Proposed Multifamily Development Summary & Statement of Use

Moraine View Pkwy & Jakes Way

- 11.36 acre site

- The proposed development will create 128 market rate, mainstream units over 2 phases.

- Phase 1 - 64 Units - (4) 16-Unit Buildings
- Phase 2 - 64 Units - (4) 16-Unit Buildings

- It is anticipated that one (1) part-time employees will be employed at the property during daytime business hours.

- Each unit will have individual trash and recycling bins.

- Tenant storage will restricted to the private garages. Property management storage will occur in the garage portion of the office / garage.

Proposed Multifamily Development Table of Contents

Moraine View Pkwy & Jakes Way

LEGAL DESCRIPTION:

LOT 44, IN WALTON'S PINE BLUFF, BEING A SUBDIVISION OF PART OF THE SE 1/4 & SW 1/4 OF SECTION 3, TOWN 4 NORTH, RANGE 15 EAST, IN THE CITY OF WHITEWATER, WALWORTH COUNTY, WISCONSIN.

CONTAINING: 494,717 SQUARE FEET OR 11.36 ACRES

BLUFF RIDGE DRIVE

APPROXIMATE LOCATION OF 60' WIDE PRIVATE DRIVE

MANHOLE
RIM = 845.53

N 89°35'53" E 736.91'

ARC = 178.38'
RAD = 130.00
CHRD BRNG = N 39°39'19" W
CHRD LNGTH = 164.71

N 78°58'16" W
11.06'

598.33'

N 00°22'48" W

SUNRISE LANE
(66' WIDE PRIVATE ROAD)

TEMPORARY 60' RADIUS TURN-AROUND TO BE ABANDONED UPON FUTURE ROAD EXTENSION PER CSM 2620

LOG PILE

THE SOUTH LINE OF THE SOUTHEAST 1/4 OF SECTION 3-4-15

S 89°35'46" W 764.10'

SANITARY MANHOLE
RIM = 836.24
10" PVC S INV. = 821.57
10" PVC N INV. = 821.46

CATCH BASIN
RIM = 836.71
12" RCP SW INV. = 831.46
SE INV. COULD NOT MEASURE
24" RCP W INV. = 830.16
24" RCP N INV. = 829.99

CURB INLET
RIM = 835.55 (FL)
12" RCP NE INV. = 832.03

169.46'

S 01°03'23" W

CONCRETE CURB

CATCH BASIN
RIM = 837.81
12" RCP W INV. = 833.02
24" RCP S INV. = 832.93
24" RCP E INV. = 832.60

CURB INLET
RIM = 836.63 (FL)
12" RCP S INV. = 833.72
12" RCP E INV. = 833.55
SUMP = 832.6±

CURB INLET
RIM = 836.68
12" RCP N INV. = 833.68
SUMP = 832.9±

ARC = 200.74'
RAD = 590.00'
CHRD BRNG = S 08°41'26" E
CHRD LNGTH = 199.77'

SANITARY MANHOLE
RIM = 838.05
10" PVC W INV. = 823.77
10" PVC E INV. = 823.66
10" PVC S INV. = 823.53
10" PVC N INV. = 823.45

CURB INLET
RIM = 837.57(FL)
12" RCP N INV. = 834.62

CATCH BASIN
RIM = 838.86
12" RCP E INV. = 834.43
12" RCP W INV. = 834.28
24" RCP S INV. = 833.50
24" RCP N INV. = 833.48

MORAINE VIEW PARKWAY
(VARIABLE WIDTH PUBLIC RIGHT OF WAY)

S 18°26'16" E

379.81'

SANITARY MANHOLE
RIM = 839.17
10" PVC W INV. = 824.80
10" PVC S INV. = 824.78
10" PVC N INV. = 824.64

SITE BENCHMARK
CHISELED X ON NE HYDRANT BOLT
ELEVATION = 840.88

CATCH BASIN
RIM = 839.49
12" RCP W INV. = 835.63
24" RCP SE INV. = 834.38
24" RCP NW INV. = 834.07

CURB INLET
RIM = 838.25(FL)
12" RCP S INV. = 836.23

CATCH BASIN
RIM = 838.55
12" RCP N INV. = 836.50
12" RCP S INV. = 836.30
12" RCP NE INV. = 835.67

CURB INLET
RIM = 838.62(FL)
12" RCP S INV. = 836.39
12" RCP SE INV. = 836.42
12" RCP NW INV. = 836.82

STORM MANHOLE
RIM = 840.52
12" RCP NE INV. = 837.31
12" RCP SW INV. = 836.65
24" RCP SE INV. = 834.78
24" RCP NW INV. = 834.74

CURB INLET
RIM = 839.37 (FL)
12" RCP NE INV. = 837.48
SUMP = 836.1±

STORM MANHOLE
RIM = 841.03
15" RCP NE INV. = 834.91
24" RCP SE INV. = 835.00
24" RCP NW INV. = 834.81

SANITARY MANHOLE
RIM = 840.84
10" PVC SE INV. = 825.50
10" PVC NW INV. = 825.44

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BROOKFIELD, WI 53045
PH: (262) 786-6600
FAX: (414) 786-6608
www.CAPITOLSURVEY.COM

NORTH

NOTES

1. SUBJECT PROPERTY ZONED: R-3, MULTI FAMILY RESIDENTIAL.

2. SETBACKS BASED ON THE CITY OF WHITEWATER ZONING CODE AND ARE AS FOLLOWS:

YARD REQUIREMENTS:
A. FRONT, THIRTY FEET FIRST FLOOR.
B. SIDE, FIFTEEN FEET; CORNER LOTS TWENTY-FIVE FEET.
C. REAR. THIRTY FEET.
D. SHORE. SEVENTY-FIVE FEET. ALL SHORELAND SHALL BE IN COMPLIANCE WITH CHAPTER 19.46, AND IN ADDITION MAY REQUIRE DNR APPROVAL.

3. LEGAL DESCRIPTION BASED ON INFORMATION FROM WALWORTH COUNTY TAX RECORDS. LEGAL DESCRIPTION NOT PROVIDED BY CLIENT.

4. THE UNDERGROUND UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, ON INFORMATION FURNISHED BY THE UTILITY COMPANIES, DIGGERS HOTLINE AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED NOR CERTIFIED TO.

5. SUBJECT PROPERTY IS LOCATED WITHIN AN AREA HAVING A ZONE DESIGNATION X: AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN, PER INFORMATION FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO. 55127C0029E, WITH A DATE OF IDENTIFICATION OF 9/3/2014, IN COMMUNITY NO. 550200, CITY OF WHITEWATER, WHICH IS THE COMMUNITY IN WHICH THE SUBJECT PROPERTY IS SITUATED.

6. PROJECT BENCHMARK – THE SOUTHWEST CORNER OF THE SOUTHEAST 1/4 OF SECTION 3-4-15, FOUND CONCRETE MONUMENT WITH BRASS CAP WITH AN ELEVATION OF 829.59.

7. SITE BENCHMARK – CHISELED CROSS ON NORTHEAST BOLT ON HYDRANT, AS SHOWN HEREON.

8. ELEVATIONS BASED ON INFORMATION FROM S.E.W.R.P.C. AND ARE AT NAVD OF 1988(12).

9. SURVEY DATUM:
COORDINATES ARE BASED ON THE WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), WALWORTH COUNTY, NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT (NAD83(2011)).

LEGEND

SAN	SANITARY SEWER	ELECTRIC TRANSFORMER	HYDRANT
ST	STORM SEWER	ELECTRIC METER	WATER VALVE
W	WATER MAIN	ELECTRIC PEDESTAL	GAS VALVE
G	BURIED GAS LINE	ELECTRIC BOX AT GRADE	MANHOLE
TEL	BURIED TELEPHONE LINE	TELEPHONE BOX AT GRADE	STORM MANHOLE
E	BURIED ELECTRIC LINE	TELEPHONE PEDESTAL	CATCH BASIN
FO	BURIED FIBER OPTIC LINE	TV PEDESTAL	CURB INLET
OHU	OVERHEAD UTILITY LINES	GAS METER	METAL LIGHT POLE
CATV	BURIED CABLE TELEVISION LINES	AIR CONDITIONER	CONCRETE LIGHT POLE
COMB	COMBINATION SEWER	UTILITY POLE	WOOD LIGHT POLE
	WOOD FENCE	WOOD SIGN	MAIL BOX
	METAL FENCE	METAL SIGN	FIBER OPTIC MARKER
	EDGE OF TREES AND BRUSH	FLAG POLE	GUY WIRE
894.32 (FL)	DOOR SILL ELEVATION	BOLLARD	
FDC	FIRE DEPARTMENT CONNECTION	BOLLARD LIGHT	
		YARD LIGHT	

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DIGGERS HOTLINE
DIAL 811 OR (800) 242-8511

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FT.

EXISTING CONDITIONS SURVEY

FOR

WHITEWATER MULTI-FAMILY

MORAINE VIEW PARKWAY
WHITEWATER, WI

DRAWN BY:	RAP	DATE:	12/01/2023
CHECKED BY:	MJB	DRAWING NO.	EC-0
CSE JOB NO.:	23-116	SHEET	1 OF 1

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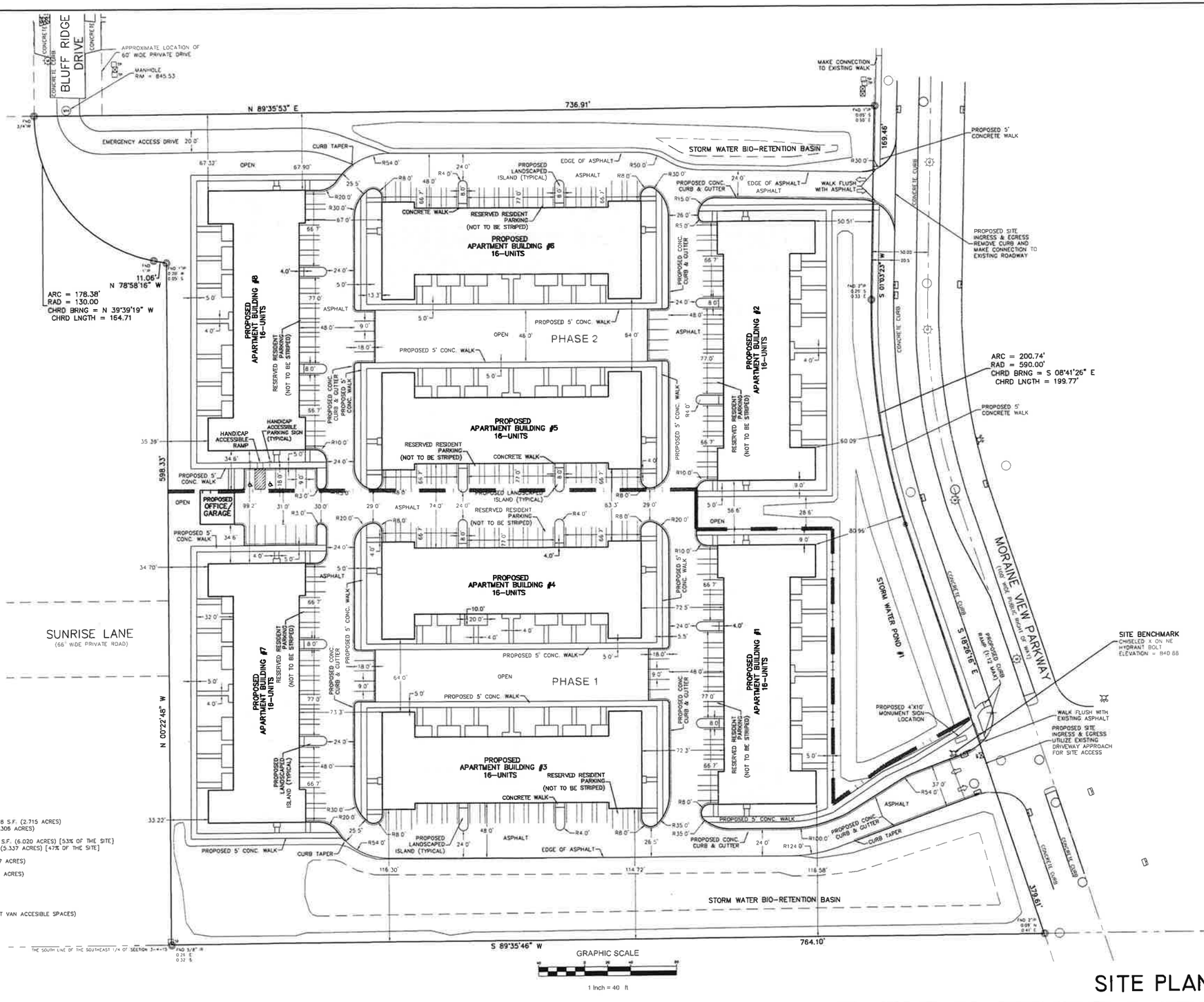
WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN



NOTES:

1. DIMENSIONS ARE TO THE FACE OF CURB OR EDGE OF ASPHALT

SITE AREAS

PROPOSED BUILDING FOOTPRINT = 118,248 S.F. (2.715 ACRES)
PROPOSED PAVEMENT = 143,995 S.F. (3.306 ACRES)

PROPOSED IMPERVIOUS AREA = 262,243 S.F. (6.020 ACRES) [53% OF THE SITE]
PROPOSED OPEN SPACE = 232,464 S.F. (5.337 ACRES) [47% OF THE SITE]

TOTAL SITE AREA = 494,707 S.F. (11.357 ACRES)

DISTURBED AREA = 482,890 S.F. (11.086 ACRES)

PROPOSED SURFACE PARKING

31 REGULAR CUSTOMER SPACES
128 RESERVED RESIDENT SPACES
2 HANDICAPPED SPACES (ADA COMPLIANT VAN ACCESIBLE SPACES)

161 TOTAL SPACES

CJE NO.: 2364R4
JULY 15, 2024
REV.: 08/06/2024

SITE PLAN

C1.0

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WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN

BLUFF RIDGE DRIVE

APPROXIMATE LOCATION OF 60' WIDE PRIVATE DRIVE

MANHOLE RIM = 845.53

N 89°35'53" E 736.91'

MAKE CONNECTION TO EXISTING WALK

CATCH BASIN
RIM = 836.71
12" RCP SW INV. = 831.48
SE INV. COULD NOT MEASURE
24" RCP W INV. = 830.16
24" RCP N INV = 829.99

CURB INLET
RIM = 835.55 (FL)
12" RCP NE INV. = 832.03
PROP. 10" SW INV. 832.50

CATCH BASIN
RIM = 837.61
12" RCP W INV. = 833.02
24" RCP S INV. = 832.93
24" RCP E INV. = 832.80

CURB INLET
RIM = 836.63 (FL)
12" RCP S INV. = 833.72
12" RCP E INV. = 833.55
SUMP = 832.6±

CURB INLET
RIM = 836.68
12" RCP N INV. = 833.88
SUMP = 832.9±

ARC = 200.74'
RAD = 590.00'
CHRD BRNG = S 08°41'26" E
CHRD LNGTH = 199.77'

PROPOSED 5' WIDE CONCRETE WALK PER CITY OF WHITEWATER STANDARDS MAX CROSS SLOPE 2%

CATCH BASIN
RIM = 838.86
12" RCP E INV. = 834.43
12" RCP W INV. = 834.28
24" RCP S INV. = 833.50
24" RCP N INV. = 833.48

CURB INLET
RIM = 837.57(FL)
12" RCP N INV. = 834.62

MORAINE VIEW PARKWAY
(100' WIDE PUBLIC RIGHT OF WAY)

SITE BENCHMARK
CHISELED X ON NE HYDRANT BOLT
ELEVATION = 840.88

CURB INLET
RIM = 838.25(FL)
12" RCP S INV. = 836.23
PROP. 12" NW INV. 837.0

CATCH BASIN
RIM = 839.49
12" RCP W INV. = 835.63
24" RCP SE INV. = 834.38
24" RCP NW INV. = 834.07

CATCH BASIN
RIM = 838.55
12" RCP N INV = 836.50
12" RCP S INV. = 836.30
12" RCP NE INV. = 835.67

CURB INLET
RIM = 838.62(FL)
12" RCP S INV. = 836.39
(TO BE REVISED)
12" RCP SE INV. = 836.42
PROP. 10" S INV. 836.5

STORM MANHOLE
RIM = 840.52
12" RCP NE INV. = 837.31
12" RCP SW INV. = 836.65
24" RCP SE INV. = 834.78
24" RCP NW INV. = 834.74

12" RCP NW INV. = 836.82 TO BE REMOVED

CURB INLET
RIM = 839.37 (FL)
12" RCP NE INV. = 837.48
SUMP = 836.1±

STORM MANHOLE
RIM = 841.03
15" RCP NE INV. = 834.91
24" RCP SE INV. = 835.00
24" RCP NW INV. = 834.81

STORM WATER BIO-RETENTION BASIN #2

STORM WATER BIO-RETENTION BASIN #1

PROPOSED APARTMENT BUILDING #5
16-UNITS
F.F.E. 844.0

PROPOSED APARTMENT BUILDING #5
16-UNITS
F.F.E. 845.0

PROPOSED APARTMENT BUILDING #4
16-UNITS
F.F.E. 845.0

PROPOSED APARTMENT BUILDING #3
16-UNITS
F.F.E. 844.0

PROPOSED APARTMENT BUILDING #2
16-UNITS
F.F.E. 843.0

PROPOSED APARTMENT BUILDING #1
16-UNITS
F.F.E. 844.0

PROPOSED APARTMENT BUILDING #6
16-UNITS
F.F.E. 845.0

PROPOSED APARTMENT BUILDING #7
16-UNITS
F.F.E. 845.0

PROPOSED OFFICE / GARAGE

PROPOSED STORM INLET

PROPOSED STORM SEWER

11.06'
N 78°58'16" W

ARC = 178.38'
RAD = 130.00
CHRD BRNG = N 39°39'19" W
CHRD LNGTH = 164.71

598.33'

N 00°22'48" W

S 01°03'23" W 169.46'

S 18°26'15" E 379.61'

S 89°35'46" W 764.10'

SUNRISE LANE
(55' WIDE PRIVATE ROAD)

THE SOUTH LINE OF THE SOUTHEAST 1/4 OF SECTION 3-4-15

END 5/8" IR
0.26' E
0.32' S

NOTES:

1. EXISTING CONDITIONS BASED ON SURVEY BY CAPITOL SURVEY ENTERPRISES.
2. DISTURBED AREA = 11.086 ACRES
3. THE DEVELOPMENT WILL RESULT IN AN INCREASE IN IMPERVIOUS SURFACE AREA ON THE SITE BY 6.020 ACRES.
4. STORM WATER MANAGEMENT MEETING ALL THE REQUIREMENTS OF THE CITY AND NR 151 WILL BE PROVIDED BY TWO PROPOSED STORM WATER BIO-RETENTION BASINS AND A PROPOSED STORM WATER WET POND LOCATED ON THE NORTH, SOUTH AND EAST SIDES OF THE SITE.
5. THE CONTRACTOR IS RESPONSIBLE FOR ANY CITY AND/OR STATE PERMITS FOR ALL WORK IN THE PUBLIC RIGHT OF WAY.
6. ALL CONSTRUCTION MATERIALS TO BE STORED ON-SITE.
7. ALL PROPOSED SPOT GRADES ALONG THE CURB ARE AT THE FLANGE LINE. ALL PROPOSED SPOT GRADES ALONG THE FACE OF A RAISED WALK ARE AT THE BOTTOM OF WALK (ASPH.) UNLESS OTHERWISE NOTED.

LEGEND

	EXISTING CONTOUR
190	PROPOSED CONTOUR
x 189.5	PROPOSED GRADE
ST	EXISTING STORM SEWER
ST	PROPOSED STORM SEWER
SAN	EXISTING SANITARY SEWER
SAN	PROPOSED SANITARY SEWER
W	EXISTING WATER MAIN
W	PROPOSED WATER MAIN
G	BURIED GAS MAIN
OHW	OVER HEAD WIRE
E	BURIED ELECTRIC

GRAPHIC SCALE
1 Inch = 40 ft

CJE NO.: 2364R4
JULY 15, 2024
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SITE GRADING PLAN C2.0

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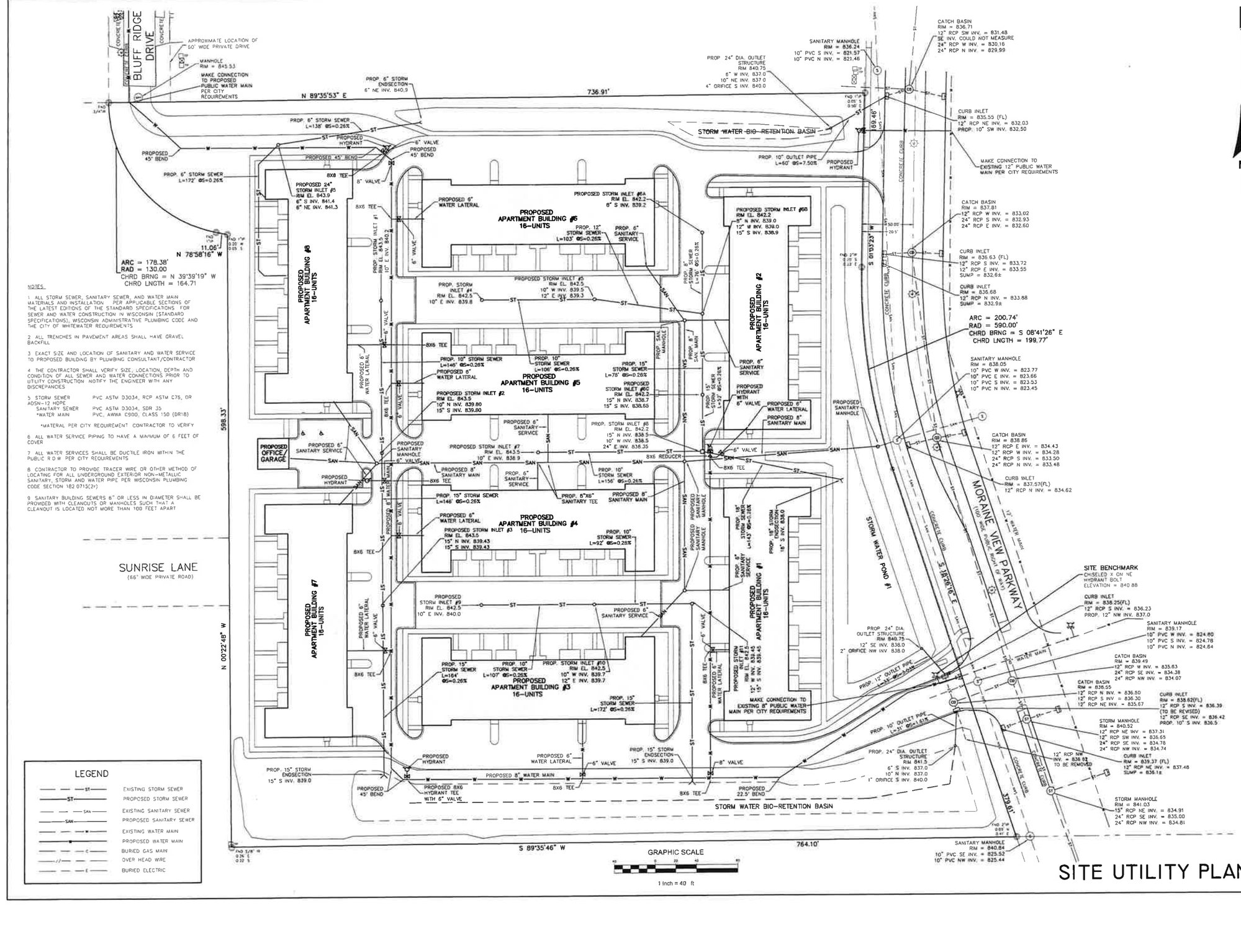
WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN



NOTES

1. ALL STORM SEWER, SANITARY SEWER, AND WATER MAIN MATERIALS AND INSTALLATION PER APPLICABLE SECTIONS OF THE LATEST EDITIONS OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN (STANDARD SPECIFICATIONS), WISCONSIN ADMINISTRATIVE PLUMBING CODE AND THE CITY OF WHITEWATER REQUIREMENTS

2. ALL TRENCHES IN PAVEMENT AREAS SHALL HAVE GRAVEL BACKFILL

3. EXACT SIZE AND LOCATION OF SANITARY AND WATER SERVICE TO PROPOSED BUILDING BY PLUMBING CONSULTANT/CONTRACTOR

4. THE CONTRACTOR SHALL VERIFY SIZE, LOCATION, DEPTH AND CONDITION OF ALL SEWER AND WATER CONNECTIONS PRIOR TO UTILITY CONSTRUCTION NOTIFY THE ENGINEER WITH ANY DISCREPANCIES

5. STORM SEWER PVC ASTM D3034, RCP ASTM C76, OR ADSN-12 HDPE
SANITARY SEWER PVC ASTM D3034, SDR 35
*WATER MAIN PVC, AWWA C900, CLASS 150 (DR18)
*MATERIAL PER CITY REQUIREMENT CONTRACTOR TO VERIFY

6. ALL WATER SERVICE PIPING TO HAVE A MINIMUM OF 6 FEET OF COVER

7. ALL WATER SERVICES SHALL BE DUCTILE IRON WITHIN THE PUBLIC R O W PER CITY REQUIREMENTS

8. CONTRACTOR TO PROVIDE TRACER WIRE OR OTHER METHOD OF LOCATING FOR ALL UNDERGROUND EXTERIOR NON-METALLIC SANITARY, STORM AND WATER PIPE PER WISCONSIN PLUMBING CODE SECTION 182.0715(2r)

9. SANITARY BUILDING SEWERS 6" OR LESS IN DIAMETER SHALL BE PROVIDED WITH CLEANOUTS OR MANHOLES SUCH THAT A CLEANOUT IS LOCATED NOT MORE THAN 100 FEET APART

SUNRISE LANE
(66' WIDE PRIVATE ROAD)

LEGEND

- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- BURIED GAS MAIN
- OVER HEAD WIRE
- BURIED ELECTRIC

CJE NO.: 2364R4
JULY 15, 2024
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SITE UTILITY PLAN C3.0

WINTER CONDITIONS

DURING WINTER CONSTRUCTION (NOVEMBER 1 TO MAY 1), CONTRACTOR TO PROVIDE TYPE B SOIL STABILIZER, POLYACRYLAMIDE (PAM) PER LATEST WDOT PAL (UPDATED 11/2/2017) ON ALL DISTURBED AREAS THAT ARE NOT TO BE DISTURBED BEYOND 7 DAYS. CONTRACTOR TO INSTALL PAM PER WDNR TECHNICAL STANDARD 1050 AND THE MANUFACTURERS SPECIFICATIONS.

PRESCRIPTIVE COMPLIANCE AREAS

PER WDNR NR151.11 WIS. ADM. CODE
MAXIMUM PERIOD OF BARE SOIL EXPOSURE FOR SLOPES EXCEEDING 20%

SLOPE AREA DRAINS TO SEDIMENT BASIN OR SEDIMENT TRAP	MAXIMUM PERIOD OF BARE SOIL EXPOSURE (CALENDER DAYS)	
	LAND DISTURBANCE BETWEEN SEPT. 16TH AND MAY 1ST	LAND DISTURBANCE BETWEEN MAY 2ND AND SEPT. 15TH

TEMPORARY STABILIZATION METHODS

TEMPORARY SEEDING:
DURING GROWING SEASON (MAY 2 – OCTOBER 31) TEMPORARY SEEDING (COVER CROP) TO BE USED FOR TEMPORARY STABILIZATION DURING SITE CONSTRUCTION.

Species	Lbs/Acre	Percent Purity
Oats	131	98
Cereal Rye	131*	97
Winter Wheat	131*	95
Annual Ryegrass	80*	97

* Fall Seeding

LAND APPLICATION OF ADDITIVES:
DURING NONGROWING SEASON (NOVEMBER 1 – MAY 1) CONTRACTOR TO PROVIDE TYPE B SOIL STABILIZER DURING SITE CONSTRUCTION. STABILIZER TO BE POLYACRYLAMIDE (PAM) PER LATEST WDOT PAL (UPDATED 11/2/2017) – SEE WDNR TECHNICALSTANDARD 1050.

STABILIZATION SHOULD BE COMPLETED WITHIN 7 DAYS OF ESTABLISHING FINAL GRADE OR THAT WILL OTHERWISE EXIST FOR MORE THAN 14 DAYS.

CONSTRUCTION SCHEDULE

1. OBTAIN PLAN APPROVAL AND OTHER APPLICABLE PERMITS.
2. INSTALL CONSTRUCTION EXIT.
3. INSTALL SILT FENCE AND CONSTRUCTION FENCE
4. STRIP AND STOCK PILE TOP SOIL. SURROUND TOP SOIL STOCK PILE WITH SILT FENCE AND TEMP. STABILIZE. LOCATION OF STOCK PILE TO BE DETERMINED BY CONTRACTOR.
5. INSTALL SEDIMENT BASINS (FUTURE BIORETENTION BASINS & WET POND)
   A. THE AREA OF THE BIO-RETENTION BASINS WILL BE USED AS A SEDIMENTATION BASIN DURING CONSTRUCTION. DO NOT INSTALL DRAINTILE, AGGREGATE OR ENGINEERED SOIL AT THIS STAGE.
   B. ROUGH GRADE BASINS AND INSTALL BASINS STANDPIPE AND 24" OUTLET PIPE AND RIP RAP
6. ROUGH GRADE SITE
7. UTILIZE DEWATERING BAG AS NECESSARY DURING EXCAVATION FOR BUILDING CONSTRUCTION. DIRECT RUNOFF FROM BAG TO EXISTING STORM WATER FACILITIES.
8. INSTALL PROPOSED UTILITIES
9. INSTALL OUTLET PROTECTION
10. INSTALL BASE COURSE OF PAVEMENT.
11. INSTALL BIORETENTION BASINS: INSTALL AGGREGATE, 6" DRAIN TILE, ENGINEERED SOIL AND PLANTINGS. PROVIDE FINAL STABILIZATION OF BASIN SIDE SLOPES THAT INCLUDE SEEDING AND MATTING.
12. FINAL GRADE SLOPES AND TOPSOIL CRITICAL SLOPES: VEGETATE AND MAT ALL DISTURBED AREAS.
13. ALL EROSION CONTROL PRACTICES WILL BE INSPECTED WEEKLY AND AFTER RAINFALL. NEEDED REPAIRS WILL BE PERFORMED IMMEDIATELY.
14. AFTER SITE IS STABILIZED, REMOVE ALL TEMPORARY MEASURES AND VEGETATE THE DISTURBED AREAS.

MAINTENANCE PLAN

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY ½" RUNOFF-PRODUCTION RAINFALL BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.

2. SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT BECOMES ABOUT 0.5 FT. DEEP AT THE FENCE. THE SILT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER.

3. ALL SEEDED AREAS WILL BE WATERED, FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.

4. ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD SHALL BE REMOVED BY STREET CLEANING BEFORE THE END OF EACH DAY.

EROSION CONTROL PRACTICES

1. SILT FENCE
2. CONSTRUCTION EXIT
3. INLET PROTECTION
4. OUTLET PROTECTION
5. EROSION MATTING
6. SEDIMENT BASIN
7. HAY BALE SEDIMENT DEWATERING PIT

FOR FINAL STABILIZATION, PROVIDE CLASS I, TYPE B EROSION MAT PER 'WISDOT EROSION CONTROL PAL' (OR EQUAL) IN ALL ROADSIDE DITCHES, DEFINED SWALES, SIDE SLOPES, OUTLOT BERMS AND ALL OTHER SLOPES 4:1 OR GREATER. INSTALL PER MANUFACTURERS SPECIFICATIONS.

LEGEND

- EXISTING CONTOUR
- 190 PROPOSED CONTOUR
- 189.5 PROPOSED GRADE
- ST EXISTING STORM SEWER
- ST PROPOSED STORM SEWER
- SAN EXISTING SANITARY SEWER
- SAN PROPOSED SANITARY SEWER
- W EXISTING WATER MAIN
- W PROPOSED WATER MAIN
- G BURIED GAS MAIN
- OVER HEAD WIRE
- E BURIED ELECTRIC
- SILT FENCE

NOTES:

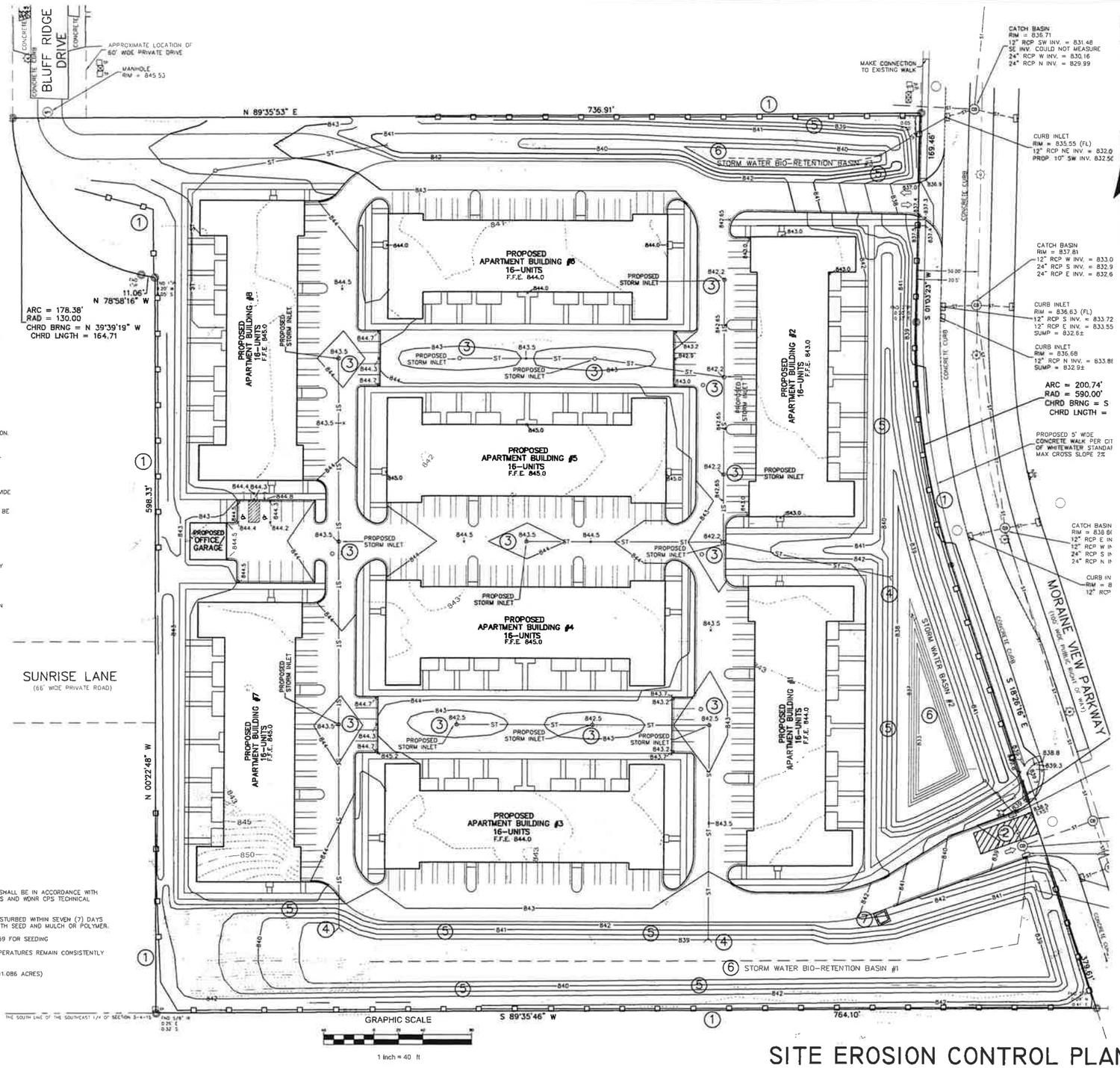
1. ALL EROSION CONTROL METHODS SHALL BE IN ACCORDANCE WITH THE CITY OF WHITEWATER STANDARDS AND WDNR CPS TECHNICAL STANDARDS.

2. ALL EXPOSED SOIL AREAS NOT DISTURBED WITHIN SEVEN (7) DAYS SHALL BE IMMEDIATELY RESTORED WITH SEED AND MULCH OR POLYMER.

SEE WDNR TECHNICAL STANDARD 1059 FOR SEEDING

DURING GROWING SEASON (SOIL TEMPERATURES REMAIN CONSISTENTLY ABOVE 53°):

3. DISTURBED AREA: 482,890 S.F. (11.086 ACRES)



CJ engineering
civil design and consulting
9205 W. Center Street
Suite 214
Milwaukee, WI 53222
PH. (414) 443-1312
www.cj-engineering.com

WHITEWATER MULTI-FAMILY DEVELOPMENT

WHITEWATER, WISCONSIN

MORAINE VIEW PARKWAY

CJE NO.: 2364R4
JULY 15, 2024
REV.: 08/06/2024

SITE EROSION CONTROL PLAN

C4.0

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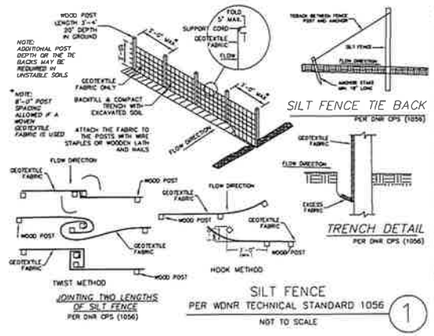
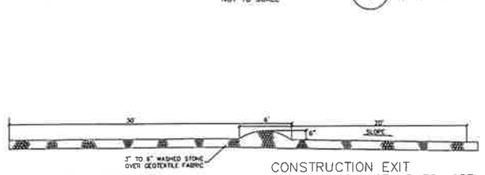
WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN

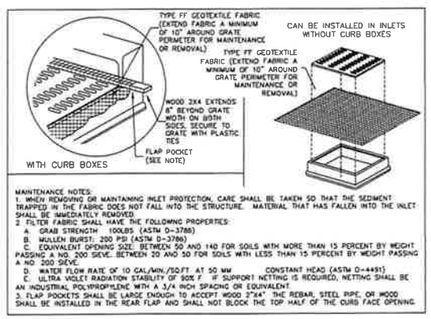


CONSTRUCTION SPECIFICATIONS

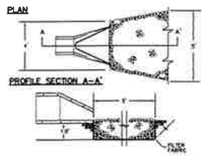
1. CONSTRUCTION SILT FENCE AROUND THE DISTURBED AREAS AS SHOWN ON EROSION CONTROL PLAN, TO PREVENT SEDIMENT FROM BEING WASHED INTO THE DRAINAGE SYSTEM
2. LOCATE POSTS PER DNR CPS (1056)
3. WHEN JOINTS ARE NECESSARY REFER, TO DNR CPS (1056)
4. FILTER FABRIC TO BE OF NYLON, POLYESTER, PROPYLENE OR ETHYLENE YARN WITH EXTRA STRENGTH – 50 LB/LIN. IN. (MIN.) – AND WITH A FLOW RATE OF AT LEAST 0.3 GAL./SQ. FT./MIN. FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS.
5. THE FILTER FABRIC SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF FABRIC IN A 4" X 6" TRENCH
6. THE FILTER FABRIC SHALL BE STAPLED AND/OR NAILED TO THE UPSLOPE SIDE OF THE POSTS.
7. POST TO BE 1 1/8" X 1 1/8" HICKORY OR OAK, 3 FEET LONG, SPACED A MAXIMUM OF 3 FEET APART.
8. USE WIRE REINFORCEMENT IN UNSTABILIZED MINOR SWALES, DITCHES AND DIVERSIONS
9. USE WISDOT APPROVED SILT FENCE



CONSTRUCTION EXIT
PER WDNR TECHNICAL STANDARD 1057
NOT TO SCALE
2



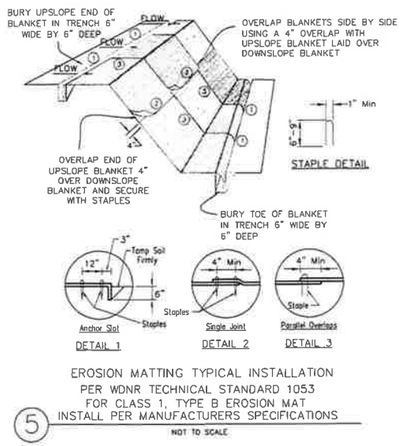
INLET PROTECTION TYPE D & C
PER WDNR TECHNICAL STANDARD 1060
NOT TO SCALE
3



CONSTRUCTION SPECIFICATIONS

1. EXCAVATE BELOW CHANNEL OUTLET AND WIDEN CHANNEL TO THE REQUIRED RIP RAP THICKNESS FOR EACH APRON. FOUNDATION TO BE CUT TO ZERO GRADE AND SMOOTHED.
2. PLACE FILTER CLOTH ON BOTTOM AND SIDES OF PREPARED FOUNDATION. ALL JOINTS TO OVERLAP A MINIMUM OF 1.0'.
3. EXERCISE CARE IN RIP RAP PLACEMENT TO AVOID DAMAGE TO FILTER FABRIC.
4. PLACE RIP RAP ON ZERO GRADE – TOP OF RIP RAP TO BE LEVEL WITH EXISTING OUTLET – NO OVERFALL AT ENDS.
5. RIP RAP TO BE HARD, ANGULAR, WELL GRADE STONE OF 5" TO 8" DIA.
6. IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION.

