SECTION C

SUPPLEMENTARY PROJECT INFORMATION

CDOT Forms per Section B
HP Geotech Subsoil Study
Terracon MSE Wall Report
Construction Plan Set - *see separate web link to plan set*

Colorado Department of Transportation
CDOT Form #250, 7/06
Version 9.1 EXC

MATERIALS DOCUMENTATION RECORD

Estimated Field Requirements for Minimum Materials Sampling, Testing, and Inspection and Record of Field and Central Laboratory Documentation of Materials.

Project Location: EcoTrail Recreation
Region: Minturn
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PROJECT TO BE TESTED AND DOCUMENTED PER THE 2009 FIELD MATERIALS MANUAL

Forward to the Bridge, Preinspection Unit, the list of materials suppliers and subcontractors upon receipt of the contractor.

UPON COMPLETION OF WORK

The contractor shall submit a certification verifying that all steel permanently incorporated in the project was produced or manufactured in the United States, either with no exception or with minor exception whose project delivered cost did not exceed the allowable amount

Upon receiving this certification, the Project Engineer will attach original to the completed CDOT Form 250 and submit to appropriate files

ITEM NUMBER	DESCRIPTION	TYPE OF TESTS	QUANTITY PLAN	TESTS REQUIRED	PROJECT ACCEPTANCE TEST REPORTED	FINAL QUANTITY	LABORATORY CHECK TESTS	# OF CHECK TESTS REQUIRED & SUBMITTED
203	Embankment Material (C.I.P.)		cubic yard			cubic yard		Preliminary Report #'s Construction Shear Tests
	Note: Project Acceptance Test: 500 cubic yards or less, visually inspect and document in Project Files	TESTABLE In-Place Density	cubic yard	required		cubic yard		
				reported				
		Moist-Den Curve	1 per soil type					
		Soil Survey (Classification)	CDOT Form 219 Date Submitted.					

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ITEM NUMBER	DESCRIPTION	TYPE OF TESTS	QUANTITY PLAN	TESTS REQUIRED	PROJECT ACCEPTANCE TEST REPORTED	FINAL QUANTITY	LABORATORY CHECK TESTS	# OF CHECK TESTS REQUIRED & SUBMITTED
206	Import Select Wall Backfill (Class 1 Structural) (Note: required tests is based off of 905 cubic yards from the given 1,649 tons.)	Gradation, Atterberg Limits	ton	required		ton	1/per source/per project required	Preliminary Reports No.'s & Laboratory Check Tests Reports
				reported				
		In-Place Density (See Schedule)		required				
				reported				
		Moist-Den Curve, If in roadbed - 1 per source			Upon project completion, submit completed CDOT Form 194, to Region. Date submitted _____.			
207	Top Soil	Plan: _____ cubic yard Final: cubic yard			Certified Test Result (CTR) Required. CTR and CDOT Form 157 Nos _____			

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ITEM NUMBER	DESCRIPTION	PLAN QUANTITY	FINAL QUANTITY	
208	Erosion Control			Field Inspect.
	Culvert Inlet Protection (Erosion Log):	_____ each	_____ each	CDOT Form 157 Nos._____
	Silfence	_____ lin ft.	_____ lin ft.	CDOT Form 157 Nos _____
	Stabilized Construction Entrance.	_____ each	_____ each	CDOT Form 157 Nos._____

ITEM NUMBER	DESCRIPTION	
212	Seeding & Sodding	Seed. COC and CDOT Form 157 Nos. _____.
		Sod: Contractor shall submit to the Project Engineer a sample of sod 6 1/2 ft x 2 ft for comparison standard Document on CDOT Form No. 157: CDOT Form 157 Nos. _____
		Fertilizer: Field inspect Document on project records. COC and CDOT Form 157 Nos._____.

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ITEM NUMBER	DESCRIPTION	TYPE OF TESTS	PLAN QUANTITY	TESTS REQUIRED	PROJECT ACCEPTANCE TEST REPORTED	FINAL QUANTITY	LABORATORY CHECK TESTS	# OF CHECK TESTS SUBMITTED
304	Aggregate Base Course Class 6	Gradation and Atterberg Limits	617 ton	required		ton	1 per source per project required	Preliminary Reports No.'s & Laboratory Check Tests Reports
				reported				
		In-Place Density		required				
				reported				
		Moist-Den Curve		1 per source				
		R-Value: Min _____ Tested _____						
		Designated Source? (Y/N) _____						

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ITEM NUMBER	DESCRIPTION	TYPE OF TESTS	PLAN QUANTITY	TESTS REQUIRED	PROJECT ACCEPTANCE TEST REPORTED	FINAL QUANTITY	LABORATORY CHECK TESTS	# OF CHECK TESTS SUBMITTED
							*	Preliminary Reports No.'s & Laboratory Check Tests Reports
403	Hot Mix Asphalt Grading	Asphalt Content	ton	required		ton	required	
				reported				
	Note. All tests, 500 tons or less, visually inspect and document in Project Files.					Bituminous Tolerance _____		
		In-Place Density		required		RAP % _____		
				reported		T.S.R = _____		
		Gradation		required				
				reported				
		Fractured Faces		required				
				reported				
	__1%__	Hydrated Lime Gradation	ton	required **				
				Submitted **			(Add 1 to this number if applicable)	

* Minimum of 1st rep and each 10k or fraction thereof. 1st rep required even if comercial source.
** HYDRATED LIME, Acceptance Samples, submitted to Central Laboratory for gradation testing See Item 307 of Schedule. Chemical. CDOT Form 157 Nos _____.
25 LB Aggregate Belt Cut Sample in accordance with CP30 is Required to be submitted with 1st Rep Sample

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		Plan Quantity	Final Quantity	Field Inspect
504	MSE Path Retaining Wall w/ Geogrid	_____ Sq. Ft	_____ Sq Ft.	CDOT Form 157 Nos _____.

		Plan Quantity	Final Quantity		
514	Pedestrian Path Rail	_____ lin ft	_____ lin ft.	CDOT Form 157 Nos _____.	CTR is required.

603	Culverts	Type	Size	Plan (Lin Ft or each)	Approved Quantities As Reported	Final Quantity	CDOT Form 157 Numbers.

See Item 604 in Schedule for Certification procedure for each type.
Document that material is on the Preapproved list and tabulate final quantities on CDOT Form 157
Total reported quantity must meet or exceed final project quantities
RUBBER GASKETS AND JOINT FILLERS· See Schedule for requirements.

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606 Guard Rail	Type	Plan Quantities	Final Quantities		Materials Represented & CDOT Form 157 Nos.
				POSTS, BLOCKS and RAIL: See Item 606 in Schedule for Certification procedures.	

See Item 604 in Schedule for Certification procedure

607 Fence	Pay Item	Plan Quantities (Lin Ft or Each)	Final Quantities (Lin Ft or Each)	Materials Represented CDOT Form 157 Nos	
					See Schedule for Certification procedure for each type.
				Other Form Nos/Dates.	

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613	Lighting	Pay Item	Plan Quantities (Lin Ft or Each)	Final Quantities (Lin Ft or Each)	Materials Represented CDOT Form 157 Nos.	See Schedule for Certification procedure for each type.

614	Traffic Control Devices	Pay Item	Plan Quantities (Lin Ft or Each)	Final Quantities (Lin Ft or Each)	Materials Represented CDOT Form 157 Nos.	See Schedule for Certification procedure for each type

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ITEM NUMBER	DESCRIPTION	TYPE OF TESTS	PLAN QUANTITY	TESTS REQUIRED	PROJECT ACCEPTANCE TEST REPORTED	FINAL QUANTITY	# OF CHECK TESTS REQUIRED AND SUBMITTED
	Various Items				Submit C O C.'s and 157's		

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PROJECT PRICE REDUCTION DOCUMENTATION

ITEM NUMBER	DESCRIPTION	PRICE REDUCTION AMOUNT	CALCULATIONS 266/105 DATES	CMO/MCR NUMBERS	LINE ITEM NO ON FINAL ESTIMATE

LABORATORY CHECK TEST DEVIATIONS

ITEM NUMBER	DESCRIPTION	MEMO DATE	157 NOS.

Document Major and Significant Independent Assurance deviations as per 10 4 of the Program in the Field Materials Manual

Attach additional sheets to this form if more space is needed for documentation.
Isolated relatively small quantities of concrete,reinforcing steel,wire mesh, bolts etc. which are paid for incidentally shall be field inspected to determine conformance with specifications Document in Project Records. If any questions arise concerning the proper documentation of materials during construction, contact the Documentation Unit of the Central Laboratory In Denver @ 303-398-6563.

FIELD DOCUMENTATION ENTERED BY: _____ DATE: _____ PROJECT ENGINEER: _____ DATE: _____

The entire / Completed Form #250
Distribution: Resident Engineer
Region Materials Engineer
FHWA (Oversight Projects only)
Documentation Unit (Materials and Geotechnical Branch)
Central Files

COLORADO DEPARTMENT OF TRANSPORTATION

CONTRACTORS PERFORMANCE CAPABILITY STATEMENT

Project #

1. List names of partnerships or joint ventures ☐ none

2. List decreases in the contractors fiscal or workmanship qualifications compared to the last prequalification statement submitted to CDOT. (Attach additional sheets if necessary.)

a. Key personnel changes ☐ none

b. Key equipment changes ☐ none

c. Fiscal capability changes (legal actions, etc.) ☐ none

d. Other changes that may effect the contractors ability to perform work. ☐ none

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE

Contractor's firm or company name	By	Date
	Title	
2nd Contractor's firm or company name (if joint venture)	By	Date
	Title	

CDOT Form #605 1/92

COLORADO DEPARTMENT OF TRANSPORTATION

ANTI-COLLUSION AFFIDAVIT

PROJECT NO.	
LOCATION	

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on behalf of my firm.

I further attest that:

1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.

2A. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project, and will not be so disclosed prior to bid opening.

2B. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.

3A. No attempt has been made to solicit, cause or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.

3B. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.

4. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complementary bid.

5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.

6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.

7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.

8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to submission of bids for this contract.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Contractor's firm or company name	By	Date
	Title	
2nd contractor's firm or company name. (If joint venture)	By	Date
	Title	

Sworn to before me this day of, 20

Notary Public	
My commission expires	

NOTE: This document must be signed in Ink.

COLORADO DEPARTMENT OF TRANSPORTATION

ASSIGNMENT OF ANTITRUST CLAIMS

PROJECT NO.

Contractor and Colorado Department of Transportation (CDOT) recognize that in actual economic practice antitrust violations ultimately impact on CDOT. Therefore, for good cause and as consideration for executing this contract and for receiving payments hereunder:

1. Contractor hereby irrevocably assigns to CDOT any and all claims it may now have or which may hereafter accrue to it under federal or state antitrust laws in connection with the particular project, goods or services purchased or acquired by CDOT pursuant to this contract.

