# JORDANELLE SPECIAL SERVICE DISTRICT

# Invitation for Bids

**Cover Sheet**

| **General Information** | | |
|---|---|---|
| Project Name | JSSD Shop Building | |
| Project Description | The Jordanelle Special Service District ("JSSD") desires to construct a Shop Building with associated site improvements. Contractor will erect steel portion of building supplied by JSSD. | |
| Contract Type | Construction – Unit Prices/Lump Sum (*See* Price Form) | |
| **Procurement Process Information** | | |
| Contract Administrator | Dave Fuller<br>5360 Old Hwy 40<br>Heber City, Utah 84032<br>david@jssd.us | |
| Project Manager | Tavis Timothy, PE<br>BT Engineering<br>tavis@b-t-eng.com | |
| ***All communications regarding this solicitation must be through the Contract Administrator and copied to the Project Manager.*** | | |
| **Basis of Award** | Award of contract will be made to the low Responsive and Responsible bidder. | |
| **Submittal Instructions** | Email or deliver your bid to the Contract Administrator listed above, before the Deadline. If delivery by email, also send to Tavis Timothy at tavis@b-t-eng.com | |
| **IFB Schedule** | | |
| • JSSD Issues Invitation for Bids | June 10, 2025 | |
| • **Deadline to submit Bids/Public Bid opening** | July 1, 2025 3:00 p.m. | |
| **Included as part of this IFB** | | |
| Part A – Project Information<br>The following documents will accompany the Invitation for Bids:<br>• Construction plans for Shop Building | | |
| Part B – Bid Content | | |
| Part C – Standard Terms of Solicitation | | |
| Part D – Construction Agreement | | |

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| • Exhibit A – General Conditions<br>• Exhibit B – Supplemental Conditions<br>• Exhibit C – Insurance Requirements |
| Part E – Forms<br>• Price Form<br>• Information Required of Bidders |
| Part F – Technical Specifications<br>• Technical Specifications<br>• Geotechnical Report |

# **J**ORDANELLE **S**PECIAL **S**ERVICE **D**ISTRICT

# Invitation for Bids

## Part A – Project Information

### 1. The Special Service District

The Jordanelle Special Service District ("JSSD") is a special service district organized pursuant to Utah Code Ann. § 17D-1-101 *et seq*. JSSD provides culinary water and sanitary sewer services in portions of Wasatch County, Utah. The Wasatch County Council serves as the governing body of JSSD, which is managed by a General Manager.

### 2. The Project

This project includes the construction of a shop building and includes site work and appurtenances. The project also includes erecting the steel structure for the building, which has already been pre-purchased by Owner.

### 3. Schedule

JSSD Issues Invitation for Bids: ..... June 10, 2025
Non-mandatory Site Visit: ..... June 18, 2:00 p.m.
(Location – JSSD Offices - 5388 N. Old Hwy 40, Heber City, Utah 84032)
Contractors Questions Due ..... June 26, 2025 5:00 p.m.
Bids Due ..... July 1, 2025 3:00 p.m.
Recommendation for Award at JSSD Board Meeting: ..... July 8, 2025
Notice of Award ..... July 9, 2025
Notice to Proceed..... July 19, 2025
Structure is 'Dried In' ..... November 1, 2025
Substantial Completion ..... May 15, 2026
Final Completion ..... June 15, 2026

### 4. Project Information

The combined project has the following components:

- Construction of Building, including erection of Owner Pre-purchased Steel Structure
- Associated site improvements and utilities

The following documents accompany the Invitation for Bids:

- Construction plans for the Shop Building

- Site Technical Specifications (Part F)
- Geotechnical Report (Part F)

# JORDANELLE SPECIAL SERVICE DISTRICT

# Invitation for Bids

## Part B – Bid Content

**1. BID CONTENT**

**A. Unit Price Bid Schedule**

Bidders to complete Price Form included in Part E – Forms.

Bidders to sign and date Price Form.

**B. Information Required from Bidders**

Bidders to complete and submit with Price form Information Required of Bidders included in Part E – Forms.

**C. Bid Bond**

Bidders to include with bid a Bid Bond (5% of Total Bid Amount). No particular form of bond is required, but the bond must be issued by a surety licensed in the State of Utah.

# JORANELLE SPECIAL SERVICE DISTRICT

# Invitation for Bids

## Part C – Standard Terms of Solicitation

### 1. INSTRUCTIONS TO BIDDERS

#### A. Submission of Bids.

Bids will be received by the Contract Administrator via email, or as otherwise arranged between the Bidders and the Contract Administrator. The Contract Administrator will log the date and time of each Bid received. Any Bid received after the Deadline to Submit Bids listed on the IFB Cover Sheet will be considered non-responsive. It is the responsibility of the Bidder to ensure that its Bid is received by the Contract Administrator by the specified time.

#### B. Minimum Standards.

This IFB sets forth the minimum requirements that all Bids must meet. Failure to submit Bids in accordance with this IFB may render the Bid unacceptable or non-responsive. JSSD may, in its sole discretion, waive minor irregularities in a Bid that do not alter the quality or quantity of the information provided.

#### C. Confidential, Protected, and Public Information

In accordance with Utah Code Section 63G-2-305(6) of the Government Records Access and Management Act ("GRAMA"), information related to this procurement will not be made public until after execution of the contract with the successful Bidder. Procurement information includes the Bids submitted by Bidders in response to this IFB and any accompanying documentation, as well as records maintained by JSSD during the procurement process.

JSSD will maintain a process to ensure confidentiality for the duration of this procurement. If the Bidder submits information in its Bid that it believes is "trade secret," the Bidder must follow the procedure set forth in Section 63G-2-309 of GRAMA.

Additionally, for ease of Bid evaluation, JSSD requests that each Bidder also follow the steps identified below:

1) Clearly mark all trade secret information as such in its Bid at the time the Bid is submitted, and state in a cover letter that the "DOCUMENT CONTAINS TRADE SECRET INFORMATION," and identifying each section and page which has been so marked;

2) Include a statement with its Bid justifying the Bidder's determination that certain records are trade secret information for each record so defined;

3) In addition to the Bid copies submitted in accordance with the Submittal Instructions on the IFB Cover Sheet, submit one electronic copy of the Bid that has all the trade secret information deleted from the Bid and label such copy of the Bid "Public Copy." If a Bidder submits a Bid containing no trade secret information, no "Public Copy" need be submitted. However, any Bidder that submits a Bid containing no trade secret information must so certify in a cover letter to its Bid; and

4) Defend any action seeking release of the records it believes to be trade secret information and indemnify, defend, and hold harmless JSSD and its agents and employees from any judgments awarded against JSSD or its agents and employees in favor of the party requesting the records, including any and all costs connected with that defense. This indemnification survives JSSD's cancellation or termination of this procurement or award and subsequent execution of the contract. In submitting a Bid, the Bidder agrees that this indemnification survives as long as the trade secret information is in possession of JSSD.

All records pertaining to this procurement will become public information after execution of the Contract, unless such records are identified as trade secret information as specified above. No liability will attach to JSSD or its agents for the errant release of trade secret information by JSSD or its agents under any circumstances.

**D. Submitting Questions to JSSD**

Questions and Requests for changes to the IFB must be submitted via email. All questions must be directed to the Contract Administrator and to the Project Manager identified on the IFB Cover Sheet.

**E. Requests for Approved Equals or Changes**

Whenever a brand, manufacturer, or product name is indicated in this IFB, they are included only for the purpose of establishing identification and a general description of the item. Wherever such names appear, the term "or approved equal" is considered to follow.

Requests for Approved Equals must be submitted to the Contract Administrator via email.

Any request for an approved equal must be fully supported with technical data, test results, or other pertinent information as evidence that the substitute offered is equal or better than the IFB requirement.

It should be understood that specifying a brand name, components, and/or equipment in this IFB will not relieve the Bidder from its responsibility to provide the product in accordance with the performance specifications, warranty, and contractual requirements. The Bidder shall notify JSSD of any inappropriate brand name, component, and/or equipment that may be called for in this IFB and shall propose a suitable substitute for consideration.

**F. Multiple or Alternative Bids**

Submission of multiple or alternative Bids, except as specifically called for in the IFB, may render all such Bids non-responsive and may cause the rejection of some or all of such Bids.

**G. Withdrawal of Bids**

A Bidder may withdraw its Bid before the Bid due date without prejudice to itself by submitting a written request for its withdrawal to the Contracts Administrator. If a Bidder withdraws its Bid prior to the Deadline to Submit Bids, JSSD will return the Bid to the Bidder.

**H. Cost of Bids**

JSSD is not liable for any costs incurred by Bidders in the preparation of Bids submitted in response to this IFB.

**I. Examination of Request for Bids**

The submission of a Bid constitutes an acknowledgment upon which JSSD may rely that the Bidder: (i) has thoroughly examined and is familiar with the IFB, including any contractual terms included in the IFB, (ii) is familiar with any work site identified in the IFB, and (iii) has reviewed and inspected all applicable statutes, regulations, ordinances, and resolutions addressing or relating to the goods and services to be provided hereunder. The failure or neglect of a Bidder to receive or examine such documents, work sites, statutes, regulations, ordinances, or resolutions will in no way relieve the Bidder from any obligations with respect to the Bidder's Bid or to any contract awarded pursuant to this IFB. No reduction or modification in the Bidder's obligations will be allowed based upon a lack of knowledge or misunderstanding of this IFB, work sites, statutes, regulations, ordinances, or resolutions.

**J. Firm Offer**

Unless otherwise stated in this IFB, submission of a Bid constitutes an offer to provide the goods or services described in the IFB, for the price set forth in the Bid. Such offer must be good and firm for a period of ninety (90) days after the Deadline to Submit Bids.

### K. No Collusion

By submitting a Bid, the Bidder represents and warrants that its Bid is genuine and not a sham, and that the Bidder has not colluded with any other parties regarding this procurement process. If JSSD learns that the Bid is not genuine, or that the Bidder did collude with other parties, or engaged in any anti-competitive or fraudulent practices in connection with this procurement process, JSSD may immediately terminate any resulting contract and seek any remedies available in equity or at law.

## 2. SELECTION PROCESS

### A. Changes to the IFB Schedule

JSSD may make changes to the IFB Schedule, in its sole discretion. Deadlines shown on the IFB Cover Sheet that apply to JSSD are estimates only, and may be adjusted by JSSD in its sole discretion.

### B. Addenda to the Request for Bids

JSSD may make changes to the IFB, by issuing a written addendum to the IFB.

### C. Public Opening

This is an IFB and, as such, the Bids submitted in response to this IFB will be publicly opened.

### D. JSSD's Procurement Options

Based on submitted information, JSSD may do or take any of the following actions, without limitation:

- award to the low responsive and responsible bidder,
- ask for more information or Clarifications before making a selection;
- if a material error in the IFB is discovered during the process, JSSD may issue an addendum to all Bidders that have submitted Bids requesting revised Bids based upon the corrected IFB;
- decline to accept any Bid;
- re-advertise;
- cancel the procurement; or
- elect to otherwise procure the needed services in accordance with JSSD policy and procedures.

**E. Responsiveness**

Bids that are conditional, that attempt to modify the IFB requirements, that contain additional terms or conditions, or that fail to conform to the requirements or specifications of the IFB may be considered non-responsive.

**F. Responsibility**

JSSD will not select a Bidder who is deemed by JSSD, in its sole discretion, to lack the ability or responsibility to perform successfully under the terms of the contract. Such determination of responsibility may encompass management, technical, legal, and financial matters.

**G. Checking References**

JSSD reserves the right to contact any reference specifically named by the Bidder in its Bid or any other additional references as deemed appropriate by JSSD, including references suggested by the Bidder's named references or references known to JSSD through its own knowledge of the industry.

**H. Requests for Clarification**

The Bidder shall provide accurate and complete information to JSSD. If information is incomplete, appears to include a clerical error, or is otherwise unclear, JSSD may either (i) declare the Bid non-responsive, (ii) evaluate the Bid as submitted, or (iii) issue a Request for Clarifications to the Bidder stating the information needed and a date and time by which the information must be provided. If the Bidder does not respond to the Request for Clarifications in a timely manner, or if the Bidder's response is deemed to be insufficient by JSSD, in its sole discretion, then JSSD may declare the Bid non-responsive.

# **J**ORDANELLE **S**PECIAL **S**ERVICE **D**ISTRICT

# Invitation for Bids

## Part D – Construction Agreement

# CONSTRUCTION AGREEMENT

This Construction Agreement ("**Agreement**") is between the Jordanelle Special Service District, a special service district organized pursuant to Utah Code Ann. §§ 17D-1-101 *et seq*. (the "**District**"), and _____, ("**Contractor**").

## RECITALS

A. The District is engaged in a project to construct a new, pre-fabricated metal shop building (the "**Project**").

B. On or about June 10, 2025, the District issued an Invitation for Bids (the "**IFB**"), seeking interested parties to submit Bids for the work required by the Project.

C. The Contractor submitted the lowest responsive and responsible bid, in the amount of $ _____ (the "**Bid Amount**").

D. The District and the Contractor desire to enter into this Agreement to define their respective roles and responsibilities with respect to the Project.

## AGREEMENT

Therefore, the parties agree as follows:

**1. Scope of Work.** (a) Contractor shall perform the Work. In the Contract Documents, "**Work**" means all design, procurement, construction, installation, startup, commissioning, and other services required by the Contract Documents, including procuring and furnishing all material, equipment, services and labor reasonably inferable from the Contract Documents as necessary to complete the Project.

(b) The Work will take place at the Site. In the Contract Documents, "**Site**" means the property identified in the construction drawings included in the IFB.

**2. Schedule.** (a) Contractor shall commence the Work within seven (7) days of Contractor's receipt of a Notice to Proceed ("**NTP**") from the District. The District is not required to issue a NTP until all insurance, bonding, and other required documentation is submitted and deemed acceptable by the District.

(b) The District may issue a limited NTP on a portion of the Work, and may issue a series of limited NTPs to provide for progression of the Work in phases. Issuance of a limited NTP will not be deemed to require the District to issue any subsequent NTPs, and will not be deemed to obligate the District to complete the Project or to pay Contractor for any portion of the Work not encompassed by an NTP issued by the District.

(c) The Contractor shall (i) achieve Substantial Completion of the Work no later than **May 15, 2026.** In the Contract Documents, "***Substantial Completion***" means that the Work has been

completed in accordance with the Contract Documents, such that the District can use the respective facilities for their intended purpose.

(d) The Contractor shall achieve Final Completion of the Work at no later than **June 15, 2026**. In the Contract Documents, "**Final Completion**" means that all Work is complete in accordance with the Contract Documents, as determined by the District's Engineer, including but not limited to, final completion of all punch list items and delivery of all documents in accordance with the Contract Documents.

(e) Time is of the essence with respect to the dates set forth in this section.

(f) Contractor acknowledges that if Substantial Completion is not attained by the applicable Substantial Completion Date, the District will suffer damages that are difficult to measure and determine with precision. If Substantial Completion is not attained by the Substantial Completion Date, Contractor shall pay the District, or the District may deduct from any money due to Contractor, ***$1,000.00*** as liquidated damages for each Day that Substantial Completion extends beyond the Substantial Completion Date.

**3. Price and Payment**. (a) Payment for the Work will be based on the Contractor's Price Form submitted in response to the IFB. For line items with a unit price basis, the District will compensate Contractor at the unit price set forth on the Contractor's Price Form, based on the actual measured quantities in the Work. For line items with a lump sum basis, the District will compensate Contractor based on the lump sum set forth on the Contractor's Price Form (such unit price and lump sum amounts, collectively, the "**Contract Price**"). The procedures for invoicing and payment are set forth in Article 4 of the General Conditions.

(b) For purposes of calculating changes in the Contract Price pursuant to Section 7.7 of the General Conditions, Contractor will be entitled to a markup of 10% for overhead and profit. Subcontractors will be entitled to a markup of 10% for overhead and profit, but the cumulative markup may not exceed 20%. An increase or decrease in the Total Price Amount as set forth on the Contractor's Price Form, as a result of actual quantities for unit price line items being different from the estimated quantities on the Price Form, will not be a basis for the Contractor charging an additional markup.

**4. Contract Documents**. (a) The Contract Documents consist of the following:

(1) All written amendments and Change Orders to this Agreement executed in accordance with Article 7 of the General Conditions;

(2) This Agreement, including the following exhibits,

Exhibit A – General Conditions

Exhibit B – Supplemental Conditions

Exhibit C – Insurance Requirements

(3) The IFB, including each Part and Section thereof;

(4) The Contractor's Proposal in response to the IFB.

(5) All addenda issued during the bidding process

(b) The parties intend that the Contract Documents include and provide for all aspects of the Work that are necessary for the proper initiation, performance, and substantial completion of the Project by the Contractor, prior to the Substantial Completion Date, and for the Contract Price. The parties intend that the Contract Documents be interpreted in harmony so as to avoid conflict, with words and phrases interpreted in a manner consistent with construction and design industry standards.

(c) Where any two or more parts or provisions of Contract Documents conflict or are inconsistent with each other, the Contract Documents will be interpreted in the manner most likely to have been intended by the District. For example, where any two or more parts of the Contract Documents impose upon Contractor differing standards or obligations with respect to substantially the same subject-matter, then the more stringent standard or obligation will apply in the absence of any intention to the contrary.

(d) Contractor acknowledges that, prior to the execution of this Agreement, it has carefully reviewed the Contract Documents for errors, omissions, conflicts or ambiguities (each, a "**Discrepancy**"), and is not aware of any Discrepancies as of the execution of this Agreement. If the Contractor becomes aware of a Discrepancy, the Contractor shall immediately notify the District's Project Director of that Discrepancy in writing. the District's Project Director shall promptly resolve the Discrepancy in writing. Contractor's failure to promptly notify the District of an apparent discrepancy will be deemed a waiver of Contractor's right to seek an adjustment of the Contract Price and Substantial Completion Date due to the discrepancy.

(e) The Contract Documents form the entire contract between the District and the Contractor and by incorporation in this Agreement are as fully binding on the parties as if repeated in this Agreement. The Contract Documents are the only contract between the District and the Contractor with respect to the Project, and supersede any other or prior agreements, commitments or representations regarding the Project. No oral representations or other agreements have been made by the parties except as specifically stated in the Contract Documents.

**5. Representatives of the Parties.** (a) The District designates **Tavis Timothy** as its Project Manager. The District's Contract Administrator for this Agreement is **Dave Fuller**. The District's Engineer is **Tavis Timothy**. The District's Senior Representative is **Max Covey**. Questions or correspondence regarding the contractual aspects of this Agreement should be directed to the Contract Administrator, at the address set forth in section 12. The District's Project Manager, and Contract Administrator are referred to collectively as the "**the District Representatives**."

(b) Contractor designates _____ as its Project Manager, and _____ as its Senior Representative (collectively, the "**Contractor Representatives**").

**6. Bonds and Insurance.** (a) Contractor shall obtain and maintain the insurance coverages set forth in Exhibit C, and shall comply with the obligations set forth in Exhibit C.

(b) The Contractor shall provide to the District a performance bond and a payment bond (the "**Bonds**"), each in an amount equal to 100% of the Proposal Amount. Contractor shall provide the Bonds to the District within ten (10) days after execution of this Agreement, and prior to commencing any Work.

**7. E-Verify.** (a) Contractor hereby certifies that it has registered and is participating in the Status Verification System to verify the work eligibility status of Contractor's new employees that are employed in the State of Utah, as required by Utah Code Ann. § 63G-12-302. Contractor shall require any Subcontractors that perform Work in the State of Utah to certify to Contractor by affidavit that they have verified the employment status of each new employee through the Status Verification System.

**8. Notices.** (a) To be deemed valid, any notice, request, claim, demand or other formal communication between the parties pertaining to any legal or contractual dispute ("**Legal Notices**") must be in writing and addressed as follows:

If to the District:

Jordanelle Special Service District
ATTN: Max Covey
5360 Old Hwy 40
Heber City, UT, 84032

With a required copy to:

Parsons Behle & Latimer
ATTN: Rob Hughes
201 South Main Street, Suite 1800
Salt Lake City, UT 84111.

If to the Contractor:

_____
_____
_____
_____

(b) To be deemed valid, Legal Notices must be given by one of the following methods: (i) by delivery in person (ii) by a nationally recognized next day courier service, (iii) by first class, registered or certified mail, postage prepaid.

(c) Either party may change the address at which that party desires to receive written notice by delivery of Legal Notice of such change to the party as set forth above. Legal Notices will be deemed effective on delivery to the notice address then applicable for the party to which the Legal Notice is directed, provided, however, that refusal to accept delivery of a Legal Notice or the inability to deliver a Legal Notice because of an address change that was not properly communicated shall not defeat or delay the effectiveness of a Legal Notice.

(d) Nothing in this section 8 is intended to limit or prohibit the parties from engaging in informal verbal or written communications using email or other means of communication

**9. Entire Agreement**. This Agreement constitutes the entire agreement between the parties with respect to the subject matter herein, and supersedes any and all other prior and contemporaneous agreements and understandings between the parties, whether oral or written. The terms of this Agreement supersede any additional or conflicting terms or provisions that may

be set forth or printed on the Contractor's invoices or other standard forms or documents that may subsequently be used to implement, record, or bill for services under this Agreement. The terms of this Agreement prevail in any dispute between the terms of this Agreement and the terms printed on any such standard forms or documents.

**10. Counterparts.** The parties may execute this Agreement in any number of counterparts, each of which when executed and delivered will constitute a duplicate original, but all counterparts together will constitute a single agreement.

**11. Effectiveness; Date.** The Agreement will become effective when all parties have fully signed it. The date of this Agreement will be the date it is signed by the last individual to sign it (as indicated by the date associated with that individual's signature).

Each individual is signing this Agreement on the date stated opposite that individual's signature.

| | |
|---|---|
| **JORDANELLE SPECIAL SERVICE DISTRICT**<br><br>By: _____<br>Max Covey<br>General Manager | Date: _____ |
| By: _____ | Date: _____ |

# Exhibit A

# General Conditions

## 1.0 General

1.1 **Cooperation.** The District and Contractor commit at all times to cooperate fully with each other, and proceed on the basis of trust and good faith, so as to permit each party to realize the benefits afforded under the Contract Documents.

1.2 **Professional Standards.** Contractor shall perform the Work in a good and workmanlike manner, and shall use reasonable skill, care, and diligence. If the Work includes professional services, Contractor shall perform those services in a professional manner, using at least that standard of care, skill and judgment that can reasonably be expected from similarly situated professionals. Work, equipment, materials, and supplies that are not expressly specified in the Contract Documents must conform to the best commercial practice for the type of Work, equipment, materials, or supplies in question. Contractor shall be solely responsible for the Work, whether performed by Contractor directly or by Contractor's Subcontractors.

1.3 **Definitions.** Terms that are defined anywhere in the Contract Documents have the same definition in all the Contract Documents, including in these General Conditions. In the Contract Documents, the following definitions apply:

> "Agreement" means the document signed by Contractor and the District, in which these General Conditions are incorporated as an exhibit.
>
> "Basis of Design Documents" means those preliminary drawings, concept design drawings, technical requirements, performance requirements, project criteria, or other documents that are (i) included in the Contract Documents, and (ii) serve as the basis or starting point for design services to be performed by Contractor, if any.
>
> "Building Codes" means the most recent version of all applicable local, state, national, and international building codes.
>
> "Construction Documents" means the final drawings and specifications that set forth in detail the requirements for construction of the Project.
>
> "Contract" means the entire contract between the District and the Contractor, including all of the Contract Documents and every Part and Section thereof.
>
> "Contract Documents" means those documents designated as Contract Documents in the Agreement.

"Contract Times" means the Substantial Completion Date, the Final Completion Date, and any other deadlines for completion of the Work, or a part thereof, as set forth in the Contract Documents.

"Contractor" means the entity that has entered into a contract with the District to perform engineering, procurement, construction, installation, and other services as detailed in the Contract Documents.

"Day" means a calendar day unless otherwise specifically noted in the Contract Documents.

"Engineering Standards" means the most recent version of all applicable standards published by engineering or construction industry groups such as ANSI, AISC, ASME, AWWA, IEEE, TEMA, NFPA, ASHRAE, UL, ARI, ASTM, CTI, SMACNA, and AMCA.

"Force Majeure Events" means unpredictable events beyond the control of Contractor that impede performance of the Work, such as riots, earthquakes, epidemics, and extreme weather events.

"General Conditions" means this document.

"Legal Requirements" means the most recent version of all applicable federal, state, and local laws, codes, Building Codes, ordinances, rules, regulations, orders and decrees of any government or quasi-government entity having jurisdiction over the Project or Site, the practices involved in the Project or Site, or any Work.

"Site" means the land or premises on which the Project is located, and might be more particularly defined in the Agreement.

"Subcontractor" means any person or entity retained by Contractor as an independent contractor to perform a portion of the Work, including materialmen and suppliers, and includes any person or entity retained by a Subcontractor.

# 2.0 Contractor's Services

## 2.1 General Services.

2.1.1 Contractor's Project Manager shall be reasonably available to the District and shall have the necessary expertise and experience required to supervise the Work. Contractor's Project Manager shall communicate regularly with the District and shall be vested with the authority to act on behalf of Contractor.

2.1.2 Contractor shall provide the District with a monthly status report detailing the progress of the Work, including (i) whether the Work is proceeding according to schedule, (ii) whether Discrepancies, conflicts, or ambiguities exist in the Contract Documents that require

resolution, (iii) whether health and safety issues exist in connection with the Work; (iv) other items that require resolution so as not to jeopardize Contractor's ability to complete the Work for the Contract Price and within the Contract Times.

2.1.3 Unless a schedule for the execution of the Work has been attached to the Agreement as an exhibit at the time the Agreement is executed, Contractor shall prepare and submit, within thirty (30) days of the execution of the Agreement, a schedule for the execution of the Work for the District's review and approval. The schedule must indicate the dates for the start and completion of the various stages of Work, including any engineering, manufacturing, testing, and shipment of the principal items of equipment, and the dates when the District information and approvals are required to enable Contractor to achieve the Contract Times. The District may identify one or more dates on the schedule when Contractor's actual progress on the Work will be measured against the scheduled progress (those dates, "**Milestone Dates**").

2.1.4 The schedule shall be revised as required by conditions and progress of the Work, but such revisions shall not relieve Contractor of its obligations to complete the Work within the Contract Times, as such dates may be adjusted in accordance with the Contract Documents. The District's review of, and response to, the schedule shall not be construed as relieving Contractor of its complete and exclusive control over the means, methods, sequences and techniques for executing the Work.

2.1.5 Contractor shall at all times employ such force, plant, materials, and tools as necessary to assure compliance with the Contract Documents and to progress the Work at such a rate as to assure achievement of the Contract Times.

2.2 **Design Services.** If the Work includes any engineering or design services sections 2.2.1 through 2.2.8 apply.

2.2.1 Contractor shall provide the necessary design services, including architectural, engineering and other design professional services, for the preparation of the required drawings, specifications and other design submittals to permit Contractor to complete the Work consistent with the Contract Documents. Contractor shall ensure that design services are performed by qualified, licensed design professionals employed by Contractor, or by qualified, independent licensed design consultants procured by Contractor.

2.2.2 Contractor and the District shall, consistent with any applicable provision of the Contract Documents, agree upon any interim design submissions that the District may wish to review, which interim design submissions may include design criteria, drawings, diagrams, and specifications setting forth the Project requirements. Interim design submissions must be consistent with the Basis of Design Documents, as the Basis of Design Documents may have been changed through the design process set forth in this Section 2.2.2. On or about the time of the scheduled submissions, Contractor and the District shall meet and confer about the submissions, with Contractor identifying during such meetings, among other things, the evolution of the design

and any changes to the Basis of Design Documents, or, if applicable, previously submitted design submissions. Changes to the Basis of Design Documents, including those that are deemed minor changes under Section 7.4.1, shall be processed in accordance with Article 7. Minutes of the meetings, including a full listing of all changes, will be maintained by Contractor and provided to all attendees for review. Following the design review meeting, the District will be entitled to at least ten (10) working days to review and comment on the interim design submissions and meeting minutes.

2.2.3 To the extent not prohibited by the Contract Documents or Legal Requirements, and with the approval of the District, Contractor may prepare interim design submissions and Construction Documents for a portion of the Work to permit construction to proceed on that portion of the Work prior to completion of the Construction Documents for the entire Work.

2.2.4 Contractor shall submit proposed Construction Documents to the District, which must be consistent with the latest set of interim design submissions, as such submissions may have been modified in a design review meeting and recorded in the meeting minutes. The parties shall have a design review meeting to discuss, and the District shall review and approve, the Construction Documents in accordance with the procedures set forth in Section 2.2.2 above. Contractor shall submit copies of approved Construction Documents to the District prior to commencement of construction.

2.2.5 The District's review and comment on interim design submissions, meeting minutes, and the Construction Documents is for the purpose of mutually establishing a conformed set of Contract Documents compatible with the requirements of the Work. Neither the District's review nor approval of any interim design submissions, meeting minutes, and Construction Documents shall be deemed to transfer any design liability from Contractor to the District, nor relieve Contractor from the obligation to perform the Work and complete the Project in full compliance with the Contract Documents.

2.2.6 Upon completion of the Work, and as a condition to receiving final payment pursuant to Section 4.7, Contractor shall prepare and provide to the District a final set of as-built drawings, depicting the Project as completed, including all changes to the Project made subsequent to the approval of the Construction Documents.

2.2.7 All drawings, specifications, interim design submissions, Construction Documents, and other documents furnished by Contractor to the District pursuant to the Contract Documents (those documents, the "**Work Product**") are deemed to be instruments of service and Contractor shall retain the ownership and intellectual property rights therein.

2.2.8 Upon the District's payment in full for the Work required for Contractor to prepare any Work Product, Contractor will be deemed to have granted to the District a perpetual license to use that Work Product in connection with the construction, occupancy, and maintenance of the Project.

2.3 **Procurement Services.** If the Work includes any procurement services, sections 2.3.1 through 2.3.7 apply

2.3.1 In the performance of its procurement services, Contractor shall at all times be and act subject to the direction and control of the District as the District's authorized limited agent. By "limited agent" the parties mean that Contractor shall have authority to represent and act for the District for the purpose of procuring equipment, materials, and supplies as necessary to complete the Project. Contractor will maintain direct supervision and complete charge and control of and responsibility for its personnel in the performance of these procurement services.

2.3.2 Equipment, materials, and supplies purchased by Contractor, and paid for by the District, that are left over at the Site or any other location where the Work is completed, shall remain the sole property of the District. Contractor shall endeavor to purchase only sufficient material, equipment and supplies that are necessary for the Project. Contractor shall endeavor to purchase on the basis that surplus materials may be returned to the vendor at a reasonably discounted price. If requested by the District, Contractor shall be responsible for disposing of all surplus equipment, materials, and supplies and shall credit the Project with the amount recovered. Contractor shall not, at any time or for any reason, knowingly or negligently acquire equipment, materials, or supplies unreasonably in excess of what will be required for completion of the Work, and Contractor shall manage Subcontractors so as to prevent them from acquiring equipment, materials, or supplies unreasonably in excess of what is required to complete the Work. Any amount of materials, equipment or supplies that is acquired in an unreasonable quantity because of negligence in contravention of the foregoing sentence shall be paid for by Contractor out of amounts otherwise payable to Contractor under the Contract, directly or by way of set off by the District.

2.3.3 Contractor shall determine and then requisition and purchase or otherwise arrange for the provision of all equipment, materials, supplies, and construction tools and equipment, except as may be furnished by the District, required for the accomplishment of the Work. With regard to the procurement of equipment, materials, and supplies intended to become a permanent part of the Project, Contractor shall purchase such materials, equipment, and supplies as limited agent for, and on behalf of, and in the name of the District on terms consistent with this Contract and acceptable to the District. Contractor shall be responsible for all aforesaid items being furnished in accordance with the requirements of this Contract.

2.3.4 Contractor shall be responsible for arrival on the Site of all items described in the preceding section in such time as to avoid any delay in the continuous prosecution of the Work. Unless otherwise directed by the District, Contractor shall, in consultation with the District and the District's insurance advisors, purchase, or arrange for the purchase of, freight forwarder insurance or similar insurance for all items described in the preceding section.

2.3.5 For equipment furnished by the District to be incorporated in the Work, if any, Contractor shall assume responsibility for administration of any purchase order in connection therewith, with respect to inspection, expediting and delivery, and the resolution of technical problems relating to manufacture.

2.3.6 Unless otherwise agreed by the District in writing, Contractor shall cause title, possession, control and risk of loss of all equipment, materials, and supplies procured by or through Contractor to remain in third parties and not to pass or be deemed to pass to the District until such equipment, materials, and supplies arrive at or are delivered to the Site. Title to all equipment, materials, and supplies must pass to the District free and clear of any and all liens, encumbrances or claims whatsoever in favor of Contractor or any third parties.

2.3.6 Contractor shall be responsible for, and shall indemnify and hold the District harmless from, all export clearances and license fees in connection with the shipment to the United States of any equipment, materials, or supplies of foreign manufacture covered by this contract and any and all taxes, duties, imports, or similar charges levied or assessed by any governmental authority having jurisdiction upon or against such equipment, materials, or supplies or the transaction giving rise to such shipment, regardless of whether title to such equipment, materials, or supplies shall have passed to or become vested in the District.

2.3.7 The District shall have the right to approve the suppliers of equipment, materials and supplies covered by this Contract. Contractor shall allow the District to personally inspect the place of manufacture of any equipment, materials, or supplies, and to observe the manufacturing process and any tests performed on equipment, materials, or supplies covered by this Contract. Contractor shall provide the District with copies of inspection reports for equipment, material, equipment, and supplies covered by this Contract, and shall draw the District's attention to any potential problem areas.

## 2.4 Government Approvals, Permits, and Legal Requirements.

2.4.1 Unless otherwise provided in the Contract Documents to be the responsibility of the District, Contractor shall obtain and pay for all necessary permits, approvals, licenses, government charges and inspection fees required for the prosecution of the Work by any government or quasi-government entity having jurisdiction over the Project. Contractor shall provide reasonable assistance to the District in obtaining those permits, approvals, and licenses that are the District's responsibility, as set forth elsewhere in the Contract Documents.

