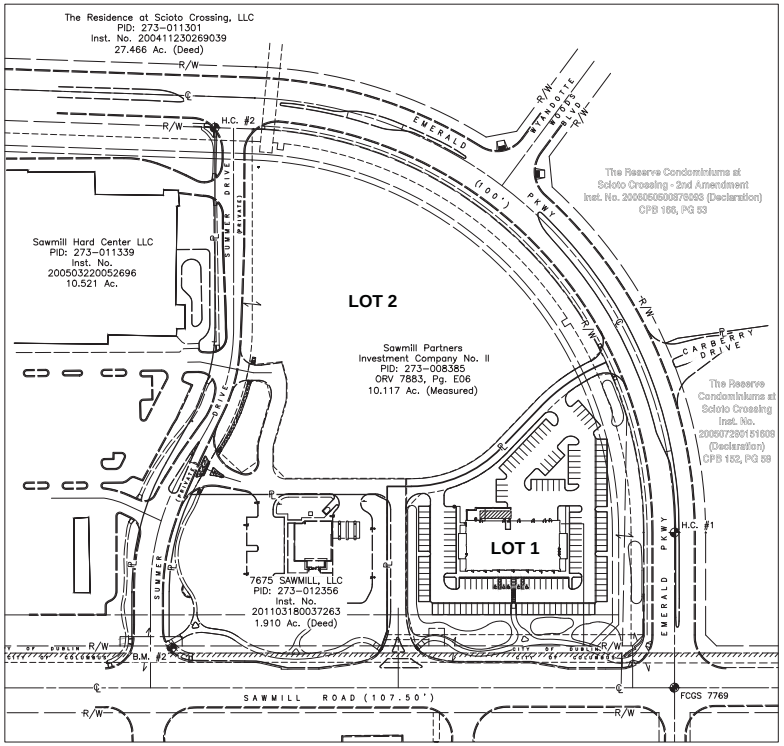
FINAL DEVELOPMENT PLAN

NORTHSTAR REALTY

CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

2015



INDEX MAP
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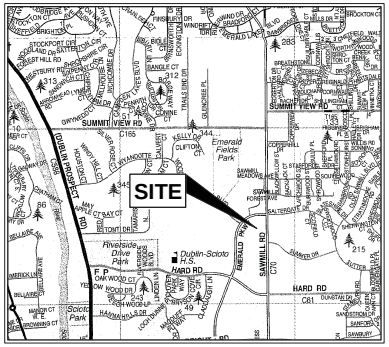

VICINITY MAP
N.T.S.

SHEET INDEX

TITLE SHEET. 1
GENERAL NOTES. 2
SITE IMPROVEMENT/UTILITY PLAN. 3
GRADING PLAN 4
EXISTING CONDITIONS. 5
DETAILS. 6

SITE DATA TABLE

AREA CALCULATIONS:

PRIVATE DEVELOPMENT AREA: 3.19 ACRES
RIGHT-OF-WAY IMPROVEMENTS AREA: 0.11 ACRES
TOTAL IMPROVEMENTS AREA: 3.65 ACRES
BIKE PATH IMPROVEMENTS: 0.21 ACRES
PERCENTAGE PUBLIC DEDICATED OR RIGHT OF WAY: 0.0% (0.00 ACRE)

PUBLIC STREETS: 0.00 ACRE
COMMON DRIVEWAYS: 0.40± ACRES
OPEN SPACE (LANDSCAPE & PONDS): 1.22 ACRES
DWELLING UNITS: N/A

BUILDING AREA: 12,000 S.F.

PARKING DATA:
STANDARD SPACES: 146
ACCESSIBLE SPACES: 5
TOTAL PARKING SPACES PROVIDED: 151
LOADING SPACES PROVIDED: 1

REQUIRED PARKING:
RESTAURANT: 3600 S.F. @1/50 = 72
PATIO: 1020 S.F. @1/50 = 21
RETAIL: 7200 S.F. @ 1/150 = 48
STORAGE: 1200 S.F. @ 1/200 = 6
TOTAL REQUIRED: 147
LOADING SPACES REQUIRED: 1

53,720± S.F. PAVEMENT ON RETAIL SITE
17,200± S.F. PAVEMENT FOR SHARED DRIVES
70,920± S.F. TOTAL PAVEMENT

PUBLIC IMPROVEMENTS TO SAWMILL ROAD (ACCESS POINT & BIKE PATH) AND A MINOR SANITARY SEWER EXTENSION ARE PROPOSED AS PART OF THIS DEVELOPMENT PLAN.

CODE REFERENCE: SECTION 153.212 OF DUBLIN CITY CODE

BENCHMARKS:

ALL BENCH MARKS AND ELEVATIONS SHOWN UPON THIS PLAN ARE BASED ON THE (NAVD88) NORTH AMERICAN VERTICAL DATUM OF 1988.

B.M. DESIGNATION "FCGS 7769"
ALUMINUM CAP IN CONCRETE MONUMENT, AT THE CENTERLINE OF CONSTRUCTION INTERSECTION OF SAWMILL ROAD WITH THE CENTERLINE OF RIGHT OF WAY OF SALTERGATE DRIVE (STA 143+33.10 1987 PLANS), ACCESS THROUGH F.C. ROAD MONUMENT BOX.
N 774347.09, E 1803483.61
ELEV. 907.53

B.M. # 1
CHISELED "X" ON S. SIDE OF METAL SIGNAL POLE BASE @ INTERSECTION OF SAWMILL ROAD AND EMERALD PARKWAY.
ELEV. 907.49

B.M. # 2
CHISELED "X" ON NW BOLT OF METAL SIGNAL POLE @ NW CORNER OF SAWMILL ROAD AND SUMMER DRIVE.
ELEV. 903.16

HORIZONTAL CONTROL
H.C. #1
SPINDLE FOUND IN THE CENTERLINE OF EMERALD PARKWAY AND LOCATED 250 FEET WEST OF THE CENTERLINE INTERSECTION OF SAWMILL ROAD AND EMERALD PARKWAY.
N 774358.54, E 1803234.06

H.C. #2
MAG NAIL FOUND AT INTERSECTION OF THE EASTERLY RIGHT-OF-WAY LINE OF EMERALD PARKWAY AND THE SOUTHERLY LINE OF SUMMER DRIVE.
N 773648.77, E 1802549.40

BASIS OF BEARING:

STATE PLANE COORDINATE SYSTEM (NAD 83, OHIO SOUTH ZONE, ADJUSTED 1986), BEING N 02°34'54" E, BETWEEN "FCGS 7772" AND "FCGS 7769" AS PUBLISHED BY THE FRANKLIN COUNTY ENGINEER.

E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

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Ohio Utilities Protection Service
Call before You Dig.
800-362-2764 or 8-1-1
www.oupsi.org

REVISIONS

NO.	DATE	DESCRIPTION	BY

SHEET NO.	OF
1	6

PROJECT 1081.001

DATE: 04/16/15

Drawing: M:\1081001_Northstar Realty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-16-15 07: Revised by: epost -LTscale: 1 -Plot scale 1=1 MS/PS

CITY OF DUBLIN STANDARD NOTES

GENERAL NOTES

1. City of Columbus and Ohio Department of Transportation Construction and Material Specifications, current editions, and any supplements thereto (hereafter referred to as Standard Specifications), shall govern all construction items unless otherwise noted. If a conflict between specifications is found, the more strict specification will apply as decided by the City Engineer. Item Numbers listed refer to City of Columbus Item Numbers unless otherwise noted.

2. The City Engineer will not be responsible for means, methods, procedures, techniques, or sequences of construction that are not specified herein. The City Engineer will not be responsible for safety on the work site, or for failure by the Contractor to perform work according to contract documents.

3. The Developer or Contractor shall be responsible to obtain all necessary permits including but not limited to Ohio EPA Permits to Install (PTI) and Notices of Intent (NOI), Building Permits, etc.

4. The Contractor shall notify the City of Dublin Division of Engineering in writing at least 3 working days prior to beginning construction.

5. The Contractor shall be solely responsible for complying with all federal, state and local safety requirements including the Occupational Safety and Health Act of 1970. The Contractor shall exercise precaution always for the protection of persons (including employees) and property. It shall also be the sole responsibility of the Contractor to initiate, maintain and supervise all safety requirements, precautions and programs in connection with the work, including the requirements for confined spaces per 29 CFR 1910.146.

6. Following completion of construction of the site improvements and before requesting occupancy, a proof survey shall be provided to the Division of Engineering that documents "as-built" elevations, dimensions, slopes and alignments of all elements of this project. The proof survey shall be prepared, signed and submitted by the Professional Engineer who sealed the constructions drawings.

7. The Contractor shall restrict construction activity to public right-of-way and areas defined as permanent and/or temporary construction easements, unless otherwise authorized by the City Engineer.

8. The Contractor shall carefully preserve benchmarks, property corners, reference points, stakes and other survey reference monuments or markers. In cases of willful or careless destruction, the Contractor shall be responsible for restorations. Resetting of markers shall be performed by an Ohio Professional Surveyor as approved by the City Engineer.

9. Non-rubber tired vehicles shall not be moved on or across public streets or highways without the written permission of the City Engineer.

10. The Contractor shall restore all disturbed areas to equal or better condition than existed before construction. Drainage ditches or watercourses that are disturbed by construction shall be restored to the grades and cross-sections that existed before construction.

11. Tracking or spilling mud, dirt or debris upon streets, residential or commercial drives, sidewalks or bike paths is prohibited according to Section 97.38 of the Dublin Code of Ordinances. Any such occurrence shall be cleaned up immediately by the Contractor at no cost to the City. If the Contractor fails to remove said mud, dirt, debris, or spillage, the City reserves the right to remove these materials and clean affected areas, the cost of which shall be the responsibility of the Contractor.

12. Disposal of excess excavation within Special Flood Hazard Areas (100-year floodplain) is not permitted.

13. All signs, landscaping, structures or other appurtenances within right-of-way disturbed or damaged during construction shall be replaced or repaired to the satisfaction of the City Engineer. The cost of this work shall be the responsibility of the Contractor.

14. All field tile broken or encountered during excavation shall be replaced or repaired and connected to the public storm sewer system as directed by the City Engineer. The cost of this work shall be the responsibility of the Contractor.

15. All precast concrete products shall be inspected at the location of manufacture. Approved precast concrete products will be stamped or have such identification noting that inspection has been conducted by the City of Columbus. Precast concrete products without proof of inspection shall not be approved for installation.

16. Backfill within a 1:1 influence line of existing structures (houses, garages, etc.) or public infrastructure (pavement, curbs, sidewalks, bike paths, etc.) shall be compacted granular backfill according to Item 912 of the Standard Specifications or Flowable CDF, Type III according to Item 636. Item 911 of the Standard Specifications shall be used elsewhere.

17. The Contractor shall submit a copy of the approved construction drawings and a list of proposed precast concrete product manufacturers to the City of Columbus Construction Inspection Division before commencing construction.

    Send the information to the following address:

    Construction Inspection Division
    City of Columbus
    1800 East 17th Avenue
    Columbus, Ohio 43219

    Send a copy of the transmittal letter to the following address:

    Division of Engineering
    City of Dublin
    5800 Shier Rings Road
    Dublin, Ohio 43016

18. All trenches within public right-of-way shall be backfilled according to the approved construction drawings or securely plated during nonworking hours. Trenches outside these areas shall be backfilled or shall be protected by approved temporary fencing or barricades during nonworking hours. Clean up shall follow closely behind the trenching operation.

19. All trees within the construction area not specifically designated for removal shall be preserved, whether shown or not shown on the approved construction drawings. Trees to be preserved shall be protected with high visibility fencing placed a minimum 15 feet from the tree trunk. Trees 6 – inches or greater at DBH (Diameter Breast Height) must be protected with fencing placed at the critical root zone or 15 feet, whichever is greater. Trees not indicated on the approved construction drawings for removal may not be removed without prior approval of the Division of Engineering.

20. Conduit must be directionally bored across streets instead of open cut, unless specifically approved by the City Engineer. Use of pneumatic air ram devices is not permitted. Permits to construct in the right-of-way of existing streets must be obtained from the City of Dublin Division of Engineering before commencing construction. Should open cutting of existing pavement be permitted, Controlled Density Backfill (Type III) shall be used in place of compacted granular backfill, according to Item 636 of the Standard Specifications.

21. The Contractor shall be responsible for the condition of trenches within the right-of-way and public easements for a period of one year from the final acceptance of the work, and shall make any necessary repairs at no cost to the City.

22. Pavements shall be cut in neat, straight lines the full depth of the existing pavement, or as required by the City Engineer. Pavement replacement shall be conducted according to City of Columbus Standard Drawing 1441 Dr. A and applicable City of Dublin standard drawings. The replacement of driveways, handicapped ramps, sidewalks, bike paths, parking lot pavement, etc. shall be provided according to the approved construction drawings and City of Dublin standard construction drawings.

23. Tree trimming within the construction zone is to be completed by a certified Arborist. At the completion of the project, the Arborist is to return and trim any broken branches as needed.

24. Any modification to the work shown on drawings must have prior written approval by the City Engineer, City of Dublin.

25. All inlets shall be channelized.

26. Park areas shall be fine-graded and seeded with the following mixture:

    Improved Kentucky Bluegrass: 40% of weight (2 varieties in equal parts)
    Improved Perennial Rye: 60% of weight (2 varieties in equal parts)
    Germination Rate: 85%
    Application Rate: 7 lbs per 1000 sq ft or as directed by the Division of Parks and Recreation, City of Dublin, Ohio.

27. Traffic control and other regulatory signs shall be Type S with a square post anchor base installation and meet all requirements of ODOT TC-41.20 and applicable City of Dublin specifications.

28. Street signs shall meet all City of Dublin specifications with lettering colored in white displayed over a brown background. Sign tubing shall be brown in color and conform with the Type S, square post anchor base installation requirements of ODOT TC-41.20.

UTILITIES

1. The following utilities are known to be located within the limits of this project:

UTILITY:	ADDRESS:	TELEPHONE:
AEP	850 TECH CENTER DRIVE GAHANNA, OHIO 43230	614.883.7832
COLUMBIA GAS	942 W. GOODALE AVE. COLUMBUS, OHIO 43212	614.460.2338
SBC AMERITECH	111 N. FOURTH ST. COLUMBUS, OHIO 43215	614.223.4362
FIRE HYDRANTS & SEWERS	CITY OF DUBLIN 5800 SHIER-RINGS RD DUBLIN, OHIO 43017	614.410.4750
WATER FACILITIES	CITY OF COLUMBUS (DIVISION OF WATER) 910 DUBLIN ROAD COLUMBUS, OHIO 43215	614.645.7788

2. The Contractor shall give notice of intent to construct to Ohio Utilities Protection Service (telephone number 800-362-2764), Producer's Underground Protection Service (telephone number 614-587-0486), and to owners of underground utilities that are not members of a registered underground protection service. Notice shall be given at least 2 working days before start of construction.

3. The identity and locations of existing underground utilities in the construction area have been shown on the approved construction drawings as accurately as provided by the owner of the underground utility. The City of Dublin and the City Engineer assumes no responsibility for the accuracy or depths of underground facilities shown on the approved construction drawings. If damage is caused, the Contractor shall be responsible for repair of the same and for any resulting contingent damage.

4. Location, support, protection and restoration of all existing utilities and appurtenances, whether shown or not shown on the approved construction drawings, shall be the responsibility of the Contractor.

5. When unknown or incorrectly located underground utilities are encountered during construction, the Contractor shall immediately notify the owner and the City Engineer.

6. Public street lighting may be in the vicinity of this project. Contact the City of Dublin, Division of Engineering at 410-4637, two days prior to beginning work.

TRAFFIC CONTROL

1. Traffic control shall be furnished, erected, maintained, and removed by the Contractor according to Ohio Manual of Uniform Traffic Control Devices (OMUTCD), current edition.

2. All traffic lanes of public roadways shall be fully open to traffic from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM unless authorized differently by the City Engineer. At all other hours the Contractor shall maintain minimum one-lane two-way traffic. Uniformed, off-duty police officers shall replace flagmen designated by the OMUTCD, and shall be present whenever one-lane, two-way traffic control is in effect. Police cruisers may be required as directed by the City Engineer.

3. If the City Engineer determines that the Contractor is not providing proper provisions for traffic control, the City Engineer shall assign uniformed, off-duty police officers to the project at no cost to the City.

4. Steady-burning, Type "C" lights shall be required on all barricades, drums, and similar traffic control devices in use at night.

5. Access from public roadways to all adjoining properties for existing residents or businesses shall be maintained throughout the duration of the project for mail, public water and sanitary sewer service, and emergency vehicles. The Contractor shall provide a traffic control plan detailing the proposed maintenance of traffic procedures. The traffic control plan must incorporate any traffic control details contained herein. The traffic control plan proposed by the Contractor must be approved by the City Engineer prior to construction.

EROSION AND SEDIMENT CONTROL

1. The Contractor or Developer is responsible for submitting a Notice of Intent (NOI) to be reviewed and approved by the Ohio EPA. The NOI must be submitted to OEPA 45 days prior to the start of construction and may entitle coverage under the Ohio EPA General Permit for Stormwater Discharges associated with construction activity. A project location map must be submitted with the NOI. A sediment and erosion control plan must be submitted to the City Engineer for approval if a sediment and erosion control plan has not already been included with the approved construction drawings. This plan must be made available at the project site at all times. The design of erosion control systems shall follow the requirements of Ohio EPA, Item 207 of Ohio Department of Transportation Standard Specifications, and the City Engineer. An Individual NPDES Stormwater Discharge Permit may be required. The Contractor shall be considered the permittee.
2. The Contractor shall provide sediment control at all points where storm water runoff leaves the project, including waterways, overland sheet flow, and storm sewers.

3. Accepted methods of providing erosion/sediment control include but are not limited to: sediment basins, silt filter fence, aggregate check dams, and temporary ground cover. Hay or straw bales are not permitted.

4. The Contractor shall provide adequate drainage of the work area at all times consistent with erosion control practices.

5. Disturbed areas that will remain unworked for 30 days or more shall be seeded or protected within seven calendar days of the disturbance. Other sediment controls that are installed shall be maintained until vegetative growth has been established. The Contractor shall be responsible for the removal of all temporary sediment devices at the conclusion of construction but not before growth of permanent ground cover.

BLASTING (If Permitted)

1. The Contractor must obtain a blasting permit from Washington Township Fire Department prior to blasting for rock excavation. The Contractor shall submit blasting reports upon completion of blasting to the City Engineer, the Owner, and the Owner's engineer. Top of rock elevations shall be shown on "as-built" construction drawings.

SANITARY SEWERS – SEE SEPARATE PLANS FOR NOTES

Notes 1 to 20 deleted. Separate Sanitary plans prepared (CC drawings) and submitted to the City of Columbus for approvals.

WATER LINE

1. All water line materials shall be provided and installed according to current specifications of the City of Columbus Division of Water.

2. All public water pipe with a diameter 3 inches to 8 inches shall be Ductile Iron, Class 53. Public water pipe 12 inches in diameter or larger shall be Ductile Iron, Class 54. Public water pipe 20 inches in diameter or larger may be prestressed concrete pipe. Private water pipe shall meet the approval of the City of Columbus Division of Water prior to approval of the construction drawings.

3. Only fire hydrants conforming to City of Columbus standards will be approved for use.

4. Public water lines shall be disinfected by the City of Columbus Division of Water. Requests for water line chlorination shall be made through the City of Dublin Division of Engineering. The cost for chlorination shall be paid for by the Contractor.

5. All water lines shall be disinfected according to Item 801.13 of the Standard specifications. Special attention is directed to applicable sections of American Water Works Association specification C-651, particularly for flushing (Section 5) and for chlorinating valves and fire hydrants (Section 7). Pressure testing shall be performed in accordance with Section 801.12 of the City of Columbus Construction and Material Specifications. When water lines are ready for disinfection, the City of Dublin shall submit two (2) sets of "as-built" plans, and a letter stating that the water lines have been pressure tested and need to be disinfected, to the City of Columbus, Division of Water. The Contractor shall be responsible for all costs associated with the disinfection of all water lines construction per this plan. Pressure testing shall be performed in accordance with Section 801.12 of the City of Columbus Construction and Material Specifications.

6. The Contractor shall paint all fire hydrants according to City of Dublin standards. The cost of painting fire hydrants shall be included in the contract unit price for fire hydrants.

7. No water taps or service connections (e.g., to curb stops or meter pits) may be issued until adjacent public water lines serving the construction site have been disinfected by the City of Columbus Division of Water and have been accepted by the City Engineer. A tap permit for each water service must be obtained from the City of Dublin and the City of Columbus Division of Water before making any taps into public water lines.

8. The Contractor shall notify the City of Columbus Division of Water at 645-7788 and the City of Dublin Division of Engineering at least 24 hours before tapping into existing water lines.

9. All water main stationing shall be based on street centerline stationing.

10. All bends, joint deflections and fittings shall be backed with concrete per City of Columbus standards.

11. The Contractor shall give written notice to all affected property owners at least 1 working day but not more than 3 working days prior to any temporary interruption of water service. Interruption of water service shall be minimized and must be approved by the City Engineer.

12. Water meters shall be installed inside proposed structures unless a meter pit installation is approved by the City of Columbus Division of Water. Meter pits must conform to standard drawings L-7103, A&B for 5/8" through 1" meters or L-6317, A, B, C&D for 1-1/2" or larger meters.

13. Water lines to be installed in embankment areas shall be placed after the embankment has been placed and compacted according to the Standard Specifications.

14. Curb stop boxes shall be located at least 1 foot inside the right-of-way and set at finished grade.

15. If the top of the operating nut of any valve is greater than 36 inches below finished grade, an extension stem shall be furnished to bring the top of the operating nut to within 24 inches of finished grade elevation.

16. All water lines shall be placed at a minimum depth of 4 feet measured from top of finished grade to top of water line. Water lines shall be set deeper at all points where necessary to clear existing or proposed utility lines or other underground restrictions by a minimum of 18 inches.

17. DELETED – NOT APPLICABLE

STORM SEWER

1. All storm water detention and retention areas and major flood routing swales shall be constructed to finish grade and hydro-seeded and hydro-mulched according to Items 203 and 659 of the Standard Specifications.

2. Where private storm sewers connect to public storm sewers, the last run of private storm sewer connecting to the public storm sewer shall be Reinforced Concrete Pipe conforming to ASTM Designation C76, Wall B, Class IV for pipe diameters 12 inches to 15 inches, Class III for 18 inches to 24 inch pipes, and 27 inches and larger pipe shall be Class II, unless otherwise shown on the approved construction drawings. Inspection is required by the City of Dublin's Division of Engineering.

3. Granular backfill shall be compacted granular material according to Item 912 of the Standard Specifications or Controlled Density Backfill according to Item 636, Type III of the Standard Specifications as directed by the City Engineer.

4. All storm sewers shall be Reinforced Concrete Pipe conforming to ASTM Designation C76, Wall B, Class IV for pipe diameters 12 inches to 15 inches, Class III for 18 inches to 24 inch pipes, and 27 inches and larger pipe shall be Class II, unless otherwise shown on the approved construction drawings.

5. Headwalls and endwalls shall be required at all storm sewer inlets or outlets to and from stormwater management facilities. Natural stone and/or brick approved by the City Engineer shall be provided on all visible headwalls and/or endwalls surfaces.

6. Storm inlets or catch basins shall be channelized and have bicycle safe grates. Manhole lids shall include City of Dublin logo and all curb inlet and catch basin grates shall induce engraved lettering: "DUMP NO WASTE; DRAINS TO RIVER."

7. Storm sewer outlets greater than 18 inches in diameter accessible from stormwater management facilities or watercourses shall be provided with safety grates, as approved by the City Engineer.

MAIL DELIVERY

1. The Contractor shall be responsible to ensure that US Mail delivery within the project limits is not disrupted by construction operations. This responsibility is limited to relocation of mailboxes to a temporary location that will allow the completion of the work and shall also include the restoration of mailboxes to their original location or approved new location. Any relocation of mailbox services must be first coordinated with the US Postal Service and the homeowner.

2. Before relocating any mailboxes, the Contractor shall contact the U.S. Postal Service and relocate mailboxes according to the requirements of the Postal Service.

USE OF FIRE HYDRANTS

1. The Contractor shall make proper arrangements with the Dublin Service Department and the Columbus Division of Water for the use of fire hydrants when used for work performed under this contract and provide the city of Dublin a copy of the Hydrant Usage Permit obtained from the City of Columbus. The Contractor shall also send a copies of permits obtained from Dublin and Columbus to the Washington and/or Perry Township Fire Department. Permits shall be kept at the construction site at all times.

2. Before the final estimate is paid, the Contractor shall submit a letter from the City of Columbus Division of Water to the City Engineer stating that the Contractor has returned the Siamese Valve to the City of Columbus and has paid all costs arising from the use of the fire hydrants

REVISIONS	DATE	BY	CHK.

