidelines: Shall be provided in triplicate to Owner in writing prior to final acceptance.

### **3.10 PESTICIDE/HERBICIDE APPLICATION**

- A. Weed Treatments: provided as needed on any infestation that occurs prior to Substantial Completion.
- B. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with District's operations and others in proximity to the Work. Notify Project Manager before each application is performed.
- C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

### **3.11 CLEANUP AND PROTECTION**

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off County's property.
- C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- D. Remove non-degradable erosion-control measures after grass establishment period.

**END OF SECTION**

**SECTION 32 93 00**

**LANDSCAPING**

**PART 1 - GENERAL**

**1.01 THE REQUIREMENT**

- A. The CONTRACTOR shall perform all the landscaping and all appurtenant work, complete, in accordance with the requirements of the Contract Documents.
- B. **Scope of Work:** Landscaping as referred to herein shall include, but not be limited to the following work: soil preparation, weed control, finish grading, furnishing, and installing plant materials, tree staking and tying, cleanup, maintenance, and guarantee.
- C. The Section cross references the following sections:
  - 1. Reference Standards
  - 2. Contractor Submittals
  - 3. Project Closeout
  - 4. Landscape Irrigation System 32 8000

**1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

- A. Codes: All codes, as referenced herein, are specified in Section 01095 - Reference Standards.
- B. Federal Specifications:
  - 1. FS O-F-241 D Fertilizer, Mixed, Commercial
- C. Commercial Standards:
  - 1. ANSI/ASTM D 422 Method for Particle-Size Analysis of Soils
  - 2. ANSI Z601 Nursery Stock
  - 3. American Association of Rules and Grading Provisions Nurserymen, Inc.

**1.3 CONTRACTOR SUBMITTALS**

- A. General: The CONTRACTOR shall furnish a certificate with each delivery or bulk material delivery, stating source, quantity, and type of material. All materials shall conform to specification requirements. All certificates shall be delivered to the LANDSCAPE ARCHITECT (here in referred to as L.A.) at the time of each delivery. All bulk delivered materials shall be delivered with level load volume plainly marked on the truck bed.
- B. Submittals required shall be submitted as specified in Division 1 - Contractor Submittals:
  - 1. Agricultural Topsoil Report.
  - 2. Literature on Fertilizers and Additives.
  - 3. Rock Mulches.
  - 4. Bark Mulch.
  - 5. Weed Barrier Fabric.

6. Literature on Staking Materials.
7. Landscape Accent Boulder – provide photos.
8. Actual photos of proposed plant material to be installed, NOT STOCK PHOTOS.

#### 1.4 QUALITY ASSURANCE

- A. Installer's Field Supervision: Contractor shall maintain an experienced full-time foreman or supervisor on Project site when planting is in progress.
- B. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory meeting or exceeding soil requirements provided herein.
- C. General: All plants furnished by the CONTRACTOR shall be true to type or name as shown in the Contract Documents and shall be tagged in accordance with the standard practice recommended by the Agricultural Code of the State of Utah; however, determination of plant species or variety will be made by the L.A.
- D. All plants shall comply with Federal and State laws requiring inspection for plant diseases and infestations. Inspection certificates required by law shall accompany each shipment of plants, and certificates shall be delivered to the L.A.
- E. All inspections specified herein will be made by the L.A. or its representative. The CONTRACTOR shall request inspection at least 24 hours in advance of the time inspection is required. Inspection will be required on the following stages of the WORK:
  1. During preliminary grading, soil preparation, and initial weeding.
  2. When trees are spotted for planting, but before planting holes have been excavated.
  3. When finish grading has been completed.
  4. When all specified work, except the maintenance period, has been completed.
  5. Final inspection at the completion of the maintenance period.
- F. Plants shall be subject to inspection and approval or rejection by the L.A. at place of growth and upon delivery to the site at any time before or during progress of the WORK and according to:
  1. Quantity, quality, size, and variety.
  2. Ball and root condition; and
  3. Latent defects and injuries resulting from handling, disease, and insects.
- G. Plants approved at pre-planting inspection shall still be subject to rejection during planting if found to be below Specifications.
- H. Rejected plants shall be identified in an obvious manner, promptly removed from the site and replaced with acceptable equals.
- I. Plants shall have been grown in nurseries which have been inspected by the governing authorities. Inspection of plant materials required by City, County, State, or Federal authorities shall be the responsibility of the CONTRACTOR, who shall have secured permits or certificates prior to delivery of plants to site.

#### 1.5 CLEANUP

- A. Upon completion of all planting operations, the portion of the project site used for a work or storage area by the CONTRACTOR shall be cleaned of all debris, superfluous materials, and equipment. All such materials and equipment shall be entirely removed from the project site as specified in Division 1 - Project Closeout.

- B. All walks, or pavement shall be swept or washed clean upon completion of the WORK of this Section.
- C. During the entire Contract period, plant containers that have been cut or removed from plant materials shall be removed from the project site daily, in accordance with the provisions for maintenance and guarantee as specified in Division 1 - Project Closeout.

#### 1.6 MAINTENANCE OF LANDSCAPE PLANTING PRIOR TO ACCEPTANCE OF PROJECT

- A. **General:** The CONTRACTOR shall be responsible for protecting, watering, and maintaining all planting and irrigation systems until final acceptance of all work under the contract.
- B. At time of acceptance of the complete project, the lawn shall be totally established with no bare spots, mowed a minimum of 3 times, and the turf shall be at least 1-1/4 to 2 inches in height. The lawn shall be fertilized a minimum of 1 time after the installation of the sod.
- C. **Watering:** Trees and shrubs shall be thoroughly soaked after planting and provided with additional water at intervals as necessary to provide for good health and growth of the planting.
- D. **Upon completion** of lawn sodding, the entire area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by the irrigation system existing on the site during dry weather or whenever necessary for proper establishment of the lawn. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired by the CONTRACTOR at its own expense.
- E. **Protection:** The CONTRACTOR shall provide adequate protection to all newly planted areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until acceptance.
- F. The CONTRACTOR shall replace any materials or equipment it has damaged, or which has been damaged by its employees or subcontractors.
- G. Partial utilization of the project shall not relieve the CONTRACTOR of any of the requirements contained in the Contract Documents.
- H. **Mowing of Lawn Areas:** First mowing of lawn areas shall begin as soon as the grass has reached a height of 3 inches and subsequent mowing shall be at least once a week, or as often as necessary to maintain all lawn areas at a uniform height of 1-1/2 to 2 inches.
- I. All lawns shall be fertilized every 3 weeks with 16-8-8 commercial fertilizer at label rate for the first 7 weeks and fertilized thereafter once every 5 months prior to acceptance.
- J. Plants shall be maintained in a vigorous, thriving condition by watering, cultivating, weeding, pruning, spraying, and other operations necessary. No trees or shrubs will be accepted unless they are healthy and show satisfactory foliage conditions.
- K. All planted areas shall be cultivated at least every 2 weeks and raked smoothly, to present a neat appearance and additional mulch shall be added where necessary.
- L. Maintenance shall include, in addition to the foregoing, cleaning, edging, repairs to stakes, wire, and wrappings, the repair of erosion, and all other necessary work of maintenance. Sidewalks and other paved areas shall be kept clean while planting and maintenance are in progress.
- M. Any and all irrigation lines broken or disrupted during this construction shall be replaced to proper working order prior to contract work and be acceptable to the OWNER.

## 1.7 FINAL INSPECTION AND GUARANTEE

- A. Inspection of the work of lawns and planting will be made at conclusion of maintenance.
- B. Written notice requesting inspection shall be submitted to the L.A. at least 10 days prior to the anticipated inspection date.
- C. Final acceptance of the WORK prior to the guarantee period of the contract will be accepted upon written approval by the L.A., on the satisfactory completion of all work, including maintenance, but exclusive of the replacement of plant material.
- D. Any delay in the completion of any item of work in the planting operation which extends the planting into more than one season shall extend the guarantee in accordance with the date of completion given above.
- E. The CONTRACTOR shall replace, as soon as weather conditions permit, all dead plants and all plants not in a vigorous, thriving condition which are noted at the end of the one-year guarantee period.
- F. Plants used for replacement shall be of the same size and variety specified in the plant list. Plants shall be furnished, planted, staked, and mulched as specified.
- G. All work done under this contract shall be left in good order to the satisfaction of the OWNER and the L.A. and the CONTRACTOR shall, without additional expense to the OWNER, replace any trees, shrubs, etc., which develop defects or die during the one-year guarantee period.

## 1.8 GUARANTEE FOLLOWING ACCEPTANCE OF PROJECT

- A. General: The CONTRACTOR shall be responsible for a period of one year after date of acceptance of all work under the Contract, for all necessary plant or tree replacements. The CONTRACTOR shall provide a written guarantee to the OWNER from the landscaping subcontractor, embodying the provisions of this Section of the Specifications.
- B. The WORK covered by the guaranteed portions of these specifications consists of providing all replacements of plants, labor, materials, equipment, and supplies and in performing all operations in connection with guarantees.
- C. The CONTRACTOR shall clean-up and remove unused or waste materials from the site and leave the area in a neat condition (satisfactory to the OWNER) whenever it performs work during the guarantee Period.
- D. **Final Inspection:** The OWNER and CONTRACTOR shall make a final inspection at the end of the one-year guarantee period. Any plants and materials found defective at the time of final inspection shall be replaced within a time agreed upon by both parties. If it is too late in the planting season for replanting, the replacements shall be made during the next planting season even though such planting may run beyond the maintenance and correction period.

## PART 2 -- PRODUCTS

### 2.1 GENERAL

- A. All landscaping materials for soil conditioning, weed abatement, or planting shall be first-grade, commercial quality and shall have certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or provided with each delivery. Delivery certificates shall be given to the L.A. as each shipment of material is delivered. A list of the materials used, together with typical certificates of each material, shall be submitted to the L.A. prior to the final acceptance of the job.

## 2.2 TERMINOLOGY AND QUALIFICATIONS

- A. Plants or plant material having characteristics not conforming to terms as defined will not be accepted. The terms "plant material" or "plants" refer to all vegetation, whether trees, shrubs, ground cover, or herbaceous vegetation.
- B. Quality refers to structure and form, as evidenced by density and number of canes and branches, compactness, symmetry, and general development without consideration of size or condition. Standard quality indicates the least acceptable quality. Plants shall be typical of the species and variety of good average uniform growth, shall be well formed and uniformly branched, and shall have the minimum number of canes specified, free from irregularities, or shall conform to minimum quality index. Where the number of canes is not specifically stated in describing this grade, the standards of the "Horticultural Standards" as adopted by the American Association of Nurserymen, shall apply. In this case, the number of canes and other factors for the appropriate classification under "quality definition" in the Horticultural Standards shall be the Quality index. Plant material below this standard will be considered "culls" and are not acceptable. Plants shall be nursery grown.
- C. Specimen means an exceptionally heavy, symmetrical, tightly-knit plant, so trained or favored in its development and appearance as to be outstanding, superior in form, number of branches, compactness, and symmetry.
- D. Size is the factor controlled by dimensions representing height or spread, or both, without consideration of quality or conditions. For standard quality, a dimension is given for height or container size, or a dimension is given for height as well as container size.
- E. Height is usually indicated with tolerance. The smaller dimension is the minimum acceptable. The larger dimension represents the maximum permissible. The average dimension of all plants must equal the average of the tolerance figures shown on each item.
- F. Condition is the factor controlled by vitality and ability to survive and thrive and be comparable with normal plants of the same species and variety in the vicinity, at the same season of the year. In addition, plants shall be free from physical damage or adverse conditions that would prevent thriving. Conditions also sometimes refer to state of growth, i.e., whether "dormant condition" or "growing condition" and this state shall be comparable to plants of similar species in the vicinity or leaves, formation of buds, and the like.
- G. Cane means a primary stem which starts from the ground, or close to the ground, at a point not higher than 1/4 the height of the plant.
- H. Caliber shall be taken 12 inches above the finish grade or ground, as a guide, or where a dimension in trunk appears to form the head of the tree.
- I. Foliage line is maximum dimension in case of specimen plants. It measures from the ground to the lowest part of the body of plant.
- J. Collected plants shall not be used.

