SUPPLEMENTAL DRAINAGE REPORT

FOR

STONEBRIDGE COMMERCIAL
WICHITA, KANSAS

SEPTEMBER 2008
Revised: December 2008

CITY OF WICHITA

Public Works, Engineering Division
Final Drainage Plan Submittal Checklist

Reviewer:_____ Date: December 23, 2008

Subdivision Name: Stonebridge Commercial Addition Location: 37th and Maize

Total Land Area Of Ownership: 36 Acres

Type: ☐ Residential ☑ Commercial ☐ Industrial ☐ Recreation ☐ Municipal ☐ Other

Applicant:_____ Contact:_____ Phone #:_____

Engineer: MKEC Engineering Consultants, Inc. Contact: Kara Anderson Phone # (316) 684-9600

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development
(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	✔		Appendix A, Stonebridge Comm. 12/06		
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	✔		Pg. 1-2, Stonebridge Comm. 12/06		
C. Discussion of offsite conditions	✔		Pg. 1-2, Stonebridge Comm. 12/06		
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	✔		Supplemental Stonebridge 12/08		
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design		✔			
F. Copy of the plat		✔			
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	✔		Appendix D, Supplemental Stonebridge 12/08		
H. Professional Engineer seal, signature and date on cover of report	✔				
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover	✔				

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)		✔			
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)	✔		Pg. 1, Supplemental Stonebridge 12/08		
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	✔		Appendix A, Supplemental Stonebridge 12/08		
D. Total Site Area and Total Impervious Area (acres)	✔				
E. Benchmarks used for site control	✔		Appendix A, Supplemental Stonebridge 12/08		
F. Streams, creeks, and waterway labeled		✔			
G. Predominant soils from USDA soil surveys, and/or on site soil borings	✔		Appendix B, Stonebridge Comm. 12/06		
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted		✔			
I. Location of existing roads, buildings, parking lots and other impervious areas.		✔			

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J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	✔		Appendix A, Supplemental Stonebridge 12/08		
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow		✔			
L. Flow paths	✔		Appendix A, Supplemental Stonebridge 12/08		
M. Location and dimensions of existing channels, bridges or culvert crossings		✔			
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration	✔		Appendix B, Supplemental Stonebridge 12/08		
O. Assumed pre-developed runoff curve numbers	✔		Appendix B, Supplemental Stonebridge 12/08		
P. Existing time of concentrations used in calculations	✔		Appendix B, Supplemental Stonebridge 12/08		
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site		✔	Used tailwater from Fox Ridge		
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)		✔			
S. Cross-section data for open channels		✔			
T. Ground water elevations, if applicable		✔			

	Applicant			Engr	
Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	✔		Appendix B, Supplemental Stonebridge 12/08		
B. Proposed time of concentrations used in calculations	✔		Appendix B, Supplemental Stonebridge 12/08		
C. Assumed post-developed runoff curve numbers	✔		Appendix B, Supplemental Stonebridge 12/08		
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)	✔		Appendix B, Supplemental Stonebridge 12/08		
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration	✔		Appendix C, Supplemental Stonebridge 12/08		
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities	✔		Appendix B, Supplemental Stonebridge 12/08		
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary		✔			
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)	✔		Appendix A, Supplemental Stonebridge 12/08		
I. Design water surface elevations and normal pool elevation for ponds.	✔		Pg 1, Supplemental Stonebridge 12/08		
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.	✔		Appendix A, Supplemental Stonebridge 12/08		
K. Proposed limits of clearing and grading		✔	Entire Site		
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	✔		Buildings & pavement are shown where known		
M. Location of existing and proposed utilities (e.g., water, sewer) and easements	✔		Appendix A, Supplemental Stonebridge 12/08		
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔		Appendix A, Supplemental Stonebridge 12/08		
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings		✔	Appendix A, Supplemental Stonebridge 12/08		

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P. Preliminary selection and location of stormwater controls	✔		Appendix A, Supplemental Stonebridge 12/08		
Q. Emergency overflow structure's flow path	✔		Appendix A, Supplemental Stonebridge 12/08		
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)	✔		Appendix A, Supplemental Stonebridge 12/08. Tailwater from Cadillac Lake controls the runoff from development		
S. The 100-year 24-hour HWL delineated on the plan for detention pond	✔		Appendix A, Supplemental Stonebridge 12/08		
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds	✔				
U. Stormwater Management Facilities located within a Reserve	✔				
V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot)	✔				
W. Off-site drainage easements or agreements required, where necessary		✔			

	Applicant			Engr	
Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile		✔			
B. Nearest base flood elevations		✔			
C. Delineation of pre-developed regulatory floodplain/floodway limits		✔			
D. Delineation of post-developed regulatory floodplain and floodway limits		✔			
E. Floodplain boundary determination per elevation (project limits shown)		✔			
F. Provide source of floodway data table and discharges		✔			
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits		✔			
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions		✔			
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)		✔			
J. Flood plains and floodways located within a Reserve, where necessary		✔			

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		✔			
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		✔			
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		✔			
D. Kansas Department of Transportation		✔			
E. Sedgwick County Right-of-way Permit		✔			

Consulting Engineer Initials _____

Supplemental Drainage Report for Stonebridge Commercial Addition
Wichita, Sedgwick County, Kansas

Post-Project Conditions

Runoff Characteristics

Post-project runoff will flow into a detention pond, then to the south and exit the site into a drainage reserve. This drainage reserve will flow south into the lakes in Fox Ridge Addition and into Cadillac Lake. The drainage and utility plan shows the proposed pond layout, Appendix A. The runoff and detention was modeled in Hydraflow Hydrographs 2007, Appendix B. The December 2006 drainage report for this addition required 10.0 acre-feet of storage for the 100-year design storm. In order to provide ten-percent more storage volume than is required to maintain the pre-project peak-runoff, the outlet structure has been modified. The pond will have a normal pool of 1349.0, a 100-year water surface elevation of 1352.48, and provide 11.5 acre-feet of storage. The pond outlet structure will be a 35^{o} v-notch weir with an opening at 1349.0 and a 6' wide opening at 1351.5.

The Stonebridge Detention pond was modeled in conjunction with the Maize South Campus Addition detention facilities. Information on the Maize South Campus drainage areas and facilities were taken from a drainage report dated October, 2007. Tailwater elevations for the Maize South Campus detention facilities were taken from the Fox Ridge LOMR.

Table 1. Stonebridge Commercial and Maize South Campus Runoff into Fox Ridge Lakes.

Description	Design Storm Flows (cfs)			
	2-Yr	5-Yr	10-Yr	100-Yr
Pre-Project Total Flow to the South	0.0	14.0	30.6	96.6
Post-Project Total Flow to the South	0.0	13.9	26.8	81.3

Runoff offsite to the south is reduced for the 2, 5, 10, and 100-yr design storms, from pre-project to post-project conditions. The Fox Ridge tailwater elevation prevents any runoff from exiting the property during a 2-year storm event.

Storm water sewer (SWS) lines are proposed to convey storm water from the commercial lots to the detention pond. A preliminary layout of the SWS is shown on the Drainage and Utility Plan, Appendix A. Hydraflow Storm Sewers 2008 was used to size the proposed system. The SWS system just east of the Menard's was sized to accommodate a 100-yr storm event with a 5-yr tail water. The rest of the SWS systems were sized for the 5-year design storm. The storm sewer calculations are in Appendix C. A Preliminary Four Corner Lot Grading Plan is included in Appendix D.

Summary

Stonebridge Commercial Addition is located on the southeast corner of the intersection of 37^{th} Street North and Maize Road. The property is approximately 36 acres and will develop for commercial use. Runoff from the site currently sheet flows across the property to the south into the Fox Ridge lakes. A drainage reserve has been constructed through the adjacent property to the south and into a Fox Ridge lake. A weir was designed to control runoff from the site. Runoff offsite to the south is reduced for the 2, 5, 10, and 100-year design storms, from pre-project to post-project conditions. The site will provide 10-percent more storage volume than needed to maintain pre-project flow-rates.

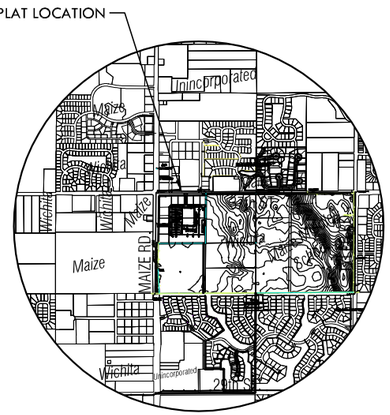
Appendix A

Drainage and Utility Plan

NOTES

1. GEOGRAPHY: Located in the Northwest portion of the City of Wichita in an area currently transitioning from agricultural uses into urban residential, institutional and commercial uses with access to K-96 via Maize Rd. and or Ridge Rd. The surrounding land uses include urban residential to the Northwest and South, rural residential to the West, and agriculture production to the immediate South and East, and institutional uses East of the agriculture production.
2. LOT TOTAL - 11 Commercial parcels
3. ANNEXATION: Lies within the City of Wichita and adjoins the City of Maize to the North and West.
4. EXISTING USE: Agricultural
5. ZONING: Existing / proposed - "LC" w/ CUP DP 295 overlay THIS PLAT SHALL CONFORM TO THE RECITALS OF CUP DP 295.
6. PLAT AREA: Gross - 36.3 Ac.
   Net - 35.93 Ac.
7. SURVEY DATE: January, 2006 (by MKEC)
8. PUBLIC UTILITIES: Shall be extended to site. Municipal sanitary sewer shall be served from the East. Municipal water shall be served from existing mains to the North and West.
9. LEGAL DESCRIPTION: See hereon
10. ACCESS CONTROLS: Shall align with developments to the West and North and also conform to access management policies as shown hereon..
11. PROPOSED COMMERCIAL: According to CUP DP 295 the total number of buildings is limited to 16 with the following minimum building setbacks:
    Arterial Street setback = 35'
    Interior side setback = 15'
    Interior side setback = 35' **
    Exterior boundary setback = 100' **
    ** (if building has a gross floor area greater than 100,000 s.f.)
12. RESERVES: All reserves are platted for irrigation, landscaping, monuments, drainage, and utilities in designated areas. Reserve "C" is also platted for a private swimming pool, pool house, and parking.
13. FLOOD: According to FEMA FIRM Community Unit Panel 200321 0125A, Effective Date June 3rd, 1986; this property lies within flood zone "C", *"areas of minimal flooding."*
14. DRAINAGE: A drainage report shall accompany this plat. The property lies within a branch of the Sand Creek drainage basin, which drains to the Little Arkansas River located in Sedgwick County and generally draining from northeast to southwest.

PLAT LOCATION



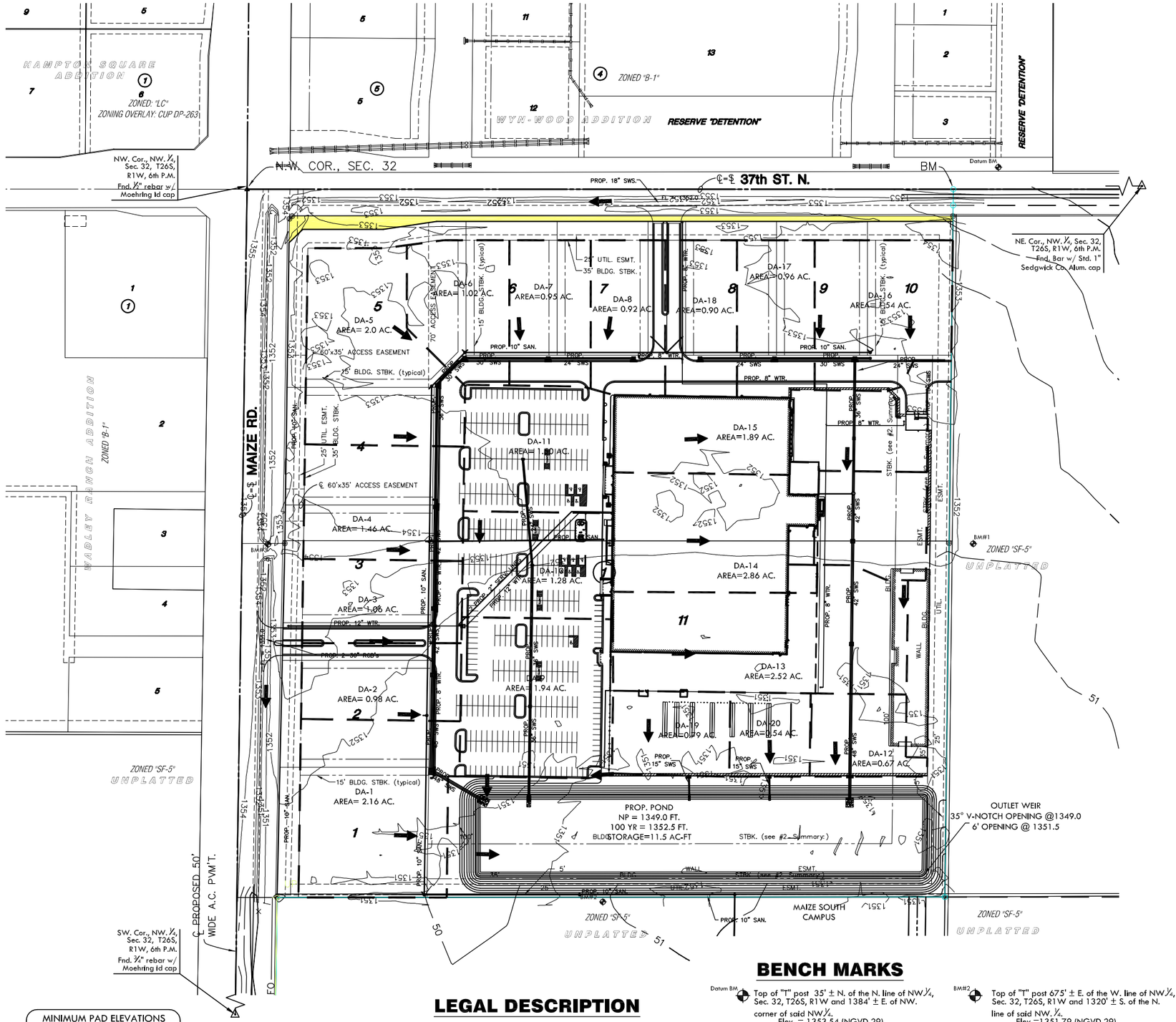
VICINITY MAP

LEGEND

- 6IN - CONIFEROUS TREE & DIAMETER
- 3IN - DECIDUOUS TREE & DIAMETER
- SN - SIGN
- PP - POWER POLE AND GUY ANCHOR
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- W - WATER LINE
- SANITARY SEWER LINE
- G - GAS LINE
- P - GAS PIPELINE
- UGT - TELEPHONE LINE
- UGE - UNDERGROUND ELECTRIC LINE
- OHE - OVERHEAD ELECTRIC
- FOC - FIBER OPTIC CABLE I
- DRAINAGE BOUNDARY
- A - DRAINAGE BOUNDARY LABEL
- FLOW ARROW

NORTH

MINIMUM PAD ELEVATIONS *LOWEST OPENINGS*		
LOTS *(inclusive)*	BLOCK	ELEVATION *NGVD*
1 - 2	1	1355.5
3 - 11	1	1355.5



LEGAL DESCRIPTION

The North ½, NW. ¼, NW. ¼, Section 32, Township 26 South, Range 1 West, Sedgwick County Kansas, EXCEPT, road right-of-way on the West and North.

TOGETHER WITH,

The South ½, NW. ¼, NW. ¼, Section 32, Township 26 South, Range 1 West, Sedgwick County Kansas, EXCEPT, road right-of-way on the West.

BENCH MARKS

Datum BM — Top of "T" post 35' ± N. of the N. line of NW¼, Sec. 32, T26S, R1W and 1384' ± E. of NW. corner of said NW¼.
Elev. = 1353.54 (NGVD 29)
166.14 (City Datum)

BM#1 — Top of "T" post 660' ± S. of the N. line of NW ¼, Sec. 32, T26S, R1W and 1325' ± E. of W. line of said NW¼.
Elev.= 1351.69(NGVD 29)
164.29 (City Datum)

BM#2 — Top of "T" post 675' ± E. of the W. line of NW¼, Sec. 32, T26S, R1W and 1320' ± S. of the N. line of said NW. ¼.
Elev.=1351.79 (NGVD 29)
164.39 (City Datum)

BM#3 — Square cut on N. end of on top of RCP 50' ± E. of the W. line of NW¼, Sec. 32, T26S, R1W and 660' ± S. of the N. line of said NW. ¼.
Elev.=1353.59 (NGVD 29)
166.19 (City Datum)

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

STONEBRIDGE COMMERCIAL

STONEBRIDGE COMMERCIAL ADDITION
WICHITA, KANSAS

DRAINAGE AND UTILITY PLAN

DATE: SEPTEMBER 2008
REVISED:
DESIGN BY: KLA
DRAWN BY: CMJ
CHECKED BY: GJA
SHEET NUMBER: 1

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Appendix B

Hydraflow Hydrographs

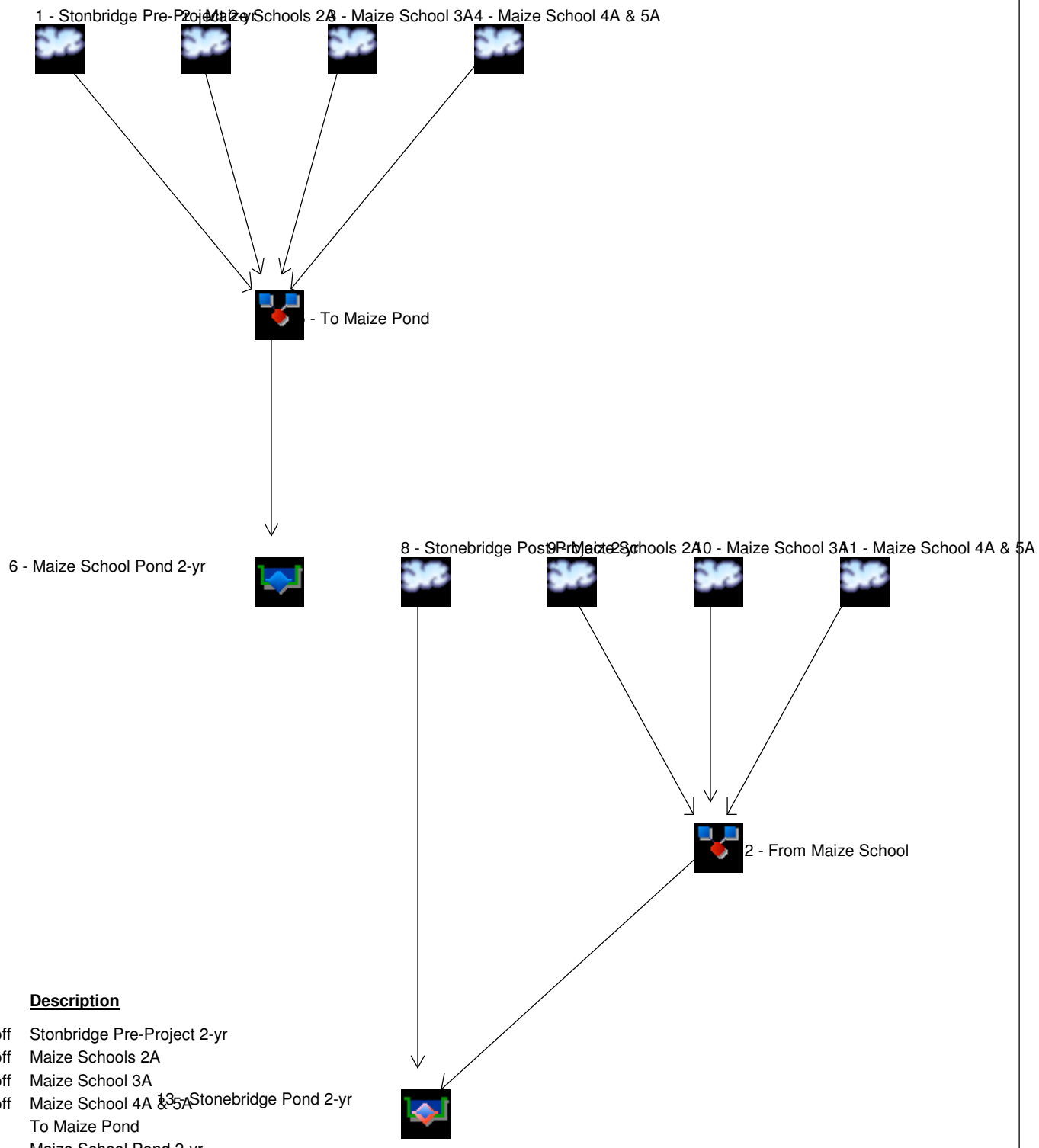
Hydraflow Table of Contents

Hydraflow Table of Contents

Hydraflow Table of Contents

Hydraflow Table of Contents

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Stonbridge Pre-Project 2-yr
2	SCS Runoff	Maize Schools 2A
3	SCS Runoff	Maize School 3A
4	SCS Runoff	Maize School 4A & 5A
5	Combine	To Maize Pond
6	Reservoir	Maize School Pond 2-yr
8	SCS Runoff	Stonebridge Post-Project 2-yr
9	SCS Runoff	Maize Schools 2A
10	SCS Runoff	Maize School 3A
11	SCS Runoff	Maize School 4A & 5A
12	Combine	From Maize School
13	Reservoir(i)	Stonebridge Pond 2-yr

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

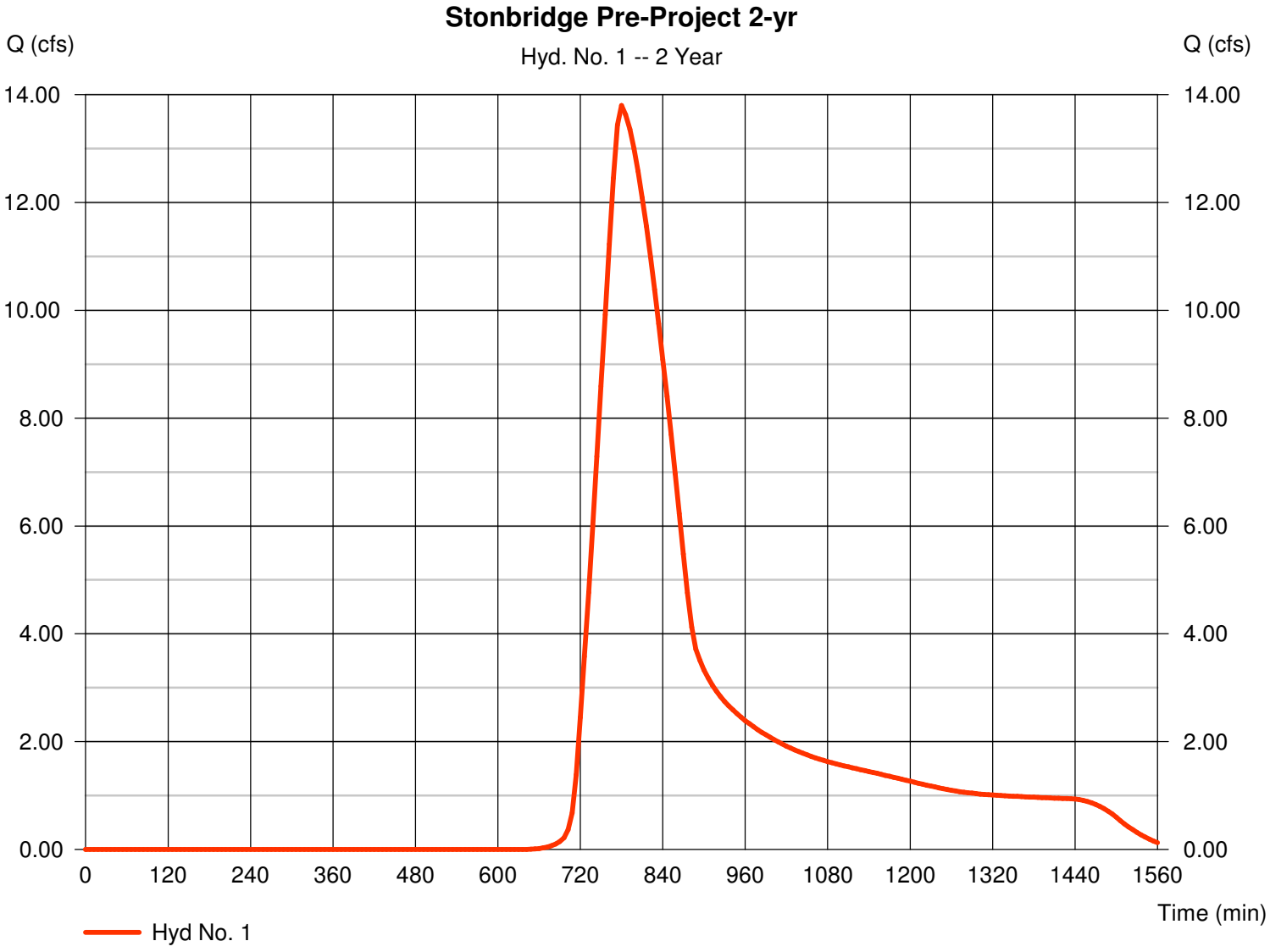
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	13.80	6	780	3.427	----	------	------	Stonbridge Pre-Project 2-yr
2	SCS Runoff	25.79	6	768	5.311	----	------	------	Maize Schools 2A
3	SCS Runoff	69.22	6	744	8.959	----	------	------	Maize School 3A
4	SCS Runoff	41.11	6	768	8.325	----	------	------	Maize School 4A & 5A
5	Combine	127.26	6	756	26.023	1, 2, 3, 4	------	------	To Maize Pond
6	Reservoir	0.000	6	n/a	0.000	5	1349.80	26.0	Maize School Pond 2-yr
8	SCS Runoff	83.25	6	726	7.963	----	------	------	Stonebridge Post-Project 2-yr
9	SCS Runoff	25.79	6	768	5.311	----	------	------	Maize Schools 2A
10	SCS Runoff	69.22	6	744	8.959	----	------	------	Maize School 3A
11	SCS Runoff	41.11	6	768	8.325	----	------	------	Maize School 4A & 5A
12	Combine	117.72	6	750	22.596	9, 10, 11	------	------	From Maize School
13	Reservoir(i)	0.000	6	n/a	0.000	8, 12	1350.81	35.6	Stonebridge Pond 2-yr

Hydrograph Report

Hyd. No. 1

Stonbridge Pre-Project 2-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.80 cfs
Storm frequency	=	2 yrs	Time to peak	=	780 min
Time interval	=	6 min	Hyd. volume	=	3.427 acft
Drainage area	=	33.930 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	105.20 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

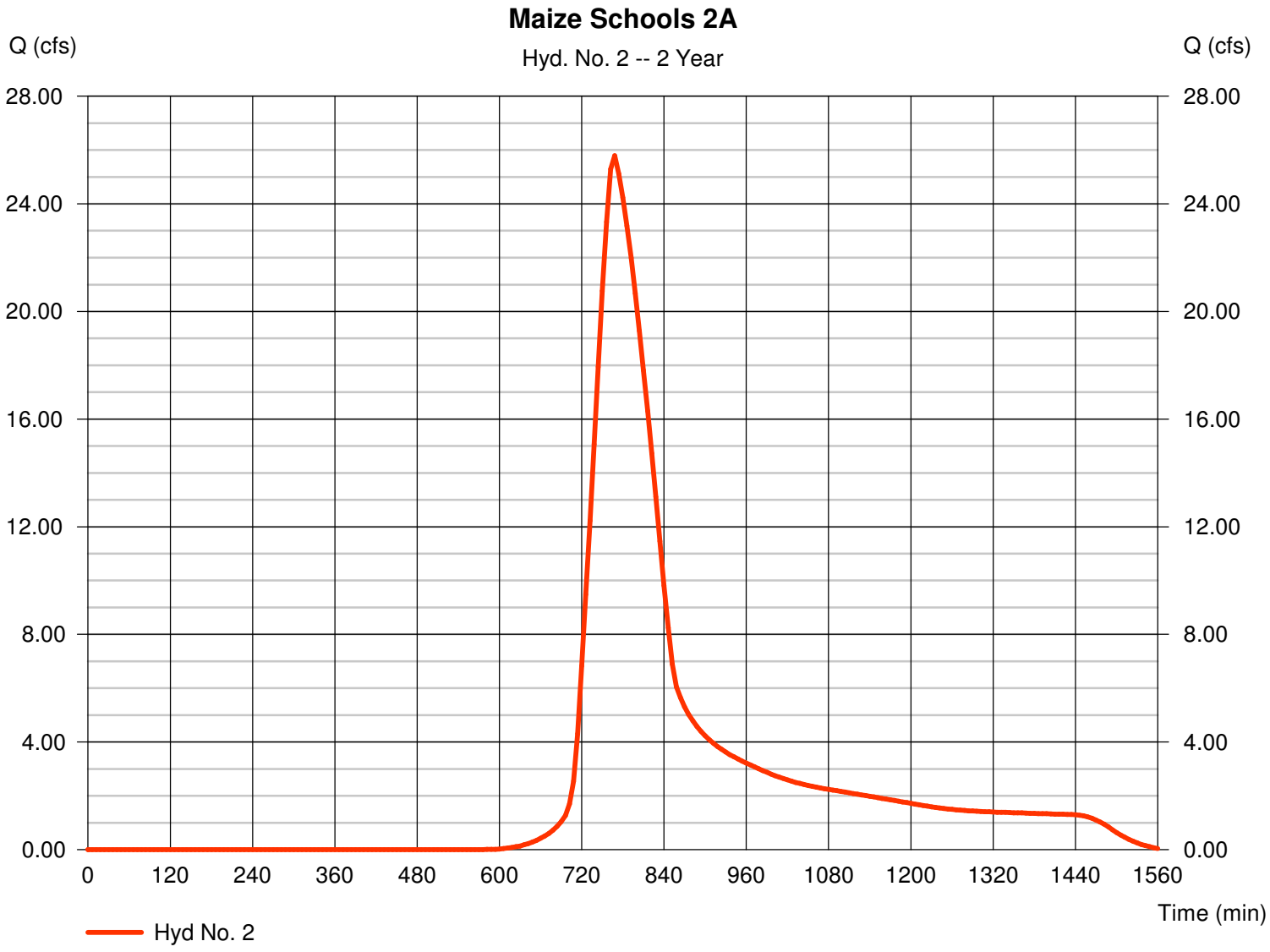


Hydrograph Report

Hyd. No. 2

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.79 cfs
Storm frequency	=	2 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	5.311 acft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

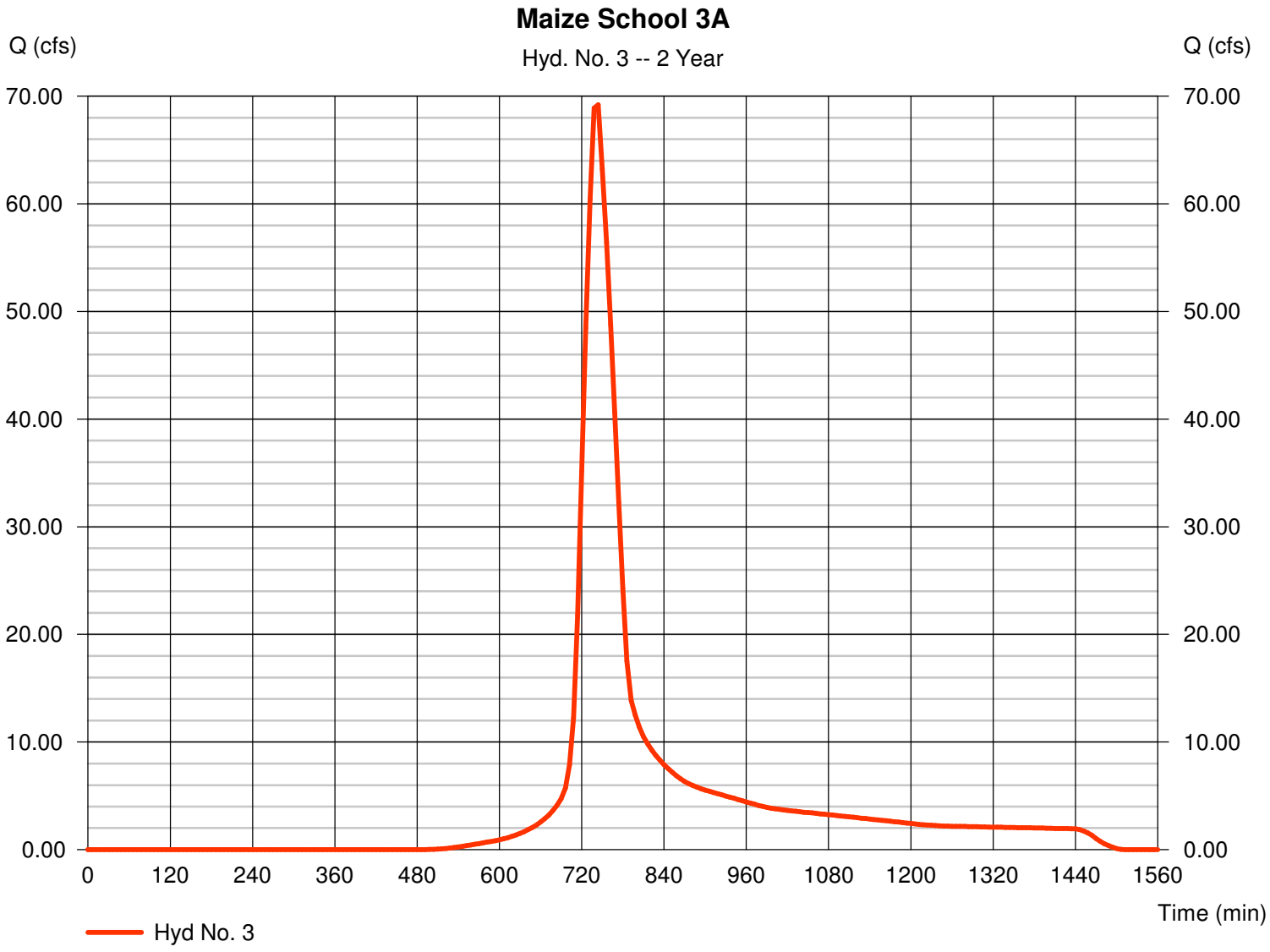


Hydrograph Report

Hyd. No. 3

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	69.22 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	8.959 acft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

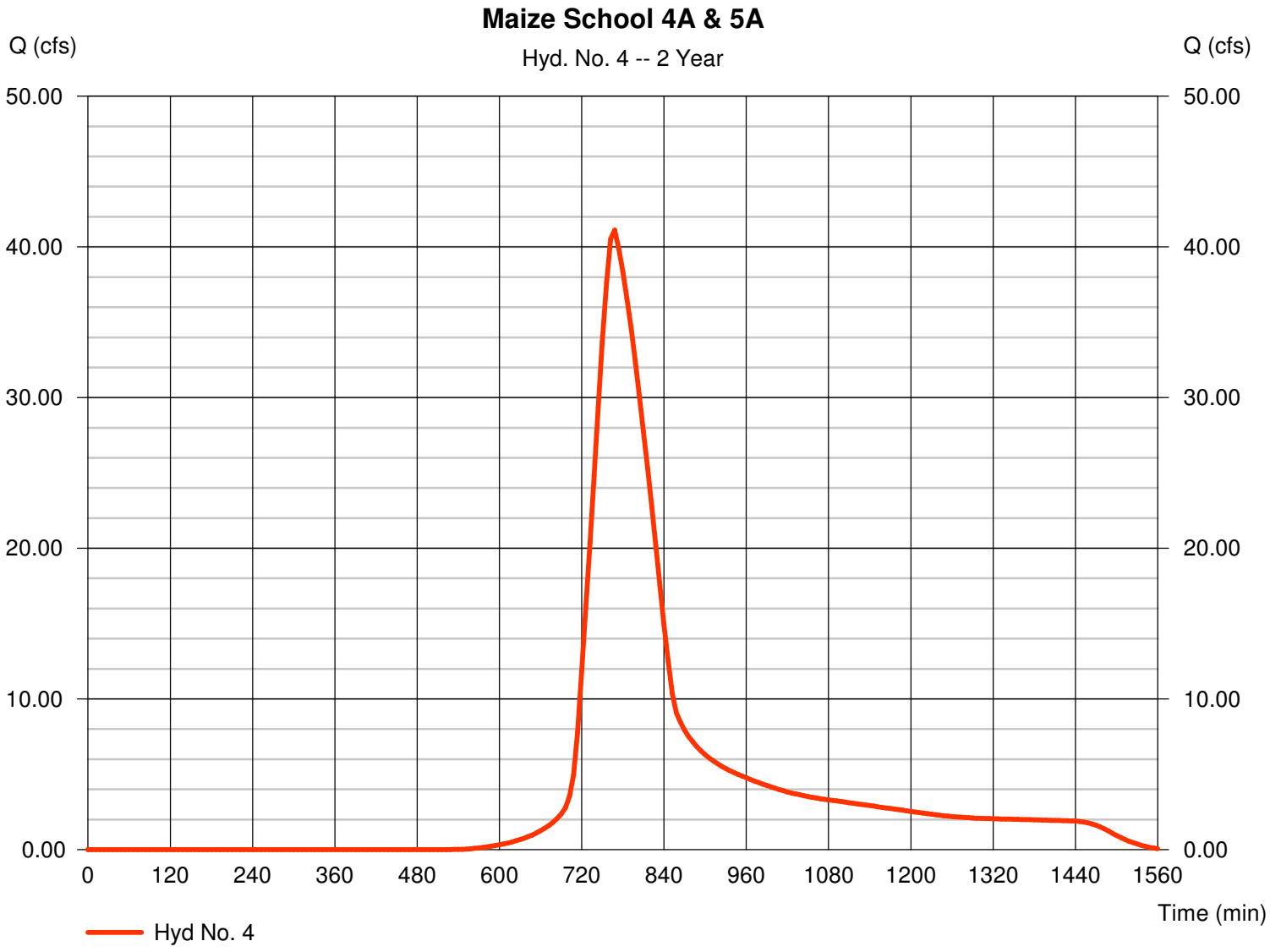


Hydrograph Report

Hyd. No. 4

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.11 cfs
Storm frequency	=	2 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	8.325 acft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

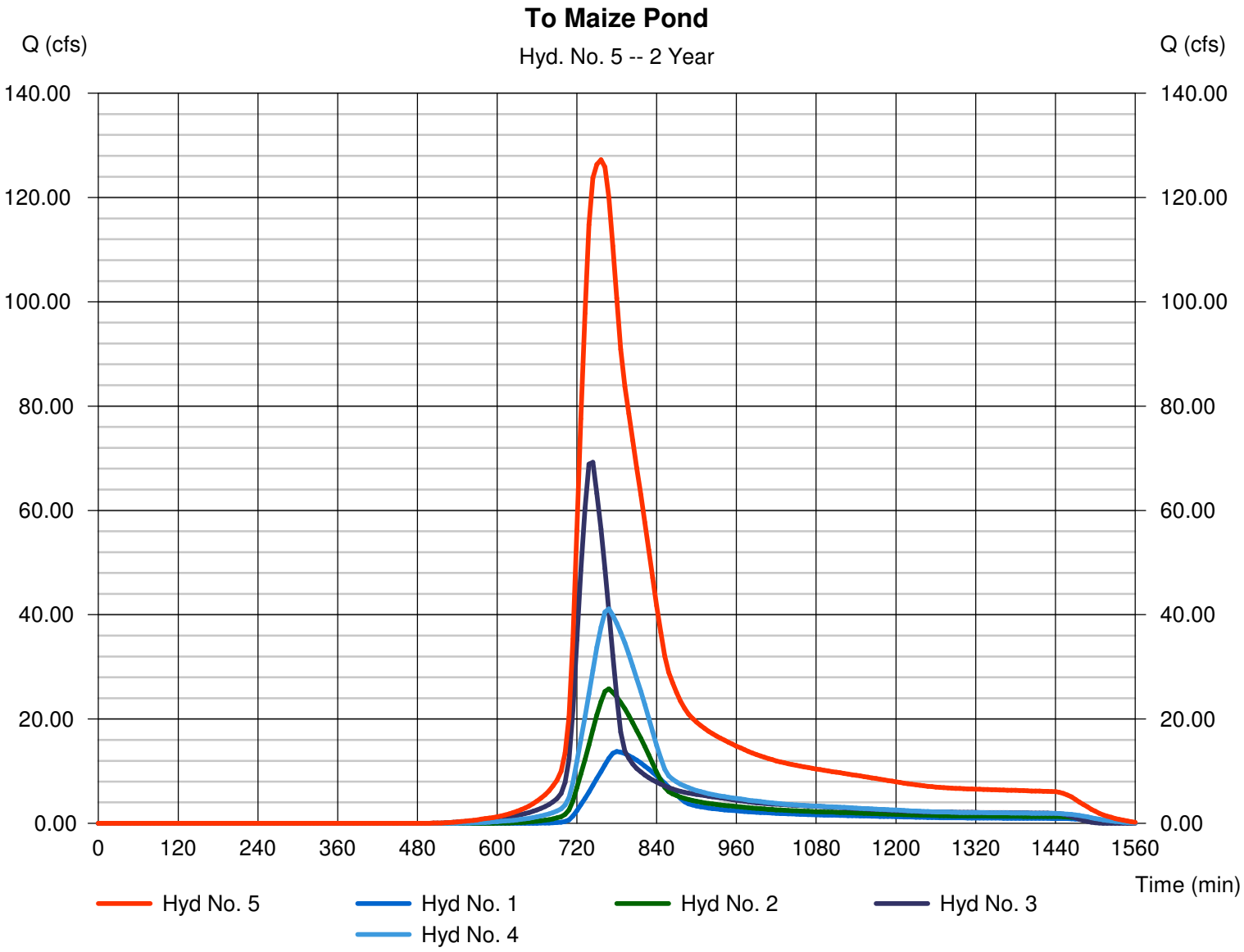


Hydrograph Report

Hyd. No. 5

To Maize Pond

Hydrograph type	= Combine	Peak discharge	= 127.26 cfs
Storm frequency	= 2 yrs	Time to peak	= 756 min
Time interval	= 6 min	Hyd. volume	= 26.023 acft
Inflow hyds.	= 1, 2, 3, 4	Contrib. drain. area	= 193.620 ac



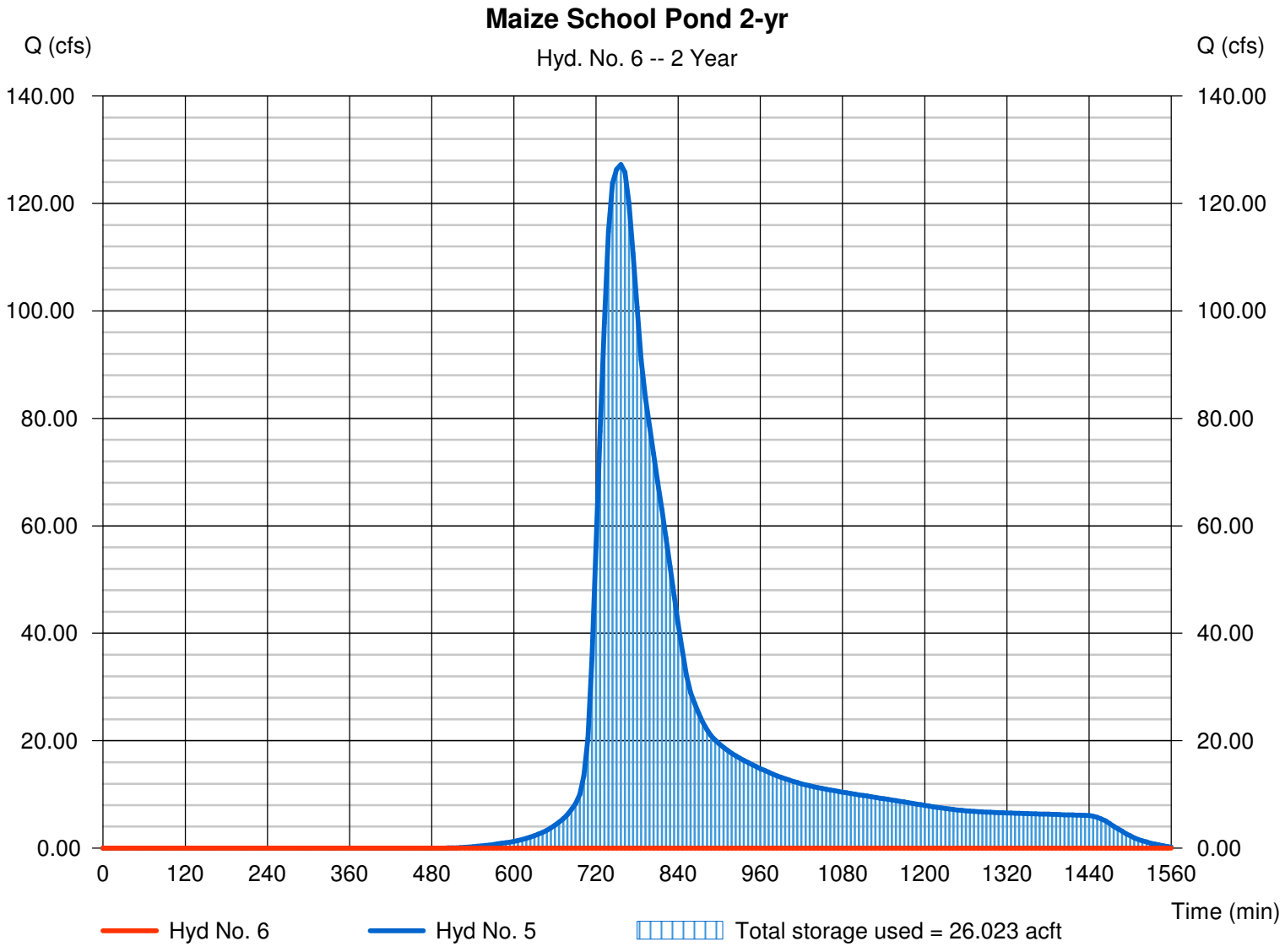
Hydrograph Report

Hyd. No. 6

Maize School Pond 2-yr

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0.000 acft
Inflow hyd. No.	=	5 - To Maize Pond	Max. Elevation	=	1349.80 ft
Reservoir name	=	Maize Combined Pond 2-YR	Max. Storage	=	26.023 acft

Storage Indication method used.



