Storm Drain Report

for

THE VILLAS AT JDC RANCH

(Located at approximately
2725 North 3100 West, Weber County, Utah)

Submitted: November 2023

Prepared for

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General Rationale

The following pages contain the final storm drainage calculations for the proposed West Haven Villas. The storm drainage plan was approached as follows:

- The natural flow of the land was mapped based on topography to determine the storm water outfall and detention/retention locations of the proposed development.
- The overall site was divided into smaller sub-basins where areas and C values were calculated.
- Anticipated peak flow rates generated by each sub-basin were calculated using the Rational Formula (Q=CiA) using the 10-yr, 30-minute duration storm.
- The runoff flows for each sub-basin were used to determine inlet sizes, pipe diameters, and pipe slopes throughout the development using a 10-year storm event.
- The retention facility was sized using the 100-yr storm design storm.

Summary of Calculations

Topography and Layout

The current terrain of the undeveloped site exhibits a predominantly level surface with a slight gradient from north to south. Consequently, the optimal placement for outfall points lies in the southwestern and southeastern sectors of the development area so that future grading will generally follow the existing contours to avoid mass grading. A retention basin is proposed in the southwest corner of the property while regional detention is being provided in the Orchards at JDC Ranch development to the east.

Sub-basins

The overall site was divided into thirty-seven storm drainage sub-basins based on proposed topography, street slopes and inlet locations (1 through 37 as shown on the drainage basin map in the appendix). The sub-basins were designed to satisfy the maximum spacing requirements of inlets and minimize spread of water across the street.

Because of the site's predominantly level terrain, the development was divided into two distinct regional drainage basins. The majority of the runoff (sub-basins 1-23) will be directed towards a regional detention facility situated to the east (within the proposed Orchards at JDC Ranch development), while the remaining flows (sub-basins 24-37) will be gathered and conveyed to a proposed retention basin positioned at the southwest corner of the proposed development.

Using the Rational Formula (Q=CiA), the peak flow rates generated for each sub-basin were calculated using a 10-year storm with a duration of 60 minutes and an intensity of 0.87 in/hr. The sub-basin flow calculations are shown on the "Sub-Basin Flows and Pipe Sizing" sheet within the appendix.

Runoff Coefficients

The runoff coefficients for the development were based on estimated areas of impervious and pervious surface. The C values below were used to calculate an overall composite C value based on a mixture of pervious and impervious areas.

EAST REGIONAL BASIN

Area	C Value
Landscaping	0.10
Asphalt	0.90
Concrete	0.90
Roof	0.80
Composite	**0.63**

WEST REGIONAL BASIN

Area	C Value
Landscaping	0.10
Asphalt	0.90
Concrete	0.90
Roof	0.80
Composite	**0.55**

The rainfall data for the storm water analysis was retrieved from the National Oceanic and Atmospheric Administration data base using historical rainfall records for West Haven City. This information is shown on the "NOAA Atlas Rainfall Data" sheet of the appendix.

Pipe and Inlet Sizing

Storm water generated in the development will be carried in the gutters along the surface and then collected in curb-face inlets. These flows will then be conveyed to the proposed detention basin through a network of underground drainage pipes. As required by the County, all public storm drain piping will be a minimum of 15" in diameter. The pipe cover at each junction was evaluated to ensure proper cover was provided. All utility crossings were assessed to avoid conflicts and ensure proper spacing.

The spread of storm water in the road was analyzed through the development using Izzard equation with a coefficient of 0.013. No areas exceeded acceptable asphalt widths, and double inlets were used in low point areas to mitigate the potential of flooding in these areas.

Retention Capacity

For the east regional drainage basin of this development (sub-basins 1-24), runoff flows will be conveyed to the proposed Orchard at JDC Ranch development where a regional detention basin has been sized to accommodate this runoff.

For the west regional drainage basin (sub-basins 25-37), runoff flows are being conveyed to a proposed retention basin located in the southwest corner of the development. This retention facility was sized using a 100-yr/24-hour storm event with no outflows. Calculations can be found in Appendix A.