## 2.3 TOPSOIL

- A. Imported topsoil shall be obtained from naturally drained areas and shall be fertile, friable loam suitable for plant growth. Topsoil shall be subject to inspection and approval at the source of supply and upon delivery and shall include an analysis from a qualified soils laboratory showing compliance with ideal specifications as shown herein.
- B. The topsoil borrow shall be of uniform quality, free from subsoil stiff or lumpy clay, hard clods, hardpan, rocks, disintegrated debris, plants, roots, seeds, and any other materials that would be toxic or harmful to plant growth. Topsoil borrow shall contain no noxious weeds or

noxious weed seeds.

- C. Topsoil borrow shall meet all specifications below for either "Ideal" or "Acceptable" categories. Soil that falls within the "Not-Acceptable" range shall not be used. The contractor shall be responsible for obtaining an Agricultural Topsoil Report from a certified laboratory in determining the suitability of proposed topsoil borrow for inclusion in the project.

**TOPSOIL QUALITY\***

Category	pH	Soluble Salts dS/m or mho/cm	Sodium Absorption Ratio (SAR)	Organic Matter %	Sand %	Silt %	Clay %	Texture Class
<b>Ideal</b>	5.5- 7.5	<2	<3	≥2.0	<70	<70	<30	Loam (L), Silt Loam (SiL)
<b>Acceptable</b>	5.0- 8.2	<4	3 to 7 SiL, SiCL, CL 3 to 10 SCL, SL, L	>1.0	<70	<70	<30	<b>Sandy Clay Loam (SCL)</b>  <b>Sandy Loam (SL)</b>  <b>Clay Loam (CL)</b>  <b>Silty Clay Loam (SiCL)</b>
<b>Not-Acceptable</b>	<5. 0  >8. 2	>4	>10	<1.0	≥70	≥70	≥30	Loamy Sand (LS)  Sandy Clay (SC)  Silty Clay (SiC)  Sand (S), Silt (S), Clay (C)

**COARSE FRAGMENTS\***

Category	%>2 mm (>5.0% exceeds guidelines)	Rocks Present >1.5" (>1.5" exceeds guidelines)
<b>Ideal</b>	□2.0	—
<b>Acceptable</b>	2.1-5.0	—
<b>Not-Acceptable</b>	>5.0	—

**TOPSOIL NUTRIENT SPECIFICATION\***

	<b>Nitrate Nitrogen ppm</b>	<b>Phosphorus ppm</b>	<b>Potassium ppm</b>	<b>Iron ppm</b>
<b>Ideal / Acceptable</b>	>20	>15	>150	>10

\* from "Topsoil Quality Guidelines for Landscaping", June 2002, AG/SO-02, prepared by Rich Koenig, Utah State University Cooperative Extension Soil Specialist, and Von Isaman, QA Consulting and Testing, LLC.

- D. **Mechanical Analysis** shall be performed and shall conform to ANSI/ASTM D 422. QUALITY ASSURANCE.

**2.4 FERTILIZER AND ADDITIVES**

- A. Fertilizer and additives shall be determined by the Topsoil Analysis and based on Section 32 9300-2.3.
- B. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.
- C. Chemical fertilizers shall be a mixed commercial fertilizer conforming to FS O-F-241 D, Type I, with percentages of nitrogen, phosphoric acid, and potash at 5-10-5 and 16-16-8. The combined N-P-K content shall be the following percentages of total weight: 5 percent nitrogen 10 percent phosphoric acid and 5 percent potash. Fertilizers shall be uniform in composition, dry, and free flowing.
- D. Tablets shall be 21 grams each 20-10-5 Agriform, Lesslie, or approved equal.

**2.5 MULCH**

- A. 'Soil Pep' mulch material shall be 'Soil Pep' as manufactured by Mountain West Bark Products, or equal.
- B. Rock Mulches
  - 1. Type 1 - 3" to 4" diameter rounded rock mulch and tan in color.
- C. Bark Mulches
  - 1. Match existing.

**2.7 PLANT MATERIALS**

- A. Plants shall meet the requirements of the Contract Documents and shall be in accordance with the botanical names and applicable standards of quality, size, condition, and type. They shall be true to name, genera, species, and variety in accordance with reference publications.
- B. Plant names are defined in "Standardized Plant Names" and "Bailey's Encyclopedia of Horticulture." When a name is not found in either reference, the accepted name used in the nursery trade shall apply.
- C. Plants shall be marked for identification. Each bundle of plants and at least 25 percent of each species and variety of separate plants in any one shipment shall have legible labels



securely attached before delivery to the site.

- D. All trees and shrubs shall be measured while their branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch or root tip to tip. No trees will be accepted with their leaders cut, or so damaged that cutting is necessary.
- E. All plants shall be symmetrical and shall conform to the size, age, and condition as specified on the plant list shown in the Contract Documents. Exceptions are as follows:
  - 1. Plants larger than specified in the plant list may be used if approved by the L.A., but use of such plants shall not increase the contract price. If the use of larger plants is approved, the spread of roots or ball earth shall be increased in proportion to the size of the plant. Bare root plants furnished in size greater than specified shall be balled and burlaped when required by the L.A.
  - 2. Where caliper or other dimensions of any plant materials are omitted from the Plant List, it shall be understood that such plant materials shall be normal stock for type
- F. Plants shall be of sound health, vigorous, and free from plant disease and shall be well-branched, shall have full foliage when in leaf, and shall have a healthy well-developed normal root system. Cold storage plants will not be accepted. Plants that are sensitive to shock from elevation change shall be grown at elevations close enough to site to alleviate any plant damage due to such change for at least 2 years.
- G. Bare rooted (BR) plants shall have well-developed branch systems and vigorous root systems. They shall be dug to sufficient depth to insure full recovery and development of the plants. The roots of these plants shall be covered with a uniformly thick coating of mud being puddled immediately after they are dug.
- H. Balled and burlaped (BB) plants shall have firm, natural balls of earth, or diameter not less than that specified and of sufficient depth to include all the fibrous and feeding roots. No plant moved with a ball will be accepted if the ball is cracked or broken before or during plant operations, except on special approval of the L.A.
- I. Roots or balls of all plants shall always be adequately protected from the sun and drying winds.
- J. Plants (indicated to be in marked cans, pots, or other containers on the plant list) shall be grown in the containers for a minimum of 6 months and a maximum of 2 years. Roots shall fill the containers but show no evidence of being or having been root bound.
- K. Trees shall have straight trunks and all old abrasions and cuts shall be completely callused over. In no case shall trees be topped before delivery.
- L. Plants shall have been transplanted or root-pruned at least once in the 2 years. Plants shall not be pruned prior to delivery except as authorized by the L.A.

## **2.8 TURF SOD**

- A. See Section 32 9200 – Lawns and Grasses

## **2.9 STAKING MATERIALS**

- A. Staking System: As indicated on Drawings
- B. Guying System: As indicated on Drawings.
- C. Flags: Standard surveyor's plastic flagging tape, white, 8 inches long.

## 2.10 EROSION-CONTROL MATERIALS

- A. Retain applicable paragraphs in this article; revise to suit Project or insert other erosion-control materials.
- B. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- C. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb./sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.
- D. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 4-inch nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.

## 2.10 LANDSCAPE ACCENT BOULDER

- A. Natural Boulder – 2-to-4-foot diameter – Tan - Round.
  - 1. Provide photos for approval.

## 2.11 MISCELLANEOUS

- A. Anti-Desiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs
- B. Weed barrier fabric shall be one of the following:
  - 1. Dewitt Weed Barrier Pro 5, Western Landscape "Polyspun" XL, or approved equal.

## PART 3 -- EXECUTION

### 3.1 GENERAL

- A. The landscape work shall not be performed at any time when it may be subject to damage by climatic conditions.
- B. The CONTRACTOR shall verify all dimensions in the Contract Documents. Dimensions and plant locations shown shall be coordinated with L.A. and final location shall be site-oriented by the planter and L.A. Any discrepancies or inconsistencies discovered shall be brought to the attention of the L.A.
- C. In case of conflict between the plant list totals and total plant count of the Contract Documents, the CONTRACTOR shall provide the higher number of plants.
- D. Delivery of materials may begin only after samples and tests have been approved by the L.A. All materials furnished for the work shall be not less than the approved sample.
- E. Substitutions for the indicated plant materials may be permitted pursuant to the Contract Documents.
- F. The CONTRACTOR shall provide temporary fencing, barricades, covering, or other protections to preserve existing landscaping items indicated to remain and to protect the adjacent properties and other structures when they may be damaged by the landscape work. As indicated on Drawings.

- G. Waste materials shall be removed and disposed of off the OWNER's property, unless otherwise indicated.
- H. It shall be the responsibility of the CONTRACTOR to avail itself of any information regarding utilities which are in work and to prevent damage to the same. The CONTRACTOR shall provide protection to the utilities as necessary.
- I. Burning of combustible materials on the site shall not be permitted.
- J. The CONTRACTOR shall provide protection for structures, sidewalks, pavements, and other facilities in areas of work which are subject to damage during landscape work. Open excavations shall be provided with barricades and warning lights which conform to the requirements of governing authorities and the State's OSHA safety requirements from dusk to dawn each day and when needed for safety.
- K. Planting areas include all areas to be landscaped unless specified or shown, otherwise.

### 3.2 EROSION-CONTROL MATERIALS

- A. Determine erode-ability of all slopes and make provisions to stabilize them immediately on being given notice to proceed with the work. Protect all newly excavated areas and existing slopes subject to erosion during every phase of the landscape operation until the project is accepted. Use measures acceptable to the owner and the landscape architect, and as an inclusive part of this contract, repair any damages occurring to the slopes or other improvements caused by erosion or sedimentation or siltation deposits, while under contract, at the contractor's expense.
- B. For erosion-control mats, install planting soil in two lifts, with a second lift equal to thickness of erosion-control mats. Install erosion-control mat and fastener as recommended by material manufacturer.
- C. Fill cells of erosion-control mat with planting soil and compact before planting.
- D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturers.
- D. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

### 3.2 SOIL PREPARATION

- A. **PRIOR** to placement of topsoil and/or amending topsoil, an Agricultural Topsoil Report shall be preformed for the existing site topsoil conditions and if used the imported topsoil. The existing and proposed topsoil shall be amended to meet the above specifications in Section 2.3 Topsoil.
- B. The landscape work shall not begin until all other trades have repaired all areas of settlement, erosion, rutting, etc., and the soils have been re-established, recompacted, and refinished to finish grades. The L.A. shall be notified of all areas which prevent the landscape work from being executed.
- C. Slope and grade all landscape areas to drain properly and prevent any standing water from occurring. Standing water will not be accepted under any condition and regarding the subject area will be required of the contractor. Call improperly draining raised or surface planters to the attention of the landscape architect for resolution with the architect or engineer before any planting. Provide positive drainage from roof down spouts away from structures at a minimum of 2%. Collect surface drainage where necessary and all roof discharge into

mechanically devised pvc catch basins, using solid and corrugated pipe.

- D. Areas requiring grading by the landscaper including adjacent transition areas shall be uniformly level or sloping between finish elevations to within 0.10-ft above or below required finish elevations.
- E. The landscape work shall not proceed until after walks, curbs, pavings, edging, and irrigation systems are in place. The contract operations shall be completed to a point where the landscape areas will not be disturbed. The subgrade shall be cleaned free of waste materials of all kinds.
- F. During grading waste materials in the planting areas such as weeds, rocks (1 inch and larger) building materials, rubble, wires, cans, glass, lumber, sticks, etc., shall be removed from the site. Weeds shall be dug out by the roots.
- G. Fertilizers, additives, peat, etc. subject to moisture damage shall be kept in a weatherproof storage place in such a manner that they will be kept dry.
- H. After removal of waste materials, the planting areas subgrade shall be scarified and pulverized to a depth of not less than 6 inches and all surface irregularities below the cover of soil removed.
- I. Finish subgrade and amended topsoil placement and grading shall consist of:
  - 1. Prepare subgrade by rough grading and removing all irregularities and debris, then till and scarify subsoil to a depth of 6 inches before placing amended topsoil. Dig subgrade down as required in shrub beds and turf sod areas for the placement of amended topsoil. Provide laser leveling on large flat areas to create a uniform level subgrade.
  - 2. Landscape contractor is responsible for the last 7 inches of grade in turf sod areas (6 inches of topsoil and 1 inch for sod) and 16 inches in shrub bed areas (4 inches of mulch and 12" of amended topsoil). The planting islands in the parking lots shall have all road base removed prior to placement of topsoil. Refer to grading plan for finish grade and drainage. Subgrade soil shall be in a loosened and rough surface finish before amended topsoil is placed over subgrade. (Sub-grade surface shall not be smooth, but a rough surface shall exist for a transition zone of amended topsoil to subsoil.) If areas of subgrade become compacted before amended topsoil is placed, subgrade shall be tilled again before amended topsoil placement.
  - 3. Placing all soil additives and fertilizers in the areas as noted on the plan and per the topsoil report.
  - 4. Till lawn and planting area subsoils and topsoil's that are compacted.
  - 5. After tilling, bring areas to uniform grades by floating and/or hand raking. In large open level areas, perform laser leveling to create uniform level areas.
  - 6. Make minor adjustment of finish grades as directed by the landscape architect or owner.
  - 7. Remove waste materials over 1" in size such as stones, roots, or other undesirable foreign materials and finish raking, dishing, dragging, and smoothing soil ready for planting.
  - 8. No grading or soil placement shall be undertaken when soil is wet or frozen.
- J. Any unusual subsoil condition that will require special treatment shall be reported to the L.A.
- K. Amended topsoil shall be uniformly distributed over all areas where required. Subgrade and amended topsoil shall be damp and free from frost.
- L. Surface drainage shall be provided as shown by molding the surfaces to facilitate the natural run-off of water. Low spots and pockets shall be filled with amended topsoil and graded to drain properly.

