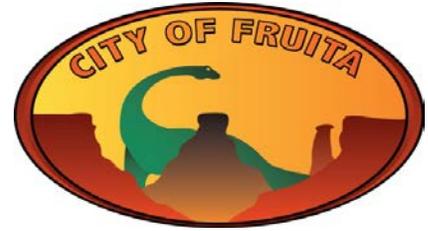


# Lower Little Salt Wash Riverfront Trail Connection

CDOT Project # STE M505 006 (18643)  
Fruita Project #130 791 77 4730



## ADDENDUM NO. 1

Date Issued: October 2, 2015  
Bids Due: October 6, 2015  
Time: 1:30 PM  
Location: 325 E. Aspen Ave.  
Fruita, CO 81521

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The items contained in this Addendum #1 are hereby issued to clarify questions received prior to the deadline or discussed at the Mandatory Pre-Bid Meeting. The information presented herein shall supersede any previously issued Bid Documents and/or information.

This Addendum shall include the following enclosed Exhibits:

- A. Revised Bid Schedule (2 Pages)
- B. Pre-Bid Meeting Attendance Sheet (2 Pages)
- C. Pre-Bid Meeting Minutes (9 Pages)
- D. Traffic Control Plan – I-70 Temporary Access
- E. Required CDOT Forms (606, 1413, 1414) (3 Pages)
- F. Email Text with Instructions and UPRR Contractor's Right of Entry Agreement (15 Pages)
- G. Project Geotechnical Report (51 Pages)

Note that CDOT Bid Forms can also be downloaded directly from the CDOT website at: <https://www.codot.gov/business/bidding/Bidding%20Forms/Bid%20Forms>

This is the only Addendum issued for the Lower Little Salt Wash Riverfront Trail Connection project. The Contractor shall acknowledge receipt of this Addendum on the Bid Schedule to be considered a responsive bid. This addendum does not change the deadline to submit a bid.

# Exhibit A

## Revised Bid Schedule

**BID SCHEDULE**

Lower Little Salt Wash Riverfront Trail Connection

Federal Aid Project STE M505 006

Project Code No. 18643

Date: 10/1/2015

ITEM	CONTRACT ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
107	Quality Control Testing - Contractor	1	LS		
201	Clearing and Grubbing	1	LS		
202	Removal of Existing Fence	696	LF		
202	Removal of Gate	1	Ea		
202	Removal of Tree	1	Ea		
203	Unclassified Excavation	1,467	CY		
203	Unclassified Excavation (Complete in Place)	4,195	CY		
206	Structure Excavation	687	CY		
206	Structure Backfill (Class 1)	362	CY		
206	Subgrade Stabilization	303	CY		
207	Topsoil	3,000	CY		
207	Stockpile Topsoil	3,000	CY		
208	Sweeping	60	HR		
208	Silt Berm	3,600	LF		
208	Erosion Log (12-Inch)	150	LF		
208	Concrete Washout Structure	5	Ea		
208	Erosion Control Supervisor	75	DAY		
208	Vehicle Tracking Pad	6	Ea		
210	Modify Bridge Drains	1	LS		
210	Relay Riprap	52	CY		
210	Adjust Manhole	2	Ea		
212	Seeding (Native)	2	AC		
212	Soil Conditioning	2	AC		
213	Mulching (Weed Free)	2	AC		
213	Mulch Tackifier	100	LB		
304	Aggregate Base Course (Class 6)	2,017	CY		
502	HP Piling (HP 12x74)	185	LF		
504	Retaining Wall	459	FF		
506	Riprap (12 Inch)	35	CY		
506	Riprap (16 Inch)	466	CY		
514	Pedestrian Railing (Steel)	258	LF		
601	Concrete Class D	140	CY		
602	Reinforcing Steel	15,989	LB		
603	18 Inch Reinforced Concrete Pipe	108	LF		
604	Inlet Type C (3 foot 6 inch)(Close Mesh)	2	Ea		
607	Fence (Temporary)	150	LF		
607	Barrier Fence with Studded Tee Line Posts (42 Inch)	357	LF		
607	Trail Closure Gate	3	Ea		
607	16 Foot Gate	1	Ea		
607	Corner Brace and Post	1	Ea		
608	Concrete Sidewalk (6 Inch)	5,100	SY		
608	Concrete Sidewalk (6 Inch)(Colored)	254	SY		
608	Concrete Sidewalk (12 Inch)(Colored)	48	SY		
608	Sidewalk Drain	14	LF		

ITEM	CONTRACT ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
614	Sign Panel (Class 1)	41	SF		
614	Steel Sign Post (U-2)	17	Ea		
620	Sanitary Facility	2	Ea		
622	Bollard	2	Ea		
625	Construction Surveying	1	LS		
626	Mobilization	1	LS		
627	Pavement Marking	11	Gal		
628	Pre-Fabricated Structural Steel Bridge	1	EA		
630	Construction Zone Traffic Control	1	LS		
630	Railroad Zone Traffic Control	1	LS		
700	Railroad Insurance	1	LS		
700	F/A Minor Contract Revisions	1	FA	\$75,000.00	\$75,000.00
700	F/A Fuel Cost Adjustment	1	FA	\$1,000.00	\$1,000.00
700	F/A OJT Colorado Training Program	1	FA	\$1,000.00	\$1,000.00
700	F/A On The Job Trainee	240	HR	\$2.00	\$480.00

**TOTAL BASE BID**

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Acknowledgement of Addenda:

Addendum #1

Date: \_\_\_\_\_ Initials \_\_\_\_\_

Company Name: \_\_\_\_\_

By: \_\_\_\_\_

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

# Exhibit B

## Pre-Bid Meeting Attendance Sheet

**MANDATORY PRE-BID MEETING  
LOWER LITTLE SALT WASH RIVERFRONT TRAIL CONNECTION**

**September 28, 2015, 1:30 PM  
CDOT PROJECT NUMBER: STE M505-006 (18643)  
BID OPENING: October 6, 2015; 1:30 PM**

Representative/Company Name	Mailing Address	Phone	E- Mail	Fax
Ken Haley City of Fruita	325 E Aspen Ave, Ste 155 Fruita, CO 81521	(970) 858-8377	khaley@fruita.org	(970) 858-0210
John Vasey City of Fruita	325 E Aspen Ave, Ste 155 Fruita, CO 81521	(970) 858-8377 (970) 433-8523	jvasey@fruita.org	(970) 858-0210
Sam Atkins City of Fruita	325 E Aspen Ave, Ste 155 Fruita, CO 81521	(970) 858-8377	satkins@fruita.org	(970) 858-0210
BILL OGLE SOUTER CONSTRUCTION, INC	2802 HAWK RD GT CO 81503	(970) 242-4436	bill@souterdigs.com souter@souterdigs.com	242-9040
TRICK DAVIS MTN. VALLEY CONTRACTING	2481 Commerce Blvd. G.J., Co. 81505	(970) 245-1990	TRICK@MVCST.COM	248-9155
Nick Worley Hudspeth + Associates	820 Megan Ave #C Rifle, CO 81650	970-309-8272	nworley@hudspethinc.com	625-5715
Jolene Mulumba Yeh & Associates, Inc	588 N Commercial Dr. GT, CO 81505	970-242-5125	jmulumba@yeh-eng.com srichards@yeh-eng.com	970-255-8512
Andy Fizecraga M.A. Concrete Const. Inc	2323 River Rd G.J., CO 81505	970-243-3221	MACONCREKARDY@BRESMAN.NET	970-243-9767

**MANDATORY PRE-BID MEETING**  
**LOWER LITTLE SALT WASH RIVERFRONT TRAIL CONNECTION**

September 28, 2015, 1:30 PM  
 CDOT PROJECT NUMBER: STE M505-006 (18643)  
 BID OPENING: October 6, 2015; 1:30 PM

Representative/Company Name	Mailing Address	Phone	E-Mail	Fax
Kevin Combs MAYS CONCRETE	1399 RIVERSIDE HWY GRAND LCT. CO 81505	243-5669	KCOMBS@MAYSCONCRETE.COM	243-2661
Buzz Bigum MAYS	" "	" "	BIGUM@MAYS CONCRETE.COM	" "
Dave McCowen CDOT	606 S 9TH ST G-T @ 81301	970 545-7352	DAVID.MCCOWEN @STATE.CO.US	
Rick Zink	2937 EL TORO RD Grand Junction	970 549-6549	Rick.Zink@ GJRMK.COM	
JUDIE GREIN	405 RIDGEVIEW STE A GJ 81507	9702438300	KENT@ RCEGJ.COM	

# Exhibit C

## Pre-Bid Meeting Minutes

**Lower Little Salt Wash Riverfront Trail Connection  
Pre-Bid Meeting Minutes  
City of Fruita**

**September 28, 2015 1:30 PM  
Mandatory Attendance**

**PROJECT STAFF**

City of Fruita	
Project Engineer	John Vasey
City Engineer	Sam Adkins
Public Works Director	Ken Haley

CDOT	
Resident Engineer	Rob Beck
Local Agency Construction Coordinator	Dave McCollough
CDOT EEO	Aleya Swington

Project Design and Plans	
River City Consultants	Jeff Mace

**PROJECT OVERVIEW**

The project is located along the Little Salt Wash crossing properties owned by the City of Fruita, Mesa County, CDOT and Union Pacific Railroad. The Project Construction Phase will be managed by the City of Fruita Engineering Department with Local Agency oversight provided by CDOT.

This Project includes approximately 0.86 Mile of 10 foot wide concrete path with gravel shoulders. A pedestrian bridge approximately 70 feet long and a 20 foot cast in place concrete box culvert are included within this project. The concrete path will pass under 3 bridges and through 2 existing concrete box culverts. There are 2 areas requiring the design and construction of retaining walls on each side of the railroad crossing.

The contractor must obtain and manage the required Storm Water Permit for the duration of construction for this project. The City of Fruita will accept the permittee responsibilities for the Project SWMP at Final Completion of the project until inactivation of the permit.

This Project includes funding from an FHWA grant administered by CDOT; therefore Davis Bacon wage rates apply. This Project includes a Disadvantaged Business Enterprise (DBE) goal of 14% and On the Job Training requirement of 240 hours.

**Lower Little Salt Wash Riverfront Trail Connection  
Pre-Bid Meeting Minutes  
City of Fruita**

**Tentative Project Schedule**

**Date - Time**

Ad dates – GJ Sentinel, WCCA, Fruita Website (22 Day Period)	September 6, 13, 20, 27, 2015
Plans and Bid Documents Available Electronic Downloads; Fruita.org, wcca-gj.com	Tuesday September 8, 2015
Mandatory Pre-Bid Conference Fruita Civic Center, Fruita, CO	Monday, September 28, 2015 1:30 PM
Question Deadline	Wednesday September 30, 2015, 5:00 PM
Addendum Issued	Friday October 2, 2015
Bid Opening Fruita Civic Center, Fruita, CO	Tuesday October 6, 2015 1:30 PM
Notice of Award	October 13, 2015
Contract Signed / Notice to Proceed – Pre-construction Meeting	October 20, 2015
Substantial Completion	75 Calendar Days

**PROJECT FUNDING**

A Federal Highways Administration grant administered by CDOT, Great Outdoors Colorado Grant and City of Fruita will fund this Project.

**CERTIFIED PAYROLLS**

Davis Bacon wage rates apply to this project. A current copy of the applicable rates is in the Bid Documents Exhibit F CDOT Standard Special Provisions – Davis Bacon Minimum Wages – January 9, 2015 (Page 189 of 218 of Bid Documents). General Decision No. CO150024 applies to Larimer, Mesa, and Weld counties. Weekly payroll reports must be turned in promptly by the Prime Contractor and all subcontractors. Delays in certified payrolls may delay Pay Estimates.

**DISADVANTAGED BUSINESS ENTERPRISES (DBE)**

This Project includes 14% DBE contracting goals. Details are covered in the Standard Special Provisions (pages 180 to 188 of Bid Documents.) Form 1413 Bidders List and Form 1414 Anticipated DBE Participation Plan are required with each bid submitted. Form 1415 DBE Commitment Confirmation and Form 1416 Good Faith Effort Report if necessary will be required from the apparent low bidder. All forms will be included in

# Lower Little Salt Wash Riverfront Trail Connection Pre-Bid Meeting Minutes City of Fruita

Addendum #1 with the electronic excel version available on the City of Fruita website. Failure to submit the DBE forms will result in rejection of the Bid.

## ON THE JOB TRAINING (OJT)

CDOT has assigned 240 hours of On the Job Training to this project. The Contractor will be subsidized \$2.00 per hour for a trainee. A revised bid schedule will be included with Addendum #1 to represent this OJT.

## BID SUBMITTAL

- CDOT prequalified contractors
- Bids due October 6, 2015 at 1:30 PM Fruita Civic Center Building
- Bid Package contained in Sealed Envelope – Labeled:
  - Lower Little Salt Wash Riverfront Trail Connection
  - Prime Contractor's Name
- Package Contents
  - Completed & Signed Bid Schedule and Acknowledgement of each Addendum
  - 5 % Bid Bond
  - Insurance Certificate - Liability
  - CDOT Form 606 - Anti-Collusion Affidavit
  - CDOT Form 1413 - Bidders List
  - CDOT Form 1414 - Anticipated DBE Participation Plan
  - Signed Exhibit G – Notification of Immigration Compliance Requirements and Certification by Contractor
- No electronic submittals will be accepted
- Note: CDOT Forms 714 and 715 as shown in Bidding Instructions are obsolete and are not required.
- Lowest Responsive Bidder required forms following bid opening:
  - CDOT Form 605 - Contractors Performance Capability Statement
  - CDOT Form 621 – Assignment of Antitrust Claims
  - CDOT Form 1415 DBE Commitment Confirmation (if applicable)
  - CDOT Form 1416 Good Faith Effort Report (if applicable)
  - Forms must be submitted to obtain award concurrence from CDOT

The City of Fruita may reject any or all bids with CDOT concurrence, depending upon a number of factors (see <http://www.dot.state.co.us/Bidding/> on the CDOT website).

## PROCESS BIDS FOR COMPLIANCE

After the lowest responsive bid contractor is selected, CDOT will submit bid paperwork for approvals and fund encumbrance. Time is of the essence for this project, every effort will be made by the City of Fruita to expedite the issuance of a contract and Notice to Proceed. **The Prime Contractor is required to complete at least 30% of the work performed by CDOT standards.**

# **Lower Little Salt Wash Riverfront Trail Connection Pre-Bid Meeting Minutes City of Fruita**

## **BID SUMMARY**

A Bid Tabulation will be prepared after the bid opening and made available on the Fruita Website.

## **PLANS:**

There are no changes to the plans at this time. The award set of plans will be published before the Pre-Construction Meeting if any changes are deemed necessary.

## **STANDARD SPECIAL PROVISIONS**

The latest copy of the CDOT Standard Special Provisions is included with the Bid Package. These are based on the CDOT 2011 Standard Specifications for Road and Bridge Construction.

## **PROJECT SPECIAL PROVISIONS**

The Project Special Provisions are specific to this Project and are included in the Bid Documents.

## **CALENDAR DAYS / INCENTIVES / LIQUIDATED DAMAGES**

The project contract is established for 75 Calendar Days. The intent is to complete this project in the 2015 Calendar year. No Incentives are offered for early completion but Liquidated Damages shall be assessed for each Calendar Day exceeding the contract time.

## **CDOT PREQUALIFICATION**

All contractors submitting a bid as the prime contractor must be prequalified with CDOT. Any new application or renewal application (CDOT Form 66) must be submitted not less than seventeen calendar days prior to the opening of any bid for projects on which the contractor desires to submit a bid according to CDOT standards. Exceptions may be considered by contacting Peter Avbenake at (303) 757-9583.

## **UPRR COORDINATION AND INSURANCE**

Contractor should be aware that all work within the railroad right-of-way shall comply with the construction and maintenance agreement included in the project documents. This includes coordination with the railroad for flagging and maintaining adequate insurance per the railroad requirements. All railroad flagging will be paid for by the City of Fruita. The City of Fruita will include all information in the UPRR agreement pertinent to construction with Addendum #1.

The Contractor shall complete a Contractor's Right of Entry Agreement with the Union Pacific Railroad (UPRR). The UPRR will provide Flaggers for the railroad tracks when construction activities are within twenty five feet (25') of the tracks.

**Lower Little Salt Wash Riverfront Trail Connection  
Pre-Bid Meeting Minutes  
City of Fruita**

**PROJECT MATERIALS TESTING**

CDOT will designate Project testing frequency on their Form 250 for all materials testing. The Contractor is responsible for providing Quality Control (QC) materials testing. The City of Fruita acting as the Local Agency will provide Quality Assurance (QA) testing, and is currently soliciting Statement of Qualifications from local firms to provide QA testing services. CDOT May cover IA (Independent Assurance) Testing.