2. Contractor hereby expressly agrees:

   a. That, upon becoming aware that a third party has commenced a civil action asserting on Contractor's behalf an antitrust claim which has been assigned to CDOT hereunder, Contractor shall immediately advise in writing:
      (1) Such third party that the antitrust claim has been assigned to CDOT, and
      (2) CDOT that such civil action is pending and of the date on which, in accordance with subparagraph a. (1) above, Contractor notified such third party that the antitrust claim had been assigned to CDOT;
   b. To take no action which will in any way diminish the value of the claims or rights assigned or dedicated to CDOT hereunder; and
   c. Promptly to pay over to CDOT its proper share of any payment under an antitrust claim brought on Contractor's behalf by any third party and which claim has been assigned to CDOT hereunder.

3. Further, Contractor agrees that in the event it hires one or more subcontractors to perform any of its duties under the contract, Contractor shall require that each such subcontractor:

   a. Irrevocably assign to CDOT (as a third party beneficiary) any and all claims that such subcontractor may have or which may thereafter accrue to the subcontractor under federal or state antitrust laws in connection with any goods or services provided by the subcontractor in carrying out the subcontractor's obligations to Contractor;
   b. Upon becoming aware that a third party has commenced a civil action on the subcontractor's behalf asserting an antitrust claim which has been assigned to CDOT hereunder, shall immediately advise in writing:
      (1) Such third party that the antitrust claim has been assigned to CDOT, and
      (2) Contractor and CDOT that such civil action is pending and of the date on which, in accordance with subparagraph b. (1) above, the subcontractor notified such third party that the antitrust claim had been assigned to CDOT;
   c. Take no action which will in any way diminish the value of the claims or rights assigned or dedicated to CDOT hereunder; and
   d. Promptly pay over to CDOT its proper share of any payment under an antitrust claim brought on the subcontractor's behalf by any third party and which claim has been assigned or dedicated to CDOT pursuant hereto.

I, acting in my capacity as officer of a bidder (bidders if a joint venture) do agree to the above assignment of antitrust claims.

Contractor's firm or company name	By	Date
	Title	
2nd contractor's firm or company name. (If joint venture.)	By	Date
	Title	

CDOT Form #621 12/91

COLORADO DEPARTMENT OF TRANSPORTATION **BIDDERS LIST DATA and UNDERUTILIZED DBE (UDBE) BID CONDITIONS ASSURANCE**	Project No.:
	Location:

Prime Contractor Instructions: This form has two sections, both must be completed and submitted with your bid. Complete **Section I** to list all subcontract quotes received (non-DBE and DBE). Complete **Section II** to report only Underutilized DBE (UDBE) participation percentages which qualify under the contract goal specification for this project. **Please review CDOT Form #715 instructions before completing Section II.** Attach additional sheets as necessary.

POLICY

It is the policy of the Colorado Department of Transportation that underutilized disadvantaged business enterprises have equal opportunity to participate on projects financed with federal, state or local entity funds. Consistent with 49 Code of Federal Regulations (CFR) Part 26.11, the Bidders List data provided by the Contractors will provide CDOT as accurate data as possible about the universe of DBE and non-DBE firms actively seeking work on its highway construction contracts, for use in setting overall DBE goals.

SECTION I: CDOT BIDDERS LIST INFORMATION (Non-DBEs and DBEs)

1) Are all subcontract bids (quotes) received by your firm for this project listed below? ☐ **Yes** ☐ **No**
2) If No, make certain any additional subcontract bidding information is submitted to the CDOT Business Programs Office before 4:00 pm on the day after bids are opened to ensure CDOT has the best data possible for setting future DBE goals (use the same table format as below):
   CDOT Business Programs Office
   4201 E. Arkansas Ave., Room 200
   Denver, Colorado 80222 **FAX:** 303-757-9019 **EMAIL:** eo@dot.state.co.us
3) The most recent CDOT Bidders List will be posted online at: www.dot.state.co.us/EEO/DBEProgramPage.htm

NAME OF FIRM SUBMITTING BID/QUOTE	CERTIFIED DBE FIRM?	WORK ITEM(S) DESCRIPTION	FIRM BEING USED?
1.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
2.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
3.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
4.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
5.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
6.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
7.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
8.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
9.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
10.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
11.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
12.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
13.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe

NAME OF FIRM SUBMITTING BID/QUOTE	CERTIFIED DBE FIRM?	WORK ITEM(S) DESCRIPTION	FIRM BEING USED?
14.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
15.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
16.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
17.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
18.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
19.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe
20.	☐ Yes ☐ No		☐ Yes ☐ No ☐ Maybe

SECTION II: UNDERUTILIZED DBE (UDBE) PARTICIPATION COMMITMENT

1) Total eligible Underutilized DBE (UDBE) percentage amount from **Box A** below: . %
2) Will your company's Underutilized DBE (UDBE) participation commitment meet the contract goal? ☐ Yes ☐ No
3) List the UDBE firms, committed work items, and eligible UDBE percentage of your bid committed to each.

UDBE FIRM NAME	CERTIFICATION NUMBER	COMMITTED WORK ITEM(S)	% COMMITMENT TOWARD DBE GOAL*
1.			. %
2.			. %
3.			. %
4.			. %
5.			. %
BOX A: TOTAL ELIGIBLE UDBE PERCENTAGE AMOUNT *(Round to nearest hundredth)* ⟶			. %

* Detailed instructions on how to calculate DBE commitment amounts are available on CDOT Form #715 and in the "Counting DBE Participation Toward Contract Goals and CDOT's annual DBE goal" section of the "DBE – Definitions and Requirements" in the *Standard Special Provisions*.

I understand that, if my company is determined to be the low bidder for the contract on this project, I must submit a completed CDOT Form #715 CERTIFICATION OF UNDERUTILIZED DBE PARTICIPATION for each firm listed in Section II of this form to the Transportation Department by 4:00 pm on the third work day after the day bids are opened. The actual amounts submitted on each CDOT Form #715 must equal or exceed the DBE percentage commitments documented on this form. In addition, if my company does not meet the DBE/UDBE goal for this project, I must submit a completed CDOT Form #718 DBE GOOD FAITH EFFORT DOCUMENTATION before 4:00 pm on the day after bids are opened. CDOT Form #715s submitted for firms not included on this form, OR for amounts exceeding those listed on this form, will be accepted but NOT counted as Good Faith Efforts. Only the efforts the contractor made prior to the bid opening will count as Good Faith Efforts.

I understand my obligation to abide by the Policy stated above Section I. I shall not discriminate on the basis of race, color, age, sex, national origin, or handicap in the bidding process or the performance of contracts.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE IN THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Company Name:	Date: / /
Company Officer Signature:	Title:

COLORADO DEPARTMENT OF TRANSPORTATION **CERTIFICATE OF PROPOSED UNDERUTILIZED DBE (UDBE) PARTICIPATION**	Project No.:	
	Project Code (SA#):	
	Location:	Form #: of

Prime Contractor – Send completed/signed form to the Business Programs Office (instructions on second page). The "Eligible UDBE Amounts" submitted on this form must equal or exceed the commitment(s) documented on the **CDOT Form 714** you submitted with your bid For the complete list of certified DBE/UDBE firms and their DBE work codes go to **http://www.dot.state.co.us/app_ucp/**

NOTE: See 49 CFR part 26.55, and the "DBE - Definitions and Requirements" in the *Standard Special Provisions*, for further information concerning counting DBE participation of truckers, subcontractors, suppliers and service providers toward the project's UDBE goal

PART 1a – TRUCKING CONTRACT

If the UDBE is being used as a trucker for one or more "trucking" DBE work codes (25500, 25505 etc.) then:

- **ACTUAL UDBE AMOUNT = Actual contract amount for the transportation services provided by the UDBE firm and any UDBE lessees.**
- ***ELIGIBLE UDBE TRUCKING AMOUNT* = [(ACTUAL UDBE AMOUNT) – (Any non-UDBE lessee amounts in this contract)*]**

* For work done on this UDBE contract with non-UDBE lessees, credit toward the project UDBE goal is given only for the broker fees or commissions the UDBE trucker receives for arranging the transportations services, because the services themselves are being performed by non-UDBEs

NAME OF UDBE FIRM	CERTIFICATION #	EXPIRATION DATE	*ELIGIBLE UDBE TRUCKING AMOUNT*
		/ /	$
DBE WORK CODE NUMBER(S) THIS UDBE IS BEING USED FOR : *Complete list of work codes is at http://www.dot.state.co us/app_ucp/*			

PART 1b – SUBCONTRACT

- ***ELIGIBLE UDBE SUBCONTRACT AMOUNT* = [(Actual UDBE contract amount) – (Any non-UDBE lower tier amounts in this contract)*]**

* Work that a UDBE subcontracts to a lower tier non-UDBE firm does not count toward the project UDBE goal.

NAME OF UDBE FIRM	CERTIFICATION #	EXPIRATION DATE	*ELIGIBLE UDBE SUBCONTRACT AMOUNT*
		/ /	$
DBE WORK CODE NUMBER(S) THIS UDBE IS BEING USED FOR : *Complete list of work codes is at http://www.dot state.co us/app_ucp/*			

PART 1c – SUPPLY CONTRACT

If the supplier is a UDBE with a "Type" field of "Manufacturer" for the item(s).

- ***ELIGIBLE UDBE SUPPLY AMOUNT* = [(Actual UDBE contract amount) X 100%]**

If the supplier is a UDBE with a "Type" field of "Regular Dealer" for the item(s):

- ***ELIGIBLE UDBE SUPPLY AMOUNT* = [(Actual UDBE contract amount) X 60%]**

NOTE: If the supplier is a UDBE with a "Type" field of "Broker" for the item(s) use **PART 1d – BROKER / SERVICE CONTRACT.**

NAME OF UDBE FIRM	CERTIFICATION #	EXPIRATION DATE	*ELIGIBLE UDBE SUPPLY AMOUNT*
		/ /	$
DBE WORK CODE NUMBER(S) THIS UDBE IS BEING USED FOR : *Complete list of work codes is at http://www dot state.co us/app_ucp/*			

PART 1d – BROKER / SERVICE CONTRACT

If purchasing materials or supplies through a UDBE with a "Type" field of "Broker", count only the amount of brokerage commission and/or delivery service fees included in the contract. Other examples of services to include in this section are bonding, brokering, consulting, security guards, and insurance etc

- ***ELIGIBLE UDBE SERVICE FEE AMOUNT* = Actual compensation retained by the UDBE broker/agent for services rendered***

* The amounts that count toward UDBE goals are limited to the compensation retained by the UDBE broker/agent for services rendered, provided the fee/commission is determined by CDOT to be reasonable and not excessive as compared with fees customarily charged for similar services.

