Haga Property – Lot 2
2107 Bayfield Parkway, Bayfield, CO
Drainage Narrative
September 14, 2023
By: PST Engineering LLC

ENGINEERING

Background

The Haga Property is a 17-acre parcel located south of US Highway 160, north and west of Bayfield Parkway, and east of the Church of Christ of Bayfield. The entire Haga Property is being subdivided into future commercial and residential lots as part of the Master Plan. PST Engineering prepared the *Haga Property – Master Plan Drainage Study* (*Master Study*) dated March 10, 2023 which describes the proposed drainage conditions of the overall property.

Lot 2 is the proposed lot south of Road E-W and west of Road N-S. The purpose of this study is to analyze the drainage conditions internal to Lot 2 and validate the assumptions made about Lot 2 in the *Master Study*.

Existing Conditions

Lot 2 is currently irrigated grazing land west of the Schroder Ditch and east of the existing residence that will remain in Lot 1. The site generally surface flows from southeast to northwest to a ditch on the west property line and into an existing 18-in CMP culvert (the design point analyzed in the *Master Study*.)

As described in the *Master Study*, soils for the site were found to be classified as Hydrological Soil Group D. Onsite soils are all Corta loam, with 1 to 3 percent slopes described as well drained with medium runoff.

Proposed Conditions

Lot 2 is proposed to be the first development to be constructed in the overall Haga development. As such, Road N-S is proposed to be installed to the Lot 2 entrance. The irrigation ditch will also be piped as part of the initial construction which will require the installation of Culverts A & B and Ditch C, all described in the *Master Study*. Road E-W and Road N-S outside of the hardscape improvements will be graded to subgrade as part of the initial construction. The overall Haga pond in Tract A will also be constructed in its entirety.

In addition to the Master Plan improvements, Lot 2 will see the construction of a private street, 33 multi-family residential units, an off-street parking lot, improvements to Bayfield Parkway and a series of storm drainage conveyance features including a private storm drain line.

Detention

Detention was designed to be provided for Lot 2 by the pond in Tract A that was designed to provide flow attenuation for the overall Haga development. Calculations for the pond assumed a land cover for

Lot 2 in the *Master Study.* The land cover assumption was found to be conservative as the composite curve number for the proposed development was found to be less than what was assumed, as summarized in Table 1.

Table 1: Assumed vs. Proposed Land Cover for Lot 2

Description	Area (acres)	Curve Number
Proposed Open Space – Good Condition	1.81	80
Proposed Impervious Area	1.31	98
Composite Curve Number	**3.12**	**88**
Assumed in Master Study	**3.12**	**92**

See Appendix A for an exhibit showing the proposed land cover of Lot 2.

Conveyance

Proposed conveyance features include curb, gutter, inlets, storm drain pipe and ditches to convey flow to the detention pond. *Hydraflow Express Extension for Autodesk Civil3D* (*Express*) was used to model the capacity of the inlets, culverts and ditches, as well as to model curb & gutter spread at the proposed inlets. Conveyance features are discussed in more detail in the following subsections.

The rational method was used to calculate flows to each of the analyzed features. Per Section 5.2.2.B of the *Town of Bayfield Infrastructure Design Standards* (*Design Standards*)– the minimum time of concentration used was 10-minutes. Rainfall intensities were taken from NOAA Atlas 14, Volume 8, Version 2 which were found to be more conservative than the values in Table 5.2 of the *Design Standards*. Rainfall data can be found in Appendix H.

See Appendix B for a map delineating sub-basins for each drainage feature and Appendix C for rational method calculation results.

Inlets

The low point of the Lot 2 private road was designed to be drained by Inlets Y1 & Inlets Y2. Inlets Y1 & Y2 were designed as Town of Bayfield standard single inlets with combination grates in a sag condition. Inlets Y1 & Y2 were modelled in *Express* with a 50% clogging factor. *Express* modelling shows that curb overtopping is not expected during the 100-year storm event.

Inlet Y3 was designed as a 24-in area drain with beehive grate to drain a swale near the amenity area. This inlet was design using the *Nyoplast Dome Grate Inlet Capacity Chart* for 6.04-cfs – double the Q100 calculated in Appendix C to model a 50% clogging factor. The head required to convey this flow is not expected to back up to overtop sidewalks or reach any adjacent building foundations.

See Appendix K for *Express* output and Nyoplast Capacity Charts.

Storm Drain

Storm drain pipe from the inlets described in the previous section were all designed using the *Hydraflow Storm Sewer Extension for Autodesk Civil3D* (*Storm Sewer*) to keep the hydraulic grade line below finish grade for the major storm events.

See Appendix E for *Storm Sewer* Output

Culvert

A culvert was designed as part of Lot 2 to convey flow beneath the proposed emergency access road. Culvert 1 (18-in) was designed to convey flow from the swale south of the southern-most townhome units to the Tract A pond.

Flows the culvert subbasin were calculated in Appendix C and *Express* was used to model both culverts in the major storm event.

See Appendix F for *Express* output.

Swales

Several swales were designed to convey flow from Lot 2. *Express* was used to model the swales based on the proposed geometry and flows from Appendix C and show no overtopping.

See Appendix G for *Express* output

LIST OF APPENDICES

APPENDIX A: LOT 2 LAND COVER SUMMARY

LEGEND

- CN = 80 (OPEN SPACE GOOD CONDITION)
- CN = 98 (IMPERVIOUS - DRIVES, ROOFS, WALKS)

LAND COVER SUMMARY:

IMPERVIOUS AREA (CN = 98) = 1.31 ACRES
OPEN SPACE AREA (CN = 80) = 1.81 ACRES

COMPOSITE CURVE NUMBER OF PROPOSED DEVELOPMENT: CN = 88

ASSUMED LAND COVER OF LOT 6 IN MASTER STUDY: CN = 92

AREA PART OF BASIN ROAD E-W (D) IN MASTER STUDY

AREA PART OF ROAD N-S BASIN IN MASTER STUDY

LOT 7
LOT 6
LOT 2
LOT 1
LOT 3
TRACT A
ROAD E-W
ROAD N-S
BAYFIELD PARKWAY

GRAPHIC SCALE
60 30 15 0 30
(IN FEET)

