



Easton Staff Development Review MEETING AGENDA

Wednesday, March 22, 2023 - 11:00 AM
Council Chambers, Easton Town Office
14 S Harrison Street

1. Staff Review

- a. Staff review only time: 10:00 AM - 11:00 AM

2. Discussion Items

- a. **Application Number:** 2023-05 Time: 11:00 AM
Location: 22, 30, 36 & 44 Jowite Street
Applicant: Kendrick Daly
Request: Sketch Plan Review to redevelop parcels 1369, 1370, 1371 and 1372; and Sketch Stormwater Management Review for the construction of new residential structures.

- b. **Application Number:** 2023-06 Time: 11:00 AM
Location: 8670 Commerce Drive
Applicant: GHD Inc.
c/o Madeline Selick Barbalance
Request: Sketch Plan Review and Sketch Stormwater Management Review for a new Water Treatment Plant.



Easton Staff Development Review
Wednesday, March 29, 2023 at 11:00am
Town Hall Chamber 2
14 S. Harrison Street, Easton

ESDR (Easton Staff Development Review) meetings are an opportunity for staff to meet with applicants to discuss our preliminary review of their application. At the ESDR meeting, staff also confirm with the applicant the next steps in the review process.

This meeting *will not be livestreamed or recorded*, since these meetings are technical discussions only between the staff and the applicant.

No public comments will be taken at this meeting, but there will be opportunities for public comment at future Planning Commission and/or Town Council public hearings.



Town of Easton
Engineering, Planning and Zoning
14 South Harrison Street, Easton, MD 21601

Easton Staff Development Review

Property Information

Address	22, 30, 36 & 44 Jowite St, Easton, MD, 21601				
Tax Map	104	Grid	EA	Parcel	1369,1370,1371,1372
Deed Reference:	Liber	02616	Folio	00084	
Plat Reference:	Liber	7	Folio	54	
Base Zoning District	R7A-PRD		Historic District	Y ☐ N ☒	
			Planning Redevelopment	Y ☒ N ☐	

Purpose of Application / Description of Work:

Naima Ventures, LLC is looking to redevelop parcels 1369,1370,1371,1372. The redevelopment includes the demolition of existing residential structures, infrastructure improvements along Tile Lane, and construction of new residential structures. Parking and refuse locations will be place along Tile Lane. Forest Conservation will be required and Naima is asking to pay fee-in-lieu as the density of the units for the site restrict the establishment of afforestation. The density is consistent with the Town of Easton comprehensive plan and Naima is asking that the afforestation be satisfied via pay-in-lieu in an effort to prevent future damage by extensive large tree growth to the proposed structures, porous asphalt, stormwater, and other utilities on the site.

Owner

Name	Naima Ventures, LLC	
Mailing Address	29760 Standish St, Easton, MD 21601	
Telephone No.	(410) 310-6241	Email ddaly@baamboys.com

Applicant / Agent

Name	Kendrick Daly	
Mailing Address	112 3rd Haven Heights, Easton, MD 21601	
Telephone No.	(410) 253-4455	Email kendrickdaly@naimaventures.com; brian@raucheng.com

Surveyor / Engineer

Name	Robert Rauch	License No.	11024	Expiration Date	July 24, 2022
Mailing Address	106 N. Harrison St, Easton, MD 21601				
Telephone No.	410-770-9081	Email	robert@raucheng.com - brian@raucheng.com		

Any modifications during review shall warrant an updated application.

I do hereby solemnly declare and affirm that the information provided by this application and the documents attached hereto accurately represent the conditions of the request and that submission of an incomplete application will be returned for correction prior to processing.

Signature of Applicant or Agent

Date 2/27/23

Printed Name of Applicant or Agent

Kendrick Daly

For Office Use Only

Easton Staff Development Review Meeting Required Y ☒ N ☐

Easton Staff Development Review Meeting Date 03/22/23

Completeness Check Date

Revisions/Resubmissions Required Y ☐ N ☐

Resubmission Date

Documents Received Y ☐ N ☐

Staff Determination

Planning Commission Required Y ☐ N ☐

BOZA Required Y ☐ N ☐

Historic District Commission Required Y ☐ N ☐

Resubmission for ESDR Required Y ☐ N ☐

Staff Signature

Date

RECEIVED
MAR 01 2023
TOWN OF EASTON

Revised 02-2019

APPENDIX B-1

SKETCH PLAN SUBMITTAL CHECKLIST

NOTE: THIS CHECKLIST REPRESENTS THE MINIMUM INFORMATION TO BE SUBMITTED ON A SITE PLAN. ADDITIONAL INFORMATION MAY BE REQUIRED FOR UNIQUE SITUATIONS.

COMPLETE THE CHECKLIST AND SUBMIT IT WITH THE PLAN. IF AN ITEM IS NOT APPLICABLE, ENTER "N/A".

- | | |
|--|------------|
| 1. Location map, | <u>X</u> |
| 2. Boundary, | <u>X</u> |
| 3. Topography, | <u>X</u> |
| 4. General proposed land uses drawn to scale, and | <u>X</u> |
| 5. The Forest Stand Delineation as detailed in the Town of Easton's Forest Conservation Ordinance. | <u>N/A</u> |
| 6. The location of any easements, rights-of-way or any other encumbrances which pertain to the property subject to the site plan review. | <u>X</u> |
| 7. Conditions of concern, for example, water courses, wetlands, floodplains, or other environmentally sensitive features. | <u>X</u> |
| 8. Location of refuse collection, exterior lighting, fencing, and all pedestrian walkways and sidewalks. | <u>X</u> |
| 9. General location and description (r.e. intended function, proposed species, etc.) of proposed landscaping. | <u>X</u> |
| 10. Location of parking including layout and landscaping. | <u>X</u> |
| 11. Conceptual building elevations or renderings illustrating the character, scale, and materials of all proposed structures. Such elevations or renderings shall be sealed by a licensed professional as described above. | <u>X</u> |
| 12. A statement describing the extent to which the application complies with the Recommended Design Principles for Easton set forth on pages 29-31 of the Comprehensive Plan | <u>X</u> |

This checklist completed by Brian Fitzgerald Date 2/27/2023

APPENDIX B-2

SKETCH STORMWATER MANAGEMENT PLAN SUBMITTAL CHECKLIST

EFFECTIVE MAY 4, 2010

NOTE: THE FOLLOWING CHECKLIST REPRESENTS THE MINIMUM INFORMATION TO BE SUBMITTED FOR SUPPORT OF A STORMWATER MANAGEMENT CONCEPT PLAN, SITE DEVELOPMENT PLAN, AND/OR FINAL DESIGN PLAN. THE TOWN MAY REQUEST ADDITIONAL INFORMATION AS DEEMED NECESSARY.

COMPLETE THE APPROPRIATE CHECKLIST AND SUBMIT IT WITH THE PLANS, APPLICATION FORM, NARRATIVE OR REPORT, AND FEE. ITEMS IN BOLD ARE REQUIRED FOR CONCEPT AND/OR SITE DEVELOPMENT PHASE REVIEW.

I. Sketch Plan Submittal

A. Site and Resource Map

Natural Resources Identified on Plan, including, but not limited to:

Please use these responses for the following:

(Provided = P; Not Provided = NP; Not Applicable = N/A)

Tidal and Non-Tidal Wetland Boundaries	<u>N/A</u>	<u>N/A</u>
Wetland Buffers		
Floodplain Boundaries and Elevations	<u>N/A</u>	
Streams and other Waterways	<u>N/A</u>	
Stream Buffers	<u>N/A</u>	
Forest Boundaries		<u>N/A</u>
Forest Buffers	<u>N/A</u>	
Critical Areas	<u>N/A</u>	
Steep Slopes (>25%)	<u>N/A</u>	
Erodible Soils	<u>N/A</u>	
Areas of High Recharge	<u>N/A</u>	
Springs		<u>N/A</u>
Soil Types and Hydrologic Soil Groups	<u>N/A</u>	
Bedrock and/or other Geologic Features	<u>N/A</u>	
Vegetative Cover		<u>P</u>
Existing Drainage Areas and Flow Patterns	<u>P</u>	
Existing Stormwater Outfalls	<u>P</u>	
Site and Resource Map field verified by a properly licensed design professional.	<u>P</u>	

Existing contours (1' max intervals) and utilities shown. P

Large tracts of contiguous open spaces, forested areas and
other important resources protected by conservation
easements. N/A

Opportunities for afforestation identified. N/A

Wetland, stream and forest buffers enhanced and/or

expanded.	<u>N/A</u>
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B. Site Fingerprinting and Development Layout

Locations of proposed impervious areas provided.	<u>P</u>
Proposed contours (1' max intervals) and utilities shown.	<u>P</u>
Preliminary locations of proposed Environmental Site Design (ESD) practices provided.	<u>P</u>
Locations of stormwater outfalls and conveyance provided with offsite storm drains, culverts and grass channels with size and slope.	<u>P</u>
Limit of disturbance and extent of clearing & grading.	<u>P</u>
Site natural resources protected during construction. If site natural resources must be disturbed during construction, please include an explanation in the stormwater narrative.	<u>P</u>
Better Site Design Techniques incorporated, including:	
Sheetflow and overland flow provided wherever possible	<u>P</u>
Building footprint and site layout designed to protect conservation areas	<u>P</u>
Proposed streets, rights of way, and/or sidewalks with modifications to reduce impervious area	<u>P</u>
Landscaped medians and/or cul-de-sacs	<u>N/A</u>
Stormwater management features in medians or cul-de-sacs	<u>N/A</u>
Private open road section with grass channels and/or biofilters	<u>N/A</u>
Minimize numbers of parking spaces and sizes	<u>P</u>
Narrow frontages to reduce road length	<u>P</u>
Site graded to encourage runoff from impervious areas to pervious areas or other natural conveyance systems	<u>P</u>

C. Stormwater Narrative

Title Page includes:

Job Name	<u>P</u>
Owner/Developer	<u>P</u>
Design Professional	<u>P</u>
Date Prepared	<u>P</u>
Seal and Signature (properly licensed Design Professional)	<u>P</u>
Project is identified as new development or redevelopment. (Redevelopment projects have $\geq 40\%$ total site imperviousness)	<u>P</u>

Project and streets designed for 2-year and 10-year quantitative management. P

Project is identified as being within the Tanyard Branch Watershed. (Projects within this watershed must manage proposed 10-year storm flows to the existing 2-year storm discharge rate.) N/A

A narrative that supports the concept and describes how the design will achieve:

Natural resource protection and enhancement	<u>P</u>
Maintenance of natural flow patterns	<u>P</u>
Reduction of impervious areas through better site design, alternative surfaces, and non-structural practices	<u>NP</u>
Implementation of ESD planning techniques and practices to the Maximum Extent Practicable (MEP)	<u>P</u>
Preliminary ESD sizing calculations provided	<u>P</u>
Integration of erosion and sediment controls (ESC) into the stormwater strategy	<u>P</u>

D. Sketch Plan Meeting

Following the Sketch Plan submittal, a meeting will be scheduled between the Town of Easton Planning & Zoning, Town Engineer, the Talbot County Soil Conservation District (SCD) ESC reviewer, the owner/developer, the SWM and ESC designer(s), and any other reviewers deemed necessary by the Town of Easton and/or the Talbot County SCD. Official Minutes from the Sketch Plan Meeting must be submitted for review and acceptance by all parties. These minutes must accompany all future submittals. OK

This checklist completed by Brian Ftizgerald Date 2/27/2023

CONTACT INFORMATION

OWNER/DEVELOPER: NAIMA VENTURES, LLC
29760 STANDISH STREET
EASTON, MD 21601
410-310-6241

ENGINEER: RAUCH Inc.
106 N HARRISON ST
EASTON, MARYLAND 21301
(410)770-9081

ZONING & PARKING NOTE: THE REQUIREMENTS FOR OFF-STREET PARKING IN THE SUPPLEMENTAL REQUIREMENTS OF THE ZONING ORDINANCE ARE NOT A REQUIREMENT IN A PRD OVERLAY ZONE. THE MULTI-FAMILY RESIDENTIAL USE IS NOW PERMITTED IN THE PRD OVERLAY DISTRICT. NO SPECIAL EXCEPTION IS REQUIRED. 38 PARKING SPACES ARE PROPOSED AND PROVIDED.

2 OF THE 38 TOTAL SPACES ARE ADA ACCESSIBLE. BOTH ADA SPACES ARE VAN ACCESSIBLE.

TOTAL ACREAGE:
PARCEL 1372: 14,400 SQ-FT / 0.331 AC.
PARCEL 1371: 7,200 SQ-FT / 0.165 AC.
PARCEL 1370: 14,400 SQ-FT / 0.331 AC.
PARCEL 1369: 21,600 SQ-FT / 0.496 AC.

TOTAL ACREAGE: 1.323 AC.

DWELLING UNIT NOTE: THE ALLOWABLE DENSITY IN THE PRD OVERLAY IS 40 DWELLING UNITS PER ACRE. 52 UNITS ARE PROPOSED AND PROVIDED.
52 UNITS / 1.323 TOTAL ACRES = 39.31 UNITS PER ACRE < 40 OK

SITE DATA

PROPERTY ADDRESS: 22, 30, 36 & 44 JOWITE STREET
EASTON, MD 21601

LATITUDE: : N 038°46'19.19"

LONGITUDE W 076°04'59.11"

PRESENT ZONING CLASSIFICATION: R7A W/ A PRD OVERLAY

PRESENT USE RESIDENTIAL

TAX MAP: 0104
GRID: 000EA
PARCELS: 1369, 1370, 1371, 1372
DEED REFERENCE: 02616/00084

FEMA FLOOD MAP: PANEL 24041C0189D

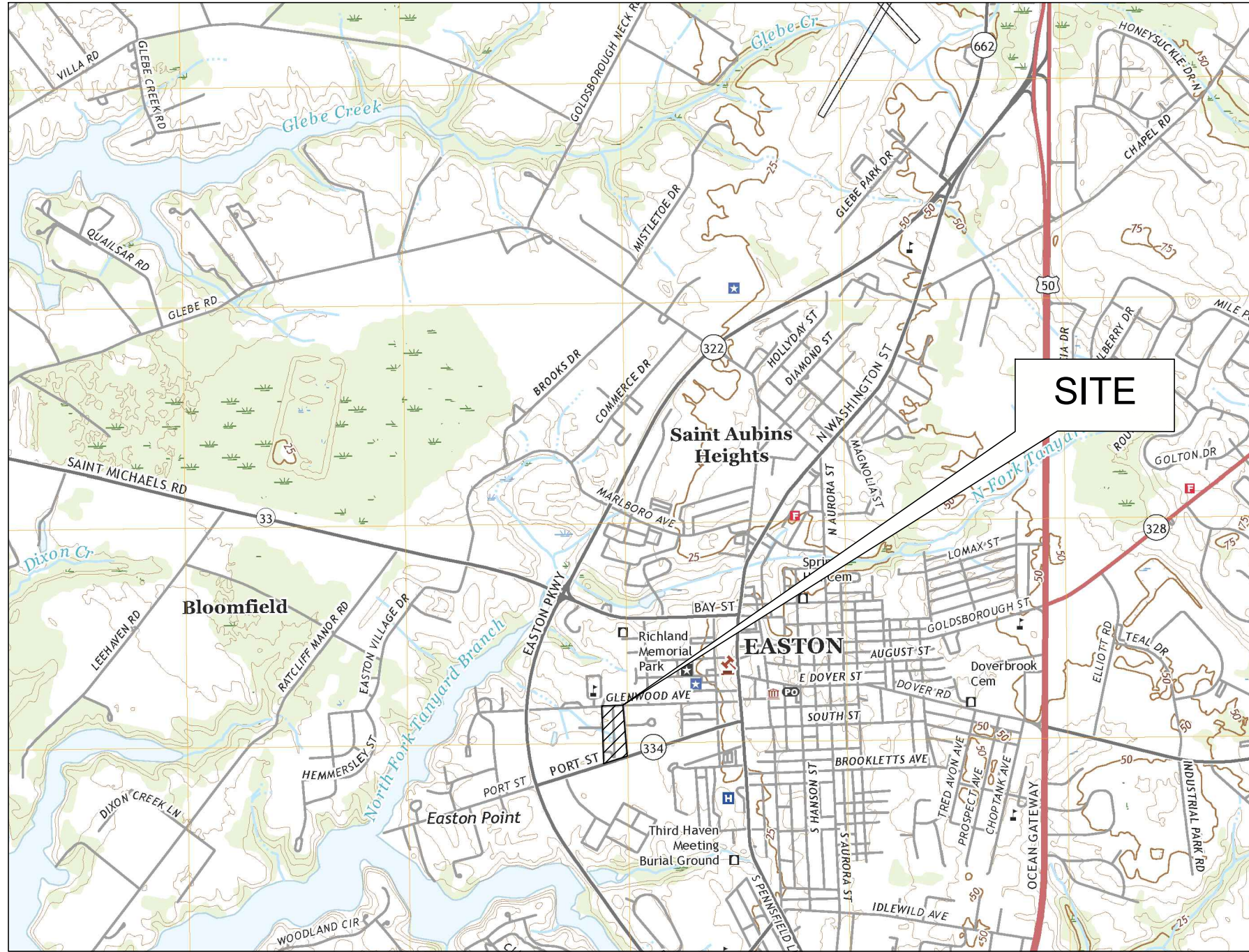
FOREST CONSERVATION PLAN: WORKSHEET INCLUDED WITH SUBMISSION; PAY-IN-LIEU

LANDSCAPING PLAN: SEE PLANTER BOX DETAIL AND LANDSCAPING PLAN FOR PLANTINGS

NAIMA VENTURES, LLC

PHASE 2 INFRASTRUCTURE PLANS

FOR
NAIMA VENTURES, LLC
TALBOT COUNTY, MARYLAND 21601



VICINITY MAP
SCALE: 1" = 2,000'

DRAWING LIST	
SHEET NUMBER	DRAWING TITLE
G-100	COVER SHEET
C-101.00	MASTER KEY SHEET
C-200.00	EROSION AND SEDIMENT CONTROL COVER
C-200.01	EROSION AND SEDIMENT CONTROL LEGEND
V-101.01-03	EXISTING & DEMOLITION PLAN
C-201.01-03	STORMWATER & EROSION AND SEDIMENT CONTROL PLAN
C-201.04	MASTER EXISTING DRAINAGE PLAN
C-201.05	MASTER PROPOSED DRAINAGE PLAN
C-201.06-08	PROPOSED DRAINAGE AREA PLAN
C-203.01	STORMWATER & STORM DRAIN PROFILES
C-203.02	STORMWATER & STORM DRAIN SCHEDULES
C-205.01-02	STORMWATER DETAILS
C-205.03-04	EROSION AND SEDIMENT CONTROL DETAILS
C-301.01-03	SITE GRADING PLAN
C-305.01-02	SITE DETAILS
C-401.01-03	UTILITY PLAN
C-405.01	ELECTRICAL, COMMUNICATIONS, & SEWER UTILITY DETAILS
C-405.02	WATER UTILITY DETAILS
C-501.01-03	LIGHTING & LANDSCAPING PLAN
C-505.01	LANDSCAPING NOTES & DETAILS
C-601.01	FIRE MARSHALL PLAN

LINETYPES

TOPOGRAPHY
MAJOR CONTOURS
MINOR CONTOURS
TOP OF SLOPE BREAKLINE
BOTTOM OF SLOPE BREAKLINE
TOPOGRAPHY BREAKLINE

CATCHMENT AREA

Tc FLOW PATH

PARCEL BOUNDARY
PARCEL SETBACK/EASEMENT
FENCELINE WOOD
FENCELINE STEEL
TREELINE/VEGETATION
ROADWAY CENTERLINE
HIGHWAY BARRIER

UTILITIES

OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
TELEPHONE LINE
GAS PIPE LINE
CABLE TV
WATER PIPE
STORMWATER PIPE

UNDERDRAIN
SANITARY SEWER
FORCE MAIN SEWER

ENVIRONMENTAL

WETLAND LINE
FLOOD PLANE 100/500 YR
MEAN HIGH WATER
MEAN LOW WATER
CRITICAL AREA BOUNDARY
BUFFER 25'/100'
SOILS BOUNDARY
SWM EASEMENT 5'/10'

EROSION AND SEDIMENT CONTROL

SILT FENCE
SUPER SILT FENCE
SILT FENCE ON PAVEMENT
LIMITS OF DISTURBANCE
LOD & SILT FENCE
LOD & SUPER SILT FENCE
LOD & SILT FENCE ON PAVEMENT
STANDARD INLET PROTECTION

AT-GRADE INLET PROTECTION

CURB INLET PROTECTION

PROPOSED

---44---

--->---

--->---

---OC---

---SS---

---W---

---SF---

---SSF---

---SFOP---

---LOD/SSF---

---LOD/SFOP---

EXISTING

---44---

--->---

--->---

---OC---

---SS---

---W---

---SF---

---SSF---

---SFOP---

---LOD/SSF---

---LOD/SFOP---

SYMBOLS

FLARED END SECTION

YARD INLET

CURB INLET

CUSTOM INLET

NYLOPLAST INLET

STORM DRAIN MANHOLE

SANITARY SEWER MANHOLE

CLEANOUT

GATE VALVE

STUB

SIGN

WATER METER

FIRE HYDRANT

WELL

BOLLARD

ELECTRIC TRANSFORMER

TELEPHONE PEDESTAL

UTILITY POLE

GUY WIRE

CONIFEROUS TREE

DECIDUOUS TREE

SPOT ELEVATION

LAND SLOPE

BENCHMARK

BOREHOLE/MONITORING WELL

LIGHTING

RIPRAP OUTLET SEDIMENT

TRAP

STONE OUTLET SEDIMENT

TRAP

TYPE-1 INLET PROTECTION

PROPOSED

---44---

--->---

--->---

---OC---

---SS---

---W---

---SF---

---SSF---

---SFOP---

---LOD/SSF---

---LOD/SFOP---

EXISTING

---44---

--->---

--->---

---OC---

---SS---

---W---

---SF---

---SSF---

---SFOP---

---LOD/SSF---

---LOD/SFOP---

HATCHES

ASPHALT

GRAVEL

CONCRETE

RIPRAP/ROCK

ESD BED BOTTOM

BRICK PAVING

EXISTING, TO BE

DEMOLISHED

STEEP SLOPES

ABBREVIATIONS

ADA

AGIP

@

BC

BM

BRL

CES

C/O

CHRD

CI

CIP

CL

CMF

CMP

Cul

CY

DI

E

EL/ELEV

EP

ESC

ES

FES

FFE

FH

FL

FT

GFA

GPD

GV

HDPE

AMERICANS WITH DISABILITIES ACT

AT GRADE INLET PROTECTION

BACK OF CURB

BENCHMARK

BUILDING RESTRICTION LINE

CONCRETE END SECTION

CLEAN OUT

CHORD

CURB INLET

CURB INLET PROTECTION

CENTERLINE

CORRUGATED MONUMENT FOUND

CORRUGATED METAL PIPE

CUBIC YARD

DUCTILE IRON

EAST

ELEVATION

EDGE OF PAVE

EROSION AND SEDIMENT CONTROL

EXISTING

FLARED END SECTION

FINISHED FLOOR ELEVATION

FIRE HYDRANT

FLOW LINE

FOOT

GROSS FLOOR AREA

GALLONS PER DAY

GATE VALVE

HIGH DENSITY POLYETHYLENE

INLET

INVERT

KILOVOLTS

ARC LENGTH

LINEAR FEET

LIMITS OF DISTURBED AREA

LEFT

MAXIMUM

MICRO-BIORETENTION

MARYLAND

MECHANICAL, ELECTRICAL, AND PLUMBING

MANHOLE

MEAN HIGH WATER

MINIMUM

MEAN LOW WATER

MARYLAND STATE HIGHWAY ADMINISTRATION

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

NORTH

NUMBER

POINT OF CURVATURE

POLYETHYLENE

PERFORATED

PROPOSED

POINT OF TANGENCY

POLYVINYL CHLORIDE

POINT OF VERTICAL INTERSECTION

DISCHARGE

RADIUS

REINFORCED CONCRETE PIPE

RUNOFF CURVE NUMBER

RIGHT-OF-WAY

RIGHT

SOUTH

STABILIZED CONSTRUCTION ENTRANCE

STORM DRAIN

STORM DRAIN MANHOLE

FRICTION SLOPE

SILT FENCE

STATE HIGHWAY ADMINISTRATION

STANDARD INLET PROTECTION

SQUARE

SANITARY SEWER

SUPER SILT FENCE

SANITARY SEWER MANHOLE

STATION

STANDARD

STORM WATER MANAGEMENT

TANGENT

THRUST BLOCK

TO BE REMOVED

TOP OF CURB

TIME OF CONCENTRATION

TAX PARCEL

TYPICAL

UNDERGROUND ELECTRIC

UNDERGROUND LIGHT CABLE

UNDERGROUND TELEPHONE

VELOCITY

WEST

WITH

ESTIMATED TOWN IMPACT FEES
TOTAL FEE COST: \$344,370

ZONING & SUBDIVISION FEES

PLAN REVIEWS:

(D) PLANNED REDEVELOPMENT (PR) REVIEW: \$150.00
(E) STORMWATER MANAGEMENT - UP TO 1 ACRE: \$1,250.00

PLANNING COMMISSION FEES

(A) CONCEPT, USE & DESIGN REVIEW: \$250.00

NOTE: THE IMPACT FEES INDICATED IN THIS NOTATION SHALL NOT BE CONSTRUCTED AS VESTED AND UNTIL SUBMISSION OF THE BUILDING APPLICATION.

EASTON UTILITIES:

CAPITAL CHARGES FOR WATER & WASTEWATER: \$7,050 PER EDU
FOR 36 ADDITIONAL EDUS = \$253,800

PLANNING & ZONING:

PROPOSED 52 MULTI-FAMILY DWELLING UNITS - 16 EXISTING
DWELLING UNITS = 36 DWELLING UNITS. (36 DU x \$2,470 PER DU = \$88,920 TOTAL).

GENERAL NOTES

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, LOCAL BUILDING CODES, BEST PRACTICES OF THE RESPECTIVE TRADES AND THE STANDARD SPECIFICATIONS AND DETAILS REFERRED TO HEREON.

THIS DRAWING SHOWS INFORMATION OBTAINED FROM AVAILABLE RECORDS REGARDING PIPES, CONDUITS, TELEPHONE LINES AND OTHER STRUCTURES AND CONDITIONS WHICH EXIST WITHIN LIMITS OF THE WORK AT AND BELOW THE SURFACE OF THE GROUND. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORTING AND PROTECTING ALL PIPES, CONDUITS, TELEPHONE LINES, AND OTHER STRUCTURES.

THE CONTRACTOR SHALL NOTIFY THE FOLLOWING TWO (2) WEEKS PRIOR TO START OF CONSTRUCTION AND SHALL COORDINATE ALL CONSTRUCTION PHASES WITH THEM:

MDE (Main Number) 410-537-3000
MDE (Eastern Shore Field Office) 410-901-4020
TOWN OF EASTON DPW 410-882-0513
EASTON UTILITIES 410-822-6110
TALBOT COUNTY SCD 410-882-1577 x 3
MISS UTILITY 800-257-7777 or 811

SHOULD ANY DAMAGE OCCUR TO ANY MARKED UTILITIES, THEY SHALL BE REPAIRED SOLELY AT THE CONTRACTORS EXPENSE.

ALL LANDSCAPING SHALL BE PERFORMED BY QUALIFIED PROFESSIONALS. ALL PLANT MATERIALS SHALL BE FROM CERTIFIED NURSERYMAN AND BE GUARANTEED FOR ONE (1) YEAR FROM THE DATE OF PLANTING.

ANY PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE REPLACED SOLELY AT THE CONTRACTORS EXPENSE.

COVER SHEET

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

PREPARED FOR NAIMA VENTURES, LLC

RAUCH
INC.

engineering design &
development services

Office: 410.770.9081 | Fax: 410.770.9867
www.rauchinc.com
Maryland Office: 106 N. Harrison St., Easton, MD 21601
Virginia Office

\\192.168.0.50\PROJECT\NA\ENGINEERING\PHASE 2\PRODUCTION\PLANS\NAIMA PHASE 2 - PRODUCTION PLANS.DWG

STANDARD EROSION AND SEDIMENT CONTROL NOTES

- The contractor shall notify the Maryland Department of the Environment (MDE) Sediment Control Inspector at 410-901-4020 and the Talbot County Department of Public Works (DPW) at 410-770-8170 at least 48 hours prior to commencing any land disturbing activities and, unless waived by the Sediment Control inspector, shall be required to hold a pre-construction meeting at the project site. The contractor must provide the name of the person on the site who is responsible for inspection and maintenance of erosion and sediment control measures and a copy of their green card to the Sediment Control Inspector.
- All projects with construction activities disturbing 1 acre or more are required to submit a General Permit (NOI) to MDE to comply with the General Permit for Construction Activity for Stormwater Discharges. The General Permit must be approved prior to disturbance activities. To obtain a General Permit (NOI) form, contact the Permits Coordinator at the MDE Compliance Program at 410-537-3510.
- The limit of disturbance shall be clearly delineated in the field prior to the pre-construction meeting and any grading activities to ensure compliance with the approved plan.
- The approved Erosion and Sediment Control Plan must be kept at the project site.
- The Talbot Soil Conservation District (TSCD) reserves the right to modify the Erosion and Sediment Control Plans.
- The TSCD may revoke the approval of the Erosion and Sediment Control Plan if work performed at the project site does not conform to the provisions of the grading permit, to the approved plan or to any written instructions from MDE, Talbot County DPW or the TSCD.
- The contractor must request that the Sediment Control Inspector approve work completed in accordance with the approved Erosion and Sediment Control Plan, the grading or building permit and the Talbot County Erosion and Sediment Control Ordinance at the following points of project development:
 - Upon completion of the installation of perimeter erosion and sediment control measures but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by MDE is made.
 - Prior to removal or modification of any sediment control structures(s).
 - Upon final stabilization of the site and prior to the removal of any sediment control measures.
- The contractor shall construct all erosion and sediment control measures per the approved plan and construction sequence and shall have them inspected and approved by the Sediment Control Inspector prior to beginning any other land disturbances.
- The contractor shall ensure that all runoff from disturbed areas is directed to the sediment control devices and shall not remove any erosion or sediment control measure without prior permission from the Sediment Control Inspector.
- The following minor plan modifications may be approved by the Sediment Control Inspector in the field:
 - Sediment control structures (except basins and traps) may be moved to meet the existing contours and field conditions, when moving these structures would have no impact on their function or design criteria.
 - Substitution of perimeter control measures may be made provided the measure substituted is equivalent (i.e., silt fence for straw bales) or is an upgrade of the original measure (i.e., silt fence to a perimeter berm with properly sized outlet).
 - Addition and extension of perimeter controls (including stone construction entrances) may be made to meet field conditions. Any modifications to the plan which are not listed above require the plan to be submitted to the TSCD for review and approval.
- The contractor shall protect all points of construction ingress and egress to prevent the deposition of materials onto public roads. All materials deposited onto public roads shall be removed immediately.
- On-site temporary stockpile areas must be placed as shown on the approved plan. If the construction schedule is to exceed 3 days, the stockpile areas must be stabilized. Stockpile areas should not exceed fifteen feet in height. If a stockpile is to exceed fifteen feet in height, it must be shown on the plan to be terraced with pipe slope drains installed and approved by TSCD. Upon the completion of the use of the stockpile area, existing ground surfaces shall be restored to their original conditions and permanently stabilized.
- Various steps in the sequence of construction may require the contractor to remove excess excavated material to an approved location or to import material from an approved location. For purposes of this plan, an approved location shall be one which is operating under an approved erosion and sediment control plan and an active grading permit at the time of construction.
- The contractor shall inspect daily and maintain continuously in an effective operating condition all erosion and sediment control measures until such time as they are removed with prior permission from the Sediment Control Inspector.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within:
 - Three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes equal to or greater than 3 horizontal to 1 vertical (3:1), and
 - Seven (7) days as to all other disturbed or graded areas on the project site. The above requirements do not apply to those areas which are shown on the plan and are currently being used for material storage or for those areas on which actual construction activities are currently being performed or to interior areas of a surface mine site where the stabilization material would contaminate the recoverable resource. Maintenance shall be performed as necessary to ensure that the stabilized areas continuously meet the appropriate requirements of the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
- Sediment control practices will be maintained until the entire contributing area to the practice has been permanently stabilized and meets the satisfaction of the Sediment Control Inspector. Sediment controls may only be removed with the authorization of the Sediment Control Inspector.
- All areas disturbed by the removal of sediment control devices must be immediately stabilized.
- Surface drainage flows over unstabilized cut and fill slopes shall be controlled by either preventing drainage flows from traversing the slopes or by installing protective devices to convey the water downslope without causing erosion. Dikes shall be installed and maintained at the top of cut or fill slopes until the slope and drainage area to it are fully stabilized, at which time the dikes must be removed and final grading done to promote sheet flow drainage. Erosion control measures must be implemented at points of concentrated flow where erosion is likely to occur.
- No permanent cut or fill slope with a gradient steeper than 3:1 will be permitted in lawn maintenance areas. A slope gradient of up to 2:1 will be permitted in non-maintenance areas provided that these areas are indicated on the erosion and sediment control plans with a low-maintenance ground cover specified for permanent stabilization. Slope gradient steeper than 2:1 will not be permitted with vegetation stabilization.
- All flow lines are to be stabilized with sod or seed with erosion control matting to a depth of flow of 1 foot.
- Sediment traps or basins are not permitted within 20 feet of a foundation which is existing or under construction. No structure may be constructed within 20 feet of an active sediment trap or basin.
- Temporary sediment traps and sediment basins shall be cleaned out and restored to the original dimensions when sediment has accumulated to one half (1/2) the wet storage depth of the trap or basin.
- Sediment removed from traps (and basins) shall be placed and stabilized in approved areas, but not within a floodplain, wetland or forest retention area. When pumping sediment laden water, the discharge must be directed to a sediment trapping device prior to release from the site.
- For approved dewatering strategies for traps and basins, see section F of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Pumping sediment laden water into the waters of the State without filtration is strictly forbidden.
- Sediment control devices placed in infiltration areas must have bottom elevations at least two (2) feet higher than the finished grade elevation of the infiltration practice. When converting a sediment trap to an infiltration device, all accumulated sediment must be removed and disposed of prior to final grading of infiltration device.
- The developer is responsible for obtaining all necessary permits prior to any construction activities. Further, the issuance of a grading permit does not relieve the developer of the responsibility to obtain any additional local, state or federal permits.

GENERAL NOTES

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, LOCAL BUILDING CODES, BEST PRACTICES OF THE RESPECTIVE TRADES AND THE STANDARD SPECIFICATIONS AND DETAILS REFERRED TO HEREON.

THIS DRAWING SHOWS INFORMATION OBTAINED FROM AVAILABLE RECORDS REGARDING PIPES, CONDUITS, TELEPHONE LINES AND OTHER STRUCTURES AND CONDITIONS WHICH EXIST WITHIN LIMITS OF THE WORK AT AND BELOW THE SURFACE OF THE GROUND. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORTING AND PROTECTING ALL PIPES, CONDUITS, TELEPHONE LINES, AND OTHER STRUCTURES.

THE CONTRACTOR SHALL NOTIFY THE FOLLOWING TWO (2) WEEKS PRIOR TO START OF CONSTRUCTION AND SHALL COORDINATE ALL CONSTRUCTION PHASES WITH THEM:

MDE (Main Number)	410-537-3000
MDE (Eastern Shore Field Office)	410-901-4020
TOWN OF EASTON DPW	410-882-0513
TALBOT COUNTY SCD	410-882-1577 x 3
MISS UTILITY	800-257-7777 or 811

SHOULD ANY DAMAGE OCCUR TO ANY MARKED UTILITIES, THEY SHALL BE REPAIRED SOLELY AT THE CONTRACTORS EXPENSE.

ALL LANDSCAPING SHALL BE PERFORMED BY QUALIFIED PROFESSIONALS. ALL PLANT MATERIALS SHALL BE FROM CERTIFIED NURSERYMAN AND BE GUARANTEED FOR ONE (1) YEAR FROM THE DATE OF PLANTING.

ANY PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE REPLACED SOLELY AT THE CONTRACTORS EXPENSE.

ENVIRONMENTAL NOTES:

- THE PROJECT SITE IS NOT LOCATED WITHIN THE CRITICAL AREA BUFFER
- THE SITE IS NOT LOCATED WITHIN A 100 YEAR FLOODPLAIN
- STEEP SLOPES ARE NOT PRESENT ON SITE
- NON TIDAL WETLANDS ARE PRESENT ON SITE

HYDROLOGY NOTES:

- STORMWATER RUNOFF DURING CONSTRUCTION WILL BE HANDLED THROUGH SILT FENCE AND INLET PROTECTION MEASURES TO PREVENT ANY SEDIMENT FROM LEAVING THE SITE AND ENTERING THE TOWN OF EASTON STORM DRAIN NETWORK. POST CONSTRUCTION STORMWATER RUNOFF FROM THE BUILDINGS WILL BE HANDLED WITH A SERIES OF PLANTER BOXES.
- THE PROJECT WILL NOT ALTER HYDROLOGY TO OR FROM THE SITE
- NO OUTLETS WILL BE ALTERED BY THIS PROJECT

STANDARD STABILIZATION NOTE

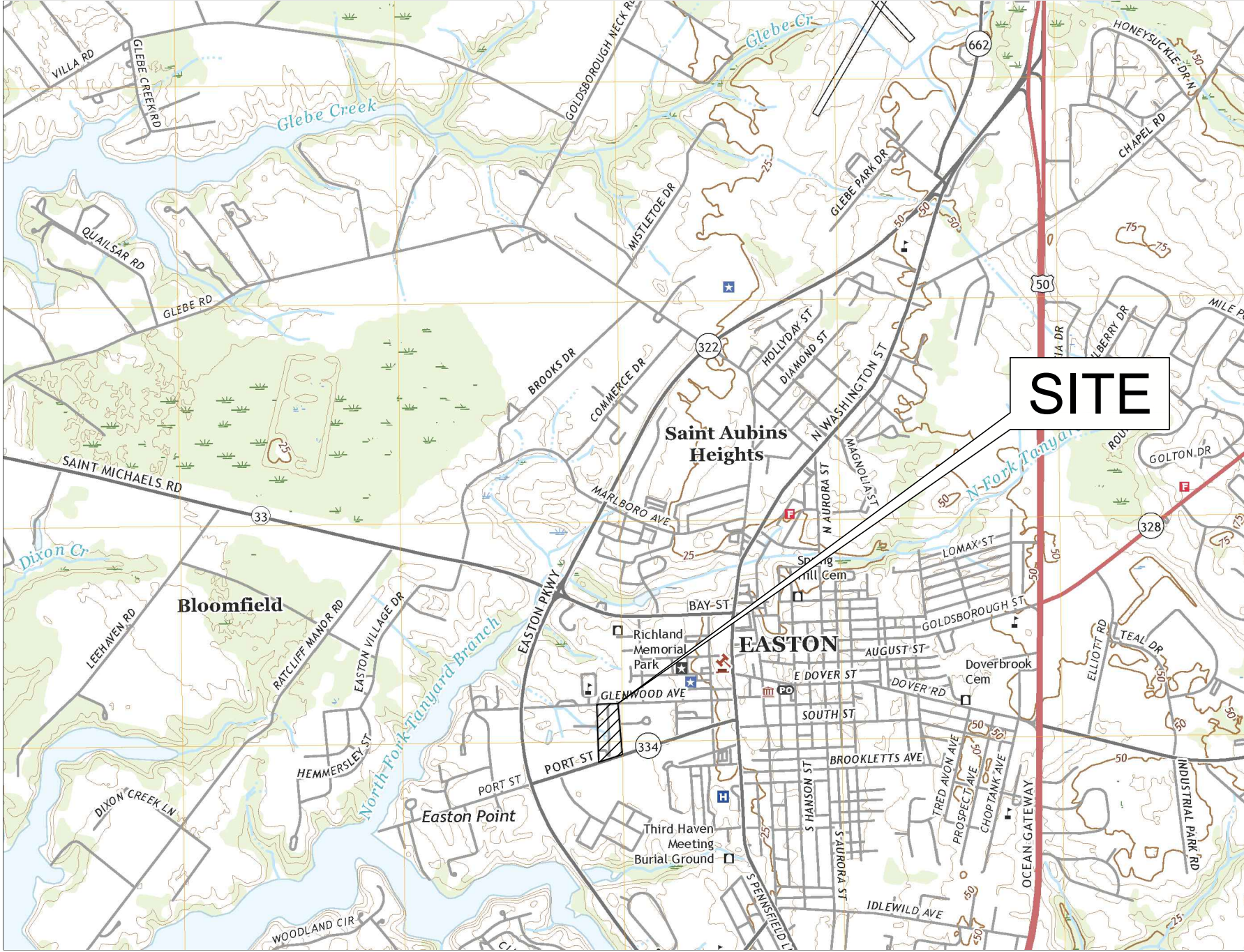
FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETE WITHIN:

- THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND
- SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING

NAIMA VENTURES, LLC

PHASE 2 EROSION & SEDIMENT CONTROL PLANS

FOR
NAIMA VENTURES, LLC
EASTON, TALBOT COUNTY, MARYLAND 21601



VICINITY MAP
SCALE: 1" = 2,000'

REVIEWED FOR THE TALBOT SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS

APPROVED:

TALBOT SOIL CONSERVATION DISTRICT

DATE

NOTE: THE TALBOT SOIL CONSERVATION DISTRICT RESERVES THE RIGHT TO ADD, DELETE, MODIFY OR OTHERWISE ALTER THE EROSION CONTROL PROVISIONS OF THIS PLAN IN THE EVENT THAT ADDITIONAL PROTECTION BECOMES NECESSARY.

DEVELOPER'S CERTIFICATION

I HEREBY CERTIFY THAT ALL OF THE DEVELOPMENT AND/OR CONSTRUCTION SHALL BE DONE IN ACCORDANCE TO THIS PLAN OF EROSION AND SEDIMENT CONTROL.

SIGNATURE

DATE

- IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR OR SUBCONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION MADE IN THIS PLAN. ANY CHANGE MADE TO THIS PLAN WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER WILL PLACE RESPONSIBILITY FOR SAID CHANGE ON THE CONTRACTOR OR SUBCONTRACTOR.
- ANY RESPONSIBLE PERSONNEL INVOLVED IN THIS CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT THE DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT.

The following items have been addressed to meet the requirements of the GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY (NPDES NUMBER MDR10, STATE DISCHARGE PERMIT NUMBER 09GP).

- Utilization of environmental site design
- Maintenance of limits of disturbance to protect natural areas
- Control of construction equipment and vehicles
- Evaluation and appropriate limitation of site clearing
- Evaluation and designation of site area for phasing or sequencing
- Identification of soils at high risk for erosion and advanced stabilization techniques to be used
- Identification of steep slopes and designation of limitations on clearing them
- Evaluation and designation of stabilization requirements and time limits and protection measures for discharges to the Chesapeake Bay, impaired waters or waters with an established Total Maximum Daily Load (TMDL).

CONTACT INFORMATION

OWNER/DEVELOPER: NAIMA VENTURES, LLC
29760 STANDISH STREET
EASTON, MD 21601
410-310-6241

ENGINEER: RAUCH inc.
106 N HARRISON ST
EASTON, MARYLAND 21301
(410)770-9081

SITE DATA

PROPERTY ADDRESS: 35 CLAY STREET
401 PORT STREET
EASTON, MD 21601

LONGITUDE: 38°46'16.40" N
38°46'21.36" N

LATITUDE: 76°04'56.18" W
76°04'59.78" W

PRESENT ZONING CLASSIFICATION: R7A W/ A PRD OVERLAY

PRESENT USE: RESIDENTIAL

TAX MAP: 0104
GRID: 000EA
PARCEL: 1381, 1382
DEED REFERENCE: 02627/0235

SITE AREA: 0.752 ACRES

PROPOSED TOTAL LIMIT OF DISTURBANCE: 1.255 ACRES
TOTAL EXISTING IMPERVIOUS: 14,265 SF
TOTAL PROPOSED IMPERVIOUS: 17,804 SF
AREA OF VEGETATIVE STABILIZATION: 13,840 SF

TOTAL CUT: 190.5 CY
TOTAL FILL: 288.8 CY
NET CUT/FILL: 98.3 CY (FILL)

FEMA FLOOD MAP: PANEL 24041C0189D

TABLE OF CONTENTS

SHEET NO.

DRAWING TITLE

C-200.00	COVER SHEET
C-200.01	LEGEND
V-101.01 - V-101.03	EXISTING CONDITIONS AND DEMOLITION PLAN
C-201.01 - C-201.03	EROSION & SEDIMENT CONTROL PLAN
C-201.04	STORMWATER MANAGEMENT EXISTING QUANTITY MAP
C-201.05 - C-201.07	STORMWATER MANAGEMENT PLAN & PROPOSED QUANTITY MAP
C-203.01 - C-203.02	STORMWATER PROFILES AND SCHEDULES
C-205.01 - C-205.02	EROSION & SEDIMENT CONTROL DETAILS
C-205.03	STORMWATER MANAGEMENT DETAILS

SITE SEQUENCE OF CONSTRUCTION:

- NOTIFY MDE AT (410) 901-4020
TALBOT SOIL CONSERVATION DISTRICT AT (410) 822-1577
TOWN OF EASTON AT (410) 822-0513
- PRE-CONSTRUCTION MEETING.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE.
- INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES (SILT FENCING & INLET PROTECTION) PER PLANS.
- COMPLETE SITE DEMOLITION AND HAUL OFF SITE (SEE SHEETS V-101.01 - V-101.03).
- REMOVE TOPSOIL AND HAUL OFFSITE. CONTRACTOR MAY STOCKPILE ONSITE AT OPEN BUILDING PADS AND WITHIN LOD. ANY STOCKPILE AREAS OUTSIDE OF LOD SHALL BE APPROVED BY ENGINEER AND TALBOT SCD.
- ROUGH GRADE SITE INSIDE LIMITS OF DISTURBANCE.
- INSTALL ALL PROPOSED STORM DRAIN PIPES/STRUCTURES ACCORDING TO PLANS
- INSTALL WATER/SEWER/UTILITY SERVICES AND STRUCTURES
- FINE GRADE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING PADS.
- ONCE ALL UTILITIES/ STORM DRAIN PIPES/LINES HAVE BEEN INSTALLED, INSTALL ALL PERMEABLE PAVEMENT STONE TO SPECIFIED GRADE AS WELL AS THE 2" PERFORATED PVC PIPE (CORE DRILLED INTO EXISTING INLET AND SEALED WITH WATERTIGHT SEAL).
- INSTALL CONCRETE SIDEWALK/CURB/VALLEY GUTTER TO SPECIFIED GRADE.
- FINAL PAVING OF PERMEABLE PAVEMENT.
- CONSTRUCT BUILDINGS.
- INSTALL/CONSTRUCT PLANTER BOXES AND CONNECT ALL DOWNSPOUTS INTO THEM.
- ALL DISTURBED AREAS TO BE PERMANENTLY STABILIZED.
- MAINTAIN ALL PERIMETER CONTROLS AND SEDIMENT CONTROL DEVICES UNTIL FINAL STABILIZATION HAS BEEN COMPLETELY ESTABLISHED.
- REMOVE PERIMETER CONTROLS UPON APPROVAL BY THE MDE SEDIMENT CONTROL INSPECTOR

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

DATE

DATE

EROSION AND SEDIMENT CONTROL COVER

FOR

NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 014-001, TALBOT COUNTY, MARYLAND
PREPARED FOR: NAIMA VENTURES, LLC

RAUCH inc.
engineering design &
development services

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www.rauchinc.com
Maryland Office: 106 N. Harrison St., Easton, MD 21601
Virginia Office: 8229 Boone Blvd., Suite 625 - Vienna, VA 22182

REVISIONS

DESCRIPTION

DATE

REV. #

DATE: 03/03/2021

SCALE: N/A

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.:

C-200.00

\\102.168.0.50\PROJECTS\NAMA\ENGINEERING\PHASE 2\PRODUCTION\PLANS\NAMA-PHASE 2 - PRODUCTION PLANS.DWG

LINETYPES

TOPOGRAPHY
MAJOR CONTOURS
MINOR CONTOURS
TOP OF SLOPE BREAKLINE
BOTTOM OF SLOPE BREAKLINE
TOPOGRAPHY BREAKLINE

CATCHMENT AREA

Tc FLOW PATH

PARCEL BOUNDARY
PARCEL SETBACK/EASEMENT
FENCELINE WOOD
FENCELINE STEEL
TREELINE/VEGETATION
ROADWAY CENTERLINE
HIGHWAY BARRIER

UTILITIES
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
TELEPHONE LINE
GAS PIPE LINE
CABLE TV
WATER PIPE
STORMWATER PIPE

UNDERDRAIN
SANITARY SEWER
FORCE MAIN SEWER

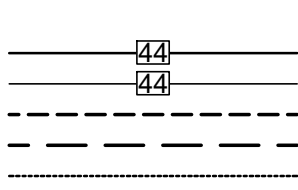
ENVIRONMENTAL
WETLAND LINE
FLOOD PLANE 100/500 YR
MEAN HIGH WATER
MEAN LOW WATER
CRITICAL AREA BOUNDARY
BUFFER 25'/100'
SOILS BOUNDARY
SWM EASEMENT 5'/10'

EROSION AND SEDIMENT CONTROL
SILT FENCE
SUPER SILT FENCE
SILT FENCE ON PAVEMENT
LIMITS OF DISTURBANCE
LOD & SILT FENCE
LOD & SUPER SILT FENCE
LOD & SILT FENCE ON PAVEMENT
STANDARD INLET PROTECTION

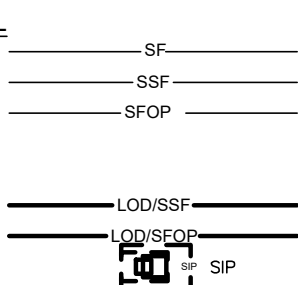
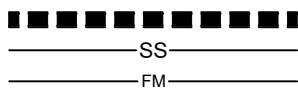
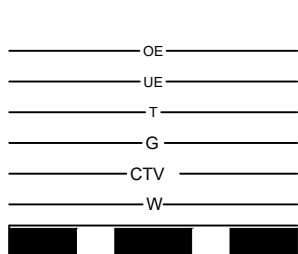
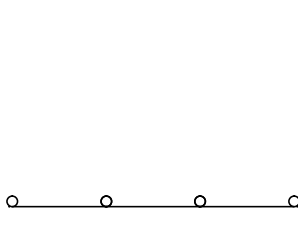
AT-GRADE INLET PROTECTION

CURB INLET PROTECTION

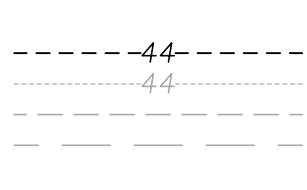
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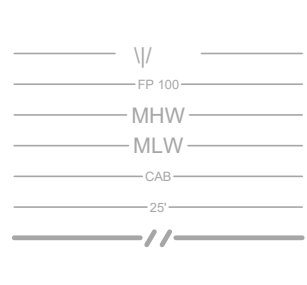
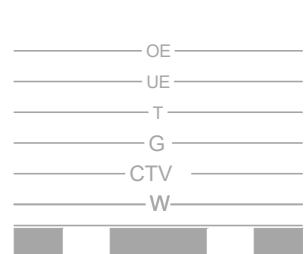
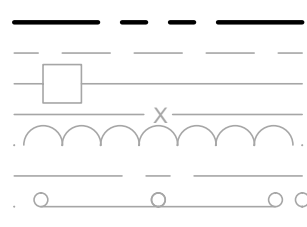
CATCHMENT AREA



EXISTING



CATCHMENT AREA



SYMBOLS

FLARED END SECTION

YARD INLET

CURB INLET

CUSTOM INLET

NYLOPLAST INLET

STORM DRAIN MANHOLE

SANITARY SEWER MANHOLE

CLEANOUT

GATE VALVE

STUB

SIGN

WATER METER

FIRE HYDRANT

WELL

BOLLARD

ELECTRIC TRANSFORMER

TELEPHONE PEDESTAL

UTILITY POLE

GUY WIRE

CONIFEROUS TREE

DECIDUOUS TREE

SPOT ELEVATION

LAND SLOPE

BENCHMARK

BOREHOLE/MONITORING WELL

LIGHTING

RIPRAP OUTLET SEDIMENT

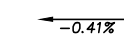
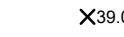
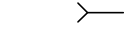
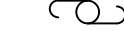
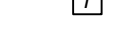
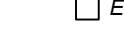
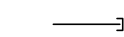
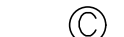
TRAP

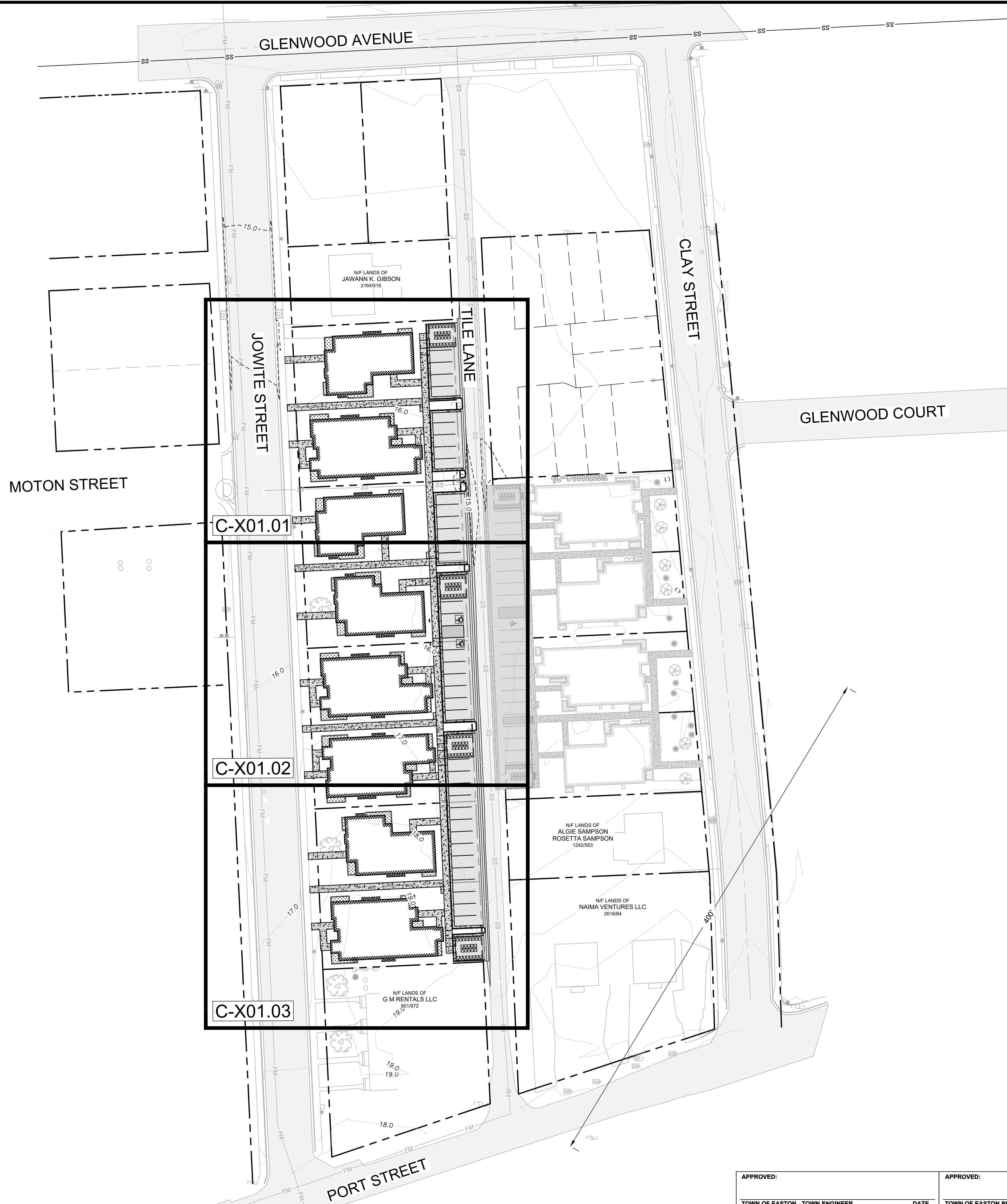
STONE OUTLET SEDIMENT

TRAP

TYPE-1 INLET PROTECTION

PROPOSED





APPROVED: _____

TOWN OF EASTON - TOWN ENGINEER DATE

APPROVED:	
TOWN OF EASTON PLANNING AND ZONING	DATE

APPROVED:	
EASTON UTILITIES - ENGINEER	DATE

REVISIONS

[illegible]

DATE:	12/28/2022
SCALE:	1" = 40'
DRAWN BY:	BBF
DESIGNED BY:	BBF
APPROVED BY:	
SHEET NO.:	C-101.00

MASTER KEY SHEET

FOR

NAIMA VENTURES, LLC

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

PREPARED FOR NAIMA VENTURES, LLC



engineering design & development services

office: 410.770.9081 | fax: 410.770.3667
email: design@raucheng.com | web: www.raucheng.com
Maryland Office: 106 N. Harrison St - Easton, MD 21601
Virginia Office: 8229 Boone Blvd, Suite 625 - Vienna, VA

\\102.168.0.50\PROJECTS\NAMA\ENGINEERING\PHASE 2\PRODUCTION PLANS\NAMA PHASE 2 - PRODUCTION PLANS.DWG



EXISTING FEATURES

- 1 GAS MAIN
- 2 8" VCP SEWER MAIN
- 3 6" CAST IRON WATER MAIN
- 4 OVERHEAD ELECTRIC
- 5 6" CONCRETE CURB
- 6 TELEPHONE LINE
- 7 NEIGHBORING PROPERTY LINE (TYP.)
- 8 SEWER CLEANOUT TO REMAIN
- 9 WATER METER TO REMAIN
- 10 STANDARD ASPHALT VALLEY GUTTER
- 11 TILE LANE RIGHT OF WAY

DEMOLITION TO BE DONE UNDER THIS CONTRACT UNDER DIRECTION OF NAIMA

DEMOLITION NOTES

- 1 EXISTING STRUCTURE TO BE DEMOLISHED
- 2 EXISTING SIDEWALK TO BE DEMOLISHED
- 3 EXISTING PATIO TO BE DEMOLISHED
- 4 EXISTING LANDSCAPING TO BE REMOVED
- 5 EXISTING PARKING AREA TO BE DEMOLISHED
- 6 EXISTING OVERHEAD UTILITIES TO BE DEMOLISHED
- 7 EXISTING UNDERGROUND UTILITIES TO BE DEMOLISHED
- 8 SEE SHEETS C-501.01 - C-501.03 FOR DETAILS REGARDING TREE REMOVAL.

EXISTING & DEMOLITION PLAN

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS
TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAIMA VENTURES, LLC

RAUCH
INC.
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REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 10'

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.: V-101.01

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

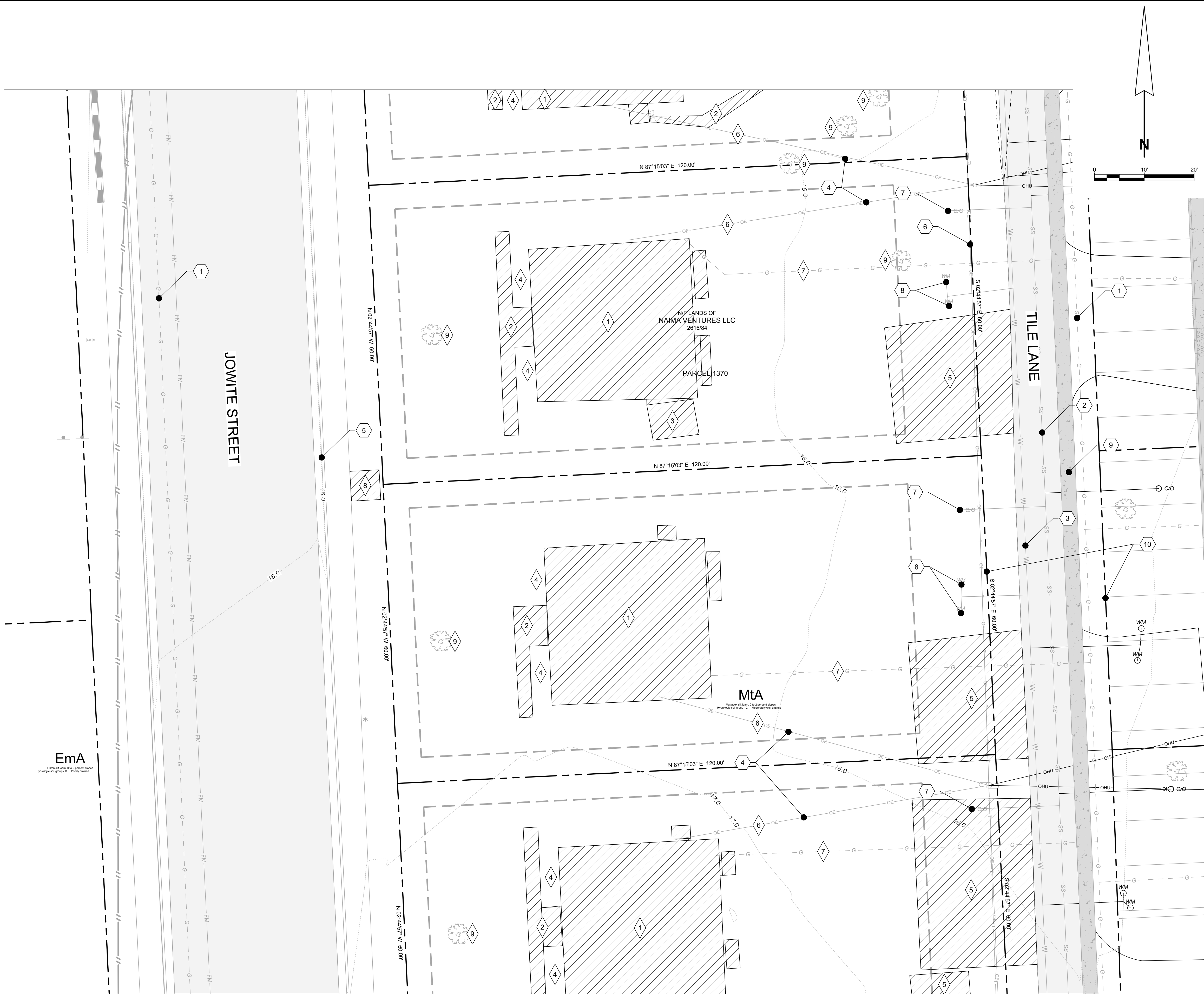
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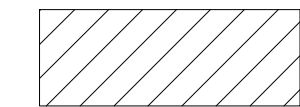
EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

\\102.168.0.50\PROJECTS\NAIMA\ENGINEERING\PHASE 2\PRODUCTION PLANS\NAIMA PHASE 2 - PRODUCTION PLANS.DWG



EmA
10000' scale, 1/4" = 100'-0" (vertical)
Hydrograph not shown, 1/4" = 100'-0" (horizontal)



DEMOLITION TO BE DONE UNDER THIS CONTRACT UNDER DIRECTION OF NAIMA

- DEMOLITION NOTES**
- 1 EXISTING STRUCTURE TO BE DEMOLISHED
 - 2 EXISTING SIDEWALK TO BE DEMOLISHED
 - 3 EXISTING PATIO TO BE DEMOLISHED
 - 4 EXISTING LANDSCAPING TO BE REMOVED
 - 5 EXISTING PARKING AREA TO BE DEMOLISHED
 - 6 EXISTING OVERHEAD UTILITIES TO BE DEMOLISHED
 - 7 EXISTING UNDERGROUND UTILITIES TO BE DEMOLISHED
 - 8 EXISTING CLUSTER MAILBOX TO BE DEMOLISHED
 - 9 SEE SHEETS C-501.01 - C-501.03 FOR DETAILS REGARDING TREE REMOVAL.

NOTE:
ALL EXISTING TREES TO BE REMOVED

EXISTING FEATURES

- 1 GAS MAIN
- 2 8" VCP SEWER MAIN
- 3 6" CAST IRON WATER MAIN
- 4 OVERHEAD ELECTRIC
- 5 6" CONCRETE CURB
- 6 TELEPHONE LINE
- 7 SEWER CLEANOUT TO REMAIN
- 8 WATER METER TO REMAIN
- 9 STANDARD ASPHALT VALLEY GUTTER
- 10 TILE LANE RIGHT OF WAY

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 10'

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.:

V-101.02

EXISTING & DEMOLITION PLAN

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

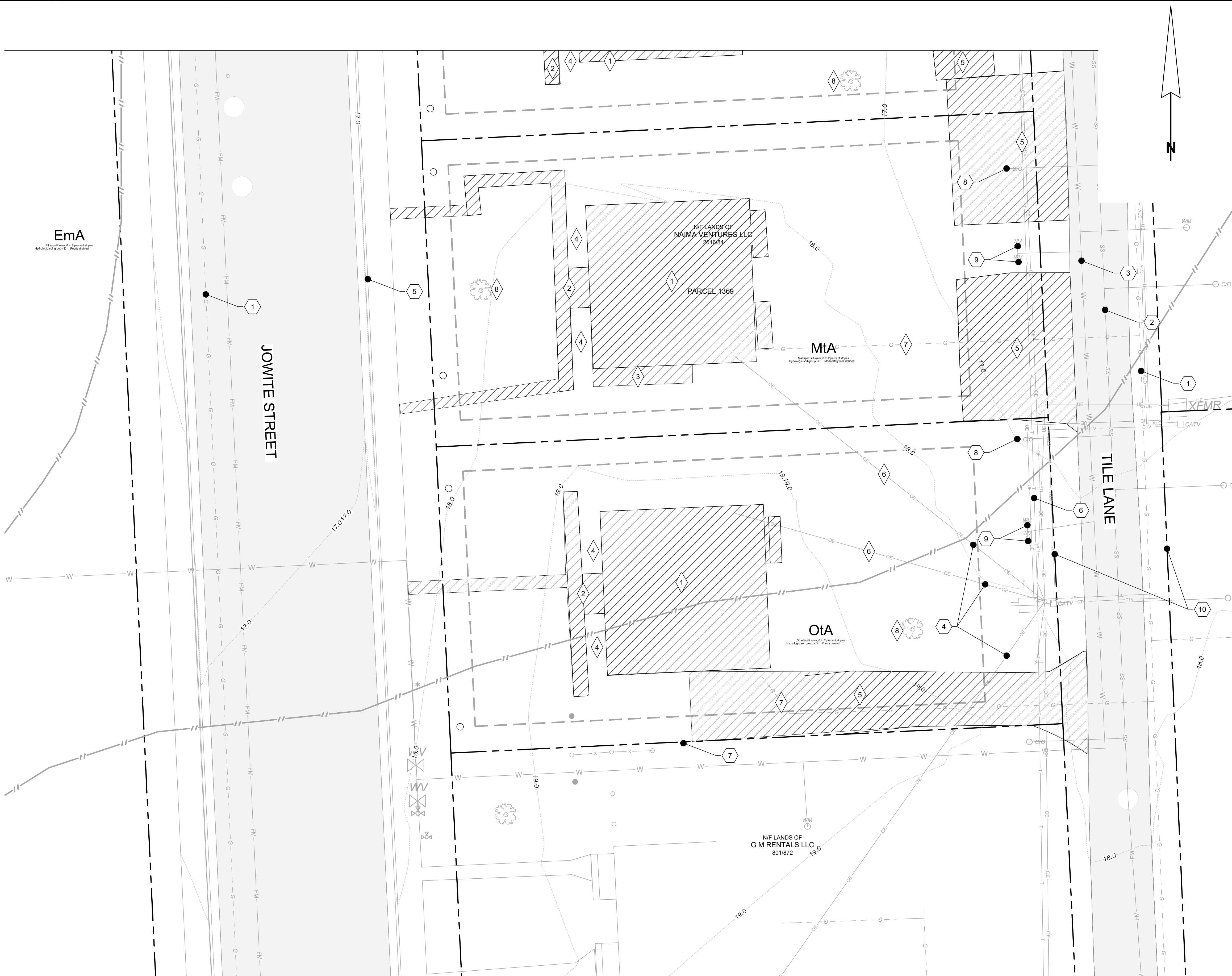
PREPARED FOR NAIMA VENTURES, LLC

RAUCH
INC.

engineering design &
development services

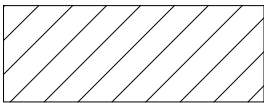
Office: 410.770.0881 | Fax: 410.770.3667
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Maryland Office: 105 N. Harrison St. - Easton, MD 21601
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EXISTING FEATURES

- 1 GAS MAIN
- 2 8" VCP SEWER MAIN
- 3 6" CAST IRON WATER MAIN
- 4 OVERHEAD ELECTRIC
- 5 6" CONCRETE CURB
- 6 TELEPHONE LINE
- 7 NEIGHBORING PROPERTY LINE (TYP.)
- 8 SEWER CLEANOUT TO REMAIN
- 9 WATER METER TO REMAIN
- 10 TILE LANE RIGHT OF WAY



DEMOLITION TO BE DONE UNDER THIS CONTRACT UNDER DIRECTION OF NAIMA

DEMOLITION NOTES

- 1 EXISTING STRUCTURE TO BE DEMOLISHED
- 2 EXISTING SIDEWALK TO BE DEMOLISHED
- 3 EXISTING PATIO TO BE DEMOLISHED
- 4 EXISTING LANDSCAPING TO BE REMOVED
- 5 EXISTING PARKING AREA TO BE DEMOLISHED
- 6 EXISTING OVERHEAD UTILITIES TO BE DEMOLISHED
- 7 EXISTING UNDERGROUND UTILITIES TO BE DEMOLISHED
- 8 SEE SHEETS C-501.01 - C-501.03 FOR DETAILS REGARDING TREE REMOVAL.

NOTE:
ALL EXISTING TREES TO BE REMOVED

APPROVED: TOWN OF EASTON - TOWN ENGINEER
DATE

APPROVED: TOWN OF EASTON PLANNING AND ZONING
DATE

APPROVED: EASTON UTILITIES - MANAGER OF ENGINEERING
DATE

EXISTING & DEMOLITION PLAN

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS
TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAIMA VENTURES, LLC

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REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 10'

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DESIGNED BY: BBF

APPROVED BY:

SHEET NO.: V-101.03

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PROPOSED FEATURES

- 1 LIMITS OF DISTURBANCE
- 2 LIMITS OF DISTURBANCE AND SILT FENCE PER DETAIL SHEET C-205.01
- 3 AT GRADE INLET PROTECTION (AGIP) PER DETAIL SHEET C-205.01
- 4 CURB INLET PROTECTION (CIP) PER DETAIL SHEET C-205.01

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

DATE

DATE

REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 10'

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.:

C-201.01

EROSION & SEDIMENT CONTROL PLAN

FOR

NAMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

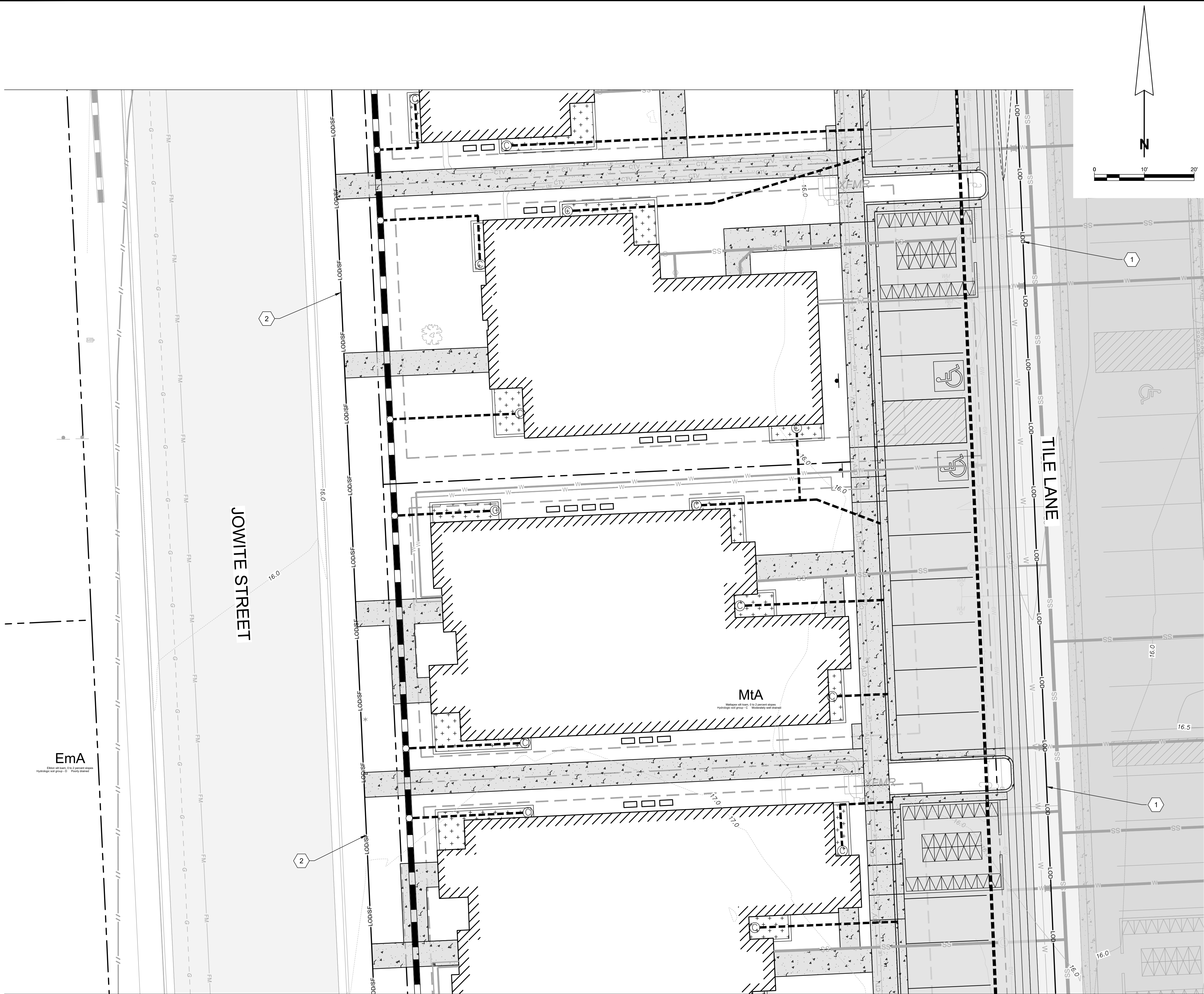
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PROPOSED FEATURES

- 1 LIMITS OF DISTURBANCE
- 2 LIMITS OF DISTURBANCE AND SILT FENCE PER DETAIL SHEET C-205.01

NOTE: PARCEL 1382 TO BE USED AS STOCKPILE & STAGING AREA FIRST. ONCE CONSTRUCTION BEGINS ON PARCEL 1382, FRONT YARDS TO BE UTILIZED AS STOCKPILE & STAGING AREAS

APPROVED:	APPROVED:	APPROVED:
TOWN OF EASTON - TOWN ENGINEER	TOWN OF EASTON PLANNING AND ZONING	EASTON UTILITIES - MANAGER OF ENGINEERING
DATE	DATE	DATE

EROSION & SEDIMENT CONTROL PLAN

FOR

NAMA - PHASE 2

INFRASTRUCTURE IMPROVEMENT PLANS

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

TAX MAP 0104, GRID 000EA

PREPARED FOR NAMA VENTURES, LLC

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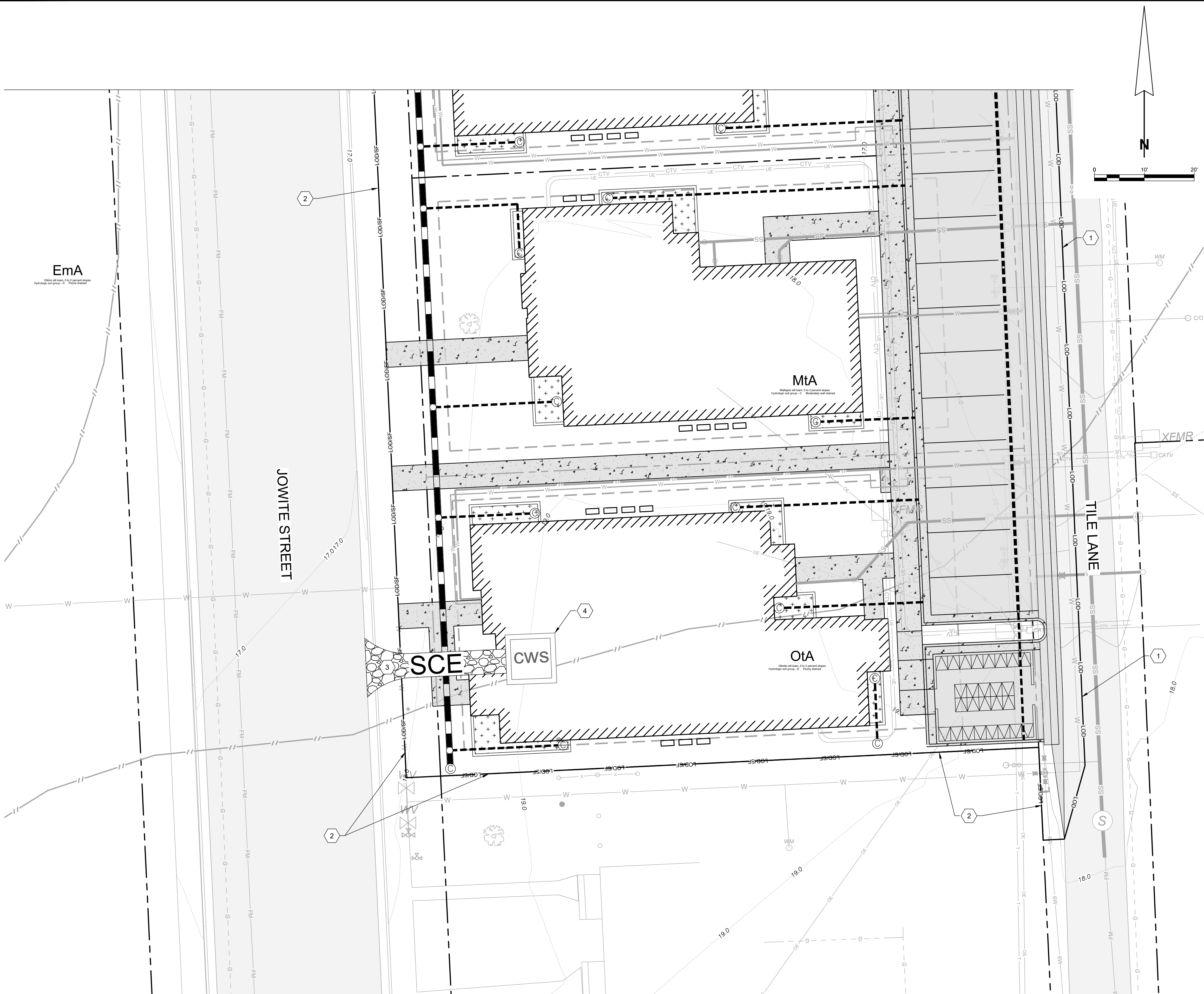
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SHEET NO.:	C-201.02

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PROPOSED FEATURES

- 1 LIMITS OF DISTURBANCE
- 2 LIMITS OF DISTURBANCE AND SILT FENCE PER DETAIL SHEET C-205.01
- 3 STABILIZED CONSTRUCTION ENTRANCE (SCE) PER DETAIL SHEET C-205.01
- 4 CONCRETE WASHOUT STRUCTURE PER DETAIL SHEET C-205.01

APPROVED:	APPROVED:	APPROVED:
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DATE	DATE	DATE

REVISIONS	
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APPROVED BY:	
SHEET NO.:	C-201.03

EROSION & SEDIMENT CONTROL PLAN

FOR

NAMA - PHASE 2

INFRASTRUCTURE IMPROVEMENT PLANS

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

TAX MAP 0104, GRID 000EA

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EXISTING CATCHMENT FEATURES

- 1 STUDY POINT #1 @ 438 GLENWOOD AVENUE DITCH
- 2 EX-I-1
- 3 EX-I-2
- 4 TOTAL EXISTING CATCHMENT AREA WITHIN L.O.D. GETTING TO STUDY POINT = 1.512 ACRES
- 5 64' OF SHEET FLOW ON GRASS @ 4.29% SLOPE
- 6 496' OF SHALLOW CONCENTRATED FLOW ON JOWITE STREET GUTTER PAN @ 0.53% SLOPE
- 7 170' OF 15" RCP PIPE FLOW @ 0.87% SLOPE

EmA
Elkton silt loam, 0 to 2 percent slopes
Hydrologic soil group - D Poorly drained

MtA
Mattapex silt loam, 0 to 2 percent slopes
Hydrologic soil group - C Moderately well drained

OtA
Onkalo silt loam, 0 to 2 percent slopes
Hydrologic soil group - D Poorly drained

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 30'

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MASTER EXISTING DRAINAGE PLAN

FOR

NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

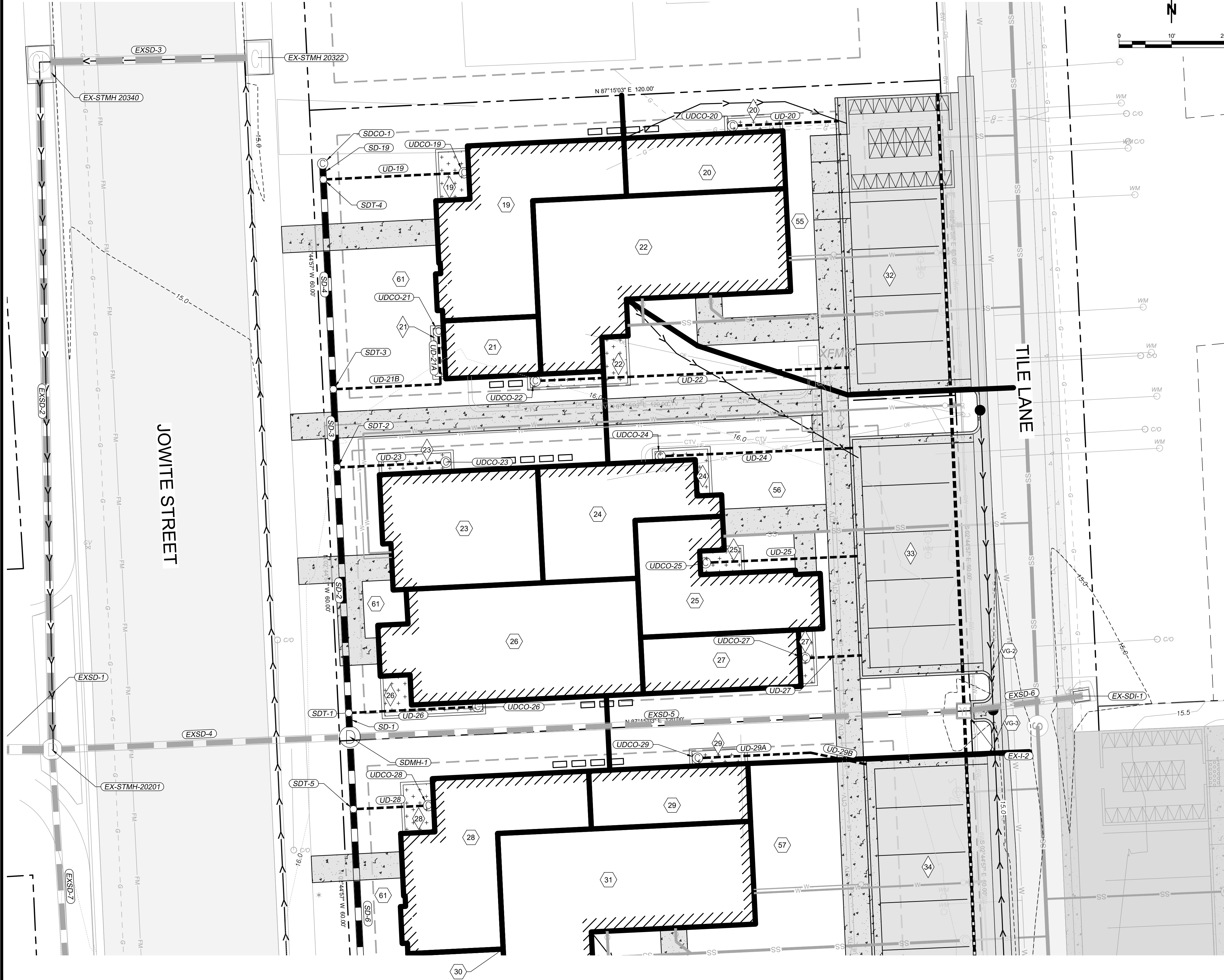
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ROOFTOP DRAINAGE AREAS

19	DRAINAGE AREA #19 = 741 S.F.	----->	19	PLANTER BOX #19. DETAIL AND TABLE ON 205.03
20	DRAINAGE AREA #20 = 333 S.F.	----->	20	PLANTER BOX #20. DETAIL AND TABLE ON 205.03
21	DRAINAGE AREA #21 = 199 S.F.	----->	21	PLANTER BOX #21. DETAIL AND TABLE ON 205.03
22	DRAINAGE AREA #22 = 1,136 S.F.	----->	22	PLANTER BOX #22. DETAIL AND TABLE ON 205.03
23	DRAINAGE AREA #23 = 648 S.F.	----->	23	PLANTER BOX #23. DETAIL AND TABLE ON 205.03
24	DRAINAGE AREA #24 = 547 S.F.	----->	24	PLANTER BOX #24. DETAIL AND TABLE ON 205.03
25	DRAINAGE AREA #25 = 550 S.F.	----->	25	PLANTER BOX #25. DETAIL AND TABLE ON 205.03
26	DRAINAGE AREA #26 = 1,025 S.F.	----->	26	PLANTER BOX #26. DETAIL AND TABLE ON 205.03
27	DRAINAGE AREA #27 = 322 S.F.	----->	27	PLANTER BOX #27. DETAIL AND TABLE ON 205.03
28	DRAINAGE AREA #28 = 741 S.F.	----->	28	PLANTER BOX #28. DETAIL AND TABLE ON 205.03
29	DRAINAGE AREA #29 = 333 S.F.	----->	29	PLANTER BOX #29. DETAIL AND TABLE ON 205.03
30	DRAINAGE AREA #30 = 199 S.F.	----->	30	NOT SHOWN. SEE NEXT SHEET. PLANTER BOX #30. DETAIL AND TABLE ON 205.03
31	DRAINAGE AREA #31 = 1,136 S.F.	----->	31	NOT SHOWN. SEE NEXT SHEET. PLANTER BOX #31. DETAIL AND TABLE ON 205.03

PLANTER BOX NUMBER

OTHER DRAINAGE AREAS

55	DRAINAGE AREA #55 = 3,000 S.F. CN = 92
56	DRAINAGE AREA #56 = 4,390 S.F. CN = 87
57	DRAINAGE AREA #57 = 4,540 S.F. CN = 88
61	DRAINAGE AREA #61 = 14,486 S.F. CN = 74

POROUS ASPHALT AREAS

32	POROUS ASPHALT #2 (PA-2) AREA = 1,172 S.F.
33	POROUS ASPHALT #3 (PA-3) AREA = 903 S.F.
34	POROUS ASPHALT #4 (PA-4) AREA = 1,097 S.F.

VALLEY GUTTERS

VG-2	VALLEY GUTTER 2
VG-3	VALLEY GUTTER 3

NOTE:

- ALL ROOFTOP TO HAVE APPROXIMATELY 37' OF SHEET FLOW AT 41.7% ($\frac{3}{8}$ ROOF PITCH) THEREFORE THE TIME OF CONCENTRATION IS AT 0.2 MINUTES OR ALMOST NEGLIGIBLE.
- ROOFTOP #20,22,24,25,27,29,31,33,35,37,38,40,42,43,45,47,49,51, & 52 WILL DISCHARGE INTO A PLANTER BOX AND OUT ONTO THE PERMEABLE PAVEMENT THROUGH THE PROPOSED CURB VIA A 4" PIPE.

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

PROPOSED DRAINAGE AREA PLAN

FOR
NAMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

PREPARED FOR NAMA VENTURES, LLC

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DATE: 03/03/2021

SCALE: 1" = 10'

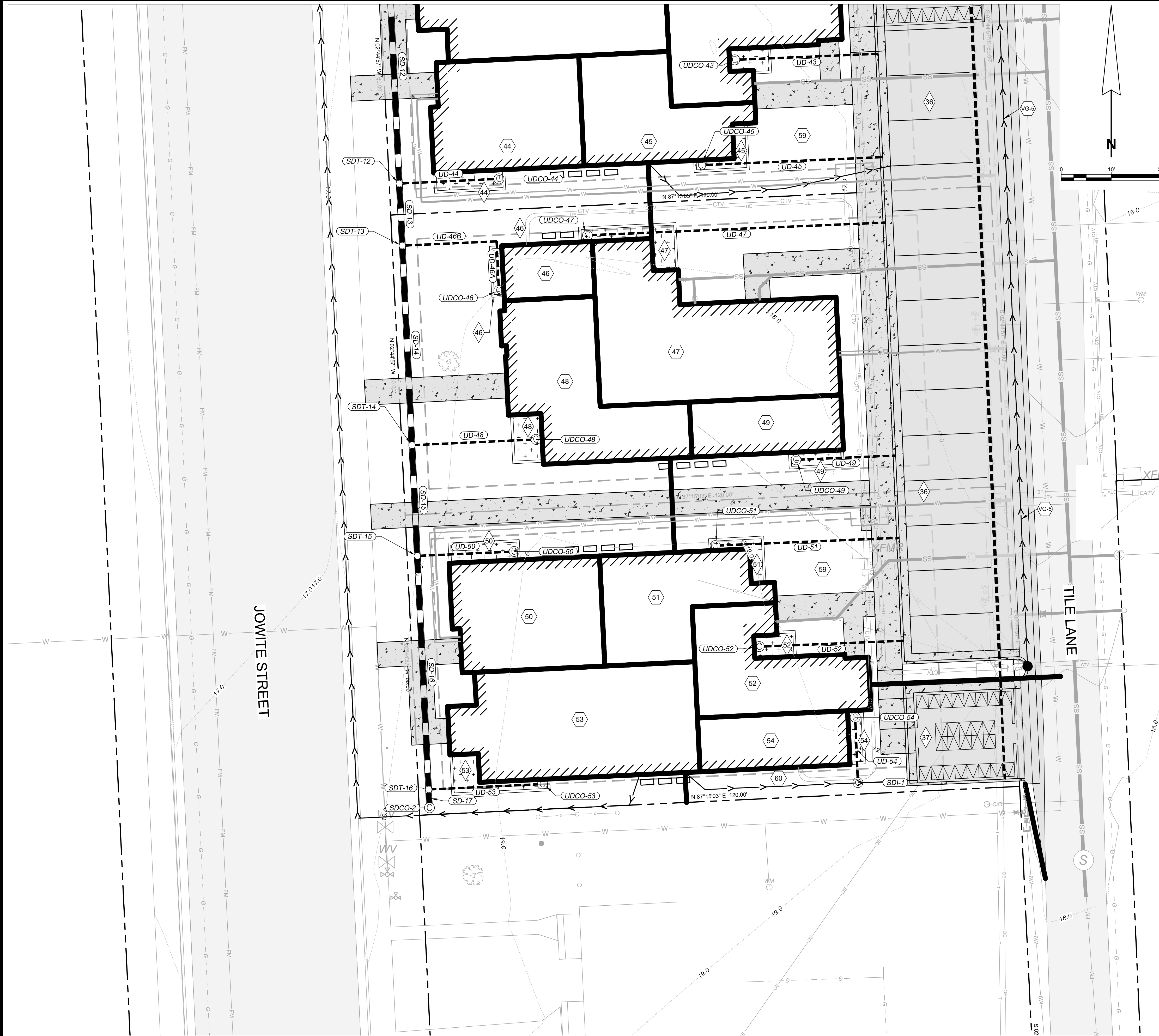
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DESIGNED BY: BBF

APPROVED BY:

SHEET NO.:

C-201.05



ROOFTOP DRAINAGE AREAS

- 44 DRAINAGE AREA #44 = 648 S.F.
- 45 DRAINAGE AREA #45 = 547 S.F.
- 46 DRAINAGE AREA #46 = 199 S.F.
- 47 DRAINAGE AREA #47 = 1,136 S.F.
- 48 DRAINAGE AREA #48 = 741 S.F.
- 49 DRAINAGE AREA #49 = 333 S.F.
- 50 DRAINAGE AREA #50 = 648 S.F.
- 51 DRAINAGE AREA #51 = 547 S.F.
- 52 DRAINAGE AREA #52 = 550 S.F.
- 53 DRAINAGE AREA #53 = 1,025 S.F.
- 54 DRAINAGE AREA #54 = 322 S.F.

PLANTER BOX NUMBER

- 44 PLANTER BOX #44. DETAIL AND TABLE ON 205.03
- 45 PLANTER BOX #45. DETAIL AND TABLE ON 205.03
- 46 PLANTER BOX #46. DETAIL AND TABLE ON 205.03
- 47 PLANTER BOX #47. DETAIL AND TABLE ON 205.03
- 48 PLANTER BOX #48. DETAIL AND TABLE ON 205.03
- 49 PLANTER BOX #49. DETAIL AND TABLE ON 205.03
- 50 PLANTER BOX #50. DETAIL AND TABLE ON 205.03
- 51 PLANTER BOX #51. DETAIL AND TABLE ON 205.03
- 52 PLANTER BOX #52. DETAIL AND TABLE ON 205.03
- 53 PLANTER BOX #53. DETAIL AND TABLE ON 205.03
- 54 PLANTER BOX #54. DETAIL AND TABLE ON 205.03

OTHER DRAINAGE AREAS

- 59 DRAINAGE AREA #59 = 8,366 S.F. CN = 92
- 60 DRAINAGE AREA #60 = 1,133 S.F. CN = 91
- 61 DRAINAGE AREA #61 = 14,486 S.F. CN = 74

POROUS ASPHALT AREAS

- 36 POROUS ASPHALT #6 (PA-6) AREA = 3,085 S.F.
- 37 POROUS ASPHALT #7 (PA-7) AREA = 387 S.F.

VALLEY GUTTERS

- VG-5 VALLEY GUTTER 5

- NOTE:
- ALL ROOFTOP TO HAVE APPROXIMATELY 37" OF SHEET FLOW AT 41.7% (5/8" ROOF PITCH) THEREFORE THE TIME OF CONCENTRATION IS AT 0.2 MINUTES OR ALMOST NEGLIGIBLE.
 - ROOFTOP #20,22,24,25,27,29,31,33,35,37,38,40,42,43,45,47,49,51, & 52 WILL DISCHARGE INTO A PLANTER BOX AND OUT ONTO THE PERMEABLE PAVEMENT THROUGH THE PROPOSED CURB VIA A 4" PIPE.

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REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 10'

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SHEET NO.: C-201.07

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

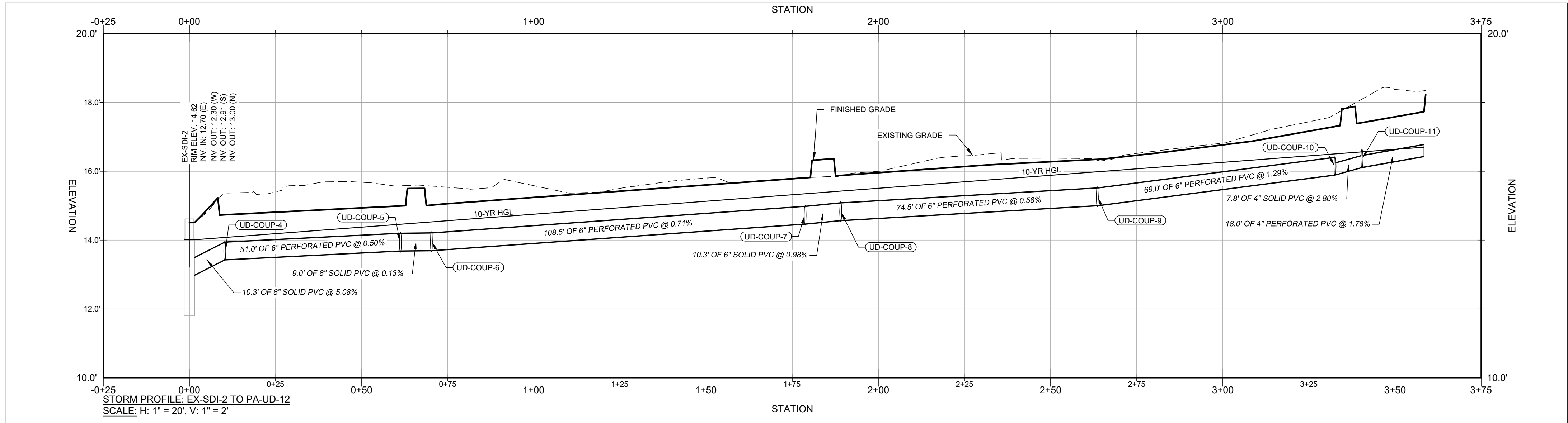
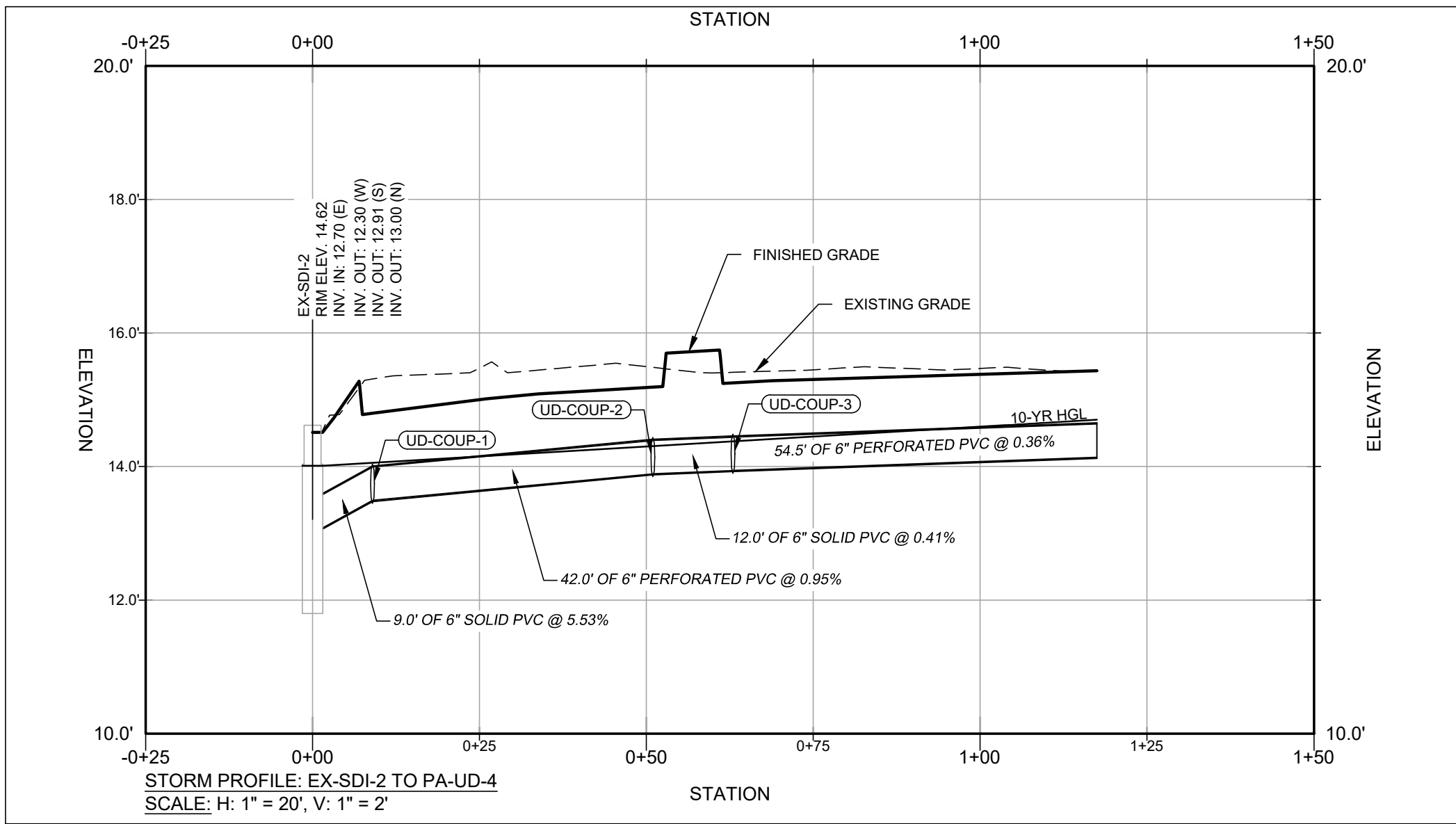
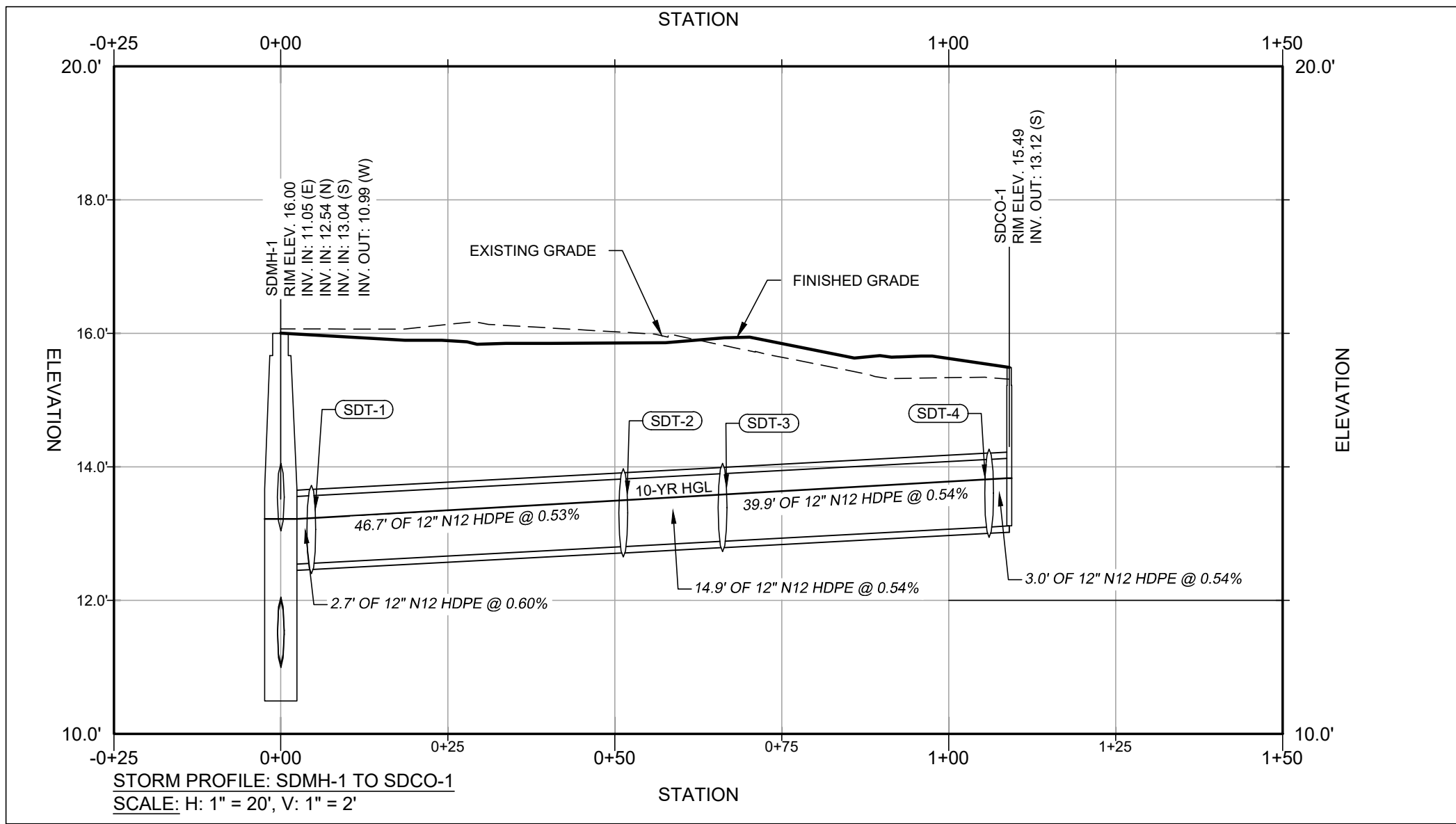
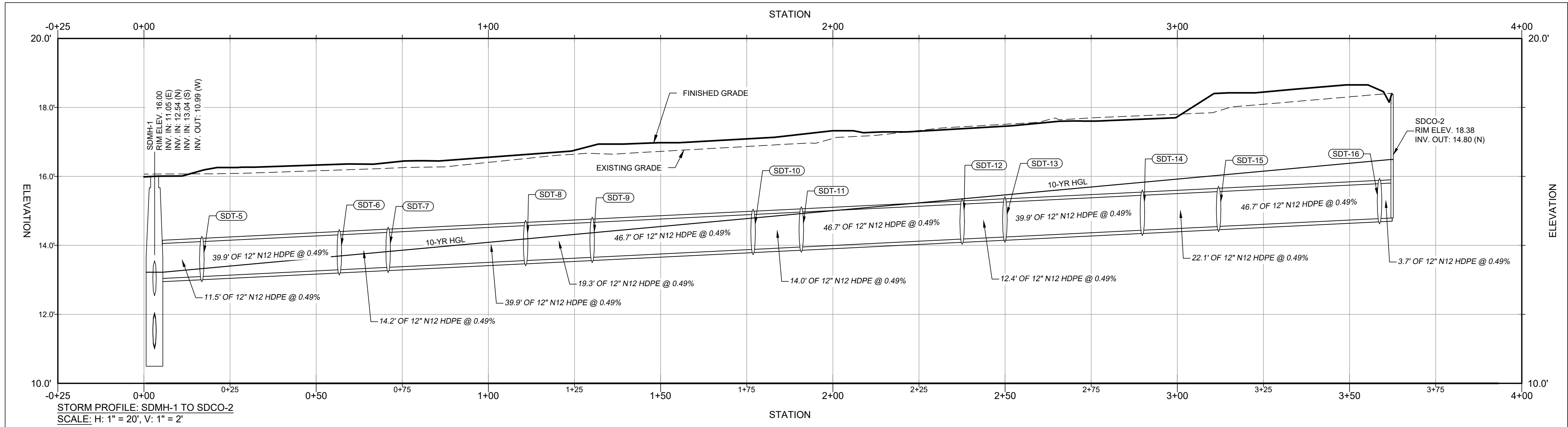
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EASTON UTILITIES - MANAGER OF ENGINEERING

FOR
NAMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAMA VENTURES, LLC

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TOWN OF EASTON PLANNING AND ZONING

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DATE: 03/03/2021

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SHEET NO.:
C-203.01

STORMWATER & STORM DRAIN PROFILES

FOR
NAMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAMA VENTURES, LLC

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STRUCTURE SCHEDULE NAIMA - PHASE 2 - STORM			
STRUCTURE NAME	STRUCTURE TYPE AND SIZE	CONNECTED PIPES	RIM ELEVATION
EX-SDI-1	Custom Inlet	CLASS III RCP INV OUT = 13.04	14.44
EX-SDI-2	EXST YARD INLET	CLASS III RCP INV IN = 12.70 CLASS III RCP INV OUT = 12.30 SOLID PVC INV OUT = 12.91 SOLID PVC INV OUT = 13.00	14.62
EX-STMH-20201	EXST SDMH	CLASS III RCP INV IN = 10.17 CLASS III RCP INV IN = 11.70 CLASS III RCP INV IN = 9.88 CLASS III RCP INV OUT = 9.81	15.49
EX-STMH 20322	EXST CURB INLET	CLASS III RCP INV OUT = 11.34	15.25
EX-STMH 20340	EXST CURB INLET	CLASS III RCP INV IN = 11.10 CLASS III RCP INV OUT = 10.49	15.25
SDCO-1	SD TERMINAL CLEANOUT	N12 HDPE INV OUT = 13.12	15.49
SDCO-2	SD TERMINAL CLEANOUT	N12 HDPE INV OUT = 14.80	18.38
SDI-1	6" X 6" GRATE EMITTER	PVC Pipe INV OUT = 15.95	18.58
SDMH-1	4' DIA PRECAST CONC MANHOLE	CLASS III RCP INV IN = 11.05 N12 HDPE INV IN = 12.54 N12 HDPE INV IN = 13.04 CLASS III RCP INV OUT = 10.99	16.00
SDT-1	12" X 4" SD TEE	N12 HDPE INV IN = 12.56 N12 HDPE INV OUT = 12.56 PVC Pipe INV OUT = 12.56	13.72
SDT-2	12" X 4" SD TEE	N12 HDPE INV IN = 12.81 N12 HDPE INV OUT = 12.81 PVC Pipe INV OUT = 12.81	13.97
SDT-3	12" X 4" SD TEE	N12 HDPE INV IN = 12.89 N12 HDPE INV OUT = 12.89 PVC Pipe INV OUT = 12.89	14.05
SDT-4	12" X 4" SD TEE	N12 HDPE INV IN = 13.10 N12 HDPE INV OUT = 13.10 PVC Pipe INV OUT = 13.10	14.27
SDT-5	12" X 4" SD TEE	N12 HDPE INV IN = 13.10 N12 HDPE INV OUT = 13.10 PVC Pipe INV OUT = 13.10	14.26
SDT-6	12" X 4" SD TEE	N12 HDPE INV IN = 13.29 N12 HDPE INV OUT = 13.29 PVC Pipe INV OUT = 13.29	14.46
SDT-7	12" X 4" SD TEE	N12 HDPE INV IN = 13.36 N12 HDPE INV OUT = 13.36 PVC Pipe INV OUT = 13.36	14.53
SDT-8	12" X 4" SD TEE	N12 HDPE INV IN = 13.56 N12 HDPE INV OUT = 13.56 PVC Pipe INV OUT = 13.56	14.73
SDT-9	12" X 4" SD TEE	N12 HDPE INV IN = 13.65 N12 HDPE INV OUT = 13.65 PVC Pipe INV OUT = 13.65	14.82
SDT-10	12" X 4" SD TEE	N12 HDPE INV IN = 13.88 N12 HDPE INV OUT = 13.88 PVC Pipe INV OUT = 13.88	15.05
SDT-11	12" X 4" SD TEE	N12 HDPE INV IN = 13.95 N12 HDPE INV OUT = 13.95 PVC Pipe INV OUT = 13.95	15.12
SDT-12	12" X 4" SD TEE	N12 HDPE INV IN = 14.18 N12 HDPE INV OUT = 14.18 PVC Pipe INV OUT = 14.18	15.35
SDT-13	12" X 4" SD TEE	N12 HDPE INV IN = 14.24 N12 HDPE INV OUT = 14.24 PVC Pipe INV OUT = 14.24	15.41
SDT-14	12" X 4" SD TEE	N12 HDPE INV IN = 14.44 N12 HDPE INV OUT = 14.44 PVC Pipe INV OUT = 14.44	15.61
SDT-15	12" X 4" SD TEE	N12 HDPE INV IN = 14.55 N12 HDPE INV OUT = 14.55 PVC Pipe INV OUT = 14.55	15.71
SDT-16	12" X 4" SD TEE	N12 HDPE INV IN = 14.78 N12 HDPE INV OUT = 14.78 PVC Pipe INV OUT = 14.78	15.94
UD-COUP-1	Null Structure	SOLID PVC INV IN = 13.49 PERFORATED PVC INV OUT = 13.49	14.04
UD-COUP-2	Null Structure	PERFORATED PVC INV IN = 13.89 SOLID PVC INV OUT = 13.89	14.43
UD-COUP-3	Null Structure	SOLID PVC INV IN = 13.94 PERFORATED PVC INV OUT = 13.94	14.48
UD-COUP-4	Null Structure	SOLID PVC INV IN = 13.43 PERFORATED PVC INV OUT = 13.43	13.97
UD-COUP-5	Null Structure	PERFORATED PVC INV IN = 13.69 SOLID PVC INV OUT = 13.69	14.23
UD-COUP-6	Null Structure	SOLID PVC INV IN = 13.70 PERFORATED PVC INV OUT = 13.70	14.24
UD-COUP-7	Null Structure	PERFORATED PVC INV IN = 14.47 SOLID PVC INV OUT = 14.47	15.02
UD-COUP-8	Null Structure	SOLID PVC INV IN = 14.57 PERFORATED PVC INV OUT = 14.57	15.12
UD-COUP-9	Null Structure	PERFORATED PVC INV IN = 15.01 PERFORATED PVC INV OUT = 15.01	15.55
UD-COUP-10	Null Structure	PERFORATED PVC INV IN = 15.90 SOLID PVC INV OUT = 15.90	16.44
UD-COUP-11	Null Structure	SOLID PVC INV IN = 16.12 PERFORATED PVC INV OUT = 16.12	16.66
UDCO-19	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-20	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-21	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-22	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00

STRUCTURE SCHEDULE NAIMA - PHASE 2 - STORM			
STRUCTURE NAME	STRUCTURE TYPE AND SIZE	CONNECTED PIPES	RIM ELEVATION
UDCO-23	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 12.95	17.50
UDCO-24	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 12.95	17.50
UDCO-25	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 12.95	17.50
UDCO-26	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 12.95	17.50
UDCO-27	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 12.95	17.50
UDCO-28	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-29	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-30	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-31	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.45	18.00
UDCO-32	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.95	18.50
UDCO-33	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.95	18.50
UDCO-34	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.95	18.50
UDCO-35	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 13.95	18.50
UDCO-36	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.15	18.70
UDCO-37	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.15	18.70
UDCO-38	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.15	18.70
UDCO-39	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.15	18.70
UDCO-40	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.15	18.70
UDCO-41	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.45	19.00
UDCO-42	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.45	19.00
UDCO-43	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.45	19.00
UDCO-44	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.45	19.00
UDCO-45	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.45	19.00
UDCO-46	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.95	19.50
UDCO-47	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.95	19.50
UDCO-48	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.95	19.50
UDCO-49	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 14.95	19.50
UDCO-50	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 15.95	20.50
UDCO-51	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 15.95	20.50
UDCO-52	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 15.95	20.50
UDCO-53	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 15.95	20.50
UDCO-54	PLANTER BOX CLEANOUT	PVC Pipe INV IN = 15.95	20.50

PIPE SCHEDULE NAIMA - PHASE 2 - STORM				
PIPE NAME SIZE/MATERIAL	LENGTH	SLOPE	UPSTREAM STRUCTURE AND INVERT	DOWNSTREAM STRUCTURE AND INVERT
SD-5 12" N12 HDPE	11.46'	0.49%	SDMH-1 INV. 13.04'	SDT-5 INV. 13.10'
SD-1 12" N12 HDPE	2.69'	0.60%	SDMH-1 INV. 12.54'	SDT-1 INV. 12.56'
EXSD-4 12" CLASS III RCP	52.59'	1.57%	EX-STMH-20201 INV. 10.17'	SDMH-1 INV. 10.99'
EXSD-5 12" CLASS III RCP	114.94'	1.09%	SDMH-1 INV. 11.05'	EX-SDI-2 INV. 12.30'
EXSD-7 12" CLASS III RCP	60.04'	0.34%	EX-STMH-20201 INV. 11.70'	INV. 11.90'
EXSD-2 15" CLASS III RCP	128.87'	0.47%	EX-STMH-20201 INV. 9.88'	EX-STMH 20340 INV. 10.49'
EXSD-3 15" CLASS III RCP	41.56'	0.58%	EX-STMH 20340 INV. 11.10'	EX-STMH 20322 INV. 11.34'
EXSD-1 18" CLASS III RCP	48.08'	0.22%	INV. 9.70'	EX-STMH-20201 INV. 9.81'
EXSD-6 12" CLASS III RCP	22.56'	1.51%	EX-SDI-2 INV. 12.70'	EX-SDI-1 INV. 13.04'
SD-19 12" N12 HDPE	3.01'	0.54%	SDT-4 INV. 13.10'	SDCO-1 INV. 13.12'
UD-19 4" PVC Pipe	26.77'	1.31%	SDT-4 INV. 13.10'	UDCO-19 INV. 13.45'
SD-4 12" N12 HDPE	39.91'	0.54%	SDT-3 INV. 12.89'	SDT-4 INV. 13.10'
UD-21B 4" PVC Pipe	20.39'	2.77%	SDT-3 INV. 12.89'	INV. 13.45'
SD-3 12" N12 HDPE	14.87'	0.54%	SDT-2 INV. 12.81'	SDT-3 INV. 12.89'
UD-23 4" PVC Pipe	20.70'	0.70%	SDT-2 INV. 12.81'	UDCO-23 INV. 12.95'
SD-2 12" N12 HDPE	46.71'	0.53%	SDT-1 INV. 12.56'	SDT-2 INV. 12.81'
UD-26 4" PVC Pipe	24.50'	1.60%	SDT-1 INV. 12.56'	UDCO-26 INV. 12.95'
SD-6 12" N12 HDPE	39.91'	0.49%	SDT-5 INV. 13.10'	SDT-6 INV. 13.29'
UD-28 4" PVC Pipe	14.27'	2.47%	SDT-5 INV. 13.10'	UDCO-28 INV. 13.45'
SD-7 12" N12 HDPE	14.17'	0.49%	SDT-6 INV. 13.29'	SDT-7 INV. 13.36'
UD-30B 4" PVC Pipe	8.22'	1.90%	SDT-6 INV. 13.29'	INV. 13.45'
SD-8 12" N12 HDPE	39.91'	0.49%	SDT-7 INV. 13.36'	SDT-8 INV. 13.56'
UD-32B 4" PVC Pipe	19.57'	3.00%	SDT-7 INV. 13.36'	INV. 13.95'
SD-9 12" N12 HDPE	19.33'	0.49%	SDT-8 INV. 13.56'	SDT-9 INV. 13.65'
UD-34 4" PVC Pipe	26.11'	1.50%	SDT-8 INV. 13.56'	UDCO-34 INV. 13.95'
SD-10 12" N12 HDPE	46.71'	0.49%	SDT-9 INV. 13.65'	SDT-10 INV. 13.88'
UD-36 4" PVC Pipe	20.17'	2.46%	SDT-9 INV. 13.65'	UDCO-36 INV. 14.15'
SD-11 12" N12 HDPE	13.99'	0.49%	SDT-10 INV. 13.88'	SDT-11 INV. 13.95'
UD-39 4" PVC Pipe	23.93'	1.11%	SDT-10 INV. 13.88'	UDCO-39 INV. 14.15'
SD-12 12" N12 HDPE	46.71'	0.49%	SDT-11 INV. 13.95'	SDT-12 INV. 14.18'
UD-41 4" PVC Pipe	23.83'	2.09%	SDT-11 INV. 13.95'	UDCO-41 INV. 14.45'
SD-13 12" N12 HDPE	12.41'	0.49%	SDT-12 INV. 14.18'	SDT-13 INV. 14.24'
UD-44 4" PVC Pipe	19.91'	1.35%	SDT-12 INV. 14.18'	UDCO-44 INV. 14.45'
SD-14 12" N12 HDPE	39.90'	0.49%	SDT-13 INV. 14.24'	SDT-14 INV. 14.44'
UD-46B 4" PVC Pipe	18.85'	3.75%	SDT-13 INV. 14.24'	INV. 14.95'
SD-15 12" N12 HDPE	22.13'	0.49%	SDT-14 INV. 14.44'	SDT-15 INV. 14.55'
UD-48 4" PVC Pipe	24.80'	2.06%	SDT-14 INV. 14.44'	UDCO-48 INV. 14.95'
SD-16 12" N12 HDPE	46.71'	0.49%	SDT-15 INV. 14.55'	SDT-16 INV. 14.78'
UD-50 4" PVC Pipe	19.36'	7.25%	SDT-15 INV. 14.55'	UDCO-50 INV. 15.95'
SD-17 12" N12 HDPE	3.66'	0.49%	SDT-16 INV. 14.78'	SDCO-2 INV. 14.80'

PIPE SCHEDULE NAIMA - PHASE 2 - STORM				
PIPE NAME SIZE/MATERIAL	LENGTH	SLOPE	UPSTREAM STRUCTURE AND INVERT	DOWNSTREAM STRUCTURE AND INVERT
UD-53 4" PVC Pipe	22.77'	5.15%	SDT-16 INV. 14.78'	UDCO-53 INV. 15.95'
UD-20 4" PVC Pipe	20.15'	11.66%	INV. 15.80'	UDCO-20 INV. 13.45'
UD-22 4" PVC Pipe	59.69'	3.50%	INV. 15.54'	UDCO-22 INV. 13.45'
UD-24 4" PVC Pipe	36.58'	6.84%	INV. 15.45'	UDCO-24 INV. 12.95'
UD-25 4" PVC Pipe	28.89'	8.00%	INV. 15.26'	UDCO-25 INV. 12.95'
UD-27 4" PVC Pipe	10.80'	19.73%	INV. 15.08'	UDCO-27 INV. 12.95'
UD-31 4" PVC Pipe	71.57'	2.46%	INV. 15.21'	UDCO-31 INV. 13.45'
UD-33B 4" PVC Pipe	31.97'	3.88%	INV. 15.24'	INV. 14.00'
UD-33A 4" PVC Pipe	29.00'	0.17%	INV. 14.00'	UDCO-33 INV. 13.95'
UD-37C 4" PVC Pipe	13.68'	5.34%	INV. 15.73'	INV. 15.00'
UD-37B 4" PVC Pipe	3.35'	5.98%	INV. 15.00'	INV. 14.80'
UD-37A 4" PVC Pipe	20.78'	3.13%	INV. 14.80'	UDCO-37 INV. 14.15'
UD-35 4" PVC Pipe	14.51'	5.86%	INV. 14.80'	UDCO-35 INV. 13.95'
UD-38 4" PVC Pipe	28.86'	5.89%	INV. 15.85'	UDCO-38 INV. 14.15'
UD-40 4" PVC Pipe	11.18'	16.46%	INV. 15.99'	UDCO-40 INV. 14.15'
UD-42B 4" PVC Pipe	10.54'	16.03%	INV. 16.14'	INV. 14.45'
UD-42A 4" PVC Pipe	9.26'	0.00%	INV. 14.45'	UDCO-42 INV. 14.45'
UD-43 4" PVC Pipe	28.69'	6.48%	INV. 16.31'	UDCO-43 INV. 14.45'
UD-45 4" PVC Pipe	36.40'	5.52%	INV. 16.46'	UDCO-45 INV. 14.45'
UD-47 4" PVC Pipe	59.59'	2.77%	INV. 16.60'	UDCO-47 INV. 14.95'
UD-49 4" PVC Pipe	19.94'	10.88%	INV. 17.12'	UDCO-49 INV. 14.95'
UD-51 4" PVC Pipe	36.81'	3.69%	INV. 17.31'	UDCO-51 INV. 15.95'
UD-52 4" PVC Pipe	28.88'	5.51%	INV. 17.54'	UDCO-52 INV. 15.95'
UD-54 4" PVC Pipe	13.04'	0.00%	SDI-1 INV. 15.95'	UDCO-54 INV. 15.95'
UD-29B 4" PVC Pipe	10.81'	9.16%	INV. 14.99'	INV. 14.00'
UD-29A 4" PVC Pipe	21.54'	2.55%	INV. 14.00'	UDCO-29 INV. 13.45'
PA-UD-5 6" SOLID PVC	10.27'	5.08%	EX-SDI-2 INV. 12.91'	UD-COUP-4 INV. 13.43'
PA-UD-6 6" PERFORATED PVC	51.00'	0.50%	UD-COUP-4 INV. 13.43'	UD-COUP-5 INV. 13.69'
PA-UD-7 6" SOLID PVC	9.00'	0.13%	UD-COUP-5 INV. 13.69'	UD-COUP-6 INV. 13.70'
PA-UD-8 6" PERFORATED PVC	108.50'	0.71%	UD-COUP-6 INV. 13.70'	UD-COUP-7 INV. 14.47'
PA-UD-9 6" SOLID PVC	10.32'	0.98%	UD-COUP-7 INV. 14.47'	UD-COUP-8 INV. 14.57'
PA-UD-10 6" PERFORATED PVC	74.48'	0.58%	UD-COUP-8 INV. 14.57'	UD-COUP-9 INV. 15.01'
PA-UD-12 4" SOLID PVC	7.82'	2.80%	UD-COUP-10 INV. 15.90'	UD-COUP-11 INV. 16.12'
PA-UD-13 4" PERFORATED PVC	18.00'	1.78%	UD-COUP-11 INV. 16.12'	INV. 16.44'
PA-UD-1 6" SOLID PVC	8.97'	5.53%	EX-SDI-2 INV. 13.00'	UD-COUP-1 INV. 13.49'
PA-UD-2 6" PERFORATED PVC	42.00'	0.95%	UD-COUP-1 INV. 13.49'	UD-COUP-2 INV. 13.89'
PA-UD-3 6" SOLID PVC	12.00'	0.41%	UD-COUP-2 INV. 13.89'	UD-COUP-3 INV. 13.94'
PA-UD-4 6" PERFORATED PVC	54.50'	0.36%	UD-COUP-3 INV. 13.94'	INV. 14.14'
PA-UD-11 6" PERFORATED PVC	69.02'	1.29%	UD-COUP-9 INV. 15.01'	UD-COUP-10 INV. 15.90'

APPROVED:	
TOWN OF EASTON - TOWN ENGINEER	DATE

APPROVED:	
TOWN OF EASTON PLANNING AND ZONING	DATE

APPROVED:	
EASTON UTILITIES - MANAGER OF ENGINEERING	DATE

STORMWATER & STORM DRAIN SCHEDULES

FOR

NAIMA - PHASE 2

INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

PREPARED FOR NAIMA VENTURES, LLC

RAUCH

INC.

engineering design &
development services

office: 410.770.0881 | fax: 410.770.9667
www.rauchinc.com
Maryland Office: 105 N. Harrison St., Easton, MD 21601
Virginia Office: 8229 Boone Blvd., Suite 625 - Vienna, VA 22182

REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

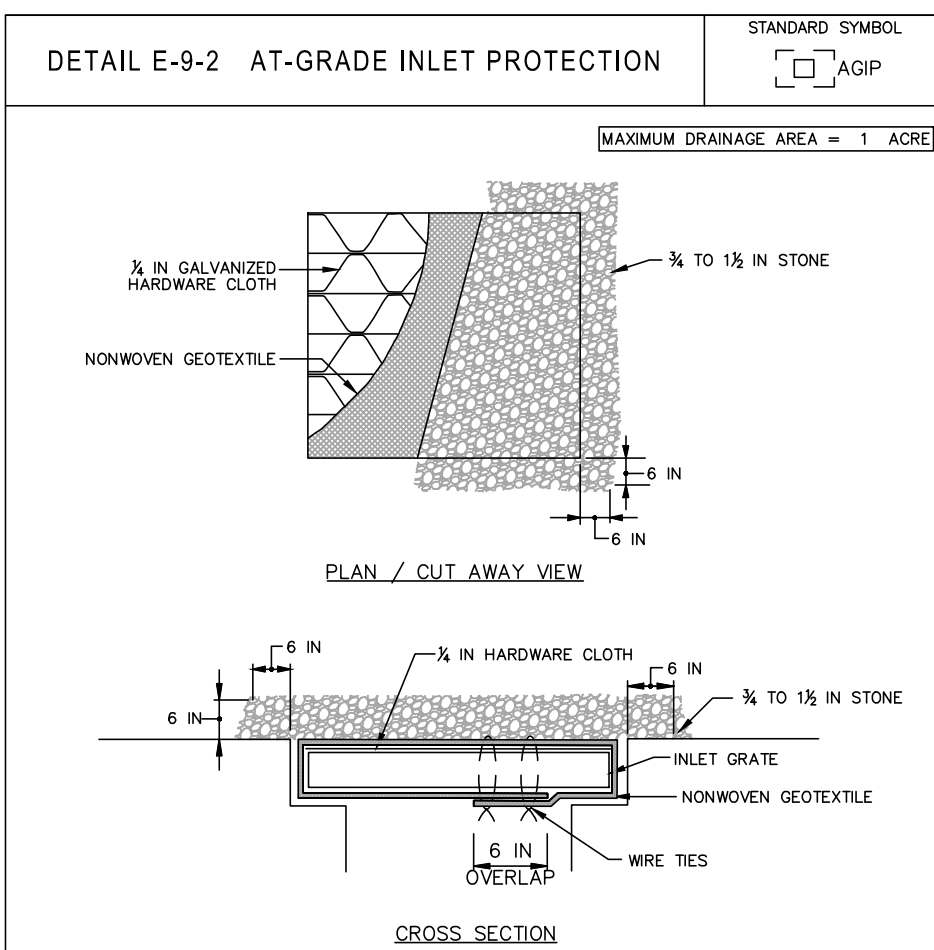
SCALE: N/A

DRAWN BY: BBF

DESIGNED BY: BBF

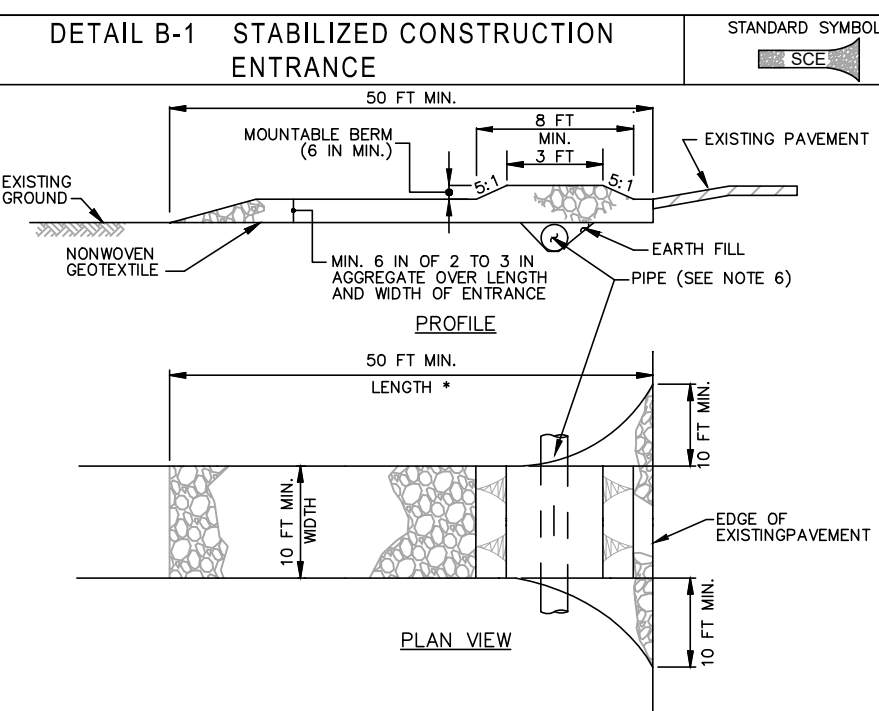
APPROVED BY:

SHEET NO.: C-203.02



- ### CONSTRUCTION SPECIFICATIONS
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
 2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
 3. PLACE CLAYE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
 4. STORM DRAIN INLET PROTECTION REQUIRES PERMANENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

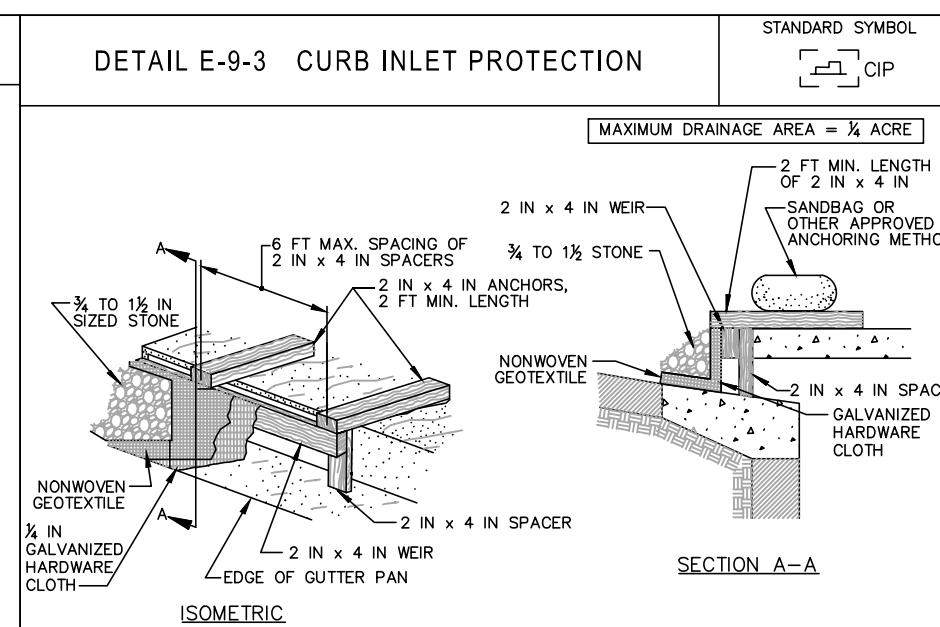
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



- ## CONSTRUCTION SPECIFICATIONS

- [illegible]

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

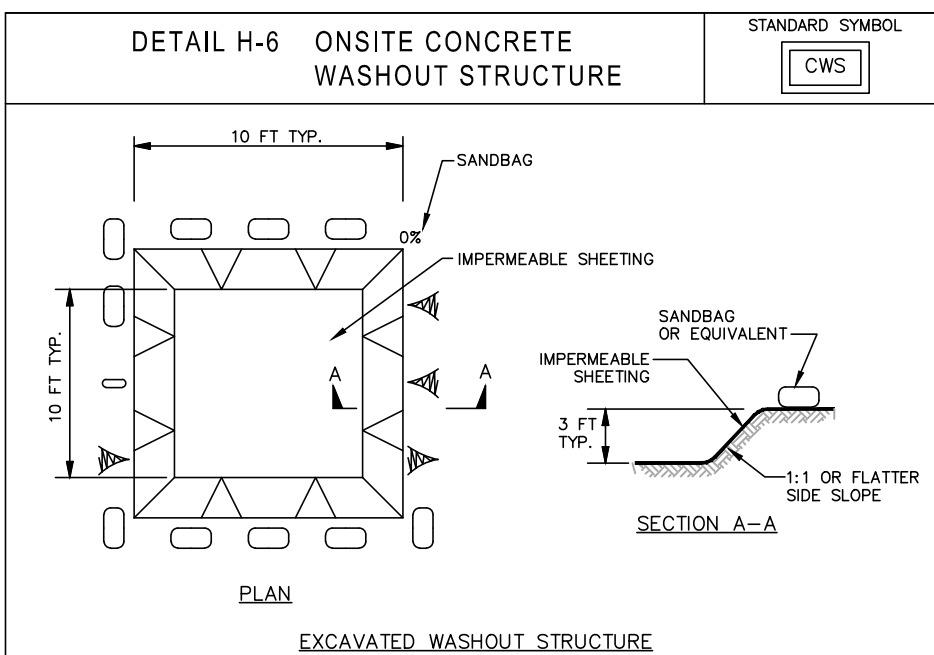
3. Contractor shall install soil erosion and sediment control devices prior to any grading. Following initial disturbance or re-disturbance, permanent or temporary stabilization shall be completed within three (3) calendar days as to the surface of all perimeter contours, dikes, embankments, perimeter berms, and other exposed areas. Stabilization shall be completed for all exposed areas of all slopes, embankments, or graded areas on the project site not under active grading.
4. Erosion control and sediment control devices shall be installed and maintained as indicated on this plan, with location adjustments to be made in the field as necessary, and to be maintained at the end of each working day until project completion. The minimum area practice shall be disturbed for the minimal amount of time possible.
5. Erosion control and sediment control devices shall be installed and maintained at the end of each working day until project completion. The minimum area practice shall be disturbed for the minimal amount of time possible.
6. Temporary seeding shall be accomplished between February 15 through April 30, or August 15 through November 30th. During this period, the following shall be accomplished:
 - a. Temporary seeding shall be accomplished between February 15 through April 30, or August 15 through November 30th. During this period, the following shall be accomplished:
 1. Temporary seeding shall conform to the following applications: 436 lbs. per ac 10-20-20; 4,000 lbs. per ac of ground limestone, to be incorporated into the soil by disk or other suitable means. Annual ryegrass shall be applied at a rate of 50 lbs. per acre using a broadcast spreader. Mature ryegrass shall be cut and removed.
 2. Temporary seeding shall conform to the following applications: 436 lbs. per ac 10-20-20; 4,000 lbs. per ac of ground limestone, to be incorporated into the soil by disk or other suitable means. Annual ryegrass shall be applied at a rate of 50 lbs. per acre using a broadcast spreader. Mature ryegrass shall be cut and removed.