**PROJECT SUBMITTALS – MATERIALS**

Project materials and work shall be documented on the Progress Reports (Form 266). Contractor furnished documents shall include Certificates of Compliance, lab test reports, mill tests, etc. Materials on the CDOT and NYDOT Approved Products Lists may be used in lieu of the Certificates of Compliance. All papers submitted shall be stamped and certified by the Prime Contractor. These must be originals signed by the manufacturer or vendor. Lack of original documents shall delay payments.

**STORM WATER MANAGEMENT PLAN - SWMP**

The contractor must obtain and manage the required Storm Water Permit for the duration of construction for this project. The City of Fruita will accept the permittee responsibilities for the Project SWMP at Final Completion of the project until inactivation of the permit.

**EROSION CONTROL SUPERVISOR (ECS)**

The Contractor must provide an Erosion Control Supervisor. This person must have completed the CDOT Erosion Control Program and obtained the ECS Certification. The ECS may be one of the Contractor's employees or hired on as a consultant. During the construction of the Project, the ECS will be required to complete daily reports and bi-weekly reports. Copies of all reports shall be forwarded to the City of Fruita Project Manager.

**UTILITIES**

Utilities are identified on the plan set to the best available information. It is the contractor's responsibility to utilize the Colorado One Call locate service during construction and protect all existing utilities

**METHOD OF HANDLING TRAFFIC (MHT)**

The Contractor must obtain the necessary permits from CDOT to establish a temporary access off of I70 to complete the required work between and south of the I70 travel lanes and west of the Little Salt Wash. The contractor must also provide traffic control plans while working around Highway 6 & 50. A City of Fruita right of way permit at no charge to the contractor will be required for all work on Greenway Drive.

# Lower Little Salt Wash Riverfront Trail Connection Pre-Bid Meeting Minutes City of Fruita

## ENVIRONMENTAL NOTES:

The Environmental Clearances are approved. Wetlands mitigation are not required. There are no concerns about nesting birds on this Project during the anticipated duration of this project.

## STAGING AREA(S)

It is the Prime Contractor's responsibility to arrange staging areas on private property for this Project. Areas adjoining the trail alignment and owned by the City of Fruita and Mesa County may be utilized as staging areas upon approval. Standard safeguards must be utilized and the disturbed areas restored at the completion of construction. Greenway Drive may be closed with the Right of Way used as a staging area. This will require notification to the City of Fruita with the Right of Way permit application.

## CLEARING AND GRUBBING

The materials generated from Clearing and Grubbing operations as well as excess spoil materials can be disposed of at the City Lagoons site or the Waste Water Reclamation Facility site on 15 Road. It is preferred that vegetative materials be taken to the 15 Road site while soils be taken to the City Lagoons site.

## PROTECTION OF PRIVATE PROPERTY

Private property adjoins the Little Salt Wash on the north side of Interstate 70. The Contractor must stay off of this private property except where construction easements have been obtained at Greenway Drive.

## RETAINING WALLS

There are two design/build retaining walls with handrails on each side of the UPRR box culvert crossing. The Contractor shall submit the design drawings to CDOT for review prior to construction of these walls.

## QUESTIONS RECEIVED PRIOR TO PRE-BID MEETING

**Q:** Can the concrete on the LLSW trail be placed by hand or does it need to be machine placed?

**A:** It is the contractor's choice how the concrete is placed, provided it conforms to the plans and specifications.

**Q:** What is the required finish and/or color on the Pedestrian Railing?

**A:** All Pedestrian Railing for this project should be unpainted weathering steel.

## Lower Little Salt Wash Riverfront Trail Connection Pre-Bid Meeting Minutes City of Fruita

**Q:** Is the Contractor required to import Item 203 Unclassified Excavation (Complete in Place)?

**A:** The Summary of Earthwork Quantities can be found on page C6. The Bid Item 203 Unclassified Excavation (Complete In Place) is for material excavated at one location on the project and placed in another location as embankment. The Bid Item 203 Unclassified Excavation is excess material that becomes the property of the contractor. The City of Fruita will accept these excess materials at the lagoon site on the south end of the project. The successful contractor may elect to remove these materials at their discretion.

**Q:** Can the contractor build the box culvert this fall and wait until next year to build the trail in an effort to avoid cold weather concrete?

**A:** No. Funding sources for this project dictate completion in the 2015 calendar year. All efforts must be made to complete the project in this timeline. Contract time consideration for weather circumstances beyond the contractors control will be granted as construction progresses. The contractor will not be granted any additional cost considerations for cold weather concrete protection, those costs should be built into the bid unit prices for construction.

### QUESTIONS RECEIVED AT PRE-BID MEETING

**Q:** How much Insurance is required for the Bid Submittal?

**A:** All contractors must submit proof of insurance in compliance with Exhibit B Construction Services Contract Insurance Requirements with their Bid Submittal. In summary this includes: Commercial General Liability \$1,000,000.00; Comprehensive Automobile Liability \$1,000,000.00.

The successful bidder will be required to provide additional insurance in conformance with Exhibit C To Contractor's Right of Entry Agreement Insurance Requirements to complete the work required at the UPRR crossing. This is required prior to signing the Contract for Construction Services.

**Q:** Will subcontractors be required to have Railroad Insurance?

**A:** A copy of the Contractor's Right of Entry Agreement form is included with Addendum #1. Exhibit B Section 12 of this agreement addresses the requirements for subcontractors and the endorsements required for the subcontractor's insurance. The text from an email sent to Mr. Haley outlines what is required for the Right of Entry Agreement and is included in Addendum #1 before the Agreement. The Prime Contractor is responsible for executing the Right of Entry Agreement and providing the required insurance and will be held liable for any incidents.

**Lower Little Salt Wash Riverfront Trail Connection  
Pre-Bid Meeting Minutes  
City of Fruita**

**Q:** Should Pay Item 206 Structure Excavation (Class 1) be Item 206 Structure Backfill (Class 1)?

**A:** Yes, this correction will be included in the revised Bid Schedule with Addendum #1.

**Q:** Was a soils report prepared for this project?

**A:** Yes, the Geotechnical Report will be included with Addendum #1.

**Q:** Is the volume of excavation from the UPRR box culvert included in Bid Item 203 Unclassified Excavation?

**A:** Yes, anything shown as crosshatching in cross sections is included in quantities. Horizontal is cut and vertical is fill. There is a section through the box.

**Q:** Will CDOT be providing a notebook for the Stormwater Discharge Permit?

**A:** No. It is the Contractor's responsibility to obtain the Stormwater Discharge Permit for this project and maintain all documentation required by the permit throughout the project.

**Q:** Does the riprap have to conform to the CDOT specification?

**A:** Yes, this project is largely funded by a Federal Enhancement Grant that is administered by CDOT, therefore all aspects of the project must conform to the CDOT specifications.

**Q:** Can the materials generated from Clearing and Grubbing south of I-70 and west of the Little Salt Wash be disposed on site?

**A:** No, all cleared and grubbed materials must be removed from the trail site and disposed at either the Fruita Lagoons Property, Fruita Waste Water Reclamation Facility property on 15 Road or an approved location of the Contractor's choosing.

**Q:** Is there any flow rate data available for the Little Salt Wash?

**A:** No, the City of Fruita checked available records and could find no flow rate data.

**Q:** Will PDA testing be required for Item 502 HP Piling (HP 12x74)?

**A:** Yes, per the specification a minimum of 2 piles must be monitored, one on each abutment.

**Q:** What is required to access the area south of I-70 and west of the Little Salt Wash?

**A:** The City of Fruita has started the process to obtain a Temporary Access Permit to access this area from I-70. A Traffic Control Plan (TCP) has been prepared and

## Lower Little Salt Wash Riverfront Trail Connection Pre-Bid Meeting Minutes City of Fruita

submitted to CDOT in this regard. This TCP is included in Addendum #1. The Contractor shall be responsible for submitting their Method of Handling Traffic utilizing the City TCP as the basis, with pertinent construction dates to CDOT upon Award of the project. The contractor shall be responsible for providing all traffic control devices and the required traffic control supervisor throughout the duration of the temporary access.

**Q:** Will CDOT require a seasonal shutdown of traffic control on I-70?

**A:** For bidding purposes the Contractors should assume no seasonal shut down will be enforced by CDOT for this project.

**Q:** Is there epoxy rebar used in this project?

**A:** *M/M Response: Epoxy coated reinforcing steel is required for the pedestrian bridge. Per the Pre-fabricated Structural Steel Bridge specification, the cost for the bridge deck including the design, galvanized steel deck forms, concrete deck and epoxy coated reinforcing should be included in the lump sum cost of the Pre-fabricated Structural Steel Bridge. The Contractor/fabricator should determine the quantities and cost for the bridge deck, (in conformance with the design requirements), to be included in the cost of the Pre-fabricated Structural Steel Bridge. Reinforcing steel (non-epoxy coated) and concrete quantities for the bridge abutments and CBC are included separately in the bid schedule.*

**Q:** There is over excavation expected for the Box Culvert north of I-70. Was there any allowance for that volume in the Earthwork Quantities?

**A:** *M/M Response: 3 ft. depth of over excavation for the CBC is accounted for as part of the Bid Schedule Item 206 Structure Excavation, in alignment with the limits shown on the "CBC Structure Excavation and backfill Detail" located on sheet S100. Additional excavation beyond the limits shown on "CBC Structure Excavation and Backfill Detail" is not included in the quantities. Additional excavation and subgrade stabilization beyond the limits shown will be required only if it is determined necessary by the representative of the geotechnical engineer during foundation excavation observations (see Structural Note #7 on sheet S100).*

# Exhibit D

## Traffic Control Plan I-70 Temporary Access



**CITY OF FRUITA**

**Contractor:** \_\_\_\_\_

City of Fruita

**Project:** \_\_\_\_\_

River Front Trail Construction  
Access off I-70.

**Method of Handling Traffic:** \_\_\_\_\_

Shoulder closure with warning signs.

**PREPARED BY TCT:** \_\_\_\_\_

T. Russell

**APPROVED BY TCS:** \_\_\_\_\_

**PHONE:** 970-216-8420

**CERTIFICATION #** 199913

**ISSUE DATE:** 10-2-2015

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

**APPROVED BY CDOT:** \_\_\_\_\_

**MUTCD 2009 REFERENCES:**

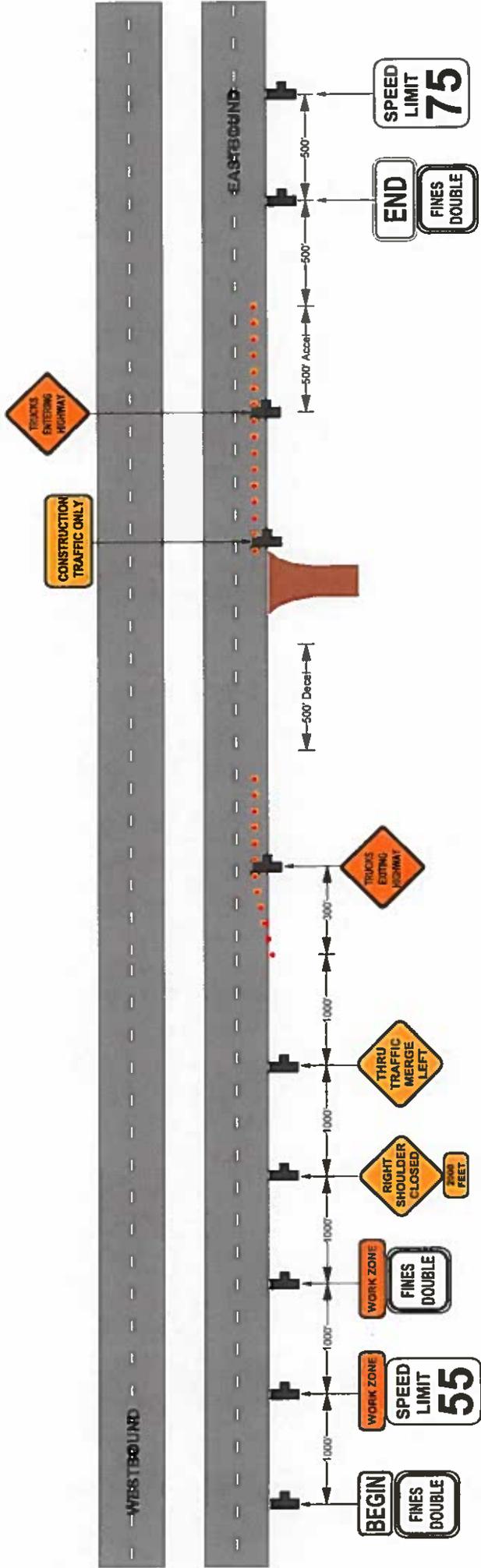
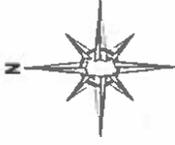
- Advanced Warning Area per speed limit Table 6C-1
- Section 6C.04
- Traffic Control Zone Figure 6C-1
- Sign Size Table 6F-1

**SIGNS AND DEVICES:**

- 1: Begin Fines double (R3-9-3, R2-6)
- 1: Work Zone 55 MPH (KM4-20, R2-155)
- 1: Work Zone Fines Double (KM4-20, R2-6)
- 1: Right shoulder Closed 2000 Feet (W21-5a)
- 1: Thru Traffic Merge Left (W4-1a)
- 1: Trucks Exiting Highway
- 1: Construction Traffic Only
- 1: Trucks Entering Highway
- 1: End Fines Doubled (R2-10, R2-6)
- 1: Speed Limit 75

**NOTES:**

1. There will be no Devices, Equipment or Machinery in the Open Travel Lanes.
2. Trucks will turn on hazard lights 1000' prior to exiting I-70.
3. All signing will be in accordance with MUTCD 2009 standards.
4. Closures shall have flashers at night
5. Field adjustments will be made as necessary.
6. This plan is for daytime use only.
7. This plan is not to scale.
8. Barrel spacing shall be 55'.
9. Sign spacing based on 75 MPH speed limit.
10. City of Fruita TCS will inspect traffic control setup during construction.



# Exhibit E

## Required CDOT Forms (606, 1413, 1414)

**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	
<b>NOTE: This document must be signed in ink.</b>	





# Exhibit F

## Email Text with Instruction and UPRR Contractor's Right of Entry Agreement

Mr. Haley,

Please find a copy of the Contractor's Right of Entry for your contractor below. Please have them execute the right of entry attached below in duplicate and in color, and return with a check for \$500 and two insurance certificates: (1) General & Commercial with 5 and 10 million limits, Auto 2 million and \$500,000 work comp with Union Pacific as the additional insured and the certificate holder; and (2) Railroad Protective with 2 and 6 million limits and Union Pacific as the primary insured. Please follow the below instructions:

*Before Union Pacific Railroad Company can permit you to perform work on its property for the Purpose, it will be necessary for you to complete and execute two originals of the enclosed Contractor's Right of Entry Agreement.*

*Please include a check made payable to the Union Pacific Railroad Company in the amount of \$500.00 for the non-refundable fee. If you require formal billing, you may consider this letter as a formal bill. In compliance with the Internal Revenue Services' new policy regarding their Form 1099, I certify that 94-6001323 is the Railroad Company's correct Federal Taxpayer Identification Number and that Union Pacific Railroad Company is doing business as a corporation.*

*Under Exhibit C of the enclosed Contractor's Right of Entry Agreement, you are required to procure Railroad Protective Liability Insurance (RPLI) for the duration of this project. Railroad Protective Liability Insurance (RPLI) may be obtained from any insurance company which offers such coverage. Union Pacific has also worked with a national broker, Marsh USA, to make available RPLI to you or your contractor. You can find additional information, premium quotes, and application forms at: [www.uprr.marsh.com](http://www.uprr.marsh.com).*

*This agreement will not be accepted by the Railroad Company until you have returned all of the following to the undersigned at Union Pacific Railroad Company:*

- 1. Executed, unaltered duplicate original counterparts of the Contractor's Right of Entry Agreement;*
- 2. Your check in the amount of \$500.00 to pay the non-refundable fee. (The Folder Number should be written on the check to insure proper credit). If you require formal billing, you may consider this letter as a formal bill;*
- 3. Copies of all of your up-to-date General Liability, Auto Liability & Workman's Compensation Insurance Certificates (yours and all contractors'), naming Union Pacific Railroad Company as additional insured;*
- 4. Copy of your up-to-date Railroad Protective Liability Insurance Certificate (yours and all contractors'), naming Union Pacific Railroad Company as additional insured.*

**RETURN ALL OF THESE REQUIRED ITEMS TOGETHER IN ONE ENVELOPE.  
DO NOT MAIL ANY ITEM SEPARATELY.**

If you have any questions concerning this agreement, please contact me as noted below. Have a safe day!