SHEET 1 OF 1

PST ENGINEERING, LLC
3520 BENNETT ST.
DURANGO, CO 81301
970-403-5492
ENGINEERING

HAGA PROPERTY
LOT 2
2107 BAYFIELD PARKWAY
BAYFIELD, CO 81122
PROPOSED LAND COVER CONDITIONS

REVISIONS			
#	DATE	DESCRIPTION	SHEET

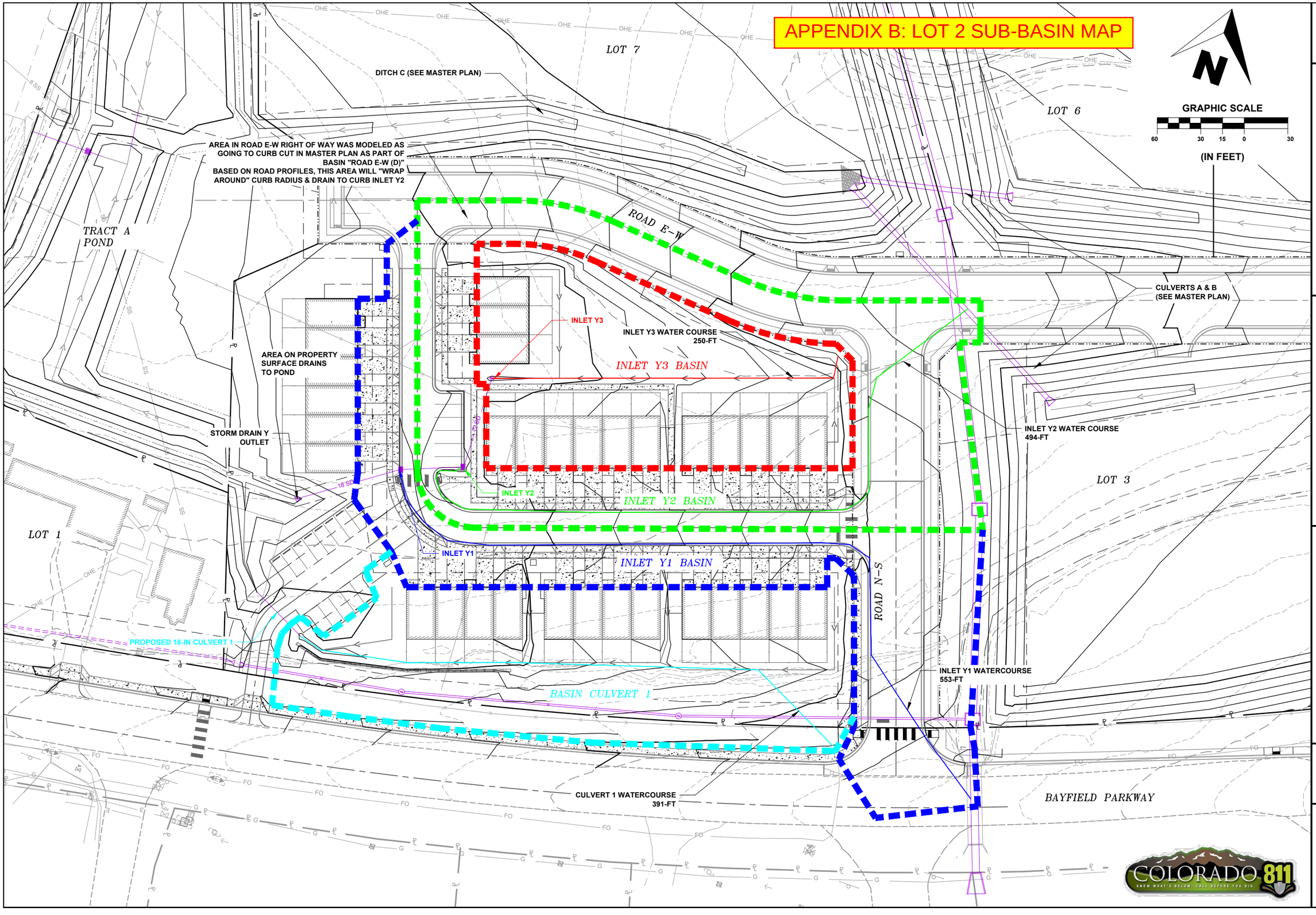
DATE: 09/11/2023
DRAWN BY: HR
CHECKED BY: SP

PRELIMINARY

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

File Path: C:\Users\holde\Sync\DST Engineering\2022 Albert Bayfield\CADiCivil3D\Exhibits\Drainage\Proposed Conditions_Phase 1.dwg

APPENDIX B: LOT 2 SUB-BASIN MAP



SHEET 1 OF 1

PST ENGINEERING, LLC
3520 BENNETT ST.
DURANGO, CO 81301
970-403-5492
ENGINEERING

HAGA PROPERTY
LOT 2
2107 BAYFIELD PARKWAY
BAYFIELD, CO 81122
PROPOSED DRAINAGE
FEATURE SUB-BASINS

REVISIONS

#	DATE	DESCRIPTION	SHEET

DATE: 09/11/2023
DRAWN BY: HR
CHECKED BY: SP

PRELIMINARY

File Path: C:\Users\holde\Sync\DST Engineering\2022 Albert Bayfield\CAD\Civil3D\Exhibits\Drainage\Proposed Subbasins_Phase 1.dwg

APPENDIX C: LOT 2 SUB-BASIN FLOW CALCULATIONS

LOT 2 SUB-BASIN FLOW CALCULATIONS

1	2	3	4	5	6	7		8		9	
Basin ID	Impervious Area (Acres)	Open Space Area (Acres)	Total Area (Acres)	Impervious Percentage	Time of Concentration (Minutes)	5-Year Rainfall Intensity (in/hr)	100-Year Rainfall Intensity (in/hr)	5-Year Runoff Coefficient	100-Year Runoff Coefficient	5-Year Flow (cfs)	100-Year Flow (cfs)
Inlet Y1	0.6	0.25	0.85	71%	10	2.75	6.76	0.614	0.773	1.43	4.44
Inlet Y2	0.73	0.22	0.95	77%	10	2.75	6.76	0.665	0.799	1.74	5.13
Inlet Y3	0.25	0.46	0.71	35%	10	2.75	6.76	0.324	0.628	0.63	3.02
Culvert 1	0.2	0.71	0.91	22%	10	2.75	6.76	0.215	0.574	0.54	3.53

Notes:

1. See Basin Map Appendix B
2. As Measured in CAD
3. As Measured in CAD
4. Column 2 + Column 3
5. Column 2 / Column 4
6. 10 Minutes = Town of Bayfield minimum per Section 5.2.2.B of the *Infrastructure Design Guide*
7. From NOAA Atlas 14, Volume 8, Version 2
8. From Table 6-4 of the *Urban Storm Drainage Criteria Manual Volume 1* - for Type D Soils
9. Q = C*I*A

TABLE 6-4 INCLUDED BELOW FOR "C" VALUE CALCULATIONS

SEE BELOW

Table 6-4. Runoff coefficient equations based on NRCS soil group and storm return period

NRCS Soil Group	Storm Return Period						
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
A	$C_A = 0.84i^{1.302}$	$C_A = 0.86i^{1.276}$	$C_A = 0.87i^{1.232}$	$C_A = 0.88i^{1.124}$	$C_A = 0.85i+0.025$	$C_A = 0.78i+0.110$	$C_A = 0.65i+0.254$
B	$C_B = 0.84i^{1.169}$	$C_B = 0.86i^{1.088}$	$C_B = 0.81i+0.057$	$C_B = 0.63i+0.249$	$C_B = 0.56i+0.328$	$C_B = 0.47i+0.426$	$C_B = 0.37i+0.536$
C/D	$C_{C/D} = 0.83i^{1.122}$	$C_{C/D} = 0.82i+0.035$	$C_{C/D} = 0.74i+0.132$	$C_{C/D} = 0.56i+0.319$	$C_{C/D} = 0.49i+0.393$	$C_{C/D} = 0.41i+0.484$	$C_{C/D} = 0.32i+0.588$

Inlet Report

APPENDIX D-1: INLET Y1 ANALYSIS

INLET Y1

Combination Inlet

Location	= Sag
Curb Length (ft)	= 3.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= 0.80
Grate Width (ft)	= 1.50
Grate Length (ft)	= 3.00

Gutter

Slope, Sw (ft/ft)	= 0.040
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 4.44

Highlighted

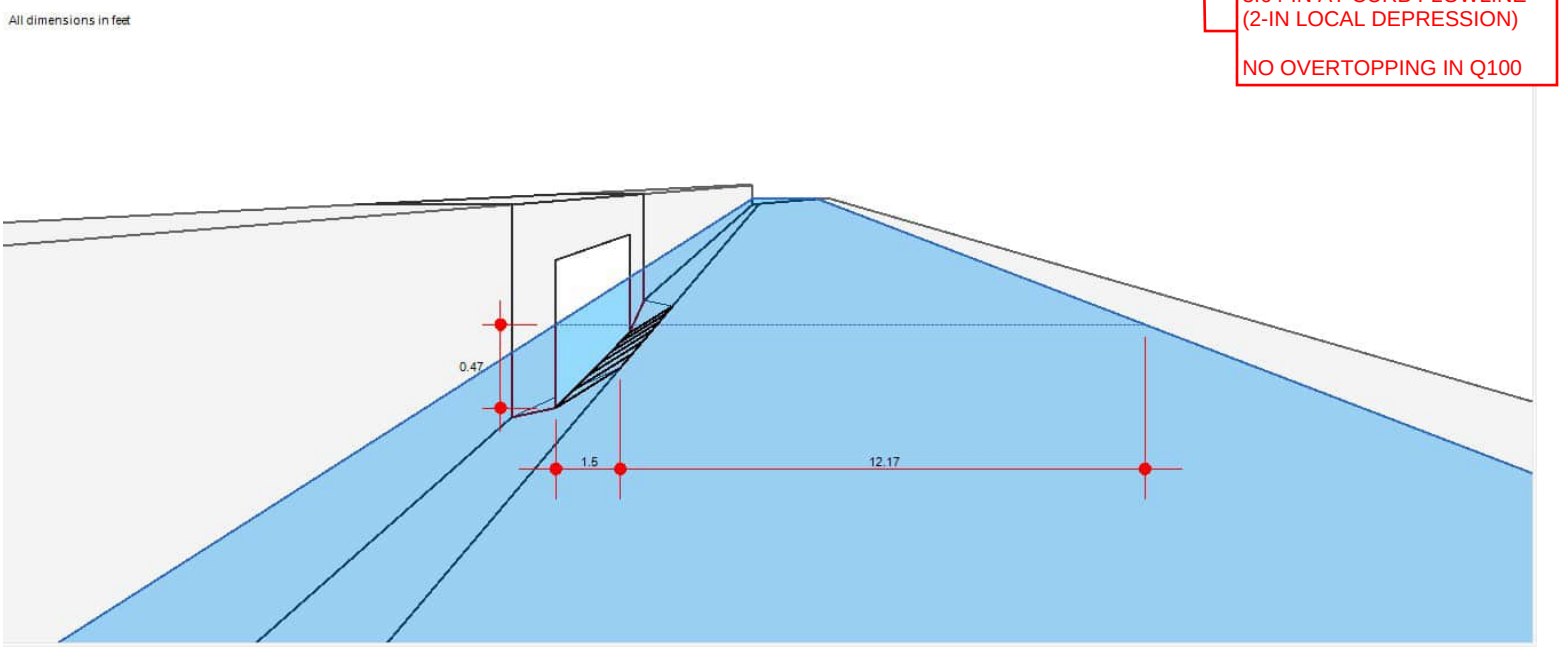
Q Total (cfs)	= 4.44
Q Capt (cfs)	= 4.44
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.64
Efficiency (%)	= 100
Gutter Spread (ft)	= 13.67
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

GRATE AREA = 1.60-SF

MODELLED AS 50% CLOGGING FACTOR

3.64-IN AT CURB FLOWLINE (2-IN LOCAL DEPRESSION)

NO OVERTOPPING IN Q100



Inlet Report

APPENDIX D-2: INLET Y2 ANALYSIS

INLET Y2

Combination Inlet

Location	= Sag
Curb Length (ft)	= 3.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= 0.80
Grate Width (ft)	= 1.50
Grate Length (ft)	= 3.00

Gutter

Slope, Sw (ft/ft)	= 0.040
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 5.13