NAME OF UDBE FIRM	CERTIFICATION #	EXPIRATION DATE	*ELIGIBLE UDBE SERVICE FEE AMOUNT*
		/ /	$
DBE WORK CODE NUMBER(S) THIS UDBE IS BEING USED FOR : *Complete list of work codes is at http://www.dot state.co.us/app_ucp/*			

PART 2 – UDBE PARTICIPATION SUMMARY

A) What is the total dollar value of this proposed trucking, subcontract, supply, OR broker/service contract that is eligible for counting toward contract goals? A = [TOTAL FROM "ELIGIBLE" COLUMNS IN PART 1] **NOTE: Provide in actual subcontractor dollars and not prime contract prices.**	A> $
B) What is the total dollar value of proposed subcontracts that are eligible for counting towards contract goals from prior sheets/forms?	B> $
C) What is the accumulative value of proposed subcontracts that are eligible for counting towards contract goals? C = [A + B]	C> $
D) What is the original contract bid total?	D> $
E) What is the accumulative percent of contract bid total subcontracted to all underutilized DBEs? E = [(C ÷ D) X 100]	E> %

PART 3 – UDBE CONFIRMATION

I confirm that my company is participating in this contract as documented in the Prime Contractor's commitment(s) in PART 1 of this form. Only the value of the work that my company is actually performing is being counted on this form.	
UDBE Firm Name:	Date: / /
UDBE Representative Signature and Title:	

PART 4 – PRIME CONTRACTOR CERTIFICATION

I certify that:

- my company has met the contracted UDBE goals or has submitted a completed CDOT Form #718.
- my company has accepted a proposal from the UDBE named above.
- my company has notified the proposed UDBE of the contracted UDBE commitment
- my company has ensured that the proposed UDBE has signed PART 3 of this form.
- my company's use of the proposed UDBE for the items of work listed above is a condition of the contract award.
- my company will invite the proposed UDBE to attend the preconstruction conference.
- my company will not use a substitute UDBE for the proposed UDBE's failure to perform under a fully executed subcontract, unless my company complies with the definitions and requirements section of the DBE Special Provisions.
- I understand that failure to comply with the information shown on this form will be considered grounds for contract termination.

I declare under penalty of perjury in the second degree, and any other applicable state or federal laws, that the statements made on this document are true and complete to the best of my knowledge.

Prime Contractor Name:	Date: / /
Officer Signature and Title:	

FORM INSTRUCTIONS

Prime Contractor:

1. An officer of the contractor(s) must complete this form.
2. Include only DBE firms which meet the underutilized criteria in the contract goal specification for this project (i.e., UDBE firms).
3. Complete only relevant section(s) for PART 1.
4. Ensure that the proposed UDBE has signed PART 3 of this form.
5. Complete ALL sections of PART 2 and PART 4.
6. Submit a separate CDOT Form #715 for EACH proposed UDBE
7. Retain a photocopy for your records
8. Send original to:

Colorado Department of Transportation
Business Programs Office
4201 E Arkansas Ave.
Denver, Colorado 80222
FAX: (303) 757-9019

COLORADO DEPARTMENT OF TRANSPORTATION

UNDERUTILIZED DBE (UDBE) GOOD FAITH EFFORT DOCUMENTATION

Project No.:	Project Code (SA#):
Location:	
Date:	No. Of Sheets Attached To Form:

The Contractor who is the apparent low bidder on a CDOT construction project, and has failed to meet the Underutilized DBE (UDBE) contract goal, shall use this form to document **all** good faith efforts that were made **prior to bid opening** by said Contractor to meet the goal. **FAILURE TO FULLY / CLEARLY COMPLETE THIS FORM MAY RESULT IN REJECTION OF THE BID.**

Each portion of this form is to be addressed in the space provided, or on supplemental sheets that follow the same tabular structure and format outlined below. Attach supporting documentation as required by CDOT. This completed form and required attachments are to be submitted to the Business Programs Office in the Center for Equal Opportunity prior to 4:00 p.m. on the day after the day bids are opened This form may be submitted by FAX (303 -757-9019) with an original copy to follow. An extension may be granted by the DBE Liaison. Only the efforts the Contractor made **prior to bid opening** will count as Good Faith Efforts consistent with the instructions on CDOT Form #714.

I. Complete the following table to document sufficient bid items identified as subcontract work to be performed by UDBEs to achieve the contract goal. This includes, where appropriate, breaking out contract work items into economically feasibly units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces. The total percentage of subcontract items identified for UDBE participation must equal or exceed the percentage UDBE goal set by CDOT.

DBE Work Code From DBE Directory	DBE Work Code Description	Closest Matching CDOT Bid Item #	Actual % Amount Of Final Contract
UDBE CONTRACT GOAL %: _____		TOTAL CONTRACT %:	

DBE DIRECTORY WORK CODES

The DBE Directory can be found online at.
http://www.dot.state.co.us/app_ucp/

- DBE work codes are 5 digit numbers where the 1st digit corresponds to the overall section the code belongs to
- The 1st 3 digits of a DBE work code identify its category
- DBE work codes ending in "00" represent certification for the entire work code category
- DBE work codes NOT ending in "00" represent certification in a specific sub-category only

II. Complete the following table to summarize **all** outreach efforts made to UDBE firms. For each subcontract item identified, contact by mail, fax, phone and/or email **100%** of the Colorado certified UDBEs whose DBE work codes match the type of work being solicited and who are marked as "**CDOT GFE Eligible**" on the DBE Directory. The Contractor shall ensure that initial solicitations allow UDBEs at least 10 calendar days to participate effectively in the bidding process. In order to determine with certainty which UDBEs are interested, the Contractor is also required to take appropriate steps to follow-up initial solicitations (e.g., regional follow-up phone calls etc.). If soliciting by telephone, attach a summary telephone log of calls, including topic of discussion, date, time, name of person contacted, and the response received. If soliciting by mail, fax, and/or email, attach one example copy of the letter, fax, and/or email sent to UDBEs along with a summary log that documents all dates and responses received. Letters, faxes and/or emails must specifically identify the project, the items to be subcontracted, and the bid date. Letters, faxes and/or emails must also provide an address and phone number where specific quantities or details will be available to bidders.

DBE Work Code From DBE Directory	DBE Work Code Description	# Of UDBEs Contacted	# Of UDBEs "Eligible"	% Of UDBEs Contacted

DBE DIRECTORY UPDATES

Go to **http://www.dot.state.co.us/app_ucp/** and use the "**Directory Updates**" button on the DBE Directory to submit any of the following documented updates on UDBE firms

- Contact information changes (e.g., phone and address etc.)
- "CDOT GFE Eligibility" status changes (e.g., UDBE firm says they don't want to be contacted via GFE solicitations etc.)

Note: *In order to verify all updates submitted, CDOT may request additional information from contractors and/or UDBE firms before posting requested changes to the Directory.*

III. Complete the following table to show **all** subcontract bids received (non-UDBE and UDBE), bid dollar amounts for each bid item, and the name of the successful bidder. Where bundled subcontract bids were received, break out quotes per bid item number. If the UDBE bids were rejected, give reasons for each case. If the work is to be counted as a potential UDBE subcontract item, the Contractor cannot elect to perform that work itself when a UDBE bid is competitive or only UDBE bids are received. Cost alone may not be adequate justification for failure to use a UDBE bid. When a non-UDBE bid is significantly lower than a UDBE bid, the Contractor may choose to perform the item itself. CDOT will determine whether a subcontractor's bid is "competitive" based on factors such as the percentage and dollar difference between quote(s), and/or the percentage the quote(s) represents of the overall contract.

CDOT Bid Item # (Break Out Bundled Quotes)	Closest DBE Work Code	Bid Item Description	Subcontractor Name (Place an * next to firm being used)	Actual Bid Item Quote Price	UDBE Firm?	% Difference On Items That UDBE Firms Bid
					☐	
					☐	
					☐	
					☐	
					☐	
					☐	
					☐	
					☐	
					☐	
					☐	
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					☐	
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					☐	
					☐	
					☐	
					☐	

IV. The efforts required herein are not exhaustive or exclusive. Other factors or types of efforts may be relevant in appropriate cases. In determining whether Good Faith Efforts have been made, the quantity and quality of the efforts made as well as kinds of efforts made may be considered. List any additional efforts to increase UDBE contract participation, such as assisting UDBEs in obtaining bonding/insurance/lines of credit, effectively using the services of community organizations/publications, and/or requesting subcontractors to assist with providing UDBE participation. Report the results of such efforts. ***Note:*** *Advertising in a publication with low UDBE subscription rates will not be considered as quality efforts by CDOT*

THE CONTRACTOR UNDERSTANDS THAT DEMONSTRATION OF GOOD FAITH EFFORTS IN ACHIEVING THE UDBE GOALS ESTABLISHED BY CDOT IS REQUIRED THROUGHOUT THE PERFORMANCE OF THE CONTRACT.

Company Name:		Phone	Fax
Title:	Printed Name:	**Signature:**	

HP Geotech
HEPWORTH - PAWLAK GEOTECHNICAL

SUBSOIL STUDY
FOR SITE GRADING AND PAVEMENT DESIGN
PROPOSED ECO REGIONAL TRAIL
DOWD JUNCTION TO MINTURN ROAD
MINTURN, COLORADO

JOB NO. 108 452A

NOVEMBER 28, 2008

PREPARED FOR:

TOWN OF MINTURN
ATTN: CHRIS CERIMELE
302 PINE STREET
MINTURN, COLORADO 81645

TABLE OF CONTENTS

PURPOSE AND SCOPE OF STUDY

This report presents the results of a subsoil study for the proposed ECO Regional Trail from near Dowd Junction to Minturn Road, Minturn, Colorado. The project site is shown on Figure 1. The purpose of the study was to develop recommendations for the site grading and pavement section designs. The study was conducted in accordance with our proposal for geotechnical engineering services to the Town of Minturn dated July 14, 2008.

A field exploration program consisting of exploratory pits was conducted to obtain information on the subsurface conditions. Samples of the subsoils obtained during the field exploration were tested in the laboratory to determine their classification, compressibility or swell and other engineering characteristics. The results of the field exploration and laboratory testing were analyzed to develop recommendations for site grading and pavement section thickness design. This report summarizes the data obtained during this study and presents our conclusions, design recommendations and other geotechnical engineering considerations based on the proposed construction and the subsurface conditions encountered.

PROPOSED CONSTRUCTION

The trail will be about 1150 feet in length and be located between Highway 24 and the Eagle River extending to the northwest of Minturn Road and bridge as shown on Figure 1. The trail will be an asphalt paved recreation path. The terrain along the northwestern 600 feet of the alignment is relatively flat and limited grading will be needed. In this area, cuts and fills will be up to about 3 or 4 feet deep. The terrain along the southeastern 550 feet of the alignment is steeply sloping down from Highway 24 to the river and a mechanically stabilized earth (MSE) retaining wall is planned to retain fill for the trail. The MSE wall will be from about 4 to 8 feet tall. Vehicle traffic along most of the path will be limited to occasional pick-up trucks. At one section of the trail, near Sta. 12+90, heavier truck traffic will access a sewer manhole for maintenance.