2.4.2 Contractor shall perform the Work in accordance with all Legal Requirements and shall provide all notices applicable to the Work as required by the Legal Requirements.

2.4.2 Contractor shall take all necessary steps to prevent the filing of any mechanic's liens on any District property. If a lien of any nature arising from or related to the Work is filed

against any District property, the Contractor shall promptly take any and all actions necessary to cause such lien to be released or discharged.

2.5 **Construction Services.**

2.5.1 Contractor shall proceed with construction in accordance with the approved Construction Documents.

2.5.2 Unless otherwise provided in the Contract Documents to be the responsibility of the District or a separate contractor, Contractor shall provide through itself or Subcontractors the necessary supervision, labor, inspection, testing, start-up, material, equipment, machinery, temporary utilities and other temporary facilities to permit Contractor to complete construction of the Project consistent with the Contract Documents.

2.5.3 Contractor is responsible for securing the Site until Substantial Completion of the Project.

2.5.4 Contractor shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract Documents. Contractor shall at all times exercise complete and exclusive control over the means, methods, sequences and techniques of construction.

2.5.5 Contractor shall employ only Subcontractors who are duly licensed and qualified to perform the Work consistent with the Contract Documents. The District may require Contractor to remove from the Project a Subcontractor, or anyone employed directly or indirectly by Contractor or a Subcontractor, if the District reasonably believes that the person or firm is not performing its assigned Work in a safe, careful, or timely manner.

2.5.6 Contractor is responsible for the proper performance of the Work of Subcontractors and any acts and omissions in connection with such performance. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between the District and any Subcontractor, including but not limited to any third-party beneficiary rights.

2.5.7 Contractor shall coordinate the activities of all of its Subcontractors. If the District performs other work on the Project or at the Site with separate contractors under the District's control, Contractor agrees to reasonably cooperate and coordinate its activities with those of such separate contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption.

2.5.8 Contractor shall keep the Site reasonably free from debris, trash and construction wastes to permit Contractor to perform its construction services efficiently, safely and without interfering with the use of adjacent land areas. Contractor shall remove materials and equipment from the Site as soon as they are no longer necessary. Upon Substantial Completion of the Work, or a portion of the Work, Contractor shall remove all debris, trash, construction wastes, materials,

equipment, machinery and tools arising from the Work or applicable portions thereof to permit the District to occupy the Project or a portion of the Project for its intended use.

2.6 **Quality Assurance/Quality Control.**

2.6.1 As a means of assuring that the performance of the Work fulfills the requirements of the Contract Documents, the Contractor and Contractor's Subcontractors shall implement a quality assurance and quality control program ("**QA/QC Plan**") for all the Work. The QA/QC Plan must provide assurance that design, procurement, manufacturing, shipping, construction, testing, storage, and examination of all equipment, materials, and services will comply with the requirements of the Contract Documents.

2.6.2 Contractor shall submit its QA/QC Plan to the District for review and approval within thirty (30) days of the execution of the Agreement.

2.6.3 Throughout the course of the Work, Contractor shall provide the District with access to Contractor's QA/QC personnel and processes to enable monitoring and quality auditing.

2.6.4 The QA/QC Plan is only an aid to achieving compliance with the Contract Documents and to documenting such compliance. The QA/QC Plan will not relieve Contractor of the responsibility to comply with other requirements of the Contract Documents.

2.7 **Inspection and Approval by the District.**

2.7.1 All Work done and all equipment, materials, and supplies are subject to inspection by the District to determine if they conform to the Contract Documents. The District shall at all times have access to the Work, including equipment, materials, and supplies being fabricated or stored off site. Contractor shall furnish at the Contractor's cost any facilities necessary for sufficient and safe access to the Work.

2.7.1 Inspections, tests, measurements, or other acts of the District are for the sole purpose of assisting the District in determining that the Work, equipment, materials, supplies, rate of progress, and quantities comply with the Contract Documents and/or Contractor's Applications for Payment. These acts or functions will not relieve the Contractor from performing the Work in full compliance with the Contract Documents nor relieve the Contractor from any of the quality, compliance, and responsibility for the Work assigned to it by the Contract Documents. No inspection by the District will constitute or imply acceptance or waiver of rights.

2.7.3 Any Work required to be inspected by the District prior to being covered, which is covered up without prior inspection or without prior consent of the District, must be uncovered and recovered by the Contractor, if requested by the District, at no cost to Owner, notwithstanding the provisions of Section 2.7.4.

2.7.4 Contractor shall provide the District with at least 48 hours advance written notice of the time at which the District must be present to perform an inspection. Failure to provide such notice will place the Contractor at risk for all consequences of non-inspection and having to uncover work.

2.7.5 The District may reject any nonconforming Work, equipment, materials, or supplies, and Contractor shall correct such rejected Work without additional compensation, even if the Work, equipment, materials, or supplies have been previously inspected or accepted by the District or even if the District failed to observe the unsuitable Work, equipment, materials, or supplies. Contractor shall bear all costs of correcting such Work, equipment, materials, or supplies, including the cost of necessary additional professional services and the cost of repairing or replacing all Work of separate contractors or Subcontractors damaged by such removal or correction.

2.7.6 If the Contractor does not promptly replace or correct such Work or material, the Owner may replace or correct the Work or material, and charge or deduct the cost of removal and replacement from any monies due to the Contractor, or recover such costs from the Contractor.

2.7.7 The District's exercise of any of its rights under this Section 2.7 will not relieve Contractor of its obligation to achieve the Contract Times, nor entitle Contractor to a Change Order.

2.8 **Contractor's Warranty.**

2.8.1 Contractor warrants to the District that the construction, including all materials and equipment furnished as part of the construction, shall be new (unless otherwise specified in the Contract Documents), of good quality, fit for their intended use as contemplated by the Contract Documents, in conformance with the Contract Documents, and free of defects in design, materials, and workmanship. Nothing in this warranty is intended to limit any manufacturer's warranty that provides the District with greater warranty rights than set forth in this Section or the Contract Documents. Contractor shall provide the District with all manufacturers' warranties upon Substantial Completion.

2.8.2 If Contractor becomes aware of any fault or defect in the Work, or non-conformance with the Contract Documents, Contractor shall give prompt written notice of that fault, defect, or non-conformance to the District.

2.8.3 Except as otherwise stated in the Contract Documents, Contractor shall correct any Work that is found to not be in conformance with the Contract Documents within a period of one (1) year from the date of Contractor's Application for Final Payment.

2.8.4 Contractor shall, within seven (7) days of receipt of written notice from the District that the Work is not in conformance with the Contract Documents, take meaningful steps to

commence correction of such nonconforming Work, including the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work. Any such corrective work must be taken with due regard with the need to maintain service to the District's customers. If Contractor fails to commence the necessary steps within such seven (7) day period, the District, in addition to any other remedies provided under the Contract Documents, may provide Contractor with written notice that the District will commence correction of such nonconforming Work with its own forces or other contractors. If the District does perform, or cause to be performed, such corrective Work, Contractor will be responsible for all reasonable costs incurred by the District in performing such correction. If the nonconforming Work creates an emergency requiring an immediate response, including an outage or reduction in capacity, the seven (7) day period identified herein will be deemed inapplicable.

2.8.5 Contractor shall bear the cost of any corrective work described in Section 2.8.4, whether those costs are incurred by Contractor or by the District. Those costs include the costs of (a) locating and identifying the defective design, equipment, component, program, or device within the failed equipment, (b) removal, correction, or replacement including transportation charges, (c) retesting, and (d) providing any the District personnel necessary to facilitate the corrective work.

2.8.6 Whenever any defect covered by the Contractor's warranty has been corrected, or any defective or failed item has been repaired or replaced pursuant hereto, the one-year warranty period will recommence as to the repaired or replaced item.

2.8.7 The one-year period referenced in Section 2.8.3 above applies only to Contractor's obligation to correct nonconforming Work and is not intended to constitute a period of limitations for any other rights or remedies the District may have regarding Contractor's other obligations under the Contract Documents.

2.8.8 Notwithstanding anything in this Section 2.8 to the contrary, the District may elect to continue to use and operate any nonconforming Work or equipment until it can be taken out of service or until corrective Work can be performed. Any such election by the District will not relieve Contractor from any of its warranty obligations.

## 3.0 Site Conditions

3.1 Unless otherwise expressly provided in the Contract Documents to be part of the Work, Contractor is not responsible for any Hazardous Materials encountered at the Site, that were not brought onto the Site by the Contractor or Subcontractor. "**Hazardous Materials**" means any substance that is deemed a hazardous waste or substance under any Legal Requirement.

3.2 If Contractor discovers at the Site any substance the Contractor reasonably believes to be a Hazardous Material, Contractor shall immediately stop Work in the area of the discovery and immediately report the discovery to the District. The District shall determine how to deal with the Hazardous Material, and Contractor shall resume Work in the area when directed to do so by the District.

3.3 Contractor will be entitled to an adjustment to the Contract Price and/or Contract Times to the extent Contractor's cost and/or time of performance have been adversely impacted by the presence of Hazardous Materials.

3.4 Notwithstanding Sections 3.1 through 3.3, the District is not responsible for Hazardous Materials introduced to the Site by Contractor, its Subcontractors, or anyone for whose acts Contractor is responsible. To the fullest extent permitted by law, Contractor shall defend and indemnify the District from and against all claims, losses, damages, liabilities and expenses, including attorneys' fees and expenses, arising out of or resulting from those Hazardous Materials introduced to the Site by Contractor, its Subcontractors, or anyone for whose acts Contractor is responsible.

3.5 If Contractor encounters a Differing Site Condition, Contractor may request a Change Order to adjust the Contract Price and/or Contract Times, to the extent Contractor's cost and/or time of performance have been adversely impacted by the Differing Site Condition. "**Differing Site Condition**" means concealed or latent physical conditions at the Site that (i) materially differ from the conditions indicated in the Contract Documents, and (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work.

3.6 Upon encountering a Differing Site Condition, Contractor shall provide prompt written notice to the District of such condition, which notice shall not be later than five (5) days after such condition has been encountered. Contractor shall, to the extent reasonably possible, provide such notice before the Differing Site Condition has been substantially disturbed or altered. Failure to promptly provide such notice will constitute a waiver of any claim for an adjustment to the Contract Times and Contract Price.

# 4.0 Payment

## 4.1 Schedule of Values.

4.1.1 Unless required by the District upon execution of this Contract, within ten (10) days of execution of the Agreement, Contractor shall submit for the District's review and approval a schedule of values for all of the Work. The Schedule of Values will (i) subdivide the Work into its respective parts, including but not limited to design, manufacture, and delivery of equipment

and materials, and engineering and construction services, (ii) include values for all items comprising the Work and, (iii) serve as the basis for monthly progress payments made to Contractor throughout the Work.

4.1.2 The District will timely review and approve the Schedule of Values so as not to delay the submission of the Contractor's first application for payment. The District and Contractor shall timely resolve any differences so as not to delay the Contractor's submission of its first application for payment.

4.2 **Application for Payment.**

4.2.1 To receive payment, Contractor shall submit to the District an Application for Payment requesting payment for all Work performed as of the date of the Application for Payment. Contractor shall not submit Applications for Payment more often than once per month. The Application for Payment must be accompanied by supporting documentation sufficient to establish, to the District's reasonable satisfaction, Contractor's entitlement to receive payment.

4.2.2 The Application for Payment may request payment for equipment and materials not yet incorporated into the Project, provided that (i) the District is satisfied that the equipment and materials are suitably stored at either the Site or another acceptable location, (ii) the equipment and materials are protected by suitable insurance, and (iii) upon payment, the District will receive the equipment and materials free and clear of all liens and encumbrances.

4.2.3 The Application for Payment will constitute Contractor's representation that the Work described therein has been performed consistent with the Contract Documents, has progressed to the point indicated in the Application for Payment, and that title to all materials and equipment will pass to the District free and clear of all claims, liens, encumbrances, and security interests upon the incorporation of the materials and equipment into the Project, or upon Contractor's receipt of payment, whichever occurs earlier.

4.3 **Sales Tax**

4.3.1 Contractor shall pay all applicable sales and use taxes, and shall itemize those amounts separately on each Application for Payment.

4.4 **The District's Payment Obligations.**

4.4.1 The District shall pay Contractor all amounts properly requested and documented within thirty (30) days of receipt of an Application for Payment.

4.4.2 Notwithstanding Section 4.4.1, the District may withhold a percentage of each payment as retention in accordance with applicable law.

4.4.3 Notwithstanding Section 4.4.1, if the District identified Milestone Dates pursuant to Section 2.1.3, and if Contractor's actual progress on the Work has fallen behind the scheduled

progress as of a Milestone Date, the District may withhold 10 percent of each subsequent payment, until Contractor has initiated remedial action to get the Work back on schedule, to the satisfaction of the District. Any amounts withheld under this section will be placed in an interest-bearing account, and the withheld money, plus accrued interest, will be released to Contractor when the Work is back on schedule, to be determined by the District in its reasonable discretion. No interest will be paid to the Contractor if the Contractor fails to meet a Substantial Completion Date. Remaining withheld payments under this section will be released to the Contractor upon Substantial Completion of the entire Work.

4.4.4. Notwithstanding Section 4.4.1, if the District determines that Contractor is not entitled to all or part of an Application for Payment as a result of Contractor's failure to meet its obligations hereunder, the District will notify Contractor in writing at least five (5) days prior to the date payment is due. The notice must indicate the specific amounts the District intends to withhold, the reasons and contractual basis for the withholding, and the specific measures Contractor must take to rectify the District's concerns. Contractor and the District will attempt to resolve the District's concerns prior to the date payment is due. If the parties cannot resolve such concerns, Contractor may pursue its rights under the Contract Documents, including those under Section 8 of these General Conditions. Contractor shall continue to perform the Work pending the resolution of any such dispute.

## 4.5 **Contractor's Payment Obligations.**

4.5.1 Contractor shall pay its Subcontractors and suppliers, in accordance with its contractual obligations to such parties, all the amounts Contractor has received from the District on account of their work. Contractor shall indemnify and defend the District against any claims for payment and mechanic's liens as set forth in Section 5.2.

## 4.6 **Substantial Completion.**

4.6.1 Contractor shall notify the District when it believes the entire Work is ready for Substantial Completion. Within five (5) days of the District's receipt of Contractor's notice, the District and Contractor will jointly inspect such Work to verify that it has met the requirements for Substantial Completion. If the Work meets the requirements for Substantial Completion, the District shall prepare and issue a Certificate of Substantial Completion that will set forth (i) the date of Substantial Completion of the Work or portion thereof, (ii) the remaining items of Work that have to be completed before Final Completion, if applicable, (iii) the remaining items of Work that have to be completed before final payment, and (iv) provisions (to the extent not already provided in the Contract Documents) establishing the District's and Contractor's responsibility for the Project's security, maintenance, utilities and insurance pending final payment.

4.6.2 Promptly after issuing the Certificate of Substantial Completion, the District shall release to Contractor all retained amounts, less an amount equal to two times the reasonable value of all remaining or incomplete items of Work as noted in the Certificate of Substantial Completion.

4.6.3 Upon Contractor's request or upon the District's own initiative, the District may, in its sole discretion, accept a portion of the entire Work as Substantially Complete. The provisions of Sections 4.6.1 and 4.6.2 will apply to that portion of the Work. The District's acceptance of a portion of the Work as Substantially Complete will not relieve Contractor of its responsibility for protection and care of the entire Work. In addition, before the District may take possession of or place into service a portion of the Work, the District and Contractor shall obtain the consent of their sureties, insurers, and any government authorities having jurisdiction over the Project.

4.6.4 Following Substantial Completion, the District may restrict Contractor's access to the Site. The District shall allow Contractor reasonable access to the Site in order for the Contractor to achieve Final Completion.

4.7 **Final Payment.**

4.7.1 When Contractor has achieved Final Completion of the Work, Contractor shall submit a Final Application for Payment and the following information:

4.7.1.1 An affidavit that there are no claims, obligations or liens outstanding or unsatisfied for labor, services, material, equipment, taxes or other items performed, furnished or incurred for or in connection with the Work which will in any way affect the District's interests;

4.7.1.2 A general release executed by Contractor waiving, upon receipt of final payment, all claims, except those claims previously made in writing to the District and remaining unsettled at the time of final payment;

4.7.1.3 Consent of Contractor's surety, if any, to final payment;

4.7.1.4 All operating manuals, warranties and other deliverables required by the Contract Documents; and

4.7.1.5 Certificates of insurance confirming that required coverages will remain in effect consistent with the requirements of the Contract Documents.

4.7.2 Upon making final payment, the District waives all claims against Contractor except claims relating to (i) Contractor's failure to satisfy its payment obligations, if such failure affects the District's interests, (ii) Contractor's failure to complete the Work consistent with the Contract Documents, including defects appearing after Substantial Completion, and (iii) the terms of any warranties required by the Contract Documents.

4.7.3 Final payment by the District constitutes an acknowledgment that warranties commence to run on the date of Contractor's Final Application for Payment.

4.7.4 Deficiencies in the Work discovered after Substantial Completion, whether or not such deficiencies would have been included on a punch list if discovered earlier, will be deemed

warranty Work. Contractor shall correct such deficiencies pursuant to Section 2.8, and the District may withhold from the final payment the reasonable value of completion of the deficient work until that work is completed.

## 5.0 Indemnification and Loss

### 5.1 **Patent and Copyright Infringement**.

5.1.1 Contractor shall defend any action or proceeding brought against the District based on any claim that the Work, or any part thereof, or the operation or use of the Work or any part thereof, constitutes infringement of any patent or copyright, now or hereafter issued. the District shall give prompt written notice to Contractor of any such action or proceeding and will reasonably provide authority, information and assistance in the defense of same. Contractor shall indemnify the District from and against all damages and costs, including but not limited to attorneys' fees and expenses awarded against the District or Contractor in any such action or proceeding. Contractor shall keep the District informed of all developments in the defense of such actions.

5.1.2 If the District is enjoined from the operation or use of the Work, or any part thereof, as the result of any patent or copyright suit, claim, or proceeding, Contractor shall at its sole expense take reasonable steps to procure the right to operate or use the Work. If Contractor cannot so procure such right within a reasonable time, Contractor shall promptly, at Contractor's expense, either (i) modify the Work so as to avoid infringement of any such patent or copyright or (ii) replace said Work with Work that does not infringe or violate any such patent or copyright.

5.1.3 Sections 5.1.1 and 5.1.2 above shall not be applicable to any suit, claim or proceeding based on infringement or violation of a patent or copyright arising from modifications to the Work by the District or its agents after acceptance of the Work.

5.1.4 The obligations set forth in this Section 5.1 shall constitute the sole agreement between the parties relating to liability for infringement of violation of any patent or copyright.

### 5.2 **Payment Claim Indemnification.**

5.2.1 Provided that the District is not in breach of its contractual obligation to make payments to Contractor for the Work, Contractor shall indemnify, defend and hold harmless the District from any claims or mechanic's liens brought against the District or against the Project as a result of the failure of Contractor, its Subcontractors, or others for whose acts Contractor is responsible, to pay for any services, materials, labor, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work. Within three (3) days of receiving written notice from the District that such a claim or mechanic's lien has been filed, Contractor shall

commence to take the steps necessary to discharge said claim or lien, including, if necessary, the furnishing of a mechanic's lien bond. If Contractor fails to do so, the District will have the right to discharge the claim or lien and hold Contractor liable for costs and expenses incurred, including attorneys' fees.

## 5.3 Contractor's General Indemnification.

5.3.1 Contractor shall indemnify and hold harmless the District and all of its officers and employees (the "**Indemnitees**") from and against any and all suits and causes of action, claims, charges, damages, demands, judgments, civil fines and penalties, or losses of any kind or nature whatsoever, for death, bodily injury or personal injury to any person, including the employees of Contractor and Subcontractors of any tier, or damage or destruction to any property caused by reason of the negligent acts, errors, omissions or willful misconduct incident to the performance of this Agreement on the part of the Contractor, Subcontractors of any tier, or any of their respective officers or employees.

5.3.2 The Contractor shall comply, and cause its Subcontractors to comply with all Legal Requirements, specifically including Legal Requirements relating to workplace safety. Contractor shall indemnify and hold harmless the Indemnitees from and against any and all suits and causes of action, claims, charges, damages, demands, judgments, civil fines and penalties, or losses of any kind or nature whatsoever, presented, brought or recovered against the Indemnitees or that may be incurred by the Indemnitees as a result of the Contractor's failure to comply with such Legal Requirements.

5.3.3 At the option of the affected Indemnitees, Contractor shall defend the affected Indemnitees against any and all suits and causes of action, claims, charges, damages, demands, judgments, civil fines and penalties, or losses of any kind or nature whatsoever, for which Contractor has an indemnification obligation. Subject to the approval of affected Indemnitees, which shall not be unreasonably withheld, the Contractor shall retain legal counsel for the purpose of defending any affected Indemnitees. Contractor shall not settle, discontinue, or allow judgment to be entered in any such suit or action without the written consent of the affected Indemnitee(s), which consent shall not be unreasonably withheld.

5.3.4 Contractor's indemnification obligations will not be limited or affected by any insurance Contractor is required to maintain pursuant to the terms of this Agreement.

## 5.4 Risk of Loss.

5.4.1 Contractor bears all risk of loss to the Project, including materials and equipment not yet incorporated into the Project, until Substantial Completion.

5.5 **Bonds.**

5.5.1 Contractor shall furnish and maintain a satisfactory performance bond. The performance bond must guarantee the faithful performance of the Contract in a manner satisfactory to the District, and that materials furnished and quality of Work shall be free from defects.

5.5.2 Contractor shall furnish and maintain a satisfactory labor and material payment bond. The bond must guarantee that Subcontractors and suppliers of equipment and materials will be paid.

5.5.3 The Bonds must be executed by a responsible corporate surety, authorized to issue such bonds in the State of Utah. Unless otherwise provided in the Agreement, the bonds must be in an amount of not less than 100 percent of the Contract Price. The bonds must be accompanied by a current copy of the surety company's license issued by the Utah Insurance Department. The Bonds must extend to Work performed pursuant to Change Orders, and to purchase of optional quantities of equipment and supplies, even if such changes are made or options exercised without notice to the surety.

5.5.4 If the District at any time deems the Bonds or other surety to be insufficient or unsatisfactory, the District may require the Contractor to replace, increase, or supplement the Bonds or other surety. In that event, the District will not be required to make further payment to the Contractor until the Contractor replaces, increases, or supplements the Bonds or other surety to the District's satisfaction.

## 6.0 Time

6.1 **Obligation to Achieve the Contract Times.**

6.1.1 Contractor shall commence performance of the Work and achieve the Contract Times in accordance with the Agreement.

6.2 **Delays to the Work.**

6.2.1 If Contractor is materially delayed in the performance of the Work due to Differing Site Conditions, Hazardous Materials, Force Majeure Events, changes in the Work, or acts or omissions of the District or anyone under the District's control (including separate contractors), the Contract Times for performance shall be reasonably extended by Change Order.

6.2.2 In addition to Contractor's right to a time extension for those events set forth in Section 6.2.1 above, Contractor will also be entitled to an appropriate adjustment of the Contract Price provided, however, that the Contract Price will not be adjusted for Force Majeure Events unless otherwise provided in the Agreement.

## 7.0 Changes

### 7.1 Change Orders.

7.1.1 Contractor shall not undertake any activity that materially changes the Work, or materially deviates from the requirements of the Contract Documents, except as authorized in this Article 7. Any costs incurred by Contractor without authorization as provided in this Article 7 will be considered non-reimbursable.

7.1.1 A Change Order is a written instrument, signed by the District and Contractor, issued after execution of the Agreement, stating their agreement on a change in the scope of the Work, the Contract Price, and/or the Contract Times.

7.1.2 All changes in the Work authorized by applicable Change Order shall be performed under the applicable conditions of the Contract Documents. The District and Contractor shall negotiate in good faith and as expeditiously as possible the appropriate adjustments for such changes.

### 7.2 Requests for Information.

7.2.1 The District may deliver to Contractor Requests for Information ("**RFI**") regarding specified changes in the Work. Upon receipt of the RFI, Contractor shall prepare an estimate of the cost and schedule impact of the change. Upon agreement between the District and Contractor on the scope of the change to the Work, and the adjustment, if any, to the Contract Price and/or Contract Times, the District and Contractor shall execute a written Change Order.

### 7.3 Direction or Authorization to Proceed.

7.3.1 A Direction or Authorization to Proceed ("**DAP**") is a written order prepared and signed by the District directing or authorizing a change in the Work prior to agreement on an adjustment in the Contract Price and/or the Contract Times. The District may issue a DAP at any time, and Contractor shall undertake the Work as set forth in the DAP, and in accordance with the Contract Documents.

7.3.2 The District and Contractor shall negotiate in good faith and as expeditiously as possible the appropriate adjustments for the DAP. Upon reaching an agreement, the parties shall prepare and execute an appropriate Change Order reflecting the terms of the agreement.

7.4 **Minor Changes in the Work.**

7.4.1 Minor changes in the Work do not involve an adjustment in the Contract Price and/or Contract Times and do not materially and adversely affect the Work, including the design, quality, performance and workmanship required by the Contract Documents. Contractor may make minor changes in the Work consistent with the intent of the Contract Documents, provided, however, that Contractor shall promptly inform the District, in writing, of any such changes and record such changes on the documents maintained by Contractor.

7.5 **Constructive Changes.**

7.5.1 A written or verbal order from the District that causes a material change in the Work will be treated as a Change Order under this Article if Contractor delivers to the District's Project Manager a written notice identifying (i) the date, circumstances, and source of the order, and (ii) an explanation of why the Contractor regards the order to be a change order. To be valid, such notice must be delivered within twenty-one (21) Days of the order.

7.6 **Equivalent Materials.**

7.6.1 Whenever in the Contract Documents any particular equipment, material, or process is indicated or specified by a patent or proprietary name, or by a trade or brand name, or by the name of a manufacturer, such wording is used for the purpose of facilitating description of the equipment, material, or process required, and for fixing the standard of quality required. The parties intend that any such wording be deemed to be followed by the words "or equivalent."

7.6.2 The Contractor may propose an equivalent alternative to any equipment, material or process specified in the Contract Documents. To make such a proposal, the Contractor must submit a written request to the District for approval at least 30 days prior to the use of such equipment, material, or process. The request shall contain the name of the manufacturer, brand, catalog number or other designation, description of the materials used, detailed descriptions, general drawings, photographs, or illustrations, and all other information showing that the equipment, material, or process is equivalent to that specified. If requested by the District, the Contractor shall have such equivalent material or equipment tested as to its quality, strength, durability, design, efficiency, finish, service, or chemical characteristics. The District may approve or deny any such request in its sole discretion.

7.6.3 If the District approves a Contractor request to use an equivalent alternative to any equipment, material, or process specified in the Contract Documents, it may do so on the condition that the Contract Price be reduced to account for the cost savings to the Contractor.

7.6.4 Any change to the requirements of the Contract Documents as described in this Section 7.6 must be documented in a Change Order.

## 7.7 Contract Price Adjustments.

7.7.1 The increase or decrease in Contract Price resulting from a change in the Work will be determined by one or more of the following methods:

7.7.1.1 Unit prices set forth in the Agreement or as subsequently agreed to between the parties;

7.7.1.2 A mutually accepted lump sum, properly itemized and supported by sufficient substantiating data to permit evaluation by the District;

7.7.1.3 Costs, fees and any other markups set forth in the Agreement; or

7.7.1.4 If an increase or decrease cannot be agreed to as set forth in items 7.7.1.1 through 7.7.1.3 above and the District issues a DAP, the cost of the change of the Work shall be determined by the actual cost or savings in the performance of the Work resulting from the change, including a reasonable markup for overhead and profit, as may be set forth or limited in the Agreement.

7.7.2 If unit prices are set forth in the Contract Documents or are subsequently agreed to by the parties, but application of such unit prices will cause substantial inequity to the District or Contractor because of differences in the character or quantity of such unit items as originally contemplated, such unit prices shall be equitably adjusted.

7.7.3 Negotiations over changes in the Contract Price will be conducted using an open-book cost-estimating process. The District defines "open-book" to include all elements of Contractor's costs, including labor hours and rates, units and estimated quantities, unit prices, equipment estimates, material costs, and subcontractor costs. Contractor shall openly share its detailed cost estimate, material and subcontractor quotations and any other information used to compile its cost estimate.

7.7.4 If the District and Contractor disagree upon whether Contractor is entitled to be paid for any services required by the District, or if there are any other disagreements over the scope of Work or proposed changes to the Work, the District and Contractor shall resolve the disagreement pursuant to Section 8 hereof.

## 7.8 **Emergencies**.

7.8.1 In any emergency affecting the safety of persons and/or property, Contractor shall act, at its discretion, to prevent threatened damage, injury or loss. Any change in the Contract Price and/or Contract Times on account of emergency work shall be determined as provided in this Section 7.

## 8.0 Claims and Claim Resolution

### 8.1 **Claims.**

8.1.1 "**Claim**" means a demand or assertion by one of the parties to the Agreement seeking, as a matter of right, adjustment of contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract Documents. The term "Claim" also includes other disputes between the District and the Contractor arising out of or relating to the Contract Documents. Claims must be made by written notice. The responsibility to substantiate claims rests with the party making the claim.

8.1.2 Claims by Contractor must be made within twenty-one (21) days after occurrence of the event giving rise to the Claim or within twenty-one (21) days after the Contractor first recognizes, or reasonably should have recognized, the condition giving rise to the Claim, whichever is later. An additional Claim made after the initial Claim has been resolved will not be considered unless submitted in a timely manner.

8.1.3 Pending final resolution of a Claim, including litigation, unless otherwise directed by the District in writing, Contractor shall proceed diligently with performance of the Work and the District shall continue to make payments in accordance with the Contract Documents.

### 8.2 **Claim Resolution.**

8.2.1 The parties shall attempt in good faith to resolve promptly through negotiation any Claim or dispute arising out of or relating to this Contract. If a dispute or Claim should arise, the District's Project Director and Contractor's Project Manager will meet at least once to attempt to resolve the dispute. For such purpose, either may request the other to meet within seven (7) days of the date the Claim is made, at a mutually agreed upon time and place.

8.2.2 If the District's Project Director and Contractor's Project Manager are not able to resolve the dispute within fourteen (14) days after their first meeting (or such longer period of time as may be mutually agreed upon), either party may request that the District's Senior Representative and the Contractor's Senior Representative meet at least once to attempt to resolve the dispute.

8.2.3 If the Claim or dispute has not been resolved within sixty (60) days of the date the Claim is made, either party may refer the Claim or dispute to non-binding mediation by sending a written mediation request to the other party. In the event that such a request is made, the Parties agree to participate in the mediation process. Non-binding mediation of claims or controversies under this Contract shall be conducted by a professional mediator that is mutually acceptable to and agreed upon by both parties (the "Mediator"). The parties and the Mediator may join in the mediation any other party necessary for a mutually acceptable resolution of the dispute. The mediation procedure shall be determined by the Mediator in consultation with the parties. The fees and expenses of the Mediator shall be borne equally by the parties.

8.2.4 If the Claim or dispute is not resolved within thirty (30) days after the commencement of mediation, or if no mediation has been commenced within one hundred and twenty (120) days of the date the Claim is made, either party may commence litigation to resolve the dispute, in accordance with the Contract Documents.

## 9.0 Suspension and Termination

### 9.1 The District's Right to Suspend Work.

9.1.1 The District may, without cause and for its convenience, order Contractor in writing to stop and suspend the Work.

9.1.2 Contractor is entitled to seek an adjustment of the Contract Price and/or Contract Times if its cost or time to perform the Work has been adversely impacted by any suspension or stoppage of the Work by the District.

### 9.2 The District's Right to Terminate for Convenience.

9.2.1 Upon ten (10) days' written notice to Contractor, the District may, for its convenience and without cause, elect to terminate this Agreement. In such event, the District shall pay Contractor for the following:

9.2.1.1 All Work executed and for proven loss, cost or expense in connection with the Work;

9.2.1.2 The reasonable costs and expenses attributable to such termination, including demobilization costs and amounts due in settlement of terminated contracts with subcontractors and consultants; and

9.2.1.3 The fair and reasonable sums for overhead and profit on the sum of items 9.2.1.1 and 9.2.1.2 above.

### 9.3 The District's Right to Perform and Terminate for Cause.

9.3.1 If Contractor fails to (i) provide a sufficient number of skilled workers, (ii) supply the equipment, materials, or supplies required by the Contract Documents, (iii) comply with applicable Legal Requirements, (iv) timely pay, without cause, consultants or subcontractors, (v) prosecute the Work with promptness and diligence to ensure that the Work is completed by the Contract Times, as such times may be adjusted, or (vi) perform the Work in accordance with the Contract Documents, then the District, in addition to any other rights and remedies provided in the Contract Documents or by law, shall have the rights set forth in Sections 9.3.2 and 9.3.3 below.

9.3.2 Upon the occurrence of an event set forth in Section 9.3.1 above, the District may provide written notice to Contractor that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within ten (10) days of Contractor's receipt of such notice. If Contractor fails to cure, or reasonably commence to cure, such problem, then the District may declare the Agreement terminated for default by providing written notice to Contractor of such declaration.

9.3.3 Upon declaring the Agreement terminated pursuant to Section 9.3.2 above, the District may enter upon the premises and take possession, for the purpose of completing the Work, of all materials, equipment, scaffolds, tools, appliances and other items thereon, which have been purchased or provided for the performance of the Work, all of which Contractor hereby transfers, assigns and sets over to the District for such purpose, and to employ any person or persons to complete the Work and provide all of the required labor, services, materials, equipment and other items. In the event of such termination, Contractor shall not be entitled to receive any further payments under the Contract Documents until the Work shall be finally completed in accordance with the Contract Documents. At such time, if the unpaid balance of the Contract Price exceeds the cost and expense incurred by the District in completing the Work, such excess shall be paid by the District to Contractor. If the District's cost and expense of completing the Work exceeds the unpaid balance of the Contract Price, then Contractor shall pay the difference to the District. Such costs and expenses include not only the cost of completing the Work, but also losses, damages, costs and expenses, including attorneys' fees and expenses, incurred by the District in connection with the reprocurement and defense of claims arising from Contractor's default.

