City of North Salt Lake

Contract Documents and Specifications for:

Eagle Pointe Landslide Remediation Project, Located South of Parkway Drive at Approx. 740 East

Project No. NSL.037
(NSL Project #14-041)

FEBRUARY, 2015

Mayor:	Len Arave
City Council:	Stewart Harmon Brian Horrocks Conrad Jacobson Matt Jensen Stan Porter

City of North Salt Lake Engineering Department
Paul Ottoson, City Engineer

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SECTION 00100
INVITATION TO BID

North Salt Lake City
10 E Center St.
North Salt Lake City, Utah 84054

Sealed bids for construction of the "Eagle Pointe Landslide Remediation Project - Project No. NSL.037 (NSL Project # 14-041" will be received by North Salt Lake City at the North Salt Lake City Hall Building, 10 East Center Street, North Salt Lake City, Utah until 2:00 PM on MARCH 17, 2015, and then at said office publicly opened and read aloud. The Bidder shall indicate the Construction Contract title, the name and address of the Bidder, and the date and time of the Bid opening.

The work to be performed consists of furnishing all labor, tools, materials, equipment, transportation, and services required for construction of the above described project as included in the Contract Documents; consisting of the following items of work: excavating and hauling away soil material from the upper scarp area of the landslide, re-grading of remaining landmass area, constructing a reinforced earthen buttress at the lower area of landslide, constructing drainage facilities, abandoning roadway at top of slope and relocating utilities, and other miscellaneous work to complete project; all in accordance with the Drawings and Specifications prepared by Gilson Engineering.

Contract Documents may be examined at the offices of the City Engineer, located at the City Hall Building at 10 East Center Street, North Salt Lake City, Utah, 84054; and at the office of Gilson Engineering, 12401 South 450 East, Building C-2, Draper, Utah, 84020.

Copies of the Contract Documents may be obtained from the City's website at www.nslcity.org, beginning DATE. Hard copies may be picked up at Gilson Engineering at 12401 South 450 East, Building C-2, Draper, Utah, for a non-refundable fee of $50.00

A PRE-BID meeting will be held for all interested Bidders at the project site, at 740 East on Parkway Drive, at 10:00 AM on MARCH 12, 2015.

Bids must be accompanied by a Bid Bond, Certified Check or Cashier's Check in the amount of 5% of the maximum bid price, drawn payable to the order of North Salt Lake City. Bid Security will be returned to each unsuccessful Bidder.

All Bids submitted shall be in conformance with the Instructions to Bidders, which are included in the Contract Documents; and shall be guaranteed by the Bidder for a period of sixty (60) days from the date of the Bid opening.

The OWNER reserves the right to reject any or all bids presented or to waive any informality in a bid and to make award in the best interest of the City.

Paul Ottoson, City Engineer
North Salt Lake City

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SECTION 00200
INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 **Defined Terms.**

A. Bidder – One who submits a Bid for Work directly to the OWNER; distinct from a SUB-BIDDER who submits a bid to a BIDDER.

B. Successful Bidder – The lowest, qualified, responsible and responsive bidder to whom the OWNER, on the basis of the OWNER'S evaluation as hereinafter provided, makes an award.

C. Bidding Documents – Documents include the Invitation to Bid, Instructions to Bidders, Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

D. OWNER – The OWNER is North Salt Lake City, 10 East Center Street, Utah 84054.

E. ENGINEERS – The CITY ENGINEER is the North Salt Lake City engineer or his agent. The DESIGN ENGINEERS are GeoStrata, 14425 South Center Point Way, Bluffdale, Utah, 85065; and Gilson Engineering, 12401 South 450 East, Building C-2, Draper, Utah, 84020.

(1) GSH and Bingham Engineering provided all design and drawings for the upper slope alternatives.

F. All other terms used in these Instructions to Bidders are defined in the Standard General Conditions of the Construction Contract, NSPE-ACEC Document 1910-8, CSI 56465 (1996 Edition) - Section 00700.

1.2 **Copies of Bidding Documents.**

A. Complete sets of the Bidding Documents in the number and for the deposit sum stated in the Invitation to Bid may be obtained from the CITY ENGINEER or Gilson Engineering.

B. Complete sets of Bidding Documents shall be used in preparing bids; neither OWNER nor ENGINEERS assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

C. OWNER and ENGINEERS in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

1.3 Physicals Conditions

A. **In General**: Prior to submitting a Bid, each Bidder shall review all available explorations, tests and data concerning surface conditions, subsurface conditions and Underground Facilities at or contiguous to the site, or otherwise, which may affect cost, progress, performance or furnishing of the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

B. **Surface and Subsurface Conditions**: Provisions concerning surface and subsurface conditions, if any, are set forth in a document titled Geotechnical Data (Section 00320). The document provides the identification of:

1. any reports of explorations and tests of subsurface conditions at the site which have been utilized in preparing the Contract Documents; and

2. any drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the site which have been utilized in preparing the Contract Documents.

C. **Underground Facilities**: Information and data indicated in the Contract Documents regarding Underground Facilities at or contiguous to the site is based upon information and data furnished to OWNER and ENGINEER by owners of such Underground Facilities. The OWNER does not assume responsibility for the accuracy or completeness thereof other than as provided in paragraph 4.04 of the General Conditions or unless expressly provided in the Supplementary Conditions (Section 00710).

D. **Additional Explorations and Tests**: If feasible as determined by OWNER, the OWNER will provide each Bidder access to the site to conduct any explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall obtain permits, fill all holes, clean up and restore the site to its former condition upon completion of such explorations. Bidder agrees to release, indemnify, defend, and save the OWNER harmless from all costs damages and liabilities of any kind whatsoever, including reasonable attorneys' fees, that may arise in connection with or as a result of the performance of such explorations or tests.

1.4 Examination of Site and Contract Documents.

A. **In General**: The OWNER shall not be bound by any statements, representations, conclusions, or assumptions made by any party, whether oral or written, except for written statements that are issued in the Bidding Documents and any Addendums.

B. **Access**: The Contract Documents designate the site for performance of the Work. Bidder is responsible to investigate the site and understand all access

requirements. All additional off site lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Bidder.

C. **Bidder's Obligations**: In addition to Bidder's other responsibilities and obligations in connection with submitting a Bid, it is the responsibility of the Bidder before submitting a Bid, to:

1. Examine the Contract Documents thoroughly;

2. Visit the site of the work to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work;

3. Investigate all applicable construction and labor conditions, quantities, and the character of the Work as they affect cost, progress, performance, or furnishing of the Work;

4. Consider federal, state and local laws and regulations that may affect cost, progress, performance or furnishing of the Work;

5. Study and carefully correlate Bidder's observations with the Contract Documents;

6. Attend any pre-bid conference, which shall be mandatory if so designated in the Notice to Bidders;

7. Review all available explorations and data concerning surface and subsurface conditions as set forth in Section 1.4 above; and

8. Identify and notify ENGINEER in writing in the manner set forth in Section 2.1 herein of all specific conflicts, omissions, errors, or discrepancies in the Contract Documents, or if Bidder is in doubt as to their meanings.

The failure or omission of any Bidder to take any of the foregoing actions shall not in any way relieve Bidder of its Bid, or from any obligation to furnish all material, equipment, labor and services necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in Bidder's Bid. Submission of a Bid shall constitute prima facie evidence of compliance by Bidder with these requirements and obligations.

D. **Deviations from the Terms of the Contract Documents**: OWNER will not accept any deviations whatsoever from the printed terms of the Agreement and the Contract Documents, except by Addendum or Change Order.

1.4 **Compensation and Quantities**.

A. **In General**: The bid price for any lump sum or unit price contract includes all labor, materials, and incidental work to fully complete the Work in a satisfactory manner under the terms of the Contract Documents. Exceptions shall be clearly noted on the Bid Schedule. Bidders are responsible to inform themselves of the character of the Work to be performed.

B **Lump Sum Work**: If the Work is to be paid for on a lump sum basis, the lump sum will be the only sum paid.

C. **Unit Price Work**: If any portion of the Work is to be paid for on a unit price basis, payment will cover only work actually performed and materials actually supplied at the unit prices bid and on the terms set forth in the Contract Documents, irrespective of any quantity approximations in the Bid Documents. Any quantity approximations in the Bid Documents are stated as a basis for determining bids, and they do not fix the amount of Work to be done or materials to be furnished. Stated quantities are estimates for the purpose of doing the class of work required. Actual quantities will vary. The OWNER may deviate in either direction from any indicated quantities. The Bidder shall have no claim for any variation in quantity, except to the extent permitted in the General Conditions.

1.5 **Effect of Submitting a Bid**

A. Bidders are responsible to carefully examine the Contract Documents, visit the site, and fully inform themselves so as to include in the Bid a sum to cover the cost of all items. Bidder's failure or omission to receive or examine any form, instrument, addendum or other document, visit the site and become acquainted with existing conditions, or attend any pre-Bid Conference, shall in no way relieve Bidder from any obligations with respect to Bidder's Bid or the Contract Documents.

B. The submission of a Bid constitutes a representation that Bidder has complied with all requirements of the Bidding Documents, that the Bid is premised on properly performing and furnishing the Work required by the Contract Documents within the times specified therein, that Bidder is informed of the conditions to be encountered and the character, quality and quantities of the Work, that Bidder believes the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work. Submission of a Bid constitutes Bidder's agreement to all of the terms, conditions and provisions of the Bidding Documents.

C. Submission of a Bid constitutes a promise that the Bidder will enter the Contract Documents in the form presented in connection with the Bid. Bidders should carefully examine all Contract Documents, including the required Agreement Bonds and insurance to be provided by the Bidder.

1. Bidder's agrees to provide the Performance Bond and Payment Bond in the forms provided in accordance with the requirements set forth in the General Conditions.
2. The Performance Bond is a guarantee of faithful performance of the requirements of the Contract Documents, including all applicable warranties. The Payment Bond is a guarantee of payment of all labor, materials, or supplies used directly or indirectly in the prosecution of the Work provided in the Construction Documents.

3. The sum of the Performance Bond and the Payment Bond may be required to be increased or decreased during the course of the Work in the event that Contract Modifications, Change Orders or Addenda increase or decrease the total contract price, at the discretion of the OWNER.

4. OWNER does not provide any release of Performance Bonds or Payment Bonds. The bonds are in effect throughout all periods during which a suit may be brought under the provisions of applicable law.

D. By submitting a bid, each Bidder agrees to waive any claim it has or may have against the Owner, the Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

E. By the submission of any Bid, Bidder represents that the matters stated therein are true and correct.

PART 2 BIDDING PROCEDURES

2.1 <u>Interpretations and Addenda</u>

A. All requests for interpretation of the Contract Documents shall be made in writing and delivered to the ENGINEER no later than seven (7) calendar days prior to opening of Bids. In the ENGINEER's discretion, ENGINEER will send the written interpretation to all persons receiving a set of Bid Documents in the form of an Addendum. If the ENGINEER does not respond to a Bidder's request for interpretation, the Bidder shall comply with the intent and terms of the Contract Documents.

B. No oral interpretations shall be made to any Bidder. The OWNER shall not be responsible for or bound by any statements, interpretations, explanations, representations, conclusions or assumptions made by any party, whether oral or written, except for written statements that are issued to all prospective bidders in an Addendum by the ENGINEER.

C. Each statement made in an Addendum is part of the Contract Documents at the location designated in the Addendum. A statement issued in an Addendum shall have the effect of modifying a portion of the Bidding Documents when the statement in the Addendum specifies a particular section, paragraph or text and states that it is to be so modified. Only the specified section, paragraph or text shall be so modified, and all other portions of the Bidding Documents shall remain if effect.

D. Bidders shall sign to acknowledge their receipt of all Addenda issued. Bidders shall also acknowledge receipt of all Addenda in the space provided in the Bid.

E. Except to postpone the Bid opening, no Addenda shall be issued within 48 hours of the Bid opening.

2.2 Equipment and Material Options Prior to Bid Opening

A. If a Bidder or Supplier wishes to supply a product other than that identified in the Contract Documents, said Bidder or Supplier shall submit a written request for approval to the ENGINEER at least three (3) business days prior to the date set for opening of bids.

B. The procedure for submission of any such product option shall be as set forth in Article 6.05 of the General Conditions. It is the sole responsibility of the Bidder or Supplier to submit complete descriptive and technical information so that ENGINEER can make a proper appraisal.

C. ENGINEER's failure to act upon such a request within two (2) days after receipt shall be deemed a denial thereof.

D. Any such approval is at the sole discretion of the ENGINEER and will be in the form of an Addendum issued to all Bidder's holding Bidding Documents indicating that the additional equipment or materials are approved as equal to those specified for the Project.

E. The Construction Contract, if awarded, will be on the basis of materials and equipment specified in the Drawings and Specifications and any changes permitted in any Addenda.

2.3 Completing Bid Documents

A. The Contract Documents identify all forms comprising the Bid Documents. Additional copies may be obtained from the ENGINEER. The Bidder shall make no stipulations or alterations on the Bid forms. The Bidder must use and execute only the Bid form and Bid Schedules bound in the Contract Documents. The complete Contract Documents (excluding the Drawings) should be submitted as the Bidder's Bid, and Bidder shall complete and submit all forms included in the Bid Form, Section 00400.

B. The Bidder shall fill in all items in the Bid form in ink or by typewriter. If applicable, furnish both the unit and total costs for each item. The total Bid price is the full price for the performance of all Work under the Contract Documents. Bidder shall initial in ink any corrections, interlineations, alterations, or erasures made by the Bidder on Bidder's entries in the Bid Documents.

C. Any work or material which is specified in the Contract Documents or which is necessary because of the nature of the Work, but which is not listed separately in the Bid Schedule shall not be measured or paid for separately. The cost of such work or material shall be considered as included in the Contract Price.

D. Bids by corporations must be executed in the corporate name by a corporate officer authorized to sign, and be properly attested to as an official act of the corporation. At the OWNER's request, authority to sign shall be submitted.

E. Bids by partnerships, joint ventures, or limited liability companies must be executed in the partnership, joint venture, or limited liability company name and signed by a partner or joint venture or member whose title and official address must be shown. If a partnership, joint venture, or limited liability company is the low bidder, the partnership, joint venture, or limited liability company must also submit evidence to the OWNER of the responsibility of the partnership, joint venture, or limited liability company as a bidder in the manner directed by the ENGINEER.

F. Where the Bidder is wholly owned subsidiary of another company, the Bid must so state, and the owner or parent corporation also must agree to sign and be bound with the Bidder.

G. All names must be typed or printed under or near the signature. Signatures shall be in longhand.

H. The Bid shall contain an acknowledgment of receipt of all Addenda. The Addenda numbers must be filled in on the Bid form.

I. The Bidder's address, telephone number, and facsimile number for communications regarding the Bid must be shown on the first page of the Bid form.

J. The divisions and sections of the specifications, and the identifications of any Drawings, shall not control Bidder in dividing the Work among subcontractors or suppliers, or delineating the Work to be performed by any specific trade.

2.4 **Submission of Bids**

A. Bids shall be submitted at the time and place indicated in the Invitation to Bid and should be enclosed in an opaque sealed envelope, marked with the Construction Project name and Contract number, the name and address of the Bidder, and the date and the opening time for Bids. If the Bid is sent through the mail or other

delivery system the sealed envelope should be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. It is the sole responsibility of the Bidder to deliver the Bid before the scheduled closing time for receipt of Bids.

B. The complete Contract Documents must be submitted with the Bid. Bidder will make no recapitulations, stipulations, alterations, alternate submissions, or modifications in any manner to any of the Contract Documents.

C. Bidder must submit a Bid by completing all of the Bid Form documents, which are:

1. The Bid portion of the Bid Form which is included in these Contract Documents, which shall be in the form of a lump sum, or in the form of unit pricing pursuant to the Bid Schedule, as called for in the Bid Form.

2. The Bid Security.

D. Alternate bids, other than those called for in the Bid form, will not be considered.

E. No oral, telegraphic, telephonic, facsimile or modified bids will be considered.

2.5 Modification and Withdrawal of Bids

A. At any time prior to the opening of Bids, Bids may be modified or withdrawn if a written notice of modification or withdrawal is signed by Bidder and delivered to the place where Bids are to be submitted. Bid Security will be returned upon proper withdrawal of a Bid prior to the time for Bid opening.

B. Within 24 hours after Bids are opened, any Bidder may file written notice with OWNER that there was material and a substantial mistake made in the preparation of its Bid. Bidder must thereafter promptly demonstrate Bidder's mistake. The OWNER has sole discretion to determine whether to permit any modification or withdrawal or the return of any Bid Security.

C. When it appears a mistake has been made, or when the OWNER desires an assurance of any matter, the OWNER may request a Bidder to confirm the Bid in writing.

2.6 Opening of Bids

A. Bids will be opened and read aloud publicly at the time and place designated in the Invitation to Bid unless obviously non-responsive. An abstract of the amounts of the base schedule of prices and any alternate schedules will be made available for review after the opening of Bids.

B. Any Bids received after the time specified in the Invitation to Bid will not be accepted and will be returned unopened.

2.7 Bids Subject To Acceptance For 60 Days

A. All bids remain subject to acceptance for 60 days after the date of the Bid opening. OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

PART 3 EVALUATION AND AWARD

3.1 Evaluation of Bidder's Qualifications

A. Within seven (7) calendar days of ENGINEER's request, a Bidder, whose Bid is under consideration for award shall submit to the ENGINEER the following information. ENGINEER may request like information on Bidder's Subcontractors and Suppliers. Bidder shall also supply any other information the ENGINEER may require.

1. A current financial statement for the Work (as provided to bonding company);

2. A chronological list of "in progress" and "completed" construction work done by Bidder during the last two (2) years; including project name, address, owner, contract name, and current telephone number;

3. Present construction commitments other than items listed in paragraph 2 above;

4. Proposed organizational structure such as firm ownership, project manager, progress scheduler, and superintendent for the Work for this Project;

5. Owned and rented equipment which is to be used to do the Work;

6. Investigations, arbitration, litigation or claims which are pending, threatened, settled or otherwise disposed of within the last three (3) years;

7. Evidence of ability to perform and complete the Work in a manner and within the time limit specified. As a minimum, identify specific experience on projects similar to the Work in physical size, cost, and nature. If the work experiences of the project manager and superintendent designated to construct this project are different than that of the Bidder, provide resumes of their work history. Include their actual project titles and indicate their actual responsibilities on each given project;

8. All matters consistent with federal, state and local laws and regulations; and

B. If Bidder believes any information should be held confidential for business reasons, Bidder must submit a written claim of business confidentiality for that particular information and include a specific statement of the reasons supporting the claim pursuant to Utah Code Ann. 63-2-308.

C. Untimely response or failure to provide the requested information by Bidder will release OWNER of any obligation to further consider the Bidder's Bid.

3.3 **Evaluation of Bids**

A. OWNER reserves the right: to reject any and all Bids or any part thereof; to waive any informalities in the Bidding Documents and elsewhere; to negotiate and agree to contract terms with the successful Bidder; to disregard non-conforming, non-responsive, unbalanced or conditional Bids; and to withhold the award for any reason deemed in the best interests of the OWNER.

B. Bids and all parties associated with the Bid must comply with all Laws and Regulations. Without limitation, the Bidder is advised and agrees that the OWNER's ordinances apply to all aspects of this procurement and any subsequent contract. Bidders will be bound to the official Contract Documents, codes, rules and policies on file.

C. OWNER reserves the right to reject any Bid if OWNER believes that it would not be in the best interest of the Project or the OWNER. Without limitation, such rejection may be because the Bid is not responsive, or the Bidder is unqualified or of doubtful ability or the Bid or Bidder fails to meet any other pertinent standard or criteria established by OWNER.

D. If the OWNER intends to make an award to a Bidder, a Notice of Award will be issued.

E. OWNER may consider all information which OWNER believes is relevant when evaluating a Bid, including, without limitation:

1. The qualifications and experience of the Bidder and of the Subcontractors, Suppliers, and other persons and organizations proposed.

2. Such alternates, unit prices and other data, as may be requested in the Bid Form, Bid Schedule, or written requests issued prior to OWNER's Notice of Intent to Award the Construction Contract.

3. Operating costs, maintenance requirements, performance data, and guarantees of ability to provide the required materials and equipment.

4. Corporate organization and capacity for any party.

5. Ability to perform and complete the Work in the manner and within the time specified.

6. Pending litigation.

7. The amount of the Bid.

8. Proper licensing to do the Work in compliance with licensing laws of the State of Utah for contractors and subcontractors.

9. All other relevant matters, consistent with OWNER's procurement code and administrative rules, ordinances and regulations.

F. To establish qualifications of Bidder, OWNER may request such data indicated in the Bidding Documents, conduct such investigations as OWNER deems appropriate, and consider any other information (whether obtained from the Bid, the Bidder, or any other source).

G. If the Construction Contract is to be awarded, it will be awarded to the lowest, responsible Bidder whose evaluation by the Owner indicates to the Owner that the award will be in the best interest of the Owner. Alternates may be accepted depending upon availability of the Owner's funds and as determined by the OWNER. Accepted alternates will be considered in determining the lowest responsible Bidder.

H. Bid Schedules will be evaluated as follows:

1. Discrepancies in the multiplication of quantities of Work items and unit prices will be resolved in favor of the unit prices. OWNER may correct Bid Schedule calculation errors accordingly.

2. Prices written out in words shall govern over prices written out in numbers.

3. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

4. Bids shall not contain any recapitulations of or changes in the Work to be done.

I. The OWNER, in the OWNER's sole discretion, shall make determinations as to disqualification of bidders or rejection of Bids. Such matters may include, without limitation, submission of more than one Bid by the Bidder (whether under the same or different names); evidence of collusion among bidders; other commitments of Bidder which, in the OWNER's sole judgment, might hinder the Work; previous defaults, Bid irregularities when not waived in the best interests of the OWNER, delays or poor performance by Bidder on any project; official

action against Bidder; and any other cause which, in the OWNER's sole discretion and judgment, is sufficient to justify disqualification of a Bidder or rejection of a Bid.

3.4 **Adjustments to the Cost of the Work After Opening or Bids**

A. The Contract Price identified in the Construction Contract represents the cost of the work which is to be paid by the OWNER to the CONTRACTOR.

B. Adjustments to the Contract Price which are agreed to between the OWNER and the successful Bidder shall be effected by signing a Change Order.

3.5 **Substitutions**

A. The Construction Contract, if awarded, will be on the basis of materials and equipment described in the Drawings, Specifications and any Addenda.

B. After the Effective Date of the Construction Contract, the procedure for submitting an application for substitution is set forth in Article 6.05.A.2.d of the General Conditions.

3.6 **Submittals Prior to Award**

A. **Performance and Payment Bonds**: The OWNER's requirements are set forth in the Performance Bond (Section 00610) and the Payment Bond (Section 00620). Standard AIA Bonds (document A312) are acceptable.

1. The form of the Bonds should be carefully examined by the Bidder.

2. When the successful Bidder delivers the executed Construction Contract to OWNER, it must be accompanied by the required Performance and Payment Bonds.

B. **Other Information**: When a determination has been made to award the Construction Contract, Bidder is required, prior to the award or after the award, or both, to furnish such other information as the ENGINEER requests.

3.7 **Signing of Construction Contract**

A. Within ten (10) days after OWNER gives Notice of Award of the Construction Contract to the successful Bidder, the Bidder shall pick up, sign and return to OWNER, the required number of copies of the Construction Contract, required bonds and insurance. A minimum of two (2) originals will be signed. One executed original will be returned to the Bidder. Bidder shall comply with all execution requirements.

B. All of Bidder's executions and submittals must be delivered to the OWNER before OWNER will execute the Construction Contract. The Construction Contract will not be deemed awarded and shall not be binding on the OWNER until it has been approved and executed by the OWNER, and a fully executed copy is formally delivered to the CONTRACTOR. The OWNER reserves the right to rescind its Notice of Award without liability, except for the return of Bidder's Bid Security, at any time before the Construction Contract has been fully executed by all parties and delivered to the CONTRACTOR.

C. Transfers, delegations or assignments of interests in the Contract Documents are prohibited, unless prior written authorization is received from the OWNER.

D. At the time of Bidding, and the signing of the Construction Contract, and at all times during the Work, Bidder shall be properly licensed to do the Work and shall be in compliance with the license laws of the State of Utah, North Salt Lake City and Davis County. The Bidder shall also require all Subcontractors to do the same.

E. If a Bidder fails to fully and properly execute the Construction Contract and provide all submittals required therewith within ten (10) days after the date of the Notice of Award, the OWNER may elect to rescind the Notice of Award, and the OWNER shall be entitled to the full amount of Bidder's Bid Security, not as a penalty, but in liquidation of and compensation for damages sustained. In the OWNER's sole discretion, a Notice to Award may then be provided to another bidder whose Bid is determined by the Owner to be most advantageous to the OWNER, price and other factors considered.

END OF DOCUMENT

SECTION 00320
GEOTECHNICAL DATA

PART 1 GENERAL

1.1 Reports of Explorations and Tests

A. In the preparation of Drawings and Specifications, ENGINEERS have relied upon the following geotechnical reports of explorations and tests of subsurface conditions at or contiguous to the Work site.

B. Accuracy: For the purposes of bidding or construction, the Bidder may rely upon the accuracy of the geotechnical data at the locations where the data was obtained and to the depths indicated, but not upon any other information, interpretations, or opinions contained in the geotechnical data itemized above or for the completeness thereof expressed or implied.

C. Geotechnical Data Part of Contract Documents: Geotechnical data itemized above have been included as part of the Contract Documents in the Supplemental General Conditions. The technical data contained therein upon which the Bidder is entitled to rely is provided in Article 4.02 of the General Conditions (Section 00700) are incorporated by reference.

1.2 Examination of Data

A. The geotechnical data is a part of the Supplemental General Conditions.

B. Copies of the geotechnical data may also be examined during regular business hours at North Salt Lake Public Works, 10 East Center Street, North Salt Lake City, Utah.

END OF DOCUMENT

SECTION 00340

CONTRACTOR'S QUALIFICATION AND EXPERIENCE AFFIDAVIT

The BIDDER shall furnish all of the following information. Failure to comply with this requirement will render the BID non-responsive and will cause its rejection. Additional sheets shall be attached as required.

Award of Contract will be based upon review and evaluation of this Affidavit.

A. Contractor's name and address:

_____

_____

_____

B. Contractor's Telephone Number: _____ Fax #_____

e-mail address_____

C. Contractor's License: Primary Classification _____

State License No. _____

Supplemental Classification held, if any: _____

D. Number of years as a contractor in Construction Work of this type: _____

E. Names and titles of Principal Officers of Contractor's Firm:

_____ Name	_____ Title
_____ Name	_____ Title
_____ Name	_____ Title
_____ Name	_____ Title

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

Name:_____ Date of Inspection:_____

G. Name, address, and telephone number of surety company and agent who will provide the required bonds on this Contract:

_____

H. List of current jobs now under construction:

Client	Telephone No.	Dollar Amount.	Type of Job

I. List two projects of this size and complexity completed within the last five years:

Client	Telephone No.	Dollar Amount.	Type of Job

J. Have you ever failed to complete any work awarded to your? If so, when, where and why?

_____

_____

K. List your major equipment available for this Contract:

L. List projects that you have failed to complete on the original schedule over the past two years:

Client	Telephone No.	Dollar Amount.	Type of Job

M. List projects that you have failed to complete on the adjusted schedule over the past two years:

Client	Telephone No.	Dollar Amount.	Type of Job

N. Submit a copy of OSHA 300 for the past two years.

O. Submit a copy of citation history from OSHA for past two years.

P. Have you had any problems with OSHA in the last two years? If so, identify the problems and specify how the problems were resolved.

Q. Are you in compliance with all applicable laws and governmental regulations? _____

R. Will you complete the project on time, as specified? _____

LIST OF SUBCONTRACTORS

The BIDDER shall list below the names and business address of each subcontractor who will perform Work under this Contract in excess of five percent (0.05) of the total bid price; and shall also list the portion of the Work which will be done by such subcontractor. After the opening of proposals, no changes or substitutions will be allowed without the written approval of the Engineer. Note: Attach additional sheets if required.

WORK TO BE PERFORMED	SUBCONTRACTOR'S NAME AND ADDRESS
1.	
2.	
3.	
4.	
5.	
6.	

Respectively Submitted:

Signature	Address
Title	Date
Contractor License No.	Taxpayer Identification No.

SECTION 00400
BID

PART 1 GENERAL

1.1 **Bid Proposal**

A. The undersigned Bidder after having personally and carefully examined all conditions surrounding the Work and the Contract Documents, proposes to furnish all labor, equipment, tools and machinery and to furnish and deliver all materials not specifically mentioned as being furnished by the OWNER, which is required in and about the construction of the Construction Contract known as: "Eagle Pointe Landslide Remediation Project, Located South of Parkway Drive at Approx. 740 East -- Project No. NSL.037 (NSL Project #14-041)".

B. The undersigned Bidder proposes to complete the Work for the price or prices listed in the Bid Schedule (Section 00410) and understands that quantities for Unit Price Work are not guaranteed.

C. The undersigned Bidder proposes to furnish bonds with the Construction Contract, signed by a surety company satisfactory to the OWNER, in an amount equal to the Construction Contract amount conditioned to insure compliance with all requirements of the Contract Documents.

D. The undersigned Bidder encloses a certified check, cashier's check or a Bid Bond for _____ Dollars ($ _____) which is five (5) percent of the total Bid amount payable to the OWNER, as a guarantee of good faith, and which it is agreed will be forfeited to the OWNER as liquidated damages in the event of the failure of the undersigned to enter into a contract and furnish satisfactory bonds and insurance to the OWNER.

E. The undersigned Bidder proposes to execute the attached Construction Contract and insurance within ten (10) days after the Notice of Award, and to begin work within five (5) days after the Notice to Proceed has been issued.

F. If OWNER finds it necessary to further define the Work, Contract Price, Contract Time or some other portion of the Construction Contract, after receiving this Bid, the Bidder promises to execute a Construction Contract Supplement prior to or concurrent with the execution of the Construction Contract, if the Construction Contract Supplement is acceptable to the Bidder.

G. It is understood that the OWNER has the right to reject this proposal or to accept it at the prices listed in the Bid Schedule.

PART 2 EXECUTION

2.1 **Bidder**

A. The Bidder is as follows:

Name: _____

Address: _____

Telephone number: _____

Facsimile number: _____

Tax identification number: _____

Website / email: _____

B. Bidder holds license number _____ issued on the _____ day of _____, by the Utah State Department of Commerce, Division of Occupational and Professional Licensing. Bidder is licensed to practice as a _____ Contractor. License renewal date is the _____ day of _____, 2015.

C. The undersigned hereby acknowledges receipt of the following Addenda:
Addendum No. 1 _____ (initial)
Addendum No. 2 _____
Addendum No. 3 _____

2.2 **Bidder's Signature**

A. Date: _____

B. Bidder's Signature: _____

C. Please print Bidder's name here: _____

D. Title: _____

END OF DOCUMENT

SECTION 00405
BID SECURITY

PART 1 GENERAL

1.1 **Bid Security Required:**

Bid Security must accompany each Bid. The total amount of the Bid on which Bid Security is to be based shall be the sum of all items of the Bid constituting the maximum amount of the possible award to the Bidder. The Bid Security amount must equal at least five (5) percent of the total amount of the Bid.

1.2 **Form of Bid Security:**

The Bid Security may be in the form of a certified check, cashier's check or Bid Bond (on form attached, if a form is prescribed). A Bid Bond must be issued by a licensed Utah agency on behalf of a surety company licensed to do business in the State of Utah. A cashier's check must be drawn on a bank doing business in the State of Utah and made payable to North Salt Lake City. No other form of Bid Security will be accepted.

1.3 **Purpose of Submission:**

The Bidder understands and by the submission of the Bid Security agrees that the Bid Security guarantees the following: that the Bidder will submit a responsive Bid, that the Bidder will not withdraw the Bid for a period of sixty days (60) after the time and date fixed for Bid opening, that the Bidder will promptly enter the Contract Documents in their present form with the OWNER if an award is made to the Bidder, that Bidder will provide the bonds and insurance required by the Contract Documents, and that Bidder will take all steps necessary to properly execute the Contract Documents. By submission of the Bid Security, the Bidder also agrees that if any of the foregoing requirements are not met, the OWNER is entitled to the full amount of the Bid Security as compensatory damages to the OWNER resulting from the failure to meet those requirements. The Bidder agrees that the OWNER may immediately execute on such security upon Bidder's failure to perform as required.

1.4 **Return of Bid Security:**

The OWNER will return Bid Securities to all except the three (3) apparent low, qualified responsive and responsible bidders within ten (10) business days after Bid opening. The remaining Bid Securities will be returned within three (3) business days after OWNER and the successful Bidder have executed the Contract Documents, or after all Bids have been rejected. OWNER shall have no obligation with respect to Bid Securities other than to return them in the manner set forth in this paragraph.

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SECTION 00410
BID SCHEDULE

Bidder agrees to perform all the work described in the Contract Documents for the following unit prices or lump sum prices.

Eagle Pointe Landslide Remediation Project --- Project No. NSL.037 (NSL Project # 14-041); for the City of North Salt Lake, Utah

SCHEDULE "A" --- UPPER SITE GRADING (APPROX. 1.8 ACS.)

Item No.	Description	Amounts & Units	Unit Price	Bid Total
1	Mobilization	Lump Sum		
2	Traffic Control	Lump Sum		
3	Erosion Control	Lump Sum		
4	General earthwork for site work from toe of scarp (approx. 50,200 c.y.); excavated material to be stockpiled at Tunnel Springs Park (short haul)	Lump Sum		
5	Construct 3-ft wide x 4-ft deep Toe Drain Catchment Trench, complete; including all required earthwork, 6" slotted pipe with fabric sleeve, fabric wrap, rock fill, and all appurtenant work	420 l.f.		
6	Restore native vegetation in disturbed work areas	71,000 s.f.		
	TOTAL -- SCHEDULE "A"			

SCHEDULE "B" --- MIDDLE SITE GRADING (APPROX. 3.4 ACS.), DRAINAGE SYSTEMS, & CONSTRUCTING BUTTRESSES

Item No.	Description	Amounts & Units	Unit Price	Bid Total
1	Mobilization	Lump Sum		
2	Traffic Control	Lump Sum		
3	Erosion Control	Lump Sum		
4	General earthwork for site work to re-grade site (approx. 15,800 c.y.); excavated material (free haul) to be used for fill on-site	Lump Sum		
5	Haul and place select excavated material from stockpile (short haul) for re-grading site (approx. 7,700 c.y. of fill)	Lump Sum		
6	Construct Upper Surface Drainage Ditch; including geomembrane liner and rock fill	340 l.f.		
7	Construct Lower Surface Drainage Ditch; including geomembrane liner and rock fill	400 l.f.		
8	Construct 6" HDPE slotted pipe lines with sleeves for Lower Drainage Ditch	220 l.f.		
9	Construct Connecting Surface Drainage Ditches; including geommembrane liners and rock fill	170 l.f.		
10	Construct 6" HDPE slotted pipe lines with sleeves for Connecting Ditches	40 l.f.		
11	Construct 8" HDPE drainage pipe lines with butt-welded joints	230 l.f.		
12	Construct 10" HDPE drainage pipe lines with butt-welded joints	320 l.f.		
13	Construct 15" Class III reinforced concrete storm drain line	80 l.f.		
14	Connect 6" slotted HDPE pipes to 8" HDPE drainage pipes; including all pipe and fittings	3 ea.		
15	Construct 6" drainage cleanouts; including all pipe and fittings, and covers	3 ea.		
16	Construct 5-ft storm drain manhole, complete	1 ea.		
17	Construct 5-ft storm drain manhole, complete, over existing 21" storm drain on Parkway Drive; including connecting to existing pipe line	1 ea.		

Item No.	Description	Amounts & Units	Unit Price	Bid Total
18	Restore roadway on Parkway Drive; including concrete curb & gutter and sidewalks, roadway pavement, and landscaping	Lump Sum		
19	Construct 6" HDPE slotted pipe line with sleeves for buttress drain	160 l.f.		
20	Construct 8" HDPE drainage pipe for buttress drain	60 l.f.		
21	Connect 8" drainage pipe to storm drain manhole	Lump Sum		
22	Furnish, place and compact gravel blanket material for buttress	740 c.y.		
23	Haul and place select excavated granular material from stockpile for buttress fill	3,500 c.y.		
24	Construct geo-grid reinforced buttress, complete; including all required earthwork, gravel base, geo-grid reinforcement, and all appurtenant work	2,300 c.y.		
25	Furnish and place 4" thick gunite with mesh over face of buttress walls	6,000 s.f.		
26	Restore native vegetation in disturbed work areas	152,000 s.f.		
	TOTAL -- SCHEDULE "B"			
	TOTAL -- SCHEDULES "A" & "B"			

SCHEDULE "C" --- LOWER SITE GRADING (APPROX. 2.8 ACS.) & CONSTRUCTING BUTTRESSES

Item No.	Description	Amounts & Units	Unit Price	Bid Total
1	Mobilization	Lump Sum		
2	Traffic Control	Lump Sum		
3	Erosion Control	Lump Sum		
4	General earthwork for site work to re-grade site (approx. 3,500 c.y.); excavated material (free haul) to be used for fill on-site	Lump Sum		
5	General earthwork for site work to re-grade site (approx. 6,100 c.y.); excavated material to be stockpiled at Tunnel Springs Park (short haul)	Lump Sum		
6	Construct 6" HDPE slotted pipe lines with sleeves for buttresses	575 l.f.		
7	Construct 8" HDPE SDR35 PVC drain line; including all pipe and fittings	170 l.f.		
8	Connect 8" solid PVC pipe to 6" slotted drain pipe; including all pipe and fittings	Lump Sum		
9	Construct 5-ft storm drain manhole, complete, over existing 21" storm drain on Parkway Drive; including connecting to existing pipe line	1 ea.		
10	Restore roadway on Parkway Drive; including concrete curb & gutter and sidewalks, roadway pavement, and landscaping	Lump Sum		
11	Saw-cut existing post-tensioned concrete pavement	190 l.f.		
12	Saw-cut existing asphalt parking lot pavement	180 l.f.		
13	Remove and dispose of existing post-tensioned concrete pavement, complete	5,150 s.f.		
14	Remove and dispose of existing asphalt parking lot pavement, complete	7,600 s.f.		
15	Remove and dispose of existing concrete block retaining wall, complete (approx. 45 l.f.)	Lump Sum		
16	Remove and dispose of existing 4-ft square storm drain inlet box, complete	1 ea.		
17	Remove and dispose of existing 2-ft square storm drain inlet boxes, complete	1 ea.		

Item No.	Description	Amounts & Units	Unit Price	Bid Total
18	Furnish, place and compact gravel blanket material for buttresses	3,500 c.y.		
19	Haul, place and grade select excavated granular material for buttress fill	42,000 c.y.		
20	Construct geo-grid reinforced buttress, complete; including all required earthwork, gravel base, geo-grid reinforcement, and all appurtenant work	8,230 c.y.		
21	Furnish and place gunite coating, 4" thick, over face of buttress walls, complete; including wire mesh and all appurtenant work	12,000 s.f.		
22	Restore native vegetation in disturbed work areas	119,400 s.f.		
	TOTAL -- SCHEDULE "C"			
	TOTAL -- SCHEDULES "A", "B" & "C"			

SCHEDULE "D" --- REMOVE EXISTING ROADWAYS & MODIFY EXISTING UTILITIES

Item No.	Description	Amounts & Units	Unit Price	Bid Total
1	Mobilization	Lump Sum		
2	Traffic Control	Lump Sum		
3	Erosion Control	Lump Sum		
4	Cleaning and grubbing work site, complete	Lump Sum		
5	Remove existing roadways, complete, at top of slope; including roadway pavement, concrete curb & gutter and sidewalks, and drainage facilities (approx. 20,800 s.f.)	Lump Sum		
6	Remove and dispose of existing utility lines, complete; including water lines, sewer lines, storm drains, and all appurtenant items; plugging ends of existing pipes to remain in place; and all appurtenant work	Lump Sum		
7	Abandon existing manholes, complete	4 ea.		
8	Construct new 15" dia storm drain line, complete: including removing existing pipe and boxes; and constructing new 15" corrugated HDPE storm drain pipe line	225 l.f.		
9	Construct new 5-ft dia storm drain manhole over existing 15" storm drain on Pace Lane; including connecting to existing pipe line	1 ea.		
10	Construct new 5-ft dia storm drain manhole over existing 8" land drain on Silvertree Lane; including connecting to existing pipe line	1 ea.		
11	Construct new catch basins in existing curb & gutter on Silvertree Lane; including removing existing concrete work; and constructing new curb & gutter	2 ea.		
12	Construct new 8" dia sewer line, complete: including removing existing pipe and appurtenant items; and constructing new 8" SDR35 PVC sewer line	200 l.f.		
13	Construct new 5-ft dia sewer manhole over existing 8" sewer line on Pace Lane; including connecting to existing pipe line	1 ea.		

Item No.	Description	Amounts & Units	Unit Price	Bid Total
14	Construct new 5-ft dia sewer manhole over existing 8" sewer line on Silvertree Lane; including connecting to existing pipe line	1 ea.		
15	Construct new 8" PVC pressure irrigation line, complete: including removing existing pipe and appurtenant items ; and constructing new 8" PVC pressure irrigation lines	220 l.f.		
16	Connect new 8-in PVC pipe to existing 10" PVC line on Pace Lane; including new pipe & fittings, new couplings, and all appurtenant work	1 ea.		
17	Connect new 8-in PVC pipe to existing 8" PVC line on Silvertree Lane; including new pipe & fittings, new couplings, and all appurtenant work	1 ea.		
18	Restore native vegetation in disturbed work areas	35,000 s.f.		
	TOTAL -- SCHEDULE "D"			
	TOTAL -- SCHEDULES "A", "B", "C", & "D"			

Note:. Bidders are advised to submit bids for all four Bid Schedules. It is anticipated that a single contract will be awarded for the lowest, responsive and responsible bid for the total overall project, including Schedules "A", "B", "C" and "D". The City reserves the right to award separate contracts for any single schedule or combinations of schedules, if it is in the best interest of the City.

SECTION 00500
CONSTRUCTION CONTRACT

PART 1 GENERAL

1.1 **Contractor**

A. Name: _____

B. Address: _____
_____
_____

C. Telephone number: _____

D. Facsimile number: _____

E. Website / email: _____

1.2 **Owner**

The name of the OWNER is North Salt Lake City.

1.3 **Construction Contract**

The Construction Contract is for the EAGLE POINTE LANDSLIDE REMEDIATION PROJECT --- Project No. NSL.037 (NSL Project # 14-041).

1.4 **Engineer**

North Salt Lake City Engineer is the OWNER's representative and agent for this Construction Contract who has the rights, authority and duties assigned to the CITY ENGINEER in the Contract Documents.

1.6 **Performance**

The Contractor agrees to perform all of the work described in the Contract Documents and comply with the terms therein for the Contract Price. The term "Contract Documents" means and includes the following:

A. Section 00100 - Invitation to Bid
B. Section 00200 - Instructions to Bidders
C. Section 00400 – Bid
D. Section 00405 - Bid Security
E. Section 00410 - Bid Schedule
F. Section 00500 - Construction Contract
G. Section 00610 - Performance Bond

H. Section 00620 - Payment Bond
I. Section 00650 - Certificate of Insurance
J. Section 00660 - Notice of Award
K. Section 00670 - Notice to Proceed
L. Section 00680 - Application for Payment
M. Section 00690 - Change Order
N. Section 00700 - General Conditions
O. Section 00710 - Supplementary Conditions
P. Section 01000 - General Requirements
Q. Section 02000 - North Salt Lake City Standards and Specifications

PART 2 TIME AND MONEY CONSIDERATIONS

2.1 Contract Price

A. The Contract Price includes the cost of the Work specified in the Contract Documents, plus the cost of all bonds, insurance, permits, fees, and all charges, expenses or assessments of whatever kind or character.

B. The Schedules of Prices awarded from the Bid Schedule are as follows.
   1. Base Bid.

C. A Construction Contract Supplement [ ] is, [ ] is not attached to this Construction Contract.

D. Based upon the above awarded schedules and the Construction Contract Supplement (if any), the Contract Price awarded is:

_____dollars

and _____ cents. ($ _____).

2.2 Contract Time

A. Substantial Completion of the Work shall occur **90 (Ninety)** calendar days after the date of the Notice to Proceed.

B. Any time specified in work sequences in the Summary of Work shall be a part of the Contract Time.

C. The OWNER anticipates that a Notice to Proceed will be given on the following date, but reserves the right to change such date:

Anticipated date of Notice to Proceed: MARCH 19, 2015

2.3 Punchlist Time

A. The Work will be complete and ready for final payment within 10 (ten) days after the date CONTRACTOR receives ENGINEER's Final Inspection Punch List unless exemptions of specific items are granted by ENGINEER in writing or an exception has been specified in the Contract Documents.

B. Permitting the CONTRACTOR to continue and finish the Work or any part of the Work after the time fixed for its completion, or after the date to which the time for completion may have been extended, whether or not a new completion date is established, shall in no way operate as a waiver on the part of the OWNER of any of OWNER's rights under this Construction Contract.

2.4 Liquidated Damages

A. Time is of the essence of this Construction Contract. CONTRACTOR agrees that OWNER will suffer damage or financial loss if the Work is not completed on time or within any time extensions allowed in accordance with Part 12 of the General Conditions. CONTRACTOR and OWNER agree that proof of the exact amount of any such damage or loss is difficult to determine. Accordingly, instead of requiring any such proof of damage or specific financial loss for late completion, CONTRACTOR agrees to pay the following sums to the OWNER as liquidated damages and not as a penalty.

1. **Late Contract Time Completion** – FIVE HUNDRED dollars and Zero cents ($500.00) for each day or part thereof that expires after the Contract Time until the Work is accepted as Substantially Complete as provided in Article 14.04 of the General Conditions.

2. **Interruption of Public Services** – No interruption of public services shall be caused by CONTRACTOR, its agents or employees, without the CITY ENGINEER's prior written approval. OWNER and CONTRACTOR agree that in the event OWNER suffers damages from such interruption, the amount of liquidated damages stipulated above shall not be deemed to be a limitation upon OWNER's right to recover the full amount of such damages.

B. **Survey Monuments**: No land survey monument shall be disturbed or moved until ENGINEER has been properly notified and the ENGINEER's surveyor has referenced the survey monument for resetting. The parties agree that upon such an unauthorized disturbance it is difficult to determine the damages from such a disturbance, and the parties agree that CONTRACTOR will pay as liquidated damages to cover such damage each expense.

C. **Deduct Damages from Moneys Owed CONTRACTOR**: OWNER shall be entitled to deduct and retain liquidated damages out of any money which may be due or become due the CONTRACTOR. To the extent that the liquidated damages

or become due the CONTRACTOR. To the extent that the liquidated damages exceed any amounts that would otherwise be due the CONTRACTOR, the CONTRACTOR shall be liable for such amounts and shall return such excess to the OWNER.

2.5 **Retainage**

A. The amount of retainage for each progress payment shall not exceed 5%.

PART 3 EXECUTION

3.1 Effective Date

A. OWNER and CONTRACTOR execute this Agreement and declare it in effect as of the _____ day of _____, 2015.

3.2 Contractor's Signature and Acknowledgment

A. Type of organization (circle):
Corporation, Limited Liability Company, Partnership, Individual,
Other_____

B. If CONTRACTOR is a corporation, attach a corporate resolution evidencing CONTRACTOR's authority to sign.

C. CONTRACTOR's Utah license number: _____

D. CONTRACTOR's signature: _____

E. Please print name here: _____

F. Title of Signatory: _____

G. **Corporate Acknowledgment**: In the County of __Davis__, State of __Utah__ on the_____ day of _____, 2015, personally appeared before me _____ and _____, who, being by me duly sworn did say that they are the _____, and _____, of _____, a_____ corporation, and that the foregoing instrument was signed in behalf of said corporation by authority of a resolution of its board of directors; and said persons acknowledged to me that said corporation executed the same.

_____
NOTARY PUBLIC, residing in _____
My Commission Expires: _____

G. **Partnership Acknowledgment**: In the County of __Davis__ , State of __Utah__ on the _____ day of _____ , 2015, personally appeared before me _____ who, being by me duly sworn on oath did say that _____ is a partner in _____ partnership and that the foregoing instrument was signed pursuant to authorization of the partnership.

_____

NOTARY PUBLIC, residing in _____
My Commission Expires: _____

G. **Limited Liability Company Acknowledgment**: In the County of __Davis__ , State of __Utah__ , on the _____ day of _____ , 2015, personally appeared before me _____ who, being by me duly sworn on oath did say that _____ is a partner in _____ partnership and that the foregoing instrument was signed pursuant to authorization of the partnership.

_____

NOTARY PUBLIC, residing in _____
My Commission Expires: _____

G. **Assumed Name Acknowledgment**: In the County of __Davis__, State of __Utah__, on the_____ day of_____ , 2015, personally appeared before me _____ who, being by me duly sworn did say that the foregoing instrument was signed with proper authority on behalf of _____ dba _____ .

_____

NOTARY PUBLIC, residing in _____
My Commission Expires: _____

G. **Individual Acknowledgment**: : In the County of Davis , State of Utah on the day _____ of _____ , 2015, personally appeared before me _____, the signer of the foregoing instrument, who duly acknowledged to me that he/she executed the same.

_____

NOTARY PUBLIC, residing in _____
My Commission Expires: _____

H. **Corporate Authority**: At the request of the OWNER, evidence satisfactory to the OWNER shall be submitted which shows the person executing this Agreement has the required authority to execute this Agreement.

3.3 **Owner's Signature and Acknowledgment**

A. OWNER's signature: _____

B. Name and Title: By: _____

Title _____

C. Attest: By: _____

Title _____

Owner Acknowledgment Here:

END OF DOCUMENT

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SECTION 00610
PERFORMANCE BOND

PART 1 GENERAL

1.1 **Procedure**

A. For filing purposes, add Performance Bond to the Contract Documents following this page.

END OF DOCUMENT

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SECTION 00620
PAYMENT BOND

PART 1 GENERAL

1.1 **Procedure**

A. For filing purposes, add Payment Bond to the Contract Documents following this page.

END OF DOCUMENT

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SECTION 00630
CERTIFICATE OF INSURANCE

PART 1 GENERAL

1.1 **Procedure**

A. For filing purposes, add Certificates of Insurance to the Contract Documents following this page.

END OF DOCUMENT

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SECTION 00640
NOTICE OF AWARD

Dated: _____

TO: _____

ADDRESS: _____

_____

PROJECT: EAGLE POINTE LANDSLIDE REMEDIATION PROJECT, LOCATED SOUTH OF PARKWAY DRIVE AT APPROXIMATELY 740 EAST -- PROJECT NO. NSL.037

OWNERS CONTRACT NUMBER: _____

You are notified that your Bid dated _____, 2015 for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for the following:

EAGLE POINTE LANDSLIDE REMEDIATION PROJECT, LOCATED SOUTH OF PARKWAY DRIVE AT APPROX. 740 EAST -- PROJECT NO. NSL.037
(NSL Project No. 14-041)

The Contract Price for your contract is: $_____

_____ dollars and _____ cents.

_____

You must comply with the following conditions precedent within fifteen (15) days of the date of this Notice of Award, that is by _____ , 2015:

1. You must deliver to the OWNER two fully executed counterparts of the Agreement including all the Contract Documents. Each of the Contract Documents must bear your signature on the signature page.
2. You must deliver with executed Agreement the Contract Security Bonds) as specified in the Instructions to Bidders.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid in default, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with the above conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

City of North Salt Lake
(Owner)

By: _____
(Authorized Signature)

Printed Name: _____

Title: _____

ACCEPTANCE OF AWARD:

_____
(Contractor)

By: _____
(Authorized Signature)

Printed Name: _____

Title: _____

Date: _____

SECTION 00650
NOTICE TO PROCEED

Date:_____

TO: _____

ADDRESS: _____

_____

PROJECT: _____

OWNER'S CONTRACT NUMBER: _____

You are notified that the Contract Time under the above contract will commence to run on _____, 2015. By that date, you are to start performing your obligations under the Contract Documents. The dates of substantial completion and completion and readiness for final payment are

_____, 2015 and _____, 2015.

Before you may start any work at the site, you must deliver to the OWNER certificates of insurance which you are required to purchase and maintain in accordance with the Contract Documents.

Also before you may start any work at the site you must:

_____

_____

_____

City of North Salt Lake
(Owner)

By:_____
(Authorized Signature)

Title:_____

RECEIPT OF NOTICE TO PROCEED:

_____
(Contractor)

By:_____
(Authorized Signature)

Printed Name: _____

Date:_____

Title:_____

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SECTION 00660
APPLICATION FOR PAYMENT NO. X

To: City of North Salt Lake (Owner)
From: _____ (Contractor)
Contract for: Eagle Pointe Landslide Remediation Project --- NSL.037
OWNER's Contract No. 14-041
For work accomplished through the date of _____

Accompanying Documentation: Pay Request #X Tabulation

1.	Original Contract Price:	$ -
2.	Net change by Change Orders:	$ -
3.	Current Contract Price (1 plus 2):	$ -
4.	Total Completed and Stored to date:	$ -
5.	Retainage (per Agreement): 5% of completed work	$ -
6.	Total completed and stored to date less retainage (4 minus 5):	$ -
7.	Less previous Application(s) for Payment:	$ -
8.	Due this Application for Payment: (6 minus 7)	$ -

CONTRACTOR'S Certification:

The undersigned CONTRACTOR certifies that: (1) all previous progress payments received from OWNER on account of Work done under the Contract referred to above have been applied to discharge in full all obligations of CONTRACTOR incurred in connection with Work covered by prior Applications for Payment numbered 0 through 1 inclusive; (2) title to all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all liens, claims, security interest and encumbrances (except such as are covered by Bond acceptable to OWNER indemnifying OWNER against any such lien, claim, security interest or encumbrance); and (3) all Work covered by this Application for Payment is in accordance with the Contractor Documents and not defective as that term is defined in the Contract Documents.

Dated _____, 2015 By: _____
CONTRACTOR

In the County of Davis, State of Utah,
Subscribed and sworn to before me this _____ day of _____, 2015

Notary Public _____
My Commission expires: _____

Payment of the above AMOUNT DUE THIS APPLICATION is approved:

Dated _____, 2015 By: _____
NORTH SALT LAKE CITY

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SECTION 00670
CHANGE ORDER

Number: X

Project: _____

Date of Issuance: _____ Effective Date: _____

Owner: City of North Salt Lake

Contractor: _____

Owner's Contract No. 14-041

You are directed to make the following changes in the Contract Documents:

Description: *Add description of change order labor and materials*

Reason for Change Order: *Explain why Change Order is necessary*

Attachments: *List any attached cost estimate, invoice, or other documentation*

CHANGE IN CONTRACT PRICE

Original Contract Price: $ _____

Net changes from previous Change Order

Number _____ to Number _____

$ _____

Contract Price prior to this Change Order:
$ _____

Net Increase / Decrease of this Change Order:
$ _____

Contract Price with all approved Change Orders:
$ _____

Approved:

By: _____
(Owner Authorized Signature)

Date: _____

CHANGE IN CONTRACT TIMES

Original Contract Times: _____

Substantial: _____
Ready for final payment: _____

Net change from previous Contract Times:
_____ days

Contract Times Prior to this Change Order:
_____
Substantial Completion: _____
Ready for final payment: _____

Net Increase / Decrease of this Change Order:
_____ days

Contract Time with all approved Change Orders:
_____
Substantial Completion: _____
Ready for final payment: _____

Accepted:

By: _____
(Contractor Authorized Signature)

Date: _____

CHANGE ORDER
INSTRUCTIONS

1.1 General Information

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect price or times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

2.1 Completing the Change Order Form

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

SECTION 00690
SUPPLEMENTARY CONDITIONS

1.1 Insurance

A. Indemnification. The Contractor shall indemnify and hold harmless the Owner, North Salt Lake City and the Engineer and their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss, or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of property (other than the work itself) including the loss of use resulting therefrom, and (b) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts may be liable, regardless of whether or not it is caused by a party indemnified hereunder.

In any and all claims against the Owner, North Salt Lake City or the Engineer or any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, liability benefit acts or other benefit acts.

The obligations of the Contractor under this paragraph shall not extend to the liability of the Engineer, his agents or employees arising out of (1) the preparation or approval of maps, drawings, reports, surveys, change orders, designs, or specifications, or (2) the giving of directions or instructions by the Engineer, his agents or employee provided such giving is the primary cause of the injury or damage.

B. Insurance - Public Liability and Property Damage. Prior to starting operations the Contractor shall present, to the Engineer, the attached certificate signed by the proper official of an acceptable and approved insurance company stating, in fact, the amount of public liability, property damage, and other insurance the Contractor has in force. The insurance company shall guarantee to notify said Engineer in the event said insurance coverage is cancelled, or expires for any reason whatsoever before completion of the Contractor's work.

C. Owner's and Engineer's Protective Liability. The Contractor shall secure and present to the Engineer prior to starting work on the project the current insurance policy that shows the Owner and the Engineer as "Additionally Insured".

D. Builders Risk Insurance. Prior to starting work on the project, the Contractor shall provide the Engineer with a Builders Risk Insurance Policy providing fire, extended coverage, and vandalism insurance in the amount of 100% of the insurable value of the Contractor's work on builders risk completed value form. This insurance company shall guarantee to notify said Engineer in the event said insurance coverage is canceled or expires for any reason whatsoever before completion of the Contractor's work.

Builders Risk Insurance is not required for pipeline construction, street improvements, earth excavation, and embankments and other such work.

Builders Risk Insurance is required when the project includes above or below grade buildings or structures. However, precast manholes, valve boxes and other such structures can also be excluded.

E. Contractor's Certificate of Insurance

This is to certify that the Policy or Policies described below have been insured by the undersigned insurance company to the insured name below and are in force at this time. If the insurance afforded thereunder is canceled or materially changed before completion of the Contractor's work, then fifteen (15) days prior written notice will be mailed to the Owner.

_____

_____

_____

Type of work performed by insured; describe work, location and Owner:

_____

_____

_____

_____

_____

_____

KIND	POLICY	EXPIRATION	LIMITS OF LIABILITY
Workmen's Compensation			Fully complies with requirements of the law of State or States in which above operations performed.
General Liability Including Vehicle Coverage			$500,000 each occurrence $500,000 Aggregate Products Completed Operations Property Damage $300,000 each occurrence $300,000 Aggregate
Owner's and Engineer's Protective Liability			Limits of liability and coverage same as for General Liability

The General Liability policy includes coverage with respect to the following hazards:

1. Independent Contractors _____

2. Products _____

3. Contractual Liability to addressee for above work _____

4. Premises - Operations _____

5. Property Damage Liability arising out of the so-called "XCU" hazards (explosions, collapse, and underground damage

_____
_____
_____
_____
_____
_____

The Motor Vehicle Liability policy includes coverage with respect to the following unless specifically designated as "NOT COVERED".

6. All owner vehicles _____

7. Employer's Non-Ownership Liability _____

8. Hired Automobiles _____

_____ (Date of Issue)

_____ (Name of Insurance Company)

_____ (City) (State)

_____ (Authorized Representative)

2.1 **Competent Men And Equipment To Be Employed**

A. The Contractor shall provide equipment in good repair, to do all work specified and required as well as sufficiently qualified workmen. He shall prosecute the work diligently at all times and shall maintain his work in a clean and safe condition during the entire performance of this contract.

B. The Contractor shall, in good workmanlike manner, perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise specified, necessary to perform and complete all the work required by this contract, within the time herein specified and in accordance with the provisions of this contract, specifications, drawings, and all supplemental plans and drawings. He shall furnish, erect, maintain, and remove temporary works as may be required.

3.1 **Safety Standards And Accident Prevention**

For work performed under this contract the Contractor shall:

A. Comply with the safety standard provisions of applicable laws, building, and construction codes, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America and State Safety Regulations, the General Safety Orders Covering Utah Industries as published by Industrial Commission of Utah, the OSHA standards as they apply, safety standards as required by the Department of Transportation (the latest edition of "Manual of Uniform Traffic Control Devices") and City or County Highway Department.

B. The Contractor shall exercise every precaution at all times for the protection of people and property which shall include, as needed, the use of shoring, bracing, barricades, guards, night watchmen, red lighting, and the elimination of hazardous conditions.

C. The Contractor shall maintain at his office or other well-known place at the job site, all articles necessary for giving first aid to the injured; and shall have an employee who has completed the American Red Cross Standard First Aid Course or its equivalent, and standing arrangements for the immediate removal to a hospital for a doctor's care of all persons who may be injured on the job site.

D. In the event the work under this contract may become hazardous to traffic or pedestrians, the Contractor shall furnish without added cost to the Owner, such flagmen, barricades, lights, signals, etc. as required to direct and control traffic during such emergencies and until such hazards have been corrected.

4.1 Hiring Provisions

In employing workmen in the construction of this project, the Contractor shall give preference to citizens of the United States, or those having declared their intention of becoming citizens. If this provision is not complied with, the contract shall be void.

5.1 Incidental Work

All minor details of work and materials which are not shown on the drawings, as well as such items which are not specifically mentioned in the specifications, but are obviously necessary for the proper completion of the work, shall be considered as incidental, and as being a part of and included with the work for which prices are given in the proposal. No extra compensation shall be allowed to the Contractor for the performance of this incidental work.

6.1 Utility Damage

A. If the Contractor damages any utility during construction he shall immediately notify the utility company, department or persons involved and shall satisfactorily repair or replace such utility, or he shall arrange for the utility company to perform said repairs or replacement. If the Contractor fails or neglects to make, or arrange with the utility company to make such repairs or replacements immediately, the Owner may make the necessary repairs and the cost of so doing will be deducted from the sum due or to become due the said Contractor under this contract.

B. The Contractor shall not be entitled to claims for damage on account of hindrance of delay from cause unless the delay is due to acts or omission on the part of the Owner. Such hindrance or delay may entitle the Contractor to an extension of time in which to complete the work. The Contractor shall give notice in writing to the engineer and Owner of the causes of such delay. No extra time will be given for time elapsing before such notice is given.

7.1 Access And Usage Of Fire Hydrants And Other Utilities

The Contractor shall not obstruct, destroy, or deter usage of fire hydrants and other utilities. He shall not use any utility without proper consent and connection from the utility company.

8.1 Protecting Existing Utilities And Facilities

Due to the nature of the project, it is not anticipated that any underground utilities will be in conflict with this work during construction. However, please note that existing underground utilities have NOT been located in the field or on the plans. Contractor is responsible for having these utilities located. The Contractor shall call Blue Stakes prior to commencing any work. The Contractor will be solely responsible to protect the existing properties whether above or below ground, to notify the owner of the utility or facility prior to excavating in the area, and to repair at his own expense any damage done during the construction of this project. Neither the Owner nor its officers or agents shall be responsible for damages as a result of the location of a utility being other than as shown on the plans, or for existing utilities not shown on the plans.

The Contractor shall protect all existing landscaping, sprinkler system, utility services, structures, buildings, walls, fences, etc. and shall make necessary repairs for damage thereto during the course of the work at his own expense.

The Contractor shall also protect all roads and walks, curb and street improvements and shall maintain them during the course of the work. He shall repair all damage to the same at his own expense. He shall only use routes designated by Owner for hauling of materials and equipment to and from site.
Special precaution shall be taken to protect residents of the area from injury.

The Contractor, before starting, shall erect fences as required by local laws and ordinances.

9.1 Special Conditions

A. Award of Contract:

1. For the allocation of costs, the overall work for this project has been divided into four separate Bid Schedules, as indicated on the project drawings.

2. Bidders are advised to submit bids for all four Bid Schedules. It is anticipated that a single contract will be awarded for the lowest, responsive and responsible bid for the total overall project, including Schedules "A", "B", "C" and "D". The City reserves the right to award separate contracts for any single schedule or combinations of schedules, if it is in the best interest of the City.

B. Onsite project work procedures:

1. If Bid Schedules "A", "B" and "C" are awarded, excavated material will be moved from Schedule "A" to Schedules "B" and "C". The excavated material from Schedule "A" is needed to complete the earthwork for the other two schedules.

2. Schedules "A" and "C" must be constructed together; the excavated material from Schedule "A" is required to construct the buttresses in Schedule "C".

3. Where buttress construction requires excavating into existing hillside, the buttresses can only be constructed at a maximum of 100 linear feet at a time, at the direction of the geotechnical engineer.

4. The "free haul" listed in the bid schedules refers to hauls from one work schedule to another, and to hauls within the work schedules.

5. The "short haul" listed in the bid schedules refers to hauls from the project area to the designated stockpile area, indicated on the Location Map on Drawing G.101, at the Tunnel Springs Park at 1080 South Eagle Pointe Drive. The park is approximately 0.9 mile from the Tennis Courts along Parkway Drive; and about 0.6 miles from top of Schedule "A".

C. All adjacent properties that are damaged shall be totally restored to match original conditions; including landscaping, grading, structures and all other related items.

D. The City shall obtain construction access to work areas, as required and as indicated, and to the construction areas located on the Gas Line easements.