If traffic loadings, path alignment or site grading plans change significantly from those described above, we should be notified to re-evaluate the recommendations contained in this report.

SITE CONDITIONS

The terrain at the site varies from strongly sloping in about the northwestern half to steeply sloping in about the southeastern half down to the northeast towards the Eagle River. The slope in the strongly sloping portion is about 4% to 6% and in the steep portion from about 40 to 50%. The steep slope is about 10 to 12 feet high and at the base of the slope is the edge of the Eagle River. Most of the site has undergone previous grading consisting of generally shallow fill placement, probably associated primarily with the Highway 24 and Minturn Road and bridge construction. There is an old barn type structure in the east central part of the site. Vegetation consists of grass and weeds with scattered brush. Most of proposed trail is within Colorado Department of Transportation (CDOT) right of way.

FIELD EXPLORATION

The field exploration for the project was conducted on October 24, 2008. Five exploratory pits were excavated at the locations shown on Figure 1 to evaluate the general subsurface conditions. The pits were dug with a rubber tire backhoe. The pits were logged by a representative of Hepworth-Pawlak Geotechnical, Inc.

Samples of the subsoils were taken with relatively undisturbed and disturbed sampling methods. Depths at which the samples were taken are shown on the Logs of Exploratory Pits, Figure 2. The samples were returned to our laboratory for review by the project engineer and testing.

SUBSOIL CONDITIONS

Graphic logs of the subsurface conditions encountered at the site are shown on Figure 2. The subsoils encountered, below about ½ to 1 foot of organic topsoil or up to about 6 feet of man-placed fill, consisted of up to 2 feet of loose to medium dense, silty clayey sand

with gravel typically overlying relatively dense, silty sandy gravel and cobbles with boulders. At Pit 5, the silty clayey sand with gravel soils were not penetrated to the natural coarse granular soils. The fill was primarily medium dense, clayey to silty sand and gravel with cobbles. At Pit 5, there was about 1 foot of slate rock and debris laden fill underlying the clayey to silty sand and gravel with cobble fill.

Laboratory testing performed on samples obtained from the pits included natural moisture content and density, gradation analyses, and Atterberg limits. Results of swell-consolidation testing performed on a relatively undisturbed sample of the matrix fill soils from Pit 1, presented on Figure 3, indicate moderate compressibility under conditions of loading and wetting. Results of gradation analyses performed on disturbed bulk samples of the fill and natural coarse granular soils (minus 3 to 5 inch fraction) are provided on Figures 4 and 5. The laboratory testing is summarized in Table 1.

No free water was encountered in the pits at the time of excavation and the subsoils were typically moist. The fill at Pit 1 was very moist.

ENGINEERING ANALYSIS

The proposed construction appears feasible based on geotechnical considerations. The existing fill where encountered is of fair to good quality and appears suitable to support the path. We should further evaluate the fill for use as structural fill and subgrade support at the time of construction. Care should be taken to not undermine the existing roadway during excavation for the MSE retaining wall. The following recommendations are provided for preliminary design of the site grading, site retaining walls and pavement section thickness.

DESIGN RECOMMENDATIONS

SITE GRADING

Embankment fills should be compacted to at least 95% of the maximum standard Proctor density (SPD) near optimum moisture content. CDOT right of way requirements may dictate a higher degree of compaction. Structural fill for the pathway can consist of the

on-site predominantly granular soils excluding debris, topsoil and oversized rocks. Prior to fill placement, the subgrade should be carefully prepared by removing all topsoil, scarifying to a depth of about 8 inches, adjusting to near optimum moisture content, and compacting to at least 95% of SPD. The fill should be benched horizontally into the portions of the site with slopes exceeding 20% grade. We should observe the subgrade preparation and fill placement and test and compaction on a regular basis.

Permanent unretained cut and fill slopes should be graded at 2 (horizontal) to 1 (vertical) or flatter and protected against erosion by revegetation or other means. Steeper cut slope grades up to 1½ (h) to 1 (v) may be feasible and can be evaluated if needed. The risk of slope instability will be increased if seepage is encountered in cuts and flatter slopes may be necessary. If seepage is encountered in permanent cuts, exploration and analysis should be conducted to determine if the seepage will adversely affect the cut slope stability.

RETAINING STRUCTURES

Mechanically stabilized earth (MSE) retaining walls can be used to retain the proposed deeper fills at the site. The MSE walls should be designed for appropriate soils parameters and surcharge pressures, and provided with underdrains to prevent build-up of hydro-static pressures behind the walls. For the MSE wall design, an angle of internal friction in the range of 28 to 30 degrees, cohesion of 0 and a moist unit weight in the range of 120 to 125 pcf can be used for the on-site predominantly granular fill and natural fine grained soils. For well graded imported granular materials, such as CDOT Class 1 structural backfill or Class 2, 5 or 6 aggregate base course material, an angle of internal friction in the range of 34 to 36 degrees, cohesion of 0 and a moist unit weight in the range of 130 to 135 pcf can be used. The MSE wall backfill should be compacted to at least 95% SPD at a moisture content within about 2% of optimum. CDOT right of way requirements may dictate a higher degree of compaction. The MSE walls should be designed by a qualified engineer and should be evaluated for both internal and global stability.

The subgrade for the wall foundation could expose existing fill or fine grained soils, and possibly groundwater, which could require subexcavation of unsuitable bearing soils and dewatering. We should observe the foundation excavation for the walls to evaluate the bearing conditions exposed. The portions of the MSE walls adjacent to the river should be protected from undermining as needed.

Boulder walls can also be used to retain shallow cuts and fills at the site. One tier boulder walls up to 6 feet in height appear feasible provided they are designed as gravity retaining structures. The boulders should be angular to subangular in shape and from about 1 to 3 feet in diameter with the larger boulders placed at the bottom of the walls. The base width of the walls should be at least 2/3 of the wall height and the base of the wall keyed below ground surface at least one foot. Loosened subgrade soils should be moistened and compacted prior to the wall construction. The face of the walls should be battered back from the vertical at ½ (h) to 1 (v) or flatter. The space between the boulders should be filled with ¾ inch screened rock. A filter fabric, such as Mirafi 140N, should separate the on-site soils from the ¾ inch screened rock. An underdrain should be provided behind the walls to prevent hydrostatic pressure buildup. We should observe construction of the walls to evaluate compliance the design.

PAVEMENT SECTION THICKNESS

We understand the path will be asphalt paved and vehicle traffic loading on the path generally limited to occasional pick-up trucks. We assume an 18 kip equivalent daily load application (EDLA) of the primarily pedestrian and occasional pick-up traffic areas to be about 3. For the heavier truck access area near Sta. 12+90, we assume an EDLA of about 15. The subgrade soils encountered at the site are somewhat variable consisting of non to low plasticity silty to clayey sandy gravels with AASHTO Classifications of A-2-4 with Group Indices of 0 for the samples tested. These materials are considered fair to good support for pavement sections and slightly susceptible to frost heave. We estimate a Hveem stabilometer 'R' value of about 20 for these soils.

Using CDOT design procedures, the above assumptions and a Regional Factor of 2.0 and a serviceability index of 2.0, we recommend the minimum pavement section thickness

consist of 3 inches of asphalt on 6 inches of base course. For the pavement section in the heavier truck traffic area near Sta. 12+90, we recommend at least of 4 inches of asphalt on 8 inches of base course.

The asphalt should be a batched hot mix, approved by the engineer and placed and compacted to the project specifications. The base course should meet CDOT Class 6 specifications. All base course and required subgrade fill should be compacted to at least 95% of the maximum standard Proctor density at a moisture content within 2% of optimum. CDOT right of way requirements may dictate a higher degree of compaction.

Required fill to establish design subgrade level can consist of the on-site soils, excluding topsoil and oversized rocks, or suitable granular material can be imported. Prior to fill placement, all topsoil should be removed, the subgrade scarified to a depth of 8 inches and adjusted to near optimum moisture, and compacted to at least 95% of standard Proctor density. The suitability of the existing fill for subgrade support, and for suitability as structural fill material, should be evaluated at the time of construction. In soft or wet areas, the subgrade may require drying or stabilization prior to fill placement. A geogrid and/or subexcavation and replacement with aggregate base soils may be needed for the stabilization. The subgrade should be proofrolled. Areas that deflect excessively should be corrected before placing pavement materials. The subgrade improvements and placement and compaction of base and asphalt materials should be monitored on a regular basis by a representative of the geotechnical engineer

LIMITATIONS

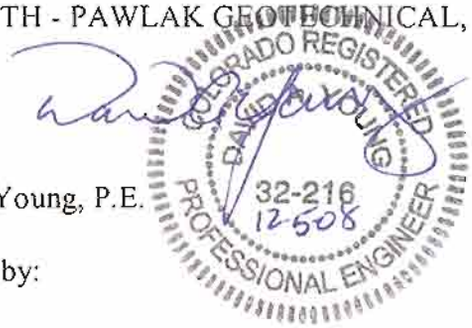
This study has been conducted in accordance with generally accepted geotechnical engineering principles and practices in this area at this time. We make no warranty either express or implied. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings drilled at the locations indicated on Figure 1, the proposed type of construction and our experience in the area. Our findings include interpolation and extrapolation of the subsurface conditions identified at the exploratory borings and variations in the subsurface conditions may not

become evident until excavation is performed. If conditions encountered during construction appear different from those described in this report, we should be notified so that re-evaluation of the recommendations may be made.

This report has been prepared for the exclusive use by our client for preliminary design purposes. We are not responsible for technical interpretations by others of our information. As the project evolves, we should provide continued consultation and field services during construction to review and monitor the implementation of our recommendations, and to verify that the recommendations have been appropriately interpreted. Significant design changes may require additional analysis or modifications to the recommendations presented herein. We recommend on-site observation of excavations and foundation bearing strata and testing of structural fill by a representative of the geotechnical engineer.

Respectfully Submitted,

HEPWORTH - PAWLAK GEOTECHNICAL, INC.



