



TOWN OF KEENESBURG  
PLANNING COMMISSION MEETING  
THURSDAY, AUGUST 6, 2020, 6:00 P.M.  
KEENESBURG TOWN MEETING HALL  
140 SOUTH MAIN STREET, KEENESBURG, CO 80643

Please join Planning Commission meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/683411325>

Link also available at: townofkeenesburg.com, Meeting Agendas  
(Toll Free): 1 866 899 4679 - Access Code: 683-411-325#

1. Call to order
2. Pledge of allegiance
3. Roll Call
4. Public Comments
5. Approval of Minutes for July 9, 2020 and July 16, 2020
6. New Business
  - a. PUBLIC HEARING: To Consider a preliminary and final plat for the RK Subdivision consisting of 15.06 acres divided into 7 lots
  - b. RESOLUTION PC2020-08 A RESOLUTION RECOMMENDING APPROVAL OF A PRELIMINARY AND FINAL PLAT FOR THE RK SUBDIVISION
  - c. PUBLIC HEARING: To Consider amending Chapters 16 and 17 of the Keenesburg Municipal Code to Integrate the Town of Keenesburg Design Standards and amending Chapter 8 regarding parking on improved surfaces.
  - d. RESOLUTION PC 2020-09 A RESOLUTION RECOMMENDING APPROVAL OF THE TOWN OF KEENESBURG DESIGN STANDARDS AND OF AN ORDINANCE AMENDING CHAPTERS 16 AND 17 OF THE KEENESBURG MUNICIPAL CODE TO INTEGRATE THE TOWN OF KEENESBURG DESIGN STANDARDS
  - e. Kaufman Annexation No. 4 and South West Parcel Sketch Plan **Re-scheduled for Meeting on September 3, 2020.**
7. Old Business



TOWN OF KEENESBURG  
PLANNING COMMISSION MEETING MINUTES  
THURSDAY, JULY 9, 2020, 6:00 P.M.  
HELD AT TOWN HALL AT  
140 S. MAIN ST., KEENESBURG, CO 80643  
AND  
HELD ELECTRONICALLY at  
<https://global.gotomeeting.com/join/508455013>

**Call to order**

The Planning Commission of the Town of Keenesburg met in a regular session, Thursday, July 9, 2020, and electronically at <https://global.gotomeeting.com>. Chair Howell called the meeting to order at 6:00 p.m.

**Pledge of allegiance**

**Roll Call**

**Members Present:** Chair John Howell; Commissioners Greening, Wafel, and Gfeller.

**Members Excused:** Commissioner Finkenbinder.

**Others Present:** Town Manager, Debra Chumley; Town Planner, Todd Hodges; Town Attorney, Kent Bruxvoort, Town Engineer; and Planning Staff, Teri Smith.

**Public Comments**

None

**Approval of Minutes for May 7, 2020**

Commissioner Wafel makes a motion to approve minutes for May 7, 2020 with a second by Commissioner Gfeller. Motion carried 4-0; roll call: Chair Howell, Commissioners Greening, Wafel, and Gfeller, voting yes.

**New Business**

**A. Public Hearing: Market Street Business Park Amended  
Final Plan**

Chair Howell opened the public hearing at 6:03 p.m. and read from the script and gave instructions and procedures regarding the public hearing. Chair asks for

notice of publication: Debra provided notification dates; publication on June 19, 2020; Mailing on June 18, 2020; and Sign posting, June 26, 2020. Chair Howell asks from the Planning Commission if there are any disclosures; no disclosures. Chair Howell asks for the applicant to approach and present the application. Chad Cox of Western Engineering at 127 S. Denver Ave., Ft. Lupton, CO is sworn in and presents the application, that this project is the same project that came before the Planning Commission and The Board of Trustees previously and the only difference is that they have eliminated one of the lots on the south and the northern split it up in similar fashion going from 4 lots to a 5 lot subdivision, everything else remains the same. Todd Hodges, Town Planner presents that this submittal is an amendment to the approved final plat and the proposed changes are an additional lot and general lot layout going from 4 lots to 5 lots. Todd further explains that screened fencing and landscape buffer will be provided along western edge of the development as this was one of the conditions of the prior final plat. Discussions from the Planning Commission on where the new development is on the south or north side of lot, it is now on north side and storm drains, drainage and storm sewer easement. Chad Cox further clarifies that the easement was centered between Lots 3 and Lots 4 and now changed to between lots 4 and 5. Chad further explains information on the storm pond and how it releases the water and how much. Chair Howell closes the Public Comment portion of the hearing at 6:17 pm. Chair Howell asks for any more questions from Planning Commissions, none. Chair Howell closes the Public Hearing at 6:18 pm.

**B. RESOLUTION NO. PC2020-07 A Resolution  
Recommending approval of a Final Plat for the Market  
Street Business Center Subdivision**

Commissioner Gfeller makes a motion to approve Resolution PC2020-07 A Resolution recommending approval of a Final Plat for the Market Street Business Center Subdivision with a second by Commissioner Wafel. Motion carried 4-0; Chair Howell, Commissioners Greening, Wafel and Gfeller, voting yes.

**Old Business**

None

**Board Comments / Reports**

None

**Adjournment**

Motion was made by Commissioner Greening to adjourn the meeting at 6:21 p.m., with a second by Commissioner Wafel. Motion carried 4-0; roll call; Chair Howell, Commissioners Greening, Wafel and Gfeller, voting yes.

ATTEST:

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John Howell  
Chairperson

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Teri Smith  
Planning Staff





TOWN OF KEENESBURG  
PLANNING COMMISSION MEETING MINUTES  
THURSDAY, JULY 16, 2020, 6:00 P.M.  
HELD AT TOWN HALL AT  
140 S. MAIN ST., KEENESBURG, CO 80643  
AND  
HELD ELECTRONICALLY at  
<https://global.gotomeeting.com/join/508455013>

**Call to order**

The Planning Commission of the Town of Keenesburg met in a regular session, Thursday, July 16, 2020, and electronically at <https://global.gotomeeting.com>. Chair Howell called the meeting to order at 6:00 p.m.

**Pledge of allegiance**

**Roll Call**

**Members Present:** Chair John Howell; Commissioners Greening, Wafel, Gfeller and Finkenbinder

**Others Present:** Town Manager, Debra Chumley; and Planning Staff, Teri Smith.

**Public Comments**

None

**New Business**

**A. Public Hearing: To Consider and Addition to the  
Keenesburg Code Section 16-1-70 adding a definition of  
Substation and Section 16-2-150 (b) adding a Substation as  
a Use by Right**

Chair Howell opened the public hearing at 6:01 p.m. and reads from the script, gives instructions and procedures regarding the public hearing. Chair asks for notice of publication: Debra provided notification dates; publication on July 1, 2020. Chair Howell asks from the Planning Commission if there are any disclosures; no disclosures. Debra Chumley, Town Manager acting on behalf of the Town Planner, states that this is a request to amend the Municipal Code in Chapter 16 to add a definition for Substation and, also to add in the heavy industrial zone a Use by Right for Substation. Staff recommending that the

Planning Commission approve the Resolution that recommends the Ordinance to the Board of Trustees. Chair Howell opens the Public Comment portion of the hearing at 6:17 pm asks if anyone would like to speak; hearing none, Chair Howell closes public comment portion of hearing. Chair reads from the script regarding the documents in the packet and inclusions and asks if there are any objections; hearing none. Chair asks for any questions from Planning Commissions. Discussion on if this is in our code right now as a Use by Special Review and it is not currently a listed use in any of the zone districts. Chair asks for comments or statements to support or deny. Chair Howell closes the Public Hearing at 6:07 pm.

**B. RESOLUTION NO. PC2020-05 A RESOLUTION  
RECOMMENDING APPROVAL OF AN ORDINANCE 2020-  
14 ADDING A DEFINITION OF SUBSTATION AND AS A  
USE BY RIGHT TO THE HEAVY INDUSTRIAL ZONE  
DISTRICT**

Commissioner Greening makes a motion to approve Resolution PC2020-05 with a second by Commissioner Wafel. Motion carried 5-0; Chair Howell, Commissioners Greening, Wafel, Gfeller and Finkenbinder, voting yes.

**C. Public Hearing: For XYZ Enterprises LLC for a second  
amendment of the Mediterranean Minor Subdivision for the  
purpose of combining two lots**

Chair Howell opened the public hearing at 6:08 and reads from the script, gives instructions and procedures regarding the public hearing. Chair ask for notice of publication: Debra provided notification dates; publication on July 1, 2020; mailing date June 30, 2020 and posting date of June 26, 2020. Chair asks for any disclosures; none. Chair asks for the applicant's representative to approach, state their name and is sworn in. Tim Naylor, with Ag Professionals, 3050 67<sup>th</sup> Ave., Greeley, CO states that they are asking to be allowed to create one lot by combining lots 1 and 2. Currently a site plan review is in process with the Staff. Discussion reasons for combining the lots. Tim Naylor states that since they will be encumbering the entire parcel with the operations for the gas station, and fuel station, the Town of Keenesburg prefers to have it as one lot so other lots cannot be sold off and then would not be able to utilize the entire property. Chair ask for the Staff Report. Debra presents on behalf of Todd Hodges, presents that this application is to combine two lots into one and the applicant has a site plan that is under staff review for a fuel station and convenience store. The site plan utilizes the entirety of the two lots and is the reason to combine the lots to accommodate site plan as one parcel. Chair Howell opens the Public Comment portion of the hearing at 6:18 pm. and asks if anyone would like to speak; hearing none, Chair Howell closes public comment portion of hearing. Chair reads from the script regarding the documents in the packet and inclusions and asks if there are any objections; hearing none. Chair asks for any questions from Planning Commissions, none. Chair asks for comments or statements to support or deny. Chair Howell closes the Public Hearing at 6:19 pm.

**D. RESOLUTION PC2020-06 A RESOLUTION  
RECOMMENDING APPROVAL OF A SEOND AMENDED  
PLAT OF MEDITERRANEA MINOR SUBDIVISION**

Commissioner Gfeller makes a motion to approve Resolution PC2020-06 with a second by Commissioner Greening. Motion carried 5-0; Chair Howell, Commissioners Greening, Wafel, Gfeller and Finkenbinder, voting yes.

**Old Business**

None

**Board Comments / Reports**

None

**Adjournment**

Motion was made by Commissioner Gfeller to adjourn the meeting at 6:23 p.m., with a second by Commissioner Wafel. Motion carried 5-0; roll call; Chair Howell, Commissioners Greening, Wafel, Gfeller and Finkenbinder, voting yes.

ATTEST:

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John Howell  
Chairperson

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Teri Smith  
Planning Staff

# STAFF REPORT

**TO: PLANNING COMMISSION**

**FROM: TODD A. HODGES, PLANNER**

**SUBJECT: RK SUBDIVISION PRELIMINARY AND FINAL PLAT**

**PC MEETING DATE: AUGUST 6, 2020**

**BOARD OF TRUSTEES MEETING DATE: AUGUST 17, 2020**

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## **I. Attachments**

1. Application submittal
2. Preliminary and Final plat drawings
3. Referral items

## **II. Project Owners and Representatives:**

### **Owners:**

Richard I. Robertson  
Heidi D. Robertson  
8537 CR 51  
Keenesburg, CO 80643

Aaron L. Kaiser  
Lori J. Kaiser  
30307 CR 8  
Keenesburg, CO 80643

### **Applicant:**

Richard I. Robertson  
Heidi D. Robertson  
8537 CR 51  
Keenesburg, CO 80643  
pri.rickrobertson@gmail.com

Aaron L. Kaiser  
Lori J. Kaiser  
30307 CR 8  
Keenesburg, CO 80643  
aaron@noraaconcrete.com

**Project Representative:**  
Same as above

### III. Location

Legal:

PT SW4 19-2-63 LOT B REC EXEMPT RE-4346



### III. Project Description

The land use application is a preliminary and final plat for the RK Subdivision. The RK Subdivision is 15.060 acres located along WCR 398, Keenesburg, CO. The final plat is the last step in the subdivision process.

The proposed subdivision was annexed into the Town of Keenesburg in 2018 and zoned Heavy Industrial. The applicant is seeking to subdivide the property into seven

(7) industrial lots with each lot being roughly 2 acres in size. Access to the lots will be provided by a col-du-sac with 60ft dedicated right-of-way (ROW), this road will be dedicated to the Town of Keenesburg. The dedicated road will be paved by the applicant. Drainage is addressed in the submittal and has been reviewed by the Town Engineer.

Surrounding land uses of the property are residential on Agricultural zoning in the County with Highway Commercial to the west and Industrial to the Northeast of the site. The proposed property is currently zoned Heavy Industrial (HI) and the applicant intends to develop all seven (7) lots within the HI zoning designation.

Under section 16-2-150 of the Town of Keenesburg municipal code, heavy industrial is purposed primarily for manufacturing, assembly and distribution of basic goods. In addition, uses that involve resource extraction operations and recycling, storage and disassembly of all types of used products and related support uses are included within this category. The proposed plat describes lots that will provide space consistent with this zone designation. Future development of the lots will be required to go through the appropriate land use process prior to construction and/or a change in use. The sketch plan conditions required addressing the open space, signage, lighting and landscaping for the development. The submittal deferred the items to development of each lot. A condition of approval has been included to address the open space requirement as required per the annexation agreement and also future landscape requirements for development of the lots as well as lighting at the entrance of the development.

Utilities for the site are provided by:

Gas: TBD in conditions

Electric: United Power

Water: Keenesburg

Sewer: Onsite Wastewater Treatment System (OWTS)

Fire: S.E. Weld County Fire

## **VIII. Findings/Conclusions**

After review of the Comprehensive Plan Municipal Code and referral comments, staff finds that:

1. The application is consistent with the Town of Keenesburg Comprehensive Plan
2. The application is consistent with the Town of Keenesburg Zoning Map
3. The application meets all criteria set forth in 17-3-20 and 17-4-20 of the Town of Keenesburg municipal code.

At the time this report was written, there have been no written objections filed with the Town concerning the proposed preliminary or final plat. Referrals were sent to the list attached to this report. Comments were received from the Town Engineer and the Town Attorney. The referrals are attached.

## **IX. Recommendation**

Based upon the findings identified in this report, staff recommends approval of the RK Subdivision Preliminary and Final Plat with the following conditions:

1. Prior to recording the final plat a subdivision improvements agreement shall be reviewed and approved by the Board of Trustees.
2. Prior to recording the final plat the applicant shall submit adequate evidence of gas service to the site.
3. Prior to recording the final plat the applicant shall adequately address the redlines and comments provided by the Town Engineer.
4. Prior to recording the final plat the applicant shall make a cash in lieu payment for 1.8 acres of land that would be the required open space dedication requirement per Section 7 of the annexation agreement.
5. Prior to recording the final plat the following note shall be placed on the plat:

Landscaping and irrigation will be a requirement for future owners of each lot as part of the development or use of each lot. Prior to development or use of any lot a pre-application meeting will be required to determine the appropriate land use process for the proposed uses.

6. Prior to recording the final plat the applicant shall adequately address the comments from the Town Attorney in the referral response dated July 28, 2020. The items include updating the property info binder, revising the certificate of ownership and dedication and revising the Town Board approval block.
7. A pdf of the revised final plat shall be sent to staff for review and approval prior to submitting the signed mylar.

## **RK SUBDIVISION PRELIMINARY PLAT APPLICATION CHECKLIST:**

The following is a summary of the checklist items:

<b>Item</b>	<b>Concept</b>	<b>Market Street BP</b>
01	All items required for the sketch plan application, to contain all changes and or conditions of approval associated with the sketch plan	NOTED
02	Application form & fee deposits	COMPLETED
03	Must meet all requirements of CRS 38-	
04	A grading and drainage plan and report	COMPLETED
05	Sanitary sewer design	EACH LOT TO PROVIDE OWTS IN FUTURE
06	Street plan and cross sections	COMPLETED
07	Traffic Study -General traffic overview and Analysis	COMPLETED
08	Primary engineer's estimate of cost	COMPLETED
09	Geotechnical Analysis and Report	COMPLETED
10.	Submit two copies of the preliminary plat, as well as an electronic version	COMPLETED





**Preliminary Plat Subdivision Application**

**Application Fee: \$500.00**

**(Plus all developer related review fees incurred by the Town of Keenesburg i.e. legal, engineering, publication, recording fees, etc.)**

**Applicant Name** Richard I. Robertson, Heidi D. Robertson, Aaron L. Kaiser, and Lori J. Kaiser

**Address** Robertson's:- 8537 WCR 51 Keenesburg, CO 8064

Kaiser's: 39673 E. 160<sup>th</sup> Avenue, Keenesburg, CO 80643

**Daytime Phone Robertson:** 303-961-3960

**Daytime Phone Kaiser:** 303-994-7947

**Emails:** pri.rickrobertson@gmail.com

aaron@noraaconcrete.com

**Subdivision Name** RK Subdivision

**Address of Proposed Subdivision** WCR 398, Keenesburg, CO 80643

**Legal Description:** LOT B, RECORDED EXEMPTION NO. 1303-19-3-RE-4346 RECORDED MARCH 28, 2006 AT RECEPTION NO. 3373994, BEEING A PART OF THE SOUTHWEST 1/4 OF SECTION 19, TOWNSHIP 2 NORTH, RANGE 63 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO

**Is the Applicant the Owner of the Property?** ☒ Yes ☐ No

**Owner Name (if not Applicant):**

**Owner Address:**

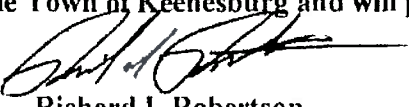
Owner's Phone:

Owner's

email:


Property Owner signature: \_\_\_\_\_ N/A \_\_\_\_\_ Date: \_\_\_\_\_

The Applicant understands that this is an application only, that is must be approved, and that any required building permits must be obtained before the property may be used in accordance with the request. The Applicant further acknowledges that the above information is correct. By signing this Application, the Applicant certifies that he or his consultants have read and understand the pertinent ordinances of the Town of Keenesburg and will prepare application materials consistent with them.

Applicant signature:  Richard I. Robertson Date: 3-19-19

Applicant signature:  Heidi D. Robertson Date: 3-19-19

Applicant signature:  Aaron L. Kaiser Date: 3-19-19

Applicant signature:  Lori J. Kaiser Date: 3-19-19





## Sustainable Traffic Solutions

Joseph L. Henderson PE, PTOE  
Traffic Engineer / Principal

July 8, 2019

Mr. Chadwin F. Cox, PE  
Western Engineering Consultants  
127 South Denver Avenue  
Fort Lupton, CO 80735

RE: Trip Generation Estimate for the Robertson-Kaiser Annexation Near Keenesburg

Dear Chad,

This letter contains a trip generation estimate for the Robertson-Kaiser Annexation industrial development that is proposed on the north side of WCR 398 near Keenesburg. Seven industrial lots are proposed to each include a building with a shop and offices. Figure 1 contains a vicinity map that shows the location of the project on the north side of WCR 398. A site plan is contained in Figure 2 that shows the site access on WCR 398 and the configuration of the lots.

The trip generation for the industrial buildings was estimated using rates that are contained in the Institute of Transportation Engineers (ITE) Trip Generation<sup>1</sup> manual. The development is expected to generate approximately 214 trips on an average weekday, 30 trips during the morning peak hour, and 27 trips during the evening peak hour (see Table 1).

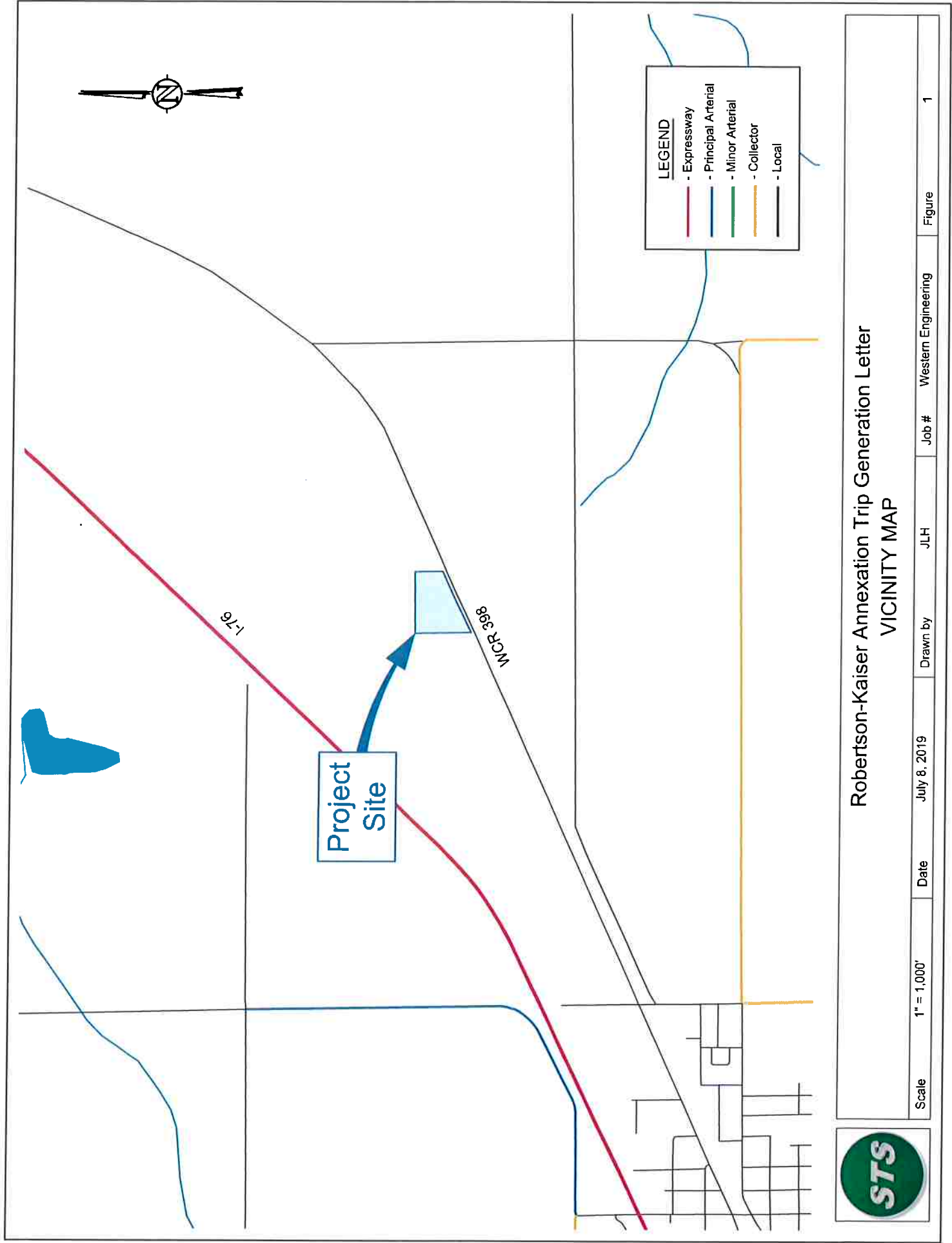
Feel free to contact me to discuss the contents of this report.

Sincerely,

Joseph L. Henderson, PE, PTOE  
Project Manager / Principal  
RK Annexation Trip Generation Letter

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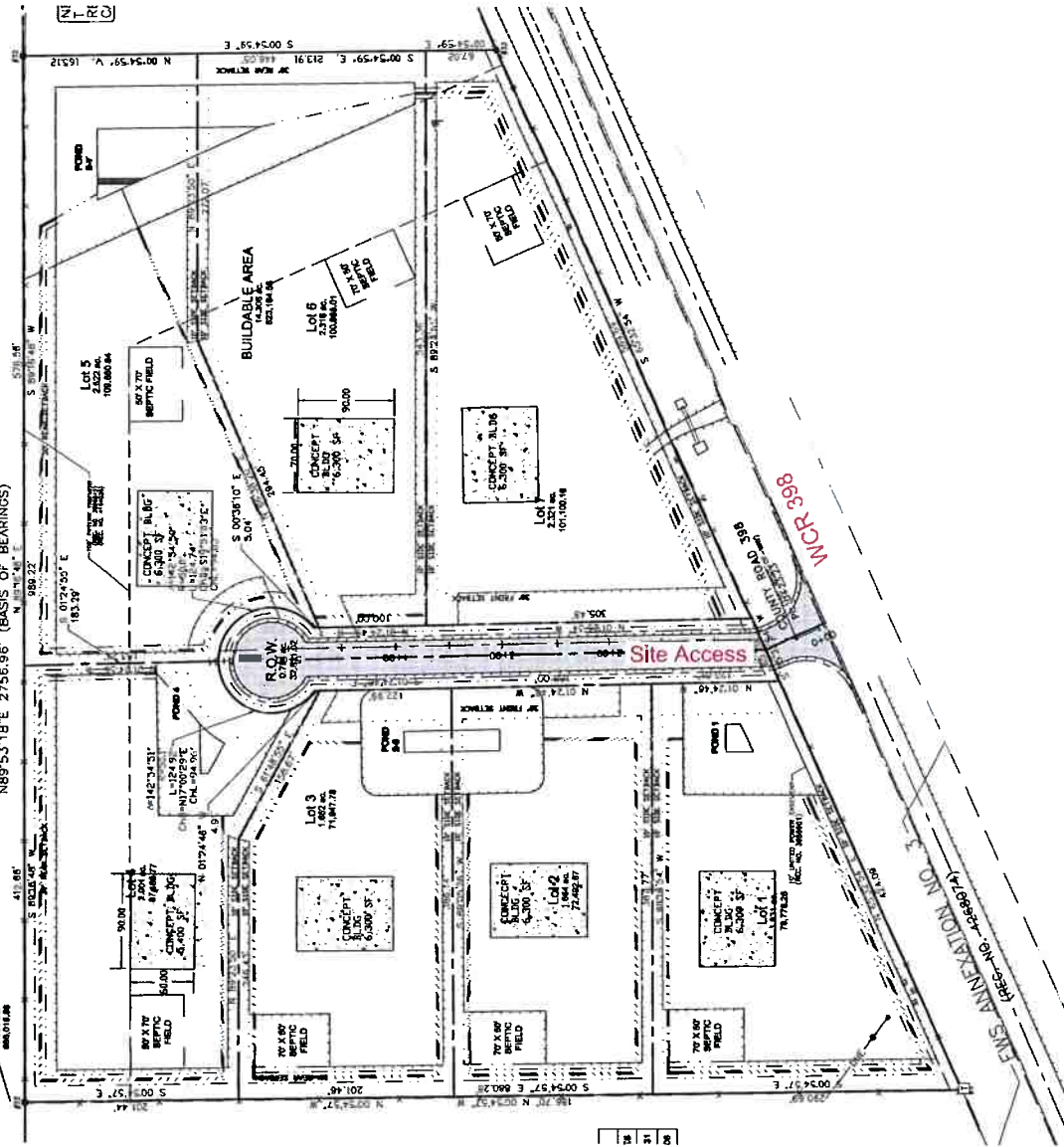
<sup>1</sup> Trip Generation, 10<sup>th</sup> Edition. Institute of Transportation Engineers. September 2017.





PARCEL NO. 130319000003  
GARY DOUGLAS MYERS (1/2 INT)  
ARTHUR W. BERGLUND  
ROBERT KENT BERGLUND  
ARUN M. TUDOR  
JANET B. WARD  
Acres (Calculated) 302.0659  
Legal 7233 THAT PT N2/SE4 19 2 63 LYING N & W OF RR R/W  
N89°53'18"E 2756.96' (BASIS OF BEARINGS)

C. 19,  
10 3/4"  
LUMINUM



# Robertson-Kaiser Annexation Trip Generation Letter SITE PLAN

Scale	NTS	Date	July 8, 2019	Drawn by	JLH	Job #	Western Engineering	Figure	2
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**Table 1. Trip Generation Estimate**

Land Use <sup>2</sup>	ITE Code <sup>1</sup>	Size	Unit	Average Daily Trips				Morning Peak Hour Trips				Evening Peak Hour Trips			
				Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
General Light Industrial - Building <sub>1</sub>	110	6.3	1,000 ft <sup>2</sup>	4.96	31	16	16	0.70	4	4	1	0.63	4	1	3
General Light Industrial - Building <sub>2</sub>	110	6.3	1,000 ft <sup>2</sup>	4.96	31	16	16	0.70	4	4	1	0.63	4	1	3
General Light Industrial - Building <sub>3</sub>	110	6.3	1,000 ft <sup>2</sup>	4.96	31	16	16	0.70	4	4	1	0.63	4	1	3
General Light Industrial - Building <sub>4</sub>	110	5.4	1,000 ft <sup>2</sup>	4.96	27	13	13	0.70	4	3	0	0.63	3	0	3
General Light Industrial - Building <sub>5</sub>	110	6.3	1,000 ft <sup>2</sup>	4.96	31	16	16	0.70	4	4	1	0.63	4	1	3
General Light Industrial - Building <sub>6</sub>	110	6.3	1,000 ft <sup>2</sup>	4.96	31	16	16	0.70	4	4	1	0.63	4	1	3
General Light Industrial - Building <sub>7</sub>	110	6.3	1,000 ft <sup>2</sup>	4.96	31	16	16	0.70	4	4	1	0.63	4	1	3
Total	---	---	---	--	214	107	107	--	30	27	4	--	27	4	24

Notes:

1. Trip generation estimates are based on rates contained in Trip Generation, 10th Edition (Institute of Transportation Engineers, September 2017).
2. The land use was provided by Western Engineering Consultants.

# **RK SUBDIVISION**

ENGINEERS ESTIMATE - CIVIL RELATED PUBLIC IMPROVEMENTS - FULL CIVIL  
June 3, 2020

ITEM	UNIT	ESTIMATED QUANTITY	APPROXIMATE UNIT PRICE, \$	TOTAL COST, \$
<b>0.00 MOBILIZATION / DEMOLITION</b>				
0.01 Mobilization	ls	1	10,000	10,000
0.02 Sawcut along County Road 398	lf	132	4	528
<b>SUBTOTAL</b>				<b>10,528</b>
<b>1.00 EARTHWORK &amp; ROADWAY / SURFACE MATERIALS</b>				
1.01 Surface to Surface Earthwork Cut and temp stockpile excess	cy	0	1.50	0
1.02 Surface to Surface Earthwork Fill (Assumed 10% shrink)	cy	4,479	3.00	13,437
1.03 Import & Place Structural Fill (Recycled conc. Class 6, or approved equal) - 11" under asphalt paving	cy	686	25	17,154
1.04 Finish surface (asphalt) - RK Drive	sy	2,246	45	101,050
<b>SUBTOTAL</b>				<b>131,641</b>
<b>2.00 EROSION CONTROL</b>				
2.01 Storm Water Management Plan & Site Erosion Control	ls	1	10,000	10,000
<b>SUBTOTAL</b>				<b>10,000</b>
<b>3.00 ELECTRIC SYSTEM</b>				
3.01 Connection to Ex. Electric System	each	1	2,500	2,500
3.02 Electric Transformer	each	1	50,000	50,000
3.03 Electric System	lf	1,202	10	12,020
3.04 Switch Boxes	each	2	1,000	2,000
3.05 Light Poles	each	5	3,000	15,000
<b>SUBTOTAL</b>				<b>81,520</b>
<b>4.00 WATER SYSTEM</b>				
4.01 8" PVC (C900) Watermain w/ restraints for each fitting - RK Drive	lf	540	55	29,700
4.02 8"x8" Restrained Tee w/ Thrust Block, 2-8" Gate Valves, and Solid Sleeve Closure Piece	each	1	4,000	4,000
4.03 8" Restrained Plug w/ Thrust Block	each	1	1,500	1,500
4.04 6" DIP Hydrant Runs - each joint and fitting restrained	lf	48	100	4,800
4.05 Hydrant Tee & G.V. (6" GV on FH run, 8" GV on main)	each	2	2,500	5,000
4.06 Fire Hydrants	each	3	5,000	15,000
4.07 8"x6" Reducer	each	1	150	150
4.08 Service line taps	each	7	250	1,750
<b>SUBTOTAL</b>				<b>61,900</b>



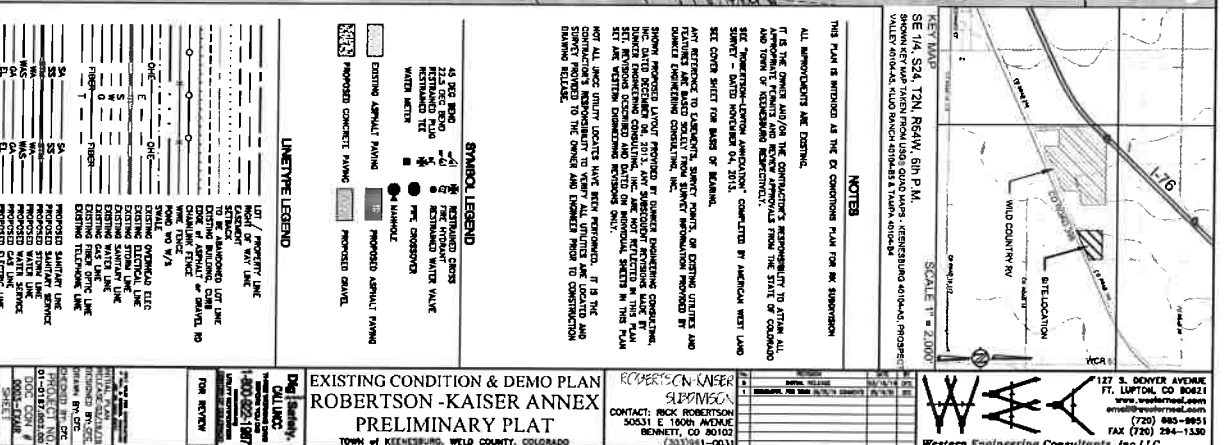
**RK SUBDIVISION****ENGINEERS ESTIMATE - CIVIL RELATED PUBLIC IMPROVEMENTS - FULL CIVIL**

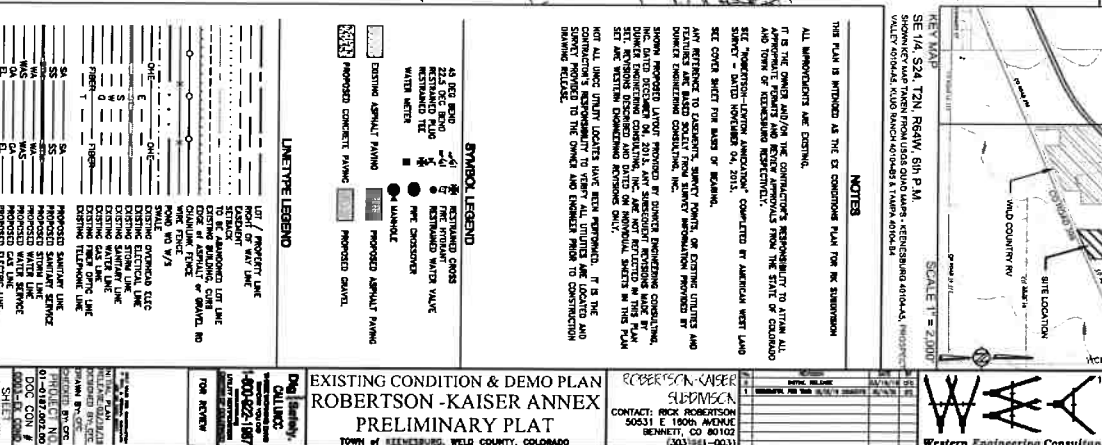
June 3, 2020

ITEM	UNIT	ESTIMATED QUANTITY	APPROXIMATE UNIT PRICE, \$	TOTAL COST, \$
<b>5.00 LANDSCAPE</b>				
5.01 Seed disturbed areas	acre	4.1	1,500	6,150
5.02 Trees (to be done by individual lots)	each	38	0	0
5.03 Shrubs (to be installed by individual lots)	each	38	0	0
5.04 Stop Signs	each	1	1,000	1,000
<b>SUBTOTAL</b>				<b>7,150</b>
<b>PROFESSIONAL SERVICES</b>				
Design Services (assumed as 10% of Civil Construction Costs) [PAID]	ls	1		0
Traffic Analysis [PAID]	ls	1		0
Construction Surveying	ls	1	7,500	7,500
Construction Engineering Services	ls	1	5,000	5,000
As-Built Engineering Services	ls	1	7,500	6,000
<b>SUBTOTAL</b>				<b>18,500</b>
<b>TOTAL ESTIMATED COST</b>			(rounded)	<b>313,000</b>
<b>CONTINGENCY</b>			(10%)	<b>31,300</b>
<b>GRAND TOTAL ESTIMATED COST</b>			(rounded)	<b>344,000</b>











NW COR. SW 1/4, SEC. 19  
T 2 N. R 63 W. FOUND 3/4"  
REBAR WITH 3 1/4" ALUMINUM  
CAP. PLS 23027.

