Purchasing Division

ADDENDUM NO. 4

DATE: **July 18, 2016**
FROM: **City of Grand Junction Purchasing Division**
TO: **All Offerors**
RE: **Hallenbeck Reservoir #1 Downstream Slope Repair Project IFB-4245-16-DH**

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. Q. The specs call for a Royer Quality Casting cleanout cover per spec 02620-2.1.A. Royer only makes this product up to 12.75" in size. My question is should we price something similar made of steel or do you have an alternate product that you would like priced into this bid?

   A. Bidders shall go ahead and include a 12.75" diameter Royer Quality Casting Aluminum Locking Well Cap into their bid. In addition, the bidders shall also include galvanized steel pipe (casing pipe) into their bid for the well cap(s) to attach too. The galvanized steel pipe shall have an outside diameter that will successfully work with the locking well cap. The aluminum locking well caps and galvanized steel pipe will not be paid for separately, but shall be included in the cost of the Toe Drain pay item.

2. The Project has identified an alternative borrow source (Borrow Site #2) for excavating material to be used for the project's embankment fill. Please reference the attached report for information regarding Borrow Site #2. The design engineer AECOM has issued approval of the alternative Borrow Site #2.

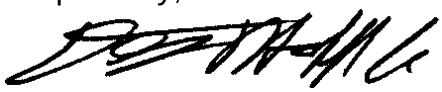
   The City of Grand Junction will stake the boundaries of Borrow Site #2 if required. The Contractor cannot excavate any material within 200-ft of the reservoir's dam structure. It's estimated that Borrow Site #2 could generate about 12,000 to 15,000 cubic yards of material.

   Following the Pre-Bid Meeting, a local material supplier proposed using slightly different gradations for the projects Filter Sand and Drain Gravel. The attached report by AECOM addresses the proposed gradations submitted by the material supplier.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,



Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado

AECOM
6200 South Quebec Street
Greenwood Village, Colorado 80111
www.aecom.com

303-694 2770 tel
303 694 3946 fax

July 18, 2016

Mr. Lee Cooper
Project Engineer
City of Grand Junction
City of Grand Junction
250 North 5th St.
Grand Junction, CO 81501

Re: Alternative Borrow Source, Downstream Slope Repair, Hallenbeck No. 1 Dam, Dam ID 420125, Water Division 4, Water District 42, SEO File C-0356F

Dear Mr. Cooper:

During the pre-bid meeting on June 13, 2016 for the upcoming construction of the Downstream Slope Repair of the Hallenbeck No. 1 Dam, an alternative borrow source for buttress material was identified. Test pits were excavated using a backhoe by the City of Grand Junction (City) on June 13, 2016 and samples were collected. The test pits are located within the shaded area, as shown on the attached Figure 1. Following the pre-bid meeting, alternative materials were also proposed for the filter sand and drain gravel materials. This letter summarizes our evaluation of the alternative borrow material for the buttress material and proposed filter sand and drain gravel gradations.

Alternative Borrow Source for Buttress Material

The City collected bulk samples and shipped the samples to a geotechnical testing laboratory. Huddlestone-Berry Engineering & Testing, LLC out of Grand Junction, CO performed gradation testing, Atterberg limits, proctor density testing, and direct shear testing on two selected samples. The samples are classified as lean clay and sandy lean clay (CL) with some sand and gravel. The liquid limit is 38 for both samples and the plastic limit is 16 and 20. The maximum dry density is 111 and 112.5 pound per cubic foot (pcf) with optimum moisture content of 18.5 and 16.5 percent. The direct shear test was performed on three remolded points tested at a normal stress of 850, 1450, and 2000 psf (6, 10, and 14 psi). The samples were compacted to nearly 100% proctor density. The tested effective stress drained friction angle is 27 and 31 degrees with effective stress drained cohesion of 1999 and 2612 pounds per square foot (psf). The laboratory results are included in Appendix A.

AEOM plotted the proposed borrow source gradation along with previous identified borrow gradations, as shown on Figure 2. The 2016 identified alternative borrow source material is similar to the previous analyzed materials and is therefore filter compatible with the proposed ASTM C33 fine aggregate. For the design analysis (AECOM, 2016) the buttress was analyzed using a drained effective stress friction angle of 34 degrees with zero cohesion intercept. The tested shear strength of the proposed buttress material falls within the analyzed range.