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10.1 Boring Logs and Lab Data. The following logs and lab data is included as follows:

A. GeoStrata Boring Logs: Plates B-1 thru B-6.

B. GeoEngineering Exploration Logs: Figures A-1 thru A-8 (19 pages).

C. GSH Boring Logs: Borings B-1 thru B-8 (22 pages).

D. GeoStrata Lab Data: Plates C-2 thru C-19.

E. Boring Location Map.

DATE	
STARTED:	9/10/14
COMPLETED:	9/10/14
BACKFILLED:	9/10/14

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number 920-004

GeoStrata Rep: S. Seal
Rig Type: Sonic

BORING NO: **B-1**
Sheet 1 of 3

LOCATION
NORTHING EASTING ELEVATION

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0	0				GP-GM	Lacustrine Gravel; Poorly Graded GRAVEL with silt and sand - brown, moist, sand is fine to medium grained, gravel is subrounded to rounded, with light red staining					
								1.6	7.7	NP	NP
	10					- sand is medium to coarse grained, gravel is rounded					
						- sand is fine to medium grained, gravel is subrounded to rounded					
								2.4	6.5	NP	NP
	15					- light brown, silt is nonplastic, gravel is subrounded					
								1.6	11.6	NP	NP
	20										
					CL	Residual Bedrock; Lean CLAY with sand - grey, very moist to wet					
	25							15.5	19.3	35	19

Moisture Content and Atterberg Limits
Plastic Limit — Moisture Content — Liquid Limit
10 20 30 40 50 60 70 80 90

GeoStrata

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SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:

Plate B-1

DATE	
STARTED:	9/10/14
COMPLETED:	9/10/14
BACKFILLED:	9/10/14

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number 920-004

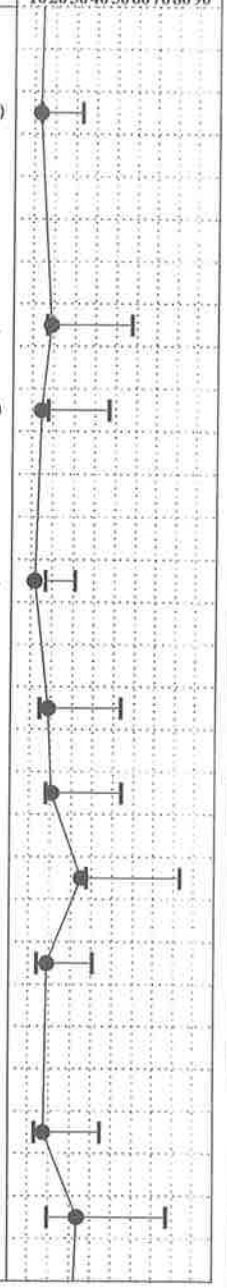
GeoStrata Rep: S. Seal
Rig Type: Sonic

BORING NO: **B-1**
Sheet 2 of 3

LOCATION
NORTHING EASTING ELEVATION

DEPTH METERS	DEPTH FEET	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	30							
10		GC	Clayey GRAVEL with sand - grey, very moist to wet		12.5	21.4	33	20
	35							
11		CH	Fat CLAY with sand - grey, moist, with occasional carbonate stringers, weakly cemented		18.4	84.7	57	41
12	40	SC	Clayey SAND - light grey, higly to completely weathered volcanic tuff		13.9	47.0	47	30
13		CL	Sandy Lean CLAY - light grey, moist		11.2	56.7	31	14
		CH	Sandy Fat CLAY - light grey to brown					
	45							
14			- with sand and trace gravel, red-brown,		18.2	62.1	53	39
		CH	Fat CLAY with sand - light grey with brown mottling		20.2	81.1	54	37
15		CH	Sandy Fat CLAY with gravel - light grey with brown mottling, moist		34.7	51.9	83	45
	50							
16		CL	Lean CLAY with sand - red-brown, moist, with thick carbonate stringers		18.3	83.2	40	27
	55							
17		CL	Sandy Lean CLAY - light grey, moist		16.9	59.7	44	32
		CH	Fat CLAY with sand - brown, moist					
18					33.4	83.4	77	58

Moisture Content and Atterberg Limits
Plastic Limit — Moisture Content — Liquid Limit
10 20 30 40 50 60 70 80 90



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SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:

Plate B-2

DATE	
STARTED:	9/10/14
COMPLETED:	9/10/14
BACKFILLED:	9/10/14

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number 920-004

GeoStrata Rep: S. Seal
Rig Type: Sonic

BORING NO: B-1
Sheet 3 of 3

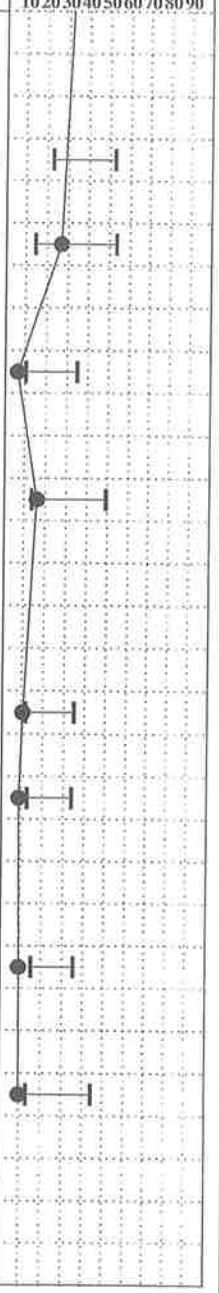
LOCATION
NORTHING EASTING ELEVATION

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	60										
19						- with grey-brown mottling			72.8	53	30
	65					- moist to very moist					
20								26.4	75.5	53	39
					CL	Competent Bedrock - Volcanic Tuff; Sandy Lean CLAY - light brown, moist					
21								6.0	51.8	35	25
	70										
					CL	Lean CLAY - light brown, moist		15.7	85.9	49	36
22											
	75										
23					CL	Lean CLAY with sand - light brown, moist		9.9	73.3	35	23
					SC	Clayey SAND - light brown, moist		8.4	48.7	34	21
24	80										
25					CL	Sandy Lean CLAY - light brown, moist		8.9	61.3	35	20
26	85							9.2	58.3	44	32
						Bottom of Test Pit @ 86 Feet					
27											

Moisture Content and Atterberg Limits

Plastic Limit — Moisture Content — Liquid Limit

10 20 30 40 50 60 70 80 90



LOG OF BORING (B) - NO BLOW COUNTS BORING LOGS.GPJ GEOSTRATA.GDT 10/22/14

GeoStrata

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SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:

Plate B-3

DATE	
STARTED:	9/11/14
COMPLETED:	9/11/14
BACKFILLED:	9/11/14

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number 920-004

GeoStrata Rep: S. Seal
Rig Type: Sonic

BORING NO: B-2
Sheet 1 of 3

LOCATION
NORTHING EASTING ELEVATION

METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0	0				GP-GM	Lacustrine Gravel; Poorly Graded GRAVEL with silt - brown, moist, silt is nonplastic, with occasional red staining					
1											
	5										
2											
3	10										
4						- wet					
	15							1.4	9.0	NP	NP
5											
					CL	Residual Bedrock; Lean CLAY with sand - light grey to grey, moist to very moist, organics					
6	20							18.8	78.2	42	28
					SC-SM	Silty Clayey SAND - grey-brown, moist, sand is fine to medium grained		14.3	40.1	21	6
7					CL	Sandy Lean CLAY - grey-brown, moist, sand is fine-grained, sand decreasing with depth		15.9	65.8	38	22
	25										
8					CL	Lean CLAY with sand - grey-brown, moist, sand is fine-grained		11.5	18.1	39	23
9											

Moisture Content and Atterberg Limits

Plastic Limit — Moisture Content — Liquid Limit

10 20 30 40 50 60 70 80 90

GeoStrata

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SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:

Plate B-4

DATE	
STARTED:	9/11/14
COMPLETED:	9/11/14
BACKFILLED:	9/11/14

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number 920-004

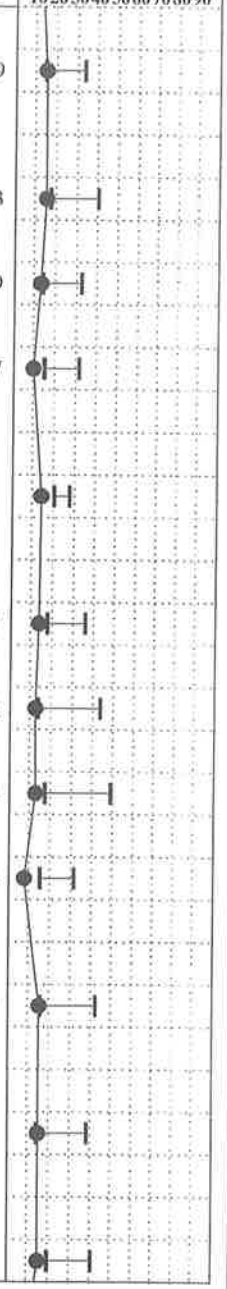
GeoStrata Rep: S. Seal
Rig Type: Sonic

BORING NO: B-2
Sheet 2 of 3

LOCATION
NORTHING EASTING ELEVATION

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	30					- light grey-brown, with occasional brown mottling		14.7	71.6	33	19
10											
	35							15.1	82.8	40	23
11					CL	Sandy Lean CLAY - light grey-brown, moist, sand is fine-grained, with occasional brown mottling - with occasional Fe staining		12.7	68.2	32	19
					GC	Clayey GRAVEL with sand - light grey brown, moist		9.5	23.1	31	17
12	40				CL ML	Sandy Silty CLAY with gravel - grey, moist, sand is medium grained, increasing clay with depth		13.9	50.3	27	7
13											
					CL	Sandy Lean CLAY - grey, moist		13.5	59.4	36	18
	45				CL	Sandy Lean CLAY with gravel - green-grey, moist to very moist					
14								12.1	53.0	44	30
					CL	Sandy Lean CLAY - brown, moist, clay has low plasticity, sand is fine-grained		12.5	65.0	49	32
15	50				GC	Clayey GRAVEL with sand - light grey, moist, rounded		7.3	19.6	31	16
16								14.9	47.0	42	27
	55										
17					CL	Sandy Lean CLAY with gravel - brown, moist, sand is fine-grained, gravel is rounded, with light Fe staining - 3" seam of Silty GRAVEL with sand		14.5	69.8	38	24
18								14.7	64.6	40	21

Moisture Content and Atterberg Limits



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SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:

Plate B-5

DATE	
STARTED:	9/11/14
COMPLETED:	9/11/14
BACKFILLED:	9/11/14

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number 920-004

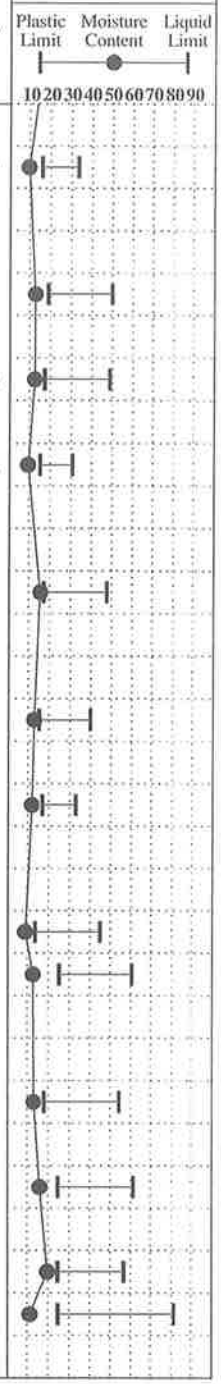
GeoStrata Rep: S. Seal
Rig Type: Sonic

BORING NO: B-2
Sheet 3 of 3

LOCATION
NORTHING EASTING ELEVATION

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	60										
19					GC	Clayey GRAVEL with sand - brown, moist, sand is fine-grained, gravel is rounded		9.0	34.1	33	17
	65				CH	Sandy Fat CLAY - brown, moist		12.3	56.3	50	31
20					GC	Clayey GRAVEL with sand - grey, moist		12.0	40.8	49	32
21						- red-brown		8.9	20.2	31	16
	70				CL	Sandy Lean CLAY with gravel - brown, moist					
22						- moist to very moist		15.1	68.8	48	31
						- red-grey mottling, decreasing gravel		12.4	56.3	40	25
23	75				CL	Competent Bedrock - Volcanic Tuff; Sandy Lean CLAY - grey, moist, sand is fine to medium grained		11.4	53.8	33	16
24								8.3	69.1	45	32
	80				CH	Fat CLAY with sand - grey, moist sand is fine to medium grained		12.1	77.3	60	36
25						- slight increase in clay content		12.5	77.6	54	37
26	85							15.5	72.6	61	37
								19.2	71.0	57	33
27					CH	Fat CLAY - grey, moist		10.7	91.2	81	57
						Bottom of Test Pit @ 89 Feet					

Moisture Content and Atterberg Limits



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SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:

Plate B-6

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	TS	Topsoil/ Forest Duff/Sod

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Material Description Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

- 2.4-inch I.D. split barrel
- Standard Penetration Test (SPT)
- Shelby tube
- Piston
- Direct-Push
- Bulk or grab

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
PPM	Parts per million
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

GEOENGINEERS

FIGURE A-1

Drilled	Start 8/7/2014	End 8/7/2014	Total Depth (ft) 54	Logged By MCK / Checked By TNH	Driller Earthcore Drilling, Inc.	Drilling Method ODEX
Surface Elevation (ft) Vertical Datum	5146.3		Hammer Data	140 (lbs) / 30 (in) Drop	Drilling Equipment	Mobile B-80 Truck Mounted
Latitude / Longitude	1528957.745 / 3460565.031		System Datum	Geographic / Utah State Plane North	Groundwater: Date Measured	Depth to Water (ft): Not encountered; Elevation (ft): N/A

Notes: Upon completion, borehole backfilled with bentonite chips

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
5145	0		15	25		1			SM	Light brown silty fine sand with occasional gravel (loose, dry)			
5140	5		18	32		2				Becomes medium dense	4		% Fines = 24 % Gravel = 6
			18	38		3							
5135	10		18	45		4			ML	Light brown sandy silt with trace gravel (very stiff, moist)	7		% Fines = 54 % Gravel = 1
5130	15		15	38		5			SM	Light brown silty sand with occasional gravel and small roots (medium dense, moist)			
5125	20		18	30		6					6		% Fines = 27 % Gravel = 2
5120	25		18	36		7				Becomes grayish tan			
5115	30		11	65		8			GP-GM	Light brown and gray poorly graded gravel with silt and sand (medium dense, moist)		2	% Fines = 8 % Gravel = 58
	35								GP	Light brown and gray poorly graded gravel with silt and sand (medium dense, moist)			

Note: See Figure A-1 for explanation of symbols.

Log of B-1

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-2
Sheet 1 of 2

Portland Date:8/29/14 Path:\\SGP\PROJECTS\16-16265\002-09\GIN\NORTH SALT LAKE LANDSLIDE.GPJ DB Template\Lib Template GEOENGINEERS 8.0\HDEB_GEOTECH_STANDARD

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
5110	35		4	73		9			GP	Light brown and gray poorly graded gravel with sand (medium dense, moist)			
5105	40		18	16		10			GP	Becomes loose			
5100	45		2	55/3"		11				Becomes dense, more coarse			
5095	50		18	34		12							

Note: See Figure A-1 for explanation of symbols.

Log of B-1 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-2
Sheet 2 of 2

Portland Date:8/29/14 Path:\\GEP PROJECTS\16\16265002-09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate:GEOENGINEERS GDT\GEB_GEOTECH_STANDARD

Drilled	Start 8/12/2014	End 8/13/2014	Total Depth (ft) 115	Logged By MCK / Checked By TNH	Driller Earthcore Drilling, Inc.	Drilling Method ODEX/Rock Core

Surface Elevation (ft) Vertical Datum	5133.8	Hammer Data	140 (lbs) / 30 (in) Drop	Drilling Equipment	Mobile B-80 Truck Mounted
Latitude Longitude	1528770.719 3460682.261	System Datum	Geographic Utah State Plane North	Groundwater	

Notes: Installed inclinometer upon completion.

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
8/22/2014	57	5076.8

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	0								SM				
5130			18	18		1				Brown silty sand with gravel and clay (loose, moist) (fill)			
	5		6	13		2			SP	Light brown and gray fine sand with roots (medium dense, moist)			
5125			6	32		3			SP-SM	Brown gravelly sand with silt, clay and small roots (medium dense, moist)			
	10		5	20		4			ML	Light brown silt with sand and clay (very stiff, moist)			
5120													
	15		18	34		5							% Fines = 88
5115													
	20		6	16		6				Becomes stiff			
5110									SM				
	25		5	50/5"		7				Light brown silty fine sand with trace clay (very dense, moist)			
5105													
	30		18	90		8				Becomes moist light brown and white silty sand with gravel			% Fines = 16 % Gravel = 38
5100													
	35												

Note: See Figure A-1 for explanation of symbols.

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Log of B-4 & B-4A

GeoEngineers

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-3
Sheet 1 of 3

Portland Date 8/29/14 Path \\GGP\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate LibTemplate GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	35		7	70		9			SM	Light brown and white silty sand with gravel (very dense, dry)			
5095									GP				
	40		5	5		10				Gray poorly graded gravel (loose, dry)			
5090									SM				
	45		5	50/5"		11				Light brown and gray silty sand with gravel (very dense, dry)			
5085													
	50		8	50/5"		12							% Fines = 14 % Gravel = 41
5080													
	55		2	50/2"		13				Becomes yellowish brown			% Fines = 49 % Gravel = 8
			8	50/4"		14	▼						
5075													
	60								CH				
5070													
	65		18	33		15				Light grayish brown fat clay with sand (hard, wet to moist)			LL = 57 PI = 18
5065									CL				
	70		6	50/5"		16				Grayish brown lean clay (hard, dry)			LL = 46 PI = 81 New boring (B-4A) located 9' east of B-4. Conditions appear similar to B-4 based on cuttings.
5060													
	75		18	90		1				Becomes brown with white sandy clay layers			

Note: See Figure A-1 for explanation of symbols.

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Log of B-4 & B-4A (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-3
Sheet 2 of 3

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
5055									CL	Brown clay with white sandy clay layers (hard, dry)			
	80		18	62		2				Becomes moist and light greenish gray with sand			
5050													
	85		5	50/5"		3				Becomes wet with coarse sand			LL = 43 PI = 15
5045													
	90		5	50/4"		4				Becomes dry			
5040													
	95		18	44		5				Becomes moist			
5035													
	100		18	48		6				With no sand			LL = 94 PI = 71
5030													
	105		4	50/4"		7			Siltstone	SILTSTONE, Reddish Brown and gray, slightly weathered, medium hard, closely jointed, with occasional sand layers			
5025													
	110		60			8							
5020													
	115												

Note: See Figure A-1 for explanation of symbols.

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Log of B-4 & B-4A (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-3
Sheet 3 of 3

Portland Date:8/29/14 Path:\\SGF\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate:\Template GEOENGINEERS8.GDT\GEI8_GEOTECH_STANDARD

Drilled	Start 8/7/2014	End 8/7/2014	Total Depth (ft) 54	Logged By MCK Checked By TNH	Driller Earthcore Drilling, Inc.	Drilling Method ODEX

Surface Elevation (ft) Vertical Datum	5149.6	Hammer Data	140 (lbs) / 30 (in) Drop	Drilling Equipment	Mobile B-80 Truck Mounted
Latitude Longitude	1529058.110 3460487.495	System Datum	Geographic Utah State Plane North	Groundwater Date Measured	Depth to Water (ft): Not encountered Elevation (ft): N/A

Notes: Upon completion, borehole backfilled with bentonite chips

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	0								SM				
			10	56		1				Light brown silty fine sand with gravel (medium dense, dry)			
5145									ML				
	5		14	44		2				Light brown sandy silt with trace gravel (very stiff, dry)			
			16	42		3					9		% Fines = 58
5140									SM				
	10		16	32		4				Light brown and white silty fine sand (medium dense, moist)			
5135													
	15		16	24		5				Becomes light brown and loose	8		% Fines = 31
5130													
	20		18	29		6					7		% Fines =26
5125													
	25		18	62		7				Becomes dense with gravel and trace silt			
									GW-GM				
5120													
	30		18	62		8				Light brown and gray well graded gravel with silt and sand (medium dense, dry)	2		% Fines = 9 % Gravel = 57
									GP-GM				
5115													
	35												

Note: See Figure A-1 for explanation of symbols.

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Log of B-6

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-4
Sheet 1 of 2

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	35		18	62		9			GP-GM	Light brown and gray poorly graded gravel with silt and sand (very dense, moist)	3		% Fines = 10 % Gravel = 71
5110	40		7	80		10				Becomes dense			
5105	45		8	49		11			GP	Light brown and gray poorly graded gravel with sand (medium dense, dry)			
5100	50		3	13		12				Becomes loose, no sand			

Note: See Figure A-1 for explanation of symbols.

DRAFT

Log of B-6 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-4
Sheet 2 of 2

Portland Date:9/29/14 Path:\\GEP-PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate:GEOENGINEERS6.GDT\GEIL_GEOTECH_STANDARD

Drilled	Start 8/7/2014	End	Total Depth (ft) 110	Logged By MCK Checked By TNH	Driller Earthcore Drilling, Inc.	Drilling Method ODEX/Rock Core

Surface Elevation (ft) Vertical Datum	5142.8	Hammer Data	140 (lbs) / 30 (in) Drop
Drilling Equipment	Mobile B-80 Truck Mounted		
Latitude Longitude	1528940.201 3460640.560	System Datum	Geographic Utah State Plane North

Notes: Upon completion, borehole backfilled with cement-bentonite grout.

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
8/22/2014	68.9	5073.9

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	0								SP				
5140			18	40		1				Brown medium to coarse sand with gravel (medium dense, moist)			
									ML				
	5		18	36		2				Light brown sandy silt with occasional gravel (very stiff, moist)			
5135			16	47		3							
	10		14	64		4							
5130													
	15		16	36		5				With trace gravel	9		% Fines = 62 % Gravel = 1
5125													
									SM				
	20		16	34		6				Light brown and gray silty fine sand with clay and some gravel (medium dense, moist)			
5120													
	25		18	36		7					10		% Fines = 27 % Gravel = 6
5115													
									GP-GM				
	30		15	101		8				Light brown and gray poorly graded gravel with silt and sand (dense, moist)			
5110													
									GW-GM				
	35												

Note: See Figure A-1 for explanation of symbols.

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Log of B-8

GeoEngineers

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-5
Sheet 1 of 3

Portland Date:8/29/14 Path:\\SGF\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DSTemplate:LoTemplate GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	35		18	80		9			GW-GM	Light brown well graded gravel with silt and ssand (dense, slightly moist)	2		% Fines = 8 % Gravel = 58
5105													
	40		5	23		10				Becomes loose			
5100													
									GP				
	45		6	70		11				Light brown and gray poorly graded gravel with sand (medium dense, dry)			
5095													
									GW-GM				
	50		10	63		12				Light brown and gray well graded gravel with silt and sand (medium dense, moist)			
5090													
	55		15	120/5"		13					3		% Fines = 13 % Gravel = 62
5085													
	60		11	120/5"		14				Becomes dark gray			
5080													
			4			15				Gray boulders, cobbles and gravel			
	65		18	41		16							
5075													
			48			R1				Large boulder (quartzite)			
	70												
5070			30			R2							
	75		18	24		17			CH	Brown fat clay with occasional sand (stiff, moist)	24	101.4	LL = 56 PI = 39

Note: See Figure A-1 for explanation of symbols.

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Log of B-8 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-5
Sheet 2 of 3

Portland Date:8/29/14 Path:\\SGP-PROJECTS\16\16265002-09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate\LibTemplate GEOENGINEERS.GDT\GEB_GEOTECH_STANDARD

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
5065									CH	Brown fat clay with occasional sand (stiff, moist)			
	80		10	90		18				Becomes hard and reddish brown with sand			
5060									CH				
	85		12	114		19				Mottled red and white gravelly fat clay (hard, wet)	15	109.8	Groundwater encountered, subsequent groundwater measurements indicate artesian
5055			18	107		20				With coarse sand and fine gravel	21	103.1	
	90		18	61		21			CL	Reddish brown lean clay (hard, wet)	28	87	LL = 38 PI = 23
5050													
	95		18	77		22							
5045									CH				
	100		5	120/5"		23				Red and white fat clay with gravel (hard, wet)			
5040													
	105		18	57		24				Becomes red and dry with occasional sand			
5035													
	110												

Note: See Figure A-1 for explanation of symbols.

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Log of B-8 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-5
Sheet 3 of 3

Drilled	Start 8/20/2014	End 8/20/2014	Total Depth (ft)	120	Logged By MCK / Checked By TNH	Driller	Earthcore Drilling, Inc.	Drilling Method	HSA/Rock Core

Surface Elevation (ft) / Vertical Datum	5145.0	Hammer Data	140 (lbs) / 30 (in) Drop	Drilling Equipment	Mobile BK-81 Truck Mounted
Latitude / Longitude	1528896.018 / 3460445.613	System Datum	Geographic / Utah State Plane North	Groundwater	
Notes: Installed inclinometer upon completion.				Date Measured	Depth to Water (ft): Not encountered; Elevation (ft): N/A

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	0								SP				
5140	5												Top 10 feet of borehole removed with vacuum truck.
5135	10												
5130	15		15	12		S1				Light brown very fine sand with trace silt (medium dense, dry)			
									CL				
5125	20		13	27		S2				Sandy clay with trace gravel			% Fines = 51.0 % Gravel = 4.3
									CL				
5120	25		16	26		S3				Grayish brown lean clay (very stiff, slightly moist)			
5115	30		18	112		S4				Becomes hard and whitish gray with trace gravel			LL = 35 PI = 19
	35												

Note: See Figure A-1 for explanation of symbols.

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Portland Date 8/29/14 Path:\\SGP\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate\LibTemplate.GEOENGINEERS8.GDT\GEI8_GEOTECH_STANDARD

Log of B-9

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-6
Sheet 1 of 4

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	35		10	41		S5			CL	Grayish brown lean clay with trace sand (hard, slightly moist)			
5105	40		18	156		S6				Becomes reddish brown with occasional sand			LL = 37 PI = 23
									ML				
5100	45		18	88		S7				Red silt with sand (very dense, dry)			
									CL				
5095	50		18	61		S8				Reddish brown lean clay with sand (hard, slightly moist)			
5090	55		18	57		S9				Becomes very stiff with trace sand			LL = 37 PI = 22
5085	60		16	82		S10				Becomes hard with trace black sand			
5080	65		15	112		S11							LL = 39 PI = 22
			18	110		S12				With sand			
5075	70			48		S13				Becomes very stiff and moist with sand and gravel (gravels are siltstone pieces)			Possible water table at 70' bgs
5070	75		16	55		S14				Becomes red with gray sandy clay and gravel			

Note: See Figure A-1 for explanation of symbols.

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Portland Date:8/29/14 Path:\\SOF\PROJECTS\16 16265002-09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ GBTemplates\Template GEOENGINEERS\GDT\GEB_GEOTECH_STANDARD

Log of B-9 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-6
Sheet 2 of 4

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
									CL	Red lean clay with gray sandy clay seams (very stiff, moist)			
									CH				
5065	80		9	150		S15				Red fat clay with coarse gravel (hard, moist) (transitioning to bedrock)			
5060	85		18	61		S16				Becomes very stiff and slightly moist with gray fat clay and sand (gravel is siltstone)			LL = 57 PI = 39
									CH				
5055	90		17	63		S17				Gray fat clay (hard, slightly moist) (siltstone weathered to clay)			LL = 81 PI =58
5050	95		18	58		S18				With sand and contains trace green clay			
5045	100		5	120/5.5"		S19				Becomes hard, dry and light grayish brown			LL = 57 PI = 34
5040	105		5.5	120/5.5"		S20							
5035	110		60			R1			Siltstone	SILTSTONE, Reddish Brown and gray, moderately to slightly weathered, medium hard, moderately closely jointed (interlayered with 3 slightly weaker claystone beds on top 3 feet)			
5030	115		60			R2							

Note: See Figure A-1 for explanation of symbols.

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Portland: Date:8/29/14 Path:\\SGP\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate\LibTemplate: GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Log of B-9 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-6
Sheet 3 of 4

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)	REMARKS
	120									SILTSTONE, Reddish Brown and gray, moderately to slightly weathered, medium hard, moderately closely jointed (interlayered with 3 slightly weaker claystone beds on top 3 feet)			

DRAFT

Note: See Figure A-1 for explanation of symbols.

Log of B-9 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-6
Sheet 4 of 4

Portland Date:6/29/14 Path:\\SGP\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ GBTemplate\LibTemplate GEOENGINEERS8.GDT\GEI8_GEOTECH_STANDARD

Drilled	Start 8/15/2014	End 8/15/2014	Total Depth (ft)	50	Logged By	MCK	Checked By	TNH	Driller	Earthcore Drilling, Inc.	Drilling Method	ODEX

Hammer Data		Drilling Equipment	Mobile B-80 Truck Mounted
Surface Elevation (ft) Vertical Datum	5128.7	Top of Casing Elevation (ft)	
Latitude Longitude	1528690.951 3460631.563	System Datum	Geographic Utah State Plane North

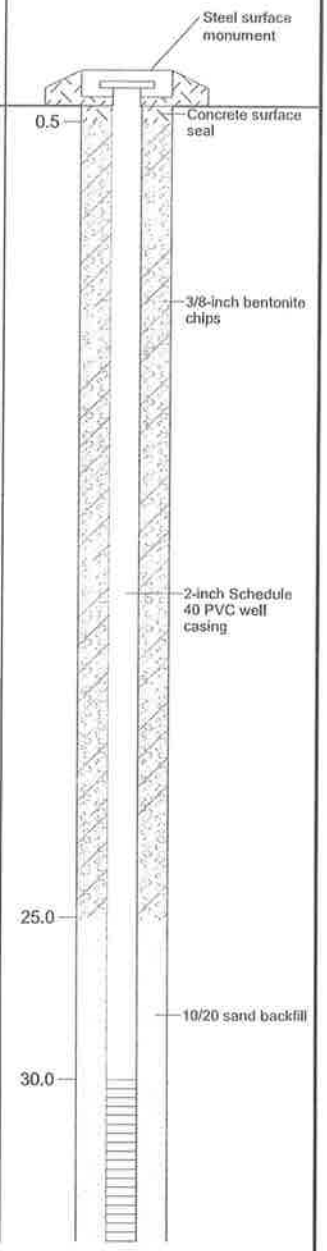
A 2 (in) well was installed on 8/15/2014 to a depth of 50 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
		N/A

Notes:

Elevation (feet)	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (psf)
	0							SP/GP	Light brown and gray sand and gravel		
5125	5										
5120	10										
5115	15										
5110	20										
5105	25										
5100	30										
5095	35										

WELL LOG



DRAFT

Note: See Figure A-1 for explanation of symbols.

Log of P-1

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-7
Sheet 1 of 2

Portland Date:8/29/14 Path:\\SGF\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate:LibTemplate:GEOENGINEERS9.GDT\GEI9_GEOTECH_WELL

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	WELL LOG
	35							SP/GP	Light brown and gray sand and gravel			
5090												
	40											2-inch Schedule 40 PVC screen, 0.010-inch slot width
5085												
	45											
5080								CL	Red fat clay			
	50											50.0

DRAFT

Note: See Figure A-1 for explanation of symbols.

Log of P-1 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-7
Sheet 2 of 2

Portland Date:8/29/14 Path:\\SGP\PROJECTS\16\16265002\09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate:GEOENGINEERS8.GDT\GEN_GEOTECH_WELL

Drilled	Start 8/15/2014	End 8/15/2014	Total Depth (ft)	51	Logged By MCK Checked By TNH	Driller	Earthcore Drilling, Inc.	Drilling Method	ODEX

Hammer Data		Drilling Equipment	Mobile B-80 Truck Mounted
Surface Elevation (ft) Vertical Datum	5145.0	Top of Casing Elevation (ft)	
Latitude Longitude	1528872.726 3460518.899	System Datum	Geographic Utah State Plane North

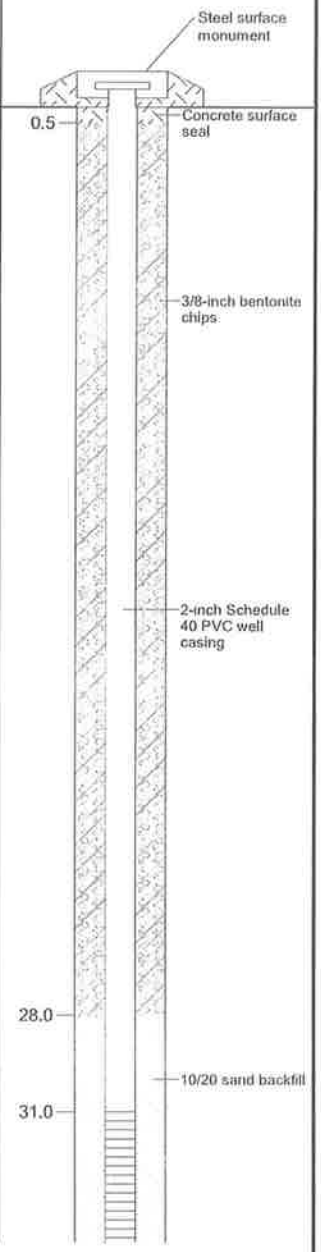
A 2 (in) well was installed on 8/15/2014 to a depth of 51 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
		N/A

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (psf)
	0								SP/GP	Light brown and gray sand and gravel		
5140	5											
5135	10											
5130	15											
5125	20											
5120	25											
5115	30											
	35											

WELL LOG



Note: See Figure A-1 for explanation of symbols.

DRAFT

Log of P-2

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-8
Sheet 1 of 2

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (psf)	WELL LOG
	35								SP/GP	Light brown and gray sand and gravel			
5105	40												2-inch Schedule 40 PVC screen, 0.010-inch slot width
5100	45												
									CL	Red and gray fat clay			
5095	50												51.0

DRAFT

Note: See Figure A-1 for explanation of symbols.

Log of P-2 (continued)

GEOENGINEERS

Project: Eagle Crest Landslide
Project Location: North Salt Lake, Utah
Project Number: 16265-002-09

Figure A-8
Sheet 2 of 2

Portland Date:8/29/14 Path:\\SGP\PROJECTS\16\16265002-09\GINT\NORTH SALT LAKE LANDSLIDE.GPJ DBTemplate\LibTemplate GEOENGINEERS8.GDT/GEI8_GEOTECH_WELL

CLIENT: Sky Properties
PROJECT: Eaglepointe Slide
PROJECT NUMBER: 1374-004-14

KEY TO BORING LOG

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫

COLUMN DESCRIPTIONS

① **Water Level:** Depth to measured groundwater table. See symbol below.

② **USCS:** (Unified Soil Classification System) Description of soils encountered; typical symbols are explained below.

③ **Description:** Description of material encountered; may include color, moisture, grain size, density/consistency,

④ **Depth (ft.):** Depth in feet below the ground surface.

⑤ **Blow Count:** Number of blows to advance sampler 12" beyond first 6", using a 140-lb hammer with 30" drop.

⑥ **Sample Symbol:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

⑦ **Moisture (%):** Water content of soil sample measured in laboratory; expressed as percentage of dryweight of

⑧ **Dry Density (pcf):** The density of a soil measured in laboratory; expressed in pounds per cubic foot.

⑨ **% Passing 200:** Fines content of soils sample passing a No. 200 sieve; expressed as a percentage.

⑩ **Liquid Limit (%):** Water content at which a soil changes from plastic to liquid behavior.

⑪ **Plasticity Index (%):** Range of water content at which a soil exhibits plastic properties.

⑫ **Remarks:** Comments and observations regarding drilling or sampling made by driller or field personnel. May include other field and laboratory test results using the following abbreviations:

CEMENTATION:	MODIFIERS:	MOISTURE CONTENT (FIELD TEST):
Weakly: Crumbles or breaks with handling or slight finger pressure.	**Trace** <5%	**Dry:** Absence of moisture, dusty, dry to the touch.
Moderately: Crumbles or breaks with considerable finger pressure.	**Some** 5-12%	**Moist:** Damp but no visible water.
Strongly: Will not crumble or break with finger pressure.	**With** > 12%	**Saturated:** Visible water, usually soil below water table.

Descriptions and stratum lines are interpretive; field descriptions may have been modified to reflect lab test results. Descriptions on the logs apply only at the specific boring locations and at the time the borings were advanced; they are not warranted to be representative of subsurface conditions at other locations or times.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS SYMBOLS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS More than 50% of material is larger than No. 200 sieve size.	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve.	CLEAN GRAVELS (little or no fines)	GW	Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
			GP	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		GRAVELS WITH FINES (appreciable amount of fines)	GM	Silty Gravels, Gravel-Sand-Silt Mixtures
			GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS More than 50% of coarse fraction passing through No. 4 sieve.	CLEAN SANDS (little or no fines)	SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
			SP	Poorly-Graded Sands, Gravelly Sands, Little or No Fines
		SANDS WITH FINES (appreciable amount of fines)	SM	Silty Sands, Sand-Silt Mixtures
			SC	Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More than 50% of material is smaller than No. 200 sieve size.	SILTS AND CLAYS Liquid Limit less than 50%		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
			CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
			OL	Organic Silts and Organic Silty Clays o f Low Plasticity
	SILTS AND CLAYS Liquid Limit greater than 50%		MH	Inorganic Silts, Micacious or Diatomacious Fine Sand or Silty Soils
			CH	Inorganic Clays of High Plasticity, Fat Clays
			OH	Organic Silts and Organic Clays of Medium to High Plasticity
HIGHLY ORGANIC SOILS			PT	Peat, Humus, Swamp Soils with High Organic Contents

Note: Dual Symbols are used to indicate borderline soil classifications.

STRATIFICATION:

DESCRIPTION	THICKNESS
Seam	up to 1/8"
Layer	1/8" to 12"

Occasional: One or less per 6" of thickness
Numerous: More than one per 6" of thickness

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Bulk/Bag Sample
- Standard Penetration Split Spoon Sampler
- Rock Core
- No Recovery
- 3.25" OD, 2.42" ID D&M Sampler
- 3.0" OD, 2.42" ID D&M Sampler
- California Sampler
- Thin Wall

WATER SYMBOL

- Water Level

FIGURE 4

GSH

GSH

BORING LOG

BORING: B-1

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 6/19/14 | DATE FINISHED: 6/20/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: ZM

DRILLING METHOD/EQUIPMENT: 8" OD Hollow-Stem Auger/Rotary Wash HAMMER: Automatic; WEIGHT: 140 lbs; DROP: 30"

GROUNDWATER DEPTH: Not Encountered (6/20/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	SC	CLAYEY FINE TO COARSE SAND trace fine gravel, occasional cobbles up to 4" in size; brown	0								slightly moist medium dense
			5								
				33							
	SM	SILTY FINE SAND with some clay; brown	10								moist to very moist medium dense
				23		27		34			
	SC	CLAYEY FINE SAND with some silt; brown	15								moist to very moist medium dense
				30		24	89	43			
	GP-GM	FINE TO COARSE SANDY FINE GRAVEL with some coarse gravel and some silt; brown	20								moist very dense
				27 50/5"							
			25								

See Subsurface Conditions section in the report for additional information.

FIGURE 3A

GSH

BORING LOG

BORING: B-1

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide

DATE STARTED: 6/19/14 DATE FINISHED: 6/20/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		grades with some cobbles and possibly small boulders below 25'; -Switched to rotary wash	25								
			30	50/5"		10		8			
		lost water circulation at 31'; added drill mud to improve circulation									
			35	40 50/3"						NP	
		slow drill advancement									
				50/5"							
			40								
			45	46 50/3"							
		8" size cobble at 49'									
			50	80							

See Subsurface Conditions section in the report for additional information.

FIGURE 3A
(continued)

GSH	BORING LOG Page: 3 of 3	BORING: B-1

CLIENT: Sky Properties — PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide — DATE STARTED: 6/19/14 — DATE FINISHED: 6/20/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		FINE TO COARSE SANDY FINE GRAVEL (continued)	52								
		End of Exploration (too much torque) at 54.0' No groundwater encountered at time of drilling. Installed 1.25" diameter slotted PVC pipe to 54.0'.	55								
			60								
			65								
			70								
			75								

See Subsurface Conditions section in the report for additional information.

FIGURE 3A
(continued)

GSH

BORING LOG

BORING: B-2

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 6/20/14 | DATE FINISHED: 6/25/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: ZM

DRILLING METHOD/EQUIPMENT: 8" OD Hollow-Stem Auger/Rotary Wash | HAMMER: Automatic; WEIGHT: 140 lbs; DROP: 30"

GROUNDWATER DEPTH: 33.0' (6/25/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	SM FILL	FILL, SILTY FINE SAND with some clay and fine gravel; brown	0								slightly moist loose
			5								
		grades with trace coarse sand	10	19							
			15	22		8		20			
			20	11							
	SC	CLAYEY FINE SAND with some silt; brown	25	29		23	102		27	9	very moist medium dense

See Subsurface Conditions section in the report for additional information.

FIGURE 3B

GSH

BORING LOG

BORING: B-2

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide

DATE STARTED: 6/20/14 DATE FINISHED: 6/25/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		CLAYEY FINE SAND (continued)	25	29		23	102		27	9	
	GC-GM	SILTY CLAYEY FINE AND COARSE GRAVEL with fine to coarse sand; brown	30	24 50/6"							moist very dense
											saturated
			35	38 50/6"		8		13			
		gravel is rounded to subrounded -Switched to rotary wash	40	40 50/3"					19	5	
			45	60/5"							
			50	50/5"							

See Subsurface Conditions section in the report for additional information.

FIGURE 3B (continued)

GSH	BORING LOG Page: 3 of 3	BORING: B-2

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 6/20/14 | DATE FINISHED: 6/25/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		SILTY CLAYEY FINE AND COARSE GRAVEL (continued)	52								
				50/3"							
		End of Exploration (too much torque) at 54.0' Installed Inclinometer Pipe to 54.0'	55								
			60								
			65								
			70								
			75								

See Subsurface Conditions section in the report for additional information.

FIGURE 3B
(continued)

GSH

BORING LOG

BORING: B-3

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 6/26/14 | DATE FINISHED: 6/26/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: ZM

DRILLING METHOD/EQUIPMENT: 8" OD Hollow-Stem Auger/Rotary Wash HAMMER: Automatic; WEIGHT: 140 lbs; DROP: 30"

GROUNDWATER DEPTH: Not Encountered (6/26/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	SM FILL	FILL, SILTY FINE SAND with some clay; brown	0								moist very loose
			5	7							
			10	16							loose
	SM	SILTY FINE SAND with some thin layers of fine sandy clay; brown	15	13		11	83	43			moist loose
	GP-GC-	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with some clay; brown Auger refusal at 18', switched to rotary wash		50/2"							moist very dense
			20								
			25	40							

See Subsurface Conditions section in the report for additional information.

FIGURE 3C

GSH

BORING LOG

BORING: B-3

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 6/26/14 | DATE FINISHED: 6/26/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		FINE TO COARSE SANDY FINE AND COARSE GRAVEL	25	40 50/4"							
			30	68		9		11			
		lost circulation at 33'	35	49							
	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with trace silt; brown	40	46 50/4"							moist very dense
			45	41 50/2"							
			50	24 31 50/4"							
		End of Exploration at 51.5'. Installed Inclinometer Pipe to 51.5'									

See Subsurface Conditions section in the report for additional information.

FIGURE 3C
(continued)

GSH

BORING LOG

BORING: B-4

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 8/8/14 | DATE FINISHED: 8/8/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: GS

DRILLING METHOD/EQUIPMENT: ODEX / HQ Coring | HAMMER: Automatic | WEIGHT: 140 lbs | DROP: 30"

GROUNDWATER DEPTH: Not Encountered (8/8/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	SC	CLAYEY FINE SAND with some fine gravel; red-gray	0								slightly moist dense
			5	32		8		30	37	19	
	SM	SILTY FINE SAND with some fine gravel; light brown	10	28		3		19			dry medium dense
	CH	FINE SANDY CLAY red (possibly weathered bedrock)	15	50/2"							dry hard
		SILTSTONE with sand-silt grains; moderately fractured; light reddish-brown	20								dry moderately hard **Core Run 1:** 20' - 25' 36" recovered RQD = 20%
			25								

See Subsurface Conditions section in the report for additional information.

FIGURE 3D

GSH	BORING LOG Page: 2 of 2	BORING: B-4

CLIENT: Sky Properties — PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide — DATE STARTED: 8/8/14 — DATE FINISHED: 8/8/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		SILTSTONE (continued) highly fractured	25								**Core Run 2:** 25' - 30' 24" recovered RQD = 0%
		End of Exploration at 30.0'. No groundwater encountered at time of drilling. About 30.3' of inclinometer casing installed to depth of about 29' with about 1.3' above ground surface. Casing was slotted and backfilled with sand below 10'. Upper 10' was backfilled with bentonite chips.	30 35 40 45 50								

See Subsurface Conditions section in the report for additional information.

FIGURE 3D
(continued)

GSH

BORING LOG

BORING: B-5

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 8/8/14 | DATE FINISHED: 8/8/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: GS

DRILLING METHOD/EQUIPMENT: ODEX / HQ Coring | HAMMER: Automatic | WEIGHT: 140 lbs | DROP: 30"

GROUNDWATER DEPTH: Not Encountered (8/8/14); 19.0' (9/1/14); 19.7' (9/20/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	FILL	ASPHALT & ROAD BASE, FILL	0								
	CL	FINE SANDY SILTY CLAY with occasional fine sand laminae; light reddish-brown		23							moist very stiff
				13		26		54	49	32	stiff
			5	16							
				15							
				18							very stiff
			10	24							
				9 50/5"		13		54			hard
	SC	CLAYEY FINE SAND highly plastic; light reddish-brown	15	66		15		44	73	55	moist very dense
▼				5 50/6"							
		CLAYSTONE-SILTSTONE with clay to silt particles; massive, highly to moderately fractured; light reddish-brown	20								dry moderately hard **Core Run 1:** 20' - 25' 12" recovered RQD = 0%
			25								

See Subsurface Conditions section in the report for additional information.

FIGURE 3E

GSH

BORING LOG

BORING: B-5

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide

DATE STARTED: 8/8/14

DATE FINISHED: 8/8/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		CLAYSTONE-SILTSTONE (continued)	25								**Core Run 2:** 25' - 30' 54" recovered RQD = 75%
			30								**Core Run 3:** 30' - 35' 60" recovered RQD = 75%
		End of Exploration at 35.0'. No groundwater encountered at time of drilling. About 33.5' of inclinometer casing installed to depth of about 33.5' with top of pipe flush with ground surface. Casing was slotted and backfilled with sand below 15'. Upper 15' was backfilled with bentonite chips.	35								
			40								
			45								
			50								

See Subsurface Conditions section in the report for additional information.

FIGURE 3E
(continued)

GSH

BORING LOG

BORING: B-6

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 8/15/14 | DATE FINISHED: 8/18/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: HW

DRILLING METHOD/EQUIPMENT: 8" OD Hollow-Stem Auger | HAMMER: Automatic | WEIGHT: 140 lbs | DROP: 30"

GROUNDWATER DEPTH: Not Encountered (8/18/14); 86.6' (9/1/14); 85.7' (9/20/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	GP FILL	FINE AND COARSE GRAVEL, FILL AND/OR DISTURBED with some fine to coarse sand and some silt; brown	0								moist loose
			5	9							
		grades with some clay	10	4							very loose
			15	4							
			20	3		1		2			slightly moist very moist
	CL	SILTY CLAY with some fine sand; brown									moist stiff
			25								

See Subsurface Conditions section in the report for additional information.

FIGURE 3F

GSH

BORING LOG

BORING: B-6

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 8/15/14 | DATE FINISHED: 8/18/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		SILTY CLAY (continued) grades with 1/8" sand lenses	25	12							
				17							very moist
	GC	CLAYEY FINE AND COARSE GRAVEL with some fine to coarse sand; brown		26							slightly moist medium dense
			30								dense
		gravel grades out		40		7		27	28	13	
	SM/ML	SILTY FINE SAND/FINE SANDY SILT with some clay and trace medium to coarse sand; brown									moist med.dense/very stiff
	CL/SC	FINE SANDY CLAY/CLAYEY FINE SAND with some silt; reddish-brown		26							moist very stiff/med.dense
			35	23							
				24							
	CL	SILTY CLAY with fine sand and angular gravel; gray grades with less fine sand but some angular gravel; reddish-brown		26							moist medium stiff moist
	GC	CLAYEY FINE GRAVEL with some fine to coarse sand; trace coarse gravel; brown	40								medium dense
				34		15	107	16	28	13	
	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with trace to some clay; orange-brown grades with cobbles up to 5" in diameter		46							slightly moist medium dense
	CL	FINE SANDY CLAY with some silt; trace medium to coarse sand; brown appears disturbed at 45' - 46' (possible slide plane)	45	26							moist very stiff
	GC	CLAYEY FINE AND COARSE GRAVEL with fine to coarse sand; brown		36		8		35	29	17	slightly moist medium dense
	CL	SILTY CLAY with some fine gravel; gray		22							moist very stiff
	SC	CLAYEY FINE SAND orange-brown grades with some medium to coarse sand	50	52							moist medium dense

See Subsurface Conditions section in the report for additional information.

FIGURE 3F
(continued)

GSH

BORING LOG

BORING: B-6

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 8/15/14 | DATE FINISHED: 8/18/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
	CL	FINE SANDY CLAY trace medium to coarse sand; trace fine gravel; orange-brown	52	41		16	110	51	49	33	moist very stiff
			55	75							hard
		coarse sand, fine gravel grade out		34							very stiff
				34							
	CL	FINE AND COARSE GRAVELLY CLAY with some fine to coarse sand; reddish-brown cobble at 61'	60	47 75/2"							moist very stiff
				39		20	100	60	46	32	
	CL	SILTY CLAY with some fine sand; trace medium to coarse sand; brown	65	64							moist hard
		grades with some fine to coarse sand; trace fine and coarse gravel; reddish-brown		34							very stiff
			70	66							hard
		grades with more sand and gravel		49		11	104	50	40	25	very stiff
	GC	CLAYEY FINE AND COARSE GRAVEL with some fine to coarse sand; reddish-brown	75								moist medium dense
	CL	SILTY CLAY with some fine sand; trace medium to coarse sand; brown		36							moist very stiff

See Subsurface Conditions section in the report for additional information.

FIGURE 3F
(continued)

GSH

BORING LOG

BORING: B-6

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide

DATE STARTED: 8/15/14 DATE FINISHED: 8/18/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		SILTY CLAY (continued)	79								
			80	55							
	SC	CLAYEY FINE SAND bright reddish-brown									moist medium dense
	CL	SILTY CLAY with some fine sand; olive green									moist very stiff
			85	39							very moist
	GC	CLAYEY FINE AND COARSE GRAVEL (CLAYSTONE- with some fine to coarse sand; reddish-brown									moist dense
			90	45 75 75/4"							slightly moist very dense
		hard drilling									
			95	58 75/2"							
		End of Exploration at 96.0'. No groundwater encountered at time of drilling. About 98' of inclinometer casing installed to depth of about 94.5' with about 3.5' above ground surface. Casing was slotted and backfilled with sand below 25'. Upper 25' was backfilled with bentonite chips.									
			100								
			105								

See Subsurface Conditions section in the report for additional information.

FIGURE 3F
(continued)

GSH

BORING LOG

BORING: B-7

CLIENT: Sky Properties | PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide | DATE STARTED: 8/19/14 | DATE FINISHED: 8/20/14

LOCATION: North Salt Lake, Utah | GSH FIELD REP.: HW

DRILLING METHOD/EQUIPMENT: 8" OD Hollow-Stem Auger | HAMMER: Automatic | WEIGHT: 140 lbs | DROP: 30"

GROUNDWATER DEPTH: Not Encountered (8/20/14); 52.9' (9/20/14) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	GP FILL	FINE TO COARSE SANDY FINE AND COARSE GRAVEL, with some silt and clay; brown	0								moist loose
			5	13							
			10	16							
				20							
			15	17		2		4			slightly moist
				6							very loose
				10							no recovery
			20	21							loose
				11							very moist
	CL	SILTY CLAY with some fine sand; brown	25	16		25		63	41	23	very moist stiff

See Subsurface Conditions section in the report for additional information.

FIGURE 3G

GSH

BORING LOG

BORING: B-7

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide

DATE STARTED: 8/19/14 DATE FINISHED: 8/20/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		SILTY CLAY (continued)	25	16		25		63	41	23	very moist stiff
		appears disturbed at 27' - 28' (possible slide plane)		15							
		grades gray with trace coarse gravel		14							
			30	13							moist
			35	19		30	90	84	40	23	very moist
		grades brown									
			40	14							
				17							
		grades gray	45	60		14	118	75	57	39	hard
		CLAYSTONE-SILTSTONE moderately fractured; light reddish-brown		23 75/6"							dry soft to slightly hard
				75/4"							moderately hard
			50	45 75/3"							

See Subsurface Conditions section in the report for additional information.

FIGURE 3G
(continued)

GSH

BORING LOG

BORING: B-7

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

PROJECT: Eaglepointe Slide

DATE STARTED: 8/19/14 DATE FINISHED: 8/20/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		CLAYSTONE-SILTSTONE (continued)	52								
			55	75/3"							
		End of Exploration at 55.5'. No groundwater encountered at time of drilling. About 58.2' of inclinometer casing installed to depth of about 54.7' with about 3.5' above ground surface. Casing was slotted and backfilled with sand below 20'. Upper 20' was backfilled with bentonite chips.	60								
			65								
			70								
			75								

See Subsurface Conditions section in the report for additional information.

FIGURE 3G
(continued)

GSH

BORING LOG

BORING: B-8

CLIENT: Sky Properties
PROJECT NUMBER: 1374-004-14
PROJECT: Eaglepointe Slide
DATE STARTED: 8/20/14
DATE FINISHED: 8/21/14
LOCATION: North Salt Lake, Utah
GSH FIELD REP.: HW
DRILLING METHOD/EQUIPMENT: 8" OD Hollow-Stem Auger / HQ Coring
HAMMER: Automatic; WEIGHT: 140 lbs; DROP: 30"
GROUNDWATER DEPTH: Not Encountered (8/21/14); 21.7' (9/1/14); 23.8' (9/20/14)
ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface									
	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with some silt; reddish-brown	0								slightly moist loose to medium dense
		grades with more silt	5	16		4		21			
	GC	CLAYEY FINE AND COARSE GRAVEL reddish-brown									moist medium dense
		Boulder 15" in thickness at 11'	10	15 75/4"		9	110	16	32	18	dense
	CL	SILTY CLAY with some fine to coarse sand; trace gravel; reddish-brown									moist hard
		CLAYSTONE - SILTSTONE moderately fractured; light reddish-brown	15	75/6"							dry moderately hard **Core Run 1:** 15.5' - 18.0' 24" recovered RQD = 44%
			20								**Core Run 2:** 18' - 23' 58" recovered RQD = 59%
			25								**Core Run 3:** 23' - 28' 57" recovered RQD = 78%

See Subsurface Conditions section in the report for additional information.

FIGURE 3H

GSH

BORING LOG

BORING: B-8

CLIENT: Sky Properties

PROJECT NUMBER: 1374-004-14

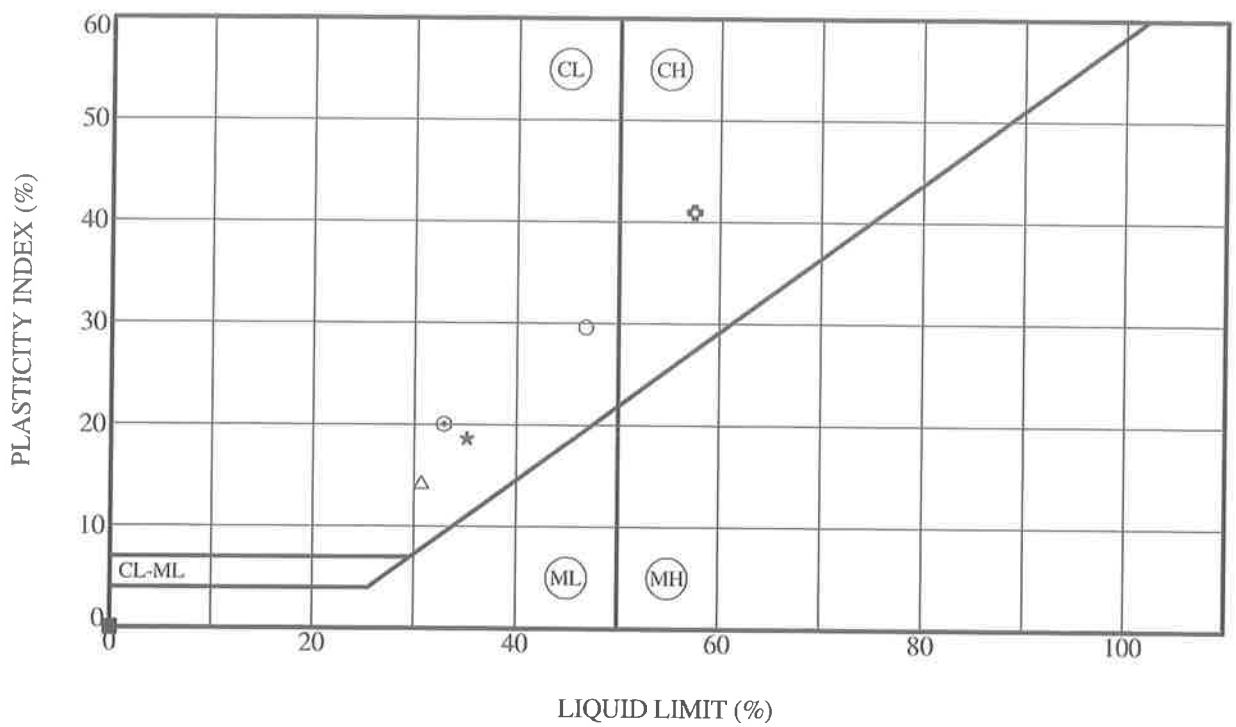
PROJECT: Eaglepointe Slide

DATE STARTED: 8/20/14 DATE FINISHED: 8/21/14

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	BLOW COUNT	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		CLAYSTONE - SILTSTONE (continued)	25								
		End of Exploration at 28.0'. No groundwater encountered at time of drilling. About 25.4' of inclinometer casing installed to depth of about 25.4' with top of pipe flush with ground surface. Casing was slotted and backfilled with sand below 10'. Upper 10' was backfilled with bentonite chips.	30								
			35								
			40								
			45								
			50								

See Subsurface Conditions section in the report for additional information.

