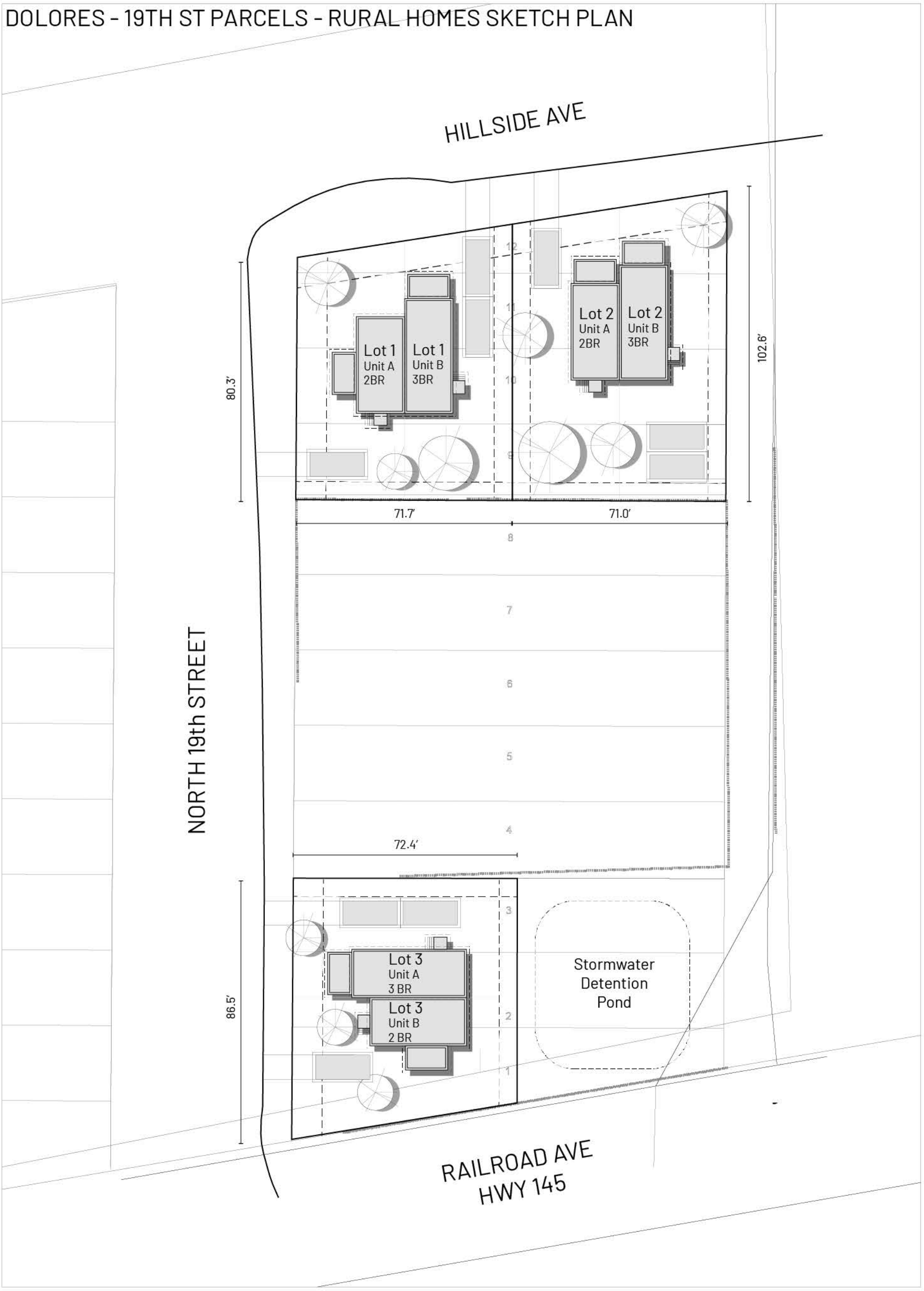
DOLORES - 19TH ST PARCELS - RURAL HOMES SKETCH PLAN



LAND USE TABLE

Lot 1	6139.3 square feet; 22% lot coverage
unit A:	2 bedroom - 1024 square feet
unit B:	3 bedroom - 1216 square feet
Lot 2	6894.1 square feet; 20% lot coverage
unit A:	2 bedroom - 1024 square feet
unit B:	3 bedroom - 1216 square feet
Lot 3	6022.7 square feet; 23% lot coverage
unit A:	3 bedroom - 1216 square feet
unit B:	2 bedroom - 1024 square feet

*All lot widths >50 feet wide; all setbacks >10 feet front yard and >6 feet sideyard

June 12, 2023

Site Analysis for Affordable Housing
Dolores, Colorado

January 31, 2023

Document Overview

This study has been commissioned by the Town of Dolores' Affordable Housing Task Force as the first part of the Rural Homes LLC project to analyze three Town-owned parcels that are being investigated for the purpose of developing workforce housing units.

As part of the site due-diligence phase, this document provides a framework for comparing the potential of each site. The document looks at (1) site access (2) floodplain issues (3) existing utilities (4) location (5) zoning (6) development density and finally (7) a schematic project budget. In outlining the site analysis in this way, we have attempted to compare the sites in 'apples-to-apples' format.

At this preliminary stage of analysis, we have made certain assumptions based on the information that is readily available. Other challenges may appear in later phases of this planning exercise as a result of new information that may come out of a site survey, geotechnical soils report, or phase 1 environmental Site Assessment.

Town of Dolores-Owned-Sites:

19th & Railroad

19th & Hillside

Dolores Maintenance

Site Access	**2**	**1**	**3**
Floodplain	**3**	**2**	**1**
Existing Utilities	**1**	**1**	**3**
Location	**1**	**1**	**3**
Zoning	**1**	**1**	**3**
Development Unit Count	**3**	**2**	**1**
Development Budget	**2**	**1**	**3**
Total	**15**	**9**	**17**

(Lower Point Score = Higher Development Potential)

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19th & Railroad

View looking northwest

View looking north

View looking northeast

View looking east

Site Access

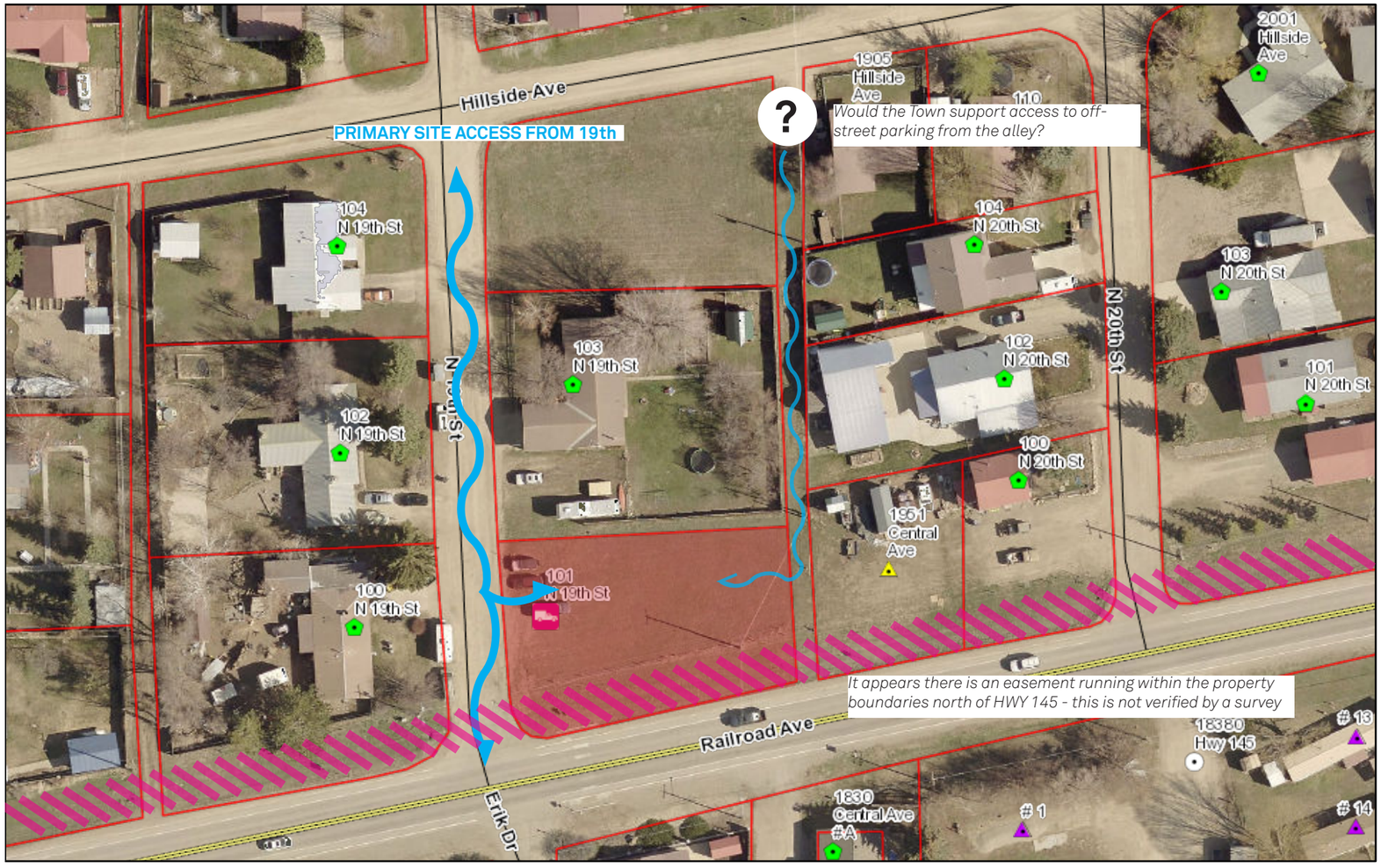
This site is bounded by Railroad Avenue (Colorado Highway 145) to the South, 19th street to the West, an existing alley to the East, and a developed residential property to the North.

The best access to this site is from the West on 19th Street. However, the site is rectangular, and narrower on the West and East edges, which presents a problem for providing frontage accessing subdivided lots while also providing two off-street parking spaces per dwelling unit as required by Dolores' land use code.

Rural Homes, LLC develops for-sale housing. To reduce the cost of homeownership, we have historically eliminated Home Owners Associations and aim to subdivide all project land (1) lots, which get sold to the workforce or (2) into Town or City owned Right-Of-Way (ROW).

The potential unit count on this site could in theory increase if the town would consider owning and maintaining an access alley along the northern property boundary. An alley along the north would provide access to units that face Railroad Ave to the south, but have off-street parking that would be accessed from the North. Alternatively, is there a way to use the existing alley and allow vehicular access exclusively through the alley from Hillside Ave? Please see the diagrams on Page 10 which demonstrates some ideas of how density could be increased on this site.

As a note, it appears there is an electrical easement that runs 25-30' into the property from the southern boundary. This easement limits the possible build-able area.



Floodplain

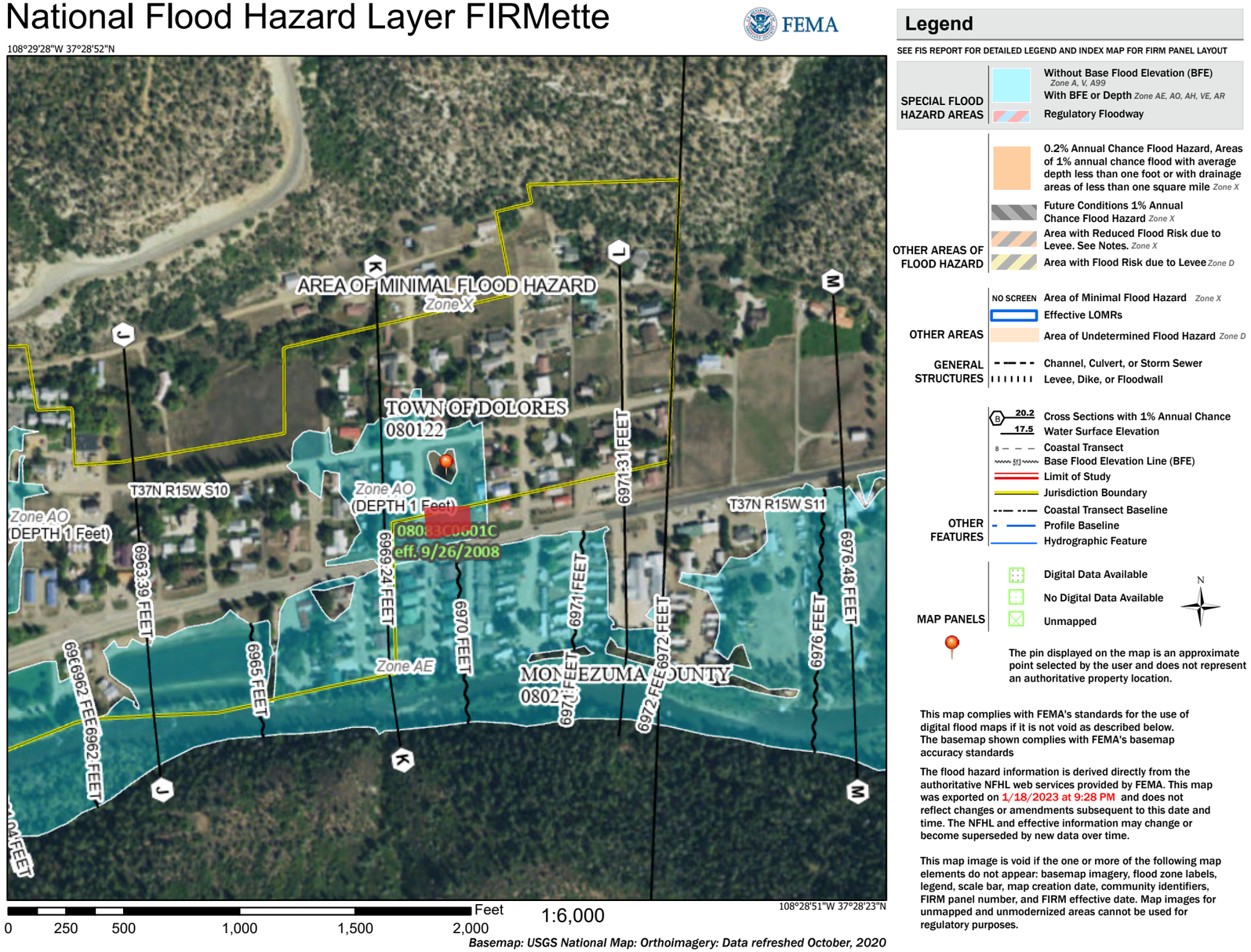
Like much of the Town of Dolores, this site is entirely within the floodplain. It is in an AO Zone which as defined by the Flood Zone Designations in the National Flood Insurance Program as:

"A river or stream flood hazard area, with 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1-3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

Fortunately, the State of Colorado's Department of Local Affairs Division of Housing still allows for housing development on sites within flood zones so long as the Finish Floor Elevation (FFE) of the home is greater than 1 foot above the Base Flood Elevation (BFE). These modular units are typically built on top of crawl spaces and are about 30" off of grade. This bodes well for the AO flood zone location.

The Base Flood Elevation would get determined by our sub-consultants, Goff Civil Engineering and would be part of the next phase of project once the Task Force has selected a site to move forward with.

Rural Homes LLC does not think that the beneficially home buyer lending opportunities that we provided for interested buyers in our Norwood and Ridgway projects would be impacted by a project located within this flood zone designation. However, if we were to pursue a project on this site, it would be an important question to consider early on in the process.



Existing Utilities & Capacity

This site is well served by existing utilities. There is a 4-inch ductile iron water line running underneath 19th street to West and a sewer line running in the alley to the East. Having infrastructure in the area is beneficial to lower the cost of building a home. In our previous projects we have needed to embed the cost of building out a subdivision (all pipes, streets, etc.) into the cost of each home at a price of $65K-$90K per unit.

Zoning - NR1

The zoning and dimensional standards of the NR-1 zone district are very favorable to building 2-unit townhome structures. For example, a townhome has a minimum lot size requirement of 1200 s.f. as opposed to a detached single family home has a 6000 s.f. minimum lot size. Additionally, a town home as a 20 foot minimum lot width as opposed to 50 foot for a detached single family home. The next page exhibits what a 2-unit townhome might look like.

Going forward, it may be advantageous to look into getting a variance for minimum lot size to build a triplex configuration.

Location

Too often, affordable housing developments are pushed to the outskirts of town. This is in infill lot, walking distance to much of the Town of Dolores, and is therefore an optimal site to consider building affordable housing.

Table 3.2: Dimensional Standards for Residential Structures

	LLR-1	LLR-2	NR-1	NR-2/NR-3, DMU	NR-1 [1], NR-2, NR-3, DMU		NR-3, DMU	NR-3
Standard					Town House [2]	3-4 DU Multifamily	5-8 DU Apartment	9+ DU Apartment
Min. Lot Dimensions								
Lot Area (min/max)								
Single Family min/max (sq. ft.)	43,560/ no max.	12,000/ 43,560	6,000/ 12,000	3,000/ 6,000				
Duplex min/max (sq. ft.)	43,560/ structure	12,000/ structure	6,000/ structure	3,000/ structure				
3-4 unit Multifamily home	43,560/ structure	12,000/ structure	6,000/ structure	6,000/ structure				
Townhouses and Apartments					1200/unit	7000/ structure	10,000/ structure	10,000/ structure
Min. Lot Width (ft.) All districts except DMU	70	70	50	50	20	50	20	50
DMU				n/a	n/a	n/a	n/a	
Max. Lot Cover. (%) All districts except DMU	20	50	50	60	70	70	70	70
DMU				100	100	100	100	
Front Build-to Line (ft)					See Sec. 3.5.C.2			
Min/max range (ft)	n/a	n/a	n/a	n/a	10-20 ft	10-20 ft	10-20 ft	10-20 ft
Min. Setbacks (ft)				NR / DMU	NR / DMU	NR / DMU	NR / DMU	NR / DMU
Front Yard	25	25	10	10 / 0	n/a / 6/0	n/a / 6/0	n/a / 6/0	n/a / 6/0
Street Side	25	25	10	10 / 0	10 / 6/0	10 / 6/0	10 / 6/0	10 / 6/0
Interior Side Yard	20	20	6	6 / 0	6 / 6/0	15 / 6/0	6 / 6/0	15 / 6/0
Rear Yard	20	20	6	6 / 25	6 / 6/25	10 [3] / 6/25	10 [3] / 6/25	10 [3] / 6/25
Det. Acc. Struct, from alley	0	0	0	0 / 0	0 / 0	0	0 / 0	0 / 0
Structure Dimensions								
Min. Area/unit (sq. ft.)	800	800	800	800	800/unit	400/unit	400/unit	400/unit
Max. Height, Principal Bldg (ft.)	35	35	35	35	35	35	35	35
Max. Height, Access. Bldg (ft)	[4]	[4]	[4]	[4]	27	27	27	27

Notes
[1] May require conditional use permit approval in NR-1 district.
[2] Side setbacks measured at exterior of building, not between individual units
[3] 20 abutting LLR-1 or LLR-2
[4] Height of principal building

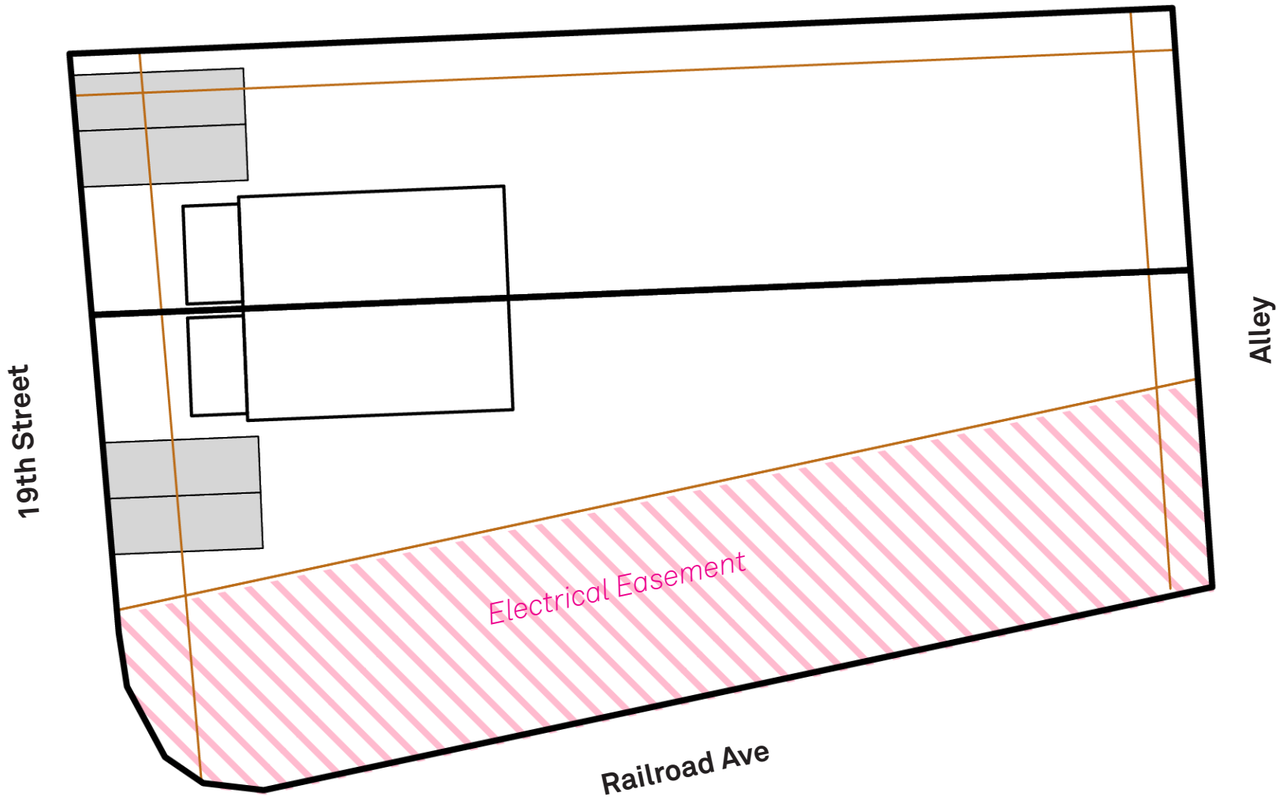
A Rural Homes Duplex - manufactured by Fading West, this rendering exemplifies the type of structure that is being laid out to take advantage of the dimensional requirements that are laid out in the Dimensional Standards for Residential Structures of the Dolores Land Use Code

Potential Unit Count

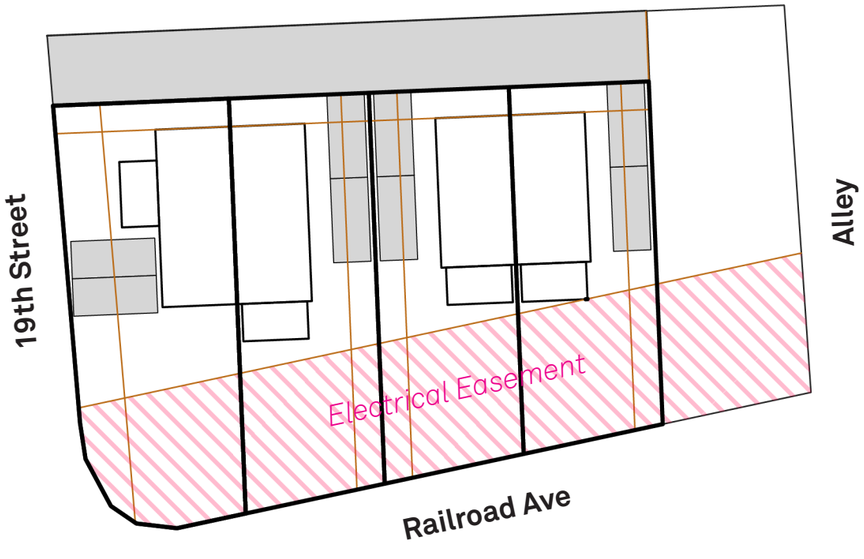
This development site faces two primary challenges that reduce its potential development density. First, the effective build-able lot area is reduced by the easement that likely runs through the southern portion of the parcel. Second, density is hindered by only having primary access of 19th street. It would likely not be possible to have frontage on HWY 145.