Proposed Filter and Drain Gradations

ASTM C404 No. 2 fine aggregate (natural gradation) has been proposed for filter sand and ASTM C33 No. 7 coarse aggregate has been proposed for drain gravel. ASTM C404 No. 2 fine aggregate (natural gradation) is compatible with the embankment material and can be used for the filter sand. ASTM C33 No. 7 coarse aggregate, however, is not filter compatible with ASTM C404 No. 2 fine

aggregate and cannot be used for the drain gravel if the ASTM C404 No.2 fine aggregate is used, as shown on Figure 3.

Recommendations
We recommend that the 2016 identified alternative borrow source could be used for buttress material. The proposed filter sand gradation meets the evaluated filter criteria, but the proposed drain gravel gradation cannot be used with the proposed filter sand gradation. Prior to final approval of the filter sand the contractor will need to obtain representative samples of the stockpile and submit in accordance with the technical specifications.

Please let me know if you have any questions or require any additional information.

Sincerely,

Christina Winckler, PE
Senior Geotechnical Engineer

List of Attachments:

Figure 1	Plan View, Alternative Borrow Source Site Option
Figure 2	Alternative Borrow Source Material Comparison
Figure 3	Proposed Filter and Drain Material Gradations
Appendix A	2016 Laboratory Testing Results

References:

AECOM, 2016. Hallenbeck No. 1 Dam, Downstream Slope Repair, Design Report, Dam ID 420125, Water Division 4, Water District 42, SEO File C-0356F, Final Report, April 8.