Legal 7233 THAT PT N2/SE4 19 2 63 LYING N & W OF RR R/W  
N89°53'18"E 2756.96' (BASIS OF BEARINGS)  
417.00'

PARCEL NO. 130319000003  
GARY DOUGLAS MYERS (1/2 INT)  
ARTHUR W. BERGLUND  
ROBERT KENT BERGLUND REVOCABLE TRUST  
ARITA M. TUDOR

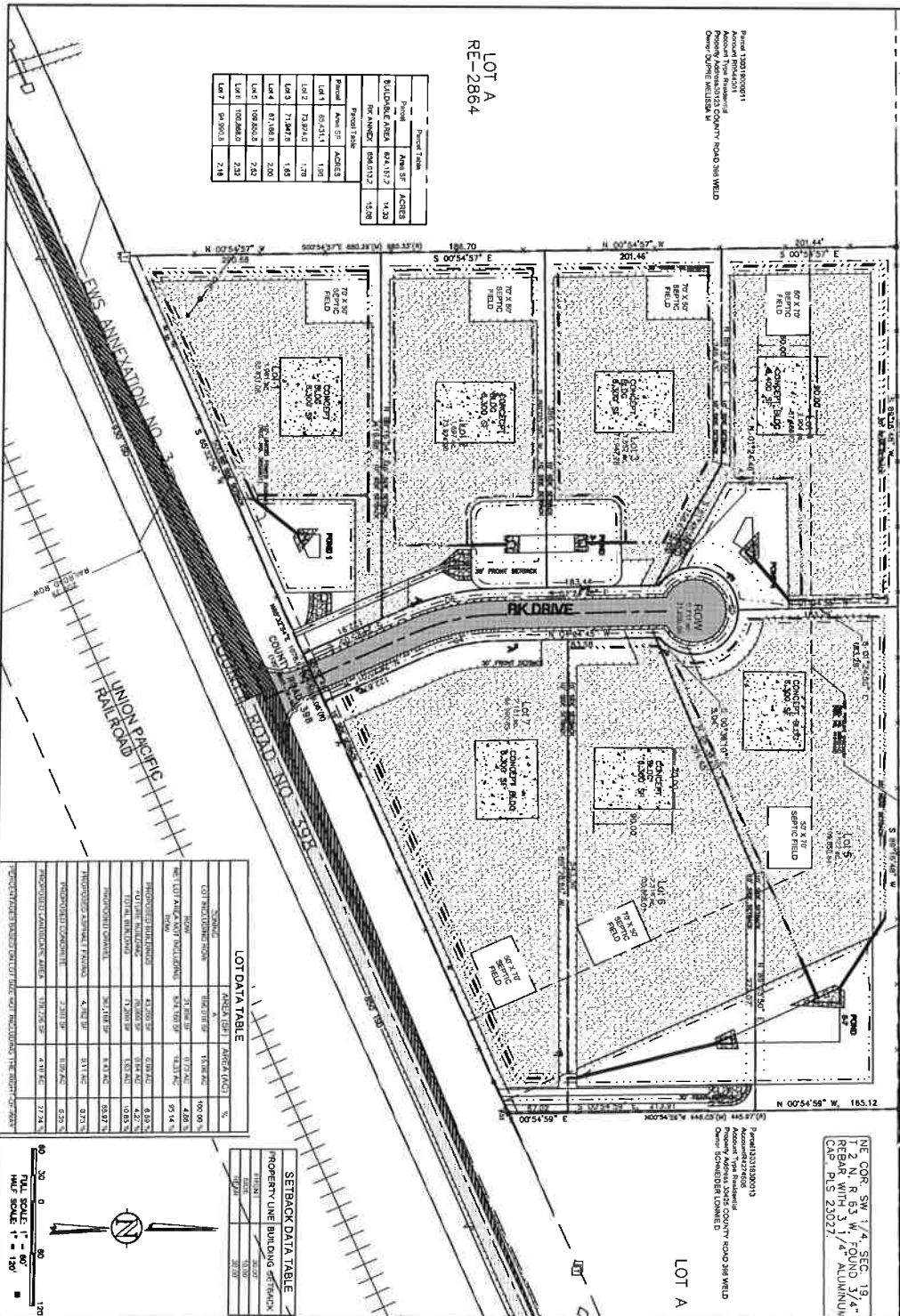
INTERSECTION SIGHT TRIANGLES SHOWN  
PER AASHTO FIGURE 9-15, CASES B1 & B2.  
DESIGN SPEED = 55 MPH (POSTED SPEED =  
45 MPH), USING COMBINATION TRUCK.  
LEFT TURN ISD = 930'. RIGHT TURN ISD = 850'.

Project Team		
Parcel	ACRES	
BUILDING AREA	824.16172	14.30
FOR ANNEX	696.01372	15.06

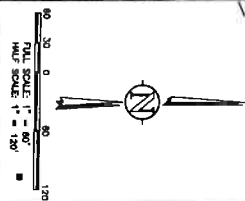
Parcel Table		
Parcel	Area S/F	ACRES
Lot 1	49,313.4	1.09
Lot 2	73,924.0	1.70
Lot 3	71,947.8	1.63
Lot 4	67,166.8	2.00
Lot 5	109,826.8	2.50
Lot 6	100,886.0	2.33
Lot 7	94,900.3	2.16

LOT A  
RE-2864



### LOT DATA TABLE

SETBACK DATA TABLE	
PROPERTY LINE	BUILDING SETBACK
FRONT	30.00'
REAR	10.00'
SIDE	20.00'



SE 1/4, S24, T3N, R64W, 6th P.M.,  
SHOWN HERE AND TAKEN FROM USGS QUAD MAPS - REGENSBURG 40104-4, MHC0411  
VALLEY 40104-5, KUAD 06040-1, 0104-11, & TADORA, 40104-14

[illegible]

**SYMBOL LEGEND**

- 16 FOOT IRON
- 22.1 CC BOLD
- REINFORCED PLUG
- REINFORCED TIE
- WATER METER
- EXISTING ASPHALT PAVING
- IMPROVED ASPHALT PAVING

LINE TYPE LEGEND	
---	LET / PROPERTY LINE
---	BOUND OF NAT. LAND
---	STRAIGHT
---	TO BE REMOVED DUE LINE
---	DEED OF ABUTMENT / CANTON, NO
---	LINE, FENCE
---	ROAD NO. 1/2
---	CRIMING OVERLAND DUE
---	CRIMING OVERLAND DUE
---	CRIMING STRONG LINE
---	CRIMING WATER LINE
---	CRIMING DUE LINE
---	CRIMING TULSAHORE LINE
---	PROPOSED SHANTALY LINE
---	PROPOSED SHANTALY SERVICE
---	PROPOSED WATER LINE
---	PROPOSED DUE LINE
---	PROPOSED DUE LINE
---	PROPOSED ELECTRIC LINE

SITE PLAN  
ROBERTSON -KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KETNESBURG, WELD COUNTY, COLORADO

ROBERTSON-KINER  
SUBDIVISION  
CONTACT: RICK ROBERTSON  
50531 E 160th AVENUE  
BENNETT, CO 80102  
781/331-0031

**WESTERN** 127 S. DENVER AVENUE  
FT. Lupton, CO 80621  
www.westernmail.com  
email@westernmail.com  
(720) 885-9951  
FAX (720) 294-1330

NW COR. SW 1/4, SEC. 19,  
T2N, R63W, FOUND 3/4"  
REBAR WITH 3/4" ALUMINUM  
CAP, PLS 20027.

ROBERT KENT BERGLUND, NEGOTIABLE TRUST  
JANET B. WARDEN  
Acres (Calculated) 302.0659  
Legal 7233 THAT PT 1/2 SEC 19 2 63 LING N & W OF RR R/W  
N 93° 53' 18" E 2756.96' (BASIS OF BEARINGS)

LUMINAIRE SCHEDULE				
SYMBOL	QTY	LABEL	LUM. WANTS	LF
6	1	16.5	16.5	1000
10	1	10.0	10.0	1000

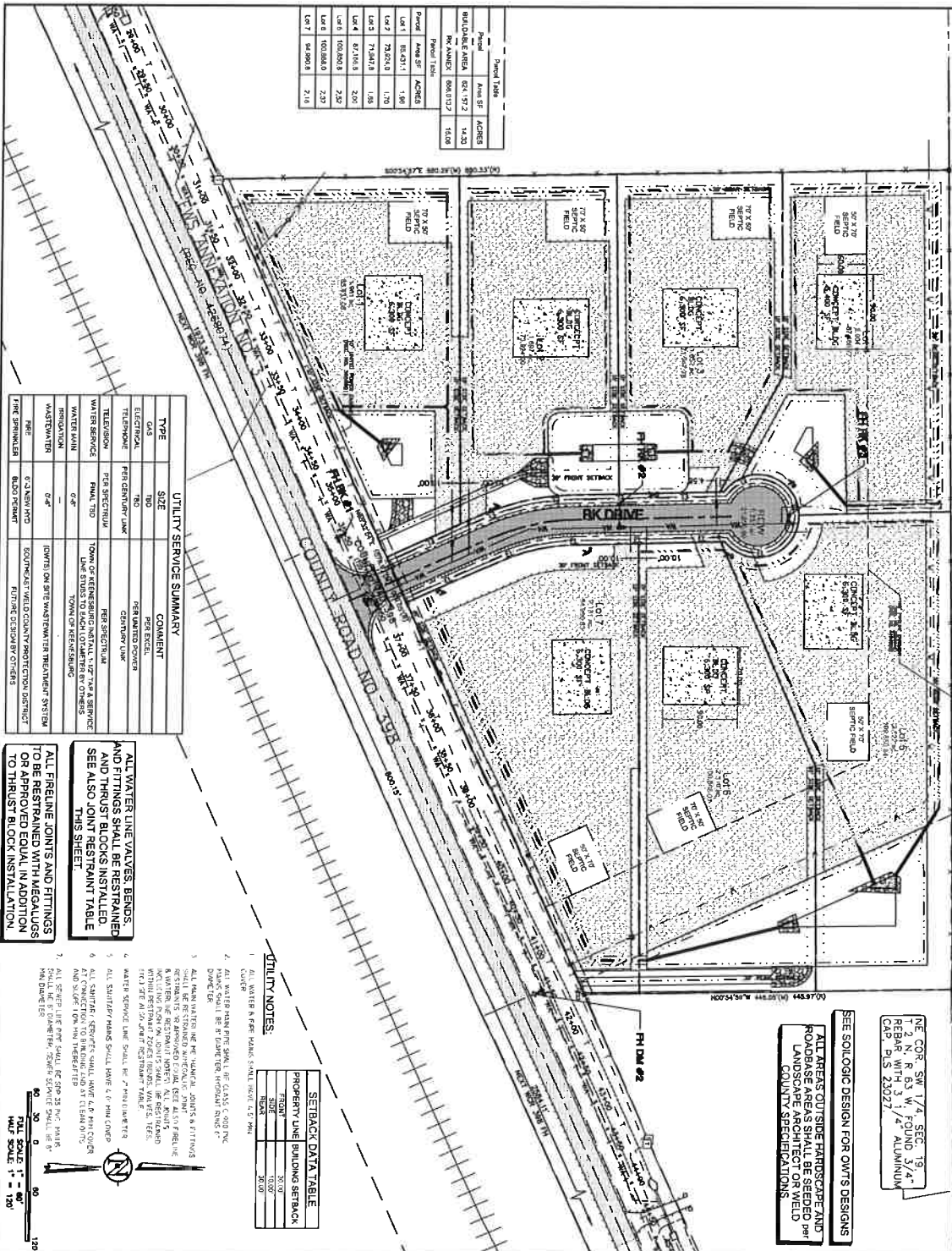
NW COR. SW 1/4, SEC. 19,  
T2N, R63W, FOUND 3/4"  
REBAR WITH 3/4" ALUMINUM  
CAP, PLS 20027.

SEE SOLOGIC DESIGN FOR DOWNS DESIGNS  
ALL AREAS OUTSIDE HARDSCAPE AND  
ROADBASE AREAS SHALL BE SEEDED PER  
LANDSCAPE ARCHITECT OR WEED  
COUNTY SPECIFICATIONS.

NOTES  
THIS PLAN IS INTENDED AS THE UTILITY PLAN FOR THE SUBDIVISION.  
ALL IMPROVEMENTS ARE EXISTING.  
IF IN THE OWNER'S POSSESSION, THE CONTRACTOR'S RESPONSIBILITY TO ATTEMPT ALL  
AND TOWN OF KEECHESBURG, COLORADO.  
SET: "KEECHESBURG-LANTANA ANNEX" COMPLETED BY JAMES WEST LAND  
SURVEY - DATED NOVEMBER 04, 2011.  
SET: OWNER SHEET FOR BASIS OF RECORD.  
ANY REQUESTS TO EXISTING SURVEY POINTS, OR EXISTING UTILITIES AND  
FEATURES ARE BASED SOLELY FROM SURVEY INFORMATION PROVIDED BY  
OWNER ENGINEERING CONSULTING, INC.  
SHOWN PROPOSED LAYOUT PROVIDED BY OWNER ENGINEERING CONSULTING,  
OWNER ENGINEERING CONSULTING, INC. ARE NOT REFLECTED IN THIS PLAN  
SET: RESUBMITTING CONSULTING, INC. ARE NOT REFLECTED IN THIS PLAN  
SET: ALL UTILITIES ARE SHOWN IN ACCORDANCE WITH THE PLAN  
SET: THE CONTRACTOR'S RESPONSIBILITY TO ATTEMPT ALL  
AND TOWN OF KEECHESBURG, COLORADO.  
SET: OWNER SHEET FOR BASIS OF RECORD.

Western Engineering Consultants, Inc. LLC  
127 S. DODD AVENUE  
FT. LUTHER, CO. 80621  
www.westerneng.com  
(720) 885-8851  
FAX (720) 754-1330

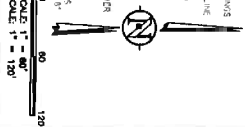
Parcel Table	
Parcel	Area SF
BUILDING AREA	54,172
PAVING AREA	15,038
PAVING TOTAL	69,210
Parcel	Area SF
Lot 1	10,231
Lot 2	10,231
Lot 3	10,231
Lot 4	10,231
Lot 5	10,231
Lot 6	10,231
Lot 7	10,231
Lot 8	10,231
Lot 9	10,231
Lot 10	10,231



UTILITY NOTES:

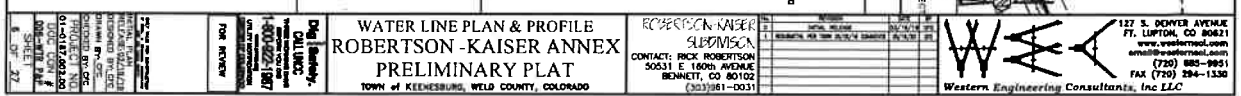
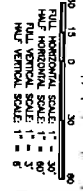
1. ALL WATER & SEWER MAINS SHALL BE CLASS C-900 PIPE.
2. ALL WATER MAINS SHALL BE CLASS C-900 PIPE.
3. ALL SEWER MAINS SHALL BE CLASS C-900 PIPE.
4. ALL GAS MAINS SHALL BE CLASS C-900 PIPE.
5. ALL ELECTRICAL MAINS SHALL BE CLASS C-900 PIPE.
6. ALL TELEPHONE MAINS SHALL BE CLASS C-900 PIPE.
7. ALL CABLE MAINS SHALL BE CLASS C-900 PIPE.
8. ALL FIBER MAINS SHALL BE CLASS C-900 PIPE.
9. ALL OTHER MAINS SHALL BE CLASS C-900 PIPE.
10. ALL UTILITY MAINS SHALL BE CLASS C-900 PIPE.

SETBACK DATA TABLE	
PROPERTY LINE	BUILDING SETBACK
FRONT	10.00'
REAR	10.00'
SIDE	10.00'



LINETYPE LEGEND	
---	UTILITY SERVICE LINE
---	WATER MAIN
---	SEWER MAIN
---	GAS MAIN
---	ELECTRIC MAIN
---	TELEPHONE MAIN
---	CABLE MAIN
---	FIBER MAIN
---	OTHER MAIN
---	UTILITY SERVICE LINE
---	WATER MAIN
---	SEWER MAIN
---	GAS MAIN
---	ELECTRIC MAIN
---	TELEPHONE MAIN
---	CABLE MAIN
---	FIBER MAIN
---	OTHER MAIN

SYMBOL LEGEND	
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY
---	EXISTING UTILITY
---	PROPOSED UTILITY



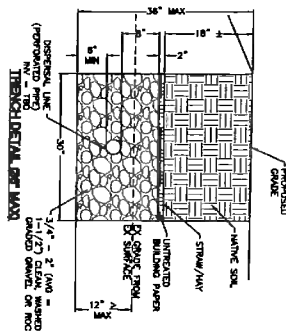
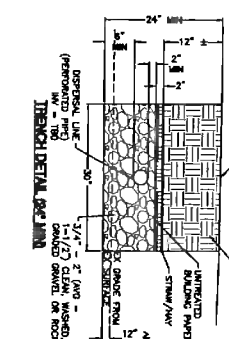




## ARTICLE XIII - Operation and Maintenance

## Sec. 30-13-20 - Service label.

- [illegible]

[illegible]

FOR REVIEW

SEPTIC PLAN  
ROBERTSON-KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KEENESBURG, WELD COUNTY, COLORADO

ROBERTSON-KAISER  
SUBMISSION  
CONTACT: RICK ROBERTSON  
50531 E 160th AVENUE  
DENNETT, CO 80102  
(303) 881-0031



127 S. DENYER AVENUE  
FT. LUTPON, CO 80821  
www.westernel.com  
email@westernel.com  
(720) 985-9951  
FAX (720) 294-1330

**Western Engineering Consultants, Inc. LLC**

W COR. SW 1/4, SEC. 19,  
2 N., R 63 W., FOUND 3/4"  
BAR WITH 3 1/4" ALUMINUM  
PLS 23027.

Legal 7233 THAT PT N2/SE4 19 2 63 LYING N & W OF RR R/W  
N89°53'18"E 2756.96' (BASIS OF BEARINGS)

PARCEL NO. 13031900003  
GARY DOUGLAS MYERS (1/2 INT)  
ARTHUR W. BERGLUND  
ROBERT KENT BERGLUND REVOCABLE TRUST  
ARNITA M. TUDOR

Acres (Calculated) 302.0655  
PT N2/SE4 19 2 63 LYING N  
N89°53'18"E 2756.96' (BASIS)

W OF RR R/W  
OF BEARINGS)

NE COR. SW 1/4, SEC 19,  
T 2 N., R 63 W., FOUND 3/4"  
REBAR WITH 3 1/4" ALUMINUM  
CAP. PLS 23027.

[illegible]

No one migration, foundation excavation, or buried utility airport, has been included in this table. Not all landscape hardcape areas have been accounted for in this table.

5/20/2020 Revision:



SE 1/4, S24, T2N, R64W, 6th P.M.  
SHOWN KEY MAP TAKEN FROM USGS QUAD MAPS - KEENESBURG 4010-A5, PROSPE  
VALLEY 4010-A5, KLUO RANCH 4010-B5 & TAMPA 4010-B4

THIS PLAN IS INTENDED AS THE HOUSE GRADING PLAN FOR THE SUPERVISION

ALL INFORMATION IS UNCLASSIFIED

ATTORNEYS, PERSONS AND REVIEW APPROVALS FROM THE STATE OF COLORADO  
AND TOWN OF KIDDERMAN RESPECTIVELY.

**SURVEY - DATED NOVEMBER 04, 2013.**

ANY REFERENCE TO EXISTENTS, SURVEY POINTS, OR EXISTING UTILITIES AND FEATURES ARE BASED SOLELY FROM SURVEY INFORMATION PROVIDED BY DUNKER ENGINEERING CONSULTING, INC.

NOT ALL UTILITY LOCATIONS HAVE BEEN PERFORMED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES ARE LOCATED AND SHOWN PRIOR TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION DRAWING RELEASE.

### SYMBOL LEGEND

-  PROPOSED ASPHALT PAVING  
 PROPOSED CONCRETE PAVING  
 PROPOSED DRIVEWAY  
 PROPOSED ASPHALT PAVING  
 PROPOSED CONCRETE PAVING  
 PROPOSED DRIVEWAY  
 PROPOSED ASPHALT PAVING  
 PROPOSED CONCRETE PAVING  
 PROPOSED DRIVEWAY  
 PROPOSED ASPHALT PAVING  
 PROPOSED CONCRETE PAVING  
 PROPOSED DRIVEWAY  
 PROPOSED ASPHALT PAVING  
 PROPOSED CONCRETE PAVING  
 PROPOSED DRIVEWAY  
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 PROPOSED CONCRETE PAVING  
 PROPOSED DRIVEWAY

### LINE TYPE LEGEND

- [illegible]

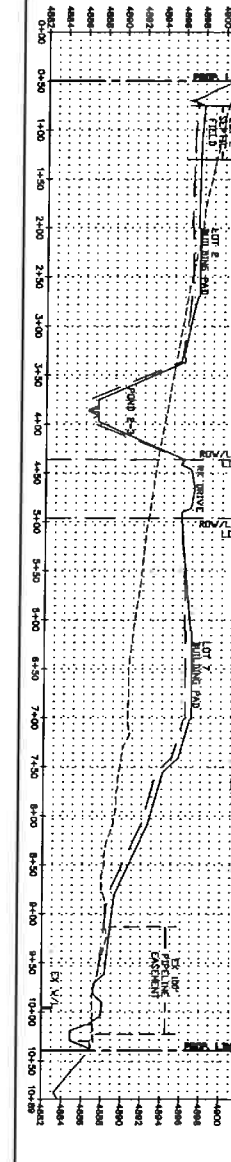
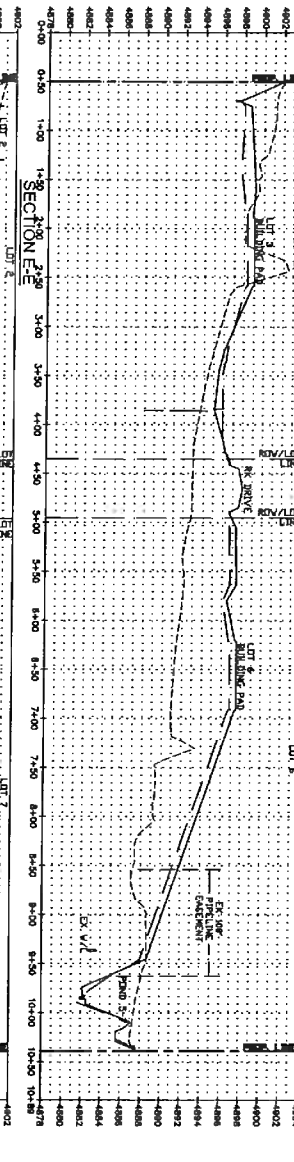
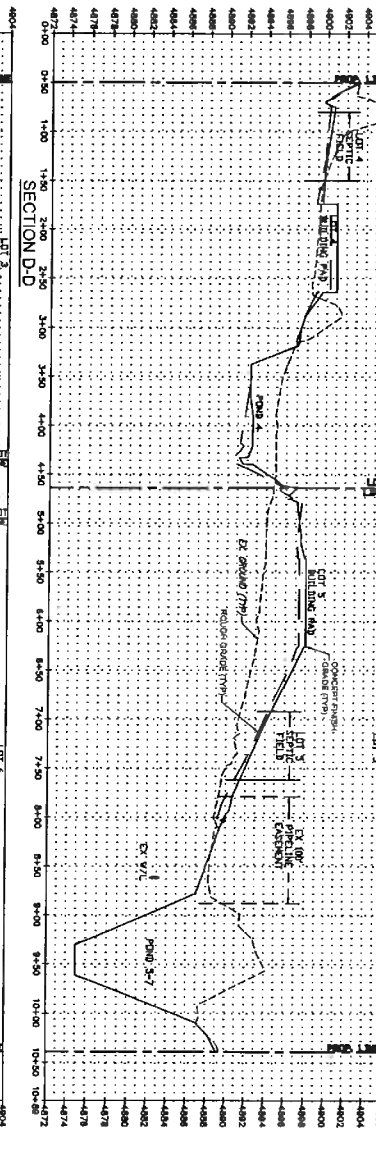
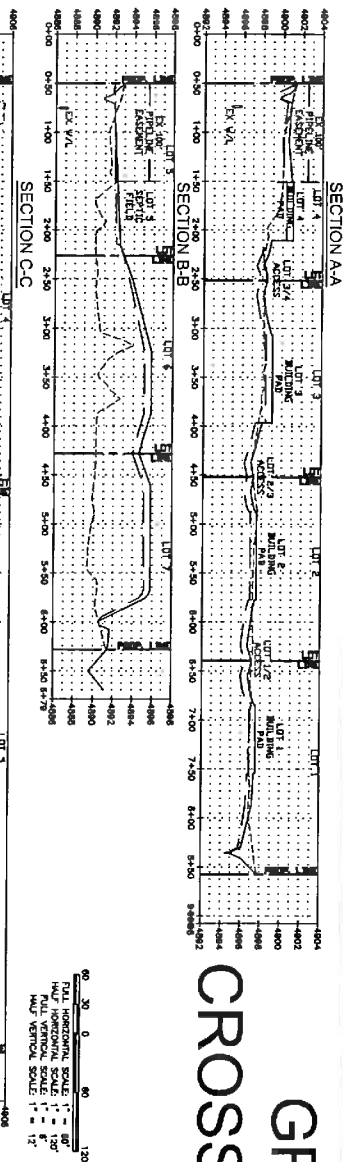
ROUGH GRADING PLAN  
ROBERTSON -KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KEENESBURG, WELD COUNTY, COLORADO

ROBERTSON-KAISER  
SUBMISSION  
CONTACT: RICK ROBERTSON  
50531 E 160th AVENUE  
BENNETT, CO 80102  
(303)861-0031

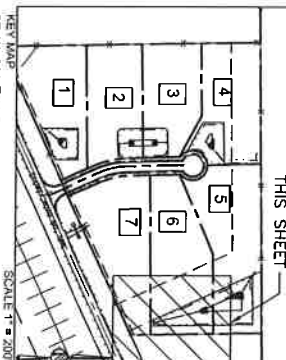
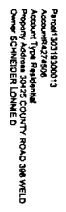
**Western Engineering Consultants, Inc. LLC**  
127 S. DENVER AVENUE  
FT. LUTON, CO 80621  
www.westernel.com  
email@westernel.com  
(720) 683-9951  
FAX (720) 294-1330



# GRADING CROSS-SECTIONS



60 30 0 30 60  
FULL HORIZONTAL SCALE: 1" = 30'  
HALF HORIZONTAL SCALE: 1" = 15'  
VERTICAL SCALE: 1" = 10'



## NOTES

THIS PLAN IS INTENDED AS THE FINAL GRADING PLAN FOR THE SUBDIVISION

ALL IMPROVEMENTS ARE DISTING.

IT IS THE ORDER AND/OR THE CONTRACTOR'S RESPONSIBILITY TO ATTAIN ALL APPROPRIATE PERMITS AND REVIEW APPROVALS FROM THE STATE OF COLORADO AND TOWN OF KEENESEBUNG RESPECTIVELY.

SIC "ROBERTSON-LEWTON ANTI-DUMPING" COMPLETED BY AMERICAN WEST LAND SURVEY - DATED NOVEMBER 04, 2013.

SIC COVER SHEET FOR BASES OF MEASURING.

ANY REFERENCE TO CANDIDATE, SURVEY POINT, OR EXISTING UTILITIES AND FEATURES ARE BASED SOLELY FROM SURVEY INFORMATION PROVIDED BY DUNCAN ENGINEERING CONSULTING, INC.


BROWN ENGINEERS LIMITED PROVIDED BY DUNCAN ENGINEERING CONSULTING, INC. DATED DECEMBER 10, 2013. ANY SURVEYING RECORDS MADE BY DUNCAN ENGINEERING CONSULTING, INC. ARE NOT REFLECTED IN THIS PLAN SET. RECORDS DISCLOSED AND DATED ON INDIVIDUAL SHEETS IN THIS PLAN SET ARE NOT NECESSARILY CONCERNING RECORDS ONLY.

NOT ALL LAND UNDER LOCATIONS HAVE BEEN PERMITTED. IT IS THE CONSTRUCTION'S RESPONSIBILITY TO VERIFY ALL UTILITIES ARE LOCATED AND SURVEY PROVIDED TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION DURING RELEASE.