Accessed from 19th, the site can only provide two townhome units (potentially three is we request a lot width variance from 20' to 16' for the middle unit)that meet the lot setback and dimensional standards of the Dolores Land Use code.

However, with the introduction of a shared alley or shared driveway, there may be a strategy to slightly increase the density of this parcel. Please see the next page.



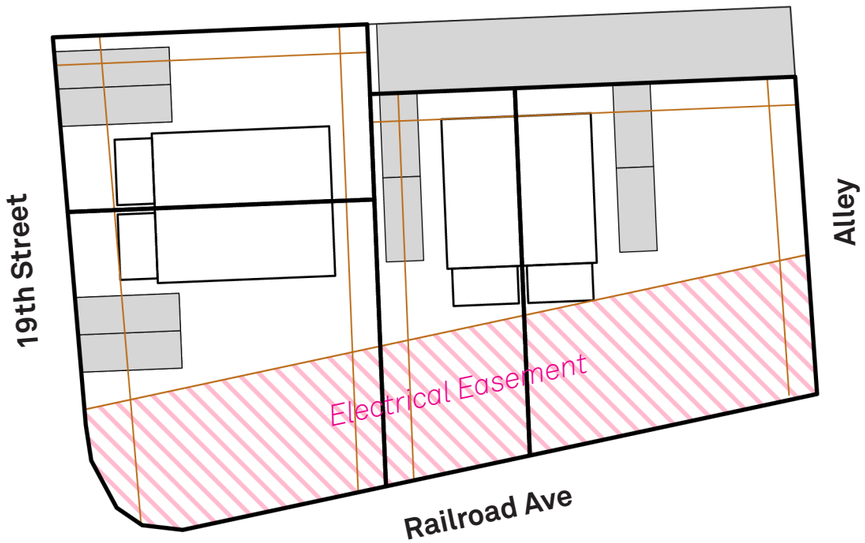
19th & Railroad



Railroad - Scheme B - 4 units

One option would be to introduce an alley that runs along the north side of the project. That alley would need to be owned and maintained by the Town, or through a party wall agreement between the homeowners that would share the use of that alley.

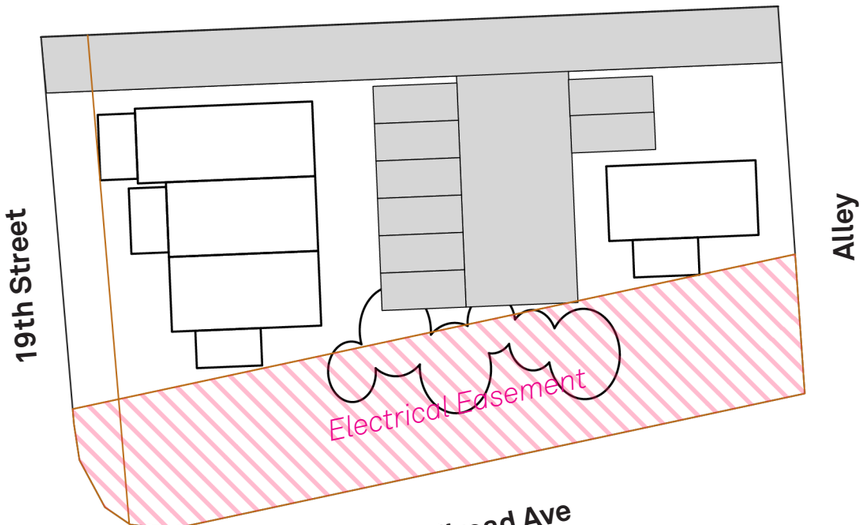
In this condition, there is an opportunity to have front porches that face HWY 145, with a green strip and sidewalk that would run within the easement.



Railroad - Scheme C - 4 units

Alternatively, homeowners could use the existing alley to access off-street parking. This scheme, similarly, uses a shared alley to increase the access to units from this property. The challenge in this scheme is how to maintain the shared alley over time. In previous Rural Homes projects, we have avoided the construction of shared amenities and tried to allocate all land to homeowner's lots or to be dedicated as a Town or City Right of Way.

19th & Railroad



Railroad - Scheme D - 4 units

This final proposal would be a more complicated ownership arrangement, but could work if an entity - such as the Town, County, or School District - were to own the lot and rent to employees.

The challenge of this proposal is how to solve the long term maintenance of the shared parking area and shared landscape zone.

This proposal demonstrates what a Triplex might look like on this property. A triplex would require a variance from the dimensional standards of the Land Use Code, which states that the minimum lot width in NR-1 must be 20 feet. The modules that we have been using from Fading West are 16' wide. Therefore, to subdivide the parcel into 3 different lots, with property lines running underneath the party walls would require a lot width variance.

Potential Development Budget

This Pro-Forma outlines a conceptual budget for 4 units on this parcel. To develop two 2BR units and two 3BR units, We believe that the average unit cost would be approximately $320,000. There may be opportunities to inject further grant offsets depending on funding sources available closer to the project delivery timeline.

Dolores 19th & Railroad - 4 units

#	Unit	FW model	unit SF	total SF
2	3BR	Shavano	1216	2432
2	2BR	Antero	1024	2048
0	Garages		432	0
0	3 BR	Torrey	1600	0
0	1BR	ADUs	416	0
4	Porches		112	448
4	Sheds		200	800
			Project Square Feet	**5,728**
			Project Units	**4**
			Fading West Square Feet	**4,480**

Dolores 19th & Railroad - 4 Units Pro Forma				TC	UC		$/SF
Planning Grant							
	Environmental - Phase 1						
	Geotechnical Engineering Soils Report						
	Civil Survey						
Entitlements Costs				$ 25,000.00	$ 6,250.00	per du	$ 4.36
	Civil Engineering Construction Documents			$ 25,000.00	$ 6,250.00	per du	$ 4.36
Land Acquisition							
Land Development				$ 73,000.00	$ 18,250.00	per du	$ 12.74
	General Contractor Horizontal Construction			$ 30,000.00	$ 7,500.00	per du	$ 5.24
	Contingency - Horizontal		10%	$ 3,000.00	$ 750.00	per du	$ 0.52
	Electrical	allowance		$ 20,000.00	$ 5,000.00	per du	$ 3.49
	Broadband	allowance		$ 20,000.00	$ 5,000.00	per du	$ 3.49
Vertical				$ 1,392,672.92	$ 348,168.23	per du	$ 243.13
	Fading West supply agreement			$ 640,640.00	$ 160,160.00	per du	$ 143.00
	Contingency - Supply Agreement		0%	$ -	$ -	per du	$ -
	EV Lot Specific Design Fee			$ 2,240.00	$ 560.00	per du	$ 0.50
	Module Shipping			$ 48,000.00	$ 12,000.00	per du	$ 10.71
	Setting & stitching			$ 32,000.00	$ 8,000.00	per du	$ 7.14
	General Contractor Vertical Finish			$ 498,000.00	$ 124,500.00	per du	$ 86.94
2	3BR			$ 250,000.00	$ 125,000.00	per du	$ 43.65
2	2BR			$ 200,000.00	$ 100,000.00	per du	$ 34.92
4	Porches			$ 20,000.00	$ 5,000.00	per du	$ 3.49
4	Sheds			$ 28,000.00	$ 7,000.00	per du	$ 4.89
	Vertical Finish Contingency		10%	$ 49,800.00	$ 12,450.00	per du	$ 8.69
	Solar			$ 59,992.92	$ 14,998.23	per du	
	Municipal Fees			$ 48,000.00	$ 12,000.00	per du	$ 8.38
4		water taps		$ 24,000.00	$ 6,000.00	per du	$ 4.19
4		sewer taps		$ 24,000.00	$ 6,000.00	per du	$ 4.19
	Building Permit Fees			$ 14,000.00	$ 3,500.00	per du	$ 2.44
Project Costs				**$ 97,283.65**	**$ 4,053.49**	per du	$ 16.98
	Public Improvements Bond			$ -	$ -	per du	$ -
	Project Insurance			$ 12,000.00	$ 500.00	per du	$ 2.09
	Marketing			$ -	$ -	per du	$ -
	Legal Fees			$ 12,000.00	$ 500.00	per du	$ 2.09
	Developer Fee		5.0%	$ 73,283.65	$ 3,053.49	per du	$ 12.79
PROJECT TOTAL				**$ 1,587,956.57**	**$ 396,989.14**	**per du**	**$ 277.23**
GRANT SUBSIDIES				**$ 317,992.92**	**$ 79,498.23**	**per unit**	**$ 55.52**
	DOLA Grant			$ 160,000.00	$ 40,000.00		$ 27.93
	Donated Tap Fees			$ 48,000.00	$ 12,000.00		$ 8.38
	All Electric Incentives			$ 10,000.00	$ 2,500.00		$ 1.75
	Unkown State Grant			$ 40,000.00	$ 10,000.00		
	CCEF Solar			$ 59,992.92	$ 14,998.23		$ 10.47
NET PROJECT COST				**1,269,963.65**	**$ 317,490.91**	**per du**	**221.71**

19th & Hillside

View looking southeast

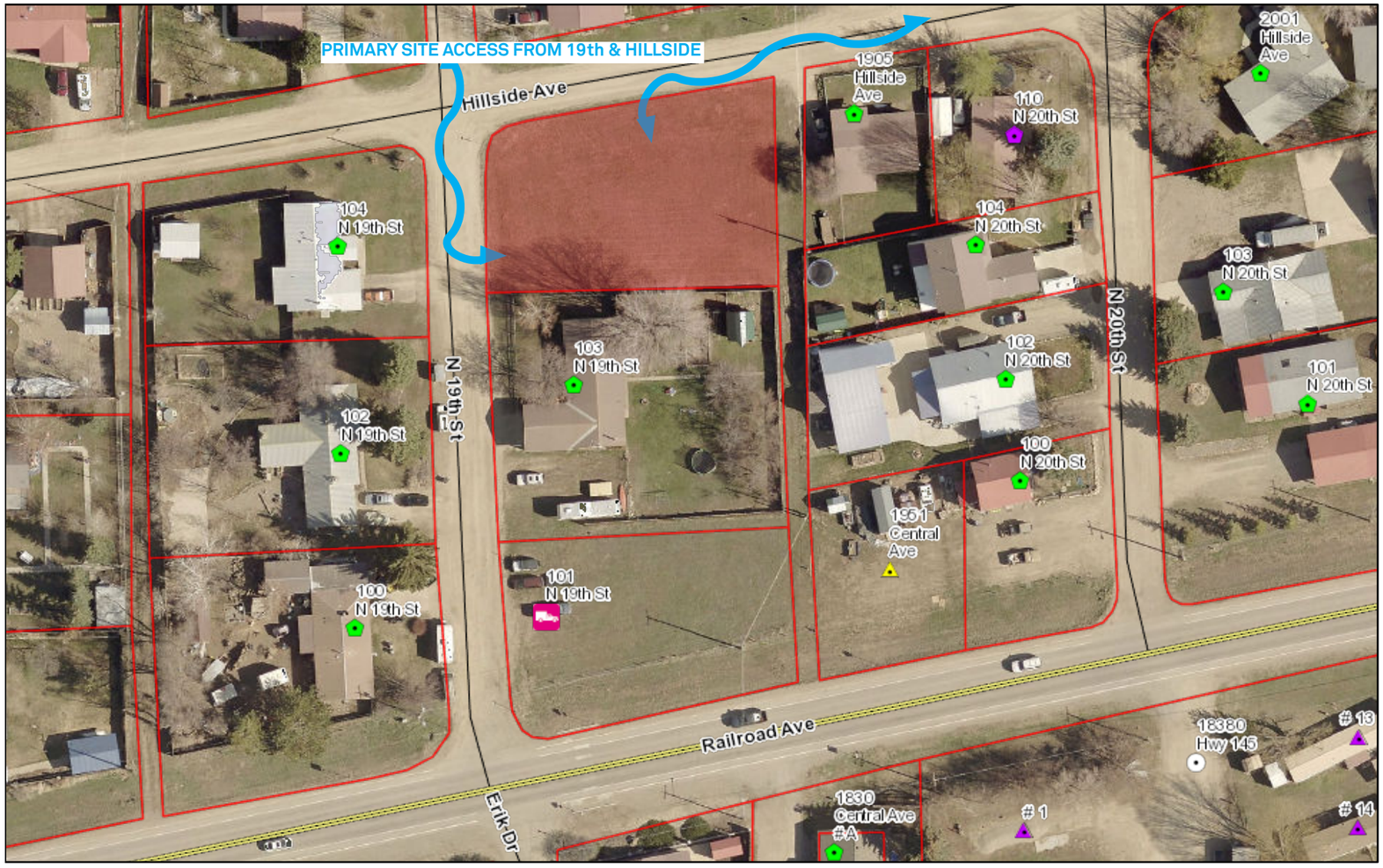
View looking south

View looking southwest

View looking west

Site Access

The 19th & Hillside parcel can be accessed from two sides, which is a significant advantage for planning access to off-street parking for multiple units. Similar to the 19th & Railroad parcel, if the Town were to consider a creative solution to long term maintenance of an alley, there may be a way to shift all parking towards to the rear of the property as opposed to being seen from the street.



Floodplain

This parcel is only partially within the floodplain, which is certainly a strategic advantage for development. Once subdivided, however, it appears that almost all lots on this parcel would be partially within in the AO Zone which as defined by the Flood Zone Designations in the National Flood Insurance Program, *is a river or stream flood hazard area, with 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1-3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.*

Fortunately, the State of Colorado's Department of Local Affairs Division of Housing still allows for housing development on sites within flood zones so long as the Finish Floor Elevation (FFE) of the home is greater than 1 foot above the Base Flood Elevation (BFE). These modular units are typically built on top of crawl spaces and are about 30" off of grade. This bodes well for the AO flood zone location.

The Base Flood Elevation would get determined by our sub-consultants, Goff Civil Engineering and would be part of the next phase of project once the Task Force has selected a site to move forward with.

Rural Homes LLC does not think that the beneficially home buyer lending opportunities that we provided for interested buyers in our Norwood and Ridgway projects would be impacted by a project located within this flood zone designation. However, if we were to pursue a project on this site, it would be an important question to consider early on in the process.

NR-1 Zoning

Existing Utilities & Capacity

This site is served by existing utilities. There is a 4-inch ductile iron water line running underneath 19th street to West and a sewer line running in the alley to the East. Having infrastructure in the area is beneficial to lower the cost of building a home. In our previous projects we have needed to embed the cost of building out a subdivision (all pipes, streets, etc.) into the cost of each home at a price of $65K-$90K per unit.

Zoning - NR1

The zoning and dimensional standards of the NR-1 zone district are very favorable to building 2-unit townhome structures. For example, a townhome has a minimum lot size requirement of 1200 s.f. as opposed to a detached single family home has a 6000 s.f. minimum lot size. Additionally, a town home as a 20 foot minimum lot width as opposed to 50 foot for a detached single family home. The next page exhibits what a 2-unit townhome might look like.

Going forward, it may be advantageous to look into getting a variance for minimum lot size to build a triplex configuration.

Location

All too often, affordable housing developments are pushed to the outskirts of town. This is in infill lot, walking distance to much of the Town of Dolores, and is therefore an optimal site to consider building affordable housing.

Potential Unit Count

Hillside - Scheme A - 5 units

This parcel is able to take advantage of access from Hillside Ave and 19th street and therefore provides a greater linear footage of frontage to access private driveways and off-street parking. This first scheme depicts the parcel being subdivided cleanly into 5 lots, many of which have lots of yard space. The fifth lot that is furthest to the East would require a slight lot width variance as its closer to 42' than 50'. Other than that, the proposal fits cleanly within the Dolores Land Use Code dimensional and setback standards.

Scheme A

Hillside - Scheme B - 6 units

The potential unit count could be increased to 6 units, either in 3 buildings (duplexes) with two townhome units or 2 buildings with three townhome units (triplexes). To avoid having all of the off-street parking in the front of the units, this scheme shows the use of an alley to have all parking 'hidden towards the back of the property and keeps the street facing facade full of front porches. The alley would preferably be maintained by the Town for this scheme to best promote the operational affordability of these units

Scheme B

Potential Development Budget

This Pro-Forma outlines a conceptual budget for 6 units on the 19th & Hillside Parcel. The conceptual budget shows that the average unit cost on this property would come in at about $315,000

Dolores 19th & Hillside - 6 units

#	Unit	FW model	unit SF	total SF
3	3BR	Shavano	1216	3648
3	2BR	Antero	1024	3072
0	Garages		432	0
0	3 BR	Torrey	1600	0
0	1BR	ADUs	416	0
6	Porches		112	672
6	Sheds		200	1200
			Project Square Feet	**8,592**
			Project Units	**6**
			Fading West Square Feet	**6,720**

Dolores 19th & Hillside - 6 Units Pro Forma					TC	UC		$/SF
Planning Grant								
	Environmental - Phase 1							
	Geotechnical Engineering Soils Report							
	Civil Survey							
Entitlements Costs					$ 25,000.00	$ 4,166.67	per du	$ 2.91
	Civil Engineering Construction Documents				$ 25,000.00	$ 4,166.67	per du	$ 2.91
Land Acquisition								
Land Development					$ 109,500.00	$ 18,250.00	per du	$ 12.74
	General Contractor Horizontal Construction				$ 45,000.00	$ 7,500.00	per du	$ 5.24
		Contingency - Horizontal		10%	$ 4,500.00	$ 750.00	per du	$ 0.52
	Electrical		allowance		$ 30,000.00	$ 5,000.00	per du	$ 3.49
	Broadband		allowance		$ 30,000.00	$ 5,000.00	per du	$ 3.49
Vertical					$ 2,089,009.38	$ 348,168.23	per du	$ 243.13
	Fading West supply agreement				$ 960,960.00	$ 160,160.00	per du	$ 143.00
		Contingency - Supply Agreement		0%	$ -	$ -	per du	$ -
		EV Lot Specific Design Fee			$ 3,360.00	$ 560.00	per du	$ 0.50
	Module Shipping				$ 72,000.00	$ 12,000.00	per du	$ 10.71
	Setting & stitching				$ 48,000.00	$ 8,000.00	per du	$ 7.14
	General Contractor Vertical Finish				$ 747,000.00	$ 124,500.00	per du	$ 86.94
	3	3BR			$ 375,000.00	$ 125,000.00	per du	$ 43.65
	3	2BR			$ 300,000.00	$ 100,000.00	per du	$ 34.92
	6	Porches			$ 30,000.00	$ 5,000.00	per du	$ 3.49
	6	Sheds			$ 42,000.00	$ 7,000.00	per du	$ 4.89
		Vertical Finish Contingency		10%	$ 74,700.00	$ 12,450.00	per du	$ 8.69
	Solar				$ 89,989.38	$ 14,998.23	per du	
		Municipal Fees			$ 72,000.00	$ 18,000.00	per du	$ 8.38
	6		water taps		$ 36,000.00	$ 6,000.00	per du	$ 4.19
	6		sewer taps		$ 36,000.00	$ 6,000.00	per du	$ 4.19
	Building Permit Fees				$ 21,000.00	$ 3,500.00	per du	$ 2.44
Project Costs					**$ 133,925.47**	**$ 5,580.23**	per du	$ 15.59
	Public Improvements Bond				$ -	$ -	per du	$ -
	Project Insurance				$ 12,000.00	$ 500.00	per du	$ 1.40
	Marketing				$ -	$ -	per du	$ -
	Legal Fees				$ 12,000.00	$ 500.00	per du	$ 1.40
	Developer Fee			5.0%	$ 109,925.47	$ 4,580.23	per du	$ 12.79
PROJECT TOTAL					**$ 2,357,434.85**	**$ 392,905.81**	**per du**	**$ 274.38**
GRANT SUBSIDIES					**$ 476,989.38**	**$ 79,498.23**	**per unit**	**$ 55.52**
	DOLA Grant				$ 240,000.00	$ 40,000.00		$ 27.93
	Donated Tap Fees				$ 72,000.00	$ 18,000.00		$ 8.38
	All Electric Incentives				$ 15,000.00	$ 2,500.00		$ 1.75
	Unkown State Grant				$ 60,000.00	$ 10,000.00		
	CCEF Solar				$ 89,989.38	$ 22,497.35		$ 10.47
NET PROJECT COST					**1,880,445.47**	**$ 313,407.58**	**per du**	**218.86**

Dolores Maintenance Yard

View looking northwest

Looking north

View looking northeast

View looking east

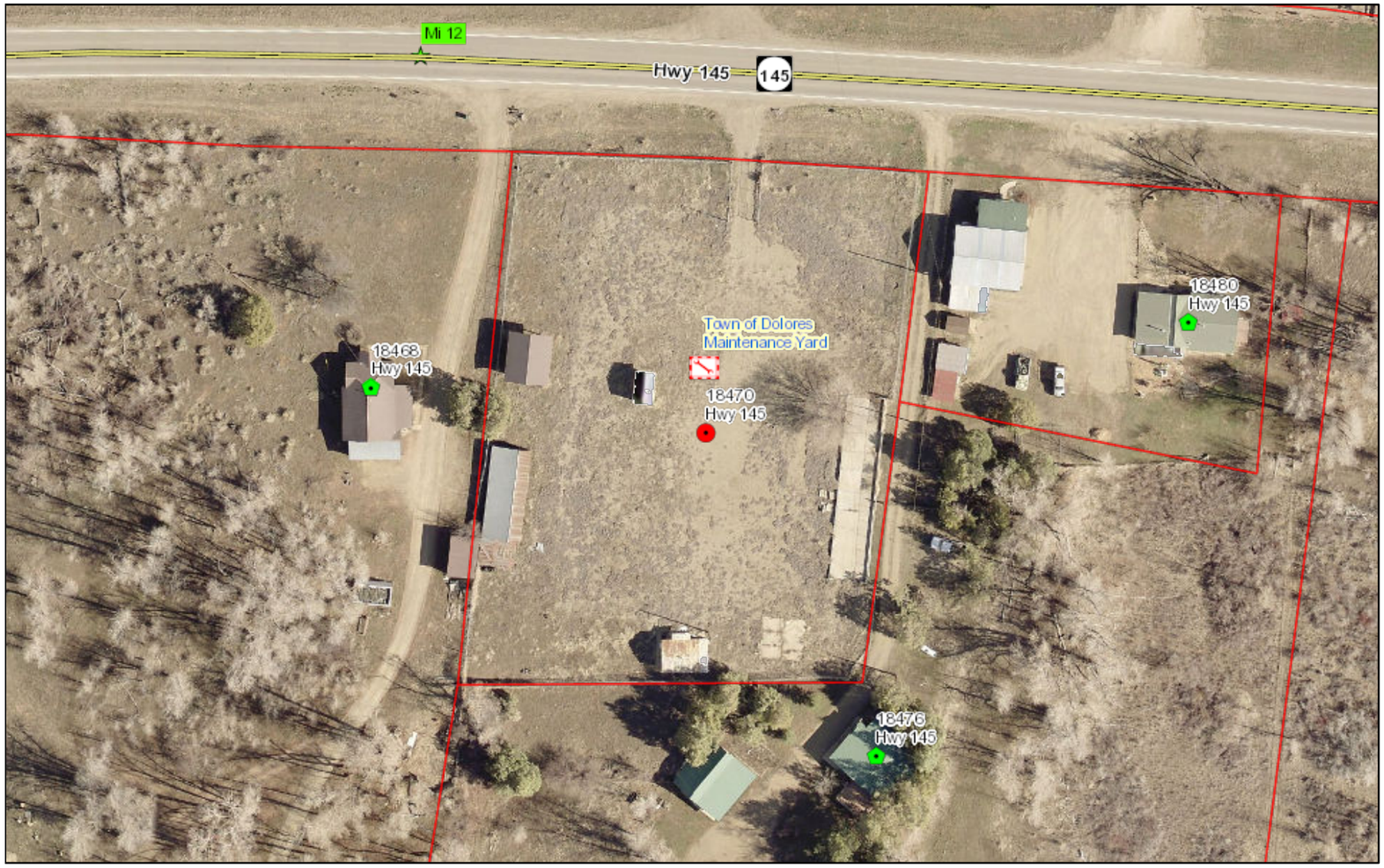
Site Access

The Dolores Maintenance Yard is approximately a 1.4 acre parcel and it has the most challenges associated with providing access for the purposes of workforce housing.