Seed Mixture (For Hardness Zone 7a) (From Table B.1)				Fertilizer Rate (10-20-20)	Lime Rate
No.	Species	Appl. Rate (lb/a/1000)	Seeding Dates	Seeding Depth (in)	
ANNUAL RYEGRASS	50#	2/15 - 4/30 8/15 - 11/30	1/2"		
BARLEY	50#	2/15 - 4/30 / 8/15 - 11/30	1"	436 lb/ac	2 tons/ac
OATS	12#	2/15 - 4/30 / 8/15 - 11/30	1"	90 lb/ac	90 lb/ac
WHEAT	20#	2/15 - 4/30 / 8/15 - 11/30	1"	1000 sf	1000 sf
CERIAL RYE	112#	2/15 - 4/30 / 8/15 - 12/15	1"		
FOXTAIL MILLET	20#	5/1 - 8/14	1/2"		
PEARL MILLET	20#	5/1 - 8/14	1/2"		

6. Mulching shall be unchopped, unrotted, small grain straw applied at a rate of 2-2½ tons per acre. Anchor muck with a mulch anchor trowel on the Contour. Wood cellulose fiber may be used for anchoring straw at a rate of 750 lbs. per acre mixed with water at a maximum of 1500 lbs. per acre. Wood cellulose fiber may be used for anchoring straw at a rate of 750 lbs. per acre mixed with water at a maximum of 1500 lbs. per acre. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 lbs. of water. Mix wood cellulose fiber with water to attain a mixture with a maximum of 50 lbs. of wood cellulose fiber per 100 lbs. of water.
7. Permanent seeding shall be completed by the end of the first of October. Permanent seeding shall be completed by the end of the 15th through October 15th. Permanent seeding at other than specified times will be allowed only upon written approval. Permanent seeding shall conform to the following applications: Permanent seeding for sites having disturbed over five (5) acres shall use fertilizer rates recommended by a soil testing laboratory and recommended by the University of Minnesota Extension Service. Permanent seeding for sites having less than five (5) acres shall be performed at the rates and dates as provided in the Permanent Seeding Summary Table below. Fertilizer and lime applications shall be performed according to the top 3-5" of the soil by disk or other suitable means. Mulching shall be accomplished as specified in the specification. See Item #60 for the specification.

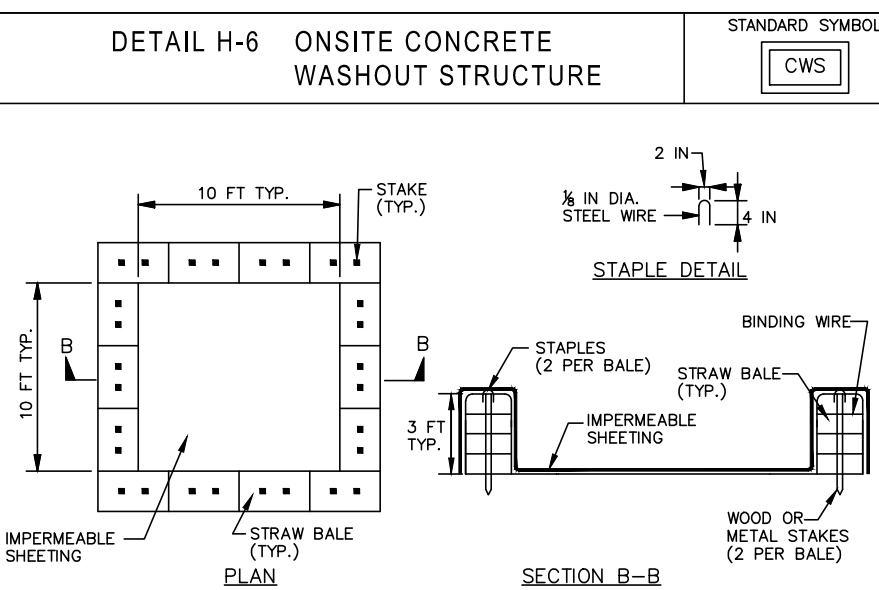
Seed Mixture (For Hardiness Zone 7a) (From Table B.3)					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Appl Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P2O5	K2O	
7	CREEPING RED FESCUE KENTUCKY BLUEGRASS	60# 15#	3/1 - 5/15 8/15 - 10/15	1/4" - 1/2"	45 lb/ac 1lb/ 1000 sf	90 lb/ac 2lb/ 1000 sf	90 lb/ac 90 lb/ 1000 sq	
8	TALL FESCUE	100#	3/1 - 5/15 8/15 - 10/15	1/4" - 1/2"				
9	TALL FESCUE KENTUCKY BLUEGRASS PERENNIAL RYEGRASS	60# 40# 20#	3/1 - 5/15 8/15 - 10/15	1/4" - 1/2"				

8. Any spoil or borrow will be placed at a site approved by the Soil Conservation District.
9. All areas remaining or intended to remain disturbed for longer than seven (7) days shall be stabilized in accordance with the USDA, Natural Resources Conservation Service Standards and Specifications for Soil Erosion and Sediment Control in developing areas for critical area stabilization.
10. It will be the responsibility of the Contractor or Subcontractor to notify the Engineer of any deviation from this plan. Any change made in this plan without written authorization from the Engineer will place responsibility of said change on the Contractor or Subcontractor.



-
- 10 FT. TYP.
- 10 FT. TYP.
- B
- B
- WOOD FRAME
- IMPERMEABLE SHEETING
- STAKE (TYP.)
- 3 FT. TYP.
- WOOD FRAME SECURELY FASTENED AROUND ENTIRE PERIMETER WITH TWO STAKES
- 10 FT. TYP.
- SECTION B-B
- PLAN
- WASHOUT STRUCTURE WITH WOOD PLANKS

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



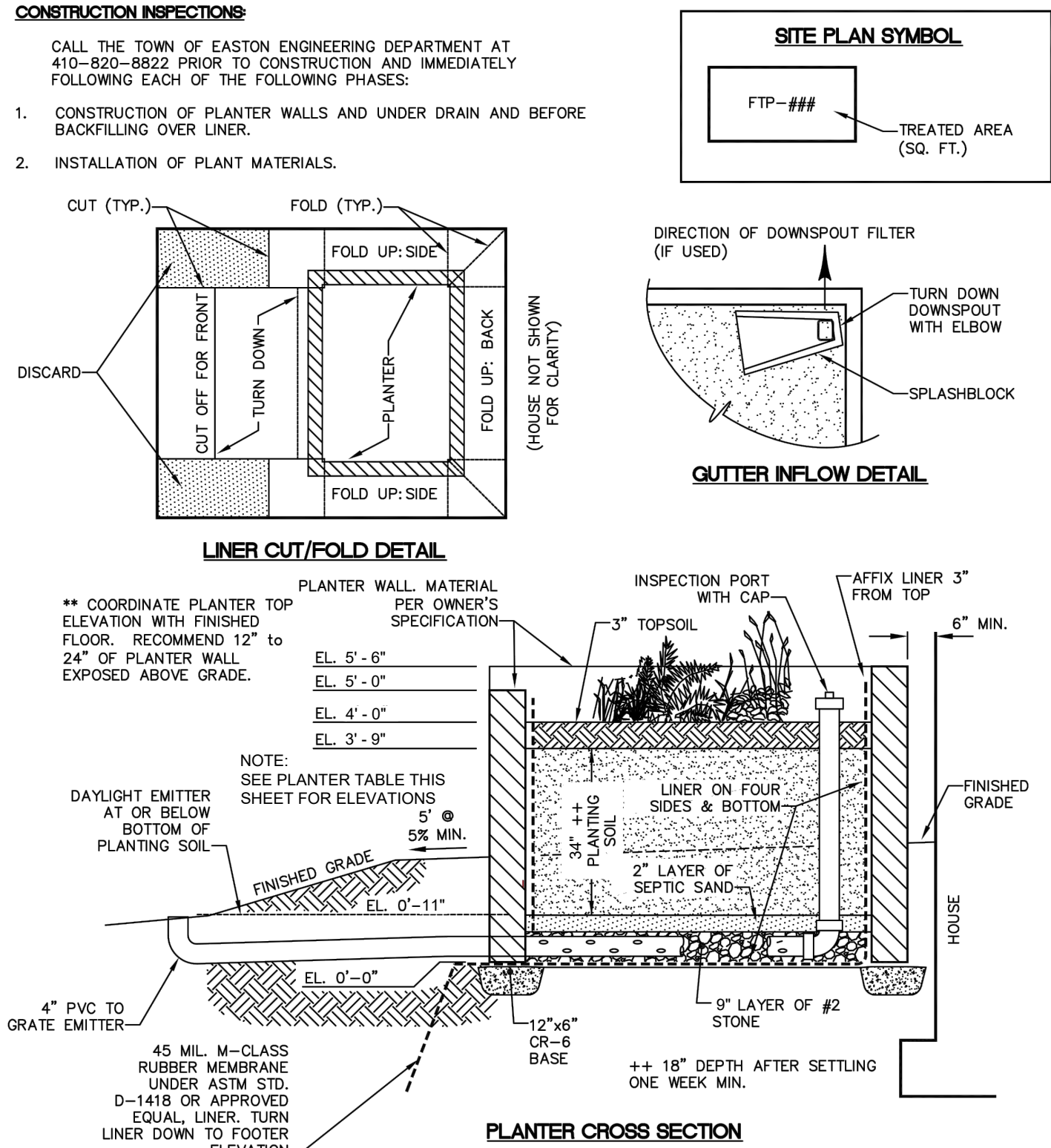
- NOTE: CAN BE TWO STACKED BALES
OR PARTIALLY EXCAVATED TO
REACH 3 FT DEPTH
- WASHOUT STRUCTURE WITH STRAW BALES

- ## CONSTRUCTION SPECIFICATIONS
1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN LINES, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTED AREAS.
 2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET.
 3. PREPARE SLOPE BASE OF ROOFS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING. FEED OF HOLES OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
 4. PROVIDE A SOD FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
 5. KEEP CONCRETE WASHOUT STRUCTURE TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E. RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, BUT NOT FULLER. REMOVE ALL SOLIDS AND LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO REMOVAL OF SOLIDS, COVER WITH A 6 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO REMOVE HARDENED SOLIDS. WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RIMP TO PREVENT SOLIDS FROM ENTERING THE FACILITY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Page 26 of 59

\\192.168.0.50\PROJECTS\NAMA\ENGINEERING\PHASE 2\PRODUCTION\PLANS\NAMA PHASE 2 - PRODUCTION PLANS.DWG



APPROVAL

TOWN ENGINEER *Rid Khan Eng*

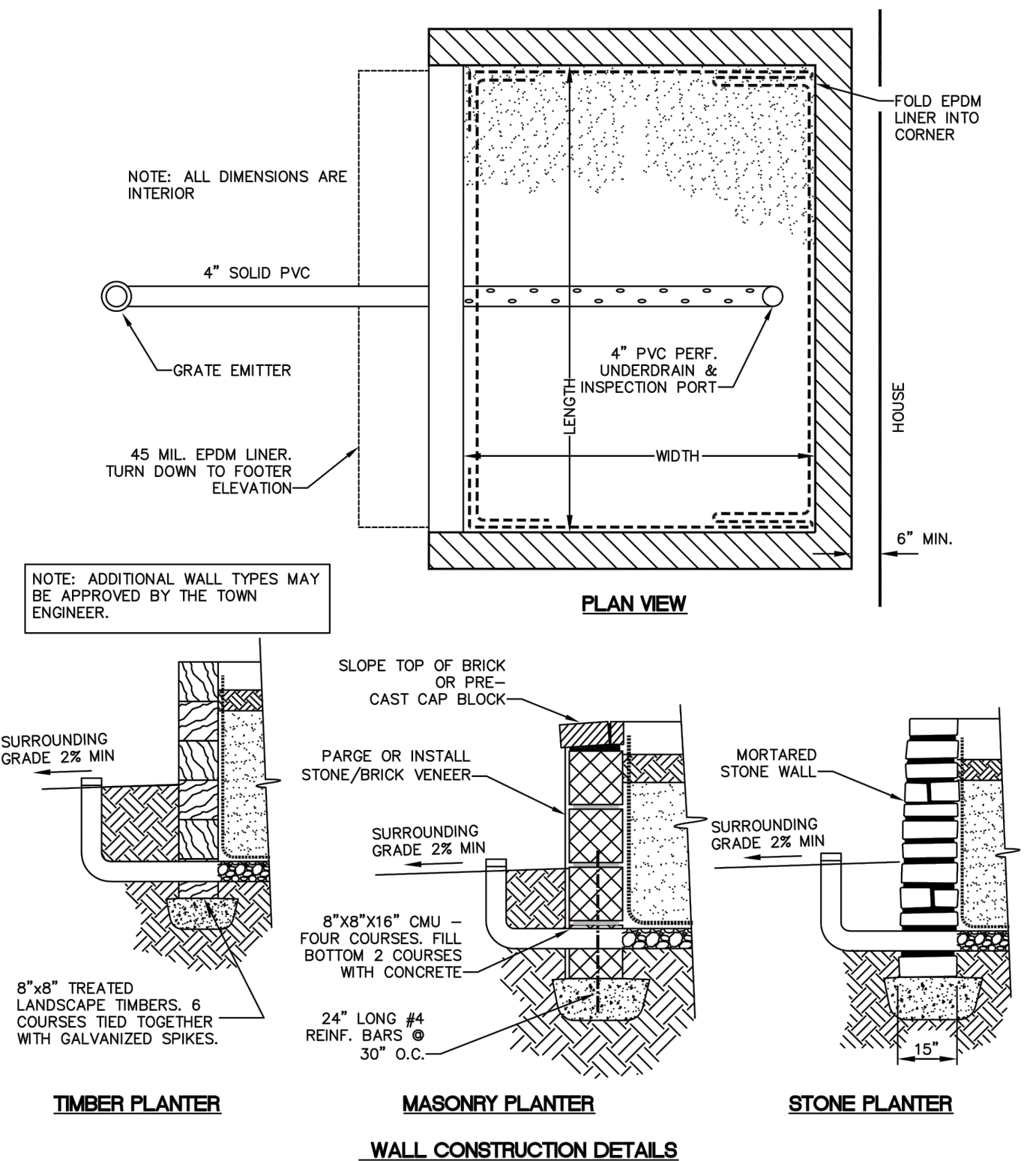
DATE *1/2020*

ISSUED: JANUARY 2020

TOWN OF EASTON STANDARD DETAILS

FLOW-THROUGH PLANTER PLAN AND SECTION

STANDARD NO: TOE-SWM-501-1



APPROVAL

TOWN ENGINEER *Rid Khan Eng*

DATE *1/2020*

ISSUED: JANUARY 2020

TOWN OF EASTON STANDARD DETAILS

FLOW-THROUGH PLANTER CONSTRUCTION DETAIL

STANDARD NO: TOE-SWM-501-2

PLANT SELECTION

- THE HOMEOWNER IS ENCOURAGED TO WORK WITH A REGISTERED LANDSCAPE ARCHITECT OR NURSERY TO CREATE AN ATTRACTIVE AND FUNCTIONAL MIX OF NATIVE PLANT SPECIES THAT ARE TOLERANT OF BOTH SATURATED AND DRY CONDITIONS.
- INFORMATION ON APPROPRIATE SPECIES IS AVAILABLE BY TYPING "BAYSAPES NATIVE PLANTS" INTO YOUR FAVORITE SEARCH ENGINE.
- THE SCHEDULE AND TYPICAL DETAIL BELOW CAN BE USED AS A BASIS FOR PLANT SELECTION AND GROUPINGS, IF DESIRED.

CONSTRUCTION NOTES

- PLANTERS SHALL BE CONSTRUCTED AFTER EXTERIOR SIDING HAS BEEN INSTALLED.
- LANDSCAPING MATERIALS SHOULD BE INSTALLED DURING THE SPRING OR FALL FALL IF POSSIBLE.
- GUTTER SCREENS AND/OR DOWNSPOUT FILTERS SHALL BE PROVIDED TO PRE-TREAT ANY ROOF AREAS THAT FLOW INTO A PLANTER. DOWNSPOUT FILTERS SHALL BE ORIENTED SO LEAVES AND DEBRIS FALL OUTSIDE THE PLANTER. (TYPE "DOWNSPOUT FILTER" IN YOUR FAVORITE SEARCH ENGINE TO FIND EXAMPLES FOR PURCHASE.)

FLOW-THROUGH PLANTER LANDSCAPE SCHEDULE

BOTANICAL NAME	COMMON NAME	SIZE	PLANTER SIZE (SQ. FT.)			
			70	140	210	280
SHRUBS:						
ILEX GLABRA (MALE ONLY)	INKBERRY	2 GAL.	PICK ONE	PICK ONE	PICK TWO	PICK TWO
ARONIA MELANOCARPA	BLACK CHOKEBERRY	2 GAL.				
MYRTICA CERIFERA	BAYBERRY	2 GAL.				
GROUND COVER:						
PANICUM VIRGATUM	SHENANDOAH SWITCHGRASS	PLUG	3	4	6	8
LIATRIS SPICATA	BLAZING STAR	PLUG	0	2	3	4

SOIL SPECIFICATIONS

- THE PLANTING SOIL SHALL HAVE A COMPOSITION OF 50% SAND, 20% COMPOSTED LEAVES, AND 30% TOPSOIL.
- TOPSOIL SHALL BE OF UNIFORM COMPOSITION, FREE OF STONES, DEBRIS, STUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN ONE INCH.
- TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE.

MAINTENANCE CRITERIA:

- WATER PLANTS LIBERALLY THE FIRST GROWING SEASON AND DURING PERIODS OF DROUGHT THEREAFTER.
- REMOVE ACCUMULATED TRASH AND VEGETATIVE DEBRIS EVERY FEW MONTHS.
- PRUNE AND REMOVE DEAD VEGETATION PERIODICALLY, AS WITH ANY LANDSCAPE BED. IF SPECIFIC PLANTS ARE NOT SURVIVING, REPLACE WITH A DIFFERENT SPECIES. WATERING MAY BE REQUIRED DURING PROLONGED DRY PERIODS.
- SILT AND SEDIMENT SHOULD BE REMOVED FROM THE SURFACE OF THE FILTER BED WHEN ACCUMULATION EXCEEDS ONE INCH.
- THE TOPSOIL AND FILTER MEDIA SHOULD BE REMOVED AND REPLACED WHEN WATER PONDS FOR MORE THAN 48 HOURS. EXISTING PLANT MATERIAL CAN BE TEMPORARILY REMOVED AND RE-PLANTED IN THE NEW SOIL.

SIZING CHART			
TREATED AREA (SQ. FT.)	PLANTER AREA (SQ. FT.)	SUGGESTED INTERIOR DIMENSIONS	
		LENGTH	WIDTH
250	10	4	3
500	20	7	3
750	30	8	4
1000	40	10	4

APPROVAL

TOWN ENGINEER *Rid Khan Eng*

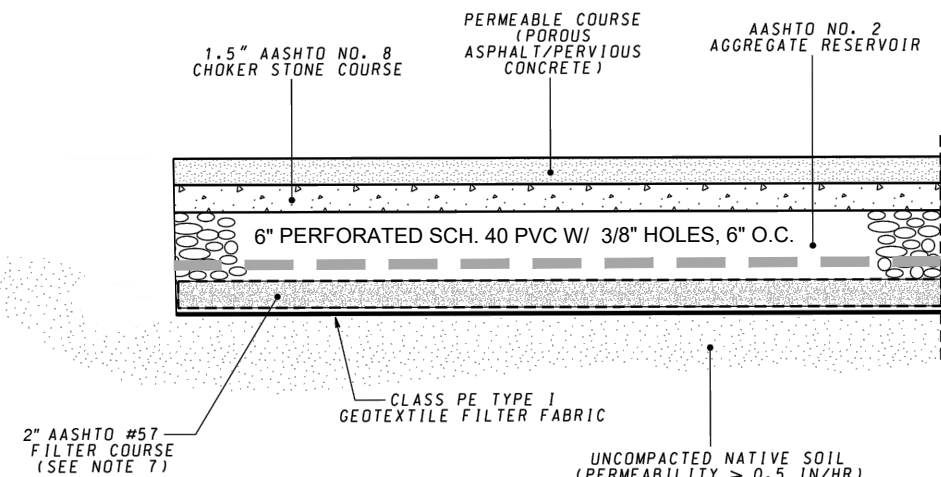
DATE *1/2020*

ISSUED: JANUARY 2020

TOWN OF EASTON STANDARD DETAILS

FLOW-THROUGH PLANTER NOTES

STANDARD NO: TOE-SWM-501-3



PERMEABLE PAVEMENT SECTION

TYPE OF TRAFFIC	POROUS ASPHALT COMPACTED THICKNESS	PERVIOUS CONCRETE THICKNESS	MINIMUM RESERVOIR LAYER THICKNESS
SIDEWALK, BIKER-BIKER TRAIL	3"	5"	8"
PASSENGER VEHICLES ONLY	4"	6"	8"
PASSENGER AND LIGHT TRUCKS	5"	6"	8"
TRUCKS (ADTT < 10)	NOT APPROPRIATE	8"	12"

NOTES

- REFER TO SPECIAL PROVISION 904 OPEN GRADED FRICTION COURSE FOR POROUS ASPHALT.
- REFER TO SPECIAL PROVISION 902 PERVIOUS CONCRETE.
- RESERVOIR LAYER THICKNESS SHALL BE DESIGNED TO MEET HYDRAULIC EVENT REQUIREMENTS.
- USE FILTER COURSE AS DIRECTED ELSEWHERE IN THE CONTRACT.
- USE FILTER FABRIC AS DIRECTED ELSEWHERE IN THE CONTRACT.
- USE LONGITUDINAL UNDERDRAIN AS DIRECTED ELSEWHERE IN THE CONTRACT. REFER TO STANDARD NOS. MD 387.11, 387.11-01, 387.12, 387.21, AND 387.21-01.
- OR AS DIRECTED ON THE PLAN OR BY THE ENGINEER.
- REFER TO SHA SPECIFICATIONS/STANDARDS FOR AFOREMENTIONED PROVISIONS AND DETAILS.

SPECIFICATION CATEGORY CODE ITEMS

APPROVED *Rid Khan Eng*

DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

APPROVAL - SHA PERVIOUS HIGHWAY ADMINISTRATION

APPROVAL - FEDERAL HIGHWAY ADMINISTRATION

APPROVAL - 2-23-18

APPROVAL - 2-23-18

REVIEWED

REVIEWED

REVIEWED

REVIEWED

Maryland Department of Transportation

STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

PERMEABLE PAVEMENT SECTIONS

STANDARD NO. MD 580.10

6-Unit Complex											
Planter Box #	Planter Box Surface Area (SF)	Rooftop Area (SF)	Impervious Area (%)	Total Drainage Area (SF)	Runoff Curve Number	Maryland Grid Coordinate (NAD 83, Northing)	Maryland Grid Coordinate (NAD 83, Easting)	Target P.E. (IN.) (site)	Actual P.E. (IN.) (site)	Target ESDv (FT. ³)	Actual ESDv (FT. ³)
19	55.0	741	93.1	796	97	404081.2772'	1573711.5757'	1.80	1.80	42.0	121.0
20	30.0	333	91.7	363	97	404091.7369'	1573770.8382'	1.80	1.80	19.0	66.0
21	20.0	199	90.9	219	97	404042.1028'	1573715.1585'	1.80	1.80	11.0	43.0
22	80.0	1136	93.4	1216	97	404046.3420'	1573741.5053'	1.80	1.80	64.0	176.0
28	55.0	741	93.1	796	97	403961.5089'	1573704.8881'	1.80	1.80	42.0	121.0
29	30.0	333	91.7	363	97	403971.1773'	1573762.4939'	1.80	1.80	19.0	66.0
30	20.0	199	90.9	219	97	403921.7478'	1573708.5262'	1.80	1.80	11.0	43.0
31	80.0	1136	93.4	1216	97	403924.6484'	1573735.0964'	1.80	1.80	64.0	176.0
32	20.0	199	90.9	219	97	403908.4791'	1573720.5040'	1.80	1.80	11.0	43.0
33	80.0	1136	93.4	1216	97	403909.2973'	1573748.4138'	1.80	1.80	64.0	176.0
34	55.0	741	93.1	796	97	403870.0653'	1573720.8004'	1.80	1.80	42.0	121.0
35	30.0	333	91.7	363	97	403864.6344'	1573777.6129'	1.80	1.80	19.0	66.0
46	20.0	199	90.9	219	97	403729.9716'	1573729.2186'	1.80	1.80	11.0	43.0
47	80.0	1136	93.4	1216	97	403730.1204'	1573755.4910'	1.80	1.80	64.0	176.0
48	55.0	741	93.1	796	97	403690.2117'	1573728.1031'	1.80	1.80	42.0	121.0
49	30.0	333	91.7	363	97	403685.6750'	1573786.4532'	1.80	1.80	19.0	66.0

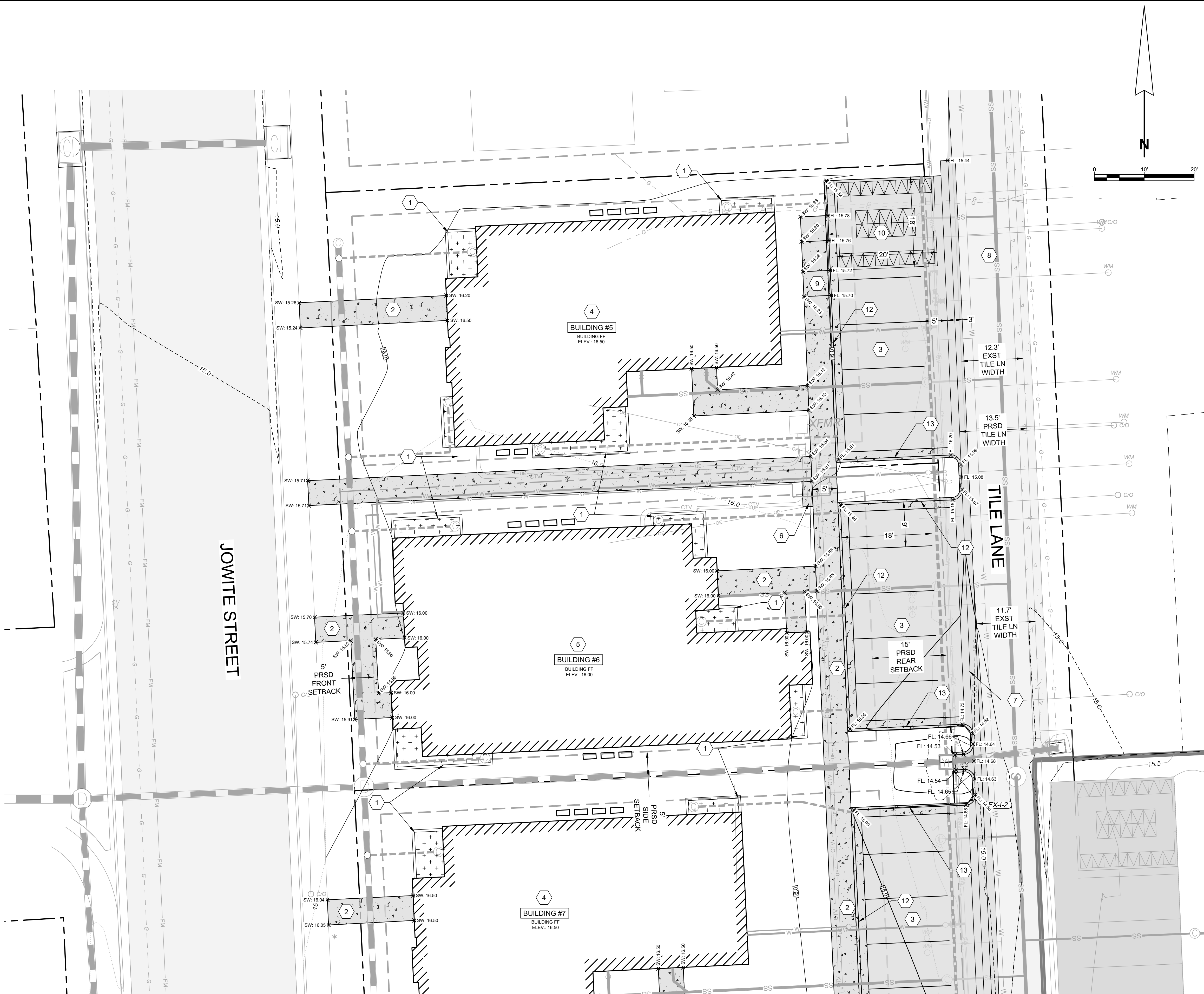
7-Unit Complex											
Planter Box #	Planter Box Surface Area (SF)	Rooftop Area (SF)	Impervious Area (%)	Total Drainage Area (SF)	Runoff Curve Number	Maryland Grid Coordinate (NAD 83, Northing)	Maryland Grid Coordinate (NAD 83, Easting)	Target P.E. (IN.) (site)	Actual P.E. (IN.) (site)	Target ESDv (FT. ³)	Actual ESDv (FT. ³)
23	50.0	648	92.8	698	97	404026.8260'	1573703.9065'	1.80	1.80	37	110.0
24	40.0	547	93.2	587	97	404027.8672'	1573758.8330'	1.80	1.80	31	88.0
25	40.0	550	93.2	590	97	404008.5798'	1573762.2664'	1.80	1.80	31	88.0
26	70.0	1025	93.6	1095	97	403982.0568'	1573700.5829'	1.80	1.80	57	154.0
27	30.0	322	91.5	352	97	403992.0377'	1573778.5777'	1.80	1.80	18	66.0
36	50.0	648	92.8	698	97	403848.2226'	1573712.1768'	1.80	1.80	37	110.0
37	40.0	547	93.2	587	97	403849.8588'	1573766.8800'	1.80	1.80	31	88.0
38	40.0	550	93.2	590	97	403830.5962'	1573770.0058'	1.80	1.80	31	88.0
39	70.0	1025	93.6	1095	97	403802.5949'	1573709.8764'	1.80	1.80	57	154.0
40	30.0	322	91.5	352	97	403813.0814'	1573786.4609'	1.80	1.80	18	66.0
41	70.0	1025	93.6	1095	97	403787.4578'	1573710.1707'	1.80	1.80	57	154.0
42	30.0	322	91.5	352	97	403786.6397'	1573787.4994'	1.80	1.80	18	66.0
43	40.0	550	93.2	590	97	403765.9380'	1573772.6876'	1.80	1.80	31	88.0
44	50.0	648	92.8	698	97	403741.7668'	1573717.4634'	1.80	1.80	37	110.0
45	40.0	547	93.2	587	97	403745.8573'	1573771.4223'	1.80	1.80	31	88.0
50	50.0	648	92.8	698	97	403666.9547'	1573718.2061'	1.80	1.80	37	110.0
51	40.0	547	93.2	587	97	403668.7397'	1573773.9512'	1.80	1.80	31	88.0
52	40.0	550	93.2	590	97	403648.8078'	1573777.0771'	1.80	1.80	31	88.0
53	70.0	1025	93.6	1095	97	403623.8441'	1573717.2444'	1.80	1.80	57	154.0
54	30.0	322	91.5	352	97	403630.3145'	1573794.5731'	1.80	1.80	18	66.0

STORM	2-YR	10-YR	100-YR
EXISTING	3.33	6.04	9.32
PROPOSED	2.83	4.61	6.24
DELTA	-0.5	-1.43	-3.08

- NOTES:
- ALL UNDERDRAINS IN ALL PLANTERS SHALL BE AT SAME INVERT ELEVATION UNTIL OUTSIDE OF PLANTER. ONCE UNDERDRAINS ARE OUTSIDE OF PLANTER, SOLID PVC PIPE TO BE USED. BENDS IN PVC PIPE WILL BE NECESSARY TO MAKE CONNECTIONS TO FACE OF CURB DISCHARGES.

Building # (From N to S)	Planter Box # (see Sheets C-201.02-C-201.03)	Finished Grade	Bottom of 9" Layer of #2 Stone	Inv of 4" SDR35 Perforated Underdrain	Top of 9" Layer of #2 Stone	Top of 2" Layer of Septic Sand	Top of 31" Layer of Planting Soil	Top of 3" Topsoil Layer	Top of Front Planter Wall & Top of Inspection Port	Top of Rear Planter Wall
5	19	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
5	20	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
5	21	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
5	22	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
6	23	15.33	12.75	12.95	13.50	13.66	16.25	16.50	17.50	18.00
6	24	15.33	12.75	12.95	13.50	13.66	16.25	16.50	17.50	18.00
6	25	15.33	12.75	12.95	13.50	13.66	16.25	16.50	17.50	18.00
6	26	15.33	12.75	12.95	13.50	13.66	16.25	16.50	17.50	18.00
6	27	15.33	12.75	12.95	13.50	13.66	16.25	16.50	17.50	18.00
7	28	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
7	29	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
7	30	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
7	31	15.83	13.25	13.45	14.00	14.16	16.75	17.00	18.00	18.50
8	32	16.33	13.75	13.95	14.50	14.66	17.25	17.50	18.50	19.00
8	33	16.33	13.75	13.95	14.50	14.66	17.25	17.50	18.50	19.00
8	34	16.33	13.75	13.95	14.50	14.66	17.25	17.50	18.50	19.00
8	35	16.33	13.75	13.95	14.50	14.66	17.25	17.50	18.50	19.00
9	36	16.53	13.95	14.15	14.70	14.86	17.45	17.70	18.70	19.20
9	37	16.53	13.95	14.15	14.70	14.86	17.45	17.70	18.70	19.20
9	38	16.53	13.95	14.15	14.70	14.86	17.45	17.70	18.70	19.20
9	39	16.53	13.95	14.15	14.70	14.86	17.45	17.70	18.70	19.20
9	40	16.53	13.95	14.15	14.70	14.86	17.45	17.70	18.70	19.20
10	41	16.83	14.25	14.45	15.00	15.16	17.75	18.00	19.00	19.50
10	42	16.83	14.25	14.45	15.00	15.16	17.75	18.00	19.00	19.50
10	43	16.83	14.25	14.45	15.00	15.16	17.75	18.00	19.00	19.50
10	44	16.83	14.25	14.45	15.00	15.16	17.75	18.00	19.00	19.50
10	45	16.83	14.25	14.45	15.00	15.16	17.75	18.00	19.00	19.50
11	46	17.33	14.75	14.95	15.50	15.66	18.25	18.50	19.50	20.00
11	47	17.33	14.75	14.95	15.50	15.66	18.25	18.50	19.50	20.00
11	48	17.33	14.75	14.95	15.50	15.66	18.25	18.50	19.50	20.00
11	49	17.33	14.75	14.95	15.50	15.66	18.25	18.50	19.50	20.00
12	50	18.33	15.75	15.95	16.50	16.66	19.25	19.50	20.50	21.00
12	51	18.33	15.75	15.95	16.50	16.66	19.25	19.50	20.50	21.00
12	52	18.33	15.75	15.95	16.50	16.66	19.25	19.50	20.50	21.00
12	53	18.33	15.75	15.95	16.50	16.66	19.25	19.50	20.50	21.00
12	54	18.33	15.75	15.95	16.50	16.66	19.25	19.50	20.50	21.00

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PROPOSED FEATURES

- 1 PLANTER BOX. DETAIL ON 405.01
- 2 4" SIDEWALK. DETAIL ON 305.01
- 3 PERVIOUS ASPHALT PARKING. DETAIL ON 405.01
- 4 6 UNIT DWELLING
- 5 7 UNIT DWELLING
- 6 CLUSTER MAILBOX
- 7 STANDARD ASPHALT VALLEY GUTTER WITH A VALLEY SLOPE OF 0.47%. DETAIL ON 305.02
- 8 2" MILL AND OVERLAY TO EXISTING TILE LANE ONCE ALL UTILITIES HAVE BEEN INSTALLED AND CONNECTIONS HAVE BEEN MADE. WEDGING REQUIRED ON TILE LANE ALONG ENTIRE LENGTH OF THE PROPOSED VALLEY GUTTER PER SPOT SHOTS ON THE SITE GRADING PLAN
- 9 PARALLEL SIDEWALK RAMP PER DETAIL ON 305.02
- 10 18'x20' FENCED REFUSE ENCLOSURE. 3' CLEAR AISLES. 4' OPENINGS WITH ADA ACCESS ON EACH END. SPACE FOR (26) 95-GALLON CARTS.
- 11 A.D.A. ACCESS AISLE
- 12 6" STANDARD CURB WITH REVERSE GRADE GUTTER PAN. SEE DETAIL ON SHEET C-305.02
- 13 6" STANDARD CURB. SEE DETAIL ON SHEET C-305.02

APPROVED:	APPROVED:	APPROVED:
TOWN OF EASTON - TOWN ENGINEER	TOWN OF EASTON PLANNING AND ZONING	EASTON UTILITIES - MANAGER OF ENGINEERING
DATE	DATE	DATE

SITE GRADING PLAN

FOR

NAIMA - PHASE 2

INFRASTRUCTURE IMPROVEMENT PLANS

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

TAX MAP 0104, GRID 000EA

PREPARED FOR NAIMA VENTURES, LLC

RAUCH

INC.

engineering design & development services

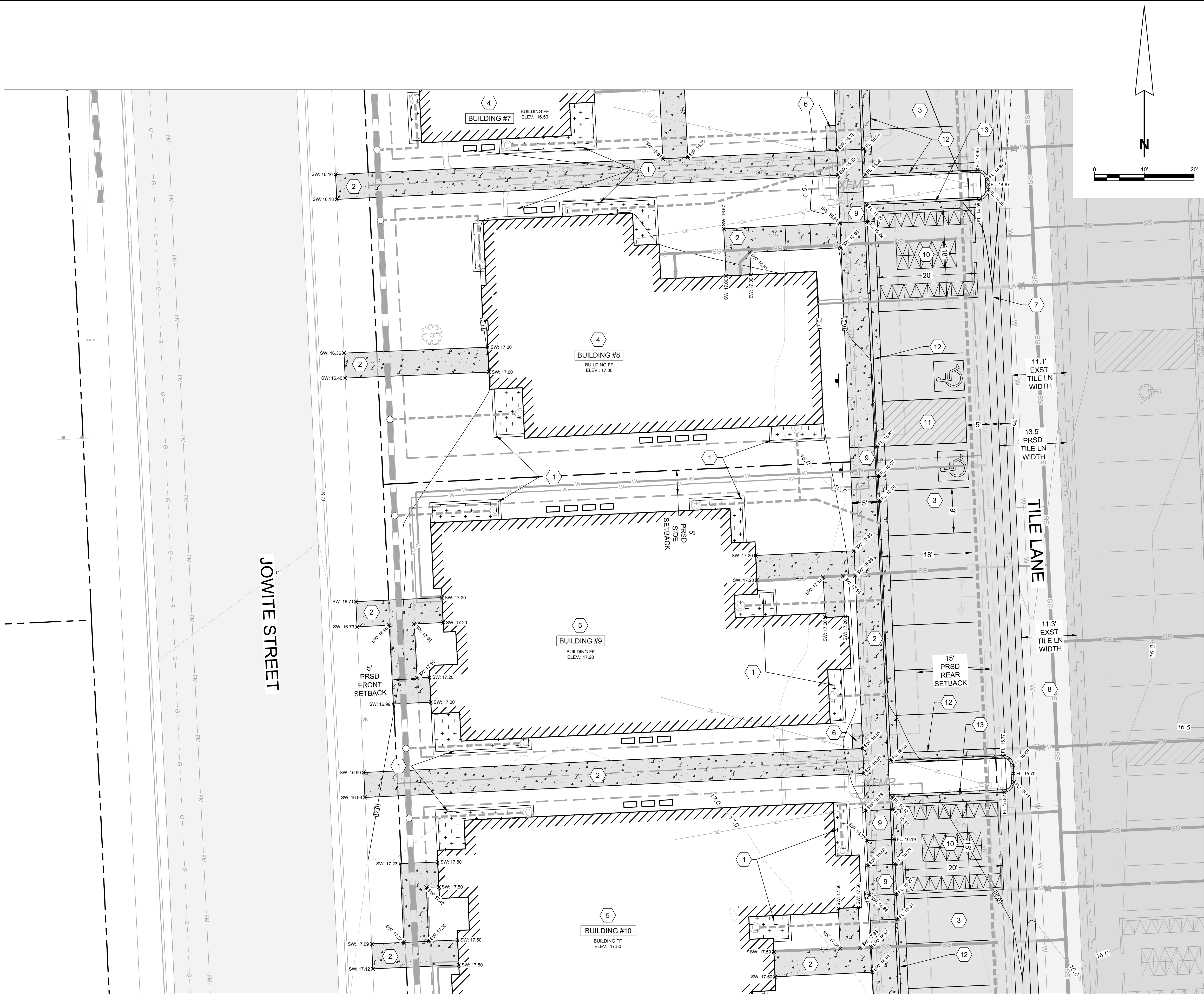
Office: 410.770.0881 | Fax: 410.770.3867
Maryland Office: 105 N. Harrison St. - Easton, MD 21601
Virginia Office: 8229 Boone Blvd, Suite 625 - Vienna, VA 22182

REVISIONS	
REV. #	DESCRIPTION

DATE:	03/03/2021
SCALE:	1" = 10'
DRAWN BY:	BBF
DESIGNED BY:	BBF
APPROVED BY:	

SHEET NO.:	C-301.01
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PROPOSED FEATURES

- 1 PLANTER BOX. DETAIL ON 405.01
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- 13 6" STANDARD CURB. SEE DETAIL ON SHEET C-305.02

SITE GRADING PLAN

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS
TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAIMA VENTURES, LLC

RAUCH
INC.
engineering design &
development services
office: 410.770.8081 | fax: 410.770.3667
email: design@raucheng.com | web: www.raucheng.com
Virginia Office: 8229 Boone Blvd, Suite 625 - Vienna, VA 22182

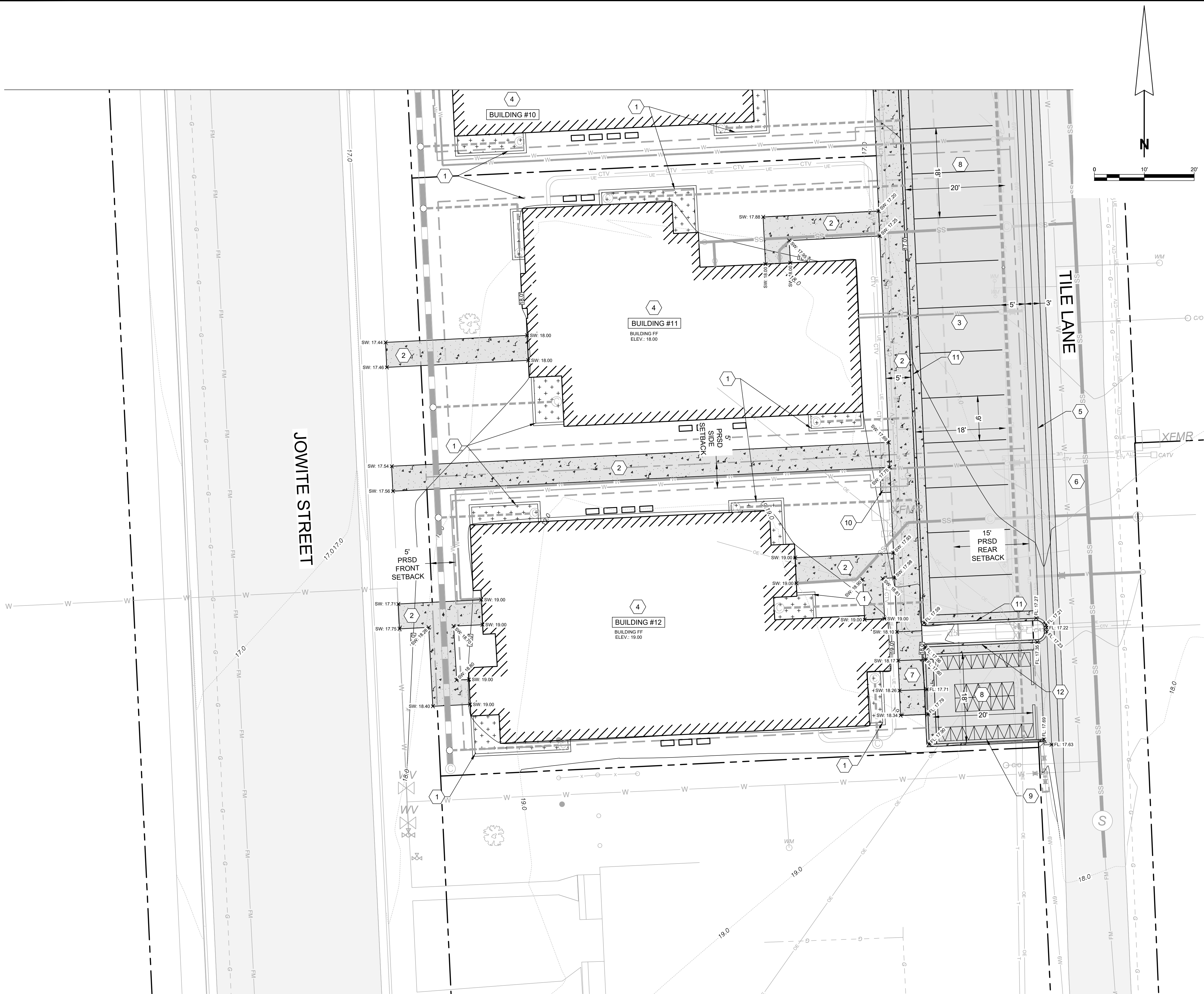
REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021
SCALE: 1" = 10'
DRAWN BY: BBF
DESIGNED BY: BBF
APPROVED BY:
SHEET NO.: C-301.02

APPROVED:	APPROVED:	APPROVED:
TOWN OF EASTON - TOWN ENGINEER	TOWN OF EASTON PLANNING AND ZONING	EASTON UTILITIES - MANAGER OF ENGINEERING
DATE	DATE	DATE

\\102.188.0.50\PROJECT\SA\NA\ENGINEERING\PHASE 2\PRODUCTION\PLANS\NA\PHASE 2 - PRODUCTION PLANS.DWG



PROPOSED FEATURES

- 1 PLANTER BOX. DETAIL ON 405.01
- 2 4" SIDEWALK. DETAIL ON 305.01
- 3 PERVIOUS ASPHALT PARKING. DETAIL ON 405.01
- 4 6 UNIT DWELLING
- 5 STANDARD ASPHALT VALLEY GUTTER WITH A VALLEY SLOPE OF 0.47%. DETAIL ON 305.02
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- 9 END OF PERMEABLE ASPHALT
- 10 CLUSTER MAILBOX
- 11 6" STANDARD CURB WITH REVERSE GRADE GUTTER PAN. SEE DETAIL ON SHEET C-305.02
- 12 6" STANDARD CURB. SEE DETAIL ON SHEET C-305.02

SITE GRADING PLAN

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS
TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAIMA VENTURES, LLC

RAUCH
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REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: 1" = 10'

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.: C-301.03

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

TOWN OF EASTON PLANNING AND ZONING

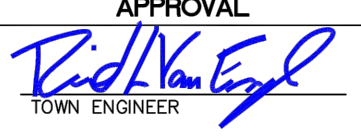
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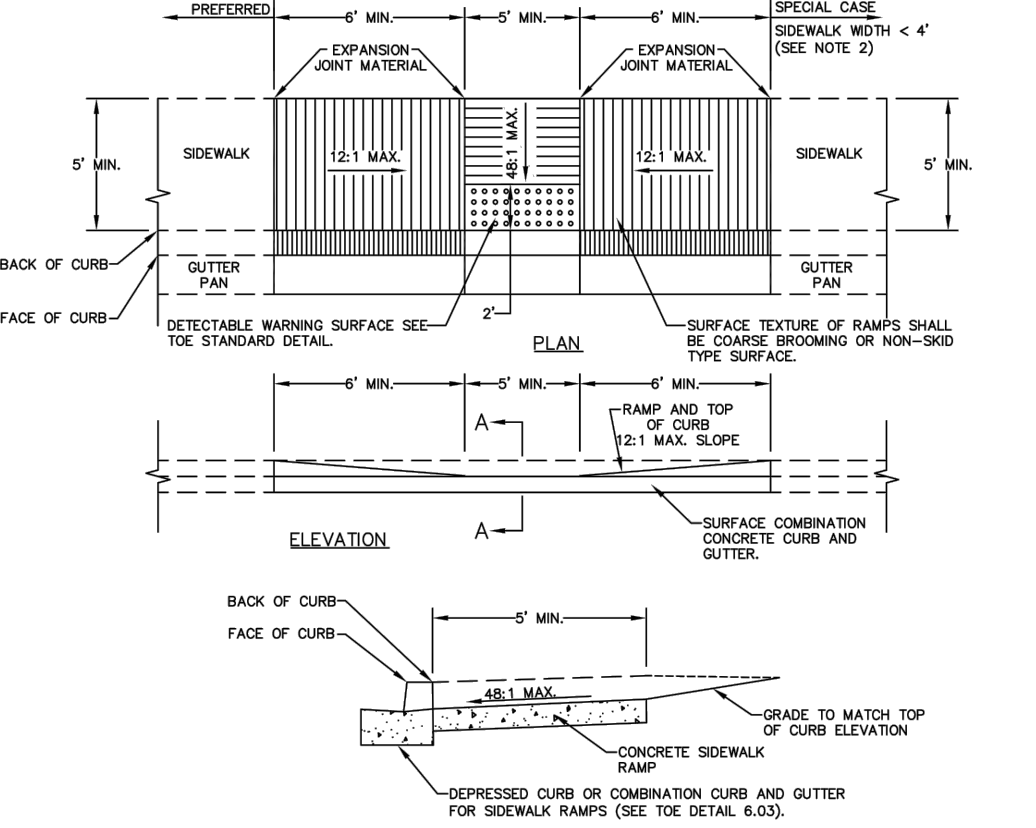
APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

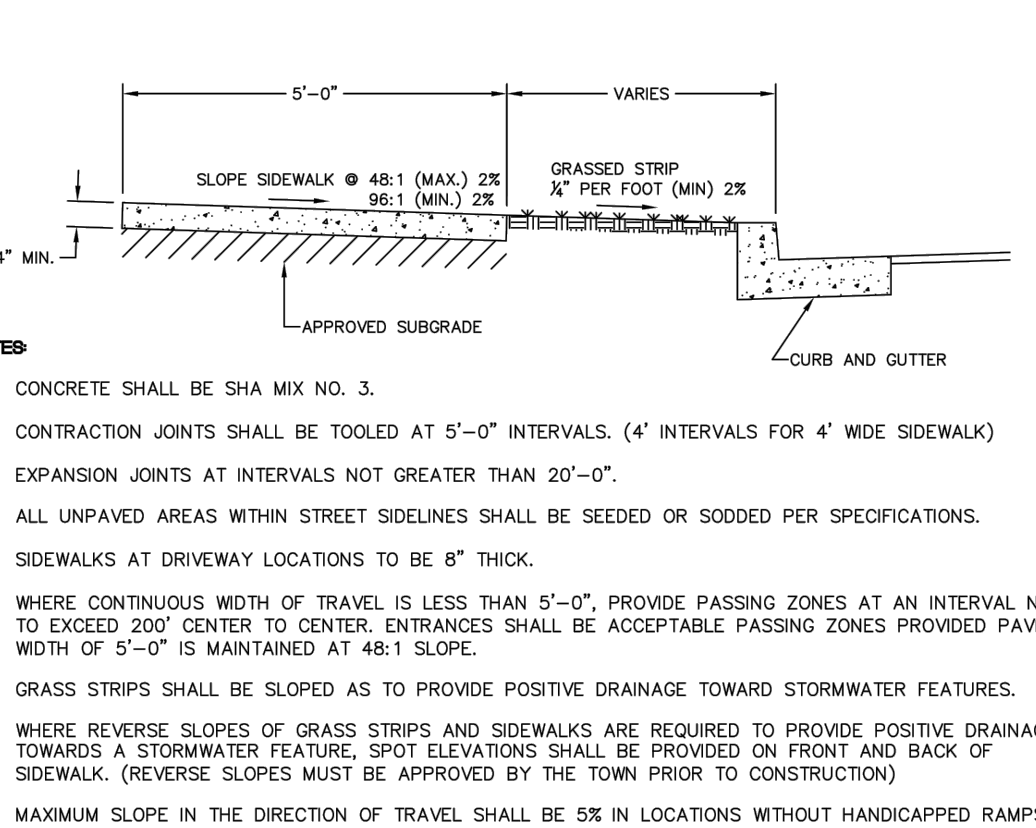
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	APPROVAL  TOWN ENGINEER DATE: 1/1/2020 ISSUED: JANUARY 2020	TOWN OF EASTON STANDARD DETAILS PAVING SPECIFICATIONS STANDARD NO.: TOE-R-101
OVERLAY - HMA SUPERPAVE 9.5 MM, PG 64-22 LEVEL 2, FOR 1-1/2" OVERLAYS. - HMA SUPERPAVE 12.5 MM, PG 64-22 LEVEL 2, FOR 2" OVERLAYS. - MATCH THE SURFACE COURSE SPECIFIED FOR THE ADJUSTMENT FULL DEPTH PAVING IF DIFFERENT FROM THE ABOVE.		
COMMERCIAL ASPHALT PAVEMENT FOR ROADS SURFACE COURSE: 2" HOT MIX ASPHALT SUPERPAVE 9.5 MM BASE COURSE: 4" HOT MIX ASPHALT SUPERPAVE, 19.0 MM PLACED IN 2-2" LIFTS SUB BASE: 9" CR-6 GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.		
RESIDENTIAL ASPHALT PAVEMENT FOR ALLEYS SURFACE COURSE: 2" HOT MIX ASPHALT SUPERPAVE 9.5 MM BASE COURSE: 2 1/2" HOT MIX ASPHALT SUPERPAVE, 19.0 MM SUB BASE: 6" CR-6 GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.		
CONCRETE PAVEMENT 6" PORTLAND CEMENT CONCRETE MIX #7 SUB BASE: 6" CR-6 GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.		

	APPROVAL  TOWN ENGINEER DATE: 1/1/2020 ISSUED: JANUARY 2020	TOWN OF EASTON STANDARD DETAILS SIDEWALK RAMPS PARALLEL STANDARD NO.: TOE-R-704
		
NOTES: - TO BE USED WHERE SIDEWALK IS ADJACENT TO THE CURB. THIS STANDARD MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION. - WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED. - NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL. THE CROSS SLOPE OF THE LANDING AREA CAN NOT EXCEED GRADE OF ROADWAY. - EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE TOWN STANDARD DETAIL. - SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES. - TRANSITION PANELS TO TIE INTO EXISTING SIDEWALK MUST BE A MINIMUM OF 5' IN LENGTH.		

	APPROVAL  TOWN ENGINEER DATE: 1/1/2020 ISSUED: JANUARY 2020	TOWN OF EASTON STANDARD DETAILS PAVING NOTES STANDARD NO.: TOE-R-102
PAVING NOTES		
PAVING REQUIREMENTS A. BASE COURSE - SUB-GRADE SHALL BE PLACED ON PREPARED AND COMPACTED REFILLED EXCAVATIONS TO THE COMPACTED DEPTH AS SHOWN ON DETAIL 9W-1.03. MATERIALS AND METHODS OF CONSTRUCTION SHALL MEET THE PROVISIONS OF MD SHA STANDARDS, SECTION 208. - GRADED AGGREGATE BASE COURSE: - GRADED AGGREGATE BASE COURSE SHALL BE SPREAD ON PREPARED AND COMPACTED REFILLED EXCAVATION TO THE COMPACTED DEPTH SHOWN ON THE DRAWING DETAILS. - GRADED AGGREGATE SHALL BE PER MD SHA STANDARD, SECTION 901. - RECYCLED CRUSHED CONCRETE IS AN ACCEPTABLE ALTERNATIVE PROVIDED THICKNESS ADJUSTMENTS ARE MADE BASED ON SUPPLEMENTAL TESTING TO BE SUBMITTED BY A QUALIFIED TESTING LABORATORY AND APPROVED BY THE TOWN ENGINEER. B. TRACK COAT - COATING SHALL BE RESIDUAL ASPHALT UNIFORMLY SPREAD BETWEEN .01 AND .05 GALLONS/SQ. YARD. - CONTRACTOR SHALL TAKE CARE NOT TO TRACK COAT ON SURFACE COURSES. C. HOT MIX ASPHALT PAVEMENT - HOT MIX ASPHALT PAVEMENT SHALL CONSIST OF A NUMBER OF COURSES OF HMA SUPERPAVE MATERIAL AND AGGREGATE ON A PREPARED SUB-BASE AS SHOWN WITHIN THE TOWN STANDARDS. - MATERIALS AND METHODS OF CONSTRUCTION SHALL MEET THE PROVISIONS OF SECTION 504 AND SECTION 904 OF THE MD SHA STANDARDS AND DETAILS. - SURFACE COURSES OF BITUMINOUS CONCRETE MIXES SHALL HAVE LESS THAN 15% OF RECYCLED ASPHALT PAVEMENT (RAP). - BASE COURSES SHALL HAVE NO MORE THAN 20% RAP. - WEATHER RESTRICTIONS: - PLANT MIXED SEAL - MINIMUM SURFACE TEMPERATURE 60° AND RISING. - SURFACE COURSE - MINIMUM SURFACE TEMPERATURE 40° AND RISING. - BASE COURSE - MINIMUM SURFACE TEMPERATURE 32° AND RISING. D. CONCRETE PAVEMENT - CONCRETE USED IN THE RESTORATION OF STREET AND ROADS SHALL BE PLACED TO THE MINIMUM THICKNESS THAT SHALL BE APPROVED BY THE TOWN. CONCRETE MAY BE A BASE COURSE WITH A BITUMINOUS CONCRETE OVERLAY OR A FINISHED SURFACE COURSE. - CONCRETE PAVEMENT SHALL MEET THE PROVISIONS OF MD SHA STANDARDS, SECTION 522. - CONCRETE SIDEWALK AND CURB AND GUTTER RESTORATION SHALL BE AS INDICATED WITHIN THE TOWN STANDARDS. E. SOIL CEMENT - WHERE THE CBR VALUES ARE FOUND TO BE LOW WITHIN THE PAVED AREA, THE TOWN WILL ALLOW THE SUB-GRADE BE REINFORCED BY A CEMENTITIOUS MATERIAL BEING MIXED IN THE SUBGRADE. APPLICATION SHALL BE SUBJECT TO THE GEOTECHNICAL INVESTIGATION. - A MINIMUM OF 2" OF GRADED AGGREGATE SHALL BE INSTALLED BETWEEN THE AMENDED SOIL AND BITUMINOUS PAVEMENT. - MINIMUM MIX DEPTH OF THE SOIL CEMENT MIXTURE SHALL BE 8" WITH A 5-5.5% MINIMUM CEMENT CONTENT.		

	APPROVAL  TOWN ENGINEER DATE: 1/1/2020 ISSUED: JANUARY 2020	TOWN OF EASTON STANDARD DETAILS CONCRETE SIDEWALK STANDARD NO.: TOE-R-701
		
NOTES: - CONCRETE SHALL BE SHA MIX NO. 3. - CONTRACTION JOINTS SHALL BE TOoled AT 5'-0" INTERVALS. (4' INTERVALS FOR 4' WIDE SIDEWALK) - EXPANSION JOINTS AT INTERVALS NOT GREATER THAN 20'-0". - ALL UNPAVED AREAS WITHIN STREET SIDELINES SHALL BE SEEDED OR SODDED PER SPECIFICATIONS. - SIDEWALKS AT DRIVEWAY LOCATIONS TO BE 8" THICK. - WHERE CONTINUOUS WIDTH OF TRAVEL IS LESS THAN 5'-0", PROVIDE PASSING ZONES AT AN INTERVAL NOT TO EXCEED 200' CENTER TO CENTER. ENTRANCES SHALL BE ACCEPTABLE PASSING ZONES PROVIDED PAVING WIDTH OF 5'-0" IS MAINTAINED AT 48:1 SLOPE. - GRASS STRIPS SHALL BE SLOPED AS TO PROVIDE POSITIVE DRAINAGE TOWARD STORMWATER FEATURES. - WHERE REVERSE SLOPES OF GRASS STRIPS AND SIDEWALKS ARE REQUIRED TO PROVIDE POSITIVE DRAINAGE TOWARDS A STORMWATER FEATURE, SPOT ELEVATIONS SHALL BE PROVIDED ON FRONT AND BACK OF SIDEWALK. (REVERSE SLOPES MUST BE APPROVED BY THE TOWN PRIOR TO CONSTRUCTION) - MAXIMUM SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 5% IN LOCATIONS WITHOUT HANDICAPPED RAMPS. - SIDEWALKS SHALL COMPLY WITH ADA REQUIREMENTS PER THE MOST UP TO DATE DEPARTMENT OF JUSTICE REGULATION 28CFR PART 36.		

	APPROVAL  TOWN ENGINEER DATE: 1/1/2020 ISSUED: JANUARY 2020	TOWN OF EASTON STANDARD DETAILS CONCRETE QUICK REFERENCE LIST STANDARD NO.: TOE-R-103
CONCRETE QUICK REFERENCE LIST		
CAST-IN-PLACE CONCRETE SIDEWALKS AND CURBING A. SUBMITTALS - SUBMIT MIX DESIGN FOR APPROVAL PRIOR TO PLACING CONCRETE (MSHA MIX #3 FOR ALL CONCRETE SIDEWALKS, AIR ENTRAINED, MINIMUM 3500 PSI MIX). FOR CURB AND GUTTER, UTILIZE MSHA MIX #7, EXCEPT MAXIMUM WATER CEMENTITIOUS RATIO OF 0.45 AND 611 POUNDS MINIMUM CEMENTITIOUS MATERIALS - AIR ENTRAINED, MINIMUM 4200 PSI MIX. - SUBMIT CONCRETE TESTING AGENCY FOR APPROVAL, WHICH CONTRACTOR OR PROJECT OWNER SHALL EMPLOY FOR INFIELD AND LABORATORY TESTING. B. CONCRETE PLACEMENT - NOTIFY TOWN OF INTENTION TO POUR CONCRETE 24 HOURS PRIOR TO PERFORMING WORK. (PHONE: 410-822-8822). - DRIVER SHALL PRESENT COMPUTER GENERATED MIX DELIVERY TICKET UPON ARRIVAL TO SITE. - DO NOT ADD WATER TO MIX AT JOB SITE UNLESS APPROVED BY ENGINEER. DO NOT POUR CONCRETE DURING RAIN EVENTS. - TESTING AGENCY SHALL TEST FOR SLUMP, TEMPERATURE AND AIR ENTRAINMENT AT THE JOB SITE. PRIOR TO POURING EACH TRUCK LOAD DELIVERED TO SITE. THE MAXIMUM TIME FROM ADDING WATER TO BATCH AT PLANT TO DISCHARGE AT SITE SHALL BE WITHIN 1 1/2 HOURS. TESTING AGENCY SHALL VERIFY THAT SUB-GRADE IS PROPERLY COMPACTED. - TESTING AGENCY SHALL COLLECT CYLINDERS FOR COMPRESSION TESTING ON EACH TRUCK LOAD OF CONCRETE DELIVERED TO SITE PER ADA REQUIREMENTS. TEST RESULTS SHALL BE PROVIDED TO THE ENGINEER WITHIN 48 HOURS OF 7 AND 28 DAY BREAKS. REPORT SHALL INCLUDE LOCATION OF POUR PER PLAN STATIONING. - ENGINEER OF HIS/HER REPRESENTATIVE SHALL VERIFY THAT AREA OF CONCRETE WORK IS PROPERLY PREPARED, FREE OF WATER, FREE OF UNSTABLE MATERIALS AND THAT ALL REINFORCEMENT REQUIRED AT DRIVEWAYS, RAMP, VALLEY GUTTERS, ETC. IS IN PLACE AND PROPERLY SUPPORTED. - COLD WEATHER CONCRETE PLACEMENT SHALL BE PROTECTED FROM DAMAGE AND FROST, FREEZING ACTION OR LOW TEMPERATURES. NO UNAPPROVED ADJUSTURES ARE PERMITTED. - CONCRETE CURB AND SIDEWALKS SHALL HAVE PROPER CONTROL JOINTS INSTALLED AT 10 FOOT INTERVALS FOR CURB AND 5 FOOT INTERVALS FOR SIDEWALK. EXPANSION JOINTS FOR CURBING SHALL BE AT EACH 100 FOOT INTERVAL PLUS AT EACH POINT OF TANGENT OR CURVE. SIDEWALKS SHALL HAVE EXPANSION JOINTS AT 20 FOOT INTERVALS OR AT CHANGE OF DIRECTION.		

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REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: N/A

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.: C-305.01

SITE DETAILS

FOR
NAMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

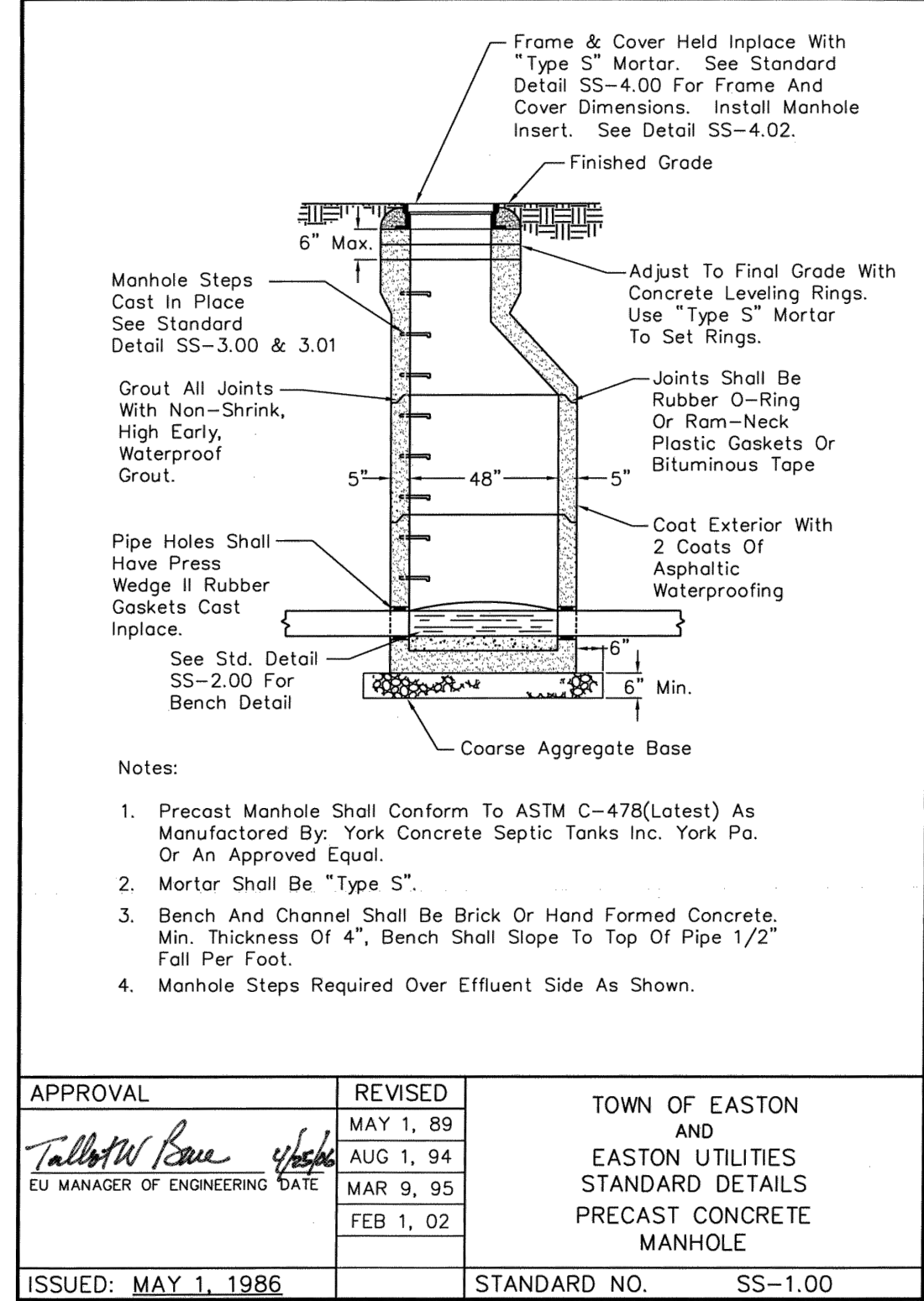
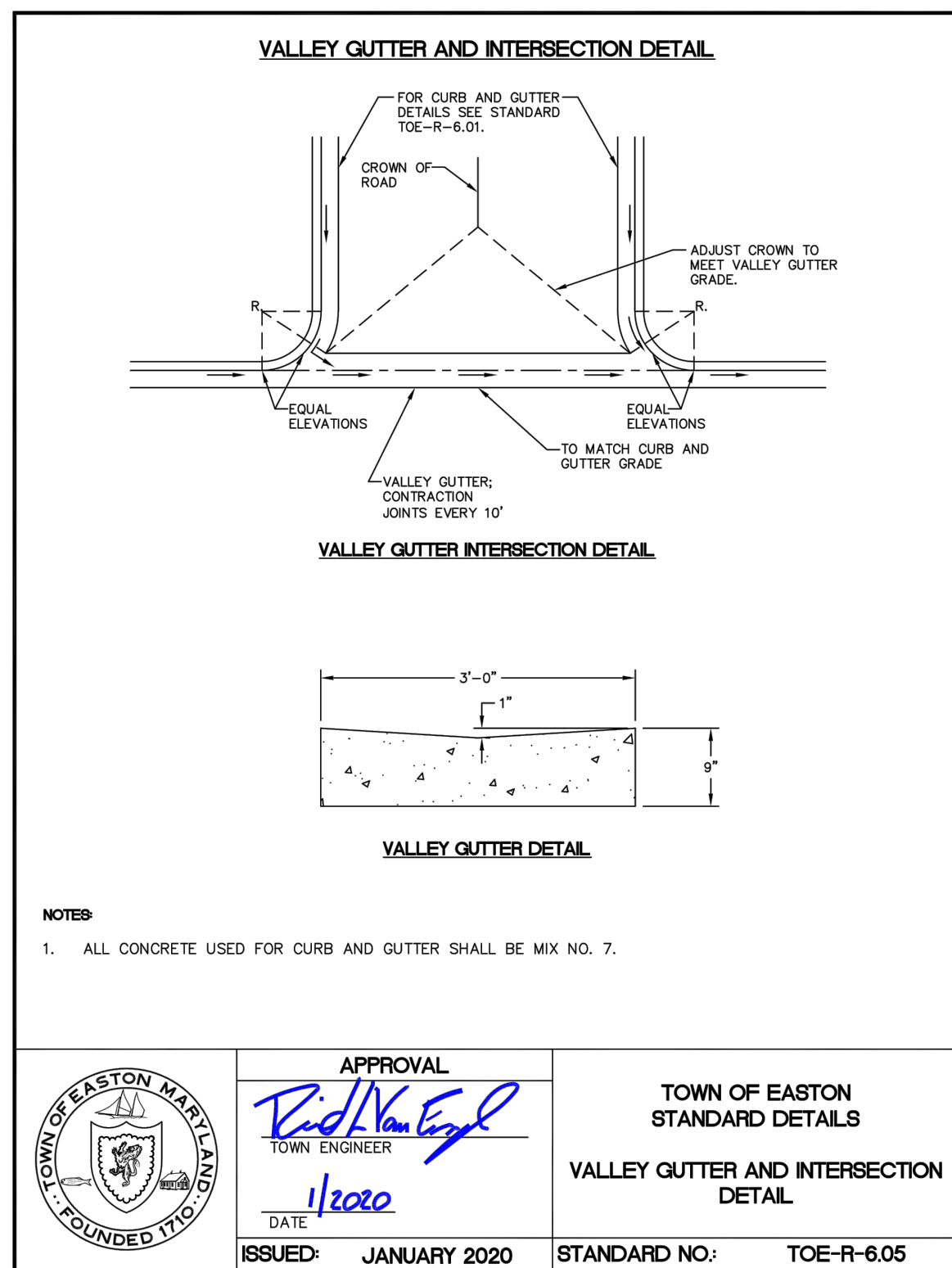
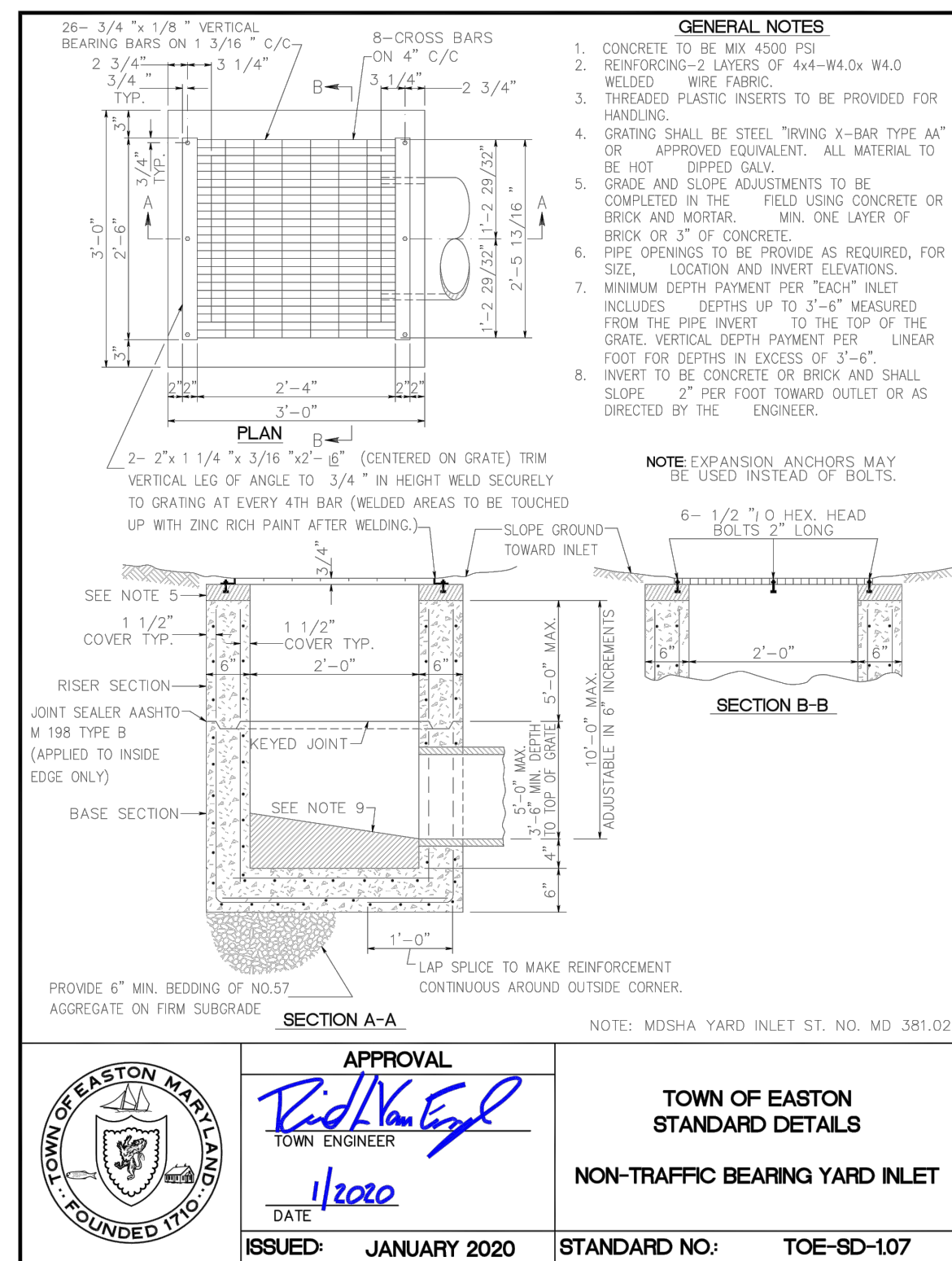
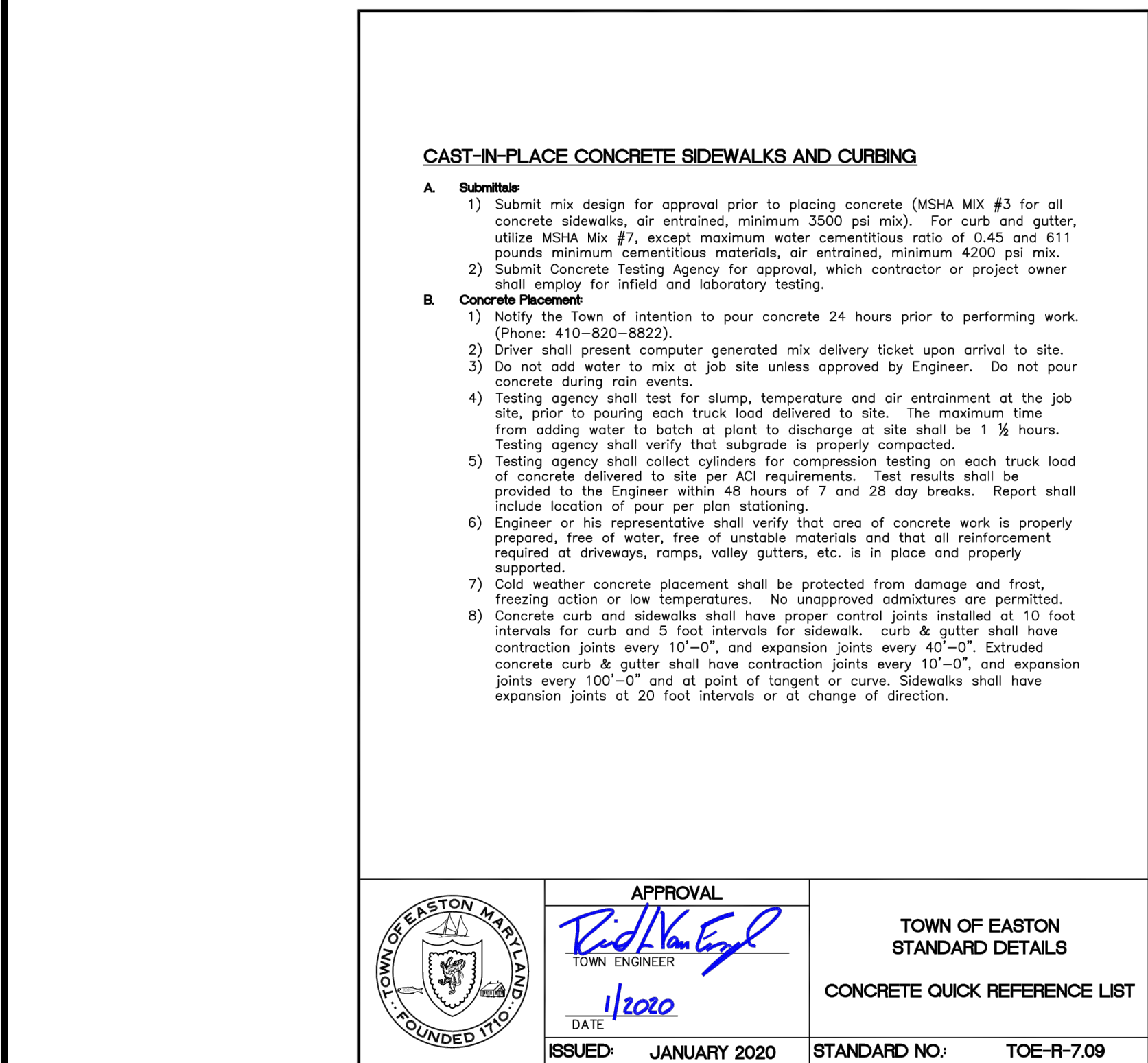
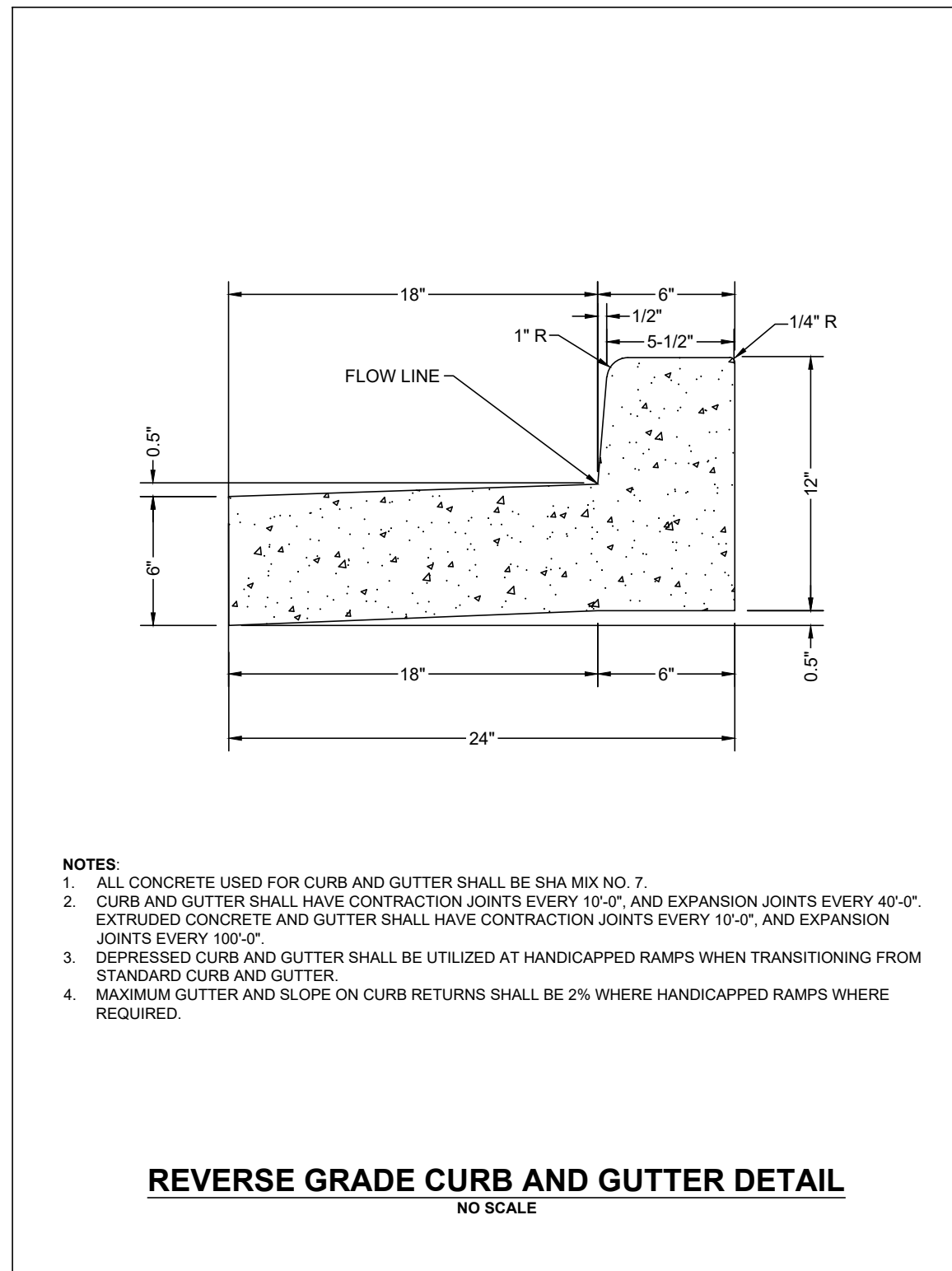
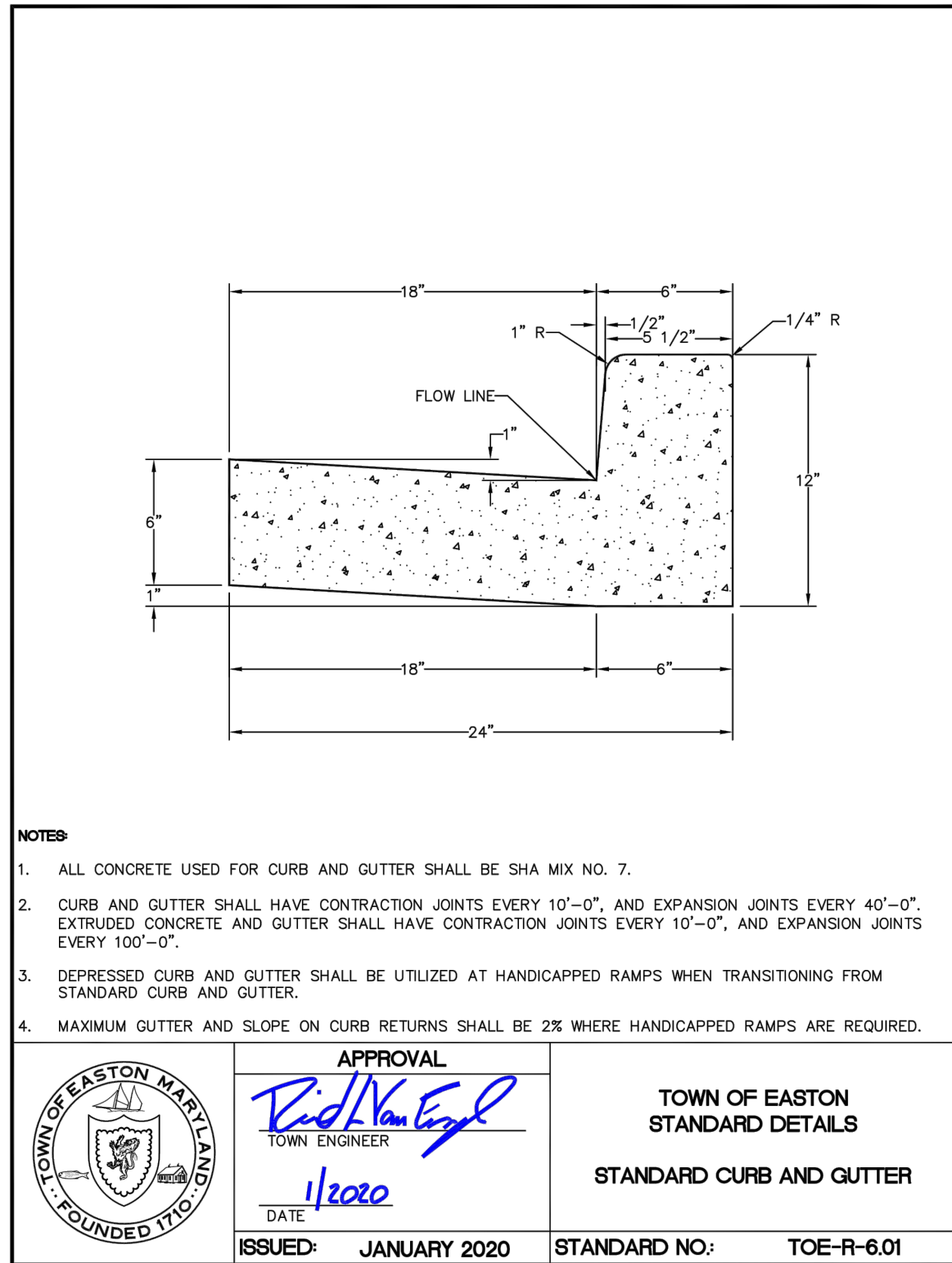
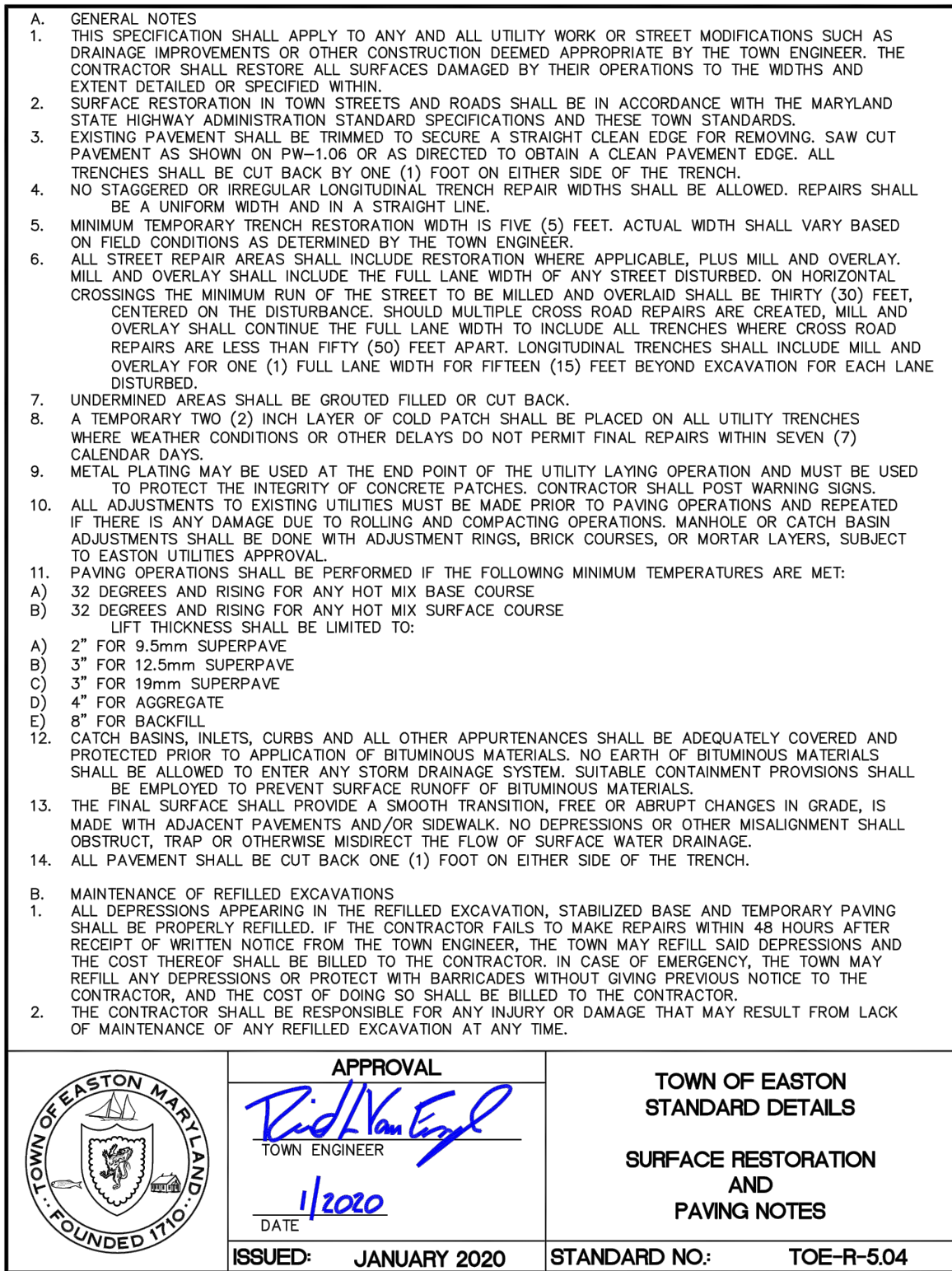
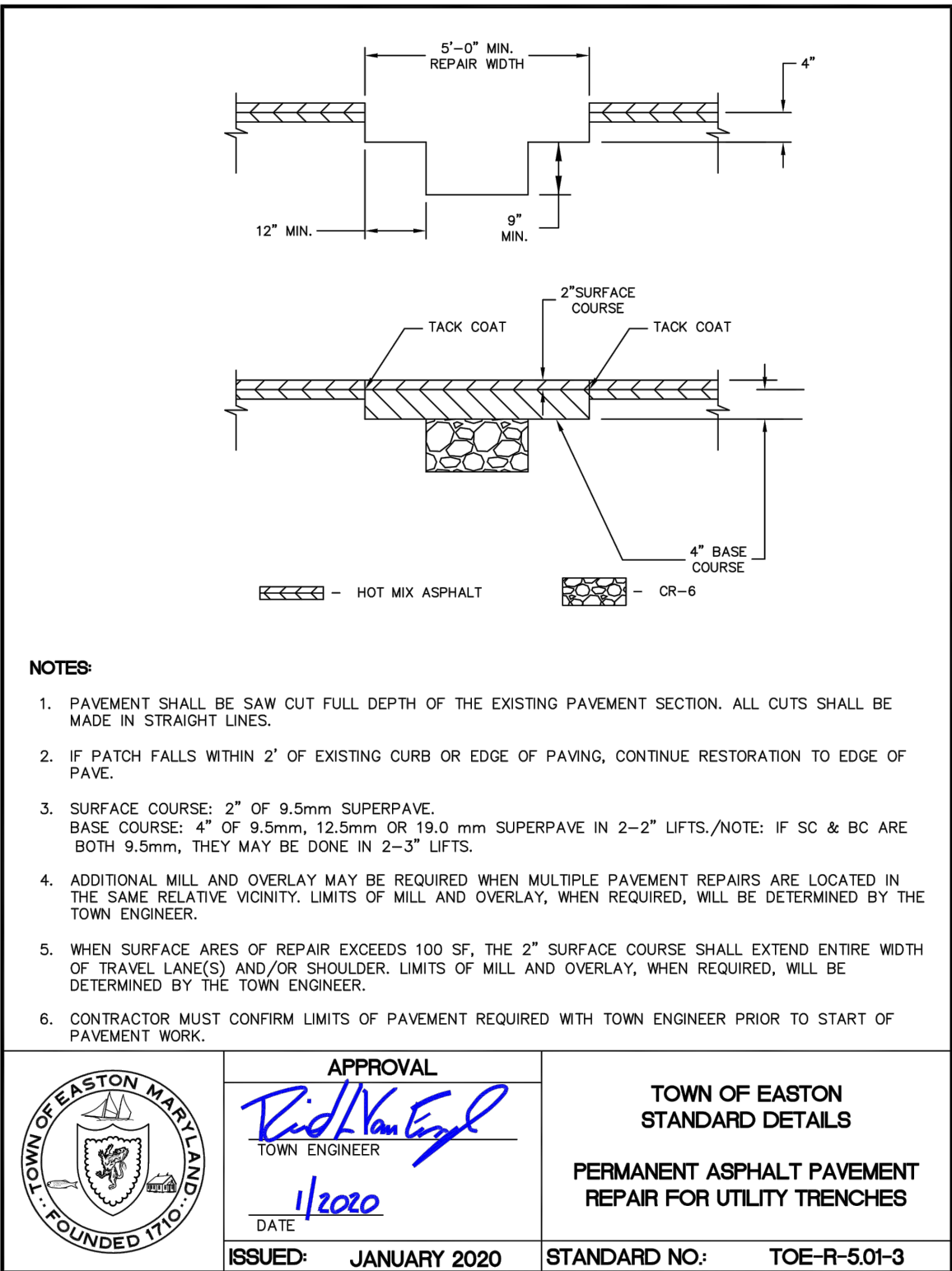
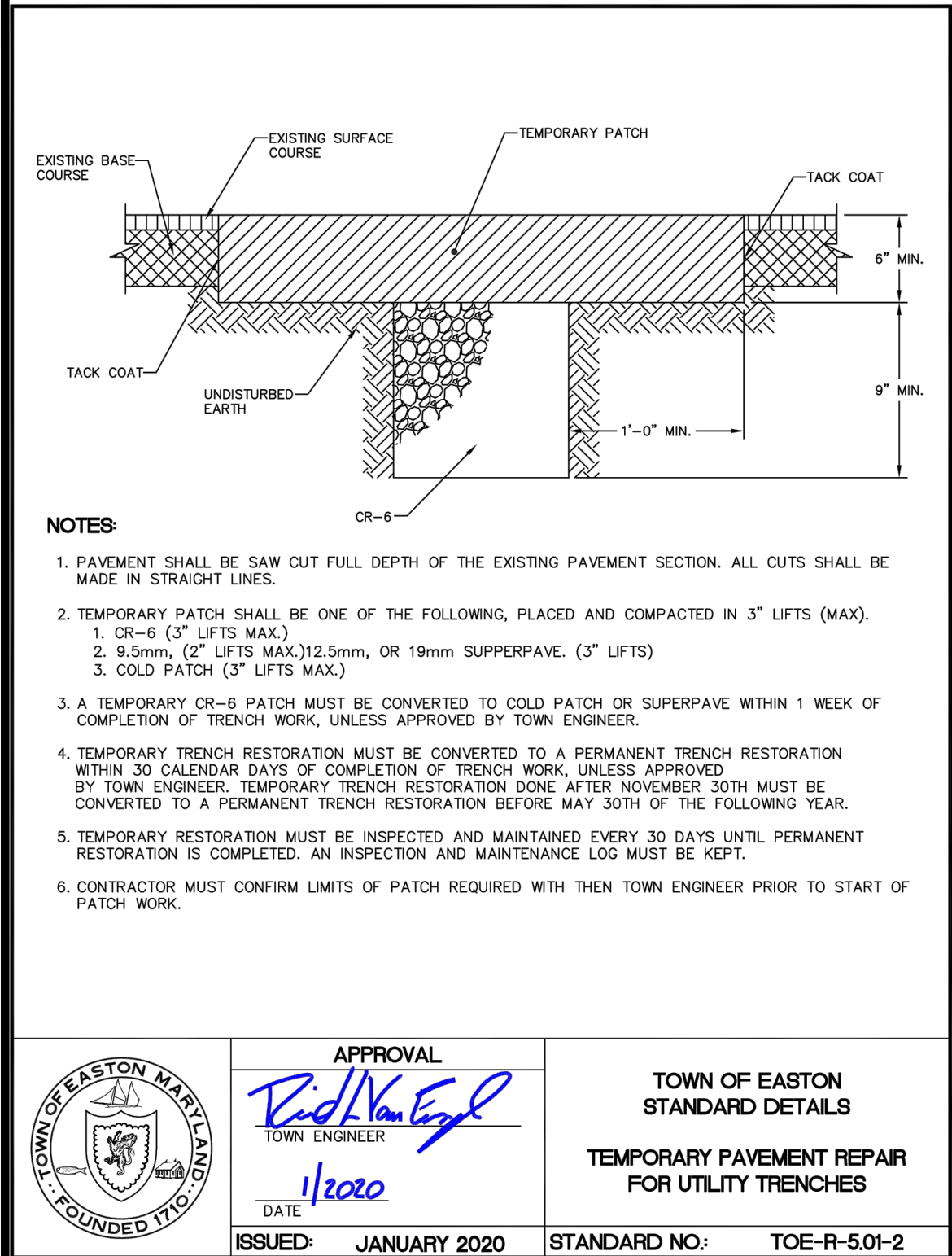
PREPARED FOR NAMA VENTURES, LLC

APPROVED:
TOWN OF EASTON - TOWN ENGINEER

APPROVED:
TOWN OF EASTON PLANNING AND ZONING

APPROVED:
EASTON UTILITIES - MANAGER OF ENGINEERING

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DATE: 03/03/2021

SCALE: N/A

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.:

C-305.02

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

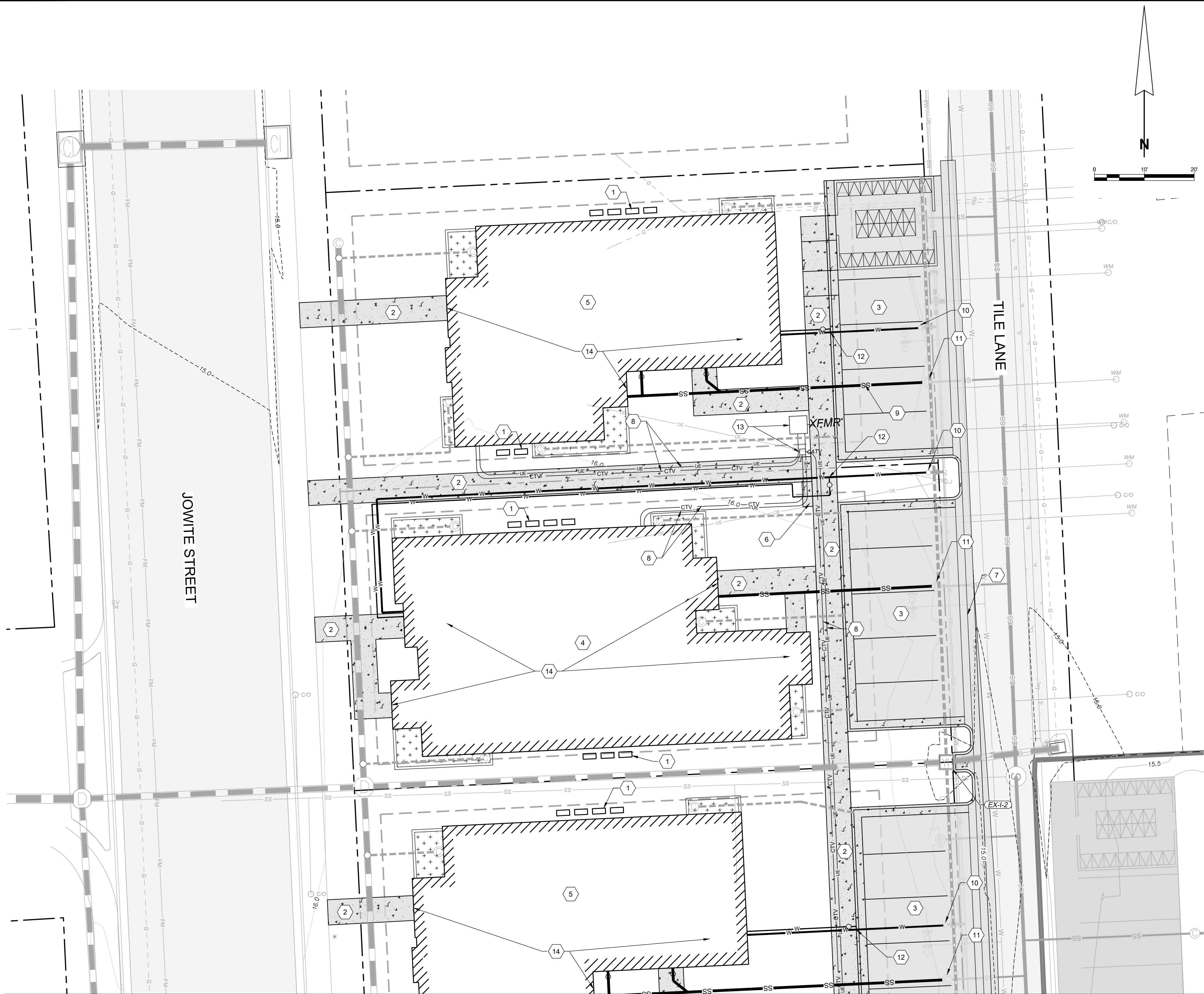
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PROPOSED FEATURES

- 1 HVAC UNITS TYP. SEE MECHANICAL PLAN FOR DETAIL
- 2 4" SIDEWALK. DETAIL ON 305.01
- 3 PERVIOUS ASPHALT PARKING. DETAIL ON 405.01
- 4 7 UNIT DWELLING
- 5 6 UNIT DWELLING
- 6 CLUSTER MAILBOX
- 7 STANDARD ASPHALT VALLEY GUTTER WITH A VALLEY SLOPE OF 0.47%. DETAIL ON 305.02
- 8 1-2 1/2" ELECTRIC AND 1-2" COMM SCH40 CONDUITS. ALL CONDUITS TO HAVE 36" COVER.
- 9 6" SEWER HOUSE CONNECTION TO BE INSTALLED ACCORDING TO DETAIL ON 505.01
- 10 TIE IN TO EXISTING 4" C-800 DR-18 WATER SERVICE WITH A 4" C509 AWWA GATE VALVE AT MAIN SEE DETAIL ON SHEET C-505.01
- 11 EXISTING SEWER CLEANOUT
- 12 4" X 2" TEE TO 2" DR-18 C-800 PVC POTABLE WATER SERVICE TO 2" METER & METER PIT PER EUC DETAIL SHEET C-505.01.
- 13 ELECTRIC TRANSFORMER PAD AND COMMUNICATION PEDESTAL. DETAIL ON C-505.01. TRANSFORMER BY OTHERS.
- 14 TYPICAL EXTERIOR WALL MOUNTED LIGHT TO BE INSTALLED 6.5' ABOVE FINISHED FLOOR AND 1' OFF DOOR HORIZONTALLY. LIGHT TO BE LITHONIA OLF13 PE BZ OR EQUAL.

NOTE:

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SHEET NO.:

C-401.01

UTILITY PLAN

FOR

NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

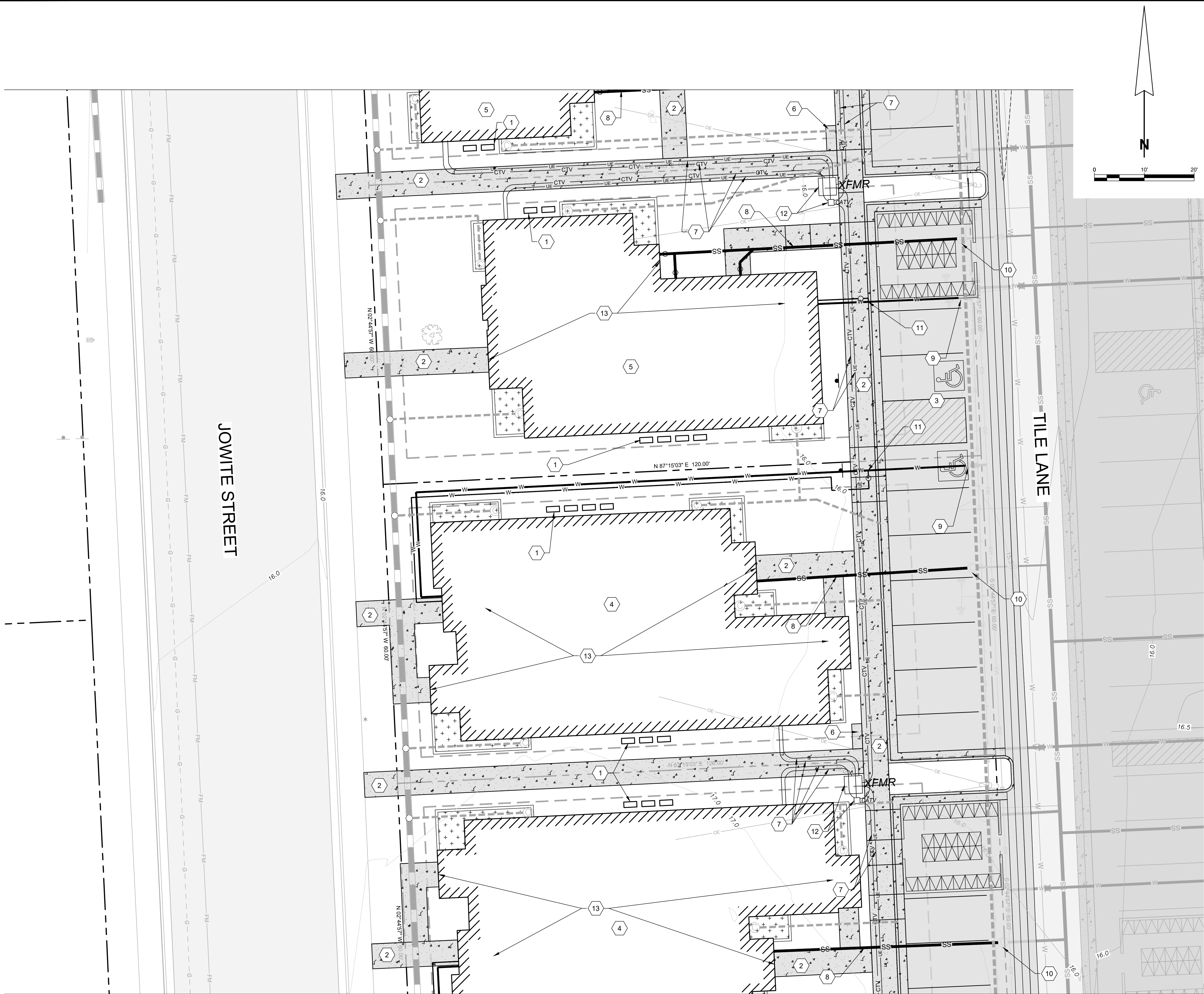
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SCALE: 1" = 10'

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.:

C-401.02

UTILITY PLAN

FOR

NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

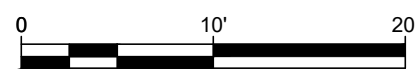
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TOWN OF EASTON - TOWN ENGINEER	DATE	TOWN OF EASTON PLANNING AND ZONING	DATE	EASTON UTILITIES - MANAGER OF ENGINEERING	DATE

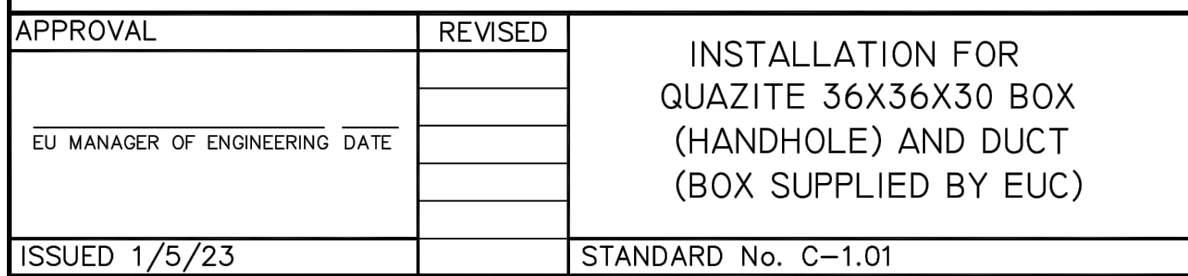
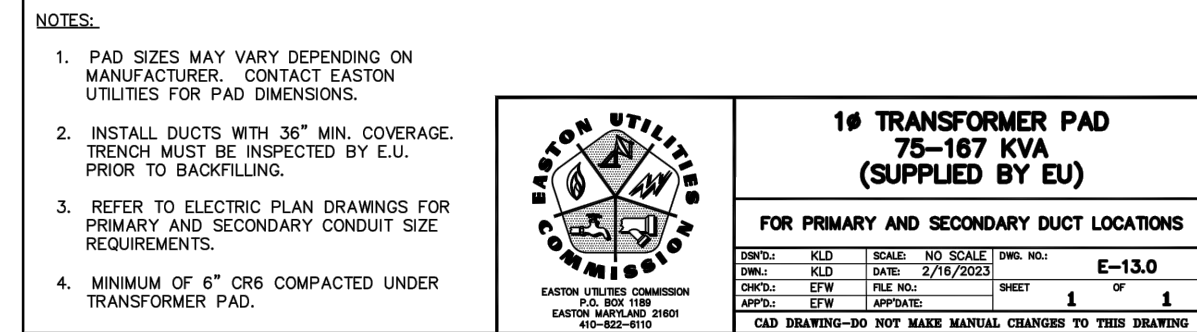
UTILITY PLAN

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS
TAX MAP 0104, GRID 000EA
ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAIMA VENTURES, LLC

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development services

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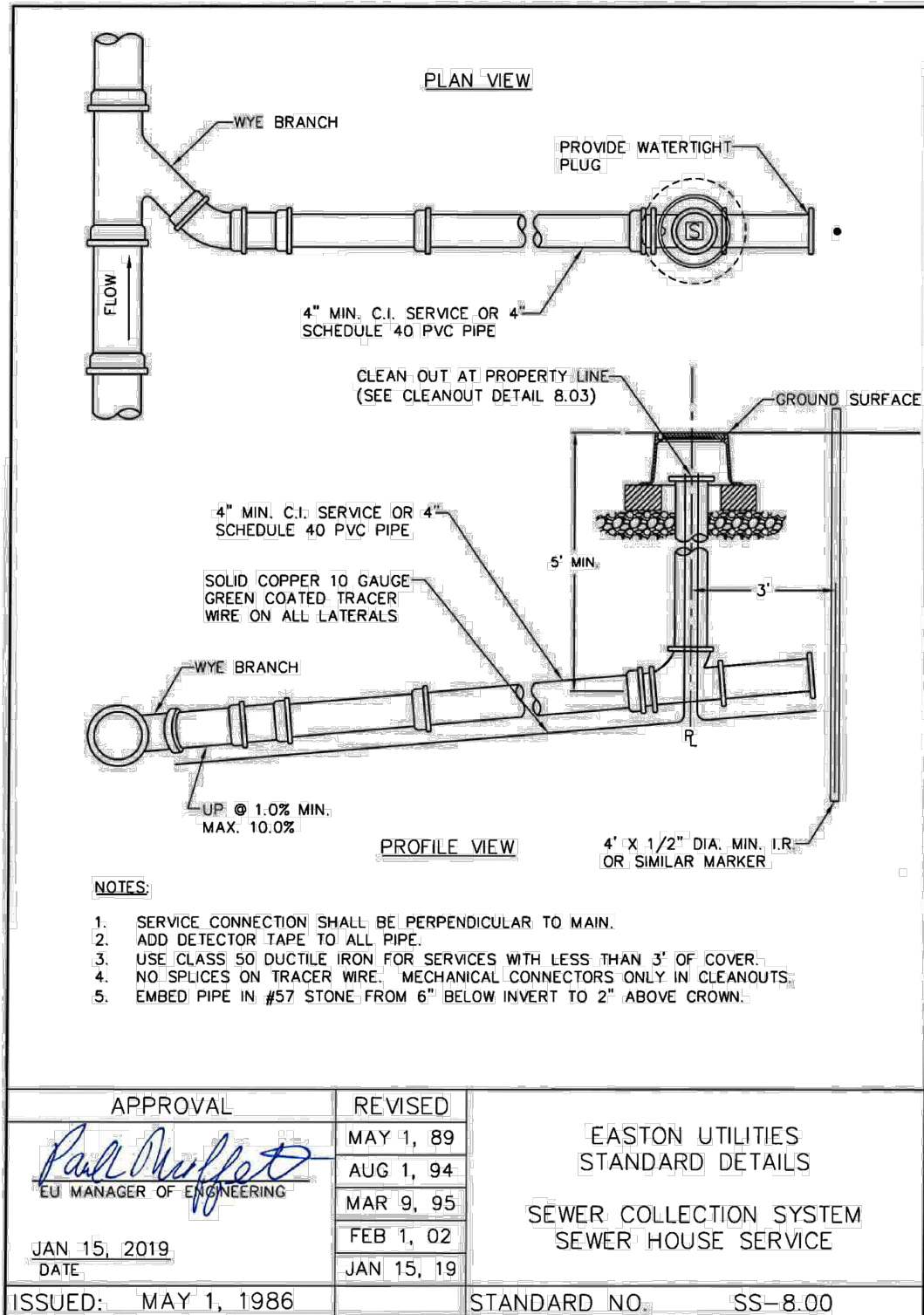
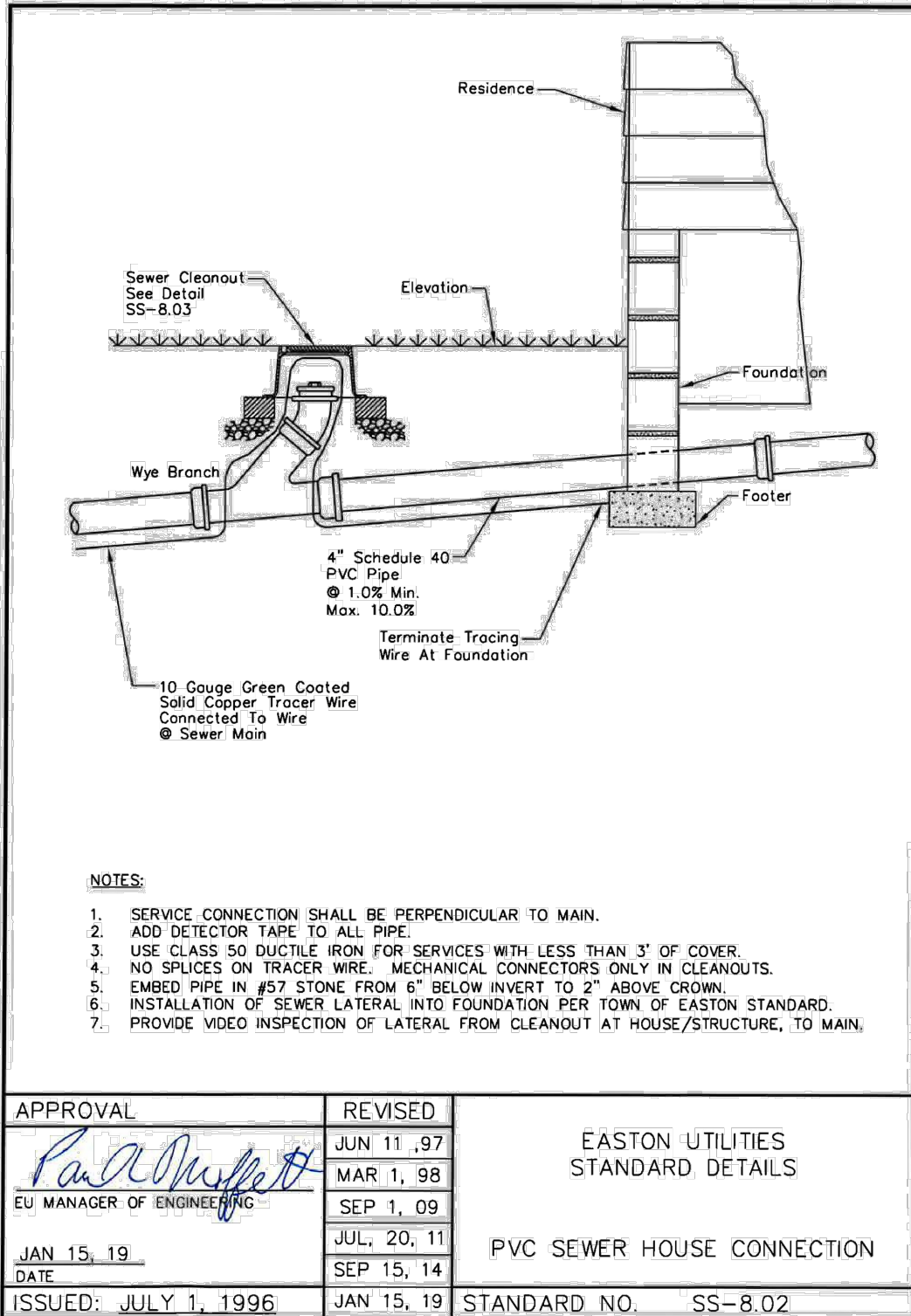
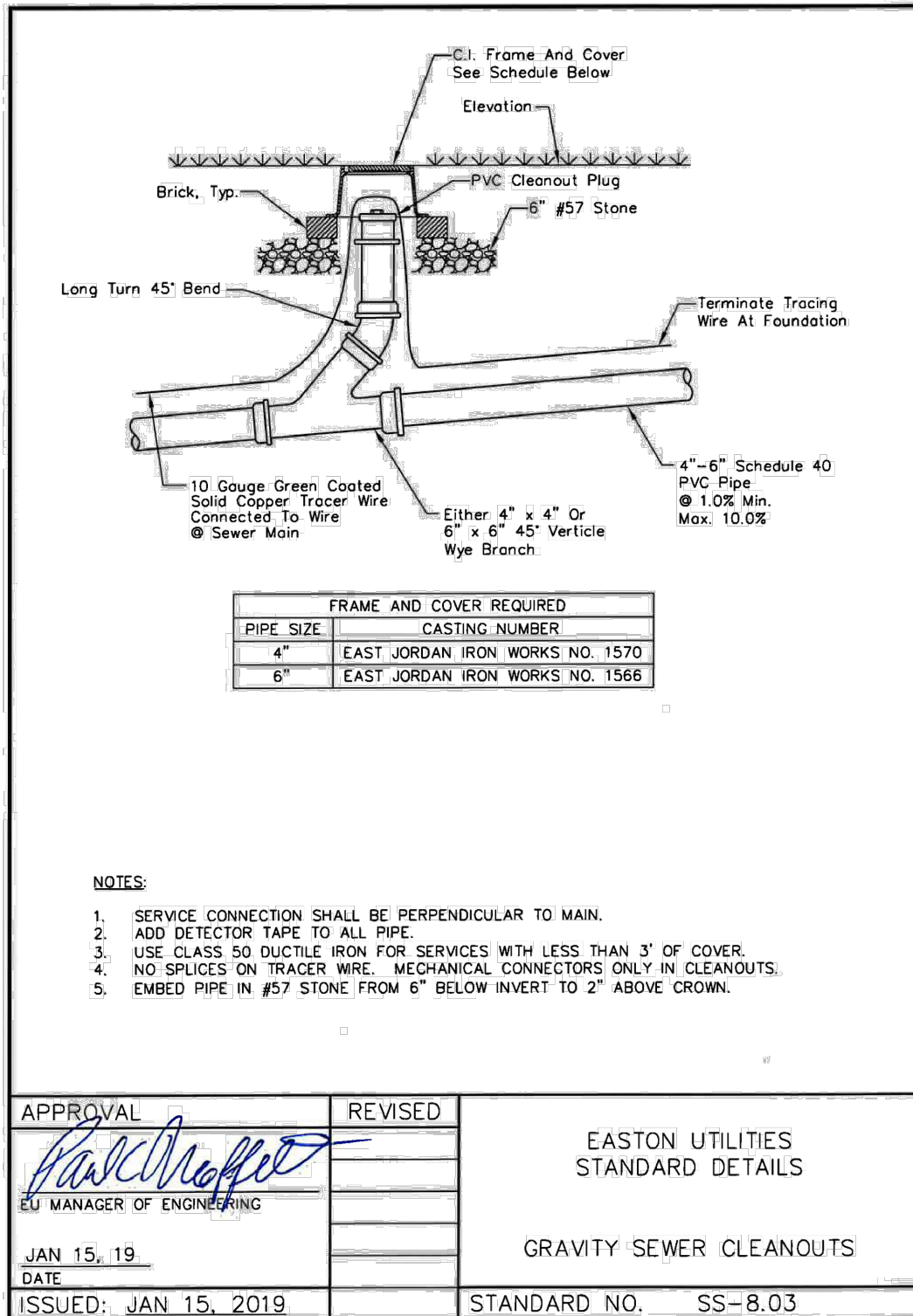
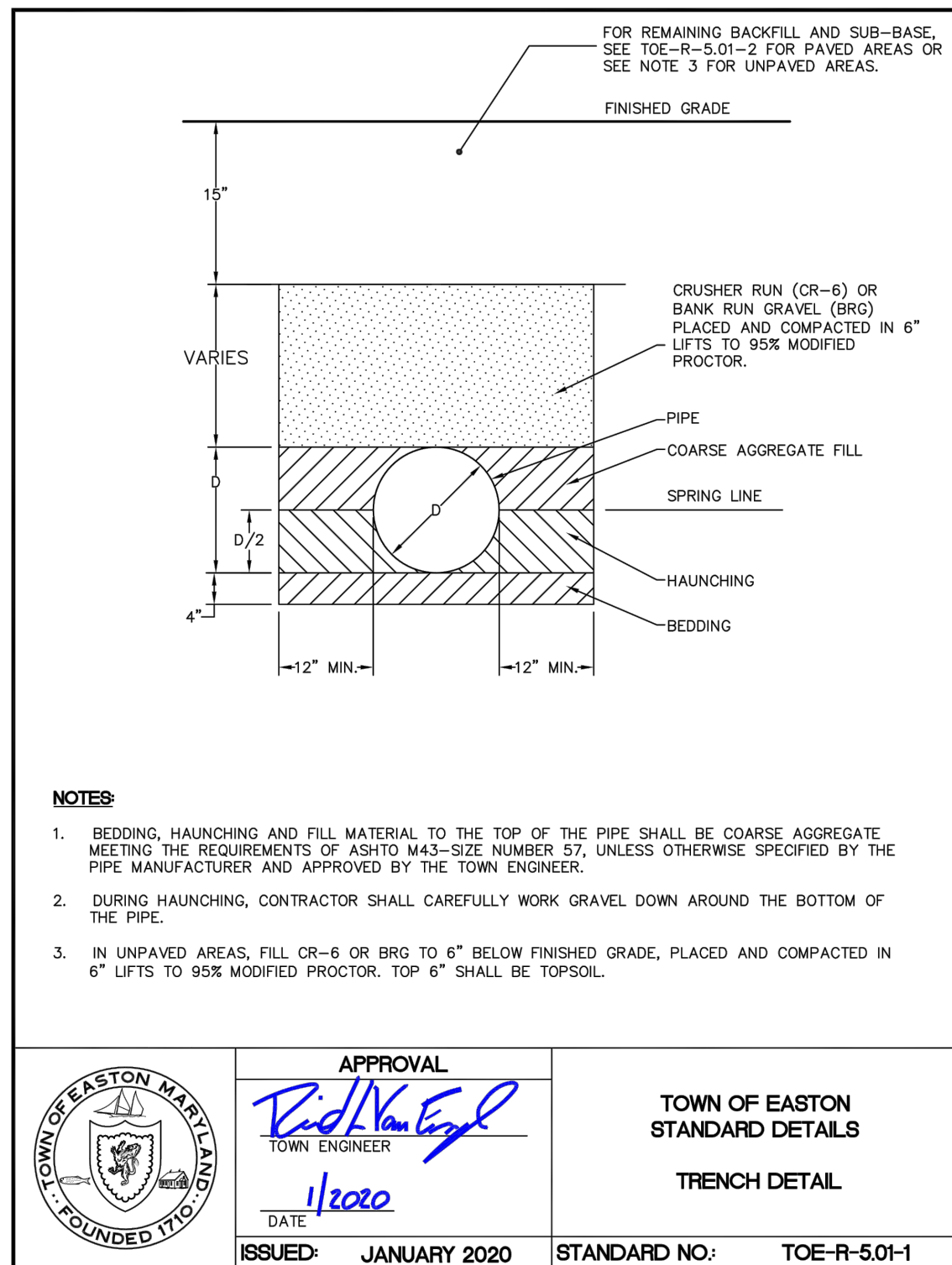
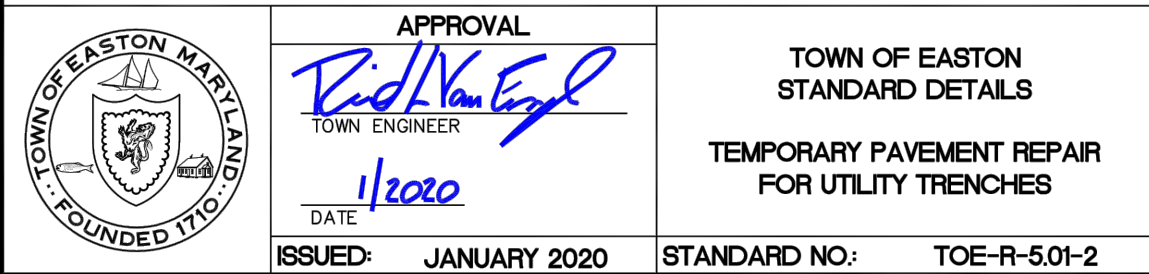
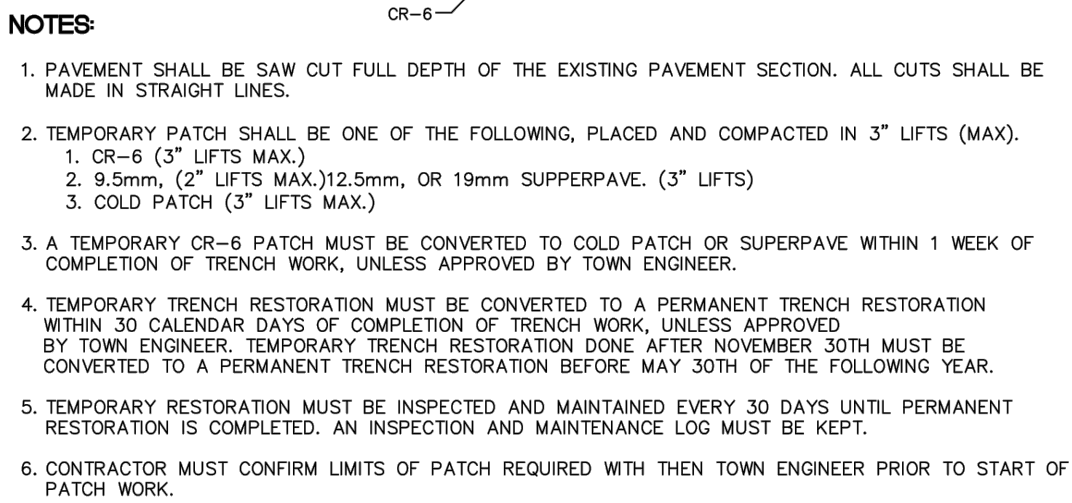
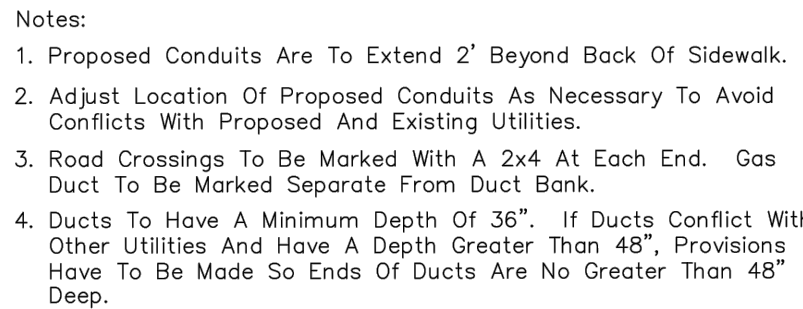
DATE:	03/03/2021
SCALE:	1" = 10'
DRAWN BY:	BBF
DESIGNED BY:	BBF
APPROVED BY:	
SHEET NO.:	C-401.03



GENERAL:

1. THE ELECTRIC AND COMMUNICATION DESIGN PROVIDED BY EASTON UTILITIES SHOWN ON THESE DRAWINGS ARE NOT A FINAL DESIGN BUT TO AID THE DESIGN ENGINEER IN THE DESIGN OF A CONSTRUCTABLE PROJECT. THE FINAL DESIGN SHALL BE PROVIDED BY THE DESIGNER. THE DESIGNER SHALL BE RESPONSIBLE FOR THE DESIGN OF OTHER PORTIONS OF THE PROJECT SUCH AS LOT LINE LAYOUT, ABOVE GRADE CONFLICTS, CONFLICTS WITH OTHER UTILITIES, ETC....
2. EXISTING CONDITIONS AND PROPOSED MODIFICATIONS TO THE SITE SHALL BE CONSIDERED DURING THE DUCTBANK DESIGN TO PREVENT CONFLICTS DURING CONSTRUCTION AND FUTURE DEVELOPMENT.
3. THE DUCTBANK SHALL BE PROTECTED USING NONMETALLIC INTERLOCKING DUCT SPACERS TO KEEP OTHERS ORGANIZED AND PROPERLY SEPARATED.
4. DUCTBANK CONDUITS SHALL BE ORGANIZED IN A MANNER THAT ALLOWS CONDUITS TO ENTER OR PASS AROUND A STRUCTURE AS PROVIDED IN THESE DRAWINGS.
5. DUCTBANK SHALL ONLY BE BACKFILLED USING SAND OR CONCRETE THAT IS FLUID ENOUGH TO FILL VOIDS, TO A DEPTH OF 6" ABOVE THE DUCT BANK OR AS REQUIRED BY THE DESIGN ENGINEER.
6. THERE SHALL NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER (90 DEGREE) BENDS (360 DEGREES) IN ANY ONE PULL POINT. IF MORE THAN ONE 90 DEGREE BEND IS NECESSARY ADDITIONAL MANHOLES, VALUITS OR PULL BOXES MAY BE PROPOSED.
7. ALL PVC ELBOW FITTINGS 4" AND LARGER SHALL HAVE A MINIMUM RADIUS OF 48".
8. ALL PVC ELBOW FITTINGS SMALLER THAN 4" SHALL HAVE A MINIMUM RADIUS OF 24".
9. ELECTRIC CONDUITS MUST MAINTAIN A MINIMUM COVER OF 36". THIS COVER WOULD INCLUDE COVER TO THE BOTTOM OF RIP RAP.
10. COMMUNICATION CONDUITS MUST MAINTAIN A MINIMUM COVER OF 24". THIS COVER WOULD INCLUDE COVER TO THE BOTTOM OF RIP RAP.
11. EQUIPMENT LOCATIONS INCLUDING TRANSFORMERS, COMMUNICATION PEDESTALS, MANHOLES AND TELECOMMUNICATION VALUITS MAY BE ADJUSTED SLIGHTLY AS NECESSARY. IF CONDITIONS EXIST THAT REQUIRE MAJOR MODIFICATIONS, PLEASE NOTIFY EASTON UTILITIES.
12. MANHOLES ELEVATIONS MAY BE ADJUSTED SLIGHTLY BUT MUST MAINTAIN THE MINIMUM INTERNAL ELEVATIONS OF 8'X24" (LOW) IF. IF CONDITIONS EXIST THAT REQUIRE MAJOR MODIFICATIONS, PLEASE NOTIFY EASTON UTILITIES.
13. EQUIPMENT INCLUDING TRANSFORMERS, COMMUNICATION PEDESTALS, MANHOLES AND TELECOMMUNICATION VALUITS SHALL NOT BE LOCATED IN SWALES, AT LOW POINTS, OR OTHER DEPRESSIONS IN THE GROUND. POSITIVE DRAINAGE MUST BE MAINTAINED TO PREVENT FLOODING.
14. STREET LIGHTS SHALL BE LOCATED 12" FROM EDGE OF PAVEMENT OR BACK OF CURB.
15. TRANSITION OF CONDUIT MATERIALS REQUIRES THE USE OF POLY-CAM SERIES 737 ID CONTROLLED TRANSITION FITTINGS. (SCHEDULE 40 PVC TO HDPE).