Highlighted

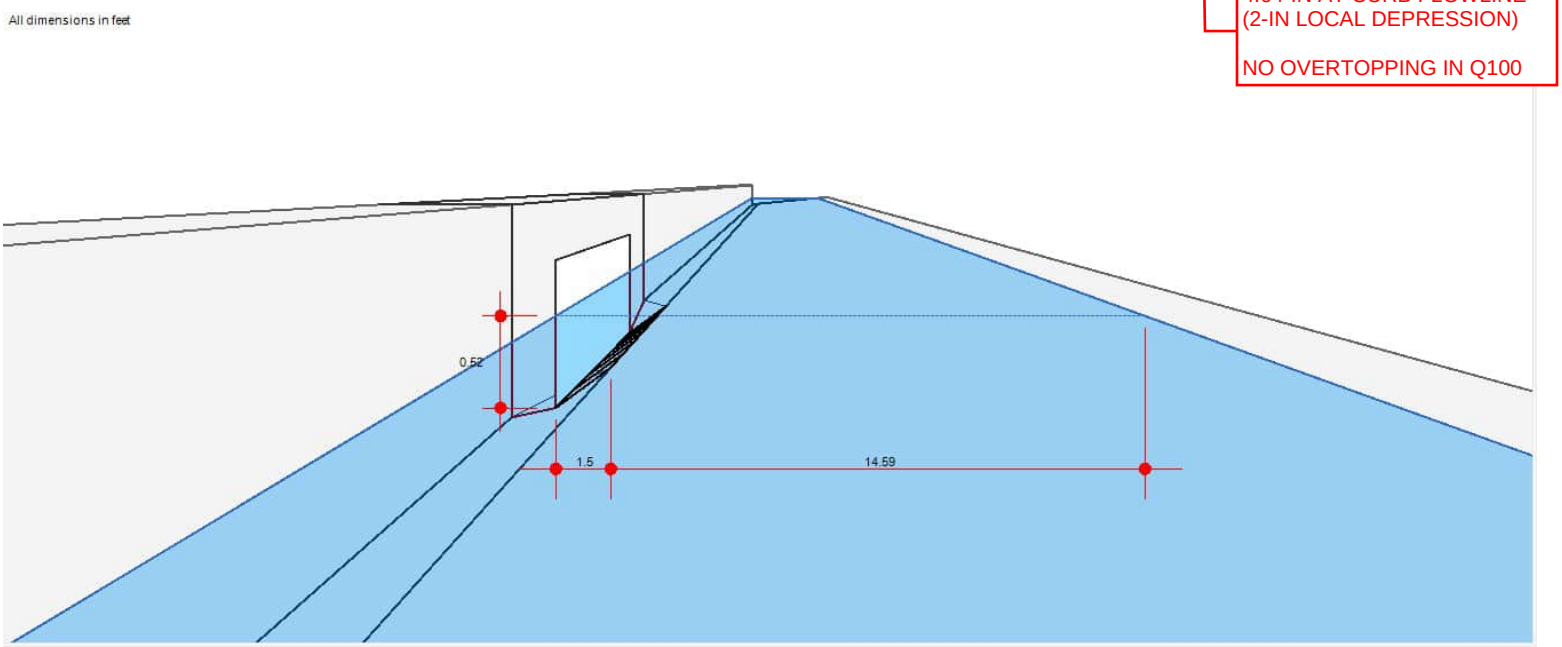
Q Total (cfs)	= 5.13
Q Capt (cfs)	= 5.13
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 6.22
Efficiency (%)	= 100
Gutter Spread (ft)	= 16.09
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

GRATE AREA = 1.60-SF

MODELLED AS 50% CLOGGING FACTOR

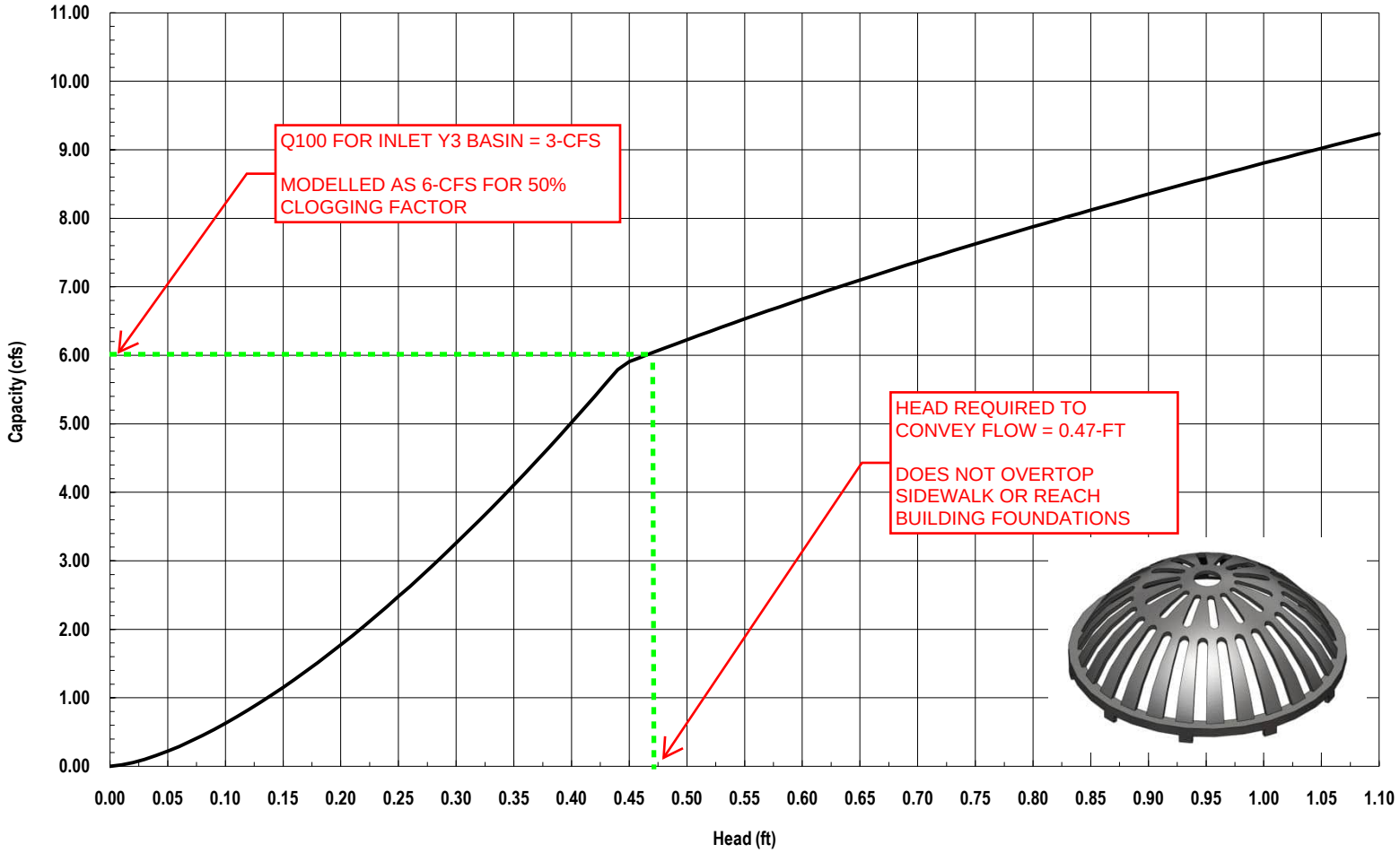
4.64-IN AT CURB FLOWLINE (2-IN LOCAL DEPRESSION)