9.3.4 If the District improperly terminates the Agreement for cause, the termination for cause will be converted to a termination for convenience in accordance with the provisions of Section 9.2 above.

## 9.4 Contractor's Right to Stop Work.

9.4.1 Contractor may, in addition to any other rights afforded under the Contract Documents or at law, stop the Work for the District's failure to timely pay amounts properly due under Contractor's Application for Payment.

9.4.2 If the District fails to timely pay amounts properly due to Contractor, Contractor may provide the District with written notice that Contractor will stop the Work unless payment is made within thirty (30) Days from the District's receipt of Contractor's notice. If the District does not cure the problem within such thirty (30) Day period, Contractor may stop the Work. In such case, Contractor shall be entitled to make a claim for adjustment to the Contract Price and Contract Times to the extent it has been adversely impacted by such stoppage.

9.5 **Contractor's Right to Terminate for Cause.**

9.5.1 Contractor, in addition to any other rights and remedies provided in the Contract Documents or by law, may terminate the Agreement for cause for the following reasons:

9.5.1.1 The Work has been stopped for one hundred and twenty (120) consecutive Days, or more than two hundred and forty (240) Days in the aggregate during the duration of the Project, because of court order, any government authority having jurisdiction over the Work, or orders by the District under Section 9.1.1 hereof, provided that such stoppages are not due to the acts or omissions of Contractor or anyone for whose acts Contractor may be responsible.

9.5.1.2 The District's failure to provide Contractor with any information, permits or approvals that are the District's responsibility under the Contract Documents which result in the Work being stopped for one hundred and twenty (120) consecutive Days, or more than two hundred and forty (240) Days in the aggregate during duration of the Project, even though the District has not ordered Contractor in writing to stop and suspend the Work pursuant to Section 9.1.1 hereof.

9.5.1.3 The District's continued failure to cure a non-payment after Contractor has stopped the Work in accordance with Section 9.4.2, above.

9.5.2 Upon the occurrence of an event set forth in Section 9.5.1 above, Contractor may provide written notice to the District that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within twenty-one (21) Days of the District's receipt of such notice. If the District fails to cure, or reasonably commence to cure, such problem, then Contractor may give a second written notice to the District of its intent to terminate within an additional seven (7) Day period. If the District, within such second seven (7) Day period, fails to cure, or reasonably commence to cure, such problem, then Contractor may declare the Agreement terminated for default by providing written notice to the District of such declaration. In such case, Contractor shall be entitled to recover in the same manner as if the District had terminated the Agreement for its convenience under Section 9.2 of the Agreement.

9.6 **Bankruptcy of Contractor.**

9.6.1 If Contractor institutes or has instituted against it a case under the United States Bankruptcy Code, or any equivalent law of another country, such event may impair or frustrate the Contractor's ability to perform its obligations under the Contract Documents. Accordingly, should such event occur:

9.6.1.1 Contractor, its trustee or other successor, shall furnish, upon request of the District, adequate assurance of the ability of the Contractor to perform all future material

obligations under the Contract Documents, which assurances shall be provided within ten (10) days after receiving notice of the request; and

9.6.1.2 Contractor shall file an appropriate action within the bankruptcy court to seek assumption or rejection of the Agreement within sixty (60) days of the institution of the bankruptcy filing and shall diligently prosecute such action. If Contractor fails to comply with its foregoing obligations, the District shall be entitled to request the bankruptcy court to reject the Agreement, declare the Agreement terminated and pursue any other recourse available to the District under this Section 9, specifically including termination for cause.

9.6.2 The rights and remedies under Section 9.6.1 above shall not be deemed to limit the ability of the District to seek any other rights and remedies provided by the Contract Documents or by law, including its ability to seek relief from any automatic stays under the United States Bankruptcy Code.

## 10.0 Miscellaneous

### 10.1 **Confidential Information.**

10.1.1 "**Confidential Information**" means information that is determined by the transmitting party to be of a confidential or proprietary nature and: (i) the transmitting party identifies as either confidential or proprietary; (ii) the transmitting party takes steps to maintain the confidential or proprietary nature of the information; and (iii) the document is not otherwise available in or considered to be in the public domain. The receiving party shall maintain the confidentiality of the Confidential Information and shall use the Confidential Information solely in connection with the Project.

### 10.2 **Prohibited Interest.**

10.2.1 No member, officer, agent, or employee of the District during his or her tenure or for one year thereafter shall have any interest, direct or indirect, including prospective employment by, Contractor or the proceeds under this Contract without specific written authorization by the District.

### 10.3 **No Publicity.**

10.3.1 Contractor shall not make any disclosure or publicize in any way its Work on the Project, or disclosure any information about the District or the Site, without the express written consent of the District.

10.4 **Assignment.**

10.4.1 Contractor acknowledges that the Work to be performed by Contractor is considered personal by the District. Contractor shall not assign or transfer its interest in this Contract without prior written approval by the District. Any attempt to assign or transfer Contractor's interest in this Contract without prior written approval by the District will be void.

10.5 **Successorship.**

10.5.1 Contractor and the District intend that the provisions of the Contract Documents are binding upon the parties, their employees, agents, heirs, successors and permitted assigns.

10.6 **Governing Law.**

10.6.1 The Agreement and all Contract Documents are governed by the laws of the State of Utah, without giving effect to its conflict of law principles. Actions to enforce the terms of this Agreement may only be brought in the Third District Court for Salt Lake County, Utah, or the Federal District Court for the District of Utah, in Salt Lake City, Utah.

10.7 **Governmental Immunity.**

10.7.1 The District does not, by entering into this Contract, waive any protections afforded by the Governmental Immunity Act of Utah, Utah Code Ann. § 63G-7-101 *et seq*.

10.8 **Severability.**

10.8.1 If any provision or any part of a provision of the Contract Documents is finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable Legal Requirements, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

10.9 **No Waiver.**

10.9.1 The failure of either Contractor or the District to insist, in any one or more instances, on the performance of any of the obligations required by the other under the Contract Documents shall not be construed as a waiver or relinquishment of such obligation or right with respect to future performance.

10.10 **Headings.**

10.10.1 The headings used in these General Conditions of Contract, or any other Contract Document, are for ease of reference only and shall not in any way be construed to limit or alter the meaning of any provision.

10.11 **Amendments.**

10.11.1 The Contract Documents may not be changed, altered, or amended in any way except in writing signed by a duly authorized representative of each party.

# Exhibit B

## Supplemental Conditions

1. The parties acknowledge and agree that the District will provide certain owner-furnished materials necessary for the completion of the Work, consisting of pre-fabricated building materials that are being manufactured and delivered to the Site by Western Steel Buildings (the "**Manufacturer**").

2. The Work to be performed under this Contract includes coordinating with the District's Engineer and the Manufacturer regarding design and constructability reviews during fabrication.

3. Contractor will be responsible for taking delivery of owner-furnished materials at the Site, including unloading. Contractor acknowledges that the Manufacturer may deliver materials in multiple shipments. Contractor shall inspect owner-furnished materials immediately upon delivery and notify the carrier and the District's Engineer of any shortages of materials, damaged or defective materials, or deviations from design. If any of the materials have become wet in transit, the Contractor shall unpack, unstack, and dry the materials to prevent corrosion.

4. Contractor shall perform the Work in accordance with the specifications and instructions provided by the Manufacturer.

# Exhibit C

## Insurance Requirements

1. During the term of the Contract, Contractor shall maintain at its own expense, and provide proof of said insurance to the District, the following types of insurance:

    i. General Liability Insurance: Commercial general liability insurance on an occurrence basis arising out of claims for bodily injury (including death) and property damage. Such insurance shall provide coverage for ongoing operations and products-completed operations, blanket contractual, broad form property damage, personal and advertising injury, independent contractors and sudden and accidental pollution liability [pollution liability arising out of a hostile fire] with a $3,000,000 minimum per occurrence limit combined bodily injury and property damage, with a $3,000,000 minimum aggregate limit, provided the general policy aggregate shall apply separately to the Contractor on a per project basis. Any aggregate limit that does not apply separately to the premises shall be at least double the required per occurrence limit.

    ii. Automobile insurance covering owned, if any, non-owned, and hired automobile with limits not less than $1,000,000 combined single limit of coverage.

    iii. Workers' Compensation Insurance: Statutory workers' compensation insurance (Part A). Such insurance shall also include employer's liability (Part B) insurance in a limit of no less than $1,000,000 for each: accident, disease, employee. No owner or officer may be excluded.

    iv. Builder's Risk / Installation Floater: Contractor shall provide optional terms for builder's risk and/or installation floater insurance. Contractor agrees to have the District approve builder's risk / installation floater insurance program including limits, deductibles, terms, etc. The District shall maintain the right to obtain and implement builder's risk / installation floater coverage at their discretion.

2. Additional Insured Endorsements: All policies of liability insurance required to be maintained by the Contractor shall be endorsed to name the District as additional insured for ongoing operations (ISO CG 20 10 or equivalent) and completed operations (ISO CG 20 37 or equivalent).

3. Primary and Non-Contributory Endorsements: The Contractor's insurance coverage shall be a primary insurance as respects to the District, its officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the District, its officers, officials, and employees shall be in excess of the contracting party's insurance and shall

not contribute with it.

4. Waiver of Subrogation Endorsements: The Contractor hereby waives any and every claim for recovery from the District, its officers, officials, and employees for any and all loss or damage covered by any of the insurance policies to be maintained under this Contractor agreement to the extent that such loss or damage is recovered under any such policy. To the extent the foregoing waiver would preclude coverage under any insurance required by this Section, the Contractor shall give written notice of the terms of such waiver to each insurance company which has issued, or which may issue in the future, any such policy of insurance (if such notice is required by the insurance policy) and shall cause each such insurance policy to be properly endorsed, or to otherwise contain one or more provisions that prevent the invalidation of the insurance coverage by reason of such a waiver.

5. Contractor states that this Agreement has been thoroughly reviewed by its insurance agent, broker or consultant, and that said agent/broker/ consultant has been instructed to procure for Contractor the insurance coverage and endorsements required herein.

# JORDANELLE SPECIAL SERVICE DISTRICT

# Invitation for Bids

## Part E – Forms

BID SCHEDULE
JSSD Shop Building

***Base Bid Schedule***

| Item No. | Item | Estimated Quantity | Unit | Unit Price | Total Estimated Price |
|---|---|---|---|---|---|
| 1 | Mobilization | 1 | LS | | $ |
| 2 | Materials Testing | 1 | LS | | $ |
| 3 | Temporary Controls / SWPPP | 1 | LS | | $ |
| 4 | Construction Staking | 1 | LS | | $ |
| 5 | Site Preparation | 1 | LS | | $ |
| 6 | Building Structure and Underground Utilities Within 5’ | 1 | LS | | $ |
| 7 | Site Concrete Driveway (6” Thick) | 3,682 | SF | $ | $ |
| 8 | Site Concrete Walkway (4” Thick) | 272 | SF | $ | $ |
| 9 | Site Asphalt (3” Asphalt, 6” Road Base) | 14,248 | SF | $ | $ |
| 10 | Sanitary Sewer System | 1 | LS | | $ |
| 11 | Drinking Water System | 1 | LS | | $ |
| 12 | Underground Power | 1 | LS | | $ |

TOTAL BID PRICE FOR BASE BID SCHEDULE

$ _____

---

**Company Name:**_____

**Authorized Signature**: _____
Date:_____

**Receipt of Addenda:**

Addendum #1 _____
Addendum #2 _____

**INFORMATION REQUIRED OF BIDDERS**

JSSD SHOP BUILDING

The BIDDER shall furnish the following information on the following form. Failure to comply with this requirement, misrepresent or provide inaccurate information will render the BID informal and may cause its rejection. Additional sheets shall be attached as required.

(1) Contractor's name and address:

_____

_____

_____

(2) Contractor's telephone number: _____.

(3) Contractor's license: Primary Classification:_____.

State License No.: _____ Supplemental

Classification held, if any: _____.

Bid Limit : _____.

(4) Number of years as a contractor in construction work of this type under the present firm name:

_____ years.

(5) List of subcontractors and suppliers for this project:

_____

_____

_____

_____

_____

(6) Complete this form by listing all construction contracts completed as the General Contractor during the last 3 years involving work of similar type and comparable value.

**- Name of project**: _____

- Names, address and telephone number of the owner:

_____

_____

- Name, address and telephone number of the engineer or architect:

_____

_____

- Location of project: _____
- Original Contract amount: _____
- Total Change Order amount: _____
- Brief description of the work involved: _____

_____

_____

**- Name of project**: _____

- Names, address and telephone number of the owner:

_____

_____

- Name, address and telephone number of the engineer or architect:

_____

_____

- Location of project: _____
- Contract amount: _____
- Total Change Order amount: _____

- Brief description of the work involved: _____

_____

_____

**INFORMATION REQUIRED OF BIDDERS**

JSSD SHOP BUILDING

**- Name of project**: _____

- Names, address and telephone number of the owner:

_____

_____

- Name, address and telephone number of the engineer or architect:

_____

_____

- Location of project: _____
- Contract amount: _____
- Total Change Order amount: _____
- Brief description of the work involved: _____

_____

_____

**- Name of project**: _____

- Names, address and telephone number of the owner:

_____

_____

- Name, address and telephone number of the engineer or architect:

_____

_____

- Location of project: _____
- Contract amount: _____
- Total Change Order amount: _____
- Brief description of the work involved: _____

_____

_____

## *Part F – Technical Specifications*

# TABLE OF CONTENTS

## *JSSD Shop Building*



**END OF TABLE OF CONTENTS**

**SECTION 01 10 00**
**SUMMARY OF WORK**

## PART 1 GENERAL

### 1.1 GENERAL

A. The work to be performed under this project shall consist of furnishing all labor, materials, and equipment necessary or required to complete the work in all respects as shown on the plans Drawings and as herein specified.

### 1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Work includes construction of a metal building for the new JSSD Shop and all related piping, site work and appurtenances.

### 1.3 CONTRACTOR USE OF PREMISES

A. CONTRACTOR's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities.

### 1.4 PROJECT SECURITY

A. CONTRACTOR shall make all necessary provisions to protect the project and CONTRACTOR's facilities from fire, theft, and vandalism, and the public from unnecessary exposure to injury.

### 1.5 CHANGES IN THE WORK

A. It is mutually understood that it is inherent in the nature of public works construction that some changes in the plans and specifications may be necessary during the course of construction to adjust them to unforeseen field conditions, and that it is of the essence of the Contract to recognize a normal and expected margin of change. ENGINEER shall have the right to make such changes, from time to time, in the plans, in the character if the work, and in the scope of the project as may be necessary or desirable to ensure the completion of the work in the most satisfactory manner without invalidating the Contract.

END OF SECTION

**SECTION 01 10 25**
**MEASUREMENT AND PAYMENT**

## 1.1 GENERAL

**A.** All work completed under this contract shall be in accordance with the Plans and Specifications and will be measured by ENGINEER/OWNER. The quantities appearing on the Bid Schedule are approximate only, and are prepared for the comparison of bids. Payment to CONTRACTOR on bid items with unit prices other than "Lump Sum" will be made for actual quantities of work performed and accepted, or material furnished in accordance with the Contract. The scheduled quantities of work to be done and materials to be furnished may be increased or decreased.

**B.** The term "Lump Sum" when used as an item of payment will mean complete payment for the work described in the contract. When a complete structure, portion of work, or unit is specified "Lump Sum" as the unit of measurement, the unit will include fittings, accessories, and all work necessary to complete the work as shown on the plans and as specified.

**C.** When the accepted quantities of work vary from the quantities in the bid schedule, CONTRACTOR shall accept as payment in full, so far as contract items are concerned, payment at the original contract unit prices for the work done. OWNER reserves the right to add to or delete from quantities listed in the bid schedule in order to match the total bid with the budgeted money available.

## 1.2 BID SCHEDULE

### A. BID ITEM 1 - MOBILIZATION

1. **GENERAL** This bid item is provided to cover CONTRACTOR's cost for general and miscellaneous responsibilities and operations not normally attributed to any other single bid item within this schedule.

2. **METHOD OF MEASUREMENT** Lump Sum

3. **BASIS OF PAYMENT** Includes all preparatory work and operations, including, but not limited to, those necessary for movement of personnel, equipment, supplies and incidental items to the project site; for establishment of all offices, buildings and other facilities necessary for work on the project; for cleanup and demobilization as required; and for all other work and operations which must be performed, or costs incurred, not otherwise paid for prior to beginning work on various items on the project site.

   All Wasatch County Permit fees shall be paid for by Owner. Contractor shall be responsible for submitting the construction drawings to the appropriate agency, applying for the permit and paying the fee. Because the fee will not be known at

the time of bid, Contractor shall not include the fee in the bid, but a Change Order will be issued to cover the fee once the cost is known.

## B. BID ITEM 2 - MATERIALS TESTING

1. **GENERAL** This item is provided to cover the Contractor's cost for general and miscellaneous responsibilities and operations associated with Materials Testing.

2. **METHOD OF MEASUREMENT** Lump Sum

3. **BASIS OF PAYMENT** Payment will be made at the contract lump sum bid price as shown and accepted by the Owner and Engineer in the Bid Schedule. Payments will be made in accordance with the following schedule:

   a) When 10% of the original contract amount is earned, 25% of the amount bid for materials testing will be paid.

   b) When 25% of the original contract amount is earned, an additional 25% for a total of 50% of the amount bid for materials testing will be paid.

   c) When 50% of the original contract amount is earned, an additional 25% for a total of 75% of the amount bid for materials testing will be paid.

   d) When 75% of the original contract amount is earned, an additional 25% for a total of 100% of the amount bid for materials testing will be paid.

## C. BID ITEM 3 – TEMPORARY CONTROLS / SWPPP

1. **METHOD OF MEASUREMENT** Lump Sum

2. **BASIS OF PAYMENT** Payment covers the cost of noise control, dust and mud control, surface water control, ground water control, pollution control, and all erosion control required for the project. Payment also includes the cost of complying with State of Utah UPDES Permit, including submitting a Notice of Intent to the Utah State Division of Water Quality, paying the Permit fees, and preparing and submitting a Storm Water Pollution Prevention Plan for County and State approval to address any erosion control measures.

   Payment covers the cost for completion of an approved plan and implementation thereof. The implementation shall include installing and maintaining Best Management Practices defined in the SWPPP, and monitoring and maintaining the requirements of the SWPPP, preparation of required reports, and meeting all other requirements of the Utah Division of Water Quality and Wasatch County. The SWPPP shall also include all disturbed areas, including adjacent staging areas.

**D. BID ITEM 4 – CONSTRUCTION STAKING**

1. **METHOD OF MEASUREMENT** Lump Sum

2. **BASIS OF PAYMENT** This item is provided to cover the Contractor's cost for general and miscellaneous responsibilities and operations associated with Construction Surveying, which shall be performed by a registered professional land surveyor.

**E. BID ITEM 5 – SITE PREPARATION**

1. **METHOD OF MEASUREMENT** Lump Sum

2. **BASIS OF PAYMENT** All major site excavation will be provided by Owner. Contactor shall anticipate approximate elevations to subgrade. Contractor shall provide excavation for all footings and foundations. Contractor to provide prep-grading and shall furnish and install all required subgrade (road base, gravel, etc). for all fill as shown on the drawings and according to required specifications including all materials, equipment, and labor required to perform the work.

**F. BID ITEM 6 – BUILDING STRUCTURE AND UNDERGROUND UTILITIES WITHIN 5'**

1. **METHOD OF MEASUREMENT** Lump Sum.

2. **BASIS OF PAYMENT** Payment covers all labor, material and equipment to complete the erection of the metal building structure, which is being provided by Owner. Payment also includes all indicated underground utilities unless paid for otherwise.

**G. BID ITEM 7 – SITE CONCRETE DRIVEWAY (6" THICK)**
**BID ITEM 8 – SITE CONCRETE WALKWAY (4" THICK)**

1. **METHOD OF MEASUREMENT** Square Foot

2. **BASIS OF PAYMENT** Payment shall be considered complete compensation for all labor, equipment, and materials necessary, including but not limited to proof-rolling of existing native soils; placement and compaction of required road base materials, placement and installation of all concrete form work, reinforcement, shoring, concrete materials, curing, removal of forms; and all other incidentals not specifically paid for in other bid items but which are shown or otherwise required to complete the installation as herein described and as shown on the Drawings.

## H. BID ITEM 9 – SITE ASPHALT (3" ASPHALT, 6" ROAD BASE)

1. **METHOD OF MEASUREMENT** Square foot basis based on the asphalt identified on the Drawings and Bid Schedule. Measurement shall be based on in-place areas measured by the Owner. Minimum asphalt thickness shall be measured at 3 inches.

2. **BASIS OF PAYMENT** Payment covers the cost of all labor, equipment and materials including but not limited to material conforming to the specifications, preparation of surfaces including cracks, edges, removing debris, tack coat, etc.; furnishing, installing and compacting the untreated base-course; handling, placement, compaction, and all other operations, materials and incidentals required to complete this item.

## M. BID ITEM 10 – SANITARY SEWER SYSTEM

1. **METHOD OF MEASUREMENT** Lump Sum

2. **BASIS OF PAYMENT** Payment shall be considered complete compensation for all labor, equipment, and materials necessary to install a new sanitary service line per JSSD Standards including but not limited to excavation, dewatering, shoring, removal and disposal of excess excavation materials, installing the piping and E-one sewer pump, connecting to existing sewer line, importing pipe zone bedding material, trench zone backfill material, backfilling, compaction, cleaning, pressure testing, marker tape, tracer wire, restoration of all surface improvements; commissioning the service lateral line, and all other operations and materials required to complete this portion of the work as herein described and as shown on the drawings.

## N. BID ITEM 11 – DRINKING WATER SYSTEM

1. **METHOD OF MEASUREMENT** Lump Sum

2. **BASIS OF PAYMENT** Payment shall be considered complete compensation for all labor, equipment, and materials necessary to install the new drinking water service line and meter box per JSSD Standards including but not limited to excavation, dewatering, shoring, removal and disposal of excess excavation materials, connecting to existing water main, installing the piping and meter box, joint and fitting restraints, importing pipe zone bedding material, trench zone backfill material, backfilling, compaction, cleaning, pressure testing, marker tape, tracer wire, restoration of all surface improvements; commissioning the service line, and all other operations and materials required to complete this portion of the work as herein described and as shown on the drawings.

## O. BID ITEM 12 – UNDERGROUND POWER

1. **METHOD OF MEASUREMENT** Lump Sum

2. **BASIS OF PAYMENT** Payment shall be considered complete compensation for all labor, equipment, and materials necessary to install the new underground power to the new building and all other operations and materials required to complete this portion of the work as herein described and as shown on the drawings.

- END OF SECTION -

**SECTION 01 14 13**
**SITE ACCESS**

## PART 1 HIGHWAY LIMITATIONS

A. The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the work. It shall be the Contractor's responsibility to construct, maintain and restore, at his own expense, any haul roads or staging areas required for his construction operations.

## PART 2 TEMPORARY ACCESS

A. General. Wherever necessary or required for the convenience of the public or individual residents at street or highway crossings, private driveways, or elsewhere, the Contractor shall provide suitable temporary bridges over unfilled excavations, except in such cases as the Contractor shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges, which written consent shall be delivered to the Engineer prior to excavation. All such bridges shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the Contractor shall adopt designs furnished by said authority for such bridges, or shall submit designs to said authority having jurisdiction in each case, and the Contractor shall adopt designs furnished by said authority for such bridges, or shall submit designs to said authority for approval, as may be required.

B. Street Use. Nothing herein shall be construed to entitled the Contractor to the exclusive use of any public street, alley, way, or parking area during the performance of the work hereunder, and he shall so conduct his operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleys, ways, or parking areas. No street shall be closed to the public without first obtaining permission of the Engineer and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown. Toe boards shall be provided to retain excavated material if required by the Engineer or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, sewer inlets, and other drainage facilities.

D. Street Closure. If closure of any street is required during construction, a formal application for a street closure shall be made to the authority having jurisdiction at least 30 days prior to the required street closure in order to determine necessary signing and detour requirements.

E. Construction Through Private Property. The Owner will provide easement agreements with private property owners along the construction routes.

The Contractor shall confine all his operation to the area within the easement limits. In general, the easement area is intended to provide reasonable access and working area for efficient operation by the Contractor.

If the Contractor desires to have additional easement width and/or additional access routes, the Contractor shall negotiate with and compensate the private property owners for such use at the Contractor's expense.

END OF SECTION 01 14 13

**SECTION 01 30 00**
**ADMINISTRATIVE REQUIREMENTS**

## PART 1 GENERAL

### 1.1 COORDINATION AND PROJECT CONDITIONS

A. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

B. 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.

C. OWNER, and/or utility owners may be working within the project area while this contract is in progress. If so, CONTRACTOR shall schedule his work in conjunction with these other organizations to minimize mutual interference.

D. If required to work in City or County streets or Utah Department of Transportation (UDOT) right-of-way, CONTRACTOR shall notify City, County, or UDOT 72 hours prior to work being performed therein. Work within the City or County streets or UDOT right-of-way shall be in accordance with their required permits and any license agreements with OWNER. CONTRACTOR shall obtain and comply with all required permits.

### 1.2 FIELD ENGINEERING

A. Contractor shall provide all construction staking as necessary to complete the required work according to the Contract Documents.

B. Locate and protect survey control and reference points. Promptly notify ENGINEER of discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to ENGINEER loss or destruction of reference point or relocation required because of changes in grades or other reasons.

### 1.3 PRECONSTRUCTION MEETING

A. Prior to the commencement of work at the site, a preconstruction conference will be held at a mutually agreed time and place which shall be attended by CONTRACTOR's Project Manager, its superintendent, and its subcontractors as appropriate. Other attendees will be:

1. ENGINEER and the Resident Project Representative (RPR),

2. Representatives of OWNER,

3. Governmental representatives as appropriate, and

4. Others as requested by CONTRACTOR, OWNER, or ENGINEER.

B. Unless previously submitted to ENGINEER, CONTRACTOR shall bring to the conference one copy of each of the following:

1. Progress schedule,

2. Procurement schedule of major equipment and materials and items requiring long lead time, and

3. Shop Drawings/Sample/Substitute or "Or Equal" submittal schedule.

C. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda may include the following:

1. CONTRACTOR's tentative schedules.

2. Transmittal, review, and distribution of CONTRACTOR's submittals.

3. Processing applications for payment.

4. Maintaining record documents.

5. Critical work sequencing.

6. Field decisions and Change Orders.

7. Use of project site, office and storage areas, security, housekeeping, and OWNER's needs.

8. Major equipment deliveries and priorities.

9. CONTRACTOR's assignments for safety and first aid.

## 1.4 PROGRESS MEETINGS

A. CONTRACTOR shall schedule and hold regular on-site progress meetings at least bi-weekly and at other times as required by ENGINEER or as required by progress of the work. CONTRACTOR, ENGINEER, and all subcontractors active on the site shall be represented at each meeting. CONTRACTOR may at its discretion request attendance by representatives of its suppliers, manufacturers', and other subcontractors.

B. The purpose of the meetings will be to review the progress of the work, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop.

C. At each construction progress meeting a progress report shall be presented by the CONTRACTOR containing an updated Progress Schedule. Where the delayed completion date of a project phase is noted, the CONTRACTOR shall describe the anticipated delays or problems and outline the action plan being taken to resolve the issues.

- END OF SECTION –

**SECTION 01 33 00**
**SUBMITTAL PROCEDURES**

## GENERAL

### 1.1 SUBMITTAL PROCEDURES

A. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

B. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

C. 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 requirements of the Work and Contract Documents.

D. Schedule submittals to expedite Project, and deliver to Engineer at business address. Coordinate submission of related items.

E. Submittals shall be submitted sufficiently in advance to allow the ENGINEER not less than ten regular working days for examining the drawings. These drawings shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items and unit assemblies in relation to the contract drawings and/or specifications.

F. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

G. When revised for resubmission, identify changes made since previous submission.

H. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

I. Submittals not requested will not be recognized or processed.

J. The ENGINEER's review of CONTRACTOR submittals shall not relieve CONTRACTOR of the entire responsibility for the corrections of details and dimensions. CONTRACTOR shall assume all responsibility and risk for any misfits due to any errors in CONTRACTOR submittals. CONTRACTOR shall be responsible for dimensions and the design of adequate connections and details.

## 1.2 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedules within 30 days after date of Owner-Contractor Agreement. After review, resubmit required revised data within ten days.

B. Submit revised Progress Schedules with each Application for Payment.

C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.

D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

E. Submit computer generated horizontal bar chart with separate line for each major portion of Work or operation, identifying first work day of each week.

F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.

G. Indicate estimated percentage of completion for each item of Work at each submission.

H. Submit separate schedule of submittal dates for shop drawings, product data, and samples.

## 1.3 PRODUCT DATA

A. Product Data: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

## 1.4 SHOP DRAWINGS

A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Fabrication of an item may be commenced only after the ENGINEER has reviewed the pertinent submittals and returned copies to CONTRACTOR marked either "Approved", or "Approved - Except as Noted". Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis of claims for extra work.

C. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.

1. Include signed and sealed calculations to support design.
2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 78 50 - Project Closeout.

## 1.5 SAMPLES

A. Whenever indicated in the specifications or requested by the ENGINEER, CONTRACTOR shall submit at least 1 sample of each item or material to the ENGINEER for acceptance at no additional cost to OWNER.

B. Samples, as required herein, shall be submitted for acceptance prior to ordering such material for delivery to the jobsite, and shall be submitted in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delay in the Work.

C. Unless otherwise specified, all colors and textures of specified items will be selected by the ENGINEER from the manufacturer's standard colors and standard materials, products, or equipment lines.

## 1.6 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

## 1.7 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

## 1.8 MANUFACTURER'S FIELD REPORTS

A. When required in individual sections, have manufacturer or Supplier provide qualified representative to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable and to make written report of observations and recommendations to ENGINEER.

**PRODUCTS -** Not Used

**EXECUTION -** Not Used

END OF SECTION

**SECTION 01 35 00**
**SAFETY AND SITE GUIDELINES**

## PART 1 GENERAL

### 1.1 CONSTRUCTION AREA PLAN

A. Construction activities are to be limited to within limits of disturbance as per plans or elements with the exception of access drives and utility improvements.

### 1.2 OSHA COMPLIANCE

A. All applicable Occupational Safety and Health Act (OSHA) regulations and guidelines are to be observed at all times.

### 1.3 ACCESS TO CONSTRUCTION AREA

A. Access during construction of the meter vault, pump station or other improvements is to be approved by the OWNER in accordance with the following requirements:
   1. All Construction Vehicles are to be identified with the Contractor's name.
   2. Material and equipment deliveries are to be consolidated to the extent feasible.

### 1.4 CONSTRUCTION PARKING AREAS

A. All vehicle and parking areas are to be managed in accordance with the following requirements:
   1. Construction crews are not to park on, or otherwise use, the natural area, streets, and neighboring properties. All vehicles are to be parked in approved parking areas.
   2. During busy construction periods involving multiple trades when all Construction Vehicles cannot be accommodated on the site, the OWNER may grant permission for overflow vehicles to temporarily park in designated areas.
   3. Vehicles parked on the road may not impede access to normal traffic and emergency vehicles, including fire trucks. Where parking on the shoulder occurs, all damage to the shoulder and landscape is to be repaired by the CONTRACTOR continually and not left for the end of construction. Vehicles may not be parked outside of the Construction Area.
   4. No vehicle repair is allowed on the site except in case of emergency or within a fully-enclosed garage. Normal maintenance of CONTRACTOR equipment is allowed.

## 1.5 DELIVERY AND STORAGE OF MATERIALS & EQUIPMENT

A. CONTRACTOR is responsible for ensuring all SUBCONTRACTORS and SUPPLIERS obey all posted speed limits and traffic regulations. The following, additional Guidelines apply to all material delivery and storage:
   1. All building materials, equipment and machinery are to be delivered to and remain within the limits of disturbance. This requirement includes all building materials, earth-moving equipment, trailers, generators, mixers, cranes and any other equipment or machinery that will remain on the Construction Site overnight.
   2. Delivery vehicles may not drive across neighboring properties to access a construction site.
   3. Delivery route maps and site supervisor contact information sheets are to be provided to all delivery personnel.
   4. Delivery personnel are to use adequate winter tires and/or chains during inclement winter weather.

## 1.6 SITE VISITATIONS

A. Due to the inherent danger associated with Construction Activities, visitors to any Construction Site are limited to those persons (such as construction workers, tradesmen, County or City agents, security staff and OWNER staff) with official business relating to the construction. Construction personnel are not to invite or bring family members or friends, especially children, to the job site.

## 1.7 FIRE AND SAFETY PRECAUTIONS

A. The following fire and safety precautions are to be adhered to at all Construction Sites:
   1. On-site fires are not allowed.
   2. All fires are to be reported even if it is thought to be contained or extinguished.
   3. One or more persons are to be appointed as the individual(s) responsible for reporting emergencies and/or phoning 911.
   4. Access for emergency vehicles is to be maintained at all times.
   5. Access to fire hydrants, emergency water tanks and emergency turnouts are not to be blocked at any time.
   6. Smoking materials are to be discarded in approved containers.
   7. A minimum of one shovel and two 20-pound ABC-Rated Dry Chemical Fire Extinguishers are to be mounted in plain view.
   8. All equipment, including small tools, must utilize a working spark arrestor.

## PART 2 EQUIPMENT

### 2.1 CONSTRUCTION TRAILERS AND/OR TEMPORARY STRUCTURES

A. Upon approval, a temporary construction trailer or portable field office may be located on the project site within limits of disturbance,

### 2.2 SANITARY FACILITIES

A. CONTRACTOR is responsible for providing adequate sanitary facilities for construction workers. Portable toilets are to be located within the limits of disturbance and are not to be located within 50 feet of drainages and/or other sensitive resources.

### 2.3 DEBRIS AND WASTE REMOVAL

A. The following debris and waste removal procedures are to be adhered to at all Construction Sites:

1. Dumping, burying and/or burning trash is not permitted anywhere within the Project Site. No trash of any kind is to be placed in utility trenches.
2. Heavy and large debris, such as broken stone and wood scraps, are to be removed from the site immediately upon completion of each work trade.
3. Concrete washout, from both trucks and mixers, is to be contained within the limits of disturbance and concealed by structure or covered with backfill. Concrete washout in road rights-of-way, setbacks or on neighboring properties is strictly prohibited.
4. Dirt, mud and/or other debris are to be promptly removed from public or private roads, open spaces, and driveways. Trucks and other equipment are to be washed clean of dirt and other debris prior to leaving the site.