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CITY OF DUBLIN, FRANKLIN COUNTY, OHIO
FINAL DEVELOPMENT PLAN
NORTHSTAR REALTY

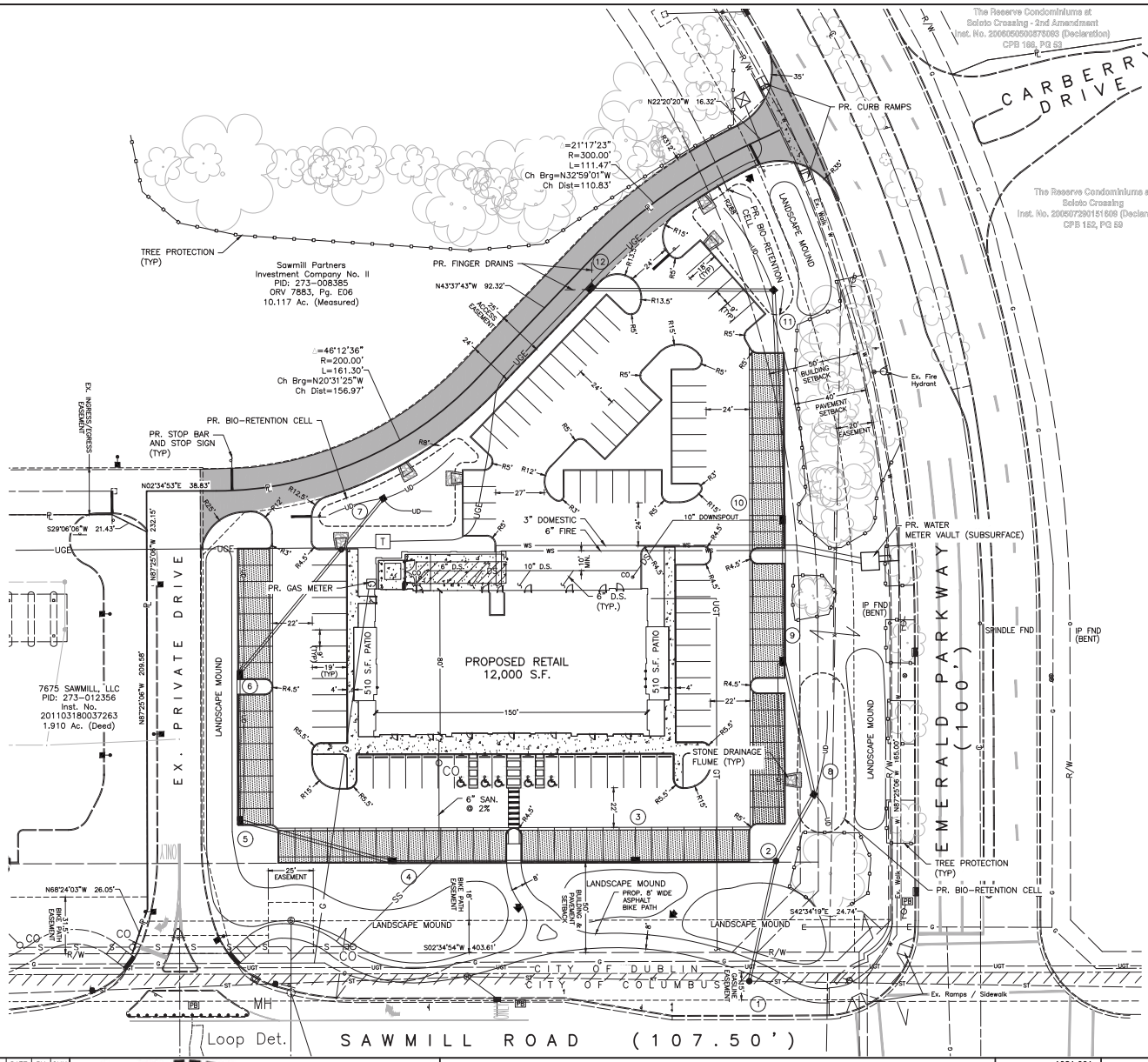
JOB NO.	1081.001
DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	____
APPROVED BY:	____
DATE:	04/16/15

GENERAL NOTES

SCALE: N/A

SHEET NO. 2 OF 6

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-16-15 07: Revised by: cpost -LTscale: 1 -Plot scale 1=1 MS/PS



LEGEND

- Ex. Fire Hydrant
- Ex. Pull Box
- Ex. Tree
- Ex. Catch Basin
- Ex. Sanitary Manhole
- Ex. Storm Manhole
- Ex. Storm Curb Inlet
- Ex. Utility Pole
- Ex. Light Pole
- Ex. Gas Service Valve
- Ex. Underground Tele. Pedastal
- Ex. Water Service Valve
- Ex. Sign
- X — Ex. Fence
- W — Ex. Water Line
- WS — Ex. Water Service
- UGT — Ex. Underground Telephone
- G — Ex. Gas
- ST — Ex. Storm
- SA — Ex Sanitary
- UGE — Ex. Underground Electric
- OHE — Ex. Overhead Electric
- Prop. Catch Basin
- Prop. Curb Inlet
- Prop. Storm Manhole
- Prop. Storm Sewer
- DS — Prop. Downspout Line
- SA — Prop. Sanitary
- SS — Prop. Sanitary Srvc.
- W — Prop. Water
- WS — Prop. Water Srvc.
- G — Prop. Gas
- UGE — Prop. Underground Electric
- UGT — Prop. Underground Telephone
- Prop. Pervious Pavement (See Details)
- Common Drive: 2" Item 404 Surface Course 3" Item 402 Intermediate Course 8" Item 304 Aggregate Base
- Prop. Concrete Walk/Drive
- CO — Prop. Clean-out
- DND — Do Not Disturb
- Proposed Flood Route
- Proposed Drainage Flow Directional Arrow
- Prop. Construction Limits
- Stone Drainage Flume

NOTE: (TBR) Shall mean to be removed.

REVISIONS	DATE	BY	CHK.

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DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	____
APPROVED BY:	____
DATE:	04/16/15

SITE IMPROVEMENT & UTILITY PLAN

SCALE: 1" = 30'

SHEET NO. 3 OF 6

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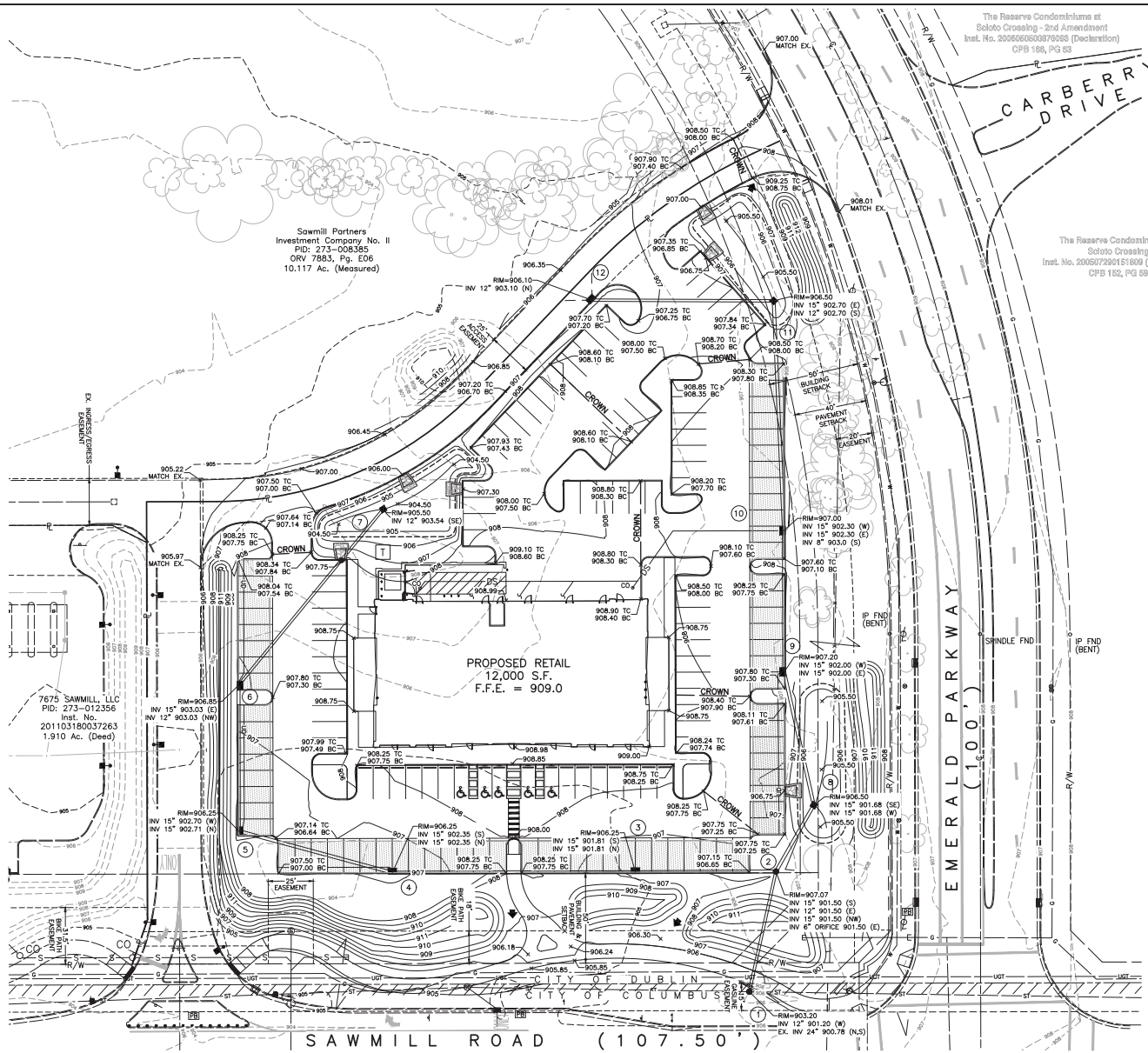

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GRADING PLAN

SCALE: 1" = 30'

SHEET NO. 4 OF 6

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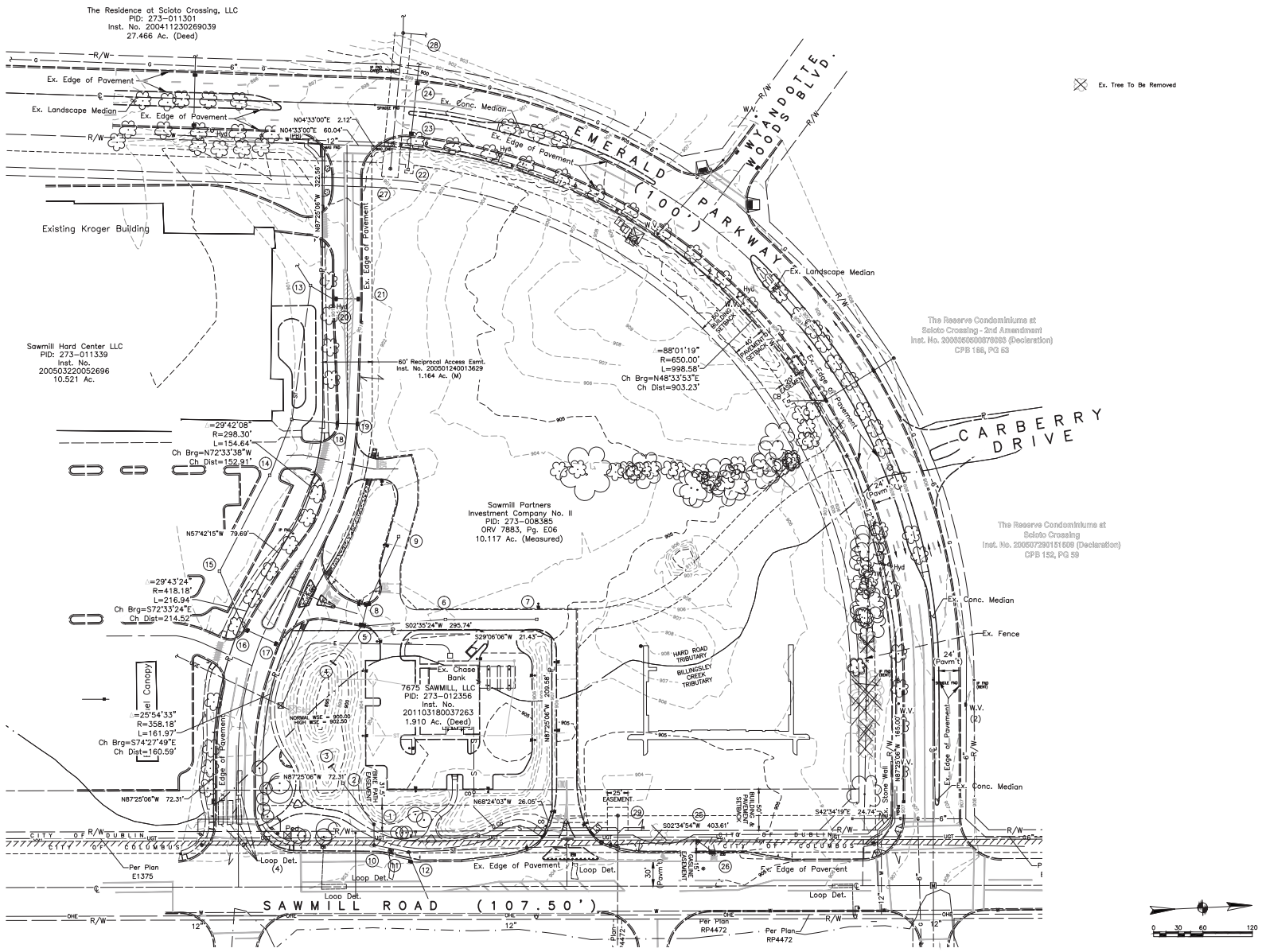


STORM/SANITARY SEWER SCHEDULE

STORM

1. Rim = 904.25
   Ex. 18" Inv. E = 899.80
   Ex. 12" Inv. SW = 899.75
2. Rim = 902.50
   Ex. 12" Inv. NE = 900.00
   Ex. 12" Inv. SW = 897.00
3. Headwall
   Ex. 12" Inv. NE = 897.00
4. HEADWALL
   Ex. 15" Inv. NW = 897.00
5. Rim = 903.25
   Ex. 15" Inv. SE = 897.55
   Ex. 12" Inv. W = 897.80
   Ex. 12" Inv. N = 897.80
6. Rim = 903.75
   Ex. 12" Inv. S = 898.80
   Ex. 12" Inv. N = 898.85
7. Rim = 904.00
   Ex. 12" Inv. S = 900.00
8. Rim = 903.25
   Ex. 12" Inv. E = 898.10
   Ex. 12" Inv. NW = 898.15
9. Rim = 902.75
   Ex. 12" Inv. N = 898.60
10. Rim = 903.09
    Ex. 30" Inv. N = 897.55
    Ex. 30" Inv. S = 897.45
11. Rim = 903.24
    Ex. 15" Inv. NE = 898.67
    Ex. 24" Inv. N = 898.04
    Ex. 30" Inv. S = 897.77
12. Rim = 902.71
    Ex. 15" Inv. E = 899.26
    Ex. 15" Inv. W = 899.22
13. Rim = 901.36
    Ex. 12" Inv. NE = 897.61
    Ex. 30" Inv. E = 895.95
    Ex. 30" Inv. SW = 895.88
14. Rim = 900.40
    Ex. 30" Inv. NW = 896.18
    Ex. 30" Inv. SE = 896.27
15. Rim = 900.24
    Ex. 30" Inv. NW = 896.44
    Ex. 12" Inv. NE = 896.95
16. Rim = 900.01
    Ex. 12" Inv. SW = 897.18
    Ex. 12" Inv. NE = 897.25
17. Rim = 899.89
    Ex. 12" Inv. SW = 897.64
18. Rim = 900.35
    Ex. 12" Inv. N = 897.63
    Ex. 12" Inv. S = 896.27
19. Rim = 900.14
    Ex. 12" Inv. S = 897.59
20. Rim = 900.91
    Ex. 12" Inv. N = 897.36
    Ex. 12" Inv. SW = 897.16
21. Rim = 901.17
    Ex. 12" Inv. S = 897.65
22. Rim = 900.26
    Ex. 18" Inv. W = 895.07
23. Rim = 898.48
    Ex. 18" Inv. E = 894.54
    Ex. 18" Inv. W = 894.61
24. Rim = 898.54
    Ex. 18" Inv. E = 894.40
    Ex. 18" Inv. W = 894.21
25. Rim = 904.44
    Ex. 24" Inv. N = 899.64
    Ex. 24" Inv. S = 899.52
26. Rim = 904.69

SANITARY

27. Rim = 900.71
    Ex. 8" Inv. W = 889.75
28. Rim = 903.43
    Ex. 8" Inv. E = 889.18
    Ex. 15" Inv. N = 888.40
    Ex. 15" Inv. W = 888.44
29. Rim = 905.29
    Ex. 8" Inv. E = 891.80

REVISIONS	DATE	BY	CHK.

E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

CONTACT:
880 KING AVENUE
COLUMBUS, OHIO 43212
(614) 299-2999
(614) 299-2992 (Fax)
www.EPFERRIS.com

CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

FINAL DEVELOPMENT PLAN

NORTHSTAR REALTY

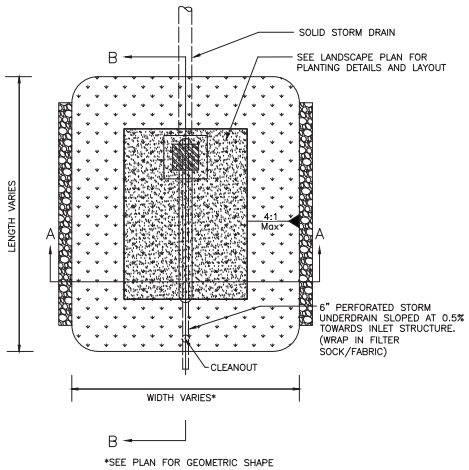
JOB NO.	1081.001
DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	____
APPROVED BY:	____
DATE:	04/16/15

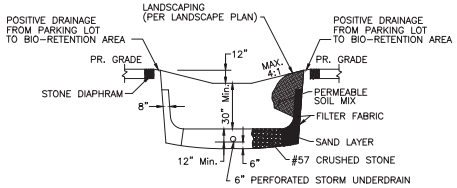
EXISTING CONDITIONS

SCALE: 1" = 60'

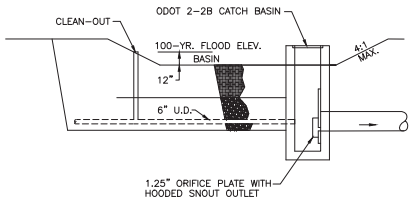
SHEET NO. 5 OF 6

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-16-15 07: Revised by: cpost -LTscale: 1 -Plot scale 1=1 MS/PS





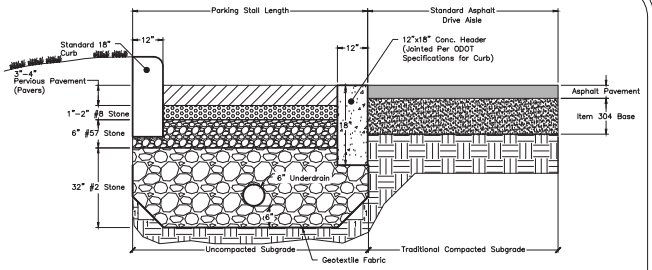
SECTION A–A



SECTION B–B

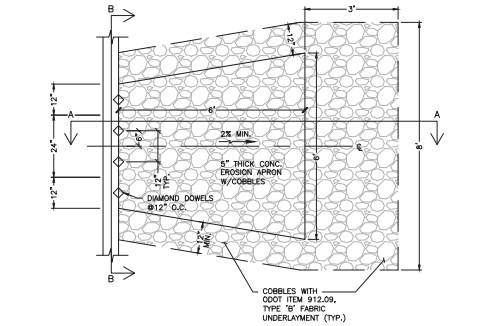
BIO-RETENTION FACILITY DETAIL

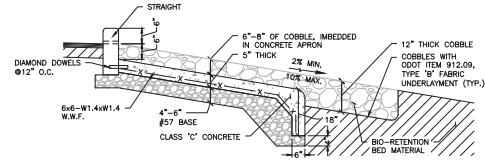
SCALE: N.T.S



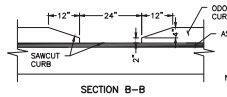
PERVIOUS PAVEMENT PARKING SPACE (TYPICAL SECTION)

N.T.S.





SECTION A–A

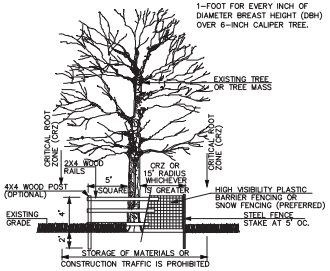


SECTION B–B

NOTE: COBBLE SHALL CONSIST OF 2" TO 6" DECORATIVE RIVER GRAVEL/COBBLES

STONE DRAINAGE FLUME DETAIL

N.T.S.



NOTES:
1. INSPECTION OF INSTALLATION IS REQUIRED. CALL (614) 410-4701.
2. THE CITY IS TO BE CONTACTED IF FENCE LOCATION NEEDS TO BE ADJUSTED OR PRIOR TO ANY ENCROACHMENT OF PRESERVATION AREA.

Tree Protection Detail

N.T.S.

REVISIONS	DATE	BY	CHK.

E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

CONTACT:
880 KING AVENUE
COLUMBUS, OHIO 43212
(614) 299-2999
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www.EPFERRIS.com

CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

FINAL DEVELOPMENT PLAN

NORTHSTAR REALTY

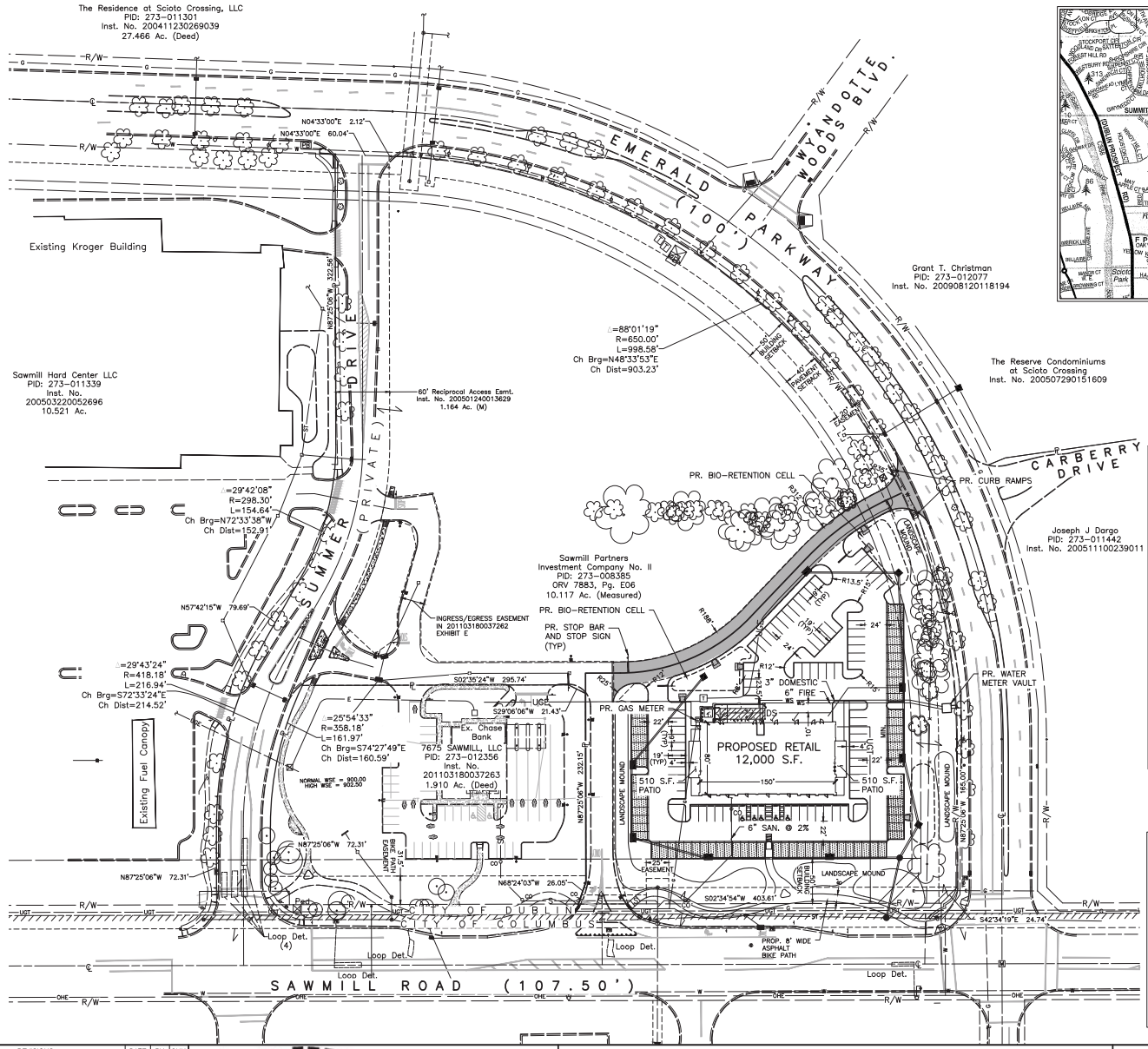
JOB NO.	1081.001
DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	____
APPROVED BY:	____
DATE:	04/16/15

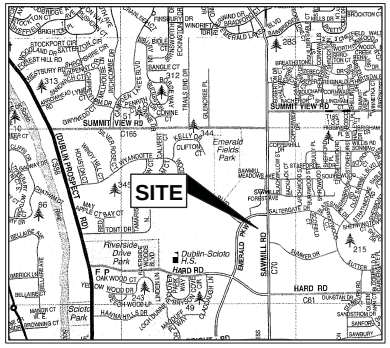
DETAILS

SCALE: N/A

SHEET NO. 6 OF 6

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-16-15 07: Revised by: cpost -LTscale: 1 -Plot scale 1=1 MS/PS





VICINITY MAP
N.T.S.

MASTER LEGEND

- Ex. Fire Hydrant
- Ex. Pull Box
- Ex. Tree
- Ex. Catch Basin
- Ex. Sanitary Manhole
- Ex. Storm Manhole
- Ex. Storm Curb Inlet
- Ex. Utility Pole
- Ex. Light Pole
- Ex. Gas Service Valve
- Ex. Undergound Tele. Pedastal
- Ex. Water Service Valve
- Ex. Sign
- X — Ex. Fence
- W — Ex. Water Line
- WS — Ex. Water Service
- UGT — Ex. Underground Telephone
- G — Ex. Gas
- ST — Ex. Storm
- SA — Ex Sanitary
- UGE — Ex. Underground Electric
- OHE — Ex. Overhead Electric
- Prop. Catch Basin
- Prop. Curb Inlet
- Prop. Storm Manhole
- Prop. Storm Sewer
- DS — Prop. Downspout Line
- SA — Prop. Sanitary
- SS — Prop. Sanitary Srvc.
- W — Prop. Water
- WS — Prop. Water Srvc.
- G — Prop. Gas
- UGE — Prop. Underground Electric
- UGT — Prop. Underground Telephone
- Prop. Pervious Pavement (See Details)
- Common Drive: 2" Item 404 Surface Course, 3" Item 402 Intermediate Course, 8" Item 304 Aggregate Base
- Prop. Concrete Walk/Drive
- CO — Prop. Clean-out
- DND — Do Not Disturb
- Proposed Flood Route
- Proposed Drainage Flow Directional Arrow
- Prop. Construction Limits
- Stone Drainage Flume

NOTE: (TBR) Shall mean to be removed.

SITE DATA TABLE

AREA CALCULATIONS:

PRIVATE DEVELOPMENT AREA: 3.19 ACRES
RIGHT-OF-WAY IMPROVEMENTS AREA: 0.11 ACRES
TOTAL IMPROVEMENTS AREA: 3.65 ACRES
BIKE PATH IMPROVEMENTS: 0.21 ACRES
PERCENTAGE PUBLIC DEDICATED OR RIGHT OF WAY: 0.0% (0.00 ACRE)

PUBLIC STREETS: 0.00 ACRE
COMMON DRIVEWAYS: 0.40± ACRES
OPEN SPACE (LANDSCAPE & PONDS): 1.22 ACRES
DWELLING UNITS: N/A

BUILDING AREA: 12,000 S.F.