NO OVERTOPPING IN Q100



APPENDIX D-3: INLET Y3 ANALYSIS

Nyloplast 24" Dome Grate Inlet Capacity Chart

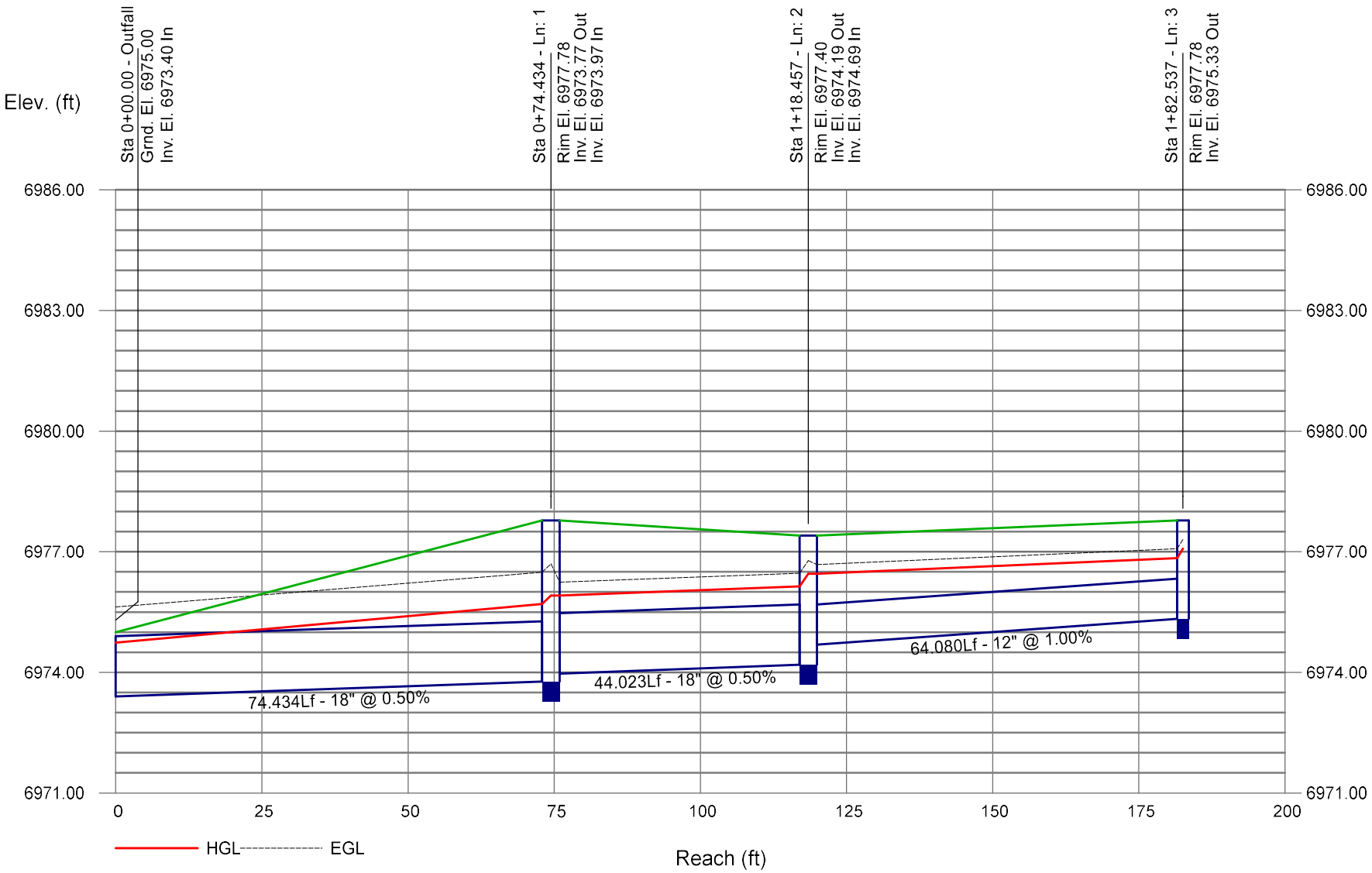


Nyloplast®
3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

Storm Sewer Profile

Proj. file: Storm Y.stm

APPENDIX E-1: STORM Y PROFILE W/ HGL SHOWN



Storm Sewer Summary Report

APPENDIX E-2: STORM SEWER HGL REPORT

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Y1	12.59	18	Cir	74.434	6973.40	6973.77	0.497	6974.74*	6975.70*	0.21	6975.91	End	Manhole
2	Y2	8.15	18	Cir	44.023	6973.97	6974.19	0.499	6975.91*	6976.14*	0.31	6976.45	1	Manhole
3	Y3	3.02	12	Cir	64.080	6974.69	6975.33	0.999	6976.45*	6976.84*	0.23	6977.07	2	Manhole

FROM APPENDIX C -

UPSTREAM LINES ADDED

HGL ABOVE PIPE CROWN, BUT BELOW FINISH GRADE IN ALL CASES

Project File: Storm Y.stm | Number of lines: 3 | Run Date: 3/6/2023

NOTES: Known Qs only ; *Surcharged (HGL above crown).