Hallenbeck No. 1 Res. - Borrow Site #2

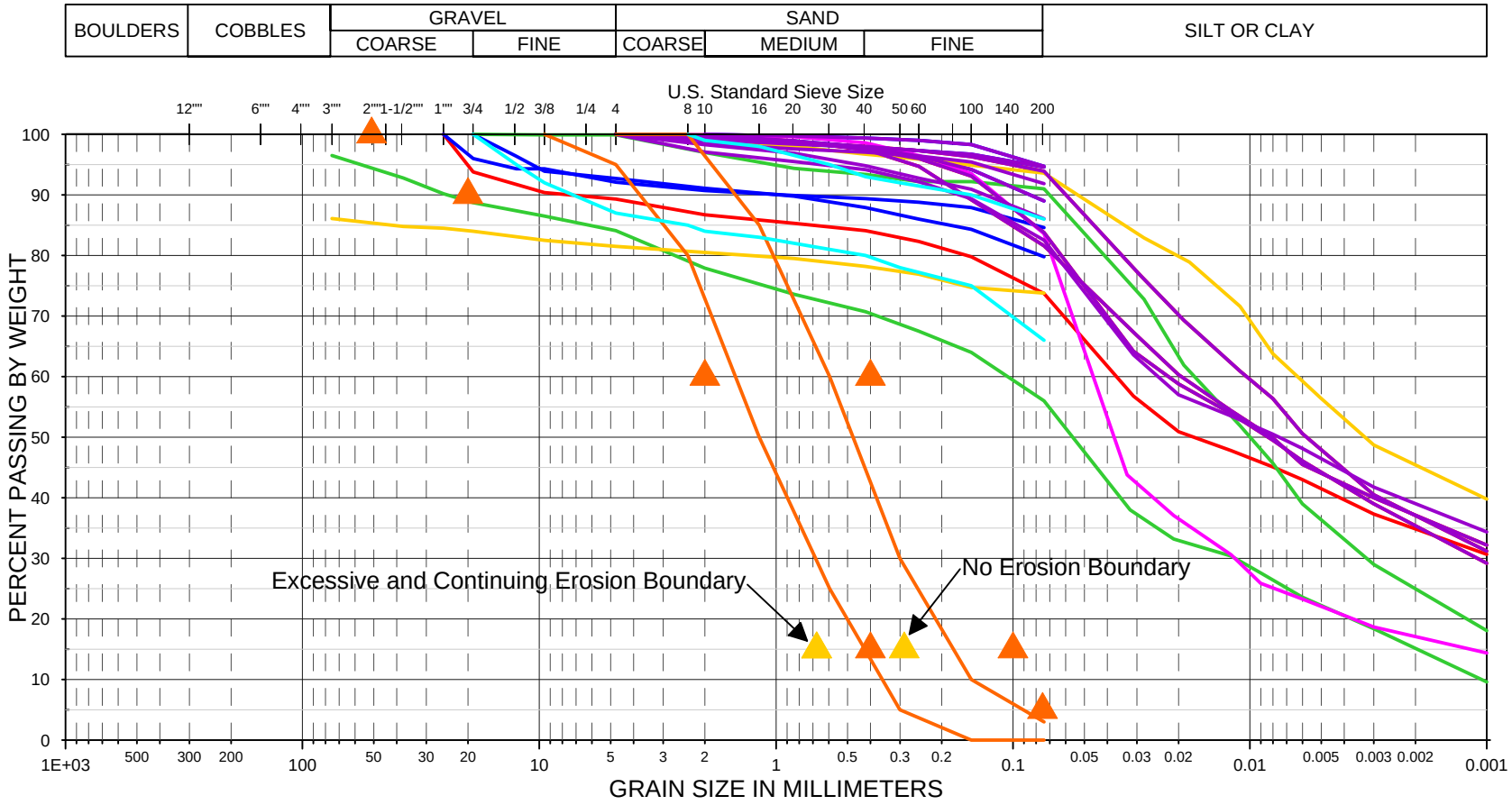
N

0 0.05 0.1 Miles

Date: 7/18/2016

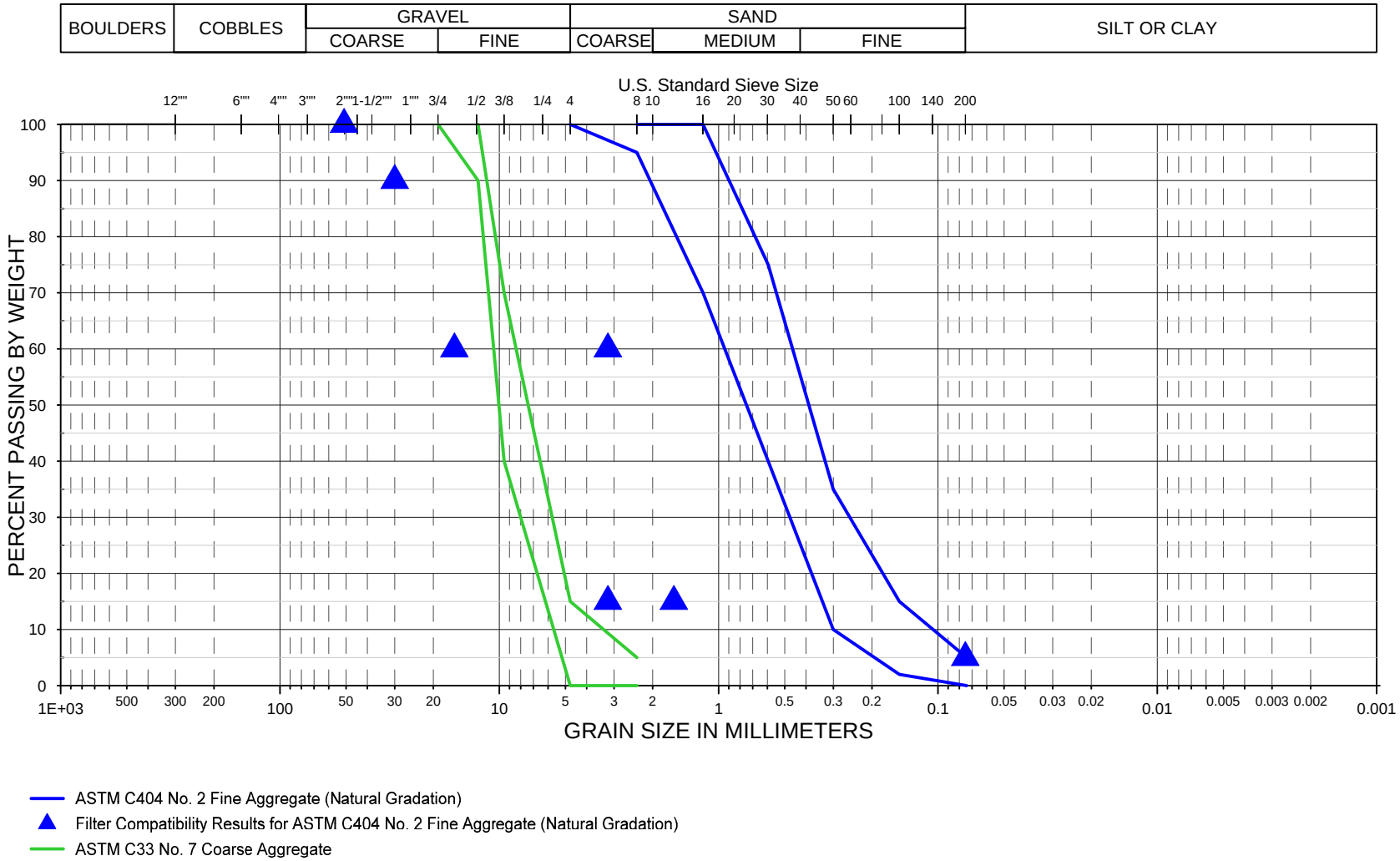
1 inch = 188 feet

CITY OF Grand Junction COLORADO
GEOGRAPHIC INFORMATION SYSTEM



- Regraded Gradation
- 2014 Investigation - Embankment and Foundation
- 1999 Investigation - Embankment and Foundation
- 2015 Investigation - Buttress
- 2015 Investigation - Embankment
- 2016 Identified Alternative Borrow Source
- 2015 Reservoir Sample
- C33 Sand
- Filter Compatibility Results