1. MINIMUM EARTH COVER OVER COMPLETED DUCT BANK SHALL BE NOT LESS THAN THAT SPECIFIED IN PROFILES.
2. THE DUCT BANK SHALL BE ASSEMBLED WITH THE JOINTS STAGGERED BY AT LEAST 4 INCHES IN THE HORIZONTAL AND VERTICAL PLANES SO THAT NO TWO JOINTS IN THE CLUSTER OF JOINTS ALIGN.
3. FOR TEN-FOOT LENGTHS OF DUCT, DUCT SPACER ASSEMBLIES SHALL BE PLACED AT 2'-6" ON EITHER SIDE OF THE MID-POINT OF EACH JOINT CLUSTER FOR TWENTY-FOOT LENGTHS OF DUCT. IN ADDITION TO DUCT SPACER ASSEMBLIES BEING PLACED 2'-6" FROM THE MID-POINT OF THE JOINT CLUSTER AT EACH END, INSTALL AN ADDITIONAL DUCT SPACER ASSEMBLY AT EACH END OF THE END SPACERS. MANUFACTURERS SPECIFICATION SHOULD BE USED IN THE EVENT ADDITIONAL SPACERS ARE RECOMMENDED.
4. DURING DUCT BANK INSTALLATION, DUCT ASSEMBLY ENDS SHALL BE CLOSED WITH PULL TAP EQUIPPED PUSH-IN POLYVINYL CHLORIDE (PVC) PROTECT DUCT PLUGS TO PREVENT SOIL OR WATER ENTRY.
5. DURING THE BACKFILLING OF SAND, PROTECT THE DUCTS; DO NOT PERMIT LARGE LOADS OF SAND TO FALL DIRECTLY ONTO THE DUCTS. INSTEAD, SLOWLY ADD SAND IN LAYERS OF DRY FLOWABLE SAND AND SPREAD THE SAND INTO PLACE TO ELIMINATE VOIDS IN AND AROUND THE DUCTS.
6. AFTER DUCT BANK INSTALLATION IS COMPLETE, A VERIFICATION MANHOLE, 12-INCHES LONG AND NOT MORE THAN 14-INCH DIAMETER SMALLER THAN THE TRADE SIZE DIAMETER OF THE DUCT SHALL BE DRAWN THROUGH THE DUCT BANK. THE MANHOLE SHALL BE 12 INCHES DEEPER THAN THE DUCT BANK AND NOT TO BE ABLE TO PASS THE MANHOLE TEST. THE CONTRACTOR, AT NO ADDITIONAL COST TO THE CONTRACT SHALL MAKE REPAIRS FOR EACH FAILED DUCT.
7. AFTER THE MANHOLE HAS BEEN DRAWN THROUGH THE DUCTS, A DUCT BRUSH AND SWAB SHALL BE PULLED THROUGH EACH DUCT TO ENSURE THAT THE DUCT INTERIOR IS CLEAN PLACE DUCT PLUGS IN THE ENDS OF EACH DUCT.
8. INSTALL RAYCHEM RAYFLAT DUCT SEALING SYSTEM OR AN APPROVED EQUAL WITHIN DUCTS ENTERING AND LEAVING THE NEW ELECTRICAL MANHOLES AND HANDHOLES. THE CONTRACTOR IS RESPONSIBLE FOR SEALING ALL DUCTS, BOTH PERMANENTLY AND TEMPORARILY AFTER EACH ELECTRICAL MANHOLE OR HANDHOLE IS CLEARED.
9. GLUE TO BE COMPATIBLE PER PIPE MANUFACTURERS RECOMMENDATION.
10. ALL CONDUITS TO BE SCHEDULE 40 BELL END MINIMUM 1' LENGTHS.
11. INSTALL A PULL ROPE (1800-PUND MIN TENSILE STRENGTH) IN EACH CONDUIT TO EACH STRUCTURE AND TERMINAL END; PROVIDE 10' SLACK AT EACH END.
12. CONTRACTOR MAY UTILIZE TRENCH BOX AND/OR SLOPE TRENCH IN ORDER TO CONSTRUCT DUCT BANK. SLOPE OF TRENCH TO BE DETERMINED IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.



NOTE:

- EASTON UTILITIES DETAILS SHOWN ON THIS SHEET ARE CURRENT AS OF THE DATE ON THESE PLANS. HOWEVER, EASTON UTILITIES IS CURRENTLY UPDATING DETAILS AND ONCE AVAILABLE, SHALL BE THE DETAILS USED FOR THIS PROJECT.

APPROVED:		APPROVED:		APPROVED:	
TOWN OF EASTON - TOWN ENGINEER	DATE	TOWN OF EASTON PLANNING AND ZONING	DATE	EASTON UTILITIES - MANAGER OF ENGINEERING	DATE

UTILITY DETAILS

FOR

INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

PREPARED FOR NAIMA VENTURES, LLC

RAUCH
inc.

engineering design & development services

Office: 410.770.9081 | fax: 410.770.3667
Email: design@raucheng.com | web: www.raucheng.com
Maryland Office: 106 N. Harrison St - Easton, MD 21601
Virginia Office: 8229 Boone Blvd, Suite 625 - Vienna, VA 22182

REVISIONS

DESCRIPTION

DATE _____

REV. #

DATE: 03/03/2021

SCALE: N/A

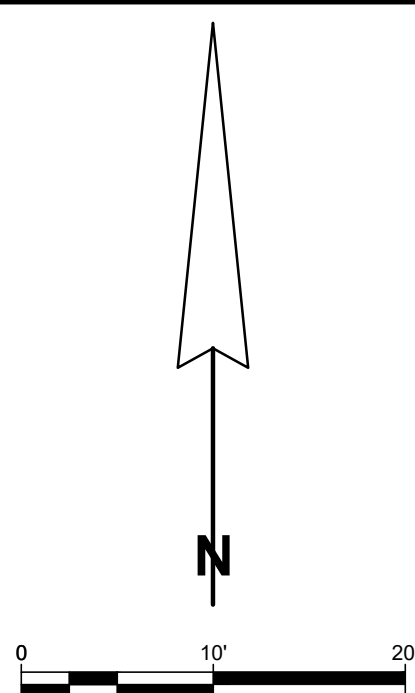
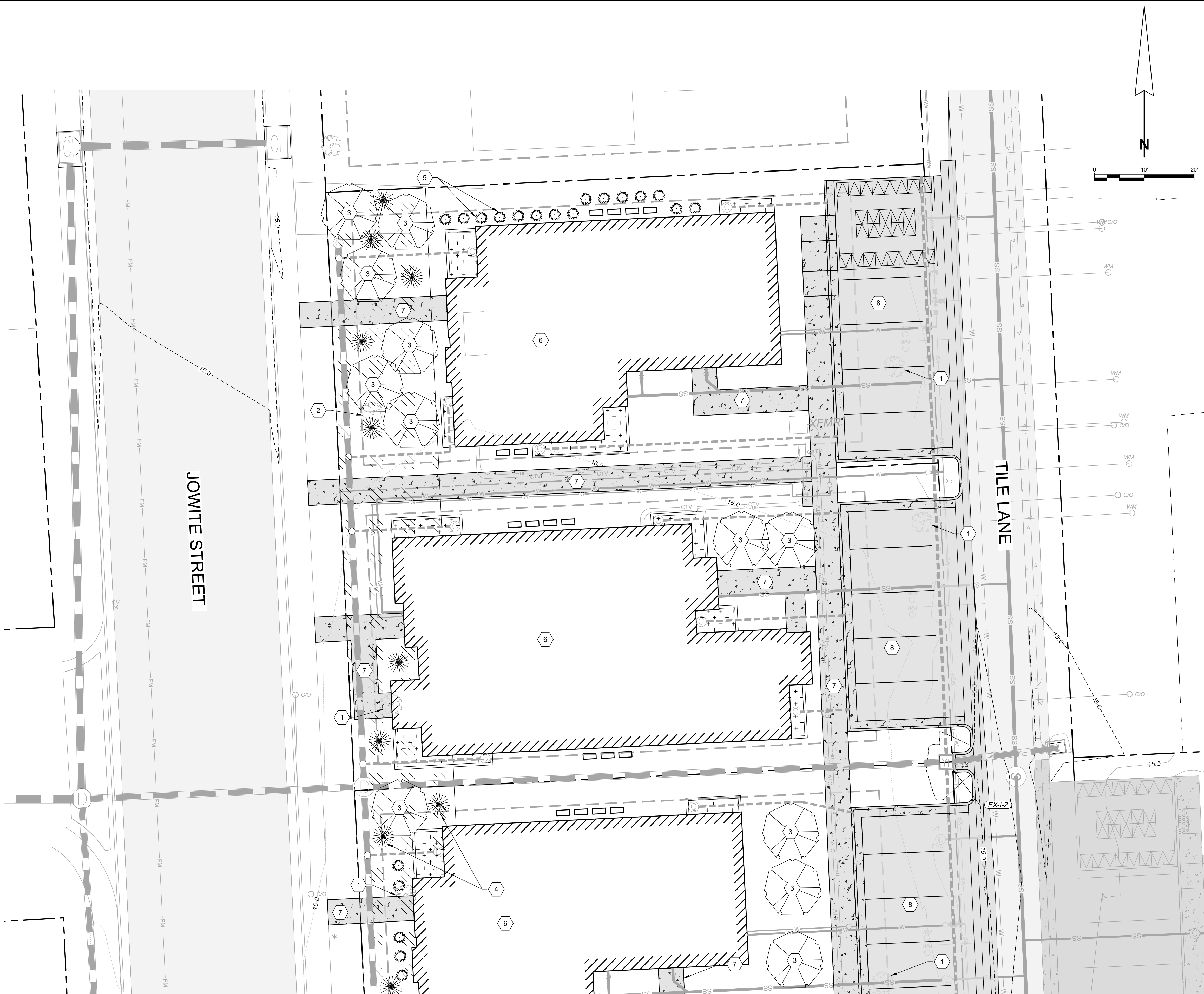
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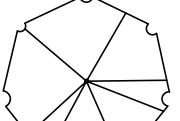
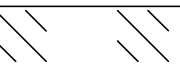
DESIGNED BY: BBF

TABLE 1

C-405.01

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LANDSCAPE SCHEDULE	
	CANOPY - OAK (OR EQUAL) - QTY: 22 PRSD; 2 EXST = 24 TOTAL
	EVERGREEN - AMERICAN HOLLY (OR EQUAL) - QTY: 20
	SHRUB - ILEX GLABRA (OR EQUAL) - QTY: 50
	BUFFER YARD

EXISTING FEATURES

- 1 EXISTING TREE TO BE REMOVED
- 2 EXISTING TREE TO BE PRESERVED. CONTRACTOR TO PROTECT AS NECESSARY DURING CONSTRUCTION

LANDSCAPING FEATURES

- 3 PROPOSED CANOPY TREES (SEE PLANTING TABLE ON 605.01)
- 4 PROPOSED EVERGREEN TREES (SEE PLANTING TABLE ON 605.01)
- 5 PROPOSED SHRUBS (SEE PLANTING TABLE ON 605.01)

PROPOSED FEATURES

- 6 PROPOSED RESIDENTIAL UNIT
- 7 PROPOSED CONCRETE SIDEWALK
- 8 PERMEABLE PAVEMENT. DETAIL ON 405.01

LANDSCAPING PLAN

FOR

NAIMA - PHASE 2

INFRASTRUCTURE IMPROVEMENT PLANS

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

TAX MAP 0104, GRID 000EA

PREPARED FOR NAIMA VENTURES, LLC

RAUCH INC.

engineering design & development services

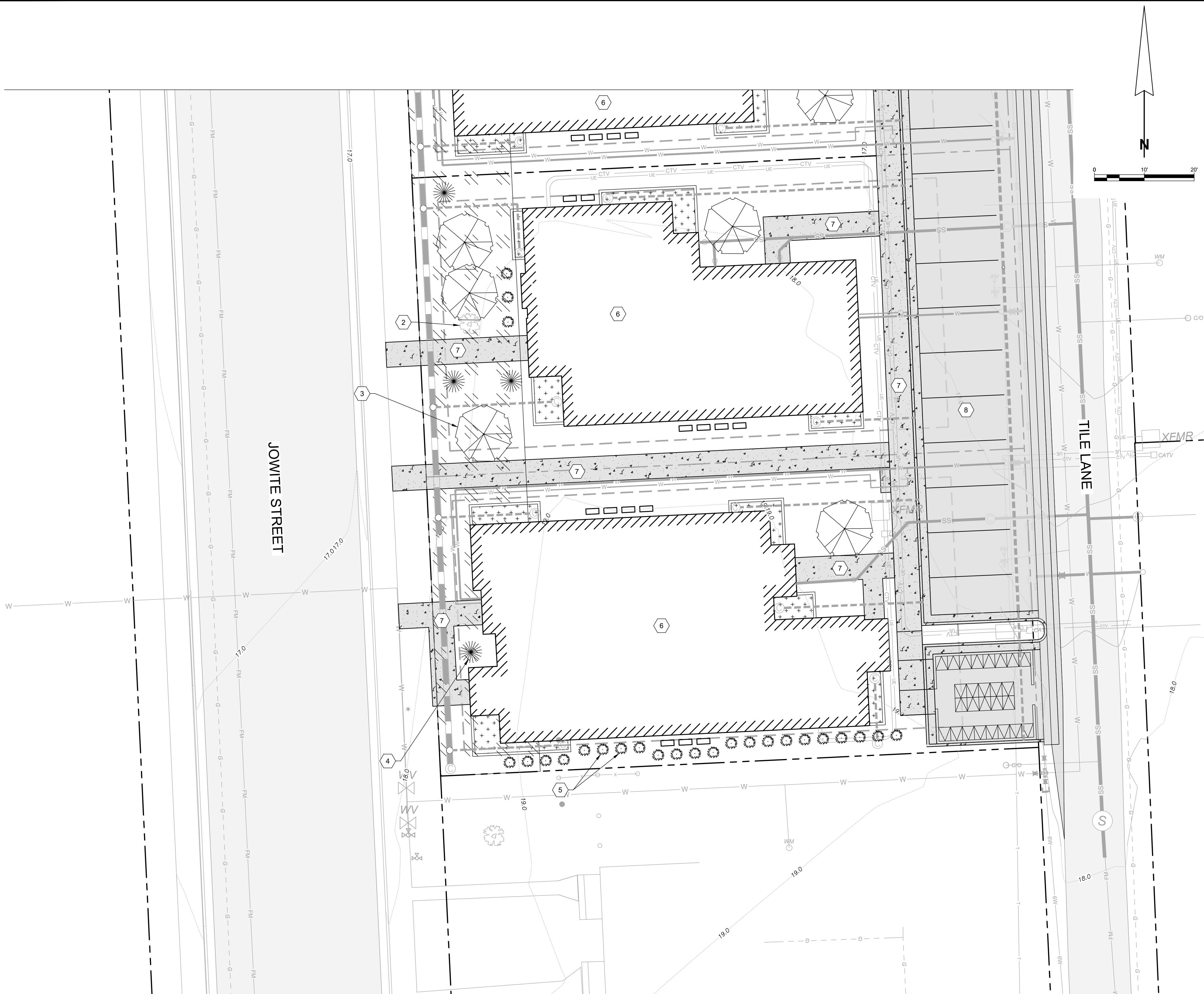
office: 410.770.0081 | fax: 410.770.3967
www.rauchinc.com
Maryland Office: 105 N. Harrison St. - Easton, MD 21601
Virginia Office: 8229 Boone Blvd, Suite 625 - Vienna, VA 22182

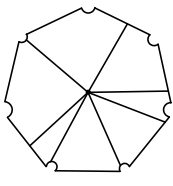
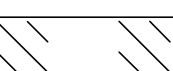
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DATE:	03/03/2021
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SHEET NO.:	C-501.01

APPROVED:	APPROVED:	APPROVED:
TOWN OF EASTON - TOWN ENGINEER	TOWN OF EASTON PLANNING AND ZONING	EASTON UTILITIES - MANAGER OF ENGINEERING
DATE	DATE	DATE

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LANDSCAPING PLAN

FOR

NAIMA - PHASE 2

INFRASTRUCTURE IMPROVEMENT PLANS

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND

TAX MAP 0104, GRID 000EA

PREPARED FOR NAIMA VENTURES, LLC

RAUCH INC.

engineering design & development services

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www.rauchinc.com
Maryland Office: 105 N. Harrison St. - Easton, MD 21821
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REVISIONS	
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APPROVED:	APPROVED:	APPROVED:
TOWN OF EASTON - TOWN ENGINEER	TOWN OF EASTON PLANNING AND ZONING	EASTON UTILITIES - MANAGER OF ENGINEERING
DATE	DATE	DATE

LANDSCAPE PLANTING REQUIREMENTS

GENERAL REQUIREMENTS:

- COMPLIANCE WITH THE TERMS OF THIS LANDSCAPE PLAN, INCLUDING ALL MAINTENANCE AND WARRANTY REQUIREMENTS PRESCRIBED HEREON IS THE RESPONSIBILITY OF THE OWNER. MAINTENANCE AND WARRANTY TERMS AND RESPONSIBILITIES OF THE CONTRACTOR SHALL BE NEGOTIATED BETWEEN OWNER AND CONTRACTOR.
- THE CONTRACTOR (CONTRACTOR) IS RESPONSIBLE FOR THE COMPLETE INSTALLATION OF ALL LANDSCAPING SHOWN OR IMPLIED ON THIS PLAN. PLANT QUANTITIES ARE SHOWN FOR CONVENIENCE ONLY AND SHALL BE VERIFIED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL NOTIFY THE OWNER, OR DESIGNATED REPRESENTATIVE IF PROPOSED SPECIES AND/OR SITE PLANTING CONDITIONS WARRANT RE-DESIGN CONSIDERATIONS.
- THE CONTRACTOR SHALL DILIGENTLY ATTEMPT TO LOCATE THE SPECIFIED NATIVE PLANT MATERIAL. IF SPECIFIED PLANT MATERIALS CANNOT BE LOCATED, ALTERNATIVES MAY BE CONSIDERED AND APPROVED, IN ADVANCE, BY THE OWNER, OR DESIGNATED REPRESENTATIVE.
- PRIOR TO LANDSCAPE INSTALLATION, THE CONTRACTOR SHALL COORDINATE A SITE MEETING WITH THE OWNER, OR DESIGNATED REPRESENTATIVE TO REVIEW THE PLAN, SITE DRAINAGE CONDITIONS AND TO DETERMINE ANY FIELD ADJUSTMENTS NECESSARY.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCING WORK, AND SHALL COORDINATE WITH OTHER CONTRACTORS ON SITE AND MISS UTILITY TO VERIFY UTILITY LOCATIONS. ANY REPAIRS TO EXISTING UNDERGROUND UTILITIES REQUIRED AS A RESULT OF ACTIONS OF THE CONTRACTOR AND/OR HIS ASSIGNS SHALL BE BORNE BY CONTRACTOR.
- THE CONTRACTOR SHALL VERIFY THAT FINAL ROUGH GRADES HAVE BEEN ESTABLISHED AND THAT THE SITE IS READY FOR LANDSCAPE INSTALLATION. THE CONTRACTOR SHALL ENSURE THAT PLANTINGS WILL HAVE ADEQUATE DRAINAGE. THE CONTRACTOR SHALL INSTALL PLANT MATERIAL FACTORING IN ANY "FINAL" GRADING WORK TO BE COMPLETED AFTER LANDSCAPE INSTALLATION.
- THE CONTRACTOR SHALL LAY OUT BEDS AND POSITION PLANTS FOR APPROVAL BY OWNER, OR DESIGNATED REPRESENTATIVE. THE CONTRACTOR SHALL REVIEW ANY SIGNIFICANT FIELD ADJUSTMENTS PRIOR TO INSTALLATION.
- NOTE:** PLANTING WITHIN THE ROOT ZONE OF EXISTING TREES REQUIRES ADDITIONAL CARE. HAND DIGGING OF PLANTING HOLES AND ADJUSTMENT OF PLANTING LAYOUT MAY BE NECESSARY.
- THE CONTRACTOR SHALL MAINTAIN A CLEAN JOB SITE AND REMOVE ALL PLANTING AND RELATED DEBRIS DAILY DURING THE COURSE OF IMPLEMENTATION.
- THE OWNER, OR DESIGNATED REPRESENTATIVE SHALL REJECT ANY AND ALL PLANT MATERIAL THAT DOES NOT MEET SPECIFICATIONS, IS DISEASED OR OTHERWISE UNHEALTHY.
- ALL LANDSCAPE INSTALLATION SHALL BE ACCOMPLISHED WITH QUALIFIED PERSONNEL, UTILIZING INDUSTRY STANDARD PRACTICES AND TECHNIQUES.

PLANT MATERIAL:

- ALL PLANT MATERIAL SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSERY STOCK AS APPROVED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE INC. LATEST EDITIONS.
- ALL PLANT MATERIAL SHALL BE NURSERY GROWN WITH SOUND HORTICULTURAL PRACTICES AND UNLESS OTHERWISE APPROVED BY THE OWNER, OR DESIGNATED REPRESENTATIVE, GROWN IN SOIL AND CLIMATE CONDITIONS SIMILAR TO THIS PROJECT SITE.
- ALL MATERIAL SHALL EXHIBIT HEALTHY GROWTH WITH GOOD BRANCHING STRUCTURE, DENSE FOLIAGE AND A FIBROUS, DEVELOPED ROOT SYSTEM.
- ALL MATERIAL SHALL BE FREE OF INSECT INFESTATION AND DISEASE. THE OWNER RESERVES THE RIGHT TO HAVE THE PLANT MATERIAL INSPECTED AND TAGGED AT THE GROWING SITE, AND TO REJECT ANY DEFICIENT MATERIAL AT THE JOB SITE.

PLANT MATERIAL HANDLING:

- ALL PLANT MATERIAL SHALL ARRIVE AT THE JOB SITE IN A HEALTHY CONDITION.
- THE CONTRACTOR SHALL STAGE DELIVERY AND PLANT INSTALLATION TO MINIMIZE STRESS ON PLANT MATERIAL.
- PLANT MATERIAL TO BE STAGED ON OR OFF THE JOB SITE SHALL BE LOCATED TO MAXIMIZE PROTECTION FROM HOT SUN AND DRYING WINDS, AND SHALL BE WATERED TO MAINTAIN A STRESS FREE CONDITION. ON-SITE WATER MAY NOT BE AVAILABLE FOR THE CONTRACTOR TO USE. THE LACK OF AVAILABLE WATER SHALL NOT RELIEVE THE CONTRACTOR OF ADEQUATE MAINTENANCE.

PLANTING SCHEDULE:

- PLANTING SCHEDULES SHALL COINCIDE WITH THE OVERALL PROGRESS OF SITE CONSTRUCTIONS.
- CERTAIN PLANT SPECIES REQUIRE SPECIFIC SEASON INSTALLATION AND SHALL BE COORDINATED APPROPRIATELY.
- PLANTING IS DISCOURAGED IN THE HOT, DRY PERIODS OF SUMMER AND DURING FROZEN GROUND CONDITIONS IN WINTER, BUT MAY BE CONSIDERED YEAR-ROUND WITH MAINTENANCE REQUIREMENTS ADDRESSED ACCORDINGLY.
- THE CONTRACTOR IS RESPONSIBLE FOR PLANT MATERIAL HEALTH AND VIGOR REGARDLESS OF WHEN THE MATERIAL IS INSTALLED.

TREE & SHRUB PLANTINGS:

- ALL TREE/SHRUB PLANTING PITS SHALL BE EXCAVATED TO A DEPTH SO THAT THE PLANT ROOT FLARE SHALL LIE AT THE FINISHED GRADE SURROUNDING THE PLANT. SOIL THAT MAY HAVE BEEN PLACED ON TOP OF ROOT BALL OR SETTLED AROUND TRUNK OR ROOT FLARE DURING TRANSPORT SHALL BE REMOVED TO ADEQUATELY EXPOSE ROOT FLARE SO PROPER PLANTING DEPTH CAN BE ESTABLISHED.
- THE ROOT BALL SHALL REST ON UNDISTURBED OR STABILIZED SOIL. THE CONTRACTOR SHALL NOTIFY THE OWNER, OR DESIGNATED REPRESENTATIVE IF THIS PLANTING DEPTH SPECIFICATION CANNOT BE IMPLEMENTED.
- TREE PLANTING PITS SHALL BE EXCAVATED DEPTH EQUAL TO THE HEIGHT OF THE ROOT BALL AND TO A WIDTH EQUALING TWICE THE ROOT BALL DIAMETER.
- EXCAVATED SOILS NOT PREVIOUSLY COMPACTED OR OTHERWISE DEGRADED SHALL BE RE-USED FOR PLANTING PIT BACKFILL. EXCAVATED SOILS UNSUITED FOR BACKFILL SHALL BE AMENDED WITH FRIABLE TOPSOIL TO CREATE A SUITABLE PLANTING SOIL AS APPROVED BY THE OWNER, OR DESIGNATED REPRESENTATIVE. EXCAVATED SOILS THAT CANNOT BE RESTORED TO A REASONABLE PLANTING SOIL SHALL BE REMOVED AND REPLACED WITH A SUITABLE PLANTING SOIL. NOTE: FOR BEDDING PURPOSES OR UNLESS OTHERWISE SPECIFIED HERON, THE CONTRACTOR SHALL ASSUME EXCAVATED SOILS ARE SUITABLE FOR PLANTING BACKFILL.
- SLOW RELEASE FERTILIZER TAB(S) (20-10-5, 21 GRAM, 2-YEAR) SHALL BE ADDED TO PLANTING HOLES AS PER MANUFACTURER'S SPECIFICATIONS.
- THE SIDES OF CONTAINER GROWN STOCK SHALL BE CUT OR SCARIFIED TO ELIMINATE BOUND ROOTS AND PROMOTE HEALTHY ROOT GROWTH.
- ALL SYNTHETIC MATERIALS FROM AROUND THE TREE TRUNK AND ROOT BALL SHALL BE REMOVED AND NOT EVIDENT WITHIN THE BACKFILL SOIL MIX. STRING, ROPE, SYNTHETIC BURLAP, PLASTIC, STRAPPING, AND OTHER MATERIALS THAT WILL NOT DECOMPOSE IN THE SOIL SHALL BE REMOVED AT THE TIME OF PLANTING
- SOIL GRADES SHALL BE FEATHERED AROUND PLANTINGS TO BLEND WITH SURROUNDING LANDSCAPE OR TURF AREAS. EXCESS EXCAVATED SOIL SHALL BE REMOVED FROM JOB SITE.
- ALL TREES AND SHRUBS SHALL BE WATERED DURING PLANTING TO MINIMIZE AIR POCKETS AND TO ENSURE SOIL CONTACT WITH ROOTS.

TREE STAKING/ GUYING:

- TREES SHALL BE STAKED TO PREVENT TOPPLING BY STRONG WIND.
- STAKES SHALL BE INSTALLED ACCORDING TO DETAIL PROVIDED ON PLAN. ANOTHER STAKING/GUYING METHOD MAY BE USED WITH APPROVAL OF OWNER'S REPRESENTATIVE.

HERBACEOUS PLANT INSTALLATION:

- ROOT MASSES SHALL BE MOIST, BUT NOT SATURATED, AT THE TIME OF PLANTING.
- PLANT PITS SHALL BE PREPARED USING A DIBBLE, SPADE OR MECHANICAL AUGER BY OPENING A HOLE AT THE PLANTING SITE. FOR PLANTINGS UNDER EXISTING TREES, PLANTING HOLES SHALL BE HAND-DUG AND LOCATIONS ADJUSTED TO ACCOMMODATE EXISTING TREE ROOTS.
- PLANTS SHALL BE PLACED IN PLANTING PITS IN A VERTICAL POSITION.
- SOIL SHALL BE BACKFILLED INTO PLANT PITS, LIGHTLY COMPRESSED TO ELIMINATE AIR POCKETS, AND FIRMED AROUND THE PLANTS.
- ALL PLANTS SHALL BE WATERED DURING PLANTING TO MINIMIZE AIR POCKETS AND TO ENSURE SOIL CONTACT WITH ROOTS.

MULCHING:

- TWO TO THREE INCHES OF SHREDDED HARDWOOD MULCH SHALL BE APPLIED TO ALL NEWLY PLANTED TREES AND SHRUBS.
- TWO TO THREE INCHES OF HARDWOOD MULCH SHALL BE APPLIED TO UPLAND HERBACEOUS PLANTING AREAS AS SHOWN ON THE PLANTING PLAN.
- MULCH SHALL NOT BE APPLIED TO SWALE, FOREBAY, OR WETLAND PLANTING SHELF AREAS.

MAINTENANCE

DURING CONSTRUCTION PERIOD:

- THE CONTRACTOR SHALL MAINTAIN ALL PLANT MATERIAL THROUGHOUT JOB COMPLETION AND FINAL ACCEPTANCE. ALL PLANT MATERIAL SHALL BE WATERED, WEEDED, MULCHED, PRUNED AND TREATED FOR INSECT DAMAGE, FUNGUS OR DISEASE TO INSURE HEALTHY GROWING CONDITIONS. WATERING SHALL PROVIDE ADEQUATE MOISTURE TO SUPPORT VIGOROUS GROWTH. DURING TIMES OF NORMAL PRECIPITATION, ALL TREES SHALL RECEIVE 1", OR APPROX. 5-10 GALLONS OF WATER PER WEEK. PLANTS IN HEAVIER SOILS SHALL BE MONITORED TO AVOID OVER-WATERING. GATOR BAGS, WATERING TRAYS, IRRIGATION, HAND WATERING, OR OTHER INDUSTRY STANDARD TECHNIQUES SHALL BE EMPLOYED TO MAINTAIN ADEQUATE MOISTURE SUPPLY TO THE PLANT MATERIAL. THE CONTRACTOR SHALL INSTRUCT THE OWNER REGARDING THE REQUIRED AND PROPER ON-GOING MAINTENANCE OF LANDSCAPE MATERIAL.

DURING WARRANTY PERIOD:

- THE CONTRACTOR SHALL VISIT THE SITE PERIODICALLY TO ADVISE OWNER OF ANY DEFICIENT CONDITIONS AFFECTING PLANT SURVIVABILITY. DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED (SEE WARRANTY BELOW).

LANDSCAPE WARRANTIES

FROM THE 2018 TOWN OF EASTON ZONING ORDINANCE:

- PRIOR TO ISSUANCE OF AN OCCUPANCY PERMIT, THE APPROVED PRELIMINARY LANDSCAPE PLAN SHALL BE IMPLEMENTED BY THE APPLICANT. AT COMPLETION, THE APPLICANT SHALL REQUEST THAT THE TOWN INSPECT THE COMPLETE LANDSCAPING AND ISSUE THE APPROPRIATE APPROVAL. THE TOWN RECOGNIZES THAT PLANTING SCHEDULES AND FAVORABLE WEATHER/CLIMATIC CONDITIONS DO NOT ALWAYS COINCIDE. THE APPLICANT SHALL MAKE EVERY REASONABLE EFFORT TO COORDINATE BUILDING AND SITE CONSTRUCTION WITH LANDSCAPE IMPROVEMENT INSTALLATION SO THAT ALL PROJECT CONSTRUCTION CAN BE COMPLETE PRIOR TO REQUEST FOR OCCUPANCY PERMITS. UPON DEMONSTRATING THAT SOME OR ALL OF THE REQUIRED LANDSCAPE IMPROVEMENTS SHOULD BE POSTPONED, AND SUBJECT TO THE APPROVAL OF THE TOWN, THE APPLICANT SHALL POST AN IRREVOCABLE FINANCIAL SURETY EQUAL TO THE ESTIMATED INSTALLATION COSTS AS APPROVED BY THE TOWN, GUARANTEEING THE COMPLETE IMPLEMENTATION OF THE LANDSCAPE PLAN WITHIN 6 MONTHS OF OCCUPANCY OR USE OF THE SITE OR SUBDIVISION. AFTER INSTALLATION IS COMPLETE AND INSPECTED AND APPROVED BY THE TOWN, THE APPLICANT SHALL REQUEST IN WRITING TO THE TOWN TO RELEASE ANY UNUSED PORTION OF THE SURETY.
- THE OWNER/DEVELOPER SHALL MAINTAIN ALL LANDSCAPE IMPROVEMENTS PROVIDING ADEQUATE GROWING CONDITIONS TO INSURE HEALTHY, VIGOROUS PLANT SURVIVAL AND GROWTH. THE TOWN RESERVES THE RIGHT TO PERIODICALLY REVIEW INSTALLED LANDSCAPES AND REPORT ANY SIGNIFICANT DEFICIENCIES TO THE OWNER/DEVELOPER. AT THE END OF TWO GROWING SEASONS, AND/OR AT ANY TIME PRIOR TO, THE TOWN SHALL ASSESS THE LANDSCAPE IMPROVEMENTS AND DIRECT REPLACEMENT OR REVITALIZATION OF ANY DEFICIENT AREAS. THE OWNER SHALL REPAIR OR REPLACE DEFICIENT ITEMS WITHIN 30 CALENDAR DAYS.
- FAILURE TO MAINTAIN, REPAIR OR REPLACE THE REQUIRED AND APPROVED LANDSCAPE IMPROVEMENTS SHALL BE CONSIDERED A VIOLATION OF THIS ORDINANCE AND SHALL BE ENFORCED IN ACCORDANCE WITH SECTION 28 – 1308 OF THE TOWN OF EASTON ZONING ORDINANCE.

MAINTENANCE:

DURING CONSTRUCTION PERIOD:

THE CONTRACTOR SHALL MAINTAIN ALL PLANT MATERIAL THROUGH JOB COMPLETION AND FINAL ACCEPTANCE, ALL PLANT MATERIAL SHALL BE WATERED, WEEDED, MULCHED, PRUNED AND TREATED FOR INSECT DAMAGE, FUNGUS OR DISEASE TO ENSURE HEALTHY GROWING CONDITIONS. WATERING SHALL PROVIDE ADEQUATE MOISTURE TO SUPPORT VIGOROUS GROWTH. TYPICALLY, ALL TREES SHOULD RECEIVE APPROXIMATELY 1", OR 5-10 GALLONS OF WATER PER WEEK. PLANTS IN HEAVIER SOILS SHALL BE MONITORED TO AVOID OVER-WATERING. GATOR BAGS, WATERING TRAYS, IRRIGATION, HAND WATERING, OR OTHER INDUSTRY STANDARD TECHNIQUES SHALL BE EMPLOYED TO MAINTAIN ADEQUATE MOISTURE SUPPLY TO THE PLANT MATERIAL. INSTRUCT OWNER REGARDING REQUIRED AND PROPER ON-GOING MAINTENANCE OF LANDSCAPE INSTALLATION.

PLANT LIST:

SYMBOL	QUAN	SCIENTIFIC NAME	COMMON NAME	SPECIFICATION
CANOPY TREES				
QP	24	QUERCUS PHELLOS	WILLOW OAK	2" CALIPER, MIN
EVERGREEN TREES				
IO	20	ILEX OPACA	AMERICAN HOLLY	7' HEIGHT, MIN
SHRUB/TREE				
IG	50	ILEX GLABRA	INKBERRY	18" HEIGHT, MIN

NOTE:

PLANTS CAN BE OR EQUAL AS APPROVED BY ENGINEER. PLANTS MUST BE NATIVE SPECIES PER "TALBOT COUNTY BUFFER MANAGEMENT PLAN GUIDELINES & PLANT LIST"

LANDSCAPE REQUIREMENTS SUMMARY PER ZONING ORDINANCE:

SECTION 1014.7:

- BUFFERYARD "C": 20' WIDE, 1 PLANT UNIT/50' OF PROPERTY (480/50) = 10 PLANTING UNITS = 10 CANOPY TREES, 20 EVERGREEN TREES, 50 LARGE SHRUBS

SECTION 1014.6.B:

- OVERALL TREES: 3 TREES*RESIDENTIAL UNIT (3*8) = 24 TREES REQUIRED
 - STREET TREES: 1 TREE/25' OF STREET CENTERLINE LENGTH (480/25) = 20 TREES
 - PARKING LOTS 1 TREE/ 5 SPACES LOCATED WITHIN PARKING INTERIOR = 8 TREES

MARYLAND ESD REGULATIONS RECOMMEND NO TREES/SHRUBS ALONG ANY PORTION OF PERMEABLE PAVEMENT IN ORDER TO PREVENT THE DISRUPTION OF THE POROSITY OF THE PAVEMENT

- TOTAL CANOPY TREES REQUIRED (24 OVERALL TREES) = 24 CANOPY TREES
- TOTAL CANOPY TREES PROVIDED = 22 PRSD CANOPY TREES; 2 EXST CANOPY TREES = 24 TOTAL CANOPY TREES
- TOTAL EVERGREEN TREES REQUIRED = 20 EVERGREEN TREES
- TOTAL EVERGREEN TREES PROVIDED = 20 EVERGREEN TREES
- TOTAL LARGE SHRUBS REQUIRED = 50 LARGE SHRUBS
- TOTAL LARGE SHRUBS PROVIDED = 50 LARGE SHRUBS

NOTE:

PER CODE SECTION 28.1014.6.B.d OVERALL APPEARANCE/SCREENING OF THE PROJECT IS BETTER SERVED USING MAX TREES = OVERALL TREES OR 24 TREES. MORE TREES PRESENT ISSUES TO DRAINAGE OF THE SITE AND APPEARANCE OF RESIDENTIAL AREA.

LANDSCAPING NOTES:

- LANDSCAPE INSTALLER SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCING WORK. INSTALLER SHALL ENSURE THAT FINAL GRADES HAVE BEEN ESTABLISHED AND THE SITE IS READY FOR LANDSCAPE INSTALLATION.
- LANDSCAPE INSTALLER SHALL MAINTAIN THE LANDSCAPE IMPROVEMENT AREAS IN A CLEAN CONDITION, REMOVING DEBRIS DAILY AND AT THE COMPLETION OF THE INSTALLATION.
- INSTALLER SHALL LAYOUT ALL BEDS AND POSITION PLANTS PER THE PLANS. ADJUST AS REQUIRED FOR FIELD CONDITIONS. REPORT SIGNIFICANT ADJUSTMENTS TO THE OWNER FOR APPROVAL PRIOR TO PLANT INSTALLATION. ALL BED AREAS SHALL BE SPRAYED WITH HERBICIDE AS NEEDED TO KILL AND/OR REMOVE ALL WEED OR GRASS VEGETATION.
- EXCEPT FOR TREE SPADE INSTALLATIONS, ALL TREE PITS SHALL BE EXCAVATED TO A DEPTH SO THAT THE ROOT BALL WILL REST ON SOLID SOIL AT THE PROPER HEIGHT. STREET TREES PLANTING PITS SHALL BE EXCAVATED AND WORKED IN A RECTANGULAR FORM WITH THE SMALL DIMENSION TWICE THE DIAMETER OF THE ROOT BALL AND THE LARGE DIMENSION AT LEAST THREE TIMES THE DIAMETER OF THE ROOT BALL. OPEN AREA TREE PITS SHALL BE EXCAVATED TO A MINIMUM DIMENSION OF TWICE THE ROOTBALL WIDTH. TREES PLANTED ON SLOPES OR SIDE SWALES SHALL BE INSTALLED AT A HEIGHT RELATING TO THE UPHILL SIDE OF THE PIT, AND MOUNDED WITH SOIL AROUND THE LOWER SIDE. ALL SIDES AND BOTTOM OF TREE PLANTING PITS SHALL BE SCARIFIED OR LOOSENED TO PERMIT ROOT GROWTH. EXCAVATED SOILS THAT HAVE BEEN PREVIOUSLY UNDISTURBED SHALL BE LOOSENED AND UTILIZED FOR BACKFILL. COMPACTED SOILS THAT CANNOT BE RESTORED TO A REASONABLE PLANTING SOIL SHALL BE REMOVED AND REPLACED WITH FRIABLE NATIVE SOILS FROM THE REGION.
- ALL SHRUB PLANTING PITS, LANDSCAPE BEDS AND PLANTING MASS AREAS SHALL BE WORKED TOWN OF EASTON 2018 EDITION ZONING ORDINANCE ARTICLE X 10-62 TO A DEPTH OF 12" (OR RAISED SLIGHTLY TO ACHIEVE A 12" FRIABLE SOIL DEPTH). SHRUB PLANTING AREAS SHALL BE WORKED TO 12" MINIMUM OUTSIDE THE ROOT BALL.
- ALL LANDSCAPE BEDS SHALL BE "V" EDGED AND MULCHED WITH MINIMUM 3" DOUBLE SHREDDED HARDWOOD BARK MULCH, OR APPROVED EQUAL. MULCH TO FENCE LINES OR BACK OF CURBS WHERE APPROPRIATE TO ELIMINATE NARROW GRASS AREAS. AVOID MULCH PILED AGAINST TREE TRUNKS, ETC.
- ALL TREES TO BE STAKED AND GUYED WITH HARDWOOD STAKES, MINIMUM OF TWO (2) - 5' LONG, OR OTHER APPROVED GUYING SYSTEM. STAKES SHALL BE DRIVEN INTO STABLE SOILS. PROVIDE WIRE GUYS WITH RUBBER PROTECTANT OR OTHER APPROVED INDUSTRY PRACTICE.
- LANDSCAPE INSTALLER SHALL MAINTAIN ALL PLANT MATERIALS THROUGH THE COMPLETION OF THE LANDSCAPE INSTALLATION, AND THEN AS REQUIRED BY THE OWNER.
- AT THE COMPLETION OF THE LANDSCAPE INSTALLATION (OR BY PHASED COMPLETION IF PROVIDED FOR ON THE PLAN), THE OWNER, OR HIS DESIGNATED REPRESENTATIVE SHALL REQUEST AN INSPECTION BY TOWN OF EASTON.

APPROVAL
Paul Van Engle
TOWN ENGINEER
DATE: 1/2020
ISSUED: JANUARY 2020

TOWN OF EASTON
STANDARD DETAILS

TREE PLANTING
STANDARD NO.: TOE-R-2.01

CONTAINER TREE & SHRUB PLANTING DETAIL

\\192.168.0.50\PROJECT\NAMA\ENGINEERING\PHASE 2 - PRODUCTION\PLANS\DWG

LANDSCAPING NOTES & DETAILS

FOR
NAIMA - PHASE 2
INFRASTRUCTURE IMPROVEMENT PLANS

TAX MAP 0104, GRID 000EA

ELECTION DISTRICT 01-001, TALBOT COUNTY, MARYLAND
PREPARED FOR NAIMA VENTURES, LLC

RAUCH
INC.

engineering design &
development services

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Virginia Office: 8229 Boone Blvd., Suite 625 - Vienna, VA 22182

REVISIONS

REV. #	DATE	DESCRIPTION

DATE: 03/03/2021

SCALE: N/A

DRAWN BY: BBF

DESIGNED BY: BBF

APPROVED BY:

SHEET NO.: C-505.01

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

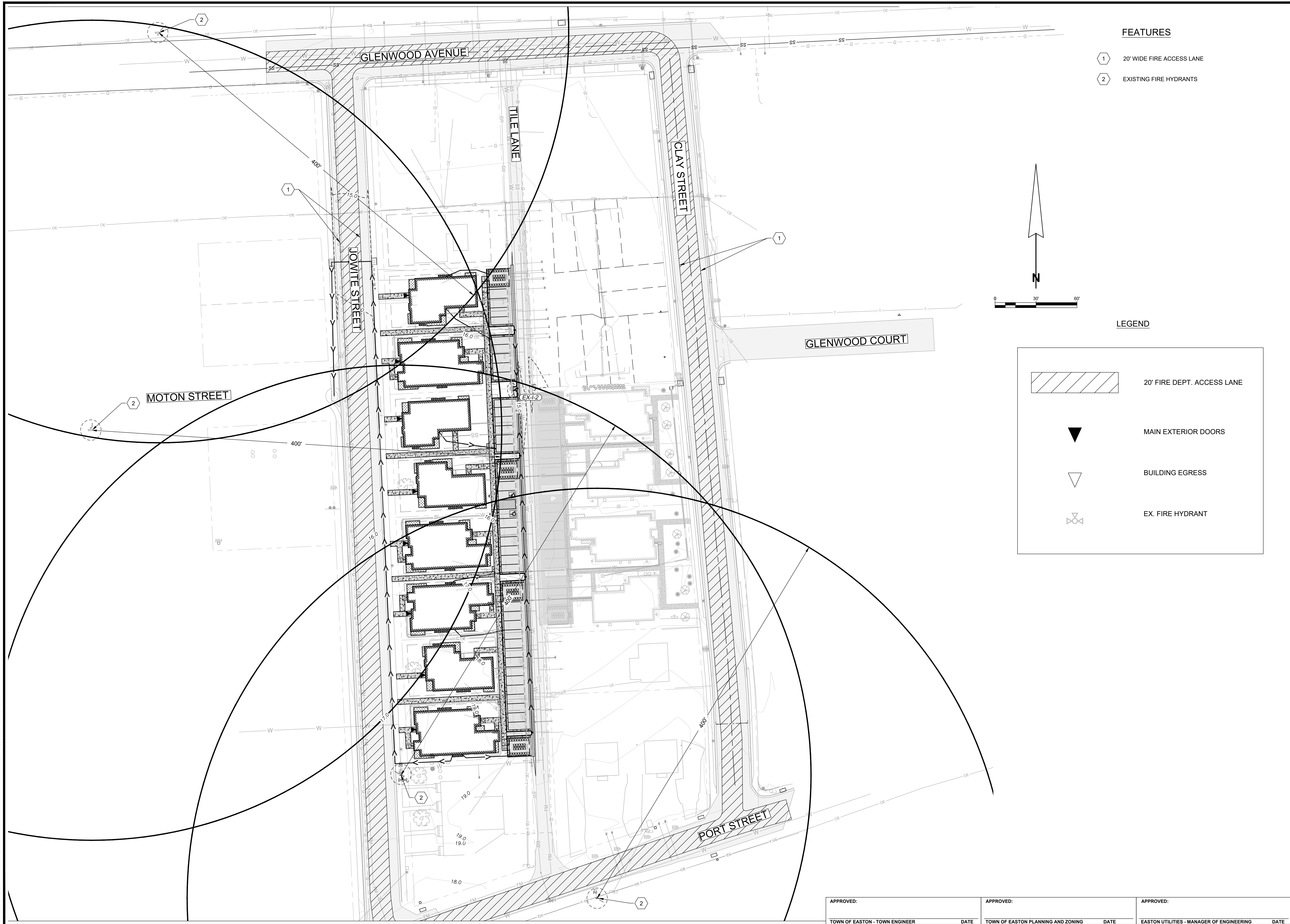
TOWN OF EASTON PLANNING AND ZONING

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE







EAST ELEVATION



NORTH ELEVATION

1 EXTERIOR ELEVATIONS - BUILDING TYPE 1

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372
FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND
PREPARED FOR DERICK DALY

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Virginia Office: 8229 Boone Blvd. Suite 625 • Vienna, VA 22182

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EXPIRATION DATE 01/19/2022.

[illegible]

DATE: 03/03/2021

SCALE: AS SHOWN

DRAWN BY: PR

DESIGNED BY:

SHEET TITLE:

ELEVATIONS
BUILDING TYPE 1

SHEET NO.:

A-201



WEST ELEVATION



SOUTH ELEVATION

1 EXTERIOR ELEVATIONS - BUILDING TYPE 1

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372
FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND
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[illegible]

DATE: 03/03/2021

SCALE: AS SHOWN

DRAWN BY: PR

DESIGNED BY:

SHEET TITLE:

ELEVATIONS
BUILDING TYPE 1

SHEET NO.:

A-202



EAST ELEVATION



NORTH ELEVATION

1 EXTERIOR ELEVATIONS - BUILDING TYPE 2

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372
FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND
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[illegible]

DATE: 03/03/2021

SCALE: AS SHOWN

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DESIGNED BY:
PR

SHEET TITLE: ELEVATIONS

ELEVATIONS
BUILDING TY

SHEET NO.:

A-203



WEST ELEVATION



SOUTH ELEVATION

1

EXTERIOR ELEVATIONS - BUILDING TYPE 2

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372
FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND
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EXPIRATION DATE 01/19/2022.

[illegible]

DATE: 03/03/2021

SCALE: AS SHOWN

DRAWN BY: PR

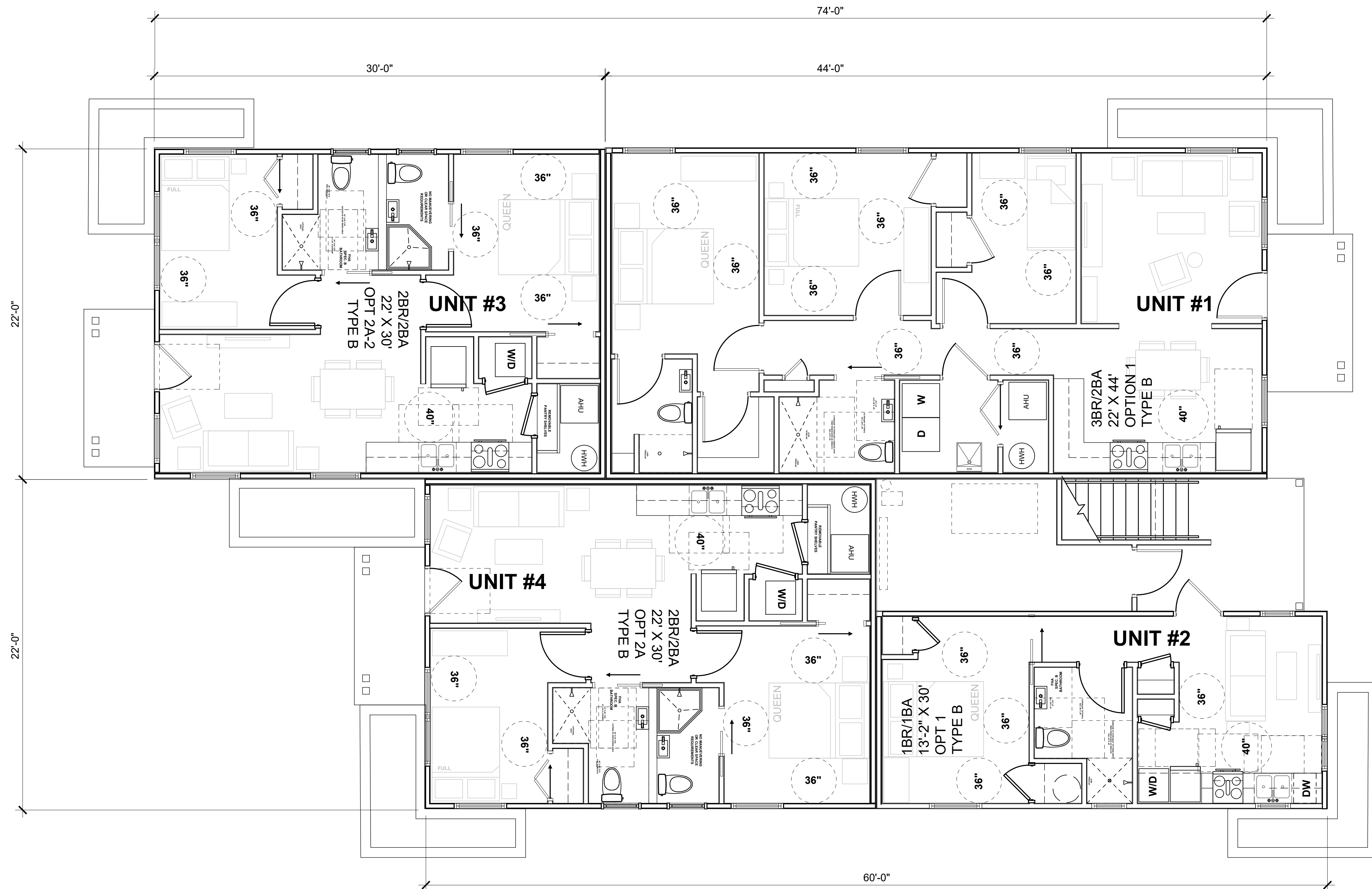
DESIGNED BY:

PR

SHEET TITLE:
ELEVATIONS

BUILDING TYPE

A-204



1 FIRST FLOOR PLAN - BUILDING TYPE ONE

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372

FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND

PREPARED FOR DERICK DALY



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[illegible]

DATE: 03/03/2021

SCALE: AS SHOWN

DRAWN BY: PR

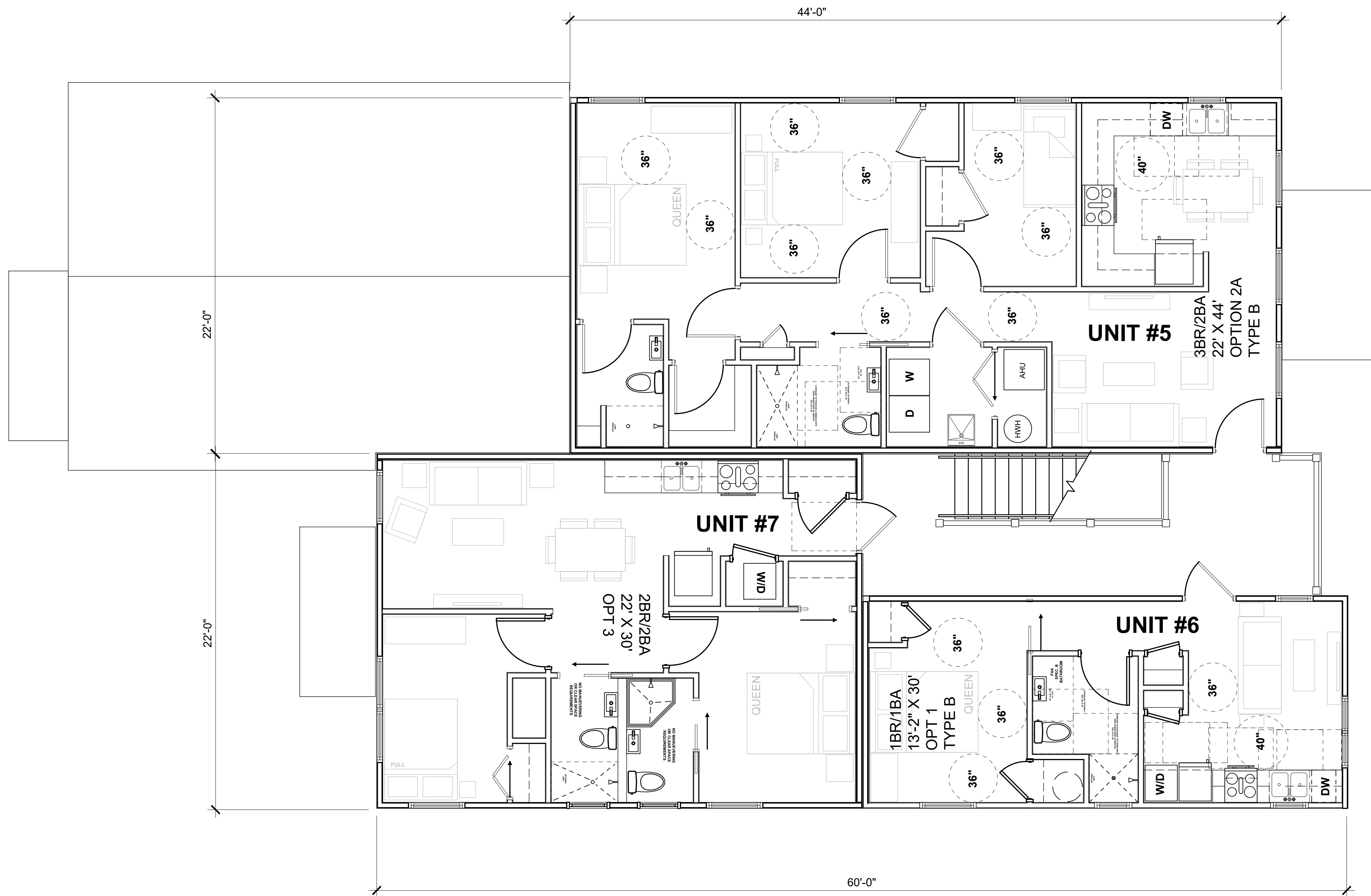
DESIGNED BY:

SHEET TITLE:

FLOOR PLANS
BUILDING TYPE ONE

SHEET NO.:

A-101



1

SECOND FLOOR PLAN - BUILDING TYPE ONE

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372

FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND

PREPARED FOR DERICK DALY

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[illegible]

DATE: 03/03/2021

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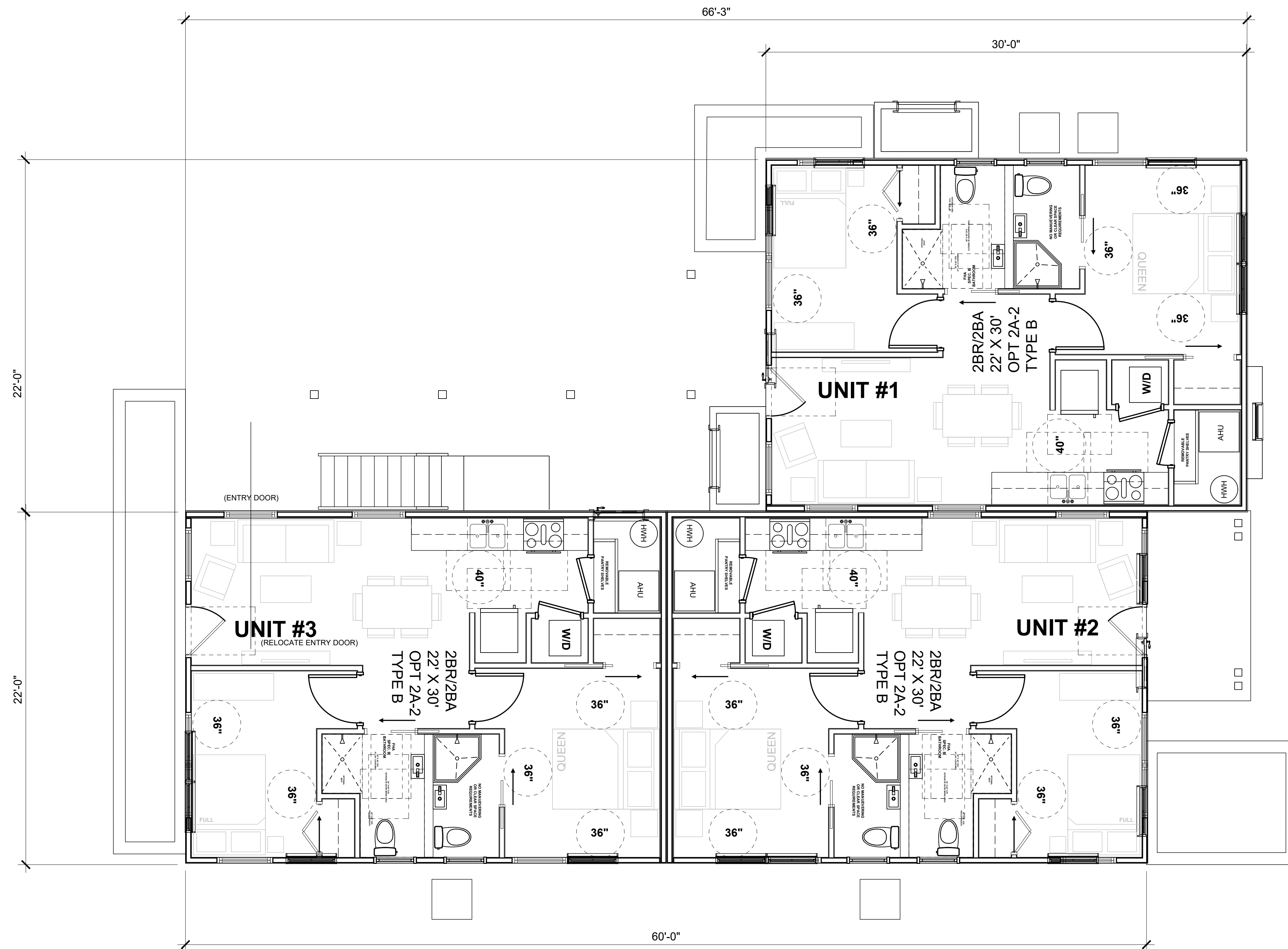
DESIGNED BY:

SHEET TITLE:

FLOOR PLANS
BUILDING TYPE ONE

SHEET NO.:

A-102



1 FIRST FLOOR PLAN - BUILDING TYPE TWO

Scale: 1/4" = 1'-0"

DRAWINGS

FOR

NAIMA VENTURES, LLC

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FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND
PREPARED FOR DERICK DALY

PREPARED FOR DERICK DALY



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EXPIRATION DATE 01/19/2022.

[illegible]

DATE: 03/03/2021

SCALE: AS SHOWN

DRAWN BY: PR

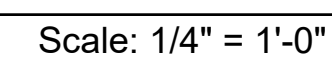
DESIGNED BY:

SHEET TITLE:

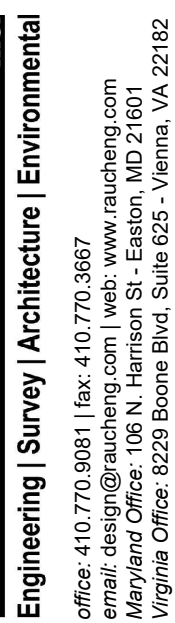
FLOOR PLANS
BUILDING TYPE TWO

SHEET NO.:

A-103



TAX MAP 104, GRID 0, PARCEL 1369, 1382, 1370, 1381, 1371, 1372
FOURTH ELECTION DISTRICT, CAROLINE COUNTY, MARYLAND
PREPARED FOR DERICK DALY



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EXPIRATION DATE 01/19/2022.

A-104



**SITE DEVELOPMENT
STORMWATER MANAGEMENT ANALYSIS
FOR
NAIMA PHASE 2 INFRASTRUCTURE PLANS
EASTON, MD 21601**

**PREPARED FOR
NAIMA VENTURES, LLC
29760 STANDISH STREET
EASTON, MD 21601**

**PREPARED BY
RAUCH, INC
106 N. HARRISON STREET
EASTON, MD 21601**

FEBRUARY 22, 2023



PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENCED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

2/22/2023

ROBERT D. RAUCH, LICENCE NO. 11024
EXPIRATION DATE 7/24/2024

DATE



Section 1 – Narrative



Site Development Stormwater Management Narrative

The proposed Naima Ventures Phase 2 development is located on 1.464 acres of land that is currently platted as 4 individual parcels, zoned R-7A. There are 0.398 acres of existing impervious surfaces on the lot. 91% of the existing soils are hydrologic Soil Type "C" and 9% of the existing soils are hydrologic soil Type "D". The proposed site plan will require disturbance of all 1.464 acres of the parcel area as well as a small portion of Tile Lane for the installation of a proposed valley gutter. The total disturbance for the project is 1.520 acres.

The proposed development plan will create 0.728 acres of impervious surfaces including rooftops, valley gutter, and sidewalks. Eight, Two-Story Dwellings will be constructed on the four parcels. There will be four, 7-unit dwellings and four, 6-unit dwellings. The proposed parking will be permeable pavement and therefore not counted as an impervious surface.

ESD to the MEP will be met through a combination of 36 planter boxes and 9,105 SF of permeable pavement. The outfall of 20 of these planter boxes will daylight through the curb and into the permeable pavement for secondary treatment. A 4" perforated PVC overflow pipe will be installed in the stone portion of the permeable pavement and connect into the existing yard inlet (EX-I-2) to assist with drainage. The remaining overflow will spill into the proposed valley gutter and drain into the rim of the existing yard inlet (EX-I-2). The remaining 16 outfalls of the planter boxes will enter a proposed storm drain network which will discharge into an proposed storm drain manhole. The connections will be made with watertight wye fittings. The outfalls of both existing structure EX-I-2 and proposed structure SDMH-1 will ultimately share a common discharge point into an existing manhole (STMH 20201) to the West of Jowite. This manhole is our Study Point for the quantity analysis of this project (SP-1). The peak flow of from the 2-year and 10-year storms from the proposed conditions at SP-1 will be less than or equal to existing condition peak flows from the same storm events. All BMP's will be designed to ensure that no flooding will occur during the 100-year storm event. See the attached table comparing the existing and proposed flows.

The attached tables confirm that ESD to the MEP table will be achieved through the implementation of the proposed BMPs and stormwater will be hydraulically handled within the finished site so that peak flows during storm events will be less than the existing conditions peak flows.

Quality Tables:

6-Unit Complex											
Planter Box #	Planter Box Surface Area (SF)	Rooftop Area (SF)	Impervious Area (%)	Total Drainage Area (SF)	Runoff Curve Number	Maryland Grid Coordinate (NAD 83, Northing)	Maryland Grid Coordinate (NAD 83, Easting)	Target P.E. (IN.) (site)	Actual P.E. (IN.) (site)	Target ESDv (FT. ³)	Actual ESDv (FT. ³)
19	55.0	741	93.1	796	97	404081.2772'	1573711.5757'	1.80	1.80	42.0	121.0
20	30.0	333	91.7	363	97	404091.7369'	1573770.8382'	1.80	1.80	19.0	66.0
21	20.0	199	90.9	219	97	404042.1028'	1573715.1585'	1.80	1.80	11.0	43.0
22	80.0	1136	93.4	1216	97	404046.3420'	1573741.5053'	1.80	1.80	64.0	176.0
28	55.0	741	93.1	796	97	403961.5089'	1573704.8881'	1.80	1.80	42.0	121.0
29	30.0	333	91.7	363	97	403971.1773'	1573762.4939'	1.80	1.80	19.0	66.0
30	20.0	199	90.9	219	97	403921.7478'	1573708.5262'	1.80	1.80	11.0	43.0
31	80.0	1136	93.4	1216	97	403924.6484'	1573735.0964'	1.80	1.80	64.0	176.0
32	20.0	199	90.9	219	97	403908.4791'	1573720.5040'	1.80	1.80	11.0	43.0
33	80.0	1136	93.4	1216	97	403909.2973'	1573748.4138'	1.80	1.80	64.0	176.0
34	55.0	741	93.1	796	97	403870.0653'	1573720.8004'	1.80	1.80	42.0	121.0
35	30.0	333	91.7	363	97	403864.6344'	1573777.6129'	1.80	1.80	19.0	66.0
46	20.0	199	90.9	219	97	403729.9716'	1573729.2186'	1.80	1.80	11.0	43.0
47	80.0	1136	93.4	1216	97	403730.1204'	1573755.4910'	1.80	1.80	64.0	176.0
48	55.0	741	93.1	796	97	403690.2117'	1573728.1031'	1.80	1.80	42.0	121.0
49	30.0	333	91.7	363	97	403685.6750'	1573786.4532'	1.80	1.80	19.0	66.0

7-Unit Complex											
Planter Box #	Planter Box Surface Area (SF)	Rooftop Area (SF)	Impervious Area (%)	Total Drainage Area (SF)	Runoff Curve Number	Maryland Grid Coordinate (NAD 83, Northing)	Maryland Grid Coordinate (NAD 83, Easting)	Target P.E. (IN.)	Actual P.E. (IN.)	Target ESDv (FT. ³)	Actual ESDv (FT. ³)
23	50.0	648	92.8	698	97	404026.8260'	1573703.9065'	1.80	1.80	37	110.0
24	40.0	547	93.2	587	97	404027.8672'	1573758.8330'	1.80	1.80	31	88.0
25	40.0	550	93.2	590	97	404008.5798'	1573762.2664'	1.80	1.80	31	88.0
26	70.0	1025	93.6	1095	97	403982.0568'	1573700.5829'	1.80	1.80	57	154.0
27	30.0	322	91.5	352	97	403992.0377'	1573778.5777'	1.80	1.80	18	66.0
36	50.0	648	92.8	698	97	403848.2226'	1573712.1768'	1.80	1.80	37	110.0
37	40.0	547	93.2	587	97	403849.8588'	1573766.8800'	1.80	1.80	31	88.0
38	40.0	550	93.2	590	97	403830.5962'	1573770.0058'	1.80	1.80	31	88.0
39	70.0	1025	93.6	1095	97	403802.5949'	1573709.8764'	1.80	1.80	57	154.0
40	30.0	322	91.5	352	97	403813.0814'	1573786.4609'	1.80	1.80	18	66.0
41	70.0	1025	93.6	1095	97	403787.4578'	1573710.1707'	1.80	1.80	57	154.0
42	30.0	322	91.5	352	97	403786.6397'	1573787.4994'	1.80	1.80	18	66.0
43	40.0	550	93.2	590	97	403765.9380'	1573772.6876'	1.80	1.80	31	88.0
44	50.0	648	92.8	698	97	403741.7668'	1573717.4634'	1.80	1.80	37	110.0
45	40.0	547	93.2	587	97	403745.8573'	1573771.4223'	1.80	1.80	31	88.0
50	50.0	648	92.8	698	97	403666.9547'	1573718.2061'	1.80	1.80	37	110.0
51	40.0	547	93.2	587	97	403668.7397'	1573773.9512'	1.80	1.80	31	88.0
52	40.0	550	93.2	590	97	403648.8078'	1573777.0771'	1.80	1.80	31	88.0
53	70.0	1025	93.6	1095	97	403623.8441'	1573717.2444'	1.80	1.80	57	154.0
54	30.0	322	91.5	352	97	403630.3145'	1573794.5731'	1.80	1.80	18	66.0

Permeable Pavement										
Name	Permeable Pavement Surface Area (SF)	Impervious Area (%)	Total Drainage Area (SF)	Runoff Curve Number	Maryland Grid Coordinate (NAD 83, Northing)	Maryland Grid Coordinate (NAD 83, Easting)	Target P.E. (IN.)	Actual P.E. (IN.)	Target ESDv (FT. ³)	Actual ESDv (FT. ³)
PA #2	1172	75.6	3000	92	404067.1155'	1573799.5958'	1.8	0.86	329	157
PA #3	903	54.7	4390	87	404009.6556'	1573801.0577'	1.8	0.61	357	121
PA #4	1097	57.3	4540	88	403940.9959'	1573804.9561'	1.8	0.69	385	147
PA #5	2333	73.8	6269	92	403853.6221'	1573808.3847'	1.8	0.84	672	313
PA #6	3085	73.6	8366	92	403717.6621'	1573813.2639'	1.8	0.83	894	413
PA #7	387	70.9	1133	91	403631.2980'	1573817.6562'	1.8	0.8	117	52

Quantity Table:

STORM	2-YR	10-YR	100-YR
EXISTING	3.33	6.04	9.32
PROPOSED	2.83	4.61	6.24
DELTA	-0.5	-1.43	-3.08

Section 2 – ESD Calculation Spreadsheets

Project Name:	Naima - Phase 2						
Date:	16-Jan-23						
	data input cells						
	calculation cells						
Step 1: Complete ESD Implementation Checklist							
<i>Check all of the Following ESD Practices That Were Implemented at Site</i>			<i>Yes - No - N/A</i>				
Environmental Mapping Was Conducted at Site Prior to Layout			YES				
Natural Areas Were Conserved (e.g., forests, wetlands, steep slopes, floodplains)			YES				
Stream, Wetland and Shoreline Buffers Were Reserved			YES				
Disturbance of Permeable Soils Was Minimized			YES				
Natural Flow Paths Were Maintained Across the Site			YES				
Building Layout Was Fingerprinted to Reduce Clearing and Grading at Site			YES				
Site Grading Promoted Sheetflow From Impervious Areas to Pervious Ones			YES				
Site Design Was Evaluated to Reduce Creation of Needless Impervious Cover			YES				
Site Design Was Evaluated to Maximize Disconnection of Impervious Cover			YES				
Site Design Was Evaluated to Identify Potential Hotspot Generating Area for Stormwater Treatment			YES				
Erosion and Sediment Control Practices and Post Construction Stormwater Management Practices Were Integrated into a Comprehensive Plan			YES				
Tree Planting Was Used at the Site to Convert Turf Areas into Forest			YES				
Step 2: Calculate Site Imperviousness and Water Quality Volume, WQv (for redevelopment)							
defined as A single tract, lot, parcel of land or combination of tracts, lots parcels of land that are in one ownership or are contiguous and in diverse ownership where development is to be performed as part of a unit, subdivision or project. See page 5.117 in the design handbook. This means that a project may be classed as redevelopment even if the LOD is less than 40% impervious							
Total SITE Area, A (acres or sq-ft)	1.323						
Existing SITE Impervious Area (acres or sq-ft)	0.398						
SITE percent impervious	30%						
Development Category (for ESD)	New Development						
LOD Area, A (acres)	1.52						
Existing LOD Impervious Surface Area (acres)	0.45						
Proposed LOD Impervious Surface Area (acres)	0.73						
Rainfall Depth, P (in)	1.0						
Existing LOD Imperviousness, I _{pre}	30%						
Proposed LOD Imperviousness, I _{post}	48%						
<i>Water Quality Calculation for Redevelopment Only</i>							
Required Treatment Area (acres)	0.000						
Runoff Coefficient, Rv	0.95						

Water Quality Volume, WQv (cf)	0							
Step 4: Calculate Environmental Site Design (ESD) Rainfall Target, P _E								
% Soil Type A	0%		RCN Soil Type A	67.75				
% Soil Type B	0%		RCN Soil Type B	79.17				
% Soil Type C	91%		RCN Soil Type C	85.58				
% Soil Type D	9%		RCN Soil Type D	88.58				
Target Pre-Developed Condition, RCN _{woods}	70.61595	Post-Developed Condition, RCN	85.85					
Soil Type A ESD Rainfall Target, P _E (in)	0.00							
Soil Type B ESD Rainfall Target, P _E (in)	0.00							
Soil Type C ESD Rainfall Target, P _E (in)	1.80							
Soil Type D ESD Rainfall Target, P _E (in)	1.80		Runoff depths for H and H analysis					
	1yr		2yr	10yr	100yr			
Maximum P _E (in)	2.7		3.4	5.3	7.6			
Site ESD Rainfall Target, P _E (in)		1.80						
ESD Runoff Depth, Q _E (in)		0.87						
ESD Runoff Volume, ESDv (cf)		4,779						
Total Treatment Volume (cf)		4,779						

Step 5: Select Nonstructural Practices to Treat the ESD Rainfall Target							
Step 6: Select Micro-Scale Practices to Treat the ESD Rainfall Target							
Micro-Scale Practices	P _E Credit Description	Contributing Drainage Area (sf)	Direct ESDv Received by Practice (cf)	WQv or ESDv from Up- Gradient Practices (cf)	WQv or ESDv credit (cf)	Runoff Volume Remaining (cf)	
Pemeable Pavement (C Soils)	ESDv credit is based on subbase thickness	27,698	3,957	N/A	1,203	2,754	
Micro-Bioretenention 1	ESDv credit is based on design storage volume	22,994	4,915	4915	3,652	1,263	

Step 7: Check for ESDv to MEP compliance and Revise Site If Necessary								
	Drainage Area Treated (sf)	50,692			WQv or ESDv Treated (cf) using ESD practices	4,855		
					P _E achieved (inches)	1.83		
					Entire ESDv Treated Through ESD Practices?	YES		
					ESDv Remaining? (cf)	0		
					If ESDV is not fully treated, is ESD to MEP achieved?	YES		
					Redevelopment WQv Requirements Met Through ESD Practices?	N/A		
<i>New Development Water Quality Volume Requirements</i>					WQv Remaining? (cf)	0		
Required Treatment Area (acres)	1.52							
Runoff Coefficient, Rv	0.48							
Water Quality Volume, WQv (cf)	2,655				New Development WQv Requirements Met Through ESD Practices?	YES		
					WQv Remaining? (cf)	0		

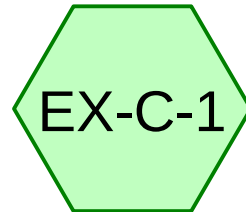
M-6

	Direct drainage				Indirect drainage		Total catchment area ----- Total ESDv to practice	Practice Specific Parameter(s)			Bed area % of direct catchment area	WQV or ESDv provided (cf)	Runoff Volume Remaining (cf)	Down-Gradient Practice and Row	SOIL TYPE
	Contributing Drainage Area (sf)	% Impervious Cover ----- RV	To fully treat sub area ----- PE required ----- WQV required	Max available WQV or ESDv from CDA (cf)	Area of upstream catchment (sf)	WQV or ESDv from Up-Gradient Practices (cf)									
Micro-Scale Practices		100%	1.80				22,994	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)					
Planter Boxes	22,994	0.95	3277	4,915	0	0	4915	1,660	1	3	7.2%	3,652	1,263		C/D
Total	22,994			4,915		0						3,652	1,263		

A-2

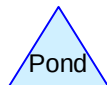
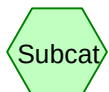
A-2	Direct drainage								
	Contributing Drainage Area (sf)	% Impervious Cover ----- RV	To fully treat sub area ----- PE required ----- WQV required	Max available WQv or ESDv from CDA (cf)	Practice Specific Parameter(s)		WQV or ESDv provided (cf)	Runoff Volume Remainin g (cf)	Down-Gradient Practice and Row
Micro-Scale Practices		65%	1.80	3,957	Pavement Area (sf)	Subbase Thickness (in)	1,203	2,754	
Pemeable Pavement (C Soils)	27,698	0.635	2638		8977	9			
Total	27,698								

Section 3 – Pre-Development Quantity Calculations



SDMH 20201 - At
Intersection of Jowite
and Moton

Existing Catchment for
Phase 2 LOD



Routing Diagram for Naima - Phase 2 - Existing HydroCAD
Prepared by RAUCH inc., Printed 02/22/23
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Naima - Phase 2 - Existing HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

Prepared by RAUCH inc.

Printed 02/22/23

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-C-1: Existing Catchment for Runoff Area=65,850 sf 29.48% Impervious Runoff Depth=2.09"
Flow Length=730' Tc=11.0 min CN=87 Runoff=3.33 cfs 0.264 af

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow=3.33 cfs 0.264 af

Primary=3.33 cfs 0.264 af

Total Runoff Area = 1.512 ac Runoff Volume = 0.264 af Average Runoff Depth = 2.09"
70.52% Pervious = 1.066 ac 29.48% Impervious = 0.446 ac

Naima - Phase 2 - Existing HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment EX-C-1: Existing Catchment for Phase 2 LOD

Runoff = 3.33 cfs @ 12.04 hrs, Volume= 0.264 af, Depth= 2.09"

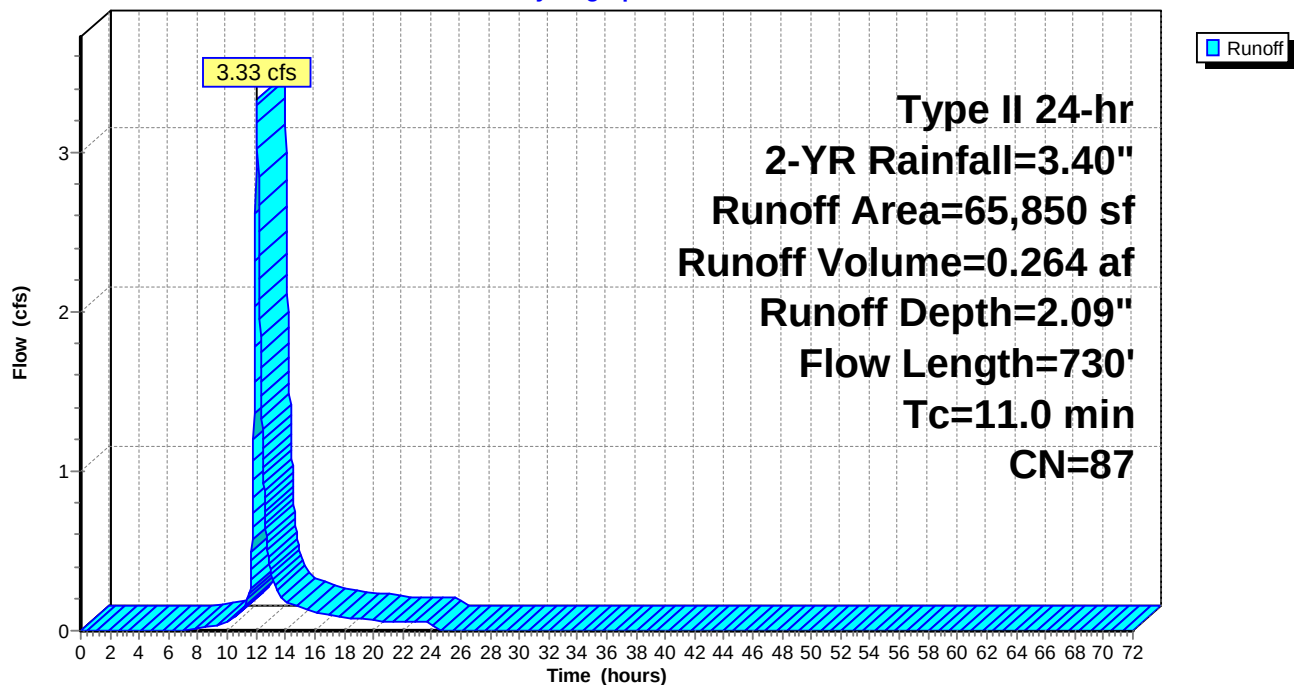
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,814	98	Paved parking, HSG D
17,598	98	Paved parking, HSG C
4,012	86	Woods/grass comb., Poor, HSG D
42,426	82	Woods/grass comb., Poor, HSG C
65,850	87	Weighted Average
46,438		70.52% Pervious Area
19,412		29.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0429	0.22		Sheet Flow, Yard Grass: Short n= 0.150 P2= 3.40"
5.6	496	0.0053	1.48		Shallow Concentrated Flow, Jowite Gutter Pan Paved Kv= 20.3 fps
0.5	170	0.0087	5.80	7.12	Pipe Channel, Pipe from CI on West Side of Jowite to SDMH-20201 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
11.0	730	Total			

Subcatchment EX-C-1: Existing Catchment for Phase 2 LOD

Hydrograph

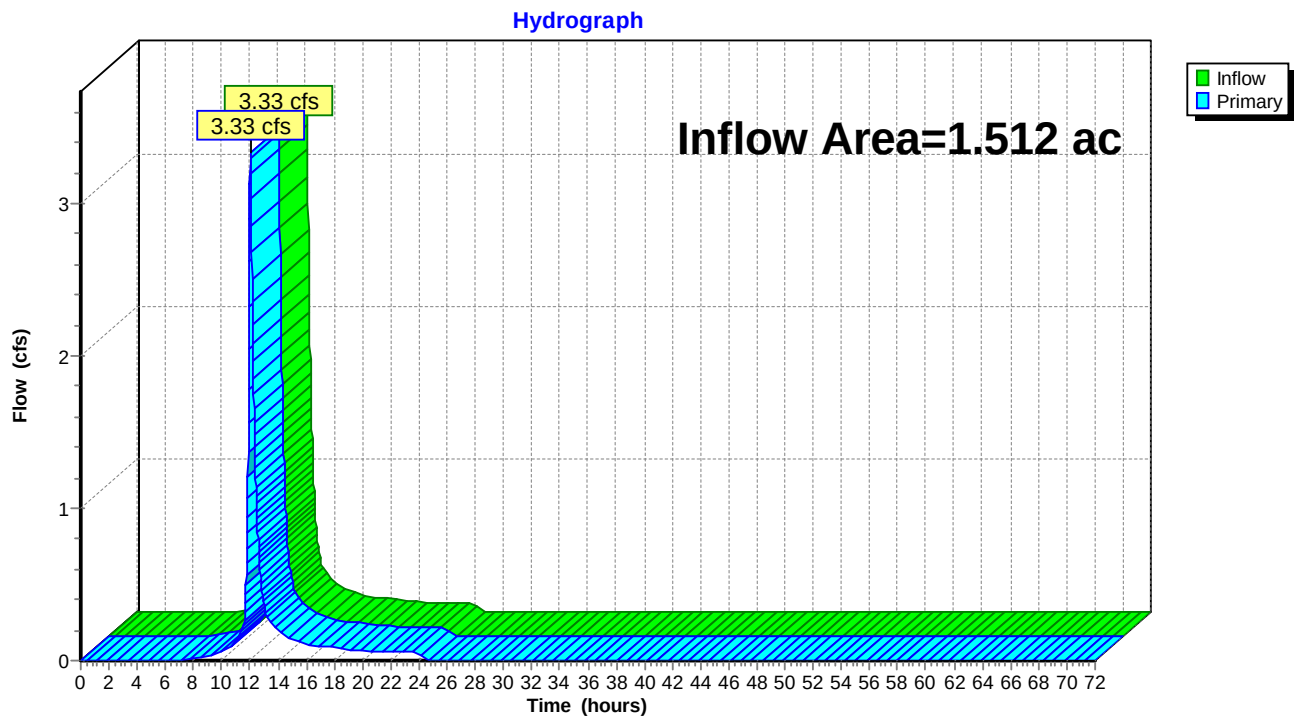


Summary for Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow Area = 1.512 ac, 29.48% Impervious, Inflow Depth = 2.09" for 2-YR event
 Inflow = 3.33 cfs @ 12.04 hrs, Volume= 0.264 af
 Primary = 3.33 cfs @ 12.04 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton



Naima - Phase 2 - Existing HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-C-1: Existing Catchment for Runoff Area=65,850 sf 29.48% Impervious Runoff Depth=3.85"
Flow Length=730' Tc=11.0 min CN=87 Runoff=6.04 cfs 0.485 af

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow=6.04 cfs 0.485 af

Primary=6.04 cfs 0.485 af

Total Runoff Area = 1.512 ac Runoff Volume = 0.485 af Average Runoff Depth = 3.85"
70.52% Pervious = 1.066 ac 29.48% Impervious = 0.446 ac

Naima - Phase 2 - Existing HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment EX-C-1: Existing Catchment for Phase 2 LOD

Runoff = 6.04 cfs @ 12.04 hrs, Volume= 0.485 af, Depth= 3.85"

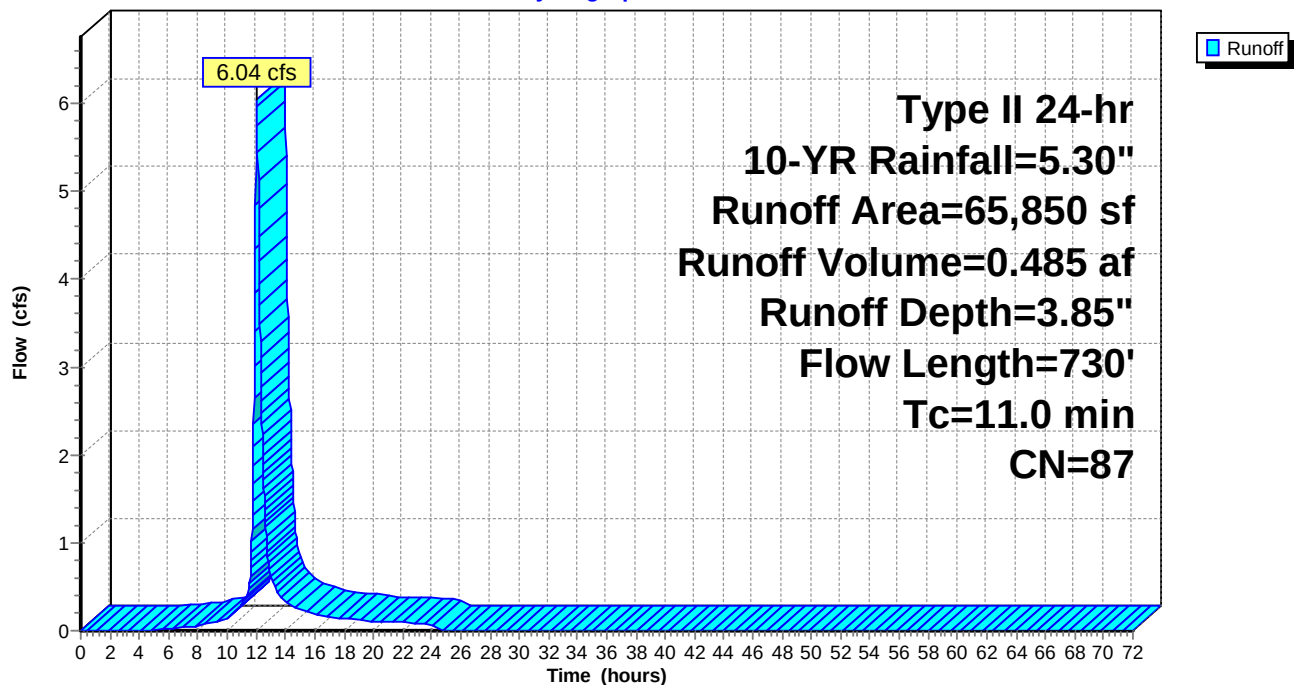
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,814	98	Paved parking, HSG D
17,598	98	Paved parking, HSG C
4,012	86	Woods/grass comb., Poor, HSG D
42,426	82	Woods/grass comb., Poor, HSG C
65,850	87	Weighted Average
46,438		70.52% Pervious Area
19,412		29.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0429	0.22		Sheet Flow, Yard Grass: Short n= 0.150 P2= 3.40"
5.6	496	0.0053	1.48		Shallow Concentrated Flow, Jowite Gutter Pan Paved Kv= 20.3 fps
0.5	170	0.0087	5.80	7.12	Pipe Channel, Pipe from CI on West Side of Jowite to SDMH-20201 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
11.0	730	Total			

Subcatchment EX-C-1: Existing Catchment for Phase 2 LOD

Hydrograph



Naima - Phase 2 - Existing HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

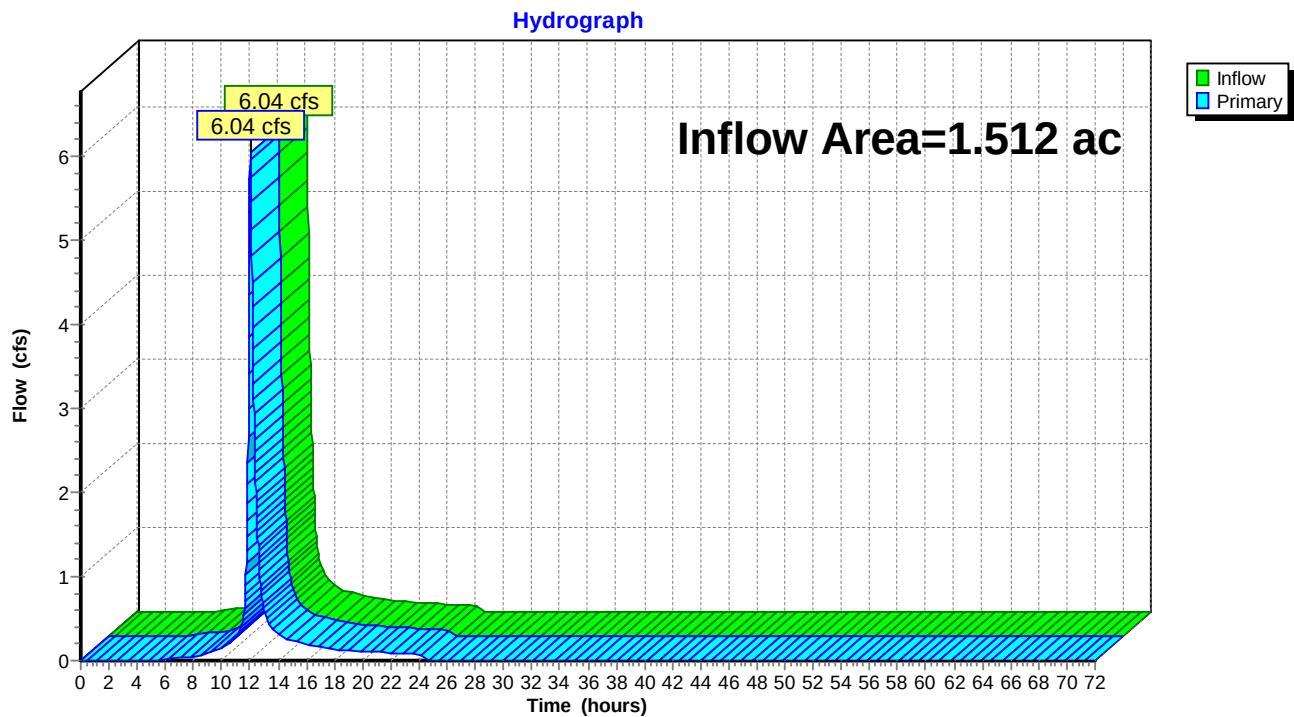
Printed 02/22/23

Summary for Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow Area = 1.512 ac, 29.48% Impervious, Inflow Depth = 3.85" for 10-YR event
Inflow = 6.04 cfs @ 12.04 hrs, Volume= 0.485 af
Primary = 6.04 cfs @ 12.04 hrs, Volume= 0.485 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton



Naima - Phase 2 - Existing HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-C-1: Existing Catchment for Runoff Area=65,850 sf 29.48% Impervious Runoff Depth=6.06"
Flow Length=730' Tc=11.0 min CN=87 Runoff=9.32 cfs 0.764 af

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow=9.32 cfs 0.764 af

Primary=9.32 cfs 0.764 af

Total Runoff Area = 1.512 ac Runoff Volume = 0.764 af Average Runoff Depth = 6.06"
70.52% Pervious = 1.066 ac 29.48% Impervious = 0.446 ac

Naima - Phase 2 - Existing HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment EX-C-1: Existing Catchment for Phase 2 LOD

Runoff = 9.32 cfs @ 12.04 hrs, Volume= 0.764 af, Depth= 6.06"

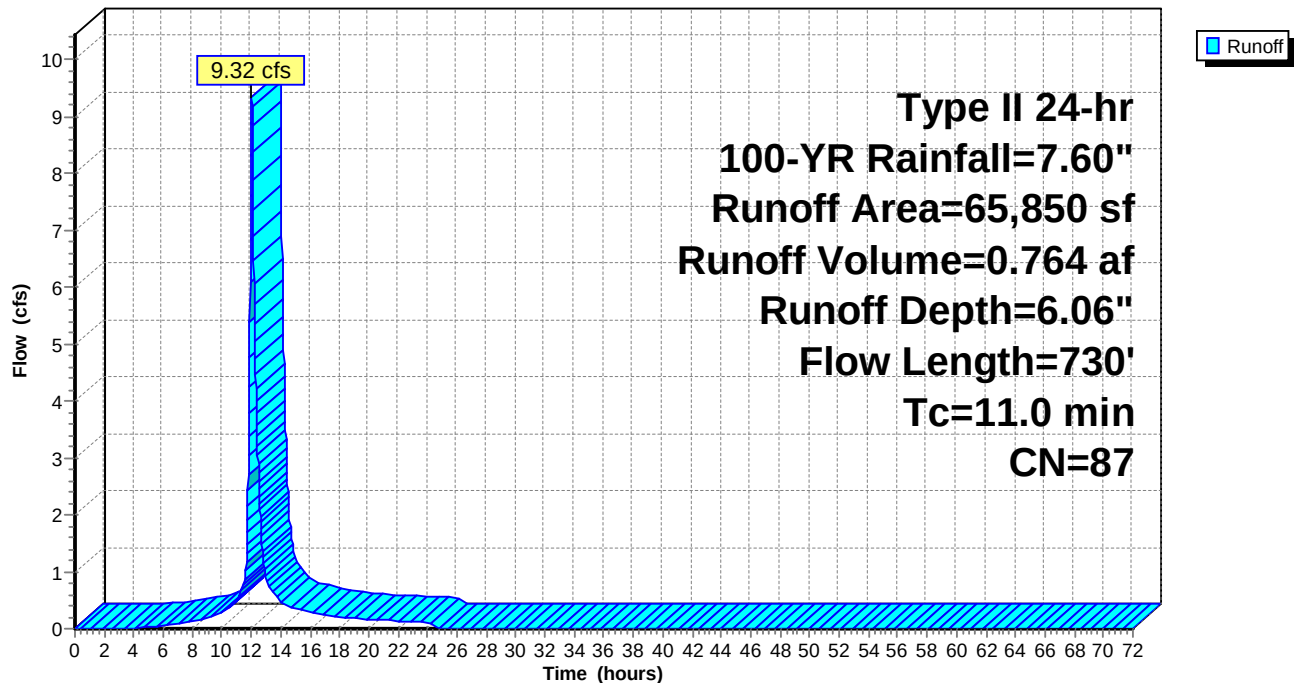
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,814	98	Paved parking, HSG D
17,598	98	Paved parking, HSG C
4,012	86	Woods/grass comb., Poor, HSG D
42,426	82	Woods/grass comb., Poor, HSG C
65,850	87	Weighted Average
46,438		70.52% Pervious Area
19,412		29.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0429	0.22		Sheet Flow, Yard Grass: Short n= 0.150 P2= 3.40"
5.6	496	0.0053	1.48		Shallow Concentrated Flow, Jowite Gutter Pan Paved Kv= 20.3 fps
0.5	170	0.0087	5.80	7.12	Pipe Channel, Pipe from CI on West Side of Jowite to SDMH-20201 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
11.0	730	Total			

Subcatchment EX-C-1: Existing Catchment for Phase 2 LOD

Hydrograph

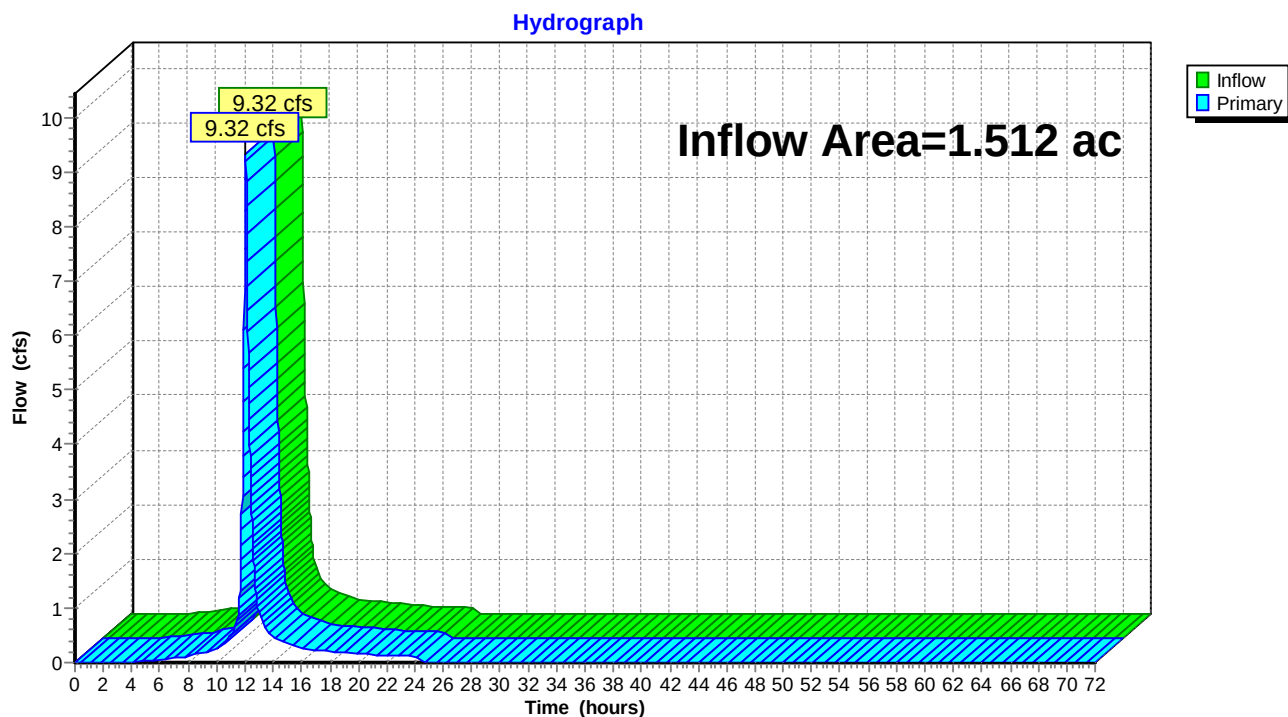


Summary for Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

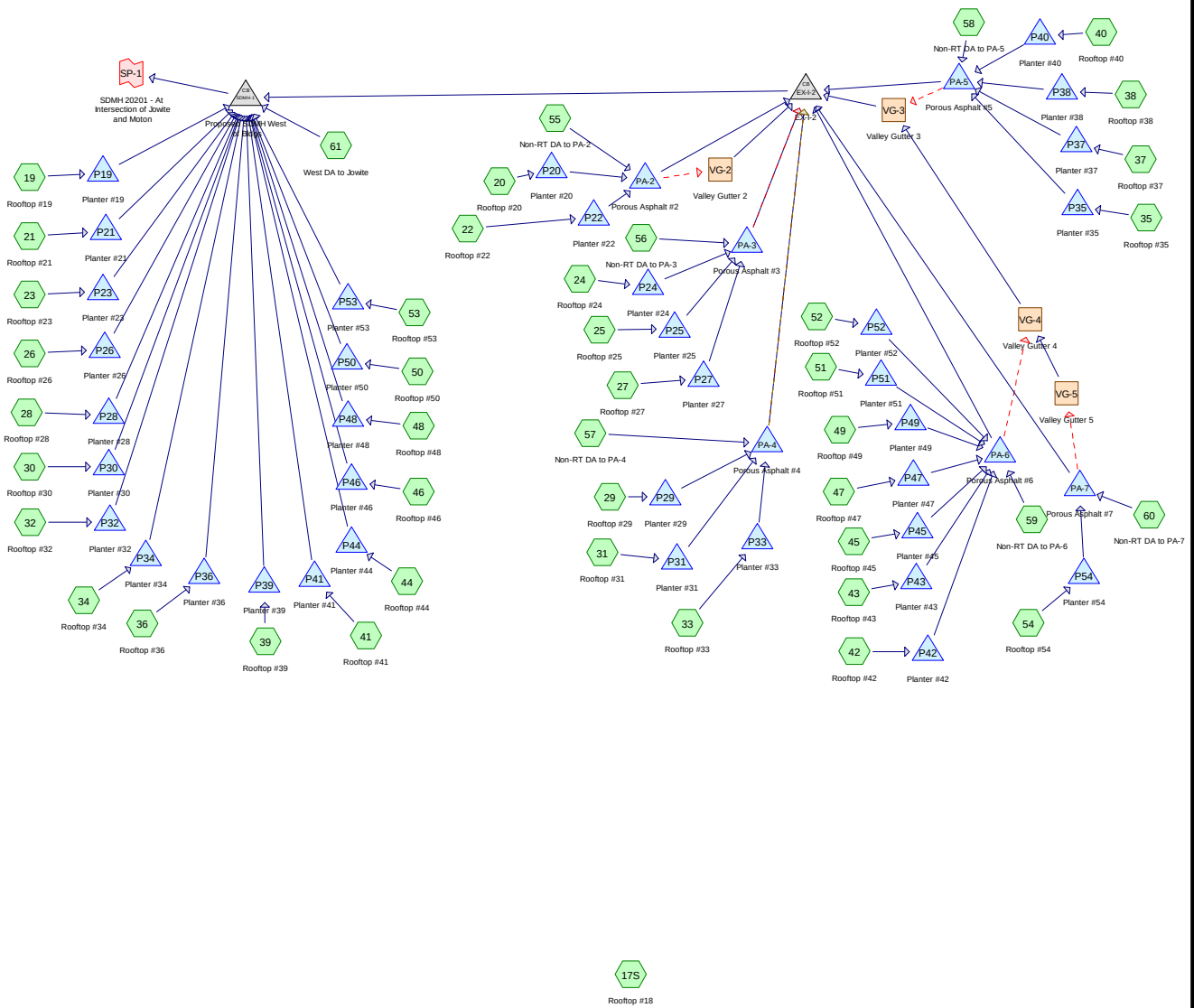
Inflow Area = 1.512 ac, 29.48% Impervious, Inflow Depth = 6.06" for 100-YR event
 Inflow = 9.32 cfs @ 12.04 hrs, Volume= 0.764 af
 Primary = 9.32 cfs @ 12.04 hrs, Volume= 0.764 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton



Section 4 – Post-Development Quantity Calculations



Routing Diagram for Naima - Phase 2 - Proposed HydroCAD
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Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 2
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 17S: Rooftop #18	Runoff Area=771 sf 96.11% Impervious Runoff Depth=3.06"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=97	Runoff=0.10 cfs 0.005 af
Subcatchment 19: Rooftop #19	Runoff Area=796 sf 93.09% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.10 cfs 0.004 af
Subcatchment 20: Rooftop #20	Runoff Area=363 sf 91.74% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.05 cfs 0.002 af
Subcatchment 21: Rooftop #21	Runoff Area=219 sf 90.87% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.03 cfs 0.001 af
Subcatchment 22: Rooftop #22	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.15 cfs 0.007 af
Subcatchment 23: Rooftop #23	Runoff Area=698 sf 92.84% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.09 cfs 0.004 af
Subcatchment 24: Rooftop #24	Runoff Area=587 sf 93.19% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.07 cfs 0.003 af
Subcatchment 25: Rooftop #25	Runoff Area=590 sf 93.22% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.07 cfs 0.003 af
Subcatchment 26: Rooftop #26	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.14 cfs 0.006 af
Subcatchment 27: Rooftop #27	Runoff Area=352 sf 91.48% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.04 cfs 0.002 af
Subcatchment 28: Rooftop #28	Runoff Area=796 sf 93.09% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.10 cfs 0.004 af
Subcatchment 29: Rooftop #29	Runoff Area=363 sf 91.74% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.05 cfs 0.002 af
Subcatchment 30: Rooftop #30	Runoff Area=219 sf 90.87% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.03 cfs 0.001 af
Subcatchment 31: Rooftop #31	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.15 cfs 0.007 af
Subcatchment 32: Rooftop #32	Runoff Area=219 sf 90.87% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.03 cfs 0.001 af
Subcatchment 33: Rooftop #33	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=2.95"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.15 cfs 0.007 af

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Subcatchment 34: Rooftop #34	Runoff Area=796 sf 93.09% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.10 cfs 0.004 af
Subcatchment 35: Rooftop #35	Runoff Area=363 sf 91.74% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.05 cfs 0.002 af
Subcatchment 36: Rooftop #36	Runoff Area=698 sf 92.84% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.09 cfs 0.004 af
Subcatchment 37: Rooftop #37	Runoff Area=587 sf 93.19% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 38: Rooftop #38	Runoff Area=590 sf 93.22% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 39: Rooftop #39	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.14 cfs 0.006 af
Subcatchment 40: Rooftop #40	Runoff Area=352 sf 91.48% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.04 cfs 0.002 af
Subcatchment 41: Rooftop #41	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.14 cfs 0.006 af
Subcatchment 42: Rooftop #42	Runoff Area=352 sf 91.48% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.04 cfs 0.002 af
Subcatchment 43: Rooftop #43	Runoff Area=590 sf 93.22% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 44: Rooftop #44	Runoff Area=698 sf 92.84% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.09 cfs 0.004 af
Subcatchment 45: Rooftop #45	Runoff Area=587 sf 93.19% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 46: Rooftop #46	Runoff Area=219 sf 90.87% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.03 cfs 0.001 af
Subcatchment 47: Rooftop #47	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.15 cfs 0.007 af
Subcatchment 48: Rooftop #48	Runoff Area=796 sf 93.09% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.10 cfs 0.004 af
Subcatchment 49: Rooftop #49	Runoff Area=363 sf 91.74% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.05 cfs 0.002 af
Subcatchment 50: Rooftop #50	Runoff Area=698 sf 92.84% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.09 cfs 0.004 af

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Type II 24-hr 2-YR Rainfall=3.40"

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Subcatchment 51: Rooftop #51	Runoff Area=587 sf 93.19% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 52: Rooftop #52	Runoff Area=590 sf 93.22% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 53: Rooftop #53	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.14 cfs 0.006 af
Subcatchment 54: Rooftop #54	Runoff Area=352 sf 91.48% Impervious Runoff Depth=2.95"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.04 cfs 0.002 af
Subcatchment 55: Non-RT DA to PA-2	Runoff Area=3,000 sf 75.57% Impervious Runoff Depth=2.54"
Flow Length=43'	Slope=0.0100 '/' Tc=6.4 min CN=92 Runoff=0.23 cfs 0.015 af
Subcatchment 56: Non-RT DA to PA-3	Runoff Area=4,390 sf 54.69% Impervious Runoff Depth=2.09"
Flow Length=55'	Slope=0.0100 '/' Tc=7.8 min CN=87 Runoff=0.26 cfs 0.018 af
Subcatchment 57: Non-RT DA to PA-4	Runoff Area=4,540 sf 57.29% Impervious Runoff Depth=2.18"
Flow Length=62'	Slope=0.0100 '/' Tc=8.6 min CN=88 Runoff=0.27 cfs 0.019 af
Subcatchment 58: Non-RT DA to PA-5	Runoff Area=6,269 sf 73.76% Impervious Runoff Depth=2.54"
Flow Length=52'	Slope=0.0100 '/' Tc=7.4 min CN=92 Runoff=0.46 cfs 0.030 af
Subcatchment 59: Non-RT DA to PA-6	Runoff Area=8,366 sf 73.55% Impervious Runoff Depth=2.54"
Flow Length=50'	Slope=0.0100 '/' Tc=7.2 min CN=92 Runoff=0.62 cfs 0.041 af
Subcatchment 60: Non-RT DA to PA-7	Runoff Area=1,133 sf 70.87% Impervious Runoff Depth=2.45"
Flow Length=48'	Slope=0.0100 '/' Tc=7.0 min CN=91 Runoff=0.08 cfs 0.005 af
Subcatchment 61: West DA to Jowite	Runoff Area=14,486 sf 0.00% Impervious Runoff Depth=1.17"
	Flow Length=721' Tc=13.9 min CN=74 Runoff=0.34 cfs 0.032 af
Reach VG-2: Valley Gutter 2	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=57.0' S=0.0061 '/' Capacity=0.14 cfs Outflow=0.00 cfs 0.000 af
Reach VG-3: Valley Gutter 3	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=66.0' S=0.0055 '/' Capacity=0.13 cfs Outflow=0.00 cfs 0.000 af
Reach VG-4: Valley Gutter 4	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=118.0' S=0.0057 '/' Capacity=0.14 cfs Outflow=0.00 cfs 0.000 af
Reach VG-5: Valley Gutter 5	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=152.0' S=0.0103 '/' Capacity=0.18 cfs Outflow=0.00 cfs 0.000 af
Pond EX-I-2: EX-I-2	Peak Elev=13.29' Inflow=1.71 cfs 0.193 af
	Outflow=1.71 cfs 0.193 af
Pond P19: Planter #19	Peak Elev=13.70' Storage=10 cf Inflow=0.10 cfs 0.004 af
	4.0" Round Culvert n=0.012 L=26.8' S=0.0131 '/' Outflow=0.10 cfs 0.004 af

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Pond P20: Planter #20	Peak Elev=15.96' Storage=33 cf Inflow=0.05 cfs 0.002 af 4.0" Round Culvert n=0.012 L=20.1' S=-0.1169 ' /' Outflow=0.04 cfs 0.002 af
Pond P21: Planter #21	Peak Elev=13.57' Storage=3 cf Inflow=0.03 cfs 0.001 af 4.0" Round Culvert n=0.012 L=30.2' S=0.0185 ' /' Outflow=0.03 cfs 0.001 af
Pond P22: Planter #22	Peak Elev=15.90' Storage=85 cf Inflow=0.15 cfs 0.007 af 4.0" Round Culvert n=0.012 L=59.7' S=-0.0350 ' /' Outflow=0.14 cfs 0.007 af
Pond P23: Planter #23	Peak Elev=13.19' Storage=9 cf Inflow=0.09 cfs 0.004 af 4.0" Round Culvert n=0.012 L=20.7' S=0.0068 ' /' Outflow=0.08 cfs 0.004 af
Pond P24: Planter #24	Peak Elev=15.66' Storage=47 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=36.6' S=-0.0683 ' /' Outflow=0.07 cfs 0.003 af
Pond P25: Planter #25	Peak Elev=15.53' Storage=45 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0820 ' /' Outflow=0.07 cfs 0.003 af
Pond P26: Planter #26	Peak Elev=13.27' Storage=15 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=24.5' S=0.0159 ' /' Outflow=0.13 cfs 0.006 af
Pond P27: Planter #27	Peak Elev=15.24' Storage=30 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=10.8' S=-0.1972 ' /' Outflow=0.04 cfs 0.002 af
Pond P28: Planter #28	Peak Elev=13.70' Storage=10 cf Inflow=0.10 cfs 0.004 af 4.0" Round Culvert n=0.012 L=14.3' S=0.0245 ' /' Outflow=0.10 cfs 0.004 af
Pond P29: Planter #29	Peak Elev=15.15' Storage=23 cf Inflow=0.05 cfs 0.002 af 4.0" Round Culvert n=0.012 L=32.3' S=-0.0477 ' /' Outflow=0.04 cfs 0.002 af
Pond P30: Planter #30	Peak Elev=13.57' Storage=3 cf Inflow=0.03 cfs 0.001 af 4.0" Round Culvert n=0.012 L=18.2' S=0.0088 ' /' Outflow=0.03 cfs 0.001 af
Pond P31: Planter #31	Peak Elev=15.60' Storage=75 cf Inflow=0.15 cfs 0.007 af 4.0" Round Culvert n=0.012 L=71.6' S=-0.0246 ' /' Outflow=0.14 cfs 0.007 af
Pond P32: Planter #32	Peak Elev=14.07' Storage=3 cf Inflow=0.03 cfs 0.001 af 4.0" Round Culvert n=0.012 L=29.6' S=0.0199 ' /' Outflow=0.03 cfs 0.001 af
Pond P33: Planter #33	Peak Elev=15.60' Storage=60 cf Inflow=0.15 cfs 0.007 af 4.0" Round Culvert n=0.012 L=61.0' S=-0.0211 ' /' Outflow=0.14 cfs 0.007 af
Pond P34: Planter #34	Peak Elev=14.20' Storage=10 cf Inflow=0.10 cfs 0.004 af 4.0" Round Culvert n=0.012 L=26.1' S=0.0149 ' /' Outflow=0.10 cfs 0.004 af
Pond P35: Planter #35	Peak Elev=15.89' Storage=26 cf Inflow=0.05 cfs 0.002 af 4.0" Round Culvert n=0.012 L=31.5' S=-0.0565 ' /' Outflow=0.04 cfs 0.002 af
Pond P36: Planter #36	Peak Elev=14.38' Storage=9 cf Inflow=0.09 cfs 0.004 af 4.0" Round Culvert n=0.012 L=20.2' S=0.0248 ' /' Outflow=0.08 cfs 0.004 af

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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P37: Planter #37	Peak Elev=15.94' Storage=32 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=37.8' S=-0.0418 ' /' Outflow=0.07 cfs 0.003 af
Pond P38: Planter #38	Peak Elev=16.06' Storage=34 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0588 ' /' Outflow=0.07 cfs 0.003 af
Pond P39: Planter #39	Peak Elev=14.47' Storage=15 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=23.9' S=0.0113 ' /' Outflow=0.13 cfs 0.006 af
Pond P40: Planter #40	Peak Elev=16.15' Storage=26 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=11.2' S=-0.1643 ' /' Outflow=0.04 cfs 0.002 af
Pond P41: Planter #41	Peak Elev=14.77' Storage=15 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=23.8' S=0.0210 ' /' Outflow=0.13 cfs 0.006 af
Pond P42: Planter #42	Peak Elev=16.30' Storage=25 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=19.8' S=-0.0854 ' /' Outflow=0.04 cfs 0.002 af
Pond P43: Planter #43	Peak Elev=16.52' Storage=37 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=28.7' S=-0.0648 ' /' Outflow=0.07 cfs 0.003 af
Pond P44: Planter #44	Peak Elev=14.74' Storage=0 cf Inflow=0.09 cfs 0.004 af 4.0" Round Culvert n=0.012 L=19.9' S=0.0136 ' /' Outflow=0.09 cfs 0.004 af
Pond P45: Planter #45	Peak Elev=16.67' Storage=39 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=36.4' S=-0.0552 ' /' Outflow=0.07 cfs 0.003 af
Pond P46: Planter #46	Peak Elev=15.07' Storage=3 cf Inflow=0.03 cfs 0.001 af 4.0" Round Culvert n=0.012 L=28.6' S=0.0248 ' /' Outflow=0.03 cfs 0.001 af
Pond P47: Planter #47	Peak Elev=16.96' Storage=71 cf Inflow=0.15 cfs 0.007 af 4.0" Round Culvert n=0.012 L=59.6' S=-0.0277 ' /' Outflow=0.14 cfs 0.007 af
Pond P48: Planter #48	Peak Elev=17.15' Storage=53 cf Inflow=0.10 cfs 0.004 af 4.0" Round Culvert n=0.012 L=24.8' S=-0.0992 ' /' Outflow=0.10 cfs 0.003 af
Pond P49: Planter #49	Peak Elev=17.28' Storage=30 cf Inflow=0.05 cfs 0.002 af 4.0" Round Culvert n=0.012 L=19.9' S=-0.1090 ' /' Outflow=0.04 cfs 0.002 af
Pond P50: Planter #50	Peak Elev=16.18' Storage=9 cf Inflow=0.09 cfs 0.004 af 4.0" Round Culvert n=0.012 L=19.4' S=0.0722 ' /' Outflow=0.08 cfs 0.004 af
Pond P51: Planter #51	Peak Elev=17.52' Storage=28 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=36.8' S=-0.0370 ' /' Outflow=0.07 cfs 0.003 af
Pond P52: Planter #52	Peak Elev=17.75' Storage=32 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0550 ' /' Outflow=0.07 cfs 0.003 af
Pond P53: Planter #53	Peak Elev=16.27' Storage=15 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=22.8' S=0.0513 ' /' Outflow=0.13 cfs 0.006 af

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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P54: Planter #54Peak Elev=18.74' Storage=36 cf Inflow=0.04 cfs 0.002 af
4.0" Round Culvert n=0.012 L=13.0' S=-0.2023 ' / Outflow=0.04 cfs 0.002 af**Pond PA-2: Porous Asphalt #2**Peak Elev=14.50' Storage=215 cf Inflow=0.37 cfs 0.023 af
Primary=0.27 cfs 0.023 af Secondary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.023 af**Pond PA-3: Porous Asphalt #3**Peak Elev=14.33' Storage=168 cf Inflow=0.37 cfs 0.026 af
Primary=0.30 cfs 0.026 af Secondary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.026 af**Pond PA-4: Porous Asphalt #4**Peak Elev=14.41' Storage=250 cf Inflow=0.52 cfs 0.035 af
Primary=0.38 cfs 0.034 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.034 af**Pond PA-5: Porous Asphalt #5**Peak Elev=14.69' Storage=568 cf Inflow=0.57 cfs 0.041 af
Primary=0.30 cfs 0.040 af Secondary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.040 af**Pond PA-6: Porous Asphalt #6**Peak Elev=15.32' Storage=919 cf Inflow=0.98 cfs 0.065 af
Primary=0.39 cfs 0.063 af Secondary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.063 af**Pond PA-7: Porous Asphalt #7**Peak Elev=16.58' Storage=46 cf Inflow=0.11 cfs 0.007 af
Primary=0.09 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.007 af**Pond SDMH-1: Proposed SDMH West of Bldgs**Peak Elev=12.86' Inflow=2.82 cfs 0.287 af
Outflow=2.82 cfs 0.287 af**Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton**Inflow=2.82 cfs 0.287 af
Primary=2.82 cfs 0.287 af**Total Runoff Area = 1.529 ac Runoff Volume = 0.298 af Average Runoff Depth = 2.34"**
37.56% Pervious = 0.574 ac 62.44% Impervious = 0.955 ac

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 17S: Rooftop #18

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 3.06"

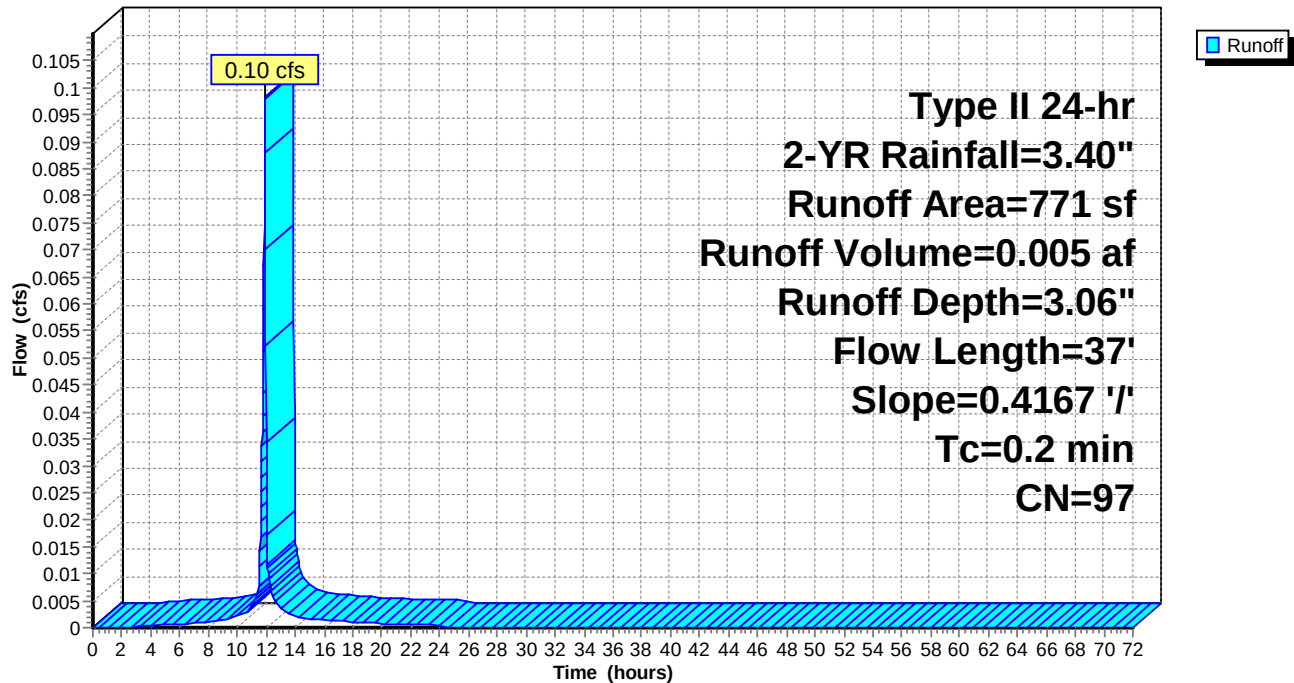
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
741	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
771	97	Weighted Average
30		3.89% Pervious Area
741		96.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 17S: Rooftop #18

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 19: Rooftop #19

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

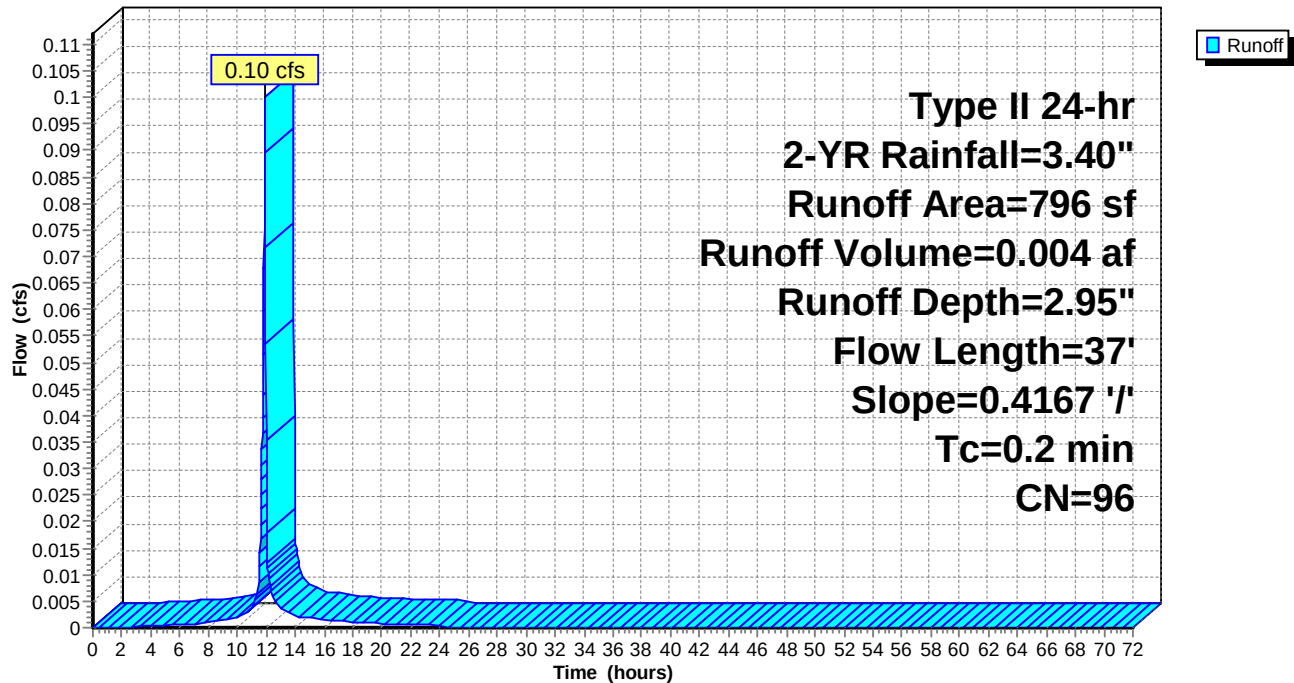
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 19: Rooftop #19

