



Stormwater Management Report

Barrington High School
Fine Arts Site Improvements
616 W. Main St
Barrington, Illinois 60010

Prepared For:

Barrington Community Unit School District 220
515 W. Main Street
Barrington, Illinois 60010

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GHA Project #5715.107

September 29, 2025



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1 Introduction

Barrington School District 220 is proposing site and building improvements to support the proposed Fine Arts facility at the Barrington High School in the Village of Barrington, Illinois. The building improvements include an auditorium expansion east of, and adjacent to, the Commons Area as well as an addition at the southerly portion of the Bus loading lot. The School District also intends to acquire four residential properties southeast of the campus near the intersection of Main Street and Haeger Avenue for the purpose of expanding parking. In addition, the proposed floor level of the Fine Arts Building necessitates the complete reconstruction of the existing parking lot southwest of the auditorium expansion.

The stormwater management is designed in accordance with Lake County Watershed Development Ordinance (WDO) requirements.

2 History and Existing Conditions

The existing 69.43-acre Barrington High School site has Flint Creek Tributary floodplain running through the property. The Flint Creek Tributary cuts through the site, dividing approximately 22.6 acres of play fields and remote parking to the north from the 46.83-acre main south campus. The proposed improvements are located at the south end of the campus and are not within the vicinity of the floodplain.

In 2001, renovations were completed at the Barrington High School site. Improvements at that time included multiple building additions and parking lot reconfigurations at the main south campus south of Flint Creek Tributary. The development proposed a detention pond located on the north side of the Flint Creek Tributary and a filter basin on the south side of Flint Creek Tributary.

In 2007, the high school track and field stadium was renovated to a synthetic turf football/soccer field. The improvements provided underground stone for detention under the field.

In 2021, there was pavement reconstruction at the south front parking lot, demolition and relocation of tennis courts, new synthetic turf field, redevelopment of the field of dreams play areas, and various pavement and sidewalk replacements. Various detention facilities were constructed.

Refer to Exhibit 1 and Figure 1 that has a tabulation summarizing the total detention required, total detention provided and the locations, and surplus storage for the entire school campus. The exhibit incorporates the detention required and provided for the proposed improvements.

The proposed Fine Arts site improvements is located within Zone A as shown in Exhibit 1. The required 100-year detention for the 2021 Zone A redevelopment is 0.41 acre-feet for 0.72 acre of net new impervious area. The 2021 project proposed 0.41 acre-feet of detention within the basin at the south end of the campus and 0.14 acre-feet of storage within the surface storage of the south parking lot, totaling a combined provided design detention volume of 0.55 acre-feet. A full

detailed survey of these detention facilities have been conducted to verify the provided volume. Based on the current survey, the south basin provides 0.39 acre-feet and the south parking lot surface storage provides 0.15 acre-feet, totaling 0.54 acre-feet of detention storage.

Note the 0.72 acre of net new impervious area used for required detention computations includes 0.58 acre of land banked phase 1/phase 2 parking areas and future building expansion for a future auditorium as shown in Exhibit 2B. These improvements have not been constructed, and their geometry will be modified as part of the proposed Fine Arts site improvements.

3 Updated Zone A Detention Requirement

Exhibits 2A and 2B are the existing and proposed drainage exhibits from the 2021 Zone A improvements. Exhibits 3A and 3B update Zone A to show current existing and proposed conditions for the Fine Arts site improvements.

Although the existing south detention basin was previously sized to accommodate an increase in impervious area for future land banked parking areas and auditorium, the amount of new impervious area to be generated by the Fine Arts improvements, including the parking lot expansion for the four residential properties to be acquired, will exceed the amount allocated in the basin. Therefore, the south detention basin will have to be expanded.

Similar to what was done in the 2021 project, the net increase in impervious area within Zone A is used to determine the updated total required detention volume. Detention is provided in the expanded detention basin southwest of the south parking lots and the existing south parking lot surface storage upstream of the basin.

As shown in Exhibits 3A and 3B, the 2021 net impervious area within Zone A is 0.14 acre, excluding the land banked phase 1/phase 2 parking areas and future building expansion that was not constructed. The 2025 improvements within Zone A results in a net increase of 1.02 acres of impervious area. Note that the net increase impervious area within the four residential properties to be acquired is based on new impervious area since 1992 because detention was previously not accounted for in these residential properties. The total updated required detention volume within Zone A is therefore based on an overall net impervious area of 1.16 acres.

As outlined in Exhibit 3B, a total of 12.50 acres drains to the detention basin for the 100-year storm. A portion of the south parking lot improvements (4.18 acres) drains to the detention basin via storm sewers that are designed for the 10-year storm, while the remaining 8.32 acres upstream drain to the basin via overland overflow. Stormwater from the basin gets restricted and then carries the stormwater north towards existing storm sewers that discharges into the filter basin south of Flint Creek Tributary.

The required detention volume is based off 2-year and 100-year allowable release rates of 0.04 and 0.15 cfs/acre, respectively. Table 1 below summarizes the detention design.

Table 1: Zone A Detention Summary – Actual Design

2021 net new impervious	0.14 acre
2025 net new impervious	1.02 acres
Combined net new impervious	1.16 acres
Actual tributary area to detention basin	12.50 acres
2-yr allowable release rate per tributary area	0.50 cfs
100-yr allowable release rate per tributary area	1.88 cfs
2-yr detention volume required	0.26 ac-ft
HWL @ 2-yr required volume in basin	798.53
100-yr detention volume required	0.65 ac-ft
100-yr detention volume provided in basin	0.71 ac-ft
HWL @ 100-yr volume provided in basin	799.5
100-yr detention volume provided in parking lot surface storage	0.15 ac-ft
HWL @ 100-yr volume provided in parking lot	802.5
Total 100-year detention volume provided	0.86 ac-ft
As-constructed restrictor size (dia., in parking lot)	5.85"
As-constructed restrictor invert in parking lot	798.14
100-yr actual release rate at restrictor in parking lot	1.86 cfs
As-constructed restrictor (dia., downstream of basin)	Low 4.0" / High 7.0"
As-constructed restrictor invert downstream of basin	797.41 / 798.53
As-constructed actual release rate at restrictor downstream of basin	0.42 cfs (2yr) / 1.67 cfs (100yr)
Volume provided in detention basin at EOF (800.5)	1.36 ac-ft

Since the overflow weir of the basin discharges south to Main Street, an IDOT road, IDOT's freeboard requirements for detention will need to be met. From Table 1, the design HWL is at 799.5, while the overflow weir is at 800.5. This meets IDOT's 1' freeboard requirement between the HWL and the overflow weir.

As shown in Table 1, the HWL of the parking lot surface storage is higher than the HWL of the detention basin. PondPack was used to model the local tributary area via storm sewers to the parking lot detention (2.98 acres). With the as-constructed 5.85" restrictor, the PondPack model shows the water level goes to the 100-year HWL of 802.5.

The updated required and provided volume calculations for Zone A as well as the PondPack model for the tributary area to the parking lot detention area are provided in Appendix B.

Overflow Weirs

There is 12.50 acres tributary to the detention basin and basin overflow weir. Emergency overflow weir has been provided to safely pass the 100-year peak flow of 55.41 cfs at the critical duration storm of 1 hour. A 150 feet overflow weir at 800.5 is proposed south of the detention basin. As shown in the overflow weir calculations in Appendix B, the overflow will safely pass the flow rate of 57.2 cfs at 800.75. The top of berm is 801.8 meeting Lake County WDO's 1 freeboard requirement between the HWL passing the 100-year peak inflow rate and the top of berm.

Exhibit 3B also shows there is 11.30 acres tributary to the south parking curb overflow weir. The 100-year peak flow rate is 51.89 cfs. The overflow will safely pass the flow rate of 51.89 cfs at 802.99.

4 Updated Zone A Water Quality Treatment Requirement

Water quality treatment is required for the proposed improvements. Note that Lake County SMC accepts that a native vegetated wetland bottom basin would automatically satisfy both water quality treatment and runoff volume reduction requirements, and there does not need to be a separate quantitative required water quality volume requirement as long as the basin is adequately sized for the required detention storage.

Although the south detention basin has wetland type plantings in which the water quality treatment requirement is automatically met, water quality practices with quantitative provided volumes are still proposed. The required water quality volume within Zone A shall be based on the net new impervious area since the 2001 existing conditions, and the water quality volumes data are updated from the April 15 and 29, 2022 supplemental stormwater reports of the Barrington High School addition/renovation project.

For the net new impervious area of 1.16 acres within Zone A, the required water quality volume is $1.00'' \times 1.16 \text{ acres} = 0.10 \text{ acre-feet}$ (approximately 4,211 cubic feet).

The expanded south detention basin has a naturalized bottom with native plantings, rip rap channel below the basin outlet, and a layer of soil media mix underneath the promote infiltration and water quality treatment. The pilot channel helps convey low flows to the outfall. The volume provided below the primary outlet of the south detention basin is 0.01 acre-feet (347 cubic feet) within the rip rap channel. Six inches of soil media mix will be added below the surface storage of the basin. The volume provided within the voids of the soil media mix is 0.08 acre-feet (3,286 cubic feet). The naturalized basin with soil media mix will satisfy the water quality treatment and hydrocarbon removal requirements per the WDO.

In addition, as copied from the April 15, 2022 supplemental stormwater report, there is an existing 12'' wet bottom filter basin on the south side of Flint Creek that provides water quality treatment for the south main campus to the creek, including the proposed improvements within Zone A. Per the 2001 report, 0.24 acre-feet (10,619 cubic feet) of water quality was required for

2.93 acres of new impervious area from the 2001 project. Approximately 0.29 acre-feet (12,639 cubic feet) is provided in the filter basin below the outlet. Therefore, there is 0.05 acre-feet (2,020 cubic feet) of surplus storage in the filter basin that can be applied to the proposed improvements in Zone A.

The combined water quality volume within Zone A is thus 0.13 acre-feet (5,653 cubic feet), satisfying the required water quality volume of 0.10 acre-feet for Zone A. There is a surplus of 0.03 acre-feet of water quality volume within this zone.

Calculations from the filter basin from the 2001 report as well as calculations of the south detention basin storage below the outlet and within the soil media mix are provided in Appendix C. Figure 2 summarizes the required and provided water quality volumes within Zone A.

5 Updated Zone A Runoff Volume Reduction Quantitative Requirement

The runoff volume reduction within Zone A shall be based on the net new impervious area since the 2001 existing conditions, and the runoff volume reduction volumes data are updated from the April 15 and 29, 2022 supplemental stormwater reports of the Barrington High School addition/renovation project.

The RVR quantity credits utilized in Zone A include the following:

- Detention Facility Credit
- Native Vegetation Cover Credit

For the Detention Facility Credit, the volume provided below the primary outlet of the south detention basin is 0.08 acre-feet (3,633 cubic feet) within the rip rap channel and voids of the soil media mix.

For the Native Vegetation Cover Credit, the 2-year, 24-hour runoff volume of the native planting area within the south basin is compared with the 2-year, 24-hour runoff volume of a turf cover over the same amount of area (following 2021 existing conditions). The difference is the runoff volume reduction. Based on the calculations provided in Appendix C, the runoff volume reduction is 0.03 acre-feet (1,307 cubic feet).

The total RVR volume within Zone A is thus 0.11 acre-feet (4,940 cubic feet). The net new impervious area is 1.16 acres. Per Appendix O of the WDO, the RVR quantity provides volume for 92.4% of the Annual Rainfall Events.

Appendix O of the WDO is enclosed in Appendix C of the report. Figure 3 summarizes the provided runoff volume reduction within Zone A.

6 Runoff Volume Reduction Qualitative Requirement

The Runoff Volume Reduction Hierarchy as outlined in the WDO was used in the evaluation of the stormwater management needs of the site. The Hierarchy was utilized as follows:

- (a) Preservation and enhancement of the stormwater management benefits of the natural resource features of the development site (e.g., areas of Hydrologic Soil Groups A and B, floodplains, Waters of the United States, Isolated Waters of Lake County, channels, drainageways, prairies, savannas, and woodlands).

There will be no disturbance to the floodplain. The south basin has a natural bottom with native plantings.

- (b) Minimization or disconnection of impervious surfaces.

The proposed impervious surfaces are the minimum necessary to provide the improvements and amenities required for the development.

- (c) Enhancement of the infiltration and storage characteristics of the development site using appropriate best management practices.

There are two basins on the site to facilitate settling and filtering of impurities collected from the existing 30" pipe on the south side of the creek and the 12" pipe on the north side. Each storm sewer collects a portion of the onsite parking lots and roadways. There is also an expanded basin proposed on the south end that collects the south parking lot drainage.

- (d) The use of open channels with native vegetation to convey stormwater runoff.

Sheet drainage has been used whenever possible to provide drainage. The use of storm sewer has been minimized throughout the site.

- (e) Structural measures that provide water quality and volume reduction.

The native planted basin has been proposed to provide water quality and volume reduction.

- (f) Structural measures that provide only volume reduction or other rainwater harvesting practices.

No other structural measures are proposed as part of this development.

- (g) Measures that provide water quality and quantity control.

The expanded south basin provides water quality and quantity control.

- (g) Measures that provide only quantity control.

No other measures are proposed as part of this development.

7 Summary

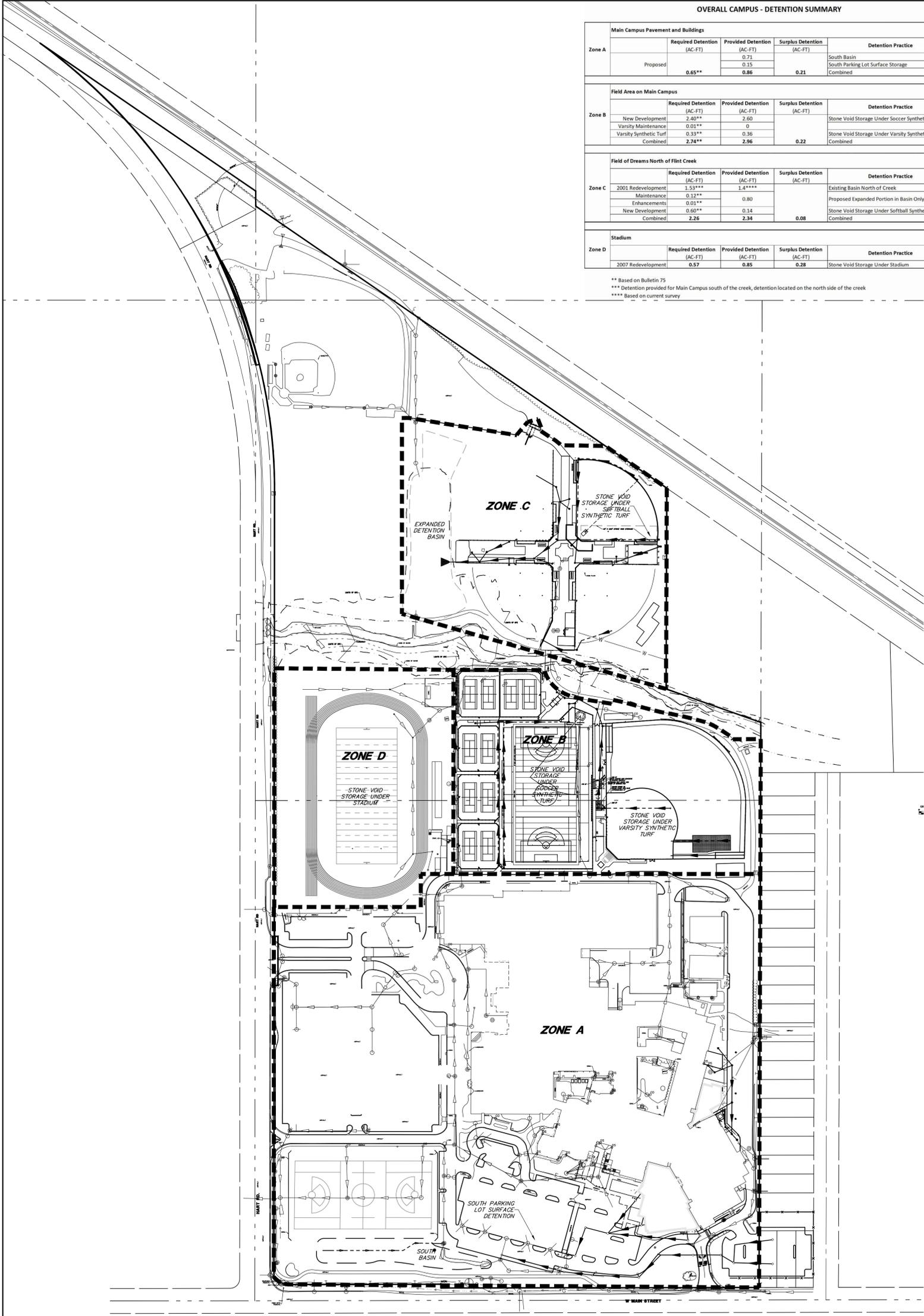
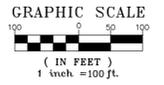
The stormwater management improvements proposed as part of the Barrington High School Fine Arts Site Improvements have been designed to comply with the Lake County Watershed Development Ordinance requirements for detention storage, water quality, and RVR of stormwater runoff.

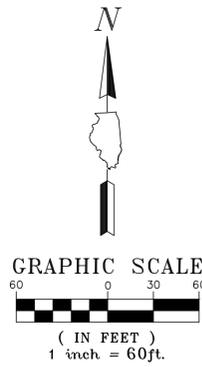
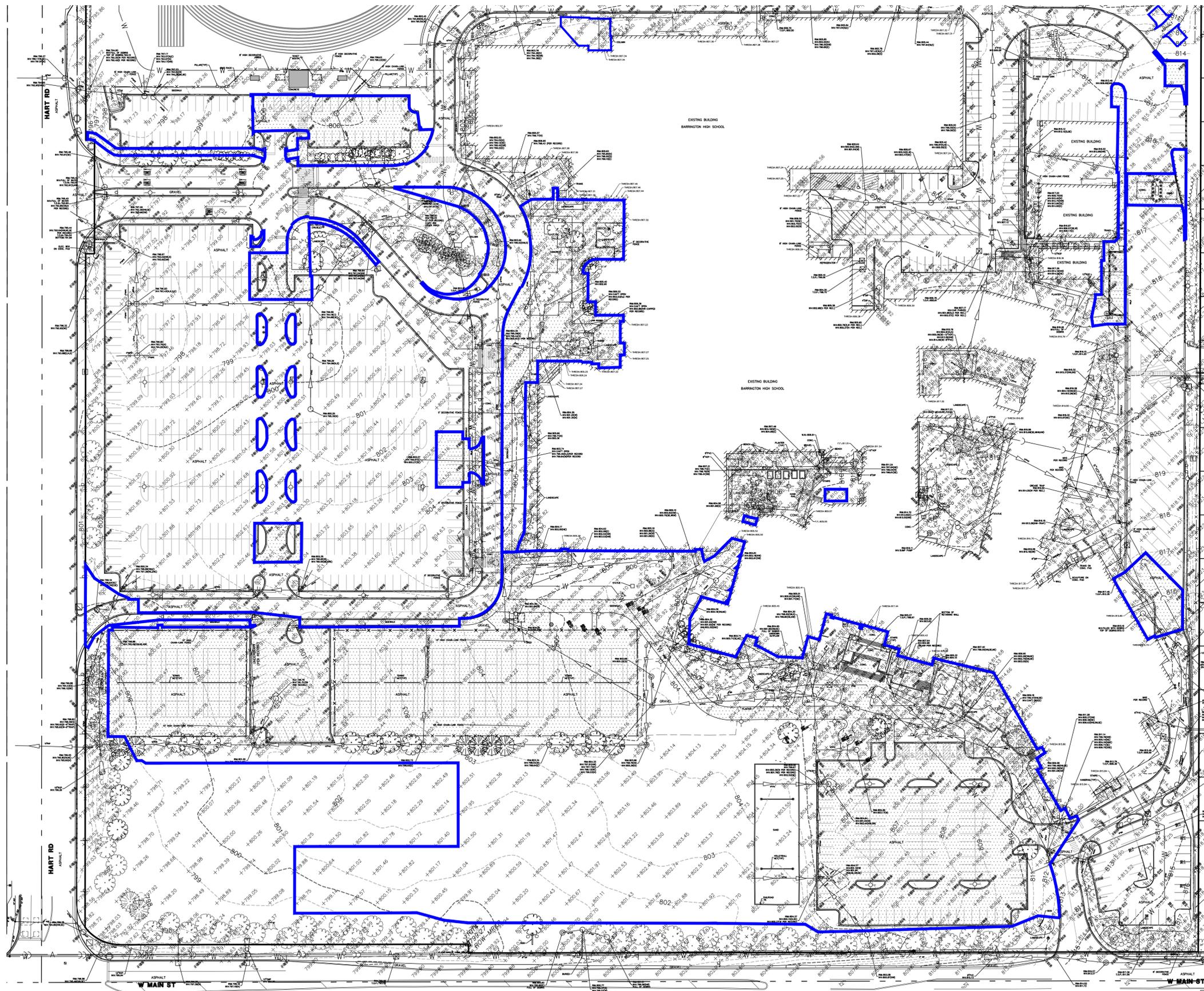
Exhibits

OVERALL CAMPUS - DETENTION SUMMARY

Main Campus Pavement and Buildings					
Zone	Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice	
Zone A	Proposed	0.71	0.71	South Basin	
		0.86	0.86	South Parking Lot Surface Storage	
		0.65**	0.21	Combined	
Field Area on Main Campus					
Zone	Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice	
Zone B	New Development	2.40**	2.60	Stone Void Storage Under Soccer Synthetic Turf	
		0.01**	0		
		0.33**	0.36		
		2.74**	2.96		
Field of Dreams North of Flint Creek					
Zone	Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice	
Zone C	2001 Redevelopment	1.53***	1.4***	Existing Basin North of Creek	
		0.12**	0.80		
		0.01**	0		
		0.60**	0.14		
2.28	2.34	0.08	Stone Void Storage Under Softball Synthetic Turf		
Stadium					
Zone	Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice	
Zone D	2007 Redevelopment	0.57	0.85	0.28	Stone Void Storage Under Stadium

** Based on Bulletin 75
 *** Detention provided for Main Campus south of the creek, detention located on the north side of the creek
 **** Based on current survey





EXISTING LEGEND

- PROJECT AREA
- IMPERVIOUS AREA
- PERVIOUS AREA

ZONE A EXISTING
PROJECT AREA = 9.09 AC
IMPERVIOUS AREA = 4.63 AC

2021

ZONE A: EXISTING DRAINAGE EXHIBIT

**BARRINGTON HIGH SCHOOL
 ADDITION / RENOVATION
 616 W MAIN STREET**

NO.	BY	DATE	REVISION	NO.	BY	DATE	REVISION
2	MXH	10-15-21	PER VILLAGE COMMENTS				
1	MXH	09-24-21	PER VILLAGE COMMENTS				

FILE: 5715.100-Drainage.dwg	SHEET NUMBER:
DRAWN BY: MXH	GHA PROJECT #
DATE: 07-13-21	5715.100
CHECKED BY: WEG	SCALE:
DATE: 07-13-21	1"=60'

OF SHEETS
3A

GHA GEWALT HAMILTON ASSOCIATES, INC.
 625 Forest Edge Drive ■ Vernon Hills, IL. 60061
 TEL 847.478.9700 ■ FAX 847.478.9701

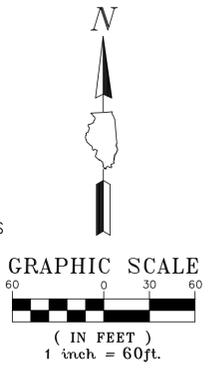
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2A



PROPOSED LEGEND

- PROJECT AREA
- IMPERVIOUS AREA
- PERVIOUS AREA
- - - TRIBUTARY TO DETENTION VIA STORM SEWERS
TO PARKING LOT SURFACE STORAGE = 2.93 AC
TO DETENTION BASIN = 3.94 AC
- TRIBUTARY TO OVERFLOW WEIR
TO PARKING LOT CURB WEIR = 10.30 AC
TO BASIN WEIR = 11.31 AC



ZONE A PROPOSED PROJECT AREA = 9.09 AC

TOTAL IMPERVIOUS AREAS = 5.35 AC
BASE = 4.77 AC
LANDBANK PHASE 1 = 0.12 AC
LANDBANK PHASE 2 = 0.11 AC
FUTURE BUILDING EXPANSION (NOT SHOWN) = 0.35 AC

NET NEW IMPERVIOUS METHOD TO DETERMINE REQUIRED DETENTION

NET NEW IMPERVIOUS = 0.72 AC

REQUIRED 2YR DETENTION = 0.16 AC-FT
REQUIRED 100YR DETENTION = 0.41 AC-FT

TOTAL 100YR DETENTION PROVIDED = 0.55 AC-FT

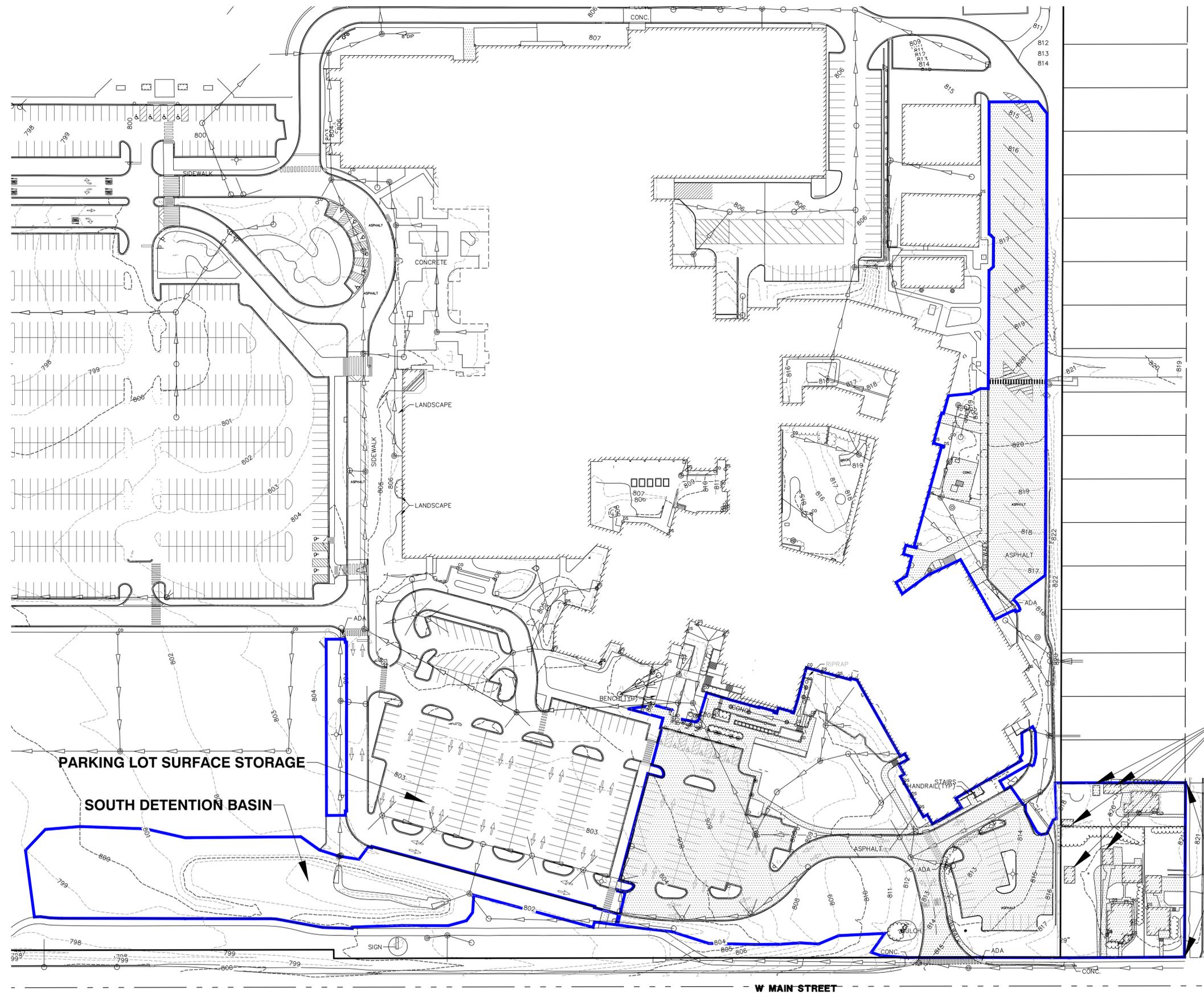
100YR DETENTION PROVIDED AT HWL 799.5 = 0.41 AC-FT (DETENTION BASIN)

100YR DETENTION PROVIDED AT HWL 802.6 = 0.14 AC-FT (PARKING LOT SURFACE STORAGE)

2021

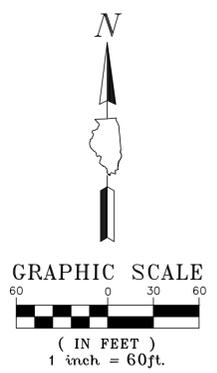
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2	MXH	10-15-21	PER VILLAGE COMMENTS				
1	MXH	09-24-21	PER VILLAGE COMMENTS				

FILE: 5715.100-Drainage.dwg	SHEET NUMBER:
DRAWN BY: MXH	GHA PROJECT #
DATE: 07-13-21	5715.100
CHECKED BY: WEG	SCALE:
DATE: 07-13-21	1"=60'



EXISTING LEGEND

- PROJECT AREA
- IMPERVIOUS AREA
- PERVIOUS AREA



ZONE A EXISTING
PROJECT AREA = 5.81 AC
IMPERVIOUS AREA = 2.74 AC

NOTE: 2.68 AC USED AS EXISTING IMPERVIOUS AREA FOR REQUIRED DETENTION COMPUTATIONS DUE TO 0.06 AC NOT SHOWN IN 1993 AERIAL IN THE FOUR ACQUIRED RESIDENTIAL PROPERTIES

2021 REQUIRED 100YR DETENTION = 0.41 AC-FT

AS-CONSTRUCTED TOTAL 100YR DETENTION PROVIDED = 0.54 AC-FT

AS-CONSTRUCTED 100YR DETENTION PROVIDED AT HWL 799.5 = 0.39 AC-FT (DETENTION BASIN)

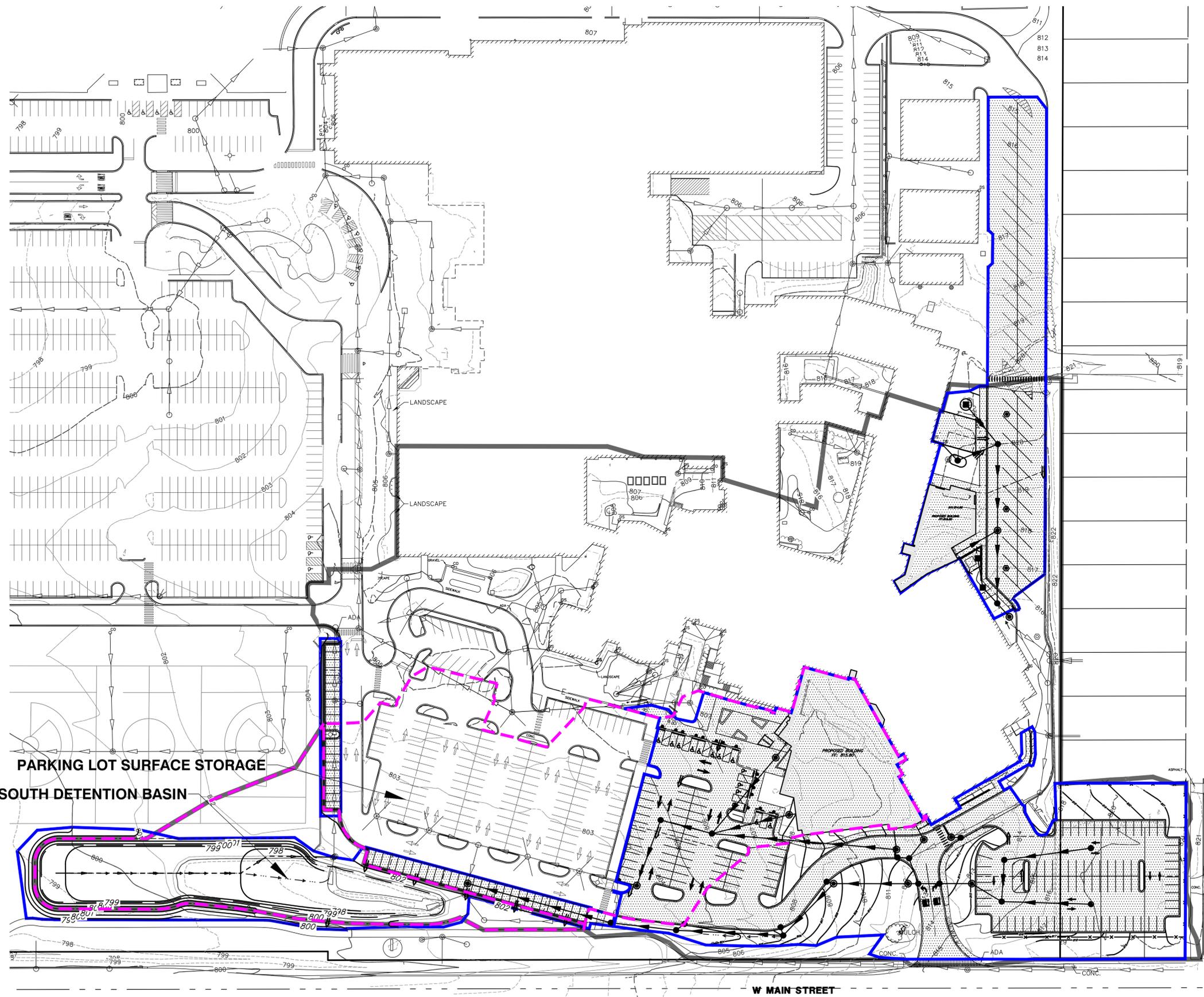
AS-CONSTRUCTED 100YR DETENTION PROVIDED AT HWL 802.6 = 0.15 AC-FT (PARKING LOT SURFACE STORAGE)

APPROX. 0.06 AC IMPERVIOUS AREA NOT SHOWN IN 1993 AERIAL

4 RESIDENTIAL PROPERTIES TO BE ACQUIRED

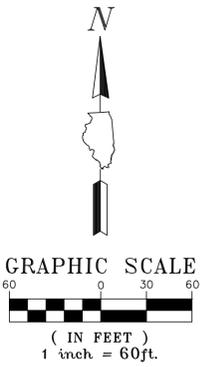
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PROPOSED LEGEND

- PROJECT AREA
- IMPERVIOUS AREA
- PERVIOUS AREA
- TRIBUTARY TO DETENTION VIA STORM SEWERS
TO PARKING LOT SURFACE STORAGE = 2.98 AC
TO DETENTION BASIN = 4.18 AC
- TRIBUTARY TO OVERFLOW WEIR
TO PARKING LOT CURB WEIR = 11.30 AC
TO BASIN WEIR = 12.50 AC



2021 ZONE A DATA (REFER TO EXHIBIT 2B)
PROPOSED IMPERVIOUS AREA = 4.77 AC (BASE ONLY)
EXISTING IMPERVIOUS AREA = 4.63 AC
NET NEW IMPERVIOUS = 0.14 AC

NOTE: LANDBANK PHASE 1, LANDBANK PHASE 2, AND FUTURE BUILDING EXPANSION NOT CONSTRUCTED IN CURRENT EXISTING CONDITIONS

2025 ZONE A DATA
PROPOSED IMPERVIOUS AREA = 3.70 AC
EXISTING IMPERVIOUS AREA = 2.68 AC
NET NEW IMPERVIOUS = 1.02 AC

UPDATED ZONE A DETENTION DATA
NET NEW IMPERVIOUS METHOD TO DETERMINE REQUIRED DETENTION

OVERALL NET NEW IMPERVIOUS SINCE 2001 EXISTING CONDITIONS = 1.16 AC

TOTAL REQUIRED 2YR DETENTION = 0.26 AC-FT
TOTAL REQUIRED 100YR DETENTION = 0.65 AC-FT

TOTAL 100YR DETENTION PROVIDED = 0.86 AC-FT

100YR DETENTION PROVIDED AT HWL 799.5 = 0.71 AC-FT (DETENTION BASIN)

100YR DETENTION PROVIDED AT HWL 802.5 = 0.15 AC-FT (PARKING LOT SURFACE STORAGE)

PARKING LOT SURFACE STORAGE

SOUTH DETENTION BASIN

W MAIN STREET

Figures

FIGURE 1: OVERALL CAMPUS - DETENTION SUMMARY

Zone A	Main Campus Pavement and Buildings				
		Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice
Proposed			0.71	0.21	South Basin
			0.15		South Parking Lot Surface Storage
		0.65**	0.86		Combined
0.21					
Zone B	Field Area on Main Campus				
		Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice
New Development		2.40**	2.60	0.22	Stone Void Storage Under Soccer Synthetic Turf
	Varsity Maintenance	0.01**	0		
	Varsity Synthetic Turf	0.33**	0.36		Stone Void Storage Under Varsity Synthetic Turf
	Combined	2.74**	2.96		Combined
0.22					
Zone C	Field of Dreams North of Flint Creek				
		Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice
2001 Redevelopment		1.53***	1.4****	0.08	Existing Basin North of Creek
	Maintenance	0.12**	0.80		Proposed Expanded Portion in Basin Only
	Enhancements	0.01**			
	New Development	0.60**	0.14		Stone Void Storage Under Softball Synthetic Turf
	Combined	2.26	2.34		Combined
0.08					
Zone D	Stadium				
		Required Detention (AC-FT)	Provided Detention (AC-FT)	Surplus Detention (AC-FT)	Detention Practice
2007 Redevelopment		0.57	0.85	0.28	Stone Void Storage Under Stadium

** Based on Bulletin 75

*** Detention provided for Main Campus south of the creek, detention located on the north side of the creek

**** Based on current survey

FIGURE 2: 2025 PROJECT - ZONE A WATER QUALITY SUMMARY

Zone A	Main Campus Pavement and Buildings						Water Quality Practice
	Net New Impervious (AC)	Required Volume (CF)	Required Volume (AC-FT)	Provided Volume (CF)	Provided Volume (AC-FT)	Surplus Volume (AC-FT)	
				347	0.01		Storage Below Outlet of South Basin Within Rip Rap Channel
				3,286	0.08		Storage Below Outlet of South Basin Within Soil Media Mix
				2,020	0.05		Surplus Storage in Filter Basin South of Creek
	1.16	4,211	0.10	5,653	0.13	0.03	Combined

FIGURE 3: 2025 PROJECT - ZONE A RUNOFF VOLUME REDUCTION SUMMARY

Zone A	Main Campus Pavement and Buildings			
	New Impervious (AC)	Provided Volume (CF)	RVR Credit	RVR Practice
	1.16	3,633	Detention Facility Credit	Storage Below Outlet of South Basin (Rip Rap Channel & Soil Media Mix)
		1,307	Native Vegetation Cover Credit	Native Vegetation Cover in South Basin
4,940			Combined	

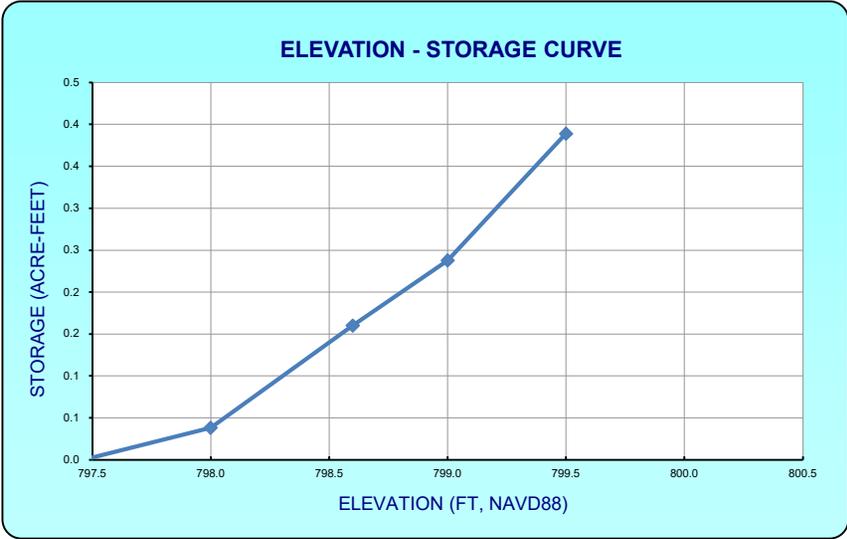
Provided Volume = 4,940 CF
New Impervious = 1.16 AC
RVR Quantity = 4,259 CF/AC
% of Annual Rainfall Events = 92.4%

Appendix A

As-Constructed Detention Storage of Zone A South Basin & South Parking Lot Surface Storage

POND:	Existing South Basin (2025 Survey)	
JOB NO.:	5715.107	Side Slopes
PROJECT:	D220 BHS Fine Arts Site Improvement	
FILE:	5715.107 Storage.xls	
DATE:	9/23/2025	

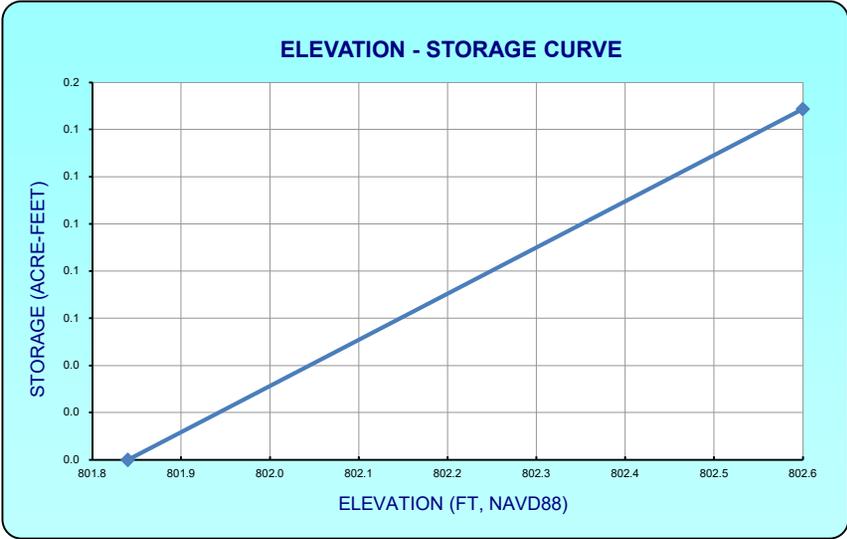
Elevation (ft)	Area		Average Area (ac)	Incremental Storage (ac-ft)	Cummulative Storage (ac-ft)
	(ft ²)	(ac)			
797.46	944	0.022			0.00
			0.071	0.038	
798.00	5,214	0.120			0.04
			0.200	0.200	
799.00	12,178	0.280			0.24
			0.303	0.151	
799.50	14,189	0.326			0.39



Elevation (ft, NAVD88)	Storage (ac-ft)	
797.46	0.00	
798.00	0.04	
798.60	0.16	2-yr HWL
799.00	0.24	
799.50	0.39	100-yr HWL

POND: Existing South Parking Lot Surface Storage (2025 Survey)
 JOB NO. 5715.107 Side Slopes
 PROJECT: D220 BHS Fine Arts Site Improvement
 FILE: 5715.107 Storage.xls
 DATE: 9/23/2025

Elevation (ft)	Area		Average Area (ac)	Incremental Storage (ac-ft)	Cummulative Storage (ac-ft)
	(ft ²)	(ac)			
801.84	0	0.000			0.00
802.60	17,056	0.392	0.196	0.149	0.15



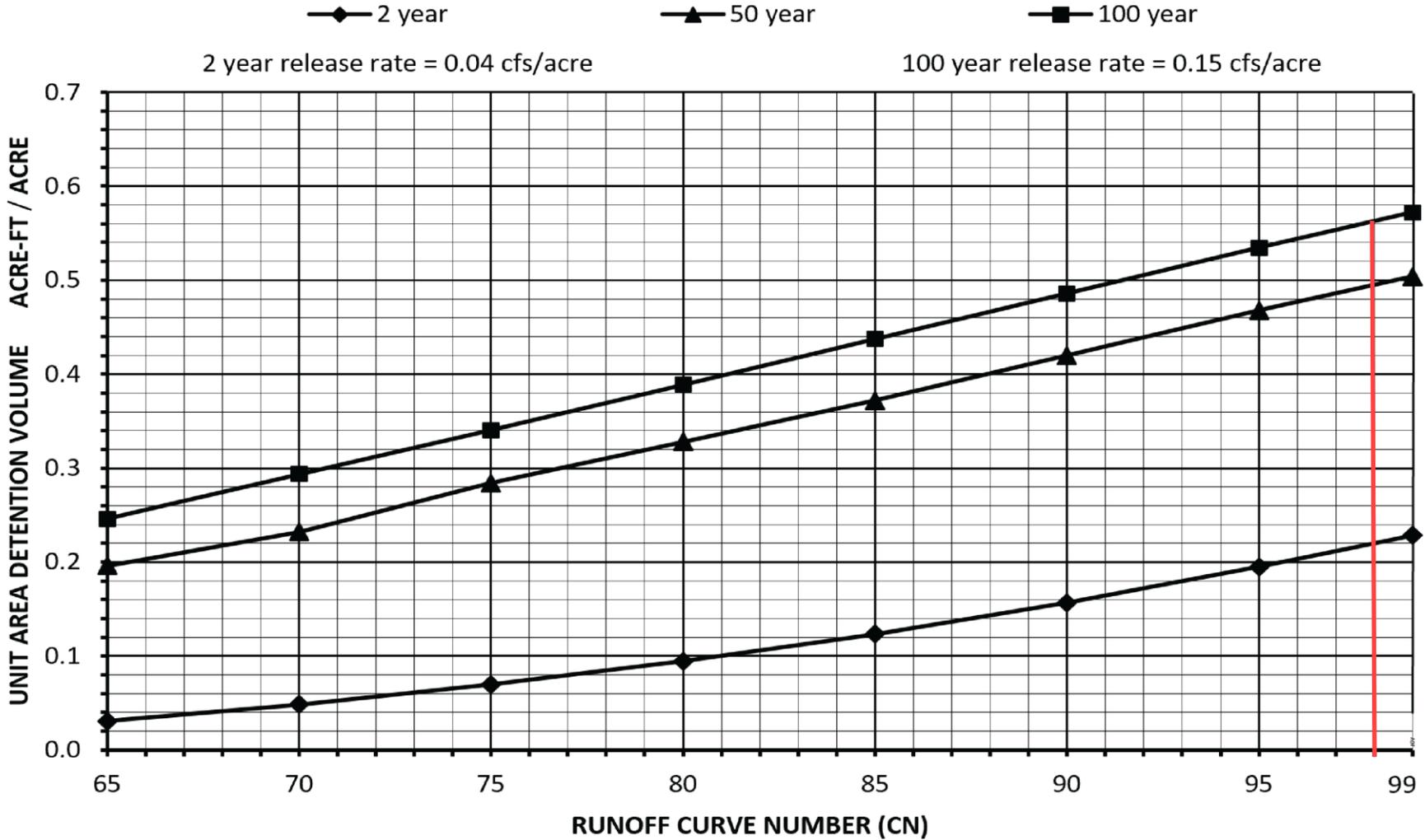
Elevation
 (ft, NAVD88)
 801.84
802.60

Storage
 (ac-ft)
 0.00
0.15

100-yr HWL

Appendix B

Required and Provided Detention and Overflow Design (Zone A)



Net impervious area = 1.16 ac

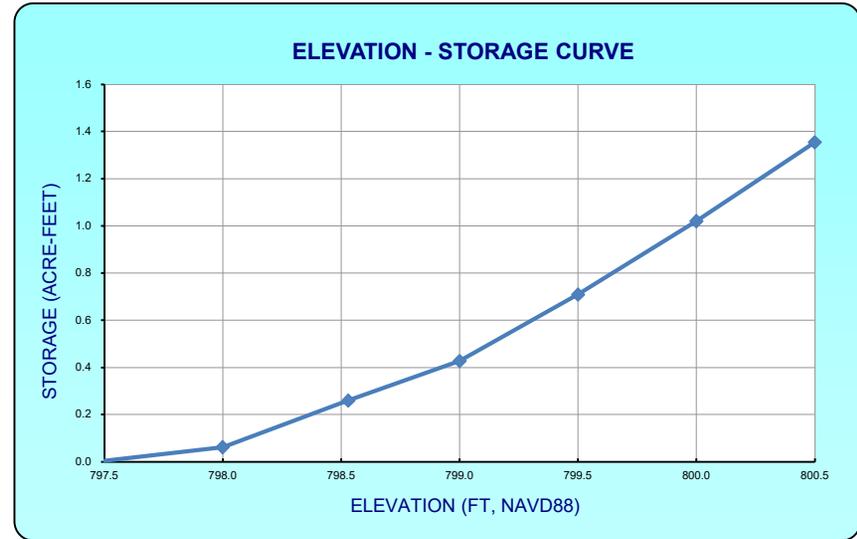
Required 2yr detention = 0.22 ac-ft/ac x 1.16 ac = **0.26 ac-ft**

Required 100yr detention = 0.53 ac-ft/ac x 1.16 ac = **0.65 ac-ft**

Appendix K: Detention Volume Versus Curve Number

POND:	<u>Expanded South Basin</u>	
JOB NO.:	<u>5715.107</u>	Side Slopes
PROJECT:	<u>D220 BHS Fine Arts Site Improvement</u>	
FILE:	<u>5715.107 Storage.xls</u>	
DATE:	<u>9/24/2025</u>	

Elevation (ft)	Area		Average Area (ac)	Incremental Storage (ac-ft)	Cummulative Storage (ac-ft)
	(ft ²)	(ac)			
797.46	944	0.022			0.00
			0.114	0.062	
798.00	9,027	0.207			0.06
			0.366	0.366	
799.00	22,833	0.524			0.43
			0.564	0.282	
799.50	26,290	0.604			0.71
			0.623	0.312	
800.00	28,000	0.643			1.02
			0.668	0.334	
800.50	30,202	0.693			1.36



Elevation (ft, NAVD88)	Storage (ac-ft)	
797.46	0.00	
798.00	0.06	
798.53	0.26	2-yr HWL
799.00	0.43	
799.50	0.71	100-yr HWL
800.00	1.02	
800.50	1.36	

**ZONE A: AS-CONSTRUCTED OUTLET CONTROL CALCULATIONS
(DOWNSTREAM OF SOUTH BASIN)**

ORIFICE FLOWS ARE BASED ON
THE FOLLOWING EQUATION:

$$Q = CA\sqrt{2gH}$$

Q = Flow (cfs)
C = Orifice Coefficient
A = Area (sf)
g = 32.2 ft/sec

WEIR FLOWS ARE BASED ON
THE FOLLOWING EQUATION:

$$Q = CL(H)^{3/2}$$

Q = Flow (cfs)
C = Weir Coefficient
L = Length (ft)

ORIFICE DATA:

Orifice 1 (low orifice)

Orifice diameter (inches)	4.00
Orifice area (sf)	0.087
Proposed invert elevation	797.41
Centerline of flow	797.58
Orifice Coefficient	0.61

Orifice 2 (high orifice)

Orifice diameter (inches)	7.00
Orifice area (sf)	0.267
Proposed invert elevation	798.53
Centerline of flow	798.82
Orifice Coefficient	0.61

WEIR DATA:

Weir length (ft)	150.0
Crest elevation	800.50
Weir Coefficient	3

Increment for water elevation increase 0.5

RATING TABLE:

Water Elevation (ft)	Orifice 1 (low)		Orifice 2 (high)		1 & 2 Q _{total} (cfs)	Weir		System Q _{total} (cfs)
	Head ₁ (ft)	Q ₁ (cfs)	Head ₂ (ft)	Q ₂ (cfs)		Head (ft)	Q (cfs)	
797.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
798.00	0.42	0.28	0.00	0.00	0.28	0.00	0.00	0.28
798.50	0.92	0.41	0.00	0.00	0.41	0.00	0.00	0.41
798.53	0.95	0.42	0.00	0.00	0.42	0.00	0.00	0.42
799.00	1.42	0.51	0.18	0.55	1.06	0.00	0.00	1.06
799.50	1.92	0.59	0.68	1.08	1.67	0.00	0.00	1.67
800.00	2.42	0.67	1.18	1.42	2.09	0.00	0.00	2.09
800.50	2.92	0.73	1.68	1.69	2.43	0.00	0.00	2.43
801.00	3.42	0.79	2.18	1.93	2.72	0.50	159.10	161.82
801.50	3.92	0.85	2.68	2.14	2.99	1.00	450.00	452.99
802.00	4.42	0.90	3.18	2.33	3.23	1.50	826.70	829.93
802.50	4.92	0.95	3.68	2.51	3.46	2.00	1272.79	1276.25
803.00	5.42	0.99	4.18	2.67	3.67	2.50	1778.78	1782.45
803.50	5.92	1.04	4.68	2.83	3.87	3.00	2338.27	2342.14
804.00	6.42	1.08	5.18	2.98	4.06	3.50	2946.56	2950.61
804.50	6.92	1.12	5.68	3.12	4.24	4.00	3600.00	3604.24
805.00	7.42	1.16	6.18	3.25	4.42	4.50	4295.67	4300.09
805.50	7.92	1.20	6.68	3.38	4.58	5.00	5031.15	5035.74

2-yr HWL

100-yr HWL

Tributary to Parking Lot Restrictor

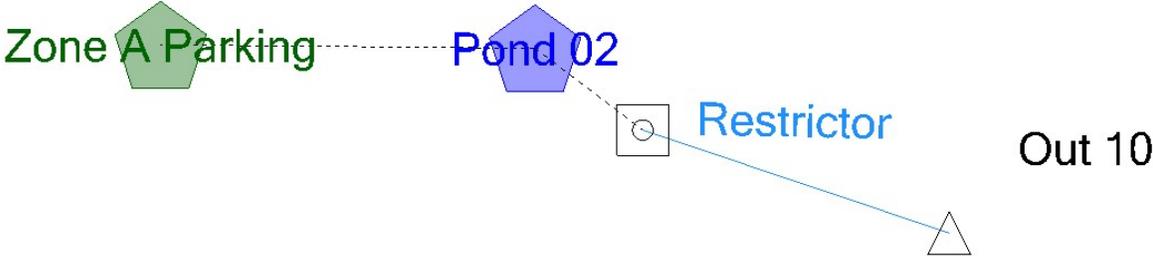


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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Zone A Parking	NE IL 2,10,50,99 - Synthetic Curve, 100 yrs	100	2.039	15.000	2.29

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Out 10	NE IL 2,10,50,99 - Synthetic Curve, 100 yrs	100	2.039	17.150	1.86

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Pond 02 (IN)	NE IL 2,10,50,99 - Synthetic Curve, 100 yrs	100	2.039	15.000	2.29	(N/A)	(N/A)
Pond 02 (OUT)	NE IL 2,10,50,99 - Synthetic Curve, 100 yrs	100	2.039	17.150	1.86	802.51	0.154

Subsection: Time-Depth Curve

Return Event: 100 years

Label: NE IL 2,10,50,99

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Time-Depth Curve: Bul75 0-10 3rdQ 50% (8.6 in)	
<hr/>	
Label	Bul75 0-10 3rdQ 50% (8.6 in)
Start Time	0.000 hours
Increment	1.000 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 1.000 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.2	0.4	0.6	0.8
5.000	1.0	1.2	1.4	1.7	2.0
10.000	2.3	2.7	3.1	3.8	4.5
15.000	5.2	6.0	6.7	7.3	7.7
20.000	8.0	8.2	8.3	8.4	8.6

Subsection: Time of Concentration Calculations
Label: Zone A Parking
Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Return Event: 100 years
Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.167 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.167 hours

Subsection: Time of Concentration Calculations
Label: Zone A Parking
Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Return Event: 100 years
Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

==== User Defined

Tc = Value entered by user
Where: Tc= Time of concentration, hours

Subsection: Runoff CN-Area

Return Event: 100 years

Label: Zone A Parking

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Pervious Area	80.000	0.210	0.0	0.0	80.000
Impervious Area	98.000	2.770	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	2.980	(N/A)	(N/A)	96.732

Subsection: Elevation vs. Volume Curve

Return Event: 100 years

Label: Pond 02

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
798.14	0.000
801.84	0.000
802.60	0.174

Subsection: Outlet Input Data

Return Event: 100 years

Label: Outlet 1

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Requested Pond Water Surface Elevations	
Minimum (Headwater)	798.14 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	802.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Lo	Forward	TW	798.14	802.60
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data

Label: Outlet 1

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Return Event: 100 years

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Structure ID: Lo
Structure Type: Orifice-Circular

Number of Openings	1
Elevation	798.14 ft
Orifice Diameter	5.85 in
Orifice Coefficient	0.610

Structure ID: TW
Structure Type: TW Setup, DS Channel

Tailwater Type	Free Outfall
----------------	--------------

Convergence Tolerances

Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.100 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Composite Rating Curve

Return Event: 100 years

Label: Outlet 1

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
798.14	0.00	(N/A)	0.00
798.24	0.00	(N/A)	0.00
798.34	0.08	(N/A)	0.00
798.44	0.18	(N/A)	0.00
798.54	0.30	(N/A)	0.00
798.64	0.46	(N/A)	0.00
798.74	0.55	(N/A)	0.00
798.84	0.62	(N/A)	0.00
798.94	0.68	(N/A)	0.00
799.04	0.74	(N/A)	0.00
799.14	0.79	(N/A)	0.00
799.24	0.85	(N/A)	0.00
799.34	0.89	(N/A)	0.00
799.44	0.94	(N/A)	0.00
799.54	0.98	(N/A)	0.00
799.64	1.02	(N/A)	0.00
799.74	1.06	(N/A)	0.00
799.84	1.10	(N/A)	0.00
799.94	1.14	(N/A)	0.00
800.04	1.18	(N/A)	0.00
800.14	1.21	(N/A)	0.00
800.24	1.24	(N/A)	0.00
800.34	1.28	(N/A)	0.00
800.44	1.31	(N/A)	0.00
800.54	1.34	(N/A)	0.00
800.64	1.37	(N/A)	0.00
800.74	1.40	(N/A)	0.00
800.84	1.43	(N/A)	0.00
800.94	1.46	(N/A)	0.00
801.04	1.49	(N/A)	0.00
801.14	1.52	(N/A)	0.00
801.24	1.54	(N/A)	0.00
801.34	1.57	(N/A)	0.00
801.44	1.60	(N/A)	0.00
801.54	1.62	(N/A)	0.00
801.64	1.65	(N/A)	0.00
801.74	1.67	(N/A)	0.00
801.84	1.70	(N/A)	0.00
801.94	1.72	(N/A)	0.00
802.04	1.75	(N/A)	0.00
802.14	1.77	(N/A)	0.00
802.24	1.79	(N/A)	0.00
802.34	1.82	(N/A)	0.00
802.44	1.84	(N/A)	0.00

Subsection: Composite Rating Curve

Label: Outlet 1

Scenario: NE IL 2,10,50,99 - Synthetic Curve, 100 yrs

Return Event: 100 years

Storm Event: Bul75 0-10 3rdQ 50% (8.6 in)

Composite Outflow Summary

Contributing Structures
Lo

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M

Master Network Summary...1

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Zone A Parking (Time of Concentration Calculations, 100 years (NE IL 2,10,50,99 - Synthetic Curve, 100 yrs))...3, 4

Subsection: Runoff CN-Area
 Label: Trib to Basin Weir
 Scenario: 100 yr 1 hr

Tribuary to basin weir

Return Event: 100.00 years
 Storm Event: 1 hr 100 yr

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Impervious Area	98.000	8.940	0.0	0.0	98.000
Pervious Area	80.000	3.560	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	12.500	(N/A)	(N/A)	92.874

Subsection: Unit Hydrograph Summary
 Label: Trib to Basin Weir
 Scenario: 100 yr 1 hr

Tribuary to basin weir

Return Event: 100.00 years
 Storm Event: 1 hr 100 yr

Storm Event	1 hr 100 yr
Return Event	100.00 years
Duration	100.000 hours
Depth	4.03 in
Time of Concentration (Composite)	0.500 hours
Area (User Defined)	12.500 acres

Computational Time Increment	0.067 hours
Time to Peak (Computed)	0.533 hours
Flow (Peak, Computed)	55.72 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	0.550 hours
Flow (Peak Interpolated Output)	55.41 ft ³ /s

100-year peak flowrate

Drainage Area	
SCS CN (Composite)	93.000
Area (User Defined)	12.500 acres
Maximum Retention (Pervious)	0.75 in
Maximum Retention (Pervious, 20 percent)	0.15 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.25 in
Runoff Volume (Pervious)	3.384 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.384 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.500 hours
Computational Time Increment	0.067 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	28.33 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: Trib to Basin Weir
Scenario: 100 yr 1 hr

Return Event: 100.00 years
Storm Event: 1 hr 100 yr

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.333 hours
Unit receding limb, T_r	1.333 hours
Total unit time, T_b	1.667 hours

Overflow Weir Calculations

Barrington High School Fine Arts Site Improvement
Project No. 5715.107
Date: 9-25-25

100 year storm frequency

South Basin Overflow Weir

Tributary Area	12.5 Acres
Runoff Curve Number	93
Time of Concentration	30 min.
100 yr peak inflow (see attached PondPack model)	55.41 cfs
Weir bottom elevation	800.50 ft
Weir top elevation	800.75 ft
Length of bottom of weir (at elev.800.5)	150.0 ft
Length of top of weir (at elev.800.75)	155.0 ft
Weir coefficient (C)	3.0
Head over weir (H)	0.25 ft
Area (A)	38.13 ft ²
Discharge Q = CAH ^{1/2}	57.2 cfs

Subsection: Runoff CN-Area
 Label: Trib to Parking Lot Weir
 Scenario: 100 yr 1 hr

Return Event: 100.00 years
 Storm Event: 1 hr 100 yr

Tribuary to south parking lot overflow weir

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Impervious Area	98.000	8.940	0.0	0.0	98.000
Pervious Area	80.000	2.360	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	11.300	(N/A)	(N/A)	94.241

Subsection: Unit Hydrograph Summary

Return Event: 100.00 years

Label: Trib to Parking Lot Weir **Tribuary to south parking lot overflow weir**

Storm Event: 1 hr 100 yr

Scenario: 100 yr 1 hr

Storm Event	1 hr 100 yr
Return Event	100.00 years
Duration	100.000 hours
Depth	4.03 in
Time of Concentration (Composite)	0.500 hours
Area (User Defined)	11.300 acres
Computational Time Increment	0.067 hours
Time to Peak (Computed)	0.533 hours
Flow (Peak, Computed)	52.25 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	0.550 hours
Flow (Peak Interpolated Output)	51.89 ft³/s 100-year peak flowrate
Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	11.300 acres
Maximum Retention (Pervious)	0.64 in
Maximum Retention (Pervious, 20 percent)	0.13 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.35 in
Runoff Volume (Pervious)	3.158 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.158 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.500 hours
Computational Time Increment	0.067 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	25.61 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: Trib to Parking Lot Weir
Scenario: 100 yr 1 hr

Return Event: 100.00 years
Storm Event: 1 hr 100 yr

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.333 hours
Unit receding limb, Tr	1.333 hours
Total unit time, Tb	1.667 hours

Culvert Analysis Report Weir

Curb Overflow Weir at
South Parking Lot

Hydraulic Component(s): Roadway

Discharge	51.89 cfs	Allowable HW Elevation	802.99 ft
Roadway Width	20.00 ft	Overtopping Coefficient	2.93 US
Low Point	802.68 ft	Headwater Elevation	802.99 ft
Discharge Coefficient (Cr)	2.93	Submergence Factor (Kt)	1.00
Tailwater Elevation	-9,999.00 ft		

Overflow HWL

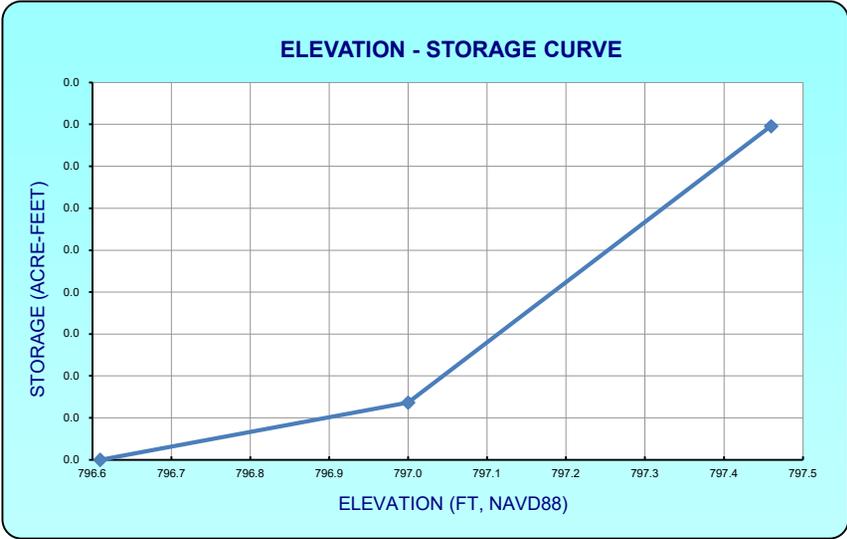
Sta (ft)	Elev. (ft)
0.00	803.21
56.00	802.68
76.00	802.69
137.00	802.79
167.00	802.99
199.00	802.88
227.00	802.99
255.00	802.91
288.00	803.00
316.00	802.90
338.00	802.90
357.00	802.83
364.00	802.97
376.00	803.14

Appendix C

Water Quality and RVR Calculations

POND:	Existing South Basin - Below Outlet (2025 Survey)	
JOB NO.:	5715.107	Side Slopes
PROJECT:	D220 BHS Fine Arts Site Improvement	
FILE:	5715.107 Storage.xls	
DATE:	9/25/2025	

Elevation (ft)	Area		Average Area (ac)	Incremental Storage (ac-ft)	Cummulative Storage (ac-ft)
	(ft ²)	(ac)			
796.61	0	0.000			0.00
			0.004	0.001	
797.00	305	0.007			0.001
			0.014	0.007	
797.46	944	0.022			0.008



Elevation (ft, NAVD88)	Storage (ac-ft)	
796.61	0.00	
797.00	0.00	
797.46	0.01	347 CF

Stormwater Water Quality Calculations - Bioretention Facility

Volume Type	Depth (feet)	Surface Area (sf)	Porosity	Storage Volume Formula	Media Volume V_d (cf)
Soil Media	0.50	26,290	0.25	$0.25 \times V_d$	3,286
				Total Provided	3,286 (CF)
					0.08 (Ac-Ft)

Gewalt - Hamilton Associates
NORTH - WATER QUALITY TREATMENT REQUIREMENTS

Barrington High School
Master Plan
Barrington, Illinois

PROJECT # 2862.650
DATE:4-20-01

TOTAL NEW IMPERVIOUS A 127433 SF
2.93 Ac

PERCENT IMPERVIOUS 100

WATER QUALITY TREATMENT REQUIREMENTS

REQUIRED VOLUME 1.0" x 1'¹/₁₂" x 2.93Ac.= 0.24AcFt

**Gewalt - Hamilton Associates
NORTH - WATER TREATMENT PROVIDED**

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WATER QUALITY STORAGE PROVIDED - NORTH

Below NWL

Provided Storage

Elevation	SF	Total SF	AVG SF	Depth	CF	Cum CF
790	92+210	302				0
			475.5	1	475.5	
791	225+424	649				475.5
			878.5	1	878.5	
792	414+694	1108				1354
			1394	1	1394	
793	660+1020	1680				2748
			2206.5	0.5	1103.25	
793.5	1059+1674	2733				3851.25
						0.09 AcFt

Elevation	SF	Total SF	AVG SF	Depth	CF	Cum CF
793	0	0				0
			4363.5	0.5	2181.75	
793.5	2676+2326+3725	8727				2181.75
						0.05 AcFt

Elevation	SF	Total SF	AVG SF	Depth	CF	Cum CF
793.5	2733+8727	11460				0
			16516	0.4	6606.4	
793.9	21572	21572				6606.4
						0.15 AcFt

Total storage provided **12639.4 CF**
0.29 AcFt

Provided 0.29 AcFt > 0.24 AcFt Required
OK

Project: Barrington High School Fine Arts Site Improvements
 By: MXH
 Date: September 25, 2025

**RVR NATIVE VEGETATION CREDIT
 ZONE A - TURF RUNOFF VOLUME CALCULATION
 2 Year 24 Hour Storm**

Hydrologic Group	Cover Description	CN (table 2-2)	AREA (Acres)	CNxAREA
D	Grass	80	0.604	48.3
TOTAL =		0.604	48.3	

Frequency (yr)	Rainfall, P (inches)	Runoff, Q (inches)
2yr-24h	3.34	1.51

$$\text{CN (weighted)} = \frac{48.3}{0.60} = 80.00$$

use 80

$$S = (1000/\text{CN}) - 10 = 2.50$$

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

TOTAL RUNOFF VOLUME = 0.076 (ac-ft)

Notations:

- CN = Curve Number
- P = Total 2-Year 24-Hour Rainfall (inches)
- S = Potential Maximum Retention (inches)
- Q = Effective Runoff Depth (inches)
- V = Total Runoff Volume = (Q/12)*Area (ac-ft)

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**RVR NATIVE VEGETATION CREDIT
 ZONE A - NATIVE VEGETATION RUNOFF VOLUME CALCULATION
 2 Year 24 Hour Storm**

Hydrologic Group	Cover Description	CN (table 2-2)	AREA (Acres)	CNxAREA	Frequency (yr)	Rainfall, P (inches)	Runoff, Q (inches)
D	Native Plantings	70	0.604	42.3	2yr-24h	3.34	0.91
TOTAL =			0.604	42.3			

CN (weighted) =	$\frac{42.3}{0.60}$	=	70.00
		use	70

TOTAL RUNOFF VOLUME = 0.046 (ac-ft)

$S = (1000/CN) - 10 = 4.29$
 $Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$

Notations:
 CN = Curve Number
 P = Total 2-Year 24-Hour Rainfall (inches)
 S = Potential Maximum Retention (inches)
 Q = Effective Runoff Depth (inches)
 V = Total Runoff Volume = (Q/12)*Area (ac-ft)

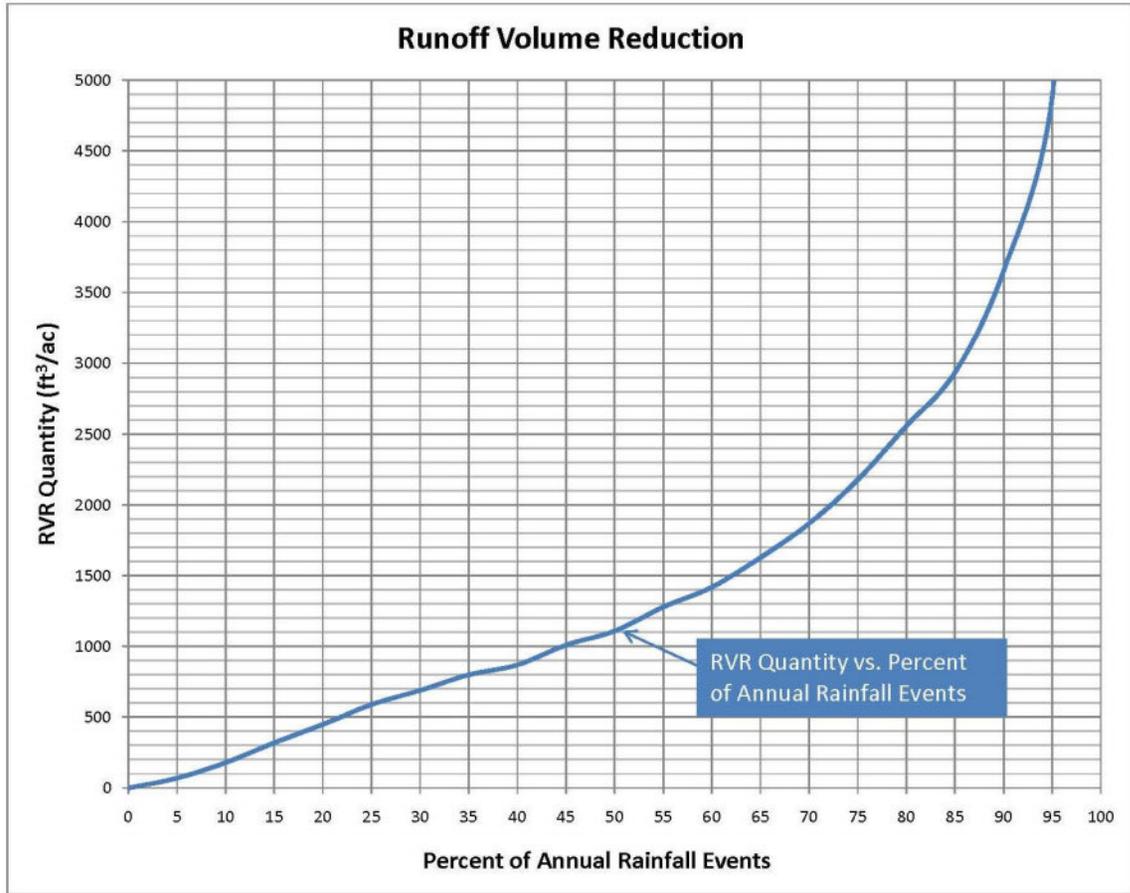
RUNOFF VOLUME REDUCTION = 0.076 AC-FT - 0.046 AC-FT = 0.03 AC-FT = 1,307 CF

Percent of Annual Rainfall Events	100% impervious values	
	Runoff Depth (in)	RVR Quantity ft ³ /ac new impervious
0	0	0
5	0.02	70
10	0.05	180
15	0.09	320
20	0.12	450
25	0.16	590
30	0.19	690
35	0.22	800
40	0.24	870
45	0.28	1010
50	0.30	1110
55	0.35	1280
60	0.39	1420
65	0.45	1630
70	0.51	1870
75	0.60	2180
80	0.70	2560
85	0.81	2940
90	1.01	3660
95	1.35	4900
99	2.41	8760

For the proposed development areas within Zone A, Total RVR volume (Detention Facility Credit + Native Vegetation Credit) = 4,940 cf

Volume / Impervious Area = 4,940 cf / 1.16 acres = 4,259 cf/ac

At 4,259 cf/ac, 92.4% of annual rainfall events



Runoff Depth based on Figure 3 of the Center For Watershed Protection Report.

Runoff Depth = P*R where:

P = Rainfall Depth (inches)

R=Volumetric Runoff Coefficient = 0.95 for 100% impervious cover [0.05+0.009(I), where I is 100% (impervious cover)]

RVR Quantity = Runoff Depth (in) / 12 (in/ft) * 43560 (ft²/ac)