### 2.4 HAZARDOUS WASTE

A. In order to monitor hazardous material use and/or respond quickly to spills, the CONTRACTOR is to comply with the following criteria:

1. The CONTRACTOR is to provide a contact person and telephone number for a company experienced in emergency response for vacuuming and containing spills for oil or other petroleum products.
2. In the event of a spill, the CONTRACTOR is to immediately attempt to stop the flow of contaminants.
3. Absorbent sheets are to be used for spill prevention and clean up. Several boxes are to be located at fuel trucks, storage areas and in maintenance vehicles. Inventories are to be maintained as necessary.
4. The responsible on-site CONTRACTOR is to commit all necessary manpower, equipment and materials to the containment and rapid clean-up of spills.

5. After any reportable spill (one or more gallons) is contained; the CONTRACTOR is to notify the appropriate local, state and federal agencies as well as the OWNER.
6. The CONTRACTOR is to maintain a list of product names and a Materials Safety Data Sheet (MSDS) for all hazardous material products used or located on-site. In the event of a leak, spill or release, the CONTRACTOR is to provide the MSDS to emergency personnel.
7. Equipment is to be fueled in designated staging areas only. Equipment that cannot be readily moved to designated staging areas is to be fueled a minimum of 100 feet from known drainage courses.
8. Fuel storage tanks must have adequately constructed catch basins.
9. Prior to storing a hazardous material, the CONTRACTOR is to ensure that:
    - The material is stored in an approved container
    - The container is tightly sealed
    - The container has the proper warning label
    - The container is inspected for leaks
10. Inspect equipment and vehicles for damaged hoses, leaks and hazards prior to the start and end of each shift. Do not run equipment that is leaking hazardous products.
11. Intentional or unreported spillage or dumping of fuels, hydraulics, solvents and other hazardous materials will be cause for eviction.

## 2.5 TREE/SHRUB AND HABITAT PROTECTION

A. The following Guidelines apply to the protection of trees, shrubs and other vegetation during construction operations:

1. Trees/shrubs are not to be removed without prior approval from the OWNER.
2. Before construction starts, exclusionary fencing is to be installed around the perimeter of all trees/shrubs not approved for removal.
3. Fencing material is to be highly visible and sturdy.
4. Construction equipment or activity is not permitted within the fenced area (exclusionary zone) without written authorization from the OWNER.
5. Adequate drainage is to be provided to prevent ponding of water around the base of trees/shrubs.
6. Soil compaction is to be avoided around all trees/shrubs.
7. Mesh netting is to be used to protect trees/shrubs from dust and paint drift.

## 2.6 AIR QUALITY CONTROL

A. Air quality control procedures are to be in accordance with the following requirements:

1. Construction equipment exhaust emissions are not to exceed local code requirements for air pollution limitations.
2. Open burning of removed vegetation is not permitted.

## 2.7 DAMAGE, REPAIR AND RESTORATION

A. Damage and scarring to other property, including streets, neighboring properties, existing buildings, roads, driveways and/or other Improvements will not be permitted. If any such damage occurs, it is to be repaired and/or restored promptly at the expense of the person causing the damage or the CONTRACTOR whose personnel or subcontractor caused the damage.

1. Upon completion of construction, each OWNER and CONTRACTOR is to clean his Construction Site and any neighboring sites that have been impacted and repair all property, which has been damaged.
2. The CONTRACTOR is financially responsible for site restoration/revegetation and refuse removal necessitated on any and all adjacent properties as a result of trespass or negligence by their employees or sub-contracted agents.

## 2.8 FIREARMS

A. The possession or discharge of any type of firearm by construction personnel anywhere within the Project Site is prohibited.

# PART 3 EXECUTION

## 3.1 ALCOHOL AND CONTROLLED SUBSTANCES

A. The consumption of alcohol or use of any controlled substance by construction personnel anywhere within the project is prohibited.

## 3.2 NO PETS

A. No pets may be brought to the project site by construction personnel.

## 3.3 NOISE CONTROL

A. The CONTRACTOR is to make every effort to keep noise to a minimum. Radios and other audio equipment may not be audible beyond the confines of the Construction Site. Violations of this provision will precipitate a total prohibition of any radios and/or other audio equipment.

## 3.4 SPEED LIMIT

A. All vehicles are to adhere to posted speed limits. Fines will be issued for those exceeding the speed limit as posted or as required by road and weather conditions.

END OF SECTION 01 35 00

**SECTION 01 45 00**
**QUALITY CONTROL AND MATERIALS TESTING**

## PART 1 GENERAL

### 1.1 MATERIALS

A. All materials incorporated in the project shall be new and shall fully comply with the specifications. Unless otherwise clearly provided in the specifications, all workmanship, equipment, materials, and articles incorporated in the work covered by the contract are to be of the best available grade of their respective kinds. Whenever, in the specifications, any material, article, device, product, fixture, form, type of construction, or process indicated or specified by patent or proprietary name, by name of manufacturer, or by catalog number, such specifications shall be deemed to be used for the purpose of establishing a standard of quality and facilitating the description of the material or process desired and shall be deemed to be followed by the words "or approved equal" and CONTRACTOR may in such case, upon receiving the ENGINEER's approval, purchase and use any item, type, or process which shall be substantially equal in every respect to that indicated or specified.

B. Materials and equipment may be used in the Work based upon receipt of a Supplier's certificate of compliance. Certificate must be in possession of CONTRACTOR and reviewed by ENGINEER prior to use.

C. Quality Assurance Testing by the OWNER and/or ENGINEER shall not relieve CONTRACTOR of responsibility to furnish materials and work in full compliance with Contract Documents.

### 1.2 MANUFACTURER'S INSTRUCTIONS

A. Should instructions conflict with Contract Documents, request clarification before proceeding.

B. When required in individual sections, submit manufacturer's instructions in the quantity required for product data, delivery, handling, storage, assembly, installation, start-up, adjusting, balancing, and finishing, as appropriate.

### 1.3 WORKMANSHIP

A. Maintain performance control and supervision over Subcontractors, Suppliers, manufacturer's, products, services, workmanship, and site conditions, to produce work in accordance with Contract Documents.

B. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

C. Provide suitable qualified personnel to produce specified quality.

D. Ensure finishes match approved samples.

## 1.4 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. When manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

## 1.5 TESTING AND INSPECTION SERVICES

A. Testing agency and testing for quality control and material testing shall be furnished by CONTRACTOR as part of the project. Results of testing shall be reported to CONTRACTOR and ENGINEER on site. Reports of the testing shall be transmitted directly to the ENGINEER.

B. Materials to be supplied under this contract will be tested and/or inspected either at their place of origin or at the site of the work by the testing agency. CONTRACTOR shall give ENGINEER written notification well in advance of actual readiness of materials to be tested and/or inspected at point of origin so ENGINEER may witness testing by the testing agency. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the material nor shall it preclude retesting or re-inspection at the site of the work.

C. CONTRACTOR shall furnish such samples of materials as are requested by the ENGINEER, without charge. No material shall be used until reports from the testing agency have been reviewed and accepted by the ENGINEER.

## 1.6 UNSATISFACTORY CONDITIONS

A. Examine areas and conditions under which materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

## 1.7 QUALITY CONTROL TESTING

A. ENGINEER’s failure to detect any defective Work or materials does not prevent later rejection when such defect is discovered nor does it obligate ENGINEER for acceptance.

B. CONTRACTOR shall provide 24-hours minimum notice to ENGINEER for all testing required by these specifications so that ENGINEER may coordinate or be present during testing.

### 1.8 TESTING ACCEPTANCE AND FREQUENCY

A. Minimum Quality Control Testing Frequency: As defined in Table 01 45 00-1, the CONTRACTOR shall be responsible to ensure that all testing is performed at the frequencies shown. CONTRACTOR shall uncover any work at no cost to OWNER to allow the testing agency to perform required testing at the frequency shown.

## PART 2 PRODUCTS - Not Used

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify utility services are available, of correct characteristics, and in correct locations.

### 3.2 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.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

**TABLE 01 45 00-1: QUALITY CONTROL TESTING FREQUENCY**

| SYSTEM or MATERIAL | TESTS | MINIMUM REQUIRED FREQUENCY |
|---|---|---|
| **SUBGRADE AND BACKFILL MATERIALS** | | |
| Section 33 05 20 Trenching | Field Density | 1 test per 200 linear feet per lift. Lift thickness before compaction – 8 inches for other than hand operated compactors, and 6 inches for hand operated compactors. |
| | Laboratory | 1 test for each material type which includes proctor, classification and gradation. |
| Section 31 23 23 Backfill | Field Density | 1 test for each 1.5 feet of backfill thickness. |
| | Laboratory | 1 test for each material type which includes proctor, classification and gradation. |
| **ASPHALT** | | |
| Section 32 12 16 Hot-Mix Asphalt Concrete Paving | Mix Design | Marshall Test Method: 1 test initially per each type of material and each change in target, and for each day of production thereafter.<br>Specific Gravity: 1 per each Marshall Test<br>Extraction: 1 test per each Marshall Test |
| | Field Density | Bituminous surfaces: 1 test per 2,000 square feet placed or part thereof. |
| | Asphalt Thickness and Core Density | Bituminous surfaces: 1 test sample every 300 linear feet of completed roadway |
| **PORTLAND CEMENT CONCRETE** | | |
| Cast-in-Place Concrete | Slump | 1 test every day of placement or 1 test for every 50 cubic yards and more frequently if batching appears inconsistent. Conduct with strength tests. |
| | Entrained air | 1 test with slump test. |
| | Ambient and concrete tem-peratures | 1 test with slump test. |
| | Water cement ratio. | to be verified and provided with batch tickets. |

| SYSTEM or MATERIAL | TESTS | MINIMUM REQUIRED FREQUENCY |
|---|---|---|
| | Compressive strength | 1 set of 4 cylinders every 50 c.y. or part thereof per day. |

NOTES:

1 Additional tests shall be conducted when variations occur due to the contractor's operations, weather conditions, site conditions, etc.

2 Classification, moisture content, Atterberg limits and specific gravity tests shall be conducted for each compaction test if applicable.

3 Tests can substitute for same tests required under "Aggregates" (from bins or source), although gradations will be required when blending aggregates.

4 Aggregate moisture tests are to be conducted in conjunction with concrete strength tests for water/cement calculations.

END OF SECTION

**SECTION 01 45 10**
**TESTING AGENCY SERVICES**

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. CONTRACTOR shall be responsible for providing Construction Quality Control Testing of all soils, concrete, etc. as required by the various sections of these specifications.

B. This section includes the following:

1. Use of independent testing agency.
2. Control testing report submittal requirements.
3. Responsibilities of testing agency.

### 1.2 REFERENCES

A. 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.

B. ASTM D 4561: Standard Practice for Quality Control Systems for and Inspection and Testing Agency for Bituminous Paving Materials.

C. ASTM E 329: Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

### 1.3 DEFINITIONS

A. Independent Testing Agency: A testing agency NOT owned by CONTRACTOR, and an agency that does not have any preferential affiliation or association with CONTRACTOR, or any of CONTRACTOR's Subcontractors and Suppliers other than entering into a contract with CONTRACTOR to perform the duties defined in these specifications.

B. Professional Engineer: An engineer who complies with Utah licensing law and is acceptable to the authority having jurisdiction.

### 1.4 QUALITY ASSURANCE

A. CONTRACTOR shall employ and pay for, all material testing services as described in Paragraph 1.1 A, through an independent testing agency which complies with ASTM D 3740, ASTM D 4561, and ASTM E 329 to test materials for contract compliance.

B. Concrete Technician: Approved by ENGINEER or ACI certified.

## 1.5 CONTRACTOR SUBMITTALS

A. Prior to start of Work, submit testing agency's name, address, telephone number and the following:

1. Person charged with engineering managerial responsibility.
2. Professional engineer on staff to review services.
3. Level of certification of technicians.

## 1.6 TESTING AGENCY SUBMITTALS

A. Field Test Report: Submit report no later than the end of the current day.

B. Laboratory Test Report: Submit original report within 48 hours after test results are determined.

C. Final Summary Report: Submit prior to final payment.

D. On all reports include:

1. Project title, number and date of the report.
2. Date, time and location of test
3. Name and address of material Supplier.
4. Identification of product being tested and type of test performed.
5. Identify whether test is initial test or retest.
6. Results of testing and interpretation of results.
7. Name of technician who performed the testing.

## 1.7 RESPONSIBILITIES OF TESTING AGENCY

A. Calibrate testing equipment at least annually with devices of an accuracy traceable to either National Bureau of Standards or acceptable values of natural physical constraints.

B. Provide sufficient personnel at site and cooperate with CONTRACTOR, ENGINEER and OWNER's Representative in performance of testing service.

C. Secure samples using procedures specified in the applicable testing code.

D. Perform testing of products in accordance with applicable sections of the Contract Documents.

E. Immediately report any compliance or noncompliance of materials and mixes to CONTRACTOR, ENGINEER and OWNER's Representative.

F. When an out-of-tolerance condition exists, perform additional inspections and testing until the specified tolerance is attained, and identify retesting on test reports.

G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Engineer. Payment for re-testing or re-inspection will be paid for by Contractor.

## 1.8 LIMITS ON TESTING AGENCY AUTHORITY

A. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Agency may not suspend Work.

C. Agency may not assume duties of Contractor.

D. Agency has no authority to accept Work for OWNER.

**PART 2 PRODUCTS -** Not Used

**PART 3 EXECUTION -** Not Used

END OF SECTION

**SECTION 01 50 00**
**TEMPORARY CONTROLS**

## 1.01 SITE MAINTENANCE

The Contractor shall keep the work site clean and free from rubbish and debris. Materials and equipment shall be removed from the site when they are no longer necessary. Upon completion of the work and before final acceptance, the work site shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance.

## 2.01 DISPOSAL OF WASTE MATERIAL

When burning is not prohibited or restricted by law, pile all combustible material within the designated or approved cleared area and dispose of by burning. Remove material from the site which is not combustible or not practicable to burn. Accomplish burning and disposal in accordance with all Federal, State and local laws relating to fire prevention, air pollution control, and other restrictions in regard to burning materials. When burning is prohibited, dispose of waste materials in accordance with the governing agency safety and health requirements.

If perishable material is burned, it shall be burned under the constant care of competent watchmen at such times and in such a manner that anything designated to remain on the property, or other adjacent property will not be jeopardized. Burning shall be done in accordance with applicable laws and ordinances.

## 3.01 "NO BURNING" PERIODS

During periods when burning operations are prohibited by local, State or Federal authorities, haul combustible material and debris from the site. If approved, pile where it will not interfere with the work, and burn when prohibition against burning is removed.

## 4.01 AIR POLLUTION CONTROL

The Contractor shall not discharge smoke, dust, and other contaminants into the atmosphere that violate the regulations of any legally constituted authority. He shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water, in amounts which result in mud on public streets, is not acceptable as a substitute for sweeping or other methods.

## 5.01 NOISE CONTROL

The Contractor shall conform to all local, state and federal noise control ordinances

## 6.01 DUST ABATEMENT

The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever, whenever and as often as necessary to prevent his operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall conform to all local, state and federal dust abatement ordinances. The Contractor shall be responsible for any damage resulting from any dust originating from his operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer. No separate payment will be allowed for dust abatement measures and all costs thereof shall be included in the Contractor's bid price.

## 7.01 RUBBISH CONTROL

During the progress of the work, the Contractor shall keep the site of the work and other areas used by him in a neat and clean condition, and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. He shall also keep his haul roads free from dirts, rubbish, and unnecessary obstructions resulting from his operations. Equipment and material storage shall be confined to areas approved by the Engineer. Disposal of all rubbish and surplus materials shall be off the site of construction, at the Contractor's expense, all in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Subpart H, Section 1926.252 of the OSHA Safety and Health Standards for Construction.

## 8.01 SANITATION

A. Toilet Facilities. Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction.

B. Sanitary and Other Organic Wastes. The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes form any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto. Disposal of all such wastes shall be at the Contractor's expense.

## 9.01 CHEMICALS

All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be strict accordance with the printed instructions of the manufacturer.

## 10.01 EROSION CONTROL

Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas to prevent erosion and sedimentation. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

Furnish material and construct temporary erosion control including berms, dikes, sediment basins, slope drains, check dams, sediment barriers, fiber mats, mulches, etc. The Engineer may direct the Contractor to install additional erosion controls if, in the opinion of the Engineer, the risk of potential erosion is not adequately addressed. Coordinate temporary control measures with permanent erosion control requirements.

A. Do not start grading work until installation of all temporary erosion control measures is complete.

B. Complete installation of all erosion control in a timely manner.

C. Do not pollute streams, canals, lakes, and other water courses. Use the erosion control measures indicated.

D. Follow the more restrictive requirements when conflicts occur between erosion control specifications and federal, state, or local agencies laws, rules, or regulations.

## 11.01 FAILURE TO EXECUTE

Failure to execute any of the temporary controls shall be sufficient cause for the Owner to stop forward progression of the work and hold progress payments until acceptable limits and standards are met.

## 12.01 FIRE SUPPRESSION PLAN

The Contractor shall be required to maintain adequate equipment, manpower and water sources available to extinguish any fires which may be started, directly or indirectly, through activities of the Contractor.

## 13.01 SMOKING

Due to a substantial risk of wildfires, smoking shall be restricted to occur only inside of enclosed equipment or other designated area. During times of higher fire danger, the local authority may place additional restrictions on smoking in the canyon area.

## 14.01 COSTS

All costs in connection with the work specified herein will be considered to be incidental to the project.

END OF SECTION 01 50 00

**SECTION 01 52 00**
**CONSTRUCTION FACILITIES**

## 1.01 GENERAL

The Contractor shall set up construction facilities in a neat and orderly manner. The Contractor shall be responsible for providing the site to establish the temporary construction facilities, where not specifically provided for in the Contract.

## 2.01 SECURITY

The Contractor shall at all times provide such permanent and temporary fencing as may be necessary to restrict unauthorized entry to the site. Contractor shall abide by the Owner's security requirements.

## 3.01 CONTRACTOR'S EQUIPMENT

A. General. It shall be the Contractor's responsibility to provide equipment that is adequate for the performance of the work under this Contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required work, and shall be subject to inspection and approval by the Engineer at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.

B. Separate Contracts. Whenever portions of the work hereunder are let under separate contracts, all of the provisions of this Section shall apply to each such prime contractor, including the requirements for separate field offices and communications facilities.

C. Construction Lighting. All work conducted at night or under conditions of deficient daylight shall be suitably lighted to ensure proper work and to afford adequate facilities for inspection and safe working conditions.

## 4.01 UTILITIES

A. Water Supply. All drinking water on the site during construction shall be furnished by the Contractor.

B. Water Connections. The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a valve and a meter, if required by said authority, of a size and type acceptable to said authority and agency.

C. Removal of Water Connections. Before final acceptance of the work on the project, all temporary connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the Engineer and to the agency owning the affected utility.

D. Power. The Contractor shall provide, at his own expense, all necessary power required for his operations under the Contract, and shall provide and maintain all temporary power lines required to perform the work in a safe and satisfactory manner. Temporary electric power installation shall meet the construction safety requirements of OSHA, State and other governing agencies.

E. Approval of Electrical Connections. All temporary connections for electricity shall be subject to approval of the Engineer and the power company representative, and shall be removed in like manner at the Contractor's expense prior to final acceptance of the work.

F. Communication. Contractor shall provide his own telephone or communication system at the site as required to complete the project.

## 5.01 SAFETY

A. General. Appropriate first aid facilities and supplies shall be kept and maintained by the Contractor at the site of the work. All persons within the construction area shall be required to wear protective helmets, protective eye wear as required, and steel toed safety shoes. In addition, all employees of the Contractor and his subcontractors shall be provided with, and required to use, personal protective and life saving equipment as set forth in Subpart E of the OSHA Safety and Health Standards for Construction (29 CFR 1926).

B. Public Safety. During the performance of the work the Contractor shall erect and maintain temporary fences, bridges, railings, and barriers and shall take all other necessary precautions and place proper guards for the prevention of accidents and he shall erect and maintain suitable and sufficient lights and other signals.

## 6.01 PROJECT SIGN

No project sign is required.

## 7.01 SANITARY FACILITIES

The Contractor shall provide and maintain sanitary facilities (toilet and wash-up facilities) for his employees and his subcontractors' employees that will comply with the regulations of the local and State Departments of Health and as directed by the Engineer.

## 8.01 STORAGE OF MATERIALS

Materials shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground. Delicate instruments and materials subject to vandalism shall be placed under locked cover and, if necessary, provided with temperature control as recommended by the manufacturer. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the Owner or lessee.

END OF SECTION 01 52 00

**SECTION 01 64 00**
**OWNER FURNISHED PRODUCTS**

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. OWNER and CONTRACTOR responsibilities for the metal building materials furnished by the OWNER.

### 1.2 RELATED SECTIONS

A. N/A

### 1.3 OWNER'S RESPONSIBILITIES

A. Once delivered, inspect metal building materials jointly with CONTRACTOR.

### 1.4 CONTRACTOR'S RESPONSIBILITIES

A. Once delivered, inspect metal building materials jointly with ENGINEER/OWNER, record damaged or defective items.

B. CONTRACTOR shall take possession of the metal building materials and be responsible for delivery to the project site.

C. CONTRACTOR's Insurance shall provide coverage for OWNER furnished items effective until final acceptance of the project by the OWNER.

D. Handle products at site, including loading, unloading, and storage.

E. Protect product from damage.

### 1.5 CONSTRUCTION DELAY

A. If OWNER furnished items may cause delay in the critical path of progress schedule notify ENGINEER in writing. Only changes to the critical path will be evidence as changes in the Contract Time.

- END OF SECTION -

**SECTION 01 71 13**
**MOBILIZATION**

## PART 1 GENERAL

A. This specification covers the following:

1. Organization and mobilization of Contractor's forces and equipment; and
2. Transporting various tools, materials, and equipment to the site.

B. Temporary Facilities and other mobilization items are specified in the General Conditions and in various sections under Division 1 and 2. Payment, however, will be included under mobilization.

## PART 2 DESCRIPTION

A. Mobilization shall include mobilization of all construction equipment, materials, supplies, appurtenances, and the like, manned and ready for commencing and prosecuting the work; and the subsequent demobilization and removal from the site of said equipment, appurtenances and the like upon completion of the work.

B. Mobilization shall also include assembly and delivery, to the project site, of equipment, materials, and supplies necessary for the prosecution of work but which are not intended to be incorporated in the work; the clearing of and preparation of the Contractor's work area; the complete assembly, in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; and all other preparatory work required to permit commencement of the actual work on the construction items for which payment is provided for under the contract.

END OF SECTION 01 71 13

**SECTION 03 10 00**
**CONCRETE FORMWORK**

## PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Work Included - Provide formwork in accordance with the provisions of this Section for all cast-in-place concrete shown on the Drawings or required by other Sections of these Specifications.

### 1.02 QUALITY ASSURANCE

A. Design of formwork - Is the Contractor's responsibility.

B. Standards - Comply with all pertinent provisions of the ACI 347.

C. Qualifications of workmen: Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed, the referenced standards, and the requirements of this work, and who shall direct all work performed under this Section.

### 1.03 SUBMITTALS

A. Manufacturers' data - Within 30 calendar days after award of the Contract, submit manufacturers' data and installation instructions for proprietary materials, including form coatings, ties and accessories, and manufactured form systems if used.

## PART 2 - PRODUCTS

### 2.01 FORM MATERIALS

A. Forms

1. Construct formwork for exposed (painted or unpainted) concrete surfaces with smooth faced undamaged plywood or other panel type materials acceptable to the Engineer, to provide continuous, straight, smooth as-cast surfaces. Furnish in largest practicable sizes to minimize number of joints for "non-architectural" concrete finish.

2. Construct formwork for concrete concealed from view or covered with cement plaster with rough sawn boards of sound grade, as approved by the Engineer, to provide a mechanical bond for subsequent application of plaster.

3. Provide for material with sufficient thickness to withstand pressure of newly placed concrete without excessive and objectionable bow or deflection.

4. Concrete Column Forms: Sonoco products company regular "Sonotube" fiber forms or equal. Provide in one piece per column.

B. Form Ties

1. Provide factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection and to prevent spalling concrete surfaces upon removal.

2. Provide ties so that portion remaining within concrete after removal of exterior parts is at least 3.8 cm (1.5") from the outer concrete surface. Provide form ties which will not leave a hole larger than 2.5 cm (1") diameter in the concrete surface.

C. Form Coatings - Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

## 2.02 DESIGN OF FORMWORK

A. General

1. Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure.

2. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for the purpose.

3. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position.

4. Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressures, stresses, lateral stability, and other factors pertinent to safety of structure during construction.

5. Provide shore and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations, using wedges or jacks or a combination thereof.

6. Provide trussed supports when adequate foundations for shores and struts cannot be secured.

7. Support form facing materials by structural members spaced sufficiently close to prevent objectionable deflection.

8. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities, and within allowable tolerances.

9. Provide camber in formwork as required for anticipated deflections due to weight and pressures of fresh concrete and construction loads.

10. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.

B. Earth Forms

Side forms of footings may be omitted and concrete placed directly against excavation only when requested by the Contractor and accepted by the Engineer. When omission of forms is accepted, provide additional concrete 2.5 cm (1") on each side of the minimum design profiles and dimensions shown.

## PART 3 - EXECUTION

### 3.01 SURFACE CONDITIONS

Examine the substrate and conditions under which work of this Section is to be performed, and correct unsatisfactory conditions which would prevent proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

### 3.02 FORM CONSTRUCTION

A. General

1. Construct forms complying with ACI 347, to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, level, and plumb work in finish structures.

2. Provide for openings, offsets, sinkages, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bullheads, anchorages, inserts, and other features required. Use selected materials to obtain required finishes.

3. Forms for openings, and construction which accommodates installation by other trades whose materials and products must be fabricated before the opportunity exists to verify the measurements of adjacent construction which affects such installations, shall be accurately sized and located as dimensioned on the Drawings. In the event that deviation from the

Drawing dimensions results in problems in the field, the Contractor shall be responsible for resolution of the conditions as approved by the Engineer, without additional expense to the Owner.

B. Fabrication

1. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where the slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways- reglets, recesses, and the like, to prevent swelling and assure ease of removal.

2. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Brace temporary closures and set tightly to temporary openings on forms in as inconspicuous locations as possible, consistent with design requirements. Form intersecting planes to provide true, clean cut corners.

C. Falsework

1. Erect falsework and support, brace and maintain it to safely support vertical, lateral, and asymmetrical loads applied until such loads can be supported by in-place construction. Construct falsework so that adjustments can be made for take-up and settlement.

2. Provide wedges, jacks, or camber strips to facilitate vertical adjustments. Carefully inspect falsework and formwork during and after concrete placement operations to determine abnormal deflection or signs of failure; make necessary adjustments to produce Work of required dimensions.

D. Forms for Exposed Concrete

1. Drill forms to suite ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes.

2. Provide sharp, clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.

3. Use extra studs, walers, and bracing to prevent objectionable bowing of forms between studs and to avoid bowed appearance in concrete. Do not use narrow strips of form material which will produce bow.

4. Assemble forms so they may be readily removed without damage to exposed concrete surfaces.

E. Corner Treatment - Unless shown otherwise, form chamfers with 2 cm x 2 cm (3/4" x 3/4") strips, accurately formed and surfaced to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to required limit and miter chamfer strips at changes in direction.

F. Control Joints - Locate as indicated

G. Provision for Other Trades - Provide openings in concrete formwork to accommodate work of other trades. Verify size and location of openings, recesses and chases with the trade requiring such items. Accurately place and securely support items to be built into forms.

H. Cleaning and Tightening - Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before concrete is placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

## 3.03 FORMS COATINGS

Coat form contact surfaces with form-coating compound before reinforcement is placed. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces which will be bonded to fresh concrete. Apply in compliance with manufacturer's instructions.

## 3.04 INSTALLATION OF EMBEDDED ITEMS

A. General - Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.

B. Edge Forms and Screens Strips for Slabs - Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure units to support types of screens required.

## 3.05 SHORES AND SUPPORTS

Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified. Submit a shore removal and reshoring schedule and drawings for the Engineer's review before proceeding with this work. Do not proceed until schedule and drawings have been reviewed.

## 3.06 REMOVAL OF FORMS

A. Formwork not supporting concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than $10^0$C ($50^0$F) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operation, and provided that curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beams soffits, joists slabs and other structural elements should be removed according to the following table unless the concrete attains a minimum strength specified by the Engineer.

| | Structural live load less than structural dead load | Structural live load more than structural dead load |
|---|---|---|
| Arch centers | 14 days | 7 days |
| Joist, beam, or girder soffits | | |
| Under 10 ft. clear span between structural supports | 7 days | 4 days |
| 10 to 20 ft. clear span between structural supports | 14 days | 7 days |
| Over 20 ft. clear span between structural supports | 21 days | 14 days |
| Slabs | | |
| Under 10 ft. clear span between structural supports | 4 days | 3 days |
| 10 to 20 ft. clear span between structural supports | 7 days | 4 days |
| Over 20 ft. clear span between structural supports | 10 days | 7 days |

C. Form Facing Material - may be removed four days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

## 3.07 RE-USE OF FORMS

Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork. When forms are reused for successive concrete

placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets.

END OF SECTION 03 10 00

**SECTION 03 20 00**
**CONCRETE REINFORCEMENT**

## PART 1 - GENERAL

### 1.01 SCOPE

This specification section covers the requirements for furnishing, detailing, fabricating, and placing reinforcing steel for cast-in-place concrete construction.

### 1.02 SUBMITTALS

A. Fully detailed shop drawings, including bending schedules and bending diagrams, shall be submitted to the Engineer for review. Shop drawings shall show fabricating and placing details and size and location of all reinforcing steel. Shop drawings shall be prepared in accordance with the applicable requirements and guidelines of ACI 315.

B. Shop drawings shall be of such detail and completeness that all fabrication and placement at the site can be accomplished. Shop drawings shall include number of pieces, sizes, and markings of reinforcing steel, laps and splices, supporting devices and accessories, and any other information required for fabrication and placement.

C. Contract Drawings for anchor bolt schedules and locations, anchors, hangers, inserts, conduits, sleeves, and any other items to be cast in concrete shall be checked for possible interference with reinforcing steel. Required clearances shall be indicated on shop drawings.

D. Refer to Section 01 33 00 for submittal requirements.

### 1.03 CERTIFICATION

Certified copies of mill tests on each heat or melt of steel stating the grade and physical and chemical properties of the reinforcing steel, and conformance with ASTM Specifications, shall be available to the Engineer at the time of inspection or sampling.

### 1.04 PRODUCT HANDLING

A. Each bundle of steel reinforcement shall be tagged at the mill with a mill tag showing the name of the mill, melt or heat number, and type or grade of steel.

B. Steel reinforcement shall be delivered to the jobsite, stored, and covered in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause which might impair bond with concrete.

C. Steel reinforcement shall be stored off the ground and shall be kept in a clean condition. Bars shall not be bent or straightened in a manner that will injure the material. Bars for the various contract items shall be stockpiled separately and shall not be used interchangeably.

D. A sufficient supply of approved steel reinforcement shall be stored at the site at all times to ensure that there will be no delay of the work.

E. Identification of steel reinforcement shall be maintained after bundles are broken.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Reinforcing Bars: Reinforcing bars shall be new, deformed steel bars and shall conform to the requirements of ASTM A615, Grade 60. Only Grade 60 reinforcing bars will be permitted on the jobsite.

B. Welded Wire Fabric: Welded wire fabric shall be new, rectangular mesh, welded, deformed steel wire fabric conforming to ASTM A185. Gauge or diameter of wire and center-to-center spacings of wire shall be as shown on the Drawings.

C. Accessories: Reinforcement accessories, consisting of spacers, chairs, ties, and similar items required for spacing, assembling, and supporting reinforcement in place, shall conform with the applicable requirements of the reference standards hereinbefore specified.

1. For footings or other concrete on grade, use supports with sand or precast concrete bases or plates or horizontal runners where wetted base materials will not support chair legs.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are hot-dip galvanized, plastic protected, or stainless steel protected.

D. Tie Wire: Tie wire for reinforcement shall be No. 16 gauge or heavier, black, mild or commercial grade steel wire.

## PART 3 - EXECUTION

### 3.01 CUTTING, BENDING AND SPLICING

A. General: Fabrication of steel shall be in accordance with the Drawings and reviewed shop drawings. Where specific details are not indicated, comply with the applicable requirements of the reference standards hereinbefore specified.

B. Cutting and Bending: Cutting and bending shall be performed at a central location, equipped and suitable for the purpose. Bars shall be accurately cut and bent as indicated on the Drawings. Bars shall be bent cold. Heating of bars for bending or straightening will not be permitted. Bars shall not be bent or straightened in any manner which will injure the material. All bars shall be labeled in accordance with bending diagrams and schedules, and like pieces secured in bundles if appropriate.

C. Splicing: Splicing shall be lap splices conforming to ACI 318 unless otherwise shown on the Drawings. When splice information is missing, utilize Class "B" type per AC1 318-95. Reinforcing bars shall not be welded.

D. Supplemental drawings will show locations of required splices and areas where splicing will not be permitted. The Contractor will be permitted to splice reinforcing steel at other locations for his convenience subject to the approval of the Engineer.

**3.02 PLACING**

A. All reinforcing steel shall be placed accurately in the positions shown on the Drawings and held firmly during the placing and setting of concrete. When placed in the work, reinforcing shall be free from dirt, grease, paint or other foreign substances. The coating of epoxy-coated steel shall be unbroken with all damaged areas repaired as specified in ASTM D3963. Uncoated steel shall be free from loose mill scale, and heavy flaky rust that can be removed by firm rubbing with burlap or equivalent treatment. After being placed, the reinforcing shall be maintained clean until completely embedded in the concrete. Care shall be exercised to prevent any disturbance of the reinforcing in concrete that has already been placed.