APPENDIX A
Calculations

NOAA ATLAS RAINFALL DATA

SITE: **JDC Villas**

Point precipitation frequency estimates (inches)
NOAA Atlas 14 Volume 1 Version 5
Data type: Precipitation depth
Time series type: Partial duration
Project area: Southwest
Location na Utah USA
Station Name: -
Latitude: 41.3088 Degree
Longitude: -112.0600 Degree
Elevation (USGS): 4243 ft

PRECIPITATION FREQUENCY ESTIMATES

by duration	1	2	5	10	25	50	100	200
5-min:	0.128	0.162	0.221	0.277	0.367	0.451	0.551	0.670
10-min:	0.196	0.246	0.336	0.421	0.558	0.686	0.838	1.020
15-min:	0.242	0.305	0.416	0.522	0.692	0.850	1.040	1.260
30-min:	0.326	0.410	0.561	0.703	0.932	1.140	1.400	1.700
60-min:	0.404	0.508	0.694	0.870	1.150	1.420	1.730	2.110
2-hr:	0.510	0.638	0.827	1.010	1.300	1.580	1.900	2.290
3-hr:	0.594	0.732	0.916	1.090	1.370	1.630	1.950	2.330
6-hr:	0.801	0.978	1.180	1.370	1.660	1.900	2.170	2.480
12-hr:	1.020	1.250	1.510	1.740	2.080	2.360	2.660	2.980
24-hr:	1.220	1.500	1.800	2.040	2.380	2.630	2.900	3.160
2-day:	1.420	1.740	2.070	2.340	2.700	2.980	3.250	3.530
3-day:	1.550	1.890	2.250	2.550	2.940	3.250	3.560	3.870
4-day:	1.670	2.040	2.430	2.750	3.190	3.520	3.870	4.210
7-day:	1.980	2.420	2.870	3.240	3.740	4.120	4.500	4.870
10-day:	2.230	2.730	3.230	3.640	4.160	4.540	4.920	5.280
20-day:	2.870	3.530	4.160	4.650	5.270	5.700	6.120	6.500
30-day:	3.460	4.240	4.980	5.540	6.260	6.770	7.250	7.700
45-day:	4.280	5.220	6.110	6.790	7.630	8.220	8.770	9.260
60-day:	5.070	6.190	7.230	8.020	9.000	9.690	10.300	10.900

Date/time (GMT): Fri Nov 3 21:08:24 2023
pyRunTime: 0.01690220832824707

SUB-BASIN & OVERALL "C" VALUES

PROJECT: **JDC Villas**
PRINTED: 11/15/2023

"C" VALUES	
0.10	Landscaping
0.90	Asphalt
0.90	Concrete (Driveways, Walks, C&G)
0.80	Roof

		Sub-basin C Values				
Sub-basin	Total Area (acres)	Landscape (acres)	Asphalt (acres)	Concrete (acres)	Roof (acres)	Composite "C" value
EAST REGIONAL BASIN						
1	1.30	0.36	0.35	0.20	0.38	**0.65**
2	1.25	0.33	0.34	0.20	0.38	**0.66**
3	0.31	0.07	0.07	0.05	0.11	**0.68**
4	0.32	0.08	0.08	0.05	0.11	**0.66**
5	0.80	0.23	0.22	0.13	0.23	**0.64**
6	1.17	0.44	0.29	0.16	0.28	**0.57**
7	0.33	0.08	0.08	0.05	0.11	**0.67**
8	0.30	0.10	0.09	0.03	0.07	**0.60**
9	0.30	0.09	0.13	0.08	0.00	**0.66**
10	0.76	0.19	0.22	0.12	0.23	**0.67**
11	0.33	0.08	0.08	0.05	0.11	**0.68**
12	0.17	0.07	0.06	0.02	0.01	**0.53**
13	0.13	0.02	0.08	0.02	0.01	**0.78**
14	0.21	0.06	0.07	0.03	0.06	**0.66**
15	0.96	0.45	0.06	0.11	0.35	**0.49**
16	0.30	0.13	0.13	0.04	0.00	**0.55**
17	0.12	0.01	0.07	0.03	0.00	**0.81**
18	0.18	0.02	0.11	0.05	0.00	**0.81**
19	0.54	0.19	0.13	0.11	0.11	**0.60**
20	0.78	0.28	0.15	0.12	0.23	**0.58**
21	0.20	0.02	0.12	0.06	0.00	**0.81**
22	1.96	0.68	0.38	0.30	0.59	**0.59**
23	1.81	0.48	0.52	0.30	0.51	**0.66**
TOTAL	14.52	4.48	3.83	2.33	3.88	**0.63**
WEST REGIONAL AREA						
24	2.14	1.13	0.12	0.21	0.68	**0.45**
25	0.05	0.04	0.01	0.00	0.00	**0.26**
26	0.03	0.02	0.01	0.00	0.00	**0.39**
27	0.31	0.10	0.06	0.07	0.07	**0.61**
28	1.14	0.46	0.20	0.14	0.34	**0.55**
29	0.83	0.30	0.14	0.12	0.28	**0.58**
30	0.23	0.05	0.07	0.06	0.05	**0.69**
31	0.02	0.00	0.02	0.00	0.00	**0.81**
32	0.02	0.01	0.02	0.00	0.00	**0.71**
33	0.41	0.13	0.12	0.09	0.06	**0.62**
34	0.02	0.01	0.01	0.00	0.00	**0.59**
35	0.65	0.16	0.20	0.11	0.17	**0.67**
36	0.15	0.02	0.09	0.04	0.00	**0.80**
37	0.15	0.02	0.09	0.04	0.00	**0.79**
TOTAL	6.15	2.46	1.15	0.90	1.65	**0.55**