OUTLET PROTECTION FOR ENDSECTION
NOT TO SCALE
4

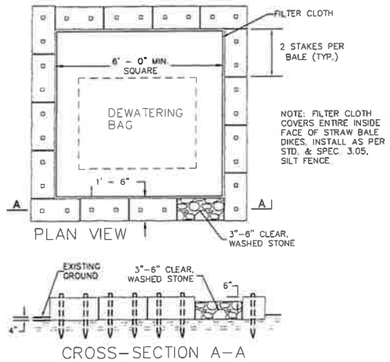


EROSION MATTING TYPICAL INSTALLATION
PER WDNR TECHNICAL STANDARD 1053
FOR CLASS 1, TYPE B EROSION MAT
INSTALL PER MANUFACTURERS SPECIFICATIONS
NOT TO SCALE
5

SITE DEWATERING

DEWATERING TO CONFORM WITH WDNR CONSERVATION PRACTICE STANDARD 1061. THE SITE HAS HIGH GROUND WATER SO DEWATERING IS ANTICIPATED. ALL PUMPED EFFLUENT FROM DEWATERING OPERATIONS (TRENCH DEWATERING OR OTHERWISE) SHALL BE DISCHARGED TO A GEOTEXTILE FILTER BAG CONFORMING TO WDNR CONSERVATION PRACTICE STANDARD 1061. THE GEOTEXTILE BAG SHALL BE PLACED ON A VEGETATED/STABILIZED GROUND AND DISCHARGE TO A SEDIMENT BASIN OR TRAP. SHOULD NO BASIN EXIST, THE GEOTEXTILE BAG SHALL BE PLACED ON FILTER FABRIC AND SURROUNDED BY A SEDIMENT BALE BARRIER CONFORMING TO CONSERVATION PRACTICE STANDARD 1055. THE FILTER FABRIC SHALL BE BROUGHT UP THE SIDES AND OVER THE TOP OF THE HAY BALES AND SECURED. DISCHARGE SHALL NOT BE ALLOWED TO FLOW OVER UNPROTECTED GROUND. IN NO CASE SHALL PUMPED WATER BE DIVERTED OUTSIDE THE PROJECT LIMITS PRIOR TO SEDIMENT REMOVAL.

PER WDNR WPDES GENERAL PERMIT: CONSTRUCTION SITE STORM WATER RUNOFF (WDNR) TRENCH DEWATERING MAY NOT EXCEED 70 GPM.

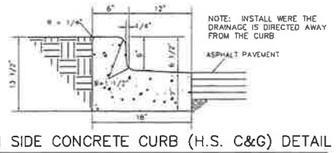


NOTE: FILTER CLOTH COVERS ENTIRE INSIDE FACE OF STRAW BALE DIKES. INSTALL AS PER STD. & SPEC. 3.05, SILT FENCE.

HAY BALE SEDIMENT DEWATERING PIT
NOT TO SCALE
7

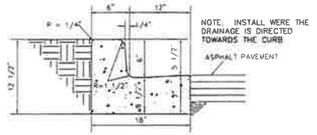
CJE NO.: 2364R4
JULY 15, 2024
REV.: 08/06/2024

EROSION CONTROL DETAILS C4.1



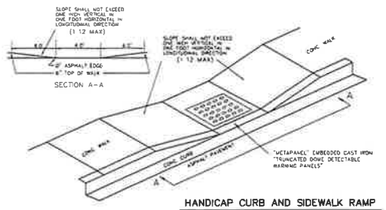
HIGH SIDE CONCRETE CURB (H.S. C&G) DETAIL

NOT TO SCALE



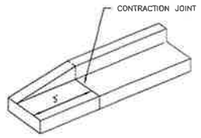
LOW SIDE CONCRETE CURB (L.S. C&G) DETAIL

NOT TO SCALE



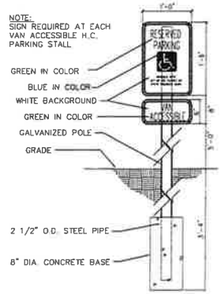
HANDICAP CURB AND SIDEWALK RAMP

NOT TO SCALE



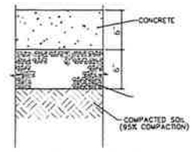
END SECTION CURB TAPER

NOT TO SCALE



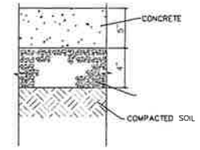
HANDICAPPED PARKING SIGN DETAIL (VAN ACCESSIBLE)

NOT TO SCALE



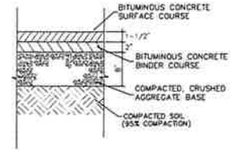
CONCRETE PAVEMENT (PADS)

NOT TO SCALE



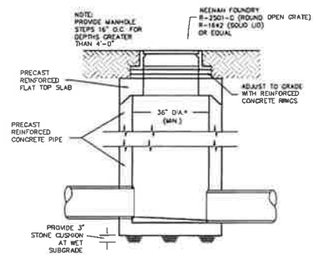
CONCRETE SIDEWALK

NOT TO SCALE



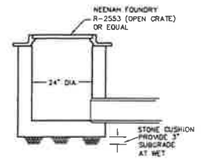
ASPHALT PAVEMENT

NOT TO SCALE



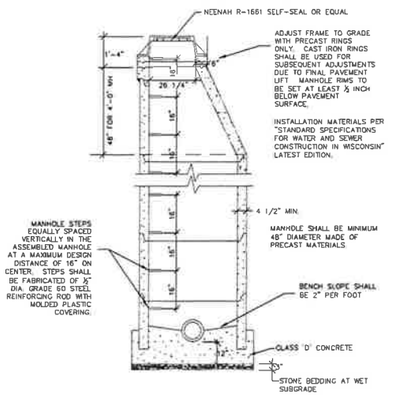
PRECAST STORM INLET/MH

NOT TO SCALE



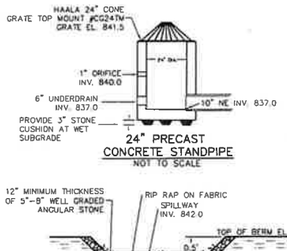
PRECAST 24" DIA. STORM INLET

NOT TO SCALE



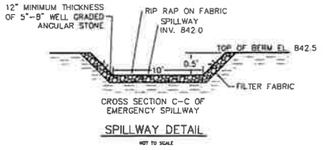
SANITARY MANHOLE

NOT TO SCALE



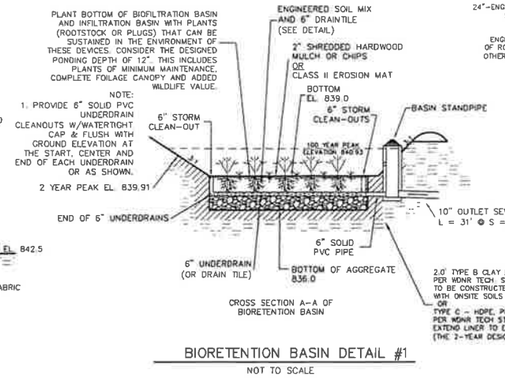
24" PRECAST CONCRETE STANDPIPE

NOT TO SCALE



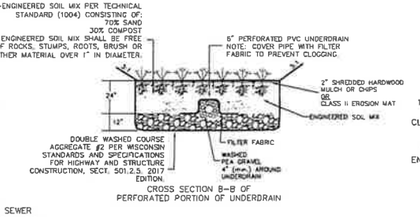
SPILLWAY DETAIL

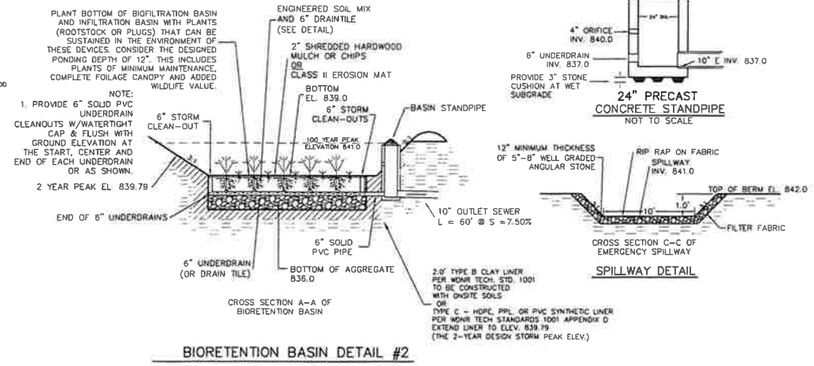
NOT TO SCALE



BIORETENTION BASIN DETAIL #1

NOT TO SCALE





BIORETENTION BASIN DETAIL #2

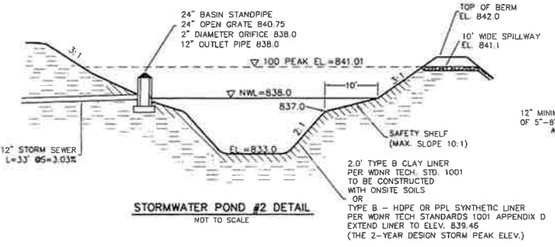
NOT TO SCALE

24" PRECAST CONCRETE STANDPIPE

NOT TO SCALE

SPILLWAY DETAIL

NOT TO SCALE

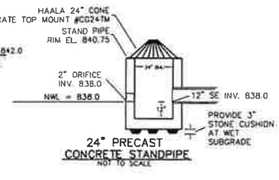


STORMWATER POND #2 DETAIL

NOT TO SCALE

EMERGENCY SPILLWAY DETAIL

NOT TO SCALE



24" PRECAST CONCRETE STANDPIPE

NOT TO SCALE

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www.cj-engineering.com

WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN

CJE NO.: 2364R4
JULY 15, 2024
REV.: 08/06/2024

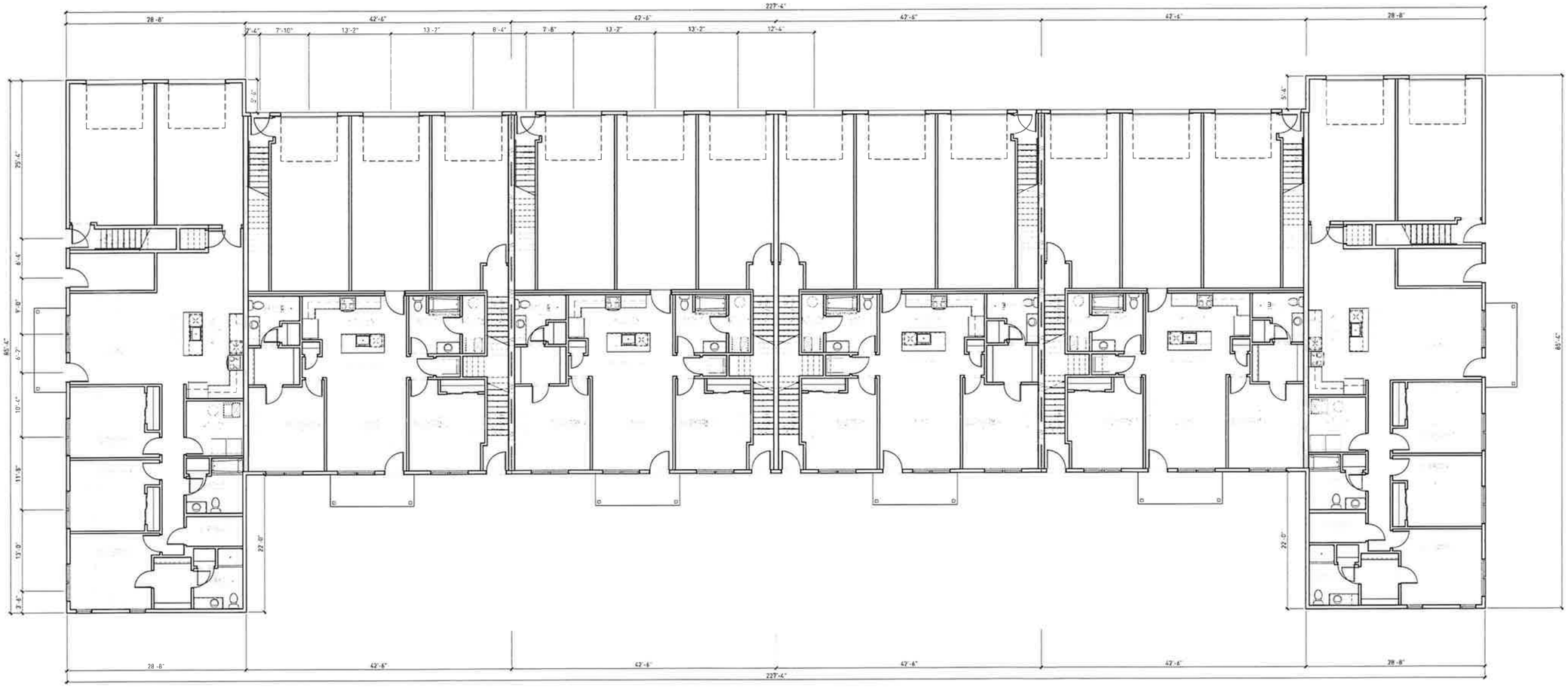
SITE DETAILS **C5.0**

Haydin
Thacker
Architecture

131 W SEEBOTH ST. SUITE 230
MILWAUKEE, WI 53204

HTARC.COM

PROJECT TEAM



01 FLOOR PLAN -
FIRST FLOOR

FOUNDATION FOOTPRINT [w/o stoops] = 14,752 s.f

SCALE = 1/8" = 1'-0"

PROJECT NAME
WHITEWATER MULTI-FAMILY

WHITEWATER, WISCONSIN

ARCHITECT PROJECT NUMBER
24006

DRAWING REVISIONS

DRAWING DATE
07.12.2024
SET TYPE

SHEET NAME
FLOOR PLAN -
FIRST FLOOR

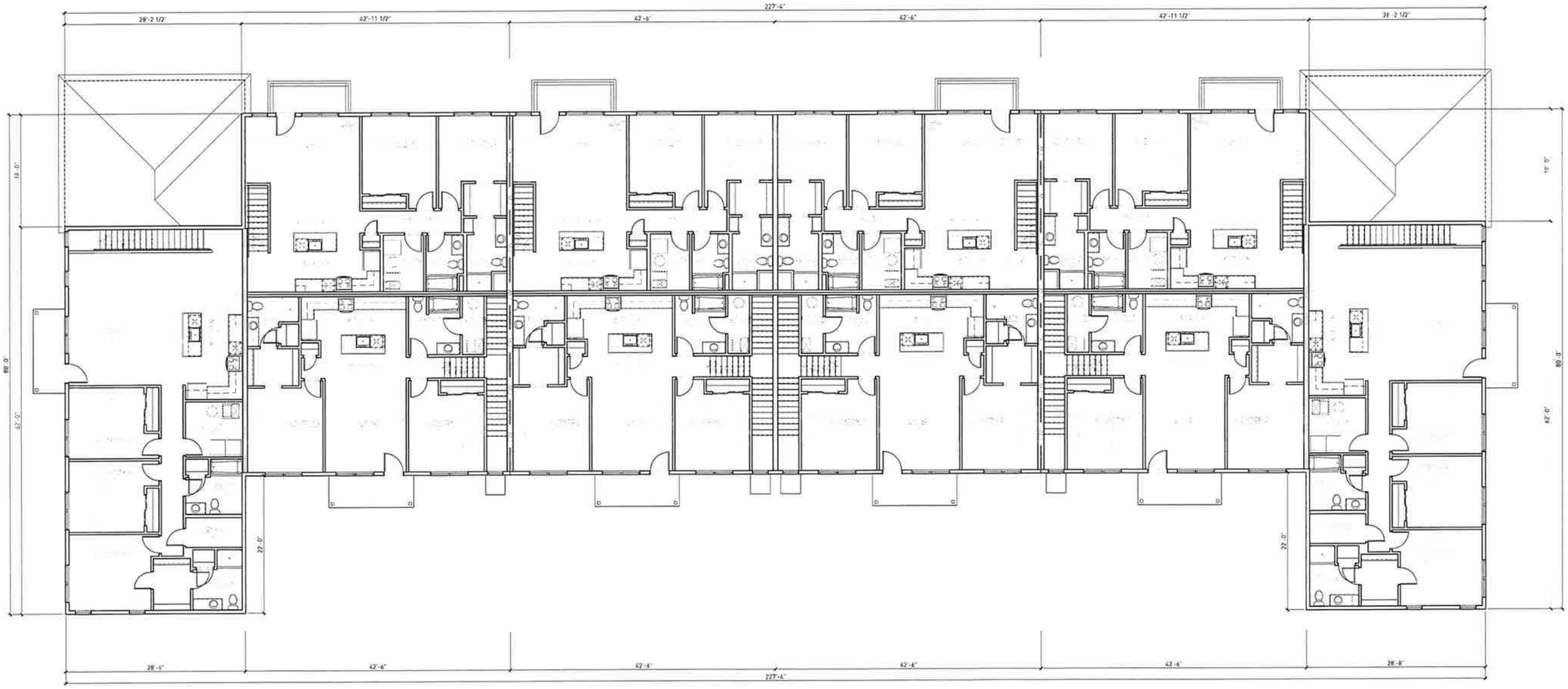
SHEET NUMBER
A200

Haydin
Thacker
Architecture

131 W SEEBOTH ST. SUITE 230
MILWAUKEE, WI 53204

HTARC.COM

PROJECT TEAM



01 FLOOR PLAN - SECOND FLOOR

GROSS AREA (including stairs) = 13,431 s.f.

SCALE = 1/8" = 1'-0"

PROJECT NAME
WHITEWATER MULTI-FAMILY

WHITEWATER, WISCONSIN

ARCHITECT PROJECT NUMBER
24006

DRAWING REVISIONS

DRAWING DATE
07.12.2024

SET TYPE

SHEET NAME
FLOOR PLAN - SECOND FLOOR

SHEET NUMBER
A201

01 FRONT ELEVATION

SCALE = 1/8" = 1'-0"

02 LEFT SIDE ELEVATION

SCALE = 1/8" = 1'-0"

03 RIGHT SIDE ELEVATION

SCALE = 1/8" = 1'-0"

04 REAR ELEVATION

SCALE = 1/8" = 1'-0"

Haydin Thacker Architecture

121 W SEEBOTH ST, SUITE 230
MILWAUKEE, WI 53204

HTARC.COM

PROJECT TEAM

PROJECT NAME
WHITEWATER MULTI-FAMILY

WHITEWATER, WISCONSIN

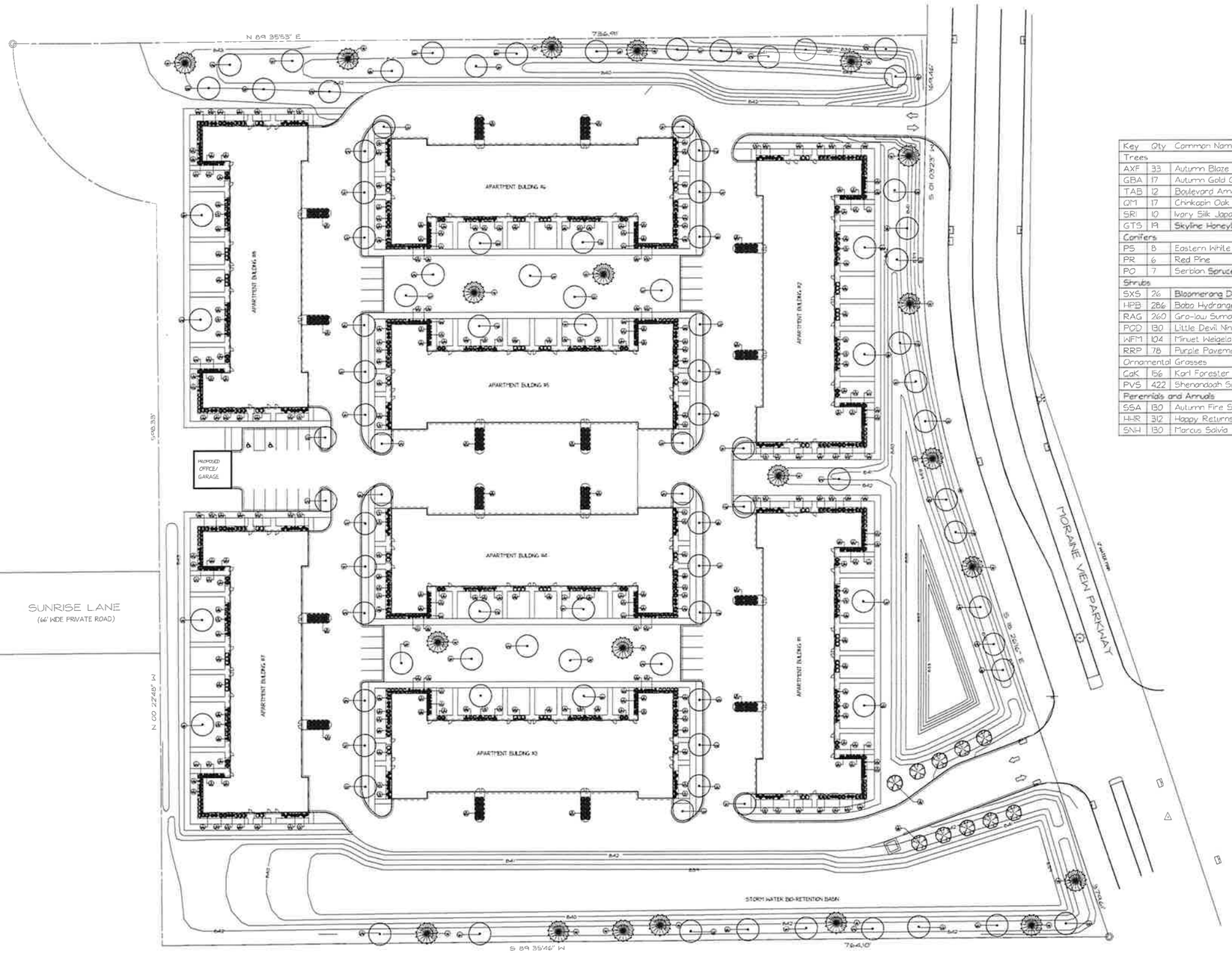
ARCHITECT PROJECT NUMBER
24006

DRAWING REVISIONS

DRAWING DATE
07.12.2024
SET TYPE

SHEET NAME
EXTERIOR ELEVATIONS

SHEET NUMBER
A400



Key	Qty	Common Name
Trees		
AXF	33	Autumn Blaze Maple
GBA	17	Autumn Gold Ginkgo
TAB	12	Boulevard American Linden
QM	17	Chinkapin Oak
SR	10	Ivory Silk Japanese Tree Lilac
GTS	19	Skyline Honeylocust
Conifers		
PS	8	Eastern White Pine
PR	6	Red Pine
PO	7	Serbian Spruce
Shrubs		
SXS	26	Bloomerang Dark Purple Lilac
HPB	286	Bobo Hydrangea
RAG	260	Gro-low Sumac
POD	130	Little Devil Ninebark
WFM	104	Minuet Weigela
RRP	78	Purple Pavement Rose
Ornamental Grasses		
CaK	156	Karl Forester Grass
PVS	422	Shenandoah Switch Grass
Perennials and Annuals		
SSA	130	Autumn Fire Sedum
HHR	312	Happy Returns Daylily
SNH	130	Marcus Salvia

KUJAWA ENTERPRISES, INC.
824 EAST RAWSON AVE.
OAK CREEK, WI 53154
PH: (414) 766-1900
WWW.KEIORANGE.COM

REVISIONS:

NO	DATE:	DESCRIPTION:
1	7/17/24	REV 1

CLIENT NAME:
Integris

PROJECT NAME:
Whitewater Multi-Family Development

PROJECT ADDRESS:
Moraine View Parkway
Whitewater, WI

DRAWN BY:
Travis Bischoff

CHECKED BY:
Chris Kujawa

DATE:
7/17/2024

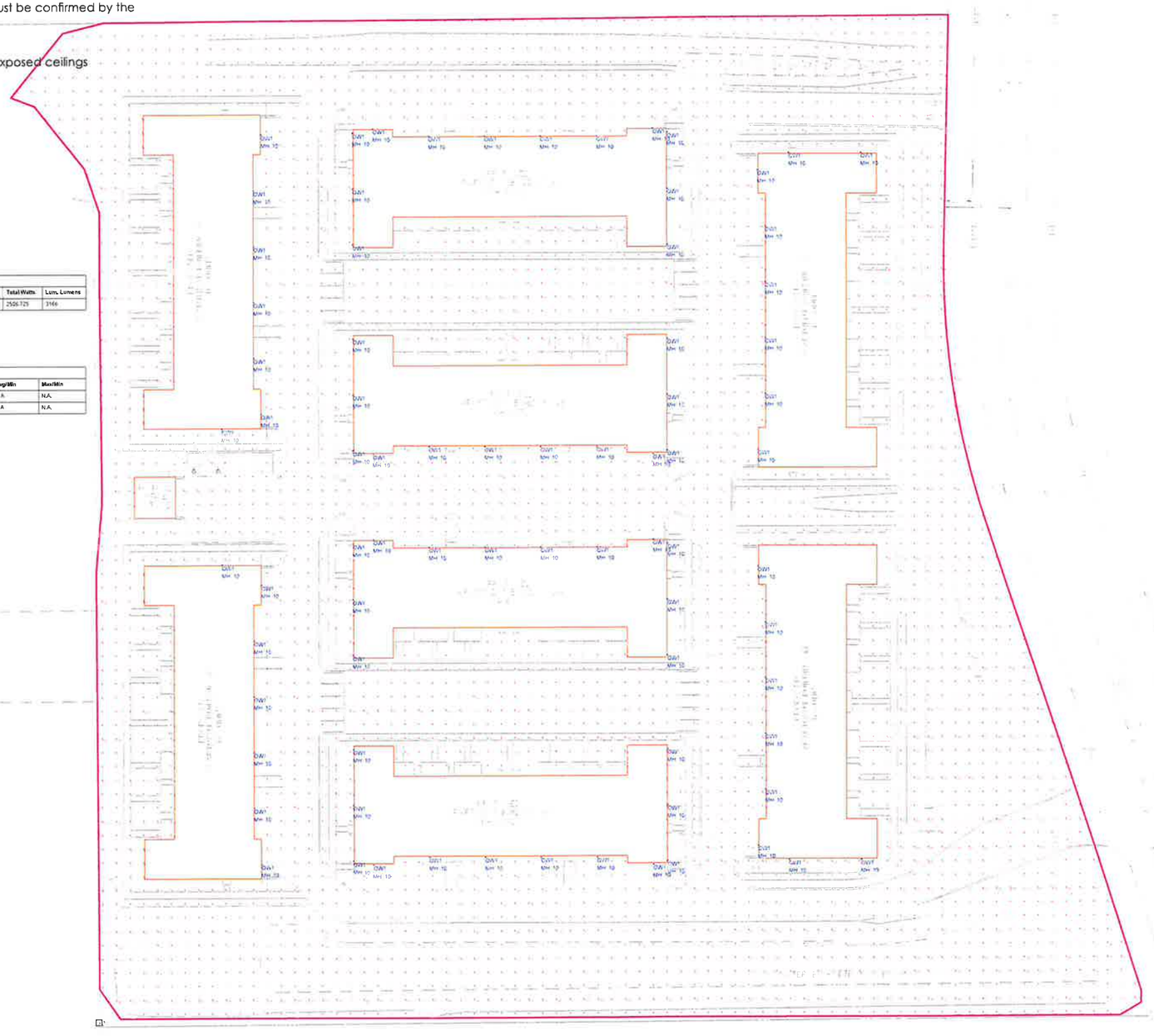
SHEET:
1 of 1

SCALE:
1" = 40'

SHEET NUMBER
L-100

NOTES:

- Customers are responsible for confirming mounting heights, fixture suspension types/ lengths, color temperature, CRI, linear fixture lengths, pole lengths, and bollard heights/ lengths prior to ordering.
- Mounting height (MH) is measured from the bottom of the fixture to the floor.
- This Lighting layout assumes the following unless values are specified and must be confirmed by the customer prior to ordering.
  - Color Temperature is 4000K
  - Room reflectance of 80, 50, 20 for standard ceilings and 50, 50, 20 for exposed ceilings
  - Wall sconces are mounted at 7 feet for calculations.



Luminaire Schedule

Qty	Label	Arrangement	LLF	MFR	Description	Lum. Watts	Total Watts	Lum. Lumens
78	CW1	SINGLE	0.950	LITHONIA	WDGE2 LED P3 40K 80CRI TFTM	32.1373	2506.725	3166

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE	Illuminance	Fc	0.54	4.4	0.00	N.A.	N.A.
PARKING + DRIVES	Illuminance	Fc	1.19	4.4	0.0	N.A	N.A.

ENTERPRISE

#	DATE	COMMENTS

REVISIONS

DRAWN BY : AD

DATE : JULY 16, 2024

SCALE : 1" = 40'- 0"

WHITEWATER MULTI-FAMILY

WHITEWATER, WI

LIGHTING LAYOUT

CJ engineering
civil design and consulting
9205 W. Center Street
Suite 214
Milwaukee, WI 53222
PH. (414) 443-1312
www.cj-engineering.com

WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN

BLUFF RIDGE DRIVE
CONCRETE
APPROXIMATE LOCATION OF 66' WIDE PRIVATE DRIVE
MANHOLE RIM = 845.53
N 89°35'53" E
736.91'
STORM WATER BIO-RETENTION BASIN
169.46'
S 01°03'23" W
CONCRETE CURB
PROPOSED APARTMENT BUILDING #6 16-UNITS
PROPOSED APARTMENT BUILDING #8 16-UNITS
PROPOSED APARTMENT BUILDING #5 16-UNITS
PROPOSED APARTMENT BUILDING #2 16-UNITS
11.06'
N 78°58'16" W
ARC = 178.38'
RAD = 130.00
CHRD BRNG = N 39°39'19" W
CHRD LNGTH = 164.71
ARC = 200.74'
RAD = 590.00'
CHRD BRNG = S 08°41'26" E
CHRD LNGTH = 199.77'
598.33'
PROPOSED OFFICE/ GARAGE
PROPOSED APARTMENT BUILDING #4 16-UNITS
PROPOSED APARTMENT BUILDING #7 16-UNITS
PROPOSED APARTMENT BUILDING #1 16-UNITS
PROPOSED APARTMENT BUILDING #3 16-UNITS
STORM WATER POND #1
S 16°58'16" E
MORAINE VIEW PARKWAY
(100' WIDE PUBLIC RIGHT OF WAY)
SITE BENCHMARK
CHISELED X ON NE HYDRANT BOLT
ELEVATION = 840.88
SUNRISE LANE
(66' WIDE PRIVATE ROAD)
N 00°22'48" W
R20.0'
R37.3'
R41.3'
TYPICAL FIRE APPARATUS DETAIL
339.61'
S 89°35'46" W
764.10'
THE SOUTH LINE OF THE SOUTHEAST 1/4 OF SECTION 2-4-15
FND 5/8" IR
0.25' E
0.20' S
GRAPHIC SCALE
1 Inch = 40 ft

CJE NO.: 2364R4
AUGUST 05, 2024

FIRE APPARATUS EXHIBIT

Submitted by Enterprise Lighting, LTD.			
Enterprise Light	**Job Name:** WHITEWATER MULTI-FAMILY	**Catalog Number:** WDGE2 LED P3 40K 80CRI TFTM MVOLT SRM DDBXD Notes:	**Type:** OW1 ELL24-131359

WDGE2 LED

Architectural Wall Sconce
Precision Refractive Optic

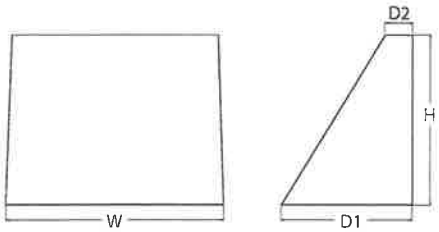
Catalog Number

Notes

Type

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight: (without options)	13.5 lbs



Introduction

The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.

WDGE2 with industry leading precision refractive optics provides great uniform distribution and optical control. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

design select

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*See ordering tree for details

WDGE LED Family Overview

Luminaire	Optics	Standard EM, 0°C	Cold EM, -20°C	Sensor	Approximate Lumens (4000K, 80CRI)						
					P0	P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--	--
WDGE2 LED	Visual Comfort	10W	18W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000	--
WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	--	7,500	8,500	10,000	12,000	--	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI T3M MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
WDGE2 LED	P0[1] P1[1] P2[2] P3[3] P4[2]	27K 2700K 30K 3000K 40K 4000K 50K 5000K AMB[3] Amber	70CRI[4] 80CRI LW[3] Limited Wavelength	T1S Type I Short T2M Type II Medium T3M Type III Medium T4M Type IV Medium TFTM Forward Throw Medium	MVOLT 347[5] 480[5]	**Shipped included** SRM Surface mounting bracket ICW Indirect Canopy/Ceiling Washer bracket (dry/damp locations only)[6] **Shipped separately** AWS 3/8inch Architectural wall spacer PBBW Surface-mounted back box (top, left, right conduit entry). Use when there is no junction box available

Options

E10WH	Emergency battery backup, Certified in CA Title 20 MAEDBS (10W, 5°C min)
E20WC	Emergency battery backup, Certified in CA Title 20 MAEDBS (18W, -20°C min)
PE[7]	Photocell, Button Type
DMG[8]	0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)
BCE	Bottom conduit entry for back box (PBBW). Total of 4 entry points
CCE	Coastal Construction

Standalone Sensors/Controls

PIR	Bi-level (100/35%) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching
PIRH	Bi-level (100/35%) motion sensor for 15-30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching
PIR1FC3V	Bi-level (100/35%) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation
PIRH1FC3V	Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation

Networked Sensors/Controls

NLTAIR2 PIR	Embedded wireless controls by nLight with Passive Infrared Occ sensor and on/off photocell for 8-15' mounting heights
NLTAIR2 PIRH	Embedded wireless controls by nLight with Passive Infrared Occ sensor and on/off photocell for 15-30' mounting heights
NLTAIREM2	Embedded wireless controls by nLight with UL924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 15-30' mounting heights

See page 4 for out of box functionality

Finish

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DSSXD	Sandstone
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white
DSSTXD	Textured sandstone

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Accessories

Ordered and shipped separately.

WDGEAWS DDBXD U	WDGE 3/8inch Architectural Wall Spacer (specify finish)
WDGE2PBBW DDBXD U	WDGE2 surface-mounted back box (specify finish)

NOTES
1. P0 option not available with sensors/controls.
2. P1-P4 not available with AMB and LW.
3. AMB and LW always go together.
4. 70CRI only available with T3M and T4M.
5. 347V and 480V not available with E10WH or E20WC.
6. Not qualified for DLC. Not available with emergency battery backup or sensors/controls
7. PE not available in 480V or with sensors/controls.
8. DMG option not available with sensors/controls.

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Dist. Type	27K (2700K, 80 CRI)					30K (3000K, 80 CRI)					40K (4000K, 80 CRI)					50K (5000K, 80 CRI)					Amber (Limited Wavelength)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P0	7W	T1S	636	92	0	0	0	666	97	0	0	0	699	101	0	0	1	691	100	0	0	1	712	47	0	0	1
		T2M	662	96	0	0	0	693	101	0	0	0	728	106	0	0	0	719	104	0	0	0	741	48	0	0	0
		T3M	662	96	0	0	0	693	101	0	0	0	728	106	0	0	0	719	104	0	0	0	741	48	0	0	0
		T4M	648	94	0	0	0	679	98	0	0	0	712	103	0	0	0	704	102	0	0	0	726	47	0	0	0
		TFTM	652	95	0	0	0	683	99	0	0	0	717	104	0	0	0	708	103	0	0	0	730	48	0	0	1
P1	11W	T1S	1,105	99	0	0	1	1,157	104	0	0	1	1,215	109	0	0	1	1,200	107	0	0	1					
		T2M	1,150	103	0	0	1	1,204	108	0	0	1	1,264	113	0	0	1	1,249	112	0	0	1					
		T3M	1,150	103	0	0	1	1,205	108	0	0	1	1,265	113	0	0	1	1,250	112	0	0	1					
		T4M	1,126	101	0	0	1	1,179	106	0	0	1	1,238	111	0	0	1	1,223	110	0	0	1					
		TFTM	1,133	101	0	0	1	1,186	106	0	0	1	1,245	112	0	0	1	1,230	110	0	0	1					
P2	19W	T1S	1,801	95	1	0	1	1,886	99	1	0	1	1,981	104	1	0	1	1,957	103	1	0	1					
		T2M	1,875	99	1	0	1	1,963	103	1	0	1	2,061	109	1	0	1	2,037	107	1	0	1					
		T3M	1,876	99	1	0	1	1,964	103	1	0	1	2,062	109	1	0	1	2,038	107	1	0	1					
		T4M	1,836	97	1	0	1	1,922	101	1	0	1	2,018	106	1	0	1	1,994	105	1	0	1					
		TFTM	1,847	97	1	0	1	1,934	102	1	0	1	2,030	107	1	0	1	2,006	106	1	0	1					
P3	32W	T1S	2,809	87	1	0	1	2,942	92	1	0	1	3,089	96	1	0	1	3,052	95	1	0	1					
		T2M	2,924	91	1	0	1	3,062	95	1	0	1	3,215	100	1	0	1	3,176	99	1	0	1					
		T3M	2,925	91	1	0	1	3,063	95	1	0	1	3,216	100	1	0	1	3,177	99	1	0	1					
		T4M	2,862	89	1	0	1	2,997	93	1	0	1	3,147	98	1	0	1	3,110	97	1	0	1					
		TFTM	2,880	90	1	0	1	3,015	94	1	0	1	3,166	99	1	0	1	3,128	97	1	0	1					
P4	47W	T1S	3,729	80	1	0	1	3,904	84	1	0	1	4,099	88	1	0	1	4,051	87	1	0	1					
		T2M	3,881	83	1	0	1	4,063	87	1	0	1	4,267	91	1	0	1	4,216	90	1	0	1					
		T3M	3,882	83	1	0	1	4,065	87	1	0	1	4,268	91	1	0	1	4,217	90	1	0	1					
		T4M	3,799	81	1	0	1	3,978	85	1	0	1	4,177	90	1	0	1	4,127	88	1	0	1					
		TFTM	3,822	82	1	0	1	4,002	86	1	0	1	4,202	90	1	0	1	4,152	89	1	0	1					

Performance Package	System Watts	Dist. Type	27K (2700K, 70 CRI)					30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P0	7W	T3M	737	107	0	0	0	763	111	0	0	0	822	119	0	0	0	832	121	0	0	1
		T4M	721	105	0	0	0	746	108	0	0	0	804	117	0	0	1	814	118	0	0	1
P1	11W	T3M	1,280	115	0	0	1	1,325	119	0	0	1	1,427	128	1	0	1	1,445	129	1	0	1
		T4M	1,253	112	0	0	1	1,297	116	0	0	1	1,397	125	0	0	1	1,415	127	0	0	1
P2	19W	T3M	2,087	110	1	0	1	2,160	114	1	0	1	2,327	123	1	0	1	2,357	124	1	0	1
		T4M	2,042	108	1	0	1	2,114	111	1	0	1	2,278	120	1	0	1	2,306	121	1	0	1
P3	32W	T3M	3,254	101	1	0	1	3,369	105	1	0	1	3,629	113	1	0	1	3,675	114	1	0	1
		T4M	3,185	99	1	0	1	3,297	103	1	0	1	3,552	111	1	0	1	3,597	112	1	0	1
P4	47W	T3M	4,319	93	1	0	1	4,471	96	1	0	1	4,817	103	1	0	2	4,878	105	1	0	2
		T4M	4,227	91	1	0	1	4,376	94	1	0	2	4,714	101	1	0	2	4,774	102	1	0	2

Electrical Load

Performance Package	System Watts	Current (A)					
		120Vac	208Vac	240Vac	277Vac	347Vac	480Vac
P0	7.0	0.061	0.042	0.04	0.039	--	--
	9.0	--	--	--	--	0.031	0.021
P1	11.0	0.100	0.064	0.059	0.054	--	--
	14.1	--	--	--	--	0.046	0.031
P2	19.0	0.168	0.106	0.095	0.083	--	--
	22.8	--	--	--	--	0.067	0.050
P3	32.0	0.284	0.163	0.144	0.131	--	--
	37.1	--	--	--	--	0.107	0.079
P4	47.0	0.412	0.234	0.207	0.185	--	--
	53.5	--	--	--	--	0.153	0.112

Lumen Output in Emergency Mode (4000K, 80 CRI, T3M)

Option	Lumens
E10WH	1,358
E20WC	2,230

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.97

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.96	>0.93	>0.87

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WDGE LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.