- M. Finish grade for sodded areas shall be 1 inch below finish grade of adjacent pavement. Finish grade (top of mulch) shrub bed areas shall be 1 inch below finish grades of adjacent pavement.

### **3.3 DELIVERY, STORAGE, AND HANDLING OF PLANT MATERIALS**

- A. No plants other than the required samples shall be dug or delivered to the site until the required inspections have been made and the plant samples are approved
- B. Plants shall not be pruned prior to delivery except upon approval by the L.A.
- C. Plant material shall be planted on the day of delivery if possible. The CONTRACTOR shall protect the stock in a temporary nursery at the project site where it shall be protected from sun and drying winds and shall be shaded, kept moist, and protected with damp soil, moss, or other acceptable material. Plants shall be planted within 2 days after delivery.
- D. All balled and burlapped plants which cannot be planted immediately in delivery shall be set on the ground and shall be well protected with soil, wet moss, or other acceptable material. Bare rooted plants, which cannot be planted immediately, shall be planted on heeled-in trenches immediately upon delivery. No material heeled-in more than one week may be used. Bundles of plants shall be opened, and the plants separated before the roots are covered. Care shall be taken to prevent air pockets among the roots.
- E. During planting operations, bare roots shall be covered with canvas, wet straw, or other suitable materials. No plants shall be bound with wire or rope at any time to damage the bark or break branches.
- F. Plants shall not be picked up or moved by stem or branches but shall be lifted the ball or container.
- G. Plants shall be lifted and handled from the bottom of the ball or container. Plants with balls cracked or broken before or during planting operations will not be accepted and shall be immediately removed from the site.

### **3.4 TREE AND PLANT LOCATIONS**

- A. The CONTRACTOR shall locate and stake all tree and shrub locations and have the locations approved by the L.A. before starting excavation for same. The plant locations shall be observed, and their locations shall be adjusted as directed by L.A. before final approval.
- B. No trees shall be located closer than 72 inches to structures unless otherwise shown. Ground covers and shrubs may be planted up to structures or curbs.
- C. Trees shall be spaced so that the mature canopy does not interfere with light or power poles. They also shall be spaced no closer than ten feet from fire hydrants, ten feet from driveways, five feet from service walks and 5 feet from water meters.

### **3.5 PLANT PITS**

- A. Plant pits, centered on location stakes, shall be excavated circular pits with vertical sides and flat or saucer shape bottom in accordance with the following sizes unless shown otherwise.
  - 1. Tree pits shall be at least 3 times greater in diameter than the specific diameter of ball or spread of roots, and at depth of ball or roots.
  - 2. Shrubs shall be planted in pits or holes of soil the depth of ball below finished grade, or as much deeper as necessary to properly set the plant at finished grade.

### **3.6 PREPARED BACKFILL**

- A. Tree and shrub pit backfilling soil shall consist of 1/2 existing topsoil borrow from plant pit and 1/2 imported topsoil borrow.
- B. Tree and shrub pits shall be provided with fertilizer tablets as follows:
  - 1 per one-gallon can plant
  - 3 per 5-gallon can plant
  - 5 per 15-gallon can plant
  - 5 per deciduous and evergreen trees

### **3.7 ROCKS OR UNDERGROUND OBSTRUCTIONS**

- A. In the event that rock or underground obstructions are encountered in the excavation of plant pits, alternative locations shall be selected by the L.A. Moving of trees to alternative locations shall not entail additional costs to the OWNER.

### **3.8 SETTING PLANT MATERIALS**

- A. The soil shall not be worked when the moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in the air or that clods will not break readily. Water shall be applied, if necessary, to provide ideal moisture for filling and for planting as specified herein.
- B. Plants shall be set in center of pits as shown in the Contract Documents. They shall be set plumb and straight, and at such a level that after settlement that the crown of the plant will be 1 to 2 inches above the finished grade.
- C. Balled and burlapped trees shall have planting soil placed and compacted around base of ball to fill all voids. All burlap ropes or wires shall be removed from the sides and tops of balls.
- D. All ground cover plants shall be evenly spaced, staggered in rows, and set at intervals specified, so as to produce a uniform effect. Plants shall be watered immediately after planting operations have been completed.
- E. All shrubs and vines shall be pruned to remove damaged branches. All bare root shrubs shall be pruned and shaped to compensate for transplant root loss.
- F. Planting soil around roots or balls shall be thoroughly compacted and watered. After planting, the soil in the shrub beds shall be cultivated between shrubs, raked smoothly, and neatly outlined. Muddy soil shall not be used for backfilling. All broken or frayed roots shall be properly cut off.
- G. Trees and shrubs on slopes steeper than 6 to 1 shall be provided with watering dams or berms at least 6 inches high and 8 inches wider than planting pit (hole) unless specified or shown otherwise.
- H. All trees shall be thoroughly watered immediately after planting.
- I. Preserve all nursery labels intact until acceptance by the landscape architect then remove them before final inspections.

### **3.9 STAKING AND TREE WRAPPING**

- A. Staking of trees shall be done immediately after they are planted. Plants shall stand plumb after staking. Staking shall be as indicated on Drawings.

- B. Trees 2-inch caliper and less shall be supported by 2 stakes placed diametrically opposite at perimeter line of ball and to sufficient depth to hold tree rigid. Stakes shall be driven vertically and not twisted or pulled. Trees shall be wired to each stake as indicated on Drawings.
- C. All deciduous trees greater than 2-inch caliper and all evergreen trees 6'-0" and taller shall be triple staked or guyed as indicated on Drawings.

### **3.10 PRUNING AND MULCHING**

- A. Each tree and shrub shall be pruned in accordance with standard horticultural practice to preserve the natural character of the plant in the manner fitting its use in the landscape design. Prune plant material only as approved by the L.A.
- B. All dead wood or suckers and all broken or badly bruised branches shall be removed by thinning out and shortening branches. Deciduous bare-rooted plants shall have not less than 1/3 of their respective leaf surfaces removed. All cuts shall be made just above a healthy bud. Pruning shall be done with clean, sharp tools.
- C. Areas to receive rock mulch are to be weed free and sprayed with a pre-emergent herbicide before the weed barrier is placed.
- D. Plants shall be mulched after planting and cultivating have been completed. A layer of mulch materials, as hereinbefore specified, shall be spread on finished landscaping grade within all planting areas to a depth of 4 inches or as indicated on the plans. The mulch around isolated trees shall be 3 feet in diameter. All shrub and ground cover beds shall be completely covered with the mulch as indicated on the Drawings.

### **3.11 MISCELLANEOUS ITEMS**

- A. Rock mulch shall be placed in the planting areas as shown, spread carefully and evenly to a minimum depth as indicated on the plans over the entire area.
- B. Rock mulch shall be placed in the landscape areas as noted on plans, spread carefully and evenly to a minimum depth as noted on plans over weed barrier fabric. Use bark mulch around tree pits in turf areas and perennials per the Drawings.
- C. Weed barrier fabric shall be placed under rock mulch so as not to be visible.
- D. Concrete curbing shall be placed so that the top finish of curbing matches adjoining concrete curbs and walks. Curbing shall be straight and uniform both horizontal and vertically. Where the curbing is next to building, curbing shall be placed against the structure without gaps between structure and curbing.

**END OF SECTION**

**SECTION 33 0505  
DUCTILE IRON PIPE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Ductile iron pipe, couplings, fittings, and joint materials.
- B. Related work includes but is not limited to,
  - 1. Excavation, Section 31 23 16.
  - 2. Trench backfill, Section 33 05 20 .
  - 3. Landscape restoration, Section 32 92 00 or Section 32 93 13.
  - 4. Pavement restoration, Section 33 05 25.

**1.02 REFERENCES**

- A. AWWA C104: American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- B. AWWA C110: American National Standard for Ductile-Iron and Gray Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.
- C. AWWA C111: American National Standard For Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
- D. AWWA C115: American National Standard for Flanged Ductile-Iron and Gray Iron Pipe with Threaded Flanges.
- E. AWWA C151: American National Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- F. AWWA C600: AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

**PART 2 PRODUCTS**

**2.01 PIPE AND FITTINGS**

- A. Buried Applications:
  - 1. Class 52 or pressure class 350 psi ductile iron pipe, AWWA C151 with push-on joints, AWWA C111.
  - 2. Cement lining for all pipe and fittings, AWWA C104.
  - 3. Class 250 fittings, AWWA C110.
  - 4. Coupler with mechanical joint fittings, AWWA C104, C110, and C111.
  - 5. Rubber gasket slip-on pipe joints, AWWA C111 with gasket lubricant.
  - 6. Bronze wedges with current capacity of 400 amps each for each joint as follows:

Pipe Diameter	No. of Wedges
less than 10"	2
10"	3
12"	4
greater than 12"	6

- B. Above Ground Applications: As buried applications, except use bolted flanged fittings, AWWA C104, C110, and C115.

**2.02 COVERINGS**

- A. Buried Mechanical Joints: Grease and 8 mil vinyl wrap plastic cover.



- B. Pipe Sections: 8 mil vinyl wrap plastic cover.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Install pipe per manufacturer's instructions and AWWA C600.
- B. Water distribution and transmission, Section 33 12 19.
- C. Gravity water systems, Section 33 31 00 or Section 33 41 00.
- D. Irrigation Systems, Section 32 84 23.

**END OF SECTION 33 0505**

**SECTION 33 0506  
POLYETHYLENE PIPE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Polyethylene pipe, couplings, fittings and joint materials.
- B. Related work includes but is not limited to,
  - 1. Excavation, Section 31 23 16.
  - 2. Trench backfill, Section 33 05 20.
  - 3. Landscape restoration, Section 32 92 00 or Section 32 93 13.
  - 4. Pavement restoration, Section 33 05 25.

**1.02 REFERENCES**

- A. AASHTO M 252: Standard Specification for Corrugated Polyethylene Drainage Pipe.
- B. AASHTO M-294: Standard Specification for Corrugated Polyethylene Drainage Pipe 300-1200 mm Diameter.
- C. AASHTO MP7-97: Standard specification for Corrugated Polyethylene Pipe – 1350 and 1500 mm Diameter.
- D. ASME B1.1: Unified Inch Screw Threads (UN and UNR Thread Form), Supplement.
- E. ASTM A 307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- F. ASTM D 2239: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter.
- G. ASTM D 2321: Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- H. ASTM D 2657: Standard Recommended Practice for Heat Joining of Thermoplastic Pipe and Fittings.
- I. ASTM D 2774: Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.
- J. ASTM D 3261: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
- K. ASTM D 3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- L. ASTM F 477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- M. ASTM F 1055: Standard Specification for Electofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.

**1.03 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 (08) at 23 deg C.

**PART 2 PRODUCTS**

**2.01 SMOOTH WALL PIPE SYSTEMS**

- A. Material: PE 3408 per ASTM D 2239 with a minimum cell classification of 345434C per

ASTM D 3350.

- B. Pipe: Smooth wall inside and out with an SDR or working pressure rating indicated or accepted by ENGINEER. 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 D 3261.
  - 2. Flanged, ASTM D 2657.
  - 3. Ultra-high molecular weight Electrofusion Tape with a Polyethylene coupler meeting ASTM F 1055 requirements.