Pond No. 7 - Maize Combined Pond 2-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1347.50	47,337	0.000	0.000
0.50	1348.00	363,399	2.073	2.073
1.50	1349.00	645,319	11.424	13.497
2.50	1350.00	723,264	15.699	29.196
3.50	1351.00	788,357	17.344	46.540
4.50	1352.00	821,610	18.477	65.016
5.50	1353.00	854,198	19.233	84.249

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

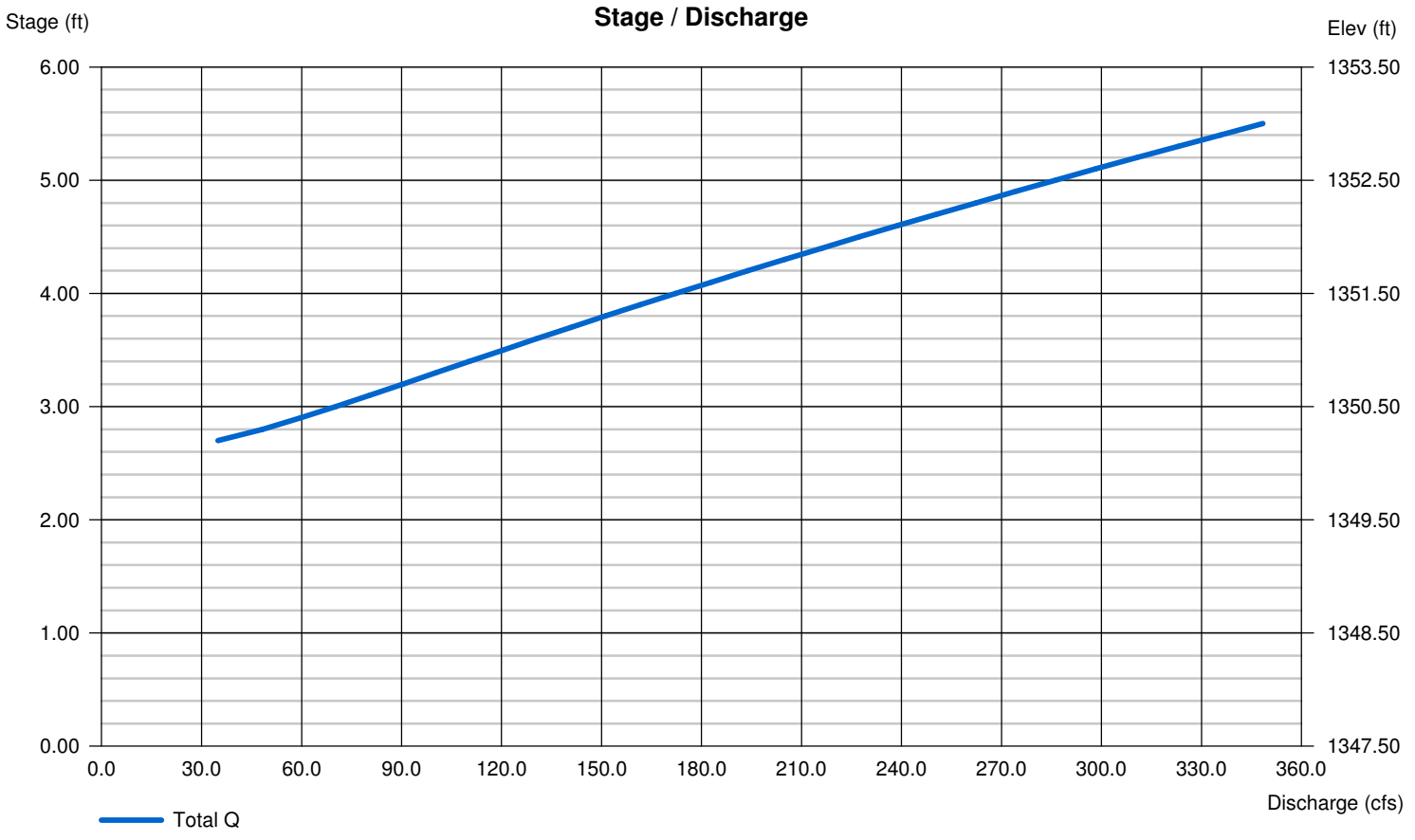
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1350.10

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

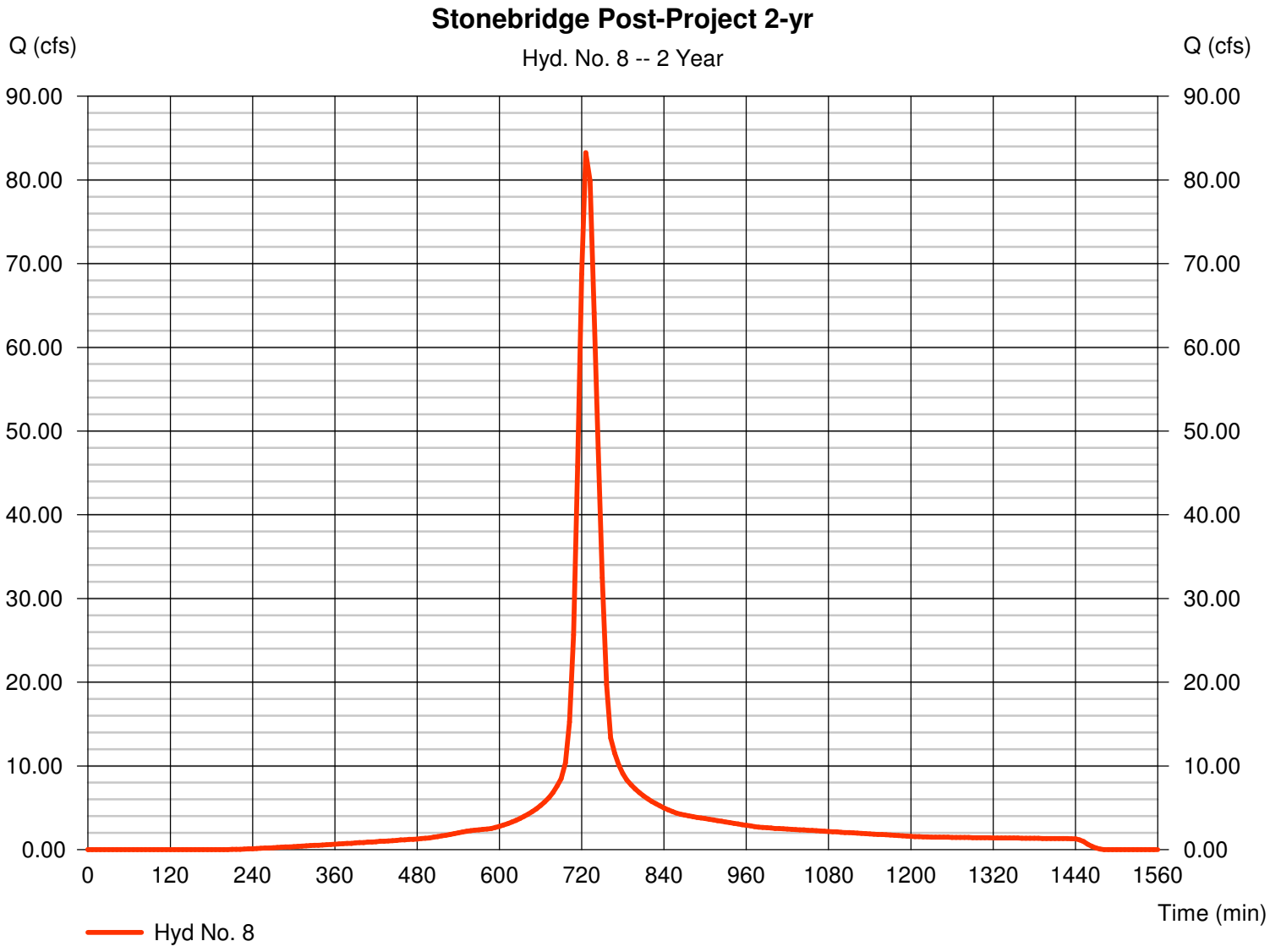


Hydrograph Report

Hyd. No. 8

Stonebridge Post-Project 2-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	83.25 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	7.963 acft
Drainage area	=	33.930 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	23.20 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

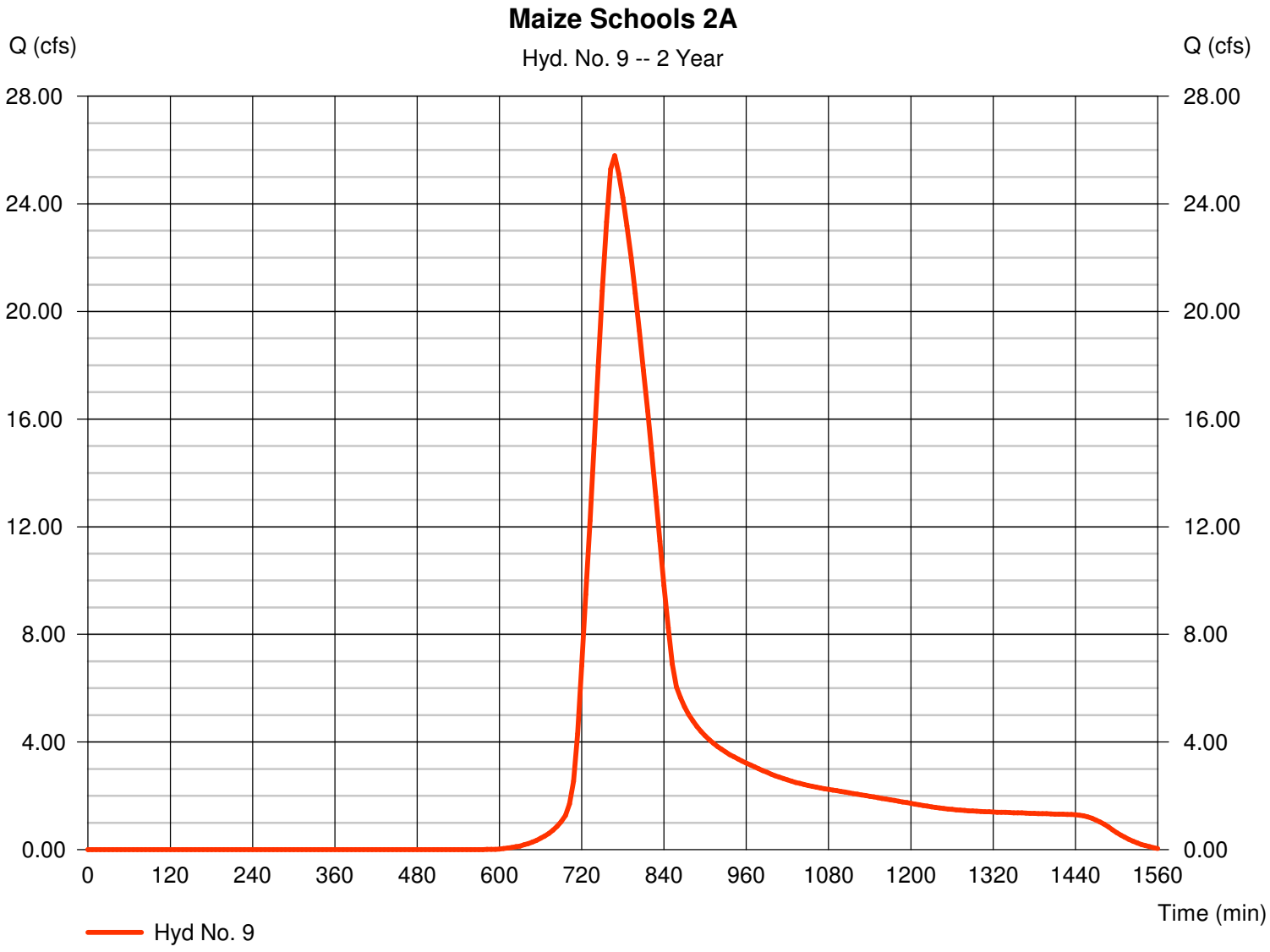


Hydrograph Report

Hyd. No. 9

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.79 cfs
Storm frequency	=	2 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	5.311 acft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

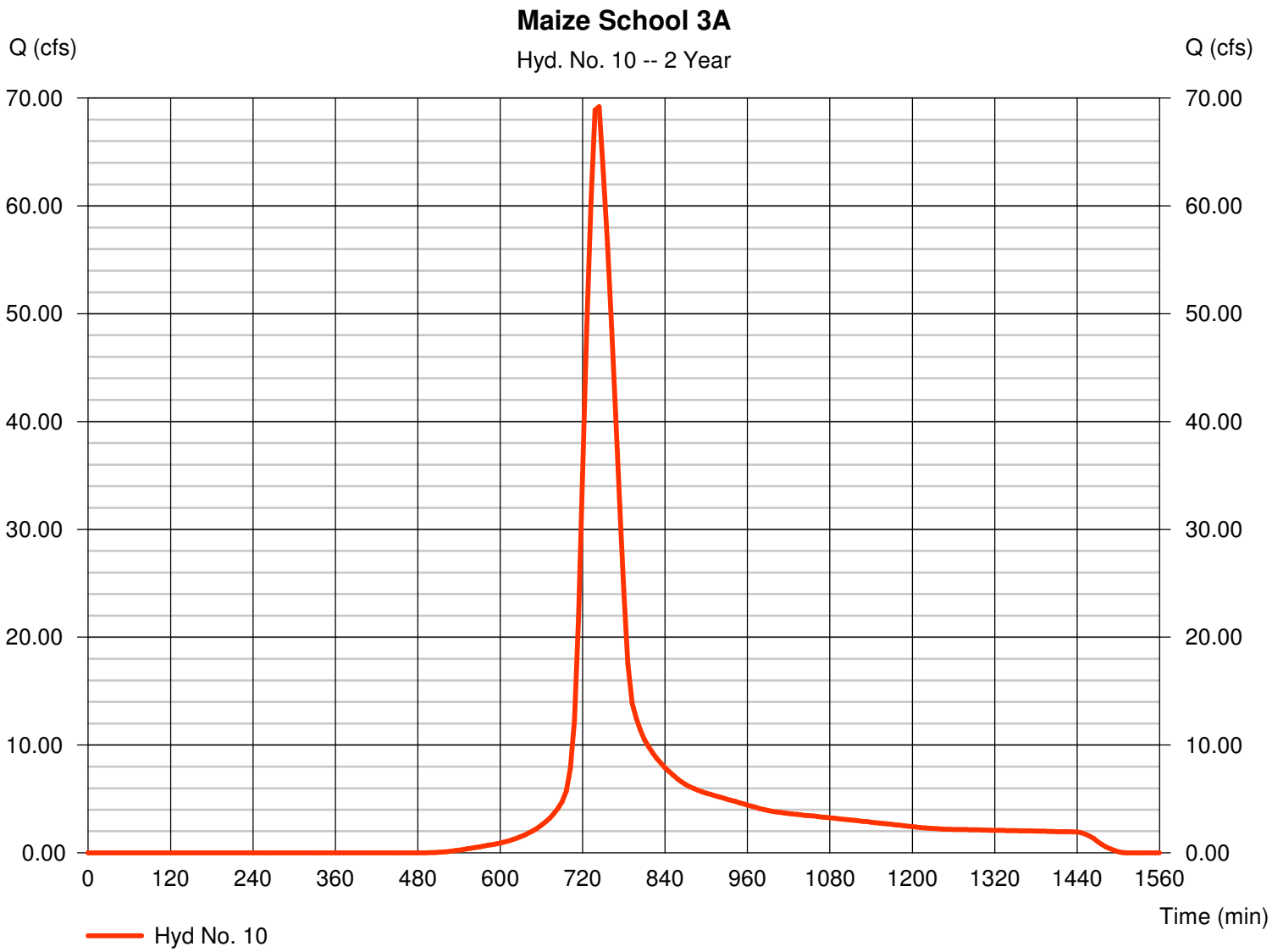


Hydrograph Report

Hyd. No. 10

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	69.22 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	8.959 acft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

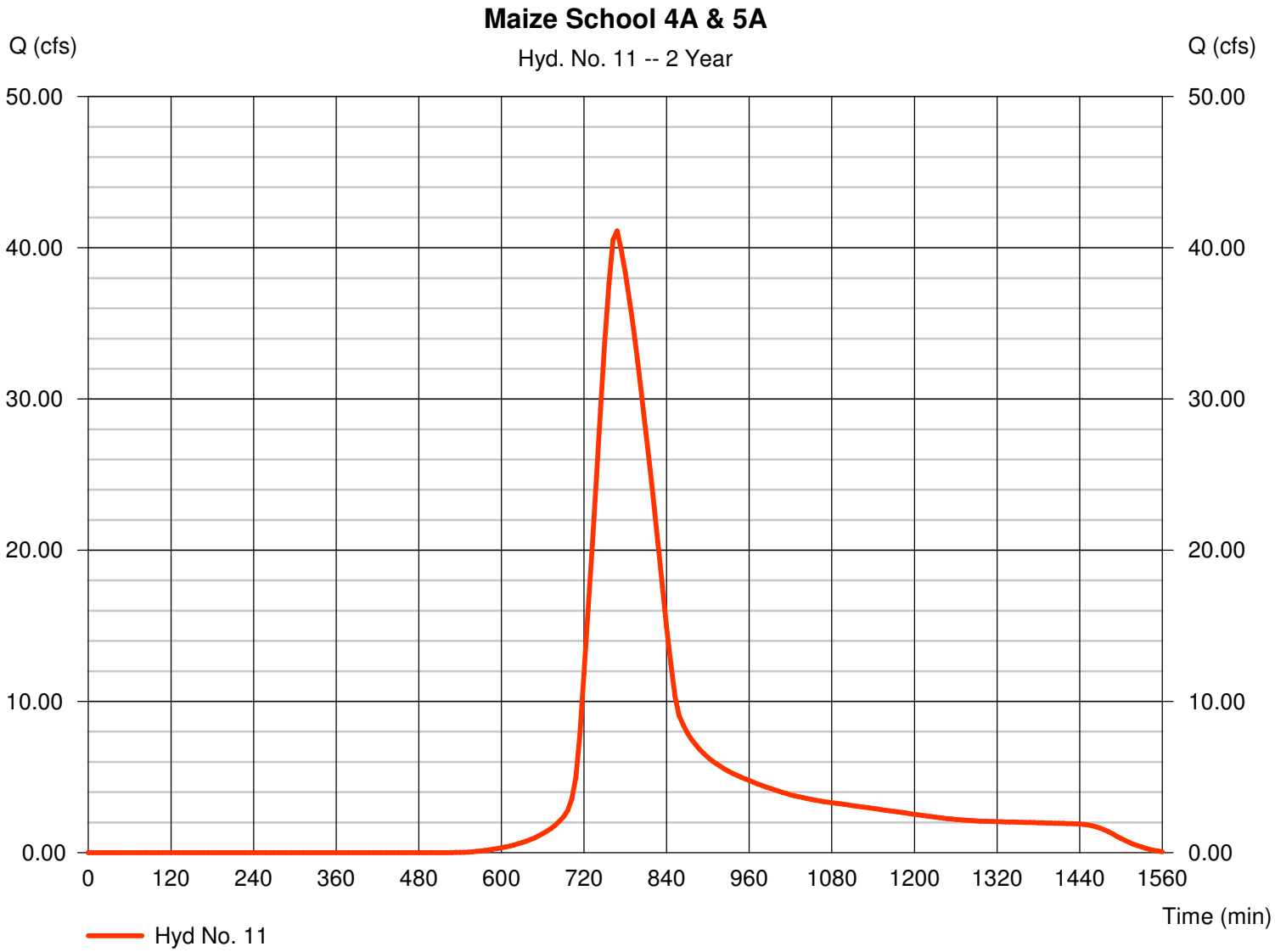


Hydrograph Report

Hyd. No. 11

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.11 cfs
Storm frequency	=	2 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	8.325 acft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

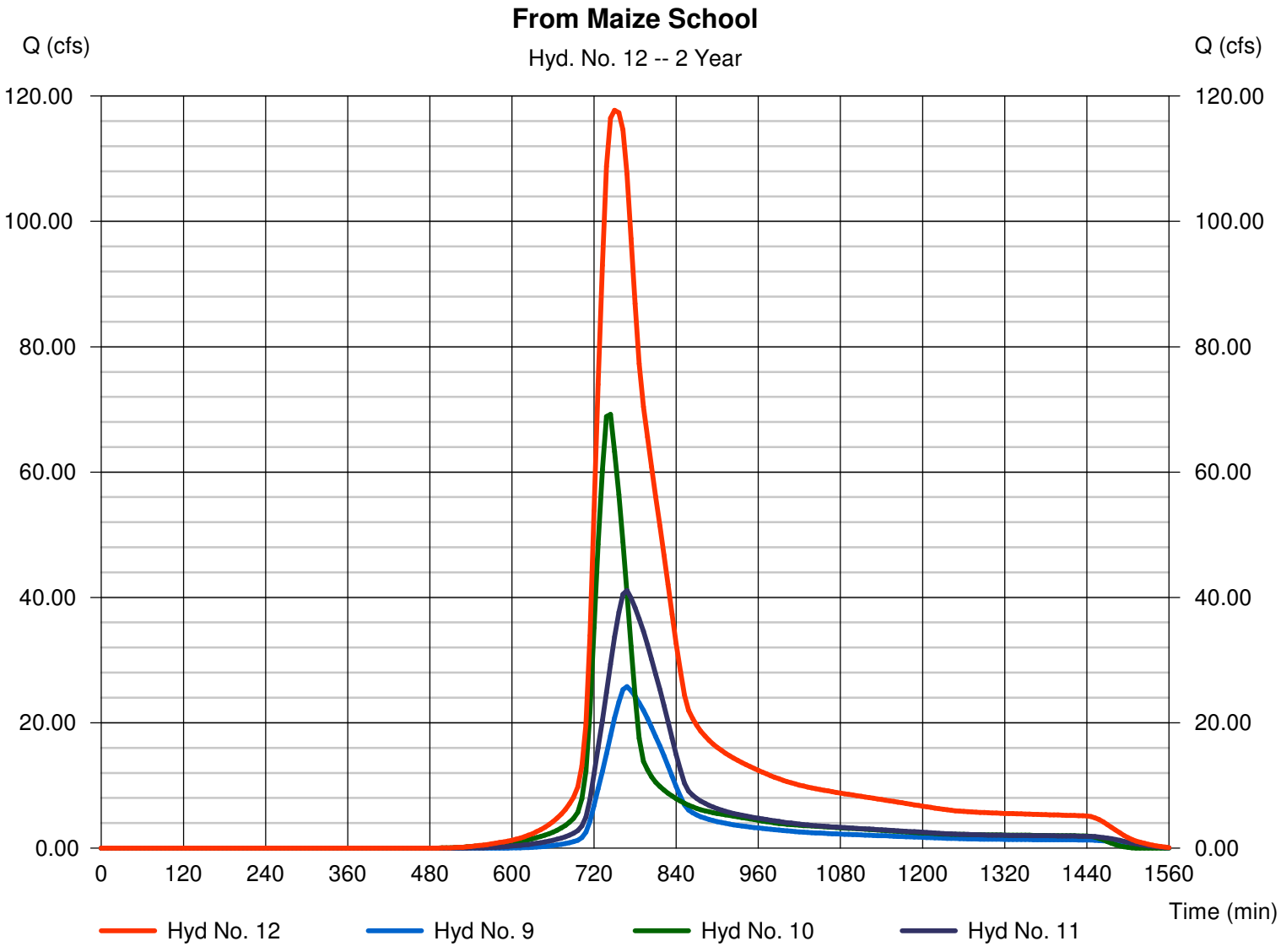


Hydrograph Report

Hyd. No. 12

From Maize School

Hydrograph type	= Combine	Peak discharge	= 117.72 cfs
Storm frequency	= 2 yrs	Time to peak	= 750 min
Time interval	= 6 min	Hyd. volume	= 22.596 acft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 159.690 ac



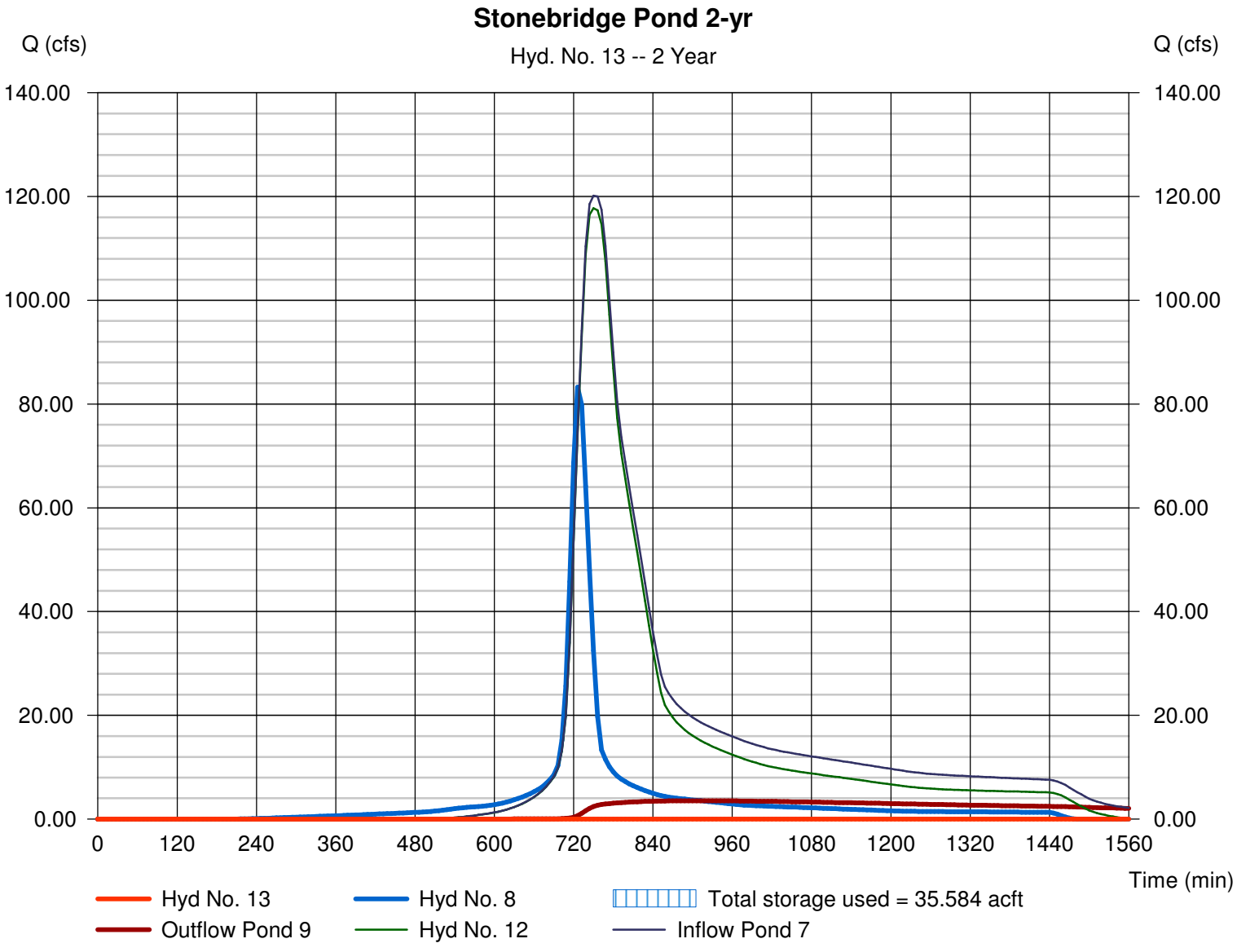
Hydrograph Report

Hyd. No. 13

Stonebridge Pond 2-yr

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0.000 acft
Upper Pond			**Lower Pond**		
Pond name	=	Stonebridge Pond 2	Pond name	=	Maize Combined Pond
Inflow hyd.	=	8 - Stonebridge Post-Project 2-yr	Other Inflow hyd.	=	12 - From Maize
Max. Elevation	=	1350.81 ft	Max. Elevation	=	1350.04 ft
Max. Storage	=	5.725 acft	Max. Storage	=	29.859 acft

Interconnected Pond Routing. Storage Indication method used.



Pond Report

Pond No. 9 - Stonebridge Pond 2

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1349.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1349.00	130,142	0.000	0.000
1.00	1350.00	138,111	3.079	3.079
2.00	1351.00	146,180	3.263	6.342
2.50	1351.50	150,200	1.701	8.043
3.00	1352.00	154,349	1.748	9.791
4.00	1353.00	162,619	3.638	13.429

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

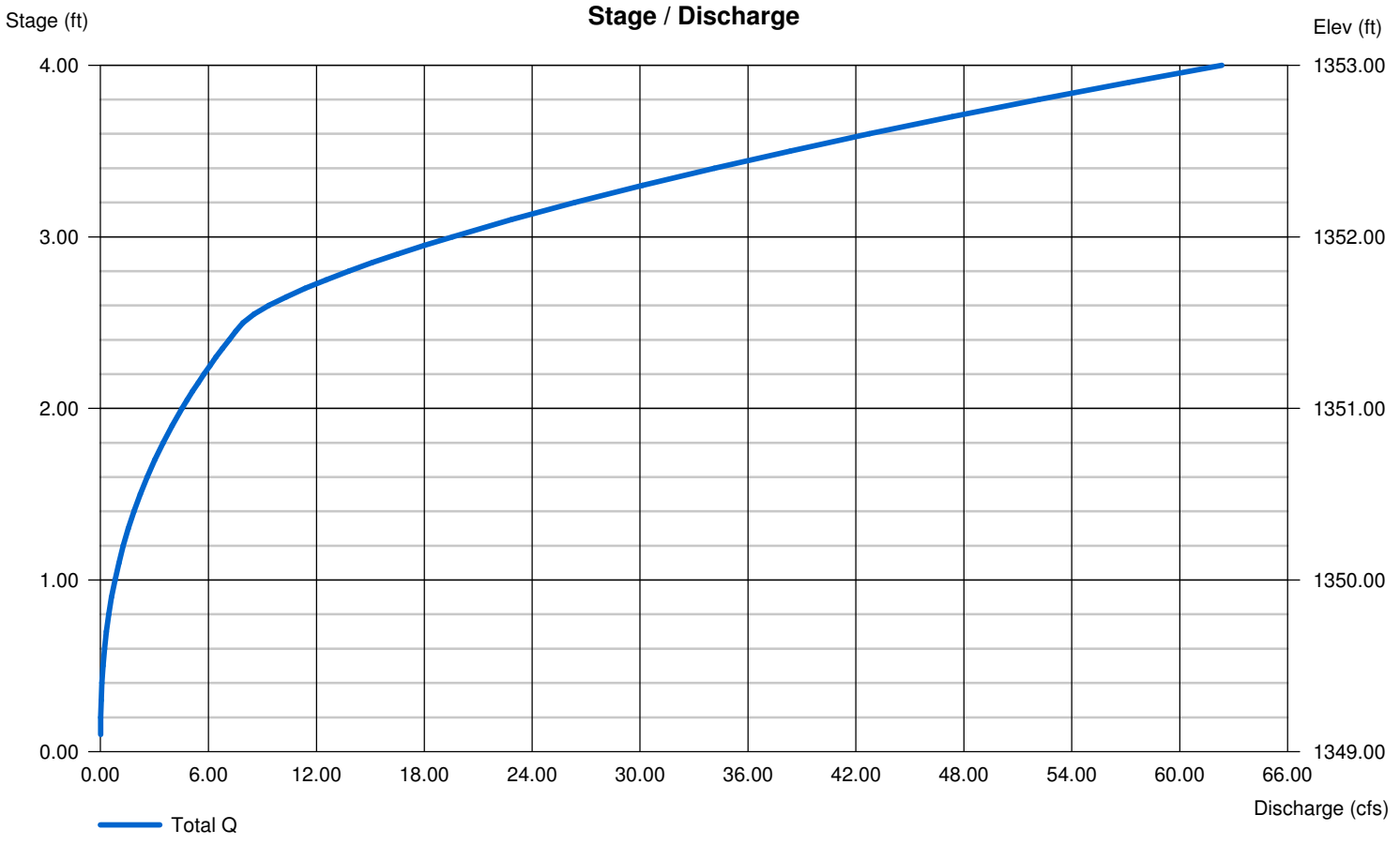
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	6.00	0.00	0.00
Crest El. (ft)	= 1349.00	1351.50	0.00	0.00
Weir Coeff.	= 0.80	3.33	3.33	3.33
Weir Type	= 35 degV	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond Report

Pond No. 7 - Maize Combined Pond 2-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1347.50	47,337	0.000	0.000
0.50	1348.00	363,399	2.073	2.073
1.50	1349.00	645,319	11.424	13.497
2.50	1350.00	723,264	15.699	29.196
3.50	1351.00	788,357	17.344	46.540
4.50	1352.00	821,610	18.477	65.016
5.50	1353.00	854,198	19.233	84.249

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

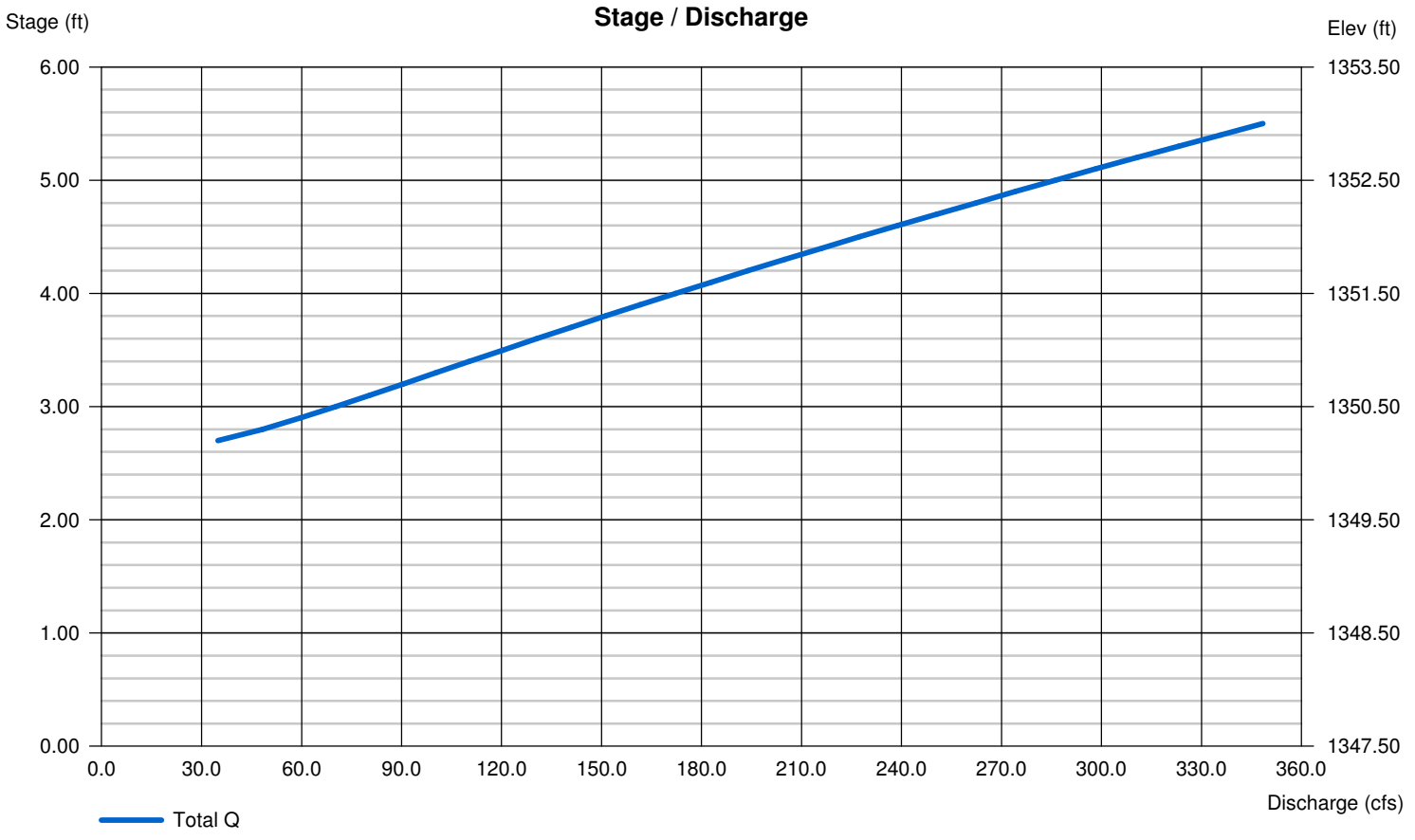
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

