

Providence Ridge Subdivision

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Introduction



Figure 1. Current Undeveloped Land

Cache Valley has a housing shortage. There is prime real estate in Providence to subdivide. The State of Utah is the first fastest growing State in the United States of America (U.S. Census Bureau, 2020)*

Alternatives

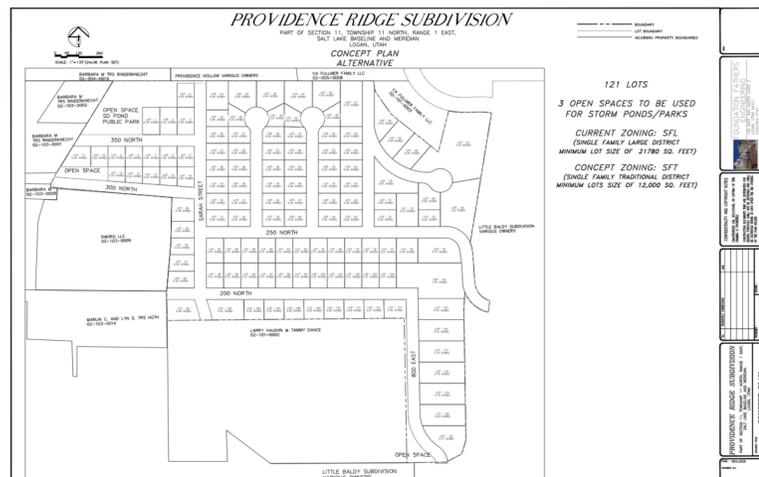


Figure 2. Possible Alternative

Multiple designs and alternative concepts were created and reviewed. They ranged from different lot sizes, number of lots, or stormwater control. In Figure 2 shows one of the alternatives. It was determined that the size of lots was the most profitable alternative. It is shown in Figure 4.

References and Support

Thank you to CRS and especially Max Peirson for all the help with our design. Thank you to our faculty advisor Professor Ball for all his help during our design and over the last 3 semesters.

*<https://www.census.gov/library/stories/2021/04/2020-census-data-release.html>

Design Criteria

Unit Cost	Number of Units	Total Profit	Unit Cost	Number of Units	Total Profit
Do Nothing Alternative			Alternative 4 (1/2 acre with Pond)		
townhomes	250000	0	.5 - .8 acres	140000	9660000
10000-12000 sq. f	80000	0	.8+ acres	160000	1600000
culdesac	110000	0	Sale Price		\$ 11,260,000.00
12000 sq ft-0.5 ac	100000	0	Cost		\$ 3,624,183.00
.5 - .8 acres	140000	0	Total Profit		\$ 7,635,817.00
.8+ acres	160000	0	Alternative 5 (12,000 sq ft Lots)		
Sale Price		\$ -	culdesac	110000	16
Cost		\$ -	12000 sq ft-0.5 ε	100000	83
Total Profit		\$ -	.8+ acres	160000	16
Alternative 2 (Maximizing Lots)			Sale Price		\$ 12,620,000.00
10000-12000 sq. f	80000	20	Cost		\$ 3,964,466.00
culdesac	110000	15	Total Profit		\$ 8,655,534.00
12000 sq ft-0.5 ac	100000	75	Alternative 6 (Townhomes)		
.8+ acres	160000	11	townhomes	250000	48
Sale Price		\$ 12,510,000.00	culdesac	110000	16
Cost		\$ 3,969,483.00	12000 sq ft-0.5 ε	100000	70
Total Profit		\$ 8,540,517.00	.8+ acres	160000	16
Alternative 3 (1/2 acre with Sump)			Sale Price		\$ 23,320,000.00
.5 - .8 acres	140000	72	Cost		\$ 6,776,368.00
.8+ acres	160000	10	Total Profit		\$ 16,543,632.00
Sale Price		\$ 11,680,000.00			
Cost		\$ 6,068,851.00			
Total Profit		\$ 5,611,149.00			

Figure 3. Profitability Analysis

Selected Alternative



Figure 4. Selected Alternative Layout and Phasing Diagram

Final Design

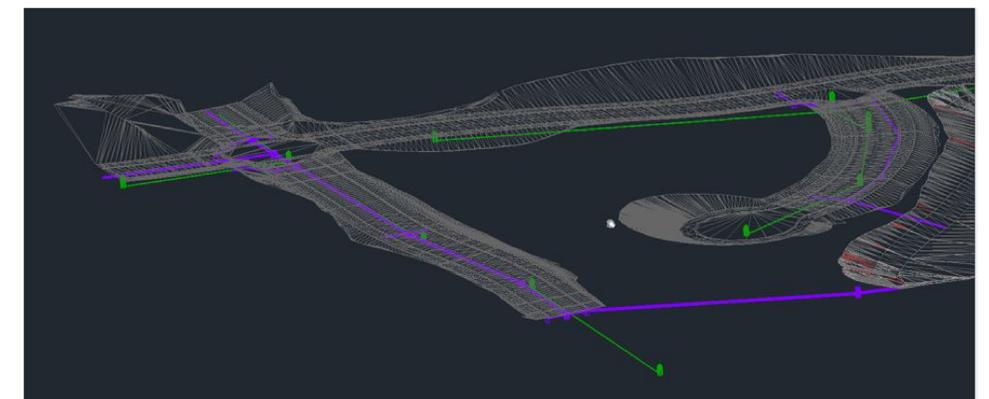


Figure 5. 3-D Rendering of Final Design

Figure 5 shows the Civil 3D design of the northwest corner of the subdivision. This is phase 1. The design includes the roads, retention pond, and the grading up to each lot from the road.

Figure 3 shows the profitability analysis of the multiple alternative concepts. This one is simplified for readability. When comparing the profitability for the various concepts the general infrastructure was calculated to make the subdivision comfortable and possible. Some of the considerations were the amount of asphalt we would need for the roads, the amount of manholes, all the utility lines, the amount of earthwork needed, and the amount each lot would sell for. Profitability was found by subtracting the expense of general infrastructure from the income of the lots.