Respectfully,

**David C. LaPlante**

Senior Manager - Real Estate

Special and Public Projects

Union Pacific Railroad

1400 Douglas St. STOP 1690 | Omaha, NE 68179

Phone: 402.544.8563 | Fax: 402.501.0340

[dclaplante@up.com](mailto:dclaplante@up.com)

[www.up.com](http://www.up.com)

UPRR Folder No. 2891-74

UPRR Audit No.: \_\_\_\_\_  
(Audit Number)

**CONTRACTOR'S  
RIGHT OF ENTRY AGREEMENT**  
\_\_\_\_\_  
(COLORADO)

**THIS AGREEMENT** is made and entered into as of the \_\_\_\_\_ day of \_\_\_\_\_, 2015, by and between **UNION PACIFIC RAILROAD COMPANY**, a Delaware corporation ("Railroad"); and

\_\_\_\_\_  
(NAME OF CONTRACTOR)  
a \_\_\_\_\_ corporation ("Contractor").  
(State of Incorporation)

**RECITALS:**

Contractor has been hired by the City of Fruita ("Political Body") to perform work relating to the construction of a grade-separated public pedestrian and bicycle trail, including the installation of an 8 foot high galvanized chain link fence and 315 linear feet of wire fence, (the "work"), with all or a portion of such work to be performed on property of Railroad in the vicinity of Railroad Mile Post 461.10 on Railroad's Green River DOT No.440843T, located at or near Fruita, Mesa County, Colorado, as such location is in the general location shown on the Railroad Location Print marked **Exhibit A**, and as detailed on the Detailed Prints collectively marked **Exhibit A-1**, each attached hereto and hereby made a part hereof, which work is the subject of a contract dated \_\_\_\_\_ between the Railroad and the Political Body.

Railroad is willing to permit Contractor to perform the work described above at the location described above subject to the terms and conditions contained in this Agreement

**AGREEMENT:**

**NOW, THEREFORE**, it is mutually agreed by and between Railroad and Contractor, as follows:

**ARTICLE 1 - DEFINITION OF CONTRACTOR.**

For purposes of this Agreement, all references in this agreement to Contractor shall include Contractor's contractors, subcontractors, officers, agents and employees, and others acting under its or their authority.

**ARTICLE 2 - RIGHT GRANTED; PURPOSE.**

Railroad hereby grants to Contractor the right, during the term hereinafter stated and upon and subject to each and all of the terms, provisions and conditions herein contained, to enter upon and have ingress to and egress from the property described in the Recitals for the purpose of performing the work described in the Recitals above. The right herein granted to Contractor is limited to those portions of Railroad's property specifically described herein, or as designated by the Railroad Representative named in Article 4.

**ARTICLE 3 - TERMS AND CONDITIONS CONTAINED IN EXHIBITS B, C AND D.**

The General Terms and Conditions contained in **Exhibit B**, the Insurance Requirements contained in **Exhibit C** and the Minimum Safety Requirements contained in **Exhibit D**, attached hereto, are hereby made a part of this Agreement.

**ARTICLE 4 - ALL EXPENSES TO BE BORNE BY CONTRACTOR; RAILROAD REPRESENTATIVE.**

- A. Contractor shall bear any and all costs and expenses associated with any work performed by Contractor, or any costs or expenses incurred by Railroad relating to this Agreement.
- B. Contractor shall coordinate all of its work with the following Railroad representative or his or her duly authorized representative (the "Railroad Representative"):

MATTHEW C. JOHNSON  
MGR TRACK MNTCE  
2790 D ROAD  
GRAND JCT, CO 81501  
Work Phone: 970-248-4254  
Cell Phone: 402-216-2305

KEITH A. KRUEGER  
MGR SIGNAL MNTCE  
901 NW NORRIS ST  
TOPEKA, KS 66608  
Cell Phone: 402 619-8044

- C. Contractor, at its own expense, shall adequately police and supervise all work to be performed by Contractor and shall ensure that such work is performed in a safe manner as set forth in Section 7 of **Exhibit B**. The responsibility of Contractor for safe conduct and adequate policing and supervision of Contractor's work shall not be lessened or otherwise affected by Railroad's approval of plans and specifications involving the work, or by Railroad's collaboration in performance of any work, or by the presence at the work site of a Railroad Representative, or by compliance by Contractor with any requests or recommendations made by Railroad Representative.

**ARTICLE 5 - SCHEDULE OF WORK ON A MONTHLY BASIS.**

The Contractor, at its expense, shall provide on a monthly basis a detailed schedule of work to the Railroad Representative named in Article 4B above. The reports shall start at the

execution of this Agreement and continue until this Agreement is terminated as provided in this Agreement or until the Contractor has completed all work on Railroad's property.

**ARTICLE 6 TERM; TERMINATION.**

- A. The grant of right herein made to Contractor shall commence on the date of this Agreement, and  
continue until \_\_\_\_\_, unless sooner terminated as herein provided, or  
*(Expiration Date)*  
at such time as Contractor has completed its work on Railroad's property, whichever is earlier. Contractor agrees to notify the Railroad Representative in writing when it has completed its work on Railroad's property.
- B. This Agreement may be terminated by either party on ten (10) days written notice to the other party.

**ARTICLE 7 CERTIFICATE OF INSURANCE.**

- A. Before commencing any work, Contractor will provide Railroad with the (i) insurance binders, policies, certificates and endorsements set forth in **Exhibit C** of this Agreement, and (ii) the insurance endorsements obtained by each subcontractor as required under Section 12 of **Exhibit B** of this Agreement.
- B. All insurance correspondence, binders, policies, certificates and endorsements shall be sent to:

*Union Pacific Railroad Company  
1400 Douglas Street, Mail Stop 1690  
Omaha, Nebraska 68179-1690  
UPRR Folder No. 2891-74*

**ARTICLE 8 DISMISSAL OF CONTRACTOR'S EMPLOYEE.**

At the request of Railroad, Contractor shall remove from Railroad's property any employee of Contractor who fails to conform to the instructions of the Railroad Representative in connection with the work on Railroad's property, and any right of Contractor shall be suspended until such removal has occurred. Contractor shall indemnify Railroad against any claims arising from the removal of any such employee from Railroad's property.

**ARTICLE 9 CROSSINGS.**

No additional vehicular crossings (including temporary haul roads) or pedestrian crossings over Railroad's trackage shall be installed or used by Contractor without the prior written permission of Railroad.

**ARTICLE 10 - CROSSINGS; COMPLIANCE WITH MUTCD AND FRA GUIDELINES.**

- A. No additional vehicular crossings (including temporary haul roads) or pedestrian crossings over Railroad's trackage shall be installed or used by Contractor without the prior written permission of Railroad.

B. Any permanent or temporary changes, including temporary traffic control, to crossings must conform to the Manual of Uniform Traffic Control Devices (MUTCD) and any applicable Federal Railroad Administration rules, regulations and guidelines, and must be reviewed by the Railroad prior to any changes being implemented. In the event the Railroad is found to be out of compliance with federal safety regulations due to the Contractor's modifications, negligence, or any other reason arising from the Contractor's presence on the Railroad's property, the Contractor agrees to assume liability for any civil penalties imposed upon the Railroad for such noncompliance.

**ARTICLE 11 - EXPLOSIVES.**

Explosives or other highly flammable substances shall not be stored or used on Railroad's property without the prior written approval of Railroad.

**IN WITNESS WHEREOF**, the parties hereto have duly executed this agreement in duplicate as of the date first herein written.

**UNION PACIFIC RAILROAD COMPANY**  
*(Federal Tax ID #94-6001323)*

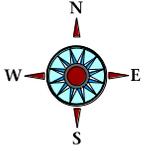
By: \_\_\_\_\_  
David C. LaPlante  
Senior Manager - Contracts

\_\_\_\_\_  
*(NAME OF CONTRACTOR)*

By \_\_\_\_\_

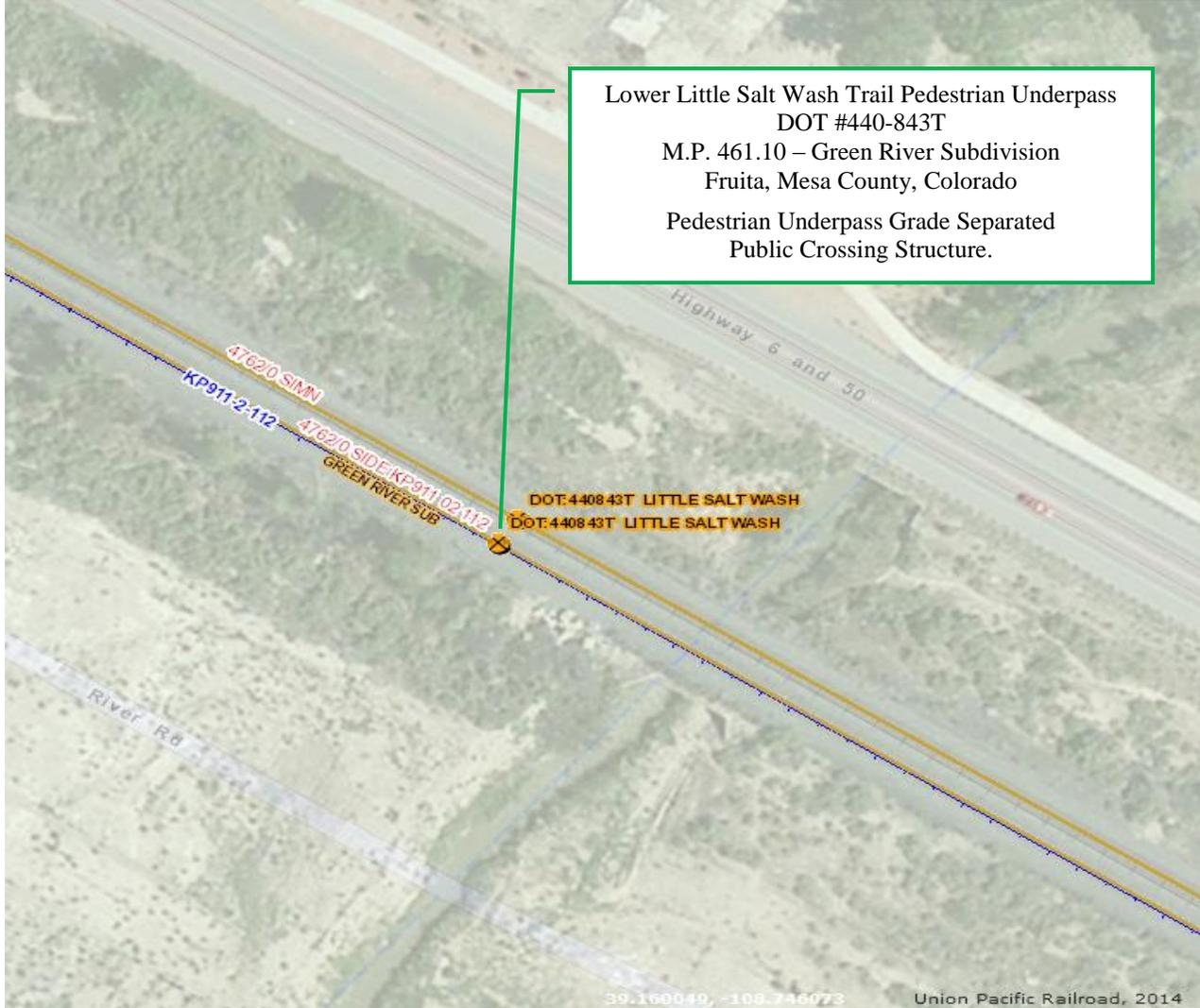
Printed Name: \_\_\_\_\_

Title \_\_\_\_\_



# EXHIBIT "A"

## RAILROAD LOCATION PRINT ACCOMPANYING A CONTRACTOR'S RIGHT OF ENTRY AGREEMENT



Lower Little Salt Wash Trail Pedestrian Underpass  
DOT #440-843T  
M.P. 461.10 – Green River Subdivision  
Fruita, Mesa County, Colorado  
Pedestrian Underpass Grade Separated  
Public Crossing Structure.

### UNION PACIFIC RAILROAD COMPANY

GREEN RIVER SUBDIVISION  
RAILROAD MILE POST 461.10  
FRUITA, MESA COUNTY, COLORADO

To accompany a Pedestrian Crossing Agreement with the  
**CITY OF FRUITA AND OR ITS CONTRACTORS**

Folder No. 2891-74                      Date: September 30, 2014

#### WARNING

IN ALL OCCASIONS, U.P. COMMUNICATIONS DEPARTMENT MUST BE CONTACTED IN  
ADVANCE OF ANY WORK TO DETERMINE EXISTENCE AND LOCATION OF FIBER OPTIC CABLE.  
PHONE: 1-(800) 336-9193



## **EXHIBIT B**

### TO CONTRACTOR'S RIGHT OF ENTRY AGREEMENT

#### **GENERAL TERMS & CONDITIONS**

##### **Section 1. NOTICE OF COMMENCEMENT OF WORK - FLAGGING.**

- A. Contractor agrees to notify the Railroad Representative at least thirty (30) working days in advance of Contractor commencing its work and at least thirty (30) working days in advance of proposed performance of any work by Contractor in which any person or equipment will be within twenty-five (25) feet of any track, or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach to within twenty-five (25) feet of any track. No work of any kind shall be performed, and no person, equipment, machinery, tool(s), material(s), vehicle(s), or thing(s) shall be located, operated, placed, or stored within twenty-five (25) feet of any of Railroad's track(s) at any time, for any reason, unless and until a Railroad flagman is provided to watch for trains. Upon receipt of such ten (10)-day notice, the Railroad Representative will determine and inform Contractor whether a flagman need be present and whether Contractor needs to implement any special protective or safety measures. If flagging or other special protective or safety measures are performed by Railroad, Railroad will bill Contractor for such expenses incurred by Railroad, unless Railroad and a federal, state or local governmental entity have agreed that Railroad is to bill such expenses to the federal, state or local governmental entity. If Railroad will be sending the bills to Contractor, Contractor shall pay such bills within thirty (30) days of Contractor's receipt of billing. If Railroad performs any flagging, or other special protective or safety measures are performed by Railroad, Contractor agrees that Contractor is not relieved of any of its responsibilities or liabilities set forth in this Agreement.
- B. The rate of pay per hour for each flagman will be the prevailing hourly rate in effect for an eight-hour day for the class of flagmen used during regularly assigned hours and overtime in accordance with Labor Agreements and Schedules in effect at the time the work is performed. In addition to the cost of such labor, a composite charge for vacation, holiday, health and welfare, supplemental sickness, Railroad Retirement and unemployment compensation, supplemental pension, Employees Liability and Property Damage and Administration will be included, computed on actual payroll. The composite charge will be the prevailing composite charge in effect at the time the work is performed. One and one-half times the current hourly rate is paid for overtime, Saturdays and Sundays, and two and one-half times current hourly rate for holidays. Wage rates are subject to change, at any time, by law or by agreement between Railroad and its employees, and may be retroactive as a result of negotiations or a ruling of an authorized governmental agency. Additional charges on labor are also subject to change. If the wage rate or additional charges are changed, Contractor (or the governmental entity, as applicable) shall pay on the basis of the new rates and charges.
- C. Reimbursement to Railroad will be required covering the full eight-hour day during which any flagman is furnished, unless the flagman can be assigned to other Railroad work during a portion of such day, in which event reimbursement will not be required for the portion of the day during which the flagman is engaged in other Railroad work. Reimbursement will also be required for any day not actually worked by the flagman following the flagman's assignment to work on the project for which Railroad is required to pay the flagman and which could not reasonably be avoided by Railroad by assignment of such flagman to other work, even though Contractor may not be working during such time. When it becomes necessary for Railroad to bulletin and assign an employee to a flagging position in compliance with union collective bargaining agreements, Contractor must provide Railroad a minimum of five (5) days notice prior to the cessation of the need for a flagman. If five (5) days notice of cessation is not given, Contractor will still be required to pay flagging charges for the five (5) day notice period required by union agreement to be given to the employee, even though flagging is not required for that period. An additional ten (10) days notice must then be given to Railroad if flagging services are needed again after such five day cessation notice has been given to Railroad.

##### **Section 2. LIMITATION AND SUBORDINATION OF RIGHTS GRANTED**

- A. The foregoing grant of right is subject and subordinate to the prior and continuing right and obligation of the Railroad to use and maintain its entire property including the right and power of Railroad to construct, maintain, repair, renew, use, operate, change, modify or relocate railroad tracks, roadways, signal, communication, fiber optics, or other wirelines, pipelines and other facilities upon, along or across any or all parts of its property, all or any of which may be freely done at any time or times by Railroad without liability to Contractor or to any other party for compensation or damages.