[illegible][illegible]

OVERFLOW GRADING DETAILS  
ROBERTSON - KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KREMESBURG, WELD COUNTY, COLORADO

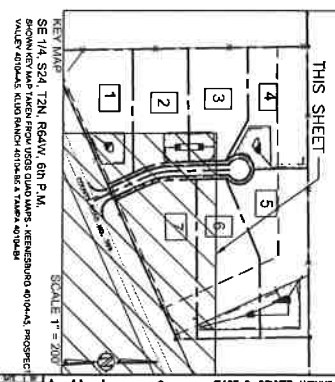
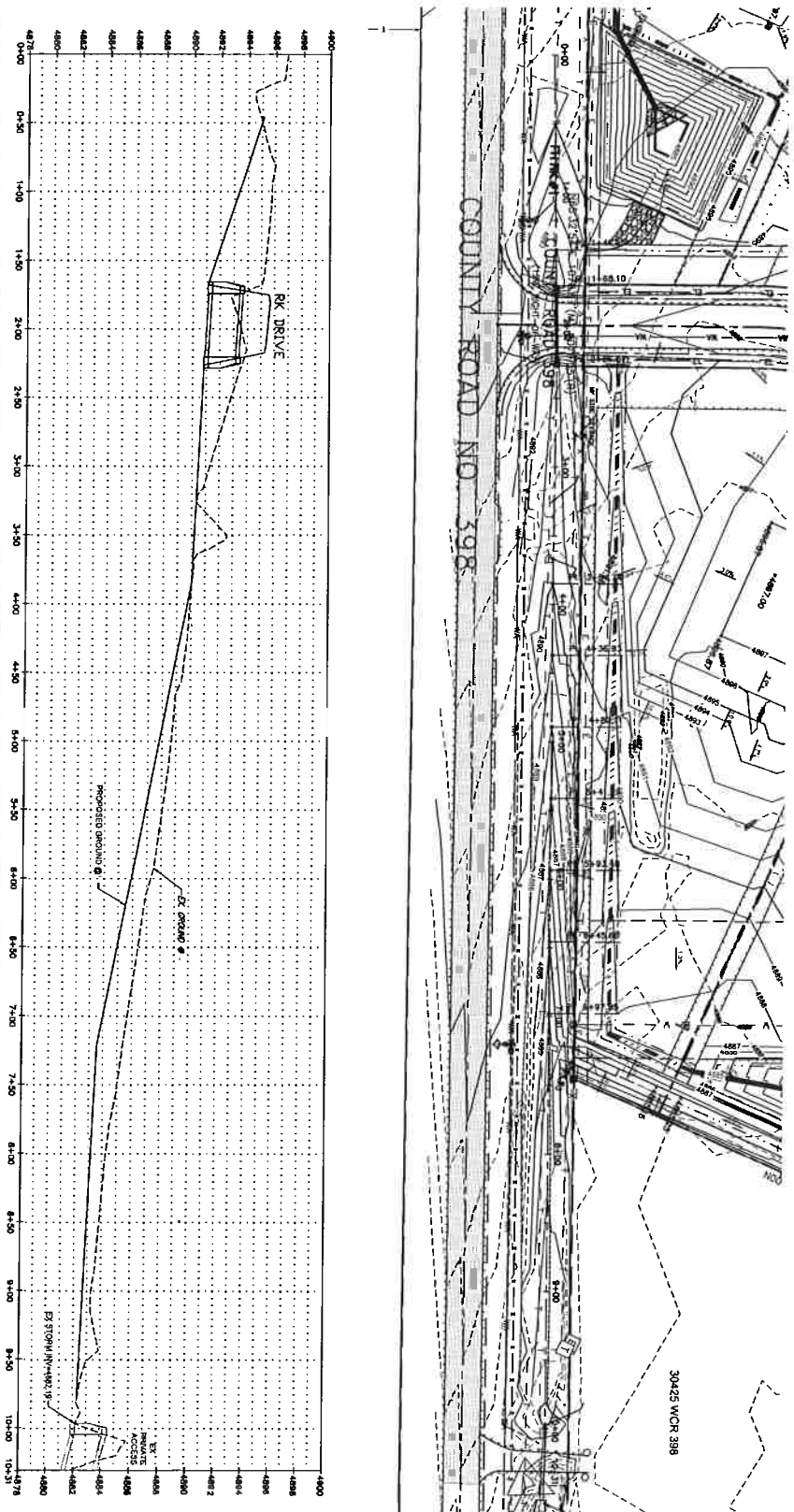
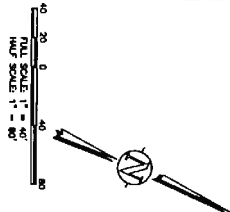
ROBERTSON-KAISER  
SUBDIVISION  
CONTACT: RICK ROBERTSON  
50531 E 180th AVENUE  
BENNETT, CO 80102  
(303) 381-0033



127 S. DENVER AVENUE  
FT. LUPTON, CO 80621  
www.westerneng.com  
email@westerneng.com  
(720) 885-9951  
FAX (720) 294-1530

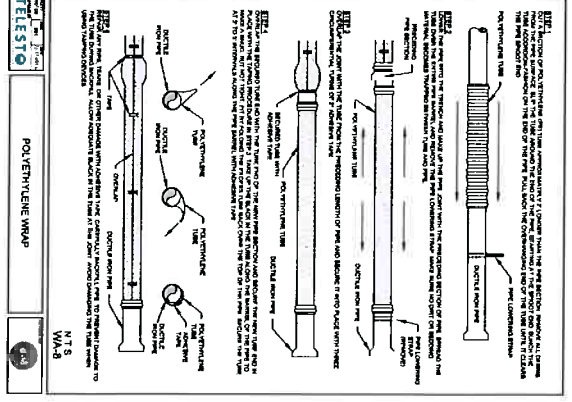
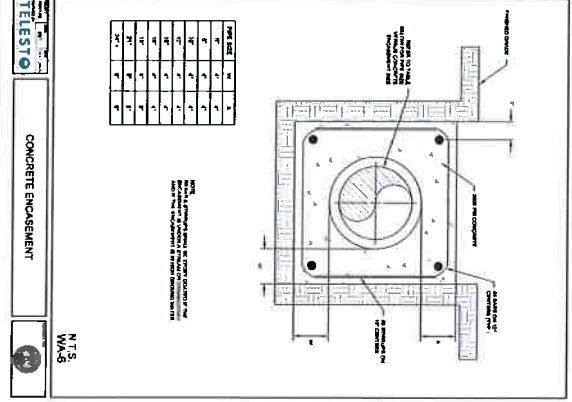
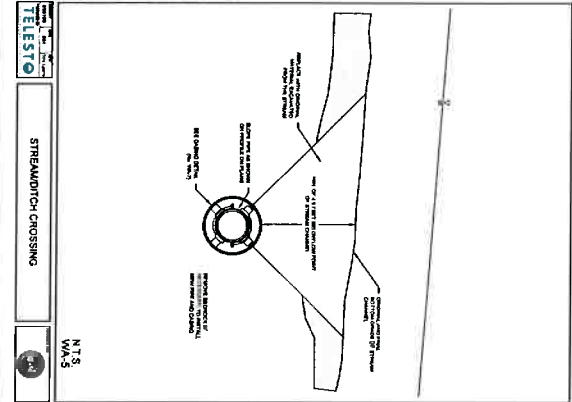
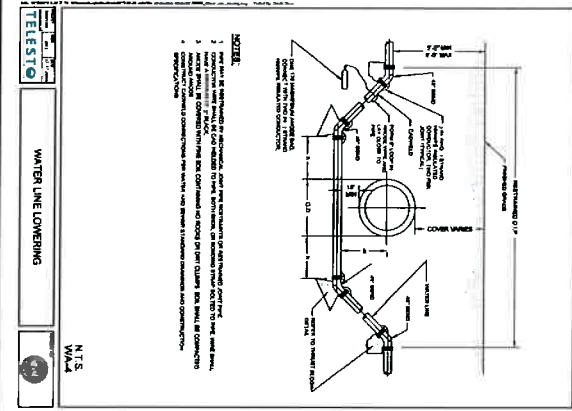
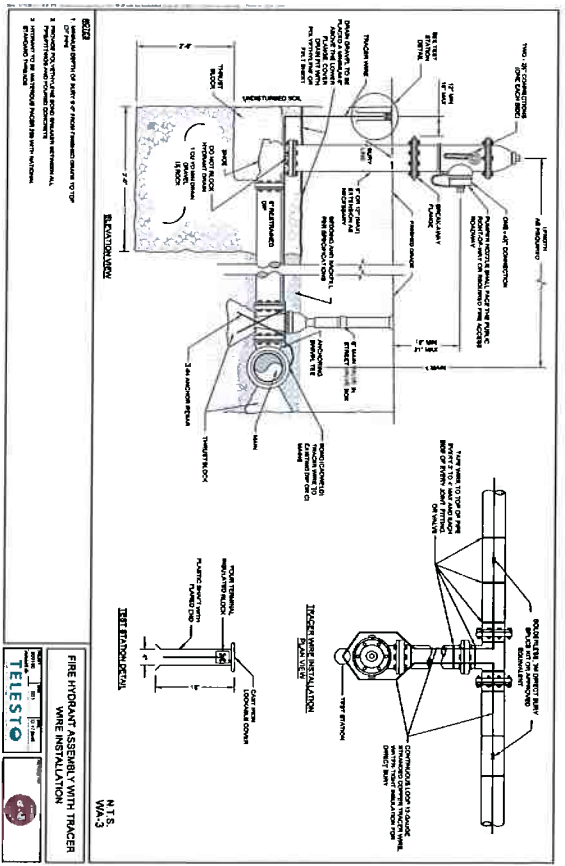
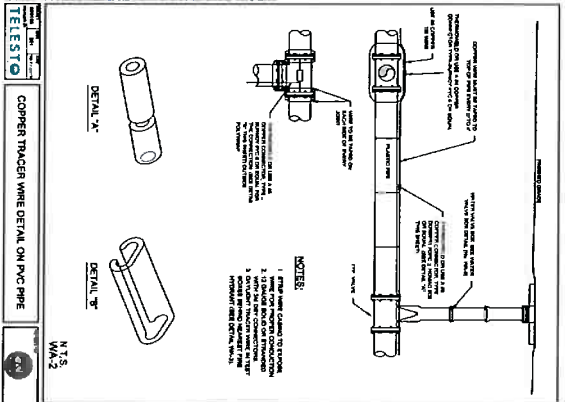
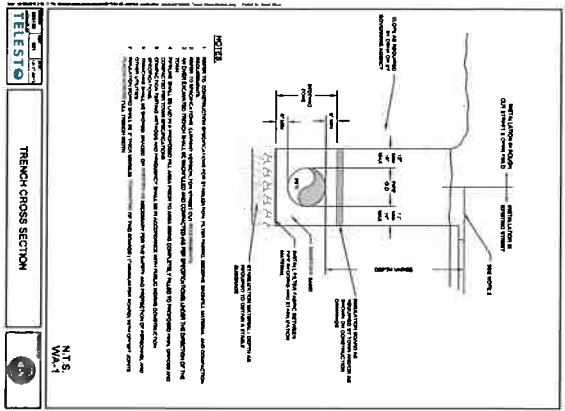
Western Engineering Consultants, Inc. LLC



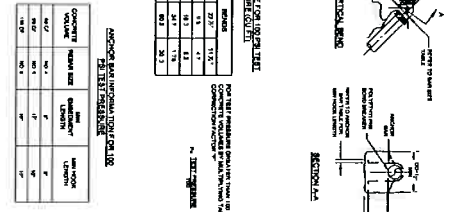
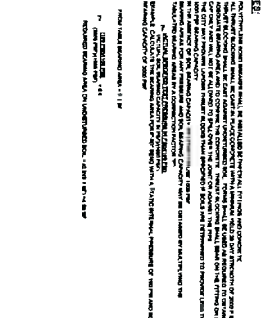




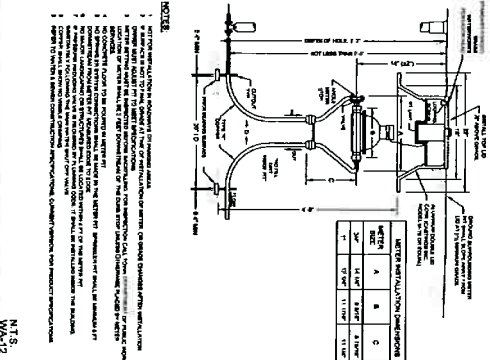




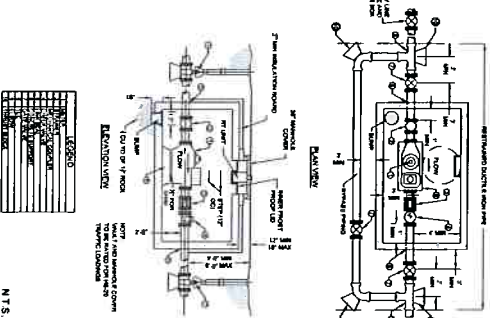



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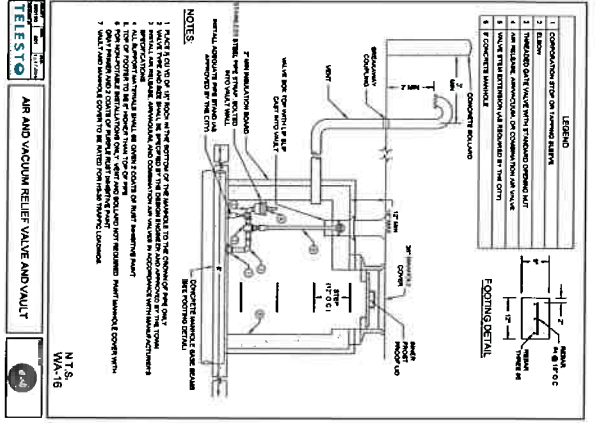
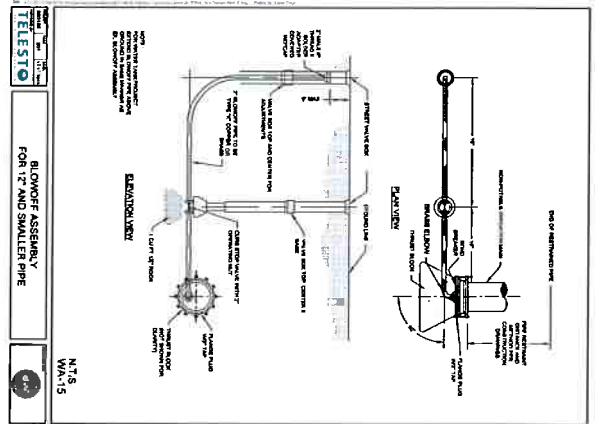
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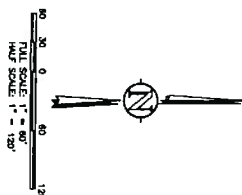


10



--	--





**FOR REVIEW**

**City of Lafayette**  
**CALL UNCS**  
 700-400-222-186  
 01-013-000-000

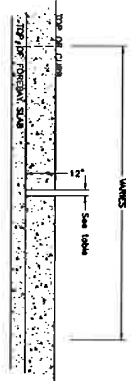
**HISTORIC DRAINAGE PLAN**  
**ROBERTSON-KAISER ANNEX**  
**PRELIMINARY PLAT**

**ROBERTSON-KAISER**  
**SUBMISC'S**  
 CONTRACT: ROCK ROBERTSON  
 50535 E 180th AVENUE  
 BENNETT, CO 80102

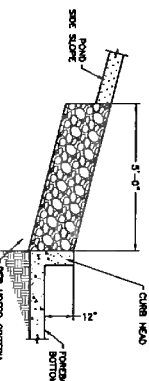
127 S. DOWNEY AVENUE  
 FT. LUDLOW, CO 80621  
 www.robertson-kaiser.com  
 robertson@robertson-kaiser.com  
 (720) 983-9951  
 FAX (720) 294-1330



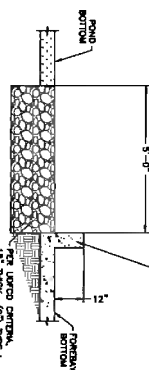




SEE TABLE FOR MATERIALS FROM FOREBAY FOR UNIFORM SOILS  
SOILS SEE STANDARD REPORT APPENDIX FOR OCCURRING  
**TYPICAL FOREBAY WEIR**  
SCALE 1" = 2'



**TYPICAL FOREBAY BANK PROTECTION CROSS SECTION**  
SCALE 1" = 2'

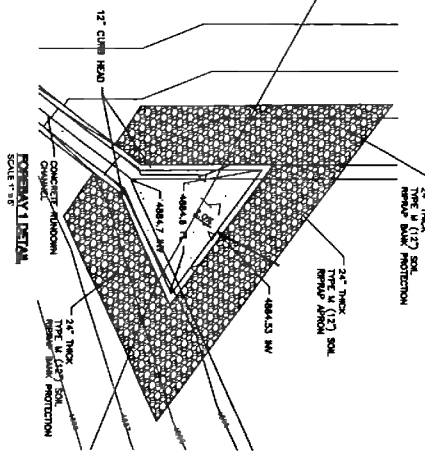


**TYPICAL FOREBAY APRON CROSS SECTION**  
SCALE 1" = 2'

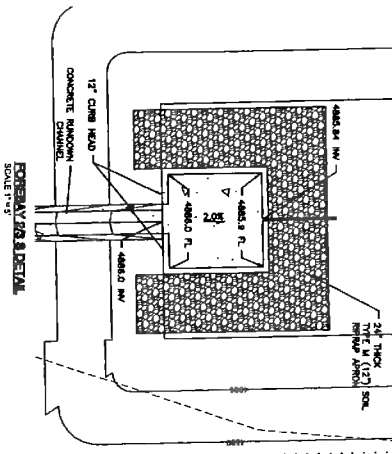


**CONCRETE RUNDOWN CHANNEL**  
SCALE 1" = 2'

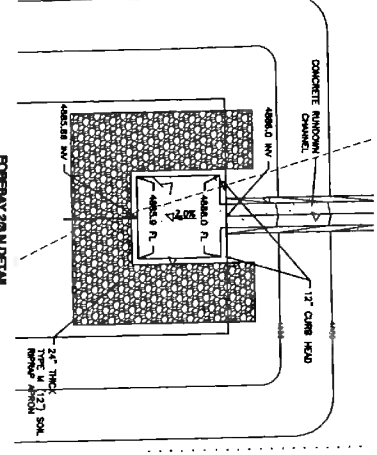
FOREBAY DATA TABLE			
FOREBAY AREA (SF)	BASED RELEASE C (MG)	DESIGN WIDTH (IN)	
1	1.07	5.1	1.1
2	1.07	5.1	1.1
3	1.07	5.1	1.1
4	1.07	5.1	1.1
5	1.07	5.1	1.1
6	1.07	5.1	1.1
7	1.07	5.1	1.1
8	1.07	5.1	1.1
9	1.07	5.1	1.1
10	1.07	5.1	1.1



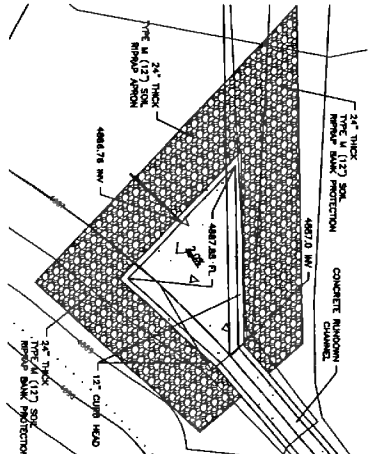
**FOREBAY #1 DETAIL**  
SCALE 1" = 2'



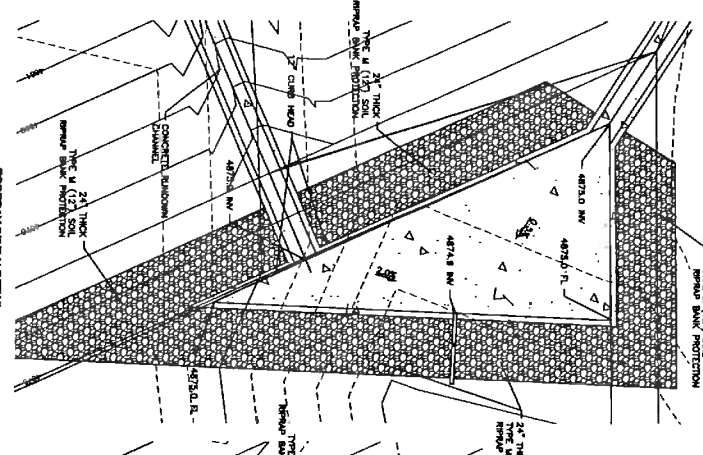
**FOREBAY #2 DETAIL**  
SCALE 1" = 2'



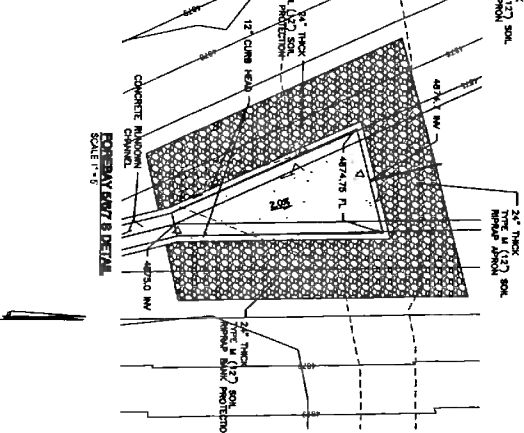
**FOREBAY #3 DETAIL**  
SCALE 1" = 2'



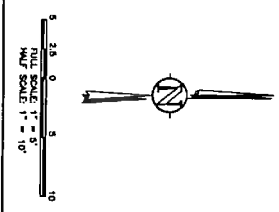
**FOREBAY #4 DETAIL**  
SCALE 1" = 2'



**FOREBAY #5 DETAIL**  
SCALE 1" = 2'



**FOREBAY #6 DETAIL**  
SCALE 1" = 2'





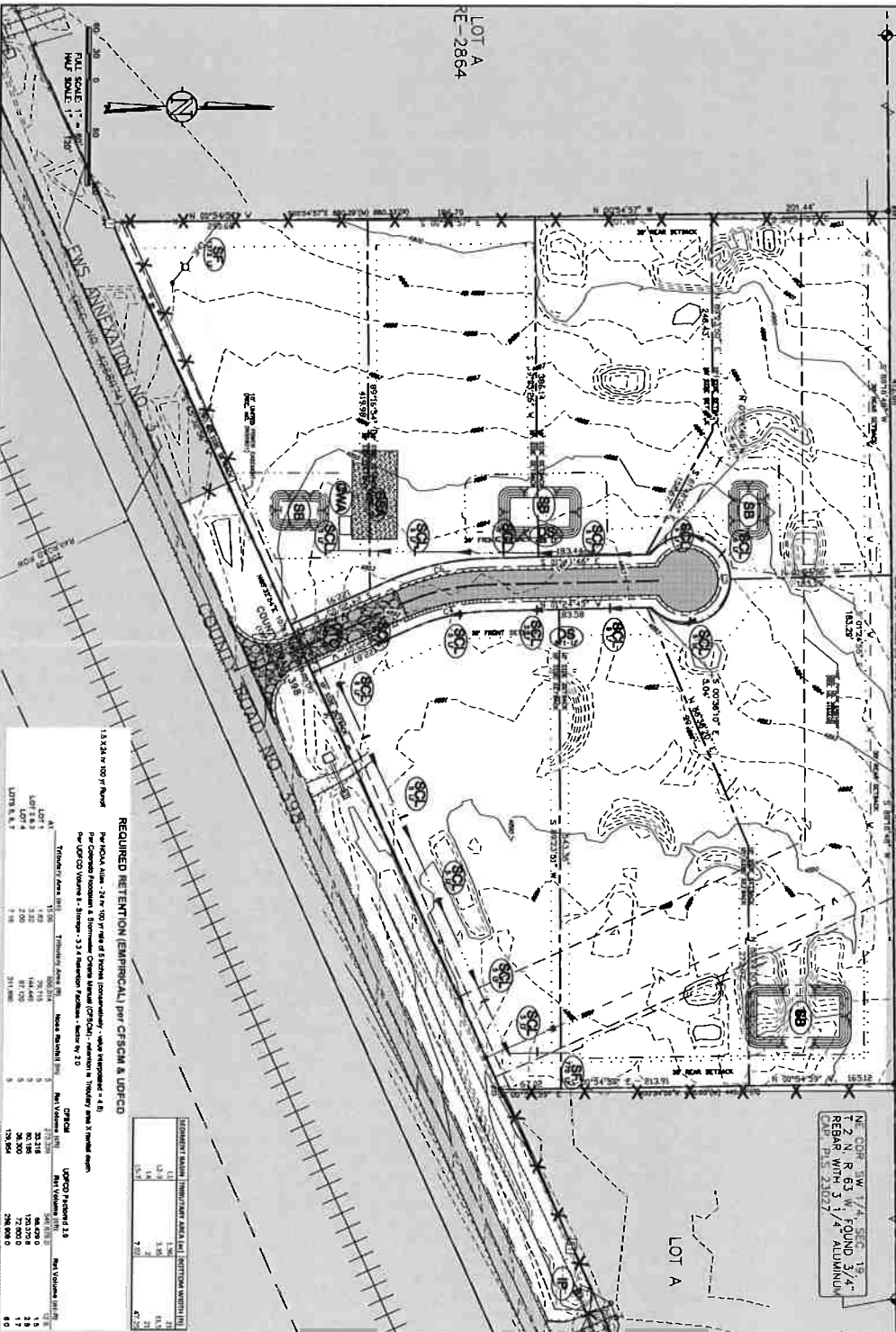


INW COR. SW 1/4, SEC. 19,  
T 2 N., R 63 W., FOUND 3/4"  
REBAR WITH 3 1/4" ALUMINUM  
CAP. P. 5 23027.

AGRES (CALCULATED) 502.0658  
LOGICAL 7233 THAT PT N2/SE4 19 2 63 LYING N & W OF RR R/W  
N89°53'18"E 2756.96' (BASES OF BEARINGS)

PARCEL NO. 130319000003  
GARY DOUGLAS MYERS (1/2 INT)  
ARTHUR W. BERGLUND  
ROBERT KENT BERGLUND REVOCABLE TRUST  
ARITA M. TUDOR

NE COR SW 1/4 SEC 19  
T 2 N. R 65 W. FOUND 3/4"  
REBAR WITH 3 1/4" ALUMINUM  
CAP. PLS 23027.



1. \$ 5.00 per hour

REQUIRED: REQUIRED (EMPIRICAL) per CFM & UOED

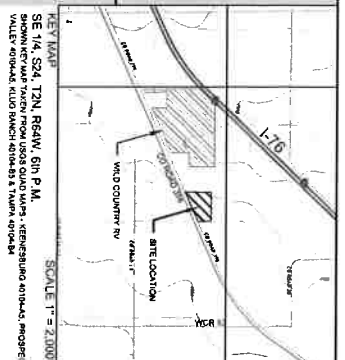
Per NOAA, table 2-7 is 100% ref. of 5 boxes concurrently, use as determined = 4.8

Per Corporate Products Inc. Stormwater Control Systems (SCS) table 2-10

Per CAUCED Volume 1, Storage = 3.2 inches of rainfall, = 2.0

AT	Tri-Nitrate Area (sq ft)	Tri-Nitrate Area (sq ft)	Moist. Retention	Per Volume	CFM	UOED Per Tri-Nitrate 1.0	Per Volume
1	1.62	70.711	1	20.315	64.079	1	1
2	1.62	70.711	1	20.315	64.079	2	2
3	1.62	70.711	1	20.315	64.079	3	3
4	1.62	70.711	1	20.315	64.079	4	4
5	1.62	70.711	1	20.315	64.079	5	5
6	1.62	70.711	1	20.315	64.079	6	6
7	1.62	70.711	1	20.315	64.079	7	7
8	1.62	70.711	1	20.315	64.079	8	8
9	1.62	70.711	1	20.315	64.079	9	9
10	1.62	70.711	1	20.315	64.079	10	10
11	1.62	70.711	1	20.315	64.079	11	11
12	1.62	70.711	1	20.315	64.079	12	12
13	1.62	70.711	1	20.315	64.079	13	13
14	1.62	70.711	1	20.315	64.079	14	14
15	1.62	70.711	1	20.315	64.079	15	15
16	1.62	70.711	1	20.315	64.079	16	16
17	1.62	70.711	1	20.315	64.079	17	17
18	1.62	70.711	1	20.315	64.079	18	18
19	1.62	70.711	1	20.315	64.079	19	19
20	1.62	70.711	1	20.315	64.079	20	20
21	1.62	70.711	1	20.315	64.079	21	21
22	1.62	70.711	1	20.315	64.079	22	22
23	1.62	70.711	1	20.315	64.079	23	23
24	1.62	70.711	1	20.315	64.079	24	24
25	1.62	70.711	1	20.315	64.079	25	25
26	1.62	70.711	1	20.315	64.079	26	26
27	1.62	70.711	1	20.315	64.079	27	27
28	1.62	70.711	1	20.315	64.079	28	28
29	1.62	70.711	1	20.315	64.079	29	29
30	1.62	70.711	1	20.315	64.079	30	30
31	1.62	70.711	1	20.315	64.079	31	31
32	1.62	70.711	1	20.315	64.079	32	32
33	1.62	70.711	1	20.315	64.079	33	33
34	1.62	70.711	1	20.315	64.079	34	34
35	1.62	70.711	1	20.315	64.079	35	35
36	1.62	70.711	1	20.315	64.079	36	36
37	1.62	70.711	1	20.315	64.079	37	37
38	1.62	70.711	1	20.315	64.079	38	38
39	1.62	70.711	1	20.315	64.079	39	39
40	1.62	70.711	1	20.315	64.079	40	40
41	1.62	70.711	1	20.315	64.079	41	41
42	1.62	70.711	1	20.315	64.079	42	42
43	1.62	70.711	1	20.315	64.079	43	43
44	1.62	70.711	1	20.315	64.079	44	44
45	1.62	70.711	1	20.315	64.079	45	45
46	1.62	70.711	1	20.315	64.079	46	46
47	1						

SEDIMENT MASS	INITIAL AREA (m <sup>2</sup> )	BOTTOM WIDTH (m)
1.1	1.56	21
1.2-9	3.36	18.9
1.4	2	21
1.5-7	7.02	47.29



INFILTRATION PONDS		
POINT	RE QUARED VOLUME	ON SLOAN VOLUME
1	34.010	34.817
2-3	61.461	66.312
4	37.476	38.543
5-7	194.067	200.402

- [illegible]

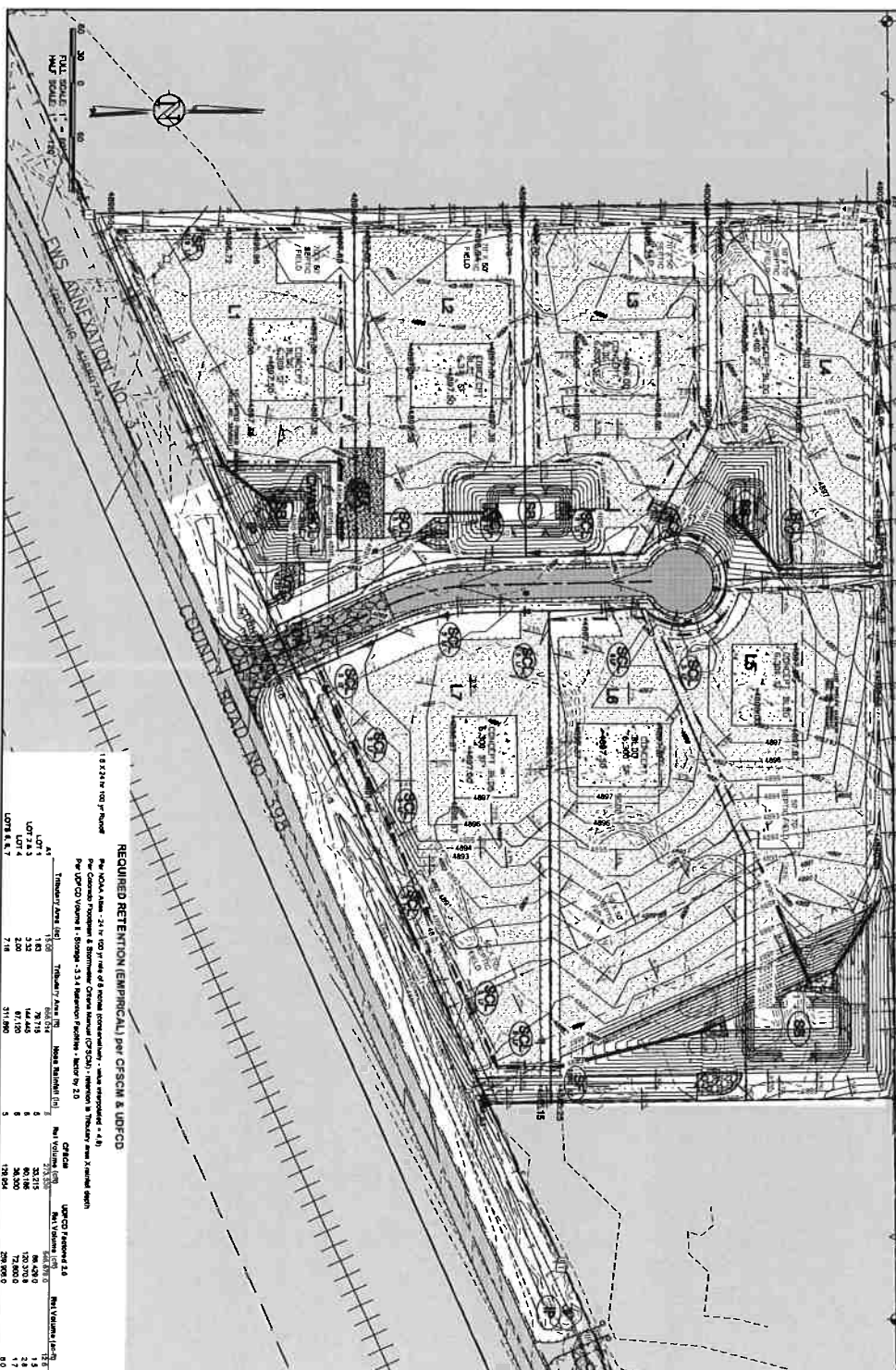
INITIAL EROSION CONTROL PLAN  
ROBERTSON -KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KEENEsburg, WELD COUNTY, COLORADO

ROBERTSON KAISER  
SLEDMISON  
CONTACT: RICK ROBERTSON  
50531 E 160th AVENUE  
BENNETT, CO 80102  
(303)881-0031

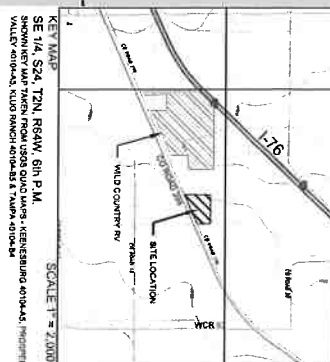
**Western Engineering Consultants, Inc. LLC**  
127 S. DENVER AVENUE  
FT. LUITON, CO 80621  
www.westernm.com  
email@westernm.com  
(720) 883-0051  
FAX (720) 294-1530

Parcel No. 130319000003  
GARY DOUGLAS MYERS (1/2 INT)  
ARTHUR W. BERGLUND  
ROBERT KENT BERGLUND REVOCABLE TRUST  
ANNE E. WARD  
ANET B. WARD

Area (Calculated) 302.0559  
Lago 7233 THAT PT N/2, S/4 19 2 63 LYING N & W OF RR R/W



	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	2053-54	2054-55	2055-56	2056-57	2057-58	2058-59	2059-60	2060-61	2061-62	2062-63	2063-64	2064-65	2065-66	2066-67	2067-68	2068-69	2069-70	2070-71	2071-72	2072-73	2073-74	2074-75	2075-76	2076-77	2077-78	2078-79	2079-80	2080-81	2081-82	2082-83	2083-84	2084-85	2085-86	2086-87	2087-88	2088-89	2089-90	2090-91	2091-92	2092-93	2093-94	2094-95	2095-96	2096-97	2097-98	2098-99	2099-00	2100-01	2101-02	2102-03	2103-04	2104-05	2105-06	2106-07	2107-08	2108-09	2109-10	2110-11	2111-12	2112-13	2113-14	2114-15	2115-16	2116-17	2117-18	2118-19	2119-20	2120-21	2121-22	2122-23	2123-24	2124-25	2125-26	2126-27	2127-28	2128-29	2129-30	2130-31	2131-32	2132-33	2133-34	2134-35	2135-36	2136-37	2137-38	2138-39	2139-40	2140-41	2141-42	2142-43	2143-44	2144-45	2145-46	2146-47	2147-48	2148-49	2149-50	2150-51	2151-52	2152-53	2153-54	2154-55	2155-56	2156-57	2157-58	2158-59	2159-60	2160-61	2161-62	2162-63	2163-64	2164-65	2165-66	2166-67	2167-68	2168-69	2169-70	2170-71	2171-72	2172-73	2173-74	2174-75	2175-76	2176-77	2177-78	2178-79	2179-80	2180-81	2181-82	2182-83	2183-84	2184-85	2185-86	2186-87	2187-88	2188-89	2189-90	2190-91	2191-92	2192-93	2193-94	2194-95	2195-96	2196-97	2197-98	2198-99	2199-00	2200-01	2201-02	2202-03	2203-04	2204-05	2205-06	2206-07	2207-08	2208-09	2209-10	2210-11	2211-12	2212-13	2213-14	2214-15	2215-16	2216-17	2217-18	2218-19	2219-20	2220-21	2221-22	2222-23	2223-24	2224-25	2225-26	2226-27	2227-28	2228-29	2229-30	2230-31	2231-32	2232-33	2233-34	2234-35	2235-36	2236-37	2237-38	2238-39	2239-40	2240-41	2241-42	2242-43	2243-44	2244-45	2245-46	2246-47	2247-48	2248-49	2249-50	2250-51	2251-52	2252-53	2253-54	2254-55	2255-56	2256-57	2257-58	2258-59	2259-60	2260-61	2261-62	2262-63	2263-64	2264-65	2265-66	2266-67	2267-68	2268-69	2269-70	2270-71	2271-72	2272-73	2273-74	2274-75	2275-76	2276-77	2277-78	2278-79	2279-80	2280-81	2281-82	2282-83	2283-84	2284-85	2285-86	2286-87	2287-88	2288-89	2289-90	2290-91	2291-92	2292-93	2293-94	2294-95	2295-96	2296-97	2297-98	2298-99	2299-00	2300-01	2301-02	2302-03	2303-04	2304-05	2305-06	2306-07	2307-08	2308-09	2309-10	2310-11	2311-12	2312-13	2313-14	2314-15	2315-16	2316-17	2317-18	2318-19	2319-20	2320-21	2321-22	2322-23	2323-24	2324-25	2325-26	2326-27	2327-28	2328-29	2329-30	2330-31	2331-32	2332-33	2333-34	2334-35	2335-36	2336-37	2337-38	2338-39	2339-40	2340-41	2341-42	2342-43	2343-44	2344-45	2345-46	2346-47	2347-48	2348-49	2349-50	2350-51	2351-52	2352-53	2353-54	2354-55	2355-56	2356-57	2357-58	2358-59	2359-60	2360-61	2361-62	2362-63	2363-64	2364-65	2365-66	2366-67	2367-68	2368-69	2369-70	2370-71	2371-72	2372-73	2373-74	2374-75	2375-76	2376-77	2377-78	2378-79	2379-80	2380-81	2381-82	2382-83	2383-84	2384-85	2385-86	2386-87	2387-88	2388-89	2389-90	2390-91	2391-92	2392-93	2393-94	2394-95	2395-96	2396-97	2397-98	2398-99	2399-00	2400-01	2401-02	2402-03	2403-04	2404-05	2405-06	2406-07	2407-08	2408-09	2409-10	2410-11	2411-12	2412-13	2413-14	2414-15	2415-16	2416-17	2417-18	2418-19	2419-20	2420-21	2421-22	2422-23	2423-24	2424-25	2425-26	2426-27	2427-28	2428-29	2429-30	2430-31	2431-32	2432-33	2433-34	2434-35	2435-36	2436-37	2437-38	2438-39	2439-40	2440-41	2441-42	2442-43	2443-44	2444-45	2445-46	2446-47	2447-48	2448-49	2449-50	2450-51	2451-52	2452-53	2453-54	2454-55	2455-56	2456-57	2457-58	2458-59	2459-60	2460-61	2461-62	2462-63	2463-64	2464-65	2465-66	2466-67	2467-68	2468-69	2469-70	2470-71	2471-72	2472-73	2473-74	2474-75	2475-76	2476-77	2477-78	2478-79	2479-80	2480-81	2481-82	2482-83	2483-84	2484-85	2485-86	2486-87	2487-88	2488-89	2489-90	2490-91	2491-92	2492-93	2493-94	2494-95	2495-96	2496-97	2497-98	2498-99	2499-00	2500-01	2501-02	2502-03	2503-04	2504-05	2505-06	2506-07	2507-08	2508-09	2509-10	2510-11	2511-12	2512-13	2513-14	2514-15	2515-16	2516-17	2517-18	2518-19	2519-20	2520-21	2521-22	2522-23	2523-24	2524-25	2525-26	2526-27	2527-28	2528-29	2529-30	2530-31	2531-32	2532-33	2533-34	2534-35	2535-36	2536-37	2537-38	2538-39	2539-40	2540-41	2541-42	2542-43	2543-44	2544-45	2545-46	2546-47	2547-48	2548-49	2549-50	2550-51	2551-52	2552-53	2553-54	2554-55	2555-56	2556-57	2557-58	2558-59	2559-60	2560-61	2561-62	2562-63	2563-64	2564-65	2565-66	2566-67	2567-68	2568-69	2569-70	2570-71	2571-72	2572-73	2573-74	2574-75	2575-76	2576-77	2577-78	2578-79	2579-80	2580-81	2581-82	2582-83	2583-84	2584-85	2585-86	2586-87	2587-88	2588-89	2589-90	2590-91	2591-92	2592-93	2593-94	2594-95	2595-96	2596-97	2597-98	2598-99	2599-00	2600-01	2601-02	2602-03	2603-04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INFLATION PONDS	
POND	DESIGN VOLUME
1	34,070
2-3	61,481
4	31,478
5-7	134,817