LEGEND

0.25 fc

0.5 fc

1.0 fc

3.0 fc

MH = 10ft

Grid = 10ft x 10ft

"P3 40K 80CRI T1S" "P3 40K 80CRI T2M" "P3 40K 80CRI T3M" "P3 40K 80CRI T4M" "P3 40K 80CRI TFTM"

Emergency Egress Options

Emergency Battery Backup

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency battery backup configurations include an independent secondary driver with an integral relay to immediately detect loss of normal power and automatically energize the luminaire. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time normal power is lost and maintain a minimum of 60% of the light output at the end of 90minutes.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9

Control / Sensor Options

Motion/Ambient Sensor (PIR_, PIRH_)

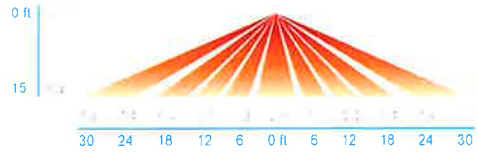
Motion/Ambeint sensor (Sensor Switch MSOD) is integrated into the the luminaire. The sensor provides both Motion and Daylight based dimming of the luminaire. For motion detection, the sensor utilizes 100% Digital Passive Infrared (PIR) technology that is tuned for walking size motion while preventing false tripping from the environment. The integrated photocell enables additional energy savings during daytime periods when there is sufficient daylight. Optimize sensor coverage by either selecting PIR or PIRH option. PIR option comes with a sensor lens that is optimized to provide maximum coverage for mounting heights between 8-15ft, while PIRH is optimized for 15-40ft mounting height.

Networked Control (NLTAIR2)

nLight® AIR is a wireless lighting controls platform that allows for seamless integration of both indoor and outdoor luminaires. Five-tier security architecture, 900 MHz wireless communication and app (CLAIRITY™ Pro) based configurability combined together make nLight® AIR a secure, reliable and easy to use platform.

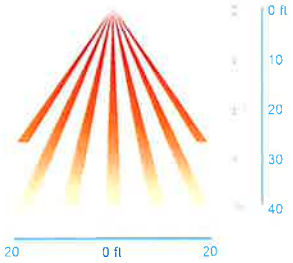
PIR

HIGH VIEW

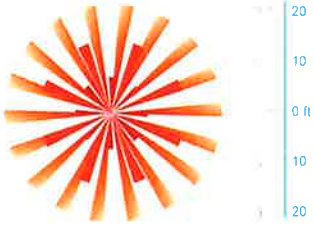


PIRH

SIDE VIEW



TOP VIEW



Option	Dim Level	High Level (when triggered	Photocell Operation	Motion Time Delay	Ramp-down Time	Ramp-up Time
PIR or PIRH	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
PIR1FC3V, PIRH1FC3V	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 1fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
NLTAIR2 PIR, NLTAIR2 PIRH (out of box)	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	7.5 min	5 min	Motion - 3 sec Photocell - 45 sec

Mounting, Options & Accessories

Motion/Ambient Sensor

D = 7"
H = 9" (Standalone controls)
11" (nLight AIR controls, 2" antenna will be pointing down behind the sensor)
W = 11.5"

PBBW – Surface-Mounted Back Box
Use when there is no junction box available.

D = 1.75"
H = 9"
W = 11.5"

AWS – 3/8inch Architectural Wall Spacer

D = 0.38"
H = 4.4"
W = 7.5"

FEATURES & SPECIFICATIONS

INTENDED USE
Common architectural look, with clean rectilinear shape, of the WDGE LED was designed to blend with any type of construction, whether it be tilt-up, frame or brick. Applications include commercial offices, warehouses, hospitals, schools, malls, restaurants, and other commercial buildings

CONSTRUCTION
The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP66 rating for the luminaire.

FINISH
Exterior painted parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes

OPTICS
Individually formed acrylic lenses are engineered for superior application efficiency which maximizes the light in the areas where it is most needed. The WDGE LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L91/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire comes with built in 6kV surge protection, which meets a minimum Category C low exposure (per ANSI/IEEE C62.41.2). Fixture ships standard with 0-10v dimmable driver.

INSTALLATION
A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The 3/8" Architectural Wall Spacer (AWS) can be used to create a floating appearance or to accommodate small imperfections in the wall surface. The ICW option can be used to mount the luminaire inverted for indirect lighting in dry and damp locations. Design can withstand up to a 1.5 G vibration load rating per ANSI C136.31.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP66 rated. PIR options are rated for wet location. Rated for -40°C minimum ambient. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified. International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 2700K and 3000K color temperature only and SRM mounting only.

GOVERNMENT PROCUREMENT
BABA – Build America Buy America: Product qualifies as produced in the United States under the definitions of the Build America, Buy America Act.
Please refer to www.acuitybrands.com/buyamerican for additional information.

WARRANTY
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:
www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

CJ engineering
civil design and consulting

STORM WATER MANAGEMENT PLAN

FOR

Whitewater Multi-Family Development

Moraine View Parkway
Whitewater, Wisconsin

July 10th, 2024

PREPARED BY:
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CJE Job No.: 2364R0-SWMP

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Narrative:

The Whitewater Multi-Family Development is a project which is proposing the development of an existing vacant parcel of land which is located along Moraine Parkway in Whitewater, Wisconsin. The proposed development will consist of 8 uniform multi-family apartment buildings as well as the construction of a facilities office and 33 onsite parking stalls. The development will also include access drive aisles and concrete pedestrian walkways throughout the property. Said walks and drives will provide access to the proposed multi-family apartment buildings.

The existing site predominantly drains from west to east and in which the site runoff is discharged to the existing storm sewer system located in Morain Parkway. The remaining portion of the site which is not captured in the storm sewer system drains to the neighboring properties to the northwest. The proposed development will maintain the existing drainage pattern of the undeveloped site while also capturing additional areas which are not currently captured in the storm sewer system in Morain parkway. The proposed development will increase the impervious area by 262,243 s.f. (6.020 acres) and will disturb approximately 11.086 acres. This value exceeds the one-acre threshold which requires the development to meet the City of whitewater's storm water ordinance for water quantity and quality. In order to meet the storm water management requirement of NR 151 and the City of Whitewater storm water ordinance, the development must not exceed the existing developments peak runoff rate during the 1,2,5,10,25 and 100 year storm events and provide a 80% reduction of total suspended solids (TSS). For the purpose of meeting both of these requirements, the development is proposing to implement three storm water basins throughout the site. There will be two bio-retention basins and one wet pond. The bio-retention basins will be located on the north and south sides of the property and the wet pond on the east side. The south bio-retention basin and the east wet pond will collect the majority of the runoff from the proposed buildings, walks and drives through a combination of storm sewer conveyance systems, grassed swales and sheet draining directly to said basins. The north bio retention will collect a portion of the stormwater runoff from the north situated buildings, walks and drives. This runoff will sheet predominantly sheet drain to the basin while a small portion of the southwest building #6 will be collected and routed using a downspout connector pipe system. The runoff that is collected in the basins will then discharge through multistage outlet structures to the existing storm sewer system on the east side of the property, maintaining the existing draining pattern. Any runoff not captured by the proposed stormwater basins has been accounted for and analyzed as undetained area in the modeling.

This development has been designed to meet to the storm water management requirements of NR 151 and the City of Whitewater which utilizes the NOAA Atlas 14 rainfall values and the MSE3 distribution for Walworth County as recommended by WI DNR and SEWRPC.

Existing Site:

Soil Types:
BpB – Boyer Complex: HSG A
DdA – Dodge Silt Loam: HSG C
KiA – Kendall Silt Loam: HSG B/D
KwB - Knowles Silt Loam: HSG C
MpB- McHenry Silt Loam: HSG B

Per USDA NRCS Web Soil Survey Viewer – Walworth County, WI

Cover & CN: CN 74, >75% Grass, Good, HSG C

Area: Total Analyzed Area: 494,707 s.f. (11.357 acres)

Developed Site: (See the Proposed Conditions Plan).

Cover & CN:
CN 74, >75% Grass, Good, HSG C
CN 98, Paved Parking, HSG C
CN 98, Roofs, HSG C
CN 98, Water Surface, HSG C

Area: Total Analyzed Area: 494,707 s.f. (11.357 acres)

24-Hour Rainfall Values:

1-Year: 2.46"
2-Year: 2.80"
5-Year: 3.42"
10-Year: 3.97"
25-Year: 4.80"
100-Year: 6.55"

All rainfall data is for 24-hour duration per the NOAA Atlas 14 rainfall values and the MSE3 distribution for Walworth County as recommended by WI DNR and SEWRPC.

Method of Analysis:

The storm water runoff quantity was calculated using the methods outlines in TR-55 ("Urban Hydrology for Small Watersheds" by the U.S. Department of Agriculture's Soil Conservation Services). Calculations were performed with the "HydroCAD 10.0" computer software.

City of Whitewater and WDNR NR151 runoff control requirements:

Whitewater: By Design, BMP's Shall be employed to maintain or reduce the peak runoff discharge rates, to the maximum extent practicable, as compared to pre-development conditions for the 2 though 100-year design storm applicable to the development site.

NR 151.123(1): By design, BMPs shall be employed to maintain or reduce the 1-year, 24-hour and the 2-year, 24-hour post-construction peak runoff discharge rates to the 1-year, 24-hour and the 2-year, 24-hour pre-development peak runoff discharge rates respectively, or to the maximum extent practicable.

Drainage Summary: (See Summary of Calculations in Appendix)

Area	1 Year Storm	2 Year Storm	5 Year Storm	10 Year Storm	25 Year Storm	100 Year Storm
Existing Conditions	8.08 cfs	11.25 cfs	17.63 cfs	23.94 cfs	33.88 cfs	56.20 cfs
Proposed Conditions						
Subcatchment 1: Area to Bioretention Basin #1	11.90 cfs	14.40 cfs	19.04 cfs	23.18 cfs	29.44 cfs	42.58 cfs
Basin #1: South Bio-Retention basin Discharge	0.04 cfs	0.08 cfs	0.16 cfs	0.22 cfs	0.33 cfs	0.54 cfs
Subcatchment 2: Area to Stormwater Pond #2	8.04 cfs	9.74 cfs	12.88 cfs	15.68 cfs	19.91 cfs	28.79 cfs
Basin #2: East Stormwater Pond Discharge	0.11 cfs	0.12 cfs	0.14 cfs	0.15 cfs	0.17 cfs	2.88 cfs
Subcatchment 3: Area to Bioretention Basin #3	3.58 cfs	4.34 cfs	5.74 cfs	6.99 cfs	8.87 cfs	12.83 cfs
Basin #3: North Bio-Retention basin Discharge	0.84 cfs	0.89 cfs	1.01 cfs	1.19 cfs	1.35 cfs	4.08 cfs
Subcatchment 4: Undetained Area	2.41 cfs	3.10 cfs	4.43 cfs	5.66 cfs	7.58 cfs	11.72 cfs
Proposed Total Runoff	**3.26 cfs**	**4.00 cfs**	**5.41 cfs**	**6.69 cfs**	**8.87 cfs**	**13.28 cfs**
Allowable Runoff	**8.08 cfs**	**11.25 cfs**	**17.63 cfs**	**23.94 cfs**	**33.88 cfs**	**56.20 cfs**

Water Quality:

Based on the proposed construction of the wet pond and grass filter strips, the site meets the City of Whitewater and WDNR requirements for water quality for redevelopment by removing over 80% of the total suspended solids (TSS) prior to discharge off site, as quantified using WinSLAMM for Windows version 10.2.0 (See appendix for inputs and calculation results). The TSS from the site development analysis is summarized below:

	Before Drainage System	After Controls	% Reduction
Total site	3079 lbs.	523.1 lbs.	83.01 %

Infiltration Exemption:

Per the USDA Natural Resources Conservation Service, Web Soil Survey, the site area consists primarily of silty clay loam and silty loam which are classified as soils with an infiltration rate less than 0.6 inches per hour. Based on NR 151.124(4)(c)1, the site is exempt from storm water infiltration requirements.

Conclusion:

The design and implementation of a new storm water wet pond and reduction of impervious surface allow the redeveloped site to meet and exceed the design requirements for storm water quantity and quality per City of Whitewater and WI DNR regulations. Therefore, the proposed development meets the storm water management water quantity and quality requirements for the City of Whitewater storm water ordinance and WDNR 151.

APPENDIX A

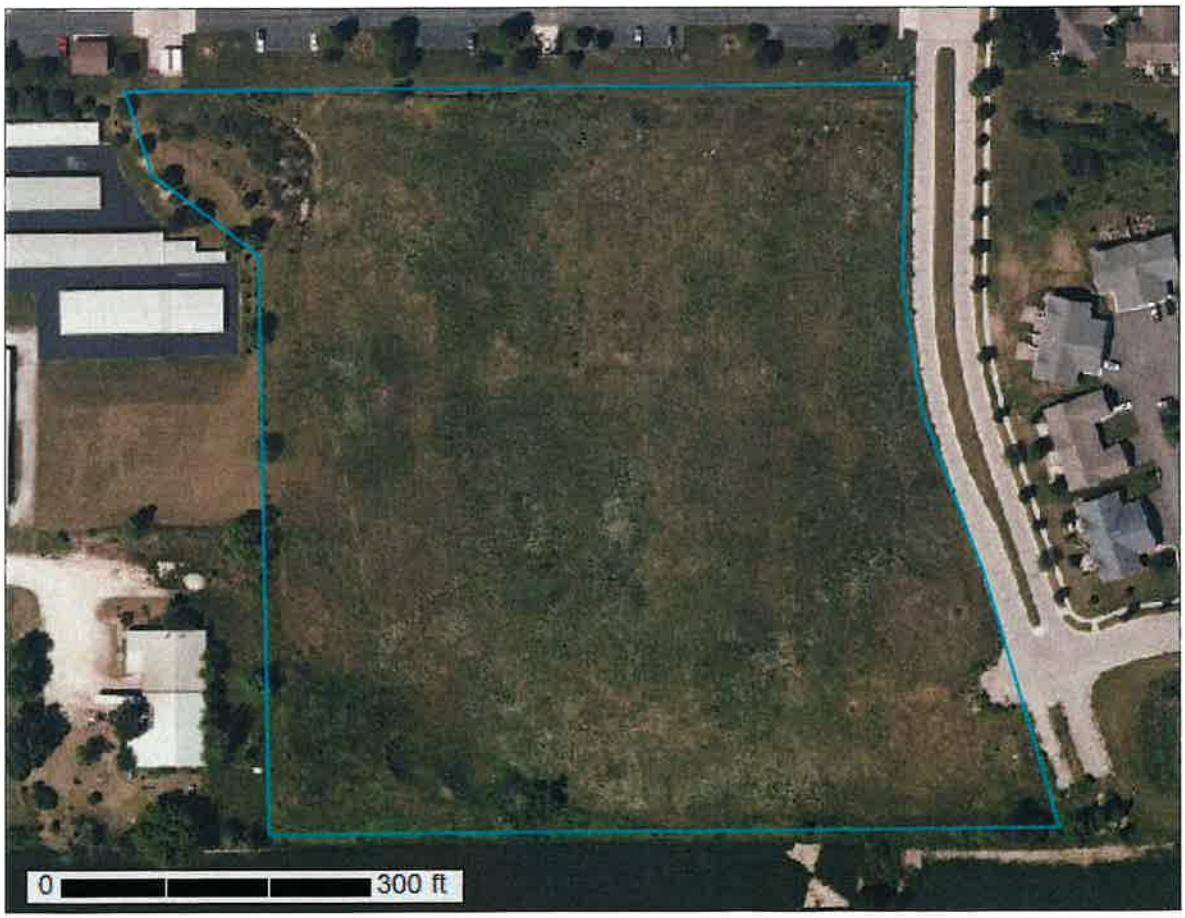
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Walworth County, Wisconsin



May 28, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,860 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Walworth County, Wisconsin
Survey Area Data: Version 20, Sep 8, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 30, 2022—Aug 18, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BpB	Boyer complex, 2 to 6 percent slopes	2.3	19.8%
DdA	Dodge silt loam, 0 to 2 percent slopes	2.0	17.5%
KlA	Kendall silt loam, 1 to 3 percent slopes	0.7	6.2%
KwB	Knowles silt loam, 2 to 6 percent slopes	5.8	51.2%
MpB	McHenry silt loam, 2 to 6 percent slopes	0.6	5.2%
Totals for Area of Interest		**11.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Walworth County, Wisconsin

BpB—Boyer complex, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: g8vv
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 38 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Boyer and similar soils: 65 percent
Boyer and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Outwash plains, stream terraces
Parent material: Sandy and loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 7 inches: loamy sand
BE,Bt - 7 to 26 inches: sandy loam
BC,2C - 26 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 60 to 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F095XB007WI - Loamy Upland with Carbonates
Forage suitability group: Low AWC, adequately drained (G095BY002WI)
Other vegetative classification: Low AWC, adequately drained (G095BY002WI)
Hydric soil rating: No

Description of Boyer

Setting

Landform: Stream terraces, outwash plains
Parent material: Sandy and loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 7 inches: sandy loam
BE,Bt - 7 to 26 inches: sandy loam
BC,2C - 26 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 60 to 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F095XB007WI - Loamy Upland with Carbonates
Forage suitability group: Low AWC, adequately drained (G095BY002WI)
Other vegetative classification: Low AWC, adequately drained (G095BY002WI)
Hydric soil rating: No

DdA—Dodge silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2szfn
Elevation: 890 to 1,200 feet
Mean annual precipitation: 31 to 35 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dodge and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dodge

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Loess over calcareous loamy till

Typical profile

Ap - 0 to 7 inches: silt loam
BE - 7 to 17 inches: silt loam
Bt1 - 17 to 29 inches: silty clay loam
2Bt2 - 29 to 35 inches: clay loam
2C - 35 to 79 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F095XB007WI - Loamy Upland with Carbonates
Forage suitability group: High AWC, adequately drained (G095BY008WI)
Other vegetative classification: High AWC, adequately drained (G095BY008WI)
Hydric soil rating: No

Minor Components

St. charles

Percent of map unit: 7 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

Mayville

Percent of map unit: 4 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

Lamartine

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Hydric soil rating: No

KIA—Kendall silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: g8x2
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 38 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kendall and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendall

Setting

Landform: Drainageways
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loess over stratified loamy outwash

Typical profile

A,E,BE - 0 to 12 inches: silt loam
Bt,Btg - 12 to 26 inches: silty clay loam
BCg,2BC,2C - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Forage suitability group: High AWC, high water table (G095BY007WI)
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: No

Minor Components

Pella

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

St. charles

Percent of map unit: 2 percent
Landform: Rises
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

KwB—Knowles silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wsry
Elevation: 640 to 1,180 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 124 to 181 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Knowles and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Knowles

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loess over loamy till over dolomite

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 12 inches: silt loam
Bt1 - 12 to 29 inches: silty clay loam
2Bt2 - 29 to 39 inches: clay loam
3R - 39 to 79 inches: bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 33 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F095XB006WI - Shallow Upland
Forage suitability group: Mod AWC, adequately drained (G095BY005WI)
Other vegetative classification: Mod AWC, adequately drained (G095BY005WI)
Hydric soil rating: No

Minor Components

Dodge

Percent of map unit: 4 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB007WI - Loamy Upland with Carbonates
Other vegetative classification: High AWC, adequately drained (G095BY008WI)
Hydric soil rating: No

Lamartine

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: No

Ritchey

Percent of map unit: 3 percent
Landform: Ground moraines

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB006WI - Shallow Upland
Hydric soil rating: No

MpB—McHenry silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2tjyr
Elevation: 820 to 1,490 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 126 to 181 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Mchenry and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mchenry

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 5 inches: silt loam
E - 5 to 10 inches: silt loam
Bt1 - 10 to 22 inches: silty clay loam
2Bt2 - 22 to 32 inches: loam
2Bt3 - 32 to 37 inches: fine sandy loam
2C - 37 to 79 inches: gravelly sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F095XB010WI - Loamy and Clayey Upland
Forage suitability group: High AWC, adequately drained (G095BY008WI)
Other vegetative classification: High AWC, adequately drained (G095BY008WI)
Hydric soil rating: No

Minor Components

Dodge, eroded

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F095XB007WI - Loamy Upland with Carbonates
Hydric soil rating: No

Elburn

Percent of map unit: 3 percent
Landform: Drainageways
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F095XB002WI - Wet Floodplain
Hydric soil rating: No

Fox

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

References

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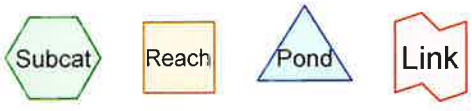
EXISITNG CONDITIONS



Routing Diagram for CJE2364R0
Prepared by {enter your company name here}, Printed 7/10/2024

Summary for Subcatchment ES: EXISITNG CONDITIONS

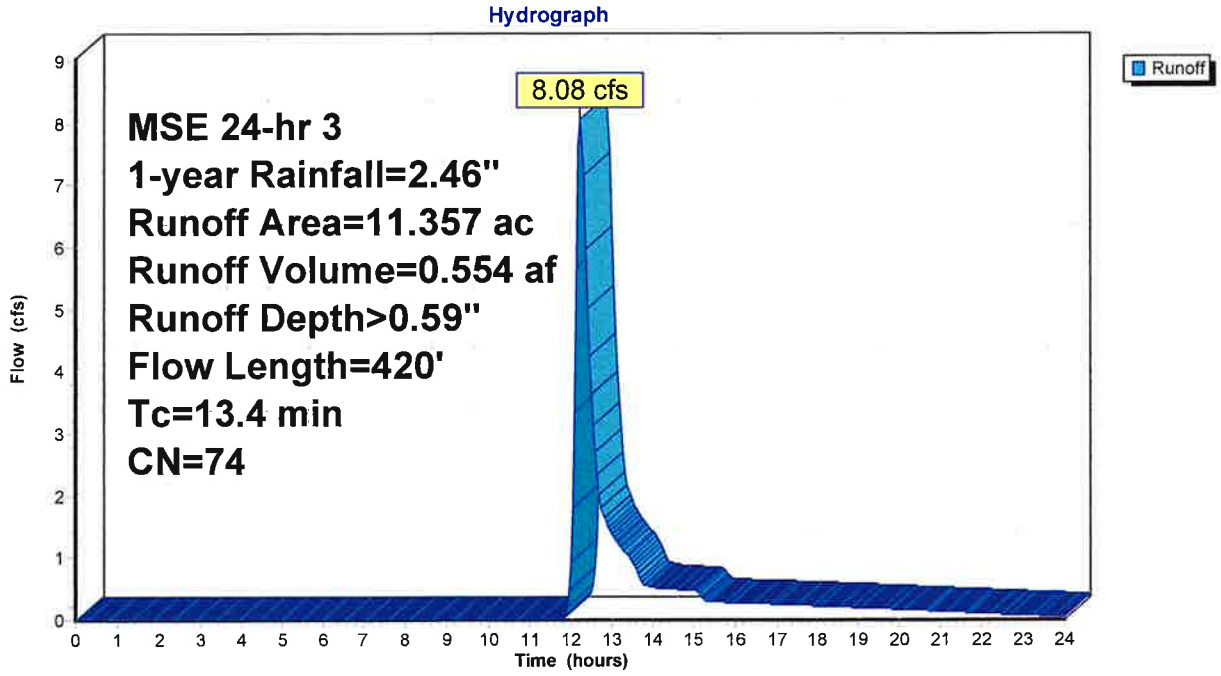
Runoff = 8.08 cfs @ 12.24 hrs, Volume= 0.554 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-year Rainfall=2.46"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS



Summary for Subcatchment ES: EXISITNG CONDITIONS

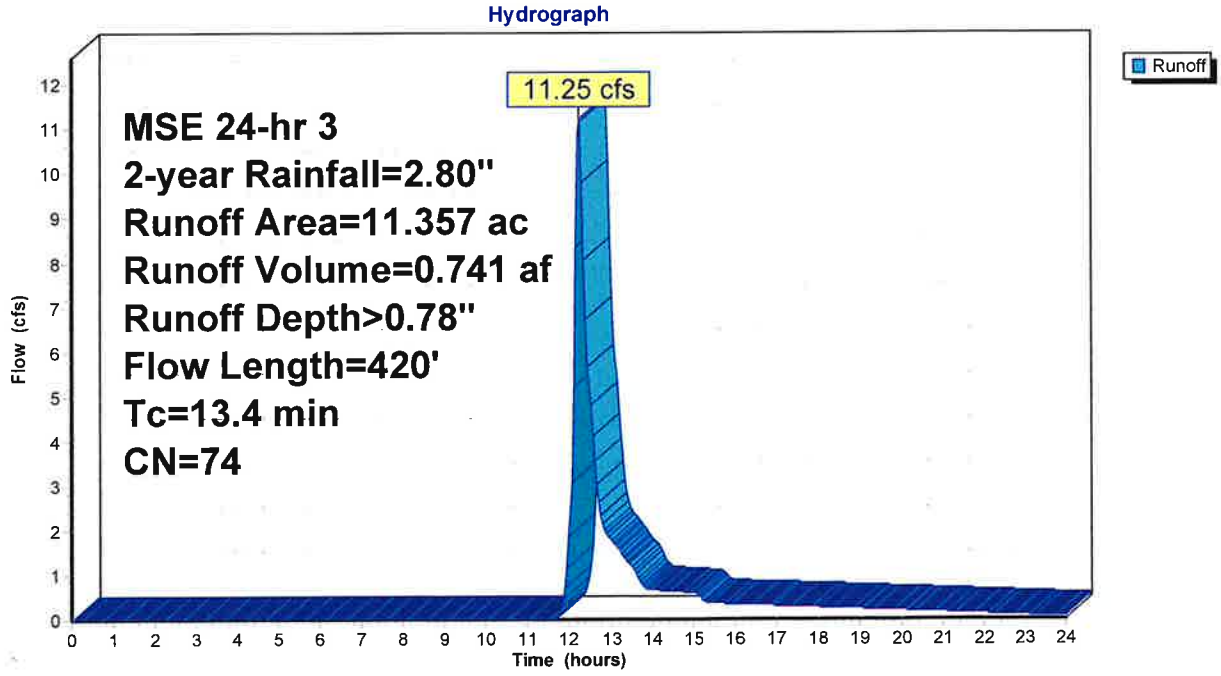
Runoff = 11.25 cfs @ 12.23 hrs, Volume= 0.741 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.80"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS



Summary for Subcatchment ES: EXISITNG CONDITIONS

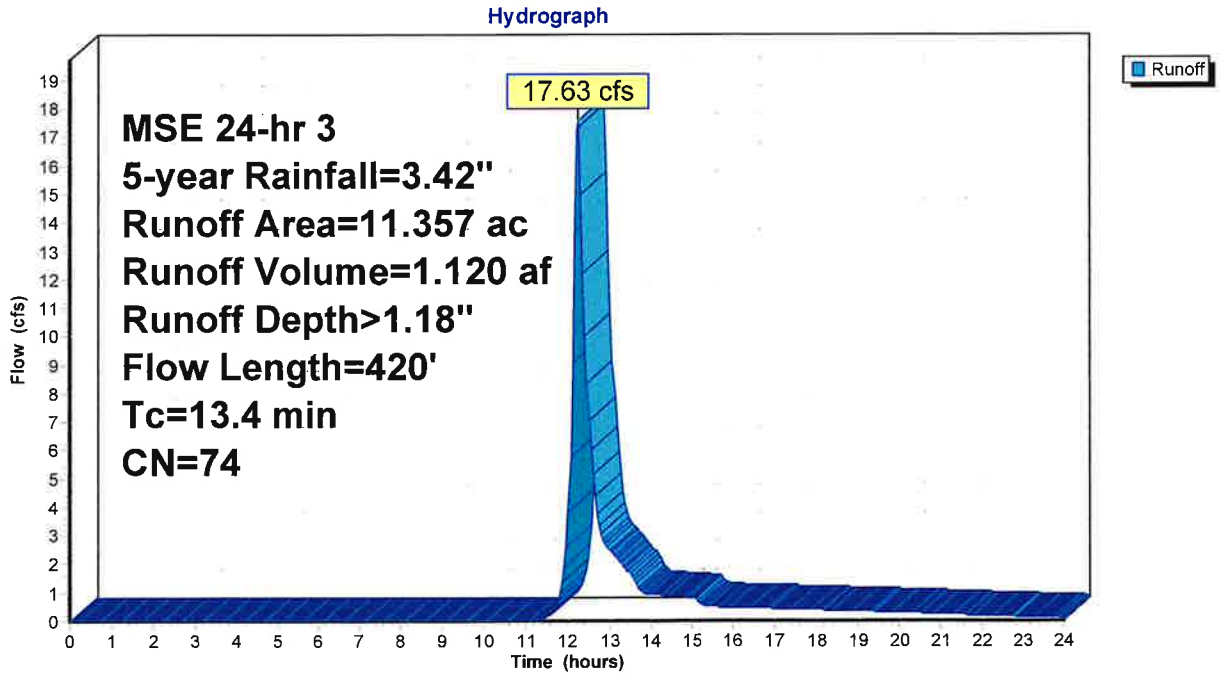
Runoff = 17.63 cfs @ 12.23 hrs, Volume= 1.120 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-year Rainfall=3.42"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS



Summary for Subcatchment ES: EXISITNG CONDITIONS

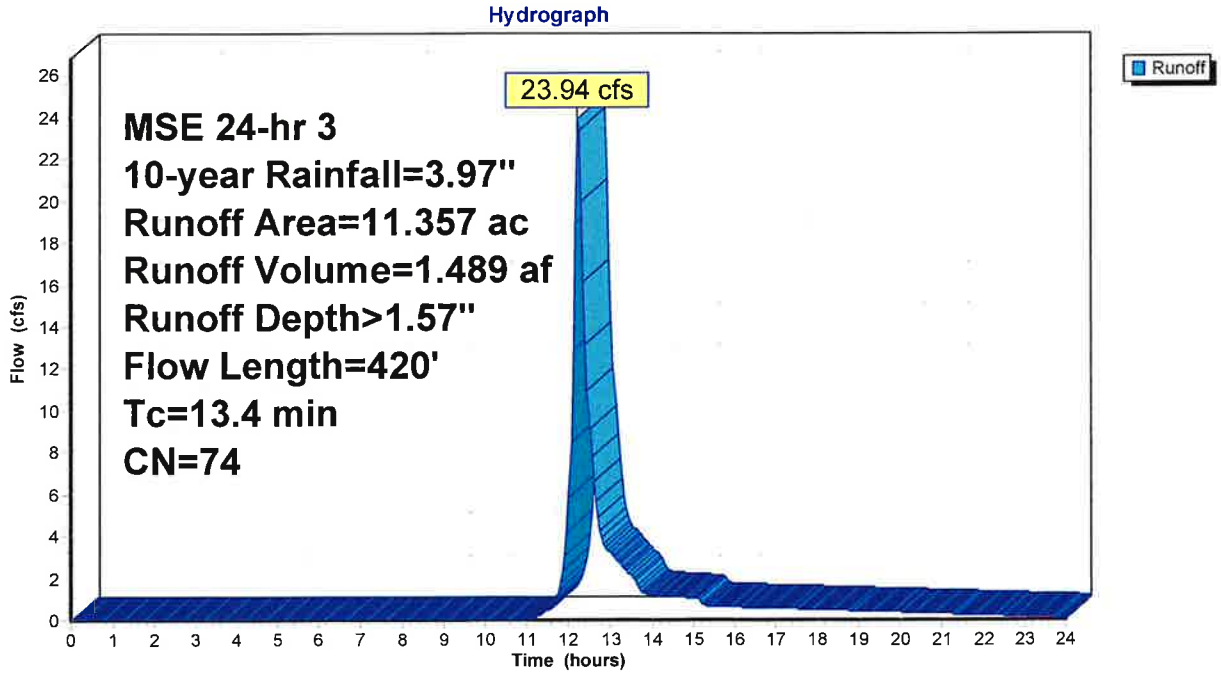
Runoff = 23.94 cfs @ 12.22 hrs, Volume= 1.489 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.97"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS



Summary for Subcatchment ES: EXISITNG CONDITIONS

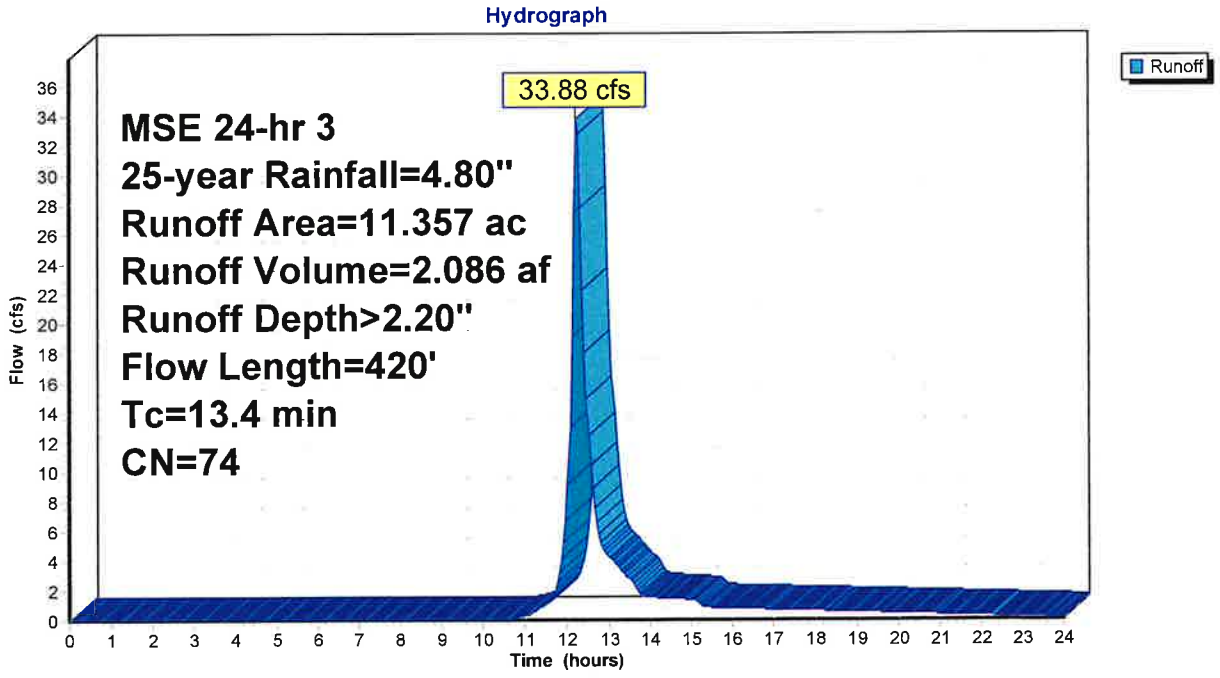
Runoff = 33.88 cfs @ 12.22 hrs, Volume= 2.086 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-year Rainfall=4.80"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS



Summary for Subcatchment ES: EXISITNG CONDITIONS

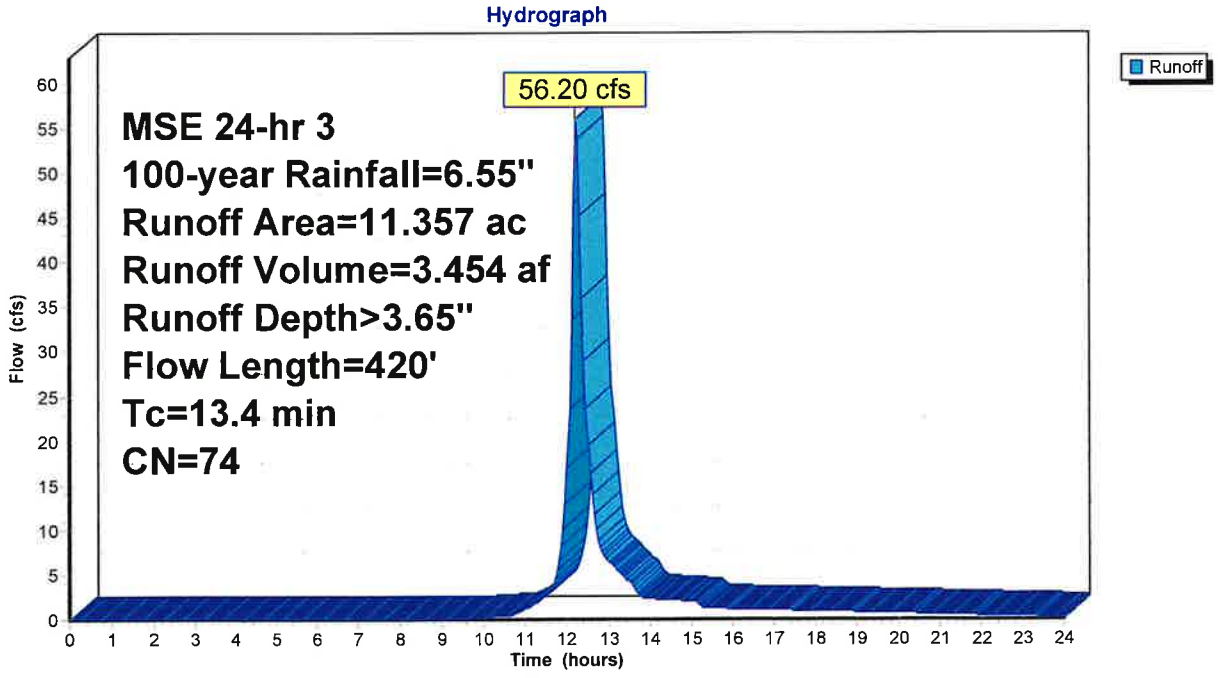
Runoff = 56.20 cfs @ 12.22 hrs, Volume= 3.454 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.55"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS



Summary for Subcatchment ES: EXISITNG CONDITIONS

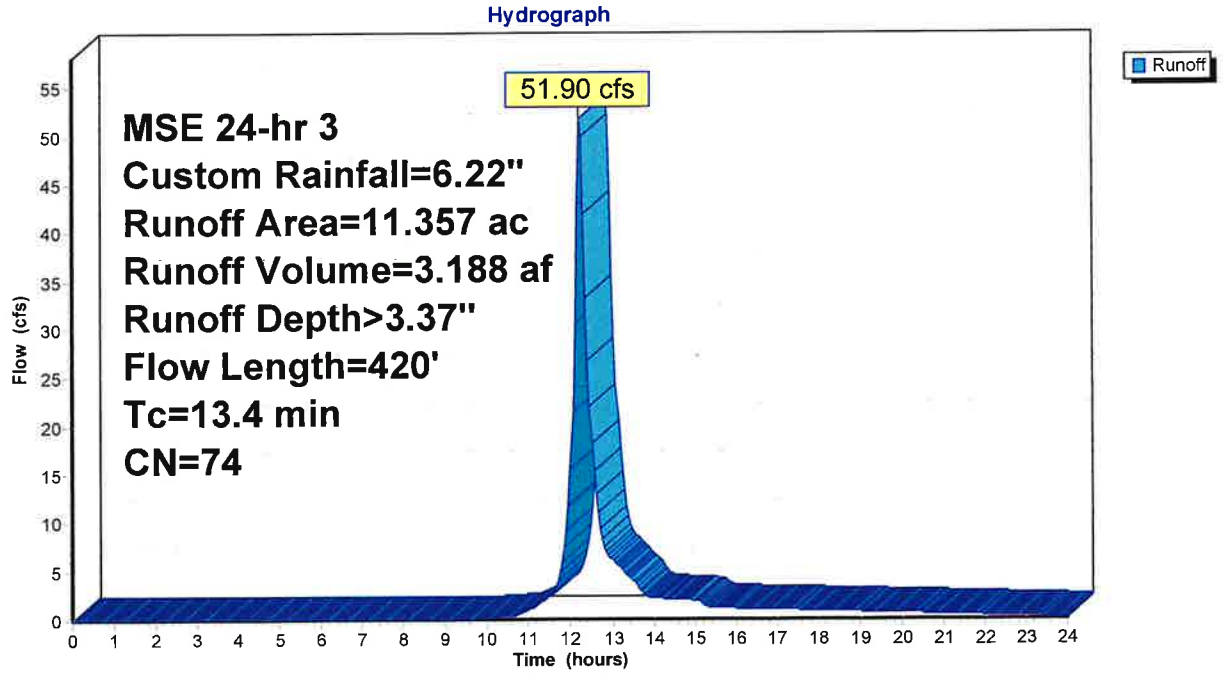
Runoff = 51.90 cfs @ 12.22 hrs, Volume= 3.188 af, Depth> 3.37"