DETENTION SIZING

SITE: **JDC Villas**
PRINTED: 11/15/2023

		Subareas	
		Area (acres)	"C" Value
Composite AREA:	14.52 acres	2.46	0.10 Landscaping
Composite "C" VALUE:	0.63	1.15	0.90 Asphalt
Allowable Discharge Rate:	0.2 cfs/acre	0.90	0.90 Concrete (Driveways, Walks, C&G)
Outlet Rate:	**2.90** cfs	1.65	0.80 Roofs

Storm Return Period: **10 years**
Source of Rainfall Data: NOAA Atlas 14 Volume 1 Version 5

DURATION (MIN)	RAINFALL INTENSITY (IN/HR)	RAINFALL (IN)	RUNOFF VOLUME (CF)	OUTLET VOLUME (CF)	DETENTION VOLUME REQUIRED (CF)
5	3.32	0.277	9153	871	8,282
10	2.53	0.421	13912	1743	12,169
15	2.09	0.522	17249	2614	14,635
30	1.41	0.703	23230	5229	18,001
60	0.87	0.870	28749	10458	18,291
120	0.51	1.010	33375	20916	12,459
180	0.36	1.090	36019	31373	4,645
360	0.23	1.370	45271	62747	-
720	0.15	1.740	57497	125494	-
1440	0.09	2.040	67411	250988	-
			Required Detention Volume:		18,291

Peak Runoff for 10-yr Storm Event: 7.92 cfs

RETENTION SIZING

SITE: **JDC Villas**
PRINTED: 11/15/2023

		Subareas	
		Area (acres)	"C" Value
Composite AREA:	6.15 acres	2.46	0.10 Landscaping
Composite "C" VALUE:	0.55	1.15	0.90 Asphalt
Allowable Discharge Rate:	0.1 cfs/acre	0.90	0.90 Concrete (Driveways, Walks, C&G)
Outlet Rate:	**0.62** cfs	1.65	0.80 Roofs

Storm Return Period: **100 years**
Source of Rainfall Data: NOAA Atlas 14 Volume 1 Version 5

DURATION (MIN)	RAINFALL INTENSITY (IN/HR)	RAINFALL (IN)	RUNOFF VOLUME (CF)	OUTLET VOLUME (CF)	DETENTION VOLUME REQUIRED (CF)
5	6.61	0.551	6809	0	6,809
10	5.03	0.838	10356	0	10,356
15	4.16	1.040	12853	0	12,853
30	2.80	1.400	17302	0	17,302
60	1.73	1.730	21380	0	21,380
120	0.95	1.900	23481	0	23,481
180	0.65	1.950	24099	0	24,099
360	0.36	2.170	26818	0	26,818
720	0.22	2.660	32873	0	32,873
1440	0.12	2.900	35839	0	35,839
			Required Retention Volume:		35,839

Peak Runoff for 100-yr Storm Event: 5.89 cfs

SUB-BASIN FLOWS AND PIPE SIZING

SITE: **JDC Villas**
PRINTED: 11/15/2023

Rational Formula
Q=C*i*A

WHERE
Q = Peak Runoff (cfs)
C = Runoff Coefficient
i = Rainfall Intensity (in/hr)
A = Contributing Area (acre)