- [illegible]

INTERIM EROSION CONTROL PLAN  
ROBERTSON -KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KEENESEBURG, WELD COUNTY, COLORADO

ROBERTSON-KAISER  
SUBMISC  
CONTACT: BOCK ROBERTSON  
50531 E 180th AVENUE  
BENNETT, CO 80102  
(303)861-0031



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**Western Engineering Consultants, Inc. LLC**

PARCEL NO. 13603180000003  
GARY DOUGLAS MYERS 1/2 INT)  
ARTHUR W. BEERGLUND  
ROBERT KENT BEERGLUND HEDGECOCK TRUST  
JANET B. WARDPA  
Acct# (Consolidated) 302.0559  
Lagol 7233 THAT PT 1/2 SEC 19 2 63 LYING N & W OF RR R/W



KEY MAP

SE 1/4, S24, T2N, R64W, 6th PM

SHOWN HEREIN TAKEN FROM USGS QUAD MAPS - ESTABLISHED 1904-1914, AND FROM 1920-1940

WATER 200 FEET AROUND BOUNDARY AS 1/4 SECTION 24

WILCO COUNTY, TEXAS

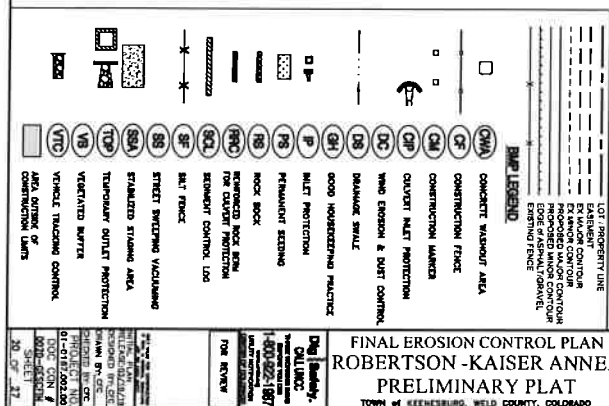
SITE LOCATION

WCR

L-16


SCALE 1" = 2,000'

SE 1/4, S24, T2N, R64W, 6th P.M.  
SHOW KEY MAP TAKEN FROM USGS QUAD MAPS - KEENESEBURG 40104-45, PRO  
VALLEY 40104-45, KLUIG RANCH 40104-85 & TAMPA 40104-84



FINAL EROSION CONTROL PLAN  
ROBERTSON-KAISER ANNEX  
PRELIMINARY PLAT  
TOWN of KEENEHURST, WELD COUNTY, COLORADO

ROBERTSON-KAISER  
SUBDIVISION  
CONTACT: RICK ROBERTSON  
50531 E 160th AVENUE  
BENNETT, CO 80102  
(303) 441-0031



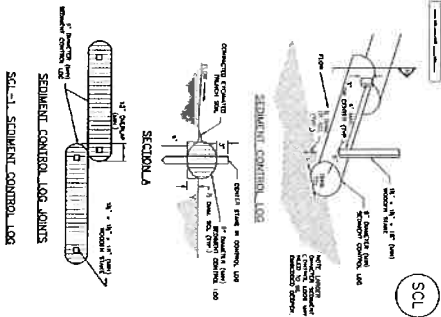
127 S. DENVER AVENUE  
FT. Lupton, CO 80621  
[www.westernecol.com](http://www.westernecol.com)  
[email@westernecol.com](mailto:email@westernecol.com)  
(720) 865-9951  
FAX (720) 294-1330

**Western Engineering Consultants, Inc.**



# Sediment Control Log (SCL)

SC-2

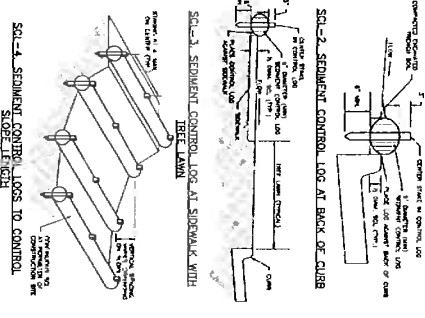


November 2010  
 Urban Drainage and Flood Control District  
 Urban Storm Drainage Criteria Manual Volume 3

SC-2

SC-2

# Sediment Control Log (SCL)

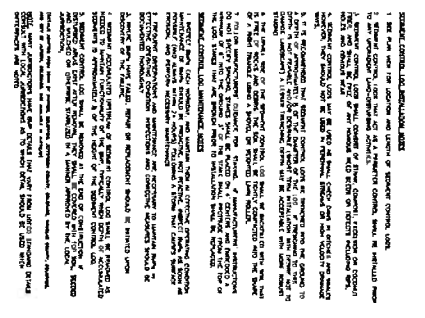


November 2010  
 Urban Drainage and Flood Control District  
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SC-2

SC-2

# Sediment Control Log (SCL)

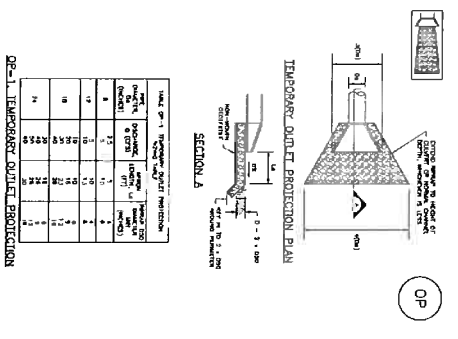


November 2010  
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SC-2

EC-8

# Temporary Outlet Protection (TOP)

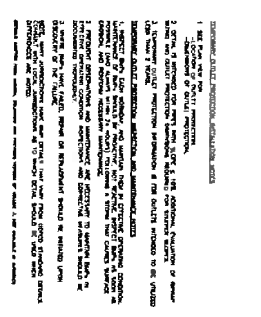


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 Urban Storm Drainage Criteria Manual Volume 3

TOP-2

# Temporary Outlet Protection (TOP)

EC-8

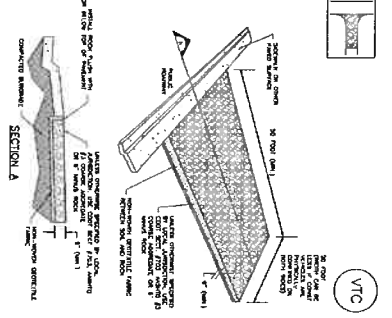


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 Urban Storm Drainage Criteria Manual Volume 3

TOP-2

# Vehicle Tracking Control (VTC)

SM-4

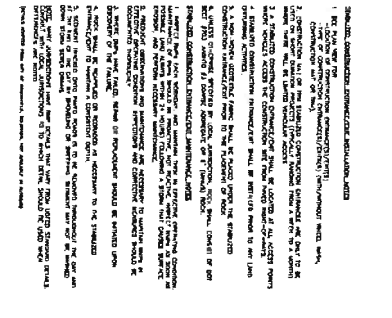


November 2010  
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 Urban Storm Drainage Criteria Manual Volume 3

VTC-3

SM-4

# Vehicle Tracking Control (VTC)

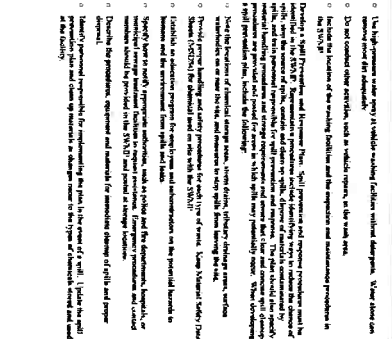


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VTC-4

# Good Housekeeping Practices (GHP)

MM-3



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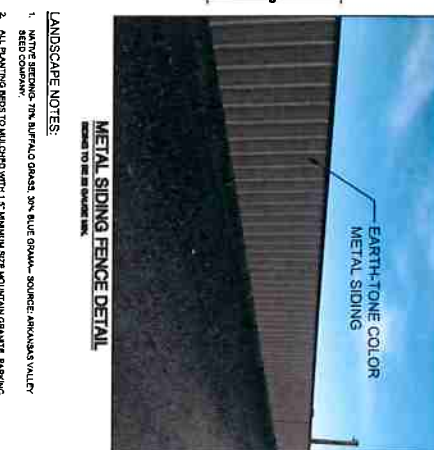
GHP-3



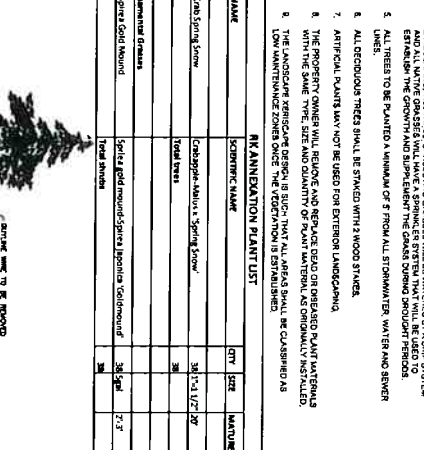








1. NATTE SEEDING, 70% BUFFALO GRASS, 30% BLUE GRASS—SOURCE: ARKANSAS VALLEY SEED COMPANY.
2. ALL PLANTING NEEDS TO BE DONE WITH 1.5" MINIMUM SIZE MOUNTAIN CRABGRASS BROADCASTER.



**© 2012 THE NEW YORK PUBLIC LIBRARY**

ALL LANDSCAPE AND SEEDED AREAS WILL BE MAINTAINED. THESE INCLUDE ANY COMBINATION OF LIVING PLANTS, SUCH AS TREES, SHRUBS, VINES, GROUND COVERS, FLOWERS OR TURF, AND MAY INCLUDE NATURAL FEATURES SUCH AS ROCKS, Boulders, ARCHITECTURAL FEATURES INCLUDING, BUT NOT LIMITED TO, FOUNTAINS, SEAT WALLS, FENCES, STREET FURNITURE, WALKS, DECKS AND OTHERS, SCREEN WALLS,

1. BE PLANTED IN A 10' X 10' X 1' PLANT BED. PLANTING SHOULD BE DONE IN THE FALL.
2. PLANTING SHOULD BE DONE IN THE FALL.
3. PLANTING SHOULD BE DONE IN THE FALL.
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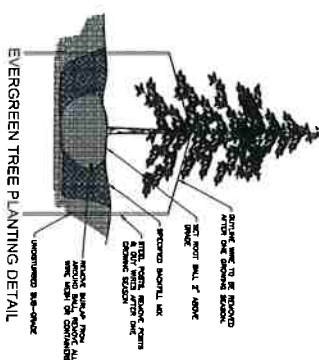
## LANDSCAPE NOTES

**METAL SIDING FENCE DETAIL**  
**DESIGNED TO BE IN COMPLIANCE WITH:**

EARTH-TONE COLOR  
METAL SIDING

PLANT LIST:	IF THE QUANTITIES IN PLANT LIST, QUANTITIES OF THE LABELS & QUANTITIES OF THE SYMBOLS ON THE PLAN DO NOT CORRELATE, THEN QUANTITIES OF SYMBOLS ON THE PLAN SHALL GOVERN.
PLANT LIST: COMMON/ALTERNATE NAME	INSTALLED SIZE
COMMON/ALTERNATE NAME	QUANTITY/ WATER LIST
COMMON/ALTERNATE NAME	WATERING SIZE

	30	CRASH (Semi-Steel) Competition-Take X Spring Snow	1-1 1/2"	LOU	30 FRONT
	30	CRASH GOLD "WOLD" Spring Japanese Solidsteel	5 GAL. 25 GAL. (750)	LOU	2-3 FRONT



### EVERGREEN TREE PLANTING DETAIL

ALL LANDSCAPE AND SEEDBED AREAS WILL BE MAINTAINED. THESE INCLUDE ANY COMBINATION OF LIVING PLANTS, SUCH AS TREES, SHRUBS, VINES, GROUND COVERS, FLOWERS OF TUFF, AND ANY INCLUDE NATURAL FEATURES SUCH AS ROCK, STONE AND BARK, AND ARCHITECTURAL FEATURES INCLUDING BUT NOT LIMITED TO FOUNTAINS, REFLECTING POOLS, ART WORKS, SCREEN WALLS, FENCES, STREET FURNITURE, WALKS, DECKS AND ORNAMENTAL CONCRETE OR STONEWORK.

WELD COUNTY SEED MIX

*Balausta* (Macraea, Longhorn)  
Bridges Grass (Vaughn, Bulla, Niter, ☐ Reno, Hassall  
Smooth Berne (Ingram, Marcher)  
Sand dropped  
*Pernettia Pinguis* (Calkins or Gumbel) (Vanzant)  
Sander Weedsgrass (Pyot, Revueuse or San Luis)  
Aster grass (Julia II, Salt on Sand)  
*Syntherisma* (Hubertus 26, Dierckhoff)

**SCREENING NOTES**

1. 6' MINIMUM HEIGHT WOOD FENCE TO BE INSTALL ALONG SUBDIVISION WEST AND EAST PROPERTY LINES.
2. INTERNAL FENCING NOT REQUIRED TO BE SCREENED.

<p>DATE: 01-11-01          DRAWN BY: J. L. HARRIS          CHECKED BY: J. L. HARRIS          PROJECT NO: 01-01-01-01          SHEET: 17</p>	<p><b>SCREENING/LANDSCAPE DETAILS</b>  <b>ROBERTSON-KAISER ANNEX</b>  <b>PRELIMINARY PLAT</b>          TOWN &amp; RANGE, WYOMING COUNTY, COLORADO</p>	<p><b>ROBERTSON-KAISER</b>  <b>SUBDIVISION</b>          CONTACT: RICK ROBERTSON          50531 E 160th AVENUE          BENTLEY, CO 80103          303-444-9999</p>
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127 S. DOWNEY AVENUE  
 FT. COLLINS, CO 80521  
 www.westerninc.com  
 (720) 985-1955  
 FAX (720) 294-1330

*Western Engineering Consultants, Inc. LLC*





## RK SUBDIVISION FINAL PLAN APPLICATION CHECKLIST:

The following is a summary of the checklist items:

Item	Concept	Market Street BP
1.	Complete land use application	COMPLETE
2.	Fees and Deposit Agreement	COMPLETE
3.	Detailed description of proposal (Narrative)	COMPLETE
4.	Title commitment	COMPLETE
5.	Copy of any surface use agreement with mineral interest owners of property	REPORT ENCLOSED
6.	List of property owners within 300 feet of property line	ENCLOSED
7.	Copies of any applicable state or federal permits for the purpose use	N/A
8.	Written certification that the notice has been provided (due at hearing)	Before Hearing
9.	Final Plat	COMPLETE SEE CDs
10.	Final Plan CDs	COMPLETED
11.	Draft Subdivision Improvements Agreement (based on Town template)	COMPLETED
12.	Service statements from each utility company or special district	Town Water Exist United Power Exists
13.	Any additional information reasonably required by Town Staff	NOTED



**Final Plat Subdivision Application**

**Application Fee: \$500.00**

**(Plus all developer related review fees incurred by the Town of Keenesburg i.e. legal, engineering, publication, recording fees, etc.)**

**Applicant Name** Richard I. Robertson, Heidi D. Robertson, Aaron L. Kaiser, and Lori J. Kaiser

**Address** Robertson's:- 8537 WCR 51 Keenesburg, CO 8064

Kaiser's: 39673 E. 160<sup>th</sup> Avenue, Keenesburg, CO 80643

**Daytime Phone Robertson:** 303-961-3960

**Daytime Phone Kaiser:** 303-994-7947

**Emails:** pri.rickrobertson@gmail.com

aaron@noraaconcrete.com

**Subdivision Name** RK Subdivision

**Address of Proposed Subdivision** WCR 398, Keenesburg, CO 80643

**Legal Description:** LOT B, RECORDED EXEMPTION NO. 1303-19-3-RE-4346 RECORDED MARCH 28, 2006 AT RECEPTION NO. 3373994, BEEING A PART OF THE SOUTHWEST 1/4 OF SECTION 19, TOWNSHIP 2 NORTH, RANGE 63 WEST OF THE 6 TH P.M., COUNTY OF WELD, STATE OF COLORADO

**Is the Applicant the Owner of the Property?** ☒ Yes ☐ No

**Owner Name (if not Applicant):**

**Owner Address:**

**Owner's Phone:**

Owner's

email:

Property Owner signature: \_\_\_\_\_ N/A \_\_\_\_\_ Date: \_\_\_\_\_

The Applicant understands that this is an application only, that is must be approved, and that any required building permits must be obtained before the property may be used in accordance with the request. The Applicant further acknowledges that the above information is correct. By signing this Application, the Applicant certifies that he or his consultants have read and understand the pertinent ordinances of the Town of Keenesburg and will prepare application materials consistent with them.

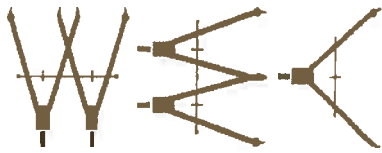
Applicant signature:  \_\_\_\_\_ Richard I. Robertson \_\_\_\_\_ Date: 3-19-19

Applicant signature:  \_\_\_\_\_ Heidi D. Robertson \_\_\_\_\_ Date: 3-14-19

Applicant signature:  \_\_\_\_\_ Aaron L. Kaiser \_\_\_\_\_ Date: 3-19-19

Applicant signature:  \_\_\_\_\_ Lori J. Kaiser \_\_\_\_\_ Date: 3-19-19





**WESTERN ENGINEERING CONSULTANTS,**  
127 S. Denver Avenue, Ft. Lupton CO 80621  
2501 Mill St. Brush, CO 80723  
Ph. 303-913-7341, Fax 720-294-1330  
Email: chadwin.cox@westerneci.com  
**Inc LLC**

June 3, 2020

Town of Keenesburg  
140 S. Main St  
Keenesburg, CO 80643

**RE: RK SUBDIVISION DEVELOPMENT FINAL PLAT SUBMITTAL**

Dear Town Staff,

Please find the attached Land Use Application and supporting documents for the RK Subdivision Development Final Plat submittal.

This letter is intended to serve as the Project narrative (Final Plat Item #3).

**General Information and Brief Project Description:**

RK Subdivision was annexed and zoned as Heavy Industrial in early 2018.

Currently the overall 15.06 acre parcel is proposed to be subdivided into 7 industrial lots. A 60 foot standard Town of Keenesburg right of way will be dedicated with a cul-de-sac for access to each Lot, said public road is named RK Drive in the attached submittal documents.

Zoning is not proposed to be changed, uses shall comply with current Town zoning code. Privately owned property to the west and north and east adjacent to the site are currently Weld County AG-A.

WCR 398 lies to the south.

**Owners**

Richard I. Robertson  
Heidi D Robertson  
8537 CR 51  
Keenesburg, CO 80643

Aaron L. Kaiser  
Lori J. Kaiser  
30307 CR 8  
Keenesburg, CO 80643

**Civil Engineer:**

Western Engineering Consultants  
127 South Denver Avenue  
Ft Lupton, Colorado 80643  
303-913-7341  
Chadwin Cox PE



Land Surveyor: American West Land Surveyors  
331 South 4<sup>th</sup> Avenue  
Brighton, Colorado 80601  
303-659-1532  
Curtis Hoos PLS

Traffic Engineer: Sustainable Traffic Solutions  
823 West 124<sup>th</sup> Drive  
Westminster, Colorado 80234  
303-589-6875  
Joe Henderson PE PTOE

Geotechnical Engineer: Soillogic  
4350 Highway 66  
Longmont, Colorado 80504  
970-535-6144  
Wolf Von Carlowitz PE, Darrel DiCarlo PE

Electrical Engineer: To Be Determined

Drainage Engineer: Western Engineering  
127 S. Denver Avenue  
Ft. Lupton, Colorado 80643  
303-913-7341  
Chadwin Cox PE

Location of Site: XXXX WCR398,  
Keenesburg, CO 80643

Total Site Area: **15.06 Acres (656,014 sf)**

Total Build-out Area:

Other Site Features:

New Public Street

Roadside open ditch along both sides of new street for rural drainage

Drainage will be routed, captured, treated, and stored on site (single lot and shared ponds)

Native Landscaping

**COMPREHENSIVE PLAN:**

The current Land Use Plan for this area shows the property as Mixed Use. The proposed industrial use will be consistent with the concept for Mixed Use.

**ZONING DISTRICT:**

The existing Zone District is Heavy Industrial.

**DENSITY:**

The maximum density will be determined during review.

**DIVERSITY:**

Industrial lots are in demand. The proposed subdivision will provide additional development opportunities to the Town of Keenesburg.

**LAND USES:**

To the west and east are rural residences. Farm ground lies to the north.

**CONNECTIVITY:**

The 7 industrial lots will be directly connected to the proposed public street which connects to WCR 398.

**OPEN SPACE:**

No open space is proposed.

**ROADWAY NETWORK:**

The Town has an existing roadway (WCR 398) to the south.

**TREATMENTS TO ROADWAYS**

Signage is proposed on RK Drive and along WCR 398.

**LOT LAYOUT:**

7 acreage lots are proposed.

**LOT INTERFACE WITH ROADWAYS:**

Access will be provided via driveways to each Lot from RK Drive.

**LOT SIZE DIVERSITY:**

Since this is an industrial subdivision there is no diversity is proposed here-in – however each lot will be individually developed so they will have diversity from each other.

**SETBACKS:**

The setbacks are 30 feet front and rear and 10 feet each side.

**LOT SIZES ENHANCING STREETCAPE:**

Lot sizes vary from 1.65 acres to 2.5 acres. No streetscape landscape is proposed.

**COMMON AREAS:**

Currently none are proposed.

**FENCING:**

All site fencing is proposed to be handled by each individual lot owner in accordance with Town regulations.

**AMENITIES, ENTRIES, CONNECTIVITY, ARCHITECTURAL & LANDSCAPE DESIGNS FOR EACH LOT**

Due to the size of the property – no additional amenities are proposed. Each industrial lot development home and lot landscaping will be individually designed.

**IRRIGATION SYSTEM**

Each lot will be required to have its own irrigation system. It is expected each lot will be xeriscaped.

**POTABLE WATER:**

Potable water currently exists in WCR 398 as it was extended recently by Williams (formerly Discovery Midstream) from the Wild Country RV Park east to the under-construction Keenesburg Gas Plant.

**ADEQUATE POTABLE WATER:**

Pursuant to the Pre-Application meeting – Town of Keenesburg water is said to not be an issue.

**STORM WATER MANAGEMENT:**

WEC has investigated that no formal downstream conveyance exists. Currently runoff is routed along the north side of WCR 398 and directed under WCR 398 just east of this property to a low point that has no outfall (i.e it is blocked by the Railroad berm).

Infiltration (retention) storage volumes are designed for shared and single lot configurations in accordance with State of Colorado Statutes and UDFCD criteria.

**COMMON AREA LANDSCAPE:**

Not applicable. All landscaping is expected to be each private lot's responsibility, including the screening buffers to the west, east, and north.

**OFF STREET PARKING:**

Based on the lot sizes no on street parking is expected and each lot will have adequate parking.

**EXTERIOR LIGHTING:**

The applicant is awaiting the Town's direction on lighting of the public rights of way. Any right of way lighting will have to adhere to standard photometric plans.

**POTENTIAL IMPACT ON ADJACENT NEIGHBORHOODS:**

Actual construction typically negatively effects adjacent properties, however the long term impact of this development is estimated have little effect on the adjacent roadways and adjacent neighbors and have positive economic impacts to the Town.

**SMELLS:**

No new smells are expected to occur.

**EXISTING OR PROPOSED MINERAL DEVELOPMENT – STATE OF OWNERSHIP – CONFLICTS:**

See attached summary of mineral rights. Based on the site of the property it is not expected that any limitations will occur. No conflicts are anticipated.

**PUBLIC IMPROVEMENTS:**

RK Drive is proposed as a 60 foot public right of way with 40 feet of future asphalt pavement (all weather surface for Phase 1).

**ACCESS:**

Each lot will have its own access to RK Drive per Keenesburg driveway details.

**GRADING:**

The property has moderate relief – approximately 8 foot drop from west to east. The proposed grading design is intended to follow typical commercial/industrial subdivision lot grading. When possible shared lot line swales are proposed to drain to shared infiltration (retention) ponds but when not possible individual swales are required to drain to individual infiltration (retention) ponds. All infiltration (retention) ponds are sized to store the 24 hour 100 year runoff event for the entire tributary area.

**STORM SEWER:**

On site conveyance will be via grass swales and concrete pans. Storm culverts are expected at driveway locations. One additional road culvert will occur where RK Drive meets WCR 398.

**SANITARY SEWER:**

No public sanitary main exists near the property. Each lot is proposed to have an Onsite Wastewater System – designed specific to each lot as it is developed (separate Site Development Plan review).

**WATER:**

A new 8" diameter waterline is proposed within RK Drive. Three new Fire Hydrants are proposed off of RK Drive in accordance with South East Weld Fire District requirements.

**GAS AND ELECTRIC:**

It is unclear whether an existing gas line is near the property however electric does exist.

An electric distribution system is proposed to be buried along all the proposed RK Drive to serve each proposed Lot

**WILL SERVICE LETTERS:**

The Owner has contacted South East Weld County Fire Rescue (SEWCFR) requesting service. A Fire Truck access analysis has been performed using SEWCFR Fire Truck template.

Water will be provided by the Town of Keenesburg system. Sewage will be private On-Site Wastewater System (Septic) in accordance with Weld County OWTS criteria. See also the Final Plan Utility & Septic sheets (5 & 8).

Electricity is provided by United Power. Gas may be available – it is unclear if it will be provided by Xcel Energy or Atmos Energy. WEC has requested Will Serve Letters from both. See also the Final Plan Utility Plan sheet (5)

**SURVEYS:**

The Site topography and boundary survey was provided by American West Land Surveyors in Brighton.

**SUBMITTAL & HOPEFUL PROJECT SCHEDULE:**

Date:	Time/ location:	Event:	Notes:
June 3, 2020	4:30 p.m.	Submit Preliminary & Final Plat documents	
September 1 <sup>st</sup> , 2020	On Site	Begin Site grading and utility construction	

## FINAL PLAT APPLICATION CHECKLIST:

The following is a summary of the checklist items:

- |   |                |
|---|----------------|
| 1. Completed land use application                         | Enclosed       |
| 2. Application fees & fee deposits                        | Enclosed       |
| 3. Written Narrative                                      | this document  |
| 4. Proof of Ownership -Title Commitment                   | Enclosed       |
| 5. Copy of any surface use agreement w/ mineral interests | Enclosed       |
| 6. List of adjacent property owners (300 feet)            | Enclosed       |
| 7. Copies of State or Federal permits                     | N/A            |
| 8. Written certification that notice has been provided    | Due at hearing |
| 9. Final Plat   | Enclosed       |
| 10. Final Plan CDs  | Enclosed       |
| 11. Draft Subdivision Improvements Agreements             | Enclosed       |

Please contact me with any questions or comments you may have on our proposal for this project!

Sincerely,



Western Engineering Consultants inc., LLC  
Chadwin F. Cox, P.E.  
Senior Project Manager

End. Final Plat Application package

Land Title Guarantee Company  
CUSTOMER DISTRIBUTION

Date: March 25, 2019

Our Order Number: FCIF25151615

Property Address: GREELEY CO 80634

WESTERN ENGINEERING CONSULTANTS INC  
Attn: CHADWIN COX  
PO BOX 595  
BRIGHTON, CO 80601  
chadwin.cox@westerneci.com

If you have any inquiries or require further assistance, please contact [Ft. Collins Customer Care](#)

Phone: 970-282-3649

Email Address: [customercare@ltgc.com](mailto:customercare@ltgc.com)



# Property Information Binder

## CONDITIONS AND STIPULATIONS

### 1. Definition of Terms

The following terms when used in this Binder mean:

- (a) "Land": The land described, specifically or by reference, in this Binder and improvements affixed thereto which by law constitute real property;
- (b) "Public Records": those records which impart constructive notice of matters relating to said land;
- (c) "Date": the effective date;
- (d) "the Assured": the party or parties named as the Assured in this Binder, or in a supplemental writing executed by the Company;
- (e) "the Company" means Old Republic National Title Insurance Company, a Minnesota stock company.

### 2. Exclusions from Coverage of this Binder

The company assumes no liability including cost of defense by reason of the following:

- (a) Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; taxes and assessments not yet due or payable and special assessments not yet certified to the Treasurer's office.
- (b) Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
- (c) Title to any property beyond the lines of the Land, or title to streets, roads, avenues, lanes, ways or waterways on which such land abuts, or the right to maintain therein vaults, tunnels, ramps, or any other structure or improvement; or any rights or easements therein unless such property, rights or easements are expressly and specifically set forth in said description.
- (d) Mechanic's lien(s), judgment(s) or other lien(s).
- (e) Defects, liens, encumbrances, adverse claims or other matters: (a) created, suffered or agreed to by the Assured; (b) not known to the Company, not recorded in the Public Records as of the Date, but known to the Assured as of the Date; or (c) attaching or creating subsequent to the Date.

### 3. Prosecution of Actions

- (a) The Company shall have the right at its own costs to institute and prosecute any action or proceeding or do any other act which in its opinion may be necessary or desirable to establish or confirm the matters herein assured; and the Company may take any appropriate action under the terms of this Binder, whether or not it shall be liable thereunder and shall not thereby concede liability or waive any provision hereof.
- (b) In all cases where the Company does not institute and prosecute any action or proceeding, the Assured shall permit the Company to use, at its option, the name of the Assured for this purpose. Whenever requested by the Company, the Assured shall give the Company all reasonable aid in prosecuting such action or proceeding, and the Company shall reimburse the Assured for any expense so incurred.

### 4. Notice of Loss - Limitation of Action

A statement in writing of any loss or damage for which it is claimed the Company is liable under this Binder shall be furnished to the Company within sixty days after such loss or damage shall have been determined, and no right of action shall accrue to the Assured under this Binder until thirty days after such statement shall have been furnished, and no recovery shall be had by the Assured under this Binder unless action shall be commenced thereon with two years after expiration of the thirty day period. Failure to furnish the statement of loss or damage or to commence the action within the time hereinbefore specified, shall be conclusive bar against maintenance by the Assured of any action under this Binder.

### 5. Option to Pay, Settle or Compromise Claims

The Company shall have the option to pay, settle or compromise for or in the name of the Assured any claim which could result in loss to the Assured within the coverage of this Binder, or to pay the full amount of this Binder. Such payment or tender of payment of the full amount of the Binder shall terminate all liability of the Company hereunder.

## 6. Limitation of Liability - Payment of Loss

(a) The liability of the Company under this Binder shall be limited to the amount of actual loss sustained by the Assured because

of reliance upon the assurances herein set forth, but in no event shall the liability exceed the amount of the liability stated on the face page hereof.

(b) The Company will pay all costs imposed upon the Assured in litigation carried on by the Company for the Assured, and all costs and attorneys' fees in litigation carried on by the Assured with the written authorization of the Company.

(c) No claim for loss or damages shall arise or be maintainable under this Binder (1) if the Company after having received notice of any alleged defect, lien or encumbrance not shown as an Exception or excluded herein removes such defect, lien or encumbrance within a reasonable time after receipt of such notice, or (2) for liability voluntarily assumed by the Assured in settling any claim or suit without written consent of the Company.

(d) All payments under this Binder, except for attorney's fees as provided for in paragraph 6(b) thereof, shall reduce the amount of the liability hereunder pro tanto, and no payment shall be made without producing this Binder or an acceptable copy thereof for endorsement of the payment unless the Binder be lost or destroyed, in which case proof of the loss or destruction shall be furnished to the satisfaction of the Company.

(e) When liability has been definitely fixed in accordance with the conditions of this Binder, the loss or damage shall be payable within thirty days thereafter.

## 7. Subrogation Upon Payment or Settlement

Whenever the Company shall have settled a claim under this Binder, all right of subrogation shall vest in the Company unaffected by any act of the Assured, and it shall be subrogated to and be entitled to all rights and remedies which the Assured would have had against any person or property in respect to the claim had this Binder not been issued. If the payment does not cover the loss of the Assured, the Company shall be subrogated to the rights and remedies in the proportion which the payment bears to the amount of said loss. The Assured, if requested by the Company, shall transfer to the Company all rights and remedies against any person or property necessary in order to perfect the right of subrogation, and shall permit the Company to use the name of the Assured in any transaction or litigation involving the rights or remedies.

## 8. Binder Entire Contract

Any action or actions or rights of action that the Assured may have or may bring against the Company arising out of the subject matter hereof must be based on the provisions of this Binder. No provision or condition of this Binder can be waived or changed except by a writing endorsed or attached hereto signed by the President, a Vice President, the Secretary, an Assistant Secretary or other validating officer of the Company.

## 9. Notices. Where Sent

All notices required to be given the Company and any statement in writing required to be furnished the Company shall be addressed to it at 400 Second Avenue South, Minneapolis, Minnesota 55401, (612) 371-1111.