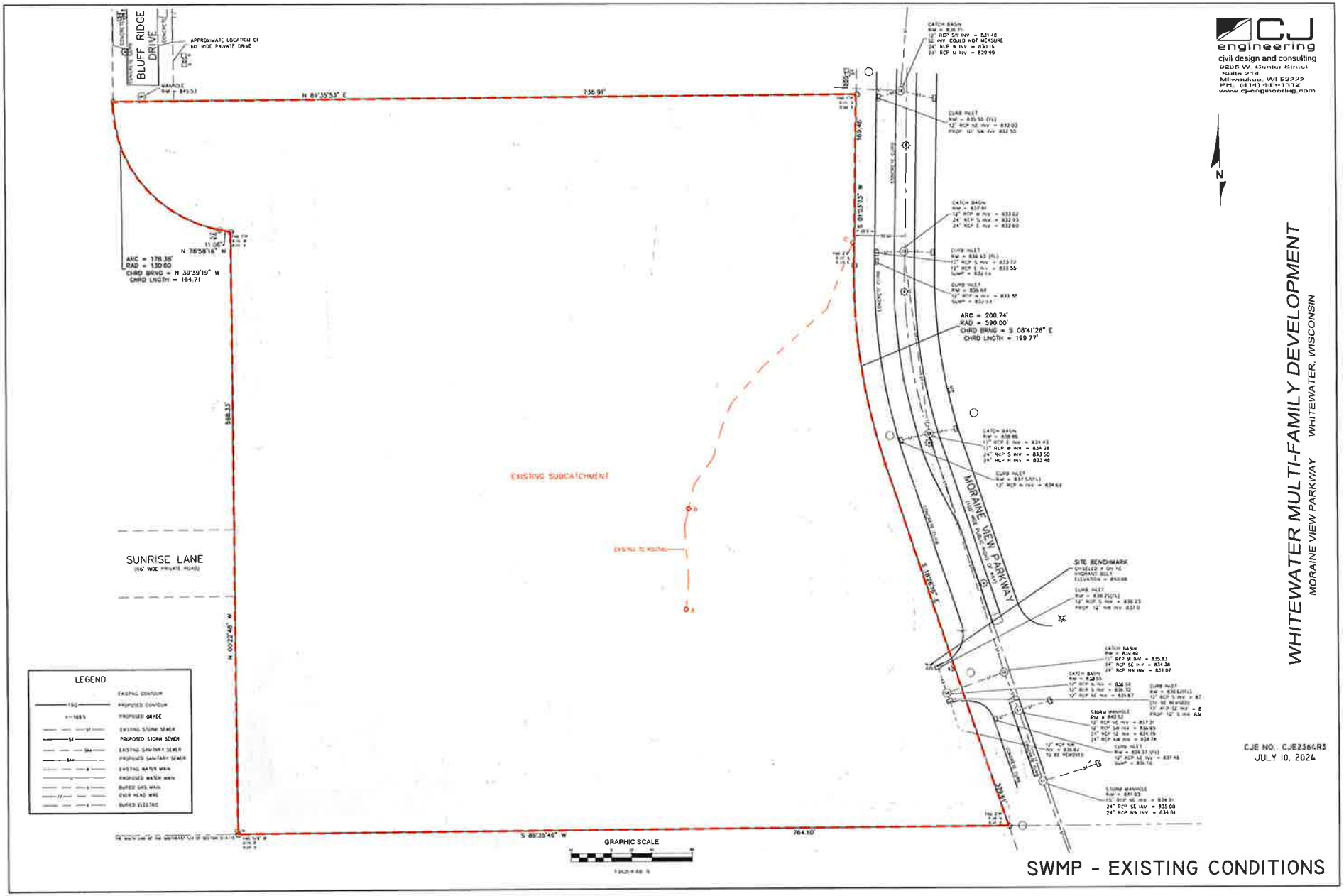
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=6.22"

Area (ac)	CN	Description
11.357	74	>75% Grass cover, Good, HSG C
11.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70"
2.7	320	0.0156	2.01		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
13.4	420	Total			

Subcatchment ES: EXISITNG CONDITIONS





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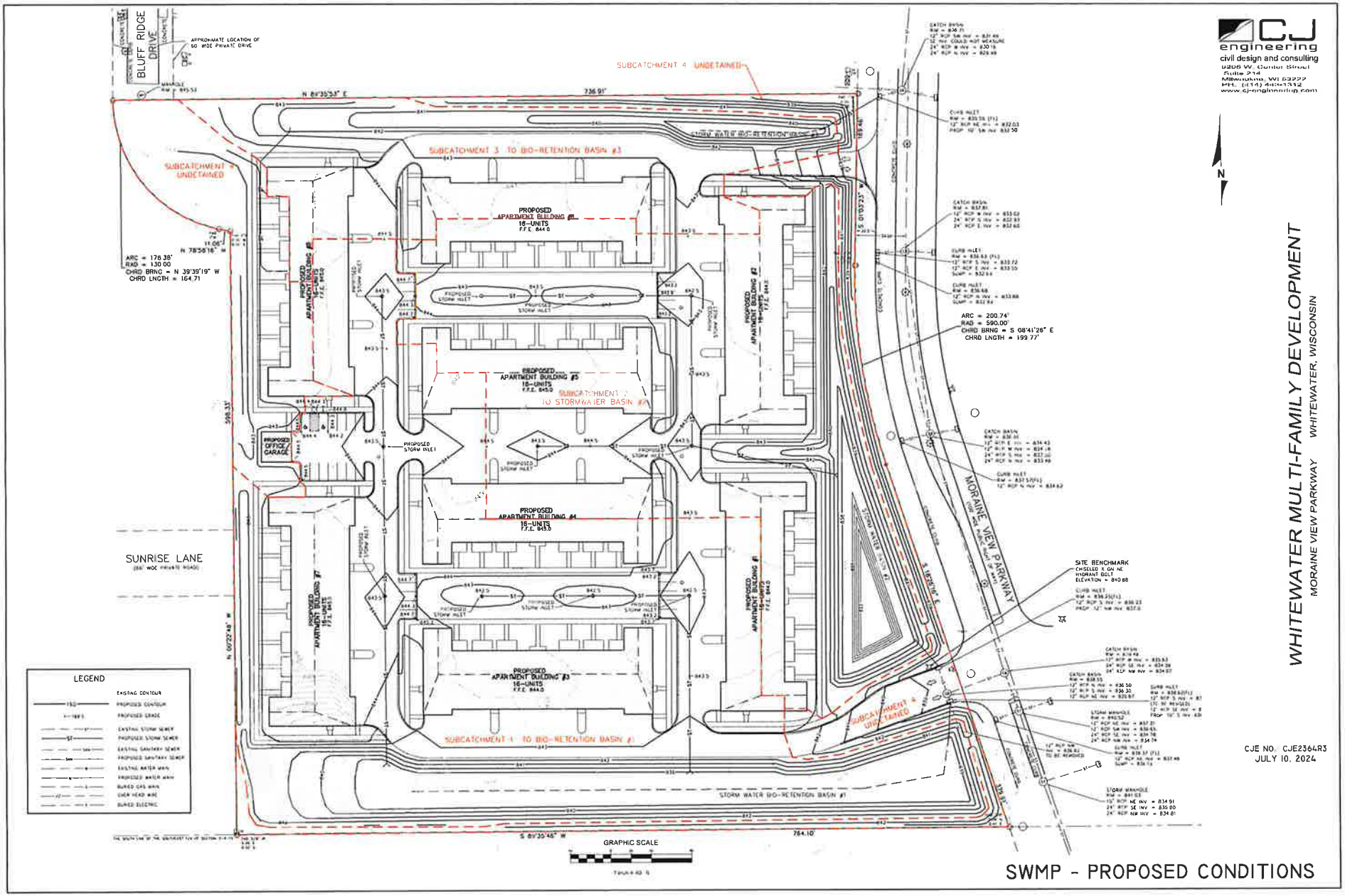
WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN

CJE NO.: CJE2364R3
JULY 10, 2024

SWMP - EXISTING CONDITIONS

APPENDIX B



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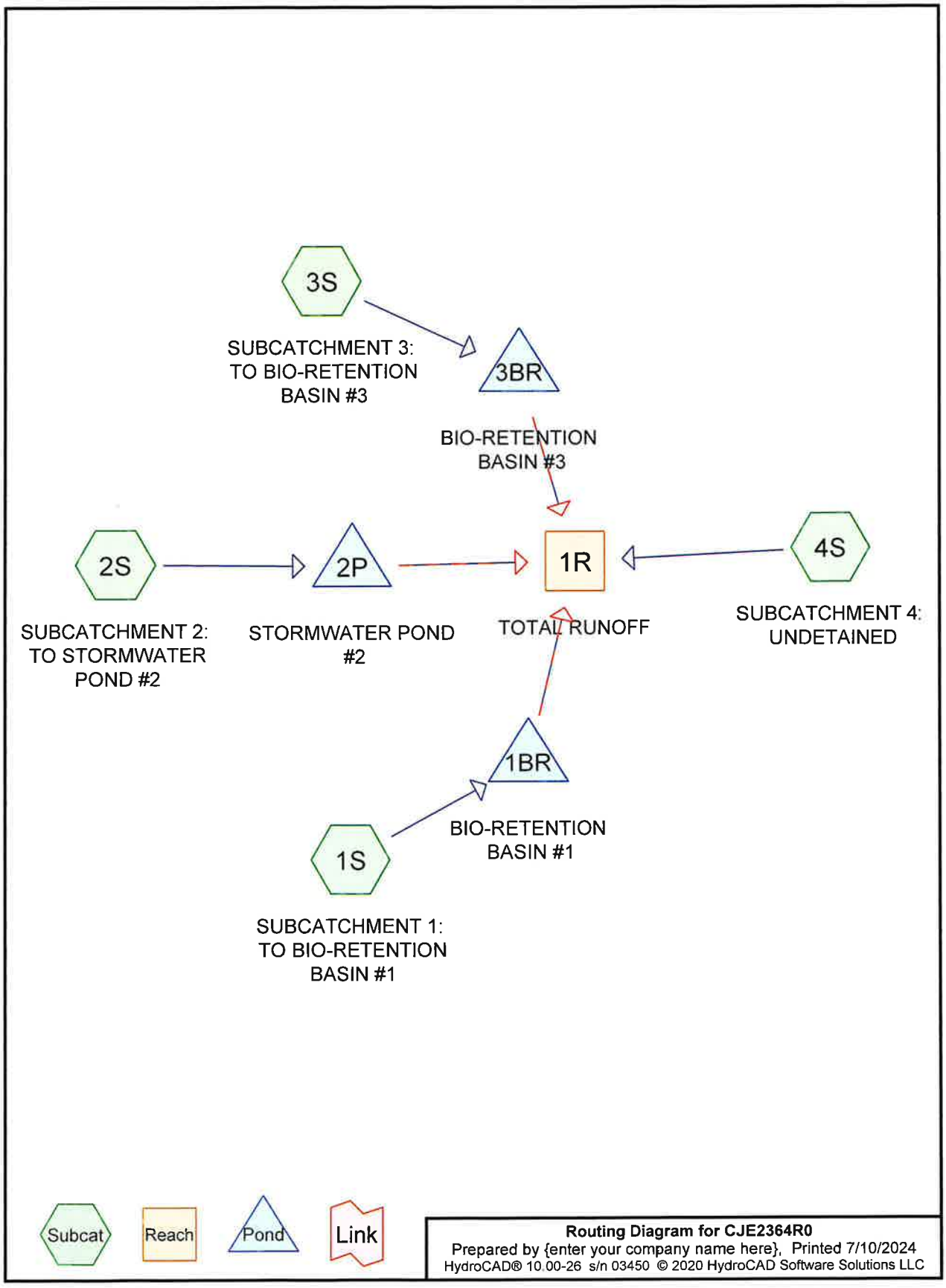
WHITEWATER MULTI-FAMILY DEVELOPMENT

MORAINE VIEW PARKWAY WHITEWATER, WISCONSIN

CJE NO. CJE2364R3
JULY 10, 2024

SWMP - PROPOSED CONDITIONS



Routing Diagram for CJE2364R0
Prepared by {enter your company name here}, Printed 7/10/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.249	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S)
1.236	98	Bldg Roof, HSG C (1S)
0.279	98	Paved parking, HSG B (4S)
3.027	98	Paved parking, HSG C (1S, 2S, 3S)
1.362	98	Roofs, HSG C (2S, 3S, 4S)
0.205	98	Water Surface, HSG C (2S)
11.358	**87**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.279	HSG B	4S
11.079	HSG C	1S, 2S, 3S, 4S
0.000	HSG D	
0.000	Other	
11.358		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	5.249	0.000	0.000	5.249	>75% Grass cover, Good	1S, 2S, 3S, 4S
0.000	0.000	1.236	0.000	0.000	1.236	Bldg Roof	1S
0.000	0.279	3.027	0.000	0.000	3.306	Paved parking	1S, 2S, 3S, 4S
0.000	0.000	1.362	0.000	0.000	1.362	Roofs	2S, 3S, 4S
0.000	0.000	0.205	0.000	0.000	0.205	Water Surface	2S
0.000	**0.279**	**11.079**	**0.000**	**0.000**	**11.358**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1BR	837.00	836.50	31.0	0.0161	0.011	10.0	0.0	0.0
2	1BR	837.50	837.00	550.0	0.0009	0.011	6.0	0.0	0.0
3	2P	838.00	837.00	33.0	0.0303	0.013	12.0	0.0	0.0
4	3BR	837.00	832.50	60.0	0.0750	0.011	10.0	0.0	0.0
5	3BR	837.50	837.00	100.0	0.0050	0.011	6.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>1.35"
Tc=6.0 min CN=88 Runoff=11.90 cfs 0.556 af

Subcatchment2S: SUBCATCHMENT2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>1.35"
Tc=6.0 min CN=88 Runoff=8.04 cfs 0.376 af

Subcatchment3S: SUBCATCHMENT3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>1.35"
Tc=6.0 min CN=88 Runoff=3.58 cfs 0.167 af

Subcatchment4S: SUBCATCHMENT4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>0.86"
Tc=6.0 min CN=80 Runoff=2.41 cfs 0.112 af

Reach 1R: TOTAL RUNOFF Inflow=3.26 cfs 0.393 af
Outflow=3.26 cfs 0.393 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=839.16' Storage=23,184 cf Inflow=11.90 cfs 0.556 af
Primary=0.04 cfs 0.024 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.024 af

Pond 2P: STORMWATER POND #2 Peak Elev=839.22' Storage=12,689 cf Inflow=8.04 cfs 0.376 af
Primary=0.11 cfs 0.109 af Secondary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.109 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=839.56' Storage=2,956 cf Inflow=3.58 cfs 0.167 af
Primary=0.84 cfs 0.147 af Secondary=0.00 cfs 0.000 af Outflow=0.84 cfs 0.147 af

Total Runoff Area = 11.358 ac Runoff Volume = 1.211 af Average Runoff Depth = 1.28"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

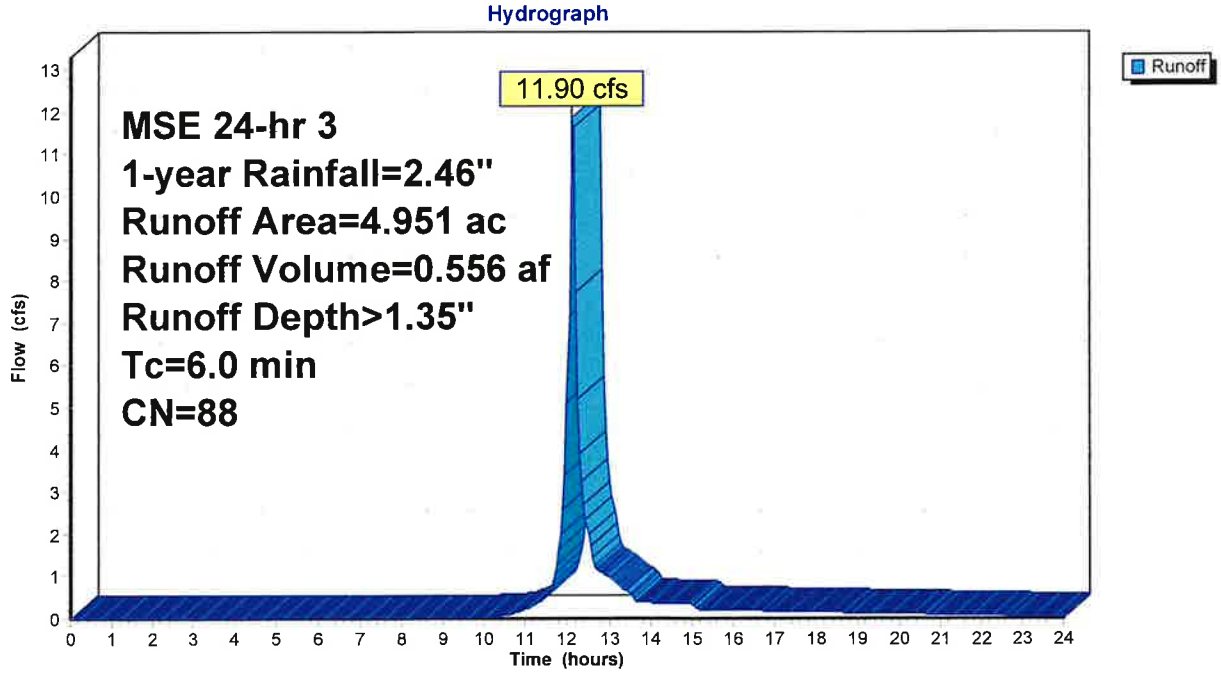
Runoff = 11.90 cfs @ 12.13 hrs, Volume= 0.556 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-year Rainfall=2.46"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

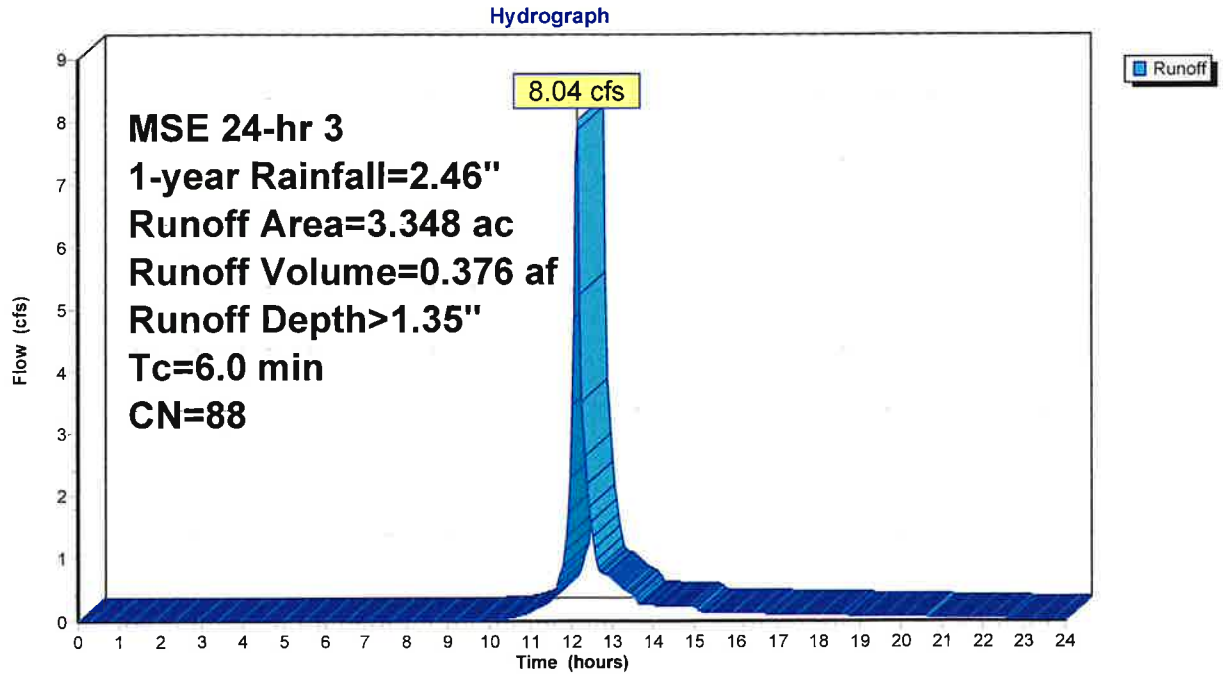
Runoff = 8.04 cfs @ 12.13 hrs, Volume= 0.376 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-year Rainfall=2.46"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

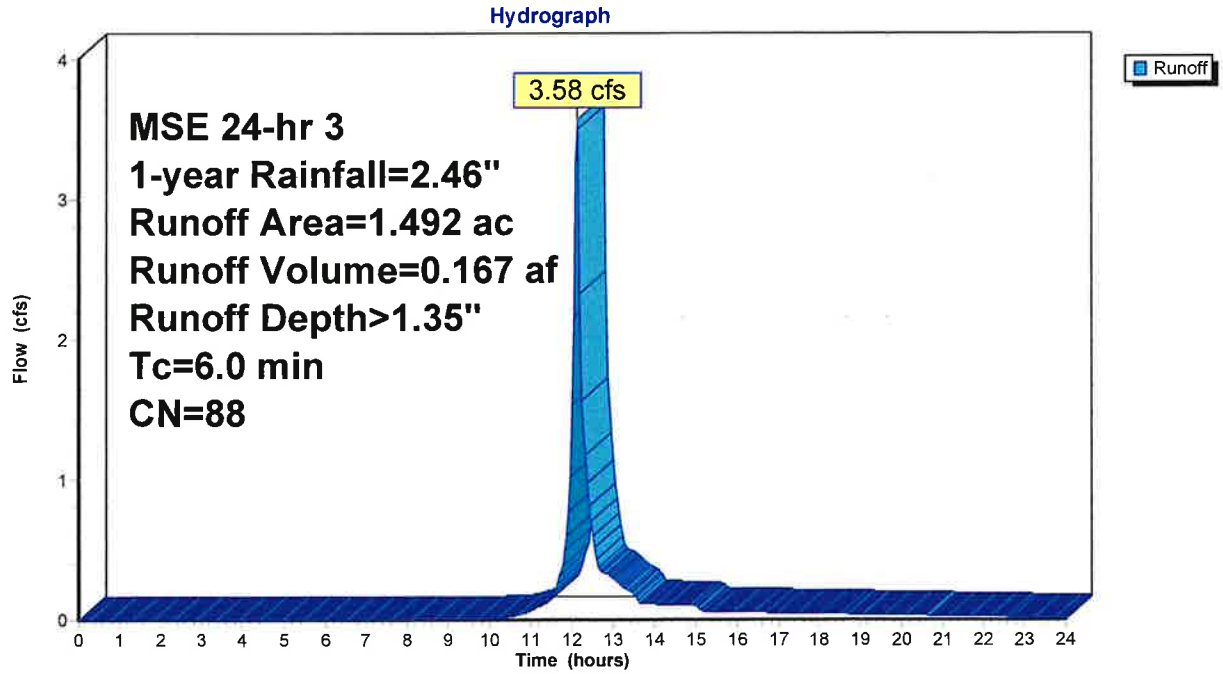
Runoff = 3.58 cfs @ 12.13 hrs, Volume= 0.167 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-year Rainfall=2.46"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

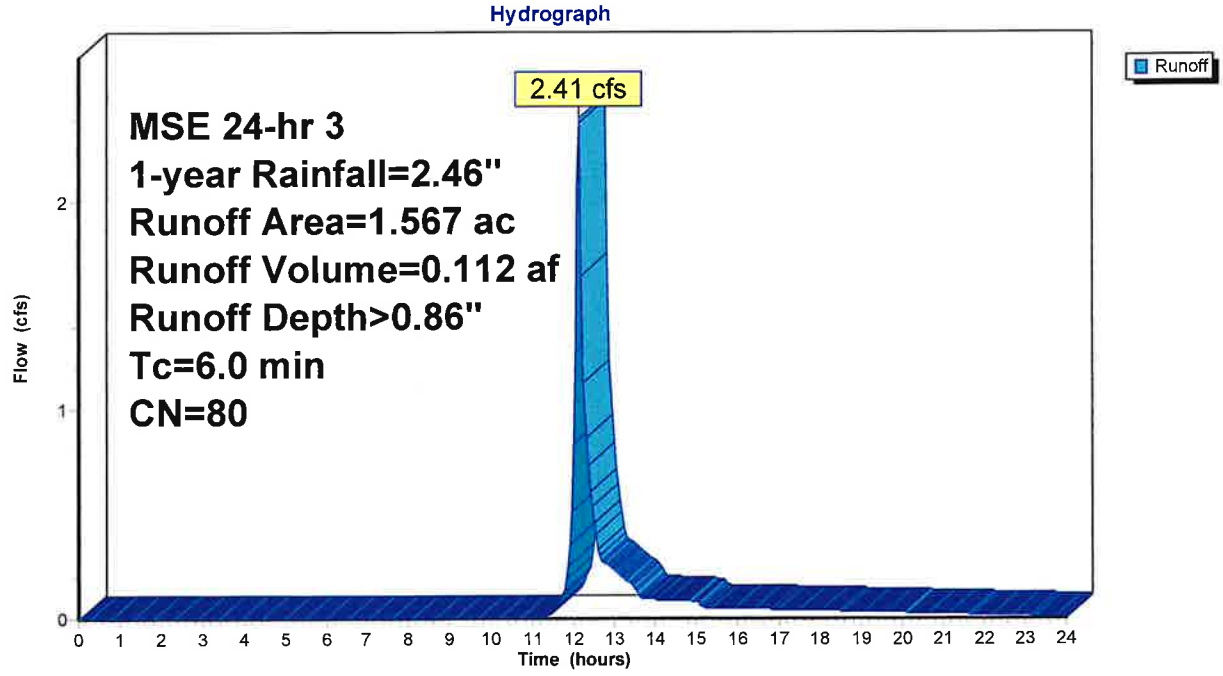
Runoff = 2.41 cfs @ 12.14 hrs, Volume= 0.112 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-year Rainfall=2.46"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



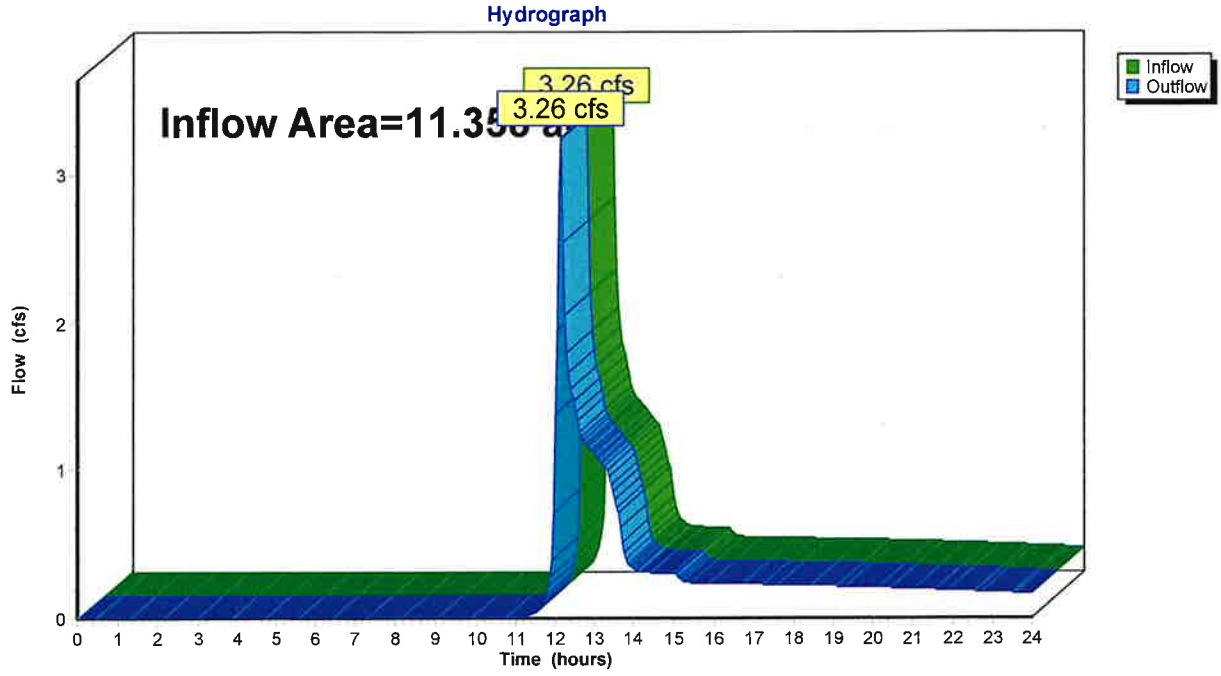
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 0.42" for 1-year event
Inflow = 3.26 cfs @ 12.14 hrs, Volume= 0.393 af
Outflow = 3.26 cfs @ 12.14 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 1.35" for 1-year event
Inflow = 11.90 cfs @ 12.13 hrs, Volume= 0.556 af
Outflow = 0.04 cfs @ 23.38 hrs, Volume= 0.024 af, Atten= 100%, Lag= 674.6 min
Primary = 0.04 cfs @ 23.38 hrs, Volume= 0.024 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.16' @ 23.38 hrs Surf.Area= 23,419 sf Storage= 23,184 cf

Plug-Flow detention time= 552.3 min calculated for 0.024 af (4% of inflow)
Center-of-Mass det. time= 411.7 min (1,214.2 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

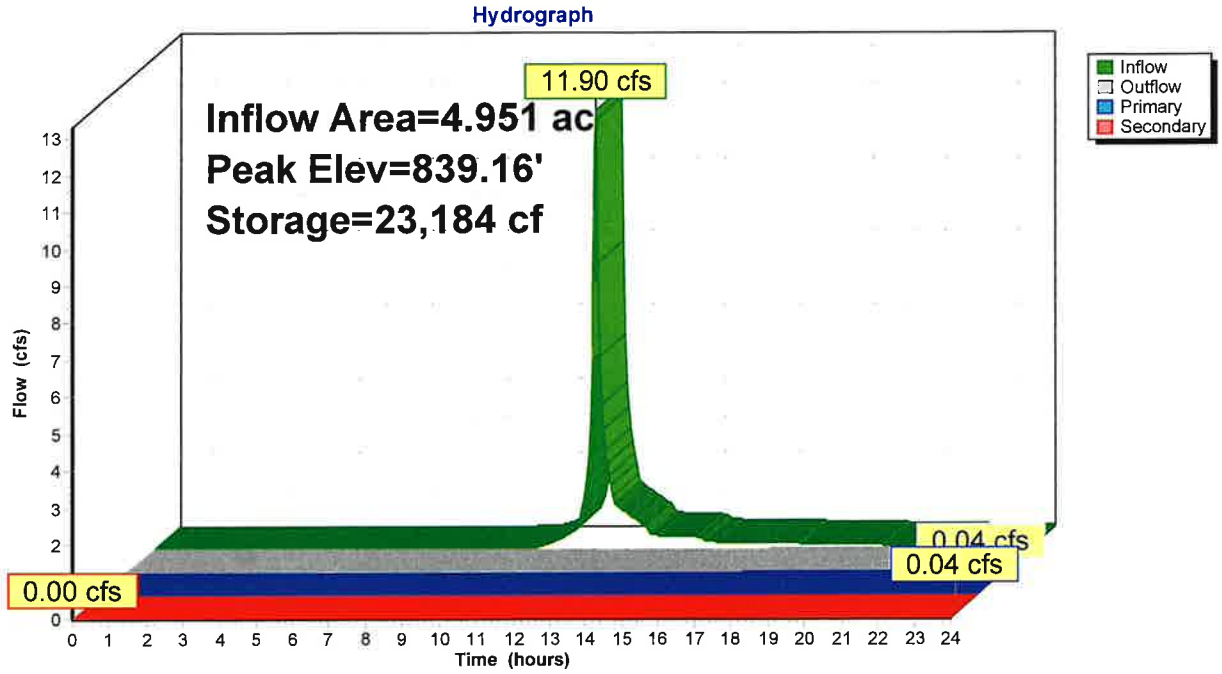
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.04 cfs @ 23.38 hrs HW=839.16' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.04 cfs of 3.47 cfs potential flow)
  └─**2=Culvert** (Passes 0.04 cfs of 0.36 cfs potential flow)
    └─**3=Exfiltration** (Exfiltration Controls 0.04 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 1.35" for 1-year event
Inflow = 8.04 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 0.11 cfs @ 17.27 hrs, Volume= 0.109 af, Atten= 99%, Lag= 307.9 min
Primary = 0.11 cfs @ 17.27 hrs, Volume= 0.109 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.22' @ 17.27 hrs Surf.Area= 12,141 sf Storage= 12,689 cf

Plug-Flow detention time= 372.0 min calculated for 0.109 af (29% of inflow)
Center-of-Mass det. time= 278.4 min (1,080.9 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

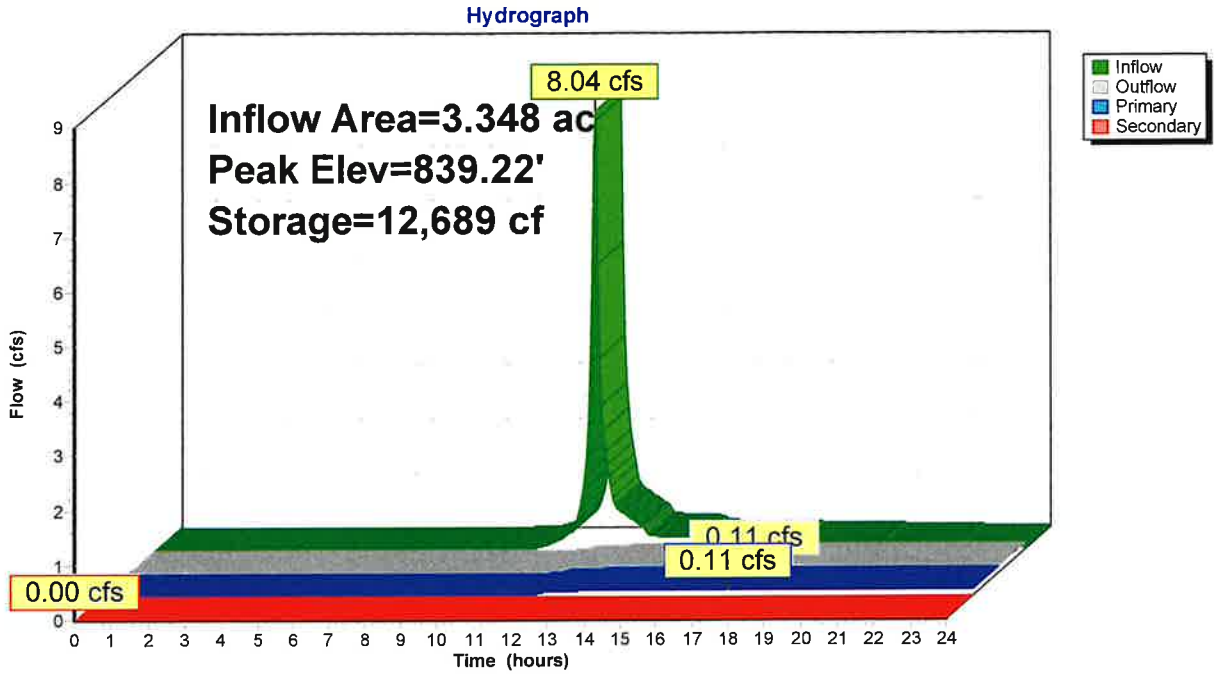
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.11 cfs @ 17.27 hrs HW=839.22' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.11 cfs of 3.20 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 5.12 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 1.35" for 1-year event
Inflow = 3.58 cfs @ 12.13 hrs, Volume= 0.167 af
Outflow = 0.84 cfs @ 12.39 hrs, Volume= 0.147 af, Atten= 76%, Lag= 15.6 min
Primary = 0.84 cfs @ 12.39 hrs, Volume= 0.147 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.56' @ 12.39 hrs Surf.Area= 3,057 sf Storage= 2,956 cf

Plug-Flow detention time= 85.9 min calculated for 0.147 af (88% of inflow)
Center-of-Mass det. time= 38.3 min (840.8 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

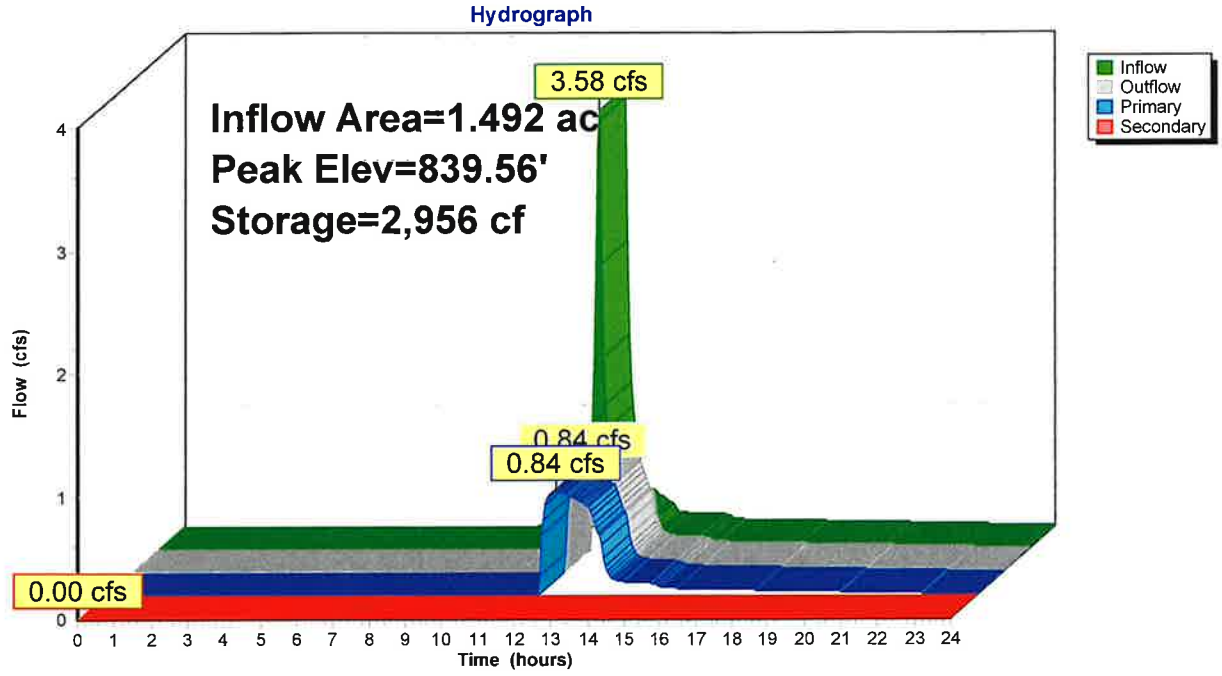
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.84 cfs @ 12.39 hrs HW=839.56' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.84 cfs of 3.84 cfs potential flow)
  └─**2=Culvert** (Barrel Controls 0.84 cfs @ 4.30 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3BR: BIO-RETENTION BASIN #3



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>1.64"
Tc=6.0 min CN=88 Runoff=14.40 cfs 0.677 af

Subcatchment2S: SUBCATCHMENT2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>1.64"
Tc=6.0 min CN=88 Runoff=9.74 cfs 0.458 af

Subcatchment3S: SUBCATCHMENT3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>1.64"
Tc=6.0 min CN=88 Runoff=4.34 cfs 0.204 af

Subcatchment4S: SUBCATCHMENT4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>1.10"
Tc=6.0 min CN=80 Runoff=3.10 cfs 0.144 af

Reach 1R: TOTAL RUNOFF Inflow=4.00 cfs 0.513 af
Outflow=4.00 cfs 0.513 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=839.31' Storage=26,896 cf Inflow=14.40 cfs 0.677 af
Primary=0.08 cfs 0.064 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.064 af

Pond 2P: STORMWATER POND #2 Peak Elev=839.46' Storage=15,753 cf Inflow=9.74 cfs 0.458 af
Primary=0.12 cfs 0.121 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.121 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=839.79' Storage=3,732 cf Inflow=4.34 cfs 0.204 af
Primary=0.89 cfs 0.184 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.184 af

Total Runoff Area = 11.358 ac Runoff Volume = 1.483 af Average Runoff Depth = 1.57"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

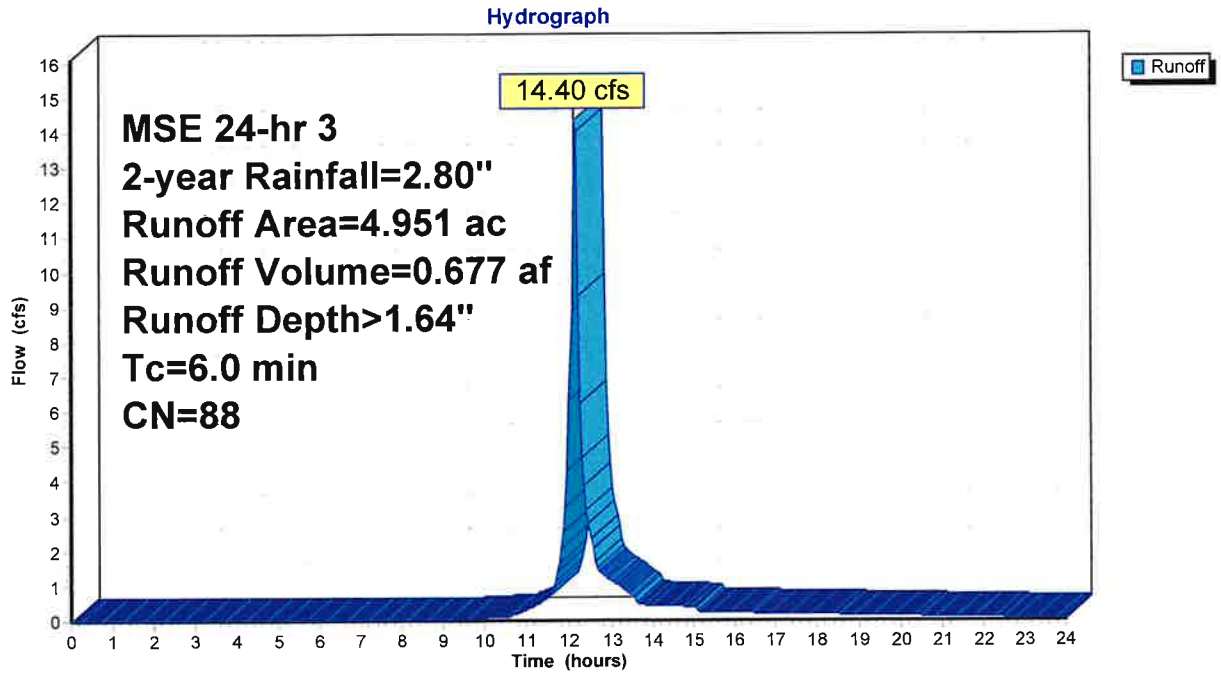
Runoff = 14.40 cfs @ 12.13 hrs, Volume= 0.677 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.80"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