- B. The foregoing grant is also subject to all outstanding superior rights (including those in favor of licensees and lessees of Railroad's property, and others) and the right of Railroad to renew and extend the same, and is made without covenant of title or for quiet enjoyment.

**Section 3. NO INTERFERENCE WITH OPERATIONS OF RAILROAD AND ITS TENANTS.**

- A. Contractor shall conduct its operations so as not to interfere with the continuous and uninterrupted use and operation of the railroad tracks and property of Railroad, including without limitation, the operations of Railroad's lessees, licensees or others, unless specifically authorized in advance by the Railroad Representative. Nothing shall be done or permitted to be done by Contractor at any time that would in any manner impair the safety of such operations. When not in use, Contractor's machinery and materials shall be kept at least fifty (50) feet from the centerline of Railroad's nearest track, and there shall be no vehicular crossings of Railroads tracks except at existing open public crossings.
- B. Operations of Railroad and work performed by Railroad personnel and delays in the work to be performed by Contractor caused by such railroad operations and work are expected by Contractor, and Contractor agrees that Railroad shall have no liability to Contractor, or any other person or entity for any such delays. The Contractor shall coordinate its activities with those of Railroad and third parties so as to avoid interference with railroad operations. The safe operation of Railroad train movements and other activities by Railroad takes precedence over any work to be performed by Contractor.

**Section 4. LIENS.**

Contractor shall pay in full all persons who perform labor or provide materials for the work to be performed by Contractor. Contractor shall not create, permit or suffer any mechanic's or materialmen's liens of any kind or nature to be created or enforced against any property of Railroad for any such work performed. Contractor shall indemnify and hold harmless Railroad from and against any and all liens, claims, demands, costs or expenses of whatsoever nature in any way connected with or growing out of such work done, labor performed, or materials furnished. If Contractor fails to promptly cause any lien to be released of record, Railroad may, at its election, discharge the lien or claim of lien at Contractor's expense.

**Section 5. PROTECTION OF FIBER OPTIC CABLE SYSTEMS.**

- A. Fiber optic cable systems may be buried on Railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. Contractor shall telephone Railroad during normal business hours (7:00 a.m. to 9:00 p.m. Central Time, Monday through Friday, except holidays) at 1-800-336-9193 (also a 24-hour, 7-day number for emergency calls) to determine if fiber optic cable is buried anywhere on Railroad's property to be used by Contractor. If it is, Contractor will telephone the telecommunications company(ies) involved, make arrangements for a cable locator and, if applicable, for relocation or other protection of the fiber optic cable. Contractor shall not commence any work until all such protection or relocation (if applicable) has been accomplished.
- B. In addition to other indemnity provisions in this Agreement, Contractor shall indemnify, defend and hold Railroad harmless from and against all costs, liability and expense whatsoever (including, without limitation, attorneys' fees, court costs and expenses) arising out of any act or omission of Contractor, its agents and/or employees, that causes or contributes to (1) any damage to or destruction of any telecommunications system on Railroad's property, and/or (2) any injury to or death of any person employed by or on behalf of any telecommunications company, and/or its contractor, agents and/or employees, on Railroad's property. Contractor shall not have or seek recourse against Railroad for any claim or cause of action for alleged loss of profits or revenue or loss of service or other consequential damage to a telecommunication company using Railroad's property or a customer or user of services of the fiber optic cable on Railroad's property.

**Section 6. PERMITS - COMPLIANCE WITH LAWS.**

In the prosecution of the work covered by this Agreement, Contractor shall secure any and all necessary permits and shall comply with all applicable federal, state and local laws, regulations and enactments affecting the work including, without limitation, all applicable Federal Railroad Administration regulations.

**Section 7. SAFETY.**

- A. Safety of personnel, property, rail operations and the public is of paramount importance in the prosecution of the work performed by Contractor. Contractor shall be responsible for initiating, maintaining and supervising all safety, operations and programs in connection with the work. Contractor shall at a minimum comply with Railroad's safety standards listed in

**Exhibit D**, hereto attached, to ensure uniformity with the safety standards followed by Railroad's own forces. As a part of Contractor's safety responsibilities, Contractor shall notify Railroad if Contractor determines that any of Railroad's safety standards are contrary to good safety practices. Contractor shall furnish copies of **Exhibit D** to each of its employees before they enter the job site.

- B. Without limitation of the provisions of paragraph A above, Contractor shall keep the job site free from safety and health hazards and ensure that its employees are competent and adequately trained in all safety and health aspects of the job.
- C. Contractor shall have proper first aid supplies available on the job site so that prompt first aid services may be provided to any person injured on the job site. Contractor shall promptly notify Railroad of any U.S. Occupational Safety and Health Administration reportable injuries. Contractor shall have a nondelegable duty to control its employees while they are on the job site or any other property of Railroad, and to be certain they do not use, be under the influence of, or have in their possession any alcoholic beverage, drug or other substance that may inhibit the safe performance of any work.
- D. If and when requested by Railroad, Contractor shall deliver to Railroad a copy of Contractor's safety plan for conducting the work (the "Safety Plan"). Railroad shall have the right, but not the obligation, to require Contractor to correct any deficiencies in the Safety Plan. The terms of this Agreement shall control if there are any inconsistencies between this Agreement and the Safety Plan.

**Section 8. INDEMNITY.**

- A. To the extent not prohibited by applicable statute, Contractor shall indemnify, defend and hold harmless Railroad, its affiliates, and its and their officers, agents and employees (individually an "Indemnified Party" or collectively "Indemnified Parties") from and against any and all loss, damage, injury, liability, claim, demand, cost or expense (including, without limitation, attorney's, consultant's and expert's fees, and court costs), fine or penalty (collectively, "Loss") incurred by any person (including, without limitation, any Indemnified Party, Contractor, or any employee of Contractor or of any Indemnified Party) arising out of or in any manner connected with (i) any work performed by Contractor, or (ii) any act or omission of Contractor, its officers, agents or employees, or (iii) any breach of this Agreement by Contractor.
- B. The right to indemnity under this Section 8 shall accrue upon occurrence of the event giving rise to the Loss, and shall apply regardless of any negligence or strict liability of any Indemnified Party, except where the Loss is caused by the sole active negligence of an Indemnified Party as established by the final judgment of a court of competent jurisdiction. The sole active negligence of any Indemnified Party shall not bar the recovery of any other Indemnified Party.
- C. Contractor expressly and specifically assumes potential liability under this Section 8 for claims or actions brought by Contractor's own employees. Contractor waives any immunity it may have under worker's compensation or industrial insurance acts to indemnify the Indemnified Parties under this Section 8. Contractor acknowledges that this waiver was mutually negotiated by the parties hereto.
- D. No court or jury findings in any employee's suit pursuant to any worker's compensation act or the Federal Employers' Liability Act against a party to this Agreement may be relied upon or used by Contractor in any attempt to assert liability against any Indemnified Party.
- E. The provisions of this Section 8 shall survive the completion of any work performed by Contractor or the termination or expiration of this Agreement. In no event shall this Section 8 or any other provision of this Agreement be deemed to limit any liability Contractor may have to any Indemnified Party by statute or under common law.

**Section 9. RESTORATION OF PROPERTY.**

In the event Railroad authorizes Contractor to take down any fence of Railroad or in any manner move or disturb any of the other property of Railroad in connection with the work to be performed by Contractor, then in that event Contractor shall, as soon as possible and at Contractor's sole expense, restore such fence and other property to the same condition as the same were in before such fence was taken down or such other property was moved or disturbed. Contractor shall remove all of Contractor's tools, equipment, rubbish and other materials from Railroad's property promptly upon completion of the work, restoring Railroad's property to the same state and condition as when Contractor entered thereon.

**Section 10. WAIVER OF DEFAULT.**

Waiver by Railroad of any breach or default of any condition, covenant or agreement herein contained to be kept, observed and performed by Contractor shall in no way impair the right of Railroad to avail itself of any remedy for any subsequent breach or default.

**Section 11. MODIFICATION - ENTIRE AGREEMENT.**

No modification of this Agreement shall be effective unless made in writing and signed by Contractor and Railroad. This Agreement and the exhibits attached hereto and made a part hereof constitute the entire understanding between Contractor and Railroad and cancel and supersede any prior negotiations, understandings or agreements, whether written or oral, with respect to the work to be performed by Contractor.

**Section 12. ASSIGNMENT - SUBCONTRACTING.**

Contractor shall not assign or subcontract this Agreement, or any interest therein, without the written consent of the Railroad. Contractor shall be responsible for the acts and omissions of all subcontractors. Before Contractor commences any work, the Contractor shall, except to the extent prohibited by law; (1) require each of its subcontractors to include the Contractor as "Additional Insured" in the subcontractor's Commercial General Liability policy and Business Automobile policies with respect to all liabilities arising out of the subcontractor's performance of work on behalf of the Contractor by endorsing these policies with ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage; (2) require each of its subcontractors to endorse their Commercial General Liability Policy with "Contractual Liability Railroads" ISO Form CG 24 17 10 01 (or a substitute form providing equivalent coverage) for the job site; and (3) require each of its subcontractors to endorse their Business Automobile Policy with "Coverage For Certain Operations In Connection With Railroads" ISO Form CA 20 70 10 01 (or a substitute form providing equivalent coverage) for the job site.

## EXHIBIT C

### TO CONTRACTOR'S RIGHT OF ENTRY AGREEMENT

#### INSURANCE REQUIREMENTS

Contractor shall, at its sole cost and expense, procure and maintain during the course of the Project and until all Project work on Railroad's property has been completed and the Contractor has removed all equipment and materials from Railroad's property and has cleaned and restored Railroad's property to Railroad's satisfaction, the following insurance coverage:

- A. COMMERCIAL GENERAL LIABILITY INSURANCE.** Commercial general liability (CGL) with a limit of not less than \$5,000,000 each occurrence and an aggregate limit of not less than \$10,000,000. CGL insurance must be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).

The policy must also contain the following endorsement, which must be stated on the certificate of insurance:

- Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Railroad Company Property" as the Designated Job Site.
- Designated Construction Project(s) General Aggregate Limit ISO Form CG 25 03 03 97 (or a substitute form providing equivalent coverage) showing the project on the form schedule.

- B. BUSINESS AUTOMOBILE COVERAGE INSURANCE.** Business auto coverage written on ISO form CA 00 01 10 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less \$5,000,000 for each accident and coverage must include liability arising out of any auto (including owned, hired and non-owned autos).

The policy must contain the following endorsements, which must be stated on the certificate of insurance:

- Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Property" as the Designated Job Site.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) if required by law.

- C. WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY INSURANCE.** Coverage must include but not be limited to:

- Contractor's statutory liability under the workers' compensation laws of the state where the work is being performed.
- Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 disease policy limit \$500,000 each employee.

If Contractor is self-insured, evidence of state approval and excess workers compensation coverage must be provided.

Coverage must include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

The policy must contain the following endorsement, which must be stated on the certificate of insurance:

- Alternate Employer endorsement ISO form WC 00 03 01 A (or a substitute form providing equivalent coverage) showing Railroad in the schedule as the alternate employer (or a substitute form providing equivalent coverage).

- D. RAILROAD PROTECTIVE LIABILITY INSURANCE.** Contractor must maintain Railroad Protective Liability insurance written on ISO occurrence form CG 00 35 12 04 (or a substitute form providing equivalent coverage) on behalf of Railroad as named insured, with a limit of not less than \$2,000,000 per occurrence and an aggregate of \$6,000,000. A binder stating the policy is in place must be submitted to Railroad before the work may be commenced and until the original policy is forwarded to Railroad.

- E. UMBRELLA OR EXCESS INSURANCE.** If Contractor utilizes umbrella or excess policies, these policies must "follow form" and afford no less coverage than the primary policy.

- F. POLLUTION LIABILITY INSURANCE.** Pollution liability coverage must be written on ISO form Pollution Liability Coverage Form Designated Sites CG 00 39 12 04 (or a substitute form providing equivalent liability coverage), with limits of at least

\$5,000,000 per occurrence and an aggregate limit of \$10,000,000.

If the scope of work as defined in this Agreement includes the disposal of any hazardous or non-hazardous materials from the job site, Contractor must furnish to Railroad evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of \$1,000,000 per loss, and an annual aggregate of \$2,000,000.

### **OTHER REQUIREMENTS**

- G.** All policy(ies) required above (except worker's compensation and employers liability) must include Railroad as "Additional Insured" using ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage). The coverage provided to Railroad as additional insured shall, to the extent provided under ISO Additional Insured Endorsement CG 20 26, and CA 20 48 provide coverage for Railroad's negligence whether sole or partial, active or passive, and shall not be limited by Contractor's liability under the indemnity provisions of this Agreement.
- H.** Punitive damages exclusion, if any, must be deleted (and the deletion indicated on the certificate of insurance), unless the law governing this Agreement prohibits all punitive damages that might arise under this Agreement.
- I.** Contractor waives all rights of recovery, and its insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors and employees. This waiver must be stated on the certificate of insurance.
- J.** Prior to commencing the work, Contractor shall furnish Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this Agreement.
- K.** All insurance policies must be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the state where the work is being performed.
- L.** The fact that insurance is obtained by Contractor or by Railroad on behalf of Contractor will not be deemed to release or diminish the liability of Contractor, including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railroad from Contractor or any third party will not be limited by the amount of the required insurance coverage.

## **EXHIBIT D**

### TO CONTRACTOR'S RIGHT OF ENTRY AGREEMENT

#### **MINIMUM SAFETY REQUIREMENTS**

The term "employees" as used herein refer to all employees of Contractor as well as all employees of any subcontractor or agent of Contractor.

#### **I. CLOTHING**

- A. All employees of Contractor will be suitably dressed to perform their duties safely and in a manner that will not interfere with their vision, hearing, or free use of their hands or feet.

Specifically, Contractor's employees must wear:

- i. Waist-length shirts with sleeves.
  - ii. Trousers that cover the entire leg. If flare-legged trousers are worn, the trouser bottoms must be tied to prevent catching.
  - iii. Footwear that covers their ankles and has a defined heel. Employees working on bridges are required to wear safety-toed footwear that conforms to the American National Standards Institute (ANSI) and FRA footwear requirements.
- B. Employees shall not wear boots (other than work boots), sandals, canvas-type shoes, or other shoes that have thin soles or heels that are higher than normal.
- C. Employees must not wear loose or ragged clothing, neckties, finger rings, or other loose jewelry while operating or working on machinery.

#### **II. PERSONAL PROTECTIVE EQUIPMENT**

Contractor shall require its employees to wear personal protective equipment as specified by Railroad rules, regulations, or recommended or requested by the Railroad Representative.

- i. Hard hat that meets the American National Standard (ANSI) Z89.1 – latest revision. Hard hats should be affixed with Contractor's company logo or name.
- ii. Eye protection that meets American National Standard (ANSI) for occupational and educational eye and face protection, Z87.1 – latest revision. Additional eye protection must be provided to meet specific job situations such as welding, grinding, etc.
- iii. Hearing protection, which affords enough attenuation to give protection from noise levels that will be occurring on the job site. Hearing protection, in the form of plugs or muffs, must be worn when employees are within:
  - 100 feet of a locomotive or roadway/work equipment
  - 15 feet of power operated tools
  - 150 feet of jet blowers or pile drivers
  - 150 feet of retarders in use (when within 10 feet, employees must wear dual ear protection – plugs and muffs)
- iv. Other types of personal protective equipment, such as respirators, fall protection equipment, and face shields, must be worn as recommended or requested by the Railroad Representative.

#### **III. ON TRACK SAFETY**

Contractor is responsible for compliance with the Federal Railroad Administration's Roadway Worker Protection regulations – 49CFR214, Subpart C and Railroad's On-Track Safety rules. Under 49CFR214, Subpart C, railroad contractors are responsible for the training of their employees on such regulations. In addition to the instructions contained in Roadway Worker Protection regulations, all employees must:

- i. Maintain a distance of twenty-five (25) feet to any track unless the Railroad Representative is present to authorize movements.

- ii. Wear an orange, reflectorized workwear approved by the Railroad Representative.
- iii. Participate in a job briefing that will specify the type of On-Track Safety for the type of work being performed. Contractor must take special note of limits of track authority, which tracks may or may not be fouled, and clearing the track. Contractor will also receive special instructions relating to the work zone around machines and minimum distances between machines while working or traveling.