## 10. Arbitration


Unless prohibited by applicable law, either the Company or the insured may demand arbitration pursuant to the Title Insurance Arbitration Rules of the American Arbitration Association.

**ANTI-FRAUD STATEMENT:** Pursuant to CRS 10-1-128(6)(a), it is unlawful to knowingly provide false, incomplete or misleading facts or information to an insurance company for the purpose of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policyholder or claimant for the purpose of defrauding or attempting to defraud the policyholder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado division of insurance within the department of regulatory agencies.


This anti-fraud statement is affixed and made a part of this policy.


Issued through the Office of:  
LAND TITLE GUARANTEE COMPANY  
3033 E 1ST AVE #600  
DENVER, CO 80206  
303-850-4165

OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY  
a Stock Company  
400 Second Avenue South  
Minneapolis, Minnesota 55401  
612) 371-1111

  
John E. Freyer, Jr., President



  
Mark Bilbrey, President

  
Rande Yeager, Secretary

**Land Title Guarantee Company Representing**

**PROPERTY INFORMATION BINDER**

**Order Number:** FCIF 25151615

**Policy Number:** PIB25151615.2602523

**Liability:** \$25,000.00

**Fee:** \$0.00

**Subject to the exclusions from coverage, the limits of liability and other provisions of the Conditions and Stipulations hereto annexed and made a part of this Binder,**

**OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY  
a Corporation, herein called the Company,**

**GUARANTEES**

**WESTERN ENGINEERING CONSULTANTS INC. LLC**

**Herein called the Assured, against loss, not exceeding the liability amount stated above, which the assured shall sustain by reason of any incorrectness in the assurance which the Company hereby gives that, according to the public records as of March 19, 2019 at 5:00 P.M.**

**1. Title to said estate or interest at the date hereof is vested in:**

AARON L. KAISER AND LORI J. KAISER AND RICHARD I. ROBERTSON AND HEIDI D. ROBERTSON

**2. The estate or interest in the land hereinafter described or referred to covered by this Binder is:**

A FEE SIMPLE

**3. The land referred to in this Binder is situated in the State of Colorado, County of Weld, described as follows:**

LOT B, RECORDED EXEMPTION NO. 1303-19-3-RE-4346 RECORDED MARCH 28, 2006 AT RECEPTION NO. 3373994, BEING A PART OF THE SOUTHWEST 1/4 OF SECTION 19, TOWNSHIP 2 NORTH, RANGE 63 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO

**4. The following documents affect the land:**

- 1) RIGHT OF WAY FOR COUNTY ROADS 30 FEET ON EITHER SIDE OF SECTION AND TOWNSHIP LINES, AS ESTABLISHED BY THE BOARD OF COUNTY COMMISSIONERS FOR WELD COUNTY, RECORDED OCTOBER 14, 1889 IN BOOK 86 AT PAGE 273.
- 2) RESERVATIONS BY THE UNION PACIFIC RAILROAD COMPANY OF:
  - (1) ALL OIL, COAL AND OTHER MINERALS UNDERLYING SUBJECT PROPERTY,
  - (2) THE EXCLUSIVE RIGHT TO PROSPECT FOR, MINE AND REMOVE OIL, COAL AND OTHER MINERALS, AND

**Land Title Guarantee Company Representing**

**PROPERTY INFORMATION BINDER**

**Order Number:** FCIF 25151615

**Policy Number:** PIB25151615.2602523

(3) THE RIGHT OF INGRESS AND EGRESS AND REGRESS TO PROSPECT FOR, MINE AND REMOVE OIL, COAL AND OTHER MINERALS, ALL AS CONTAINED IN DEED RECORDED MARCH 18, 1897, IN BOOK 153 AT PAGE [40](#).

3) EASEMENT GRANTED TO THE CHICAGO TITLE AND TRUST COMPANY, FOR DITCHES, LATERALS AND WATERWAYS, AND INCIDENTAL PURPOSES, BY INSTRUMENT RECORDED NOVEMBER 09, 1925, UNDER RECEPTION NO. [472600](#) IN BOOK 779.

4) TERMS, CONDITIONS AND PROVISIONS OF RIGHT OF WAY RECORDED JANUARY 12, 1933 IN BOOK 942 AT PAGE [126](#).

5) EASEMENT GRANTED TO NATURAL GAS PRODUCTS COMPANY, FOR PIPELINES, AND INCIDENTAL PURPOSES, BY INSTRUMENT RECORDED AUGUST 06, 1956 IN BOOK 1457 AT PAGE [139](#)

6) EASEMENT GRANTED TO WESTERN SLOPE GAS COMPANY, FOR RIGHT OF WAY, AND INCIDENTAL PURPOSES, BY INSTRUMENT RECORDED MARCH 31, 1966, UNDER RECEPTION NO. [1485898](#).

7) TERMS, CONDITIONS AND PROVISIONS OF INSTRUMENT RECORDED APRIL 05, 1979 AT RECEPTION NO. [1786513](#) IN BOOK 865.

8) TERMS, CONDITIONS AND PROVISIONS OF PIPELINE RIGHT OF WAY AGREEMENT RECORDED SEPTEMBER 23, 1991 AT RECEPTION NO. [2263846](#) IN BOOK 1311.

9) TERMS, CONDITIONS AND PROVISIONS OF SURFACE FACILITY GRANT RECORDED SEPTEMBER 23, 1991 AT RECEPTION NO. [2263862](#) IN BOOK 1311.

10) EASEMENTS, CONDITIONS, COVENANTS, RESTRICTIONS, RESERVATIONS AND NOTES ON THE PLAT OF EXEMPTION RECORDED MARCH 28, 2006 UNDER RECEPTION NO. [3373994](#).

11) RIGHT OF WAY EASEMENT AS GRANTED TO KERR-MCGEE GATHERING LLC IN INSTRUMENT RECORDED NOVEMBER 07, 2012, UNDER RECEPTION NO. [3886842](#).

CORRECTION RECORDED APRIL 8, 2016 AT RECEPTION NO. [4194036](#)

12) TERMS, CONDITIONS AND PROVISIONS OF EASEMENT DEED BY COURT ORDER RECORDED MARCH 15, 2013 AT RECEPTION NO. [3917346](#).

13) RIGHT OF WAY EASEMENT AS GRANTED TO UNITED POWER INC IN INSTRUMENT RECORDED AUGUST 13, 2013, UNDER RECEPTION NO. [3955901](#).

14) OIL AND GAS LEASE RECORDED FEBRUARY 19, 2014 UNDER RECEPTION NO. [3996868](#) AND ANY AND ALL ASSIGNMENTS THEREOF, OR INTEREST THEREIN.

**Land Title Guarantee Company Representing**

**PROPERTY INFORMATION BINDER**

**Order Number:** FCIF 25151615

**Policy Number:** PIB25151615.2602523

15) (ITEM INTENTIONALLY DELETED)

16) EXISTING LEASES OR TENANCIES, IF ANY

17) OIL AND GAS LEASE RECORDED DECEMBER 18, 2017 UNDER RECEPTION NO. [4361001](#) AND ANY AND ALL ASSIGNMENTS THEREOF, OR INTEREST THEREIN.

18) EASEMENTS, CONDITIONS, COVENANTS, RESTRICTIONS, RESERVATIONS AND NOTES ON THE PLAT OF RK ANNEXATION TO THE TOWN OF KEENESBURG RECORDED JUNE 14, 2018 UNDER RECEPTION NO. [4407039](#).

19) TERMS, CONDITIONS AND PROVISIONS OF AGREEMENT RECORDED JUNE 14, 2018 AT RECEPTION NO. [4407354](#).

NOTE: THIS BINDER DOES NOT REFLECT THE STATUS OF TITLE TO WATER RIGHTS OR REPRESENTATION OF SAID RIGHTS, RECORDED OR NOT.

NOTE: THIS BINDER IS NOT A REPORT OR REPRESENTATION AS TO MINERAL INTERESTS, AND SHOULD NOT BE USED, OR RELIED UPON, IN CONNECTION WITH THE NOTICE REQUIREMENTS THAT ARE SET FORTH IN CRS 24-65.5-103.

NOTE: ADDITIONAL UPDATES TO THE EFFECTIVE DATE OF THE BINDER MAY BE REQUESTED BY THE PROPOSED INSURED. ONE UPDATE IS INCLUDED WITH THIS BINDER AT NO ADDITIONAL COST. ANY ADDITIONAL UPDATES WILL BE ISSUED AT THE COST OF \$125 PER UPDATE. FOR EACH UPDATE PROVIDED, A REVISED BINDER WILL BE ISSUED SHOWING A NEW EFFECTIVE DATE AND ANY MATTERS RECORDED SINCE THE EFFECTIVE DATE OF THE PREVIOUS BINDER.



# KEENESBURG PLANNING DEPARTMENT

## DEVELOPMENT REVIEW REFERRAL

**FROM:** TODD HODGES, TOWN PLANNER

**DATE:** JUNE 26, 2020

**PROJECT:** RK Subdivision Preliminary and Final Plan

**INTERNAL DISTRIBUTION:**

<input checked="" type="checkbox"/> City Engineer	<input checked="" type="checkbox"/> City Attorney	<input checked="" type="checkbox"/> City Clerk
<input checked="" type="checkbox"/> Public Works Manager	<input checked="" type="checkbox"/> Building Inspector	

**OUTSIDE DISTRIBUTION:**

<input checked="" type="checkbox"/> SE Weld Fire Protection District	<input checked="" type="checkbox"/> Weld County Department of Planning Services
<input checked="" type="checkbox"/> CDOT	<input type="checkbox"/> Army Corp of Engineers
<input checked="" type="checkbox"/> Atmos Energy	<input checked="" type="checkbox"/> Postmaster
<input checked="" type="checkbox"/> United Power	<input type="checkbox"/> Colorado Department of Natural Resources
<input type="checkbox"/> Colorado Division of Wildlife	<input checked="" type="checkbox"/> Weld County Public Works
<input checked="" type="checkbox"/> Weld County School District RE-3	<input checked="" type="checkbox"/> Century Link
<input type="checkbox"/> Division of Water Resources	<input type="checkbox"/> Town of Hudson

**If you have comments, please respond by:** July 17, 2020

Comments may be emailed to [toddhodesdesign@qwestoffice.net](mailto:toddhodesdesign@qwestoffice.net) or mailed to the address below. A non-response to this referral may be considered a favorable response.

**COMMENTS:**

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## THDLLC

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**From:** Kathleen Kelly <kathleen@kellypc.com>  
**Sent:** Tuesday, July 28, 2020 1:24 PM  
**To:** Todd Hodges  
**Cc:** Debra Chumley; Kent Bruxvoort (kent.bruxvoort@pec1.com)  
**Subject:** RK Subdivision -- Review Comments

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi, Todd:

We have reviewed the application materials for the preliminary and final plat for the RK Subdivision and have the following comments:

- The sketch plan approval by the Town Board has several conditions of approval, including: "Adequately address open space, signage, lighting, and landscaping for the development."
  - No open space is shown on the plat, and the application narrative indicates no open space is proposed with this application. Section 7 of the Annexation Agreement requires 12% open space or cash in lieu of dedication. We recommend a condition of approval requiring cash in lieu of 1.8 acres of land (12% of 15.06 acres).
  - Regarding landscaping, the application narratives states landscaping and irrigation will be provided by each lot owner as part of the site plan. We recommend a condition of approval requiring a note be added to the plat to inform future lot owners of this deferred obligation.
- The Property Information Binder submitted with the application materials is dated March 25, 2019. An update needs to be provided before recording the plat. If the updated PIB reflects a mortgage or other lien, a lienholder consent will need to be added to the plat.
- The Certificate of Ownership and Dedication should be revised to read as follows, following the legal description:

Have laid out, subdivided and platted said land as per drawing hereon contained under the name and style of RK Subdivision, a subdivision of a part of the Town of Keenesburg, County of Weld, State of Colorado, and by these presents do hereby dedicate to the Town of Keenesburg the streets, avenues and other public places as shown on the accompanying plat for the public use thereof forever and does further dedicate to the use of the Town of Keenesburg and all serving public utilities those portions of said real property which are so designated as easements as shown.

It is expressly understood and agreed by the undersigned that all expenses and costs involved in constructing and installing sanitary sewer works and lines, water system works and lines, gas service lines, electrical service works and lines, landscaping, curbs, gutters, street pavement, sidewalks, and other such utilities and services shall be guaranteed and paid for by the subdivider or arrangements made by the subdivider thereof which are approved by the Town of Keenesburg, Colorado, and such sums shall not be paid by the Town of Keenesburg, and that any item so constructed or installed when accepted by the Town of Keenesburg shall become the sole property of said Town of Keenesburg, Colorado, except private roadway curbs, gutter and pavement and items owned by municipality franchised utilities,



other serving public entities, and/or CenturyLink, which when constructed or installed shall remain and/or become the property of such municipality franchised utilities, other serving public entities, and/or CenturyLink. and shall not become the property of the Town of Keenesburg, Colorado.

- The Town Board approval block should be revised to read as follows:

This is to certify that the plat of RK Subdivision was approved by the Board of Trustees of the Town of Keenesburg by Resolution No. \_\_\_\_\_, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, and that the Mayor of the Town of Keenesburg, on behalf of the Town of Keenesburg, hereby acknowledges said plat upon which this certification is endorsed for all purposes indicated hereon.

Please let me know if you have any questions. Thanks.

**Kathleen M. Kelly**

Kelly PC  
999 18<sup>th</sup> Street, Suite 1450  
Denver, CO 80202  
P: (303) 298-1601 x215  
F: (303) 298-1627



\*\*\*\*\* CONFIDENTIALITY NOTICE \*\*\*\*\*

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July 9, 2020

Debra Chumley  
Town of Keenesburg Manager  
P.O. Box 312  
140 S. Main Street  
Keenesburg, CO 80643

RE: RK Subdivision, Preliminary and Final Plat  
Review of Construction Drawings and Drainage Report

Dear Debra:

Professional Engineering Consultants (PEC) reviewed the Final Plat submitted for the Preliminary and Final Plat application for the proposed RK Subdivision.

These comments should be addressed by letter or by a resubmittal of the documents, as applicable.

1. We have noticed from the Construction Drawings that access to Lots 1 and 4 may be a challenge due to storm drainage ponds and swales that cover the lot frontage. Please coordinate with Western Engineering Consultants to confirm the means of access to these lots. As applicable, access easements may need to be added to the plat.
2. Is a 10-foot easement for drainage and utilities, and perhaps access, needed at the north lot line for Lot 6?
3. Please use the term "drainage easement" rather than "detention pond easement" behind Lots 5 through 7.

Please let me know if you have any questions or comments.

Respectfully Submitted,

PROFESSIONAL ENGINEERING CONSULTANTS, PA



Kent Bruxvoort, P.E.  
Town Engineer

cc: Todd Hodges, Town Planner

July 29, 2020

Debra Chumley  
Town of Keenesburg Manager  
P.O. Box 312  
140 S. Main Street  
Keenesburg, CO 80643

RE: RK Subdivision, Preliminary and Final Plat  
Review of Construction Drawings and Drainage Report

Dear Debra:

Professional Engineering Consultants (PEC) reviewed the Final Drainage Report and Construction Drawings submitted for the Preliminary and Final Plat application for the proposed RK Subdivision. Redline comments are provided on the documents and the comments below summarize those more detailed comments.

These comments should be addressed with a resubmittal of the documents.

1. As mentioned in our comment letter at Sketch Plan, the Town would prefer that stormwater storage facilities be detention ponds rather than retention ponds. If the applicant were to choose to design with retention ponds, a thorough justification must be provided in the drainage report, and design methods from the Mile High Flood District Storm Drainage Criteria Manual, Volume 2, Chapter 12, Section 6.7 must be used for pond sizing and clearly documented. Also, the applicant would have to document that retained water will infiltrate in accordance with Colorado Revised Statutes §37-92-602(8). Currently, the design does not appear to meet storm drainage criteria based on the documentation in the drainage report.
2. We note and appreciate that the project's access from County Road 398 has been altered to make it a perpendicular intersection. The typical road section should be moved from the cover sheet to Sheet 11.
3. We note that a Trip Generation narrative has been prepared. It is our opinion that auxiliary lanes to the project are not justified by anticipated traffic volumes.
4. The Site Plan, Sheet 4, should depict how access to Lots 1 and 4 will be achieved. Both lots have storm drainage ponds and swales that cover the lot frontage.
5. Through conversation with the Town's Public Works Director, the Town directs the applicant/developer to install 1" taps for each of the seven lots, with 1-1/2" copper service lines extended to the property lines and capped. Future tap and raw water development fees for the individual lot developer will be based on actual meter size. If individual site use demands a larger tap than the 1" tap, then that user can upsize the tap as necessary.
6. We recommend deferring the sanitary sewer service sizing until the Site Plan submittal and individual onsite wastewater treatment system design for each lot.
7. The Town will require that adequate site lighting be provided at the entrance to the subdivision, to be determined through the process of negotiating the Subdivision Improvements Agreement.
8. See redline comments on construction drawings provided with this letter.

Please let me know if you have any questions or comments.

Respectfully Submitted,

PROFESSIONAL ENGINEERING CONSULTANTS, PA



Kent Bruxvoort, P.E.  
Town Engineer

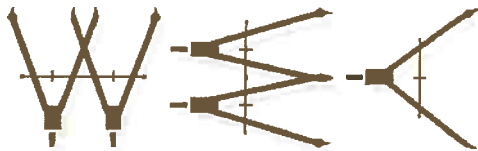
cc: Todd Hodges, Town Planner

**FINAL DRAINAGE REPORT  
FOR  
RK SUBDIVISION  
PART OF THE SW ¼ SEC 19, T2N, R63W  
KEENESBURG, COLORADO  
WELD COUNTY**

**CASE NO.**

**RICHARD ROBERTSON AND AARON KAISER  
ROBERTSON'S: 8357 WCR 51  
KEENESBURG, CO 80643**

**KAISER'S: 39673 E. 160<sup>TH</sup> AVENUE  
KEENESBURG, CO 80643**



Western Engineering Consultants inc LLC  
127 South Denver Avenue  
Fort Lupton, CO 80621

Revised:	May 19, 2020
Revised:	October 09, 2019
Original:	March 27, 2019

FINAL DRAINAGE REPORT  
FOR  
RK SUBDIVISION  
PART OF THE SW ¼ SEC 19, T2N, R63W  
KEENESBURG, COLORADO

Prepared For:

RICHARD ROBERTSON & AARON KAISER

Contact: Richard Robertson - Owner  
8537 County Road 51  
Keenesburg, CO 80643  
303-961-0031

Contact: Aaron Kaiser - Owner  
39673 E 160<sup>th</sup> Ave  
Keenesburg, CO 80643  
303-994-7947

Prepared By:

WESTERN ENGINEERING CONSULTANTS inc LLC  
127 South Denver Avenue  
Fort Lupton, CO 80621  
(720) 685-9951  
Contact: Chadwin F. Cox, P.E.

Revised: May 19, 2020  
Revised: October 09, 2019  
Original: March 27, 2019

## CERTIFICATIONS

I hereby certify that this report and plan for the drainage design of Town of Keenesburg RK Subdivision was prepared by me, or under my direct supervision, for the owners thereof, in accordance with the provisions of Colorado Floodplain and Stormwater Criteria Manual, and Urban Drainage and Flood Control District Design and Technical Criteria, and approved variances and exceptions hereto. I understand that Town of Keenesburg does not and will not assume liability for drainage facilities designed by others.

\_\_\_\_\_  
Chadwin F. Cox, P.E.  
Registered Professional Engineer  
State of Colorado No. 33802

*Richard Robertson and Aaron Kaiser hereby certify that the drainage facilities for RK Subdivision design shall be constructed according to the design presented in this report. I understand that the Town of Keenesburg does not and will not assume liability for the drainage facilities designed and/or certified by my engineer, and that the Town of Keenesburg reviews drainage plans pursuant to Colorado revised Statutes Title 30, Article 28, but cannot, on behalf of RK Subdivision, guarantee that final drainage design review will absolve RK Subdivision and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat, Final Development Plan, and/or Subdivision Development Plan does not imply approval of my engineer's drainage design.*

\_\_\_\_\_  
**RK Subdivision**  
**Richard Robertson or Owner's Representative**

\_\_\_\_\_  
**RK Subdivision**  
**Aaron Kaiser or Owner's Representative**



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## **APPENDICES**

### **APPENDIX A**

Vicinity Map (USGS)  
Key Map (Google Earth)  
FEMA Firmette  
Soil Survey Map & Soil Legend  
Geotechnical Study

### **APPENDIX B**

UDFCD Runoff & Rational Method References  
NOAA Atlas 14 Rainfall - Point Precipitation Frequency

### **APPENDIX C**

Infiltration Pond Design, and Channel Capacities, etc.

### **APPENDIX D**

Drainage Plan – (full size – 24 x 36)



Not a technical comment, but throughout this report the site is referred to as "bare." I think it would be more accurate to say "native vegetation" or something like that. Or "undeveloped" if that's the point being made.

## INTRODUCTION

This study provides the final design for the construction of RK Subdivision. The overall site is an approximate 15.06 acre property as defined by the Final Plat prepared by American West Land Surveying Co. dated July 28, 2019.

The proposed RK Subdivision site is proposed on an undeveloped site. The existing site is predominantly bare except for some piled materials near the middle of the site.

The project shall include approximately seven (7) Commercial Lots. A 60 foot right-of-way is proposed to be constructed from County Road 398 north between the lots.

RK Subdivisions lies approximately two miles northeast of the I-76 interchange with Market St. County Road 398 is the south border.

The entire RK Subdivision site and all adjacent and surrounding properties are historically tributary to Lost Creek which lies approximately 2 miles southeast of the site, which ultimately flows into the South Platte River which lies approximately 16 miles northeast of Lost Creek.

Based on the initial coordination with the Town, no Final Drainage Studies for any property north of Interstate 76 including adjacent properties were known to exist.

south

RK Subdivision does not lie within a Master Flood or Drainage Planned Study. The entire subdivision is within Zone X "Area of Minimal Flood Hazard" and not within the 100 year floodplain per FEMA FIRM 08123C2180E – effective January 20, 2016.

## I. GENERAL LOCATION AND DESCRIPTION

### A. Site Location

The property lies in the Southwest ¼ of Section 19, Township 2 North, Range 63 West of the 6<sup>th</sup> P.M.

The overall property nets 15.06 acres +/- . County Road 398 lies along the southern border.

A vicinity and key map of the site are included in Appendix A of this study as well as on the following page.

The scales below are not accurate since the maps included herein are for exhibit purposes only.

*RK Subdivision – Final Drainage Report  
Town of Keenesburg Case #xxx*

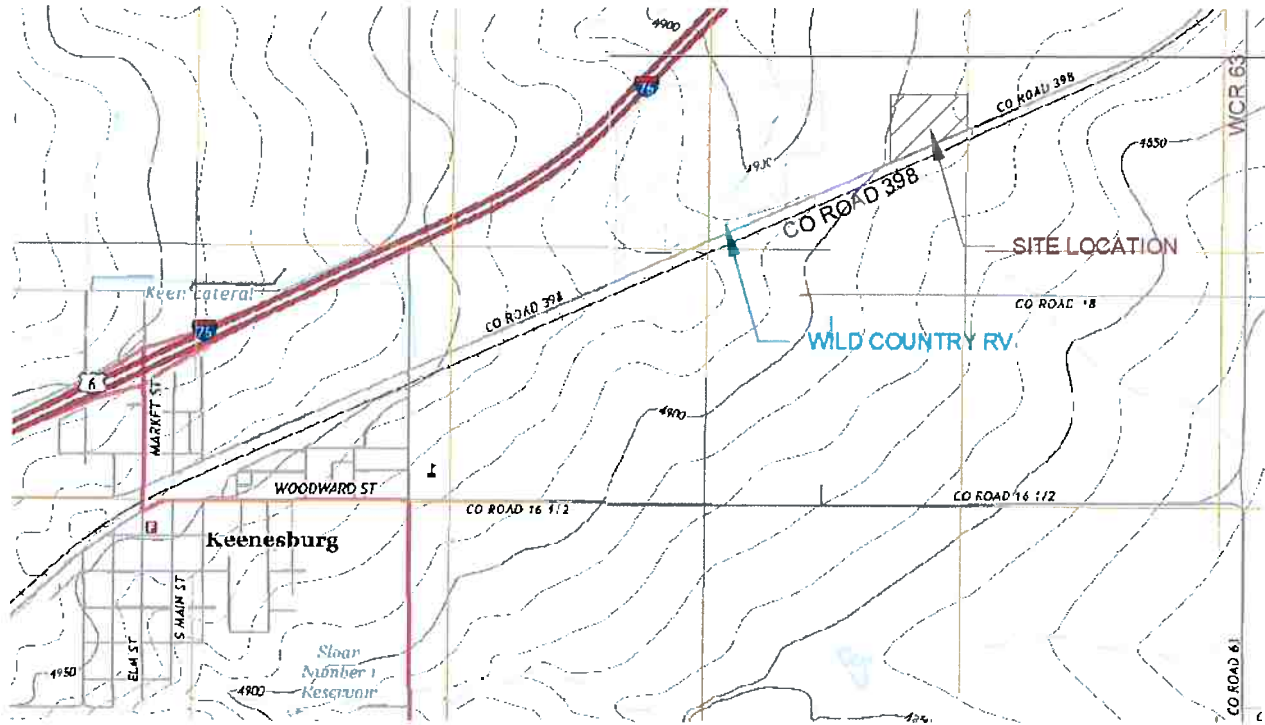


The Google Earth Exhibit above shows the site and the adjacent properties and their relationship to I-76 and Weld County Roads in the Town of Keenesburg.

*RK Subdivision – Final Drainage Report  
Town of Keenesburg Case # xxx*

*May 19, 2020*

Page 2 of 16



The USGS Exhibit above details historic topography of project site, Interstate 76, Weld County Roads and their proximity to the Town of Keenesburg.

*RK Subdivision – Final Drainage Report  
Town of Keenesburg Case # xxx*

The runoff condition from the site needs to be clarified. It is stated here that the site slopes to the roadside ditch. But design of infiltration ponds was justified by the statement that the site has no formal outfall.

B. Description of Property

The metes and bounds legal description for the property is included in Appendix A.

Currently this parcel has slight to moderate topographical relief – 17 feet from the northwest edge (4904 elevation) to the southeast edge (4887 elevation). Ultimately the site does slope generally in one direction – to the southeast corner of the site to the County Road 398 ditch which runs adjacent to the property. Existing slopes average at 1.55%. The historic slopes appear to be 1.0% based on the USGS Quad from west to east.

The existing grades in general match the historical direction per USGS Quad maps.

The approximate grade at the four corners of the property are as follows – 4904.69 NW corner, 4891.50 NE corner, 4886.85 SE corner, and 4898.70 SW corner of RK Subdivision.

The subdivision is made up of multiple soil types, all NRCS classified B soils. The subdivision consists of 18 (Colby-Adena Loams) and 47 (Olney Fine Sandy Loam).

The adjacent R.O.W. basin to the south as well as the off-site basin to the west are the same NRCS soil types (Type B). The off-site basin to the northwest is a different NRCS soil type (Type C). All soil types are noted as well drained. Soils classifications were taken from Hydrologic Soil Type Map (Appendix A) USDA Soil Survey.

Be consistent,  
see p. 5

## II. DRAINAGE BASINS AND SUB-BASINS

A. Major Drainage Basins

The RK Subdivision Site is solely located in the South Platte River basin and all existing and developed drainage is ultimately tributary to the South Platte River. The historic and existing basins are shown on sheet 04 and 05.

### HISTORIC

**Basin H** (15.06 ac) includes everything but the off-site basins (OFF N, OFF W) to the north and west. As noted above, the historic grades (1.0%) drained off-site to the northeast. As noted previously, the entirety of the site and this basin is (100%) NRCS Soil Type B.

All runoff values presented herein have been prepared with the recently updated method of check for time of concentration – the UDFCD 2017 equation of:  $(26-17i) + [L_{\text{travel}} / (60*(14i + 9)*(S_o)^{.5})]$ . All values provided in this study are as determined by the 2017 time of concentration check.

The Historic effective imperviousness value used was 2.0%. The minor (5yr) storm runoff is approximately 0.17 cfs, and the major storm runoff is approx. 17.28 cfs at Design Point H1.



## **EXISTING**

**Basin E** (15.06 ac) includes everything but the off-site basins (OFF N, OFF W) to the north and west. As noted previously the topography slopes at 1.55% throughout the basin. The entirety of the site and this basin is (100%) NRCS Soil Type B.

The existing effective imperviousness value used was modeled at 2.0% since the overall basin (primarily undeveloped) includes the developed gas station, convenience store, and asphalt parking lot. The minor (5yr) storm runoff is approximately 0.29 cfs, and the major storm runoff is approximately 30.27 cfs at Design Point E1.

## **OFFSITE BASINS**

**Basin OFF-N** includes part of the existing Parcels 130319000003 and 130524000026 to the north and northwest of the site. The basin is uphill ~~from the site and drains~~ on-site at approximately 1.0%. The Basin is predominantly NRCS Soil Type B. **Type C?**

The effective imperviousness value used is 3.66% as the basin is bare ground with some existing buildings. The minor (5yr) storm-runoff is approximately 0.39 cfs, and the major storm runoff is approximately 17.17 cfs at Design Point OFF N.

Proposed grading is designed to capture the runoff from this basin and send it to either Pond 4 or Pond 5-7 through swale 4N or swale 5N, respectively.

**Basin OFF-W** includes part of the existing Parcels 130319000011, 130524400042, and 130524000026 to the west and northwest of the site. The basin is uphill from the site and drains on-site at approximately 1.3%. The Basin is predominantly NRCS Soil Type B.

The effective imperviousness value used is 6.00% as the basin is predominately bare ground with existing asphalt parking and an existing building. The minor (5yr) storm-runoff is approximately 1.15 cfs, and the major storm runoff is approximately 28.93 cfs at Design Point OFF W.

Proposed grading is designed to capture the runoff from this basin and send it to one of the drainage ponds on the west half of the site (Pond 1, 2-3, or 4) through on-site drainage swales.

## B. Minor Developed Drainage Basins

The Developed sub-basins related to this project are shown on sheet 07.

This study provides the final developed drainage characteristics for the ~ 15.06 acre site.

The developed basins for the RK Subdivision site are defined as Basins Lot 1, Lot 2, Lot 3, Lot 4, Lot 5, Lot 6, Lot 7, and ROW RK. Basin Lot 1 includes the designed Subdivision Infiltration Pond 1. Basins Lot 2 and Lot 3 share the designed Subdivision Infiltration Pond 2-3. Basin Lot 4 includes the designed Subdivision Infiltration Pond 4. Basins Lot 5, Lot 6, and Lot 7 share the designed Subdivision Infiltration Pond 5-7.

The weighted average imperviousness for the entire site (All Basins without 100 year pond water surfaces is 39.85%).

Each minor storm event referred to below is the 5 year event and each major storm event referred to below is the 100 year event. The 10 year event has also been calculated.

Calculations are carried out to the hundredths for consistency purposes only.

### 1. Basin Lot 1 (1.96 acres)

Basin Lot 1 is the developed lot in the southwest corner of the site. Although this basin is currently undeveloped bare ground, it has been modeled to receive a 6,300 square foot concrete building pad in the future.

Runoff from Basin Lot 1 begins at the west edge of the building pad and will be directed overland west to Swale 1W then south towards Swale 1S and ultimately east to the proposed concrete rundown to Forebay 1 in Infiltration Pond 1. The release from Basin Lot 1 occurs at Design Point 1 where Swale 1S meets Pond 1.

The developed effective imperviousness value calculated for Basin Lot 1 is 43.65% and the Rational runoff calculations were based on said existing conditions. NRCS Soil Type for this basin is solely Type B. The minor (5yr) storm runoff is approximately 1.34 cfs, and the major storm runoff approximately 5.45 cfs.

2. Basin Lot 2 (1.70 acres)

Basin Lot 2 is one of the center lots on the west half of the site, located directly north of Lot 1. Although this Basin is currently undeveloped bare ground, it has been modeled to receive a 6,300 square foot concrete building pad in the future.

Runoff from Basin Lot 2 begins at the west edge of the building pad and is directed overland west towards Swale 2W then south towards Swale 2S and ultimately east and northeast to the proposed concrete rundown to Forebay 2/3 S in Infiltration Pond 2-3. The release from Basin Lot 2 occurs at Design Point 2 where Swale 2S meets Pond 2-3.

The developed effective imperviousness value calculated for Basin Lot 2 is 43.03%. NRCS Soil Type for this basin is solely Type B. The minor storm runoff is 2.27 cfs, and the major storm runoff is 9.39 cfs. Calculations were carried out to the hundredths for consistency purposes only.

3. Basin Lot 3 (1.65 acres)

Basin Lot 3 is one of the center lots on the west half of the site, located directly north of Lot 2. Although this Basin is currently undeveloped bare ground, it has been modeled to receive a 6,300 square foot concrete building pad in the future.

Runoff from Basin Lot 3 begins in the northeast corner of the building pad and is directed overland west towards Swale 3W then south towards Swale 3S and ultimately east and northeast to the proposed concrete rundown to Forebay 2/3 N in Infiltration Pond 2-3. The release from Basin Lot 3 occurs at Design Point 3 where Swale 3S meets Pond 2-3.

The developed effective imperviousness value calculated for Basin Lot 3 is 31.37%. NRCS Soil Type for this basin is solely Type B. The minor storm runoff is 0.80 cfs, and the major storm runoff is 4.16 cfs. Calculations were carried out to the hundredths for consistency purposes only.

4. Basin Lot 4 (2.00 acres)  
Basin Lot 4 is located in the northwest corner of the site. Although this Basin is currently undeveloped bare ground, it has been modeled to receive a 5,400 square foot concrete building pad in the future.

Runoff from Basin Lot 4 begins in the northeast corner of the building pad and is directed overland northeast towards Swale 4N then east towards Swale 4E and ultimately south to the proposed concrete rundown to Forebay 4 in Infiltration Pond 4. The release from Basin Lot 4 occurs at Design Point 4 where Swale 4E meets Pond 4.

The developed effective imperviousness value calculated for Basin Lot 4 is 41.34%. NRCS Soil Type for this basin is solely Type B. The minor storm runoff is 1.50 cfs, and the major storm runoff is 6.38 cfs. Calculations were carried out to the hundredths for consistency purposes only.

5. Basin Lot 5 (1.95 acres)  
Basin Lot 5 is located in the northeast corner of the site. Although this Basin is currently undeveloped bare ground, it has been modeled to receive a 6,300 square foot concrete building pad in the future.

Runoff from Basin Lot 5 begins in the northwest corner of the building pad and is directed overland north towards Swale 5N then east and ultimately to the proposed concrete rundown to Forebay 5/6/7 N in Infiltration Pond 5-7. The release from Basin Lot 5 occurs at Design Point 5 where Swale 5N meets Pond 5-7.

The developed effective imperviousness value calculated for Basin Lot 5 is 43.65%. NRCS Soil Type for this basin is solely Type B. The minor storm runoff is 1.95 cfs, and the major storm runoff is 7.96 cfs. Calculations were carried out to the hundredths for consistency purposes only.

