Highland Residential Subdivision Design

Kreed Trane – Tyler Jones – Mark Takara
UVU Civil Engineering | 2025-2026

Project Overview: This project involved the design of a 29.77-acre residential subdivision in Highland, Utah, consisting of 32 single-family lots. The development was designed to integrate with existing infrastructure while meeting all Highland City standards for roadway design, utilities, grading, and stormwater management.

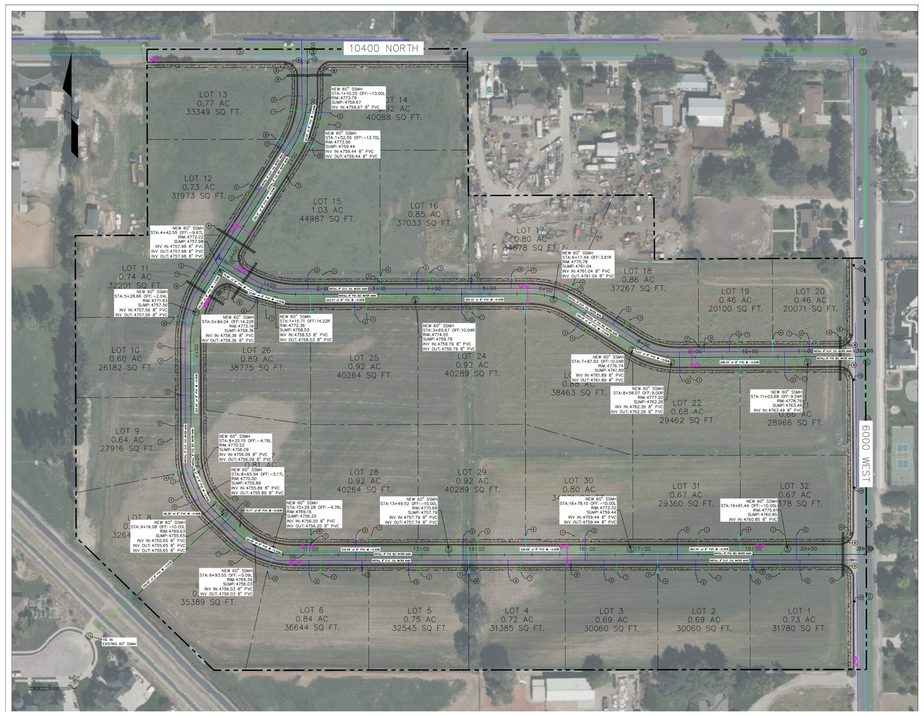
The final design includes a complete set of construction plans featuring roadway layouts, utility systems, grading and drainage design, and stormwater infrastructure sized for the 100-year storm event.

Sewer Alignment Options
Option 2 Chosen





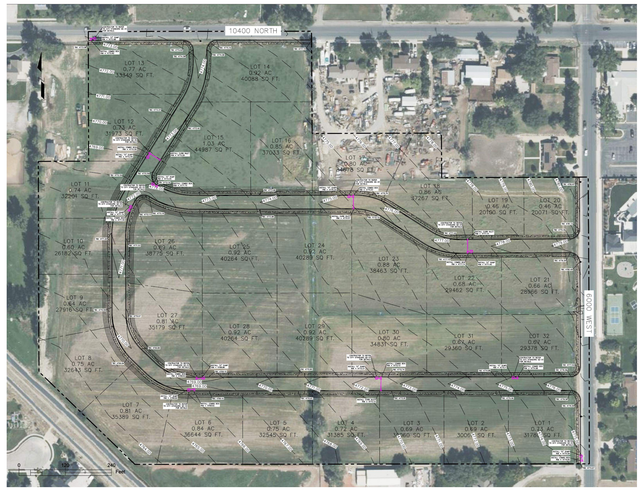




Survey Equipment Used:
Spectra Precision SP80
GNSS Receiver



Storm Drain Calculations
11 Sumps Required



CAPSTONE BASIN B — Sump Capacity Calculations

SUMP SPECIFICATIONS	
Percolation Rate (min/in)	1.00
Void ratio in drain rock	0.40
Height of top cone section (ft)	3.00
Height of manhole section (ft)	3.00
Inside diameter of manhole section (ft)	6.00
Wall thickness (in)	6.00
Number of manhole sections	3
Excavation beyond outside of manhole (ft)	2.00
Bottom of manhole section to bottom of rock (ft)	1.00
Height of drain rock (ft)	10.000
Area available for percolation (ft^2)	440.608
Calculated Percolation Capacity (ft^3/s)	0.612
Additional Outflow (ft^3/s)	0.00
Storage in Manhole Sections (ft^3)	282.743
Storage in drain rock voids (ft^3)	241.588
Total storage in sump (ft^3)	524.332

BASIN	
Total Area (acres)	2.304
Average Runoff Coefficient, C	0.467
Number of sumps in area	2.00
Max required storage (from table) (ft^3)	865.379
Storage available in sump(s) (ft^3)	1048.664
Additional storage required (+)/excess (–) (ft^3)	-183.284

time (min)	rain I (in/hr)	C	Area (Acre)	Q (CIA)	vol (ft^3)	perc+outflow (ft^3)
5	6.46	0.467	2.304	6.955	1043.20	367.17
10	4.91	0.467	2.304	5.286	1585.79	734.35
15	4.06	0.467	2.304	4.371	1966.90	1101.52
30	2.73	0.467	2.304	2.939	2645.14	2203.04
60	1.69	0.467	2.304	1.819	3274.94	4406.08
120	0.93	0.467	2.304	0.999	3596.62	8812.17
180	0.63	0.467	2.304	0.677	3656.69	13218.25
360	0.34	0.467	2.304	0.367	3964.81	26436.50
720	0.20	0.467	2.304	0.214	4627.54	52873.00
1440	0.10	0.467	2.304	0.109	4697.31	105746.01