FIGURE 3H
(continued)



Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	B-1	8.0	NP	NP	NP		Poorly Graded GRAVEL with silt and sand
⊠	B-1	13.0	NP	NP	NP		Poorly Graded GRAVEL with silt and sand
▲	B-1	18.0	NP	NP	NP		Poorly Graded GRAVEL with silt and sand
★	B-1	25.0	35	16	19		Lean CLAY with sand
⊙	B-1	32.0	33	13	20		Clayey GRAVEL with sand
✿	B-1	37.0	57	17	40		Fat CLAY with sand
○	B-1	39.0	47	17	30		Clayey SAND
△	B-1	43.0	31	16	15		Sandy Lean CLAY

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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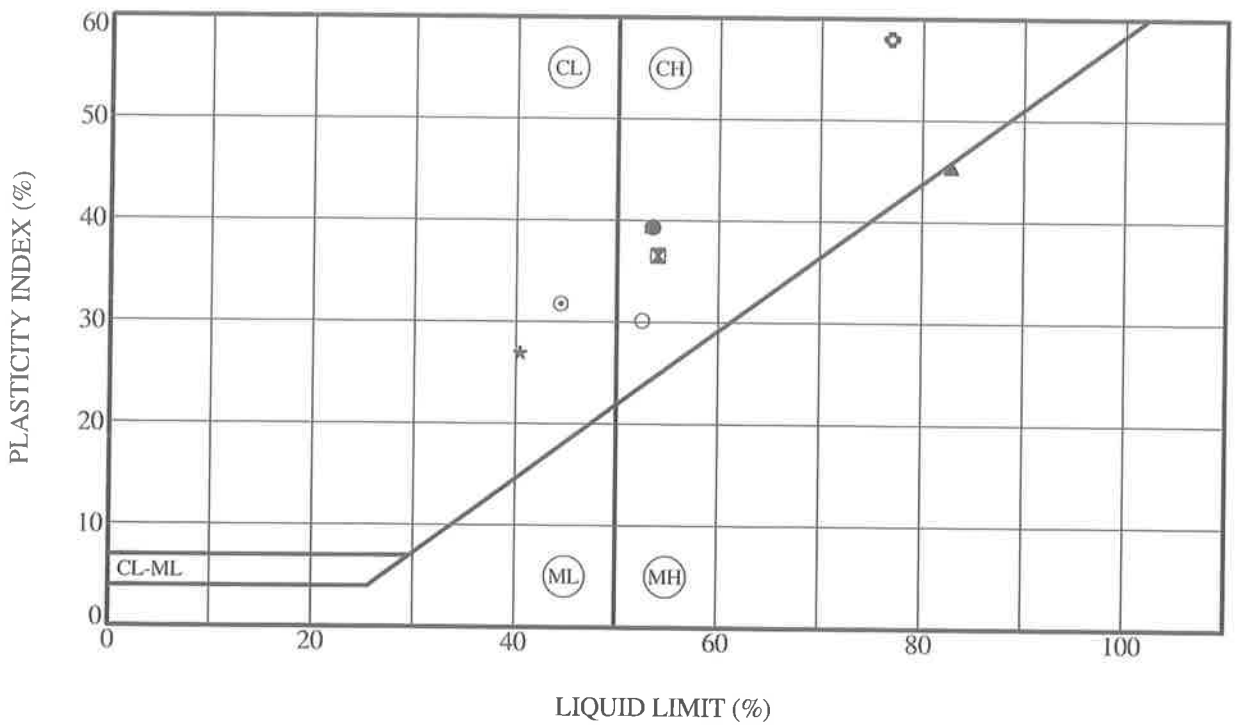

Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	B-1	46.0	53	14	39		Sandy Fat CLAY
⊠	B-1	48.0	54	17	37		Fat CLAY with sand
▲	B-1	50.0	83	37	46		Sandy Fat CLAY with gravel
★	B-1	52.0	40	13	27		Lean CLAY with sand
⊙	B-1	56.0	44	13	31		Sandy Lean CLAY
✿	B-1	58.0	77	19	58		Fat CLAY with sand
○	B-1	63.0	53	22	31		Fat CLAY with sand
△	B-1	65.0	53	14	39		Fat CLAY with sand

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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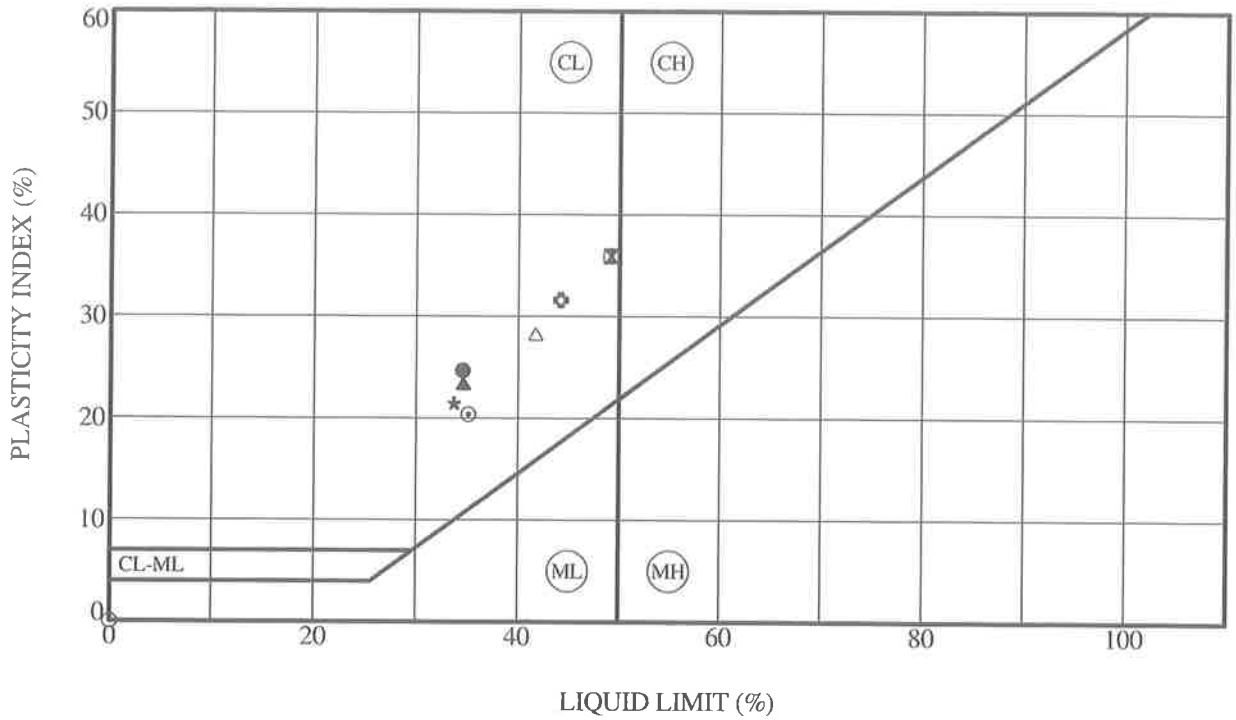

Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	B-1	68.0	35	10	25		Sandy Lean CLAY
⊠	B-1	71.0	49	13	36		Lean CLAY
▲	B-1	76.0	35	11	24		Lean CLAY with sand
★	B-1	78.0	34	12	22		Clayey SAND
⊙	B-1	82.0	35	15	20		Sandy Lean CLAY
✿	B-1	85.0	44	13	31		Sandy Lean CLAY
○	B-2	14.0	NP	NP	NP		Poorly Graded GRAVEL with silt
△	B-2	19.0	42	13	29		Lean CLAY with sand

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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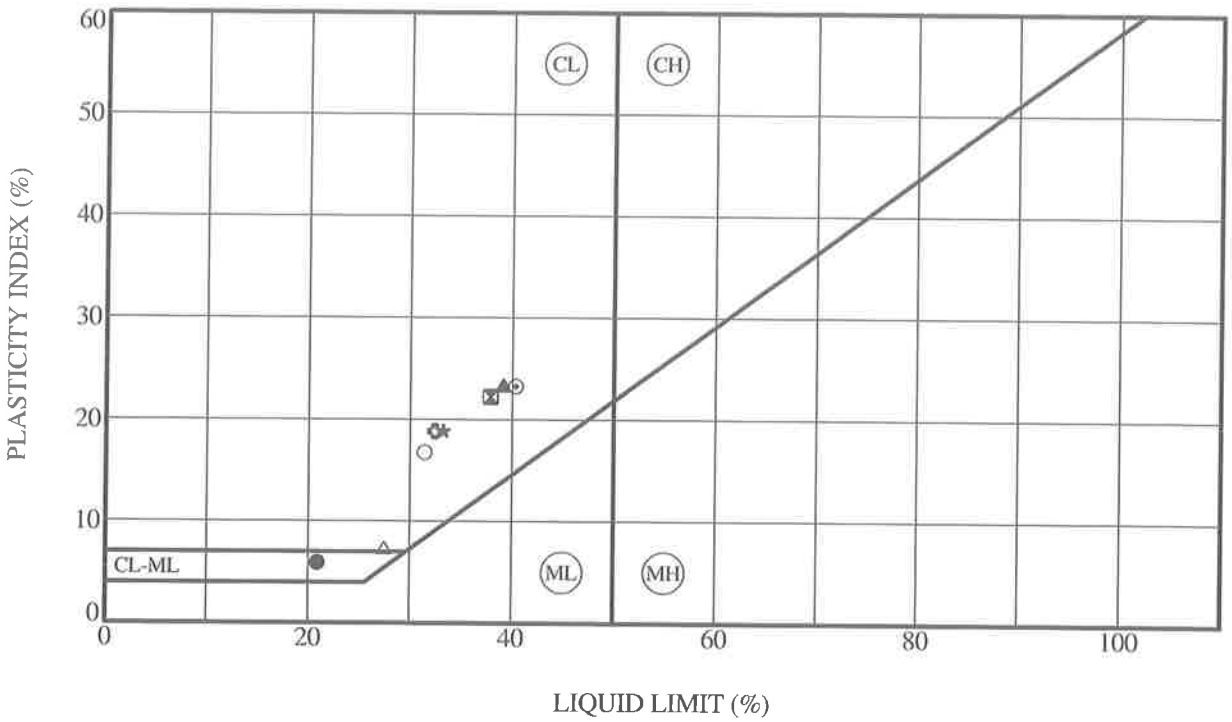

Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	B-2	22.0	21	15	6		Silty Clayey SAND
⊠	B-2	24.0	38	16	22		Sandy Lean CLAY
▲	B-2	28.0	39	16	23		Lean CLAY with sand
★	B-2	31.0	33	14	19		Lean CLAY with sand
⊙	B-2	34.0	40	17	23		Lean CLAY with sand
✿	B-2	36.0	32	14	18		Sandy Lean CLAY
○	B-2	38.0	31	15	16		Clayey GRAVEL with sand
△	B-2	41.0	27	20	7		Sandy Silty CLAY with gravel

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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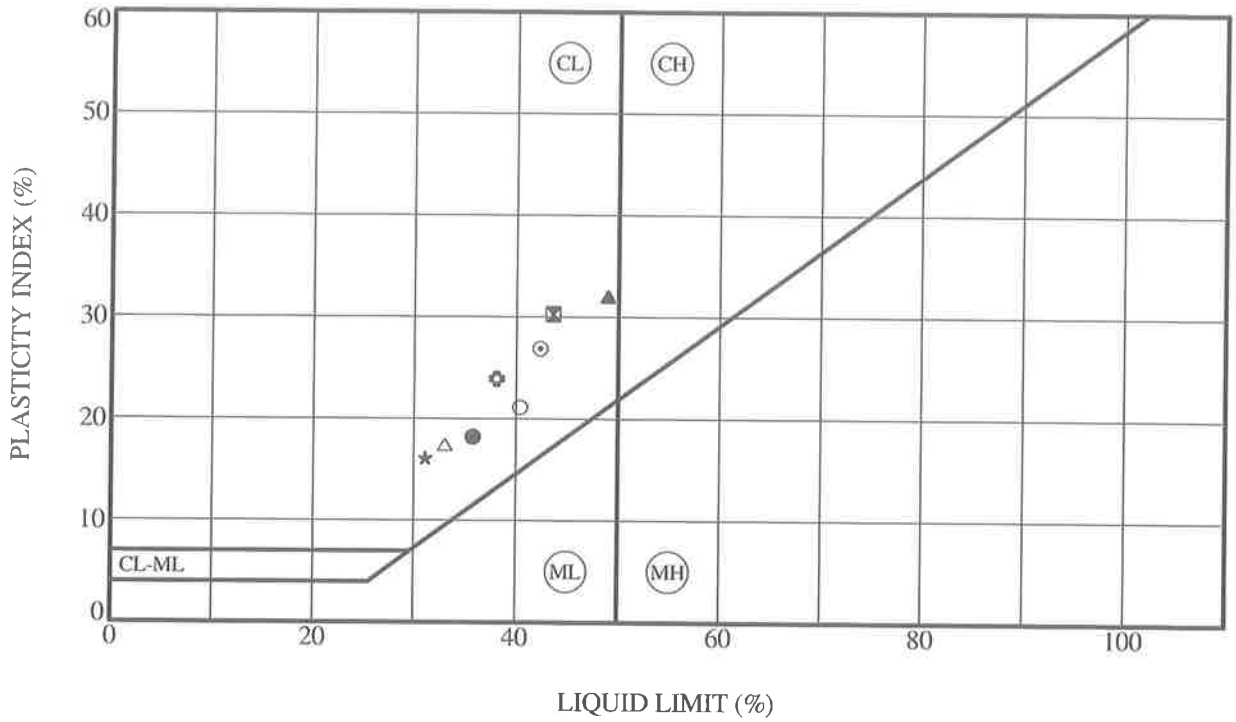
C_ATTERBERG BORING LOGS.GPJ GEOSTRATA.GDT 9/30/14



Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	B-2	44.0	36	18	18		Sandy Lean CLAY
⊠	B-2	46.0	44	13	31		Sandy Lean CLAY with gravel
▲	B-2	48.0	49	17	32		Sandy Lean CLAY
★	B-2	50.0	31	15	16		Clayey GRAVEL with sand
⊙	B-2	53.0	42	15	27		Clayey GRAVEL with sand
✿	B-2	56.0	38	14	24		Sandy Lean CLAY
○	B-2	59.0	40	19	21		Sandy Lean CLAY
△	B-2	61.0	33	16	17		Clayey GRAVEL with sand

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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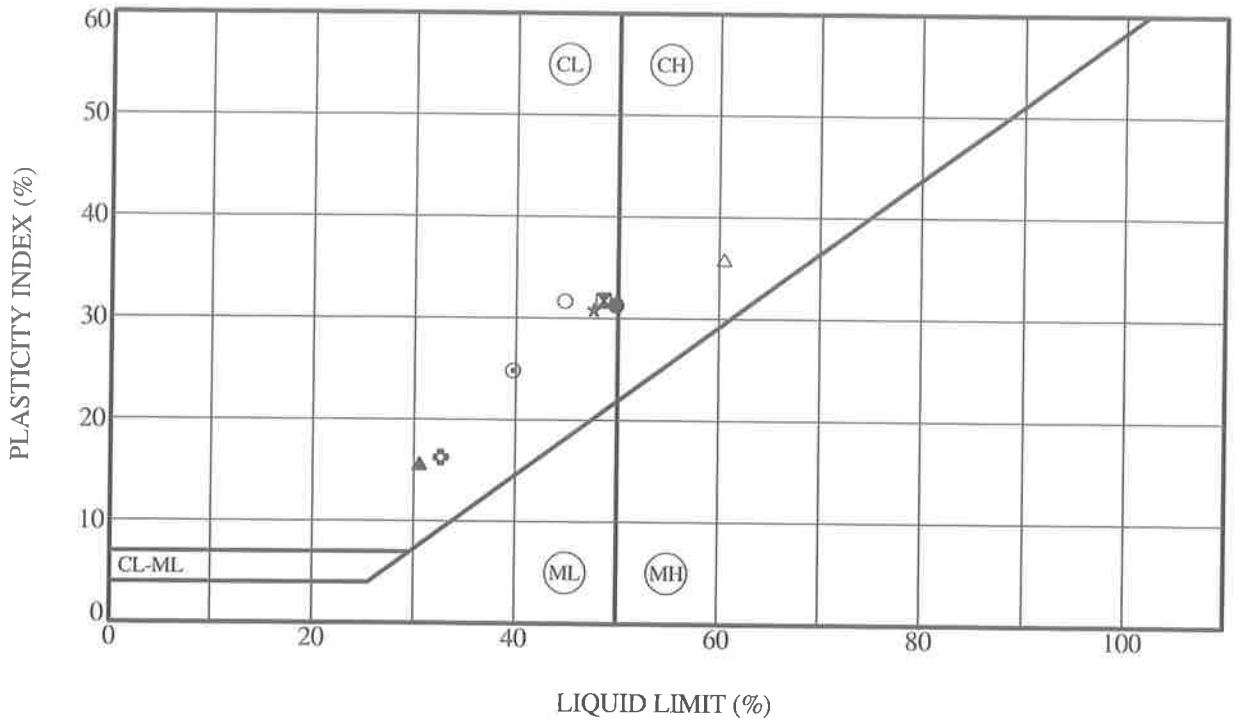

	Sample Location	Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	B-2	64.0	50	18	32		Sandy Fat CLAY
⊠	B-2	66.0	49	17	32		Clayey GRAVEL with sand
▲	B-2	68.0	31	15	16		Clayey GRAVEL with sand
★	B-2	71.0	48	17	31		Sandy Lean CLAY with gravel
⊙	B-2	74.0	40	15	25		Sandy Lean CLAY with gravel
✿	B-2	76.0	33	16	17		Sandy Lean CLAY
○	B-2	79.0	45	13	32		Sandy Lean CLAY
△	B-2	80.0	60	25	35		Fat CLAY with sand

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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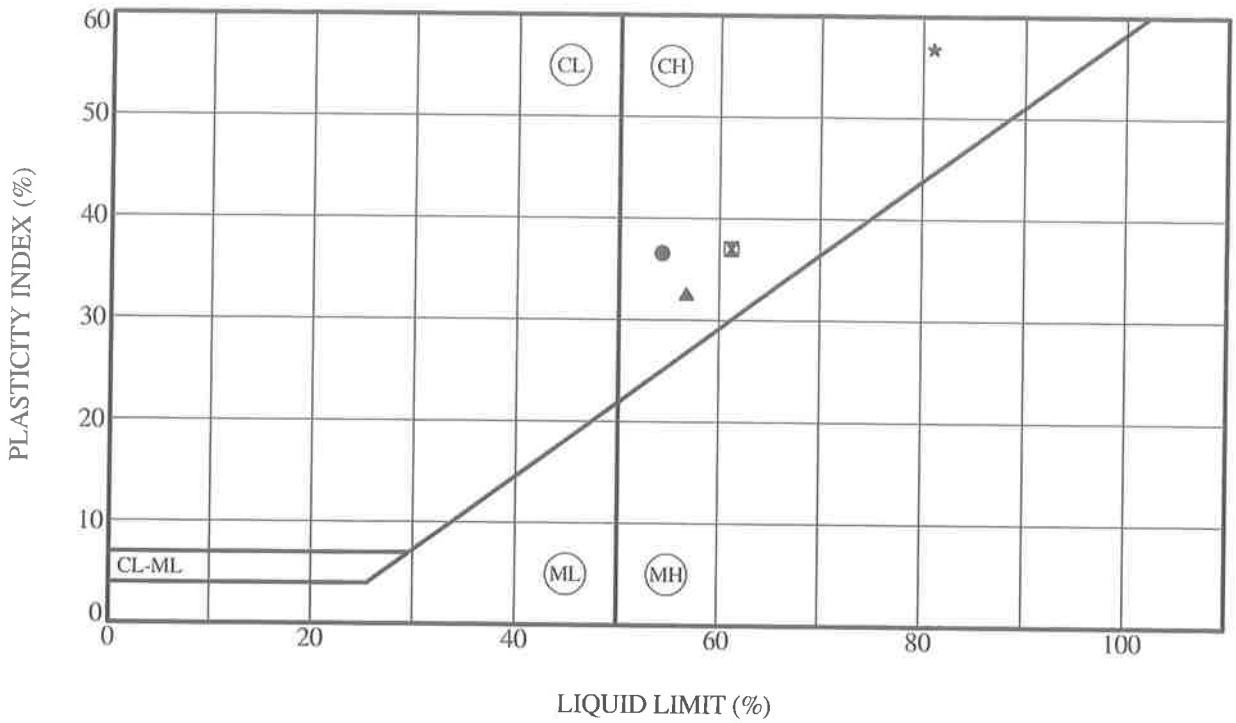

	Sample Location	Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	**B-2**	**83.0**	**54**	**18**	**36**		**Fat CLAY with sand**
⊠	**B-2**	**85.0**	**61**	**24**	**37**		**Fat CLAY with sand**
▲	**B-2**	**87.0**	**57**	**24**	**33**		**Fat CLAY with sand**
★	**B-2**	**88.0**	**81**	**24**	**57**		**Fat CLAY**

GeoStrata

ATTERBERG LIMITS' RESULTS - ASTM D 4318

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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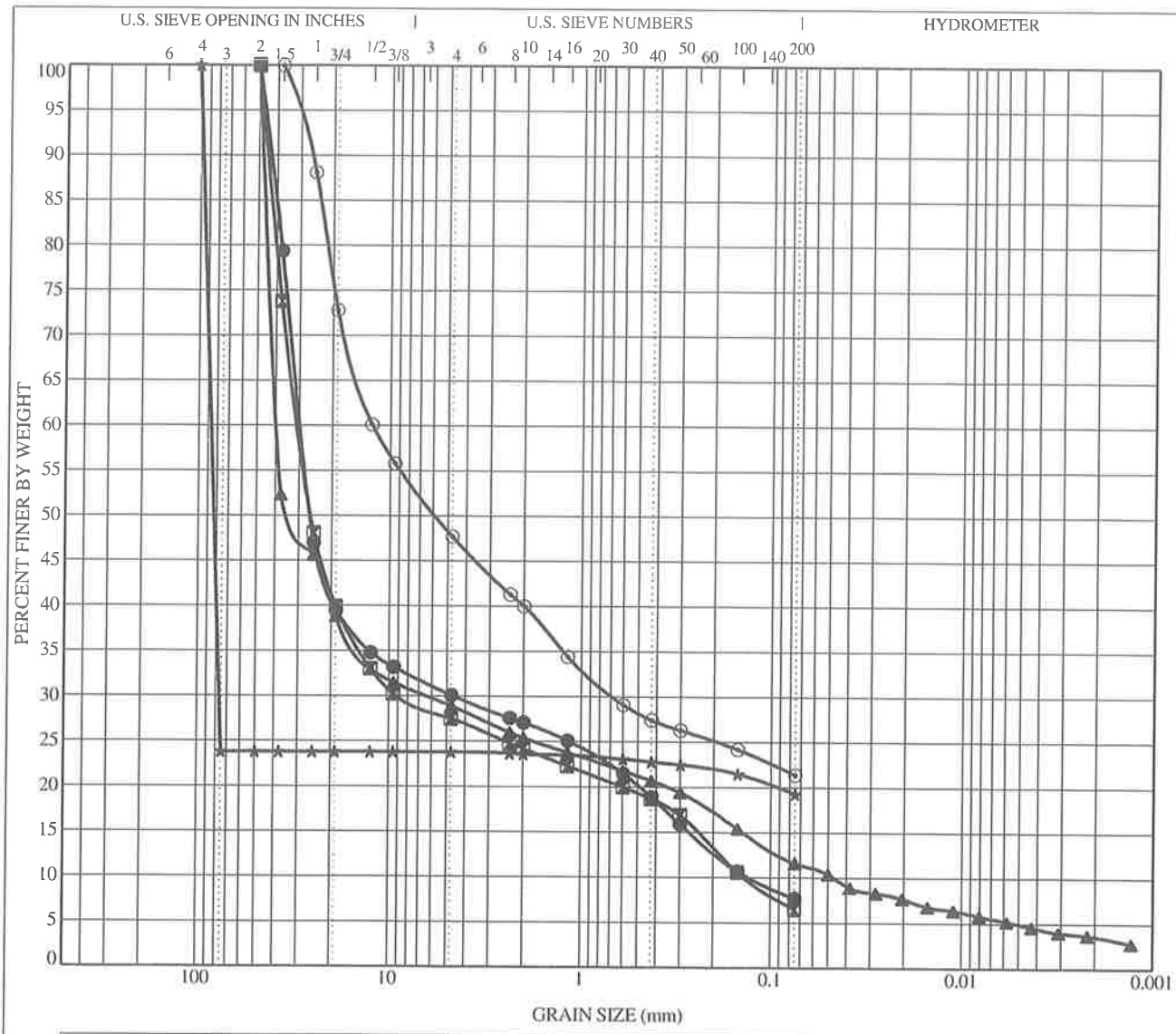

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-1	8.0	**Poorly Graded GRAVEL with silt and sand**	NP	NP	NP	5.68	230.54
⊠	B-1	13.0	**Poorly Graded GRAVEL with silt and sand**	NP	NP	NP	19.92	222.56
▲	B-1	18.0	**Poorly Graded GRAVEL with silt and sand**	NP	NP	NP	22.06	839.32
★	B-1	25.0	**Lean CLAY with sand**	35	16	19		
⊙	B-1	32.0	**Clayey GRAVEL with sand**	33	13	20		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	8.0	50	29.417	4.619	0.128	69.9	22.4	7.7	
⊠	B-1	13.0	50	30.163	9.025	0.136	72.5	21.0	6.5	
▲	B-1	18.0	50	39.283	6.369	0.047	71.1	17.3	8.1	3.5
★	B-1	25.0	101.6	86.634	76.875		4.0	4.5	19.3	
⊙	B-1	32.0	37.5	12.42	0.673		52.3	26.3	21.4	

GeoStrata

GRAIN SIZE DISTRIBUTION - ASTM D422

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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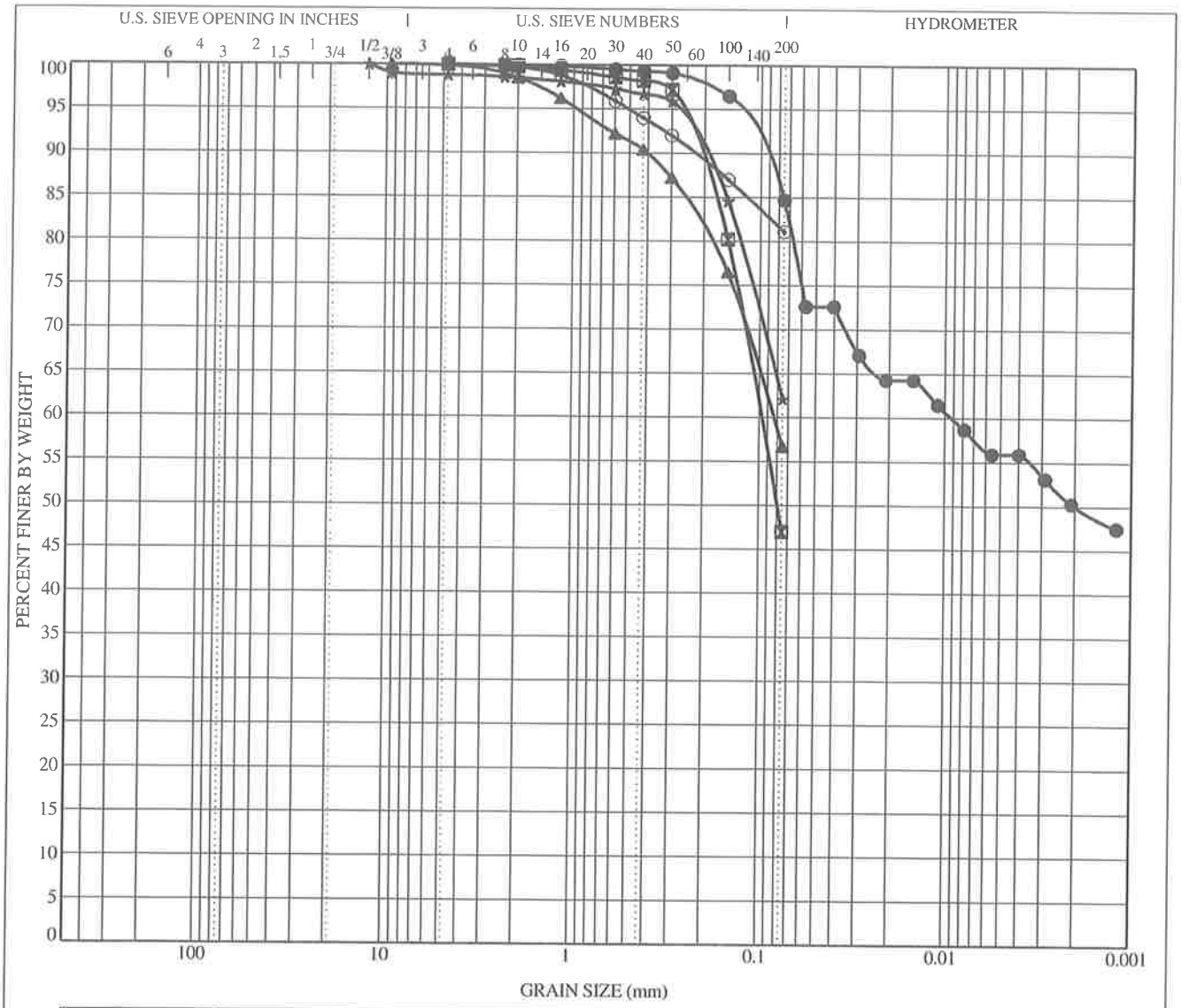

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-1	37.0	Fat CLAY with sand	57	17	40		
⊠	B-1	39.0	Clayey SAND	47	17	30		
▲	B-1	43.0	Sandy Lean CLAY	31	16	15		
★	B-1	46.0	Sandy Fat CLAY	53	14	39		
⊙	B-1	48.0	Fat CLAY with sand	54	17	37		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	37.0	4.75	0.009			0.0	15.3	34.6	50.1
⊠	B-1	39.0	4.75	0.098			0.0	53.0	47.0	
▲	B-1	43.0	9.5	0.084			0.1	43.2	56.7	
★	B-1	46.0	12.5				1.2	36.7	62.1	
⊙	B-1	48.0	4.75				0.0	18.9	81.1	

GeoStrata

GRAIN SIZE DISTRIBUTION - ASTM D422

North Salt Lake City
Eagle Pointe Landslide
North Salt Lake, UT
Project Number: 920-004

Plate

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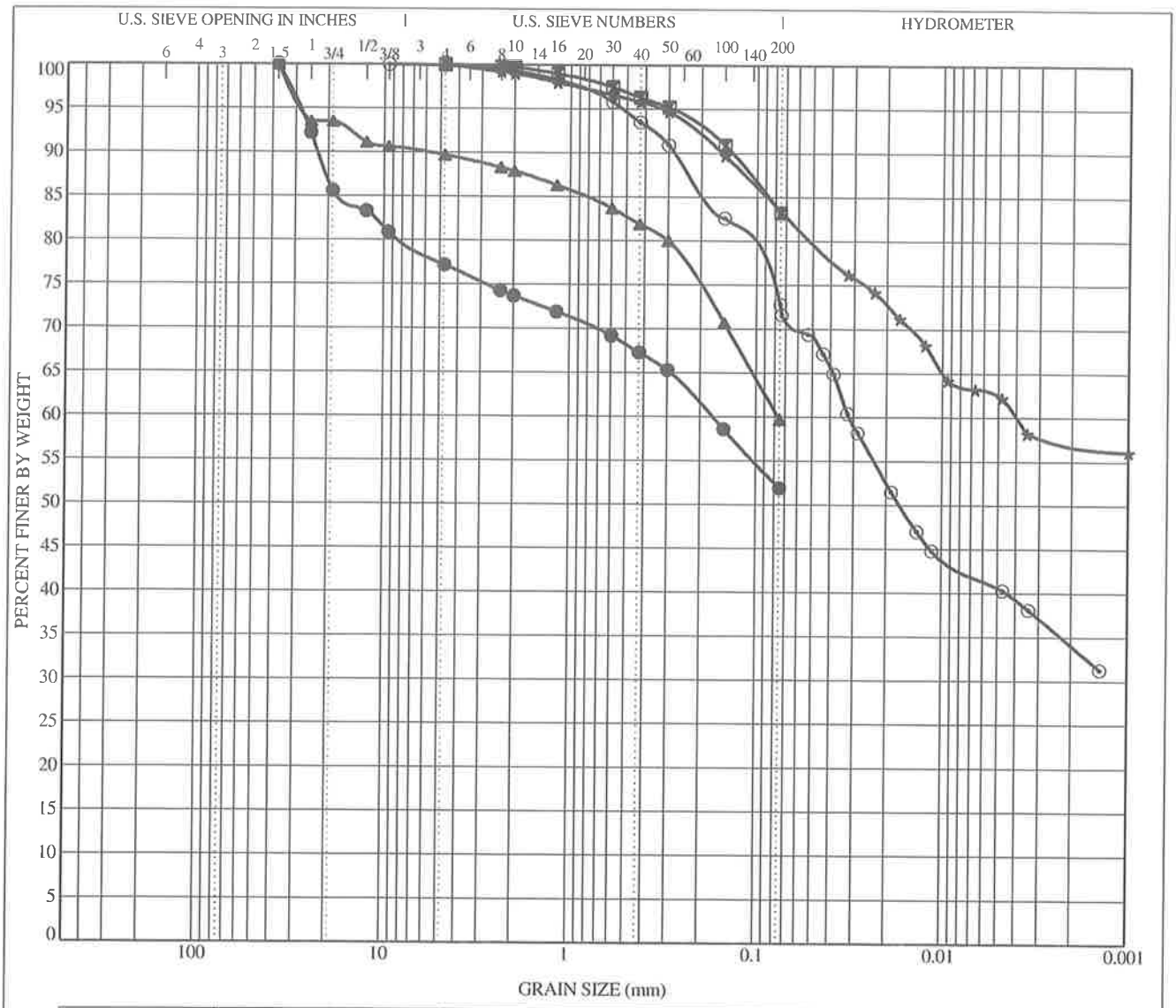

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-1	50.0	**Sandy Fat CLAY with gravel**	83	37	46		
⊠	B-1	52.0	**Lean CLAY with sand**	40	13	27		
▲	B-1	56.0	**Sandy Lean CLAY**	44	13	31		
★	B-1	58.0	**Fat CLAY with sand**	77	19	58		
⊙	B-1	63.0	**Fat CLAY with sand**	53	22	31		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	50.0	37.5	0.173			22.8	25.3	51.9	
⊠	B-1	52.0	4.75				0.0	16.8	83.2	
▲	B-1	56.0	37.5	0.076			10.3	30.0	59.7	
★	B-1	58.0	4.75	0.004			0.0	16.6	26.1	57.3
⊙	B-1	63.0	9.5	0.032			0.1	27.1	38.8	34.0

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North Salt Lake, UT
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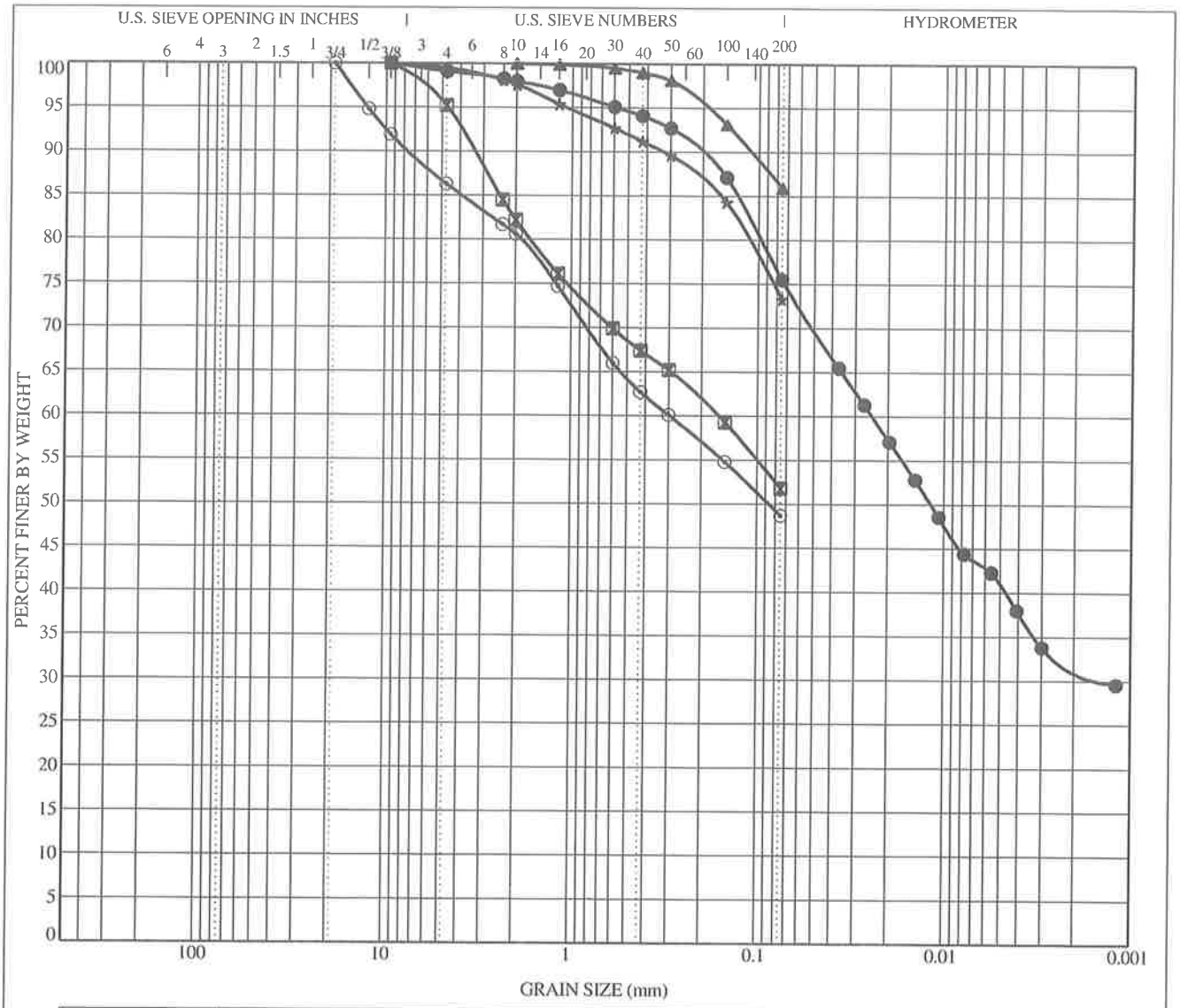

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-1	65.0	**Fat CLAY with sand**	53	14	39		
⊠	B-1	68.0	**Sandy Lean CLAY**	35	10	25		
▲	B-1	71.0	**Lean CLAY**	49	13	36		
★	B-1	76.0	**Lean CLAY with sand**	35	11	24		
⊙	B-1	78.0	**Clayey SAND**	34	12	22		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	65.0	9.5	0.024	0.001		0.9	23.6	43.6	31.9
⊠	B-1	68.0	9.5	0.163			4.8	43.4	51.8	
▲	B-1	71.0	2				0.0	14.1	85.9	
★	B-1	76.0	9.5				0.5	26.2	73.3	
⊙	B-1	78.0	19	0.296			13.7	37.6	48.7	

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North Salt Lake, UT
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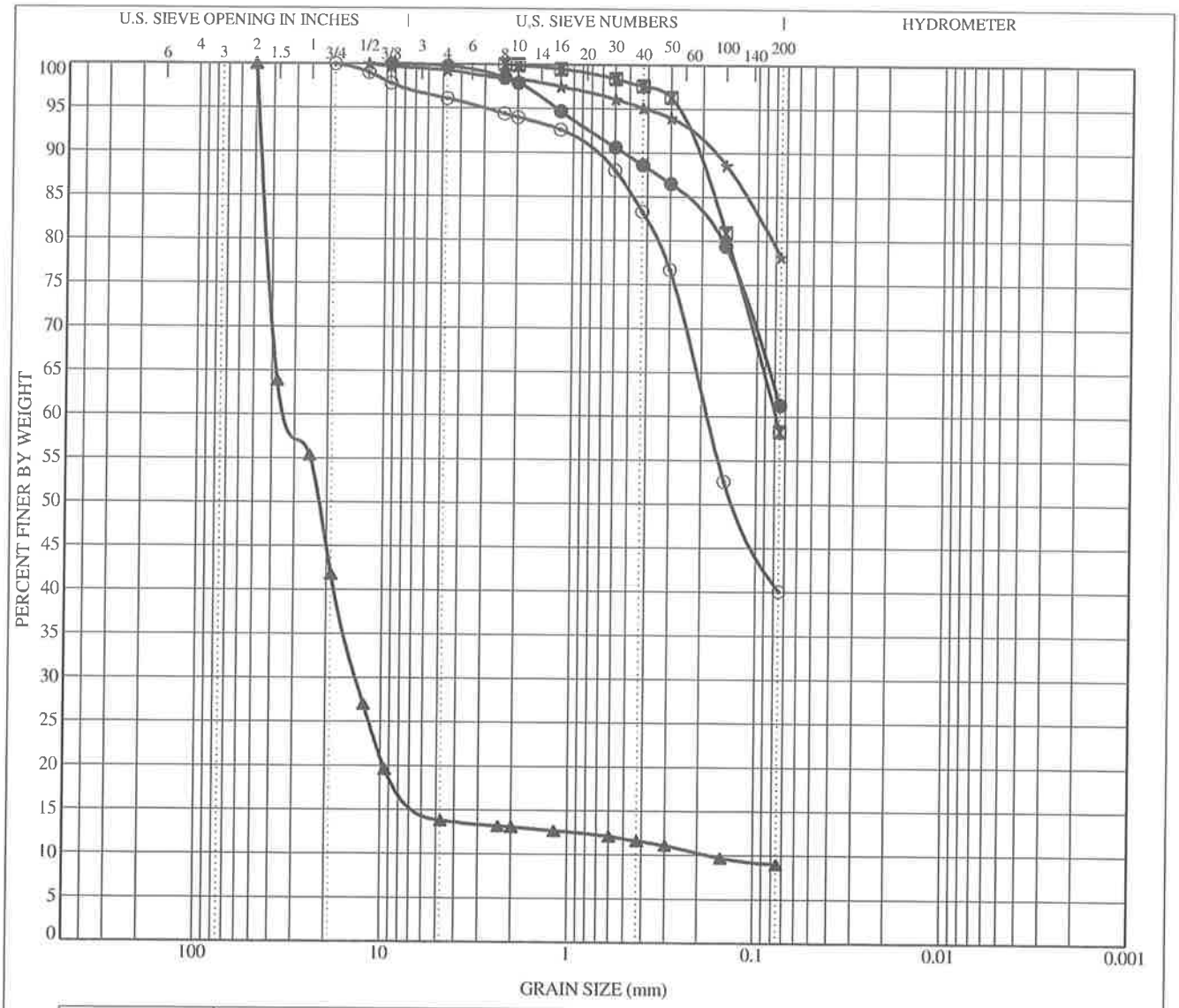

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-1	82.0	Sandy Lean CLAY	35	15	20		
⊠	B-1	85.0	Sandy Lean CLAY	44	13	31		
▲	B-2	14.0	Poorly Graded GRAVEL with silt	NP	NP	NP	34.17	178.91
★	B-2	19.0	Lean CLAY with sand	42	13	29		
⊙	B-2	22.0	Silty Clayey SAND	21	15	6		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	82.0	9.5				0.2	38.5	61.3	
⊠	B-1	85.0	2.36	0.079			0.0	41.7	58.3	
▲	B-2	14.0	50	31.134	13.607	0.174	86.2	4.8	9.0	
★	B-2	19.0	12.5				0.7	21.1	78.2	
⊙	B-2	22.0	19	0.186			3.9	56.0	40.1	

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North Salt Lake, UT
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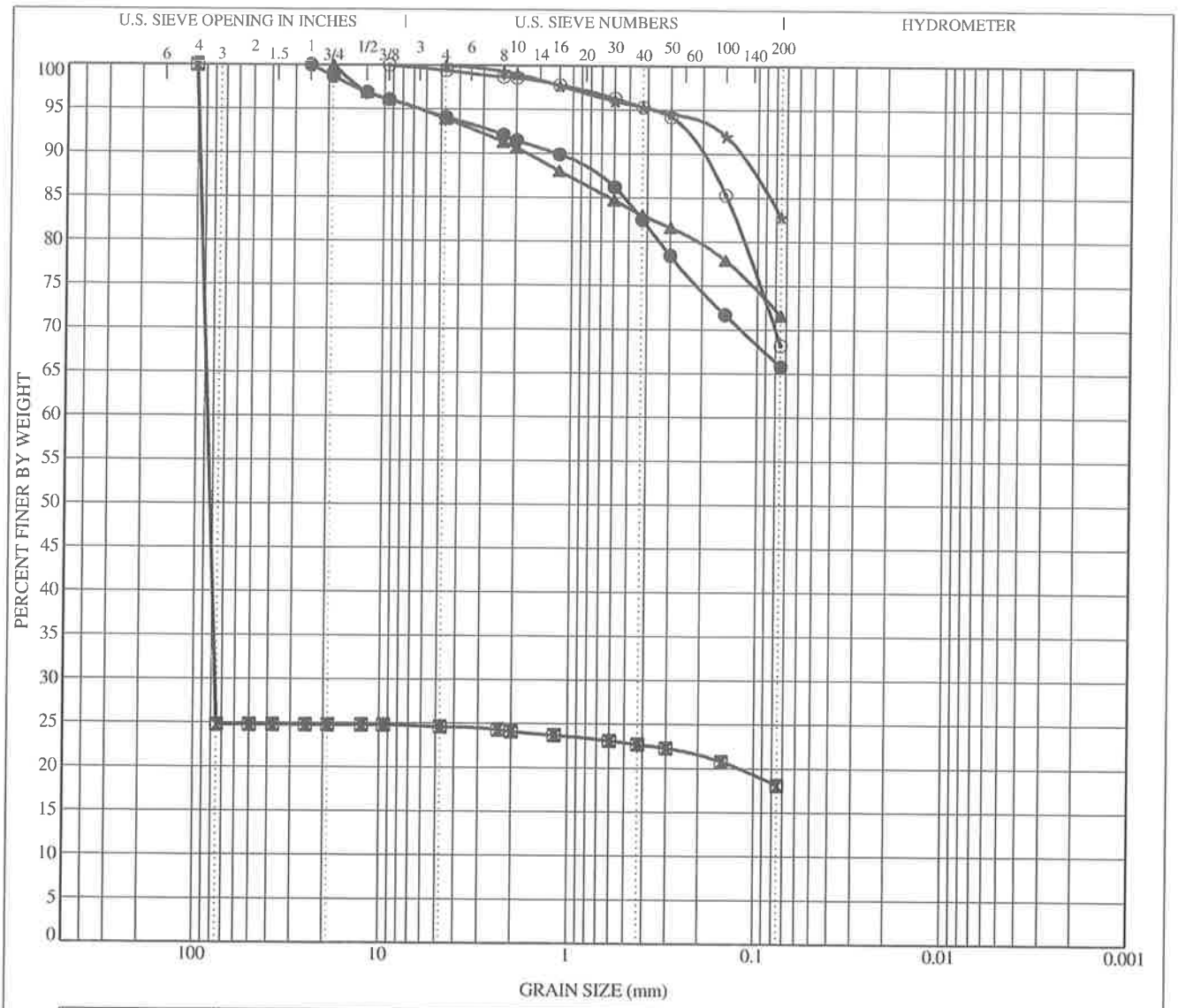

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	24.0	Sandy Lean CLAY	38	16	22		
⊠	B-2	28.0	Lean CLAY with sand	39	16	23		
▲	B-2	31.0	Lean CLAY with sand	33	14	19		
★	B-2	34.0	Lean CLAY with sand	40	17	23		
⊙	B-2	36.0	Sandy Lean CLAY	32	14	18		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	24.0	25				5.9	28.3	65.8	
⊠	B-2	28.0	101.6	86.451	76.591		4.1	6.5	18.1	
▲	B-2	31.0	19				6.1	22.3	71.6	
★	B-2	34.0	4.75				0.0	17.2	82.8	
⊙	B-2	36.0	9.5				0.6	31.2	68.2	

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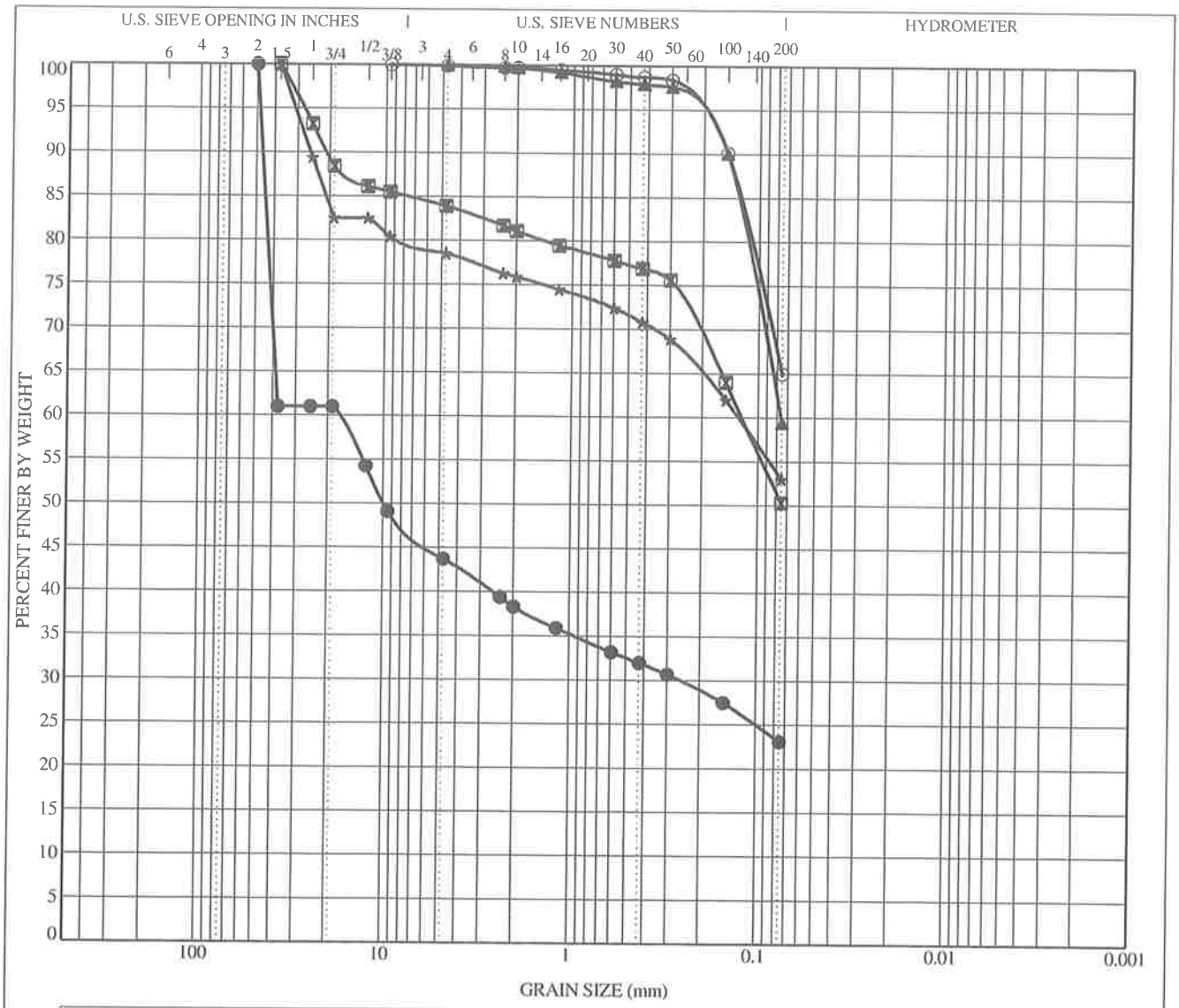

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	38.0	**Clayey GRAVEL with sand**	31	15	16		
⊠	B-2	41.0	**Sandy Silty CLAY with gravel**	27	20	7		
▲	B-2	44.0	**Sandy Lean CLAY**	36	18	18		
★	B-2	46.0	**Sandy Lean CLAY with gravel**	44	13	31		
⊙	B-2	48.0	**Sandy Lean CLAY**	49	17	32		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	38.0	50	17.849	0.258		56.3	20.6	23.1	
⊠	B-2	41.0	37.5	0.123			16.1	33.6	50.3	
▲	B-2	44.0	4.75	0.076			0.0	40.6	59.4	
★	B-2	46.0	37.5	0.129			21.5	25.5	53.0	
⊙	B-2	48.0	9.5				0.1	34.9	65.0	

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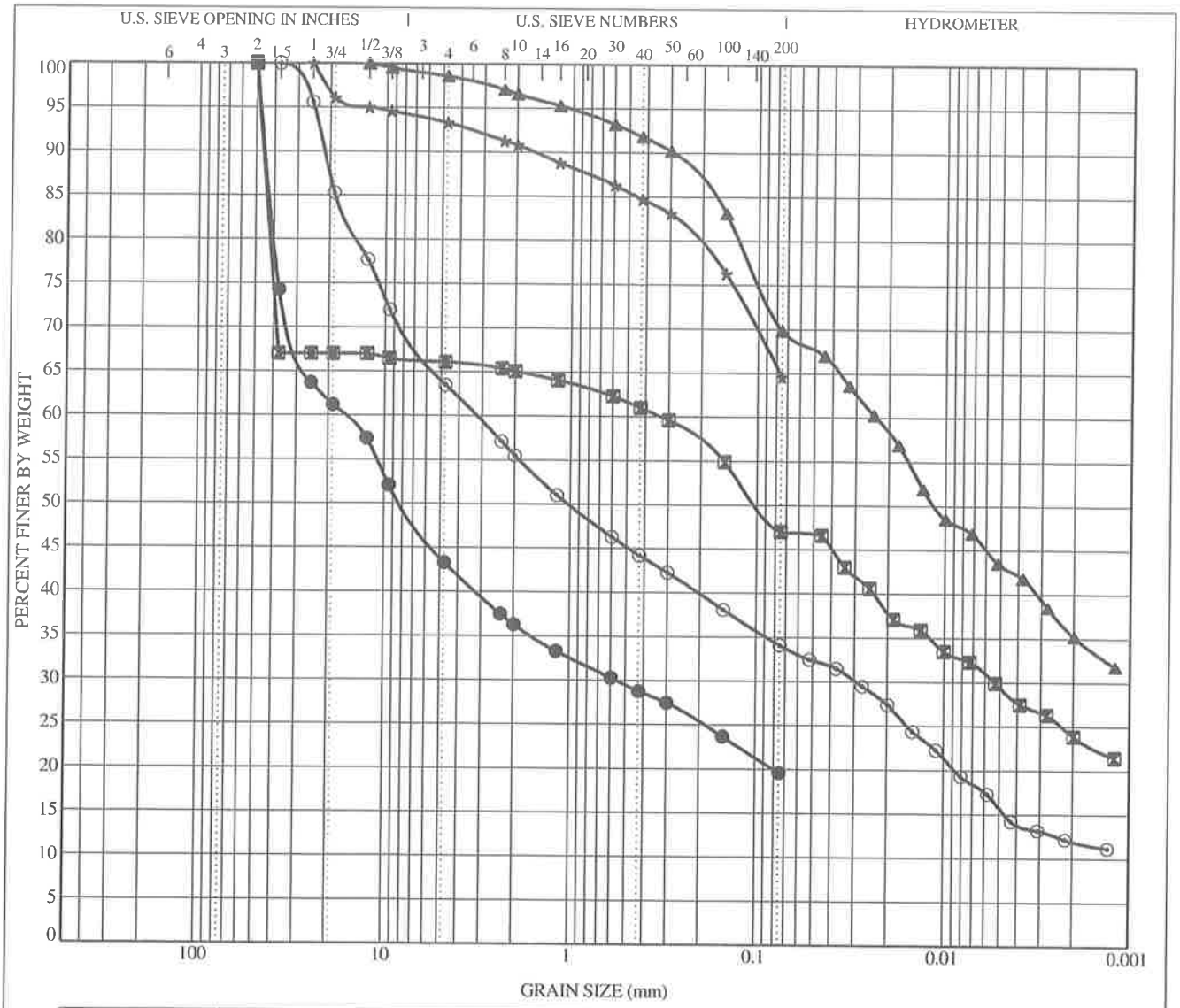

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	50.0	Clayey GRAVEL with sand	31	15	16		
⊠	B-2	53.0	Clayey GRAVEL with sand	42	15	27		
▲	B-2	56.0	Sandy Lean CLAY	38	14	24		
★	B-2	59.0	Sandy Lean CLAY	40	19	21		
⊙	B-2	61.0	Clayey GRAVEL with sand	33	16	17		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	50.0	50	16.647	0.56		56.7	23.7	19.6	
⊠	B-2	53.0	50	0.331	0.005		33.9	19.1	23.1	23.9
▲	B-2	56.0	12.5	0.024			1.4	28.8	34.6	35.2
★	B-2	59.0	25				6.7	28.7	64.6	
⊙	B-2	61.0	37.5	3.24	0.03		36.5	29.4	22.1	12.0

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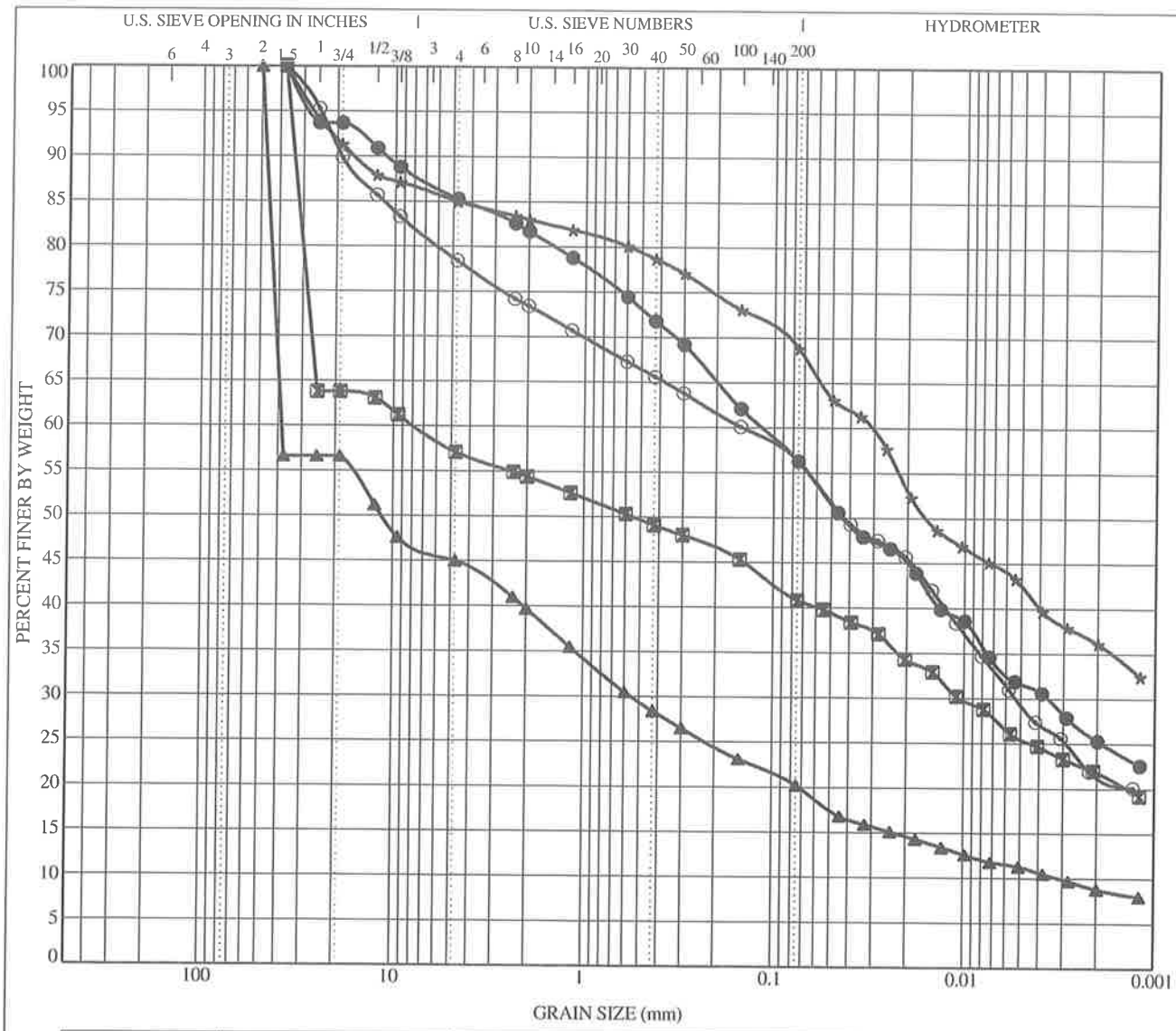

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	64.0	**Sandy Fat CLAY**	50	18	32		
⊠	B-2	66.0	**Clayey GRAVEL with sand**	49	17	32		
▲	B-2	68.0	**Clayey GRAVEL with sand**	31	15	16	2.54	12215.93
★	B-2	71.0	**Sandy Lean CLAY with gravel**	48	17	31		
⊙	B-2	74.0	**Sandy Lean CLAY with gravel**	40	15	25		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	64.0	37.5	0.117	0.004		14.7	29.0	31.0	25.3
⊠	B-2	66.0	37.5	7.756	0.01		42.9	16.3	19.0	21.8
▲	B-2	68.0	50	38.355	0.553	0.003	55.0	24.8	11.4	8.8
★	B-2	71.0	37.5	0.032			15.0	16.2	32.7	36.1
⊙	B-2	74.0	37.5	0.147	0.005		21.6	22.1	34.7	21.6

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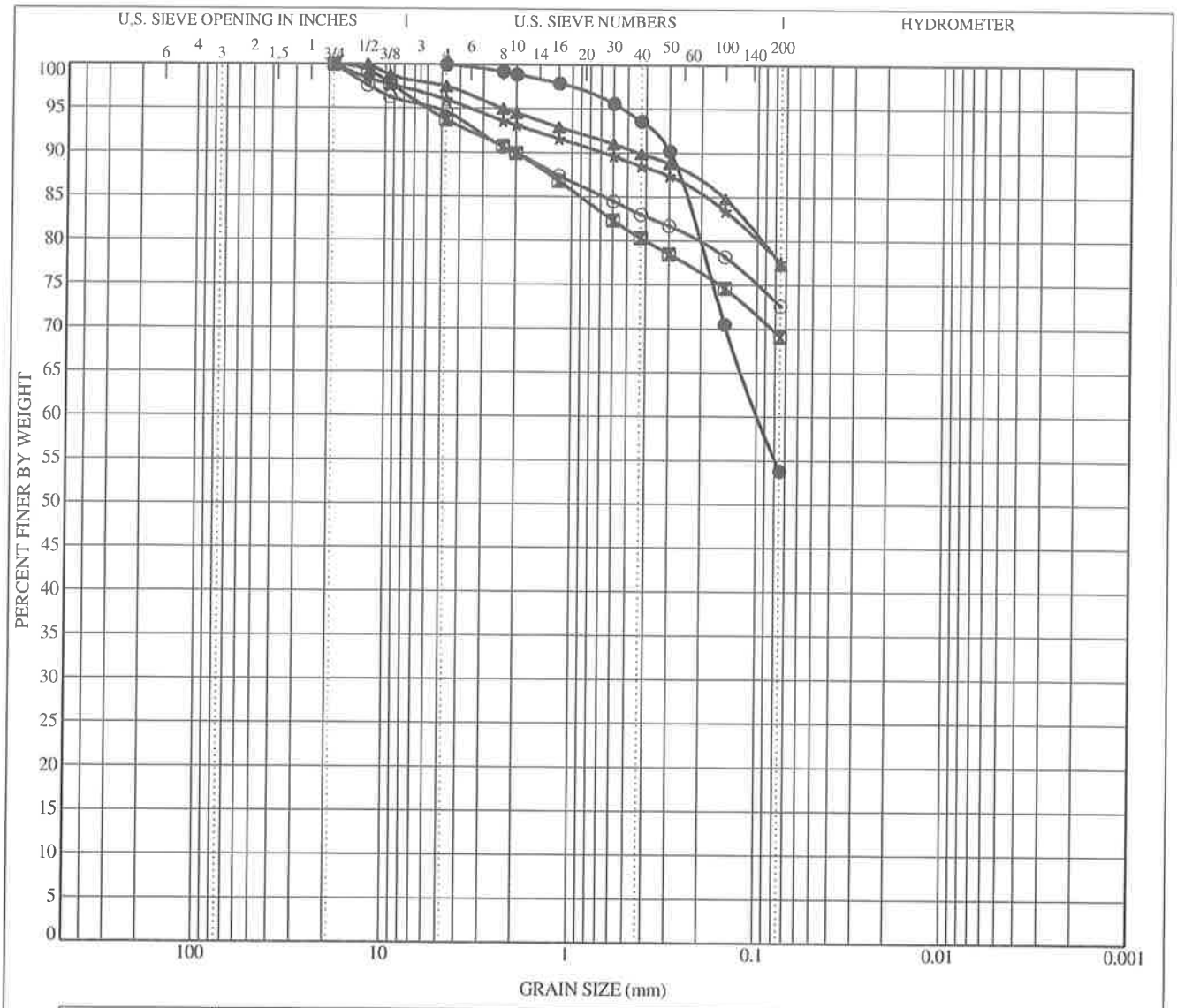

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	76.0	**Sandy Lean CLAY**	33	16	17		
⊠	B-2	79.0	**Sandy Lean CLAY**	45	13	32		
▲	B-2	80.0	**Fat CLAY with sand**	60	25	35		
★	B-2	83.0	**Fat CLAY with sand**	54	18	36		
⊙	B-2	85.0	**Fat CLAY with sand**	61	24	37		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	76.0	4.75	0.097			0.0	46.2	53.8	
⊠	B-2	79.0	19				6.3	24.6	69.1	
▲	B-2	80.0	12.5				2.5	20.2	77.3	
★	B-2	83.0	19				4.0	18.4	77.6	
⊙	B-2	85.0	19				5.4	22.0	72.6	

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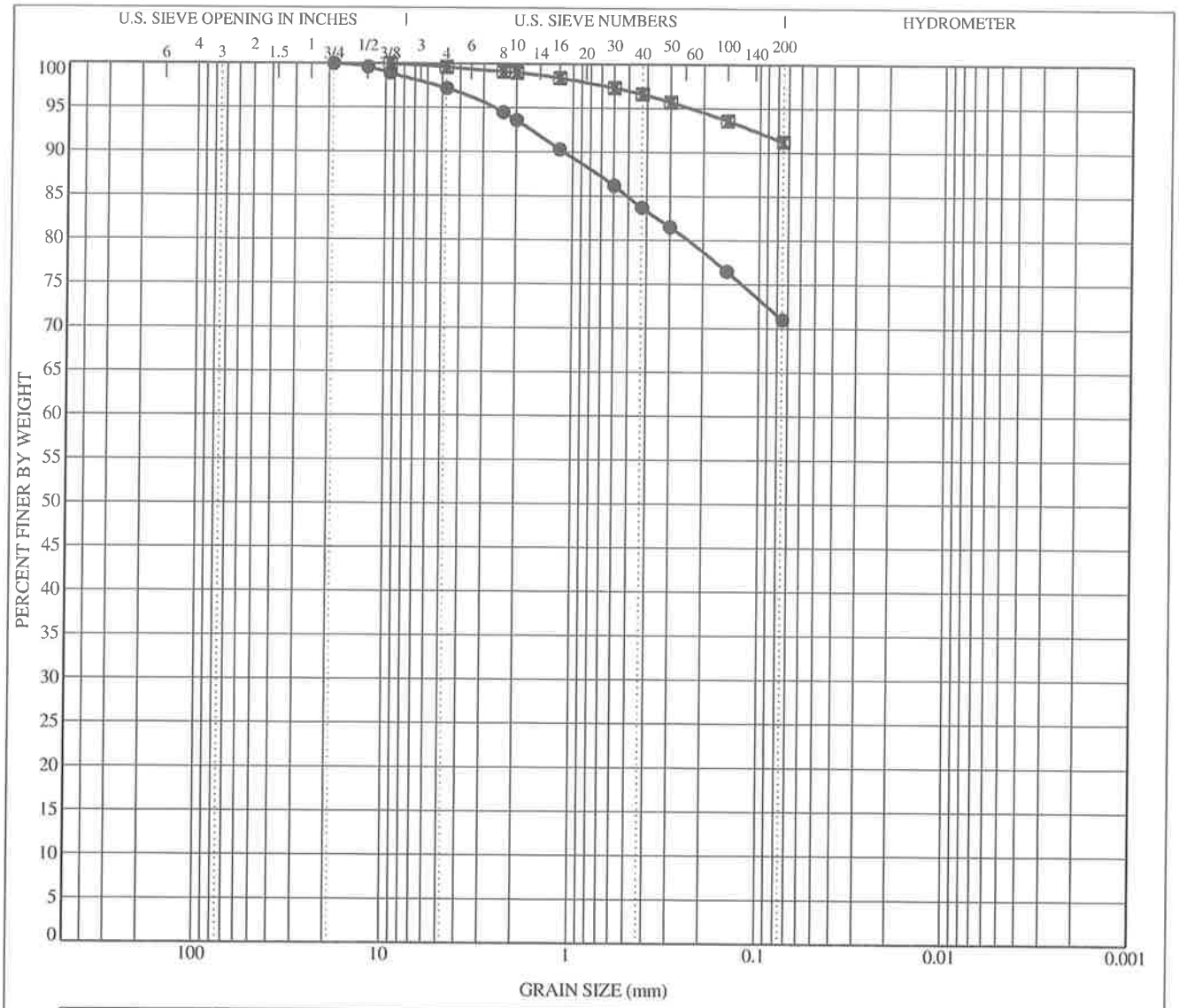

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	87.0	**Fat CLAY with sand**	57	24	33		
⊠	B-2	88.0	**Fat CLAY**	81	24	57		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	87.0	19				2.8	26.2	71.0	
⊠	B-2	88.0	9.5				0.4	8.4	91.2	

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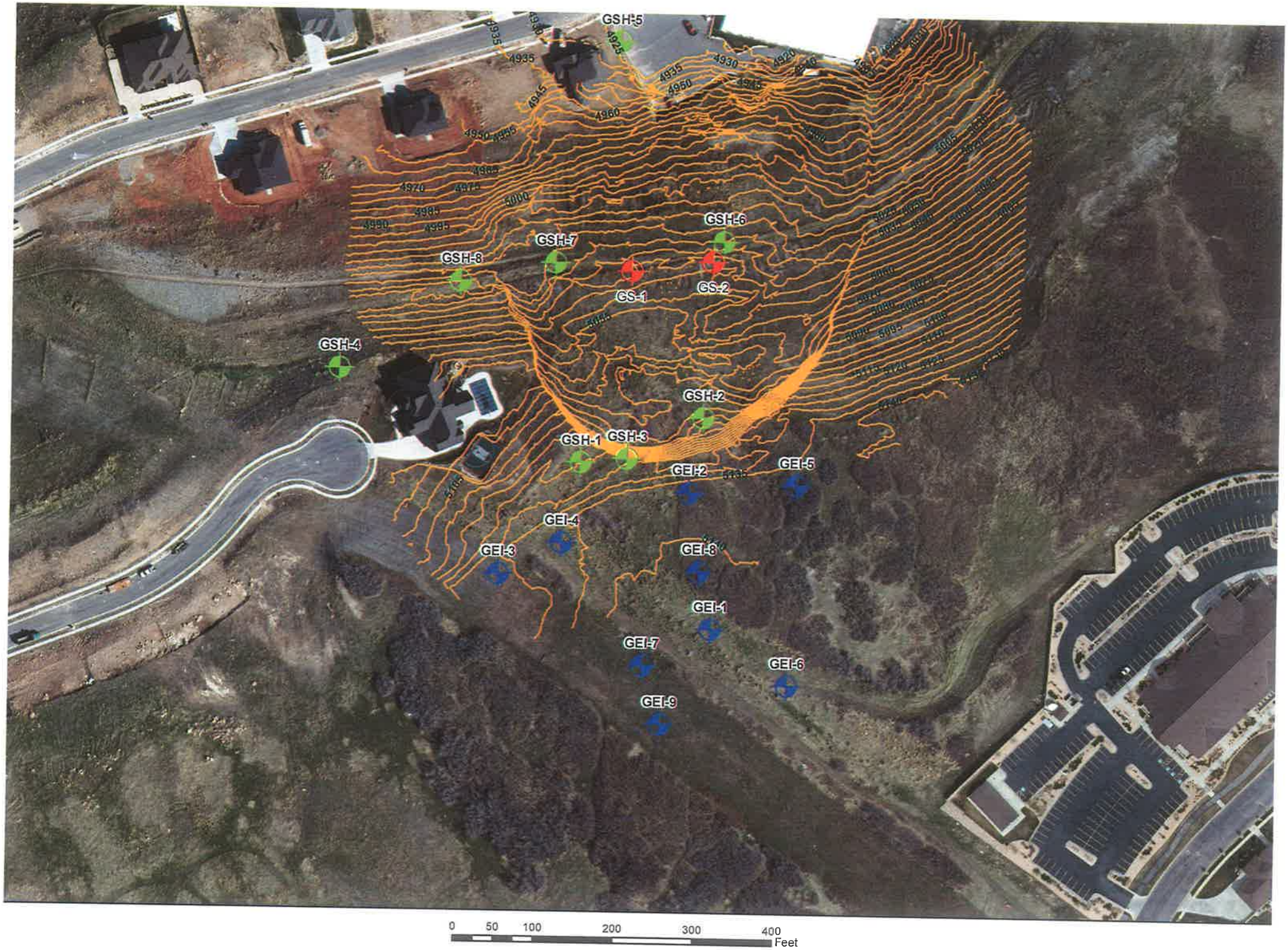
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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

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12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 1 of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

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27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*—Polychlorinated biphenyls.

31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

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40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

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addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

   a. does not conform to the Contract Documents; or

   b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

   c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

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1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

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2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of

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the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

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1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation , (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

   a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

   b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

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3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the

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Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

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3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

   b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other

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professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. reviewing and checking all such information and data;

   b. locating all Underground Facilities shown or indicated in the Contract Documents;

   c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

   d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price

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or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by

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Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

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B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

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1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

   a. Such insurance shall remain in effect for two years after final payment.

   b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

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1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property

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insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery

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against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

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ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

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6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

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2. *Substitute Items:*

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

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4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or

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other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

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6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all

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court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

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

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor

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shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

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D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

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1. *Shop Drawings:*

   a. Submit number of copies specified in the General Requirements.

   b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

   a. Submit number of Samples specified in the Specifications.

   b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

   a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

   b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

   c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

   d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop

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Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

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1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

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

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor,

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Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

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

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

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ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

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7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

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8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits

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and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

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B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

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10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The

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opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on

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Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

   c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

   e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

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f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

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D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

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D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

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c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the

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control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

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C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

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13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute

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resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and

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equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the

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Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

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b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

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d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities

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pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

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14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

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1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

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1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

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F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

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ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

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17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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DIVISION 01

GENERAL REQUIREMENTS

SECTION 01100

PROJECT DESCRIPTION

PART 1 GENERAL

1.01 PROJECT

A. Project Name: SITE STABILIZATION PROJECT FOR EAGLE POINTE LANDSLIDE, LOCATED SOUTH OF PARKWAY DRIVE AT APPROXIMATELY 740 EAST --- PROJECT # NSL.037 --- in the City of North Salt Lake, Davis County, Utah.

B. Project Scope: The Project consists of the items of Work listed in Section 02100, Measurement and Payment.

B. Owner's Name: City of North Salt Lake, Utah.

1. City Engineer: Paul Ottoson, P.E.

C. Design Engineer's Name: GeoStrata; and Gilson Engineering, Inc., Consultant Engineers and Surveyors.

1. Alternate Designers: GSH / Bingham Engineering.

D. The Project shall be constructed according to these project specifications and drawings; and according to the APWA Manuals of Standard Specifications and Drawings, Latest Editions.