Project No. 60422760	Hallenbeck No.1 Dam	Alternative Borrow Source Material Comparison	Figure 2
URS			



Project No. 60422760	Hallenbeck No. 1 Dam	Proposed Filter and Drain Gradations	Figure 3
URS			

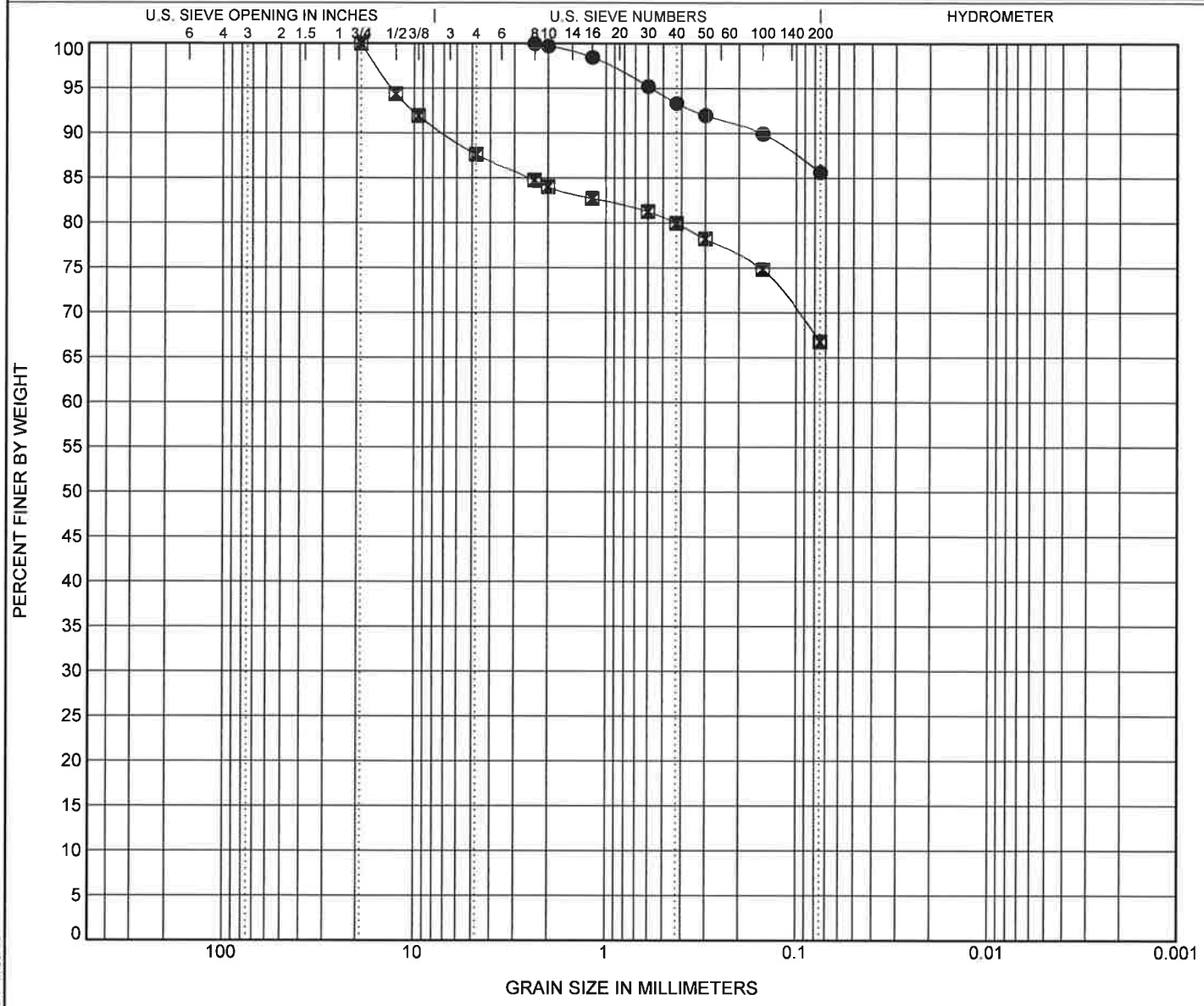
Appendix A
2016 Laboratory Testing Data

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

GRAIN SIZE DISTRIBUTION

CLIENT City of Grand Junction **PROJECT NAME** Hallenbeck Reservoir

PROJECT NUMBER 00208-0063 **PROJECT LOCATION** Grand Junction, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● **Sample 1**	**06/16**	**LEAN CLAY(CL)**	**38**	**22**	**16**		