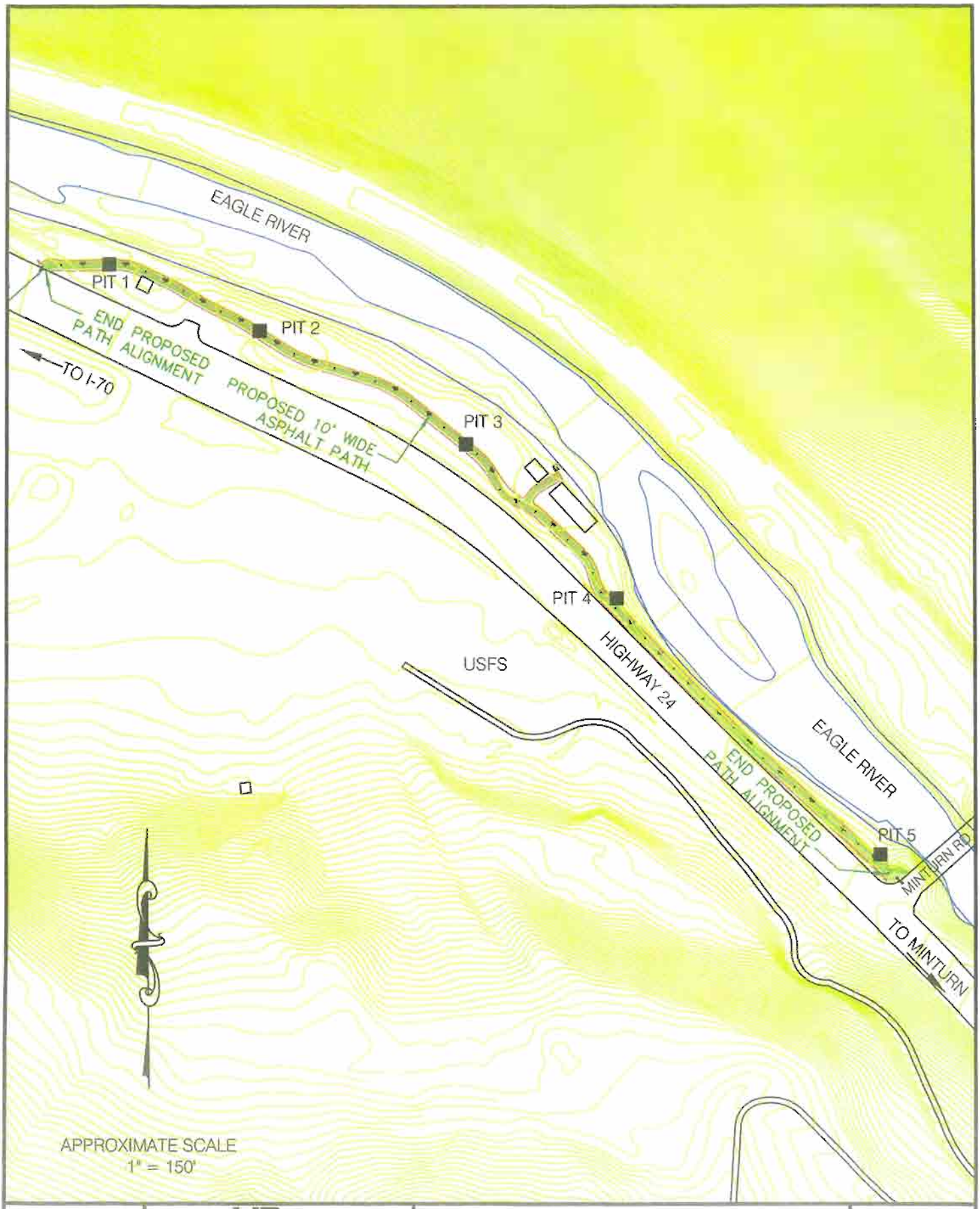
David A. Young, P.E.

Reviewed by:

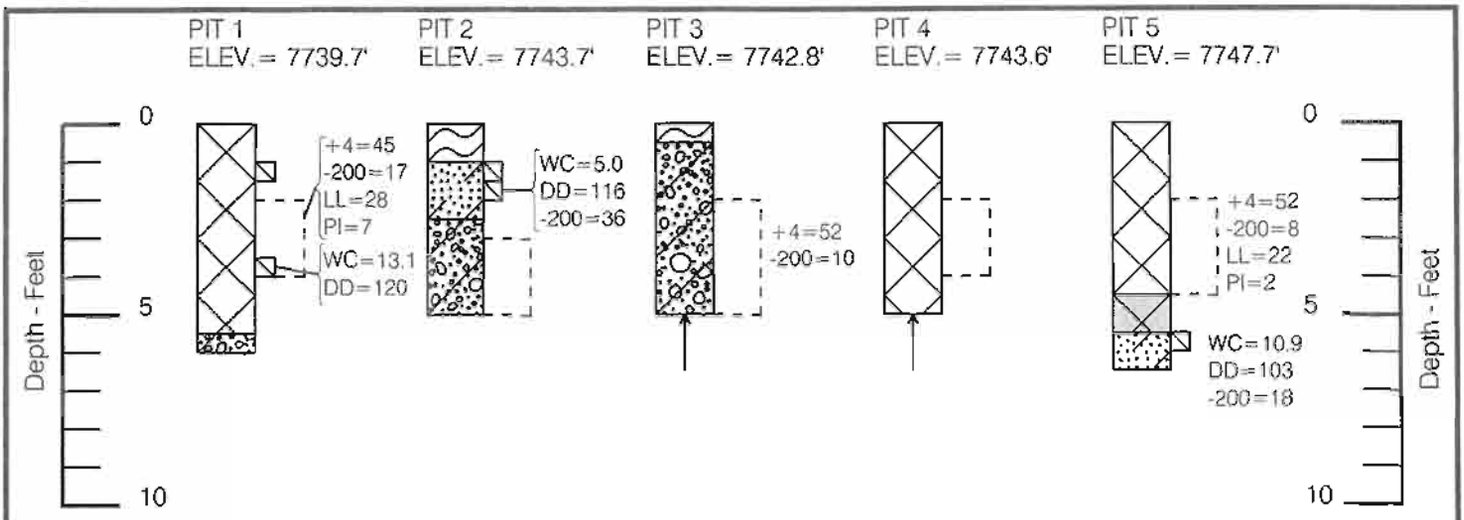
Daniel E. Hardin, P.E.

DAY/vam

cc: Alpine Engineering – Attn: Gary Brooks (brooks@alpinecivil.com)
ECO Trails – Attn: Ellie Caryl (ellie.caryl@eaglecounty.us)



108 452A	HP Geotech Hepworth–Pawlak Geotechnical	LOCATION OF EXPLORATORY PITS	Figure 1



LEGEND:

FILL; man-placed, clayey to silty sand and gravel with cobbles and small boulders, medium dense, moist to very moist at Pit 1, brown to dark brown.

FILL; man-placed, primarily cobble size slate rocks mixed with debris, moist, gray.

TOPSOIL; organic sandy silty clay, moist, dark brown.

SAND (SM-SC); silty clayey, gravelly, loose to medium dense, moist, brown to red-brown

GRAVEL AND COBBLES (GM-GP); with boulders, sandy, slightly silty, dense, moist, brown, rocks are primarily subrounded to rounded.

2" Diameter hand driven liner sample.

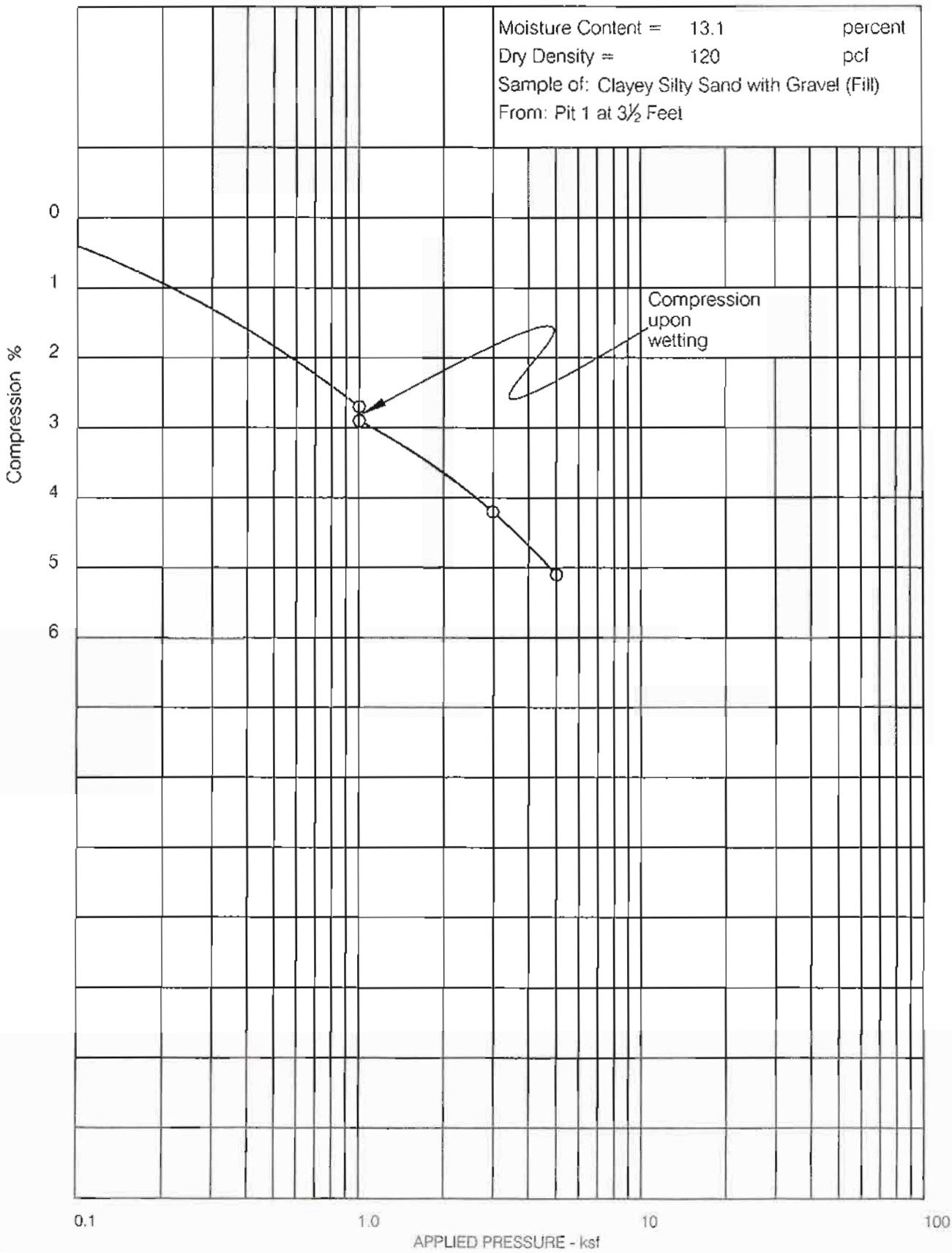
Disturbed bulk sample.

Practical digging refusal on boulder.