PARKING DATA:
STANDARD SPACES: 146
ACCESSIBLE SPACES: 5
TOTAL PARKING SPACES PROVIDED: 151
LOADING SPACES PROVIDED: 1

REQUIRED PARKING:
RESTAURANT: 3600 S.F. @1/50 = 72
PATIO: 1020 S.F. @1/50 = 21
RETAIL: 7200 S.F. @ 1/150 = 48
STORAGE: 1,200 S.F. @ 1/200 = 6
TOTAL REQUIRED: 147
LOADING SPACES REQUIRED: 1

53,720± S.F. PAVEMENT ON RETAIL SITE
17,200± S.F. PAVEMENT FOR SHARED DRIVES
70,920± S.F. TOTAL PAVEMENT

PUBLIC IMPROVEMENTS TO SAWMILL ROAD (ACCESS POINT & BIKE PATH) AND A MINOR SANITARY SEWER EXTENSION ARE PROPOSED AS PART OF THIS DEVELOPMENT PLAN.

CODE REFERENCE: SECTION 153.212 OF DUBLIN CITY CODE

SIGNATURES

PROPERTY OWNER — DATE

APPLICANT — DATE

APPROVED:

PLANNING & ZONING COMMISSION SECRETARY, CITY OF DUBLIN — DATE

0 30 60 120

REVISIONS	DATE	BY	CHK.

E. P. FERRIS AND ASSOCIATES INC
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CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

FINAL DEVELOPMENT PLAN

NORTHSTAR REALTY

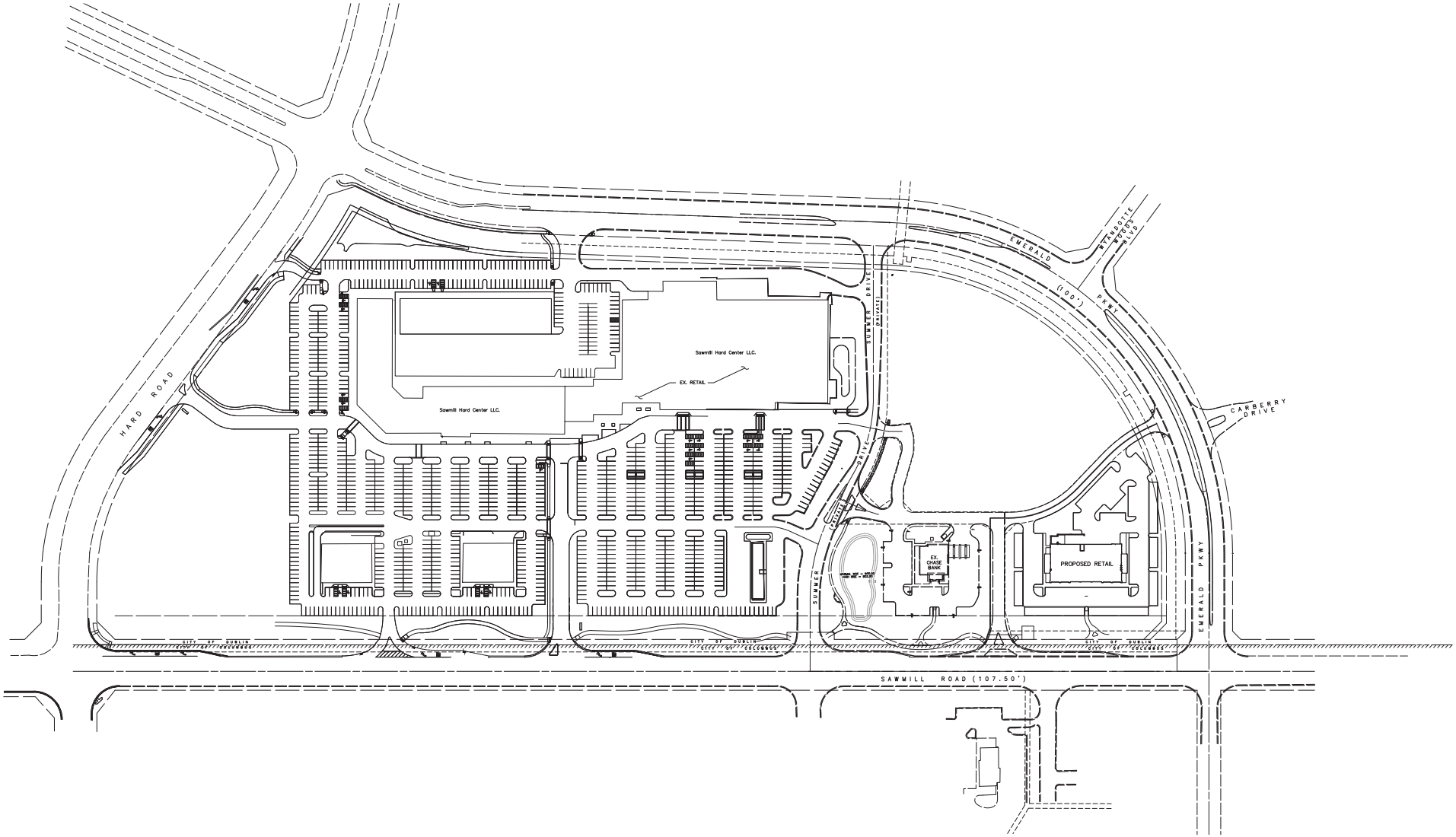
JOB NO.	1081.001
DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	SWG
APPROVED BY:	___
DATE:	04/16/15

FINAL DEVELOPMENT PLAN

SCALE: 1" = 60'

SHEET NO. 1 OF 2

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan_SIGNATURE.dwg Saved on: 02-19-15 15:59 Revised by: cpost -1layout: 1 -Plot scale 1=1 MS/PS



0 50 100 200

REVISIONS	DATE	BY	CHK.

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CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

FINAL DEVELOPMENT PLAN

NORTHSTAR REALTY

JOB NO.	1081.001
DESIGNED BY:	____
DRAWN BY:	CLP
CHECKED BY:	SWG
APPROVED BY:	____
DATE:	04/16/15

FINAL DEVELOPMENT PLAN

SCALE:	
1" = 100'	
SHEET NO.	OF
2	2

M:\1081001_NorthstarRealty\DWG\Production Drawings\Overall Development Exhibit.dwg -Layout1 LAST EDITED Bryant ON 4/16/15

E.P. FERRIS & ASSOCIATES INC

PRELIMINARY PLAT
SAWMILL-EMERALD SUBDIVISION
SAWMILL ROAD AND EMERALD PARKWAY
QUARTER TOWNSHIP 2, TOWNSHIP 2 NORTH, RANGE 19 WEST, UNITED STATES MILITARY LANDS
CITY OF DUBLIN, COUNTY OF FRANKLIN, STATE OF OHIO

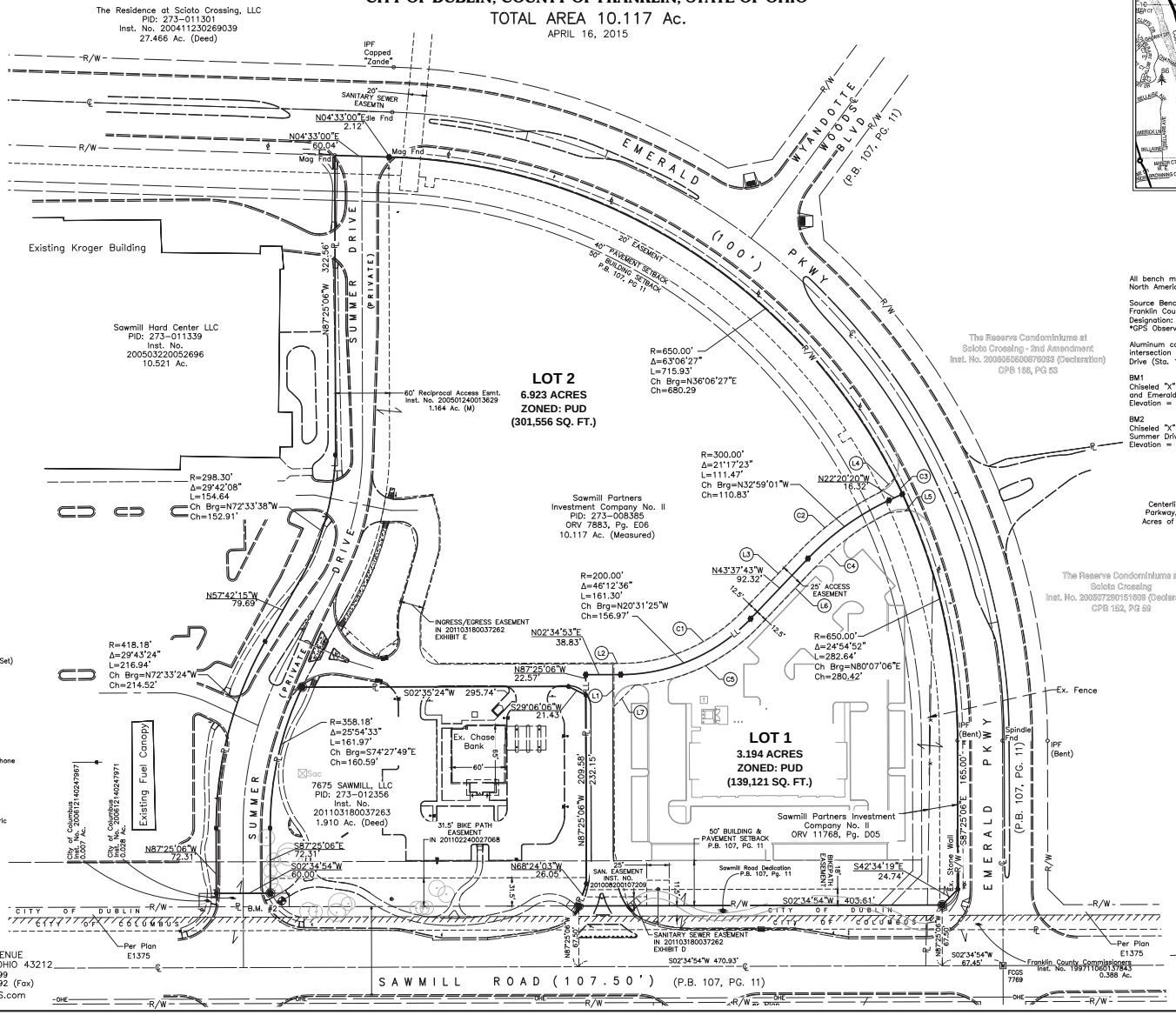
TOTAL AREA 10.117 Ac.

APRIL 16, 2015

GENERAL NOTES

FEMA ZONE:
At the time of platting, Sawmill-Emerald Subdivision Plat is in Zone "X" (Areas determined to be out of the 0.2% chance floodplain.) per FEMA Flood Insurance Rate Map for Franklin County, Ohio and Incorporated Areas, Map Number 39049C0152K with eeffective date of June 17, 2008. No field surveying was performed to determine these zones.

UTILITY PROVIDERS:
Water: City of Columbus
Sanitary: City of Dublin
Storm: City of Dublin
Electric: AEP
Gas: Columbia Gas
Telephone: SBC Ameritech



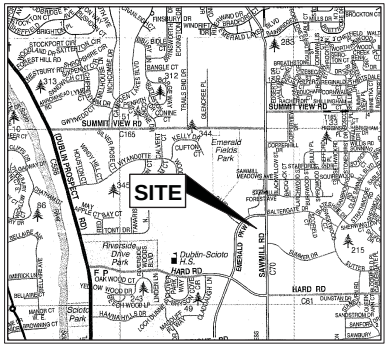
Zoning Information:
EXISTING ZONING: PUD
PARCEL ID NUMBERS: 273-008385

Civil Engineer Information:
E.P. FERRIS & ASSOCIATES
880 KING AVENUE
COLUMBUS, OHIO 43212
Contacts: SEAN GILLILAN, P.E.
PH: 614-299-2999
FAX: 614-299-2992
EMAIL: sgillilan@epferris.com

Owner/Developer Information:
SAWMILL PARTNERS INVESTMENT COMPANY NO.II
c/o PLAZA PROPERTIES, INC.
3016 MARYLAND AVENUE
COLUMBUS, OHIO 43209
CONTACT: CRAIG GOODWIN
PH: 614-238-2001
EMAIL: cbgoodwin@plazaproperties.com

LEGEND

	Ex. Fire Hydrant		Property Line
	Ex. Pull Box	LL	Lot Line
	Ex. Tree	R/W	Right-of-Way
	Ex. Catch Basin	o	Iron Pin Found (IPF)
	Ex. Sanitary Manhole		Iron Pin (or MagNail Set)
	Ex. Storm Manhole		Mag Nail Set
	Ex. Storm Curb Inlet	(D)	Deed or Plat
	Ex. Utility Pole	(M)	Measured Value
	Ex. Light Pole		Monument Found
	Ex. Undergound Tele. Pedastal	W	Ex. Water Line
	Ex. Water Service Valve	WS	Ex. Water Service
	Ex. Sign	UGT	Ex. Underground Telephone
X	Ex. Fence	G	Ex. Gas
	Corp. Line	ST	Ex. Storm
	Center Line	SA	Ex Sanitary
	Permanent Marker	UGE	Ex. Underground Electric
		OHE	Ex. Overhead Electric



LOCATION MAP
N.T.S.

BENCH MARKS

All bench marks and elevations shown upon this plan are based on the (NAVD88) North American Vertical Datum of 1988.

Source Bench Mark
Franklin County Survey Control
Designation: "FCGS 7769"
*GPS Observed Elevation = 907.53

Aluminum cap in concrete monument, at the centerline of construction intersection of Sawmill Road with the centerline of right of way of Saltergate Drive (Sta. 143+33.10 1987 plans), access through F.C. Road monument box.

BM1
Chiseled "X" on S. side of metal signal pole base @ intersection of Sawmill Road and Emerald Parkway.
Elevation = 907.49

BM2
Chiseled "X" on NW bolt of metal signal pole @ NW corner of Sawmill Road and Summer Drive.
Elevation = 903.16

BASIS OF BEARING

Centerline of Sawmill Road as shown on Roadway Dedication Plat of Emerald Parkway, Wyandotte Woods Boulevard, Sawmill Road and the Vacation of 0.086 Acres of Hard Road in Plat Book 107, Page 11, being South 02° 34' 54" West.

ACCESS ESMT. LINE TABLE

LINE	DISTANCE	BEARING
L1	47.94'	N87°24'55"W
L2	7.50'	N02°34'53"E
L3	92.32'	N43°37'43"W
L4	21.69'	N41°23'33"W
L5	23.31'	S03°45'40"E
L6	92.32'	S43°37'43"E
L7	32.88'	S43°03'07"E

ACCESS ESMT. CURVE TABLE

NO.	RADIUS	LENGTH	DELTA (∆)	CHORD BEARING	CHORD
C1	187.50'	151.22'	46°12'36"	N20°31'25"W	147.16'
C2	312.50'	111.65'	20°28'12"	N33°23'37"W	111.05'
C3	650.00'	39.55'	3°29'09"	N67°40'51"E	39.54'
C4	285.63'	100.75'	20°12'36"	S33°35'24"E	100.23'
C5	212.50'	155.88'	42°01'49"	S22°36'48"E	152.41'

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0 30 60 120
Scale: 1"= 60'

PRELIMINARY PLAT
SAWMILL-EMERALD SUBDIVISION
SAWMILL ROAD AND EMERALD PARKWAY
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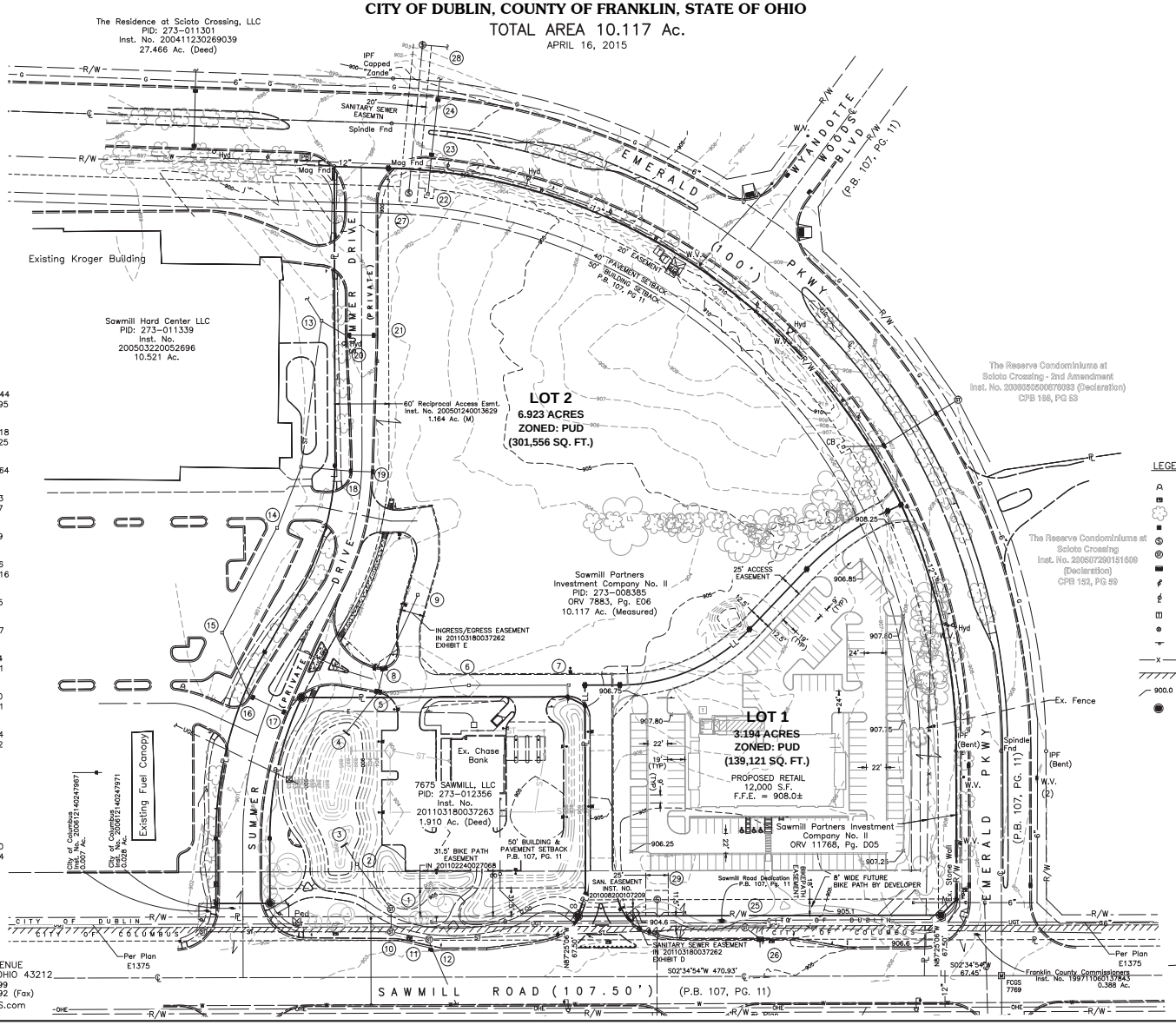
TOTAL AREA 10.117 Ac.

APRIL 16, 2015



STORM/SANITARY SEWER SCHEDULE

STORM

1. Rim = 904.25; Ex. 18" Inv. E = 899.80; Ex. 12" Inv. SW = 899.75
2. Rim = 902.50; Ex. 12" Inv. NE = 900.00; Ex. 12" Inv. SW = 897.00
3. Headwall; Ex. 12" Inv. NE = 897.00
4. HEADWALL; Ex. 15" Inv. NW = 897.00
5. Rim = 903.25; Ex. 15" Inv. SE = 897.55; Ex. 12" Inv. W = 897.80; Ex. 12" Inv. N = 897.80
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8. Rim = 903.25; Ex. 12" Inv. E = 898.10; Ex. 12" Inv. NW = 898.15
9. Rim = 902.75; Ex. 12" Inv. N = 898.60
10. Rim = 903.09; Ex. 30" Inv. N = 897.55; Ex. 30" Inv. S = 897.45
11. Rim = 903.24; Ex. 15" Inv. NE = 898.67; Ex. 24" Inv. N = 898.04; Ex. 30" Inv. S = 897.77
12. Rim = 902.71; Ex. 15" Inv. E = 899.26; Ex. 15" Inv. W = 899.22
13. Rim = 901.36; Ex. 12" Inv. NE = 897.61; Ex. 30" Inv. E = 895.95; Ex. 30" Inv. SW = 895.88
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17. Rim = 899.89; Ex. 12" Inv. SW = 897.64
18. Rim = 900.35; Ex. 12" Inv. N = 897.63; Ex. 12" Inv. S = 896.27
19. Rim = 900.14; Ex. 12" Inv. S = 897.59
20. Rim = 900.91; Ex. 12" Inv. N = 897.36; Ex. 12" Inv. SW = 897.16
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LEGEND

	Ex. Fire Hydrant		Center Line
	Ex. Pull Box	LL	Lot Line
	Ex. Tree		Property Line
	Ex. Catch Basin	R/W	Right-of-Way
	Ex. Sanitary Manhole		Iron Pin Found (IPF)
	Ex. Storm Manhole		Iron Pin (or MagNail Set)
	Ex. Storm Curb Inlet		Mag Nail Set
	Ex. Utility Pole	(D)	Deed or Plat
	Ex. Light Pole	(M)	Measured Value
	Ex. Undergound Tele. Pedastal		Monument Found
	Ex. Water Service Valve	W	Ex. Water Line
	Ex. Sign	WS	Ex. Water Service
X	Ex. Fence	UGT	Ex. Underground Telephone
	Corp. Line	G	Ex. Gas
900.0	Pr. Spot Elevation	ST	Ex. Storm
	Permanent Marker	SA	Ex Sanitary
		UGE	Ex. Underground Electric
		OHE	Ex. Overhead Electric

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FINAL PLAT
SAWMILL-EMERALD SUBDIVISION
SAWMILL ROAD AND EMERALD PARKWAY
QUARTER TOWNSHIP 2, TOWNSHIP 2 NORTH, RANGE 19 WEST, UNITED STATES MILITARY LANDS
CITY OF DUBLIN, COUNTY OF FRANKLIN, STATE OF OHIO

TOTAL AREA 10.117 Ac.

APRIL 16, 2015

Situated in the State of Ohio, County of Franklin, City of Dublin, being in Quarter Township 2, Township 2, Range 19, United States Military Lands and being a subdivision of a 8.953 acre portion of an original 75.549 acre tract and 45.032 acre tract as conveyed to Sawmill Partners Investment Company No. II as described in Official Record 7883, Page E06 and Official Record 11768, Page D05, record references to those of the Recorder's Office, Franklin County, Ohio.

The undersigned Sawmill Partners Investment Company No. II being the owners of the land platted herein, duly authorized in the premises, do hereby certify that this plat correctly represents their "SAWMILL-EMERALD SUBDIVISION" a subdivision of lots numbers 1 through 2, inclusive and do hereby accept this plat of same.

A bike path easement is dedicated to the City of Dublin, where indicated on the plat, for the construction and maintenance of a permanent bike path for recreational use.

An access easement, for ingress and egress, is reserved where indicated on the plat for the benefit of Lot 1, Lot 2 and the 1.910 acre parcel conveyed to 7675 Sawmill LLC in Instrument Number 201103180037263 (Auditor's Parcel No. 273-012356).

The undersigned further agrees that any use of improvements made o this land shall be in conformity with all existing valid zoning, platting, health, or other lawful rules and regulations, including the applicable off-street parking and loading requirements of the Municipality of Dublin, Ohio, for the benefit of himself and all other subsequent owners or assigns taking title from, under, or through the undersigned.

In witness where of I have hereunto se my hand and affixed my official seal this _____ day of _____, 2015.

Witness: Signed _____

_____

_____

STATE OF OHIO SS

Before me, a Notary Public in and for the State of Ohio, personally appeared _____ who acknowledged the signing of the foregoing instrument to be their voluntary act and deed for the purposes therein expressed.

In witness where of I have set my hand and affixed my official seal this _____ day of _____, 2015.

My Commission expires _____

_____
Notary Public, State of Ohio

MUNICIPALITY OF DUBLIN, OHIO

Approved this _____ day of _____, 2015.

_____
Director of Land Use & Long Range Planning, Commission City of Dublin, Ohio

Approved this _____ day of _____, 2015.

_____
City Engineer, City of Dublin, Ohio

Approved by motion, passed by City Council, City of Dublin, Ohio on this _____ day of _____, 2015, wherein accepted as such for the City of Dublin, Ohio.