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 20: Rooftop #20

Runoff = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

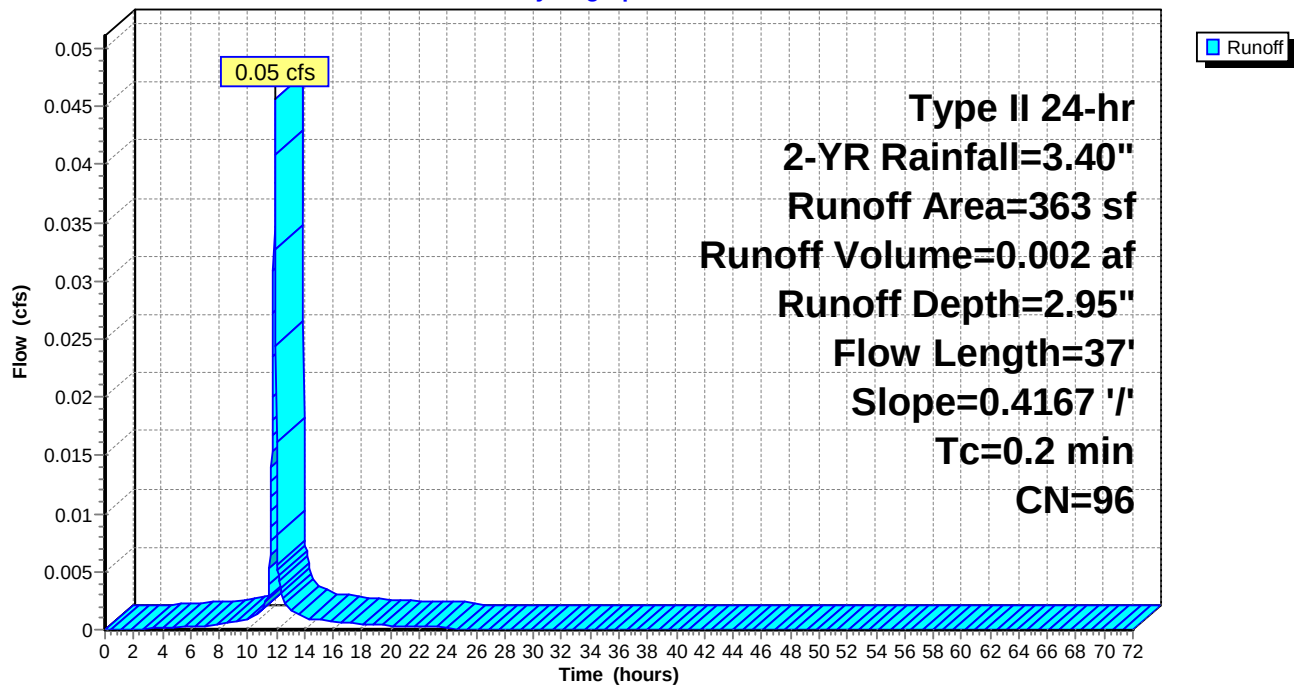
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 20: Rooftop #20

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 21: Rooftop #21

Runoff = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Depth= 2.95"

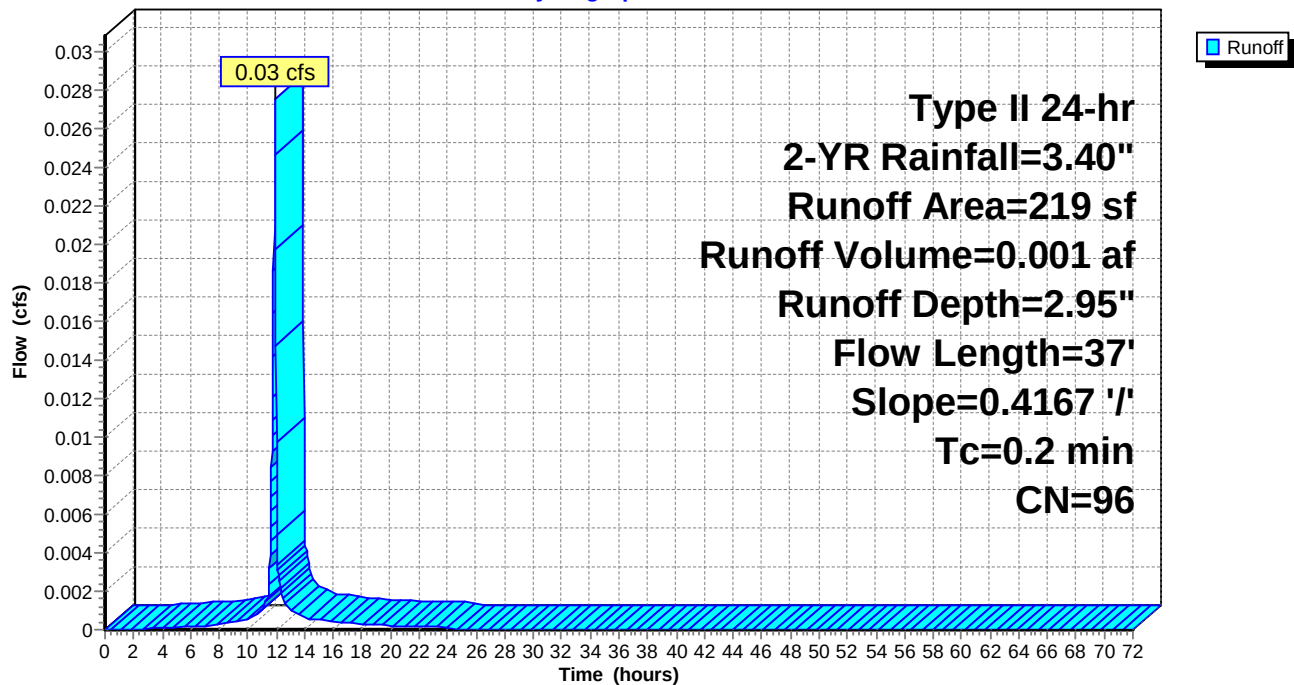
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 21: Rooftop #21

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 22: Rooftop #22

Runoff = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 2.95"

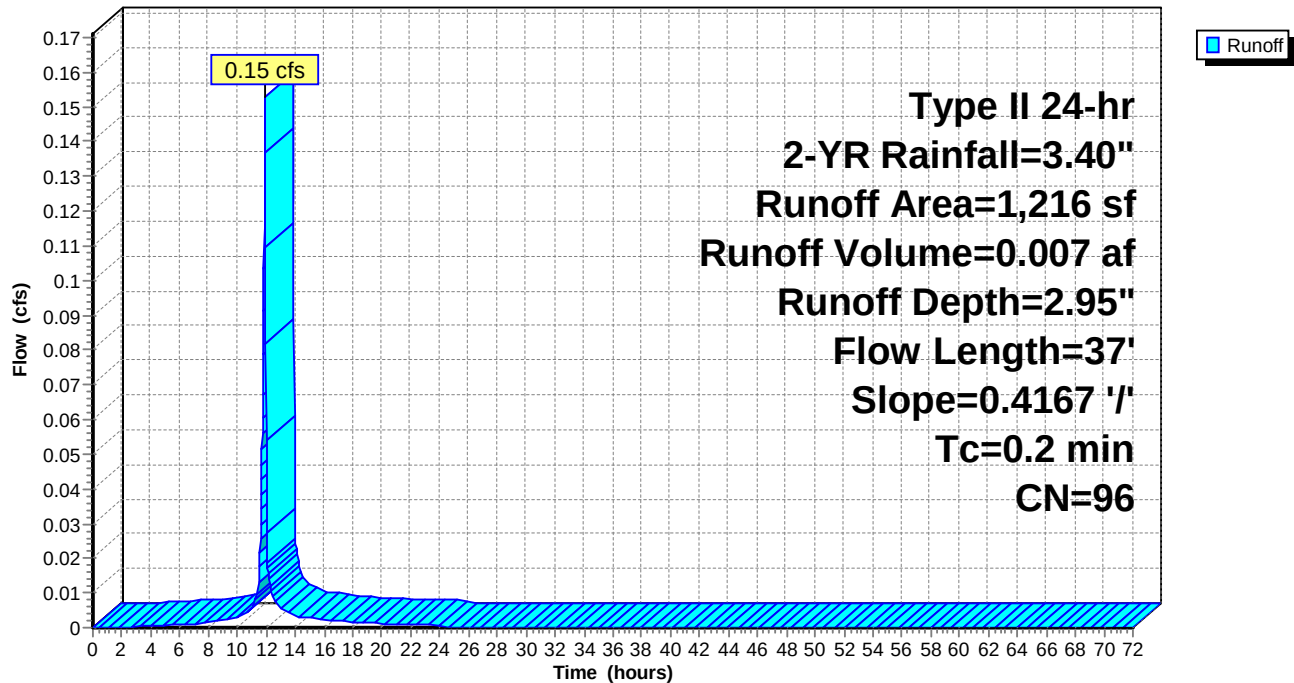
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 22: Rooftop #22

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 23: Rooftop #23

Runoff = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

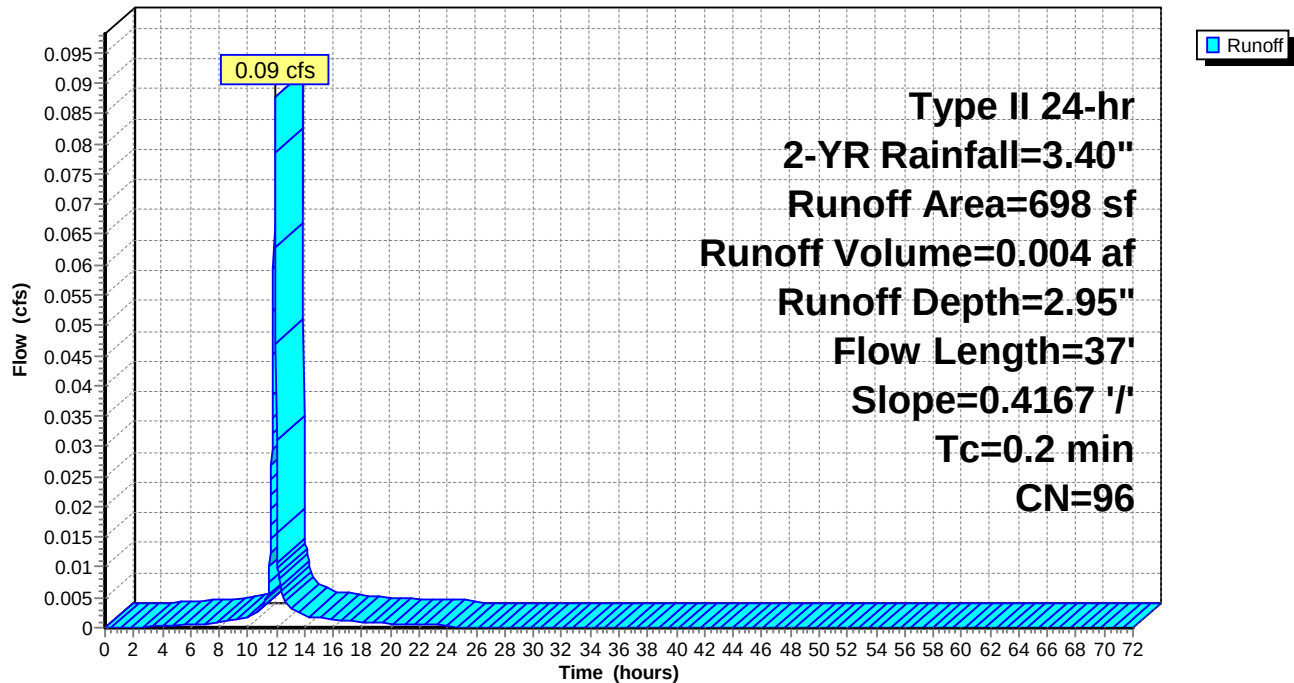
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 23: Rooftop #23

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 24: Rooftop #24

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

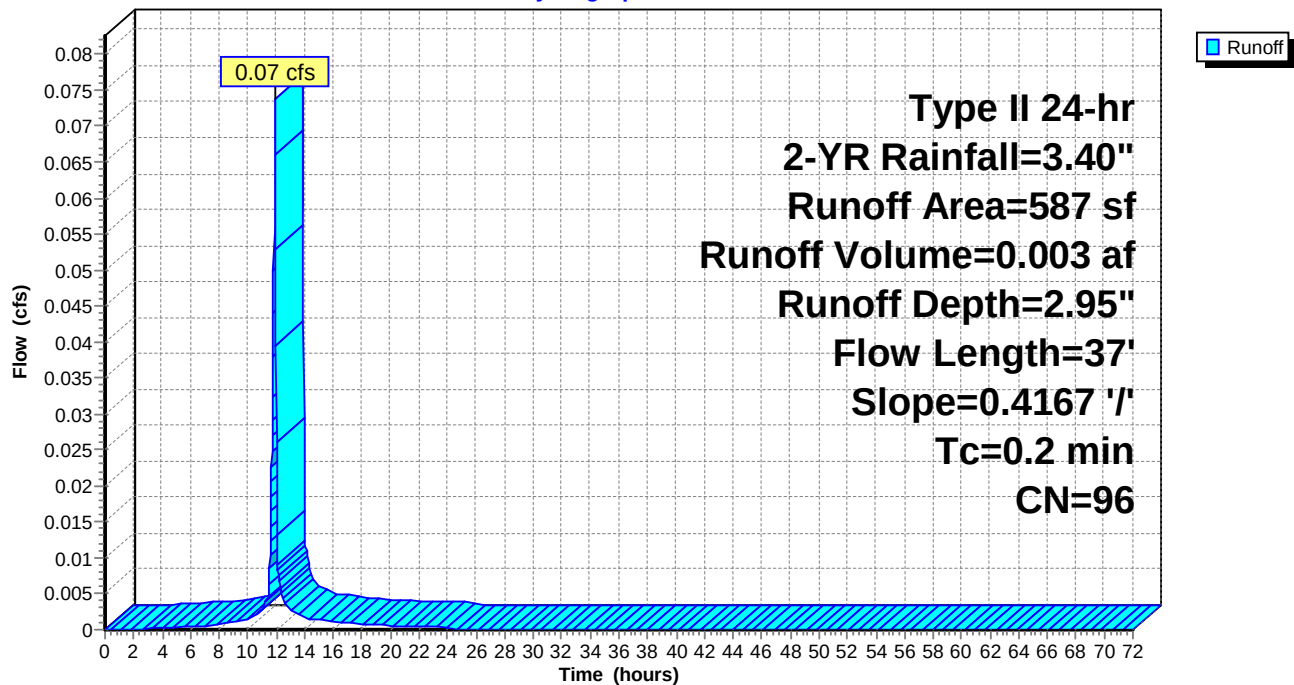
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 24: Rooftop #24

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 25: Rooftop #25

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

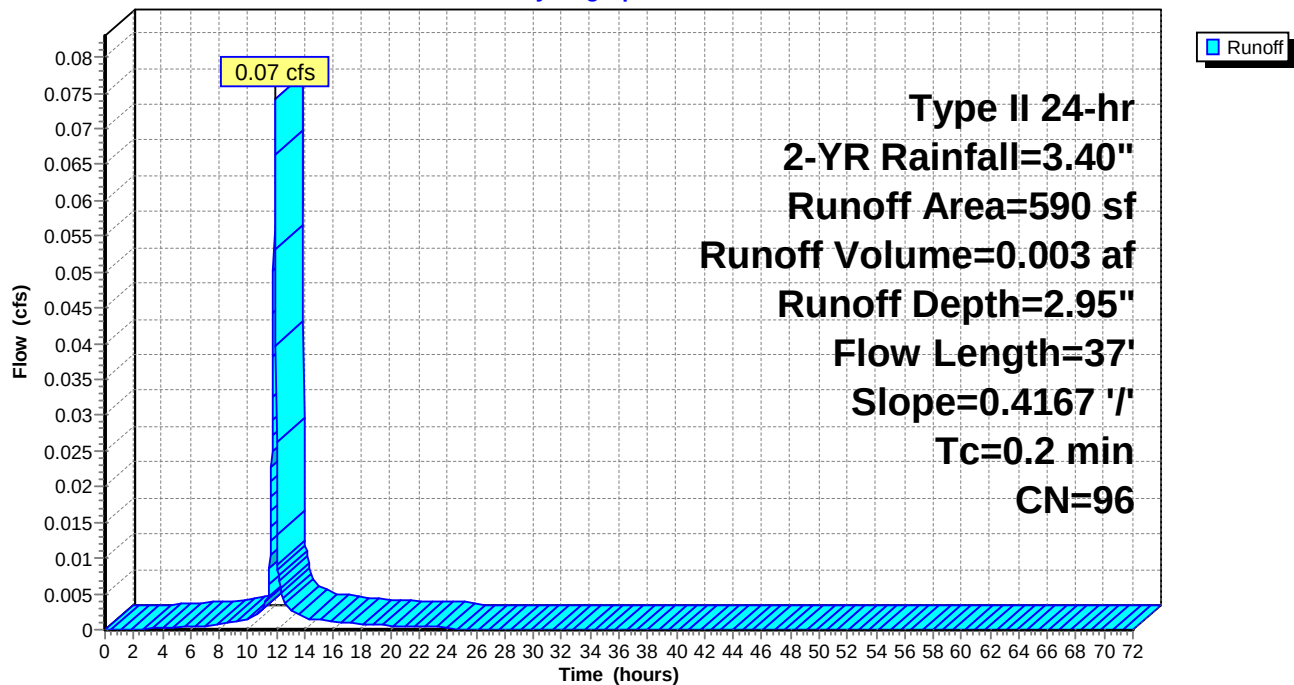
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 25: Rooftop #25

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 26: Rooftop #26

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 2.95"

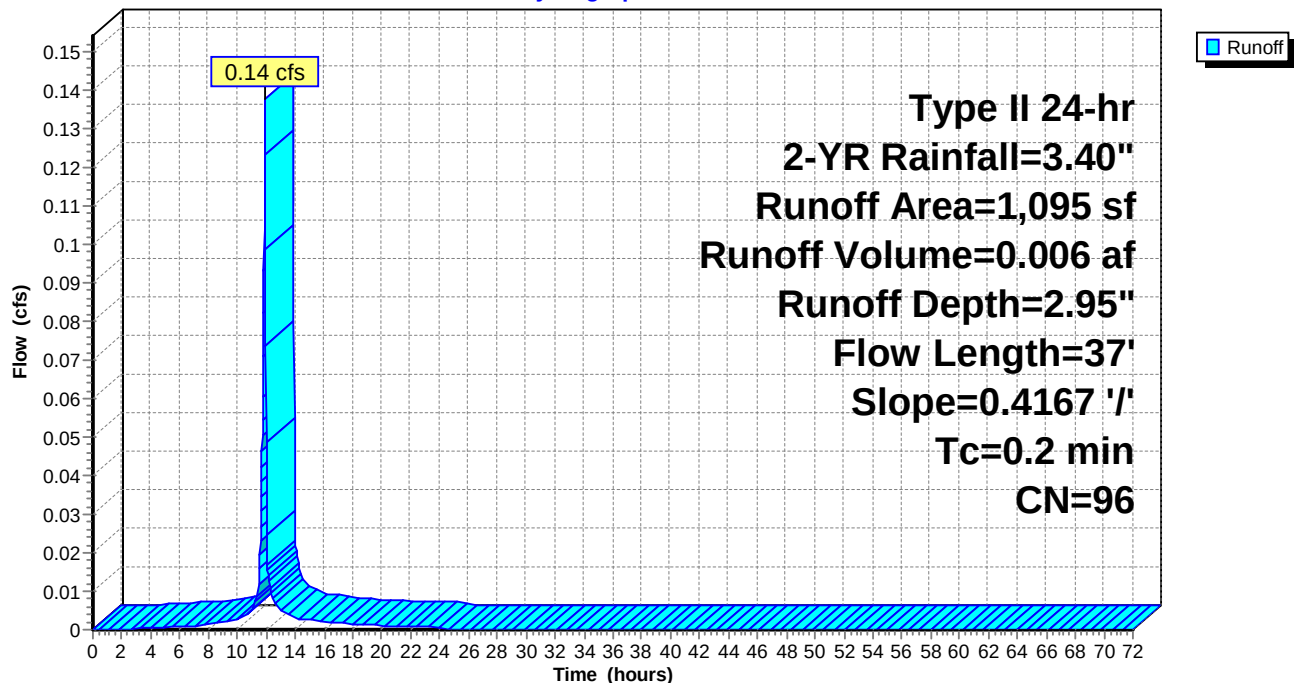
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 26: Rooftop #26

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 27: Rooftop #27

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

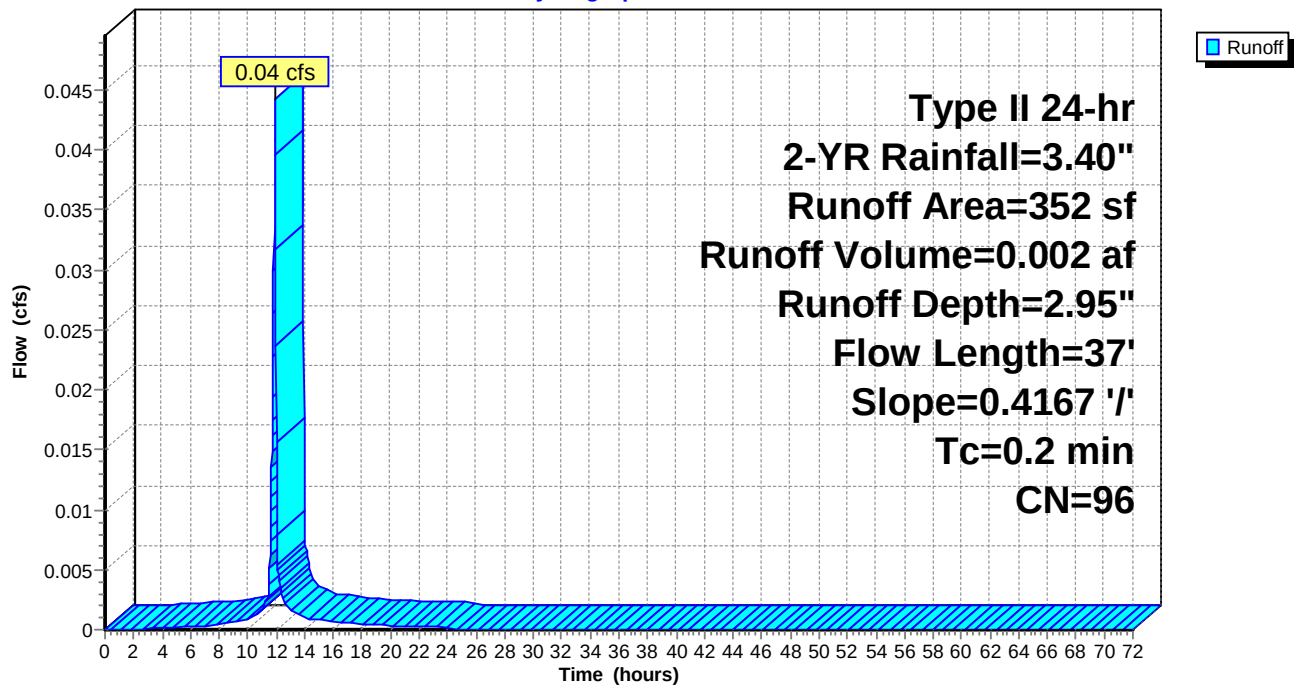
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 27: Rooftop #27

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 28: Rooftop #28

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

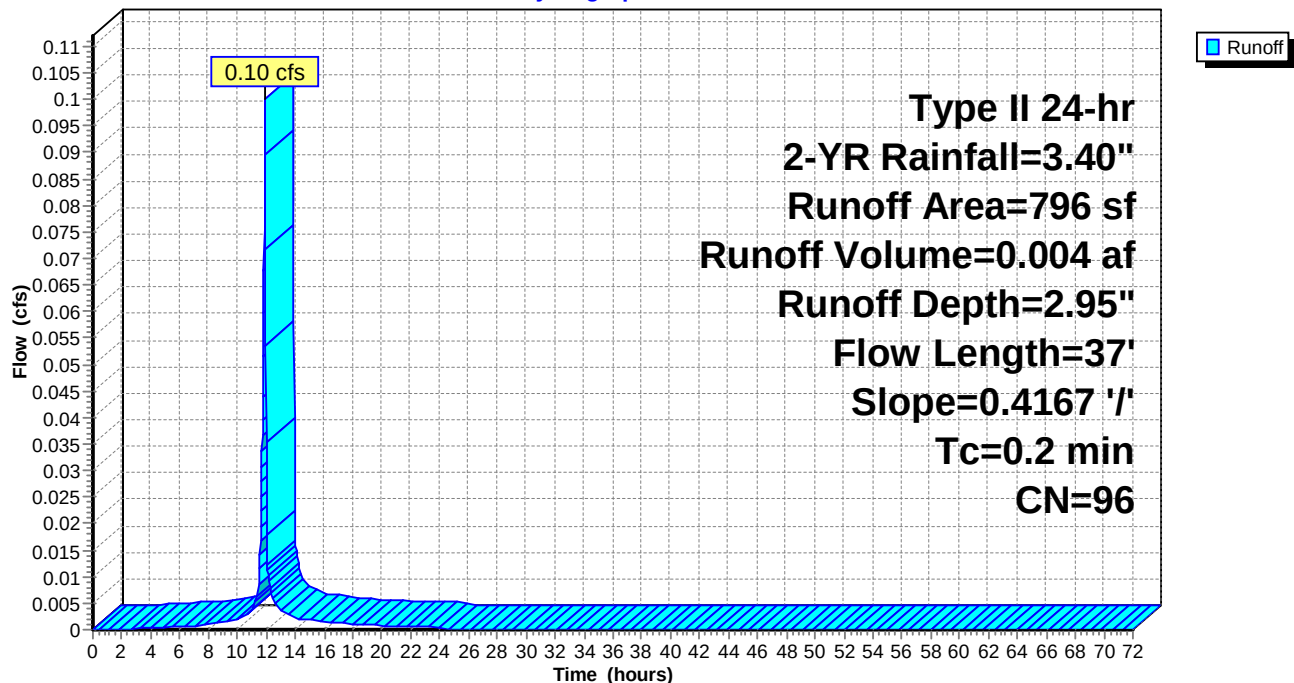
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 28: Rooftop #28

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 29: Rooftop #29

Runoff = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

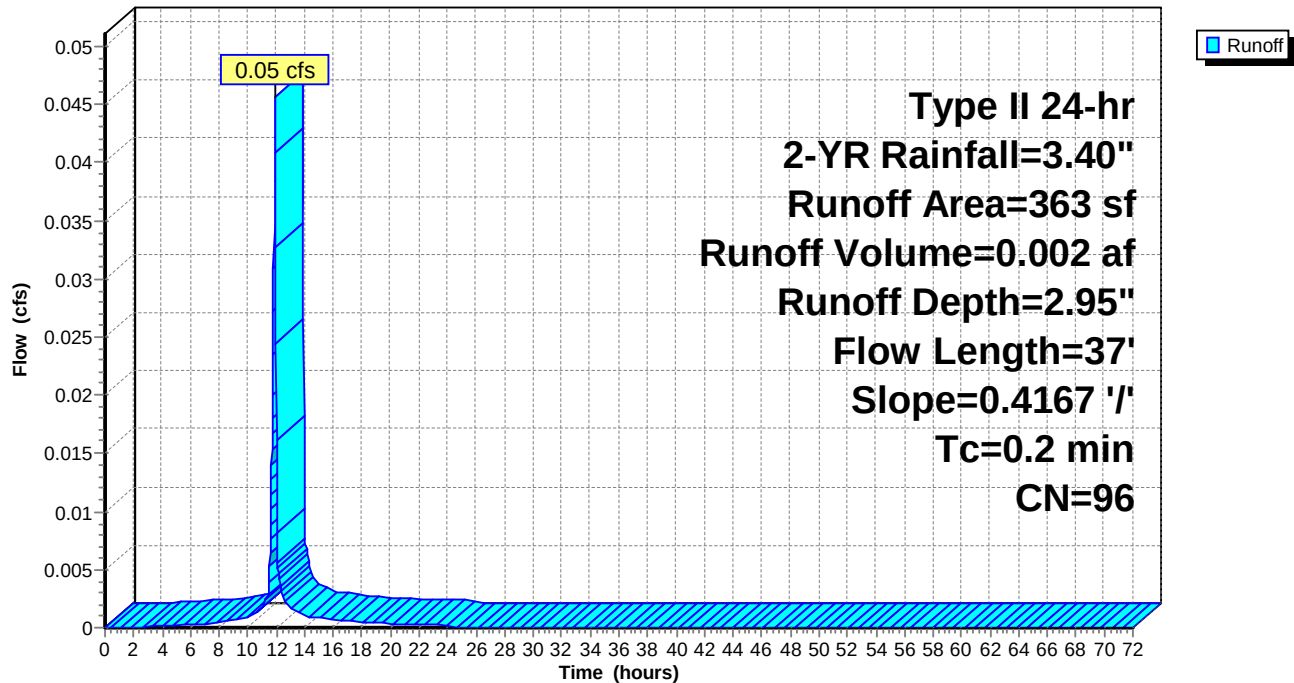
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 29: Rooftop #29

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 30: Rooftop #30

Runoff = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Depth= 2.95"

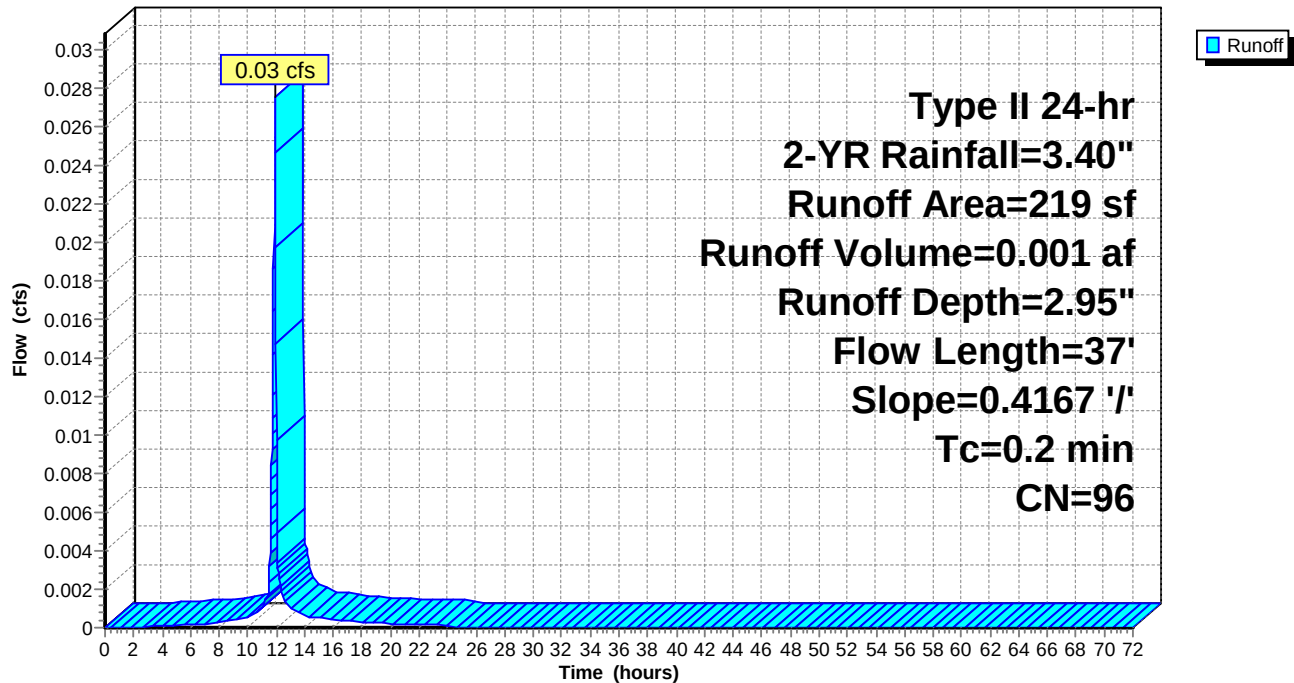
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 30: Rooftop #30

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 31: Rooftop #31

Runoff = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 2.95"

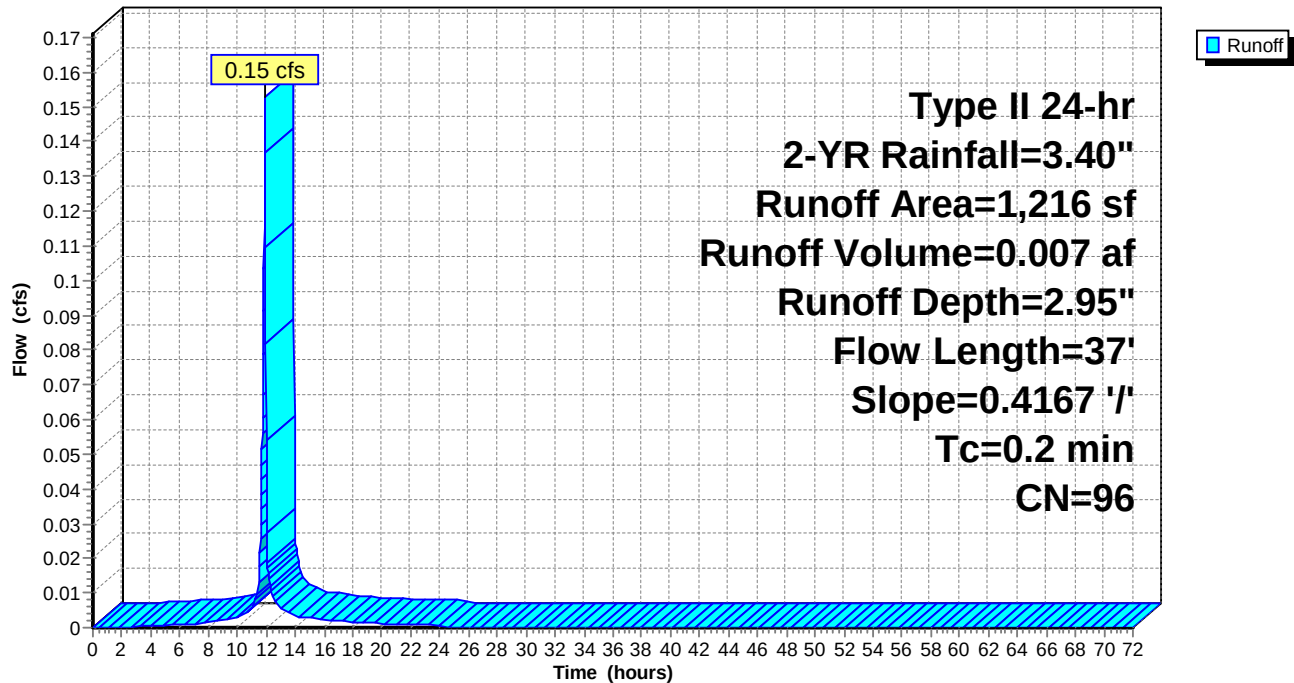
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 31: Rooftop #31

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 32: Rooftop #32

Runoff = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Depth= 2.95"

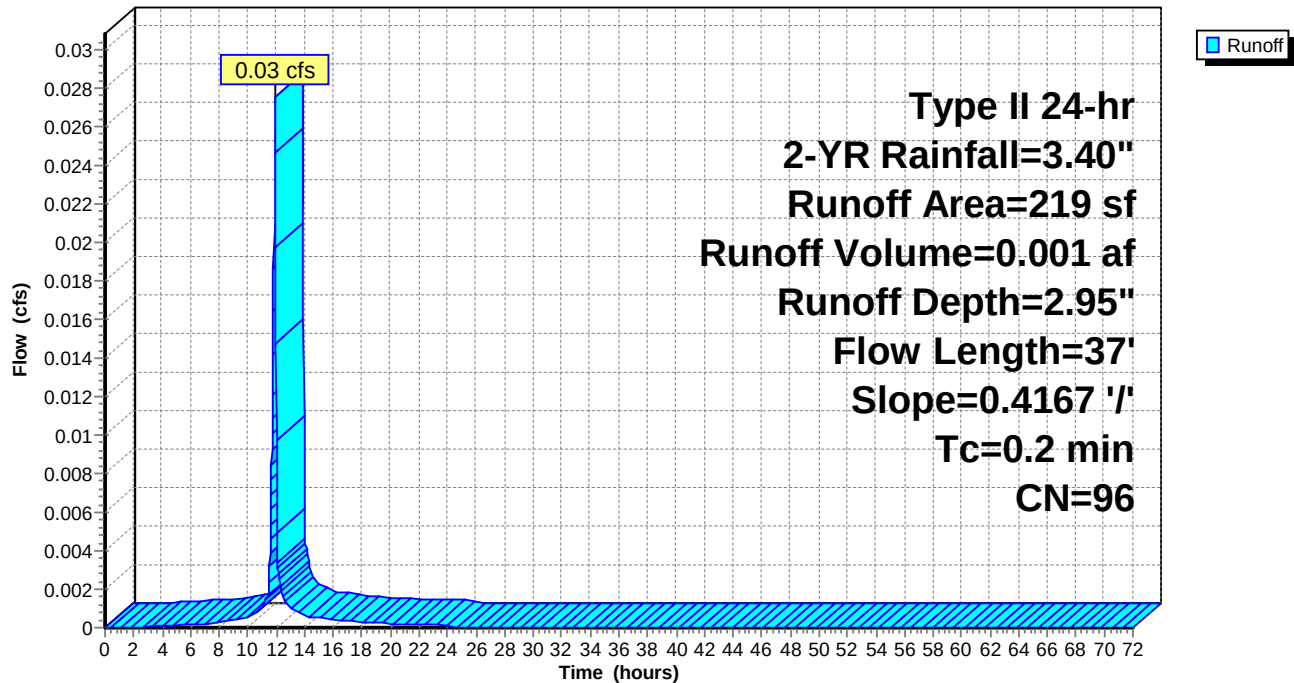
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 32: Rooftop #32

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 33: Rooftop #33

Runoff = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 2.95"

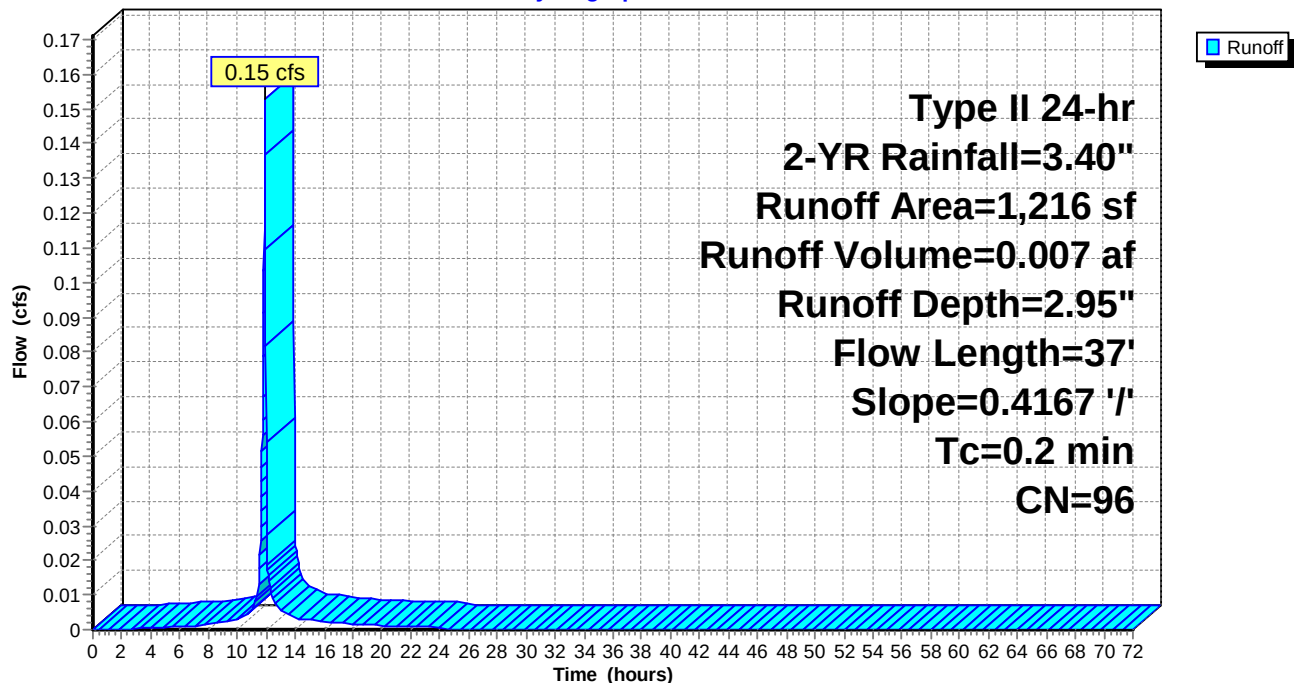
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 33: Rooftop #33

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 34: Rooftop #34

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

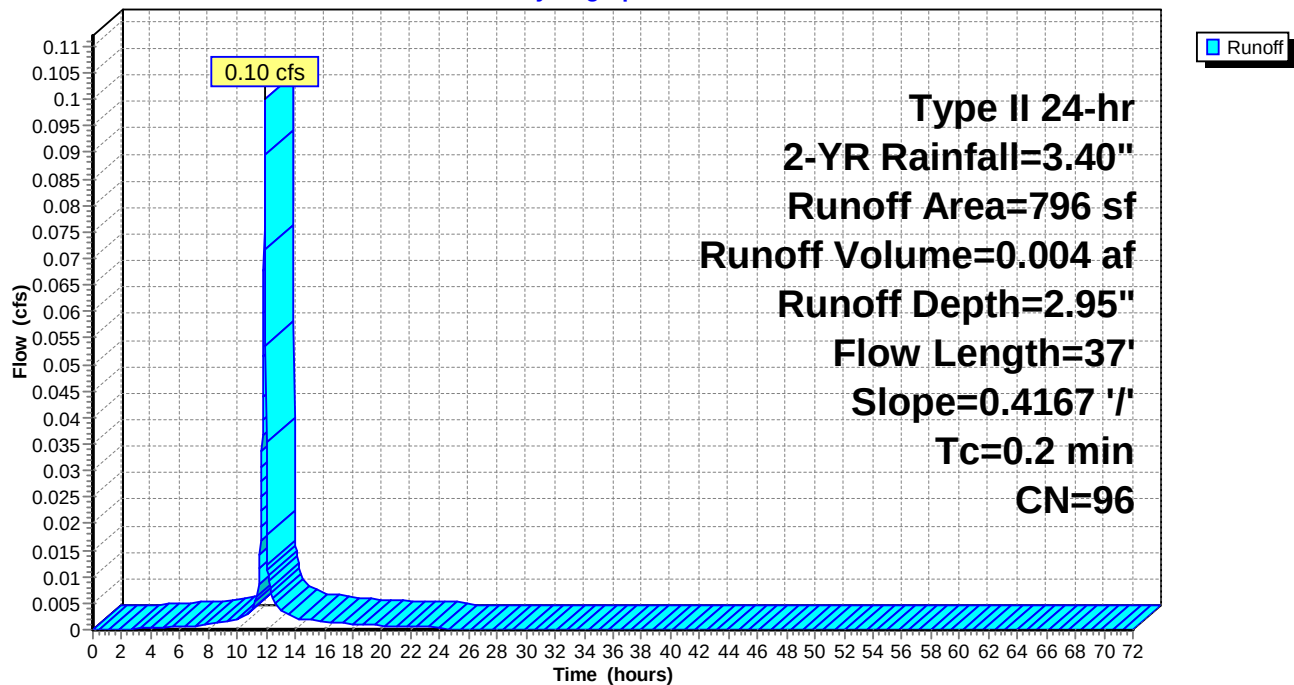
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 34: Rooftop #34

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 35: Rooftop #35

Runoff = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

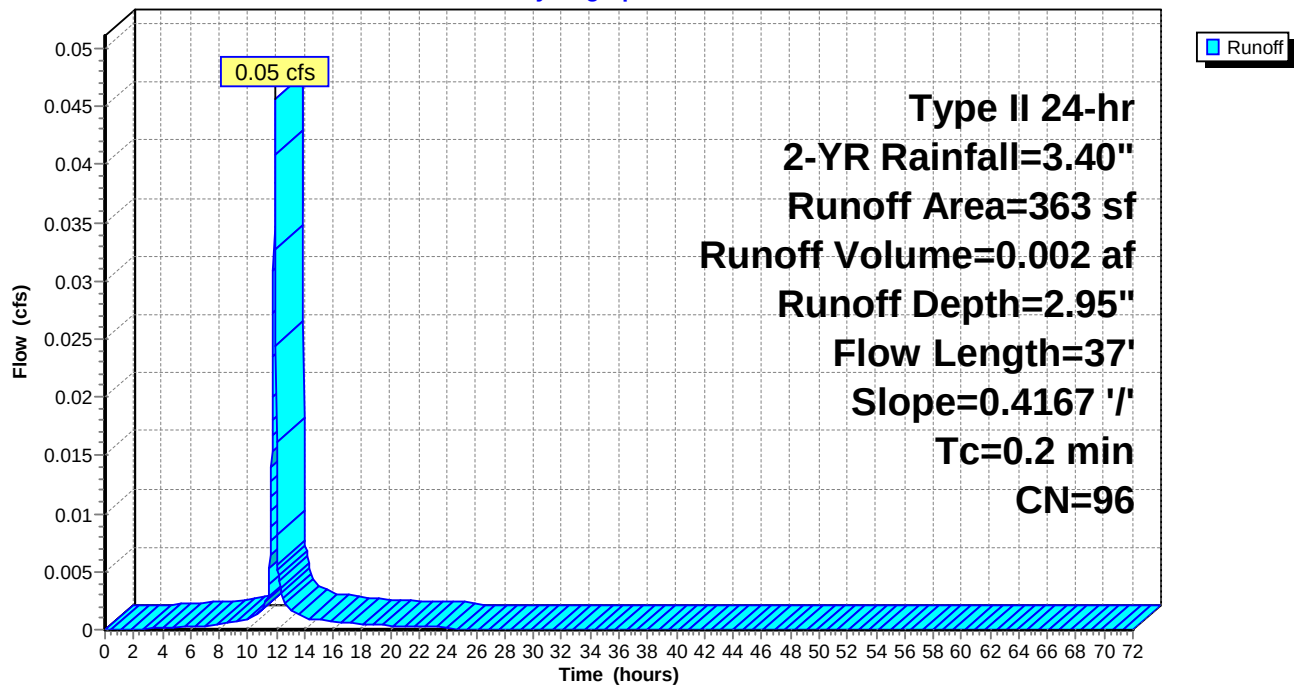
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 35: Rooftop #35

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

Printed 02/22/23

Summary for Subcatchment 36: Rooftop #36

Runoff = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

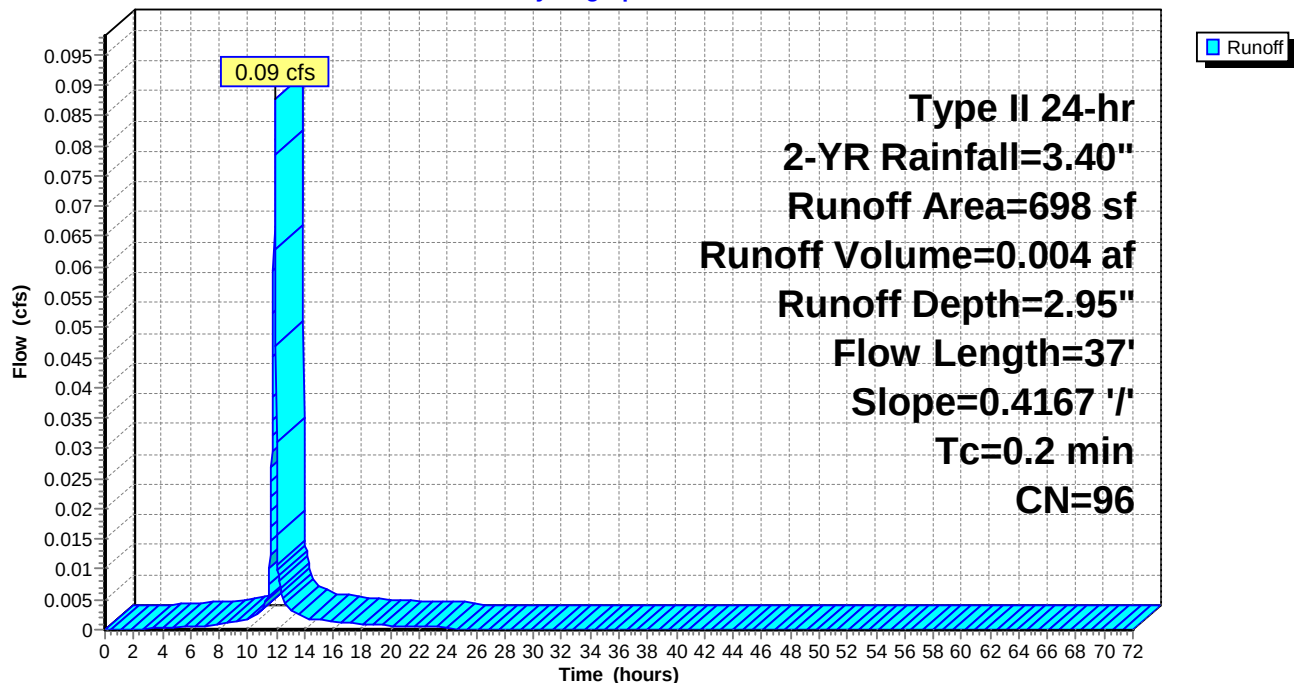
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 36: Rooftop #36

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 37: Rooftop #37

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

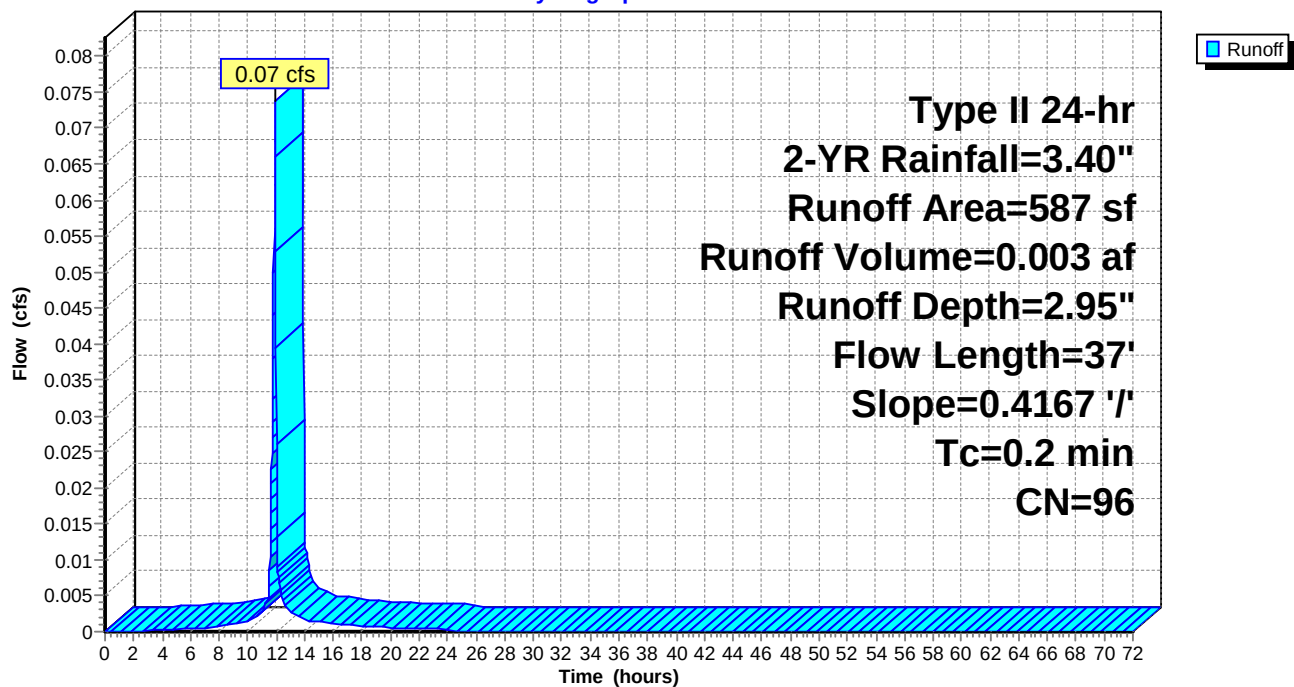
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 37: Rooftop #37

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 38: Rooftop #38

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

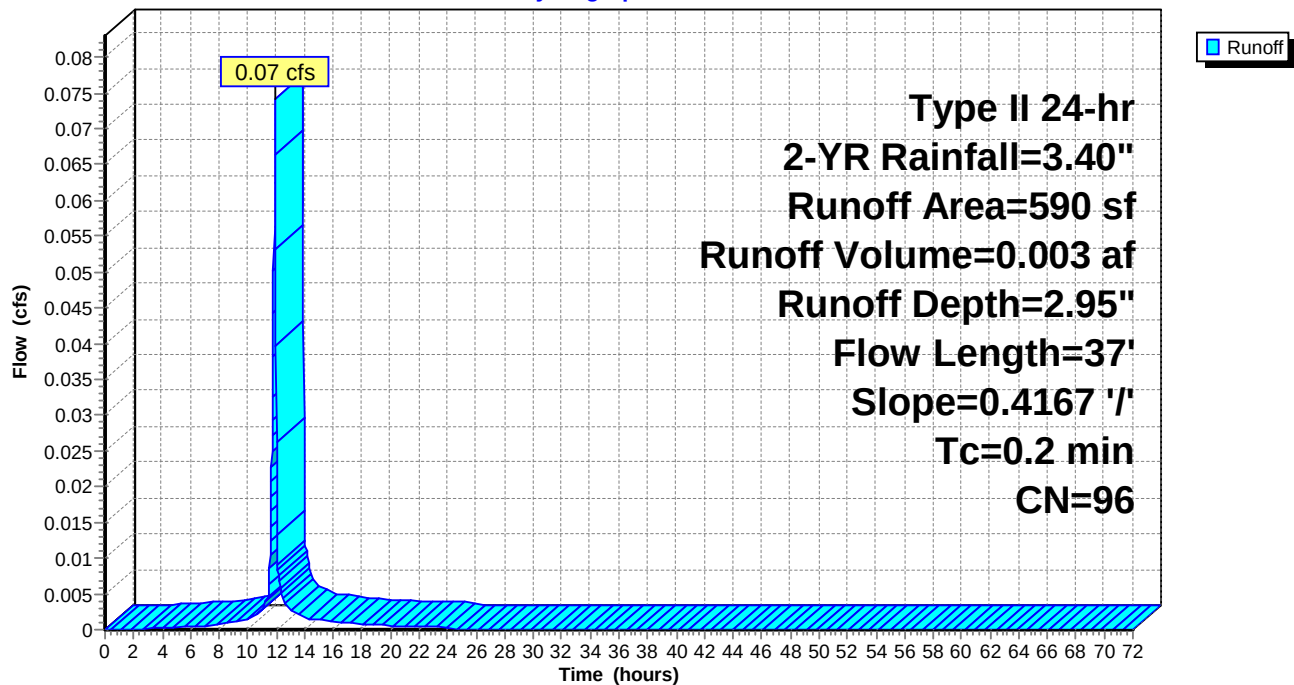
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 38: Rooftop #38

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 39: Rooftop #39

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 2.95"

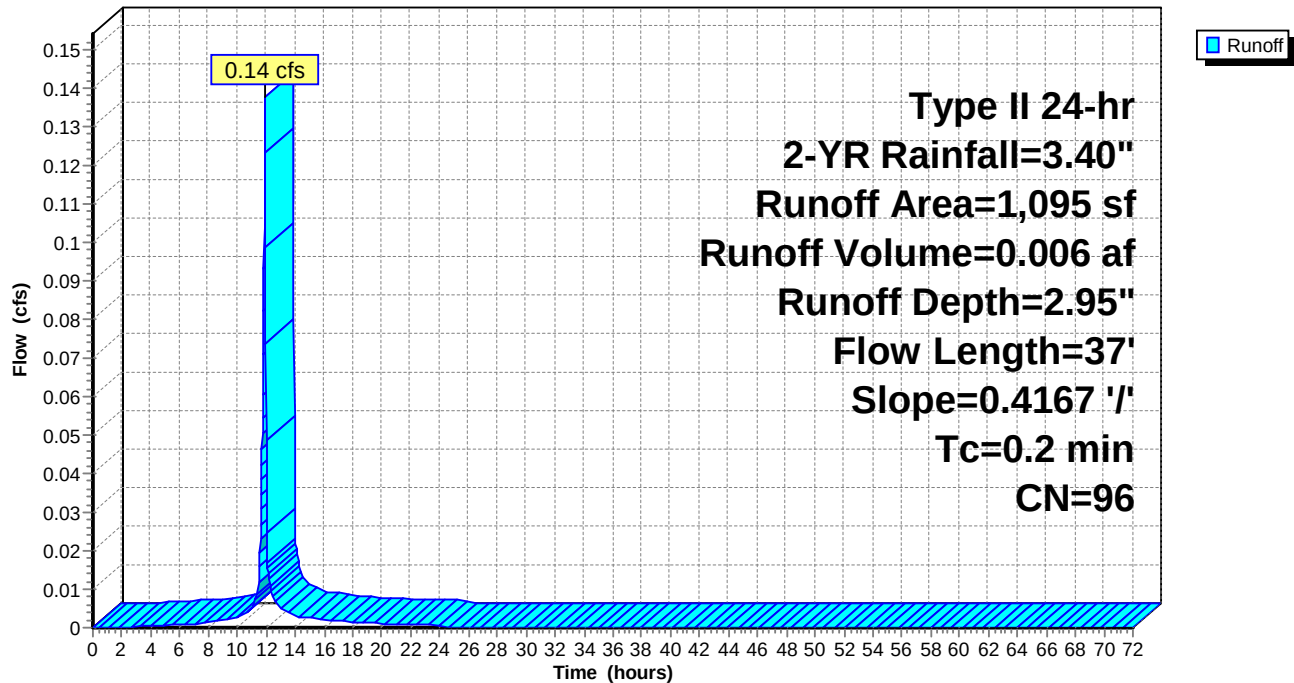
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 39: Rooftop #39

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 40: Rooftop #40

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

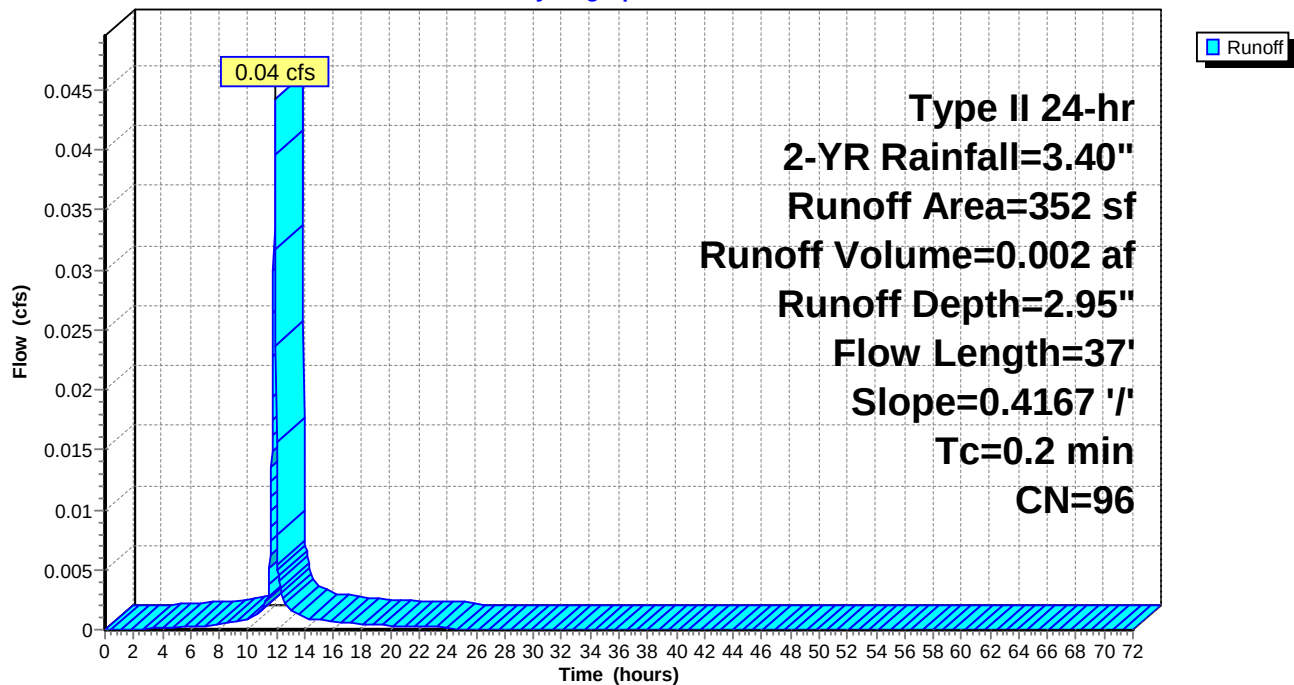
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 40: Rooftop #40

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 41: Rooftop #41

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 2.95"

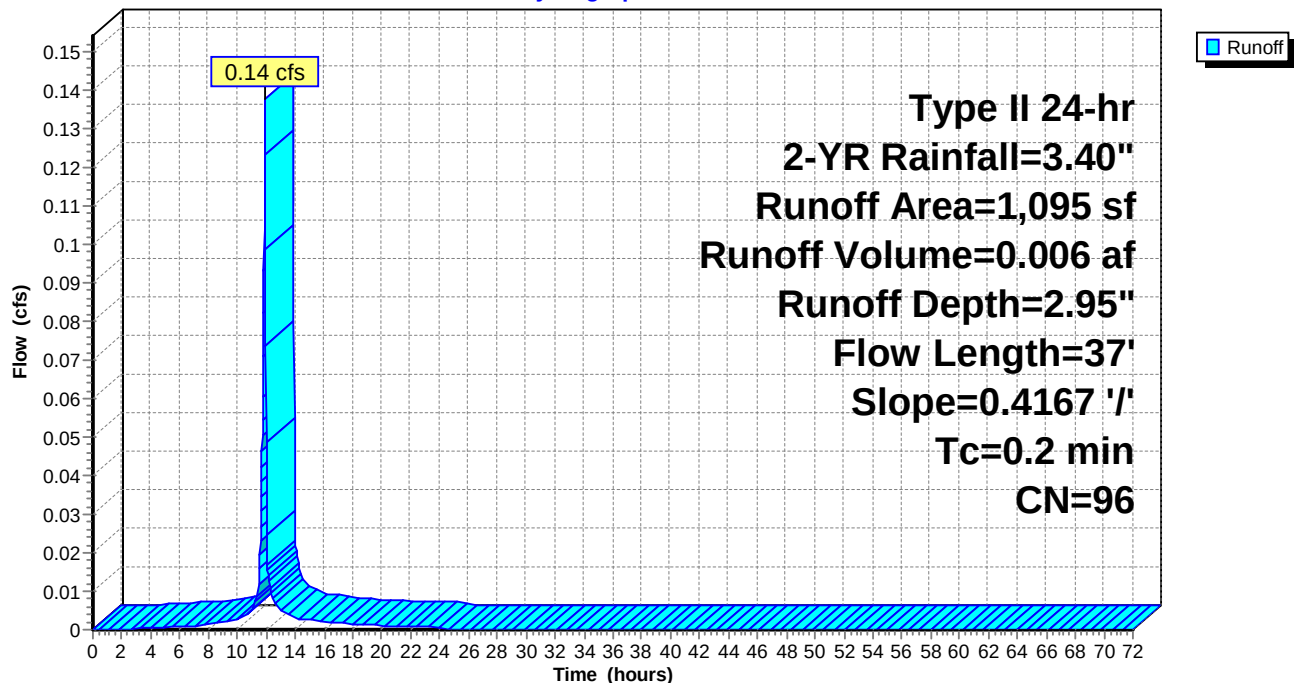
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 41: Rooftop #41

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 42: Rooftop #42

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

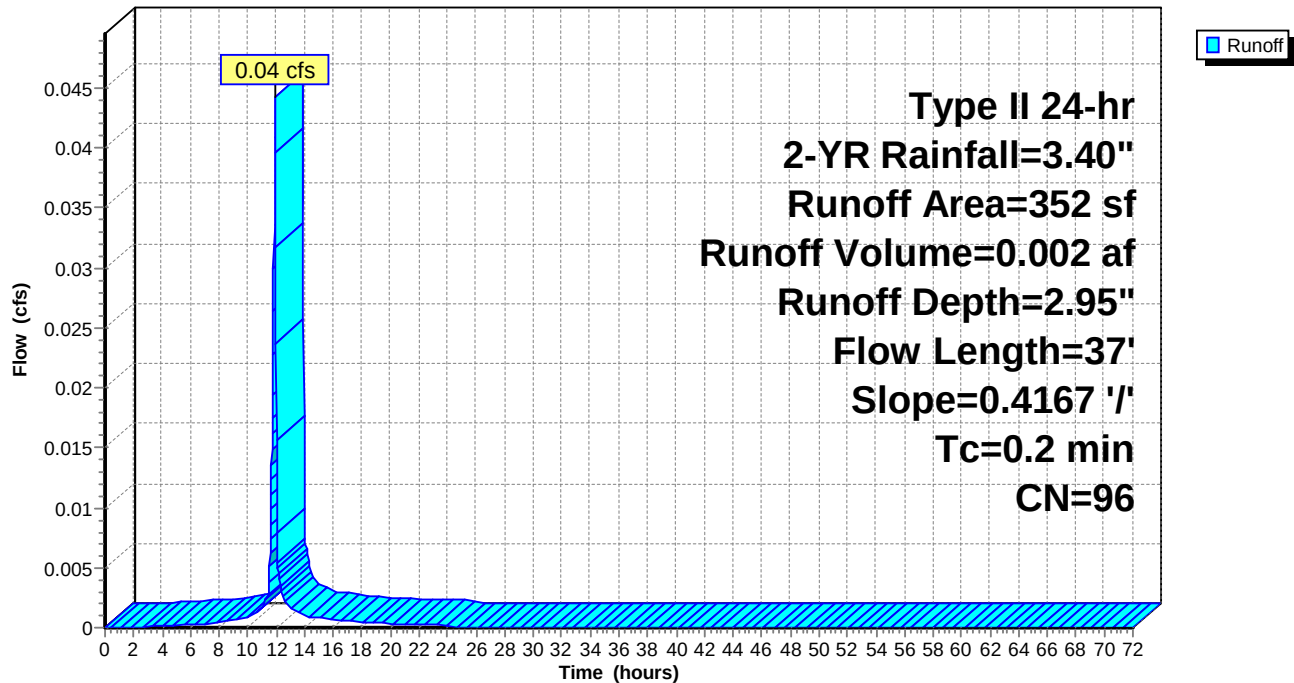
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 42: Rooftop #42

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 43: Rooftop #43

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

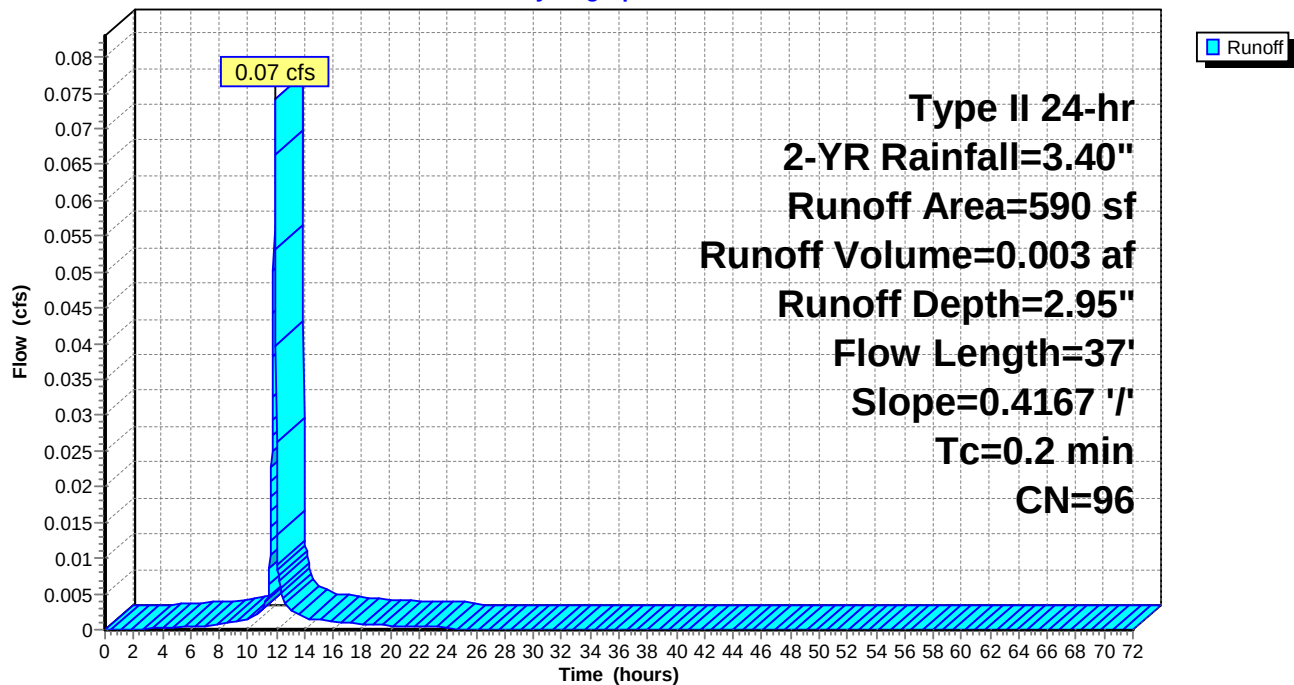
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 43: Rooftop #43

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 44: Rooftop #44

Runoff = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

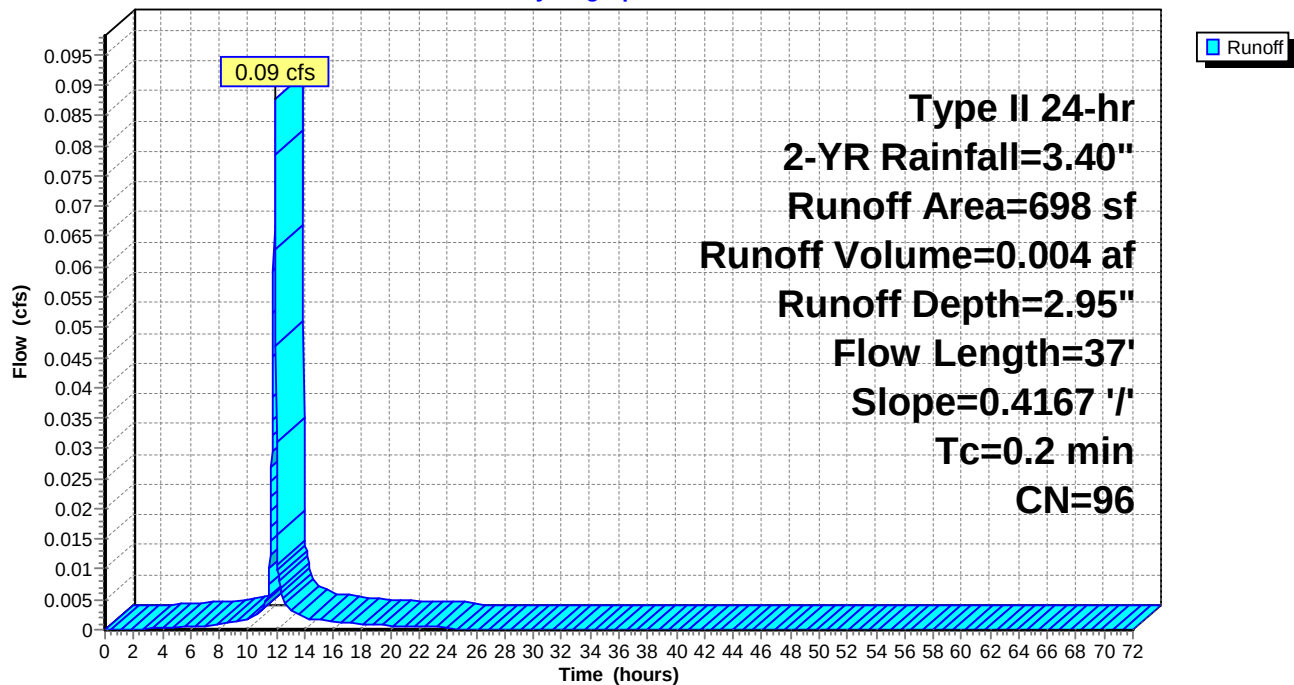
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 44: Rooftop #44

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 45: Rooftop #45

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

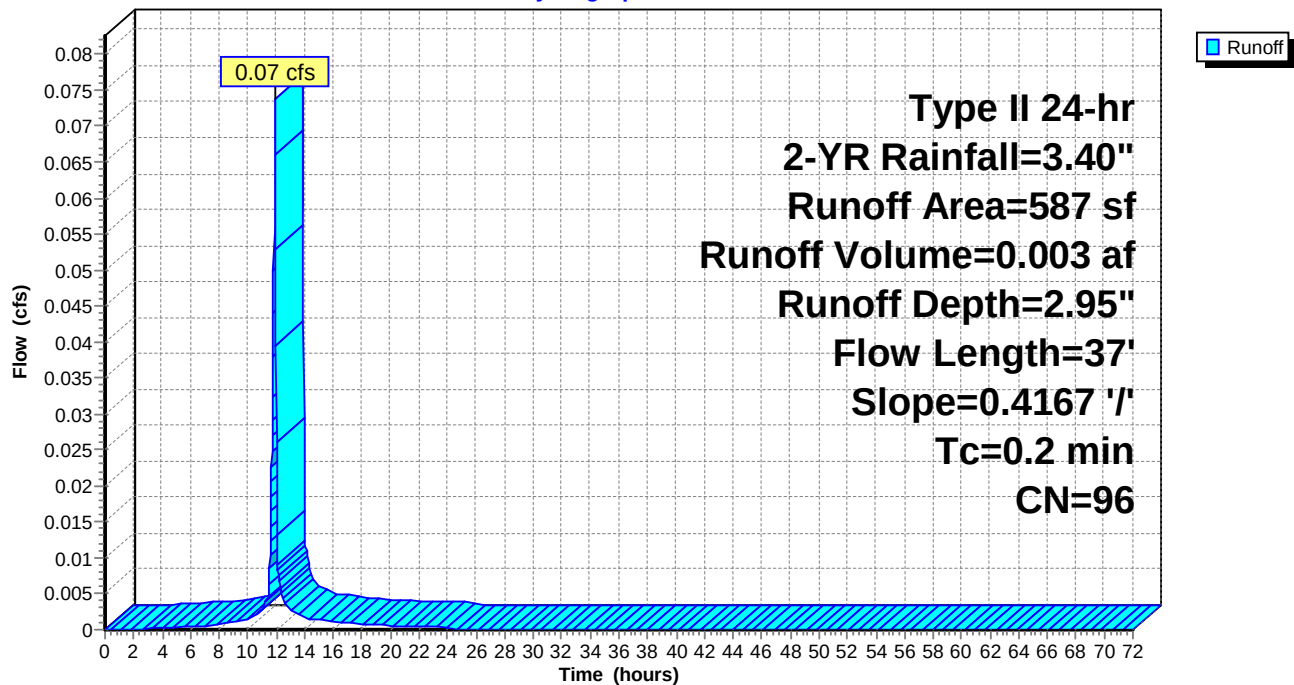
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 45: Rooftop #45

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 46: Rooftop #46

Runoff = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Depth= 2.95"

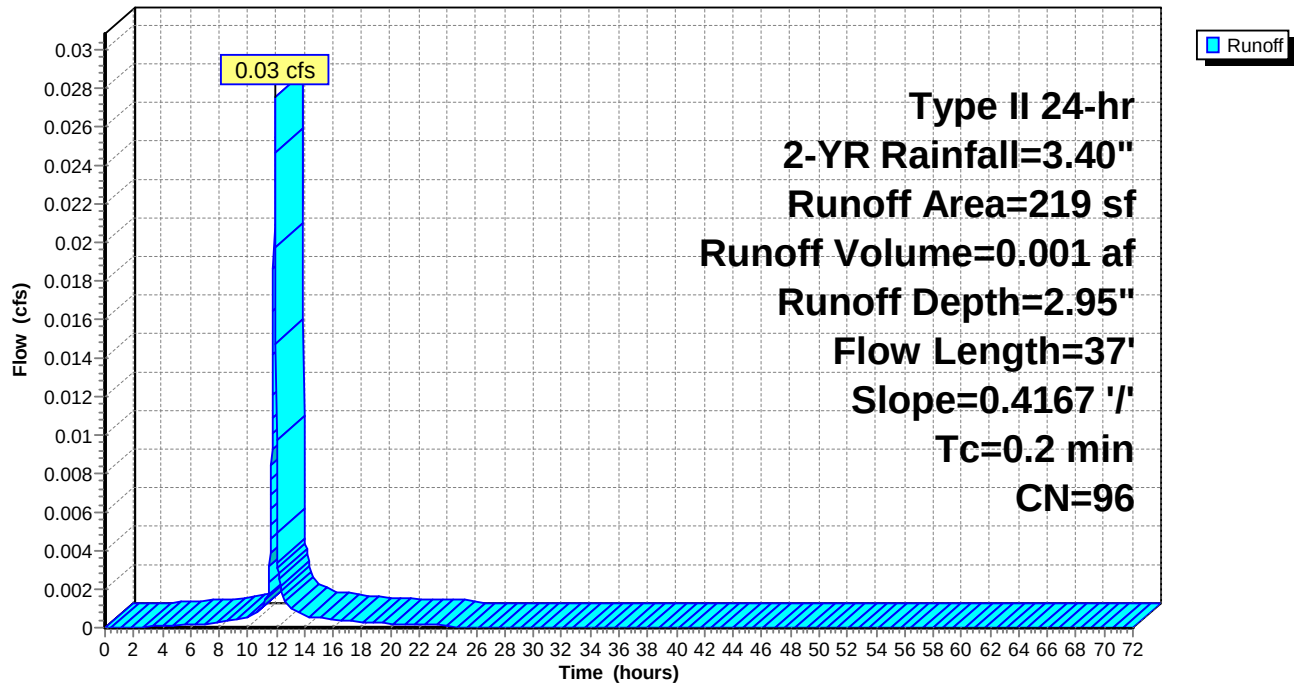
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 46: Rooftop #46

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 47: Rooftop #47

Runoff = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 2.95"

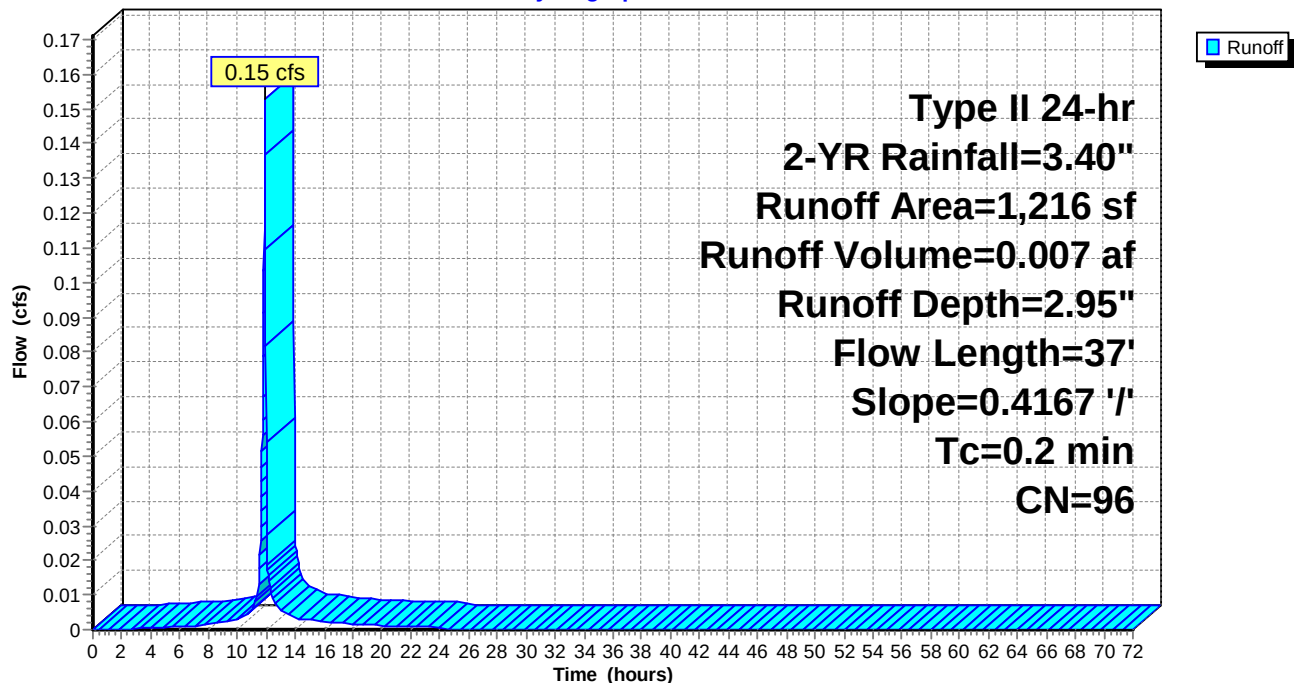
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 47: Rooftop #47

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 48: Rooftop #48

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

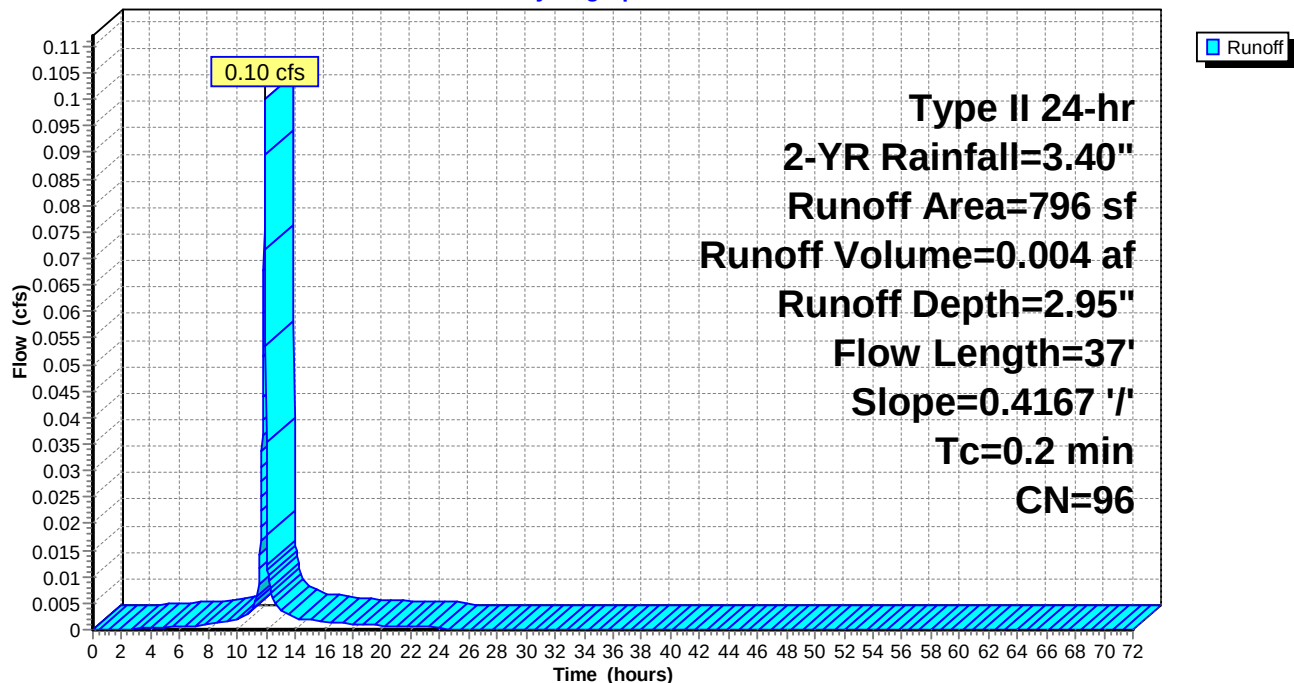
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 48: Rooftop #48

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 49: Rooftop #49

Runoff = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

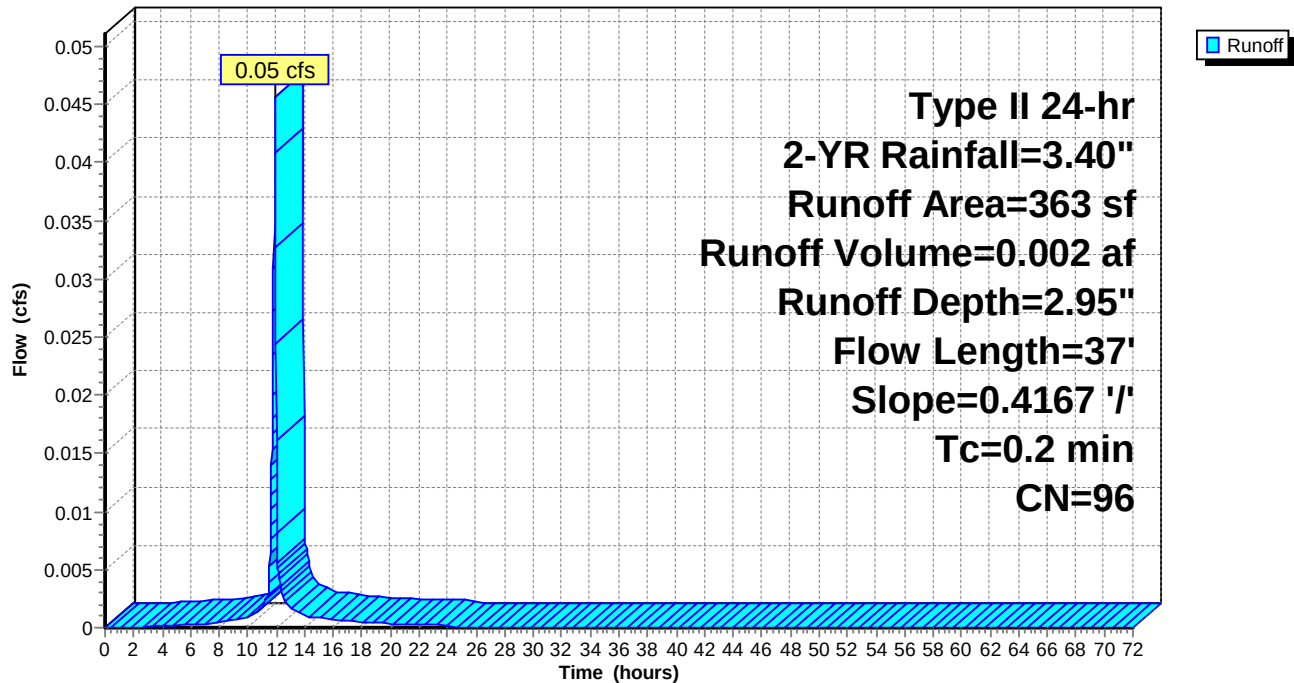
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 49: Rooftop #49

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 50: Rooftop #50

Runoff = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af, Depth= 2.95"

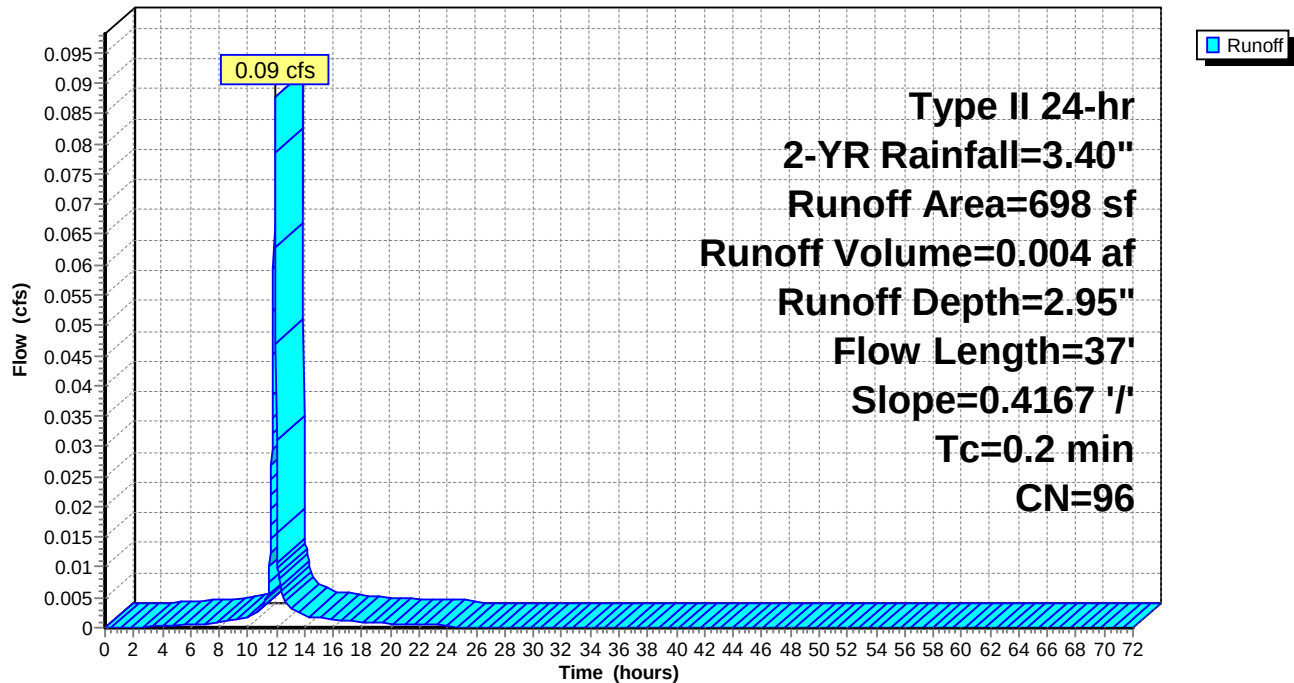
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 50: Rooftop #50

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 51: Rooftop #51

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

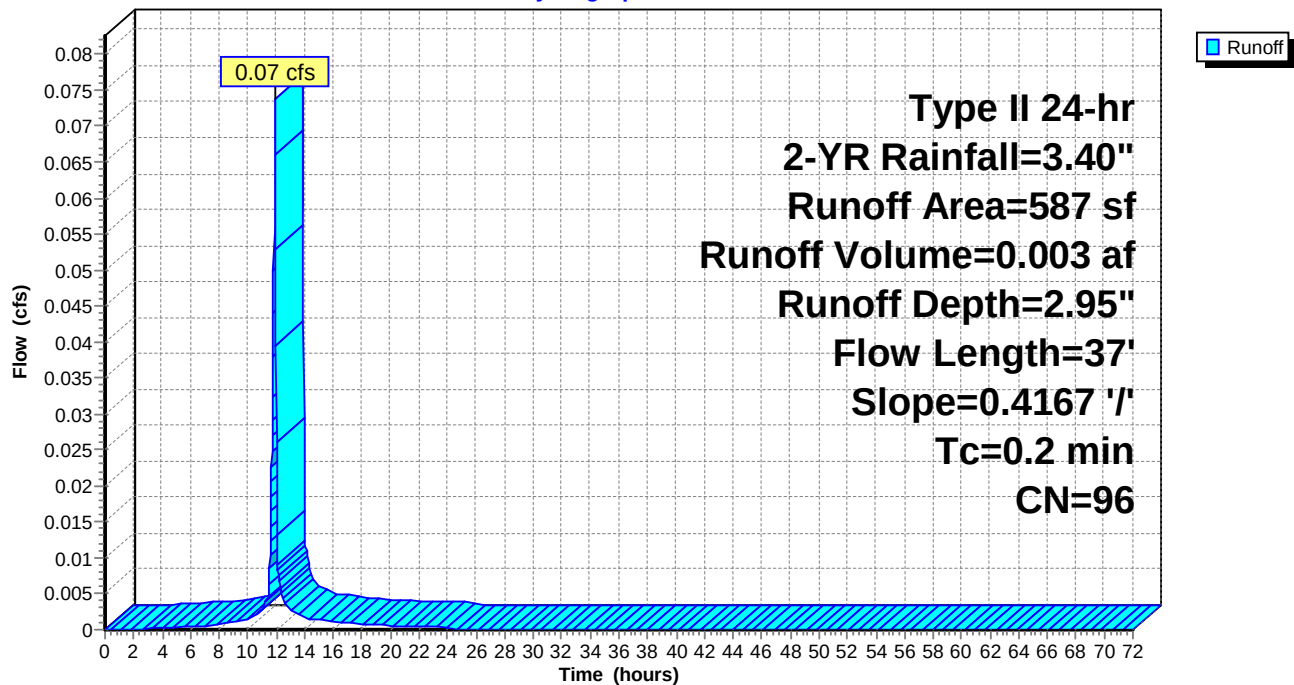
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 51: Rooftop #51

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 52: Rooftop #52

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 2.95"

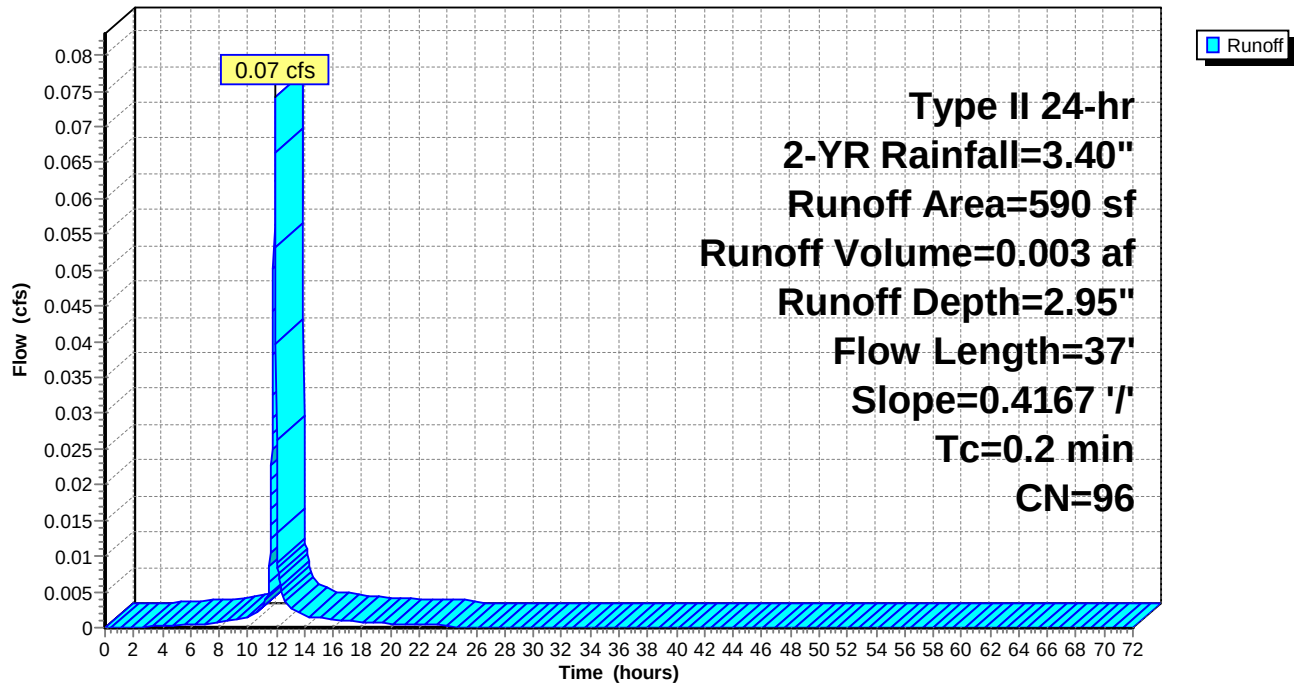
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 52: Rooftop #52

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 53: Rooftop #53

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 2.95"

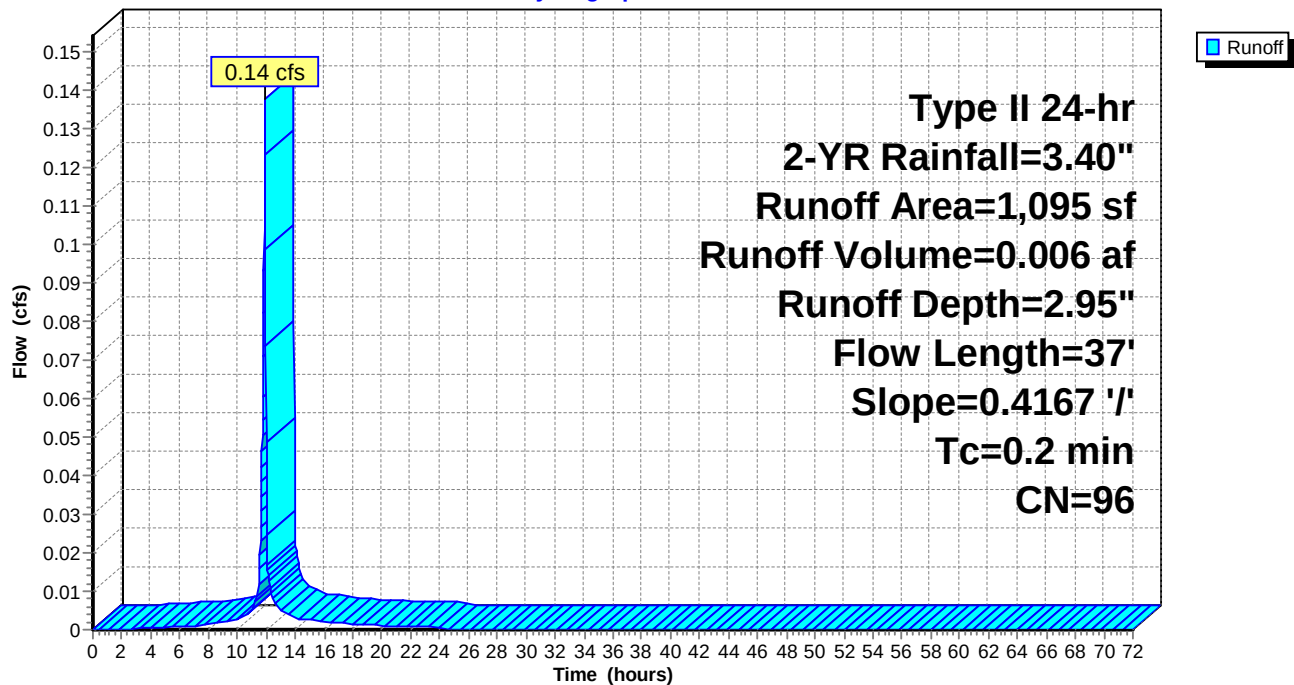
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 53: Rooftop #53

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 54: Rooftop #54

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 2.95"

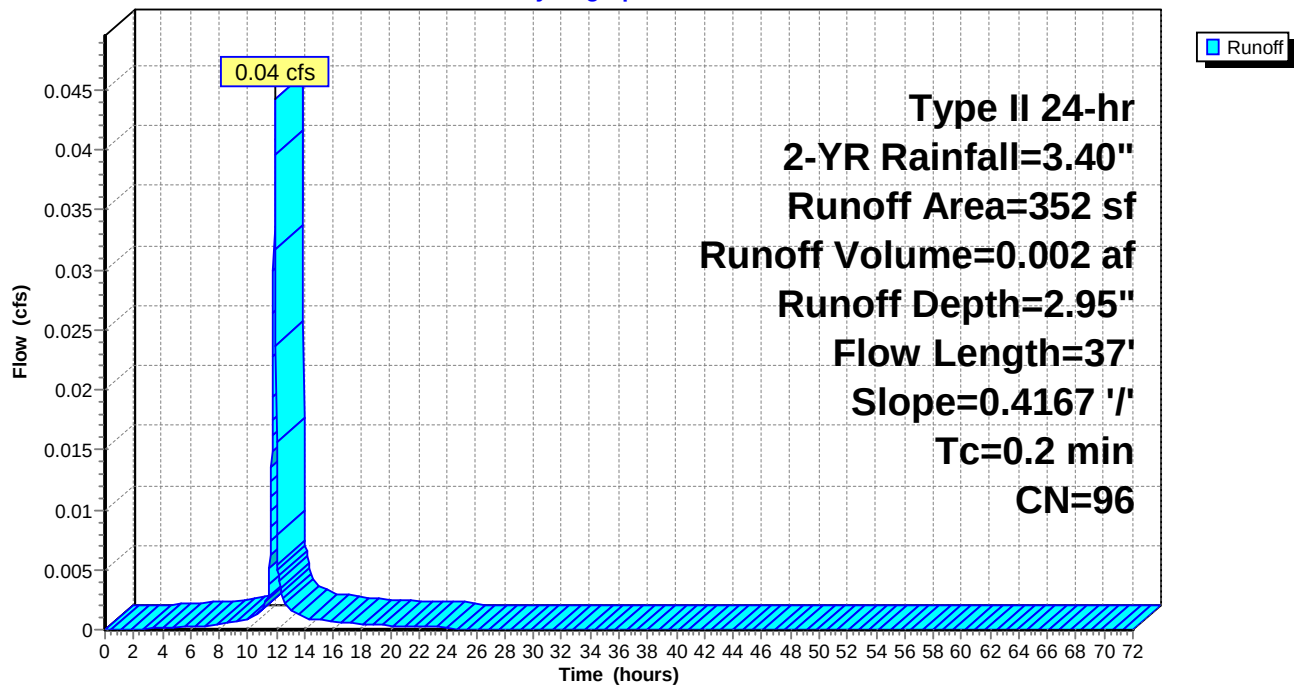
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 54: Rooftop #54

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 55: Non-RT DA to PA-2

Runoff = 0.23 cfs @ 11.99 hrs, Volume= 0.015 af, Depth= 2.54"

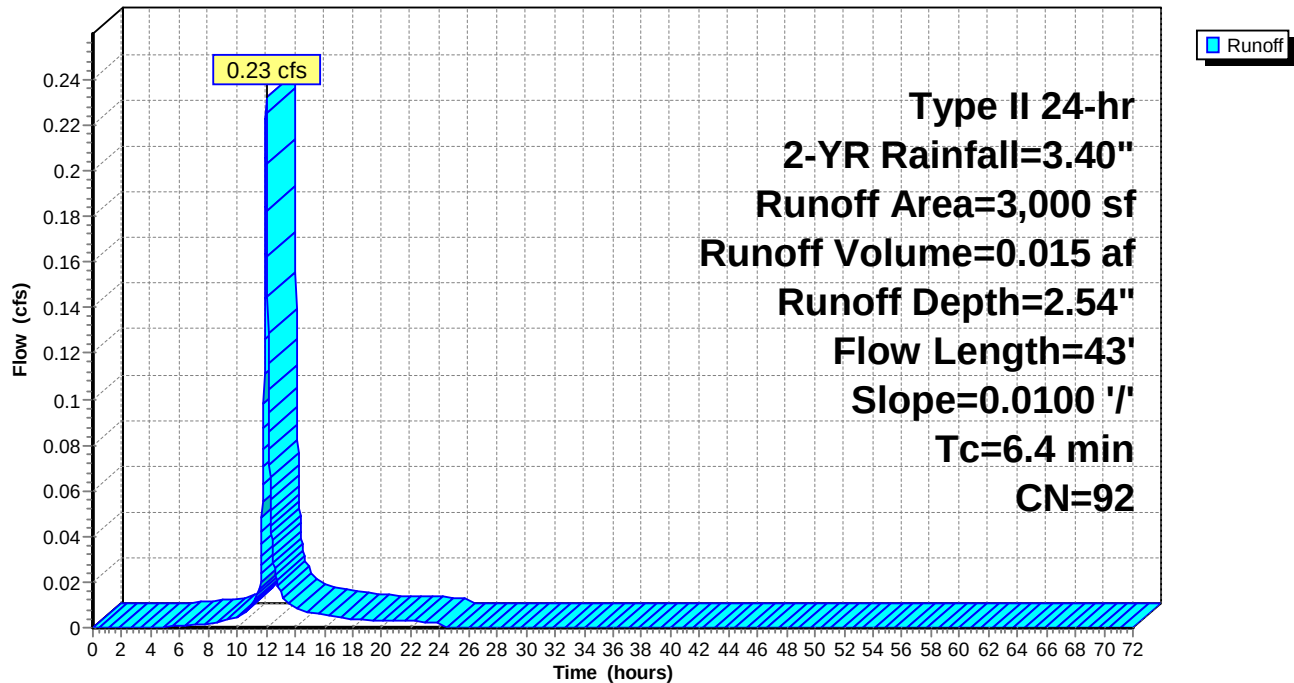
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
733	74	>75% Grass cover, Good, HSG C
* 2,267	98	Impervious
3,000	92	Weighted Average
733		24.43% Pervious Area
2,267		75.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	43	0.0100	0.11		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 55: Non-RT DA to PA-2

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 56: Non-RT DA to PA-3

Runoff = 0.26 cfs @ 12.01 hrs, Volume= 0.018 af, Depth= 2.09"

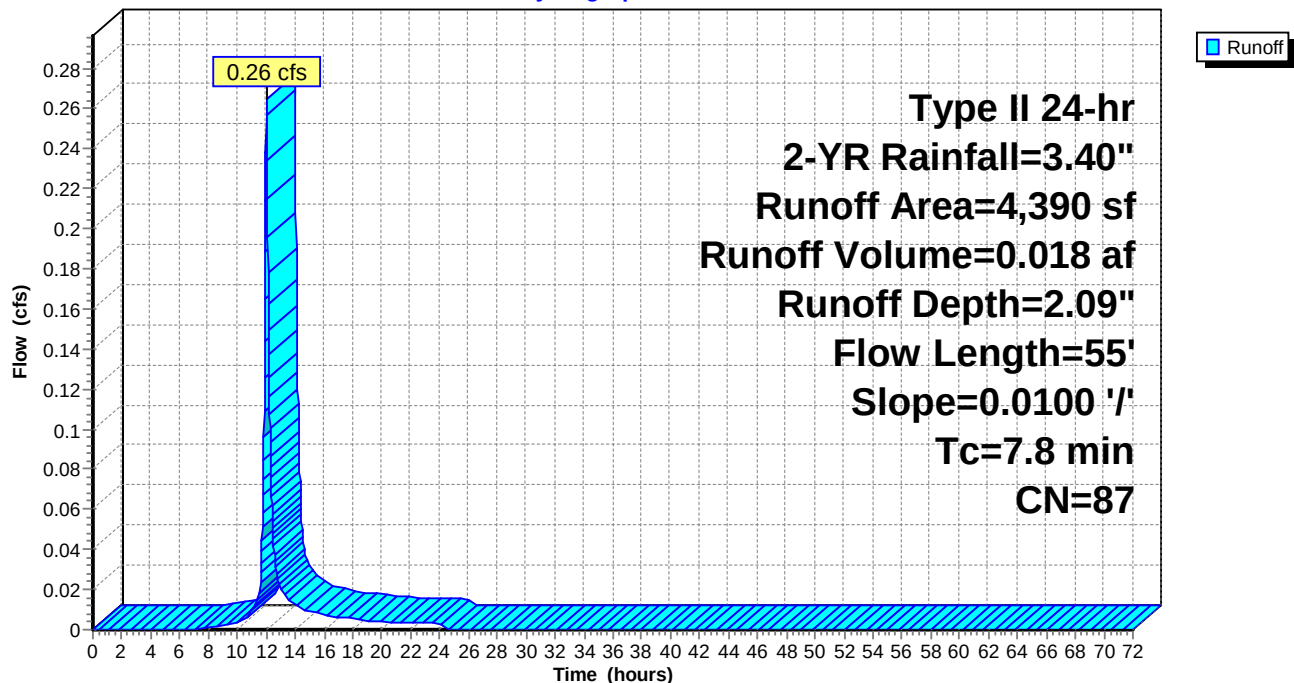
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,989	74	>75% Grass cover, Good, HSG C
2,401	98	Paved parking, HSG C
4,390	87	Weighted Average
1,989		45.31% Pervious Area
2,401		54.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	55	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 56: Non-RT DA to PA-3

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 57: Non-RT DA to PA-4

Runoff = 0.27 cfs @ 12.02 hrs, Volume= 0.019 af, Depth= 2.18"

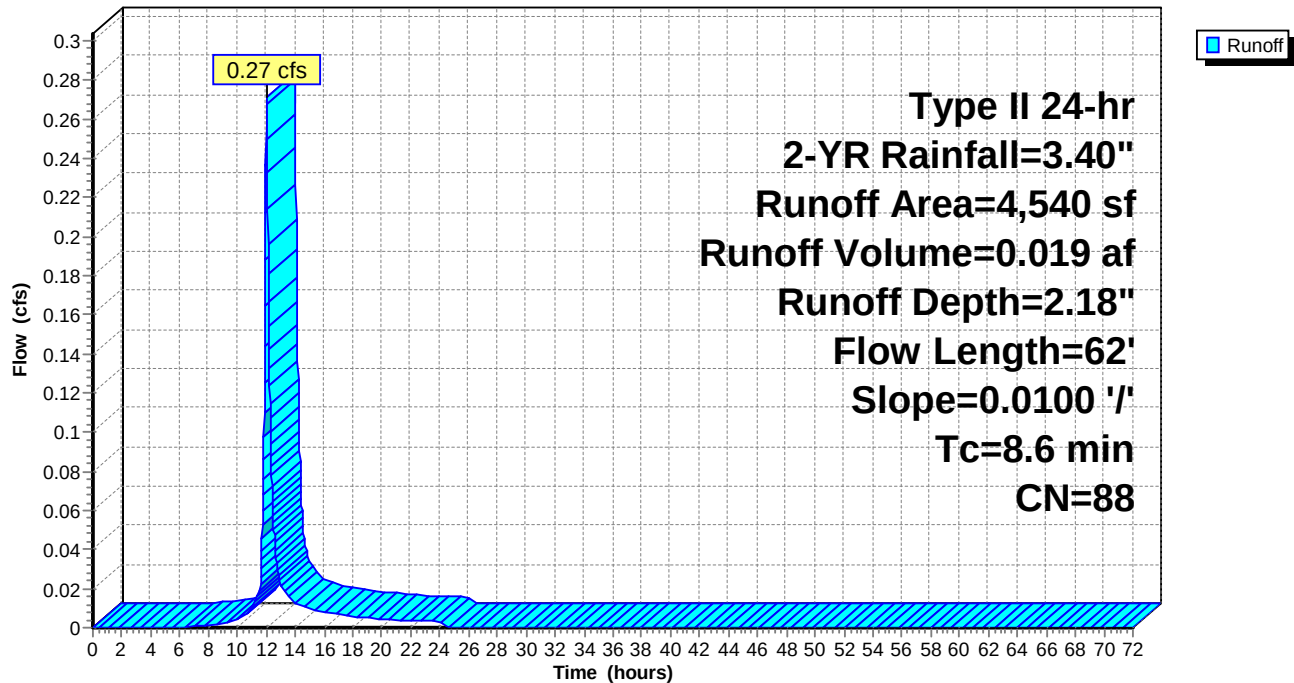
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,939	74	>75% Grass cover, Good, HSG C
2,601	98	Paved parking, HSG C
4,540	88	Weighted Average
1,939		42.71% Pervious Area
2,601		57.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	62	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 57: Non-RT DA to PA-4

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 58: Non-RT DA to PA-5

Runoff = 0.46 cfs @ 12.00 hrs, Volume= 0.030 af, Depth= 2.54"

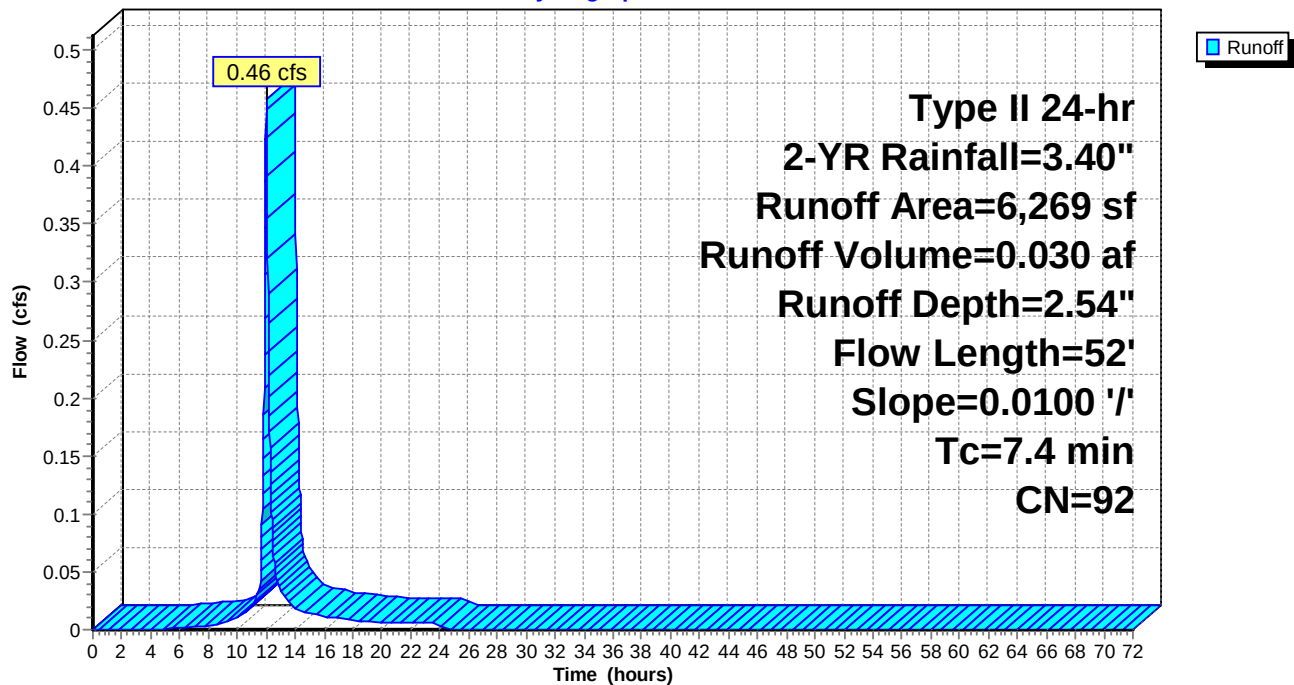
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
1,645	74	>75% Grass cover, Good, HSG C
4,624	98	Paved parking, HSG C
6,269	92	Weighted Average
1,645		26.24% Pervious Area
4,624		73.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	52	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 58: Non-RT DA to PA-5

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 59: Non-RT DA to PA-6

Runoff = 0.62 cfs @ 12.00 hrs, Volume= 0.041 af, Depth= 2.54"

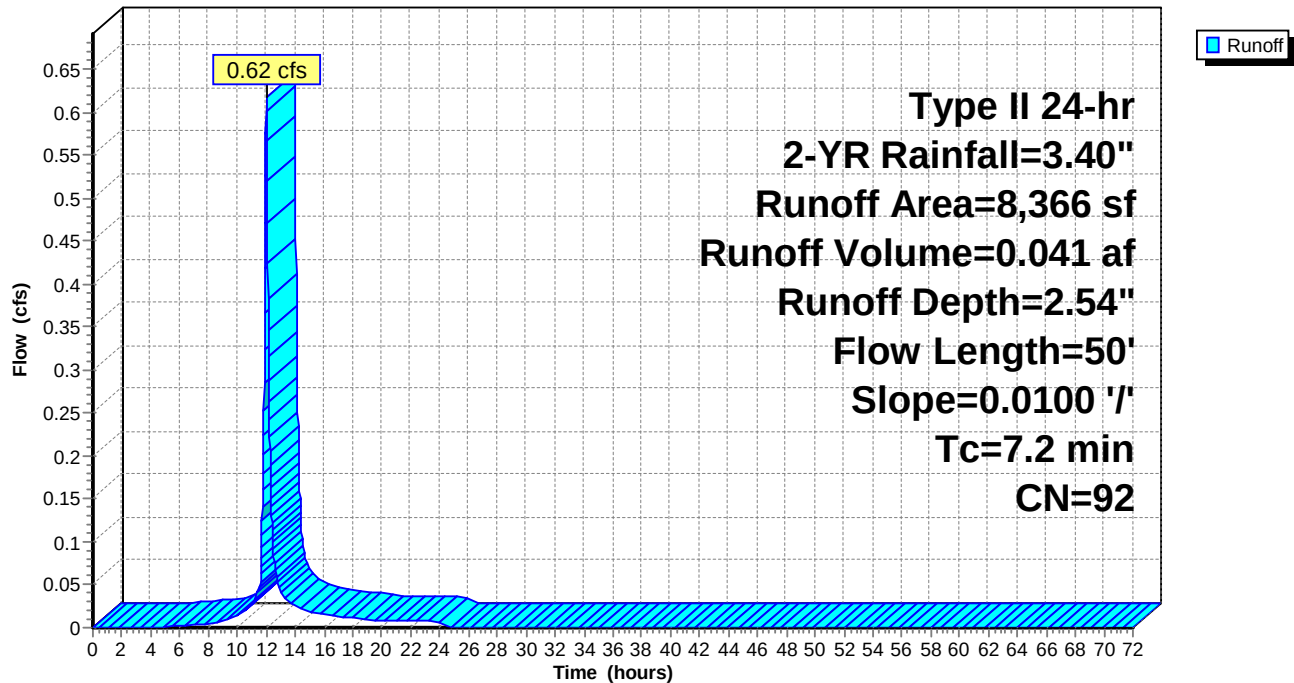
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
2,213	74	>75% Grass cover, Good, HSG C
6,153	98	Paved parking, HSG C
8,366	92	Weighted Average
2,213		26.45% Pervious Area
6,153		73.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 59: Non-RT DA to PA-6

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 60: Non-RT DA to PA-7

Runoff = 0.08 cfs @ 12.00 hrs, Volume= 0.005 af, Depth= 2.45"

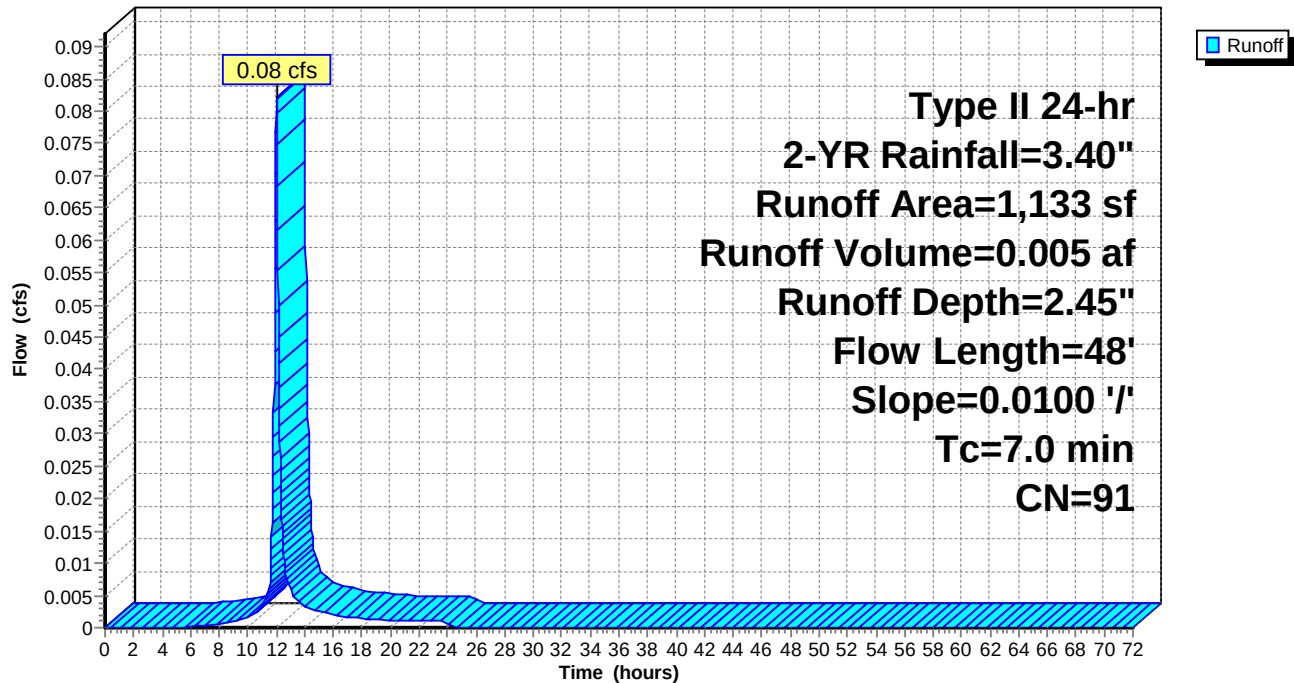
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
330	74	>75% Grass cover, Good, HSG C
803	98	Paved parking, HSG C
1,133	91	Weighted Average
330		29.13% Pervious Area
803		70.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	48	0.0100	0.11		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 60: Non-RT DA to PA-7

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Subcatchment 61: West DA to Jowite

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.032 af, Depth= 1.17"

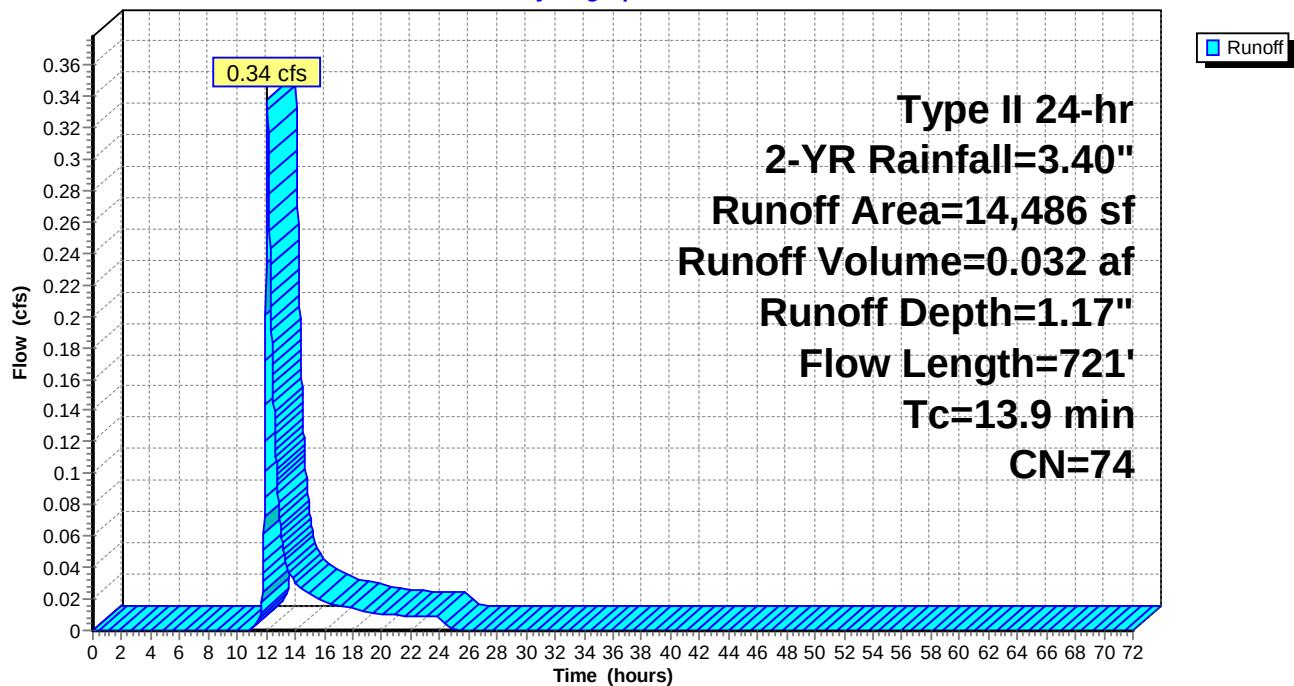
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-YR Rainfall=3.40"

Area (sf)	CN	Description
14,486	74	>75% Grass cover, Good, HSG C
14,486		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	55	0.0100	0.12		Sheet Flow, Sideyard Grass: Short n= 0.150 P2= 3.40"
5.6	496	0.0053	1.48		Shallow Concentrated Flow, Gutter Pan Paved Kv= 20.3 fps
0.5	170	0.0087	5.80	7.12	Pipe Channel, Pipe from CI on West Side of Jowite to SDMH-20201 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
13.9	721	Total			

Subcatchment 61: West DA to Jowite

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Reach VG-2: Valley Gutter 2

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

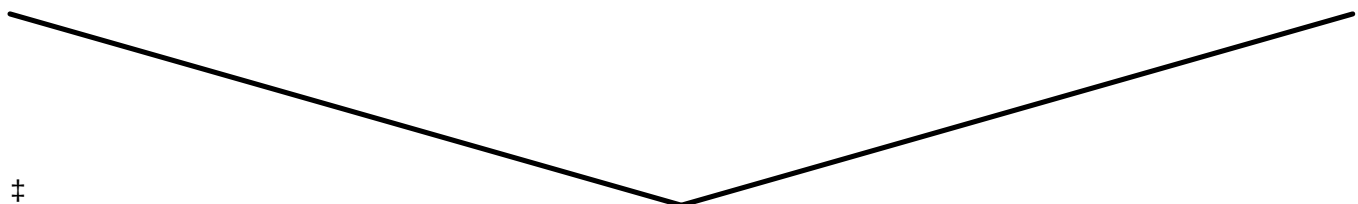
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.14 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 '/' Top Width= 2.88'

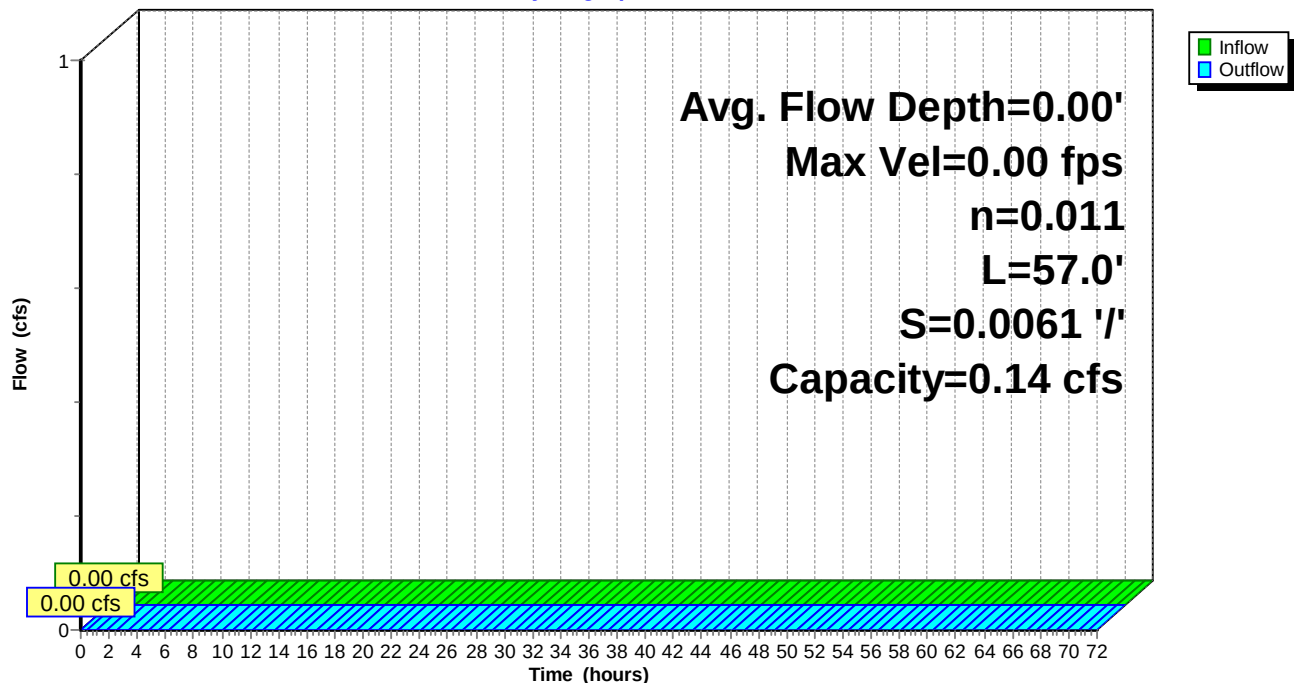
Length= 57.0' Slope= 0.0061 '/'

Inlet Invert= 15.10', Outlet Invert= 14.75'



Reach VG-2: Valley Gutter 2

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Reach VG-3: Valley Gutter 3

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

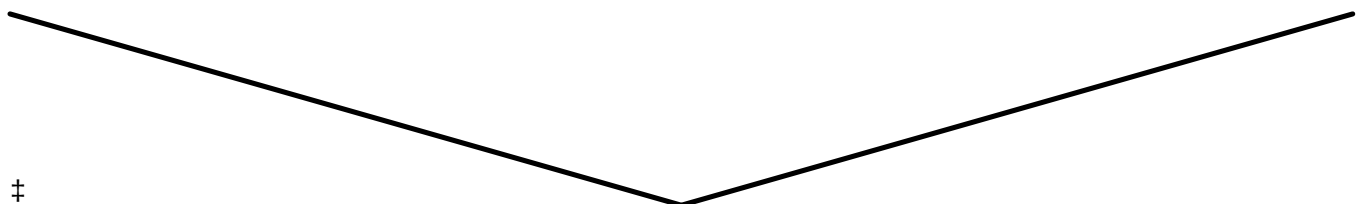
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.13 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 ' Top Width= 2.88'

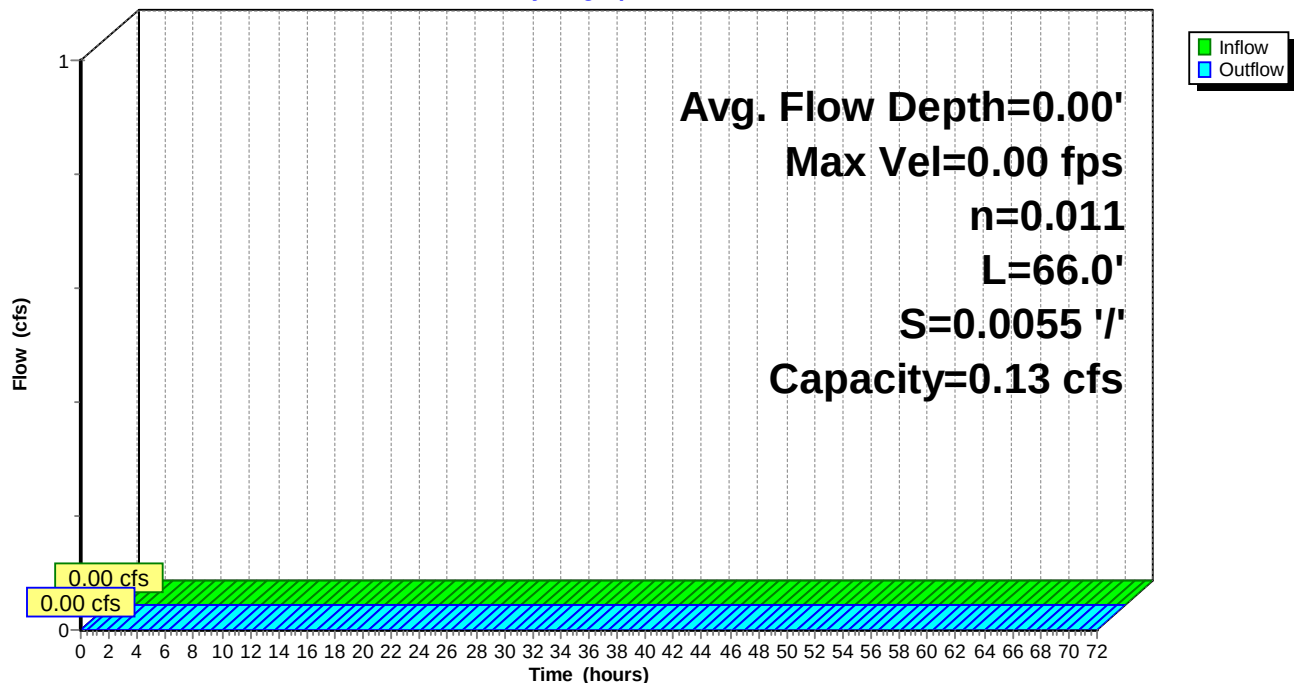
Length= 66.0' Slope= 0.0055 ' / '

Inlet Invert= 15.11', Outlet Invert= 14.75'