SUB BASIN FLOWS (10-yr Storm Event)

SUB-BASIN	A (acres)	*i (in/hr)	C (unitless)	Q (cfs)
1	1.30	0.87	0.65	**0.73**
2	1.25	0.87	0.66	**0.72**
3	0.31	0.87	0.68	**0.18**
4	0.32	0.87	0.66	**0.19**
5	0.80	0.87	0.64	**0.45**
6	1.17	0.87	0.57	**0.58**
7	0.33	0.87	0.67	**0.19**
8	0.30	0.87	0.60	**0.16**
9	0.30	0.87	0.66	**0.17**
10	0.76	0.87	0.67	**0.44**
11	0.33	0.87	0.68	**0.19**
12	0.17	0.87	0.53	**0.08**
13	0.13	0.87	0.78	**0.09**
14	0.21	0.87	0.66	**0.12**
15	0.96	0.87	0.49	**0.41**
16	0.30	0.87	0.55	**0.15**
17	0.12	0.87	0.81	**0.09**
18	0.18	0.87	0.81	**0.13**
19	0.54	0.87	0.60	**0.28**
20	0.78	0.87	0.58	**0.40**
21	0.20	0.87	0.81	**0.14**
22	1.96	0.87	0.59	**1.01**
23	1.81	0.87	0.66	**1.03**
24	2.14	0.87	0.45	**0.83**
25	0.05	0.87	0.26	**0.01**
26	0.03	0.87	0.39	**0.01**
27	0.31	0.87	0.61	**0.17**
28	1.14	0.87	0.55	**0.54**
29	0.83	0.87	0.58	**0.42**
30	0.23	0.87	0.69	**0.14**
31	0.02	0.87	0.81	**0.01**
32	0.02	0.87	0.71	**0.01**
33	0.41	0.87	0.62	**0.22**
34	0.02	0.87	0.59	**0.01**
35	0.65	0.87	0.67	**0.38**
36	0.15	0.87	0.80	**0.10**
37	0.15	0.87	0.79	**0.10**

* (10-yr/24 hr storm, 60 minute duration)

SUB-BASIN FLOWS AND PIPE SIZING

SITE: **JDC Villas**
PRINTED: 11/15/2023

Manning Equation
Q=(Cm/n)*A*R^(2/3)*S^(1/2)

WHERE
Q = Pipe capacity (cfs)
Cm = unit conversion factor--1.49 in English units (dimensionless)
n = Manning roughness coefficient (dimensionless)
A = Cross sectional area of pipe--calc. from pipe dia. (sq. ft.)
R = Hydraulic radius of pipe--calc. from pipe dia. (sq. ft.)
S = Slope of hydraulic grade line (ft/ft)

Cm = 1.49
n = 0.013 RCP

PIPE SIZING BASED ON 10-YR STORM EVENT

PIPE NO.	CONTRIBUTING SUB-BASIN(s)	PIPE CAPACITY NEEDED (cfs)	PIPE DIA. (inches)*	MINIMUM REQ'D HGL SLOPE (%)	ACTUAL PIPE SLOPE (%)
A	2,3	0.90	**15**	**0.02%**	0.14%
B	1,2,3,4	1.82	**15**	**0.08%**	0.11%
C	1,2,3,4,5	2.27	**15**	**0.12%**	0.24%
D	1,2,3,4,5,7	2.46	**15**	**0.14%**	0.16%
E	6,9	0.76	**15**	**0.01%**	0.14%
F	1,2,3,4,5,6,7,8,9,12	3.45	**18**	**0.11%**	0.14%
G	1,2,3,4,5,6,7,8,9,10,11,12	4.08	**18**	**0.15%**	0.17%
H	13	0.09	**15**	**0.00%**	0.14%
I	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4.29	**18**	**0.17%**	0.21%
N	22	1.01	**15**	**0.02%**	0.14%
M	22,23	2.04	**15**	**0.10%**	0.12%
L	19,20	0.68	**15**	**0.01%**	0.14%
K	18,19,20,21,22,23	2.99	**18**	**0.08%**	0.09%
J	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20,21,22,23	7.92	**30**	**0.04%**	0.06%
O	26,27	0.18	**15**	**0.00%**	0.14%
P	25,26,27,28	0.73	**15**	**0.01%**	0.06%
Q	30,31	0.15	**15**	**0.00%**	0.14%
R	25,26,27,28,29,30,31,32	1.32	**15**	**0.04%**	0.17%
S	25,26,27,28,29,30,31,32,34	1.33	**15**	**0.04%**	0.16%
T	33,37	0.32	**15**	**0.00%**	0.14%
U	25,26,27,28,29,30,31,32,33,34,35,3 6,37	2.13	**15**	**0.11%**	3.19%

INLET SIZING

SITE: **JDC Villas**
PRINTED: 11/15/2023

INLET NO.	CONTRIBUTING SUB-BASIN NO.	REQUIRED INLET CAPACITY (CFS)	TYPE OF INLET REQUIRED
1	2,3	0.90	**SINGLE CURB FACE INLET**
2	1,4	0.92	**SINGLE CURB FACE INLET**
3	5	0.45	**SINGLE CURB FACE INLET**
4	7	0.19	**SINGLE CURB FACE INLET**
5	6,9	0.76	**SINGLE CURB FACE INLET**
6	8,12	0.23	**SINGLE CURB FACE INLET**
7	10,11	0.63	**SINGLE CURB FACE INLET**
8	14,16	0.27	**SINGLE CURB FACE INLET**
9	13	0.09	**SINGLE CURB FACE INLET**
10	17	0.09	**SINGLE CURB FACE INLET**
11	19,20	0.68	**SINGLE CURB FACE INLET**
12	18,21	0.27	**SINGLE CURB FACE INLET**
13	22	1.01	**SINGLE CURB FACE INLET**
14	23	1.03	**SINGLE CURB FACE INLET**
15	26,27	0.18	**SINGLE CURB FACE INLET**
16	25,28	0.55	**SINGLE CURB FACE INLET**
17	30,31	0.15	**SINGLE CURB FACE INLET**
18	29,32	0.44	**SINGLE CURB FACE INLET**
19	34	0.01	**SINGLE CURB FACE INLET**
20	33,37	0.32	**SINGLE CURB FACE INLET**
21	19,21	0.42	**SINGLE CURB FACE INLET**

SPREAD OF WATER IN STREET

SITE: **JDC Villas**
PRINTED: 11/15/2023

Izzard Equation (form of Manning Equation)

Q=(0.56)*(Z/n)*(d^(8/3))*S^(1/2)

WHERE

Q = Hydraulic capacity of street and gutter (CFS)
Z = 1/Sx, where Sx is the cross slope of the pavement (ft/ft)
n = Manning roughness coefficient (dimensionless)
d = Depth of water at face of curb (ft)
S = Longitudinal slope of street (ft/ft)

Where street cross slopes vary (when water is in both the gutter and on the pavement, the equivalent straight slope section is as follows:

Z3 = Z1*(1+(((Z2/Z1)-1)*((T-W)/(T+(W*((Z2/Z1)-1))))^(8/3)))

WHERE

Z3 = Reciprical of cross slope of equivalent section (this is Z in the main Izzard Equation) (ft/ft)
Z1 = Reciprical of cross slope of gutter (ft/ft)
Z2 = Reciprical of cross slope of pavement (ft/ft)
T = Spread of water from face of curb (ft)
W = Width of gutter (ft)

INPUT DATA

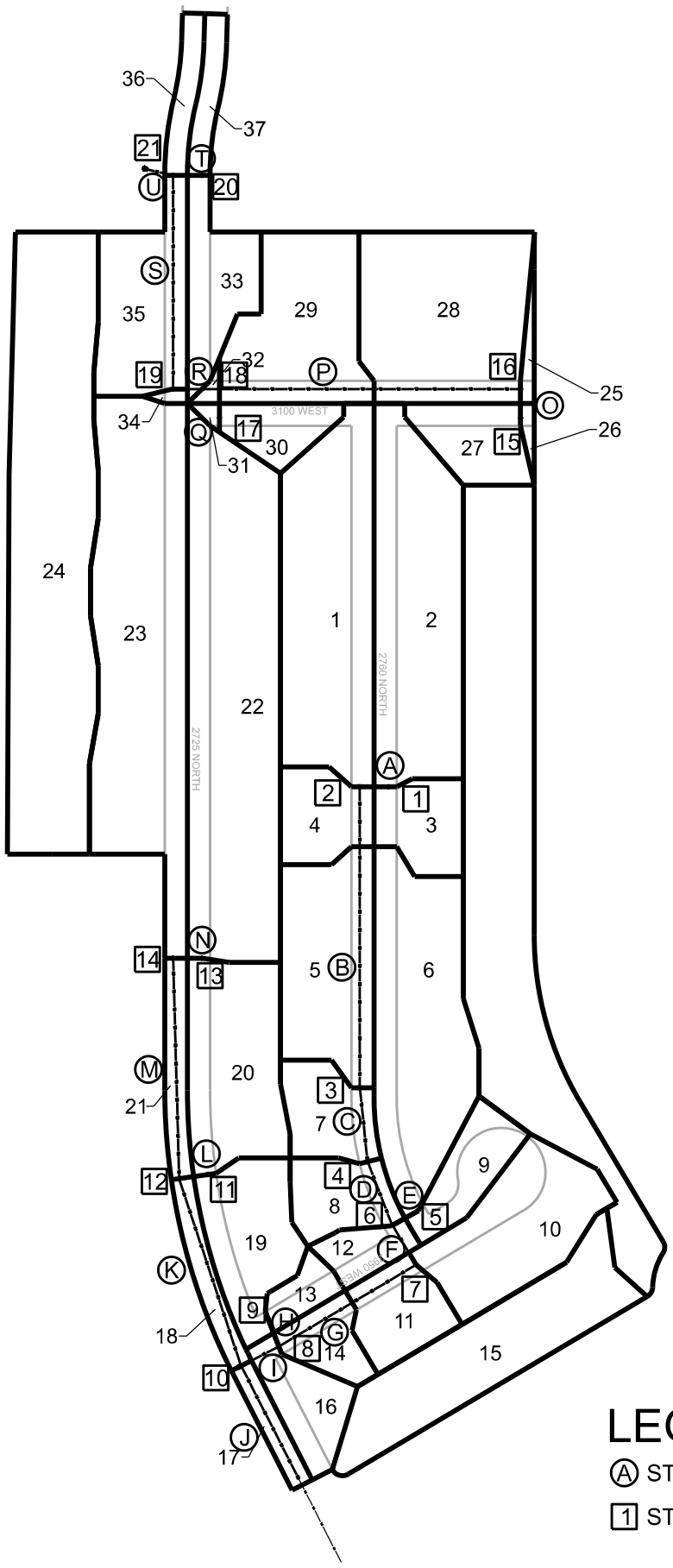
n =	0.013	(coefficient of friction)
W =	2.5	(width of gutter in feet)
Sx =	2.00%	(cross slope of street)
d =	2	(vertical distance from flowline of gutter to lip of gutter in inches)

COMPOUND SECTION FOR A GIVEN DEPTH (D) OF FLOW AT THE FACE OF CURB

D =	2.00	2.50	3.00	3.50	3.80	4.30	4.80	5.30	5.80
Z3 =	14.000	14.425	15.699	17.378	18.448	20.220	21.909	23.480	24.925
Z1 =	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
Z2 =	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
T =	2.500	4.583	6.667	8.750	10.000	12.083	14.167	16.250	18.333

LONGITUDINAL STREET GRADE (%)	HYDRAULIC CAPACITY (Q) OF STREET AND GUTTER (CFS) - EACH SIDE								
0.40%	0.32	0.60	1.06	1.77	2.34	3.57	5.18	7.24	9.77
0.45%	0.34	0.64	1.13	1.88	2.48	3.79	5.50	7.68	10.36
0.50%	0.36	0.67	1.19	1.98	2.62	3.99	5.80	8.09	10.92
0.55%	0.38	0.70	1.24	2.08	2.75	4.18	6.08	8.49	11.46
0.60%	0.39	0.73	1.30	2.17	2.87	4.37	6.35	8.86	11.97
0.65%	0.41	0.76	1.35	2.26	2.98	4.55	6.61	9.23	12.45
0.70%	0.42	0.79	1.40	2.34	3.10	4.72	6.86	9.57	12.92
0.75%	0.44	0.82	1.45	2.43	3.21	4.89	7.10	9.91	13.38
0.80%	0.45	0.85	1.50	2.51	3.31	5.05	7.33	10.23	13.82
0.85%	0.47	0.87	1.55	2.58	3.41	5.20	7.56	10.55	14.24
0.90%	0.48	0.90	1.59	2.66	0.00	5.35	7.78	10.86	14.65
1.00%	0.51	0.95	15.00	2.80	0.00	5.64	8.20	11.44	15.45
1.10%	0.53	0.99	24.00	2.94	3.88	5.92	8.60	12.00	16.20
1.20%	0.56	1.04	1.84	3.07	0.00	6.18	8.98	12.53	16.92
1.30%	0.58	1.08	1.91	3.19	0.00	6.43	9.35	13.05	17.61
1.40%	0.60	1.12	1.98	3.31	0.00	6.68	9.70	13.54	18.28
1.50%	0.62	1.16	2.05	3.43	0.00	6.91	10.04	14.01	18.92
1.60%	0.64	1.20	2.12	3.54	0.01	7.14	10.37	14.47	19.54
1.70%	0.66	1.24	2.19	3.65	0.01	7.36	10.69	14.92	20.14
1.80%	0.68	1.27	2.25	3.76	4.97	7.57	11.00	15.35	20.73
1.90%	0.70	1.31	2.31	3.86	5.10	7.78	11.30	15.77	21.29
2.00%	0.72	1.34	2.37	3.96	5.24	7.98	11.59	16.18	21.85
2.20%	0.75	1.41	2.49	4.15	5.49	8.37	12.16	16.97	22.91
2.40%	0.79	1.47	2.60	4.34	5.74	8.74	12.70	17.73	23.93
2.60%	0.82	1.53	2.70	4.52	5.97	9.10	13.22	18.45	24.91
2.80%	0.85	1.59	2.81	4.69	6.20	9.44	13.72	19.15	25.85
3.00%	0.88	1.64	2.91	4.85	6.41	9.77	14.20	19.82	26.76
3.50%	0.95	1.77	3.14	5.24	6.93	10.56	15.34	21.41	28.90
4.00%	1.01	1.90	3.35	5.60	7.40	11.28	16.40	22.89	30.90
4.50%	1.08	2.01	3.56	5.94	7.85	11.97	17.39	24.27	32.77
5.0%	1.13	2.12	3.75	6.26	8.28	12.62	18.33	25.59	34.54
5.5%	1.19	2.22	3.93	6.57	8.68	13.23	19.23	26.84	36.23
6.0%	1.24	2.32	4.11	6.86	9.07	13.82	20.08	28.03	37.84
6.5%	1.29	2.42	4.28	7.14	9.44	14.39	20.90	29.17	39.38
7.0%	1.34	2.51	4.44	7.41	9.80	14.93	21.69	30.27	40.87
7.5%	1.39	2.60	4.59	7.67	10.14	15.45	22.45	31.34	42.31
8.0%	1.43	2.68	4.74	7.92	10.47	15.96	23.19	32.36	43.69
8.5%	1.48	2.76	4.89	8.17	10.79	16.45	23.90	33.36	45.04
9.0%	1.52	2.84	5.03	8.40	11.11	16.93	24.59	34.33	46.34
9.5%	1.56	2.92	5.17	8.63	11.41	17.39	25.27	35.27	47.61
10.0%	1.60	3.00	5.30	8.86	11.71	17.84	25.92	36.18	48.85
10.5%	1.64	3.07	5.44	9.08	12.00	18.28	26.56	37.08	50.06
11.0%	1.68	3.14	5.56	9.29	12.28	18.71	27.19	37.95	51.23
11.5%	1.72	3.21	5.69	9.50	12.56	19.13	27.80	38.80	52.39
12.0%	1.76	3.28	5.81	9.70	12.83	19.55	28.40	39.64	53.51
12.5%	1.79	3.35	5.93	9.90	13.09	19.95	28.98	40.46	54.62

APPENDIX B
Drawings



LEGEND

Ⓐ STORM DRAIN PIPE LETTER

[1] STORM DRAIN INLET BOX NUMBER

MUSTANG DESIGN, LLC
797 N 1100 E, SUITE 200
LEHI, UTAH 84043

Mustang DESIGN

THE VILLAS AT JDC RANCH
STORM DRAIN SUB-BASINS & PIPING NETWORK
AN ACTIVE SENIOR COMMUNITY
WEBER COUNTY, UTAH

LAST DATE OF CHANGE: OCTOBER 2023

PROJ. #:	2023005
DRAWN BY:	PSJ
DESIGN BY:	PSJ
CHECKED BY:	JC
SCALE OF SHEET:	1" = 220'
SHEET	1
OF	1