B. Welded wire fabric shipped in rolls shall be straightened into flat sheets before being placed.

C. The CRSI-WCRSI "Recommended Practice for Placing Reinforcing Bars" shall be used as a guide for placing, supporting, and tying the reinforcing steel.

D. Reinforcing shall be supported in position by means of concrete, metal or plastic chairs, metal hangers, metal spacers, or other satisfactory metal supports. Concrete blocks used for support purposes shall have a strength level and quality comparable to the concrete in which they are used. The use of broken stone, metal pipe, and wooden blocks will not be permitted. Concrete blocks shall be used for supporting reinforcing on subgrade. Stainless steel, concrete, plastic coated or plastic supports, as approved, shall be used for supporting reinforcing against surfaces which will be exposed to view in the finished structure. The use of nails driven into the forms to support the reinforcing steel will not be permitted. Reinforcing shall be placed so that there will be a clear distance of at least one inch between the reinforcing and any anchor bolts or other embedded metalwork.

E. Unless otherwise specified, measurements made in placing reinforcing bars shall be to the centerline of the bars, except that cover shall be measured to the outside surface of the bar. No reinforcing steel shall be covered with concrete until it has been checked by the Engineer and his permission given to proceed with the concreting. The Engineer shall be given sufficient notice for inspection of the reinforcement.

F. All laps, hooks, and bends in reinforcing bars shall conform to the requirements of ACI 315 and ACI 318 unless otherwise shown on the Drawings. Bars in lapped splices shall be in contact and tied in such manner as to maintain at least the specified minimum clearances to adjacent bars and the specified minimum covers. Lap splices of closely spaced bars shall be staggered when possible and where required by or permitted by the Engineer.

G. Welded wire fabric shall be lapped sufficiently to maintain uniform strength and shall be securely fastened at the ends and edges. The laps shall conform to the requirements of CRSI Publication, "Placing Reinforcing Bars."

H. The minimum concrete clear cover over reinforcing steel shall be 3 inches where the concrete is against soil. In all other cases, the minimum concrete coverage for steel reinforcement shall be as specified in ACI 318, Section 7.7, unless otherwise shown on the Drawings.

I. Tolerances for Placing Reinforcing Steel:

1. Variation of protective covering:

| Clear Cover | Maximum Variation |
|---|---|
| 6 inch | 2 inch |
| 4 inch | 3/8 inch |
| 3 inch | 3/8 inch |
| 2 inch | 1/4 inch |
| 1-1/2 inch | 1/4 inch |
| 1 inch | 1/8 inch |
| 3/4 inch | 1/8 inch |

2. Variation from indicated spacing: One bar diameter or 1-inch maximum.

## 3.03 CLEANING

Reinforcement at time of depositing concrete shall be free of all coatings which might impair bond with concrete, such as form oil, curing compound, mud or heavy deposits of rust.

## 3.04 NOTIFICATION AND INSPECTION

Contractor shall notify the Engineer at least 24 hours ahead of each concrete placement, and no concrete shall be placed until all reinforcing steel has been inspected by the Engineer after installation by the Contractor.

## 3.05 CORRECTION DURING CONCRETE PLACEMENT

Capable steel workers shall be kept on the work at all times during the placing of concrete, and they shall properly reset any reinforcement displaced by runways, workers, or other causes. Reinforcement shall not be bent after being partially embedded in hardened concrete.

## 3.06 DEFECTIVE WORK

A. The following reinforcing steel work will be considered defective and may be ordered by the Engineer to be removed and replaced by the Contractor at no additional cost to the Owner:

1. Bars with kinks or bends not indicated on Drawings;
2. Bars injured due to bending or straightening;
3. Bars heated for bending or straightening;
4. Bars with broken epoxy coating;
5. Reinforcement not placed in accordance with the Drawings or Specifications;
6. Bars that have been welded.

END OF SECTION 03 20 00

**SECTION 03 25 30**
**CONCRETE JOINTS AND WATERSTOPS**

## PART 1 - GENERAL

### 1.01 SCOPE

A. This Specification Section covers the furnishing and installing of concrete waterstops, and other concrete jointing material.

B. The Contractor shall construct expansion, contraction and construction joints in the concrete work as shown on the Drawings or as directed by the Engineer. The Engineer may require that a waterstop be placed in any or all types of joints.

### 1.02 DEFINITIONS

A. Expansion joint is defined as a joint filled with resilient material to permit concrete dimensional change without damage to the concrete.

B. Contraction joint is defined as a concrete surface on or against which new concrete is to be placed to provide for volumetric shrinkage of monolithic units or movement between monolithic units but not bonded. The surface of the concrete first placed at a contraction joint shall be coated with sealing compound before the concrete on the other side of the joint is placed.

C. Construction joint is defined as a concrete surface that has reached its final setting and on or against which new concrete is placed. Construction joints not indicated on the Drawings shall be so made and located as to least impair the strength of the structure. The Contractor shall show on his submittal drawings the proposed locations of all construction joints for the Engineer's review.

### l.03 SUBMITTALS

A. The Contractor shall provide a manufacturer's certificate warranting compliance of each material with this specification. The certificate shall identify the material, quantity, batch number, and date of manufacture.

B. Unless otherwise directed, the Contractor shall submit to the Engineer samples of materials to be used.

### 1.04 QUALITY ASSURANCE

A. It is required that all waterstop field joints and mastic installation shall be subject to continuous, rigid observation and no such work shall be scheduled or started without prior arrangements with the Engineer for observation.

B. All field joints in PVC waterstop shall be subject to rigid inspection for misalignment, bubbles, inadequate bond, porosity, cracks, offsets and other defects which would reduce the potential resistance of the material to water pressure at any point. All defective joints shall be removed from the site and disposed of by the Contractor.

## PART 2 - PRODUCTS

### 2.01 GENERAL

All materials placed in contact with each other shall be checked for mutual compatibility.

### 2.02 WATERSTOPS

A. Waterstops shall be of an approved type, supplied by an approved manufacturer and shall be plastic made of virgin polyvinylchloride (PVC) compound, shall be ribbed, uniform in dimensions, dense, homogeneous, free from porosity, and as detailed on the Drawings. No reclaimed PVC shall be used in the compound. Manufacturer shall be Greenstreak, Durajoint or approved equal.

B. The finished waterstop material shall meet the following minimum requirements:

| | | |
|---|---|---|
| Tensile strength | 2,000 psi min. | (ASTM D-638) |
| Ultimate elongation | 350% min. | (ASTM D-638) |
| Shore hardness | 75 ± 5 | (ASTM D-2240) |
| Specific gravity | 1.38 max | (ASTM D-792) |
| Stiffness in flexure | 700 psi min. | (ASTM D-747) |
| Cold brittleness | No Failure at -35°F | (ASTM D-746) |
| Water absorption: 48 hours | 0.15% max | (ASTM D-570) |
| Tear Resistance | 290 lb./in. min. | (ASTM D-624) |

C. Factory made waterstop joints shall have a tensile strength across the joint equal to at least 600 psi. Field splices and joints shall be made in accordance with the waterstop manufacturer's instructions using a thermostatically-controlled heating iron.

### 2.03 JOINT SEALANT

A. Joints shall be sealed using Sikaflex-2c NS EZ, or approved equal, and shall meet the requirements of ASTM C-920, Type M, Grade NS, Class 25 and FS-TT-S-00227E, Type II, Class A.

B. All joints receiving a joint sealant shall be primed using Sikaflex Primers 429/202, or approved equal.

## PART 3 - EXECUTION

### 3.01 EXPANSION, CONTRACTION, AND CONSTRUCTION JOINTS

A. General: Joint locations and details not shown on the Drawings shall be in accordance with a plan or schedule submitted to and accepted by the Engineer. In no case shall any fixed metal, embedded in concrete, be continuous through an expansion or contraction joint.

B. Construction Joint Treatment: As a lift is completed, the surface shall be protected immediately from any condition that will damage the concrete.

C. Cleaning: Horizontal and vertical construction joints and other construction joints indicated to be bonded shall be prepared for receiving the next lift by cleaning with either wet sandblasting or high-pressure water jet shall be equal to that obtained with wet sandblasting.

D. Vertical Construction and Contraction Joints: Bond is expected in vertical construction joints, and they shall be cleaned. Bond is not expected in vertical contraction joints, and they shall be coated with a bond breaker compound. Curing compound on the joint may serve this purpose. The entire substructure of the pumping plant shall be a monolith with no contraction joints permitted.

### 3.02 INSTALLING WATERSTOP

A. Waterstop shall be embedded in the concrete with equal portions on both sides of the joint unless shown otherwise on the Drawings, and the concrete carefully placed and vibrated to ensure a complete filling and bond between the concrete and waterstop.

B. Waterstop material shall be laid in the longest practicable length, with joints spliced to form a continuous watertight seal, and shall be supported and protected from becoming damaged. Damaged waterstop shall be replaced at the Contractor's own expense.

C. PVC waterstop shall be stored so as to permit free circulation of air around the material and to protect it from direct rays of the sun.

D. In the event any PVC waterstop is installed in the concrete on one side of a joint and will remain unembedded for more than 2 days, suitable precautions shall be taken to shade and protect the exposed material from the direct rays of the sun until the entire waterstop is embedded in concrete.

END OF SECTION 03 25 30

**SECTION 03 30 00**
**CAST-IN-PLACE CONCRETE**

## PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Work included - Provide all cast-in-place concrete, in place, as indicated on the Drawings, specified herein, and needed for a complete and proper installation.

### 1.02 QUALITY ASSURANCE

A. Standards

1. Perform cast-in-place concrete work in accordance with ACI 3l8, latest edition.

2. Comply with other standards specified in this Section.

3. In case of conflict between the referenced standards, the more stringent requirements shall govern.

B. Qualifications of Installers

1. Throughout the progress of installation of the work of this Section, provided at least one person who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be present at the site and shall direct all work performed under this Section.

2. In actual installation of the work of this Section, use adequate numbers of skilled workmen to ensure installation in strict accordance with the approved design.

3. In acceptance of rejection of work performed under this Section, the Engineer will make no allowance for lack of skill on the part of workmen.

C. Quality Control

1. Inspection and testing of concrete shall be performed by a testing firm selected by the Contractor. All testing shall be paid for by the Contractor.

2. Contractor shall provide minimum notice of 48 hours prior to concrete pours.

3. Do not begin concrete production until all mixes have been reviewed by the Engineer.

4. Testing. The determination of compressive strength in psi will be made by testing 4-inch diameter by 8-inch cylinders, made and cured in accordance with specifications for "Making and Curing Concrete Compression and Flexural Strength Test Specimens in the Field (ASTM C31) and the "Test for Compressive Strength of Cylindrical Concrete Specimens" (ASTM C39). Tests and analyses of the aggregates and of the resulting concrete will be made by the Engineer at frequent intervals from the Trial Batch specified in Section 1.02 C 4a. The mixes used shall be changed whenever, in the opinion of the Engineer, such change is necessary or desirable to secure the required workability, density, impermeability, surface finish and strength, and the Contractor shall be entitled to no additional compensation because of such changes. The cost of all laboratory tests on cement, aggregates, and concrete will be borne by the Contractor, and the Contractor shall provide test cylinders and assist the Engineer in obtaining specimens for testing.

   Determine strength per ASTM C 39. Test 1 cylinder at 7 days, 2 cylinders at 28 days and 1 cylinder at 56 days if the average of the 28 day cylinders is not at the specified strength.

## 1.03 SUBMITTALS

A. General - Comply with provisions of Part 2.

B. Product data - within 30 calendar days after award of Contract submit:

   (1) Complete materials list of items proposed to be furnished and installed under this Section;

   (2) Sufficient data to demonstrate compliance with the specified requirements;

   (3) Complete description of proposed curing methods;

   (4) Complete mix designs, prepared in accordance with the provisions of subparagraph 1.02 C1 above.

C. Shop Drawings - Accompanying the above submittal, submit complete Shop Drawings including, but not necessarily limited to:

   (1) Location of all proposed construction joints, keying, and water stops;

   (2) Location of all openings, depressions, construction and control joints, trenches, sleeves, inserts, and other items affecting reinforcement and placing of concrete.

## 1.04 PRODUCT HANDLING

A. Protection - Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all other trades.

B. Replacement - In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

# PART 2 - PRODUCTS

## 2.01 CONCRETE

A. Concrete shall be designed in accordance with ACI Standard Recommended Practice for Design of Concrete mixes latest edition to produce the strength for each type of concrete with the slumps and maximum sizes of coarse aggregates specified. Compressive strength, maximum water content, and maximum slump shall conform to the following:

Concrete unless otherwise specified:

1. Compressive Strength at 28 days = 4,000 psi for slabs, 4,500 psi for footings and foundations.
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
4. Cement Content: Minimum 611 pound per cubic yard; 6.5 bag mix.
5. Water-Cement Ratio: Maximum 45 percent by weight.
6. Total Air Content: 5 to 7 percent for concrete exposed to freezing and thawing; and 2 to 4 percent for other concrete; per ASTM C 173.
7. Maximum Slump: 4 to 2 inches for structures; 3 to 1 1/2 inches for blocks and pavement.
8. Maximum Aggregate Size: one inch.

B. Concrete designated as "lean concrete":

1. Compressive strength at 28 days = 2,000 lbs/sq inch.
2. Minimum Cement Content = 4 sacks/cu yd.

C. Thrust Block Concrete: Thrust and anchor block concrete shall conform with this specification with the exception of the following items:

1. Type I or II Portland Cement may be used.

2. The maximum water cement (W/C) ratio shall be .50.
3. The average 28-day strength of three consecutive tests shall not fall below 3000 psi.
4. A water-reducing admixture will not be required.

**2.02 CEMENT**

A. General

1. All Portland Cement shall conform to the requirements of ASTM C150.

2. Cement to be used in construction at or below grade shall comply with the requirements of Type II.

3. Cement for above grade construction shall be Type II or Type V.

4. Do not use cement having a temperature greater than 60 degrees C (140 degrees F).

B. Sequence of Use - Use only one brand of cement for the entire work and use in the same sequence as received at the site.

C. Mill Tests - Furnish mill tests for all cement. The 28 day cube strength results may be submitted in a separate report but shall be related to the specific batch tested.

**2.03 AGGREGATE**

A. General - All aggregates shall conform to requirements of ASTM C 33, except as modified below:

| U.S. Size | Zone 2 | Zone 3 | Zone 4 |
|---|---|---|---|
| 3/8 inch | 100 | 100 | 100 |
| No. 4 | 100 | 100 | 100 |
| No. 8 | 98-100 | 90-100 | 98-100 |
| No. 16 | 55-90 | 75-100 | 90-100 |
| No. 30 | 35-59 | 69-79 | 80-100 |
| No. 50 | 8-30 | 12-40 | 15-50 |
| No. 100 | 0-10 | 0-10 | 0-15 |

B. Coarse Aggregates

1. Coarse aggregate shall be crushed stone complying with ASTM C33.
2. If the Contractor demonstrates to the Engineer by tests that a finer gradation can be used with the proposed fine aggregate to produce an equal or better quality concrete, the use of the finer gradation will be

approved by the Engineer when complete substantiating data is submitted and approved.

3. Quality Comparisons will be made on compressive strength, flexural strengths, workability, and drying shrinkage.

C. Aggregate Sources - Provide aggregates from one source of supply only.

D. Aggregate sizes

1. Maximum aggregate size shall be not larger than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars.

2. Stockpile the aggregate in a manner to protect from contamination.

## 2.04 WATER

Water used as an ingredient in concrete shall be clean, potable, and free from injurious amounts of foreign matter.

## 2.05 CONCRETE ADMIXTURES

A. Air Entraining Agent. An air-entraining agent meeting the requirements of "Specifications for Air Entraining Admixtures for Concrete" (ASTM C260) shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 2 to 4 percent; provided that, when the mean daily temperature in the vicinity of the worksite falls below 40°F for more than one day, the total air content provided shall be 4 to 8 percent. The Owner reserves the right, at any time, to sample and test the air-entraining agent received on the job by the Contractor. In no event shall any of said agent be used for work under the contract without approval by the Engineer. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement.

B. Water-Reducing Agent. At the Contractor's option, or at the request of the Engineer, but in either case at the expense of the Contractor, an admixture may be added to the concrete to control the set, effect water reduction and increase workability. Such admixtures may be either a hydroxylated carboxylic acid type or a hydroxylated polymer type, but shall contain no calcium chloride. The required quantities of cement shall be used in the mix regardless of whether or not any admixture is used.

The quantity of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions. Where the air temperature at the time of

placement is expected to be consistently over 80`F, such admixture shall be Super Concrete Emulsion's "Plastiment," Master Builder's "Pozzolith 300R," or equal. Where the air temperature at the time of placementis expected to be consistently under 40`F, such admixture shall be Super Concrete Emulsion's "Plastocrete A," or equal.

C. Calcium Chloride. The use of calcium chloride in concrete will not be permitted.

## 2.06 CURING MATERIALS

A. Burlap mats weighing approximately 305 grams per square feet (9 oz. per square yard) for moist curing shall conform to AASHTO M182.

B. Liquid curing compound shall be Hunt Process 225-TU as manufactured by Hunt Process Company, Santa Fe Springs, California or equal. It shall contain a fugitive dye so that areas of application will be readily distinguishable for a 30-day period in the sunlight.

C. Asphalt emulsion damp-proofing agent shall be Laykold Waterproofing as manufactured by Chevron Asphalt Company, Oakland, California or equal.

## 2.07 OTHER MATERIALS

A. Waterstops shall be extruded from an elastomeric polyvinylchloride compound and shall be as manufactured by Water Seals, Inc., Chicago, Illinois or equal. No reclaimed or scrap material shall be used.

(1) Flat-strip waterstops shall have a minimum thickness of 3/16 of an inch and shall be as shown in the drawings.

(2) Center-bulb waterstops shall be as shown on the drawings.

(3) Fittings shall be used at intersections of all ribbed waterstops.

B. Vapor barriers shall be polyethylene sheets having a minimum thickness of 0.2 mm.

C. Construction joint sealant shall be polyurethane polymer designed for bonding to concrete which is continuously submerged in water. No material will be acceptable which has an unsatisfactory history as to bond or durability when used in the joints of hydraulic structures. Surface to be sealed shall be primed with primer supplied by the same manufacturers supplying the sealant. No sealant will be permitted to be used without a primer.

D. Concrete floor hardener shall be Conrad Sovig Company, "K-Natural," or equal.

E. Metallic aggregate, heavy-duty finish, shall be packaged ground and graded cubicle-iron particles with dispersing agents formulated to blend with portland cement for monolithic surface treatment. Use iron aggregate free from nonferrous metals, oil, grease, rust, and other impurities.

F. Nonshrink grout shall be a ready-to-use metallic aggregate product requiring only the addition of water at the job site, and shall have the following attributes:

(1) Be capable of producing a flowable grouting material having no drying shrinkage or settlement at any age;

(2) The compressive strength of grout (50 mm or 2" cubes) shall be not less than 350 kg per sq. cm (5,000 psi) at age seven days, and 527 kg per sq. cm (7,500 psi) at age 28 days.

(3) Store, mix, and place the nonshrink grout in strict accordance with manufacturer's recommendations as approved by the Engineer.

## 2.08 BATCHING, MIXING, AND DELIVERY EQUIPMENT

A. Use transit-mixed concrete from approved batching and mixing plant. Batch, mix, and transport concrete to site in accordance with provisions of ASTM C 94.

## 2.09 PUMPING OF CONCRETE

A. General. Pumping of concrete will be permitted only with the Engineer's approval. If in the Engineer's opinion, the pumped concrete does not produce satisfactory end results, the Contractor shall discontinue the pumping operation and proceed with the placing of concrete using conventional methods.

B. Pumping Equipment.

(1) The pumping equipment must have two cylinders and be designed to operate with one cylinder only in case the other one is not functioning. In lieu of this requirement, the Contractor may have a standby pump on the site during pumping.

(2) The minimum diameter of the hose (conduit) shall be 4 inches.

(3) Pumping equipment and hoses (conduits) that, in the opinion of the Engineer, are not functioning properly, shall be replaced.

(4) Aluminum conduits for conveying the concrete will not be permitted.

C. Proportioning. Concrete shall conform to specifications subsections 2.01 through 2.05.

D. Field Control. Concrete samples for slump (ASTM C143) and test cylinders (ASTM C31 and C39) will be taken at the placement (discharge) end of the line.

## PART 3 - EXECUTION

### 3.01 INSPECTION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

### 3.02 CONCRETE PLACEMENT

A. General - Place concrete in compliance with practices and recommendations of ACI 304, and as herein specified. Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the work. Concrete which is not placed in accordance with these specifications, or which is of inferior quality, as determined by the Engineer, shall be removed and replaced by and at the expense of the Contractor. No concrete shall be placed except in the presence of duly authorized representative of the Engineer.

B. Procedures

1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section.

2. If a section cannot be placed continuously, provide construction joints as herein specified.

3. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.

4. Deposit concrete as nearly as practicable in its final location to avoid segregation due to rehandling and flowing.

5. Do not subject concrete to any procedure which will cause segregation.

6. Screen concrete which is to receive other construction to the proper level to avoid excessive skimming and grouting.

7. Do not use concrete which becomes nonplastic and unworkable, or does not meet the required quality control limits, or which has been contaminated by foreign materials.

8. Remove rejected concrete from the site and dispose of it in a location approved by the Engineer for that purpose.

C. Order of Placing Concrete.

(a) The order of placing concrete in all parts of the work shall be subject to the approval of the Engineer. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown on the drawings. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall have cured at least 7 days before the contiguous unit or units are placed, except that the corner sections of vertical walls shall not be placed until all the adjacent wall panels have cured at least 14 days.

D. Concrete Conveying

1. Handle concrete from the point of delivery and transfer to the concrete conveying equipment, and to the locations of final deposit, as rapidly as practicable and by methods which will prevent segregation and loss of concrete mix materials.

2. Provide runways for wheeled concrete conveying equipment from the concrete delivery point to the locations of final deposit.

3. Keep interior surfaces of conveying equipment. Free from hardened concrete, debris, water, and other deleterious materials.

4. Pumps may be used only if they can pump the mix designed. Do not add fine aggregate or water to the mix to satisfy needs of a pumping device.

5. Use chutes or tremies for placing concrete where a drop of more than 2 m (72") is required.

6. Where free drop through tremies exceeds 6 m (18'-0"), use flow checking devices.

E. Placing Concrete in Forms

1. Deposit concrete in forms in horizontal layers not deeper than 60 cm (24"), and avoid inclined construction joints.

2. Where placement consists of several layers, place each layer while preceding layer is still plastic and to avoid cold joints.

3. Remove temporary spreaders in forms when concrete placing has reached the elevation of such spreaders.

4. Do not place concrete in supporting elements until the concrete previously placed in columns and walls is no longer plastic.

F. Placing Concrete Slabs

1. Deposit and consolidate concrete slabs in a continuous operation, within the limits of construction joints, until the placing of a panel or section is completed.

2. Consolidate concrete during placement by use of the specified equipment, thoroughly working concrete around the reinforcement and into corners.

3. Consolidate concrete placed in beams and girders of supported slabs, and against bulkheads of slabs on grade, as specified for formed concrete structures.

4. Consolidate concrete in remainder of slabs by vibrating bridge screeds, roller pipe screeds, or other methods acceptable to the Engineer.

5. Limit the time of vibrating consolidation to prevent bringing an excess of fine aggregate to the surface.

6. Bring slab surfaces to the correct level with a straightedge, and then strike off.

7. Use bullfloats or darbies to smooth the surface, leaving it free from bumps and hollows.

8. Do not sprinkle water on the plastic surface; do not disturb the slab surfaces prior to start of finishing operations.

9. Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the pour. As the work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the pour screeded in an up-slope direction.

G. Hot Weather Placing - Comply with ACI 305.

1. When hot weather conditions exist which would seriously impair the quality and strength of concrete, place the concrete as follows:

(1) Maintain concrete temperature at time of placement below 32 degrees C (90-deg F). Use chilled mixing water or chopped ice to control concrete temperature, provided the water equivalent of the ice is calculated to the total amount of water.

(2) Cover reinforcing steel with water-soaked burlap if the steel becomes too hot. Steel temperature shall not exceed the ambient air temperature immediately prior to placement of concrete.

(3) Wet forms thoroughly prior to placement of concrete.

(4) Use set-control admixtures in the mix.

H. Cold Weather Placing. Comply with ACI 306.

1. Earth foundations shall be free from frost or ice when concrete is placed upon or against them.

2. Design mix, mixing procedures, placing, finishing and curing of concrete when the concrete temperature is lower than 55 degrees F or when the temperature of the air is lower than 40 degrees F shall be deemed "cold weather" concrete work and shall require additional and special procedures for such work.

3. Concrete aggregates shall be warmed, water shall be warmed, and all equipment shall be kept as near concrete temperature as possible. Water-cement ratio shall be carefully adjusted to prevent excessive cooling or possible freezing. An excessively low temperature conditions, all areas to receive concrete shall be protected with enclosures and the temperature maintained above the allowed minimum with space heaters or similar equipment.

4. After concrete is placed and compacted the finishing shall be done as quickly as possible and the concrete retained at a temperature of not less than 50 degrees F for at least 72 hours, after which time the temperature may be reduced at the rate of not more than one degree F per hour for the first 24 hours. Calcium chloride, other salts, or foreign materials shall not be used in concrete to prevent freezing.

5. During curing, freezing of concrete shall be prevented. Any concrete frozen before completely cured shall be removed and replaced by the Contractor at no additional cost to the Owner.

6. Where artificial heat is employed, special care shall be taken to prevent the concrete from drying.

## 3.03 CONSOLIDATION

A. General

1. Consolidate all concrete in accordance with provisions of ACI 309.

2. Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand-spading, rodding, or tamping.

3. Do not use vibrators to transport concrete inside the forms.

4. During all phases of operation, maintain a frequency of not less than 10,000 vibrations per minute per internal vibrator.

5. Do not vibrate forms or reinforcement.

B. Equipment

1. Provide adequate number of units and power source at all times. Maintain spare units on hand to ensure adequacy.

2. If, in the opinion of the Engineer, the equipment being used is not adequate to accomplish proper consolidation, the Engineer may order delay in further placement of concrete until such equipment is available for use at the location of placement of concrete.

C. Procedures

1. Limit duration of vibration to time necessary to produce satisfactory consolidation without causing segregation of aggregates.

2. Insert the vibrator so as to penetrate the lift immediately below the one being placed, and manipulate to blend the two lifts.

3. Do not insert the vibrator into lower courses which have begun to set.

4. Use the vibrator to melt down the concrete as it is being placed, and use the vibrator to consolidate the mass of concrete.

5. In the case of wall construction, assign at least one vibrator and vibrator-operator to melting down the mix; and assign at least one other vibrator and vibrator-operator to consolidating the mass of concrete.

6. Spacing between insertions of the vibrator which is used to consolidate shall not exceed twice the radius of action as shown in table 5.1.4 of ACI 309.

7. Under no circumstances shall the points of insertion during the consolidation phase be more than 45 cm (18") apart.

D. Maintenance of Vibrators - Initiate a maintenance program for the vibrators to assure that they are operating at peak efficiency at all times, and to facilitate effective consolidation of the concrete.

## 3.04 JOINTS

A. Construction Joints.

1. General.

(a) Construction joints shall be provided where shown on the drawings. If construction joints necessary for the progress of the work are not shown on the drawings, show them in complete detail on the Shop Drawings required under paragraph 1.03 C.

(b) Provide keyways 1 1/2 inch deep in all construction joints in walls, slabs, and between footings and walls.

(c) Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints.

(d) Except where otherwise shown or specified, at all joints where waterstops are required, the joint face of the first pour shall be coated with liquid curing compound (paragraph 2.06 B). The surfaces of the groove for the sealant shall not be coated.

2. Construction Joint Sealant.

(a) Where shown, construction joints in floor slabs shall be provided with tapered grooves which shall be filled with a construction joint sealant. The material used for forming the tapered grooves shall be left in the grooves until just before the grooves are cleaned and filled with joint sealant. After removing the forms from the grooves, all laitance and fins shall be removed, and the grooves shall be sandblasted. The grooves shall be allowed to become thoroughly dry, after which they shall be blown out; immediately thereafter, they shall be primed and filled with the construction joint sealant. The primer and sealant shall be placed strictly in accordance with the recommendations of the manufacturer, taking special care to properly mix the sealant prior to application. All sealant shall cure at least 7 days before the structure is filled with water.

(b) All sealant shall be installed by a competent waterproofing subcontractor who has a successful record of performance in similar installations. Before work is commenced, the crew doing the work shall be instructed as to the proper method of application by a representative of the sealant manufacturer. The Contractor shall provide a 5-year written guarantee of the entire sealant installation against defects in materials and workmanship, together with a statement that he agrees to repair or replace, to the

satisfaction of the Owner, at not cost to the Owner, any such defective areas which become evident within said 5-year guarantee period.

3. Waterstops. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are used, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated.

B. Isolation Joints in Slabs on Grade. Provide isolation joints in slabs on grade at point of contact between slabs on grade and vertical surfaces where indicated. Caulk in accordance with the provisions of Section 07900.

C. Control Joints in Slabs on Grade. Provide control joints in slabs on grade to form panels or patterns as shown. Use one of the following alternates:

(1) Cast a formed sheet metal key in the slab.

(2) Insert a pre-molded hardboard or fiberboard strip into the fresh concrete until the top surface of the strip is flush with the slab surface. After the concrete has cured for at least seven days, remove inserts and clean loose debris from the joint. Caulk all joints.

## 3.05 CONCRETE FINISHING

A. Finish of Formed Surfaces

1. Rough Form Finish

(1) Provide as-cast rough form finish to formed concrete surfaces that are to be concealed in the finish work or by any other construction.

(2) Standard rough form finish shall be the concrete surface having the texture imparted by the form facing material used, with tie holes and defective areas repaired and patched, and all fins and other projections exceeding 6 mm (1/4") in height rubbed down or chipped off.

2. Smooth Form Finish

(1) Provide as-cast smooth form finish for formed concrete surfaces that are to be exposed to view, or that are to be covered with a coating material other than cement plaster applied directly to the concrete.

(2) Produce smooth form finish by selecting form material to impart a smooth, hard, uniform texture and arranging them orderly and symmetrically with a minimum of seams.

(3) Repair and patch defective areas with all fins and other projections completely removed and smoothed.

3. Related Unformed Surfaces - At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike off smooth and finish with a smooth troweled finish.

B. Monolithic Slab Finishes

1. Scratch Finish

(1) Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for terrazzo tile and other bonded applied cementitious-finish flooring material.

(2) After placing slabs, plane the surface to a tolerance not exceeding 6 mm (1/4") in 60 cm (24") when tested with a straightedge.

(3) Slope uniformly to drains where required.

(4) After leveling, roughen the surface before its final set by using a stiff broom, a brush, or a rake.

2. Float Finish

(1) Apply float finish to monolithic slab surfaces that are to receive trowel finish and other finishes as specified, and to slab surfaces which are to be covered with insulation, and as otherwise shown on the Drawings or in the schedules.

(2) After placing concrete slabs, do not work the surface further until ready for floating.

(3) Begin floating when the surface water has disappeared and when the concrete has stiffened sufficiently to permit operation of a power driven float, or both.

(4) Consolidate the surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units.

(5) Check and level the surface plane to a tolerance not exceeding 6 mm (1/4") in 3 m (10'-0") when tested with a 3 m (10'-0") straightedge placed on the surface at not less than two different angles.

(6) Cut down high spots and fill low spots.

(7) Uniformly slope to drains where required.

(8) Immediately after leveling, refloat the surfaces to a smooth, uniform, granular texture.

3. Trowel Finish

(1) Apply trowel finish to monolithic slab surfaces that are to be exposed to view, unless otherwise shown, and to slab surfaces that are to be covered with resilient flooring, carpeting, paint, or other thin-film finish coating system.

(2) After floating, begin the first trowel finish operation using a power-driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.

(3) Consolidate the concrete surface by the final hand troweling operation, free from trowel marks, uniform in texture and appearance, and with a surface plane to tolerance not exceeding 3 mm (1/8") in 3 m (10'-0") when tested with a 3 m (10'-0") straightedge.

(4) Grind smooth those surface defects which would telegraph through applied floor covering system.

4. Nonslip Broom Finish

(1) Apply nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as shown on the Drawings or in the schedules.

(2) Immediately after trowel finishing, slightly roughen the concrete surface by brooming in the direction perpendicular to the main traffic route. Use a fiber bristle broom.

(3) Coordinate the required finish with the Engineer prior to application.

5. Chemical Hardener Finish

(1) Apply chemical hardener finish to all exposed dry interior concrete floors.

(2) Apply liquid chemical hardener after complete curing and drying of the concrete surface.

(3) Dilute the liquid hardener with water and apply three coats:

| | |
|---|---|
| a. First Coat: | 1/3 strength |
| b. Second Coat: | 1/2 strength |
| c. Third Coat: | 2/3 strength |

(4) Evenly apply all coats allow 24 hours drying time between coats.

6. Heavy-Duty Wear-Resistant Finish.

(1) Provide heavy-duty wear-resistant finish to slab surfaces maintenance area of the Control Building.

(2) Premix Portland Cement and required dispersing agents, and deliver to the site in moisture-resistant sealed bags.

(3) Apply the premixed material at the manufacturer's recommended rate, providing not less than 7.35 kg of material per sq. m (1.4 lbs. per sq. ft.).

(4) Immediately following the first floating operation, uniformly distribute over the concrete surface approximately 1/2 of the specified weight of the blended dry shake materials, and embed with power floating.

(5) After the first dry shake application has been embedded, uniformly distribute the remaining portion of blended dry shake material at right angles to the first application, and embed by power floating.

(6) Comply with manufacturer's application instructions.

(7) After completion of broadcasting and floating, apply a trowel finish as specified herein.

