

Canyon Cottages Subdivision

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Introduction

Mountain West Engineering was approached by Jeff Jorgensen in March of 2022 and was asked to design a subdivision near Bear Lake in Garden City, Utah. The purpose of the subdivision was to build smaller homes that would serve as rental properties. The subdivision was to be built on an undeveloped 12-acre lot owned by the client. Mountain West Engineering was asked to provide the design and orientation of the road for the subdivision, route all sewer and water, as well as provide adequate drainage and catches for the area. Mountain West Engineering was not asked to provide designs for the homes or any surrounding roadways.

Building of the Canyon Cottages Subdivision would be beneficial for the town of Garden City by bringing in more tourists which could improve the local economy and boost the city's revenue.

Design Factors	Weight (%)	Asphalt Cul-de-Sac	Concrete Cul-de-sac	Through Street	Larger Lots	Do Nothing
Number of lots	15 %	14	2.1	14	2.1	14 2.1 9 1.35 0 0
Size of lots (0-5)	10 %	2	0.2	2	0.2	4 0.4 0 0
Ease of access (0-5)	5 %	3	0.15	3	0.15	5 0.25 3 0.15 1 0.05
Environmental impact (0-5)	5 %	5	-0.25	4	-0.2	4 -0.2 3 -0.15 0 0
Ease of Drainage (0-5)	10 %	5	0.5	5	0.5	5 0.5 5 0.5 5 0.5
Ease of Construction (0-5)	5 %	3	0.15	4	0.2	2 0.1 3 0.15 5 0.25
Ease of Maintenance (0-5)	5 %	3	0.15	3	0.15	4 0.2 3 0.15 5 0.25
Noise (0-5)	5 %	3	-0.15	4	-0.2	4 -0.2 3 -0.15 0 0
Aesthetics (0-5)	5 %	4	0.2	3	0.15	3 0.15 5 0.25 5 0.25
Profitability (0-5)	15 %	5	0.75	5	0.75	4 0.6 2 0.3 1 0.15
Overall cost (0-5)	20 %	3	-0.6	4	-0.8	5 -1 3 -0.6 0 0
Total	100 %	Score: 3.2	Score: 3	Score: 2.5	Score: 2.35	Score: 1.45

Figure 2 - Pugh matrix used to evaluate alternatives

Alternatives

The following alternatives were evaluated for the design of Canyon Cottages Subdivision

- Alternative 1: Cul-de-sac
- Alternative 2: Through Street
- Alternative 3: Less Lots, Larger acreage per Lot
- Alternative 4: Do Nothing