1. Work on this project shall be done as specified in these project specifications and as indicated on the project drawings.

2. All work not covered by these specifications shall be done as specified in the Standard Specifications and as indicated on the Standard Drawings.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00500 - Agreement.

1.03 PROJECT DRAWINGS

A. The project drawings are listed on Drawing #G.101; which form a part of this contract as set forth in the Agreement.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01200

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Price and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED SECTIONS

A. Section 00500 - Agreement: Contract Price, retainages, payment period, monetary values of unit prices.

B. Section 00700 - General Conditions and Document 00800 - Supplemental General Conditions: Additional requirements for progress payments, final payment, changes in the Work.

C. Section 00800 - Supplemental General Conditions: Percentage allowances for Contractor's overhead and profit.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in Section 19 of the General Conditions.

B. Present required information in typewritten form.

C. Form: Contract Form including continuation sheets when required.

D. For each item, provide a column for listing each of the following:

1. Item Number.
2. Description of work.
3. Scheduled Values.
4. Previous Applications.
5. Work in Place under this Application.
6. Authorized Change Orders.
7. Total Completed to Date of Application.
8. Percentage of Completion.
9. Balance to Finish.
10. Retainage.

E. Execute certification by signature of authorized officer.

F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

G. Submit three copies of each Application for Payment.

H. Include the following with the application:

1. Transmittal letter as specified for Submittals in Section 01300.

2. Construction progress schedule, revised and current as specified in Section 01300.

3. Project record documents as specified in Section 01780, for review by the Owner which will be returned to the Contractor.

I. When the City Engineer or City Inspector requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in the Contractor's employ or Subcontractors of changes to the Work.

B. The City Engineer or City Inspector will advise of minor changes in the Work, not involving an adjustment to Contract Price or Contract Time as authorized by the Conditions of the Contract, by issuing supplemental instructions in writing.

C. Construction Change Directive: The City Engineer may issue a document, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. The document will describe changes in the Work, and will designate method of determining any change in Contract Price or Contract Time.

2. Promptly execute the change in Work.

D. Proposal Request: The City Engineer may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. The Contractor shall prepare and submit a fixed price quotation within seven days.

E. The Contractor may propose a change by submitting a request for change to the City Engineer, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01600.

F. Computation of Change in Contract Amount:

1. For change requested by the City Engineer for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.

2. For change requested by the Contractor, the amount will be based on the Contractor's request for a Change Order as approved by the City Engineer.

3. For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.

4. For change ordered by the City Engineer without a quotation from the Contractor, the amount will be determined by the City Engineer based on the Contractor's substantiation of costs as specified for Time and Material work.

G. Substantiation of Costs: Provide full information required for evaluation.

1. On request, provide following data:
   a. Quantities of products, labor, and equipment.
   b. Taxes, insurance, and bonds.
   c. Overhead and profit.
   d. Justification for any change in Contract Time.
   e. Credit for deletions from Contract, similarly documented.

2. Support each claim for additional costs with additional information:
   a. Origin and date of claim.
   b. Dates and times work was performed, and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: The City Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract on Contract Change Order Form.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.05 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01700.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01270

UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Measurement and payment criteria applicable to Work performed under a unit price or lump sum price payment method.

B. Defect assessment and non-payment for rejected work.

1.02 COSTS INCLUDED

A. Unit Prices or Lump Sum Prices included on the Bid Form shall include full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

B. Quantities indicated in the Bid Form will be the maximum amount of these items to be used, without prior approval, in writing, by the Engineer. Over-runs of these items will not be paid for if prior approval was not received by the Contractor; and will be at the Contractor own expense, with no additional cost to the Owner.

1.04 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. Measurements and quantities will be verified by the City Inspector or City Engineer.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

D. Measurement Devices:

1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.

2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.

3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.

E. Measurement by Weight:

1. Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

2. Soil material will be measured by scale weight. Weights will be converted to volume measurements by use of soil density.

F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

G. Measurement by Area: Measured by square dimension using mean length and width or radius.

H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

I. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

J. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify the City Inspector or City Engineer prior to starting work.

K. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

1.05 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work which is incorporated in or made necessary by the Work and accepted by the City Inspector or City Engineer, multiplied by the unit sum/price.

B. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.

2. Products determined as unacceptable before or after placement.

3. Products not completely unloaded from the transporting vehicle.

4. Products placed beyond the lines and levels of the required Work.

5. Products remaining on hand after completion of the Work.

6. Loading, hauling, and disposing of rejected Products.

1.06 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the City Inspector or City Engineer it is not practical to remove and replace the Work, the City Inspector or City Engineer, will direct one of the following remedies:

1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of the City Engineer.

2. The defective Work will be partially repaired to the instructions of the City Engineer, and the unit sum/price will be adjusted to a new sum/price at the discretion of the City Engineer.

C. If, in the opinion of the Owner, it is not practical to remove and replace the Work, the Owner will direct one of the following remedies:

1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of the Owner.

2. The defective Work will be partially repaired to the instructions of the Owner, and the unit sum/price will be adjusted to a new sum/price at the discretion of the Owner.

D. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.

E. The authority of the City Engineer to assess the defect and identify payment adjustment is final.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01282

PAYMENT

PART 1 GENERAL

1.01 RELATED SECTIONS

A. Section 01200: Price and Payment Procedures.

1.02 REFERENCES

A. Rental Rate Blue Book for Construction Equipment

B. Wall Street Journal

1.03 SCOPE OF PAYMENT

A. The Owner shall fully compensate the Contractor as provided in the contract for:

1. Furnishing all materials, labor, equipment, tools, transportation, and incidentals required for acceptable completion of the work.

B. Lump sum or unit price:

1. Consider payment as full compensation for all resources and incidentals necessary to complete the work.

C. The Owner will not pay the Contractor for:

1. Work that is in excess of that contained in the contract.

2. Removal and replacement of defective work.

3. Loss of anticipated profits.

D. Partial payment or releasing of retainage does not relieve the Contractor of the obligation to correct all defective work or materials.

1.04 ELIMINATED ITEMS

A. Accept the City Engineer's authority to eliminate contract items found to be unnecessary to complete the work.

B. Request reimbursement for all costs incurred before notification of elimination.

1.05 VARIATION IN QUANTITIES AND SIGNIFICANT CHANGES IN CHARACTER OF WORK

A. The Owner will pay the original contract unit prices for the accepted quantities of work or provide adjustment when the accepted quantities of work vary from the estimated quantities in the contract.

1. The Owner will not allow compensation for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense and subsequent loss of expected reimbursement or from any other cause.

1.06 DIFFERING SITE CONDITIONS, CHANGES, AND EXTRA WORK

A. The Owner will pay for differing site conditions, changes, and extra work at either unit price or lump sum as stipulated in the order authorizing the work.

B. The City Engineer uses contract unit prices if they are representative of the work to be performed.

1. Unit price work will be reimbursed at the rates established in the contract.
   a. These rates include compensation for the actual work and associated field indirect costs, home office overheads, profit, and all other costs incidental to the work unless otherwise defined in the contract.

C. Negotiated lump sum or unit pricing for changes to the contract work will be based on the Contractor's estimate to do the work as validated by the City Engineer's review or independent cost estimate.

1. Support the price with a detailed cost estimate. Include the following in the estimate:
   a. Labor and equipment hours based on agreed upon productivity rates.
   b. Use the actual cost of wages, benefits, burdens, and other labor related expenses for the labor rates applied to the estimated man-hours.
      1) Include certified accounting records verifying these costs or make them available upon request of the City Engineer.
   c. Materials will be reimbursed at actual cost as determined by supplier invoices or estimates.
      1) Materials produced on site, such as granular borrow or UTBC will be reimbursed according to the labor and equipment rates used to produce such materials.
   d. Use the actual cost of the equipment to the Contractor for equipment rates applied to the estimated equipment hours.
      1) Include certified accounting records verifying these costs or make them available upon request of the City Engineer.

2. A markup of 15 percent will be paid on all expenses identified above. This markup compensates the Contractor for home office overheads, profit, and incidental costs.

3. No other expenses will be compensated unless approved by the City Engineer.

1.07 COMPENSATION FOR EXCUSABLE DELAYS

A. Document all costs claimed that result directly from a delay caused by the Owner.

1. Use actual records kept in the usual course of business and measure increased ownership expenses according to generally accepted accounting principles.
   a. Do not use equipment rental rate guides.

2. The Owner will not compensate for the following:
   a. Profit more than provided in accordance with this section
   b. Loss of profit
   c. Labor inefficiencies
   d. Home office overhead exceeding that provided
   e. Consequential damages, including, but not limited to, loss of bonding capacity, loss of bidding opportunities, and insolvency
   f. Any indirect costs or expenses
   g. Attorney's fees, claims preparation expenses, or litigation costs

B. Compensable costs will be determined as follows:

1. Direct Costs: Actual costs of the Contractor's workforce and equipment idled by the delayed activity.
   a. Provide an accountant's certification of all costs.

2. Field Indirect Costs: Actual costs for job-site supervision and field office operating costs, or other costs not directly associated with a particular work activity, for the period of delay.
   a. Provide an accountant's certification of all costs.

3. Home Office Overhead: Unabsorbed home office costs that would have been paid for by the project billings if the work had not been delayed. To be entitled to home office overhead costs, demonstrate the delay-causing event resulted in financial harm.
   a. No unabsorbed home office overheads will be reimbursed for the first five calendar days of the delay-causing event.

b. Calculate home office overhead cost from the sixth calendar day of the delay-causing event through its end if the project is between 0 and 95 percent complete.

c. Use the following formula to calculate home office overhead costs:

$$E = D\,[0.05(A)/C]$$

Where:

0.05	=	Allowed markup for home office overhead
A	=	Current contract value
C	=	Total contract duration in calendar days, including approved time extensions
D	=	Number of calendar days the critical path of the schedule is delayed due to the delay-causing event minus five.
E	=	Total reimbursable amount for unabsorbed home office overhead

d. No home office overheads will be reimbursed if the delay occurs after the project is 95 percent complete.

C. The total reimbursable cost for a compensable delay is the sum of the daily agreed to costs for direct costs, field indirect costs, and unabsorbed home office overhead costs as computed in accordance with this article for the duration of the delay. No other costs, including profit, will be reimbursed.

1.08 FORCE ACCOUNT

A. The City Engineer may require the Contractor to work on a force account basis when the Contractor and City Engineer are unable to negotiate an agreed upon price for changed or added work.

1. Costs reimbursed in accordance with this section are considered full and complete compensation for:
   a. All field indirect costs, including project management and supervision, field office operating costs, and all field office staff, except for time spent in immediate and direct supervision of the force account work.
   b. All home office overhead costs and other indirect costs incurred as a result of the force account work.

2. The Owner will not compensate for small tools costing $200 or less or any other costs for which no specific allowance is provided in this section.

B. Compensation for labor:

1. The Owner will pay straight time for all hours worked. Overtime must have the prior written approval of the City Engineer.

2. The Owner will pay for all labor, including direct supervision used in the actual and direct performance of the work at the wage or scale agreed upon in writing before beginning work.

3. The Owner will reimburse for actual costs paid to or in behalf of workers, including health and welfare required by collective bargaining agreements or other employment contract generally applicable to the classes of labor employed on the work.

4. The Owner will pay the Contractor an amount equal to 60 percent of the sum of the above items to cover the costs of bonds, insurance, taxes, and all other indirect costs in addition to the above costs.
   a. Submit wage, payroll, and cost records pertaining to work paid for on a force account basis to the City Engineer. This information is open to inspection or audit.

5. The Owner will reimburse for actual costs for subsistence and travel allowance.

C. Compensation for materials:

1. The Owner will pay for all materials accepted by the City Engineer and incorporated in the project at actual cost, including sales taxes and transportation charges plus 15 percent.
   a. Materials such as saw blades, drill bits, etc., expended in the course of performing the work, excluding equipment, are considered incorporated in the project.

b. Include invoices with statements for all materials used. Certify by affidavit the cost of material furnished from Contractor's stocks when no invoice is available.

D. Compensation for equipment:

1. The Owner will not pay for pickup trucks used solely for transportation.

2. The Owner will pay for machinery or special equipment, excluding small tools, authorized by the City Engineer at an hourly rate obtained from the Rental Rate Blue Book for Construction Equipment. These hourly rental rates are determined by the monthly rental rate taken from the above-mentioned publication divided by 176. The total hourly rates have been computed from equipment costs currently in effect and do not include costs for operating personnel.

   Obtain this publication through:
   Equipment Watch
   1735 Technology Drive, Suite 410
   San Jose, CA 95110-1313
   Phone: (800) 669-3282
   Fax: (800) 224-3527
   Refer to http://www.udot.utah.gov/go/standardsreferences.

   The rates require adjustment by a Regional Factor and a Depreciation Factor with operating and standby rates established as follows:
   a. Operating Rate - For those hours the equipment is actually in use.
      1) Includes ownership and operating costs adjusted for Depreciation and Region factors.
   b. Standby Rate - Compensation for equipment required to be at the work site but not operating. This rate is 50 percent of the adjusted ownership and operating costs computed above.
      1) The duration of allowable standby time is to be approved in writing by the City Engineer with a maximum of eight hours per day or 40 hours in a week.

3. The Owner will use the shown capacity that is closest to the manufacturer's when the Manufacturer's Rated Capacity falls between those shown in the Rental Rate Blue Book for Construction Equipment.

4. Agree upon all rates in writing before beginning work.

5. Obtain approval from the City Engineer for any equipment rental rates not provided before the start of any force account work.

6. The Owner will allow move-in and move-out transportation cost for a piece of equipment not available on the job, if the particular piece of equipment is not moved onto the job under its own power.
   a. The Owner will allow hourly operating rate for equipment moved to the site under its own power.
   b. The Owner will pay these charges only once for any particular piece of equipment except in unusual circumstances that must be justified in writing and agreed to by the City Engineer.

7. The Owner will add a 10 percent allowance on the first $5,000 plus five percent of the balance in excess of $5,000 for overhead for all rented or leased equipment paid for by invoices when the equipment used is specialized and not available in the Contractor's inventory and is rented or leased from an outside source.
   a. Submit the rental or lease agreement to the City Engineer for approval where the rental rate charged exceeds the rate determined by the Rental Rate Blue Book for Construction Equipment.
   b. The Owner will pay equipment-operating costs at the rate from the Rental Rate Blue Book for Construction Equipment for rented or leased equipment for each hour the equipment was actually used.

8. The equipment may be rented from a local source when the required equipment is in the Contractor's available inventory but not on the project site. The City Engineer may approve rental rates for equipment obtained from local sources when such rates are within 10 percent of the Rental Rate Blue Book for Construction Equipment. Move-in and move-out costs for Contractor owned equipment may be considered when comparing rental costs of equipment obtained from local sources when the equipment is to be used less than a week.

a. This option is only allowed when the cost of locally rented equipment is less than using Contractor owned equipment including move-in and move-out charges.
b. Such rentals must be supported by a cost analysis indicating the method used was the least expensive.
c. The Owner will reimburse for such equipment based on the Rental Rate Blue Book for Construction Equipment if the Contractor elects to rent equipment of a type that is in the Contractor's inventory and the rental costs exceed that allowed by this article.

E. Subcontracts:

1. The Owner will pay an additional allowance equal to six percent for overhead for the subcontract for all force account work performed under an approved subcontract.

2. The City Engineer will review each situation to determine that performing the work by subcontract is justified.

F. Compare cost records daily with the City Engineer.

G. Provide an itemized statement of the cost of the force account work at the City Engineer's request including:

1. Name, classification, date, daily hours designating straight time and overtime, total hours, rate, and extension for each laborer and supervisor. Payrolls may be used for some of this information.

2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

3. Quantities of materials, prices, and extensions.

4. Transportation of materials and equipment.

5. Cost of fringe benefits and subsistence.

6. Subcontractors.

1.09 PROGRESS PAYMENTS

A. The Owner will make progress payments at least once each month as the work is progressing.

B. More frequent payments may be made during any period when the Owner determines that the value of work performed during the period is sufficient to warrant a payment.

C. Payments are based on estimates prepared by the City Engineer of the value of the work performed and materials in place under the contract and for payment for material on hand in accordance with this section.

D. The Owner will not make any progress payment when the total value of the work done since the last estimate is less than $1,000.

E. The Owner will deduct and retains five percent from the total value of work until after the entire contract has been completed in an acceptable manner with the following exceptions:
a. Retention for subcontracted work is paid upon satisfactory completion and acceptance by the Owner.
b. The City Engineer may prepare a semi-final estimate with the consent of the Surety from which the Owner retains 1.5 percent of the original contract amount when no less than 95 percent of the work has been completed. The Owner certifies the remainder for payment, less all previous payments.

F. The Contractor may enter into an addendum agreement providing for payment of retained money into an escrow account, or the Owner does so automatically.

1. This money is applied to the purchase of approved securities that are to be held by an escrow agent until satisfactory completion of the construction contract.

2. The value of the securities placed in escrow has a minimum value equal to or greater than the amount that would otherwise be retained.

3. The addendum agreement must be executed concurrently with the execution of the construction contract. Agreement forms will be available in the office of the City Engineer.

G. The Owner will pay the Contractor within 14 calendar days after certification and approval of billings and estimates.

1. The Contractor and City Engineer agree to a Saturday partial estimate closing date. Succeeding partial estimates close on the same Saturday for each succeeding month.

2. The Contractor approves partial estimate before submission.

1.10 PAYMENT FOR MATERIAL ON HAND

A. Present the delivery copies of invoices. The Owner may include advance payments for acceptable nonperishable materials purchased expressly for incorporation in the work when delivered in the vicinity of the project or stored in approved storage place in the partial payment invoice.

1. The City Engineer determines the amount to be included in the estimate, but in no case will the amount exceed the value of the materials as shown on the delivery invoice or 75 percent of the in-place price, whichever is less.

2. Furnish evidence that the stockpiled materials are irrevocably obligated to the project when the approved storage location is other than the project site.

3. The Owner will not pay when the invoice value of such materials, as determined by the City Engineer, amounts to less than $2,000 or if materials are to be stored less than 30 calendar days, unless otherwise specified.
   a. The OWNER will waive the 30 day limit and pay advance payment for Pavement Marking Tape if the Pavement Marking Tape placement is delayed more than one week beyond the original CPM schedule date.

4. Furnish the City Engineer certified paid invoices or a certified statement with a copy of the check showing payment within 60 calendar days following the date of the estimate invoice on which the stockpile material is to be paid by the Owner.

5. Material will be removed from the next partial estimate as stockpiled materials if proper invoices showing payment to the supplier is not received.

B. The Owner will not make any partial payment on living or perishable materials until incorporated as specified in the contract.

C. The Owner will not pay for materials brought onto the site at the Contractor's election that may be incorporated into the project such as fuels, supplies, metal decking forms, ties, or supplies used to improve efficiency of operations.

D. Approval of partial payment for stockpiled materials does not constitute final acceptance of such materials for use in completing items of work.

E. The Owner will purchase at actual cost and without any percentage allowance for profit, materials delivered to the project in compliance with the contract or left unused due to changes in plans or variation in quantities, if the materials are not practicably returnable for credit.

1. Purchased materials become the property of the Owner.

2. Actual costs are based on invoice price plus transportation costs.

F. Payment is limited to contract quantities unless ordered by the City Engineer. Assume responsibility for excess materials delivered to the project or aggregate produced beyond the contract amount without authority from the City Engineer.

G. Surplus aggregates up to the contract quantities may be purchased provided the material is stockpiled where directed and meets specification requirements when stockpiled at the option of the Owner.

1. The Owner will pay for material accepted on an agreed price basis, which price is normally the Contractor's production cost.

2. The Owner pays a negotiated price for transporting and stockpiling materials at the directed location.

1.11 FINAL PAYMENT

A. The City Engineer prepares the final estimate of work performed when the project has been accepted.

1. The Owner will process the estimate for final payment if the Contractor approves the final estimate and does not object to the quantities within 30 calendar days of receiving the final estimate.

2. The Owner will pay the entire sum due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the contract after approval of the final estimate by the Contractor.

B. File a full, complete, and itemized written statement with the Owner justifying the adjustment within 30 calendar days after the final estimate is submitted for approval if additional payment is due from the Owner.

1. Contractor waives all disputes not itemized.

2. Submission of disputes by the Contractor will not be reason for withholding full payment of the total value of work shown on the City Engineer's final estimate.

3. The Owner will evaluate the dispute.
   a. The final estimate is revised accordingly under the terms of the contract if it is determined that additional payment is due.
   b. The estimate as submitted is final if it is determined that no additional payment is due.

C. All prior partial estimates and payments are subject to correction in the final estimate and payment.

D. The Owner will complete and deliver the final estimate to the Contractor within 90 days of contract completion.

1.12 FUEL COST ADJUSTMENT

A. Fuel cost adjustment is intended to limit the risk to the Contractor from potentially unstable fuel prices that might occur during the contract.

1. This provision is not intended to estimate actual quantities of fuel used in construction operations or compensate for actual price variations experienced by the Contractor.

2. The Owner will determine adjustments under the provisions of this section and presumes the Contractor has relied on these provisions when determining unit bid prices.

3. The Contractor may invoke this provision at any time during the contract by written notification to the City Engineer.
   a. Adjustments are then made on all prior and future partial estimates.
   b. This provision becomes effective when it remains in effect for the duration of the contract.

B. Abbreviations and Terms:

1. Estimate Price for fuel (EPf): The fuel price established for the partial estimate period.

a. The Owner will determine the EPf on the first Monday of each month using the spot price per barrel for West Texas Intermediate (WTI) crude oil posted in the commodities and futures section of the Wall Street Journal. This spot price is averaged with spot prices posted for the previous three Mondays to establish the EPf.

b. The EPf remains in effect until the first Monday of the following month and is used for regular partial estimates closed before the first Monday of the following month.

2. Base Price for fuel (BPf): The contract base fuel price, equal to the EPf in effect on the date of the contract bid opening.

3. Fuel Factor (FF): A combined diesel and gasoline usage factor established for purposes of calculating the Fuel Cost Adjustment.

   a. Table 1 shows the items of work eligible for adjustment.

4. Fuel Cost Adjustment (FCA): The fuel cost adjustment in dollars determined in accordance with this article.

C. Determining FCA:

1. FCA only applies to acceptable work performed on major contract items and eligible items in Table 1 with an individual value of more than $100,000, or as otherwise specified in Table 1, based on original contract quantities.

2. FCA does not apply to work added by change order.

3. FCA may be positive or negative depending on the changes or differences between the BPf and the EPf.

4. Work performed after the expiration of contract time and approved time extensions, the EPf will be limited to the lesser of:

   a. The EPf for the estimate period when the work was performed.

   b. The EPf for the last partial estimate period before the expiration of the contract time.

D. FCA formula:

1. When the EPf is more than 15 percent above the BPf:

$$FCA = \frac{[(EPf - BPf) - 0.05\ BPf]\ Q\ (FF)}{42}$$

2. When the EPf is more than 15 percent below the BPf:

$$FCA = \frac{[(EPf - BPf) + 0.05\ BPf]\ Q\ (FF)}{42}$$

3. Where:

Q	=	Quantity of acceptable work performed
FF	=	Fuel factor for Q
42	=	Conversion of gallons of fuel per barrel of crude

E. The Owner will determine the feasibility of proceeding with the remainder of the project and will notify the Contractor in writing if the project is to be terminated if the EPf increases by more than 50 percent from the BPf for an eligible item of work.

Table 1

Items Eligible for FCA		
Item of Work	**Quantity of Work (Q)**	**Fuel Factor (FF)**
Roadway Excavation, Borrow, Granular Borrow, Top Soil	Cubic Yard / Ton	0.45 0.25
Underdrain Granular Backfill	Cubic Yard	1.16
Untreated Base Course	Ton / Cubic Yard	0.84 1.63
Hot Mix Asphalt	Ton / Cubic Yard	3.60 7.00
Open Graded Surface Course	Ton Cubic Yard	3.60 6.80
Stone Matrix Asphalt (SMA)	Ton / Cubic Yard	3.60 6.80
Rotomilling Profile Rotomilling In-Place Cold Recycled Asphaltic Base Recycled Surface	Sq Yd Sq Yd Sq Yd Sq Yd	0.03
Chip Seal Coat	Square Yard	0.03
Portland Cement Concrete Pavement Lean Concrete Base Course	Sq Yd-In Sq Yd-In	0.214 0.048
Riprap	Cubic Yard	0.57
Bridges exceeding $500,000 Includes the following items: Structural Concrete, Piles, Reinforcing Steel, Prestressed Concrete Members, and Structural Steel 36 inch and larger pipe culvert – combined items exceeding $200,000	$	0.038

1.13 ASPHALT COST ADJUSTMENT

A. Asphalt cost adjustment is intended to limit the risk to the Contractor from potentially unstable asphalt prices that might occur during the contract.

1. This provision is not intended to estimate actual quantities of asphalt used or compensate for actual price variations experienced by the Contractor.

2. The Owner will determine adjustments under the provisions of this article and presumes that the Contractor has relied on these provisions for adjustments when determining unit bid prices.

3. The Contractor may invoke this provision at any time during the contract by written notification to the City Engineer.
   a. Adjustments are then made on all future partial estimates.
   b. This provision becomes effective when it remains in effect for the duration of the contract.

B. The Owner will adjust the price of asphalt materials for acceptable work performed on bid items that contain asphalt materials.

C. Abbreviations and Terms:

1. Estimate Price for asphalt (EPa): The asphalt price established for the partial estimate period.
   a. The Owner will determine the EPa on the first Monday of each month using the spot price per barrel for West Texas Sour (WTS) crude oil posted in the commodities and futures section of the Wall Street Journal. This spot price is averaged with spot prices posted for the previous three Mondays to establish the EPa.
   b. The EPa remains in effect until the first Monday of the following month and is used for regular partial estimates closed before the first Monday of the following month.

2. Base Price for asphalt (BPa): The contract base asphalt price, equal to the EPa in effect on the date of the contract bid opening.

3. Asphalt Cost Adjustment (ACA): The asphalt cost adjustment in dollars determined in accordance with this article.

D. Determining ACA:

1. ACA does not apply to any work performed within 120 calendar days of the contract bid opening date.

2. ACA does not apply to work added by change order.

3. ACA may be positive or negative depending on the changes or differences between the BPa and the EPa.

4. For work performed after the expiration of contract time and approved time extensions, the EPa will be limited to the lesser of:
   a. The EPa for the estimate period when the work was performed.
   b. The EPa for the last partial estimate period before the expiration of the contract time.

E. ACA Formula:

1. When the EPa is more than 15 percent above the BPa:

$$ACA = [(EPa - BPa) - 0.05\ BPa]\ (5.6)\ T$$

2. When the EPa is more than 15 percent below the BPa:

$$ACA = [(EPa - BPa) + 0.05\ BPa]\ (5.6)\ T$$

3. Where:
   T = Tons of asphalt used
   5.6 = Conversion of barrels of crude oil per ton of asphalt

F. The City Engineer determines T as follows:

1. For PG asphalt binders
   a. Use the target percentage of asphalt binder in the approved mix design for the quantity of accepted material for:
      1) Hot Mix Asphalt (HMA)
      2) Stone Matrix Asphalt (SMA)
   b. Use the quantity of accepted asphalt binder for:
      1) Open-Graded Surface Course (OGSC)
      2. Use the residual asphalt calculated from the quantity of accepted material for Emulsified Asphalts.
   3. Use the quantity of accepted material for Cutback Asphalts.

G. The Owner will determine the feasibility of proceeding with the remainder of the project and notifies the Contractor in writing if the project is to be terminated if the EPa increases by more than 50 percent from the BPa for an eligible item of work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Progress meetings.

C. Construction progress schedule.

D. Progress videotapes and photographs.

E. Coordination drawings.

F. Submittals for review, information, and project closeout.

G. Number of copies of submittals.

H. Submittal procedures.

1.02 RELATED SECTIONS

A. Document 00700 - General Conditions: Dates for applications for payment.

B. Document 00700 - General Conditions: Duties of the Construction Manager.

C. Section 01700 - Execution Requirements: Additional coordination requirements.

D. Section 01780 - Closeout Submittals: Project record documents.

1.03 PROJECT COORDINATION

A. Project Coordinator: City Inspector.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for project access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to the City Engineer through the Project Coordinator:

1. Requests for interpretation.

2. Requests for substitution.

3. Shop drawings, product data, and samples.

4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. The Owner will schedule a meeting after Notice of Award.

B. Attendance Required:

1. Owner.
2. City Inspector.
3. City Safety Coordinator.
4. City Engineer.
5. Contractor.
6. Representative from Utility Companies.

C. Prior to Meeting:

1. Execution of Owner -Contractor Agreement.
2. Submission of executed bonds and insurance certificates.

D. Agenda:

1. Distribution of Contract Documents.
2. Submission of list of Subcontractors, and progress schedule.
3. Designation of personnel representing the parties in Contract, Contractor, Owner, and City Engineer.
4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
5. Review safety standards and procedures.
6. Scheduling.
7. Scheduling activities of a testing company and Geotechnical Engineer, if required.

E. Record minutes and distribute copies within two days after meeting to participants, with one copy to Contractor, City Engineer, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, City Inspector, City Safety Coordinator, City Engineer, as appropriate to agenda topics for each meeting.

D. Agenda:

1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

E. Record minutes and distribute copies within two days after meeting to participants, with one copy to Contractor, City Engineer, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01325

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.04 PROGRESS DVD'S AND DIGITAL PHOTOGRAPHS

A. Provide DVD disc's and digital photographs, from a digital camera with at least 7.1 mega pixels, of construction throughout progress of Work; produced by an experienced photographer, acceptable to the City Inspector and City Engineer.

B. Take photographs when and as directed by the City Inspector or City Engineer and as follows:

C. Views:

1. Video tape and photographs shall show total project, from beginning to end, prior to start of work and after work has been completed; with additional footage or photographs to portray special items of interest and unusual conditions.

2. Consult with the City Inspector or City Engineer for instructions on views required to adequately show original conditions. No work shall be started until original conditions are adequately shown.

3. Provide factual presentation.

4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

D. DVD's: provide two copies.

1. DVD's shall include narration to identify date, locations, and indicating special items of interest.

E. Photographs: submit on CD; two copies.

1. Photographs shall be burned onto a CD and shall be placed in chronological order.

2. Size: 3 1/2 x 5 inch; mounted for binder and tabs.

3. Identify each photograph with label description of Project, contract number, phase, orientation of view, date and time of view, and name of individual who took photograph.

F. Deliver DVD's at end of project, or when directed by the City Inspector or City Engineer, with transmittal letter specified in this section.

G. Deliver DVD's with each Application for Payment with transmittal letter specified in this Section.

H. Deliver CD's with photographs from the total project to the Owner upon completion of the project with project record documents. Catalog and label photographs in chronological sequence; provide table of contents.

3.05 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to the City Engineer.

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:

1. Product data.

2. Shop drawings.

3. Samples for selection.

4. Samples for verification.

B. Submit to the City Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 - CLOSEOUT SUBMITTALS.

3.07 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:

1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for the City Engineer's knowledge as contract administrator or for the Owner. No action will be taken.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:

1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

B. Submit for the Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:

1. Small size sheets, not larger than 8-1/2 x 11 inches: Submit the number of copies which the Contractor requires, plus two copies which will be retained by the City Engineer.
2. Larger sheets, not larger than 36 x 48 inches: Submit the number of opaque reproductions which Contractor requires, plus two copies which will be retained by City Engineer.

B. Documents for Information: Submit two copies.

C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.

D. Samples: Submit the number specified in individual specification sections; one of which will be retained by the City Engineer.

1. After review, produce duplicates.

2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

A. Transmit each submittal with transmittal letter.

B. Sequentially number the transmittal letters. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply the Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Deliver submittals to the City Engineer at business address.

F. Schedule submittals to expedite the Project, and coordinate submission of related items.

G. For each submittal for review, allow 7 days excluding delivery time to and from the Contractor.

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

I. Provide space for Contractor and City Engineer review stamps.

J. When revised for re-submission, identify all changes made since previous submission.

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

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

END OF SECTION

SECTION 01325

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 REFERENCES

A. AGC (CPM) - The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry; Associated General Contractors of America; latest edition.

B. M-H (CPM) - CPM in Construction Management - Project Management with CPM, O'Brien, McGraw-Hill Book Company; latest edition.

1.03 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days, as directed by the City Inspector or City Engineer.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment, as directed by the City Inspector or City Engineer.

F. Submit the number of opaque reproductions the Contractor requires, plus one copy which will be retained by the City Engineer.

G. Submit under transmittal letter form specified in Section 01300.

1.04 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.05 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches or width required.

C. Sheet Size: Multiples of 8-1/2 x 11 inches.

D. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules for each stage of Work identified in Section 01100.

E. Provide sub-schedules to define critical portions of the entire schedule.

F. Include conferences and meetings in schedule.

G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from the City Engineer. Indicate decision dates for selection of finishes.

I. Indicate delivery dates for owner-furnished products.

J. Coordinate content with schedule of values specified in Section 01200.

K. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with the City Inspector or City Engineer at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report, as directed by the City Inspector or City Engineer, to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, the City Engineer, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 01400

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.

B. Quality assurance submittals.

C. Control of installation.

D. Tolerances.

E. Testing and inspection services.

F. Manufacturers' field services.

1.02 RELATED SECTIONS

A. Section 00300 - Information Available to Bidders: Soil investigation data.

B. Section 00700 - General Conditions: Inspections and approvals required by public authorities.

C. Section 01300 - Administrative Requirements: Submittal procedures.

D. Section 01600 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCES

A. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

B. ASTM D 290 - Standard Practice for Bituminous Mixing Plant Inspection.

C. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

D. ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

E. ASTM E 543 - Standard Practice for Agencies Performing Nondestructive Testing.

F. ASTM E 548 - Standard Guide for General Criteria used for Evaluating Laboratory Competence.

G. Use the latest edition of the above reference standards as of the date of the project.

1.04 SUBMITTALS

A. Testing Agency Qualifications:

1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Test Reports: After each test/inspection, promptly submit two copies of report to the City Inspector or City Engineer and to the Contractor; within maximum of 24 hours.

1. Include:
   a. Date issued.
   b. Project title and number.
   c. Name of inspector.
   d. Date and time of sampling or inspection.
   e. Identification of product and specifications section.
   f. Location in the Project.
   g. Type of test/inspection.
   h. Date of test/inspection.
   i. Results of test/inspection.
   j. Conformance with Contract Documents.
   k. When requested by the City Inspector or City Engineer, provide interpretation of results.

2. Test reports are submitted for the City Inspector or City Engineer's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor to the City Inspector or City Engineer, in quantities specified for Product Data.

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

2. Certificates may be recent or previous test results on material or Product, but must be acceptable to the City Inspector or City Engineer.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for the City Inspector or City Engineer's benefit as contract administrator or for the Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

F. Erection Drawings: Submit drawings for the City Inspector or City Engineer's benefit as contract administrator or for the Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

2. Data indicating inappropriate or unacceptable Work may be subject to action by the City Inspector, City Engineer or the Owner.

1.05 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from the City Engineer before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the City Inspector or City Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform specified testing. See Supplemental General Conditions for specified testing.

B. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing. See Supplemental General Conditions for specified testing.

C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

D. Contractor and Owner Employed Agency:

1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 548, ASTM C 1093, ASTM E 543, ASTM C 1021, ASTM C 1077, ASTM C 1093, and ASTM C 1021.

2. Inspection agency: Comply with requirements of ASTM D290.

3. Laboratory: Authorized to operate in State in which Project is located.

4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

5. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from the City Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from the City Engineer before proceeding.

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

3.03 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with the City Engineer and Contractor in performance of services.

2. Perform specified sampling and testing of Products in accordance with specified standards.

3. Ascertain compliance of materials and mixes with requirements of Contract Documents.

4. Promptly notify the City Inspector or City Engineer and the Contractor of observed irregularities or non conformance of Work or Products.

5. Perform additional tests and inspections required by the City Inspector or City Engineer.

6. Attend preconstruction meetings and progress meetings, when requested.

7. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

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

2. Agency may not approve or accept any portion of the Work.

3. Agency may not assume any duties of Contractor.

4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

2. Cooperate with laboratory personnel, and provide access to the Work.

3. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.

4. Notify the City Inspector or City Engineer and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by the Contractor beyond specified requirements.

6. Arrange with the Owner's agency and pay for additional samples, tests, and inspections required by the Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by the City Inspector or City Engineer. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Sum/Price.

3.04 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.05 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of the City Inspector or City Engineer, it is not practical to remove and replace the Work, the City Inspector or City Engineer will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary sanitary facilities.

B. Temporary Controls: Barriers, enclosures, and fencing.

C. Vehicular access and parking.

1.02 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required chemical or marine type toilets of acceptable type. Provide at time of project mobilization.

B. Use of existing facilities is permitted, where acceptable to the owners of the facilities.

C. Maintain daily in clean and sanitary condition.

D. At end of construction, remove portable toilets completely.

1.03 BARRIERS

A. Provide sufficient barriers at all unsafe places at or near construction areas and to protect existing facilities and adjacent properties from damage from construction operations; in all cases maintain safe passageways through construction areas.

B. Provide protection for plants designated to remain. Replace damaged plants.

C. Protect non-owned vehicular traffic, stored materials, and structures from damage.

1.04 FENCING

A. Where required, provide temporary fences at construction areas to contain domestic animals.

B. After project work is completed, the temporary fences shall be totally removed.

1.05 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and the Owner.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Maintain at least one lane of traffic for local residences, or as directed by the City Inspector.

D. Provide and maintain access to adjacent businesses as directed.

E. Provide means of removing mud from vehicle wheels before entering streets.

F. Provide temporary parking areas to accommodate construction personnel.

1.06 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary equipment, facilities, materials, prior to Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to the original conditions. Restore permanent facilities used during construction to specified conditions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01560

SAFETY STANDARDS AND ACCIDENT PREVENTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Safety Standards.

B. Accident Prevention.

1.02 DEFINITIONS

A. OSHA - Occupational Safety and Health Administration.

B. UOSHA - Utah Occupational Safety and Health Administration.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Provide copy of OSHA 200 for past two years.

C. Provide copy of citation history from OSHA for past two years.

D. Provide copy of safety and health program.

1.04 SAFETY STANDARDS AND ACCIDENT PREVENTION

A. Health and safety, as well as environmental concerns, are given top priority by the Owner.

B. With respect to all work performed for this Contract, the Contractor shall:

1. Provide a safe and healthful work place in accordance with all federal, state and local regulations.
2. Conform to all rules and regulation of OSHA.
3. Immediately notify the OWNER of ANY accident or job related illness that occurs on the job site.
4. Notify UOSHA of any serious accident within 12 hours of such occurrence, as required by the Utah Administrative Code R574-102 13.1.1.
5. Notify the OWNER of any sub-contractor retained to work on this project; and assure that they are informed of the Safety and Health Standards required by this Contract.
6. Provide the OWNER with a traffic plan for the work zone and buffer zone. Plan must be approved by U.D.O.T. where necessary.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations and procedures.

1.02 RELATED SECTIONS

A. Document 00200 - Instructions to Bidders: Product options and substitution procedures prior to bid date.

B. Section 01400 - Quality Requirements: Product quality monitoring.

1.03 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

1. Submit within 15 days after date of Agreement.

2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project.

D. Provide written statement that materials and equipment being furnished are suitable and proper for the intended installations; that suppliers have investigated intended uses; and that items will satisfactorily perform and operate in the installations.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

B. Provide interchangeable components of the same manufacture for components being replaced.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Engineer will consider requests for substitutions only within 15 days after date of Agreement.

C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

E. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the substitution as for the specified product.

3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

4. Waives claims for additional costs or time extension which may subsequently become apparent.

5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.

F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:

1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.

3. The Engineer will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

3.03 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

D. For exterior storage of fabricated products, place on sloped supports above ground.

E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

F. Store loose granular materials on relatively solid, flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Surveying for laying out the work.

C. Cleaning and protection.

D. Closeout procedures, except payment procedures.

1.02 RELATED SECTIONS

A. Section 01300 - Administrative Requirements: Submittals procedures.

B. Section 01400 - Quality Requirements: Testing and inspection procedures.

C. Section 01500 - Temporary Facilities and Controls:

D. Section 01780 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

1.03 PROJECT CONDITIONS

A. Grade work areas to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

E. Erosion and Sediment Control: Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

1. Minimize amount of bare soil exposed at one time.

2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.04 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Coordinate completion and clean-up of work of separate sections.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01600.

PART 3 EXECUTION

3.01 EXAMINATION

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

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

C. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Cut, move, or remove items as necessary for access to construction area. Replace and restore at completion where necessary.

B. Remove unsuitable material, such as brush, weeds, wood, metals, concrete and rocks. Load and haul removed materials and dispose of in an acceptable manner.

3.03 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify City Inspector or Engineer of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Control datum for survey is that established by Owner provided survey.

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

F. Promptly report to City Inspector or Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

G. Owner's surveyors will replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

H. Utilize recognized engineering survey practices.

I. Establish elevations, lines, grades and elevations. Locate and lay out by instrumentation and similar appropriate means.

J. Periodically verify layouts by same means.

K. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install Products as specified in individual sections.

3.05 PROGRESS CLEANING

A. Maintain construction areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipes and other closed spaces, prior to enclosing the space.

C. Collect and remove waste materials, debris, and rubbish from site periodically and dispose off-site.

3.06 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

C. Prohibit traffic from landscaped areas.

3.07 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Clean site; sweep paved areas, rake clean landscaped surfaces.

C. Remove waste and surplus materials, rubbish, and construction facilities from the site.

3.08 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide copies to Engineer and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.

C. Notify City Inspector or Engineer when work is considered ready for Substantial Completion.

D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Engineer's review.

E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

F. Accompany Project Coordinator on preliminary final inspection.

G. Notify Inspector or Engineer when work is considered finally complete.

H. Complete items of work determined by Inspector or Engineer's final inspection.

END OF SECTION

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Warranties and bonds.

1.02 RELATED SECTIONS

A. Conditions of the Contract: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Section 01700 - Execution Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

F. Section 01785 - Project Evaluation.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Engineer with claim for final Application for Payment.

B. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

C. Project Evaluation: Submit form to Engineer with claim for final Application for Payment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.

2. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish main floor datum.

2. Measured depths of manholes in relation to rim elevation.

3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

4. Field changes of dimension and detail.

5. Details not on original Contract drawings.

3.02 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

3.03 PROJECT EVALUATION FORM

A. See Section 01785 - PROJECT EVALUATION.

B. Complete all items on the Project Evaluation Form and submit with final Application for Payment.

C. Owner and Engineer shall also each complete the Project Evaluation form; which will be included with the Project file for use in future evaluation of the Contractor.

END OF SECTION

SECTION 01785

PROJECT EVALUATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Evaluation Document.

1.02 RELATED SECTIONS

A. Section 01780 - Closeout Submittals.

1.03 SUBMITTALS

A. Project Evaluation: Document must be submitted to Engineer with claim for final Application for Payment.

1.04 PROJECT EVALUATION

A. Project to be evaluated by the Owner, Engineer and Contractor.

B. Project evaluation by Owner and Engineer will be used to rate the Contractor's performance; which will be used to determine Contractor's qualification for future projects with the Owner.

C. Evaluation shall be done on a five point system; with 5 being excellent, 1 being poor and N/A for items which do not apply.

D. The following areas are to be evaluated.

E. Contract: How well was the Contract followed.

1. Time: _____.
2. Materials: _____.
3. Pricing: _____.
4. Bid: _____.
5. Change Orders: _____.
6. Warranties: _____.

F. Quality of Work.

1. Workmanship: _____.
2. Materials: _____.
3. Equipment Used: _____.

G. Quality of Materials.

1. Storage on Site: _____.
2. Care to Prevent Damage: _____.

H. Red-Line Drawings.

1. Provided: _____.
2. Quantity: _____.
3. On Time: _____.

I. Working Relationships.

1. Owner's Engineer: _____.
2. Owner's Employees: _____.
3. General Public: _____.
4. Property Owners: _____.

J. Contractor's Performance on Previous Projects with Owner.

1. Owner: _____.
2. Engineer: _____.

K. COMMENTS:_____

_____

_____

_____

_____

_____

END OF SECTION

DIVISION 02

PROJECT CONSTRUCTION

SECTION 02100

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Measurement and payment for site stabilization project, and all appurtenant work; including:

1. Mobilization, traffic control, and erosion control.
2. Clearing and grubbing work sites; including removal of vegetation.
3. General earthwork for site work.
4. Restoring native vegetation in disturbed work areas.
5. Constructing catchment trenches and drainage ditches.
6. Constructing storm drain lines, drainage lines, and related structures.
7. Connecting slotted HDPE pipe to HDPE storm drain lines.
8. Constructing storm drain manholes over existing storm drain lines.
8. Restoring existing roadways.
9. Constructing buttress; including fill material, gravel blanket, granular fill, geo-grid reinforcement, and slotted drain lines.
10. Removing existing roadway pavement and concrete items at top of slope; and modifying existing utilities.

1.02 RELATED SECTIONS

A. See appropriate sections of the Contract Documents for criteria applicable to Work performed under a unit price or lump sum price payment method.

1.03 MEASUREMENT AND PAYMENT

A. Measurement shall be made in units or lump sums, as described below.

B. Payment shall be made at the unit price or lump sum price bid in the bid schedule for the items described below; which shall be payment in full for all costs of furnishing labor, tools, equipment, materials, testing, etc., to complete the items of work as specified and as indicated on the drawings.

C. Where Bid Items are to paid for with lump sum prices and approximate quantities are indicated in the item descriptions, these quantities are shown to indicate the approximate scope of the work item. The Contractor shall examine the project drawings and shall visit the site of the work, and shall make his own determinations of the amount of work necessary to complete the work items as indicated and as required.

1. The lump sum price for these items shall be the maximum amount paid to complete these items; unless written prior approval for any change in lump sum price has been issued by the City Engineer.
   a. The changes for lump sum prices for these items will not be paid for if prior approval was not received by the Contractor; and will be at the Contractor's own expense, with no additional cost to the City.

D. Bid items shown with letter and number, indicate bid schedule and item number.

E. Mobilization (Bid Items No. A-1, B-1, C-1 and D-1):

1. Basis for Measurement: Lump Sum.

2. Basis for Payment: Includes all preparatory work and operations, such as movement of personnel, supplies, materials and incidental items to the project site; establishment of offices and other facilities necessary for work on the project; furnishing, erecting and maintaining construction signs and barricades; and all other work and operations which must be performed or costs incurred prior to beginning work on the project.
   a. Payment shall also include all costs for de-mobilization after the project has been completed.

F. Traffic Control (Bid Items No. A-2, B-2, C-2, and D-2):

1. Basis for Measurement: Lump Sum.

2. Basis for Payment: Includes furnishing, erecting and maintaining traffic control signs and barricades; furnishing flaggers as required; and all appurtenant work required for traffic control.

G. Erosion Control (Bid Items No. A-3, B-3, C-3, and D-3):

1. Basis for Measurement: Lump Sum.

2. Basis for Payment: Includes furnishing, erecting and maintaining erosion control facilities during project construction, including silt fences; and all appurtenant work required for erosion control.
   a. Payment shall also include all costs for removing erosion control facilities, as required and as directed, after the project has been completed.

H. Clearing and Grubbing of Work Areas (Bid Item No. D-4):

1. Basis for Measurement: By the acre of area actually cleared and grubbed.

2. Basis for Payment: Includes clearing and grubbing entire work areas for stabilization projects, as indicated and as directed, to include removing vegetation, rubbish, debris and related items; separating unacceptable material from acceptable material, as indicated and as directed; loading and placing acceptable materials in stockpile if it is to be re-used; removing excess and unsuitable material from work areas and disposing of the material in an acceptable manner; and all appurtenant work.

I. General Earthwork for Upper Site Work with Short Haul (Bid Item No. A-4):

1. Basis of Measurement: Lump Sum.

2. Basis for Payment: Includes all required general earthwork for site work, including: clearing and grubbing as required; excavating to cut back top slope of existing landslide, from toe of scarp at a 2:1 slope, to the limits indicated and as directed; re-grading area to smooth out existing grades and to provide positive drainage, as indicated and as directed; and all appurtenant work to complete earthwork for upper site work with short haul.
   a. Payment shall include loading, hauling and placing excavated material in stockpiles at the Tunnel Springs Park, where indicated.
   b. Payment shall include all de-watering, as required and as described in these specifications.
   c. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   d. Payment shall also include separating and stockpiling large boulders encountered during general earthwork that are to be installed in the drainage ditches for energy dissipation, as directed.

J. General Earthwork for Middle Site Work with Free Haul (Bid Item No. B-4):

1. Basis of Measurement: Lump Sum.

2. Basis for Payment: Includes all required general earthwork for site work, including: clearing and grubbing as required; excavating to cut back slopes of existing landslide, to the limits indicated and as directed; re-grading to smooth out existing grades and to provide positive drainage, as indicated and as directed; and all appurtenant work to complete earthwork for middle site work with free haul.
   a. Payment shall include loading, hauling and placing excavated material in stockpiles on-site to be re-used in re-grading the site.
   b. Payment shall include all de-watering, as required and as described in these specifications.
   c. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   d. Payment shall also include separating and stockpiling large boulders encountered during general earthwork that are to be installed in the drainage ditches for energy dissipation, as directed.

K. Haul and Place Select Excavated Material for Middle Site Work with Short Haul (Bid Item No. B-5):

1. Basis of Measurement: Lump Sum

2. Basis for Payment: Includes loading, hauling and placing select excavated material from stockpile for re-grading site, as indicated and as directed.
   a. Payment shall include separating select, excavated material from designated stockpile, as directed; and loading and hauling material to site.

L. General Earthwork for Lower Site Work with Free Haul (Bid Item No. C-4):

1. Basis of Measurement: Lump Sum.

2. Basis for Payment: Includes all required general earthwork for site work, including: clearing and grubbing as required; excavating to cut back slopes of existing landslide, to the limits indicated and as directed; re-grading to smooth out existing grades and to provide positive drainage, as indicated and as directed; and all appurtenant work to complete earthwork for lower site work with free haul.
   a. Payment shall include loading, hauling and placing excavated material in stockpiles on-site to be re-used in re-grading the site.
   b. Payment shall include all de-watering, as required and as described in these specifications.
   c. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   d. Payment shall also include separating and stockpiling large boulders encountered during general earthwork that are to be installed in the drainage ditches for energy dissipation, as directed.

M. General Earthwork for Lower Site Work with Short Haul (Bid Item No. C-5):

1. Basis of Measurement: Lump Sum.

2. Basis for Payment: Includes all required general earthwork for site work, including: clearing and grubbing as required; excavating to cut back top slope of existing landslide, from toe of scarp at a 2:1 slope, to the limits indicated and as directed; re-grading area to smooth out existing grades and to provide positive drainage, as indicated and as directed; and all appurtenant work to complete earthwork for lower site work with short haul.
   a. Payment shall include loading, hauling and placing excavated material in stockpiles at the Tunnel Springs Park, where indicated.
   b. Payment shall include all de-watering, as required and as described in these specifications.
   c. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   d. Payment shall also include separating and stockpiling large boulders encountered during general earthwork that are to be installed in the drainage ditches for energy dissipation, as directed.

N. Construct Top Drain Catchment Trench (Bid Item No. A-6):

1. Basis for Measurement: By the linear foot of trench actually constructed.

2. Basis for Payment: Includes all required earthwork, to include general excavation for trench of the size and length indicated, backfilling excavation as required, and compacting backfill material; furnishing and placing geotextile fabric wrap as required; furnishing and installing HDPE slotted pipe of the size indicated, including fabric sleeve around pipe; connecting ends of slotted trench pipe to ends of slotted pipes at the Middle Drainage Ditch; furnishing, placing and compacting rock fill, to the limits as indicated and as directed; and all appurtenant work to complete construction of catchment trench.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   c. Payment shall also include separating and stockpiling large boulders encountered during general earthwork that are to be installed in the drainage ditches for energy dissipation, as directed.

O. Construct Upper Surface Drainage Ditch (Bid Item No. B-6):

1. Basis of Measurement: By the linear feet of drainage ditch actually constructed.

2. Basis for Payment: Includes all required earthwork, to include general excavation for drainage ditch of the size as indicated, backfilling excavation as required, and compacting backfill material; furnishing and placing geomembrane liner as indicated, including sand bedding; furnishing, placing and compacting rock fill, to the limits as indicated and as directed; installing stockpiled boulders, as directed, for energy dissipation; and all appurtenant work to complete construction of drainage ditch.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   c. Payment shall also include separating and stockpiling large boulders encountered during general earthwork to be installed in the ditches for energy dissipation, as directed.

P. Construct Lower Surface Drainage Ditch (Bid Item No. B-7):

1. Basis of Measurement: By the linear feet of drainage ditch actually constructed.

2. Basis for Payment: Includes all required earthwork, to include general excavation for drainage ditch of the size as indicated, backfilling excavation as required, and compacting backfill material; furnishing and placing geomembrane liner as indicated, including sand bedding; furnishing, placing and compacting rock fill, to the limits as indicated and as directed; installing stockpiled boulders, as directed, for energy dissipation; and all appurtenant work to complete construction of drainage ditch.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.
   c. Payment shall also include separating and stockpiling large boulders encountered during general earthwork to be installed in the ditches for energy dissipation, as directed.

Q. Construct Slotted Pipe Lines for Drainage Ditches (Bid Items B-8 and B-10):

1. Basis of Measurement: By the linear feet of slotted pipe lines actually constructed.

2. Basis for Payment: Includes all required earthwork; furnishing and installing HDPE slotted pipe and fittings to the limits and of the size indicated, including fabric sleeve around pipe; and all appurtenant work.

R. Construct Connecting Surface Drainage Ditches (Bid Item No. B-9):

1. Basis of Measurement: By the linear feet of drainage ditch actually constructed.

2. Basis for Payment: Includes all required earthwork, to include general excavation for drainage ditch of the size as indicated, backfilling excavation as required, and compacting backfill material; furnishing and placing geomembrane liner as indicated, including sand bedding; furnishing, placing and compacting rock fill, to the limits as indicated and as directed; installing stockpiled boulders, as directed, for energy dissipation; and all appurtenant work to complete construction of drainage ditch.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.

   c. Payment shall also include separating and stockpiling large boulders encountered during general earthwork to be installed in the ditches for energy dissipation, as directed.

S. Excavating for Structures:

1. Basis of Measurement: Measurement for structural excavation shall be made and included in the unit price or lump sum price bid for the item of work that requires excavation.

2. Basis for Payment: Includes excavating to required cross sections and elevations, loading and placing materials in stockpile if it is to be reused; removing excess and unacceptable material from project site; backfilling excavations around structures; and compaction of backfill material.

3. Does not include over-excavation: Payment for structural excavation will not be made for over-excavated work, nor for replacement materials.

T. HDPE Storm Drain Pipe and Fittings (Bid Items No. B-11 and B-12):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork for storm drain lines as indicated, to include excavating for trenches as required, backfilling all trenches, and compacting backfill material; furnishing, placing and compacting pipe bedding material; furnishing and installing HDPE storm drain pipe and fittings with butt-welded joints, of the type and size as indicated; and all appurtenant work.

U. RCP Storm Drain Pipe Line (Bid Item No. B-13):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork for storm drain line across roadway, to include excavating for trenches as required, backfilling all trenches, and compacting backfill material; furnishing, placing and compacting pipe bedding material; furnishing and installing reinforced concrete storm drain pipe and fittings of the type and size as indicated; and all appurtenant work.

V. Connect Slotted HDPE Pipe to New HDPE Storm Drain Pipe (Bid Items No. B-14):

1. Basis for Measurement: By the unit of each connection made.

2. Basis for Payment: Includes cost of all related earthwork, to include excavating, backfilling excavations, and compacting backfill; furnishing and installing HDPE pipe and fittings, as indicated, for connection; connecting new pipe and fittings to slotted HDPE pipe and HDPE storm drain pipe with butt-welded joints; and all appurtenant work to complete the connection.

W. Storm Drain Cleanouts (Bid Item No. B-15):

1. Basis for Measurement: By the unit of each cleanout actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating for new cleanouts, backfilling excavations around cleanouts, and compacting backfill material; constructing storm drain cleanouts, as indicated, including pipe and fittings, rings and covers, and all appurtenant items; connecting cleanout pipes to storm drain pipe lines; and all appurtenant work to complete cleanouts.

X. Storm Drain Manhole (Bid Item No. B-16):

1. Basis for Measurement: By the unit of each manhole actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating for new manhole, backfilling excavations around manhole, and compacting backfill material; constructing storm drain manhole, as indicated, including precast concrete base, riser sections, ring and cover, and all appurtenant items; connecting new pipes to new manhole, and forming and sealing pipe inlets and outlets; and all appurtenant work to complete manhole.

Y. Storm Drain Manholes over Existing Storm Drain Line on Parkway Drive (Bid Items No. B-17 and C-9):

1. Basis for Measurement: By the unit of each manhole actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating for new manhole and to expose existing drain pipe, backfilling excavations and around structures and pipes, and compacting backfill; cutting and removing section of existing pipe as required and as directed; constructing storm drain manhole, as indicated, including precast concrete manhole, ring and cover, and all appurtenant items; connecting new and existing pipes to new manhole, and forming and sealing pipe inlets and outlets; and all appurtenant work to complete the manhole.

Z. Restore Roadway on Parkway Drive (Bid Items No. B-18 and C-10):

1. Basis for Measurement: Separate Lump Sum for each location.

2. Basis for Payment: Includes all required earthwork, to include excavating for removal of existing pavement and concrete items to allow construction of project work, backfilling excavations as required, and compacting backfill; removing existing asphalt pavement, concrete curb and gutter and sidewalk, and other related items, as required; restoring asphalt pavement as required, including gravel road base; restoring concrete curb and gutter, sidewalks and related items as required and as directed; restoring existing landscaping along new concrete work, as required and as directed; and all appurtenant work to complete roadway restoration.

AA. Restore Native Vegetation in Disturbed Work Areas (Bid Items No. A-6, B-26, C-22 and D-18):

1. Existing native vegetation, such native grasses and miscellaneous vegetation, shall be removed as required for project construction and as directed. Native vegetation shall be restored to full width and length of existing vegetation removed, as directed.

2. Basis for Measurement: By the square foot of native vegetation actually restored.

3. Basis of Payment: Includes all required earthwork; furnishing and installing erosion control mat, of the type indicated and as directed; preparation of areas to be reseeded as required; furnishing and placing new native grass seeding and other vegetation items as required and as directed; and all appurtenant work required to complete the restoration.
   a. New vegetation items shall match existing items removed and adjacent vegetation.

AB. HDPE Slotted Buttress Drain Pipe and Fittings for Buttresses (Bid Items No. B-19 and C-6):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork for buttress drain lines as indicated, to include excavating for trenches as required, backfilling all trenches, and compacting backfill material; furnishing and placing rock fill material, as indicated; furnishing and installing HDPE slotted drain pipe and fittings, of the size indicated, including fabric sleeve around pipe; furnishing and installing HDPE solid drain pipe and fittings, where shown and of the size indicated; and all appurtenant work.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.

AC. HDPE Storm Drain Pipe (Bid Item No. B-20):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork for storm drain line as indicated, to include excavating for trenches as required, backfilling all trenches, and compacting backfill material; furnishing, placing and compacting pipe bedding material; furnishing and installing HDPE storm drain pipe and fittings, of the type and size as indicated; and all appurtenant work.

AD. Connect HDPE Storm Drain Pipe to Storm Drain Manhole (Bid Item No. B-21):

1. Basis of Measurement: Lump Sum.

2. Basis of Payment: Includes all required earthwork; core-cutting manhole wall as required; furnishing and installing sleeve in hole; furnishing and installing FxPE HDPE pipe, of the type and size as indicated; and all appurtenant work.

AE. PVC Storm Drain Pipe (Bid Item No. C-7):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork for storm drain line as indicated, to include excavating for trenches as required, backfilling all trenches, and compacting backfill material; furnishing, placing and compacting pipe bedding material; furnishing and installing PVC storm drain pipe and fittings, of the type and size as indicated; and all appurtenant work.

AF. Connect New PVC Storm Drain Pipe to Slotted HDPE Buttress Drain (Bid Items No. C-8):

1. Basis for Measurement: Lump Sum.

2. Basis for Payment: Includes cost of all related earthwork, to include excavating, backfilling excavations, and compacting backfill; furnishing and installing PVC pipe and fittings, as indicated, for connection; connecting new pipe and fittings to PVC storm drain pipe and to slotted HDPE pipe with butt-welded joints; and all appurtenant work to complete the connection.

AG. Saw-Cut Existing Concrete Pavement (Bid Item No. C-11):

1. Basis for Measurement: By the linear foot of pavement saw-cut.

2. Basis for Payment: Includes all work required for saw-cutting existing post-tensioned concrete tennis court pavement, as indicated and as directed; and all appurtenant work.

AH. Saw-Cut Existing Asphalt Pavement (Bid Item No. C-12):

1. Basis for Measurement: By the linear foot of pavement saw-cut.

2. Basis for Payment: Includes all work required for saw-cutting existing asphalt pavement in parking lot, as indicated and as directed; and all appurtenant work.

AI. Remove and Dispose of Existing Concrete Pavement (Bid Item No. C-13):

1. Basis for Measurement: By the square foot of concrete pavement actually removed.

2. Basis for Payment: Includes breaking-up existing post-tensioned concrete pavement, to the limits indicated and as directed; removing the concrete debris and reinforcement from the paved areas, as required; disposing of the removed materials in an acceptable manner; and all appurtenant work.

AJ. Remove and Dispose of Existing Asphalt Pavement (Bid Item No. C-14):

1. Basis for Measurement: By the square foot of concrete pavement actually removed.

2. Basis for Payment: Includes breaking-up or pulverizing existing asphalt pavement, to the limits indicated and as directed; removing the asphalt debris from the paved areas, as required; disposing of asphalt debris in an acceptable manner; and all appurtenant work.

AK. Remove and Dispose of Existing Block Retaining Wall (Bid Item No. C-15):

1. Basis for Measurement: Lump Sum.

2. Basis for Payment: Includes all required earthwork to expose the base of the block retaining walls, backfilling excavations, and compacting backfill material as required; demolishing the existing concrete block wall and appurtenant items, to the limits indicated and as directed; removing the debris from the work areas, as required; disposing of the debris in an acceptable manner; and all appurtenant work to complete the removal.

AL. Remove and Dispose of Existing Storm Drain Inlet Boxes (Bid Items No. C-16 and C-17):

1. Basis for Measurement: By the unit of each box removed.

2. Basis for Payment: Includes all required earthwork to expose the existing inlet boxes and adjacent pipes, backfilling excavations, and compacting backfill material as required; cutting existing pipes at each side of the boxes and plugging the pipes to remain in place; removing the existing inlet boxes, pipes as required and as directed, and all appurtenant items, as indicated and as directed; disposing of the removed material in an acceptable manner; and all appurtenant work to complete the removals.

AM. Gravel Blanket Material for Buttresses (Bid Items No. B-22 and C-18):

1. Basis of Measurement: By the cubic yard of gravel material placed and compacted.

2. Basis for Payment: Includes all required general earthwork, including grading and compacting to prepare sub-grade for gravel blanket, to the thickness and limits indicated and as directed; furnishing, placing and compacting gravel material, as indicated and as directed; and all appurtenant work to complete gravel blanket for buttress.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction has been completed; and removal of diversion facilities after the work is completed.

AN. Granular Fill for Buttresses (Bid Items No. B-23 and C-19):

1. Basis of Measurement: By the cubic yard of fill material placed and compacted.

2. Basis for Payment: Includes hauling and placing select granular excavated material for the buttress, as indicated and as directed.
   a. Payment shall include separating select, excess granular material from general excavations, as directed; and loading and hauling material to buttress site.

AO. Construct Geo-Grid Reinforced Buttresses (Bid Items No. B-24 and C-20):

1. Basis of Measurement: By the cubic yard of buttress constructed.

2. Basis for Payment: Includes furnishing and placing geo-grid reinforcement, as indicated and as directed, to wrap around fill material; grading and compacting granular fill material in layers between the geo-grid reinforcement, to the limits indicated and as directed; and all appurtenant work to complete construction of reinforced buttresses.
   a. Payment shall include all de-watering, as required and as described in these specifications.
   b. Payment shall also include costs for providing temporary facilities to divert existing flow of storm water around areas of construction, as required; maintaining flow of diverted storm water until construction of the trails have been completed; and removal of diversion facilities after the work is completed.

AP. Furnish and Place Gunite Coating Over Face of Buttress Walls (Bid Items No. B-25 and C-21):

1. Basis of Measurement: By the square feet of gunite placed.

2. Basis for Payment: Includes preparing the face of the walls as required and as directed; furnishing and placing wire mesh, as indicated and as directed; furnishing and placing gunite to the walls to the thickness as indicated; and all appurtenant work to complete coating.

AQ. Remove Existing Roadway (Bid Item No. D-5):

1. Basis for Measurement: By the square foot of roadway actually removed.

2. Basis for Payment: Includes saw-cutting existing asphalt pavement, concrete curb and gutter, and sidewalks, as required and as directed, at the top of the new slope; breaking-up and removing the existing asphalt pavement and concrete items, to the limits indicated and as directed; disposing of the removed materials in an acceptable manner; re-grading roadway area as directed; and all appurtenant work to complete the removal.

AR. Remove Existing Utilities for Roadway Area (Bid Item No. D-6):

1. Basis for Measurement: Lump Sum.

2. Basis for Payment: Includes all required earthwork, including excavating as required to expose the existing utility lines and appurtenant items to be removed in existing roadway at top of slope, including water lines, sewer lines, storm drains, and other items to be removed; cutting existing pipe lines, as indicated and as directed; removing and disposing of existing pipe and fittings, valves and valve boxes, fire hydrants, manholes, storm drain boxes, and appurtenant items; plugging ends of existing pipe lines to remain with permanent plugs, as directed; and all appurtenant work to complete removing existing utility lines.

AS. Abandon Existing Manholes in Roadway Area (Bid Item No. D-7):

1. Basis for Measurement: By the unit for each manhole abandoned.

2. Basis for Payment: Includes all required earthwork, including excavating as required to expose the top portion of the existing manholes to be abandoned in existing roadway, backfilling all excavations, and compacting backfill material, as required and as directed; plugging all pipe openings in the bases of the manholes; removing the top portions of the existing manholes, as indicated and as directed, to approximately 4-feet below the ground surfaces; disposing of the removed materials in an acceptable manner; backfilling the remaining portions of manholes with sand to the tops of remaining manholes, as indicated; and all appurtenant work to complete abandonment of existing manholes.