Reach VG-3: Valley Gutter 3

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Reach VG-4: Valley Gutter 4

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

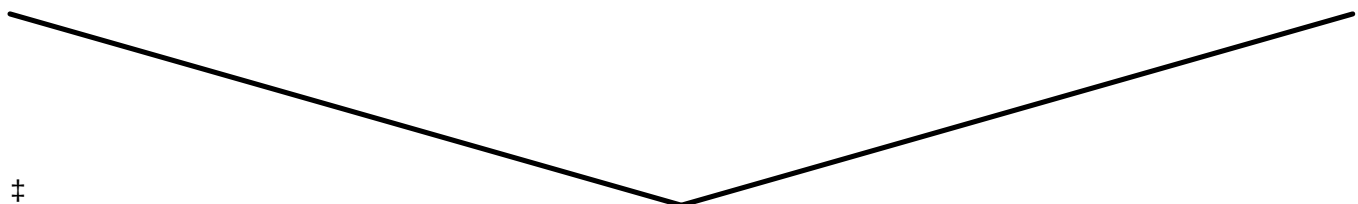
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.14 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 '/' Top Width= 2.88'

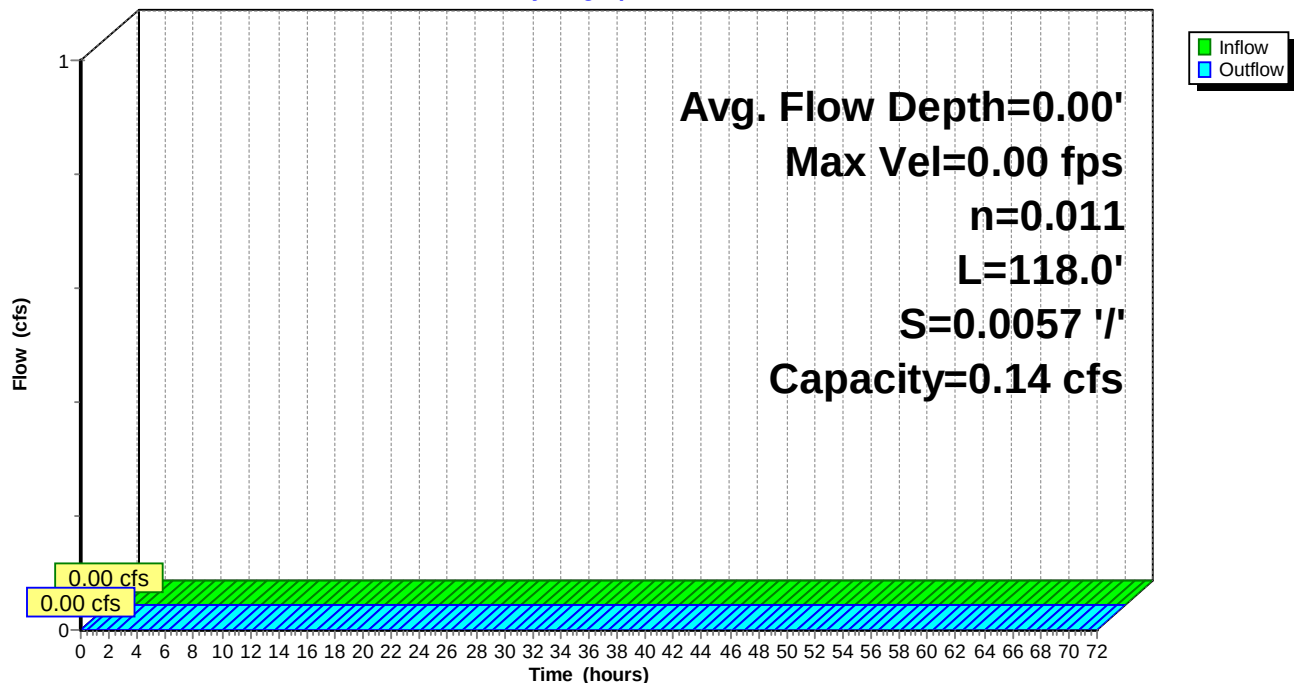
Length= 118.0' Slope= 0.0057 '/'

Inlet Invert= 15.78', Outlet Invert= 15.11'



Reach VG-4: Valley Gutter 4

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Reach VG-5: Valley Gutter 5

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

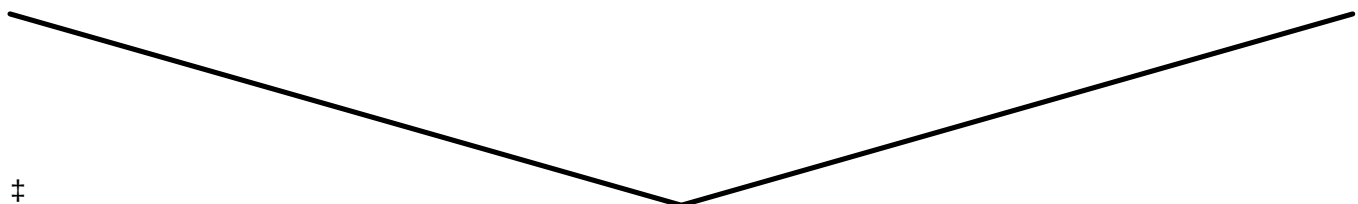
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.18 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 ' Top Width= 2.88'

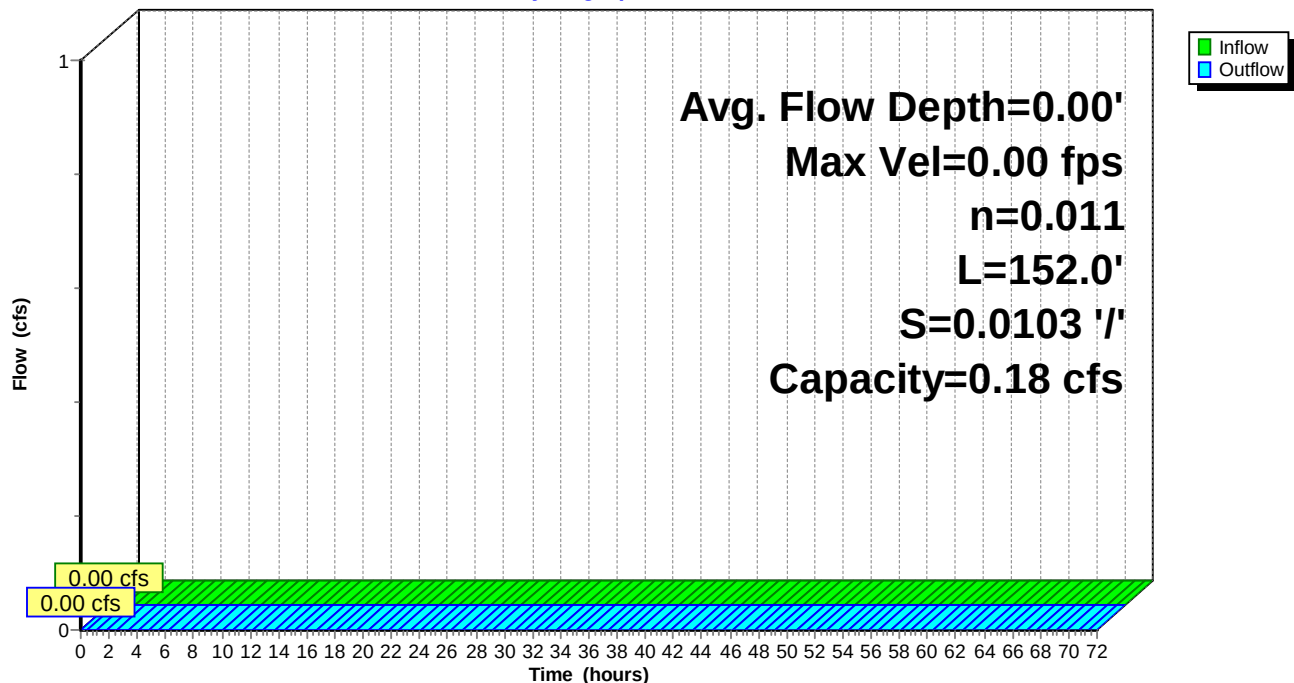
Length= 152.0' Slope= 0.0103 ' / '

Inlet Invert= 17.34', Outlet Invert= 15.78'



Reach VG-5: Valley Gutter 5

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond EX-I-2: EX-I-2

Inflow Area = 0.921 ac, 75.76% Impervious, Inflow Depth = 2.52" for 2-YR event
Inflow = 1.71 cfs @ 12.02 hrs, Volume= 0.193 af
Outflow = 1.71 cfs @ 12.02 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min
Primary = 1.71 cfs @ 12.02 hrs, Volume= 0.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.29' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	2.0" x 2.0" Horiz. Orifice/Grate X 11.00 columns X 11 rows C= 0.600 in 24.0" x 24.0" Grate (84% open area) Limited to weir flow at low heads
#2	Primary	12.30'	12.0" Round CMP_Round 12" L= 172.1' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 12.30' / 12.00' S= 0.0017 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

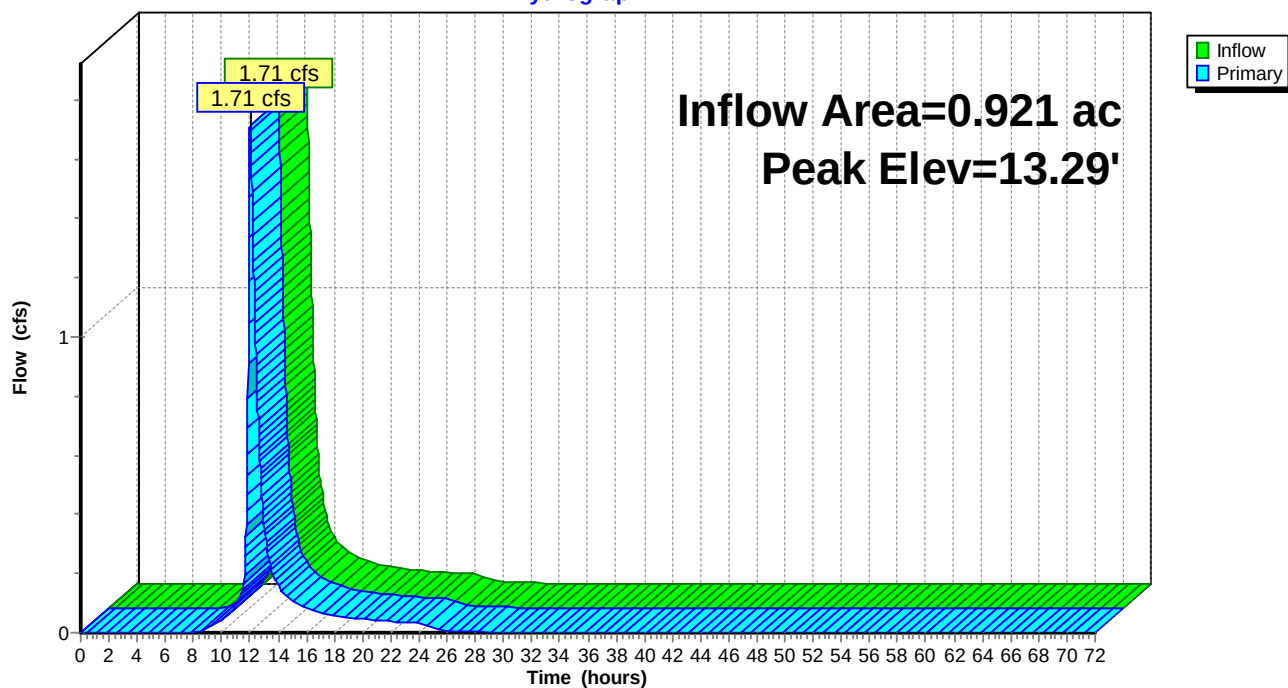
Primary OutFlow Max=1.71 cfs @ 12.02 hrs HW=13.28' TW=12.75' (Dynamic Tailwater)

1=Orifice/Grate (Controls 0.00 cfs)

2=CMP_Round 12" (Outlet Controls 1.71 cfs @ 2.76 fps)

Pond EX-I-2: EX-I-2

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P19: Planter #19

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.10 cfs @ 11.91 hrs, Volume= 0.004 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.10 cfs @ 11.91 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 13.70' @ 11.91 hrs Surf.Area= 55 sf Storage= 10 cf

Plug-Flow detention time= 30.5 min calculated for 0.004 af (98% of inflow)
 Center-of-Mass det. time= 15.2 min (778.7 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	55	0.0	0	0
13.25	55	40.0	0	0
16.99	55	40.0	82	82
17.00	55	100.0	1	83
18.00	55	100.0	55	138
18.01	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 26.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.10' S= 0.0131 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.91 hrs HW=13.70' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.35 fps)

Naima - Phase 2 - Proposed HydroCAD

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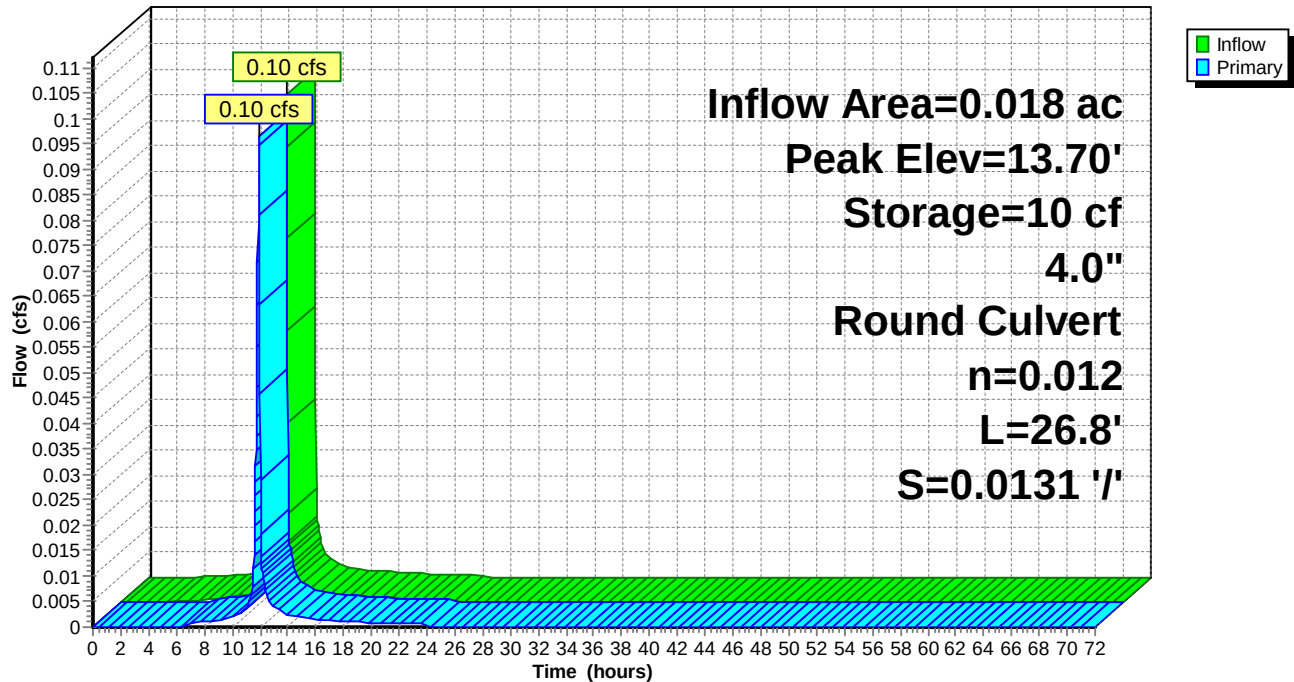
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P19: Planter #19

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P20: Planter #20

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.80' Surf.Area= 30 sf Storage= 31 cf

Peak Elev= 15.96' @ 11.90 hrs Surf.Area= 30 sf Storage= 33 cf (2 cf above start)

Plug-Flow detention time= 180.6 min calculated for 0.001 af (66% of inflow)

Center-of-Mass det. time= 3.3 min (766.8 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	30	0.0	0	0
13.25	30	40.0	0	0
16.99	30	40.0	45	45
17.00	30	100.0	0	45
18.00	30	100.0	30	75
18.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.80'	4.0" Round Culvert L= 20.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.80' S= -0.1169 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=15.96' TW=14.42' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.04 cfs @ 1.07 fps)

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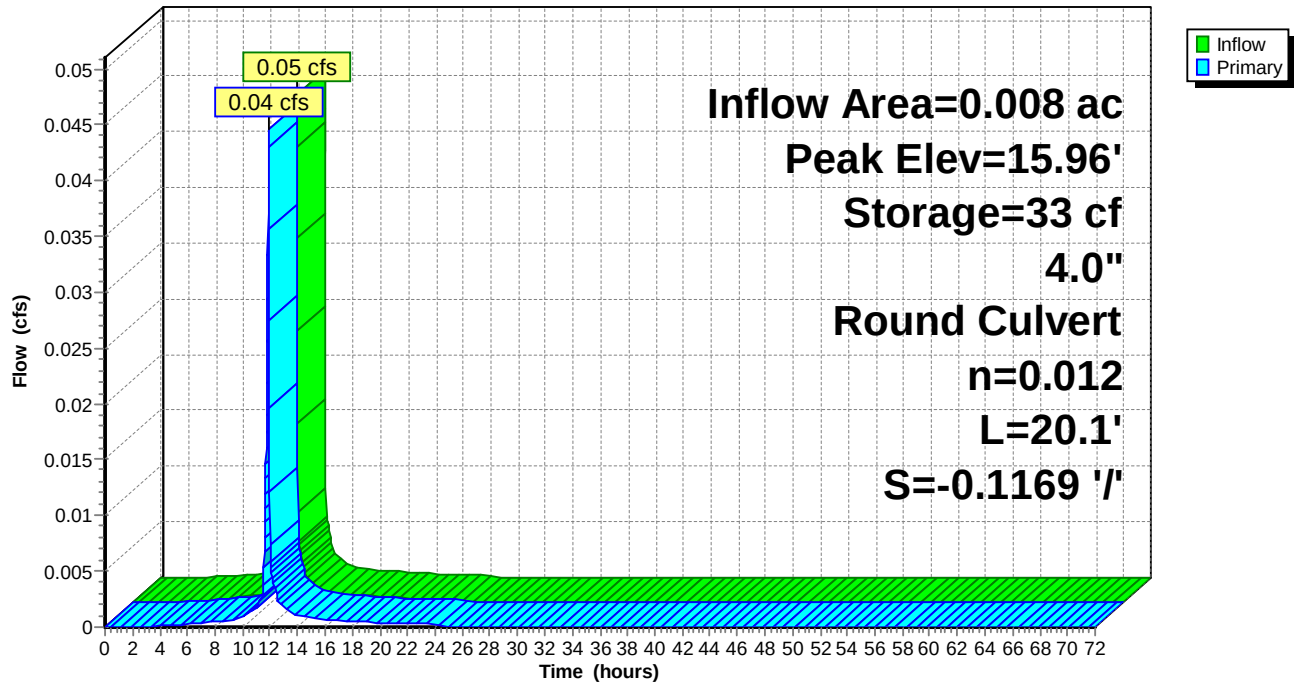
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P20: Planter #20

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P21: Planter #21

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af
 Outflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.57' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 36.7 min calculated for 0.001 af (97% of inflow)

Center-of-Mass det. time= 16.9 min (780.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	20	0.0	0	0
13.25	20	40.0	0	0
16.99	20	40.0	30	30
17.00	20	100.0	0	30
18.00	20	100.0	20	50
18.01	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 30.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 12.89' S= 0.0185 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.03 cfs @ 11.90 hrs HW=13.57' TW=12.83' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.03 cfs @ 0.94 fps)

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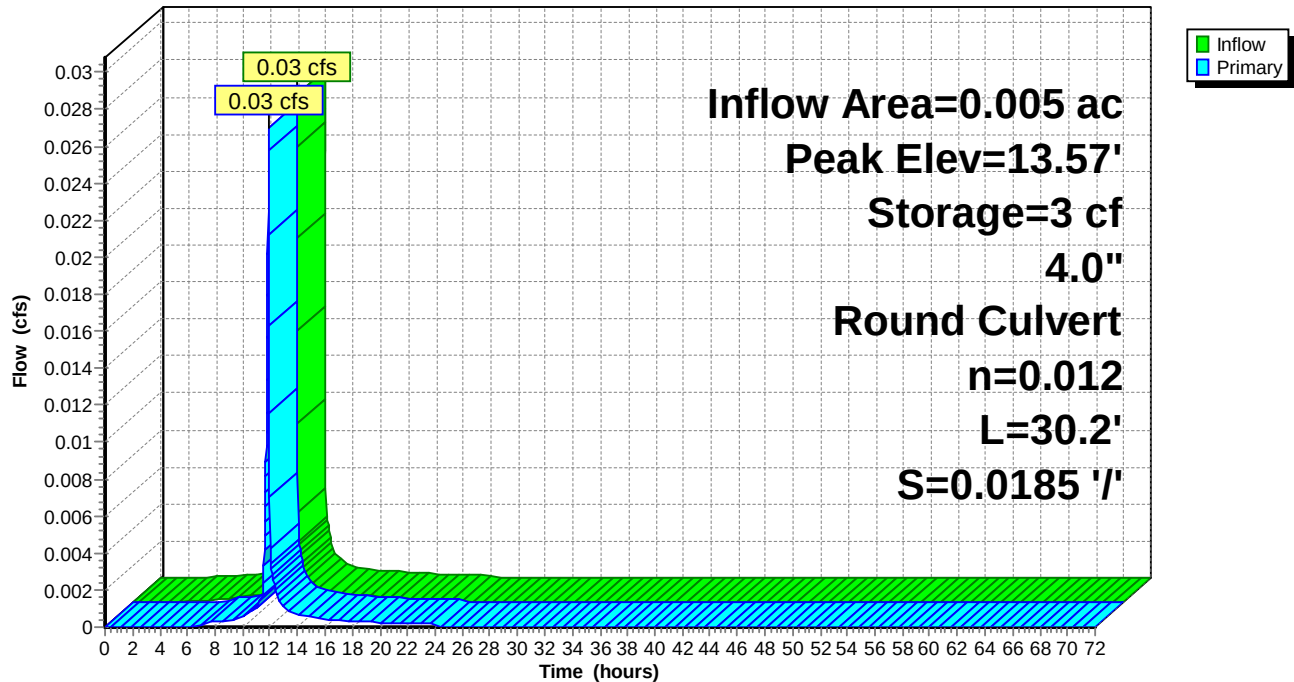
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P21: Planter #21

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P22: Planter #22

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.14 cfs @ 11.91 hrs, Volume= 0.007 af, Atten= 7%, Lag= 1.0 min
 Primary = 0.14 cfs @ 11.91 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.54' Surf.Area= 80 sf Storage= 74 cf

Peak Elev= 15.90' @ 11.92 hrs Surf.Area= 80 sf Storage= 85 cf (11 cf above start)

Plug-Flow detention time= 152.0 min calculated for 0.005 af (75% of inflow)

Center-of-Mass det. time= 4.9 min (768.5 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	80	0.0	0	0
13.25	80	40.0	0	0
16.99	80	40.0	120	120
17.00	80	100.0	1	121
18.00	80	100.0	80	201
18.01	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.54'	4.0" Round Culvert L= 59.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.54' S= -0.0350 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.14 cfs @ 11.91 hrs HW=15.89' TW=14.43' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.14 cfs @ 1.61 fps)

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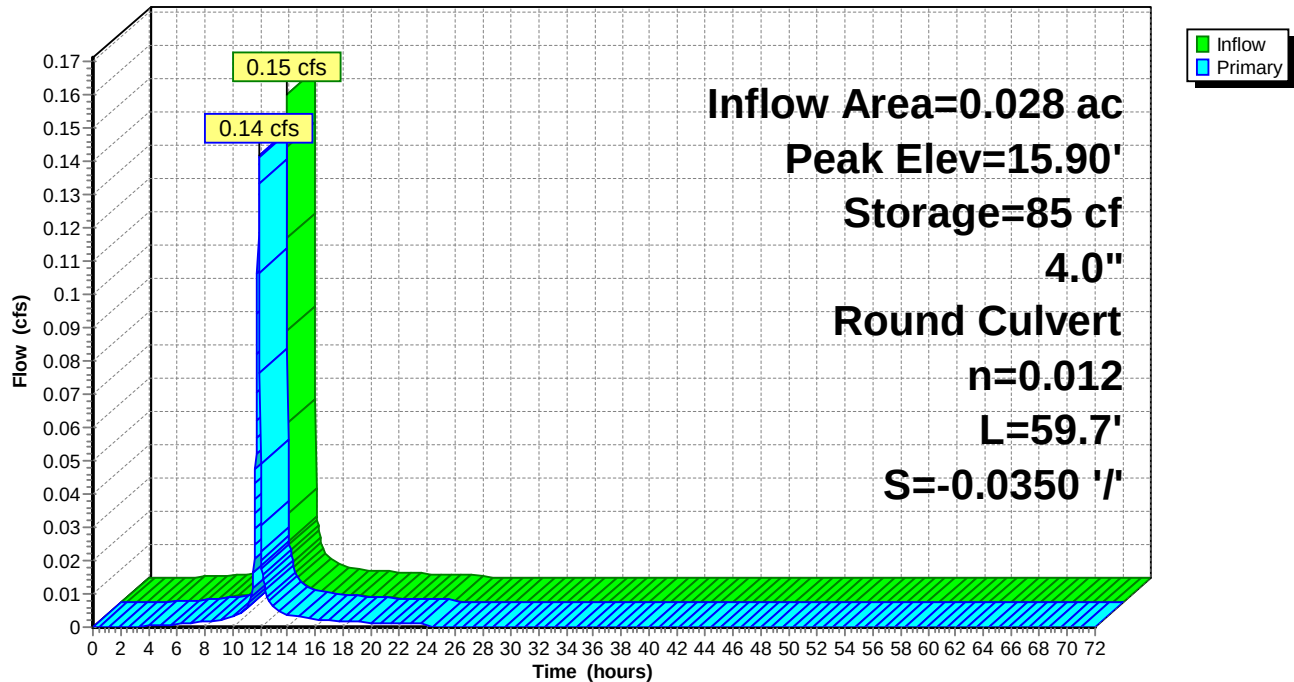
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P22: Planter #22

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P23: Planter #23

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.08 cfs @ 11.91 hrs, Volume= 0.004 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.08 cfs @ 11.91 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 13.19' @ 11.91 hrs Surf.Area= 50 sf Storage= 9 cf

Plug-Flow detention time= 31.1 min calculated for 0.004 af (98% of inflow)
 Center-of-Mass det. time= 15.7 min (779.3 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	50	0.0	0	0
12.75	50	40.0	0	0
16.49	50	40.0	75	75
16.50	50	100.0	1	76
17.50	50	100.0	50	126
17.51	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	12.95'	4.0" Round Culvert L= 20.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 12.81' S= 0.0068 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.08 cfs @ 11.91 hrs HW=13.19' TW=12.83' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 0.08 cfs @ 1.76 fps)

Naima - Phase 2 - Proposed HydroCAD

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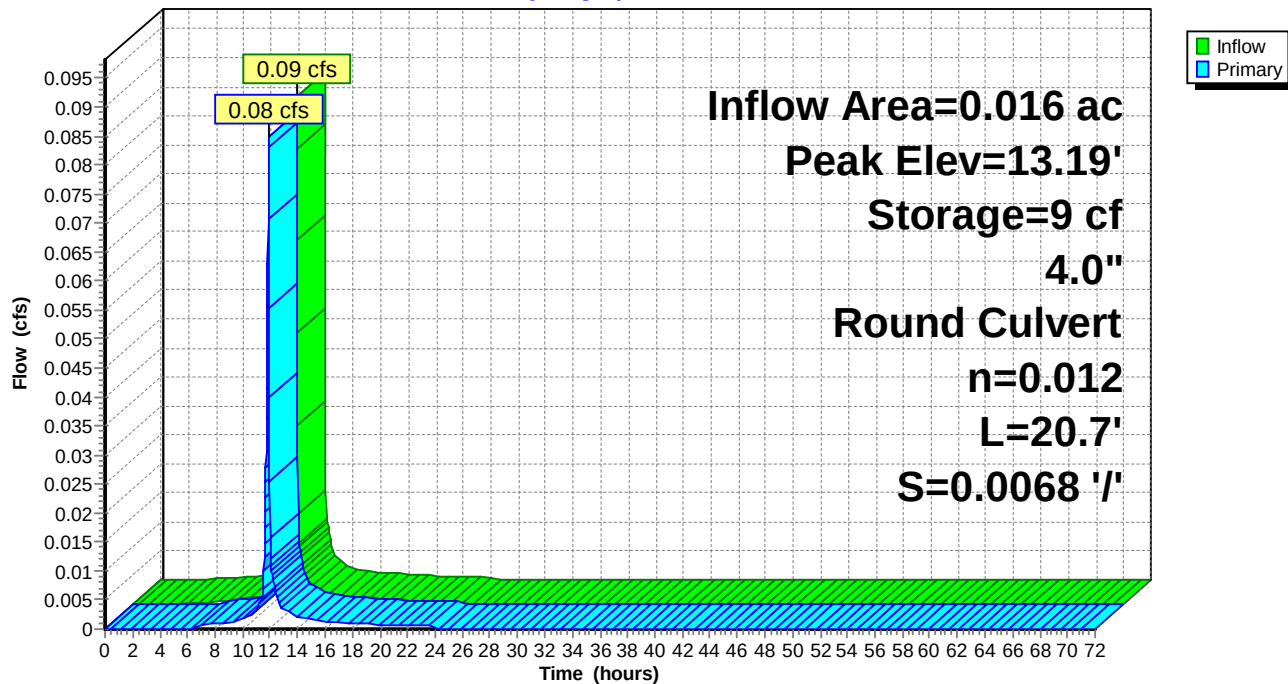
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P23: Planter #23

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P24: Planter #24

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.45' Surf.Area= 40 sf Storage= 43 cf

Peak Elev= 15.66' @ 11.91 hrs Surf.Area= 40 sf Storage= 47 cf (3 cf above start)

Plug-Flow detention time= 167.4 min calculated for 0.002 af (70% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	40	0.0	0	0
12.75	40	40.0	0	0
16.49	40	40.0	60	60
16.50	40	100.0	0	60
17.50	40	100.0	40	100
17.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	4.0" Round Culvert L= 36.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.45' S= -0.0683 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=15.66' TW=14.25' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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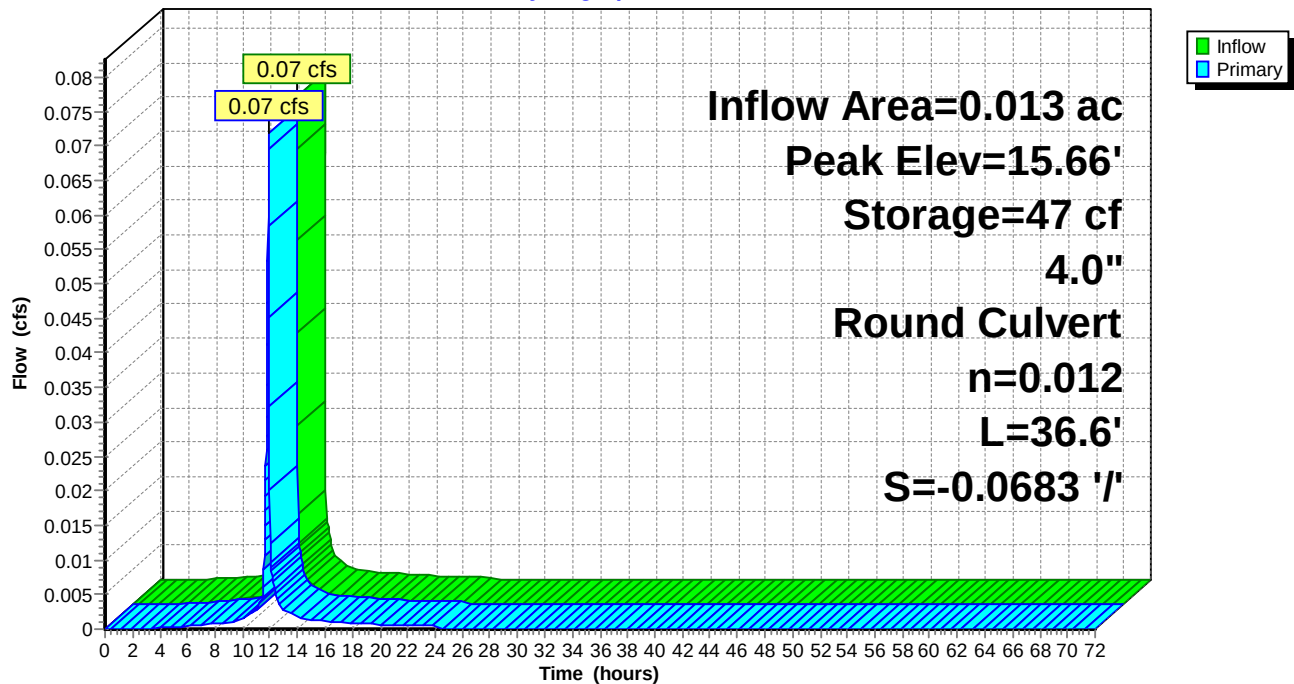
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P24: Planter #24

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P25: Planter #25

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.32' Surf.Area= 40 sf Storage= 41 cf

Peak Elev= 15.53' @ 11.91 hrs Surf.Area= 40 sf Storage= 45 cf (3 cf above start)

Plug-Flow detention time= 162.2 min calculated for 0.002 af (71% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	40	0.0	0	0
12.75	40	40.0	0	0
16.49	40	40.0	60	60
16.50	40	100.0	0	60
17.50	40	100.0	40	100
17.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.32'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.32' S= -0.0820 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=15.53' TW=14.25' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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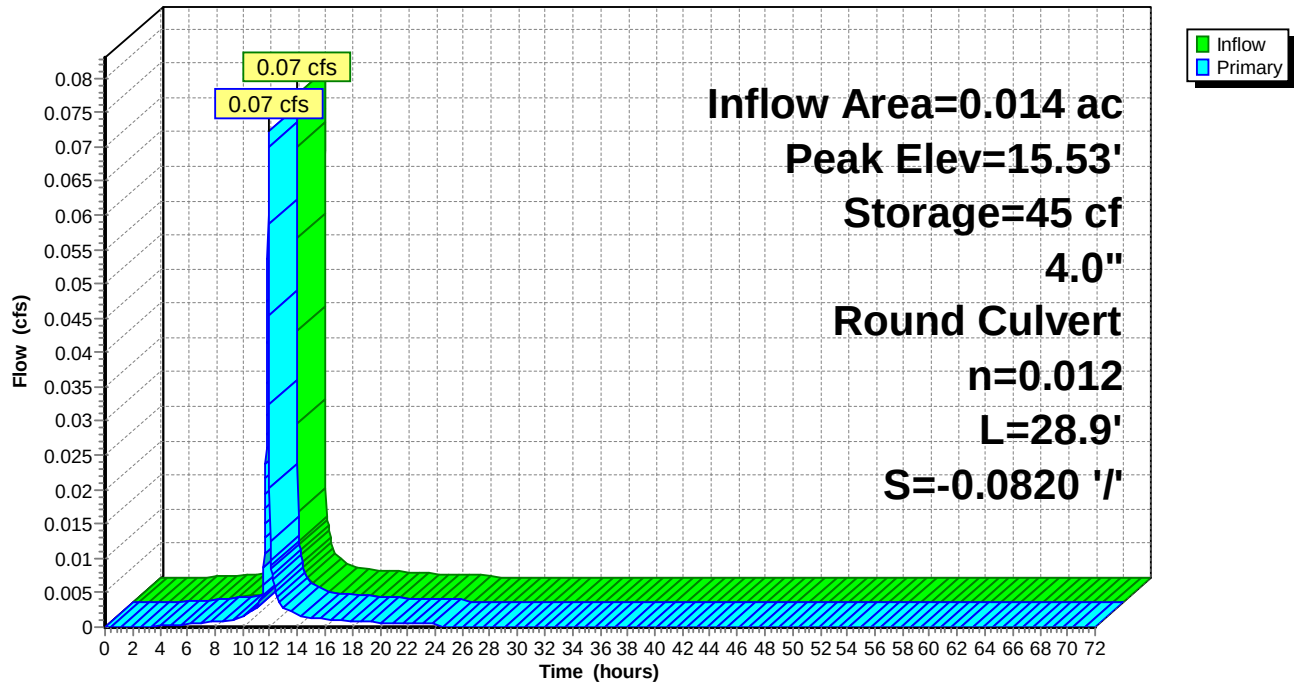
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P25: Planter #25

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P26: Planter #26

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 13.27' @ 11.91 hrs Surf.Area= 70 sf Storage= 15 cf

Plug-Flow detention time= 29.1 min calculated for 0.006 af (98% of inflow)
 Center-of-Mass det. time= 14.8 min (778.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	70	0.0	0	0
12.75	70	40.0	0	0
16.49	70	40.0	105	105
16.50	70	100.0	1	106
17.50	70	100.0	70	176
17.51	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	12.95'	4.0" Round Culvert L= 24.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 12.56' S= 0.0159 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=13.27' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.51 fps)

Naima - Phase 2 - Proposed HydroCAD

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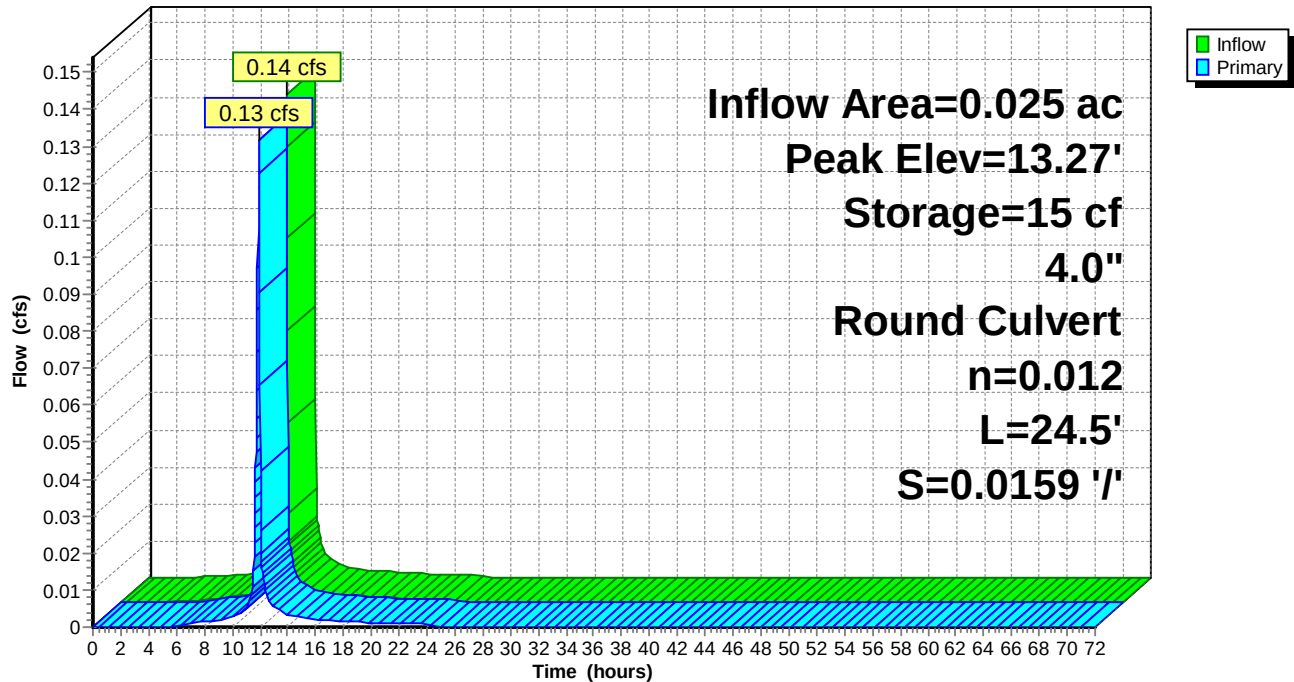
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P26: Planter #26

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P27: Planter #27

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.4 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.08' Surf.Area= 30 sf Storage= 28 cf

Peak Elev= 15.24' @ 11.90 hrs Surf.Area= 30 sf Storage= 30 cf (2 cf above start)

Plug-Flow detention time= 174.5 min calculated for 0.001 af (68% of inflow)

Center-of-Mass det. time= 3.3 min (766.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	30	0.0	0	0
12.75	30	40.0	0	0
16.49	30	40.0	45	45
16.50	30	100.0	0	45
17.50	30	100.0	30	75
17.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.08'	4.0" Round Culvert L= 10.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.08' S= -0.1972 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=15.24' TW=14.25' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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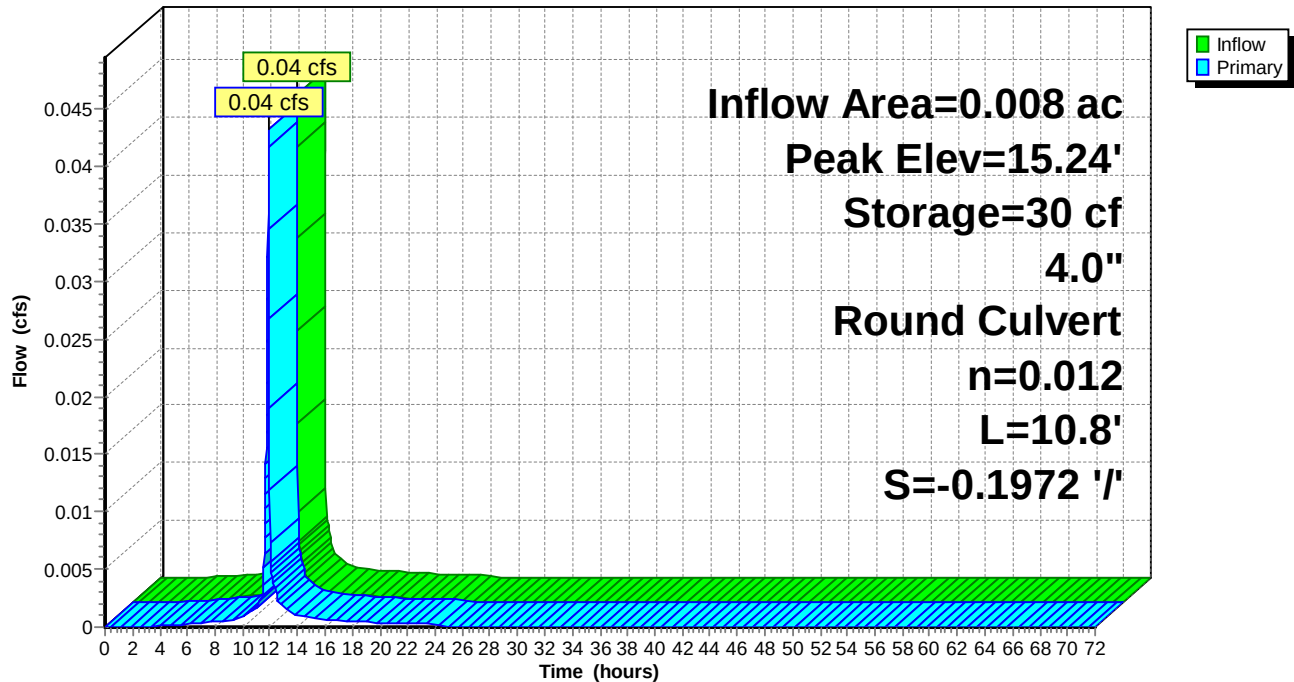
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P27: Planter #27

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P28: Planter #28

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.10 cfs @ 11.91 hrs, Volume= 0.004 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.10 cfs @ 11.91 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.70' @ 11.91 hrs Surf.Area= 55 sf Storage= 10 cf

Plug-Flow detention time= 30.5 min calculated for 0.004 af (98% of inflow)

Center-of-Mass det. time= 15.2 min (778.7 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	55	0.0	0	0
13.25	55	40.0	0	0
16.99	55	40.0	82	82
17.00	55	100.0	1	83
18.00	55	100.0	55	138
18.01	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 14.3' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.10' S= 0.0245 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.91 hrs HW=13.70' TW=12.84' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.35 fps)

Naima - Phase 2 - Proposed HydroCAD

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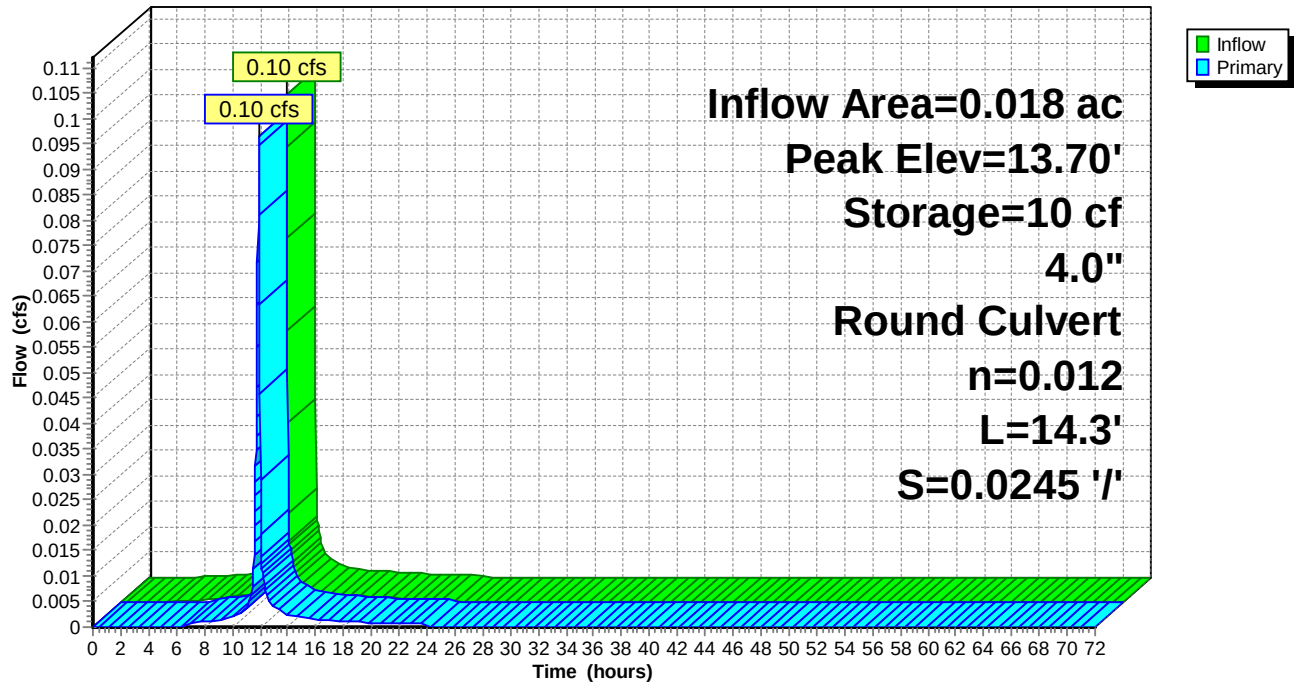
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P28: Planter #28

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P29: Planter #29

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 14.99' Surf.Area= 30 sf Storage= 21 cf

Peak Elev= 15.15' @ 11.90 hrs Surf.Area= 30 sf Storage= 23 cf (2 cf above start)

Plug-Flow detention time= 146.6 min calculated for 0.002 af (76% of inflow)

Center-of-Mass det. time= 3.3 min (766.8 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	30	0.0	0	0
13.25	30	40.0	0	0
16.99	30	40.0	45	45
17.00	30	100.0	0	45
18.00	30	100.0	30	75
18.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	14.99'	4.0" Round Culvert L= 32.3' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 14.99' S= -0.0477 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=15.15' TW=14.31' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.04 cfs @ 1.07 fps)

Naima - Phase 2 - Proposed HydroCAD

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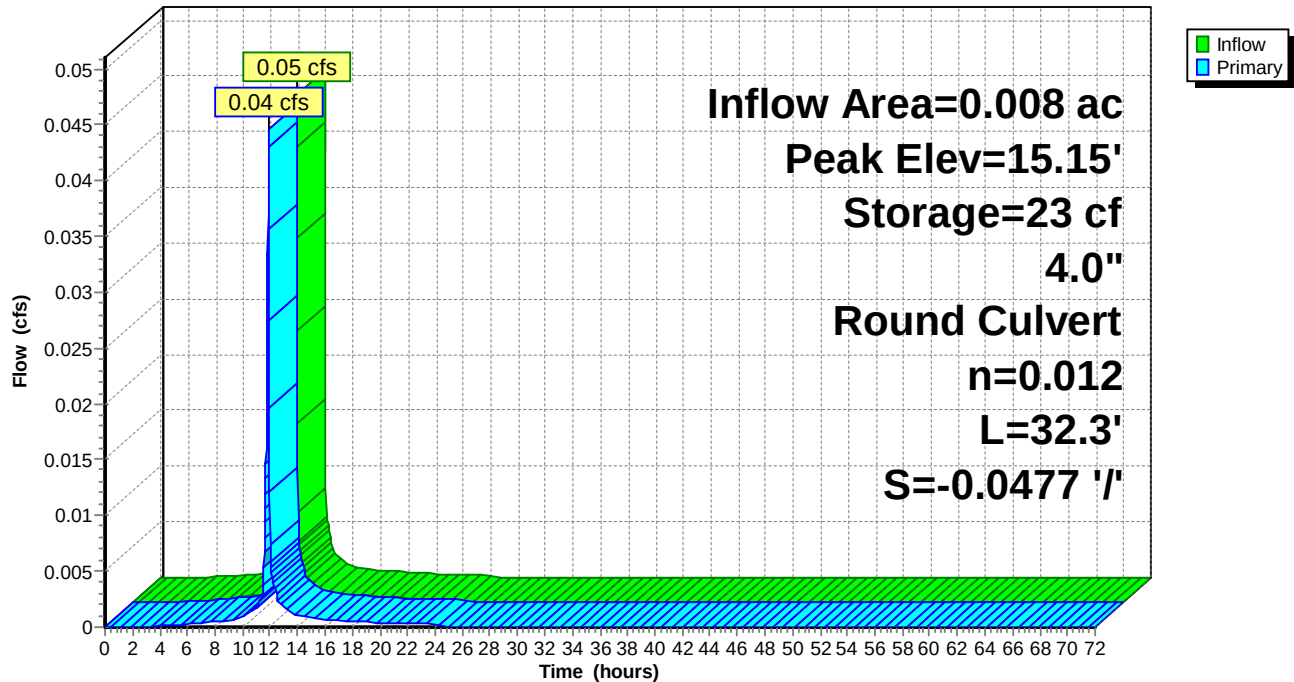
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P29: Planter #29

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P30: Planter #30

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af
 Outflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.57' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 36.8 min calculated for 0.001 af (97% of inflow)

Center-of-Mass det. time= 17.0 min (780.6 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	20	0.0	0	0
13.25	20	40.0	0	0
16.99	20	40.0	30	30
17.00	20	100.0	0	30
18.00	20	100.0	20	50
18.01	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 18.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.29' S= 0.0088 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.03 cfs @ 11.90 hrs HW=13.57' TW=12.83' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.03 cfs @ 0.94 fps)

Naima - Phase 2 - Proposed HydroCAD

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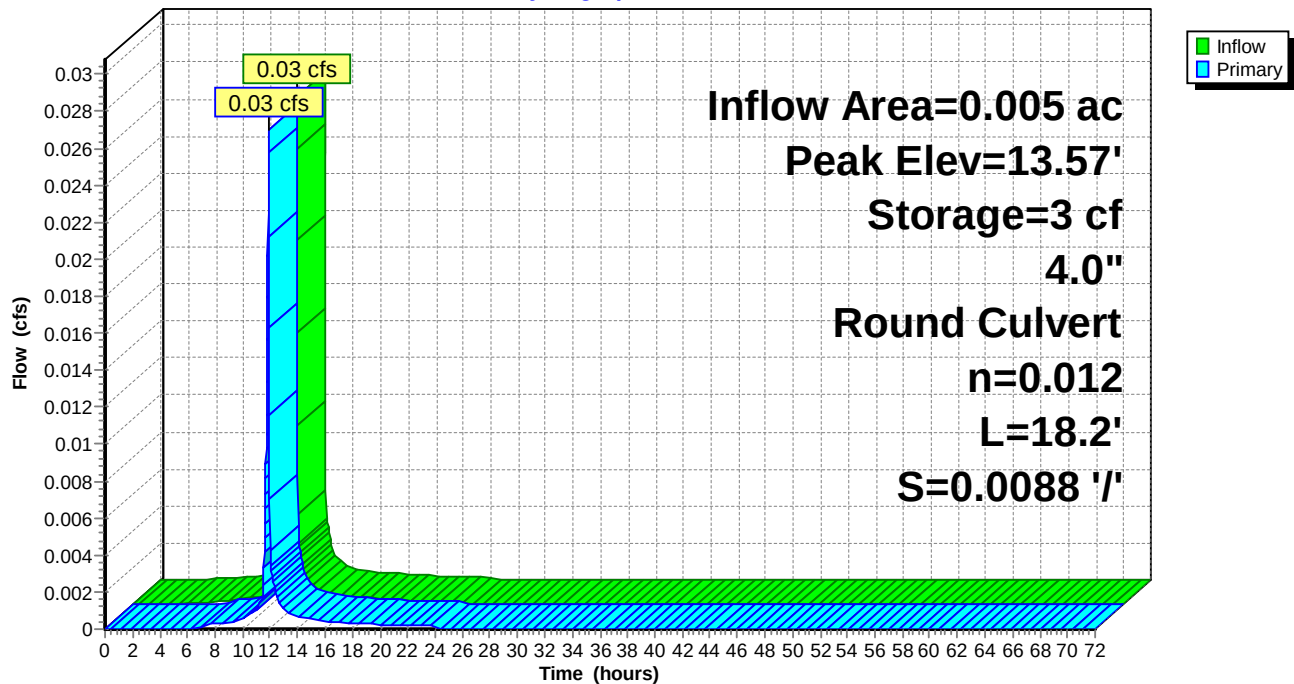
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P30: Planter #30

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P31: Planter #31

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.14 cfs @ 11.92 hrs, Volume= 0.007 af, Atten= 11%, Lag= 1.3 min
 Primary = 0.14 cfs @ 11.92 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.21' Surf.Area= 80 sf Storage= 63 cf

Peak Elev= 15.60' @ 11.92 hrs Surf.Area= 80 sf Storage= 75 cf (12 cf above start)

Plug-Flow detention time= 140.2 min calculated for 0.005 af (79% of inflow)

Center-of-Mass det. time= 4.9 min (768.5 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	80	0.0	0	0
13.25	80	40.0	0	0
16.99	80	40.0	120	120
17.00	80	100.0	1	121
18.00	80	100.0	80	201
18.01	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.21'	4.0" Round Culvert L= 71.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.21' S= -0.0246 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.14 cfs @ 11.92 hrs HW=15.60' TW=14.34' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.14 cfs @ 1.56 fps)

Naima - Phase 2 - Proposed HydroCAD

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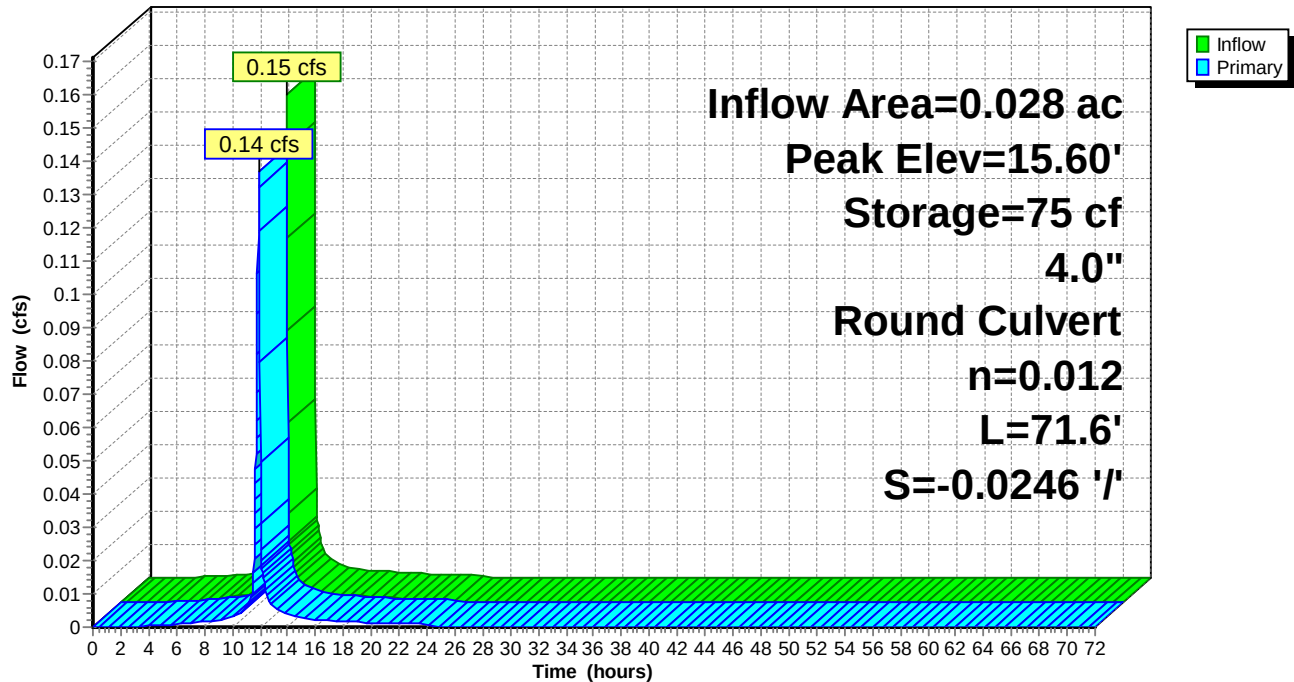
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Pond P31: Planter #31

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P32: Planter #32

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af
 Outflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.07' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 36.2 min calculated for 0.001 af (97% of inflow)

Center-of-Mass det. time= 16.9 min (780.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	20	0.0	0	0
13.75	20	40.0	0	0
17.49	20	40.0	30	30
17.50	20	100.0	0	30
18.50	20	100.0	20	50
18.51	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices	
#1	Primary	13.95'	4.0" Round Culvert L= 29.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 13.36' S= 0.0199 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.03 cfs @ 11.90 hrs HW=14.07' TW=12.83' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.03 cfs @ 0.94 fps)

Naima - Phase 2 - Proposed HydroCAD

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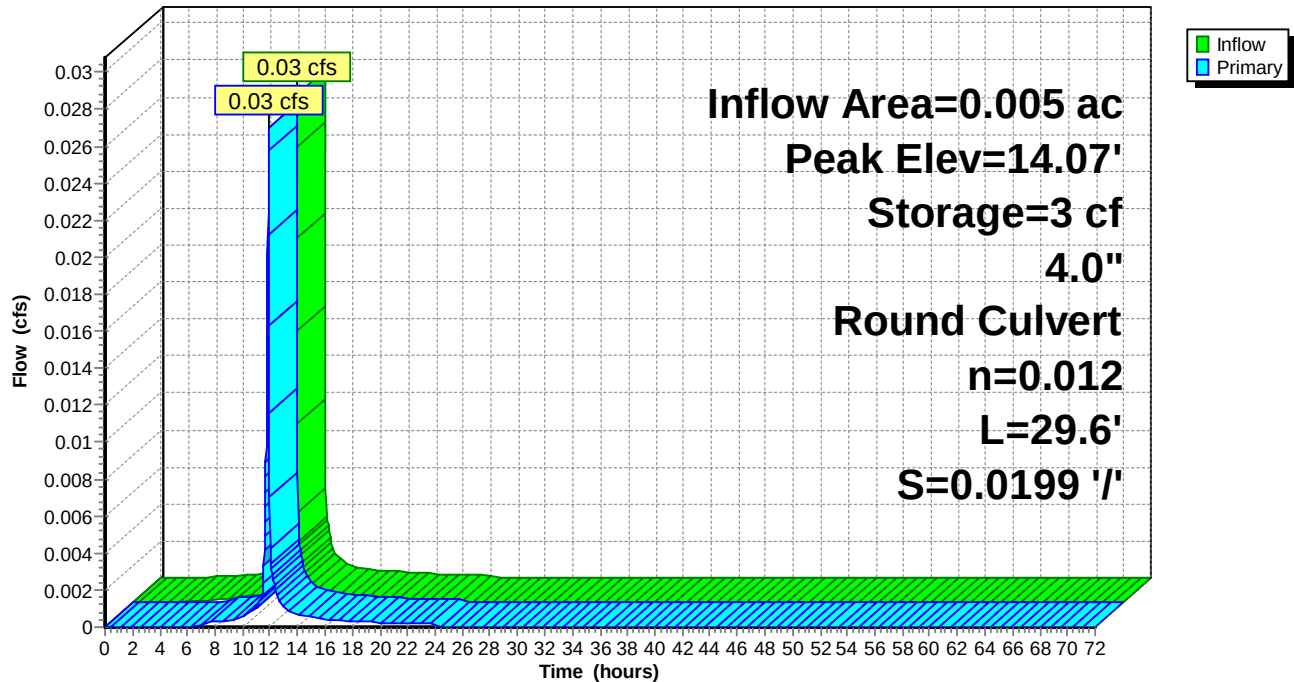
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Pond P32: Planter #32

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P33: Planter #33

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.14 cfs @ 11.92 hrs, Volume= 0.007 af, Atten= 8%, Lag= 1.0 min
 Primary = 0.14 cfs @ 11.92 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.24' Surf.Area= 80 sf Storage= 48 cf

Peak Elev= 15.60' @ 11.92 hrs Surf.Area= 80 sf Storage= 60 cf (12 cf above start)

Plug-Flow detention time= 120.3 min calculated for 0.006 af (84% of inflow)

Center-of-Mass det. time= 4.9 min (768.5 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	80	0.0	0	0
13.75	80	40.0	0	0
17.49	80	40.0	120	120
17.50	80	100.0	1	121
18.50	80	100.0	80	201
18.51	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices	
#1	Primary	15.24'	4.0" Round Culvert L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 15.24' S= -0.0211 ' / S= -0.0211 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.14 cfs @ 11.92 hrs HW=15.60' TW=14.33' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.14 cfs @ 1.60 fps)

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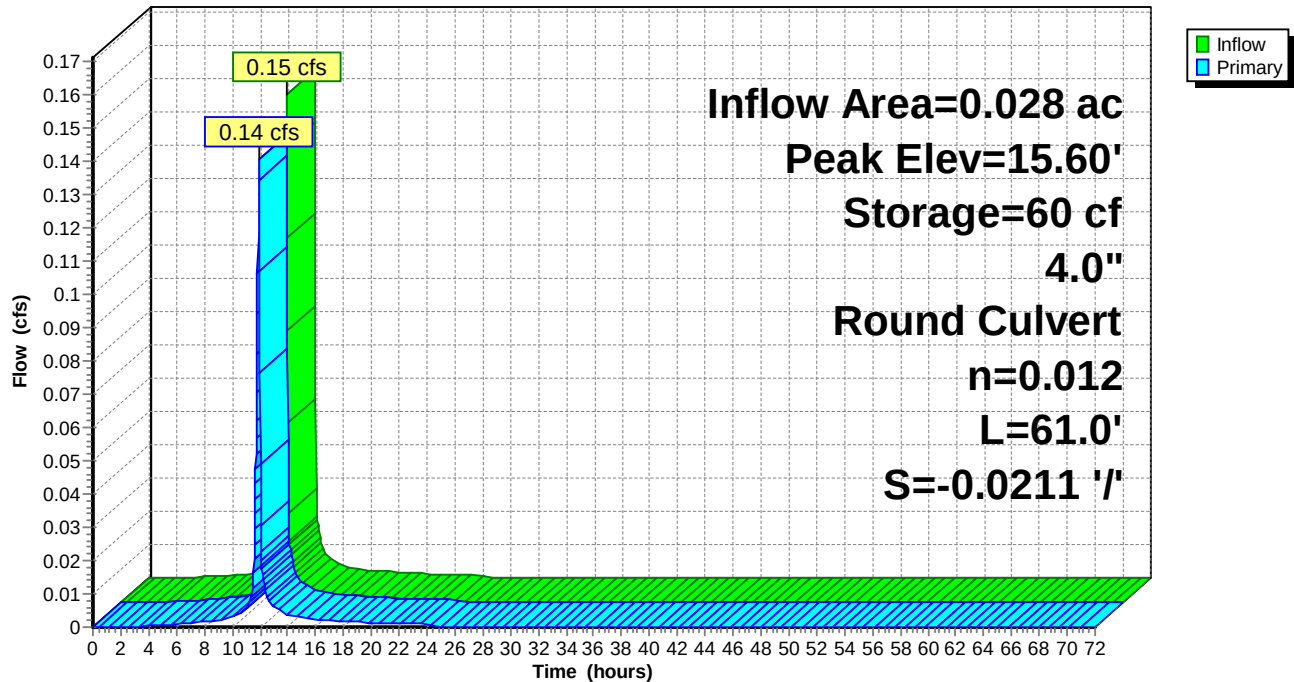
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P33: Planter #33

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P34: Planter #34

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.10 cfs @ 11.91 hrs, Volume= 0.004 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.10 cfs @ 11.91 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.20' @ 11.91 hrs Surf.Area= 55 sf Storage= 10 cf

Plug-Flow detention time= 30.1 min calculated for 0.004 af (98% of inflow)
 Center-of-Mass det. time= 15.2 min (778.7 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	55	0.0	0	0
13.75	55	40.0	0	0
17.49	55	40.0	82	82
17.50	55	100.0	1	83
18.50	55	100.0	55	138
18.51	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.95'	4.0" Round Culvert L= 26.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 13.56' S= 0.0149 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.91 hrs HW=14.20' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.35 fps)

Naima - Phase 2 - Proposed HydroCAD

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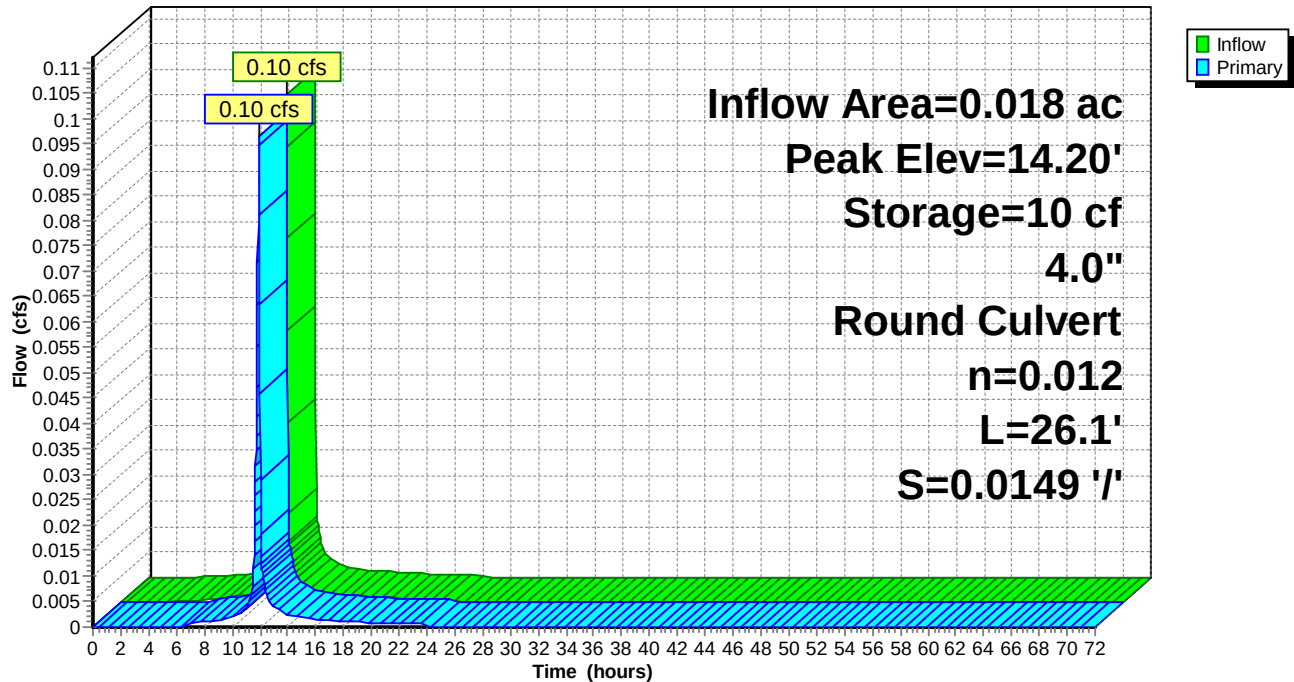
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Pond P34: Planter #34

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P35: Planter #35

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.73' Surf.Area= 30 sf Storage= 24 cf

Peak Elev= 15.89' @ 11.90 hrs Surf.Area= 30 sf Storage= 26 cf (2 cf above start)

Plug-Flow detention time= 156.8 min calculated for 0.001 af (73% of inflow)

Center-of-Mass det. time= 3.3 min (766.8 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	30	0.0	0	0
13.75	30	40.0	0	0
17.49	30	40.0	45	45
17.50	30	100.0	0	45
18.50	30	100.0	30	75
18.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.73'	4.0" Round Culvert L= 31.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 15.73' S= -0.0565 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=15.89' TW=14.50' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.04 cfs @ 1.07 fps)

Naima - Phase 2 - Proposed HydroCAD

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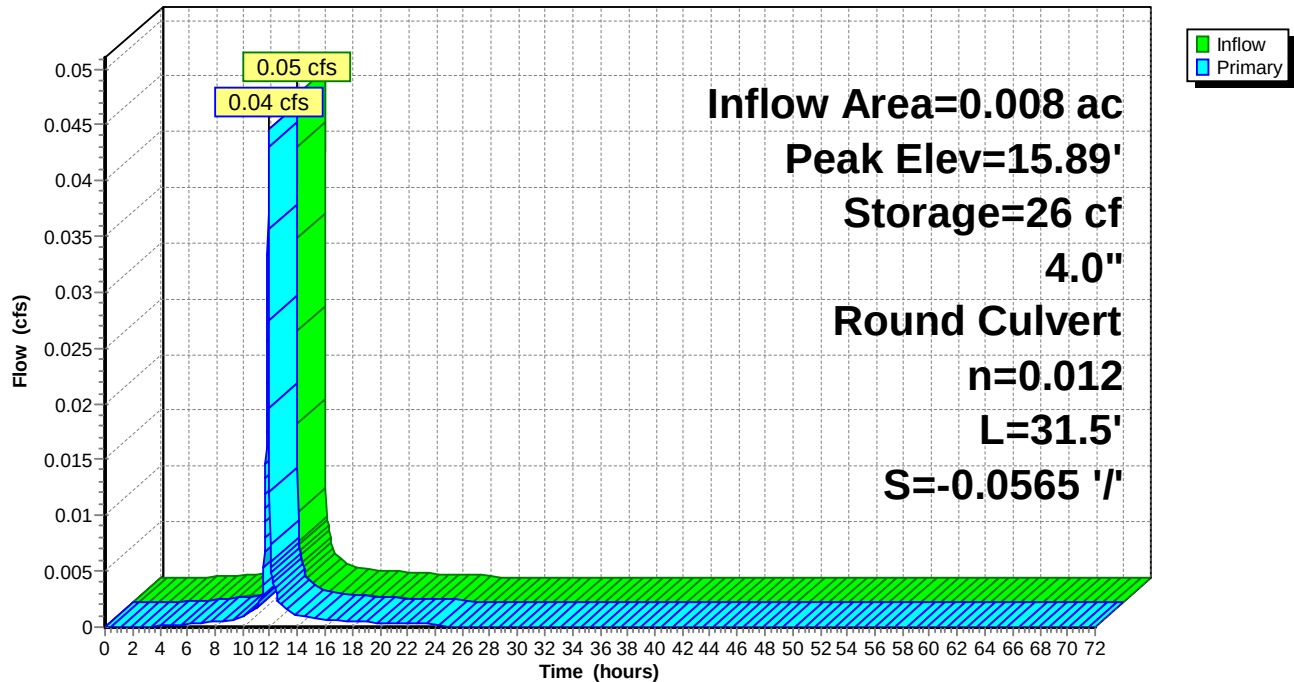
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P35: Planter #35

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P36: Planter #36

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.08 cfs @ 11.91 hrs, Volume= 0.004 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.08 cfs @ 11.91 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.38' @ 11.91 hrs Surf.Area= 50 sf Storage= 9 cf

Plug-Flow detention time= 31.3 min calculated for 0.004 af (98% of inflow)
 Center-of-Mass det. time= 15.4 min (778.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.94'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	50	0.0	0	0
13.95	50	40.0	0	0
17.69	50	40.0	75	75
17.70	50	100.0	0	75
18.70	50	100.0	50	125
18.71	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	14.15'	4.0" Round Culvert L= 20.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 13.65' S= 0.0248 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.08 cfs @ 11.91 hrs HW=14.38' TW=12.83' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.08 cfs @ 1.29 fps)

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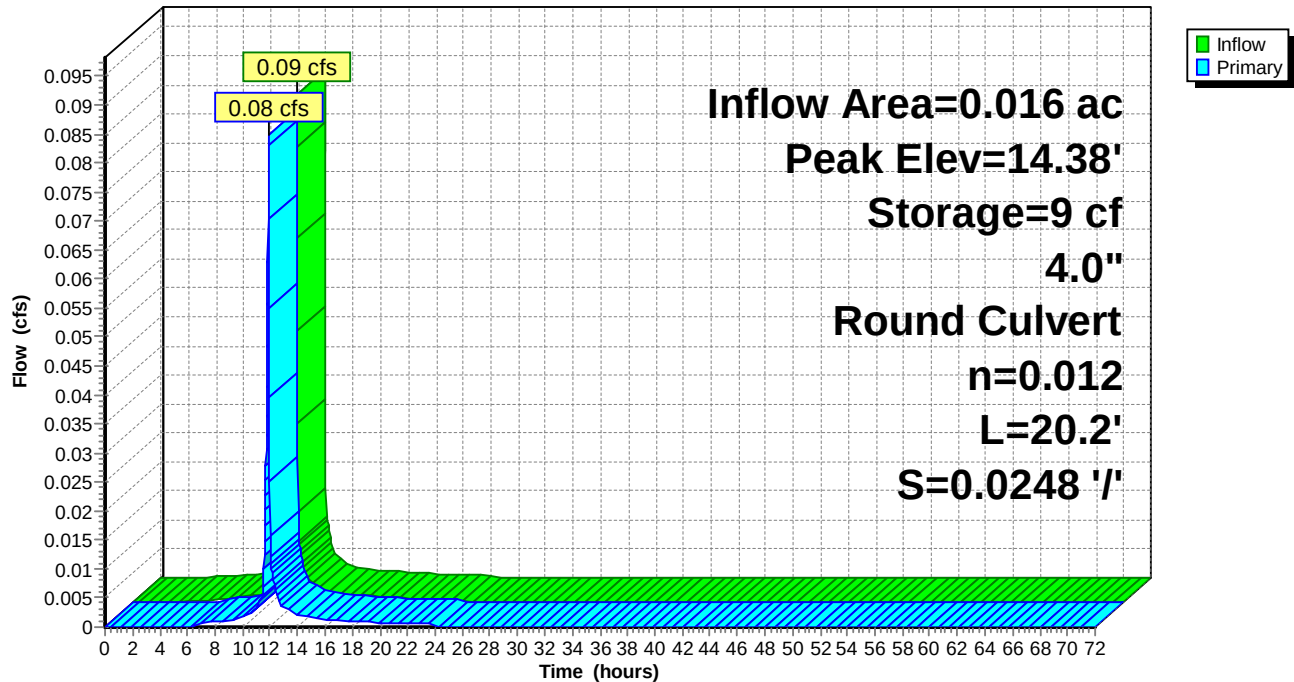
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Pond P36: Planter #36

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P37: Planter #37

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.73' Surf.Area= 40 sf Storage= 29 cf

Peak Elev= 15.94' @ 11.91 hrs Surf.Area= 40 sf Storage= 32 cf (3 cf above start)

Plug-Flow detention time= 134.4 min calculated for 0.003 af (80% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	40	0.0	0	0
13.95	40	40.0	0	0
17.69	40	40.0	60	60
17.70	40	100.0	0	60
18.70	40	100.0	40	100
18.71	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.73'	4.0" Round Culvert L= 37.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.73' S= -0.0418 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=15.94' TW=14.50' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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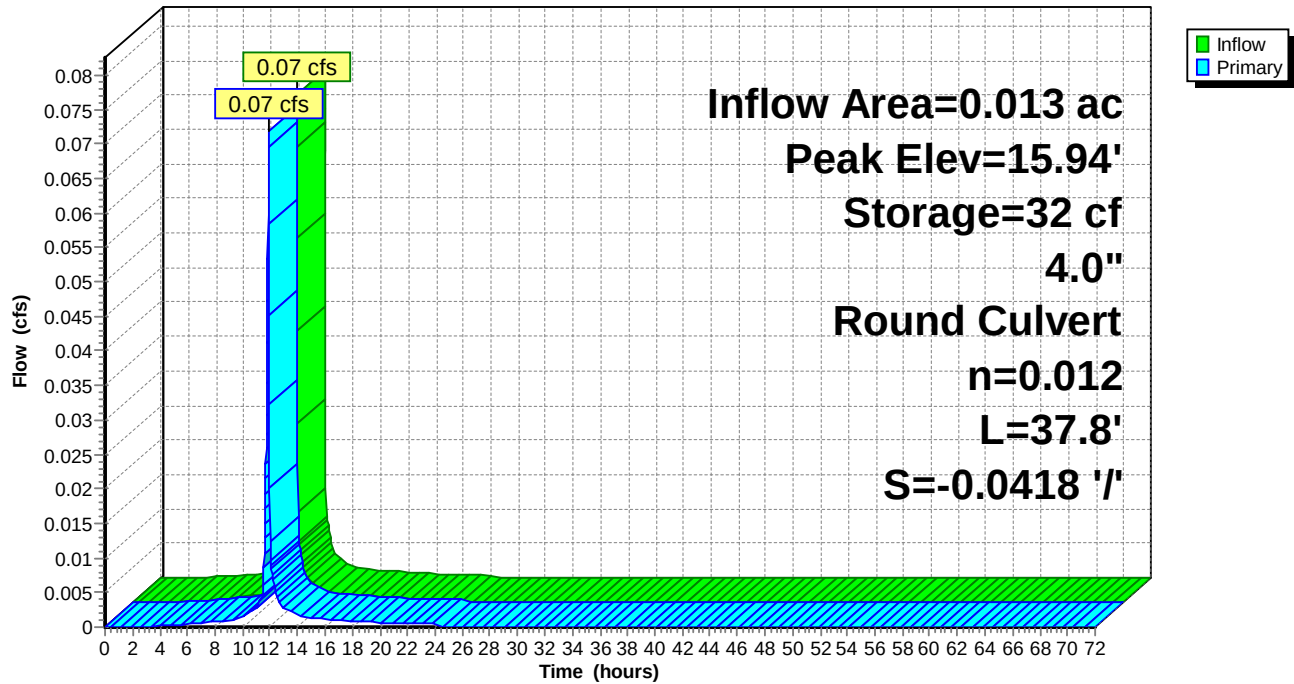
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P37: Planter #37

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P38: Planter #38

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.85' Surf.Area= 40 sf Storage= 31 cf

Peak Elev= 16.06' @ 11.91 hrs Surf.Area= 40 sf Storage= 34 cf (3 cf above start)

Plug-Flow detention time= 138.4 min calculated for 0.003 af (79% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	40	0.0	0	0
13.95	40	40.0	0	0
17.69	40	40.0	60	60
17.70	40	100.0	0	60
18.70	40	100.0	40	100
18.71	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.85'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.85' S= -0.0588 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=16.06' TW=14.50' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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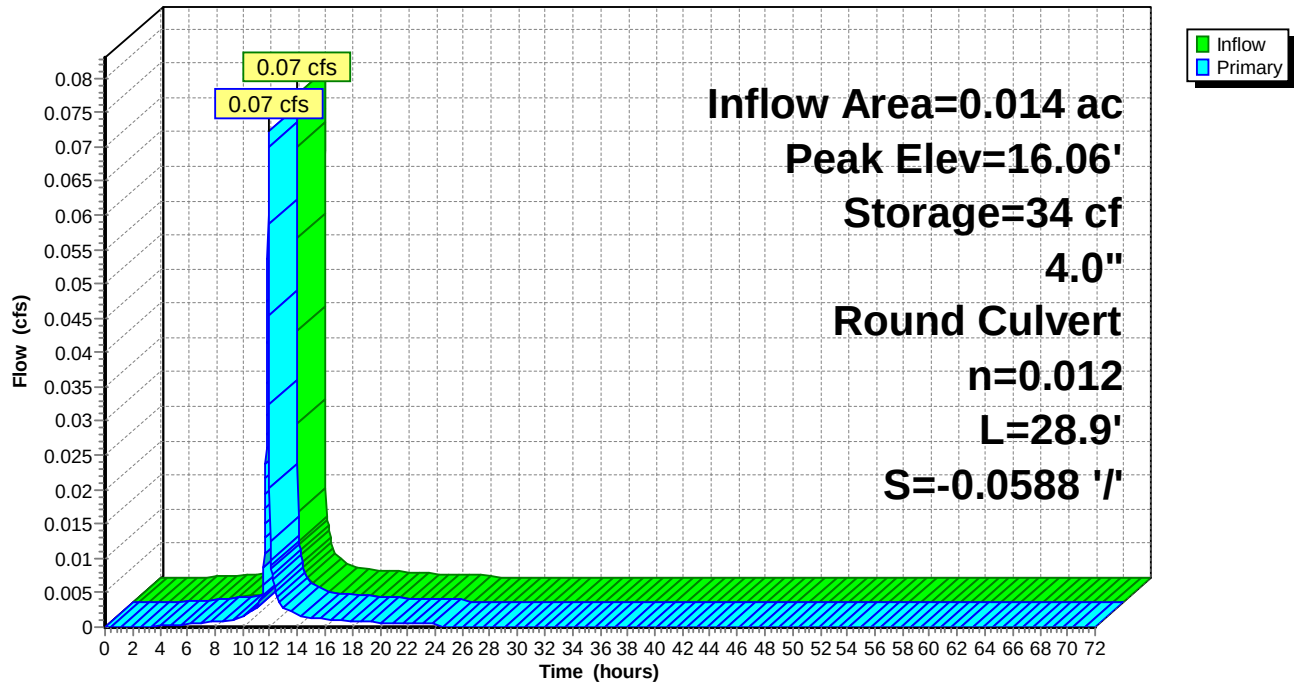
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Pond P38: Planter #38

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P39: Planter #39

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.47' @ 11.91 hrs Surf.Area= 70 sf Storage= 15 cf

Plug-Flow detention time= 28.7 min calculated for 0.006 af (98% of inflow)
 Center-of-Mass det. time= 14.8 min (778.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.94'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	70	0.0	0	0
13.95	70	40.0	0	0
17.69	70	40.0	105	105
17.70	70	100.0	1	106
18.70	70	100.0	70	176
18.71	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	14.15'	4.0" Round Culvert L= 23.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 13.88' S= 0.0113 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=14.47' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.51 fps)

Naima - Phase 2 - Proposed HydroCAD

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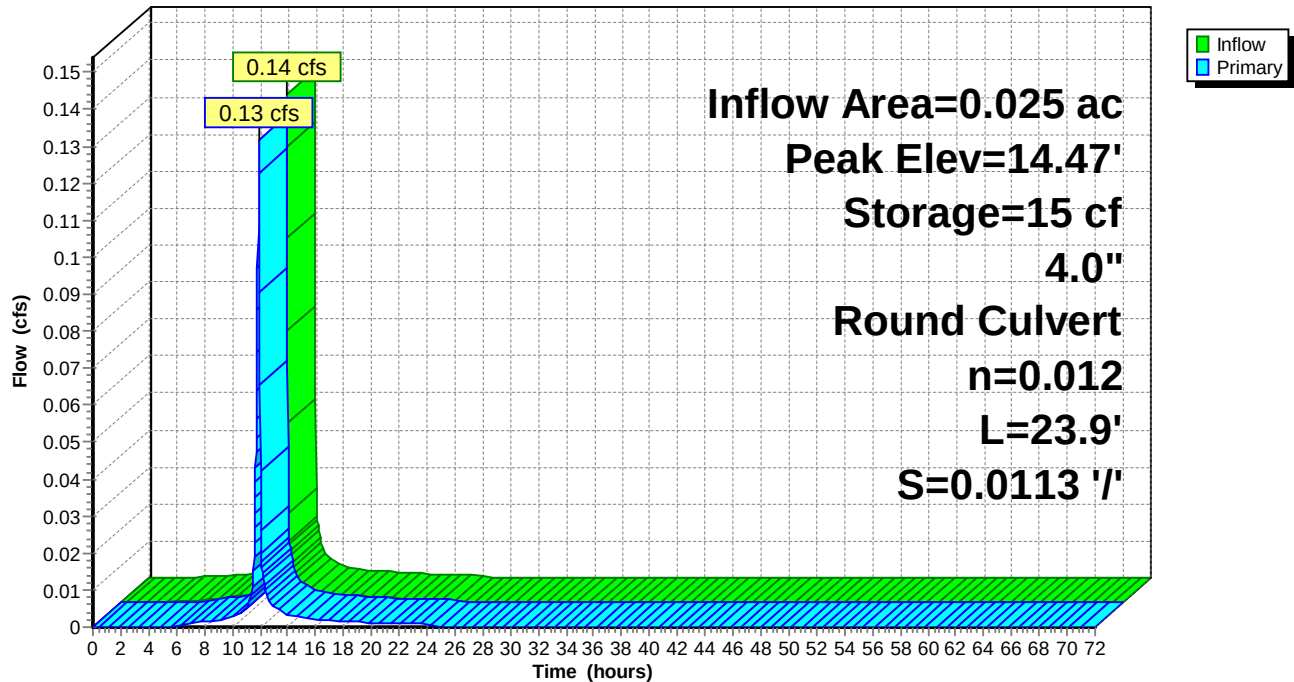
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Pond P39: Planter #39

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P40: Planter #40

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.4 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.99' Surf.Area= 30 sf Storage= 25 cf

Peak Elev= 16.15' @ 11.90 hrs Surf.Area= 30 sf Storage= 26 cf (2 cf above start)

Plug-Flow detention time= 162.6 min calculated for 0.001 af (72% of inflow)

Center-of-Mass det. time= 3.4 min (766.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	30	0.0	0	0
13.95	30	40.0	0	0
17.69	30	40.0	45	45
17.70	30	100.0	0	45
18.70	30	100.0	30	75
18.71	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.99'	4.0" Round Culvert L= 11.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.99' S= -0.1643 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=16.15' TW=14.50' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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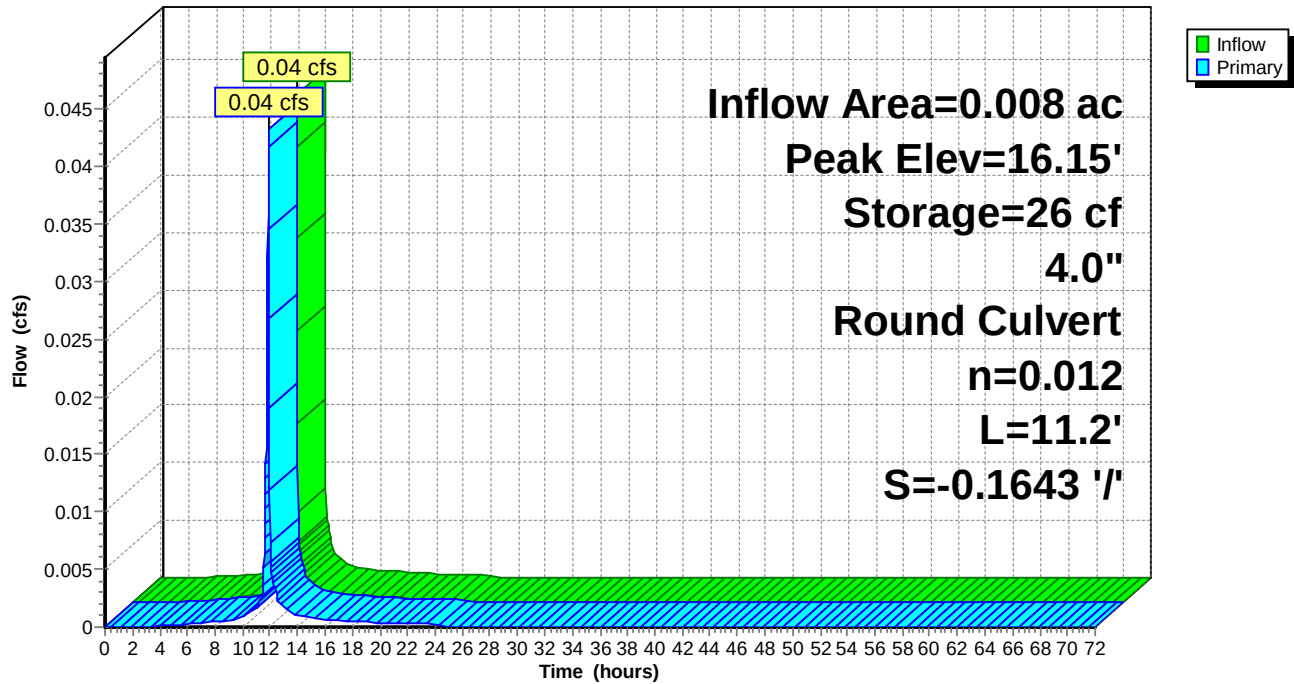
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Pond P40: Planter #40

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P41: Planter #41

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.77' @ 11.91 hrs Surf.Area= 70 sf Storage= 15 cf

Plug-Flow detention time= 28.7 min calculated for 0.006 af (98% of inflow)
 Center-of-Mass det. time= 14.8 min (778.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.24'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	70	0.0	0	0
14.25	70	40.0	0	0
17.99	70	40.0	105	105
18.00	70	100.0	1	106
19.00	70	100.0	70	176
19.01	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	14.45'	4.0" Round Culvert L= 23.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 13.95' S= 0.0210 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=14.77' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.51 fps)

Naima - Phase 2 - Proposed HydroCAD

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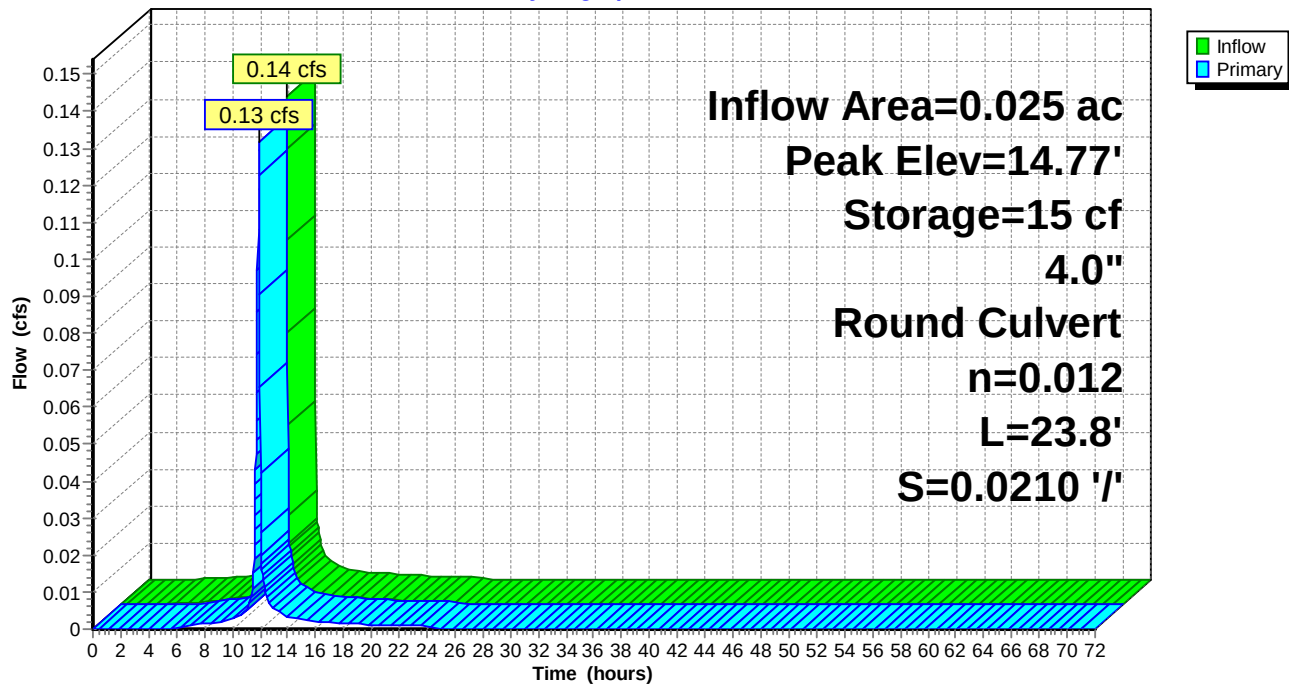
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Pond P41: Planter #41

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P42: Planter #42

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.4 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.14' Surf.Area= 30 sf Storage= 23 cf

Peak Elev= 16.30' @ 11.90 hrs Surf.Area= 30 sf Storage= 25 cf (2 cf above start)

Plug-Flow detention time= 155.6 min calculated for 0.001 af (74% of inflow)

Center-of-Mass det. time= 3.3 min (766.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	14.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	30	0.0	0	0
14.25	30	40.0	0	0
17.99	30	40.0	45	45
18.00	30	100.0	0	45
19.00	30	100.0	30	75
19.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	16.14'	4.0" Round Culvert L= 19.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.14' S= -0.0854 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=16.30' TW=15.09' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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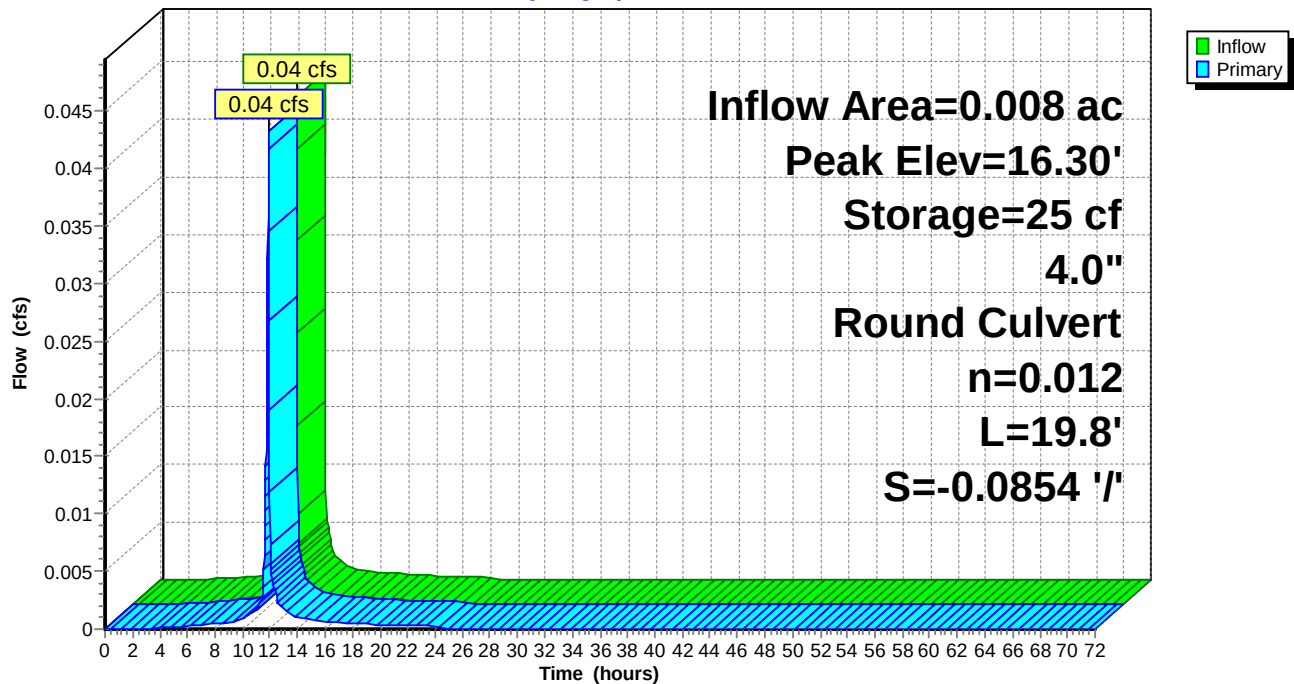
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Pond P42: Planter #42

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P43: Planter #43

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.31' Surf.Area= 40 sf Storage= 33 cf

Peak Elev= 16.52' @ 11.91 hrs Surf.Area= 40 sf Storage= 37 cf (3 cf above start)

Plug-Flow detention time= 144.4 min calculated for 0.003 af (77% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	14.24'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	40	0.0	0	0
14.25	40	40.0	0	0
17.99	40	40.0	60	60
18.00	40	100.0	0	60
19.00	40	100.0	40	100
19.01	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	16.31'	4.0" Round Culvert L= 28.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.31' S= -0.0648 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=16.52' TW=15.10' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

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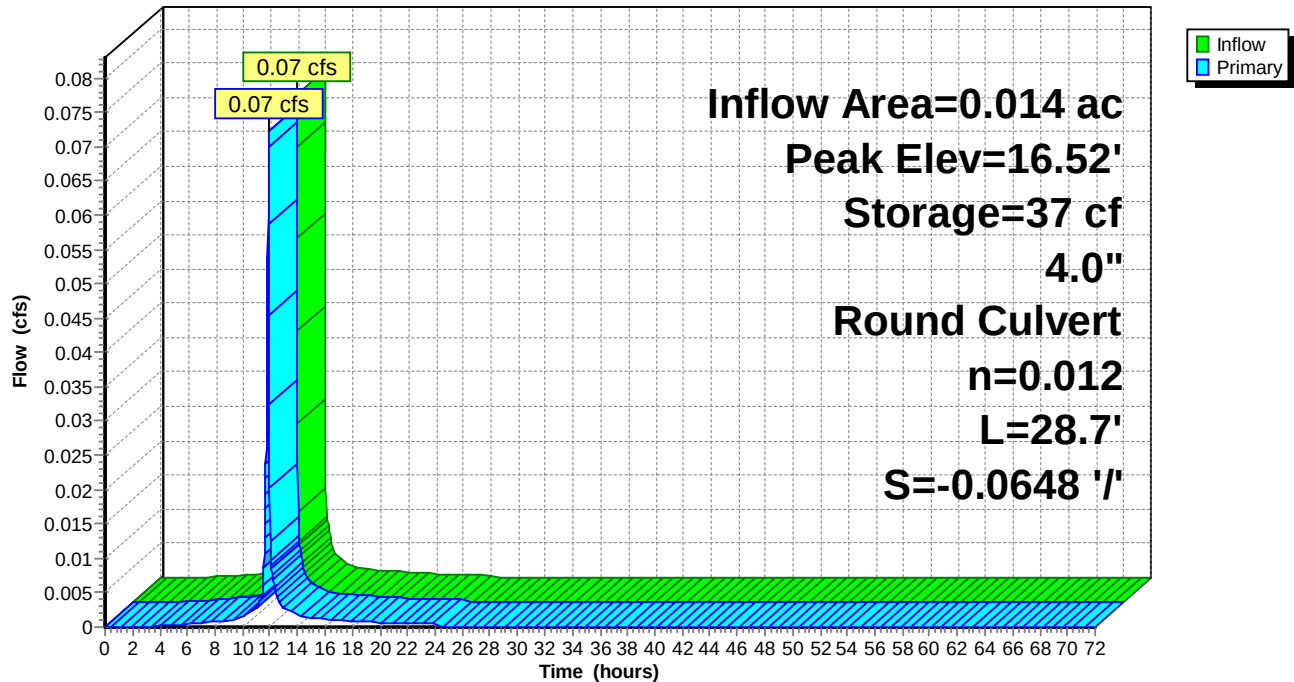
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P43: Planter #43

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P44: Planter #44

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.74' @ 11.90 hrs Surf.Area= 50 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.0 min (763.5 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	121 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	50	0.0	0	0
14.75	50	40.0	0	0
17.99	50	40.0	65	65
18.00	50	100.0	1	66
19.00	50	100.0	50	116
19.01	1,000	100.0	5	121

Device	Routing	Invert	Outlet Devices
#1	Primary	14.45'	4.0" Round Culvert L= 19.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 14.18' S= 0.0136 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.12 cfs @ 11.90 hrs HW=14.74' TW=12.82' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.12 cfs @ 1.45 fps)

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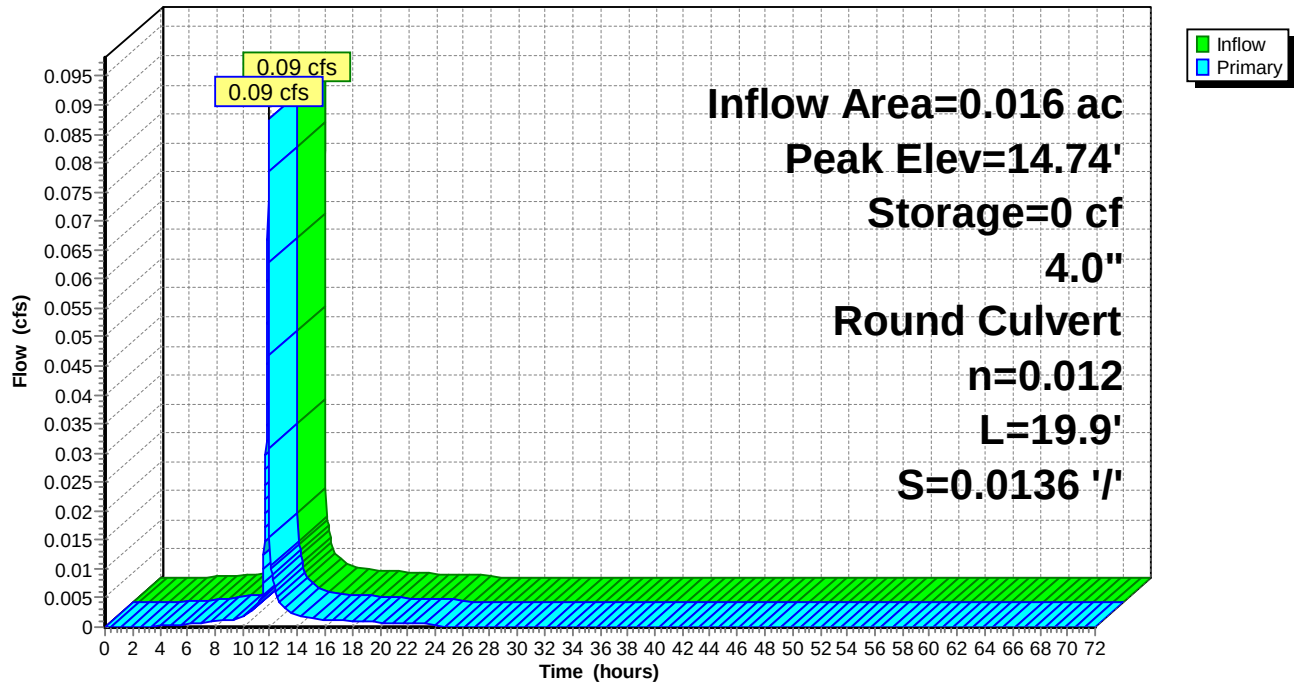
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P44: Planter #44

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P45: Planter #45

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.46' Surf.Area= 40 sf Storage= 36 cf

Peak Elev= 16.67' @ 11.91 hrs Surf.Area= 40 sf Storage= 39 cf (3 cf above start)

Plug-Flow detention time= 150.6 min calculated for 0.002 af (75% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.24'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	40	0.0	0	0
14.25	40	40.0	0	0
17.99	40	40.0	60	60
18.00	40	100.0	0	60
19.00	40	100.0	40	100
19.01	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices	
#1	Primary	16.46'	4.0" Round Culvert L= 36.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.46' S= -0.0552 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=16.67' TW=15.10' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

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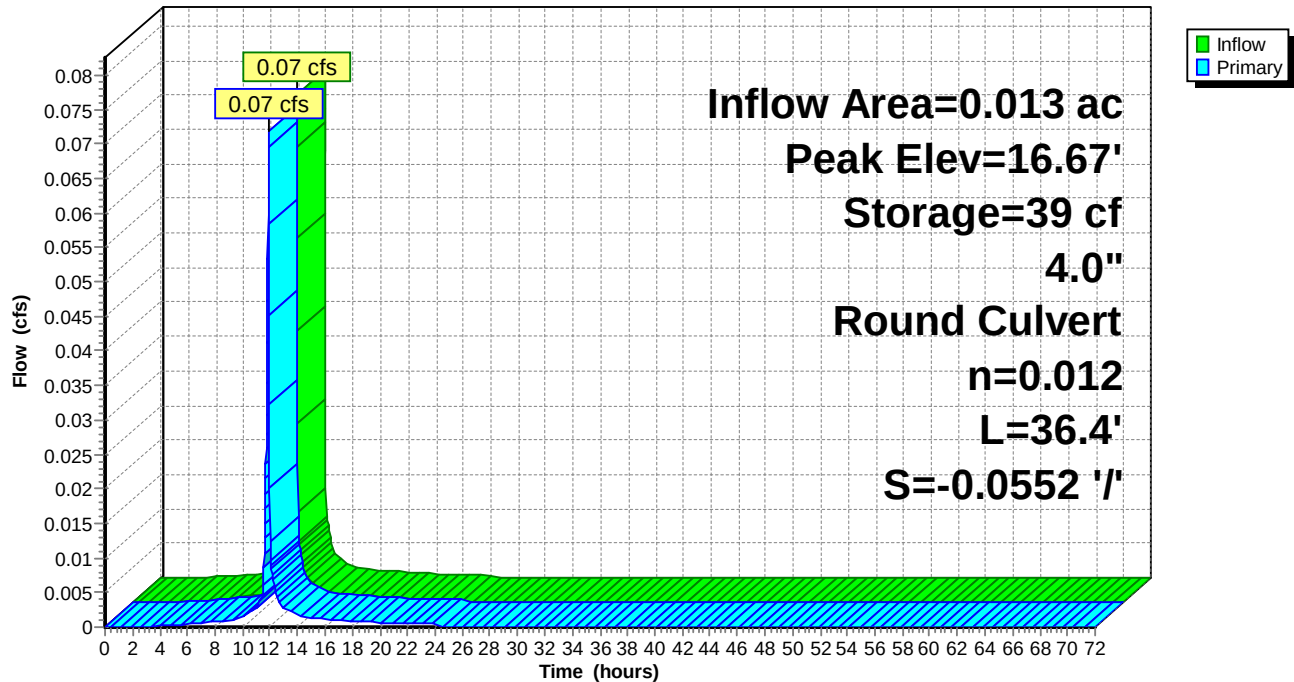
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P45: Planter #45

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P46: Planter #46

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af
 Outflow = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 15.07' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 36.7 min calculated for 0.001 af (97% of inflow)
 Center-of-Mass det. time= 16.9 min (780.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	20	0.0	0	0
14.75	20	40.0	0	0
18.49	20	40.0	30	30
18.50	20	100.0	0	30
19.50	20	100.0	20	50
19.51	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices	
#1	Primary	14.95'	4.0" Round Culvert L= 28.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 14.24' S= 0.0248 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.03 cfs @ 11.90 hrs HW=15.07' TW=12.83' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.03 cfs @ 0.94 fps)

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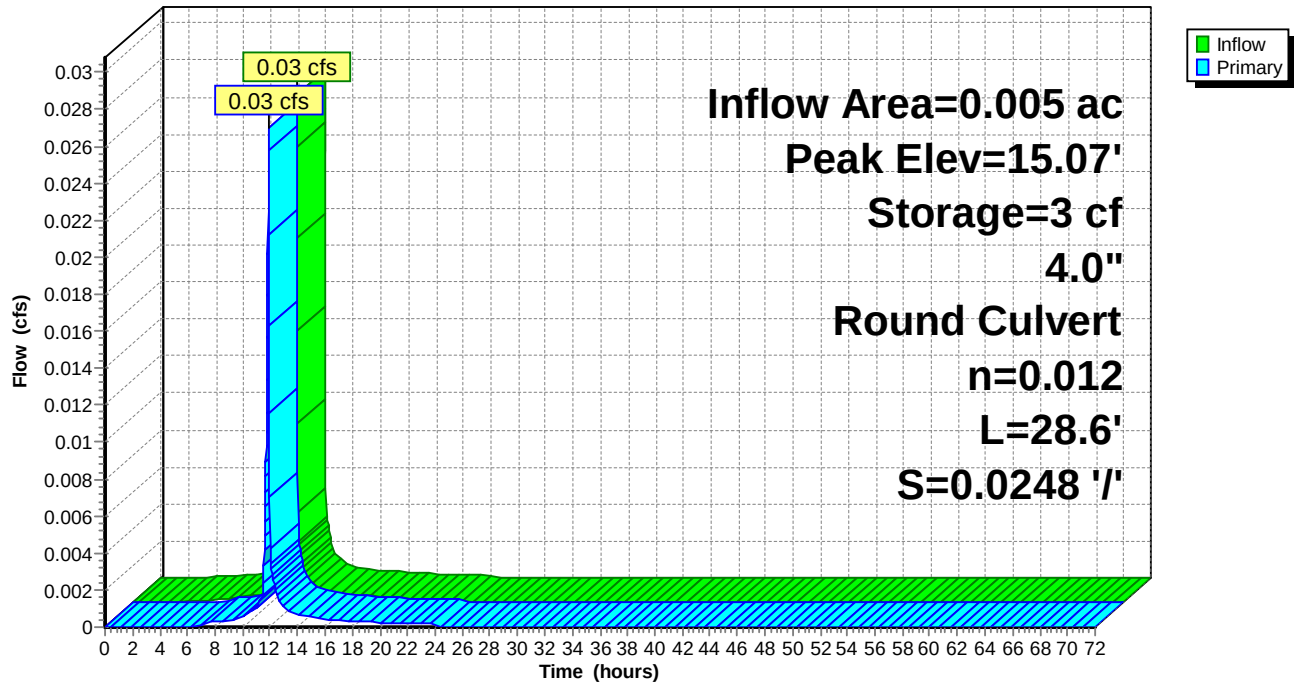
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P46: Planter #46

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P47: Planter #47

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.14 cfs @ 11.91 hrs, Volume= 0.007 af, Atten= 7%, Lag= 1.0 min
 Primary = 0.14 cfs @ 11.91 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.60' Surf.Area= 80 sf Storage= 60 cf

Peak Elev= 16.96' @ 11.92 hrs Surf.Area= 80 sf Storage= 71 cf (11 cf above start)

Plug-Flow detention time= 136.1 min calculated for 0.005 af (80% of inflow)

Center-of-Mass det. time= 4.9 min (768.5 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	80	0.0	0	0
14.75	80	40.0	0	0
18.49	80	40.0	120	120
18.50	80	100.0	1	121
19.50	80	100.0	80	201
19.51	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	16.60'	4.0" Round Culvert L= 59.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 16.60' S= -0.0277 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.14 cfs @ 11.91 hrs HW=16.95' TW=15.11' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.14 cfs @ 1.61 fps)

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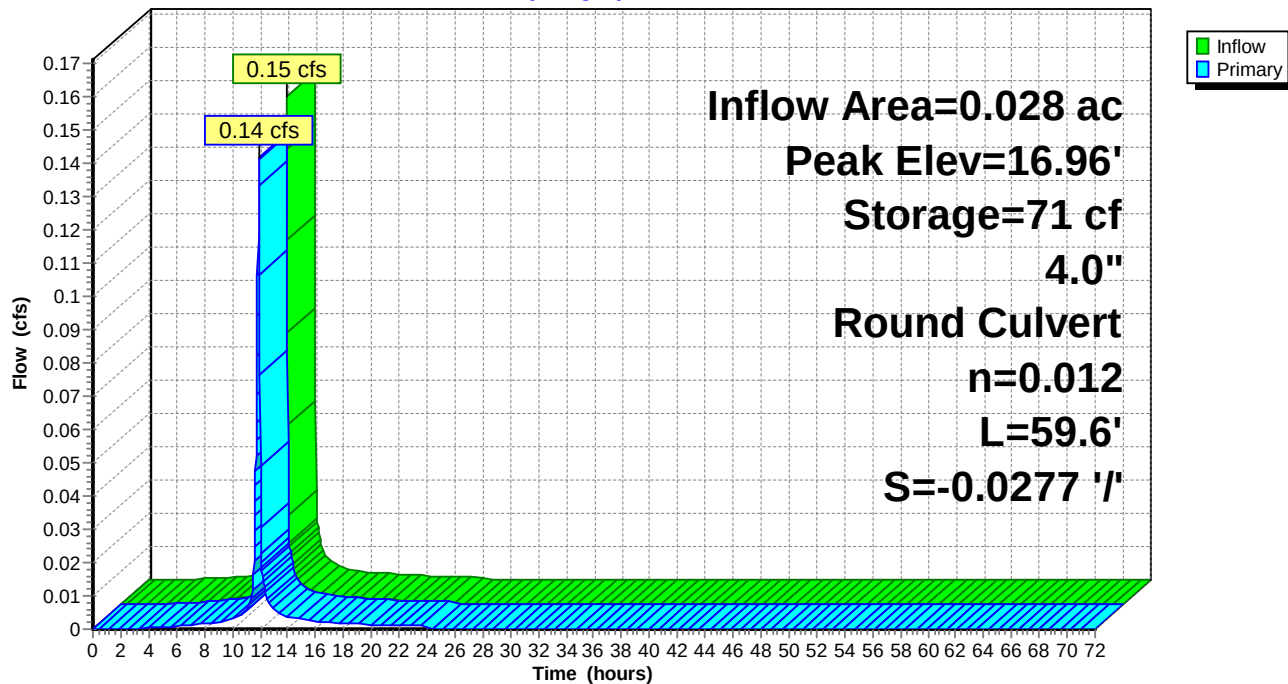
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Pond P47: Planter #47

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P48: Planter #48

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.10 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.10 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 17.15' @ 11.91 hrs Surf.Area= 55 sf Storage= 53 cf

Plug-Flow detention time= 150.0 min calculated for 0.003 af (76% of inflow)
 Center-of-Mass det. time= 62.3 min (825.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	55	0.0	0	0
14.75	55	40.0	0	0
18.49	55	40.0	82	82
18.50	55	100.0	1	83
19.50	55	100.0	55	138
19.51	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	16.90'	4.0" Round Culvert L= 24.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.44' / 16.90' S= -0.0992 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.91 hrs HW=17.15' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.35 fps)

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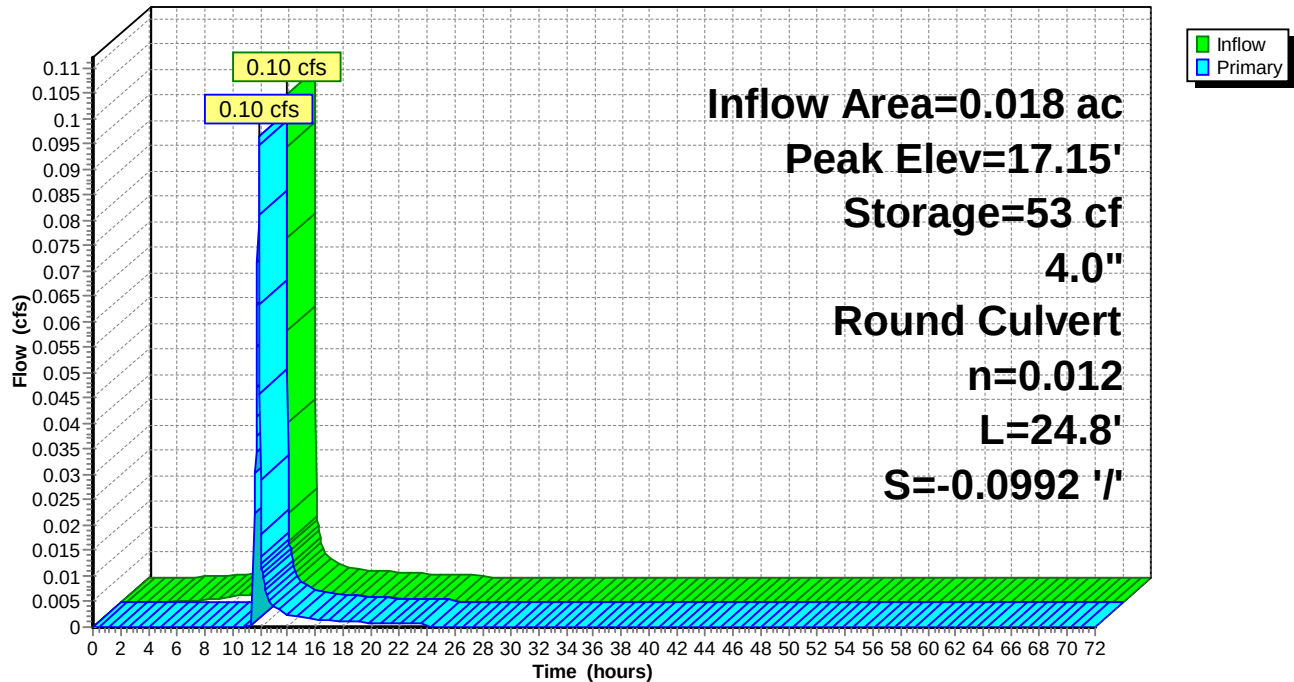
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Pond P48: Planter #48

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P49: Planter #49

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.05 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.12' Surf.Area= 30 sf Storage= 29 cf

Peak Elev= 17.28' @ 11.90 hrs Surf.Area= 30 sf Storage= 30 cf (2 cf above start)

Plug-Flow detention time= 173.3 min calculated for 0.001 af (68% of inflow)

Center-of-Mass det. time= 3.3 min (766.8 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	14.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	30	0.0	0	0
14.75	30	40.0	0	0
18.49	30	40.0	45	45
18.50	30	100.0	0	45
19.50	30	100.0	30	75
19.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	17.12'	4.0" Round Culvert L= 19.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 17.12' S= -0.1090 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=17.28' TW=15.09' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.04 cfs @ 1.07 fps)

Naima - Phase 2 - Proposed HydroCAD

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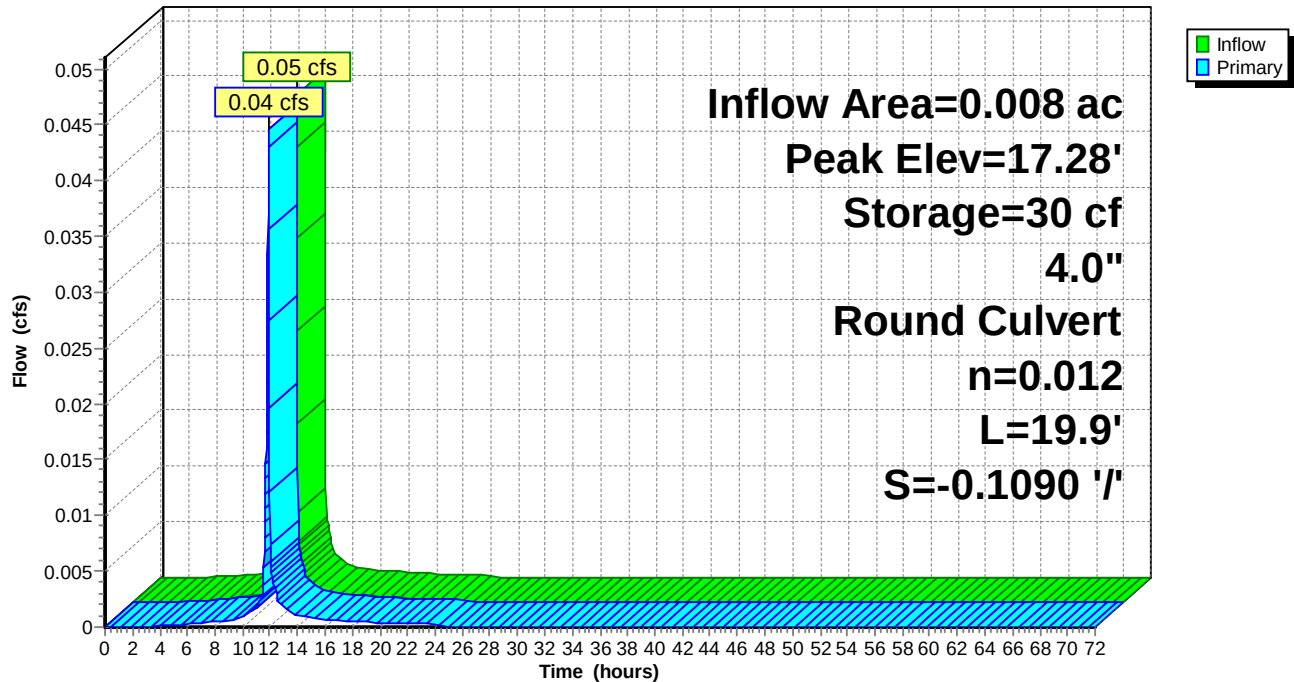
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P49: Planter #49

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P50: Planter #50

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.09 cfs @ 11.90 hrs, Volume= 0.004 af
 Outflow = 0.08 cfs @ 11.91 hrs, Volume= 0.004 af, Atten= 3%, Lag= 0.5 min
 Primary = 0.08 cfs @ 11.91 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 16.18' @ 11.91 hrs Surf.Area= 50 sf Storage= 9 cf

Plug-Flow detention time= 31.3 min calculated for 0.004 af (98% of inflow)
 Center-of-Mass det. time= 15.4 min (778.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	50	0.0	0	0
15.75	50	40.0	0	0
19.49	50	40.0	75	75
19.50	50	100.0	1	76
20.50	50	100.0	50	126
20.51	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	15.95'	4.0" Round Culvert L= 19.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 14.55' S= 0.0722 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.08 cfs @ 11.91 hrs HW=16.18' TW=12.83' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.08 cfs @ 1.29 fps)

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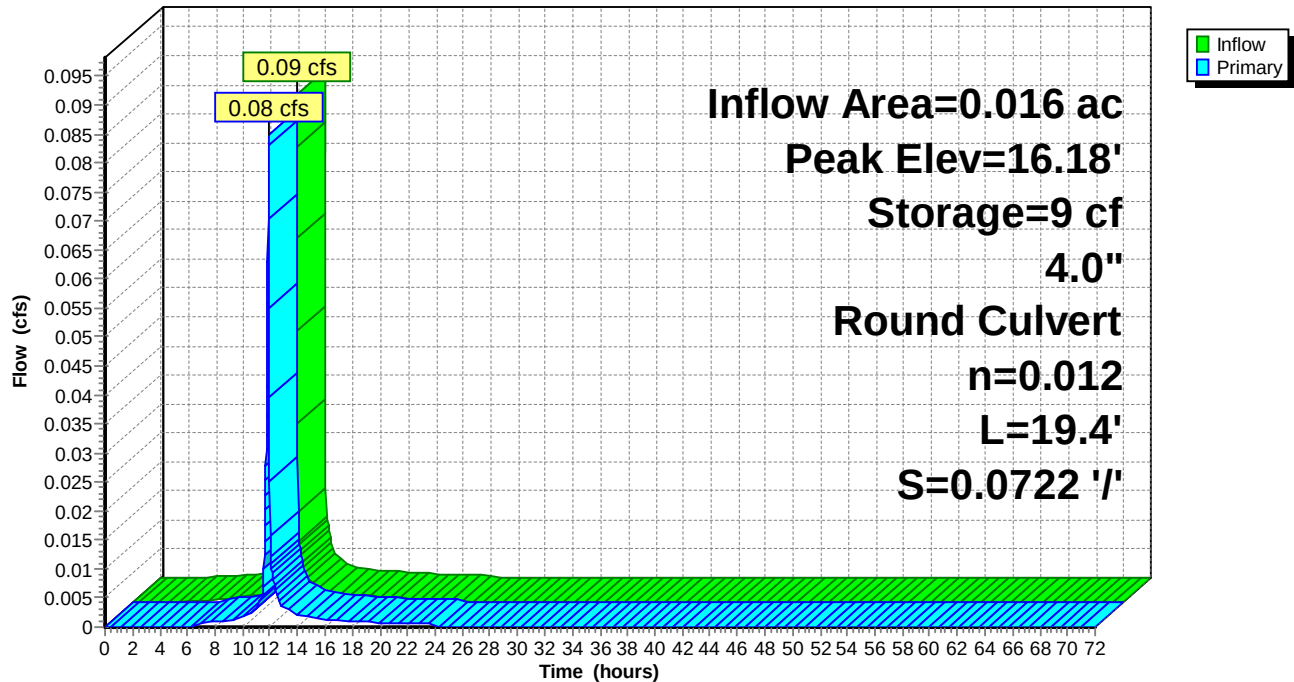
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P50: Planter #50

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Summary for Pond P51: Planter #51

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.31' Surf.Area= 40 sf Storage= 25 cf

Peak Elev= 17.52' @ 11.91 hrs Surf.Area= 40 sf Storage= 28 cf (3 cf above start)

Plug-Flow detention time= 124.7 min calculated for 0.003 af (83% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	40	0.0	0	0
15.75	40	40.0	0	0
19.49	40	40.0	60	60
19.50	40	100.0	0	60
20.50	40	100.0	40	100
20.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices	
#1	Primary	17.31'	4.0" Round Culvert L= 36.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 17.31' S= -0.0370 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=17.52' TW=15.10' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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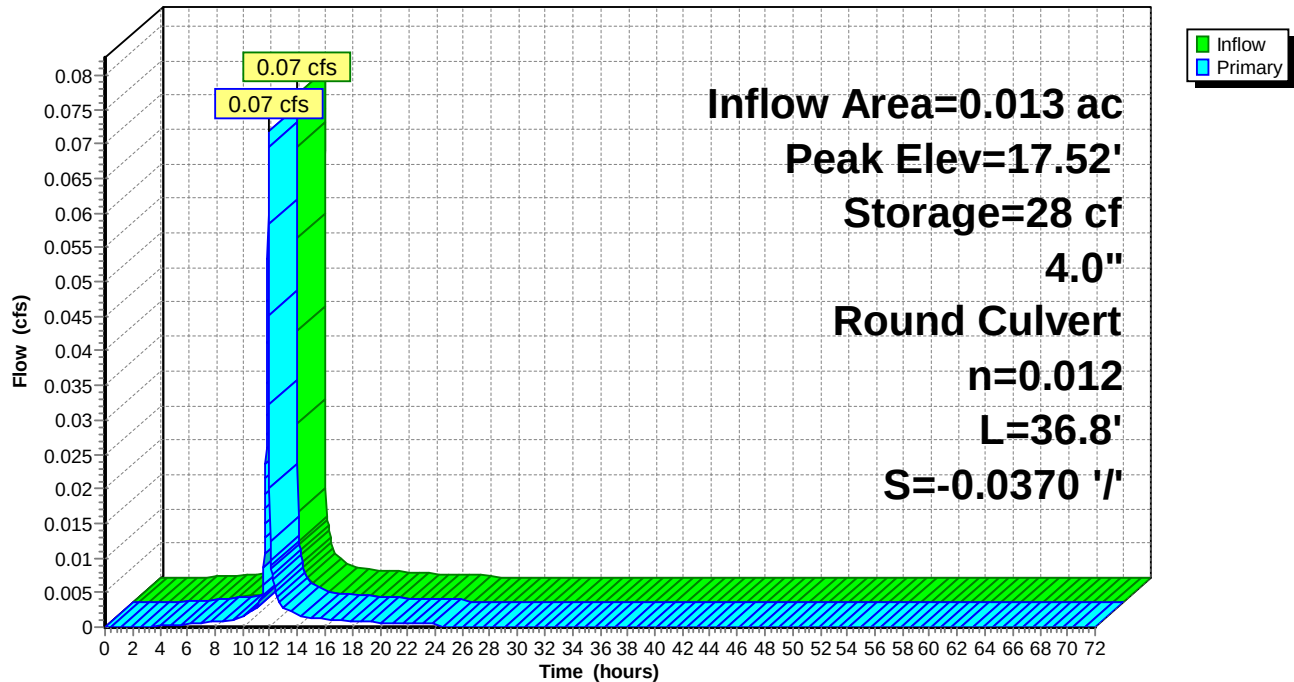
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Pond P51: Planter #51

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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P52: Planter #52

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.07 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.54' Surf.Area= 40 sf Storage= 29 cf

Peak Elev= 17.75' @ 11.91 hrs Surf.Area= 40 sf Storage= 32 cf (3 cf above start)

Plug-Flow detention time= 134.1 min calculated for 0.003 af (80% of inflow)

Center-of-Mass det. time= 3.5 min (767.0 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	40	0.0	0	0
15.75	40	40.0	0	0
19.49	40	40.0	60	60
19.50	40	100.0	0	60
20.50	40	100.0	40	100
20.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	17.54'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 17.54' S= -0.0550 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.91 hrs HW=17.75' TW=15.10' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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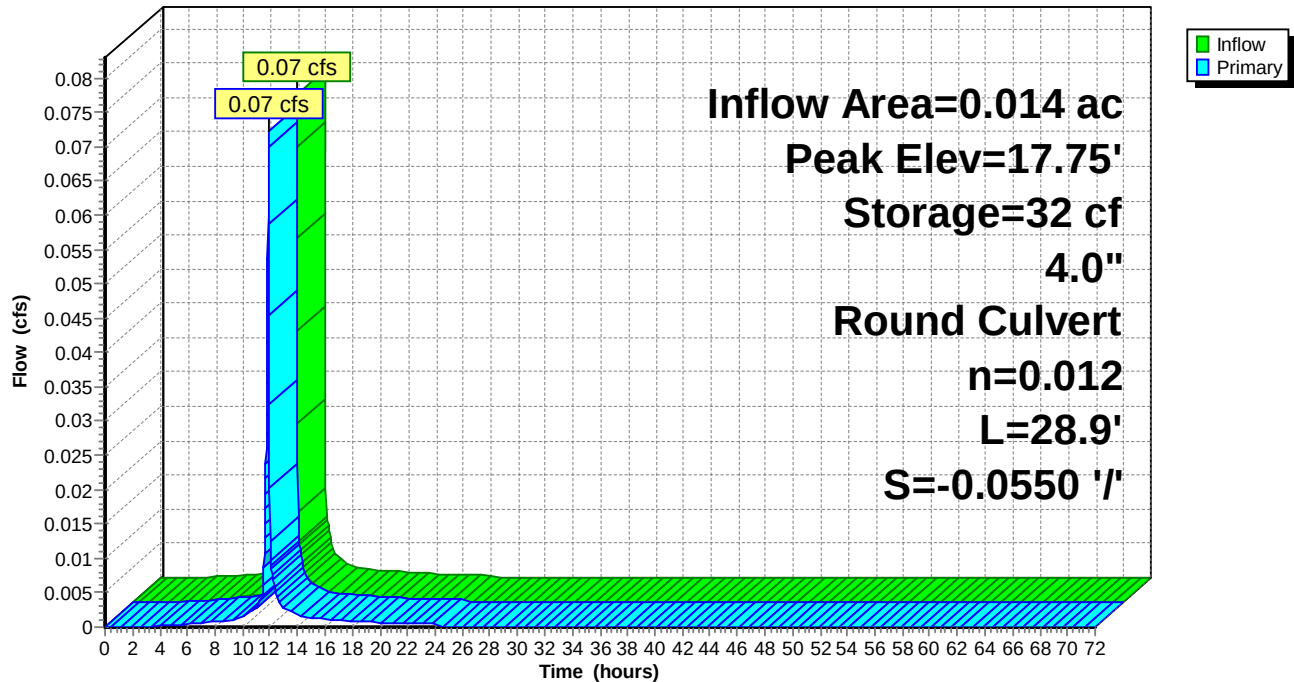
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P52: Planter #52

Hydrograph



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P53: Planter #53

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 16.27' @ 11.91 hrs Surf.Area= 70 sf Storage= 15 cf

Plug-Flow detention time= 29.1 min calculated for 0.006 af (98% of inflow)
 Center-of-Mass det. time= 14.8 min (778.4 - 763.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	70	0.0	0	0
15.75	70	40.0	0	0
19.49	70	40.0	105	105
19.50	70	100.0	1	106
20.50	70	100.0	70	176
20.51	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	15.95'	4.0" Round Culvert L= 22.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 14.78' S= 0.0513 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=16.27' TW=12.84' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.51 fps)