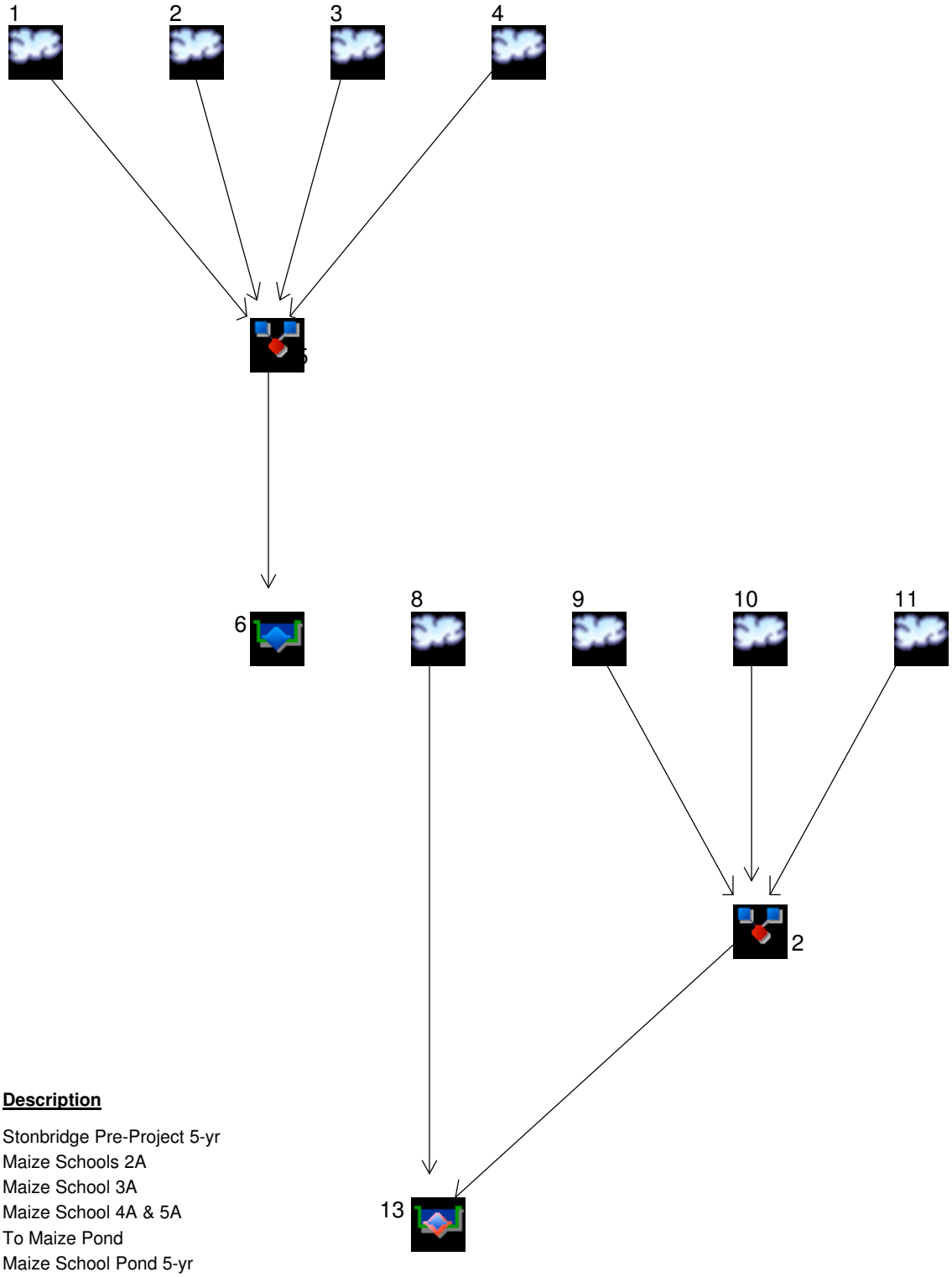
Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1350.10

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Stonbridge Pre-Project 5-yr
2	SCS Runoff	Maize Schools 2A
3	SCS Runoff	Maize School 3A
4	SCS Runoff	Maize School 4A & 5A
5	Combine	To Maize Pond
6	Reservoir	Maize School Pond 5-yr
8	SCS Runoff	Stonebridge Post-Project 5-yr
9	SCS Runoff	Maize Schools 2A
10	SCS Runoff	Maize School 3A
11	SCS Runoff	Maize School 4A & 5A
12	Combine	From Maize School
13	Reservoir(i)	Stonebridge Pond 5-yr

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

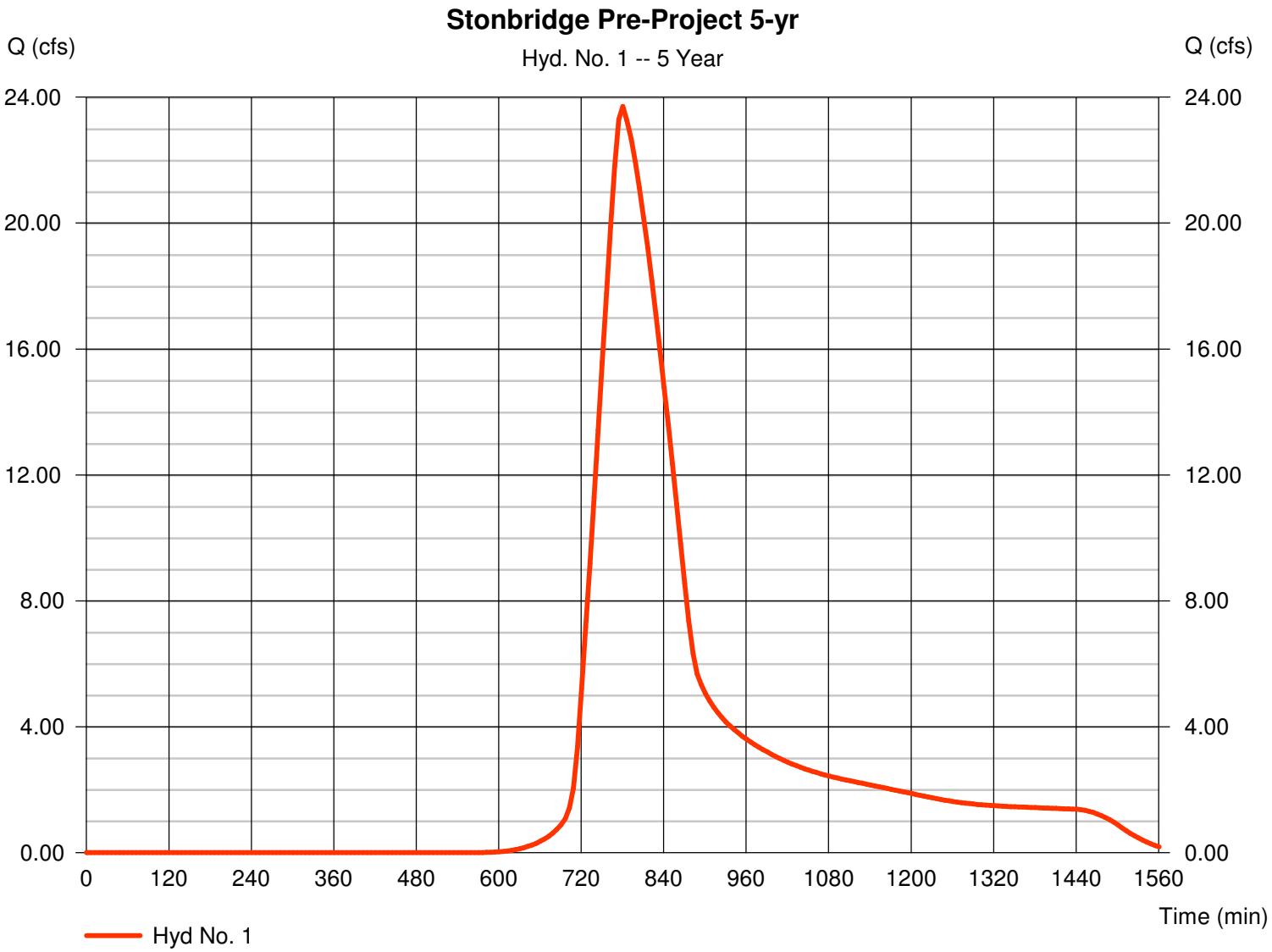
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	23.70	6	780	244,857	------	------	------	Stonbridge Pre-Project 5-yr
2	SCS Runoff	41.30	6	768	362,613	------	------	------	Maize Schools 2A
3	SCS Runoff	104.55	6	738	586,958	------	------	------	Maize School 3A
4	SCS Runoff	63.36	6	768	552,767	------	------	------	Maize School 4A & 5A
5	Combine	198.46	6	756	1,747,195	1, 2, 3, 4	------	------	To Maize Pond
6	Reservoir	14.03	6	1110	324,323	5	1350.24	1,451,346	Maize School Pond 5-yr
8	SCS Runoff	112.60	6	726	475,981	------	------	------	Stonebridge Post-Project 5-yr
9	SCS Runoff	41.30	6	768	362,613	------	------	------	Maize Schools 2A
10	SCS Runoff	104.55	6	738	586,958	------	------	------	Maize School 3A
11	SCS Runoff	63.36	6	768	552,767	------	------	------	Maize School 4A & 5A
12	Combine	181.84	6	750	1,502,339	9, 10, 11	------	------	From Maize School
13	Reservoir(i)	13.90	6	1200	392,872	8, 12	1351.44	1,793,010	Stonebridge Pond 5-yr

Hydrograph Report

Hyd. No. 1

Stonbridge Pre-Project 5-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.70 cfs
Storm frequency	=	5 yrs	Time to peak	=	780 min
Time interval	=	6 min	Hyd. volume	=	244,857 cuft
Drainage area	=	33.930 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	101.40 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

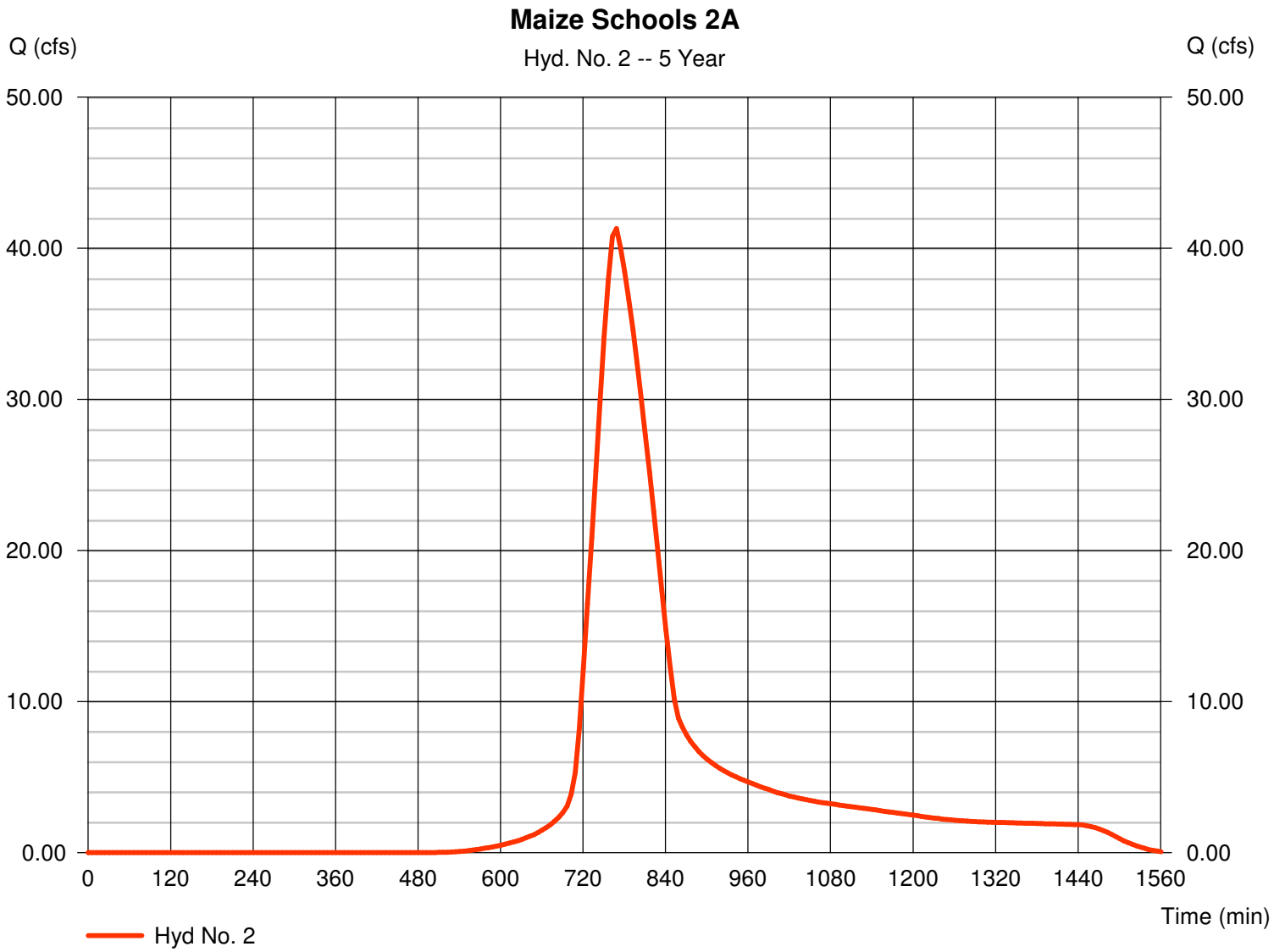


Hydrograph Report

Hyd. No. 2

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.30 cfs
Storm frequency	=	5 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	362,613 cuft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

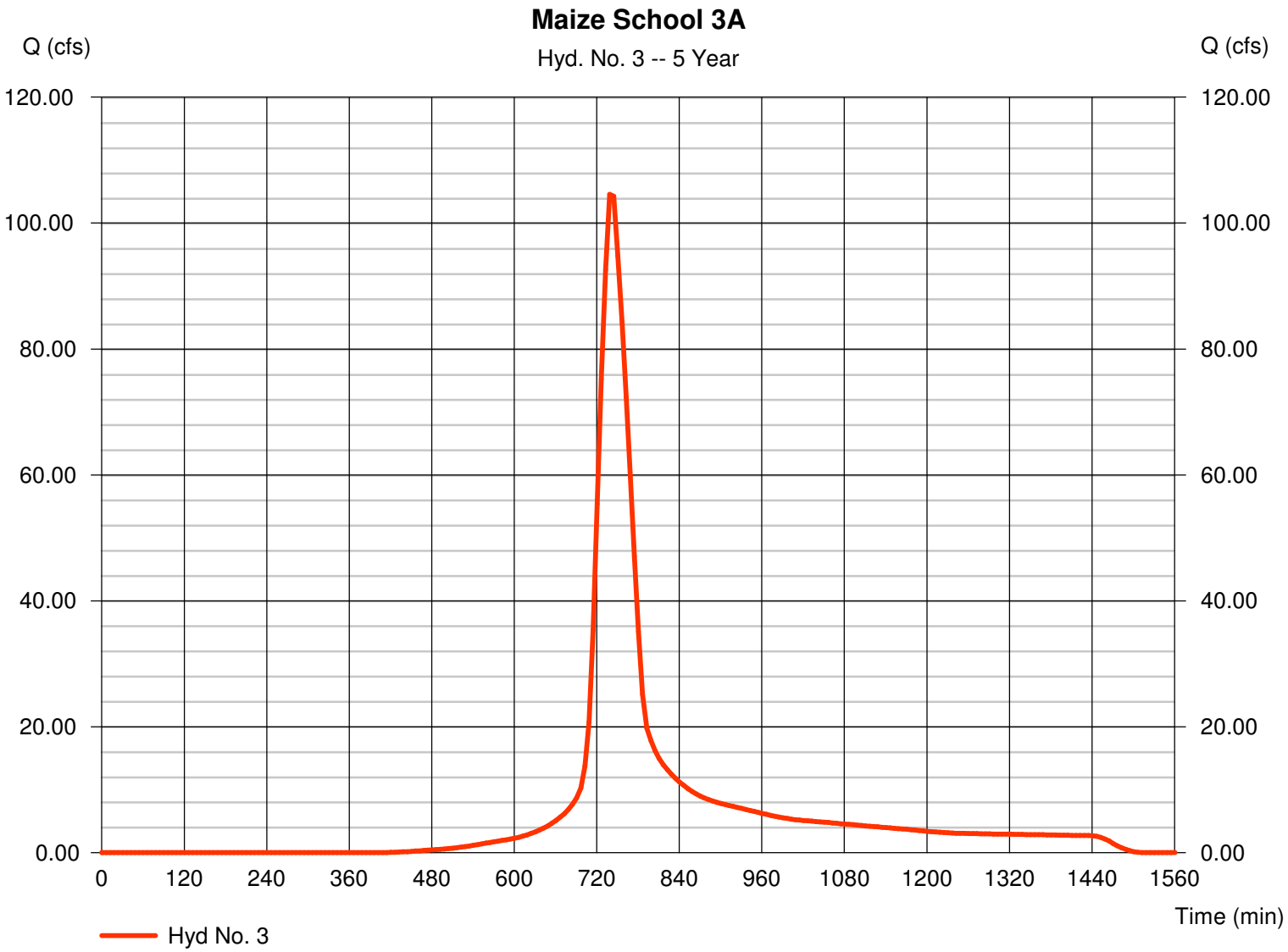


Hydrograph Report

Hyd. No. 3

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	104.55 cfs
Storm frequency	=	5 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	586,958 cuft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

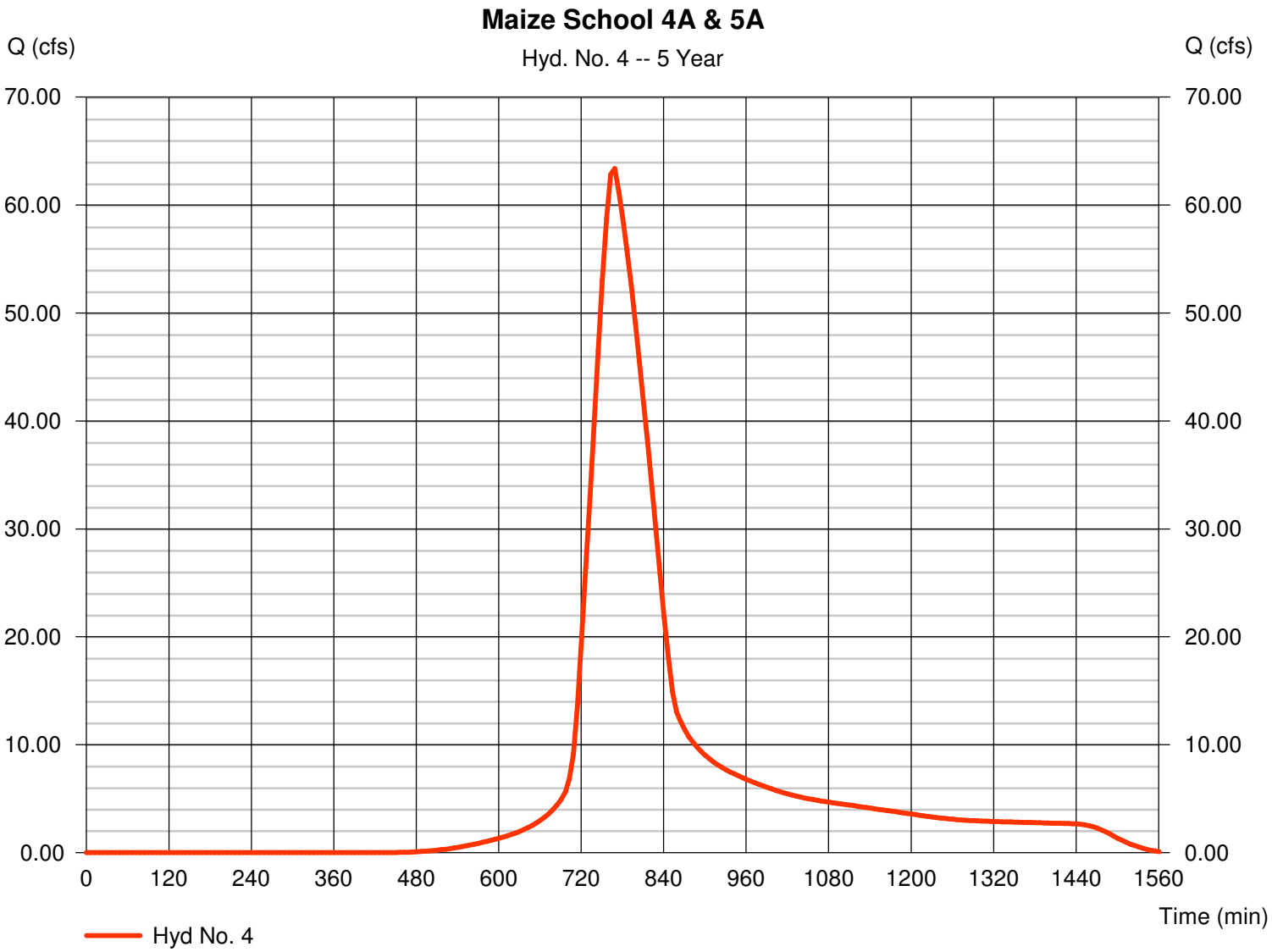


Hydrograph Report

Hyd. No. 4

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	63.36 cfs
Storm frequency	=	5 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	552,767 cuft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

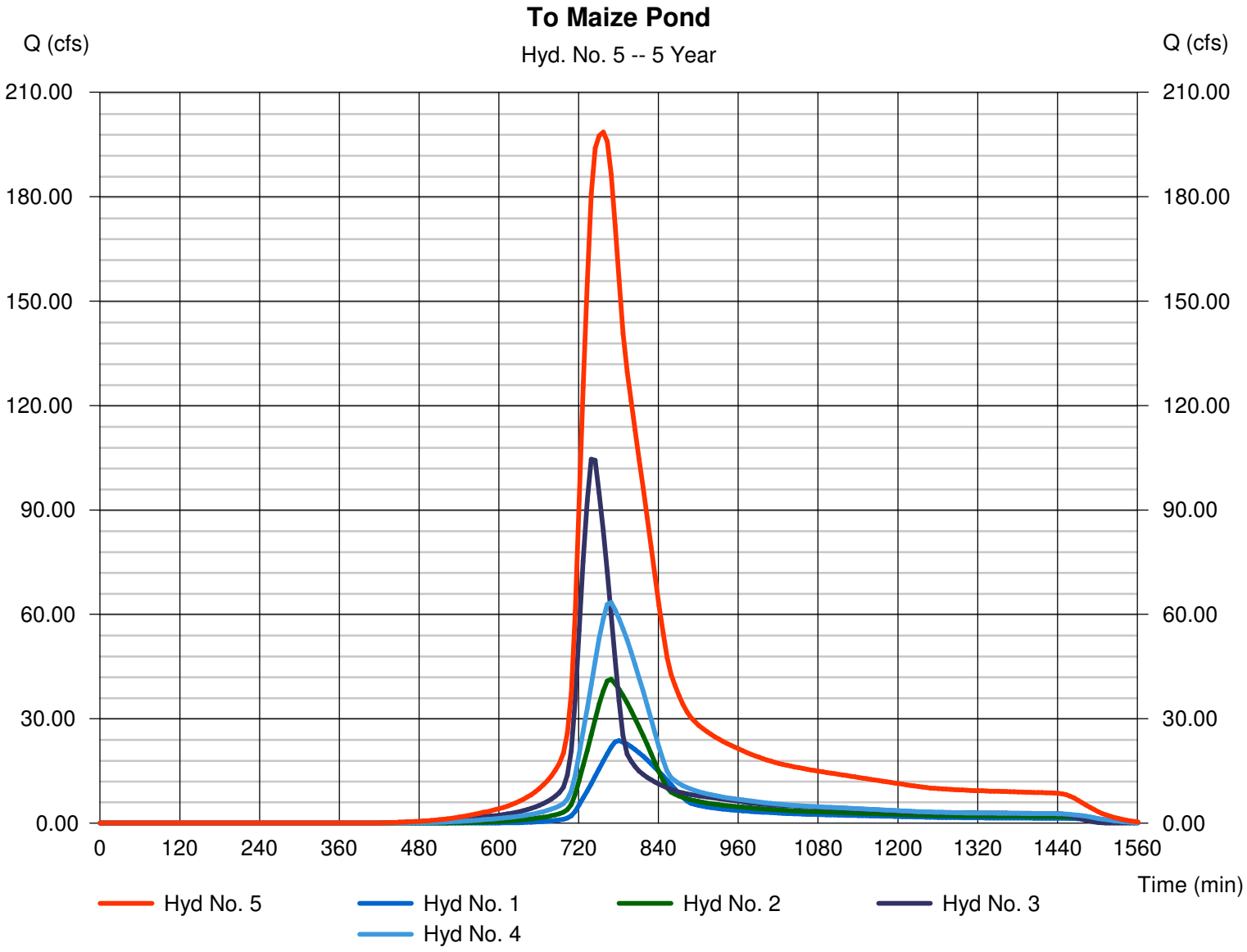


Hydrograph Report

Hyd. No. 5

To Maize Pond

Hydrograph type	= Combine	Peak discharge	= 198.46 cfs
Storm frequency	= 5 yrs	Time to peak	= 756 min
Time interval	= 6 min	Hyd. volume	= 1,747,195 cuft
Inflow hyds.	= 1, 2, 3, 4	Contrib. drain. area	= 193.620 ac



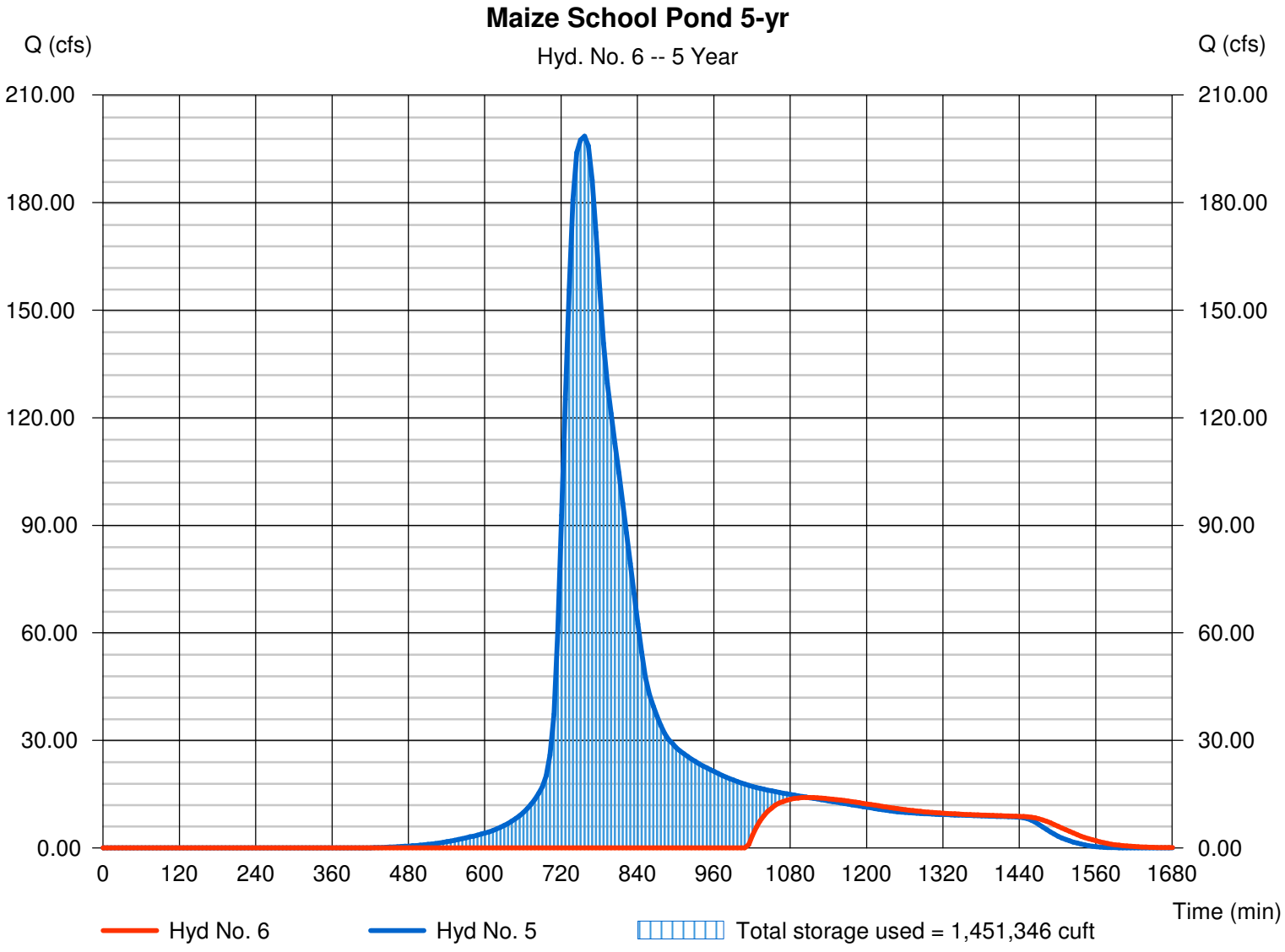
Hydrograph Report

Hyd. No. 6

Maize School Pond 5-yr

Hydrograph type	=	Reservoir	Peak discharge	=	14.03 cfs
Storm frequency	=	5 yrs	Time to peak	=	1110 min
Time interval	=	6 min	Hyd. volume	=	324,323 cuft
Inflow hyd. No.	=	5 - To Maize Pond	Max. Elevation	=	1350.24 ft
Reservoir name	=	Maize Combined Pond 5-YR	Max. Storage	=	1,451,346 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - Maize Combined Pond 5-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1347.50	47,337	0	0
0.50	1348.00	363,399	90,307	90,307
1.50	1349.00	645,319	497,610	587,916
2.50	1350.00	723,264	683,853	1,271,769
3.50	1351.00	788,357	755,501	2,027,270
4.50	1352.00	821,610	804,846	2,832,116
5.50	1353.00	854,198	837,768	3,669,884

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

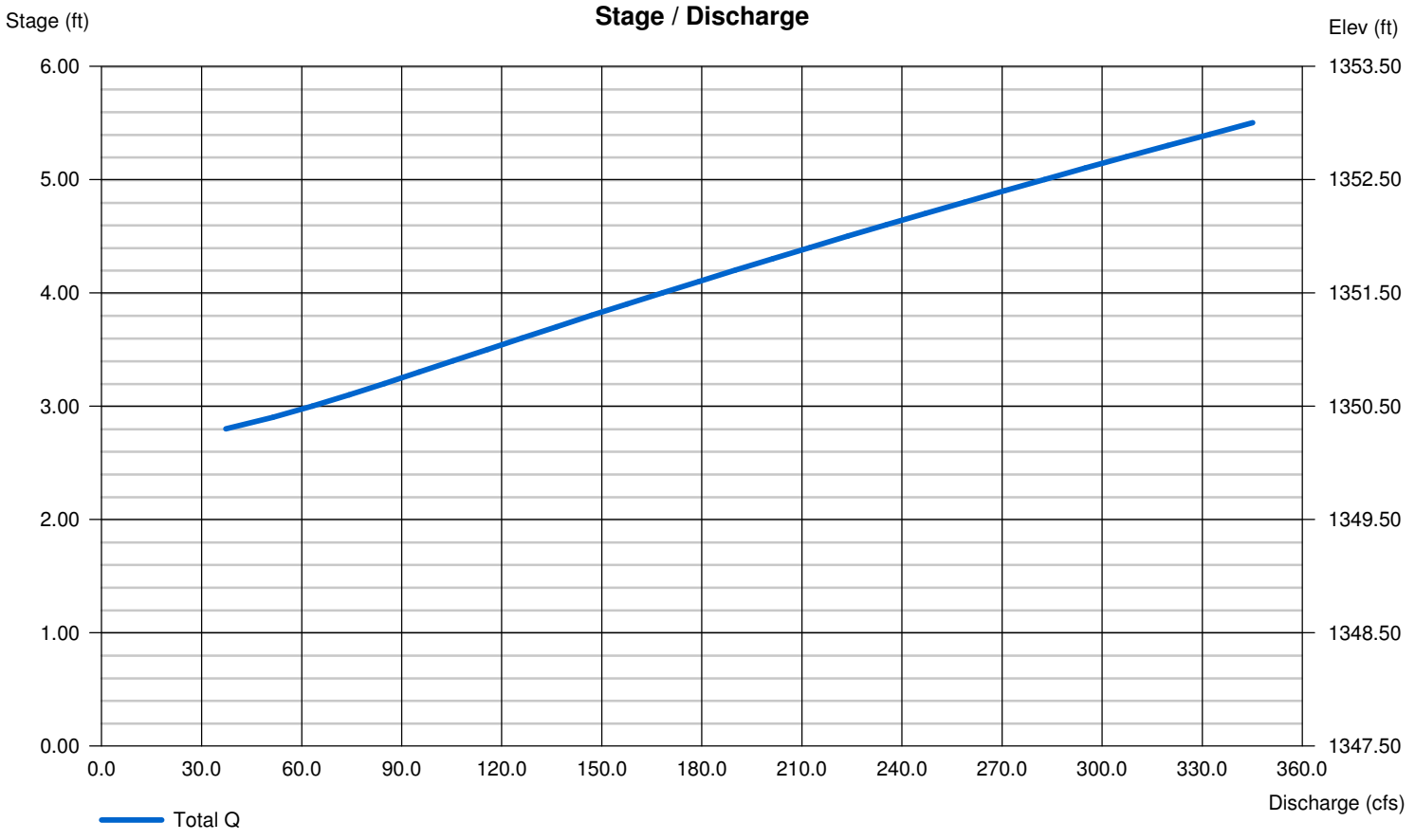
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1350.20

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

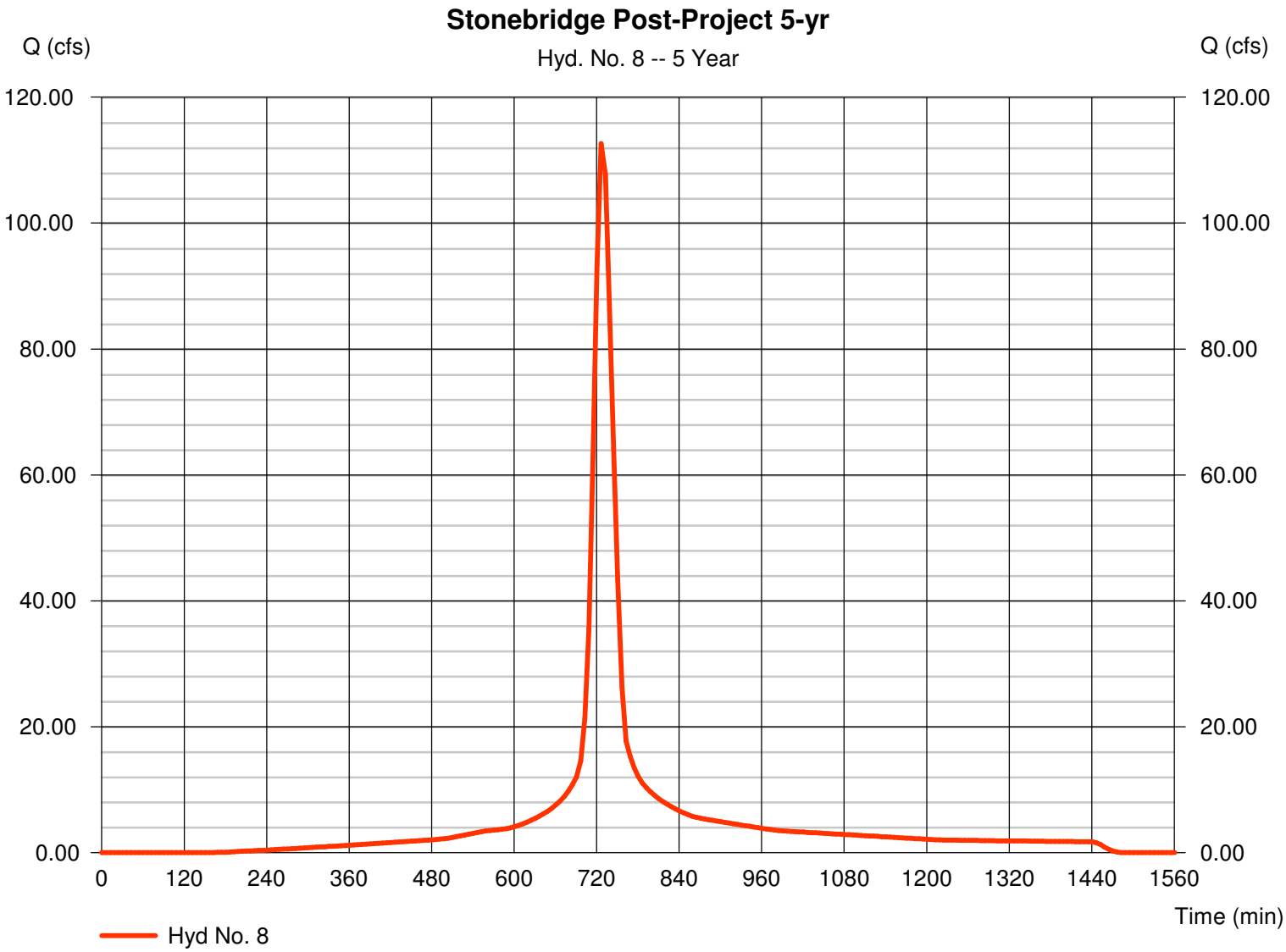


Hydrograph Report

Hyd. No. 8

Stonebridge Post-Project 5-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	112.60 cfs
Storm frequency	=	5 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	475,981 cuft
Drainage area	=	33.930 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	22.30 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

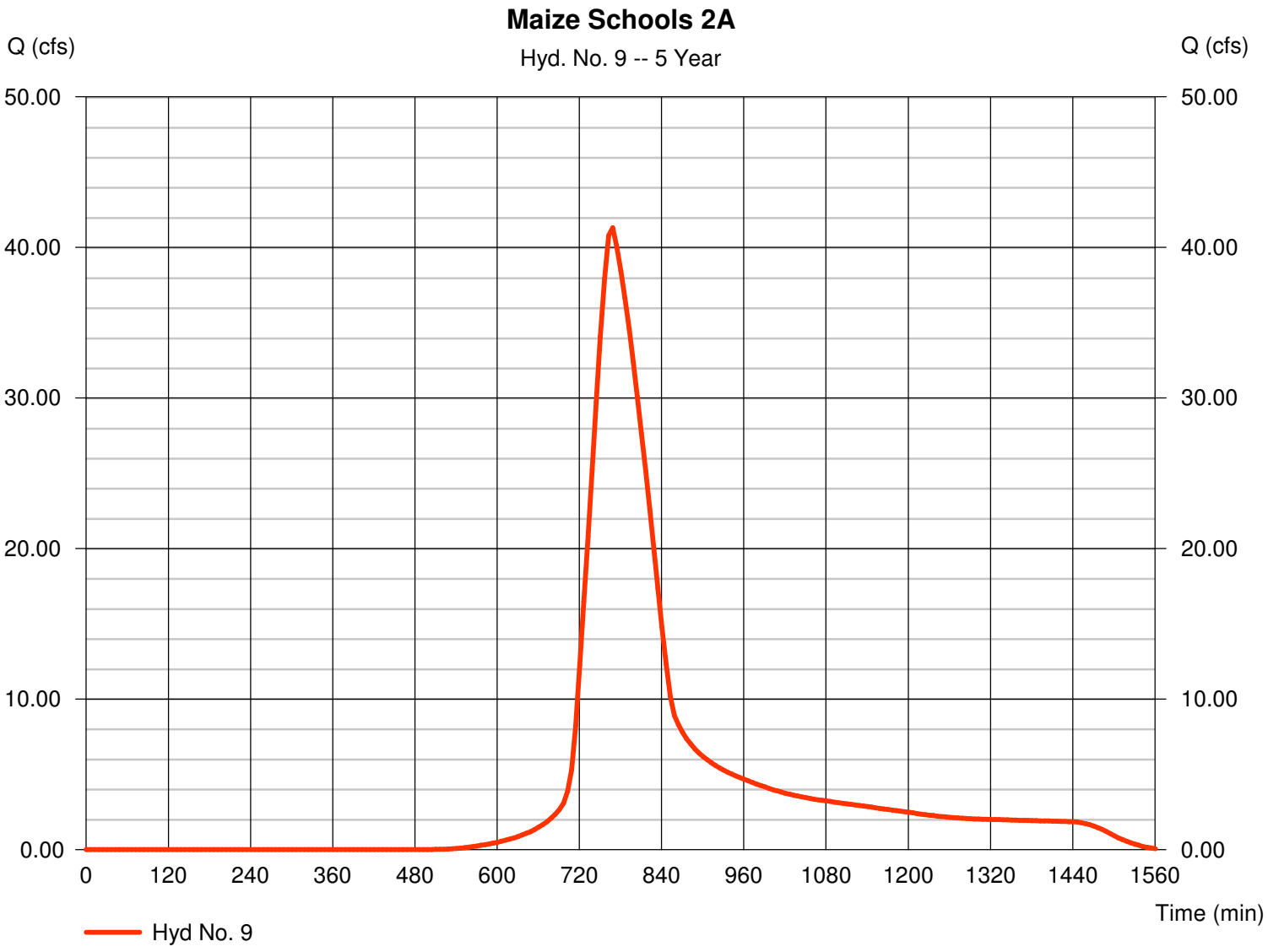


Hydrograph Report

Hyd. No. 9

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.30 cfs
Storm frequency	=	5 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	362,613 cuft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