Culvert Report

APPENDIX F-1: CULVERT 1 ANALYSIS

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Sep 11 2023

CULVERT 1

Invert Elev Dn (ft)	=	6976.00
Pipe Length (ft)	=	43.00
Slope (%)	=	3.67
Invert Elev Up (ft)	=	6977.58
Rise (in)	=	18.0
Shape	=	Circular
Span (in)	=	18.0
No. Barrels	=	1
n-Value	=	0.011
Culvert Type	=	Circular Culvert
Culvert Entrance	=	Smooth tapered inlet throat
Coeff. K,M,c,Y,k	=	0.534, 0.555, 0.0196, 0.9, 0.2

Embankment

Top Elevation (ft)	=	6981.00
Top Width (ft)	=	12.00
Crest Width (ft)	=	30.00

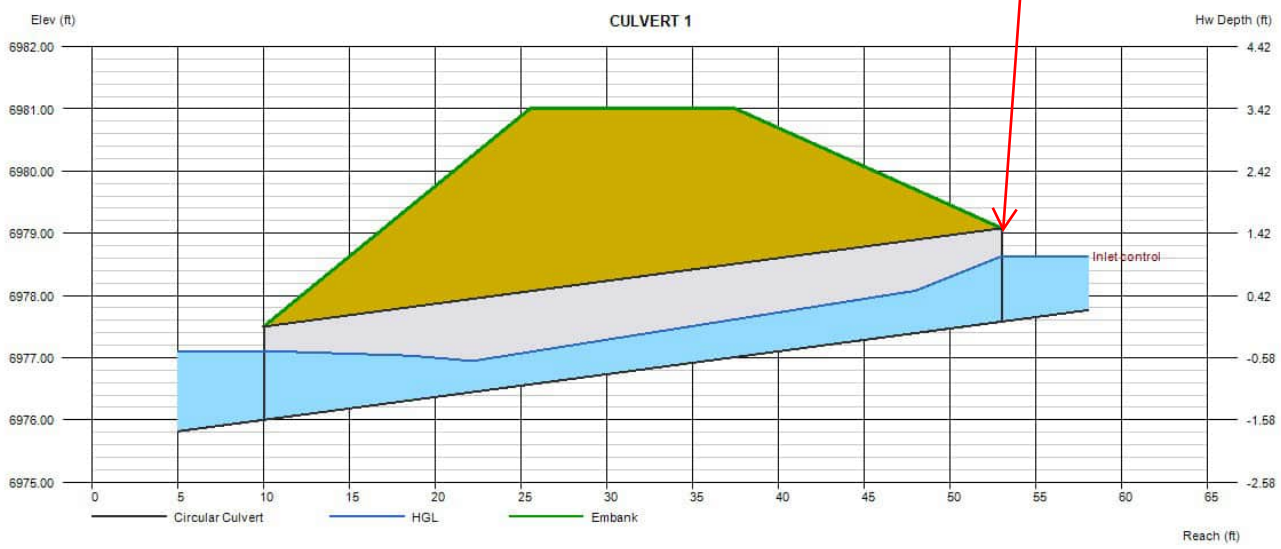
Calculations

Qmin (cfs)	=	3.53
Qmax (cfs)	=	3.53
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	3.53
Qpipe (cfs)	=	3.53
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	2.52
Veloc Up (ft/s)	=	4.24
HGL Dn (ft)	=	6977.11
HGL Up (ft)	=	6978.30
Hw Elev (ft)	=	6978.63
Hw/D (ft)	=	0.70
Flow Regime	=	Inlet Control

NO OVERTOPPING
EMERGENCY ACCESS
DURING 100-YEAR STORM



Channel Report

APPENDIX G-1: INLET Y3 SWALE

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Mar 6 2023

DITCH TO INLET Y3

Triangular

Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.026

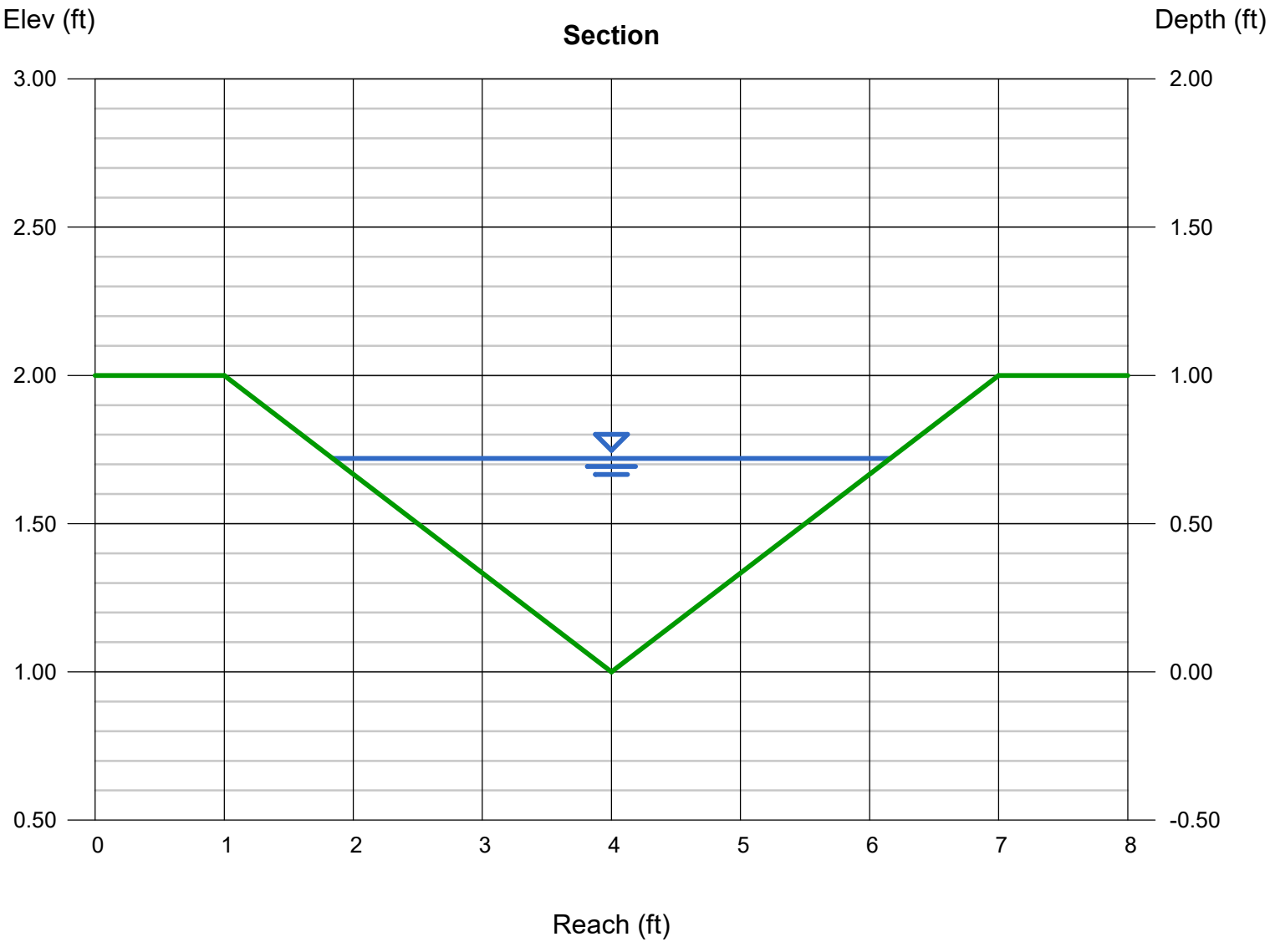
Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.02