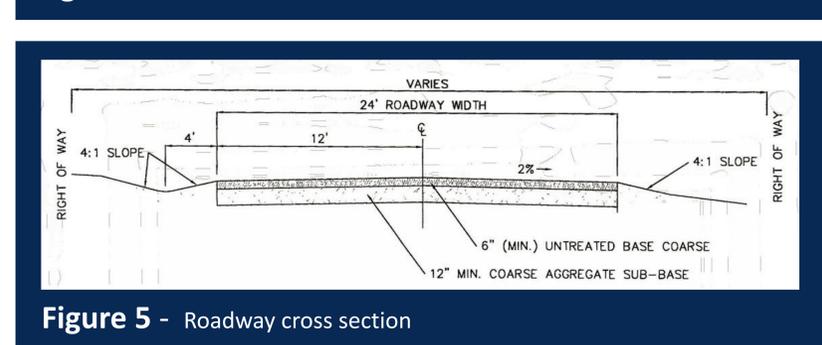
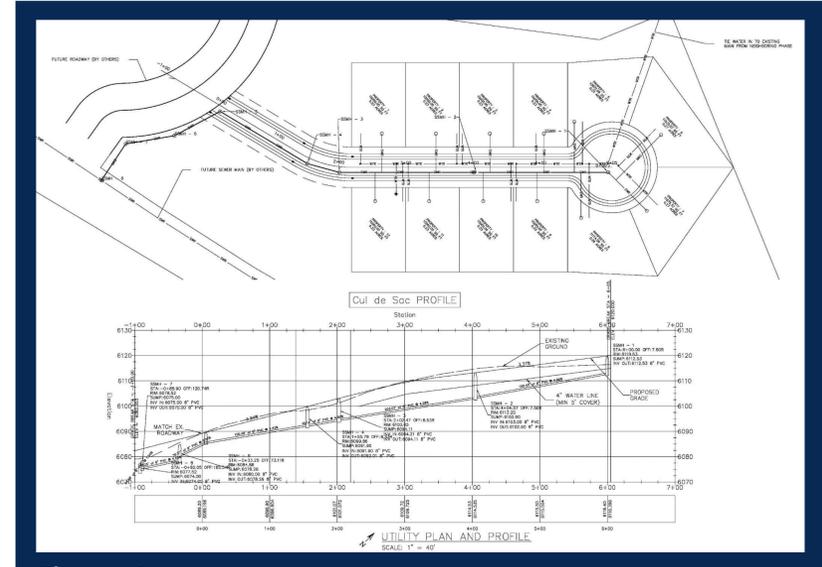
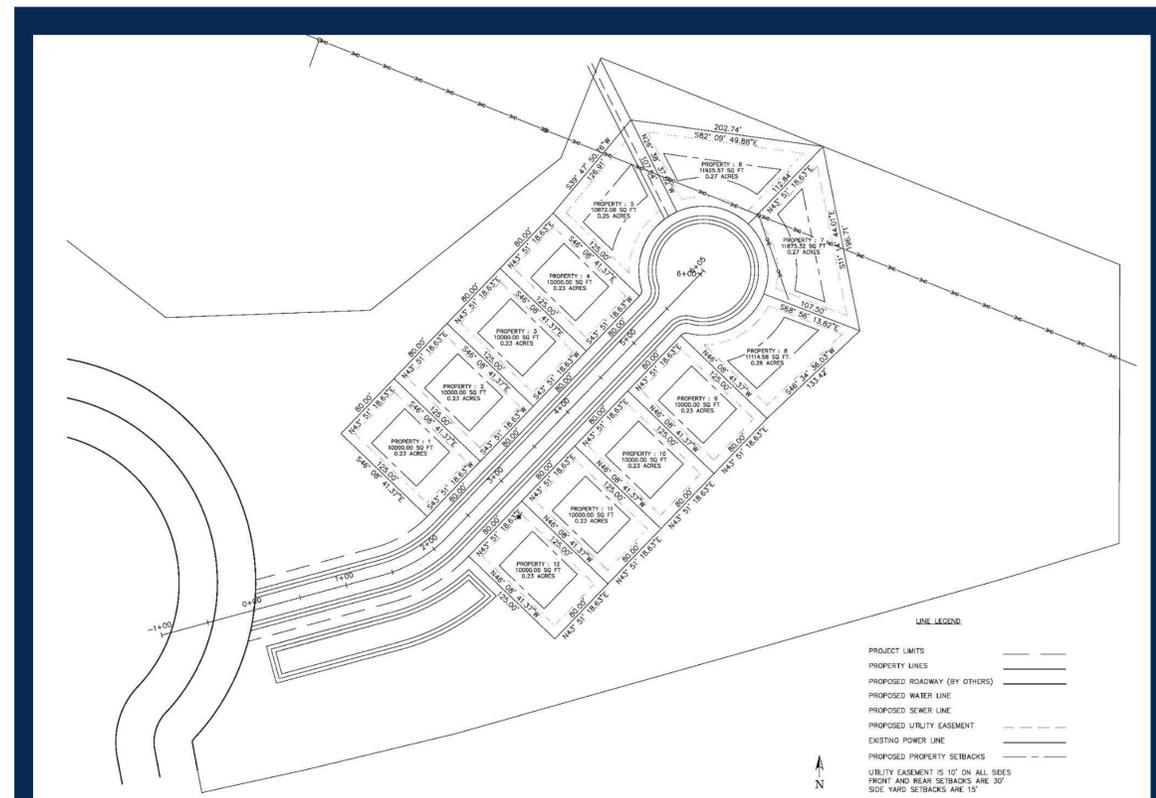
The criteria used for evaluation included number of lots, size of lots, ease of access, environmental impact, ease of drainage, ease of construction, ease of maintenance, noise, aesthetics, and profitability. Of the established criteria, number of lots, size of lots, profitability, and overall cost were weighted the heaviest. The alternatives were scored individually and compared against each other. The pugh matrix used for evaluation can be found in Figure 2.

Final Design

After evaluating the different alternatives we determined that a pavement cul-de-sac was the best option. The final design includes:

- (12) 0.23 Acre lots
- 104,625 ft³ Clear and grub
- 24' Roadway with (2) 12' lanes
- 20,908 ft² 3" Asphalt
- 524 T 6" Road base
- 4' Shoulders each side of roadway
- 14,800 ft³ Drainage basin
- (6) Storm drain boxes with grates
- 437' 15" Drainage pipeline
- 1,372' of 6" Water pipeline
- 1,361' 8" Sewer pipeline

The final cost is \$498,524 at \$41,544 per lot.



Acknowledgments

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