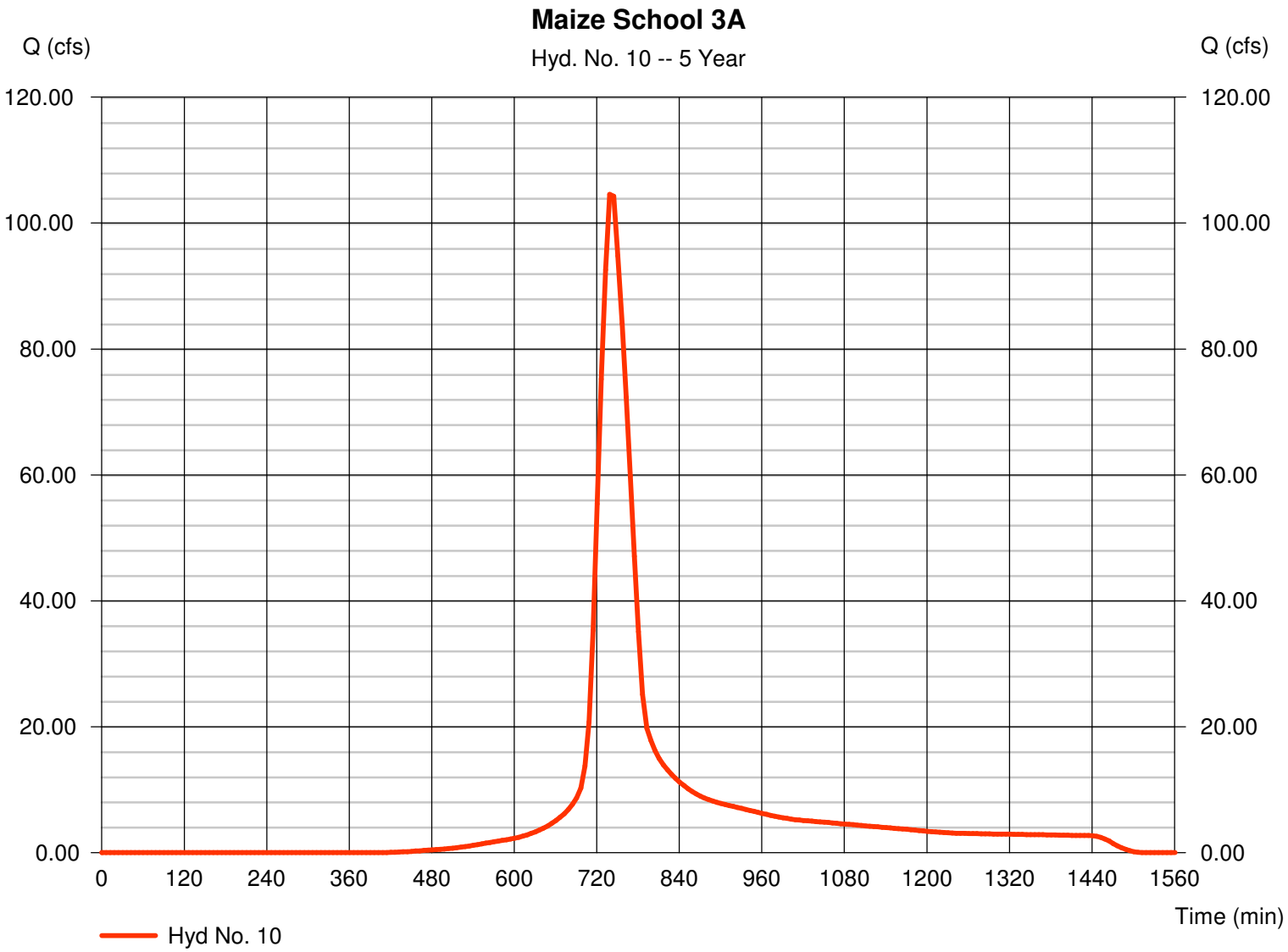


Hydrograph Report

Hyd. No. 10

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	104.55 cfs
Storm frequency	=	5 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	586,958 cuft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

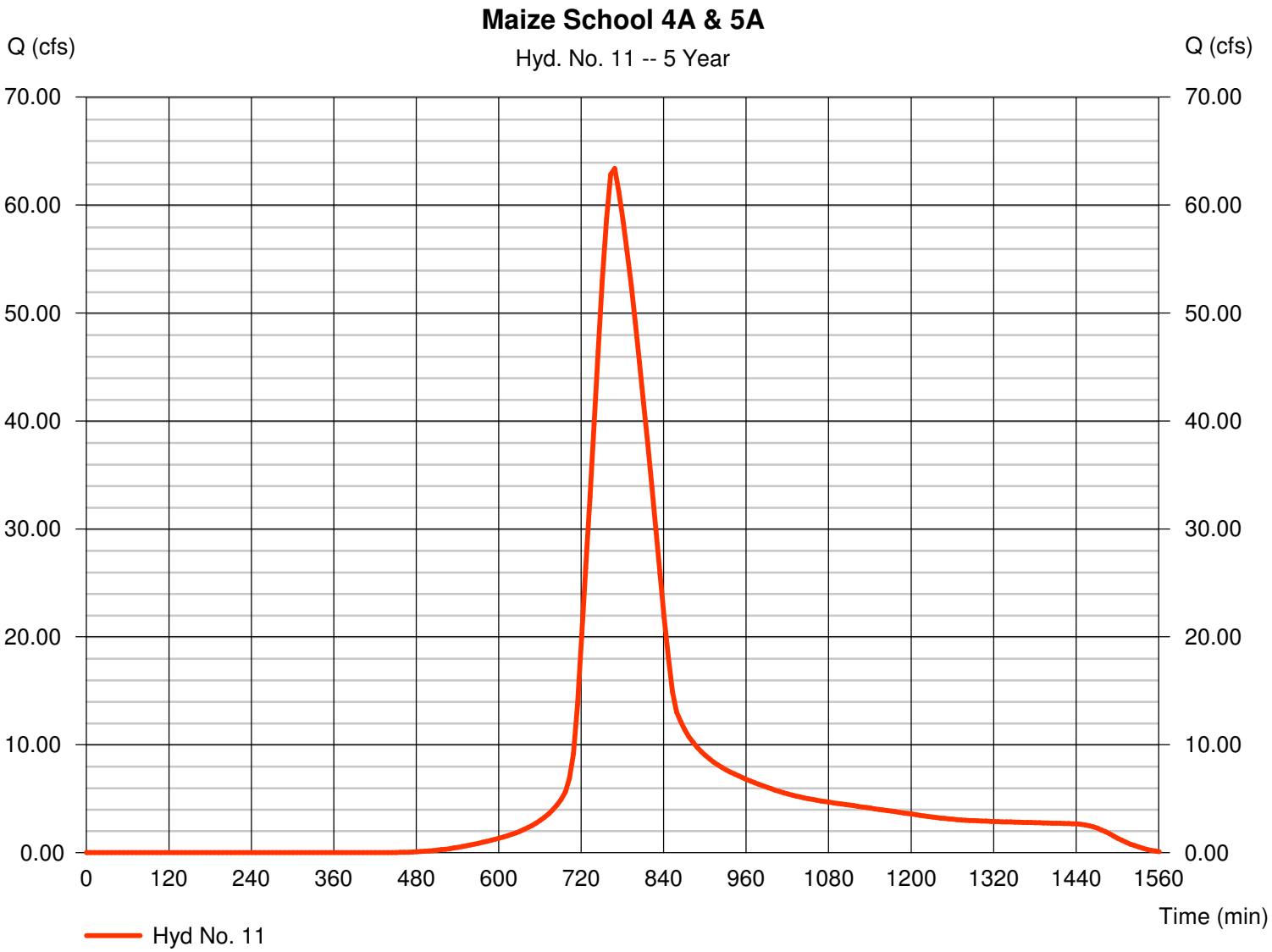


Hydrograph Report

Hyd. No. 11

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	63.36 cfs
Storm frequency	=	5 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	552,767 cuft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

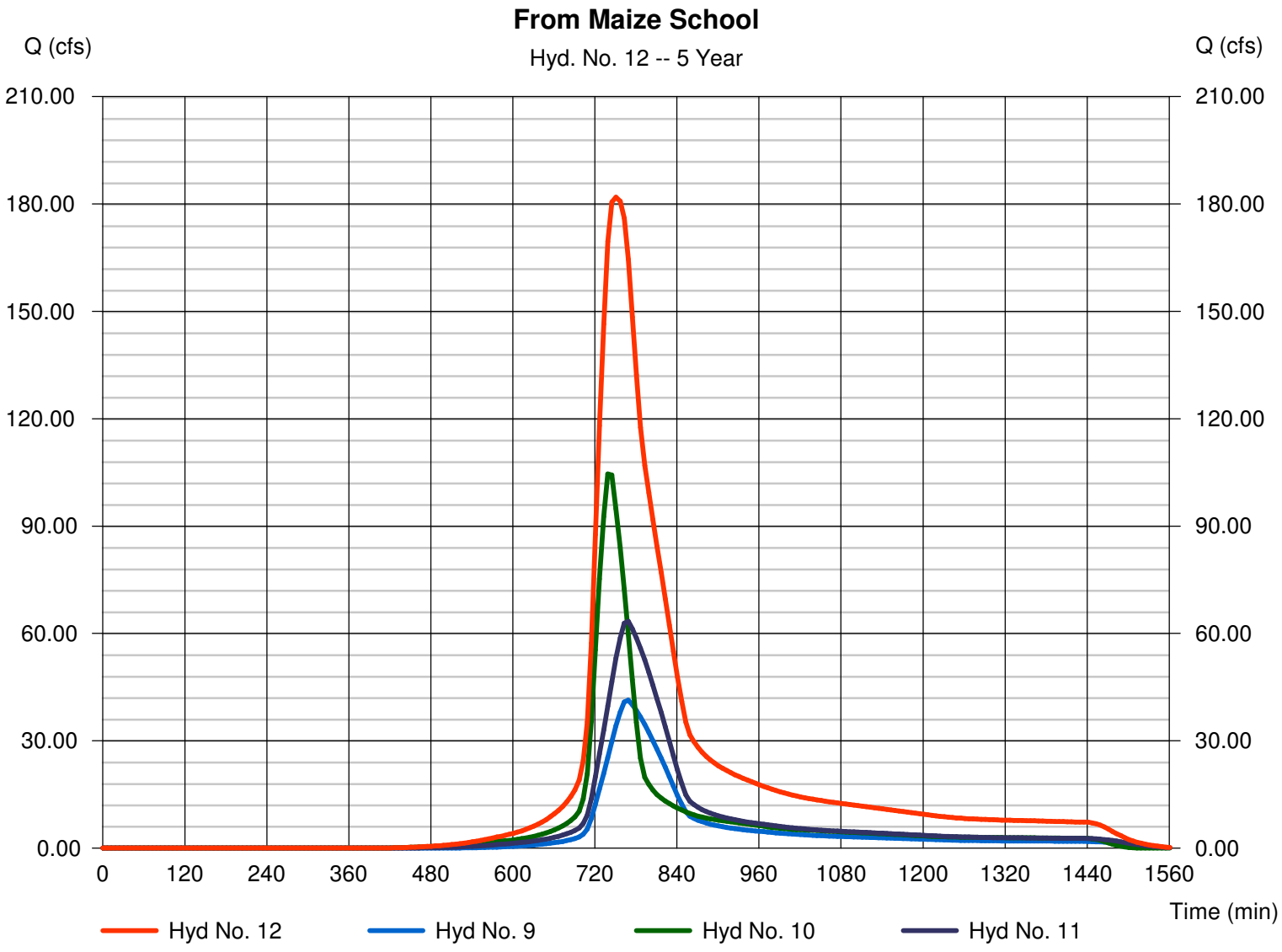


Hydrograph Report

Hyd. No. 12

From Maize School

Hydrograph type	= Combine	Peak discharge	= 181.84 cfs
Storm frequency	= 5 yrs	Time to peak	= 750 min
Time interval	= 6 min	Hyd. volume	= 1,502,339 cuft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 159.690 ac



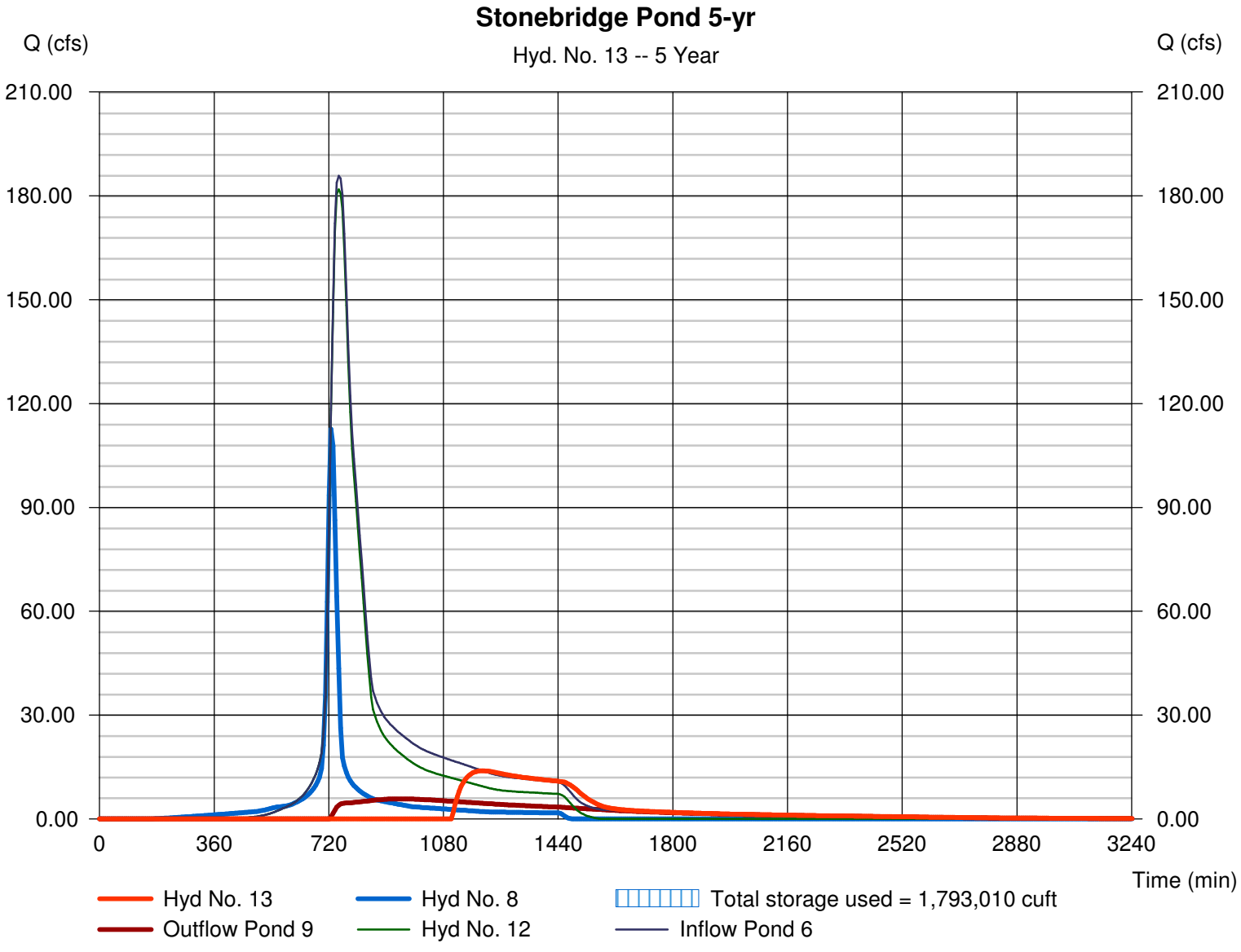
Hydrograph Report

Hyd. No. 13

Stonebridge Pond 5-yr

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	13.90 cfs
Storm frequency	=	5 yrs	Time to peak	=	1200 min
Time interval	=	6 min	Hyd. volume	=	392,872 cuft
Upper Pond			**Lower Pond**		
Pond name	=	Stonebridge Pond 2	Pond name	=	Maize Combined Pond
Inflow hyd.	=	8 - Stonebridge Post-Project 5-yr	Other Inflow hyd.	=	12 - From Maize
Max. Elevation	=	1351.44 ft	Max. Elevation	=	1350.24 ft
Max. Storage	=	341,920 cuft	Max. Storage	=	1,451,091 cuft

Interconnected Pond Routing. Storage Indication method used.



Pond Report

Pond No. 9 - Stonebridge Pond 2

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1349.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1349.00	130,142	0	0
1.00	1350.00	138,111	134,127	134,127
2.00	1351.00	146,180	142,146	276,272
2.50	1351.50	150,200	74,095	350,367
3.00	1352.00	154,349	76,137	426,504
4.00	1353.00	162,619	158,484	584,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

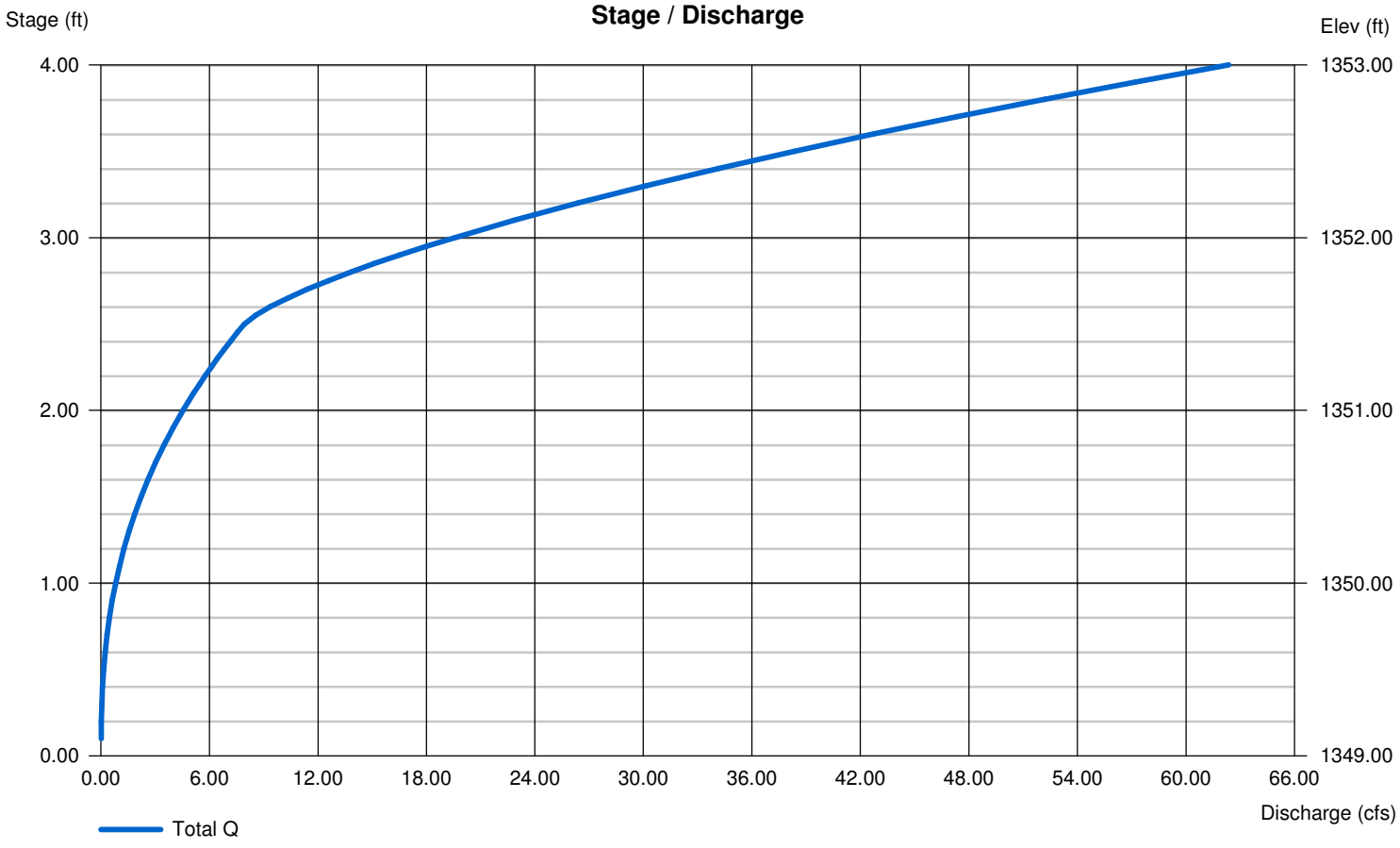
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	6.00	0.00	0.00
Crest El. (ft)	= 1349.00	1351.50	0.00	0.00
Weir Coeff.	= 0.80	3.33	3.33	3.33
Weir Type	= 35 degV	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond Report

Pond No. 6 - Maize Combined Pond 5-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1347.50	47,337	0	0
0.50	1348.00	363,399	90,307	90,307
1.50	1349.00	645,319	497,610	587,916
2.50	1350.00	723,264	683,853	1,271,769
3.50	1351.00	788,357	755,501	2,027,270
4.50	1352.00	821,610	804,846	2,832,116
5.50	1353.00	854,198	837,768	3,669,884

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

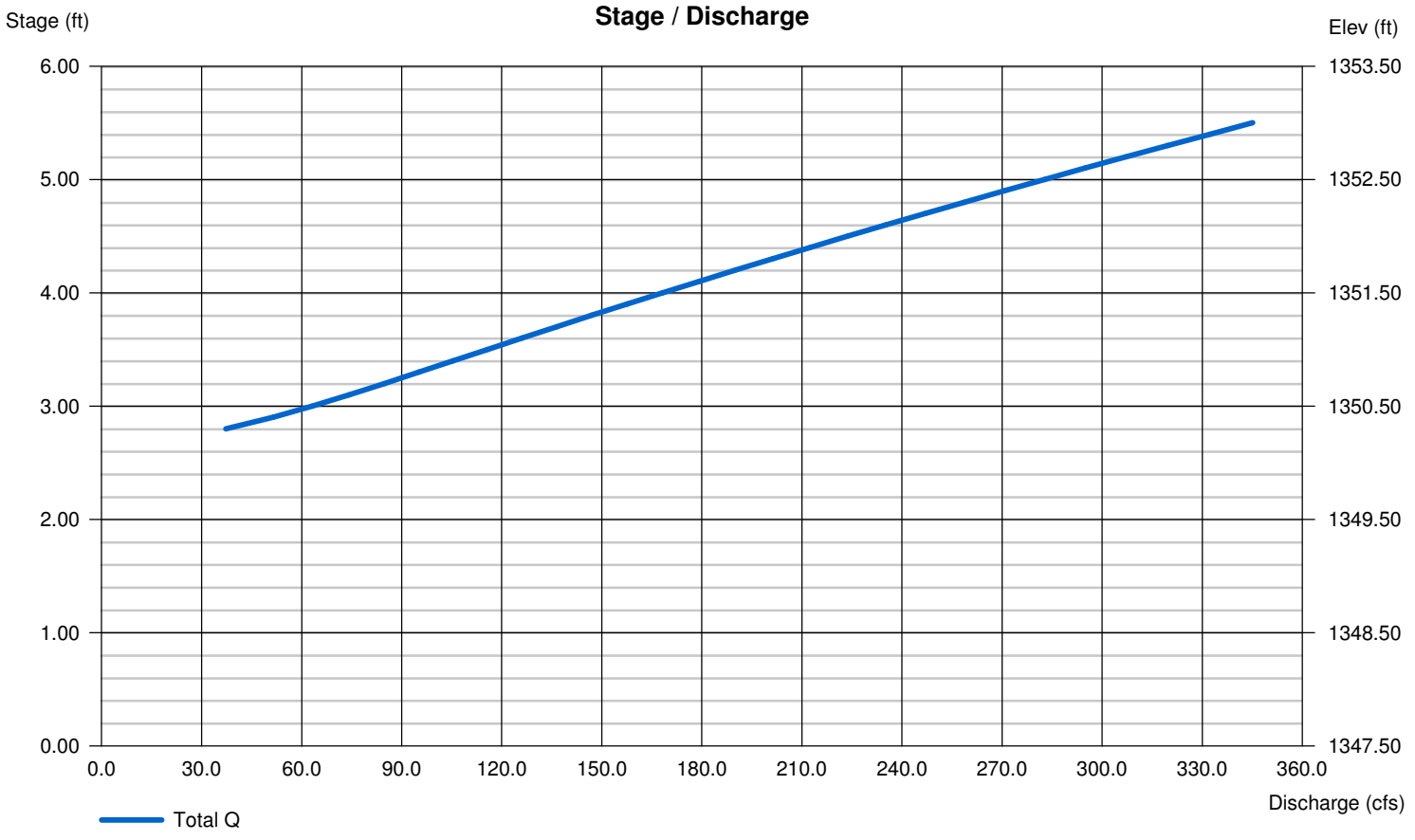
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

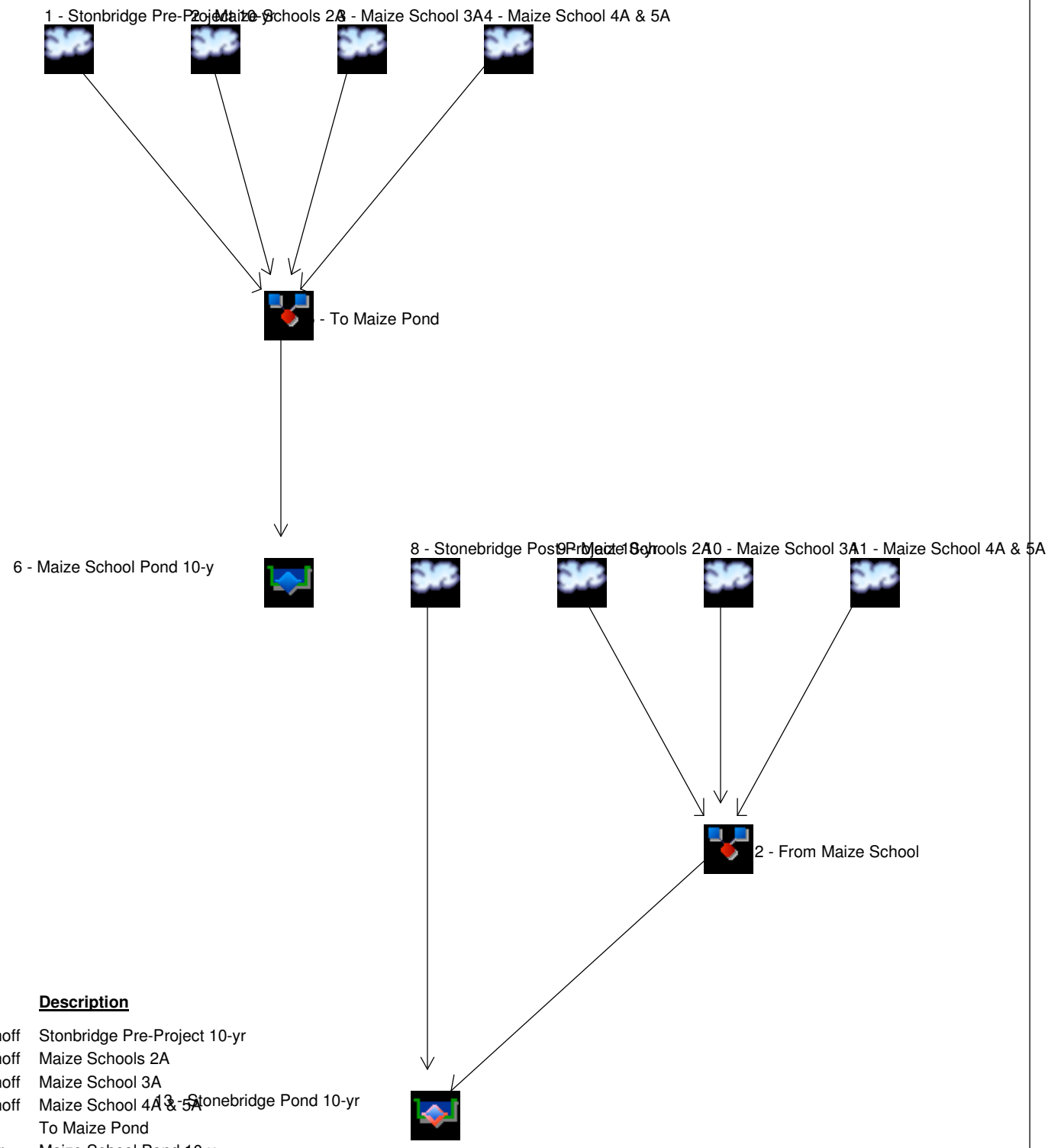
Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1350.20

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Stonbridge Pre-Project 10-yr
2	SCS Runoff	Maize Schools 2A
3	SCS Runoff	Maize School 3A
4	SCS Runoff	Maize School 4A & 5A
5	Combine	To Maize Pond
6	Reservoir	Maize School Pond 10-y
8	SCS Runoff	Stonebridge Post-Project 10-yr
9	SCS Runoff	Maize Schools 2A
10	SCS Runoff	Maize School 3A
11	SCS Runoff	Maize School 4A & 5A
12	Combine	From Maize School
13	Reservoir(i)	Stonebridge Pond 10-yr

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

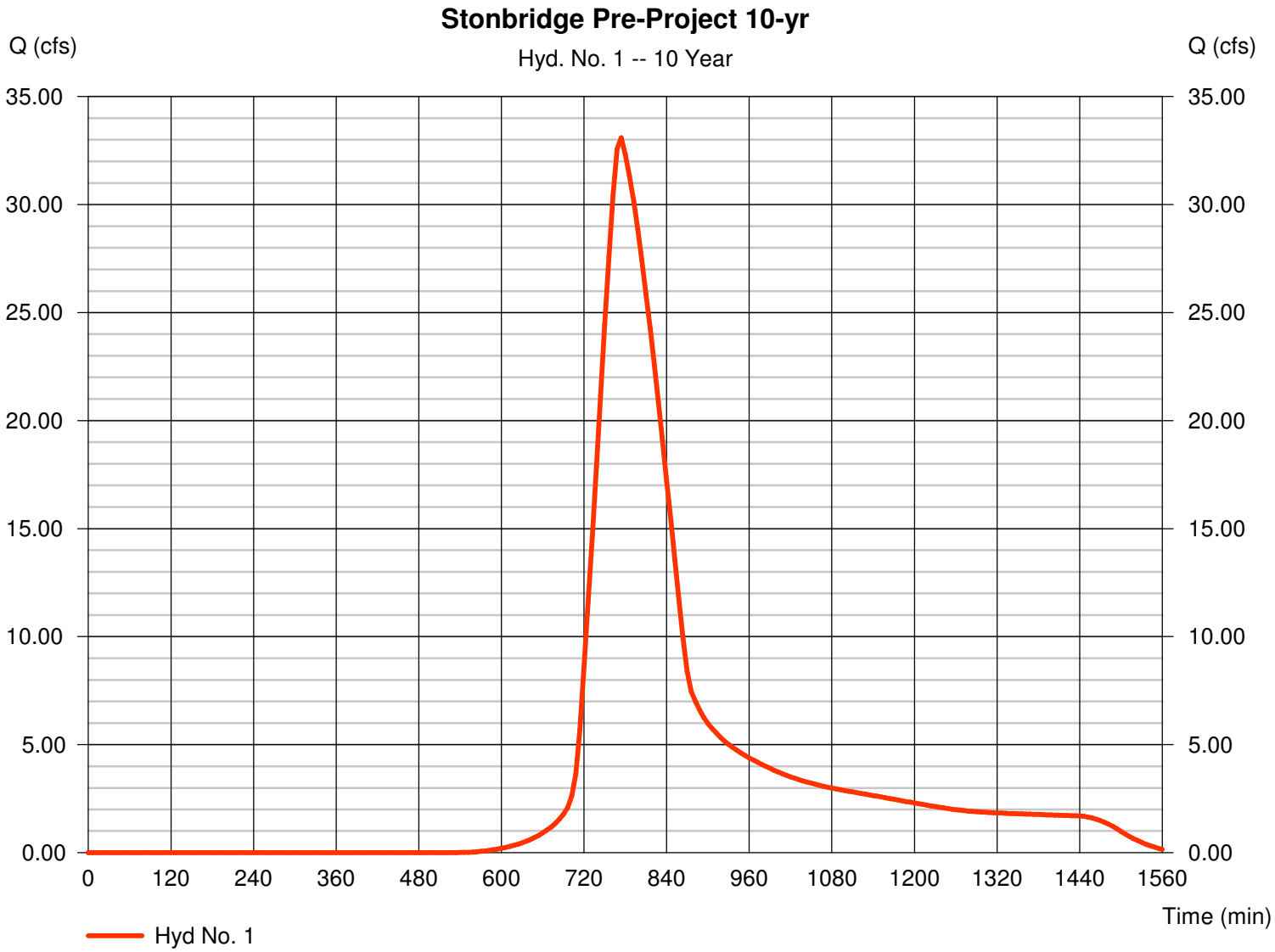
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	33.09	6	774	7.344	----	------	------	Stonbridge Pre-Project 10-yr
2	SCS Runoff	51.92	6	768	10.410	----	------	------	Maize Schools 2A
3	SCS Runoff	128.46	6	738	16.545	----	------	------	Maize School 3A
4	SCS Runoff	78.39	6	768	15.674	----	------	------	Maize School 4A & 5A
5	Combine	251.10	6	756	49.973	1, 2, 3, 4	------	------	To Maize Pond
6	Reservoir	30.62	6	918	15.574	5	1350.38	35.7	Maize School Pond 10-y
8	SCS Runoff	131.67	6	726	12.879	----	------	------	Stonebridge Post-Project 10-yr
9	SCS Runoff	51.92	6	768	10.410	----	------	------	Maize Schools 2A
10	SCS Runoff	128.46	6	738	16.545	----	------	------	Maize School 3A
11	SCS Runoff	78.39	6	768	15.674	----	------	------	Maize School 4A & 5A
12	Combine	225.21	6	750	42.629	9, 10, 11	------	------	From Maize School
13	Reservoir(i)	26.82	6	984	20.403	8, 12	1351.67	44.2	Stonebridge Pond 10-yr

Hydrograph Report

Hyd. No. 1

Stonbridge Pre-Project 10-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	33.09 cfs
Storm frequency	=	10 yrs	Time to peak	=	774 min
Time interval	=	6 min	Hyd. volume	=	7.344 acft
Drainage area	=	33.930 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	91.40 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

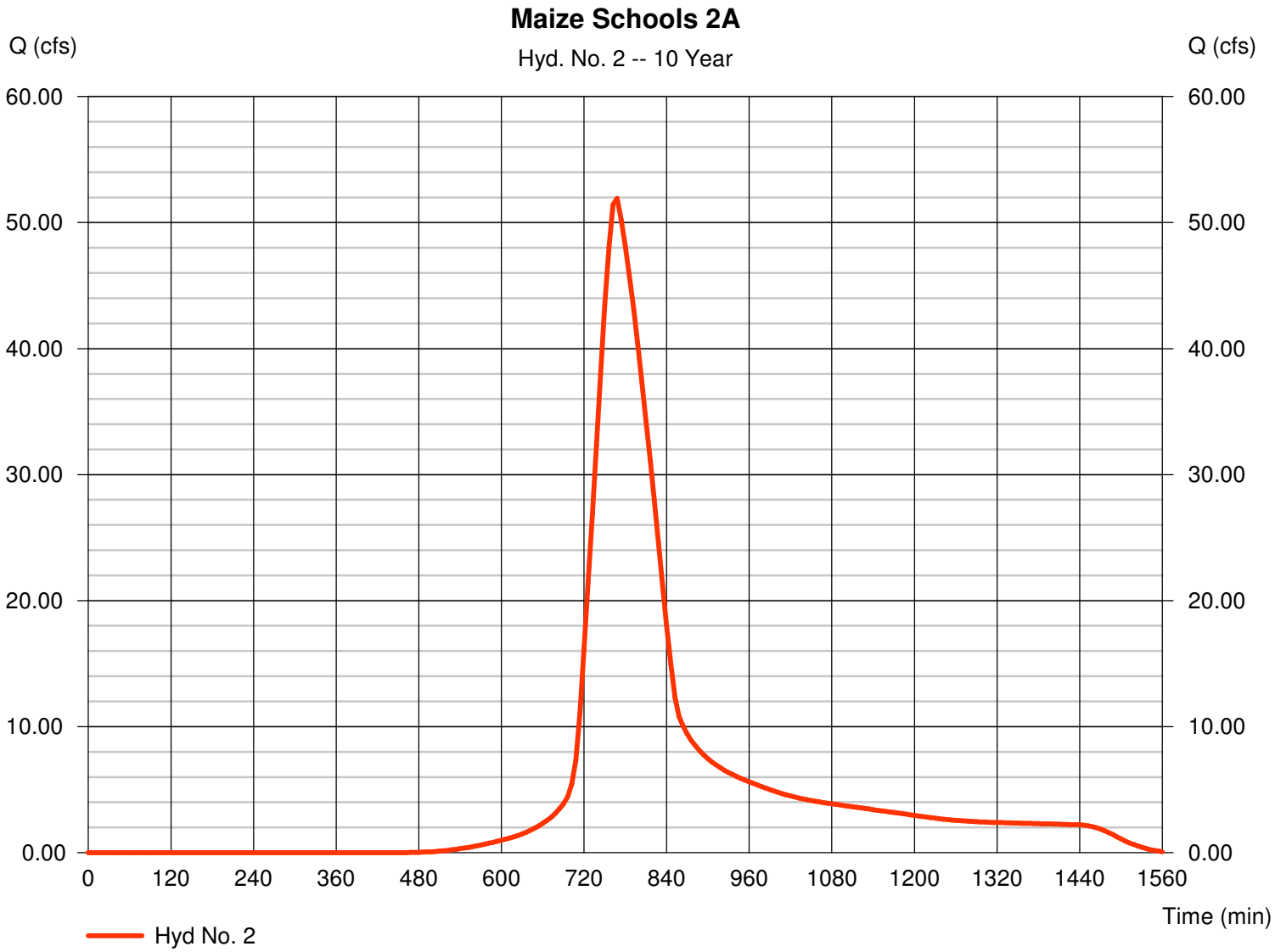


Hydrograph Report

Hyd. No. 2

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	51.92 cfs
Storm frequency	=	10 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	10.410 acft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

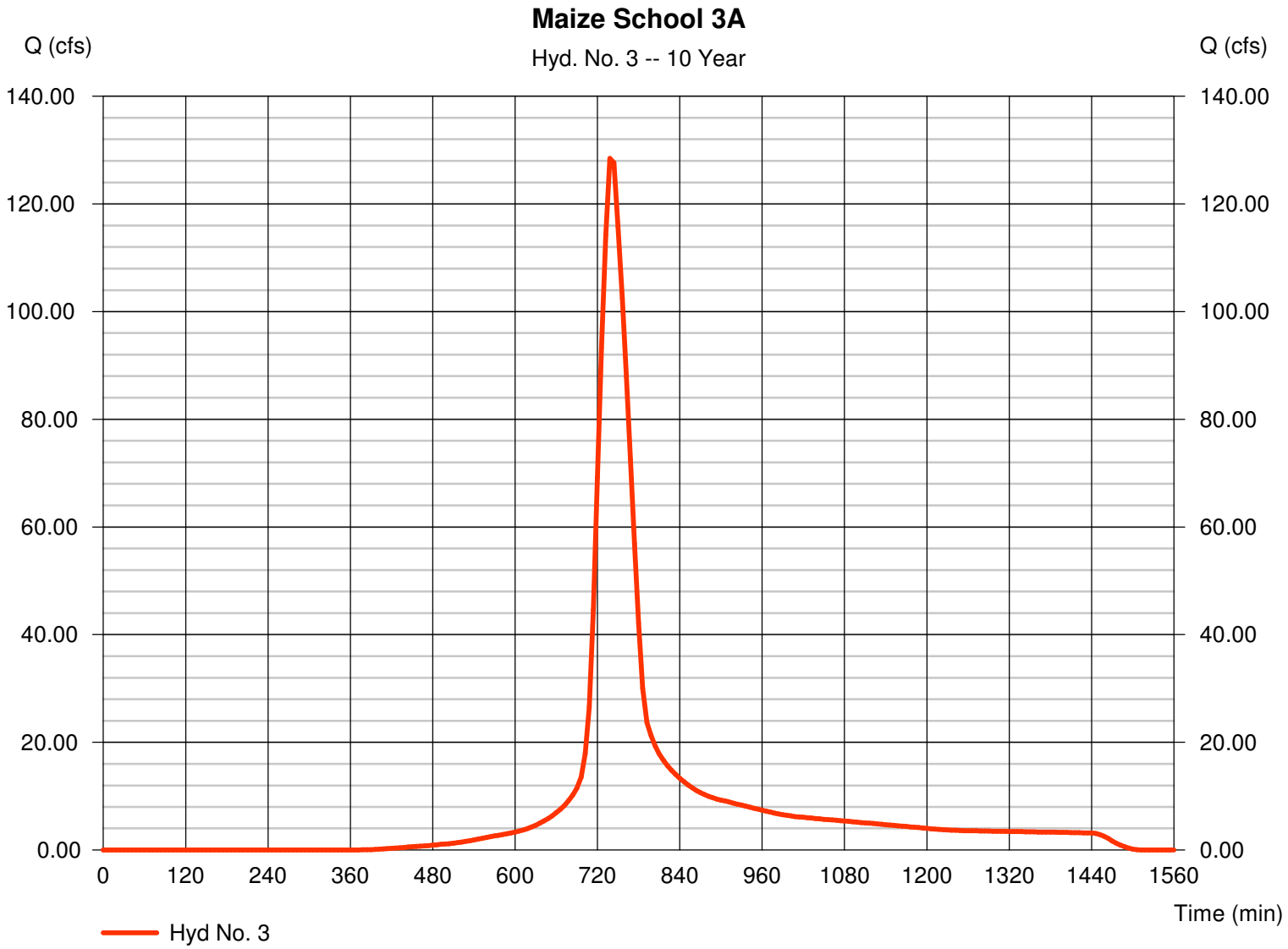


Hydrograph Report

Hyd. No. 3

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	128.46 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	16.545 acft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

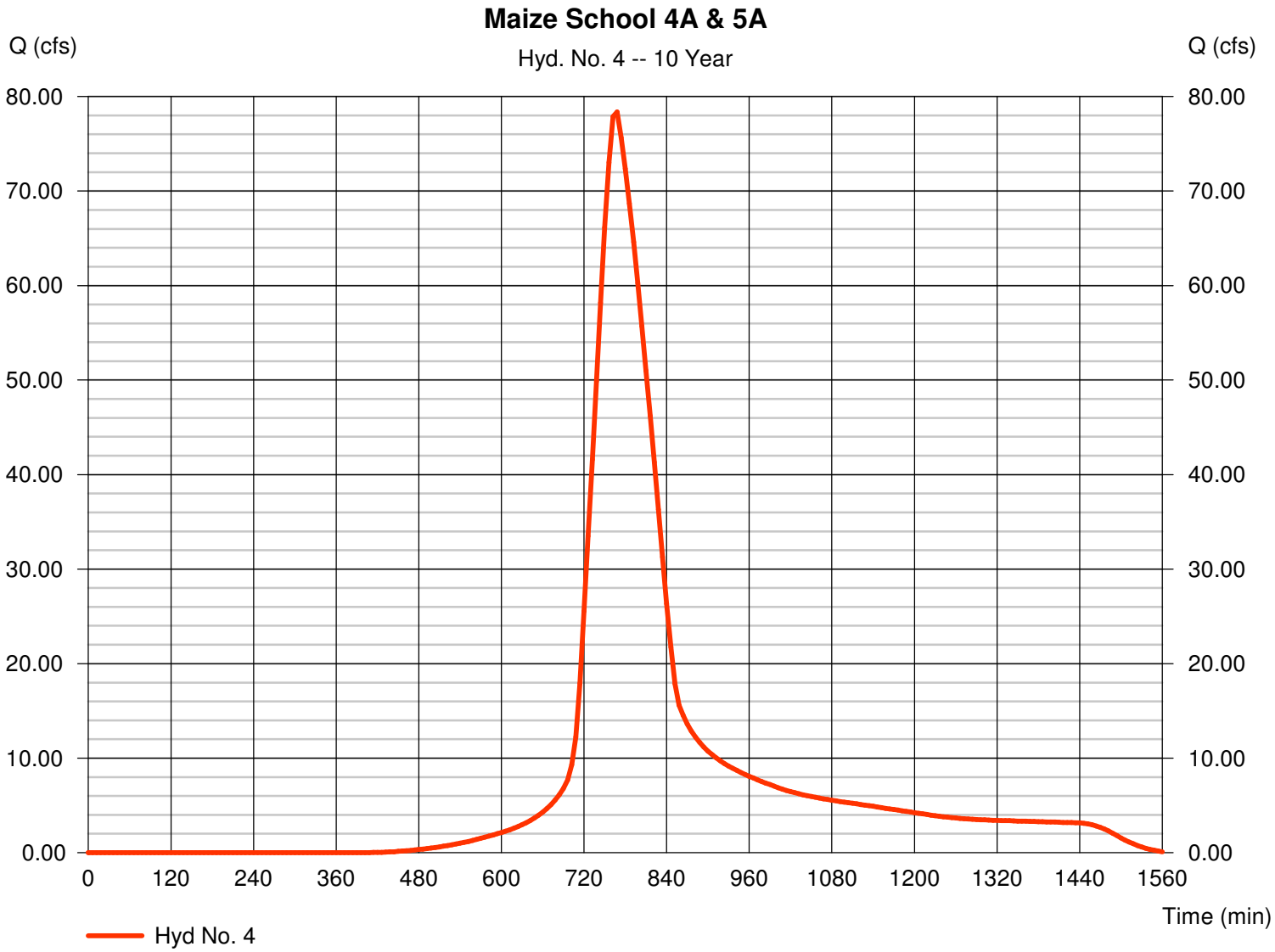


Hydrograph Report

Hyd. No. 4

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	78.39 cfs
Storm frequency	=	10 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	15.674 acft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

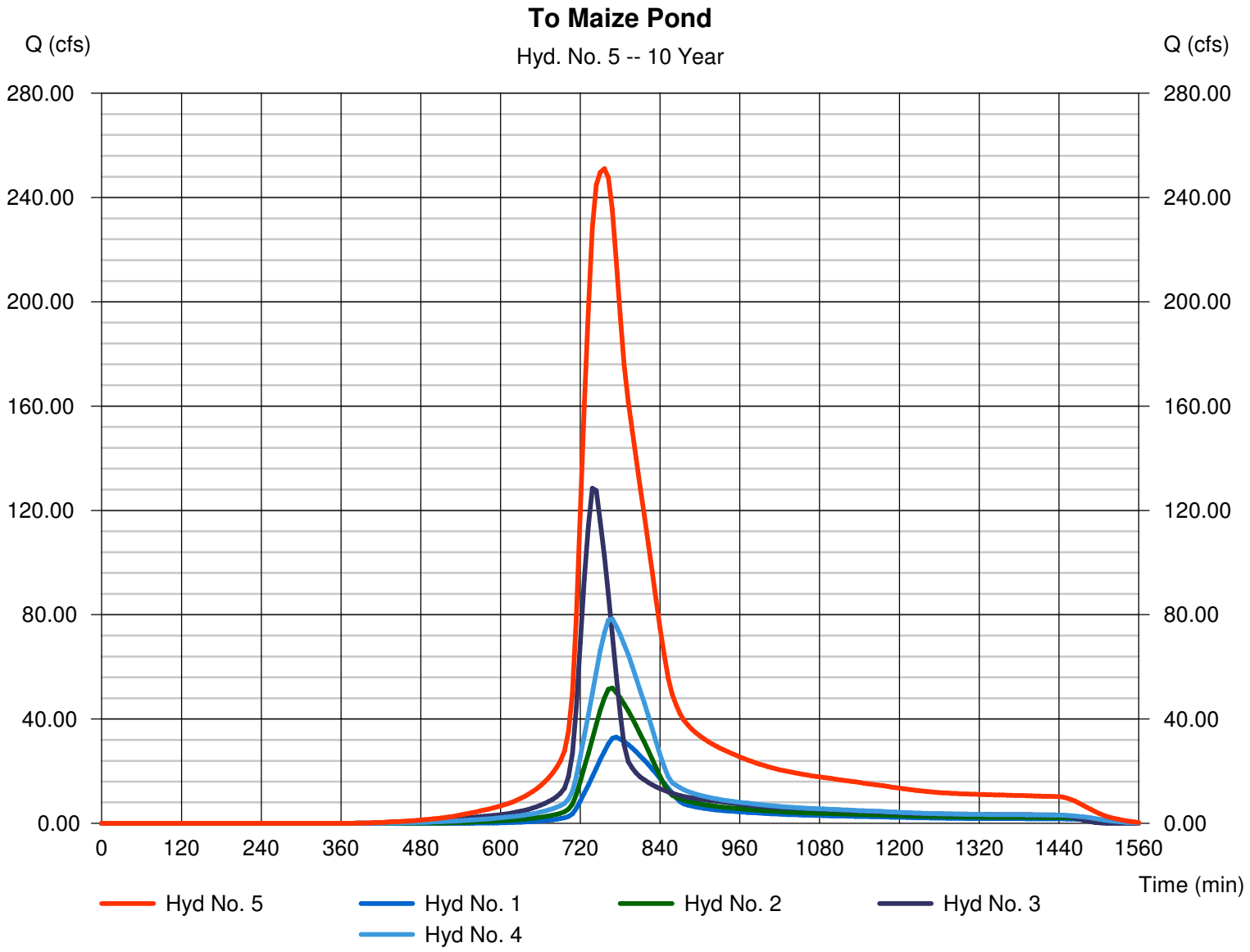


Hydrograph Report

Hyd. No. 5

To Maize Pond

Hydrograph type	= Combine	Peak discharge	= 251.10 cfs
Storm frequency	= 10 yrs	Time to peak	= 756 min
Time interval	= 6 min	Hyd. volume	= 49.973 acft
Inflow hyds.	= 1, 2, 3, 4	Contrib. drain. area	= 193.620 ac



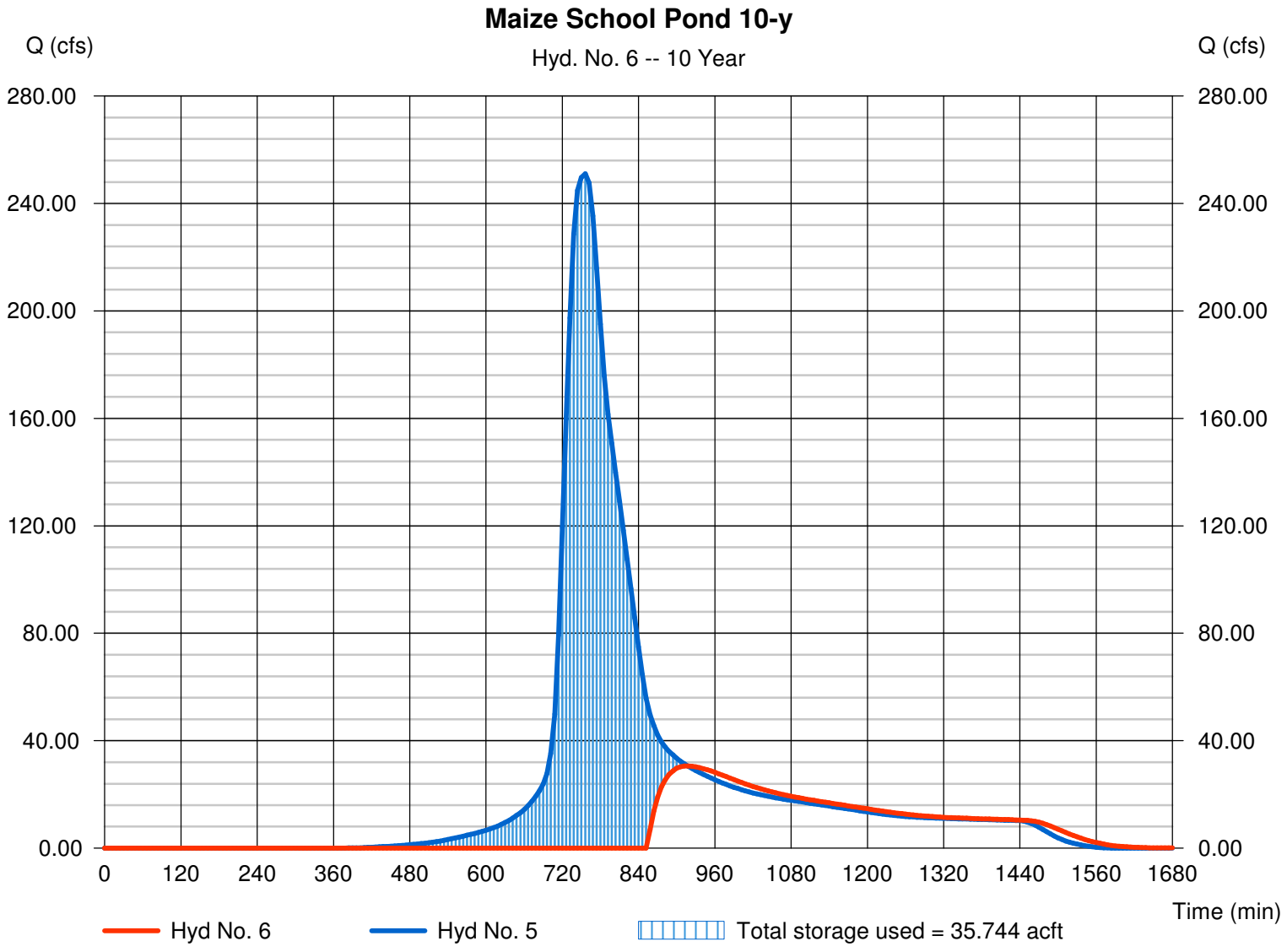
Hydrograph Report

Hyd. No. 6

Maize School Pond 10-y

Hydrograph type	=	Reservoir	Peak discharge	=	30.62 cfs
Storm frequency	=	10 yrs	Time to peak	=	918 min
Time interval	=	6 min	Hyd. volume	=	15.574 acft
Inflow hyd. No.	=	5 - To Maize Pond	Max. Elevation	=	1350.38 ft
Reservoir name	=	Maize Combined Pond 10-YR	Max. Storage	=	35.744 acft

Storage Indication method used.



Pond Report

Pond No. 5 - Maize Combined Pond 10-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1347.50	47,337	0.000	0.000
0.50	1348.00	363,399	2.073	2.073
1.50	1349.00	645,319	11.424	13.497
2.50	1350.00	723,264	15.699	29.196
3.50	1351.00	788,357	17.344	46.540
4.50	1352.00	821,610	18.477	65.016
5.50	1353.00	854,198	19.233	84.249

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

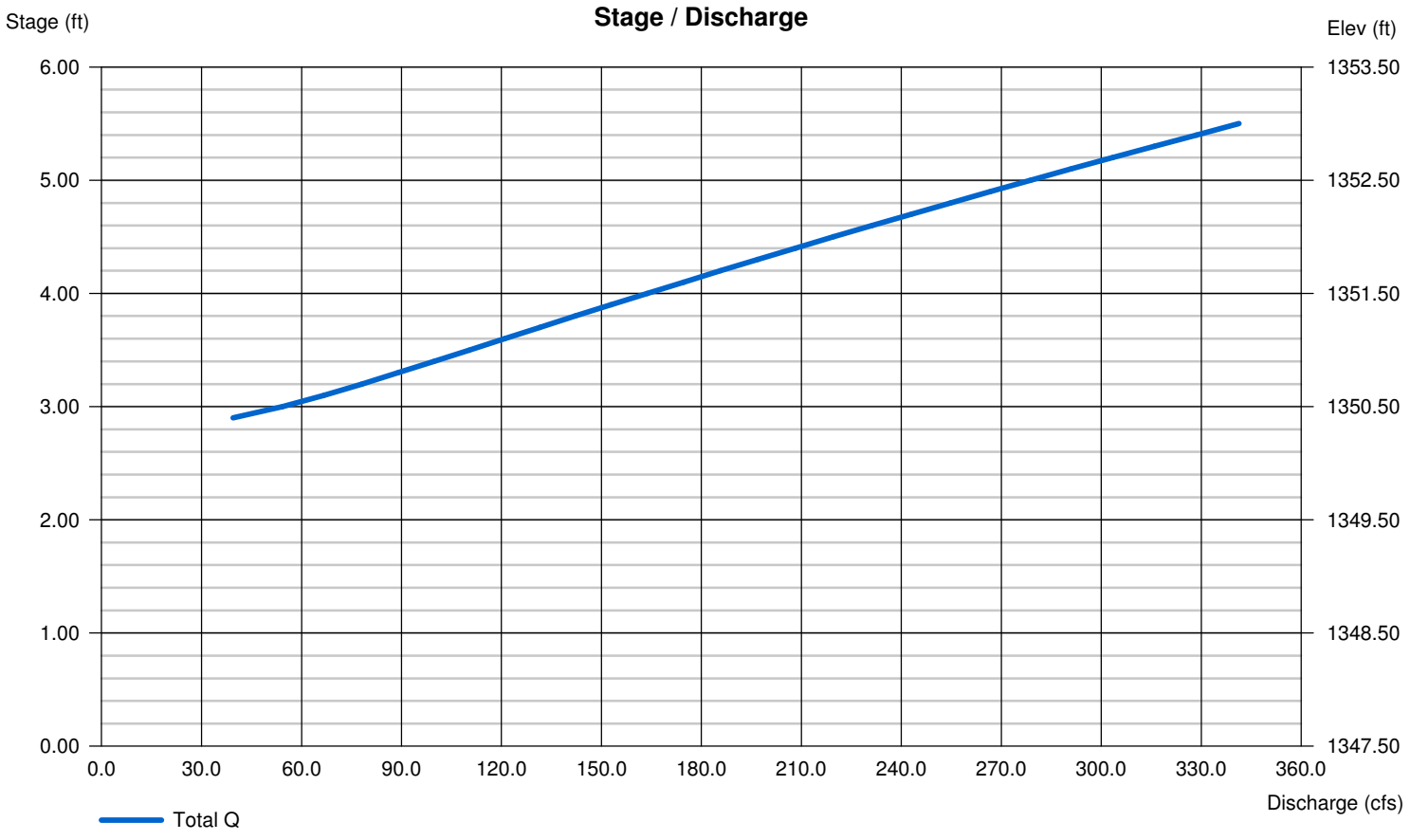
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1350.30

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

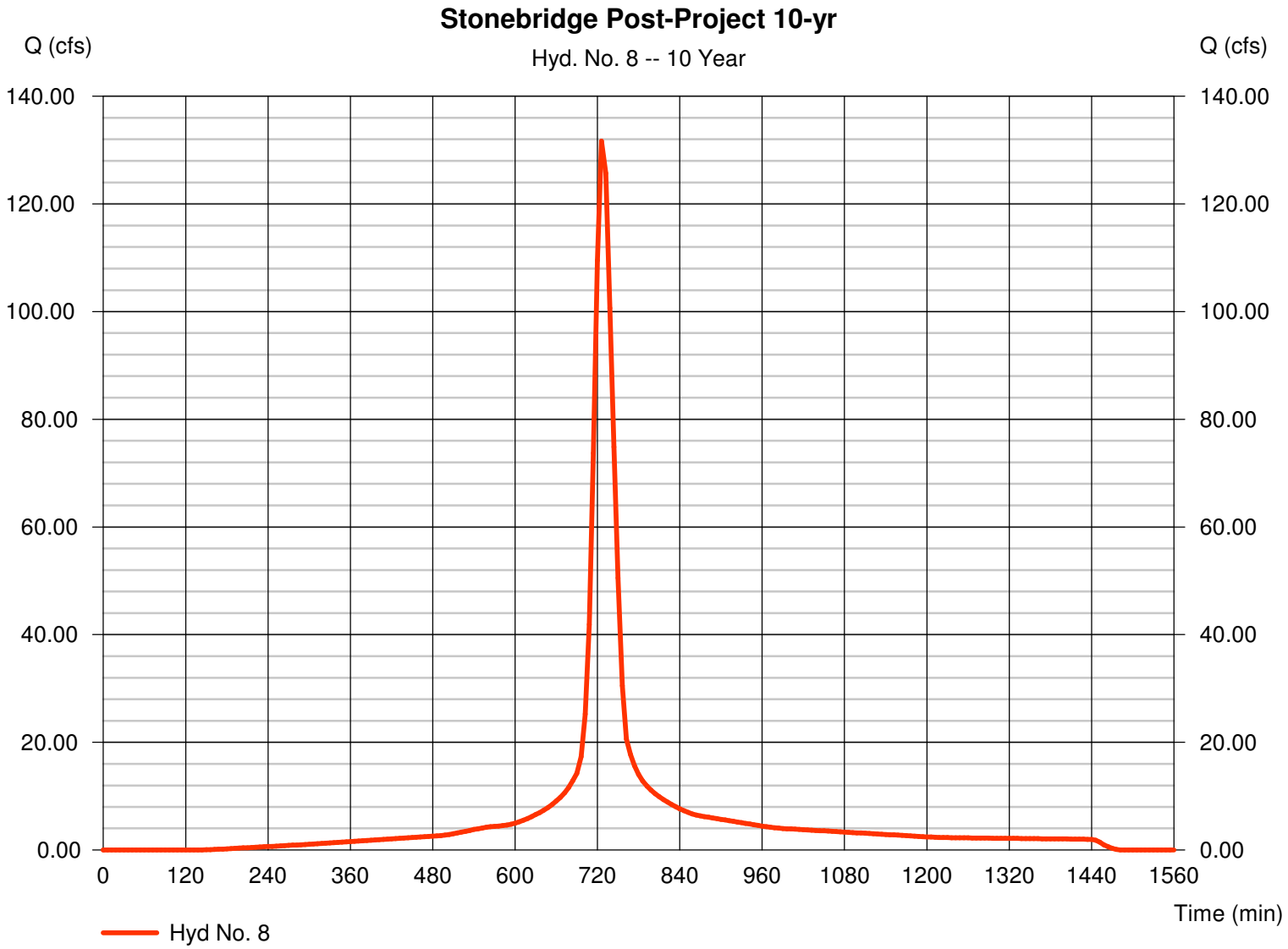


Hydrograph Report

Hyd. No. 8

Stonebridge Post-Project 10-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	131.67 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	12.879 acft
Drainage area	=	33.930 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	20.50 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

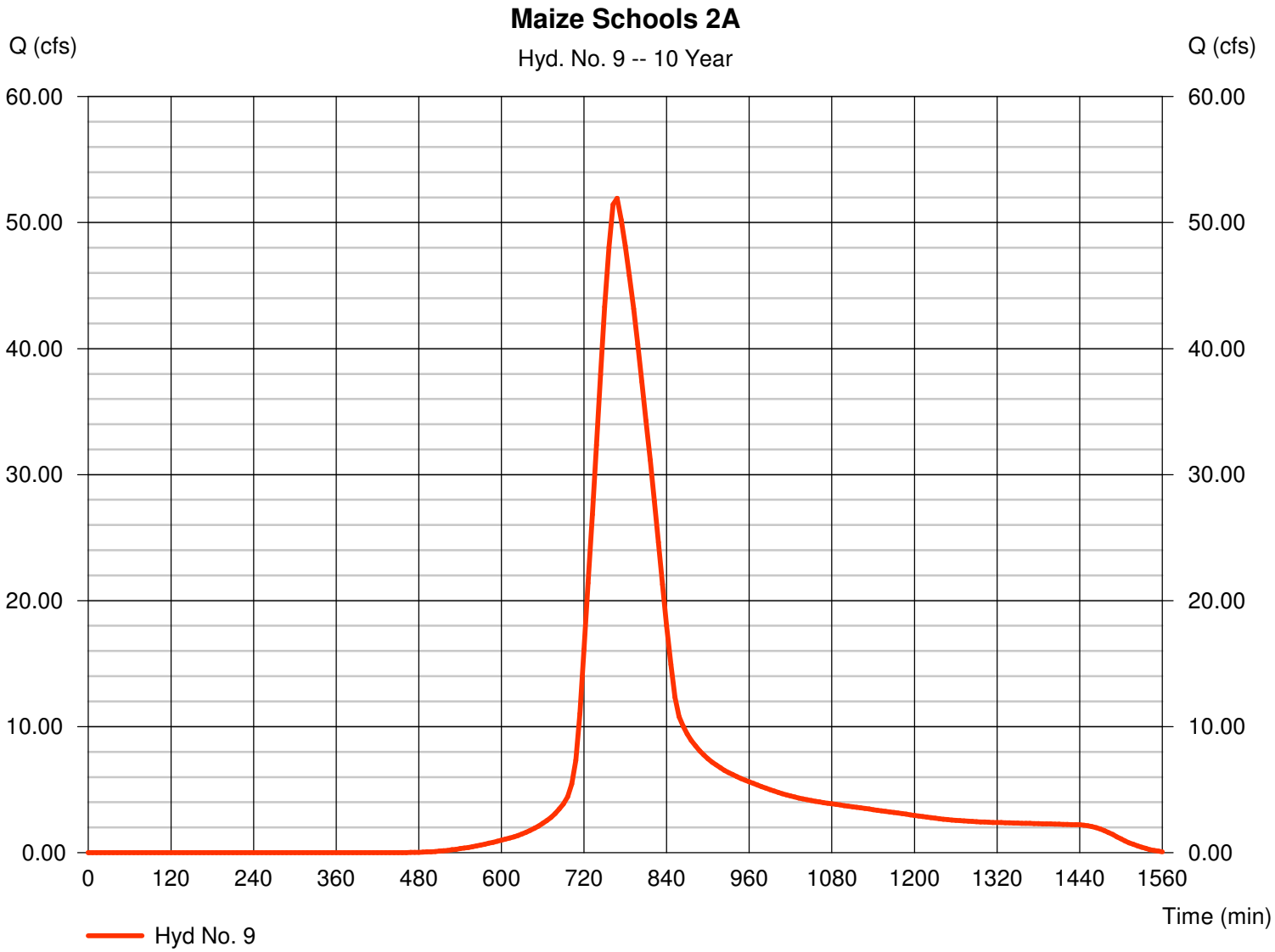


Hydrograph Report

Hyd. No. 9

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	51.92 cfs
Storm frequency	=	10 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	10.410 acft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

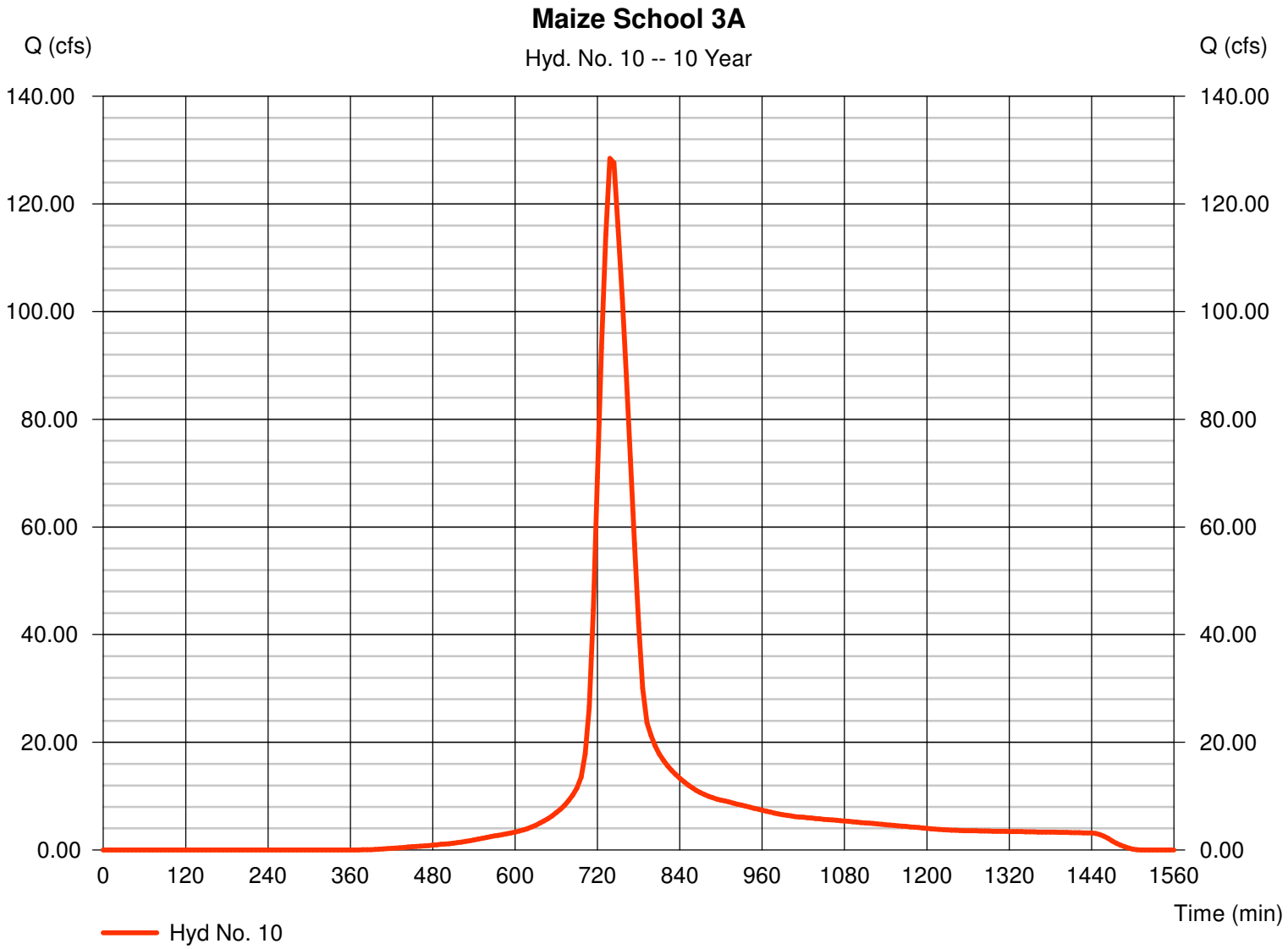


Hydrograph Report

Hyd. No. 10

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	128.46 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	16.545 acft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

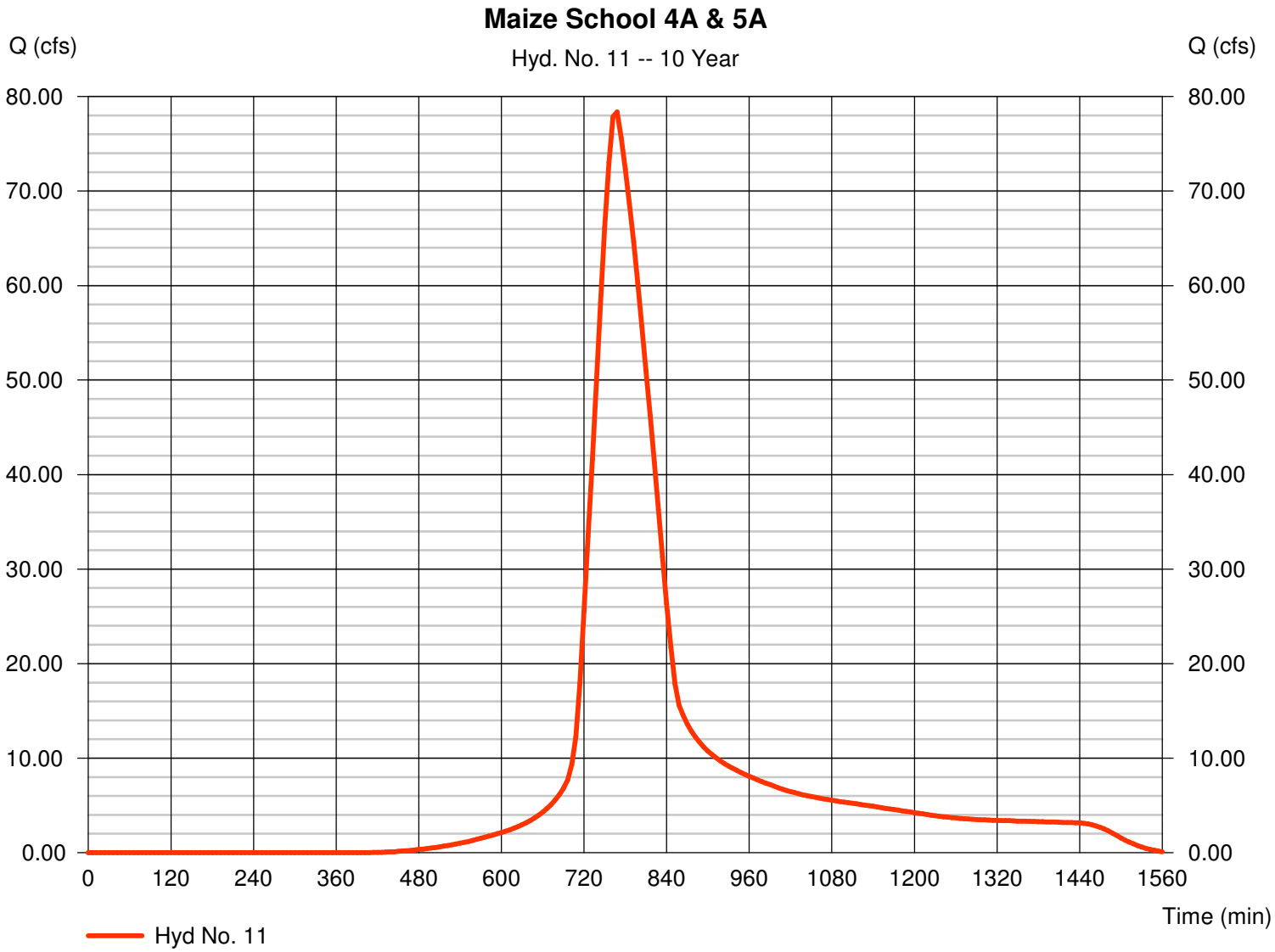


Hydrograph Report

Hyd. No. 11

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	78.39 cfs
Storm frequency	=	10 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	15.674 acft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

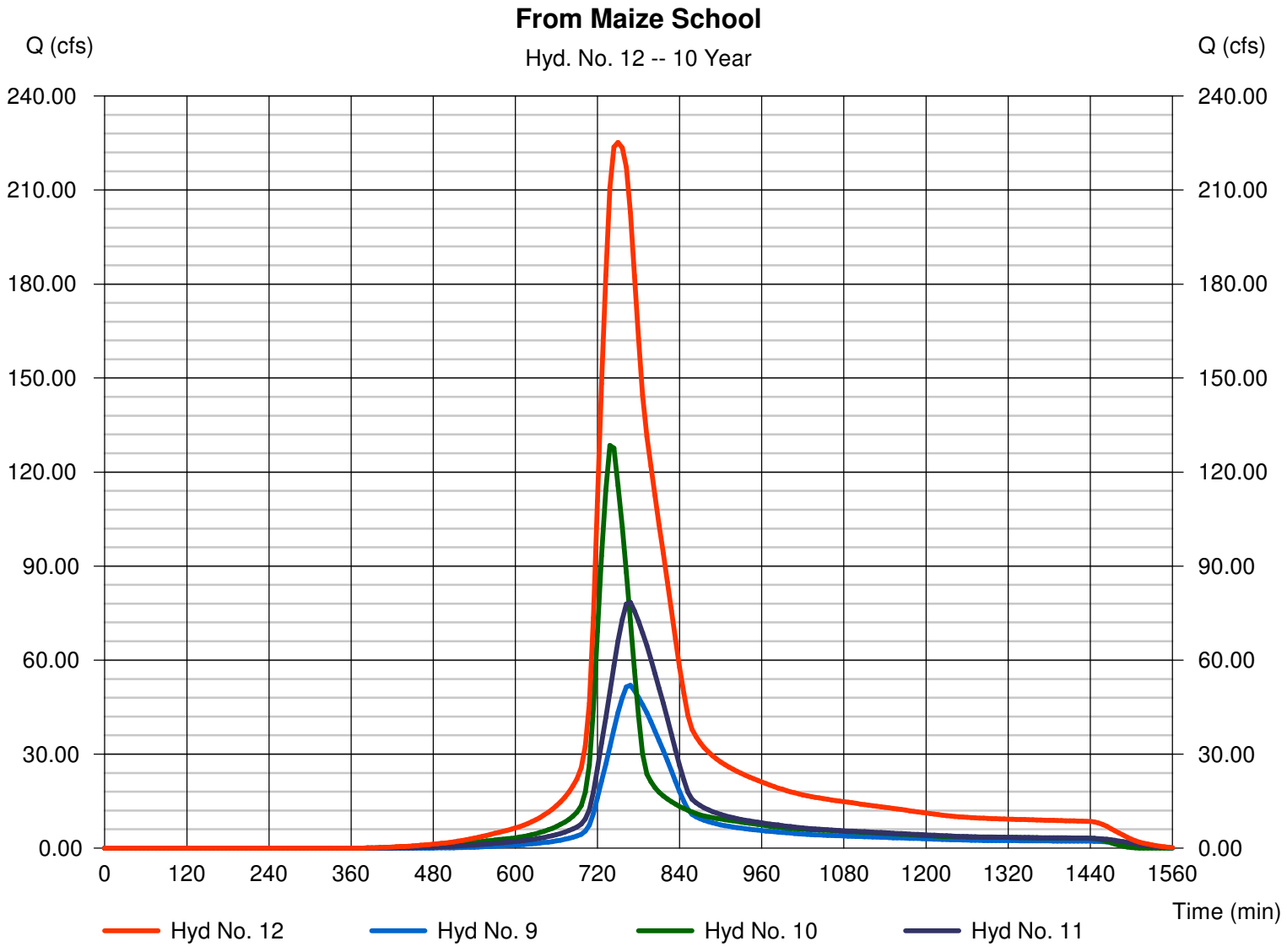


Hydrograph Report

Hyd. No. 12

From Maize School

Hydrograph type	= Combine	Peak discharge	= 225.21 cfs
Storm frequency	= 10 yrs	Time to peak	= 750 min
Time interval	= 6 min	Hyd. volume	= 42.629 acft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 159.690 ac



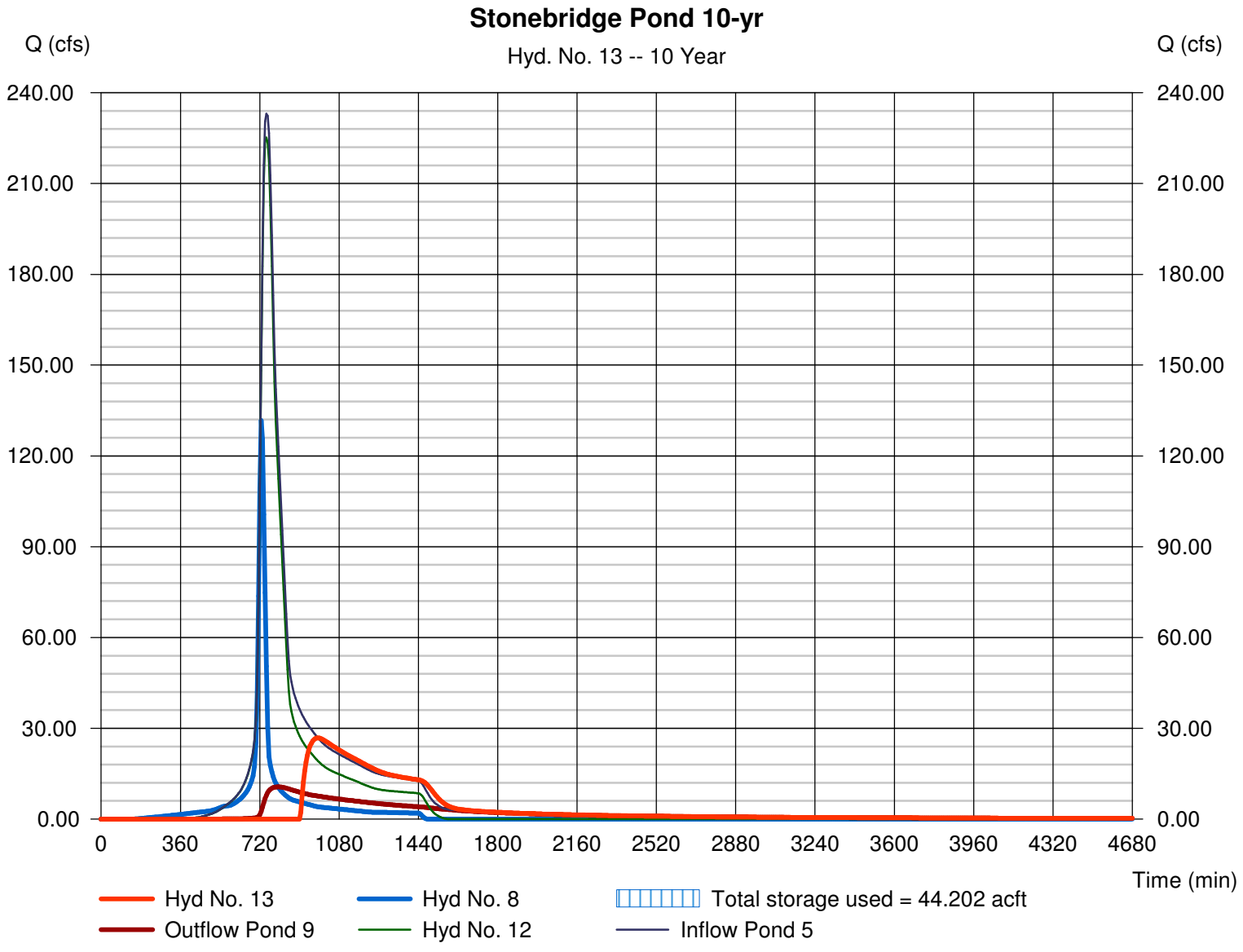
Hydrograph Report

Hyd. No. 13

Stonebridge Pond 10-yr

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	26.82 cfs
Storm frequency	=	10 yrs	Time to peak	=	984 min
Time interval	=	6 min	Hyd. volume	=	20.403 acft
Upper Pond			**Lower Pond**		
Pond name	=	Stonebridge Pond 2	Pond name	=	Maize Combined Pond
Inflow hyd.	=	8 - Stonebridge Post-Project 10-yr	Other Inflow hyd.	=	12 - From Maize
Max. Elevation	=	1351.67 ft	Max. Elevation	=	1350.37 ft
Max. Storage	=	8.625 acft	Max. Storage	=	35.577 acft

Interconnected Pond Routing. Storage Indication method used.



Pond Report

Pond No. 9 - Stonebridge Pond 2

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1349.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1349.00	130,142	0.000	0.000
1.00	1350.00	138,111	3.079	3.079
2.00	1351.00	146,180	3.263	6.342
2.50	1351.50	150,200	1.701	8.043
3.00	1352.00	154,349	1.748	9.791
4.00	1353.00	162,619	3.638	13.429

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

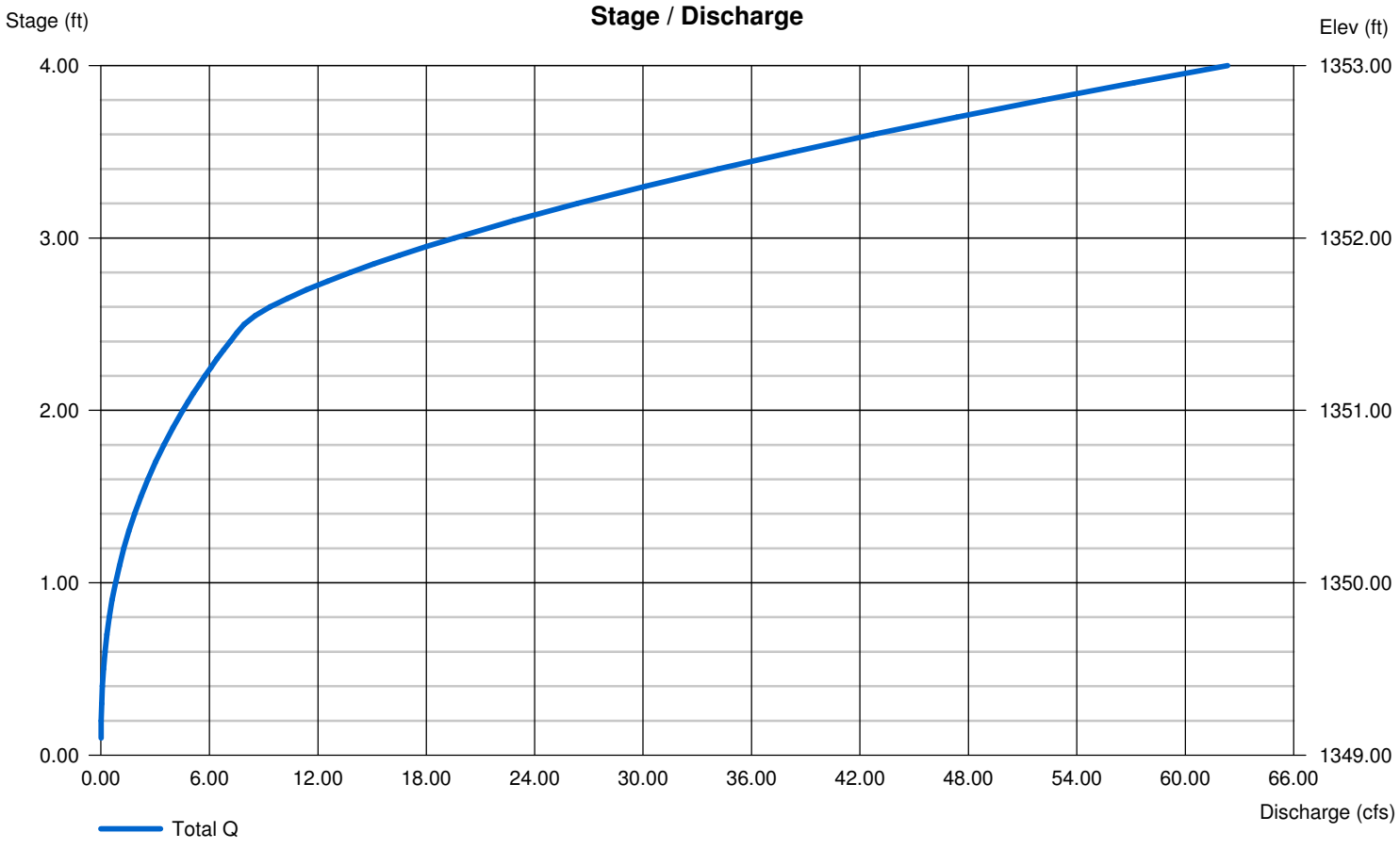
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	6.00	0.00	0.00
Crest El. (ft)	= 1349.00	1351.50	0.00	0.00
Weir Coeff.	= 0.80	3.33	3.33	3.33
Weir Type	= 35 degV	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond No. 5 - Maize Combined Pond 10-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1347.50	47,337	0.000	0.000
0.50	1348.00	363,399	2.073	2.073
1.50	1349.00	645,319	11.424	13.497
2.50	1350.00	723,264	15.699	29.196
3.50	1351.00	788,357	17.344	46.540
4.50	1352.00	821,610	18.477	65.016
5.50	1353.00	854,198	19.233	84.249

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

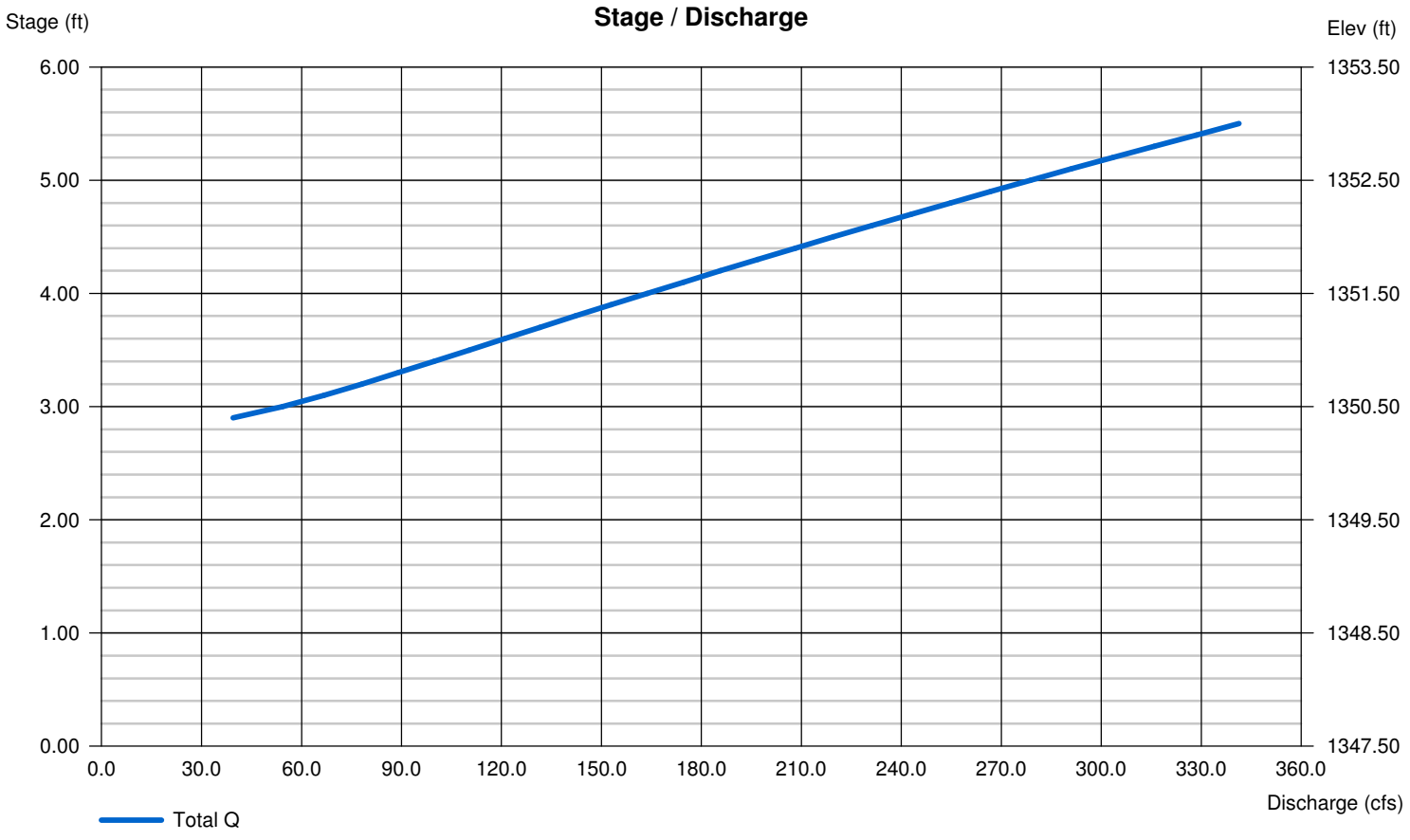
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

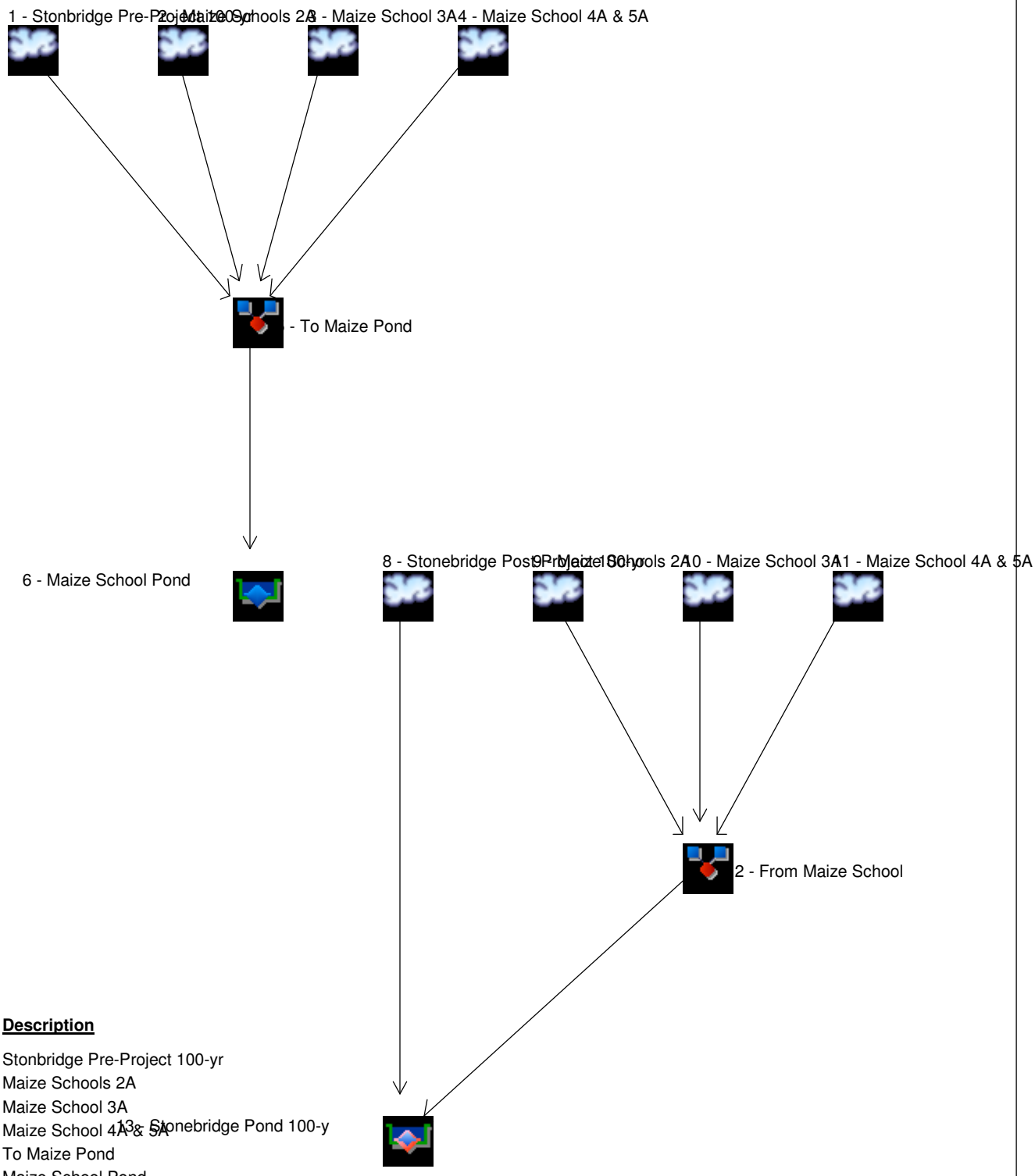
Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1350.30

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Stonbridge Pre-Project 100-yr
2	SCS Runoff	Maize Schools 2A
3	SCS Runoff	Maize School 3A
4	SCS Runoff	Maize School 4A & 5A
5	Combine	To Maize Pond
6	Reservoir	Maize School Pond
8	SCS Runoff	Stonebridge Post-Project 100-yr
9	SCS Runoff	Maize Schools 2A
10	SCS Runoff	Maize School 3A
11	SCS Runoff	Maize School 4A & 5A
12	Combine	From Maize School
13	Reservoir(i)	Stonebridge Pond 100-y

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

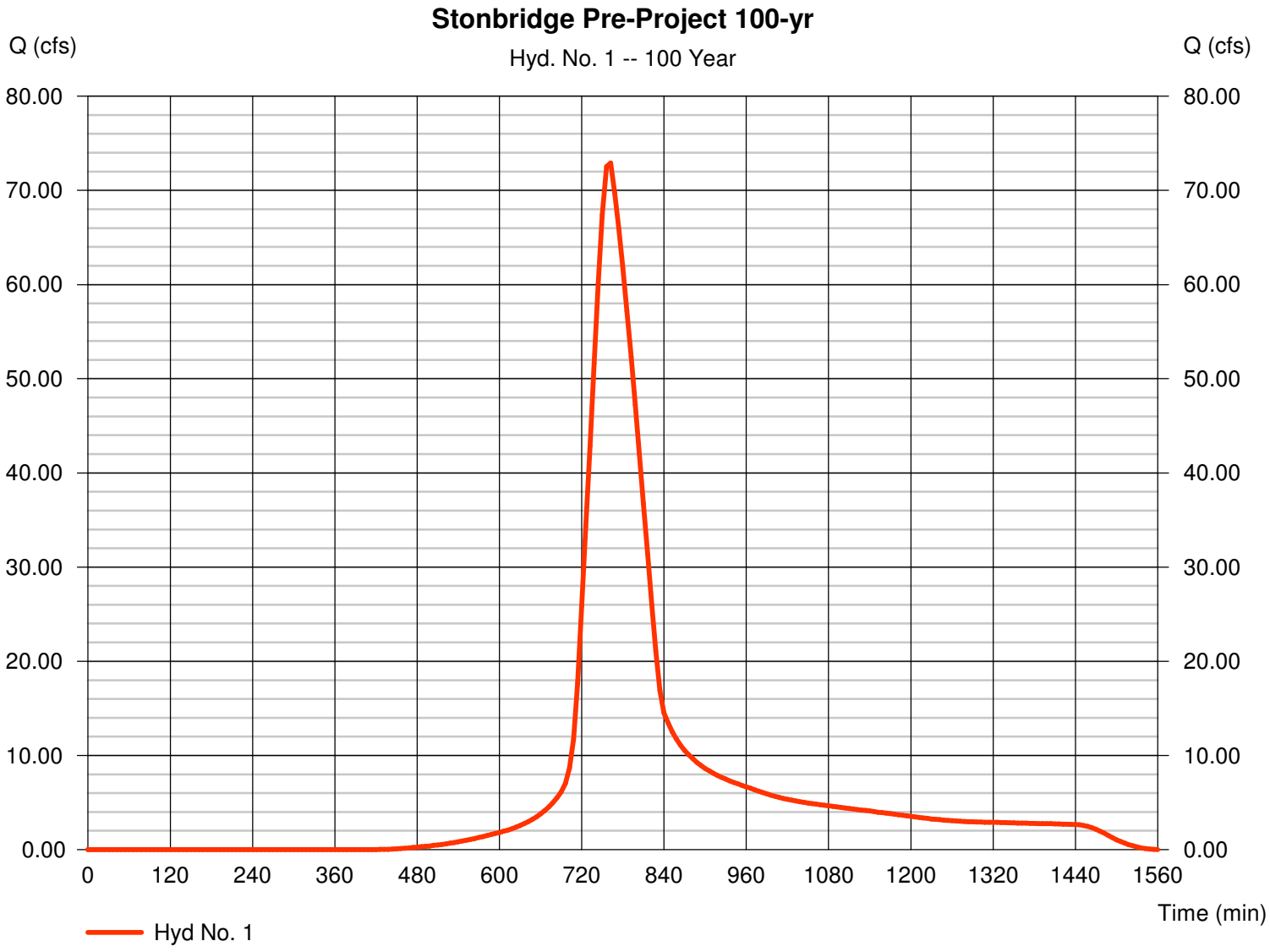
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	72.90	6	762	13.213	----	------	------	Stonbridge Pre-Project 100-yr
2	SCS Runoff	92.09	6	768	18.442	----	------	------	Maize Schools 2A
3	SCS Runoff	216.84	6	738	28.149	----	------	------	Maize School 3A
4	SCS Runoff	134.33	6	768	27.021	----	------	------	Maize School 4A & 5A
5	Combine	455.56	6	756	86.825	1, 2, 3, 4	------	------	To Maize Pond
6	Reservoir	96.63	6	846	34.742	5	1351.57	57.0	Maize School Pond
8	SCS Runoff	245.61	6	720	18.776	----	------	------	Stonebridge Post-Project 100-yr
9	SCS Runoff	92.09	6	768	18.442	----	------	------	Maize Schools 2A
10	SCS Runoff	216.84	6	738	28.149	----	------	------	Maize School 3A
11	SCS Runoff	134.33	6	768	27.021	----	------	------	Maize School 4A & 5A
12	Combine	387.02	6	750	73.612	9, 10, 11	------	------	From Maize School
13	Reservoir(i)	81.32	6	858	39.597	8, 12	1352.48	67.0	Stonebridge Pond 100-y

Hydrograph Report

Hyd. No. 1

Stonbridge Pre-Project 100-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	72.90 cfs
Storm frequency	=	100 yrs	Time to peak	=	762 min
Time interval	=	6 min	Hyd. volume	=	13.213 acft
Drainage area	=	33.930 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	71.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

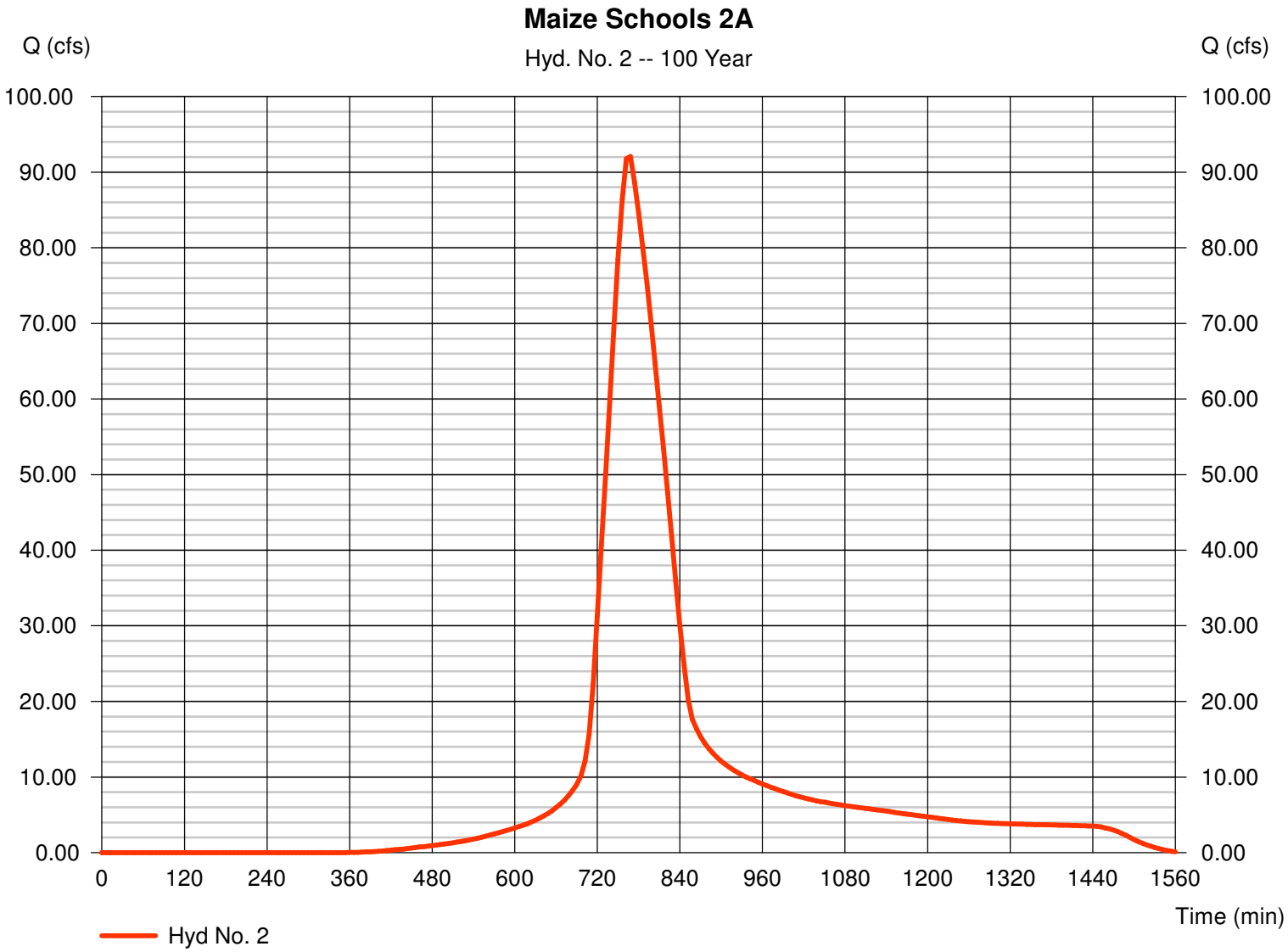


Hydrograph Report

Hyd. No. 2

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	92.09 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	18.442 acft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

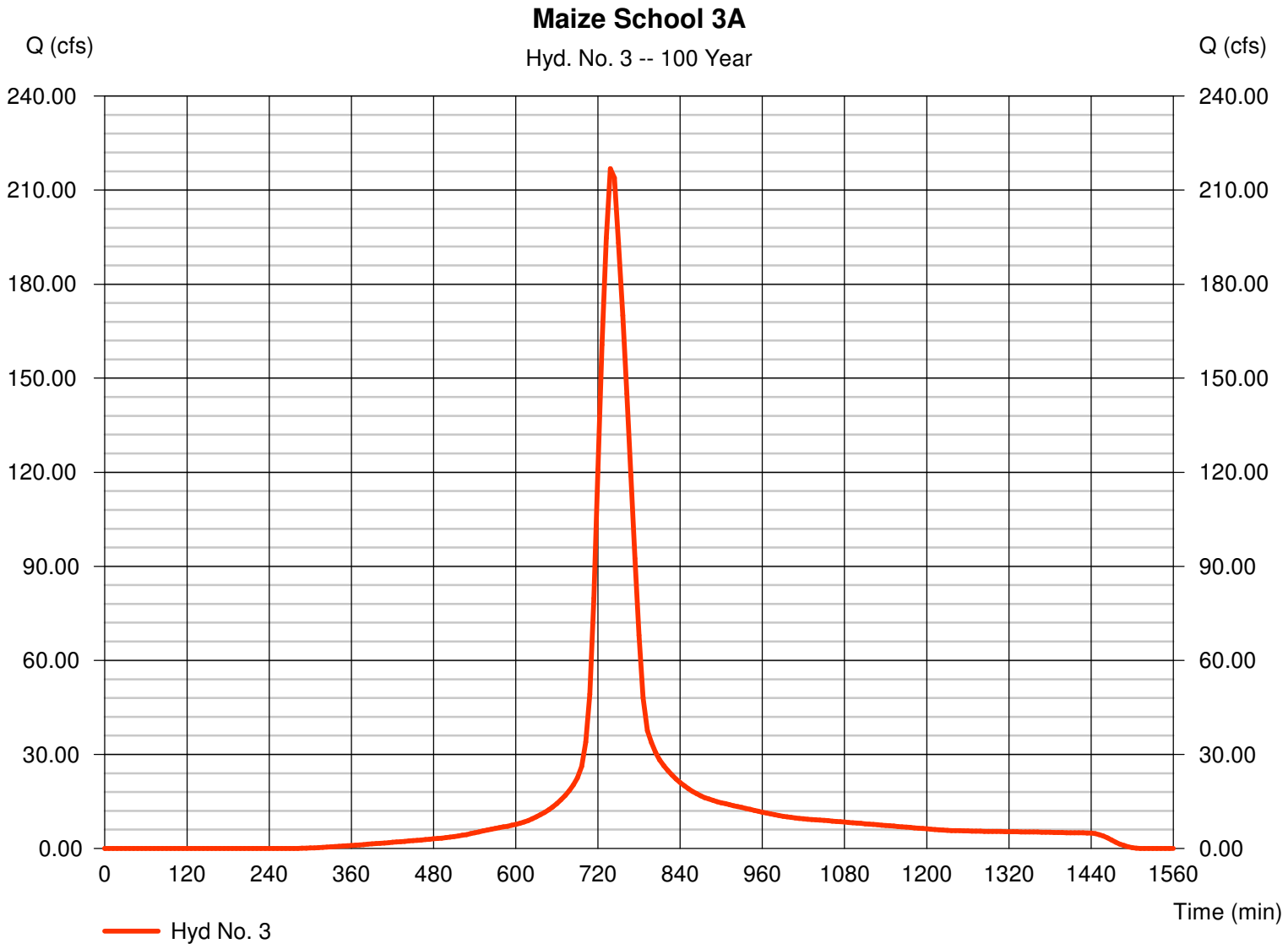


Hydrograph Report

Hyd. No. 3

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	216.84 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	28.149 acft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

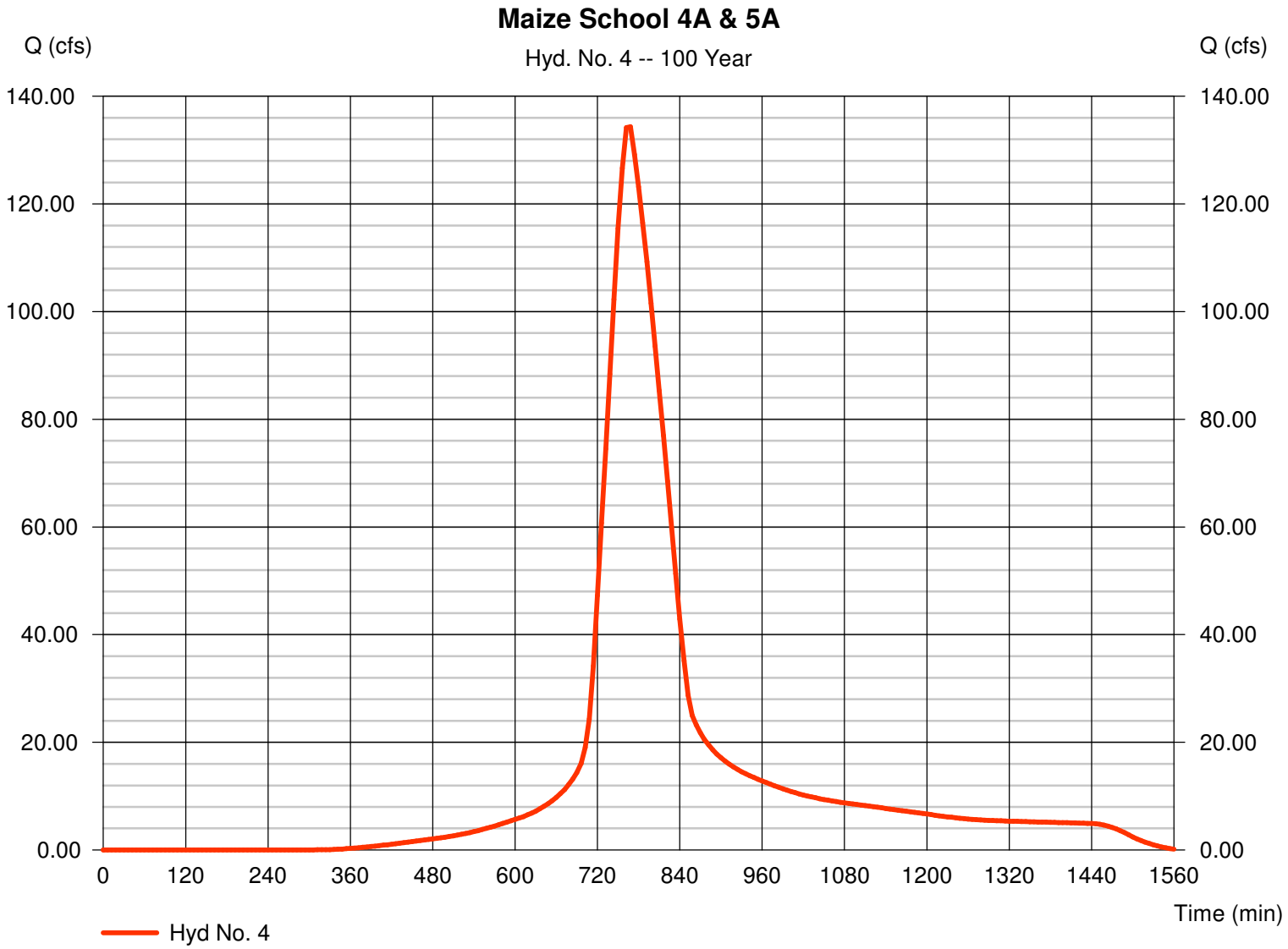


Hydrograph Report

Hyd. No. 4

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	134.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	27.021 acft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

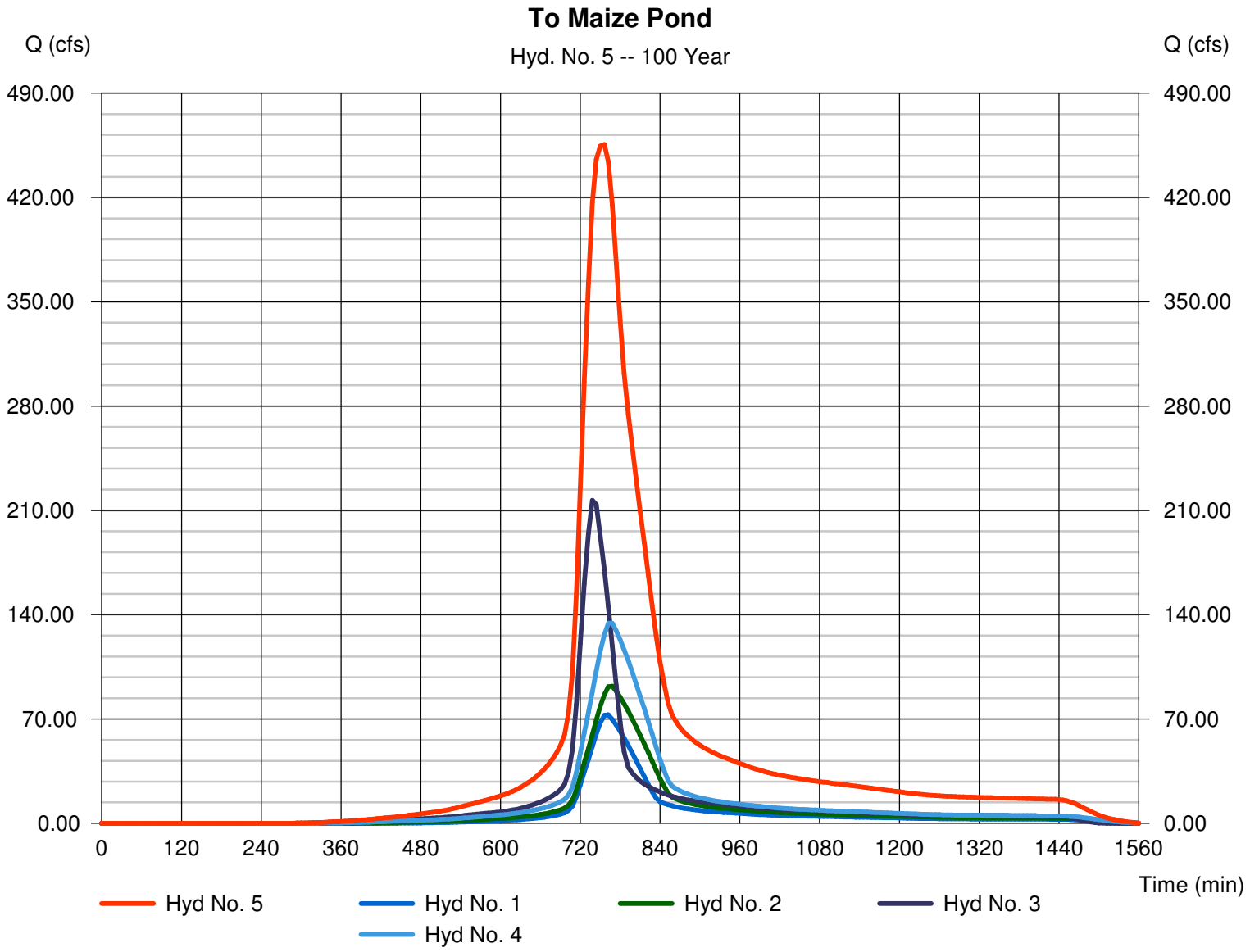


Hydrograph Report

Hyd. No. 5

To Maize Pond

Hydrograph type	= Combine	Peak discharge	= 455.56 cfs
Storm frequency	= 100 yrs	Time to peak	= 756 min
Time interval	= 6 min	Hyd. volume	= 86.825 acft
Inflow hyds.	= 1, 2, 3, 4	Contrib. drain. area	= 193.620 ac



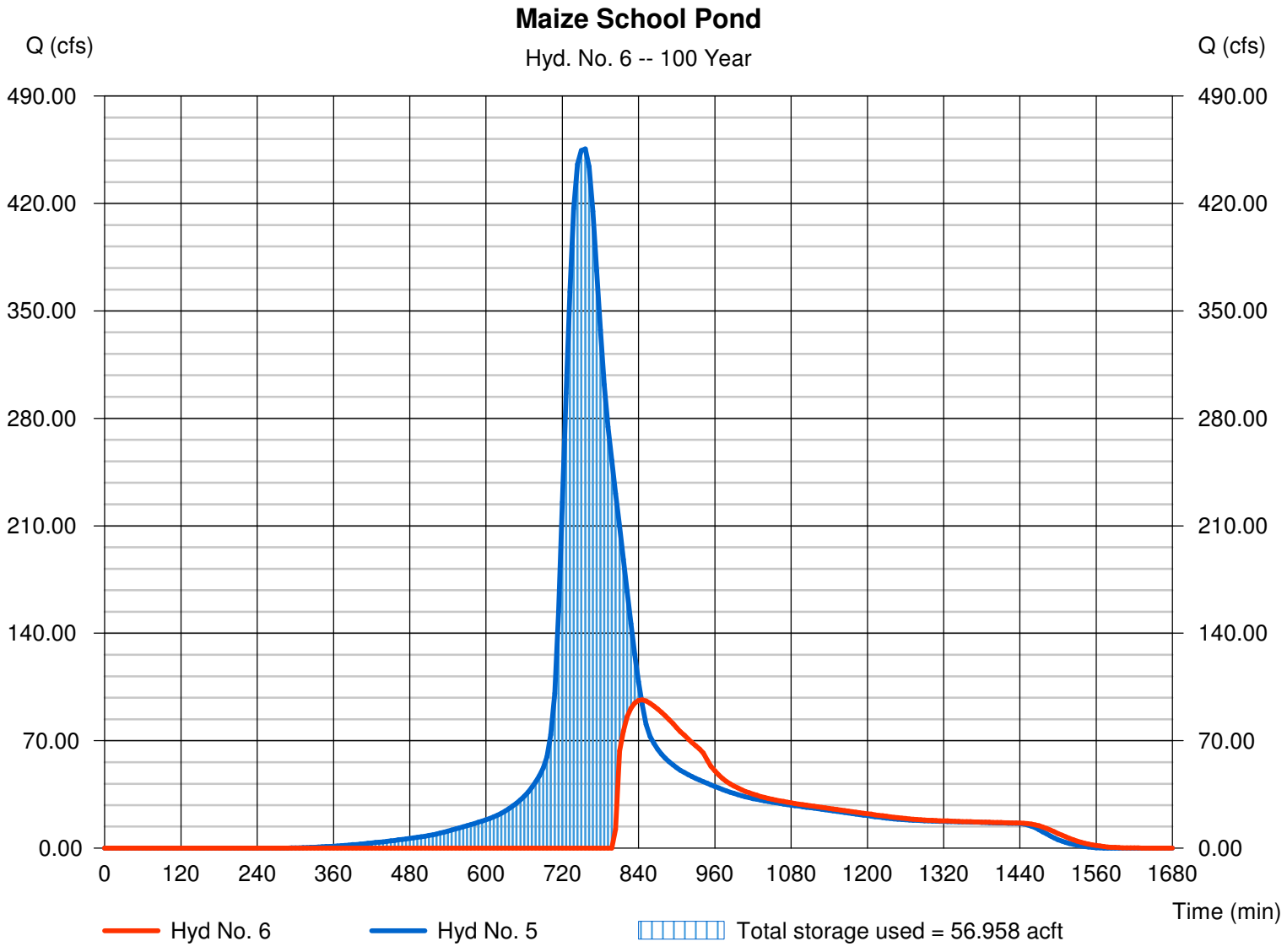
Hydrograph Report

Hyd. No. 6

Maize School Pond

Hydrograph type	=	Reservoir	Peak discharge	=	96.63 cfs
Storm frequency	=	100 yrs	Time to peak	=	846 min
Time interval	=	6 min	Hyd. volume	=	34.742 acft
Inflow hyd. No.	=	5 - To Maize Pond	Max. Elevation	=	1351.57 ft
Reservoir name	=	Maize Combined Pond 100-YR	Max. Storage	=	56.958 acft

Storage Indication method used.



Pond Report

Pond No. 4 - Maize Combined Pond 100-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1347.50	47,337	0.000	0.000
0.50	1348.00	363,399	2.073	2.073
1.50	1349.00	645,319	11.424	13.497
2.50	1350.00	723,264	15.699	29.196
3.50	1351.00	788,357	17.344	46.540
4.50	1352.00	821,610	18.477	65.016
5.50	1353.00	854,198	19.233	84.249

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

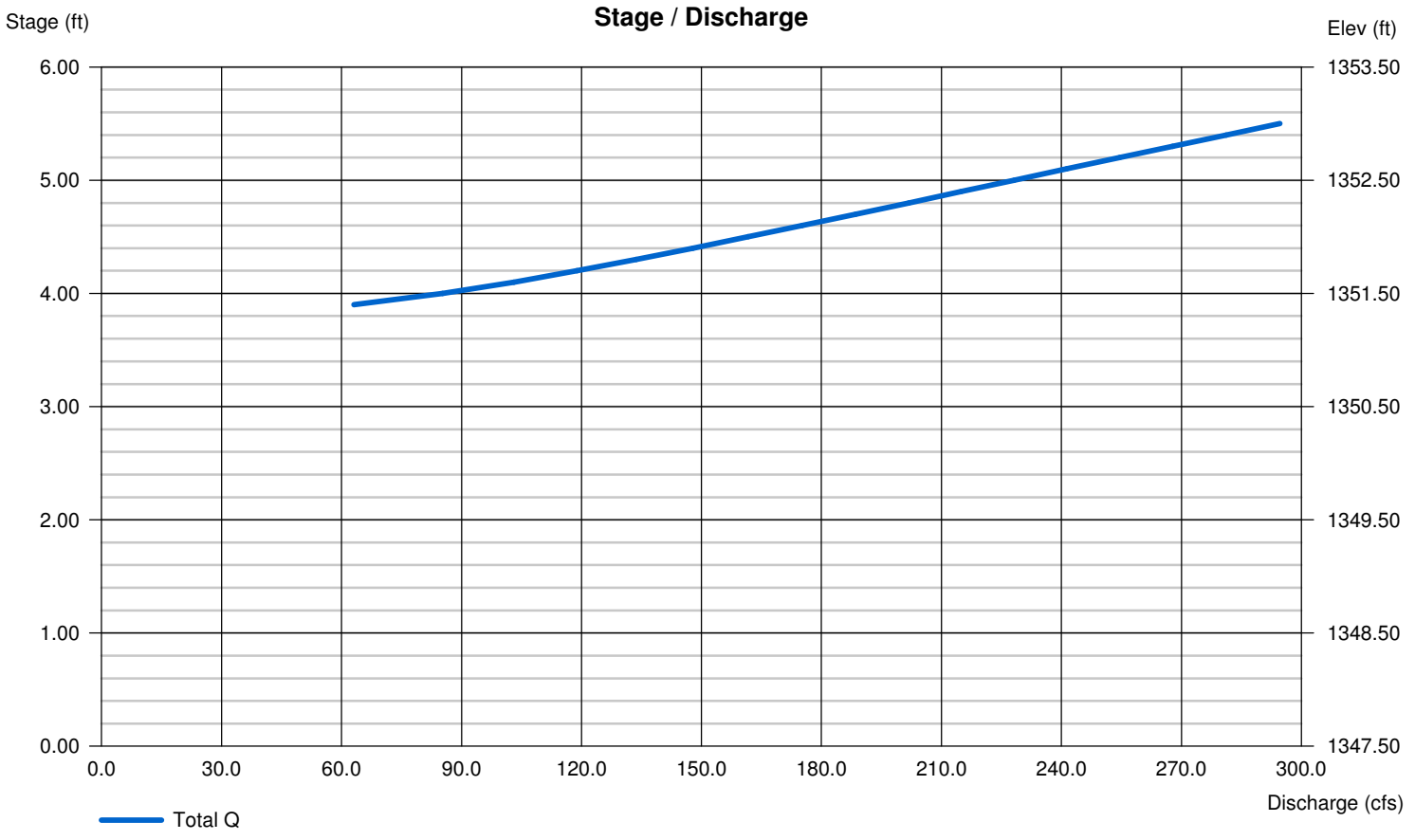
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1351.30

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

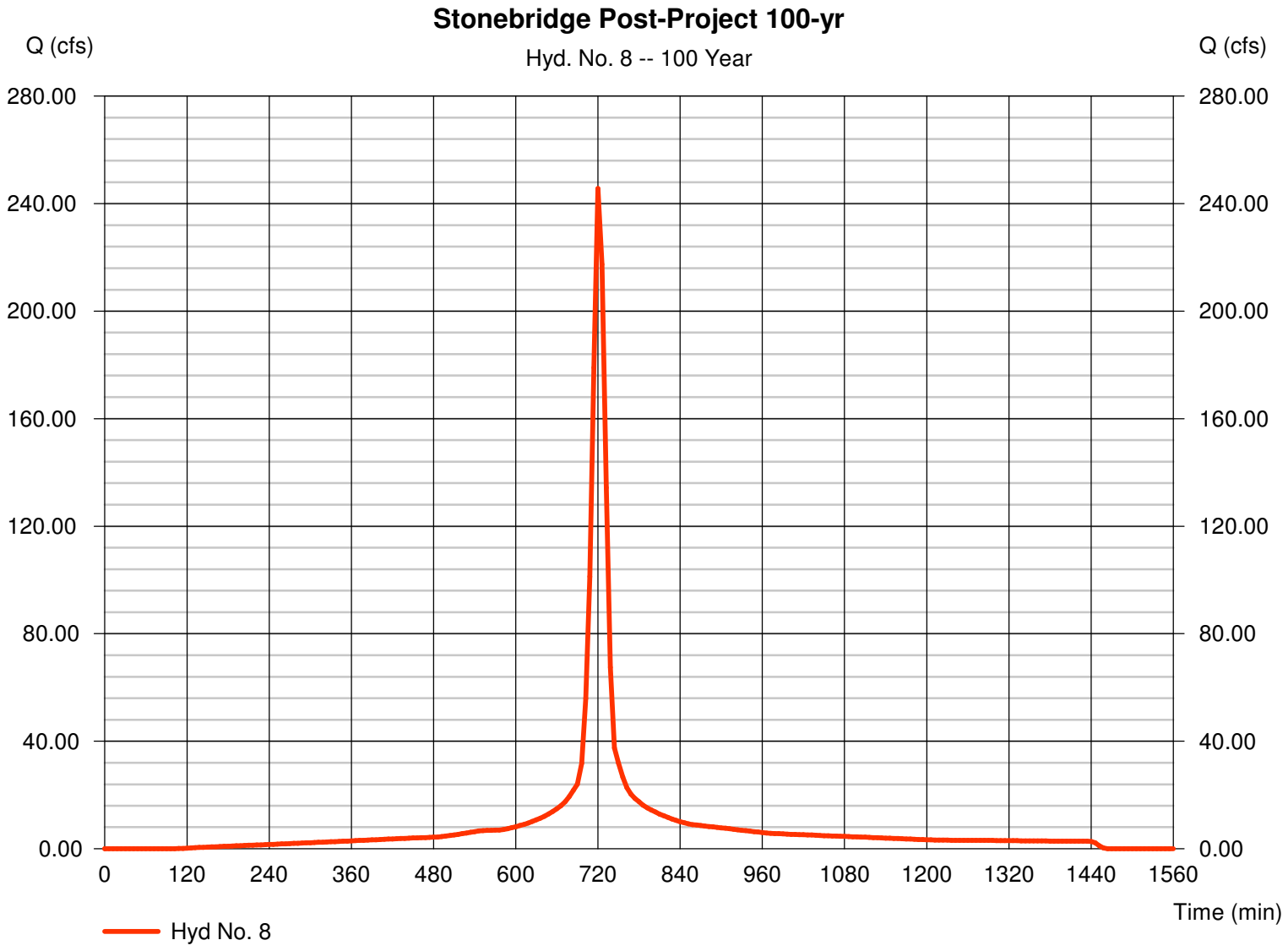


Hydrograph Report

Hyd. No. 8

Stonebridge Post-Project 100-yr

Hydrograph type	=	SCS Runoff	Peak discharge	=	245.61 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	18.776 acft
Drainage area	=	33.930 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	17.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

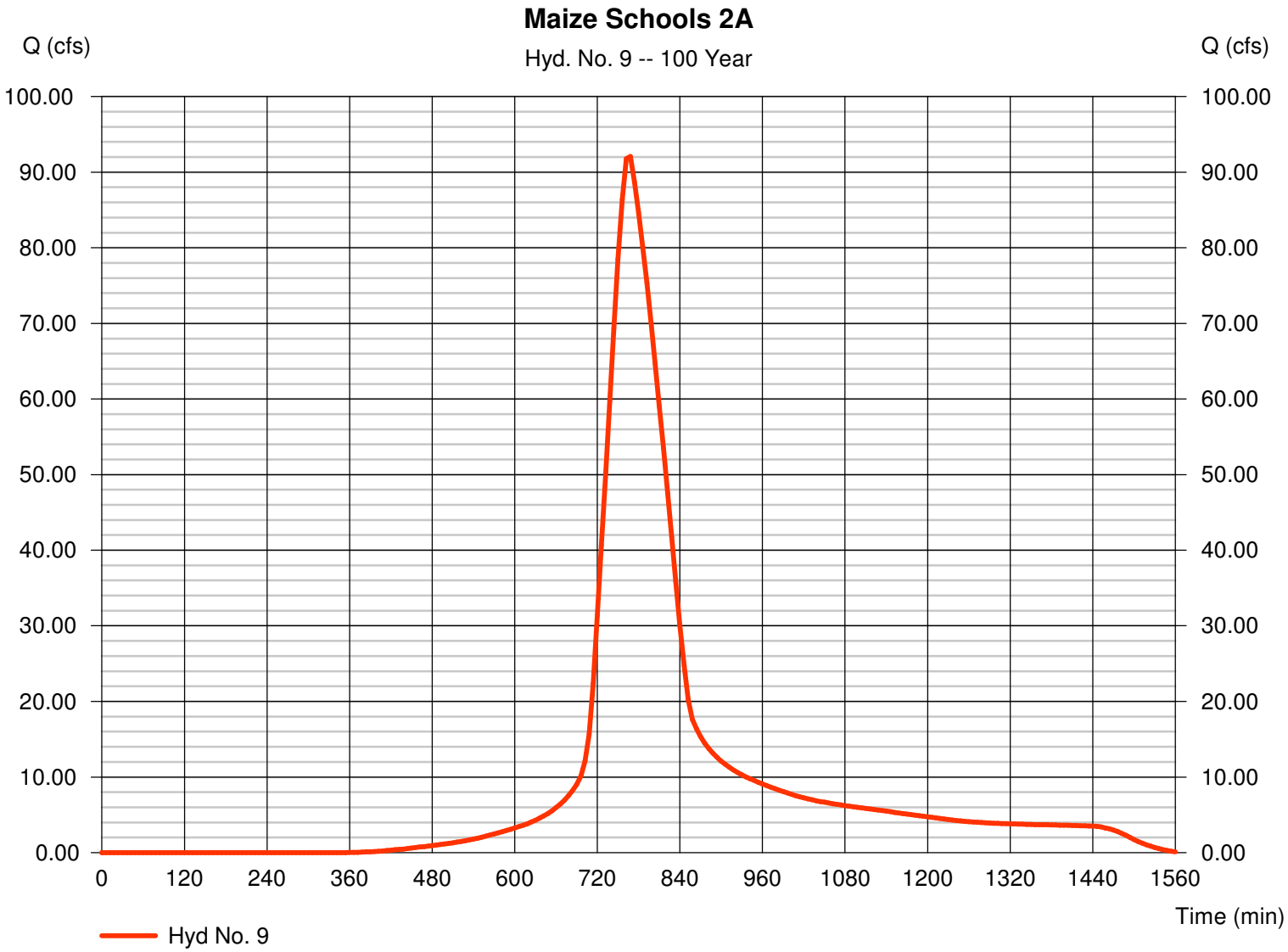


Hydrograph Report

Hyd. No. 9

Maize Schools 2A

Hydrograph type	=	SCS Runoff	Peak discharge	=	92.09 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	18.442 acft
Drainage area	=	42.040 ac	Curve number	=	78.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

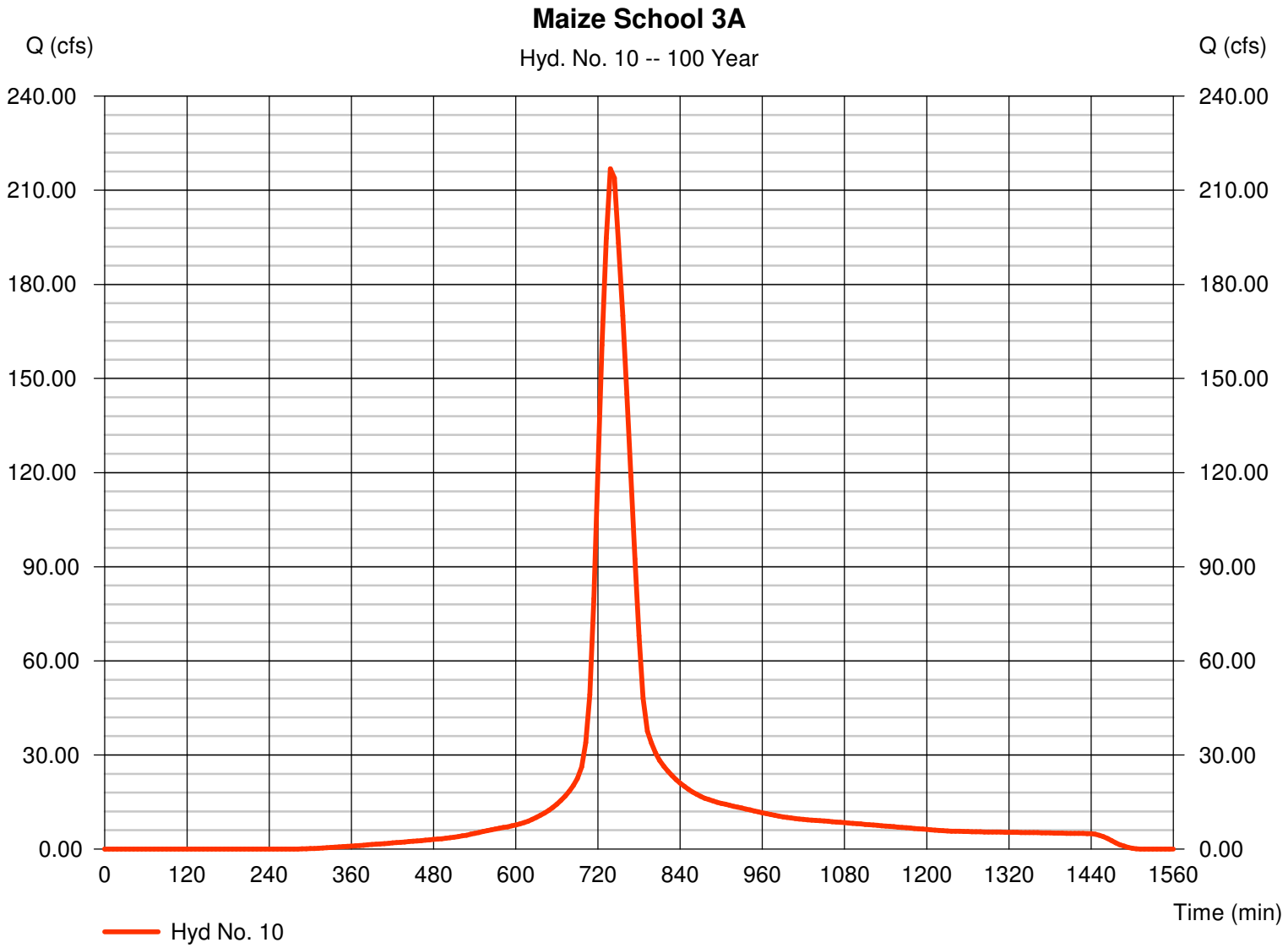


Hydrograph Report

Hyd. No. 10

Maize School 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	216.84 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	28.149 acft
Drainage area	=	59.870 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

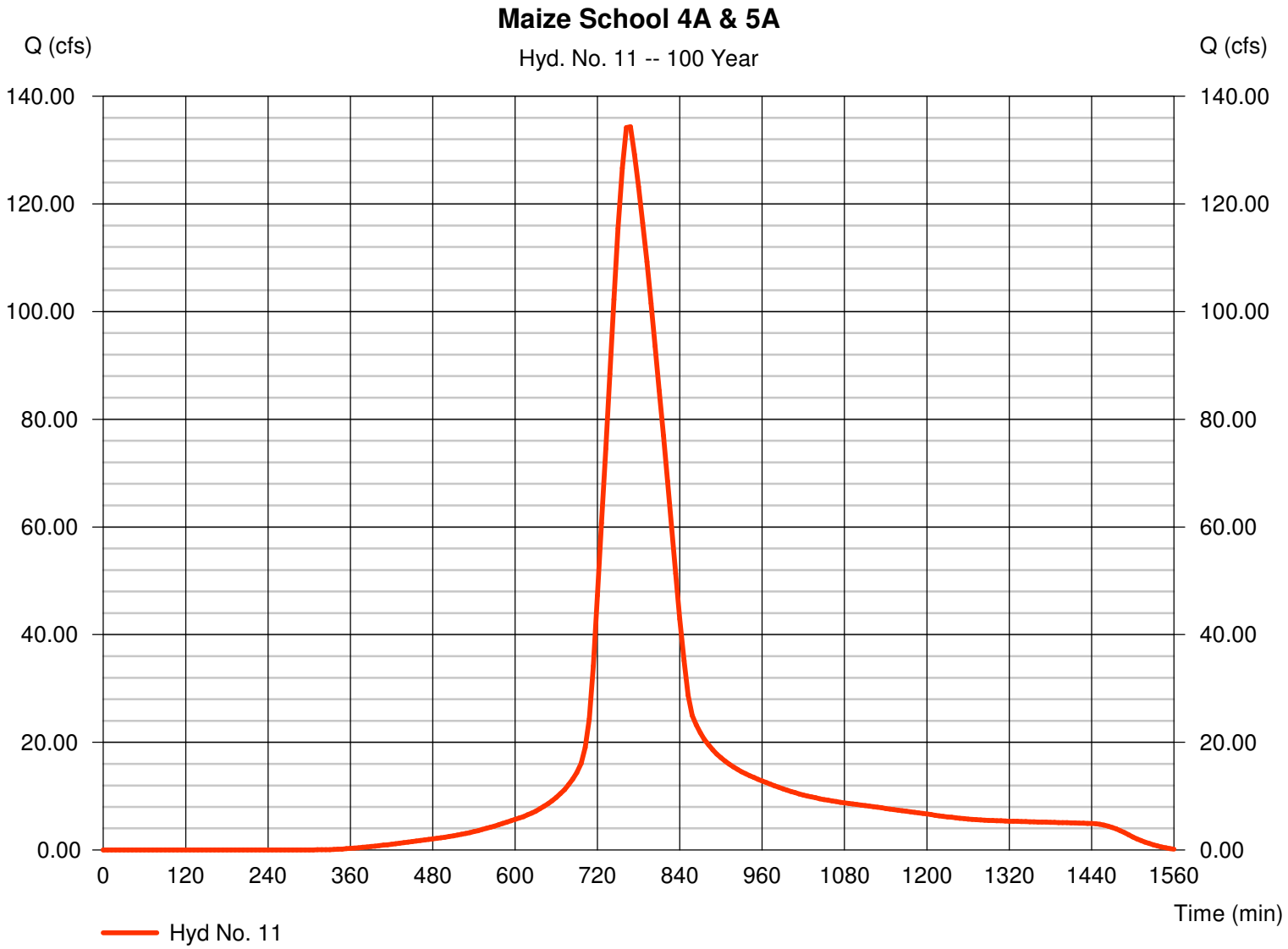


Hydrograph Report

Hyd. No. 11

Maize School 4A & 5A

Hydrograph type	=	SCS Runoff	Peak discharge	=	134.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	6 min	Hyd. volume	=	27.021 acft
Drainage area	=	57.780 ac	Curve number	=	81.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	82.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

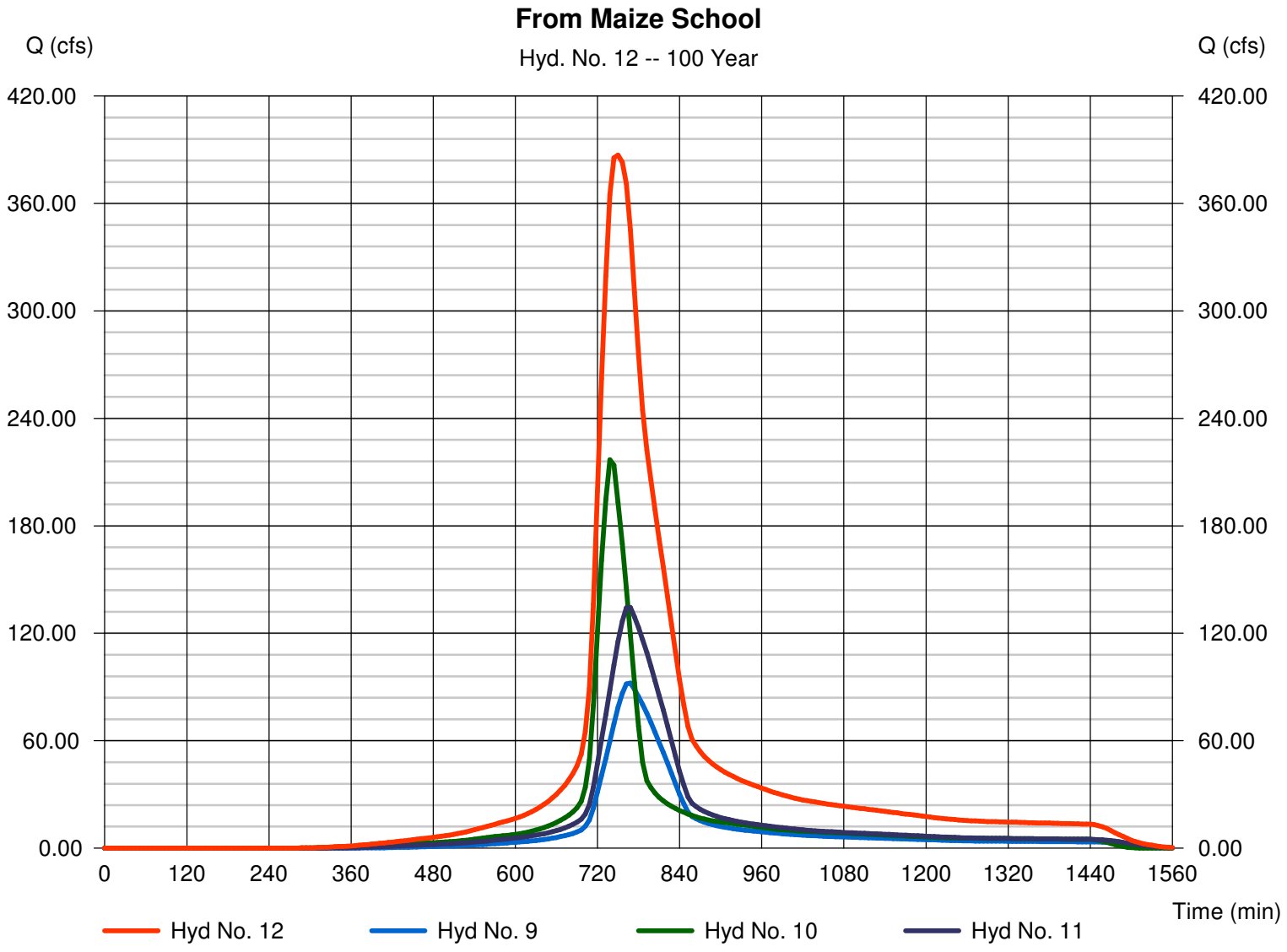


Hydrograph Report

Hyd. No. 12

From Maize School

Hydrograph type	= Combine	Peak discharge	= 387.02 cfs
Storm frequency	= 100 yrs	Time to peak	= 750 min
Time interval	= 6 min	Hyd. volume	= 73.612 acft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 159.690 ac



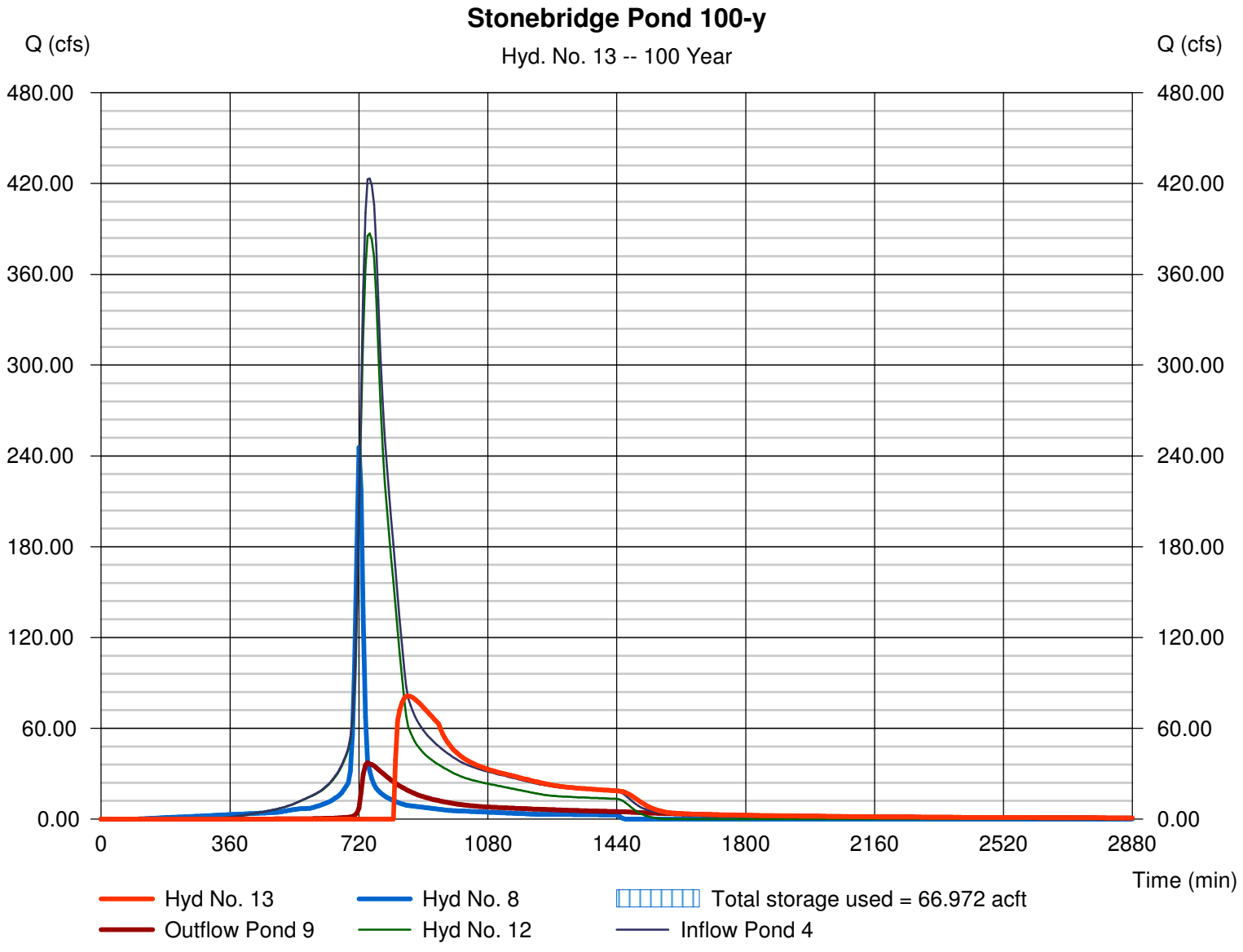
Hydrograph Report

Hyd. No. 13

Stonebridge Pond 100-y

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	81.32 cfs
Storm frequency	=	100 yrs	Time to peak	=	858 min
Time interval	=	6 min	Hyd. volume	=	39.597 acft
Upper Pond			**Lower Pond**		
Pond name	=	Stonebridge Pond 2	Pond name	=	Maize Combined Pond
Inflow hyd.	=	8 - Stonebridge Post-Project 100-yr	Other Inflow hyd.	=	12 - From Maize
Max. Elevation	=	1352.48 ft	Max. Elevation	=	1351.48 ft
Max. Storage	=	11.523 acft	Max. Storage	=	55.449 acft

Interconnected Pond Routing. Storage Indication method used.



Pond Report

Pond No. 9 - Stonebridge Pond 2

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1349.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1349.00	130,142	0.000	0.000
1.00	1350.00	138,111	3.079	3.079
2.00	1351.00	146,180	3.263	6.342
2.50	1351.50	150,200	1.701	8.043
3.00	1352.00	154,349	1.748	9.791
4.00	1353.00	162,619	3.638	13.429

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

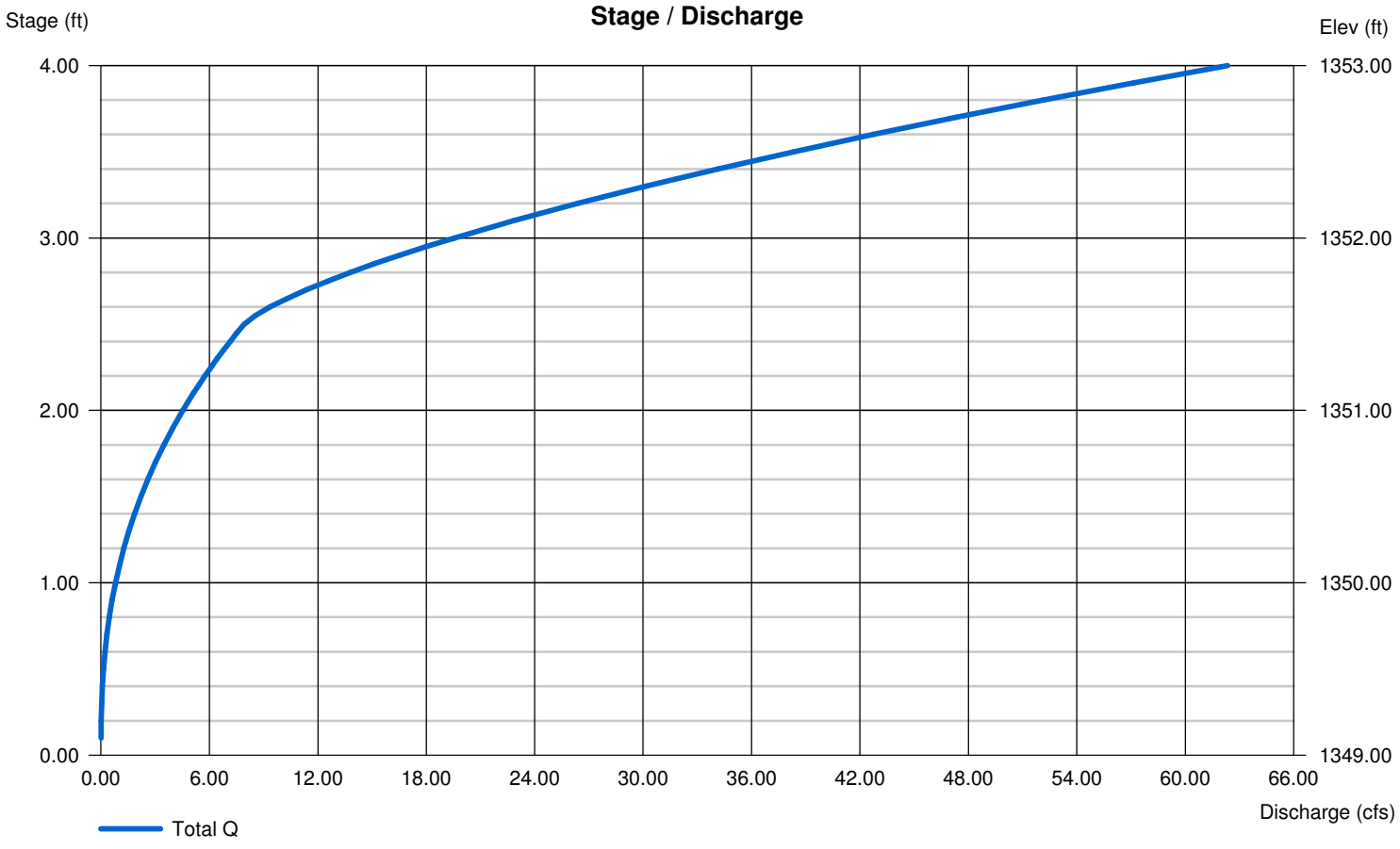
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	6.00	0.00	0.00
Crest El. (ft)	= 1349.00	1351.50	0.00	0.00
Weir Coeff.	= 0.80	3.33	3.33	3.33
Weir Type	= 35 degV	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond Report

Pond No. 4 - Maize Combined Pond 100-YR

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1347.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1347.50	47,337	0.000	0.000
0.50	1348.00	363,399	2.073	2.073
1.50	1349.00	645,319	11.424	13.497
2.50	1350.00	723,264	15.699	29.196
3.50	1351.00	788,357	17.344	46.540
4.50	1352.00	821,610	18.477	65.016
5.50	1353.00	854,198	19.233	84.249

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

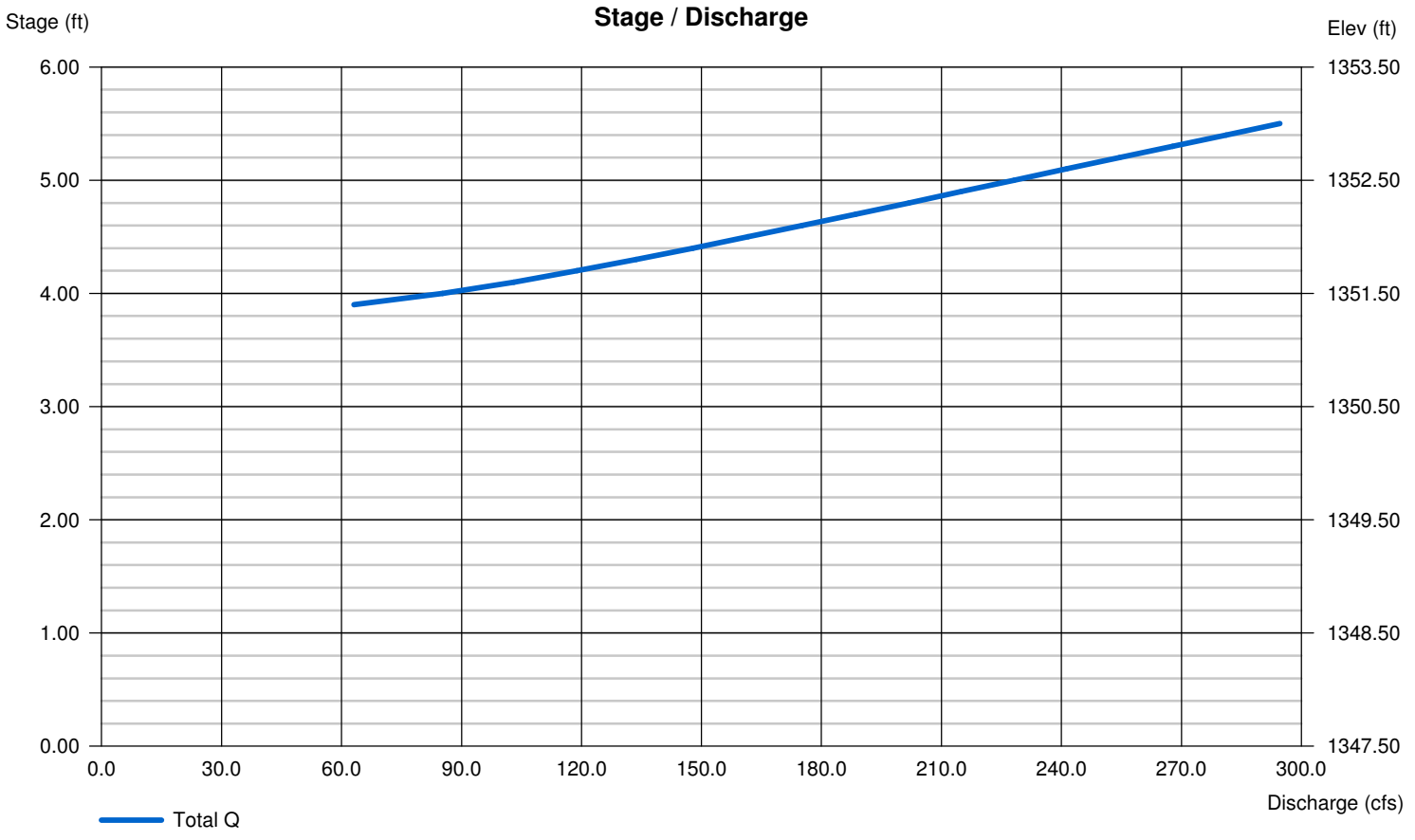
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	8.00	0.00	0.00
Crest El. (ft)	= 1347.50	1349.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1351.30

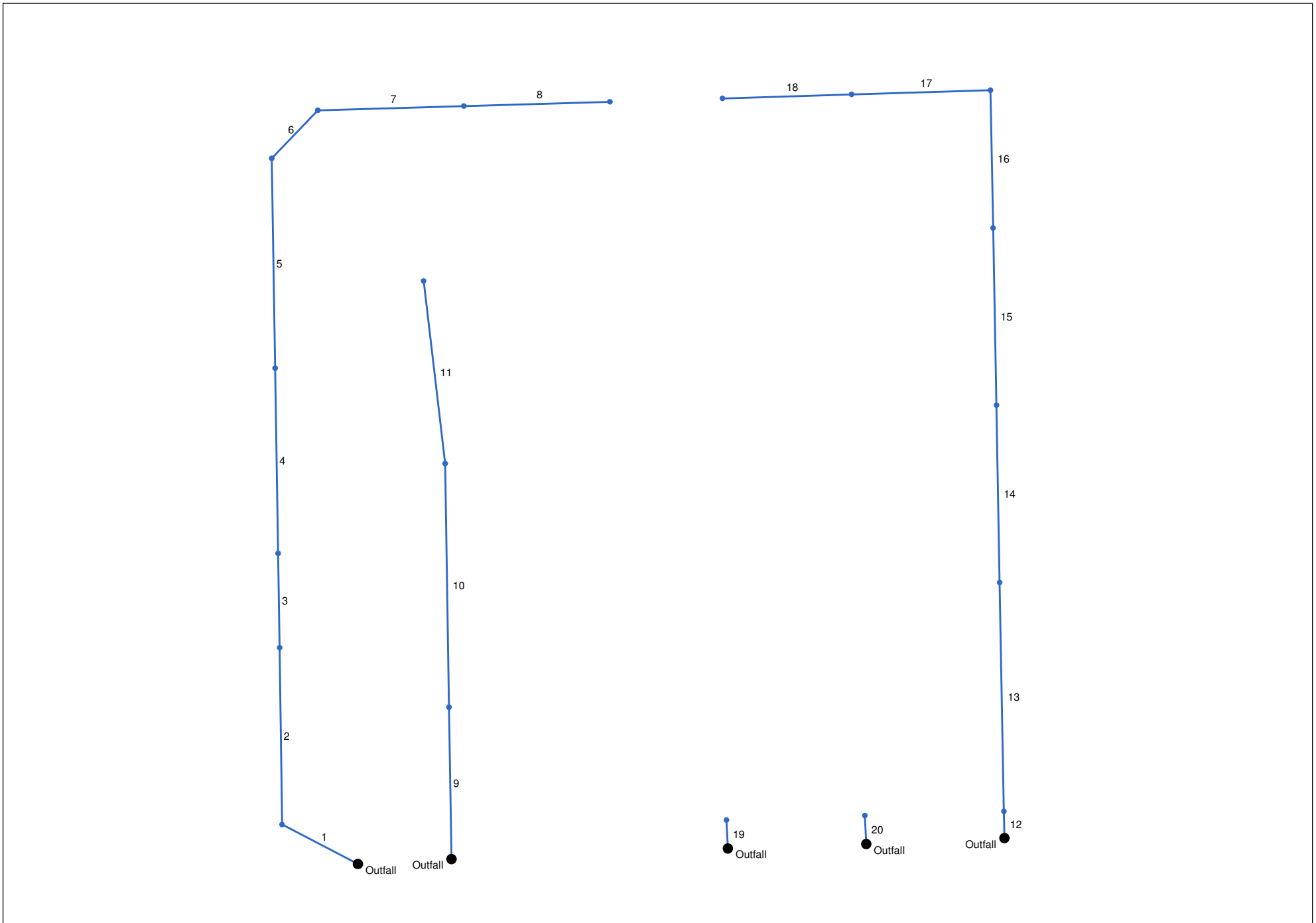
Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Appendix C

Hydraflow Storm Sewer Calculations

Hydraflow Storm Sewers Plan



Project File: SWS Pipe Size Trial 3_5_5-yrcomb.stm	Number of lines: 20	Date: 12-18-2008

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	93	-152	Curb	0.00	2.16	0.85	15.0	1343.50	1.18	1344.59	48	Cir	0.013	1.35	1353.00	
2	1	192	62	Curb	0.00	0.98	0.85	15.0	1344.69	0.10	1344.88	48	Cir	0.013	0.50	1353.00	
3	2	102	0	Curb	0.00	1.06	0.85	15.0	1345.38	0.12	1345.50	42	Cir	0.013	0.50	1353.00	
4	3	201	0	Curb	0.00	1.46	0.85	15.0	1345.60	0.12	1345.84	42	Cir	0.013	0.50	1353.00	
5	4	227	0	Curb	0.00	2.00	0.85	15.0	1346.34	0.12	1346.61	36	Cir	0.013	1.12	1353.00	
6	5	72	45	Curb	0.00	1.02	0.85	15.0	1347.11	0.17	1347.23	30	Cir	0.013	1.12	1353.00	
7	6	158	45	Curb	0.00	0.95	0.85	15.0	1347.33	0.16	1347.58	30	Cir	0.013	0.50	1353.00	
8	7	158	0	Curb	0.00	0.92	0.85	15.0	1348.08	0.21	1348.41	24	Cir	0.013	1.00	1353.00	
9	End	164	-91	DrGrt	0.00	1.94	0.85	15.0	1344.67	1.05	1346.40	36	Cir	0.013	0.50	1353.00	
10	9	264	0	DrGrt	0.00	1.28	0.85	15.0	1346.50	0.12	1346.82	36	Cir	0.013	0.50	1353.00	
11	10	199	-6	DrGrt	0.00	1.50	0.85	15.0	1347.82	0.21	1348.24	24	Cir	0.013	1.00	1353.00	
12	End	29	-91	Curb	0.00	0.67	0.85	15.0	1344.00	0.10	1344.03	48	Cir	0.013	0.50	1352.95	
13	12	248	0	DrGrt	0.00	2.52	0.85	15.0	1344.13	0.10	1344.38	48	Cir	0.013	0.50	1353.64	
14	13	192	0	DrGrt	0.00	2.86	0.85	15.0	1344.88	0.12	1345.11	42	Cir	0.013	0.50	1353.64	
15	14	192	0	DrGrt	0.00	1.89	0.85	15.0	1345.67	0.12	1345.90	36	Cir	0.013	0.50	1353.30	
16	15	149	0	Curb	0.00	1.54	0.85	15.0	1346.00	0.12	1346.18	36	Cir	0.013	1.50	1353.00	
17	16	150	-91	Curb	0.00	0.96	0.85	15.0	1346.68	0.16	1346.92	30	Cir	0.013	0.50	1353.00	
18	17	140	0	Curb	0.00	0.90	0.85	15.0	1347.42	0.21	1347.71	24	Cir	0.013	1.00	1353.00	
19	End	31	-93	Curb	0.00	0.79	0.85	15.0	1347.56	3.11	1348.52	15	Cir	0.013	1.00	1352.95	
20	End	31	-93	Curb	0.00	0.54	0.85	15.0	1347.56	3.11	1348.52	15	Cir	0.013	1.00	1352.95	

Project File: SWS Pipe Size Trial 3_5_5-yrcomb.stm | Number of lines: 20 | Date: 12-18-2008

Storm Sewer Summary 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		40.79	48	Cir	93	1343.50	1344.59	1.178	1351.44*	1351.52*	0.22	1351.74	End	Curb-Horiz
2		32.44	48	Cir	192	1344.69	1344.88	0.099	1351.80*	1351.89*	0.05	1351.95	1	Curb-Horiz
3		28.65	42	Cir	102	1345.38	1345.50	0.118	1351.95*	1352.03*	0.07	1352.10	2	Curb-Horiz
4		24.55	42	Cir	201	1345.60	1345.84	0.120	1352.13*	1352.25*	0.05	1352.30	3	Curb-Horiz
5		18.91	36	Cir	227	1346.34	1346.61	0.119	1352.30*	1352.49*	0.12	1352.61	4	Curb-Horiz
6		11.17	30	Cir	72	1347.11	1347.23	0.166	1352.64*	1352.70*	0.09	1352.79	5	Curb-Horiz
7		7.23	30	Cir	158	1347.33	1347.58	0.158	1352.83*	1352.88*	0.02	1352.90	6	Curb-Horiz
8		3.56	24	Cir	158	1348.08	1348.41	0.208	1352.91*	1352.95*	0.02	1352.97	7	Curb-Horiz
9		18.25	36	Cir	164	1344.67	1346.40	1.052	1351.44*	1351.56*	0.05	1351.62	End	DropGrate
10		10.75	36	Cir	264	1346.50	1346.82	0.121	1351.68*	1351.75*	0.02	1351.77	9	DropGrate
11		5.80	24	Cir	199	1347.82	1348.24	0.211	1351.77*	1351.90*	0.05	1351.95	10	DropGrate
12		43.85	48	Cir	29	1344.00	1344.03	0.104	1351.44*	1351.47*	0.09	1351.56	End	Curb-Horiz
13		41.26	48	Cir	248	1344.13	1344.38	0.101	1351.58*	1351.79*	0.08	1351.87	12	DropGrate
14		31.51	42	Cir	192	1344.88	1345.11	0.120	1351.87*	1352.06*	0.08	1352.14	13	DropGrate
15		20.46	36	Cir	192	1345.67	1345.90	0.120	1352.18*	1352.36*	0.07	1352.43	14	DropGrate
16		13.15	36	Cir	149	1346.00	1346.18	0.121	1352.50*	1352.56*	0.08	1352.64	15	Curb-Horiz
17		7.19	30	Cir	150	1346.68	1346.92	0.160	1352.66*	1352.71*	0.02	1352.73	16	Curb-Horiz
18		3.48	24	Cir	140	1347.42	1347.71	0.207	1352.74*	1352.77*	0.02	1352.79	17	Curb-Horiz
19		3.05	15	Cir	31	1347.56	1348.52	3.113	1351.44*	1351.51*	0.10	1351.61	End	Curb-Horiz
20		2.09	15	Cir	31	1347.56	1348.52	3.113	1351.44*	1351.47*	0.05	1351.52	End	Curb-Horiz