_____
Clerk of Council, City of Dublin, Ohio

Transferred this _____ day of _____, 2015

_____
Auditor, Franklin County, Ohio

_____
Deputy Auditor, Franklin County, Ohio

Filed for record this _____ day of _____, 2015 at ___:____M

Fee _____ File No. _____

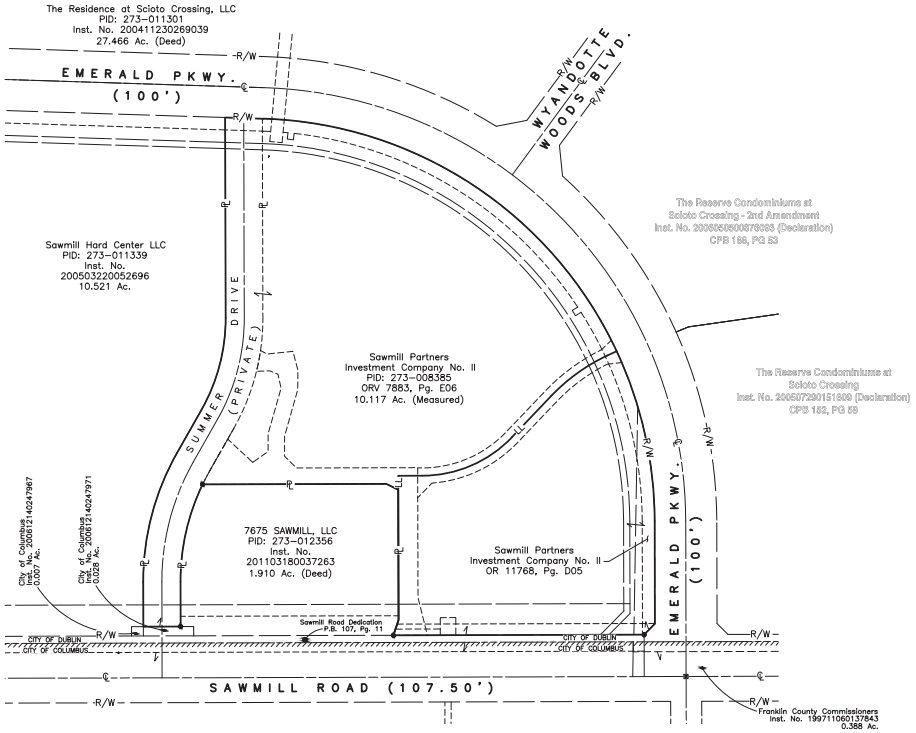
_____
Recorder, Franklin County, Ohio

Recorded this _____ day of _____, 2015 Plat Book _____ Pages _____

_____
Deputy Recorder, Franklin County, Ohio

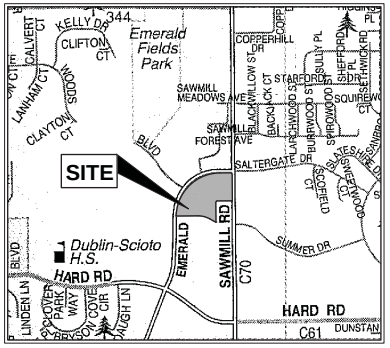
E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

CONTACT:
880 KING AVENUE
COLUMBUS, OHIO 43212
(614) 299-2999
(614) 299-2992 (Fax)
www.EPFERRIS.com



STATE OF OHIO
MATTHEW E. FERRIS
S-8230
REGISTERED
PROFESSIONAL SURVEYOR

BY: _____
Matthew E. Ferris, P.E., P.S.
Registered Surveyor No. 8230



LOCATION MAP
SCALE: 1" = 1000'

NOTES:

Protective fencing shall be installed as shown on the Tree Preservation Plan during all phases of construction.

FLOOD NOTE:

At the time of platting, Sawmill-Emerald Subdivision Plat is in Zone "X" (Areas determined to be out of the 0.2% chance floodplain.) per FEMA Flood Insurance Rate Map for Franklin County, Ohio and Incorporated Areas, Map Number 39049C0125K with eeffective date of June 17, 2008. No field surveying was performed to determine these zones.

BASIS OF BEARING:

Centerline of Sawmill Road as shown on Roadway Dedication Plat of Emerald Parkway, Wyandotte Woods Bouleward, Sawmill Road and the Vacation of 0.086 Acres of Hard Road in Plat Book 107, Page 11, being South 02° 34' 54" West.

BENCHMARKS:

All bench marks and elevations shown upon this plan are based on the (NAVD88) North American Vertical Datum of 1988.

Source Bench Mark
Franklin County Survey Control
Designation: "FCGS 7769"
*GPS Observed Elevation = 907.53

Aluminum cap in concrete monument, at the centerline of construction intersection of Sawmill Road with the centerline of right of way of Saltergate Drive (Sta. 143+33.10 1987 plans), access through F.C. Road monument box.

BM1
Chiseled "X" on S. side of metal signal pole @ intersection of Sawmill Road and Emerald Parkway.
Elevation = 907.49

BM2
Chiseled "X" on NW bolt of metal signal pole @ NW corner of Sawmill Road and Summer Drive.
Elevation = 903.16

CERTIFICATION:

We do hereby certify that we have surveyed the attached premises, prepared the attached plat, and that said plat is correct. All dimensions are shown in feet and decimal pars thereof. Dimensions shown along curves are chord measurements. Monumentation is to be placed upon completion of construction necessary to the improvement of this land and are indicated by the following symbols:

PERMANENT MARKERS: Permanent markers, where indicated hereon, are to be 1" by 30" solid iron rods. Pins are to be set to monument the points indicated and are to be set, capped with an aluminum cap stamped "E.P. FERRIS SURVEYOR 8230".

LEGEND

℄	Center Line
LL	Lot Line
PL	Property Line
R/W	Right-of-Way
○	Iron Pin Found (IPF)
●	Iron Pin Set
⊕	Mag Nail Set
(D)	Deed or Plat
(M)	Measured Value
Ⓜ	Monument Found
//////	Corp. Line
◉	Permanent Marker

0 50 100 200
Scale: 1"= 100'

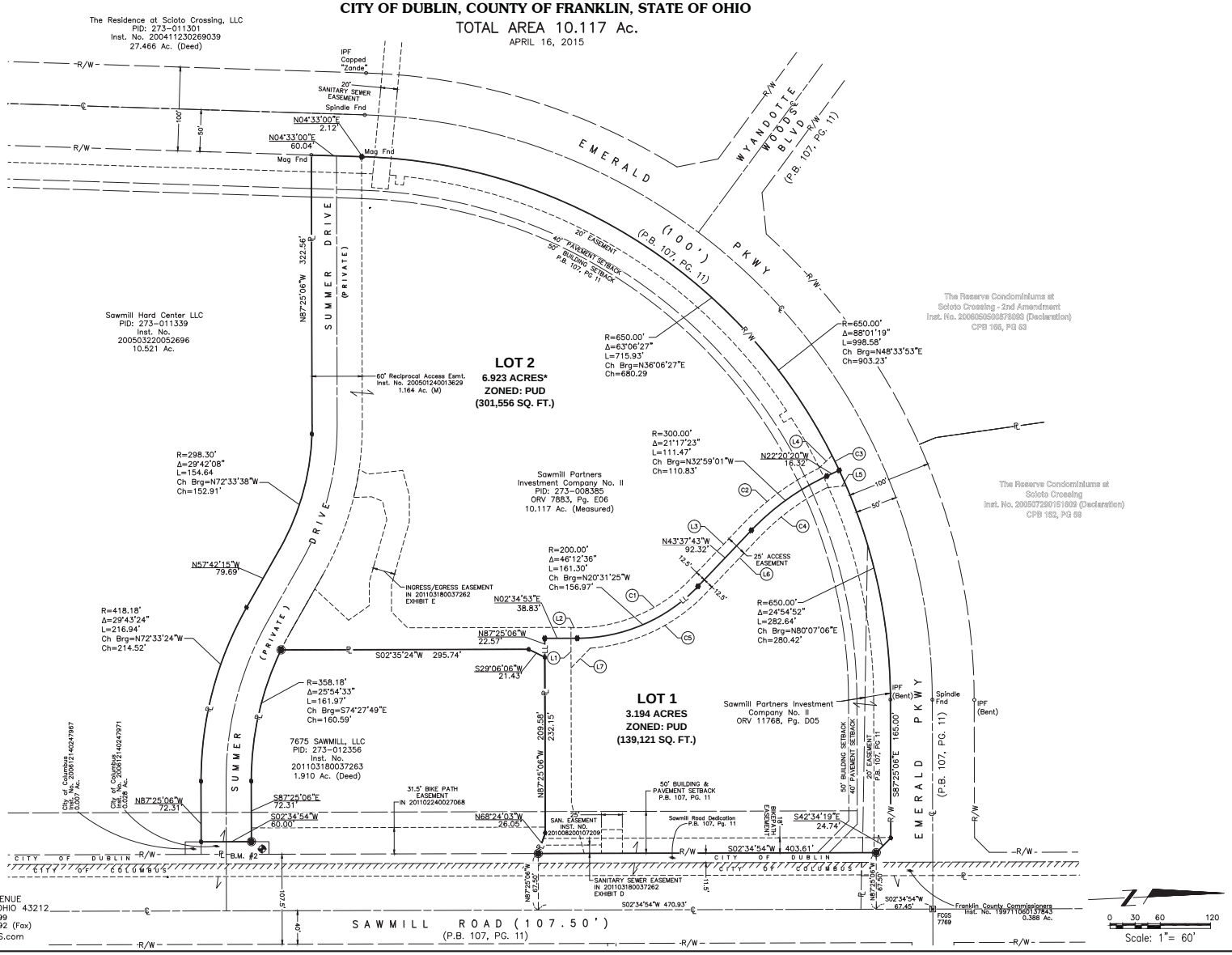
FINAL PLAT
SAWMILL-EMERALD SUBDIVISION
SAWMILL ROAD AND EMERALD PARKWAY
QUARTER TOWNSHIP 2, TOWNSHIP 2 NORTH, RANGE 19 WEST, UNITED STATES MILITARY LANDS
CITY OF DUBLIN, COUNTY OF FRANKLIN, STATE OF OHIO

TOTAL AREA 10.117 Ac.

APRIL 16, 2015

ACCESS ESMT. LINE TABLE		
LINE	BEARING	DISTANCE
L1	N87°24'55"W	47.94'
L2	N02°34'53"E	7.50'
L3	N43°37'43"W	92.32'
L4	N41°23'33"W	21.69'
L5	S03°45'40"E	23.31'
L6	S43°37'43"E	92.32'
L7	S43°03'07"E	32.88'

ACCESS ESMT. CURVE TABLE					
NO.	LENGTH	RADIUS	DELTA (Δ)	CHORD BEARING	CHORD
C1	151.22'	187.50'	46°12'36"	N20°31'25"W	147.16'
C2	111.65'	312.50'	20°28'12"	N33°23'37"W	111.05'
C3	39.55'	650.00'	3°29'09"	N67°40'51"E	39.54'
C4	100.75'	285.63'	20°12'36"	S33°35'24"E	100.23'
C5	155.88'	212.50'	42°01'49"	S22°36'48"E	152.41'



*NOTE: LOT 2 INCLUDES 1.164 ACRES IWTHIN SUMMER DRIVE, RESULTING IN A DEVELOPABLE AREA OF 5.759 ACRES.

E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

CONTACT:
880 KING AVENUE
COLUMBUS, OHIO 43212
(614) 299-2999
(614) 299-2992 (Fax)
www.EPFERRIS.com

Drainage Analysis and Pond Design

Northstar Realty
Sawmill Road & Emerald Parkway

Dublin, Ohio

Prepared By:

E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

880 King Ave.
Columbus, Ohio 43212

EP Ferris # 1081-001

I hereby certify that the calculations contained herein are accurate to the best of my knowledge and belief.

STATE OF OHIO
MICHAEL J. OVERSTREET #E-65572 REGISTERED
PROFESSIONAL ENGINEER

By: Michael J. Overstreet, P.E.

4/16/15
Date

INTRODUCTION:

The following report presents the preliminary design and analysis of the stormwater management for Northstar Realty on Sawmill Road & Emerald Parkway in Dublin, Ohio. Detention for the site is provided through the use of pervious pavement with underground storage in stone voids along with pipe storage and some detention in bio-retention cells. The storage shall be governed by the release rates set forth by the City of Dublin Master Drainage Plan.

The total area for the proposed project is approximately 3.02 acres, which the majority of this area (2.88 acres) shall drain into the proposed water quality and detention system. A portion of the site (Ex. Private Drive to the south) will not be included as it was designed to flow to the adjacent site retention pond. Water quality shall be handled within the proposed detention facility per Ohio EPA and City of Dublin requirements.

HYDROLOGIC ANALYSIS:

All hydrologic parameters were determined using methodology described in the City of Dublin Stormwater Management Design Manual, dated June 2013. Both Pre-Development and Post-Development runoff and peak discharge amounts were calculated through HydroCAD version 9.10 software.

The Master Drainage Plan for the City of Dublin was used in order to compute allowable release rates for the proposed improvements. This site is part of the two watersheds; The Hard Road Watershed (SubArea 1005) and The Billingsley Creek Watershed (SubArea 370).

All proposed drainage will be directed to the Billingsley Creek Watershed (Existing 24” storm sewer along Sawmill Road) due the highly restrictive requirements of the Hard Road Watershed. The release rates will be limited to only the Billingsley rate requirements even though part of the Hard Road Watershed will be tributary. The storage shall be governed by the release of the 1 year-allowable release rate to the critical storm, storms less frequent than the critical storm shall be released at a rate limited to that storms allowable rate.

PRE-DEVELOPED CONDITIONS:

The pre-developed condition of the site consists of an open site with ground cover vegetation, grasses and several sparse tree clusters. The areas around the site are developed suburban commercial and residential uses. The site is relatively flat in nature with a high point near the southwest portion of the site delineating the two watersheds.

Currently the site is divided into two tributary divides per the Master Drainage Study. One portion of the site is tributary to the Billingsley Creek Watershed, sub-basin number 370. The other portion is tributary to the Hard Road Watershed, sub-basin number 1005. A total of 2.35 acres of the overall site is tributary to the Billingsley Creek Watershed. The remaining 0.67 acres is tributary to the Hard Road Watershed.

POST-DEVELOPED CONDITIONS:

The post developed condition for the site will consist of a proposed building, asphalt and pervious pavement parking. The existing access drive to the south was not included as tributary to the proposed site. The developed area of the site is approximately 2.88 acres. Approximately 0.14 acres of the 3.02 acre site (mostly along the Sawmill Road) will go undetained, however, a portion of the site (drive from Emerald Parkway) is outside the property line but included. These two areas were estimated to essentially be equal and cancel each other.

The outlet flow rates will be controlled based upon the City of Dublin's Master Storm Water Management Plan. A critical storm was determined for the site by comparing pre to post 1 year, 24 hour storm runoff volumes and the increase created by the post developed condition (See calculation below). This project creates a 188% increase in the 1 year, 24-hour volume. According to the storm water regulations, this means the critical storm event is a 25-year storm. All events more frequent and equal to the 25-year storm must release at the 1-year pre-developed rate that is determined by the master drainage study.

The 2.35 acres of area tributary to the Billingsley watershed was used to establish an allowable release rate per acre per the Master Drainage Plan. There will be a change in the watershed areas from the Hard Road Watershed to the Billingsley Creek Watershed as a result of this development, but with no increase in controlled rate to the Billingsley Creek Watershed. The detention will be sized to release the runoff according to the Master Drainage Plan. By limiting the release rate in this manner, the design intent is that the proposed development does not create adverse conditions to the Billingsley Creek Watershed beyond what is provided in the Master Drainage Plan. There will instead be a decrease in tributary area to the Hard Road watershed with no increase to the Billingsley watershed, in terms of runoff from this site.

Tables have been provided below summarizing the preliminary results of storm water management and calculations for the project. Table 1 describes the comparative release rates for pre and post developed storms as well as the allowable release rates based upon the critical storm and pond level information for each respective storm. Table 2 is intended to show the capacity of the pond above the normal water surface

elevation. Table 3 is intended to show how the 2.35 acres relates to the Master Drainage Plan release rates allowable per acre of area.

Critical Storm Calculation:

The critical storm is determined by comparing the increase in runoff volume of the 1-year 24-hour rainfall event from the pre-developed condition to that of the post-developed.

Pre-Development 1-Year Storm Event: 0.118 af
Post-Development 1-Year Storm Event: 0.340 af
((0.340 af – 0.118 af) / 0.118 af) x 100% = 188% **(25 year critical storm)**

Table 1 – Stormwater Management Summary Table

	1 year	**2 year**	**5 year**	**10 year**	**25 year**	**50 year**	**100 year**
Predev. Q (cfs)	1.89	2.84	4.32	5.60	7.49	9.09	10.81
Postdev. Q (cfs)	5.20	6.60	8.59	10.21	12.48	14.36	16.32
Allowable Release (cfs)*	1.88	1.88	1.88	1.88	1.88	6.35	7.99
Actual Release (cfs)	1.21	1.34	1.51	1.64	1.81	1.99	2.08
Ponding Elev.	903.40’	903.76’	904.29’	904.74’	905.40’	906.16’	906.59’
Storage (cf) @ Elev.	4,398	6,119	8,675	10,842	13,988	16,636	19,572
Storage Depth	1.90’	2.26’	2.79’	3.24’	3.90’	4.66’	5.09’

***See table 3 for release rate summary and assumptions.**

Table 2 - Pond Storage Elevation-Volume Table

Elevation	**Total Storage Provided (cf)**
901.50	0
902.50	119
903.50	4,508
904.50	8.901
905.50	13,293
906.50	17,718
906.90	20,447

Table 3 – Allowable Release Rate Tabulation
(Billingsley Watershed)
(2.35 Ac.)

Storm Event	cfs/Acre Allowable	Site Allowable cfs/Acre
1 year	0.8	1.88
2 year	1.0	2.35
5 year	1.3	3.06
10 year	1.5	3.53
25 year	2.0	4.70
50 year	2.7	6.35
100 year	3.4	7.99

Runoff shall be controlled with an orifice plate placed inside an outlet structure which will drain into the existing storm sewer system along Sawmill Road. A circular orifice, currently calculated at 6" diameter, at Elev. 901.50 is to control the 1 through 100 year events. In the event the orifice fails, the overflow is designed to pass over curb inlets located along the edges of pavement with a top of curb elevation set at Elev. 906.75.

WATER QUALITY:

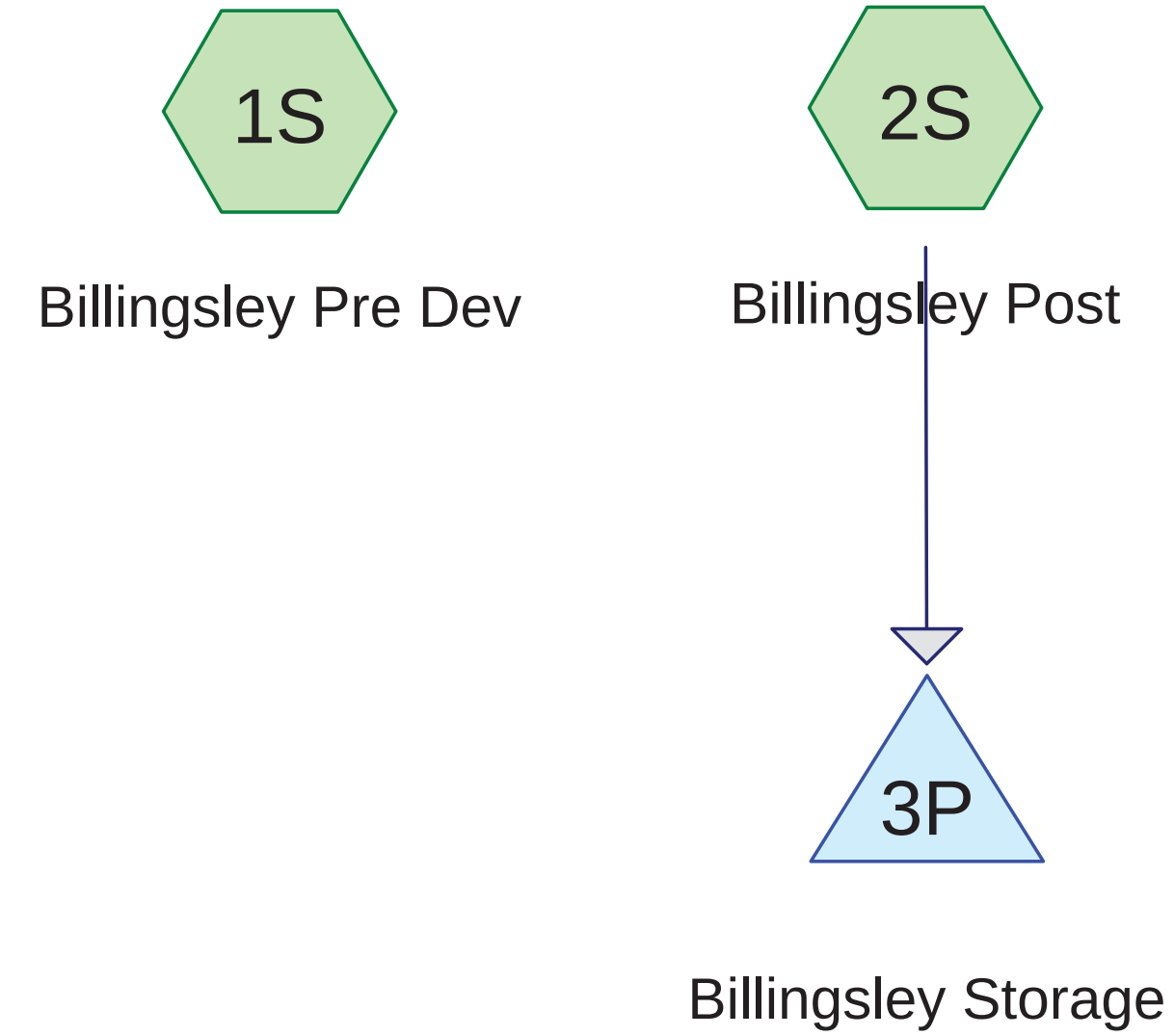
Water quality storage and treatment shall be provided by various bio-retention cells located throughout the site. Bio-retention is sized per the Ohio EPA water quality guidelines. Calculations for water quality are found in Appendix B). Pervious pavement is provided for storage as well as addition sediment control for the site with a drawdown time contingent on outlet control and existing soils. See details of bio-retention and pervious pavement on Sheet 6 of the Final Development Plan.

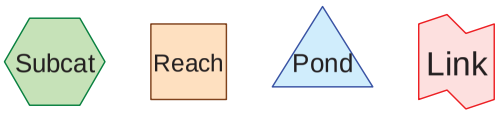
SUMMARY:

The developed site is controlled at one location via a 6" orifice and uses a combination of pervious pavement with stone voids underneath along with pipe storage and above ground storage. The release rate is per the Billingsley Creek Watershed restrictions provided from the City of Dublin Stormwater Master Plan. A small portion of the Hard Road Watershed will drain to the Billingsley Creek Watershed as a result of this development but the detention system will still be regulated per the allowable Billingsley Creek Watershed restrictions.

Further details regarding the detailed design of the entire storm water management system will be provided when the engineering of the development area is complete. Additional details can be provided as required for the City of Dublin Engineering staff to determine if the proposed system is acceptable and meets Dublin City Code.

APPENDIX A
HydroCAD REPORT





Drainage Diagram for Billingsly Prelim Drainage
Prepared by E.P. Ferris & Associates, Printed 4/15/2015
HydroCAD® 9.10 s/n 05053 © 2010 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.350	78	Pre-developed Conditions (1S)
2.880	92	Post-Developed (2S)

Summary for Subcatchment 1S: Billingsley Pre Dev

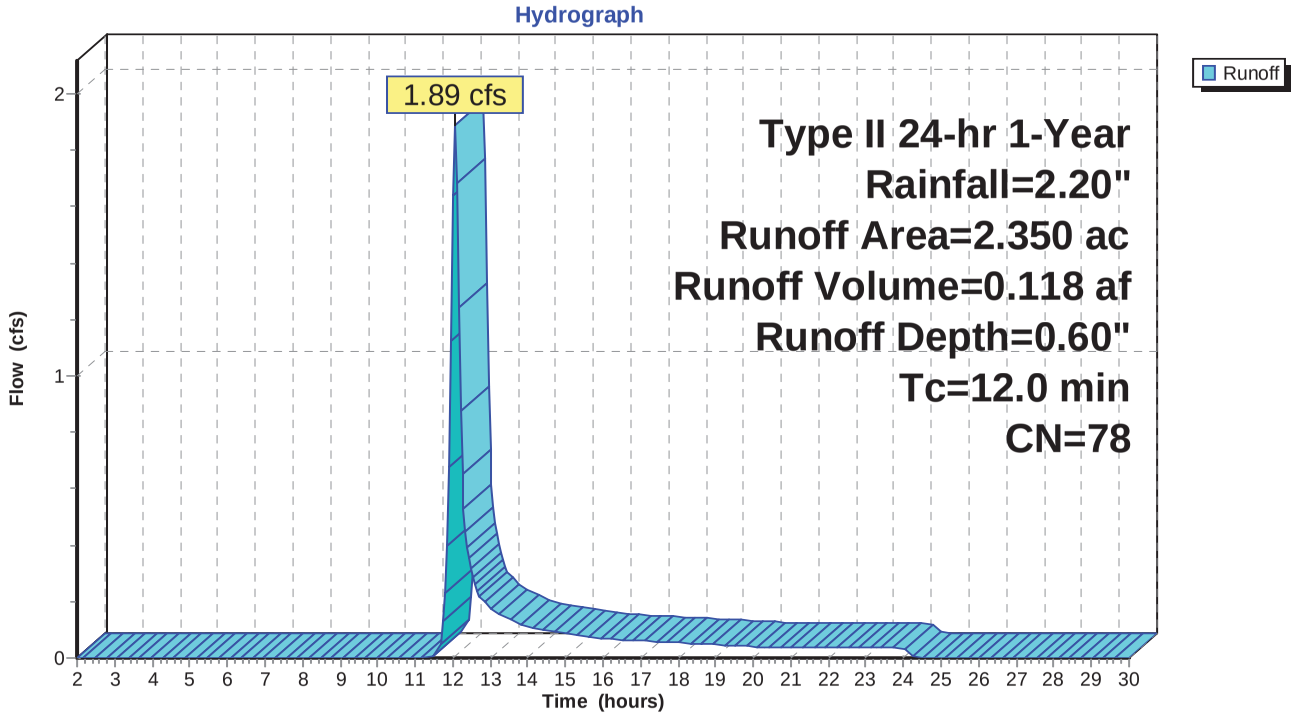
Runoff = 1.89 cfs @ 12.05 hrs, Volume= 0.118 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