#### **IV. EQUIPMENT**

- A. It is the responsibility of Contractor to ensure that all equipment is in a safe condition to operate. If, in the opinion of the Railroad Representative, any of Contractor's equipment is unsafe for use, Contractor shall remove such equipment from Railroad's property. In addition, Contractor must ensure that the operators of all equipment are properly trained and competent in the safe operation of the equipment. In addition, operators must be:
  - i. Familiar and comply with Railroad's rules on lockout/tagout of equipment.
  - ii. Trained in and comply with the applicable operating rules if operating any hy-rail equipment on-track.
  - iii. Trained in and comply with the applicable air brake rules if operating any equipment that moves rail cars or any other railbound equipment.
- B. All self-propelled equipment must be equipped with a first-aid kit, fire extinguisher, and audible back-up warning device.
- C. Unless otherwise authorized by the Railroad Representative, all equipment must be parked a minimum of twenty-five (25) feet from any track. Before leaving any equipment unattended, the operator must stop the engine and properly secure the equipment against movement.
- D. Cranes must be equipped with three orange cones that will be used to mark the working area of the crane and the minimum clearances to overhead powerlines.

#### **V. GENERAL SAFETY REQUIREMENTS**

- A. Contractor shall ensure that all waste is properly disposed of in accordance with applicable federal and state regulations.
- B. Contractor shall ensure that all employees participate in and comply with a job briefing conducted by the Railroad Representative, if applicable. During this briefing, the Railroad Representative will specify safe work procedures, (including On-Track Safety) and the potential hazards of the job. If any employee has any questions or concerns about the work, the employee must voice them during the job briefing. Additional job briefings will be conducted during the work as conditions, work procedures, or personnel change.
- C. All track work performed by Contractor meets the minimum safety requirements established by the Federal Railroad Administration's Track Safety Standards 49CFR213.
- D. All employees comply with the following safety procedures when working around any railroad track:
  - i. Always be on the alert for moving equipment. Employees must always expect movement on any track, at any time, in either direction.
  - ii. Do not step or walk on the top of the rail, frog, switches, guard rails, or other track components.
  - iii. In passing around the ends of standing cars, engines, roadway machines or work equipment, leave at least 20 feet between yourself and the end of the equipment. Do not go between pieces of equipment if the opening is less than one car length (50 feet).
  - iv. Avoid walking or standing on a track unless so authorized by the employee in charge.
  - v. Before stepping over or crossing tracks, look in both directions first.
  - vi. Do not sit on, lie under, or cross between cars except as required in the performance of your duties and only when track and equipment have been protected against movement.
- E. All employees must comply with all federal and state regulations concerning workplace safety.

# Exhibit G

# Project Geotechnical Report



**Huddleston-Berry**  
Engineering & Testing, LLC

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**GEOTECHNICAL INVESTIGATION  
LOWER LITTLE SALT WASH TRAIL  
FRUITA, COLORADO  
PROJECT#00456-0006**

**RIVER CITY CONSULTANTS, INC.  
744 HORIZON COURT, SUITE 110  
GRAND JUNCTION, COLORADO 81506**

**JUNE 17, 2011**

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**Huddleston-Berry Engineering and Testing, LLC  
640 White Avenue, Unit B  
Grand Junction, Colorado 81501**

## **SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

A geologic hazards and geotechnical investigation was conducted for the proposed Lower Little Salt Wash Trail in Fruita, Colorado. The project location is shown on Figure 1 – Site Location Map. The purpose of the investigation was to evaluate the surface and subsurface conditions at the site with respect to geologic hazards, foundation design, pavement design, and earthwork for the proposed construction. This summary has been prepared to include the information required by civil engineers, structural engineers, and contractors involved in the project.

### **Subsurface Conditions (p. 2)**

The subsurface investigation consisted of nine borings, drilled on May 20<sup>th</sup> and May 23<sup>rd</sup>, 2011. The borings generally encountered native sand, clay, and silt soils above dense gravel soils. Groundwater was encountered in most of the borings at depths of between 6.5 and 14.8 feet below the existing ground surface. The native clay soils moderately plastic and are anticipated to range from tending to consolidate at their existing density to being slightly expansive after compaction and introduction to excess moisture. The native sand and silt soils are non-plastic to slightly plastic and are anticipated to compress under loading.

### **Geologic Hazards and Constraints (p. 4)**

No geologic hazards were identified which would preclude construction. However, construction should consider the risks of movement associated with the moisture sensitive soils at the site. In addition, surface and groundwater may impact the construction depending upon the time of year that construction is completed.

### **Summary of Foundation Recommendations**

#### *Bridge/Culvert between City of Fruita Lagoons and James M. Robb state park*

- *Foundation Type* – Shallow Foundations bearing on dense gravel soils. (p. 5)
- *Maximum Allowable Bearing Capacity* – 2,000 psf. (p. 6)

#### *Retaining Walls*

- *Subgrade Preparation* – 12-inches of scarified, recompacted native soils. Subgrade stabilization may be necessary. (p. 6)
- *Maximum Allowable Bearing Capacity* – 1,250 psf (p. 6)

### **Summary of Pavement Recommendations (p. 7)**

It is recommended that the trail consist of 6-inches of concrete above 6-inches of base course.

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### FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Plan

### APPENDICES

Appendix A – UDSA NRCS Soil Survey Data

Appendix B – Typed Boring Logs

Appendix C – Laboratory Testing Results

## **1.0 INTRODUCTION**

As part of improvements to recreational infrastructure in Western Colorado, a new pedestrian trail is proposed between N. Coulson Street and Raptor Road along Little Salt Wash in Fruita. As part of the design development process, Huddlestone-Berry Engineering and Testing, LLC (HBET) was retained by River City Consultants to conduct a geologic hazards and geotechnical investigation at the site.

### **1.1 Scope**

As discussed above, a geologic hazards and geotechnical investigation was conducted for the proposed Lower Little Salt Wash Trail in Fruita, Colorado. The scope of the investigation included the following components:

- Conducting a subsurface investigation to evaluate the subsurface conditions at the site.
- Collecting soil samples and conducting laboratory testing to determine the engineering properties of the soils at the site.
- Providing recommendations for structure foundations and subgrade preparation.
- Providing recommendations for bearing capacity.
- Providing recommendations for lateral earth pressure.
- Providing recommendations for drainage, grading, and general earthwork.
- Providing recommendations for trail pavements.
- Evaluating potential geologic hazards at the site.

The investigation and report were completed by a Colorado registered professional engineer in accordance with generally accepted geotechnical and geological engineering practices. This report has been prepared for the exclusive use of River City Consultants, the City of Fruita, and Mesa County.

### **1.2 Site Location**

The trail is proposed to run from N. Coulson Street, north of the Independence Village assisted living facility, to Raptor Road, east of the City of Fruita's sewage treatment lagoons. In addition, the trail is proposed to extend south to the James M. Robb state park. The project location is shown on Figure 1 – Site Location Map.

### **1.3 Proposed Construction**

The proposed construction is anticipated to consist of a new pedestrian trail. As part of the construction a new culvert or bridge is likely between the City of Fruita lagoon property and the James M. Robb state park. In addition, to facilitate the trail construction, retaining walls may be necessary along portions of the alignment.

## 2.0 GEOLOGIC SETTING

### 2.1 Soils

Soils data was obtained from the USDA Natural Resource Conservation Service Web Soil Survey. The data indicates that the soils at the site include Sagers silty clay loam, 0 to 2 percent slopes; Sagers silty clay loam, saline, 0 to 2 percent slopes; Glenton very fine sandy loam, 0 to 2 percent slopes; Fruitland sandy clay loam, 0 to 2 percent slopes; Bebeever-Green River-Riverwash, 0 to 2 percent slopes; Ustifluvents, 0 to 2 percent slopes; and Turley clay loam, 0 to 2 percent slopes. Soil survey data, including descriptions of the soil units, is included in Appendix A.

Road and street construction (applicable to trail construction) in the Sagers soils is described as somewhat limited due to shrink-swell. Road and street construction in the Glenton, Bebeever, Green River, and Ustifluvents soils is described as somewhat to very limited due to flooding. Road and street construction in the Fruitland and Turley soils is described as not limited.

Shallow excavation in the site soils is described as ranging from somewhat to very limited due to cutbank caving, depth to saturated zone, and/or flooding. The site soils have a low potential for frost action and moderate to high risk of corrosion of steel.

The Fruitland and Riverwash soils are described as having a low risk of corrosion of concrete. The remaining soil types are indicated to have a moderate to high risk of corrosion of concrete.

### 2.2 Geology

According to the *Geologic Map of Colorado* by Ogden Tweto (1979), the site is underlain by Quaternary gravels and alluvium. The gravels and alluvium are underlain by Mancos shale bedrock. The Mancos shale unit is thick in the Grand Valley and has a low to moderate potential for expansion.

### 2.3 Groundwater

Groundwater was encountered in all but two of the borings at depths of between 6.5 and 14.8 feet below the existing ground surface. In general, the groundwater levels were consistent with the water elevation in Little Salt Wash and/or the Colorado River.

## 3.0 SUBSURFACE INVESTIGATION

The subsurface investigation was conducted on May 20<sup>th</sup> and May 23<sup>rd</sup>, 2011, and consisted of nine borings drilled to depths of between 7.0 and 17.0 feet. The locations of the borings are shown on Figure 2 – Site Plan. Typed boring logs are included in Appendix B. Samples of the native soils were collected during Standard Penetration Testing (SPT) and using bulk sampling methods at the locations shown on the logs.

As shown on the logs, the subsurface conditions along the trail alignment were variable. Boring B-1, conducted in the northern portion of the trail near Gewont Lane, encountered 1.0 foot of clayey sand and gravel with organics and debris fill above tan to gray, dry to moist, loose to medium dense silty sand to a depth of 10.0 feet. The sand was underlain by reddish brown to gray, moist, stiff silty, sandy clay to the bottom of the boring. Groundwater was not encountered in B-1 at the time of the investigation.

Boring B-2, conducted on the north side of US Highway 6 & 50, encountered 7.5 feet of fill materials above brown to gray, moist, loose sandy silt to a depth of 11.0 feet. Below the silt, gray to white, moist to wet, medium dense to very loose silty sand extended to a depth of 16.0 feet. The sand was underlain by brown to red, moist, soft silty clay to the bottom of the boring. Groundwater was encountered in B-2 at a depth of 14.8 feet at the time of the investigation.

Boring B-3, conducted on the north side of US Highway 6 & 50 adjacent to Little Salt Wash, encountered 1.5 feet of silty sand with organics topsoil above brown to gray, moist to wet, loose to medium dense silty sand to a depth of 10.5 feet. The sand was underlain by gray, wet, medium dense to dense sandy gravel to the bottom of the boring. Groundwater was encountered in B-3 at a depth of 8.0 feet at the time of the investigation.

Boring B-4, conducted along Little Salt Wash between the railroad and I-70, encountered 9.25 feet of brown to red to gray, moist to wet, loose to medium dense silty sand above reddish brown to gray, moist to wet, stiff to very loose interbedded silty clay and sandy silt to a depth of 15.0 feet. The clay and silt was underlain by brown, wet, dense sandy gravel to the bottom of the boring. Groundwater was encountered in B-4 at a depth of 6.5 feet at the time of the investigation.

Boring B-5, conducted along Little Salt Wash on the north side of I-70, encountered brown to gray, moist to wet, very loose to medium dense silty sand from the ground surface to the bottom of the boring. Groundwater was encountered in B-5 at a depth of 8.0 feet at the time of the investigation.

Boring B-6, conducted along Little Salt Wash on the south side of I-70, encountered 1.0 foot of clayey sand with organics topsoil above brown, moist, loose silty sand to a depth of 5.0 feet. The sand was underlain by brown, moist to wet, medium dense to dense sandy gravel to the bottom of the boring. Groundwater was encountered in B-6 at a depth of 7.0 feet at the time of the investigation.

Boring B-7, conducted in the western portion of the City of Fruita lagoon property, encountered 1.0 foot of sandy gravel and cobbles fill above brown to gray, moist to wet, very loose sandy silt to a depth of 10.0 feet. The silt was underlain by gray, wet, loose silty sand to a depth of 12.0 feet. Below the sand, brown, wet, medium dense to dense sandy gravel extended to the bottom of the boring. Groundwater was encountered in B-7 at a depth of 9.0 feet at the time of the investigation.

Boring B-8, conducted at the location of the proposed bridge to the James M. Robb state park, encountered 4.0 feet of clayey sand and gravel fill above brown, moist, loose silty sand to a depth of 8.0 feet. The sand was underlain by brown, wet, dense sandy gravel to the bottom of the boring. Groundwater was not encountered in B-8 at the time of the investigation.

Boring B-9, conducted at the proposed trail connection to Raptor Road, encountered 0.5 feet of clay with sand and gravel fill above brown to gray, moist, soft to stiff lean clay with sand to a depth of 8.75 feet. The clay was underlain by brown, very moist, very loose silty sand to a depth of 9.5 feet. Below the sand, brown, wet, medium dense sandy gravel extended to the bottom of the boring. Groundwater was encountered in B-9 at a depth of 10.0 feet at the time of the investigation.

## **4.0 LABORATORY TESTING**

Selected native soil samples collected from the borings were tested in the Huddleston-Berry Engineering and Testing LLC geotechnical laboratory for natural moisture content and density determination, grain size analysis, Atterberg limits determination, maximum dry density and optimum moisture (Proctor) determination, swell/consolidation testing, California Bearing Ratio (CBR), and soluble sulfates content determination. The laboratory testing results are included in Appendix C.

The laboratory testing results indicate that the native sand soils are non-plastic. In addition, the sand soils were shown to tend to compress under loading. The native silt soils were shown to be slightly plastic. The native clay soils were indicated to be moderately plastic. In addition, the clay soils were shown to tend to consolidate under loading. However, the CBR results indicate that the native clay soils are slightly expansive when compacted and introduced to excess moisture. Water soluble sulfates were detected in the site soils in concentrations as high as 0.4%.

## **5.0 GEOLOGIC INTERPRETATION**

### **5.1 Geologic Hazards**

The most critical geologic hazard identified on the site is the risk of flooding of Little Salt Wash and the Colorado River. In addition, moisture sensitive soils are present at the site.

### **5.2 Geologic Constraints**

The primary geologic constraint to construction is the presence of Little Salt Wash and the Colorado River. In addition, shallow groundwater associated with the watercourses will likely impact construction. The moisture sensitive soils may also impact the construction.

### **5.3 Water Resources**

As discussed previously, Little Salt Wash and the Colorado River are the primary water features in the project area.

### **5.4 Mineral Resources**

Potential mineral resources in western Colorado generally include gravel, uranium ore, and commercial rock products such as flagstone. As discussed previously, gravels were encountered during the subsurface investigation. In addition, the southern portion of the trail, crossing the City of Fruita sewage lagoon site, is mapped in the Mesa County GIS database as containing gravel resources. However, the trail will not occupy a significant area of land. As a result, the trail construction is not anticipated to impact the future extraction of any gravel resources in the project area.

## **6.0 CONCLUSIONS**

Based upon the available data sources, field investigation, and nature of the proposed construction, HBET does not believe that there are any geologic conditions which should preclude construction of the trail. However, foundations, trail pavements, retaining walls, and earthwork will have to consider the impacts of the moisture sensitive soils and the potential for flooding of Little Salt Wash and/or the Colorado River.

## **7.0 RECOMMENDATIONS**

### **7.1 Bridge/Culvert Foundations**

As discussed previously, a new culvert or bridge is proposed to connect the trail from the City of Fruita sewage lagoons site to the James M. Robb state park. Boring B-9 conducted in this area encountered 9.5 feet of clay and sand soils above dense gravel soils. In general, due to the depth of the drainage channel proposed to be crossed by the culvert or bridge, it is recommended that a culvert or bridge at this location be founded on the native dense sandy gravel soils.

It is recommended that the bottoms of the foundation excavations be scarified to a depth of 6 to 8-inches, moisture conditioned, and proofrolled to the Engineer's satisfaction. Where soft or loose materials are encountered, they should be removed and replaced with structural fill.

Any structural fill should extend laterally beyond the edges of the foundation a distance equal to the thickness of structural fill. Structural fill should be moisture conditioned, placed in maximum 8-inch loose lifts, and compacted to a minimum of 95% of the standard Proctor maximum dry density for fine grained soils or modified Proctor maximum dry density for coarse grained soils, within  $\pm 2\%$  of the optimum moisture content as determined in accordance with ASTM D698 or D1557C, respectively. Pit-run materials should be proofrolled to the Engineer's satisfaction.

For foundation subgrade prepared as recommended, a maximum allowable bearing capacity of 2,000 psf may be used.

## 7.2 Retaining Wall Foundations

Based upon information provided to HBET, retaining walls may be necessary to support the trail on the north side of the US Highway 6 & 50 culvert crossing and between US Highway 6 & 50 and the railroad tracks. Boring B-3, conducted on the north side of Highway 6 & 50 encountered native silty sand soils to a depth of 10.5 feet. Therefore, retaining walls will likely be constructed above the native sand soils. However, the actual depth of wall foundations will likely be dependent upon the results of scour analyses.