6. Basin Lot 6 (2.32 acres)  
Basin Lot 6 is the center lot on the east half of the site. Although this Basin is currently undeveloped bare ground, it has been modeled to receive a 6,300 square foot concrete building pad in the future.

Runoff from Basin Lot 6 begins in the southwest corner of the building pad and is directed overland south towards Swale 6-7 then east ultimately to the proposed concrete rundown to Forebay 5/6/7 N in Infiltration Pond 5-7. The release from Basin Lot 6 occurs at Design Point 6 where Swale 6-7 meets Pond 5-7.

The developed effective imperviousness value calculated for Basin Lot 6 is 43.03%. NRCS Soil Type for this basin is solely Type B. The minor storm runoff is 1.77 cfs, and the major storm runoff is 7.31 cfs. Calculations were carried out to the hundredths for consistency purposes only.

7. Basin Lot 7 (2.18 acres)  
Basin Lot 7 is located on the southeast corner of the site. Although this Basin is currently undeveloped bare ground, it has been modeled to receive a 6,300 square foot concrete building pad in the future.

Runoff from Basin Lot 7 begins in the south side of the building pad and is directed overland south to Swale 7S then northeast and ultimately to the proposed concrete rundown to Forebay 5/6/7 S in Infiltration Pond 5-7. The release from Basin Lot 7 occurs at Design Point 7 where Swale 7S meets Pond 5-7.

The developed effective imperviousness value calculated for Basin Lot 7 is 31.37%. NRCS Soil Type for this basin is solely Type B. The minor storm runoff is 1.14 cfs, and the major storm runoff is 5.96 cfs. Calculations were carried out to the hundredths for consistency purposes only.

8. Basin ROW RK (0.73 acres)  
Basin ROW RK includes the proposed RK Drive to the middle of the site. This basin was mapped from the north end of the proposed cul-de-sac south to the south property line of the site.

The 500 foot length of Road has a low point at the south property line, sloping at 0.5% from the north. The Basin is NRCS Soil Type B.

The effective imperviousness value used is 41.34% and was based on the 32 foot wide asphalt section and four (4) foot gravel shoulder. The minor (5yr) storm runoff is approximately 0.59 cfs, and the major storm runoff is approximately 2.51 cfs at Design Point 8.

Does the runoff from this basin drain to Ponds 1 and 5/6/7, or to the CR398 ROW?

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### III. DRAINAGE DESIGN CRITERIA

#### A. Regulations

The calculations provided in this letter report have been prepared in conformance with the Town of Keenesburg Development Standards and Regulations (Ref 1) – per Professional Engineering Consultants direction that the Town has adopted the Colorado Water Conservation Board and Colorado Department of Natural Resources “*Colorado Floodplain and Stormwater Criteria Manual Volumes 1 and 2*” (Ref 3), and “*Urban Drainage Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual, Volumes I thru III*” (Ref 2), latest release unless otherwise noted.

All design elements outlined in this report, and illustrated in the construction plans, are proposed as final conditions (as directed, assumed, or otherwise prepared) in order to complete the development of this Project.

#### B. Drainage Studies, Outfall Systems Plans, Site Constraints

No apparent Final Drainage Study appears to have been prepared as part of this property in the past. The Town of Keenesburg falls just outside of the Urban Drainage boundary.

Coordination with Town staff confirmed ~~no~~ Final Drainage Report is known to exist for this property or any Town limit property north of Interstate 76.

No significant constraint was ~~identified as part of the design of this project~~ beyond the flat nature of the area and ~~existing encroachment of the Senior Center to the east.~~ ?

#### C. Hydrology

The rainfall intensity information was obtained from the NOAA Atlas 14 using 1 hour rainfall depths as taken from UDSDC Manual Vol 1 (Ref 2).

Town of Keenesburg adopted the Colorado Water Conservation Board and Colorado Department of Natural Resources “*Colorado Floodplain and Stormwater Criteria Manual Volumes 1 and 2*” (Ref 3), and “*Urban Drainage Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual, Volumes I thru III*” (Ref 2), latest release unless otherwise noted were utilized for confirmation of 100 year and 10 year event storm rainfall data.

Upon review of the aforementioned references, the NOAA Atlas 14 was referenced and data derived for 1 hour rainfall depths at 2, 5, 10, and 100 year events are as follows:

DESIGN STORM	WEC Derived from USDCM NOAA Atlas 14
	1-hr Event (inches)
2	0.87
5	1.14
10	1.42
100	2.66

The precipitation depth derived from the NOAA Atlas 14 by WEC for the 1-hour design storm was 2.66 inches rainfall depth for the 100-year storm, 1.42 inches rainfall depth for the 10-year storm, and 1.14 inches rainfall depth for the 5 year storm.

The Rational Method for storm-water runoff calculations, using the Equations as described in the UDFCD (Reference 2) Criteria Manual Chapter 5 Runoff was used to calculate stormwater flows within this study. The run-off coefficient 'C' values were obtained from the UDFCD (Reference 2) Criteria Manual as well based on the predominate NRCS Soil Type.

It appears no on site water quality or detention has been provided or maintained for any of the adjacent or neighboring properties (currently primarily open space).

The use of weighted runoff coefficients is to accurately portray the proposed final conditions of the maximum build out (maximum lot coverage) for this project based on the best available information at this time. Sole use of Table RO-5 is applicable for Master Plan Drainage analysis including projects of this type – however calculation of proposed final conditions using weighted runoff coefficients provides a more thorough and accurate analysis.

The site has been modeled based on the current expected build out conditions. However, should additional paving occur the Swale conveyances have been sized to handle added runoff.

No other offsite basins have been modeled beyond those noted previously (OFF-N, OFF-W, and ROW-398) since the adjacent surveyed topography indicated adjacent runoff is not directed onto this property (nor is runoff directed from this property due to the existing grades being directed off-site to the existing WCR 398 road-side ditch).

It is the expectation of this study that any development or improvements to the property adjacent will require them to provide appropriate stormwater design(s).

This project will not negatively affect the adjacent property and will provide modern stormwater control that does not currently exist. In short, this project will be an enormous improvement to the area.



D. Hydraulics

The conveyance of onsite site stormwater occurs primarily overland across pavements and then through landscape and into swales that will ultimately convey runoff to proposed infiltration ponds. Please see Appendix C for all related swale and pond capacities.

There are no major drainage ways on this site or immediately adjacent. The South Platte River lies approximately 16 miles northeast.

E. Water Quality Enhancement

Water quality will be provided by overland runoff (gravel or vegetated native grasses) and also by the proposed grassed pond bottoms. Additional grass swales may be incorporated by the future Lots.

F. Groundwater

Project Geotechnical Reports have been completed at each proposed pond location by High Plains Engineering & Design, LLC dated January 22, 2020 and can be found in Appendix A.

No groundwater was encountered during the subsurface investigations.

Developed runoff is not anticipated to increase groundwater levels but will be infiltrated into the subsurface soils.

Should groundwater levels surface (above the design bottom) at any time for more than 24 hours the Engineer of Record should be contacted and plans to mitigate said groundwater be undertaken (i.e. cleaning of outlet structure and/or raising of Pond bottom above groundwater).

#### **IV. STORMWATER MANAGEMENT FACILITY DESIGN**

A. Stormwater Conveyance Facilities

Runoff analysis for stormwater management has been included and presented in this report.

No Master study exists for this area.

Capacity calculations for the proposed Swales are included in Appendix C.

We would like to see more justification for the design and more clarification on the approach used--the language is confusing. Please state whether the design is for detention with release to the roadside swale or whether it is for retention and infiltration, with provision for spilling extremely large events. It seems the site does have a formal outfall with the CR398 roadside ditch. We'd like to see more justification for the approach than this statement.

B. Stormwater Storage Facilities

Traditional Stormwater storage and attenuation (water quality and infiltration) is currently proposed since this site does not currently have a source of formal outfall. Multiple Infiltration Ponds have been designed to contain the developed runoff from the site.

UDFCD Criteria Volumes (Ref 2) were referenced for determining necessary storage volumes.

Four independent volumes were calculated – (1) WQCV, (2) Required EURV, (3) required 100 yr, (4) Available volume @ Emergency Overflow. UDFCD UD spreadsheet version 3.07 was utilized to calculate said volumes;

Pond 1: (1) 1,540 cubic feet, (2) 5,042 cubic feet, (3) 34,010 cubic feet, and (4) 34,811 cubic feet.

Pond 2-3: (1) 2,595 cubic feet, (2) 8,186 cubic feet, (3) 61,482 cubic feet, and (4) 66,313 cubic feet.

Pond 4: (1) 2,316 cubic feet, (2) 7,58 cubic feet, (3) 36,320 cubic feet, and (4) 36,543 cubic feet.

Pond 5-7: (1) 5,747 cubic feet, (2) 18,382 cubic feet, (3) 194,887 cubic feet, and (4) 200,402 cubic feet.

The current RK Subdivision Pond 1 storage/grading design provides volume for proposed Lot 1 (maximized imperviousness of 43.65%). Pond 2-3 storage/grading design provides volume for the proposed Lots 2 and 3 (maximized imperviousness of 43.03%). Pond 4 storage/design provides volume for proposed Lot 4 (maximized imperviousness of 41.34%). Pond 5-7 storage/design provides volume (1.5x100yr Storm) for proposed Lots 5, 6, and 7 (maximized imperviousness of 43.65%).

Each pond has been designed with an emergency overflow spillway wall that will allow stored water to exit the ponds into the designed spillway channels before overtopping the top of the ponds. Each spillway was designed the carry 2x100yr developed runoff with a flow depth of no more than 6". See Sheet 17D of the Construction Drawings for the spillway wall and channel details.

All calculations are included in Appendix C.

I'm pretty sure the design intent is for retention ponds--I don't see design of outlet control structures and pipes. But we need to see the infiltration calculations documenting that the ponds will infiltrate within the State-mandated time frames, similar to the approach taken with the Altitude Energy pond. And the pond volumes will have to be sized in accordance with MHFD Criteria Manual Volume 2, Chapter 12, Section 6.7.

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C. Water Quality BMP's

Overland runoff will provide some water quality. Infiltration Pond Forebays will treat all routed runoff. Additional BMP's in accordance with current UDFCD Volume III criteria (Ref 2) may be added in the future.

D. Floodplain

This project does not lie within a floodplain. The entire subdivision is within Zone X "Area of Minimal Flood Hazard" per FEMA FIRM 08123C2180E – effective January 20, 2016. See also the FIRMETTE map included Appendix A.

E. Groundwater

Typical Lot runoff is expected to moderately infiltrate the seeded grasses and gravel covered site under most minor events. Under multiple minor events or major events runoff is expected to sheet flow to adjacent swales and be routed to the appropriate Subdivision Infiltration Pond as designed. Minimal effect to the groundwater is expected.

F. Additional permitting

No additional permitting is anticipated.

G. Storm System Maintenance

This section defines the maintenance responsibilities for RK Subdivision:

- Swales – including but not limited to mowing, weed control, cleaning and removing debris, removing accumulated sediment, adding erosion control, and replacement of any damaged or failing improvements. Improvements for Swales include the concrete pan and adjacent grades and vegetation.
- Drainage Basins – including but not limited to mowing, weed control, cleaning and removing debris, removing accumulated sediment, adding erosion control, and replacement of any damaged or failing improvements. Improvements for each Basin beyond all Swales include the on-site grading, on site native grass, and proposed concrete curb adjacent to all proposed Buildings, parking, and access.
- Infiltration Ponds – including but not limited to mowing, weed control, cleaning and removing debris, removing accumulated sediment, adding erosion control, and replacement of any damaged or failing improvements. Improvements for the Infiltration Ponds includes 4:1 seeded slopes, forebays, trickle pan, and the pond bottoms.

Frequency of inspections and maintenance are as follows:

- Swales, Basins, and Infiltration Ponds should be inspected monthly or within 24 hours of each measureable precipitation event.
- Any damaged or lost material (riprap) should be replaced immediately
- Mowing should occur monthly or more often depending upon growth.
- Weed control should occur a minimum of two times per spring/summer/fall season
- Cleaning beyond inspections noted above should occur at a minimum of annually

## V. CONCLUSIONS

### A. Compliance with standards

This Drainage Study for the RK Subdivision site is located in Town limits and was prepared in conformance with the Town of Keenesburg Development Standards and Regulations (Ref 1), the Colorado Water Conservation Board and Colorado Department of Natural Resources “*Colorado Floodplain and Stormwater Criteria Manual Volumes 1 and 2*” (Ref 3), and the Urban Drainage Flood Control District Storm Drainage Design and Technical Criteria (Ref 2).

This drainage design and concept quantifies the requirements to manage stormwater runoff.

### B. Variances

No variance is proposed or requested.

This is not in compliance with standards unless WEC documents that the retention ponds are designed in accordance with MHFD Criteria for volume retention and meet State release time frames per CRS Section 37-92-602(8).

### C. Drainage concept

The intent of this design is to provide the drainage analysis necessary for capture, routing, and infiltration of the runoff generated by the RK Subdivision property.

### D. Additional Items

No additional items were considered at this time.

## VI. REFERENCES

1. Weld County Storm Drainage Design Manual “Weld County Engineering and Construction Criteria – Chapter 5: Drainage Criteria” Revised April 2012.
2. Urban Storm Drainage Criteria Manual, Volumes I-III, Denver Regional Council of Governments, 2016, Revised 2017 & 2018, and all subsequent updates
3. Colorado Water Conservation Board and Colorado department of Natural Resources “Colorado Floodplain and Stormwater Criteria Manual Volumes 1 and 2”

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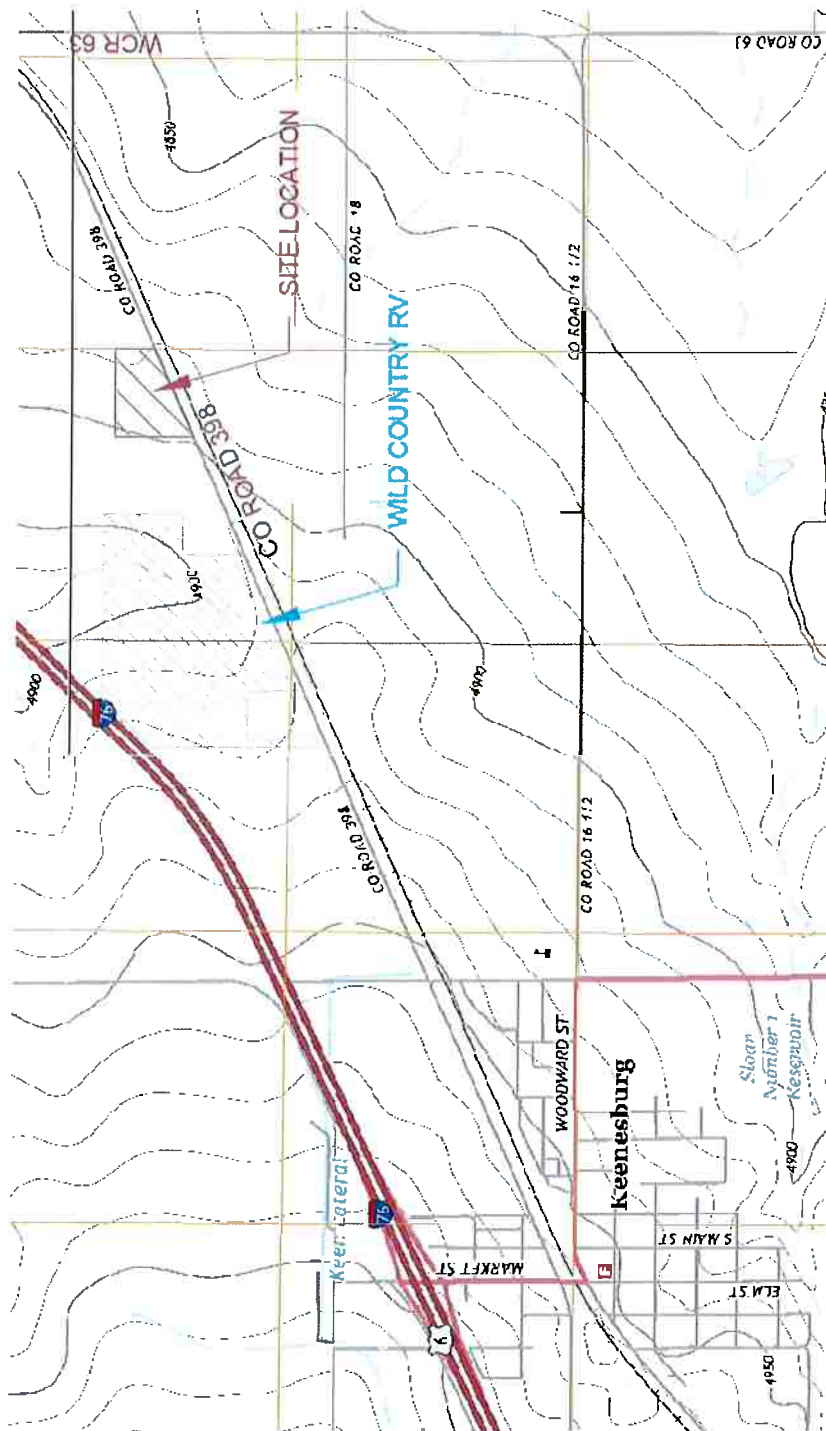
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# APPENDIX A

Vicinity Map (USGS) / Key Map / FEMA Flood Insurance Rate Map (FIRM),  
Legal Description, Soil Survey Map and Soil Legend, Geotechnical Report







# National Flood Hazard Layer FIRMette



40°7'34.37"N



USGS The National Map Orthoimagery. Data refreshed October, 2017.  
40°7'6.86"N  
104°28'49.71"W

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**

Without Base Flood Elevation (BFE)  
*Zone A, V, A99*

With BFE or Depth *Zone AE, AO, AH, VE, AP*

Regulatory Floodway

0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone 2*

Future Conditions 1% Annual Chance Flood Hazard *Zone X*

Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*

Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**

NO SCREEN

Area of Minimal Flood Hazard *Zone X*

Effective LOMRS

Area of Undetermined Flood Hazard *Zone X*

**GENERAL STRUCTURES**

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

**OTHER FEATURES**

Cross Sections with 1% Annual Chance Water Surface Elevation

Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

**MAP PANELS**

Digital Data Available

No Digital Data Available

Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **3/27/2019 at 6:57:24 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for **Weld County, Colorado, Southern Part**

## RK Subdivision



March 21, 2019



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil



## Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

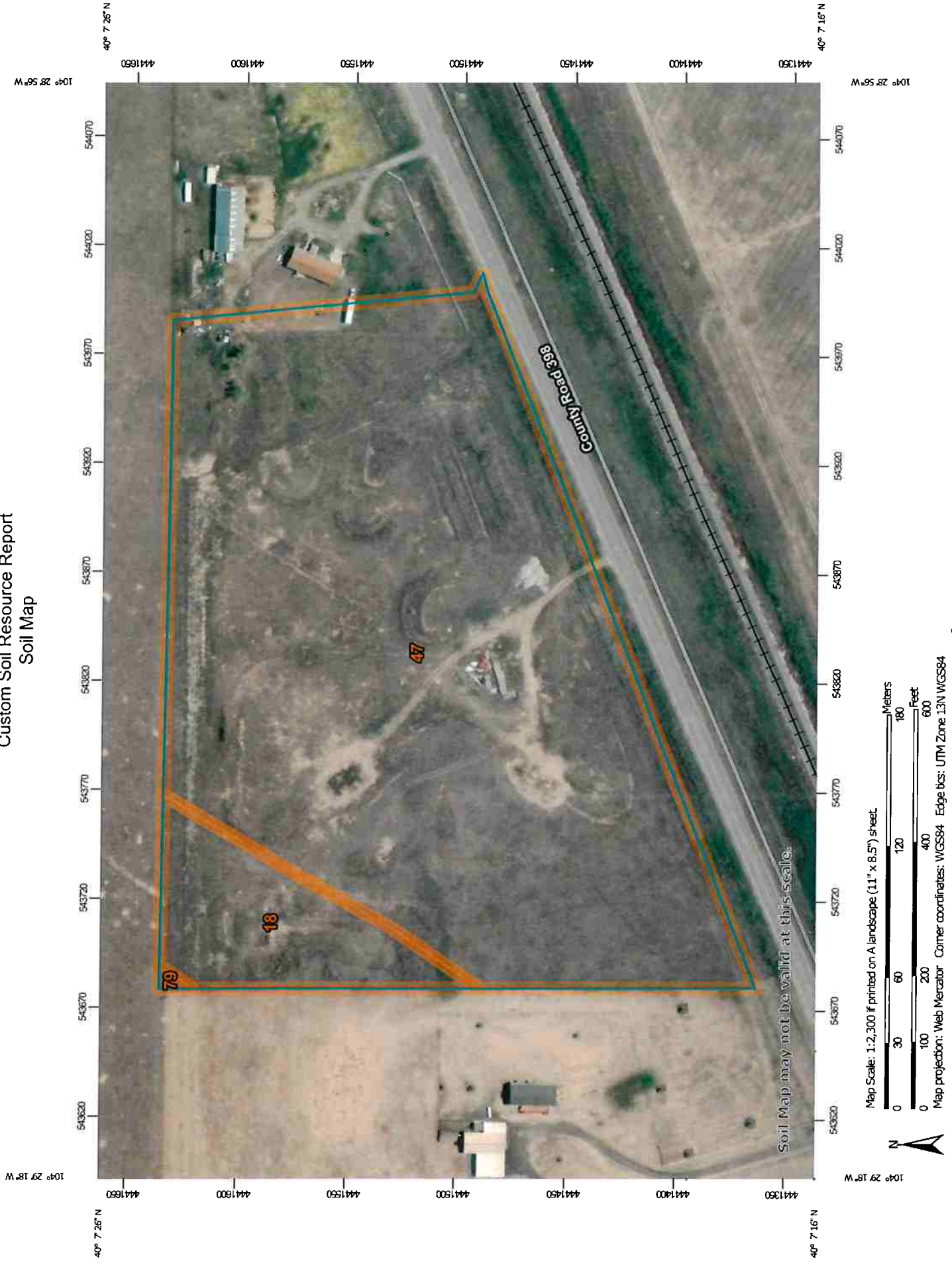
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map





## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
18	Colby-Adena loams, 3 to 9 percent slopes	1.6	10.1%
47	Olney fine sandy loam, 1 to 3 percent slopes	14.6	89.8%
79	Weld loam, 1 to 3 percent slopes	0.0	0.1%
<b>Totals for Area of Interest</b>		<b>16.2</b>	<b>100.0%</b>

## Map Unit Descriptions

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, 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

## Custom Soil Resource Report

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*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one 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.

## Weld County, Colorado, Southern Part

### 18—Colby-Adena loams, 3 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 361t  
*Elevation:* 4,750 to 4,900 feet  
*Mean annual precipitation:* 12 to 16 inches  
*Mean annual air temperature:* 48 to 55 degrees F  
*Frost-free period:* 120 to 160 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Colby and similar soils:* 55 percent  
*Adena and similar soils:* 30 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Colby

##### Setting

*Landform:* Ridges, hills, plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Calcareous eolian deposits

##### Typical profile

*H1 - 0 to 7 inches:* loam  
*H2 - 7 to 60 inches:* silt loam

##### Properties and qualities

*Slope:* 5 to 9 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 2.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 15 percent  
*Available water storage in profile:* High (about 10.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4e  
*Hydrologic Soil Group:* B  
*Ecological site:* Loamy Slopes (R067BY008CO)  
*Hydric soil rating:* No

#### Description of Adena

##### Setting

*Landform:* Hills, plains, ridges  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear



## Custom Soil Resource Report

*Parent material:* Calcareous eolian deposits

### Typical profile

*H1 - 0 to 6 inches:* loam

*H2 - 6 to 9 inches:* clay loam

*H3 - 9 to 60 inches:* silt loam

### Properties and qualities

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Runoff class:* Medium

*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 in profile:* 15 percent

*Available water storage in profile:* High (about 10.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* 3e

*Land capability classification (nonirrigated):* 4e

*Hydrologic Soil Group:* C

*Ecological site:* Loamy Plains (R067BY002CO)

*Hydric soil rating:* No

### Minor Components

#### Kim

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### Keith

*Percent of map unit:* 4 percent

*Hydric soil rating:* No

#### Weld

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

#### Wiley

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

## 47—Olney fine sandy loam, 1 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 362v

*Elevation:* 4,600 to 5,200 feet

*Mean annual precipitation:* 11 to 15 inches

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*Mean annual air temperature:* 46 to 54 degrees F

*Frost-free period:* 125 to 175 days

*Farmland classification:* Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

### Map Unit Composition

*Olney and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Olney

#### Setting

*Landform:* Plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Mixed deposit outwash

#### Typical profile

*H1 - 0 to 10 inches:* fine sandy loam

*H2 - 10 to 20 inches:* sandy clay loam

*H3 - 20 to 25 inches:* sandy clay loam

*H4 - 25 to 60 inches:* fine sandy loam

#### Properties and qualities

*Slope:* 1 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 15 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water storage in profile:* Moderate (about 7.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3e

*Land capability classification (nonirrigated):* 4c

*Hydrologic Soil Group:* B

*Ecological site:* Sandy Plains (R067BY024CO)

*Hydric soil rating:* No

### Minor Components

#### Zigweid

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

#### Vona

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

## 79—Weld loam, 1 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 2x0hw  
*Elevation:* 3,600 to 5,750 feet  
*Mean annual precipitation:* 12 to 17 inches  
*Mean annual air temperature:* 46 to 54 degrees F  
*Frost-free period:* 115 to 155 days  
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Weld and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Weld

#### Setting

*Landform:* Interfluves  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Calcareous loess

#### Typical profile

*Ap - 0 to 8 inches:* loam  
*Bt1 - 8 to 12 inches:* clay  
*Bt2 - 12 to 15 inches:* clay loam  
*Btk - 15 to 28 inches:* loam  
*Bk - 28 to 60 inches:* silt loam  
*C - 60 to 80 inches:* silt loam

#### Properties and qualities

*Slope:* 1 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 14 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 5.0  
*Available water storage in profile:* High (about 11.3 inches)

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### Interpretive groups

*Land capability classification (irrigated): 2e*  
*Land capability classification (nonirrigated): 3c*  
*Hydrologic Soil Group: C*  
*Ecological site: Loamy Plains (R067BY002CO)*  
*Hydric soil rating: No*

### Minor Components

#### Adena

*Percent of map unit: 8 percent*  
*Landform: Interfluves*  
*Landform position (two-dimensional): Shoulder*  
*Landform position (three-dimensional): Interfluve*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Ecological site: Loamy Plains (R067BY002CO)*  
*Hydric soil rating: No*

#### Colby

*Percent of map unit: 7 percent*  
*Landform: Hillslopes*  
*Landform position (two-dimensional): Backslope*  
*Landform position (three-dimensional): Side slope*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Ecological site: Loamy Plains (R067BY002CO)*  
*Hydric soil rating: No*

#### Keith

*Percent of map unit: 3 percent*  
*Landform: Interfluves*  
*Landform position (two-dimensional): Summit*  
*Landform position (three-dimensional): Interfluve*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Ecological site: Loamy Plains (R067BY002CO)*  
*Hydric soil rating: No*

#### Baca

*Percent of map unit: 2 percent*  
*Landform: Interfluves*  
*Landform position (two-dimensional): Shoulder, summit*  
*Landform position (three-dimensional): Interfluve*  
*Down-slope shape: Linear, convex*  
*Across-slope shape: Linear, convex*  
*Ecological site: Loamy Plains (R067BY002CO)*  
*Hydric soil rating: No*

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**HIGH PLAINS ENGINEERING & DESIGN, LLC**

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## **SUBSURFACE INVESTIGATION AND FOUNDATION RECOMMENDATIONS**

***Prepared For:***

Platte River Investments, Inc.  
8537 County Road 51  
Keenesburg, CO 80643

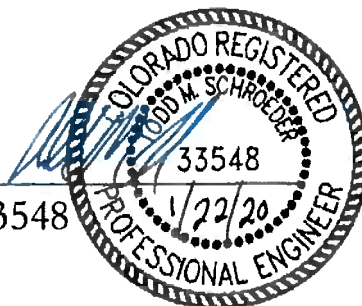
***Job Site Located At:***

Future 1.83 Acre Parcel Currently Located within  
Parcel No. 130319300014  
Lot 1  
A Part of the SW1/4 of Section 19  
T2N, R63W of the 6<sup>th</sup> P.M.  
Weld County, CO

January 22, 2020

**JOB #19-9433**

Todd M. Schroeder P.E. 33548



## **AGREEMENT OF PURPOSE AND DISCLAIMER:**

The parties specifically agree and contract that the purpose of the provided subsurface investigation is to test, analyze, and provide geotechnical recommendations for the foundation recommendations. This report presents a description of subsurface conditions encountered at the site, design, and construction criteria influenced by the subsurface conditions. The opinions and recommendations presented in this report are based on the data generated during this field exploration, laboratory testing, and our experience. A foundation design sealed by a Professional Engineer is required to obtain a building permit but is not included in this report.

*The parties specifically agree that High Plains Engineering & Design, LLC has not been retained nor will they render an opinion concerning environmental issues, hazardous waste or any other known and or unknown conditions that may be present on the job site, since this is not our area of expertise.*

## **LOCATION AND SITE CONDITIONS:**

This report represents the results of the data obtained during the subsoil investigation for the proposed steel building located at Future 1.83 Acre Parcel Currently Located within Parcel No. 130319300014, Lot 1, A Part of the SW1/4 of Section 19, T2N, R63W of the 6<sup>th</sup> P.M., Weld County, CO.

The proposed building site is a vacant lot. The site is reasonably level with approximate slopes of 1.0% to the East-Northeast. The lot appears to be well drained with no erosion evident.

The depths of the excavation are anticipated to range from two (2) to four (4) feet below grades that existed at the time of this investigation. It is anticipated that final grades may be adjusted to accommodate drainage and construction depths. It is recommended that we review the final grading plan to determine if any revisions to the recommendations presented in this report are necessary.

## **SUBSOIL CONDITIONS:**

Two, four-inch-diameter holes were drilled up to a depth of fifteen feet at the project site on January 7, 2020, as shown on the attached site map. Soil samples were analyzed in the field and laboratory to determine the characteristics of the soil (per Unified Soil Classification System) for identification and foundation design recommendations. In general, the soil profiles in test-holes #1 & #2 indicated Clay with Low Plasticity (CL) to a depth of 4 feet, underlain by Clay with Medium Plasticity (CL) to a final depth of 15 feet.

The Standard Penetration Test per ASTM D1586 for test-hole #1 showed 19 blows for a 12-inch penetration at a depth of 2 feet, 17 blows for a 12-inch penetration at a depth of 4 feet, and 35 blows for a 12-inch penetration at a depth of 9 feet. Please note that actual subsurface soil conditions may vary between samples and locations tested.



One-dimensional swell/consolidation tests were performed on selected samples to evaluate the expansive, compressive and collapsing nature of the soils and/or bedrock strata. These tests indicated an expansion potential of 2.7% at a depth of 2 feet, an expansion potential of 2.5% at a depth of 4 feet and an expansion potential of 1.5% at a depth of 9 feet. The soils in this report were classified using the American Society of Testing Materials (ASTM) procedures.

The geotechnical practice in the State of Colorado utilizes a relative scale to evaluate swelling (expansion) potentials. When a sample is wetted under a surcharge pressure of 500 pounds per square foot (psf), the measured swell is classified as low, moderate, high, or very high. The following table represents the relative classification criteria. Please note that the measured swell is not the only criteria for slab-on-grade recommendations and additional factors are considered by the engineer when evaluating the risk for slab-on-grade construction.

TABLE 1	
SLAB PERFORMANCE RISK CATEGORY	REPRESENTATIVE PERCENT SWELL (500 PSF SURCHARGE)
LOW	0 TO <3
MODERATE	3 TO <5
HIGH	5 TO <8
VERY HIGH	≥8

Source: Colorado Association of Geotechnical Engineers, Guideline for Slab Performance Risk Evaluation and Residential Basement Floor System Recommendations (Denver Metropolitan Area), 1996

## GROUNDWATER:

Groundwater levels were not recorded at the time of our field investigation; however, it may be possible for groundwater to exist at construction depths at a later date. The groundwater can be expected to fluctuate throughout the year depending on variations in precipitation, surface drainage and irrigation on the site. The possible presence of shallow bedrock/dense clays beneath the surface is favorable for the formation of "perched" groundwater. We recommend that the bottom of the basement or crawlspace excavations be maintained at least 4 feet above the free groundwater level.

The ground water levels recorded represent the free, static water levels after equalization of hydrostatic pressures in the test-hole borings. It is possible that the groundwater levels recorded in the test-hole borings may not be present at those levels in the foundation excavations. Flow rates, seepage paths, hydrostatic pressures, seasonal groundwater fluctuations, water quality and other factors were not determined in this investigation. A program, which may include special well construction, test procedures, long-term monitoring, and analysis, would be necessary to determine these factors.

## FOUNDATION RECOMMENDATIONS:

The Clay with Low Plasticity (CL) and Clay with Medium Plasticity (CL) material has a bearing strength of 2000 pounds per square foot (psf) and an equivalent liquid pressure of 55 pcf. We recommend the use of a continuous spread footing, due to the low expansion-consolidation potential of the analyzed soils. **The foundation must be constructed at the location in which soils investigation was performed.**

**All rebar must be fully contained within the footing/foundation and shall not have any contact with the native soils due to the known risks of soluble sulfates contained in area soils.**

All loose and disturbed soil shall be removed before placing of the concrete for the foundation. The bottom of the foundation shall be a minimum of 30" below final grade (or that required by local jurisdiction; whichever is greater) for frost protection.

Soil settlement resulting from the assumed structural loads is estimated to be one inch or less. Soil expansion at this site may be up to one inch in some areas. No foundation wall is to exceed twenty-five feet in length without utilizing buttresses or counterforts unless otherwise designed by the foundation engineer.

Engineered steel reinforcements shall be required in the footings and foundation walls. This will give walls or footing beams the strength to span or bridge over any loose or soft pockets of soil that may develop during construction.

**Owners shall be made aware of all contents of this report, and the fact that *water accumulation around foundation elements is the primary cause of distressed foundations.***

To help prevent secondary damage that could be caused by slab movement, the following construction techniques are additional recommendations for the foundation construction.

## SLAB ON GRADE CONSTRUCTION:

**Steel Building/Shop and Exterior Slab-on-grade Concrete:** The soil encountered at or below anticipated slab elevations has a low swell potential. If removal and replacement of soil below slabs is required, use a non-expansive granular soil with Plasticity Index less than 15 and Liquid Limit less than 30 and compacted to a minimum of 95% ASTM D698 (Standard Proctor Density), within 2% of the optimum moisture content.

The slabs should be constructed as "floating" slabs, which are free to move in the vertical direction. The slabs should not be attached to interior or exterior bearing members. The following design and construction details for slab-on-grade construction are recommended.