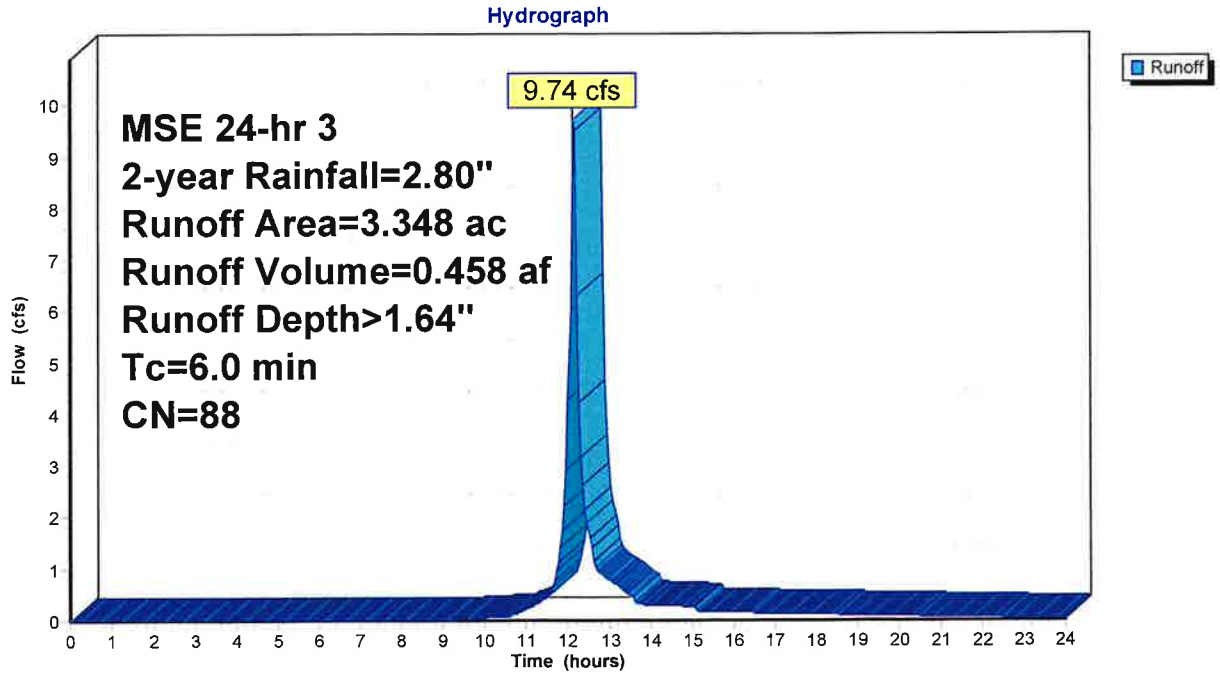
Runoff = 9.74 cfs @ 12.13 hrs, Volume= 0.458 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.80"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

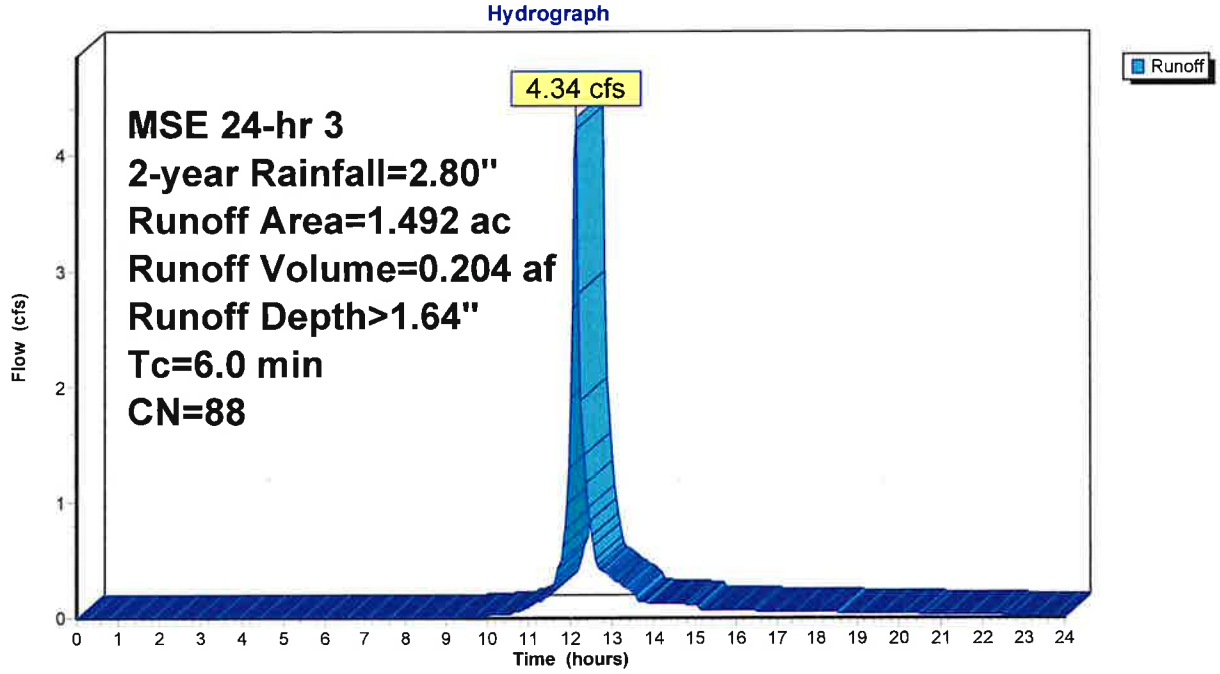
Runoff = 4.34 cfs @ 12.13 hrs, Volume= 0.204 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.80"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

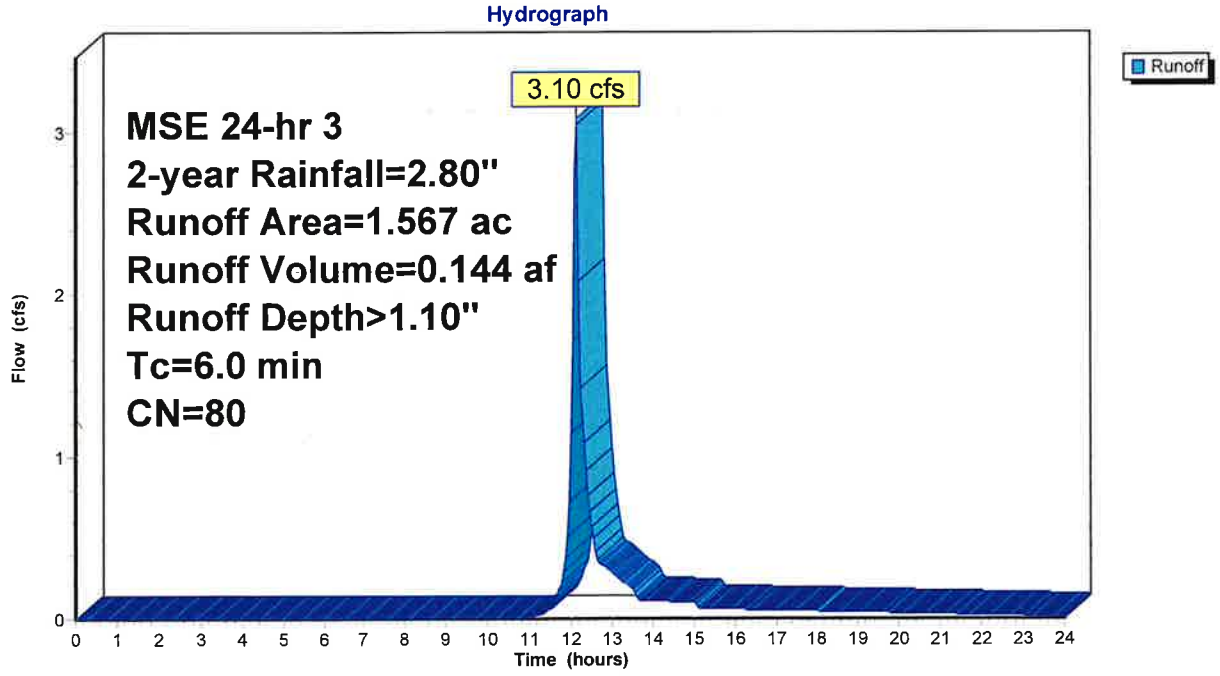
Runoff = 3.10 cfs @ 12.14 hrs, Volume= 0.144 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.80"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



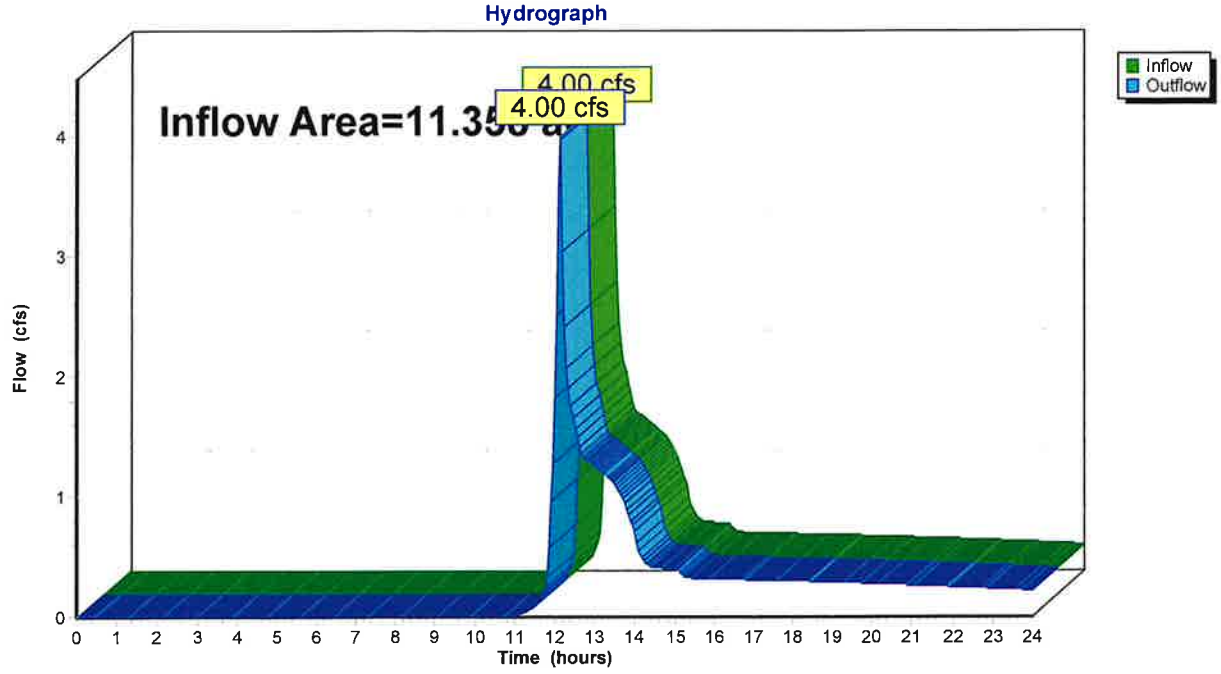
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 0.54" for 2-year event
Inflow = 4.00 cfs @ 12.14 hrs, Volume= 0.513 af
Outflow = 4.00 cfs @ 12.14 hrs, Volume= 0.513 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 1.64" for 2-year event
Inflow = 14.40 cfs @ 12.13 hrs, Volume= 0.677 af
Outflow = 0.08 cfs @ 21.97 hrs, Volume= 0.064 af, Atten= 99%, Lag= 590.3 min
Primary = 0.08 cfs @ 21.97 hrs, Volume= 0.064 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.31' @ 21.97 hrs Surf.Area= 24,503 sf Storage= 26,896 cf

Plug-Flow detention time= 471.8 min calculated for 0.064 af (9% of inflow)
Center-of-Mass det. time= 349.1 min (1,147.6 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

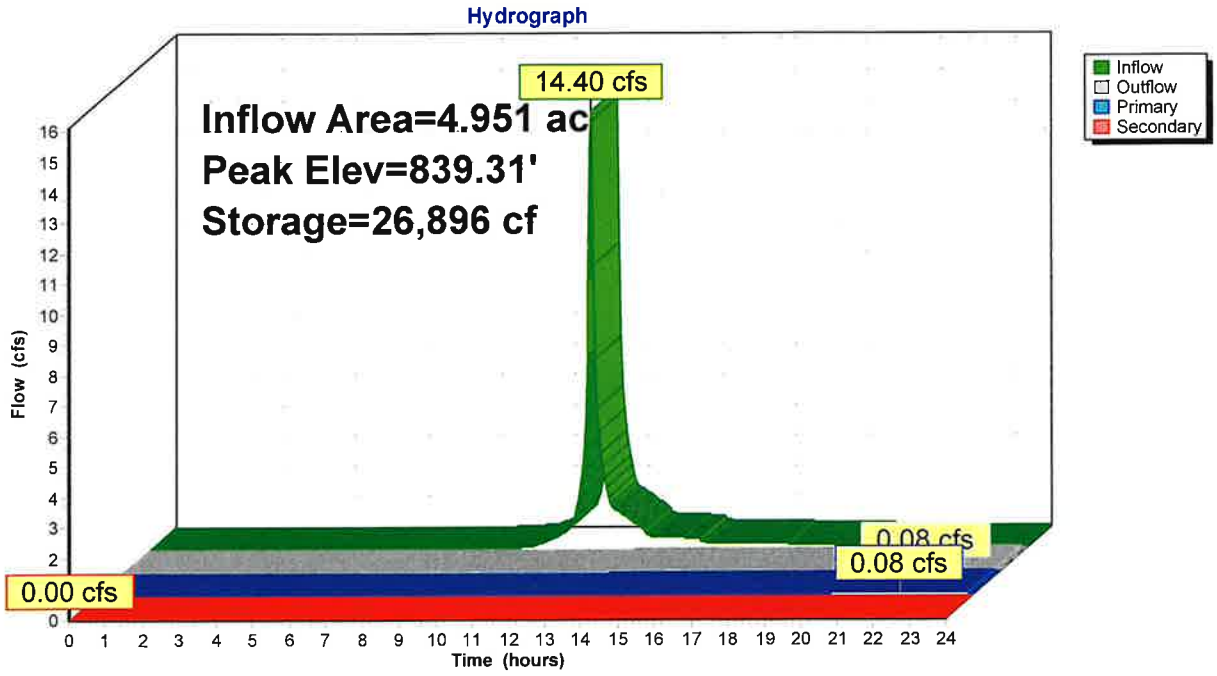
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 21.97 hrs HW=839.31' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.08 cfs of 3.62 cfs potential flow)
  - **2=Culvert** (Passes 0.08 cfs of 0.37 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.08 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
- **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 1.64" for 2-year event
Inflow = 9.74 cfs @ 12.13 hrs, Volume= 0.458 af
Outflow = 0.12 cfs @ 17.77 hrs, Volume= 0.121 af, Atten= 99%, Lag= 338.3 min
Primary = 0.12 cfs @ 17.77 hrs, Volume= 0.121 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.46' @ 17.77 hrs Surf.Area= 13,005 sf Storage= 15,753 cf

Plug-Flow detention time= 376.0 min calculated for 0.121 af (27% of inflow)
Center-of-Mass det. time= 280.6 min (1,079.2 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

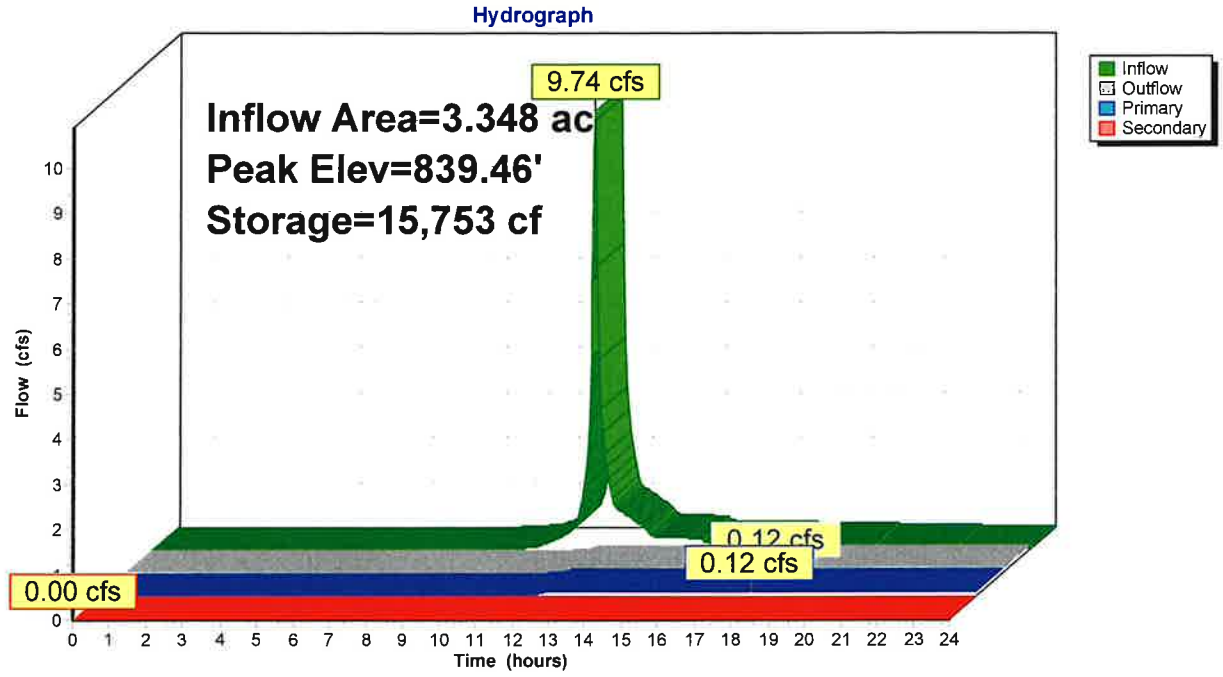
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.12 cfs @ 17.77 hrs HW=839.46' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.12 cfs of 3.70 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.65 fps)
—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 1.64" for 2-year event
Inflow = 4.34 cfs @ 12.13 hrs, Volume= 0.204 af
Outflow = 0.89 cfs @ 12.43 hrs, Volume= 0.184 af, Atten= 79%, Lag= 17.7 min
Primary = 0.89 cfs @ 12.43 hrs, Volume= 0.184 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.79' @ 12.43 hrs Surf.Area= 3,576 sf Storage= 3,732 cf

Plug-Flow detention time= 84.5 min calculated for 0.184 af (90% of inflow)
Center-of-Mass det. time= 42.3 min (840.9 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

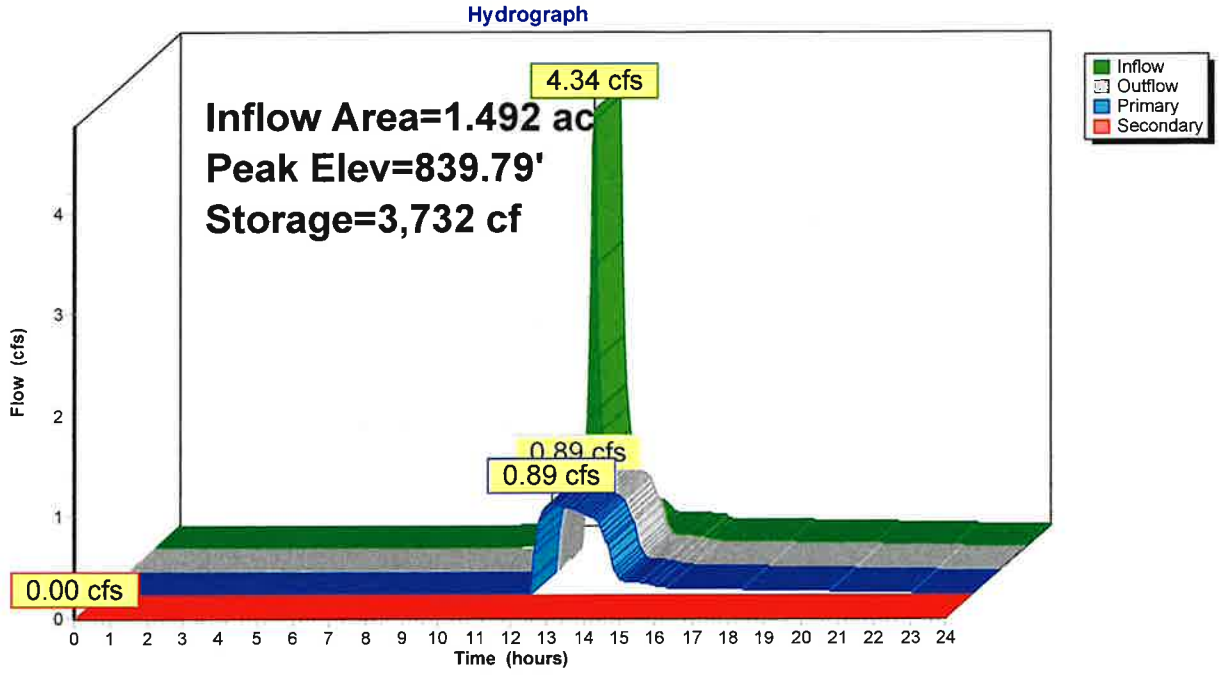
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.89 cfs @ 12.43 hrs HW=839.79' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.89 cfs of 4.05 cfs potential flow)
  └─**2=Culvert** (Barrel Controls 0.89 cfs @ 4.54 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3BR: BIO-RETENTION BASIN #3



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>2.20"
Tc=6.0 min CN=88 Runoff=19.04 cfs 0.906 af

Subcatchment2S: SUBCATCHMENT2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>2.20"
Tc=6.0 min CN=88 Runoff=12.88 cfs 0.612 af

Subcatchment3S: SUBCATCHMENT3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>2.20"
Tc=6.0 min CN=88 Runoff=5.74 cfs 0.273 af

Subcatchment4S: SUBCATCHMENT4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>1.57"
Tc=6.0 min CN=80 Runoff=4.43 cfs 0.205 af

Reach 1R: TOTAL RUNOFF Inflow=5.41 cfs 0.738 af
Outflow=5.41 cfs 0.738 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=839.60' Storage=34,139 cf Inflow=19.04 cfs 0.906 af
Primary=0.16 cfs 0.139 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.139 af

Pond 2P: STORMWATER POND #2 Peak Elev=839.89' Storage=21,638 cf Inflow=12.88 cfs 0.612 af
Primary=0.14 cfs 0.141 af Secondary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.141 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=840.15' Storage=5,189 cf Inflow=5.74 cfs 0.273 af
Primary=1.01 cfs 0.253 af Secondary=0.00 cfs 0.000 af Outflow=1.01 cfs 0.253 af

Total Runoff Area = 11.358 ac Runoff Volume = 1.997 af Average Runoff Depth = 2.11"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

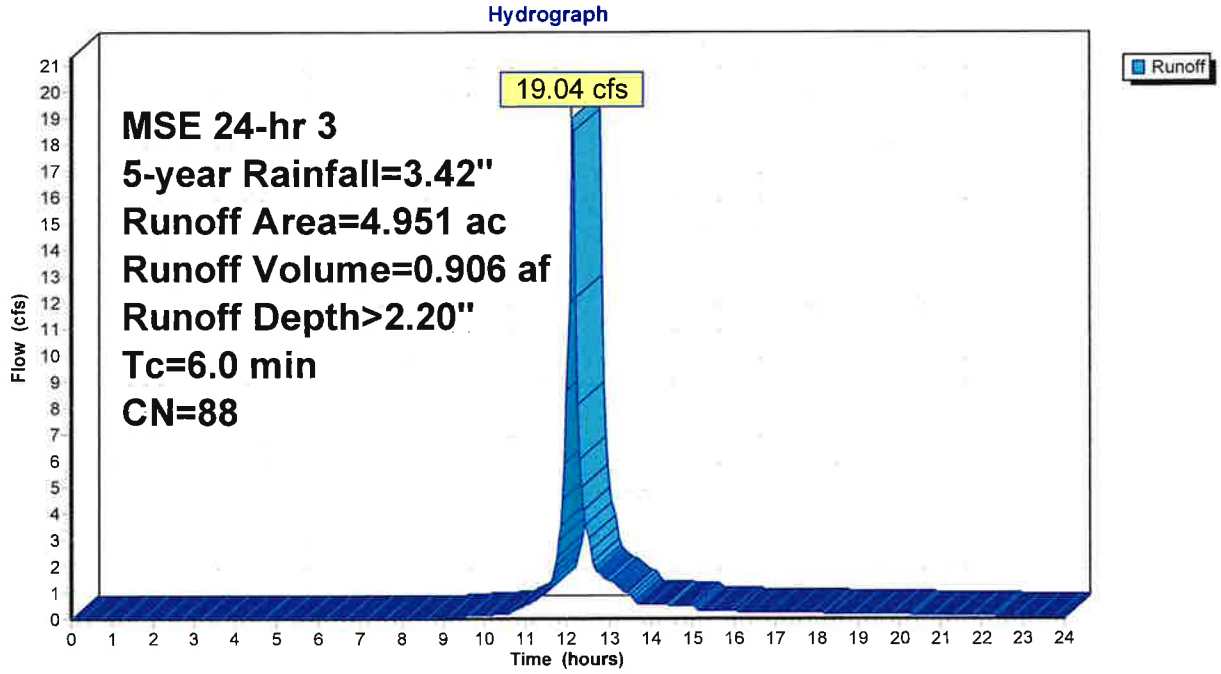
Runoff = 19.04 cfs @ 12.13 hrs, Volume= 0.906 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-year Rainfall=3.42"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

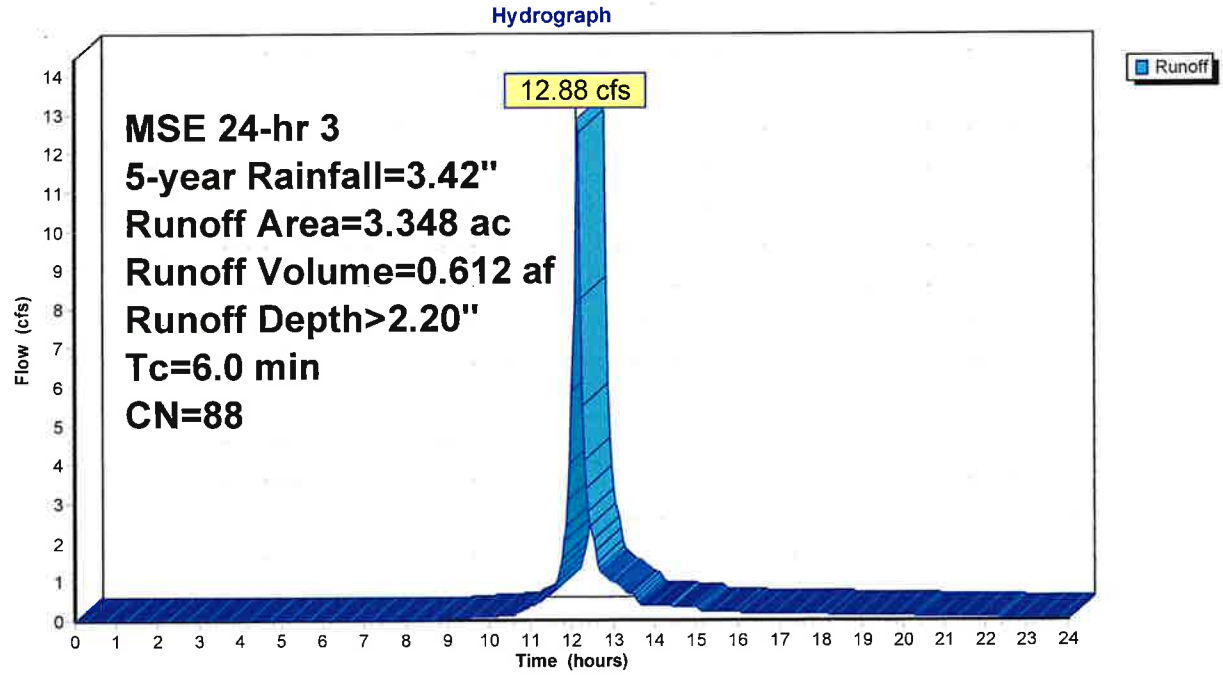
Runoff = 12.88 cfs @ 12.13 hrs, Volume= 0.612 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-year Rainfall=3.42"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

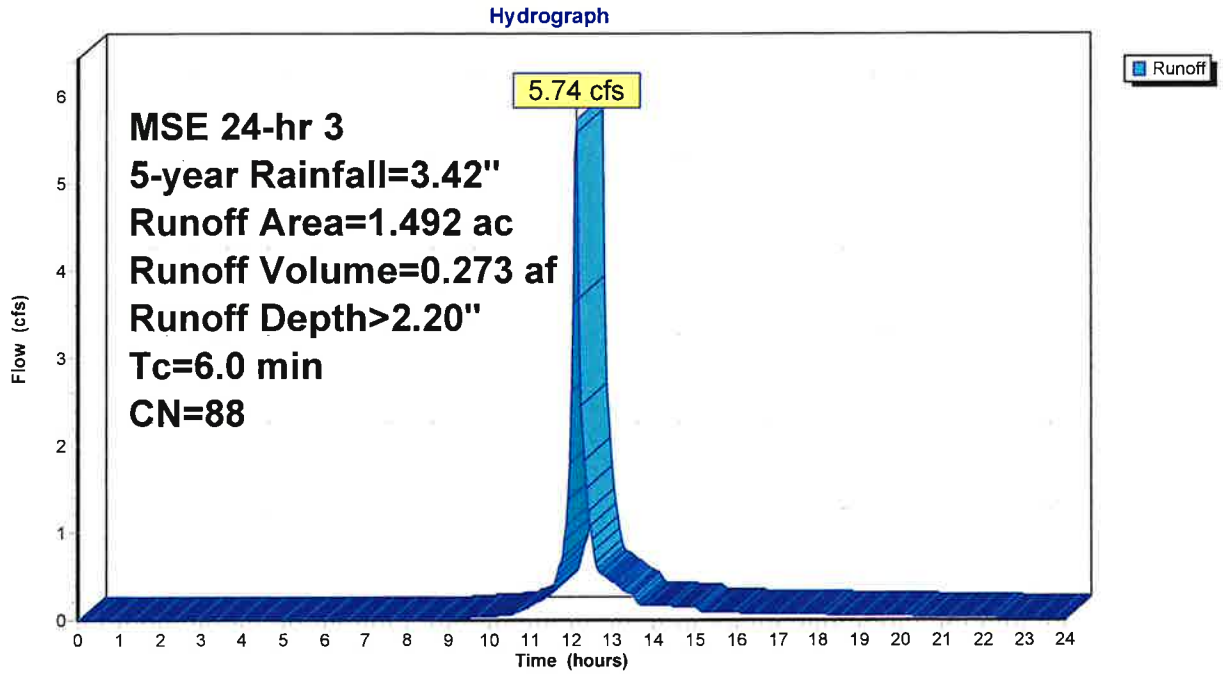
Runoff = 5.74 cfs @ 12.13 hrs, Volume= 0.273 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-year Rainfall=3.42"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

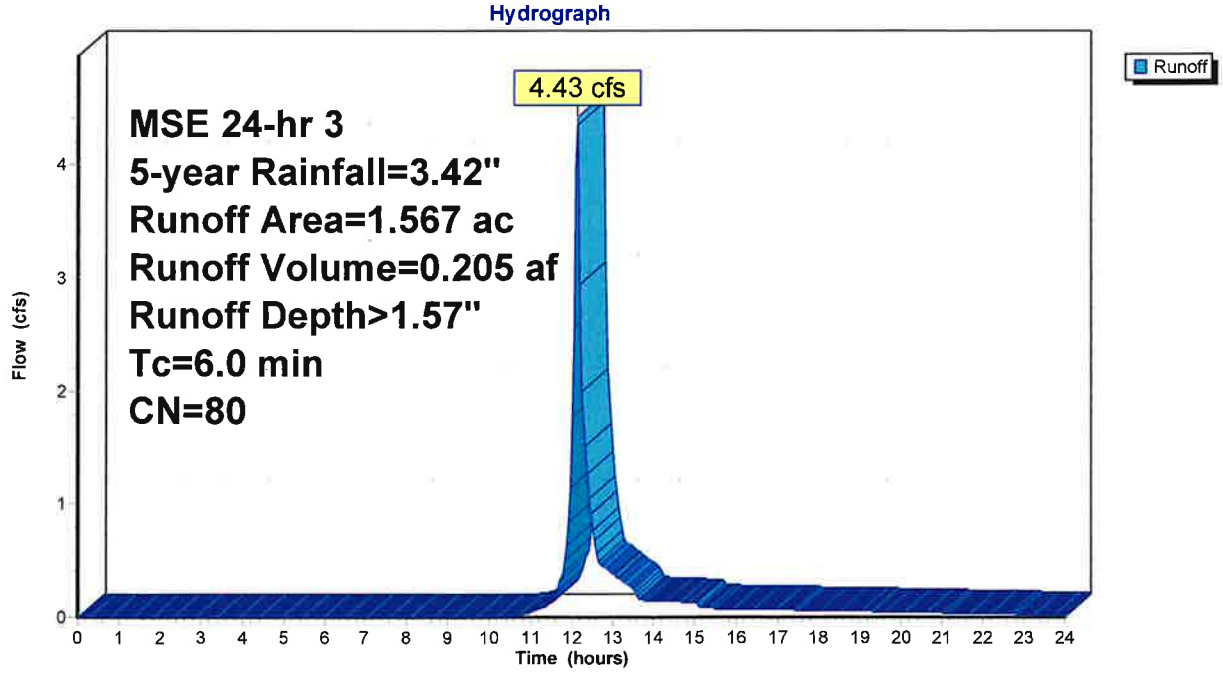
Runoff = 4.43 cfs @ 12.14 hrs, Volume= 0.205 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-year Rainfall=3.42"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



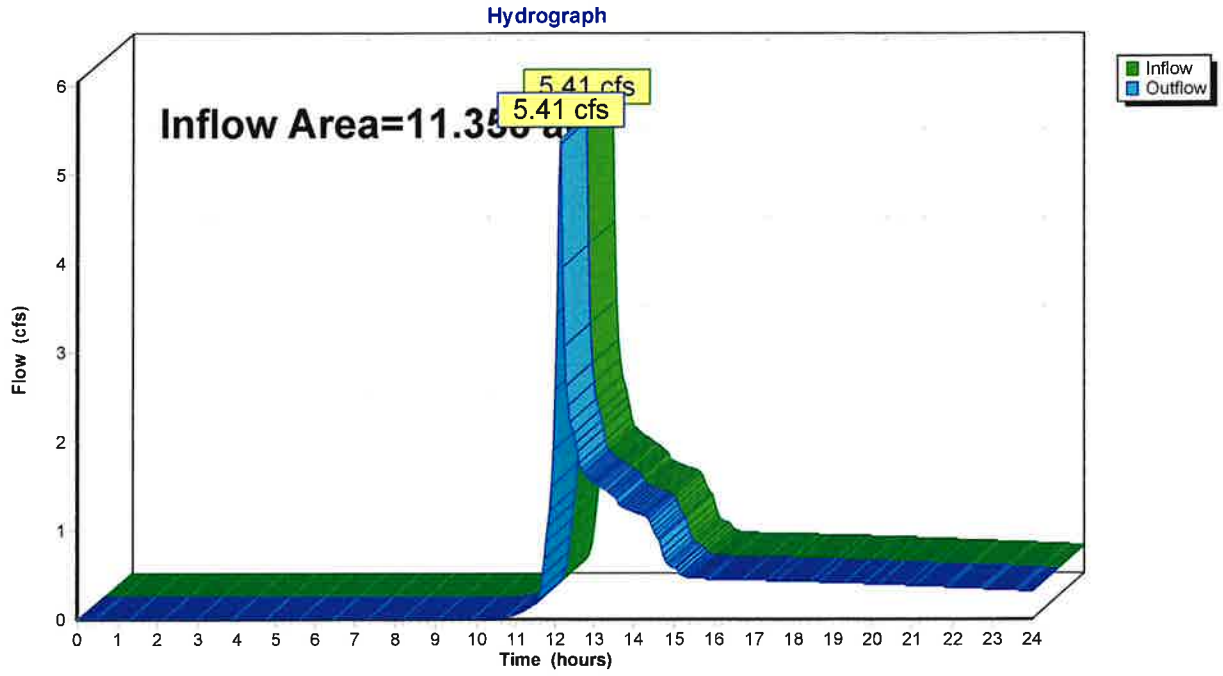
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 0.78" for 5-year event
Inflow = 5.41 cfs @ 12.14 hrs, Volume= 0.738 af
Outflow = 5.41 cfs @ 12.14 hrs, Volume= 0.738 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 2.20" for 5-year event
Inflow = 19.04 cfs @ 12.13 hrs, Volume= 0.906 af
Outflow = 0.16 cfs @ 20.21 hrs, Volume= 0.139 af, Atten= 99%, Lag= 485.0 min
Primary = 0.16 cfs @ 20.21 hrs, Volume= 0.139 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.60' @ 20.21 hrs Surf.Area= 26,491 sf Storage= 34,139 cf

Plug-Flow detention time= 431.9 min calculated for 0.139 af (15% of inflow)
Center-of-Mass det. time= 319.0 min (1,111.8 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

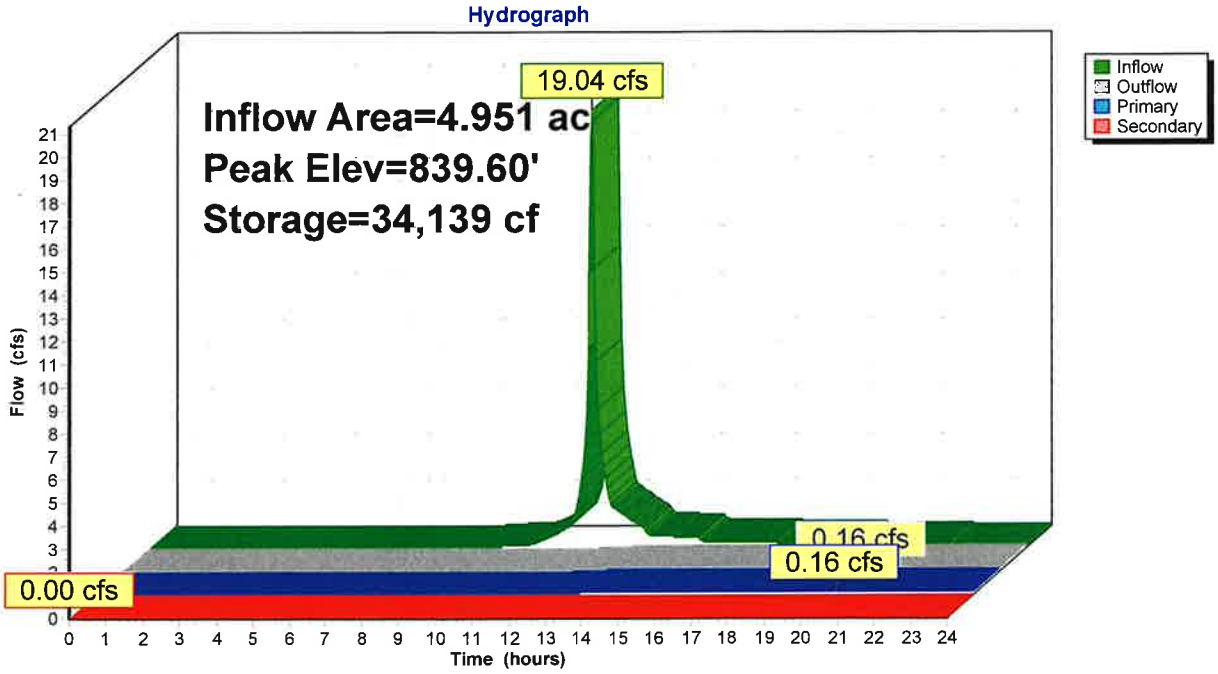
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.16 cfs @ 20.21 hrs HW=839.60' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.16 cfs of 3.88 cfs potential flow)
  - **2=Culvert** (Passes 0.16 cfs of 0.40 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.16 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
- **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 2.20" for 5-year event
Inflow = 12.88 cfs @ 12.13 hrs, Volume= 0.612 af
Outflow = 0.14 cfs @ 18.55 hrs, Volume= 0.141 af, Atten= 99%, Lag= 385.1 min
Primary = 0.14 cfs @ 18.55 hrs, Volume= 0.141 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.89' @ 18.55 hrs Surf.Area= 14,521 sf Storage= 21,638 cf

Plug-Flow detention time= 382.7 min calculated for 0.140 af (23% of inflow)
Center-of-Mass det. time= 282.8 min (1,075.5 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