Project File: SWS Pipe Size Trial 3_5_5-yrcomb.stm

Number of lines: 20

Run Date: 12-18-2008

NOTES: Return period = 5 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	93	2.16	10.55	0.85	1.84	8.97	15.0	22.4	3.8	40.79	155.9	3.25	48	1.18	1343.50	1344.59	1351.44	1351.52	0.00	1353.00	
2	1	192	0.98	8.39	0.85	0.83	7.13	15.0	21.1	3.9	32.44	45.25	2.58	48	0.10	1344.69	1344.88	1351.80	1351.89	1353.00	1353.00	
3	2	102	1.06	7.41	0.85	0.90	6.30	15.0	20.4	3.9	28.65	34.51	2.98	42	0.12	1345.38	1345.50	1351.95	1352.03	1353.00	1353.00	
4	3	201	1.46	6.35	0.85	1.24	5.40	15.0	19.1	4.1	24.55	34.79	2.55	42	0.12	1345.60	1345.84	1352.13	1352.25	1353.00	1353.00	
5	4	227	2.00	4.89	0.85	1.70	4.16	15.0	17.6	4.2	18.91	22.99	2.68	36	0.12	1346.34	1346.61	1352.30	1352.49	1353.00	1353.00	
6	5	72	1.02	2.89	0.85	0.87	2.46	15.0	17.1	4.3	11.17	16.73	2.28	30	0.17	1347.11	1347.23	1352.64	1352.70	1353.00	1353.00	
7	6	158	0.95	1.87	0.85	0.81	1.59	15.0	16.1	4.4	7.23	16.30	1.47	30	0.16	1347.33	1347.58	1352.83	1352.88	1353.00	1353.00	
8	7	158	0.92	0.92	0.85	0.78	0.78	15.0	15.0	4.5	3.56	10.33	1.13	24	0.21	1348.08	1348.41	1352.91	1352.95	1353.00	1353.00	
9	End	164	1.94	4.72	0.85	1.65	4.01	15.0	18.1	4.2	18.25	68.41	2.58	36	1.05	1344.67	1346.40	1351.44	1351.56	0.00	1353.00	
10	9	264	1.28	2.78	0.85	1.09	2.36	15.0	16.3	4.4	10.75	23.22	1.52	36	0.12	1346.50	1346.82	1351.68	1351.75	1353.00	1353.00	
11	10	199	1.50	1.50	0.85	1.28	1.28	15.0	15.0	4.5	5.80	10.39	1.85	24	0.21	1347.82	1348.24	1351.77	1351.90	1353.00	1353.00	
12	End	29	0.67	11.34	0.85	0.57	9.64	15.0	22.1	3.8	43.85	46.27	3.49	48	0.10	1344.00	1344.03	1351.44	1351.47	0.00	1352.95	
13	12	248	2.52	10.67	0.85	2.14	9.07	15.0	20.5	3.9	41.26	45.64	3.28	48	0.10	1344.13	1344.38	1351.58	1351.79	1352.95	1353.64	
14	13	192	2.86	8.15	0.85	2.43	6.93	15.0	19.2	4.1	31.51	34.82	3.28	42	0.12	1344.88	1345.11	1351.87	1352.06	1353.64	1353.64	
15	14	192	1.89	5.29	0.85	1.61	4.50	15.0	17.9	4.2	20.46	23.08	2.89	36	0.12	1345.67	1345.90	1352.18	1352.36	1353.64	1353.30	
16	15	149	1.54	3.40	0.85	1.31	2.89	15.0	16.9	4.3	13.15	23.16	1.86	36	0.12	1346.00	1346.18	1352.50	1352.56	1353.30	1353.00	
17	16	150	0.96	1.86	0.85	0.82	1.58	15.0	15.9	4.4	7.19	16.38	1.47	30	0.16	1346.68	1346.92	1352.66	1352.71	1353.00	1353.00	
18	17	140	0.90	0.90	0.85	0.77	0.77	15.0	15.0	4.5	3.48	10.29	1.11	24	0.21	1347.42	1347.71	1352.74	1352.77	1353.00	1353.00	
19	End	31	0.79	0.79	0.85	0.67	0.67	15.0	15.0	4.5	3.05	11.39	2.49	15	3.11	1347.56	1348.52	1351.44	1351.51	0.00	1352.95	
20	End	31	0.54	0.54	0.85	0.46	0.46	15.0	15.0	4.5	2.09	11.39	1.70	15	3.11	1347.56	1348.52	1351.44	1351.47	0.00	1352.95	

Project File: SWS Pipe Size Trial 3_5_5-yrcomb.stm | Number of lines: 20 | Run Date: 12-18-2008

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Total flows limited to inlet captured flows. ; c = cir e = ellip b = box

Inlet Report

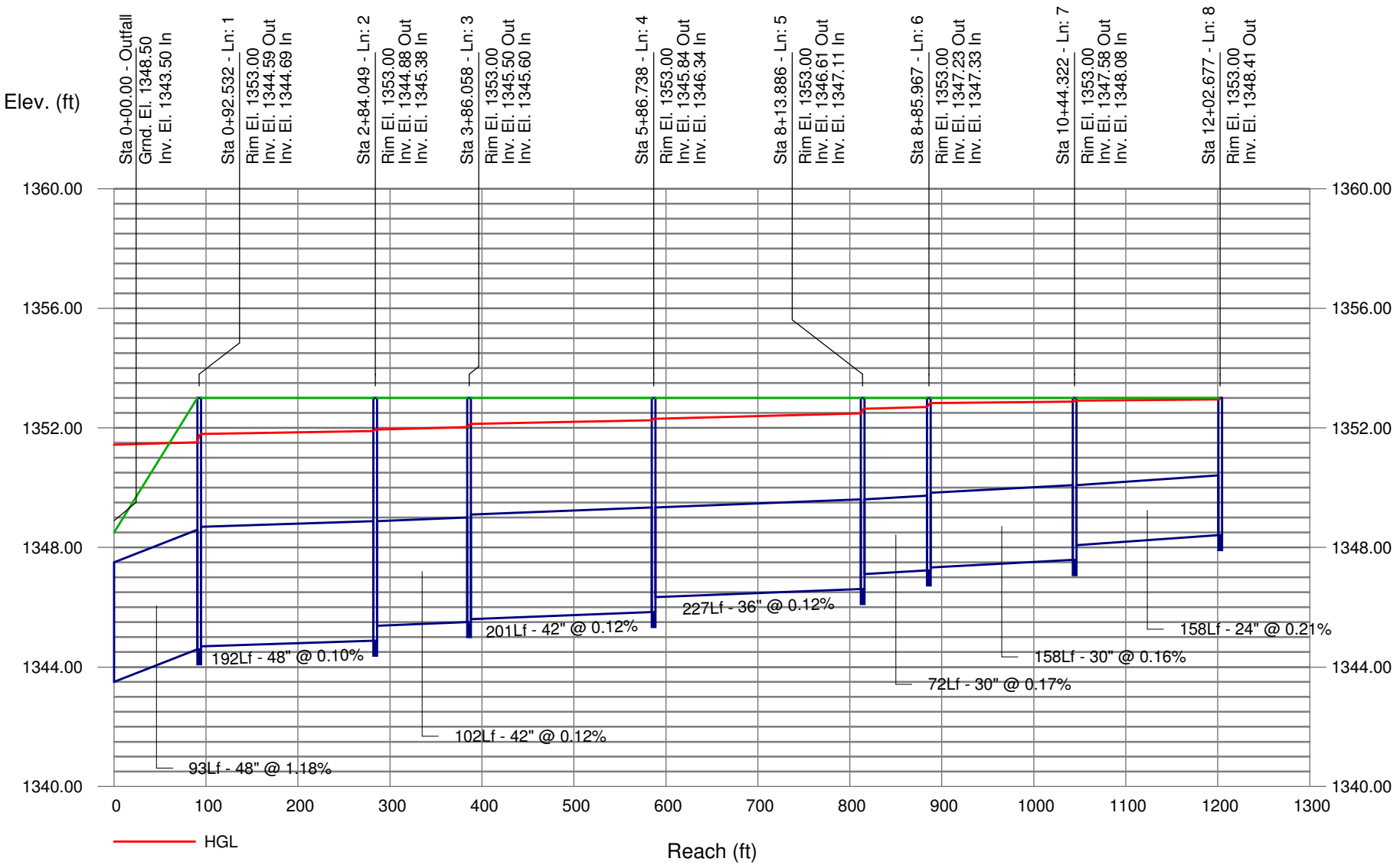
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1		8.35	0.00	8.35	0.00	Curb	4.0	10.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.47	20.64	0.47	20.64	0.0	Off
2		3.79	0.00	3.79	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.39	16.52	0.39	16.52	0.0	Off
3		4.10	0.00	4.10	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.41	17.42	0.41	17.42	0.0	Off
4		5.65	0.00	5.65	0.00	Curb	4.0	10.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.38	15.88	0.38	15.88	0.0	Off
5		7.73	0.00	7.73	0.00	Curb	4.0	10.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.45	19.60	0.45	19.60	0.0	Off
6		3.94	0.00	3.94	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.40	16.97	0.40	16.97	0.0	Off
7		3.67	0.00	3.67	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.38	16.18	0.38	16.18	0.0	Off
8		3.56	0.00	3.56	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.38	15.84	0.38	15.84	0.0	Off
9		7.50	0.00	7.50	0.00	DrGrt	0.0	0.00	16.00	4.00	4.00	Sag	2.00	0.020	0.020	0.000	0.29	33.00	0.29	33.00	0.0	Off
10		4.95	0.00	4.95	0.00	DrGrt	0.0	0.00	8.00	2.00	4.00	Sag	2.00	0.020	0.020	0.000	0.27	30.62	0.27	30.62	0.0	Off
11		5.80	0.00	5.80	0.00	DrGrt	0.0	0.00	8.00	2.00	4.00	Sag	2.00	0.020	0.020	0.000	0.30	33.59	0.30	33.59	0.0	Off
12		2.59	0.00	2.59	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.32	12.81	0.32	12.81	0.0	Off
13		9.74	0.00	9.74	0.00	DrGrt	0.0	0.00	16.00	4.00	4.00	Sag	2.00	0.020	0.020	0.000	0.35	38.52	0.35	38.52	0.0	Off
14		11.06	0.00	11.06	0.00	DrGrt	0.0	0.00	16.00	4.00	4.00	Sag	2.00	0.020	0.020	0.000	0.38	41.56	0.38	41.56	0.0	Off
15		7.31	0.00	7.31	0.00	DrGrt	0.0	0.00	16.00	4.00	4.00	Sag	2.00	0.020	0.020	0.000	0.28	32.50	0.28	32.50	0.0	Off
16		5.95	0.00	5.95	0.00	Curb	4.0	10.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.39	16.46	0.39	16.46	0.0	Off
17		3.71	0.00	3.71	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.39	16.30	0.39	16.30	0.0	Off
18		3.48	0.00	3.48	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.37	15.61	0.37	15.61	0.0	Off
19		3.05	0.00	3.05	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.35	14.30	0.35	14.30	0.0	Off
20		2.09	0.00	2.09	0.00	Curb	4.0	5.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.000	0.28	11.08	0.28	11.08	0.0	Off

Project File: SWS Pipe Size Trial 3_5_5-yrcomb.stm | Number of lines: 20 | Run Date: 12-18-2008

NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

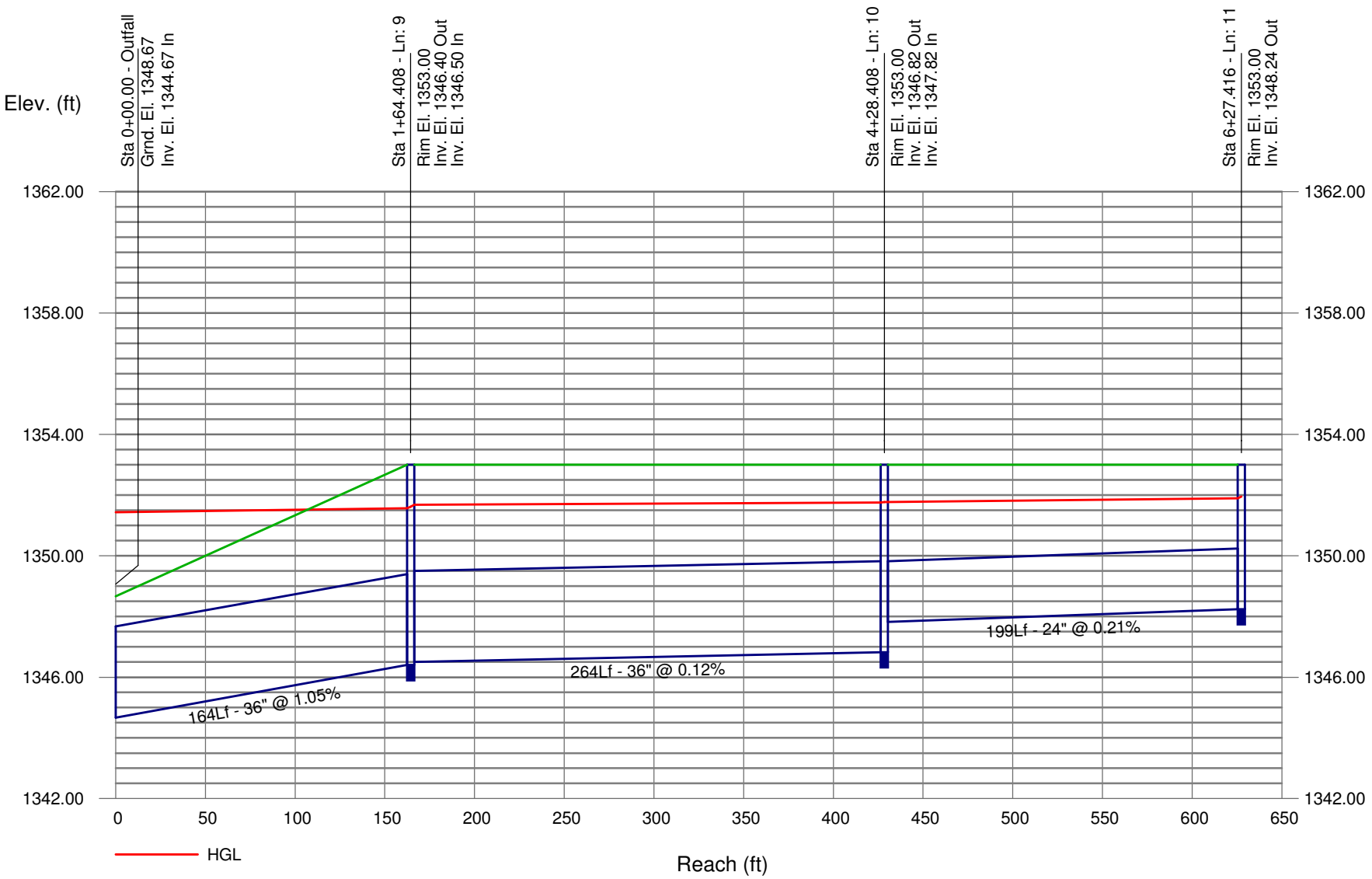
Storm Sewer Profile

Proj. file: SWS Pipe Size Trial 3_5_5-yrcomb.stm



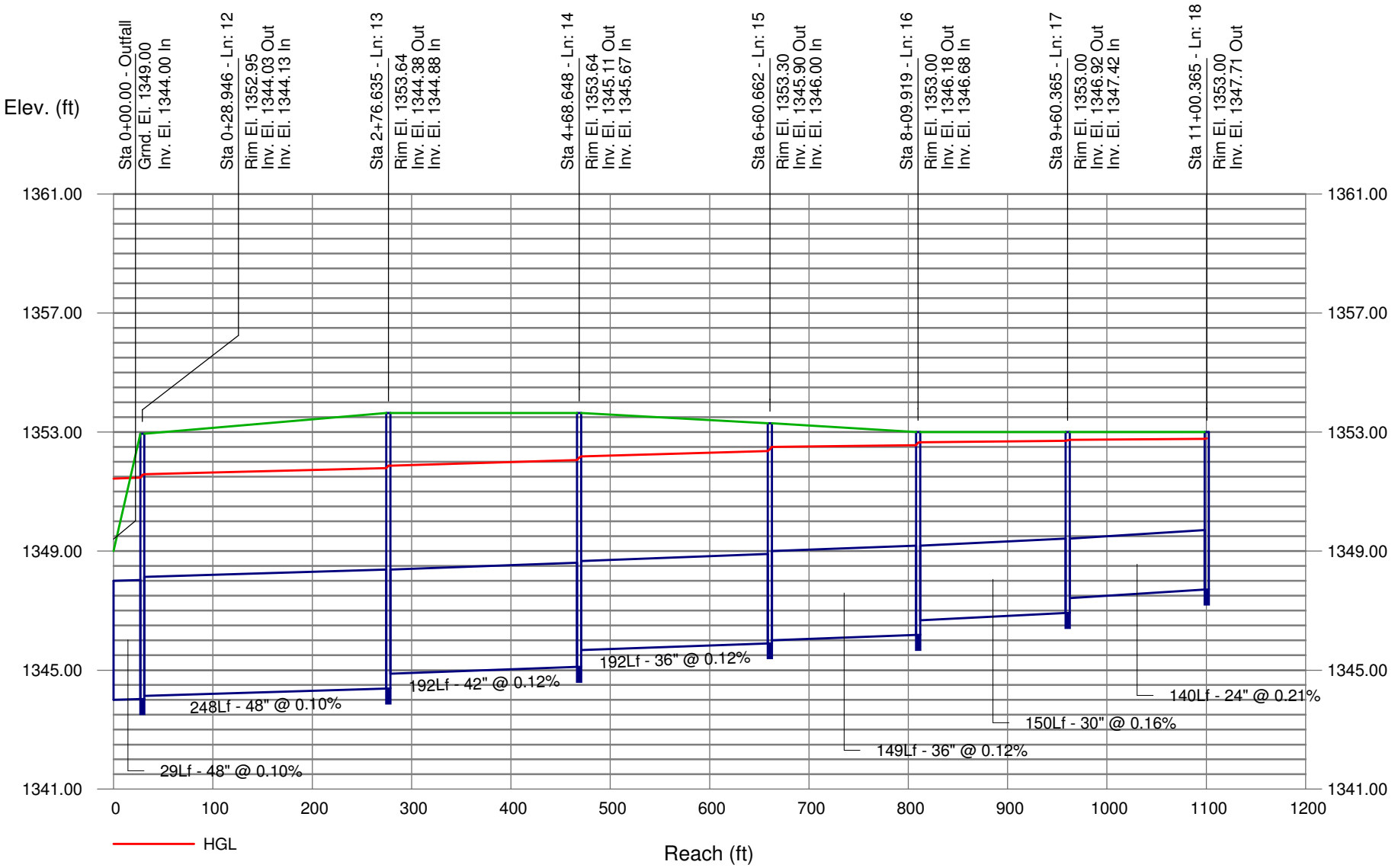
Storm Sewer Profile

Proj. file: SWS Pipe Size Trial 3_5_5-yrcomb.stm



Storm Sewer Profile

Proj. file: SWS Pipe Size Trial 3_5_5-yrcomb.stm



Storm Sewer Profile

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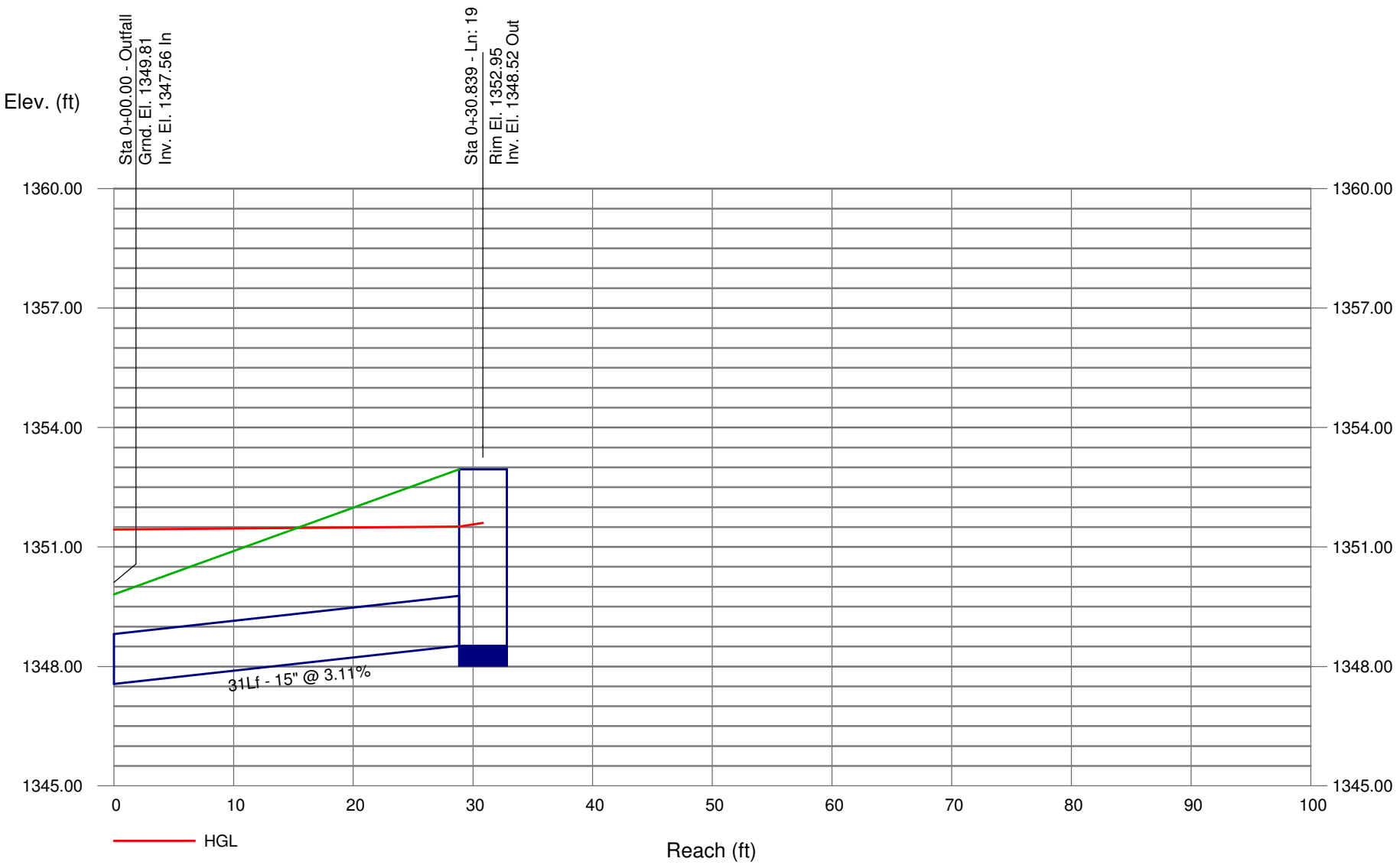
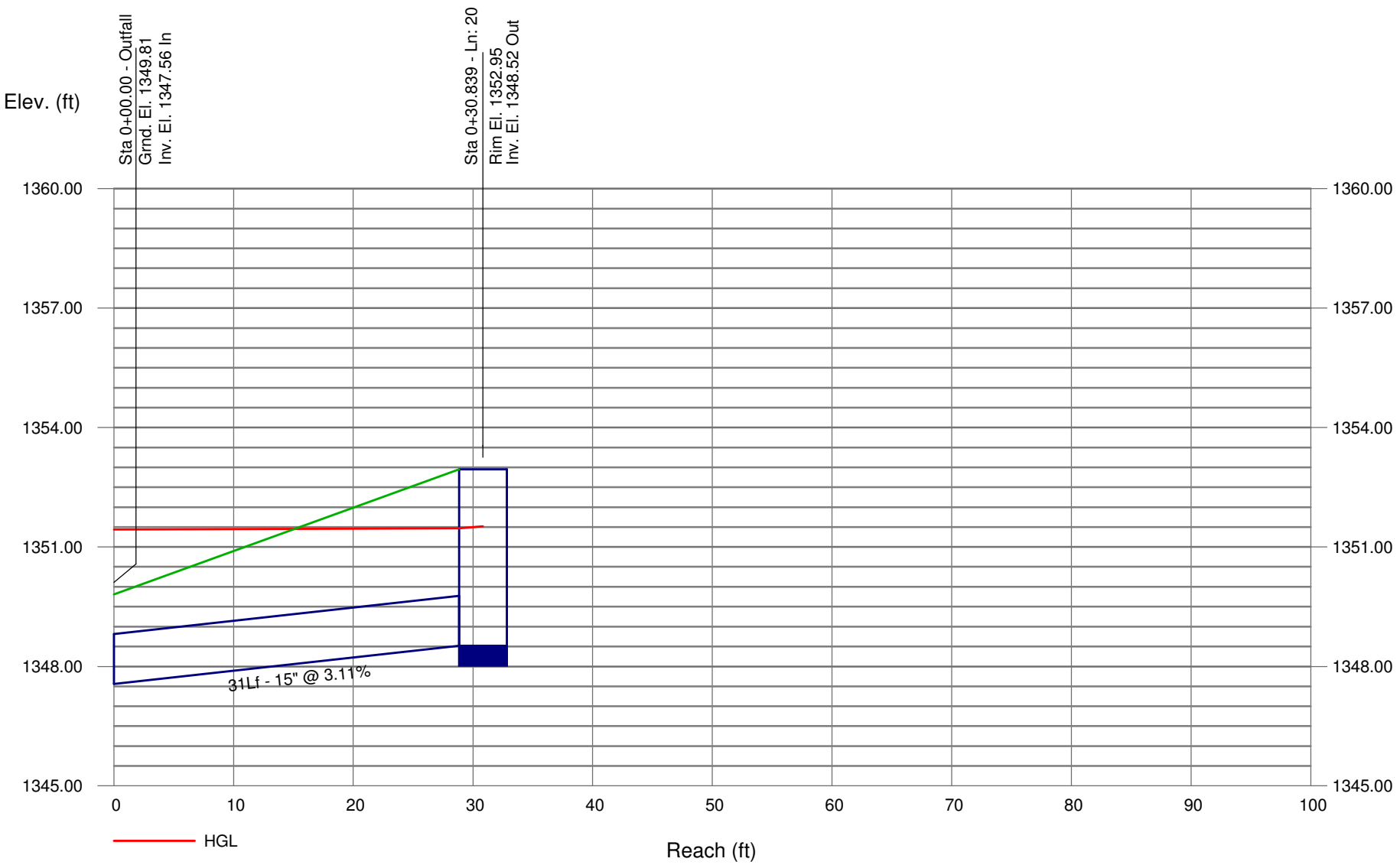
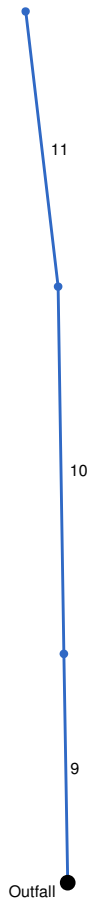


Storm Sewer Profile

Proj. file: SWS Pipe Size Trial 3_5_5-yrcomb.stm



Hydraflow Storm Sewers Plan



Project File: SWS Pipe Size Trial 3_100_5-yrcomb.stm	Number of lines: 3	Date: 12-18-2008

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
9	End	164	-91	DrGrt	0.00	1.94	0.91	15.0	1344.67	1.05	1346.40	36	Cir	0.013	0.50	1353.00	
10	9	264	0	DrGrt	0.00	1.28	0.91	15.0	1346.50	0.12	1346.82	36	Cir	0.013	0.50	1353.00	
11	10	199	-6	DrGrt	0.00	1.50	0.91	15.0	1347.82	0.21	1348.24	24	Cir	0.013	1.00	1353.00	

Project File: SWS Pipe Size Trial 3_100_5-yrcomb.stm

Number of lines: 3

Date: 12-18-2008

Storm Sewer Summary 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
9		31.63	36	Cir	164	1344.67	1346.40	1.052	1351.44*	1351.81*	0.16	1351.97	End	DropGrate
10		18.63	36	Cir	264	1346.50	1346.82	0.121	1352.17*	1352.38*	0.05	1352.43	9	DropGrate
11		10.05	24	Cir	199	1347.82	1348.24	0.211	1352.43*	1352.82*	0.16	1352.98	10	DropGrate

Project File: SWS Pipe Size Trial 3_100_5-yrcomb.stm | Number of lines: 3 | Run Date: 12-18-2008

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
9	End	164	1.94	4.72	0.91	1.77	4.30	15.0	17.7	6.9	31.63	68.41	4.48	36	1.05	1344.67	1346.40	1351.44	1351.81	0.00	1353.00	
10	9	264	1.28	2.78	0.91	1.16	2.53	15.0	16.0	7.2	18.63	23.22	2.64	36	0.12	1346.50	1346.82	1352.17	1352.38	1353.00	1353.00	
11	10	199	1.50	1.50	0.91	1.37	1.37	15.0	15.0	7.4	10.05	10.39	3.20	24	0.21	1347.82	1348.24	1352.43	1352.82	1353.00	1353.00	

Project File: SWS Pipe Size Trial 3_100_5-yrcomb.stm

Number of lines: 3

Run Date: 12-18-2008

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Total flows limited to inlet captured flows. ; c = cir e = ellip b = box

Inlet Report

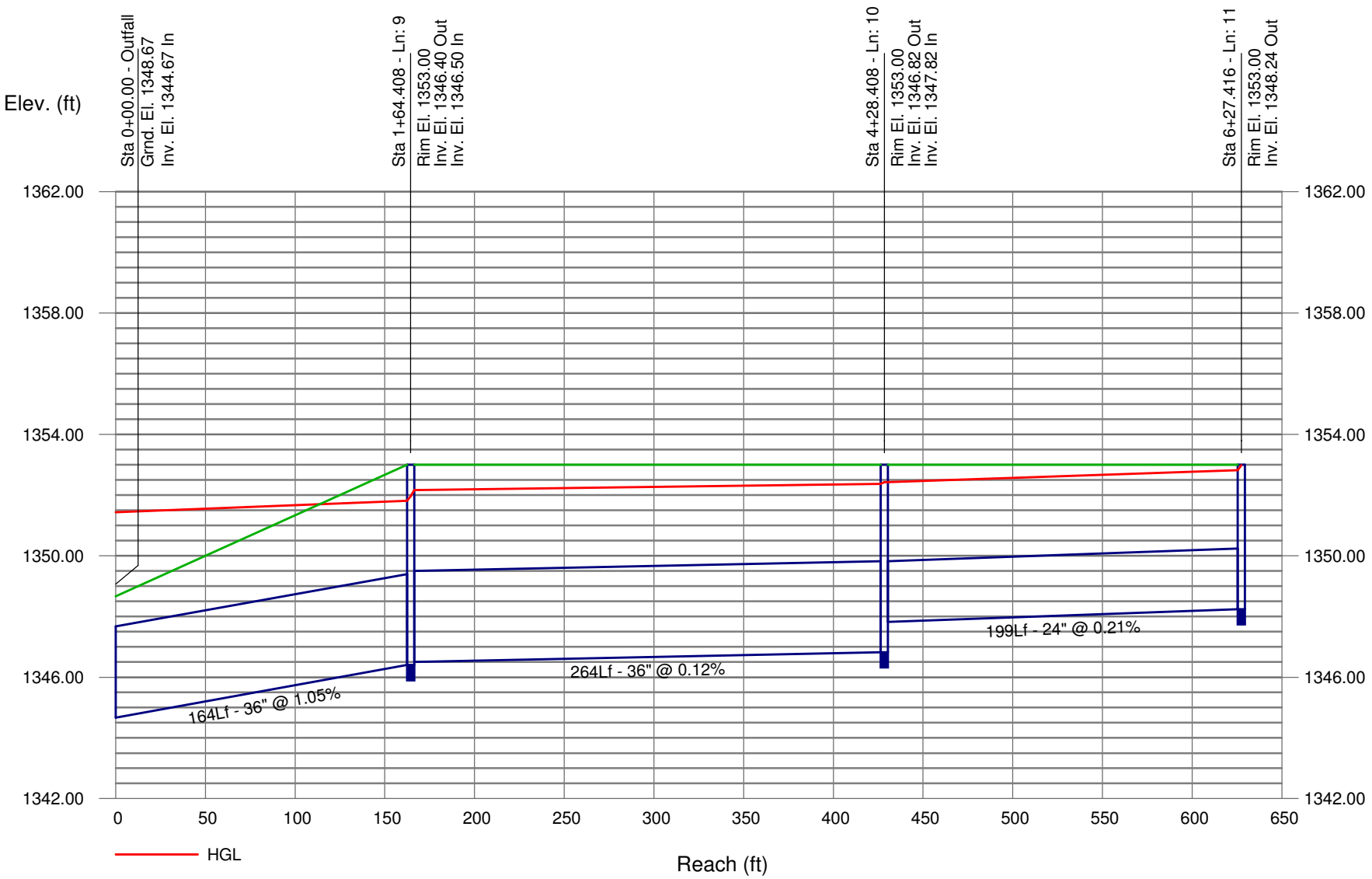
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
9		13.00	0.00	13.00	0.00	DrGrt	0.0	0.00	16.00	4.00	4.00	Sag	2.00	0.020	0.020	0.000	0.42	45.85	0.42	45.85	0.0	Off
10		8.58	0.00	8.58	0.00	DrGrt	0.0	0.00	8.00	2.00	4.00	Sag	2.00	0.020	0.020	0.000	0.38	42.42	0.38	42.42	0.0	Off
11		10.05	0.00	10.05	0.00	DrGrt	0.0	0.00	8.00	2.00	4.00	Sag	2.00	0.020	0.020	0.000	0.43	46.71	0.43	46.71	0.0	Off

Project File: SWS Pipe Size Trial 3_100_5-yrcomb.stm | Number of lines: 3 | Run Date: 12-18-2008

NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Storm Sewer Profile

Proj. file: SWS Pipe Size Trial 3_100_5-yrcomb.stm



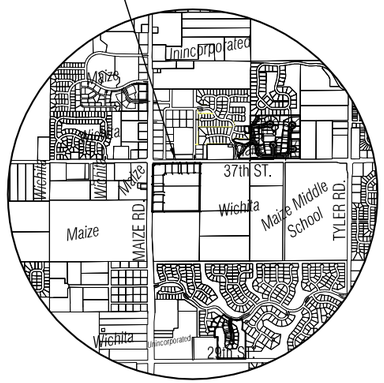
Appendix D

Preliminary Four Corner Lot Grading Plan

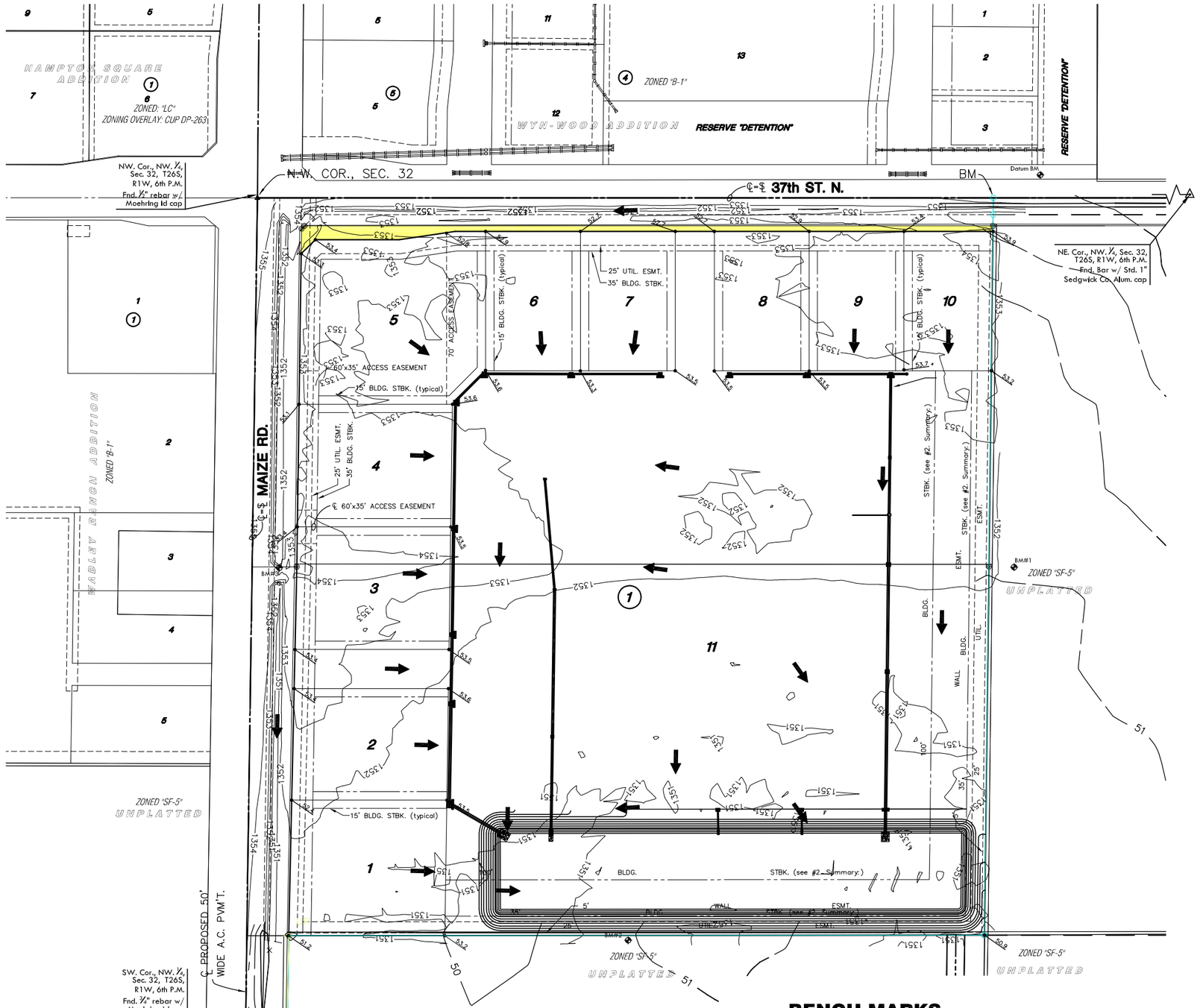
NOTES

1. GEOGRAPHY: Located in the Northwest portion of the City of Wichita in an area currently transitioning from agricultural uses into urban residential, institutional and commercial uses with access to K-96 via Maize Rd. and or Ridge Rd. The surrounding land uses include urban residential to the Northwest and South, rural residential to the West, and agriculture production to the immediate South and East, and institutional uses East of the agriculture production.
2. LOT TOTAL - 11 Commercial parcels
3. ANNEXATION: Lies within the City of Wichita and adjoins the City of Maize to the North and West.
4. EXISTING USE: Agricultural
5. ZONING: Existing / proposed - "LC" w/ CUP DP 295 overlay THIS PLAT SHALL CONFORM TO THE RECITALS OF CUP DP 295.
6. PLAT AREA: Gross - 36.3 Ac.
   Net - 35.93 Ac.
7. SURVEY DATE: January, 2006 (by MKEC)
8. PUBLIC UTILITIES: Shall be extended to site. Municipal sanitary sewer shall be served from the East. Municipal water shall be served from existing mains to the North and West.
9. LEGAL DESCRIPTION: See hereon
10. ACCESS CONTROLS: Shall align with developments to the West and North and also conform to access management policies as shown hereon..
11. PROPOSED COMMERCIAL: According to CUP DP 295 the total number of buildings is limited to 16 with the following minimum building setbacks:
    Arterial Street setback = 35'
    Interior side setback = 15'
    Interior side setback = 35' **
    Exterior boundary setback = 100' **
    ** (if building has a gross floor area greater than 100,000 s.f.)
12. RESERVES: All reserves are platted for irrigation, landscaping, monuments, drainage, and utilities in designated areas. Reserve "C" is also platted for a private swimming pool, pool house, and parking.
13. FLOOD: According to FEMA FIRM Community Unit Panel 200321 0125A, Effective Date June 3rd, 1986; this property lies within flood zone "C", *"areas of minimal flooding."*
14. DRAINAGE: A drainage report shall accompany this plat. The property lies within a branch of the Sand Creek drainage basin, which drains to the Little Arkansas River located in Sedgwick County and generally draining from northeast to southwest.

PLAT LOCATION



VICINITY MAP



LEGEND

- 6IN - CONIFEROUS TREE & DIAMETER
- 33IN - DECIDUOUS TREE & DIAMETER
- SN - SIGN
- PP - POWER POLE AND GUY ANCHOR
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- W - WATER LINE
- SS - SANITARY SEWER LINE
- G - GAS LINE
- P - GAS PIPELINE
- UGT - TELEPHONE LINE
- UGE - UNDERGROUND ELECTRIC LINE
- OHE - OVERHEAD ELECTRIC
- FOC - FIBER OPTIC CABLE I
- DRAINAGE BOUNDARY
- A - DRAINAGE BOUNDARY LABEL
- FLOW ARROW

NORTH

MINIMUM PAD ELEVATIONS *LOWEST OPENINGS*		
LOTS *(inclusive)*	BLOCK	ELEVATION *NGVD*
1 - 2	1	1355.5
3 - 11	1	1355.5

100 0 100 200
1"=100'
1 : 1,200

LEGAL DESCRIPTION

The North ½, NW. ¼, NW. ¼, Section 32, Township 26 South, Range 1 West, Sedgwick County Kansas, EXCEPT, road right-of-way on the West and North.
TOGETHER WITH,
The South ½, NW. ¼, NW. ¼, Section 32, Township 26 South, Range 1 West, Sedgwick County Kansas, EXCEPT, road right-of-way on the West.

BENCH MARKS

Datum BM — Top of "T" post 35' ± N. of the N. line of NW¼, Sec. 32, T26S, R1W and 1384' ± E. of NW. corner of said NW¼.
Elev. = 1353.54 (NGVD 29)
166.14 (City Datum)

BM#1 — Top of "T" post 660' ± S. of the N. line of NW ¼, Sec. 32, T26S, R1W and 1325' ± E. of W. line of said NW¼.
Elev.= 1351.69(NGVD 29)
164.29 (City Datum)

BM#2 — Top of "T" post 675' ± E. of the W. line of NW¼, Sec. 32, T26S, R1W and 1320' ± S. of the N. line of said NW. ¼.
Elev.=1351.79 (NGVD 29)
164.39 (City Datum)

BM#3 — Square cut on N. end of on top of RCP 50' ± E. of the W. line of NW¼, Sec. 32, T26S, R1W and 660' ± S. of the N. line of said NW. ¼.
Elev.=1353.59 (NGVD 29)
166.19 (City Datum)

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

STONEBRIDGE COMMERCIAL

STONEBRIDGE COMMERCIAL ADDITION
WICHITA, KANSAS

LOT GRADING PLAN

DATE: OCTOBER 2008
REVISED:
DESIGN BY: KLA
DRAWN BY: CMJ
CHECKED BY: GJA
SHEET NUMBER: 1

J:\Civil\05440\dwg\Drng\SEPT 08\grd\05440LGP.dwg