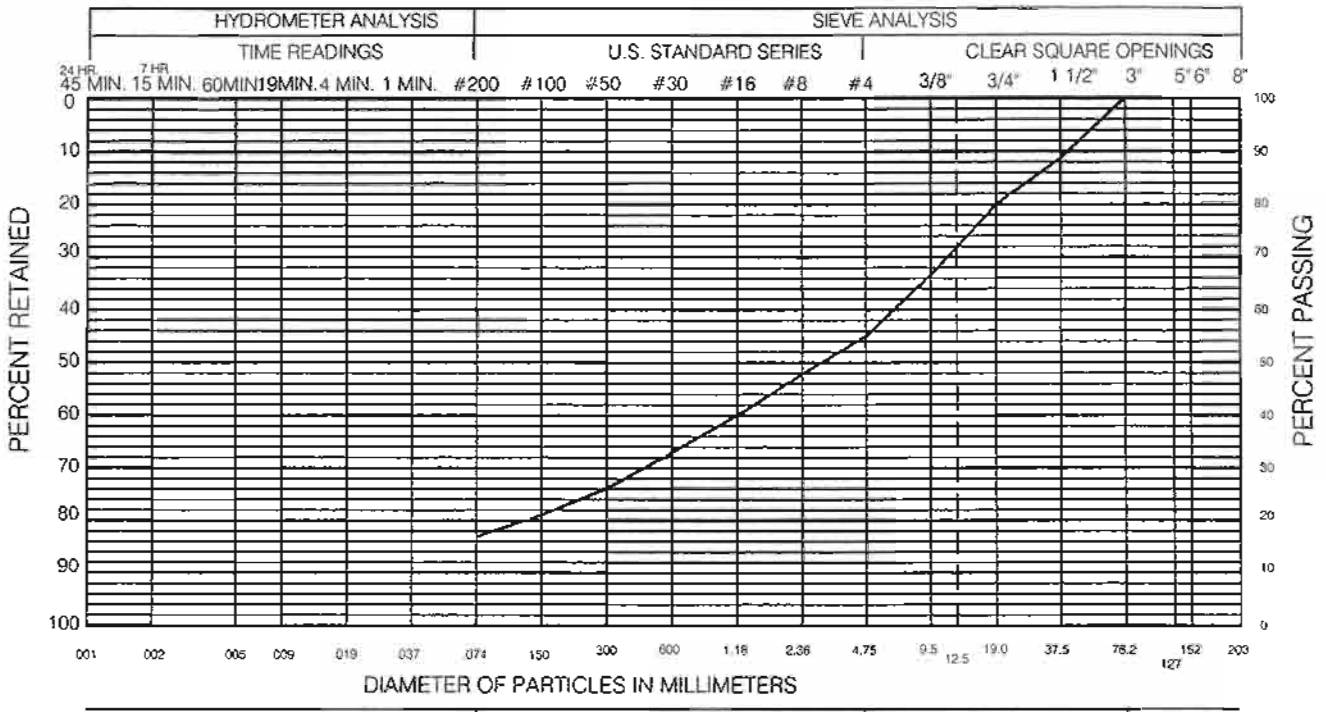
NOTES:

1. Exploratory pits were excavated on October 24, 2008 with a Deere mini-excavator.
2. Locations and elevations of exploratory pits were provided by Alpine Engineering. Logs of pits are drawn to depth.
3. The lines between materials shown on the exploratory pit logs represent the approximate boundaries between material types and transitions may be gradual.
4. No free water was encountered in the pits at the time of excavating. Fluctuation in water level may occur with time.
5. Laboratory Testing Results:
   - WC = Water Content (%)
   - DD = Dry Density (pcf)
   - +4 = Percent retained on the No. 4 sieve
   - -200 = Percent passing No. 200 sieve
   - LL = Liquid Limit (%)
   - PI = Plasticity Index (%)

108 452A	HP Geotech Hepworth–Pawlak Geotechnical	LOGS OF EXPLORATORY PITS	Figure 2



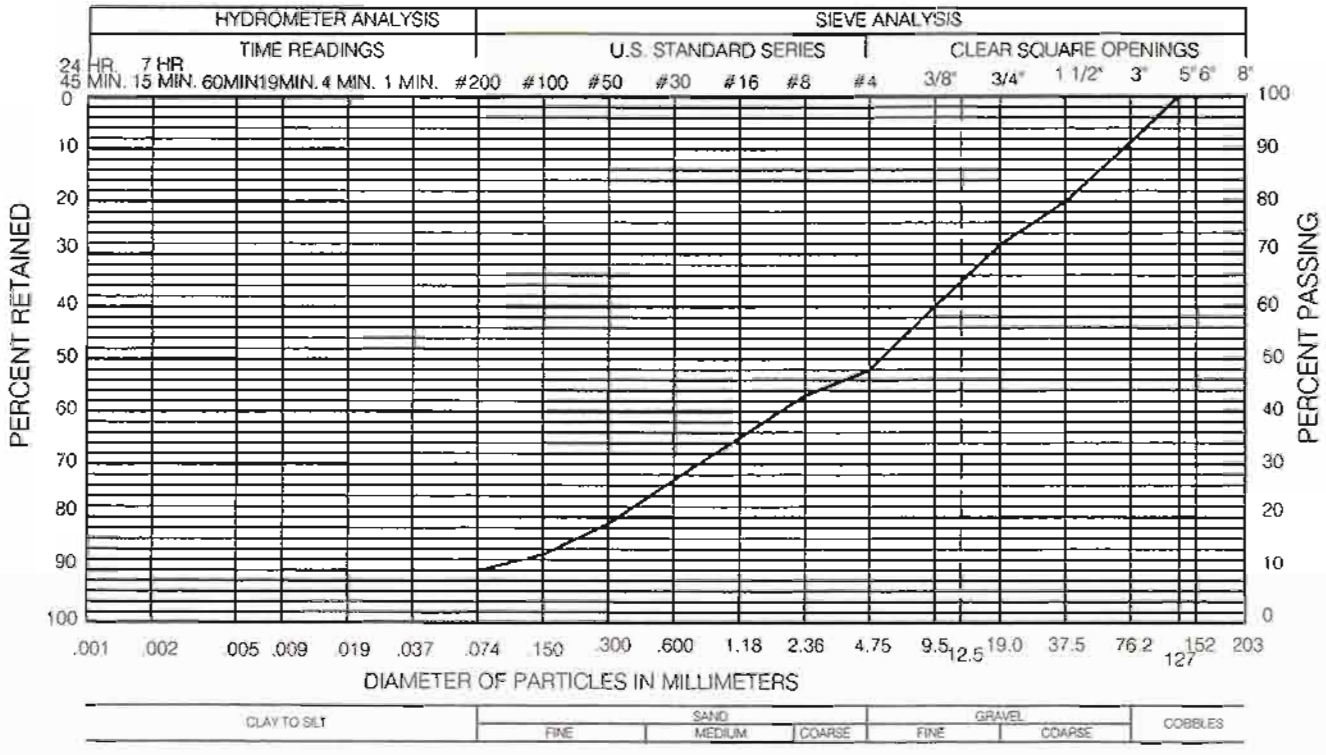
108 452A	HP Geotech Hepworth–Pawlak Geotechnical	SWELL-CONSOLIDATION TEST RESULTS	Figure 3



GRAVEL 45 % SAND 38 % SILT AND CLAY 17 %

LIQUID LIMIT 28 % PLASTICITY INDEX 7 %

SAMPLE OF: Clayey Silty Sandy Gravel (Fill) FROM: Pit 1 at 2 to 4 Feet

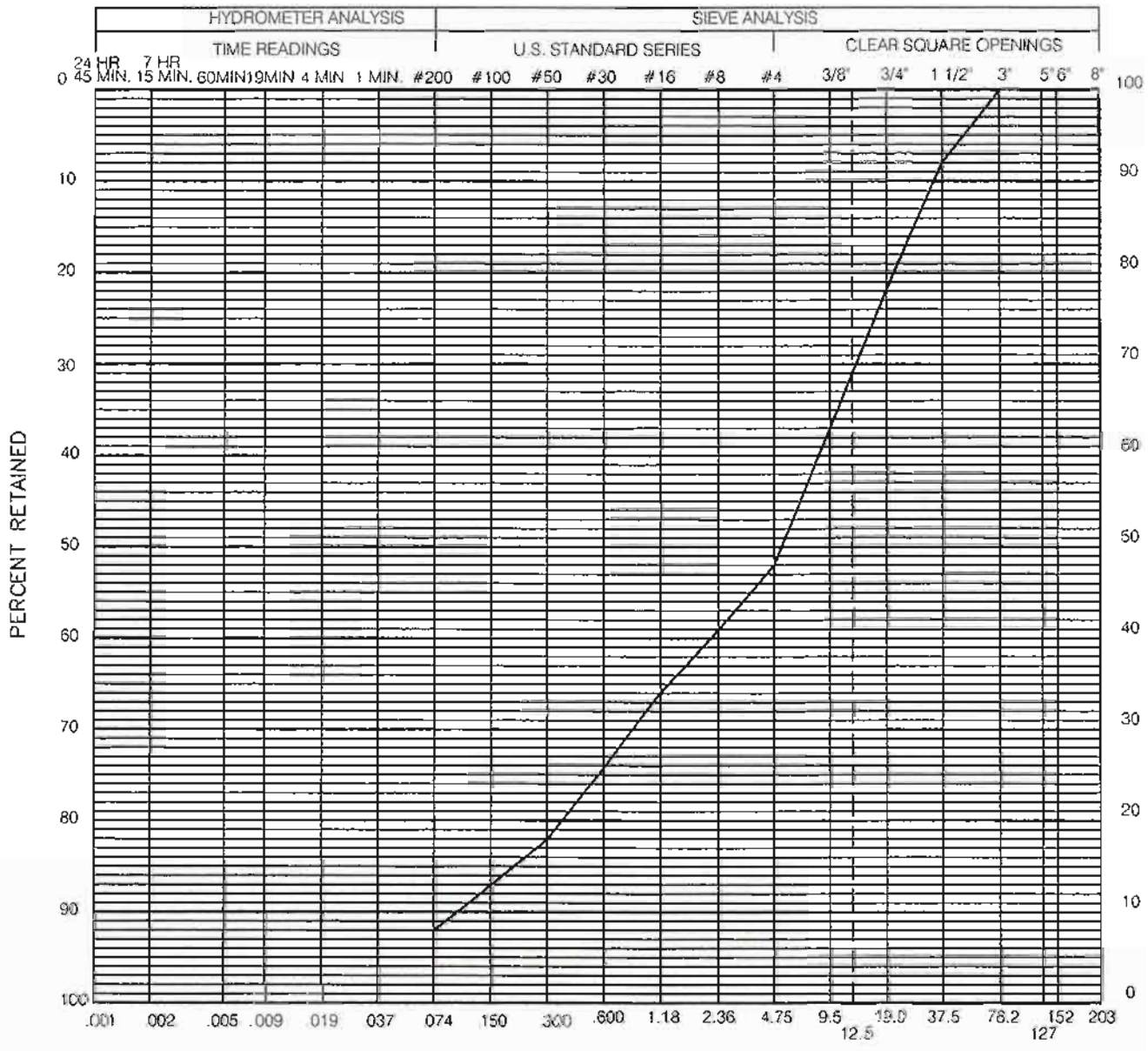


GRAVEL 52 % SAND 38 % SILT AND CLAY 10 %

LIQUID LIMIT % PLASTICITY INDEX %

SAMPLE OF: Slightly Silty Sandy Gravel with Cobbles FROM: Pit 3 at 2 to 5 Feet

108 452A	HP Geotech Hepworth–Pawlak Geotechnical	GRADATION TEST RESULTS	Figure 4



GRAVEL 52 % SAND 40 % SILT AND CLAY 8 %

LIQUID LIMIT 22 % PLASTICITY INDEX 2 %

SAMPLE OF: Silty Sandy Gravel (Fill) FROM: Pit 5 at 2 to 4½ Feet

108 452A	HP Geotech Hepworth–Pawlak Geotechnical	GRADATION TEST RESULTS	Figure 5

HEPWORTH-PAWLAK GEOTECHNICAL, INC.