⊠ **Sample 2**	**06/16**	**SANDY LEAN CLAY(CL)**	**38**	**18**	**20**		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **Sample 1**	**06/16**	**2.36**				**0.0**	**14.4**	**85.6**	
⊠ **Sample 2**	**06/16**	**19**				**12.4**	**20.9**	**66.7**	

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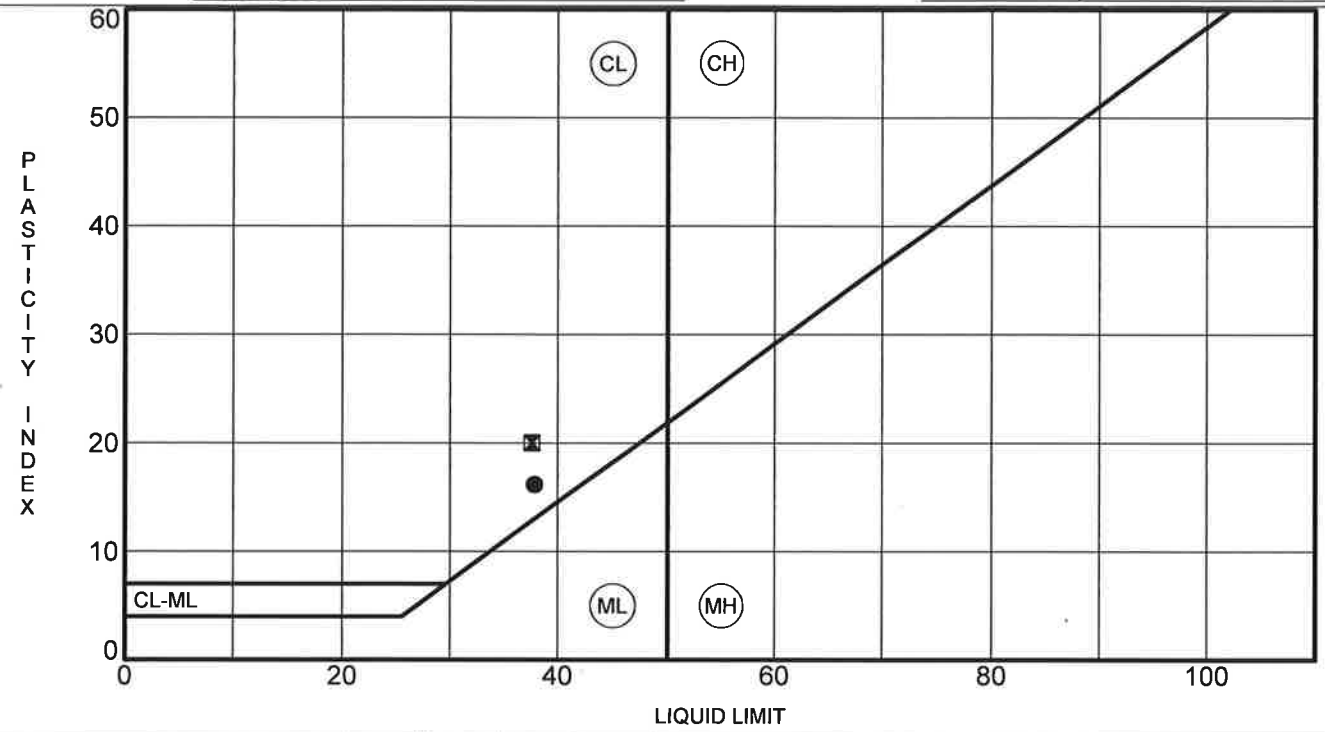
ATTERBERG LIMITS' RESULTS

CLIENT City of Grand Junction **PROJECT NAME** Hallenbeck Reservoir

PROJECT NUMBER 00208-0063 **PROJECT LOCATION** Grand Junction, CO



	Specimen Identification		LL	PL	PI	#200	Classification
●	**Sample 1**	**6/23/2016**	**38**	**22**	**16**	**86**	**LEAN CLAY(CL)**
⊠	**Sample 2**	**6/23/2016**	**38**	**18**	**20**	**67**	**SANDY LEAN CLAY(CL)**

