CITY OF Grand Junction COLORADO

Purchasing Division

ADDENDUM NO. 2

DATE: **October 30, 2018**
FROM: **City of Grand Junction Purchasing Division**
TO: **All Offerors**
RE: **Kannah Creek Intake and/or Purdy Mesa Flowline Rehabilitation IFB-4568-18-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to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.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:

1. Question: Can Mountain Peak bid the controls / SCADA portion of this project since we assisted JUB with the design?

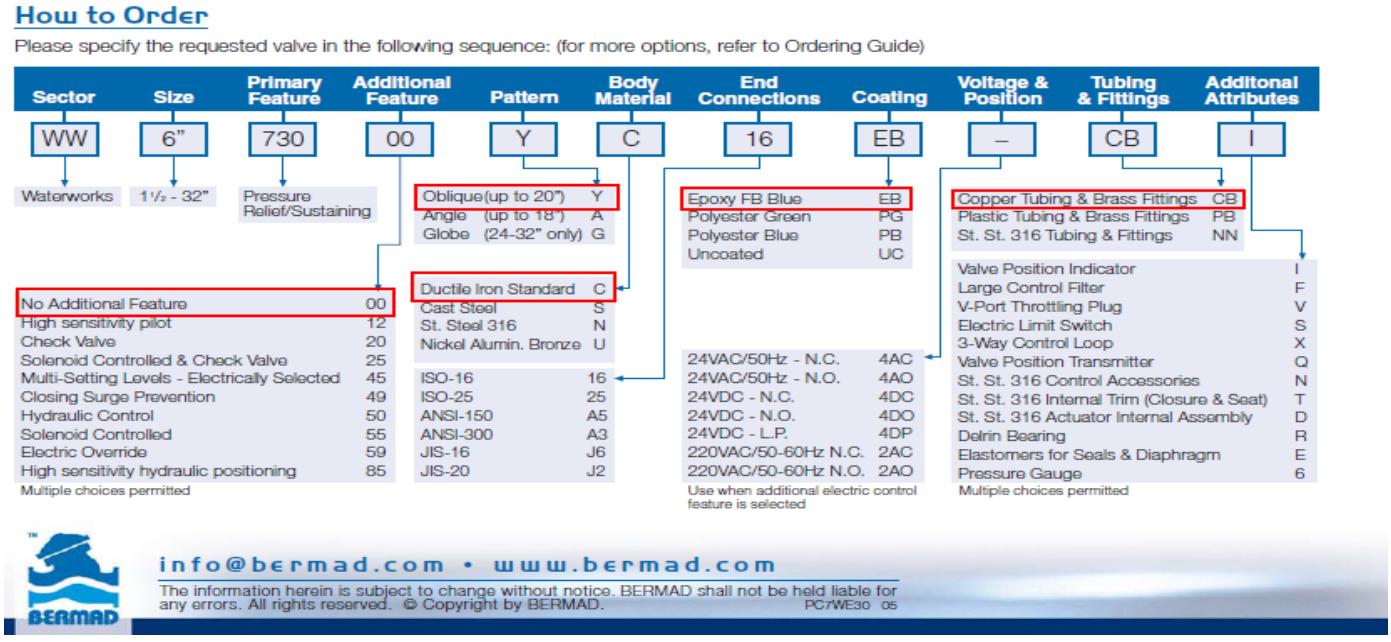
   Answer: Mountain Peak may be a sub-contractor to any prime contractor that submits a bid response to this solicitation process.

2. Question: The current specification in Bid Alternate 3, Section 03 15 16 Concrete Expansion and Construction Joints, Item 2.8 calls for polyurethane sealant. We would like to request that POURTHANE NS be reviewed as a silane water-repellent material. Please advise if it is acceptable.

   Answer: The awarded contractor may submit for review and approval an alternative to the specified product, provided it meets all the required performance specifications.

3. Question: C2-503, page 361 #30 calls for 16" Bermad 730 Pressure Sustaining Valve. Do you have the specs for this valve?

   Answer: The ordering information is noted in this screen shot from Bermad:



How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide)

Sector	Size	Primary Feature	Additional Feature	Pattern	Body Material	End Connections	Coating	Voltage & Position	Tubing & Fittings	Additonal Attributes
WW	6"	730	00	Y	C	16	EB	–	CB	I
Waterworks	1½ - 32"	Pressure Relief/Sustaining								

Pattern: Oblique (up to 20") Y; Angle (up to 18") A; Globe (24-32" only) G

Body Material: Ductile Iron Standard C; Cast Steel S; St. Steel 316 N; Nickel Alumin. Bronze U

End Connections: ISO-16 16; ISO-25 25; ANSI-150 A5; ANSI-300 A3; JIS-16 J6; JIS-20 J2

Coating: Epoxy FB Blue EB; Polyester Green PG; Polyester Blue PB; Uncoated UC

Tubing & Fittings: Copper Tubing & Brass Fittings CB; Plastic Tubing & Brass Fittings PB; St. St. 316 Tubing & Fittings NN

Additional Feature: No Additional Feature 00; High sensitivity pilot 12; Check Valve 20; Solenoid Controlled & Check Valve 25; Multi-Setting Levels - Electrically Selected 45; Closing Surge Prevention 49; Hydraulic Control 50; Solenoid Controlled 55; Electric Override 59; High sensitivity hydraulic positioning 85. Multiple choices permitted

Voltage & Position: 24VAC/50Hz - N.C. 4AC; 24VAC/50Hz - N.O. 4AO; 24VDC - N.C. 4DC; 24VDC - N.O. 4DO; 24VDC - L.P. 4DP; 220VAC/50-60Hz N.C. 2AC; 220VAC/50-60Hz N.O. 2AO. Use when additional electric control feature is selected

Additonal Attributes: Valve Position Indicator I; Large Control Filter F; V-Port Throttling Plug V; Electric Limit Switch S; 3-Way Control Loop X; Valve Position Transmitter Q; St. St. 316 Control Accessories N; St. St. 316 Internal Trim (Closure & Seat) T; St. St. 316 Actuator Internal Assembly D; Delrin Bearing R; Elastomers for Seals & Diaphragm E; Pressure Gauge 6. Multiple choices permitted

BERMAD

info@bermad.com • www.bermad.com

PC7WE30 05

4 Clarification: The Tentative Time Schedule has been modified as there is no City Council meeting scheduled on November 21. This **REVISED** Tentative Time Schedule supersedes any other calendar posted previously.

➢ Mandatory Pre-Bid Meeting	October 18, 2018
➢ Inquiry deadline, no questions after this date	October 26 2018
➢ Addendum Posted	October 30, 2018
➢ Submittal deadline for proposals	November 7, 2018
➢ **City Council Approval**	**December 5, 2018**
➢ **Notice of Award & Contract execution**	**December 10, 2018**
➢ **Bonding & Insurance Cert due**	**December 14, 2018**
➢ **Preconstruction meeting**	**December 14, 2018**
➢ **Work begins no later than**	**December 17, 2018**

Final Completion dates remain the same

5. Pre-Bid Meeting Agenda including minutes of questions and project comments is attached as Exhibit A (six pages).

6. Pre-Bid Attendance List (Sign-In Sheet) is attached as Exhibit B (one page).

7. Geotechnical Reports are attached as Exhibit C, Purdy Mesa Flowline (19 pages) and Exhibit D, Kannah Creek Intake (10 pages).

8. Revised SCADA Plan Sheet C2-505 is attached as Exhibit E (one page).

9. Debris Screen/Separator Plan As-Built Plan Sheet and additional photos of interior are attached as Exhibit F (seven pages).

10. Clarification: Section 3.3.19 from the original IFB document has been amended to read:

3.3.19 Quality Control Testing:

Supplier shall perform quality control testing on concrete. Supplier shall perform quality control testing on the following items as specified in the General Contract Documents for Capital Improvement Projects as specified for Part time inspection:

- Backfill
- Class 3
- Class 6
- Concrete

The City will perform all other necessary QC, including, but not limited to:

- Backfill
- Class 3
- Class 6
- Concrete

Supplier shall perform Quality Control (QC) testing on the Asphalt. The Contractor shall provide QC throughout the Contract, with the use of his/her own QC Technicians or the use of a certified laboratory. In accordance with Section 401.06.3 of the City of Grand Junction Standard Specifications for Road and Bridge Construction, results of all QC tests shall be

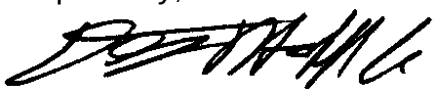
submitted to the Project Engineer and the City's Quality Assurance (QA) Technician within 4 hours of the time of sampling. Failure to do so may require that paving be suspended until all sampling results have been received, reviewed, and approved. The Contractor shall supply QC Lab personnel for night work for comparison of test data. If lab personnel is not supplied, paving operations will be suspended until one is available. QC Field personnel shall remain on site during the duration of the paving operation or until in-place density are met.

The Contractor, at their own discretion, may elect to forgo the concrete and soils QC field testing (in-place soils density) for placement of Embankment and Aggregate Base Course. QA testing for these items will be performed by the City. Laboratory results for submittal purposes will be provided by the contractor. However, if a sufficient number of failed test results are observed by the City and/or its QA testing representatives, written notification will be provided to the contractor, and back payment to the City for failed location re-tests will be required. In the event of a discrepancy regarding field testing, the City's, or its QA representative's test results will prevail unless the Contractor has QC field test results to submit for comparison.

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

All other conditions of subject remain the same.