1. Floor slabs placed above potentially expansive soils will be expected to heave and crack to some degree. It is impossible to predict with certainty how much slab movement will actually occur. **When the owners cannot tolerate slab movement, we recommend to install a structural slab in place of the conventional slab on grade for floor construction.**
2. Where steel building/shop slabs and exterior slabs-on-grade are chosen, and the owners understand and accept all the risks associated with slab movement, the following recommendations should be followed with the amount of over-excavation and replacement with imported fill determined by the owner/builder.
  - a. Positive separations and/or isolation joints should be provided between slabs and all foundation walls, bearing members (columns), plumbing and utility lines. Isolation may be achieved with ½ inch expansion material or by sleeving. Vertical movement of the slabs should not be restricted. A minimum void of 3 inches should be provided with all non-bearing partition walls to allow movement without damaging the structure. Provide a minimum ½ inch space at the bottom of all doorjamb. It is the owner's responsibility to maintain these void spaces. Mechanical equipment set on the slab will require an expandable/collapsible connection to ductwork, etc.
  - b. Eliminate plumbing under slabs where feasible. Where such plumbing is unavoidable, it should be thoroughly pressure tested during construction.
  - c. A vapor retarder is required per IRC R506.2.3 except use 15-mil minimum thickness, located per ACI guidelines and installed per ASTM specifications. Floor slabs and footings should not be constructed on frozen subgrade. Slabs should be reinforced with rebar or wire mesh to help control crack separation.
3. Provide frequent scoring of the slabs in square dimensions (non- rectangular) to provide joints for controlled cracking of the slab. Control joints should be placed at distances equal to 24 to 30 times the slab thickness and the depth of sawed control joints should be ¼ of the slab thickness. Joints should be sawed as soon as the concrete will withstand the energy of sawing without raveling the edges of the joint. For most concrete mixtures, sawing should be completed within 6 to 18 hours after pouring, but never more than 24 hours. Install a good quality sealant (pliable/non-hardening) in these joints to prevent surface discharges of liquid from penetrating slab sub-grades.
4. The soils that will support the concrete slabs should be kept moist during construction by occasional sprinkling of water. The soils should be moistened to +/- 2 % optimum moisture within 24 hours of pouring the slabs. This procedure will help maintain the moisture content of the underlying soil. **\*\*Heavy watering or pooling of any kind next to the foundation or within the backfilled area is not recommended.\*\***

## **BACKFILL:**

**The foundation and retaining walls must be well cured and well braced prior to backfilling.**

Any soil disturbed adjacent to bearing foundation components are to be **re-compacted to a minimum of 95% Standard Proctor Density (ASTM D698)**. Backfill that bears concrete slabs shall be compacted to 95% Standard Proctor Density (ASTM D698). Mechanical compaction methods shall be utilized, (water-flooding techniques are strictly prohibited). See Compaction Section for more information regarding compaction requirements and techniques.

Proper drainage away from the foundation walls shall be provided. The owners are advised to immediately fill any settled areas to eliminate water accumulation near the foundation. A minimum slope of 12 inches in the first 10 feet from the perimeter of the building is recommended. Roof downspouts and sill cocks should discharge into long concrete splash blocks (5 feet long min.) or into gutter extensions to deposit runoff water beyond the limits of the backfill soil near the foundation walls. Plastic membranes should not be used to cover the ground surface immediately surrounding the structure; geotextile fabric should be utilized for weed control. Any drainage water from uphill shall be diverted around the structure.

Sprinkling systems should not be installed or direct water to be within 10 feet of the foundation. The owner/builder is also advised that irrigation lines can leak and/or break, resulting in release of excessive amounts of water near the foundation. This can cause damage to slabs and foundation walls. **WATER ACCUMULATION AROUND FOUNDATION ELEMENTS IS THE MAIN CAUSE OF DISTRESSED FOUNDATIONS.**

## **COMPACTION:**

*Placing Fill:* No brush, sod, frozen material, perishable material, unsuitable material, or stones of four inches or greater in maximum dimension shall be placed in the fill. The distribution of the material on the fill shall be such as to avoid the formation of layers of materials differing substantially in characteristics from the surrounding materials.

The materials are to be delivered to the backfill surface at a uniform rate, and in such quantity as to permit a satisfactory construction procedure. Unnecessary concentration of backfill machinery travel tending to cause ruts and other hollows more than six inches in depth, are to be re-graded and compacted. After dumping of fill material on the backfill surface, the material is to be spread by approved methods in approximately 6 inches compacted thickness.

*Moisture Control:* The material in each layer shall be compacted by rolling and shall contain the optimum moisture required for maximum compaction, as nearly practicable and as determined by the soils engineer. The moisture content shall be uniform throughout all layers. If in the opinion of the soils engineer it is not possible to obtain moisture content by adding water on the fill surface, the contractor may be required to add the necessary moisture to backfill material in the borrow area.

*Compaction:* When the moisture condition and content of each spread layer is satisfactory, it shall be compacted by a method approved by the soils engineer to **95% ASTM D698 (Standard Proctor Density) for slab areas, and 98% ASTM D698 for footing and/or pad areas.** A Standard Proctor test is to be performed for each typical fill material and frequent tests of the density of the fill must be taken.

In general, to compact cohesion-less free-draining materials, *the above guidelines also apply.*

When compacting cohesion-less free-draining materials such as gravel and sand, the materials shall be deposited in layers and compacted by treads of a crawler type tractor, surface of internal vibrators, pneumatic or smooth rollers, power or hand tampers, or by any other means approved by the soils engineer. The thickness of the horizontal layers after compaction is not to exceed 6 inches compacted thickness if compaction is performed by tractor treads, surface vibrators or similar equipment, or not more than penetrating length of the vibrator head if compaction is performed by internal vibrators. When the moisture content and condition of each spread layer is satisfactory, it shall be compacted by a method approved by the soils engineer to **91% ASTM D1557 (Modified Proctor Density) for slab areas, and 94% ASTM D1557 for footing and/or pad areas.**

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**\*\*If soils conditions are encountered which appear different from the test borings as presented in this report, it is required that this office be called to make an observation of the open excavation prior to placing the footings. The cost of this observation is not part of this report.\*\***

This project should be constructed by a qualified contractor with experience in similar projects. The owner/builder is advised to observe and document the construction process to ensure the construction is performed in accordance with the design drawings and technical specifications. **The foundation and retaining walls must be well cured and well braced prior to backfilling.**

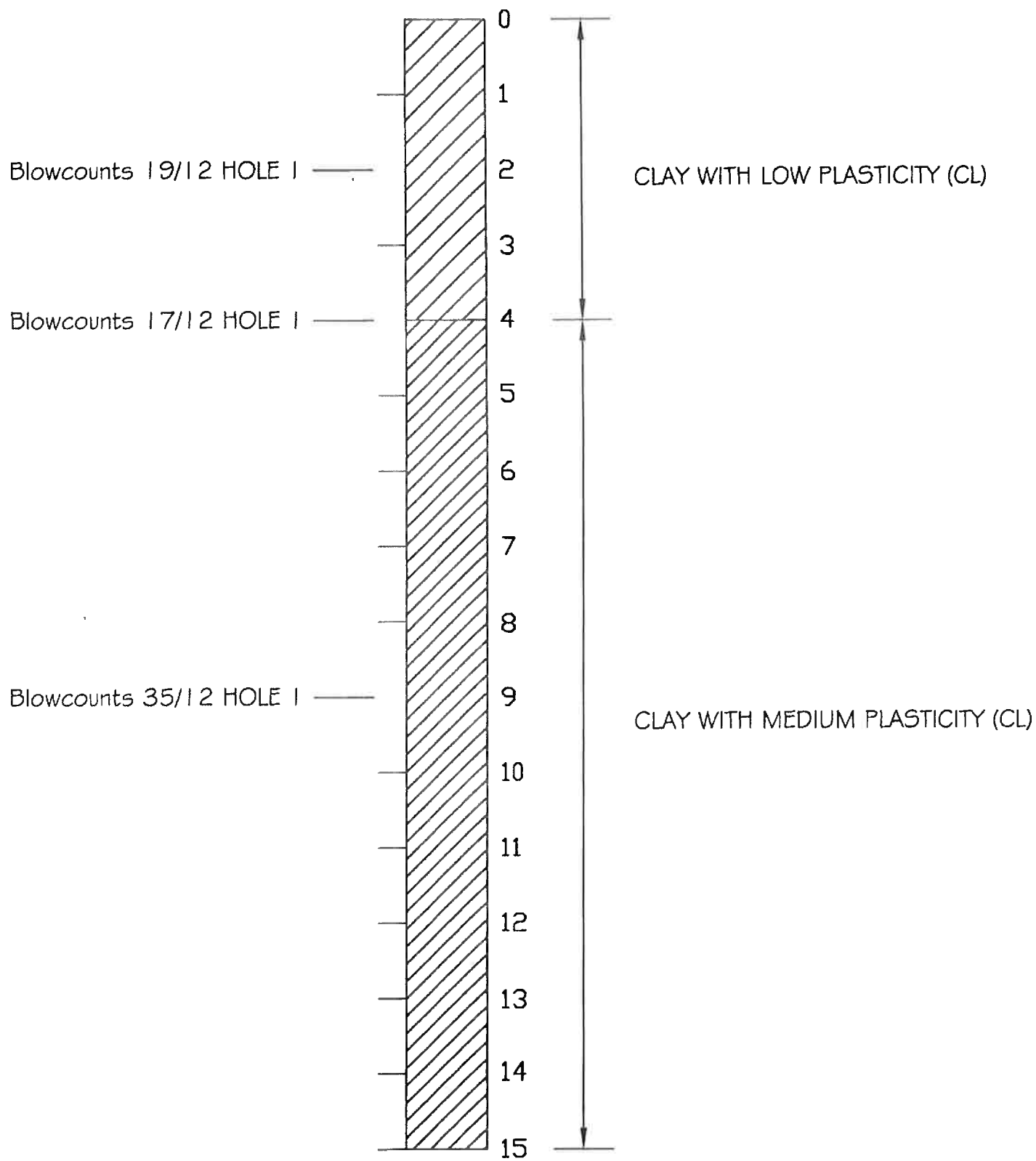
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## **DISCLAIMER:**

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THE PARTIES SPECIFICALLY AGREE THAT *HIGH PLAINS ENGINEERING & DESIGN, LLC.* HAS NOT BEEN RETAINED NOR WILL THEY RENDER AN OPINION CONCERNING ANY ENVIRONMENTAL ISSUES, HAZARDOUS WASTE OR ANY OTHER KNOWN OR UNKNOWN CONDITIONS THAT MAY BE PRESENT ON SITE.

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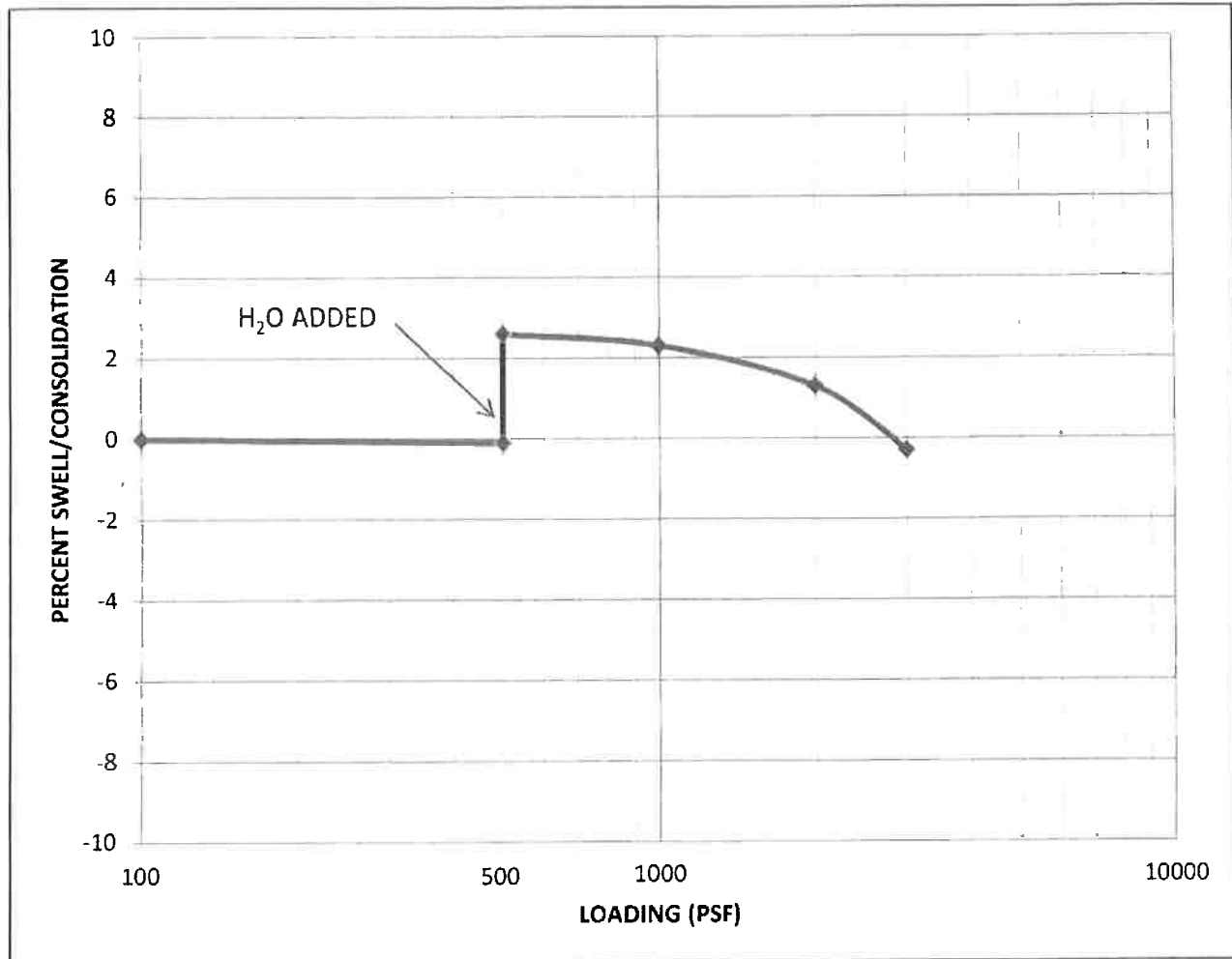


TEST HOLE(S) 1 & 2



# **HIGH PLAINS ENGINEERING & DESIGN, LLC**

555 MAIN STREET, P.O. BOX 1077, HUDSON, CO 80642 • PHONE: 303-857-9280 • FAX: 303-857-9238



HOLE #	DEPTH	L.L.	P.L.	P.I.	% EXPANSION	% CONSOLIDATION	% MOISTURE
1	2' BC	35.33	22.25	13.09	2.7		9.96

SOIL TYPE: CLAY WITH LOW PLASTICITY (CL)

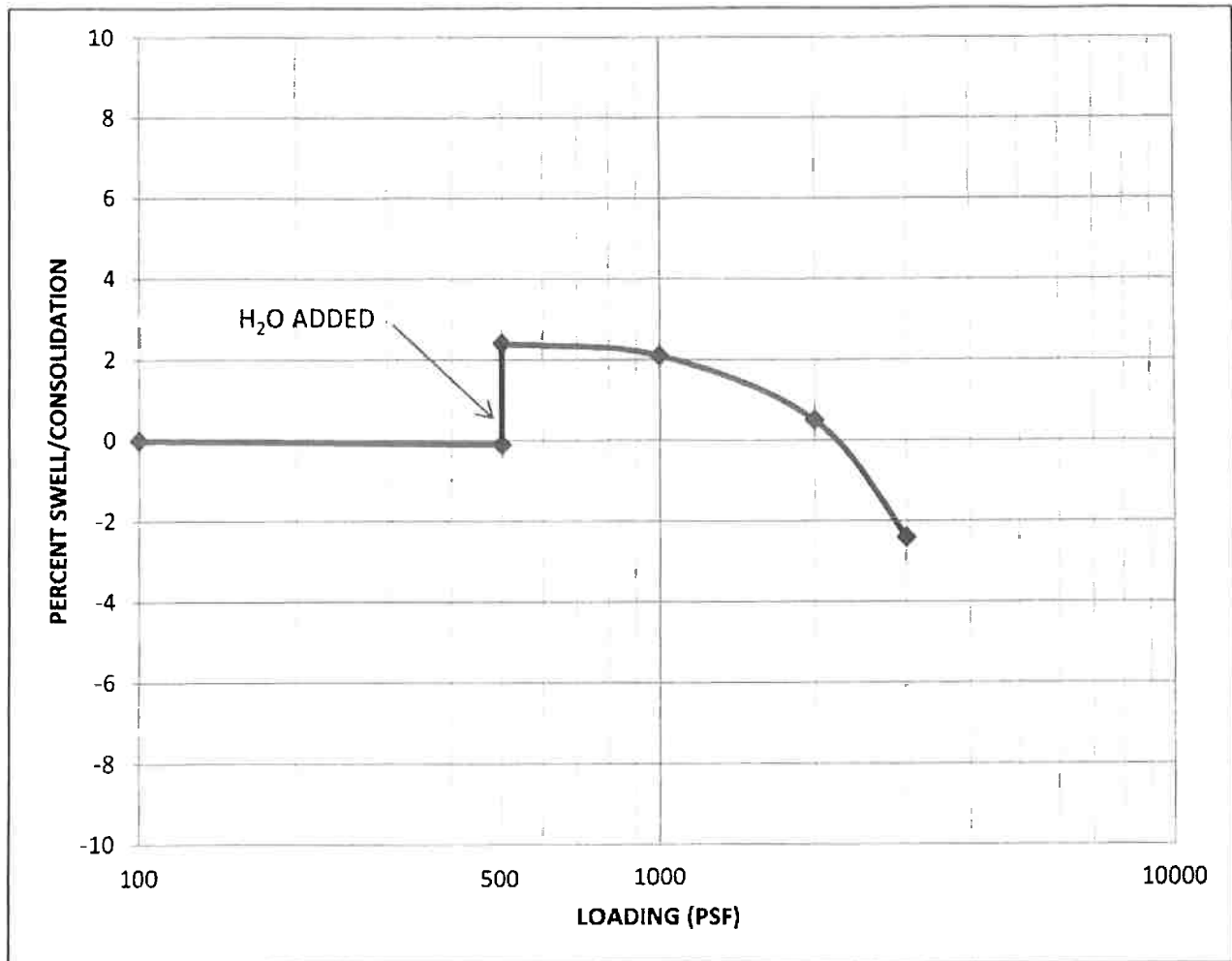
JOB NO:	19-9433	JOB LOCATION:	
DATE:	1/22/20	FUTURE 1.83 ACRE PARCEL LOCATED WITHIN PARCEL 130319300014	
DRAWN:	KELSEY	LOT 1, A PART OF THE SW1/4 OF SEC. 19, T2N, R63W OF THE 6TH P.M.	
CHECKED:	TMS	WELD COUNTY, CO	





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HOLE #	DEPTH	L.L.	P.L.	P.I.	% EXPANSION	% CONSOLIDATION	% MOISTURE
1	4' BC	37.95	21.95	16.00	2.5		9.5

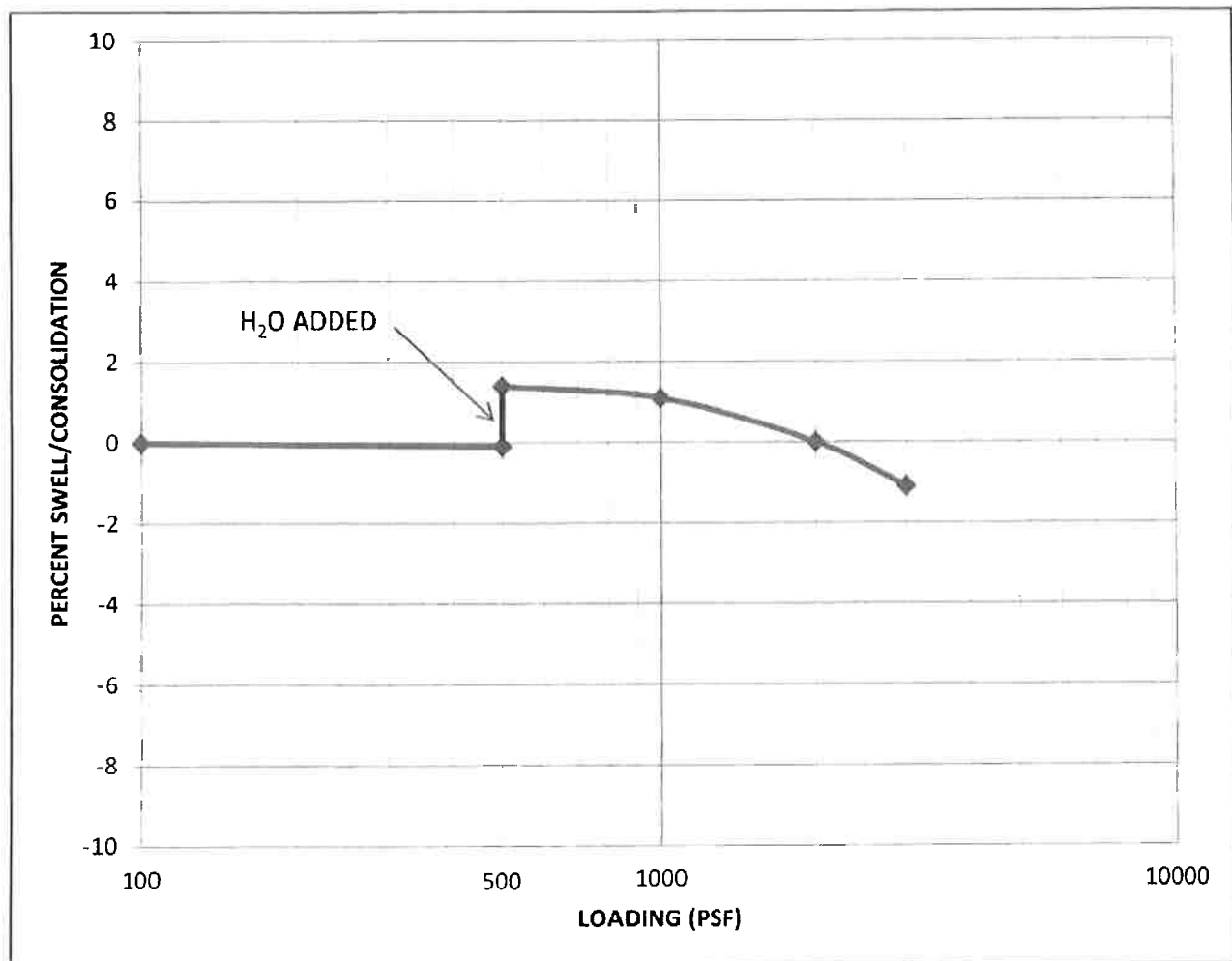
SOIL TYPE: CLAY WITH MEDIUM PLASTICITY (CL)

JOB NO:	19-9433	JOB LOCATION:	
DATE:	1/22/20	FUTURE 1.83 ACRE PARCEL LOCATED WITHIN PARCEL 130319300014	
DRAWN:	KELSEY	LOT 1, A PART OF THE SW1/4 OF SEC. 19, T2N, R63W OF THE 6TH P.M.	
CHECKED:	TMS	WELD COUNTY, CO	



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HOLE #	DEPTH	L.L.	P.L.	P.I.	% EXPANSION	% CONSOLIDATION	% MOISTURE
1	9' BC	42.63	22.62	20.01	1.5		13.43

SOIL TYPE: CLAY WITH MEDIUM PLASTICITY (CL)

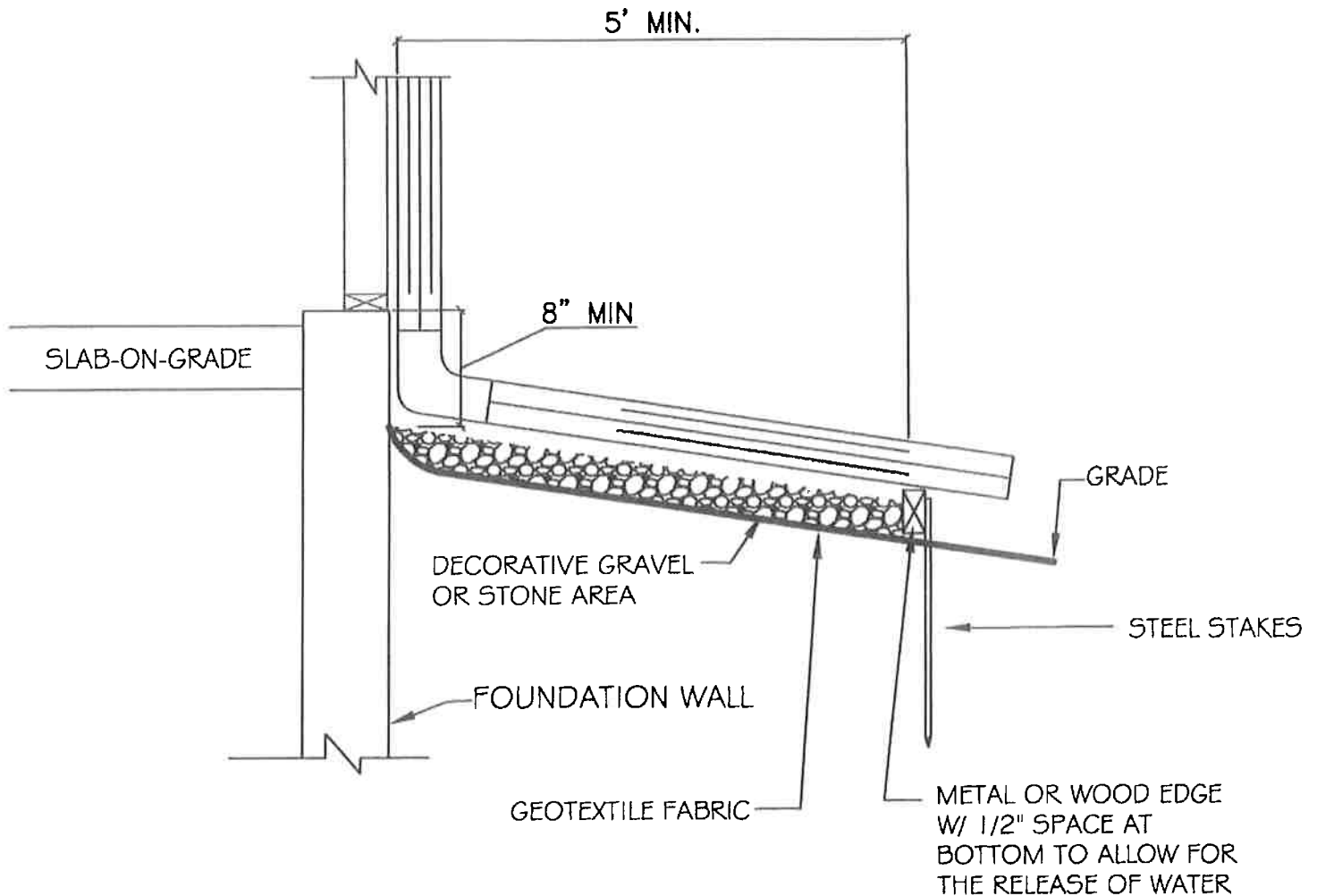
JOB NO:	19-9433	JOB LOCATION:	
DATE:	1/22/20	FUTURE 1.83 ACRE PARCEL LOCATED WITHIN PARCEL 130319300014	
DRAWN:	KELSEY	LOT 1, A PART OF THE SW1/4 OF SEC. 19, T2N, R63W OF THE 6TH P.M.	
CHECKED:	TMS	WELD COUNTY, CO	



**HIGH PLAINS ENGINEERING & DESIGN, LLC**

555 MAIN STREET, P.O. BOX 1077, HUDSON, CO 806420 PHONE (303) 857-9280 FAX (303) 857-923

## FOUNDATION GRADING DETAIL



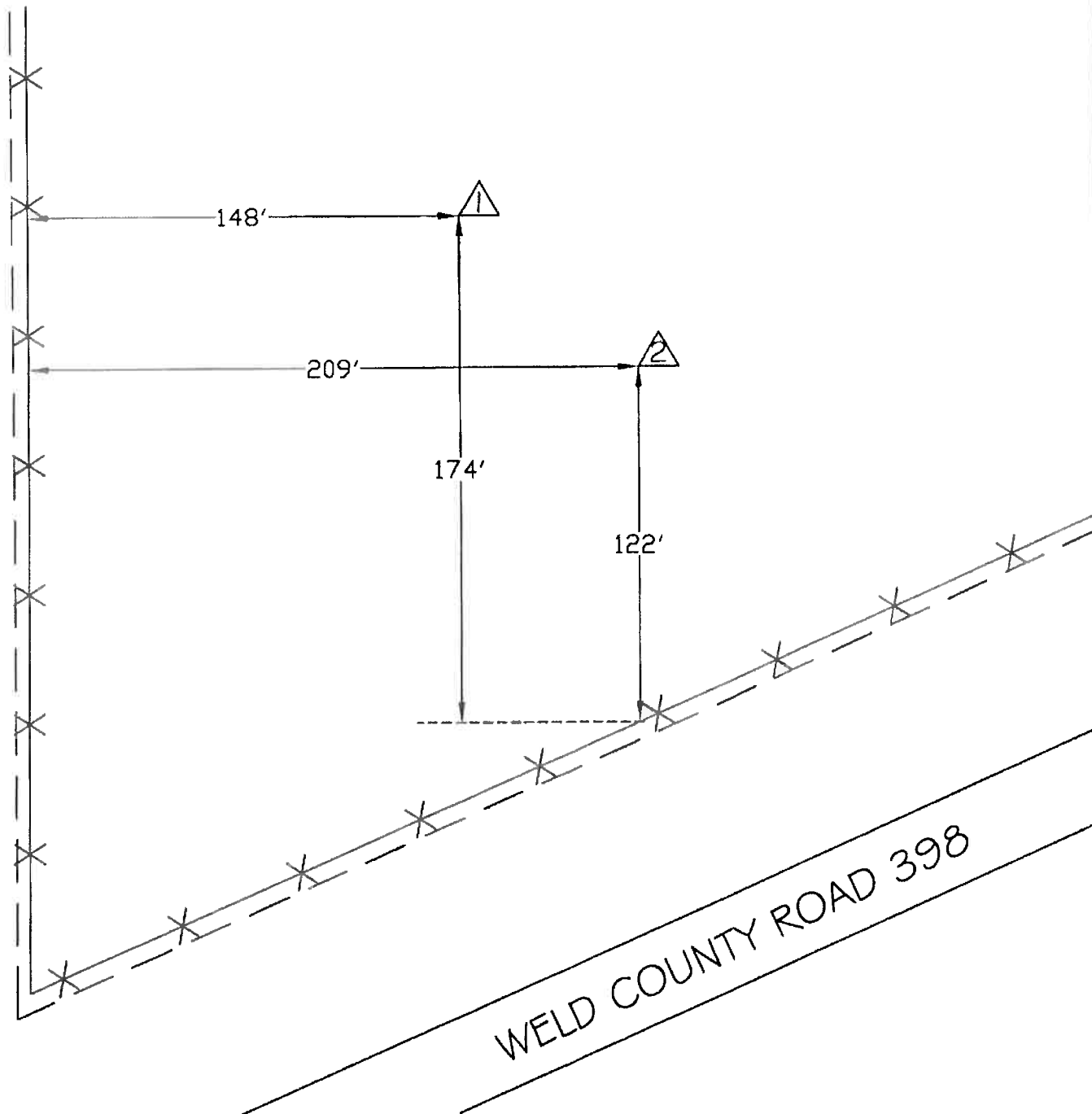
### NOTE

1. PROVIDE A MINIMUM SLOPE OF 12" IN THE FIRST 10'-0" FROM FOUNDATION (10%)
2. DOWNSPOUTS AND EXTENSIONS SHOULD EXTEND BEYOND THE GRAVEL OR STONE AREA
3. HARDSCAPING NEXT TO FOUNDATION SHOULD SLOPE AWAY AT 2% SLOPE



# SITE MAP

FUTURE 1.83 ACRE PARCEL CURRENTLY LOCATED WITHIN PARCEL 130319300014  
LOT 1 A PART OF THE SW 1/4 OF SECTION 19, T2N, R63W OF THE 6TH P.M.  
WELD COUNTY, CO



## LEGEND

- - Percolation Test Hole
- X - Percolation Profile Hole
- △ - Soil Profile Hole
- \*\* - Fence
- ☆ - Bench Mark
- - Soil Pit

All locations shown above are based on specific information furnished by others or estimates made in the field by High Plains Engineering & Design personnel. The locations, distances, directions, etc. are not the result of a property survey but are approximations and are not warranted to be exact. It is the owner/builder's responsibility to define property boundaries and ensure all onsite improvements are located within the platted site and out of inappropriate easements. All distances are to be verified prior to excavation.



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## **SUBSURFACE INVESTIGATION AND FOUNDATION RECOMMENDATIONS**

***Prepared For:***

Platte River Investments, Inc.  
8537 County Road 51  
Keenesburg, CO 80643

***Job Site Located At:***

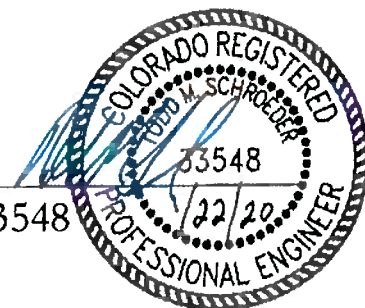
Future 1.66 Acre Parcel Currently Located within  
Parcel No. 130319300014  
Lot 2  
A Part of the SW1/4 of Section 19  
T2N, R63W of the 6<sup>th</sup> P.M.  
Weld County, CO

January 22, 2020

**JOB #19-9434**

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Todd M. Schroeder P.E. 33548



## **AGREEMENT OF PURPOSE AND DISCLAIMER:**

The parties specifically agree and contract that the purpose of the provided subsurface investigation is to test, analyze, and provide geotechnical recommendations for the foundation recommendations. This report presents a description of subsurface conditions encountered at the site, design, and construction criteria influenced by the subsurface conditions. The opinions and recommendations presented in this report are based on the data generated during this field exploration, laboratory testing, and our experience. A foundation design sealed by a Professional Engineer is required to obtain a building permit but is not included in this report.

*The parties specifically agree that High Plains Engineering & Design, LLC has not been retained nor will they render an opinion concerning environmental issues, hazardous waste or any other known and or unknown conditions that may be present on the job site, since this is not our area of expertise.*

## **LOCATION AND SITE CONDITIONS:**

This report represents the results of the data obtained during the subsoil investigation for the proposed steel building located at the Future 1.66 Acre Parcel currently located within Parcel No. 130319300014, Lot 2, A Part of the SW1/4 of Section 19, T2N, R63W of the 6<sup>th</sup> P.M., Weld County, CO.

The proposed building site is a vacant lot. The site is reasonably level with approximate slopes of 1.5% to the East. The lot appears to be well drained with no erosion evident.

The depths of the excavation are anticipated to range from two (2) to four (4) feet below grades that existed at the time of this investigation. It is anticipated that final grades may be adjusted to accommodate drainage and construction depths. It is recommended that we review the final grading plan to determine if any revisions to the recommendations presented in this report are necessary.