Highlighted

Depth (ft)	= 0.72
Q (cfs)	= 3.020
Area (sqft)	= 1.56
Velocity (ft/s)	= 1.94
Wetted Perim (ft)	= 4.55
Crit Depth, Yc (ft)	= 0.58
Top Width (ft)	= 4.32
EGL (ft)	= 0.78

INLET Y3 BASIN Q100



Channel Report

APPENDIX G-2: SWALE TO CULVERT 1

Swale to Culvert 1

Triangular

Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.026

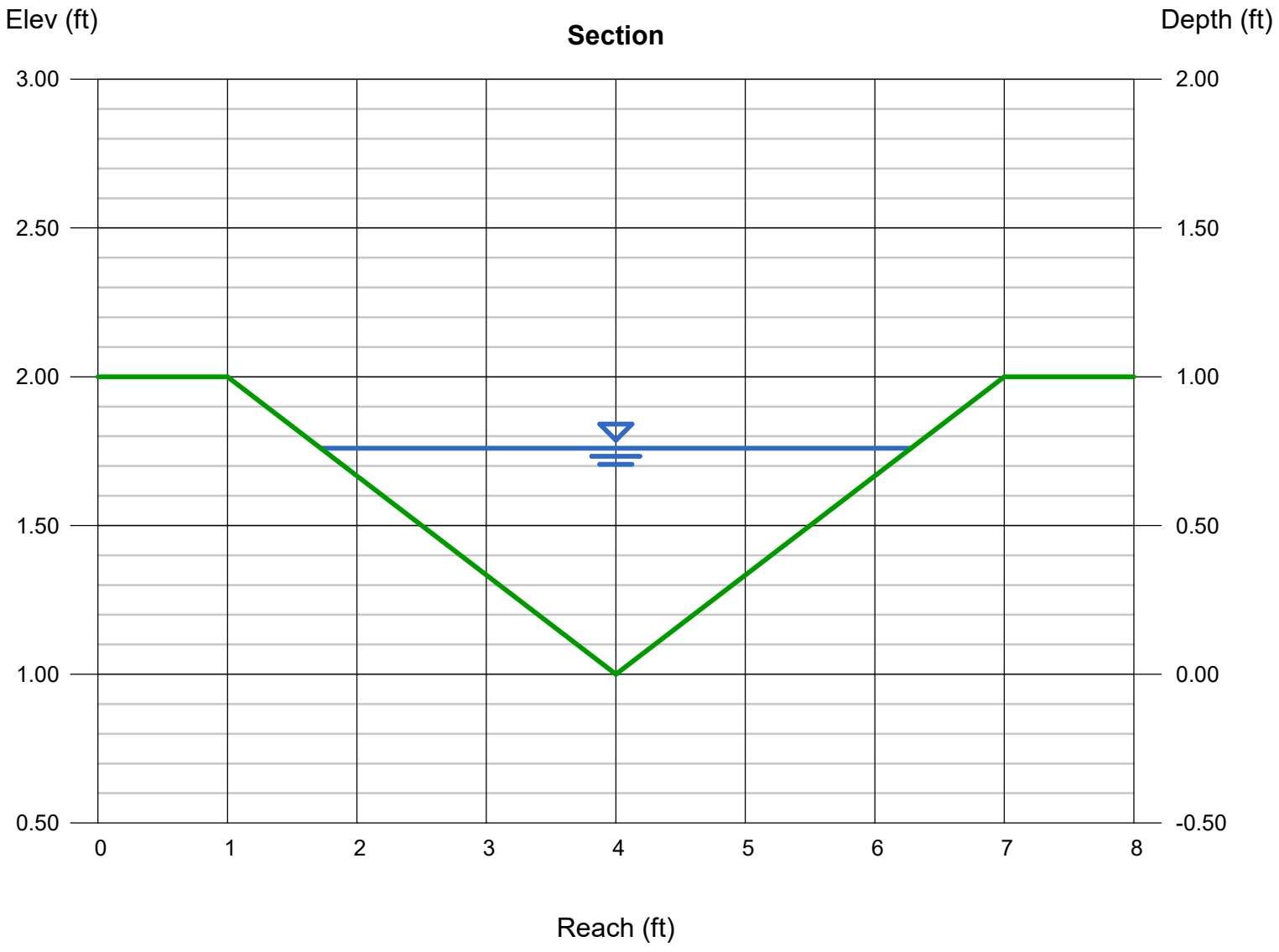
Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.53

Highlighted

Depth (ft)	= 0.76
Q (cfs)	= 3.530
Area (sqft)	= 1.73
Velocity (ft/s)	= 2.04
Wetted Perim (ft)	= 4.81
Crit Depth, Yc (ft)	= 0.62
Top Width (ft)	= 4.56
EGL (ft)	= 0.82