**2.02 CORRUGATED WALL PIPE SYSTEMS**

- A. Material: Polyethylene, ASTM D 3350 with a cell class as required in AASHTO M 252, AASHTO M 294 or AASHTO MP7-97
- B. Pipe: Type S or D unless specified otherwise. Corrugations may be either annular or helical.

<b>Type</b>	<b>Description</b>
C	Circular pipe with a corrugated surface inside and out
CP	Type C pipe with perforations
S	Circular pipe with an outer corrugated wall and a smooth inter wall
SP	Type S pipe with perforations
D	Circular pipe with a corrugated wall sandwiched between a smooth outer wall and a smooth inner wall

- C. Fittings:
  - 1. Blow molded with cell class 335420C, ASTM D 3350.
  - 2. Rotational molded with cell class 213320C, ASTM D 3350.
  - 3. Shop or field remanufactured of the same material as the pipe
- D. Joints:
  - 1. Bell and spigot with gaskets, ASTM F 477. 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 hex heads, Class 2 fit, ASTM A 307; Grade B, threads, ASME B1.1.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Install pipe as per manufacturer's instructions, ASTM D 2321 or ASTM D 2774.
- B. Water distribution and transmission, Section 33 12 19.
- C. Gravity water systems, Section 33 31 00 or Section 33 41 00.
- D. Irrigation Systems, Section 32 84 23.

- E. Tape wrap steel materials for protection against corrosion after piping installation.

**END OF SECTION 33 0506**

**South Jordan Middle School  
Parking Lot Addition/Remodel  
South Jordan, Utah**

**Jordan School District  
West Jordan, Utah**

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**SECTION 33 0507  
POLYVINYL CHLORIDE PIPE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Polyvinyl chloride pipe, couplings, fittings and joint materials.
- B. Related work includes but is not limited to,
  - 1. Excavation, Section 31 23 16.
  - 2. Trench backfill, Section 33 05 20.
  - 3. Landscape restoration, Section 32 92 00 or Section 32 93 13.
  - 4. Pavement restoration, Section 33 05 25.

**1.02 REFERENCES**

- A. ASTM D 1784: Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- B. ASTM D 2241: Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR - Series).
- C. ASTM D 2321: Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- D. ASTM D 2412: Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- E. ASTM D 2564: Standard Specification for Solvent Cement for Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- F. ASTM D 2729: Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- G. ASTM D 2774: Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.
- H. ASTM D 2855: Standard Practice for Making Solvent Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
- I. ASTM D 3034: Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- J. ASTM D 3139: Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- K. ASTM D 3212: Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- L. ASTM F 656: Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- M. ASTM F 679: Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
- N. ASTM F 949: Standard Specification for Poly(vinyl Chloride) (PVC) Corrugated sewer Pipe with a Smooth Interior and Fittings.
- O. AWWA C900: AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution.

**1.03 DEFINITIONS**

- A. Standard Dimension Ratio (SDR): Outside diameter of pipe divided by wall thickness.

**PART 2 PRODUCTS**

**2.01 GRAVITY PIPE SYSTEMS**

- A. Pipe:
  - 1. Solid smooth wall, 4 to 15 inch diameter, ASTM D 3034.
  - 2. 18 to 27 inch diameter, ASTM F 679.
  - 3. 4 to 10 inches diameter corrugated wall with a smooth interior, ASTM F 949.
- B. Fittings: ASTM D 1784.
- C. Stiffness: 50 psi minimum when measured at 5 percent deflection, ASTM D 2412.
- D. Additives and Fillers: Not to exceed 10 parts by weight; 100 parts of resin in the compound.
- E. Joints: Bell and spigot with flexible elastomeric seals, ASTM D 3212.
- F. Flattening: No visual evidence of splitting, cracking, or breaking when flattened to 60 percent deflection, ASTM D 2412.

## **2.02 PRESSURE PIPE SYSTEMS**

- A. Pipe: Conform to AWWA C900 except use outside diameters defined by ductile iron pipe sizes. Dimensions, class, SDR, and tolerances per ASTM D 2241.
- B. Compounds: Type 1, Grade 1, Class 12454A, ASTM D 1784.
- C. Joints:
  - 1. Bell and spigot with flexible elastomeric seals, ASTM D 3139. Use non-toxic lubricant.
  - 2. Solvent weld, ASTM D 2564.

## **2.03 PERFORATED PIPE SYSTEMS**

- A. Pipe: Refer to gravity pipe products above.
- B. Perforations: ASTM D 2729.
- C. Joints: Push-on, solvent weld or other.

## **2.04 SOLVENT WELDS**

- A. Primer, ASTM F 656.
- B. Glue, ASTM D 2564.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install pipe per manufacturer's instructions, ASTM D 2321 for gravity systems, AWWA C900 or ASTM D 2774 for pressure systems, And ASTM D 2855 for underground Irrigation Systems.
- B. Water distribution and transmission, Section 33 12 19.
- C. Gravity water systems, Section 33 31 00 or Section 33 41 00.
- D. Irrigation System, Section 32 84 23.

**END OF SECTION 33 0507**

**SECTION 33 0514  
UTILITY GRADE ADJUSTMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Raise, lower, or change slope of Street Fixtures.
- B. Install Cover Collars.
- C. This section is NOT APPLICABLE to raising and lowering Street Fixtures that withstand internal pressure.

**1.02 DEFINITIONS**

- A. Box: A structure such as a valve box, meter box, monument box, fire hydrant box, electrical pull box, cleanout box or other like structure not intended for human entry.
- B. Cover Collar: A concrete filled annular space between metal frames and the adjacent Pavement structural section.
- C. Extension Ring: A concrete or metal ring used to adjust surface elevations and surface cross slopes of Street Fixture covers. Metal rings are used between metal frames and metal covers or grates. Concrete rings are used below metal frames or in the concrete structure below.
- D. Manhole: A structure designed to permit human entry and working space inside and to confine and control the flow of pipe-conveyed fluids. These structures are collectively referred to as manholes regardless of composition, design, type or depth.
- E. Street Fixture: The top of existing structures such as but not limited to Manholes, catch basin, sumps, inlets, valve boxes, meter boxes, monument boxes, and similar structure in a thoroughfare surface.
- F. Vault: A structure intended for human entry containing electrical/telephone facilities or other like utilities.

**PART 2 PRODUCTS**

**2.01 PAVEMENT**

- A. Asphalt Concrete: AC-20-DM-1/2, Section 32 12 05.
- B. Cast-in-place Concrete: Class 4000, Section 03 30 04.

**2.02 GROUT**

- A. Hydraulic cement.

**2.03 EXTENSION RINGS**

- A. Metal: Cast iron or steel.
- B. Cast-in-place Concrete: Class 4000, Section 03 30 04.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Determine condition of existing incidental structure. Any item not reported damaged prior to construction shall be considered unbroken and must be replaced by CONTRACTOR at no additional cost to OWNER.



- B. Provide invert cover over pipe in cleanout box to prevent gravel, concrete, or debris from entering pipeline.
- C. Unless indicated otherwise, arrange for utility companies to adjust their own structures.
- D. Coordinate all adjustments with requirements of affected utility company.

**3.02 ADJUST STRUCTURE TO GRADE**

- A. Restrict excavation around the structure to a minimum area.
- B. At the completion of the structure adjustment, backfill the void around the structure and compact before paving or landscaping.
- C. Apply mortar to inside and outside of concrete grade rings used to make adjustments.
- D. If the cone is cracked during construction, restack the Manhole with shorter Manhole sections and install a new cone at no additional cost to the OWNER.

**3.03 ADJUST COVER IN PAVEMENT SURFACE**

- A. Method A - Metal Extension Rings:
  - 1. Use rings that lock together.
  - 2. Set frame at desired elevation and cross-slope.
  - 3. Seal joints between Pavement and ring.
- B. Method B – Concrete Extension Rings:
  - 1. Place concrete grade rings under frame or in structure riser shaft.
  - 2. Set frame at desired elevation and cross-slope.
  - 3. Provide 100 percent concrete support under frame. Do not use wood, bricks, concrete fragments, blocks or particles as support.
  - 4. Grout seams between concrete rings and between frame and concrete rings.
- C. Method C – Place Concrete:
  - 1. Set frame at desired elevation and cross-slope.
  - 2. Place concrete and provide 100 percent concrete support under frame.
- D. Method D – Concrete Deck:
  - 1. Remove existing concrete deck.
  - 2. Reset steel rebar.
  - 3. Set frame to grade, set forms.
- E. Pour concrete. Provide complete concrete support under Street Fixture.

**3.04 INSTALLING COVER COLLAR**

- A. Open an annular space between pavement and Street Fixture cover. Unless indicated otherwise, provide 12 inches of annular space.
- B. Set concrete collar to 1/4 inch minimum to 1/2 inch maximum below asphalt concrete pavement surface and 1/4 inch below Portland cement concrete pavement surface.
- C. Trowel finish, Section 03 35 00.

**3.05 PAVEMENT SURFACE RESTORATION**

- A. In new streets or overlays, adjust Street Fixture cover after bituminous paving is complete.
- B. Pavement restoration, Section 33 05 25.

**END OF SECTION 33 0514**

**SECTION 33 0520  
BACKFILLING TRENCHES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Trench backfill materials.
- B. Trench backfilling requirements.
- C. Surface restoration requirements.

**1.02 DEFINITIONS**

- A. Bedding: That surface of the Excavation or portion of the Pipe Zone below the pipe.
- B. Pipe Zone: That zone in a backfilling operation which supports, and surrounds the pipe barrel, and extends to 1 foot above the top of the pipe barrel.

**1.03 SUBMITTALS**

- A. Submit maximum laboratory dry density and optimum laboratory moisture content for:
  - 1. Subgrade material, and
  - 2. Each type of fill to be used.
- B. Upon ENGINEER's request, submit a written quality control Inspections and testing report describing source and field quality control activities performed by CONTRACTOR and its Suppliers.

**1.04 QUALITY ASSURANCE**

- A. Do not change material sources, or aggregate without ENGINEER's knowledge.
- B. Reject backfill material that does not comply with requirements specified in this section.

**1.05 STORAGE AND PROTECTION**

- A. Storage:
  - 1. Safely stockpile backfill materials.
  - 2. Separate differing materials, prevent mixing, and maintain optimum moisture content of backfill materials.
- B. Protection:
  - 1. During installation or repair, plug end of pipe or fitting except when installing next section of pipe or fitting.
  - 2. Avoid displacement of and injury to Work while compacting or operating equipment.
  - 3. Movement of construction machinery over Work at any stage of construction is solely at CONTRACTOR's risk.

**1.06 SITE CONDITIONS**

- A. Do not place, spread, or roll any backfill material over material that is damaged by water. Remove and replace damaged material at no additional cost to OWNER.
- B. Control traffic and erosion. Keep area free of trash and debris. Repair settled, eroded, and rutted areas.
- C. Reshape and compact damaged structural section to required density.
- D. Restore any damaged structure to its original strength and condition.
- E. Replace contaminated backfill at no additional cost to OWNER.

**1.07 SEQUENCING**

- A. Coordinate backfilling operation with pipeline commissioning requirements in Section 33 08 00.

**1.08 ACCEPTANCE**

- A. General:
  - 1. Native material may be wasted if there is no additional cost to substitute material acceptable to ENGINEER.
  - 2. For material acceptance refer to.
    - a. Common fill, Section 31 05 13.
    - b. Crushed aggregate base, Section 32 11 23.
    - c. Cement treated fill, Section 31 05 15.
- B. Trench Backfilling: One test per Lot.

<b>Table 1: Lot Size for Trench Backfilling Operation</b>		
<b>Material</b>	<b>Test Criteria</b>	<b>Lot size</b>
Subgrade	Standard (a)	200 lineal feet
Common Fill	Standard (a)	200 lineal feet per lift 25 square feet of footing area per lift
Crushed Aggregate Base	Modified (a)	200 lineal feet per lift 25 square feet of footing area per lift
Flowable Fill	Strength (b)	50 cubic yards
NOTES (a) Proctor density, Section 33 05 05 (b) Compressive strength, Section 31 05 15 (c) Lift thickness above the pipe zone before compaction, 8 inches.		

**1.09 WARRANTY**

- A. Any settlement noted in Trench backfill or in structures built over the Trench backfill will be considered to be caused by improper compaction methods and shall be corrected at no cost to the OWNER.
- B. Restore structures damaged by settlement at no additional cost to OWNER.

**PART 2 PRODUCTS**

**2.01 BACKFILL MATERIALS**

- A. Common fill, Section 31 05 13.
- B. Crushed aggregate base, Section 32 11 23.
- C. Cement treated fill, Section 31 05 15.
- D. Slag or asphalt bearing material not allowed.

## **2.02 ACCESSORIES**

- A. Water: Make arrangements for sources of water during construction and make arrangements for delivery of water to site. Comply with local Laws and Regulations at no additional cost to OWNER when securing water from water utility company.
- B. Geotextile Fabric: Section 31 05 19.
- C. Identification Tape: Permanent, bright-colored, continuous-printed magnetic plastic tape, intended for direct-burial service; not less than 6 inches wide by 4 mils thick. The tape shall read "CAUTION: BURIED INSTALLATION BELOW". Color of tape as follows.
  - 1. Red: Electric power lines, cables, conduit and lighting cables
  - 2. Yellow: Gas, oil, steam, Petroleum or gaseous materials
  - 3. Orange: Communications, alarm, signal, cables or conduits.
  - 4. Blue: Potable water
  - 5. Purple: Reclaimed Water, irrigation and slurry lines
  - 6. Green: Sewer and storm drain lines

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Verify backfill material meets gradation requirements, foundation walls are braced to support surcharge forces imposed by backfilling operations, areas to be backfilled are free of debris, snow, ice or water, and Trench bottom is not frozen.
- B. If Subgrade is not readily compactable secure written authorization for extra excavation and backfill; Section 31 23 16.
- C. Avoid injuring and displacement of pipe and structures while compacting soil or operating equipment next to pipeline.
- D. Place geotextile fabrics; Section 31 05 19.

### **3.02 GENERAL BACKFILLING REQUIREMENTS**

- A. Protect Subgrade from desiccation, flooding and freezing.
- B. Do not damage corrosion protection on pipe.
- C. Repair or replace damaged pipe at no additional cost to OWNER.
- D. Withdraw sheathing, Shoring, piles, and similar supports as backfilling progresses. Backfill and compact all holes left by removals.
- E. Provide sufficient water quality facilities to protect downstream fish and wildlife, and to meet State water quality requirements.
- F. Water settling of Trench backfill is not permitted. "Jetting" of Trench backfill is prohibited.

### **3.03 PIPE ZONE**

- A. Maintain uniform foundation along barrel of pipe with sufficient relief for joint connections.
- B. Use backfill materials meeting pipe manufacturer's recommendations. Maximum backfill particle size is 3/4 inch for plastic pipe.
- C. Do not permit free fall of backfill material which may damage pipe, pipe finish, or pipe alignment.
- D. Except where piping must remain exposed for tests, fill Pipe Zone as soon as possible.

### **3.04 TRENCH ABOVE PIPE ZONE**

- A. Maximum lift thickness before compaction is 8 inches.
- B. Fill unauthorized Excavations with material acceptable to ENGINEER at no additional cost to OWNER.

- C. Do not damage adjacent structures or service lines.
- D. Install continuous plastic line marker directly over buried lines 18 inches below finished grade.

**3.05 MODIFIED BACKFILL LAYER METHOD**

- A. At discretion of CONTRACTOR, backfill may be placed in thicker layers than indicated above subject to the following provisions.
  - 1. CONTRACTOR proves the ability of proposed method to achieve specified average compaction density.
  - 2. ENGINEER, on the basis of test results, approves the system in writing.
- B. Should CONTRACTOR find it necessary to change the method or any part of it, including the source of material, or the rate of placing the material, obtain approval of ENGINEER, who may require a further trial area.
- C. If testing shows a previously approved system is no longer producing the required degree of compaction, make changes to comply.
- D. Where vibration effects are creating environmental problems, make changes to eliminate problems.

**3.06 COMPACTION**

- A. Compact backfill, Section 33 05 05.
  - 1. A-1 soils: 95 percent or greater of a Modified Proctor Density.
  - 2. Other soils: 95 percent or greater of a Standard Proctor Density.

**3.07 COMPRESSIVE STRENGTH**

- A. Where a flowable fill is used, provide compressive strength indicated in Section 31 05 15. Use fill which flows easily and vibration is not required.

**3.08 SURFACE RESTORATION**

- A. Provide temporary paved surfaces where Trenches pass through roadways, Driveways or sidewalks.
- B. Restore paved surfaces; Section 33 05 25.
- C. Finish landscaped surfaces with grass, Section 32 92 00 or with other ground cover, Section 32 93 13.

**3.09 CLEANING**

- A. Remove stockpiles from the site. Grade site surface to prevent free standing surface water.
- B. Leave borrow areas clean and neat.

**END OF SECTION 33 0520**

**SECTION 33 0800  
COMMISSIONING OF WATER UTILITIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Testing requirements for potable and non-potable water piping systems.
- B. Warning: DO NOT use hydrostatic pressures described in this section for air-pressure testing.

**1.02 DEFINITIONS**

- A. Leakage: The quantity of water required to maintain the specified hydrostatic test pressure after the pipeline has been filled with water and the air expelled.
- B. Non-rigid Pipe: Any pipe that requires Bedding and backfill material for structural support.

**1.03 SUBMITTALS**

- A. Pipeline Test Report: Submit.
  - 1. Type of test.
  - 2. Identification of pipe system.
  - 3. Size, type, location and length of pipe in test section.
  - 4. Test pressure and time.
  - 5. Video cassette and log of visual examination.
  - 6. Amount of Leakage versus allowable.
  - 7. Date of test approval.
  - 8. Signature of test supervisor.
  - 9. Signature of Resident Project Representative witnessing and accepting the test.

**1.04 PROJECT CONDITIONS**

- A. Repair pipeline system at no additional cost to OWNER until it passes specified commissioning tests.

**1.05 WARRANTY**

- A. At the end of the One Year Correction Period repeat any test requested by ENGINEER to verify warranty of pipeline performance.

**PART 2 PRODUCTS**

**2.01 TESTING MATERIALS**

- A. Medium: Water, air.
- B. Recording Equipment (pressure systems):
  - 1. Supply all equipment and power to perform pressure testing.
  - 2. Secure approval of pressure gages.
  - 3. Locate all gages and recording equipment away from effect of sunshine or unsuitable weather conditions.
  - 4. Place, vents, pressure taps and drains for the test. Repair pipeline at completion of test at no additional cost to OWNER.

### PART 3 EXECUTION

#### 3.01 PREPARATION

- A. Notify ENGINEER 48 hours in advance of test.
- B. Carry out tests as pipeline construction progresses to ensure construction methods are producing satisfactory results.
- C. Remove debris, sediment and other material from installed pipe prior to testing. Do not discharge or flush sand, gravel, concrete, debris or other foreign material into any existing pipeline system. Flushing with clean water only will be allowed but with minimal flows to eliminate exceeding capacities of the existing gravity systems. Flushing into existing pressurized water systems will not be allowed.

#### 3.02 ALIGNMENT AND GRADE TEST

- A. Do not allow line and grade of pipe to vary more than 1/2 inch in 10 feet and not more than 1 inch variance from true line at any location.
- B. Do not allow grade of pipe to vary more than 1/4 inch in 10 feet for all design grades less than or equal to 1 percent and not more than 1/2 inch total variance from true grade at any location. Also, do not allow grade of pipe to vary more than 1/2 inch in 10 feet for all design grades greater than 1 percent and not more than 1 inch total variance from true grade at any location. These tolerances shall be acceptable provided that such variation does not result in a level or reverse sloping invert.
  - 1. The variation in the invert elevation between adjoining ends of pipe due to eccentricity of joining surface and pipe interior surfaces shall not exceed 1/64 inch per inch of pipe diameter, or 1/4 inch maximum.

#### 3.03 PRESSURE TEST

- A. Air Test: Per pipe manufacturer's recommendation. B. Hydrostatic test:
  - 1. Provide 225 psi test pressure for 2 hours unless specified otherwise.
  - 2. Provide air release taps at pipeline's highest elevations and expel all air before the test. Insert permanent plugs after test has been completed.
  - 3. No piping installation will be acceptable until the leakage is less than the amount allowed by industry standards for the type of pipe material being tested or if no standard prevails than the number of gallons per hour as determined by the formula:

$$Q = \frac{LD \times \text{square root of } P}{133,200}$$

Where:

- Q = allowable leakage, in gallons per hour. L = length of pipe under test in feet.
- D = nominal diameter of pipe in inches.
- P = average test pressure, in pounds per square inch (gage).
- C. Locate and repair defective joints and retest until the leakage rate is less than allowable.
- D. Repair any noticeable leakage even if total leakage is less than allowable.

#### 3.04 OBSTRUCTION AND DEFLECTION TEST

- A. Obstructions: Maximum protuberance is 1 inch.
- B. Deflections:
  - 1. Do not use mechanical pulling equipment when pulling mandrels through pipe.

2. Maximum reduction of internal diameter in any plane measured full length of installation and not less than 30 days after installation as follows.
  - a. Polyvinyl chloride pipe, 7.5 percent.
  - b. High density polyethylene pipe, 5 percent.
  - c. Ductile iron pipe, 3 percent.
  - d. Corrugated metal pipe, 7.5 percent.
3. Recommend an alternate method of measurement if mandrel testing would cause damage to internal pipe coating.

### **3.05 INFILTRATION TEST**

- A. Maximum is 50 gallons per inch diameter per mile per 24 hours.

### **3.06 PIPE TESTING SCHEDULE**

- A. Irrigation - Gravity System:
  1. Grade test: All circuits drain.
- B. Irrigation – Pressure System:
  1. Grade test: All circuits drain.
  2. Pressure test.
  3. Operational Testing:
    - a. Perform operational testing after hydrostatic test is complete; backfill is in place and sprinkler heads adjusted to final coverage.
    - b. Demonstrate system meets coverage requirements and automatic controls function properly.
    - c. Coverage requirements are based on operation of 1 circuit at a time.
- C. Sanitary Sewers:
  1. Alignment and grade test.
  2. Obstructions and deflection test.
  3. Infiltration test for gravity pipeline systems.
  4. Pressure test for pressure pipeline systems.
  5. Video inspection.
- D. Subdrains:
  1. Grade test: All pipelines drain.
  2. Obstructions and deflection test.
- E. Storm Drains:
  1. Alignment and grade test.
  2. Obstructions and deflection test.
  3. Infiltration test for gravity pipeline systems.
  4. Pressure test for pressure pipeline systems.
  5. Video inspection.
- F. Potable Water System:
  1. Obstruction and deflection test.
  2. Pressure test.
  3. Disinfection (Section 33 13 00).

**END OF SECTION 33 0800**



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**SECTION 33 1100  
WATER DISTRIBUTION AND TRANSMISSION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Water distribution and transmission system identification, valves, boxes, service connections and accessories.
- B. This section is applicable to potable and non-potable water pressure systems.

**1.02 REFERENCES**

- A. ACPA: American Concrete Pipe Association.
- B. Applicable water company requirements.
- C. AWWA C600: AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
- D. AWWA C605: AWWA Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
- E. AWWA C800: AWWA Standard for Underground Service Line Valves and Fittings.
- F. AWWA M11: AWWA Manual for Steel Pipe - Design and Installation.
- G. CDA: Copper Development Association.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Depth of Cover:
  - 1. 48 inches minimum to top of pipe, service line, or as indicated in local building code. 72 inches maximum unless ENGINEER authorizes otherwise.
  - 2. If less cover, provide additional protection to withstand frost and external loads.
- B. Remove any section of pipe already placed that is found to be defective or damaged. Relay or replace without additional cost to OWNER.

**1.04 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical product data and installation instructions.
- B. Commissioning: Submit testing data indicated in Section 33 08 00.
- C. Record Documents: Submit documents, Section 01 78 39. Include details of underground structures, connections, thrust blocks and anchors. Show interface and spatial relationship between piping and adjacent structures.
- D. Operating and Maintenance: Submit data, Section 01 78 23. Include maintenance data, parts lists, product data, and shop drawings.

**1.05 SITE CONDITIONS**

- A. Minimize neighborhood traffic interruptions. Barricade stockpiles.
- B. Secure acceptance of pipeline lateral tie-in work.
- C. Repair public and private facilities damaged by CONTRACTOR.
- D. Do not turn on or turn off any valve outside of the Work prior to securing ENGINEER's or water company's permission.