## **SUBSOIL CONDITIONS:**

Two, four-inch-diameter holes were drilled up to a depth of fifteen feet at the project site on January 7, 2020, as shown on the attached site map. Soil samples were analyzed in the field and laboratory to determine the characteristics of the soil (per Unified Soil Classification System) for identification and foundation design recommendations. In general, the soil profiles in test-holes #1 & #2 indicated Clay with Medium Plasticity (CL) to a final depth of 15 feet.

The Standard Penetration Test per ASTM D1586 showed 25 blows for a 12-inch penetration at a depth of 2 feet, 18 blows for a 12-inch penetration at a depth of 4 feet, and 25 blows for a 12-inch penetration at a depth of 7 feet. Please note that actual subsurface soil conditions may vary between samples and locations tested.

One-dimensional swell/consolidation tests were performed on selected samples to evaluate the expansive, compressive and collapsing nature of the soils and/or bedrock strata. These tests indicated an expansion potential of 1.5% at a depth of 2 feet, an expansion potential of 2.8% at a depth of 4 feet and an expansion potential of 4.3% at a depth of 7 feet. The soils in this report were classified using the American Society of Testing Materials (ASTM) procedures.

The geotechnical practice in the State of Colorado utilizes a relative scale to evaluate swelling (expansion) potentials. When a sample is wetted under a surcharge pressure of 500 pounds per square foot (psf), the measured swell is classified as low, moderate, high, or very high. The following table represents the relative classification criteria. Please note that the measured swell is not the only criteria for slab-on-grade recommendations and additional factors are considered by the engineer when evaluating the risk for slab-on-grade construction.

TABLE 1	
SLAB PERFORMANCE RISK CATEGORY	REPRESENTATIVE PERCENT SWELL (500 PSF SURCHARGE)
LOW	0 TO <3
MODERATE	3 TO <5
HIGH	5 TO <8
VERY HIGH	≥8

Source: Colorado Association of Geotechnical Engineers, Guideline for Slab Performance Risk Evaluation and Residential Basement Floor System Recommendations (Denver Metropolitan Area), 1996

## GROUNDWATER:

Groundwater levels were not recorded at the time of our field investigation; however, it may be possible for groundwater to exist at construction depths at a later date. The groundwater can be expected to fluctuate throughout the year depending on variations in precipitation, surface drainage and irrigation on the site. The possible presence of shallow bedrock/dense clays beneath the surface is favorable for the formation of "perched" groundwater. We recommend that the bottom of the basement or crawlspace excavations be maintained at least 4 feet above the free groundwater level.

The ground water levels recorded represent the free, static water levels after equalization of hydrostatic pressures in the test-hole borings. It is possible that the groundwater levels recorded in the test-hole borings may not be present at those levels in the foundation excavations. Flow rates, seepage paths, hydrostatic pressures, seasonal groundwater fluctuations, water quality and other factors were not determined in this investigation. A program, which may include special well construction, test procedures, long-term monitoring, and analysis, would be necessary to determine these factors.

## FOUNDATION RECOMMENDATIONS:

The Clay with Low Plasticity (CL) material has a bearing strength of 2000 pounds per square foot (psf) and an equivalent liquid pressure of 55 pcf. We recommend the use of a continuous spread footing, due to the low expansion-consolidation potential of the analyzed soils. **The foundation must be constructed at the location in which soils investigation was performed.**

**All rebar must be fully contained within the footing/foundation and shall not have any contact with the native soils due to the known risks of soluble sulfates contained in area soils.**

Unmonitored moisture content in foundation excavations over an extended period of time can create foundation stress and potential damage after backfilling operations are complete. Foundation excavations left open for a period greater than 7 days will require moisture monitoring and/or moisture augmentation. High Plains Engineering & Design, LLC cannot be held responsible for foundation damage as a result of the failure to monitor moisture content after a period of 7 days. If it's anticipated that the foundation excavation will be left open for an extended period of time, the general contractor/owner shall contact High Plains Engineering & Design, LLC for further recommendations.

All loose and disturbed soil shall be removed before placing of the concrete for the foundation. The bottom of the foundation shall be a minimum of 30" below final grade (or that required by local jurisdiction; whichever is greater) for frost protection.

Soil settlement resulting from the assumed structural loads is estimated to be one inch or less. Soil expansion at this site may be up to one inch in some areas. No foundation wall is to exceed twenty-five feet in length without utilizing buttresses or counterforts unless otherwise designed by the foundation engineer.

Engineered steel reinforcements shall be required in the footings and foundation walls. This will give walls or footing beams the strength to span or bridge over any loose or soft pockets of soil that may develop during construction.

**Owners shall be made aware of all contents of this report, and the fact that water accumulation around foundation elements is the primary cause of distressed foundations.**

To help prevent secondary damage that could be caused by slab movement, the following construction techniques are additional recommendations for the foundation construction.



## SLAB ON GRADE CONSTRUCTION:

**Steel Building/Shop and Exterior Slab-on-grade Concrete:** The soil encountered at or below anticipated slab elevations has a low/moderate swell potential. If removal and replacement of soil below slabs is required, use a non-expansive granular soil with Plasticity Index less than 15 and Liquid Limit less than 30 and compacted to a minimum of 95% ASTM D698 (Standard Proctor Density), within 2% of the optimum moisture content.

The slabs should be constructed as "floating" slabs, which are free to move in the vertical direction. The slabs should not be attached to interior or exterior bearing members. The following design and construction details for slab-on-grade construction are recommended.

1. Floor slabs placed above potentially expansive soils will be expected to heave and crack to some degree. It is impossible to predict with certainty how much slab movement will actually occur. **When the owners cannot tolerate slab movement, we recommend to install a structural slab in place of the conventional slab on grade for floor construction.**
2. Where steel building/shop slabs and exterior slabs-on-grade are chosen, and the owners understand and accepts all the risks associated with slab movement, the following recommendations should be followed with the amount of over-excavation and replacement with imported fill determined by the owner/builder.
  - a. Positive separations and/or isolation joints should be provided between slabs and all foundation walls, bearing members (columns), plumbing and utility lines. Isolation may be achieved with ½ inch expansion material or by sleeving. Vertical movement of the slabs should not be restricted. A minimum void of 3 inches should be provided with all non-bearing partition walls to allow movement without damaging the structure. Provide a minimum ½ inch space at the bottom of all doorjamb. It is the owner's responsibility to maintain these void spaces. Mechanical equipment set on the slab will require an expandable/collapsible connection to ductwork, etc.
  - b. Eliminate plumbing under slabs where feasible. Where such plumbing is unavoidable, it should be thoroughly pressure tested during construction.
  - c. A vapor retarder is required per IRC R506.2.3 except use 15-mil minimum thickness, located per ACI guidelines and installed per ASTM specifications. Floor slabs and footings should not be constructed on frozen subgrade. Slabs should be reinforced with rebar or wire mesh to help control crack separation.

3. Provide frequent scoring of the slabs in square dimensions (non- rectangular) to provide joints for controlled cracking of the slab. Control joints should be placed at distances equal to 24 to 30 times the slab thickness and the depth of sawed control joints should be  $\frac{1}{4}$  of the slab thickness. Joints should be sawed as soon as the concrete will withstand the energy of sawing without raveling the edges of the joint. For most concrete mixtures, sawing should be completed within 6 to 18 hours after pouring, but never more than 24 hours. Install a good quality sealant (pliable/non-hardening) in these joints to prevent surface discharges of liquid from penetrating slab sub-grades.
4. The soils that will support the concrete slabs should be kept moist during construction by occasional sprinkling of water. The soils should be moistened to  $\pm 2\%$  optimum moisture within 24 hours of pouring the slabs. This procedure will help maintain the moisture content of the underlying soil. \*\*Heavy watering or pooling of any kind next to the foundation or within the backfilled area is not recommended.\*\*

## **BACKFILL:**

**The foundation and retaining walls must be well cured and well braced prior to backfilling.**

Any soil disturbed adjacent to bearing foundation components are to be **re-compacted to a minimum of 95% Standard Proctor Density (ASTM D698)**. Backfill that bears concrete slabs shall be compacted to 95% Standard Proctor Density (ASTM D698). Mechanical compaction methods shall be utilized, (water-flooding techniques are strictly prohibited). See Compaction Section for more information regarding compaction requirements and techniques.

Proper drainage away from the foundation walls shall be provided. The owners are advised to immediately fill any settled areas to eliminate water accumulation near the foundation. A minimum slope of 12 inches in the first 10 feet from the perimeter of the building is recommended. Roof downspouts and sill cocks should discharge into long concrete splash blocks (5 feet long min.) or into gutter extensions to deposit runoff water beyond the limits of the backfill soil near the foundation walls. Plastic membranes should not be used to cover the ground surface immediately surrounding the structure; geotextile fabric should be utilized for weed control. Any drainage water from uphill shall be diverted around the structure.

Sprinkling systems should not be installed or direct water to be within 10 feet of the foundation. The owner/builder is also advised that irrigation lines can leak and/or break, resulting in release of excessive amounts of water near the foundation. This can cause damage to slabs and foundation walls. **WATER ACCUMULATION AROUND FOUNDATION ELEMENTS IS THE MAIN CAUSE OF DISTRESSED FOUNDATIONS.**

## COMPACTION:

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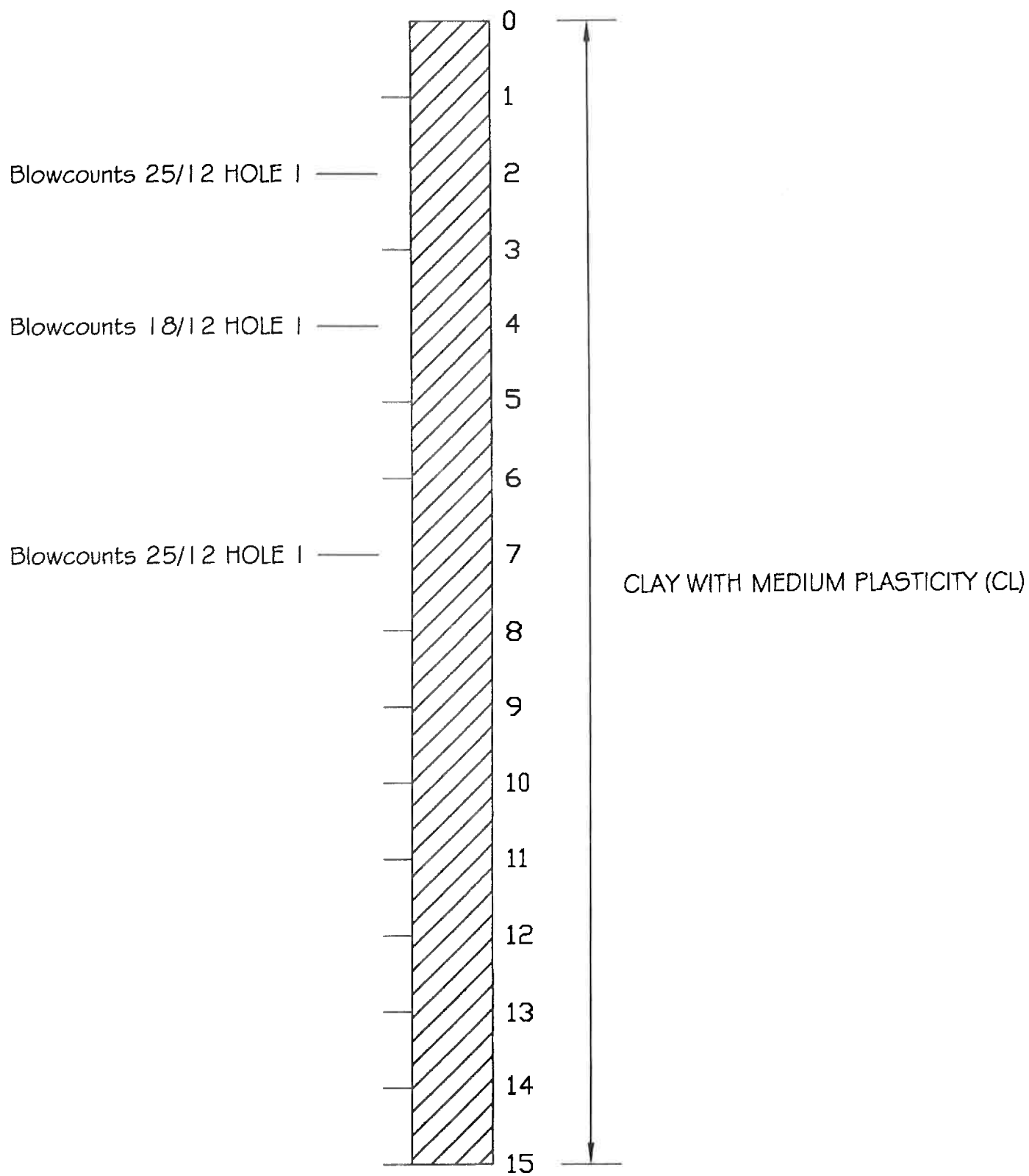
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## DISCLAIMER:

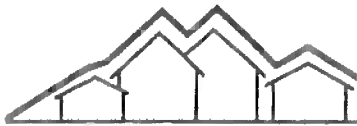
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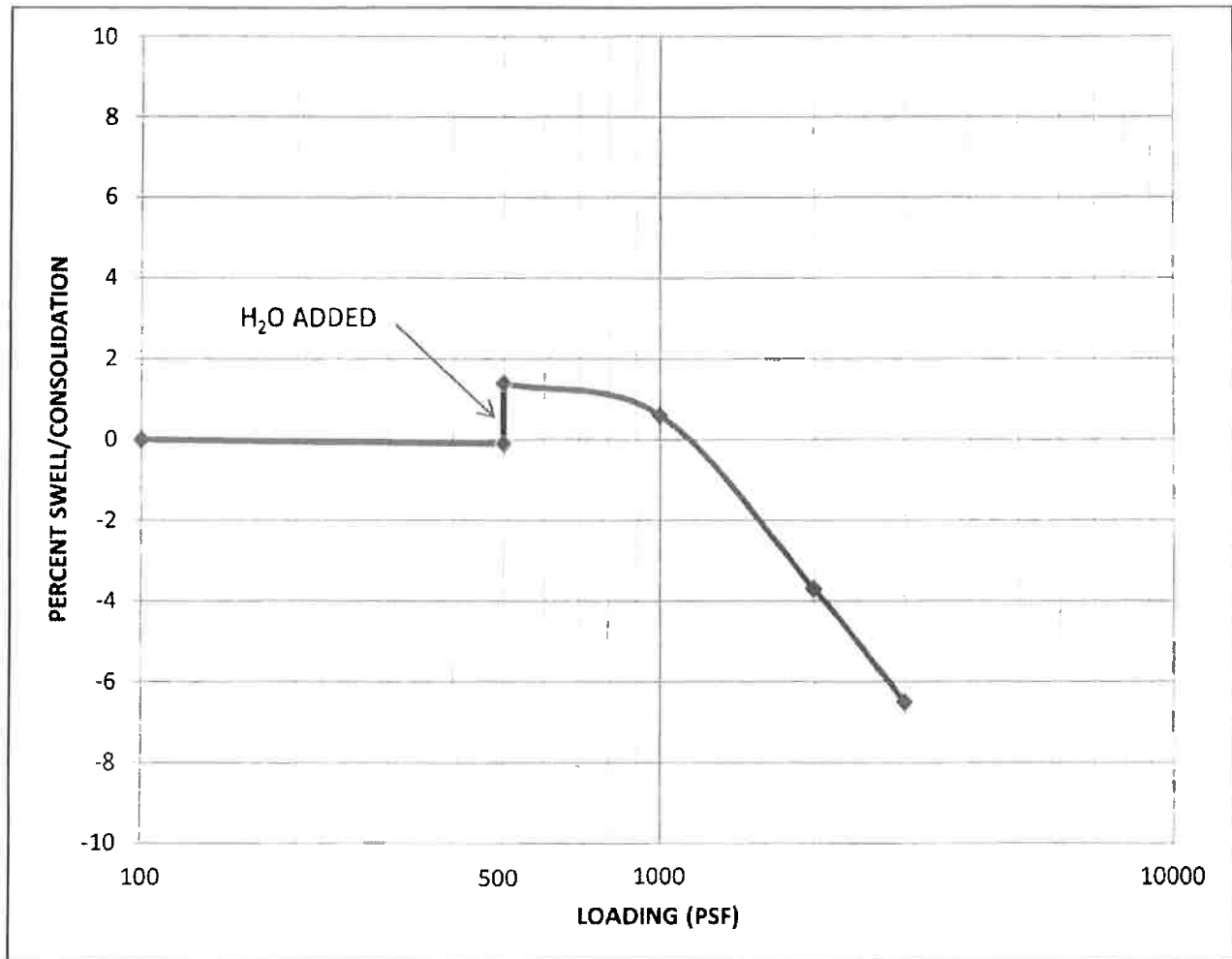


TEST HOLE(S) 1 # 2



# HIGH PLAINS ENGINEERING & DESIGN, LLC

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HOLE #	DEPTH	L.L.	P.L.	P.I.	% EXPANSION	% CONSOLIDATION	% MOISTURE
1	2' BC	35.99	20.58	15.41	1.5		8.81

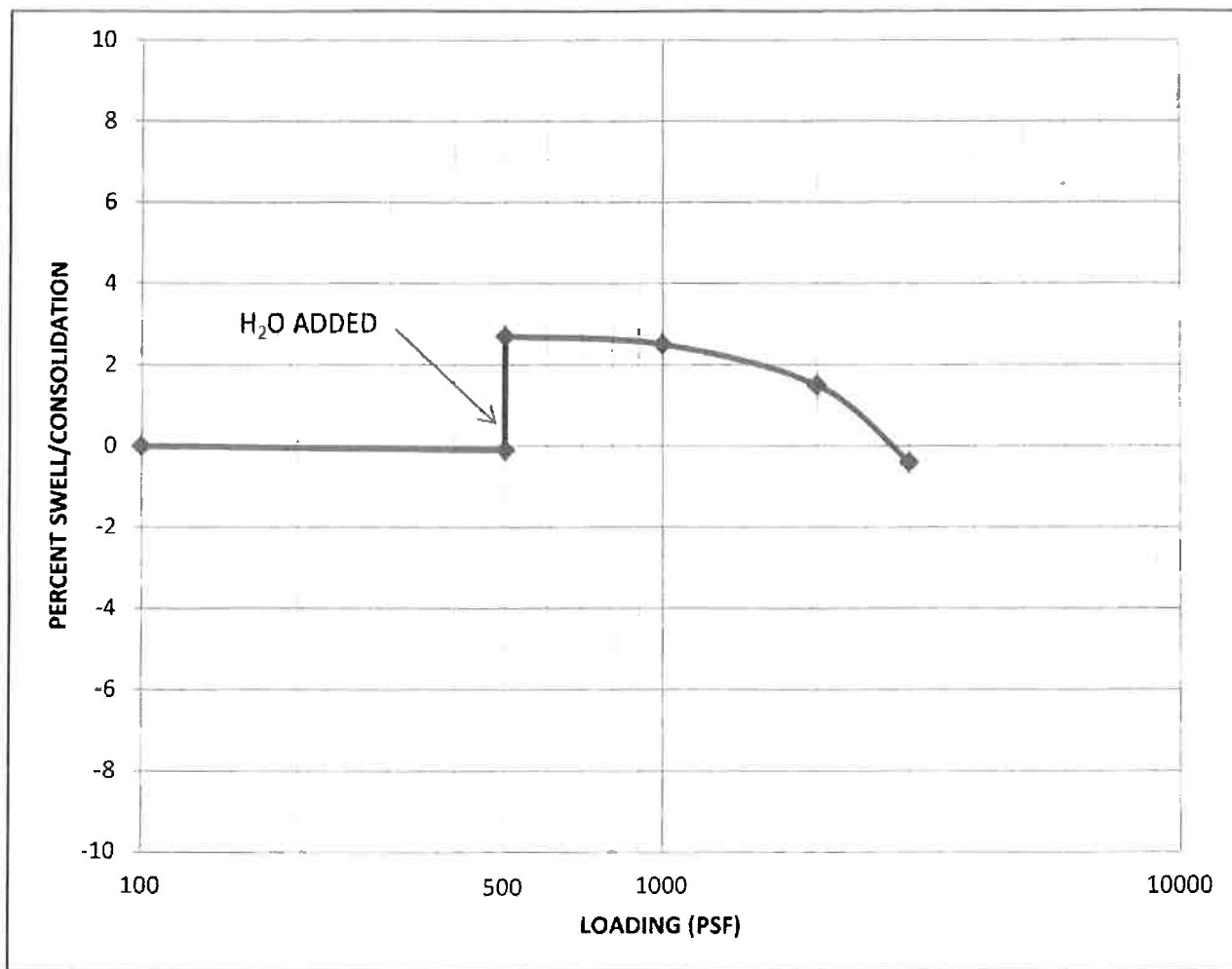
SOIL TYPE: CLAY WITH MEDIUM PLASTICITY (CL)

JOB NO:	19-9434	JOB LOCATION:	
DATE:	1/22/20	FUTURE 1.66 ACRE PARCEL LOCATED WITHIN PARCEL 13031900014	
DRAWN:	KELSEY	LOT 2, A PART OF THE SW1/4 OF SEC. 19, T2N, R63W OF THE 6TH P.M.	
CHECKED:	TMS	WELD COUNTY, CO	



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HOLE #	DEPTH	L.L.	P.L.	P.I.	% EXPANSION	% CONSOLIDATION	% MOISTURE
1	4' BC	39.86	22.12	17.74	2.8		8.76

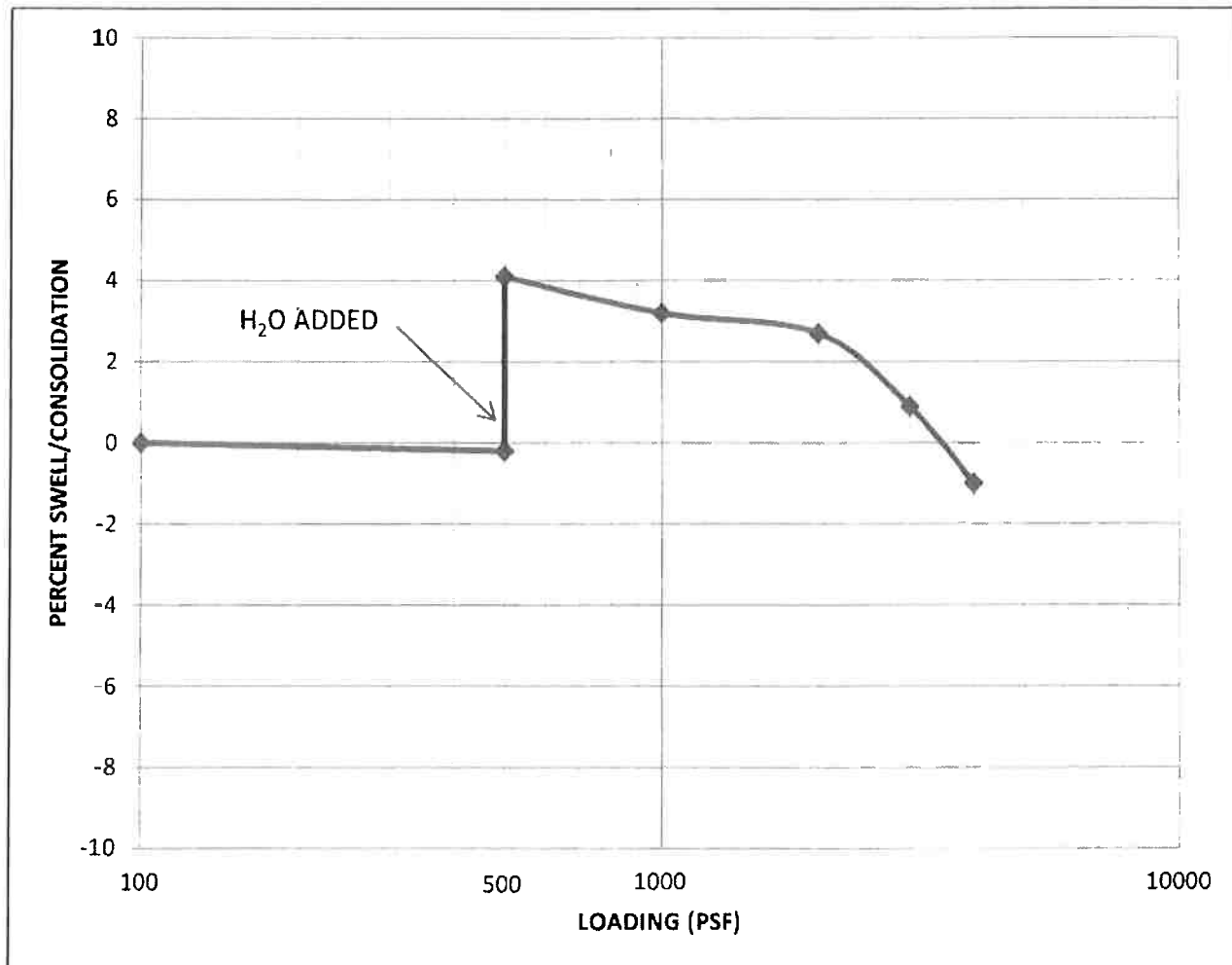
SOIL TYPE: CLAY WITH MEDIUM PLASTICITY (CL)

JOB NO:	19-9434	JOB LOCATION:	
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DRAWN:	KELSEY	LOT 2, A PART OF THE SW1/4 OF SEC. 19, T2N, R63W OF THE 6TH P.M.	
CHECKED:	TMS	WELD COUNTY, CO	



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HOLE #	DEPTH	L.L.	P.L.	P.I.	% EXPANSION	% CONSOLIDATION	% MOISTURE
1	7' BC	43.00	23.51	19.49	4.3		13.73

SOIL TYPE: CLAY WITH MEDIUM PLASTICITY (CL)

JOB NO:	19-9434	JOB LOCATION:	
DATE:	1/22/20	FUTURE 1.66 ACRE PARCEL LOCATED WITHIN PARCEL 13031900014	
DRAWN:	KELSEY	LOT 2, A PART OF THE SW1/4 OF SEC. 19, T2N, R63W OF THE 6TH P.M.	
CHECKED:	TMS	WELD COUNTY, CO	

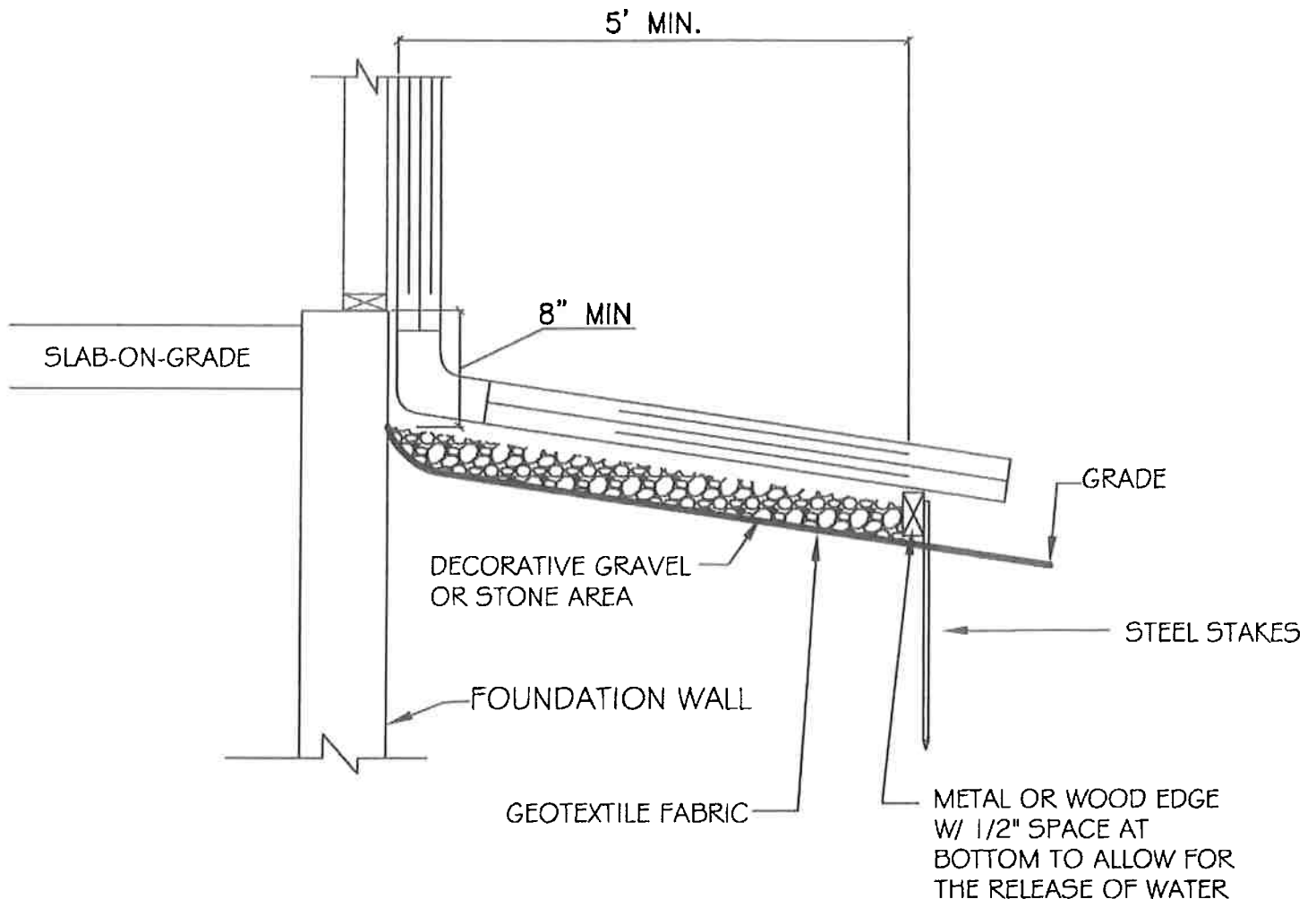




**HIGH PLAINS ENGINEERING & DESIGN, LLC**

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## FOUNDATION GRADING DETAIL



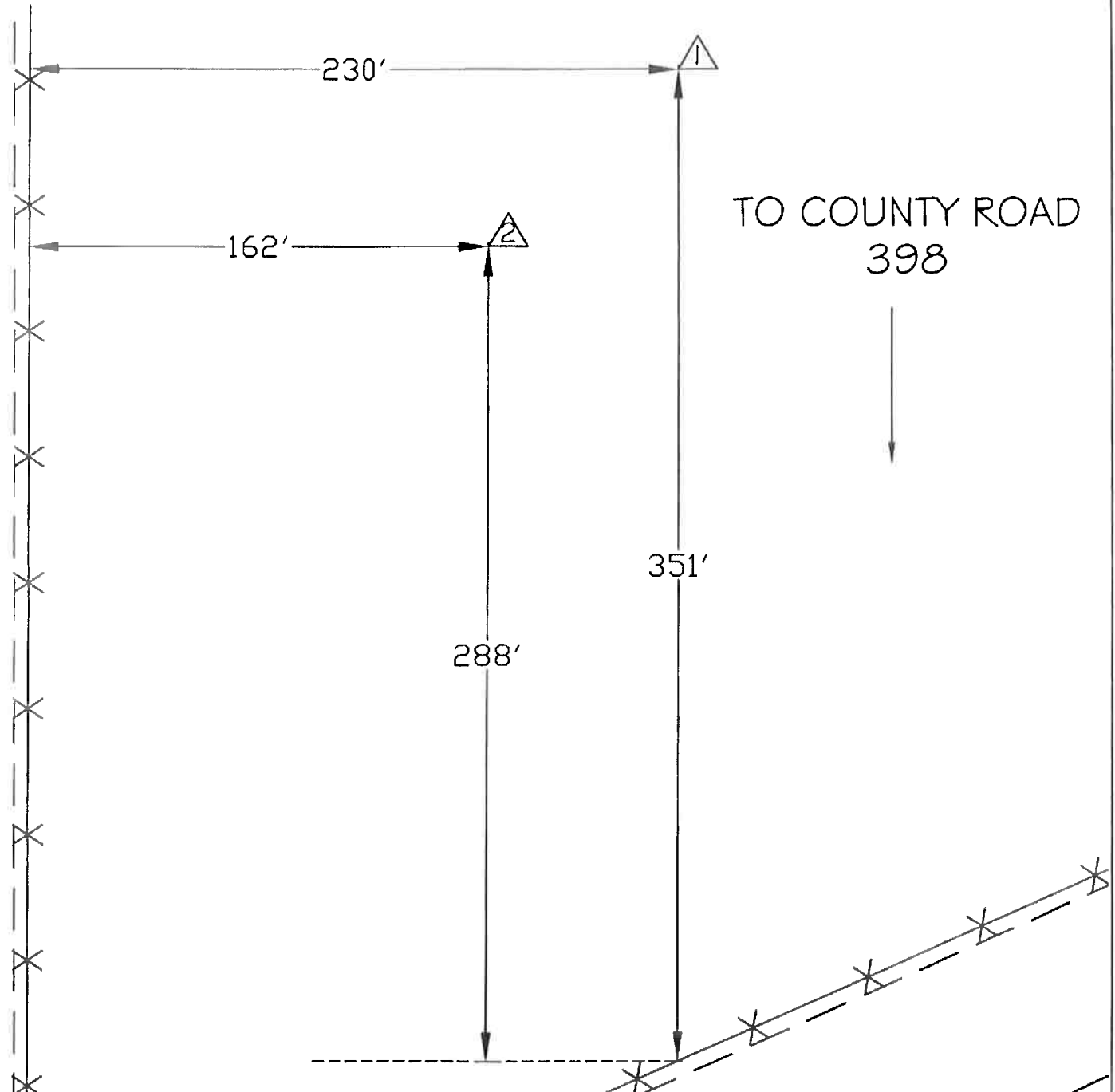
### NOTE

1. PROVIDE A MINIMUM SLOPE OF 1 2" IN THE FIRST 10'-0" FROM FOUNDATION (10%)
2. DOWNSPOUTS AND EXTENSIONS SHOULD EXTEND BEYOND THE GRAVEL OR STONE AREA
3. HARDSCAPING NEXT TO FOUNDATION SHOULD SLOPE AWAY AT 2% SLOPE



# SITE MAP

FUTURE 1.66 ACRE PARCEL CURRENTLY LOCATED WITHIN PARCEL 130319300014  
LOT 2, A PART OF THE SW 1/4 OF SECTION 19, T2N, R63W OF THE 6TH P.M.  
WELD COUNTY, CO



## LEGEND

- - Percolation Test Hole
- X - Percolation Profile Hole
- △ - Soil Profile Hole
- XX - Fence
- ☆ - Bench Mark
- - Soil Pit

All locations shown above are based on specific information furnished by others or estimates made in the field by High Plains Engineering & Design personnel. The locations, distances, directions, etc. are not the result of a property survey but are approximations and are not warranted to be exact. It is the owner/builder's responsibility to define property boundaries and ensure all onsite improvements are located within the platted site and out of inappropriate easements. All distances are to be verified prior to excavation.