## 3.06 CURING AND DAMPPROOFING

A. General. All concrete shall be cured for not less than 14 days after placing, in accordance with the methods specified herein for the different parts of the work, and described in detail in the following subsections.

| Surface to be Cured or Dampproofed | Method |
|---|---|
| Unstripped wooden forms | 1 |

| | |
|---|---|
| Construction joints between footings and walls, and between floor slab and columns | 2 |
| Encasement concrete and thrust blocks | 3 |
| All concrete surfaces not specifically provided for elsewhere in this subsection | 4 |
| Floor slabs in hydraulic structures and exterior surfaces of exposed roof slabs | 5 |
| Exterior buried surfaces of walls | 6 |

(1) Method 1. Wooden forms shall be wetted immediately after concrete has been poured and shall be kept wet with water until removed. If forms are removed with 14 days of placing the concrete, curing shall be continued in accordance with the applicable method.

(2) Method 2. The surface shall be covered with burlap mats which shall be kept wet with water for the duration of the curing period, until the concrete in the walls has been placed. No curing compound shall be applied to surfaces cured under Method 2.

(3) Method 3. The surface shall be covered with moist earth not less than 4 hours, nor more than 24 hours, after the concrete is placed.

(4) Method 4.

(a) The surface shall be sprayed with a liquid curing compound which will not affect the bond of paint to the concrete surface. It shall be applied in accordance with the manufacturer's instructions at a maximum coverage rate of 200 square feet per gallon in such a manner as to cover the surface with a uniform film which will seal thoroughly.

(b) Where the curing compound method is used, care shall be exercised to avoid damage to the seal during the curing period. Should the seal be damaged or broken before the expiration of the curing period, the break shall be repaired immediately by the application of additional curing compound over the damaged portion.

(c) Wherever curing compound may have been applied by mistake to surfaces against which concrete subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by wet sandblasting just prior to the placing of new concrete.

(d) Where curing compound is specified, it shall be applied within 2 hours after completion of the finish on unformed surfaces, and within 2 hours after removal of forms on formed surfaces. Repairs required to be made to formed surfaces shall be made within the said 2-hour period; provided however, that any such repairs which cannot be made within the said 2-hour period shall be delayed until after the curing compound has been applied. When repairs are to be made to an area on which curing compound has been applied, the area involved shall first be wet-sandblasted to remove the curing compound, following which repairs shall be made as provided under subsection 3.08.

5. Method 5. Immediately after the concrete has been troweled, it shall be given a coat of curing compound in accordance with subsection (e), herein. Not less than 1 hour nor more than 4 hours after the coat of curing compound has been applied, the surface shall be wetted with water delivered through a fog nozzle, and concrete-curing blankets shall be placed on the slabs. The curing blankets shall consist of one of the following two types:

(a) Sheets of heavy, waterproof sisalkraft paper laid with the edges butted together and with the joints between strips sealed with 2-inch wide strips of sealing tape or with the edges lapped not less than 3 inches and fastened together with a waterproof cement to form a continuous watertight joint.

(b) Sheets of clear polyethylene having a thickness of not less than 6 mils laid with edges butted together and with the joints between sheets sealed with 1-inch wide strips of acetate tape.

The curing blankets shall be left in place during the 14-day curing period and shall not be removed until after concrete for adjacent work has been placed. Should the curing blankets become torn or otherwise ineffective, the Contractor shall replace damaged sections. During the first 7 days of the curing period, no traffic of any nature and no depositing, temporary or otherwise, of any materials shall be permitted on the curing blankets. During the remainder of the curing period, foot traffic and temporary depositing of materials that impose light pressure will be permitted only on top of plywood sheets 5/8-inch minimum thickness, laid over the curing blanket.

6. Method 6.

(a) The surface shall be sprayed with a dampproofing agent consisting of an asphalt emulsion immediately after the wall forms have been removed. The asphalt emulsion shall be approved by the Engineer. Application shall be in two coats. The first coat shall be diluted to

2 strength by the addition of water and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon of dilute solution. The second coat shall consist of an application of the specified material, undiluted, and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon.

## 3.08 REMEDIAL WORK

A. General. Reinforce or replace deficient work as directed by the Engineer and at no additional cost to the Owner.

B. Care and Repair of Concrete. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the specifications, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

C. Treatment of Surface Defects.

1. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the Engineer, and then only in strict accordance with his directions. Concrete containing voids, holes, honeycombing, or similar depression defects, shall be completely removed and replaced; provided that where required or approved by the Engineer, defects shall be repaired with gunite or with cement mortar placed by an approved compressed air mortar gun. In no case will extensive patching of honeycombed concrete be permitted. All repairs and replacements herein specified shall be promptly executed by the Contractor at his own expense.

2. Defective surfaces to be repaired as specified in subsection (a) hereof shall be cut back from trueline a minimum depth of 2-inch over the entire area. Feathered edges shall be avoided. Where chipping or cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32-inch depth of the surface film from all hard portions, by means of an efficient sandblast.

   After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with gunite or with cement mortar so that while the

repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The material used for repair purposes shall consist of a mixture of 1 sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas white portland cement as is required to make the color of the patch match the color of the surrounding concrete.

3. Holes left by tie-rod cones shall be reamed with suitable toothed reamers so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired in an approved manner with dry-packed mortar. Holes left by form tying devices having a rectangular cross-section, and other imperfections having a depth greater than their least surface dimension, shall not be reamed but shall be repaired in an approved manner with dry-packed mortar.

4. All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of Section 03300, subsection 3.05, using approved methods which will not disturb the bond, cause sagging, or horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

5. Prior to filling any structure with water, any cracks that may have developed shall be "vee'd" as shown on the drawings and filled with sealant conforming to the requirements of subsections 2.07 C and 3.04 A of this section.

## 3.09 TOLERANCES

A. General. The Contractor shall set and maintain concrete forms so as to ensure that the completed work is within the tolerances specified herein. "Tolerance" is defined as the permissible variation from lines, grades, or dimensions shown on the drawings. Where tolerances are not stated in the specifications, permissible deviations will be according to ACI 347.

B. Special Tolerances.

| | Item | Tolerance |
|---|---|---|
| 1. | Variation of the constructed linear outline from the established position in plan | In 10 feet: 1/4 inch<br>In 20 feet or more: 2 inch |
| 2. | Variation from the level or from the grades shown on the drawings | In 10 feet: 1/4 inch<br>In 20 feet or more: 2 inch |
| 3. | Variation from the plumb | In 10 feet: 1/4 inch |

| | | |
|---|---|---|
| | | In 20 feet or more: 2 inch |
| 4. | Variation in the thickness of slabs and walls | Minus 1/4 inch<br>Plus 2 inch |
| 5. | Variation in the locations and sizes of slab and wall openings | + 1/4 inch |

END OF SECTION 03 30 00

**SECTION 32 11 23**
**ROAD BASE - UNTREATED BASE COURSE**

## PART 1 GENERAL

### 1.1 DESCRIPTION

A. This work consists of the placement of Sub-Base and Untreated Base Course material at designated road ways and all driving surfaces as indicated on the Drawings.

### 1.2 REFERENCES

A. The latest edition of the following publication forms a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

| | |
|---|---|
| AASHTO T 88- | Particle Size Analysis of Soils |
| AASHTO T 180- | Moisture-Density Relations of Soils Using a 10-lb. (4.54 kg) Rammer and an 18-in (457 mm) Drop |
| AASHTO T 191- | Density of Soil In-Place by the Sand-Cone Method |
| AASHTO T 205- | Density of Soil In-Place by the Rubber-Balloon Method |
| AASHTO T 238- | Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) |
| AASHTO T 239- | Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) |

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM D 422- | Particle-Size Analysis of Soils |
| ASTM D 698- | Test Method of Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.5-kg) Rammer and 12-in. (305-mm) Drop |
| ASTM D 1556- | Density of Soil in Place by the Sand-Cone method |
| ASTM D 1557- | Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop |
| ASTM D 2487- | Classification of Soils for Engineering Purposes |
| ASTM D 2922- | Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) |
| ASTM D 3017- | Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |

B. The latest edition of the Utah Department of Transportation Standard Specification for Road and Bridge Construction (UDOT).

## 1.3 SUBMITTALS

A. Untreated Base Course (APWA Grade 1 or Grade 1 ½).

# PART 2 PRODUCTS

## 2.1 MATERIALS

A. Untreated Base Course Materials shall meet the APWA Specifications for Grade 1 or Grade 1 ½ as shown in Table 1.

**TABLE 1**

| SIEVE SIZE | GRADE 1 GRADATION (PERCENT PASSING) | GRADE 1 ½ GRADATION (PERCENT PASSING) |
|---|---|---|
| 1 1/2 inch | - | 100 |
| 1 inch | 100 | - |
| 3/4 inch | - | 70 - 85 |
| 1/2 inch | 79 - 91 | - |
| 3/8 inch | - | 55 - 75 |
| No. 4 | 49 - 61 | 40 - 65 |
| No. 16 | 27 - 35 | 25 - 40 |
| No. 200 | 7 - 11 | 7 - 11 |

# PART 3 EXECUTION

## 3.1 SUBGRADE PREPARATION

A. Prior to placement of untreated base course materials, the foundation area to receive untreated base course materials shall be scarified to a minimum depth of 8-inches and recompacted to 95% minimum laboratory density as determined by ASTM D-1557**.**

## 3.2 UNTREATED BASE COURSE MATERIAL PLACEMENT

A. No Untreated Base Course material shall be placed on sub-grade materials until the sub-grade has been checked and accepted by ENGINEER.

B. Road base material placed on driving surfaces shall be compacted to a minimum density of 96% in accordance with ASTM D-1557 to provide a uniform graded smooth surface.

C. Untreated Base Course material shall be placed to a minimum thickness eight (8) inches or as shown on the drawings.

## 3.3 FIELD QUALITY CONTROL

A. CONTRACTOR shall be responsible for directing proper placement of all road base materials. CONTRACTOR shall be responsible for the stability of the road base materials during placement and shall replace any portions which have become displaced due to careless or negligent work on the part of CONTRACTOR, or to damage resulting from natural causes, such as storms.

B. Whenever the work areas to receive Sub-Base and/or Untreated Base Course material are covered with snow, the snow must be removed prior to placing the road base and/or Untreated Base Course, and deposited outside the immediate construction areas at CONTRACTOR's expense.

- END OF SECTION -

**SECTION 32 12 16**
**HOT-MIX ASPHALT CONCRETE PAVING**

## PART 1 GENERAL

### 1.1 SUMMARY

A. This section addresses the requirements for installing hot-mix asphalt concrete, as outlined in Section 33 05 25 – Pavement Restoration of the APWA Specifications, and as modified herein.

### 1.2 RELATED SECTIONS

A. Related work specified in other sections includes but is not limited to:

Section 32 11 23 – Road Base – Untreated Base Course
Section 32 12 13.13 – Tack Coat (APWA)
Section 32 12 16.13 – Plant-Mix – Asphalt Paving (APWA)
Section 33 05 25 – Pavement Restoration (APWA)

### 1.3 REFERENCES

A. The American Public Works Association General Conditions and Standard Specifications for Construction, latest edition.

B. The following are also references applicable to this section.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM D 1559: | Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus. |
| ASTM D 2041: | Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures. |
| ASTM D 2950: | Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Method. |
| ASTM D 3665: | Standard Practice for Random Sampling of Construction Materials. |

### 1.4 SUBMITTALS

A. Laboratory mix design for proposed hot-mix asphalt concrete paving.

B. Means and methods for removal, reprocessing, and placement of existing asphalt surfaces as base course material.

C. Laboratory mix design for proposed tack coat application.

D. Quality assurance tests for asphalt and aggregate material sources.

E. Copies of batch delivery tickets shall be submitted during progress of the work, and shall show the following information:
   1. Name of production facility
   2. Serial number of ticket
   3. Date and truck number
   4. Name of CONTRACTOR
   5. Job name and location
   6. Weight of asphalt concrete
   7. Loading temperature
   8. Signature or initial of plant representative
   9. Type and grade of asphalt cement
   10. Type and grade of aggregate
   11. Applicable mix design method
   12. Separate weights of aggregate and asphalt

F. Submit type and number of rollers required for compacting asphalt concrete

## 1.5 SITE CONDITIONS

A. Pave 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 pave during rain or unsuitable weather or when surface is wet.

## 1.6 ACCEPTANCE

A. Acceptance of hot-mix asphalt concrete paving is based upon minimum density, minimum thickness, smoothness, and surface appearance. Smoothness and surface appearance shall be as defined by Section 32 12 16.13 of the APWA Specifications.

# PART 2 PRODUCTS

## 2.1 BITUMINOUS MATERIAL

A. The bituminous material shall be ***PG 58-28*** for the 1/2" mix design.

B. Sampling and testing shall be the responsibility of CONTRACTOR, and shall be performed as required in Section 01 45 00 - Quality Control and Materials Testing.

## 2.2 TACK COAT

A. Tack coat material shall conform to all requirements of Section 32 12 13.13 - Tack Coat (APWA).

## PART 3 EXECUTION

### 3.1 PREPARATION

A. Preparation shall conform to all requirements of Section 32 12 16 of the APWA specifications.

B. CONTRACTOR shall map and mark all existing surface utilities within the line of work, and shall lower fixtures if pavement machine is not capable of passing over structure.

C. All asphalt and concrete surfaces within the line of work are to be removed and disposed of properly by the CONTRACTOR. The CONTRACTOR may, upon written authorization of the OWNER, use processed asphalt materials as base course material. Excess materials shall be removed and disposed by the CONTRACTOR.

D. Existing asphalt pavements and drive approach extensions to be removed shall be cut by a wheel cutter, clay spade, or other device capable of making a neat, reasonably straight and smooth cut without damaging adjacent pavement and/or concrete that is not to be removed. The cutting device operation shall be subject to the approval of the ENGINEER.

E. Any existing base, surfacing, or pavement shall be thoroughly cleaned immediately prior to receiving the plant-mixed surfacing. Where existing pavement is being widened or extended, it shall be cut to a straight vertical face prior to the paving operations and treated with asphalt paint binder.

### 3.2 BASE COURSE

A. Base course material shall be placed in accordance with Section 32 11 23 of these specifications.

B. Base course surfaces shall be maintained in an acceptable condition for both moisture and density, as defined by Section 32 11 23 - Road Base, until the overlying hot-mix asphalt cement materials have been placed, at no additional expense to the OWNER.

### 3.3 PLACEMENT OF TACK COAT

A. Apply tack coat to all existing asphalt concrete surfaces preparatory to placing asphalt concrete pavement in accordance with Section 32 12 13.13 – Tack Coat of the APWA specifications.

## 3.4 PLACEMENT OF HOT-MIX ASPHALT CONCRETE

A. For all excavations within twenty-four (24) inches of any structure, concrete, or edge of existing pavement surface; CONTRACTOR shall remove and replace existing pavement surface to the concrete, structure, or edge of existing pavement surface.

B. Where a longitudinal trench is partly in pavement, the pavement shall be replaced to the original pavement edge, on a straight line, parallel to the center line of the roadway.

C. Where no part of a longitudinal trench is in the pavement, surfacing replacement will only be required where existing surfacing materials have been removed.

D. Spreading shall be as nearly continuous as possible.

E. Placement shall also allow for line, grade, elevations, and thickness specified herein and as shown on the drawings.

F. When asphalt concrete is laid against vertical surfaces such as gutters, the face of the vertical surface shall be roughened for proper bonding, cleaned, and then painted with a light coating of asphalt cement or emulsified asphalt.

G. At terminations of new surface course, the asphalt concrete shall be feathered into the existing surface over such a distance as may be required to produce a smooth riding transition. Base course and single course construction shall be joined by vertical butt joints finished and rolled to a smooth surface.

H. Asphaltic concrete shall not be placed when frozen materials are present in the base or sub-base.

I. Asphaltic concrete shall not be placed during adverse conditions, i.e., rain or when a roadway surface is wet.

J. Asphaltic concrete shall be placed between April 15 and October 15. Asphalt concrete shall not be placed after October 15 and before April 15 of the following year unless roadway surface temperatures are 50-deg F and rising in the shade. Approval to place the asphalt concrete after October 15 and before April 15 of the following year requires written approval from the OWNER.

K. Roadways not completed prior to October 15, and not meeting the requirements of this section, shall be repaired by placing a temporary 2-inch thick asphalt (or other ENGINEER approved surface) course over all exposed, earthen surfaces. These temporary surfaces shall be completely removed and repaired in accordance with these specifications at no additional expense to the OWNER.

L. Asphalt rolling shall be in accordance with Section 32 12 16 of the APWA specifications. The CONTRACTOR shall establish and document a rolling pattern

for obtaining densities. The test strip shall be no shorter than 300 feet. Establishment of rolling patterns are for the purpose of establishing minimum rolling patterns, and shall not release the CONTRACTOR of meeting all requirements of these specifications and drawings.

M. The target density for asphalt placement shall be 94 percent of laboratory density plus or minus two (2) percent. If an individual test result falls below 92 percent of maximum density, the material represented by that test will be considered defective, and shall be removed and replaced by the CONTRACTOR at no additional cost to the OWNER.

N. The minimum acceptable thickness of asphalt for completed roadways shall be 3 inches, as verified by core samples. Areas found to contain less than the minimum thickness shall be removed and replaced at no additional expense to the OWNER.

O. The completed finish shall be as specified in Section 32 12 16 of the APWA specifications.

P. CONTRACTOR shall adjust the height of all street fixtures to match final grade. If required, concrete collars shall be placed around all surface street fixtures (i.e. manholes, valve boxes, monuments, etc.).

Q. CONTRACTOR shall complete all concrete collars within 2 weeks of completion of paving each roadway section.

R. CONTRACTOR shall restripe streets, as required, in accordance with Section 32 17 23 - Pavement Markings of the APWA specifications.

## 3.5 SITE SAFETY AND TRAFFIC CONTROL

A. Site safety and traffic control shall be the responsibility of the CONTRACTOR.

B. The CONTRACTOR shall verify full compliance with all applicable local, county, state and/or federal regulations, and shall comply with Traffic Control in Section 01 55 26.

- END OF SECTION -

# GEOTECHNICAL INVESTIGATION
# HWY 40 JSSD SHOP

**PROPERTY LOCATION**
**40.574900, -111.425392**
**WASATCH COUNTY, UTAH**

**Project No.: 25126**

**Prepared For:**
**TAVIS TIMOTHY**
**BT ENGINEERING, PLLC**
**6136 W. VALLEY VIEW DRIVE**
**HIGHLAND, UT 84003**
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**MAY 15, 2025**

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**APPENDICES**

# 1 INTRODUCTION

This report presents the geotechnical investigation for the proposed development identified as the new Jordanelle Special Service District (JSSD) shop, located northeast of the existing JSSD building located at 5360 Old Hwy 40, Heber City, Utah, as shown on the Site Vicinity Map in Appendix A (Figure A-1).

The field investigation consisted of four (4) test pits. The test pits were excavated to a depth of 12 to 15-ft below the existing ground surface elevations. Locations of test pits are shown on Appendix A (Figure A-2). Detailed test pit logs can be found in Appendix B (Figures B-2 to B-5). Recommendations in this report are based upon information gathered from the field investigation, site observation, published geologic maps, laboratory testing, and engineering analysis.

# 2 PURPOSE AND SCOPE

The purpose of this investigation was to assess the suitability of on-site soils for the proposed development and provide geotechnical recommendations. The scope of work completed for this study included site reconnaissance, subsurface exploration, soil sampling, laboratory testing, engineering analyses, and preparation of this report.

# 3 SITE AND PROJECT INFORMATION

## 3.1 PROJECT DESCRIPTION

Based on our understanding of the project, the proposed development will consist of a main office building, maintenance shop, and 7 vehicle bays. No specific structural loading information was provided at the time of this report, but we understand the proposed buildings will be up to two-stories, constructed on traditional continuous or spread footings. Based on the site plan and information provided by client, we understand the building will not include a basement. Below is our proposed scope of geotechnical work per such project understanding.

## 3.2 EXISTING SITE CONDITIONS

At the time of our filed investigation, the property was undeveloped and contained no existing structures. The property is primarily bound by open and undeveloped property. An access road bounds the property to the west and was used to access the site at the time of investigation. Old Highway 40 is located approximately 600-feet to the west of the property. Timpanogos Canal is located approximately 200-feet to the east of the property. The existing JSSD shop is located approximately 700-feet to the south of the property. The surrounding properties generally consist of open and undeveloped agricultural land. Shrubs, native grasses and forbs are the dominant vegetation throughout the property.

# 4 GEOLOGY RESEARCH AND REVIEW

## 4.1 SURFICIAL GEOLOGY

Based on the available geologic map[1], the project site is mapped within the Qaf1 unit, which is described as: *Young fan alluvium (Holocene) - Poorly to moderately sorted, weakly to non-stratified, clay- to boulder-size sediment deposited principally by debris flows and debris floods at the mouths of active drainages; forms characteristic, mostly undissected alluvial-fan morphology whose upper parts exhibit abundant boulders and debris-flow levees that radiate away from fan apex; equivalent to the upper part of young and middle fan alluvium (Qafy), but differentiated because Qaf1 typically forms small, isolated, undissected fan surfaces; probably less than 20 feet (6 m) thick.*

The geologic conditions presented in this section were obtained by locating the subject site on available large-scale geologic maps. Due to the scales involved, the precise location of the site can be difficult to determine. The large-scale geologic maps describe only general trends. Local variations are possible and site-specific geology may differ from those described herein. A site-specific detailed geologic description is beyond our scope of work.

## 4.2 LIQUEFACTION

Certain areas within the intermountain region possess a potential for liquefaction during seismic events. Liquefaction is a phenomenon whereby loose, saturated, non-cohesive soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Liquefaction can result in densification of such deposits, resulting in settlement of overlying layers. Three conditions should typically be present for liquefaction to occur in soils:

- The soil should be susceptible to liquefaction, i.e., soil layers with less than fifteen percent clay, existing below the groundwater table.
- The soil should be in a loose state.
- Ground shaking should be strong enough to cause liquefaction.

Based on the liquefaction hazard map[2], the site is mapped near a zone designated as having a “moderate” liquefaction potential[2]. A “moderate” liquefaction potential indicates that there is an approximate 10 to 50% probability of having a seismic event exceeding critical acceleration in 100 years. A site-specific liquefaction study is not performed and is beyond our proposed scope of work.

1 Robert F. Biek, 2022, Geologic Map of the Heber City Quadrangle, Wasatch and Summit Counties, Utah. M-295DM. UGS. 1:24,000 scale.

2 Christenson, G.E., Shaw, L.M., 2008, Liquefaction special study areas, Wasatch Front and nearby areas, Utah: Utah Geological Survey, Supplement map to Circular 106, scale 1:250,000

# 5 FIELD EXPLORATIONS

## 5.1 SUBSURFACE INVESTIGATION

Subsurface soil conditions at the project site were explored by excavating four test pits (TP-1 to TP-4) at representative locations near the proposed structures and parking bays. The test pits were excavated using a medium-sized excavator to depths of approximately 12 to 15-feet below the existing ground surface. Stratigraphy and classification of the soils were logged under the direction of our Engineering Geologist.

Disturbed samples were obtained at various depths and stored in sealed plastic bags. Undisturbed samples were not obtained due to the dense sand and gravel encountered within the test pits. The samples were transported to our laboratory in sealed containers for testing. The test pits were backfilled to near ground surface with on-site soils. Sample types with depths are shown in detail in the Test Pit Logs found in Appendix B (Figure B-2 to B-5). A Key to Soil Symbols is presented on Figure B-1.

## 5.2 SUBSURFACE CONDITIONS

### *5.2.1 Soils*

The soils encountered in the test pits consisted of approximately 4 to 11 feet of topsoil and undocumented fill at the ground surface. Undocumented fill was observed in each test pit. Below the topsoil and undocumented fill was generally native, CLAYEY GRAVEL with SAND (GC), CLAYEY SAND (SC), and SANDY LEAN CLAY (CL) to the full depth of the test pits excavated for this investigation. A more detailed description is presented in Test Pit Logs (Appendix B Figure B-2 to B-5). The stratification lines shown on the enclosed Test Pit Logs represent the approximate boundary between soil types. The actual in-situ transition may be gradual. Due to the nature and depositional characteristics of native soils, care should be taken in interpolating subsurface conditions between and beyond the exploration location.

### *5.2.2 Groundwater*

Groundwater was not encountered in any of the test pit locations at the time of the site investigation. It should be noted that it is possible for the groundwater levels to fluctuate during the year depending on the season and climate. Additionally, discontinuous zones of perched water may exist at various locations and depths beneath the ground surface. Therefore, groundwater conditions encountered during and/or after construction may differ from those encountered during our field investigation.

# 6 LABORATORY TESTING

Geotechnical laboratory tests were conducted on selected soil samples obtained during our field investigation. The laboratory testing program was designed to evaluate the engineering characteristics of onsite earth materials. Laboratory tests for this investigation include: Grain Size

Distribution Analysis, Atterberg Limits Test, Moisture Content of Soil by Mass, and Direct Shear Testing.

The results of laboratory tests are presented on the test pit log in Appendix B (Figure B-2 through B-5), the Summary of Laboratory Test Results table (Figure C-1), and on the test result figures presented in Appendix C (Figures C-2 through C-5).

# 7 RECOMMENDATIONS AND CONCLUSIONS

## 7.1 GENERAL CONCLUSIONS

Supporting data upon which the following recommendations are based have been presented in the previous sections of this report. The recommendations presented herein are governed by the engineering properties of the earth materials encountered and tested as part of our subsurface exploration and the anticipated design data discussed in *Section 3.1, Project Description*. If subsurface conditions other than those described herein are encountered during construction, and/or if design changes are initiated, Wilding Engineering must be informed in writing so that our recommendations can be reviewed and revised as changes or conditions may require.

## 7.2 EARTHWORK

### *7.2.1 Site Preparation and Grading*

It is the contractor's responsibility to locate and protect all existing utility lines, whether shown on the drawings or not.

In general, the soils encountered in the test pits generally consisted of approximately 4 to 11-feet of topsoil and undocumented fill at the ground surface. All topsoil, undocumented fill, moisture-sensitive soils or any soil containing organic or deleterious materials shall be removed where new structures, pavements, or concrete flatwork are to be placed. Topsoil may be stockpiled on site for subsequent use in landscape areas.

Upon completion of site grubbing and prior to placement of any fill, the exposed subgrade should be evaluated by Wilding Engineering. Proof rolling with loaded construction equipment may be a part of this evaluation. Soils that are observed to rut or deflect excessively (typically greater than 1-inch unless otherwise approved by our Geotechnical Engineer) under the moving load of a loaded rubber-tired truck or other suitable construction vehicle should be over-excavated down to firm undisturbed native soils and backfilled with properly placed and compacted structural fill *Sections 7.2.3 and 7.2.4*.

Excavations should be made using an excavator equipped with a smooth edge where possible. If the subgrade is disturbed during construction, disturbed soils should be over-excavated to firm, undisturbed soil and backfilled with compacted structural fill.

For ease of construction and to increase the likelihood of favorable soil conditions, we recommend that site preparation, earthwork, and pavement subgrade preparation be accomplished during warmer, drier months.

### *7.2.2 Excavation Stability*

All utility excavations shall be carefully supported, maintained, and protected during construction in accordance with OSHA Regulations. It is the responsibility of the contractor to maintain safe working conditions. Temporary construction excavations shall be properly sloped or shored, in compliance with current federal, state, and local requirements. Excavations are to be made to minimize subsequent filling. A trench box or shoring may be used. Coarse-grained material, soil with low fines content (material passing the No. 200 sieve) and wet soils can easily become unstable and in some areas where there could be toppling, cave-ins or sliding.

Wilding Engineering does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations. As stated in the OSHA regulations, "a competent person shall evaluate the soil exposed in the excavations as part of his/her safety procedures". In no case should slope height, slope inclination, or excavation depth, including utility trench excavations depth, exceed those specified in local, state, and federal safety regulations.

### *7.2.3 Structural Fill Material*

All fill placed for support of structures, concrete flatwork, or pavements shall consist of structural fill. The contractor should have confidence that the anticipated method of compaction will be suitable for the type of structural fill used. All structural fill should be free of vegetation, debris or frozen material, and should contain no materials larger than 4 inches nominal size.

Structural fill shall consist of well-graded granular material, with a maximum aggregate size of 4 inches, and a maximum of 25% passing the #200 sieve. The fill material finer than the #40 sieve shall have a liquid limit (LL) less than 25 and a Plastic Index (PI) less than 10. Specifications for gradation of structural fill are provided in Table 7.1. This material shall be free from organics, garbage, frost, and other loose, compressible, or deleterious materials.

**Table 7.1 Material Specification for Structural Fill**

| Grain Size | Percent Passing |
|---|---|
| 4-inch | 100 |
| ¾-inch | 60 to 100 |
| No. 4 | 40 to 80 |
| No. 200 | no greater than 25 |
| Plastic Index (PI) | < 10 |
| Liquid Limit (LL) | < 25 |

Variations to the structural fill gradation described above must be approved by our Geotechnical Engineer. Fine-grained materials (clays and silts) are not generally suitable for use as fill due to their inherent resistance to uniform moisture conditioning and workability to achieve desired compaction, as well as their proclivity to change volume when the soil becomes either drier or wetter. Imported structural fill is preferred and it is usually easier for compaction. Based on our field investigation, most of the near-surface soils were undocumented fill with debris that are not suitable to be reused as structural fill.

The contractor should anticipate testing all soils used as structural fill frequently to assess the maximum dry density, fines content, and moisture content, etc. Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

### *7.2.4 Structural Fill Placement and Compaction*

All structural fill should be placed in maximum 6-inch loose lifts if compacted by small hand-operated compaction equipment, maximum 8-inch loose lifts if compacted by light-duty rollers, and maximum 12-inch loose lifts if compacted by heavy duty compaction equipment that is capable of efficiently compacting the entire thickness of the lift. We recommend that all structural fill be compacted on a horizontal plane, unless otherwise approved by our Geotechnical Engineer.

Structural fill placed for subgrade below load bearing areas including footings, concrete slabs and pavements should be compacted to at least 95% of the maximum dry density as determined by ASTM D1557 for fill thickness less than 5 feet and at least 97% of the maximum dry density as determined by ASTM D1557 for fill thickness between 5 to 8 feet. Structural fill placed in non-load bearing areas including landscape areas should be compacted to at least 90% of the maximum dry density (ASTM D1557). The moisture content should be slightly above (within 2%) the optimum moisture content at the time of placement and compaction. Wilding Engineering should be notified if structural fill thickness exceeds 8 feet so the compaction percentage requirement can be adjusted accordingly. Also, prior to placing any fill, the contractor should request Wilding Engineering to observe the excavations and evaluate if any unsuitable materials or loose soils have been removed. Proper grading should precede placement of fill, as described in *Section 7.2.1, Site Preparation and Grading***.**

Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

### *7.2.5 Utility Trenches*

Construction of the pipe bedding shall consist of preparing an acceptable pipe foundation, excavating the pipe groove in the prepared foundation, and backfilling from the foundation to 12 inches above the top of the pipe. All piping shall be protected from lateral displacement and possible damage resulting from impact or unbalanced loading during backfilling operations by being adequately bedded.

The soils in the utility pipe trenches are to meet the specified structural fill requirements in *Sections 7.2.3 and 7.2.4*.

**Pipe foundation:** shall consist of imported granular soils. Wherever the trench subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, the trench shall be excavated below the bottom of the pipe to such depth as may be necessary, and this additional excavation shall be filled with compacted well-graded, granular soil per *Sections 7.2.3 and 7.2.4*.

**Pipe groove:** shall be excavated in the pipe foundation to receive the bottom quadrant of the pipe so that the installed pipe will be true to line and grade. Bell holes shall be dug after the trench bottom has been graded. Bell holes shall be excavated so that only the barrel of the pipe bears on the pipe foundation.

**Pipe bedding:** (from pipe foundation to 12 inches above top of pipe) shall be deposited and compacted in layers not to exceed 9 inches in uncompacted depth. Placement and compaction of bedding materials shall be performed simultaneously and uniformly on both sides of the pipe. All bedding materials shall be placed in the trench in a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses.

Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

### *7.2.6 Moisture Protection and Surface Drainage*

Precautions should be taken during and after construction to eliminate saturation of foundation soils. Over wetting the soils prior to or during construction may result in increased softening and pumping, causing equipment mobility problems and difficulties in achieving compaction.

Moisture should not be allowed to infiltrate the soils in the vicinity of, or upslope from, the structures. It should be noted that there will be an increased risk of settlement or movement if foundation soils become over-wetted. After the footings were constructed, the following recommendations for foundation moisture protection and drainage should be considered:

- Backfill around foundation walls should consist of fine-grained soils with low-permeability. Free-draining sandy and gravelly soils should not be used. The backfill should be placed in 12-inch lifts and compacted to at least 90% of the maximum dry density of the modified Proctor (ASTM D1557).
- The ground surface within 10 feet of the foundation walls should be sloped to drain away from structure with a minimum slope of 5% (2% if hardscaped).
- Roof runoff devices and downspouts should be installed around the entire perimeter of the structure to collect and discharge all roof runoff a minimum of 10 feet from the foundation walls. The runoff should always be allowed to flow away as designed and not back flow against the foundation; pop-ups, direct drainage or other options may be considered. Rain gutters, downspouts, discharge pipes and pop-ups (if used) should be inspected and cleared frequently so they remain unclogged.

- Only hand watering or drip irrigation should be used within 5 feet of the foundation walls, but xeriscaping or desert landscaping is preferred. Irrigation and/or water lines near the foundation walls should be maintained in good working order.
- Snow should be cleared in a timely manner within 10 feet of the foundation walls to prevent snow from melting and wetting the foundation soils.
- Above recommendations should be maintained throughout the life of the buildings.

## 7.3 FOUNDATION RECOMMENDATIONS

The foundations for the proposed structures may consist of conventional strip and/or spread footings. Strip and spread footing footings should be a minimum of 20 and 36 inches wide, respectively, and exterior shallow footings should be embedded at least 36 inches below final grade for frost protection and confinement. Interior shallow footings not susceptible to frost conditions should be embedded at least 16 inches for confinement. The following sections include more detailed recommendations for shallow foundations. Significant amount of undocumented fill was encountered in the test pits so a large amount of the earthwork may be needed to over-excavate the undocumented fill and replace with structural fill. We recommend considering deep foundation systems for cost comparison. Example of deep foundations include helical piers, micropiles, etc. The deep foundation system should be designed and constructed by a qualified contractor.