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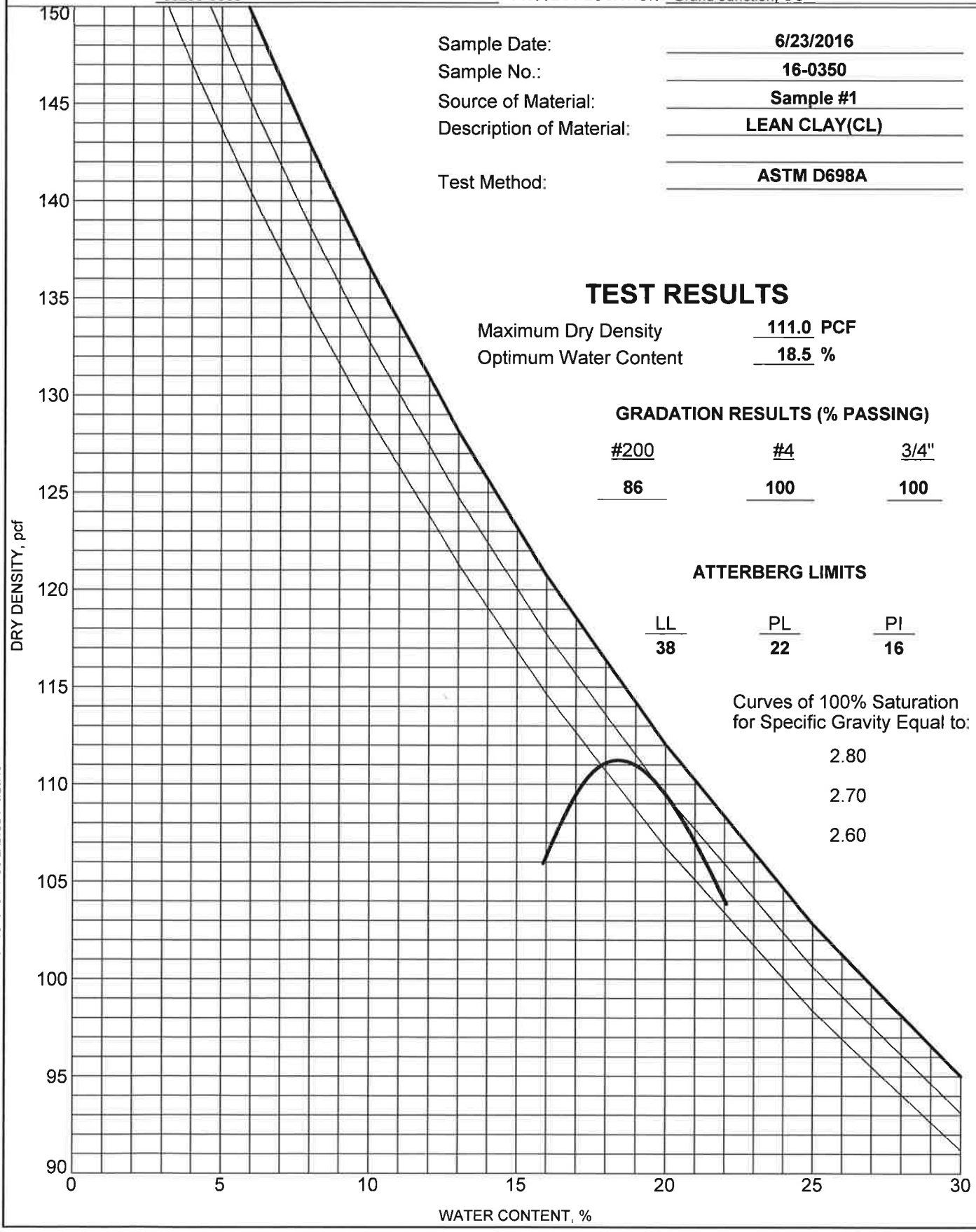
MOISTURE-DENSITY RELATIONSHIP

CLIENT City of Grand Junction **PROJECT NAME** Hallenbeck Reservoir

PROJECT NUMBER 00208-0063 **PROJECT LOCATION** Grand Junction, CO



Sample Date: **6/23/2016**

Sample No.: **16-0350**

Source of Material: **Sample #1**

Description of Material: **LEAN CLAY(CL)**

Test Method: **ASTM D698A**

TEST RESULTS

Maximum Dry Density **111.0** PCF

Optimum Water Content **18.5** %

GRADATION RESULTS (% PASSING)