Prior to placement of wall foundation (concrete for rigid cantilever wall or concrete/base course for MSE wall), it is recommended that the bottoms of the foundation excavations be scarified to a depth of 12-inches, moisture conditioned, and re-compacted to a minimum of 95% of the standard Proctor maximum dry density, within  $\pm 2\%$  of the optimum moisture content as determined in accordance with ASTM D698. However, the sand soils at the foundation elevation will likely be saturated and compaction of the subgrade may be difficult. Where instabilities in the subgrade are encountered, geotextile and/or geogrid reinforcement may be required. HBET should be contacted to provide specific recommendations for subgrade stabilization based upon the actual subgrade conditions encountered during construction.

For foundation subgrade prepared as recommended, a maximum allowable bearing capacity of 1,250 psf may be used.

## 7.3 Lateral Earth Pressures

Structures should be designed to resist lateral earth pressures. We recommend that the proposed retaining walls be designed using the following earth pressure coefficients:

### Native Clay and Silt

- $K_a = 0.39$
- $K_p = 2.56$

### Native Sand

- $K_a = 0.36$
- $K_p = 2.77$

### Class 1 Structural Backfill

- $K_a = 0.33$
- $K_p = 3.00$

The earth pressure coefficients above assume horizontal backslope and should be increased where the backslope is not level. Computed lateral earth pressures on the walls should consider a surcharge loading of 100 psf for maintenance traffic on the trail.

Resistance to sliding at the base of foundations can be calculated based upon a coefficient of friction of 0.30 for the native silt/clay soils, a coefficient of 0.34 for the native sand soils, and a coefficient of 0.36 for Class I Structural Backfill. It is important to note that these coefficient of friction values are for ultimate soil strength. The structural engineer should apply an appropriate factor of safety to the above values.

#### **7.4 Corrosion of Steel and Concrete**

Based upon information provided in the USDA NRCS Web Soil Survey, the soils at the site generally have a moderate to high risk of corrosion of uncoated steel. The risk of corrosion may be increased where flooding or groundwater fluctuations result in periods of wetting and drying. Therefore, it is recommended that the structural engineer consider corrosion where steel utilities or steel retaining wall components are included in the design.

With regard to soil corrosivity to concrete, based upon the Soil Survey data and water soluble sulfate concentrations in the native soils, the risk of corrosion of concrete is high. In general, Type V cement is indicated by the International Building Code. However, Type V cement can be difficult to obtain in Western Colorado. Where Type V cement is unavailable, a minimum of Type I-II sulfate resistant cement is recommended.

#### **7.5 Excavations**

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. The native soils generally classify as Type C soil with regard to OSHA's *Construction Standards for Excavations*. In general, for Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V. However, below and/or near the water table, the native soils are anticipated to tend to slough. As a result, shoring and or very shallow cut slopes may be required in some areas where the trail is immediately adjacent to Little Salt Wash or the Colorado River.

#### **7.6 Trail Pavements**

Based upon the results of the subsurface investigation and the anticipated earthwork, the trail subgrade may consist of materials ranging from granular fill to moderately plastic clay. In addition, HBET understands that maintenance traffic will likely use the trail. In general, it is recommended that the trail consist of 6-inches of concrete above 6-inches of base course.

Prior to trail construction, the prism should be stripped of all topsoil, uncontrolled fill, or other unsuitable materials. It is recommended that soils in the subgrade be scarified to a depth of 12 inches and re-compacted to a minimum of 95% of the standard Proctor maximum dry density, within  $\pm 2\%$  of the optimum moisture content as determined in accordance with ASTM D698.

Aggregate base course should be placed in maximum 9-inch loose lifts, moisture conditioned, and compacted to a minimum of 95% of the maximum dry density, within  $\pm 2\%$  of optimum moisture content as determined by AASHTO T-180. In addition to density testing, base course should be proofrolled to verify subgrade stability.

It is recommended that concrete pavement consist of CDOT Class P concrete or alternative approved by the Engineer. In addition, pavements should conform to local specifications.

The long-term performance of the trail pavements is dependent on positive drainage away from the pavements. Ditches, culverts, and inlet structures in the vicinity of paved areas must be maintained to prevent ponding of water on the pavement. All pavements should conform to applicable local specifications.

## 8.0 GENERAL

The recommendations included above are based upon the results of the subsurface investigation and on our local experience. These conclusions and recommendations are valid only for the proposed construction.

As discussed previously, the subsurface conditions at the site were variable. Although HBET believes that the investigation was sufficient to adequately characterize the range of subsurface conditions at the site, the precise nature and extent of subsurface variability may not become evident until construction. Therefore, it is recommended that a representative of HBET be retained to provide engineering oversight and construction materials testing services during the construction. This is to verify compliance with the recommendations included in this report or permit identification of significant variations in the subsurface conditions which may require modification of the recommendations.

Huddlestone-Berry Engineering and Testing, LLC is pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:  
Huddlestone-Berry Engineering and Testing, LLC

Michael A. Berry, P.E.  
Vice President of Engineering



**FIGURES**

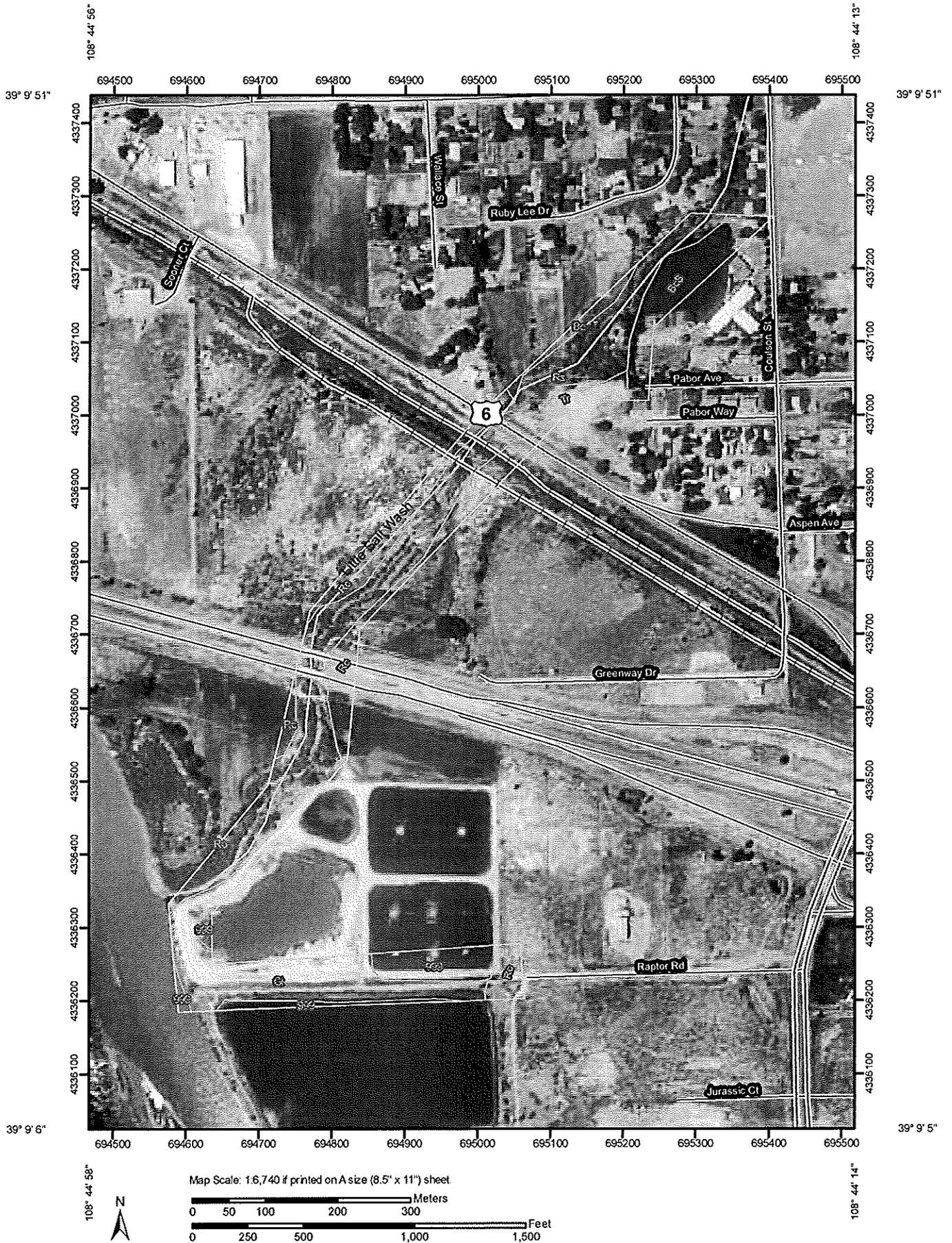




FIGURE 2  
Site Plan

**APPENDIX A**  
**Soil Survey Data**

Soil Map—Mesa County Area, Colorado



## MAP LEGEND

	Area of Interest (AOI)		Very Stony Spot
	Soils		Wet Spot
	Soil Map Units		Other
	Blowout	<b>Special Line Features</b>	
	Borrow Pit		Gully
	Clay Spot		Short Steep Slope
	Closed Depression		Other
	Gravel Pit	<b>Political Features</b>	
	Gravelly Spot		Cities
	Landfill	<b>Water Features</b>	
	Lava Flow		Oceans
	Marsh or swamp		Streams and Canals
	Mine or Quarry	<b>Transportation</b>	
	Miscellaneous Water		Rails
	Perennial Water		Interstate Highways
	Rock Outcrop		US Routes
	Saline Spot		Major Roads
	Sandy Spot		Local Roads
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		
	Spoil Area		
	Stony Spot		

## MAP INFORMATION

Map Scale: 1:6,740 if printed on A size (8.5" x 11") sheet.  
 The soil surveys that comprise your AOI were mapped at 1:24,000. Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado  
 Survey Area Data: Version 3, Sep 25, 2007

Date(s) aerial images were photographed: 8/1/1993; 8/3/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Mesa County Area, Colorado (CO680)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
999	Water	2.7	8.1%
Bc	Sagers silty clay loam, 0 to 2 percent slopes	0.6	1.8%
BcS	Sagers silty clay loam, saline, 0 to 2 percent slopes	3.1	9.4%
Gt	Glenton very fine sandy loam, 0 to 2 percent slopes	6.6	19.7%
Rc	Fruiland sandy clay loam, 0 to 2 percent slopes	6.0	17.9%
Ro	Bebeevar-Green River-Riverwash, 0 to 2 percent slopes	0.0	0.0%
Rs	Ustifluvents, 0 to 2 percent slopes	13.4	40.2%
Tr	Turley clay loam, 0 to 2 percent slopes	0.9	2.8%
<b>Totals for Area of Interest</b>		<b>33.3</b>	<b>100.0%</b>

## Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

## Report—Map Unit Description

### Mesa County Area, Colorado

#### 999—Water

#### Bc—Sagers silty clay loam, 0 to 2 percent slopes

##### Map Unit Setting

*Elevation:* 4,500 to 5,900 feet

*Mean annual precipitation:* 5 to 8 inches

*Mean annual air temperature:* 50 to 54 degrees F

*Frost-free period:* 150 to 190 days

### Map Unit Composition

*Sagers and similar soils:* 90 percent

### Description of Sagers

#### Setting

*Landform:* Alluvial fans, terraces

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Alluvium and slope alluvium derived from calcareous shale and sandstone

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 15 percent

*Gypsum, maximum content:* 5 percent

*Maximum salinity:* Nonsaline to slightly saline (2.0 to 8.0 mmhos/cm)

*Available water capacity:* High (about 9.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2e

*Land capability (nonirrigated):* 7c

#### Typical profile

*0 to 12 inches:* Silty clay loam

*12 to 25 inches:* Silty clay loam

*25 to 60 inches:* Silty clay loam

### BcS—Sagers silty clay loam, saline, 0 to 2 percent slopes

#### Map Unit Setting

*Elevation:* 4,500 to 4,900 feet

*Mean annual precipitation:* 5 to 8 inches

*Mean annual air temperature:* 50 to 54 degrees F

*Frost-free period:* 150 to 190 days

#### Map Unit Composition

*Sagers, saline, and similar soils:* 90 percent

#### Description of Sagers, Saline

#### Setting

*Landform:* Alluvial fans, terraces

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Alluvium and slope alluvium derived from calcareous shale and sandstone

**Properties and qualities**

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water*

*(Ksat):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 15 percent

*Gypsum, maximum content:* 5 percent

*Maximum salinity:* Moderately saline to strongly saline (16.0 to 32.0 mmhos/cm)

*Available water capacity:* Very low (about 3.0 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 8s

**Typical profile**

*0 to 12 inches:* Silty clay loam

*12 to 25 inches:* Silty clay loam

*25 to 60 inches:* Silty clay loam

**Gt—Glenton very fine sandy loam, 0 to 2 percent slopes**

**Map Unit Setting**

*Elevation:* 4,500 to 4,900 feet

*Mean annual precipitation:* 7 to 10 inches

*Mean annual air temperature:* 50 to 54 degrees F

*Frost-free period:* 150 to 190 days

**Map Unit Composition**

*Glenton and similar soils:* 90 percent

**Description of Glenton**

**Setting**

*Landform:* Alluvial fans, flood plains

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from sandstone and shale

**Properties and qualities**

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)

*Depth to water table:* About 48 to 72 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Maximum salinity:* Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)  
*Available water capacity:* Moderate (about 8.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2e  
*Land capability (nonirrigated):* 7c

**Typical profile**

*0 to 14 inches:* Very fine sandy loam  
*14 to 60 inches:* Stratified sandy loam to very fine sandy loam

**Rc—Fruitland sandy clay loam, 0 to 2 percent slopes**

**Map Unit Setting**

*Elevation:* 4,600 to 4,800 feet  
*Mean annual precipitation:* 7 to 10 inches  
*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 150 to 190 days

**Map Unit Composition**

*Fruitland and similar soils:* 90 percent

**Description of Fruitland**

**Setting**

*Landform:* Alluvial fans  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from sandstone and shale

**Properties and qualities**

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 2.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Maximum salinity:* Nonsaline (0.0 to 2.0 mmhos/cm)  
*Available water capacity:* Moderate (about 7.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2e  
*Land capability (nonirrigated):* 7c

**Typical profile**

*0 to 8 inches:* Sandy clay loam  
*8 to 30 inches:* Stratified sandy loam to gravelly fine sandy loam  
*30 to 60 inches:* Stratified sandy loam to fine sandy loam

## Ro—Bebeevar-Green River-Riverwash, 0 to 2 percent slopes

### Map Unit Setting

*Elevation:* 4,430 to 4,820 feet  
*Mean annual precipitation:* 7 to 10 inches  
*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 135 to 190 days

### Map Unit Composition

*Bebeevar and similar soils:* 45 percent  
*Green river and similar soils:* 35 percent  
*Riverwash:* 20 percent

### Description of Bebeevar

#### Setting

*Landform:* Flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium over sandy and gravelly alluvium derived from sandstone and shale

#### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)  
*Depth to water table:* About 24 to 48 inches  
*Frequency of flooding:* Rare  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Maximum salinity:* Nonsaline (0.0 to 2.0 mmhos/cm)  
*Available water capacity:* Low (about 4.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s  
*Land capability (nonirrigated):* 7s

#### Typical profile

*0 to 9 inches:* Loam  
*9 to 14 inches:* Loam  
*14 to 18 inches:* Fine sandy loam  
*18 to 32 inches:* Sand  
*32 to 59 inches:* Very cobbly sand

### Description of Green River

#### Setting

*Landform:* Flood plains, terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear

*Parent material:* Clayey alluvium over coarse-loamy alluvium derived from sandstone and shale

**Properties and qualities**

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Capacity of the most limiting layer to transmit water*

*(Ksat):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* About 24 to 48 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 5 percent

*Maximum salinity:* Nonsaline to moderately saline (2.0 to 16.0 mmhos/cm)

*Sodium adsorption ratio, maximum:* 5.0

*Available water capacity:* Moderate (about 7.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2e

*Land capability (nonirrigated):* 7c

**Typical profile**

*0 to 10 inches:* Clay loam

*10 to 16 inches:* Fine sandy loam

*16 to 24 inches:* Fine sandy loam

*24 to 32 inches:* Fine sandy loam

*32 to 44 inches:* Fine sandy loam

*44 to 52 inches:* Fine sandy loam

*52 to 60 inches:* Very cobbly sand

**Description of Riverwash**

**Setting**

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and gravelly alluvium

**Properties and qualities**

*Slope:* 0 to 2 percent

*Drainage class:* Somewhat excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (6.00 to 20.00 in/hr)

*Depth to water table:* About 0 to 24 inches

*Frequency of flooding:* Frequent

*Available water capacity:* Very low (about 1.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 6w