Respectfully,



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

CITY OF Grand Junction COLORADO

PUBLIC WORKS & PLANNING

EXHIBIT A

Pre-Bid Meeting Agenda

Date: Tuesday, October 3, 2017

Project: **2017 Kannah Creek Intake Rehabilitation**

Location: City of Grand Junction Kannah Creek Intake
10001 Kannah Creek Road, Whitewater, CO 81527

Conducted by: Duane Hoff, Jr., Senior Buyer
John Eklund, Project Engineer

---

1. Introduction, attendance list.

2. Project description – Work consists of:
   a. Bid Alternative 1 - The rehabilitation of the City of Grand Junction Kannah Creek Intake. All dimensions in scope of work should be verified by Contractors prior to submission of bids. The project generally consists of the demolition and reconstruction of the concrete intake structure, demolition and installation of 330 LF of 24" C-900 PVC DR-25 water line, 152' LF of 18" C-900 DR-25 water line, replacement of headgate, two 6" air valves, two electromagnetic flow meters (one 8" and one 18"), and bypass pipe in two locations. Removal and disposal of existing steel pipe and screen structure including removal of concrete structure for screen to one foot above ground level and fill of remaining concrete structure. Control upgrades include bypass control valves and electronic automation Including one Programmable Logic Controller (PLC), which will be housed in a new prefabricated structure. The new structure must also contain irrigation pump and control and the water treatment equipment that provides potable water to the City's Water Supply Supervisor residence. Potable water service to this residence must be maintained for the duration of the project. All concrete installation shall include 6" of Class 6 aggregate base course.
   b. Bid Alternate 2 – Purdy Mesa Flowline at Sullivan Draw. All dimensions in scope of work should be verified by Contractors prior to submission of bids. The project generally consists and of the installation of approximately 6,530 LF of 20" Eagle Loc C-900 PVC DR-25 water line, installation of Pressure Sustaining Valve Assembly, installation of Flow Control Valve Assembly, SCADA equipment and implementation, 6" and 8" air valves, insertion flow meter (20"), and other

appurtenant work. Control upgrades include control valves and electronic automation, including one Programmable Logic Controller (PLC) and three photo voltaic power supplies, which will be housed in new CMU structures, and level sensor equipment to monitor water depth in the tank (either existing or Bid Alt 3 tank), and appurtenant work.

c. Bid Alternate 3 – Purdy Mesa Flowline - Volume Control Tank. All dimensions in scope of work should be verified by Contractors prior to submission of bids. The project generally consists of the construction of a Volume Control Tank and appurtenant piping connections. Control upgrades include control valves and 6" air valve, site grading and revegetation, and appurtenant work. Tank is 68' interior diameter and approximately 16' storage depth.

d.

3. The anticipated construction schedule for this project is as follows:
   - Mandatory Pre-Bid Meeting October 18, 2018
   - Inquiry deadline, no questions after this date October 26 2018
   - Addendum Posted October 30, 2018
   - Submittal deadline for proposals November 7, 2018
   - City Council or Board of Commissioners Approval November 21, 2018
   - Notice of Award & Contract execution November 26, 2018
   - Bonding & Insurance Cert due November 30, 2018
   - Preconstruction meeting November 30, 2018
   - Work begins no later than December 3, 2018
   - Final Completion – Bid Alternate 1, Kannah Creek Intake November 15, 2019
   - Final Completion – Bid Alternate 2, PMFL Sullivan Draw Replacement May 17, 2019
   - Final Completion – Bid Alternate 3, Purdy Mesa Flow Control Tank May 17, 2019

4. Project documents -
   a. City of Grand Junction Standard Contract Documents
   b. Project Bid Documents
   c. Construction plans

5. Bid submittal procedures -
   a. Complete Bid Form, sign and attach Bid Bond, include Bid Schedule (excel) & subcontractor list, and references
   b. Submit bid only rough Rocky Mountain E-Purchasing (https://www.rockymountainbidsystem.com/default.asp)
   c. Attendance at bid opening is mandatory

6. Insurance and bonding requirements – Refer to Bid Documents
   a. 5% bid bond [Section 2.22]
   b. Performance and payment bonds (100%) [Section 2.23]
   c. Insurance in General Conditions [Section 2.16]. Due 10 calendar days after Notice of Award. Reference Bid Number and Project under "Additional Remarks".

7. IFB Addenda –
   a. Addendum number 1 was issued on October 17, 2018 and included corrected Bid Schedule
   b. Addendum number 2 will be issued following this pre-bid meeting and will include the following items:
      - *Attendance list,*
      - *Agenda*
   c. Final Addendum expected October 30, 2018

8. Project specific issues –
   a. **General** –
      i) Do we have to bid all three alternatives?
         (1) No, bidders may bid on one, two or all three bid alternates. Please note that bidders must give a unit price for all items in each Bid Alternate on which they are bidding. Missing/blank line items will be cause for rejection of the bid for that Bid Alternate.
      ii) Where can the bid documents be found?
         (1) https://www.bidnetdirect.com/colorado/city-of-grand-junction
      iii) Contractors have the opportunity to reduce the bid amount by a certain percentage based on when payment is made by the City. Contractors should be aware of this option on the bid form.
      iv) Inquiry deadline is October 26, 2018 at 5:00pm.

v) Any questions from contractors should be directed to Duane Hoff **and** Susan Hyatt at the City Purchasing Department.
vi) The bid opening will be held November 7, 2018.
vii) Completion dates for the various bid alternatives are:
(1) Bid Alternate 1, Kannah Creek Intake – November 15, 2019
(2) Bid Alternate 2, PMFL Sullivan Draw – May 17, 2019
(3) Bid Alternate 3, PMFL Control Tank – May 17, 2019.
viii) Type-A Pipe Bedding, Haunch, and initial backfill material will be required on this Project and shall be incidental to the pipe pay items.
ix) The Kannah Creek project and Sullivan Draw project are automation projects aimed at providing remote system control.
x) All communication components need to be consistent with other City specified equipment.
xi) Is the contractor paying for QA/QC? And can HBET be used for both?
(1) See Revised Quality Control Testing Section 3.3.19
xii) Additional material is available near Juniata Reservoir, access to the material is via the hike in area parking lot.

b. **Bid Alternative 1** – Kannah Creek Rehabilitation
i) Existing soil is expected to be rocky. Contractor can expect large boulders to be encountered during trenching operations. There is a Rock Excavation pay item to account for rocks encountered that are 1 cu. yd. and larger.
ii) Native backfill material shall have all rock with its largest dimension being 15" and larger removed from the backfill material. This wasted rock can be set aside on City Property
iii) Clearing and Grubbing shall be kept to a minimum width to allow for successful installation of the new pipe. Cleared material is to be mulched and spread out along the disturbed ground, but must be kept out of Kannah Creek floodplain.
iv) Contractor must have written approval prior to demolition of existing historic structures on site.
v) The potable water well and filter system, part of Bid Alternate 1, need to be maintained in operable condition throughout construction. Temporary housing for the equipment is included in the bid item. Brief shut down of less than a day is acceptable given 24-hours advance notice to Project Engineer and Water Supply Supervisor.
vi) Slade Connell provided an overview of the existing components housed in the existing cipolletti weir building.

vii) Potable water treatment equipment and VFD's are in good working order and shall be re-used.

viii) Irrigation pump shall be replaced with equivalent size and performance pump. VFD for pump shall be re-used.

ix) Concrete foundation of the existing cipolletti weir building will need to be removed below grade.

x) The approximate location of the tie-in of the 20" PVC pipe at +/- Sta 1+25 was shown.

xi) Location of existing conduit sweeps was shown that will be used as pull points for the new conduits.

xii) The tie in location at the upstream side of the Farmers Screen was shown.

xiii) The old screen and concrete structure was available for inspection. Removal of the existing concrete was discussed with emphasis that vibration of the surrounding earth was not acceptable. The concrete would need to be cut one foot above grade and removed. Removed concrete could be placed within the existing concrete structure once metal was removed. Please see as-built drawing of debris screen, provided with this addendum, for further detail about this structure.

xiv) The existing steel pipe that has already been removed and staged on site was pointed out. This material is part of the remove steel bid item.

xv) Limits of pipe salvage were clarified. Pipe not removed from the ground can be abandoned in place.

xvi) The City does not have control of the water coming down Kannah Creek. Runoff and delivery water will be maintained in the creek during construction.

xvii) The diversion structure needs to be in place during spring runoff conditions.

xviii) How do we define subgrade preparation for the new diversion structure?

xix) Please see the geotechnical report provided with this addendum. The subgrade will need to be prepared in accordance with the recommendation in the geotechnical report and to the line and grade as shown on the plans.

xx) Staging areas for Bid Alt 1 are along the existing road to the intake and north of the caretaker's house. Access to all the garage structures must be maintained at all times.

c. **Bid Alternate 2 and 3** – Purdy Mesa Flowline Sullivan Draw and Flow Control Tank

i) Cactus protection plan from the BLM is included with the specifications and will be the contractor's responsibility to provide staking for the protected areas.

Please note that a biologist will be on-site during construction to verify compliance with Cactus Protection Plan.

ii) There are locations along the Sullivan Draw project that the BLM will require an archeologist be present during excavation. The Contractor will not be responsible for providing the archeologist.

iii) The existing pipe will need to stay in service except when the tie-in connections are made with the new pipe.

iv) Raw water can be used for construction water. Taps on the existing pipe will need to be made in areas where the existing pipe is to be abandoned. The contractor is to coordinate the tap location with the City and have approval of location prior to completing any taps on the existing raw water line.

v) Castagra is not an acceptable coating alternative for tank components.

EXHIBIT B

Solicitation Name:	kannah Creek Intake and/or Purdy Mesa Flowline Rehabilitation
Solicitation #:	IFB-4568-18-DH
Date:	10/18/2018
Time:	10:30am

SIGN-IN SHEET

CITY OF Grand Junction COLORADO

	Company Name	Representative Name	Phone	Email
1	MAN Concrete Inc	Buzz Bigum	970 361 2133	bbigum@mmaysconcrete.com
2	Core and Main	Joe Vescio	970-628-7104	Joe.Vescio@Coreandmain.com
3	Mueller Const. Services Inc	Joe Mueller	970-230-9353	JMueller@MuellerConstruction.NET
4	KES	Tom Ware / Casey Mills	970 256 0465	CMills@GCS-LLC.net
5	Sorter Construction	Jesse Nelson	970-242-1436	jesse@sorterconstruction.com
6	JUB Engineers	Brett Gormley	970 208 8508	BGormley@JUB.com
7	MA Concrete Const	Jeff Nimon	243-3221	MAConcreteInvoice@grandvalley.net
8	Brown Hill controls	Kris Lantzy	970-471-1650	KLantzy@BrownsHillco.com
9	United Companies	Justin Vensel	970-243-4900	justin.vensel@unitedco.com
10	John Eklund ← GOGJ		970 244-1558	johne@gjcity.org
11	GJ Winwater	Curtis Haynes	970-255-8015	chaynes@winwaterworks.com
12	Elam	Mandy Tousley	970-242-5370	mandy.tousley@elamconstruction.com
13	GJ Pipe	Roland Hutson	970 244-8275	roland.hutson@gjpipe.com
14	MOUNTAIN PEAK CONTROLS (PAONIA)	BRIAN MITCHEM	303-885-5967	bmitchem@mountainpeakcontrols.com

EXHIBIT C

Huddleston-Berry
Engineering & Testing, LLC

640 White Avenue
Grand Junction, Colorado 81501
Phone: 970-255-8005
Fax: 970-255-6818
Info@huddlestonberry.com

June 5, 2018
Project#00208-0080

City of Grand Junction Engineering
333 West Avenue, Building C
Grand Junction, Colorado 81501

Attention: Mr. John Eklund

Subject: Geotechnical Investigation
Purdy Mesa Flowline
Whitewater, Colorado

Dear Mr. Eklund,

This letter presents the results of a geotechnical investigation conducted by Huddleston-Berry Engineering & Testing, LLC (HBET) for the Purdy Mesa Flowline project in Whitewater, Colorado. The site location is shown on Figure 1 – Site Location Map. The proposed construction is anticipated to include replacement of approximately 1.25 miles of water pipeline. In addition, a new storage tank is proposed at the east end of the pipeline. The scope of our investigation included collecting subsurface information along the pipeline alignment and tank location for use by consultants on the project.