#200	#4	3/4"
86	100	100

ATTERBERG LIMITS

LL	PL	PI
38	22	16

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

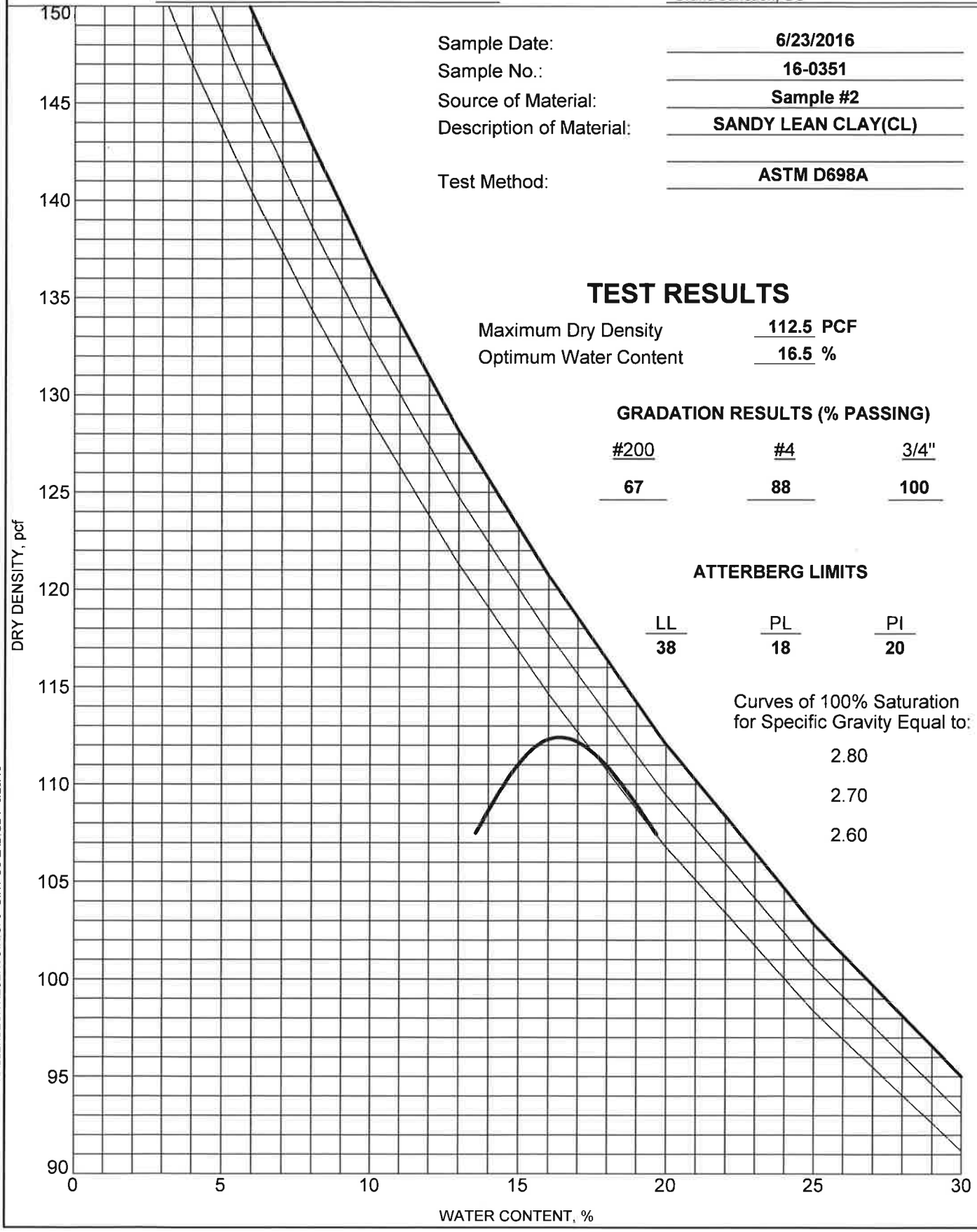
COMPACTION 00208-0063 HALLENBECK RESERVOIR.GPJ GINT US LAB.GDT 6/29/16

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

MOISTURE-DENSITY RELATIONSHIP

CLIENT City of Grand Junction **PROJECT NAME** Hallenbeck Reservoir

PROJECT NUMBER 00208-0063 **PROJECT LOCATION** Grand Junction, CO



Sample Date: **6/23/2016**

Sample No.: **16-0351**

Source of Material: **Sample #2**

Description of Material: **SANDY LEAN CLAY(CL)**

Test Method: **ASTM D698A**

TEST RESULTS

Maximum Dry Density **112.5** PCF

Optimum Water Content **16.5** %

GRADATION RESULTS (% PASSING)