Naima - Phase 2 - Proposed HydroCAD

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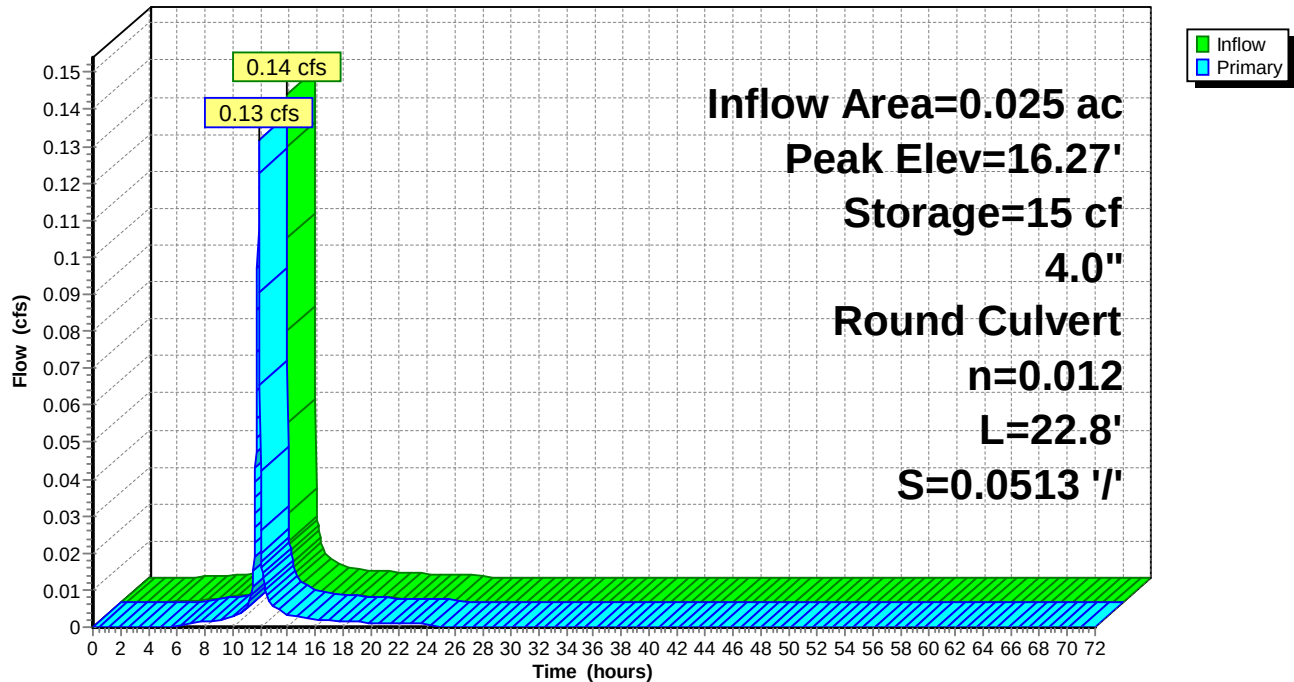
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P53: Planter #53

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond P54: Planter #54

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 2.95" for 2-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.4 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 18.58' Surf.Area= 30 sf Storage= 34 cf

Peak Elev= 18.74' @ 11.90 hrs Surf.Area= 30 sf Storage= 36 cf (2 cf above start)

Plug-Flow detention time= 196.7 min calculated for 0.001 af (61% of inflow)

Center-of-Mass det. time= 3.3 min (766.9 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	30	0.0	0	0
15.75	30	40.0	0	0
19.49	30	40.0	45	45
19.50	30	100.0	0	45
20.50	30	100.0	30	75
20.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	18.58'	4.0" Round Culvert L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 18.58' S= -0.2023 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=18.74' TW=16.53' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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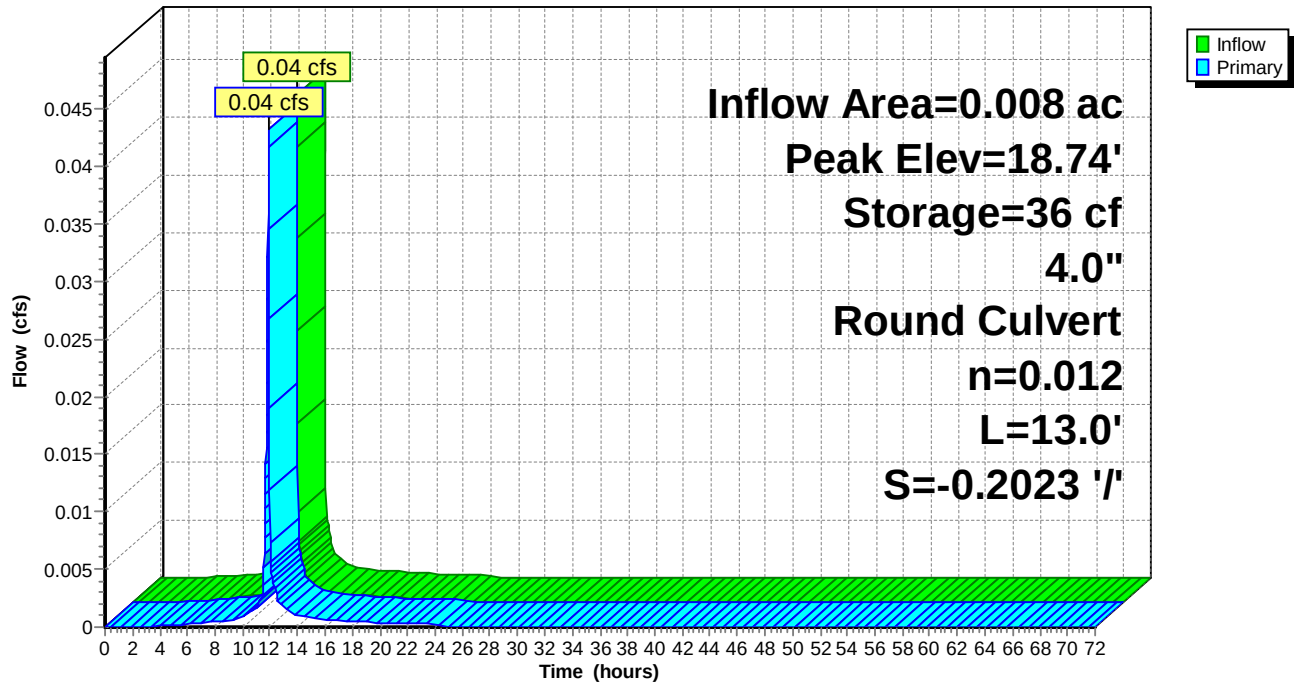
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond P54: Planter #54

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond PA-2: Porous Asphalt #2

Inflow Area = 0.105 ac, 81.59% Impervious, Inflow Depth = 2.68" for 2-YR event
 Inflow = 0.37 cfs @ 11.93 hrs, Volume= 0.023 af
 Outflow = 0.27 cfs @ 12.01 hrs, Volume= 0.023 af, Atten= 28%, Lag= 4.7 min
 Primary = 0.27 cfs @ 12.01 hrs, Volume= 0.023 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.50' @ 12.01 hrs Surf.Area= 1,172 sf Storage= 215 cf

Plug-Flow detention time= 63.5 min calculated for 0.023 af (98% of inflow)

Center-of-Mass det. time= 48.6 min (834.4 - 785.9)

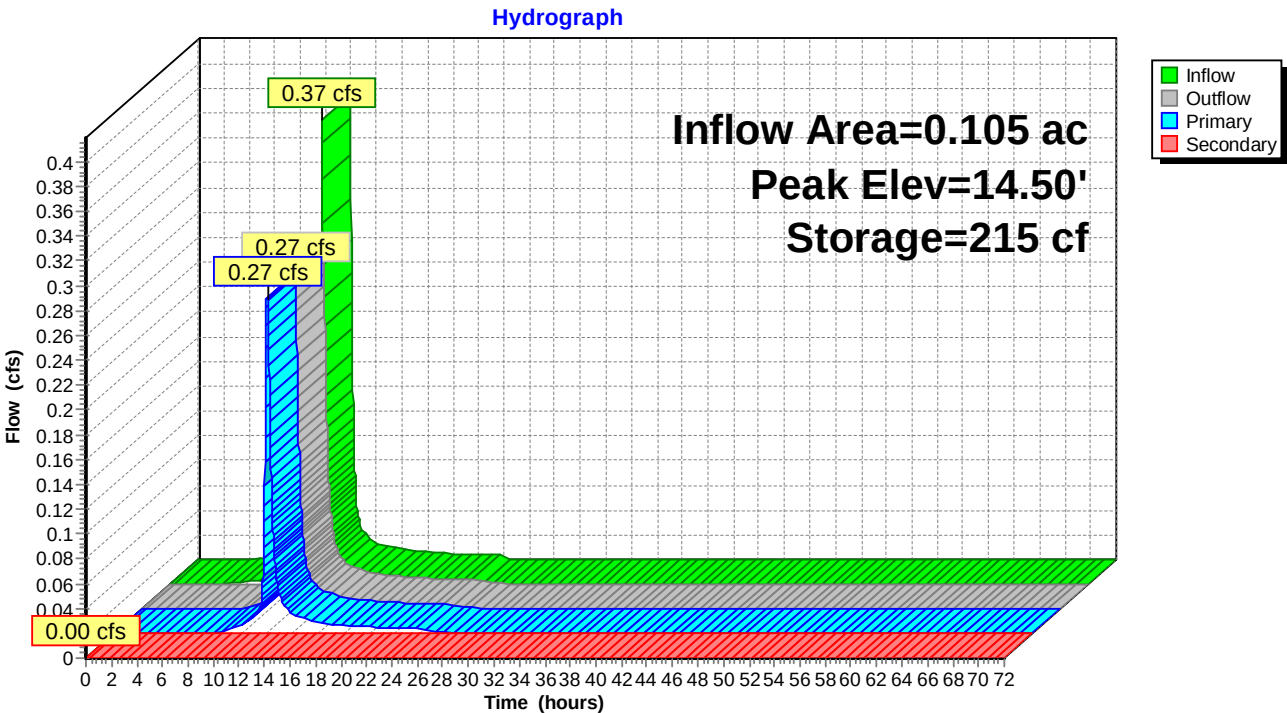
Volume	Invert	Avail.Storage	Storage Description
#1	14.04'	4,998 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.04	1,172	0.0	0	0
14.05	1,172	40.0	5	5
14.80	1,172	40.0	352	356
14.81	1,172	20.0	2	359
15.21	1,172	20.0	94	452
15.22	12,000	100.0	66	518
15.50	20,000	100.0	4,480	4,998

Device	Routing	Invert	Outlet Devices
#1	Primary	14.09'	6.0" Round Culvert L= 55.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.09' / 13.90' S= 0.0035 ' / S= 0.0035 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.36'	55.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.27 cfs @ 12.01 hrs HW=14.50' TW=13.29' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.27 cfs @ 2.14 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.04' TW=15.10' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-2: Porous Asphalt #2



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond PA-3: Porous Asphalt #3

Inflow Area = 0.136 ac, 64.54% Impervious, Inflow Depth = 2.31" for 2-YR event
 Inflow = 0.37 cfs @ 11.93 hrs, Volume= 0.026 af
 Outflow = 0.30 cfs @ 12.01 hrs, Volume= 0.026 af, Atten= 19%, Lag= 5.2 min
 Primary = 0.30 cfs @ 12.01 hrs, Volume= 0.026 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.33' @ 12.01 hrs Surf.Area= 903 sf Storage= 168 cf

Plug-Flow detention time= 42.1 min calculated for 0.026 af (98% of inflow)

Center-of-Mass det. time= 32.5 min (834.8 - 802.3)

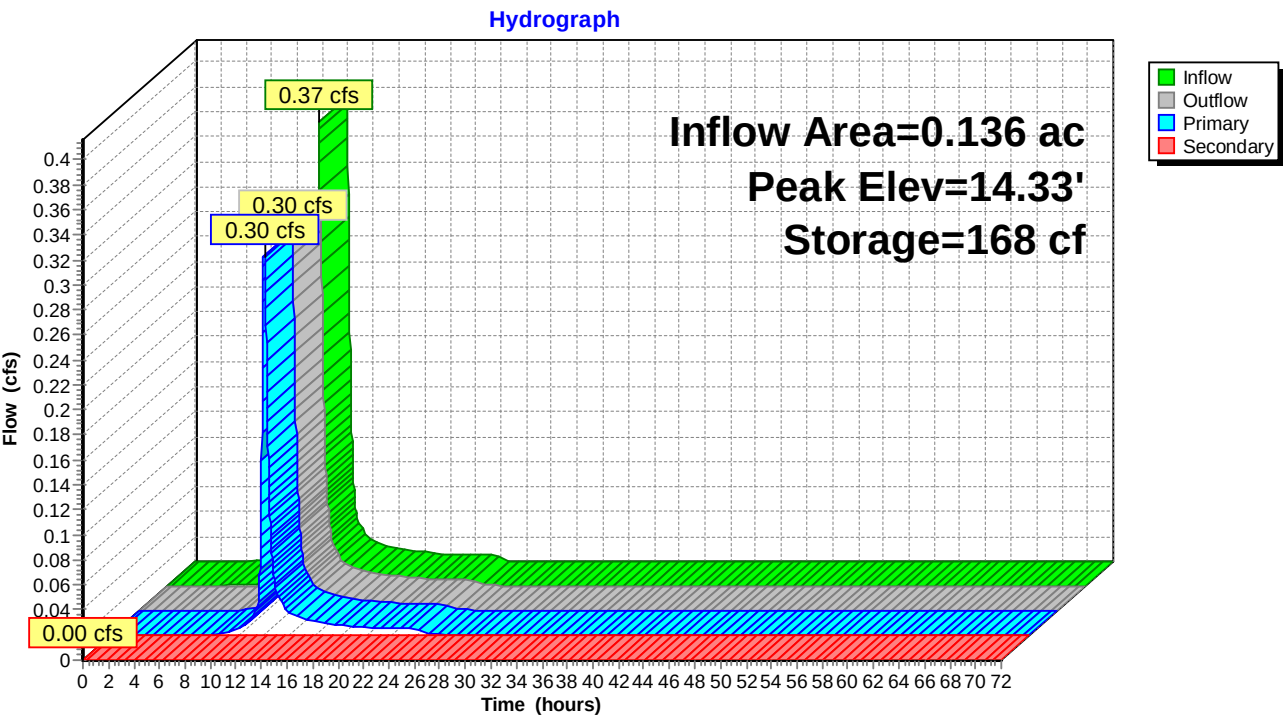
Volume	Invert	Avail.Storage	Storage Description
#1	13.86'	7,773 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.86	903	0.0	0	0
13.87	903	40.0	4	4
14.62	903	40.0	271	275
14.63	903	20.0	2	276
15.03	903	20.0	72	349
15.04	12,000	100.0	65	413
15.50	20,000	100.0	7,360	7,773

Device	Routing	Invert	Outlet Devices
#1	Primary	13.91'	6.0" Round Culvert L= 43.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.91' / 13.70' S= 0.0049 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.04'	43.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.30 cfs @ 12.01 hrs HW=14.33' TW=13.29' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.30 cfs @ 1.73 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=13.86' TW=12.30' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-3: Porous Asphalt #3



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond PA-4: Porous Asphalt #4

Inflow Area = 0.168 ac, 70.97% Impervious, Inflow Depth = 2.47" for 2-YR event
 Inflow = 0.52 cfs @ 11.93 hrs, Volume= 0.035 af
 Outflow = 0.38 cfs @ 12.00 hrs, Volume= 0.034 af, Atten= 26%, Lag= 4.0 min
 Primary = 0.38 cfs @ 12.00 hrs, Volume= 0.034 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.41' @ 12.00 hrs Surf.Area= 1,097 sf Storage= 250 cf

Plug-Flow detention time= 45.2 min calculated for 0.034 af (98% of inflow)

Center-of-Mass det. time= 36.2 min (831.2 - 794.9)

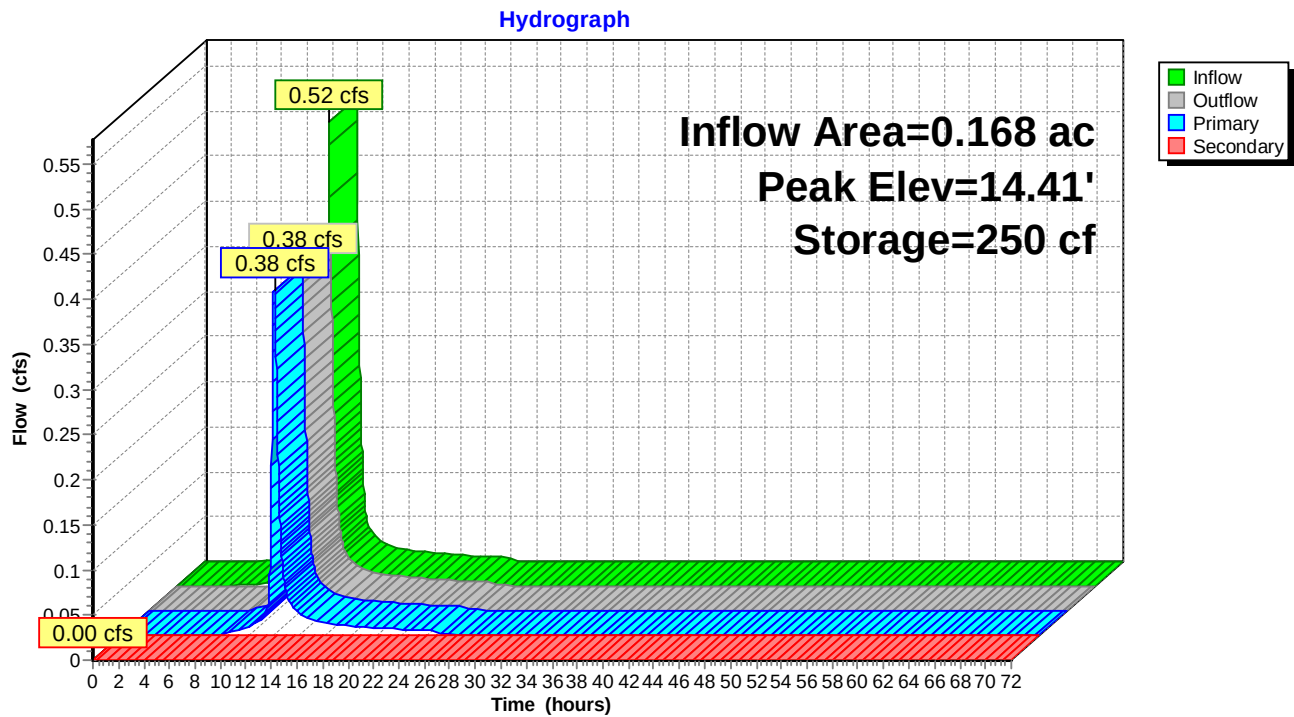
Volume	Invert	Avail.Storage	Storage Description
#1	13.84'	8,169 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.84	1,097	0.0	0	0
13.85	1,097	40.0	4	4
14.60	1,097	40.0	329	333
14.61	1,097	20.0	2	336
15.01	1,097	20.0	88	423
15.02	12,000	100.0	65	489
15.50	20,000	100.0	7,680	8,169

Device	Routing	Invert	Outlet Devices
#1	Primary	13.89'	6.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.89' / 13.70' S= 0.0037 ' / S= 0.0037 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.02'	52.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.38 cfs @ 12.00 hrs HW=14.41' TW=13.29' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.38 cfs @ 2.34 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=13.84' TW=12.30' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-4: Porous Asphalt #4



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond PA-5: Porous Asphalt #5

Inflow Area = 0.187 ac, 78.13% Impervious, Inflow Depth = 2.64" for 2-YR event
 Inflow = 0.57 cfs @ 11.94 hrs, Volume= 0.041 af
 Outflow = 0.30 cfs @ 12.13 hrs, Volume= 0.040 af, Atten= 47%, Lag= 11.5 min
 Primary = 0.30 cfs @ 12.13 hrs, Volume= 0.040 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.69' @ 12.13 hrs Surf.Area= 2,333 sf Storage= 568 cf

Plug-Flow detention time= 102.9 min calculated for 0.040 af (97% of inflow)

Center-of-Mass det. time= 85.9 min (876.1 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.08'	4,812 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.08	2,333	0.0	0	0
14.09	2,333	40.0	9	9
14.84	2,333	40.0	700	709
14.85	2,333	20.0	5	714
15.25	2,333	20.0	187	901
15.26	12,000	100.0	72	972
15.50	20,000	100.0	3,840	4,812

Device	Routing	Invert	Outlet Devices
#1	Primary	14.13'	6.0" Round Culvert L= 109.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.13' / 14.00' S= 0.0012 ' / S= 0.0012 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.26'	109.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.30 cfs @ 12.13 hrs HW=14.69' TW=13.22' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.30 cfs @ 1.72 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.08' TW=15.11' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Naima - Phase 2 - Proposed HydroCAD

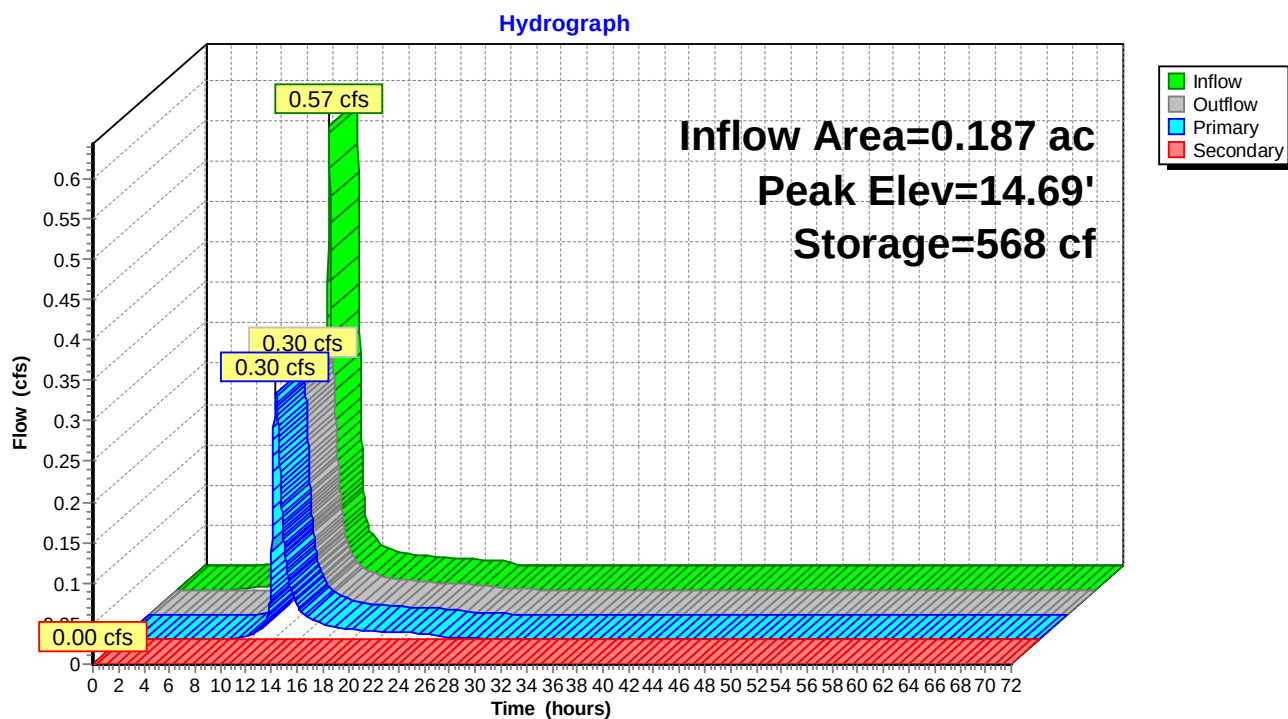
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Type II 24-hr 2-YR Rainfall=3.40"

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Pond PA-5: Porous Asphalt #5



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond PA-6: Porous Asphalt #6

Inflow Area = 0.290 ac, 80.14% Impervious, Inflow Depth = 2.68" for 2-YR event
 Inflow = 0.98 cfs @ 11.93 hrs, Volume= 0.065 af
 Outflow = 0.39 cfs @ 12.02 hrs, Volume= 0.063 af, Atten= 60%, Lag= 5.6 min
 Primary = 0.39 cfs @ 12.02 hrs, Volume= 0.063 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.32' @ 12.15 hrs Surf.Area= 3,085 sf Storage= 919 cf

Plug-Flow detention time= 96.0 min calculated for 0.063 af (98% of inflow)

Center-of-Mass det. time= 80.9 min (867.5 - 786.6)

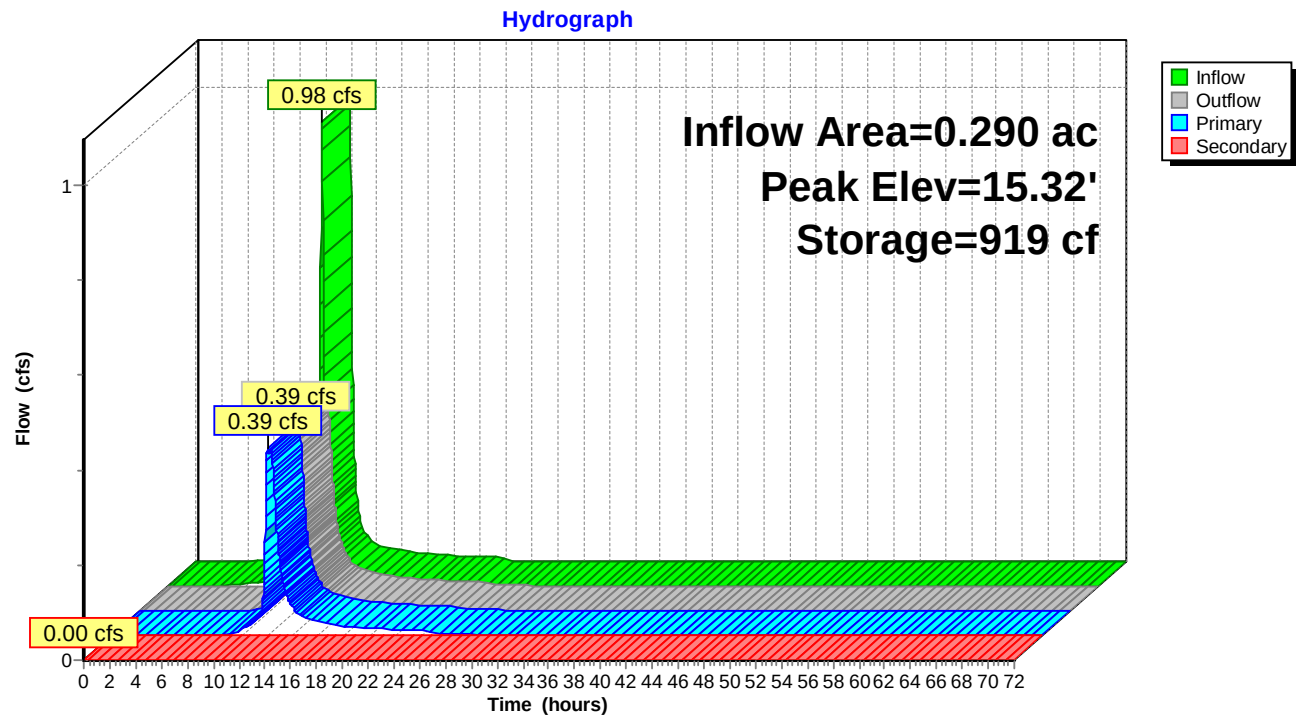
Volume	Invert	Avail.Storage	Storage Description
#1	14.58'	5,106 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.58	3,085	0.0	0	0
14.59	3,085	40.0	12	12
15.34	3,085	40.0	926	938
15.35	3,085	20.0	6	944
15.75	3,085	20.0	247	1,191
15.76	12,000	100.0	75	1,266
16.00	20,000	100.0	3,840	5,106

Device	Routing	Invert	Outlet Devices
#1	Primary	14.63'	6.0" Round Culvert L= 144.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.63' / 14.30' S= 0.0023 ' / S= 0.0023 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.76'	144.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.39 cfs @ 12.02 hrs HW=15.27' TW=13.28' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.39 cfs @ 2.04 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.58' TW=15.78' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-6: Porous Asphalt #6



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond PA-7: Porous Asphalt #7

Inflow Area = 0.034 ac, 75.76% Impervious, Inflow Depth = 2.57" for 2-YR event
 Inflow = 0.11 cfs @ 11.93 hrs, Volume= 0.007 af
 Outflow = 0.09 cfs @ 12.01 hrs, Volume= 0.007 af, Atten= 13%, Lag= 4.3 min
 Primary = 0.09 cfs @ 12.01 hrs, Volume= 0.007 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 16.58' @ 12.01 hrs Surf.Area= 387 sf Storage= 46 cf

Plug-Flow detention time= 47.3 min calculated for 0.007 af (98% of inflow)

Center-of-Mass det. time= 32.0 min (824.6 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	16.28'	4,851 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.28	387	0.0	0	0
16.29	387	40.0	2	2
17.04	387	40.0	116	118
17.05	387	20.0	1	118
17.45	387	20.0	31	149
17.46	12,000	100.0	62	211
17.75	20,000	100.0	4,640	4,851

Device	Routing	Invert	Outlet Devices
#1	Primary	16.33'	4.0" Round Culvert L= 18.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 16.33' / 16.20' S= 0.0072 ' / S= 0.0072 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	17.46'	18.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.09 cfs @ 12.01 hrs HW=16.58' TW=13.29' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.09 cfs @ 1.33 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=16.28' TW=17.34' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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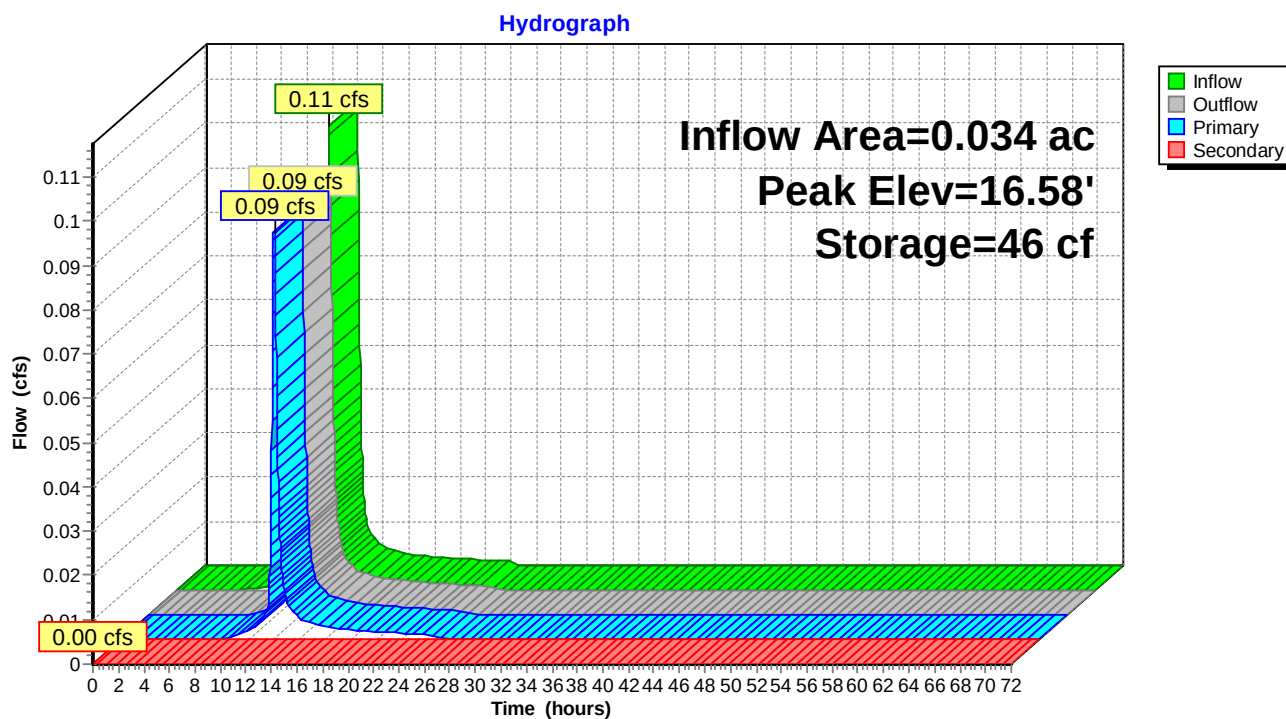
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Pond PA-7: Porous Asphalt #7



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Type II 24-hr 2-YR Rainfall=3.40"

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Summary for Pond SDMH-1: Proposed SDMH West of Bldgs

Inflow Area = 1.512 ac, 62.04% Impervious, Inflow Depth = 2.27" for 2-YR event
Inflow = 2.82 cfs @ 11.93 hrs, Volume= 0.287 af
Outflow = 2.82 cfs @ 11.93 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min
Primary = 2.82 cfs @ 11.93 hrs, Volume= 0.287 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 12.86' @ 11.93 hrs

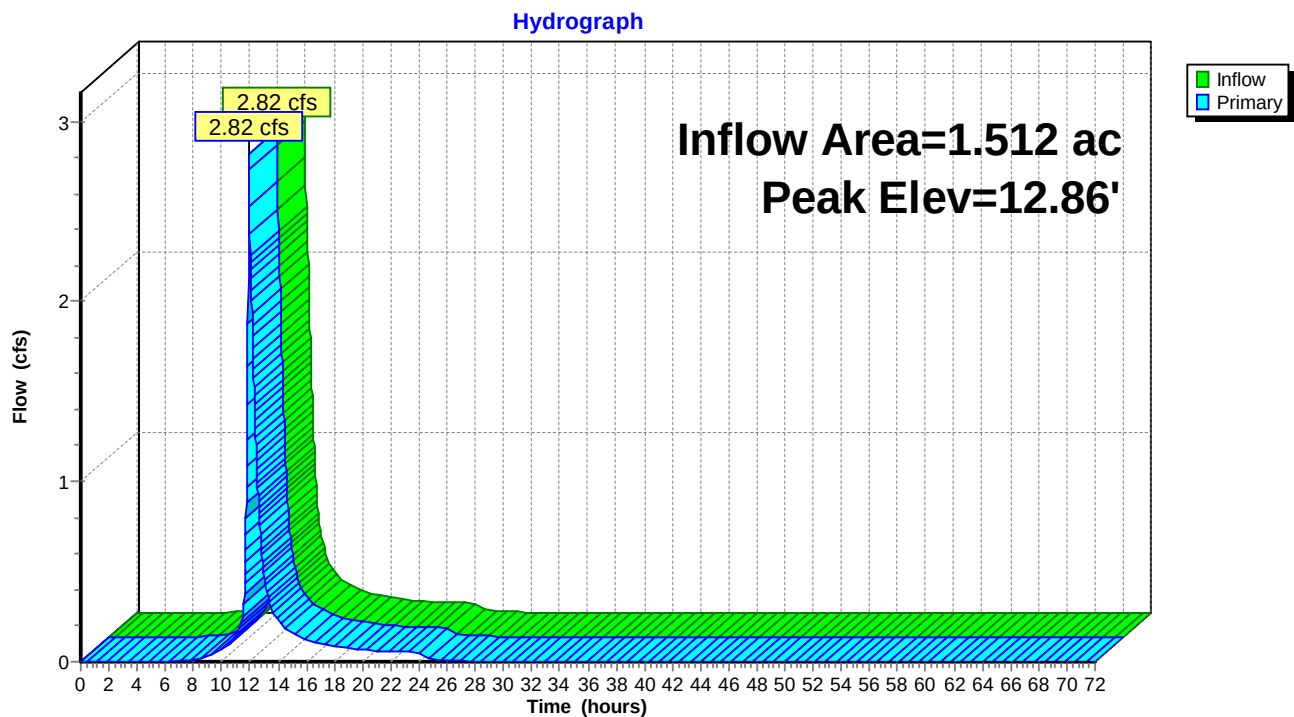
Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	2.0" x 2.0" Horiz. Orifice/Grate X 11.00 columns X 11 rows C= 0.600 in 24.0" x 24.0" Grate (84% open area) Limited to weir flow at low heads
#2	Primary	12.00'	15.0" Round Culvert L= 172.1' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 12.00' / 10.14' S= 0.0108 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=2.80 cfs @ 11.93 hrs HW=12.85' TW=0.00' (Dynamic Tailwater)

1=Orifice/Grate (Controls 0.00 cfs)

2=Culvert (Inlet Controls 2.80 cfs @ 3.14 fps)

Pond SDMH-1: Proposed SDMH West of Bldgs



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Type II 24-hr 2-YR Rainfall=3.40"

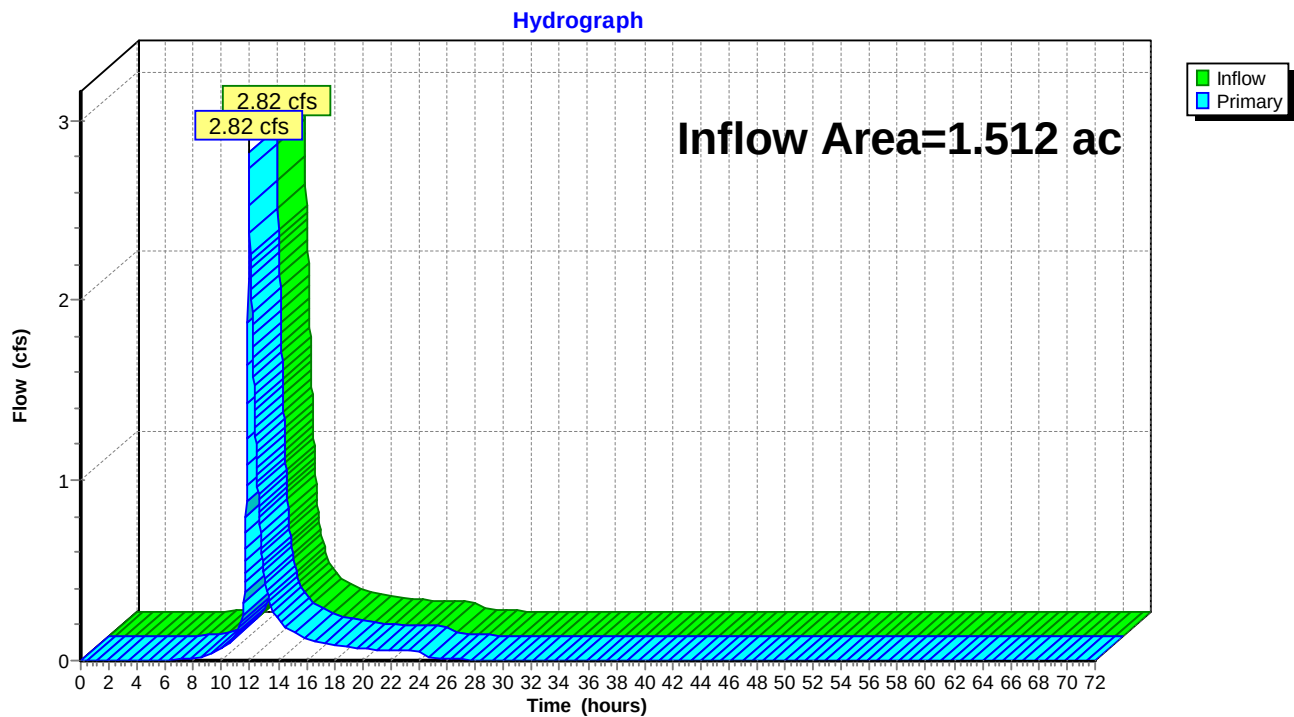
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Summary for Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow Area = 1.512 ac, 62.04% Impervious, Inflow Depth = 2.27" for 2-YR event
Inflow = 2.82 cfs @ 11.93 hrs, Volume= 0.287 af
Primary = 2.82 cfs @ 11.93 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 2
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 17S: Rooftop #18	Runoff Area=771 sf 96.11% Impervious Runoff Depth=4.95"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=97	Runoff=0.15 cfs 0.007 af
Subcatchment 19: Rooftop #19	Runoff Area=796 sf 93.09% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.16 cfs 0.007 af
Subcatchment 20: Rooftop #20	Runoff Area=363 sf 91.74% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.07 cfs 0.003 af
Subcatchment 21: Rooftop #21	Runoff Area=219 sf 90.87% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.04 cfs 0.002 af
Subcatchment 22: Rooftop #22	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.24 cfs 0.011 af
Subcatchment 23: Rooftop #23	Runoff Area=698 sf 92.84% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.14 cfs 0.006 af
Subcatchment 24: Rooftop #24	Runoff Area=587 sf 93.19% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.12 cfs 0.005 af
Subcatchment 25: Rooftop #25	Runoff Area=590 sf 93.22% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.12 cfs 0.005 af
Subcatchment 26: Rooftop #26	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.22 cfs 0.010 af
Subcatchment 27: Rooftop #27	Runoff Area=352 sf 91.48% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.07 cfs 0.003 af
Subcatchment 28: Rooftop #28	Runoff Area=796 sf 93.09% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.16 cfs 0.007 af
Subcatchment 29: Rooftop #29	Runoff Area=363 sf 91.74% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.07 cfs 0.003 af
Subcatchment 30: Rooftop #30	Runoff Area=219 sf 90.87% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.04 cfs 0.002 af
Subcatchment 31: Rooftop #31	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.24 cfs 0.011 af
Subcatchment 32: Rooftop #32	Runoff Area=219 sf 90.87% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.04 cfs 0.002 af
Subcatchment 33: Rooftop #33	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=4.83"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.24 cfs 0.011 af

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Subcatchment 34: Rooftop #34	Runoff Area=796 sf 93.09% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.16 cfs 0.007 af
Subcatchment 35: Rooftop #35	Runoff Area=363 sf 91.74% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 36: Rooftop #36	Runoff Area=698 sf 92.84% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.14 cfs 0.006 af
Subcatchment 37: Rooftop #37	Runoff Area=587 sf 93.19% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.12 cfs 0.005 af
Subcatchment 38: Rooftop #38	Runoff Area=590 sf 93.22% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.12 cfs 0.005 af
Subcatchment 39: Rooftop #39	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.22 cfs 0.010 af
Subcatchment 40: Rooftop #40	Runoff Area=352 sf 91.48% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 41: Rooftop #41	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.22 cfs 0.010 af
Subcatchment 42: Rooftop #42	Runoff Area=352 sf 91.48% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 43: Rooftop #43	Runoff Area=590 sf 93.22% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.12 cfs 0.005 af
Subcatchment 44: Rooftop #44	Runoff Area=698 sf 92.84% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.14 cfs 0.006 af
Subcatchment 45: Rooftop #45	Runoff Area=587 sf 93.19% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.12 cfs 0.005 af
Subcatchment 46: Rooftop #46	Runoff Area=219 sf 90.87% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.04 cfs 0.002 af
Subcatchment 47: Rooftop #47	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.24 cfs 0.011 af
Subcatchment 48: Rooftop #48	Runoff Area=796 sf 93.09% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.16 cfs 0.007 af
Subcatchment 49: Rooftop #49	Runoff Area=363 sf 91.74% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 50: Rooftop #50	Runoff Area=698 sf 92.84% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.14 cfs 0.006 af

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Subcatchment 51: Rooftop #51	Runoff Area=587 sf 93.19% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.12 cfs 0.005 af
Subcatchment 52: Rooftop #52	Runoff Area=590 sf 93.22% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.12 cfs 0.005 af
Subcatchment 53: Rooftop #53	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.22 cfs 0.010 af
Subcatchment 54: Rooftop #54	Runoff Area=352 sf 91.48% Impervious Runoff Depth=4.83"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.07 cfs 0.003 af
Subcatchment 55: Non-RT DA to PA-2	Runoff Area=3,000 sf 75.57% Impervious Runoff Depth=4.38"
Flow Length=43'	Slope=0.0100 '/' Tc=6.4 min CN=92 Runoff=0.39 cfs 0.025 af
Subcatchment 56: Non-RT DA to PA-3	Runoff Area=4,390 sf 54.69% Impervious Runoff Depth=3.85"
Flow Length=55'	Slope=0.0100 '/' Tc=7.8 min CN=87 Runoff=0.48 cfs 0.032 af
Subcatchment 57: Non-RT DA to PA-4	Runoff Area=4,540 sf 57.29% Impervious Runoff Depth=3.95"
Flow Length=62'	Slope=0.0100 '/' Tc=8.6 min CN=88 Runoff=0.48 cfs 0.034 af
Subcatchment 58: Non-RT DA to PA-5	Runoff Area=6,269 sf 73.76% Impervious Runoff Depth=4.38"
Flow Length=52'	Slope=0.0100 '/' Tc=7.4 min CN=92 Runoff=0.77 cfs 0.053 af
Subcatchment 59: Non-RT DA to PA-6	Runoff Area=8,366 sf 73.55% Impervious Runoff Depth=4.38"
Flow Length=50'	Slope=0.0100 '/' Tc=7.2 min CN=92 Runoff=1.03 cfs 0.070 af
Subcatchment 60: Non-RT DA to PA-7	Runoff Area=1,133 sf 70.87% Impervious Runoff Depth=4.27"
Flow Length=48'	Slope=0.0100 '/' Tc=7.0 min CN=91 Runoff=0.14 cfs 0.009 af
Subcatchment 61: West DA to Jowite	Runoff Area=14,486 sf 0.00% Impervious Runoff Depth=2.61"
	Flow Length=721' Tc=13.9 min CN=74 Runoff=0.79 cfs 0.072 af
Reach VG-2: Valley Gutter 2	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=57.0' S=0.0061 '/' Capacity=0.14 cfs Outflow=0.00 cfs 0.000 af
Reach VG-3: Valley Gutter 3	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=66.0' S=0.0055 '/' Capacity=0.13 cfs Outflow=0.00 cfs 0.000 af
Reach VG-4: Valley Gutter 4	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=118.0' S=0.0057 '/' Capacity=0.14 cfs Outflow=0.00 cfs 0.000 af
Reach VG-5: Valley Gutter 5	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
	n=0.011 L=152.0' S=0.0103 '/' Capacity=0.18 cfs Outflow=0.00 cfs 0.000 af
Pond EX-I-2: EX-I-2	Peak Elev=14.01' Inflow=2.69 cfs 0.334 af
	Outflow=2.69 cfs 0.334 af
Pond P19: Planter #19	Peak Elev=13.83' Storage=13 cf Inflow=0.16 cfs 0.007 af
	4.0" Round Culvert n=0.012 L=26.8' S=0.0131 '/' Outflow=0.15 cfs 0.007 af

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Pond P20: Planter #20	Peak Elev=16.01' Storage=33 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=20.1' S=-0.1169 ' /' Outflow=0.07 cfs 0.003 af
Pond P21: Planter #21	Peak Elev=13.61' Storage=3 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=30.2' S=0.0185 ' /' Outflow=0.04 cfs 0.002 af
Pond P22: Planter #22	Peak Elev=16.30' Storage=98 cf Inflow=0.24 cfs 0.011 af 4.0" Round Culvert n=0.012 L=59.7' S=-0.0350 ' /' Outflow=0.21 cfs 0.011 af
Pond P23: Planter #23	Peak Elev=13.35' Storage=12 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=20.7' S=0.0068 ' /' Outflow=0.12 cfs 0.006 af
Pond P24: Planter #24	Peak Elev=15.73' Storage=48 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=36.6' S=-0.0683 ' /' Outflow=0.11 cfs 0.005 af
Pond P25: Planter #25	Peak Elev=15.61' Storage=46 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0820 ' /' Outflow=0.11 cfs 0.005 af
Pond P26: Planter #26	Peak Elev=13.55' Storage=23 cf Inflow=0.22 cfs 0.010 af 4.0" Round Culvert n=0.012 L=24.5' S=0.0159 ' /' Outflow=0.18 cfs 0.010 af
Pond P27: Planter #27	Peak Elev=15.29' Storage=31 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=10.8' S=-0.1972 ' /' Outflow=0.07 cfs 0.003 af
Pond P28: Planter #28	Peak Elev=13.83' Storage=13 cf Inflow=0.16 cfs 0.007 af 4.0" Round Culvert n=0.012 L=14.3' S=0.0245 ' /' Outflow=0.15 cfs 0.007 af
Pond P29: Planter #29	Peak Elev=15.20' Storage=24 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=32.3' S=-0.0477 ' /' Outflow=0.07 cfs 0.003 af
Pond P30: Planter #30	Peak Elev=13.61' Storage=3 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=18.2' S=0.0088 ' /' Outflow=0.04 cfs 0.002 af
Pond P31: Planter #31	Peak Elev=16.05' Storage=90 cf Inflow=0.24 cfs 0.011 af 4.0" Round Culvert n=0.012 L=71.6' S=-0.0246 ' /' Outflow=0.20 cfs 0.011 af
Pond P32: Planter #32	Peak Elev=14.11' Storage=3 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=29.6' S=0.0199 ' /' Outflow=0.04 cfs 0.002 af
Pond P33: Planter #33	Peak Elev=16.01' Storage=73 cf Inflow=0.24 cfs 0.011 af 4.0" Round Culvert n=0.012 L=61.0' S=-0.0211 ' /' Outflow=0.21 cfs 0.011 af
Pond P34: Planter #34	Peak Elev=14.33' Storage=13 cf Inflow=0.16 cfs 0.007 af 4.0" Round Culvert n=0.012 L=26.1' S=0.0149 ' /' Outflow=0.15 cfs 0.007 af
Pond P35: Planter #35	Peak Elev=15.94' Storage=26 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=31.5' S=-0.0565 ' /' Outflow=0.07 cfs 0.003 af
Pond P36: Planter #36	Peak Elev=14.48' Storage=11 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=20.2' S=0.0248 ' /' Outflow=0.13 cfs 0.006 af

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Pond P37: Planter #37	Peak Elev=16.01' Storage=33 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=37.8' S=-0.0418 ' /' Outflow=0.11 cfs 0.005 af
Pond P38: Planter #38	Peak Elev=16.14' Storage=35 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0588 ' /' Outflow=0.11 cfs 0.005 af
Pond P39: Planter #39	Peak Elev=14.69' Storage=21 cf Inflow=0.22 cfs 0.010 af 4.0" Round Culvert n=0.012 L=23.9' S=0.0113 ' /' Outflow=0.20 cfs 0.010 af
Pond P40: Planter #40	Peak Elev=16.20' Storage=27 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=11.2' S=-0.1643 ' /' Outflow=0.07 cfs 0.003 af
Pond P41: Planter #41	Peak Elev=14.99' Storage=21 cf Inflow=0.22 cfs 0.010 af 4.0" Round Culvert n=0.012 L=23.8' S=0.0210 ' /' Outflow=0.20 cfs 0.010 af
Pond P42: Planter #42	Peak Elev=16.35' Storage=25 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=19.8' S=-0.0854 ' /' Outflow=0.07 cfs 0.003 af
Pond P43: Planter #43	Peak Elev=16.60' Storage=38 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=28.7' S=-0.0648 ' /' Outflow=0.11 cfs 0.005 af
Pond P44: Planter #44	Peak Elev=14.78' Storage=1 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=19.9' S=0.0136 ' /' Outflow=0.13 cfs 0.006 af
Pond P45: Planter #45	Peak Elev=16.74' Storage=40 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=36.4' S=-0.0552 ' /' Outflow=0.11 cfs 0.005 af
Pond P46: Planter #46	Peak Elev=15.11' Storage=3 cf Inflow=0.04 cfs 0.002 af 4.0" Round Culvert n=0.012 L=28.6' S=0.0248 ' /' Outflow=0.04 cfs 0.002 af
Pond P47: Planter #47	Peak Elev=17.36' Storage=84 cf Inflow=0.24 cfs 0.011 af 4.0" Round Culvert n=0.012 L=59.6' S=-0.0277 ' /' Outflow=0.21 cfs 0.011 af
Pond P48: Planter #48	Peak Elev=17.28' Storage=56 cf Inflow=0.16 cfs 0.007 af 4.0" Round Culvert n=0.012 L=24.8' S=-0.0992 ' /' Outflow=0.15 cfs 0.006 af
Pond P49: Planter #49	Peak Elev=17.33' Storage=31 cf Inflow=0.07 cfs 0.003 af 4.0" Round Culvert n=0.012 L=19.9' S=-0.1090 ' /' Outflow=0.07 cfs 0.003 af
Pond P50: Planter #50	Peak Elev=16.28' Storage=11 cf Inflow=0.14 cfs 0.006 af 4.0" Round Culvert n=0.012 L=19.4' S=0.0722 ' /' Outflow=0.13 cfs 0.006 af
Pond P51: Planter #51	Peak Elev=17.59' Storage=30 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=36.8' S=-0.0370 ' /' Outflow=0.11 cfs 0.005 af
Pond P52: Planter #52	Peak Elev=17.83' Storage=33 cf Inflow=0.12 cfs 0.005 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0550 ' /' Outflow=0.11 cfs 0.005 af
Pond P53: Planter #53	Peak Elev=16.49' Storage=21 cf Inflow=0.22 cfs 0.010 af 4.0" Round Culvert n=0.012 L=22.8' S=0.0513 ' /' Outflow=0.20 cfs 0.010 af

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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P54: Planter #54Peak Elev=18.79' Storage=37 cf Inflow=0.07 cfs 0.003 af
4.0" Round Culvert n=0.012 L=13.0' S=-0.2023 ' / Outflow=0.07 cfs 0.003 af**Pond PA-2: Porous Asphalt #2**Peak Elev=14.70' Storage=309 cf Inflow=0.61 cfs 0.040 af
Primary=0.44 cfs 0.039 af Secondary=0.00 cfs 0.000 af Outflow=0.44 cfs 0.039 af**Pond PA-3: Porous Asphalt #3**Peak Elev=14.60' Storage=266 cf Inflow=0.64 cfs 0.046 af
Primary=0.49 cfs 0.046 af Secondary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.046 af**Pond PA-4: Porous Asphalt #4**Peak Elev=14.89' Storage=398 cf Inflow=0.85 cfs 0.060 af
Primary=0.63 cfs 0.060 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.060 af**Pond PA-5: Porous Asphalt #5**Peak Elev=15.19' Storage=872 cf Inflow=0.95 cfs 0.070 af
Primary=0.49 cfs 0.069 af Secondary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.069 af**Pond PA-6: Porous Asphalt #6**Peak Elev=15.78' Storage=1,519 cf Inflow=1.59 cfs 0.110 af
Primary=0.53 cfs 0.108 af Secondary=0.00 cfs 0.000 af Outflow=0.53 cfs 0.108 af**Pond PA-7: Porous Asphalt #7**Peak Elev=16.70' Storage=65 cf Inflow=0.18 cfs 0.013 af
Primary=0.15 cfs 0.012 af Secondary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.012 af**Pond SDMH-1: Proposed SDMH West of Bldgs**Peak Elev=13.22' Inflow=4.59 cfs 0.508 af
Outflow=4.59 cfs 0.508 af**Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton**Inflow=4.59 cfs 0.508 af
Primary=4.59 cfs 0.508 af**Total Runoff Area = 1.529 ac Runoff Volume = 0.522 af Average Runoff Depth = 4.10"**
37.56% Pervious = 0.574 ac 62.44% Impervious = 0.955 ac

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 17S: Rooftop #18

Runoff = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 4.95"

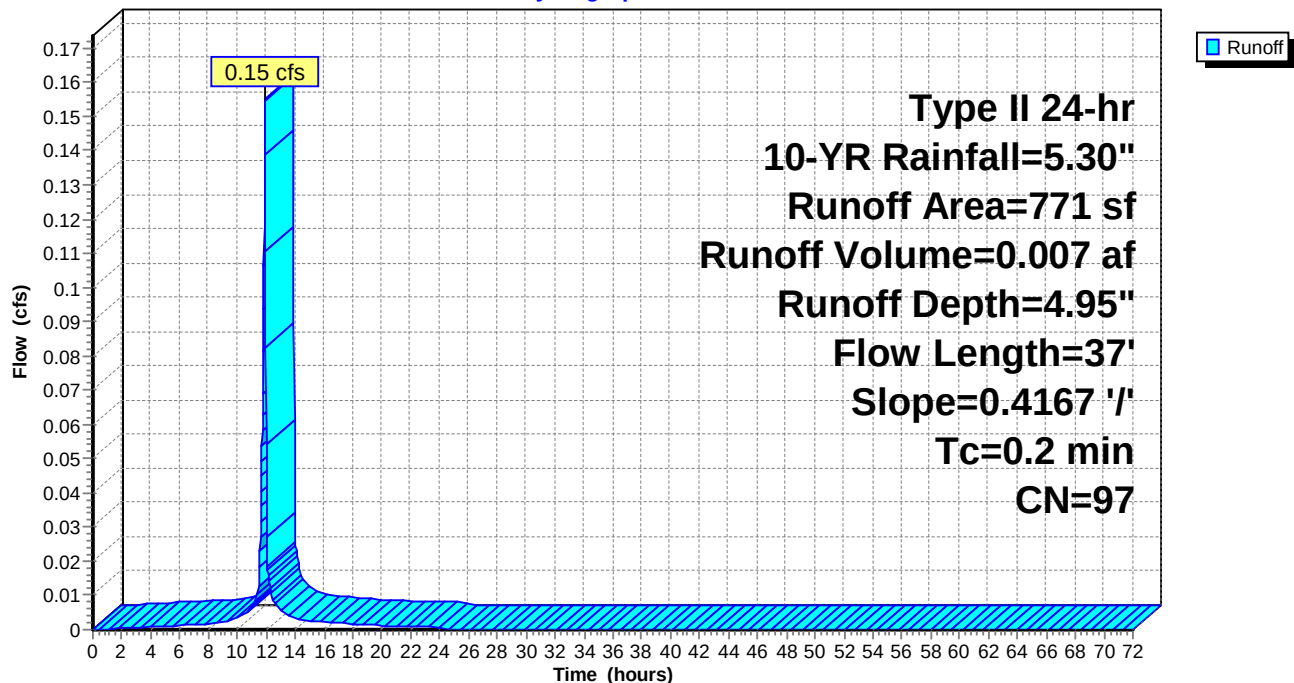
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
741	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
771	97	Weighted Average
30		3.89% Pervious Area
741		96.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 17S: Rooftop #18

Hydrograph



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Summary for Subcatchment 19: Rooftop #19

Runoff = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 4.83"

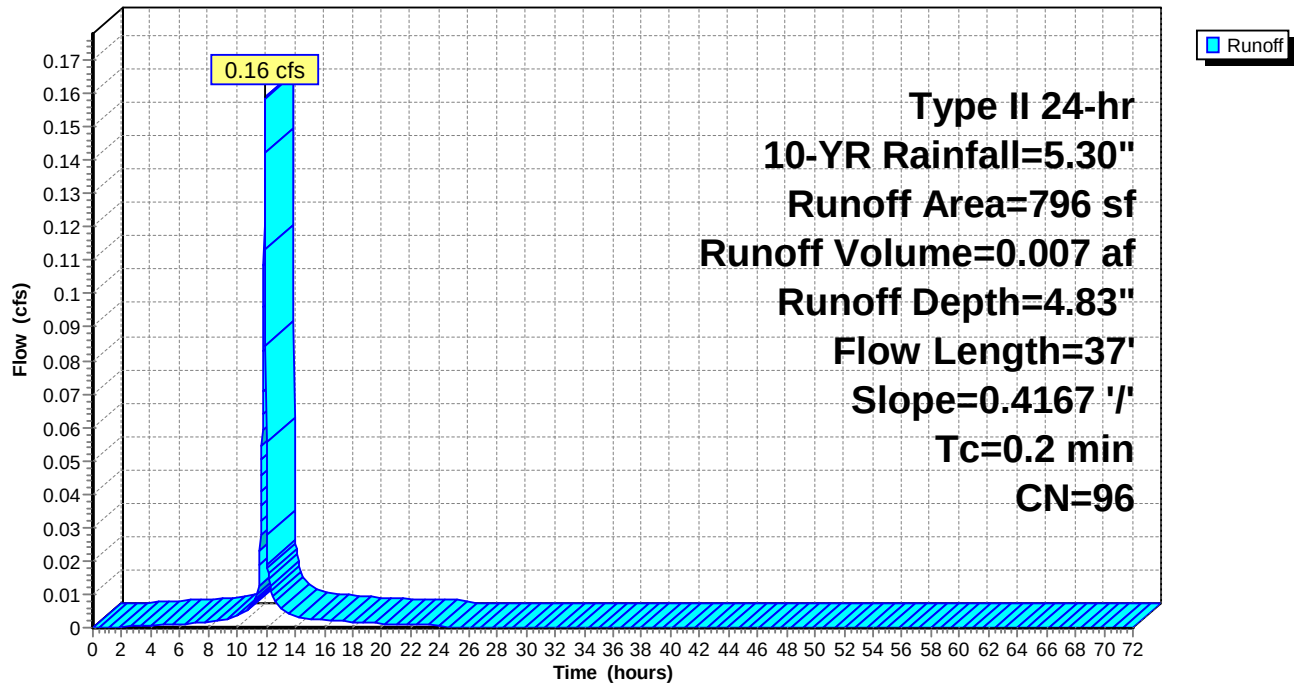
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 19: Rooftop #19

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 20: Rooftop #20

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

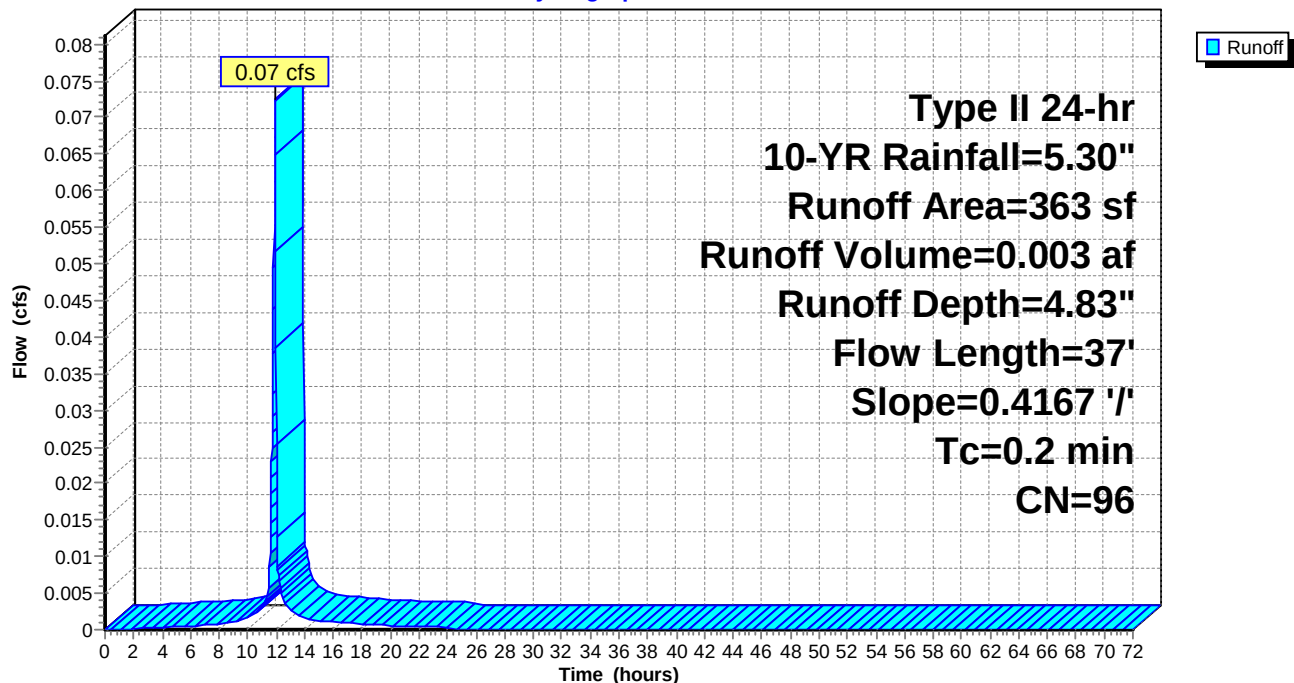
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 20: Rooftop #20

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 21: Rooftop #21

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 4.83"

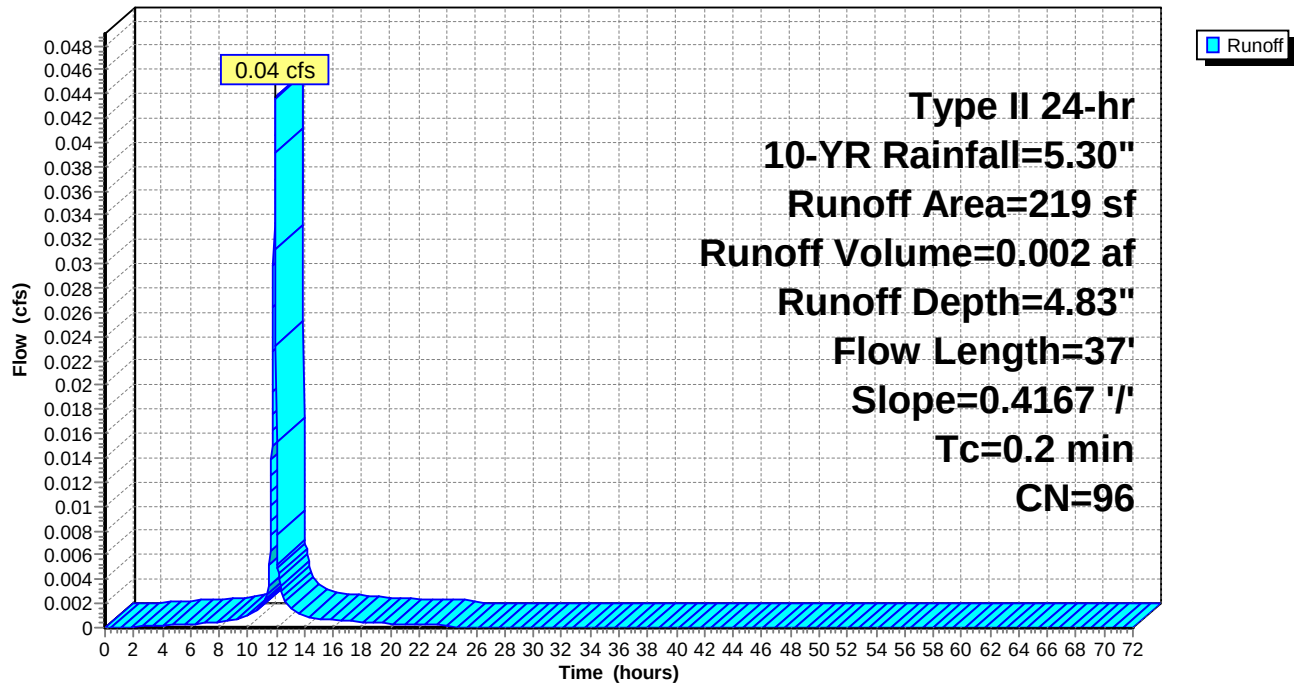
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 21: Rooftop #21

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 22: Rooftop #22

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 4.83"

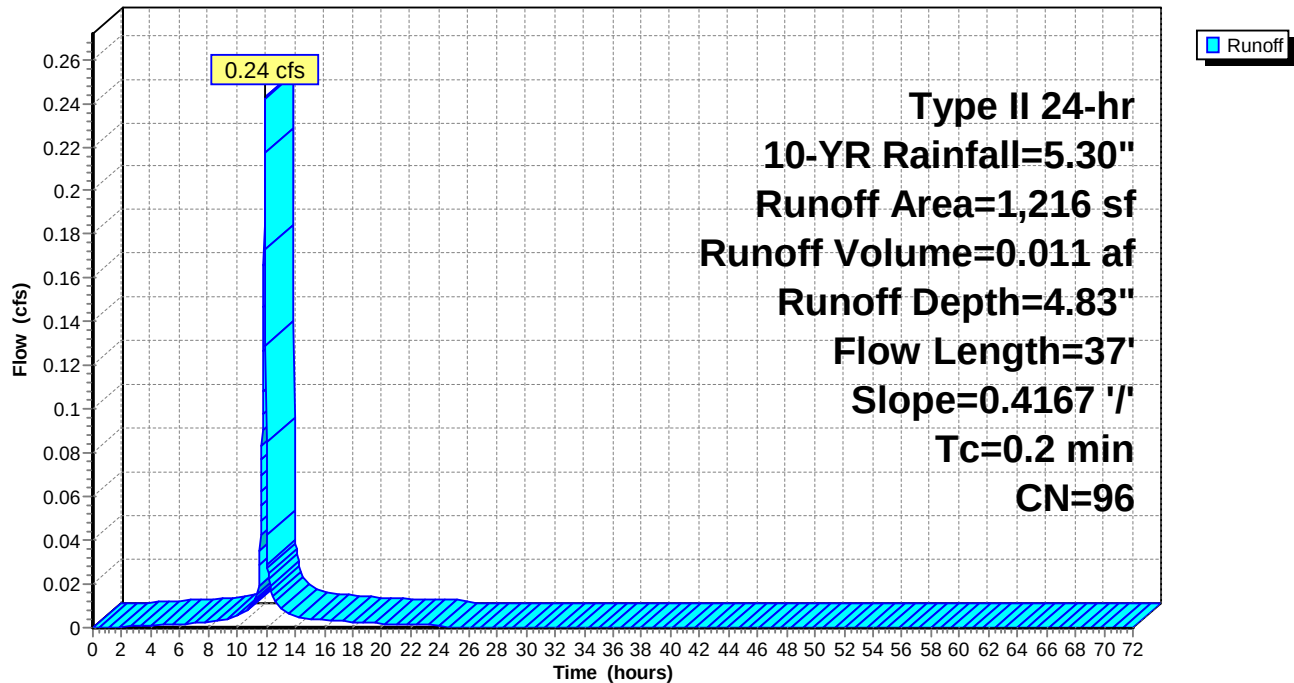
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 22: Rooftop #22

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 10-YR Rainfall=5.30"

Printed 02/22/23

Summary for Subcatchment 23: Rooftop #23

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 4.83"

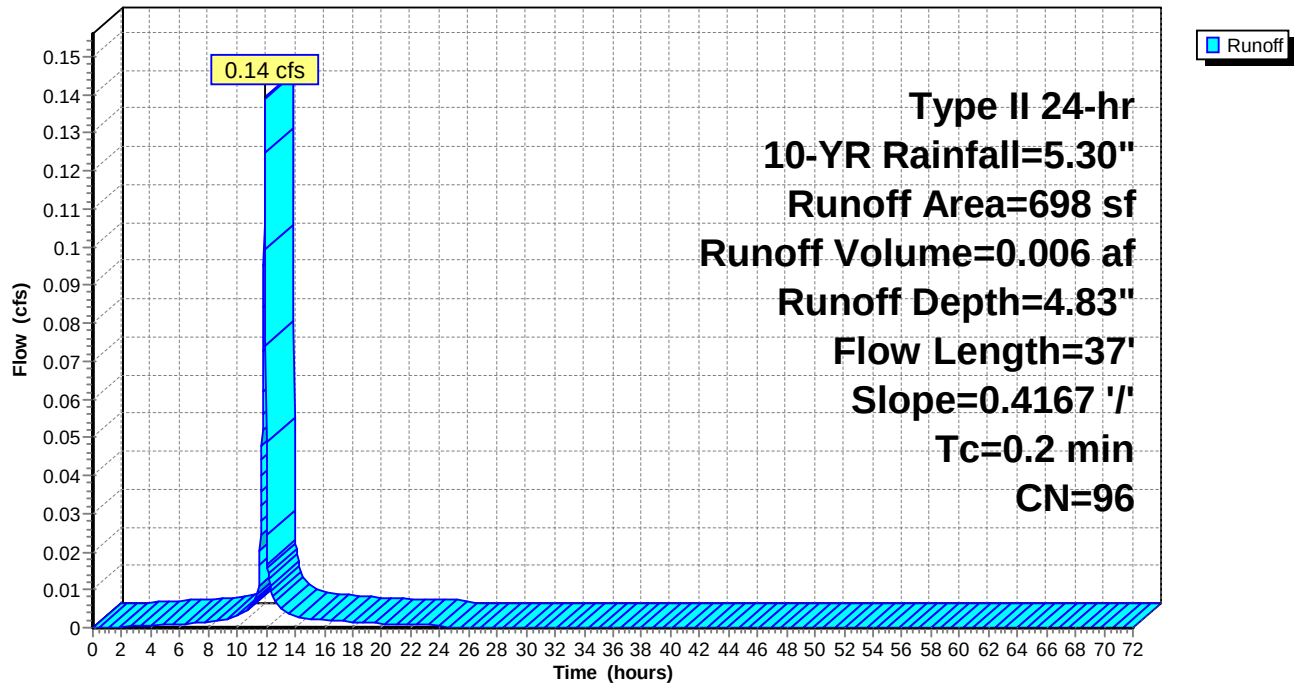
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 23: Rooftop #23

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 24: Rooftop #24

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

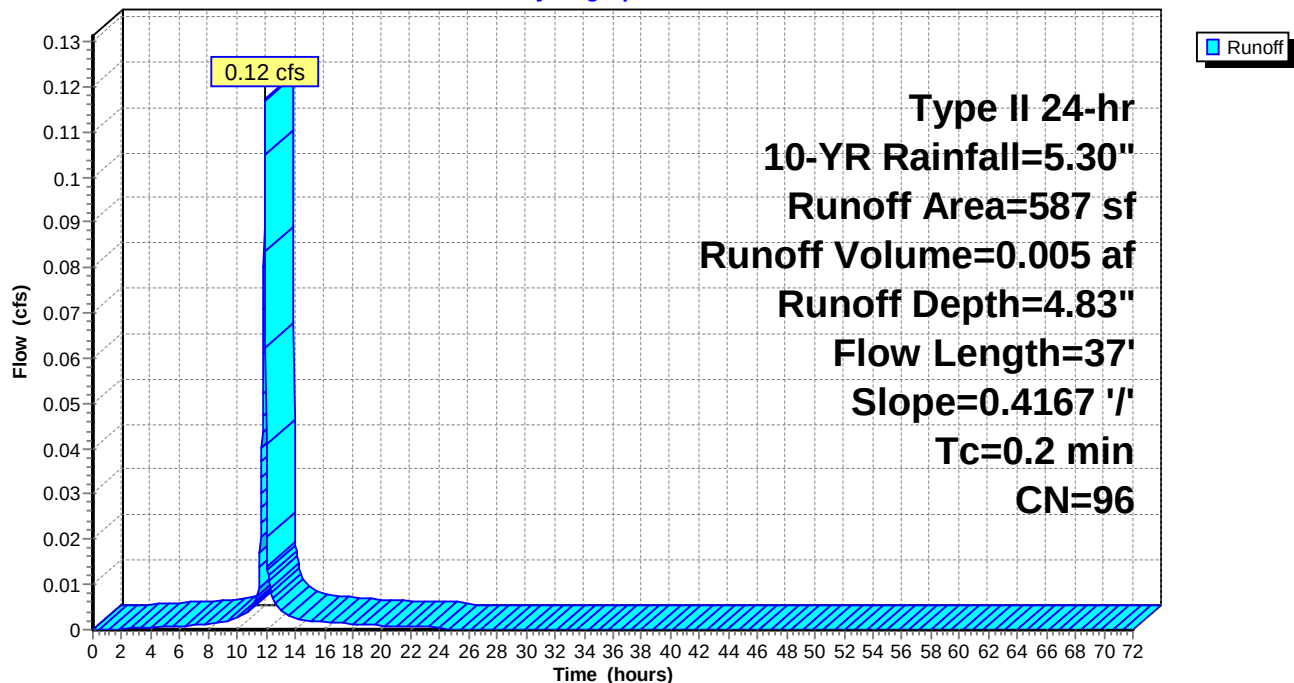
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 24: Rooftop #24

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 25: Rooftop #25

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

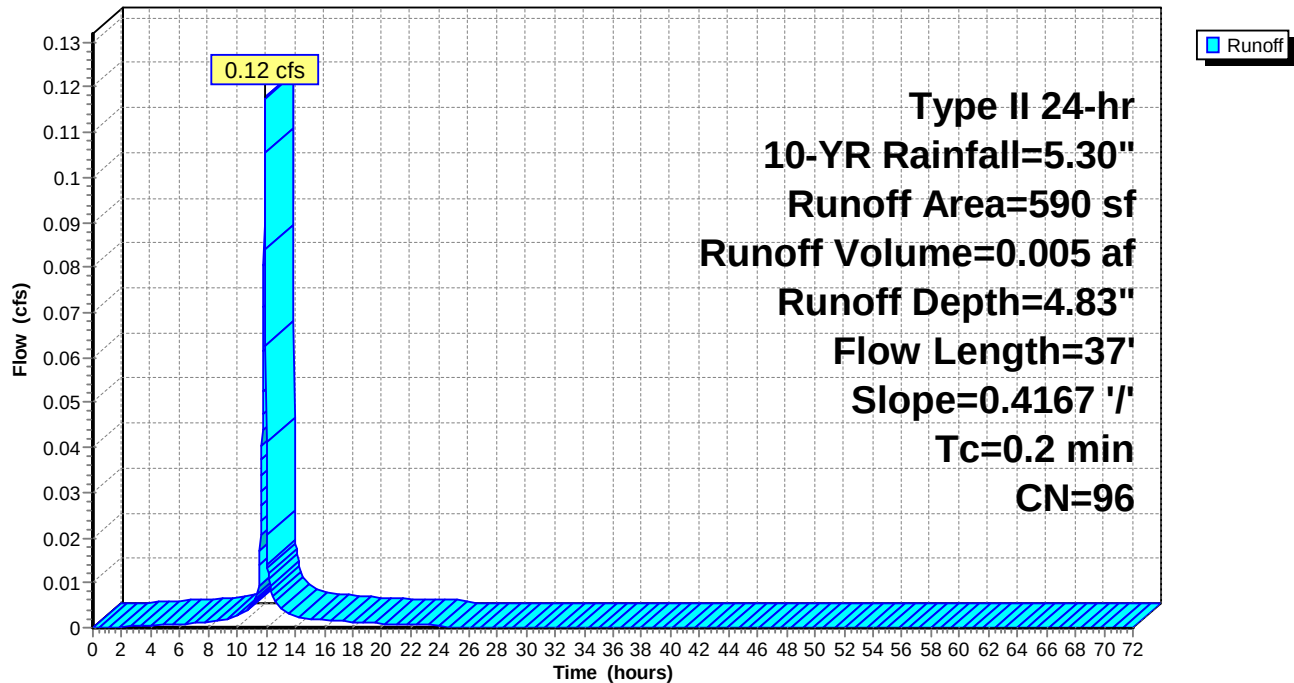
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 25: Rooftop #25

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 26: Rooftop #26

Runoff = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 4.83"

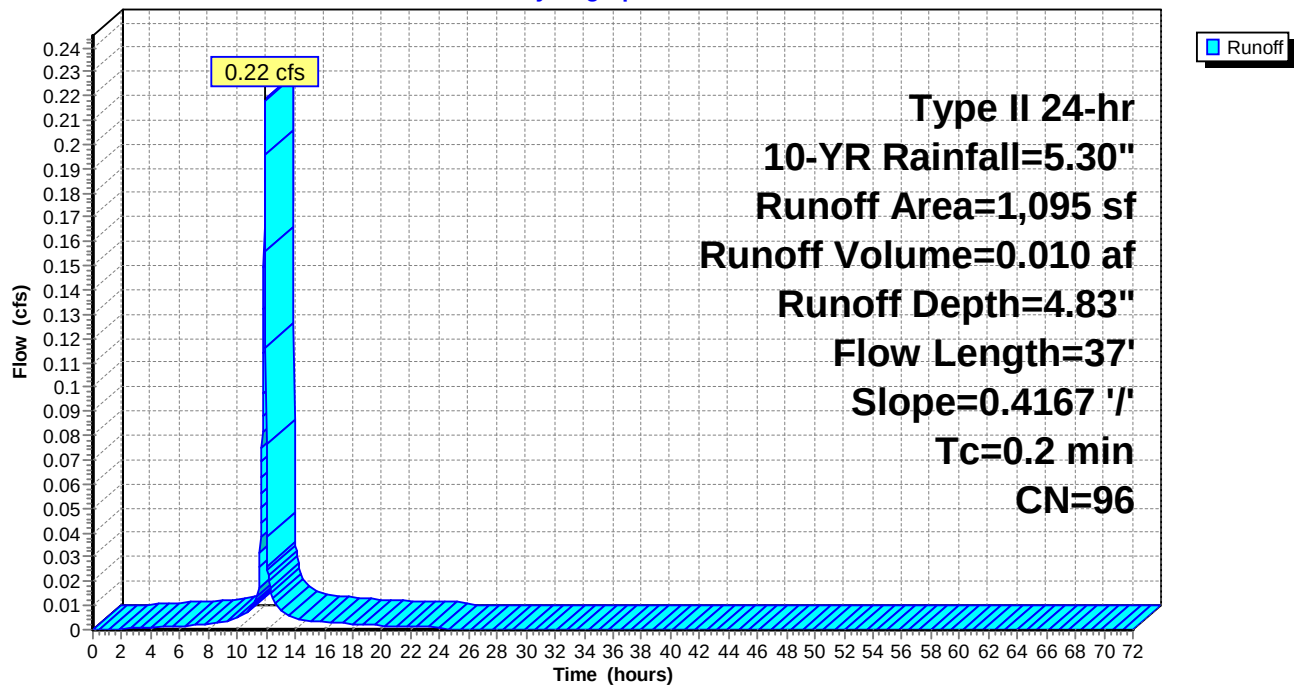
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 26: Rooftop #26

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 27: Rooftop #27

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

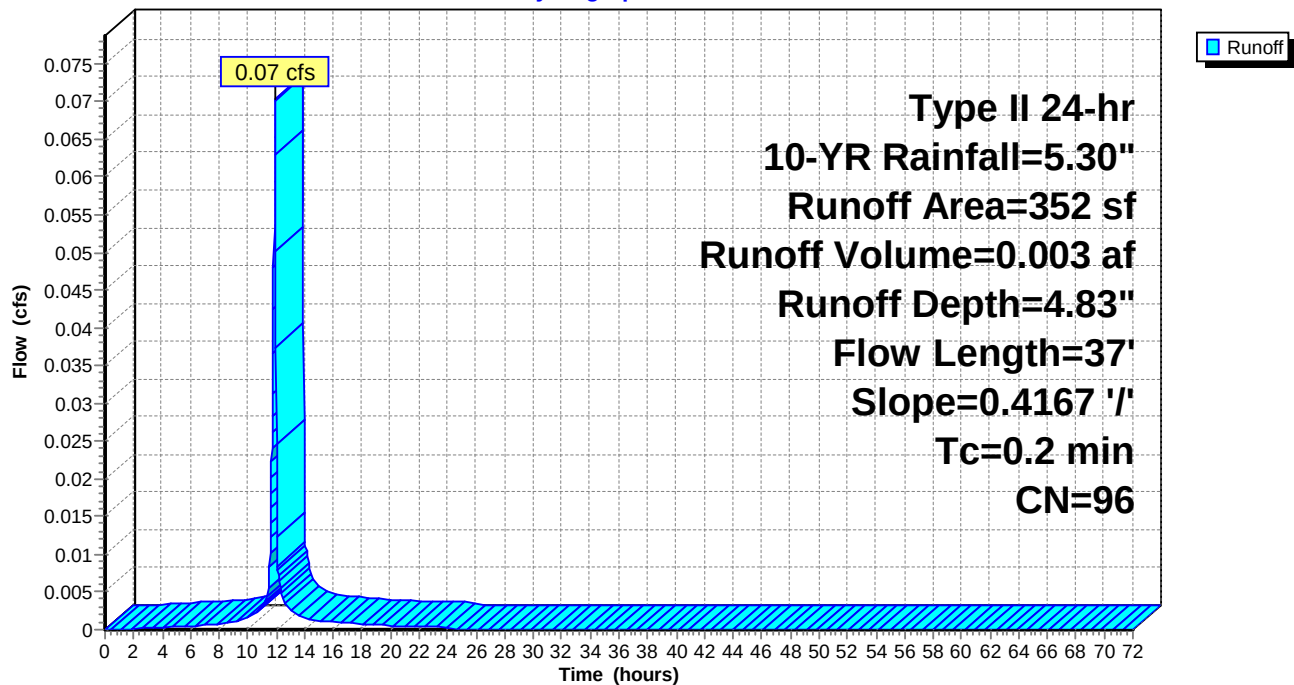
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 27: Rooftop #27

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 28: Rooftop #28

Runoff = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 4.83"

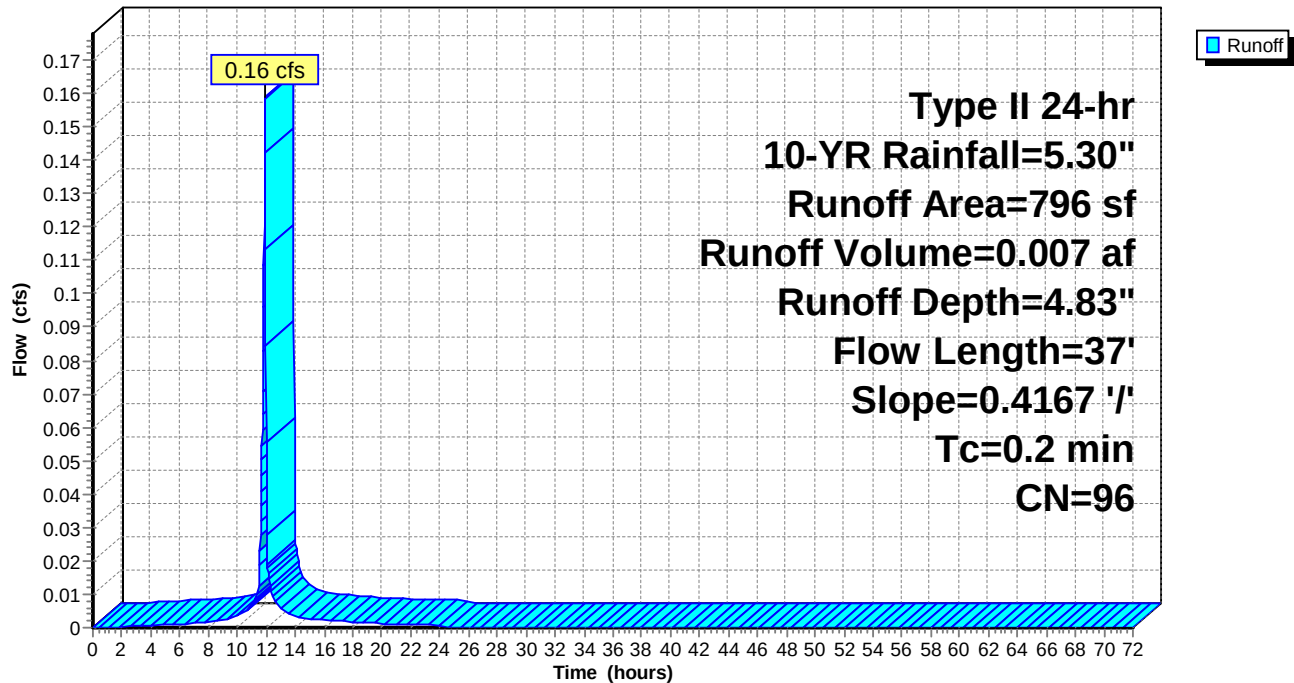
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 28: Rooftop #28

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 29: Rooftop #29

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

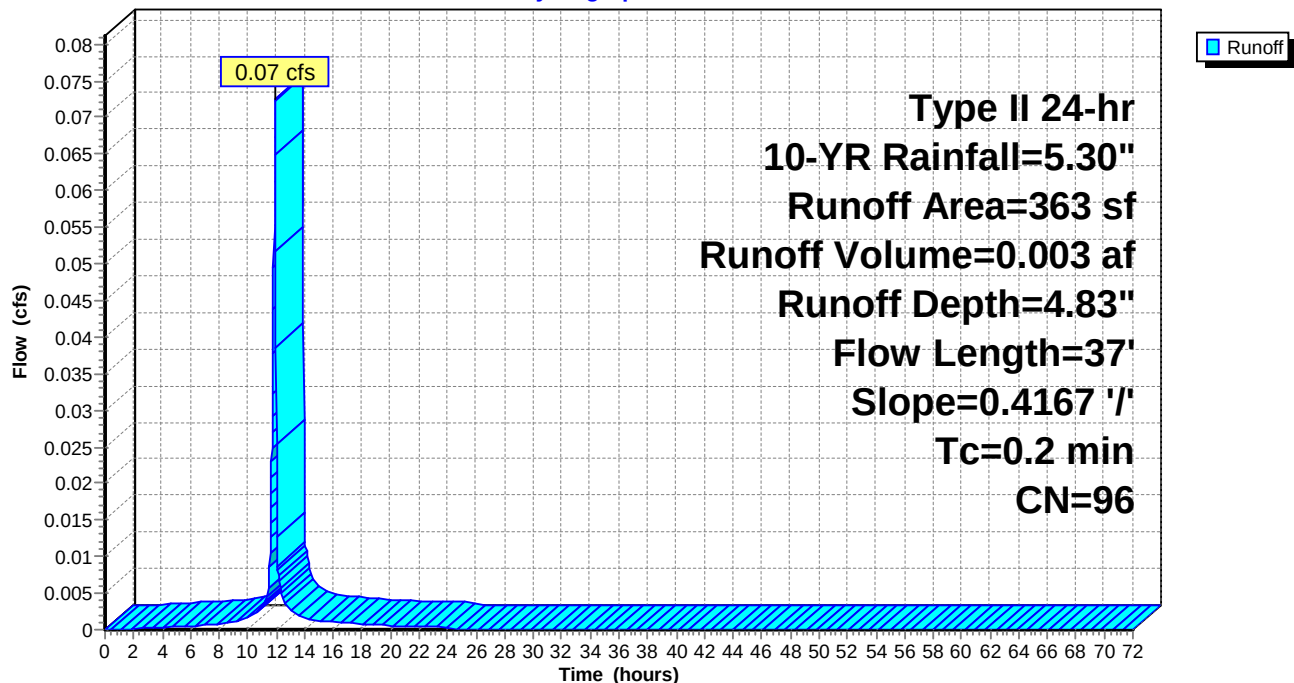
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 29: Rooftop #29

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

Printed 02/22/23

Summary for Subcatchment 30: Rooftop #30

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 4.83"

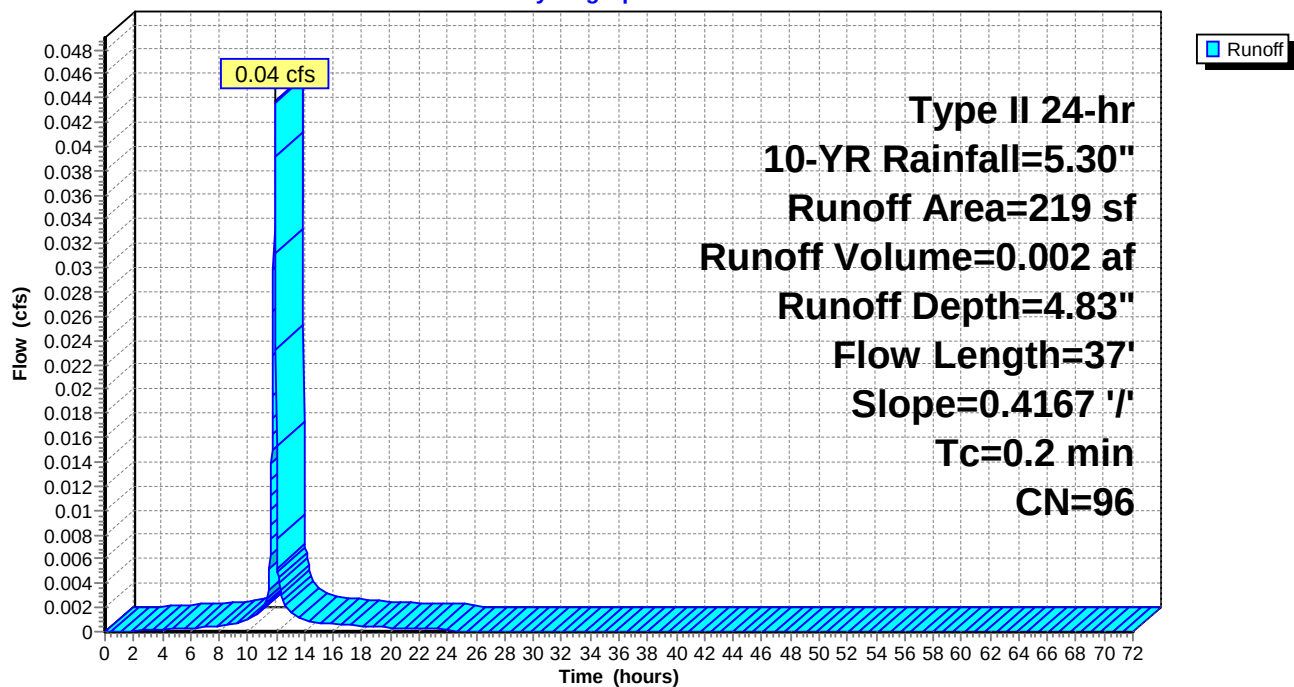
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 30: Rooftop #30

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 31: Rooftop #31

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 4.83"

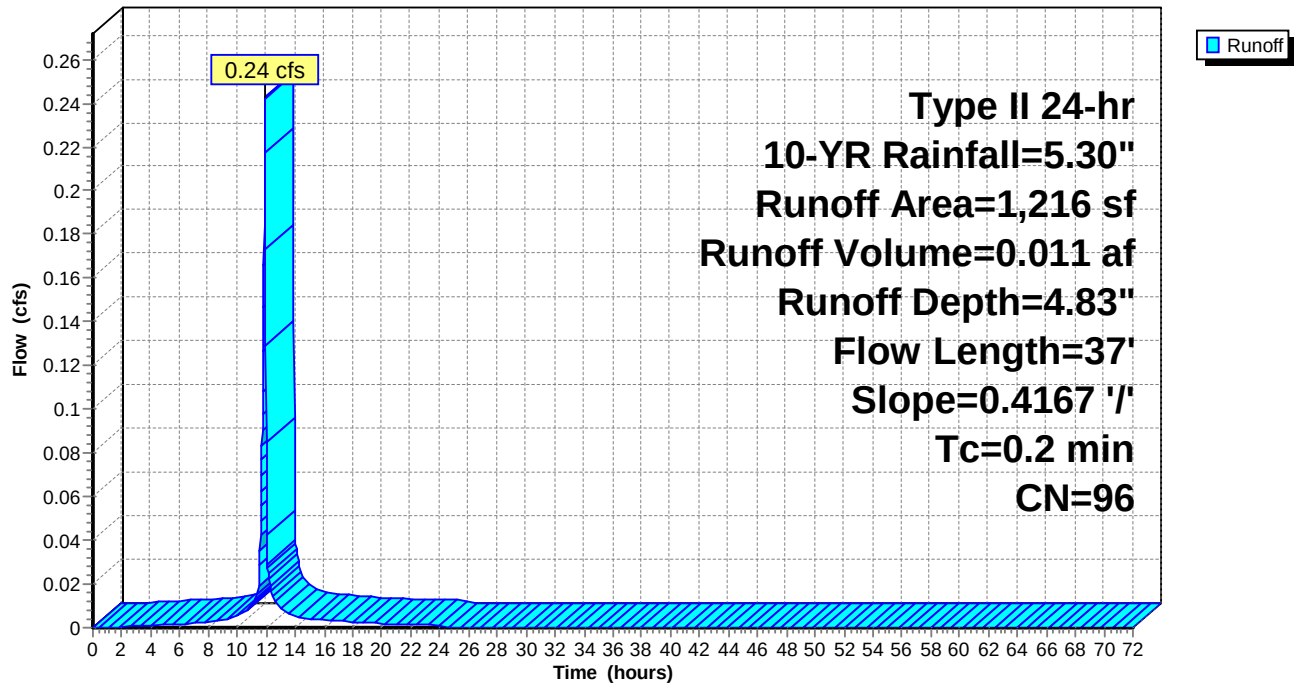
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 31: Rooftop #31

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 32: Rooftop #32

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 4.83"

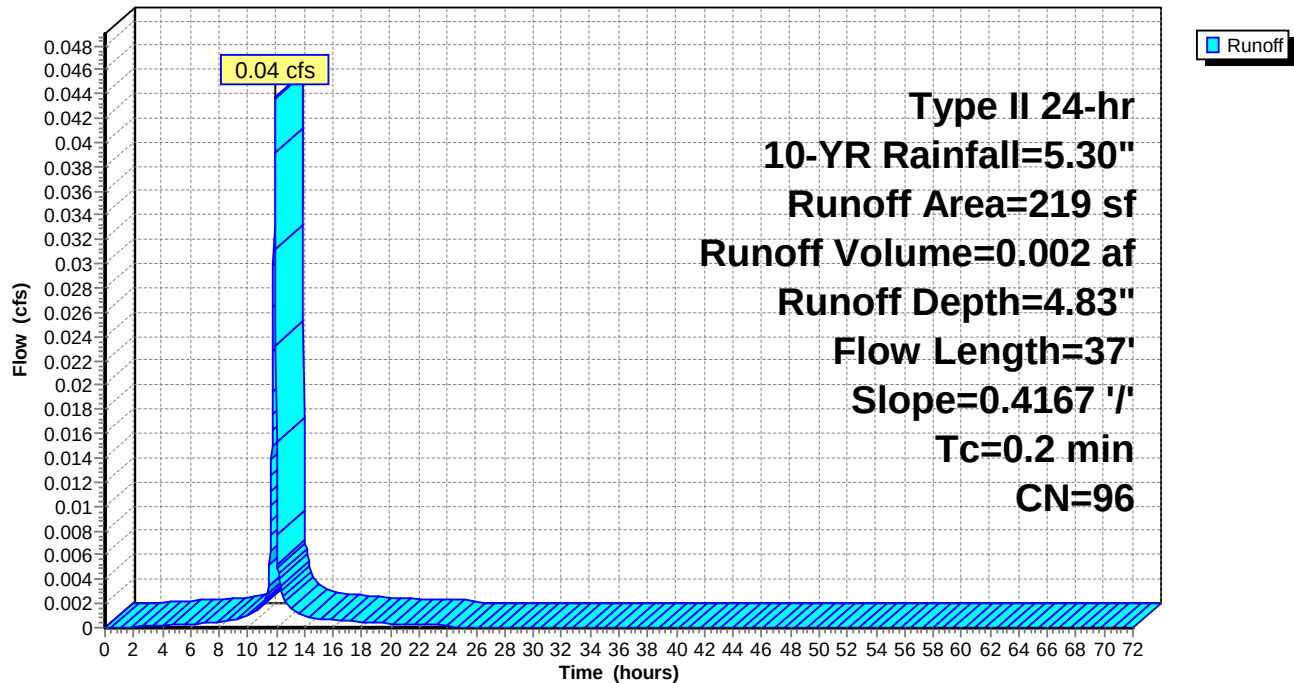
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 32: Rooftop #32

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 33: Rooftop #33

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 4.83"

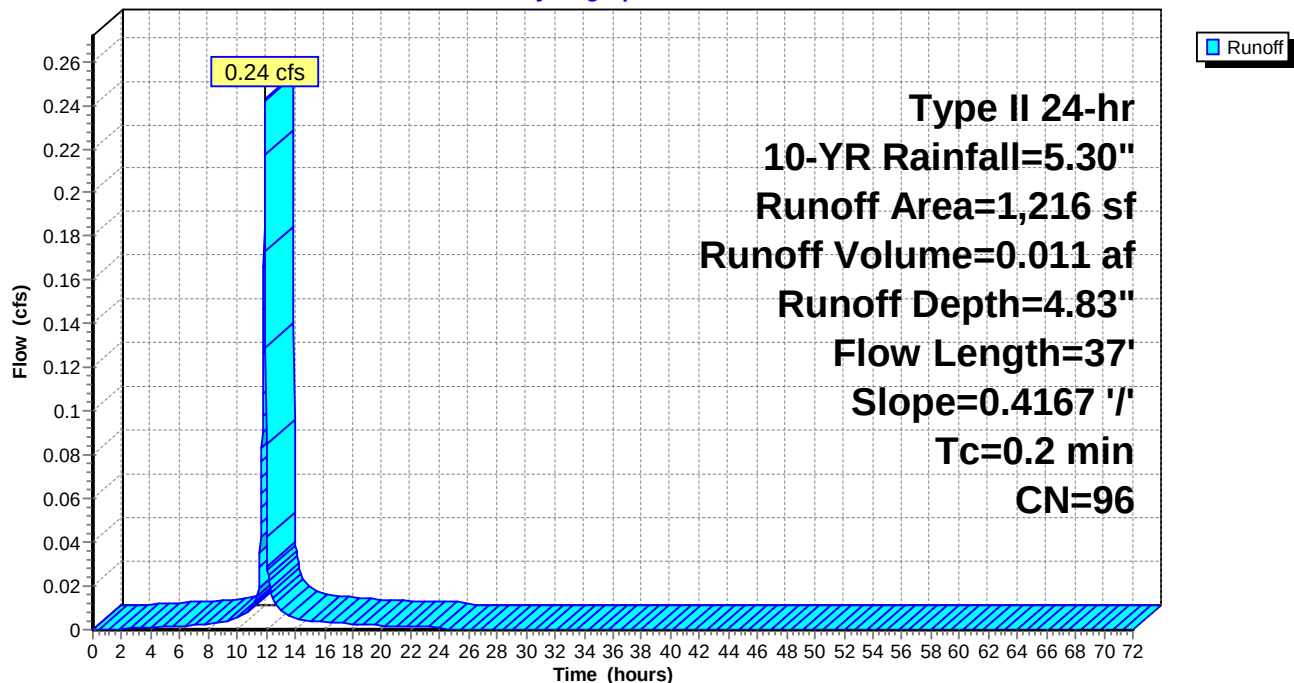
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 33: Rooftop #33

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 34: Rooftop #34

Runoff = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 4.83"

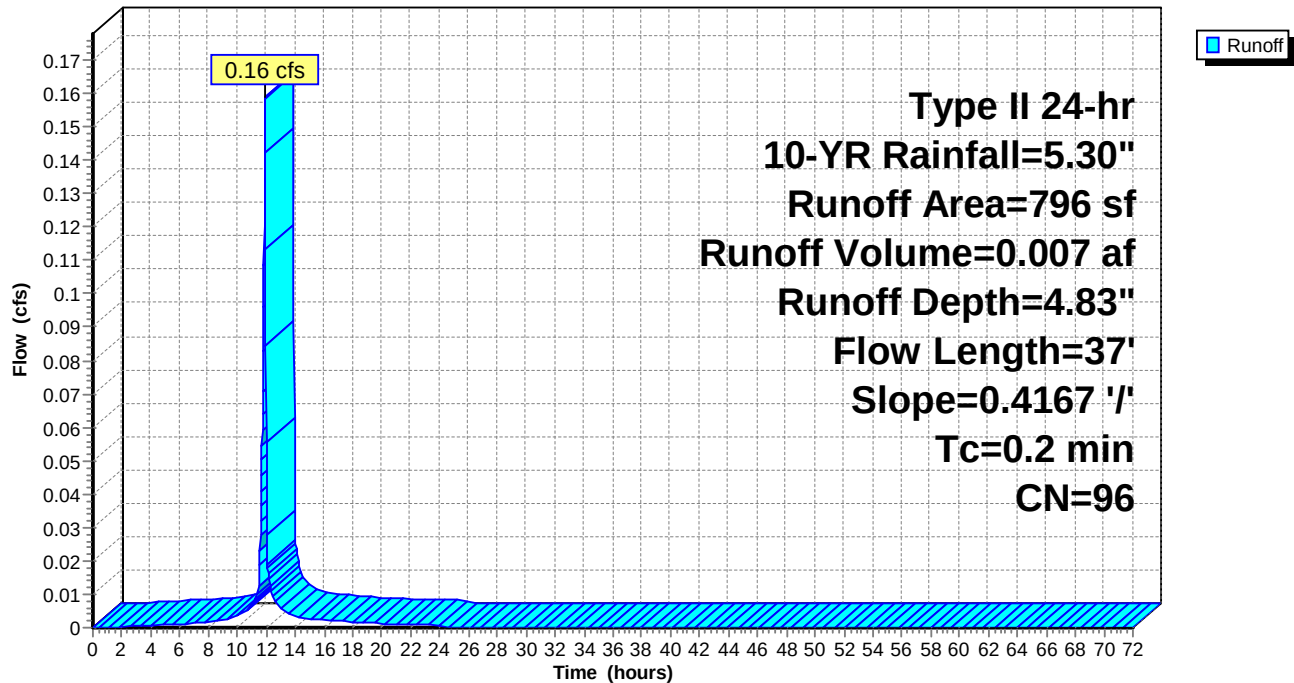
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 34: Rooftop #34

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 35: Rooftop #35

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

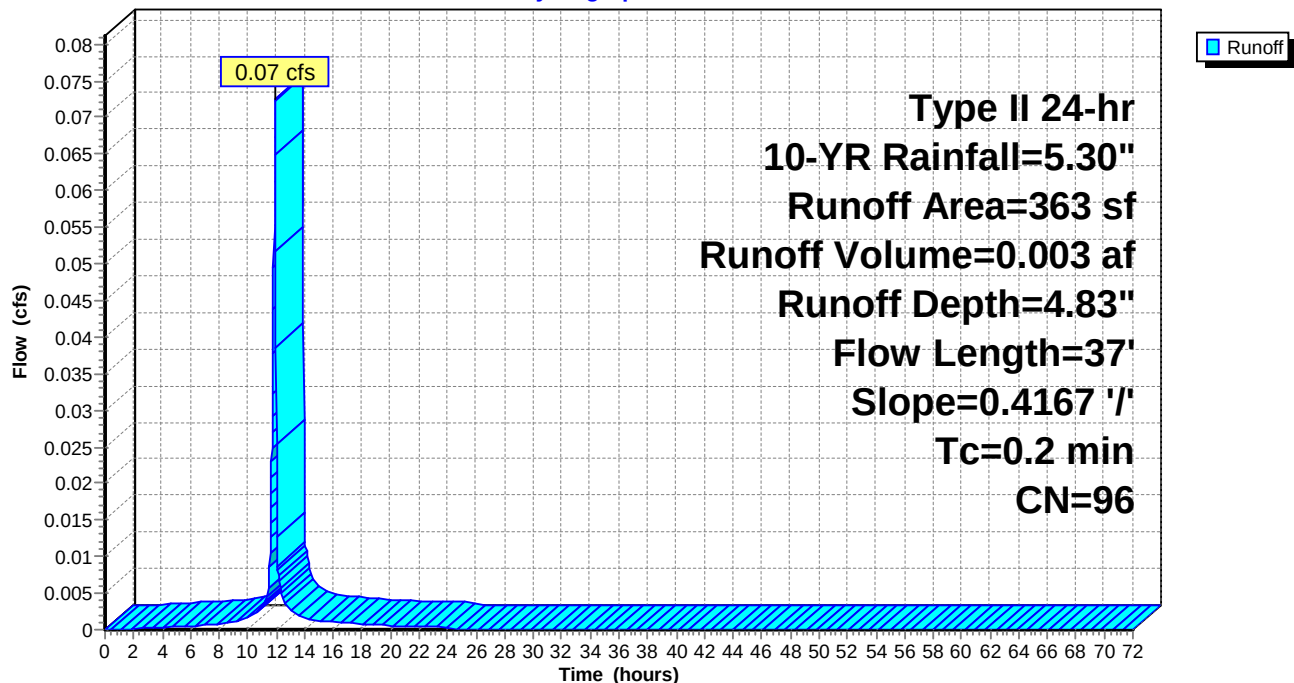
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 35: Rooftop #35

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 36: Rooftop #36

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 4.83"

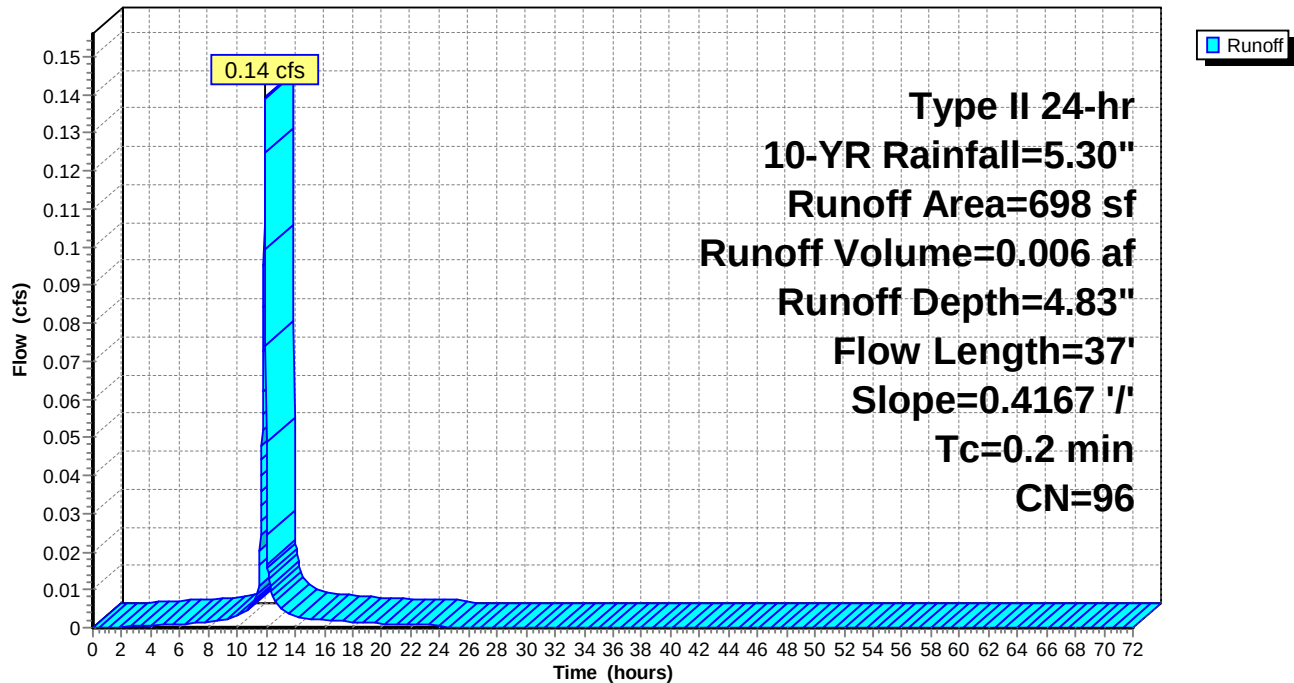
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 36: Rooftop #36

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 37: Rooftop #37

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

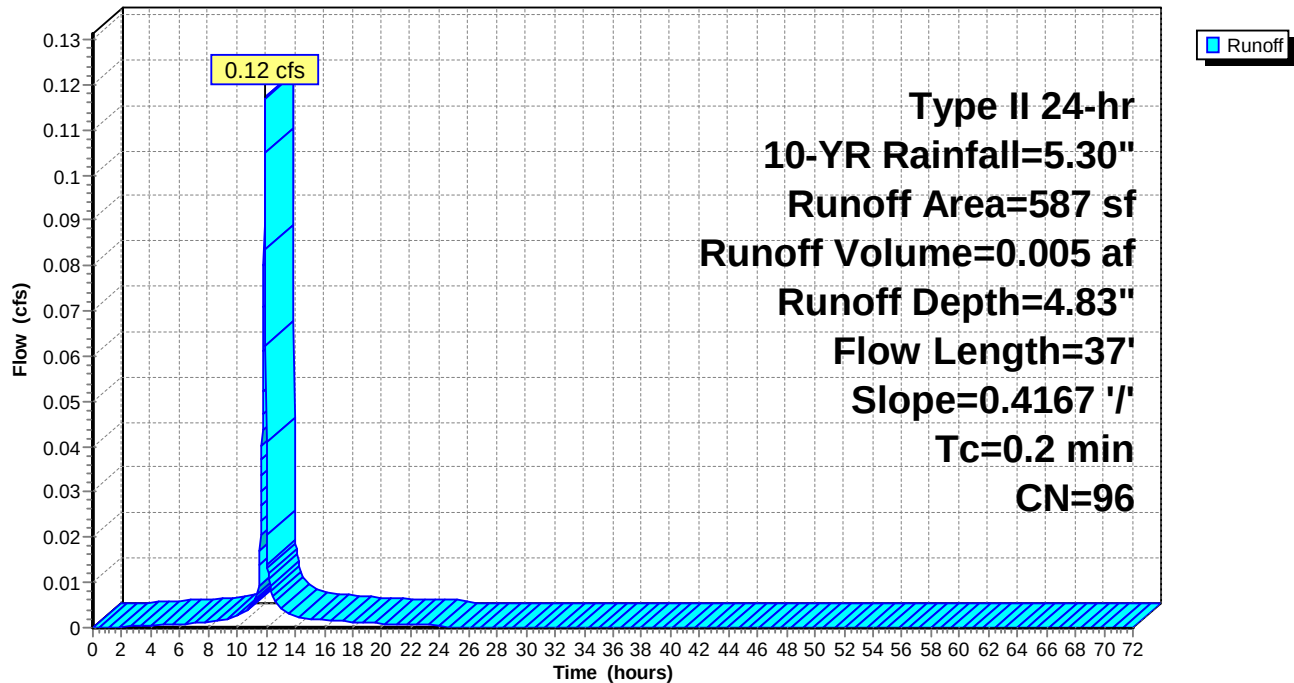
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 37: Rooftop #37

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 38: Rooftop #38

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

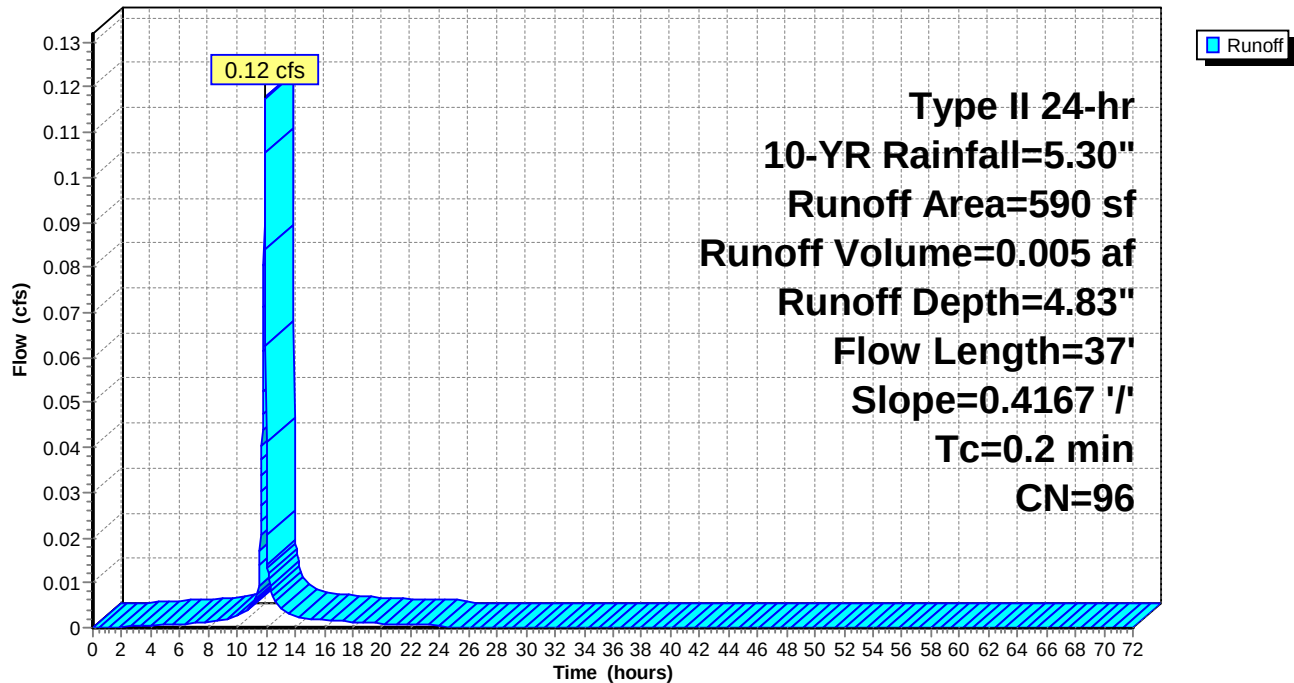
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 38: Rooftop #38

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 39: Rooftop #39

Runoff = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 4.83"

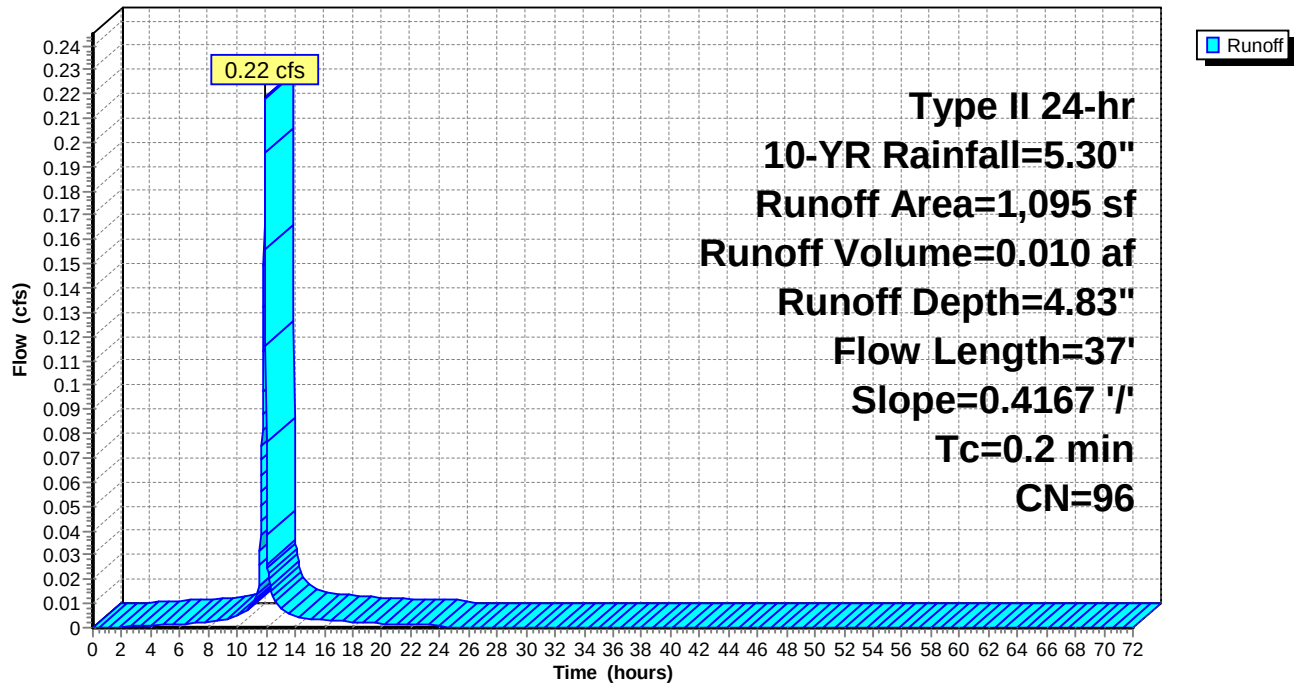
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 39: Rooftop #39

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 40: Rooftop #40

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

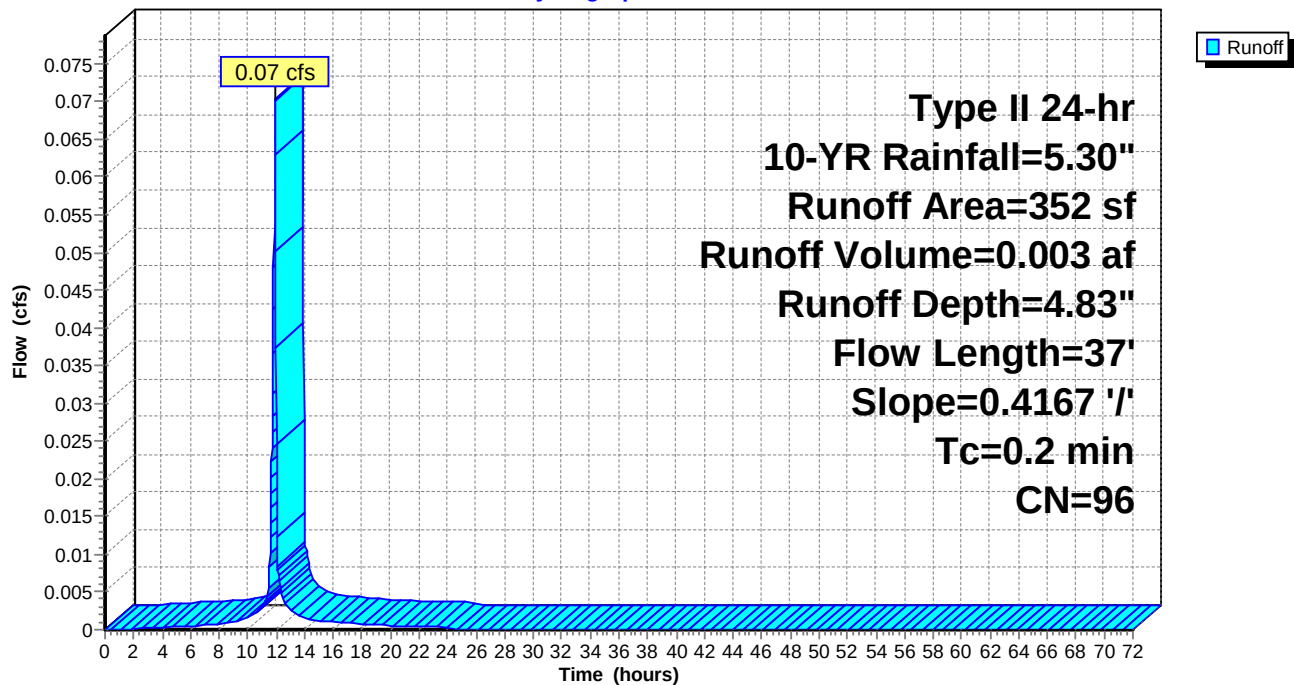
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 40: Rooftop #40

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 41: Rooftop #41

Runoff = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 4.83"

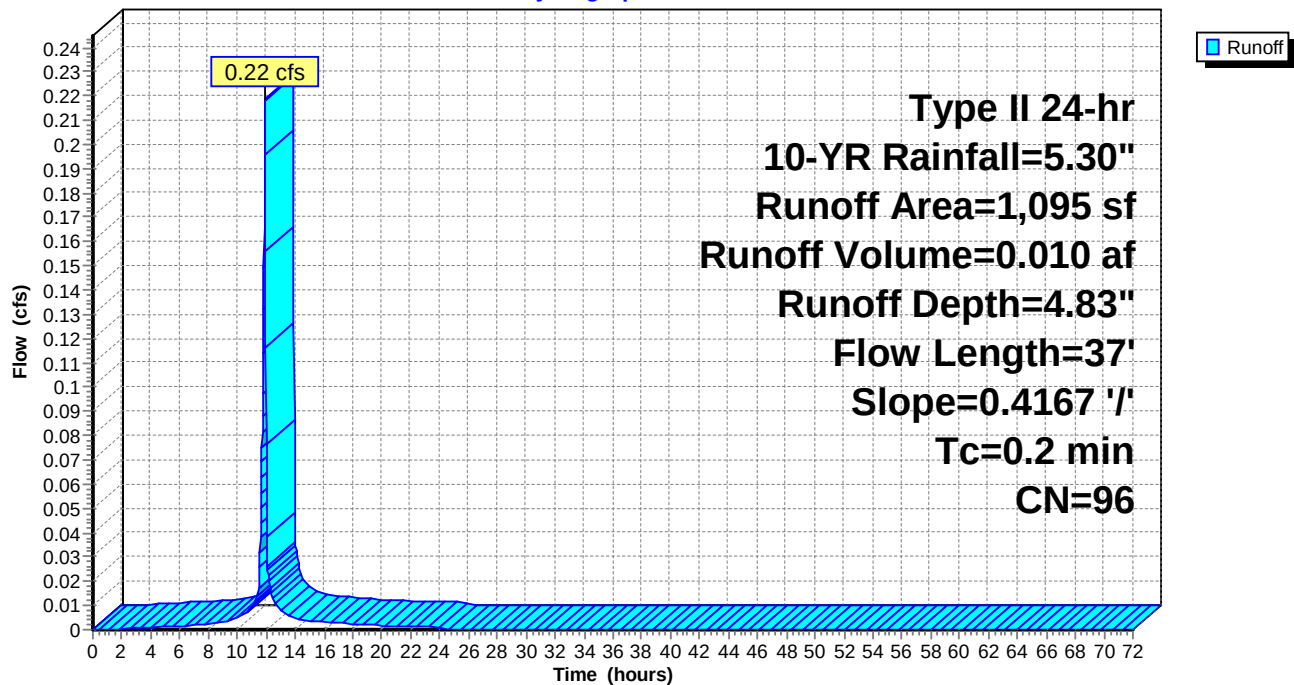
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 41: Rooftop #41

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 42: Rooftop #42

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

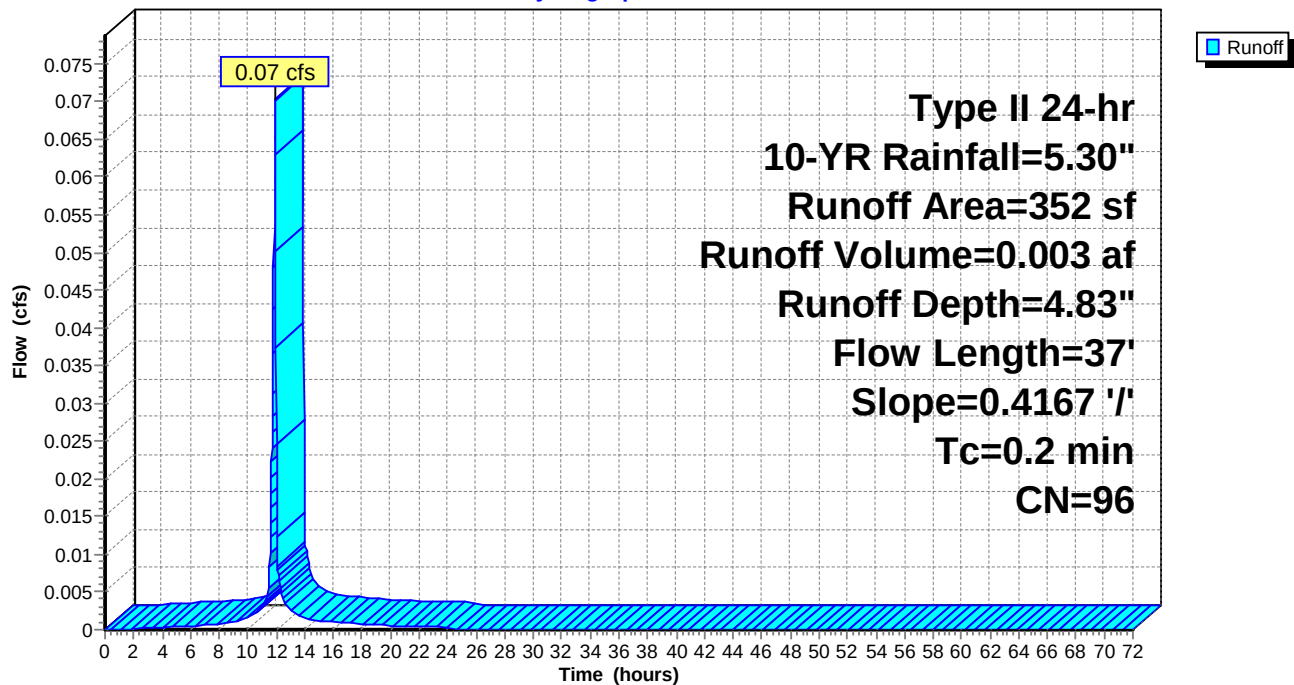
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 42: Rooftop #42

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 43: Rooftop #43

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

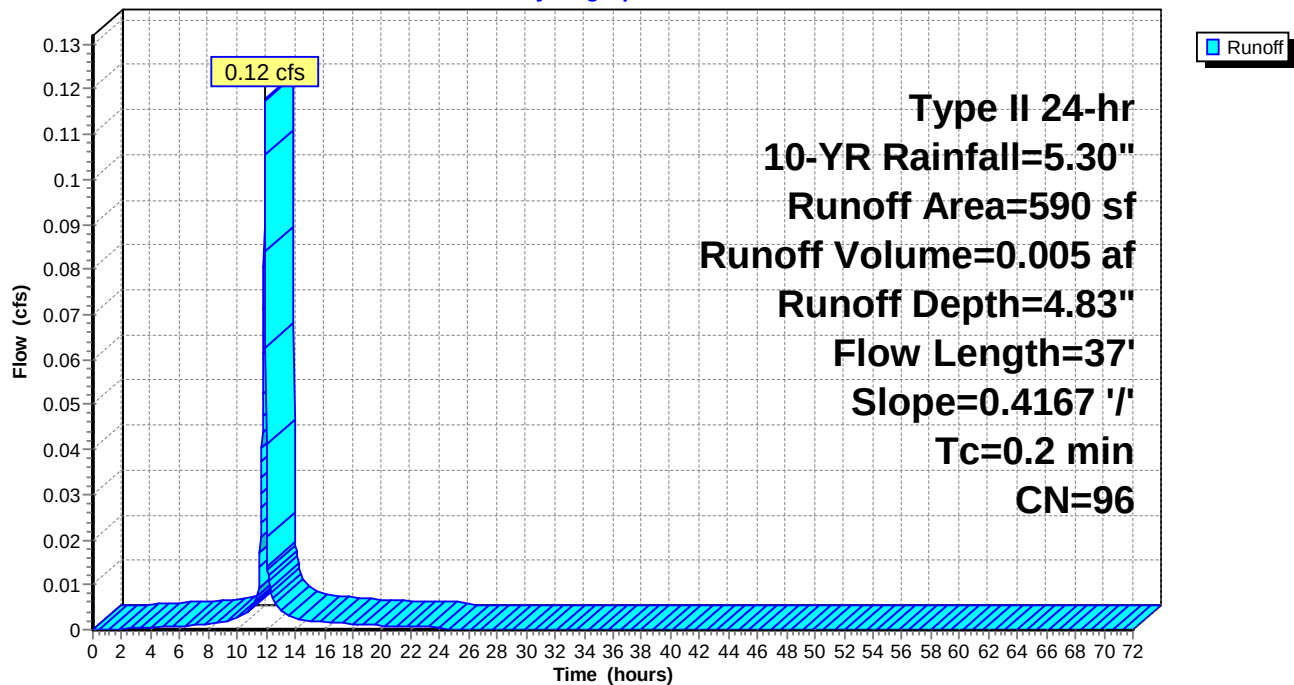
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 43: Rooftop #43

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 44: Rooftop #44

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 4.83"