Subsurface Investigation

The subsurface investigation included eight test pits along the pipeline and at the proposed tank location as shown on Figure 2 – Site Plan. The test pits were excavated to depths of between 5.0 and 10.0 feet below the existing ground surface. Typed test pit logs are included in Appendix A.

As indicated on the logs, the subsurface conditions along the pipeline were variable. However, Test Pits TP-1 through TP-3, and TP-6, encountered 1.0 to 2.5 feet of sand and clay soils above soft to medium hard, completely to highly weathered shale bedrock to the bottoms of the excavations. Groundwater was not encountered in these pits at the time of the investigation.

In Test Pit TP-4, the weathered shale bedrock was deeper. Brown, moist, medium stiff to stiff sandy lean clay soils with gravel and trace cobbles extended to a depth of 9.0 feet where the shale was encountered. Groundwater was not encountered in TP-4 at the time of the investigation.

In Test Pits TP-5 and TP-7, the shallow soils consisted of dense to very dense cobbles and boulders in matrix soils ranging from sandy gravel to sandy lean clay. In TP-5, the cobble and boulder soils extended to a depth of 6.5 feet where soft to medium hard, weathered shale bedrock was encountered. Backhoe bucket refusal was encountered on a boulder in TP-5 at a depth of 5.0 feet. Groundwater was not encountered in TP-5 or TP-7 at the time of the investigation.

Test Pit TP-8, conducted at the proposed tank location, encountered tan, moist, dense sandy gravel and cobbles soils from the ground surface to the bottom of the excavation. Groundwater was not encountered in TP-8 at the time of the investigation.

Laboratory Testing

Laboratory testing was conducted on samples of the native soils encountered in the test pits. The testing included grain size analysis, Atterberg limits determination, natural moisture content determination, and maximum dry density and optimum moisture content (Proctor) determination. The laboratory testing results are included in Appendix B.

The laboratory testing results indicate that native clay soils are moderately plastic. Due to the presence of larger particles, undisturbed samples of the clay were unable to be collected for swell/consolidation testing. However, based upon the plasticity of the material and upon our experience with similar soils in the area, the native clay soils are anticipated to be slightly expansive.

General Notes

The information included above is based upon the results of the subsurface investigation and on our local experience. This information is valid only for the proposed construction.

In addition, as discussed previously, the subsurface conditions across the site were variable. However, the precise nature and extent of subsurface variability may not become evident until construction. HBET should be contacted to evaluate the subgrade conditions where significant subsurface variations beyond those outlined above are encountered during construction.

We are 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:
Huddleston-Berry Engineering and Testing, LLC

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

FIGURES

Google Earth

miles 4
km 7

FIGURE 1
Site Location Map

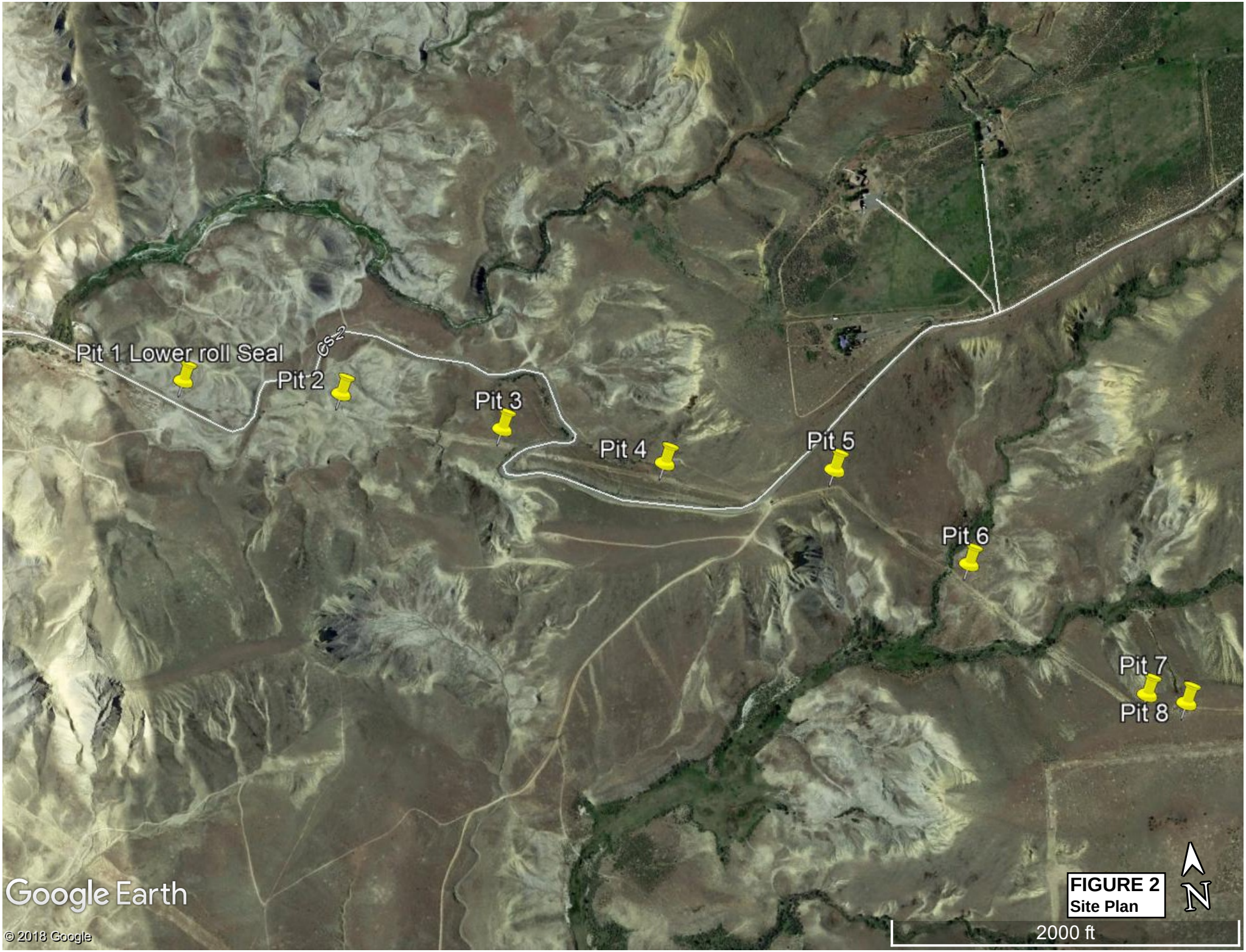


FIGURE 2
Site Plan

APPENDIX A
Typed Test Pit Logs

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

TEST PIT NUMBER TP-1

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Silty SAND with Organics (TOPSOIL)										
2.5		Silty SAND (sm), tan, moist, loose										
5.0		SHALE, grey, soft to medium hard, completely weathered to highly weathered										
7.5		Bottom of test pit at 9.0 feet.										

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

TEST PIT NUMBER TP-2

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy Lean CLAY with Organics (TOPSOIL)										
		SHALE, black, soft to medium hard, completely weathered to highly weathered										
2.5												
5.0												
7.5												
		Bottom of test pit at 9.0 feet.										

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

TEST PIT NUMBER TP-3

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy Lean CLAY with Organics (TOPSOIL)										
		Sandy Lean CLAY with trace Gravel and Cobbles (CL), brown, moist, medium stiff *** Lab Classified GB1	GB 1					7	40	25	15	67
2.5		SHALE, grey, soft to medium hard, highly weathered										
5.0												
7.5		Bottom of test pit at 9.5 feet.										

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

TEST PIT NUMBER TP-4

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy Lean CLAY with Organics (TOPSOIL)										
		Sandy Lean CLAY with Gravel and trace Cobbles (CL), brown, moist, medium stiff to stiff										
		*** Lab Classified GB1	GB 1					4	39	18	21	62
2.5												
5.0												
7.5												
		SHALE, black, soft, highly weathered										
10.0		Bottom of test pit at 10.0 feet.										

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640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

TEST PIT NUMBER TP-5

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy Lean CLAY with Gravel and Organics (TOPSOIL0										
		COBBLES and BOULDERS in a Sandy Lean CLAY Matrix (cl), brown, moist, dense										
2.5												
5.0												
		SHALE, grey, soft to medium hard, highly weathered										
7.5												
10.0		Bottom of test pit at 10.0 feet.										

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TEST PIT NUMBER TP-6

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy Lean CLAY with Gravel and trace Cobbles (cl), brown, moist, soft to medium stiff										
2.5		SHALE, grey, soft to medium hard, highly weathered										
5.0												
7.5												
		Bottom of test pit at 9.5 feet.										

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970-255-6818

TEST PIT NUMBER TP-7

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES Bucket Refusal at 5-Ft
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy GARVEL and COBBLES with Organics (TOPSOIL)										
		COBBLES and BOULDERS in a Sandy GRAVEL Matrix (gw), tan, moist, dense to very dense										
2.5												
5.0		Bottom of test pit at 5.0 feet.										

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TEST PIT NUMBER TP-8

CLIENT City of Grand Junction
PROJECT NAME Purdy Mesa Flowline
PROJECT NUMBER 00208-0080
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/24/18 **COMPLETED** 4/24/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy GRAVEL and COBBLES with Organics (TOPSOIL)										
		Sandy GRAVEL and COBBLES with trace Boulders (gw), tan, moist, dense										
2.5												
5.0												
7.5												
10.0		Bottom of test pit at 10.0 feet.										

APPENDIX B
Laboratory Testing Results

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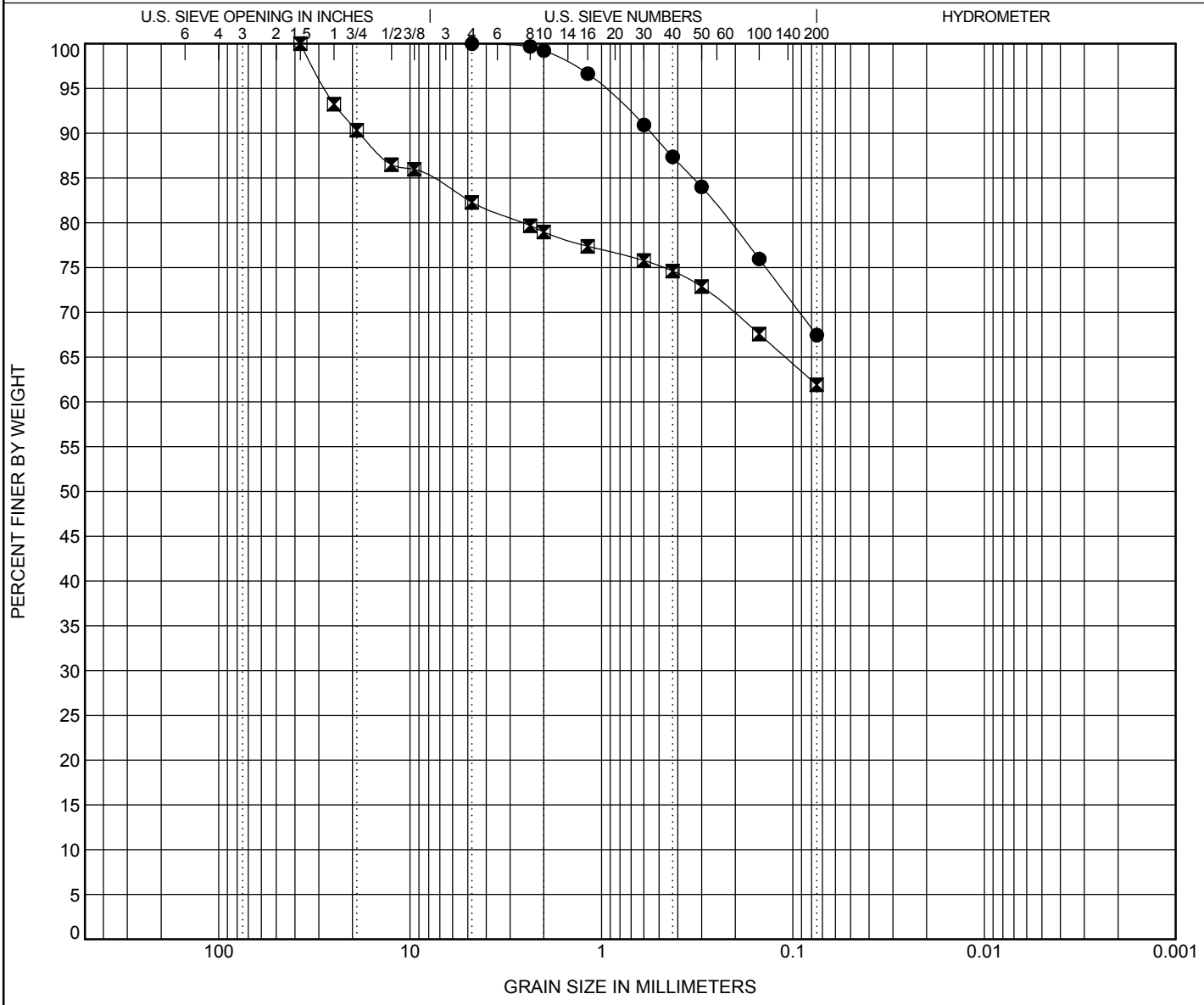
GRAIN SIZE DISTRIBUTION

CLIENT City of Grand Junction **PROJECT NAME** Purdy Mesa Flowline

PROJECT NUMBER 00208-0080 **PROJECT LOCATION** Whitewater, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● TP-3, GB1	4/2018	**SANDY LEAN CLAY(CL)**	**40**	**25**	**15**		
⊠ TP-4, GB1	4/2018	**SANDY LEAN CLAY with GRAVEL(CL)**	**39**	**18**	**21**		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP-3, GB1	4/2018	**4.75**				**0.0**	**32.5**	**67.5**	
⊠ TP-4, GB1	4/2018	**37.5**				**17.7**	**20.4**	**61.9**	

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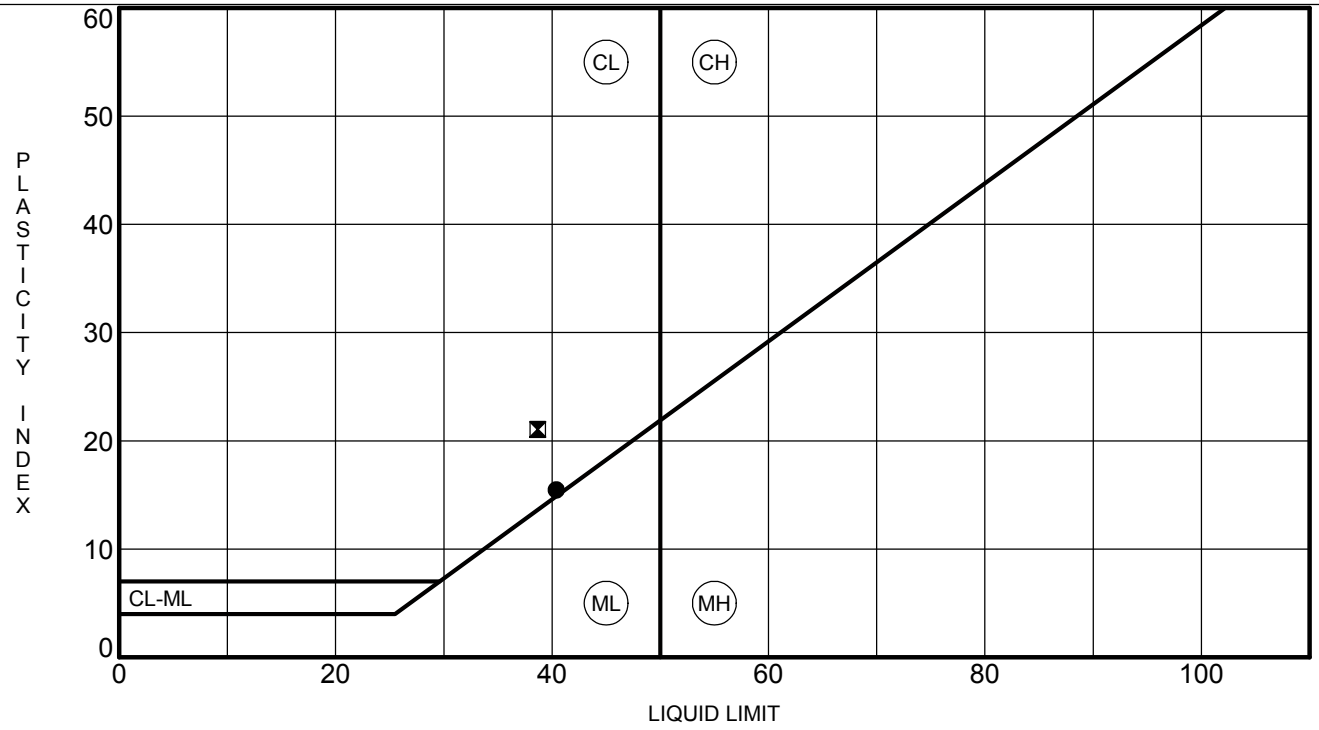
ATTERBERG LIMITS' RESULTS

CLIENT City of Grand Junction **PROJECT NAME** Purdy Mesa Flowline

PROJECT NUMBER 00208-0080 **PROJECT LOCATION** Whitewater, CO



	Specimen Identification		LL	PL	PI	#200	Classification
●	**TP-3, GB1**	**4/2018**	**40**	**25**	**15**	**67**	**SANDY LEAN CLAY(CL)**
⧓	**TP-4, GB1**	**4/2018**	**39**	**18**	**21**	**62**	**SANDY LEAN CLAY with GRAVEL(CL)**

Huddleston-Berry Engineering & Testing, LLC
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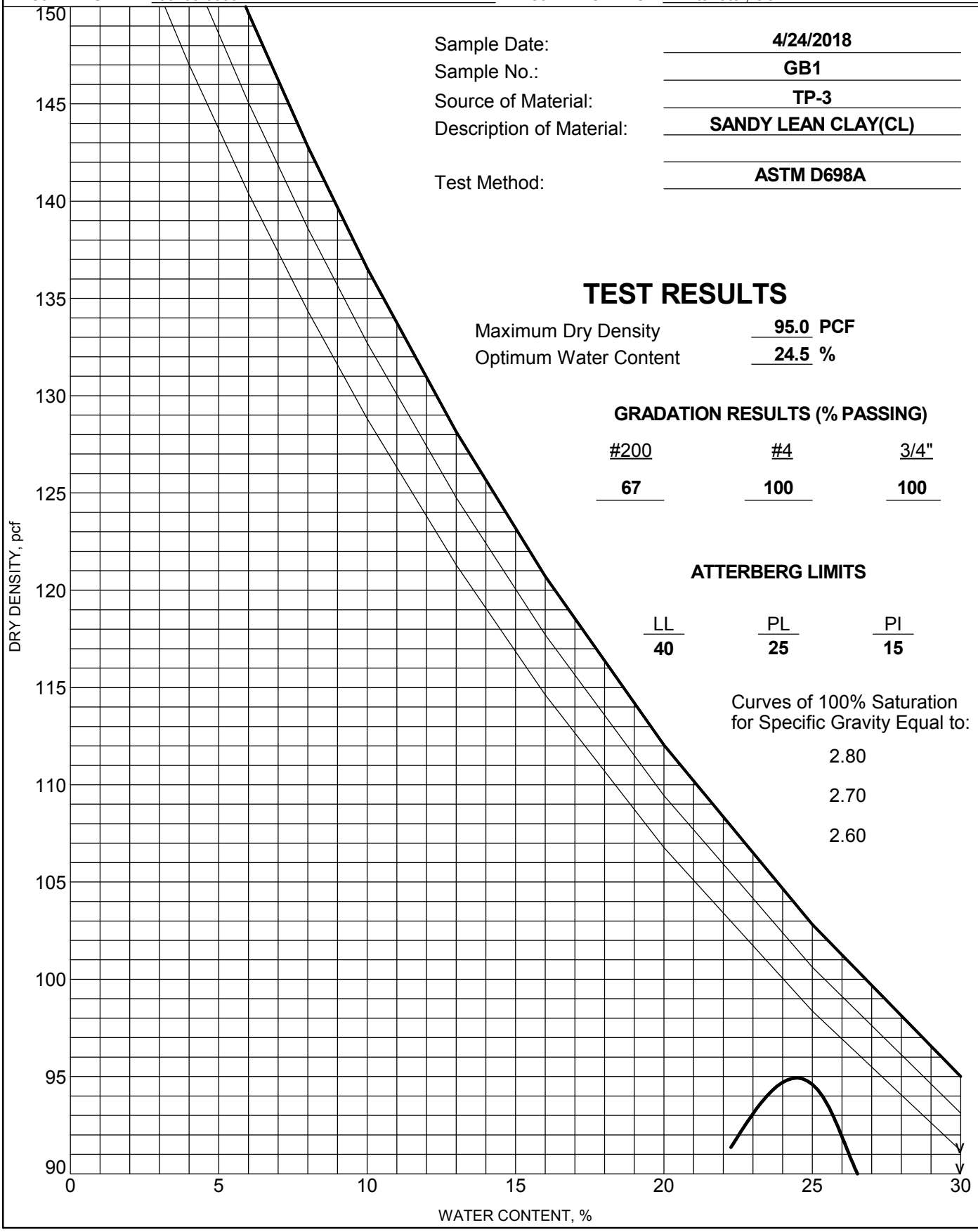
970-255-6818