*Land capability (nonirrigated):* 7w

**Typical profile**

*0 to 6 inches:* Very gravelly sand

*6 to 60 inches:* Stratified extremely gravelly coarse sand to gravelly sand

## Rs—Ustifluvents, 0 to 2 percent slopes

### Map Unit Setting

*Elevation:* 4,500 to 4,900 feet  
*Mean annual precipitation:* 7 to 10 inches  
*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 150 to 190 days

### Map Unit Composition

*Ustifluvents and similar soils:* 85 percent

### Description of Ustifluvents

#### Setting

*Landform:* Flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from sandstone and shale

#### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 30 to 60 inches  
*Frequency of flooding:* Occasional  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Gypsum, maximum content:* 5 percent  
*Maximum salinity:* Slightly saline to moderately saline (8.0 to 16.0 mmhos/cm)  
*Available water capacity:* Low (about 4.6 inches)

#### Interpretive groups

*Land capability (nonirrigated):* 7c  
*Ecological site:* Saltdesert Overflow (R034XY407CO)

#### Typical profile

*0 to 2 inches:* Sandy loam  
*2 to 8 inches:* Very fine sandy loam  
*8 to 22 inches:* Stratified loamy sand to sandy clay loam  
*22 to 60 inches:* Very gravelly sandy loam

## Tr—Turley clay loam, 0 to 2 percent slopes

### Map Unit Setting

*Elevation:* 4,500 to 4,800 feet  
*Mean annual precipitation:* 7 to 10 inches  
*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 150 to 190 days

### Map Unit Composition

*Turley and similar soils:* 90 percent

### Description of Turley

#### Setting

*Landform:* Fan remnants

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from sandstone and shale

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water*

*(Ksat):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 10 percent

*Gypsum, maximum content:* 4 percent

*Maximum salinity:* Nonsaline (0.0 to 2.0 mmhos/cm)

*Available water capacity:* High (about 10.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2e

*Land capability (nonirrigated):* 7c

#### Typical profile

*0 to 10 inches:* Clay loam

*10 to 20 inches:* Fine sandy loam

*20 to 30 inches:* Clay loam

*30 to 60 inches:* Stratified loam to silty clay loam

### Data Source Information

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 3, Sep 25, 2007

## Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

*Lawns and landscaping* require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

## Report—Roads and Streets, Shallow Excavations, and Lawns and Landscaping

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Roads and Streets, Shallow Excavations, and Lawns and Landscaping— Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bc—Sagers silty clay loam, 0 to 2 percent slopes							
Sagers	90	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
BcS—Sagers silty clay loam, saline, 0 to 2 percent slopes							
Sagers, saline	90	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Salinity	1.00
						Droughty	0.98

Roads and Streets, Shallow Excavations, and Lawns and Landscaping— Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Gt—Glenton very fine sandy loam, 0 to 2 percent slopes							
Glenton	90	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Depth to saturated zone	0.15		
				Cutbanks cave	0.10		
Rc—Fruiland sandy clay loam, 0 to 2 percent slopes							
Fruiland	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Ro—Bebevar-Green River-Riverwash, 0 to 2 percent slopes							
Bebevar	45	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.40	Cutbanks cave	1.00	Droughty	0.01
				Depth to saturated zone	0.95		
Green river	35	Somewhat limited		Very limited		Not rated	
		Flooding	0.40	Cutbanks cave	1.00		
				Depth to saturated zone	0.95		
Riverwash	20	Not rated		Not rated		Not rated	
Rs—Ustifluvents, 0 to 2 percent slopes							
Ustifluvents	85	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Depth to saturated zone	0.73	Droughty	0.10
				Flooding	0.60		
Tr—Turley clay loam, 0 to 2 percent slopes							
Turley	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		

### Data Source Information

Soil Survey Area: Mesa County Area, Colorado  
 Survey Area Data: Version 3, Sep 25, 2007

## Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*Subsidence* is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (*K<sub>sat</sub>*), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

*Risk of corrosion* pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

## Report—Soil Features

Soil Features—Mesa County Area, Colorado											
Map symbol and soil name	Kind	Restrictive Layer			Hardness	Subsidence		Potential for frost action	Risk of corrosion		
		Depth to top	Thickness	Initial		Total	Uncoated steel		Concrete		
Bc—Sagers silty clay loam, 0 to 2 percent slopes	In	In				In	In				
Sagers	—	—	—		0	—	—	Low	High	Moderate	
BcS—Sagers silty clay loam, saline, 0 to 2 percent slopes											
Sagers, saline	—	—	—		0	—	—	Low	High	High	
Gl—Glenton very fine sandy loam, 0 to 2 percent slopes											
Glenton	—	—	—		0	—	—	Low	High	High	
Rc—Fruitland sandy clay loam, 0 to 2 percent slopes											
Fruitland	—	—	—		0	—	—	Low	Moderate	Low	
Ro—Bebevar-Green River-Riverwash, 0 to 2 percent slopes											
Bebevar	—	—	—		0	—	—	Low	High	High	
Green river	—	—	—		0	—	—	Low	High	High	
Riverwash	—	—	—		0	—	—	Low	High	Low	

Soil Features— Mesa County Area, Colorado									
Map symbol and soil name	Kind	Restrictive Layer		Hardness	Subsidence		Potential for frost action	Risk of corrosion	
		Depth to top	Thickness		Initial	Total		Uncoated steel	Concrete
Rs—Ustifluvents, 0 to 2 percent slopes	In	In			In	In			
Ustifluvents	—	—	—		0	—	Low	High	High
Tr—Turley clay loam, 0 to 2 percent slopes									
Turley	—	—	—		0	—	Low	High	Moderate

### Data Source Information

Soil Survey Area: Mesa County Area, Colorado  
 Survey Area Data: Version 3, Sep 25, 2007

**APPENDIX B**  
**Typed Boring Logs**



Huddlestone-Berry Engineering & Testing, LLC  
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 970-255-8005  
 970-255-6818

**BORING NUMBER B-1**

PAGE 1 OF 1

CLIENT <u>River City Consultants</u>	PROJECT NAME <u>Lower Little Salt Wash</u>
PROJECT NUMBER <u>00456-0006</u>	PROJECT LOCATION <u>Fruita, CO</u>
DATE STARTED <u>5/20/11</u> COMPLETED <u>5/20/11</u>	GROUND ELEVATION _____ HOLE SIZE <u>4"</u>
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Simco 2000 Truck Rig</u>	AT TIME OF DRILLING <u>dry</u>
LOGGED BY <u>AS</u> CHECKED BY <u>MAB</u>	AT END OF DRILLING <u>dry</u>
NOTES _____	AFTER DRILLING <u>---</u>

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Clayey SAND and GRAVEL with Organics and Debris (FILL), brown, moist, medium dense										
2.5		Silty SAND (SM) tan to gray, dry to moist, loose to medium dense  GB1: Lab Classified	GB 1					5	NP	NP	NP	32
5.0			MC 1	83	5-8-9 (17)		98	20				
10.0		Silty Sandy CLAY (cl), reddish brown to gray, moist, stiff, abundant sulfates										
15.0		Bottom of hole at 15.0 feet.	SS 1	100	4-4-4 (8)							

GEO TECH BH COLUMNS 00456-0006 LOWER LITTLE SALT WASH GPJ GINT US LAB.GDT 6/17/11



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# BORING NUMBER B-2

PAGE 1 OF 1

CLIENT River City Consultants PROJECT NAME Lower Little Salt Wash  
 PROJECT NUMBER 00456-0006 PROJECT LOCATION Fruita, CO  
 DATE STARTED 5/20/11 COMPLETED 5/20/11 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 4"  
 DRILLING CONTRACTOR S. McKracken GROUND WATER LEVELS:  
 DRILLING METHOD Simco 2000 Truck Rig ▽ AT TIME OF DRILLING 14.8 ft  
 LOGGED BY AS CHECKED BY MAB ▽ AT END OF DRILLING 14.8 ft  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Silty SAND with Gravel and Organics (FILL), red, dry to moist, loose										
		Sandy CLAY with Gravel (FILL), brown to dark gray, moist, stiff										
5			SS 1	17	2-3-4-5 (7)							
		Sandy SILT (ml), brown to gray, moist, loose, organics present										
10			SS 2	100	2-4-4-7 (8)							
		Silty SAND (sm), gray to white, moist to wet, medium dense to very loose										
15			SS 3	100	3-1-1-2 (2)							
		Silty Clay (cl), brown to light red, moist, soft, abundant sulfates										
		Bottom of hole at 17.0 feet.										

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# BORING NUMBER B-3

PAGE 1 OF 1

CLIENT <u>River City Consultants</u>	PROJECT NAME <u>Lower Little Salt Wash</u>
PROJECT NUMBER <u>00456-0006</u>	PROJECT LOCATION <u>Fruita, CO</u>
DATE STARTED <u>5/20/11</u> COMPLETED <u>5/20/11</u>	GROUND ELEVATION _____ HOLE SIZE <u>4"</u>
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Simco 2000 Truck Rig</u>	▼ AT TIME OF DRILLING <u>8.0 ft</u>
LOGGED BY <u>AS</u> CHECKED BY <u>MAB</u>	▼ AT END OF DRILLING <u>8.0 ft</u>
NOTES _____	AFTER DRILLING <u>---</u>

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Silty SAND with Organics (TOPSOIL), brown, moist										
2.5		Silty SAND (sm), with thin clayey sand lenses and gravel lenses, brown to gray, moist to wet, loose to medium dense	MC 1	75	3-6-8-9 (14)							
5.0												
7.5												
10.0			SS 1	92	3-14-14-15 (28)							
12.5		Sandy GRAVEL (gw), gray, wet, medium dense to dense										
		Bottom of hole at 14.5 feet.										

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**BORING NUMBER B-4**

PAGE 1 OF 1

CLIENT River City Consultants PROJECT NAME Lower Little Salt Wash  
 PROJECT NUMBER 00456-0006 PROJECT LOCATION Fruita, CO  
 DATE STARTED 5/23/11 COMPLETED 5/23/11 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 4"  
 DRILLING CONTRACTOR S. McKracken GROUND WATER LEVELS:  
 DRILLING METHOD Simco 2000 Truck Rig ▽ AT TIME OF DRILLING 6.5 ft  
 LOGGED BY AS CHECKED BY MAB ▽ AT END OF DRILLING 6.5 ft  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		Silty SAND (sm), with silty clay lenses, brown, reddish brown and dark gray, moist to wet, loose to medium dense	GB 1									
			SS 1	67	4-5-6-6 (11)							
5												
		Interbedded layers of Silty CLAY (cl) and Sandy SILT (ml), reddish brown to gray, moist to wet, stiff and very loose	SS 2	100	1-2-4-6 (6)							
10												
		Sandy GRAVEL (gw), brown, wet, dense	SS 3	83	17-17-20 (37)							
15												
		Bottom of hole at 16.3 feet.										

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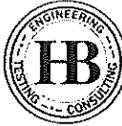
**BORING NUMBER B-5**

PAGE 1 OF 1

CLIENT <u>River City Consultants</u>	PROJECT NAME <u>Lower Little Salt Wash</u>
PROJECT NUMBER <u>00456-0006</u>	PROJECT LOCATION <u>Fruita, CO</u>
DATE STARTED <u>5/23/11</u> COMPLETED <u>5/23/11</u>	GROUND ELEVATION _____ HOLE SIZE <u>4"</u>
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Simco 2000 Truck Rig</u>	▼ AT TIME OF DRILLING <u>8.0 ft</u>
LOGGED BY <u>AS</u> CHECKED BY <u>MAB</u>	▼ AT END OF DRILLING <u>8.0 ft</u>
NOTES _____	AFTER DRILLING <u>--</u>

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Silty SAND (sm) with clayey sand lenses, brown to gray, moist to wet, very loose to medium dense, abundant sulfates										
2.5			MC 1	89	3-4-7 (11)							
5.0			GB 1									
7.5			SS 1	46	1-0-0-1 (0)							
10.0												
12.5			SS 2	100	3-2-6-6 (8)							
15.0		Bottom of hole at 15.0 feet.										

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**BORING NUMBER B-6**

PAGE 1 OF 1

CLIENT River City Consultants PROJECT NAME Lower Little Salt Wash  
 PROJECT NUMBER 00456-0006 PROJECT LOCATION Fruita, CO  
 DATE STARTED 5/20/11 COMPLETED 5/20/11 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 4"  
 DRILLING CONTRACTOR S. McCracken GROUND WATER LEVELS:  
 DRILLING METHOD Simco 2000 Truck Rig ▼ AT TIME OF DRILLING 7.0 ft  
 LOGGED BY AS CHECKED BY MAB ▼ AT END OF DRILLING 7.0 ft  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Clayey SAND with Organics (TOPSOIL), brown, moist										
		Silty SAND (sm), with gravel lenses, brown, moist, loose										
2.5												
5.0		Sandy GRAVEL (gw), brown, moist to wet, medium dense to dense	SS 1	78	5-16-20-26/0"							
		Bottom of hole at 7.0 feet.										

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**BORING NUMBER B-7**

PAGE 1 OF 1

CLIENT River City Consultants PROJECT NAME Lower Little Salt Wash  
 PROJECT NUMBER 00456-0006 PROJECT LOCATION Fruita, CO  
 DATE STARTED 5/20/11 COMPLETED 5/20/11 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 4"  
 DRILLING CONTRACTOR S. McCracken GROUND WATER LEVELS:  
 DRILLING METHOD Simco 2000 Truck Rig ▽ AT TIME OF DRILLING 9.0 ft  
 LOGGED BY AS CHECKED BY MAB ▽ AT END OF DRILLING 9.0 ft  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS				
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (%)	
0.0		Sandy GRAVEL and COBBLES (FILL), brown, moist, dense											
2.5		Sandy SILT (ML), with silty sand lenses, brown to gray, moist to wet, very loose  SS1: Lab Classified	SS 1	88	2-2-2-2 (4)			26	22	21	1	55	
5.0													
7.5													
10.0		Silty SAND (sm), gray, wet, loose	SS 2	100	2-1-2-3 (3)								
12.5		Sandy GRAVEL (gw), brown, wet, medium dense to dense											
		Bottom of hole at 14.0 feet.											

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**BORING NUMBER B-9**

PAGE 1 OF 1

CLIENT River City Consultants PROJECT NAME Lower Little Salt Wash  
 PROJECT NUMBER 00456-0006 PROJECT LOCATION Fruita, CO  
 DATE STARTED 5/20/11 COMPLETED 5/20/11 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 4"  
 DRILLING CONTRACTOR S. McKracken GROUND WATER LEVELS:  
 DRILLING METHOD Simco 2000 Truck Rig ▽ AT TIME OF DRILLING 10.0 ft  
 LOGGED BY AS CHECKED BY MAB ▼ AT END OF DRILLING 10.0 ft  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Lean CLAY with Sand and Gravel (FILL), brown, moist										
2.5		Lean CLAY with Sand (CL), sandy silt lenses, trace gravel, brown to gray, moist, soft to stiff, abundant sulfates GB1: Lab Classified	GB 1					2	39	15	24	80
2.5			MC 1	89	5-5-6 (11)		94	27				
5.0												
7.5			SS 1	83	1-2-1-2 (3)							
7.5		Silty SAND (sm), brown, very moist, very loose										
10.0		Sandy GRAVEL (gw), brown, wet, medium dense to dense										
12.5			SS 2	0	9-9-14 (23)							
		Bottom of hole at 14.5 feet.										