The primary access point would be off of Highway 145. A traffic study performed by a Colorado Department of Transportation consultant by the name of Skip Hudson, based in Grand Junction would be required in order to determine what unit count would trigger a requirement for acceleration and deceleration lanes. That study would cost approximately $3,000 and is not currently included in the scope of work of this planning agreement.

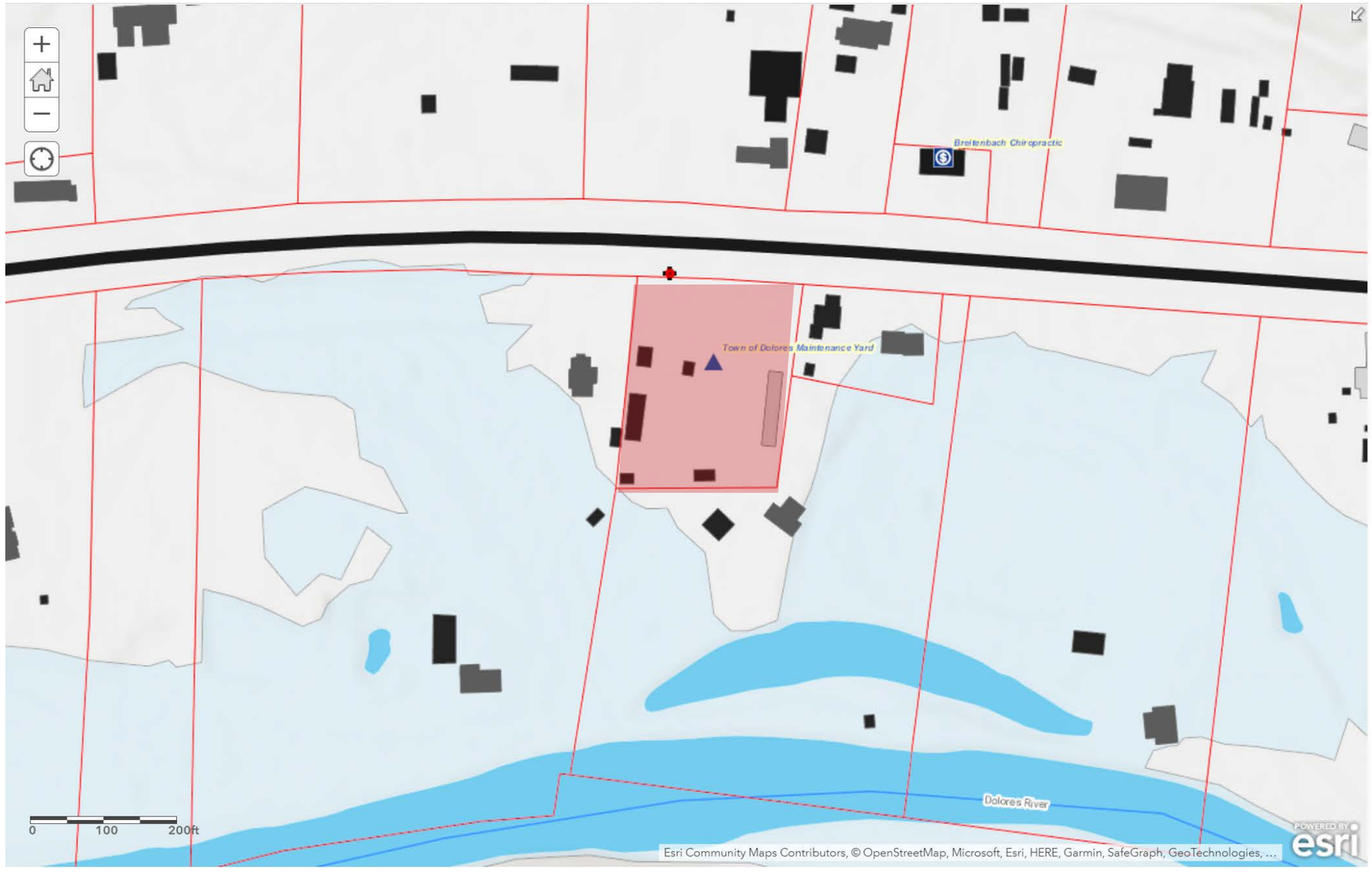
The paradox here is that the development would require being build at a high density in order to amortize the significant infrastructure cost of extending over 1800 linear feet of 8” water pipe. The risk of building at a higher density is that it would then require the additional work of providing improvements to the highway in the form of acceleration and deceleration lanes. That would provide an even greater added cost to the infrastructure component of this site.

Once within the parcel boundaries, the access road would need to be coordinated, reviewed, and approved by the local fire protection authority. Usually, fire trucks require a cul-de-sac with a minimum of a 85 foot diameter in order to turn around. Would the local life safety authorities be ok with a hammerhead road system as shown on page 23?



Floodplain

This parcel is not in the floodplain.



Existing Utilities & Capacity

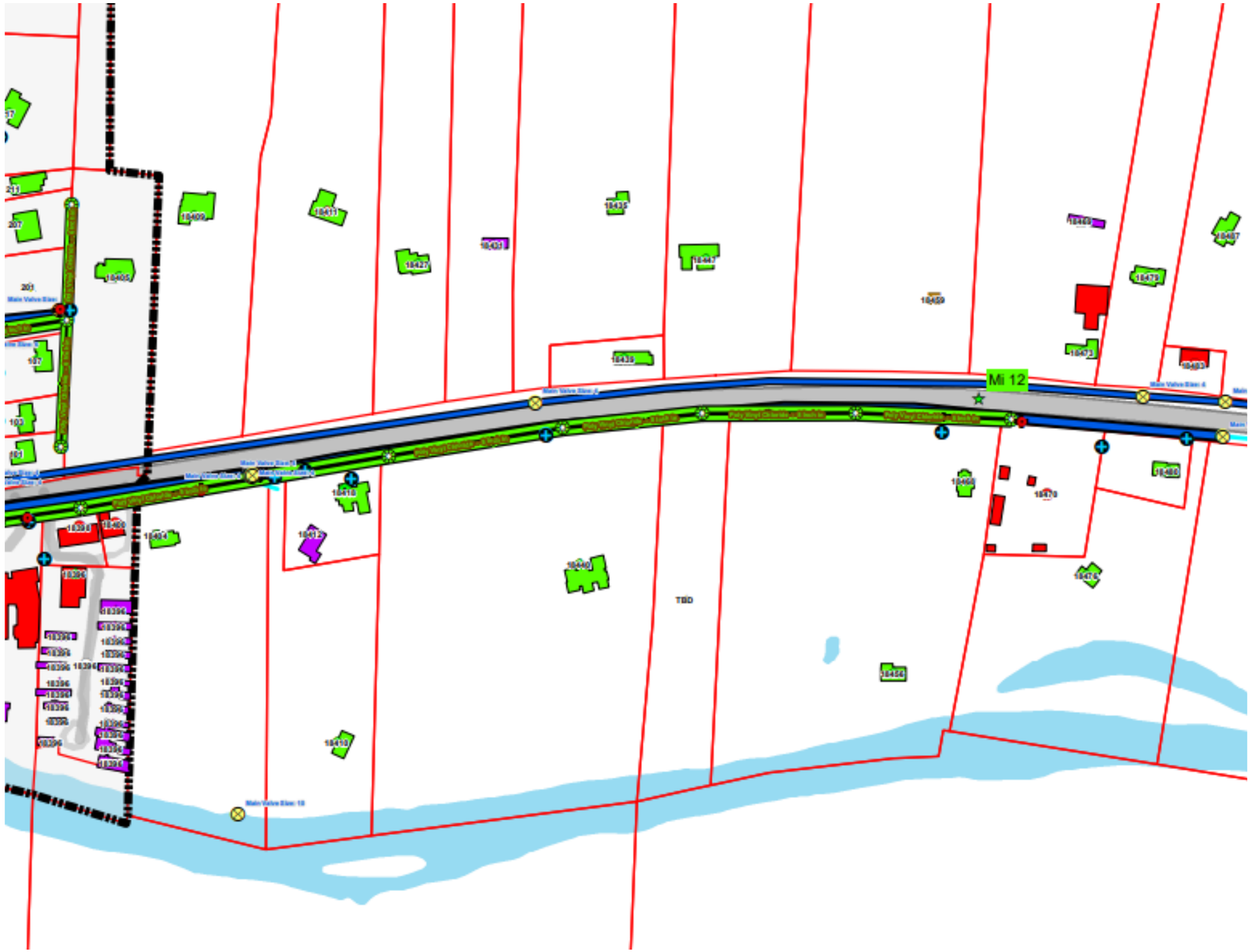
One of the primary challenges to developing this site is requiring the extension of an 8" water line approximately 1815 feet from the Town boundary to the site. The work required to extend this infrastructure would take place within the Colorado Department of Transportation Right of Way, which creates a series of cost, logistical, and administrative challenges. Water line is inadequate and will require replacing the current 4" with a minimum 8" approximately 1815 feet. This extension is completely in CDOT right-of-way. The parcel would require internal streets, sewer and water distribution, which adds to the average unit cost of the project.

Zoning - R-10

The Dolores Maintenance Yard is in the R-10 zone district which is for large lot single-unit dwellings. Developing this parcel would require a zone change to something more similar to NR-1. Currently, the zone district requires a 10 acre minimum lot area (the lot size is only 1.4 acres), a minimum lot width of 200 feet, and large 20-25 foot setbacks.

Location

All too often, affordable housing developments are pushed to the outskirts of town. Developing housing on the outskirts of town, where residents could only walk into stores, schools, and the library along the CDOT Right of Way would encourage a car-centric development. From a conceptual standpoint, the infill sites along 19th street are much better locations to build affordable housing.



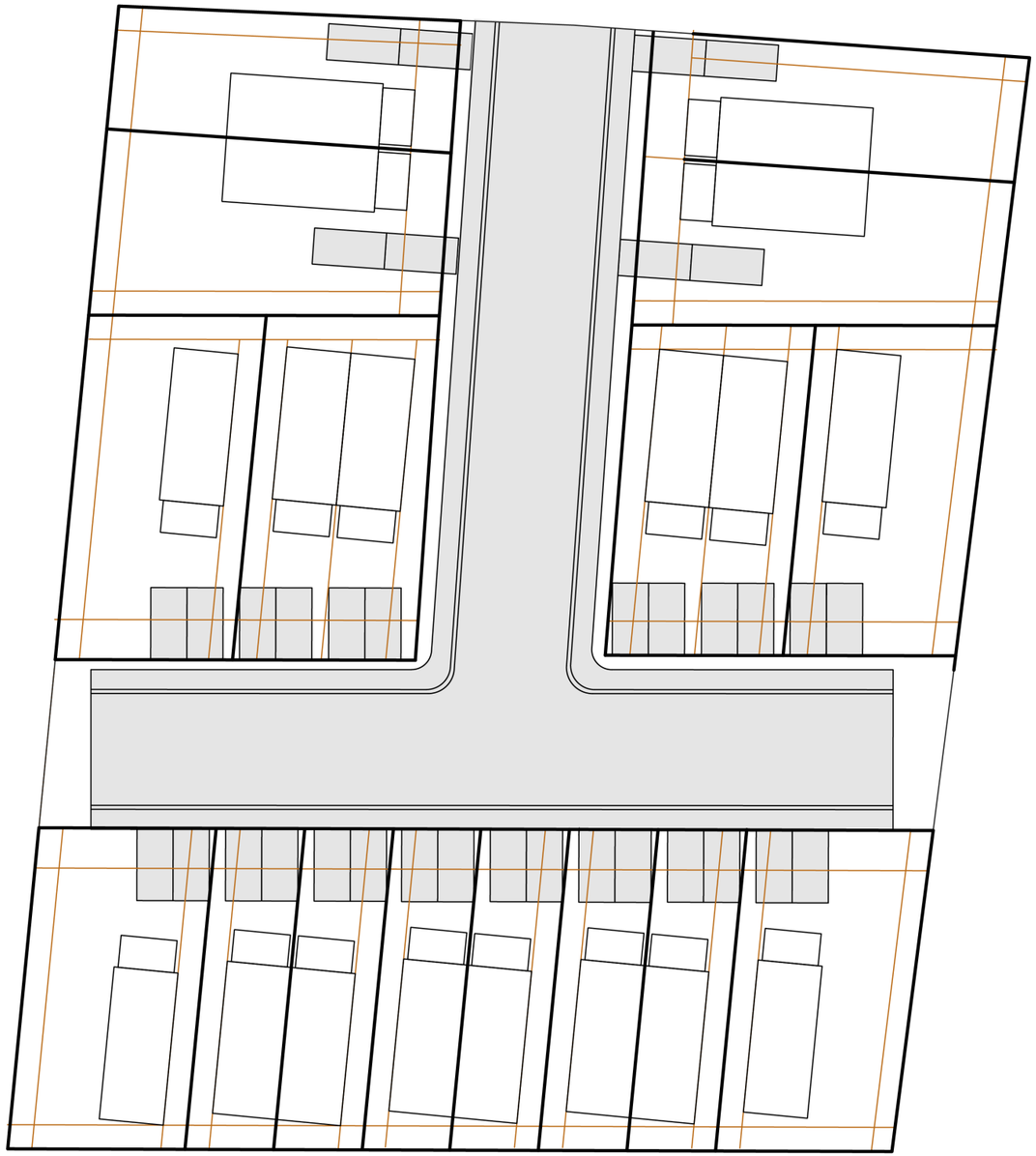
Potential Unit Count

This site diagram shows 18 units in the Dolores Maintenance parcel. The streets built within the parcel double-load units on either side of the streets.

An important question to get answered early is if the fire department would feel okay with this kind of 'hammer-head' street system. Building a cul-de-sac or loop road, would increase the surface area of street system and reduce the unit count, which effectively increases the per-unit cost of infrastructure construction. On top of the required waterline extension and the potential to build out acceleration and deceleration lanes within HWY 145, the per-unit infrastructure cost to develop housing on this parcel could completely bust the development budget as seen on the next page.

This layout shows a few detached single family homes that would require a lot width variance. The best planning tool to develop this site would be to pursue a PUD, or Planned Unit Development.

The Planned Unit Development Act of 1972 was established to encourage innovative developments with unique and valued community attributes. PUDs allow for consideration of development proposal that differ from required development improvements identified in the Land Use Code. PUDs often offer different options to the applicant when planning and obtaining City approval for their development. PUDs allow flexibility with respect to dimensional requirements and increased densities under certain conditions or circumstances. PUDs encourage conservation of a site's natural characteristics, innovative residential, commercial and industrial development plans which will result in a more efficient use of open space and provide affordable housing for year around residents."



Potential Development Budget

This Pro-Forma outlines a conceptual budget for 18 units on the Dolores Maintenance Yard Parcel. The conceptual budget shows that the average unit cost on this property would be about $450,000.

Dolores Maintenance Yard - 18 Units

#	Unit	FW model	unit SF	total SF
9	3BR	Shavano	1216	10944
9	2BR	Antero	1024	9216
0	Garages		432	0
0	3 BR	Torrey	1600	0
0	1BR	ADUs	416	0
18	Porches		112	2016
18	Sheds		200	3600
			Project Square Feet	**25,776**
			Project Units	**18**
			Fading West Square Feet	**20,160**

Dolores Maintenance Yard - 18 Units Pro Forma					TC	UC		$/SF
Planning Grant								
	Environmental - Phase 1							
	Geotechnical Engineering Soils Report							
	Civil Survey							
Entitlements Costs					$ 111,000.00	$ 6,166.67	per du	$ 4.31
	Traffic Study				$ 3,000.00	$ 166.67	per du	$ 0.12
	CDOT work permit				$ 8,000.00	$ 444.44	per du	$ 0.31
	Civil Engineering Construction Documents				$ 85,000.00	$ 4,722.22	per du	$ 3.30
	Landscape Architecture				$ 15,000.00	$ 833.33	per du	$ 0.58
Land Acquisition								
Land Development					$ 2,560,500.00	$ 142,250.00	per du	$ 99.34
	General Contractor Horizontal Construction				$ 2,070,000.00	$ 115,000.00	per du	$ 80.31
	Contingency - Horizontal			15%	$ 310,500.00	$ 17,250.00	per du	$ 12.05
	Electrical		allowance		$ 90,000.00	$ 5,000.00	per du	$ 3.49
	Broadband		allowance		$ 90,000.00	$ 5,000.00	per du	$ 3.49
Vertical					$ 6,267,028.14	$ 348,168.23	per du	$ 243.13
	Fading West supply agreement				$ 2,882,880.00	$ 160,160.00	per du	$ 143.00
	Contingency - Supply Agreement			0%	$ -	$ -	per du	$ -
	EV Lot Specific Design Fee				$ 10,080.00	$ 560.00	per du	$ 0.50
	Module Shipping				$ 216,000.00	$ 12,000.00	per du	$ 10.71
	Setting & stitching				$ 144,000.00	$ 8,000.00	per du	$ 7.14
	General Contractor Vertical Finish				$ 2,241,000.00	$ 124,500.00	per du	$ 86.94
	9	3BR			$ 1,125,000.00	$ 125,000.00	per du	$ 43.65
	9	2BR			$ 900,000.00	$ 100,000.00	per du	$ 34.92
	18	Porches			$ 90,000.00	$ 5,000.00	per du	$ 3.49
	18	Sheds			$ 126,000.00	$ 7,000.00	per du	$ 4.89
		Vertical Finish Contingency		10%	$ 224,100.00	$ 12,450.00	per du	$ 8.69
	Solar				$ 269,968.14	$ 14,998.23	per du	
	Dolores Municipal Fees				$ 216,000.00	$ 54,000.00	per du	$ 8.38
	18		water taps		$ 108,000.00	$ 6,000.00	per du	$ 4.19
	18		sewer taps		$ 108,000.00	$ 6,000.00	per du	$ 4.19
	Building Permit Fees				$ 63,000.00	$ 3,500.00	per du	$ 2.44
Project Costs					**$ 582,238.77**	**$ 24,259.95**	per du	$ 22.59
	Public Improvements Bond			allowance	$ 45,000.00	$ 1,875.00	per du	$ 1.75
	Project Insurance			allowance	$ 85,000.00	$ 3,541.67	per du	$ 3.30
	Marketing			allowance	$ 15,000.00	$ 625.00	per du	$ 0.58
	Legal Fees			allowance	$ 40,000.00	$ 1,666.67	per du	$ 1.55
	Developer Fee			4.5%	$ 397,238.77	$ 16,551.62	per du	$ 15.41
PROJECT TOTAL					**$ 9,520,766.91**	**$ 528,931.49**	**per du**	**$ 369.37**
GRANT SUBSIDIES					**$ 1,430,968.14**	**$ 79,498.23**	**per unit**	**$ 55.52**
	DOLA Grant				$ 720,000.00	$ 40,000.00		$ 27.93
	Donated Tap Fees				$ 216,000.00	$ 54,000.00		$ 8.38
	All Electric Incentives				$ 45,000.00	$ 2,500.00		$ 1.75
	Unkown State Grant				$ 180,000.00	$ 10,000.00		
	CCEF Solar				$ 269,968.14	$ 67,492.04		$ 10.47
NET PROJECT COST					**8,089,798.77**	**$ 449,433.26**	**per du**	**313.85**

Comparison

Dolores Site Grading Rubric

This rubric was created to compare the sites in apples-to-apples format. The sites are ranked among each category. The lower score suggests the greatest ease of development potential. Given Rural Homes LLC is actively involved in three other developments at any given time, a lower barrier to development suggests getting housing constructed on a faster timeline with fewer hurdles to surmount.

	19th & Railroad	*19th & Hillside*	*Maintenance Yard*
Site Access	**2**	**1**	**3**
Existing Utilities & Capacity	**1**	**1**	**3**
Floodplain	**3**	**2**	**1**
Unit Count	**3**	**1**	**2**
Unit Cost	**3**	**2**	**1**
Location	**1**	**1**	**3**
Zoning	**2**	**1**	**3**
	15	*9*	*17*

Rural Homes Recommendation

Rural Homes recommends moving forward with a project that combines using the 19th street parcels into one development. This project could result in somewhere between 8 to 11 units of affordable housing.

The primary advantage to building on these sites at the same time is that we would be able to tap into the existing water and sewer lines with laterals and connect to existing streets in order to prevent the cost of building infrastructure, which could account for anywhere between 15-30% of the unit cost. Secondly, there would be significant hurdles to working alongside the CDOT Right Of Way to install the water line extension and navigate the vehicular access off Highway 145.

The real benefit of this project site for attainable workforce housing is that it targets infill parcels that are close to the town core and amenities like the schools, library, and businesses.

The conceptual budget is another primary driver for this recommendation. Without the per-unit cost of infrastructure, these homes will be able to go to market and lower prices and help provide for-sale housing that is attainable for the workforce that earns between 60-120% of Montezuma County's Area Median Income.

