Storm Runoff Calculations (100 Yr Existing)

Maverik Inc, Eden UT

4/10/2018 EF 5799-230

The following runoff calculations are based on the Rainfall - Intensity - Duration Frequency Curve for Eden, UT area taken from the NOAA Atlas 14 database, using a 100 year storm 24 hour storm. Storm water runoff has been calculated for **existing site conditions**.

The calculations are as follows:

1. Drainage Area:

Total Area = 1.33 acre or 58,052 ft²

Runoff Coefficients

Landscaped Area (ft²)	24,932	C = 0.20
Roof/Hardscape Area (ft²)	33,121	C = 0.95

Weighted Runoff Coefficient C = 0.63

2. Volume of Run-off for 100-year 24-Hour Storm Event:

C = 0.63 Post-Development Allowed Flow: 0.1 cfs/acre
I = See Below in/hr
A = 58052 ft²
Q(out) = 0.13 ft³/s (based on allowed cfs/acre rate)

time (min)	time (sec)	i (in.)	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	0.00
5	300	0.55	6.54	5.53	1658.12	39.98	1618.14
10	600	0.83	4.98	4.21	2525.21	79.96	2445.25
15	900	1.03	4.12	3.48	3133.70	119.94	3013.75
30	1800	1.38	2.76	2.33	4198.54	239.89	3958.66
60	3600	1.71	1.71	1.45	5202.54	479.77	4722.77
120	7200	1.90	0.95	0.80	5780.61	959.54	4821.06
180	10800	1.93	0.64	0.54	5871.88	1439.31	4432.56
360	21600	2.08	0.35	0.29	6328.24	2878.63	3449.61
720	43200	2.49	0.21	0.18	7575.64	5757.26	1818.38
1440	86400	2.70	0.11	0.10	8214.54	11514.52	-3299.97

Total Required Detention Volume 4,821 ft³

Storm Runoff Calculations (100 Yr Post Construction)

Maverik Inc, Eden UT

4/10/2018 EF 5799-230

The following runoff calculations are based on the Rainfall - Intensity - Duration Frequency Curve for Eden, UT area taken from the NOAA Atlas 14 database, using a 100 year storm 24 hour storm. Storm water runoff has been calculated for **completed site conditions**.

The calculations are as follows:

1. Drainage Area:

Total Area = 1.33 acre or 58,052 ft²

Runoff Coefficients

Landscaped Area (ft²)	8,571	C = 0.20
Roof/Hardscape Area (ft²)	49,482	C = 0.95

Weighted Runoff Coefficient C = 0.84

2. Volume of Run-off for 100-year 24-Hour Storm Event:

C = 0.84 Post-Development Allowed Flow: 0.1 cfs/acre
I = See Below in/hr
A = 58052 ft²
Q(out) = 0.13 ft³/s (based on allowed cfs/acre rate)

time (min)	time (sec)	i (in.)	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	0.00
5	300	0.55	6.54	7.37	2210.15	39.98	2170.17
10	600	0.83	4.98	5.61	3365.91	79.96	3285.95
15	900	1.03	4.12	4.64	4176.98	119.94	4057.03
30	1800	1.38	2.76	3.11	5596.34	239.89	5356.45
60	3600	1.71	1.71	1.93	6934.59	479.77	6454.82
120	7200	1.90	0.95	1.07	7705.10	959.54	6745.56
180	10800	1.93	0.64	0.72	7826.76	1439.31	6387.45
360	21600	2.08	0.35	0.39	8435.06	2878.63	5556.43
720	43200	2.49	0.21	0.23	10097.74	5757.26	4340.48
1440	86400	2.70	0.11	0.13	10949.35	11514.52	-565.16