AT. Construct New 15-inch Storm Drain Pipe Line (Bid Item No. D-8):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork, including excavating as required to expose the existing for storm drain lines and structures to be removed in the existing roadway area as indicated, excavating trenches for new pipe line as required, backfilling all trenches, and compacting backfill material; removing and disposing of existing pipe and fittings, boxes, and appurtenant items as required; plugging ends of the existing pipes to remain with permanent plugs, as directed; furnishing, placing and compacting pipe bedding material; furnishing and installing new HDPE storm drain pipe and fittings with butt-welded joints, of the type and size as indicated; and all appurtenant work.

AU. Storm Drain Manhole over Existing Storm Drain Line on Pace Lane (Bid Item No. D-9):

1. Basis for Measurement: By the unit of each manhole actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating for new manhole and to expose existing storm drain pipe, backfilling excavations and around structures and pipes, and compacting backfill; cutting and removing section of existing pipe as required and as directed; constructing storm drain manhole, as indicated, including precast concrete manhole, ring and cover, and all appurtenant items; connecting new and existing pipes to new manhole, and forming and sealing pipe inlets and outlets; and all appurtenant work to complete the manhole.

AV. Storm Drain Manhole over Existing Land Drain Line on Silvertree Lane (Bid Item No. D-10):

1. Basis for Measurement: By the unit of each manhole actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating for new manhole and to expose existing land drain pipe, backfilling excavations and around structures and pipes, and compacting backfill; cutting and removing section of existing pipe as required and as directed; constructing storm drain manhole, as indicated, including precast concrete manhole, ring and cover, and all appurtenant items; connecting new and existing pipes to new manhole, and forming and sealing pipe inlets and outlets; and all appurtenant work to complete the manhole.

AW. Catch Basins in Existing Curb & Gutter on Silvertree Lane (Bid Item No. D-11):

1. Basis for Measurement: By the unit of each catch basin actually constructed.

2. Basis for Payment: Includes breaking-up, removing and disposing of existing curb & gutter, as required and as directed; all required earthwork, to include excavating for new catch basins, backfilling excavations and around structures and pipes, and compacting backfill; constructing storm catch basins, as indicated, including precast concrete boxes, frames and grates, and all appurtenant items; connecting new pipes to new boxes, and forming and sealing pipe inlets and outlets; constructing new concrete curb and gutters, as required, between ends of existing curb and gutter and new catch basins; and all appurtenant work to complete the boxes.

AX. Construction New 8-inch PVC Sewer Pipe Line (Bid Item No. D-12):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork, including excavating as required to expose the existing for sewer lines and structures to be removed in the existing roadway as indicated, excavating trenches for new pipe line as required, backfilling all trenches, and compacting backfill material; removing and disposing of existing pipe and fittings, and appurtenant items as directed; plugging ends of existing pipes to remain with permanent plugs, as directed; furnishing, placing and compacting pipe bedding material; furnishing and installing new HDPE sewer pipe and fittings, of the type and size as indicated, with butt-welded joints; and all appurtenant work.

AY. Sewer Manholes over Existing Sewer Lines (Bid Items No. D-13 and D-14):

1. Basis for Measurement: By the unit of each manhole actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating for new manhole and to expose existing sewer pipe, backfilling excavations and around structures and pipes, and compacting backfill; cutting and removing section of existing pipe as required and as directed; constructing sewer manhole, as indicated, including precast concrete manhole, ring and cover, and all appurtenant items; connecting new and existing pipes to new manhole, and forming and sealing pipe inlets and outlets; and all appurtenant work to complete the manhole.

AZ. Construct New 8-inch Pressure Irrigation Pipe Line (Bid Item No. D-15):

1. Basis of Measurement: By the linear foot of pipe actually installed.

2. Basis of Payment: Includes all required earthwork, including excavating as required to expose the existing for pressure irrigation lines to be removed in the existing roadway as indicated, excavating trenches for new pipe line as required, backfilling all trenches, and compacting backfill material; removing and disposing of existing pipe and fittings, and appurtenant items as directed; plugging ends of the existing pipes to remain with permanent plugs, as directed; furnishing, placing and compacting pipe bedding material; furnishing and installing new HDPE pressure irrigation pipe and fittings, of the type and size as indicated, with butt-welded joints; and all appurtenant work.

BA. Connect New Pressure Irrigation Pipes to Existing Pipe Lines (Bid Items No. D-16 and D-17):

1. Basis for Measurement: By the unit of each connection actually constructed.

2. Basis for Payment: Includes all required earthwork, to include excavating to expose existing pipe lines, backfilling excavations and around pipes, and compacting backfill; cutting and removing sections of existing pipe as required and as directed; connecting new pipe to existing pipe line, as indicated, including all new pipe and fittings, couplings, and all appurtenant items; and all appurtenant work to complete the connections.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 02300

GENERAL EARTHWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Earthwork for site work, as indicated on the drawings and as directed by the Engineer.

1. Clearing and grubbing all work areas, as required and as directed.

2. Compacting fill and backfill materials, as required.

B. Loading and disposing of excavated material, as indicated and as required.

C. Removing miscellaneous items.

D. Finish grading.

E. Erosion control.

F. Dust control.

1.02 RELATED SECTIONS

A. Section 02315 - Structural Excavation: Building and foundation excavating.

B. Section 02316 - Fill and Backfill: Backfilling for site work, project pipe lines and at structures.

1.03 REFERENCES

A. AASHTO T 99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.

B. AASHTO T 180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.

C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

D. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

F. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)).

G. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

H. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

I. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

K. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

L. Specification for Excavating on State Highways.

M. General Safety Orders Covering Utah Industries - Section 69, Trenches.

N. United States Department of Labor OSHA Publication 2085 - "Employer - Employee, Safe Practice for Excavation and Trenching Operations".

O. Utah Occupational Safety and Health Rules and Regulations - General Standard (UOSHA).

P. Use the latest edition of the above reference standards as of the date of the Project.

1.04 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

1.05 SUBMITTALS

A. See appropriate sections of the Contract Documents for submittal procedures.

B. Samples, where required by the Engineer: 10 pound sample of each type of fill; submit to testing laboratory as directed by the laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

E. Compaction Density Test Reports.

F. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with the City of North Salt Lake's standards and applicable APWA standards.

1. Maintain one copy of standards on job site.

B. Testing shall be done according to the appropriate sections of the Contract Documents.

1.07 PROJECT CONDITIONS

A. Protect above-grade and below-grade utilities that remain.

B. Protect natural vegetation adjacent to work areas, from excavating equipment and vehicular traffic.

C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. See Section 02316 - Fill and Backfill.

2.02 EROSION CONTROL MAT

A. Erosion Control mat shall be a double net, straw and coconut mat.

1. Mat shall contain 70 percent straw fiber and 30 percent coconut fiber; and shall weigh at least 0.7 pounds per square foot.

2. Top netting shall be heavy weight photodegradable netting; and the bottom netting shall be medium weight photodegradable netting.

3. Mat shall be sewn on 2-inch centers.

4. Mat shall be Model CFS072R Double Net Straw / Coconut Erosion Control Mat, or acceptable equal.

PART 3 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

C. Notify utility company to remove and relocate utilities, where and as required.

D. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.02 CLEARING AND GRUBBING

A. All areas of the work indicated to be excavated or filled shall be first cleared and grubbed of vegetation, brush, weeds, rubbish and loose boulders.

B. All cleared and grubbed material shall be removed from work sites and disposed of in an acceptable manner.

3.03 EXCAVATING

A. Excavate for site work to the lines, grades and cross-sections as indicated on the drawings and as directed.

B. Notify the City Inspector of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. All excavating shall be done according to OSHA Standards and other applicable regulations.

D. Excavation and grading operations shall be conducted in such a manner so as to cause minimum inconvenience to adjacent property, including dust control.

E. Surfaces of excavated areas shall be maintained reasonable smooth at all times to ensure proper drainage. If existing drainage is interrupted, provide temporary facilities to re-route and maintain drainage.

1. Temporary drainage facilities shall be considered incidental to work involved; and shall be removed after work is completed.

F. After stripping, excavating and grading has been completed to achieve design grades, the subgrade shall be proof-rolled to a firm, non-yielding surface, as directed by the City Inspector. Soft areas detected during the proof-rolling shall be removed and replaced with granular fill material (Fill Type III), as required and as directed by the City Inspector.

G. When unsuitable material is encountered in excavated areas at sub-grade elevations, excavate as required to remove unsuitable material and backfill areas with selected backfill material, as directed.

H. Remove large rocks and boulders encountered at sub-grade elevations to a depth of not less than 6-inches below sub-grade, and fill and compact excavation with suitable material.

I. Suitable large rocks and boulders encountered during excavation operations shall be stock-piled on-site to be used in drainage ditches, as designated and directed by the City Inspector.

   1. These rocks and boulders shall be securely placed in the drainage ditches for energy dissipation, where and as directed by the Engineer.

J. Remove excavated material and stockpile material where and as directed by the Engineer.

   1. Acceptable excavated material to be re-used on the project site will be loaded, hauled and placed in areas to be filled or placed stockpiles on-site, where and as directed. This will be considered "free haul".

   2. Acceptable excavated material that is not to be re-used on the project site will be loaded, hauled and placed in stockpiles at designated sites near the project site, where and as directed. This will be considered "short haul".

   3. Unacceptable excess excavated material will be loaded, hauled and disposed of, as directed.

K. See Section 02316 for backfilling and filling procedures.

L. Benching Slopes: Horizontally bench existing slopes greater than 1:4 (V:H) to key fill material to slope for firm bearing. Benches shall have at least one foot step and graded to drain.

M. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

N. During construction, provide and maintain sufficient means and devices to promptly remove and properly dispose of all water entering excavations or other parts of the work.

   1. Dispose of water from work area in an acceptable manner, without damage to adjacent property.

   2. No pipe or fill material shall be installed in water.

   3. Any damage to pipe work or backfill work caused by water shall be repaired by the Contractor, at his expense.

O. The use of explosives will not be allowed.

3.04 SOIL REMOVAL

A. Segregate excavated material at time of excavation into acceptable material by type and unsuitable material, as determined by the Engineer.

B. Place acceptable excavated material in fills as required and as directed; or stockpile material to be re-used on project site by type, as directed.

C. Acceptable excavated materials that are to be re-used on the project site shall be loaded and removed from work areas and placed in stockpiles on-site, as directed.

   1. Stockpile materials separately in areas designated on-site, within 200 feet of points of excavation; pile depths shall be as required, as acceptable to the Engineer, and shall be protected from erosion.

D. Acceptable excavated materials that are not to be re-used on the project site shall be loaded and removed from work areas and placed in stockpiles at nearby designated site, as indicated and as directed.

3.05 EMBANKMENTS, BACKFILLING AND FILLING

A. Remove all vegetation, debris, unsuitable soil materials, obstructions and deleterious materials from designated areas prior to placement of embankments, fills or backfills.

B. Where existing ground surfaces have density less than that specified for particular area, plow area to required depth, pulverize existing material, moisture-condition to optimum moisture content and compact to required percentage of maximum density.

C. Construct embankments, backfills and fills as indicated on the drawings and as directed by the City Inspector. Embankments, backfills and fills shall be constructed of the native silty gravels and sands excavated from the site, as directed and accepted by the City Inspector.

D. Place material in piles or windrows; then spread evenly in homogeneous, uniformly mixed layers.

E. Place embankments, backfill and fill material in continuous horizontal layers of not more than 8-inches, loose depth, over the entire embankments areas, backfill areas and fill areas. Moisture-control each layer of material to provide moisture content within 2 percent of optimum moisture content; but keep moist enough at all times to provide dust control.

F. Moisture control material in borrow areas or stock-piles to ensure good conditioning.

G. Place granular excavated material for fill for buttress as indicated on the drawings and as directed.

H. Compact each layer to 95 percent of maximum dry density as per ASTM D 698.

I. Each lift shall be properly scarified for a maximum depth of 2 inches and moisture controlled before placement of another lift, as directed by the City Inspector.

J. Do not place embankment, backfill or fill material that is muddy, frozen or contains frost or ice.

K. Do not place embankments, backfill or fill material on surfaces that are muddy, frozen or contain frost or ice.

L. See Section 02316 for backfilling and filling procedures.

M. Surfaces of fill areas shall be properly cross graded at all times to ensure proper drainage. If existing drainage is interrupted, provide temporary facilities to re-route and maintain drainage.

   1. Temporary drainage facilities shall be considered incidental to work involved; and shall be removed after work is completed.

N. Correct areas that are over-excavated.

   1. Use structural fill material, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

3.06 COMPACTING

A. Compact backfill and fill material to provide not less than the following percentages of maximum density for each area classification:

   1. Embankments: Compact each layer of backfill or fill material to 95 percent of maximum dry density.

   2. Non-Landscaped Unpaved Areas: Compact each layer of backfill or fill material to 90 percent of maximum dry density.

B. Moisture Control. Before compaction, moisture control sub-grades or layers of backfill and fill material, as required, to achieve optimum moisture content of material.

1. The application of water to fill material for moisture conditioning shall be accomplished at the borrow area or stockpile area; with only minor water adjustment (less than 2 percent) during fill placement.

2. For dry material, apply water uniformly to surface of material in a way that will prevent free water from appearing on surface during or after compaction operations.
3. For soil material that is too wet to allow compaction, remove and replace backfill or fill material, or scarify sub-grade material and air dry, until desired moisture content is reached.

C. No compaction required for cut areas or undisturbed earth.

3.07 CONSTRUCTING BUTTRESS

A. The buttress shall be constructed at the bottom of the landslide area, as indicated on the drawings and as directed by the Engineer.

1. Excavation of the upper scarp will produce material that is to be used in construction of the buttress.
   a. The Contractor should be aware that the deposits are interbedded sand and gravel lake bed deposits and will need to be mixed to meet the gradation requirements of the buttress specifications.
   b. No pockets of sand or gravel shall be present in the final buttress placement.
   c. The Engineer will require the removal of and mixing of material, if gradation pockets are created during construction of the buttress.

2. Remove all vegetation, debris, unsuitable soil materials, obstructions and deleterious materials from designated areas prior to construction of buttress and related items.

3. Where existing ground surfaces have density less than that specified for particular area, plow area to required depth, pulverize existing material, moisture-condition to optimum moisture content and compact to required percentage of maximum density.

B. Construct the drainage system at the base of the buttress, as indicated and as directed.

1. Furnish and install 6-inch dia. slotted HDPE pipe and fittings, as indicated and as directed.
   a. The slotted pipe shall be installed inside of a fabric sleeve, as indicated.

2. Connect the new 6-inch drainage system to existing drainage pipe at the east end of the buttress, as indicated and as directed.
   a. At the point of connection, cut the existing drainage pipe and remove a section of the pipe, as required and as directed.
   b. Furnish and install new pipe, fittings and couplings, as required to make the connection.

C. Construct the gravel blanket for the buttress fill, as indicated and as directed.

1. Grade and compact the area to receive the gravel material, as required and as directed, to prepare the sub-grade for the fill.

2. Furnish, place and compact the gravel blanket material, as described above, to the thickness indicated and as directed.

D. Construct the reinforced buttress and related items as indicated on the drawings and as directed by the Engineer.

1. Furnish and place geo-grid reinforcement as indicated on the drawings

2. Place, grade and compact selected granular materials that has been excavated from the site, as directed and accepted by the Engineer.
   a. Place material in piles or windrows; then spread evenly in homogeneous, uniformly mixed layers.
   b. Place fill material in continuous horizontal layers of not more than 8-inches, loose depth, over the entire fill areas. Moisture-control each layer of material to provide moisture content within 2 percent of optimum moisture content; but keep moist enough at all times to provide dust control.

c. Moisture control material in stock-piles to ensure good conditioning.
d. Each lift shall be properly scarified for a maximum depth of 2 inches and moisture controlled before placement of another lift, as directed by the City Inspector.
e. Do not place fill material that is muddy, frozen or contains frost or ice.
f. Do not place fill material on surfaces that are muddy, frozen or contain frost or ice.
g. See Section 02316 for backfilling and filling procedures.

3. Surfaces of fill areas shall be properly cross graded at all times to ensure proper drainage. If existing drainage is interrupted, provide temporary facilities to re-route and maintain drainage.
   a. Temporary drainage facilities shall be considered incidental to work involved; and shall be removed after work is completed.

4. Correct areas that are over-excavated.
   a. Use structural fill material, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

3.08 REMOVING MISCELLANEOUS EXISTING ITEMS

A. Remove Existing Concrete Pavement and Asphalt Pavement.

1. The existing post-tensioned concrete pavement and asphalt parking lot pavement near the tennis courts shall be removed and disposed of, as indicated and as directed.

2. Existing pavement shall be saw-cut at the limits of removal, as indicated and as directed.

3. Existing post-tensioned concrete tennis court pavement shall be broken-up and removed from the paved area; and the concrete debris and reinforcement shall be loaded and disposed of in an acceptable manner.

4. Existing asphalt parking lot pavement shall be shall be broken-up and removed from paved areas, as indicated and as directed; and the asphalt material shall be loaded and disposed of in an acceptable manner.

B. Remove Existing Roadway Near Top of Landslide.

1. The existing roadway near the top of the landslide area shall be removed and disposed of, as indicated and as directed; including asphalt pavement, concrete curb and gutter, sidewalks, and appurtenant items.

2. Existing asphalt pavement shall be saw-cut at the limits of removal as directed; and asphalt pavement shall be broken-up and removed from paved areas, as indicated and as directed by the City Inspector.
   a. Broken-up asphalt material and gravel road base shall be loaded, hauled and disposed of in an acceptable manner.

3. Existing concrete curb and gutter shall be saw-cut at the limits of removal as directed; and the concrete curb and gutter and sidewalks shall be broken-up and removed from the roadway area, as indicated and as directed.
   a. Broken-up concrete material and gravel base shall be loaded, hauled and disposed of in an acceptable manner.

4. After removal of roadway, re-grade roadway area as required and as directed.

C. Remove Existing Utility Lines.

1. The existing utility lines, located in the roadway to be removed, are to be abandoned, as indicated and as directed.

2. Existing water lines to be abandoned shall be exposed, as directed, and disconnected from the water system to remain in service, as indicated and as directed.
   a. Where existing water lines are to be disconnected from the water system to remain, excavate as

required to expose water lines as directed; cut existing water lines and remove sections of pipe as directed; and furnish and install permanent plugs in the ends of the pipes to remain.

3. Excavate as required to expose the existing utility lines to be removed, including water lines, sewer lines, storm drain lines, and any other utilities to be removed.

4. Remove the existing utility lines to the limits indicated and as directed, including pipe and fittings, fire hydrants, valves and valve boxes, manholes, storm drain boxes, and all appurtenant items; backfill trenches as directed and compact backfill material as required; and dispose of removed materials in an acceptable manner.

3.09 RELOCATING EXISTING UTILITY LINES

A. Relocate Existing Storm Drain Lines.

1. Excavate as required to expose existing storm drain lines to be abandoned, as directed; and disconnect lines from the storm drain systems to remain in service, as indicated and as directed.

   a. Where existing storm drain lines are to be disconnected from the storm drain system to remain, excavate as required to expose the storm drain lines at two locations; cut existing storm drain lines and remove sections of pipe as directed; and furnish and install permanent plugs in ends of the pipe to remain.

2. Construct new storm drain line, as indicated and as directed, with HDPE pipe and fittings, with butt-welded joints. See appropriate Sections of the APWA standards.

3. Construct new storm drain manholes over existing storm drain line and existing land drain line, as indicated and as directed.
   a. Excavate as required to expose existing storm drain line on Pace Lane, at the location indicated; and cut and remove a section of the existing pipe line as required and as directed.
   b. Excavate as required to expose existing land drain line on Silvertree Lane, at the location indicated; and cut and remove a section of the existing pipe line as required and as directed.
   c. Construct the manholes, as indicated and as directed. See appropriate Sections of the APWA standards.
   d. Connect new manhole to existing storm drain pipes, as indicated and as directed, with new pipe of the same type as the existing pipe using appropriate type couplings.
   e. Connect new manhole to existing land drain pipes, as indicated and as directed, with new pipe of the same type as the existing pipe using appropriate type couplings.

B. Relocate Existing Sewer Line.

1. Excavate as required to expose existing sewer lines to be abandoned, as directed; and disconnect lines from the sewer systems to remain in service, as indicated and as directed.
   a. Where existing sewer lines are to be disconnected from the sewer system to remain, excavate as required to expose the sewer lines as indicated; cut existing sewer lines and remove sections of pipe as directed; and furnish and install permanent plugs in ends of the pipe to remain.

2. Construct new sewer line, as indicated and as directed, with HDPE pipe and fittings, with butt-welded joints. See appropriate Sections of the APWA standards.

3. Construct new sewer manholes over existing sewer lines, as indicated and as directed.
   a. Excavate as required to expose existing sewer line on Pace Lane, at the location indicated; and cut and remove a section of the existing pipe line as required and as directed.
   b. Excavate as required to expose existing sewer line on Silvertree Lane, at the location indicated; and cut and remove a section of the existing pipe line as required and as directed.
   c. Construct the manhole, as indicated and as directed. See appropriate Sections of the APWA standards.
   d. Connect new manholes to existing sewer pipes, as indicated and as directed, with new pipe of the same type as the existing pipe using appropriate type couplings.

C. Relocate Existing Pressure Irrigation Line.

1. Excavate as required to expose existing pressure irrigation lines to be abandoned, as directed; and disconnect lines from the pressure irrigation systems to remain in service, as indicated and as directed.
   a. Where existing pressure irrigation lines are to be disconnected from the pressure irrigation system to remain, excavate as required to expose the water lines as indicated; cut existing water lines and remove sections of pipe as directed; and furnish and install permanent plugs in ends of the pipe to remain.

2. Construct new pressure irrigation line, as indicated and as directed, with HDPE pressure pipe and fittings, with butt-welded joints. See appropriate Sections of the APWA standards.

3. Connect new pressure irrigation lines to existing pressure irrigation lines, as indicated and as directed.
   a. Excavate as required to expose existing pressure irrigation line on Pace Lane, at the location indicated; and cut and remove a section of the existing pipe line as required and as directed.
   b. Excavate as required to expose existing pressure irrigation line on Silvertree Lane, at the location indicated; and cut and remove a section of the existing pipe line as required and as directed.
   c. Connect new pipe lines to existing pipe lines, as indicated and as directed, with new pipe and fittings as required and appropriate type couplings.

3.10 RESTORING NATIVE VEGETATION IN DISTURBED WORK AREAS

A. Restore native vegetation within project work areas, which are disturbed or damaged by project operations, as indicated and as directed by the City Inspector.

1. After excavations are backfilled, graded and compacted, the surfaces of the graded areas shall be prepared for seeding, as required and as directed.

B. Slopes shall be protected by erosion control mats, as indicated and as directed.

C. New Native Grass Seed.

1. Seed. Seed shall be fresh, clean, new crop seed; mechanically premixed to the proportions as specified by the supplier. Seed shall be a blend as indicated below, or acceptable equal, as supplied by Granite Seed Company of Lehi, Utah. Planting rates shall be as specified by the seed supplier and as acceptable to the City Engineer.

2. Standards. Seeds shall comply with "Standards of Official Seed Analysis of North America"; for 85% purity, 80% germination and 1% (maximum) weed seed.

3. Delivery. Seed shall be delivered to the site in original unopened containers, bearing the dealer's guaranteed analysis and germination percentage and a certificate or stamp or release by a County agriculture commissioner.

4. Seed Mix. Seed mix shall be a blend of the following, or acceptable equal.
   a. Grasses:

Buchloe dactyloides	Buffalo Grass
Bouteloua gracillis	Blue Gramma Grass
Elymus lanceolatus 'Sodar'	Streambank Wheatgrass
Festuca ovina glauca	Blue Fescue
Festuca ovina	Sheep Fescue

   b. Forbs (Perennial Wild Flowers)

Aster spp.	Aster
Berlandiera lyrata	Chocolate Flower
Erigonum umbellatum	Sulpher Buckwheat
Erigeron speciosus	Aspen Daisy
Gaillardia aristata	Indian Blanket Flower
Gillia aggregate	Scarlet Gillia
Linum perenne, var. lewisii	Lewis Blue Flax
Lupinus argenteus	Silvery Lupine

Mirabillis multiflora	Wild Four O' Clock
Oenothera caespitosa	Evening Primrose
Penstimon pinifolius	Pineleaf Penstimon
Penstemon secundifloris	Sidebells Penstemon
Penstemon strictus	Rocky Mountain Penstemon
Ratitiba columnifera	Mexican Hat Coneflower
Senecio longilobus	Threadleaf Groundsel
Viguiera multiflora	Showy Goldeneye
Zinnia grandiflora	Prairie Zinnia

5. Seed to be applied by hydraulic method shall be mixed with wood fiber mulch, fertilizer and polimer at 50 pounds per 100 square feet.

D. Maintain restored native grass areas for a period of at least two year after planting or until accepted by the City Engineer.

1. Where areas are damaged by erosion or settlement, supply additional erosion control mats, top soil and seeding, as necessary and as directed, to correct damage.

2. Maintain health of planted areas after planting.

3. Watering: After planting native grasses, keep restored areas continuously moist until healthy growth is established in the restored areas.

4. Weeding: Uproot and remove all weeds completely. Do not allow growth and germination of weed seeds. Fill in holes caused by weeding with top soil and rake smooth.

5. Protection: Protect restored areas against foot traffic by erecting temporary barriers and warning signs; replant damaged items.

3.11 MISCELLANEOUS WORK

A. Staging Areas.

1. The areas designated by the City Inspector shall be used by the Contractor as staging areas for equipment and materials.

2. After the project is completed, the staging areas shall be cleaned and excess materials shall be properly disposed of as described herein; the areas shall be graded to match original conditions; the areas shall be seeded with native grass as specified herein and as directed by the City Inspector; and all other appurtenant work shall be done to restore the areas to their original conditions, as directed.

3.12 TOLERANCES

A. Top Surface of Sub-grade: Plus or minus 1/10 foot from required elevations.

B. Top Surface of Finish Grade: Plus or minus 1/2 inch from required elevations.

3.13 FIELD QUALITY CONTROL

A. See appropriate sections of Contract Documents for general requirements for field inspection and testing.

B. See Section 02316 for compaction density testing requirements.

3.14 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 02312

TRENCHING FOR DRAINAGE SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating, backfilling and compacting for project drainage systems.

1.02 RELATED SECTIONS

A. Section 02316 - Fill and Backfill: Backfilling for project pipe lines and at structures.

B. Section 02636 - Drainage Systems: Construction of drainage systems.

1.03 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

1.04 REFERENCES

A. AASHTO T 99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.

B. AASHTO T 180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.

C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

D. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

F. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)).

G. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

H. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

I. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

J. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

K. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

L. Specification for Excavating on State Highways.

M. General Safety Orders Covering Utah Industries - Section 69, Trenches.

N. United States Department of Labor OSHA Publication 2085 - "Employer - Employee, Safe Practice for Excavation and Trenching Operations".

O. Utah Occupational Safety and Health Rules and Regulations - General Standard (UOSHA).

P. Use the latest edition of the above reference standards as of the date of the Project.

1.05 DEFINITIONS

A. Pipe Line Grades and Elevations: Indicated on drawings.

B. Trench Cross Sections: Indicated on standard trench detail drawings.

C. Subgrade Elevations: Bottom of road base in paved areas, as indicated on drawings.

D. Finish Grade Elevations: Top of pavement in paved areas, as indicated on drawings.

E. Ground Elevations: Indicated on the drawings.

1.06 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Samples, where required by the City Engineer: 10 pound sample of each type of fill material; submit to testing laboratory as directed by the laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

E. Compaction Density Test Reports.

1.07 PROJECT CONDITIONS

A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated, as acceptable to the City Engineer.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.

2. Prevent contamination.

3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey bench marks and intended elevations for the Work are as indicated.

D. Verify locations of existing utility lines in the Work area. Protect all utility lines from excavating equipment and vehicular traffic.

E. Protect plants and other features to remain.

F. Protect bench marks, survey control points, existing structures, fences, and other improvements from excavating equipment and vehicular traffic.

G. Provide erosion control facilities as required and as directed. These facilities shall be maintained during the construction operations; and shall removed after the project construction has been completed.

H. The depths of drainage trenches may be adjusted during trenching operations to match existing subsurface conditions, as recommended by the geotechnical engineers.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. See Section 02316 - Fill and Backfill.

2.02 SOURCE QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, testing of samples for compliance will be provided before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

2.03 FABRIC WRAP AND LINERS

A. Geotextile Fabric Wrap: Non-biodegradable, non-woven, drainage fabric; No. 4545 manufactured by Amoco, or Typar No. 3401, or acceptable equal.

B. Geomembrane Liner: HDPE textured geomembrane liner, with 40 mils thickness; as manufactured by Poly-Flex, Inc., or acceptable equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

C. Notify utility company to remove and relocate utilities, where and as required.

3.02 TRENCHING

A. Excavate trenches as required to allow project drainage systems to be constructed to line and grade as indicated on the drawings.

B. Notify City Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. All trenching shall be done according to OSHA Standards and other applicable regulations.

D. Excavating and grading operations shall be conducted in such a manner so as to cause minimum inconvenience to adjacent property, including dust control.

E. Surfaces of excavated areas shall be maintained reasonable smooth at all times to ensure proper drainage. If existing drainage is interrupted, provide temporary facilities to re-route and maintain drainage. Temporary drainage facilities shall be considered incidental to work involved; and shall be removed after work has been completed.

F. Do not interfere with 45 degree bearing splay of adjacent concrete structures.

G. Excavate trenches to width, depth and cross section as indicated on the trench detail drawings and as directed.

H. Hand trim excavations. Remove loose matter.

I. When unsuitable material is encountered in excavated areas at subgrade elevations, excavate as required to remove the unsuitable material; and backfill and compact areas with select backfill material.

J. Remove large stones and other hard material encountered at subgrade elevations, which could damage piping or impede consistent backfilling or compaction, to a depth of not less than 6-inches below subgrade; and fill and compact with select suitable material.

K. In native grass areas, remove the top12-inches of top soil material and store separately from other excavated material, as directed by the City Inspector.

L. Remove excavated material that is unsuitable for re-use on the project from site and dispose of in an acceptable manner.

M. Stockpile excavated material to be re-used in area designated on site (See Paragraph 1.07, Project Conditions, herein).

N. Remove excess excavated material from site and dispose of in an acceptable manner.

O. Excavations beyond or below lines and grades indicated shall be refilled with fill material and compacted, at the Contractor's expense.

P. During construction, provide and maintain sufficient means and devices to promptly remove and properly dispose of all water entering excavations or other parts of the work.

1. Dispose of water from work area in an acceptable manner, without damage to adjacent property.

2. No pipe or fill shall be installed in water.

3. Water shall not be allowed to rise over project work until it has set for at least 24 hours.

4. Any damage to project work caused by water shall be repaired by the Contractor, at his expense.

5. The Contractor is responsible for designing and installing dewatering systems as required to allow construction of the project; and for removing the system after the project is completed.

Q. The use of explosives will not be allowed.

R. Contractor shall provide excavation and safety equipment for test holes used in quality assurance testing, as directed by the City Engineer; at no additional cost to the Owner.

S. Silt fences shall be installed along the low edge of work areas and at other locations, as directed by the City Engineer, and as required for erosion control.

3.03 PREPARATION FOR ROCK FILL PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with pipe bedding material, Fill Type III, or other acceptable material, as directed by the City Engineer.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.04 BACKFILLING

A. Backfilling shall conform to the requirements of Section 02316 - Fill and Backfill.

B. Furnish and place geotextile fabric wrap in the drainage trenches, as indicated and as directed; and backfill drainage zone with 1 to 2-inch sewer rock, ASTM Size No. 3, as indicated and as directed.

1. Fabric wrap shall be installed as per the manufacturer's written instructions and recommendations.

C. Furnish and place geomembrane liners in the drainage ditch and basins, as indicated and as directed; and place rock, as indicated.

1. Geomembrane liners shall be installed as per the manufacturer's written instructions and recommendations.

D. Backfill above drainage zone, up to subgrade or finish grade elevations with structural fill material, Fill Type II or Fill Type VIII, or other acceptable material, as indicated on trench detail drawings and as directed by the City Engineer.

E. Employ a placement method that does not disturb or damage project work.

F. Do not backfill with wet or frozen materials.

G. Maintain optimum moisture content of fill materials to attain required compaction density.

H. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

I. Soil Fill: Place and compact material in equal continuous layers not exceeding 12 inches compacted depth.

J. Where directed by the City Inspector, backfill material may be consolidated by an acceptable method.

K. Correct areas that are over-excavated.

1. Use structural fill material, flush to required elevation, compacted to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

3.05 COMPACTING

A. Compact backfill and fill material to provide not less than the following percentages of maximum density for each area classification:

1. Under ditch maintenance access ways and similar construction: to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

2. At other locations: to at least 85 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

B. Moisture Control. Before compaction, moisture control subgrades or layers of backfill and fill material, as required, to achieve optimum moisture content of material.

1. For dry material, apply water uniformly to surface of material in a way that will prevent free water from appearing on surface during or after compaction operations.

2. For soil material that is too wet to allow compaction, remove and replace backfill and fill material, or scarify subgrade material and air dry, until desire moisture content is reached.

C. No compaction is required for cut areas or undisturbed earth.

3.06 FINISH GRADING

A. Grade project areas uniformly to lines and grades, as indicated, including adjacent transition areas.

B. Finish surfaces shall be smooth and compact, with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades, as directed.

C. Degree of finish required will be that which is normally obtainable from brade/grader operation.

D. Place top soil material in native grass areas as indicated and as directed.

1. Place top soil material to compacted thickness of 6-inches, as indicated.

2. Remove roots, weeds, rocks and foreign material while spreading.

3. Fine grade top soil to eliminate uneven areas or low spots. Maintain profiles and contour of subgrade.

4. Lightly compact place top soil material.

3.07 TOLERANCES

A. Top Surface of Backfilling in unimproved areas: Plus or minus 1 inch from required elevations.

B. Top Surface of Backfilling in improved areas: Plus or minus 1/2 inch from required elevations

3.08 FIELD QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for field inspection and testing.

B. Testing is to be done as indicated in the Supplemental General Conditions; test results will be sent to the Engineer within 24 hours after the tests are completed.

C. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.

D. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.

E. If tests indicate work does not meet specified requirements, remove work, replace and retest.

F. Frequency of Tests: one test for each 200 cubic yard of material, or as directed by the Engineer.

3.09 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade areas to prevent standing surface water.

END OF SECTION

SECTION 02315

STRUCTURAL EARTHWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Earthwork for structure volume below grade, paving, and other project work.

1.02 RELATED SECTIONS

A. Section 02300 - General Earthwork: Excavating, backfilling, embankments and compacting for project trails.

B. Section 02316 - Fill and Backfill: Fill materials, filling, and compacting.

1.03 REFERENCES

A. See Section 02300 - General Earthwork.

1.04 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

1.05 PROJECT CONDITIONS

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

B. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

3.02 EXCAVATING

A. Excavate to accommodate new structures and construction operations to lines and elevations indicated.

B. Notify City Inspector of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. All excavating be done according the OSHA Standards and other applicable safety regulations.

D. Do not interfere with 45 degree bearing splay of foundations.

E. Cut excavations wide enough to allow construction of structures as indicated; bottom dimensions shall be sufficient to provide at least 12 inches clear between extreme outside of concrete work and side of excavation. No tunneling or under cutting will be permitted.

F. Hand trim excavations. Remove loose matter.

G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 02316.

H. Grade top perimeter of excavation to prevent surface water from draining into excavation.

I. Remove excavated material that is unsuitable for re-use from site and dispose of in an acceptable manner.

J. Stockpile excavated material to be re-used in areas designated on site.

K. Remove excess excavated material from site and dispose of in an acceptable manner.

3.03 BACKFILLING

A. Backfilling shall conform to the requirements of Section 02316 - Fill and Backfill.

B. Backfill under structures with structural backfill material, Fill Type II, or other acceptable material, and compact to 96 percent of maximum density.

C. Backfill around structures with structural backfill material, Fill Type II, or other acceptable material, up to sub-grade or finish grade elevations, as indicated, and compact to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

D. Employ placement method that will not disturb or damage structure.

E. Backfill shall be brought up uniformly around structures, so as to eliminate any possibility of unbalanced loading on structure which could damage or movement.

F. No backfill shall be placed against new concrete work until concrete has been accepted by the City Inspector; and backfill operation has been authorized.

G. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted.

H. Structural Backfill: Place and compact materials uniformly around structures in equal continuous layers not exceeding 12 inches compacted.

I. Correct areas that are over-excavated with structural backfill material, compacted to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557); at the Contractor's expense.

3.04 FIELD QUALITY CONTROL

A. See appropriate sections of the Contract Documents for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

C. Testing is to be done as indicated in appropriate sections of the Contract Documents; test results will be sent to the City Inspector within 24 hours after the tests are completed.

D. Perform compaction density testing on compacted backfill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.

3.05 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

3.06 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 02316

FILL AND BACKFILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for site work.

B. Filling, backfilling, and compacting for drainage systems.

1.02 RELATED SECTIONS

A. Section 02300 - General Earthwork: Earthwork for project access ways.

B. Section 02312 - Trenching for Drainage Systems: Earthwork for project drainage trenches and ditch.

C. Section 02315 - Structural Earthwork: Earthwork for structures.

D. Section 02636 - Drainage Systems: Construction of drainage trenches and ditch.

1.03 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

B. Field measurements of trenches and other excavations, and weigh tickets will be used as a check of measurement for materials furnished, but will not be individually considered as evidence of placement.

1. A factor based on the density of material used will be used for converting from tons to cubic yards measurements when tickets are used for checking quantities furnished. Allowance for waste will be considered in such conversions.

1.04 REFERENCES

A. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in.(457 mm) Drop.

B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

C. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.

D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

E. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

F. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

G. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

J. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

K. Use the latest issue of the reference standards as of the date of the Project.

1.05 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Sub-grade Elevations: Indicated on drawings.

C. Trail Centerline Elevations: Indicated on drawings.

1.06 SUBMITTALS

A. See appropriate sections of the Contract Documents for submittal procedures.

B. Samples: 10 pound sample of each type of fill; submit in air-tight containers to testing laboratory, if requested by the City Engineer.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, if requested by the City Engineer.

E. Compaction Density Test Reports.

1.07 PROJECT CONDITIONS

A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.

2. Prevent contamination.

3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey bench marks and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill - Fill Type I: Imported borrow or soil excavated on-site if acceptable to the City Engineer; conforming to Type A-1-a of AASHTO Classification of Soils and Soil-Aggregate Mixtures.

1. Graded.

2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

3. Conforming to ASTM D 2487 Group Symbol CL; liquid limit less than 50.

4. Not more than 15 percent passing No. 200 sieve.

B. Structural Fill - Fill Type II: Imported borrow or soil excavated on-site if acceptable to the City Engineer; conforming to Type A-1-a of AASHTO Classification of Soils and Soil-Aggregate Mixtures.

1. Graded.

2. Free of lumps larger than 3 inches, rocks larger than 2 inches, deleterious matter and debris.

3. Conforming to ASTM D 2487 Group Symbol GW, GP, SW and SP.

4. Not more than 15 percent passing No. 200 sieve.

C. Concrete for Fill: Lean concrete.

1. Conforming to Flowable Fill, Section 03575 of the Utah Department of Transportation's Standard Specifications.

D. Granular Fill - Gravel - Fill Type III: Angular crushed washed stone; free of shale, clay, friable material and debris.

1. Graded in accordance with ASTM C 136, within the following limits:
   a. 2 inch sieve: 100 percent passing.
   b. 1 inch sieve: 95 percent passing.
   c. 3/4 inch sieve: 95 to 100 percent passing.
   d. 5/8 inch sieve: 75 to 100 percent passing.
   e. 3/8 inch sieve: 55 to 85 percent passing.
   f. No. 4 sieve: 35 to 60 percent passing.
   g. No. 16 sieve: 15 to 35 percent passing.
   h. No. 40 sieve: 10 to 25 percent passing.
   i. No. 200 sieve: 5 to 10 percent passing.

E. Granular Fill – 3/4" Gravel – Fill Type IV: Angular crushed washed stone; free of shale, clay, friable material and debris.

1. Graded in accordance with ASTM C 136, within the following limits:
   a. 1 inch sieve: 100 percent passing.
   b. 3/4 inch sieve: 90 to 100 percent passing.
   c. 3/8 inch sieve: 30 to 65 percent passing.
   d. No. 4 sieve: 5 to 25 percent passing.
   e. No. 8 sieve: 0 to 10 percent passing.
   f. No. 16 sieve: 0 to 5 percent passing.

F. Granular Fill - Course Gravel - Fill Type V: Free draining granular backfill material; natural or crushed aggregate.

1. Graded in accordance with ASTM C-136, within the following limits:
   a. 2 inch sieve: 100 percent passing.
   b. 1 inch sieve: 95 to 100 percent passing.
   c. 1/2 inch sieve: 25 to 60 percent passing.
   d. No. 4 sieve: 0 to 10 percent passing.

G. Sand - Fill Type VI: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.

1. Graded in accordance with ASTM C 136; within the following limits:
   a. No. 4 sieve: 100 percent passing.
   b. No. 14 sieve: 10 to 100 percent passing.
   c. No. 50 sieve: 5 to 90 percent passing.
   d. No. 100 sieve: 4 to 30 percent passing.
   e. No. 200 sieve: 0 to 5 percent passing.

H. **Drain Rock Fill**: Free draining granular material.

1. Graded in accordance with ASTM C 136; within the following limits.
   a. 4-inch sieve: 100 percent passing.
   b. 2-inch sieve: 90 to 100 percent passing.
   c. 1-inch sieve: 35 to 70 percent passing.
   d. 1/2-inch sieve: 0 to 20 percent passing.
   e. No. 4 sieve: 0 to 5 percent passing.

I. **Buttress Fill**: Selected on-site excavated material.

1. Graded in accordance with ASTM C 136; within the following limits.
   a. 6-inch sieve: 100 percent passing.
   b. 3-inch sieve: 80 to 100 percent passing.
   c. 3/4-inch sieve: 55 to 100 percent passing.
   d. No. 4 sieve: 40 to 90 percent passing.
   e. No. 200 sieve: 10 to 35 percent passing.

2. Minimum friction angle required will be 34 degrees; and the maximum plasticity index is 20 percent.

J. Top Soil - Fill Type VII: Top soil excavated on-site.

1. Graded.

2. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.

3. Acidity range (pH) of 5.5 to 7.5.

4. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.

5. Conforming to ASTM D2487 Group Symbol OH.

K. On Site Soil - Fill Type VIII: Material excavated during site construction and trenching operations; free of organic matter and debris.

1. On-site soil may only be used as fill, backfill and trench backfill if recommended by the geotechnical engineer of record and is acceptable to the City Inspector or City Engineer.

2. The geotechnical engineer of record shall define placement and compaction requirements.

3. The City shall employ and pay for quality control services of the geotechnical engineer of record.

4. The geotechnical engineer of record shall prepare a letter or report summerizing:
   a. Testing methods, test frequencies and observations.
   b. Any non-conforming conditions and corrective actions taken to remedy the non-conformities.
   c. Compliance of the work to the project specifications.

2.02 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, non-woven, drainage fabric; No. 4545 manufactured by Amoco, or Typar No. 3401, or acceptable equal.

B. Buttress Geo-Grid Reinforcement: as indicated on the project drawings.

2.03 SOURCE QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, testing of samples for compliance will be provided before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.02 PREPARATION

A. Scarify sub-grade surface to a depth of 12 inches to identify soft spots.

B. Cut out soft areas of sub-grade not capable of compaction in place. Backfill with Fill Type II or III as directed by the City Inspector.

C. Compact sub-grade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to finish contours and elevations indicated using unfrozen materials.

B. Fill up to sub-grade elevations where indicated.

C. Employ a placement method that does not disturb or damage other work.

D. Do not fill over porous, wet, frozen or spongy sub-grade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

G. Soil Fill: Place and compact material in equal continuous layers not exceeding 12 inches compacted depth.

H. Slope grade away from structures at a minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend project slopes into existing areas.

I. Correct areas that are over-excavated.

1. Load-bearing foundation surfaces: Use structural fill, Fill Type II, flush to required elevation, compacted to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

2. Other areas: Use general fill, Fill Type I or Fill Type VIII flush to required elevation, compacted to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

J. Compaction Density Unless Otherwise Specified or Indicated:

1. Under paving, slabs-on-grade, and similar construction: at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

2. Under structures: at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

3. At other locations: at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

K. Consolidation density shall be 85 percent of maximum dry density.

L. Reshape and re-compact fills subjected to vehicular traffic.

3.04 FILL AT SPECIFIC LOCATIONS

A. Fill in unimproved areas:

1. Use general fill, Fill Type I or Fill Type VIII, unless otherwise specified or indicated.

2. Fill to finish grade elevations.

3. Maximum depth per lift: 12 inches, compacted.

4. Consolidate to minimum 85 percent of maximum dry density.

B. Structural Fill at structures and embankments:

1. Use structural fill, Fill Type II.

2. Fill up to subgrade elevations.

3. Maximum depth per lift: 8 inches, compacted.

4. Compact to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

C. Under paved areas and other concrete work:

1. Use granular fill, Fill Type II or Fill Type III.

2. Depth: six inches deep, or as indicated on drawings.

3. Compact to at least 95 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

D. At Landscaped and Cultivated Areas:

1. Use general fill, Fill Type I or Fill Type VIII.

2. Fill up to 24 to 36 inches below finish grade elevations, as directed by the City Inspector.

3. Compact to at least 85 percent of maximum dry density as determined by the modified Proctor method (ASTM D-1557).

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

3.06 FIELD QUALITY CONTROL

A. See appropriate sections of the Contract Documents for general requirements for field inspection and testing.

B. Testing is to be done by an independent testing company for the Owner or Contractor, as indicated in the Supplemental General Conditions; test results for all tests will be sent to the City within 24 hours after the tests have been completed.

C. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.

D. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.

E. If tests indicate work does not meet specified requirements, remove work, replace and retest.

F. Frequency of Tests: as directed by the City Inspector or City Engineer.

G. The City Inspector shall have the right to determine when and where all soil testing shall be preformed.

3.07 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 02635

STORM DRAIN SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Storm drain pipe, fittings, and accessories.

B. Storm drain manholes, cleanout boxes, and appurtenant items.

1.02 RELATED SECTIONS

A. Section 02312 - Trenching for Drainage Systems: Excavating, bedding, backfilling and compacting.

B. Section 02315 - Structural Earthwork: Excavating for structures and appurtenant items.

C. Section 02316 - Fill and Backfill: Bedding and backfilling.

D. Section 02640 - Manholes and Covers.

E. Section 03300 - Cast-in-Place Concrete: Concrete for miscellaneous construction.

1.03 REFERENCES

A. ASTM C 14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.

B. ASTM C 76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

C. ASTM C 443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

D. ASTM C 858 - Standard Specifications for Underground Precast Concrete Utility Structures.

E. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.

F. ASTM D 3212 - Standard Specifications for Joints for Drain and Sewer Plastic Pipe Using Flexible Elastomeric Joints.

G. ASTM D 3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

H. ASTM D 3350 - Standard Specifications for Polyethylene Plastic Pipe and Fittings Material.

I. ASTM F 1417 - Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-pressure Air.

J. AWWA C 906 - Polyethylene (PE) Pressure Pipe and Fittings, 4-in thru 63-inch, For Water Distribution and Transmission.

K. Use the latest issue of the standard reference standards as of the date of the project.

1.04 DEFINITIONS

A. Pipe Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating pipe, pipe accessories, and miscellaneous structures.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Project Record Documents:

1. Record location of pipe lines, connections, manholes, inlet boxes, and miscellaneous structures; and record invert elevations.

2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable code for materials and installation of the Work of this section.

1.07 QUALITY ASSURANCE

A. Perform Work in accordance with City's requirements as described herein.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store precast items according to manufacturer's instructions and recommendations, and as directed by the City Engineer.

PART 2 PRODUCTS

2.01 DRAIN PIPE MATERIALS

A. Concrete Pipe: Non-reinforced, ASTM C 14, Class 3 minimum; inside nominal diameter of 4-inch through 12-inch, as indicated; bell and spigot end joints with gaskets.

B. Concrete Pipe: Reinforced, ASTM C 76, Class III minimum with Wall type B; mesh reinforcement; inside nominal diameter as indicated, bell and spigot end joints.

C. Joint Seals for Concrete Pipe: ASTM C 443, rubber compression gasket joint for positive seal.

D. High Density Polyethylene Pipe: AWWA C906 HDPE pipe and fittings with outside diameter as indicated; and with butt-welded joints.

E. Pipe Fittings: Same material as pipe, formed to suit pipe size and end design, in required tees, bends, and other configurations as required.

2.02 REINFORCED CONCRETE STRUCTURES

A. Reinforced Concrete Structures. Reinforced concrete structures are shown on the drawings as constructed of precast reinforced concrete boxes, but poured-in-place boxes may be constructed at the option of the Contractor.

1. Concrete work shall conform to applicable requirements of Section 03300.

2. Precast Concrete. Precast reinforced concrete boxes shall be constructed, of the types and sizes indicated on the drawings; and shall be designed for H-20 highway loading.

a. Precast vaults shall conform to ASTM C 858; and shall be as manufactured by Amcor-White, Inc., Dura-Crete, or other manufacturer acceptable to the City Engineer.

3. Poured-in-Place Concrete. Poured-in-place reinforced concrete boxes, of equal dimensional and strength characteristics, may be constructed; which shall conform to applicable requirements of Section 03300.
   a. Contractor shall submit design drawings for the proposed poured-in-place concrete boxes; which shall have wall thickness, bottom slab thickness, and top slab thickness as required for H-20 highway loading. Design drawings shall be reviewed and approved by the Engineer.

4. Reinforcement. Reinforcing steel shall be as specified in Section 03300, using Grade 60 bar of the size(s) shown on the drawings.
   a. Reinforcement shall be of the size indicated; and shall be placed as shown.

5. Steps. Plastic encased steel steps shall be installed in the vault walls; spaced at 12-inches on center and centered under the access opening, as indicated and as directed by the Engineer. Steps shall be copolymer poly-propylene-encased, 60,000 tensile strength steel, Model PSI-FF manhole steps, as manufactured by M. A. Industries, Inc., or steps accepted to the City Engineer.

B. Proprietary Items. Provide proprietary items of the type, size and manufacture noted on the drawings or as required to complete the work, or alternate items acceptable to the City Engineer.

C. Miscellaneous Metal Work. Furnish and erect miscellaneous metal work as required to complete the vaults, as described herein and as shown on the drawings.

1. Codes. Specifications for the Design, Fabrication and Erection of Structural Steel For Buildings of the American Institute of Steel Construction shall govern the work. Welding shall be done in accordance with AWS D1.1 of the American Welding Society Standards.

2. Substitutions. Substitutions of sections or modifications of details, or both, and the reasons therefore shall be submitted for acceptance by the City Engineer.

3. Responsibility for Errors. The Contractor shall be responsible for all errors of detailing, fabrication, erection, and correct fitting of the miscellaneous metal work.

4. Materials. Material shall conform to their respective specifications as follows:
   a. Bolts and Nuts: ASTM Standard A-307
   b. Gray Iron Castings: A-48 Class 40 or Better
   c. Structural Steel: ASTM Standard A-36
   d. Washers: ASTM Standard B-27.2, Type B
   e. Miscellaneous Items: Miscellaneous items shall be as indicated on the drawings or as required.

D. Frames and Covers: Heavy duty cast iron, as indicated or acceptable equal; designed for H-20 highway loading; solid, with pick holes; size and type as indicated, see Section 02640.

E. Frames and Grates: Size and type as indicated on the drawings.

F. Joint Filler: flexible, bituminous mastic, gasket type sealant.

2.03 BEDDING AND BACKFILL MATERIALS

A. Bedding: As specified in Sections 02312 and 02316.

B. Backfill: As specified in Sections 02312 and 02316.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 02312, Trenching for Pipe Work, and Sections 02315 and 02316 for additional requirements.

B. Hand trim excavations for accurate placement of pipe and structures to elevations indicated.

C. Backfill around pipe with bedding material as indicated, tamp in place and compact; then complete backfilling.

3.02 INSTALLATION - PIPE

A. Verify that trench cut is ready to receive work; and that excavations, dimensions, and elevations are as indicated on drawings.

B. Install concrete pipe, fittings, and accessories in accordance with manufacturer's instructions and recommendations. Seal joints watertight.

C. Install HDPE pipe, fittings, and accessories, on slopes as indicated, in accordance with manufacturer's instructions and recommendations; with butt-welded joints.

D. Install pipe to slope gradients noted on drawings; with maximum variation from true slope of 0.10 feet.

E. Connect existing and new storm drain pipe to new storm drain boxes as indicated and as directed.

F. Connect pipe to structures with appropriate type flexible couplings as recommended by manufacturer. Grout around pipes after installations are complete. Make all connections watertight.
   a. Provide pipe joint or flexible coupling on all pipes approximately 18-inches from outside of structures.

G. Connect HDPE pipe to structures as indicated; grout around pipes after connection is complete, as indicated and as directed.

3.03 INSTALLATION - STORM DRAIN STRUCTURES

A. Trim bottom of excavations clean and smooth to correct elevations; place bedding as indicated.

B. Install precast boxes plumb, according to the manufacturer's instructions, at the design elevations as indicated; connect project pipes with appropriate type flexible couplings.

   1. Construct cast-in-place concrete boxes, as indicated; connect project pipes with appropriate type flexible couplings.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Install cast iron covers and frames level on top slab of boxes, as indicated and according to manufacturer's instructions. Provide grade rings as required to set covers and frames at proper elevations to match adjacent ground surfaces.

E. Fill all joints between box sections, grade rings, and cover frames with joint sealant.

F. Connect existing pipe to new structures, as indicated on the drawings and as directed, with appropriate type flexible couplings as recommended by manufacturer. Grout around pipes after installations are complete. Make all connections watertight.
   a. The size of existing pipe, fittings, and appurtenant items required to make the connection shall be determined at the time of construction.
   b. Provide pipe joint or flexible coupling on all pipes approximately 18-inches from outside of structures.

3.04 STORM DRAIN MANHOLE OVER EXISTING STORM DRAIN PIPE

A. The new storm drain manhole shall be constructed over the existing storm drain pipe where and as indicated on the drawings and as directed by the City Inspector. The size of existing pipe shall be verified at the time of construction; and the fittings and appurtenant items required to make the connection of the existing pipe to the new manhole shall be determined at the time of construction.

B. Excavate as required to expose the existing storm drain pipe at the point of connection; determine the actual conditions at the point of connection and all fittings and appurtenant items required to make the connection; and have all materials on site prior to making the connection to the existing pipe.

C. Construction of the new manhole over the existing pipe shall include: cutting and removing a section of the existing pipe as required and as directed; constructing the new manhole, as indicated and as directed; furnishing and installing new pipe, of the same size and type of existing pipe; connecting the new pipe to the ends of the existing pipe and into new manhole with the appropriate type and size coupling; and all appurtenant work required to complete the manhole construction.

3.05 REMOVE EXISTING STORM DRAIN MANHOLES

A. Existing storm drain manholes shall be removed where the existing roadway is to be removed, as indicated on the drawings and as directed by the City Inspector, to allow excavation operations to be performed for the project site work.

B. Excavate as required to expose the existing storm drain manhole and adjacent storm drain pipes.

C. Cut the existing concrete storm drain pipe on each side of the existing manhole as required and as directed; disconnect the existing pipe from each side of the manhole; remove the pipe from the excavation; and dispose of the pipe material in an acceptable manner.

D. Remove the existing manhole sections and appurtenant items from the excavation; dispose of the removed material in an acceptable manner; and perform all appurtenant work required to complete the removal.

E. Backfill excavations to required elevations.

3.06 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 01400.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

C. Low Pressure Air Test: Pressurize line to be tested to approximately 3.5 psi. Allow pressure to stabilize for a minimum of 2 minutes; if during this period pressure drops below 3.5 psi, more air shall be added to raise pressure up to 3.5 psi. After this stabilization period, air supply shall be disconnected and timing shall begin. The time of the test, in minutes, shall be equal to the pipe diameter, in inches. The maximum allowable pressure drop during the specified time period shall be 1.0 psi.

D. Infiltration Test: Infiltration test required when pipe line is below groundwater level. The amount of water leaking into the pipe shall be measured; allowable infiltration shall be one gallon per day per inch diameter of pipe per mile of pipe.

E. Exfiltration Test: Exfiltration test required when pipe line is above groundwater level. The section of pipe to be tested, including upstream structure, shall be filled with water to not less than four feet nor more than eight feet above lowest point of pipe section being tested. The amount of water added during the test period to maintain water level shall be measured; allowable exfiltration shall be one gallon per day per inch diameter of pipe per mile of pipe.

F. Deflection Test: Check alignment by sighting through pipe or by measurements. Pipe lines shall not vary from alignment shown on the drawings by more than 0.25 foot.

3.07 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

SECTION 02636

DRAINAGE SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drainage trenches and appurtenant items.

B. Drainage ditch and appurtenant items.

1.02 RELATED SECTIONS

A. Section 02312 - Trenching for Drainage Systems: Excavating, backfilling and compacting.

B. Section 02315 - Excavation: Excavating for structures and appurtenant items.

C. Section 02316 - Fill and Backfill: Bedding and backfilling.

1.03 DEFINITIONS

A. Pipe Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating pipe, pipe accessories, and miscellaneous structures.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Project Record Documents:

1. Record location of pipe lines, connections, and miscellaneous structures; and record invert elevations.

2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for materials and installation of the Work of this section.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with City's requirements as described herein.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store precast items according to manufacturer's instructions and recommendations, and as directed by the City Engineer.

PART 2 PRODUCTS

2.01 DRAIN PIPE MATERIALS

A. HDPE Slotted Pipe: Single Wall Corrugated Pipe, as manufactured by ADS Pipe, or acceptable equal; with Type B slot pattern.

B. Pipe Fittings: Same material as pipe, formed to suit pipe size and end design, in required tees, bends, and other configurations as required.

2.02 BEDDING AND BACKFILL MATERIALS

A. Bedding: As specified in Sections 02312 and 02316.

B. Backfill: As specified in Sections 02312 and 02316.

2.03 RIPRAP

A. Riprap shall be hard, durable quarry stone with less than 35 percent wear when tested for resistance to abrasion in conformance with ASTM C 535.

B. Bulk density shall be not less than 160 pounds per dry cubic foot, with not less than 15 percent weight loss after 5 cycles, as ASTM C 88.

C. Riprap size and nominal thickness shall be as indicated on the drawings; and shall be reasonably well graded.

2.04 DRAIN ROCK

A. Drain Rock: As specified in Section 02316.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 02312, Trenching for Drainage Systems, and Sections 02315 and 02316 for additional requirements.

B. Hand trim excavations for accurate placement of pipe and structures to elevations indicated.

C. Backfill around pipe with bedding material as indicated, tamp in place and compact; then complete backfilling.

3.02 INSTALLATION - PIPE

A. Verify that trench cut is ready to receive work; and that excavations, dimensions, and elevations are as indicated on drawings.

B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions and recommendations; with open joints.

C. Install pipe to slope gradients indicated on drawings; with maximum variation from true slope of 0.10 feet.

E. Connect new drainage systems to new HDPE storm drain line as indicated and as directed.

1. Install tee, of the appropriate size, on slotted pipe at the location indicated and as directed; with the opening in the down position, vertically as indicated.

2. Install pipe from the tee on the slotted pipe to a tee on the HDPE storm drain line; connect the pipe to the tees with the appropriate type couplings, as indicated and as directed.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 01400.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

C. Deflection Test: Check alignment by sighting through pipe or by measurements. Pipe lines shall not vary from alignment shown on the drawings by more than 0.25 foot.

3.04 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

SECTION 02640

MANHOLES AND COVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Monolithic cast-in-place concrete manholes with precast transition to lid frame, covers, anchorage, and accessories.

B. Modular precast concrete manhole sections with tongue-and-groove joints, precast transition to lid frame, covers, anchorage, and accessories.

1.02 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete.

1.03 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

1.04 REFERENCES

A. ASTM A 48 - Standard Specification for Gray Iron Castings.

B. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.

C. ASTM C 858 - Standard Specification for Underground Precast Concrete Utility Structures.

D. ASTM C 923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

E. Use the latest edition of the above reference standards as of the date of the project.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of pipe inverts.

C. Product Data: Provide manhole covers, component construction, manhole steps, features, configuration, and dimensions.

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this section with at least three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Amcor-White, Inc.

B. Geneva Pipe Company

C. Substitutions: See Section 01600 - Product Requirements.

2.02 MATERIALS

A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C 478, with gaskets in accordance with ASTM C 923.

B. Concrete: As specified in Section 03300.

C. Concrete Reinforcement: As specified in Section 03300.

D. Pipe and Fittings: As specified in Section 02535.

2.03 COMPONENTS

A. Manhole Base: precast concrete manhole base of appropriate size.

1. Provide appropriate size flexible sleeves of synthetic rubber, with stainless steel clamps and bolts, for all pipe openings in base section.

2. Construct poured-in-place manhole base where manhole is to be constructed over existing sewer pipe line, as directed by the Engineer. Manhole base shall be constructed as indicated on the drawings.

B. Manhole Rise Sections: precast riser sections of appropriate size and length, extending from top of base section to bottom of top section.

C. Manhole Top Section: precast eccentric cone section of appropriate size, with 30-inch diameter top opening.

1. Flat slab top sections can be used only where indicated on the plan drawings and accepted by the City Inspector; designed for H-20 live loading and one-foot minimum earth cover.

D. Joints: Base section, riser sections, and top section shall have lipped male/female ends, which shall provide uniform and continuous interior wall surface.

1. Joints shall be sealed with pre-lubricated rubber gaskets, conforming to requirements of ASTM C 443 and C 361; Forsheda No. 114 Seal, manufactured by Forsheda Pipe Seal Company, or equal.

E. Grade Rings: precast grade rings, as required, to adjust height of manhole lid and frame.

1. Grade rings shall have key locks and use mastic sealer to insure watertight installation.

2. Maximum height of grade rings shall be 12 inches.

F. Lid and Frame: ASTM A 48, Class 30B Cast iron construction, machined flat bearing surface, removable lid with cleated surface and pick holes, lockable lid if indicated, vented lid design in improved areas and solid lid design in unimproved areas, H-20 highway load rating; lid molded with identifying name. Provide Model A-1180 manufactured by D & L Supply., or acceptable equal.

1. All manhole lids shall be imprinted with either "STORM DRAIN" or "SEWER", as required.

G. Manhole Steps: Formed, copolymer polypropylene-encased, steel rungs; 3/4 inch diameter minimum. Cast-in-place or vibrate into green concrete. Model PSI-FF manhole steps, manufactured by M. A. Industries, Inc., or acceptable equal.

H. Collars: constructed of concrete as indicated on the drawings.

I. Pipe and Fittings: piping for drop manholes shall be constructed as indicated on the drawings; pipe and fittings shall conform to appropriate sections of Section 02535 and Section 02635.

2.04 CONFIGURATION

A. Manholes shall be constructed as indicated on the Standard Manhole Detail drawing.

B. Shaft Construction: Concentric with eccentric cone top section; lipped male/female joints; sleeved to receive pipe sections.

C. Shape: Cylindrical, unless indicated otherwise.

D. Clear Inside Dimensions: 48 inch or 60 inch diameter, as indicated.

E. Design Depth: As indicated.

F. Clear Lid Opening: 30 inch diameter, as indicated.

G. Pipe Entry: Provide openings for all pipes entering manhole, as indicated.

H. Steps: 12 inches on center vertically, set into manhole wall directly under opening.

I. Drop Manholes shall be constructed as indicated on the drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location, and ready for roughing into Work.

C. Verify excavation for manholes is correct.

3.02 PREPARATION

A. Where native material encountered at foundation depth of manhole is considered unsuitable, remove unsuitable material; and place and compact bedding material, to limits directed by District Inspector.

3.03 MANHOLES

A. Install precast concrete manhole base level on a compacted foundation, according to manufacturer's instructions.

B. Construct cast-in-place manhole base over existing pipe lines, as acceptable to the City Inspector. Manhole base shall be constructed as indicated on the drawing.

1. After new manhole has been completed, saw-cut into top of existing storm drain or sewer pipe, remove section of pipe as required and as directed, and dispose of the removed material; construct watertight grout invert channels through new manhole, between new pipe and existing pipe line, as directed. invert channel shall be formed to direct flows through the manhole as indicated.

2. Divert existing storm water or sewage flows around work area to allow connection to existing pipe lines to be made, as required and as directed.

C. Place manhole riser sections plumb and level, from the manhole base to the top section, as indicated and according to manufacturer's instructions; anchor to base; align steps perpendicular to pipe line, and seal joints.

D. Place top section, cone section or flat slab, on top riser section, with opening positioned over steps.

1. In improved areas, top of cone section or flat slab shall be from 10-inches to 18-inches below final surface elevation, as directed by the City Inspector.

2. In unimproved areas, top section shall be installed so that the top of the frame and cover will be a minimum of 12-inches above the adjacent natural ground surfaces, as directed by the City Inspector.

E. Install grade rings, as required, to adjust top of lid and frame to match finish elevations.

F. Connect pipe to manhole with appropriate type flexible coupling as recommended by manufacturer. Provide pipe joint or flexible coupling on all pipes approximately 18-inches from outside of manhole. Grout around pipe after installation is complete. Make connections watertight.

G. Provide pipe stubs for future connections of the same type of pipe used on the project, and of the size indicated.

1. Alignment and grade of stub to be determined by the City Inspector.

2. Install permanent, watertight plug or cap on end of stub, outside of the manhole.

H. Grout inside of manhole base sections to form channel between connected pipes, as indicated. Trowel smooth. Top of channel shall be a same elevation as top of outlet pipe.

I. Set cover frames and covers level without tipping, to correct elevations. After placement, grout around the exterior of frame from top of concrete top section to top of frame, as indicated, to ensure watertight condition.

1. After frames and covers have been set, construct the concrete collars as indicated on the drawings and as directed by the City Inspector.
   a. Collars in improved areas shall be 8-inches thick.
   b. Collars in unimproved areas shall be 18-inches thick; install manhole markers into the concrete collars approximately 9 inches from the edge of manhole rings, as recommended by the manufacturer and as directed by the City Inspector.

J. After manhole base has been completed, furnish and install temporary pipe plugs to seal all interior pipe openings; plugs to be Brent DuoSeal Pipe Plug by Burke Rubber Company, Cherne Pipe Plug by Cherne Manufacturing Company, or acceptable equal. Pipe plugs shall remain in place until final review and acceptance of completed pipe lines. Plugs shall then be removed; and shall be property of Contractor.