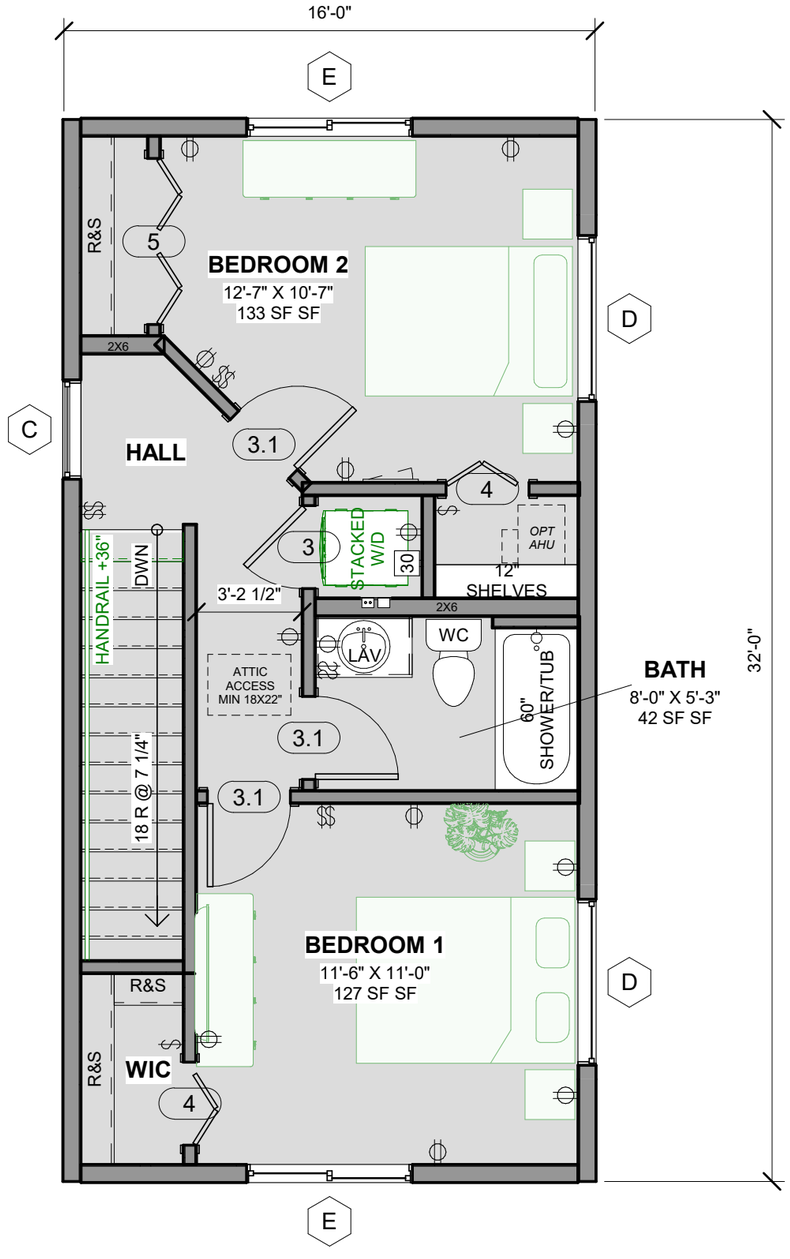
If the Task Force and Town Council agree with this recommendation, then the next steps would be to order a Site Survey from Goff Civil Engineering, order a Phase 1 Environmental Site Assessment from SME Environmental (both based in Durango) and order a Geotechnical Soils Engineering Report from Lambert & Associates in Montrose.

Fading West Plan Types:

2BR ‘ Antero’

1024 s.f.

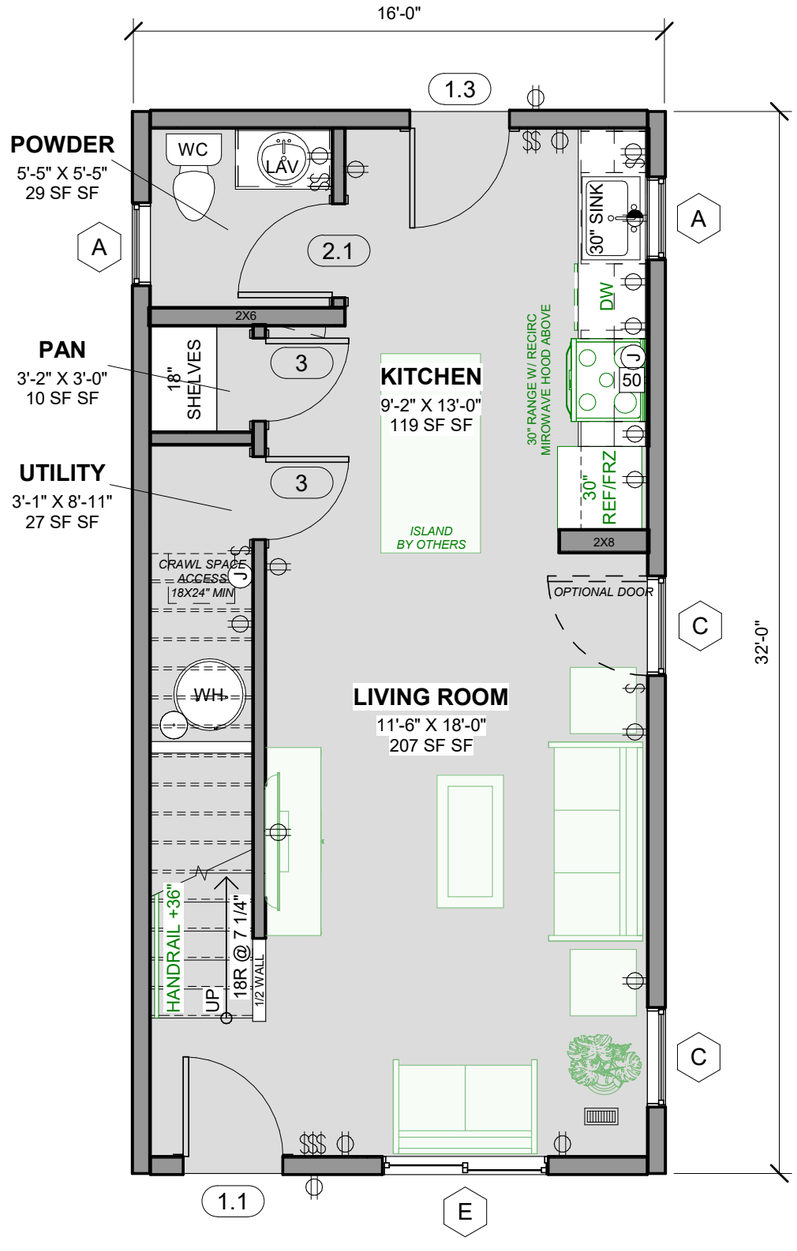
Here is a representative floor plan for a 2-bedroom unit that is depicted in the space planning diagrams in this document. On the next page, you will find a representative 3-bedroom floor plan.



2 16-FT ANTERO L2

512 SQ. FT.

0 2’ 4’ 8’



1 16-FT ANTERO L1

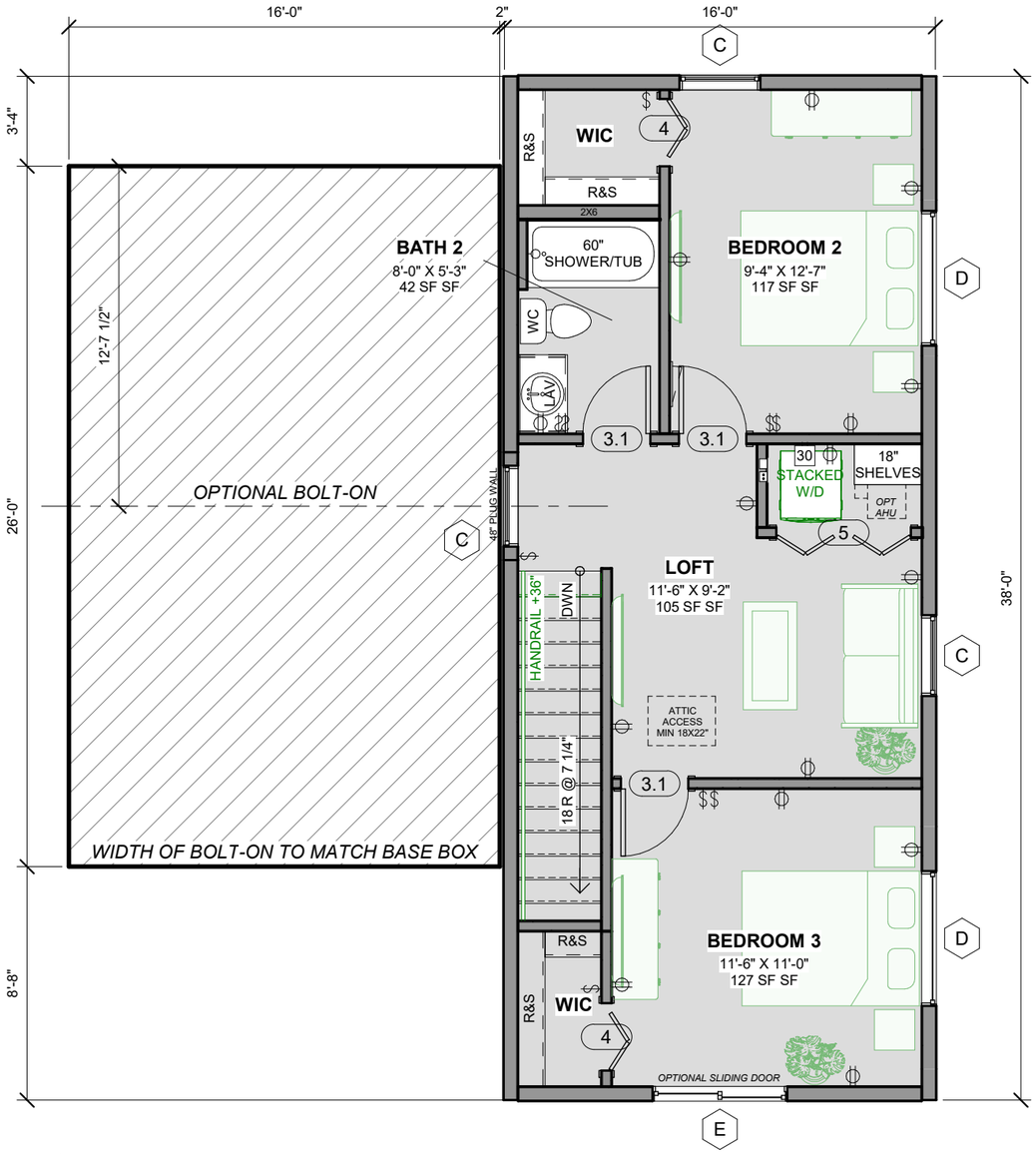
512 SQ. FT.

0 2’ 4’ 8’

Fading West Plan Types:

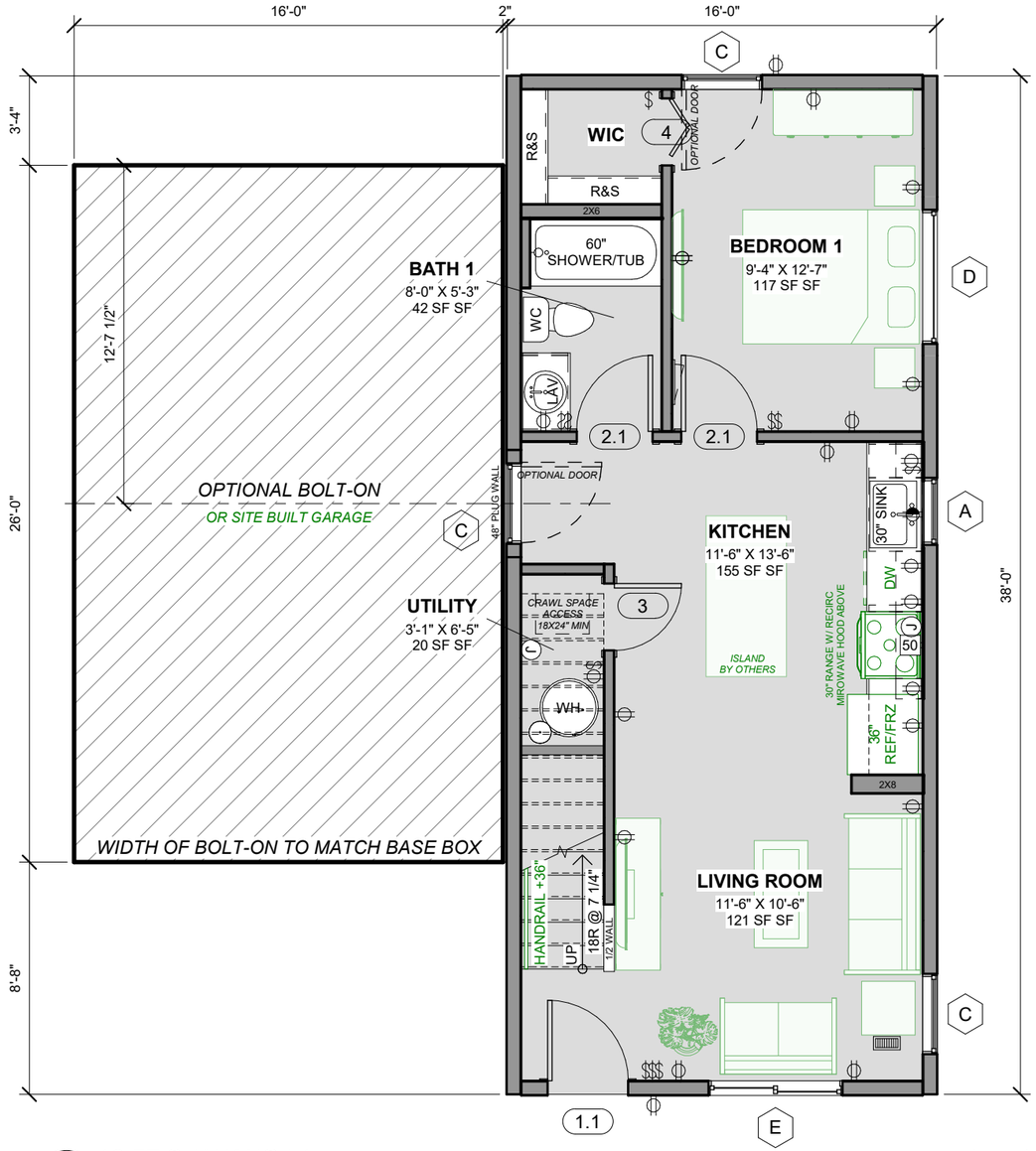
3BR ‘Shavano’

1216 s.f.



2 16-FT SHAVANO L2

608 SQ. FT.

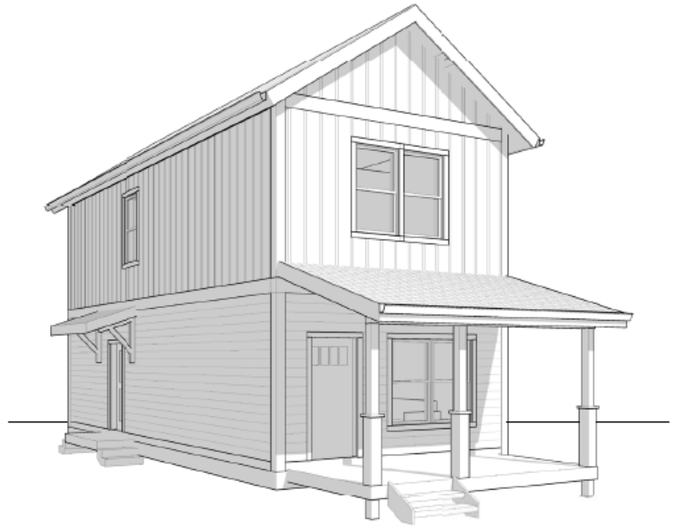


1 16-FT SHAVANO L1

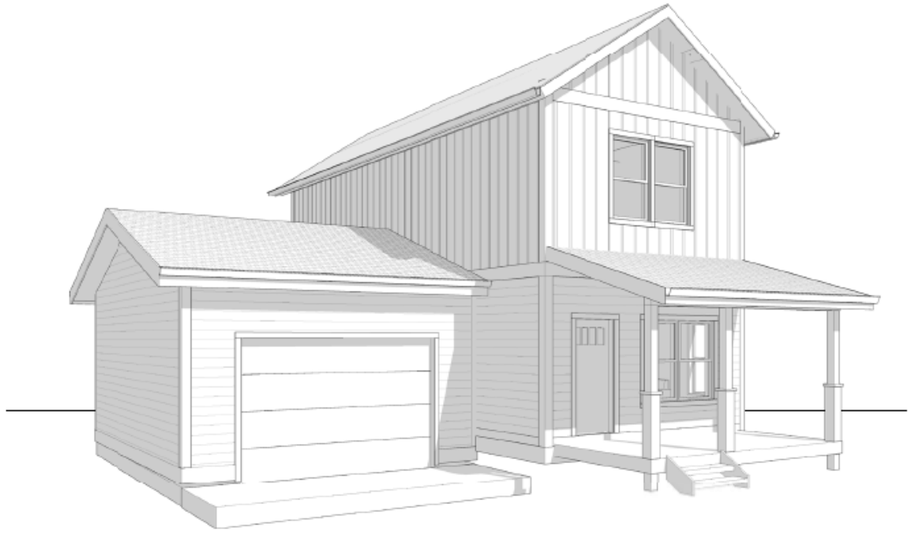
608 SQ. FT.

Fading West Unit Types:

In past Rural Homes developments, we have used the same floor plan but in many different ways. See, for example, how the 3 BR ‘Shavano’ unit can have a site constructed garage or be compiled into a 2 or 3 unit townhome to give a project a variety of configurations and change the otherwise repetitive nature of a affordable housing development.



3BR ‘Shavano’
1216 s.f.



3BR ‘Shavano’ with site constructed garage
1600 s.f.

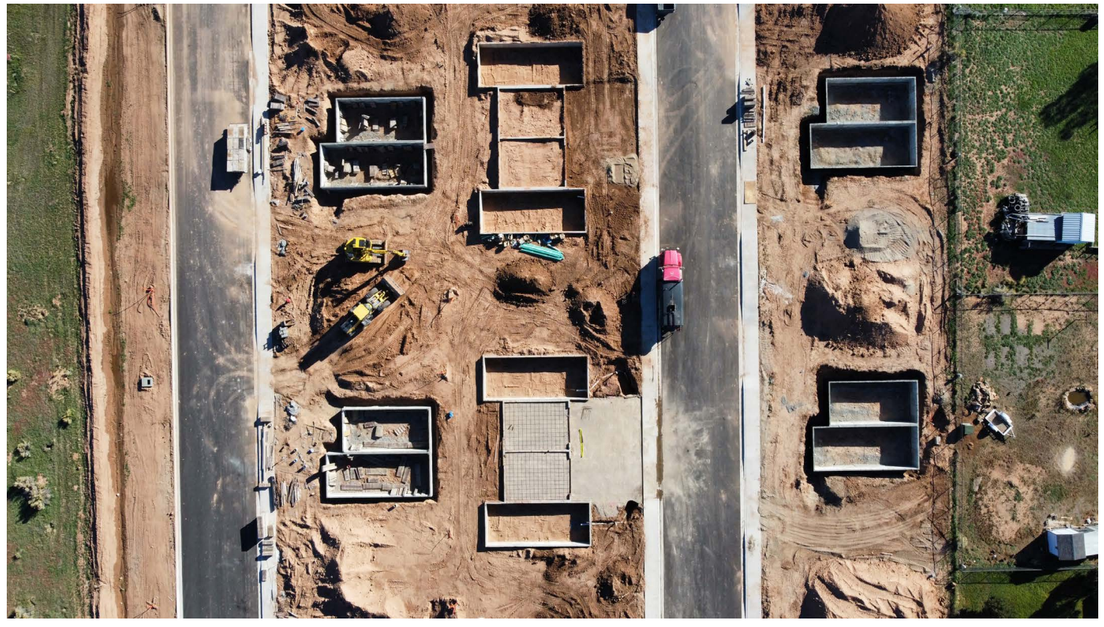
Duplex Townhome - 2BR ‘Antero/3BR ‘Shavano’
1024/1216 s.f.

Triplex Townhome - ‘Shavano/Antero/Shavano’

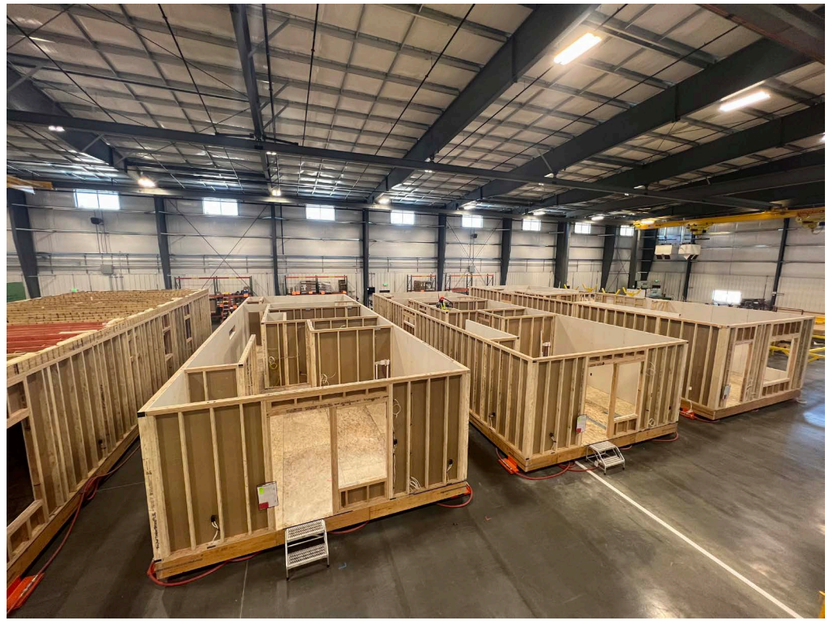
Fading West Unit Types:
3BR ‘Shavano’
1216 s.f.

Fading West Unit Types:
Duplex Townhome - 2BR ‘Antero/3BR ‘Shavano’

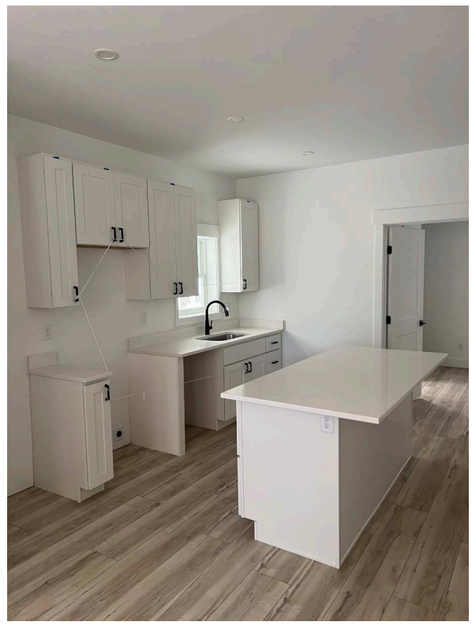
Construction Process



Step 1: site work - including foundations & infrastructure



Step 2: units are stick-framed in a factory controlled environment



Step 3: units are wrapped - looking like the interior photo here on the inside

Construction Process

Step 5: some preparatory work while staged on ‘cribs’

Step 6: craning, setting and stitching!

Step 7: on site finish including garages, porches, and solar panels!

Deed Restriction Basics

Here are some bullet-points that outline the main principles of the deed restriction we wrote for Pinion Park Norwood. The deed restriction was a requirement for state funding and passed an internal review by the State's Attorney General's office.