MOISTURE-DENSITY RELATIONSHIP

CLIENT City of Grand Junction **PROJECT NAME** Purdy Mesa Flowline

PROJECT NUMBER 00208-0080 **PROJECT LOCATION** Whitewater, CO



Sample Date: **4/24/2018**

Sample No.: **GB1**

Source of Material: **TP-3**

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

Test Method: **ASTM D698A**

TEST RESULTS

Maximum Dry Density **95.0** PCF

Optimum Water Content **24.5** %

GRADATION RESULTS (% PASSING)

#200	#4	3/4"
67	100	100

ATTERBERG LIMITS

LL	PL	PI
40	25	15

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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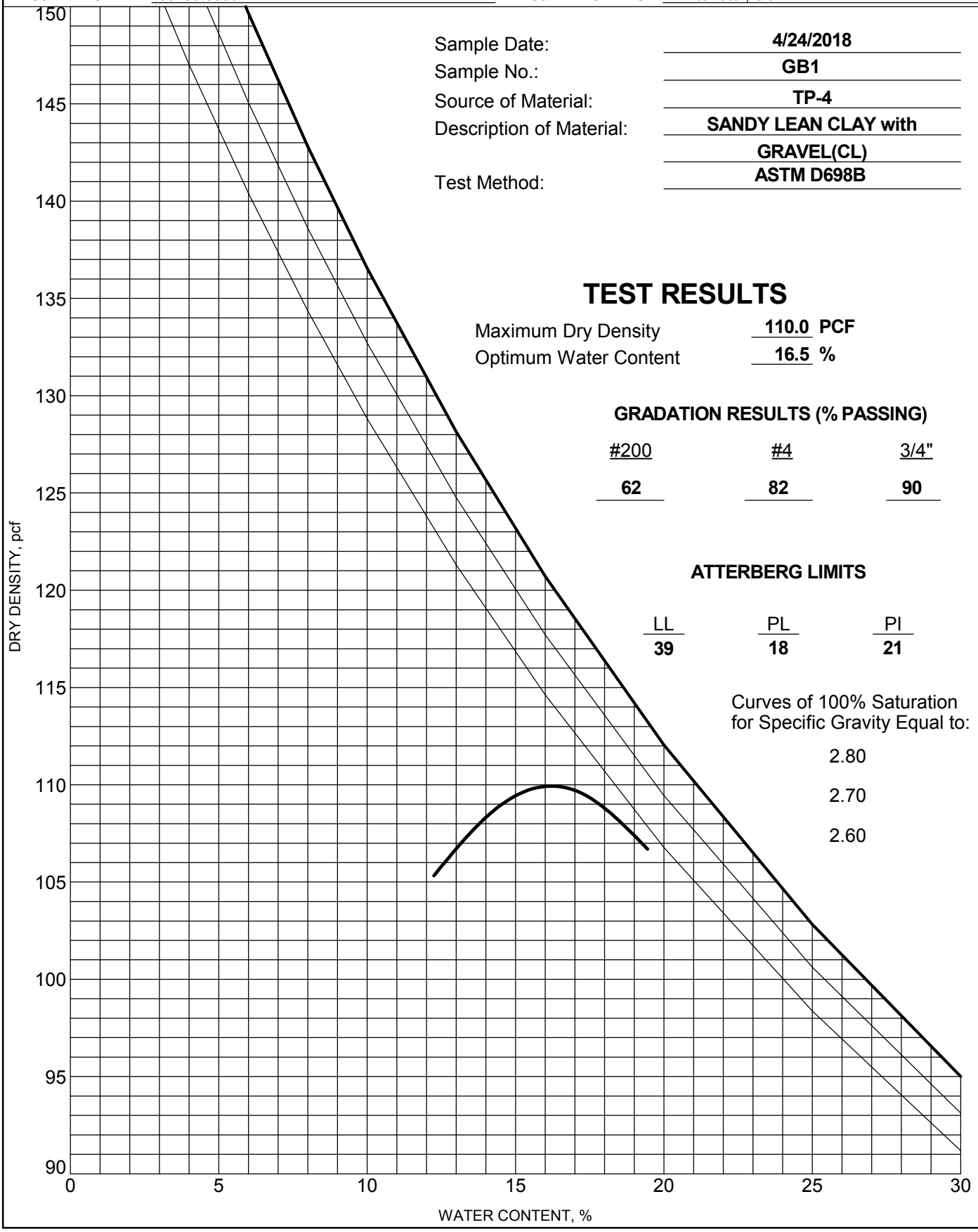
MOISTURE-DENSITY RELATIONSHIP

CLIENT City of Grand Junction **PROJECT NAME** Purdy Mesa Flowline

PROJECT NUMBER 00208-0080 **PROJECT LOCATION** Whitewater, CO



Sample Date: **4/24/2018**

Sample No.: **GB1**

Source of Material: **TP-4**

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

Test Method: **ASTM D698B**

TEST RESULTS

Maximum Dry Density **110.0** PCF

Optimum Water Content **16.5** %

GRADATION RESULTS (% PASSING)

#200	#4	3/4"
62	82	90

ATTERBERG LIMITS

LL	PL	PI
39	18	21

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

EXHIBIT D

Huddleston-Berry
Engineering & Testing, LLC

640 White Avenue
Grand Junction, Colorado 81501
Phone: 970-255-8005
Fax: 970-255-6818
Info@huddlestonberry.com

May 4, 2018
Project#00208-0079

City of Grand Junction Engineering
333 West Avenue, Building C
Grand Junction, Colorado 81501

Attention: Mr. John Eklund

Subject: Geotechnical Investigation
Kannah Creek Intake
Whitewater, Colorado

Dear Mr. Eklund,

This letter presents the results of a geotechnical investigation conducted by Huddleston-Berry Engineering & Testing, LLC (HBET) for the Kannah Creek Intake project in Whitewater, Colorado. The site location is shown on Figure 1 – Site Location Map. The proposed construction is anticipated to include construction of a new diversion dam. In addition, a portion of the existing flow measurement building is proposed to be replaced. The scope of our investigation included evaluating the subsurface conditions at the site to aid in developing foundation recommendations for the proposed construction.

Subsurface Investigation

The subsurface investigation included two test pits at the site as shown on Figure 2 – Site Plan. Test pits TP-1 and TP-2 were excavated to depths of 8.0 and 5.5 feet below the existing ground surface, respectively. Typed test pit logs are included in Appendix A.

Test Pit TP-1, conducted on the west side of the existing flow measurement building, encountered a thin layer of granular base course at the ground surface above brown, moist, medium dense to dense sandy silt with gravel, cobbles, and boulders to a depth of 4.0 feet. The silt was underlain by brown, moist, medium dense to dense cobbles and boulders in a sandy silt matrix to the bottom of the excavation. Groundwater was not encountered in TP-1 at the time of the investigation.

Test Pit TP-2, conducted on the west side of the existing diversion dam, encountered brown, moist, dense cobbles and boulders in a clay matrix with abundant organics from the ground surface to a depth of 1.5 feet. Below the organic rich material, brown, moist, dense to very dense cobbles and boulders in a sandy silty clay matrix extended to the bottom of the excavation. Backhoe bucket refusal was encountered on boulders at a depth of 5.5 feet. Groundwater was not encountered in TP-2 at the time of the investigation.

Flow Measurement Building Recommendations

Based upon the results of the subsurface investigation and nature of the proposed construction, shallow foundations are generally recommended for the new flow measurement building. Spread footings and monolithic (turndown) structural slab foundations are both appropriate alternatives. However, in order to provide a uniform bearing stratum and reduce the risk of excessive differential movements, it is recommended that the foundations be constructed above a minimum of 12-inches of structural fill.

The native soils are generally suitable for reuse as structural fill; provided particles in excess of 3-inches in diameter are removed. Imported structural fill should consist of a granular, non-expansive, non-free draining material such as crusher fines or CDOT Class 6 base course. Unless it can be demonstrated that they are not free-draining, pit-run materials may not be used as structural fill.

For spread footing foundations, the footing areas may be trenched. However, for monolithic slab foundations, the structural fill should extend across the entire building pad area to a depth of 12-inches below the turndown edges. Structural fill should extend laterally beyond the edges of the foundations a distance equal to the thickness of structural fill for both foundation types.

Prior to placement of structural fill, it is recommended that the bottom of the foundation excavation be moisture conditioned and proofrolled to the Engineer's satisfaction. 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 and 90% of the modified Proctor maximum dry density for coarse grained soils, within ± 2% of the optimum moisture content as determined in accordance with ASTM D698 and D1557, respectively.

Structural fill should be extended to within 0.1-feet of the bottom of the foundation. No more than 0.1-feet of gravel should be placed below the footings or turndown edge as a leveling course.

For structural fill consisting of the native soils or imported granular materials, and foundation building pad preparation as recommended, a maximum allowable bearing capacity of 2,000 psf may be used. In addition a modulus of subgrade reaction of 150 pci may be used for structural fill consisting of the native sand soils and a modulus of 250 pci may be used for structural fill consisting of crusher fines or base course. Foundations subject to frost should be at least 24 inches below the finished grade. In general, for construction in accordance with the above recommendations, HBET anticipates that differential settlements will be less than 0.5 inch and total settlements will be less than 1.0 inch.