K. Coordinate with other sections of work to provide correct size, shape, and location.

3.04 FIELD QUALITY CONTROL

A. Manholes shall be tested using vacuum test method to demonstrate integrity of installed materials and construction procedures. Method and material for repair shall be as acceptable to the City Inspector.

1. Each manhole shall be tested immediately after assembly and backfilling.

2. Plug all lift holes with an acceptable non-shrink grout.

3. Plug all pipes entering manhole; securely brace plugs during test.

4. Test head shall be placed at inside top of cast iron frame, or as accepted by City Inspector; and the seal shall be inflated in accordance with manufacturer's recommendations.

B. Testing shall conform to ASTM C 1244, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

C. If manhole fails initial test, make necessary repairs with non-shrink grout. Manhole shall be retested until satisfactory test is obtained.

END OF SECTION

SECTION 02721

GRAVEL SURFACING AND ROAD BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. New gravel road base.

B. Restore gravel road base.

C. New gravel surfacing.

D. Restore gravel surfacing.

1.02 RELATED SECTIONS

A. Section 02300 - General Earthwork.

B. Section 02316 - Fill and Backfill: Compacted fill under base course.

C. Section 02741 - Hot Mix Asphalt (HMA) Paving: Binder and finish asphalt courses.

1.03 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

1.04 REFERENCES

A. AASHTO M 147 - Materials for Aggregate and Soil-Aggregate; American Association of State Highway and Transportation Officials.

B. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop; American Association of State Highway & Transportation Officials.

C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

D. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

F. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

G. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

H. Use the latest edition of the above reference standards as of the date of the project.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

C. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction Density Test Reports.

1.06 PROJECT CONDITIONS

A. Provide sufficient quantities of gravel material to meet project schedule and requirements. When necessary, store materials on site in advance of need, in areas designated by the City Engineer.

B. When aggregate materials need to be stored on site, locate stockpiles where indicated.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.

2. Prevent contamination.

3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey bench marks and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. Gravel Road Base: Gravel road base, conforming to State Department of Transportation Standard Specifications, Section 02721.

B. Gravel Road Surfacing: Gravel road surfacing, conforming to State Department of Transportation Standard Specifications, Section 02721.

C. Gravel material shall be a Blended Aggregate material: Angular crushed stone; free of shale, clay, friable material and debris.

1. Graded in accordance with ASTM C 136, within the following limits:
   a. 1 inch sieve: 100 percent passing.
   b. 1/2 inch sieve: 79 to 91 percent passing.
   c. No. 4 sieve: 49 to 61 percent passing.
   d. No. 16 sieve: 27 to 35 percent passing.
   e. No. 200 sieve: 7 to 11 percent passing.

D. Portion of aggregate passing through No. 40 sieve shall be non-plastic.

2.02 SOURCE QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for testing and analysis of aggregate materials.

B. Where aggregate materials are specified using ASTM D 2487 classification, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. For new gravel road base and new gravel surfacing, verify that excavations have been backfilled, graded, compacted and accepted by the City Engineer; that gradients and elevations are correct; and that surfaces are dry.

B. For restoration of gravel road base and gravel surfacing, verify that excavations have been backfilled, compacted and accepted by the City Engineer; that gradients and elevations are correct; and that surfaces are dry.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

A. New Gravel Road Base

1. Where new gravel road base is to be placed, the sub-base shall be scarified, graded and rolled to provide a compact, smooth base for placement of road base, as indicated and as directed.

2. Place gravel road base material over prepared substrate to provide total compacted thickness as indicated, as described herein and as directed.

3. The top of the road base shall match to top of adjacent road base, as required, as indicated and as directed.

B. Restoring Gravel Road Base

1. Gravel road base shall be restored to the full width and length of existing asphalt surfaces removed, as indicated and as directed.

2. Restore gravel road base, along with temporary gravel surfaces, within one day after backfill of excavations has been placed, compacted and accepted by the City Inspector.

3. Place gravel road base material over prepared substrate to provide total compacted thickness equal to the adjacent road base, but not less than the thickness as indicated. The top of the restored road base shall match to top of adjacent road base, as required and as directed.

4. Place temporary gravel surfaces over the gravel road base, from the top of the road base to the top of the adjacent pavement.

5. Temporary gravel shall be maintained by blading, sprinkling, rolling, adding additional gravel as required, and all appurtenant work to provide safe, uniform surfaces over excavated areas satisfactory to the City Inspector. The temporary surface shall be restored at least every 7 days until the final surfacing is to be placed; and sprinkled with water at least once each day, including weekends and holidays.

6. When final surfacing is to be placed, remove the temporary gravel to the bottom of the surface to be restored. After removing temporary gravel, the sub-base shall be graded and rolled to provide a compact, smooth base for placement of final surfacing.

C. New Gravel Surfaces.

1. Where new gravel surfaces are to be placed, the sub-base shall be scarified, graded and rolled to provide a compact, smooth base for placement of gravel surfaces, as indicated and as directed.

2. Place and spread gravel surfacing material over prepared substrate to provide total compacted thickness as indicated, as described herein, and to the limits shown on the drawings.

3. The top of the new gravel surfacing shall be as indicated and as directed.

D. Restoring Gravel Surfaces.

1. Gravel surfaces shall be restored to the full width and length of existing gravel road shoulders removed, as indicated and as directed.

2. Restore gravel surfacing within 7 days after fill has been placed, compacted and accepted by the City Inspector.

3. Place gravel surfacing material over prepared substrate to provide total compacted thickness equal to the adjacent gravel surfacing, but not less than the thickness as indicated. The top of the restored gravel surfacing shall be as indicated and as directed.

4. Gravel surfacing shall be restored within one day after trench backfill has been placed, compacted and accepted by the City Inspector. Gravel surfacing shall be maintained until final asphalt pavement has been restored.

5. Gravel material shall match the adjacent surfacing as near as practical.

C. Place gravel road base and gravel surfacing material at near optimum moisture.

D. Place aggregate in maximum 4 inch layers and roller compact to 97 percent of maximum dry density.

E. Level and contour surfaces to elevations and gradients indicated.

F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Scheduled Compacted Thickness: Within 1/4 inch.

C. Variation From Design Elevation: Within 1/2 inch.

3.05 FIELD QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for field inspection and testing.

B. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556 or ASTM D2922.

C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("Standard Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests: At least once per day, and as directed by the City Inspector; and not to exceed 200 square yards of material placed per test.

3.06 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 02741

HOT MIX ASPHALT (HMA) PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt paving for restoration of asphalt surfaces.

B. Asphalt paving for new asphalt surfaces.

1.02 RELATED SECTIONS

A. Section 02316 - Fill and Backfill: Compacted subgrade for paving.

B. Section 02721 - Gravel Surfacing and Road Base: Gravel road base.

1.03 REFERENCES

A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; The Asphalt Institute.

B. AI MS-19 - A Basic Asphalt Emulsion Manual; The Asphalt Institute.

C. ASTM D 946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.

D. Utah Department of Transportation Standard Specifications, Section 02741.

E. Use the latest edition of the above reference standards as of the date of the Project.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with appropriate sections of Utah Department of Transportation Standard Specifications.

B. Mixing Plant: Conform to U.D.O.T. Standard Specifications.

C. Obtain materials from same source throughout.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable City requirements for paving work on City streets.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Place asphalt mix when ambient air or surface temperature is 50 degrees F and rising.

B. Do not place asphalt during adverse conditions, such as rain or snow, or when roadway surfaces are wet or frozen.

C. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement: Grade AC-20; conforming to U.D.O.T. Standard Specifications, Section 704.

B. Aggregate for Binder Course: Angular crushed washed stone; free of shale, clay, friable material and debris.

1. 3/4-inch Mix; graded in accordance with ASTM C 136, within the following limits:
   a. 3/4 inch sieve: 100 percent passing.
   b. 1/2 inch sieve: 74 to 99 percent passing.
   c. 3/8 inch sieve: 69 to 91 percent passing.
   d. No. 4 sieve: 49 to 65 percent passing.
   e. No 8 sieve: 33 to 47 percent passing.
   f. No. 16 sieve: 21 to 35 percent passing.
   g. No. 50 sieve: 6 to 18 percent passing.
   h. No. 200 sieve: 2 to 6 percent passing.

2. 1/2-inch Mix; graded in accordance with ASTM C 136, within the following limits:
   a. 1/2 inch sieve: 100 percent passing.
   b. No. 4 sieve: 60 to 80 percent passing.
   c. No. 16 sieve: 28 to 42 percent passing.
   g. No. 50 sieve: 11 to 23 percent passing.
   h. No. 200sieve: 3 to 7 percent passing.

C. Tack Coat: Homogeneous, rapid curing, liquid asphalt; conforming the U.D.O.T. Standard Specifications.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Use dry material to avoid foaming. Mix uniformly.

B. Binder Course: 5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2; and conforming to U.D.O.T. Standard Specifications.

C. Submit proposed mix design of each class of mix for review prior to beginning of work.

2.03 SOURCE QUALITY CONTROL

A. Test mix design and samples in accordance with AI MS-2.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrades are dry and ready to support paving and imposed loads; and that sub-grades have been accepted by the City Inspector.

B. Verify gradients and elevations of base are correct.

3.02 BASE COURSE

A. Section 02721 - Gravel Base Course forms the base construction for work of this section.

3.03 PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions.

B. Apply tack coat to contact surfaces of curbs, gutters, existing pavement, surfaces of manhole frames, and other related items, as directed.

3.04 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with U.D.O.T. Standard Specifications.

B. Place asphalt within two hours of applying tack coat.

C. Place to compacted thickness indicated.

D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.05 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within two hours of applying tack coat.

B. Place binder course to compacted thickness required and as directed.

C. Place wearing course within two hours of placing and compacting binder course.

D. Place wearing course to compacted thickness required to obtain total pavement thickness indicated.

E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

F. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.06 REMOVING EXISTING ASPHALT PAVEMENT

A. Existing asphalt pavement shall be removed as indicated and as directed by the City Inspector.

1. Saw-cut existing road pavement, as indicated and as directed.

2. The existing pavement to be removed shall be broken-up, to the limits as indicated and as directed.

3. Asphalt material shall be removed from work areas and disposed of in an acceptable manner.

3.06 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.

C. Variation from True Elevation: Within 1/2 inch.

3.07 FIELD QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for quality control.

B. Provide field inspection and testing. Take samples and perform tests in accordance with U.D.O.T. Standard Specifications.

3.08 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for two days or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 02850

CONCRETE STREET IMPROVEMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete curb and gutter, sidewalks, and appurtenant items.

1.02 RELATED SECTIONS

A. Section 02300 - General Excavation.

B. Section 02315 - Structural Excavation.

C. Section 02316 - Fill and Backfill.

D. Section 02721 - Gravel Road Base.

E. Section 03300 - Concrete.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

1.04 ACCEPTANCE

A. Curb and gutter, sidewalks, and appurtenant concrete items shall conform to the lines, grades, cross slopes and finishes as specified herein.

B. Curb and gutter, sidewalks, and appurtenant concrete items may be accepted at a reduced price when concrete strength is below specified strengths, as follows:

Pay Factor	PSI Below 28-day Compressive Strength
0.98	1 to 100
0.94	101 to 200
0.88	201 to 300
0.80	301 to 400
0.50*	> 400

* or the City Engineer may reject the concrete work.

C. Concrete for concrete items listed above will be rejected if the slump or air content is outside of specified limits.

PART 2 PRODUCTS

2.01 PORTLAND CEMENT CONCRETE

A. Use Portland Cement Concrete, as specified in Section 03300; using 3/4 inch maximum aggregate.

B. Concrete Reinforcement shall be as specified in Section 03300.

2.02 GRAVEL BASE

A. Gravel Base shall be as specified in Section 02721.

2.03 EXPANSION JOINT FILLER

A. Expansion Joint Filler: Shall be 1/2-inch thick; conforming to ASTM D 1751 or AASHTO M 213. Joint filler shall be one-piece; and shall extend full width and depth of concrete section; 1/4-inch below and conforming to finished top surfaces of concrete items.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify excavations for concrete items are correct and acceptable to the City Inspector.

3.02 EARTHWORK

A. See Section 02300 - General Excavation and Section 02315 - Structural Excavation for requirements for excavating, backfilling and compacting; See Section 02316 - Fill and Backfill for requirements for filling and backfilling; and see Section 02721 - Gravel Base Course for requirements of gravel base.

B. Hand trim excavations for accurate placement of gravel base for concrete items.

C. Furnish, place, grade and compact gravel base for concrete work, as indicated on the drawings and as directed.

1. Curb and Gutter: compacted thickness shall be 6 inches.

2. Sidewalks: compacted thickness shall be 5 inches.

D. Backfill around completed concrete items to required elevations, tamp in place and compact as required.

3.03 CONSTRUCTION

A. Form Work.

1. Forms shall be set to the required grade and lines, as indicated on the drawing; rigidly braced and secured.

2. Install sufficient quantity of forms to allow continuous progress of work; and so that forms can remain in place for at least 24 hours after placement of concrete.

3. Check completed form work for grade and alignment, before placing any concrete. Tolerances for form work shall not exceed 1/8-inch in 10 feet for the top of forms; and 1/4-inch in 10 feet for the vertical face.

4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

B. Concrete Placement.

1. Comply with applicable requirements of Section 03000 - Concrete for design, mixing and placement of concrete; and with the requirements herein.

2. Do not place concrete until subgrade and forms have been checked for line and grade; and are acceptable to the City Engineer.

3. Moisten subgrade as required to provide a uniform dampened condition at time concrete is placed.

4. Place concrete using methods which will prevent segregation of concrete mix, and with as little rehandling as possible.

5. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

6. Consolidate concrete along the face of forms with an internal vibrator. Keep vibrator away from joint assemblies or side frames. Consolidate with care to prevent dislocation of reinforcement and joint materials.

7. Use only square-faced shovels for hand spreading and consolidation.

C. Expansion Joints. Construct expansion joints true-to-line, with face perpendicular to the surface of the concrete item and at right angle to centerline of the concrete item, unless shown otherwise. Joints shall be filled with joint filler material.

1. Curb and Gutter. Provide expansion joints at a spacing not to exceed 40 feet, on center; where new curb and gutter abut drainage structures and other concrete construction; and elsewhere as indicated on drawings and as directed by the City Engineer.

2. Sidewalks. Provide expansion joints at a spacing not to exceed 40 feet, on center; where new sidewalk abut other concrete construction; and elsewhere as indicated on drawings and as directed.

D. Construction Joints. Construct construction joints true-to-line, with face perpendicular to the surface of the concrete item and at right angle to centerline of the concrete item, unless shown otherwise. Joints shall be filled with joint filler material.

1. Provide construction joints where required and as directed by the City Engineer.

E. Contraction Joints. Construct contraction (weakened-plane) joints true-to-line, with face perpendicular to the surface of the concrete item and at right angle to centerline of the concrete item, unless shown otherwise.

1. Curb and Gutter. Provide contraction joints at a spacing not to exceed 10 feet, on center; unless indicated otherwise on the drawings and as directed. Construct joints by inserting a 1/8-inch thick steel division plate, matching cross-section of curb and gutter, into concrete; plate shall not be embedded into bottom 4-1/2 inches of the curb and gutter. Set division plate into plastic concrete and carefully remove after concrete has hardened.

2. Sidewalks. Provide contraction joints at a spacing not to exceed 4 feet, on center; unless indicated otherwise on the drawings and as directed. Construct joints by inserting a 1/8-inch thick steel division plate into concrete; plate shall embedded 1/4 of pavement thickness, measured from the top of the sidewalk. Set division plate into plastic concrete and carefully remove after concrete has hardened.

F. Finishing and Ruling.

1. After striking off and consolidating concrete, smooth exposed surfaces by screeding and floating; adjust floating to compact surfaces and produce uniform texture.

2. After floating, check surfaces for trueness with a 10-foot long straightedge. Distribute concrete as required to remove surface irregularities; and refloat repaired surfaces to provide smooth, continuous surfaces with a tolerance of 1/4-inch when measured by the 10-foot long straightedge.

3. Work edges of curb and gutter, sidewalks, transverse joints, and contraction joints with an edging tool; and round to 1/4-inch radius, unless indicated otherwise.

4. Work edges of top back of curbs with an edging tool; and round to 1/2-inch radius, unless indicated otherwise.

5. Finishing:
   a. Curb and Gutter. After completion of floating and when excess moisture and surface sheen has disappeared, trowel finish exposed surfaces smooth, free of trowel marks, and uniform in texture and appearance.

b. Sidewalks. After completion of floating and when excess moisture and surface sheen has disappeared, broom finish exposed surfaces by pulling a fine-hair broom across concrete surfaces, perpendicular to line of traffic, until uniform in texture and appearance, and as acceptable to the City Engineer.

G. Form Removal and Repair Work.

1. Forms shall not be removed for at least 24 hours after concrete has been placed, unless otherwise acceptable to the City Engineer.

2. After form removal, clean ends of joints and point-up minor honeycombed areas.

3. Remove and replace areas or sections of concrete with major honeycomb areas, as required and as directed by the City Engineer.

H. Curing Concrete.

1. Protect and cure finished concrete, complying with applicable requirements of Section 03000 – Concrete.

2. Use moist-curing methods for initial curing, whenever possible.

3. A membrane-forming curing compound shall be used, when directed by the City Engineer; applied in accordance with the manufacturer's written instructions.

3.04 REMOVE EXISTING CURB & GUTTER AND SIDEWALK

A. Existing concrete curb and gutter and sidewalk shall be removed and disposed of where and as directed, as indicated on the detail drawings, and as described herein, to allow construction of project work.

1. Remove and dispose of sections of existing curb and gutter and sidewalk, where and as directed, according to the requirements of Section 02300.
   a. Existing curb and gutter shall be saw-cut as required and as directed; and sections of the curb and gutter to be removed shall be broken-up and removed, as directed; and the concrete debris shall be disposed of in an acceptable manner.
   b. Existing concrete sidewalks adjacent to the curb and gutter shall be saw-cut as required and as directed; and the sidewalk to be removed shall be broken-up and removed, as directed; and the concrete debris shall be disposed of in an acceptable manner.

2. Where the curb and gutter and sidewalk are to be restored, construct new concrete curb and gutter and sidewalk of the same size and type as existing items, as indicated and as directed.
   a. Excavate as required to establish proper sub-bases for the new gravel base for the new curb and gutter and sidewalks; and scarify, fine grade, and compact the sub-base to the required densities.
   b. Furnish, place, grade and compact new gravel base for new concrete work, of the thicknesses indicated above.
   c. Construct new concrete curb and gutter and sidewalks, as required and as directed, to replace the curb and gutter and sidewalk removed.
   d. New curb and gutter and sidewalk shall match the ends of the existing concrete items.

3.05 REPAIR AND MAINTENANCE

A. Contractor shall repair and maintain project island curbs, curb and gutter, sidewalks, waterways, ADA accessible ramps, and other concrete structures as required, during the guarantee period.

1. All repairs shall be made with materials similar and equal to those described in these specifications.

2. All construction shall be done as described in these specifications.

B. Just before expiration of the guarantee period, the Contractor shall, make all such repairs as may be necessary to produce concrete items which will:

1. Conform substantially in contour to the concrete item as first constructed.

2. Be free from cracks or depressions showing disintegration of the concrete mixture of the concrete item.

3. Be free from all settlement of the surface of the concrete pavement holding water, or other settlements showing variation of 3/8-inch or more from the edge of a four-foot long straightedge.

4. Not have settled because of incomplete compaction of the subgrade.

C. When repairs, that are necessary to be made during the guarantee period, amount to more than fifty percent of a section between two expansion joints, the entire section shall be removed and disposed of; and that section shall be reconstructed in accordance with these specifications.

3.06 PROTECTION OF CONSTRUCTED CONCRETE ITEMS

A. Protect concrete items of this section from damage by subsequent construction activities.

B. Replace damaged concrete items which cannot be repaired to the City Engineer's satisfaction.

END OF SECTION

DIVISION 03

CONCRETE

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete form work.

B. Concrete curbs and slabs on grade.

C. Concrete foundation walls and vaults.

D. Concrete reinforcement.

E. Joint devices associated with concrete work.

F. Miscellaneous concrete items, including equipment pads, thrust blocks, and other miscellaneous items.

G. Concrete curing.

1.02 MEASUREMENT AND PAYMENT

A. See Section 01270 - Unit Prices, for additional unit price requirements.

B. Concrete for Miscellaneous Structures.

1. Basis for Measurement: concrete and reinforcement for miscellaneous structures and other work shall be made and included in the unit price and lump sum price bid for the miscellaneous items of work.

2. Basis for Payment: Includes form work, reinforcement, concrete, placement, accessories, consolidating and leveling, curing and finishing.

C. Concrete - Grouting.

1. Basis for Measurement: grouting for miscellaneous structures and other work shall be made and included in the unit price and lump sum price bid for the miscellaneous items of work.

2. Basis for Payment: Includes preparation of substrate, grout, placement, consolidating, troweling, and curing.

1.03 REFERENCES

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International.

B. ACI 301 - Specifications for Structural Concrete for Buildings.

C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

D. ACI 305R - Hot Weather Concreting.

E. ACI 306R - Cold Weather Concreting.

F. ACI 308 - Standard Practice for Curing Concrete.

G. ACI 309R - Guide for Consolidation of Concrete.

H. ACI 318 - Building Code Requirements for Reinforced Concrete and Commentary.

I. ACI 347 - Guide to Form work for Concrete.

J. ASTM A 185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

K. ASTM A 615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

L. ASTM C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

M. ASTM C 33 - Standard Specification for Concrete Aggregates.

N. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

O. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.

P. ASTM C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

Q. ASTM C 150 - Standard Specification for Portland Cement.

R. ASTM C 171 - Standard Specification for Sheet Materials for Curing Concrete.

S. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

T. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.

U. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

V. ASTM C 494 - Standard Specification for Chemical Admixtures for Concrete.

W. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

X. ASTM C 881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

Y. ASTM C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

Z. ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

AA. ASTM D 994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

AB. ASTM D 1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

AC. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinyl chloride Waterstop; Corps of Engineers.

AD. Use the latest issue of the above reference standards as of the date of the Project.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products.

C. Samples: Submit one, four inch long samples of waterstops and construction joint devices, as directed.

D. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.

E. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Acquire cement from same source and aggregate from same source for entire project.

C. Follow recommendations of ACI 305R when concreting during hot weather.

D. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORM WORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.

2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

3. Form Ties: Snap-Off type that will leave no metal within 1-1/2 inches of concrete surface. Use of tie wire as form ties will not be permitted.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A 615 Grade 60.

1. Deformed billet-steel bars.

2. Unfinished.

B. Welded Steel Wire Fabric: ASTM A 185, plain type.

1. Coiled Rolls or flat sheets.

2. Mesh Size and Wire Gage: As indicated on drawings.

C. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gauge.

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

3. Provide galvanized or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C 150, Type IIA - Air Entraining Portland type.

B. Cement: ASTM C 150, Type V - Sulfate Resistant Portland type, when exposed to sewage.

C. Fine and Coarse Aggregates: ASTM C 33.

D. Fly Ash: ASTM C 618, Class F.

E. Calcined Pozzolan: ASTM C 618, Class N.

F. Water: Clean and not detrimental to concrete.

G. Synthetic Fiber Reinforcement: Comply with ASTM C 1116; 1/2 inch length.

2.04 ADMIXTURES

A. Air Entrainment Admixture: ASTM C 260.

B. Chemical Admixtures: ASTM C 494, Type D - Water Reducing and Retarding.

1. Provide products manufactured by Sika Chemical Corporation or acceptable equal.

2.05 CONCRETE ACCESSORIES

A. Epoxy Bonding System: ASTM C 881, type as required by project conditions.

B. Non-Shrink Grout: ASTM C 1107; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 48 Hours: 2,400 psi.

2. Minimum Compressive Strength at 28 Days: 7,000 psi.

C. Moisture-Retaining Cover: ASTM C 171; clear polyethylene or white burlap-polyethylene sheet.

D. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent.

2.06 JOINT DEVICES AND MATERIALS

A. Waterstops: PVC type, COE CRD-C 572.

B. Joint Filler: ASTM D 1751; Asphalt impregnated fiberboard or felt, 1/2 inch thick; tongue and groove profile.

2.07 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

C. Fibrous Reinforcement: Where indicated, add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

D. Normal Weight Concrete:

1. Compressive Strength, per ASTM C 39 at 28 days: 4,000 psi.

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 592.2 lb per cubic yard; 6.3 bag mix.

5. Water-Cement Ratio: Maximum 48 percent by weight.

6. Total Air Content: 4 to 8 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.

2.08 MIXING

A. Transit Mixers: Comply with ASTM C 94.

B. During hot weather or under other conditions contributing to rapid setting of concrete, mixing times will be reduced as follows:

1. When air temperature is between 85 and 90 degrees (F), reduce mixing time and delivery time from 90 minutes to 75 minutes.

2. When air temperature is above 90 degrees (F), reduce mixing time and delivery time to 60 minutes.

C. Provide batch ticket for each batch used in the work. Ticket shall indicate project identification name and number, date, mix type, mix time, quantity, and amount of water added.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Form work: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Forms shall be mortar tight, properly aligned, as indicated, to produce concrete surfaces meeting the surface requirements specified herein.

C. Forms shall be constructed so they can be removed without hammering on or prying against concrete, and without damaging concrete in any way.

D. Verify that forms are clean before applying release agent.

E. Coordinate placement of joint devices with erection of concrete form work and placement of form accessories.

F. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

G. In locations where new concrete is doweled to existing work, drill holes in existing concrete, fill holes with epoxy bonding agent, and insert steel dowels.

H. The Engineer's review of form work will not relieve the Contractor from any responsibility as to the adequacy of the form work, shoring and bracing design. All form work installed by the Contractor shall be solely at his risk. The Engineer's review will not lessen or diminish the Contractor's liability.

I. Alignment and Tolerances. Form work shall be designed and constructed so that concrete surfaces of finished structures will comply with the tolerances specified in ACI 347; and will conform to the following:

1. Vertical Alignment: maximum allowable variation, from bottom to top of a wall, is plus or minus 3/8 inch.

2. Plumb: maximum allowable variations as follows:
   a. In plumb and surfaces of columns and walls is plus or minus 1/4 inch in any 10-feet of length; and a maximum of one-inch for entire length.
   b. In plumb for exposed corner, control-joint grooves, or other conspicuous lines is plus or minus 1/4 inch in any 20-foot of length; and a maximum of 1/2-inch for the entire length.

3. Wall Thickness: shall not vary more than minus 1/8 inch or plus 1/2 inch.

4. Level or Grade: maximum variation from level or grade indicated shall not exceed plus or minus 1/4 inch in any 10-foot of length; or plus or minus 3/8-inch in any 20-foot of length.

5. Distance: maximum variation in distance between walls, columns, or other members shall not exceed plus or minus 1/4 inch in any 10-foot of length; and not more than one-inch total variation.

3.03 INSTALLING REINFORCEMENT

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install wire fabric in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Engineer not less than 24 hours prior to commencement of placement operations. No concrete shall be placed until all form work, construction joints, reinforcing steel, and other items have been completed and accepted by the Engineer.

D. Before placing concrete, inspect and complete form work installations, reinforcing steel placement, and items to be embedded or cast-in.

E. Notify other crafts involved in ample time to permit installation of their work; cooperate with other trades in setting such work.

F. All dirt, chips, sawdust, debris, mud, water and other foreign matter shall be removed from within forms or within excavated areas adjacent to forms before any concrete is placed.

G. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

H. Separate slabs on grade from vertical surfaces with 1/4 inch thick joint filler.

I. Install joint devices in accordance with manufacturer's instructions.

J. Concrete shall be conveyed from mixer to forms as rapidly as possible within specified time limits; and by methods that will prevent segregation of concrete mix.

K. Concrete shall be placed within 15 minutes after it has been discharged from mixer.

L. Provide adequate equipment and labor for conveying concrete to ensure a continuous flow of concrete at delivery point.

M. Concrete shall be deposited as close as possible to its final position in the forms; there shall be no vertical drop greater than 8 feet, except where suitable equipment is provided to prevent segregation of concrete and where specifically authorized.

N. Deposit concrete so that it will be effectively consolidated in horizontal layers not more than 12 inches thick; except that all slabs shall be placed in single layer.

O. Where placement consists of several layers, place each layer while the preceding layer is still plastic to avoid cold joints, and within 30 minutes after placement of preceding layer.

P. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

Q. Place concrete continuously between predetermined expansion, control, and construction joints.

R. Do not interrupt successive placement; do not permit cold joints to occur.

S. Do not use concrete which becomes non-plastic or unworkable, does not meet the required quality control limits, or which has become contaminated by foreign materials. Do not use re-tempered concrete. Remove rejects concrete from the project site and dispose of in an acceptable manner.

T. Place floor slabs in checkerboard or saw cut pattern indicated.

U. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

V. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 foot.

W. Concrete shall not be placed in water; nor shall water be allowed to rise over freshly placed concrete until the concrete has set sufficiently to prevent its being damaged thereby.

3.05 CONSOLIDATING

A. Consolidate each layer of concrete immediately after placement with internal vibrators in accordance with ACI 309, except for slabs 4 inches thick or less.

B. Vibrators shall be inserted vertically at uniform spacing over entire area of placement; spacing to be approximately 1-1/2 times radius of action of vibrator. Vibrators shall penetrate rapidly to bottom of layer being placed, and at least 6 inches into the preceding layer.

C. Vibrators shall be supplemented by hand spading adjacent to forms on exposed surfaces. Concrete shall be compacted and well worked into all corners and angles in forms, and around reinforcement and embedded items.

3.06 FORM REMOVAL

A. Forms shall be removed in a manner that will prevent damage to concrete and ensure complete safety of the structure.

B. Forms shall not be removed until approval is given by the Engineer.

C. Form work for columns, walls and other members not supporting weight of concrete may be removed when concrete has attained sufficient strength to resist damage from removal operation; but not before at least 48 hours after concrete placement.

D. Form work for columns, walls, roof slabs, and other members supporting weight of concrete may not be removed until concrete has attained sufficient strength to carry imposed loads as determined by compression tests, and when directed by the Engineer.

3.07 CONCRETE FINISHING

A. Repair and patch surface defects, including tie holes, on all surfaces immediately after removing form work.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:

1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.

D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:

1. Wood float surfaces that will receive trowel finish or other finishes, as indicated.

2. Steel trowel surfaces that will be left exposed.

3. Broom finish exterior concrete to provide non-slip finish.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:50 nominal.

F. All exposed edges to be chamfered; 3/4 inches minimum.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI 308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than 7 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:

1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-fog spray, or saturated burlap, as acceptable to the Engineer.

2. Begin final curing after initial curing but before surface is dry.
   a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.
   b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01400.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design to engineer and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Compressive Strength Tests: ASTM C 39. For each test, mold and cure three concrete test cylinder. Obtain test samples for every 50 cu yd or less of concrete placed.

F. Take two additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each load at point of discharge; and perform slump test with each set of test cylinders taken.

1. If maximum slump for the application is exceeded, it will be assumed that the water content is excessive and the load shall be rejected.

2. If slump is less that the minimum for the application, a measured quantity of water may be added to the mix; quantity shall not exceed 1/6 gallon of water per bag of cement.

3. Water shall be added only in the presence of the Engineer and after a slump test has been made.

4. If concrete has been mixed for more than one hour, the loss of slump shall be considered as being caused by setting of concrete; water shall not be added, and the load shall be rejected.

H. Perform test to determine air content in accordance with ASTM C 231; a minimum of one test shall be done each time a slump test is made. Air content shall be within specified limits.

3.10 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

3.11 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Structure Not Exposed to View: 4,000 psi 28 day concrete; form finish surface, with honeycomb and holes filled and repaired.

B. Exposed Structures: 4,000 psi 28 day concrete; air entrained, smooth rubbed finish.

END OF SECTION

CITY OF NORTH SALT LAKE

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

PROJECT # GEO.021

LOCATED BETWEEN EAGLEPOINT DRIVE AND PARKWAY DRIVE IN THE CITY OF NORTH SALT LAKE

GILSON ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS
12401 SOUTH 450 EAST DRAPER, UT. 84020
BUILDING C, UNIT 2
PHONE: (801) 571-9414
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GeoStrata
Engineering & Geosciences
14425 S. Center Point Way
Bluffdale, Utah 84065
801-501-0583
www.geostrata-llc.com

PROFESSIONAL ENGINEER
2/18/15
No. 4939508-2202
JAMES J. MILLIGAN
STATE OF UTAH

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
GEO.021

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ABBREVIATIONS

ADJ	ADJUST
ADS	ADVANCE DRAINAGE SYSTEM
ARV	AIR RELEASE VALVE
BC	BAR AND CAP
BOW	BACK OF WALK
BVCE	BEGINNING VERTICAL CURVE ELEV.
BVCS	BEGINNING VERTICAL CURVE STATION
CB	CATCH BASIN
CBL	CABLE
CH	CHORD BEARING
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC	CONCRETE
COR.	SECTION CORNER
D	DELTA ANGLE
DET	DETAIL
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWING
EG	EXISTING GRADE
ELEV	ELEVATION
EOC	EDGE OF CONCRETE
EP	EDGE OF PAVEMENT
EVCE	END VERTICAL CURVE ELEV.
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY
EX	EXISTING
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FO	FIBER OPTICS
FT	FOOT
GB	GRADE BREAK
HC	HANDICAP
HDPE	HIGH DENSITY POLY ETHYLENE
HP	HIGH POINT
INV.	INVERT
IRR	IRRIGATION
L.F.	LINEAR FEET
LIP	LIP OF CURB
LP	LOW POINT
LT.	LEFT
MAX.	MAXIMUM
MH	MANHOLE
MIN.	MINIMUM
MON	MONUMENT
NTS	NOT TO SCALE
OC	ON CENTER
OHP	OVER HEAD POWER
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PRV	PRESSURE REDUCING VALVE
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE PIPE
R	RADIUS
ROW	RIGHT OF WAY
RT.	RIGHT
S	SEWER
SD	STORM DRAIN
SER	SOUTH END RADIUS
SSMH	SEWER MANHOLE
STA	STATION
STD	STANDARD
SW	SECONDARY WATER
TBC	TOP BACK OF CURB
TOA	TOP OF ASPHALT
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TOW	TOP OF WALL
TYP	TYPICAL
UG	UNDER GROUND POWER
VPC	VERTICAL POINT OF CURVE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
W	WATER
WM	WATER METER
WV	WATER VALVE

IDENTIFICATION SYSTEM

SEE DETAIL 5-C.1

TYPICAL DETAIL CALL OUT

DIRECTION OF VIEW — SECTION NUMBER — 1 / C.13 — *DRAWING SECTION IS REFERENCE TO

TYPICAL SECTION CUT

DESCRIPTION — DETAIL NUMBER — DETAIL — SCALE: N.T.S. — SCALE — 1 / C-1 — *DRAWING DETAIL IS REFERENCED TO

TYPICAL DETAIL IDENTIFICATION

DESCRIPTION — SECTION NUMBER — SECTION — SCALE: N.T.S. — SCALE — 1 / C-1 — *DRAWING WHICH SECTION IS TAKEN

TYPICAL SECTION IDENTIFICATION

*NOTE: IF DETAIL OR SECTION IS REFERENCED TO MULTIPLE SHEETS THE SHEET NUMBER WILL INDICATE 'VARIES'

LEGEND AND SYMBOLS

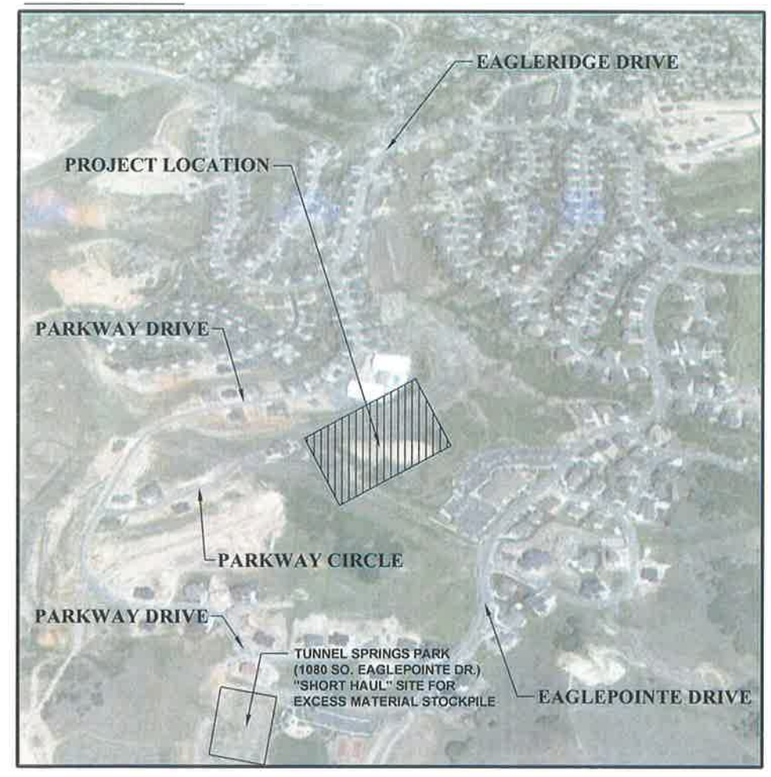
- SECTION CORNER & LINE (FOUND)
- BOUNDARY/PHASE LINE
- ADJACENT PL or LOT LINES
- RIGHT-OF-WAY LINE
- CENTERLINE of ROAD
- EASEMENT LINE
- CURB & GUTTER
- = EDGE OF ASPHALT
- FENCE
- LOT LINE
- DAYLIGHT- CUT
- DAYLIGHT- FILL
- PROPOSED INDEX CONTOUR (4475)
- PROPOSED INTERMEDIATE CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- SANITARY SEWER MANHOLE & PIPE
- STORM DRAIN CLEAN OUT & PIPE
- CATCH BASIN
- 4' COMBO BOX
- 4' INLET
- MANHOLE & CULINARY WATER LINE
- WATER VALVE
- = PROPOSED FIRE HYDRANT
- POWER
- STREET LIGHT
- GAS LINE & MANHOLE
- TELEPHONE LINE
- CABLE TELEVISION LINE
- DRAINAGE / DITCH CENTERLINE
- IRRIGATION LINE
- AIR RELIEF VALVE
- TELE-MH
- GAS-MH
- ELEC MH
- POWERPOLE
- GUY WIRE
- STREET SIGN
- TELE-RISE
- TELE-VAULT
- UTIL-POLE
- S-1 SEWER TAG
- SD-1 SD-TAG
- 4400.00 TBC SPOT ELEVATION
- 4400 EXISTING ELEVATION
- 4442 PROPOSED ELEVATION
- = PROPOSED ASPHALT
- = PROPOSED CONCRETE

*NOTE: ALL EXISTING FEATURES WILL BE IN A SHADED LINE

SHEET INDEX

	COVER SHEET
G.101	INDEX AND LEGEND
G.102	GENERAL NOTES / UDOT NOTES
C.101	EXISTING SITE PLAN
C.102	PROPOSED GRADING PLAN ALT. 1
C.103	PROPOSED DRAINAGE AND LOWER UTILITIES
C.104	PROPOSED UPPER UTILITY RELOCATION AND DEMOLITION PLAN
C.301	PROFILE WALL 1:1 (1)
C.302	PROFILE WALL 1:1 (2)
C.303	PROFILE WALL 1:1 (3)
C.304	PROFILE PARKING LOT (1)
C.305	PROFILE PARKING LOT (2)
C.306	PROFILE PARKING LOT (3)
C.307	PROFILE TENNIS COURT (1)
C.308	PROFILE TENNIS COURT (2)
C.309	PROFILE EVANS PROPERTY
C.310	PROFILE STORM DRAIN
W.101	WALL PROFILE
W.102	WALL PROFILE
D.101	DETAILS
D.102	DETAILS
D.103	DETAILS
D.104	DETAILS
ER.101	SWPP PLAN
ER.102	BMP DETAILS

LOCATION MAP



PROFESSIONAL ENGINEER
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CITY OF NORTH SALT LAKE

REV	DATE	BY	COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: INDEX
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

INDEX AND LEGEND

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A

PROJ # GEO.021

G.101

Z:\PROJECTS (misc.)\GEO.021.14 NSL LANDSLIDE TOPO\CADD\PLAN SET\COVER G101 G102.dwg, 2/18/2015 2:38:37 PM, Aimie

GENERAL NOTES

1. THIS DESIGN IS AN ORIGINAL UNPUBLISHED WORK AND MAY NOT BE DUPLICATED, PUBLISHED AND/OR USED WITHOUT THE WRITTEN CONSENT OF GILSON ENGINEERING, INC.

2. THESE SHEETS - LISTED BY DRAWING INDEX, ALL ACCOMPANYING SPECIFICATIONS FOR MATERIALS, WORKMANSHIP QUALITY, AND NOTES HAVE BEEN PREPARED SOLELY FOR THE CONSTRUCTION AND FINISH OF PROJECT IMPROVEMENTS, COMPLETE AND READY FOR USE.

3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH PERTINENT JURISDICTIONAL CODES, RESTRICTIONS, COVENANTS, AND/OR ORDINANCES. ANY CONFLICT BETWEEN DESIGN AND REQUIREMENT SHALL BE REPORTED TO GILSON ENGINEERING, INC. BEFORE PROCEEDING. FAILURE TO DO SO VOIDS THE DESIGN.

4. ANY AND ALL PROPOSED CHANGE, MODIFICATIONS AND/OR SUBSTITUTION SHALL BE REPORTED TO GILSON ENGINEERING, INC. BEFORE PROCEEDING. ANY DEVIATION FROM THE CONTRACT DOCUMENTS, WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF GILSON ENGINEERING, INC. VOIDS THE DESIGN.

5. IN THE EVENT OF CONFLICT BETWEEN THE DESIGN DOCUMENTS AND/OR JURISDICTIONAL REQUIREMENTS, THE MORE RESTRICTIVE FROM THE STANDPOINT OF SAFETY AND PHYSICAL SECURITY SHALL APPLY.

6. THE CITY SHALL BE NOTIFIED OF ANY INSTALLATION OR WORK NECESSARY TO THE FUNCTIONING, SAFETY AND/OR PHYSICAL SECURITY OF DESIGN THAT IS TO BE ENCAPSULATED OR OTHERWISE PERMANENTLY OBSCURED FROM INSPECTION A MINIMUM OF TWO (2) WORKING DAYS BEFORE ENCLOSURE.

7. ANY DAMAGE, DISRUPTION OR COMPROMISE OF AMBIENT RIGHTS-OF-WAY, UTILITIES, OR ENVIRONMENTAL QUALITY SHALL BE IMMEDIATELY RECTIFIED BY THE CONTRACTOR TO THE SATISFACTION OF GILSON ENGINEERING, INC. AT NO COST TO THE OWNER.

8. ALL WORK SHALL BE INSPECTED BY GOVERNING AGENCIES IN ACCORDANCE WITH THEIR REQUIREMENTS. JURISDICTIONAL APPROVAL SHALL BE SECURED BEFORE PROCEEDING WITH WORK.

9. CONTRACTOR IS RESPONSIBLE TO SCHEDULE INSPECTIONS WITH CITY.

CONSTRUCTION NOTES

1. ALL WORK WITHIN THE SITE SHALL CONFORM TO THE CURRENT CITY STANDARDS AND SPECIFICATIONS AND APWA.

2. CONTRACTOR SHALL MEET ALL OF THE REQUIREMENTS ESTABLISHED FOR SAFE TRENCHING. (SEE OSHA AND UOSHA REQUIREMENTS, LATEST EDITIONS).

3. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES BEFORE LAYING PIPE WITHIN 200 FEET OF SAID UTILITIES WHICH MAY BE EXPOSED, DAMAGED OR CROSSED AS SHOWN ON THE DRAWINGS OR AS "BLUE STAKED". CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE UTILITY COMPANY TO MOVE THE UTILITY IF NECESSARY OR OBTAIN PERMISSION FROM THE ENGINEER TO MODIFY GRADES OF PROJECT LINES IN ORDER TO GO AROUND EXISTING UTILITIES.

4. SEWER MAINS, WATER MAINS, GAS MAINS AND OTHER UTILITIES ARE SHOWN ON THE PLANS IN A GENERAL SCHEMATIC WAY ACCORDING TO INFORMATION RECEIVED FROM OTHERS AND SOMETIMES FROM FIELD MEASUREMENTS. THE ACCURACY OR COMPLETENESS OF THE LOCATIONS SHOWN IS APPROXIMATE ONLY. THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF EXISTING SERVICE CONNECTIONS AND UTILITIES, VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS AND TAKE THE NECESSARY STEPS TO AVOID THEM.

5. SPECIFIC INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS SHALL SUPERSEDE ITEMS COVERED IN THESE DRAWINGS.

UTILITY NOTES

1. CONTRACTOR SHALL VERIFY DEPTH AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTING ANY NEW UTILITY LINES. NOTIFY CIVIL ENGINEER OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO ANY CONNECTIONS BEING MADE.

2. WATER METERS SHALL BE INSTALLED PER CURRENT WATER DISTRICT STANDARDS AND SPECIFICATIONS. IT WILL BE THE CONTRACTORS RESPONSIBILITY TO INSTALL ALL ITEMS REQUIRED.

3. WATER LINES, VALVES, FIRE HYDRANTS, FITTINGS ETC. ARE TO BE CONSTRUCTED AS SHOWN. CONTRACTOR IS RESPONSIBLE TO CONSTRUCT ANY VERTICAL ADJUSTMENTS NECESSARY TO CLEAR SEWER, STORM DRAIN OR OTHER UTILITIES AS NECESSARY INCLUDING VALVE BOXES AND HYDRANT SPOOLS TO PROPER GRADE.

4. CONTRACTOR SHALL PROTECT EXISTING PIEZOMETER AND INCLINOMETER MONITORING WELLS DURING CONSTRUCTION. UPON COMPLETION OF GRADING, CONTRACTOR SHALL CUT PVC PIPE TO 6" BELOW GROUND SURFACE, RE-INSTALL PROTECTIVE HANDHOLE AND GROUT/CONCRETE IN PLACE.

5. NO CONSTRUCTION ACTIVITY OF ANY KIND CAN BE PERFORMED ON KERN RIVER'S RIGHT-OF-WAY WITHOUT CONTACTING KERN RIVER, SIGNING AN ENCROACHMENT PERMIT OR AGREEMENT, COMPLYING WITH LOCAL UTILITY ONE-CALL LAWS, AND ENGAGING IN ANY OTHER ACTIONS DEEMED NECESSARY BY KERN RIVER TO PROTECT KERN RIVER'S FACILITIES.

6.ALL CONSTRUCTION ACTIVITIES PERFORMED ON KERN RIVER AND QUESTAR RIGHT OF WAY SHALL BE PERFORMED ACCORDING TO THEIR REQUIREMENTS.

CAUTION NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY: THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO THE NORMAL WORKING HOURS; AND THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

PROFESSIONAL ENGINEER
2/18/15
No. 4939903-2202
JAMES J. MILLIGAN
STATE OF UTAH

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC.
1549 SOUTH 400 EAST
BUILDING C, UNIT 2
SALT LAKE CITY, UTAH 84115
FAX: (801) 571-1845
5449 SOUTH 1700 WEST
RIVERDALE, UT 84405
(801) 394-4515 FAX: (801) 773-0091
GeoStrata
Engineering & Geosciences
10653 S. Crane Pointe Way
Sandy, Utah 84092
801.501.0222
www.geostrata.com

CITY OF NORTH SALT LAKE

REV DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: GENERAL NOTES
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

GENERAL NOTES / UDOT NOTES

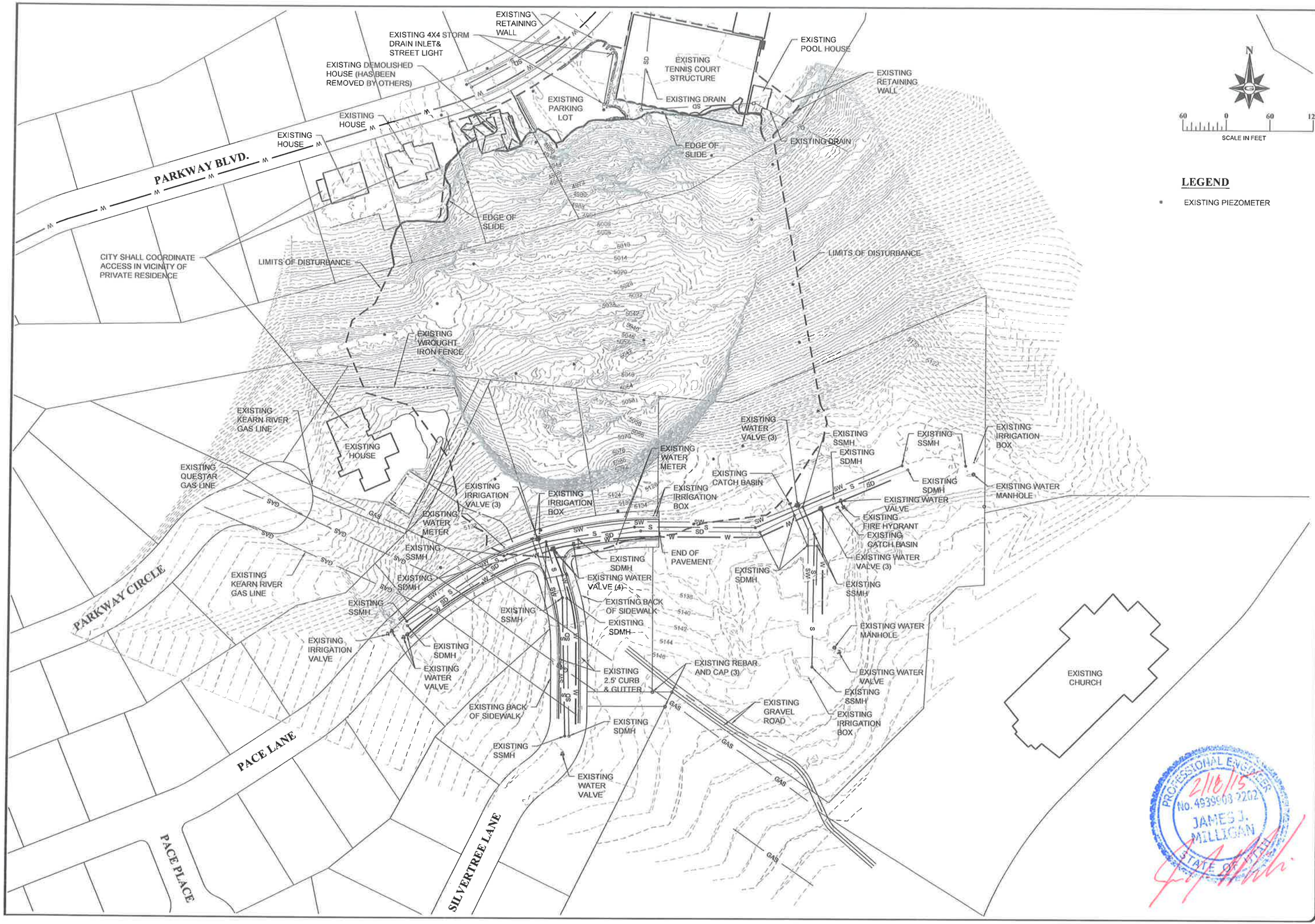
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A

PROJ. # GEO.021

G.102



CONSULTING ENGINEERS AND SURVEYORS:
GILSON ENGINEERING INC.
12463 SOUTH HIGHLAND DRAPER, UT 84020 PHONE: (801) 576-0444 FAX: (801) 571-0444
3440 SOUTH 1700 WEST SALT LAKE CITY, UT 84119 PHONE: (801)973-8181 FAX: (801)973-0040

GeoStrata Engineering & Geosciences
John S. Lowe Hunt Riley
Phone: (801) 561-1010
561-561-0323
www.geostrata-llc.com

NORTH SALT LAKE CITY

REV DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME EX SITE PLAN
DESIGNED/DRAWN BY AL
CHECKED
APPROVED

EXISTING SITE PLAN

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

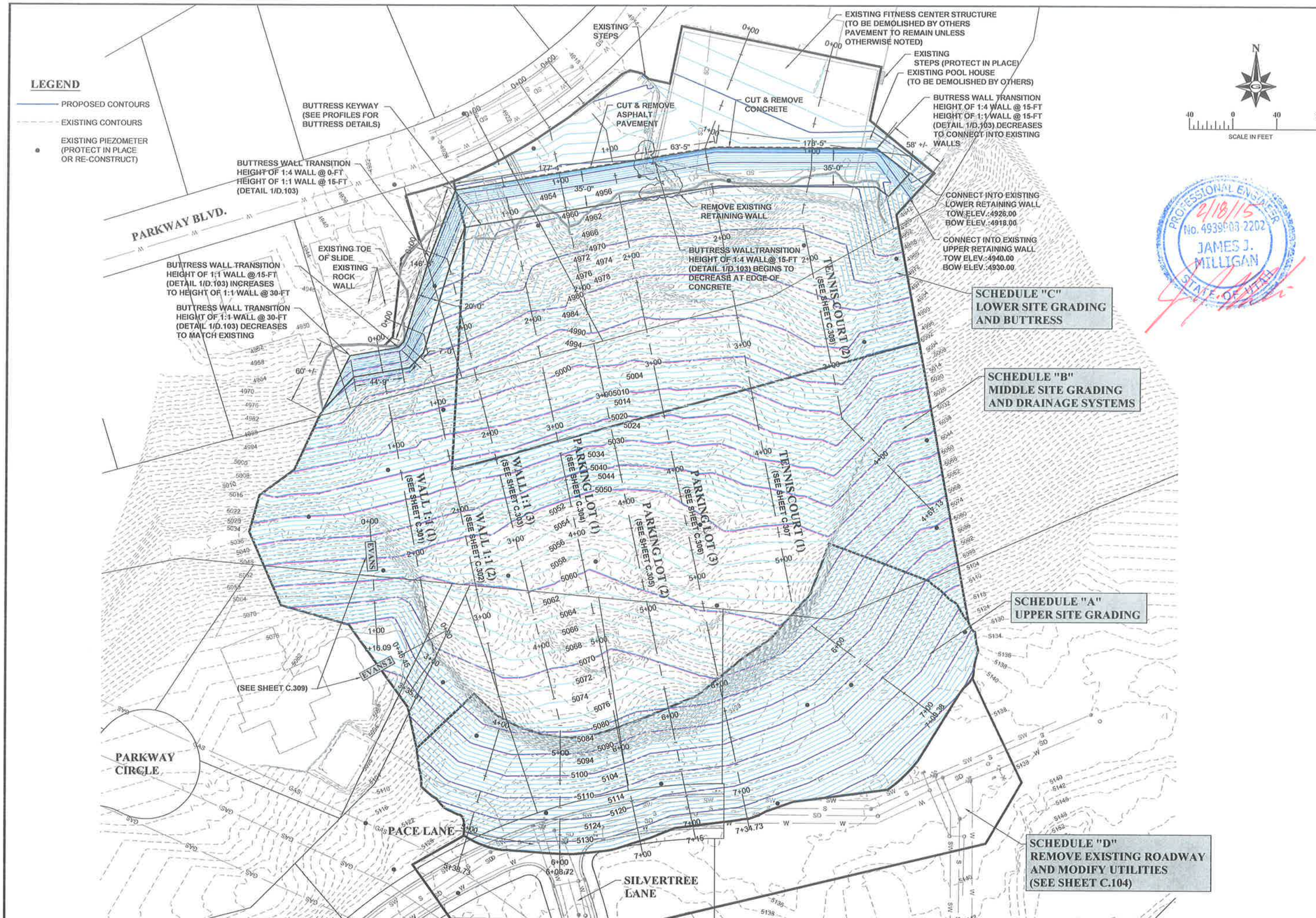
NORTH SALT LAKE, UTAH

REVISION: A

PROJ. # GEO.021

C.101

Z:\PROJECTS (misc)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\C 101 EX-SITEPLAN.dwg, 2/18/2015 10:58 07 AM, Aimie



CONSULTING ENGINEERS AND SURVEYORS

GILSON ENGINEERING INC.

GeoStrata Engineering & Geosciences

CITY OF NORTH SALT LAKE UTAH

REVISIONS

REV	DATE	BY	COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015

DRAWING NAME C.102 GRADING PLAN

DESIGNED/DRAWN BY AL

CHECKED | APPROVED

PROPOSED GRADING PLAN

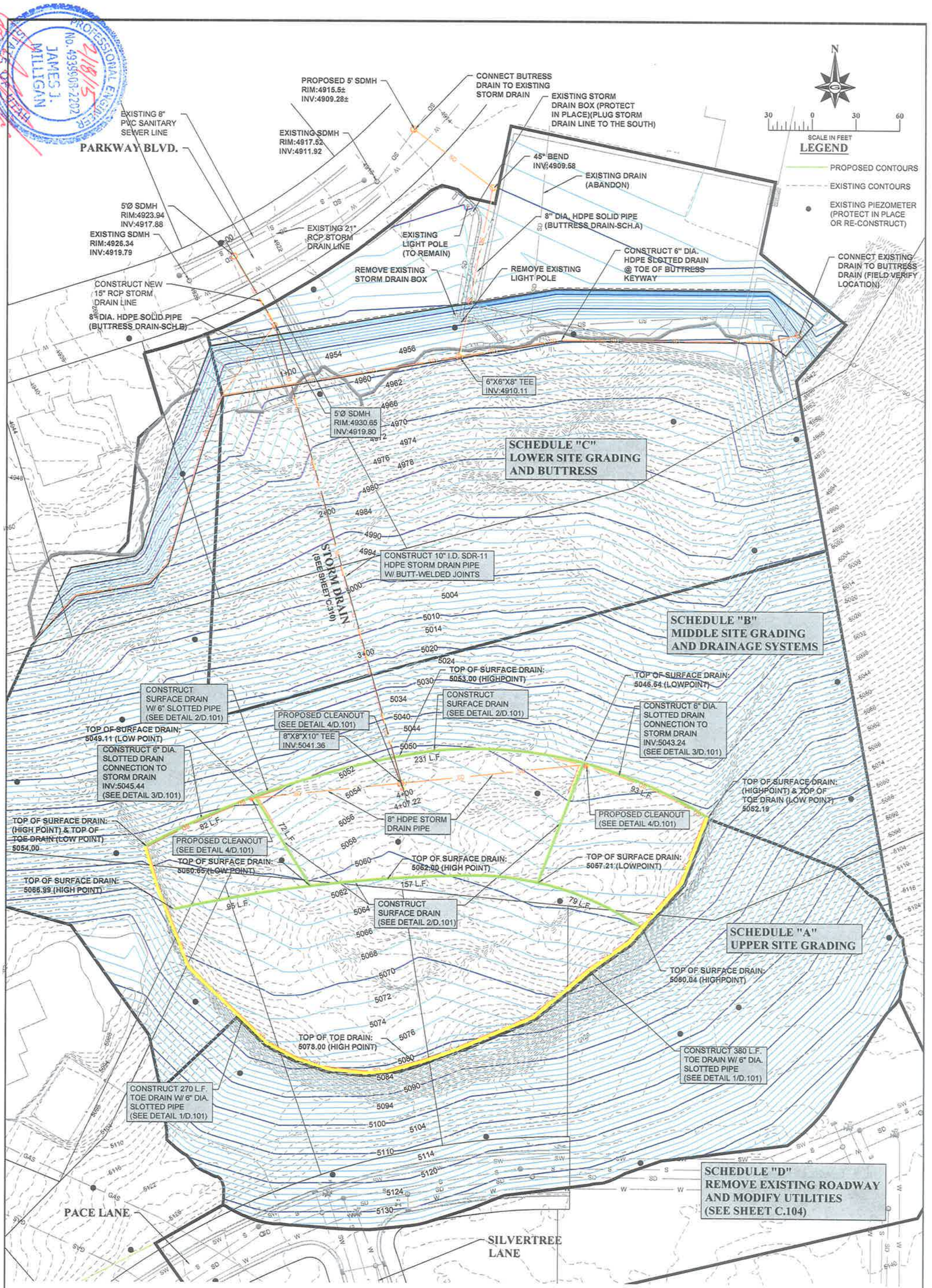
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A

PROJ. # GEO.021

C.102



C.103

PROJ.# GEO.021

REVISION: A

PROPOSED DRAINAGE AND UTILITIES

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

DATE: FEBRUARY 2015

DRAWING NAME: C.103 DRAINAGE

DESIGNED/DRAWN BY: AL

CHECKED: APPROVED:

REVISIONS

REV	DATE	BY	COMMENTS

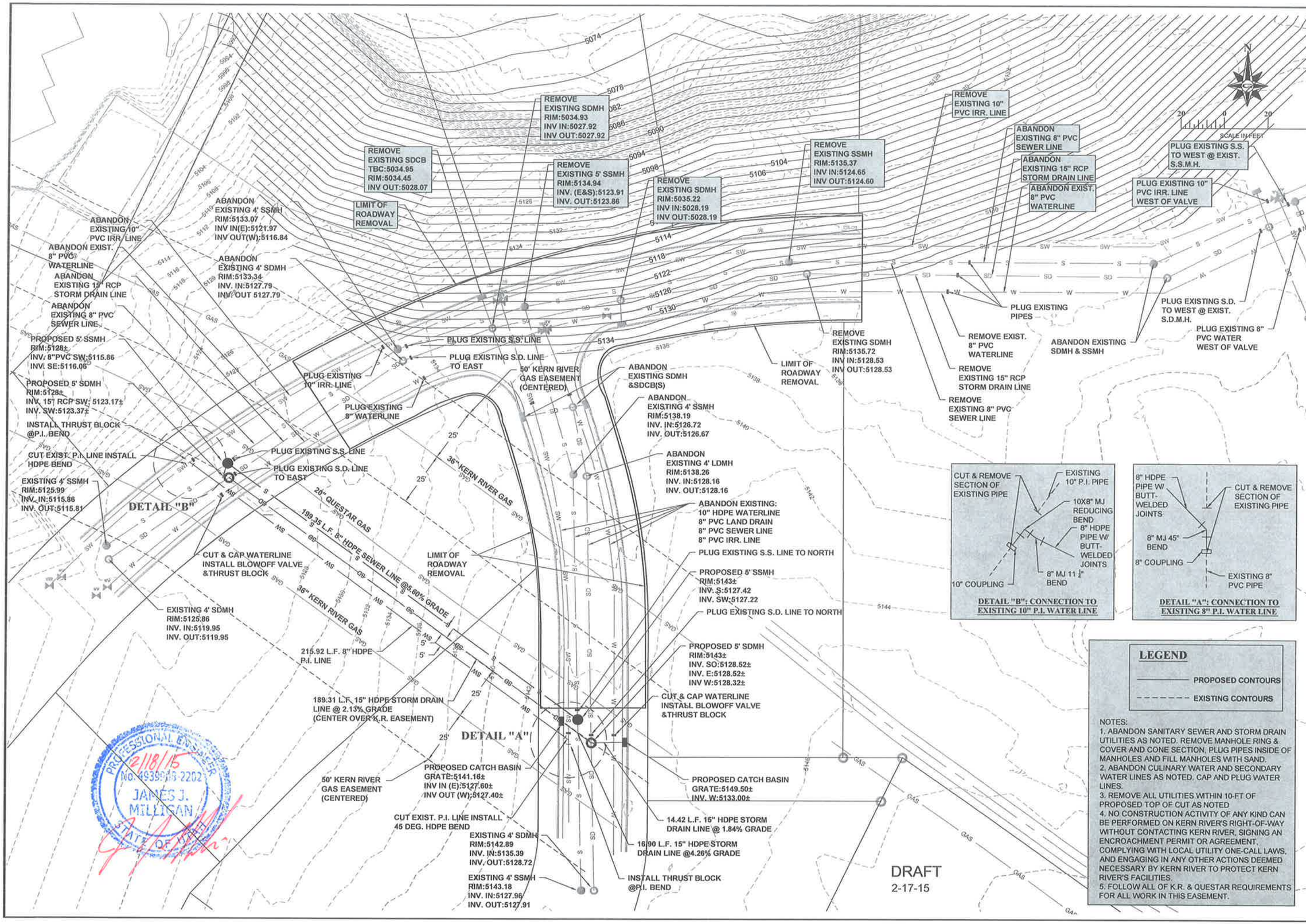
1" SCALE MEASURES 1" ON FULL SIZE SHEETS ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

CITY OF NORTH SALT LAKE UTAH

GeoStrata Engineering & Geosciences

CONSULTING ENGINEERS AND SURVEYORS

GILSON ENGINEERING INC.