1. Earn below 120% of Montezuma County's Area Median Income

		2022 Montezuma County Income Limits			
			Household Size		
AMI	**1**	**2**	**3**	**4**	**5**
60%	$ 34,537.50	$ 39,450.00	$ 44,400.00	$ 49,312.50	$ 53,287.50
80%	$ 46,050.00	$ 52,600.00	$ 59,200.00	$ 65,750.00	$ 71,050.00
100%	$ 57,562.50	$ 65,750.00	$ 74,000.00	$ 82,187.50	$ 88,812.50
120%	$ 69,075.00	$ 78,900.00	$ 88,800.00	$ 98,625.00	$ 106,575.00
140%	$ 80,587.50	$ 92,050.00	$ 103,600.00	$ 115,062.50	$ 124,337.50

2. Work in Dolores School District (unless granted an exception
   -1200 hours over 12 months
   -8 months per 12 months at a minimum of 40 hours per month

3. Occupy your home for 8 months per 12 months per year as your sole and primary residence within 150 mile radius

4. Assets cannot exceed 3x the home's purchase price

5. Lottery - priority goes to teachers, government employees, non-profit healthcare workers and government responders

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 12. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-2, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by Montezuma County. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study Report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study Report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

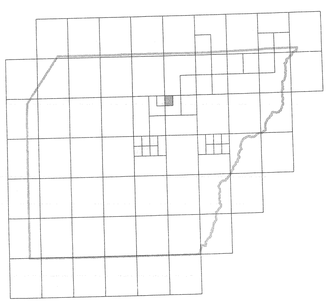
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA Map (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.

Montezuma County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)
Chicken Creek	4.0
Lost Canyon Creek	4.0
Mancos River	4.0

Example: To convert Chicken Creek elevations to NAVD 88, 4.0 feet were added to the NGVD 29 elevations.

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperative Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 37 NORTH, RANGE 15 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary

Floodway boundary

Zone D Boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line

23 — 23 — Transect line

97° 07' 30.00"
32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

42 75 000m N — 1000-meter Universal Transverse Mercator grid ticks, zone 12

6000000 FT — 5000-foot ticks: Colorado State Plane coordinate system, south zone (FIPSZONE 0503), Lambert Conformal Conic projection

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 26, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

PANEL 0601C

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MONTEZUMA COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 0601 OF 1450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MONTEZUMA COUNTY	080285	0601	C
TOWN OF DOLORES	080122	0601	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08083C0601C

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

TRAUTNER GEOTECH LLC
GEOTECHNICAL ENGINEERING, MATERIAL TESTING
AND ENGINEERING GEOLOGY

GEOTECHNICAL ENGINEERING STUDY
PROPOSED 101 AND 105 NORTH 19th STREET
RESIDENTIAL STRUCTURES

Dolores, Colorado

April 4, 2023

PREPARED FOR:

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Rural Homes Project
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PROJECT NO. 57824GE

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1.0 REPORT INTRODUCTION

This report presents our geotechnical engineering recommendations for the proposed 101 and 105 North 19th Street Residential Structures to be located in Dolores, Colorado. This report was requested by David Bruce, Rural Homes Project, and was prepared in accordance with our proposal dated February 8, 2023, Proposal No.23072P.

As outlined within our proposal for services for this project, the client is responsible for appropriate distribution of this report to other design professionals and/or governmental agencies unless specific arrangements have been made with us for distribution.

Geotechnical engineering is a discipline which provides insight into natural conditions and site characteristics such as; subsurface soil and water conditions, soil strength, swell (expansion) potential, consolidation (settlement) potential, and often slope stability considerations. The information provided by the geotechnical engineer is utilized by many people including the project owner, architect or designer, structural engineer, civil engineer, the project builder and others. The information is used to help develop a design and subsequently implement construction strategies that are appropriate for the subsurface soil and water conditions, and slope stability considerations. We are available to discuss any aspect of this report with those who are unfamiliar with the recommendations, concepts, and techniques provided below.

This geotechnical engineering report is the beginning of a process involving the geotechnical engineering consultant on any project. It is imperative that the geotechnical engineer be consulted throughout the design and construction process to verify the implementation of the geotechnical engineering recommendations provided in this report. Often the design has not been started or has only been initiated at the time of the preparation of the geotechnical engineering study. Changes in the proposed design must be communicated to the geotechnical engineer so that we have the opportunity to tailor our recommendations as needed based on the proposed site development and structure design.

The following outline provides a synopsis of the various portions of this report;

- Section 1.0 provides an introduction and an establishment of our scope of service.
- Sections 2.0 and 3.0 of this report present our geotechnical engineering field and laboratory studies
- Sections 4.0 through 7.0 presents our geotechnical engineering design parameters and recommendations which are based on our engineering analysis of the data obtained.
- Section 8.0 provides a brief discussion of construction sequencing and strategies which may influence the geotechnical engineering characteristics of the site. Ancillary information such as some background information regarding soil corrosion and radon considerations is also presented as general reference.
- Section 9.0 provides our general construction monitoring and testing recommendations.
- Section 10.0 provides our limitations.

The data used to generate our recommendations are presented throughout this report and in the attached figures.

All recommendations provided within this report must be followed in order to achieve the intended performance of the foundation system and other components that are supported by the site soil.

1.1 Proposed Construction

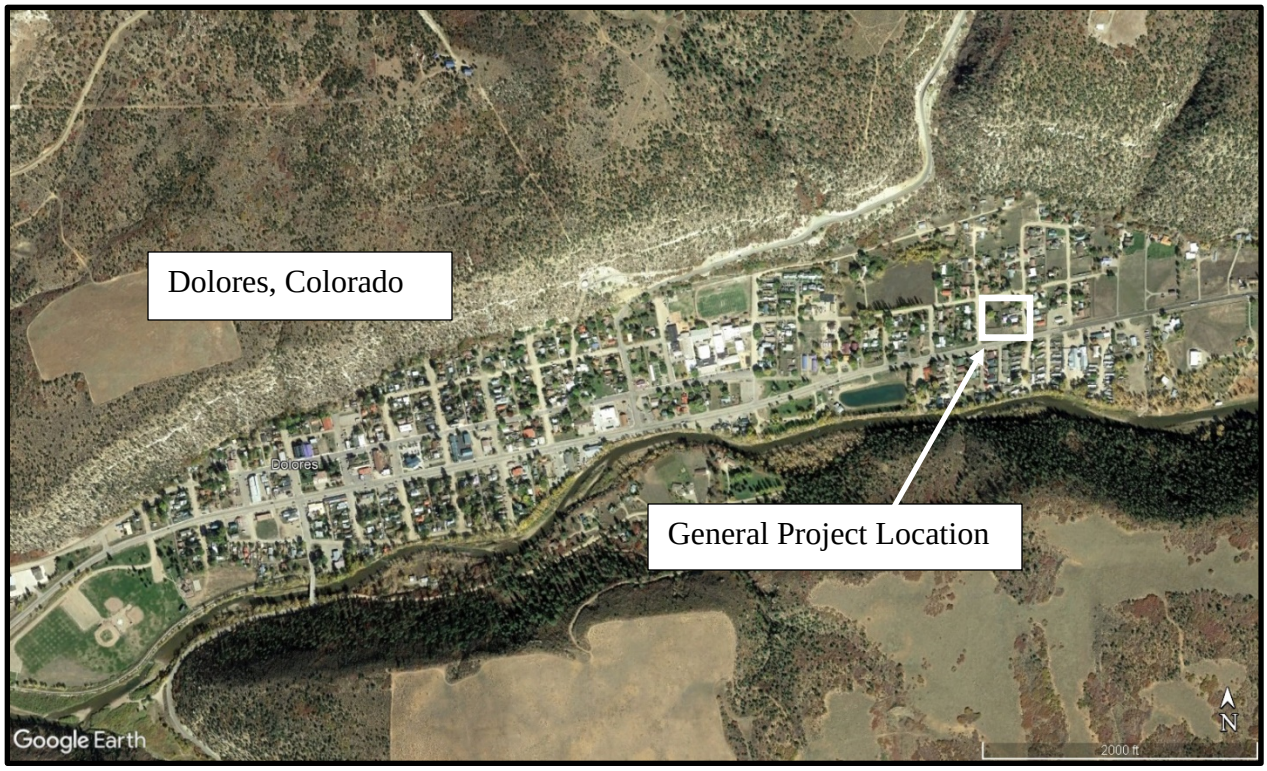
Architectural details and grading plans were not available at the time of this report. We generally understand that the proposed residential structures will be approximately 1,200 square feet at each of the subject project addresses. The structures will be supported by steel reinforced concrete foundation systems. We understand that the floor system is proposed to be supported over a crawl space, and anticipate that the garage areas (if used) will be concrete slab-on-grade. We assume relatively light foundation loadings, typical of the proposed type of construction. When final building location, grading and loading information have been developed, we should be notified to re-evaluate the recommendations presented in this report.

2.0 FIELD STUDY

2.1 Site Description and Geomorphology

The project site is located adjacent to the east side of North 19th Street between Railroad Avenue and Hillside Drive in Dolores, Colorado. The general project site location is presented below as Figure 2.1. The imagery used for Figure 2.1 was obtained from Google Earth (imagery date: 9/11/2019).

Figure 2.1: General Project Location

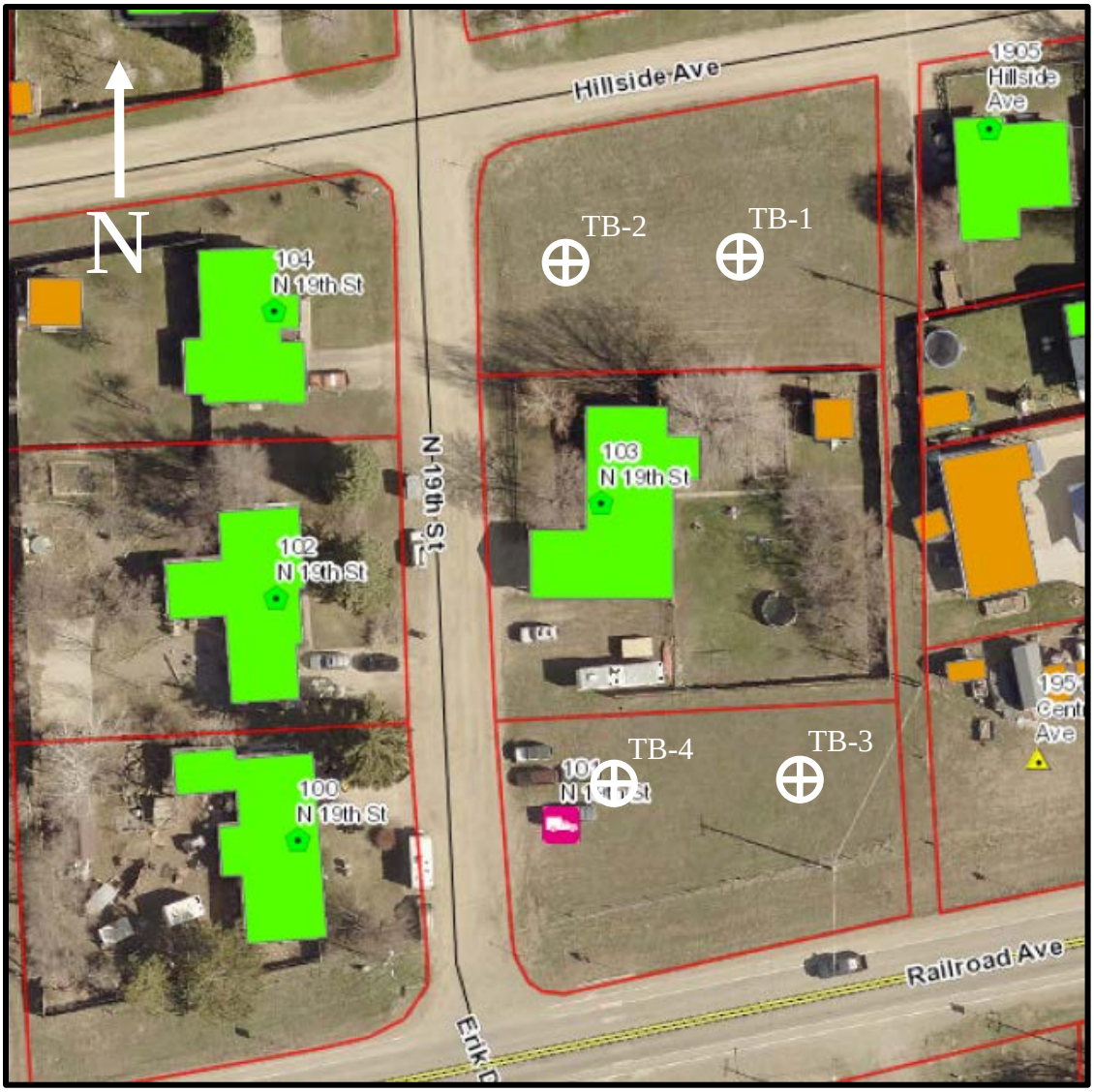


The project lots currently consist of undeveloped land. The ground surface on the lots is relatively flat with inclinations less than about 15:1; horizontal to vertical (h:v). We anticipate that the current ground surface topography has been influenced to some degree by past grading and placement of some fill materials. About 4 feet of snow existed on the site at the time of our field study, with exception to areas that had been cleared to allow access of our drilling equipment. The geomorphology in the vicinity of the project site generally consists of alluvial gravel and cobble deposits with a sandy clay/silt soil matrix.

2.2 Subsurface Soil and Water Conditions

We advanced a total of four auger test borings for the project. Two test borings were advanced at each of the project site addresses. A schematic showing the approximate test boring locations is provided below as Figure 2.2. The imagery used for Figure 2.2 was obtained from the Montezuma County GIS (imagery date: 2021). The logs of the soils encountered in our test borings are presented in Appendix A.

Figure 2.2: Approximate Test Boring Locations



The schematic presented above was prepared using notes and field measurements obtained during our field exploration and is intended to show the approximate test boring locations for reference purposes only.

Generally, we encountered soft to very soft and very moist to wet sandy silt soil with organic matter from the ground surface to depths ranging from about 1 to 2 feet below the ground surface. The soft and very moist to wet soil conditions encountered at the time of our March 13, 2023 field study was partially due to heavy winter precipitation and snow melt.

At depths ranging from about 1 to 2 feet below the ground surface, below the upper organic silt soils, we encountered soft to medium stiff and moist to very moist sandy clay/silt soil to depths ranging from about 3 to 4 feet below the ground surface elevation where we encountered medium dense to very dense gravel and cobbles with a sandy clay soil matrix. We encountered auger

refusal on very dense nested cobbles in each of the test borings at depths ranging from about 6 to 11 feet below the ground surface elevation. The soil materials encountered and tested exhibit a relatively low swell potential, particularly when the overall granular nature of the soil mass is accounted for. The shallow soils tested (upper sandy silt soils) exhibit a moderate to high consolidation potential.

We encountered subsurface free water at depths ranging from about 7½ to 8 feet below the ground surface at the Test Boring TB-1 and TB-2 locations, and at a depth of 5½ feet below the ground surface at the Test Boring TB-4 location. Test Boring TB-3 encountered auger refusal prior to the subsurface free water elevation. We anticipate that the subsurface free water elevation will be located at shallower depths than we encountered (March 13, 2023) field study during spring and early summer snow melt events or other heavy precipitation events. We anticipate that the subsurface free water elevation correlates closely with the water elevation in the Dolores River which is located about 500 feet to the south of the project site. We are not aware of the typical subsurface water fluctuation in the project area however we suspect that it could vary substantially. We are available to install subsurface water monitoring wells if desired. If installed the wells will need to be registered with the State of Colorado Division of Water Resources. Trautner Geotech does not perform hydrology related engineering services.

The logs of the subsurface soil conditions encountered in our test borings are presented in Appendix A. The logs present our interpretation of the subsurface conditions encountered in the test borings at the time of our field work. Subsurface soil and water conditions are often variable across relatively short distances. It is likely that variable subsurface soil and water conditions will be encountered during construction. Laboratory soil classifications of samples obtained may differ from field classifications.

3.0 LABORATORY STUDY

The laboratory study included tests to estimate the strength, swell and consolidation potential of the soils tested. We performed the following tests on select samples obtained from the test borings. The laboratory test results are provided in Appendix B.

- Moisture Content and Dry Density
- Sieve Analysis (Gradation)
- Atterberg Limits, Liquid Limit, Plastic Limit and Plasticity Index
- Swell Consolidation Tests

A synopsis of some of our laboratory data for some of the samples tested is tabulated below.

Sample Designation	Percent Passing #200 Sieve	Atterberg Limits LL/PI	Moisture Content (percent)	Dry Density (PCF)	Measured Swell Pressure (PSF)	Swell or Consolidation Potential
TB-1; 5.5- 8 feet*	22	19/5	6.4	128.3*	760	0.3 (% under 100 psf load)
TB-2 @ 1.5 feet	-	-	204	104.1	510	0.4 (% under 100 psf load)
TB-3; 0-4 feet	72	33/12	-	-	-	-
TB-3 @ 4.5 feet*	-	-	4.9	119.6*	1,420	2.9 (% under 100 psf load)
TB-4 @ 1 foot	-	-	10.7	91.8	350	0.2 (% under 100 psf load)

*NOTES:
1. We determine the swell pressure as measured in our laboratory using the constant volume method. The graphically estimated load-back swell pressure may be different from that measured in the laboratory.
2. Negative Swell-Consolidation Potential indicates compression under conditions of loading and wetting.
3. * = Swell-Consolidation test performed on remolded sample due to rock content. Test results should be considered an estimate only of the swell or consolidation potential at the density and moisture content indicated.

4.0 FOUNDATION RECOMMENDATIONS

Based on the results of the field and laboratory studies, a shallow foundation such as spread footings or a mat foundation may be considered to support the structures. Our recommendations for spread footings are presented in Section 4.1.1 below, and recommendations for mat foundation systems presented in Section 4.1.2 below. The following items should be understood;

- We are not aware of the minimum required finished floor elevation for the structure based on the flood plain elevation for the area. We anticipate that it may be required to raise the finished floor elevation above the existing site grade due to potential flooding concerns.
    - The shallow soils exhibit a moderate to high consolidation potential. Relatively high settlement could occur if spread footings were constructed on the shallow soils. Our recommendations for spread footings (provided in Section 4.1.1 below, are based on the foundation excavation extending to the granular soil deposits that we encountered at depths ranging from about 3 to 4 feet below the ground surface elevation. As discussed in Section 4.1.1, structural fill may then be placed over the granular soil deposits to the desired footing support elevation. It is possible that subsurface water could be encountered during the foundation excavation phase depending on the subsurface water conditions at the time of construction.
    - If the depth of excavation becomes a problem for the structures, then a mat foundation that bears at a shallower depth may be considered. The mat foundation bearing elevation must extend below the upper organic soil layer that we encountered to depths ranging from about 1 to 2 feet below the ground surface at the test boring locations.
    - Alternatively, a deep foundation system may be considered to support the structures such as helical piers. We are available to provide general/preliminary recommendations for helical piers or other deep foundation system concepts at your request.

- The potential seasonal high subsurface water elevation on the subject lots is not known by us. It is possible that subsurface water could accumulate in open subsurface areas such as crawl space areas depending on the depth of these features.

We are available to discuss the items above and potential construction related issues with you at your request. We should be contacted if any questions arise from the recommendations provided in this report. We should be contacted to observe the initial foundation excavation process to provide potential site or area specific recommendations depending on the conditions of the subsurface soils.

4.1 Shallow Foundation System Concepts

There are numerous types of shallow foundation systems and variants of each type. Shallow foundation system concepts discussed below include:

- Spread Footings (continuous and isolated) and stem walls
- Mat or Raft Foundations

The integrity and long-term performance of each type of foundation system is influenced by the quality of workmanship which is implemented during construction. It is imperative that all excavation and fill placement operations be conducted by qualified personnel using appropriate equipment and techniques to provide suitable support conditions for the foundation system.

4.1.1 Spread Footings

Properly designed and constructed continuous spread footings with stem walls (or beams) have the ability to distribute the forces associated with volume changes in the support soils (primarily settlement potential for the subject project). The rigidity of the system helps reduce differential movement and associated damage to the overlying structure. Volume changes in the soils that support isolated pad footings will result in movement of the columns and structural components supported by the columns. Damage to the structure due to this type of movement can be severe. If possible, we recommend that isolated pad footings be avoided and that the foundation system be designed as rigid as is reasonably possible.

Careful preparation of the support soils, placement of granular compacted structural fill, careful placement and compaction of stem wall backfill and positive surface drainage adjacent to the foundation system all help reduce the potential for volume changes to occur in the support soils.

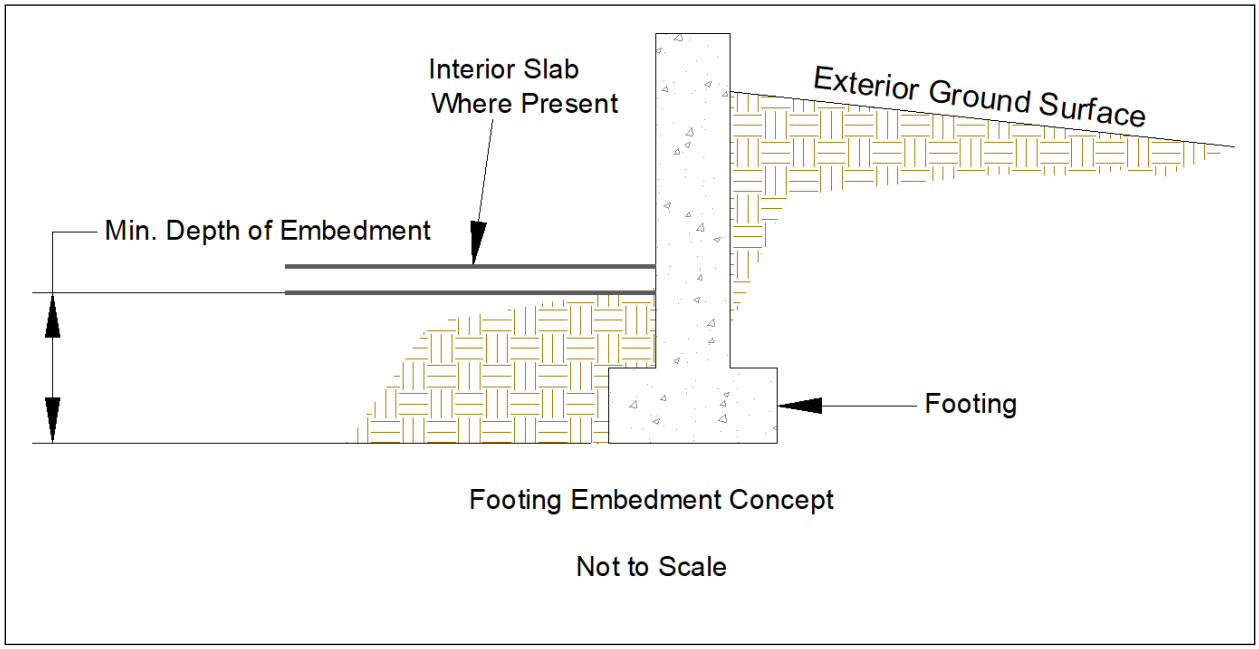
We recommend that the footings be supported by a layer of moisture conditioned and compacted natural soil which is overlain by a layer of compacted structural fill material. This concept is outlined below:

- The foundation excavation should be excavated to the granular soil deposits that underlie the project sites. We encountered the granular soil deposits at depths ranging from about 3 to 4 feet below the existing site ground surface elevation at our test boring locations.
- The bottom of the excavation should be proof compacted prior to placement of structural fill.

- A minimum 1 foot thick layer of structural fill should then be placed and compacted. Additional depths of structural fill may be used provided the total depth of structural fill does not exceed 3 feet.
    - The structural fill should consist of clean or well screened crushed rock that passes the 2-inch sieve screen and exhibits less than 5 percent passing the #4 sieve screen. The clean or well screened crushed rock structural fill should be placed in maximum 8 inch loose lift thicknesses and adequately consolidated with a minimum 300-pound vibratory plate style compactor.
    - It may be necessary to place a separation fabric such as Mirafi 500X between the subgrade soils and clean crushed rock, particularly if yielding soil conditions are encountered or larger clean rock type material is used (greater than about ¾ inch nominal maximum size).
- The moisture conditioned natural soil material and the granular soils should be compacted as discussed under the Compaction Recommendations portion of this report below.