## **PART 2 PRODUCTS**

### **2.01 PIPES AND FITTINGS**

- A. Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, and capacities indicated. Use only NSF approved products in drinking water systems. All such products shall be appropriately stamped with the NSF logo.
- B. Where not indicated, provide proper selection as determined by installer and acceptable to ENGINEER to comply with installation requirements.
- C. Provide sizes and types of equipment connections for fittings of material that matches pipe material used in the piping system. Where more than one type of material or product Option is indicated, selection is installer's choice.
- D. Provide pipe fittings and accessories of same material and weight or class as pipe, with joining method indicated or recommended by manufacturer.

### **2.02 VALVES**

- A. Section 33 12 16.

### **2.03 VALVE BOX**

- A. Buried Valves In Traffic Areas: 2 piece, cast iron, screw adjustable sleeve, 5 - 1/4 inch shaft, with a drop lid.
- B. Buried Valves in Non-traffic Areas: Slip type of height required for the installation.
- C. Markings: On cover of valve box, cast the appropriate utility lettering.

### **2.04 VALVE CHAMBER**

- A. General: Refer to applicable design criteria requirements explained in Laws and Regulations.
- B. Basin: Class 4000 concrete floor and walls.
- C. Steps: Plastic, cast into sidewalls greater than 4 feet deep.
- D. Top: Flat slab class 4000 concrete.
- E. Frame and Cover: Scoriated asphalt coated, heavy duty ductile iron conforming to Section 05 56 00 with flat top design and appropriate utility lettering. Shape and size as indicated.

### **2.05 MORTAR, GROUT, AND CONCRETE**

- A. Mortar: Cement, Section 04 05 16.
- B. Grout: Cement, Section 03 61 00.
- C. Concrete:
  - 1. Cast-in-place: Class 4000, Section 03 30 04.
  - 2. Precast: Class 5000, Section 03 40 00.

### **2.06 TAPPING SADDLES**

- A. Provide bronze alloy, ductile iron, or stainless steel saddles with stainless steel double straps.
- B. Provide tapping saddles that have a minimum rated working pressure of 300 psi, neoprene Buna N gaskets, and bronze tapered threads.

### **2.07 SERVICE CONNECTION**

- A. Type K copper pipe; Section 33 05 03 with flare type 200 psi compression fittings in

accordance with AWWA C800. If materials used in main line are non-copper, provide a plastic nipple to separate the metals.

## **2.08 ACCESSORIES**

- A. Bolts, Nuts, Washers: Steel, Section 05 05 23.
- B. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.
- C. Corporation Stops: All bronze with tapered threads.
- D. Hydrant and Valve: Dry barrel, Section 33 12 19.
- E. Water Meter and Valve: Section 33 12 19.
- F. Grease: Non-oxide.
- G. Polyethylene Sheet: 8 mil thick.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify Trench Excavation is ready to receive work, and dimensions, and elevations are as indicated.
- B. Commencing installation means acceptance of existing conditions.

### **3.02 PREPARATION**

- A. Excavation, Section 31 23 16. Hand trim to required elevations. Correct over excavations.
- B. Remove stones or other hard matter that could damage pipe embedment or impede backfilling or compaction.
- C. Examine areas and conditions under which materials and products are to be installed. Do not proceed with system installation until unsatisfactory conditions have been corrected in manner acceptable to system installer.
- D. Clearly identify and promptly set aside defective or damaged pipe. E. Use pipe cutting tool acceptable to pipe manufacturer.

### **3.03 LOCATING POTABLE WATER PIPE**

- A. Comply with Utah Drinking Water Act. As a minimum locate potable water pipe at least 18 inches vertical and 10 feet horizontal edge to edge between water and sewer lines. Place water lines above sewer line.
- B. Where potable water pipe crosses under gravity-flow sewer lines, fully encase the sewer pipe in concrete for a distance at least 10 feet each side of the crossing.
  - 1. Do not locate any joint in the water line within 36 inches of the crossing.
  - 2. Encase water line if it is within 24 inches of a sewer force main or inverted syphon.
  - 3. Encase sewer main joints in concrete if joints are horizontally closer than 36 inches to the water line.
- C. Do not put potable water lines in the same Trench with sewer lines, storm drains or electric wires.

### **3.04 INSTALLATION - PIPE AND FITTING**

- A. General:
  - 1. Seal each open end of pipeline at end of day's work.
  - 2. Grease all bolts and nuts then apply polyethylene sheet and tape wrap.

- B. Steel Pipe: AWWA M11.
- C. Ductile Iron Pipe: AWWA C600.
- D. Copper Tube: CDA "Copper Tube Handbook".
- E. Polyethylene Pipe: For 3 inches and smaller pipe follow AWWA C901. Install all other sizes per manufacturer's installation instructions.
- F. Polyvinyl Chloride Pipe: AWWA C605.
- G. Concrete Pipe: ACPA "Concrete Pipe Handbook".
- H. Wedges: Install metal wedges on all metal pipe systems.

### **3.05 INSTALLATION – CONCRETE THRUST BLOCKS**

- A. Do not make hydrostatic tests of Section 33 08 00 until thrust block concrete has cured for at least 5 days.
- B. Provide thrust blocks on all plugs, caps, tees, hydrants and vertical or horizontal bends.
- C. Provide stainless steel or epoxy coated steel tie rods and clamps or shackles to restrain thrust.
- D. Unless otherwise indicated or directed by ENGINEER, place the base and bearing sides of thrust blocking directly against undisturbed earth.
- E. Sides of thrust blocking not subject to thrust may be placed against forms. Place thrust blocking so the fitting joints will be accessible for repair.

### **3.06 INSTALLATION - VALVES AND VALVE BOXES**

- A. Valves:
  - 1. Ensure all parts are in working order.
  - 2. Set location of valves outside of sidewalk limits, Driveway Approaches and other pedestrian or vehicular interference.
  - 3. Install plumb with stems pointing up.
  - 4. Grease all exposed bolts and nuts then apply polyethylene sheet and tape wrap.
- B. Valve Boxes:
  - 1. Set over valve nut so operator's key is plumb with clearance in valve box when opening and closing the valve.
  - 2. Adjust box to finish grade.
  - 3. Clean all dirt or foreign material out of box.

### **3.07 INSTALLATION – TAPS**

- A. Apply for and pay for applicable permits from water company for the indicated size and location of tap to water main. Comply with all connection requirements of water company.
- B. Make all service taps with a tapping machine acceptable to the water company. Use teflon tape on all taps unless indicated otherwise.
- C. The minimum distance between taps is 24 inches, with a 5 degree stagger. Do not make service taps within 24 inches of the end of pipe. Install taps at 60 degrees from vertical, or authorized by ENGINEER.
- D. Service saddles are required on all taps except, 3/4 inch or 1" taps to new ductile iron pipe
- E. Grease all exposed bolts and nuts then apply polyethylene sheet and tape wrap.

### **3.08 INSTALLATION – SERVICE LINES**

- A. Replacing Existing Water Service Line:
  - 1. Follow AWWA C800, Utah public drinking water regulations and Utah plumbing code requirements.
  - 2. When replacing water service lines, replace non-copper pipe with type K copper pipe, Section 33 05 03.

- B. Looping Existing Water Service:
  - 1. Minimum pipe diameter 3/4 inch.
  - 2. Pinching tools used to close and open service lines may be used only if allowed by ENGINEER. When service line pinches cannot be returned to previous shape or flow, remove and replace damaged portion of pipe.
  - 3. Soldered joints or connections not allowed.
  - 4. For copper to iron connections use a brass pack joint compression coupling with joint locking device.
  - 5. For copper- to- copper connections use a brass flare coupling.
  - 6. Follow details shown in the Drawings.
- C. Meter Box: Install meter boxes back of the curb, outside of sidewalks and Driveway Approaches and outside of other pedestrian and vehicular interference.

### **3.09 INSTALLATION – WATER MAIN LOOP (SYPHON)**

- A. Existing water mains may not match standard size. Excavate to obtain actual pipe diameter and match size.
- B. Do not shutdown pipeline until couplings and fittings are on site. Coordinate shutdown with water company.
- C. Connections to steel or transite pipe requires transition couplings or sleeves with transition gaskets.
- D. Grease all exposed bolts and nuts then apply polyethylene sheet and tape wrap
- E. Provide thrust blocks except where joints are welded. Follow details shown on the Drawings.

### **3.10 DISINFECTION**

- A. Section 33 13 00.
- B. After disinfection, legally dispose of disinfection water.

### **3.11 BACKFILLING**

- A. Prior to Backfilling:
  - 1. Secure ENGINEER's acceptance of brass wedge installations and concrete thrust block installations.
  - 2. For pressure pipe testing follow Section 33 08 00 requirements and for disinfection follow Section 33 13 00 requirements.
- B. Trenches: Section 33 05 20.
- C. Landscapes: Section 31 23 23.

### **3.12 SURFACING RESTORATION**

- A. Roadway Trenches and Patches: Section 33 05 25.
- B. Landscapes: Section 32 92 00 or Section 32 93 13 as applicable.

**END OF SECTION 33 1100**

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**SECTION 33 1216  
WATER VALVES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Gate, butterfly, plug, check, pressure reducing, pressure relief, control valves and their installation.
- B. Related work includes but is not limited to,
  - 1. Excavation, Section 31 23 16.
  - 2. Trench backfill, Section 33 05 20 .
  - 3. Landscape restoration, Section 32 92 00 or Section 32 93 13.
  - 4. Pavement restoration, Section 33 05 25.

**1.02 REFERENCES**

- A. AWWA C111: American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
- B. AWWA C504: AWWA Standard for Rubber-Seated Butterfly Valves.
- C. AWWA C508: AWWA Standard for Swing-Check Valves for Waterworks Service, 2 In. Through 24 In. NPS.
- D. AWWA C509: AWWA Standard for Resilient-Seated Gate Valves for Water and Sewerage Systems.
- E. AWWA C550: AWWA Standard for Protective Interior Coatings for Valves and Hydrants.
- F. AWWA C600: AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

**1.03 SUBMITTALS**

- A. Provide technical information as required for evaluating the quality of the valve. As a minimum include dimensions, weights, materials lists and operation charts.

**PART 2 PRODUCTS**

**2.01 VALVES - GENERAL**

- A. Underground:
  - 1. Less than 3 inches: Screwed ends.
  - 2. 3 inches and larger: Flanged or mechanical joint ends as specified. Non-rising stem. Two inches square operating nut. Low alloy steel bolts, AWWA C111.
- B. Submerged or Above Sewage or Water:
  - 1. Valve body bolts per manufacturer's recommendations.
  - 2. For joining valve to piping system use stainless steel nuts and bolts, Section 05 05 23.
- C. Below an Operating Deck: Provide shaft extension from the valve to deck level.
- D. Above Ground: Non-rising stems equipped with a hand wheel.
- E. Manually Operated Valves Over 6 feet Above Operating Level: Provide chain operated handles.
- F. Clearance: Install so that handles clear all obstruction when moved from opened to closed.
- G. Rated Working Pressure: 150 psi unless indicated.
- H. Coating: Interior, AWWA C550. Exterior per manufacturer's recommendation.



**2.02 GATE VALVES**

- A. Material: Cast iron body, bronze mounted. Furnish valves 3 inches through 48 inches that conform to the requirements of AWWA C509, non-rising stem design with "O" ring seals.
- B. Operating Direction: Open counterclockwise.
- C. Buried Valves: Flanged, mechanical joint, or as indicated.

**2.03 BUTTERFLY VALVES**

- A. Material: Cast iron body, bronze mounted. Furnish valves 3 inches through 48 inches that conform to the requirements of AWWA C504.
- B. Body Type: Short body or long body at CONTRACTOR's option or short body valves only where the disc will not interfere with adjacent fittings.
- C. Wafer Valves: Subject to approval.

**2.04 ECCENTRIC PLUG VALVES**

- A. Material: Cast iron body, bronze mounted, non-lubricated, eccentric, quarter-turn type with resilient face plugs, ductile iron discs with upper and lower shafts integral.
- B. Markings: Indicate open and close position.
- C. Port Areas: At least 82 percent of full pipe area.
- D. Resilient Seat Seals: Buna N, field replaceable.