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

Job No. 108 452A

SAMPLE LOCATION		NATURAL MOISTURE CONTENT	NATURAL DRY DENSITY	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH	AASHTO Classification	SOIL OR BEDROCK TYPE
PIT	DEPTH (ft)	(%)	(pcf)	GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTIC INDEX (%)	(PSF)		
1	2-4			45	38	17	28	7		A-2-4(0)	Clayey silty sandy gravel (fill)
	3½	13.1	120								Clayey silty sand with gravel (fill)
2	1½	5.0	116			36					Silty clayey sand with gravel
3	2-5			52	38	10					Slightly silty sandy gravel with cobbles
5	2-4½			52	40	8	22	2		A-2-4(0)	Silty sandy gravel (fill)
	5	10.9	103			18					Clayey silty sand with gravel

Terracon

COPY

March 4, 2009.

Eco Trails of Eagle County
P.O Box 1070
Gypsum, CO. 81637

Attn: Mr. Harry Taylor
Director

Re: **Engineering Design Services**
Proposed MSE Retaining Wall
Eco Regional Trail
Dowd Junction to Minturn Road
Minturn, Colorado
Terracon Project No 65095802

At your request, Terracon Consultants, Inc. (Terracon) has completed engineering design of the proposed MSE retaining walls for the referenced project. Our design services have been completed subject to the Terracon Proposal No G081287 dated December 19, 2008. Engineering plans and calculations used in the design of the retaining walls are attached. Supporting design documentation, including geogrid and connection strength data are also attached. Sheet RW-2 of the project plans provides the Technical Scope of Work, along with material requirements and specifications for construction of the retaining walls.

The engineering design has been completed on the basis of information provided to Terracon as outlined in Section 1.03 of the Technical Scope of Work as shown on Sheet RW-2 of the project plans. The engineering design has been based on the following assumed geotechnical parameters:

Wall Area	Cohesion, c psf	Internal Friction (ϕ)	Unit Weight (γ) pcf
Reinforced (CDOT Class 1)	--	34	130
Retained	--	28	125
Foundation	--	28	125
Foundation (global analyses)	100	30	125

The Geotechnical Engineer shall confirm that the actual foundation conditions meet or exceed assumed design assumptions Scour protection should be provided to avoid erosion at the base of the wall.

With this submittal, our engineering design services for the project are complete The Technical Scope of Work also calls for certain testing, inspection and post design engineering services. Terracon is available to discuss the scope of work that you may require of us for post design services on this project.

NCMA DESIGN METHOD
Eco Regional Trail

PROJECT IDENTIFICATION

Title:	Eco Regional Trail
Project Number:	65095802
Client:	Eco Trails of Eagle County
Designer:	AMV
Station Number:	Wall A, Sta 1+15

Description:

Company's information:

Name: Terracon Consulltants
Street: 4685 S. Ash Ave. Suite H-4

Tempe, AZ 85282
Telephone #: 480-897-8200
Fax #: 480-897-1133
E-Mail: amvieira@terracon.com

Original file path and name: N:\Projects\2009\65095802\Submittal 1\Calculation\MSEW-.....
.....on\MSEW-STA 1+15.BEN
Original date and time of creating this file: Thu Feb 12 09:41:27 2009

PROGRAM MODE:

ANALYSIS
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

SOIL DATA

REINFORCED SOIL

Unit weight, γ	130.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

RETAINED SOIL

Unit weight, γ	125.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	28.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight, γ_{equiv}	125.0 lb/ft ^{3}
Equivalent internal angle of friction, ϕ_{equiv}	28.0 °
Equivalent cohesion, c_{equiv}	0.0 lb/ft ^{2}

Water table is at wall base elevation

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2543
Inclination of internal slip plane, ψ = 58.35°.
Ka (external stability) = 0.3189

BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 0.00 N γ = 3.51

SEISMICITY

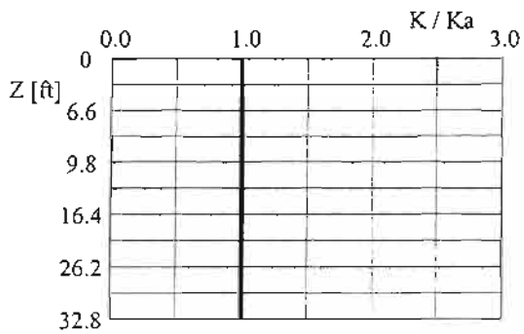
Not Applicable

INPUT DATA: Geogrids
(Analysis)

D A T A	Geogrid type #1	Geogrid type #2	Geogrid type #3	Geogrid type #4	Geogrid type #5
Tult [lb/ft]	3500.0				
Durability reduction factor, RFd	1.10				
Installation-damage reduction factor, RFid	1.20				
Creep reduction factor, RFc	1.58	N/A	N/A	N/A	N/A
Fs-overall for strength	N/A				
Coverage ratio, Rc	1.000				
Cds = tan(ro) / tan(Phi.reinforced)	0.58				
Ci	0.80	N/A	N/A	N/A	N/A

Variation of Lateral Earth Pressure Coefficient With Depth

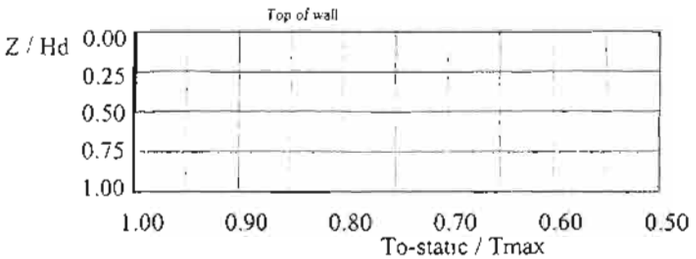
Z	K / Ka
0 ft	1.00
3.3 ft	1.00
6.6 ft	1.00
9.8 ft	1.00
13.1 ft	1.00
16.4 ft	1.00
19.7 ft	1.00



INPUT DATA: Facia and Connection
(Analysis)

FACIA type: Facing enabling frictional connection of reinforcement (e.g., modular concrete blocks, gabions)
Depth/height of block is 1.00/0.67 ft. Horizontal distance to Center of Gravity of block is 0.50 ft.
Average unit weight of block is γ_r = 125.00 lb/ft ^{3}

Z / Hd	To-static / Tmax
0.00	1.00
0.25	1.00
0.50	1.00
0.75	1.00
1.00	1.00



Peak Strength Criterion

Geogrid Type #1 Weight of blocks	(1) Tultconn (2)	Geogrid Type #2 Weight of blocks	Tultconn	Geogrid Type #3 Weight of blocks	Tultconn	Geogrid Type #4 Weight of blocks	Tultconn	Geogrid Type #5 Weight of blocks	Tultconn
0.0	1000.00								
3476.9	1997.00	N/A		N/A		N/A		N/A	

Service Strength Criterion @ 3/4"

Geogrid Type #1 Weight of blocks	(3) Tconn @ 3/4"	Geogrid Type #2 Weight of blocks	Tconn @ 3/4"	Geogrid Type #3 Weight of blocks	Tconn @ 3/4"	Geogrid Type #4 Weight of blocks	Tconn @ 3/4"	Geogrid Type #5 Weight of blocks	Tconn @ 3/4"
0.0	700.00								
3476.5	1313.00	N/A		N/A		N/A		N/A	

Ultimate Strength Criterion

Weight of blocks	Vu (4)
0.0	770.00
3984.1	2800.00

Service Strength Criterion

Weight of blocks	Vu' (5)
0.0	770.00
3984.1	2800.00

(1) (2) (3) (4) (5) Weight of blocks, Tultconn., Tconn@3/4", Vu and Vu' are in [lb/ft]

D A T A (for connection only)	Type #1	Type #2	Type #3	Type #4	Type #5
Product Name	Strata SG..	N/A	N/A	N/A	N/A
Durability reduction factor, RFd	1.00	N/A	N/A	N/A	N/A
Creep reduction factor, RFc	1.00	N/A	N/A	N/A	N/A
Overall factor of safety: connection break, Fs	N/A	N/A	N/A	N/A	N/A
Overall factor of safety: connection pullout, Fs	N/A	N/A	N/A	N/A	N/A

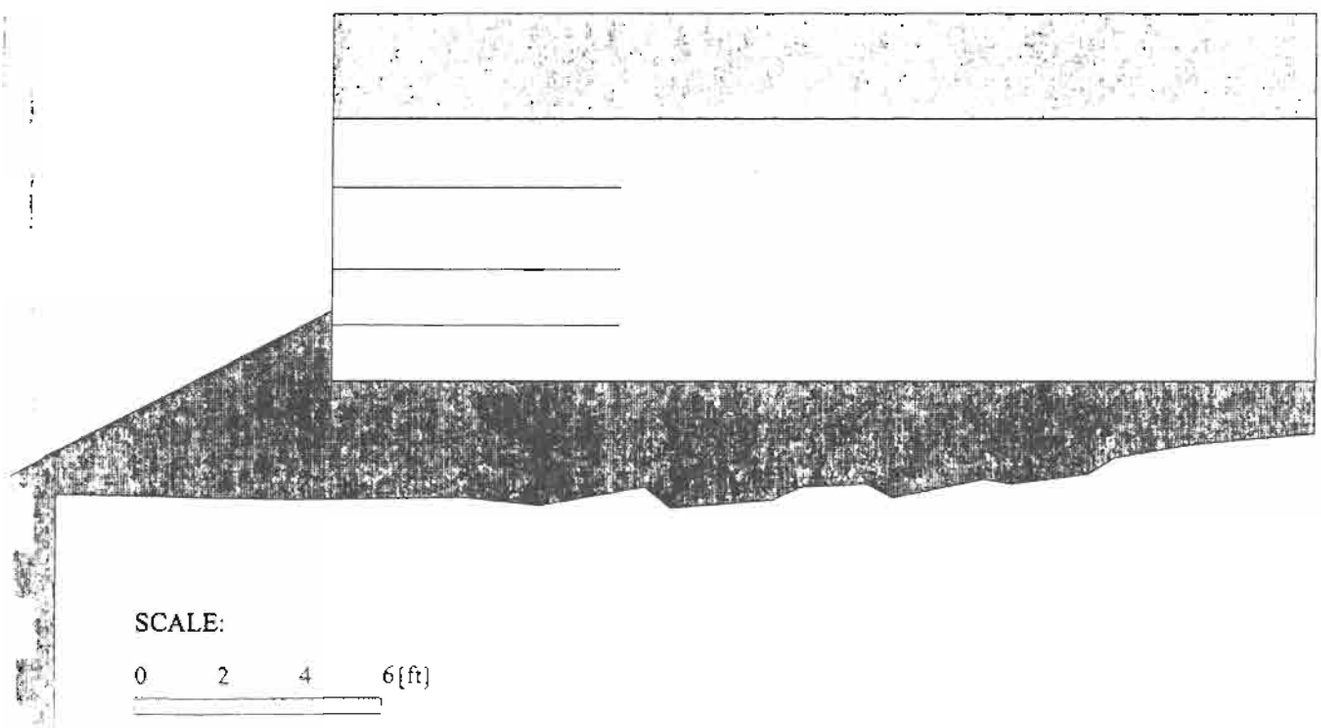
INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	6.33	[ft]	{ Embedded depth is E = 1.68 ft, and height above top of finished bottom grade is H = 4.65 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00°