### *7.3.1 Installation and Bearing Material*

Footings may be placed entirely on firm, undisturbed, native granular soils or entirely on a uniform layer of structural fill (24-inch minimum thickness) extending to firm, undisturbed, native soils. Footings should not be placed partially on native soils, partially on undocumented fill, and/or partially on structural fill unless otherwise approved by our Geotechnical Engineer. Structural fill (if used) should meet material recommendations and be placed and compacted as recommended in *Sections 7.2.3 and 7.2.4*. Structural fill should extend from the outside edge of the footing for a distance equal to the depth of structural fill placed.

If encountered during footing excavation, all topsoil, moisture-sensitive soils, undocumented fill, soft areas, frozen material or other inappropriate material shall be removed from the footing zone to a depth recommended by Wilding Engineering. Footings placed on slopes shall be benched so that all footing bases are horizontal.

Footing excavations shall be observed by us prior to placement of structural fill, concrete, or reinforcement steel to assess their suitability for placement of footings.

**Footing excavations shall be observed by Wilding Engineering prior to placement of structural fill, concrete, or reinforcement steel to assess their suitability for placement of footings.**

### *7.3.2 Bearing Pressure*

Conventional strip and spread footings constructed as described in *Section 7.3.1 Installation and Bearing Material* may be proportioned for a maximum net allowable bearing pressure of **2,200 pounds per square foot (psf)**. The recommended net allowable bearing pressure refers to the total dead load plus live load conditions and can be increased by 30% to include short-term loading (wind and seismic).

### *7.3.3 Static Settlement*

Assuming no additional surcharge beside footing loads is applied, static settlements of properly designed and constructed conventional footings, founded as described above, are anticipated to be less than 1 inch. Differential settlements should be on the order of half the total settlement or ½ inch over 30 feet. If additional loads (e.g. imported fill) are introduced, we should be contacted to re-evaluate settlement.

### *7.3.4 Frost Protection*

All exterior footings are to be constructed at least 36 inches below the ground surface for frost protection and confinement. This includes walk-out areas and may require fill to be placed around building. Interior footings not susceptible to frost conditions should be embedded at least 16 inches for confinement. If foundations are constructed through the winter months, all soils on which footings will bear shall be protected from freezing.

### *7.3.5 Construction Observation*

Wilding Engineering shall periodically monitor excavations prior to installation of footings. Observation of soil before placement of structural fill or concrete is required to evaluate any field conditions not encountered in the investigation which would alter the recommendations or this report. **All structural fill material shall be tested under the direction of our Geotechnical Engineer for material and compaction requirements.**

### *7.3.6 Foundation Drainage*

Soils encountered in the subsurface explorations at elevations of proposed foundations consisted of Group II soils (GC, SC, and CL) according to 2021 International Residential Code (IRC) Section R405. A foundation drainage system is required where the foundation is installed on Group II soils per IRC 2021 if the foundations retain earth and enclose habitable or usable spaces located below grade. If desired, a drainage system can be constructed according to IBC 2021 Section R405, accessible at:https://codes.iccsafe.org/s/IRC2021P2/part-iii-building-planning-and-construction/IRC2021P2-Pt03-Ch04-SecR405

## 7.4 LATERAL FORCES

### *7.4.1 Resistance for Footings*

Lateral forces imposed upon conventional foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and frictional resistance between the base of the footing and the supporting subgrade. In evaluating the frictional resistance, a coefficient of friction of 0.38, 0.39, or 0.45 may be used for native fine-grained soils (clay/silt), native granular soils (sand/gravel), or structural fill against concrete, respectively.

### *7.4.2 Lateral Earth Pressures on Foundation Walls*

Ultimate lateral earth pressures are estimated from native soils or structural fill acting against buried walls and structures may be computed from the lateral pressure coefficients or equivalent fluid densities presented in the following table:

**Table 7.2 Lateral Earth Pressures – Native Fine-grained Soils**

| Condition | Lateral Pressure Coefficient | Equivalent Fluid Density (pounds per cubic foot) |
|---|---|---|
| Active | 0.39 | 48 |
| At-rest | 0.48 | 60 |
| Passive | 3.12 | 387 |

**Table 7.3 Lateral Earth Pressures – Native Granular Soils**

| Condition | Lateral Pressure Coefficient | Equivalent Fluid Density (pounds per cubic foot) |
|---|---|---|
| Active | 0.31 | 41 |
| At-rest | 0.47 | 62 |
| Passive | 3.25 | 430 |

**Table 7.4 Lateral Earth Pressures – Structural Fill**

| Condition | Lateral Pressure Coefficient | Equivalent Fluid Density (pounds per cubic foot) |
|---|---|---|
| Active | 0.26 | 32 |
| At-rest | 0.41 | 52 |
| Passive | 3.85 | 481 |

For seismic analyses, recent research presented by Lew, Sitar, Al Atik and others in their publication in 2010[1] provided provisional recommendations for the design of building basement walls. Based on this publication, if the retained earth materials are cohesive soils (including cemented soils and clayey soils), the horizontal ground acceleration, $k_h$, may be taken as one-half of the PGA (g). If the retained earth materials are cohesionless (including sandy silt, sand, and gravel), the horizontal ground acceleration, $k_h$, may be estimated from Table 7.5 below.

**Table 7.5 Horizontal Ground Acceleration* for Cohesionless Retained Earth Material**

| Peak Ground Acceleration (g) | Recommended $k_h$ |
|---|---|
| Less than 0.4 | 0 |
| 0.4 | 0.25 PGA |
| 0.6 | 0.5 PGA |
| 1.0 | 0.67 PGA |

* For other levels of peak ground acceleration, linear interpolation of the tabulated values may be used.

Lew, Sitar, Al Atik and others cited recent research suggesting that the earth pressure distribution under seismic loading is very similar to a fluid distribution (i.e., triangular distribution), like static earth pressure. This is consistent with the dynamic earth pressure distributions directly measured and interpreted from the pressure sensors, strain gage and load cell data measured on walls during shake table modeling (Mikola and others, 2014)[2].

It should be noted that the above static and seismic coefficients and densities assume horizontal backfill and vertical wall face with no buildup of hydrostatic pressures. Hydrostatic and surcharge loadings, if any, should be added to the presented values. Over-compaction behind walls should be avoided. If sloping backfill is present, we should be consulted to provide more accurate lateral pressure parameters once the design geometry is established.

Walls and structures allowed to rotate slightly should use the active condition. If the element is constrained against rotation, the at-rest condition should be used. These values should be used with an appropriate factor of safety against overturning and sliding. Additionally, if passive resistance is calculated in conjunction with frictional resistance, the passive resistance should be reduced by ½. Resisting passive earth pressure from soils subject to frost or heave, or otherwise above prescribed minimum depths of embedment, should be neglected in design.

1 Lew, M., Sitar, N., Al Atik, L., Pourzanjani, M., and Hudson, M. B., 2010, “Seismic Earth Pressures on Deep Building Basements”, SEAOC 2010 Convention Proceedings, Structural Engineers Association of California.
2 Mikola, R.G., Candia, G. and Sitar, N., 2014, “Seismic Earth Pressures on Retaining Structures and Basement Walls”, Tenth U.S. National Conference on Earthquake Engineering, Frontiers of Earthquake Engineering, July 21-25, 2014, Anchorage, Alaska.

### 7.5 CONCRETE SLABS-ON-GRADE & MODULUS OF SUBGRADE REACTION

Concrete slabs-on-grade for interior floor slabs should be constructed on 4" of free draining gravel, overlying firm undisturbed native subgrade or a uniform layer of structural fill overlying firm undisturbed native subgrade. The 4 inches of free draining gravel is recommended to provide a capillary break below the finish floor slab and underlying soils. The gravel should consist of a ¾ inch minus clean drain rock. The gravel should be compacted until tight and relatively unyielding.

Concrete slabs–on-grade for exterior flatwork should be constructed on firm, undisturbed native subgrade or a uniform layer of structural fill overlying firm undisturbed native subgrade.

For all slab-on-grade construction the structural fill shall be consistent with Sections 7.2.3 and 7.2.4. The concrete slabs constructed on subgrade prepared in accordance with the preceding recommendations may be designed using a **modulus of subgrade reaction (k) of 60 psi**/in and should be designed with appropriately spaced, deep control joints to control the location of cracking as a result of shrinkage. Consideration should be given to reinforcing the slabs with welded wire, rebar, or fiber mesh.

A moisture barrier (vapor retarder) consisting of 6-mil (0.006 inch) thick polyethylene or approved equivalent should be placed below slabs-on-grade where moisture-sensitive floor coverings or equipment is planned. Prior to placing this moisture barrier, any objects that could puncture it, such as protruding rocks, should be removed from the building pad.

### 7.6 SEISMIC INFORMATION

Based on the USGS Quaternary Fault and Fold Database of the United States, the project site is located approximately 1.7-miles southeast of the Bald Mountain Fault, approximately 9-miles west of the East Kamas Fault, and approximately 10-miles north of the Round Valley Faults. The Provo Section of the Wasatch Fault is located approximately 18-miles to the west-southwest of the subject project.

Seismic values were obtained for the subject property utilizing the ASCE 7 Hazards Tool[1] as recommended on USGS website per the 2021 International Building Code (IBC) and ASCE 7-16 code. The ground motions values produced by the web tools are presented in Table 7.6 below based on the site coordinates and Site Class D – Default (see ASCE/SEI 7-16 Section 11.4.3)[2]. More detailed seismic parameters are presented in Appendix D. If a non-default site class is desired to potentially reduce the seismic values, a geophysical survey extending to 100' in depth may be conducted at a relatively low cost.

1 ASCE 7 Hazards Tool, https://asce7hazardtool.online/, accessed May 2025.
2 It should be noted that our field explorations only extended to 15 feet below existing ground surface. According to ASCE 7-16 Section 20.1, the site class shall be based on site-specific data (average soil parameters) to a depth of 100 feet. The soils at deeper depths may have properties that meet criteria of other site classification which, on average, may change the site classification in the upper 100 feet. A geotechnical investigation to 100 feet is beyond our scope of work.

**Table 7.6 Seismic Ground Motion Parameters**

| Parameters | $S_S$ | $S_1$ | $S_{MS}$ | $S_{DS}$ | $PGA_M$ |
|---|---|---|---|---|---|
| Acceleration (g) | 0.550 | 0.195 | 0.748 | 0.498 | 0.329 |

### 7.7 SOIL CORROSIVITY

Based on our field observation and experience in similar soils, the near-surface site soils are expected to exhibit a low potential for sulfate attack when in contact with concrete elements. We therefore recommend that conventional Type II cement be used for construction.

The onsite soils are considered to be "corrosive"[1] to ferrous materials. A qualified corrosion engineer should be consulted to provide an assessment of any metal that may be associated with construction of ancillary water lines and reinforcing steel, valves and similar improvements.

## 8 LIMITATIONS

The recommendations contained in this report are based on our limited field exploration, laboratory testing, and understanding of the proposed construction. The subsurface data used in the preparation of this report were obtained from the explorations made for this investigation. It is possible that variations in the soil and groundwater conditions could exist between and beyond the points explored or below the maximum depths of exploration. The nature and extent of variations may not be evident until construction occurs or after. If any conditions are encountered at this site that are different from those described in this report, we should be immediately notified so that we may make any necessary revisions to recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, Wilding Engineering should be notified.

This report was prepared in accordance with the generally accepted standard of practice in the project area at the time the report was written. No other warranty, expressed or implied, is made. The concept of risk is a significant consideration of geotechnical analyses. The analytical means and methods used in performing geotechnical analyses and development of resulting recommendations do not constitute an exact science. Analytical tools used by geotechnical engineers are based on limited data, empirical correlations, engineering judgment and experience. As such the solutions and resulting recommendations presented in this report cannot be considered risk-free and constitute our best professional opinions and recommendations based on the available data and other design information available at the time they were developed. Our conclusions and recommendations are provided only from a geotechnical perspective. Site Specific evaluation of geologic or natural hazards, including but not limited to faulting, debris flow, landslide, slope stability, liquefaction, rockfall, flooding, etc., is beyond our scope of work.

1 Roberge, P.R., 2000, Handbook of corrosion engineering: McGraw-Hill, p. 150.

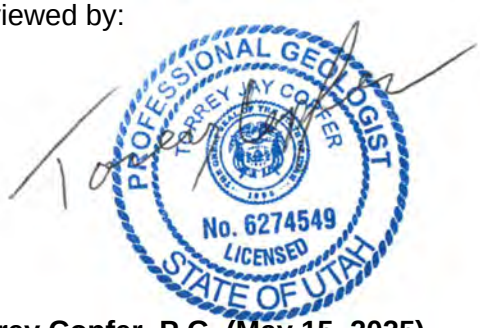
This report was prepared for our client's exclusive use on the project. It is the Client's responsibility to see that all parties to the project including the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

We appreciate the opportunity of providing this service for you. If you have any questions concerning this report or require additional information or services, please contact us at 801-553-8112.

Report prepared by:

**Austin N. Deane, G.I.T.**
Staff Geologist

Reviewed by:




**Torrey Copfer, P.G. (May 15, 2025)**
Engineering Geologist

**Shun Li, P.E.**
Geotechnical Department Manager

**WILDING ENGINEERING, INC.**

# APPENDIX A


Image Reference:
Google Earth Imagery Date 3/24/2025

200 0 200 400 600 800 ft

1:7,500

WILDING ENGINEERING



## Legend

- Approximate Site Boundary
- Roads

Hwy 40 JSSD Shop
5360 Old Highway 40
Heber City, Utah
Project Number: 25126

**Site Vicinity Map**

**Figure A-1**


Image Reference: Googe Earth March 2025

30 0 30 60 90 120 ft

1:500

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## Legend

- Approximate Site Boundary
- Approximate Test Pit Location

Hwy 40 JSSD Shop
5360 Old Highway 40
Heber City, Utah
Project Number: 25126

**Exploration Location Map**

**Figure A-2**

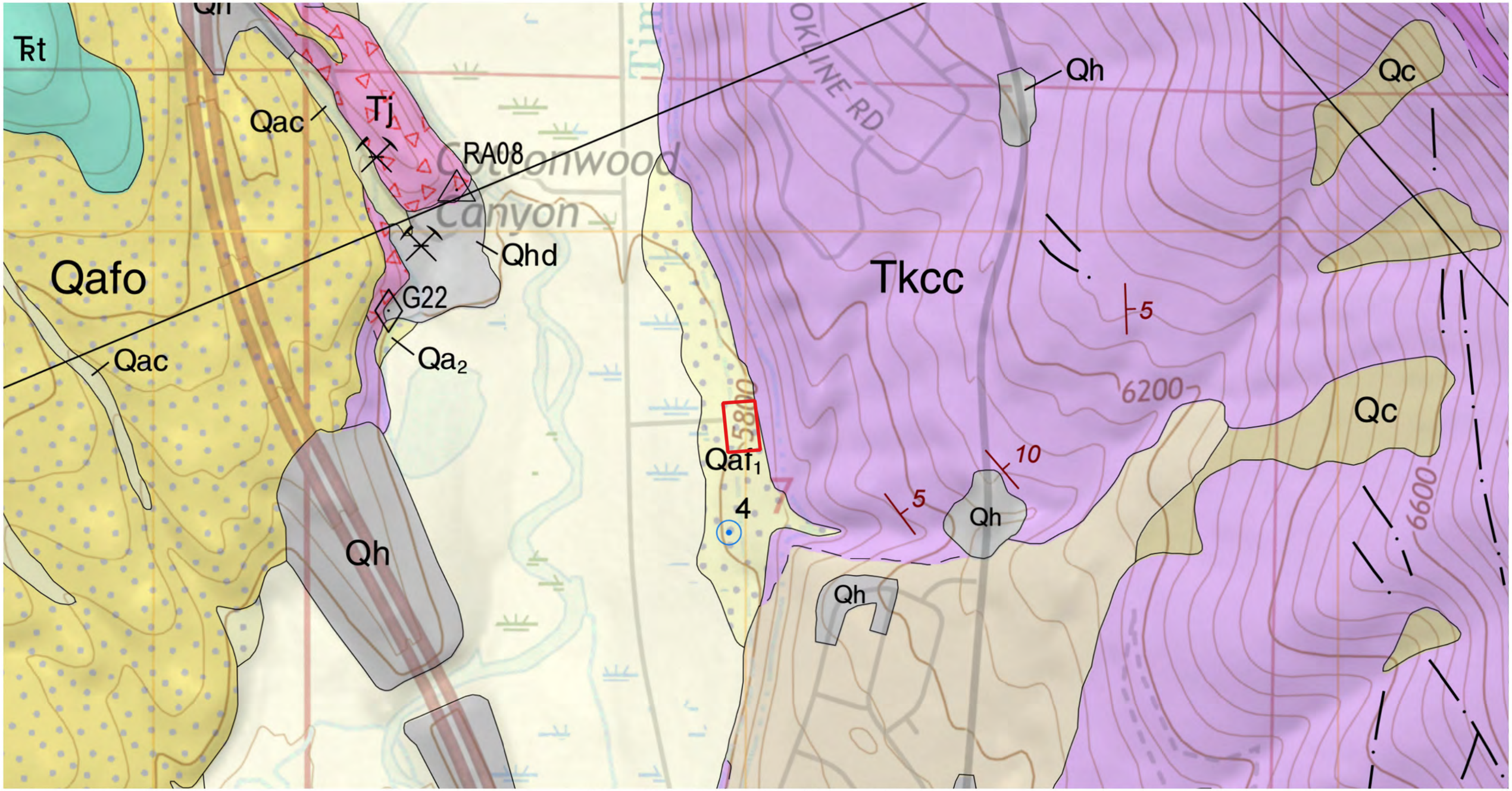


Image Reference: Google Earth Image Date March 2025

Robert F. Biek, 2022, Geologic Map of the Heber City Quadrangle, Wasatch and Summit Counties, Utah. M-295DM. UGS. 1:24,000 scale.

300 0 300 600 900 1,200 ft

1:6,000

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## Legend

Hwy 40 JSSD Shop
5360 Old Highway 40
Heber City, Utah
Project Number: 25126

**Geologic Map**

**Figure A-3**

# APPENDIX B

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

# KEY TO SYMBOLS

**CLIENT** BT Engineering, PLLC **PROJECT NAME** HWY-40 JSSD Shop

**PROJECT NUMBER** 25126 **PROJECT LOCATION** Heber City, Wasatch County, Utah

## LITHOLOGIC SYMBOLS
## (Unified Soil Classification System)


CL: USCS Low Plasticity Clay


FILL: Fill (made ground)


GC: USCS Clayey Gravel


SC: USCS Clayey Sand

## SAMPLER SYMBOLS


Hand Sample

## WELL CONSTRUCTION SYMBOLS

## ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION


Water Level at Time Drilling, or as Shown


Water Level at End of Drilling, or as Shown


Water Level After 24 Hours, or as Shown

**Figure No.: B - 1**

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

# TEST PIT NUMBER TP-1



**CLIENT** BT Engineering, PLLC
**PROJECT NAME** HWY-40 JSSD Shop
**PROJECT NUMBER** 25126
**PROJECT LOCATION** Heber City, Wasatch County, Utah
**DATE STARTED** 4/16/25 **COMPLETED** 4/16/25
**GROUND ELEVATION** 5813 ft **TEST PIT SIZE** NA inches
**EXCAVATION CONTRACTOR** JSSD
**GROUND WATER LEVELS:**
**EXCAVATION METHOD** Test Pit
**AT TIME OF EXCAVATION** --- Groundwater not encounterd
**LOGGED BY** AD **CHECKED BY** SL
**AT END OF EXCAVATION** ---
**NOTES** Lat: 40.574696; Long: -111.425205
**AFTER EXCAVATION** ---

| DEPTH (ft) | SAMPLE TYPE NUMBER | TESTS | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|
| 0.0 | | | | | **TOPSOIL/FILL- Poorly Graded SAND with Silt and Gravel:** with debris, medium dense, moist, light brown. |
| 4.0 | | | | | 5809.0 |
| | | | | | **NATIVE - Clayey GRAVEL with Sand:** medium dense to dense, moist, brown. |
| 7.5 | H 1 | MC = 10%<br>LL = 26<br>PL = 17<br>Fines = 25% | GC | | |
| 10.0 | H 2 | | | | |
| | H 3 | | | | |
| 12.0 | | | | | 5801.0 |

Bottom of test pit at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 5/6/25 14:57 - G:\DATA\25126 OLD HWY 40 JSSD SHOP GEOTECHNICAL\GINT\BORING LOGS.GPJ

**Figure No.: B-2**

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

# TEST PIT NUMBER TP-2



**CLIENT** BT Engineering, PLLC
**PROJECT NAME** HWY-40 JSSD Shop
**PROJECT NUMBER** 25126
**PROJECT LOCATION** Heber City, Wasatch County, Utah
**DATE STARTED** 4/16/25 **COMPLETED** 4/16/25
**GROUND ELEVATION** 5804 ft **TEST PIT SIZE** NA inches
**EXCAVATION CONTRACTOR** JSSD
**GROUND WATER LEVELS:**
**EXCAVATION METHOD** Test Pit
**AT TIME OF EXCAVATION** --- Groundwater Not Encountered
**LOGGED BY** AD **CHECKED BY** SL
**AT END OF EXCAVATION** ---
**NOTES** Lat: 40.575198; Long: -111.425242
**AFTER EXCAVATION** ---

| DEPTH (ft) | SAMPLE TYPE NUMBER | TESTS | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|
| 0.0 | | | | | **TOPSOIL/FILL- Poorly Graded SAND with Silt and Gravel:** with debris, medium dense, moist, light brown to black. |
| 2.5 | | | | | (Some wood, garbage, but mostly clean undocumented fill) |
| 5.0 | H 1 | | | | |
| 7.5 | | | | | |
| 9.0 | | | | | 5795.0 |
| | | | | | **NATIVE - Clayey SAND:** medium dense, moist, brown. |
| 10.0 | | | SC | | |
| 12.5 | H 2 | MC = 15%<br>LL = 32<br>PL = 17<br>Fines = 48% | | | |
| 14.0 | | | | | 5790.0 |
| | | | | | Bottom of test pit at 14.0 feet. |

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 5/6/25 14:57 - G:\DATA\25126 OLD HWY 40 JSSD SHOP GEOTECHNICAL\GINT\BORING LOGS.GPJ

**Figure No.: B-3**

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

# TEST PIT NUMBER TP-3



**CLIENT** BT Engineering, PLLC
**PROJECT NAME** HWY-40 JSSD Shop
**PROJECT NUMBER** 25126
**PROJECT LOCATION** Heber City, Wasatch County, Utah
**DATE STARTED** 4/16/25 **COMPLETED** 4/16/25
**GROUND ELEVATION** 5801 ft **TEST PIT SIZE** NA inches
**EXCAVATION CONTRACTOR** JSSD
**GROUND WATER LEVELS:**
**EXCAVATION METHOD** Test Pit
**AT TIME OF EXCAVATION** --- Groundwater not encounterd
**LOGGED BY** AD **CHECKED BY** SL
**AT END OF EXCAVATION** ---
**NOTES** Lat: 40.574821; Long: -111.425510
**AFTER EXCAVATION** ---

| DEPTH (ft) | SAMPLE TYPE NUMBER | TESTS | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|
| 0.0 | | | | | **TOPSOIL/FILL- Poorly Graded SAND with Silt and Gravel:** with debris, medium dense, moist, light brown. |
| 2.5 | | | | | (some boulders 3-4ft. diameter; asphalt, wood, debris) |
| 5.0 | | | | | |
| 7.5 | | | | | |
| 10.0 | H 1 | | | | |
| | | | | | 11.0 — 5790.0 |
| | | | | | **NATIVE - Clayey SAND:** medium dense, moist, dark brown. |
| 12.5 | H 2 | MC = 17%<br>LL = 25<br>PL = 17<br>Fines = 41% | SC | | |
| | | | | | 14.0 — 5787.0 |
| | | | | | Bottom of test pit at 14.0 feet. |

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 5/6/25 14:57 - G:\DATA\25126 OLD HWY 40 JSSD SHOP GEOTECHNICAL\GINT\BORING LOGS.GPJ

**Figure No.: B-4**

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

# TEST PIT NUMBER TP-4



**CLIENT** BT Engineering, PLLC
**PROJECT NAME** HWY-40 JSSD Shop
**PROJECT NUMBER** 25126
**PROJECT LOCATION** Heber City, Wasatch County, Utah
**DATE STARTED** 4/16/25 **COMPLETED** 4/16/25
**GROUND ELEVATION** 5804 ft **TEST PIT SIZE** NA inches
**EXCAVATION CONTRACTOR** JSSD
**GROUND WATER LEVELS:**
**EXCAVATION METHOD** Test Pit
**AT TIME OF EXCAVATION** --- Groundwater not encounterd
**LOGGED BY** AD **CHECKED BY** SL
**AT END OF EXCAVATION** ---
**NOTES** Lat: 40.574674; Long: -111.425553
**AFTER EXCAVATION** ---

| DEPTH (ft) | SAMPLE TYPE NUMBER | TESTS | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|
| 0.0 | | | | | **TOPSOIL/FILL- Poorly Graded SAND with Silt and Gravel:** with debris, medium dense, moist, light brown. |
| 5.0 | | | | | 5.0 5799.0 |
| | H 1 | MC = 17%<br>LL = 31<br>PL = 16<br>Fines = 54% | CL | | **NATIVE - Sandy LEAN CLAY:** Stiff, moist, brown. |
| 10.0 | H 2 | | | | 10.0 5794.0 |
| | | | | | **Sandy LEAN CLAY:** medium stiff, moist, brown. |
| 15.0 | H 3 | | CL | | 15.0 5789.0 |

Bottom of test pit at 15.0 feet.

**Figure No.: B-5**

# APPENDIX C

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

# SUMMARY OF LABORATORY TEST RESULTS



**CLIENT** BT Engineering, PLLC **PROJECT NAME** HWY-40 JSSD Shop

**PROJECT NUMBER** 25126 **PROJECT LOCATION** Heber City, Wasatch County, Utah

| Test Pit | Depth (ft) | Moisture (%) | Dry Density (pcf) | Liquid Limit | Plastic Limit | Plasticity Index | Gravel (%) | Sand (%) | Fines (%<#200 Sieve) | Classification |
|---|---|---|---|---|---|---|---|---|---|---|
| TP-1 | 7.0 | 10.2 | | 26 | 17 | 9 | 41 | 34 | 25 | GC |
| TP-2 | 13.0 | 15.3 | | 32 | 17 | 15 | 6 | 45 | 48 | SC |
| TP-3 | 12.0 | 17.0 | | 25 | 17 | 8 | 8 | 50 | 41 | SC |
| TP-4 | 6.0 | 17.2 | | 31 | 16 | 15 | 6 | 41 | 54 | CL |



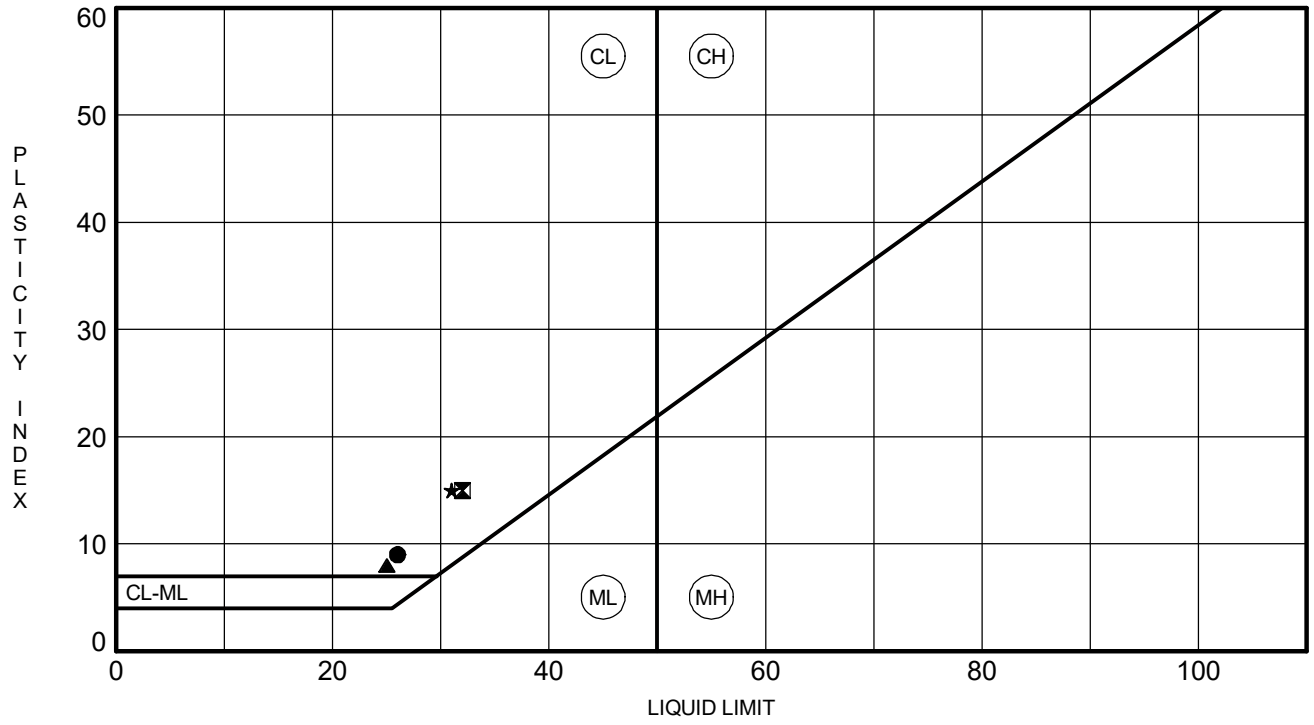
**Figure No.: C - 1**

# ATTERBERG LIMITS' RESULTS

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

**CLIENT** BT Engineering, PLLC **PROJECT NAME** HWY-40 JSSD Shop

**PROJECT NUMBER** 25126 **PROJECT LOCATION** Heber City, Wasatch County, Utah




| | TEST PIT | DEPTH | LL | PL | PI | Fines | Classification |
|---|---|---|---|---|---|---|---|
| ● | **TP-1** | **7.0** | **26** | **17** | **9** | **25** | **CLAYEY GRAVEL with SAND(GC)** |
| ⊠ | **TP-2** | **13.0** | **32** | **17** | **15** | **48** | **CLAYEY SAND(SC)** |
| ▲ | **TP-3** | **12.0** | **25** | **17** | **8** | **41** | **CLAYEY SAND(SC)** |
| ★ | **TP-4** | **6.0** | **31** | **16** | **15** | **54** | **SANDY LEAN CLAY(CL)** |

ATTERBERG LIMITS - GINT STD US LAB.GDT - 5/6/25 14:44 - G:\DATA\25126 OLD HWY 40 JSSD SHOP GEOTECHNICAL\GINT\BORING LOGS.GPJ

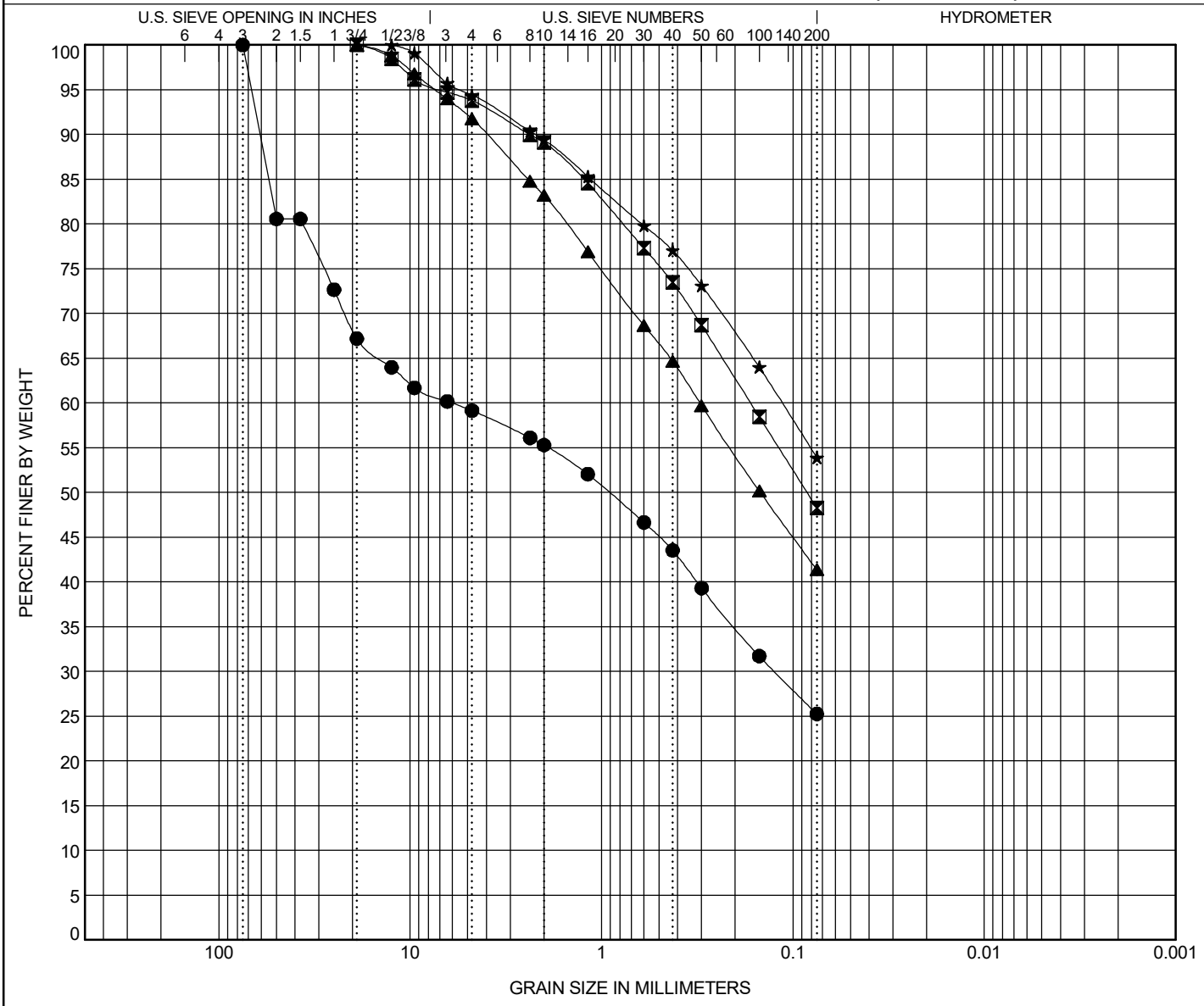
**Figure No.: C - 2**

# GRAIN SIZE DISTRIBUTION

Wilding Engineering, Inc.
14721 South Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 801-553-8112

**CLIENT** BT Engineering, PLLC **PROJECT NAME** HWY-40 JSSD Shop

**PROJECT NUMBER** 25126 **PROJECT LOCATION** Heber City, Wasatch County, Utah




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | TEST PIT | DEPTH | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | **TP-1** | **7.0** | **CLAYEY GRAVEL with SAND(GC)** | **26** | **17** | **9** | | |
| ⊠ | **TP-2** | **13.0** | **CLAYEY SAND(SC)** | **32** | **17** | **15** | | |
| ▲ | **TP-3** | **12.0** | **CLAYEY SAND(SC)** | **25** | **17** | **8** | | |
| ★ | **TP-4** | **6.0** | **SANDY LEAN CLAY(CL)** | **31** | **16** | **15** | | |

| | TEST PIT | DEPTH | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | **TP-1** | **7.0** | **75** | **6.077** | **0.125** | | **41** | **34** | **25.3** | |
| ⊠ | **TP-2** | **13.0** | **19** | **0.166** | | | **6** | **45** | **48.3** | |
| ▲ | **TP-3** | **12.0** | **19** | **0.306** | | | **8** | **50** | **41.4** | |
| ★ | **TP-4** | **6.0** | **12.5** | **0.114** | | | **6** | **41** | **53.9** | |

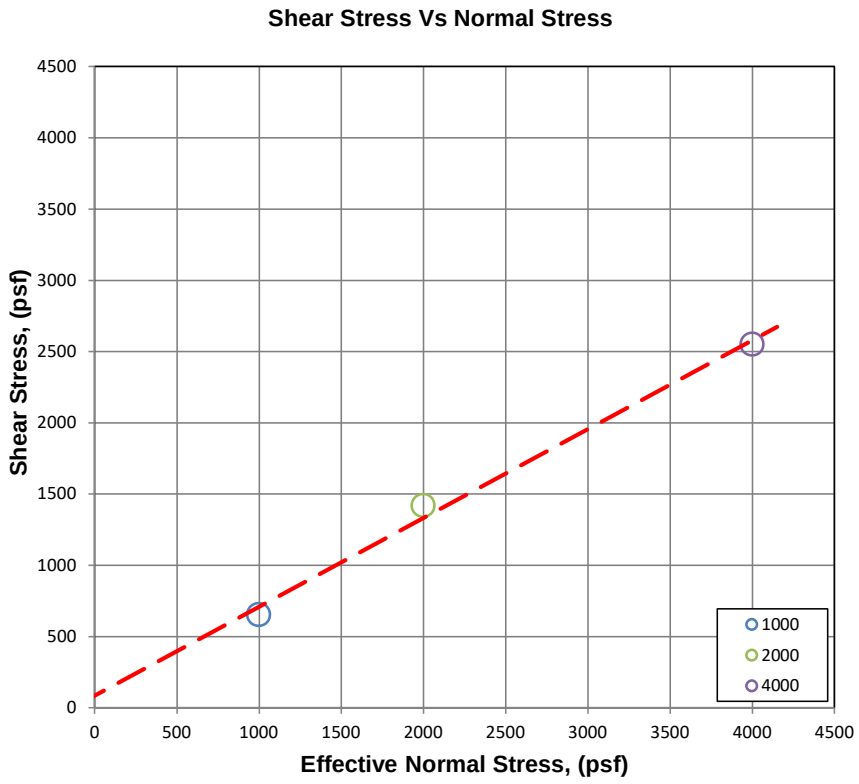
GRAIN SIZE - GINT STD US LAB.GDT - 5/6/25 14:44 - G:\DATA\25126 OLD HWY 40 JSSD SHOP GEOTECHNICAL\GINT\BORING LOGS.GPJ

**Figure No.: C - 3**

# Wilding Engineering, Inc.

**ASTM D3080**

| | |
|---|---|
| Tested By | Jason Wright |
| Date | 5/2/25 |
| Computed By | Jeremy Wright EIT |
| Date | 5/8/25 |
| Checked By | Shun Li PE |
| Date | 5/8/25 |




| Mohr-Coulomb Stress Envelope | | | Parameter | Specimen A | B | C | D |
|---|---|---|---|---|---|---|---|
| Φ' and c' from Best-Fit Straight Line | Φ' (deg) | 32 | Initial Water Content (%) | 10.2 | 10.2 | 10.2 | N/A |
| | c' (psf) | 85 | Final Water Content (%) | 21.7 | 20.3 | 20.5 | N/A |
| | $R^2$ | 0.9938 | Dry Density (psf) | 108.9 | 108.9 | 108.9 | N/A |
| | SSE | N/A | Diameter (in) | 2.42 | | | |
| Peak Φ' for c' = 0 | Normal Stress | Ø' (deg) | Height (in) | 1.00 | | | |
| | 1000 | 33 | Strain Rate (in/min) | 0.0030 | | | |
| | 2000 | 35 | LL/PL/PI | 26/17/9 | | | |
| | 4000 | 33 | Average $T_{50}$ (min) | 0.005 | | | |

| | | Data Points | | |
|---|---|---|---|---|
| **Project:** | HWY-40 JSSD Shop | **Normal Stress** | **Corrected Shear Stress** | |
| **Project Number:** | 25186 | | | |
| **Boring Number:** | NA | | | |
| **Sample Number:** | TP-1 | 1000 | 652 | |
| **Depth:** | 7 feet | 2000 | 1418 | |
| **Sample Type:** | Remolded | 4000 | 2551 | |
| **Rel. Compaction:** | 100% | | | |
| **Description:** | Clayey GRAVEL with Sand (GC) | | | |
| **Remarks:** | Sample remolded to estimated in situ moisture and density & split on the No. 10 sieve | | | |

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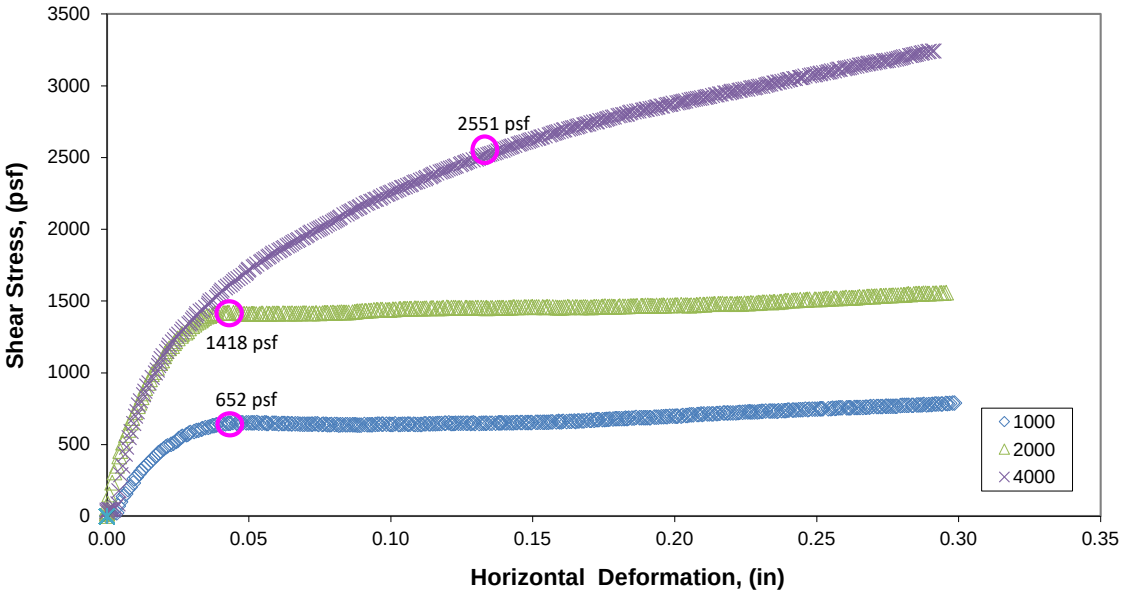
**Figure No.: C-4a**

# Wilding Engineering, Inc.

**ASTM D3080**

| Tested By | Jason Wright | Date | 5/2/25 | Computed By | Jeremy Wright EIT | Date | 5/8/25 | Checked By | Shun Li PE | Date | 5/8/25 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Corrected Shear Stress Vs. Horizontal Deformation**




**Shear Stress Vs Normal Stress, assuming c'=0**

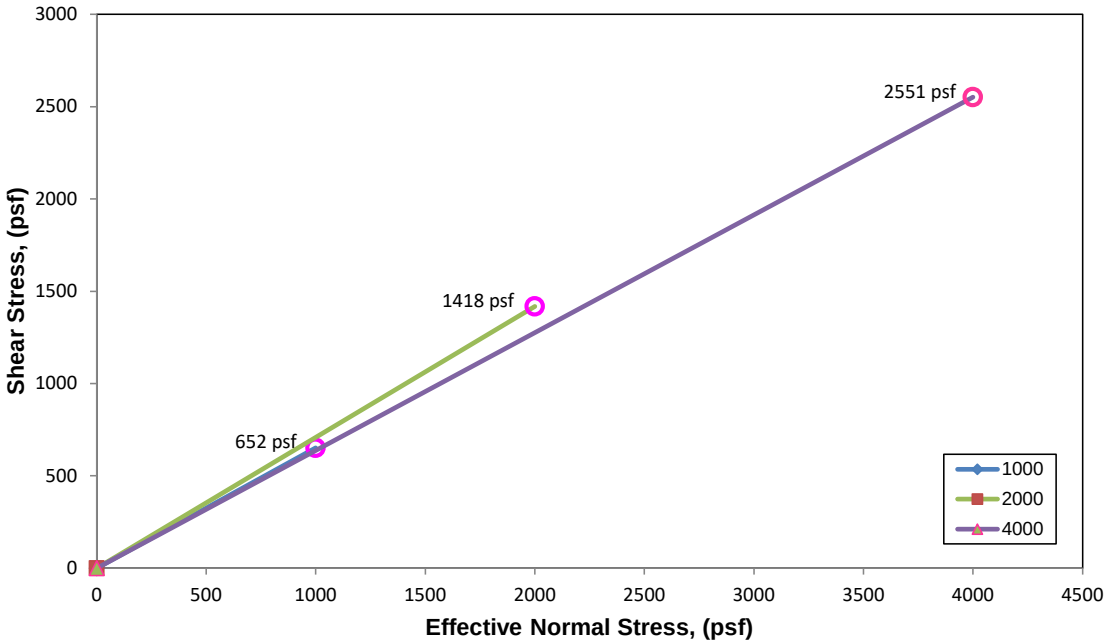



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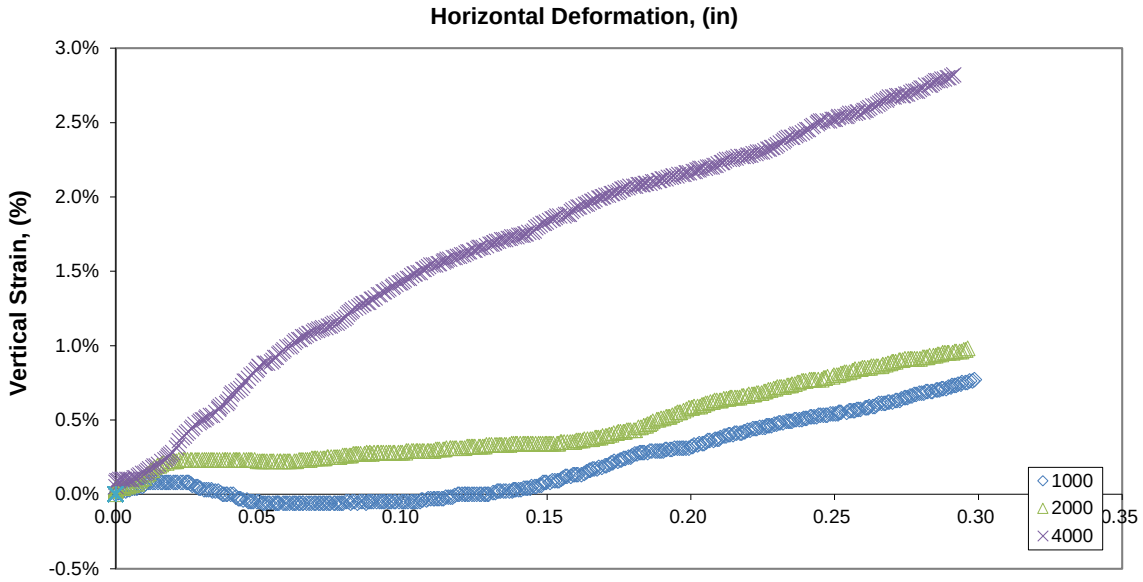
**Figure No.: C-4b**

# Wilding Engineering, Inc.

**ASTM D3080**

| | |
|---|---|
| Tested By | Jason Wright |
| Date | 5/2/25 |
| Computed By | Jeremy Wright EIT |
| Date | 5/8/25 |
| Checked By | Shun Li PE |
| Date | 5/8/25 |

**Vertical Strain Vs. Horizontal Deformation**




**Consolidation Curves**

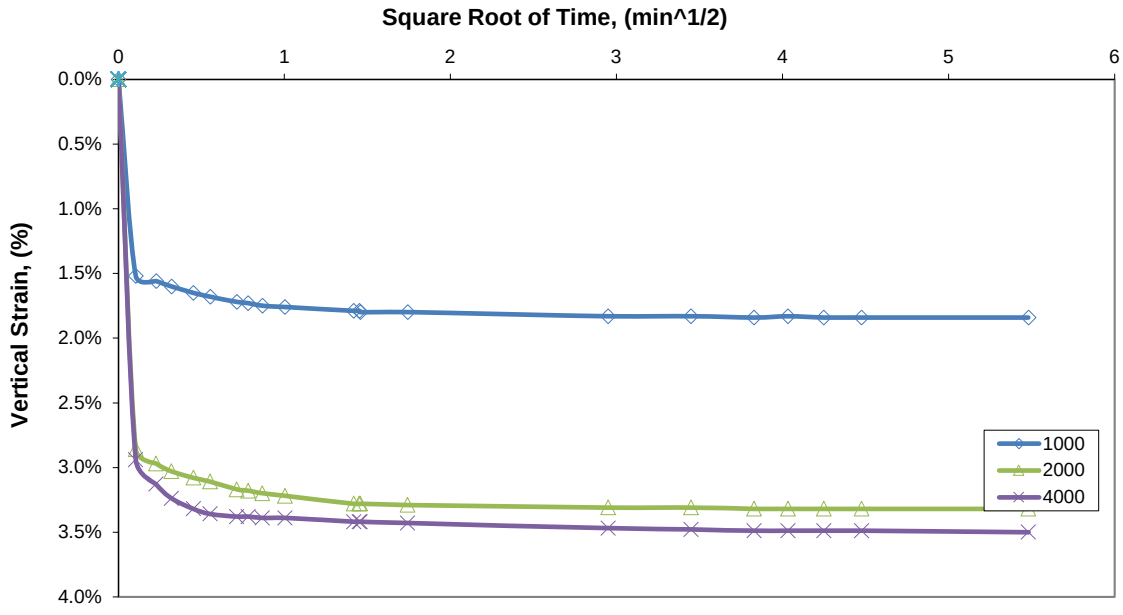



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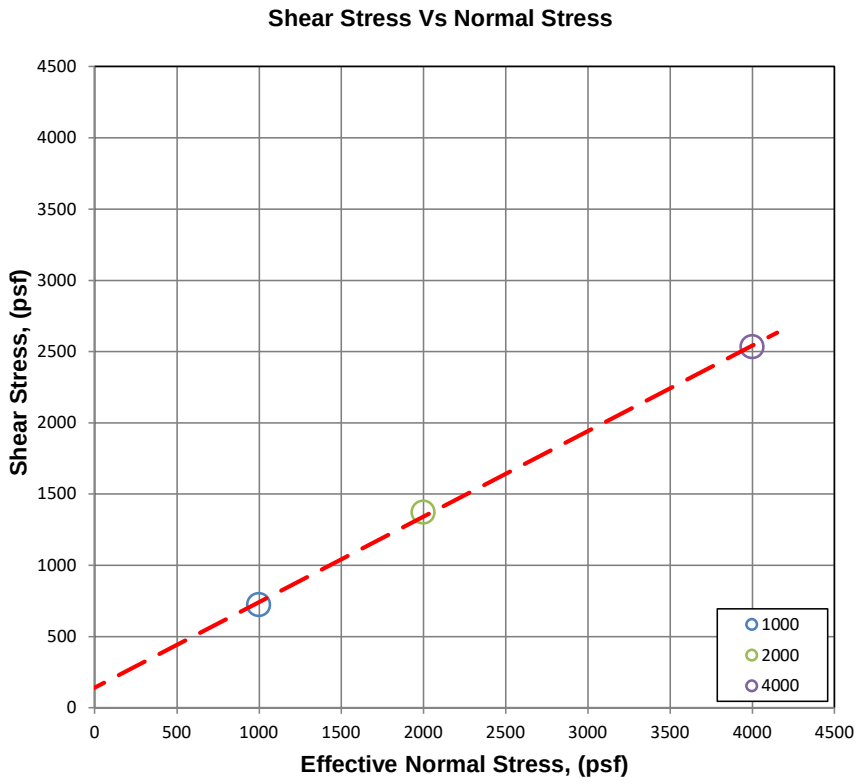
**Figure No.: C-4c**

# Wilding Engineering, Inc.

**ASTM D3080**

| | |
|---|---|
| 5/9/25 | Date |
| Shun Li PE | Checked By |
| 5/9/25 | Date |
| Jeremy Wright EIT | Computed By |
| 5/7/25 | Date |
| Jason Wright | Tested By |




| Mohr-Coulomb Stress Envelope | | | | Specimen | | | |
|---|---|---|---|---|---|---|---|
| | | | Parameter | A | B | C | D |
| Φ' and c' from Best-Fit Straight Line | Φ' (deg) | 31 | Initial Water Content (%) | 17.2 | 17.2 | 17.2 | N/A |
| | c' (psf) | 140 | Final Water Content (%) | 21.7 | 21.1 | 21.8 | N/A |
| | $R^2$ | 0.9992 | Dry Density (psf) | 102.4 | 102.4 | 102.4 | N/A |
| | SSE | N/A | Diameter (in) | 2.42 | | | |
| Peak Φ' for c' = 0 | Normal Stress | Ø' (deg) | Height (in) | 1.00 | | | |
| | 1000 | 36 | Strain Rate (in/min) | 0.0010 | | | |
| | 2000 | 34 | LL/PL/PI | 31/16/15 | | | |
| | 4000 | 32 | Average $T_{50}$ (min) | 0.033 | | | |

| | | Data Points | | |
|---|---|---|---|---|
| Project: | HWY-40 JSSD Shop | Normal Stress | Corrected Shear Stress | |
| Project Number: | 25186 | | | |
| Boring Number: | NA | | | |
| Sample Number: | TP-4 | 1000 | 721 | |
| Depth: | 6 feet | 2000 | 1370 | |
| Sample Type: | Remolded | 4000 | 2531 | |
| Rel. Compaction: | 100% | | | |
| Description: | Sandy Lean CLAY (CL) | | | |
| Remarks: | Sample remolded to estimated in situ moisture and density & split on the No. 10 sieve | | | |

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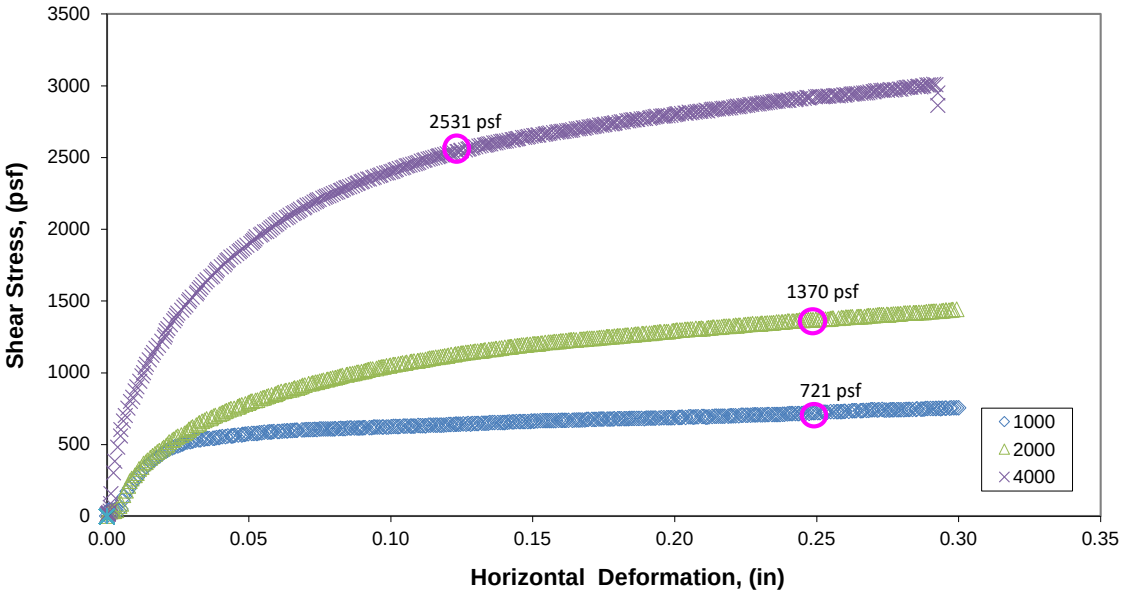
**Figure No.: C-5a**

# Wilding Engineering, Inc.

**ASTM D3080**

| | |
|---|---|
| Tested By | Jason Wright |
| Date | 5/7/25 |
| Computed By | Jeremy Wright EIT |
| Date | 5/9/25 |
| Checked By | Shun Li PE |
| Date | 5/9/25 |

**Corrected Shear Stress Vs. Horizontal Deformation**




**Shear Stress Vs Normal Stress, assuming c'=0**

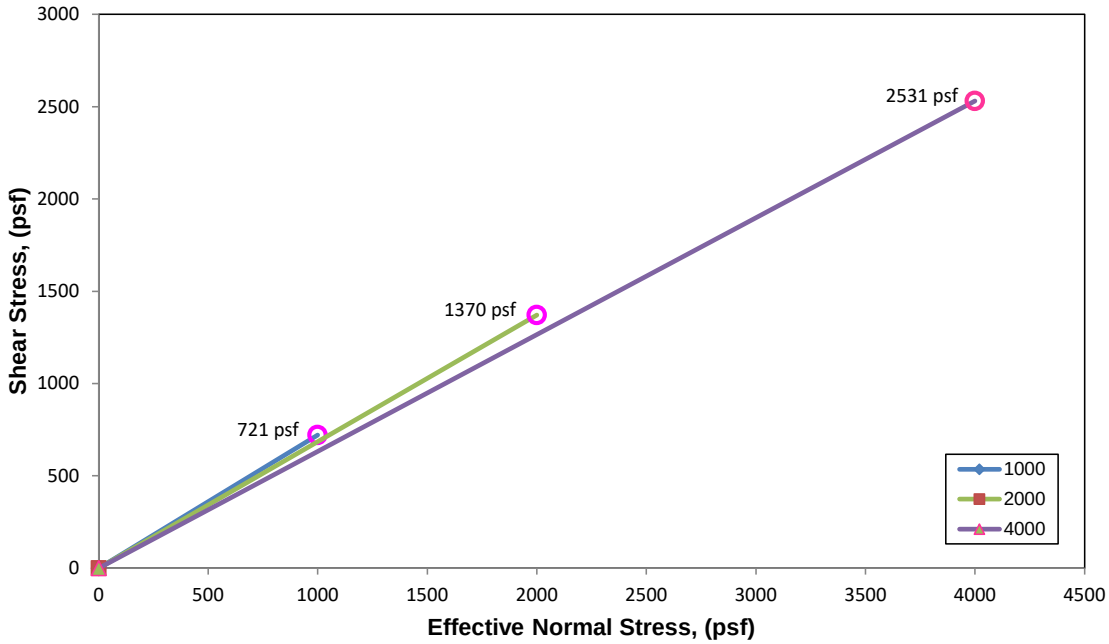



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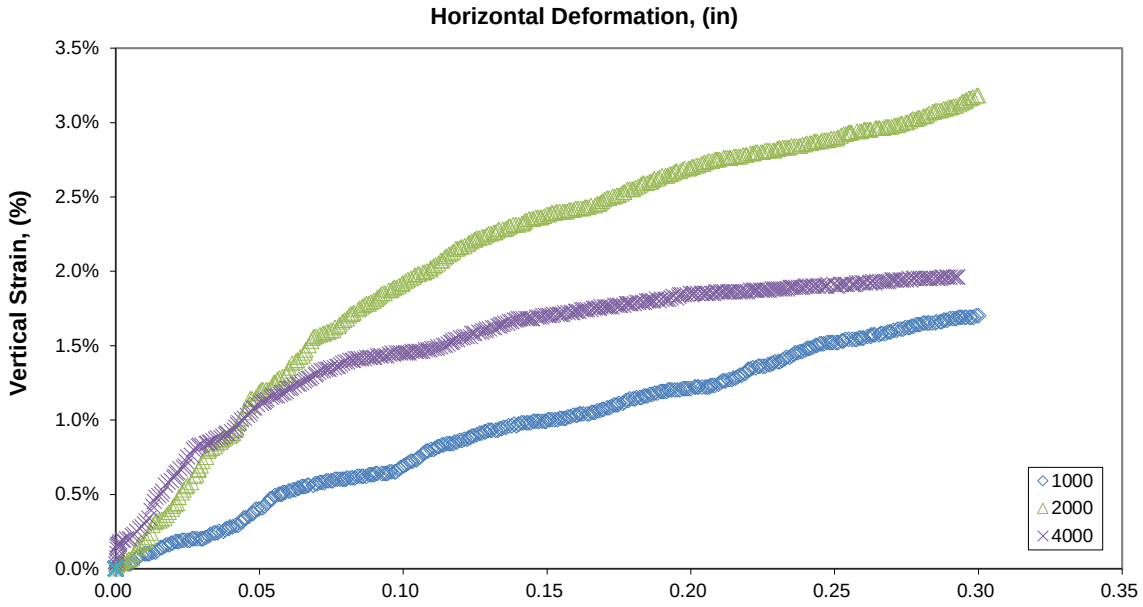
**Figure No.: C-5b**

# Wilding Engineering, Inc.

**ASTM D3080**

| Tested By | Jason Wright | Date | 5/7/25 | Computed By | Jeremy Wright EIT | Date | 5/9/25 | Checked By | Shun Li PE | Date | 5/9/25 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Vertical Strain Vs. Horizontal Deformation**




**Consolidation Curves**

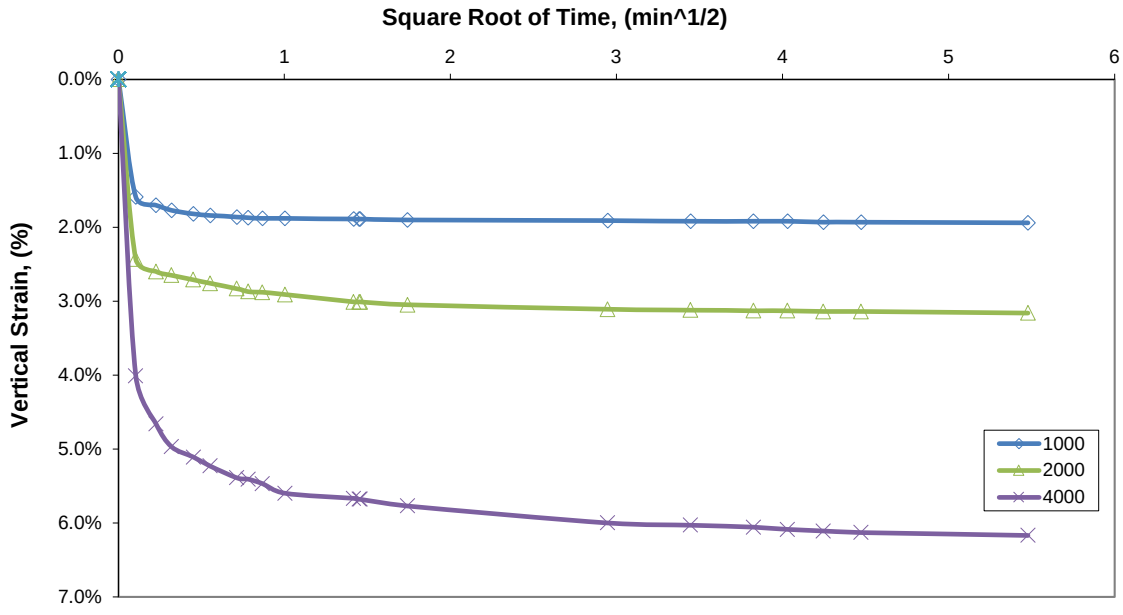



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**Figure No.: C-5c**

# APPENDIX D

# ASCE Hazards Report

**Address:**
No Address at This Location

| | | | |
|---|---|---|---|
| **Standard:** | ASCE/SEI 7-16 | **Latitude:** | 40.574903 |
| **Risk Category:** | III | **Longitude:** | -111.425395 |
| **Soil Class:** | D - Default (see Section 11.4.3) | **Elevation:** | 5804.987815326533 m (NAVD 88) |


# Seismic

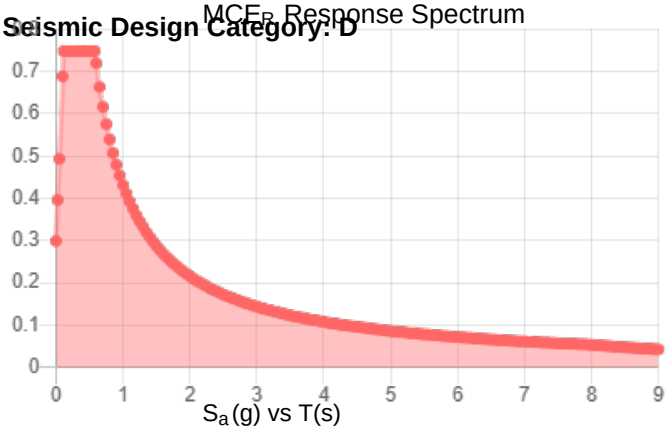
**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

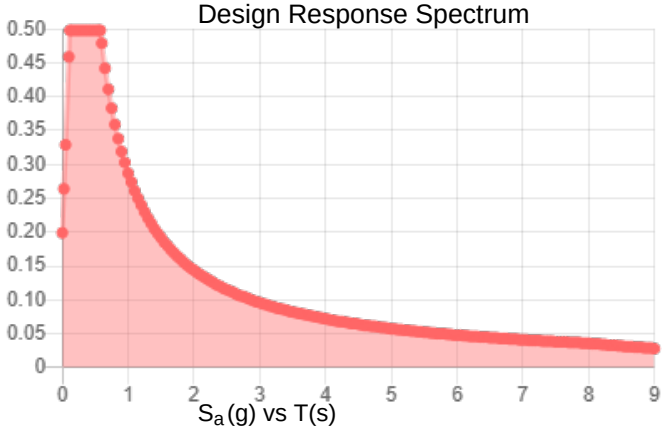
| | | | |
|---|---|---|---|
| $S_S$ : | 0.55 | $S_{D1}$ : | 0.287 |
| $S_1$ : | 0.195 | $T_L$ : | 8 |
| $F_a$ : | 1.36 | PGA : | 0.242 |
| $F_v$ : | 2.21 | $PGA_M$ : | 0.329 |
| $S_{MS}$ : | 0.748 | $F_{PGA}$ : | 1.358 |
| $S_{M1}$ : | 0.431 | $I_e$ : | 1.25 |
| $S_{DS}$ : | 0.498 | $C_v$ : | 1.066 |

**Seismic Design Category: D**

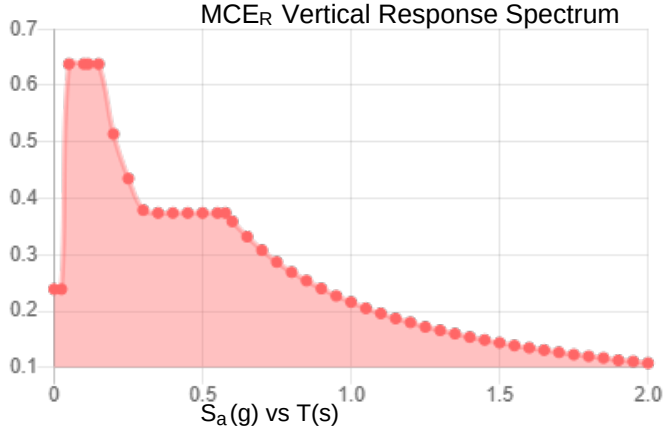
$MCE_R$ Response Spectrum



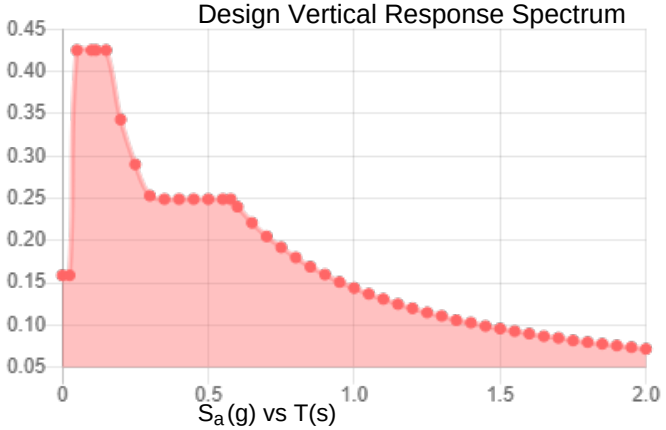

Design Response Spectrum




$MCE_R$ Vertical Response Spectrum




Design Vertical Response Spectrum




**Data Accessed:** **Mon Mar 24 2025**

**Date Source:**

**USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.**

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