CULVERT 1 BASIN Q100



APPENDIX H: RAINFALL DATA

NOAA Atlas 14, Volume 8, Version 2
Location name: Bayfield, Colorado, USA*
Latitude: 37.2317°, Longitude: -107.5912°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**2.21** (1.74-2.87)	**2.74** (2.15-3.55)	**3.76** (2.95-4.90)	**4.75** (3.71-6.20)	**6.32** (4.87-8.76)	**7.70** (5.75-10.7)	**9.23** (6.65-13.0)	**10.9** (7.56-15.7)	**13.4** (8.90-19.6)	**15.4** (9.92-22.6)
10-min	**1.61** (1.27-2.09)	**2.00** (1.58-2.60)	**2.75** (2.16-3.59)	**3.47** (2.71-4.55)	**4.63** (3.56-6.41)	**5.64** (4.21-7.82)	**6.76** (4.87-9.53)	**7.99** (5.53-11.5)	**9.80** (6.52-14.4)	**11.3** (7.27-16.5)
15-min	**1.31** (1.03-1.70)	**1.63** (1.28-2.12)	**2.24** (1.75-2.92)	**2.83** (2.20-3.70)	**3.76** (2.90-5.21)	**4.58** (3.42-6.36)	**5.49** (3.96-7.75)	**6.50** (4.50-9.34)	**7.97** (5.30-11.7)	**9.18** (5.91-13.4)
30-min	**0.818** (0.644-1.06)	**1.04** (0.820-1.35)	**1.45** (1.14-1.89)	**1.84** (1.44-2.41)	**2.44** (1.87-3.36)	**2.96** (2.20-4.09)	**3.52** (2.53-4.95)	**4.14** (2.86-5.93)	**5.02** (3.34-7.34)	**5.75** (3.70-8.41)
60-min	**0.459** (0.362-0.597)	**0.627** (0.493-0.816)	**0.914** (0.716-1.19)	**1.16** (0.906-1.52)	**1.52** (1.15-2.07)	**1.81** (1.34-2.48)	**2.12** (1.51-2.95)	**2.43** (1.67-3.46)	**2.87** (1.90-4.17)	**3.22** (2.07-4.71)
2-hr	**0.255** (0.203-0.326)	**0.367** (0.292-0.470)	**0.550** (0.437-0.706)	**0.702** (0.554-0.904)	**0.912** (0.694-1.21)	**1.07** (0.800-1.43)	**1.24** (0.892-1.68)	**1.40** (0.971-1.95)	**1.62** (1.08-2.30)	**1.78** (1.16-2.57)
3-hr	**0.185** (0.149-0.235)	**0.268** (0.215-0.341)	**0.402** (0.322-0.511)	**0.510** (0.406-0.652)	**0.656** (0.501-0.855)	**0.765** (0.573-1.01)	**0.871** (0.632-1.17)	**0.976** (0.682-1.34)	**1.11** (0.748-1.56)	**1.21** (0.799-1.73)
6-hr	**0.125** (0.101-0.156)	**0.163** (0.133-0.204)	**0.226** (0.183-0.283)	**0.277** (0.223-0.348)	**0.347** (0.270-0.446)	**0.400** (0.304-0.520)	**0.453** (0.334-0.600)	**0.505** (0.359-0.684)	**0.574** (0.393-0.795)	**0.626** (0.420-0.879)
12-hr	**0.086** (0.071-0.106)	**0.102** (0.084-0.125)	**0.128** (0.105-0.158)	**0.150** (0.123-0.186)	**0.182** (0.144-0.231)	**0.207** (0.160-0.265)	**0.232** (0.174-0.304)	**0.258** (0.187-0.345)	**0.293** (0.205-0.401)	**0.321** (0.218-0.443)
24-hr	**0.056** (0.047-0.068)	**0.063** (0.053-0.077)	**0.075** (0.062-0.091)	**0.085** (0.071-0.104)	**0.100** (0.081-0.126)	**0.112** (0.089-0.142)	**0.125** (0.096-0.161)	**0.138** (0.102-0.182)	**0.157** (0.111-0.211)	**0.171** (0.119-0.233)
2-day	**0.034** (0.028-0.040)	**0.038** (0.032-0.046)	**0.046** (0.039-0.055)	**0.052** (0.044-0.063)	**0.061** (0.050-0.075)	**0.068** (0.054-0.084)	**0.074** (0.058-0.094)	**0.081** (0.061-0.105)	**0.090** (0.065-0.119)	**0.097** (0.068-0.130)
3-day	**0.025** (0.021-0.030)	**0.028** (0.024-0.034)	**0.034** (0.029-0.040)	**0.039** (0.033-0.046)	**0.045** (0.037-0.055)	**0.050** (0.040-0.061)	**0.055** (0.043-0.069)	**0.060** (0.045-0.076)	**0.066** (0.048-0.086)	**0.071** (0.051-0.094)
4-day	**0.020** (0.017-0.024)	**0.023** (0.020-0.027)	**0.028** (0.024-0.032)	**0.031** (0.027-0.037)	**0.036** (0.030-0.044)	**0.040** (0.033-0.049)	**0.044** (0.035-0.055)	**0.048** (0.036-0.061)	**0.053** (0.039-0.069)	**0.057** (0.041-0.075)
7-day	**0.014** (0.012-0.016)	**0.016** (0.013-0.018)	**0.018** (0.016-0.021)	**0.021** (0.018-0.024)	**0.024** (0.020-0.029)	**0.027** (0.022-0.032)	**0.029** (0.023-0.036)	**0.032** (0.025-0.040)	**0.036** (0.026-0.045)	**0.038** (0.028-0.049)
10-day	**0.011** (0.009-0.012)	**0.012** (0.011-0.014)	**0.014** (0.013-0.017)	**0.016** (0.014-0.019)	**0.019** (0.016-0.022)	**0.021** (0.017-0.025)	**0.023** (0.018-0.028)	**0.025** (0.019-0.031)	**0.027** (0.021-0.035)	**0.029** (0.022-0.038)
20-day	**0.007** (0.006-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.011)	**0.010** (0.009-0.012)	**0.012** (0.010-0.014)	**0.013** (0.011-0.015)	**0.014** (0.011-0.017)	**0.015** (0.012-0.019)	**0.017** (0.013-0.021)	**0.018** (0.013-0.022)
30-day	**0.006** (0.005-0.006)	**0.006** (0.006-0.007)	**0.007** (0.007-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.011)	**0.010** (0.009-0.012)	**0.011** (0.009-0.013)	**0.012** (0.009-0.014)	**0.013** (0.010-0.016)	**0.014** (0.010-0.017)
45-day	**0.005** (0.004-0.005)	**0.005** (0.005-0.006)	**0.006** (0.005-0.007)	**0.007** (0.006-0.007)	**0.008** (0.007-0.009)	**0.008** (0.007-0.009)	**0.009** (0.007-0.010)	**0.010** (0.008-0.011)	**0.010** (0.008-0.013)	**0.011** (0.008-0.014)
60-day	**0.004** (0.004-0.004)	**0.004** (0.004-0.005)	**0.005** (0.005-0.006)	**0.006** (0.005-0.006)	**0.007** (0.006-0.007)	**0.007** (0.006-0.008)	**0.008** (0.006-0.009)	**0.008** (0.007-0.010)	**0.009** (0.007-0.011)	**0.010** (0.007-0.012)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical