

Storm Runoff Calculations

Allen Property - Ivory Homes
Taylor, UT
7/6/2016 1:41

The following runoff calculations are based on the Rainfall - Intensity - Duration Frequency Curve for the Taylor, UT area taken from data compiled using NOAA Atlas 14 for a 50-year storm event.

Runoff storm water has been calculated for two different sets of conditions, one being undeveloped land and the other with land fully improved. The difference between the two quantities will be retained in a subsurface detention basin where the storm water will be released at its historical rate of 0.2 cfs/acre.

The calculations are as follows:

1. Drainage Area:

Runoff Coefficients
Paved Area 182,344
Landscaped Area 967,905
Roof 96,600

Weighted Runoff Coefficient

Provide detention basin in driveway gate @ Rounding W

Provide grading plan detail for the detention basin

Adjust detention boundaries to provide vehicular access for maintenance!

add C.B.

2. Time of Concentration:

Using Storm Water Run-Off "Overland Flow Time"

Tc = 30 minutes

3. Rainfall Intensities:

Rainfall Intensities were obtained using NOAA Atlas 14 for a 50-year storm event. This can be seen in section 5 below.

Rainfall Intensity for a 15 minute Time of Concentration 2.25 in/hr

4. Peak Run-off:

Runoff Coefficient C = 0.37
Rainfall Intensity i = 2.25 in./hr.
Acreage A = 28.62 ACRES
Runoff Quantity Q = CIA

Q (total) Q = 23.69 cfs

5. Allowable Discharge:

Allowable Discharge of Storm Water Volume (pre-development) is 0.2 cfs per acre.
Allowable Discharge Q = (0.2 x acres)

Allowable Discharge = Q = 5.72 cfs

6. Volume of Run-off for 50-year 24 hour Storm Event:

C = 0.37
A = 28.62
Q(out) = 5.72 (based on 0.2 cfs/acre)

time (min)	time (sec)	i (in./hr.)	Q (cfs)	Vol. in (cf)	Vol. out (cf)	Difference (cf)
0	0	0.00	0.00	0.00	0.00	0.00
5	300	5.32	56.01	16801.89	1717.42	15084.46
10	600	4.04	42.53	25518.65	3434.85	22083.81
15	900	3.34	35.16	31645.66	5152.27	26493.39
30	1800	2.25	23.69	42636.37	10304.54	32331.83
60	3600	1.39	14.63	52679.60	20609.07	32070.52
120	7200	0.77	8.11	58364.45	41219.15	17146.30
180	10800	0.53	5.57	60145.70	61627.22	-1681.52
360	21600	0.31	3.26	70492.12	123654.45	-53162.32
720	43200	0.19	2.01	86964.49	247308.89	-160444.40
1440	86400	0.11	1.15	99143.76	494617.79	-395474.02

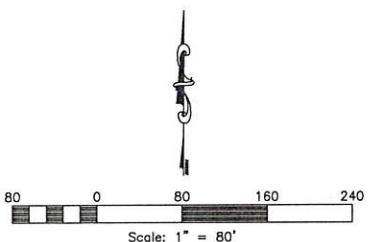
Required Detention Volume 32331.83 c.f.

7. Orifice Sizing

Given: Q = 5.72 cfs
Zg = 64.4 ft
H = 2.50 ft
Cd = 0.62
R = SQRT(Q/(0.7*(64.4+H)*0.5/ft))
R = 0.48 feet
D = 5.78 inches
D = 11.55 inches

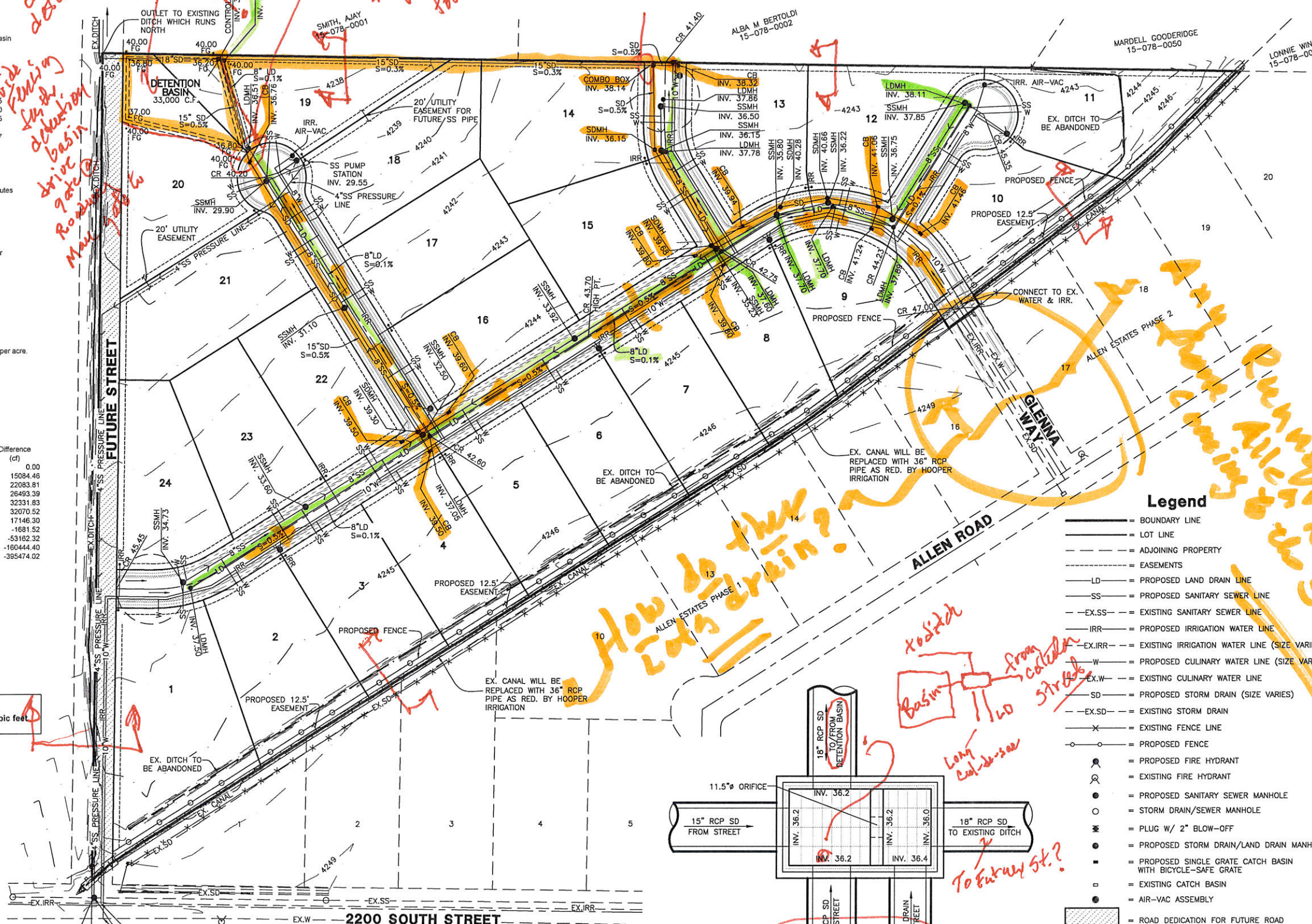
SUMMARY:

The required volume of the detention basin is 32,332 cubic feet
Orifice Diameter at outlet is 11.55 inches



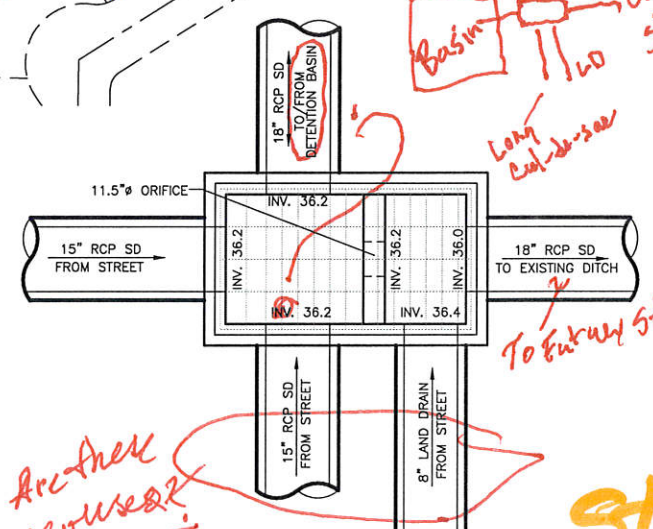
Notes:

1. CONTOURS ARE SHOWN WITH A ONE FOOT INTERVAL.
2. CONNECT CULINARY WATER AND IRRIGATION TO EXISTING UTILITIES IN 2200 SOUTH STREET AND GLENNA WAY.
3. CONNECT SANITARY SEWER PRESSURE LINE TO EXISTING SEWER LINE IN 2200 SOUTH STREET.
4. EXISTING CANAL WILL BE PIPED WITH A 36" RCP
5. LAND DRAIN SYSTEM WILL BE MAINTAINED BY THE HOA
6. IRRIGATION SYSTEM WILL BE DESIGNED BY IRRIGATION COMPANY
7. SLOPE OF GRAVITY 8" SANITARY SEWER IS 0.5%
8. SLOPE OF GRAVITY 8" LAND DRAIN IS 0.1%



Legend

- BOUNDARY LINE
- LOT LINE
- ADJOINING PROPERTY
- EASEMENTS
- LD = PROPOSED LAND DRAIN LINE
- SS = PROPOSED SANITARY SEWER LINE
- EX.SS = EXISTING SANITARY SEWER LINE
- IRR = PROPOSED IRRIGATION WATER LINE
- EX.IRR = EXISTING IRRIGATION WATER LINE (SIZE VARIES)
- W = PROPOSED CULINARY WATER LINE (SIZE VARIES)
- EX.W = EXISTING CULINARY WATER LINE
- SD = PROPOSED STORM DRAIN (SIZE VARIES)
- EX.SD = EXISTING STORM DRAIN
- EXISTING FENCE LINE
- PROPOSED FENCE
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED SANITARY SEWER MANHOLE
- STORM DRAIN/SEWER MANHOLE
- PLUG W/ 2" BLOW-OFF
- PROPOSED STORM DRAIN/LAND DRAIN MANHOLE
- PROPOSED SINGLE GRATE CATCH BASIN WITH BICYCLE-SAFE GRATE
- EXISTING CATCH BASIN
- AIR-VAC ASSEMBLY
- ROAD DEDICATION FOR FUTURE ROAD



Saddlebred Acres

Weber County, Utah

Control Box Plan View

Developer:

Ivory Homes
970 Woodoak LN.
Salt Lake City, UT. 84117
(801) 386-6708

Reeve & Associates, Inc.
RA

REVISIONS	DESCRIPTION
DATE	CITY COMMENTS
10-25-16	

Saddlebred Acres
PART OF THE NE 1/4 OF SECTION 28, T.4N., R. 1W., S.1B & M., U.S. SURVEY
WEBER COUNTY, UTAH

Preliminary Utilities Plan

REVISED: 10-25-16

Project Info.

Engineer: G. Thorsen
Designer: C. Cave
Begin Date: JUNE 23, 2016
Name: SADDLEBRED ACRES
Number: 4948-06

Sheet	2
2	Sheets