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**APPENDIX C**  
**Laboratory Testing Results**



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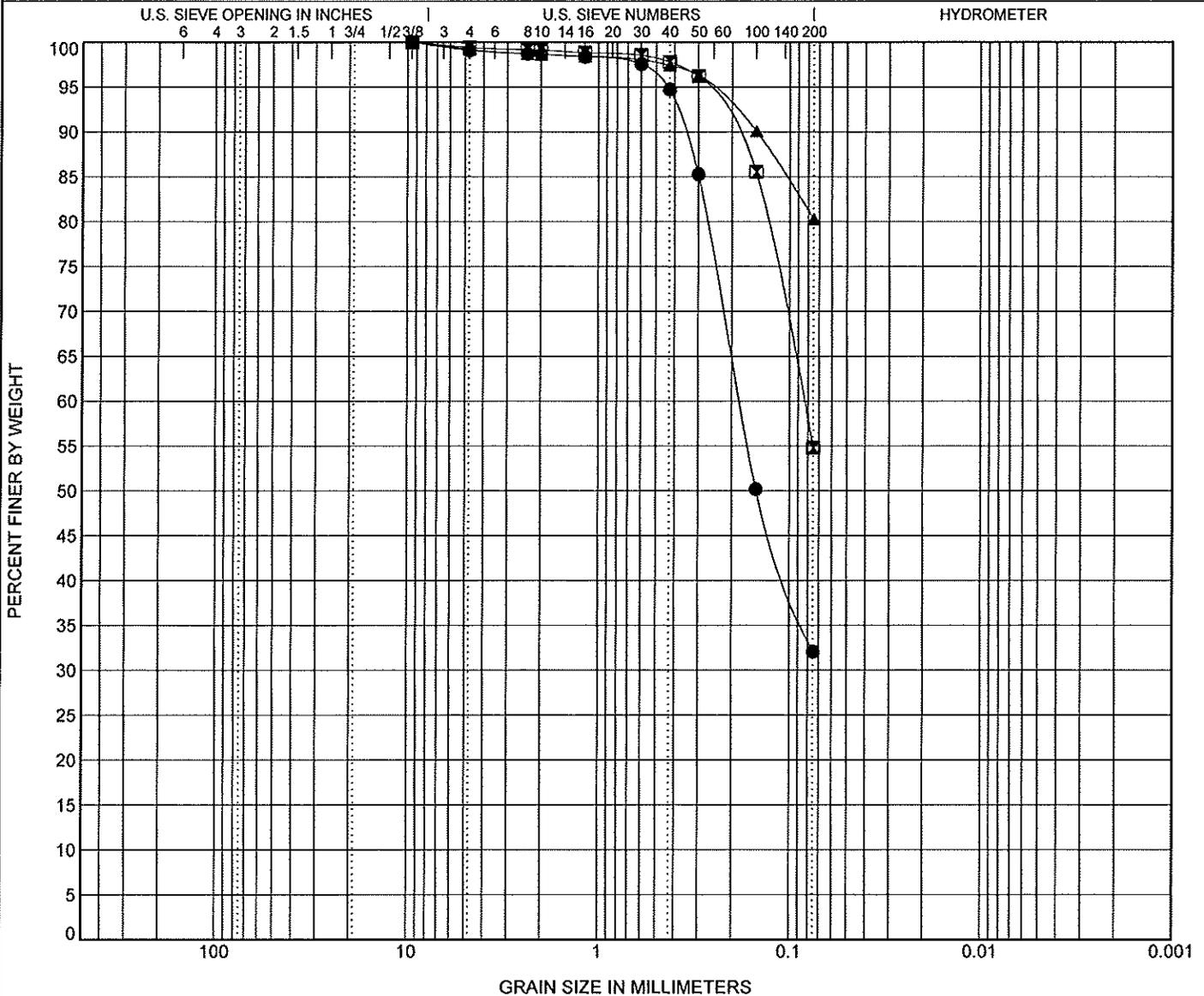
# GRAIN SIZE DISTRIBUTION

CLIENT River City Consultants

PROJECT NAME Lower Little Salt Wash

PROJECT NUMBER 00456-0006

PROJECT LOCATION Fruita, CO







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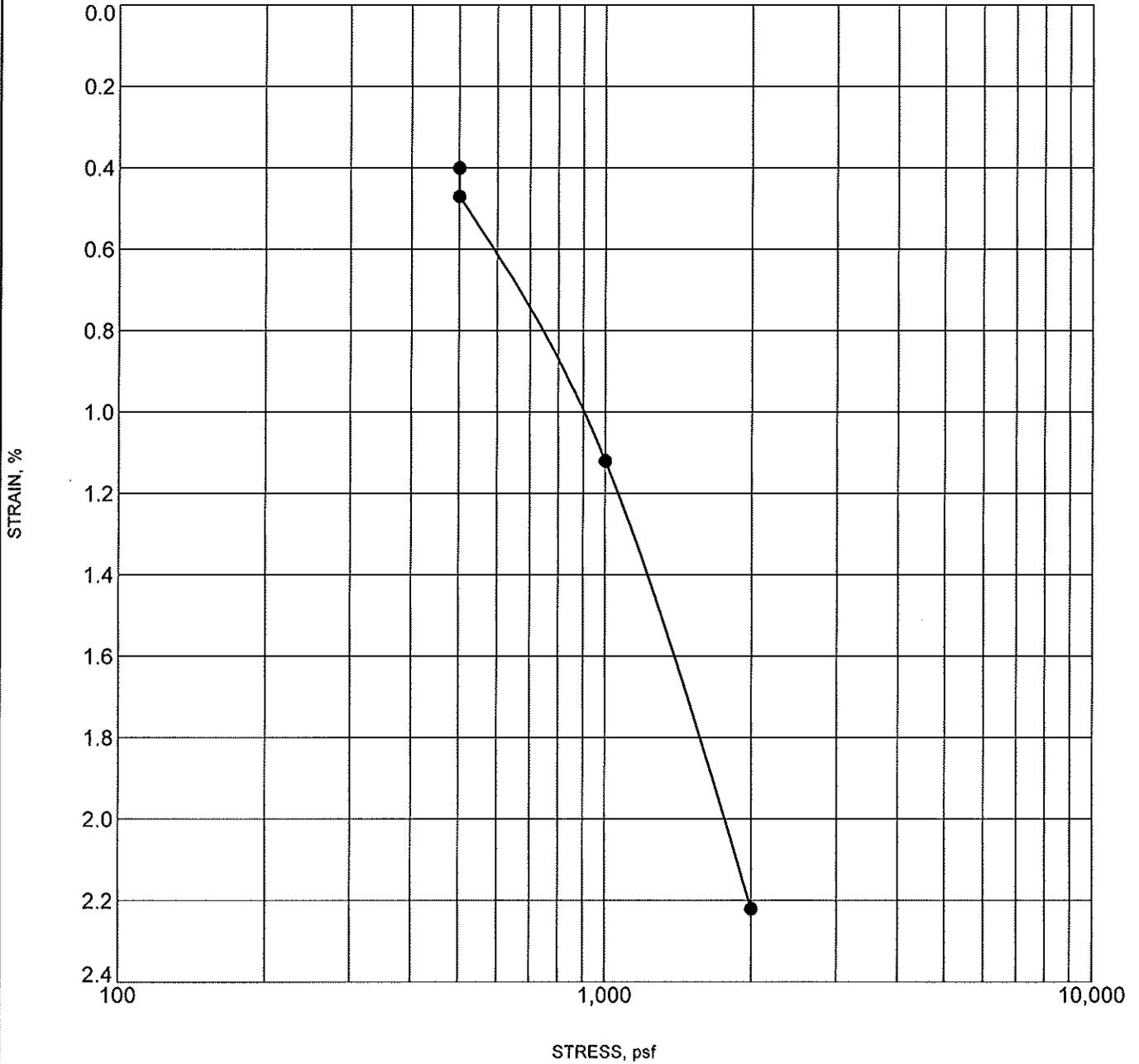
# CONSOLIDATION TEST

CLIENT River City Consultants

PROJECT NAME Lower Little Salt Wash

PROJECT NUMBER 00456-0006

PROJECT LOCATION Fruita, CO



CONSOL STRAIN 00456-0006 LOWER LITTLE SALT WASH.GPJ\_GINT US LAB.GDT 6/17/11

Specimen Identification	Classification	$\gamma_d$	MC%
● B-1 5.0		98	20



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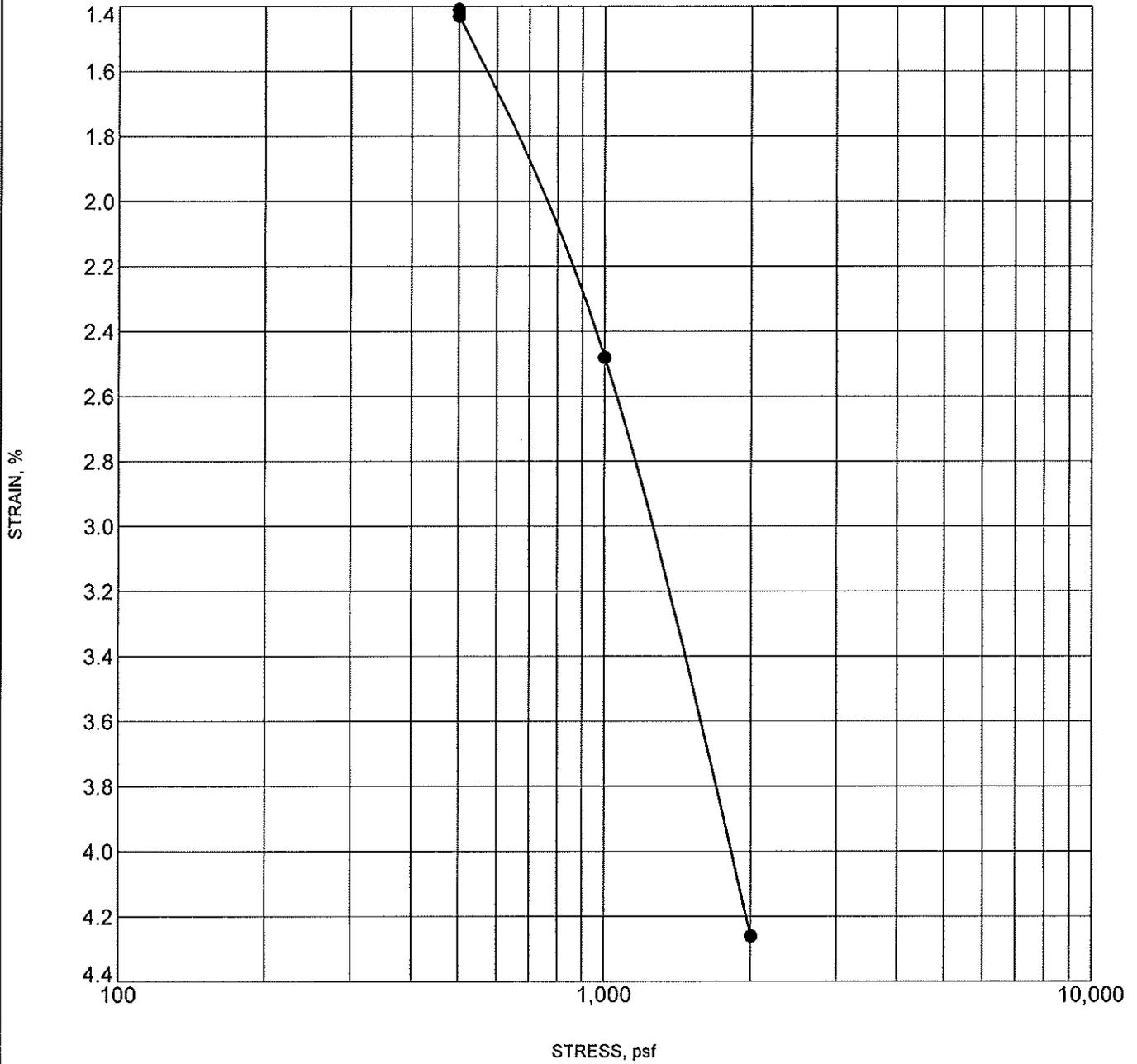
# CONSOLIDATION TEST

CLIENT River City Consultants

PROJECT NAME Lower Little Salt Wash

PROJECT NUMBER 00456-0006

PROJECT LOCATION Fruita, CO



CONSOL-STRAIN\_00456-0006\_LOWER LITTLE SALT WASH.GPJ\_GINT US LAB.GDT\_6/17/11

Specimen Identification	Classification	$\gamma_d$	MC%
● B-9      2.0		94	27



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# MOISTURE-DENSITY RELATIONSHIP

CLIENT River City Consultants

PROJECT NAME Lower Little Salt Wash

PROJECT NUMBER 00456-0006

PROJECT LOCATION Fruita, CO

Sample Date: 5/20/2011  
 Sample No.: GB-1  
 Source of Material: B-1  
 Description of Material: SILTY SAND(SM)  
 Test Method: ASTM D698A

## TEST RESULTS

Maximum Dry Density 112.6 PCF  
 Optimum Water Content 14.0 %

### GRADATION RESULTS (% PASSING)

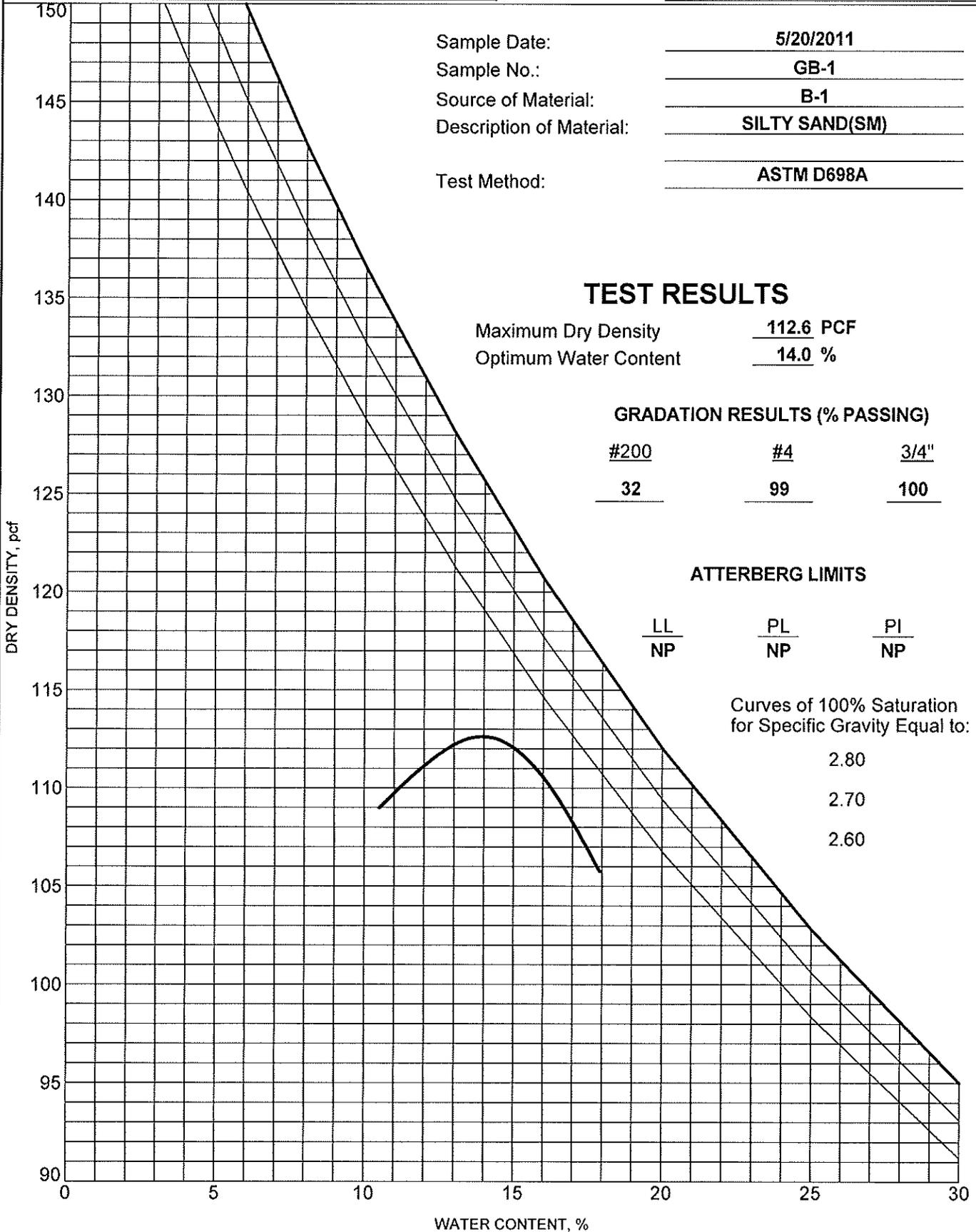
#200	#4	3/4"
<u>32</u>	<u>99</u>	<u>100</u>

### ATTERBERG LIMITS

$\frac{LL}{NP}$	$\frac{PL}{NP}$	$\frac{PI}{NP}$

Curves of 100% Saturation  
 for Specific Gravity Equal to:

2.80  
 2.70  
 2.60



COMPACTION\_00456-0006 LOWER LITTLE SALT WASH.GPJ GINT US LAB.GDT 6/17/11



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# MOISTURE-DENSITY RELATIONSHIP

CLIENT River City Consultants PROJECT NAME Lower Little Salt Wash  
 PROJECT NUMBER 00456-0006 PROJECT LOCATION Fruita, CO

Sample Date: 5/20/2011  
 Sample No.: GB-1  
 Source of Material: B-9  
 Description of Material: LEAN CLAY with SAND(CL)  
 Test Method: ASTM D698A

## TEST RESULTS

Maximum Dry Density 108.0 PCF  
 Optimum Water Content 15.3 %

### GRADATION RESULTS (% PASSING)

#200	#4	3/4"
<u>80</u>	<u>99</u>	<u>100</u>

### ATTERBERG LIMITS

LL	PL	PI
<u>39</u>	<u>15</u>	<u>24</u>

Curves of 100% Saturation  
 for Specific Gravity Equal to:

2.80  
 2.70  
 2.60