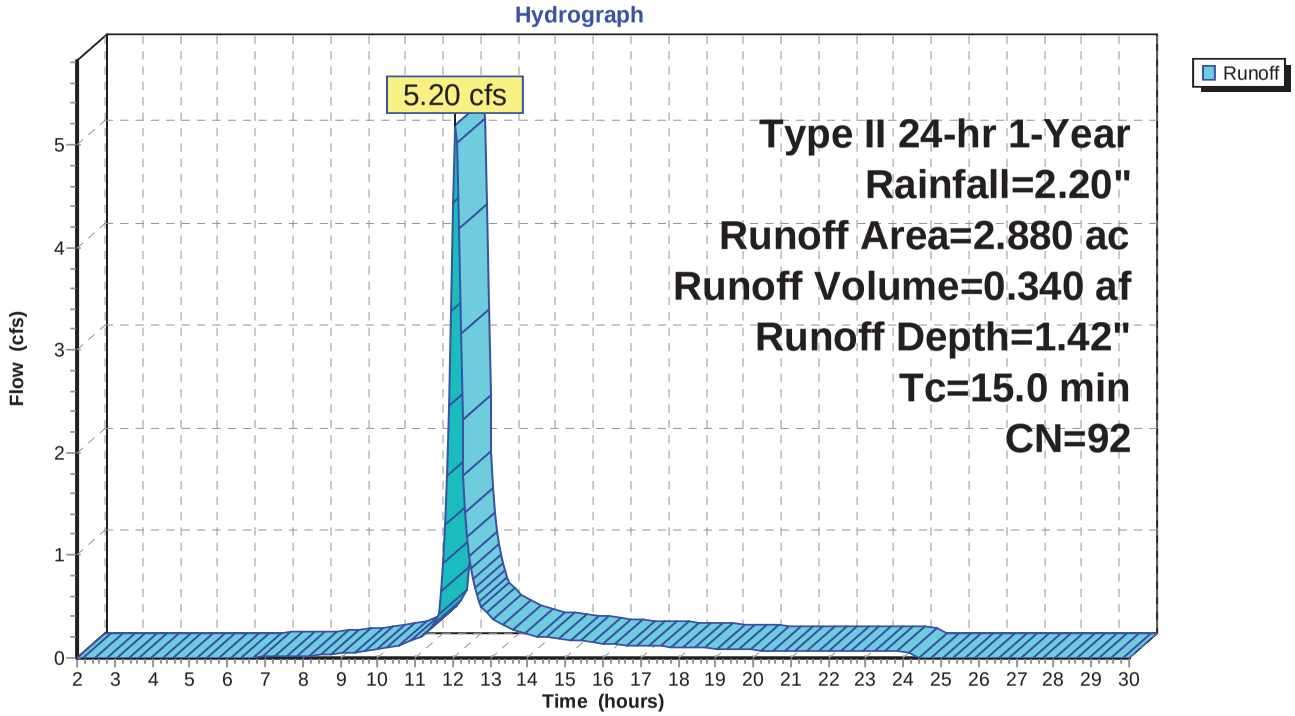
Runoff = 5.20 cfs @ 12.07 hrs, Volume= 0.340 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 1.42" for 1-Year event
Inflow = 5.20 cfs @ 12.07 hrs, Volume= 0.340 af
Outflow = 1.21 cfs @ 12.39 hrs, Volume= 0.340 af, Atten= 77%, Lag= 19.6 min
Primary = 1.21 cfs @ 12.39 hrs, Volume= 0.340 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 903.40' @ 12.39 hrs Surf.Area= 11,497 sf Storage= 4,398 cf

Plug-Flow detention time= 24.2 min calculated for 0.340 af (100% of inflow)
Center-of-Mass det. time= 24.1 min (841.4 - 817.3)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

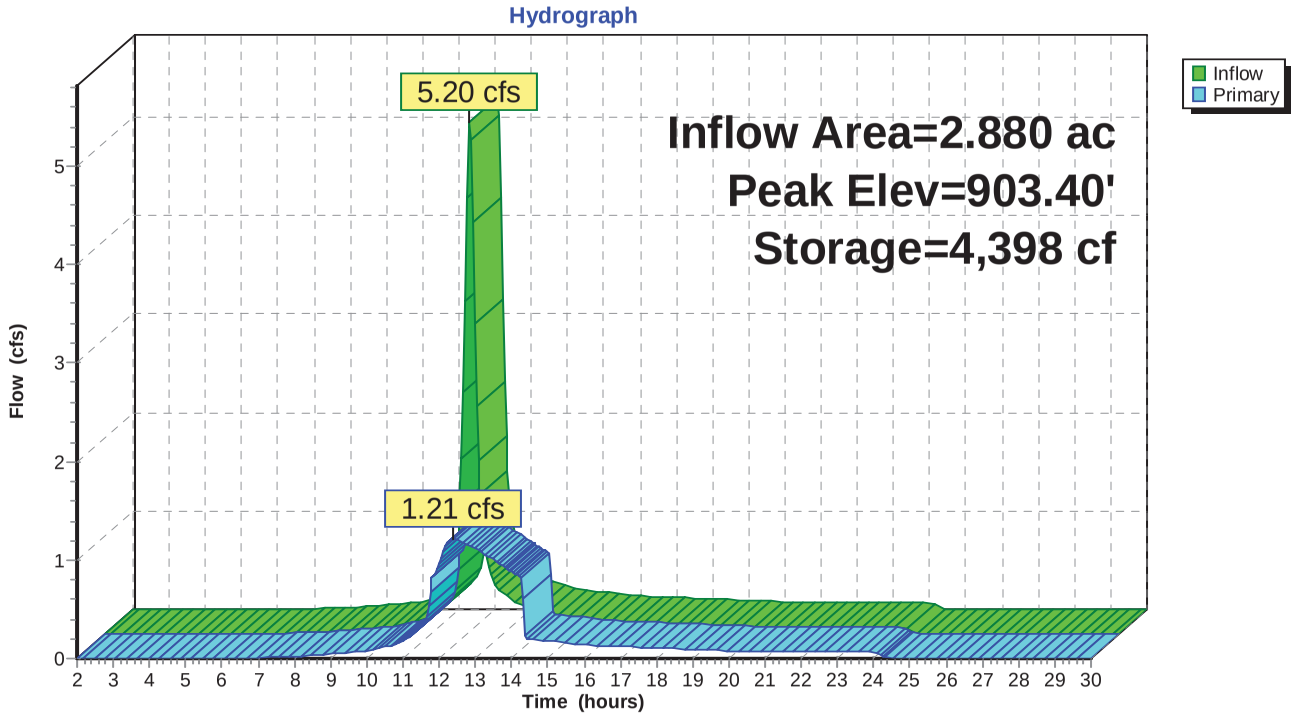
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

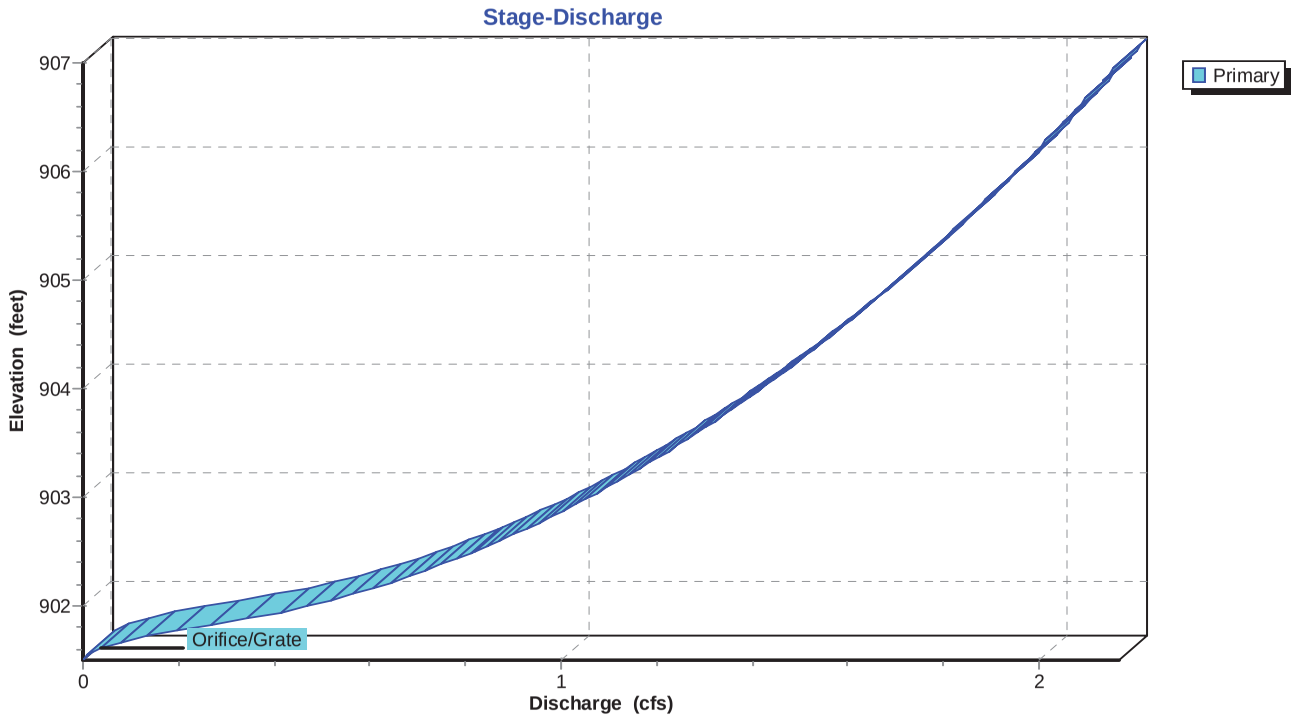
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.21 cfs @ 12.39 hrs HW=903.40' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.21 cfs @ 6.18 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



Summary for Subcatchment 1S: Billingsley Pre Dev

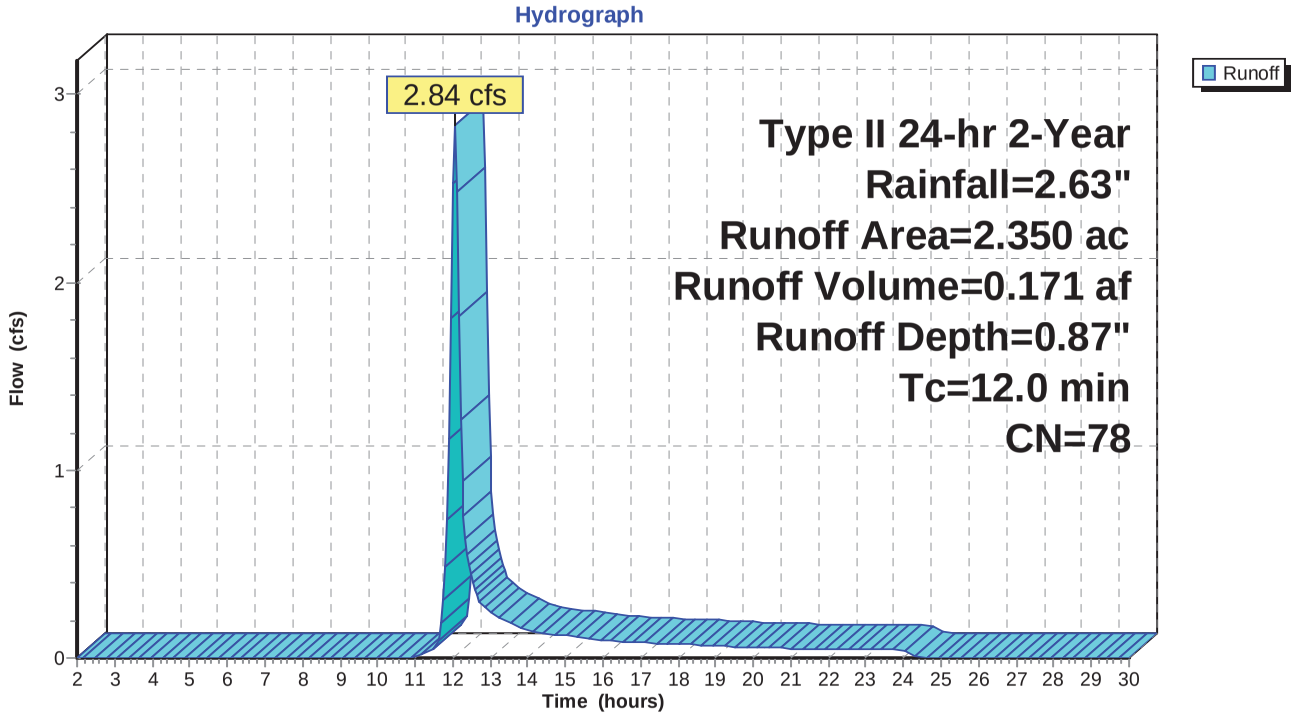
Runoff = 2.84 cfs @ 12.05 hrs, Volume= 0.171 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

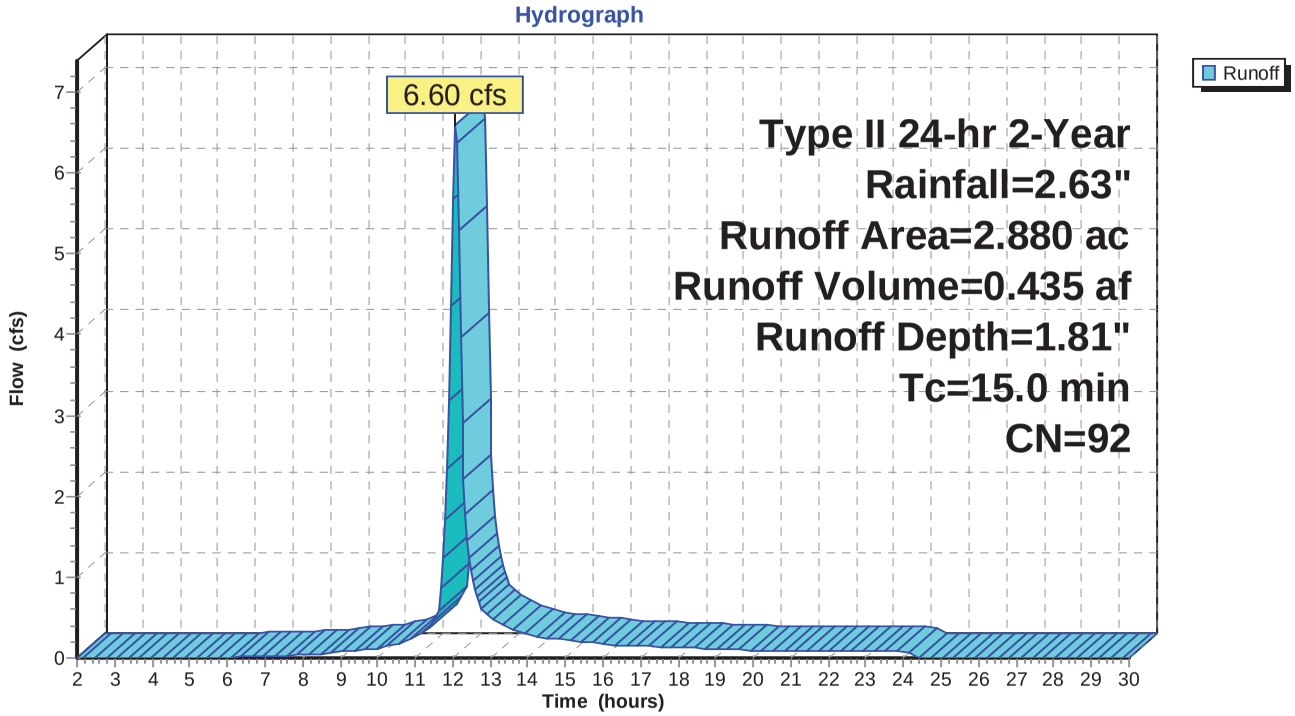
Runoff = 6.60 cfs @ 12.07 hrs, Volume= 0.435 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 1.81" for 2-Year event
Inflow = 6.60 cfs @ 12.07 hrs, Volume= 0.435 af
Outflow = 1.34 cfs @ 12.43 hrs, Volume= 0.435 af, Atten= 80%, Lag= 21.8 min
Primary = 1.34 cfs @ 12.43 hrs, Volume= 0.435 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 903.76' @ 12.43 hrs Surf.Area= 11,497 sf Storage= 6,119 cf

Plug-Flow detention time= 32.2 min calculated for 0.435 af (100% of inflow)
Center-of-Mass det. time= 32.1 min (842.4 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

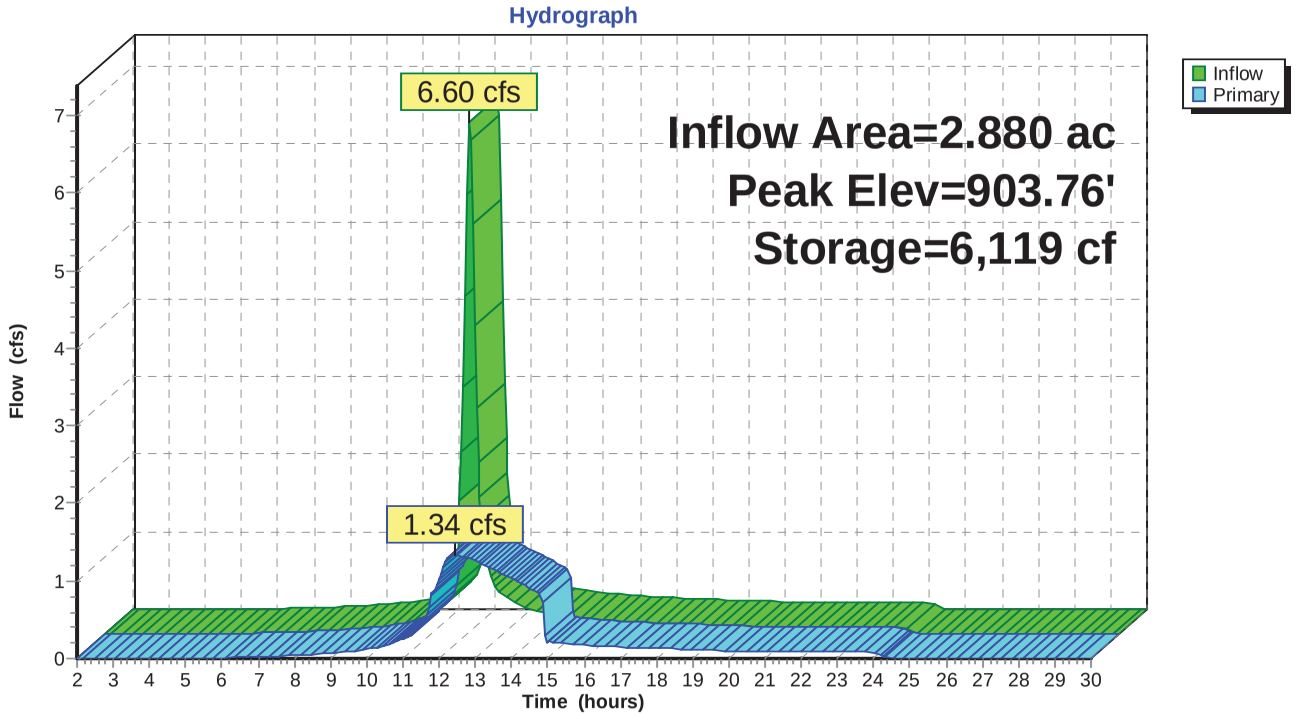
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

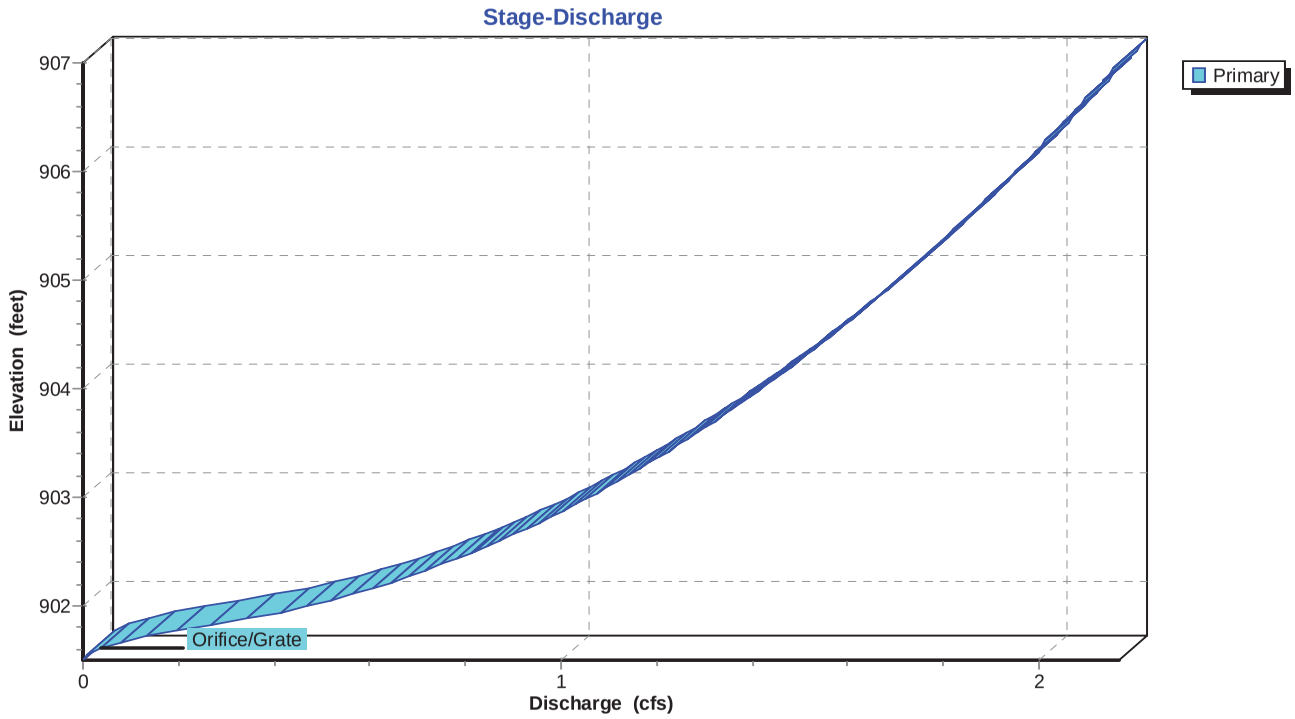
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.34 cfs @ 12.43 hrs HW=903.75' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.34 cfs @ 6.82 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



Summary for Subcatchment 1S: Billingsley Pre Dev

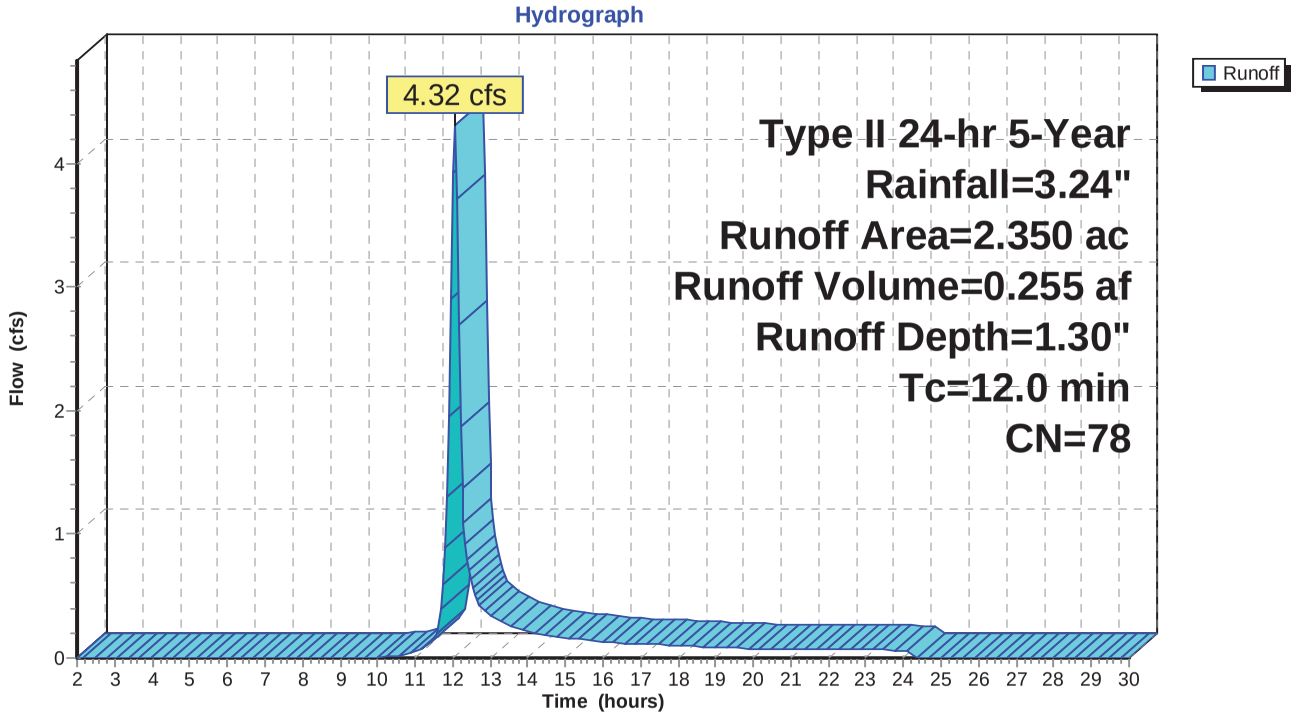
Runoff = 4.32 cfs @ 12.04 hrs, Volume= 0.255 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

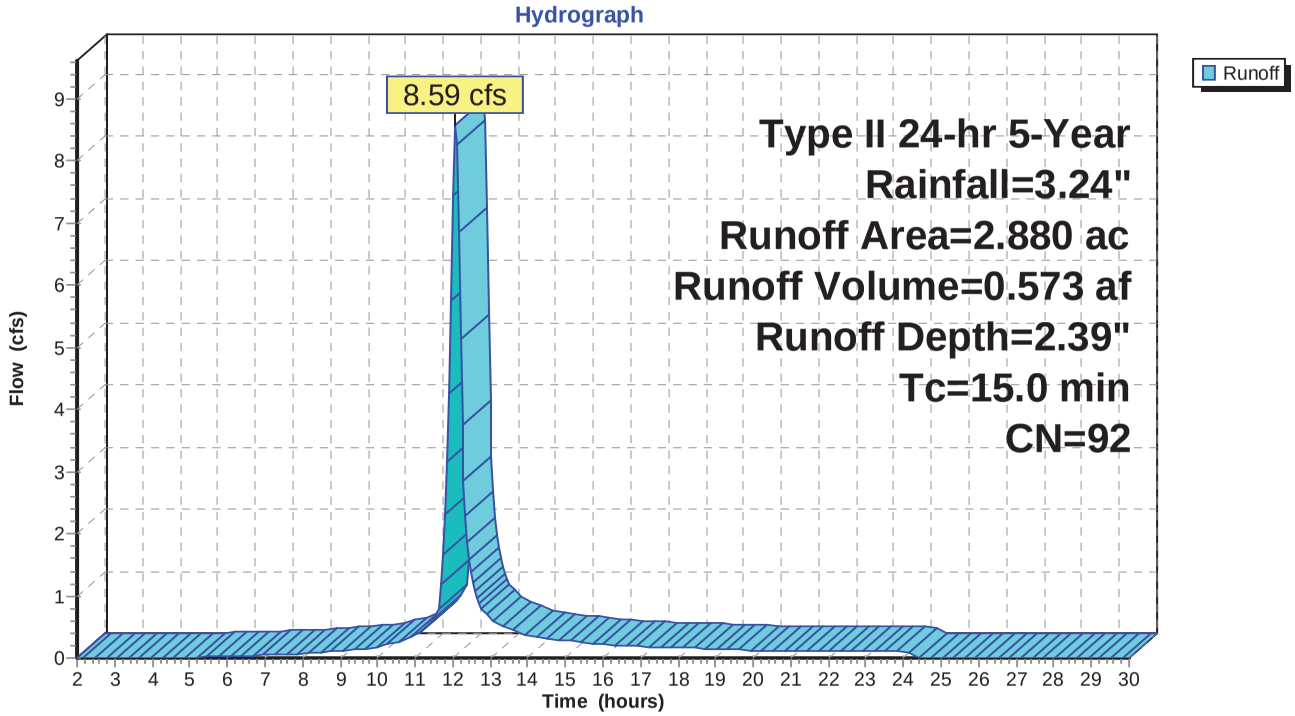
Runoff = 8.59 cfs @ 12.06 hrs, Volume= 0.573 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 2.39" for 5-Year event
Inflow = 8.59 cfs @ 12.06 hrs, Volume= 0.573 af
Outflow = 1.51 cfs @ 12.47 hrs, Volume= 0.573 af, Atten= 82%, Lag= 24.4 min
Primary = 1.51 cfs @ 12.47 hrs, Volume= 0.573 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 904.29' @ 12.47 hrs Surf.Area= 11,497 sf Storage= 8,675 cf

Plug-Flow detention time= 42.8 min calculated for 0.572 af (100% of inflow)
Center-of-Mass det. time= 42.7 min (845.2 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

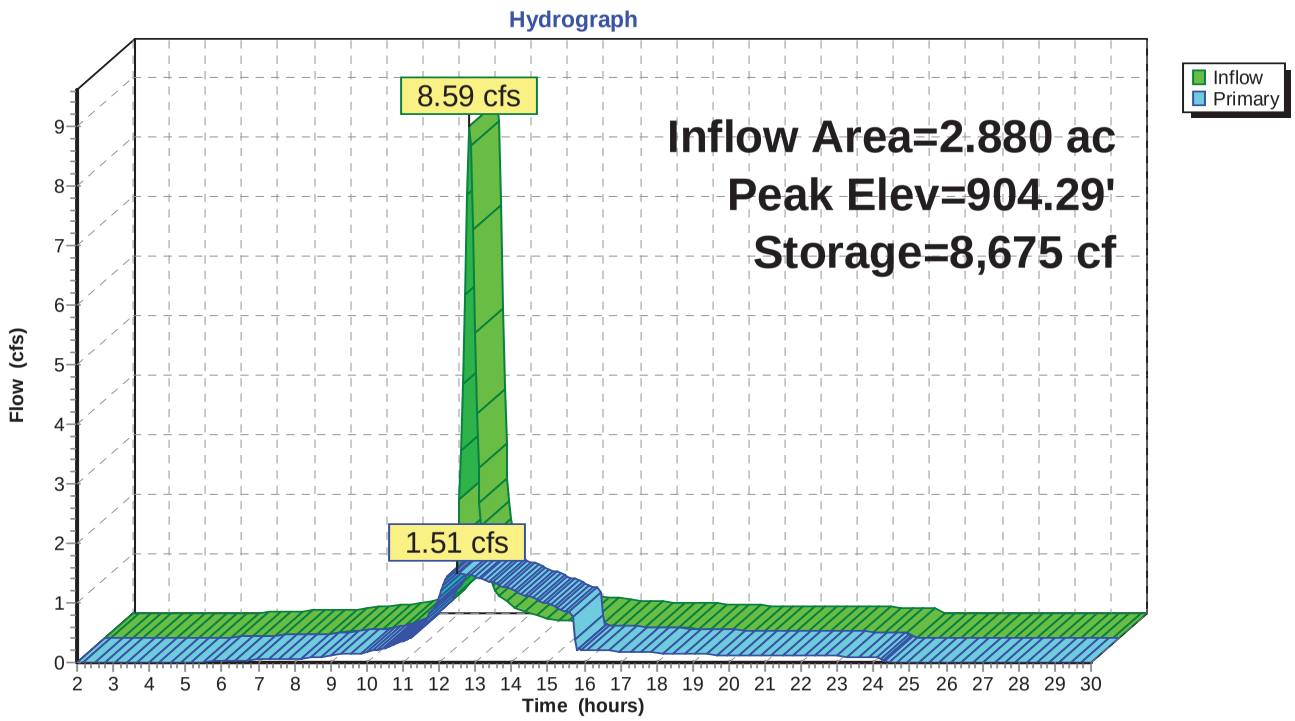
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

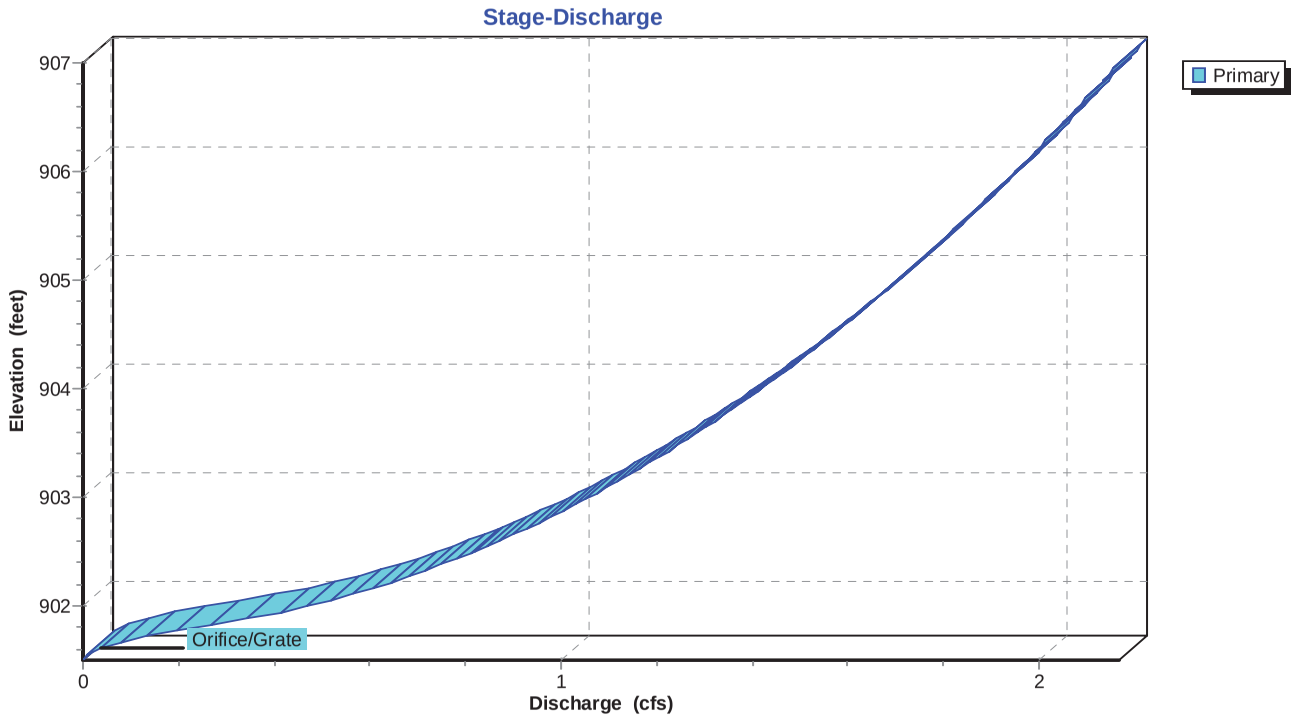
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.51 cfs @ 12.47 hrs HW=904.29' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.51 cfs @ 7.67 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



Summary for Subcatchment 1S: Billingsley Pre Dev

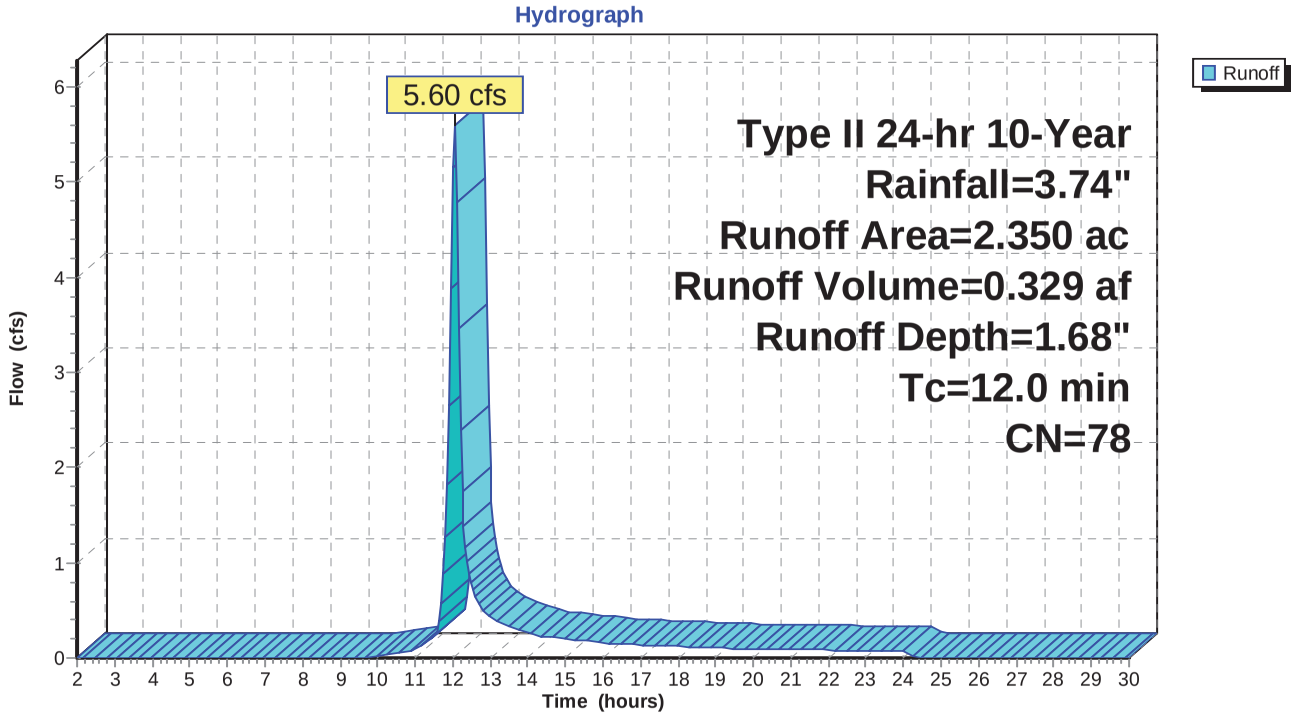
Runoff = 5.60 cfs @ 12.04 hrs, Volume= 0.329 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

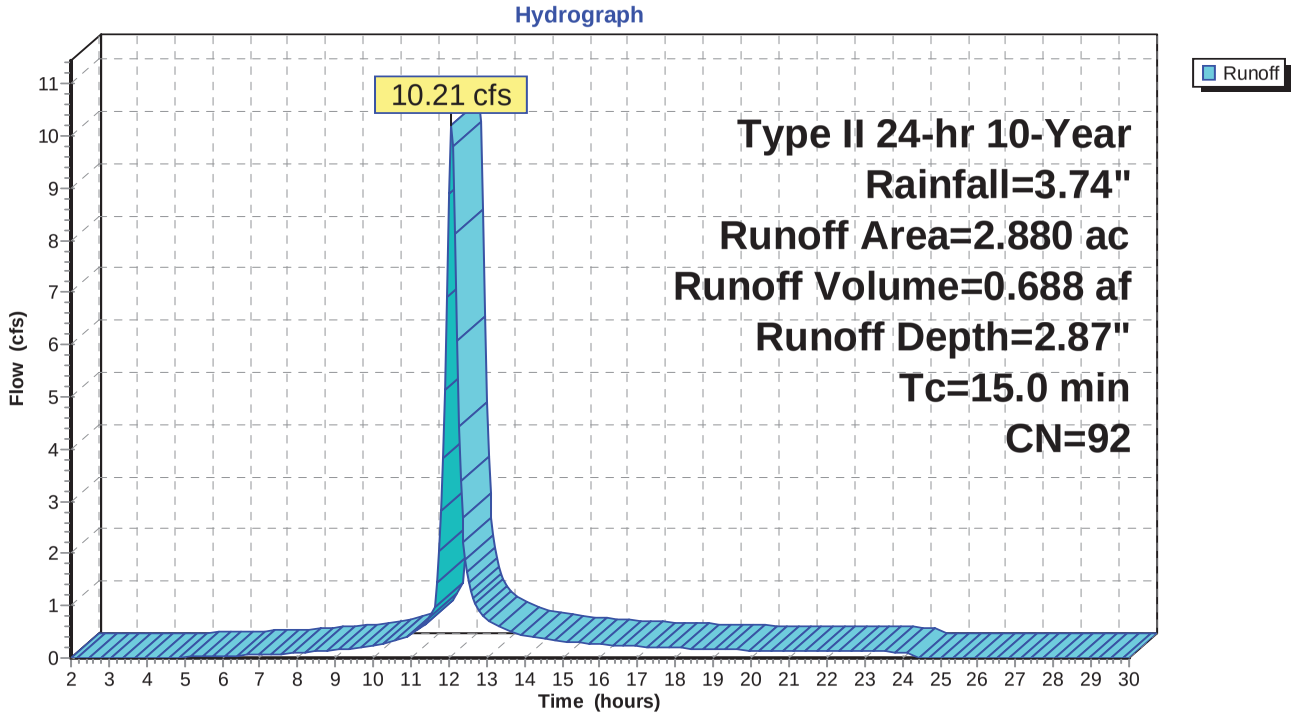
Runoff = 10.21 cfs @ 12.06 hrs, Volume= 0.688 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 2.87" for 10-Year event
Inflow = 10.21 cfs @ 12.06 hrs, Volume= 0.688 af
Outflow = 1.64 cfs @ 12.50 hrs, Volume= 0.688 af, Atten= 84%, Lag= 26.2 min
Primary = 1.64 cfs @ 12.50 hrs, Volume= 0.688 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 904.74' @ 12.50 hrs Surf.Area= 11,497 sf Storage= 10,842 cf

Plug-Flow detention time= 50.9 min calculated for 0.687 af (100% of inflow)
Center-of-Mass det. time= 50.8 min (848.2 - 797.4)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

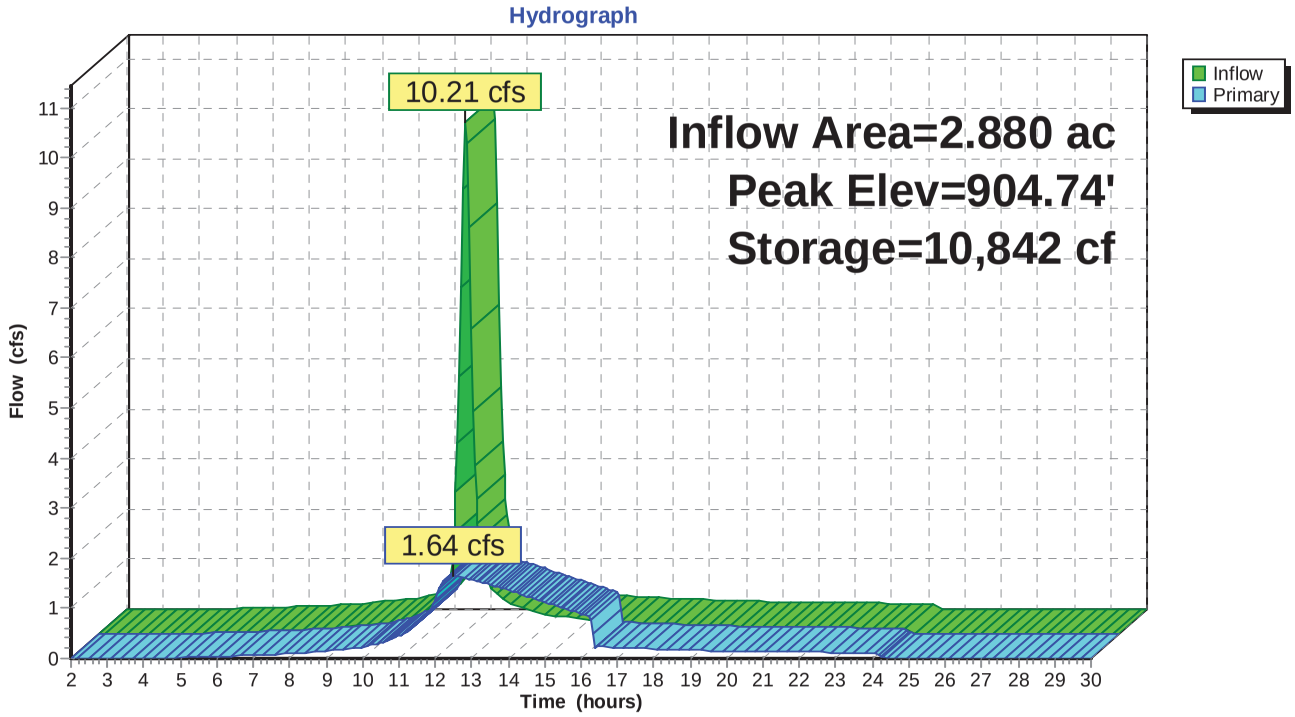
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

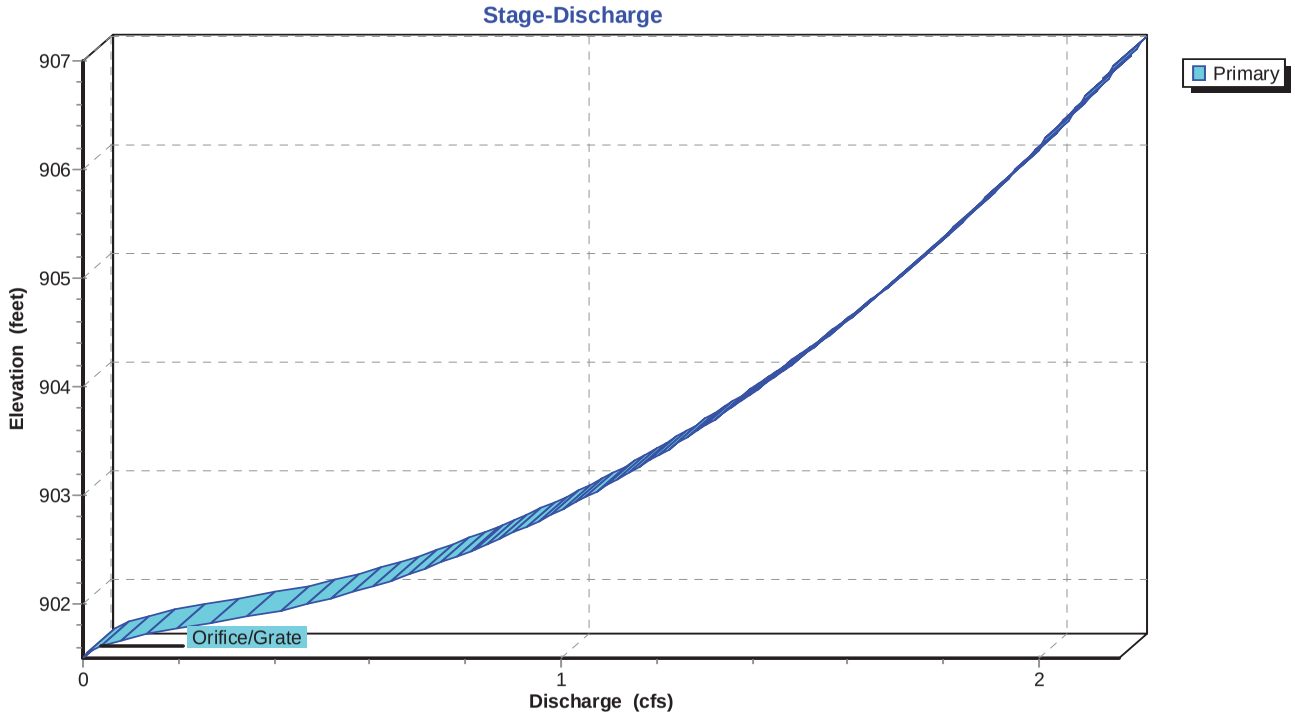
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.64 cfs @ 12.50 hrs HW=904.74' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.64 cfs @ 8.33 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



Summary for Subcatchment 1S: Billingsley Pre Dev

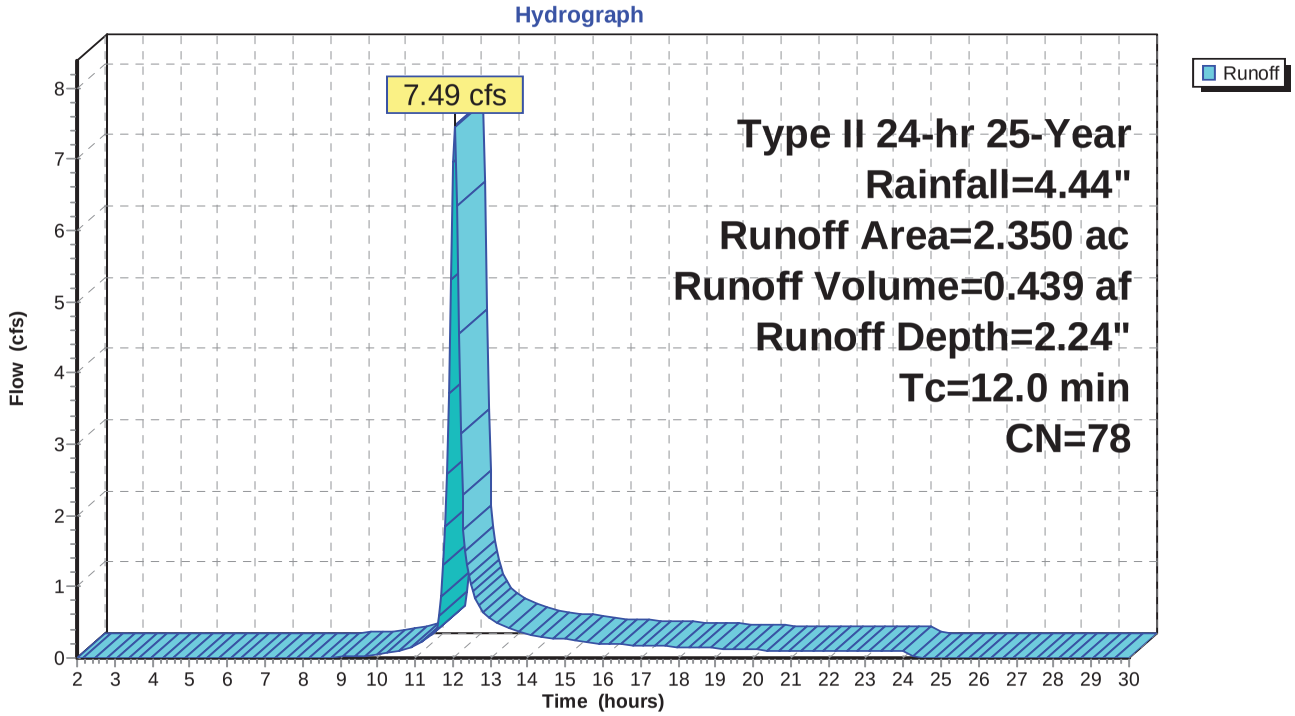
Runoff = 7.49 cfs @ 12.04 hrs, Volume= 0.439 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

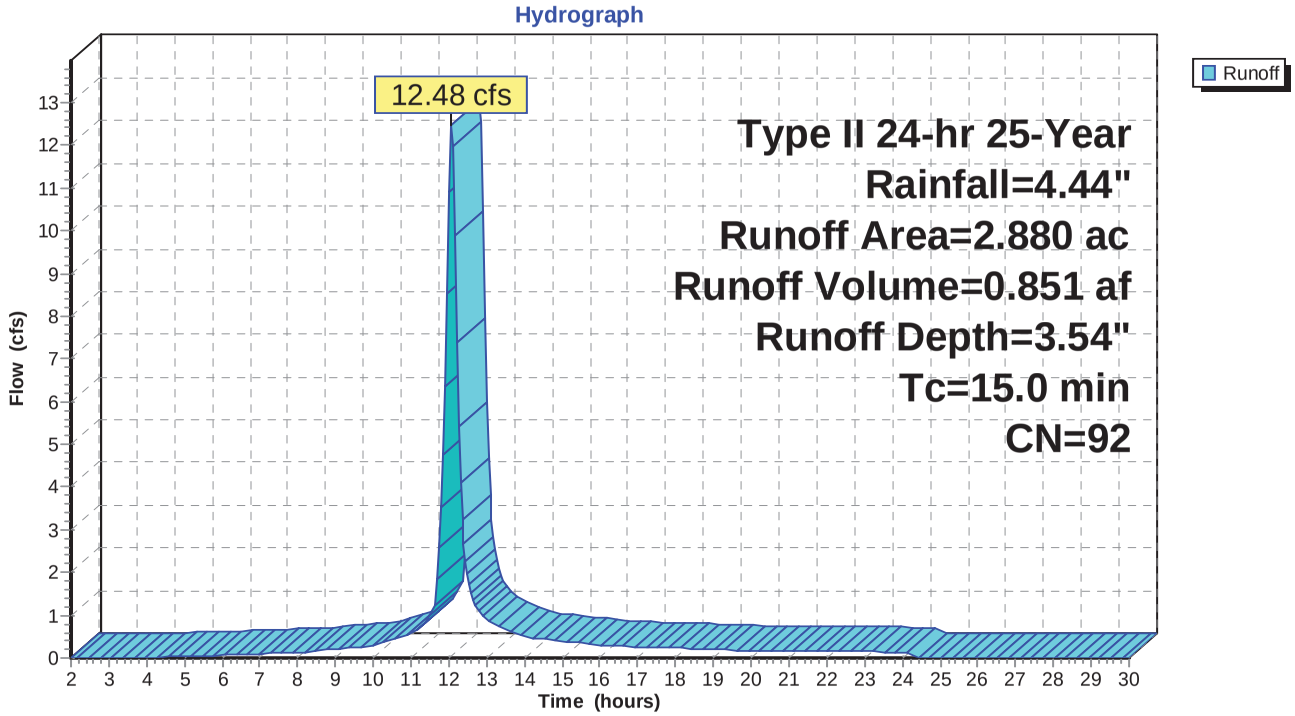
Runoff = 12.48 cfs @ 12.06 hrs, Volume= 0.851 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 3.54" for 25-Year event
Inflow = 12.48 cfs @ 12.06 hrs, Volume= 0.851 af
Outflow = 1.81 cfs @ 12.54 hrs, Volume= 0.851 af, Atten= 86%, Lag= 28.3 min
Primary = 1.81 cfs @ 12.54 hrs, Volume= 0.851 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 905.40' @ 12.54 hrs Surf.Area= 11,497 sf Storage= 13,988 cf

Plug-Flow detention time= 61.8 min calculated for 0.849 af (100% of inflow)
Center-of-Mass det. time= 61.7 min (853.2 - 791.6)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

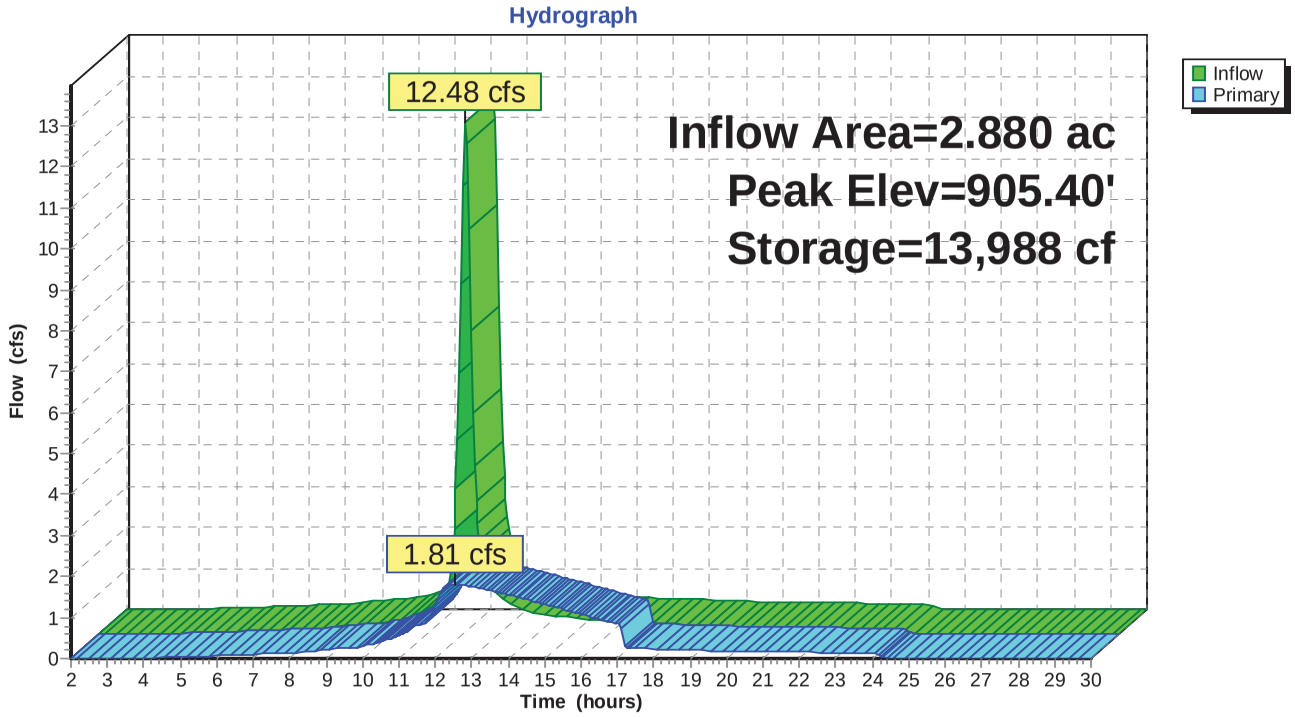
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

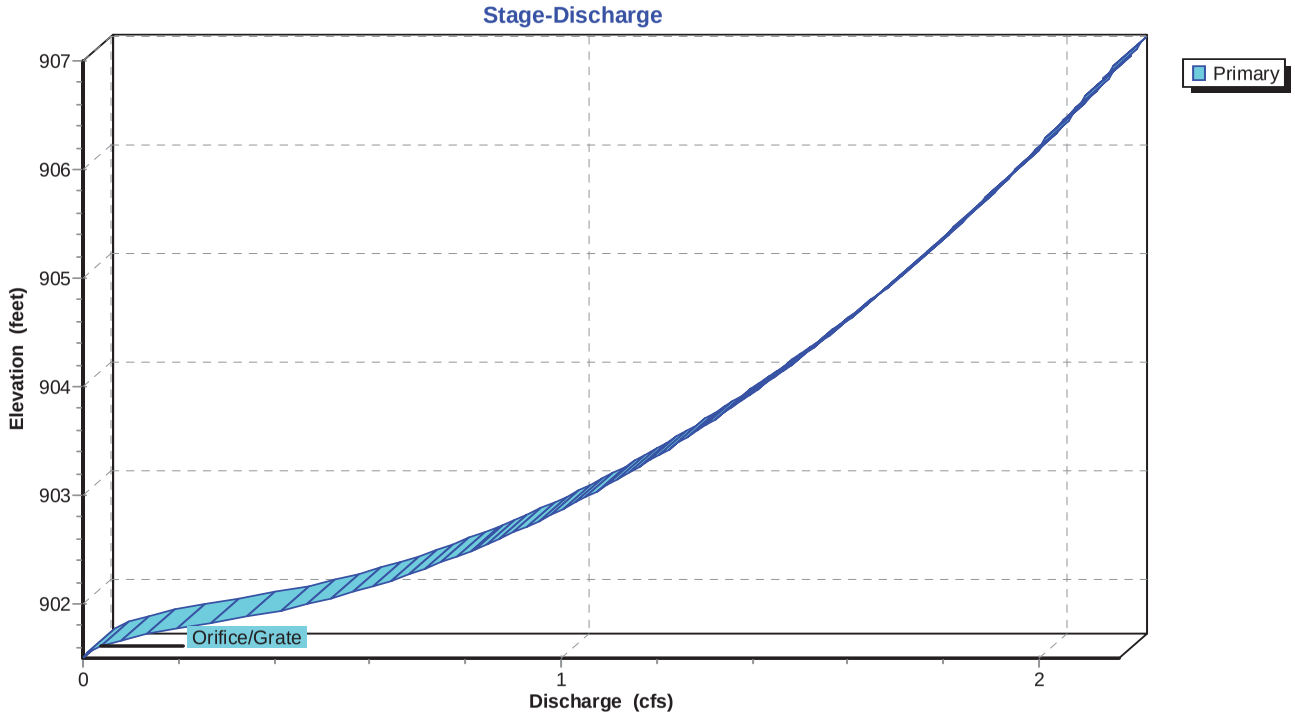
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.81 cfs @ 12.54 hrs HW=905.40' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.81 cfs @ 9.20 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



Summary for Subcatchment 1S: Billingsley Pre Dev

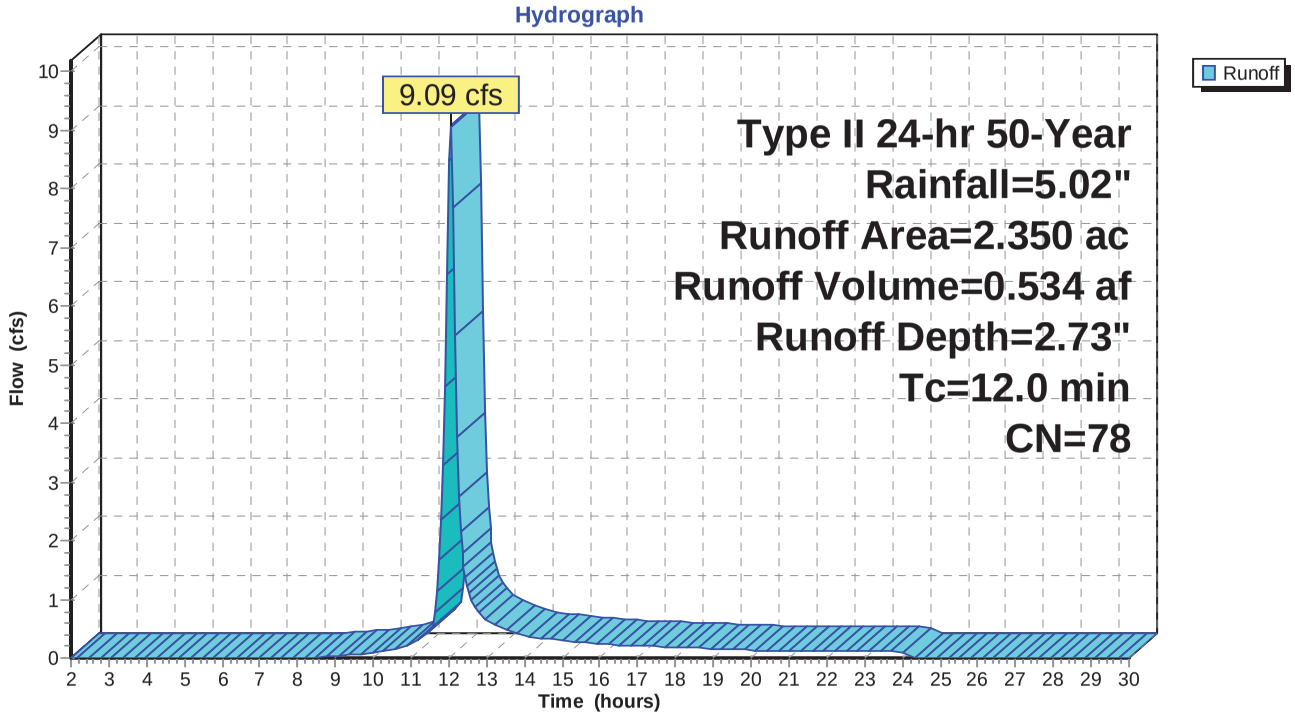
Runoff = 9.09 cfs @ 12.04 hrs, Volume= 0.534 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

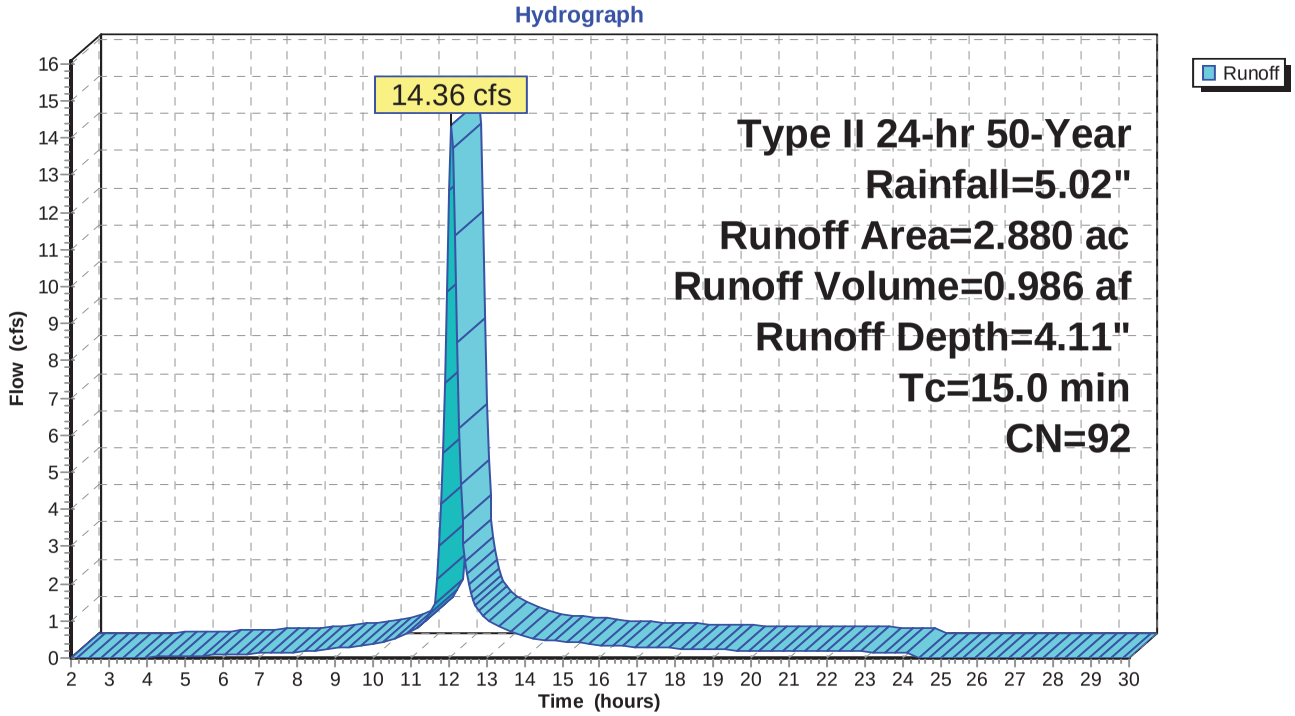
Runoff = 14.36 cfs @ 12.06 hrs, Volume= 0.986 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 4.11" for 50-Year event
Inflow = 14.36 cfs @ 12.06 hrs, Volume= 0.986 af
Outflow = 1.99 cfs @ 12.55 hrs, Volume= 0.986 af, Atten= 86%, Lag= 29.3 min
Primary = 1.99 cfs @ 12.55 hrs, Volume= 0.986 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 906.16' @ 12.55 hrs Surf.Area= 18,157 sf Storage= 16,636 cf

Plug-Flow detention time= 69.7 min calculated for 0.984 af (100% of inflow)
Center-of-Mass det. time= 69.6 min (857.2 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

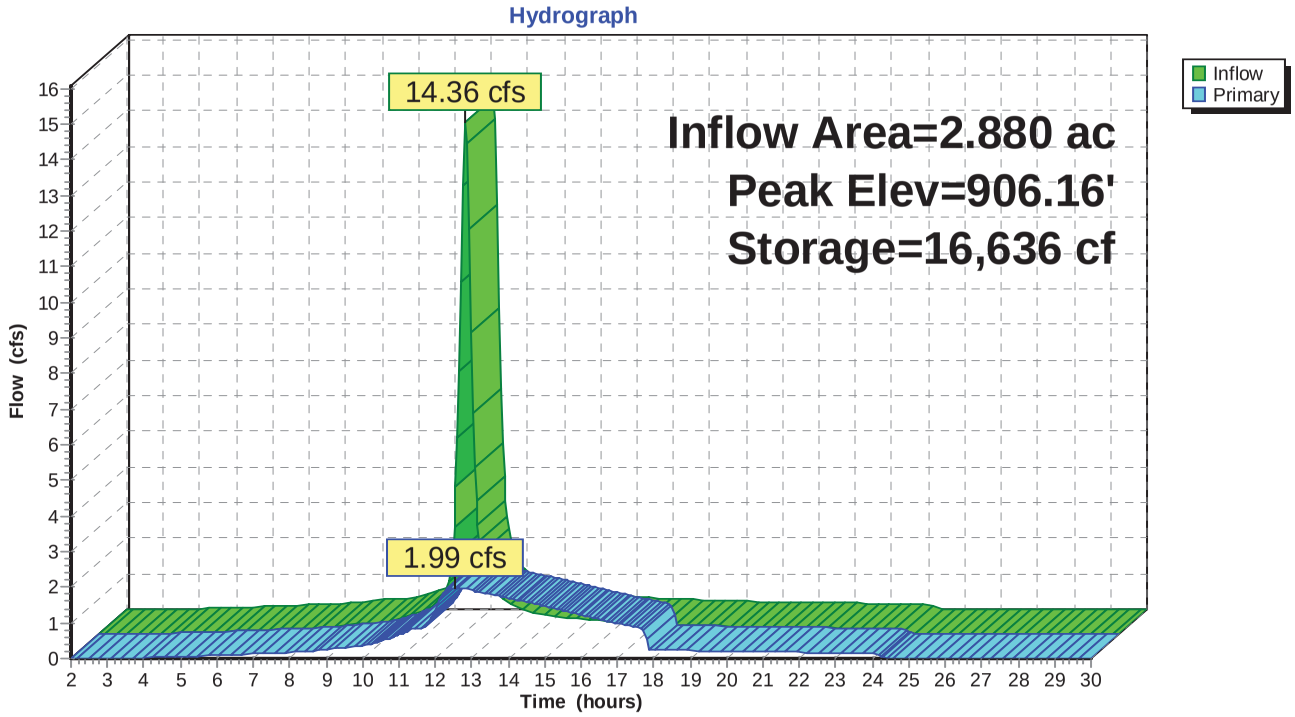
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

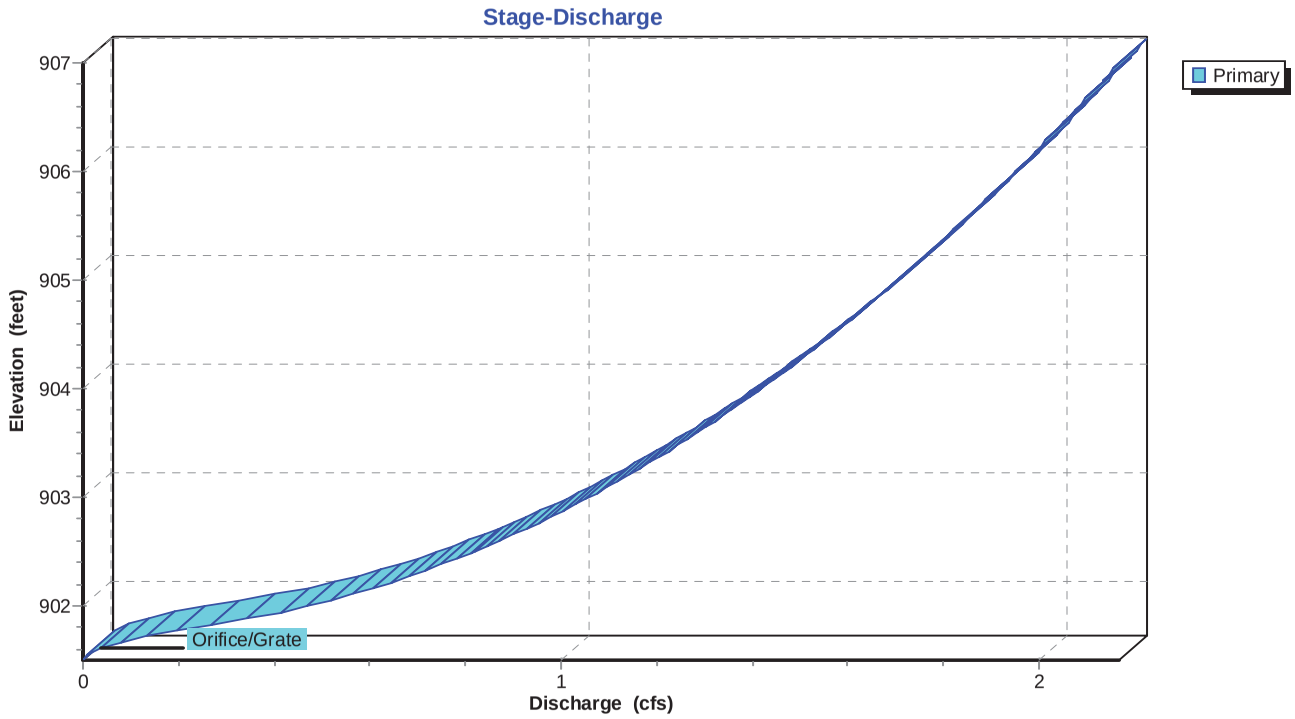
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.99 cfs @ 12.55 hrs HW=906.16' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.99 cfs @ 10.11 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



Summary for Subcatchment 1S: Billingsley Pre Dev

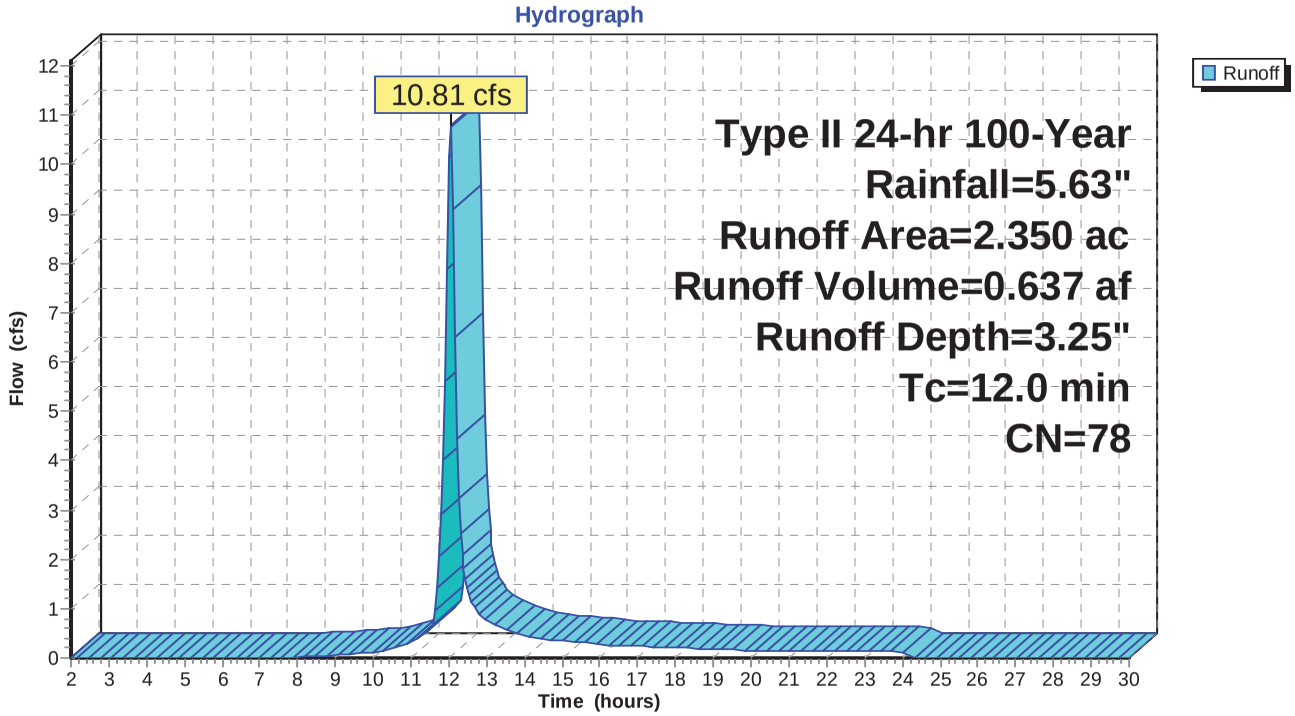
Runoff = 10.81 cfs @ 12.04 hrs, Volume= 0.637 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	2.350	78	Pre-developed Conditions
	2.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, ToC Assumed**

Subcatchment 1S: Billingsley Pre Dev



Summary for Subcatchment 2S: Billingsley Post

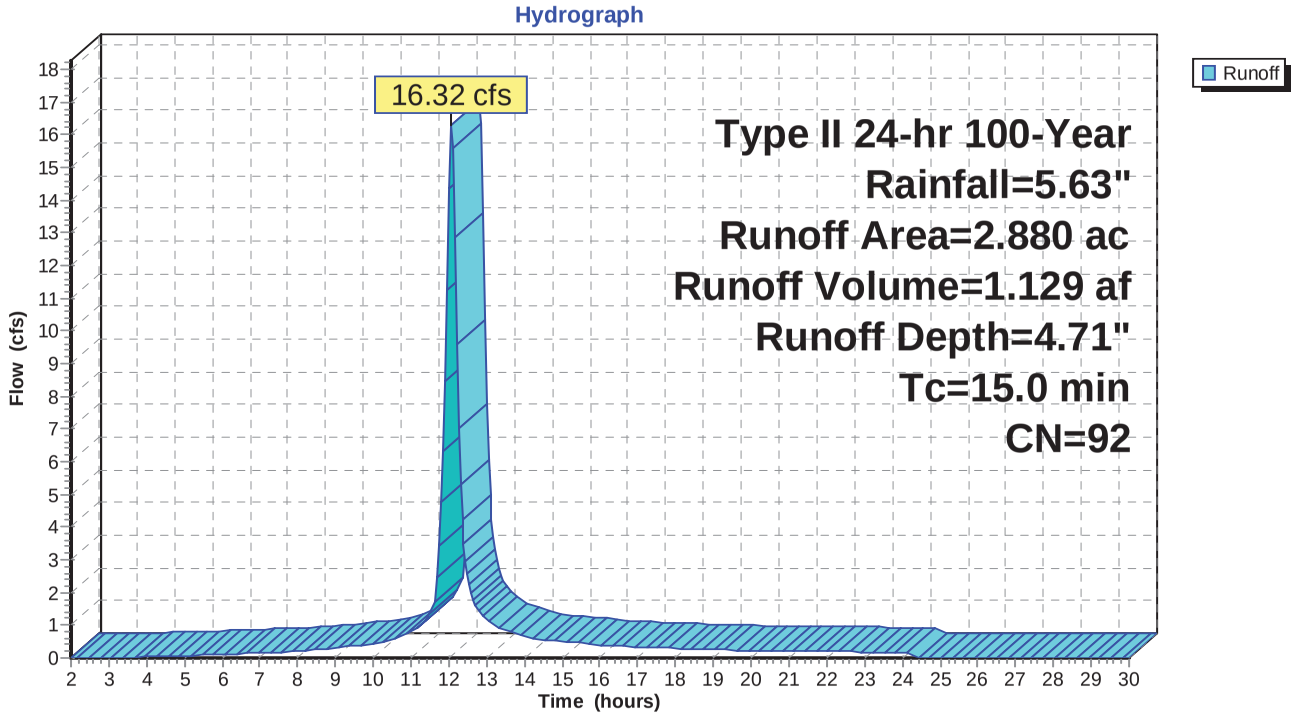
Runoff = 16.32 cfs @ 12.06 hrs, Volume= 1.129 af, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	2.880	92	Post-Developed
	2.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Tc Post Assumed Minimum**

Subcatchment 2S: Billingsley Post



Summary for Pond 3P: Billingsley Storage

Inflow Area = 2.880 ac, 0.00% Impervious, Inflow Depth = 4.71" for 100-Year event
Inflow = 16.32 cfs @ 12.06 hrs, Volume= 1.129 af
Outflow = 2.08 cfs @ 12.58 hrs, Volume= 1.129 af, Atten= 87%, Lag= 31.1 min
Primary = 2.08 cfs @ 12.58 hrs, Volume= 1.129 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 906.59' @ 12.58 hrs Surf.Area= 18,032 sf Storage= 19,572 cf