**2.05 CHECK VALVES**

- A. Material: AWWA C508.
- B. Valves 2-1/2 inches in Size and Smaller: 200 psi working pressure Y-pattern, bronze, regrinding, swing check valve with screwed ends.
- C. Valves 3 inches in Size and Larger: Iron body, bronze mounted, flanged end, swing valves with stainless steel hinge pins.
- D. Outside Weight and Lever: Required.

**2.06 PRESSURE REDUCING VALVES - SERVICE LINE**

- A. Operation: Capable of reducing a varying higher upstream pressure to an adjustable constant lower downstream pressure.
- B. Spring and nylon reinforced diaphragm type construction.
- C. Equip with Y-strainer upstream of valve.

**2.07 PRESSURE REDUCING VALVES - MAIN LINE**

- A. Operation: Capable of maintaining an adjustable constant downstream pressure regardless of upstream pressure.
- B. Type: Hydraulically operated using a direct-acting, spring-loaded, normally open, pilot valve controlled diaphragm.
- C. Provide a single removable seat and a resilient disc. No "O" ring type discs permitted. No external packing glands permitted. No pistons operating the main valve or pilot controls permitted.
- D. Equip with Y-strainers on the pilot controls, variable closing and opening speed controls and a valve position indicator.
- E. Rating: 250 psi working pressure with flanged connections.
- F. Include an upstream and downstream pressure gage capable of accurately measuring

system pressures.

**2.08 PRESSURE RELIEF VALVES**

- A. Operation: Maintain a constant upstream pressure by passing or relieving excess pressure.
- B. Closed Valves: Drip-tight.
- C. Type: Hydraulically operated, pilot control using a diaphragm with a single removable seat and resilient disc.
- D. Pilot Controls: Direct acting, adjustable between 20 and 200 psi, spring-loaded diaphragm valve.
- E. Rating: 250 psi working pressure with flanged connections.

**2.09 CONTROL VALVE**

- A. Types: Diaphragm actuated, single seated, composition disc, hydraulically operated globe valve.
- B. Pilot Controls: Externally mounted, four-way, solenoid pilot valve with self-cleaning strainers and diaphragm type check valves.
- C. Equip with a limit switch for pump control.
- D. Equip with a built-in lift check valve to prevent flow reversal.
- E. Rating: 250 psi working pressure with flanged connections.
- F. Solenoids and the Limit Switch: Supplied with operating voltage as indicated.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Flush all lines before valve installation.
- B. In ductile iron water mains install valves, AWWA C600.
- C. Install butterfly valve shafts vertical in Vault boxes and horizontal otherwise.

**END OF SECTION 33 1216**

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**SECTION 33 1219  
HYDRANTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Dry-barrel fire hydrants, valves, piping and accessories.

**1.02 REFERENCES**

- A. AWWA C110: American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.
- B. AWWA C111: American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
- C. AWWA C209: AWWA Standard for Cold-Applied Tape Coatings for the Exterior of Special Section, Connections, and Fittings for Steel Water Pipelines.
- D. AWWA C210: AWWA Standard for Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
- E. AWWA C213: AWWA Standard for Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel water Pipelines.
- F. AWWA C214: AWWA Standard for Tape Coating Systems for the Exterior of Steel Water Pipelines.
- G. AWWA C502: AWWA Standard for Dry-Barrel Fire Hydrants.
- H. AWWA M17: AWWA Manual for Installation, Operation, and Maintenance of Fire Hydrants.

**1.03 PRODUCT HANDLING**

- A. Package fire hydrants, gate valves, and valve boxes for protection against dirt and damage during shipment and storage.
- B. Do not plug drain hole.

**1.04 SUBMITTALS**

- A. Product Data: Manufacturer's technical product data and installation instructions.
- B. Shop Drawings: Show interface and spatial relationship between piping and adjacent structures.
- C. Field Quality Control Reports: For system commissioning.

**1.05 JOB CONDITIONS**

- A. Notify appropriate fire department as soon as hydrant is removed or placed in service.

**PART 2 PRODUCTS**

**2.01 DRY-BARREL FIRE HYDRANT**

- A. Cast iron compression type, AWWA C502, opening against pressure and closing with pressure, base valve design, 150 psi working pressure, with 1/4 inch diameter minimum tapping and bronze plug in standpipe.
  - 1. Size: 5-1/4 inch valve opening.
  - 2. Direction to Open Hydrant: Counterclockwise.
  - 3. Size and Shape of Operating and Cap Nuts: Pentagon. 1-1/2 inch point to flat.
  - 4. Hose Nozzles: Two 2-1/2 inch National Standard Thread, cap, gasket and chain.

5. Pumper Nozzle: One 4-1/2 inch National Standard Thread, cap, gasket and chain.
6. Depth of Burial: 48 inches or consistent with main depth.
7. Connection to Main: 6 inches flanges or mechanical joint.
8. Pressure: 150 psi working pressure and 300 psi hydrostatic pressure.
9. Inlet Bottom Connection: 6 inches mechanical joint or flanged in accordance with AWWA C110 and AWWA C111, designed to allow separation at the sidewalk level when hydrant is sheared off.
10. Automatic Drain: Opens as the hydrant is closed.

## **2.02 PIPE AND FITTINGS**

- A. Ductile iron, Section 33 05 05. Standard drilling, AWWA C110.
- B. PVC, Section 33 05 07.
- C. Steel, Section 33 05 09. Standard drilling, 150 lb.
- D. Spool, Schedule 40 steel, epoxy lined, exterior wrapped with minimum 60 mil thick tape wrap, AWWA C210 or C213 and C209 or C214 with two welded in place 150 lb. steel ANSI B 16.5 slip on flanges.

## **2.03 VALVES**

- A. Gate valve. Section 33 12 19.
- B. If indicated, furnish an auxiliary 6 inch diameter valve with end connections as required.

## **2.04 ACCESSORIES**

- A. Bolts, Nuts, Washers: Stainless steel, Section 05 05 23.
- B. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.
- C. Thrust Blocks: Cast-in-place concrete, Class 2000 minimum, Section 03 30 04.
- D. Valve Box, Valve Chamber: Section 33 12 19.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Excavation, Section 31 23 16.

### **3.02 INSTALLATION**

- A. Install hydrants, valves, and valve boxes as indicated and located in accordance with AWWA M17. Hydrants shall not be connected to or located within 10 feet of a sanitary sewer or storm drain.
- B. Install so bottom of hydrant base flange is even with or less than 4 inches above grade.
- C. Point 4-1/2" pumper nozzle to face the street.
- D. Drain holes at base of hydrant to remain clear with a minimum of 1 cubic yard of clean Sewer Rock (Section 32 11 23) placed around hydrant base and drain. Place sheet plastic over gravel to prevent silting.
- E. Coal tar and tape wrap steel pipe.
- F. Grease all buried nuts and bolts and wrap with 8 mil polyethylene sheet and tape.
- G. Install thrust blocks, Section 33 12 19.

### **3.03 BACKFILLING**

- A. Secure water company permission to commence backfilling operation.
- B. Trenches, Section 33 05 20.
- C. Structures and landscaping, Section 31 23 23.
- D. Pavements, Section 32 05 10.

**3.04 PAINT**

- A. Paint buried portion of hydrant with two coats of coal tar enamel or asphalt.
- B. Paint hydrant barrel and caps with one coat primer and final coat per water company paint standards.

**3.05 FIELD QUALITY CONTROL**

- A. Commissioning, Section 33 08 00.
- B. Disinfection, Section 33 13 00.

**END OF SECTION 33 1219**

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**SECTION 33 1300  
DISINFECTION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Disinfection of potable water system.
- B. Test and report results.

**1.02 REFERENCES**

- A. AWWA A100: AWWA Standard for Water Wells.
- B. AWWA B300: AWWA Standard for Hypochlorites.
- C. AWWA B301: AWWA Standard for Liquid Chlorine.
- D. AWWA C651: AWWA Standard for Disinfecting Water Mains.
- E. AWWA C652: AWWA Standard for Disinfection of Water-Storage Facilities.
- F. State of Utah: Public Drinking Water Regulations, Part 2, Section 12.

**1.03 DEFINITIONS**

- A. Disinfectant Residual: The quantity of disinfectant in treated water.
- B. PPM: Parts per million.

**1.04 SUBMITTALS**

- A. CONTRACTOR's evidence of experience in disinfection.
- B. Bacteriological laboratory's evidence of certification if laboratory is not OWNER's laboratory.
- C. Disinfection Report: 3 copies containing:
  - 1. Date issued.
  - 2. Project name and location.
  - 3. Treatment contractor's name, address and phone number.
  - 4. Type and form of disinfectant used.
  - 5. Time and date of disinfectant injection started.
  - 6. Time and date of disinfectant injection completed.
  - 7. Test locations.
  - 8. Initial and follow-up disinfectant residuals in ppm for each outlet tested.
  - 9. Time and date of flushing start.
  - 10. Time and date of flushing completion.
  - 11. Disinfectant residual after flushing in ppm for each outlet tested.
  - 12. Flush water disposal location and acceptance by local agency.
- D. Bacteriological Report: 3 copies including:
  - 1. Date issued.
  - 2. Project name and location.
  - 3. Laboratory's name, certification number, address, and phone number.
  - 4. Time and date of water Sample collection.
  - 5. Name of person collecting Samples.
  - 6. Test locations.
  - 7. Time and date of laboratory test start.
  - 8. Coliform bacteria test results for each outlet tested.
  - 9. Certification that water conforms or fails to conform to bacterial standards of State of Utah public drinking water regulations.
  - 10. Bacteriologist's signature.



**1.05 QUALITY ASSURANCE**

- A. Bacteriological Laboratory: Certified by State of Utah if laboratory is other than OWNER's laboratory.

**1.06 PRODUCT HANDLING**

- A. Store and protect disinfectant in accordance with manufacturer's recommendations to protect against damage or contamination. Do not use unsuitable disinfectant.
- B. Follow all instruction labeling for safe handling and storage of disinfectant materials.

**1.07 REGULATORY REQUIREMENTS**

- A. Conform to State of Utah public drinking water regulations.

**PART 2 PRODUCTS**

**2.01 DISINFECTANT**

- A. Liquid Chlorine: AWWA B301 with chlorine 99.5 percent pure by volume.
- B. Sodium Hypochlorite: AWWA B300 with not less than 100 grams per liter available chlorine.
- C. Calcium Hypochlorite: AWWA B300 with 65 to 70 percent available chlorine by weight in granular form.
- D. Powder, tablet, or gas according to manufacturer's specification.

**2.02 ALKALI**

- A. Caustic Soda or Soda Ash.

**2.03 ACID**

- A. Hydrochloric (Muriatic) type.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Provide necessary signs, barricades, and notices to prevent accidental exposure to disinfecting materials, consuming disinfecting water, or disturbing the system being disinfected.
- B. Make sure the potable water system is complete, clean, and that the system to be disinfected is not connected to the existing system.

**3.02 DISINFECTION OF WATER LINES**

- A. Use one method defined under AWWA C651 that is acceptable to ENGINEER.
- B. After pressure testing per Section 33 08 00, flush system through hydrants or if a hydrant does not exist, install a tap of sufficient size to provide 2.5 feet per second flushing velocity in the line.
- C. Starting at outlet closest to water source, bleed water from each outlet until chlorine residual reaches outlet. Repeat process at each outlet throughout system.
- D. Collect a bacteriological water sample at end of line to be tested. If sample fails

bacteriological test, flush system and retest. Continue flushing and retesting until a good sample is obtained.

- E. If flushing does not produce a passing bacteriological test disperse disinfectant throughout system to obtain 10 to 25 ppm of free chlorine residual.
- F. Flush the chlorinated water from the main until chlorine measurements show the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.
- G. After a negative bacteriological sample is obtained, let the system relax for 24 hours. Flush and collect a subsequent bacteriological sample for testing. If the subsequent test is negative then water line is acceptable.

**3.03 DISINFECTION OF CULINARY WELLS**

- A. Use one method defined under AWWA A100 that is acceptable to ENGINEER.
- B. Do not start disinfection until well is thoroughly cleaned.
- C. Use a disinfecting solution containing a minimum of 50 ppm residual chlorine.
- D. Flush system after disinfection.

**3.04 DISINFECTION OF WATER STORAGE RESERVOIRS**

- A. Use one method defined under AWWA C652 that is acceptable to the ENGINEER.
- B. Do not start disinfection until water storage tank is thoroughly cleaned.
- C. Provide and use necessary safety equipment for workers in contact with disinfectant or gasses.
- D. Flush system after disinfection.