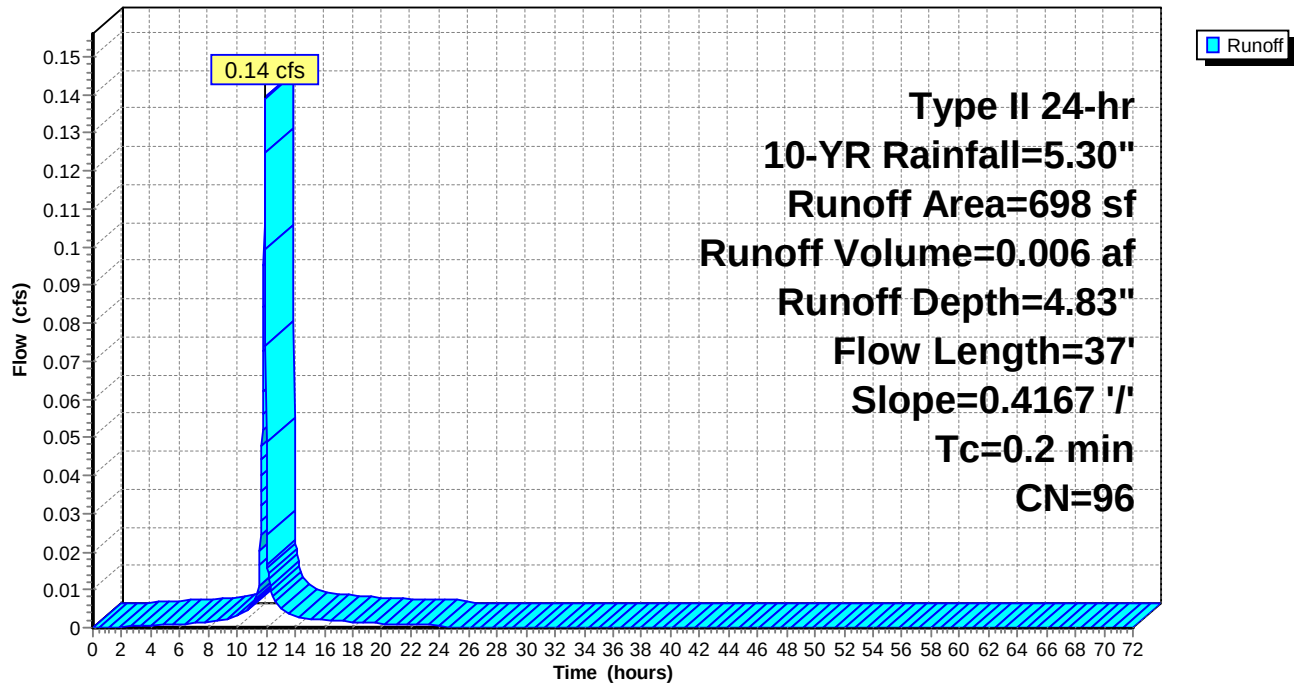
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 44: Rooftop #44

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 45: Rooftop #45

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

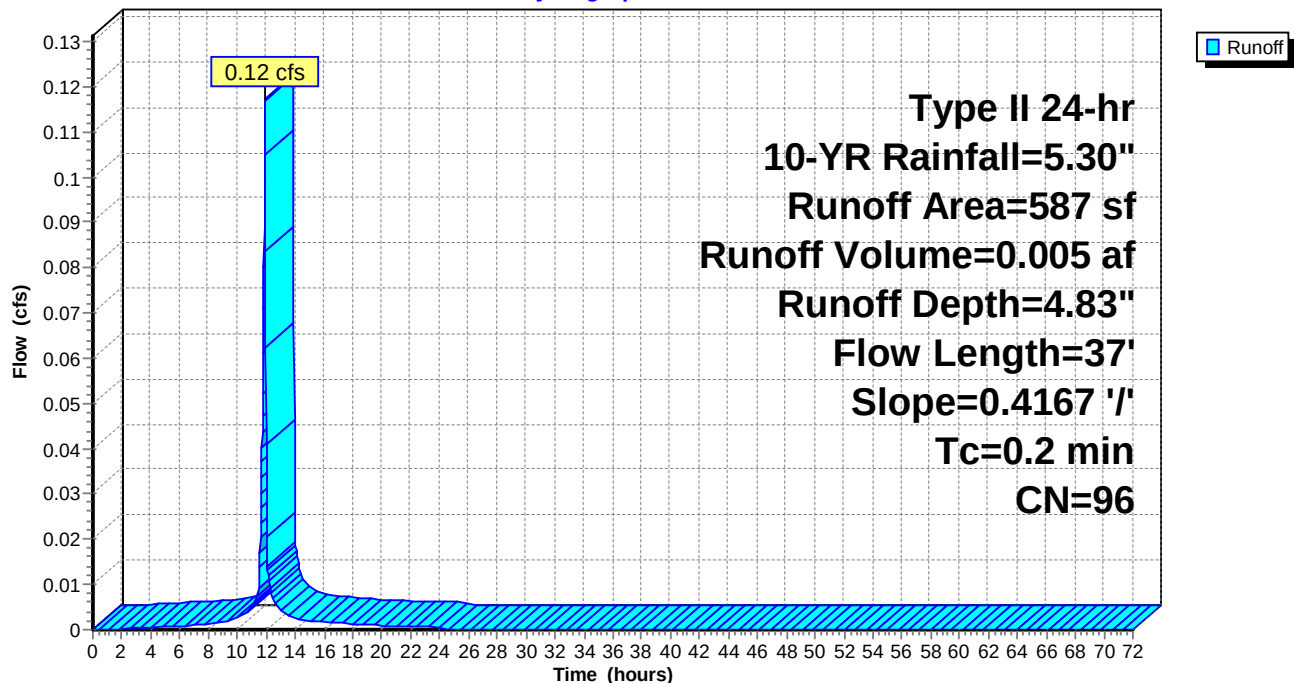
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 45: Rooftop #45

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 46: Rooftop #46

Runoff = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Depth= 4.83"

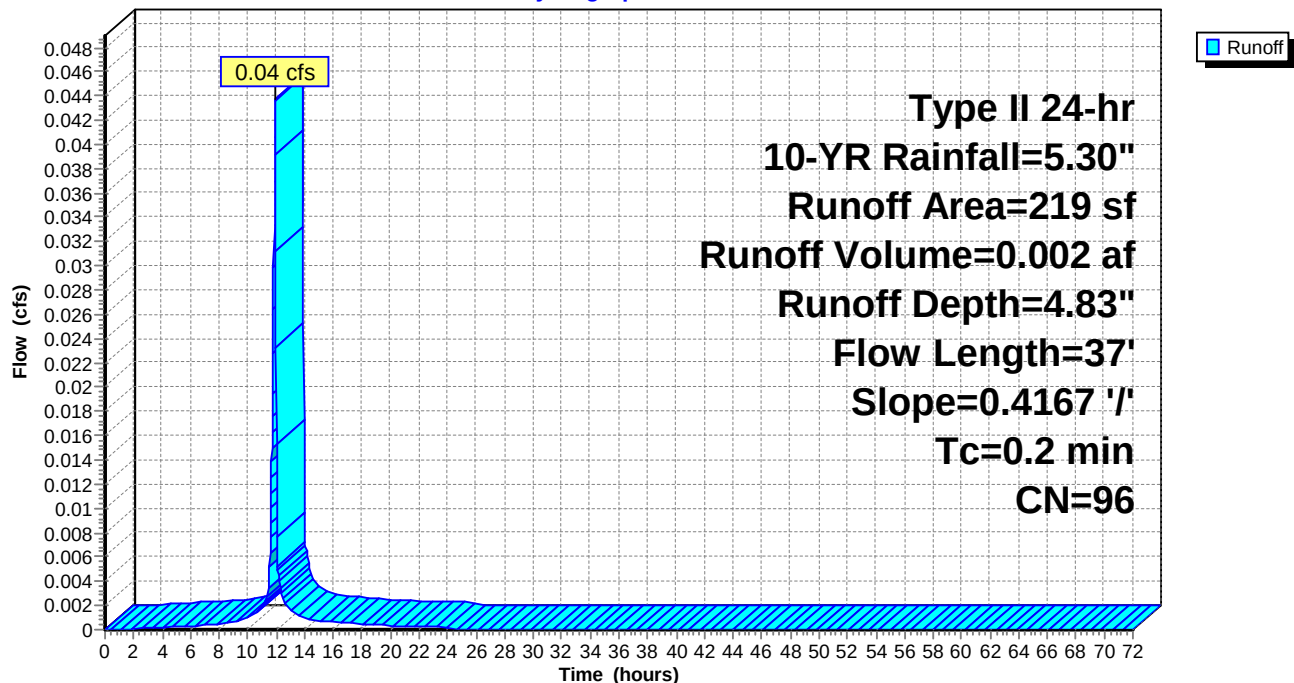
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 46: Rooftop #46

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 47: Rooftop #47

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 4.83"

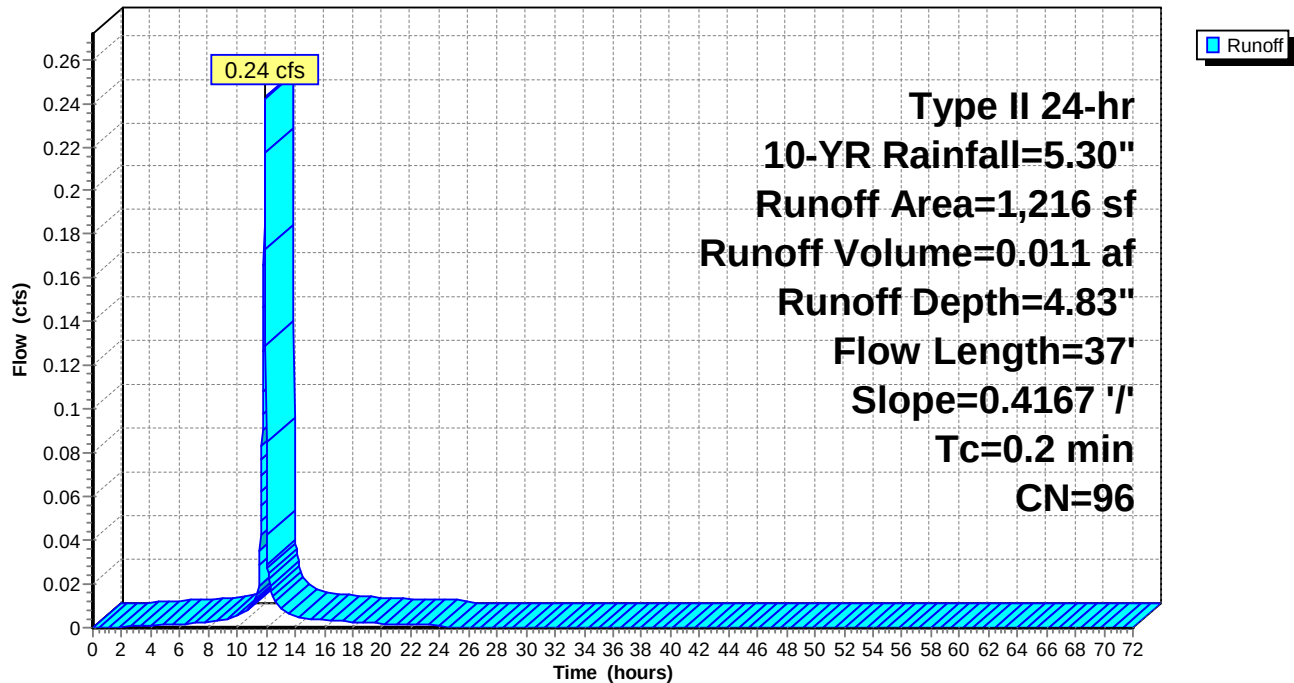
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 47: Rooftop #47

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 48: Rooftop #48

Runoff = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af, Depth= 4.83"

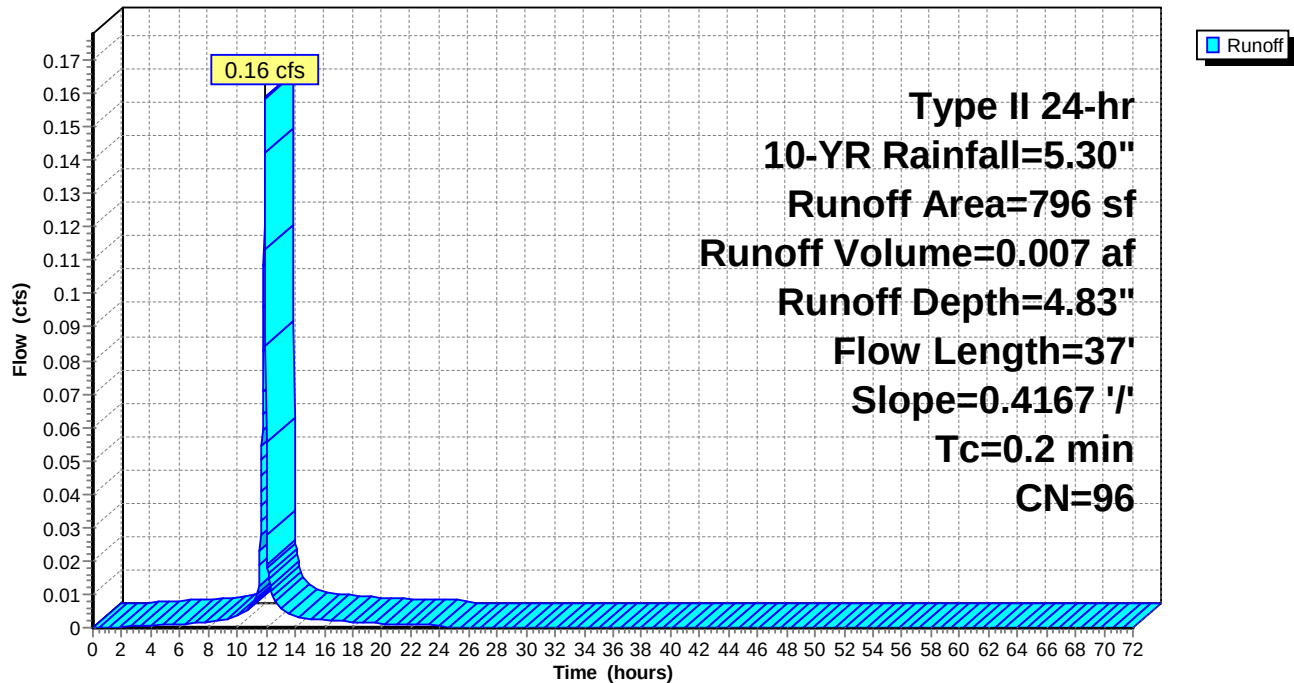
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 48: Rooftop #48

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 49: Rooftop #49

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

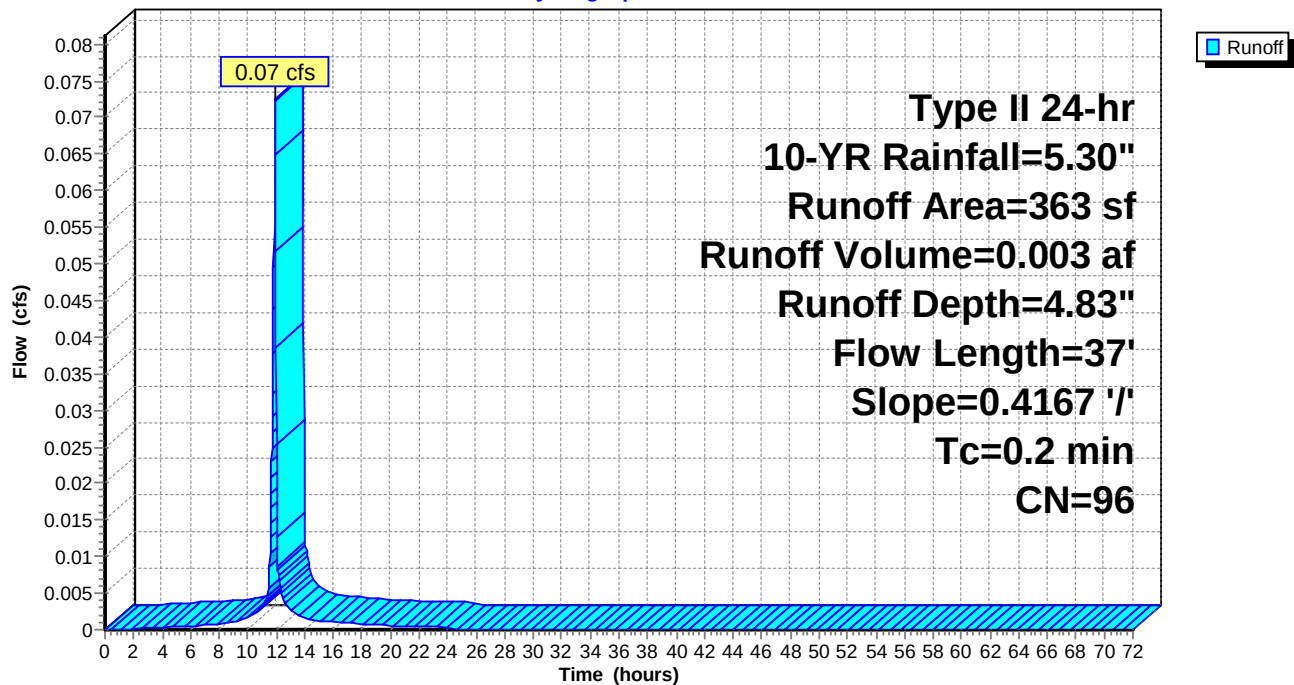
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 49: Rooftop #49

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 50: Rooftop #50

Runoff = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af, Depth= 4.83"

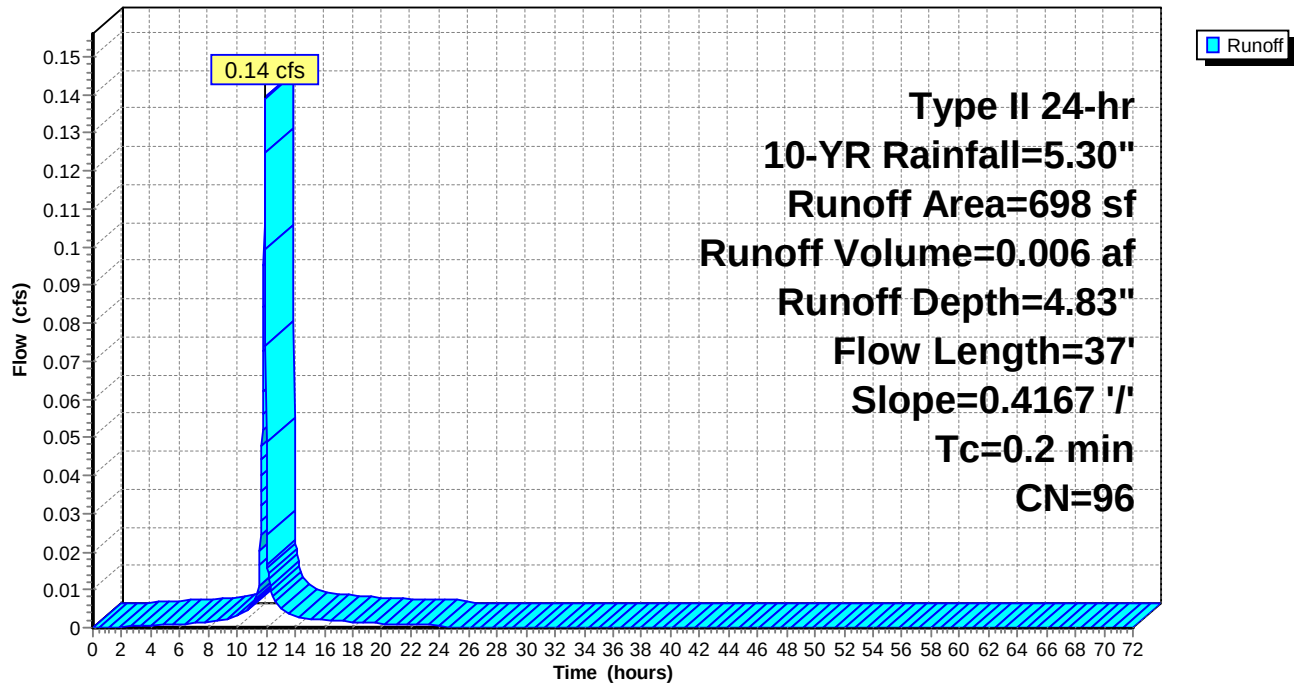
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 50: Rooftop #50

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 51: Rooftop #51

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

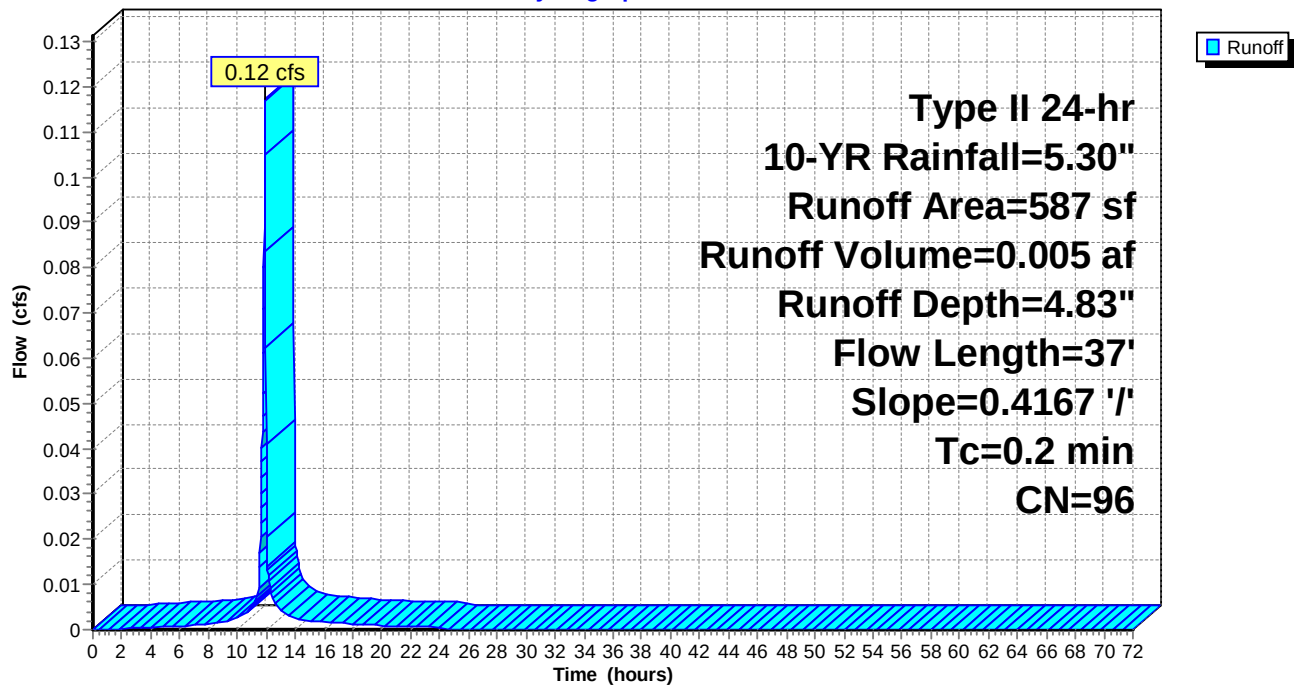
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 51: Rooftop #51

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 52: Rooftop #52

Runoff = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 4.83"

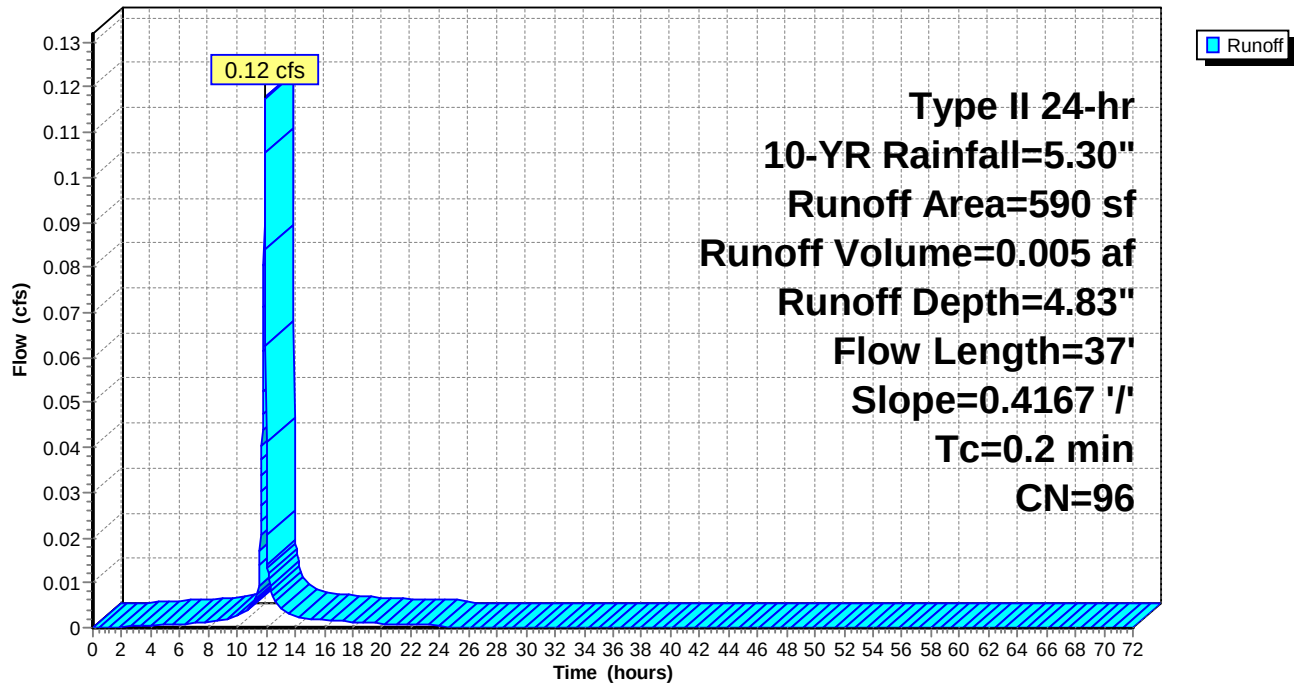
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 52: Rooftop #52

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 53: Rooftop #53

Runoff = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 4.83"

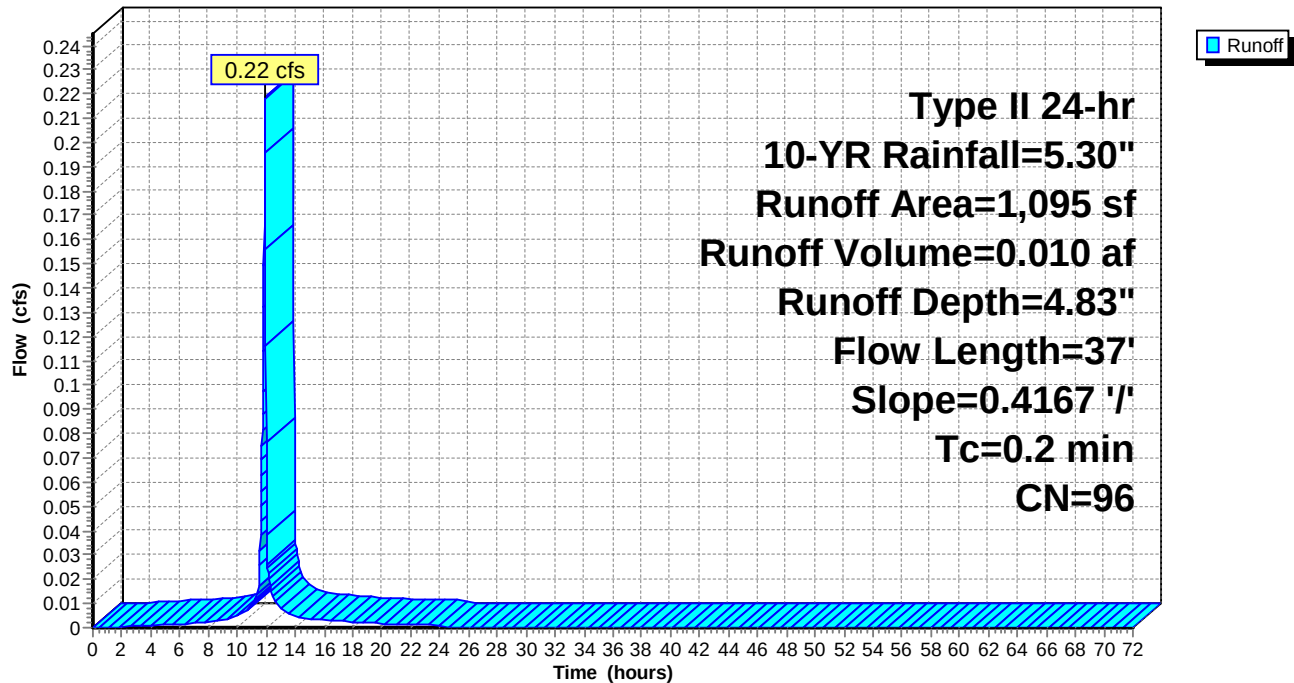
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 53: Rooftop #53

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 54: Rooftop #54

Runoff = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 4.83"

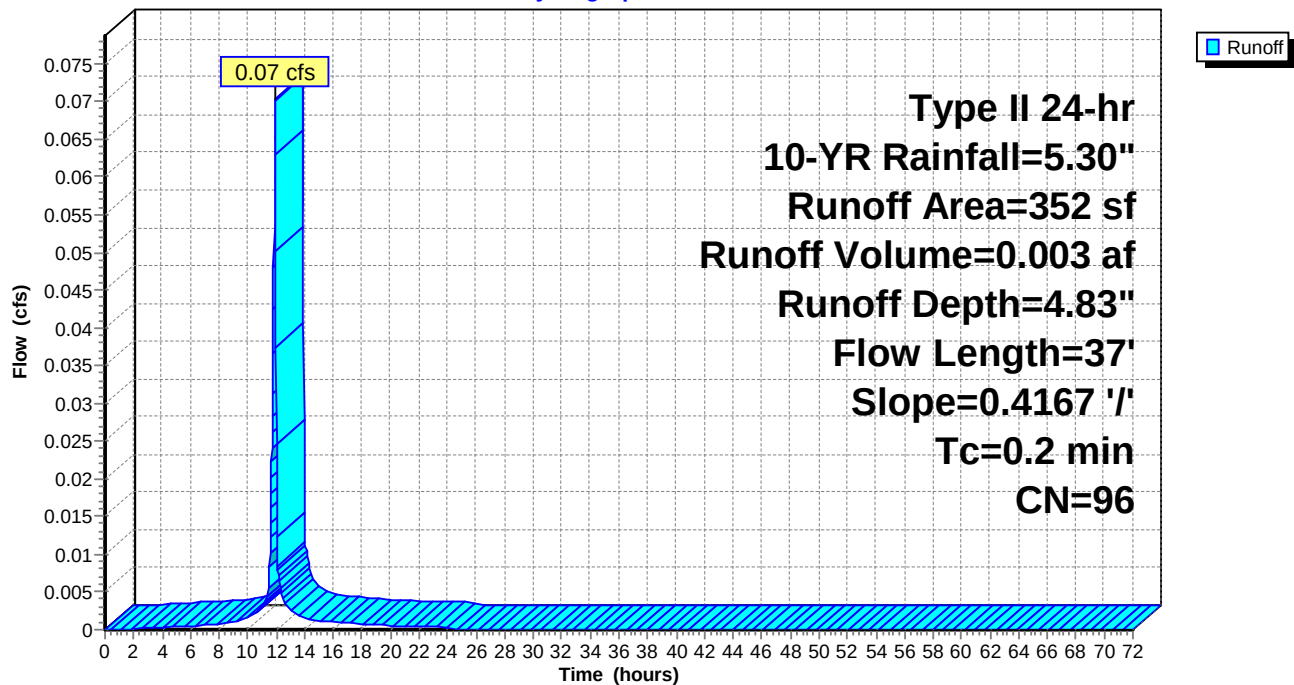
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 54: Rooftop #54

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 55: Non-RT DA to PA-2

Runoff = 0.39 cfs @ 11.99 hrs, Volume= 0.025 af, Depth= 4.38"

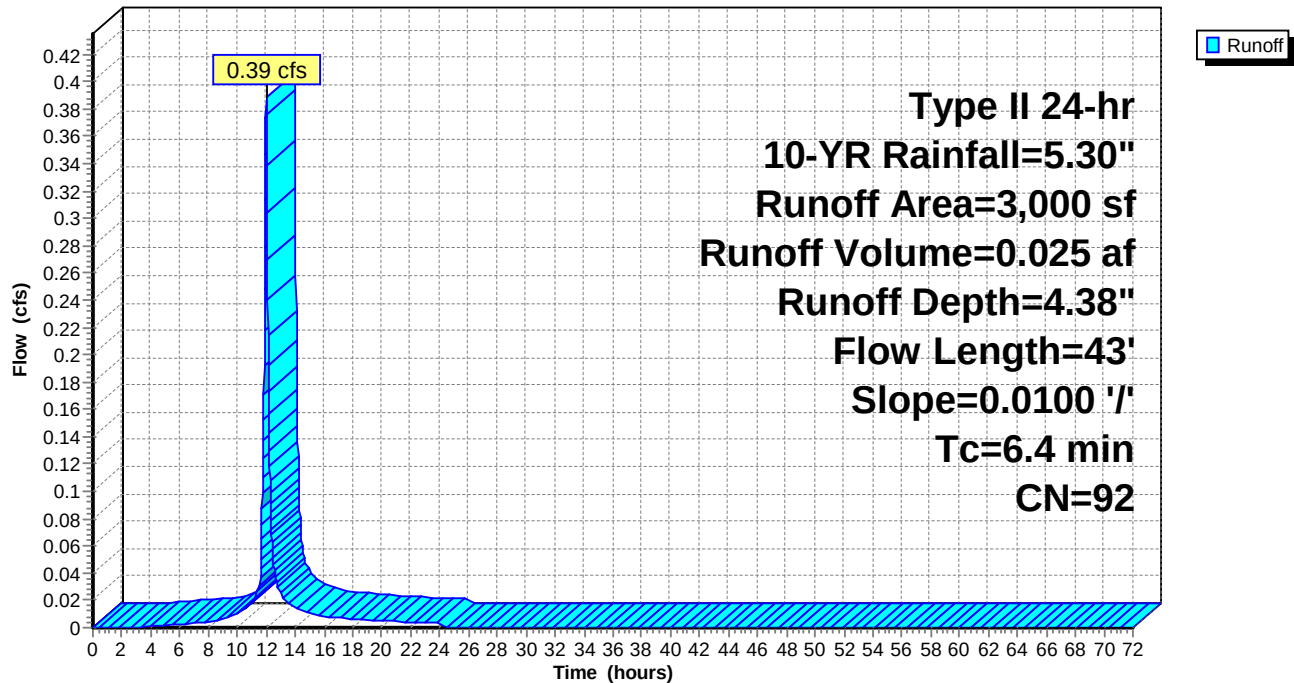
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
733	74	>75% Grass cover, Good, HSG C
* 2,267	98	Impervious
3,000	92	Weighted Average
733		24.43% Pervious Area
2,267		75.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	43	0.0100	0.11		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 55: Non-RT DA to PA-2

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 56: Non-RT DA to PA-3

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.032 af, Depth= 3.85"

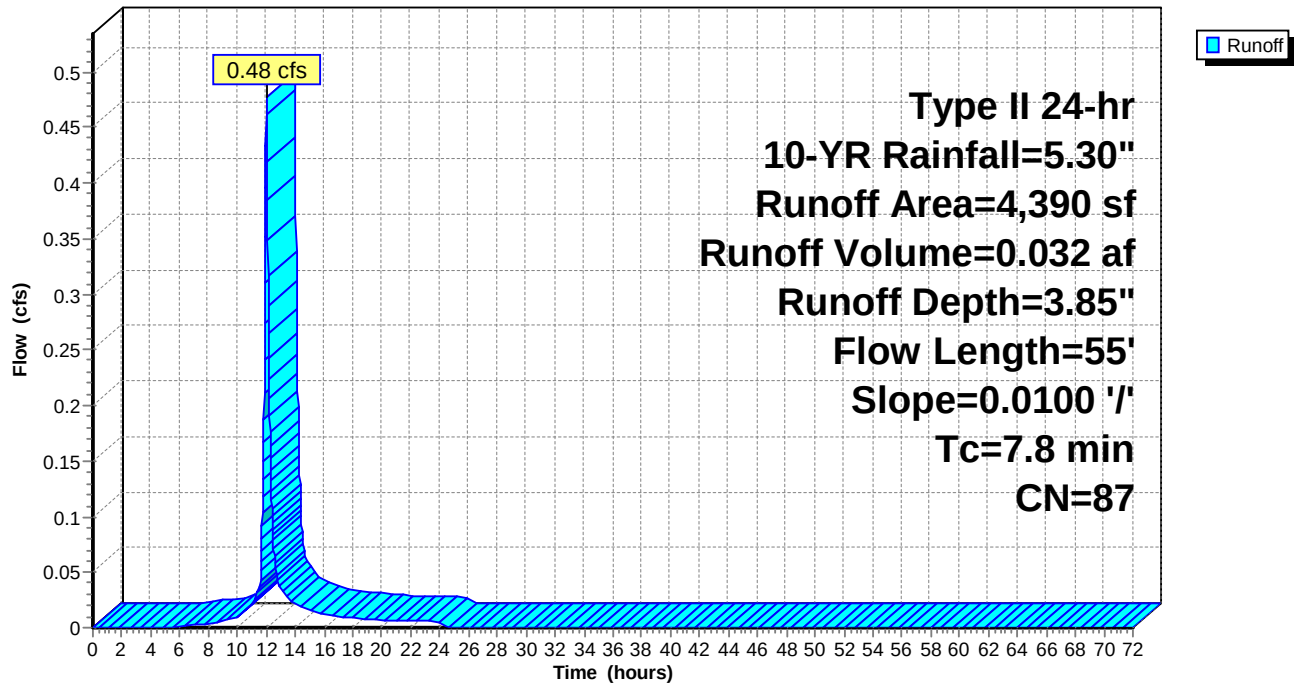
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,989	74	>75% Grass cover, Good, HSG C
2,401	98	Paved parking, HSG C
4,390	87	Weighted Average
1,989		45.31% Pervious Area
2,401		54.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	55	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 56: Non-RT DA to PA-3

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 57: Non-RT DA to PA-4

Runoff = 0.48 cfs @ 12.01 hrs, Volume= 0.034 af, Depth= 3.95"

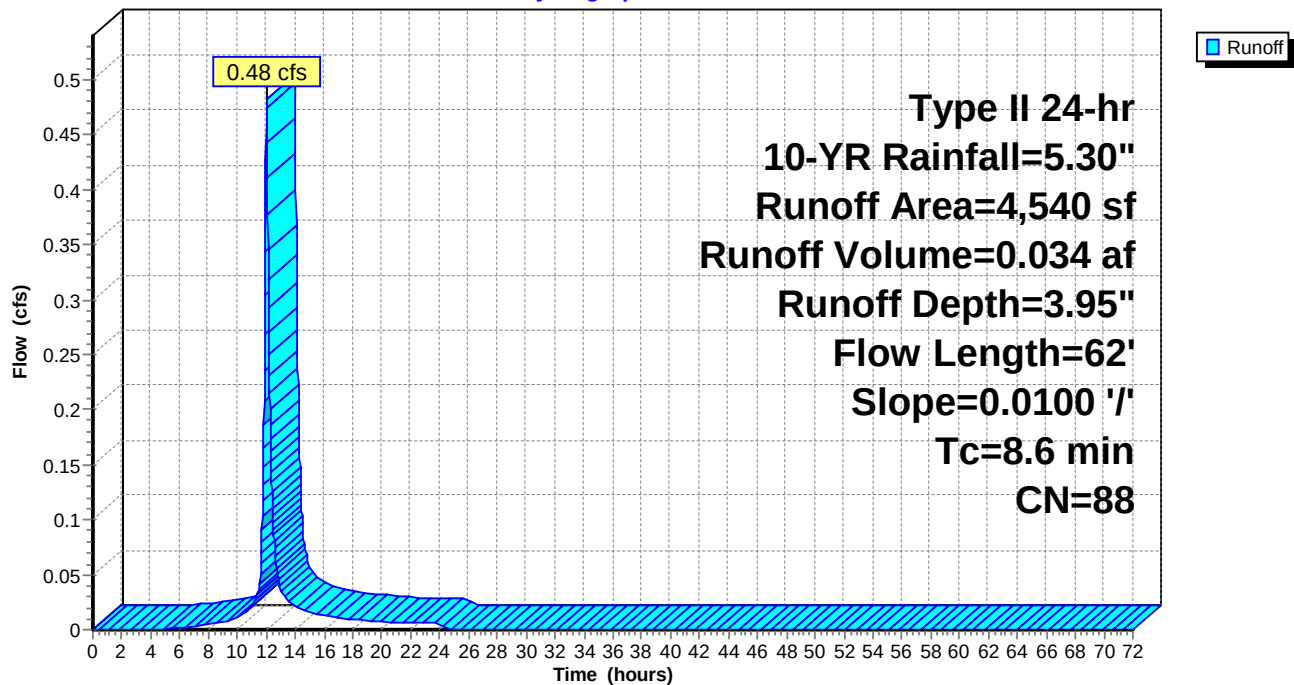
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,939	74	>75% Grass cover, Good, HSG C
2,601	98	Paved parking, HSG C
4,540	88	Weighted Average
1,939		42.71% Pervious Area
2,601		57.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	62	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 57: Non-RT DA to PA-4

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 58: Non-RT DA to PA-5

Runoff = 0.77 cfs @ 12.00 hrs, Volume= 0.053 af, Depth= 4.38"

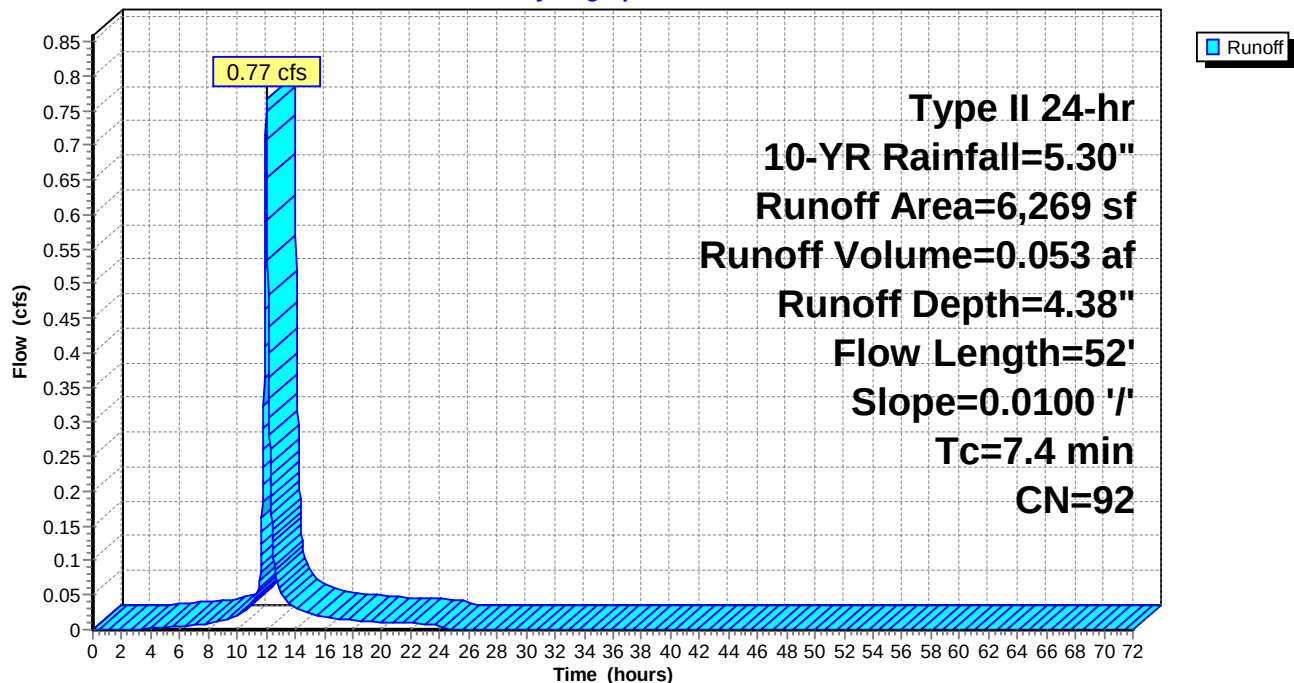
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
1,645	74	>75% Grass cover, Good, HSG C
4,624	98	Paved parking, HSG C
6,269	92	Weighted Average
1,645		26.24% Pervious Area
4,624		73.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	52	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 58: Non-RT DA to PA-5

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 59: Non-RT DA to PA-6

Runoff = 1.03 cfs @ 12.00 hrs, Volume= 0.070 af, Depth= 4.38"

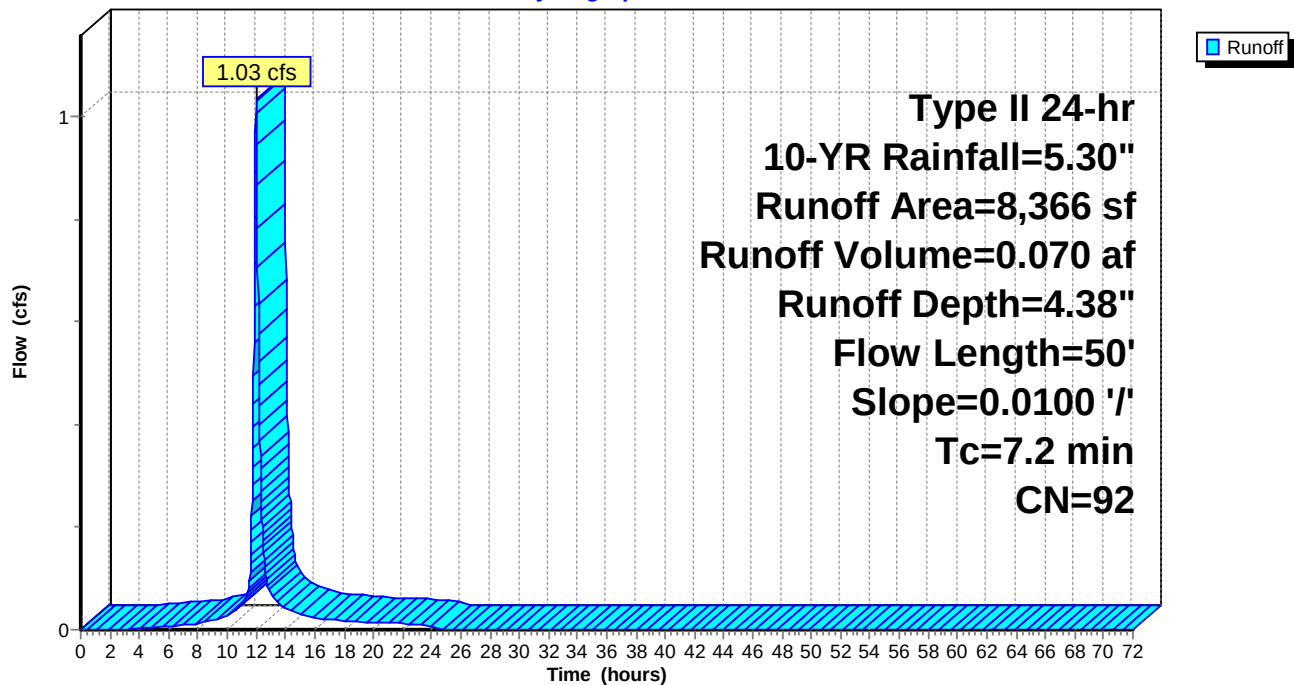
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
2,213	74	>75% Grass cover, Good, HSG C
6,153	98	Paved parking, HSG C
8,366	92	Weighted Average
2,213		26.45% Pervious Area
6,153		73.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 59: Non-RT DA to PA-6

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 60: Non-RT DA to PA-7

Runoff = 0.14 cfs @ 11.99 hrs, Volume= 0.009 af, Depth= 4.27"

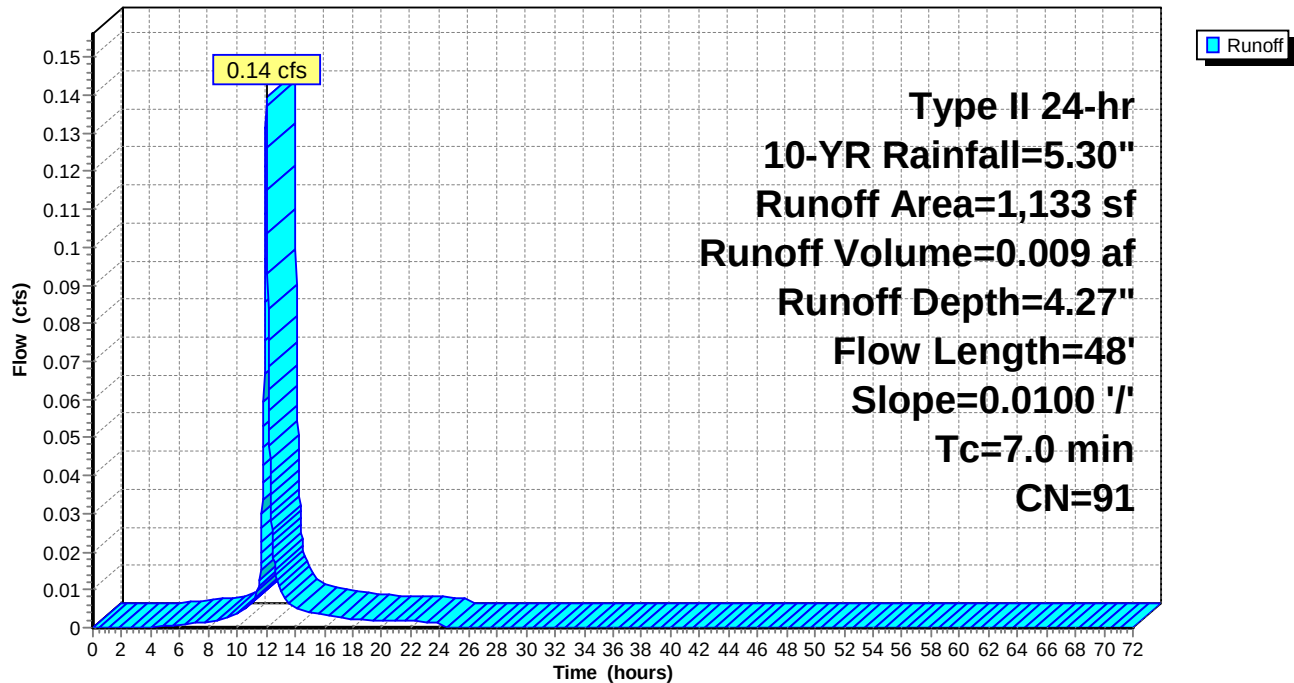
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
330	74	>75% Grass cover, Good, HSG C
803	98	Paved parking, HSG C
1,133	91	Weighted Average
330		29.13% Pervious Area
803		70.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	48	0.0100	0.11		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 60: Non-RT DA to PA-7

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Subcatchment 61: West DA to Jowite

Runoff = 0.79 cfs @ 12.08 hrs, Volume= 0.072 af, Depth= 2.61"

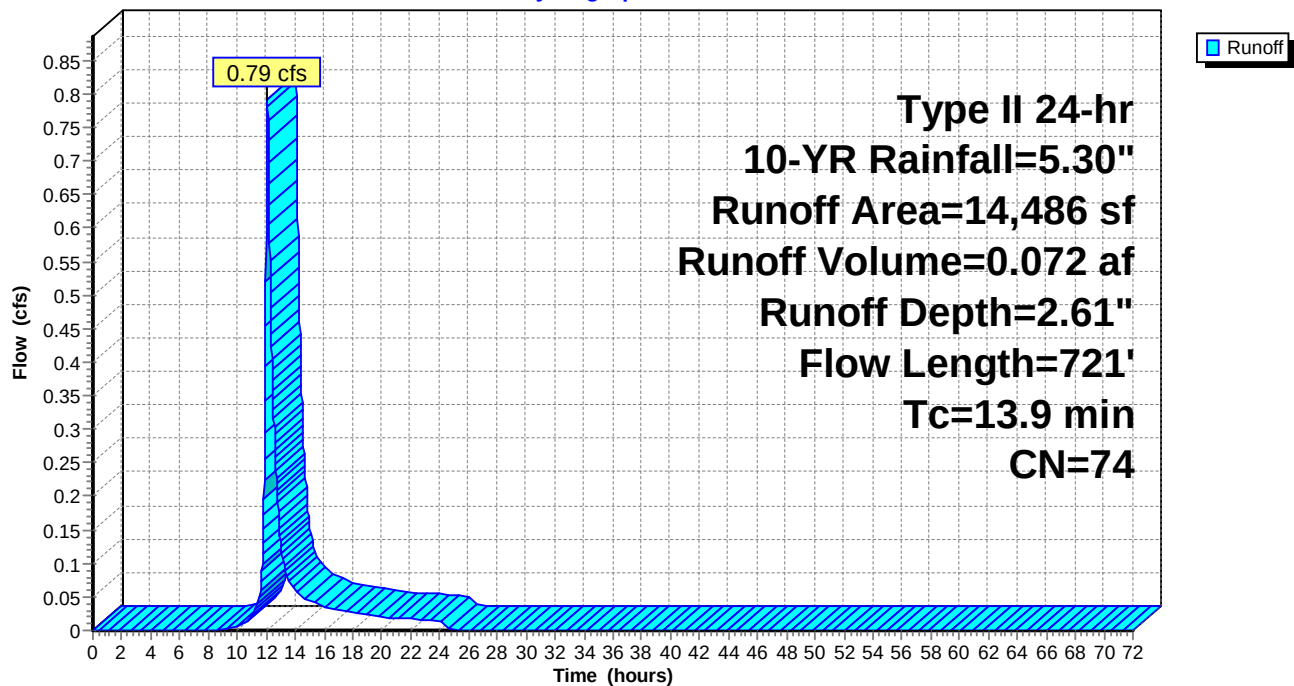
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-YR Rainfall=5.30"

Area (sf)	CN	Description
14,486	74	>75% Grass cover, Good, HSG C
14,486		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	55	0.0100	0.12		Sheet Flow, Sideyard Grass: Short n= 0.150 P2= 3.40"
5.6	496	0.0053	1.48		Shallow Concentrated Flow, Gutter Pan Paved Kv= 20.3 fps
0.5	170	0.0087	5.80	7.12	Pipe Channel, Pipe from CI on West Side of Jowite to SDMH-20201 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
13.9	721	Total			

Subcatchment 61: West DA to Jowite

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Reach VG-2: Valley Gutter 2

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

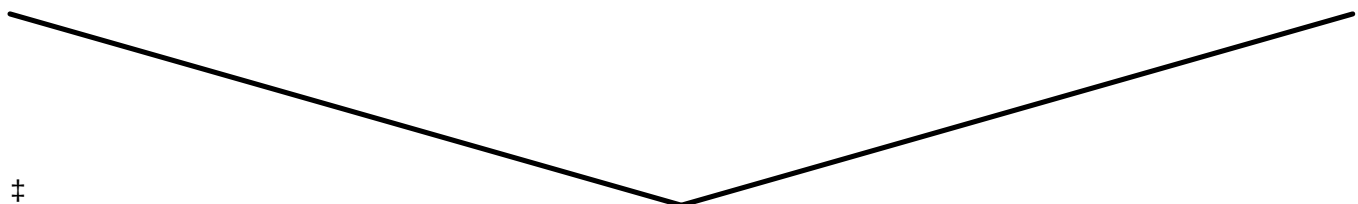
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.14 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 '/' Top Width= 2.88'

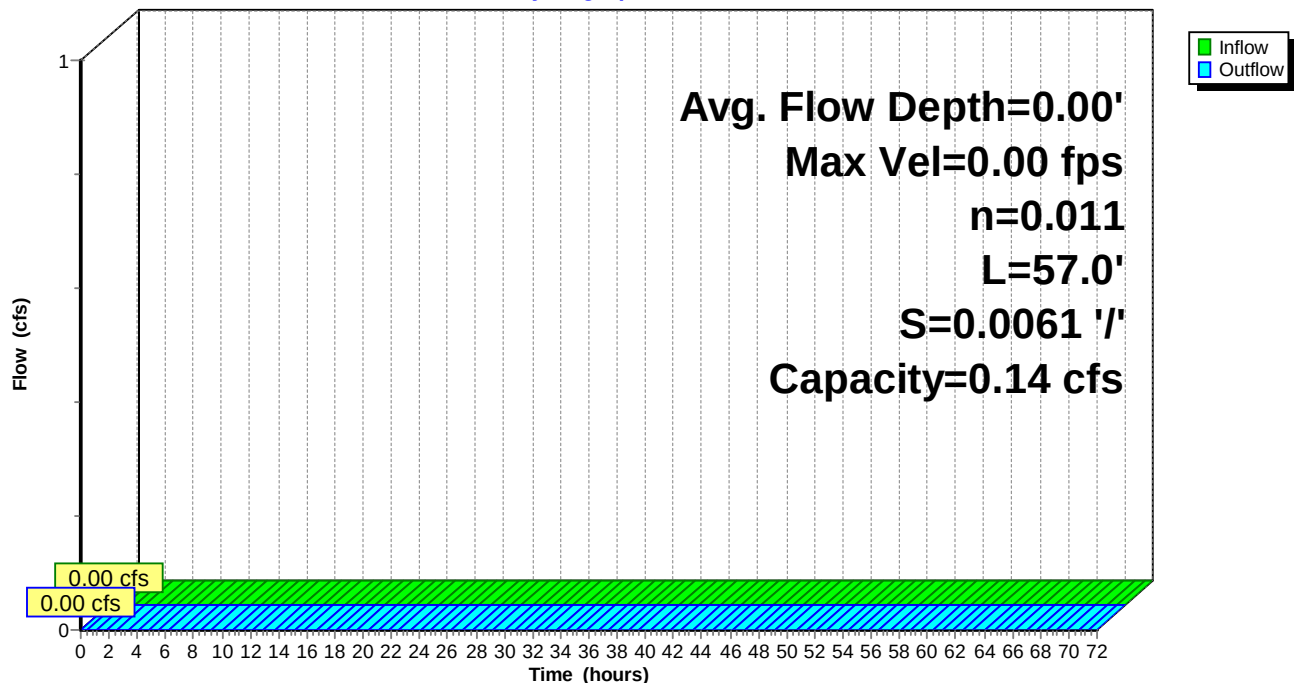
Length= 57.0' Slope= 0.0061 '/'

Inlet Invert= 15.10', Outlet Invert= 14.75'



Reach VG-2: Valley Gutter 2

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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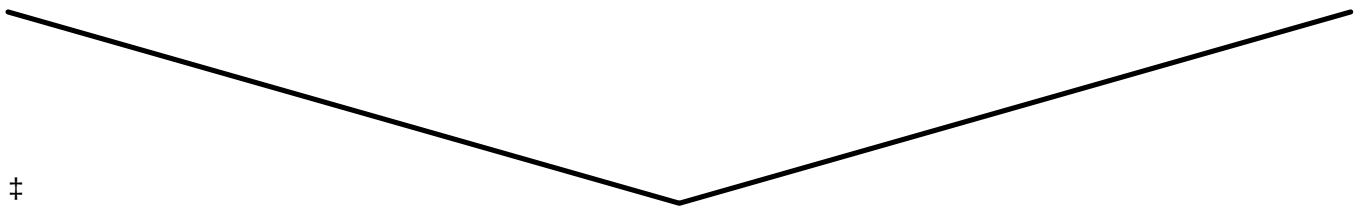
Summary for Reach VG-3: Valley Gutter 3

Inflow = 0.00 cfs @ 12.38 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 12.53 hrs, Volume= 0.000 af, Atten= 33%, Lag= 8.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

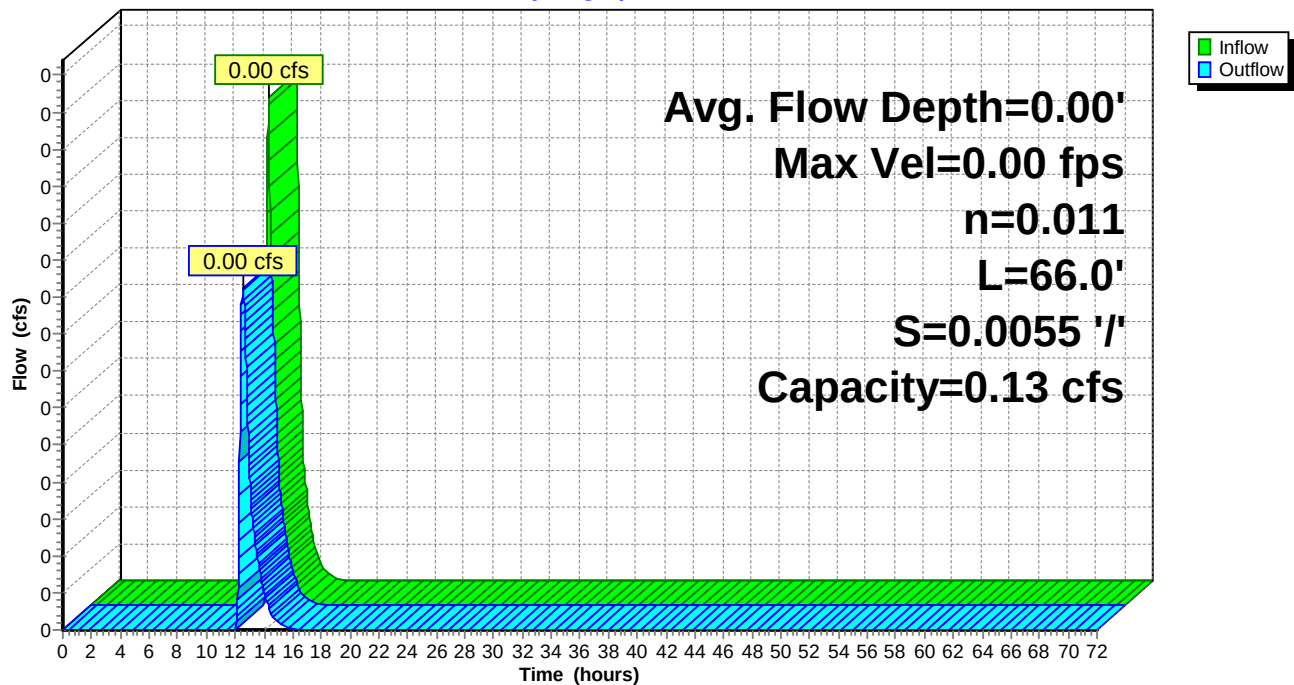
Peak Storage= 0 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.13 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean
Side Slope Z-value= 18.0 '/' Top Width= 2.88'
Length= 66.0' Slope= 0.0055 '/'
Inlet Invert= 15.11', Outlet Invert= 14.75'



Reach VG-3: Valley Gutter 3

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Reach VG-4: Valley Gutter 4

Inflow = 0.00 cfs @ 12.18 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 12.38 hrs, Volume= 0.000 af, Atten= 67%, Lag= 12.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.38 hrs

Average Depth at Peak Storage= 0.00'

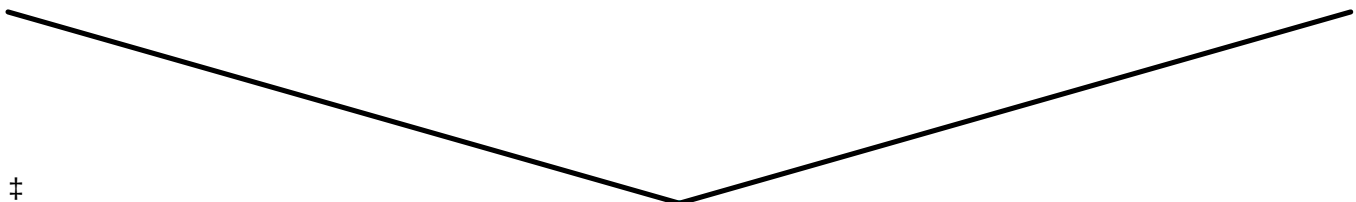
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.14 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 ' Top Width= 2.88'

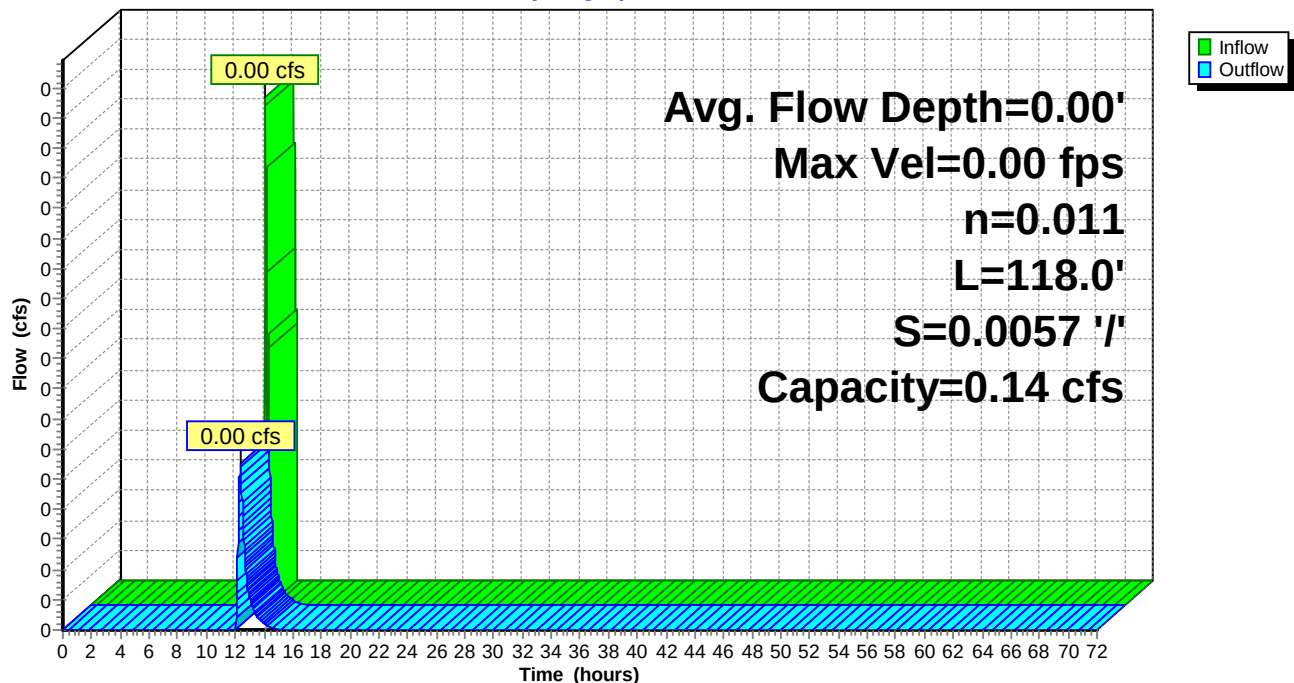
Length= 118.0' Slope= 0.0057 ' / '

Inlet Invert= 15.78', Outlet Invert= 15.11'



Reach VG-4: Valley Gutter 4

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Reach VG-5: Valley Gutter 5

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

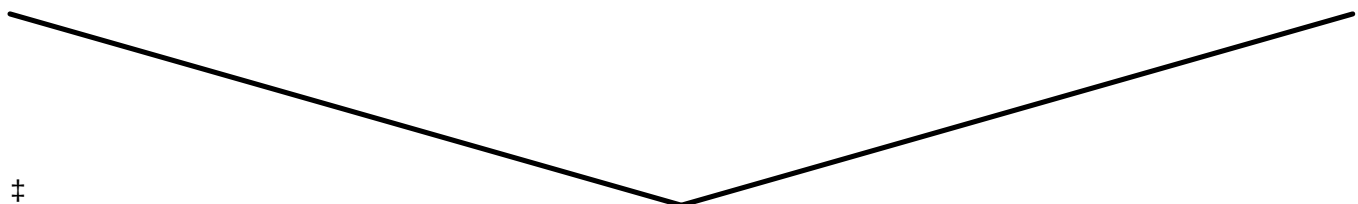
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.18 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 '/' Top Width= 2.88'

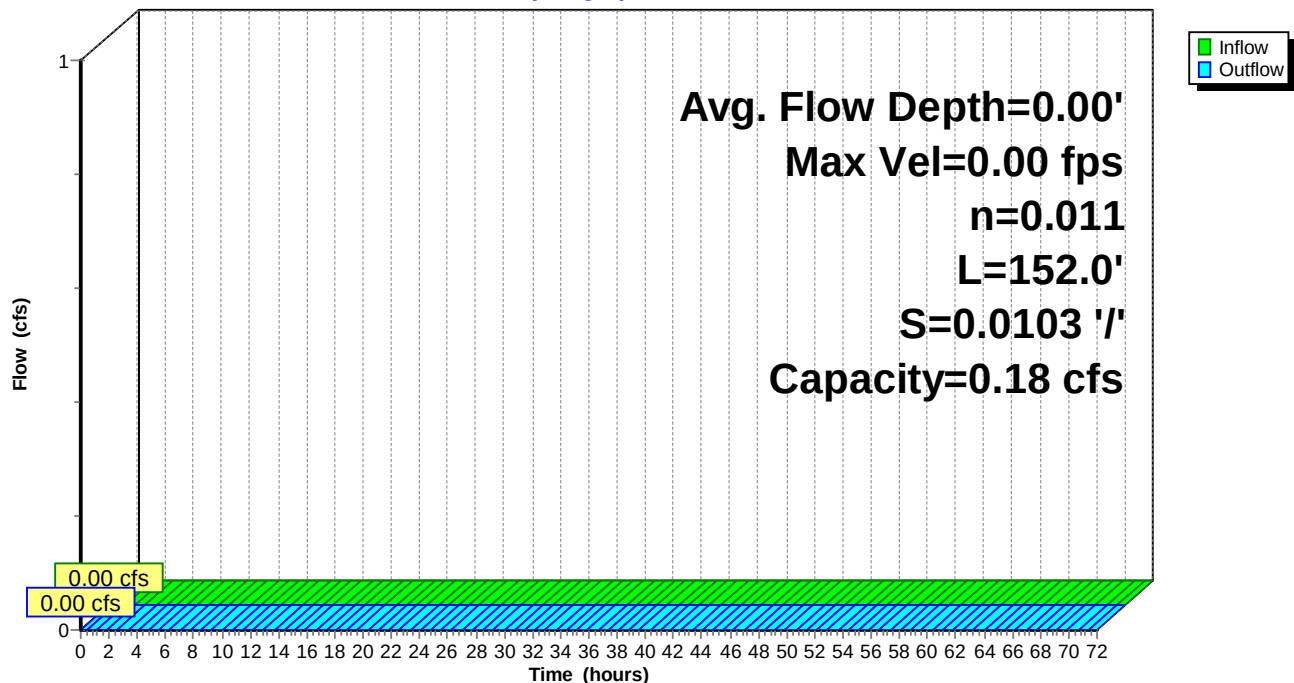
Length= 152.0' Slope= 0.0103 '/'

Inlet Invert= 17.34', Outlet Invert= 15.78'



Reach VG-5: Valley Gutter 5

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond EX-I-2: EX-I-2

Inflow Area = 0.921 ac, 75.76% Impervious, Inflow Depth = 4.35" for 10-YR event
Inflow = 2.69 cfs @ 12.04 hrs, Volume= 0.334 af
Outflow = 2.69 cfs @ 12.04 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 12.04 hrs, Volume= 0.334 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 14.01' @ 12.03 hrs

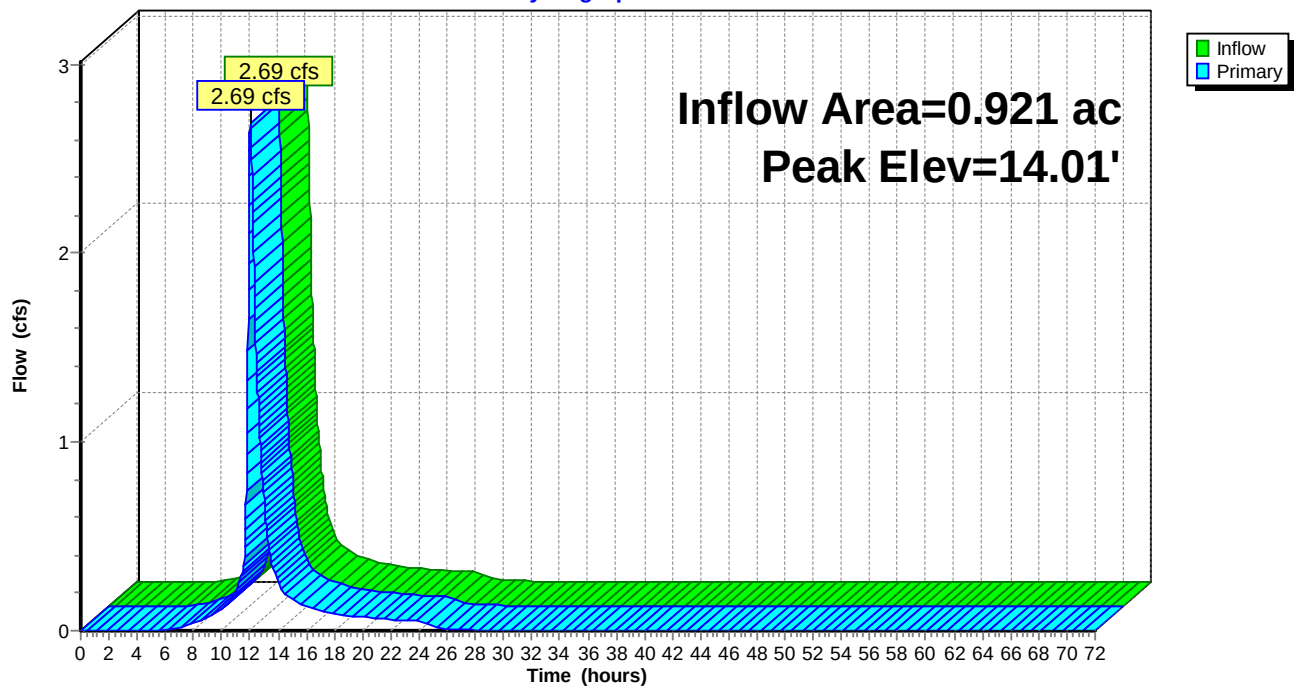
Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	2.0" x 2.0" Horiz. Orifice/Grate X 11.00 columns X 11 rows C= 0.600 in 24.0" x 24.0" Grate (84% open area) Limited to weir flow at low heads
#2	Primary	12.30'	12.0" Round CMP_Round 12" L= 172.1' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 12.30' / 12.00' S= 0.0017 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.69 cfs @ 12.04 hrs HW=14.01' TW=13.03' (Dynamic Tailwater)

1=Orifice/Grate (Controls 0.00 cfs)
2=CMP_Round 12" (Outlet Controls 2.69 cfs @ 3.43 fps)

Pond EX-I-2: EX-I-2

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P19: Planter #19

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.15 cfs @ 11.91 hrs, Volume= 0.007 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.15 cfs @ 11.91 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.83' @ 11.91 hrs Surf.Area= 55 sf Storage= 13 cf

Plug-Flow detention time= 21.1 min calculated for 0.007 af (99% of inflow)

Center-of-Mass det. time= 11.2 min (763.2 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	55	0.0	0	0
13.25	55	40.0	0	0
16.99	55	40.0	82	82
17.00	55	100.0	1	83
18.00	55	100.0	55	138
18.01	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 26.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.10' S= 0.0131 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.15 cfs @ 11.91 hrs HW=13.82' TW=13.19' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.15 cfs @ 1.72 fps)

Naima - Phase 2 - Proposed HydroCAD

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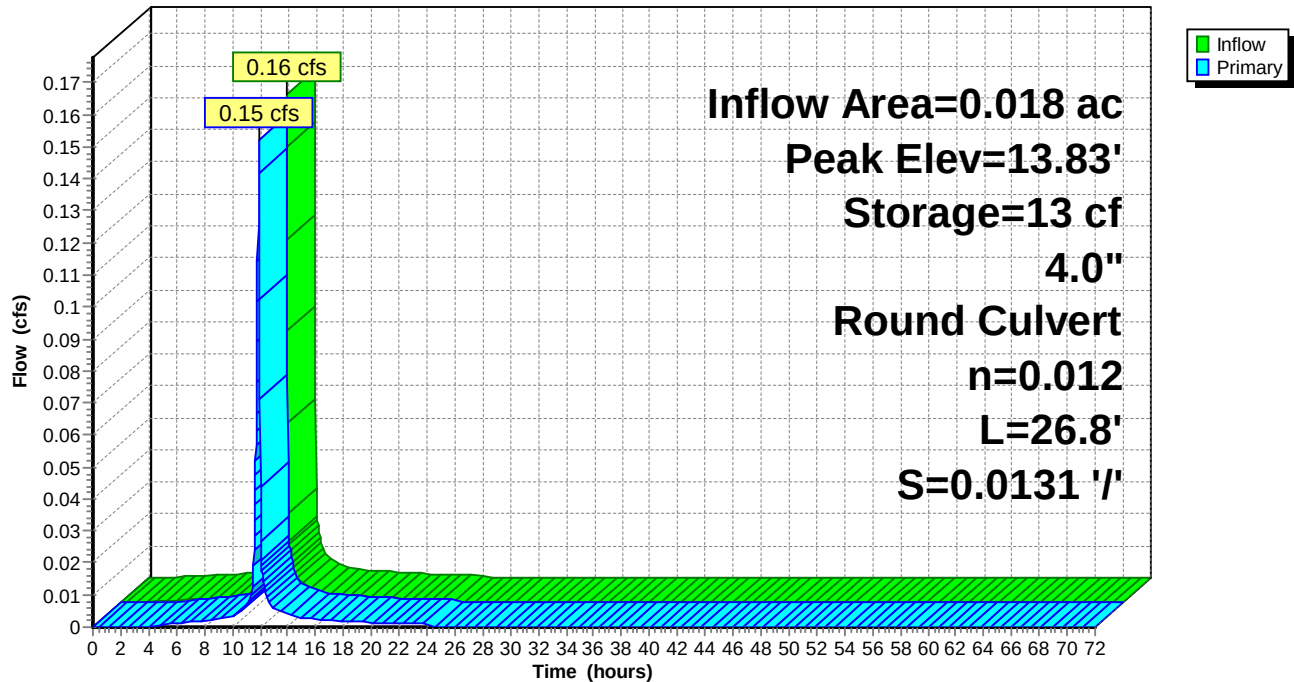
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P19: Planter #19

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P20: Planter #20

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.80' Surf.Area= 30 sf Storage= 31 cf

Peak Elev= 16.01' @ 11.90 hrs Surf.Area= 30 sf Storage= 33 cf (3 cf above start)

Plug-Flow detention time= 144.5 min calculated for 0.003 af (79% of inflow)

Center-of-Mass det. time= 2.6 min (754.6 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	30	0.0	0	0
13.25	30	40.0	0	0
16.99	30	40.0	45	45
17.00	30	100.0	0	45
18.00	30	100.0	30	75
18.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.80'	4.0" Round Culvert L= 20.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.80' S= -0.1169 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=16.01' TW=14.55' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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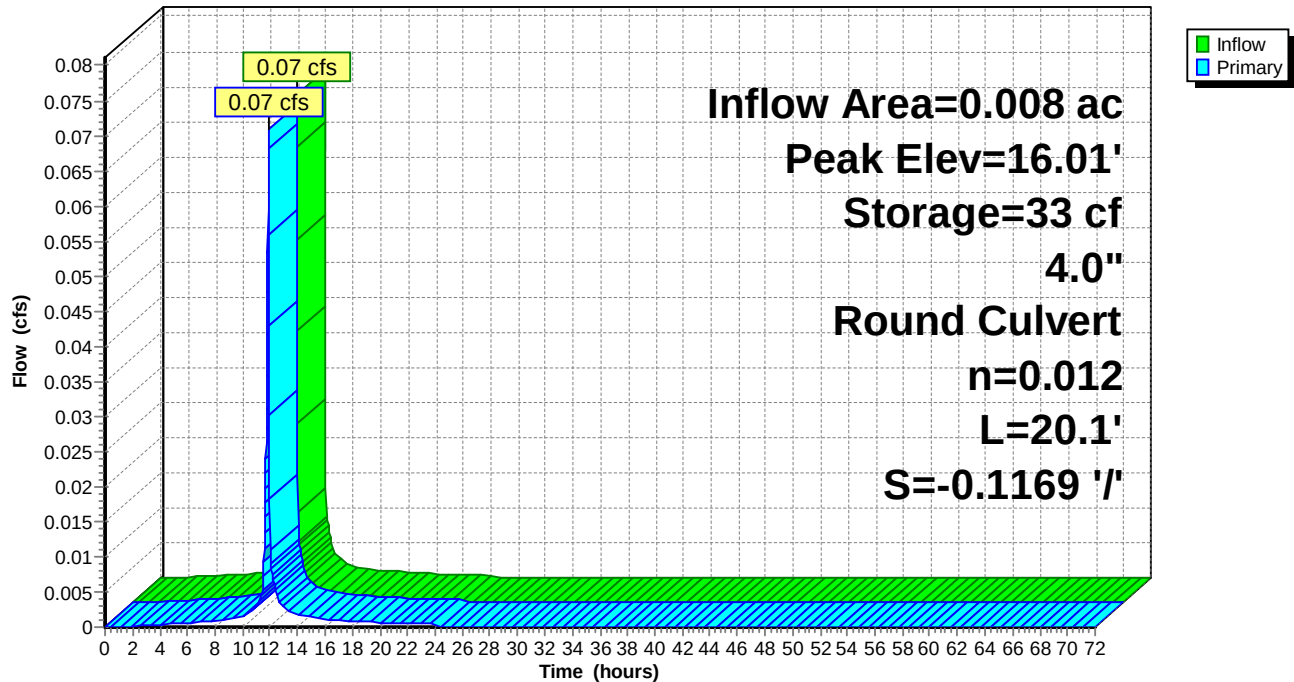
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P20: Planter #20

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P21: Planter #21

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.2 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.61' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 25.2 min calculated for 0.002 af (98% of inflow)

Center-of-Mass det. time= 12.4 min (764.4 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	20	0.0	0	0
13.25	20	40.0	0	0
16.99	20	40.0	30	30
17.00	20	100.0	0	30
18.00	20	100.0	20	50
18.01	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 30.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 12.89' S= 0.0185 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=13.61' TW=13.17' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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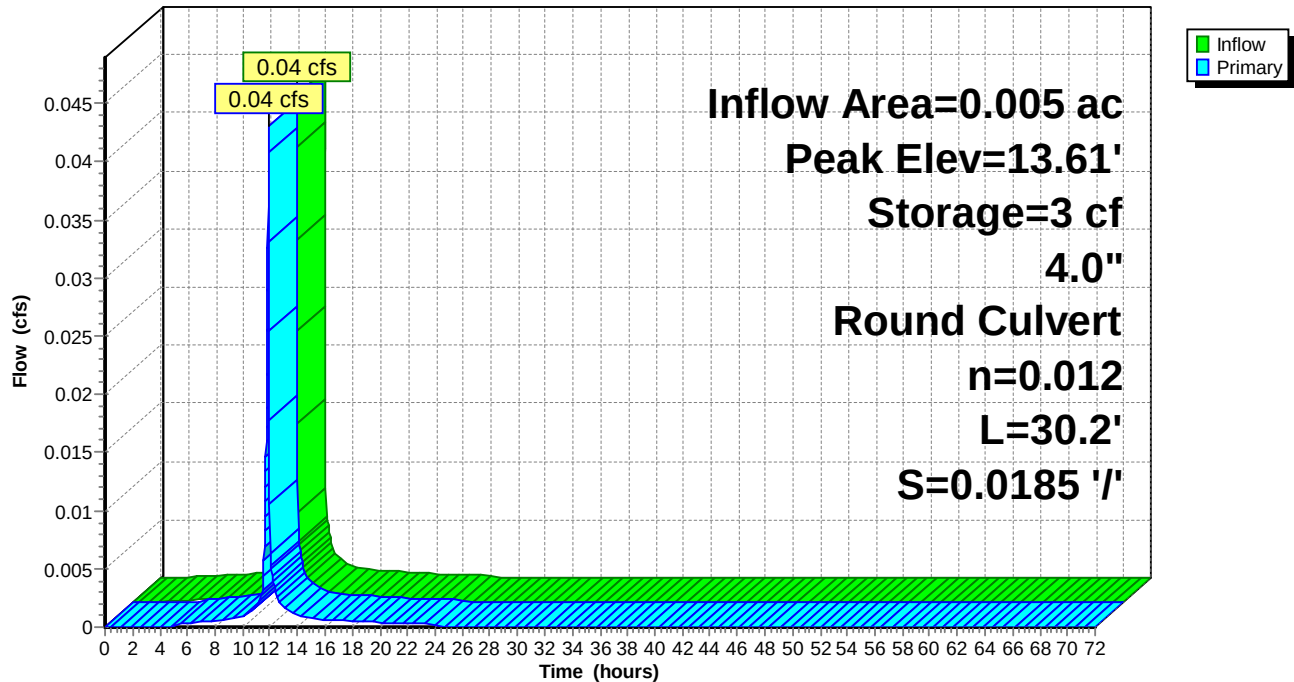
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P21: Planter #21

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P22: Planter #22

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.21 cfs @ 11.93 hrs, Volume= 0.011 af, Atten= 15%, Lag= 1.6 min
 Primary = 0.21 cfs @ 11.93 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.54' Surf.Area= 80 sf Storage= 74 cf

Peak Elev= 16.30' @ 11.93 hrs Surf.Area= 80 sf Storage= 98 cf (24 cf above start)

Plug-Flow detention time= 121.5 min calculated for 0.010 af (85% of inflow)

Center-of-Mass det. time= 4.1 min (756.1 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	80	0.0	0	0
13.25	80	40.0	0	0
16.99	80	40.0	120	120
17.00	80	100.0	1	121
18.00	80	100.0	80	201
18.01	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.54'	4.0" Round Culvert L= 59.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.54' S= -0.0350 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.93 hrs HW=16.29' TW=14.59' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.20 cfs @ 2.35 fps)

Naima - Phase 2 - Proposed HydroCAD

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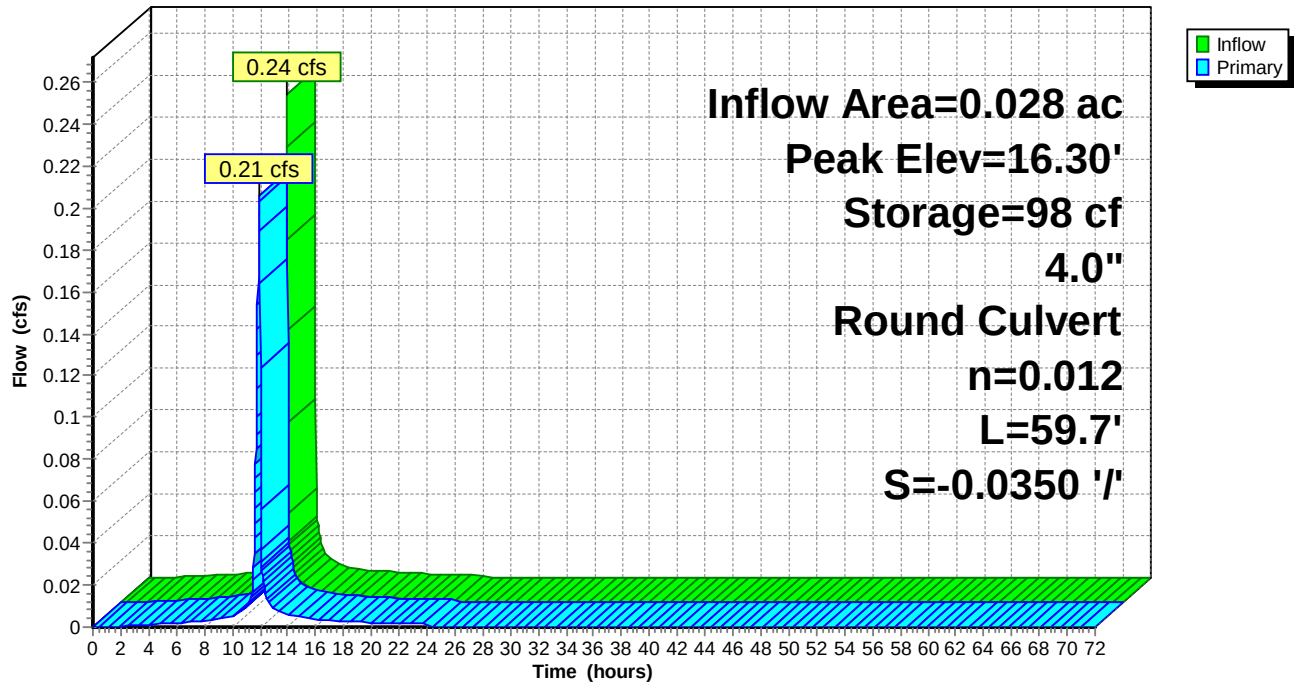
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P22: Planter #22

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P23: Planter #23

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.12 cfs @ 11.90 hrs, Volume= 0.006 af, Atten= 11%, Lag= 0.2 min
 Primary = 0.12 cfs @ 11.90 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.35' @ 11.92 hrs Surf.Area= 50 sf Storage= 12 cf

Plug-Flow detention time= 21.4 min calculated for 0.006 af (98% of inflow)

Center-of-Mass det. time= 11.6 min (763.6 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	50	0.0	0	0
12.75	50	40.0	0	0
16.49	50	40.0	75	75
16.50	50	100.0	1	76
17.50	50	100.0	50	126
17.51	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	12.95'	4.0" Round Culvert L= 20.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 12.81' S= 0.0068 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.90 hrs HW=13.32' TW=13.16' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.13 cfs @ 1.64 fps)

Naima - Phase 2 - Proposed HydroCAD

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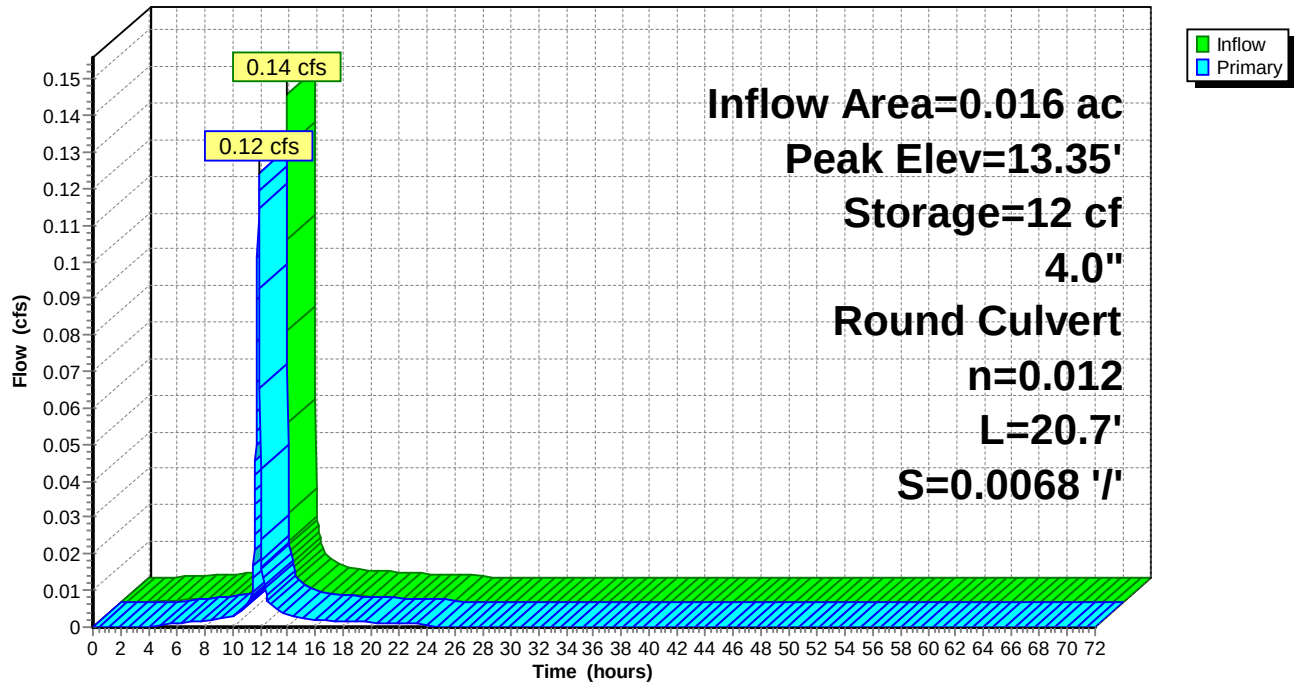
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Pond P23: Planter #23

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P24: Planter #24

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.45' Surf.Area= 40 sf Storage= 43 cf

Peak Elev= 15.73' @ 11.90 hrs Surf.Area= 40 sf Storage= 48 cf (5 cf above start)

Plug-Flow detention time= 134.3 min calculated for 0.004 af (82% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	40	0.0	0	0
12.75	40	40.0	0	0
16.49	40	40.0	60	60
16.50	40	100.0	0	60
17.50	40	100.0	40	100
17.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	4.0" Round Culvert L= 36.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.45' S= -0.0683 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=15.73' TW=14.42' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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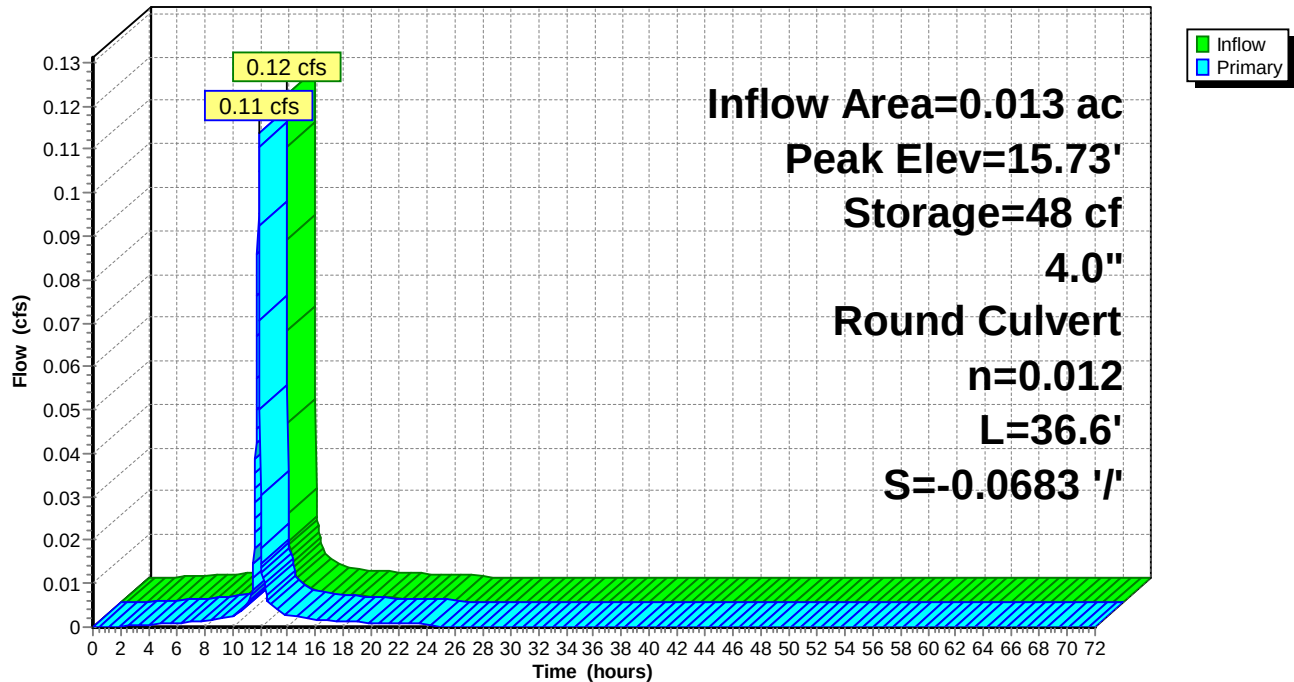
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P24: Planter #24

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P25: Planter #25

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.32' Surf.Area= 40 sf Storage= 41 cf

Peak Elev= 15.61' @ 11.90 hrs Surf.Area= 40 sf Storage= 46 cf (5 cf above start)

Plug-Flow detention time= 130.6 min calculated for 0.005 af (83% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	40	0.0	0	0
12.75	40	40.0	0	0
16.49	40	40.0	60	60
16.50	40	100.0	0	60
17.50	40	100.0	40	100
17.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.32'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.32' S= -0.0820 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=15.60' TW=14.42' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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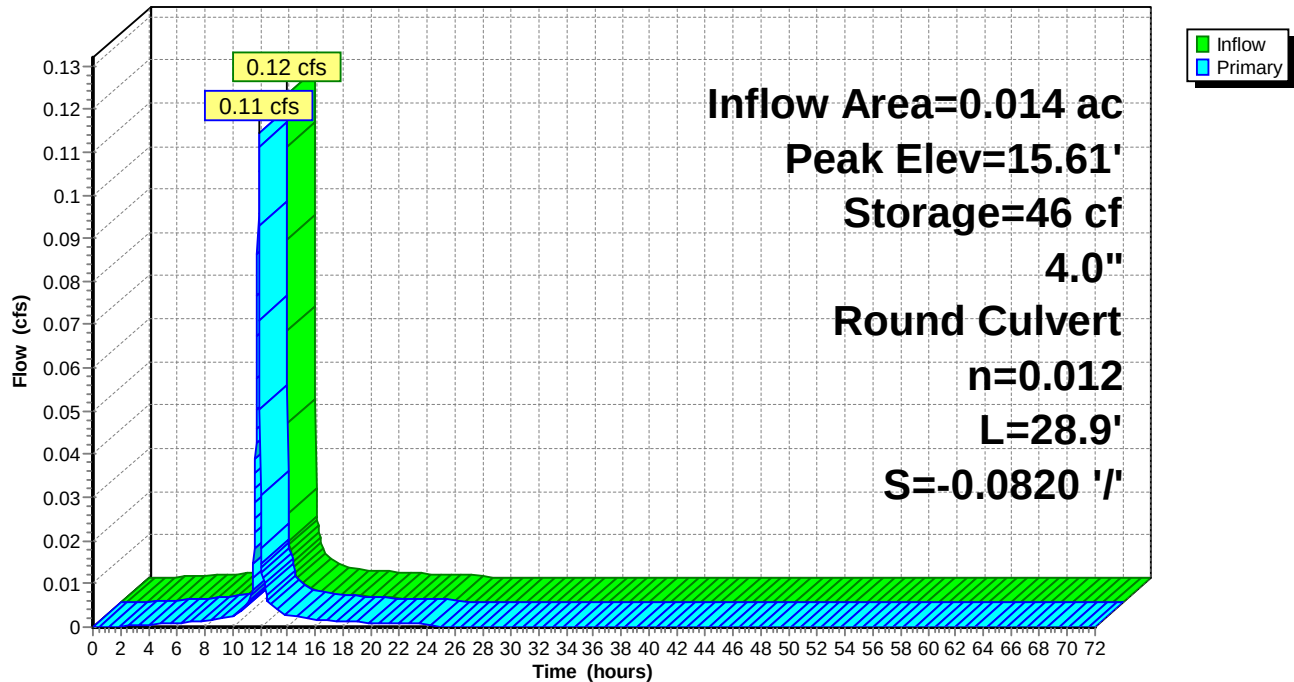
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P25: Planter #25

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P26: Planter #26

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.18 cfs @ 11.91 hrs, Volume= 0.010 af, Atten= 16%, Lag= 0.9 min
 Primary = 0.18 cfs @ 11.91 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.55' @ 11.93 hrs Surf.Area= 70 sf Storage= 23 cf

Plug-Flow detention time= 19.8 min calculated for 0.010 af (99% of inflow)

Center-of-Mass det. time= 11.1 min (763.0 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	70	0.0	0	0
12.75	70	40.0	0	0
16.49	70	40.0	105	105
16.50	70	100.0	1	106
17.50	70	100.0	70	176
17.51	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	12.95'	4.0" Round Culvert L= 24.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 12.56' S= 0.0159 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.19 cfs @ 11.91 hrs HW=13.53' TW=13.20' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.19 cfs @ 2.13 fps)

Naima - Phase 2 - Proposed HydroCAD

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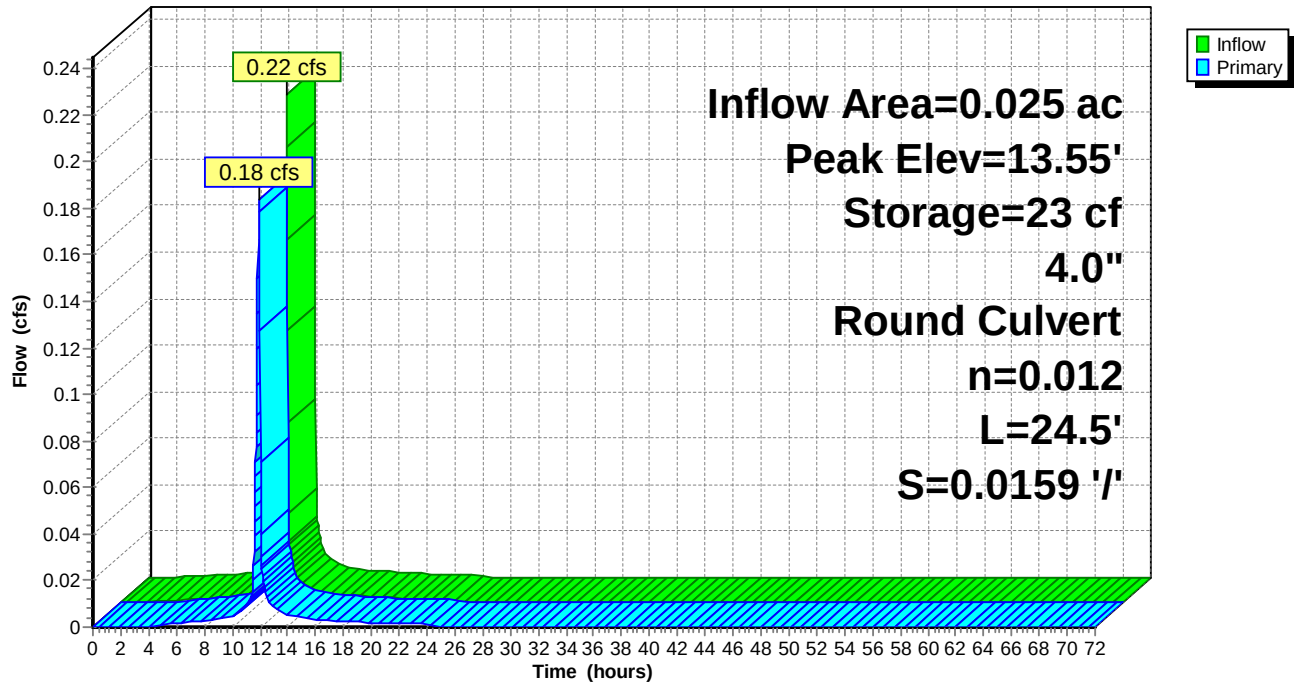
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Pond P26: Planter #26

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P27: Planter #27

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.08' Surf.Area= 30 sf Storage= 28 cf

Peak Elev= 15.29' @ 11.90 hrs Surf.Area= 30 sf Storage= 31 cf (2 cf above start)

Plug-Flow detention time= 140.1 min calculated for 0.003 af (80% of inflow)

Center-of-Mass det. time= 2.7 min (754.7 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	30	0.0	0	0
12.75	30	40.0	0	0
16.49	30	40.0	45	45
16.50	30	100.0	0	45
17.50	30	100.0	30	75
17.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.08'	4.0" Round Culvert L= 10.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.08' S= -0.1972 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=15.28' TW=14.42' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.07 cfs @ 1.22 fps)

Naima - Phase 2 - Proposed HydroCAD

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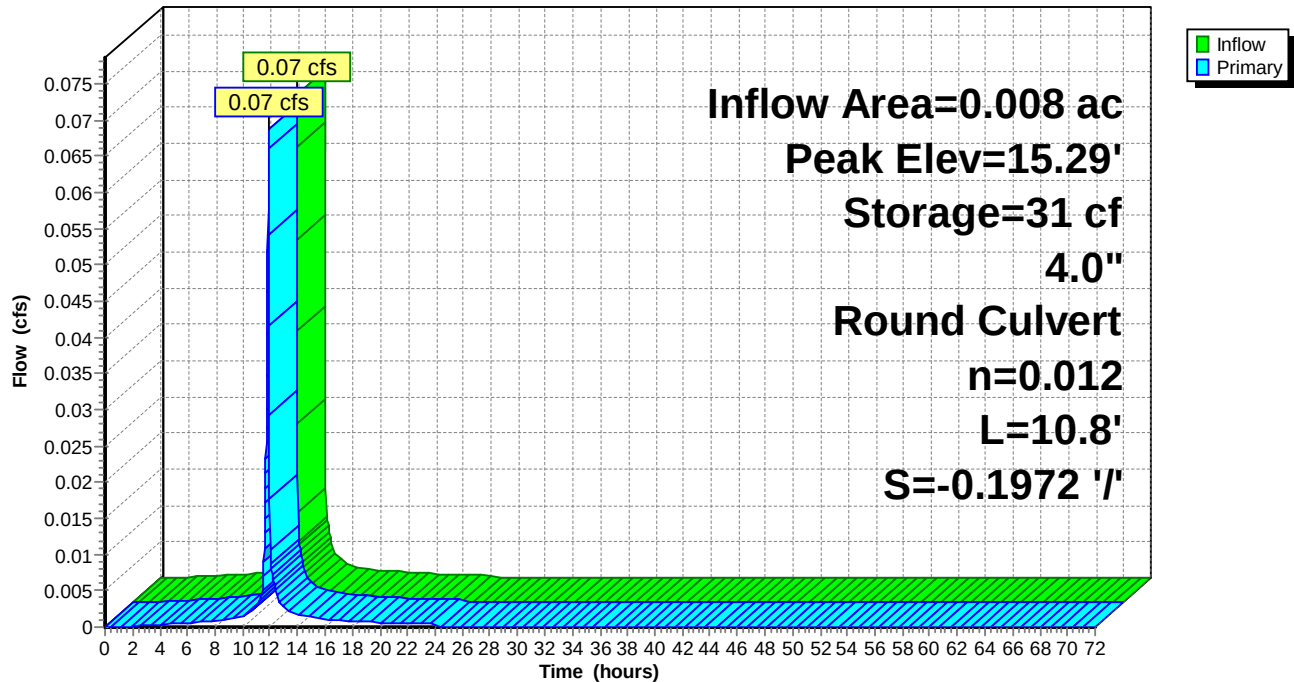
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P27: Planter #27

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Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P28: Planter #28

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.15 cfs @ 11.91 hrs, Volume= 0.007 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.15 cfs @ 11.91 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.83' @ 11.91 hrs Surf.Area= 55 sf Storage= 13 cf

Plug-Flow detention time= 20.7 min calculated for 0.007 af (99% of inflow)

Center-of-Mass det. time= 11.2 min (763.2 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	55	0.0	0	0
13.25	55	40.0	0	0
16.99	55	40.0	82	82
17.00	55	100.0	1	83
18.00	55	100.0	55	138
18.01	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 14.3' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.10' S= 0.0245 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.15 cfs @ 11.91 hrs HW=13.82' TW=13.19' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.15 cfs @ 1.72 fps)

Naima - Phase 2 - Proposed HydroCAD

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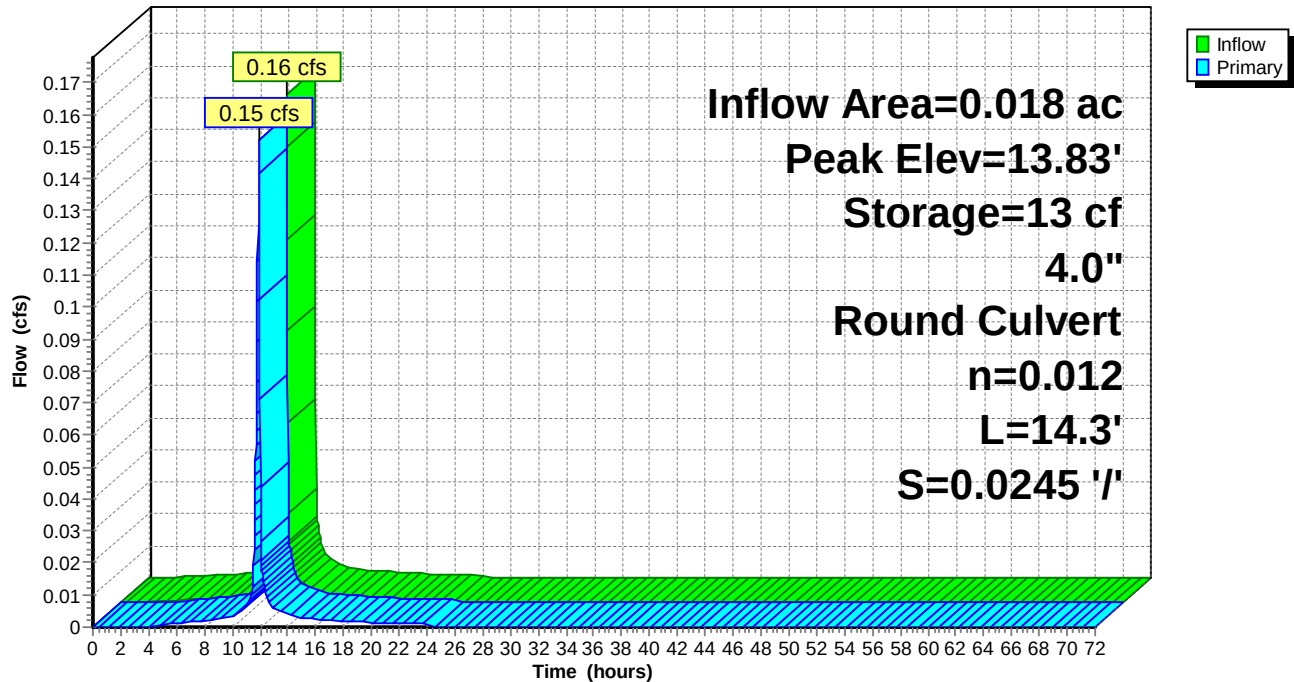
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P28: Planter #28

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P29: Planter #29

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 14.99' Surf.Area= 30 sf Storage= 21 cf

Peak Elev= 15.20' @ 11.90 hrs Surf.Area= 30 sf Storage= 24 cf (3 cf above start)

Plug-Flow detention time= 116.9 min calculated for 0.003 af (86% of inflow)

Center-of-Mass det. time= 2.6 min (754.6 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	30	0.0	0	0
13.25	30	40.0	0	0
16.99	30	40.0	45	45
17.00	30	100.0	0	45
18.00	30	100.0	30	75
18.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	14.99'	4.0" Round Culvert L= 32.3' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 14.99' S= -0.0477 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=15.20' TW=14.50' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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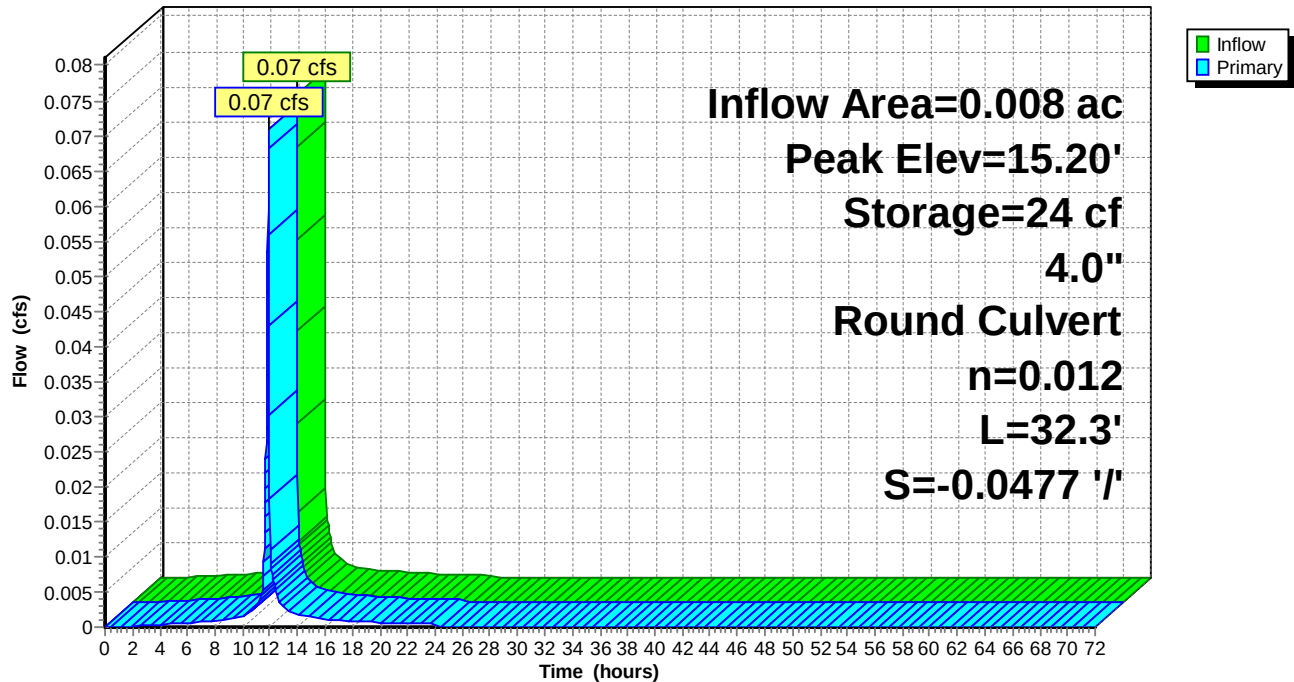
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P29: Planter #29

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P30: Planter #30

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.2 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 13.61' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 24.9 min calculated for 0.002 af (98% of inflow)
 Center-of-Mass det. time= 12.5 min (764.5 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	20	0.0	0	0
13.25	20	40.0	0	0
16.99	20	40.0	30	30
17.00	20	100.0	0	30
18.00	20	100.0	20	50
18.01	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 18.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.29' S= 0.0088 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=13.61' TW=13.17' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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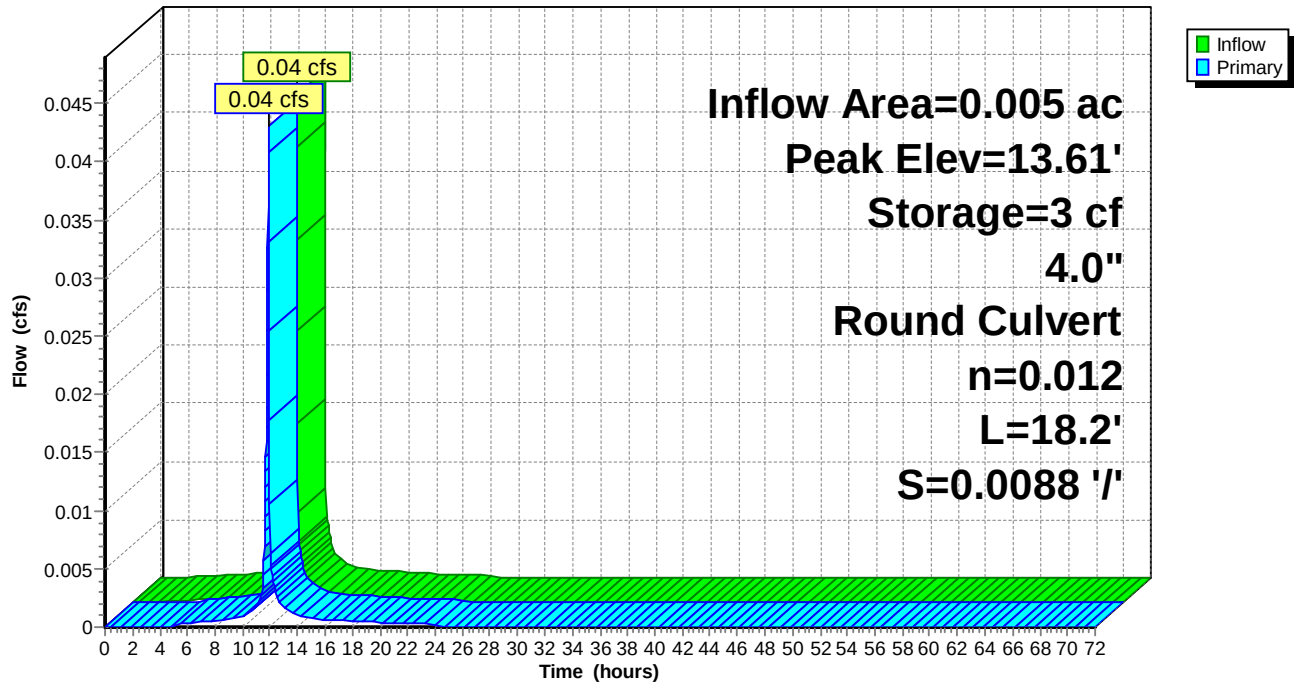
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P30: Planter #30

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P31: Planter #31

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.20 cfs @ 11.93 hrs, Volume= 0.011 af, Atten= 17%, Lag= 1.8 min
 Primary = 0.20 cfs @ 11.93 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.21' Surf.Area= 80 sf Storage= 63 cf

Peak Elev= 16.05' @ 11.93 hrs Surf.Area= 80 sf Storage= 90 cf (27 cf above start)

Plug-Flow detention time= 110.8 min calculated for 0.010 af (87% of inflow)

Center-of-Mass det. time= 4.2 min (756.1 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	80	0.0	0	0
13.25	80	40.0	0	0
16.99	80	40.0	120	120
17.00	80	100.0	1	121
18.00	80	100.0	80	201
18.01	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.21'	4.0" Round Culvert L= 71.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.21' S= -0.0246 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.93 hrs HW=16.04' TW=14.57' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.20 cfs @ 2.29 fps)

Naima - Phase 2 - Proposed HydroCAD

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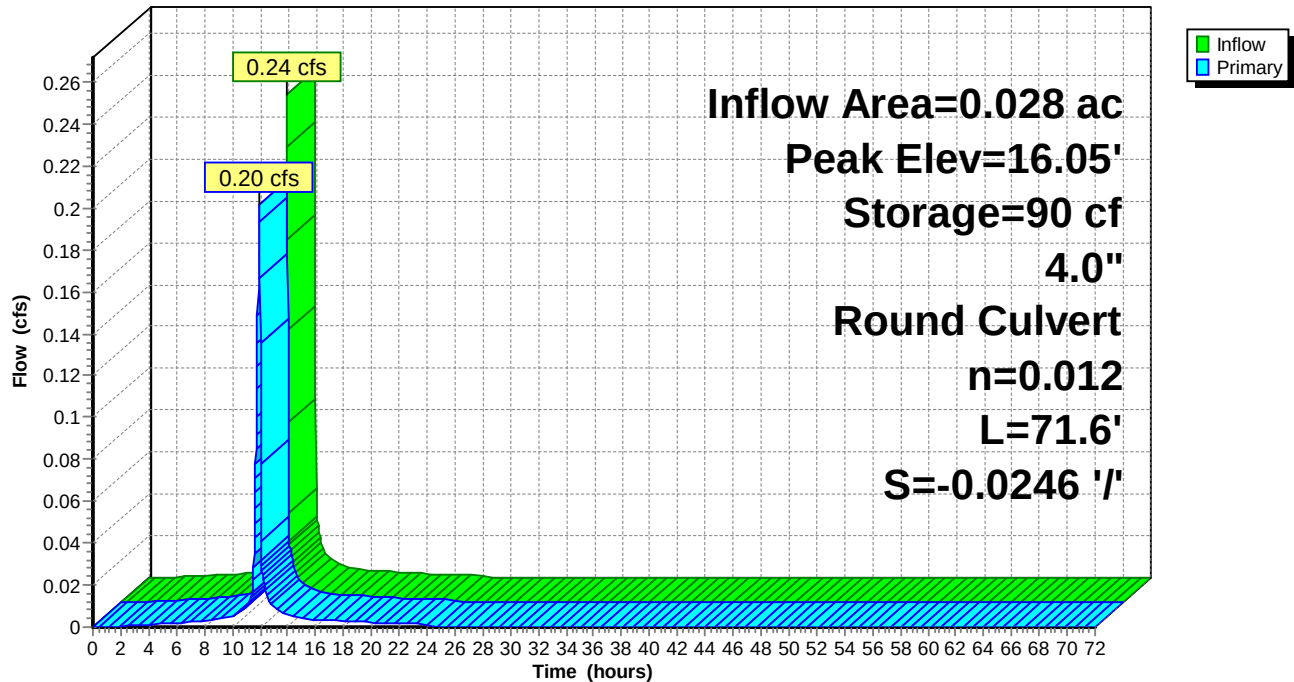
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Pond P31: Planter #31

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P32: Planter #32

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.2 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.11' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 24.8 min calculated for 0.002 af (98% of inflow)

Center-of-Mass det. time= 12.4 min (764.4 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	20	0.0	0	0
13.75	20	40.0	0	0
17.49	20	40.0	30	30
17.50	20	100.0	0	30
18.50	20	100.0	20	50
18.51	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.95'	4.0" Round Culvert L= 29.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 13.36' S= 0.0199 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=14.11' TW=13.17' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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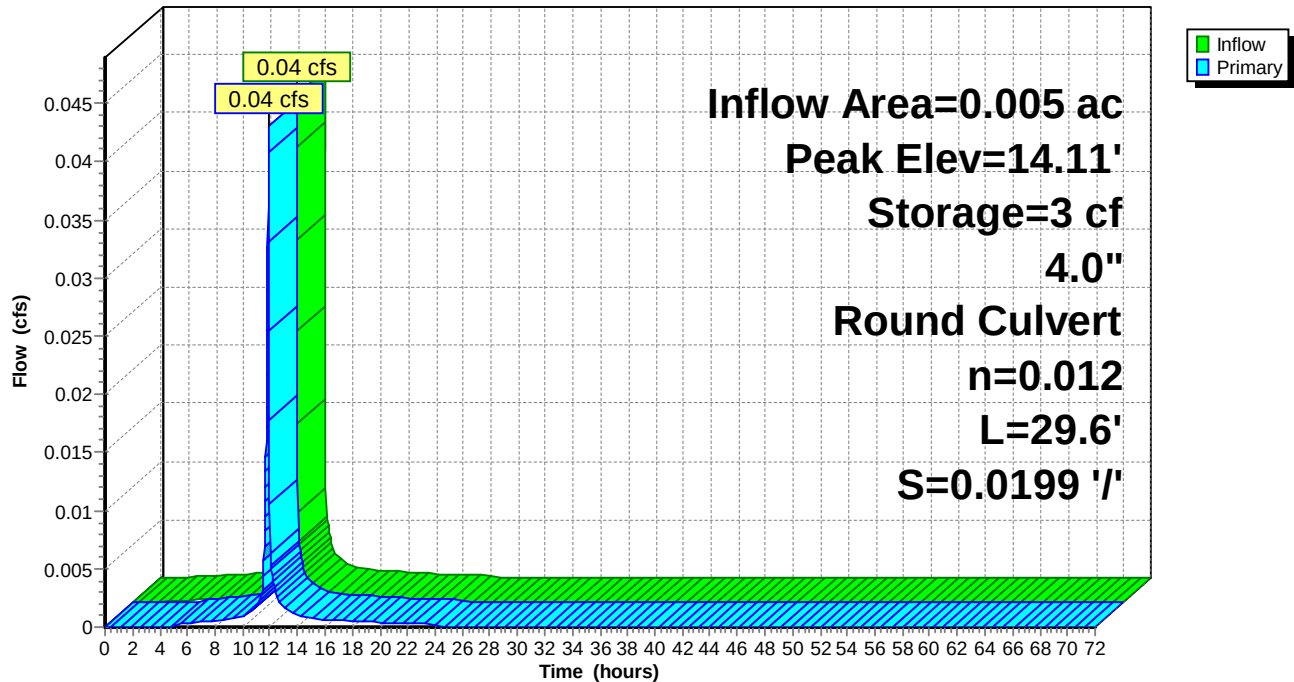
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P32: Planter #32

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P33: Planter #33

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.21 cfs @ 11.93 hrs, Volume= 0.011 af, Atten= 15%, Lag= 1.6 min
 Primary = 0.21 cfs @ 11.93 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.24' Surf.Area= 80 sf Storage= 48 cf

Peak Elev= 16.01' @ 11.93 hrs Surf.Area= 80 sf Storage= 73 cf (25 cf above start)

Plug-Flow detention time= 92.5 min calculated for 0.010 af (90% of inflow)

Center-of-Mass det. time= 4.1 min (756.1 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.74'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	80	0.0	0	0
13.75	80	40.0	0	0
17.49	80	40.0	120	120
17.50	80	100.0	1	121
18.50	80	100.0	80	201
18.51	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.24'	4.0" Round Culvert L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 15.24' S= -0.0211 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.93 hrs HW=16.00' TW=14.57' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.20 cfs @ 2.34 fps)

Naima - Phase 2 - Proposed HydroCAD

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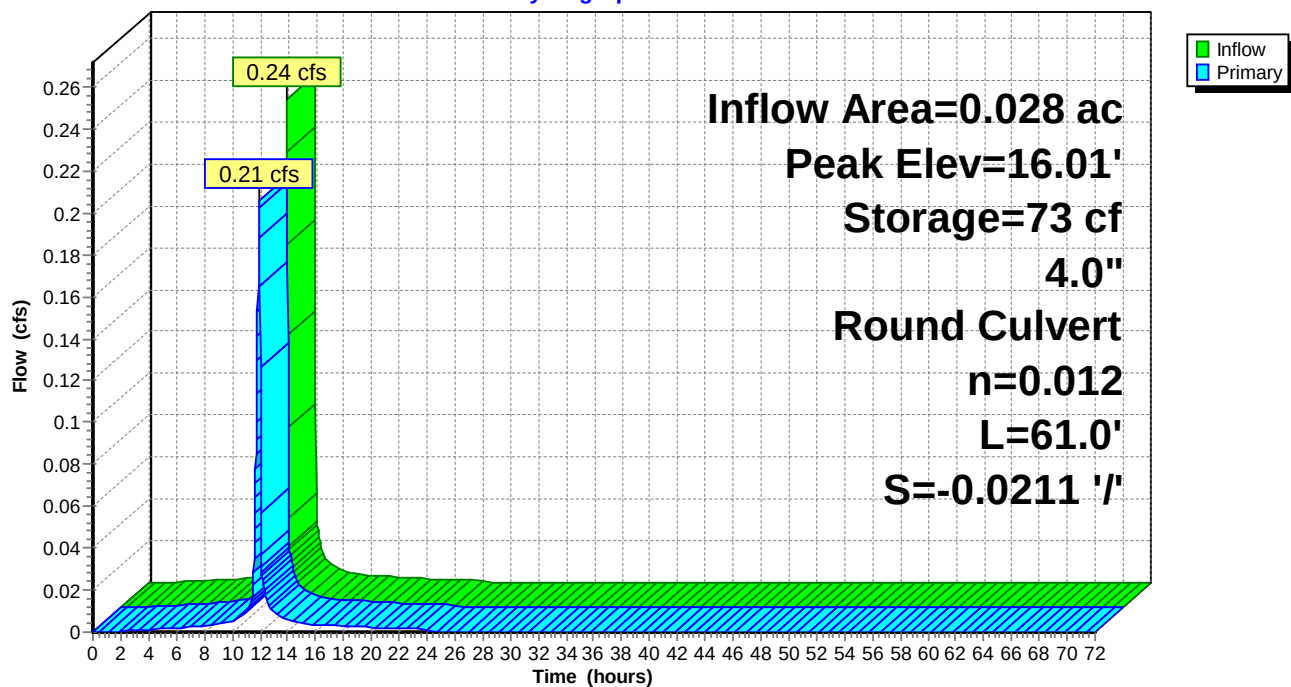
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P33: Planter #33

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P34: Planter #34

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.15 cfs @ 11.91 hrs, Volume= 0.007 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.15 cfs @ 11.91 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.33' @ 11.91 hrs Surf.Area= 55 sf Storage= 13 cf

Plug-Flow detention time= 21.1 min calculated for 0.007 af (99% of inflow)

Center-of-Mass det. time= 11.2 min (763.2 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	55	0.0	0	0
13.75	55	40.0	0	0
17.49	55	40.0	82	82
17.50	55	100.0	1	83
18.50	55	100.0	55	138
18.51	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.95'	4.0" Round Culvert L= 26.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 13.56' S= 0.0149 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.15 cfs @ 11.91 hrs HW=14.32' TW=13.19' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.15 cfs @ 1.72 fps)

Naima - Phase 2 - Proposed HydroCAD

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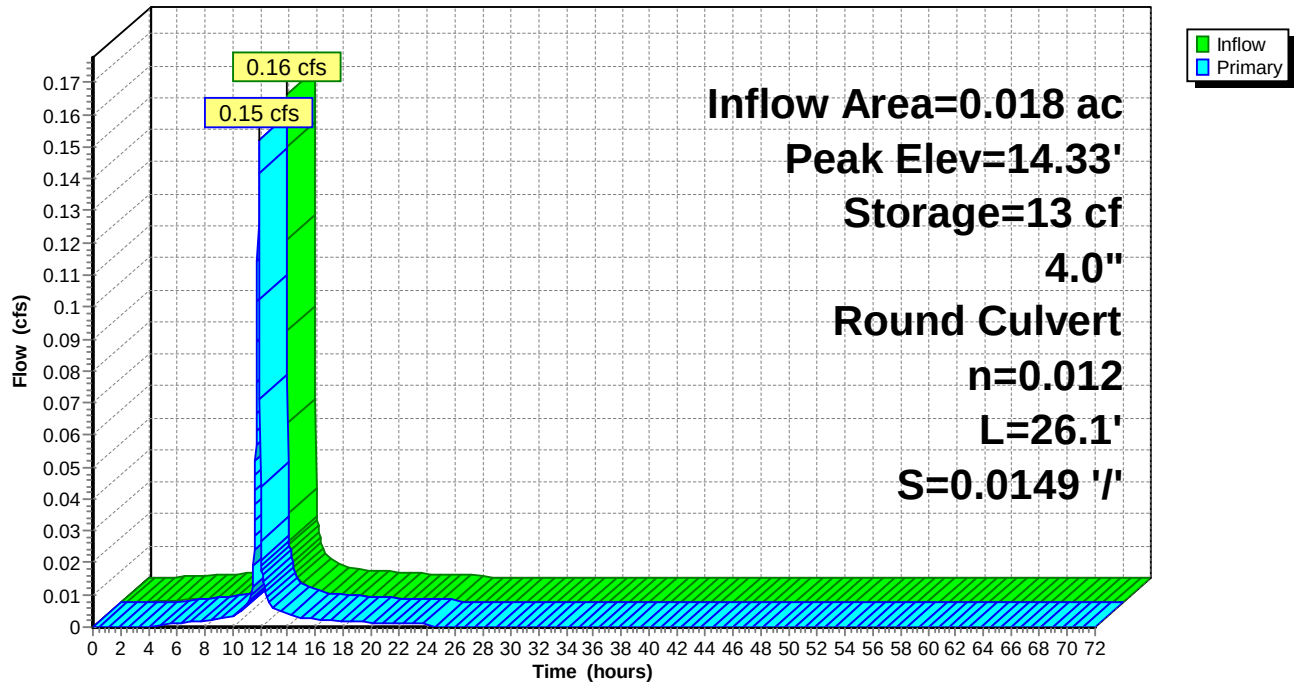
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P34: Planter #34

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P35: Planter #35

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.73' Surf.Area= 30 sf Storage= 24 cf

Peak Elev= 15.94' @ 11.90 hrs Surf.Area= 30 sf Storage= 26 cf (3 cf above start)

Plug-Flow detention time= 126.0 min calculated for 0.003 af (84% of inflow)