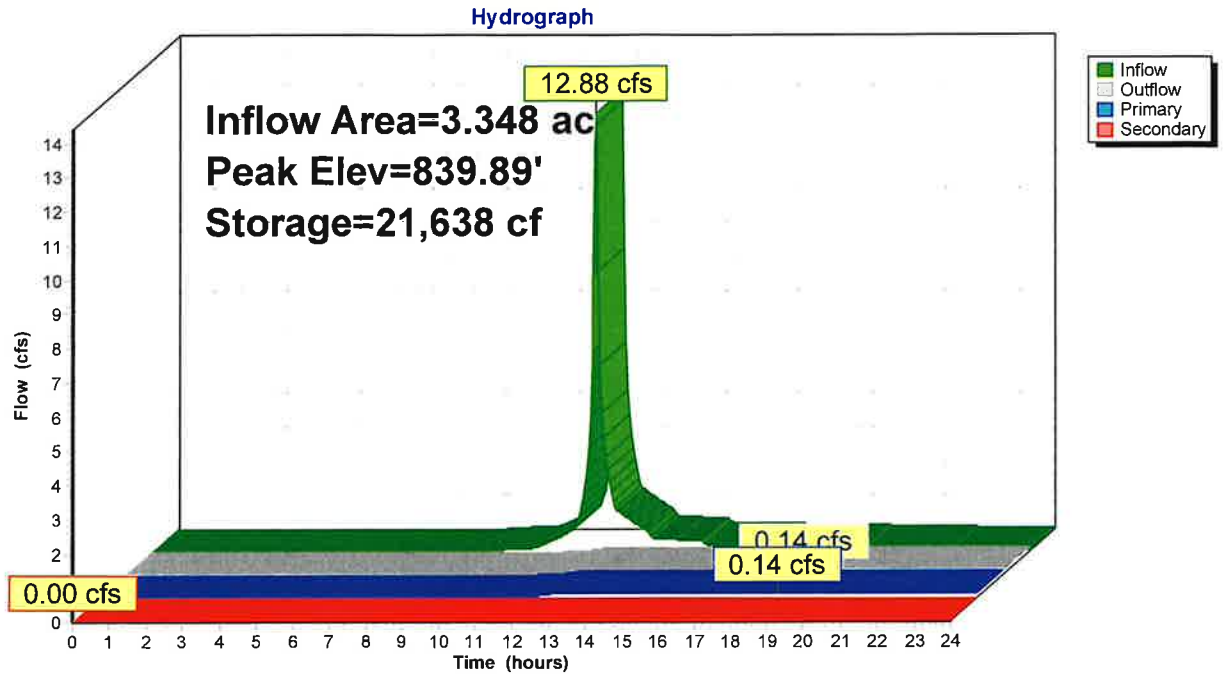
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.14 cfs @ 18.55 hrs HW=839.89' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.14 cfs of 4.45 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.47 fps)
—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 2.20" for 5-year event
Inflow = 5.74 cfs @ 12.13 hrs, Volume= 0.273 af
Outflow = 1.01 cfs @ 12.47 hrs, Volume= 0.253 af, Atten= 82%, Lag= 20.4 min
Primary = 1.01 cfs @ 12.47 hrs, Volume= 0.253 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.15' @ 12.47 hrs Surf.Area= 4,840 sf Storage= 5,189 cf

Plug-Flow detention time= 84.2 min calculated for 0.252 af (92% of inflow)
Center-of-Mass det. time= 50.8 min (843.6 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

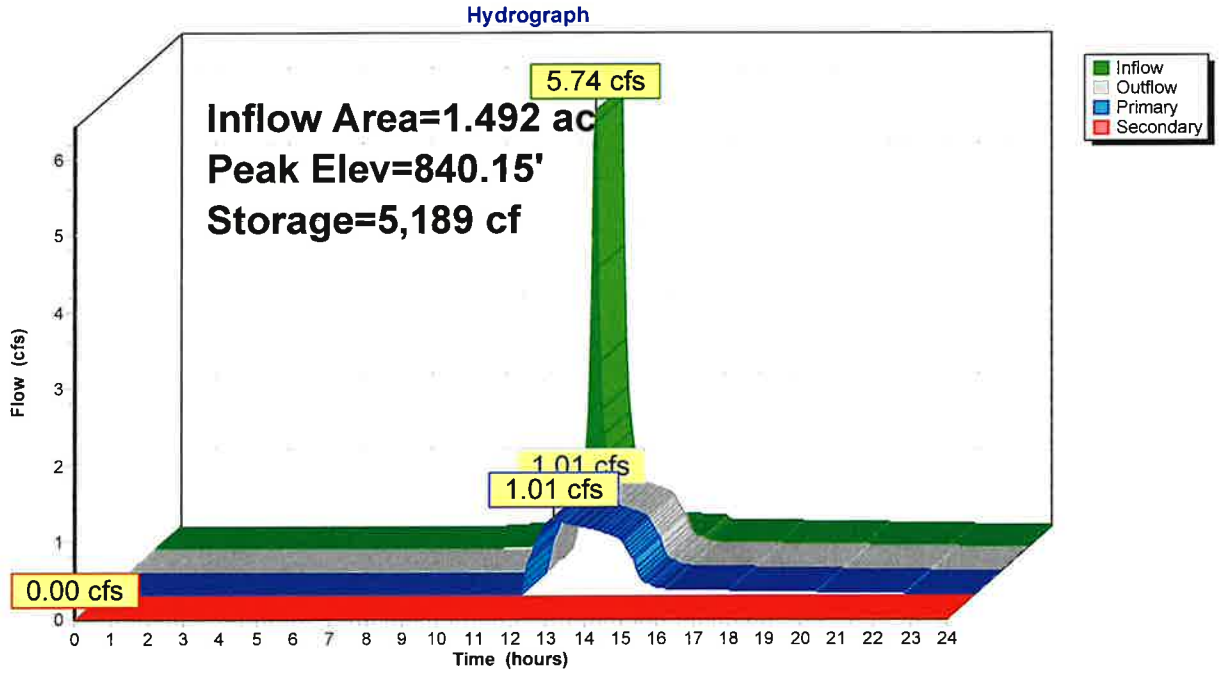
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.01 cfs @ 12.47 hrs HW=840.15' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.01 cfs of 4.34 cfs potential flow)
  └─**2=Culvert** (Barrel Controls 0.96 cfs @ 4.88 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.32 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3BR: BIO-RETENTION BASIN #3



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>2.70"
Tc=6.0 min CN=88 Runoff=23.18 cfs 1.114 af

Subcatchment2S: SUBCATCHMENT2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>2.70"
Tc=6.0 min CN=88 Runoff=15.68 cfs 0.753 af

Subcatchment3S: SUBCATCHMENT3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>2.70"
Tc=6.0 min CN=88 Runoff=6.99 cfs 0.336 af

Subcatchment4S: SUBCATCHMENT4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=80 Runoff=5.66 cfs 0.263 af

Reach 1R: TOTAL RUNOFF Inflow=6.69 cfs 0.939 af
Outflow=6.69 cfs 0.939 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=839.85' Storage=41,032 cf Inflow=23.18 cfs 1.114 af
Primary=0.22 cfs 0.205 af Secondary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.205 af

Pond 2P: STORMWATER POND #2 Peak Elev=840.25' Storage=27,098 cf Inflow=15.68 cfs 0.753 af
Primary=0.15 cfs 0.156 af Secondary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.156 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=840.38' Storage=6,417 cf Inflow=6.99 cfs 0.336 af
Primary=1.19 cfs 0.315 af Secondary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.315 af

Total Runoff Area = 11.358 ac Runoff Volume = 2.467 af Average Runoff Depth = 2.61"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

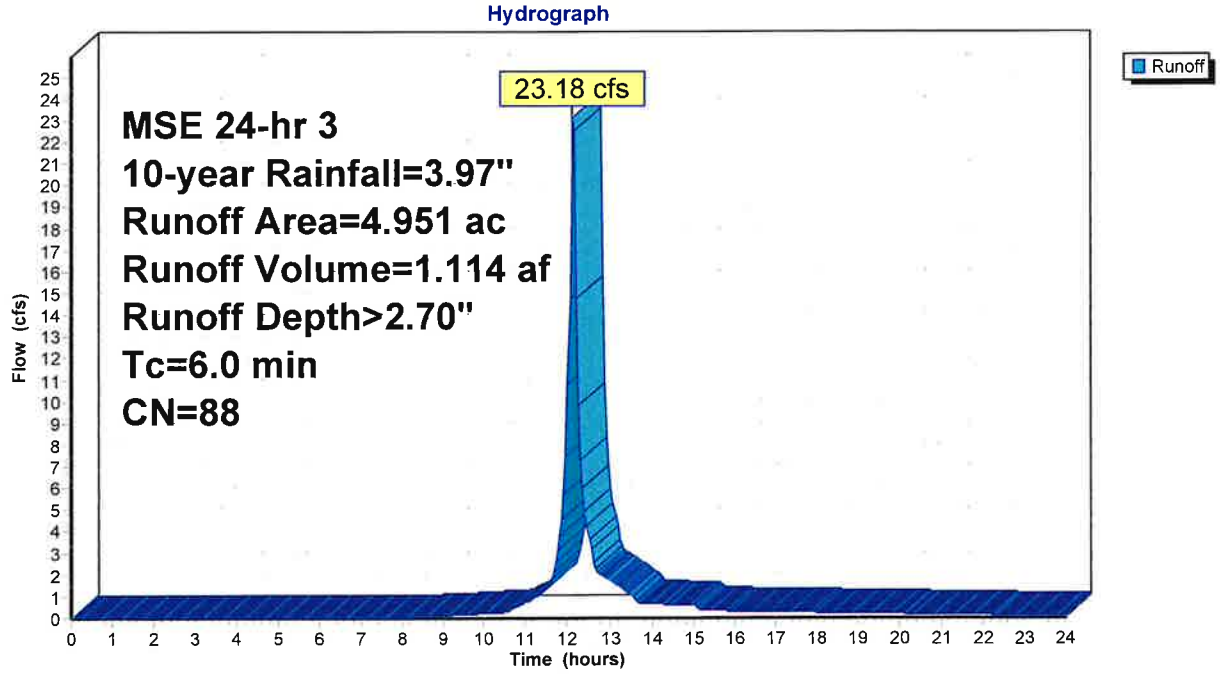
Runoff = 23.18 cfs @ 12.13 hrs, Volume= 1.114 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.97"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

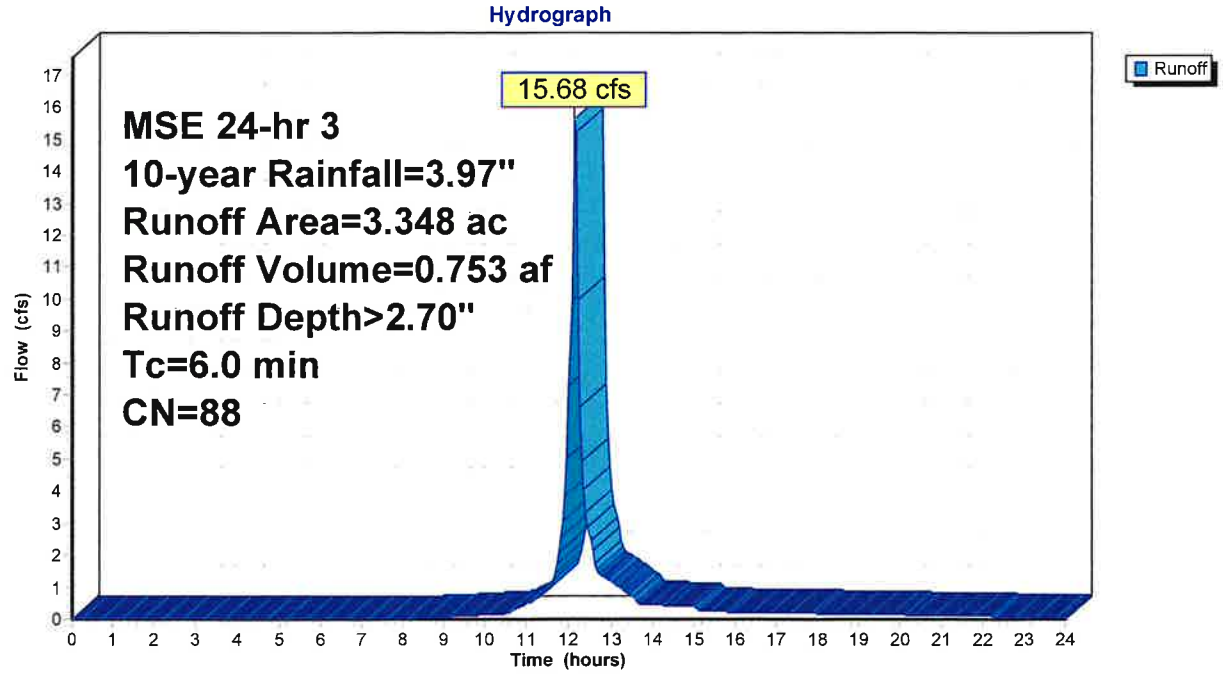
Runoff = 15.68 cfs @ 12.13 hrs, Volume= 0.753 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.97"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

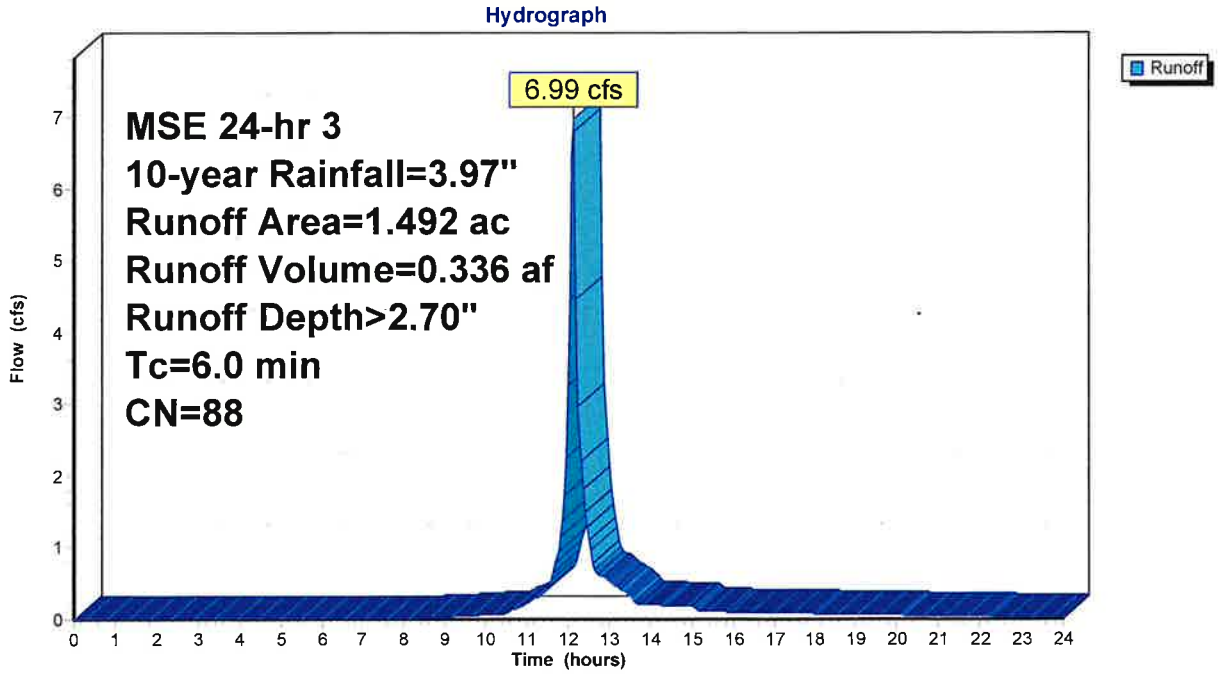
Runoff = 6.99 cfs @ 12.13 hrs, Volume= 0.336 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.97"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

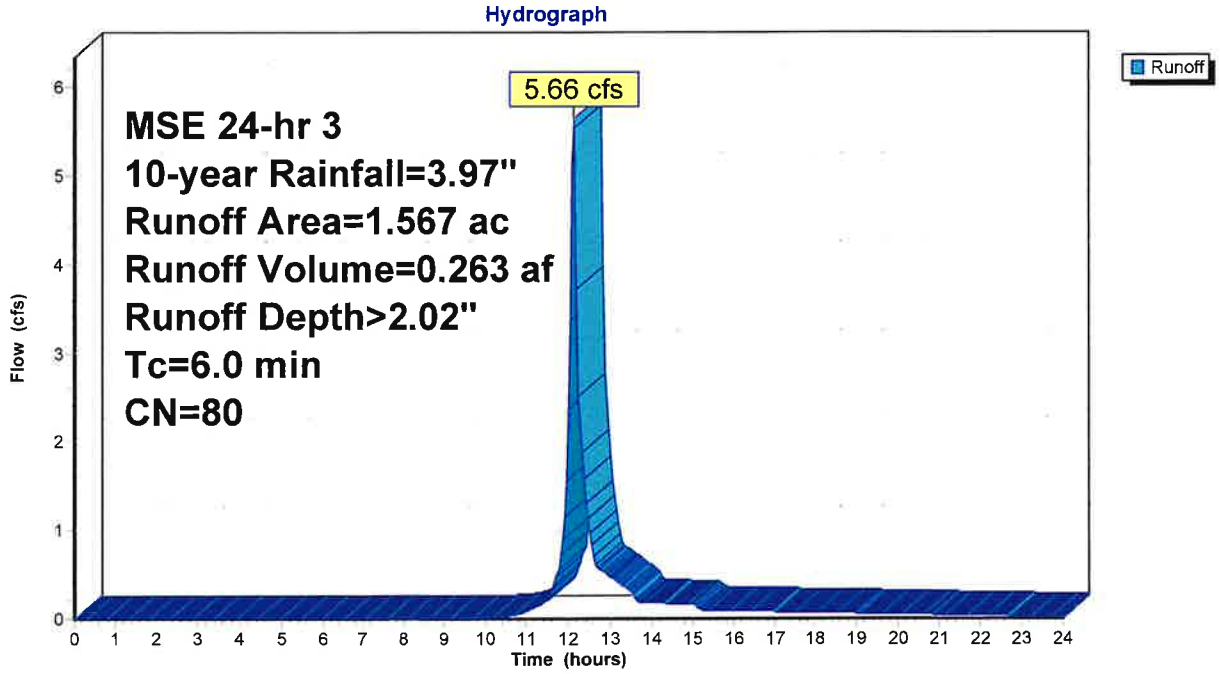
Runoff = 5.66 cfs @ 12.13 hrs, Volume= 0.263 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.97"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



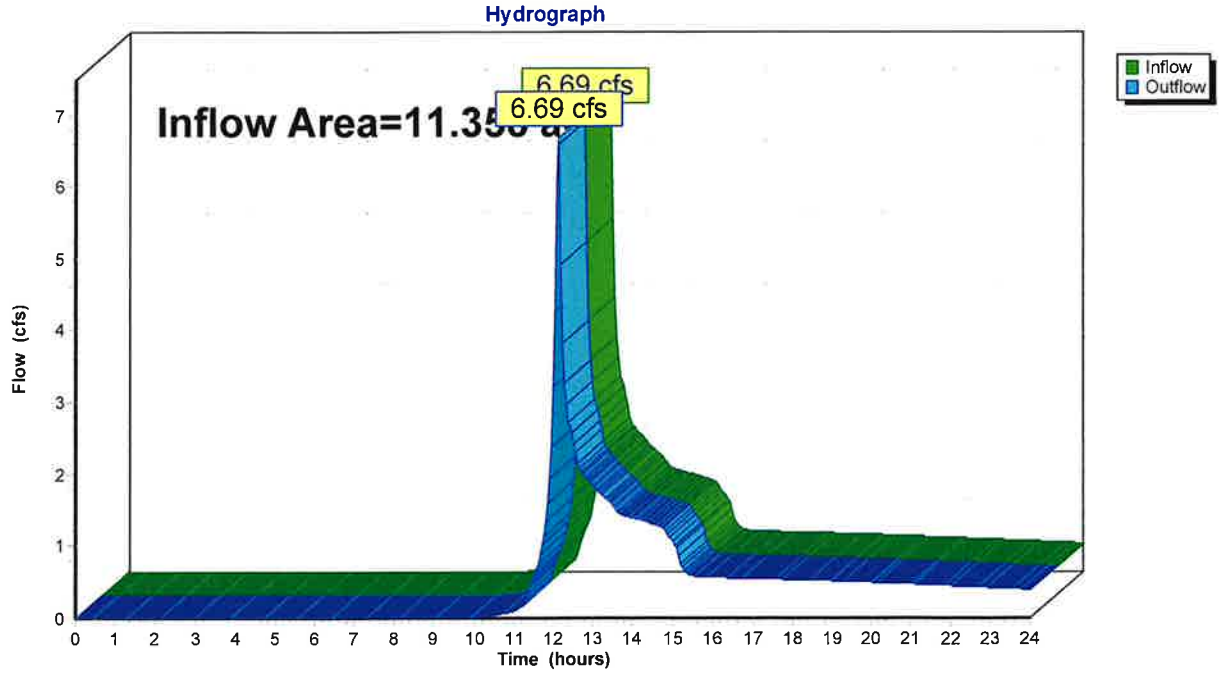
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 0.99" for 10-year event
Inflow = 6.69 cfs @ 12.14 hrs, Volume= 0.939 af
Outflow = 6.69 cfs @ 12.14 hrs, Volume= 0.939 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 2.70" for 10-year event
Inflow = 23.18 cfs @ 12.13 hrs, Volume= 1.114 af
Outflow = 0.22 cfs @ 19.20 hrs, Volume= 0.205 af, Atten= 99%, Lag= 424.0 min
Primary = 0.22 cfs @ 19.20 hrs, Volume= 0.205 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 839.85' @ 19.20 hrs Surf.Area= 28,253 sf Storage= 41,032 cf

Plug-Flow detention time= 422.6 min calculated for 0.205 af (18% of inflow)
Center-of-Mass det. time= 312.3 min (1,100.9 - 788.6)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

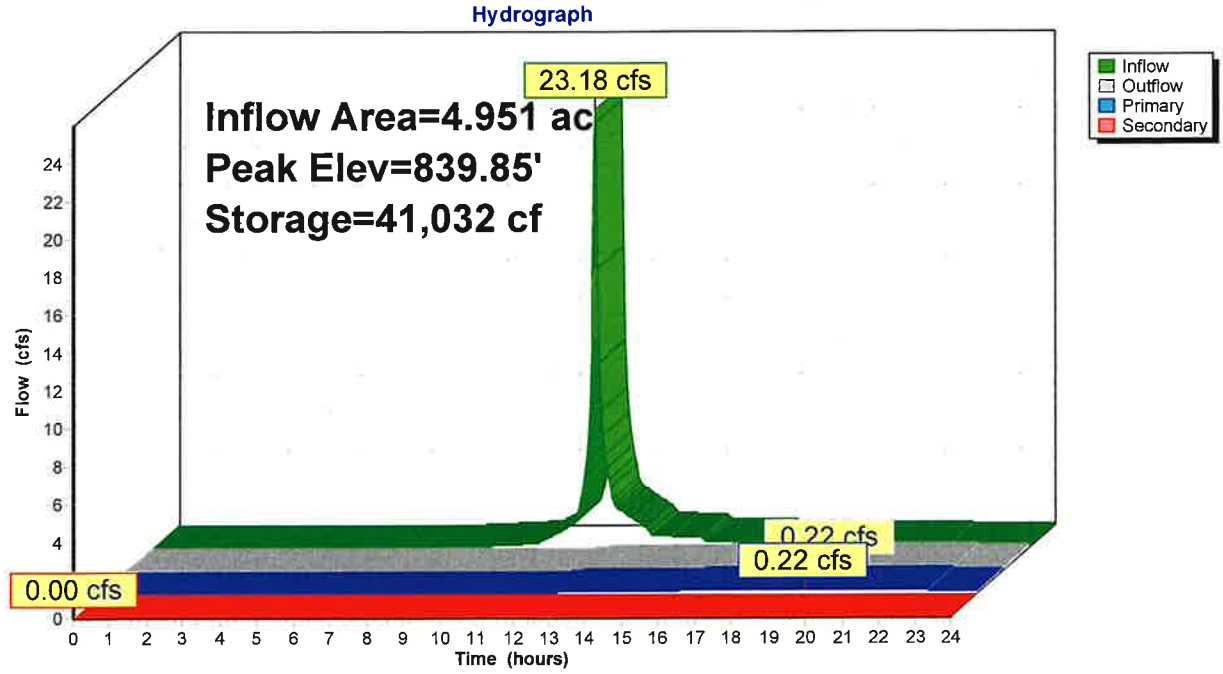
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.22 cfs @ 19.20 hrs HW=839.85' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.22 cfs of 4.10 cfs potential flow)
  └─**2=Culvert** (Passes 0.22 cfs of 0.42 cfs potential flow)
    └─**3=Exfiltration** (Exfiltration Controls 0.22 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 2.70" for 10-year event
Inflow = 15.68 cfs @ 12.13 hrs, Volume= 0.753 af
Outflow = 0.15 cfs @ 19.05 hrs, Volume= 0.156 af, Atten= 99%, Lag= 415.5 min
Primary = 0.15 cfs @ 19.05 hrs, Volume= 0.156 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.25' @ 19.05 hrs Surf.Area= 16,040 sf Storage= 27,098 cf

Plug-Flow detention time= 389.4 min calculated for 0.155 af (21% of inflow)
Center-of-Mass det. time= 283.4 min (1,072.0 - 788.6)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

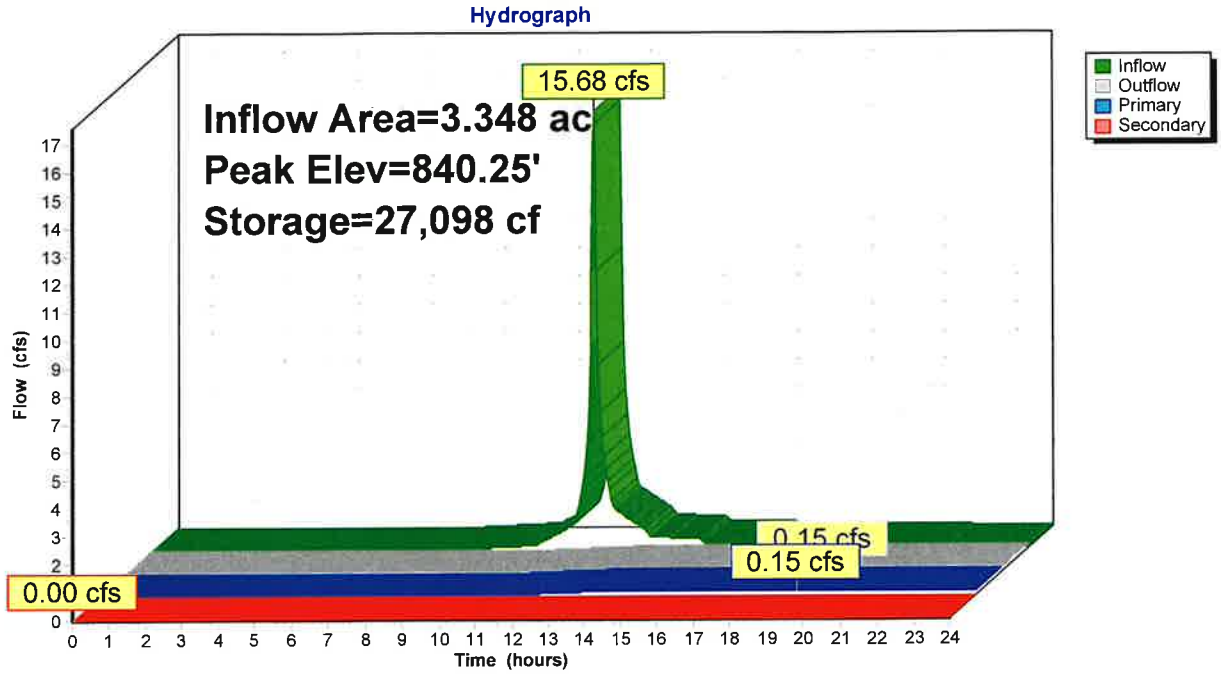
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.15 cfs @ 19.05 hrs HW=840.25' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.15 cfs of 5.00 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 7.08 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 2.70" for 10-year event
Inflow = 6.99 cfs @ 12.13 hrs, Volume= 0.336 af
Outflow = 1.19 cfs @ 12.48 hrs, Volume= 0.315 af, Atten= 83%, Lag= 20.7 min
Primary = 1.19 cfs @ 12.48 hrs, Volume= 0.315 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.38' @ 12.48 hrs Surf.Area= 6,041 sf Storage= 6,417 cf

Plug-Flow detention time= 84.1 min calculated for 0.315 af (94% of inflow)
Center-of-Mass det. time= 55.6 min (844.2 - 788.6)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

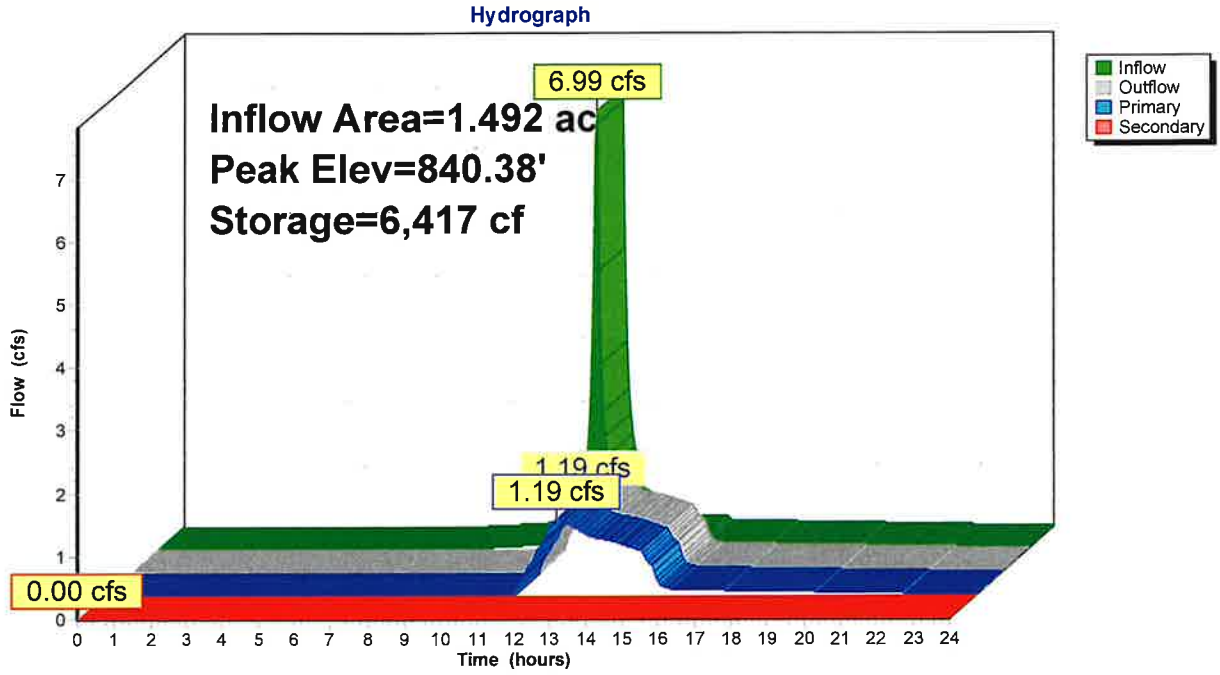
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.19 cfs @ 12.48 hrs HW=840.38' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.19 cfs of 4.52 cfs potential flow)
  ├─**2=Culvert** (Barrel Controls 1.00 cfs @ 5.09 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.21 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3BR: BIO-RETENTION BASIN #3



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>3.48"
Tc=6.0 min CN=88 Runoff=29.44 cfs 1.435 af

Subcatchment2S: SUBCATCHMENT2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>3.48"
Tc=6.0 min CN=88 Runoff=19.91 cfs 0.970 af

Subcatchment3S: SUBCATCHMENT3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>3.48"
Tc=6.0 min CN=88 Runoff=8.87 cfs 0.432 af

Subcatchment4S: SUBCATCHMENT4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>2.72"
Tc=6.0 min CN=80 Runoff=7.58 cfs 0.355 af

Reach 1R: TOTAL RUNOFF Inflow=8.87 cfs 1.253 af
Outflow=8.87 cfs 1.253 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=840.21' Storage=51,791 cf Inflow=29.44 cfs 1.435 af
Primary=0.33 cfs 0.311 af Secondary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.311 af

Pond 2P: STORMWATER POND #2 Peak Elev=840.74' Storage=35,639 cf Inflow=19.91 cfs 0.970 af
Primary=0.17 cfs 0.175 af Secondary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.175 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=840.67' Storage=8,423 cf Inflow=8.87 cfs 0.432 af
Primary=1.35 cfs 0.412 af Secondary=0.00 cfs 0.000 af Outflow=1.35 cfs 0.412 af

Total Runoff Area = 11.358 ac Runoff Volume = 3.193 af Average Runoff Depth = 3.37"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

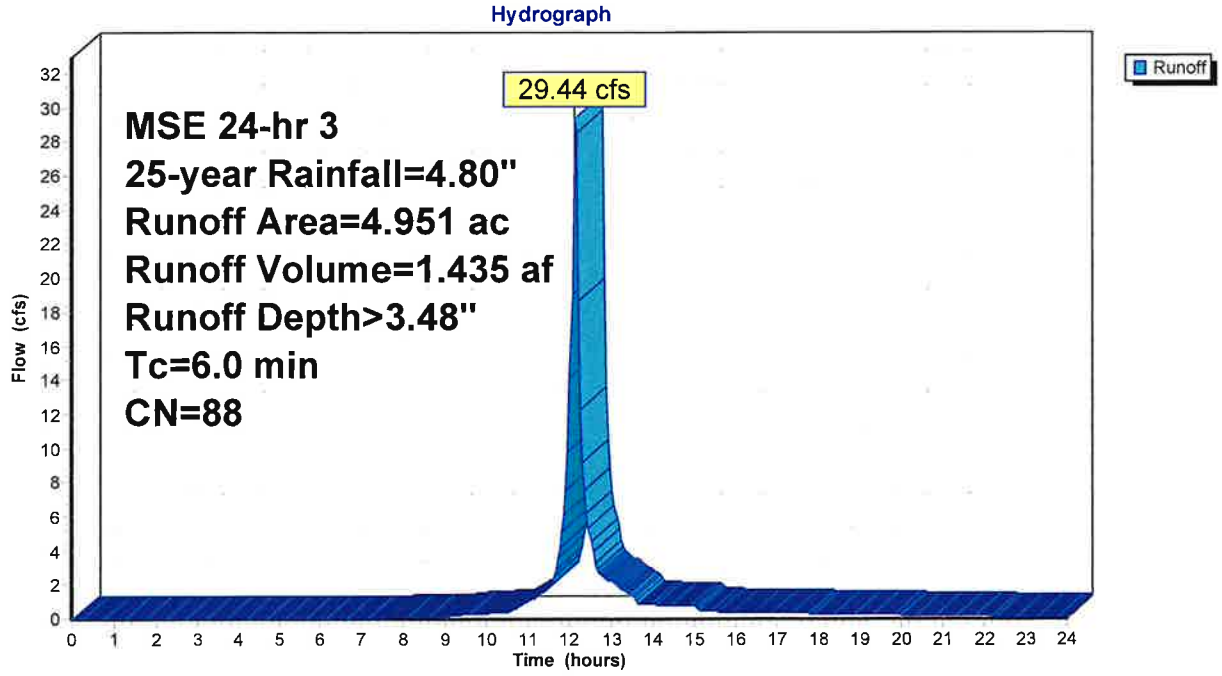
Runoff = 29.44 cfs @ 12.13 hrs, Volume= 1.435 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-year Rainfall=4.80"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

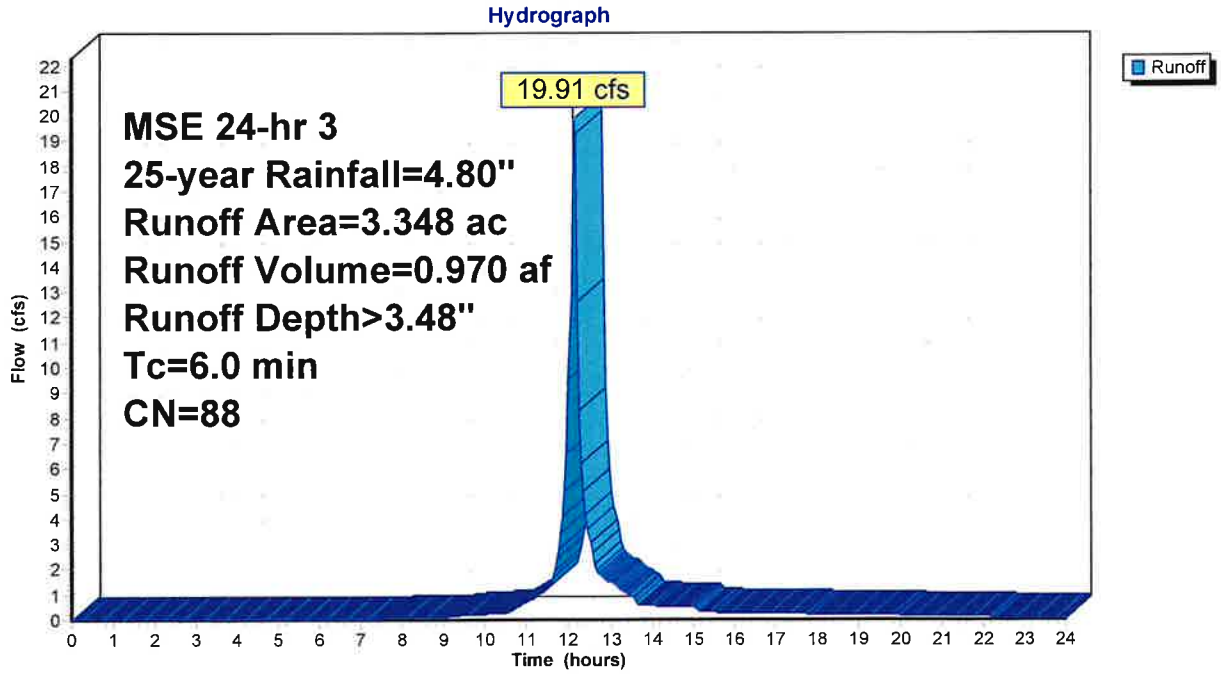
Runoff = 19.91 cfs @ 12.13 hrs, Volume= 0.970 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-year Rainfall=4.80"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

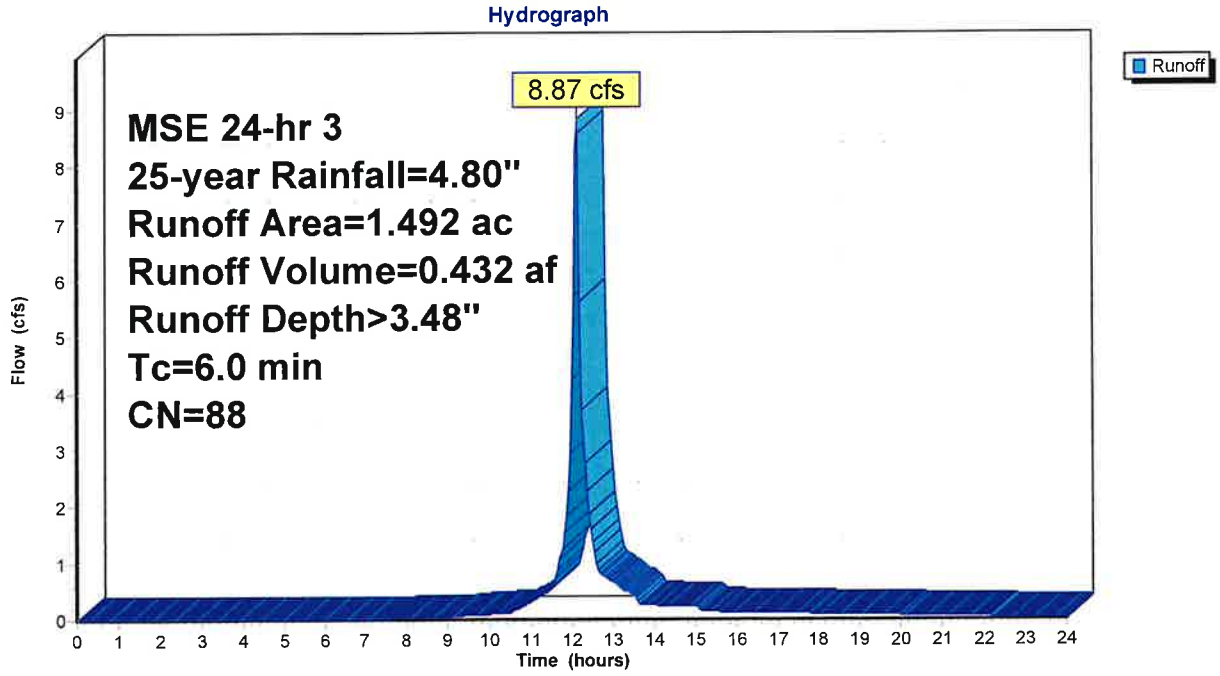
Runoff = 8.87 cfs @ 12.13 hrs, Volume= 0.432 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-year Rainfall=4.80"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

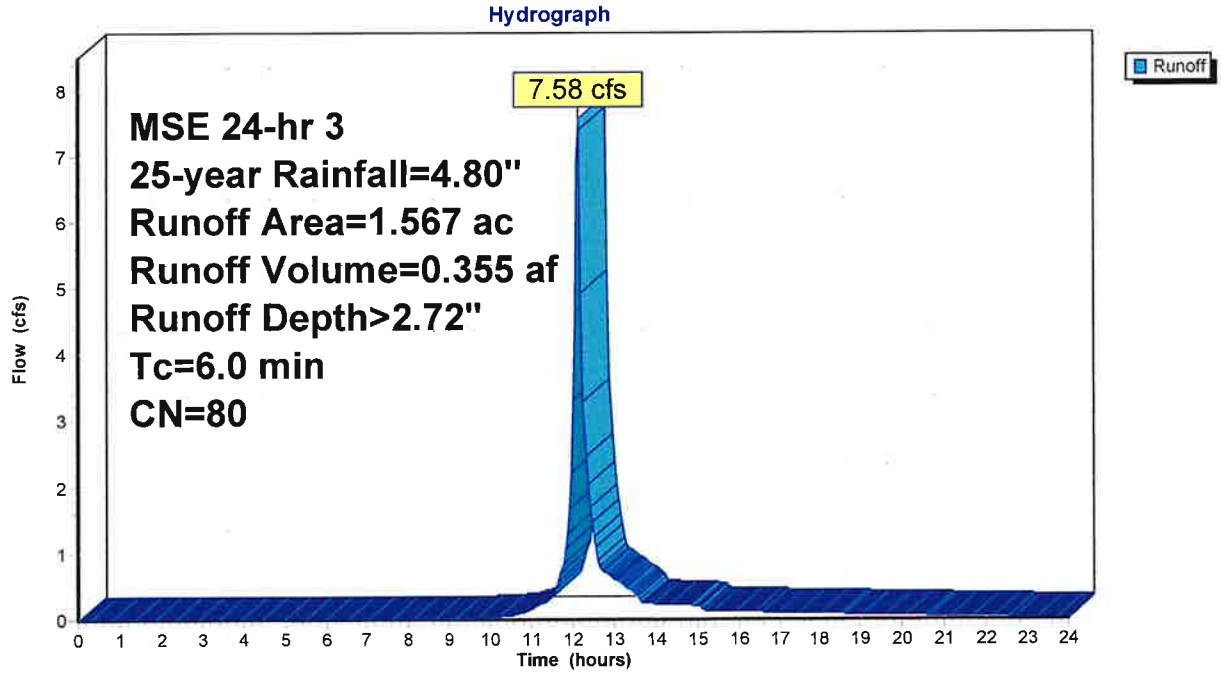
Runoff = 7.58 cfs @ 12.13 hrs, Volume= 0.355 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-year Rainfall=4.80"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



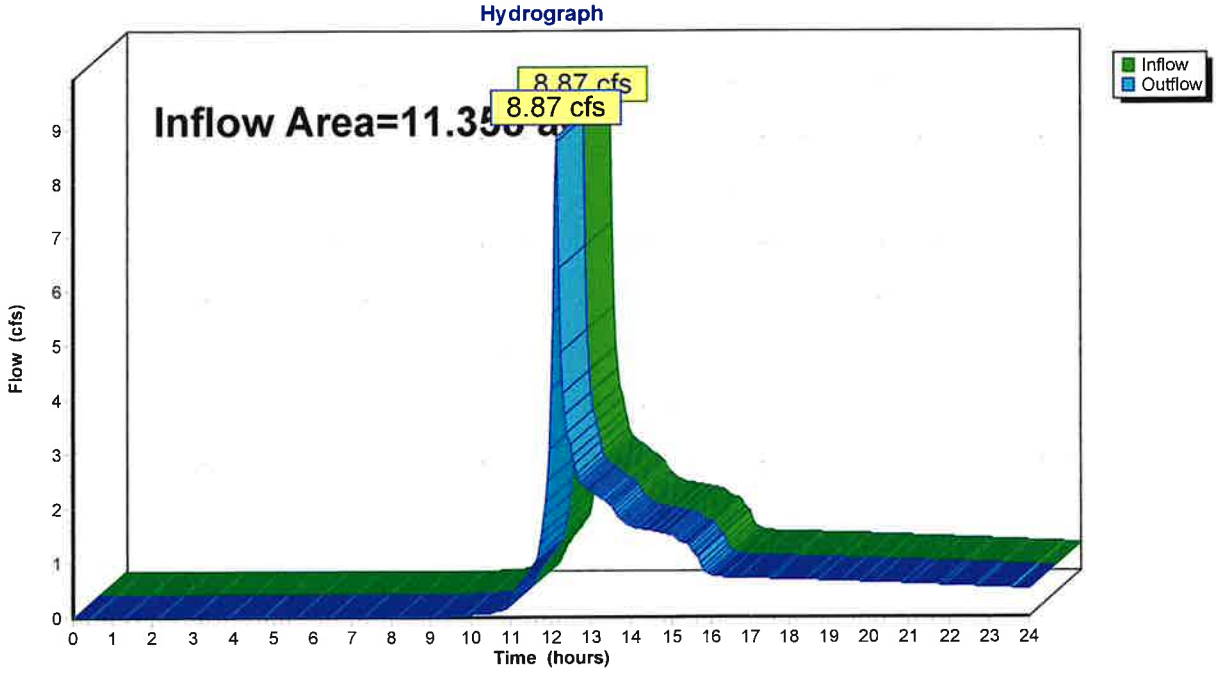
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 1.32" for 25-year event
Inflow = 8.87 cfs @ 12.14 hrs, Volume= 1.253 af
Outflow = 8.87 cfs @ 12.14 hrs, Volume= 1.253 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 3.48" for 25-year event
Inflow = 29.44 cfs @ 12.13 hrs, Volume= 1.435 af
Outflow = 0.33 cfs @ 17.87 hrs, Volume= 0.311 af, Atten= 99%, Lag= 344.3 min
Primary = 0.33 cfs @ 17.87 hrs, Volume= 0.311 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.21' @ 17.87 hrs Surf.Area= 30,906 sf Storage= 51,791 cf

Plug-Flow detention time= 419.5 min calculated for 0.311 af (22% of inflow)
Center-of-Mass det. time= 310.2 min (1,093.8 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

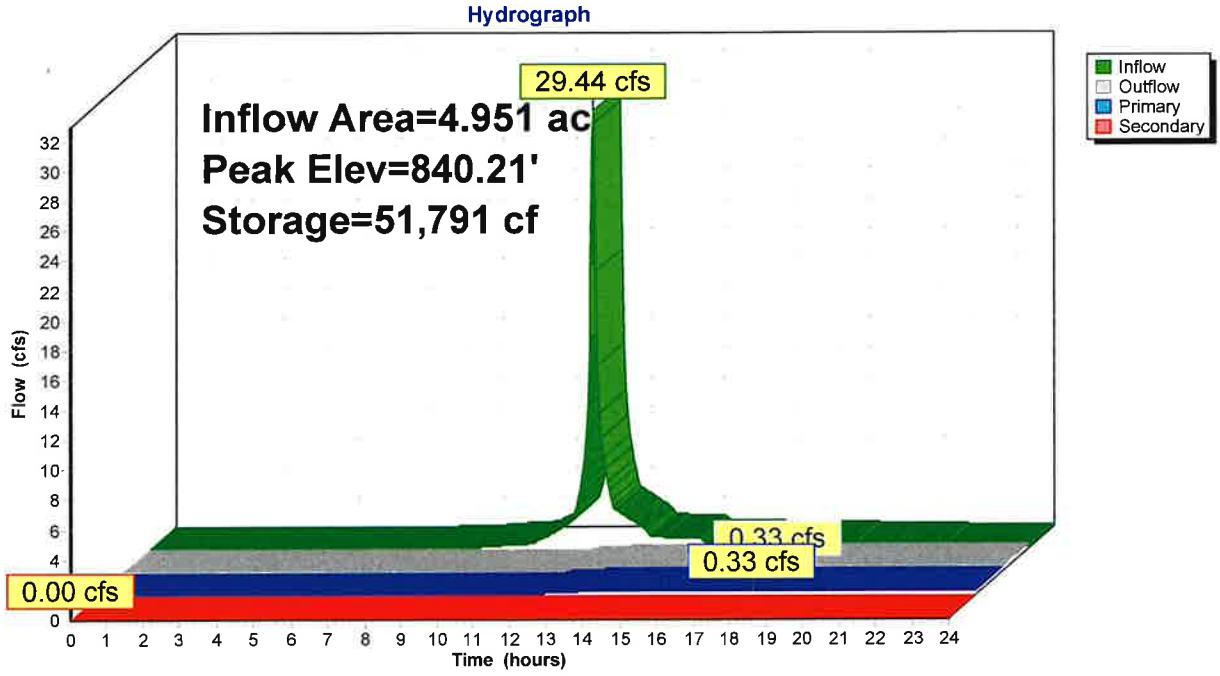
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.33 cfs @ 17.87 hrs HW=840.21' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.33 cfs of 4.39 cfs potential flow)
  - **2=Culvert** (Passes 0.32 cfs of 0.45 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.32 cfs)
  - **4=Orifice/Grate** (Orifice Controls 0.01 cfs @ 1.99 fps)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
- **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 3.48" for 25-year event
Inflow = 19.91 cfs @ 12.13 hrs, Volume= 0.970 af
Outflow = 0.17 cfs @ 19.71 hrs, Volume= 0.175 af, Atten= 99%, Lag= 454.8 min
Primary = 0.17 cfs @ 19.71 hrs, Volume= 0.175 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.74' @ 19.71 hrs Surf.Area= 18,308 sf Storage= 35,639 cf

Plug-Flow detention time= 400.4 min calculated for 0.175 af (18% of inflow)
Center-of-Mass det. time= 282.6 min (1,066.2 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

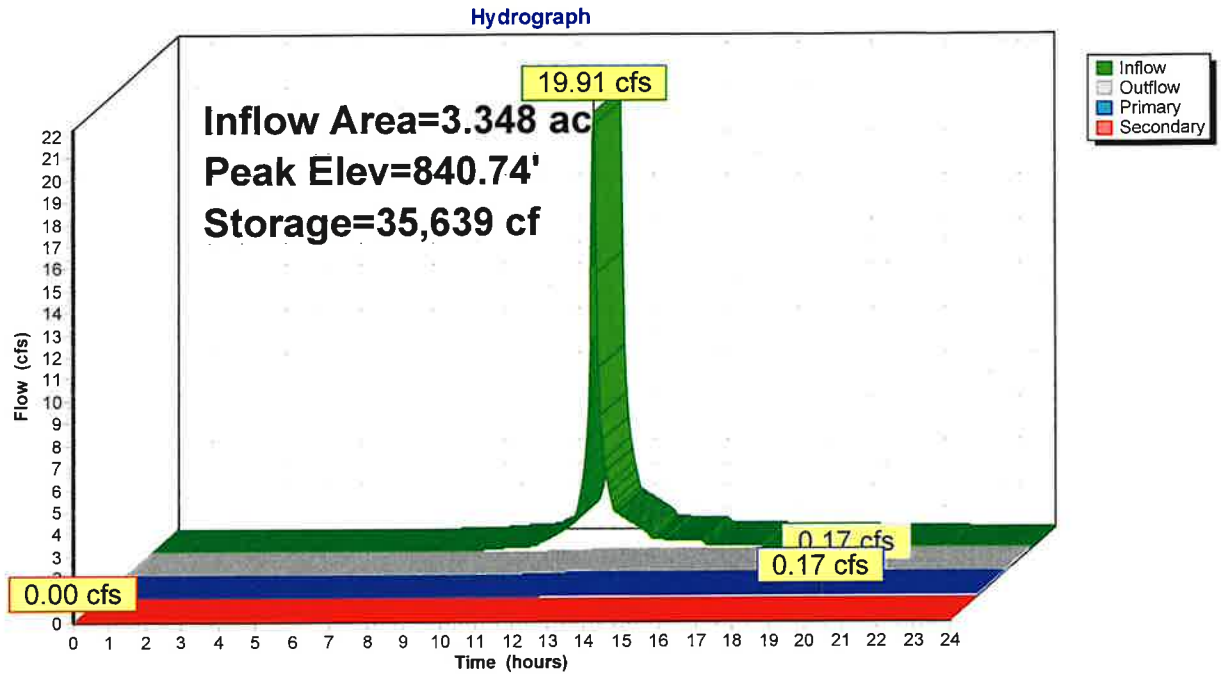
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.17 cfs @ 19.71 hrs HW=840.74' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.17 cfs of 5.66 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 7.85 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 3.48" for 25-year event
Inflow = 8.87 cfs @ 12.13 hrs, Volume= 0.432 af
Outflow = 1.35 cfs @ 12.51 hrs, Volume= 0.412 af, Atten= 85%, Lag= 22.8 min
Primary = 1.35 cfs @ 12.51 hrs, Volume= 0.412 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.67' @ 12.51 hrs Surf.Area= 7,606 sf Storage= 8,423 cf

Plug-Flow detention time= 86.7 min calculated for 0.411 af (95% of inflow)
Center-of-Mass det. time= 63.4 min (847.0 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

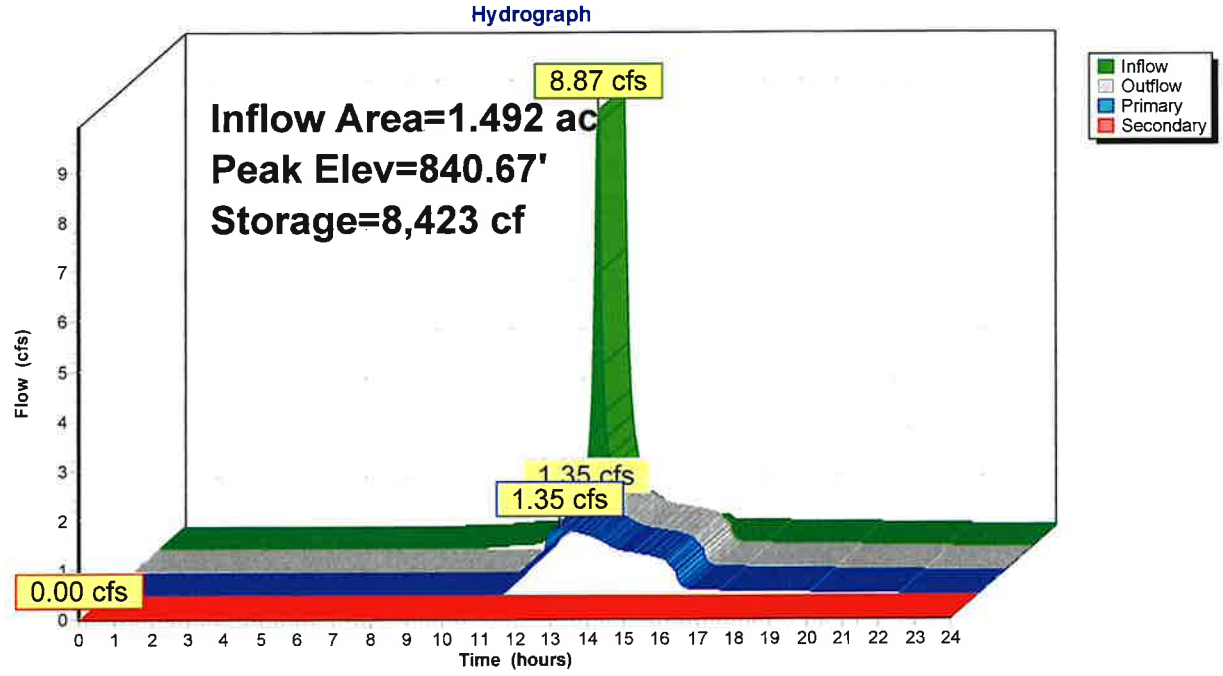
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.35 cfs @ 12.51 hrs HW=840.67' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.35 cfs of 4.74 cfs potential flow)
  └─**2=Culvert** (Barrel Controls 1.05 cfs @ 5.34 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.30 cfs @ 3.42 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3BR: BIO-RETENTION BASIN #3



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>5.16"
Tc=6.0 min CN=88 Runoff=42.58 cfs 2.127 af

Subcatchment2S: SUBCATCHMENT2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>5.16"
Tc=6.0 min CN=88 Runoff=28.79 cfs 1.438 af

Subcatchment3S: SUBCATCHMENT3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>5.16"
Tc=6.0 min CN=88 Runoff=12.83 cfs 0.641 af

Subcatchment4S: SUBCATCHMENT4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>4.28"
Tc=6.0 min CN=80 Runoff=11.72 cfs 0.559 af

Reach 1R: TOTAL RUNOFF Inflow=13.28 cfs 2.319 af
Outflow=13.28 cfs 2.319 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=840.93' Storage=75,944 cf Inflow=42.58 cfs 2.127 af
Primary=0.54 cfs 0.514 af Secondary=0.00 cfs 0.000 af Outflow=0.54 cfs 0.514 af

Pond 2P: STORMWATER POND #2 Peak Elev=841.01' Storage=40,661 cf Inflow=28.79 cfs 1.438 af
Primary=2.88 cfs 0.626 af Secondary=0.00 cfs 0.000 af Outflow=2.88 cfs 0.626 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=841.00' Storage=11,226 cf Inflow=12.83 cfs 0.641 af
Primary=4.08 cfs 0.620 af Secondary=0.00 cfs 0.000 af Outflow=4.08 cfs 0.620 af

Total Runoff Area = 11.358 ac Runoff Volume = 4.766 af Average Runoff Depth = 5.03"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

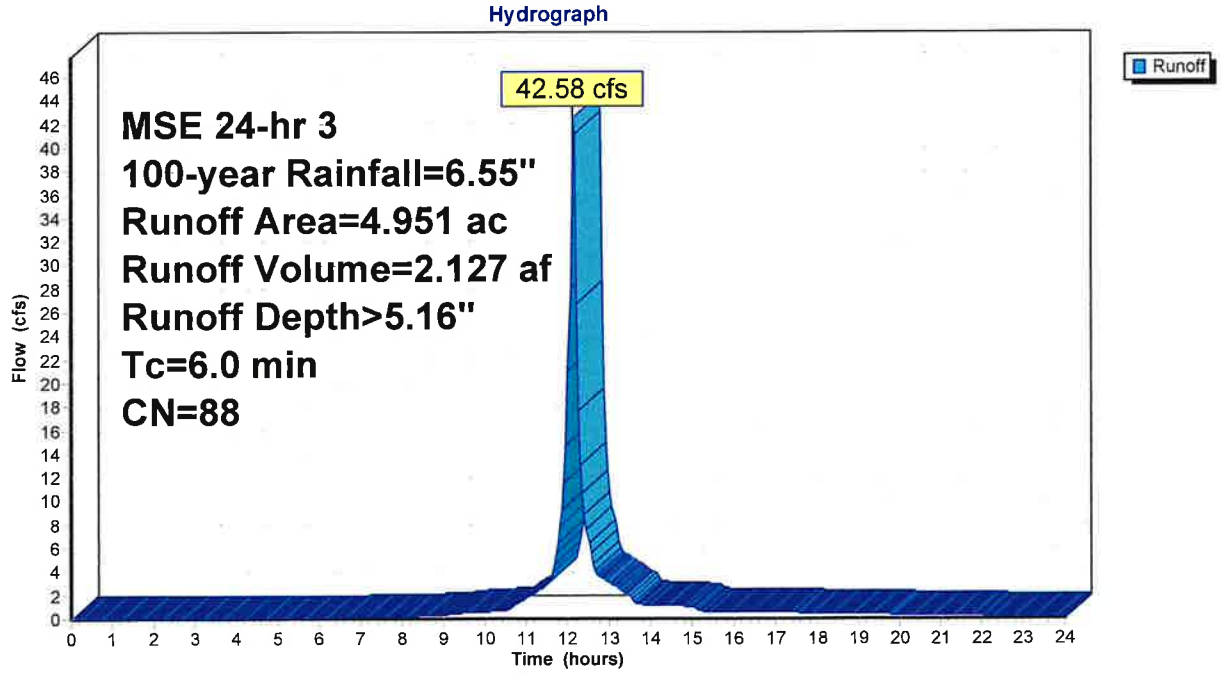
Runoff = 42.58 cfs @ 12.13 hrs, Volume= 2.127 af, Depth> 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.55"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

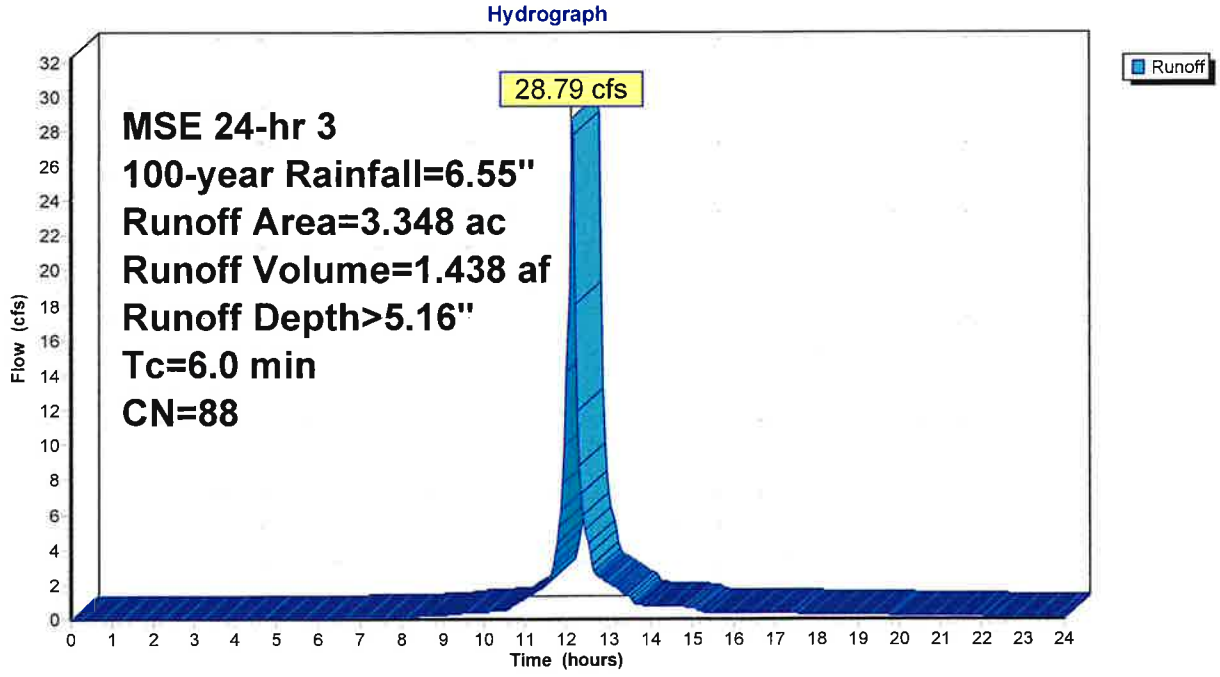
Runoff = 28.79 cfs @ 12.13 hrs, Volume= 1.438 af, Depth> 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.55"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

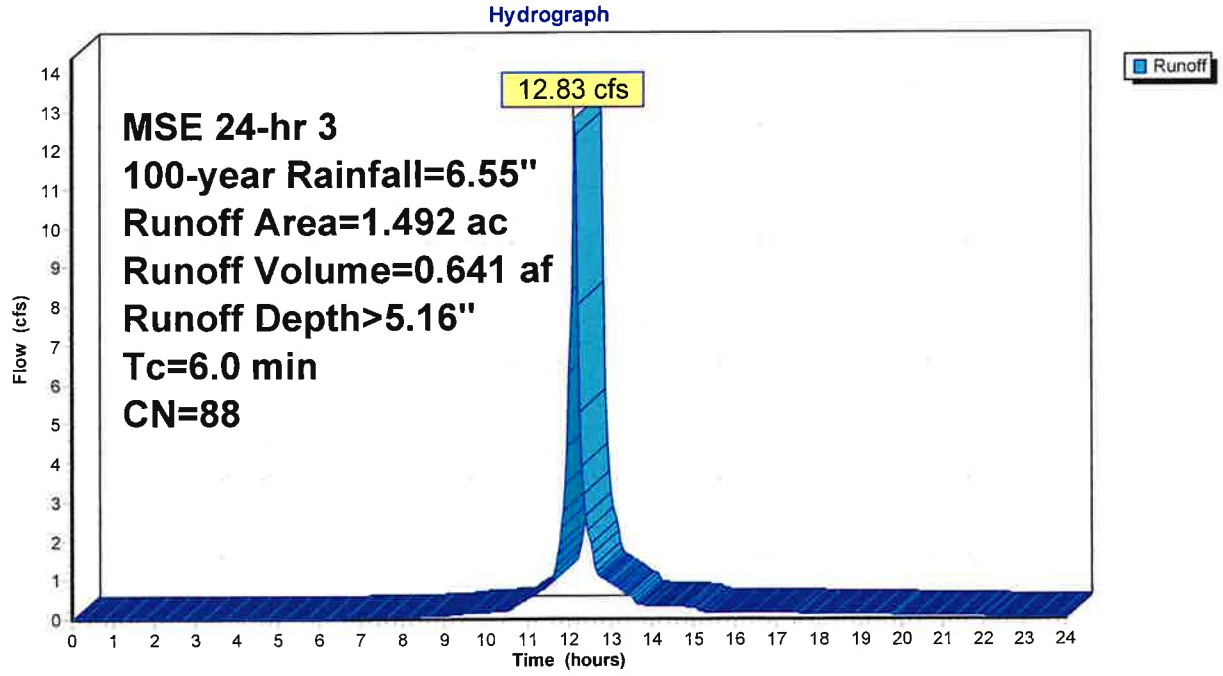
Runoff = 12.83 cfs @ 12.13 hrs, Volume= 0.641 af, Depth> 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.55"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

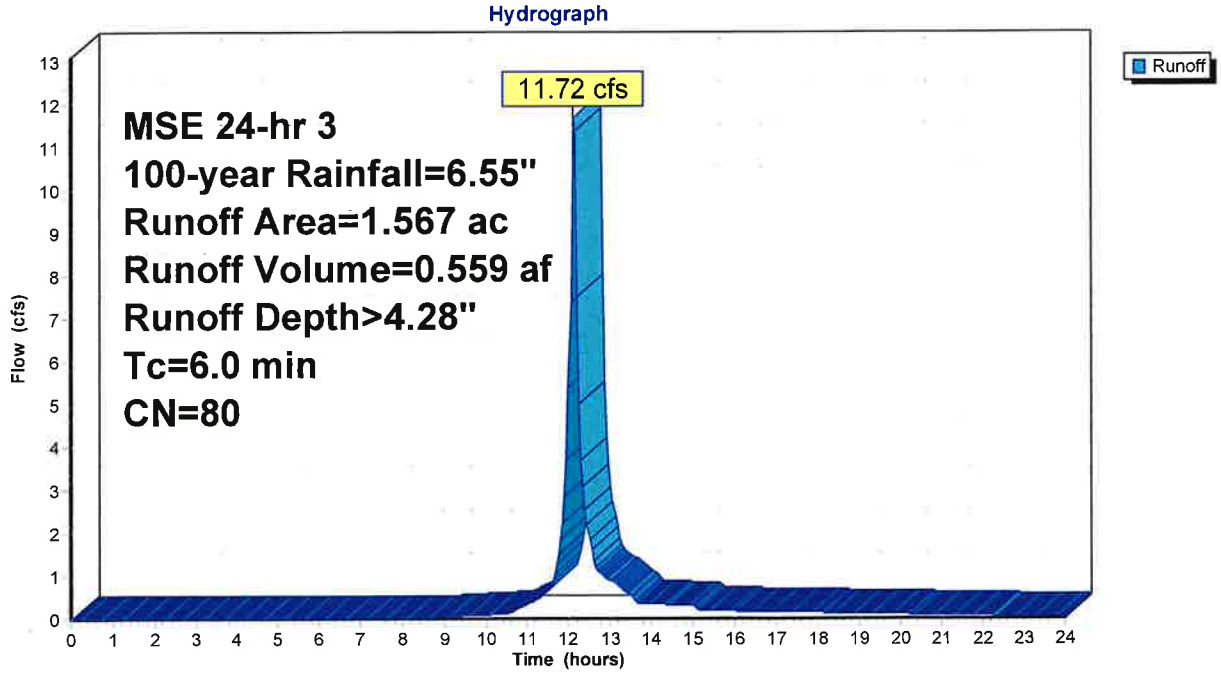
Runoff = 11.72 cfs @ 12.13 hrs, Volume= 0.559 af, Depth> 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.55"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



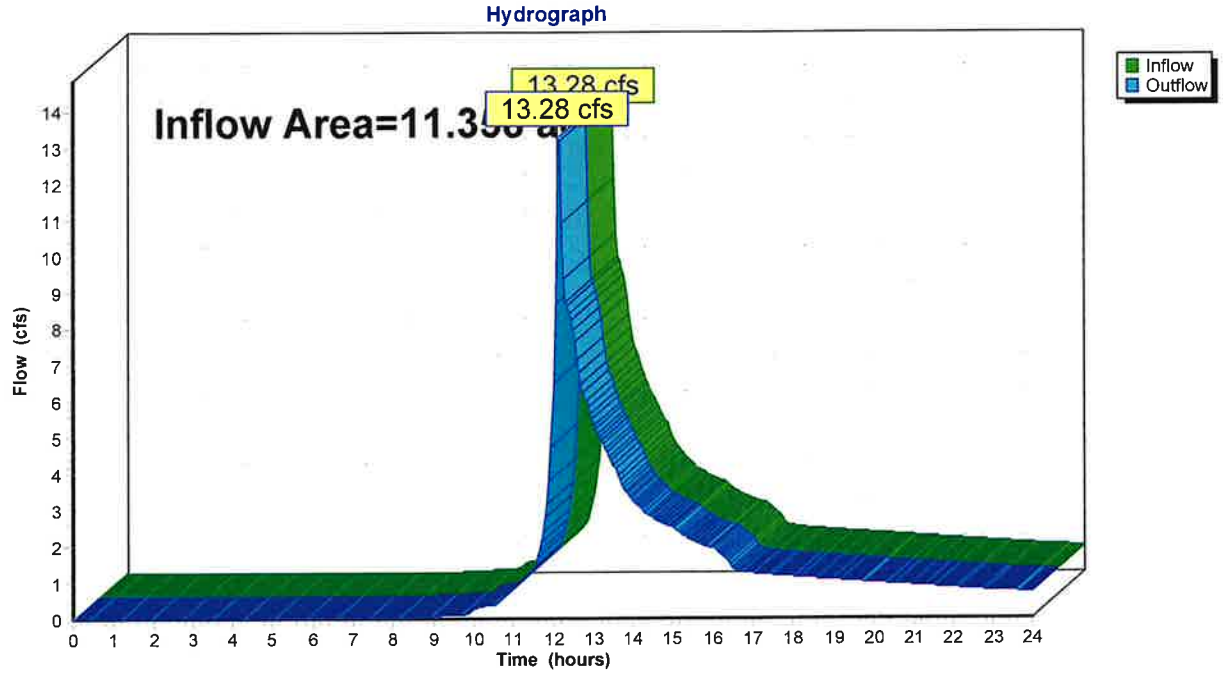
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 2.45" for 100-year event
Inflow = 13.28 cfs @ 12.14 hrs, Volume= 2.319 af
Outflow = 13.28 cfs @ 12.14 hrs, Volume= 2.319 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 5.16" for 100-year event
Inflow = 42.58 cfs @ 12.13 hrs, Volume= 2.127 af
Outflow = 0.54 cfs @ 16.79 hrs, Volume= 0.514 af, Atten= 99%, Lag= 279.9 min
Primary = 0.54 cfs @ 16.79 hrs, Volume= 0.514 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.93' @ 16.79 hrs Surf.Area= 36,295 sf Storage= 75,944 cf

Plug-Flow detention time= 424.2 min calculated for 0.514 af (24% of inflow)
Center-of-Mass det. time= 311.9 min (1,087.7 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

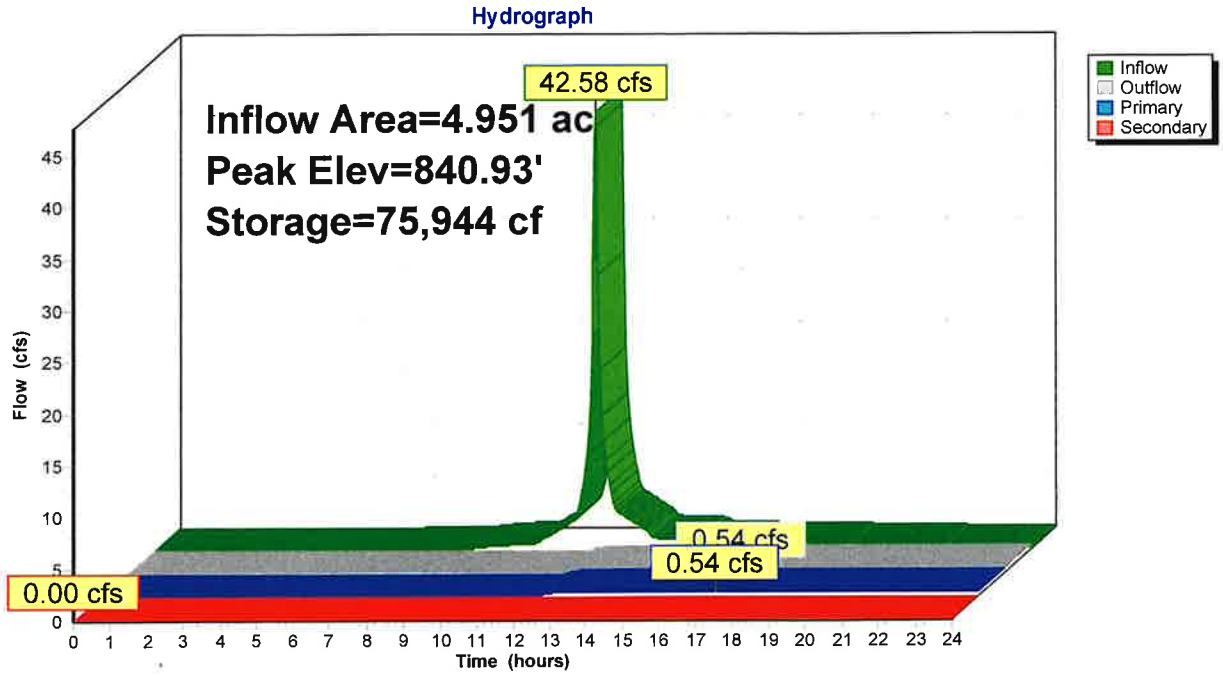
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.54 cfs @ 16.79 hrs HW=840.93' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.54 cfs of 4.92 cfs potential flow)
  └─**2=Culvert** (Barrel Controls 0.51 cfs @ 2.60 fps)
    └─**3=Exfiltration** (Passes 0.51 cfs of 0.53 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.54 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 5.16" for 100-year event
Inflow = 28.79 cfs @ 12.13 hrs, Volume= 1.438 af
Outflow = 2.88 cfs @ 12.64 hrs, Volume= 0.626 af, Atten= 90%, Lag= 30.5 min
Primary = 2.88 cfs @ 12.64 hrs, Volume= 0.626 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 841.01' @ 12.64 hrs Surf.Area= 19,509 sf Storage= 40,661 cf

Plug-Flow detention time= 222.5 min calculated for 0.626 af (43% of inflow)
Center-of-Mass det. time= 136.7 min (912.5 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

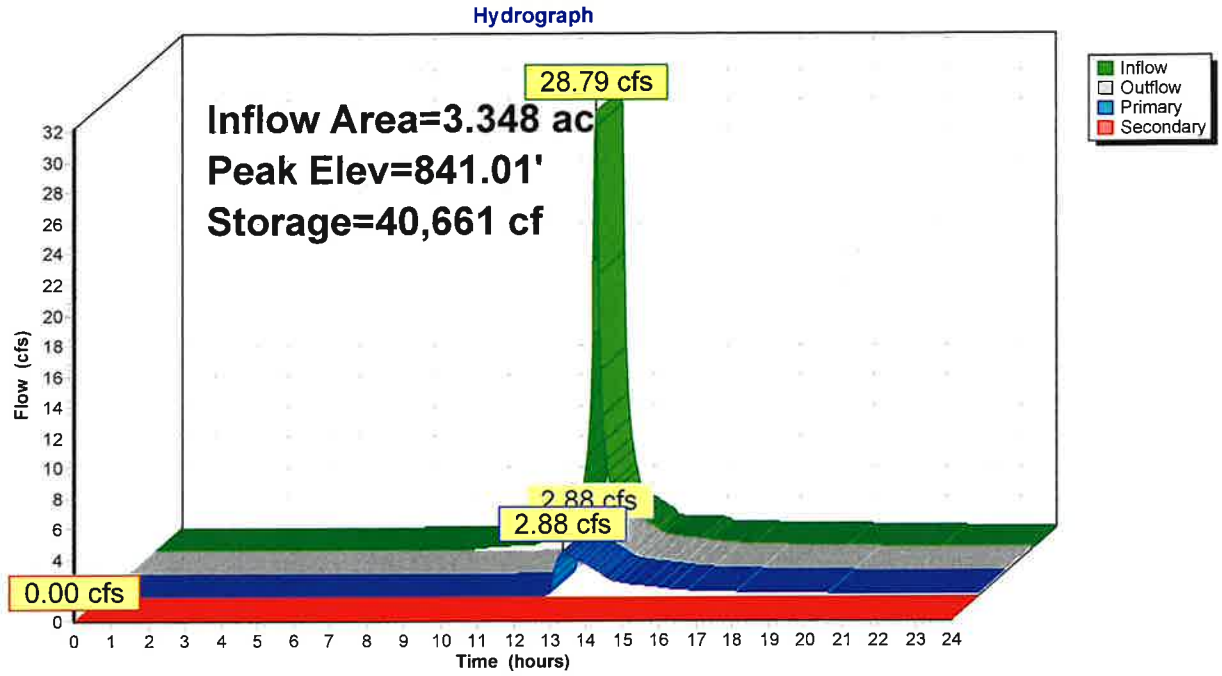
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.88 cfs @ 12.64 hrs HW=841.01' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 2.88 cfs of 5.99 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.23 fps)
—**3=Orifice/Grate** (Weir Controls 2.70 cfs @ 1.66 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 5.16" for 100-year event
Inflow = 12.83 cfs @ 12.13 hrs, Volume= 0.641 af
Outflow = 4.08 cfs @ 12.30 hrs, Volume= 0.620 af, Atten= 68%, Lag= 10.5 min
Primary = 4.08 cfs @ 12.30 hrs, Volume= 0.620 af
Secondary = 0.00 cfs @ 12.30 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 841.00' @ 12.30 hrs Surf.Area= 9,361 sf Storage= 11,226 cf

Plug-Flow detention time= 78.0 min calculated for 0.620 af (97% of inflow)
Center-of-Mass det. time= 60.8 min (836.6 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

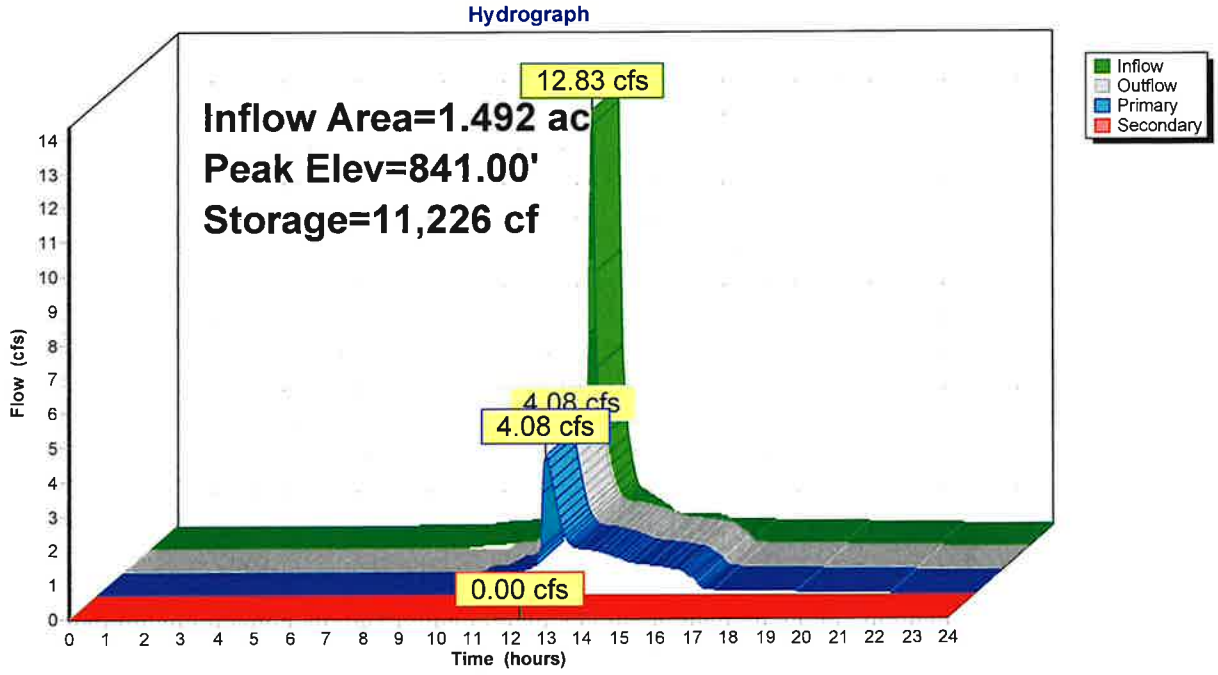
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.07 cfs @ 12.30 hrs HW=841.00' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.07 cfs of 4.97 cfs potential flow)
  ├─**2=Culvert** (Barrel Controls 1.10 cfs @ 5.61 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.38 cfs @ 4.40 fps)
  └─**4=Orifice/Grate** (Weir Controls 2.58 cfs @ 1.64 fps)

Secondary OutFlow Max=0.00 cfs @ 12.30 hrs HW=841.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.10 fps)

Pond 3BR: BIO-RETENTION BASIN #3



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: SUBCATCHMENT 1: TO Runoff Area=4.951 ac 57.67% Impervious Runoff Depth>4.84"
Tc=6.0 min CN=88 Runoff=40.11 cfs 1.996 af

Subcatchment 2S: SUBCATCHMENT 2: TO Runoff Area=3.348 ac 59.89% Impervious Runoff Depth>4.84"
Tc=6.0 min CN=88 Runoff=27.12 cfs 1.349 af

Subcatchment 3S: SUBCATCHMENT 3: TO Runoff Area=1.492 ac 58.11% Impervious Runoff Depth>4.84"
Tc=6.0 min CN=88 Runoff=12.09 cfs 0.601 af

Subcatchment 4S: SUBCATCHMENT 4: Runoff Area=1.567 ac 24.38% Impervious Runoff Depth>3.98"
Tc=6.0 min CN=80 Runoff=10.93 cfs 0.520 af

Reach 1R: TOTAL RUNOFF Inflow=12.51 cfs 2.121 af
Outflow=12.51 cfs 2.121 af

Pond 1BR: BIO-RETENTION BASIN #1 Peak Elev=840.80' Storage=71,180 cf Inflow=40.11 cfs 1.996 af
Primary=0.51 cfs 0.483 af Secondary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.483 af

Pond 2P: STORMWATER POND #2 Peak Elev=840.95' Storage=39,605 cf Inflow=27.12 cfs 1.349 af
Primary=2.07 cfs 0.538 af Secondary=0.00 cfs 0.000 af Outflow=2.07 cfs 0.538 af

Pond 3BR: BIO-RETENTION BASIN #3 Peak Elev=840.95' Storage=10,792 cf Inflow=12.09 cfs 0.601 af
Primary=3.37 cfs 0.581 af Secondary=0.00 cfs 0.000 af Outflow=3.37 cfs 0.581 af

Total Runoff Area = 11.358 ac Runoff Volume = 4.466 af Average Runoff Depth = 4.72"
46.21% Pervious = 5.249 ac 53.79% Impervious = 6.109 ac

Summary for Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1

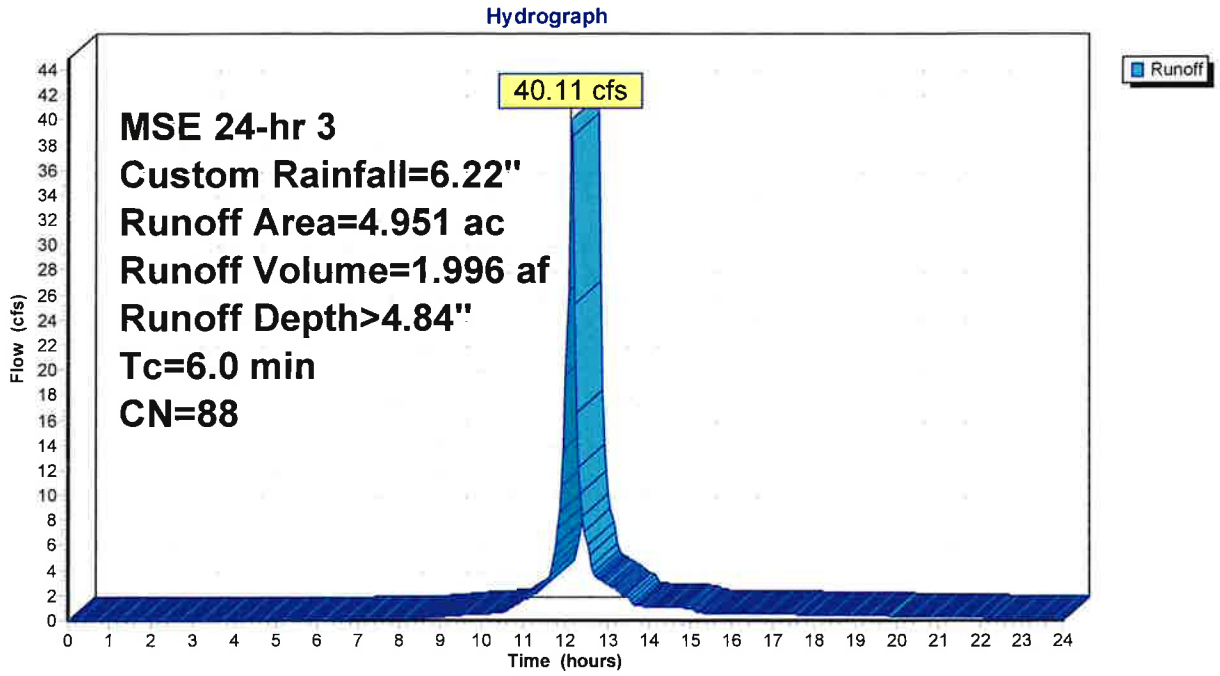
Runoff = 40.11 cfs @ 12.13 hrs, Volume= 1.996 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=6.22"

	Area (ac)	CN	Description
*	1.236	98	Bldg Roof, HSG C
*	1.619	98	Paved parking, HSG C
	2.096	74	>75% Grass cover, Good, HSG C
	4.951	88	Weighted Average
	2.096		42.33% Pervious Area
	2.855		57.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 1S: SUBCATCHMENT 1: TO BIO-RETENTION BASIN #1



Summary for Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2

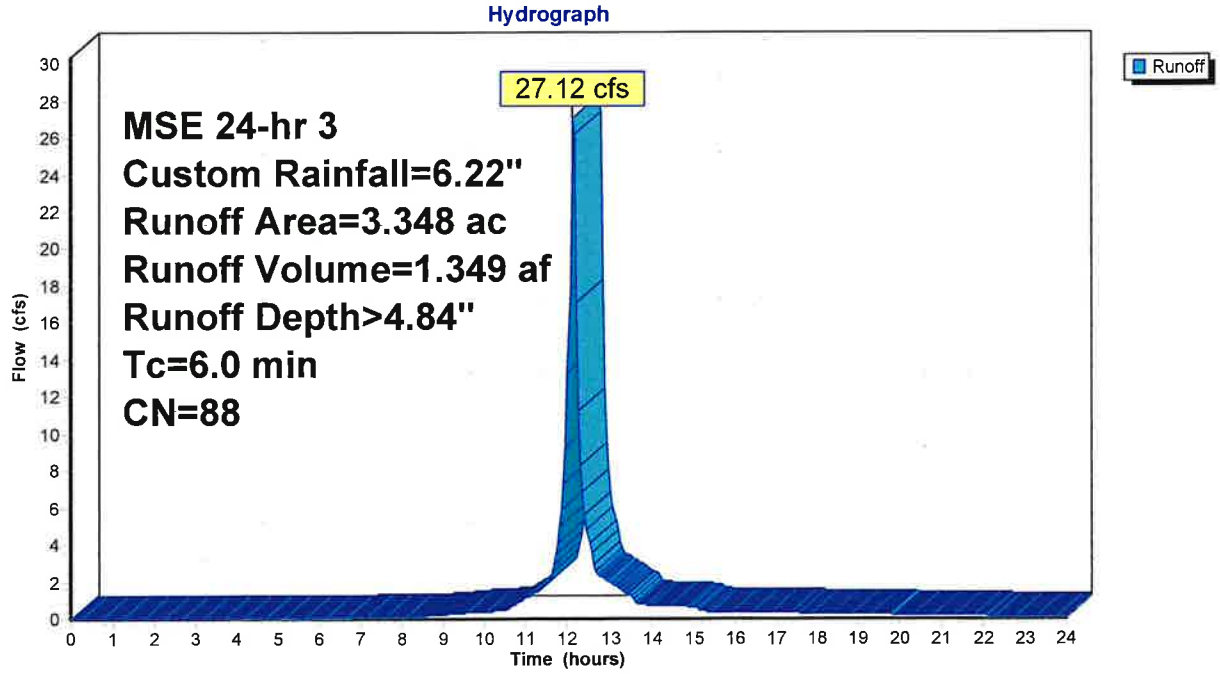
Runoff = 27.12 cfs @ 12.13 hrs, Volume= 1.349 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=6.22"

Area (ac)	CN	Description
0.895	98	Roofs, HSG C
1.343	74	>75% Grass cover, Good, HSG C
0.905	98	Paved parking, HSG C
0.205	98	Water Surface, HSG C
3.348	88	Weighted Average
1.343		40.11% Pervious Area
2.005		59.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TC**

Subcatchment 2S: SUBCATCHMENT 2: TO STORMWATER POND #2



Summary for Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3

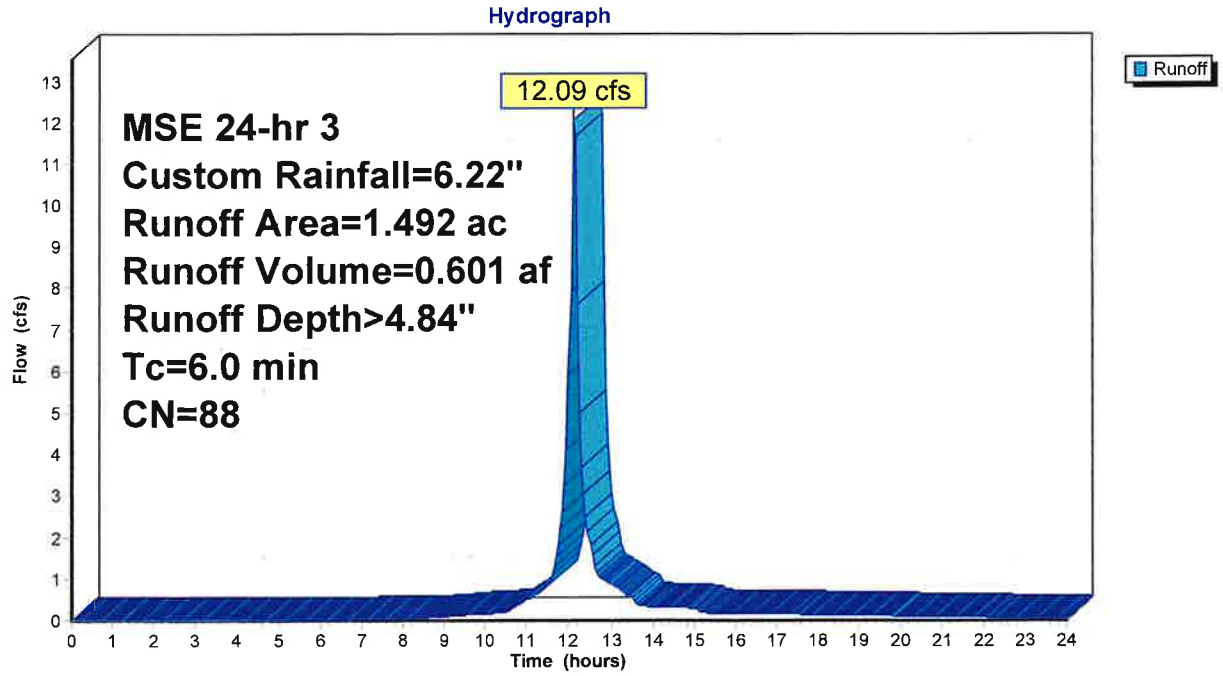
Runoff = 12.09 cfs @ 12.13 hrs, Volume= 0.601 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=6.22"

	Area (ac)	CN	Description
*	0.503	98	Paved parking, HSG C
	0.625	74	>75% Grass cover, Good, HSG C
	0.364	98	Roofs, HSG C
	1.492	88	Weighted Average
	0.625		41.89% Pervious Area
	0.867		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 3S: SUBCATCHMENT 3: TO BIO-RETENTION BASIN #3



Summary for Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED

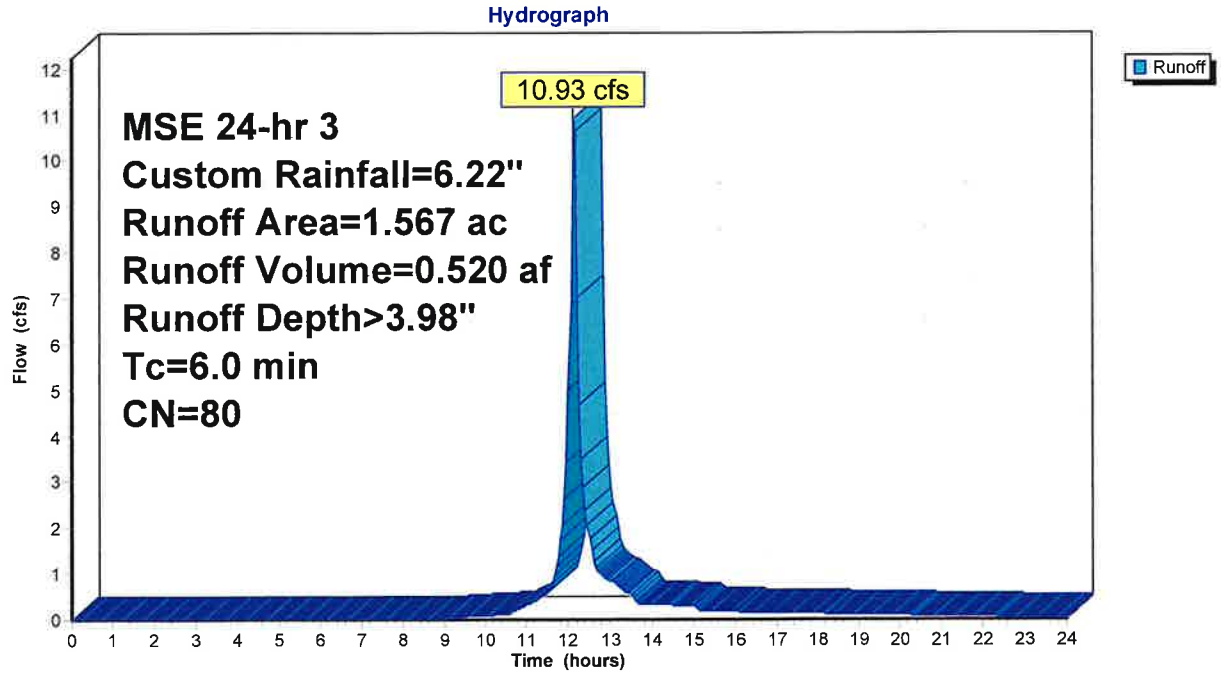
Runoff = 10.93 cfs @ 12.13 hrs, Volume= 0.520 af, Depth> 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=6.22"

	Area (ac)	CN	Description
*	0.279	98	Paved parking, HSG B
	1.185	74	>75% Grass cover, Good, HSG C
	0.103	98	Roofs, HSG C
	1.567	80	Weighted Average
	1.185		75.62% Pervious Area
	0.382		24.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TC**

Subcatchment 4S: SUBCATCHMENT 4: UNDETAINED



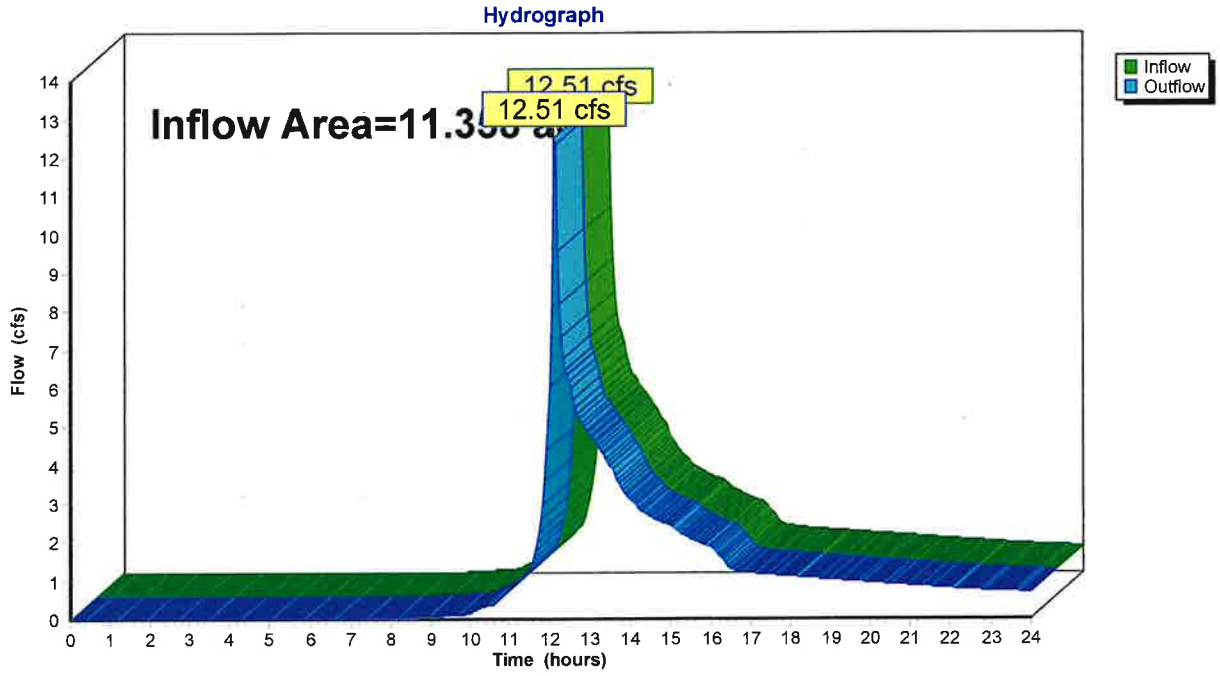
Summary for Reach 1R: TOTAL RUNOFF

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.358 ac, 53.79% Impervious, Inflow Depth > 2.24" for Custom event
Inflow = 12.51 cfs @ 12.14 hrs, Volume= 2.121 af
Outflow = 12.51 cfs @ 12.14 hrs, Volume= 2.121 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF



Summary for Pond 1BR: BIO-RETENTION BASIN #1

Inflow Area = 4.951 ac, 57.67% Impervious, Inflow Depth > 4.84" for Custom event
Inflow = 40.11 cfs @ 12.13 hrs, Volume= 1.996 af
Outflow = 0.51 cfs @ 16.67 hrs, Volume= 0.483 af, Atten= 99%, Lag= 272.5 min
Primary = 0.51 cfs @ 16.67 hrs, Volume= 0.483 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.80' @ 16.67 hrs Surf.Area= 35,297 sf Storage= 71,180 cf

Plug-Flow detention time= 421.3 min calculated for 0.483 af (24% of inflow)
Center-of-Mass det. time= 310.5 min (1,087.5 - 777.1)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	143,934 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

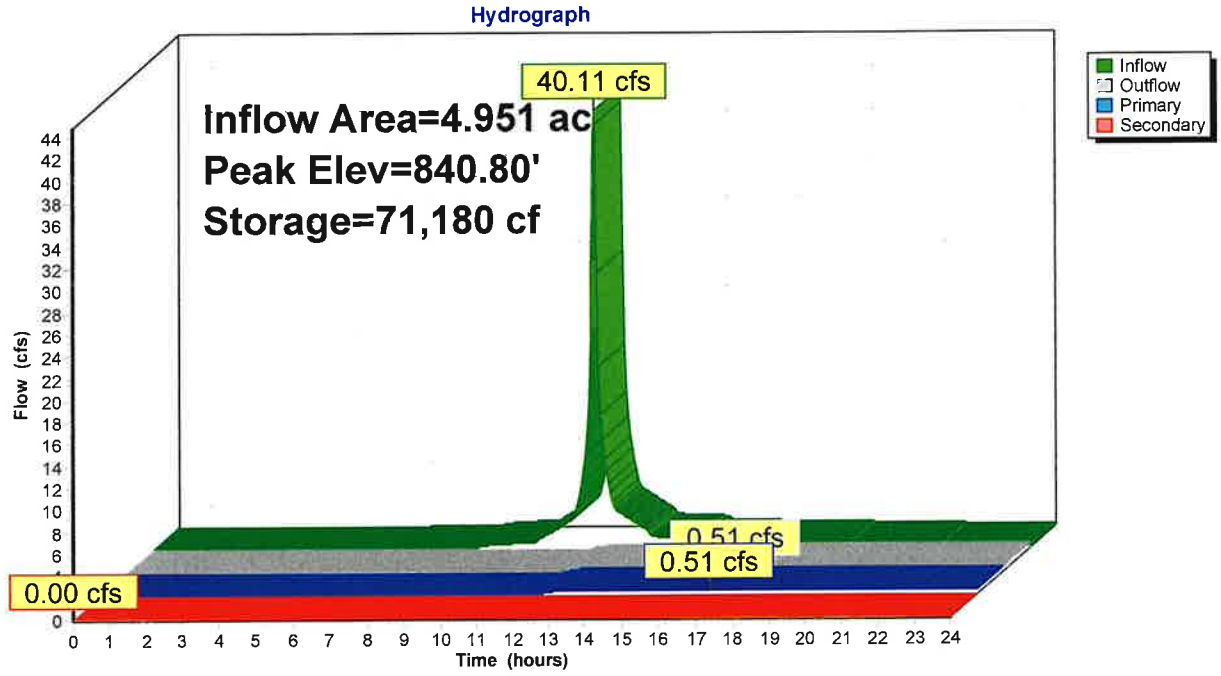
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	22,316	0.0	0	0
836.01	22,316	33.0	74	74
837.00	22,316	33.0	7,291	7,364
837.01	22,316	27.0	60	7,425
838.99	22,316	27.0	11,930	19,355
839.00	22,316	100.0	223	19,578
840.00	29,313	100.0	25,815	45,392
841.00	36,810	100.0	33,062	78,454
842.00	45,695	100.0	41,253	119,706
842.50	51,216	100.0	24,228	143,934

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 836.50' S= 0.0161 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0009 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	837.00'	**1.630 in/hr Exfiltration over Surface area above 837.00'** Excluded Surface area = 22,316 sf
#4	Device 1	840.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	841.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	842.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.51 cfs @ 16.67 hrs HW=840.80' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.51 cfs of 4.83 cfs potential flow)
  └─**2=Culvert** (Passes 0.49 cfs of 0.50 cfs potential flow)
    └─**3=Exfiltration** (Exfiltration Controls 0.49 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.19 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BR: BIO-RETENTION BASIN #1



Summary for Pond 2P: STORMWATER POND #2

Inflow Area = 3.348 ac, 59.89% Impervious, Inflow Depth > 4.84" for Custom event
Inflow = 27.12 cfs @ 12.13 hrs, Volume= 1.349 af
Outflow = 2.07 cfs @ 12.93 hrs, Volume= 0.538 af, Atten= 92%, Lag= 48.1 min
Primary = 2.07 cfs @ 12.93 hrs, Volume= 0.538 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.95' @ 12.93 hrs Surf.Area= 19,270 sf Storage= 39,605 cf

Plug-Flow detention time= 241.5 min calculated for 0.538 af (40% of inflow)
Center-of-Mass det. time= 152.8 min (929.9 - 777.1)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	61,695 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

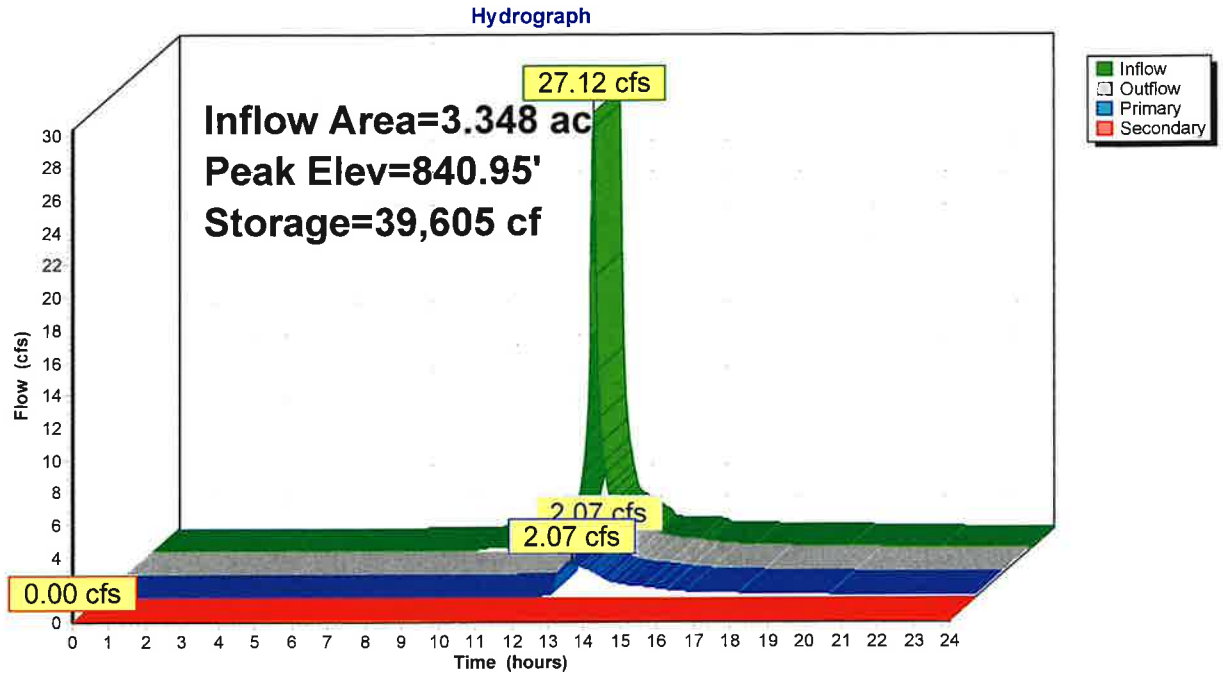
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	8,920	0	0
839.00	11,375	10,148	10,148
840.00	14,920	13,148	23,295
841.00	19,480	17,200	40,495
842.00	22,920	21,200	61,695

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0303 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	838.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	841.10'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.07 cfs @ 12.93 hrs HW=840.95' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 2.07 cfs of 5.92 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.16 fps)
3=Orifice/Grate (Weir Controls 1.89 cfs @ 1.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: STORMWATER POND #2



Summary for Pond 3BR: BIO-RETENTION BASIN #3

Inflow Area = 1.492 ac, 58.11% Impervious, Inflow Depth > 4.84" for Custom event
Inflow = 12.09 cfs @ 12.13 hrs, Volume= 0.601 af
Outflow = 3.37 cfs @ 12.33 hrs, Volume= 0.581 af, Atten= 72%, Lag= 11.9 min
Primary = 3.37 cfs @ 12.33 hrs, Volume= 0.581 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 840.95' @ 12.33 hrs Surf.Area= 9,114 sf Storage= 10,792 cf

Plug-Flow detention time= 80.5 min calculated for 0.581 af (97% of inflow)
Center-of-Mass det. time= 62.4 min (839.4 - 777.1)

Volume	Invert	Avail.Storage	Storage Description
#1	836.00'	22,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

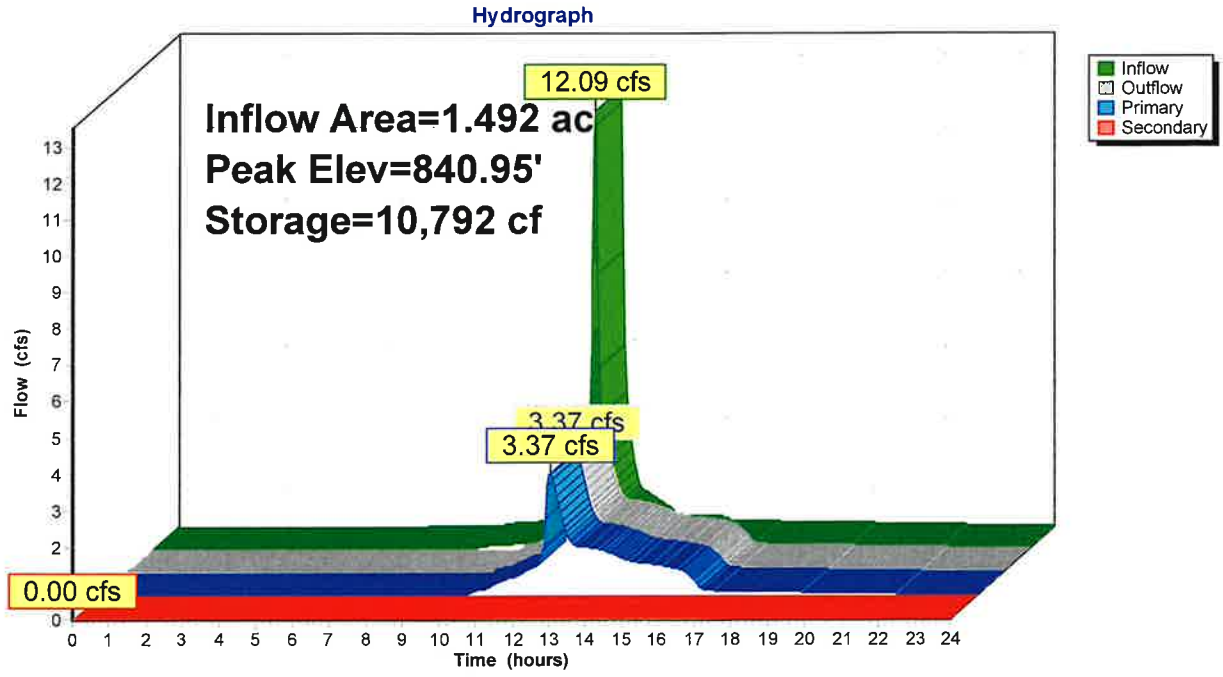
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.00	1,815	0.0	0	0
836.01	1,815	33.0	6	6
837.00	1,815	33.0	593	599
837.01	1,815	27.0	5	604
838.99	1,815	27.0	970	1,574
839.00	1,815	100.0	18	1,592
840.00	4,033	100.0	2,924	4,516
841.00	9,355	100.0	6,694	11,210
842.00	12,800	100.0	11,078	22,288

Device	Routing	Invert	Outlet Devices
#1	Primary	837.00'	**10.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.00' / 832.50' S= 0.0750 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	837.50'	**6.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.50' / 837.00' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 1	840.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	840.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	841.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.35 cfs @ 12.33 hrs HW=840.95' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.35 cfs of 4.94 cfs potential flow)
  └─**2=Culvert** (Barrel Controls 1.09 cfs @ 5.57 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.37 cfs @ 4.27 fps)
  └─**4=Orifice/Grate** (Weir Controls 1.88 cfs @ 1.47 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=836.00' TW=0.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3BR: BIO-RETENTION BASIN #3



Data file name: Z:\WinSLAMM\CJE2364R0.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 07-10-2024 Time: 09:12:42
Site information:

LU# 1 - Residential: Subcatchment 3: To Bioretention Basin #3 Total area (ac): 1.492
1 - Roofs 1: 0.364 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.503 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.625 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Residential: Subcatchment 2: To Stormwater Pond #1 Total area (ac): 3.348
1 - Roofs 1: 0.895 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.905 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.343 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.205 ac. PSD File: Source Area PSD File:

LU# 3 - Residential: Subcatchment 1: To Bioretention Basin #1 Total area (ac): 4.951
1 - Roofs 1: 1.236 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 1.619 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 2.096 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Residential: Subcatchment 4: Undetained Total area (ac): 1.567
1 - Roofs 1: 0.103 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.279 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.185 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Biofilter CP# 1 (DS) - Bioretention Basin #3
1. Top area (square feet) = 12800
2. Bottom aea (square feet) = 1815
3. Depth (ft): 5.5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 1.63
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.27
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
User-Defined Media Type 1.000
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 5
Outlet type: Surface Discharge Pipe
1. Surface discharge pipe outlet diameter (ft): 0.33
2. Pipe invert elevation above datum (ft): 4
3. Number of surface pipe outlets: 1
Outlet type: Drain Tile/Underdrain
1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 1
3. Number of underdrain outlets: 1

Control Practice 2: Biofilter CP# 2 (DS) - Bioretention Basin #1

1. Top area (square feet) = 51216
2. Bottom aea (square feet) = 22316
3. Depth (ft): 6.5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 1.63
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.27
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil
User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 6

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 0.08
2. Pipe invert elevation above datum (ft): 4
3. Number of surface pipe outlets: 1

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 1
3. Number of underdrain outlets: 1

Control Practice 3: Filter Strip CP# 1 (DS) - DS Filter Strips # 1

Total drainage area (acres)= 1.567
Fraction of drainage area served by filter strips (ac) = 0.90
Total filter strip width (ft) = 1200.0
Effective flow length (ft) = 20
Infiltration rate (in/hr)= 0.150
Typical longitudinal slope (ft.H/ft.V) = 0.250
Typical grass height (in) = 4.0
Swale retardance factor = D
Use stochastic analysis to determine infiltration rate: False
Infiltration rate coeficient of variation (COV) = 0.00
Particle size distribution file name: Not needed - calculated by program
Surface Clogging Load (lbs/sf) = 3.50

SLAMM for Windows Version 10.5.0

Data file name: Z:\WinSLAMM\CJE2364R0.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 07-10-2024 Time of run: 09:11:11
Total Area Modeled (acres): 11.358
Years in Model Run: 1.00

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	554361	-	88.96	3079	-
Outfall Total with Controls:	521014	6.02%	16.08	523.1	83.01%
Annualized Total After Outfall Controls:	522446			524.5	

Biofilter # 1 is expected to clog in 8.73 years.. Percent Solids Reduction due to Engineered Media = 80
Biofilter # 2 is expected to clog in 31.4 years.. Percent Solids Reduction due to Engineered Media = 80

Storm Water Practice Maintenance Plan

This exhibit explains the basic function of each of the storm water practices for the Whitewater Muli-Family Development and prescribes the minimum maintenance requirements to remain compliant with this Agreement. The maintenance activities listed below are aimed to ensure these practices continue serving their intended functions in perpetuity. The list of activities is not all inclusive, but rather indicates the minimum type of maintenance that can be expected for this particular site.

STORMWATER POND – WET DETETNION BASIN

System Description:
The wet detention basin is designed to trap 80% of sediment in runoff and maintain pre-development downstream peak flows. The site runoff will either sheet drain to the pond or be captures in inlets and conveyed through a series of stormwater pipes to the basins forebay. The basin has one forebay located at the low end of a grass swale. In addition to runoff conveyance, the grass swale also allow filtration of pollutants, especially from smaller storms. The forebay is 4 feet deep. The forebay will trap coarse sediments in runoff, such as road sands, thus reducing maintenance of the main basin. The main pool will trap the finer suspended sediment. To do this, the pond size, water level and outlet structures must be maintained as specified in this Agreement.

Minimum Maintenance Requirements:
To ensure the proper long-term function of the storm water management practices described above, the following activities must be completed:

1. All outlet pipes must be checked monthly to ensure there is no blockage from floating debris or ice, especially the trash rack in front of the 3-inch orifice and the trash rack on the outlet structure in the main basin. Any blockage must be removed immediately.
2. Grass swales shall be preserved to allow free flowing of surface runoff in accordance with approved grading plans. No buildings or other structures are allowed in these areas. No grading or filling is allowed that may interrupt flows in any way.
3. Grass swales, inlets and outlets must be checked after heavy rains (minimum of annually) for signs of erosion. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the downstream forebay or basin. Erosion matting is recommended for repairing grassed areas.
4. NO trees are to be planted or allowed to grow on the earthen berms. Tree root systems can reduce soil compaction and cause berm failure. The berms must be inspected annually and any woody vegetation removed.
5. Invasive plant and animal species shall be managed in compliance with Wisconsin Administrative Code Chapter NR 40. This may require eradication of invasive species in some cases.
6. If the permanent pool falls below the safety shelf, a review shall be performed to determine whether the cause is liner leakage or an insufficient water budget. If the cause is leakage, the liner shall be repaired. Leakage due to muskrat burrows may require removal of the animals, repair of the liner with clay, and

embedding wire mesh in the liner to deter further burrowing. If the permanent pool cannot be sustained at the design elevation, benching of the safety shelf may be necessary.

7. If floating algae or weed growth becomes a nuisance (decay odors, etc.), it must be removed from the basin or the forebay and deposited where it cannot drain back into the basin. Removal of the vegetation from the water reduces regrowth the following season (by harvesting the nutrients). Wetland vegetation must be maintained along the waters edge for safety and pollutant removal purposes.
8. If mosquitoes become a nuisance, the use of mosquito larvicide containing naturally-occurring Bti soil bacteria is recommended.
9. When sediment in the forebay or the basin has accumulated to an elevation of three feet below the outlet elevation, it must be removed. All removed sediment must be placed in an appropriate upland disposal site and stabilized (grass cover) to prevent sediment from washing back into the basin. The forebays will likely need sediment removal first. Failure to remove sediment from the forebays will cause resuspension of previously trapped sediments and increase downstream deposition.
10. No grading or filling of the basin or berm other than for sediment removal is allowed, unless otherwise approved by the City of Whitewater.
11. Periodic mowing of the grass swales will encourage vigorous grass cover and allow better inspections for erosion. Waiting until after August 1 will avoid disturbing nesting wildlife. Mowing around the basin or the forebay may attract nuisance populations of geese to the property and is not necessary or recommended.
12. Any other repair or maintenance needed to ensure the continued function of the storm water practices or as ordered by the City of Whitewater under the provisions listed on page 1 of this Agreement.
13. Aerators/Fountains – If an aerator or fountain is desired for visual and other aesthetic effects (aerators designed to mix the contents of the pond are prohibited) they must meet all of the items below:
    - i. Use an aerator/fountain that does not have a depth of influence that extends into the sediment storage depth (i.e. more than three feet below the normal water surface).
    - ii. If the water surface drops due to drought or leakage, the aerator / fountain may not be operated until the water rises enough for the depth of influence to be above the sediment storage layer. Therefore, if the depth of influence of the aerator / fountain is two feet, the water surface must be within one foot or less of the lowest pond outlet.
    - iii. Provide an automatic shut-off of the aerator/fountain as the pond starts to rise during a storm event. The aerator/fountain must remain off while the pond depth returns to the permanent pool elevation and, further, shall remain off for an additional 48 hours, as required for the design micron particle size to settle to below the draw depth of the pump.
    - iv. Configure the pump intake to draw water primarily from a horizontal plane so as to minimize the creation of a circulatory pattern from bottom to top throughout the pond

BIORETENTION BASIN

System Description:

The storm water management facility includes a bioretention basin. The basin is designed to reduce peak flows and reduce runoff total suspended solids (TSS) from the site by intercepting the runoff and allowing it to seep (infiltrate) into the engineered soil layer and through the perforated under-drain pipe. To function correctly, the bioretention basin size, depth, outlet manhole and under-drain pipe must be maintained as specified in this Agreement.

Minimum Maintenance Requirements:

To ensure the proper function of the bioretention basin, the following list of maintenance activities are required to be performed by the owner or authorized qualified representative:

1. A minimum of 70% soil cover made up of plants must be maintained on the bioretention basin bottom. The basin sides shall be a turf grass. Maintain plants and grasses per qualified landscape contractor recommendations.
2. Seasonal (early spring) inspection of the soil surface for the presence of sodium accumulation due to the introduction of chlorides for winter maintenance of the parking lot should occur. It is also recommended that the soil be flushed with 1" of clean water 3-4 times each spring. Consider reducing sodium/salting or use sodium alternatives.
3. The basin and all components (outlet manhole, outlet pipe, vegetation and spillway) should be inspected after each heavy rain of 1.5" or more. If the basin is not draining properly (within 72 hours), further inspection may be required by persons with expertise in storm water management and/or soils.
4. If basin is not draining, the 6" drain tile should be cleared of any blockages or obstructions. Clear blockages in the underdrain pipe, if present through the underdrain cleanout. Expose the stone and soil immediately around the pipe, clear blockages and replace per approved design. Also examine outlet orifice through the dual treated planks within the pond outlet manhole. Remove any sediment accumulated within the manhole and orifice.

5. If soil testing shows that the soil surface has become crusted, sealed or compacted, Engineered soil should be replaced. Expose 6" drain tile and verify it is clear of obstructions. Remove and replace engineered soil per WDNR specifications. Replace bioretention plantings per approved Landscape Plan for the project.
6. If sedimentation is determined to be causing the failure, the accumulated sediment must be removed and the area replanted in accordance with the approved Landscape Plan for the project. Sediment removed shall be deposited offsite at an appropriate soil disposal facility.
7. All outlet pipes, other flow control devices within the basin outlet manhole must be kept free of debris. Any blockage must be removed immediately.
8. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the system. Erosion matting is recommended for repairing grassed areas.
9. Heavy equipment and vehicles must be kept off of the bottom and side slopes of bioretention basin to prevent soil compaction. Soil compaction will reduce infiltration and may cause failure of the basin, resulting in ponding and possible growth of wetland plants.
10. No unauthorized trees are to be planted or allowed to grow on the earthen berms or bottom of the basin. On the berms, tree root systems can reduce soil compaction and cause berm failure. On the basin bottom, trees may shade out the native grasses. Woody vegetation must be removed.
11. Check for invasive species growth and remove per species specific recommended practices.
12. No grading or filling of the basin or berms other than for sediment removal is allowed.
13. Inspections should be performed per City requirements. An inspection form must be completed and documented by a qualified person that represents the Owner. Any needed maintenance must be documented and scheduled for immediate repair. All repairs must be documented, preferably with photographs.
14. Snow shall not be dumped directly onto the conditioned planting bed.

15. See chart below for maintenance activity and frequency:

Activity	Frequency
Water Plants	As necessary
Water as	As needed after
Re-mulch	As needed
Treat	As needed
Inspect soil	Monthly
Remove	Monthly
Add	Once per year