Total Required Detention Volume 6,746 ft³

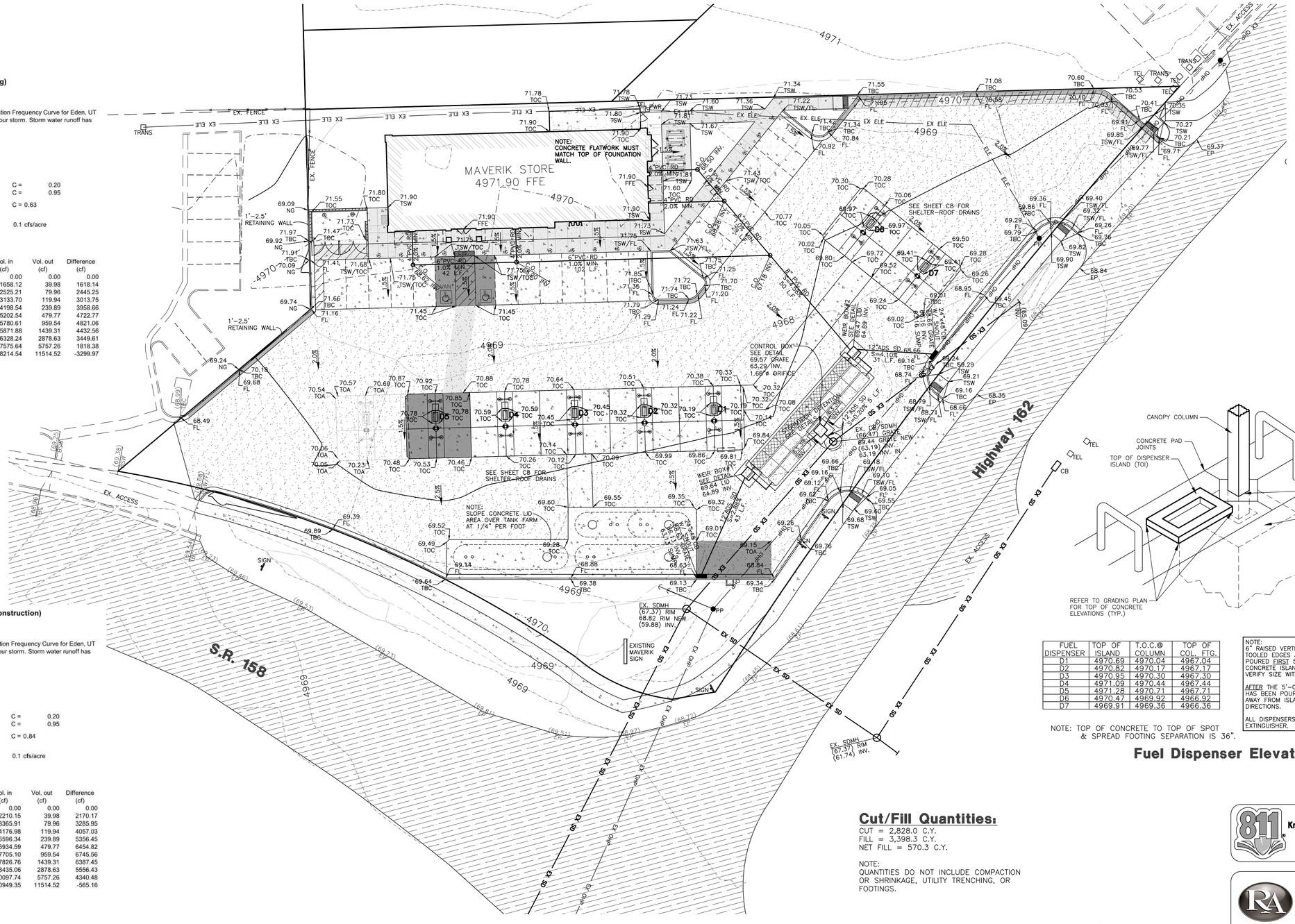
3. Orifice Sizing

Given: Q = 0.13 cfs
2g = 64.4 ft/s²
H = 3.00 ft
Cd = 0.62 for circular openings
R = SQRT(Q/pi/(0.7*(64.4*H)^0.5))

R = 0.07 feet
0.84 inches
D = 1.68 inches
SUMMARY: A = 2.23 inches ^2 0.0155 ft ^2

Orifice size is 1.68 inches

Existing Conditions Required Volume: 4,821 ft³
Proposed Improvements Required Volume: 6,746 ft³
Difference = Total Volume Required: 1,924 ft³



Scale: 1" = 20'

FUEL DISPENSER	TOP OF ISLAND	T.O.C.@ COLUMN	TOP OF COL. FTG.
D1	4970.69	4970.04	4967.04
D2	4970.82	4970.17	4967.17
D3	4970.95	4970.30	4967.30
D4	4971.09	4970.44	4967.44
D5	4971.28	4970.71	4967.71
D6	4970.47	4969.92	4966.92
D7	4969.91	4969.36	4966.36

NOTE: TOP OF CONCRETE TO TOP OF SPOT & SPREAD FOOTING SEPARATION IS 36".

NOTE:
6" RAISED VERTICAL CONCRETE ISLAND WITH TOOLED EDGES AND CORNERS TO BE POURED FIRST 5'-0" x 3'-0" CONCRETE ISLAND (NO METAL FORM – VERIFY SIZE WITH DISPENSER MANUF.)

AFTER THE 5'-0" – 3'-0" FUEL ISLAND HAS BEEN POURED, SLOPE CONCRETE AWAY FROM ISLAND IN ALL (4) DIRECTIONS.

ALL DISPENSERS TO BE EQUIPPED WITH AN EXTINGUISHER.

Fuel Dispenser Elevations

Cut/Fill Quantities:

CUT = 2,828.0 C.Y.
FILL = 3,398.3 C.Y.
NET FILL = 570.3 C.Y.

NOTE:
QUANTITIES DO NOT INCLUDE COMPACTION OR SHRINKAGE, UTILITY TRENCHING, OR FOOTINGS.

Elevation Datum
SITE BENCHMARK #1:
BRASS CAP MONUMENT
NORTHING = 22717.10
EASTING = 15343.94
ELEVATION = 4978.61'

Elevation Datum
SITE BENCHMARK #2:
BRASS CAP MONUMENT
NORTHING = 22736.34
EASTING = 12676.29
ELEVATION = 4963.72'

Note:
Contractor to verify ALL Existing Utility Locations, Terminations and Invert Elevations.

811 Know what's below. Call before you dig.

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PROJECT NUMBER: 5799-230
DRAWN BY: RWH
ENGINEER: JNR

REGISTERED PROFESSIONAL ENGINEER 375328 J. NATE REEVE STATE OF UTAH

PROJECT NUMBER

ISSUE DATE:
APR. 13, 2018

REVISIONS:

No.	Date	Description

NOTE:
Bid documents should not be separated or issued as partial sets to subcontractors. Bidders are responsible for all portions of the documents that pertain to work covered by sub-bids. Bidder assumes full responsibility for error or misinterpretations resulting from partial sets of Bidding Documents by itself or any sub-bidder.

Conflicting information or errors found in the construction documents should be brought to the attention of the architect immediatly. In the event of a conflict in the drawings, bidder should not assume the least expensive option will meet the project requirements.

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