Plug-Flow detention time= 78.6 min calculated for 1.127 af (100% of inflow)
Center-of-Mass det. time= 78.4 min (862.4 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	902.50'	14,323 cf	**Pervious Pvmnt (Prismatic)**Listed below (Recalc)
#2	906.00'	6,800 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#3	901.50'	1,252 cf	**15.0" D x 1,020.0'L Pipe Storage S= 0.0040 '/'**
		22,375 cf	Total Available Storage

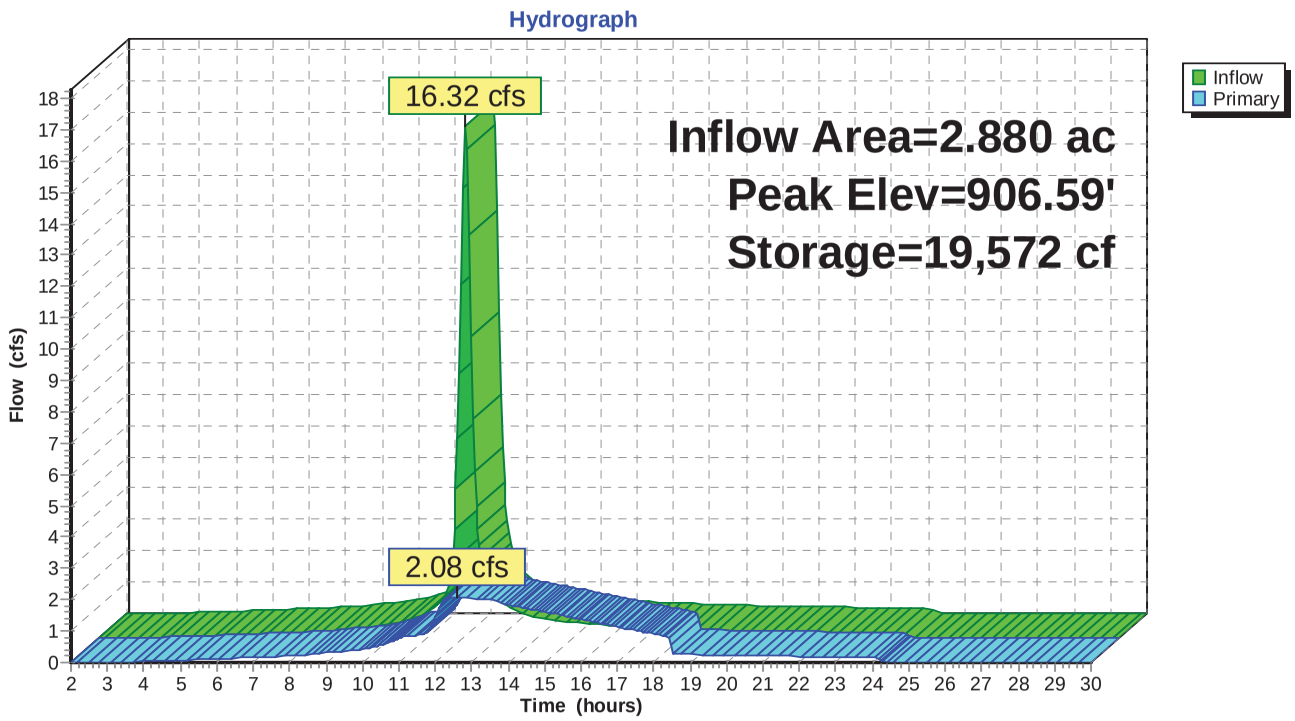
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.50	11,190	0.0	0	0
905.70	11,190	40.0	14,323	14,323

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
906.00	6,800	0	0
907.00	6,800	6,800	6,800

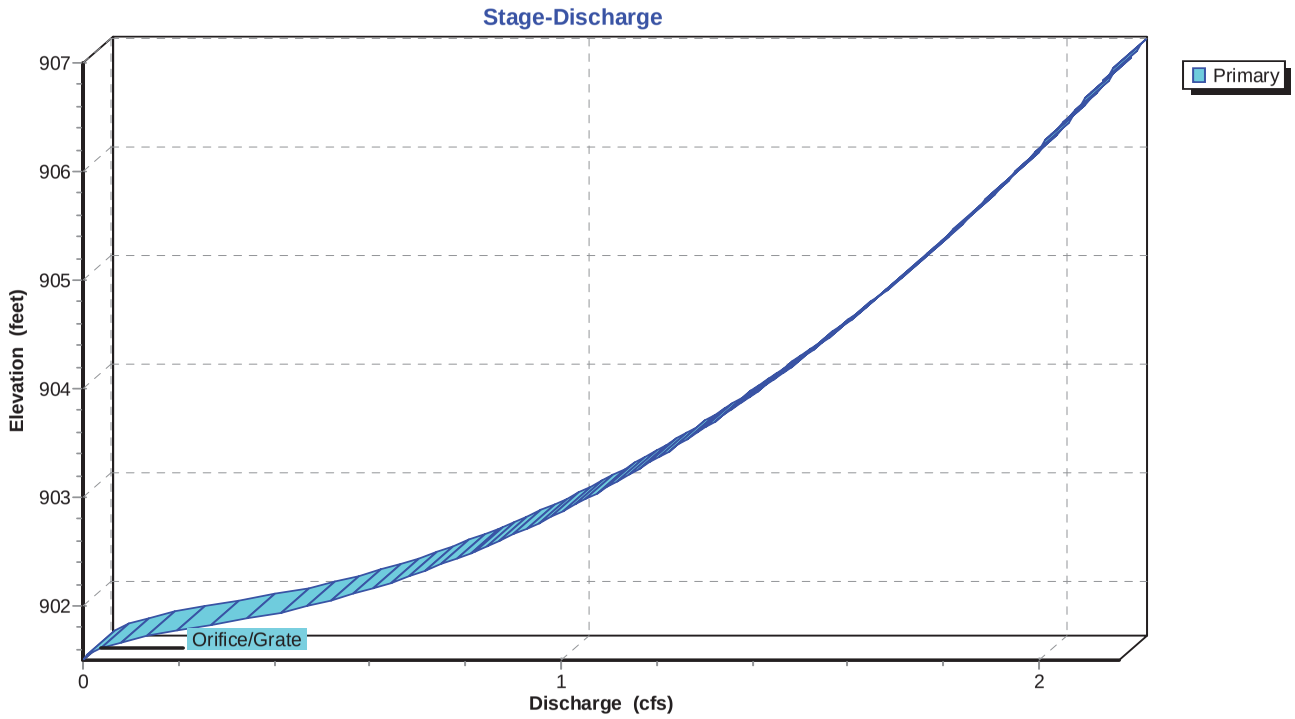
Device	Routing	Invert	Outlet Devices
#1	Primary	901.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.08 cfs @ 12.58 hrs HW=906.59' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 2.08 cfs @ 10.59 fps)

Pond 3P: Billingsley Storage



Pond 3P: Billingsley Storage



APPENDIX B

(Water Quality Calculations)

WATER QUALITY CALCULATIONS

E. P. FERRIS and ASSOCIATES INC.
880 King Avenue
Columbus, Ohio 43212
614-299-2999
614-299-2992 (Fax)

Dublin/Emerald Pkwy
Dublin, Ohio

Prepared IMJO
Checked: SWG

Date: -

Project: 1081.01

Water Quality Calculation - Per Ohio EPA requirements

WQv = C x P x (A/12)

C - See Table 1 or calculate using formula
P - precepitation depth (usually 0.75)
A - Area draining to BMP in Acres

C:	0.8	
P:	0.75	0.75 is OEPA
A:	2.88	Acres
	125453	Sq-Ft

Table 1 C Values:

Industrial/Commercial	0.8
High Density residential (>8dw/ac)	0.5
Medium Density res. (4 to 8 dw/ac)	0.4
Low Density res (<4 dw/ac)	0.3
Open Space and Recreation Area	0.2

Formula:

$C=0.858i^3 - 0.78i^2 +0.774i +0.04$

WQv:	0.144	acre-ft
	6273	cubic feet REQUIRED for treatment of disturbed area
	1255	cubic feet of sediment volume

Value for 'i': 0.95

WQv
Total: 7527

C = 0.806978

BIORETENTION CALCULATIONS

E. P. FERRIS and ASSOCIATES INC.
880 King Avenue
Columbus, Ohio 43212
614-299-2999
614-299-2992 (Fax)

Sawmill/Emerald Northstar Project
Dublin, Ohio

Prepared By: MJO
Checked: SWG

Date: 1/20/2015

Project: 1081.01

$$A = \frac{(WQ_v \cdot d)}{[3600 \cdot K \cdot T \cdot (h + d)]}$$

Where:

A	Surface Area of Bioretention Cell Planting Soil Bed (Acre)
WQ_v	Water Quality Volume Required (Acre-Ft)
d	Depth of the Planting Soil (ft) - min of 4'
T	Drawndown time in Hours - 40 hours for Ohio EPA
K	Permeability of the planting soil within the soil bed (ft/s) - 1.2×10^{-5} ft/sec (min.), which is equal to 0.5 in/hr
h	Average depth of water above filter bed (ft) Usually 1/2 the maximum depth above the bed - 12" is max. depth, so 0.5ft is typically used

Inputs:

WQ_v	7527	Cu. Ft.	0.172796	Acre-Ft	
d	4	ft			
T	24	hours			
K	0.000012	ft/sec	0.5184	in/hr	
h	1	ft			
Area:	0.13333	Acre	5807.87	Sq. Ft.	Required area to treat WQv
Area Provided:			6315	Sq. Ft.	

APPENDIX C

(Storm Sewer Calculations)

PROJECT: Northstar Realty **DATE:** 04/15/15

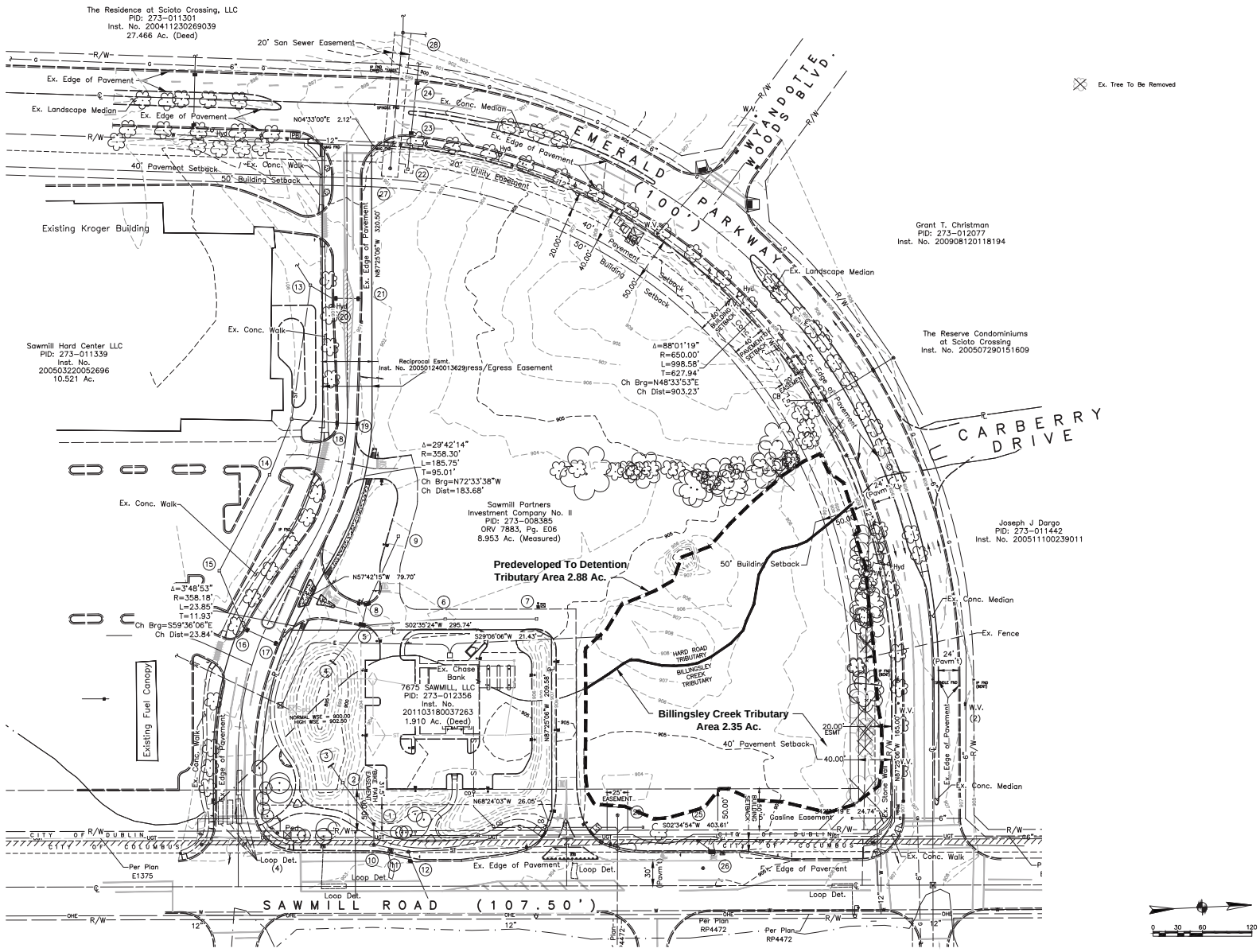
BY: MJO **CHECKED BY:** SWG **CONSULTANT:** E.P. FERRIS & ASSOCIATES **DESIGN/CHECK STORM:** 2|5

MH or CB No.	Sta.	Outlet	Incre. Acres	Total Acres	"C"	Incre. C x A	Sum C x A	To Inlet Ti min	In Pipe Tp min	Total Tc min	Rainfall Intensity (in/hr)	Req. CFS	Pipe Size (Inches)	"n" Value	Slope %	V ft/sec	Q CFS	Pipe Length	Invert Up end	Invert Lo end	T/C	*pipe thickness*	Depth (invert)	Cover (surface)	*pvmt thickness*	Cover (subgrade)	Rainfall Intensity (in/hr)	Flow, Q_{req} (cfs)	Minor Loss Coeff. K	Minor losses, H_m (ft)	Frictional Slope, S_f (ft)	Friction Loss, H_f (ft)	HGL Elevation
CI-12		CB-11	0.20	0.20	0.80	0.16	0.16	10	0.6	10	3.42	0.55									906.10		3.00	1.83	0.00	1.83	4.63	0.74					903.28
													12	0.013	0.40	2.86	2.25	100.9	903.10	902.70		0.170							0.25	0.0318	0.0004	0.0436	
CB-11		CI-10	0.18	0.38	0.80	0.14	0.30	10	0.8	10.6	3.42	1.04									906.50		3.80	2.36	0.00	2.36	4.63	1.41					903.20
													15	0.013	0.31	2.95	3.62	127.7	902.70	902.30		0.190							0.25	0.0339	0.0005	0.0606	
CI-10		CI-9	0.58	0.96	0.80	0.46	0.77	10	0.5	11.4	3.34	2.57									907.00		4.70	3.26	0.00	3.26	4.52	3.47					903.11
													15	0.013	0.38	3.26	4.00	78.5	902.30	902.00		0.190							0.25	0.0413	0.0029	0.2267	
CI-9		CB-8	0.15	1.11	0.80	0.12	0.89	10	0.4	11.9	3.34	2.97									907.20		5.20	3.76	0.00	3.76	4.52	4.01					902.84
													15	0.013	0.42	3.43	4.21	75.8	902.00	901.68		0.190							0.25	0.0457	0.0039	0.2926	
CB-8		MH-2	0.24	1.35	0.80	0.19	1.08	10	0.3	12.3	3.26	3.52									906.50		4.82	3.38	0.00	3.38	4.42	4.77					902.50
													15	0.013	0.42	3.44	4.22	42.4	901.68	901.50		0.190							0.25	0.0459	0.0055	0.2312	
MH-2																																	902.23
CB-7		CI-6	0.57	0.57	0.80	0.46	0.46	10	0.8	10	3.42	1.56									905.50		1.96	0.79	0.00	0.79	4.63	2.11					904.52
													12	0.013	0.40	2.89	2.27	126.6	903.54	903.03		0.170							0.25	0.0324	0.0035	0.4446	
CI-6		CI-5	0.16	0.73	0.80	0.13	0.58	10	0.3	10.8	3.42	2.00									906.85		3.55	2.11	0.00	2.11	4.63	2.70					904.04
													15	0.013	0.74	4.54	5.57	81.0	903.30	902.70		0.190							0.25	0.0801	0.0018	0.1419	
CI-5		CI-4	0.24	0.97	0.80	0.19	0.78	10	0.5	11.1	3.34	2.59									906.25		3.55	2.11	0.00	2.11	4.52	3.51					903.82
													15	0.013	0.40	3.32	4.08	88.3	902.70	902.35		0.190							0.25	0.0429	0.0029	0.2603	
CI-4		CI-3	0.28	1.25	0.80	0.22	1.00	10	0.7	11.6	3.34	3.34									906.25		3.90	2.46	0.00	2.46	4.52	4.52					903.52
													15	0.013	0.40	3.34	4.10	135.0	902.35	901.81		0.190							0.25	0.0433	0.0049	0.6610	
CI-3		MH-2	0.28	1.53	0.80	0.22	1.22	10	0.4	12.3	3.26	3.99									906.25		4.44	3.00	0.00	3.00	4.42	5.41					902.82
													15	0.013	0.40	3.33	4.08	78.0	901.81	901.50		0.190							0.25	0.0430	0.0070	0.5464	
MH-2																																	902.23
MH-2		MH-1	0.00	2.88	0.80	0.00	2.30	10	0.4	12.6	3.26	1.88									909.00		7.50	6.33	0.00	6.33	4.42	1.88					902.23
													12	0.013	0.44	3.01	2.37	68.4	901.50	901.20		0.170							0.25	0.0352	0.0028	0.1905	
MH-1																																	902.00
		Equals the Allowable Release Rate through the 25 yr. Storm																															

File: Proposed Storm Calcs.xls

APPENDIX D

(Tributary Maps)



REVISIONS	DATE	BY	CHK.

E. P. FERRIS AND ASSOCIATES INC.
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CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

FINAL DEVELOPMENT PLAN

NORTHSTAR REALTY

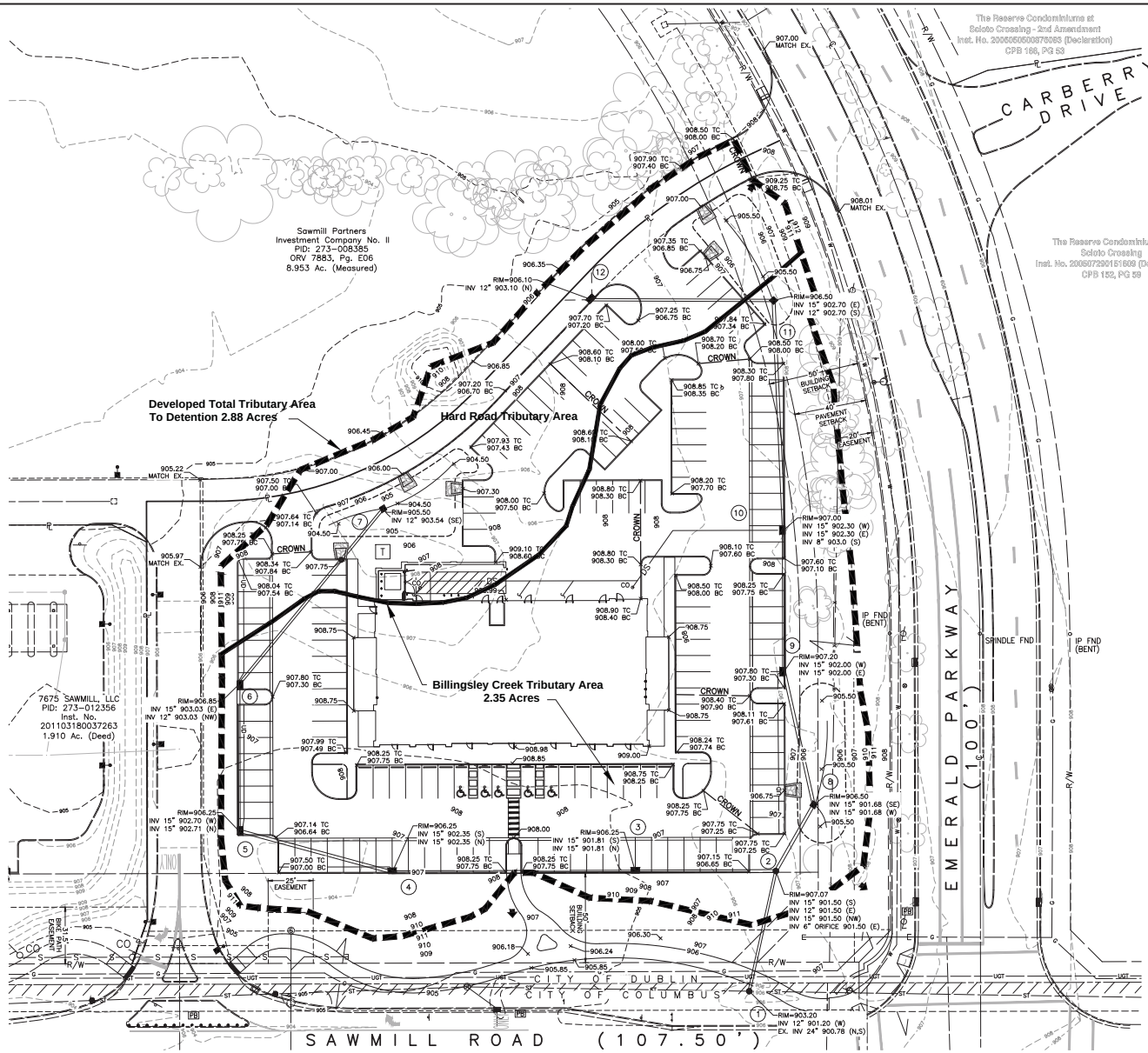
JOB NO.	1081.001
DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	____
APPROVED BY:	____
DATE:	04/09/15

PRE-DEVELOPED TRIBUTARY MAP

SCALE: 1" = 60'

SHEET NO. 1 OF 1

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-09-15 16:03 Revised by: MOverstreet -LTscale: 1 -Plot scale 1=1 MS/PS



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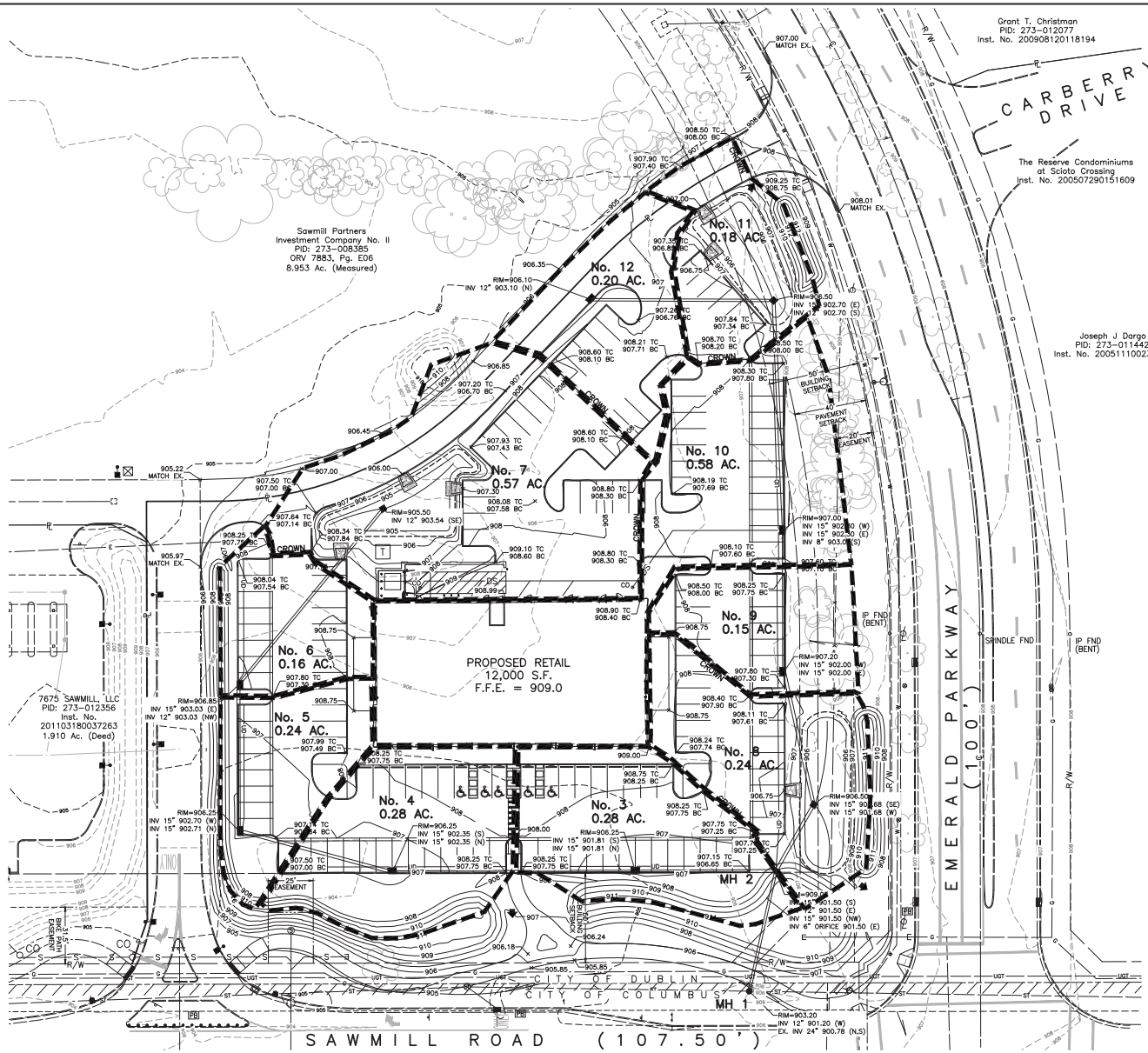
DEVELOPED TRIBUTARY MAP

SCALE: 1" = 30'

SHEET NO. 1 OF 1

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-16-15 07:51 Revised by: MDverstreet -LTscale: 1 -Plot scale 1=1 MS/PS



REVISIONS	DATE	BY	CHK.

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APPROVED BY:	____
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DEVELOPED TRIBUTARY MAP STORM SEWER

SCALE: 1" = 30'

SHEET NO. 1 OF 1

Drawing: M:\1081001_NorthstarRealty\DWG\Production Drawings\Final Development Plan.dwg Saved on: 04-09-15 15:03 Revised by: MOverstreet -LTscale: 1 -Plot scale 1=1 MS/PS

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