CONSULTING ENGINEERS AND SURVEYORS
GILSON PROFESSIONAL ENGINEERING INC.
1304 SOUTH 400 EAST, OREM, UT 84058 P.O. BOX 1262, OREM, UT 84059 PHONE: (801) 375-2444 FAX: (801) 375-9480
5446 SOUTH 1700 WEST, WEST HAVEN, UT 84401 PHONE: (801) 731-1181 FAX: (801) 731-2001

GeoStrata Engineering & Geosciences
1603 S. Carver Point Way, Salt Lake City, UT 84093 801.943.0353 www.geostrata-llc.com

CITY OF NORTH SALT LAKE, UTAH

REVISIONS

REV	DATE	BY	COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME C.104
DESIGNED BY AL
DRAWN BY
CHECKED
APPROVED

UTILITY RECONFIGURATION

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION A

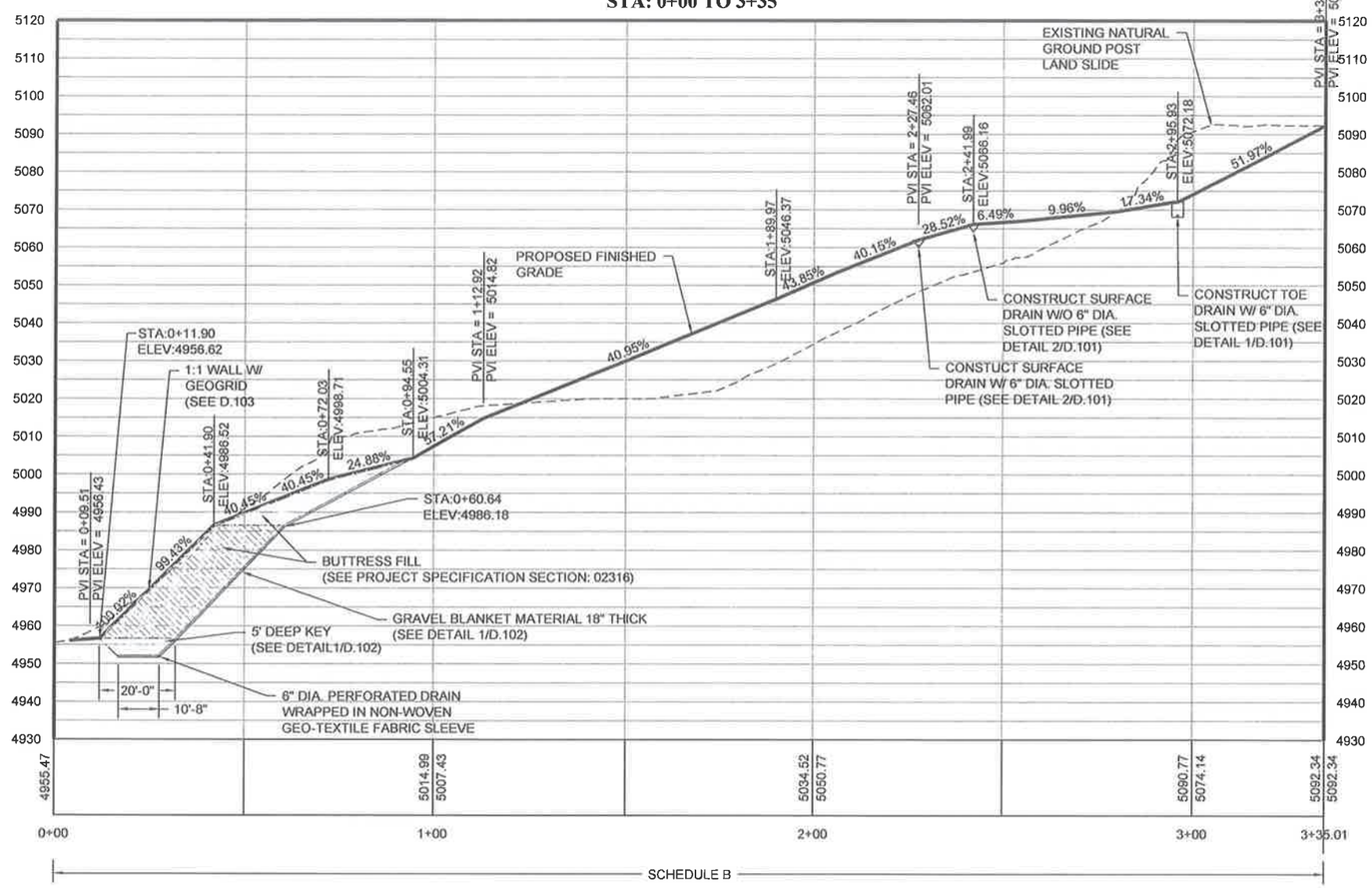
PROJ. # GEO.021

C.104

Z:\PROJECTS (misc)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\C 102 UTILITY RECONFIGURATION.dwg, 2/18/2015 1:35:21 PM, Arnie

WALL 1:1 (1)

STA: 0+00 TO 3+35



PROFESSIONAL ENGINEER
2/18/15
No. 4939903-2202
JAMES J. MILLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 20'
VER: 1" = 20'

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING, INC.
13464 SOUTH 400 EAST
SUITE 100
BUILDING C, UNIT 2
DRAPER, UTAH 84020
PHONE: (801) 572-5941
FAX: (801) 572-0404
3440 SOUTH 1700 WEST
REVERSAL, UT 84403
PHONE: (801) 972-6670
FAX: (801)972-6691

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14618 S. Center Point Way
Bluffdale, Utah 84065
801.561.1041
www.GeoStrataEng.com

NORTH SALT LAKE & HILL CITY

REVISIONS			
REV	DATE	BY	COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: C.301 PROFILE
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

PROFILE WALL 1:1 (1)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ. # GEO.021
C.301

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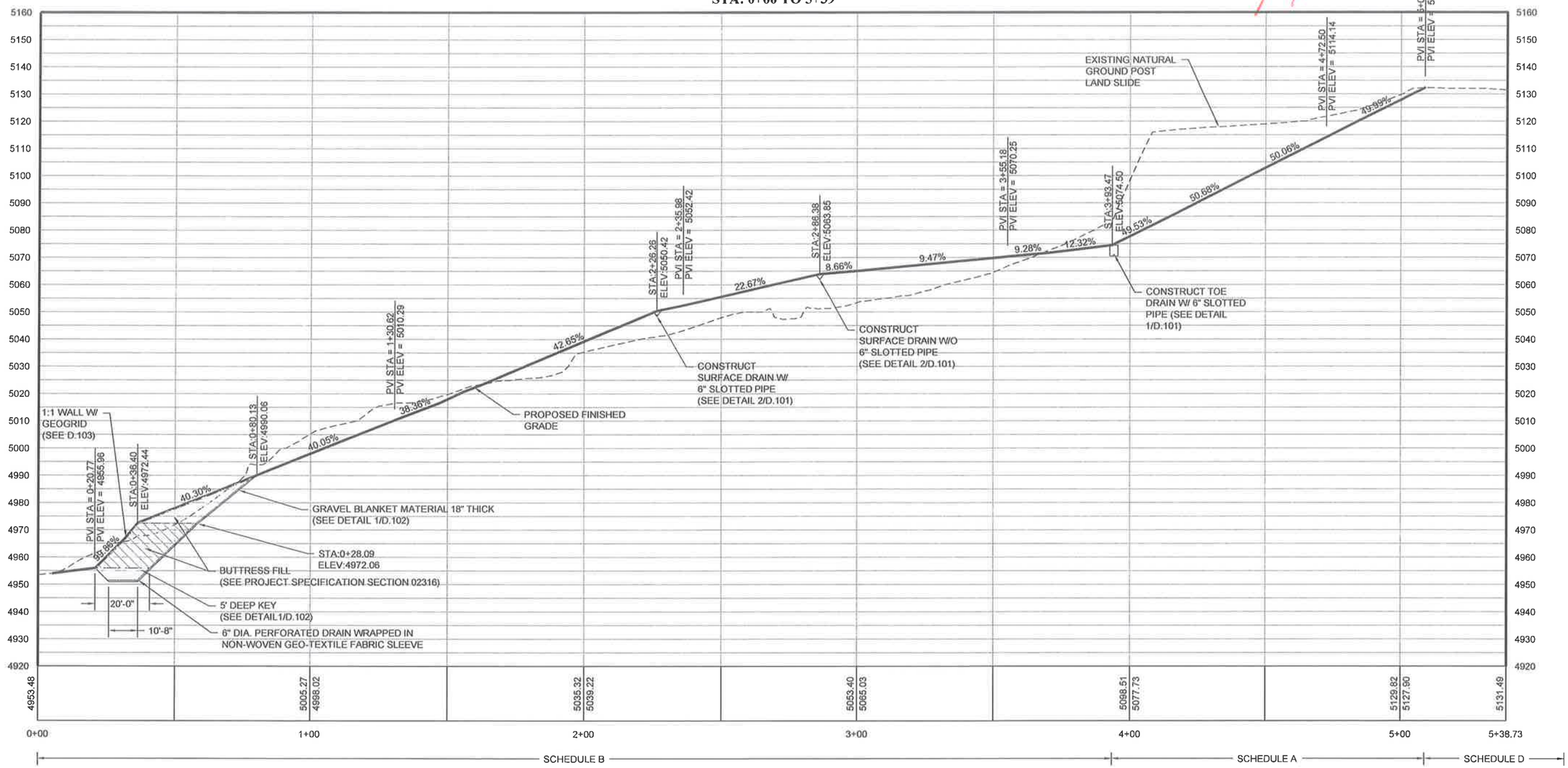
WALL 1:1 (2)

STA: 0+00 TO 5+39



SCALE:
HOR: 1" = 20'
VER: 1" = 20'

PROFESSIONAL ENGINEER
2/18/15
No. 4939508-2202
JAMES J. MILLIGAN
STATE OF UTAH

CONSULTING ENGINEERS AND SURVEYORS
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HURRICANE, UT 84737
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FAX: (801) 773-0841

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5466 S. Corner Point Drive
Murray, Utah 84123
801 261-0523
www.geostrata-llc.com

CITY OF NORTH SALT LAKE UTAH

REV	DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: C.302 PROFILE
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

PROFILE WALL 1:1 (2)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ. # GEO.021
C.302

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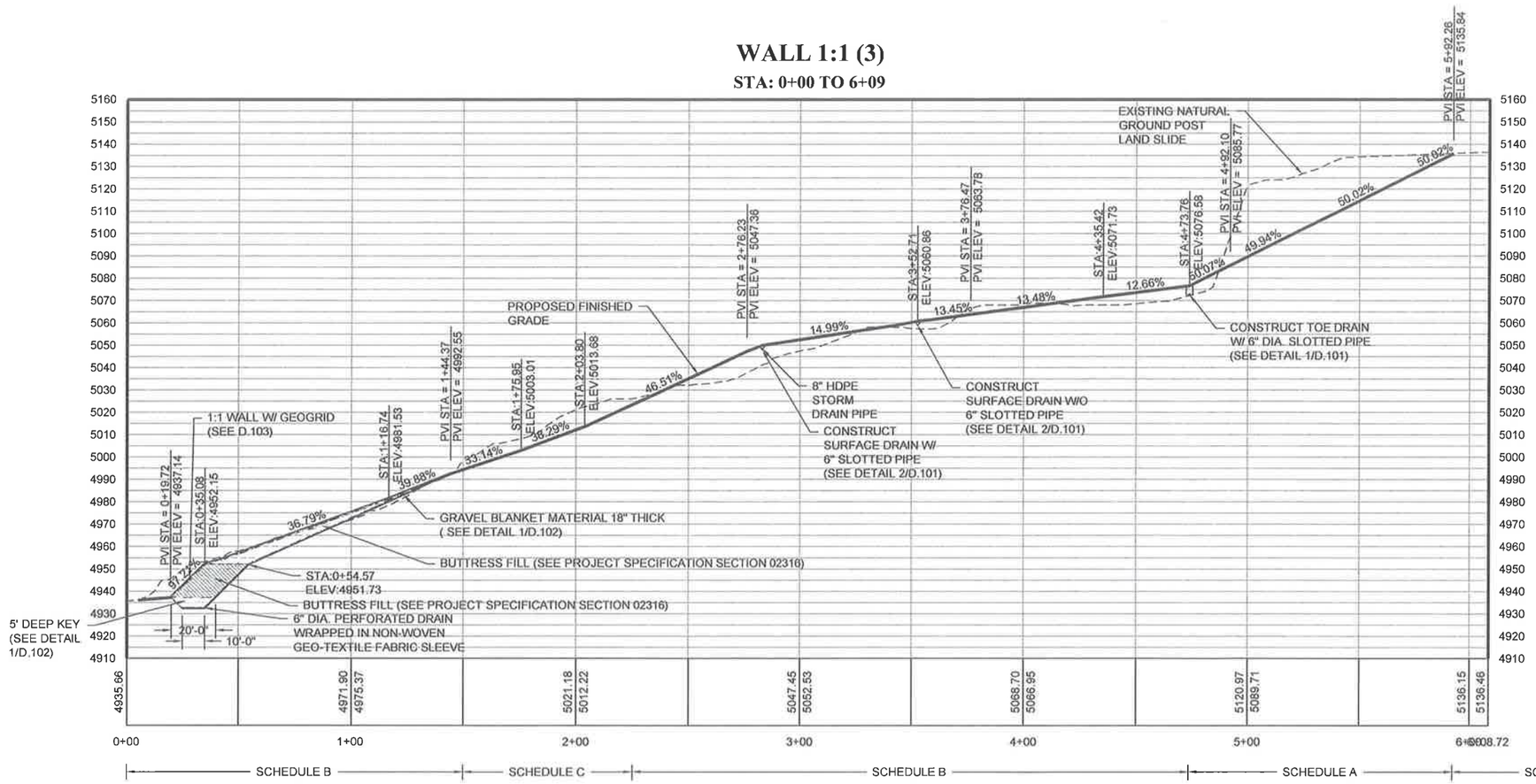
WALL 1:1 (3)

STA: 0+00 TO 6+09



PROFESSIONAL ENGINEER
2/18/15
No. 4939703-2202
JAMES J. MILLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 30'
VER: 1" = 30'

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC
12401 SOUTH 450 EAST DRAPER, UT 84020 PHONE: (801) 571-7474 FAX: (801) 571-1846
3440 SOUTH 1100 WEST WEST VALLEY CITY, UT 84119 PHONE: (801) 972-1191 FAX: (801) 972-0851

GeoStrata Engineering & Geosciences
10653 S. Center Point Way Suite 100 Sandy, UT 84070 801.501.0223 www.geostratagroup.com

NORTH SALT LAKE CITY OF NORTH SALT LAKE UTAH

REVISIONS
REV DATE BY COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME C.303 PROFILE.dwg
DESIGNED/DRAWN BY AL
CHECKED APPROVED

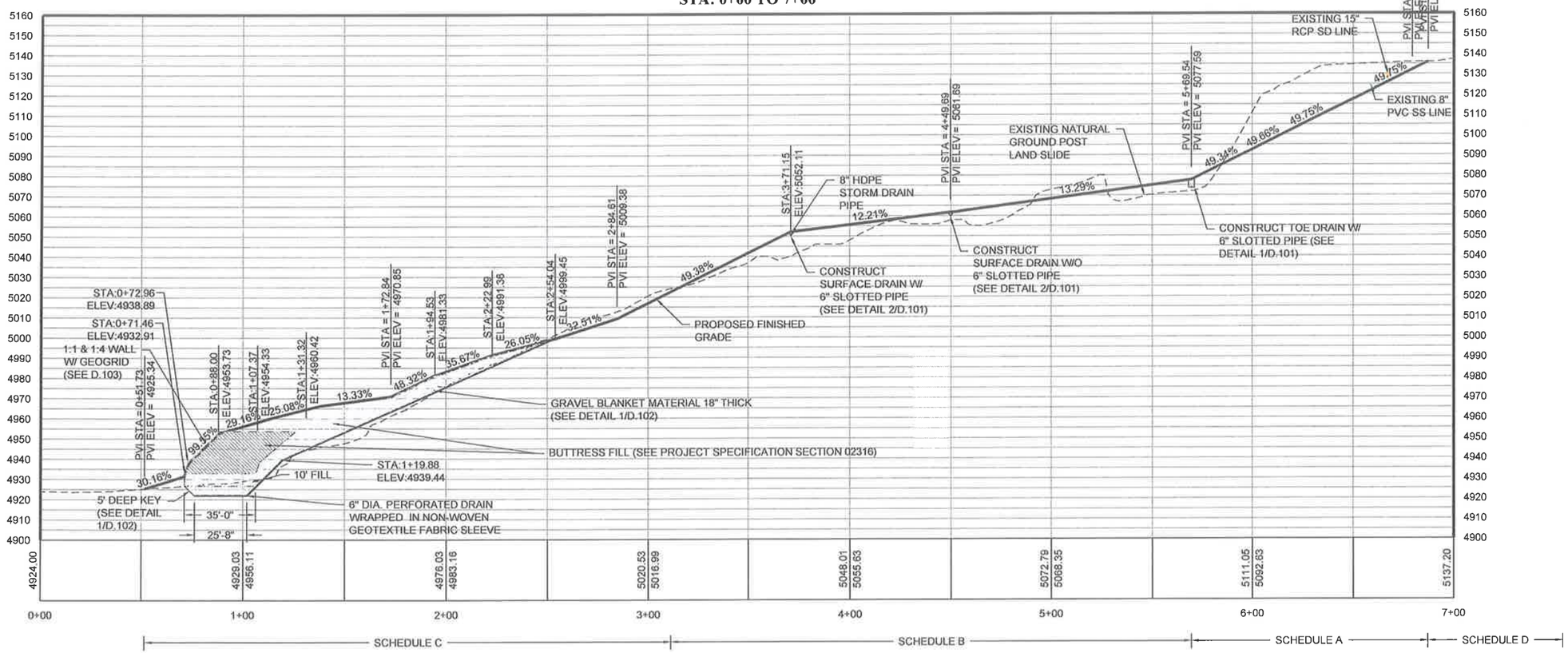
PROFILE WALL 1:1 (3)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ. # GEO.021
C.303

Z:\PROJECTS (misc)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES.dwg, 2/18/2015 1:41:41 PM, Arnie

PARKING LOT (1)

STA: 0+00 TO 7+00



PROFESSIONAL ENGINEER
2/18/15
No. 4939-03-2202
JAMES J. MELLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 30'
VER: 1" = 30'

CONSULTING ENGINEERS AND SURVEYORS

GILSON ENGINEERING INC

GeoStrata Engineering & Geosciences

CITY OF NORTH SALT LAKE

REV	DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME C.304 PROFILE
DESIGNED/DRAWN BY AL
CHECKED
APPROVED

PROFILE PARKING LOT (1)

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A

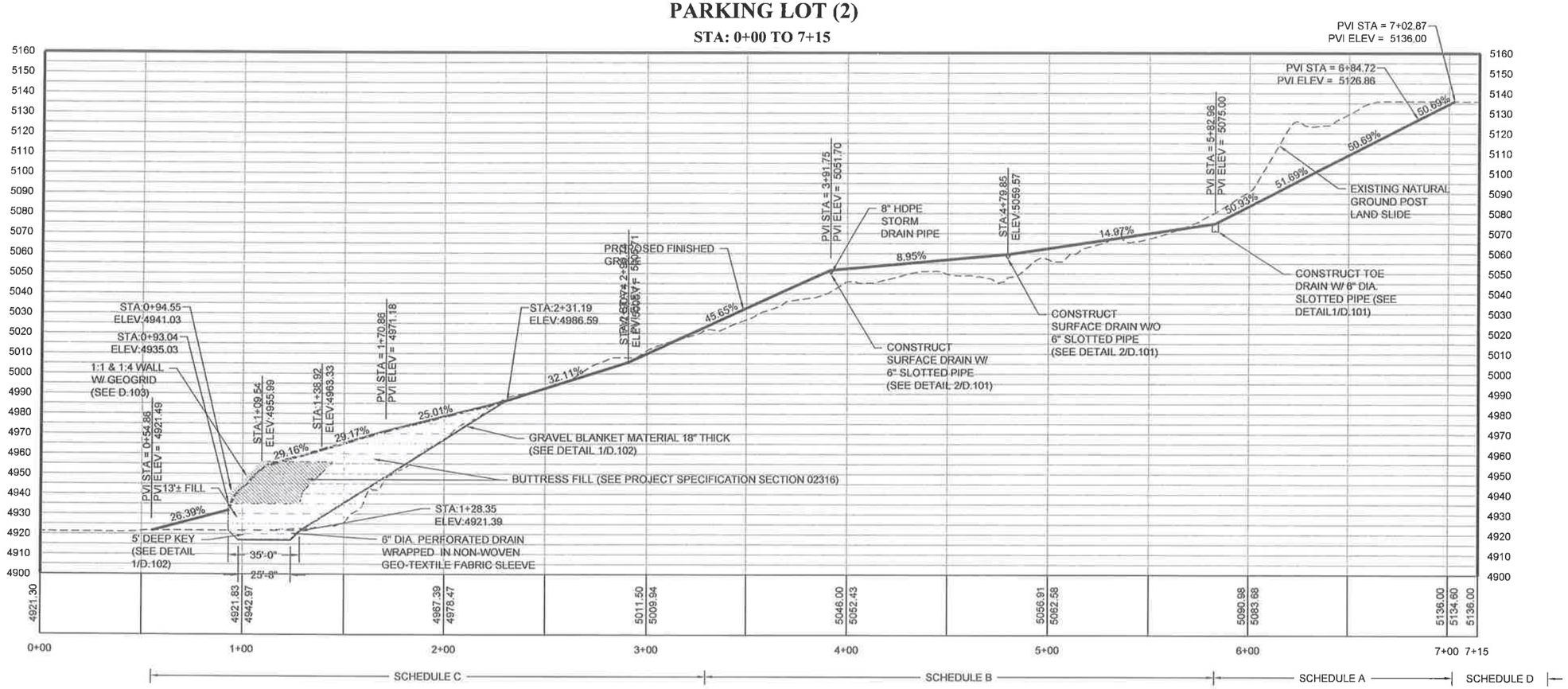
PROJ # GEO.021

C.304

Z:\PROJECTS (misc.)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES.dwg, 2/19/2015 1:42:13 PM, Aimie

PARKING LOT (2)

STA: 0+00 TO 7+15



PROFESSIONAL ENGINEER
2/18/15
No. 4939103-2202
JAMES J. MILLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 30'
VER: 1" = 30'

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC.
13401 SOUTH 400 EAST
DRAPER, UT 84020
PHONE: (801) 571-4844
FAX: (801) 571-4847
1446 SOUTH 1700 WEST
WOODS CROSS, UT 84087
PHONE: (801) 773-7191
FAX: (801) 773-7190

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Engineering & Geosciences
1426 S. Foothill Drive
Salt Lake City, UT 84108
801.585.0553
www.geostrata-llc.com

CITY OF NORTH SALT LAKE, UTAH

REV.	DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST FOR ORIGINAL FORTHAL SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME C.305 PROFILE
DESIGNED/DRAWN BY AL
CHECKED
APPROVED

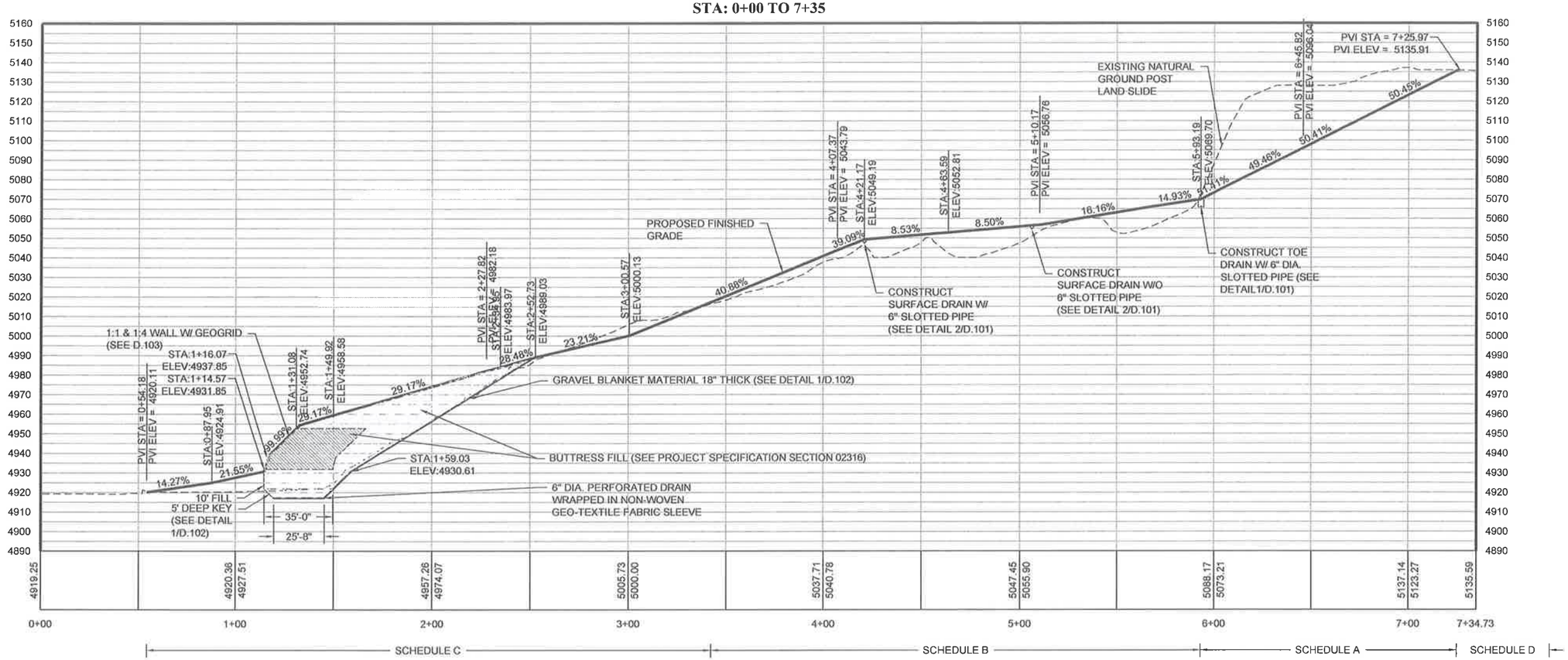
PROFILE PARKING LOT (2)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ. # GEO.021
C.305

Z:\PROJECTS (misc.)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES.dwg, 2/18/2015 1:43:19 PM, Aimie

PARKING LOT (3)

STA: 0+00 TO 7+35



PROFESSIONAL ENGINEER
2/18/15
No. 4939903-2202
JAMES J. MILLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 30'
VER: 1" = 30'

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC
1401 SOUTH 450 EAST
SPANISH FORK, UT 84660
PHONE: (801) 798-0555
FAX: (801) 798-0555
3440 SOUTH 1700 WEST
SALT LAKE CITY, UT 84104
PHONE: (801) 972-1178
FAX: (801) 972-1179
FAX: (801) 972-0080

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Engineering & Geosciences
10653 S. Center Point Pkwy
Suite 100
Sandy, UT 84092
801 561-5555
www.geostrata-llc.com

NORTH SALT LAKE CITY OF UTAH

REV	DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME C.306 PROFILE
DESIGNED/DRAWN BY AL
CHECKED
APPROVED

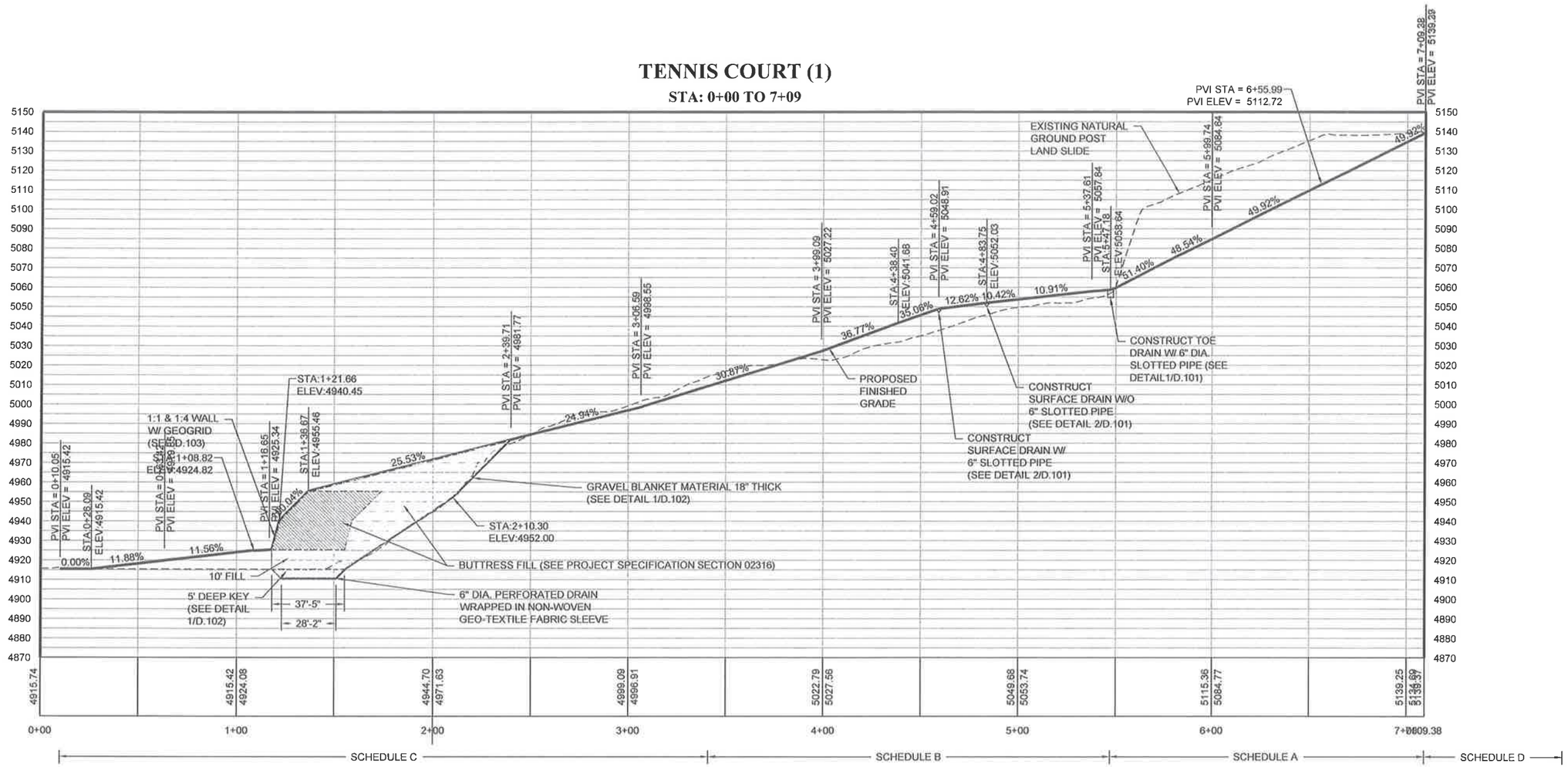
PROFILE PARKING LOT (3)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ # GEO.021
C.306

Z:\PROJECTS (misc)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES.dwg, 2/18/2015 1 43:50 PM, Aimie

TENNIS COURT (1)

STA: 0+00 TO 7+09



SCALE:
HOR: 1" = 30'
VER: 1" = 30'

PROFESSIONAL ENGINEER
2/18/15
No. 4939503-2202
JAMES J. MILLIGAN
STATE OF UTAH

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC.
12905 SOUTH 400 EAST
DRAPER, UT 84020
BUILDING C, UNIT 2
PHONE: (801) 571-7170
FAX: (801) 571-8404
3440 SOUTH 1700 WEST
RIVERDALE, UT. 84405
PHONE: (801) 731-1597
FAX: (801) 731-0291

GeoStrata
Engineering & Geosciences
Vernon A. Gardner, Principal Geologist
Bountiful, Utah 84010
801-824-0263
www.geostrata-ut.com

NORTH SALT LAKE CITY, UTAH

REVISIONS
REV | DATE | BY | COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: PROFILE
DESIGNED/DRAWN BY: AL
CHECKED | APPROVED

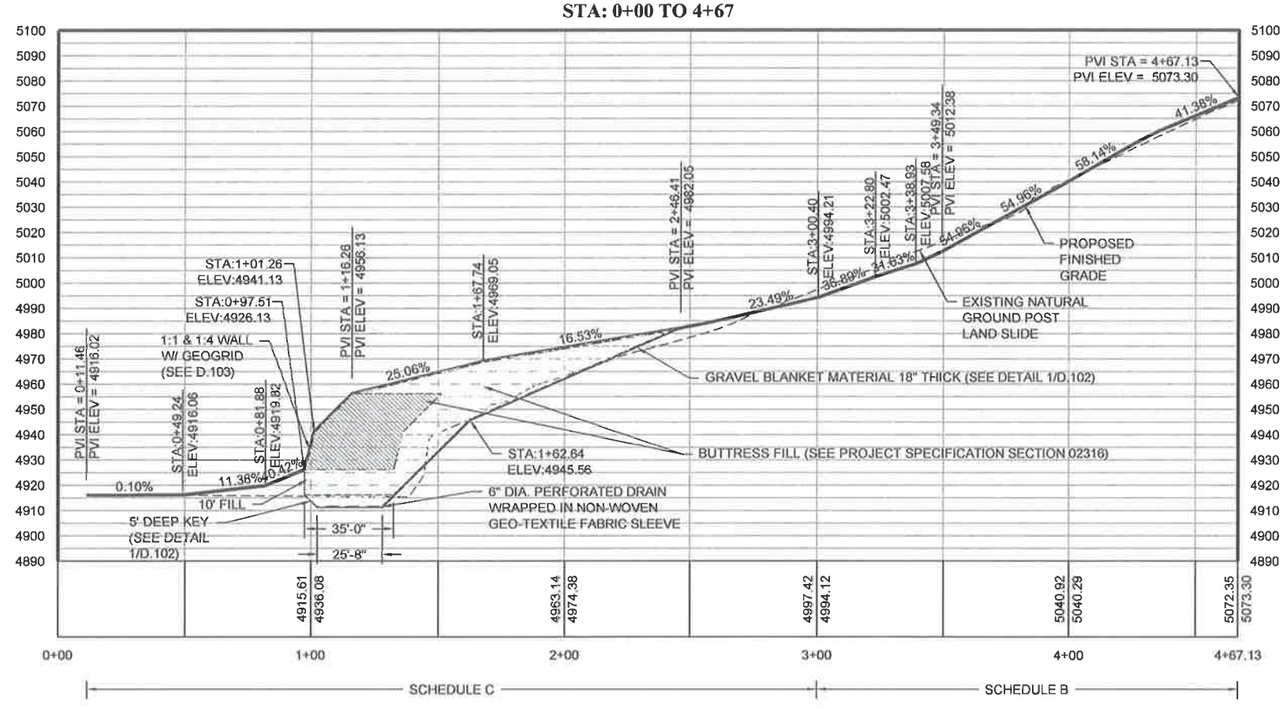
PROFILE TENNIS COURT (1)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ. #: GEO.021
C.307

Z:\PROJECTS (misc.)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES.dwg, 2/18/2015 1 44 20 PM, Aimie

TENNIS COURT (2)

STA: 0+00 TO 4+67



PROFESSIONAL ENGINEER
2/18/15
No. 4939903-2202
JAMES J. MILLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 30'
VER: 1" = 30'

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC
1290 SOUTH 400 EAST
SUITE 100
BOUNDS C. UNITS
PHONE: (801) 373-444
FAX: (801) 373-444
3440 SOUTH 1700 WEST
WEST VALLEY CITY, UT
PHONE: (801) 73-151
FAX: (801)973-0000

GeoStrata
Engineering & Geosciences
1400 S. Center Street (Rte)
Salt Lake City, UT 84115
801 810-0553
www.geostrata-llc.com

CITY OF NORTH SALT LAKE UTAH

REV	DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

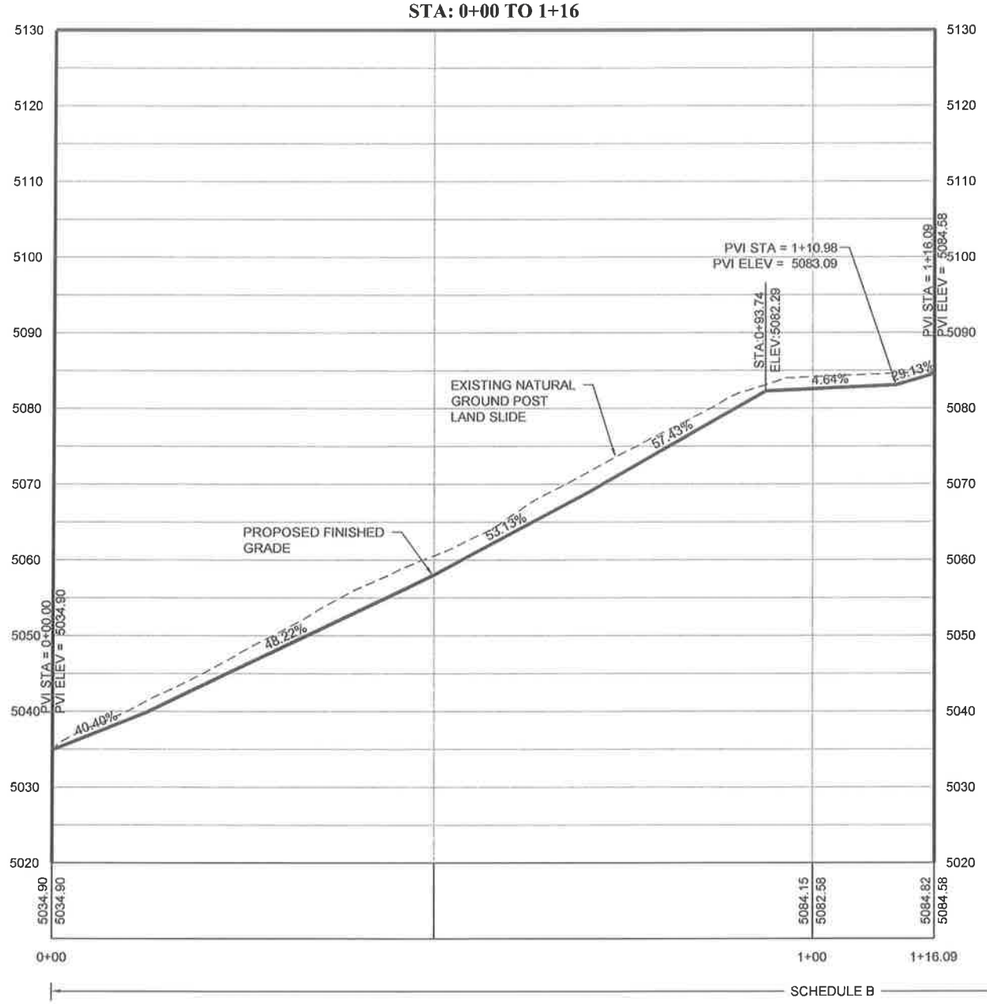
DATE FEBRUARY 2015
DRAWING NAME
E-308
DESIGNED:DRAWN BY:
AL
CHECKED
APPROVED

PROFILE TENNIS COURT (2)
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

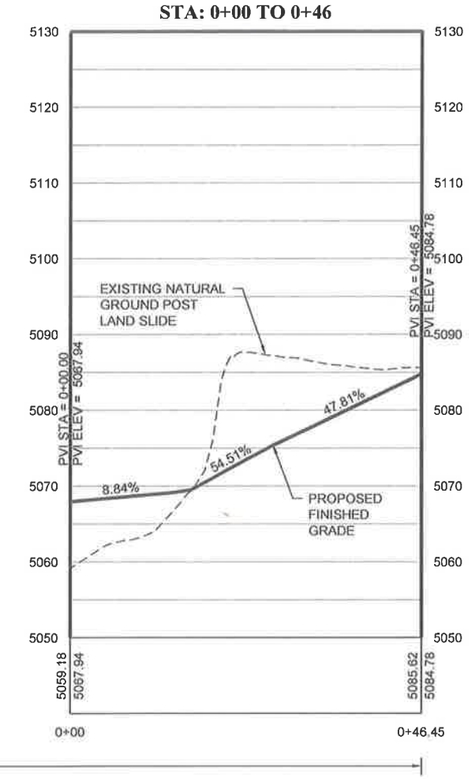
REVISION: A
PROJ. # GEO.021
C.308

Z:\PROJECTS (misc)\GEO 021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES dwg, 2/18/2015 1:45:02 PM, Aimie

EVANS
STA: 0+00 TO 1+16



EVANS 2
STA: 0+00 TO 0+46



NOTE:
PROFILES SHOWN ARE FOR REFERENCE ONLY.
TIE IN POINTS FOR PROPOSED SURFACE TO
EXISTING SURFACE PER PLAN.

PROFESSIONAL ENGINEER
2/18/15
No. 4939903-2202
JAMES J. MILLIGAN
STATE OF UTAH

SCALE:
HOR: 1" = 10'
VER: 1" = 10'

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC
2401 SOUTH 450 EAST
OREM, UT 84058
PHONE: (801) 373-2414
FAX: (801) 373-0048
5640 SOUTH 1700 WEST
WEST HAVEN, UT 84401
PHONE: (801) 773-1773
FAX: (801) 773-0001

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Engineering & Geosciences
1465 N. Curson Avenue Ste
Tempe, AZ 85281
801.840.5553
www.geostrata-llc.com

NORTH SALT LAKE & UTAH CITY COUNTIES
I-15

REVISIONS
REV | DATE | REV COMMENTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: C.309 PROFILE
DESIGNED/DRAWN BY: AJL
CHECKED | APPROVED

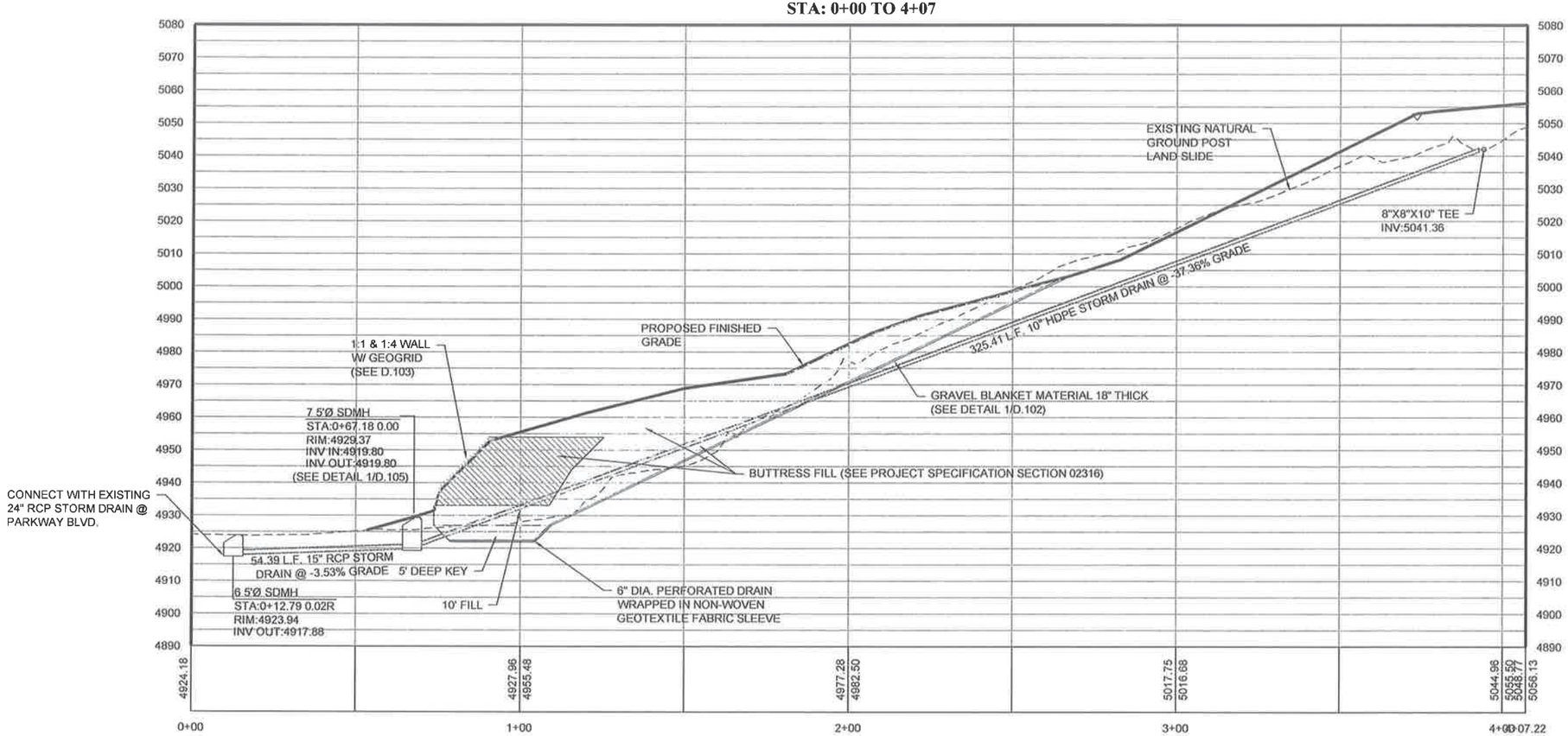
PROFILE EVANS PROPERTY
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ # GEO.021
C.309

Z:\PROJECTS (misc.)\GEO.021 14 NSL LANDSLIDE TOPO\CADD\PLAN SET\PROFILES.dwg, 2/18/2015 1:45:36 PM, Arnie

STORM DRAIN

STA: 0+00 TO 4+07



NOTES:

1. STORM DRAIN TO BE CONSTRUCTED WITH SCHEDULE B
2. SEE SHEET C.304 FOR ADDITIONAL SURFACE PROFILE DETAILS IN AREA OF STORM DRAIN.
3. IF SCHEDULE B IS CONSTRUCTED BEFORE SCHEDULE C CONSTRUCT STORM DRAIN PER PLAN WITH A MINIMUM OF 2-FT OF COVER OVER TOP OF STORM DRAIN PIPE

PROFESSIONAL ENGINEER
2/18/15
No. 4939503-2202
JAMES J. MILLICAN
STATE OF UTAH

SCALE:
HOR: 1" = 20'
VER: 1" = 20'

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CITY OF NORTH SALT LAKE, UTAH

REVISIONS

REV	DATE	BY	COMM'NTS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF-SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: C.310 PROFILE
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

PROFILE STORM DRAIN

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A

PROJ. # GEO.021

C.310

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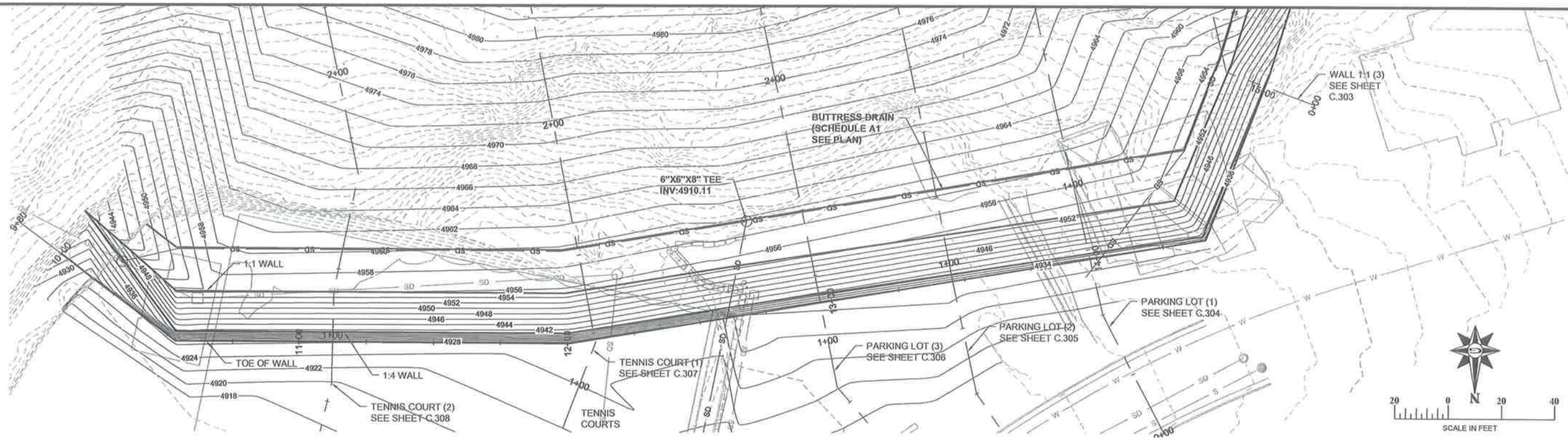
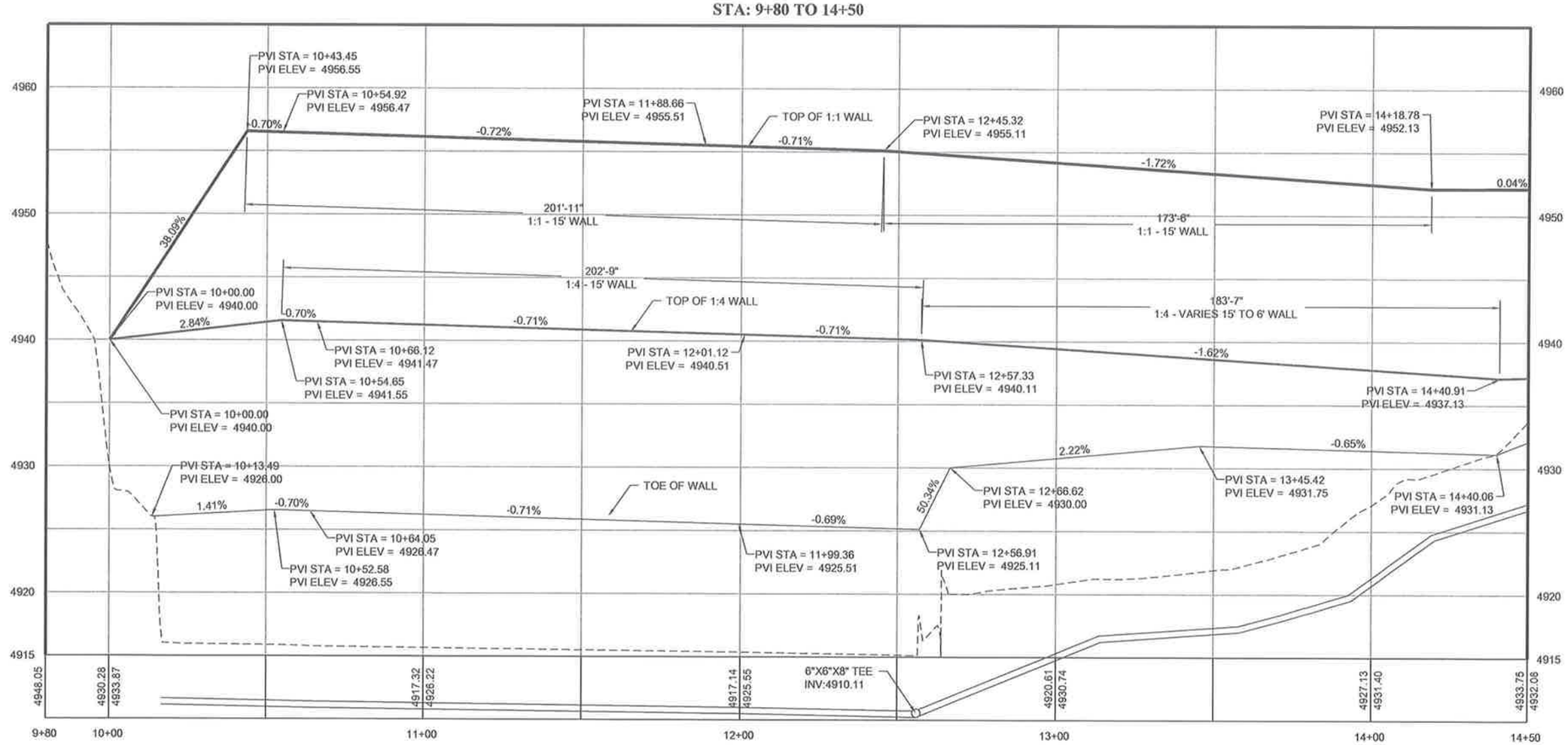


WALL 1

STA: 9+80 TO 14+50



SEE SHEET W.102

SCALE:
HOR: 1" = 20'
VER: 1" = 5'

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No. 4939503-2202
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CITY OF NORTH SALT LAKE UTAH

REVISIONS
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1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY ON HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: WALL WALL
DESIGNED/DRAWN BY: AL
CHECKED | APPROVED

WALL PROFILE STA: 09+80 TO 14+50

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A
PROJ. # GEO.021
W.101

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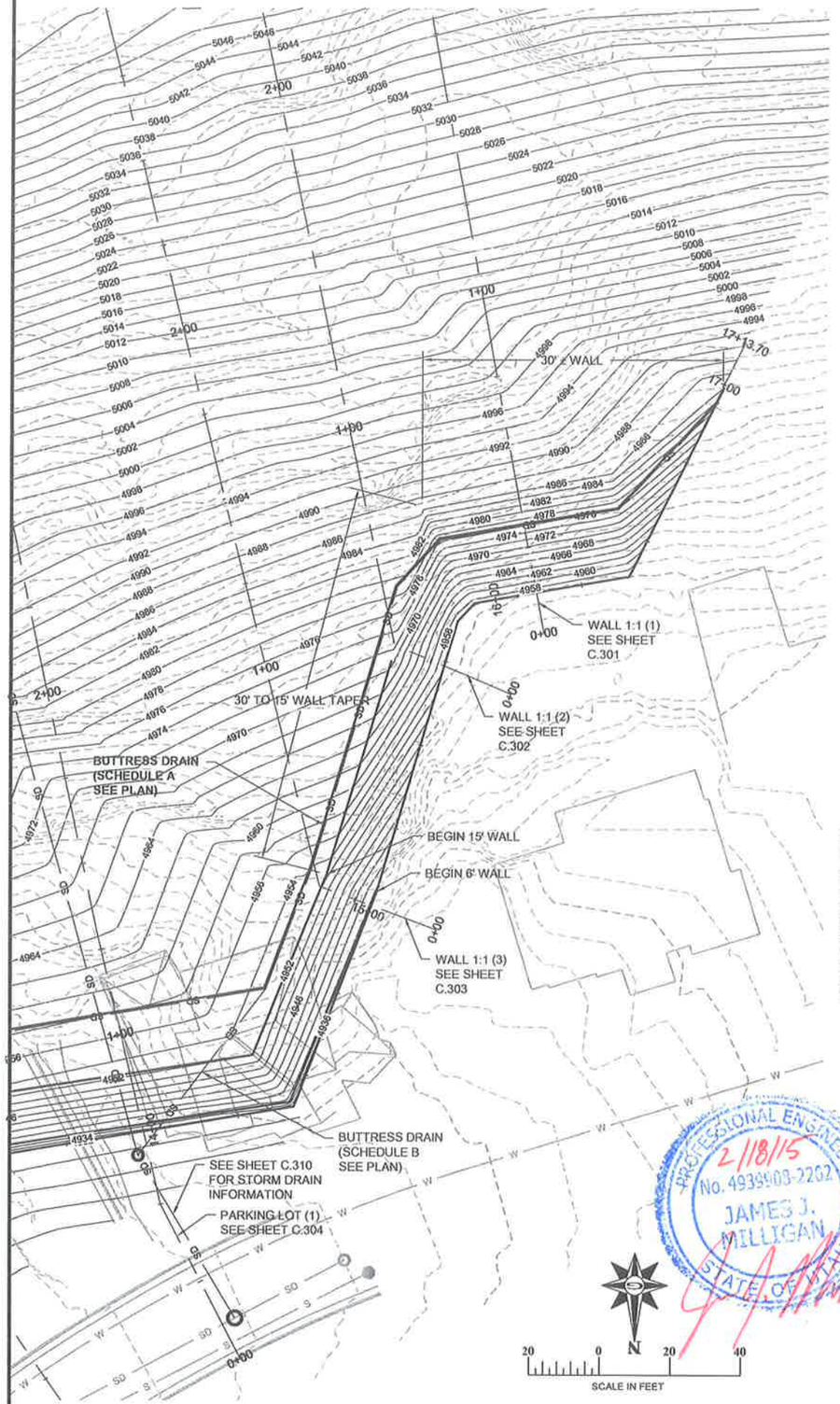
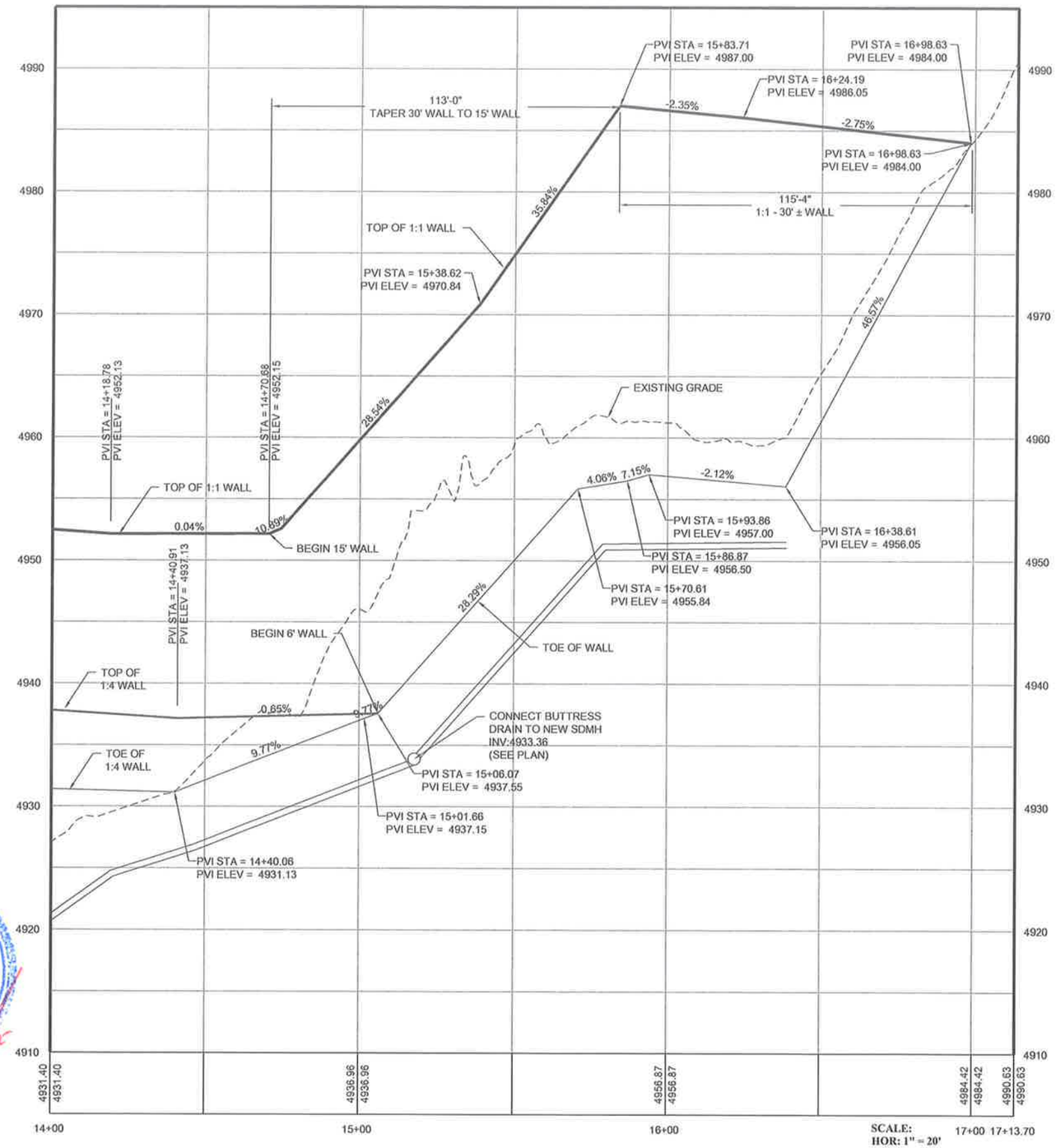


SEE SHEET W.101

WALL 1

STA: 14+00 TO 17+14



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NORTH SALT LAKE CITY
SALT LAKE CITY

REVISIONS

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1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: W.102 WALL
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

WALL PROFILE STA: 14+00 TO 17+14

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

REVISION: A

PROJ. # GEO.021

W.102

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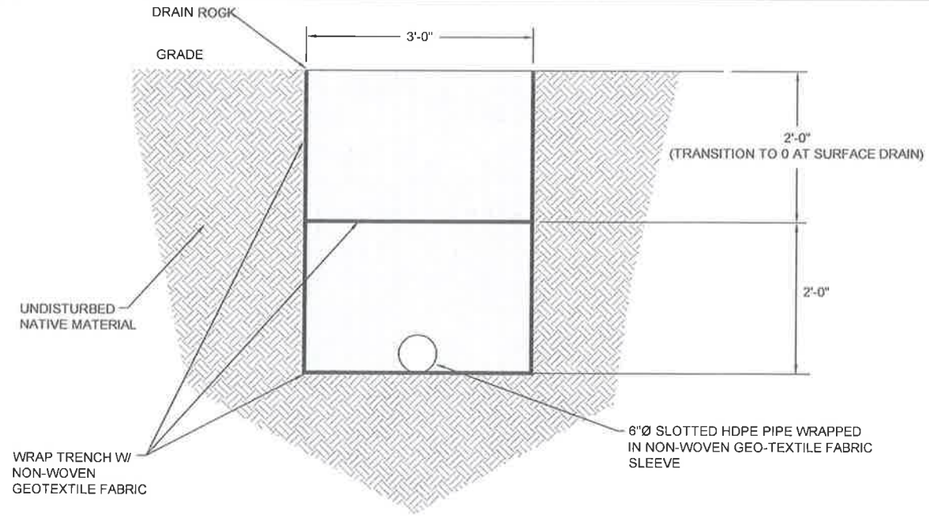
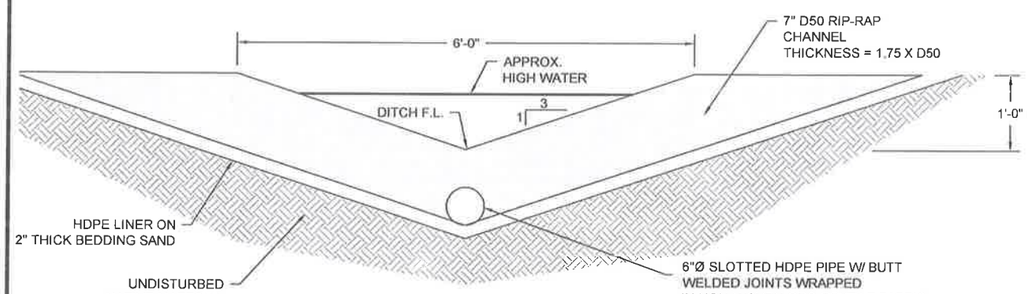
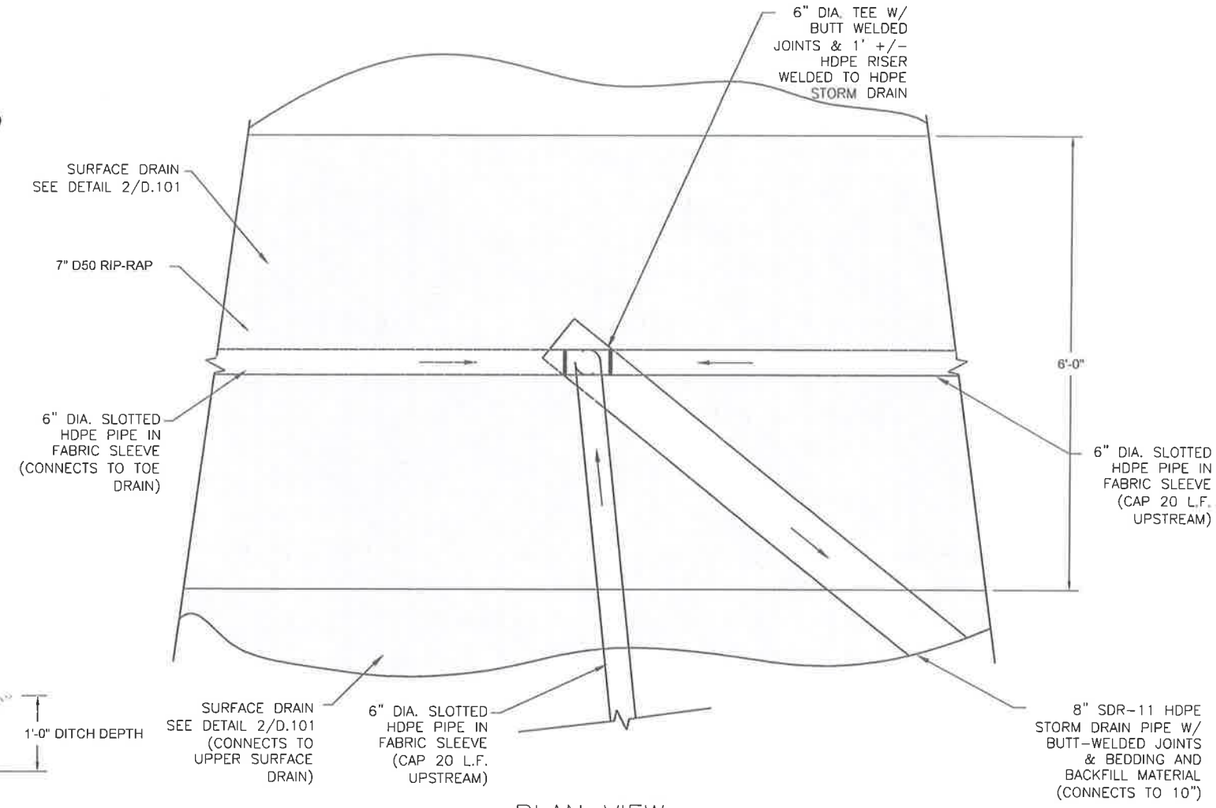


TOE DRAIN (1 / C.103)
SCALE: N.T.S.

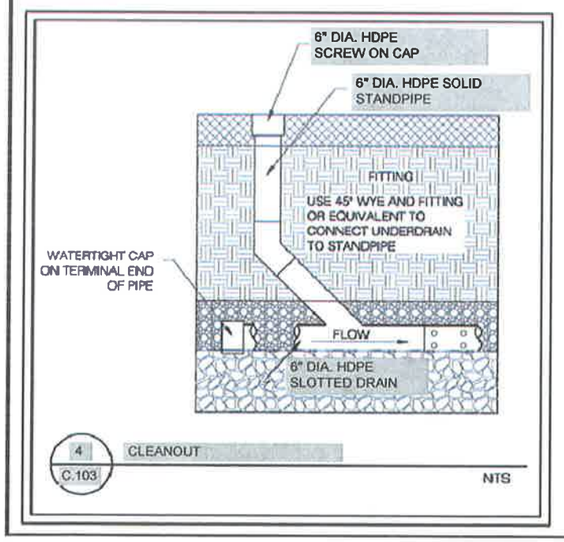


SURFACE DRAIN (2 / C.103)
SCALE: N.T.S.