Diversion Dam Recommendations

Based upon the results of the subsurface investigation and upon our observations at the site, the existing concrete diversion dam appears to be founded on the native cobble and boulder soils. However, due to the site constraints, HBET was unable to evaluate the soil conditions on the east end of the existing dam.

In general, the native cobble and boulder materials are in a dense to very dense condition and will provide excellent support for the new structure. As a result, HBET recommends that the new diversion dam bear directly on the native soils. However, where numerous boulders are present in the subgrade, it may be preferable to pour a concrete leveling pad to interlock with the boulders and provide a uniform bearing surface for the base of the dam. In this case, the leveling pad should include dowels to provide a connection to the primary dam structure. Also, a keyway may be necessary at the base of the dam to limit the potential for seepage below the dam.

Prior to placement of concrete for the leveling pad and/or dam, it is recommended that the bottom of the foundation excavation be moisture conditioned and proofrolled to the Engineer's satisfaction. Large particles may need to be removed at the direction of the Geotechnical and/or Structural Engineer.

For construction above properly prepared dense native soils, a maximum allowable bearing capacity of 3,000 psf may be used. In addition a modulus of subgrade reaction of 200 pci may be used for the dense native soils. In general, for construction in accordance with the above recommendations, HBET anticipates that differential settlements will be less than 0.75 inch and total settlements will be less than 1.5 inches.

Lateral Earth Pressures

Any retaining walls should be designed to resist lateral earth pressures. For backfill consisting of the native soils or imported granular, non-free draining, non-expansive material, we recommend that the walls be designed for an equivalent active fluid unit weight of 45 pcf in areas where no surcharge loads are present. An at-rest equivalent fluid unit weight of 65 pcf is recommended for braced walls. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls.

Corrosion of Concrete

Water soluble sulfates are common to the soils in Western Colorado. Therefore, at a minimum, Type I-II sulfate resistant cement is recommended for construction at this site.

Excavation

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. Trenching and excavations should be sloped back, shored, or shielded for worker protection in accordance with applicable OSHA standards. The soils generally classify as Type C soil with regard to OSHA's *Construction Standards for Excavations*. For Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V.

As discussed previously, boulders were present in the subsurface at the site. Therefore, large equipment may be necessary to complete excavation at the site; particularly at the dam location.

General Notes

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, only one test pit was conducted at each structure location. Therefore, the precise nature and extent of subsurface variability may not become evident until construction. HBET should be provided the opportunity to examine the actual subgrade conditions at the flow measurement building and diversion dam prior to concrete placement to verify the validity of the recommendations herein.

We are 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:
Huddleston-Berry Engineering and Testing, LLC

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

FIGURES

FIGURE 1
Site Location Map

FIGURE 2
Site Plan

APPENDIX A
Typed Test Pit Logs

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

TEST PIT NUMBER TP-1

CLIENT City of Grand Junction
PROJECT NAME Kannah Creek Intake
PROJECT NUMBER 00208-0079
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/12/18 **COMPLETED** 4/12/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Granular Base Course										
		Sandy SILT with Gravel, Cobbles, and Boulders (ml), brown, moist, medium dense										
2.5												
		COBBLES and BOULDERS in a Sandy SILT matrix (ml), brown, moist, dense										
5.0												
7.5												
		Bottom of test pit at 8.0 feet.										

Huddleston-Berry Engineering & Testing, LLC
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Grand Junction, CO 81501
970-255-8005
970-255-6818

TEST PIT NUMBER TP-2

CLIENT City of Grand Junction
PROJECT NAME Kannah Creek Intake
PROJECT NUMBER 00208-0079
PROJECT LOCATION Whitewater, CO
DATE STARTED 4/12/18 **COMPLETED** 4/12/18
GROUND ELEVATION _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR Client
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF EXCAVATION dry
NOTES _____
AFTER EXCAVATION ---

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: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		COBBLES and BOULDERS in a Sandy SILT matrix with Organics (TOPSOIL)										
2.5		COBBLES and BOULDERS in a Sandy SILT matrix (ml), brown, moist, dense to very dense	GB 1									
5.0		Bottom of test pit at 5.5 feet.										

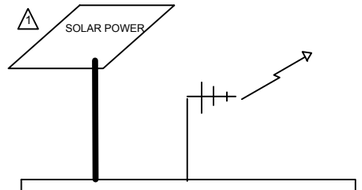
EXHIBIT E

Notes: (General and location specific)

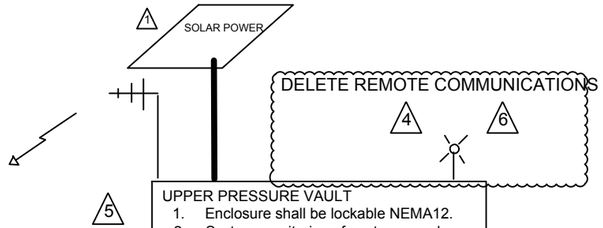
1) 12vdc Solar power system shall be sized for full system load for minimum of 3 consecutive days of full cloud cover. Batteries shall be kept in a separate box appropriate for storage. Solar panel(s) shall be mounted on contractor provided pole outside of building. Power wiring shall be run in conduit between the solar panel and the battery system.
2) Purdy Mesa Tank site will send the tank level signal to the existing Kannah Creek WTP site via the Kannah Creek Tank site. Integrator will add the Purdy Mesa tank level signal and associated high / low alarms to the Kannah Creek SCADA system.
3) ~~Integrator will setup communications via internet connection to the operator interface at the control vault location (cell link with fixed IP address). The Integrator will ensure that the WTP interface is secure to prevent unwanted outside access.~~
4) ~~The flow vault will be the primary pressure control site for the pipeline. Communications to this site will be via cellular modem. The modem will need additional security to prevent access from networks outside of the water treatment plant (Tosibox 500 or equivelant)~~
5) Pressure / flow control will be accomplished by monitoring both up and downstream pressures as well as system flow. In automatic mode, the PLC will actuate either the open or close solenoid on the Burmad valve in order to increase / decrease pressure as needed to maintain desired pressure / flow. The operator interface will display system pressures and flow as well as any alarm conditions (low / high pressure, sensor failure, low battery). A graphical representation of the vault will also be displayed. The operator will be able to enter desired flow / pressure setpoints (password protected). In manual mode, the operator will be able to actuate either the open or close solenoid as needed from the Operator interface (password protected.). Alarms will be emailed (or text via email) to appropriate city personnel.
6) ~~The city has been granted access to the radio tower on Whitewater hill (Clifton Water District). The integrator may do a radio path survey to determine if this will allow for a more desireable communications path than cellular network.~~
7) Integrator will ensure that they provide all necessary components and setup so that the system operates as intended.
8) Integrator will provide a minimum of (2) 3 hr. training sessions on the operation and maintenance of the system
9) Project submittals shall include bill of materials with associated cut sheets on all proposed equipment. Control panel layout and wiring drawings shall also be provided (11x17).
10) Project O&M shall include bill of materials and equipment manuals. As-built drawings shall be provided in 11x17 format. A flash drive shall be furnished with all O&M data as well as copy of drawings in PDF and Autocad 2016 or higher. Additionally, copies of the PLC and OIT programs shall be furnished on the flash drive.

DELETE WTP SITE WORK FROM SCOPE

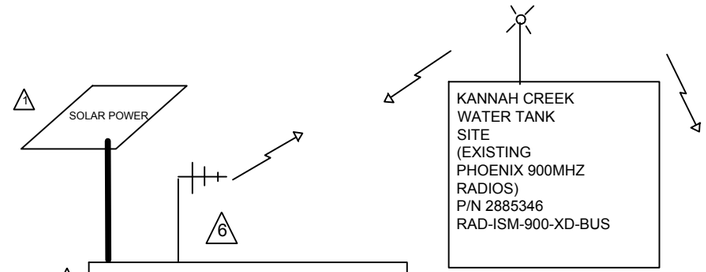
WTP SITE
1. ~~Monitor and control the flow vault site via IP address link~~
2. ~~Monitor the new tank level via existing remote connection to Kannah Creek~~
3. ~~Add new control panel in main flow control vault to monitor and control new pressure sustaining valve.~~
4. ~~All equipment will be fuse protected.~~
5. ~~Panel will need ethernet link to WTP control room and wiring from new vault to panel.~~
6. Primary Components
   - 6.1. ~~Allen Bradley Micrologix1100 PLC with 1762-IF4 analog input module~~
   - 6.2. ~~Red Lion G07S0000 Operator interface or equal. All data shall be logged to the OIT data storage device every 5 minutes.~~
   - 6.3. ~~Pressure transmitter with display. Range 0-150 PSI 4-20mA Output. (2) Rosemount 2088 series or equal~~
   - 6.4.



LOWER PRESSURE VAULT
1. Enclosure shall be lockable NEMA12. White in color.
2. System monitoring of upstream and downstream pressure and system flow
3. All equipment shall be fuse protected.
4. All I/O shall be wired through terminal blocks and tagged with Radio input / output address.
5. Primary Components
   - 5.1. Phoenix Contact RAD-900-IFS radio system with RAD-AI4-IFS analog module with appropriate lightning protection.
   - 5.3. Pressure transmitter with display. Range 0-150 PSI 4-20mA Output. (2) Rosemount 2088 series or equal



UPPER PRESSURE VAULT
1. Enclosure shall be lockable NEMA12.
2. System monitoring of upstream and downstream pressure and system flow
3. System control of upstream pressure
4. All equipment shall be fuse protected.
5. All I/O shall be wired through terminal blocks and tagged with PLC input / output address.
6. Primary Components
   - 6.1. Allen Bradley Micrologix1100 PLC with 1762-IF4 analog input module
   - 6.2. Red Lion G07S0000 Operator interface or equal. All data shall be logged to the OIT data storage device every 5 minutes.
   - 6.3. Phoenix Contact RAD-900-IFS. Use PLC serial port to communicate to lower vault.
   - 5.3. Pressure transmitter with display. Range 0-150 4-20mA Output. (2) Rosemount 2088 series or equal
   - 6.4 Insertion magnetic flowmeter Seametrics EX-250 with FT-440 display or equal
   - 6.5 4-20mA Loop powered Battery Voltage monitor



TANK SITE
1. Enclosure shall be lockable NEMA12.
2. System monitoring of tank level.
3. Tank level will be sent to the Kannah Creek WTP via the Kannah Creek Tank RTU for control of the Purdy Mesa Intake valve. Operations shall enter desired tank level setpoint for valve control.
4. All equipment shall be fuse protected.
5. All I/O shall be wired through terminal blocks and tagged with PLC input / output address.
6. Primary components
   - 6.1. Phoenix Contact point to point 900Mhz radio system to link to Kannah Creek. Radio shall have appropriate lightning protection.
   - 5.2 Submersible Pressure transmitter Range 0-10 PSI 4-20mA Output. E&H Waterpilot or equal
   - 5.3 The tank level transmitter shall have appropriate lightning protection

KANNAH CREEK WATER TANK SITE (EXISTING PHOENIX 900MHZ RADIOS) P/N 2885346 RAD-ISM-900-XD-BUS

KANNAH CREEK WTP (EXISTING PHOENIX 900MHZ RADIOS) P/N 2885346 RAD-ISM-900-XD-BUS
1. Tank level setpoint shall be added to the existing valve control system

NUMBER	REVISION	BY	DATE
6	Deletion of Cellular network	·	10/18
5	Change of material mfg.	·	9/18
4	90% Review Modifications	·	8/9/18
3	Addition of Pressure Vault at WTP	·	7/16/18
2	60% Review Modifications	·	6/27/18
1	60% Drawing Set	·	6/12/18

DRAWN BY: BRM	5/15/18	PROJECT NUMBER: 81-18-013	
DESIGNED BY: BRM	5/15/18	CAD NUMBER: C2-505	
APPROVED BY: .	.	DRAWING SCALE: NONE	
WITNESSED BY: .	.		