The footing embedment is a relatively critical, yet often overlooked, aspect of foundation construction. The embedment helps develop the soil bearing capacity, increases resistance of the footing to lateral movement and decreases the potential for rapid moisture changes in the footing support soils, particularly in crawl space areas. Interior footing embedment reduces the exposure of the crawl space support soils to dry crawl space air. Reduction in drying of the support soil helps reduce downward movement of interior footings due to soil shrinkage.

All footings should have a minimum depth of embedment of at least one 1 foot. The embedment concept is shown below.



Footing Embedment Concept

Not to Scale

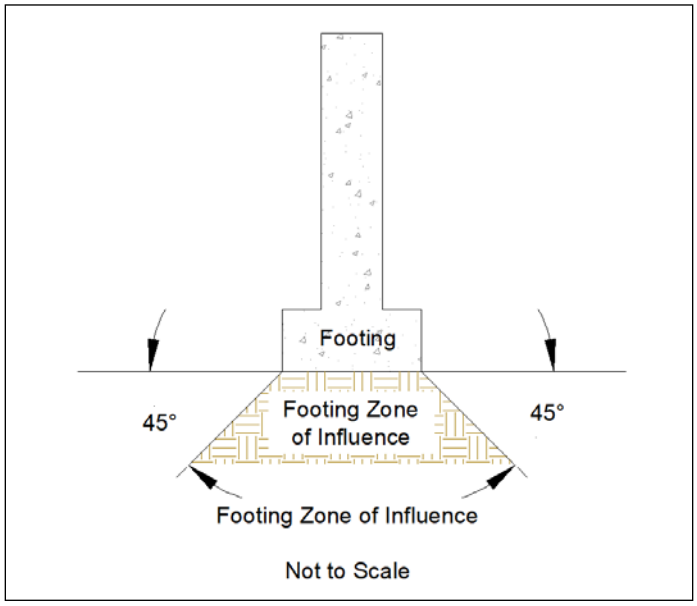
Spread footings located away from sloped areas may be designed using the bearing capacity information tabulated below.

Minimum Depth of Embedment (Feet)	Continuous Footing Design Capacity (psf)	Isolated Footing Design Capacity (psf)
1	1,500	1,500
2	2,000	2,000
3	2,500	2,500

The bearing capacity values tabulated above may be increased by 20 percent for transient conditions associated with wind and seismic loads. Snow loads are not transient loads.

The bearing capacity values tabulated above are based on a continuous spread footing width ranging from about 1½ to 2½ feet, and an isolated footing width ranging from about 3 to 4 feet. Development of the final footing design width is usually an iterative process based on evaluation of design pressures, footing widths and the thickness of compacted structural fill beneath the footings. We should be contacted as the design process continues to re-evaluate the design capacities above based on the actual proposed footing geometry.

The compacted structural fill should be placed and compacted as discussed in the Construction Considerations, "Fill Placement Recommendations" section of this report, below. The zone of influence of the footing (at elevations close to the bottom of the footing) is often approximated as being between two lines subtended at 45 degree angles from each bottom corner of the footing. The compacted structural fill should extend beyond the zone of influence of the footing as shown in the sketch below.



A general and simple rule to apply to the geometry of the compacted structural fill blanket is that it should extend beyond each edge of the footing a distance which is equal to the fill thickness.

We estimate that continuous footings designed and constructed as discussed above will have a total post construction settlement in the range of about 1/2 inch, and isolated footings will have a total post construction settlement in the range of about 1/2 to 2/3 inch.

All footings should be support at an elevation deeper than the maximum depth of frost penetration for the area. This recommendation includes exterior isolated footings and column supports. Please contact the local building department for specific frost depth requirements.

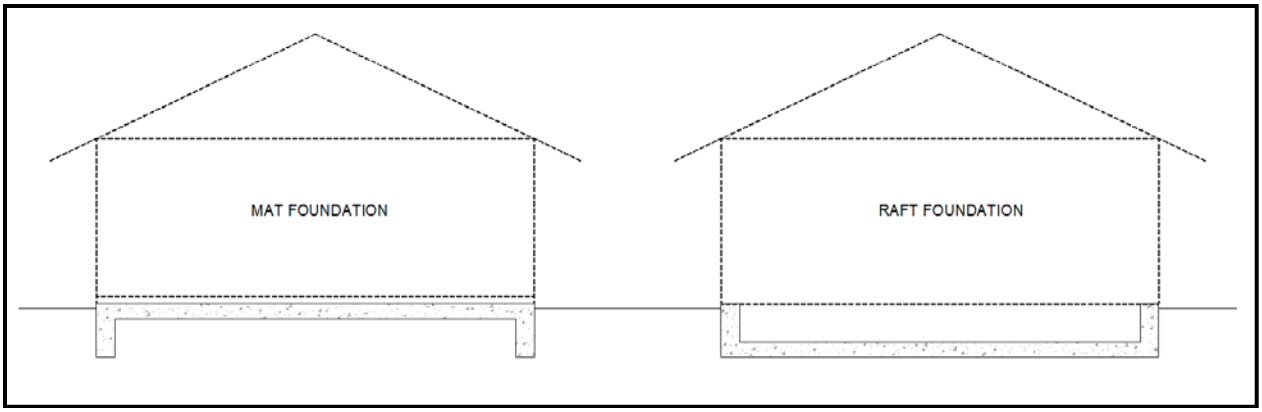
The post construction differential settlement may be reduced by designing footings that will apply relatively uniform loads on the support soils. Concentrated loads should be supported by footings that have been designed to impose similar loads as those imposed by adjacent footings.

Under no circumstances should any footing be supported by more than 3 feet of compacted structural fill material unless we are contacted to review the specific conditions supporting these footing locations.

The design concepts and parameters presented above are based on the soil conditions encountered in our test borings. We should be contacted during the initial phases of the foundation excavation at the site to assess the soil support conditions and to verify our recommendations.

4.1.2 Mat Foundations

Mat or raft foundations are commonly used to support structures on sites with soft and/or wet soil conditions. The design concepts of either system are similar, but their configurations are slightly different. This is shown in the sketch below.



Depending on the subsurface conditions, the depth of the support elevation of a raft foundation may be varied as needed to improve the support characteristics for the raft. The discussion presented below is appropriate for either concept. For purposes of clarity we will use the term “mat” for the remainder of our discussion below.

The mat foundation may be designed using a modulus of subgrade reaction of 100 pounds per cubic inch (pci). We should be contacted if stress concentrated areas exceed 1,000 pounds per square foot during the mat foundation structural design.

The organic soils must be removed from below the mat foundation area. We encountered organic soils to depths ranging from about 1 to 2 feet at our test boring locations. We recommend that a minimum 12-inch thick layer of compacted structural fill be used to support the mat or raft. The subgrade soils should be compacted as discussed below prior to placement of the structural fill materials.

- If a mat type system will be used (supported at relatively shallow depths below the existing site grade) then we recommend the structural fill consist of CDOT Class 6 aggregate base course material.
- If a raft type system is used (supported at frost depth elevation on or near the granular soil deposits that we encountered at depths ranging from about 3 to 4 feet below the ground surface) then a clean crushed rock aggregate should be used as the structural fill (specifications provided in Section 4.1.1 above).
    - We are not aware of the potential seasonal high subsurface free water elevation. It may be necessary to waterproof a raft type foundation depending on the chosen support elevation below the existing site grade.

4.1.3 General Shallow Foundation Considerations

Some movement and settlement of any shallow foundation system will occur after construction. Utility line connections through and foundation or structural component should be appropriately sleeved to reduce the potential for damage to the utility line. Flexible utility line connections will further reduce the potential for damage associated with movement of the structure.

5.0 RETAINING STRUCTURES

We understand that laterally loaded walls will not be included with the project. Please contact us if lateral earth pressure values are needed.

6.0 SUBSURFACE DRAIN SYSTEM

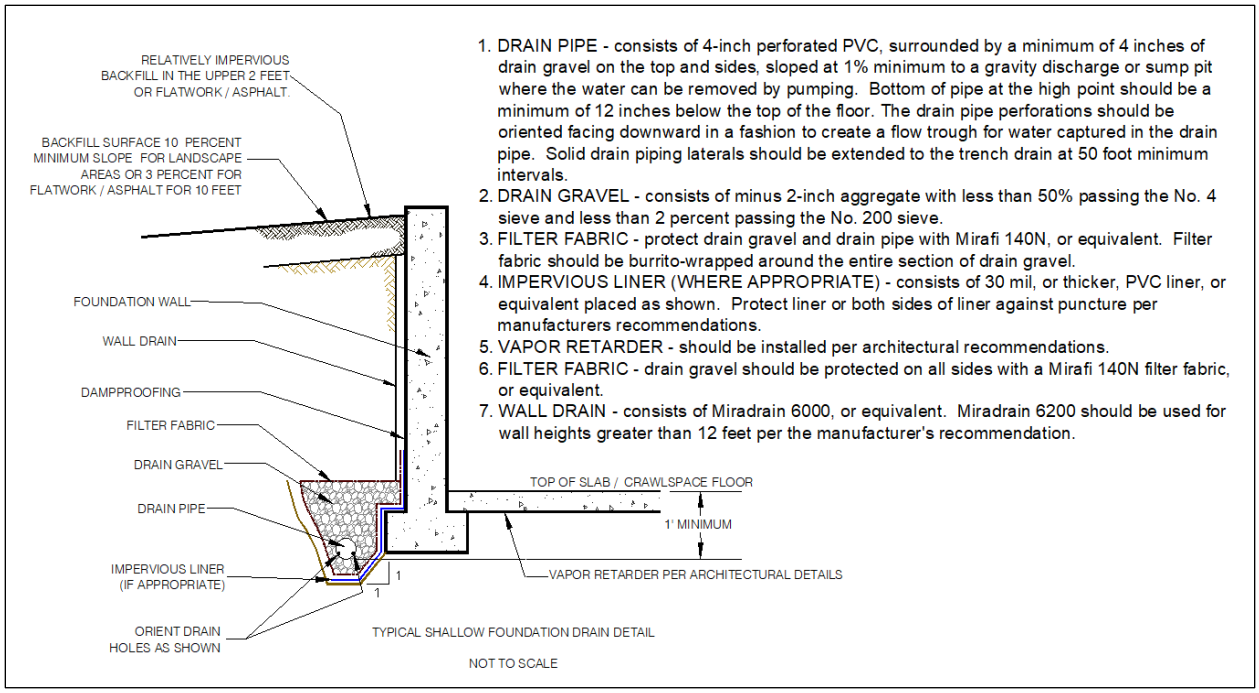
Since retaining structures are not proposed for this site a subsurface drain system is not needed to reduce hydrostatic pressures. If subsurface areas, such as crawl space area are planned the subsurface drain system concept below may be included in the project design to reduce the tendency for water to accumulate in subsurface areas.

As discussed throughout this report, the potential seasonal high subsurface free water elevation is not known for the area. A foundation drain will have little to know benefit to drain subsurface free water associated with the water table below the project site. The recommendations provided below are for general reference if it is decided to incorporate a foundation drain for the project structures. We may be contacted to discuss the need and implementation of a foundation drain system at your request.

A drain system constructed with a free draining aggregate material and a 4 inch minimum diameter perforated drain pipe should be constructed adjacent to retaining structures and/or adjacent to foundation walls. The drain pipe perforations should be oriented facing downward. The system should be protected from fine soil migration by a fabric-wrapped aggregate which

surrounds a rigid perforated pipe. We do not recommend use of flexible corrugated perforated pipe since it is not possible to establish a uniform gradient of the flexible pipe throughout the drain system alignment. Corrugated drain tile is perforated throughout the entire circumference of the pipe and therefore water can escape from the perforations at undesirable locations after being collected. The nature of the perforations of the corrugated material further decreases its effectiveness as a subsurface drain conduit.

The drain should be placed at each level of excavation and at least 12 inches below lowest adjacent finish floor or crawlspace grade. The drain system pipe should be graded to surface outlets or a sump vault. The drain system should be sloped at a minimum gradient of about 2 percent, but site geometry and topography may influence the actual installed pipe gradient. Water must not be allowed to pool along any portion of the subsurface drain system. An improperly constructed subsurface drain system may promote water infiltration to undesirable locations. The drain system pipe should be surrounded by about 2 to 4 cubic feet per lineal foot of free draining aggregate. If a sump vault and pump are incorporated into the subsurface drain system, care should be taken so that the water pumped from the vault does not recirculate through pervious soils and obtain access to the basement or crawl space areas. An impervious membrane should be included in the drain construction for grade beam and pier systems or other foundation systems such as interrupted footings where a free pathway for water beneath the structure exists. A generalized subsurface drain system concept is shown below.



There are often aspects of each site and structure which require some tailoring of the subsurface drain system to meet the needs of individual projects. Drain systems that are placed adjacent to void forms must include provisions to protect and support the impervious liner adjacent to the void form. We are available to provide consultation for the subsurface drain system for this project, if desired.

Water often will migrate along utility trench excavations. If the utility trench extends from areas above the site, this trench may be a source for subsurface water within the proposed basement or crawl space. We recommend that the utility trench backfill be thoroughly compacted to help reduce the amount of water migration. The subsurface drain system should be designed to collect subsurface water from the utility trench and direct it to surface discharge points.

7.0 CONCRETE FLATWORK

We anticipate that both interior and exterior concrete flatwork will be considered in the project design. Concrete flatwork is typically lightly loaded and has a limited capability to resist shear forces associated with uplift from swelling soils and/or frost heave or consolidation of soft soils. It is prudent for the design and construction of concrete flatwork on this project to be able to accommodate some movement associated with volume changes in the support soils.

7.1 Interior Concrete Slab-on-Grade Floors

There are limited options available to help mitigate the influence of volume changes in the support soil for concrete slab-on-grade floors, these include:

- Preconstruction scarification, moisture conditioning and re-compaction of the natural soils in areas proposed for support of concrete flatwork, and/or,
- Placement and compaction of granular compacted structural fill material

Although the soil on this site does not exhibit a high swell potential the performance of the structure may be improved by isolating the floors from the interior partition walls. Interior walls may be structurally supported from framing above the floor, or interior walls and support columns may be supported on interior portions of the foundation system.

Interior concrete flatwork, or concrete slab-on-grade floors, should be underlain by scarification, moisture conditioning and compaction of about 6 inches of the natural soils followed by placement of at least 12 inches of compacted granular structural fill material that is placed and compacted as discussed in the Construction Considerations, “Fill Placement Recommendations” section of this report, below. The structural fill should consist of CDOT Class 6 aggregate material. The organic soils must be removed from areas below the concrete flatwork.

All plumbing lines should be pressure tested before backfilling to help reduce the potential for wetting. The only means to completely mitigate the influence of volume changes on the performance of interior floors is to structurally support the floors over a void space. Floors that are suspended by the foundation system will not be influenced by volume changes in the site soils. The suggestions and recommendations presented in this section are intended to help reduce the influence of swelling soils on the performance of the concrete slab-on-grade floors.

7.1.1 Capillary and Vapor Moisture Rise

Capillary and vapor moisture rise through the slab support soil may provide a source for moisture in the concrete slab-on-grade floor. This moisture may promote development of mold or mildew

in poorly ventilated areas and may influence the performance of floor coverings and mastic placed directly on the floor slabs. The type of floor covering, adhesives used, and other considerations that are not related to the geotechnical engineering practice will influence the design. The architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of protection required for their products.

Comments for Reduction of Capillary Rise

One option to reduce the potential for capillary rise through the floor slab is to place a layer of clean aggregate material, such as washed concrete aggregate for the upper 4 to 6 inches of fill material supporting the concrete slabs.

Comments for Reduction of Vapor Rise

To reduce vapor rise through the floor slab, a moisture barrier such as a 6 mil (or thicker) plastic, or similar impervious geotextile material is often be placed below the floor slab. The material used should be protected from punctures that will occur during the construction process.

There are proprietary barriers that are puncture resistant that may not need the underlying layer of protective material. Some of these barriers are robust material that may be placed below the compacted structural fill layer. We do not recommend placement of the concrete directly on a moisture barrier unless the concrete contractor has had previous experience with curing of concrete placed in this manner. As mentioned above, the architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of moisture and vapor protection required for their products.

7.1.2 Slab Reinforcement Considerations

The project structural engineer should be contacted to provide steel reinforcement design considerations for the proposed floor slabs. Any steel reinforcement placed in the slab should be placed at the appropriate elevations to allow for proper interaction of the reinforcement with tensile stresses in the slab. Reinforcement steel that is allowed to cure at the bottom of the slab will not provide adequate reinforcement.

7.2 Exterior Concrete Flatwork Considerations

Exterior concrete flatwork includes concrete driveway slabs, aprons, patios, and walkways. The desired performance of exterior flatwork typically varies depending on the proposed use of the site and each owner's individual expectations. As with interior flatwork, exterior flatwork is particularly prone to movement and potential damage due to movement of the support soils. This movement and associated damage may be reduced by following the recommendations discussed under interior flatwork, above. Unlike interior flatwork, exterior flatwork may be exposed to frost heave, particularly on sites where the bearing soils have a high silt content such as the subject project sites. It is prudent to remove silt soils from exterior flatwork support areas where movement of exterior flatwork will adversely affect the project, such as near the interface between the driveway and the interior garage floor slab. If silt soils are encountered, they should be removed to the maximum depth of frost penetration for the area where movement of exterior

flatwork is undesirable.

If some movement of exterior flatwork is acceptable, we suggest that the support areas be prepared by scarification, moisture conditioning and re-compaction of about 6 inches of the natural soils followed by placement of at least 6 inches of compacted granular fill material. The scarified material and granular fill materials should be placed as discussed under the Construction Considerations, "Fill Placement Recommendations" section of this report, below.

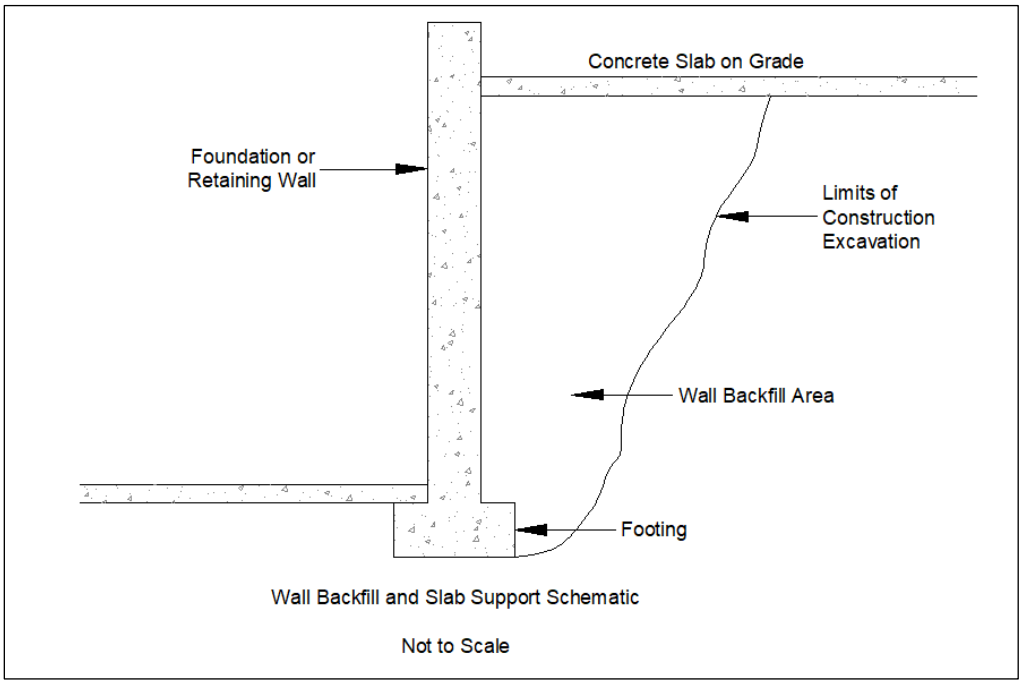
It is important that exterior flatwork be separated from exterior column supports, masonry veneer, finishes and siding. No support columns, for the structure or exterior decks, should be placed on exterior concrete unless movement of the columns will not adversely affect the supported structural components. Movement of exterior flatwork may cause damage if it is in contact with portions of the structure exterior.

Landscaping and landscaping irrigation often provide additional moisture to the soil supporting exterior flatwork. Excessive moisture will promote heave of the flatwork either due to expansive soil, or due to frost action. If movement of exterior slabs is undesirable, we recommend against placement of landscaping that requires irrigation. The ground surfaces near exterior flatwork must be sloped away from flatwork to reduce surface water migration to the support soil.

Exterior flatwork should not be placed on soils prepared for support of landscaping vegetation. Cultivated soils will not provide suitable support for concrete flatwork.

7.3 General Concrete Flatwork Comments

It is relatively common that both interior and exterior concrete flatwork is supported by areas of fill adjacent to either shallow foundation walls or basement retaining walls. A typical sketch of this condition is shown below.



Settlement of the backfill shown above will create a void and lack of soil support for the portions of the slab over the backfill. Settlement of the fill supporting the concrete flatwork is likely to cause damage to the slab-on-grade. Settlement and associated damage to the concrete flatwork may occur when the backfill is relatively deep, even if the backfill is compacted.

If this condition is likely to exist on this site it may be prudent to design the slab to be structurally supported on the retaining or foundation wall and designed to span to areas away from the backfill area as designed by the project structural engineer. We are available to discuss this with you upon request.

8.0 CONSTRUCTION CONSIDERATIONS

This section of the report provides comments, considerations and recommendations for aspects of the site construction which may influence, or be influenced by the geotechnical engineering considerations discussed above. The information presented below is not intended to discuss all aspects of the site construction conditions and considerations that may be encountered as the project progresses. If any questions arise as a result of our recommendations presented above, or if unexpected subsurface conditions are encountered during construction we should be contacted immediately.

8.1 Fill Placement Recommendations

There are several references throughout this report regarding both natural soil and compacted structural fill recommendations. The recommendations presented below are appropriate for the fill placement considerations discussed throughout the report above.

All areas to receive fill, structural components, or other site improvements should be properly prepared and grubbed at the initiation of the project construction. The grubbing operations should include scarification and removal of organic material and soil. No fill material or concrete should be placed in areas where existing vegetation or fill material exist.

We suspect that man-placed fill and subterranean structures may be encountered as the project construction progresses. All existing fill material should be removed from areas planned for support of structural components. Excavated areas and subterranean voids should be backfilled with properly compacted fill material as discussed below.

8.1.1 Subgrade Soil Stabilization

We suspect that soft, yielding soil conditions may be encountered at various locations on the project site during construction. This material may be challenging to compact in preparation for placement of overlying fill material. We have provided two general categories of concepts to stabilize these soils to provide a suitable substrate for placement and compaction of overlying compacted fill. These include:

1.) Mechanical Stabilization; using soil and/or geotextile materials, and,
2.) Chemical Stabilization; using dry Portland cement.