#200	#4	3/4"
67	88	100

ATTERBERG LIMITS

LL	PL	PI
38	18	20

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION 00208-0063 HALLENBECK RESERVOIR.GPJ GINT US LAB.GDT 6/29/16

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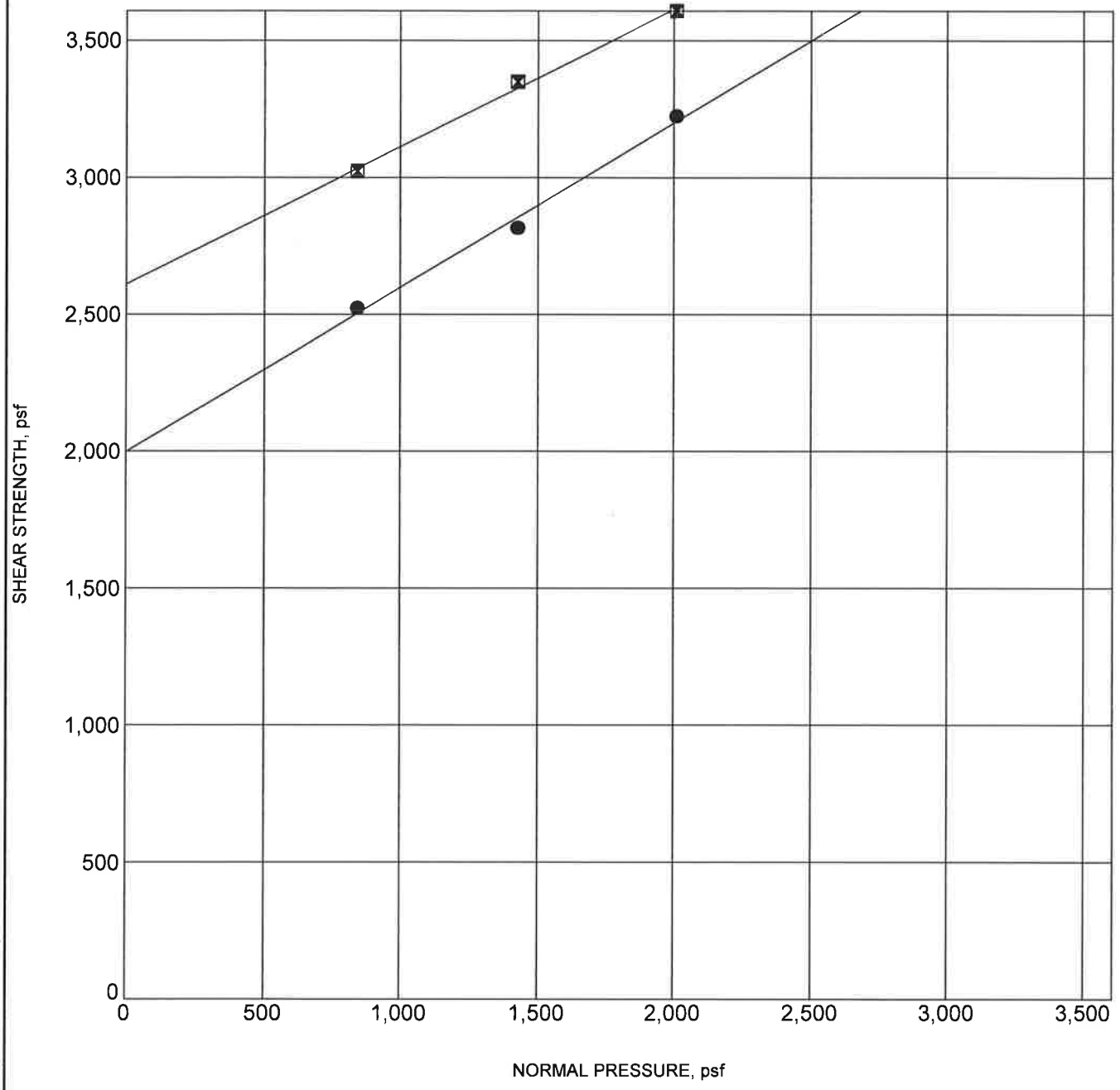
970-255-6818

DIRECT SHEAR TEST

CLIENT City of Grand Junction **PROJECT NAME** Hallenbeck Reservoir

PROJECT NUMBER 00208-0063 **PROJECT LOCATION** Grand Junction, CO



Specimen Identification		Classification	γ_d	MC%	c	ϕ
● Sample #1	0.0	LEAN CLAY(CL)	110	18	1999	31
⊠ Sample #2	0.0	SANDY LEAN CLAY(CL)	112	16	2612	27