UNIFORM SURCHARGE

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 250.0 [lb/ft ²]

ANALYZED REINFORCEMENT LAYOUT:



SCALE:

0 2 4 6[ft]

ANALYSIS: CALCULATED FACTORS (Static conditions)

Bearing capacity, Fs = 2.44, Meyerhof stress 1097 lb ft-

Foundation Interface: Direct sliding, Fs = 2 342, Eccentricity, e/L = 0.0881, Fs-overturning = 5.53

GEOGRID				CONNECTION							
#	Elevation [ft]	Length [ft]	Type #	Fs @ 3/4" [service criterion]	Fs-peak [failure criterion]	Fs-overall [geogrid strength]	Geogrid strength Fs	Pullout resistance Fs	Direct sliding Fs	Eccentricity e/L	Product name
1	1.33	6.00	1	1.90	2.76	3.97	3.974	6.484	3.162	0.0602	Strata SG ..
2	2.67	6.00	1	3.61	5.23	7.84	7.842	7 319	4 254	0 0365	Strata SG ..
3	4.00	6.00	1	2 81	4.05	6.34	6.342	2 686	6.653	0.0175	Strata SG ..

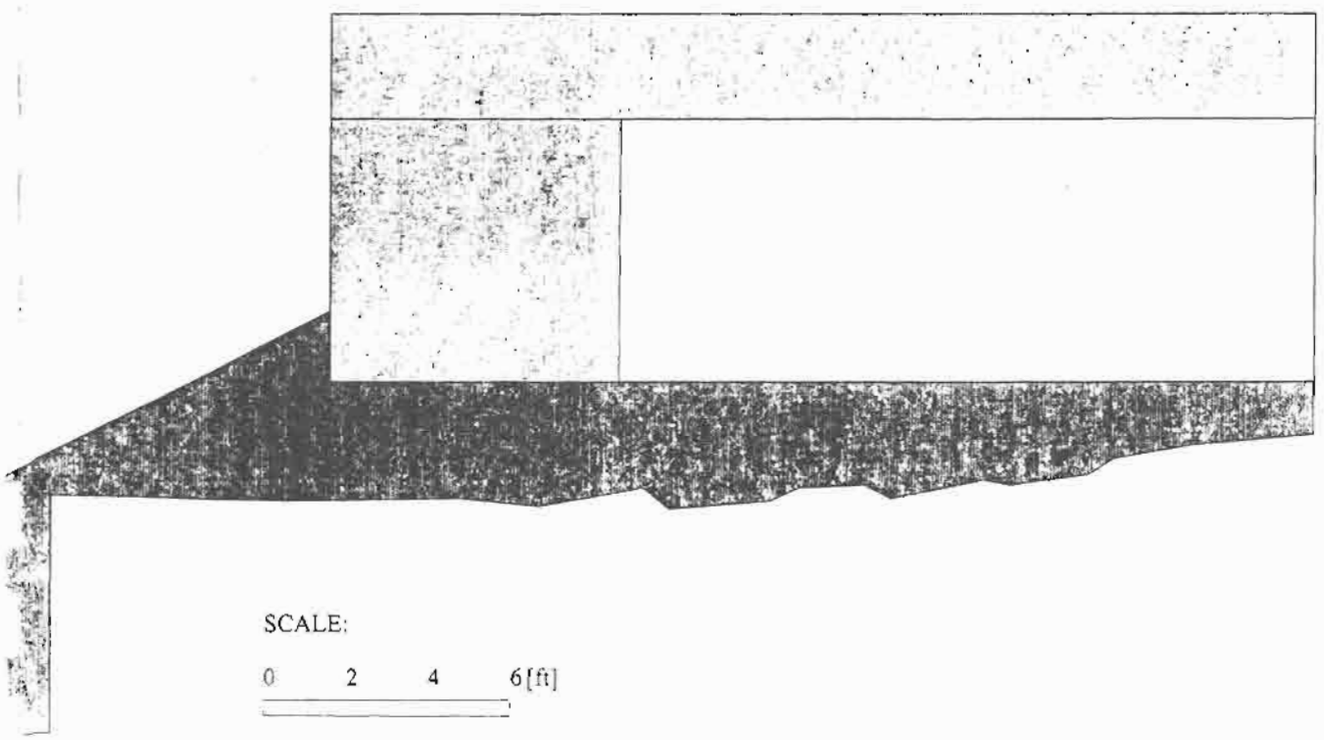
GLOBAL/COMPOUND STABILITY ANALYSIS (Using Bishop method and ROR = 0.0)

For the specified search grid, the calculated minimum Fs is 1.616

(it corresponds to a critical circle at Xc = -3.00, Yc = 10.47 and R = 13.47 [ft]).

BEARING CAPACITY for GIVEN LAYOUT

	STATIC	SEISMIC	UNITS
(Water table is at wall base elevation)			
Ultimate bearing capacity, q-ult	2253	N/A	[lb/ft ^{2}]
Meyerhof stress, σ_v	1123.9	N/A	[lb/ft ^{2}]
Eccentricity, e	0.28	N/A	[ft]
Eccentricity, e/L	0.041	N/A	
Fs calculated	2.00	N/A	
Base length	7.00	N/A	[ft]



SCALE:

0 2 4 6 [ft]

DIRECT SLIDING for GIVEN LAYOUT
(for GEOGRID reinforcements)

Along reinforced and foundation soils interface: Fs-static = 2.342

#	Geogrid Elevation [ft]	Geogrid Length [ft]	Fs Static	Fs Seismic	Geogrid Type #	Product name
1	1.33	6.00	3.162	N/A	1	Strata SG 200
2	2.67	6.00	4.254	N/A	1	Strata SG 200
3	4.00	6.00	6.653	N/A	1	Strata SG 200

ECCENTRICITY for GIVEN LAYOUT

At interface with foundation: e/L static = 0.0881; Overturning: Fs-static = 5.53

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	1.33	6.00	0.0602	N/A	1	Strata SG 200
2	2.67	6.00	0.0365	N/A	1	Strata SG 200
3	4.00	6.00	0.0175	N/A	1	Strata SG 200

RESULTS for STRENGTH Live Load included in calculating Tmax

#	Geogrid Elevation [ft]	Tavailable [lb/ft]	Tmax [lb/ft]	Tmd [lb/ft]	Specified minimum Fs-overall static	Actual calculated Fs-overall static	Specified minimum Fs-overall seismic	Actual calculated Fs-overall seismic	Product name
1	1.33	1678	442.45	N/A	N/A	3.793	N/A	N/A	Strata SG ..
2	2.67	1678	275.98	N/A	N/A	6.081	N/A	N/A	Strata SG ..
3	4.67	1678	263.93	N/A	N/A	6.358	N/A	N/A	Strata SG ..

RESULTS for PULLOUT Live Load included in calculating Tmax

NOTE: Live load is not included in calculating the overburden pressure used to assess pullout resistance.

#	Geogrid Elevation [ft]	Coverage Ratio	Tmax [lb/ft]	Tmd [lb/ft]	Le [ft] (see NOTE)	La [ft]	Avail.Static Pullout, Pr [lb/ft]	Specified Static Fs	Actual Static Fs	Avail.Seism. Pullout, Pr [lb/ft]	Specified Seismic Fs	Actual Seismic Fs
1	1.33	1.000	442.4	N/A	5.18	0.82	3632.8	N/A	8.211	N/A	N/A	N/A
2	2.67	1.000	276.0	N/A	4.35	1.65	2235.7	N/A	8.101	N/A	N/A	N/A
3	4.67	1.000	263.9	N/A	3.12	2.88	727.0	N/A	2.754	N/A	N/A	N/A

RESULTS for CONNECTION (static conditions)

Live Load included in calculating Tmax

#	Geogrid Elevation [ft]	Connection force, To [lb/ft]	FS - Bulging		Available connection strength, Tcl-failure criterion [lb/ft]	Available connection strength, Tcs-service criterion [lb/ft]	Available Geogrid strength, Tavailable [lb/ft]	Fs-overall connection peak		Fs-overall connection service		Fs-overall Geogrid strength		Product name
			Peak	Deformation				Specified	Actual	Specified	Actual	Specified	Actual	
1	1.33	422	8.35	8.35	1167	803	1678	N/A	2.76	N/A	1.90	N/A	3.97	Strata SG ..
2	2.67	214	9.84	9.84	1119	773	1678	N/A	5.23	N/A	3.61	N/A	7.84	Strata SG ..
3	4.00	265	5.03	5.03	1072	744	1678	N/A	4.05	N/A	2.81	N/A	6.34	Strata SG ..

GLOBAL/COMPOUND STABILITY ANALYSIS (Using Bishop method and ROR = 0.0)

For the specified search grid, the calculated minimum Fs is 1.608
(it corresponds to a critical circle at Xc = -3.17, Yc = 11.56 and R = 14.43 [ft] where (x=0, y=0) is taken at the TOE or Xc = 13.50, Yc = 111.56 and R = 14.43 [ft] when the terrain coordinate system is used as shown in the table below.)

TERRAIN/WATER PROFILE

Point	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
Soil layer #1:	γ = 125.00 [lb/ft^3]			ϕ = 30.0°		c = 100.00 [lb/ft^2]					
x [ft]	0.0	1.0	2.6	3.0	4.0	16.6	43.0	44.0	45.0	47.5	50.0
y [ft]	95.4	95.4	95.4	95.4	95.4	101.7	100.0	100.0	100.0	120.0	120.0
Water table:											
x [ft]	0.0	2.0	4.0	5.0	6.0	8.0	9.9	10.1	12.0	19.0	20.0
y [ft]	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5