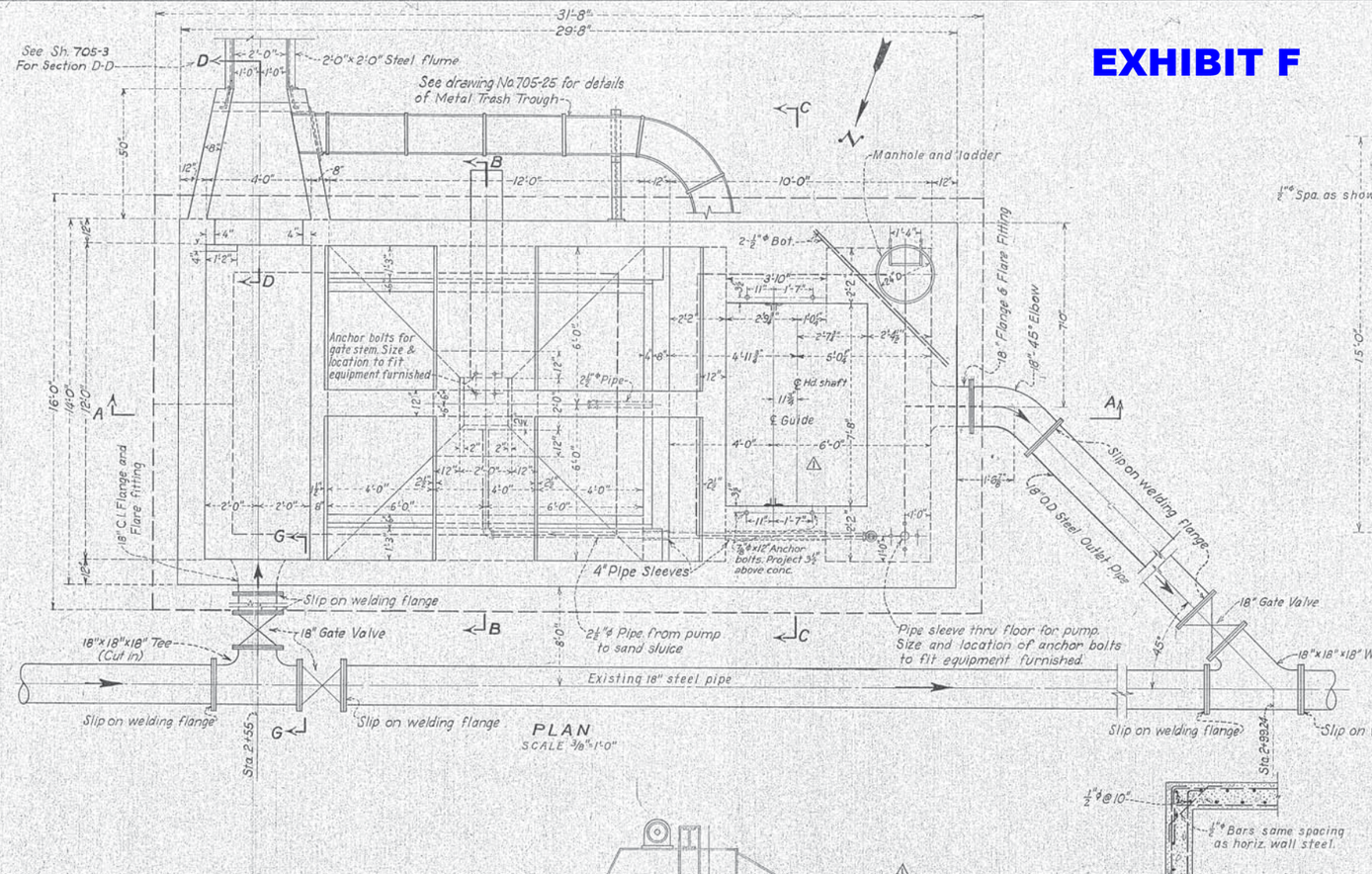
PROJECT:
JUB ENGINEERS
PURDY MESA PIPELINE PROJECT

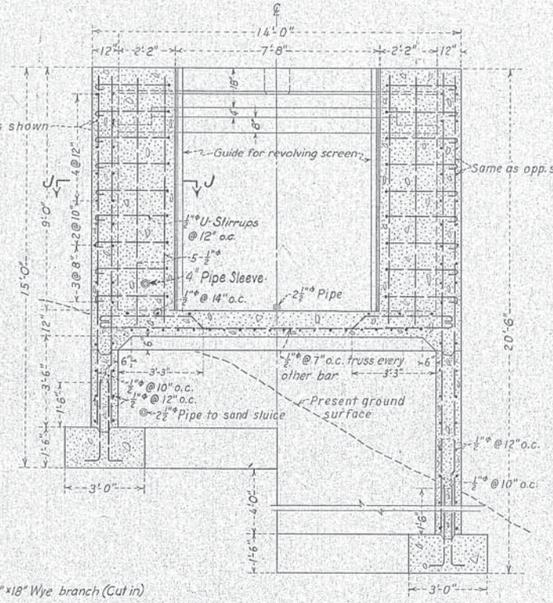
DRAWING TITLE:
SCADA SYSTEM
COMMUNICATIONS OVERVIEW

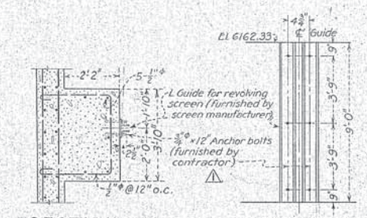
SHEET NO.
C2-505

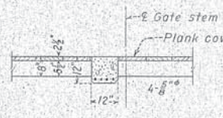
REVISION
6

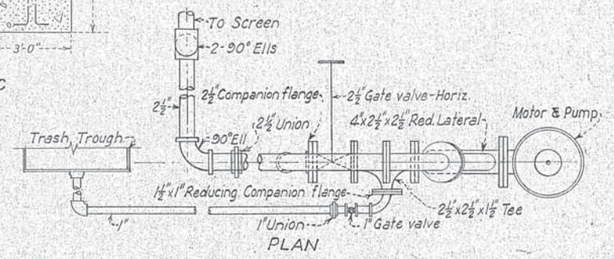
EXHIBIT F

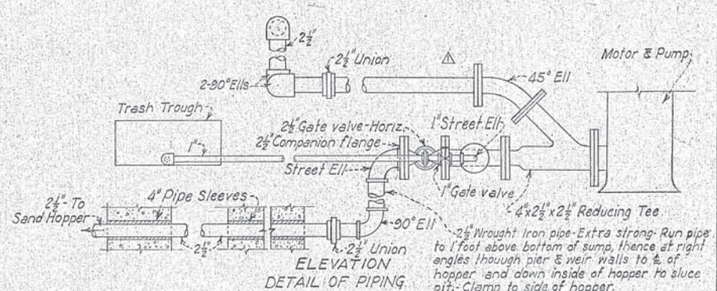


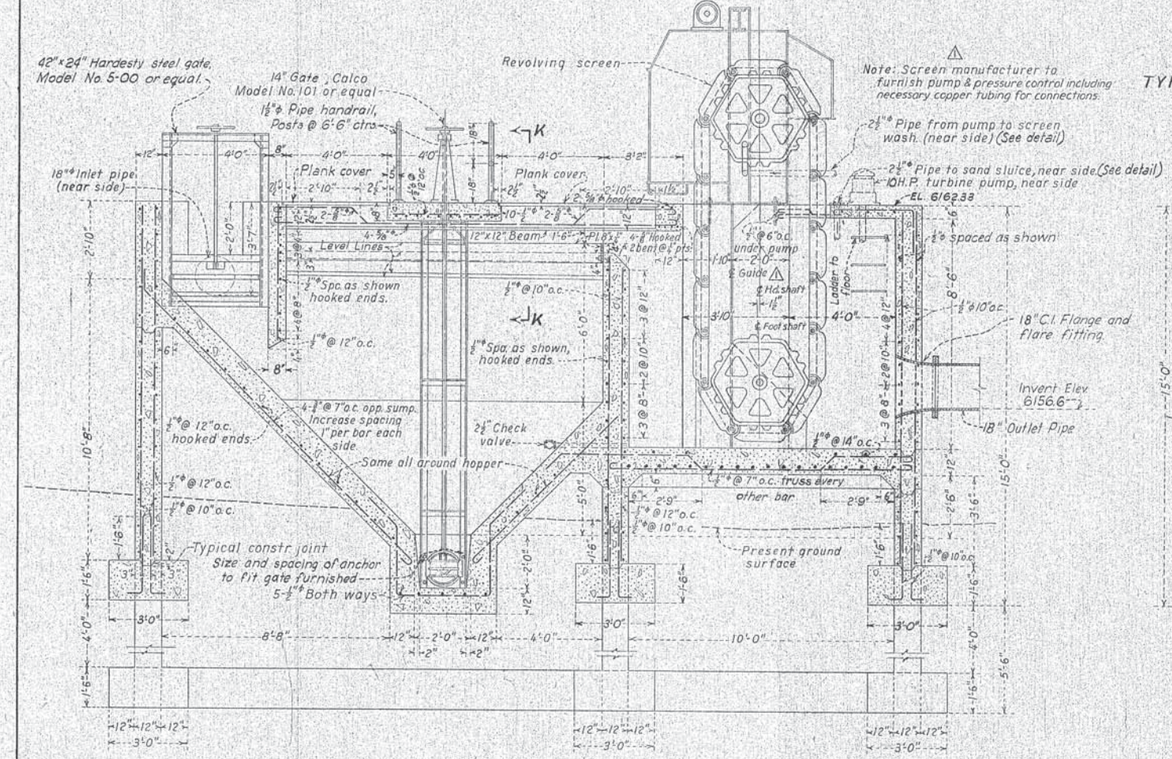


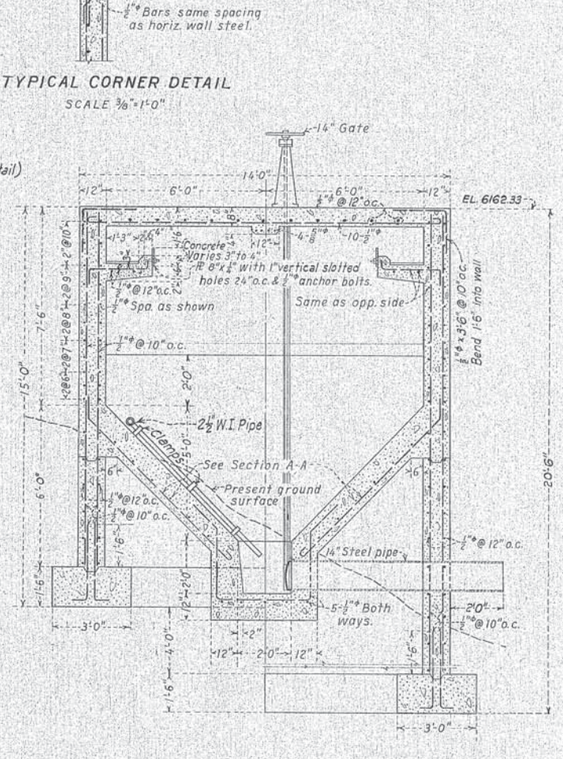












NOTE

Reinforcement to have min. cover of 1½" except where conc. comes in contact with earth when min. cover will be 2" for walls and floor slabs and 3" for footings.

All new 18" O.D. steel pipe to be fabricated of ¼" plate.

All flanges to be drilled for Class 125 American Standard.

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	Dimensions added to conform with screen manufacturer's specifications. 2½" Gate valve relocated. Note revised.	9/19/46	F.W.
2	As built	10-29-48	F.W.

Graphic Scale ⅜"=1'-0" 0 5

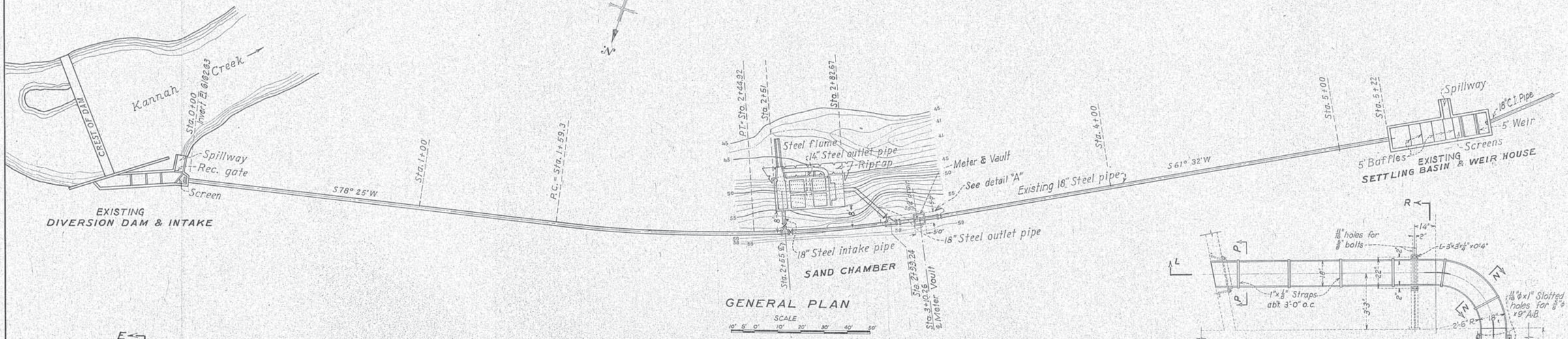
CITY OF GRAND JUNCTION

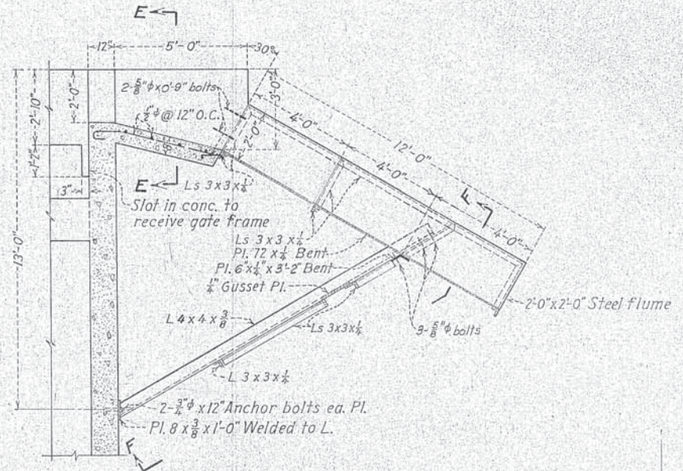
R. J. TIPTON & ASSOCIATES INC., ENGINEERS
DENVER, COLORADO

IMPROVEMENTS TO WATER SUPPLY SYSTEM
SAND CHAMBER AND SCREEN
PLAN AND SECTIONS

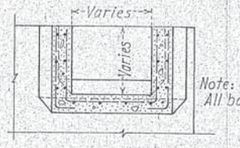