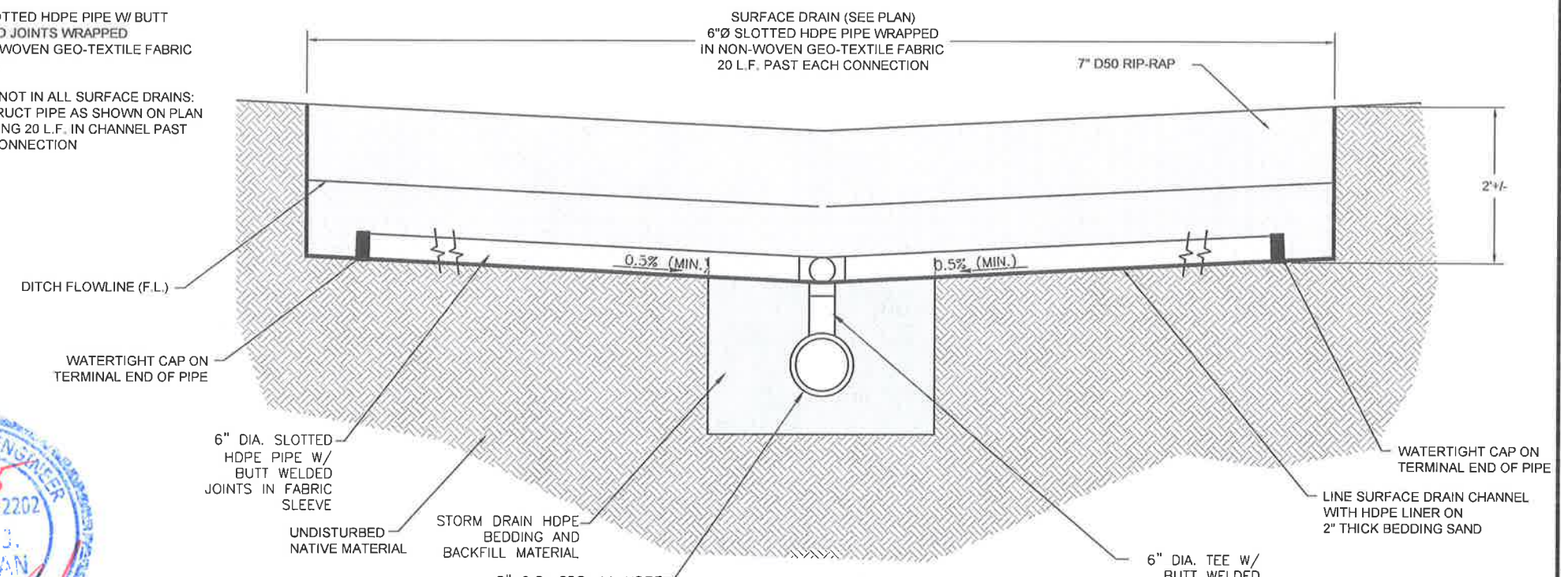
PIPE IS NOT IN ALL SURFACE DRAINS: CONSTRUCT PIPE AS SHOWN ON PLAN INCLUDING 20 L.F. IN CHANNEL PAST EACH CONNECTION



PLAN VIEW



4 / C.103 CLEANOUT
NTS



SECTION VIEW

SURFACE DRAIN TO STORM DRAIN CONNECTION (3 / C.103)
SCALE: N.T.S.

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NORTH SALT LAKE CITY

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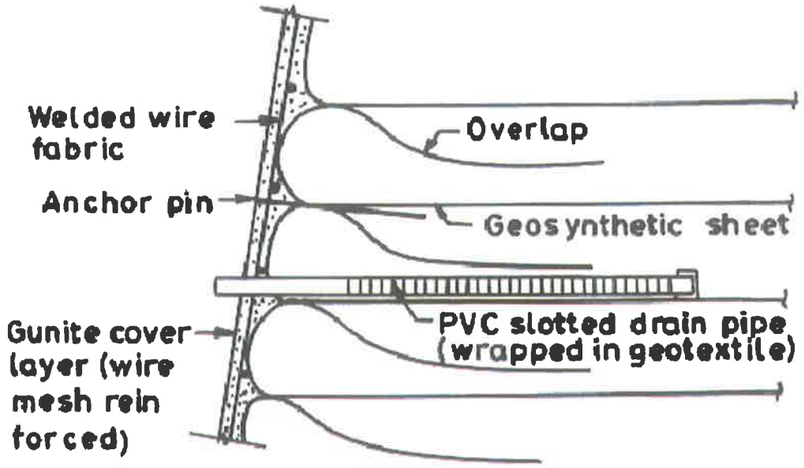
			REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

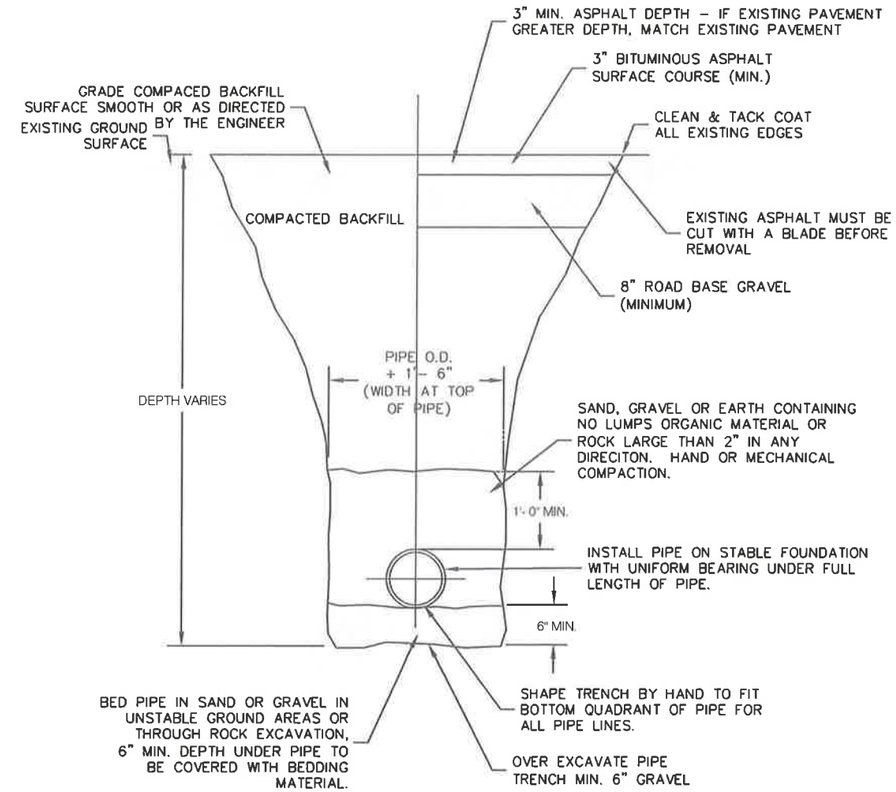
DATE FEBRUARY 2015
DRAWING NAME D.101-DETAILS-SHEET D.101
DESIGNED/DRAWN BY AL
CHECKED
APPROVED

DETAILS
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

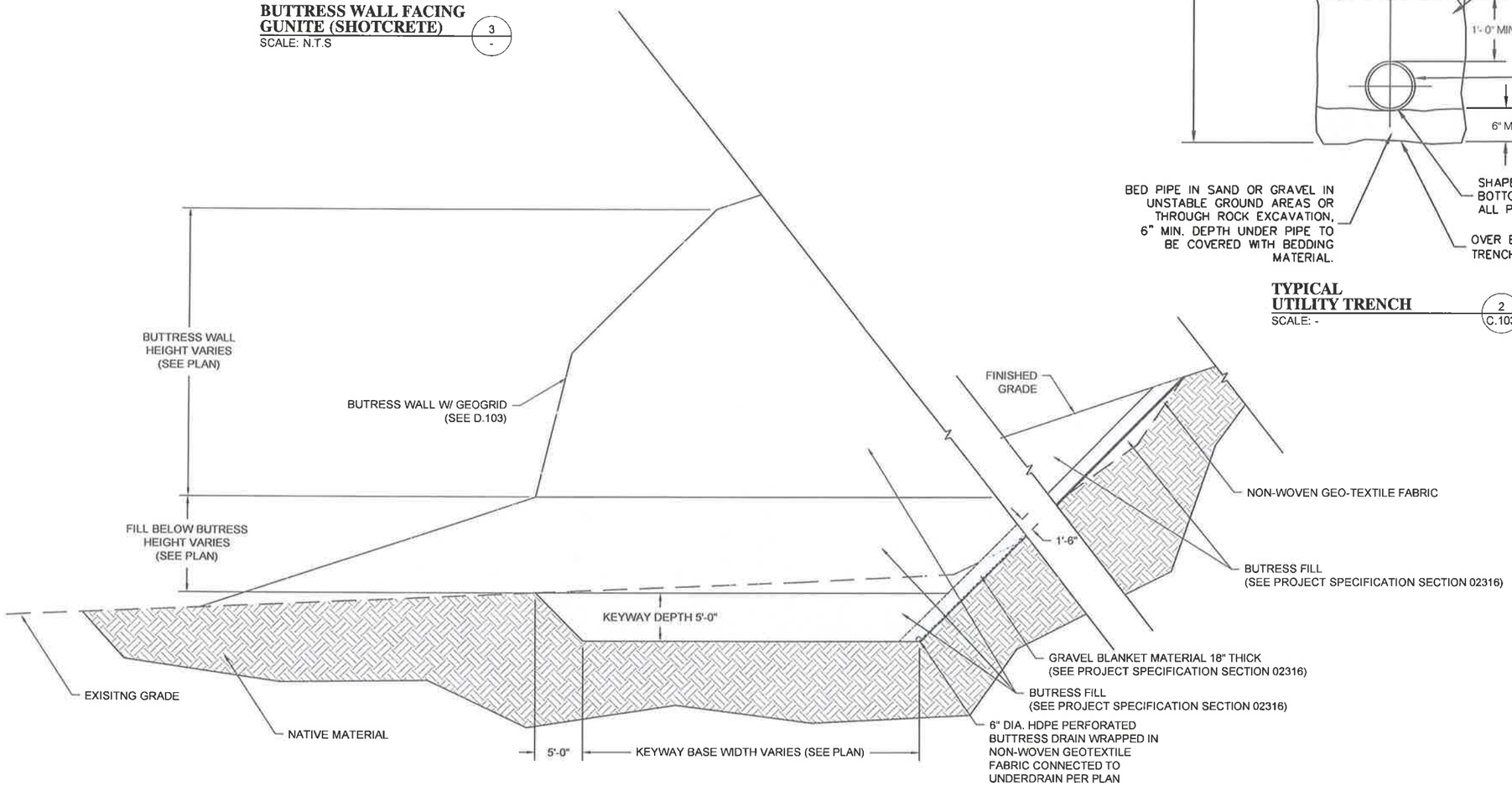
REVISION A
PROJ. # GEO.021
D.101



BUTTRESS WALL FACING GUNITE (SHOTCRETE) 3 / -
SCALE: N.T.S



TYPICAL UTILITY TRENCH 2 / C.103
SCALE: -



BUTTRESS KEYWAY & GRAVEL BLANKET DETAIL 1 / -
SCALE: N.T.S

PROFESSIONAL ENGINEER
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CITY OF NORTH SALT LAKE & SALT LAKE CITY

REV	DATE	BY	COMMENTS

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1" SCALE MEASURES 1" ON FULL SIZE SHEETS
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DATE FEBRUARY 2015
DRAWING NAME D.102 CAD PLANSET 2.1.10
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DETAILS

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

NORTH SALT LAKE, UTAH

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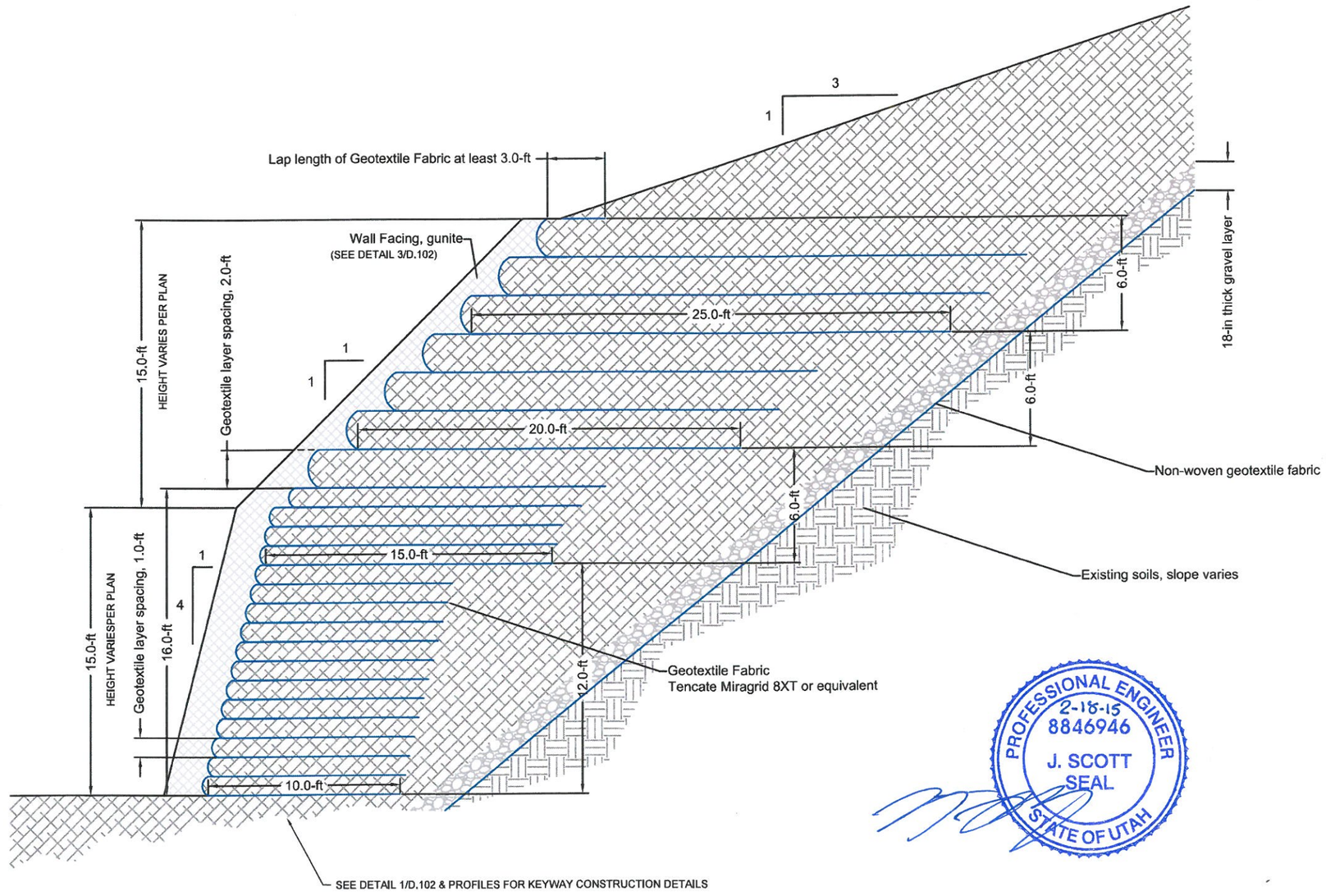
PROJ. # GEO.021
D.102



PROFESSIONAL ENGINEER
2-18-15
8846946
J. SCOTT
SEAL
STATE OF UTAH

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North Salt Lake City
North Salt Lake Landslide
North Salt Lake, UT
Project Number: 920-004

BUTTRESS RETAINING WALL (1)
SCALE: N.T.S

Plate
1

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NORTH SALT LAKE CITY & HERITAGE

REVISIONS
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1" SCALE MEASURES 1" ON FULL SIZE SHEETS
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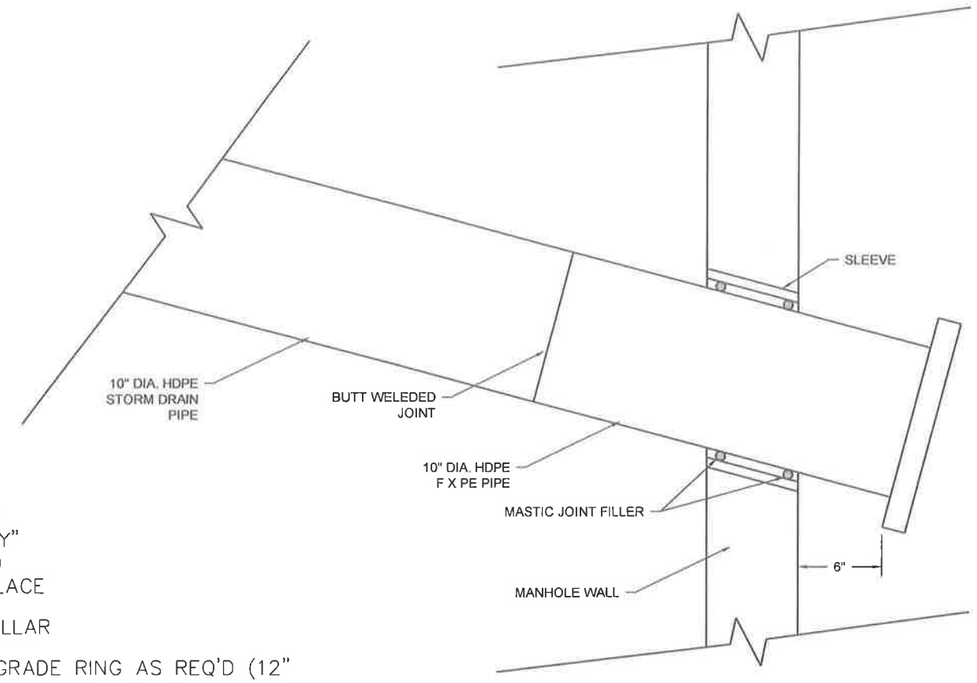
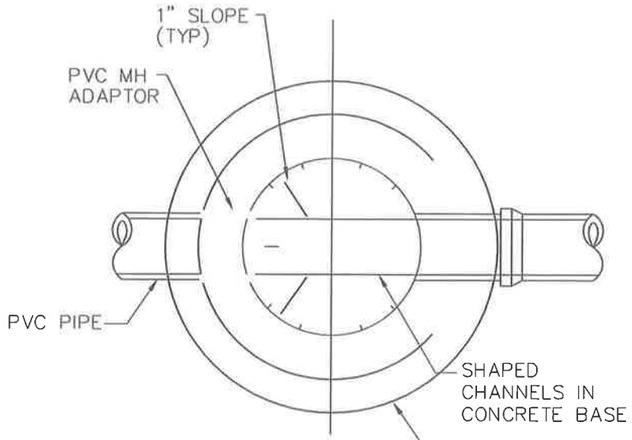
CHECKED: | APPROVED:

DETAILS
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

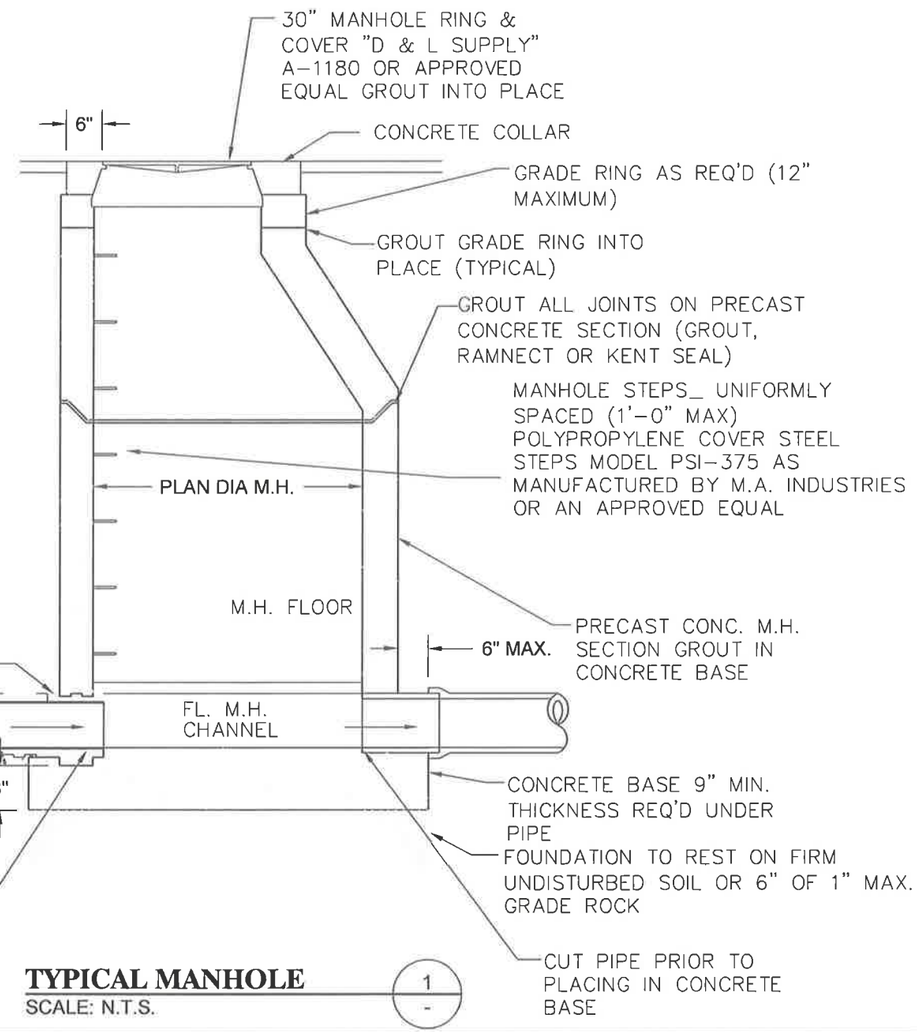
REVISION: A
PROJ. # GEO.021
D.103



HDPE PIPE TO MANHOLE CONNECTION DETAIL (2 / -)
SCALE: N.T.S



PLAN



TYPICAL MANHOLE (1 / -)
SCALE: N.T.S.

NOTE:
RUBBER BOOT JOINTS WITH STAINLESSSTEEL CONNECTION BAND IS ACCEPTABLE SUBSTITUTES FOR STANDARD JOINTS SHOWN

PROFESSIONAL ENGINEER
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CITY OF NORTH SALT LAKE UTAH

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IF SCALE MEASURES 1" ON FULL SIZE SHEETS ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
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DETAILS
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: A
PROJ. # GEO.021
D.104

LEGEND

- -BMP SILT FENCE ER.02
- -BMP INSPECTIOIN AND MAINTENANCE, BMP STABILIZED CONSTRUCTION ENTRANCE AND WASH AREA ER.01-ER.02
- -TOPSOIL STOCKPILE AREA (OR AS DIRECTED BY OWNER) BMP EARTH BERM BARRIER ER.01
- -BMP MATERIALS STORAGE, BMP VEHICLE AND EQUIPMENT FUELING, BMP CONCRETE WASTE MANAGEMENT, BMP PORTABLE TOILETS, BMP EARTH BERM BARRIER ER.01-ER.02
- -BMP DUST CONTROLS, BMP GRADING PRACTICES, BMP CONTAMINATED OR ERODIBLE SURFACE AREAS, REPOSITORY STOCKPILE AREA (OR AS DIRECTED BY OWNER), BMP EARTH BERM BARRIER ER.01-ER.02
- -BMP INLET PROTECTION

CONTRACTOR
AND APPROVED THE STORMWATER PROTECTION PLAN ITEMS CONTAINED HEREIN AND WILL COMPLY WITH IT'S PROVISIONS.

CONTRACTOR'S REPRESENTATIVE

NOTE: SIGNED COPIES OF THIS PLAN AND STATE NOI SHALL BE KEPT ON SITE AT ALL TIMES.

EROSION CONTROL NOTES

1. AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING EROSION DUE TO WIND AND RUNOFF. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING THE EROSION CONTROL FACILITIES SHOWN ON THE PLAN.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING DRAINAGE AND EROSION CONTROL FACILITIES AS REQUIRED. STREETS SHALL BE KEPT CLEAN OF DEBRIS FROM TRAFFIC FROM THE SITE.

3. CONTRACTOR SHALL USE VEHICLE TRACKING CONTROL AT ALL LOCATIONS WHERE VEHICLES WILL ENTER OR EXIT THE SITE. CONTROL FACILITIES WILL BE MAINTAINED WHILE CONSTRUCTION IS IN PROGRESS, MOVED WHEN NECESSARY, AND REMOVED WHEN THE SITE IS PAVED.

4.STORM DRAIN INLET PROTECTION DEVICES SHALL BE INSTALLED IMMEDIATELY UPON INDIVIDUAL INLETS BECOMING FUNCTIONAL.

5. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL OBTAIN A COPY OF THE STORM WATER MANAGEMENT PLAN AND THE STATE OF UTAH DISCHARGE PERMIT SYSTEM. GENERAL PERMIT FOR "STORM DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY" AND BECOME FAMILIAR WITH THEIR CONTENT.

6. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, ETC.) SHALL BE DISPOSED IN A MANNER THAT PREVENTS CONTACT WITH STORM WATER DISCHARGES FROM THE SITE.

7. FUGITIVE DUST AREAS SHALL BE CONTROLLED BY SPRAYING WATER ON THE DRY AREAS OF THE SITE. CONTRACTOR SHALL SUPPLY THE CITY WITH A DUST CONTROL PLAN AT THE TIME OF THE PRE-CONTSTRUCTION MEETING.

8. NO RUBBISH, TRASH, GARBAGE OR OTHER SUCH MATERIALS SHALL BE DISCHARGED INTO DRAINAGE DITCHES OR WATERS OF THE STATE.

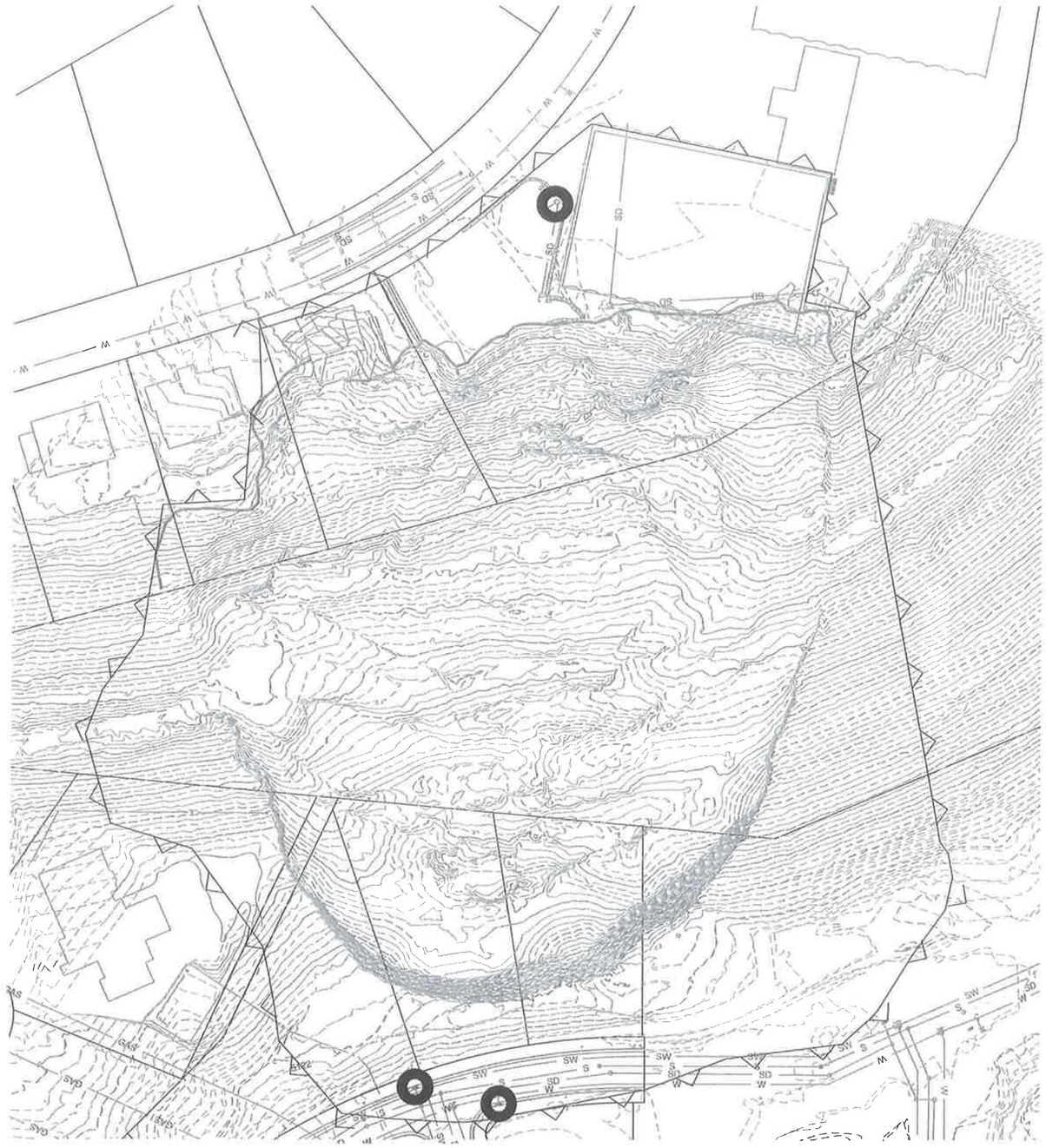
9. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, STRAW BALES, ETC.) DUE TO GRADE CHANGES OR OTHER UNFORESEEN CONDITIONS DURING DEVELOPMENT OF THE PROJECT.

11. ALL INLETS SHALL HAVE TEMPORARY INLET CONTROL.

12. TEMPORARY SANITATION FACILITIES ARE REQUIRED.

13. CONTRACTOR SHALL COORDINATE WITH PUBLIC WORKS INSPECTOR ON ALL REQUESTS TO MODIFY OR MAKE CHANGES TO SWPPP/EROSION CONTROL PLAN.



NOTES

1 - ALL PROPOSED AND EXISTING INLETS ARE TO BE PROTECTED. SEE BMP INLET PROTECTION C.55, BMP CATCH BASIN CLEANING, BMP INSPECTION AND MAINTENANCE FOR INLET PROTECTION DETAILS.

2 - EXISTING GROUND COVER = 50% SEE BMP PRESERVATION OF EXISTING VEGETATION.

3 - SEQUENCE OF CONSTRUCTION

PHASE I

1. INSTALL STABILIZED CONSTRUCTION ENTRANCES.
2. CONSTRUCT SILT FENCES ON THE SITE.
3. CONSTRUCT SEDIMENTATION PONDS WHERE NEEDED PER DISCRETION OF CONTRACTOR.
   SIZE TO BE DETERMINED BY ENGINEER.
4. HALT ALL ACTIVITIES AND CONTACT CIVIL ENGINEERING CONSULTANT TO PERFORM INSPECTION OF BMP'S. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND DISTURBING CONTRACTORS BEFORE PRECEDING WITH CONSTRUCTION.
5. PREPARE TEMPORARY PARKING AND STORAGE AREAS.
6. START CONSTRUCTION OF BUILDING PAD AND STRUCTURES. STORM DRAIN WATER DURING CONSTRUCTION WILL BE LOCATED IN RETENTION POND.
7. BEGIN GRADING THE SITE.

PHASE II

1. MAINTAIN SILT FENCE, INLET PROTECTION AND STABILIZED CONSTRUCTION EXITS INSTALLED DURING PHASE #1
2. COMPLETE PERMANENT DETENTION POND CONSTRUCTION.
3. BEGIN CONSTRUCTION OF UNDERGROUND UTILITIES.
4. INSTALL INLET PROTECTION AT NEW STORM DRAIN INLETS, AS INSTALLED.
8. INSTALL PERMANENT VEGETATION AND PLANT MATERIALS.
9. REMOVE ALL TEMPORARY EROSION & SEDIMENTATION CONTROL DEVICES (ONLY AFTER FINAL STABILIZATION HAS BEEN ACHIEVED).

4 - DETAILS AND BMP'S ON DRAWINGS C.54-C.56 ARE INCORPORATED INTO THIS PLAN BY REFERENCE.

LAND DISTURBANCE NOTES

1. CONTRACTOR SHOULD PERFORM EARTHWORK IN ACCORDANCE WITH THE NORTH SALT LAKE CITY LAND DISTURBANCE ORDINANCE, THE CITY'S STANDARD SPECIFICATIONS, NORTH SALT LAKE CITY LAND DISTURBANCE DESIGN AND CONSTRUCTION STANDARDS, EROSION, SEDIMENT, REVEGETATION REQUIREMENTS, AND THE DUST CONTROL PLANS REQUIRED BY THE STATE OF UTAH, DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF AIR QUALITY.

2. THE CONTRACTOR WILL PERFORM EARTHWORK IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS OUTLINED IN THE LAND DISTURBANCE DESIGN AND CONSTRUCTION STANDARDS AND THE RECOMMENDED EARTHWORK SPECIFICATIONS FOUND IN THE REPORT OF GEOTECHNICAL ENGINEER, AND THE GEOTECHNICAL INVESTIGATION LOCATED IN THE PROJECT TECHNICAL SPECIFICATION. IN THE EVENT THERE IS A CONFLICT BETWEEN THE DOCUMENTS MENTIONED HEREIN AND NORTH SALT LAKE CITY'S EROSION AND SEDIMENT CONTROL REQUIREMENTS OR THE DUST CONTROL PLAN AS REQUIRED BY THE STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF AIR QUALITY, NORTH SALT LAKE CITY'S REQUIREMENTS AND THE STATE REQUIREMENTS WILL CONTROL.

3. THE SEQUENCE OF CONSTRUCTION IS TO BE FOLLOWED.

4. SEDIMENTATION BMPS SHOWN ON THE EROSION CONTROL AND SEDIMENT CONTROL PLANS TO BE INSTALLED WITHIN THE SAME WORKING DAY THE LAND DISTURBANCE OCCURS.

5. DUST CONTROL BMPS ARE TO BE ON SITE AND IMPLEMENTED AS SOON AS LAND DISTURBANCE OCCURS. THE DUST CONTROL AS REQUIRED BY THE STATE OF UTAH AIR QUALITY PLAN IS TO BE SUBMITTED WITH THE GRADING PLAN. THE DEVELOPER IS RESPONSIBLE FOR CONTROLLING THE DUST PRODUCTED AT HIS PROJECT AND SHALL PROVIDE THE NECESSARY MITIGATION TO KEEP THE DUST TO THE ACCEPTABLE LIMITS IDENTIFIED IN THE AIR QUALITY PERMIT OBTAINED FOR THE STATE OF UTAH, DEPARTMENT OF ENVIORONMENTAL QUALITY, AND DIVISION OF AIR QUALITY.

6. ALL AREAS TO BE REVEGETATED ARE TO RECEIVE REVEGETATION BMPS WITHIN 21 DAYS OF DISTURBANCE.

7. IF THE EXISTING GRADE IS DIFFERENT FROM WHAT IS SHOWN ON THIS GRADING PLAN, STOP WORK AND CONTACT THE TOWN OF VINEYARD, ENGINEERING DEPARTMENT. WORK IS TO REMAIN STOPPED UNTIL THE TOWN'S ENGINEERING DEPARTMENT PROVIDES A WRITTEN NOTICE TO RESUME WORK.

8. THE PROJECT OWNER IS RESPONSIBLE FOR MAINTAINING THE STREETS, STORM DRAINS, AND CHANNELS, DITCHES AND SWALES FREE FROM DEBRIS, SOIL, MUD, OR OTHER MATERIAL THAT WOULD CAUSE A PUBLIC SAFETY CONCERN, VIOLATE THE TOWN'S UPDES PERMIT, STATE OR FEDERAL LAWS, OR PREVENT THE FACILITY FROM OPERATING.

9. ALL CONCRETE TRUCKS ARE TO USE THE DESIGNATED WASHOUT AREA(S). FAILURE TO COMPLY WILL RESULT IN A WORK STOP AND THE OFFENDER COULD BE GUILTY OF A CLASS C MISDEMEANOR.

10. L.O.D. BARRIERS ARE TO BE IN PLACE AND MAINTAINED UNTIL WRITTEN NOTIFICATION IS RECEIVED FROM THE ENGINEERING DEPARTMENT. THE OWNER IS RESPONSIBLE FOR MAINTAINING L.O.D. BARRIERS.

11. IF DISTURBANCE OCCURS OUTSIDE THE L.O.D. WORK WILL STOP AND REMAIN STOPPED UNTIL THE WRITTEN RESPONSE IS RECEIVED FROM THE TOWN.

12. THE OWNER IS TO BE RESPONSIBLE FOR ADDITIONAL GRADING INFORMATION AS REQUIRED THROUGHOUT THE REMAINDER OF THE PROJECT.

13. SILT FENCES TO BE INSTALLED AT ALL DOWN GRADE SLOPES AND SHALL BE REQUIRED ON PHASE LINE FOR NON-CONCURRENT CONSTRUCTION.

14. ADDITIONAL CONSTRUCTION ENTRANCES SHALL BE REQUIRED ON PHASE LINE FOR NON-CONCURRENT CONSTRUCTION.

PROFESSIONAL ENGINEER
2/18/15
No. 4939503-2202
JAMES J. MELLIGAN
STATE OF UTAH

N

60 0 60 120
SCALE IN FEET

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SALT LAKE CITY CORPORATION

REV	DATE	BY	COMMENTS

REVISIONS

1" SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE FEBRUARY 2015
DRAWING NAME ER.101 SWPPP
DESIGNED/DRAWN BY AL
CHECKED
APPROVED

SWPPP

NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT

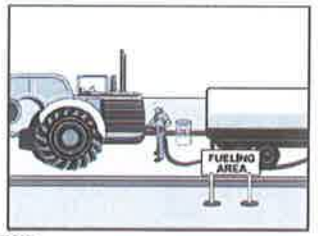
NORTH SALT LAKE, UTAH

REVISION: A

PROJ. # GEO.021

ER.101

BMP: VEHICLE AND EQUIPMENT FUELING



OBJECTIVES
■ HOUSEKEEPING PRACTICES
□ CONTAIN WASTE
□ MINIMIZE DISTURBED AREAS
□ STABILIZE DISTURBED AREAS
□ PROTECT SLOPE/CHANNELS
□ CONTROL SITE PERIMETER
□ CONTROL INTERNAL EROSION

DESCRIPTION:
PREVENT FUEL SPILLS AND LEAKS, AND REDUCE THEIR IMPACTS TO STORM WATER BY USING OFF-SITE FACILITIES, FUELING IN DESIGNATED AREAS ONLY, ENCLOSING OR COVERING STORED FUEL, IMPLEMENTING SPILL CONTROLS, AND TRAINING EMPLOYEES AND SUBCONTRACTORS.

INSTALLATION / APPLICATION:
- USE OFF-SITE FUELING STATIONS AS MUCH AS POSSIBLE. FUELING VEHICLES AND EQUIPMENT OUTDOORS OR IN AREAS WHERE FUEL MAY SPILL/LEAK ONTO PAVED SURFACES OR INTO DRAINAGE PATHWAYS CAN POLLUTE STORM WATER. IF YOU FUEL A LARGE NUMBER OF VEHICLES OR PIECES OF EQUIPMENT, CONSIDER USING AN OFF-SITE FUELING STATION. THESE BUSINESSES ARE BETTER EQUIPPED TO HANDLE FUEL SPILLS PROPERLY. PERFORMING THIS WORK OFF-SITE CAN ALSO BE ECONOMICAL BY ELIMINATING THE NEED FOR A SEPARATE FUELING AREA AT YOUR SITE.
- IF FUELING MUST OCCUR ON-SITE, USE DESIGNATED AREAS, LOCATED AWAY FROM DRAINAGE COURSES, TO PREVENT THE RUN-ON OF STORM WATER AND THE RUNOFF OF SPILLS. DISCOURAGE "TOPPING-OFF" OF FUEL TANKS.
- ALWAYS USE SECONDARY CONTAINMENT, SUCH AS A DRAIN PAN OR DROP CLOTH, WHEN FUELING TO CATCH SPILLS/LEAKS. PLACE A STOCKPILE OF SPILL CLEANUP MATERIALS WHERE IT WILL BE READILY ACCESSIBLE. USE ADSORBENT MATERIALS ON SMALL SPILLS RATHER THAN HOSING DOWN OR BURYING THE SPILL. REMOVE THE ADSORBENT MATERIALS PROMPTLY AND DISPOSE OF PROPERLY.
- CARRY OUT ALL FEDERAL AND STATE REQUIREMENTS REGARDING STATIONARY ABOVE GROUND STORAGE TANKS. (40 CF SUB. J) AVOID MOBILE FUELING OF MOBILE CONSTRUCTION EQUIPMENT AROUND THE SITE; RATHER, TRANSPORT THE EQUIPMENT TO DESIGNATED FUELING AREAS. WITH THE EXCEPTION OF TRACKED EQUIPMENT SUCH AS BULLDOZERS AND PERHAPS FORKLIFTS, MOST VEHICLES SHOULD BE ABLE TO TRAVEL TO A DESIGNATED AREA WITH LITTLE LOST TIME. TRAIN EMPLOYEES AND SUBCONTRACTORS IN PROPER FUELING AND CLEANUP PROCEDURES.

LIMITATIONS:
- SENDING VEHICLES/EQUIPMENT OFF-SITE SHOULD BE DONE IN CONJUNCTION WITH STABILIZED CONSTRUCTION ENTRANCE.

MAINTENANCE:
- KEEP AMPLE SUPPLIES OF SPILL CLEANUP MATERIALS ON-SITE.
- INSPECT FUELING AREAS AND STORAGE TANKS ON A REGULAR SCHEDULE.

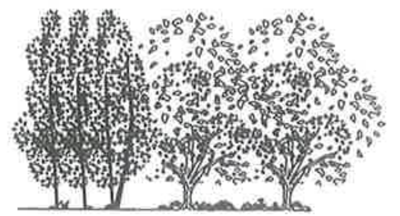
TARGETED POLLUTANTS
□ SEDIMENT
□ NUTRIENTS
■ TOXIC MATERIALS
■ OIL & GREASE
□ FLOATABLE MATERIALS
□ OTHER WASTE

■ HIGH IMPACT
■ MEDIUM IMPACT
□ LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIREMENTS
■ CAPITAL COSTS
□ O&M COSTS
■ MAINTENANCE
■ TRAINING

■HIGH ■MEDIUM □LOW

BMP: PRESERVATION OF EXISTING VEGETATION



OBJECTIVES
□ HOUSEKEEPING PRACTICES
□ CONTAIN WASTE
■ MINIMIZE DISTURBED AREAS
■ STABILIZE DISTURBED AREAS
■ PROTECT SLOPE/CHANNELS
■ CONTROL SITE PERIMETER
□ CONTROL INTERNAL EROSION

GENERAL DESCRIPTION:
CAREFULLY PLANNED PRESERVATION OF EXISTING VEGETATION MINIMIZES THE POTENTIAL OF REMOVING OR INJURING EXISTING TREES, VINES, SHRUBS, AND/OR GRASSES THAT SERVE AS EROSION CONTROLS.

APPLICATIONS:
THIS TECHNIQUE IS APPLICABLE TO ALL TYPES OF SITES. AREAS WHERE PRESERVING VEGETATION CAN BE PARTICULARLY BENEFICIAL ARE FLOODPLAINS, WETLANDS, STREAM BANKS, STEEP SLOPES, AND OTHER AREAS WHERE EROSION CONTROLS WOULD BE DIFFICULT TO ESTABLISH, INSTALL, OR MAINTAIN.

INSTALLATION / APPLICATION CRITERIA:
- CLEARLY MARK, FLAG OR FENCE VEGETATION OR AREAS WHERE VEGETATION SHOULD BE PRESERVED.
- PREPARE LANDSCAPING PLANS WHICH INCLUDE AS MUCH EXISTING VEGETATION AS POSSIBLE AND STATE PROPER CARE DURING AND AFTER CONSTRUCTION.
- DEFINE AND PROTECT WITH BERMS, FENCING, SIGNS, ETC. A SETBACK AREA FROM VEGETATION TO BE PRESERVED.
- PROPOSE LANDSCAPING PLANS WHICH DO NOT INCLUDE PLANT SPECIES THAT COMPETE WITH THE EXISTING VEGETATION.
- DO NOT LOCATE CONSTRUCTION TRAFFIC ROUTES, SPOIL PILES, ETC. WHERE SIGNIFICANT ADVERSE IMPACT ON EXISTING VEGETATION MAY OCCUR.

LIMITATIONS:
- REQUIRES FORWARD PLANNING BY THE OWNER/DEVELOPER, CONTRACTOR AND DESIGN STAFF.
- FOR SITES WITH DIVERSE TOPOGRAPHY, IT IS OFTEN DIFFICULT AND EXPENSIVE TO SAVE EXISTING TREES WHILE GRADING THE SITE SATISFACTORILY FOR THE PLANNED DEVELOPMENT.
- MAY NOT BE COST EFFECTIVE WITH HIGH LAND COSTS.

MAINTENANCE:
- INSPECTION AND MAINTENANCE REQUIREMENTS FOR PROTECTION OF VEGETATION ARE LOW.
- MAINTENANCE OF NATIVE TREES OR VEGETATION SHOULD CONFORM TO LANDSCAPE PLAN SPECIFICATIONS.

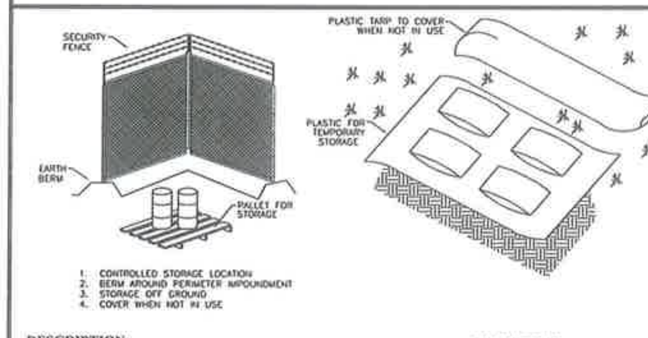
TARGETED POLLUTANTS
■ SEDIMENT
□ NUTRIENTS
□ TOXIC MATERIALS
□ OIL & GREASE
□ FLOATABLE MATERIALS
□ OTHER WASTE

■ HIGH IMPACT
■ MEDIUM IMPACT
□ LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIREMENTS
■ CAPITAL COSTS
□ O&M COSTS
□ MAINTENANCE
□ TRAINING

■HIGH ■MEDIUM □LOW

BMP: MATERIALS STORAGE



1. CONTROLLED STORAGE LOCATION
2. BERM AROUND PERIMETER IMPOUNDMENT
3. STORAGE OFF GROUND
4. COVER WHEN NOT IN USE

DESCRIPTION:
CONTROLLED STORAGE OF ON-SITE MATERIALS.

APPLICATION:
- STORAGE OF HAZARDOUS, TOXIC, AND ALL OTHER CHEMICAL SUBSTANCES.
- ANY CONSTRUCTION SITE WITH OUTSIDE STORAGE OF MATERIALS.

INSTALLATION/APPLICATION CRITERIA:
- DESIGNATE A SECURED AREA WITH LIMITED ACCESS AS THE STORAGE LOCATION. ENSURE NO WATERWAYS OR DRAINAGE PATHS ARE NEARBY.
- CONSTRUCT COMPACTED EARTHEN BERM (SEE EARTH BERM BARRIER INFORMATION SHEET OR SIMILAR PERIMETER CONTAINMENT AROUND STORAGE LOCATION FOR IMPOUNDMENT IN THE CASE OF SPILLS.
- ENSURE ALL ON-SITE PERSONNEL UTILIZE DESIGNATED STORAGE AREA. DO NOT STORE EXCESSIVE AMOUNTS OF MATERIAL THAT WILL NOT BE UTILIZED ON SITE.
- FOR ACTIVE USE OF MATERIALS AWAY FROM THE STORAGE AREA ENSURE MATERIALS ARE NOT SET DIRECTLY ON THE GROUND AND ARE COVERED WHEN NOT IN USE. PROTECT STORM DRAINAGE DURING USE.

LIMITATIONS:
- DOES NOT PREVENT CONTAMINATION DUE TO MISHANDLING OF PRODUCTS.
- SPILL PREVENTION AND RESPONSE PLAN STILL REQUIRED.
- ONLY EFFECTIVE IF MATERIALS ARE ACTIVELY STORED IN CONTROLLED LOCATION.

MAINTENANCE:
- INSPECT DAILY AND REPAIR ANY DAMAGE TO PERIMETER IMPOUNDMENT OR SECURITY FENCING.
- VERIFY THAT ALL MATERIALS ARE BEING CORRECTLY STORED (I.E. STANDING UPRIGHT, IN LABELED CONTAINERS, TIGHTLY CAPPED) AND THAT NO MATERIALS ARE BEING STORED AWAY FROM THE DESIGNATED LOCATION.

OBJECTIVES
■HOUSEKEEPING PRACTICES
■CONTAIN WASTE
□MINIMIZE DISTURBED AREAS
□STABILIZE DISTURBED AREAS
□PROTECT SLOPES/CHANNELS
□CONTROL SITE PERIMETER
□CONTROL INTERNAL EROSION

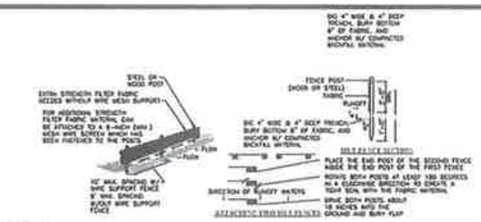
TARGETED POLLUTANTS
□SEDIMENT
□NUTRIENTS
■TOXIC MATERIALS
□OIL & GREASE
□FLOATABLE MATERIALS
■OTHER WASTE

■HIGH IMPACT
■MEDIUM IMPACT
□LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIRED
■CAPITAL COSTS
■O&M COSTS
■MAINTENANCE
■ TRAINING

■HIGH ■MEDIUM □LOW

BMP: SILT FENCE



DESCRIPTION:
A TEMPORARY SEDIMENT BARRIER CONSISTING OF ENTRENCHED FILTER FABRIC STRETCHED ACROSS AND SECURED TO SUPPORTING POSTS.

APPLICATION:
- PERIMETER CONTOL: PLACE BARRIER AT DOWNGRADIENT LIMITS OF DISTURBANCE
- SEDIMENT BARRIER: PLACE BARRIER AT TOE OF SLOPE OR SOIL STOCKPILE
- PROTECTION OF EXISTING WATERWAYS: PLACE BARRIER NEAR TOP OF STREAM BANK
- INLET PROTECTION: PLACE FENCE SURROUNDING CATCHBASINS

INSTALLATION / APPLICATION CRITERIA:
- PLACE POSTS 6 FEET APART ON CENTER ALONG CONTOUR (OR USE PREASSEMBLED UNIT) AND DRIVE 1 FOOT MINIMUM INTO GROUND. EXCAVATE AN ANCHOR TRENCH IMMEDIATELY UPGRADIENT OF POSTS.
- SECURE WIRE MESH (14 GAGE MIN. WITH 6 INCH OPENINGS) TO UPSLOPE SIDE OF POSTS. ATTACH WITH HEAVY DUTY 1 INCH LONG WIRE STAPLES, TIE WIRES OR HOG RINGS.
- CUT FABRIC TO REQUIRED WIDTH, UNROLL ALONG LENGTH OF BARRIER AND DRAPE OVER BARRIER. SECURE FABRIC TO MESH WITH TWINE, STAPLES, OR SIMILAR, WITH TRAILING EDGE EXTENDING INTO ANCHOR TRENCH.
- BACKFILL TRENCH OVER FILTER FABRIC TO ANCHOR.

LIMITATIONS:
- RECOMMEND MAXIMUM DRAINAGE AREA OF 0.5 ACRE PER 100 FEET OF FENCE
- RECOMMEND MAXIMUM UPGRADIENT SLOPE LENGTH OF 150 FEET
- RECOMMEND MAXIMUM UPHILL GRADE OF 2:1 (50%)
- RECOMMEND MAXIMUM FLOW RATE OF 0.5 CFS
- PONDING SHOULD NOT BE ALLOWED BEHIND FENCE

MAINTENANCE:
- INSPECT IMMEDIATELY AFTER ANY RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
- LOOK FOR RUNOFF BYPASSING ENDS OF BARRIERS OR UNDERCUTTING BARRIERS.
- REPAIR OR REPLACE DAMAGED AREAS OF THE BARRIER AND REMOVE ACCUMULATED SEDIMENT.
- REANCHOR FENCE AS NECESSARY TO PREVENT SHORTCUTTING.
- REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ½ THE HEIGHT OF THE FENCE.

APPLICATIONS
□ HOUSEKEEPING PRACTICES
□ CONTAIN WASTE
□ MINIMIZE DISTURBED AREAS
□ STABILIZE DISTURBED AREAS
■ PROTECT SLOPES/CHANNELS
■ CONTROL SITE PERIMETER
■ CONTROL INTERNAL EROSION

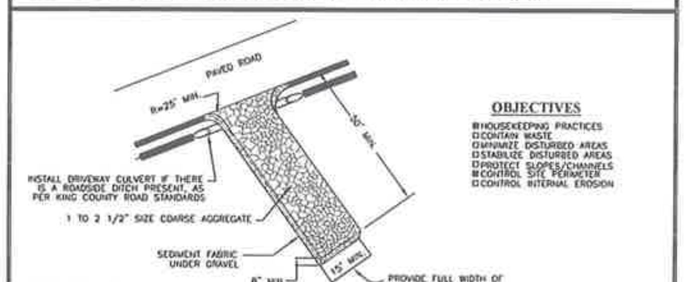
TARGETED POLLUTANTS
■ SEDIMENT
□ NUTRIENTS
□ TOXIC MATERIALS
□ OIL & GREASE
□ FLOATABLE MATERIALS
□ OTHER WASTE

■ HIGH IMPACT
■ MEDIUM IMPACT
□ LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIREMENTS
■ CAPITAL COSTS
■ O&M COSTS
■ MAINTENANCE
□ TRAINING

■HIGH ■MEDIUM □LOW

BMP: STABILIZED CONSTRUCTION ENTRANCE AND WASH AREA



OBJECTIVES
■HOUSEKEEPING PRACTICES
□CONTAIN WASTE
□MINIMIZE DISTURBED AREAS
□STABILIZE DISTURBED AREAS
□PROTECT SLOPES/CHANNELS
■CONTROL SITE PERIMETER
□CONTROL INTERNAL EROSION

DESCRIPTION:
A STABILIZED PAD OF CRUSHED STONE LOCATED WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE FROM OR TO THE PAVED SURFACE. THE AREA CAN BE USED TO SPRAY OFF VEHICLES BEFORE THEY LEAVE THE SITE.

APPLICATION:
AT ANY POINT OF INGRESS OR EGRESS AT A CONSTRUCTION SITE WHERE ADJACENT TRAVELED WAY IS PAVED. GENERALLY APPLIES TO SITES OVER 2 ACRES UNLESS SPECIAL CONDITIONS EXIST.

INSTALLATION/APPLICATION CRITERIA:
- CLEAR AND GRUB AREA AND GRADE TO PROVIDE MAXIMUM SLOPE OF 2%
- COMPACT SUB GRADE AND PLACE FILTER FABRIC IF DESIRED (RECOMMENDED FOR ENTRANCES TO REMAIN FOR MORE THAN 3 MONTHS).
- PLACE COARSE AGGREGATE, 1 TO 2 1/2 INCHES IN SIZE, TO A MINIMUM DEPTH OF 8 INCHES.
- PROVIDE WATER TO THE AREA THAT CAN BE USED TO SPRAY OFF VEHICLES AS NEEDED TO PREVENT THE TRACKING OF MUD OFF OF THE CONSTRUCTION SITE. THIS MAY NOT BE NEEDED DURING DRY PERIODS OF WORK, BUT IS NEEDED WHEN CONSTRUCTION IS PROCEEDING UNDER WET CONDITION.
- PROVIDE BERMS AS NEEDED TO PREVENT SEDIMENT LADEN WASH WATER FROM ENTERING STORM WATER FACILITIES OR OTHER WATER BODIES, OR LEAVING THE SITE.

LIMITATIONS:
- REQUIRES PERIODIC TOP DRESSING WITH ADDITIONAL STONES.
- SHOULD BE USED IN CONJUNCTION WITH STREET SWEEPING ON ADJACENT PUBLIC RIGHT-OF-WAY.
- MUST BE SITUATED SUCH THAT WASTE WATER DOES NOT RUN OFF SITE.

MAINTENANCE:
- INSPECT DAILY FOR LOSS OF GRAVEL OR SEDIMENT BUILDUP.
- INSPECT ADJACENT ROADWAY FOR SEDIMENT DEPOSIT AND CLEAN BY SHOVELING AND SWEEPING.
- REPAIR ENTRANCE AND REPLACE GRAVEL AS REQUIRED TO MAINTAIN CONTROL IN GOOD WORKING CONDITION.
- EXPAND STABILIZED AREA AS REQUIRED TO ACCOMMODATE TRAFFIC AND PREVENT EROSION AR DRIVEWAYS.

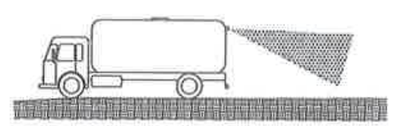
TARGETED POLLUTANTS
■SEDIMENT
□NUTRIENTS
□TOXIC MATERIALS
□OIL & GREASE
□FLOATABLE MATERIALS
□OTHER CONSTRUCTION WASTE

■HIGH IMPACT
■MEDIUM IMPACT
□LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIRED
■CAPITAL COSTS
■O&M COSTS
■MAINTENANCE
□TRAINING

■HIGH ■MEDIUM □LOW

BMP: DUST CONTROLS



DESCRIPTION:
DUST CONTROL MEASURES ARE USED TO STABILIZE SOIL FROM WIND EROSION, AND REDUCE DUST BY CONSTRUCTION ACTIVITIES.

APPLICATION:
DUST CONTROL IS USEFUL IN ANY PROCESS AREA, LOADING AND UNLOADING AREA, MATERIAL HANDLING AREAS, AND TRANSFER AREAS WHERE DUST IS GENERATED. STREET SWEEPING IS LIMITED TO AREAS THAT ARE PAVED.

INSTALLATION/APPLICATION CRITERIA:
- TWO KINDS OF STREET SWEEPERS ARE COMMON: BRUSH AND VACUUM. VACUUM SWEEPERS ARE MORE EFFICIENT AND WORK BEST WHEN THE AREA IS DRY.
- MECHANICAL EQUIPMENT SHOULD BE OPERATED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS AND SHOULD BE INSPECTED REGULARLY.
- WATER MAY BE SPRAYED ON THE GROUND SURFACE TO MOISTEN DRY SOILS, MAKING IT LESS SUSCEPTIBLE TO WIND EROSION.

LIMITATIONS:
- STREET SWEEPING IS LABOR AND EQUIPMENT INTENSIVE AND MAY NOT BE EFFECTIVE FOR ALL POLLUTANTS.
- WATER SPRAYED FROM WATER TRUCKS MUST BE DONE AT A RATE SUCH THAT THE WATER IS ABSORBED IN THE SOIL; IF EXCESSIVE AMOUNTS OF WATER ARE USED, IT MAY RUN OFF, CARRYING SOIL WITH IT.

MAINTENANCE:
IF EXCESS WATER RESULTS FROM WATER SPRAYING, DUST-CONTAMINATED WATERS SHOULD NOT BE ALLOWED TO RUN OFF SITE. AREAS MAY NEED TO BE RESPRAYED TO KEEP DUST FROM SPREADING.

OBJECTIVES
■HOUSEKEEPING PRACTICES
□CONTAIN WASTE
■MINIMIZE DISTURBED AREAS
■STABILIZE DISTURBED AREAS
□PROTECT SLOPES/CHANNELS
□CONTROL SITE PERIMETER
□CONTROL INTERNAL EROSION

TARGETED POLLUTANTS
■SEDIMENT
□NUTRIENTS
□TOXIC MATERIALS
□OIL & GREASE
□FLOATABLE MATERIALS
□OTHER WASTE

■HIGH IMPACT
■MEDIUM IMPACT
□LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIRED
■CAPITAL COSTS
□O&M COSTS
■MAINTENANCE
■TRAINING

■HIGH ■MEDIUM □LOW

BMP: GRADING PRACTICES

SOILS EXPOSED FROM LAND GRADING ACTIVITIES ARE VERY VULNERABLE TO EROSION

OBJECTIVES
□HOUSEKEEPING PRACTICES
□CONTAIN WASTE
■MINIMIZE DISTURBED AREAS
■STABILIZE DISTURBED AREAS
■PROTECT SLOPES/CHANNELS
□CONTROL SITE PERIMETER
■CONTROL INTERNAL EROSION

DESCRIPTION:
CONTROL SOIL EROSION BY MINIMIZING THE EXPOSURE OF BARE SOIL TO EROSIVE FORCES. THIS IS DONE BY:
(1) LIMITING THE AMOUNT OF LAND DISTURBED AT ONE TIME IN PREPARATION FOR CONSTRUCTION.
(2) LIMITING THE AMOUNT OF TIME BETWEEN THE DISTURBANCE OF SOIL AND PROTECTION OR STABILIZATION OF DISTURBED SOILS.
(3) USING GRADING PRACTICES TO PROTECT EXPOSED SOILS SUSCEPTIBLE TO STORM WATER RUNOFF. RELATED PRACTICES INCLUDE CONSTRUCTION SEQUENCING, PRESERVATION OF EXISTING VEGETATION, EROSION CONTROL PRACTICES AND SEDIMENT CONTROL PRACTICES.

APPROACH:
- LIMIT THE AREA OF DISTURBANCE TO THOSE AREAS REQUIRING GRADING. THIS PRESERVES EXISTING VEGETATION AND REDUCES THE VULNERABILITY OF SOIL TO EROSION.
- BASED ON EROSION POTENTIAL AND SEDIMENT CONTROL MEASURES ON THE SITE, ESTABLISH WHAT AREAS ARE TO GRADED AT ONE TIME.
- AN UNDISTURBED BUFFER ZONE CONTAINING VEGETATION AT THE LOWEST ELEVATION OF A CONSTRUCTION SITE CAN REDUCE THE TRANSPORT OF SEDIMENT OFF SITE.
- INITIATE SOIL PROTECTION MEASURES DURING THE COURSE OF WORK TO MINIMIZE THE LENGTH OF TIME SOILS EXPOSED TO EROSIVE FORCES.
- CONDUCT WORK IN STAGES SO THAT CONSTRUCTION OR SOIL STABILIZATION OCCURS PROMPTLY AFTER DISTURBANCE OF SOIL.
- ESTABLISH A SCHEDULE GOVERNING THE STABILIZATION OF DISTURBED SLOPES, BOTH IN TERMS OF PASSAGE OF TIME SINCE COMMENCEMENT AND COMPLETION OF DISTURBANCE AND IN TERMS OF PLANTING SEASON.
- LEAVING THE SURFACE OF THE DISTURBED SOIL GRADED IN A ROUGHENED CONDITION (NOT SMOOTH) CAN REDUCE THE QUANTITY AND VELOCITY OF STORM WATER RUNOFF.
- PREVENT STORM WATER RUNOFF FROM RUNNING ONTO STEEP SLOPES FROM ABOVE.
- AVOID LONG, STEEP CUT OR FILL SLOPES THAT ALLOW RUNOFF WATER OF SUFFICIENT QUANTITY OR VELOCITY TO CUT INTO AND ERODE THE SLOPE.

LIMITATIONS:
- THE SPECIFIC APPROACH TO GRADING ON A PARTICULAR SITE DEPENDS ON THE CONDITIONS OF THE SITE AND SURROUNDING LAND; ENGINEERING JUDGMENT IS REQUIRED TO DESIGN THE APPROACH BEST SUITED FOR EACH SITE.

MAINTENANCE:
- PRACTICES MAY NEED TO VARY FROM THE APPROVED PLAN IF EROSION PROBLEMS APPEAR WHEN STORM WATER RUNOFF OCCURS.

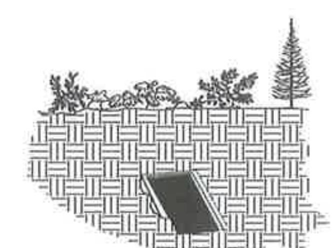
TARGETED POLLUTANTS
■SEDIMENT
□NUTRIENTS
□HEAVY MATERIALS
□TOXIC MATERIALS
□OXYGEN DEMANDING SUBSTANCES
□OIL & GREASE
□FLOATABLE MATERIALS
□BACTERIA & VIRUSES

■HIGH IMPACT
■MEDIUM IMPACT
□LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIRED
■CAPITAL COSTS
□O&M COSTS
□MAINTENANCE
■ TRAINING

■HIGH ■MEDIUM □LOW

BMP: INSPECTION AND MAINTENANCE



APPLICATIONS
□MANUFACTURING
■MATERIAL HANDLING
■VEHICLE MAINTENANCE
□CONSTRUCTION
□COMMERCIAL ACTIVITIES
□ROADWAYS
■WASTE CONTAINMENT
■HOUSEKEEPING PRACTICES

DESCRIPTION:
INSPECT AND MAINTAIN ALL STRUCTURAL BMP's (BOTH EXISTING AND NEW) ON A ROUTINE BASIS TO REMOVE POLLUTANTS FROM ENTERING STORM DRAIN INLETS. THIS INCLUDES THE ESTABLISHMENT OF A SCHEDULE FOR INSPECTIONS AND MAINTENANCE.

APPROACH:
REGULAR MAINTENANCE OF ALL STRUCTURAL BMP's IS NECESSARY TO ENSURE THEIR PROPER FUNCTIONALITY.
- ANNUAL INSPECTIONS.
- PRIORITIZE MAINTENANCE TO CLEAN, MAINTAIN, AND REPAIR OR REPLACE STRUCTURES IN AREAS BEGINNING WITH THE HIGHEST POLLUTANT LOADING.
- CLEAN STRUCTURAL BMP's IN HIGH POLLUTANT AREAS JUST BEFORE THE WET SEASON TO REMOVE SEDIMENTS AND DEBRIS ACCUMULATED DURING THE SUMMER AND FALL.
- KEEP ACCURATE LOGS OF WHAT STRUCTURES WERE MAINTAINED AND WHEN THEY WERE MAINTAINED.
- RECORD THE AMOUNT OF WASTE COLLECTED.

LIMITATIONS:
- AVAILABILITY OF TRAINED STAFF.

TARGETED POLLUTANTS
■SEDIMENT
■NUTRIENTS
□HEAVY METALS
■TOXIC MATERIALS
□OXYGEN DEMANDING SUBSTANCES
■OIL AND GREASE
■FLOATABLE MATERIALS
□BACTERIA AND VIRUSES

■HIGH IMPACT
■MEDIUM IMPACT
□LOW OR UNKNOWN IMPACT

IMPLEMENTATION REQUIRED
■CAPITAL COSTS
■O&M COSTS
■MAINTENANCE
■STAFFING
□TRAINING
□ADMINISTRATIVE

■HIGH ■MEDIUM □LOW

PROFESSIONAL ENGINEER
2/18/15
No. 4939903-2202
JAMES J. MILLIGAN
STATE OF UTAH

CONSULTING ENGINEERS AND SURVEYORS
GILSON ENGINEERING INC
GeoStrata Engineering & Geosciences
CITY OF NORTH SALT LAKE UTAH

REV	DATE	BY	COMMENTS

REVISIONS

SCALE MEASURES 1" ON FULL SIZE SHEETS
ADJUST ACCORDINGLY FOR HALF SIZE SHEETS

DATE: FEBRUARY 2015
DRAWING NAME: ER 102 BMP DETAILS
DESIGNED/DRAWN BY: AL
CHECKED
APPROVED

BMP DETAILS
NORTH SALT LAKE LANDSLIDE STABILIZATION PROJECT
NORTH SALT LAKE, UTAH

REVISION: D
PROJ. # GEO.021
ER.102