Mechanical stabilization of soil often includes placement of aggregate material and/or larger cobbles (3-4 inch size) into an area where the soils are yielding. The most predictable technique is to over-excavate these soft areas by about 8 to 12 inches, (or more, if needed) lightly proof compact the exposed soil, place a layer of woven geosynthetic or geogrid-type material, such as or Mirifi RS 280i or BXG 120 geogrid, followed by placement of a “clean crushed aggregate” material with a nominal maximum size of 3 inches and not more than about 5 percent passing the #4 sieve. This clean crushed aggregate material should then be consolidated with a plate-type compactor. A less robust fabric, such as a non-woven geofabric, (such as Mirifi 140N) is placed on top of this aggregate layer followed by placement and compaction of the overlying fill material. For sites with extremely soft conditions it may be necessary to increase the clean aggregate layer to about 18 inches and place an intermediate layer of geogrid (or fabric) at mid-height of this layer.

Chemical stabilization using Portland cement is effective for most soils. Generally, this technique is more suitable for isolated soft areas. Generally dry Portland cement powder may be placed on the surface of the soft yielding material and subsequently mixed into the soil. The effectiveness of this technique is partially dependent upon the thoroughness of the mixing. If it can be thoroughly mixed the application rate of the Portland cement need not be more than 10 percent, and often an application of 5 to 7 percent will provide a significant decrease in free water and stabilize the material. After mixing, the material should be allowed to “rest” for about two of more hours prior to compaction. The treated material will often yield some during initial compaction, but will generally increase in rigidity as the process of hydration begins takes place. If yielding under compaction is excessive, the material should be allowed “cure” additionally prior to continued compaction effort being applied. Often it takes more time, such as overnight, to allow the cement to fully stabilize the material so this strategy is often implemented in an area at the end of a work day and allowed to cure overnight followed by subsequent fill placement on the following day.

8.1.2 Natural Soil Fill

Any natural soil used for any fill purpose should be free of all deleterious material, such as organic material and construction debris. Natural soil fill includes excavated and replaced material or in-place scarified material. Our recommendations for placement of natural soil fill are provided below.

- The natural soils should be moisture conditioned, either by addition of water to dry soils, or by processing to allow drying of wet soils. The proposed fill materials should be moisture conditioned to between about optimum and about 2 percent above optimum soil moisture content. This moisture content can be estimated in the field by squeezing a sample of the soil in the palm of the hand. If the material easily makes a cast of soil which remains in-tact, and a minor amount of surface moisture develops on the cast, the material is close to the desired moisture content. Material testing during construction is the best means to assess the soil moisture content.
- Moisture conditioning of clay or silt soils may require many hours of processing. If possible, water should be added and thoroughly mixed into fine grained soil such as clay or silt the day prior to use of the material. This technique will allow for development of a more uniform moisture content and will allow for better compaction of the moisture conditioned materials.
- The moisture conditioned soil should be placed in lifts that do not exceed the capabilities of the compaction equipment used and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.
- We typically recommend a maximum fill lift thickness of 6 inches for hand operated equipment and 8 to 10 inches for larger equipment.
- Care should be exercised in placement of utility trench backfill so that the compaction operations do not damage underlying utilities.
- The maximum recommended lift thickness is about 6 to 8 inches. The maximum recommended rock size for natural soil fill is about 3 inches. This may require on-site screening or crushing if larger rocks are present. We must be contacted if it is desired to utilize rock greater than 3 inches for fill materials.

8.1.3 Granular Compacted Structural Fill

Granular compacted structural fill is referenced in numerous locations throughout the text of this report. Granular compacted structural fill should be constructed using an imported commercially produced rock product such as aggregate road base. Many products other than road base, such as clean aggregate or select crusher fines may be suitable, depending on the intended use. If a specification is needed by the design professional for development of project specifications, a material conforming to the Colorado Department of Transportation (CDOT) “Class 6” aggregate road base material can be specified. This specification can include an option for testing and approval in the event the contractor’s desired material does not conform to the Class 6 aggregate specifications. We have provided the CDOT Specifications for Class 6 material below.

Grading of CDOT Class 6 Aggregate Base-Course Material	
Sieve Size	Percent Passing Each Sieve
1 inch	100
¾ inch	95-100
#4	30-65
#8	25-55
#200	3-12

Liquid Limit less than 30

All compacted structural fill should be moisture conditioned and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test. Areas where the structural fill will support traffic loads under concrete slabs or asphalt concrete should be compacted to at least 95 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.

Clean aggregate fill, if appropriate for the site soil conditions, must not be placed in lifts exceeding 8 inches and each lift should be thoroughly vibrated, preferably with a plate-type vibratory compactor prior to placing overlying lifts of material or structural components. We should be contacted prior to the use of clean aggregate fill materials to evaluate their suitability for use on this project.

8.2 Excavation Considerations

Unless a specific classification is performed, the site soils should be considered as an Occupational Safety and Health Administration (OSHA) Type C soil and should be sloped and/or benched according to the current OSHA regulations. Excavations should be sloped and benched to prevent wall collapse. Any soil can release suddenly and cave unexpectedly from excavation walls, particularly if the soils is very moist, or if fractures within the soil are present. Daily observations of the excavations should be conducted by OSHA competent site personnel to assess safety considerations.

We encountered subsurface water in our test borings. We suspect that it may be necessary to dewater excavations to provide for suitable working conditions.

If possible, excavations should be constructed to allow for water flow from the excavation the event of precipitation during construction. If this is not possible it may be necessary to remove water from snowmelt or precipitation from the foundation excavations to help reduce the influence of this water on the soil support conditions and the site construction characteristics.

8.2.1 Excavation Cut Slopes

We anticipate that some permanent excavation cut slopes may be included in the site development. Temporary cut slopes should not exceed 5 feet in height and should not be steeper than about 1:1 (horizontal to vertical) for most soils. Permanent cut slopes greater than 5 feet or steeper than 2½:1 must be analyzed on a site-specific basis.

8.3 Utility Considerations

Subsurface utility trenches will be constructed as part of the site development. Utility line backfill often becomes a conduit for post construction water migration. If utility line trenches approach the proposed project site from above, water migrating along the utility line and/or backfill may have direct access to the portions of the proposed structure where the utility line penetrations are made through the foundation system. The foundation soils in the vicinity of the utility line penetration may be influenced by the additional subsurface water. There are a few options to help mitigate water migration along utility line backfill. Backfill bulkheads constructed with high clay content soils and/or placement of subsurface drains to promote utility line water discharge away from the foundation support soil.

Some movement of all structural components is normal and expected. The amount of movement may be greater on sites with problematic soil conditions. Utility line penetrations through any walls or floor slabs should be sleeved so that movement of the walls or slabs does not induce movement or stress in the utility line. Utility connections should be flexible to allow for some movement of the floor slab.

8.4 Exterior Grading and Drainage Comments

The following recommendations should be following during construction and maintained for the life of the structure with regards to exterior grading and surface drainage.

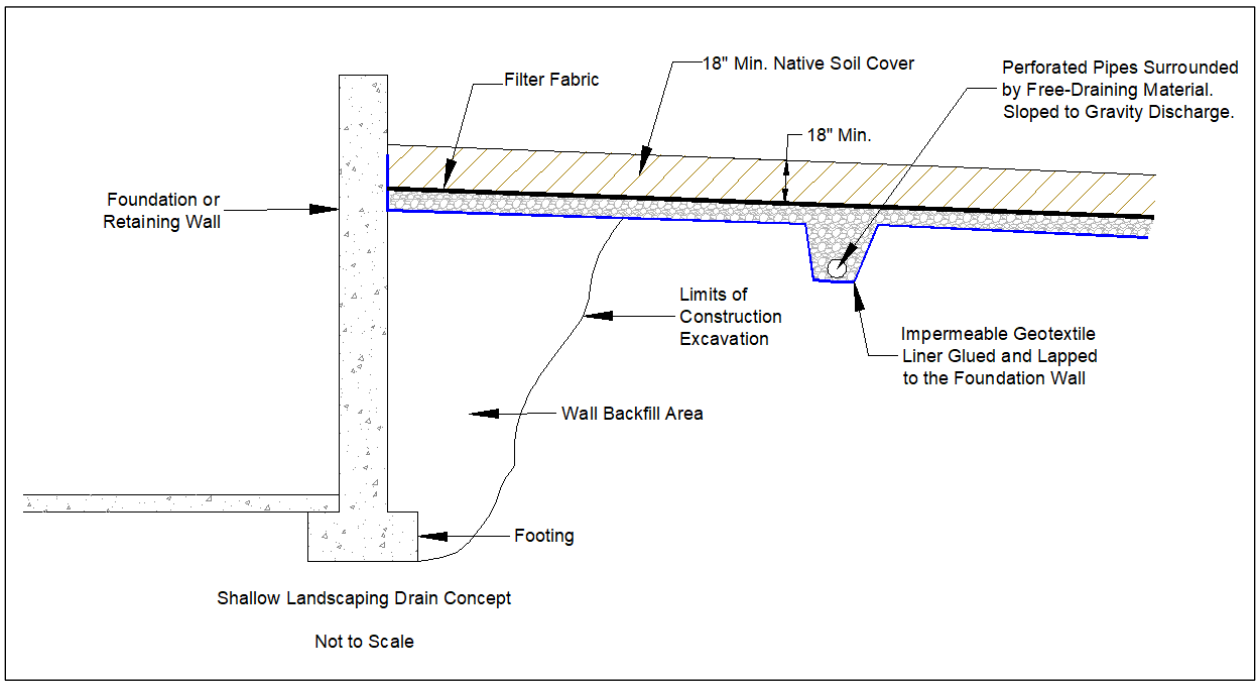
- The ground surface adjacent to the structure should be sloped to promote water flow away from the foundation system and flatwork.
- Snow storage areas should not be located in areas which will allow for snowmelt water access to support soils for the foundation system or flatwork.
- The project civil engineer, architect or builder should develop a drainage scheme for the site. We typically recommend the ground surface surrounding the exterior of the building be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 12 inches in the first 10 feet in unpaved areas and a minimum slope of 3 inches in the first 10 feet in paved areas.
- Water flow from the roof of the structure should be captured and directed away from the structure. If the roof water is collected in an eave gutter system, or similar, the discharge points of the system must be located away from areas where the water will have access to the foundation backfill or any structure support soils. If downspouts are used, provisions should be made to either collect or direct the water away from the structure.
- Care should be taken to not direct water onto adjacent property or to areas that would negatively influence existing structures or improvements.

8.5 Landscaping Considerations

We recommend against construction of landscaping which requires excessive irrigation. Generally landscaping which uses abundant water requires that the landscaping contractor install topsoil which will retain moisture. The topsoil is often placed in flattened areas near the structure to further trap water and reduce water migration from away from the landscaped areas. Unfortunately, almost all aspects of landscape construction and development of lush vegetation

are contrary to the establishment of a relatively dry area adjacent to the foundation walls. Excess water from landscaped areas near the structure can migrate to the foundation system or flatwork support soils, which can result in volume changes in these soils.

A relatively common concept used to collect and subsequently reduce the amount of excess irrigation water is to glue or attach an impermeable geotextile fabric or heavy mill plastic to the foundation wall and extend it below the topsoil which is used to establish the landscape vegetation. A thin layer of sand can be placed on top of the geotextile material to both protect the geotextile from punctures and to serve as a medium to promote water migration to the collection trench and perforated pipe. The landscape architect or contractor should be contacted for additional information regarding specific construction considerations for this concept which is shown in the sketch below.



A free draining aggregate or sand may be placed in the collection trench around the perforated pipe. The perforated pipe should be graded to allow for positive flow of excess irrigation water away from the structure or other area where additional subsurface water is undesired. Preferably the geotextile material should extend at least 10 or more feet from the foundation system.

Care should be taken to not place exterior flatwork such as sidewalks or driveways on soils that have been tilled and prepared for landscaping. Tilled soils will settle which can cause damage to the overlying flatwork. Tilled soils placed on sloped areas often “creep” down-slope. Any structure or structural component placed on this material will move down-slope with the tilled soil and may become damaged.

The landscape drain system concept provided above is optional for this site and provided only if there is a desire to reduce the potential for subsurface water migration to below grade finished areas or crawl space areas. Often this concept is implemented only on the northern sides of

structures and/or where snow may accumulate and melt water may migrate toward subsurface areas under the structure.

8.6 Soil Sulfate and Corrosion Issues

The requested scope of our services did not include assessment of the chemical constituents of corrosion potential of the site soils. Most soils in southwest Colorado are not typically corrosive to concrete. There has not been a history of damage to concrete due to sulfate corrosion in the area.

We are available to perform soluble sulfate content tests to assess the corrosion potential of the soils on concrete if desired.

8.7 Radon Issues

The requested scope of service of this report did not include assessment of the site soils for radon production. Many soils and formational materials in western Colorado produce Radon gas. The structure should be appropriately ventilated to reduce the accumulation of Radon gas in the structure. Several Federal Government agencies including the Environmental Protection Agency (EPA) have information and guidelines available for Radon considerations and home construction. If a radon survey of the site soils is desired, please contact us.

8.8 Mold and Other Biological Contaminants

Our services do not include determining the presence, prevention or possibility of mold or other biological contaminants developing in the future. If the client is concerned about mold or other biological contaminants, a professional in this special field of practice should be consulted.

9.0 CONSTRUCTION MONITORING AND TESTING

Engineering observation of subgrade bearing conditions, compaction testing of fill material and testing of foundation concrete are equally important tasks that should be performed by the geotechnical engineering consultant during construction. We should be contacted during the construction phase of the project and/or if any questions or comments arise as a result of the information presented below. It is common for unforeseen, or otherwise variable subsurface soil and water conditions to be encountered during construction. As discussed in our proposal for our services, it is imperative that we be contacted during the foundation excavation stage of the project to verify that the conditions encountered in our field exploration were representative of those encountered during construction. Our general recommendations for construction monitoring and testing are provided below.

- Consultation with design professionals during the design phases: This is important to ensure that the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.
- Grading Plan Review: A grading plan was not available for our review at the time of this report. A grading plan with finished floor elevations for the proposed construction should

be prepared by a civil engineer licensed in the State of Colorado. Trautner Geotech should be provided with grading plans once they are complete to determine if our recommendations based on the assumed bearing elevations are appropriate.

- Observation and monitoring during construction: A representative of the Geotechnical engineer from our firm should observe the foundation excavation, earthwork, and foundation phases of the work to determine that subsurface conditions are compatible with those used in the analysis and design and our recommendations have been properly implemented. Placement of backfill should be observed and tested to judge whether the proper placement conditions have been achieved. Compaction tests should be performed on each lift of material placed in areas proposed for support of structural components.
- If asphaltic concrete is placed for driveways or aprons near the structure we are available to provide testing of these materials during placement.

10.0 LIMITATIONS

This study has been conducted based on the geotechnical engineering standards of care in this area at the time this report was prepared. We make no warranty as to the recommendations contained in this report, either expressed or implied. The information presented in this report is based on our understanding of the proposed construction that was provided to us and on the data obtained from our field and laboratory studies. Our recommendations are based on limited field and laboratory sampling and testing. Unexpected subsurface conditions encountered during construction may alter our recommendations. We should be contacted during construction to observe the exposed subsurface soil conditions to provide comments and verification of our recommendations.

The recommendations presented above are intended to be used only for this project site and the proposed construction which was provided to us. The recommendations presented above are not suitable for adjacent project sites, or for proposed construction that is different than that outlined for this study.

This report provides geotechnical engineering design parameters, but does not provide foundation design or design of structure components. The project architect, designer or structural engineer must be contacted to provide a design based on the information presented in this report.

This report does not provide an environmental assessment nor does it provide environmental recommendations such as those relating to Radon or mold considerations. If recommendation relative to these or other environmental topics are needed and environmental specialist should be contacted.

The findings of this report are valid as of the present date. However, changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or the broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

We are available to review and tailor our recommendations as the project progresses and additional information which may influence our recommendations becomes available.

Please contact us if you have any questions, or if we may be of additional service.

Respectfully,
TRAUTNER GEOTECH

Jonathan P. Butler, P.E.
Geotechnical Engineer

APPENDIX A

Field Study Results

TRAUTNER GEOTECH LLC

Field Engineer	: Jonathan Butler
Hole Diameter	: 3.25" I.D.
Drilling Method	: Continuous Flight
	: Hollow Auger
Sampling Method	: Mod. California Sampler,
	: Standard Split Spoon
Date Drilled	: March 13, 2023
Total Depth (approx.)	: 8 feet
Location	: See Figure 2.2

LOG OF BORING TB-1

101 and 105 North 19th Street
Dolores, Colorado
Mr David Bruce, Rural Homes Project

Project Number: 57824GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	SILT, sandy, organics, very soft, very moist, dark brown	ML					
1	CLAY, sandy, soft to medium stiff, very moist, brown	CL					
3	GRAVEL, COBBLES, sandy, slightly clayey, slightly silty, medium dense to very dense, moist, brown	GP-GC			11/6 10/6 12/6	▽	Water level at 8 feet after drilling
8	Auger refusal at 8 feet on very dense nested cobbles						
9							

TRAUTNER GEOTECH LLC

Field Engineer	: Jonathan Butler
Hole Diameter	: 3.25" I.D.
Drilling Method	: Continuous Flight
	: Hollow Auger
Sampling Method	: Mod. California Sampler,
	: Standard Split Spoon
Date Drilled	: March 13, 2023
Total Depth (approx.)	: 11 feet
Location	: See Figure 2.2

LOG OF BORING TB-2

101 and 105 North 19th Street
Dolores, Colorado
Mr David Bruce, Rural Homes Project

Project Number: 57824GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0–1	SILT, sandy, organics, very soft, very moist, dark brown	ML					
1–3	CLAY, SILT, sandy, soft to medium stiff, very moist to wet, brown	CL-ML			2/6 5/6		
3–7	GRAVEL, SAND, slightly silty, medium dense to dense, moist, brown	GM			10/6 10/6 8/6		
7–11	GRAVEL, COBBLES, sandy, slightly silty, dense to very dense, very moist to wet, brown	GP-GM			7/6 17/6 24/6	▽	Water level at 7.5 feet after drilling
11–12	Auger refusal at 11 feet on very dense nested cobbles						

TRAUTNER GEOTECH LLC

Field Engineer	: Jonathan Butler
Hole Diameter	: 3.25" I.D.
Drilling Method	: Continuous Flight
	: Hollow Auger
Sampling Method	: Mod. California Sampler,
	: Standard Split Spoon
Date Drilled	: March 13, 2023
Total Depth (approx.)	: 6 feet
Location	: See Figure 2.2

LOG OF BORING TB-3

101 and 105 North 19th Street
Dolores, Colorado
Mr David Bruce, Rural Homes Project

Project Number: 57824GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	SILT, sandy, organics, very soft, very moist, dark brown	ML					
2	CLAY, sandy, medium stiff, slightly moist, brown to tan	CL					
4	GRAVEL, COBBLES, sandy, slightly clayey, dense to very dense, moist, brown	GC-GP			20/6 29/6		
6	Auger refusal at 6 feet on large cobble						
7							

TRAUTNER GEOTECH LLC

Field Engineer	: Jonathan Butler
Hole Diameter	: 3.25" I.D.
Drilling Method	: Continuous Flight
	: Hollow Auger
Sampling Method	: Mod. California Sampler,
	: Standard Split Spoon
Date Drilled	: March 13, 2023
Total Depth (approx.)	: 9 feet
Location	: See Figure 2.2

LOG OF BORING TB-4

101 and 105 North 19th Street
Dolores, Colorado
Mr David Bruce, Rural Homes Project

Project Number: 57824GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

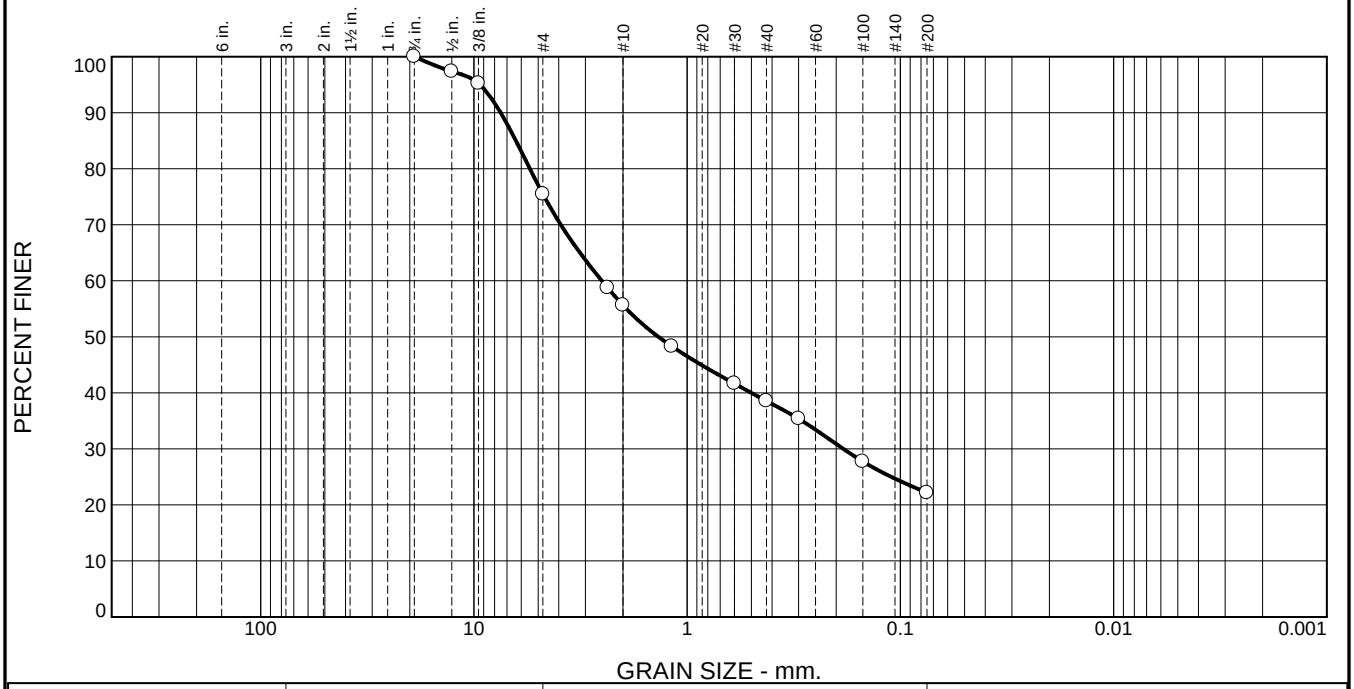
Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	SILT, sandy, organics, soft, very moist, dark brown	ML					
1					2/6		
2	CLAY, sandy, soft to medium stiff, moist, brown to tan	CL			2/6		
3							
4	GRAVEL, SAND, slightly clayey, few cobbles, loose to medium dense, very moist to wet, brown	GC			6/6		
5					5/6		
					2/6	▽	Water level at 5.5 feet after drilling
6							
7					9/6		
					6/6		
8					4/6		
9	Auger refusal at 9 feet on cobble						
10							

APPENDIX B

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	25	19	17	17	22	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100		
.5	97		
.375	95		
#4	75		
#8	59		
#10	56		
#16	48		
#30	42		
#40	39		
#50	35		
#100	28		
#200	22		

* (no specification provided)

Material Description

Silty, clayey sand with gravel

Atterberg Limits (ASTM D 4318)

PL= 14 **LL=** 19 **PI=** 5

Classification

USCS (D 2487)= SC-SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 7.4875 D_{85}= 6.3573 D_{60}= 2.5112
D_{50}= 1.3649 D_{30}= 0.1852 D_{15}=
D_{10}= C_u= C_c=

Remarks

C10506-C

Date Received: 3/13/23 **Date Tested:** 3/15/23

Tested By: R. Barrett

Checked By: J. Butler

Title: P.E.

Location: TB-1
Depth: 5.5'-8.0'

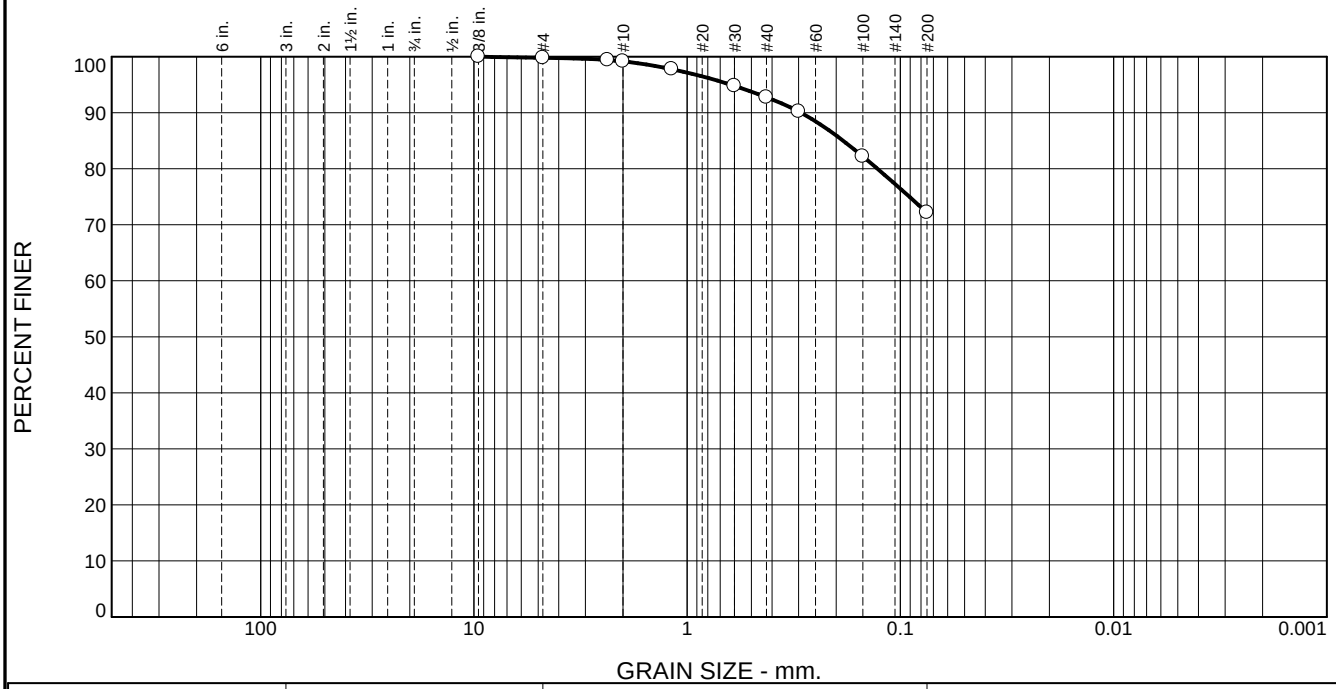
Date Sampled: 3/13/23

TRAUTNER GEOTECH LLC

Client: Mr. David Bruce, Rural Homes Project
Project: 101 and 105 North 19th Street, Dolores, Colorado

Project No: 57824GE **Figure** B.1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	6	21	72	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.375	100		
#4	100		
#8	99		
#10	99		
#16	98		
#30	95		
#40	93		
#50	90		
#100	82		
#200	72		

* (no specification provided)

Material Description

Lean clay with sand

Atterberg Limits (ASTM D 4318)

PL= 21 **LL=** 33 **PI=** 12

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(7)

Coefficients

D_{90}= 0.2929 D_{85}= 0.1857 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

C10506-H

Date Received: 3/13/23 **Date Tested:** 3/15/23

Tested By: R. Barrett

Checked By: J. Butler

Title: P.E.

Location: TB-3
Depth: 0-4'

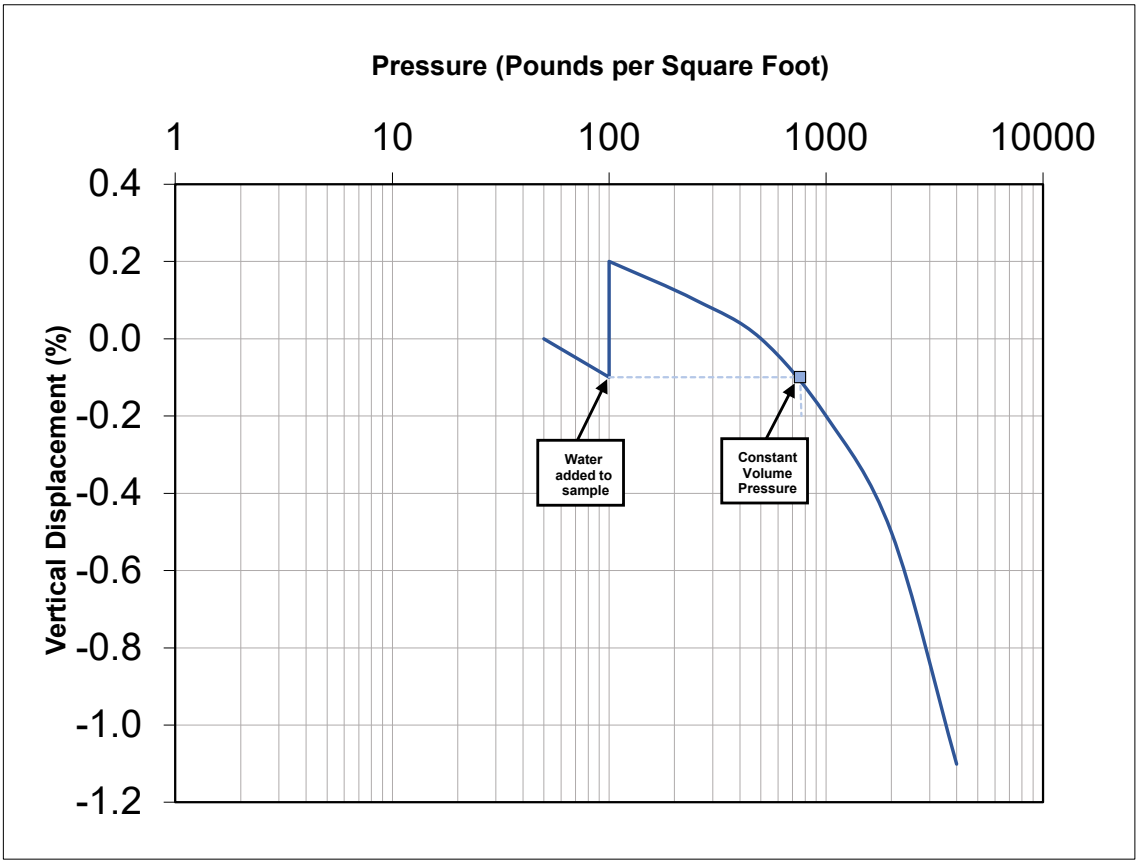
Date Sampled: 3/13/23

TRAUTNER GEOTECH LLC

Client: Mr. David Bruce, Rural Homes Project
Project: 101 and 105 North 19th Street, Dolores, Colorado

Project No: 57824GE **Figure** B.2

SWELL - CONSOLIDATION TEST

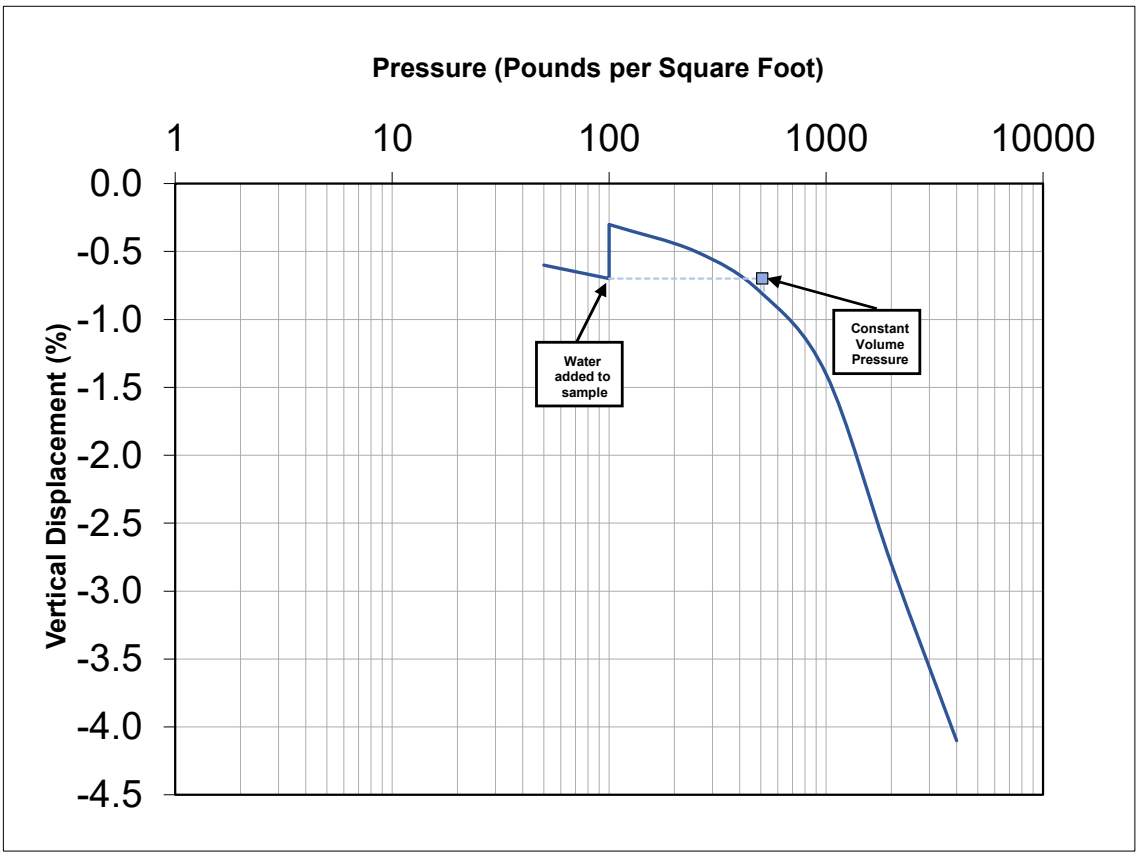


SUMMARY OF TEST RESULTS		
Sample Source:	TB-1@5.5'-8.0'	
Visual Soil Description:	SAND, silty,clayey (SC-SM)	
Swell Potential (%)	0.3%	
Constant Volume Swell Pressure (lb/ft^2):	760	
	Initial	**Final**
Moisture Content (%):	6.4	9.6
Dry Density (lb/ft^3):	128.3	129.8
Height (in.):	0.999	0.988
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	57824GE
Sample ID:	C10506-C
Figure:	B.3

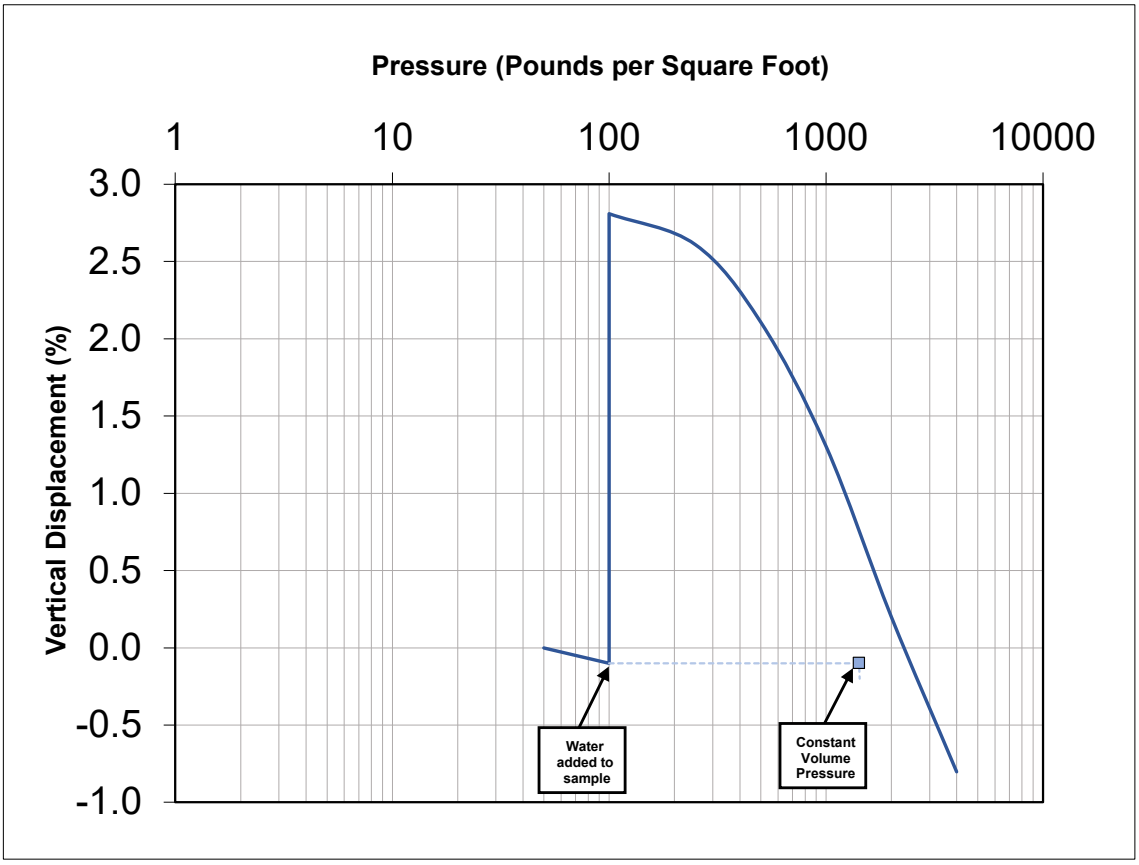
SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-2@1.5'	
Visual Soil Description:	CLAY, SILT (CL-ML)	
Swell Potential (%)	0.4%	
Constant Volume Swell Pressure (lb/ft^2):	510	
	Initial	**Final**
Moisture Content (%):	20.4	20.2
Dry Density (lb/ft^3):	104.1	108.6
Height (in.):	1.000	0.959
Diameter (in.):	1.94	1.94

Project Number:	57824GE
Sample ID:	C10506-E
Figure:	B.4

SWELL - CONSOLIDATION TEST

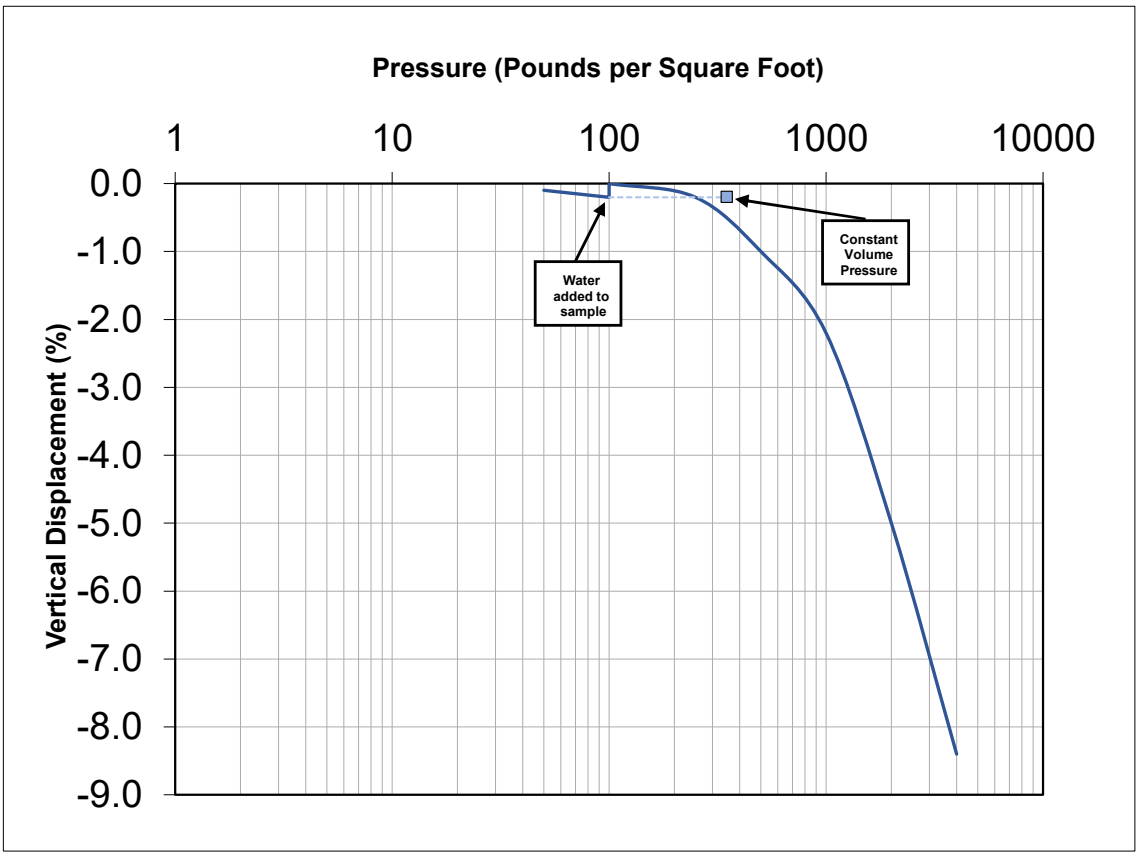


SUMMARY OF TEST RESULTS		
Sample Source:	TB-3@4.5'	
Visual Soil Description:	SAND, clayey (SC)	
Swell Potential (%)	2.9%	
Constant Volume Swell Pressure (lb/ft^2):	1,420	
	Initial	**Final**
Moisture Content (%):	4.9	15.7
Dry Density (lb/ft^3):	119.6	120.1
Height (in.):	0.997	0.989
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 250 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 250 PSF.

Project Number:	57824GE
Sample ID:	C10506-I
Figure:	B.5

SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-4@1'	
Visual Soil Description:	SILT, sandy (ML)	
Swell Potential (%)	0.2%	
Constant Volume Swell Pressure (lb/ft^2):	350	
	Initial	**Final**
Moisture Content (%):	10.7	17.6
Dry Density (lb/ft^3):	91.8	104.8
Height (in.):	1.000	0.916
Diameter (in.):	1.94	1.94

Project Number:	57824GE
Sample ID:	C10506-K
Figure:	B.6

RESULTS OF SURVEY
LOTS 1–3 & 9–12, BLOCK 2
SMITH ADDITION

LOCATED IN THE SE1/4 OF SECTION 10, T 37 N, R 15 W, N.M.P.M.
MONTEZUMA COUNTY, COLORADO

Units shown hereon = U.S. Survey Feet

Measured bearings are grid bearings of the Colorado State Plane Coordinate System, South Zone, NAD 1983. Reference bearing is the west line of the SMITH ADDITION, Rec. No. 259015. The ends of said line having been monumented as shown hereon. (Reference bearing = N 00°28'51" E)

DESCRIPTION OF MONUMENTS

- ⊙ Set 5/8" x 24" rebar with a 1–1/2" aluminum cap stamped PLS 38422 – B.M. Boniface
- ◉ Found 5/8" rebar with a 1–1/2" aluminum cap stamped PLS 12027 – R.E. Johnson

Deposited this _____ day of _____ , 2023
at _____ _.m., in Book _____ of the Montezuma
County Surveyor's land survey plats at Page _____,
Reception Number _____.

PROPERTY DESCRIPTION:
Lots 1–3 and Lots 9–12 in Block 2 of PROPOSED ANNEXATION TO THE TOWN OF DOLORES, MONTEZUMA COUNTY, COLORADO OF THE SMITH ADDITION as recorded in the office of the Montezuma County Clerk and Recorder, Montezuma County, Colorado, Reception Number 259015.

CERTIFICATE OF SURVEYOR:
I hereby state that this survey and plat were prepared from field notes of an actual survey performed by me or under my direct responsibility, supervision and checking, and from documents recorded in the Office of the Montezuma County, Colorado, Clerk and Recorder, and that, in my professional opinion, they are true and correct to the best of my knowledge, belief and information based on the standards of care of Professional Land Surveyors practicing in the State of Colorado. This survey is not a guaranty or warranty, either expressed or implied.

PRELIMINARY FOR REVIEW

Brian M. Boniface , P.L.S.
Colorado Registration No. 38422

Date

NOTICE:
According to the laws of the State of Colorado, any legal action based upon any defect in this survey must commence within three years after such defect was first discovered. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

GOFF
ENGINEERING + SURVEYING INC
126 ROCK POINT DRIVE
PO BOX 97
DURANGO, COLORADO 81302
970.247.1705

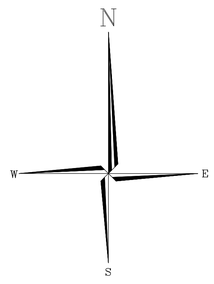
RESULTS OF SURVEY
LOTS 1–3 & 9–12
BLOCK 2
SMITH ADDITION
SE1/4 SECTION 10, T 37 N, R 15 W, N.M.P.M.

SHEET 1 OF 1

PREPARED BY:	SM	CHECKED BY:	BB
PROJECT NO.	23-027	SCALE:	1"=30'
DATE:	06/12/2022		

TOPOGRAPHIC SURVEY
LOTS 1–3 & 9–12, BLOCK 2
SMITH ADDITION

LOCATED IN THE SE1/4 OF SECTION 10, T 37 N, R 15 W, N.M.P.M.
MONTEZUMA COUNTY, COLORADO



1" = 20'

20 10 0 20

Units shown hereon = U.S. Survey Feet

Bearings are grid bearings of the Colorado State Plane Coordinate System, South Zone, NAD 1983.

Vertical Datum – NAVD 88
Contour Interval = 1 foot

LEGEND

- Existing fence
- Overhead power
- Buried telecom
- Edge of gravel
- Utility pole
- Pole anchor
- Electric meter
- Telecom pedestal
- Water wellhead
- Gravel

DESCRIPTION OF MONUMENTS

- ⊙ Set 5/8" x 24" rebar with a 1–1/2" aluminum cap stamped PLS 38422 – B.M.Boniface
- ● Found 5/8" rebar with no L.S. I.D.

CERTIFICATE OF SURVEYOR:

I hereby state that this topographic survey and plat were prepared from field notes of an actual survey performed by me or under my direct responsibility, supervision and checking, and from documents recorded in the Office of the Montezuma County, Colorado, Clerk and Recorder, and that, in my professional opinion, they are true and correct to the best of my knowledge, belief and information based on the standards of care of Professional Land Surveyors practicing in the State of Colorado. This survey is not a guaranty or warranty, either expressed or implied.

PRELIMINARY FOR REVIEW

Brian M. Boniface , P.L.S.
Colorado Registration No. 38422

Date

NOTICE:

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TOPOGRAPHIC SURVEY
LOTS 1–3 & 9–12
BLOCK 2
SMITH ADDITION

SHEET 1 OF 1

SE1/4 SECTION 10, T 37 N, R 15 W, N.M.P.M.

PREPARED BY:	SM	CHECKED BY:	BB
PROJECT NO.	23-027	SCALE:	1"=20'
DATE:	06/12/2022		