DRAWN F.W. APPROVED R. J. TIPTON AND ASSOCIATES INC.
TRACED F.W. APPROVED DIRECTOR OF PUBLIC WORKS AND PLANNING
CHECKED O.K. APPROVED CITY MANAGER

DENVER, COLORADO JUNE 1946 705-24



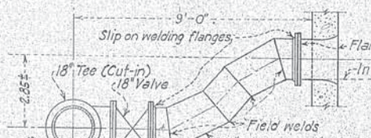


SECTION D-D
SCALE 3/8" = 1'-0"

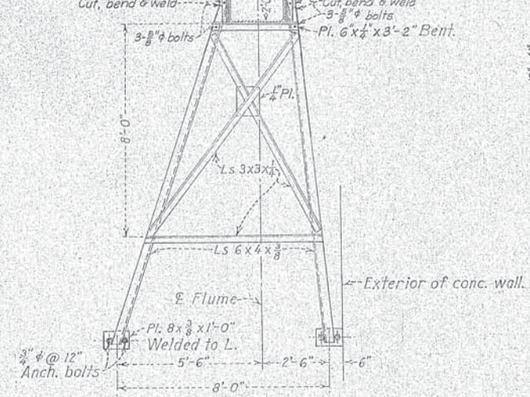


SECTION E-E
SCALE 3/8" = 1'-0"

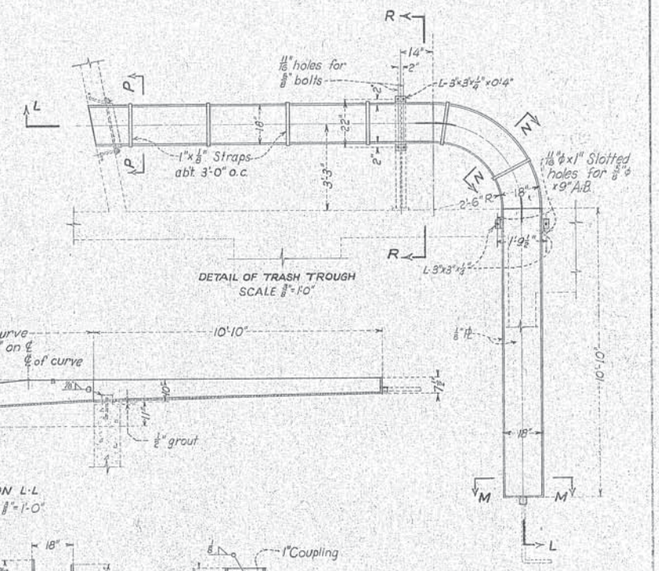
LADDER DETAIL
SCALE 3/8" = 1'-0"

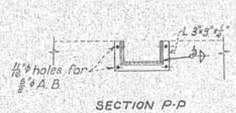


SECTION G-G
SCALE 3/8" = 1'-0"

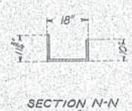


SECTION F-F
SCALE 3/8" = 1'-0"

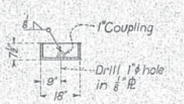




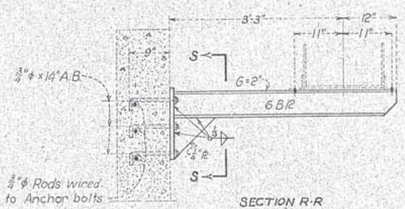
SECTION P-P
SCALE 3/8" = 1'-0"



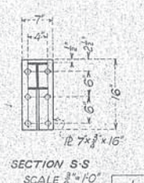
SECTION N-N
SCALE 3/8" = 1'-0"



SECTION M-M
SCALE 3/8" = 1'-0"



SECTION R-R
SCALE 1/4" = 1'-0"



SECTION S-S
SCALE 3/8" = 1'-0"

Graphic Scales
3/8" = 1'-0" 12" 0" 6" 12"
1/4" = 1'-0" 6" 3" 0" 6"

No.	DESCRIPTION	DATE	BY
1	As built	10-29-48	F.B.C.

REVISIONS

CITY OF GRAND JUNCTION
R. J. TIPTON & ASSOCIATES INC., ENGINEERS
DENVER, COLORADO

IMPROVEMENTS TO WATER SUPPLY SYSTEM
SAND CHAMBER AND SCREEN LOCATION PLAN AND SECTIONS

DRAWN F.W. APPROVED
TRACED L.W.M. APPROVED
CHECKED O.K. APPROVED

R. J. TIPTON AND ASSOCIATES, INC.
DIRECTOR OF PUBLIC WORKS AND PLANNING
CITY ENGINEER

DENVER, COLORADO JUNE 1946

705