**3.05 FIELD QUALITY CONTROL**

- A. Bacteriological Test:
  - 1. Collect Samples for testing no sooner than 16 hours after system flushing.
  - 2. Analyze water samples per State of Utah requirements.
  - 3. If bacteriological test proves water quality to be unacceptable, repeat system treatment.
  - 4. Do not place water systems into service until a negative bacteriological test is made. Provide a copy of the negative bacteriological test to ENGINEER.
- B. Disposal of Disinfectant:
  - 1. Legally dispose of disinfecting water and ensure no chlorine buildup or damage to the environment.

**END OF SECTION 33 1300**

**South Jordan Middle School  
Parking Lot Addition/Remodel  
South Jordan, Utah**

**Jordan School District  
West Jordan, Utah**

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**SECTION 33 4100  
STORM DRAINAGE SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Gravity systems such as irrigation, sub-drains, and storm drains.
- B. Pressure systems are indicated in Section 33 12 19.

**1.02 REFERENCES**

- A. ASTM C 478: Standard Specification for Precast Reinforced Concrete Manhole Section.
- B. ASTM C 891: Standard Practice for Installation of Underground Precast Concrete Utility Structures.
- C. ASTM C 923: Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Vertical Cover: 2 feet minimum or as indicated.
- B. Remove any section of pipe already placed that is found to be out of alignment tolerance indicated, defective, or damaged. Relay or replace without additional cost to OWNER.

**1.04 PROJECT CONDITIONS**

- A. Minimize neighborhood traffic interruptions. Barricade stockpiles.
- B. Provide access to adjacent properties for local traffic and pedestrians, Section 01 31 13.
- C. Repair public and private facilities damaged by CONTRACTOR.
- D. Prior to Backfilling: Commission pipeline per Section 33 08 00. Provide sizes and types of equipment connections and fittings which match pipe materials when pressure testing system.

**1.05 ACCEPTANCE**

- A. Each storm drain system component must pass applicable requirements in Section 33 08 00.

**PART 2 PRODUCTS**

**2.01 PIPING AND FITTINGS**

- A. Provide piping materials and factory fabricated piping products of sizes, types, and classes indicated.
- B. Where not indicated, provide proper selection acceptable to ENGINEER to comply with installation requirements.
- C. Provide pipe fittings and accessories of same material and weight or class as pipe, with joining method indicated or recommended by manufacturer.

**2.02 IN-PLANE WALL DRAINAGE**

- A. Drainage Core: Manufacturer's standard three-dimensional non-bio- degradable, plastic designed to effectively conduct water to foundation drainage system.
- B. Filter Fabric: Manufacturer's standard non-woven geotextile fabric of polypropylene or

polyester fibers, or combination.

## **2.03 SUB DRAIN FILL MATERIALS**

- A. Sewer Rock, Section 32 11 23 and geotextile, Section 31 05 19.

## **2.04 MORTAR, GROUT AND CONCRETE**

- A. Mortar: Cement, Section 04 05 16.
- B. Grout: Cement, Section 03 61 00.
- C. Concrete:
  - 1. Cast-in-place: Class 4000, Section 03 30 04.
  - 2. Precast: Class 5000, Section 03 40 00.

## **2.05 CLEANOUTS AND MANHOLES**

- A. Basin: Concrete floor with cast in place concrete walls or ASTM C478 precast requirements.
- B. Steps: None.
- C. Top: Concentric cone. Concentric flat slab concrete deck allowed only with ENGINEER's permission.
- D. Frame and Cover: Asphalt coated, heavy duty, ductile iron; Section 05 56 00 with flat top design meeting load rating H-20 and appropriate utility lettering. Shape, size and lifting device as indicated.
- E. Pipe Connectors:
  - 1. Precast Bases: Resilient, ASTM C 923. Sand mortar grout pipe connections.
  - 2. Cast in Place or Connections to Existing Manhole with Plastic Pipe: Use rubber Manhole adapter gasket for precast sections. Grout; Section 03 61 00 for cast in place sections.
- F. Joints in Sections: Bituminous mastic coating unless indicated otherwise.

## **2.06 INLETS AND CATCH BASINS**

- A. Basin: Concrete floor and walls.
- B. Frame and Grate:
  - 1. Asphalt coated, heavy duty, cast iron: Section 05 56 00. Shape and size as indicated.
  - 2. Galvanized, heavy duty, steel: Sections 05 12 00 and 05 05 10. Shape and size as indicated.
- C. Pipe Connectors: Resilient, ASTM C 923. Sand mortar grout.

## **2.07 OUTFALLS**

- A. Cast-in-place or precast concrete with reinforced headwall, apron, and tapered sides. Provide riprap, Section 31 37 00, if indicated.

## **2.08 DRAIN PIPE JOINT SCREENS**

- A. Heavy mesh burlap, coal-tar saturated felt, 18 to 14 mesh copper screening or synthetic drainage fabric.
- B. Plastic or corrosion resistant metal bands.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Verify Trench Excavation is ready to receive work, and dimensions, and elevations are as indicated.
- B. Hand-trim Excavations to required elevations. Backfill over excavations and compact, Section 33 05 05.
- C. Remove stones larger than 2 inches or other hard matter that could damage pipe or impede backfilling or compaction.
- D. Examine areas and conditions under which materials and products are to be installed. Do not proceed with system installation until unsatisfactory conditions have been corrected in manner acceptable to system installer.
- E. Clearly identify and promptly set aside defective or damaged pipe. F. Use pipe cutting tool acceptable to pipe manufacturer.

### **3.02 INSTALLATION - PIPE AND FITTINGS**

- A. Place bell or groove end facing upstream.
- B. Install gaskets per manufacturer's recommendations.
- C. Plug pipeline branches, stubs or other open ends which are not to be immediately connected.
- D. Clean interior of pipe of dirt and debris as work progresses.
- E. Insulate dissimilar metals from direct contact with each other using neoprene gaskets or asphalt coatings.
- F. Meet line and grade tolerance specified in Section 33 08 00.

### **3.03 INSTALLATION - CLEANOUTS AND MANHOLES**

- A. Form bottom of Excavation clean and smooth to correct elevation.
- B. Place structures in location indicated.
- C. Install precast units, ASTM C 891.
- D. Provide elevations and pipe inverts for inlets and outlets indicated.
- E. Where structures occur in Pavements, mount frame and cover 1/2 inch below finished surface, elsewhere set 3 inches above finished grade. Provide a concrete Cover Collar between the frame and asphalt Pavement.

### **3.04 INSTALLATION - INLETS OR CATCH BASINS**

- A. Form bottom of Excavation clean and smooth to correct elevation.
- B. Construct with all connecting piping and appurtenances in their final position.
- C. Cut all piping parallel to interior surface wall. Grout connection to provide smooth transition inlet into pipe.

### **3.05 INSTALLATION - SUB DRAIN SYSTEMS**

- A. Install pipe and fittings per manufacturer's instruction.
- B. Open Joint Systems: Loosely butt pipe ends. Place 12 inches wide filter fabric around pipe circumference, centered over joint.
- C. Mechanical Joint Perforated Pipe System: Place pipe with perforations facing down.
- D. Place drainage pipe on bed of Sewer Rock, Section 31 05 13.

### **3.06 ABANDONED UTILITIES**

- A. Use concrete to plug and cap open ends of abandoned underground utilities that are to remain in place.

- B. Provide closures to withstand hydrostatic or earth pressure that may result after ends of abandoned utilities have been closed.

**3.07 TAP CONNECTIONS**

- A. Not allowed. Provide a cleanout or Manhole structure.

**3.08 BACKFILLING**

- A. Prior to Backfilling: Commission pipeline, Section 33 08 00. Provide sizes and types of equipment connections and fittings which match pipe materials when pressure testing system.
- B. Trenches: Section 33 05 20.
- C. Structures or Landscapes: Section 31 23 23.

**3.09 CLEANING**

- A. Remove debris, concrete, or other extraneous material that accumulates in existing piping or structures.
- B. Clean all pipelines after testing. Do not flush sand, gravel, concrete, debris or other materials into existing piping system.

**3.10 SURFACE RESTORATION**

- A. Provide temporary paved surfaces where Trenches pass through roadways, Driveways, or sidewalks.
- B. Restore paved surfaces, Section 33 05 25.
- C. Finish landscaped surfaces as applicable.
  - 1. With grass; Section 32 92 00 or
  - 2. Other ground cover; Section 32 93 13.

**END OF SECTION 33 4100**

- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

## **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package signs as required to prevent damage before installation.

## **1.07 GUARANTEE**

- A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
- B. Manufacturer shall provide 2 year warranty against material and manufacturing defects.

## **1.08**

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Flat Signs:
  - 1. Best Sign Systems, Inc.: [www.bestsigns.com](http://www.bestsigns.com).
  - 2. Cosco Industries: [www.coscoarchitecturalsigns.com](http://www.coscoarchitecturalsigns.com).
  - 3. Inpro: [www.inprocorp.com](http://www.inprocorp.com).
  - 4. Mohawk Sign Systems, Inc.: [www.mohawksign.com](http://www.mohawksign.com).
  - 5. Seton Identification Products: [www.seton.com](http://www.seton.com).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Dimensional Letter Signs:
  - 1. A.R.K. Ramos Architectural Signage Systems Cast Aluminum Letters: [www.arkramos.com/#sle](http://www.arkramos.com/#sle).
  - 2. Cosco Industries Cast Aluminum Letters: [www.coscoarchitecturalsigns.com/#sle](http://www.coscoarchitecturalsigns.com/#sle).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 SITE SIGNAGE**

- A. General:
  - 1. All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Materials:
  - 1. Exterior Steel Panels:
    - a. Panel Construction: 16 gage electro-galvanized paintlock steel, ASTM A 591.
    - b. Corner Condition: Round 1/2 inch (13 mm) diameter corner.
    - c. Mounting: Post Mounted.
  - 2. Sign Posts:
    - a. Post: Galvanized 2 inch (50 mm) square x 12 gage steel tube with 7/16 inch (11 mm) holes at 1 inch (25 mm) on center.
    - b. Ground Anchor Sleeve: Galvanized 2 1/2 inch (64 mm) square x 12 gage sleeve.
- C. Signage Types:
  - 1. ADA Signage and Parking Signage with Pictograms:
    - a. Text/Pictogram Placement: Centered.



- b. Size/Shape: Varies, refer to drawings.
  - c. Context of Text/Pictograms: Exact verbiage/pictograms will be supplied at time of shop drawing submittal. Contractor shall coordinate with Owner/Architect.
    - 1) "Reserved Parking Only".
    - 2) "Reserved Parking Only - Van Accessible Parking Only".
    - 3) "No Parking - Bus Loading Zone".
    - 4) "Parent Drop Off".
    - 5) "No Parking - Fire Lane".
    - 6) "One Way".
    - 7) "Bus Only".
    - 8) "Stop".
  - d. Locations: As shown on drawings.
- D. Finishes:
- 1. Panel: One (1) coat of metal primer and Two (2) coats of synthetic automotive enamel.
    - a. Colors: As selected by Architect.
  - 2. Text and Graphics: Two (2) coats of bulletin paint.
    - a. Font: ADA approved font as selected by Architect from manufacturer's full range.
    - b. Color: White.

### 2.03 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

### 2.04 SIGN TYPES

- A. Flat Signs: Signage media without frame.
  - 1. Edges: Square.
  - 2. Corners: Radiused.

### 2.05 DIMENSIONAL LETTERS

- A. Metal Letters:
  - 1. Metal: Aluminum casting.
  - 2. Metal Thickness: 1/8 inch minimum.
  - 3. Letter Height: As indicated on the drawings.
  - 4. Text and Typeface:
    - a. Character Font: Gemini Helvetica (Helvetica Bold).
    - b. Character Case: Upper case only.
  - 5. Finish: Clear Anodized, Brushed, satin.
  - 6. Mounting: Screw attached trough back of Metal Mounting Plate.
- B. Mounting Plate:
  - 1. Metal: 1/2" Aluminum Plate.
  - 2. Finish: Kynar Painted Finish, color as selected by Architect.

### 2.06 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Exposed Screws: Stainless steel.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
- B. Complete all finishing operations, including painting, before beginning installation of signage systems.
- C. Surfaces shall be dry and free from dirt, grease and loose paint.
- D.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

**END OF SECTION 10 140**