Center-of-Mass det. time= 2.6 min (754.6 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	30	0.0	0	0
13.75	30	40.0	0	0
17.49	30	40.0	45	45
17.50	30	100.0	0	45
18.50	30	100.0	30	75
18.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.73'	4.0" Round Culvert L= 31.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 15.73' S= -0.0565 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=15.94' TW=14.69' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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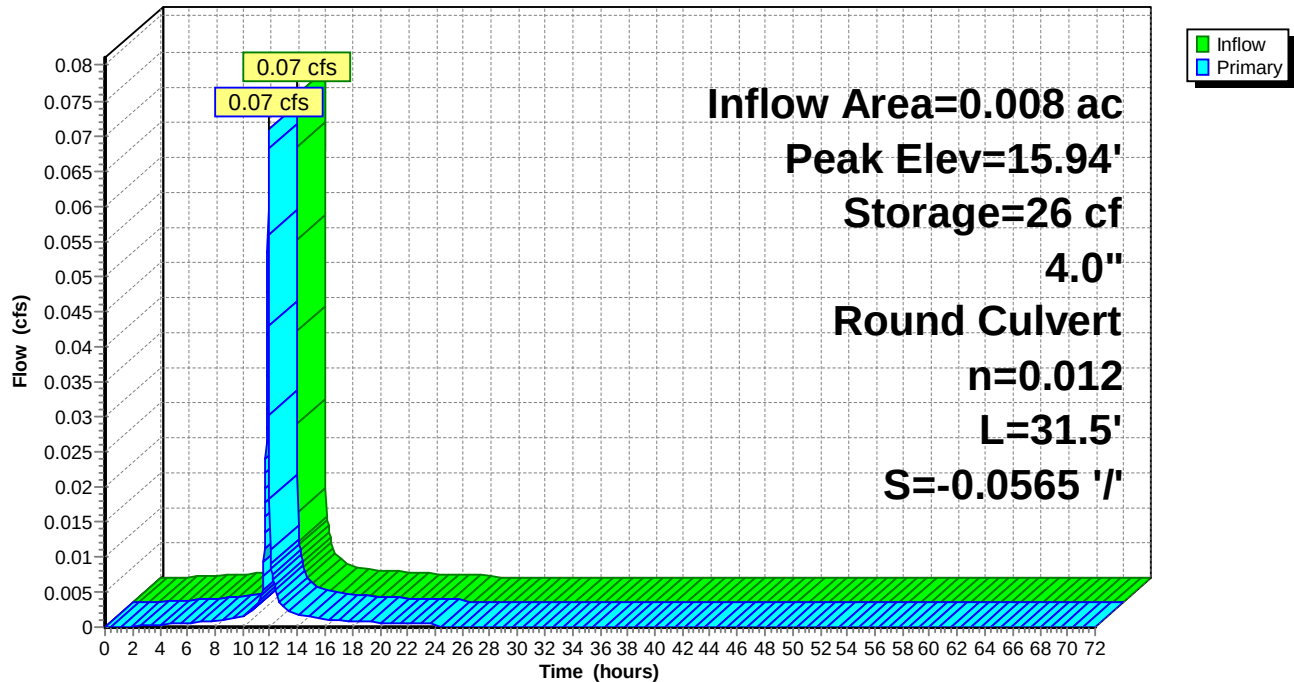
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P35: Planter #35

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P36: Planter #36

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.48' @ 11.91 hrs Surf.Area= 50 sf Storage= 11 cf

Plug-Flow detention time= 21.6 min calculated for 0.006 af (99% of inflow)
 Center-of-Mass det. time= 11.3 min (763.3 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.94'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	50	0.0	0	0
13.95	50	40.0	0	0
17.69	50	40.0	75	75
17.70	50	100.0	0	75
18.70	50	100.0	50	125
18.71	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	14.15'	4.0" Round Culvert L= 20.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 13.65' S= 0.0248 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=14.47' TW=13.18' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.53 fps)

Naima - Phase 2 - Proposed HydroCAD

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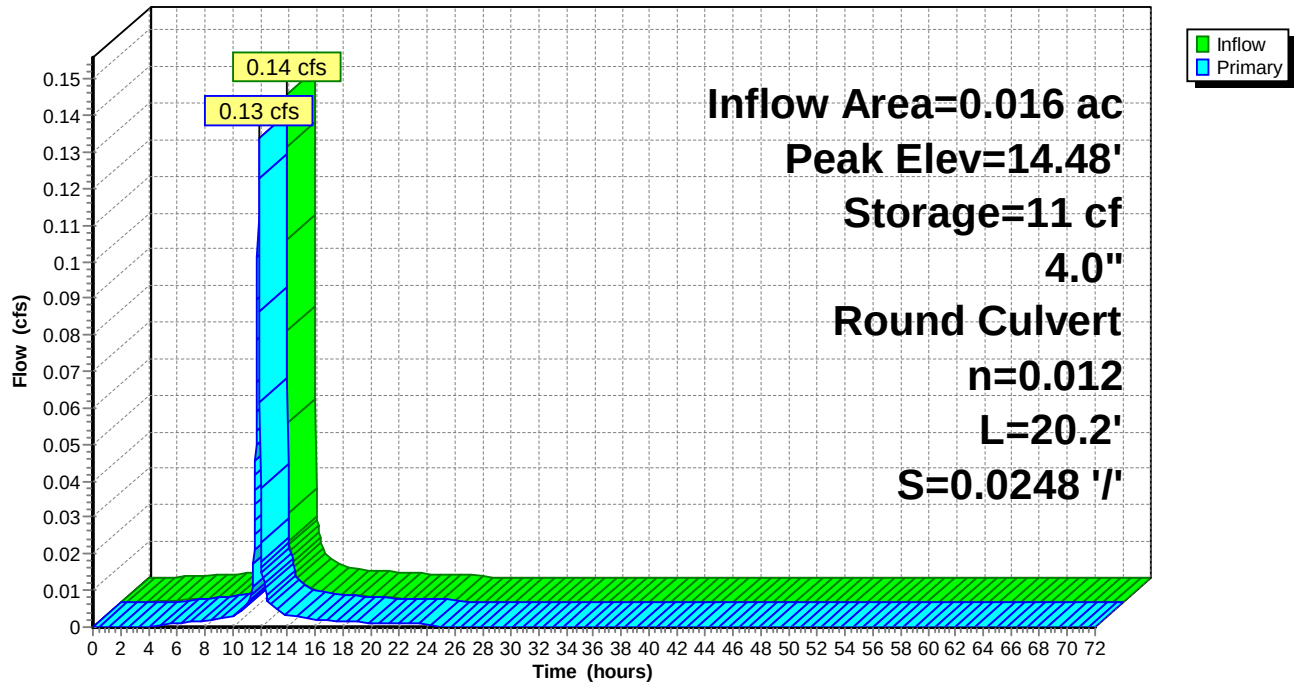
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P36: Planter #36

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P37: Planter #37

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.73' Surf.Area= 40 sf Storage= 29 cf

Peak Elev= 16.01' @ 11.90 hrs Surf.Area= 40 sf Storage= 33 cf (5 cf above start)

Plug-Flow detention time= 105.1 min calculated for 0.005 af (88% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	40	0.0	0	0
13.95	40	40.0	0	0
17.69	40	40.0	60	60
17.70	40	100.0	0	60
18.70	40	100.0	40	100
18.71	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.73'	4.0" Round Culvert L= 37.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.73' S= -0.0418 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=16.01' TW=14.70' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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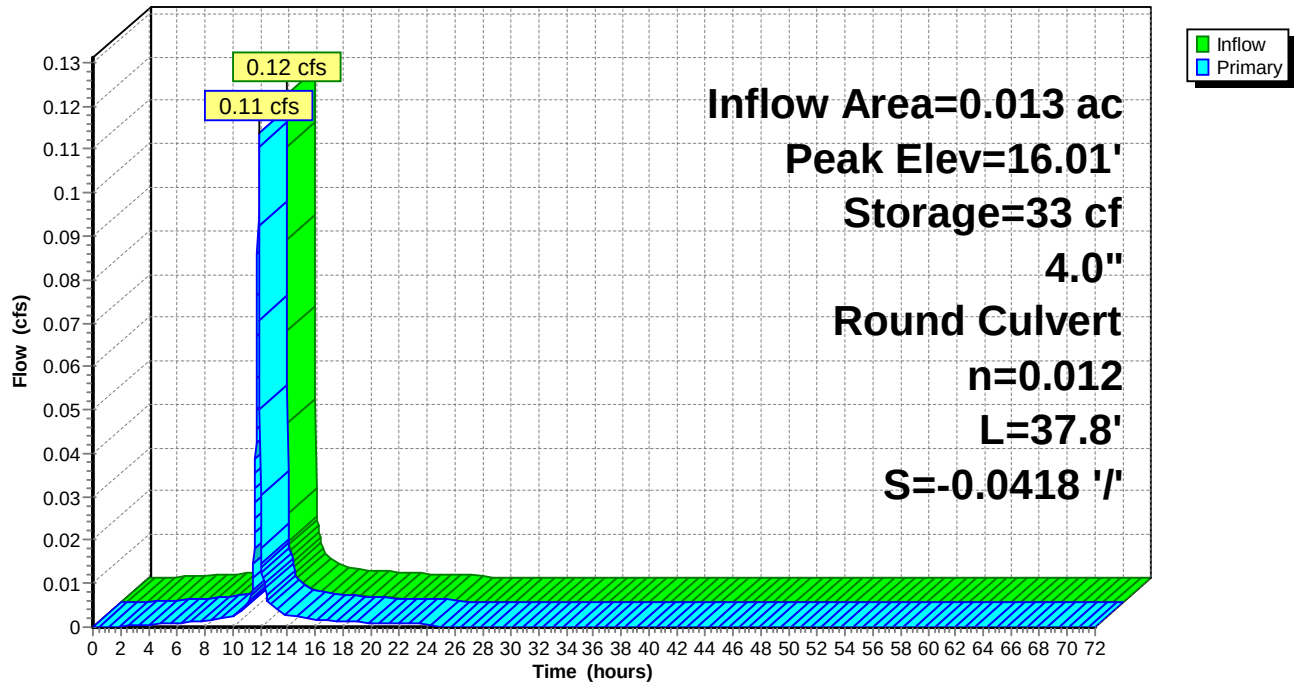
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Pond P37: Planter #37

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P38: Planter #38

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.85' Surf.Area= 40 sf Storage= 31 cf

Peak Elev= 16.14' @ 11.90 hrs Surf.Area= 40 sf Storage= 35 cf (5 cf above start)

Plug-Flow detention time= 109.1 min calculated for 0.005 af (87% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	40	0.0	0	0
13.95	40	40.0	0	0
17.69	40	40.0	60	60
17.70	40	100.0	0	60
18.70	40	100.0	40	100
18.71	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.85'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.85' S= -0.0588 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=16.13' TW=14.70' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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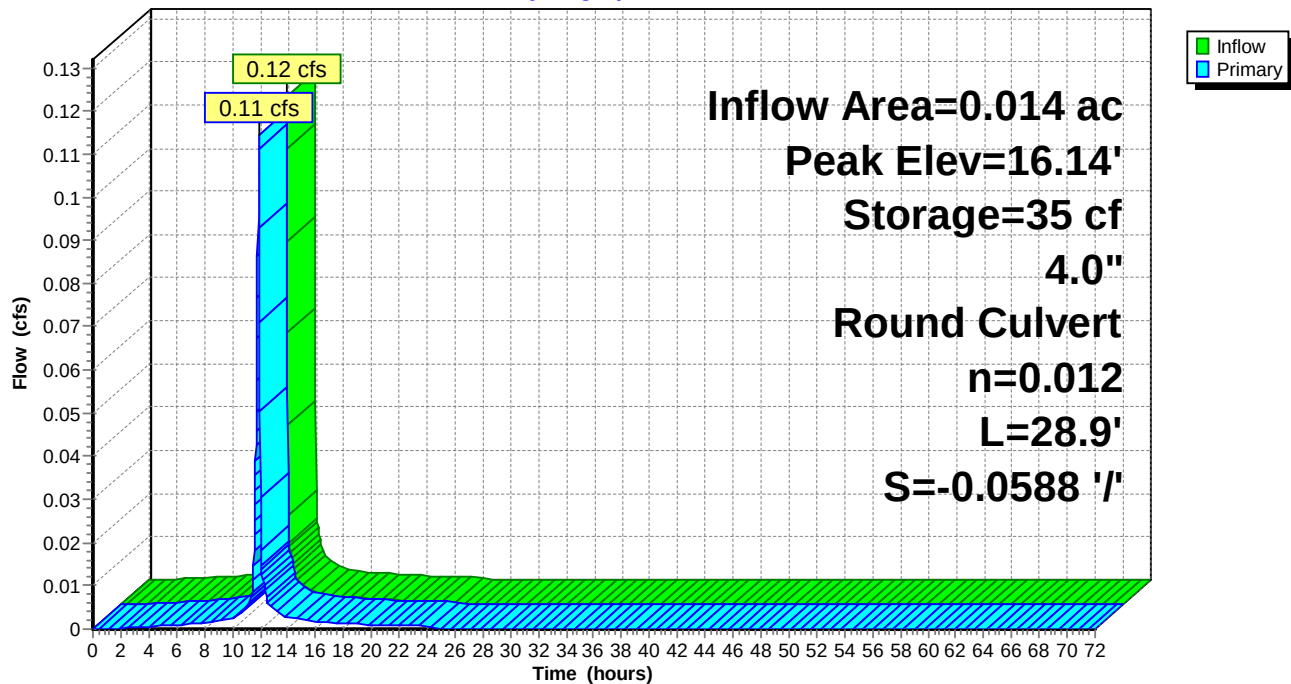
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Pond P38: Planter #38

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P39: Planter #39

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.20 cfs @ 11.92 hrs, Volume= 0.010 af, Atten= 7%, Lag= 1.0 min
 Primary = 0.20 cfs @ 11.92 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.69' @ 11.92 hrs Surf.Area= 70 sf Storage= 21 cf

Plug-Flow detention time= 20.2 min calculated for 0.010 af (99% of inflow)

Center-of-Mass det. time= 11.0 min (763.0 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.94'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	70	0.0	0	0
13.95	70	40.0	0	0
17.69	70	40.0	105	105
17.70	70	100.0	1	106
18.70	70	100.0	70	176
18.71	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	14.15'	4.0" Round Culvert L= 23.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 13.88' S= 0.0113 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.92 hrs HW=14.68' TW=13.20' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.20 cfs @ 2.31 fps)

Naima - Phase 2 - Proposed HydroCAD

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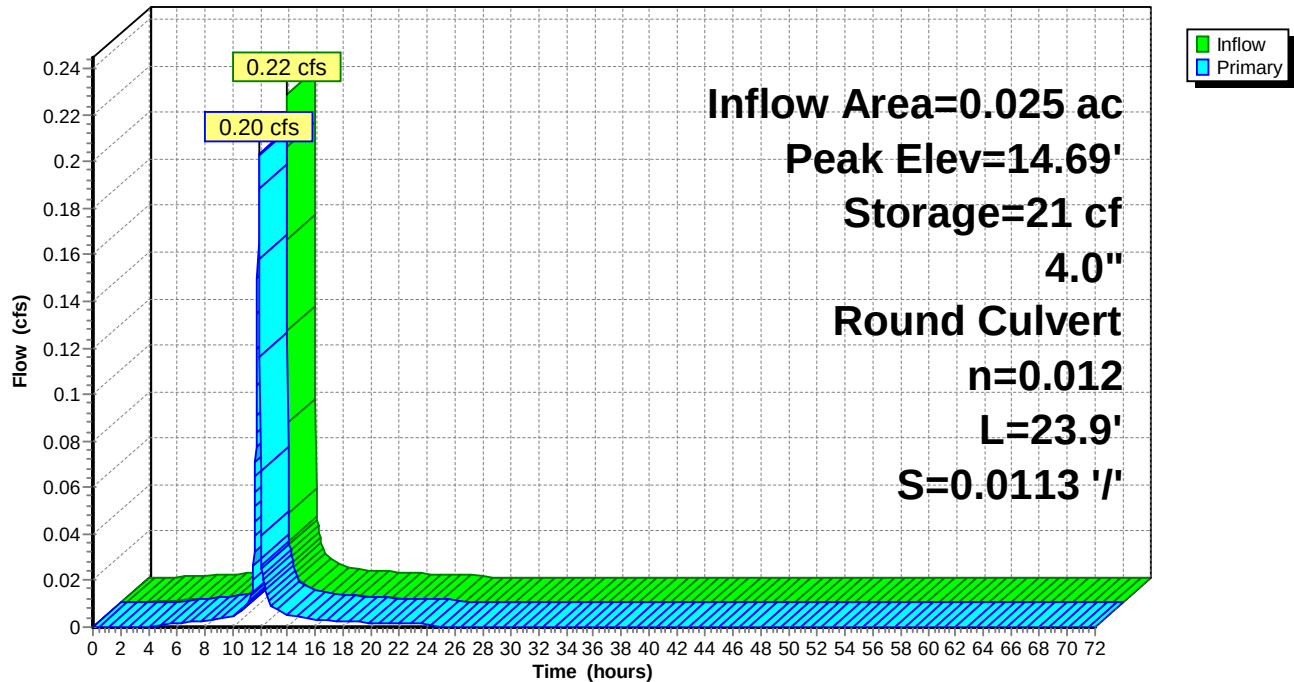
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Pond P39: Planter #39

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P40: Planter #40

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.99' Surf.Area= 30 sf Storage= 25 cf

Peak Elev= 16.20' @ 11.90 hrs Surf.Area= 30 sf Storage= 27 cf (2 cf above start)

Plug-Flow detention time= 130.1 min calculated for 0.003 af (83% of inflow)

Center-of-Mass det. time= 2.7 min (754.7 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	30	0.0	0	0
13.95	30	40.0	0	0
17.69	30	40.0	45	45
17.70	30	100.0	0	45
18.70	30	100.0	30	75
18.71	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.99'	4.0" Round Culvert L= 11.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.99' S= -0.1643 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=16.19' TW=14.69' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.07 cfs @ 1.22 fps)

Naima - Phase 2 - Proposed HydroCAD

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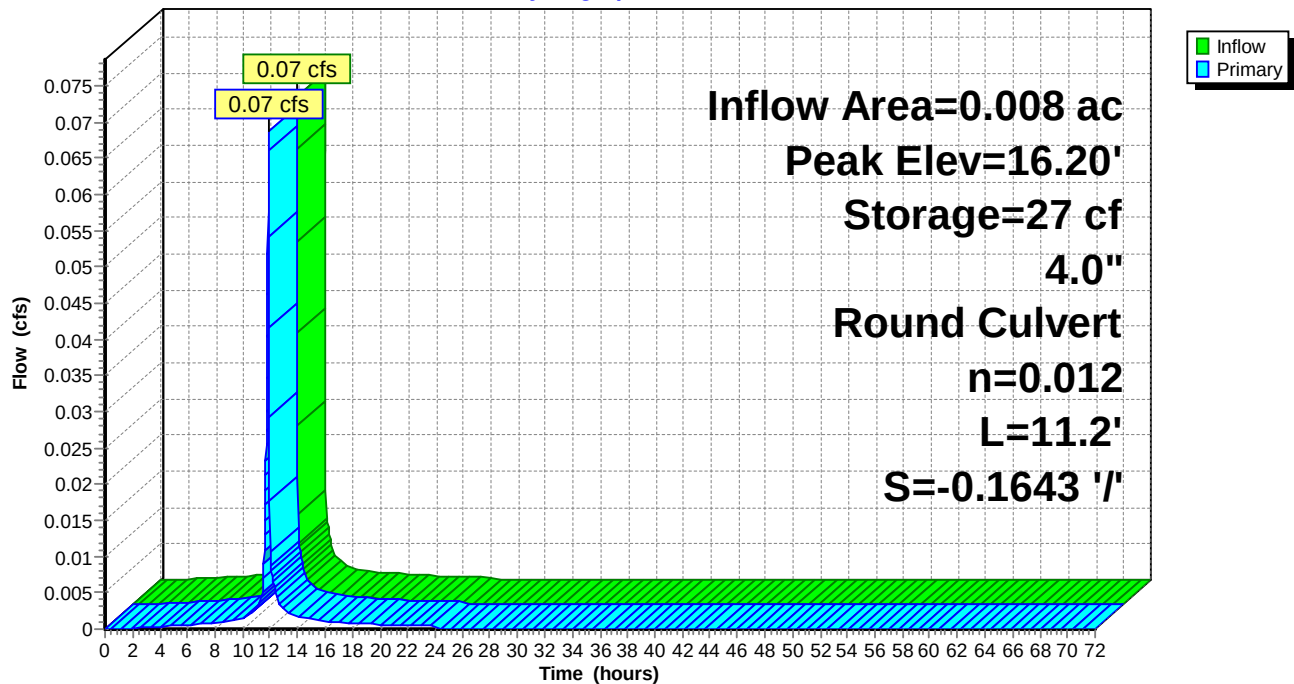
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Pond P40: Planter #40

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Summary for Pond P41: Planter #41

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.20 cfs @ 11.92 hrs, Volume= 0.010 af, Atten= 7%, Lag= 1.0 min
 Primary = 0.20 cfs @ 11.92 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.99' @ 11.92 hrs Surf.Area= 70 sf Storage= 21 cf

Plug-Flow detention time= 19.8 min calculated for 0.010 af (99% of inflow)

Center-of-Mass det. time= 11.0 min (763.0 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.24'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	70	0.0	0	0
14.25	70	40.0	0	0
17.99	70	40.0	105	105
18.00	70	100.0	1	106
19.00	70	100.0	70	176
19.01	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	14.45'	4.0" Round Culvert L= 23.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 13.95' S= 0.0210 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.92 hrs HW=14.98' TW=13.20' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.20 cfs @ 2.31 fps)

Naima - Phase 2 - Proposed HydroCAD

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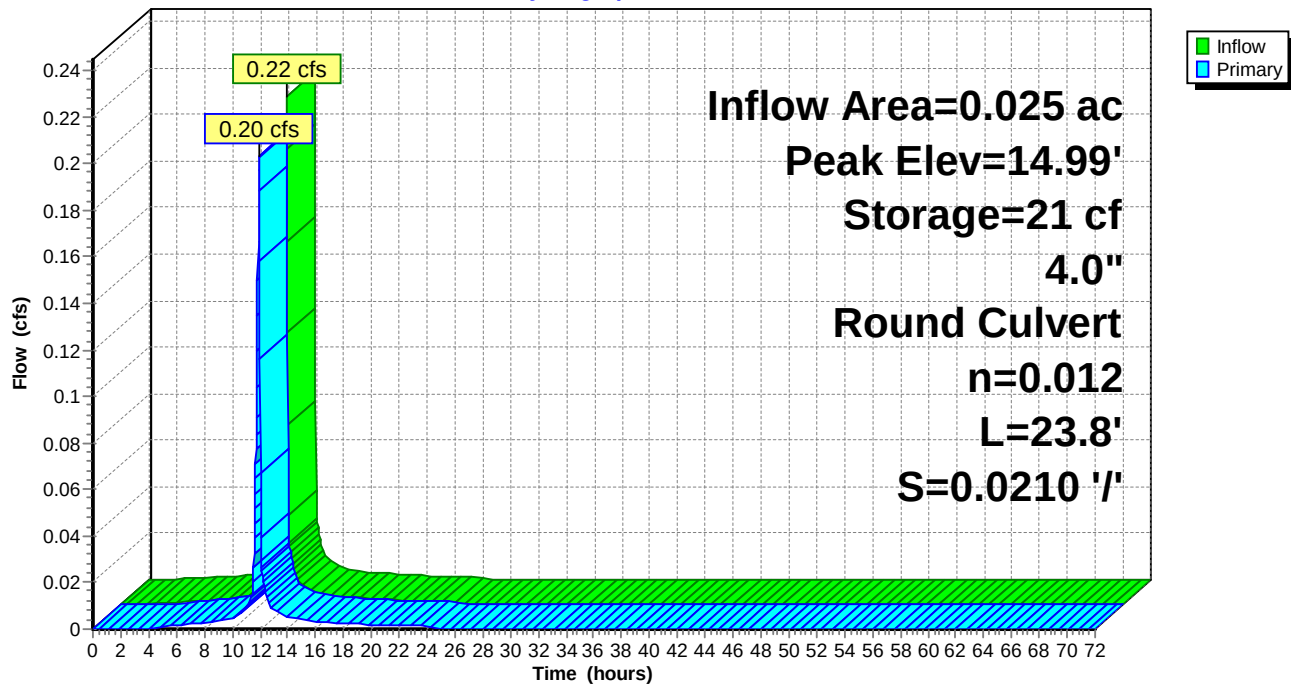
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Pond P41: Planter #41

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P42: Planter #42

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.14' Surf.Area= 30 sf Storage= 23 cf

Peak Elev= 16.35' @ 11.90 hrs Surf.Area= 30 sf Storage= 25 cf (2 cf above start)

Plug-Flow detention time= 124.7 min calculated for 0.003 af (84% of inflow)

Center-of-Mass det. time= 2.7 min (754.7 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	30	0.0	0	0
14.25	30	40.0	0	0
17.99	30	40.0	45	45
18.00	30	100.0	0	45
19.00	30	100.0	30	75
19.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	16.14'	4.0" Round Culvert L= 19.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.14' S= -0.0854 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=16.34' TW=15.35' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.07 cfs @ 1.22 fps)

Naima - Phase 2 - Proposed HydroCAD

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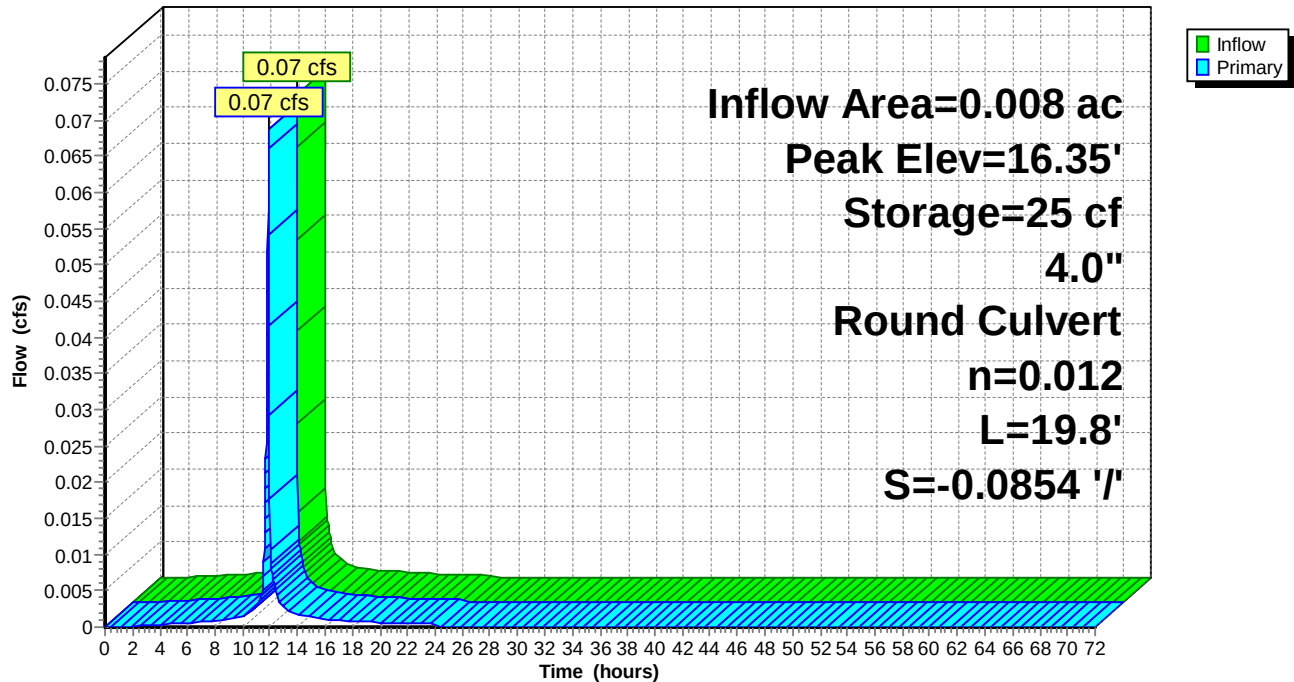
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P42: Planter #42

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P43: Planter #43

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.31' Surf.Area= 40 sf Storage= 33 cf

Peak Elev= 16.60' @ 11.90 hrs Surf.Area= 40 sf Storage= 38 cf (5 cf above start)

Plug-Flow detention time= 114.6 min calculated for 0.005 af (86% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	14.24'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	40	0.0	0	0
14.25	40	40.0	0	0
17.99	40	40.0	60	60
18.00	40	100.0	0	60
19.00	40	100.0	40	100
19.01	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	16.31'	4.0" Round Culvert L= 28.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.31' S= -0.0648 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=16.59' TW=15.36' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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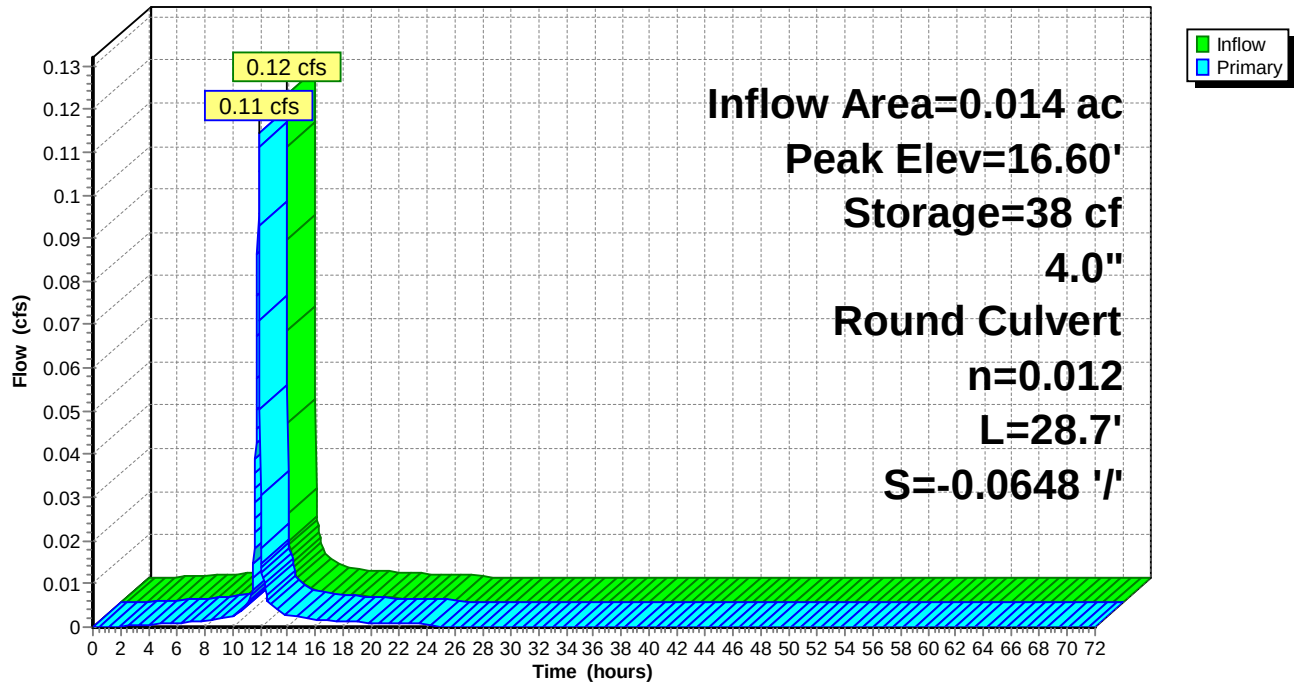
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P43: Planter #43

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P44: Planter #44

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.78' @ 11.91 hrs Surf.Area= 50 sf Storage= 1 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.2 min (752.2 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	121 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	50	0.0	0	0
14.75	50	40.0	0	0
17.99	50	40.0	65	65
18.00	50	100.0	1	66
19.00	50	100.0	50	116
19.01	1,000	100.0	5	121

Device	Routing	Invert	Outlet Devices
#1	Primary	14.45'	4.0" Round Culvert L= 19.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 14.18' S= 0.0136 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=14.77' TW=13.18' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.53 fps)

Naima - Phase 2 - Proposed HydroCAD

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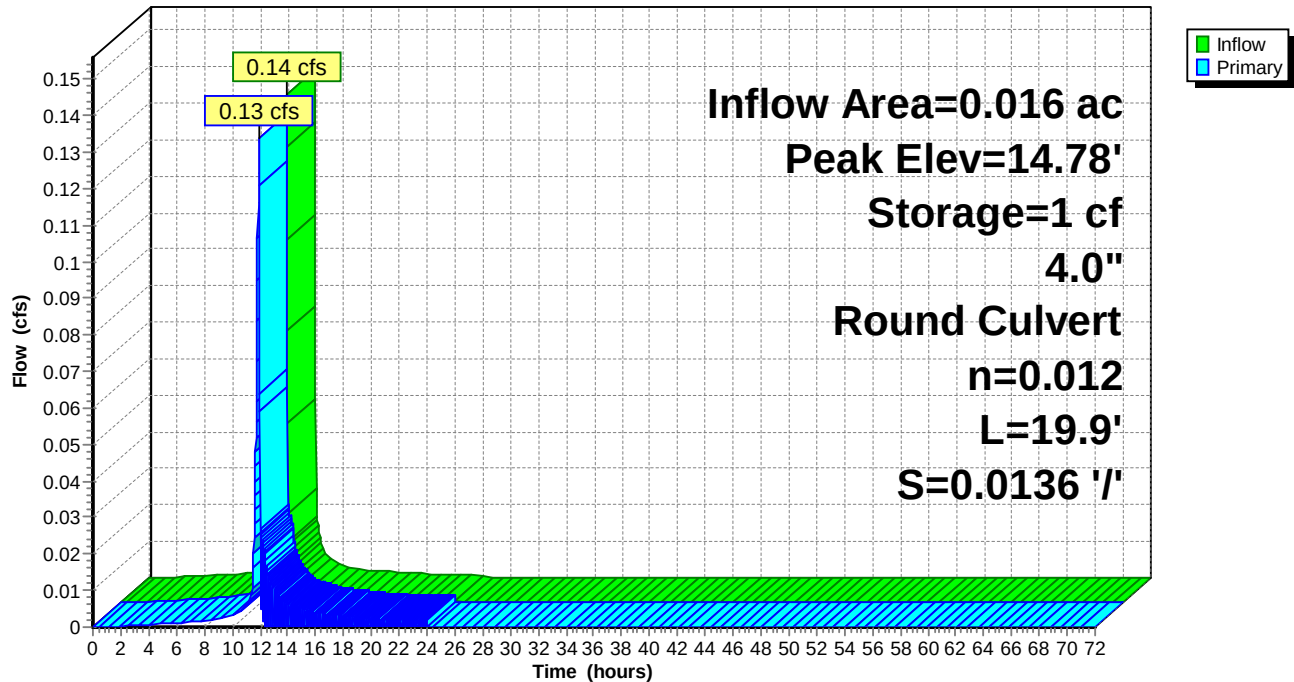
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P44: Planter #44

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P45: Planter #45

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.46' Surf.Area= 40 sf Storage= 36 cf

Peak Elev= 16.74' @ 11.90 hrs Surf.Area= 40 sf Storage= 40 cf (5 cf above start)

Plug-Flow detention time= 119.9 min calculated for 0.005 af (85% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.24'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	40	0.0	0	0
14.25	40	40.0	0	0
17.99	40	40.0	60	60
18.00	40	100.0	0	60
19.00	40	100.0	40	100
19.01	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices	
#1	Primary	16.46'	4.0" Round Culvert L= 36.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.46' S= -0.0552 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=16.74' TW=15.36' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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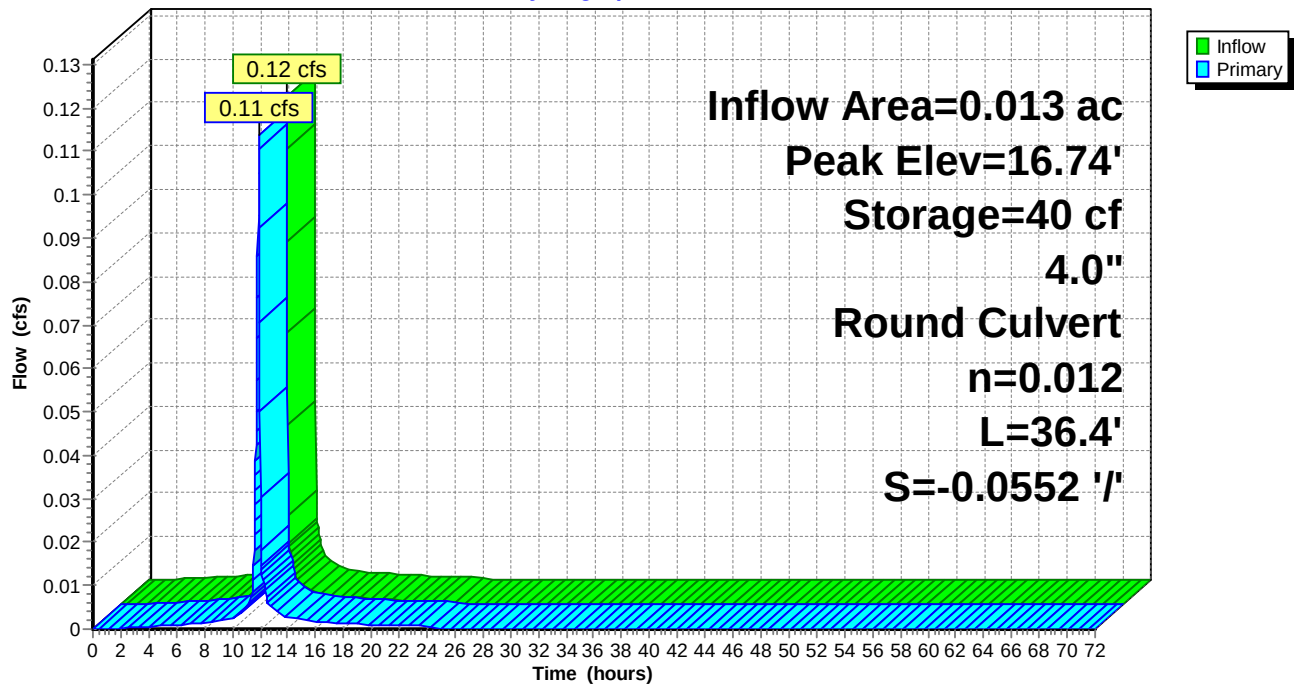
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P45: Planter #45

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P46: Planter #46

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af
 Outflow = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.2 min
 Primary = 0.04 cfs @ 11.90 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 15.11' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 24.8 min calculated for 0.002 af (98% of inflow)
 Center-of-Mass det. time= 12.4 min (764.4 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	20	0.0	0	0
14.75	20	40.0	0	0
18.49	20	40.0	30	30
18.50	20	100.0	0	30
19.50	20	100.0	20	50
19.51	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	14.95'	4.0" Round Culvert L= 28.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 14.24' S= 0.0248 ' S= 0.0248 ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.04 cfs @ 11.90 hrs HW=15.11' TW=13.17' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.04 cfs @ 1.06 fps)

Naima - Phase 2 - Proposed HydroCAD

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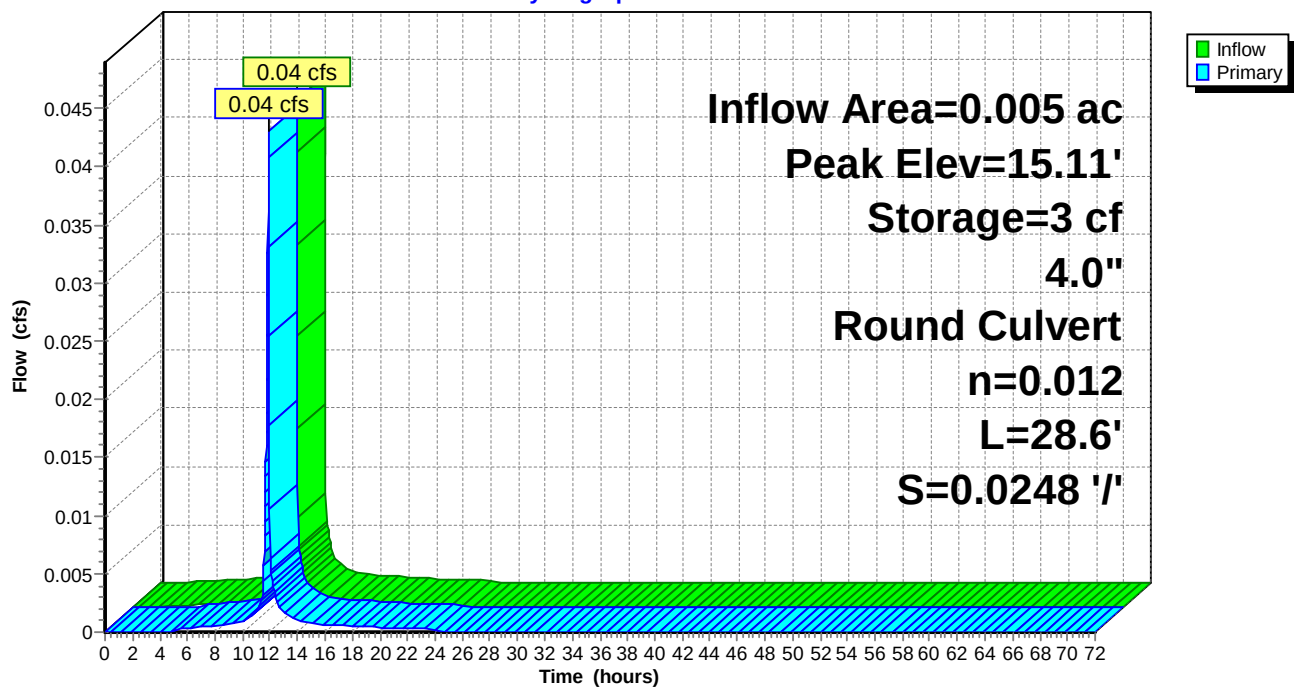
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P46: Planter #46

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P47: Planter #47

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.21 cfs @ 11.93 hrs, Volume= 0.011 af, Atten= 15%, Lag= 1.6 min
 Primary = 0.21 cfs @ 11.93 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.60' Surf.Area= 80 sf Storage= 60 cf

Peak Elev= 17.36' @ 11.93 hrs Surf.Area= 80 sf Storage= 84 cf (24 cf above start)

Plug-Flow detention time= 106.4 min calculated for 0.010 af (88% of inflow)

Center-of-Mass det. time= 4.1 min (756.1 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	14.74'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	80	0.0	0	0
14.75	80	40.0	0	0
18.49	80	40.0	120	120
18.50	80	100.0	1	121
19.50	80	100.0	80	201
19.51	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	16.60'	4.0" Round Culvert L= 59.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 16.60' S= -0.0277 ' / S= -0.0277 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.93 hrs HW=17.35' TW=15.49' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.20 cfs @ 2.35 fps)

Naima - Phase 2 - Proposed HydroCAD

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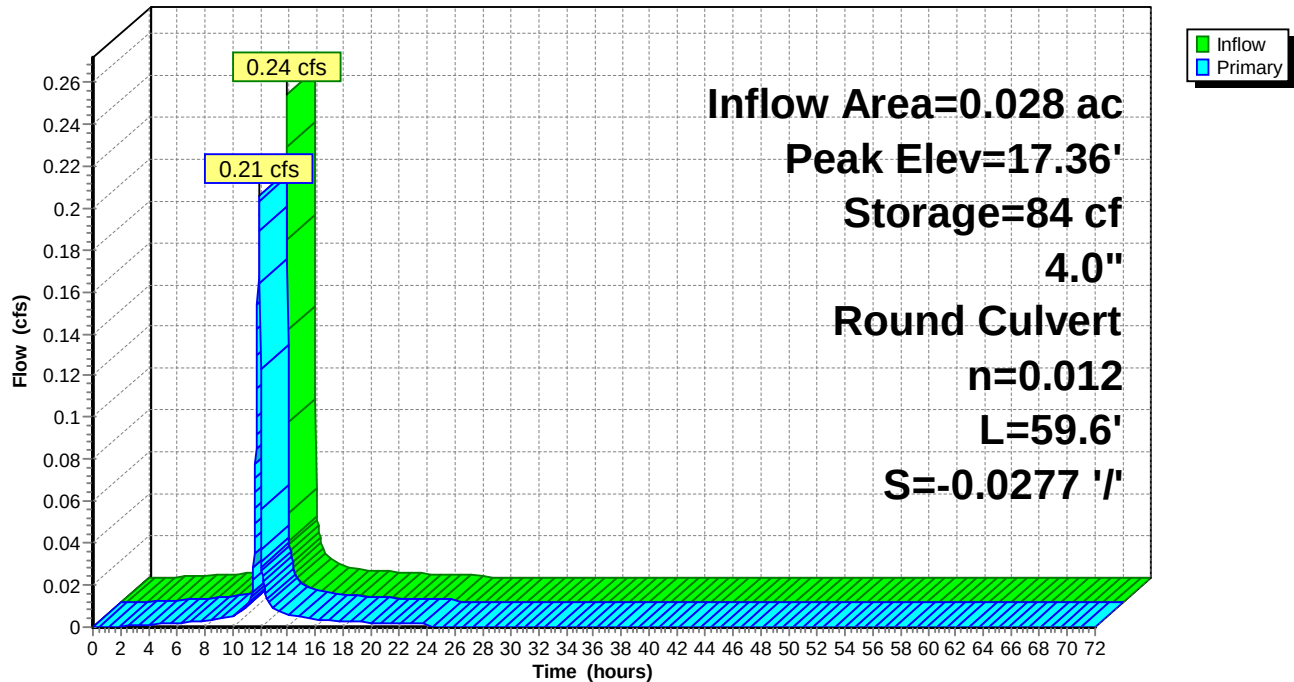
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P47: Planter #47

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P48: Planter #48

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.16 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.15 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.8 min
 Primary = 0.15 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 17.28' @ 11.91 hrs Surf.Area= 55 sf Storage= 56 cf

Plug-Flow detention time= 119.7 min calculated for 0.006 af (85% of inflow)
 Center-of-Mass det. time= 51.7 min (803.7 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	55	0.0	0	0
14.75	55	40.0	0	0
18.49	55	40.0	82	82
18.50	55	100.0	1	83
19.50	55	100.0	55	138
19.51	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	16.90'	4.0" Round Culvert L= 24.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.44' / 16.90' S= -0.0992 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.15 cfs @ 11.91 hrs HW=17.27' TW=13.19' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.15 cfs @ 1.72 fps)

Naima - Phase 2 - Proposed HydroCAD

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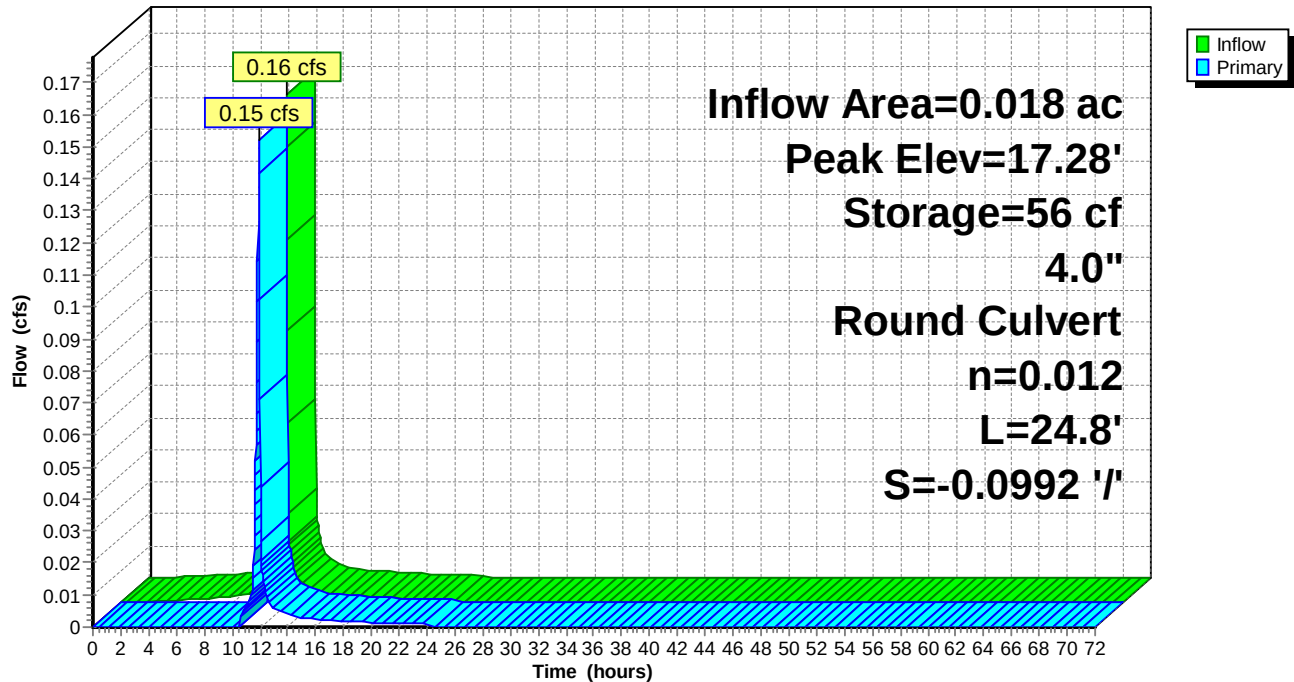
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P48: Planter #48

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P49: Planter #49

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.12' Surf.Area= 30 sf Storage= 29 cf

Peak Elev= 17.33' @ 11.90 hrs Surf.Area= 30 sf Storage= 31 cf (3 cf above start)

Plug-Flow detention time= 138.8 min calculated for 0.003 af (80% of inflow)

Center-of-Mass det. time= 2.6 min (754.6 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	30	0.0	0	0
14.75	30	40.0	0	0
18.49	30	40.0	45	45
18.50	30	100.0	0	45
19.50	30	100.0	30	75
19.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices	
#1	Primary	17.12'	4.0" Round Culvert L= 19.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 17.12' S= -0.1090 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=17.33' TW=15.35' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.07 cfs @ 1.23 fps)

Naima - Phase 2 - Proposed HydroCAD

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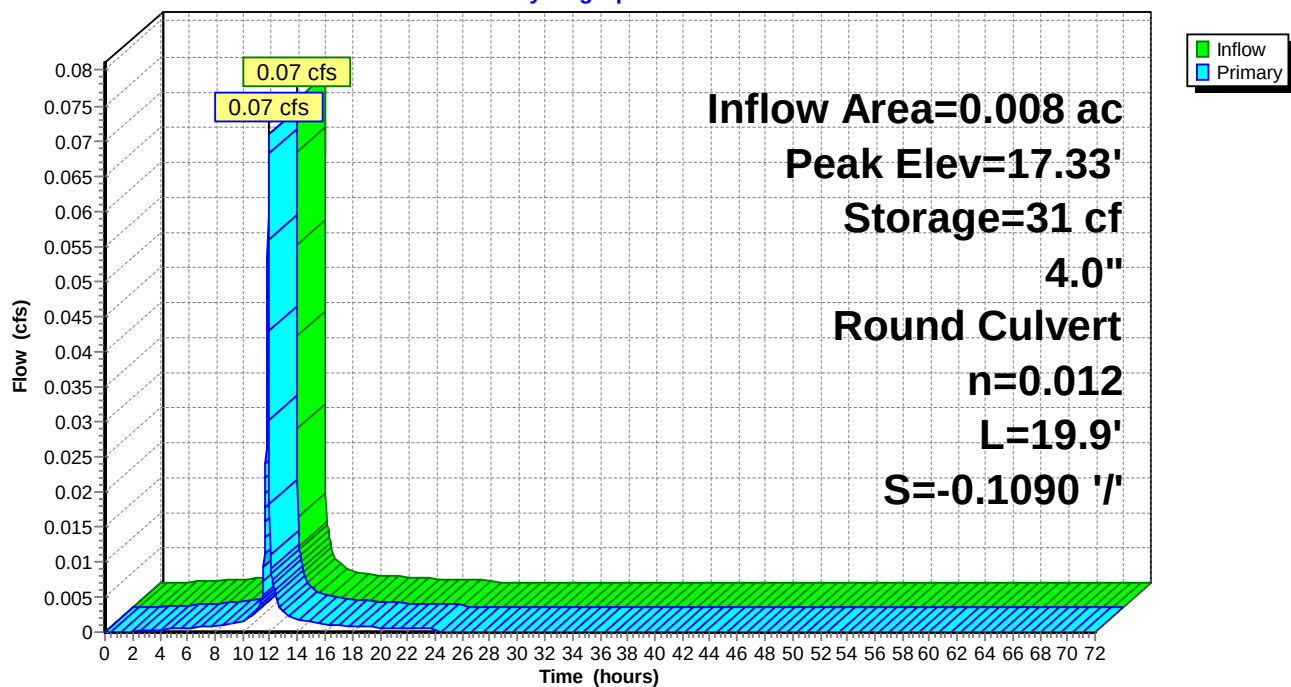
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Pond P49: Planter #49

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P50: Planter #50

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.14 cfs @ 11.90 hrs, Volume= 0.006 af
 Outflow = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.13 cfs @ 11.91 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 16.28' @ 11.91 hrs Surf.Area= 50 sf Storage= 11 cf

Plug-Flow detention time= 21.6 min calculated for 0.006 af (99% of inflow)
 Center-of-Mass det. time= 11.3 min (763.3 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	50	0.0	0	0
15.75	50	40.0	0	0
19.49	50	40.0	75	75
19.50	50	100.0	1	76
20.50	50	100.0	50	126
20.51	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	15.95'	4.0" Round Culvert L= 19.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 14.55' S= 0.0722 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.13 cfs @ 11.91 hrs HW=16.27' TW=13.18' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.13 cfs @ 1.53 fps)

Naima - Phase 2 - Proposed HydroCAD

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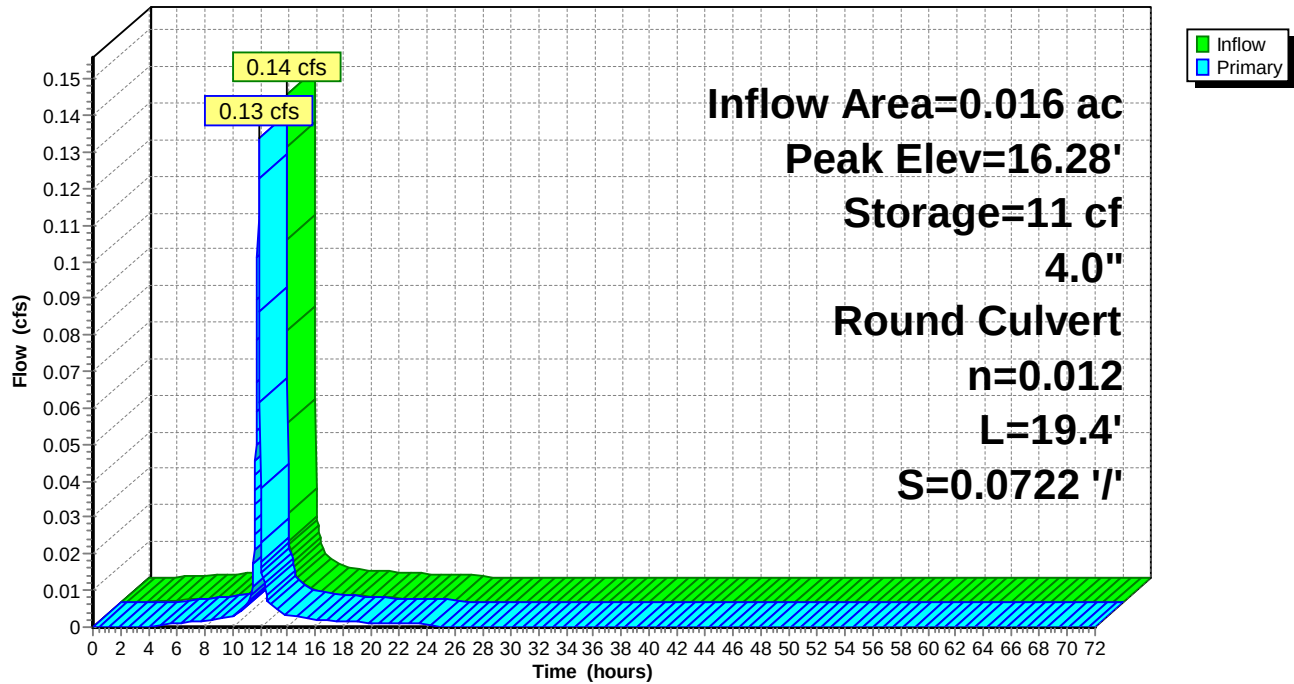
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Pond P50: Planter #50

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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P51: Planter #51

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.31' Surf.Area= 40 sf Storage= 25 cf

Peak Elev= 17.59' @ 11.90 hrs Surf.Area= 40 sf Storage= 30 cf (5 cf above start)

Plug-Flow detention time= 96.9 min calculated for 0.005 af (89% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	40	0.0	0	0
15.75	40	40.0	0	0
19.49	40	40.0	60	60
19.50	40	100.0	0	60
20.50	40	100.0	40	100
20.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	17.31'	4.0" Round Culvert L= 36.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 17.31' S= -0.0370 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=17.59' TW=15.36' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

Naima - Phase 2 - Proposed HydroCAD

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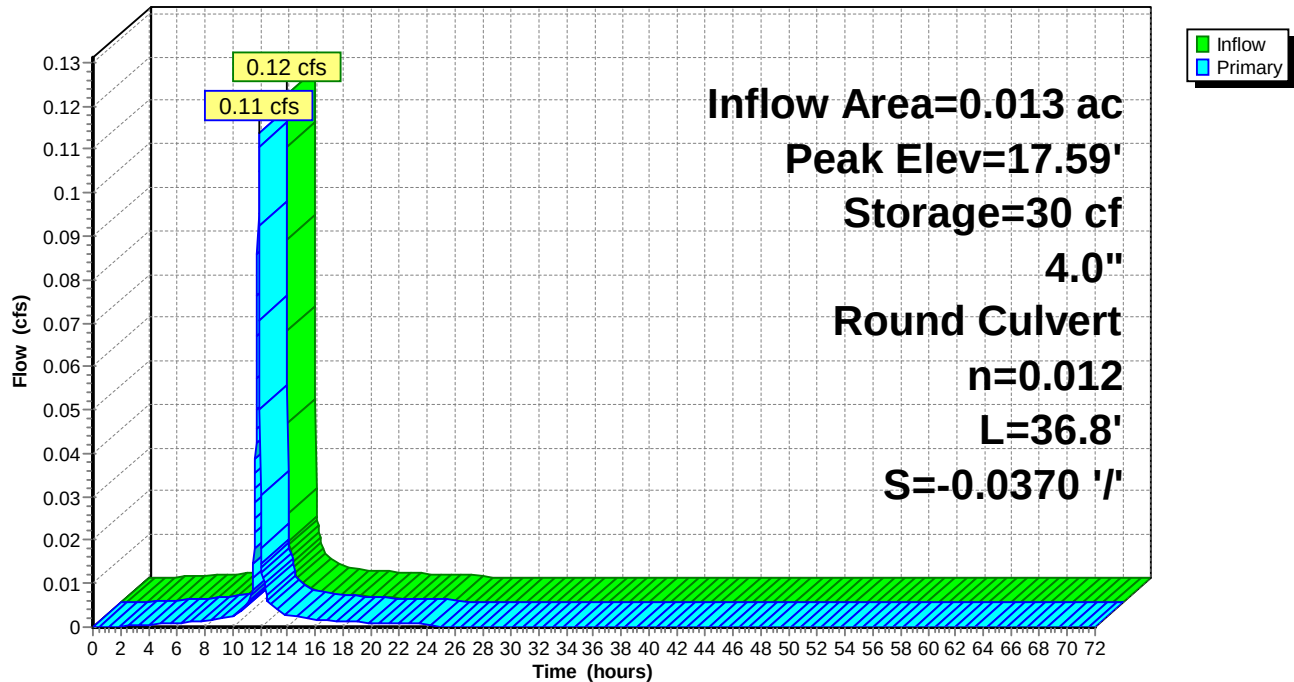
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Pond P51: Planter #51

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P52: Planter #52

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.12 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.11 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.54' Surf.Area= 40 sf Storage= 29 cf

Peak Elev= 17.83' @ 11.90 hrs Surf.Area= 40 sf Storage= 33 cf (5 cf above start)

Plug-Flow detention time= 105.4 min calculated for 0.005 af (88% of inflow)

Center-of-Mass det. time= 2.8 min (754.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	40	0.0	0	0
15.75	40	40.0	0	0
19.49	40	40.0	60	60
19.50	40	100.0	0	60
20.50	40	100.0	40	100
20.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	17.54'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 17.54' S= -0.0550 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 11.90 hrs HW=17.82' TW=15.36' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.43 fps)

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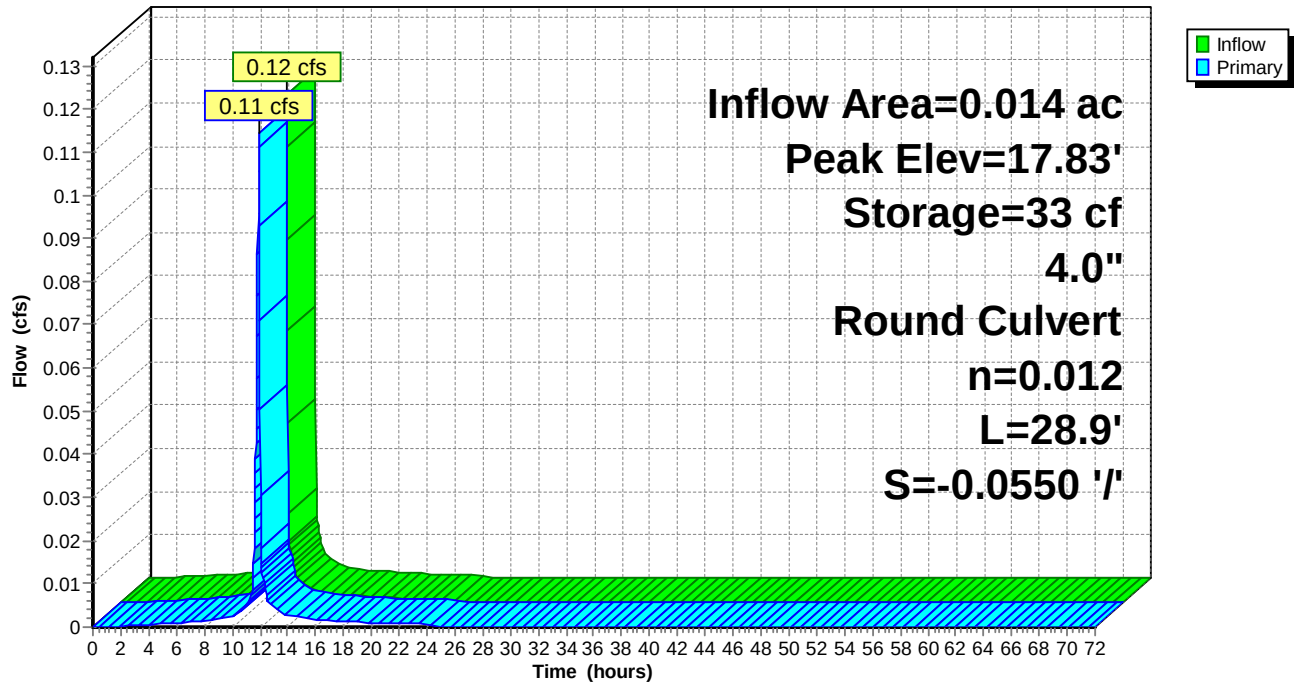
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P52: Planter #52

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P53: Planter #53

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.22 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.20 cfs @ 11.92 hrs, Volume= 0.010 af, Atten= 7%, Lag= 1.0 min
 Primary = 0.20 cfs @ 11.92 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 16.49' @ 11.92 hrs Surf.Area= 70 sf Storage= 21 cf

Plug-Flow detention time= 19.8 min calculated for 0.010 af (99% of inflow)
 Center-of-Mass det. time= 11.0 min (763.0 - 752.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	70	0.0	0	0
15.75	70	40.0	0	0
19.49	70	40.0	105	105
19.50	70	100.0	1	106
20.50	70	100.0	70	176
20.51	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	15.95'	4.0" Round Culvert L= 22.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 14.78' S= 0.0513 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.20 cfs @ 11.92 hrs HW=16.48' TW=13.20' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.20 cfs @ 2.31 fps)

Naima - Phase 2 - Proposed HydroCAD

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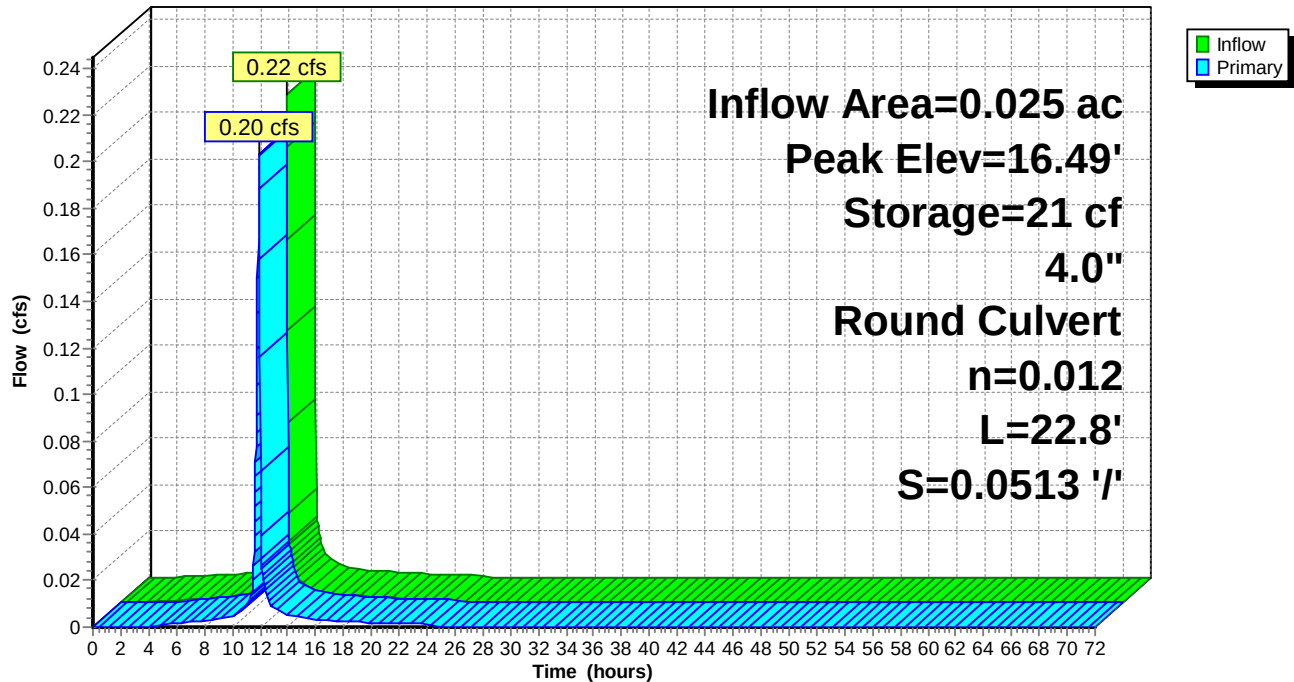
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P53: Planter #53

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond P54: Planter #54

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 4.83" for 10-YR event
 Inflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.07 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 18.58' Surf.Area= 30 sf Storage= 34 cf

Peak Elev= 18.79' @ 11.90 hrs Surf.Area= 30 sf Storage= 37 cf (2 cf above start)

Plug-Flow detention time= 154.8 min calculated for 0.002 af (76% of inflow)

Center-of-Mass det. time= 2.7 min (754.7 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	30	0.0	0	0
15.75	30	40.0	0	0
19.49	30	40.0	45	45
19.50	30	100.0	0	45
20.50	30	100.0	30	75
20.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	18.58'	4.0" Round Culvert L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 18.58' S= -0.2023 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.07 cfs @ 11.90 hrs HW=18.78' TW=16.62' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.07 cfs @ 1.22 fps)

Naima - Phase 2 - Proposed HydroCAD

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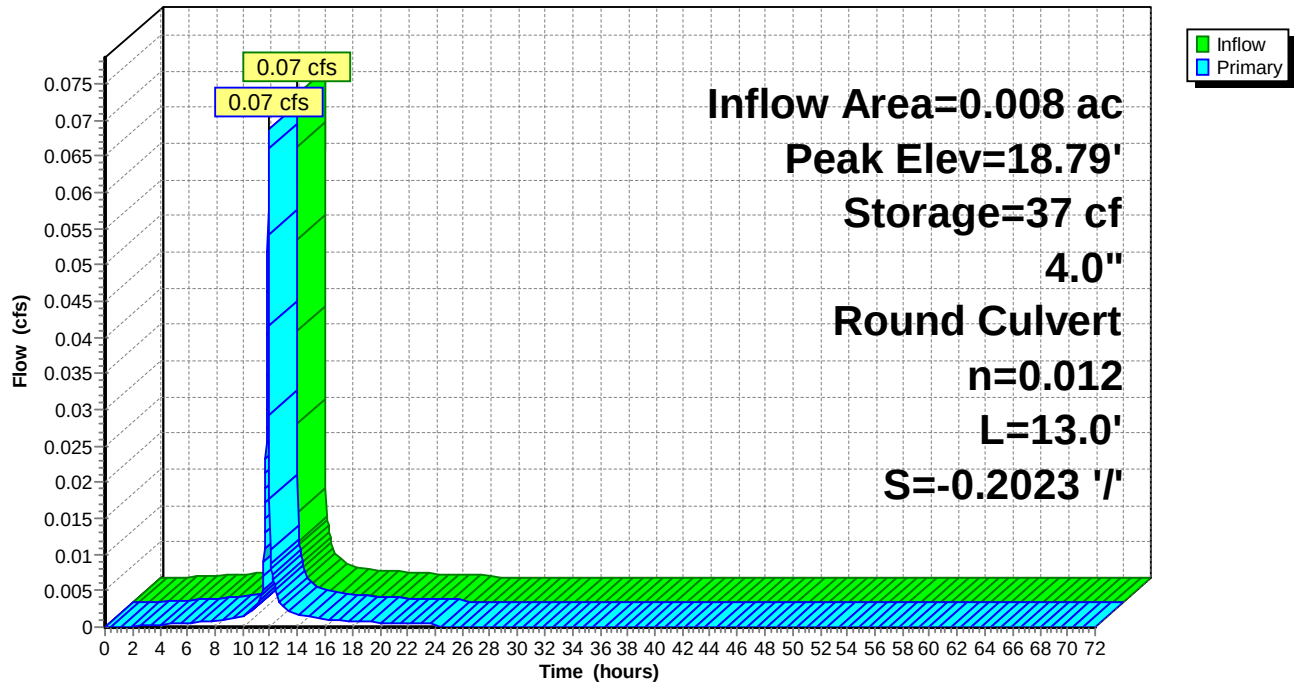
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond P54: Planter #54

Hydrograph



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond PA-2: Porous Asphalt #2

Inflow Area = 0.105 ac, 81.59% Impervious, Inflow Depth = 4.54" for 10-YR event
 Inflow = 0.61 cfs @ 11.95 hrs, Volume= 0.040 af
 Outflow = 0.44 cfs @ 12.02 hrs, Volume= 0.039 af, Atten= 27%, Lag= 4.3 min
 Primary = 0.44 cfs @ 12.02 hrs, Volume= 0.039 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.70' @ 12.02 hrs Surf.Area= 1,172 sf Storage= 309 cf

Plug-Flow detention time= 46.5 min calculated for 0.039 af (99% of inflow)

Center-of-Mass det. time= 37.9 min (810.2 - 772.2)

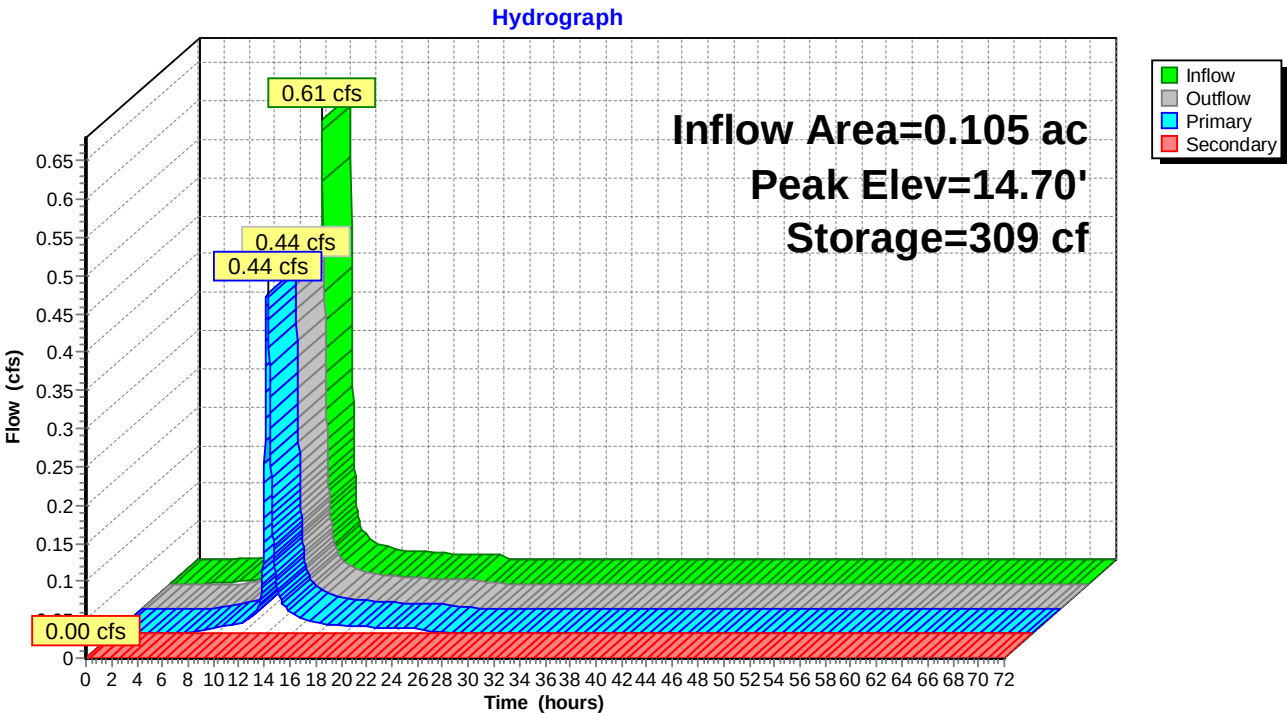
Volume	Invert	Avail.Storage	Storage Description
#1	14.04'	4,998 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.04	1,172	0.0	0	0
14.05	1,172	40.0	5	5
14.80	1,172	40.0	352	356
14.81	1,172	20.0	2	359
15.21	1,172	20.0	94	452
15.22	12,000	100.0	66	518
15.50	20,000	100.0	4,480	4,998

Device	Routing	Invert	Outlet Devices
#1	Primary	14.09'	6.0" Round Culvert L= 55.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.09' / 13.90' S= 0.0035 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.36'	55.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.44 cfs @ 12.02 hrs HW=14.70' TW=14.01' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.44 cfs @ 2.36 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.04' TW=15.10' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-2: Porous Asphalt #2



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond PA-3: Porous Asphalt #3

Inflow Area = 0.136 ac, 64.54% Impervious, Inflow Depth = 4.10" for 10-YR event
 Inflow = 0.64 cfs @ 11.93 hrs, Volume= 0.046 af
 Outflow = 0.49 cfs @ 12.04 hrs, Volume= 0.046 af, Atten= 23%, Lag= 6.6 min
 Primary = 0.49 cfs @ 12.04 hrs, Volume= 0.046 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.60' @ 12.04 hrs Surf.Area= 903 sf Storage= 266 cf

Plug-Flow detention time= 31.0 min calculated for 0.046 af (99% of inflow)

Center-of-Mass det. time= 25.0 min (812.8 - 787.9)

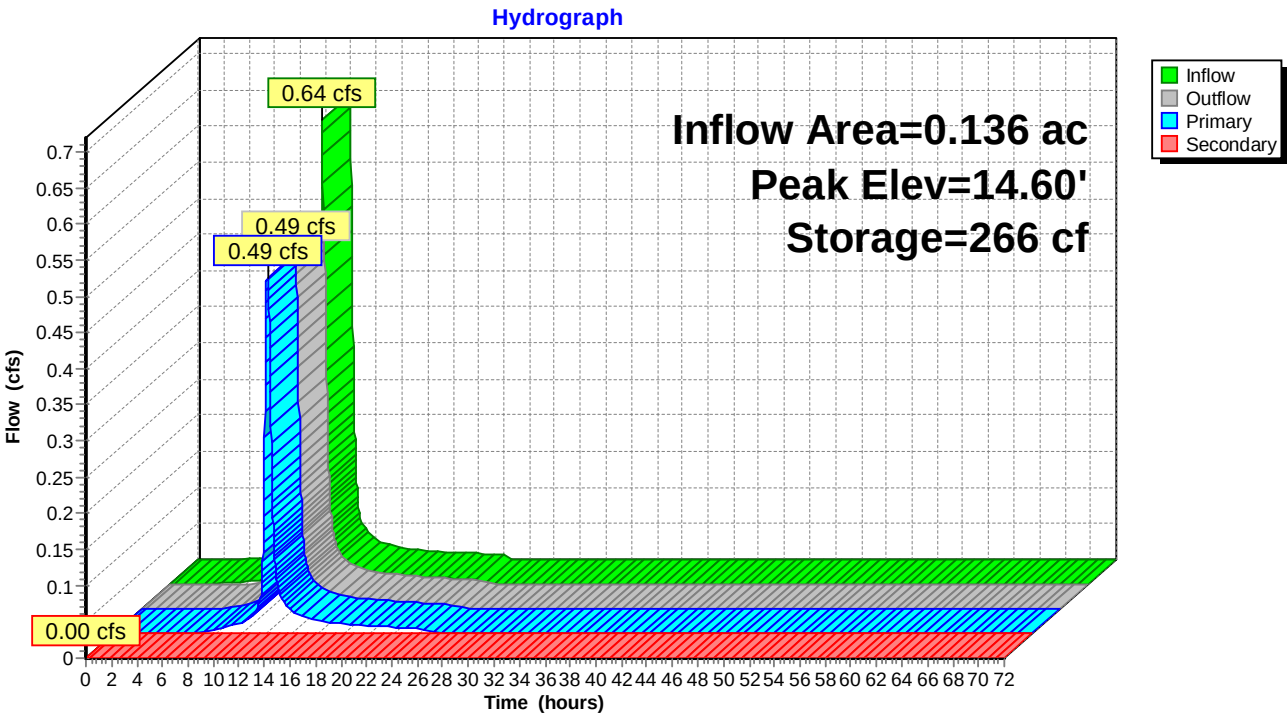
Volume	Invert	Avail.Storage	Storage Description
#1	13.86'	7,773 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.86	903	0.0	0	0
13.87	903	40.0	4	4
14.62	903	40.0	271	275
14.63	903	20.0	2	276
15.03	903	20.0	72	349
15.04	12,000	100.0	65	413
15.50	20,000	100.0	7,360	7,773

Device	Routing	Invert	Outlet Devices
#1	Primary	13.91'	6.0" Round Culvert L= 43.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.91' / 13.70' S= 0.0049 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.04'	43.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.49 cfs @ 12.04 hrs HW=14.60' TW=14.01' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.49 cfs @ 2.51 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=13.86' TW=12.30' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-3: Porous Asphalt #3



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond PA-4: Porous Asphalt #4

Inflow Area = 0.168 ac, 70.97% Impervious, Inflow Depth = 4.29" for 10-YR event
 Inflow = 0.85 cfs @ 11.95 hrs, Volume= 0.060 af
 Outflow = 0.63 cfs @ 12.02 hrs, Volume= 0.060 af, Atten= 26%, Lag= 4.3 min
 Primary = 0.63 cfs @ 12.02 hrs, Volume= 0.060 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 14.89' @ 12.02 hrs Surf.Area= 1,097 sf Storage= 398 cf

Plug-Flow detention time= 34.0 min calculated for 0.060 af (99% of inflow)

Center-of-Mass det. time= 28.3 min (809.5 - 781.2)

Volume	Invert	Avail.Storage	Storage Description
#1	13.84'	8,169 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.84	1,097	0.0	0	0
13.85	1,097	40.0	4	4
14.60	1,097	40.0	329	333
14.61	1,097	20.0	2	336
15.01	1,097	20.0	88	423
15.02	12,000	100.0	65	489
15.50	20,000	100.0	7,680	8,169

Device	Routing	Invert	Outlet Devices
#1	Primary	13.89'	6.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.89' / 13.70' S= 0.0037 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.02'	52.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.63 cfs @ 12.02 hrs HW=14.89' TW=14.01' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.63 cfs @ 3.20 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=13.84' TW=12.30' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Naima - Phase 2 - Proposed HydroCAD

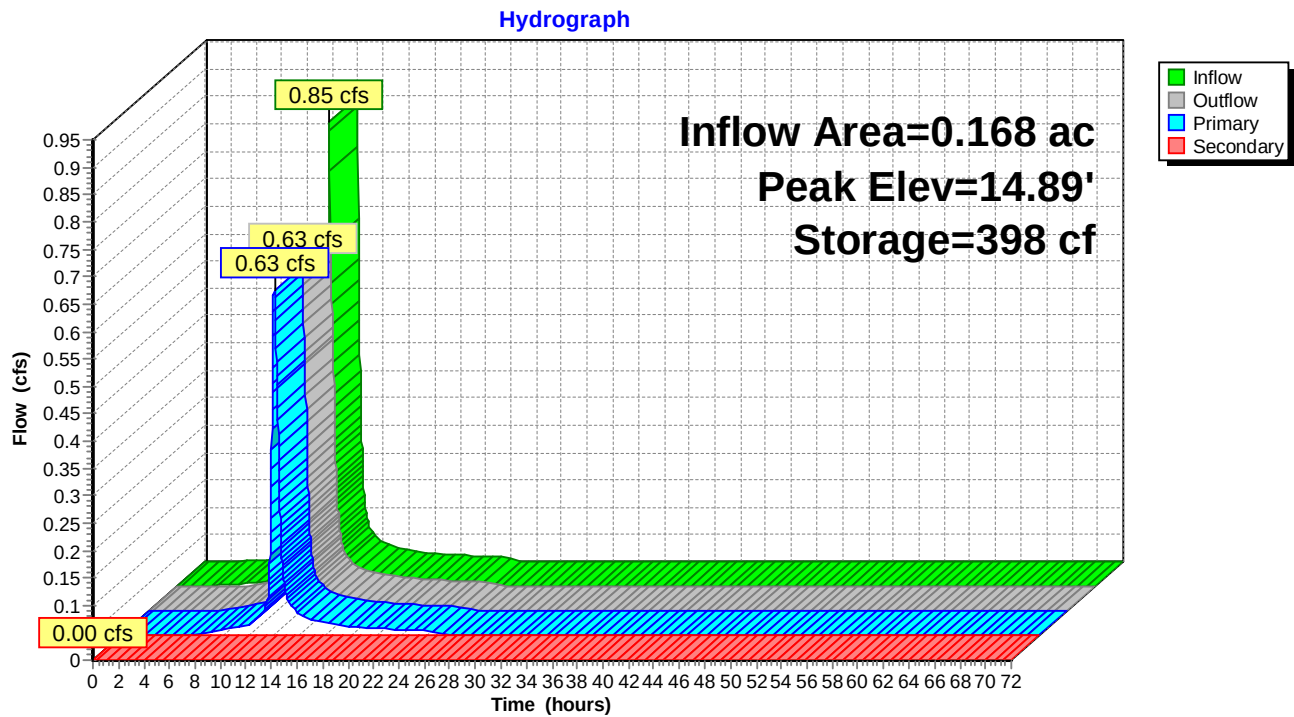
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Pond PA-4: Porous Asphalt #4



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond PA-5: Porous Asphalt #5

Inflow Area = 0.187 ac, 78.13% Impervious, Inflow Depth = 4.49" for 10-YR event
 Inflow = 0.95 cfs @ 11.94 hrs, Volume= 0.070 af
 Outflow = 0.49 cfs @ 12.13 hrs, Volume= 0.069 af, Atten= 48%, Lag= 11.8 min
 Primary = 0.49 cfs @ 12.13 hrs, Volume= 0.069 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.19' @ 12.13 hrs Surf.Area= 2,333 sf Storage= 872 cf

Plug-Flow detention time= 79.7 min calculated for 0.069 af (98% of inflow)

Center-of-Mass det. time= 68.7 min (844.9 - 776.2)

Volume	Invert	Avail.Storage	Storage Description
#1	14.08'	4,812 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.08	2,333	0.0	0	0
14.09	2,333	40.0	9	9
14.84	2,333	40.0	700	709
14.85	2,333	20.0	5	714
15.25	2,333	20.0	187	901
15.26	12,000	100.0	72	972
15.50	20,000	100.0	3,840	4,812

Device	Routing	Invert	Outlet Devices
#1	Primary	14.13'	6.0" Round Culvert L= 109.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.13' / 14.00' S= 0.0012 ' / S= 0.0012 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.26'	109.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.49 cfs @ 12.13 hrs HW=15.19' TW=13.85' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.49 cfs @ 2.52 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.08' TW=15.11' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Naima - Phase 2 - Proposed HydroCAD

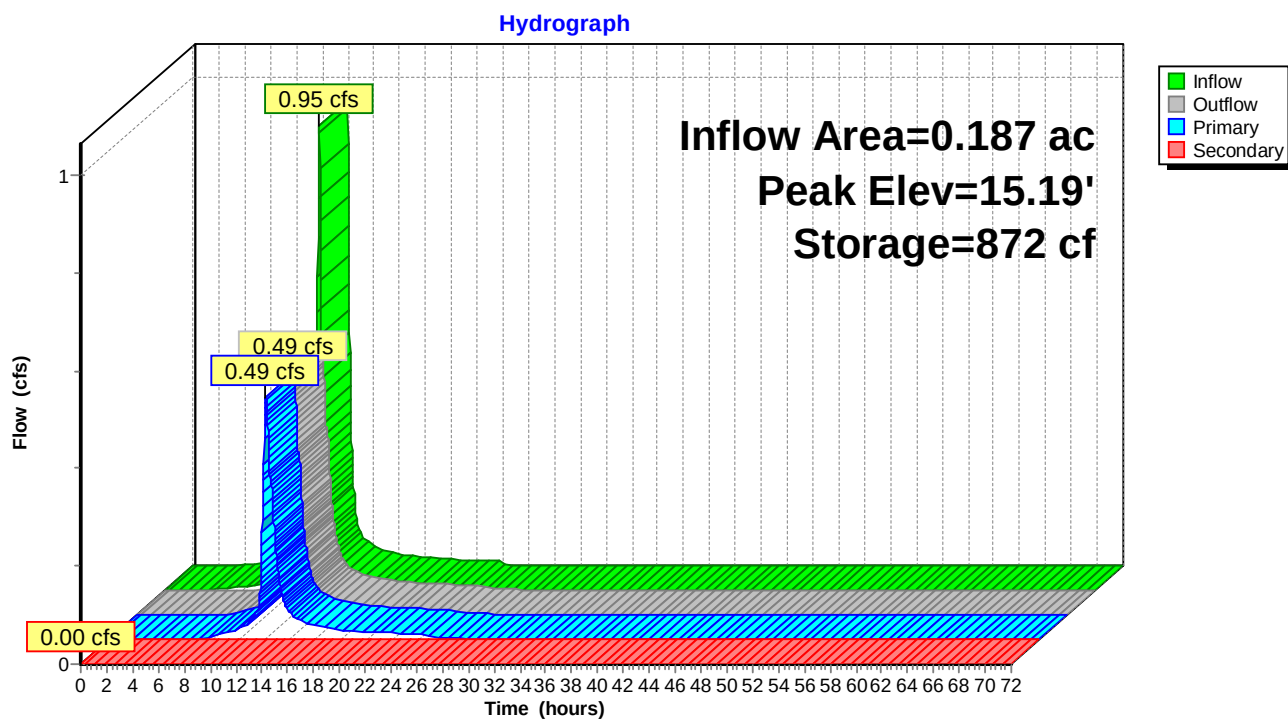
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Type II 24-hr 10-YR Rainfall=5.30"

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Pond PA-5: Porous Asphalt #5



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond PA-6: Porous Asphalt #6

Inflow Area = 0.290 ac, 80.14% Impervious, Inflow Depth = 4.53" for 10-YR event
 Inflow = 1.59 cfs @ 11.93 hrs, Volume= 0.110 af
 Outflow = 0.53 cfs @ 12.19 hrs, Volume= 0.108 af, Atten= 67%, Lag= 16.0 min
 Primary = 0.53 cfs @ 12.20 hrs, Volume= 0.108 af
 Secondary = 0.00 cfs @ 12.18 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.78' @ 12.20 hrs Surf.Area= 12,682 sf Storage= 1,519 cf

Plug-Flow detention time= 77.6 min calculated for 0.108 af (99% of inflow)

Center-of-Mass det. time= 68.3 min (841.3 - 773.0)

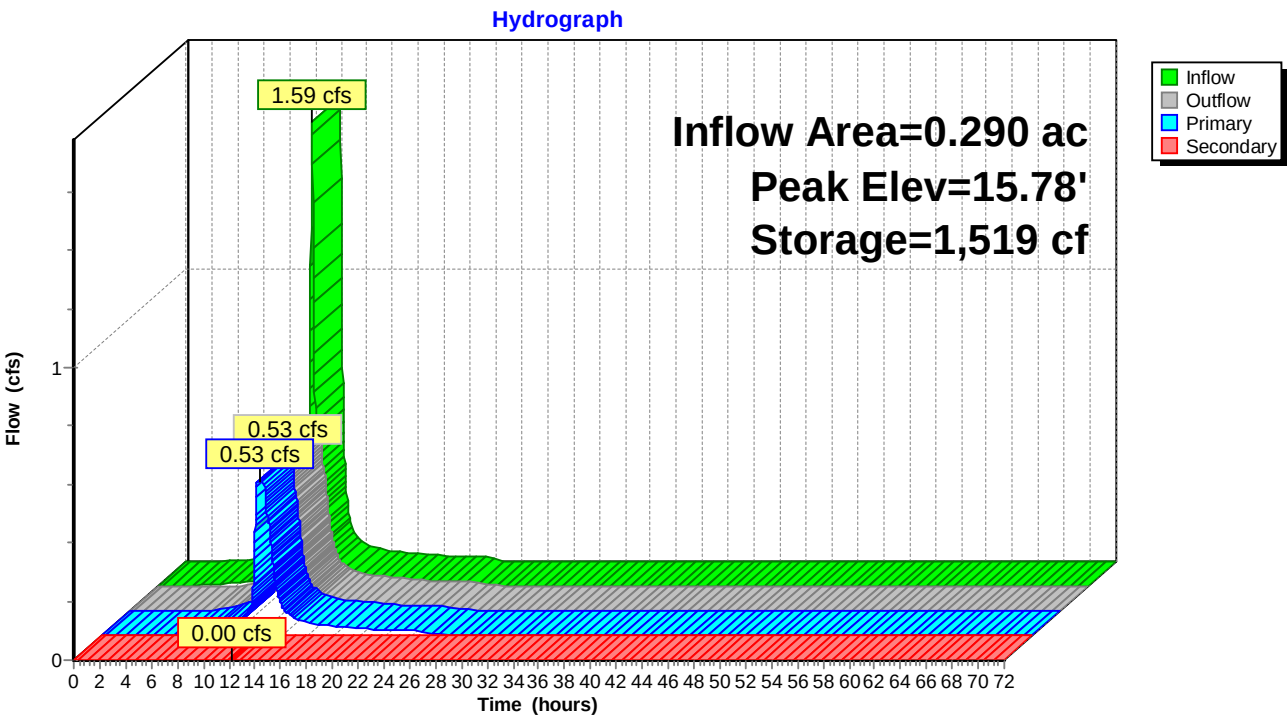
Volume	Invert	Avail.Storage	Storage Description
#1	14.58'	5,106 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.58	3,085	0.0	0	0
14.59	3,085	40.0	12	12
15.34	3,085	40.0	926	938
15.35	3,085	20.0	6	944
15.75	3,085	20.0	247	1,191
15.76	12,000	100.0	75	1,266
16.00	20,000	100.0	3,840	5,106

Device	Routing	Invert	Outlet Devices
#1	Primary	14.63'	6.0" Round Culvert L= 144.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.63' / 14.30' S= 0.0023 ' / S= 0.0023 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.76'	144.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.53 cfs @ 12.20 hrs HW=15.78' TW=13.71' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.53 cfs @ 2.70 fps)**Secondary OutFlow** Max=0.00 cfs @ 12.18 hrs HW=15.78' TW=15.78' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-6: Porous Asphalt #6



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond PA-7: Porous Asphalt #7

Inflow Area = 0.034 ac, 75.76% Impervious, Inflow Depth = 4.41" for 10-YR event
 Inflow = 0.18 cfs @ 11.93 hrs, Volume= 0.013 af
 Outflow = 0.15 cfs @ 12.01 hrs, Volume= 0.012 af, Atten= 15%, Lag= 4.9 min
 Primary = 0.15 cfs @ 12.01 hrs, Volume= 0.012 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 16.70' @ 12.01 hrs Surf.Area= 387 sf Storage= 65 cf

Plug-Flow detention time= 33.7 min calculated for 0.012 af (99% of inflow)

Center-of-Mass det. time= 24.9 min (803.4 - 778.5)

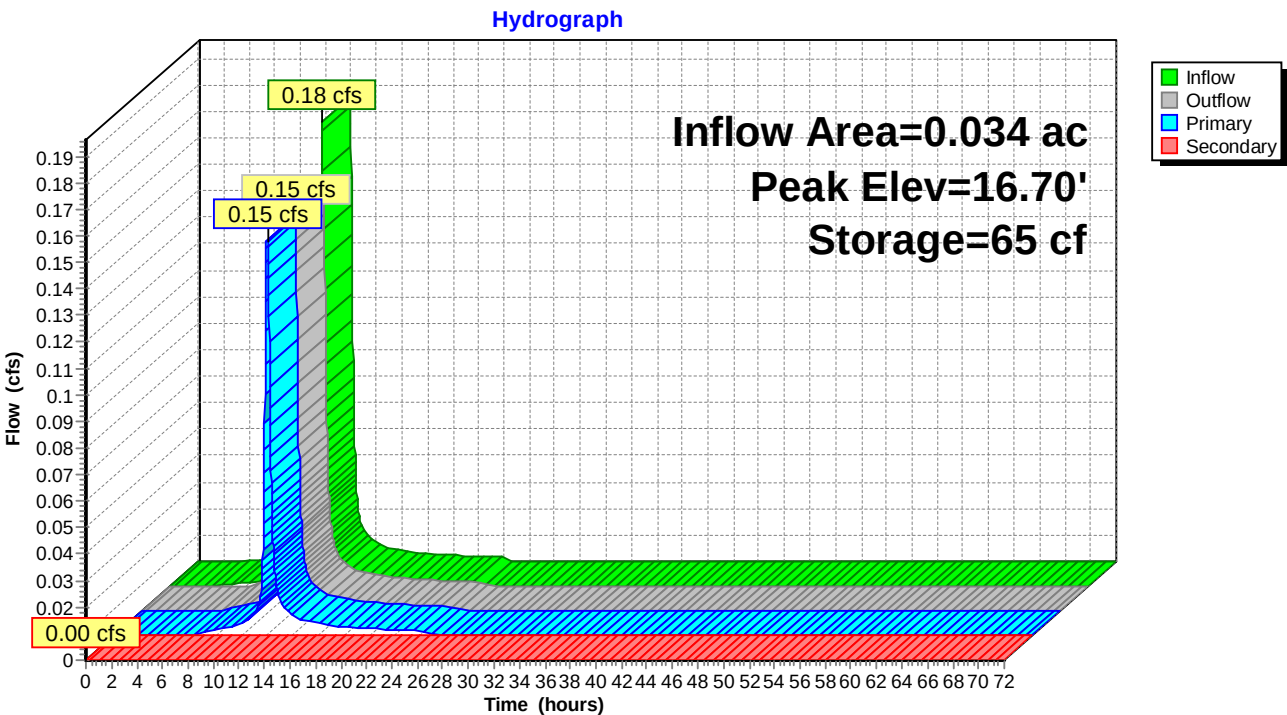
Volume	Invert	Avail.Storage	Storage Description
#1	16.28'	4,851 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.28	387	0.0	0	0
16.29	387	40.0	2	2
17.04	387	40.0	116	118
17.05	387	20.0	1	118
17.45	387	20.0	31	149
17.46	12,000	100.0	62	211
17.75	20,000	100.0	4,640	4,851

Device	Routing	Invert	Outlet Devices
#1	Primary	16.33'	4.0" Round Culvert L= 18.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 16.33' / 16.20' S= 0.0072 ' / S= 0.0072 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	17.46'	18.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.15 cfs @ 12.01 hrs HW=16.70' TW=14.00' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.15 cfs @ 1.70 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=16.28' TW=17.34' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-7: Porous Asphalt #7



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Type II 24-hr 10-YR Rainfall=5.30"

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Summary for Pond SDMH-1: Proposed SDMH West of Bldgs

Inflow Area = 1.512 ac, 62.04% Impervious, Inflow Depth = 4.03" for 10-YR event
Inflow = 4.59 cfs @ 11.93 hrs, Volume= 0.508 af
Outflow = 4.59 cfs @ 11.93 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min
Primary = 4.59 cfs @ 11.93 hrs, Volume= 0.508 af

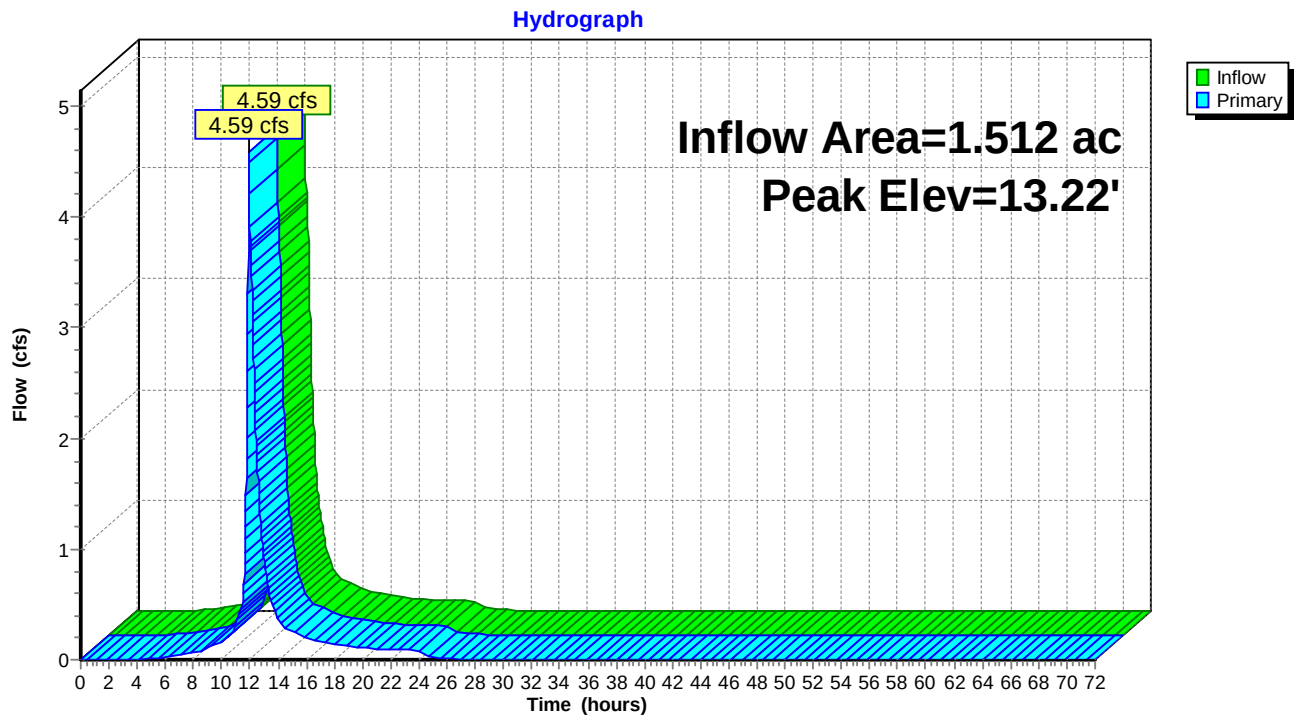
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 13.22' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	2.0" x 2.0" Horiz. Orifice/Grate X 11.00 columns X 11 rows C= 0.600 in 24.0" x 24.0" Grate (84% open area) Limited to weir flow at low heads
#2	Primary	12.00'	15.0" Round Culvert L= 172.1' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 12.00' / 10.14' S= 0.0108 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=4.57 cfs @ 11.93 hrs HW=13.22' TW=0.00' (Dynamic Tailwater)

1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Inlet Controls 4.57 cfs @ 3.75 fps)

Pond SDMH-1: Proposed SDMH West of Bldgs



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Type II 24-hr 10-YR Rainfall=5.30"

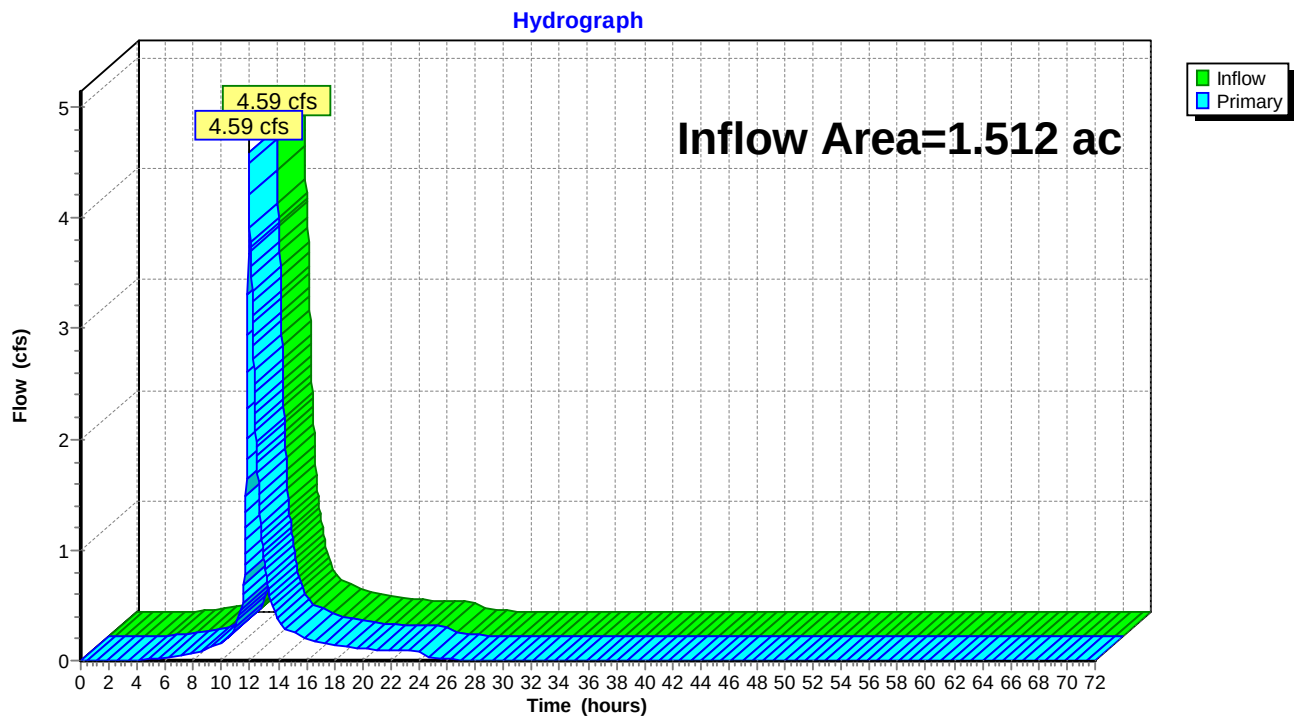
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Summary for Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow Area = 1.512 ac, 62.04% Impervious, Inflow Depth = 4.03" for 10-YR event
Inflow = 4.59 cfs @ 11.93 hrs, Volume= 0.508 af
Primary = 4.59 cfs @ 11.93 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton



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Type II 24-hr 100-YR Rainfall=7.60"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points x 2
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 17S: Rooftop #18	Runoff Area=771 sf 96.11% Impervious Runoff Depth=7.24"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=97	Runoff=0.22 cfs 0.011 af
Subcatchment 19: Rooftop #19	Runoff Area=796 sf 93.09% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.23 cfs 0.011 af
Subcatchment 20: Rooftop #20	Runoff Area=363 sf 91.74% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.10 cfs 0.005 af
Subcatchment 21: Rooftop #21	Runoff Area=219 sf 90.87% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.06 cfs 0.003 af
Subcatchment 22: Rooftop #22	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.35 cfs 0.017 af
Subcatchment 23: Rooftop #23	Runoff Area=698 sf 92.84% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.20 cfs 0.010 af
Subcatchment 24: Rooftop #24	Runoff Area=587 sf 93.19% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.17 cfs 0.008 af
Subcatchment 25: Rooftop #25	Runoff Area=590 sf 93.22% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.17 cfs 0.008 af
Subcatchment 26: Rooftop #26	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.32 cfs 0.015 af
Subcatchment 27: Rooftop #27	Runoff Area=352 sf 91.48% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.10 cfs 0.005 af
Subcatchment 28: Rooftop #28	Runoff Area=796 sf 93.09% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.23 cfs 0.011 af
Subcatchment 29: Rooftop #29	Runoff Area=363 sf 91.74% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.10 cfs 0.005 af
Subcatchment 30: Rooftop #30	Runoff Area=219 sf 90.87% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.06 cfs 0.003 af
Subcatchment 31: Rooftop #31	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.35 cfs 0.017 af
Subcatchment 32: Rooftop #32	Runoff Area=219 sf 90.87% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.06 cfs 0.003 af
Subcatchment 33: Rooftop #33	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 'l' Tc=0.2 min CN=96	Runoff=0.35 cfs 0.017 af

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Type II 24-hr 100-YR Rainfall=7.60"

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Subcatchment 34: Rooftop #34	Runoff Area=796 sf 93.09% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.23 cfs 0.011 af
Subcatchment 35: Rooftop #35	Runoff Area=363 sf 91.74% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.10 cfs 0.005 af
Subcatchment 36: Rooftop #36	Runoff Area=698 sf 92.84% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.20 cfs 0.010 af
Subcatchment 37: Rooftop #37	Runoff Area=587 sf 93.19% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.17 cfs 0.008 af
Subcatchment 38: Rooftop #38	Runoff Area=590 sf 93.22% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.17 cfs 0.008 af
Subcatchment 39: Rooftop #39	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.32 cfs 0.015 af
Subcatchment 40: Rooftop #40	Runoff Area=352 sf 91.48% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.10 cfs 0.005 af
Subcatchment 41: Rooftop #41	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.32 cfs 0.015 af
Subcatchment 42: Rooftop #42	Runoff Area=352 sf 91.48% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.10 cfs 0.005 af
Subcatchment 43: Rooftop #43	Runoff Area=590 sf 93.22% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.17 cfs 0.008 af
Subcatchment 44: Rooftop #44	Runoff Area=698 sf 92.84% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.20 cfs 0.010 af
Subcatchment 45: Rooftop #45	Runoff Area=587 sf 93.19% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.17 cfs 0.008 af
Subcatchment 46: Rooftop #46	Runoff Area=219 sf 90.87% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.06 cfs 0.003 af
Subcatchment 47: Rooftop #47	Runoff Area=1,216 sf 93.42% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.35 cfs 0.017 af
Subcatchment 48: Rooftop #48	Runoff Area=796 sf 93.09% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.23 cfs 0.011 af
Subcatchment 49: Rooftop #49	Runoff Area=363 sf 91.74% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.10 cfs 0.005 af
Subcatchment 50: Rooftop #50	Runoff Area=698 sf 92.84% Impervious Runoff Depth=7.12"
Flow Length=37'	Slope=0.4167 '/' Tc=0.2 min CN=96 Runoff=0.20 cfs 0.010 af

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Subcatchment 51: Rooftop #51	Runoff Area=587 sf 93.19% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.17 cfs 0.008 af
Subcatchment 52: Rooftop #52	Runoff Area=590 sf 93.22% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.17 cfs 0.008 af
Subcatchment 53: Rooftop #53	Runoff Area=1,095 sf 93.61% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.32 cfs 0.015 af
Subcatchment 54: Rooftop #54	Runoff Area=352 sf 91.48% Impervious Runoff Depth=7.12"
Flow Length=37' Slope=0.4167 '/' Tc=0.2 min CN=96	Runoff=0.10 cfs 0.005 af
Subcatchment 55: Non-RT DA to PA-2	Runoff Area=3,000 sf 75.57% Impervious Runoff Depth=6.65"
Flow Length=43' Slope=0.0100 '/' Tc=6.4 min CN=92	Runoff=0.58 cfs 0.038 af
Subcatchment 56: Non-RT DA to PA-3	Runoff Area=4,390 sf 54.69% Impervious Runoff Depth=6.06"
Flow Length=55' Slope=0.0100 '/' Tc=7.8 min CN=87	Runoff=0.73 cfs 0.051 af
Subcatchment 57: Non-RT DA to PA-4	Runoff Area=4,540 sf 57.29% Impervious Runoff Depth=6.18"
Flow Length=62' Slope=0.0100 '/' Tc=8.6 min CN=88	Runoff=0.74 cfs 0.054 af
Subcatchment 58: Non-RT DA to PA-5	Runoff Area=6,269 sf 73.76% Impervious Runoff Depth=6.65"
Flow Length=52' Slope=0.0100 '/' Tc=7.4 min CN=92	Runoff=1.13 cfs 0.080 af
Subcatchment 59: Non-RT DA to PA-6	Runoff Area=8,366 sf 73.55% Impervious Runoff Depth=6.65"
Flow Length=50' Slope=0.0100 '/' Tc=7.2 min CN=92	Runoff=1.53 cfs 0.106 af
Subcatchment 60: Non-RT DA to PA-7	Runoff Area=1,133 sf 70.87% Impervious Runoff Depth=6.53"
Flow Length=48' Slope=0.0100 '/' Tc=7.0 min CN=91	Runoff=0.21 cfs 0.014 af
Subcatchment 61: West DA to Jowite	Runoff Area=14,486 sf 0.00% Impervious Runoff Depth=4.57"
Flow Length=721' Tc=13.9 min CN=74	Runoff=1.40 cfs 0.127 af
Reach VG-2: Valley Gutter 2	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.011 L=57.0' S=0.0061 '/' Capacity=0.14 cfs	Outflow=0.00 cfs 0.000 af
Reach VG-3: Valley Gutter 3	Avg. Flow Depth=0.39' Max Vel=1.51 fps Inflow=1.89 cfs 0.023 af
n=0.011 L=66.0' S=0.0055 '/' Capacity=0.13 cfs	Outflow=1.51 cfs 0.023 af
Reach VG-4: Valley Gutter 4	Avg. Flow Depth=0.35' Max Vel=1.53 fps Inflow=3.04 cfs 0.015 af
n=0.011 L=118.0' S=0.0057 '/' Capacity=0.14 cfs	Outflow=1.37 cfs 0.015 af
Reach VG-5: Valley Gutter 5	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.011 L=152.0' S=0.0103 '/' Capacity=0.18 cfs	Outflow=0.00 cfs 0.000 af
Pond EX-I-2: EX-I-2	Peak Elev=14.66' Inflow=4.43 cfs 0.512 af
	Outflow=4.43 cfs 0.512 af
Pond P19: Planter #19	Peak Elev=14.14' Storage=20 cf Inflow=0.23 cfs 0.011 af
4.0" Round Culvert n=0.012 L=26.8' S=0.0131 '/'	Outflow=0.19 cfs 0.011 af

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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P20: Planter #20	Peak Elev=16.06' Storage=34 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=20.1' S=-0.1169 ' /' Outflow=0.10 cfs 0.005 af
Pond P21: Planter #21	Peak Elev=13.81' Storage=5 cf Inflow=0.06 cfs 0.003 af 4.0" Round Culvert n=0.012 L=30.2' S=0.0185 ' /' Outflow=0.06 cfs 0.003 af
Pond P22: Planter #22	Peak Elev=16.96' Storage=119 cf Inflow=0.35 cfs 0.017 af 4.0" Round Culvert n=0.012 L=59.7' S=-0.0350 ' /' Outflow=0.28 cfs 0.017 af
Pond P23: Planter #23	Peak Elev=14.02' Storage=26 cf Inflow=0.20 cfs 0.010 af 4.0" Round Culvert n=0.012 L=20.7' S=0.0068 ' /' Outflow=0.17 cfs 0.009 af
Pond P24: Planter #24	Peak Elev=15.86' Storage=50 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=36.6' S=-0.0683 ' /' Outflow=0.16 cfs 0.008 af
Pond P25: Planter #25	Peak Elev=15.73' Storage=48 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0820 ' /' Outflow=0.16 cfs 0.008 af
Pond P26: Planter #26	Peak Elev=14.37' Storage=46 cf Inflow=0.32 cfs 0.015 af 4.0" Round Culvert n=0.012 L=24.5' S=0.0159 ' /' Outflow=0.25 cfs 0.015 af
Pond P27: Planter #27	Peak Elev=15.34' Storage=31 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=10.8' S=-0.1972 ' /' Outflow=0.10 cfs 0.005 af
Pond P28: Planter #28	Peak Elev=14.11' Storage=19 cf Inflow=0.23 cfs 0.011 af 4.0" Round Culvert n=0.012 L=14.3' S=0.0245 ' /' Outflow=0.20 cfs 0.011 af
Pond P29: Planter #29	Peak Elev=15.25' Storage=24 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=32.3' S=-0.0477 ' /' Outflow=0.10 cfs 0.005 af
Pond P30: Planter #30	Peak Elev=13.80' Storage=4 cf Inflow=0.06 cfs 0.003 af 4.0" Round Culvert n=0.012 L=18.2' S=0.0088 ' /' Outflow=0.05 cfs 0.003 af
Pond P31: Planter #31	Peak Elev=16.77' Storage=113 cf Inflow=0.35 cfs 0.017 af 4.0" Round Culvert n=0.012 L=71.6' S=-0.0246 ' /' Outflow=0.27 cfs 0.017 af
Pond P32: Planter #32	Peak Elev=14.14' Storage=3 cf Inflow=0.06 cfs 0.003 af 4.0" Round Culvert n=0.012 L=29.6' S=0.0199 ' /' Outflow=0.06 cfs 0.003 af
Pond P33: Planter #33	Peak Elev=16.67' Storage=94 cf Inflow=0.35 cfs 0.017 af 4.0" Round Culvert n=0.012 L=61.0' S=-0.0211 ' /' Outflow=0.28 cfs 0.017 af
Pond P34: Planter #34	Peak Elev=14.54' Storage=18 cf Inflow=0.23 cfs 0.011 af 4.0" Round Culvert n=0.012 L=26.1' S=0.0149 ' /' Outflow=0.22 cfs 0.011 af
Pond P35: Planter #35	Peak Elev=15.99' Storage=27 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=31.5' S=-0.0565 ' /' Outflow=0.10 cfs 0.005 af
Pond P36: Planter #36	Peak Elev=14.65' Storage=14 cf Inflow=0.20 cfs 0.010 af 4.0" Round Culvert n=0.012 L=20.2' S=0.0248 ' /' Outflow=0.19 cfs 0.009 af

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Pond P37: Planter #37	Peak Elev=16.14' Storage=35 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=37.8' S=-0.0418 ' /' Outflow=0.16 cfs 0.008 af
Pond P38: Planter #38	Peak Elev=16.26' Storage=37 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0588 ' /' Outflow=0.16 cfs 0.008 af
Pond P39: Planter #39	Peak Elev=15.05' Storage=31 cf Inflow=0.32 cfs 0.015 af 4.0" Round Culvert n=0.012 L=23.9' S=0.0113 ' /' Outflow=0.28 cfs 0.015 af
Pond P40: Planter #40	Peak Elev=16.25' Storage=28 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=11.2' S=-0.1643 ' /' Outflow=0.10 cfs 0.005 af
Pond P41: Planter #41	Peak Elev=15.35' Storage=31 cf Inflow=0.32 cfs 0.015 af 4.0" Round Culvert n=0.012 L=23.8' S=0.0210 ' /' Outflow=0.28 cfs 0.015 af
Pond P42: Planter #42	Peak Elev=16.40' Storage=26 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=19.8' S=-0.0854 ' /' Outflow=0.10 cfs 0.005 af
Pond P43: Planter #43	Peak Elev=16.72' Storage=40 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=28.7' S=-0.0648 ' /' Outflow=0.16 cfs 0.008 af
Pond P44: Planter #44	Peak Elev=14.95' Storage=4 cf Inflow=0.20 cfs 0.010 af 4.0" Round Culvert n=0.012 L=19.9' S=0.0136 ' /' Outflow=0.19 cfs 0.010 af
Pond P45: Planter #45	Peak Elev=16.87' Storage=42 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=36.4' S=-0.0552 ' /' Outflow=0.16 cfs 0.008 af
Pond P46: Planter #46	Peak Elev=15.14' Storage=3 cf Inflow=0.06 cfs 0.003 af 4.0" Round Culvert n=0.012 L=28.6' S=0.0248 ' /' Outflow=0.06 cfs 0.003 af
Pond P47: Planter #47	Peak Elev=18.02' Storage=105 cf Inflow=0.35 cfs 0.017 af 4.0" Round Culvert n=0.012 L=59.6' S=-0.0277 ' /' Outflow=0.28 cfs 0.017 af
Pond P48: Planter #48	Peak Elev=17.49' Storage=61 cf Inflow=0.23 cfs 0.011 af 4.0" Round Culvert n=0.012 L=24.8' S=-0.0992 ' /' Outflow=0.22 cfs 0.010 af
Pond P49: Planter #49	Peak Elev=17.38' Storage=32 cf Inflow=0.10 cfs 0.005 af 4.0" Round Culvert n=0.012 L=19.9' S=-0.1090 ' /' Outflow=0.10 cfs 0.005 af
Pond P50: Planter #50	Peak Elev=16.45' Storage=14 cf Inflow=0.20 cfs 0.010 af 4.0" Round Culvert n=0.012 L=19.4' S=0.0722 ' /' Outflow=0.19 cfs 0.009 af
Pond P51: Planter #51	Peak Elev=17.72' Storage=32 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=36.8' S=-0.0370 ' /' Outflow=0.16 cfs 0.008 af
Pond P52: Planter #52	Peak Elev=17.95' Storage=35 cf Inflow=0.17 cfs 0.008 af 4.0" Round Culvert n=0.012 L=28.9' S=-0.0550 ' /' Outflow=0.16 cfs 0.008 af
Pond P53: Planter #53	Peak Elev=16.85' Storage=31 cf Inflow=0.32 cfs 0.015 af 4.0" Round Culvert n=0.012 L=22.8' S=0.0513 ' /' Outflow=0.28 cfs 0.015 af

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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P54: Planter #54Peak Elev=18.84' Storage=37 cf Inflow=0.10 cfs 0.005 af
4.0" Round Culvert n=0.012 L=13.0' S=-0.2023 ' / Outflow=0.10 cfs 0.005 af**Pond PA-2: Porous Asphalt #2**Peak Elev=15.21' Storage=466 cf Inflow=0.88 cfs 0.060 af
Primary=0.59 cfs 0.059 af Secondary=0.00 cfs 0.000 af Outflow=0.59 cfs 0.059 af**Pond PA-3: Porous Asphalt #3**Peak Elev=15.05' Storage=501 cf Inflow=0.97 cfs 0.072 af
Primary=0.67 cfs 0.070 af Secondary=0.09 cfs 0.001 af Outflow=0.67 cfs 0.071 af**Pond PA-4: Porous Asphalt #4**Peak Elev=15.04' Storage=678 cf Inflow=1.25 cfs 0.092 af
Primary=0.68 cfs 0.086 af Secondary=0.33 cfs 0.006 af Outflow=0.82 cfs 0.091 af**Pond PA-5: Porous Asphalt #5**Peak Elev=15.28' Storage=1,186 cf Inflow=1.41 cfs 0.106 af
Primary=0.52 cfs 0.097 af Secondary=0.81 cfs 0.008 af Outflow=1.30 cfs 0.104 af**Pond PA-6: Porous Asphalt #6**Peak Elev=15.84' Storage=2,265 cf Inflow=2.33 cfs 0.165 af
Primary=0.55 cfs 0.152 af Secondary=3.04 cfs 0.015 af Outflow=3.58 cfs 0.163 af**Pond PA-7: Porous Asphalt #7**Peak Elev=16.89' Storage=94 cf Inflow=0.26 cfs 0.019 af
Primary=0.21 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.21 cfs 0.019 af**Pond SDMH-1: Proposed SDMH West of Bldgs**Peak Elev=13.74' Inflow=6.25 cfs 0.789 af
Outflow=6.25 cfs 0.789 af**Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton**Inflow=6.25 cfs 0.789 af
Primary=6.25 cfs 0.789 af**Total Runoff Area = 1.529 ac Runoff Volume = 0.803 af Average Runoff Depth = 6.30"**
37.56% Pervious = 0.574 ac 62.44% Impervious = 0.955 ac

Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 17S: Rooftop #18

Runoff = 0.22 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 7.24"

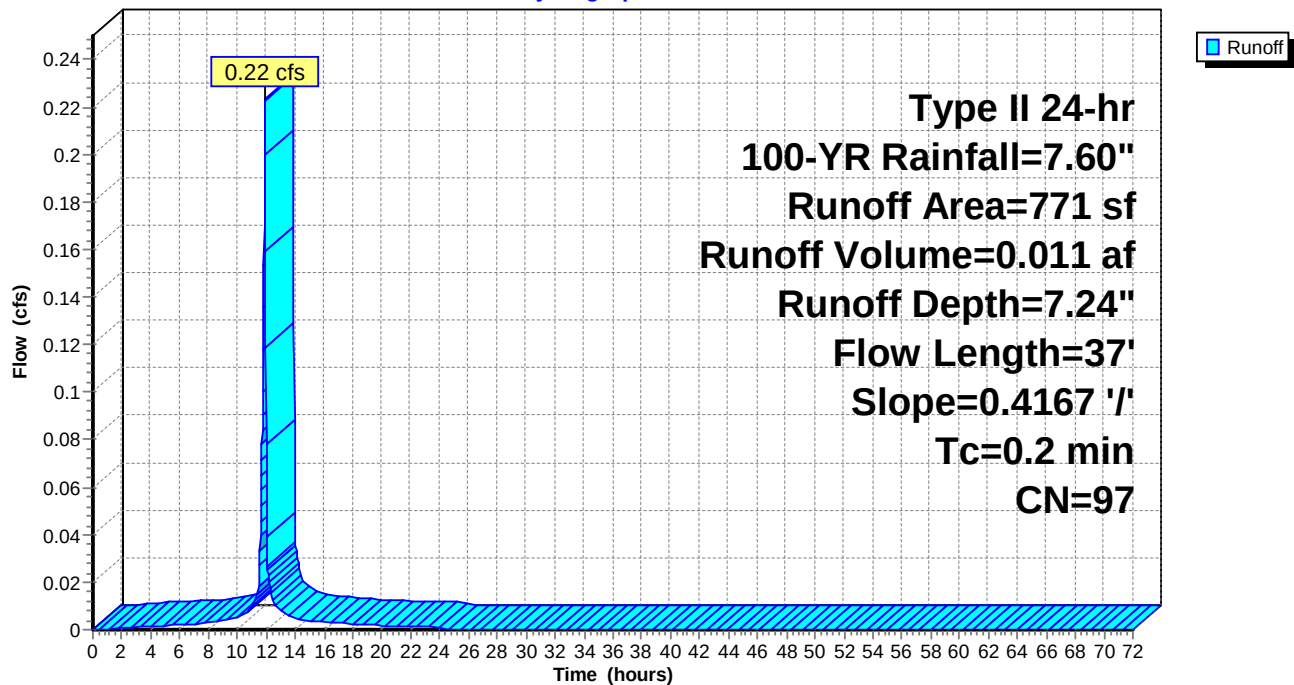
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
741	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
771	97	Weighted Average
30		3.89% Pervious Area
741		96.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 17S: Rooftop #18

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 19: Rooftop #19

Runoff = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 7.12"

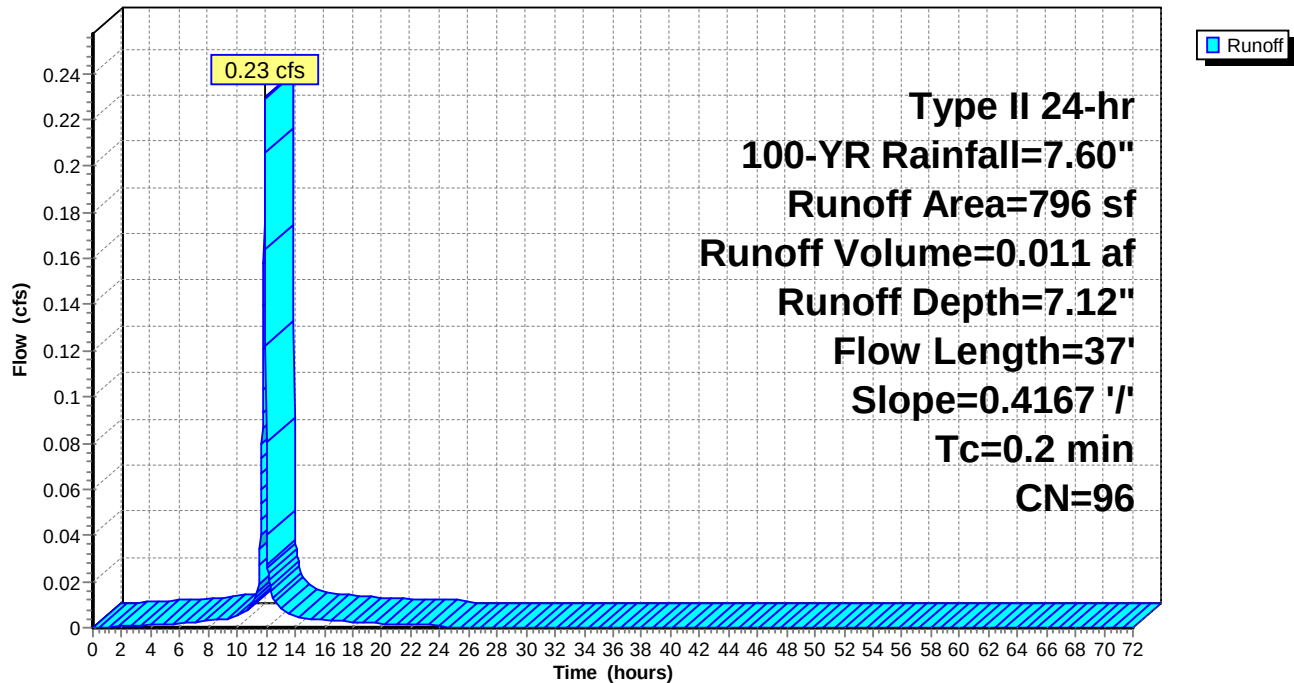
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 19: Rooftop #19

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 20: Rooftop #20

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

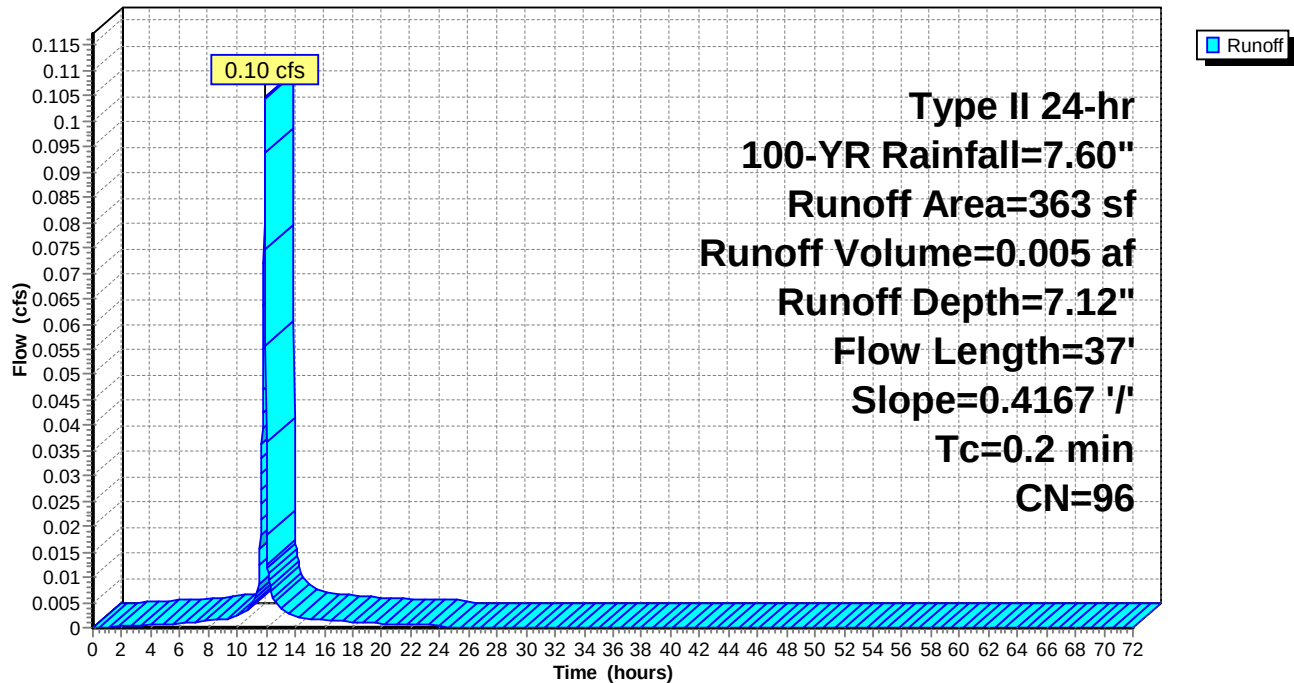
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 20: Rooftop #20

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 21: Rooftop #21

Runoff = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 7.12"

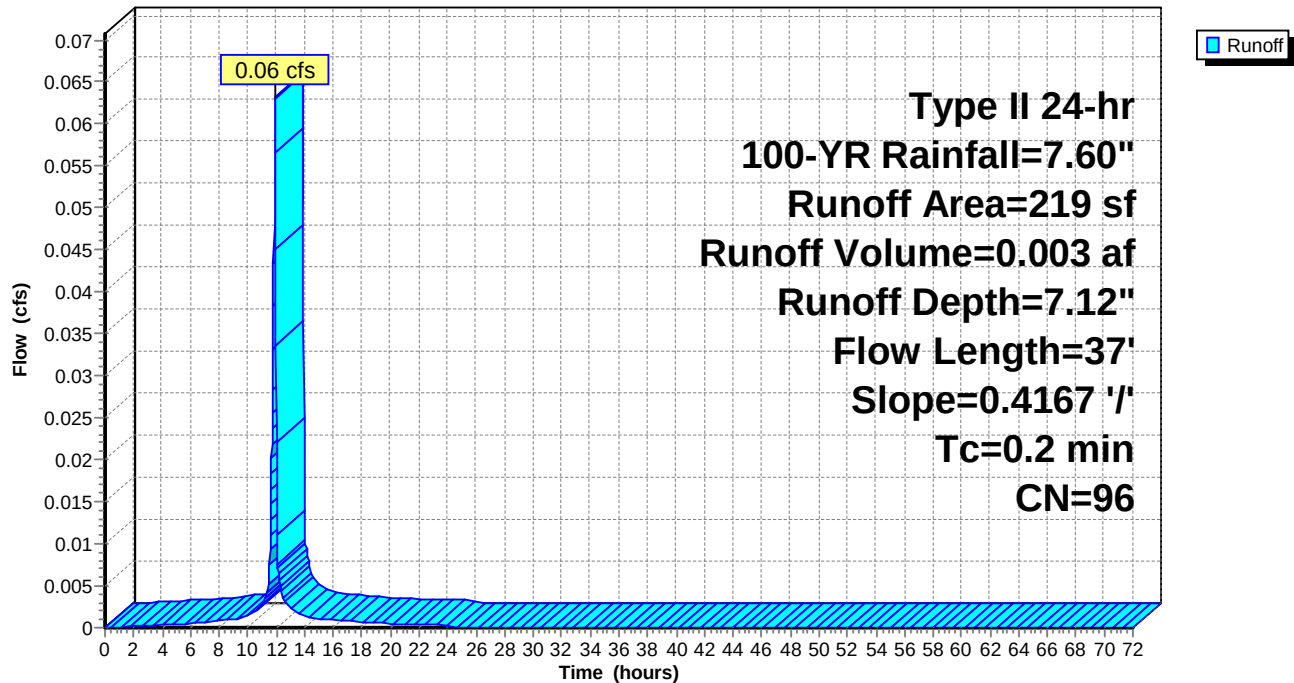
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 21: Rooftop #21

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 22: Rooftop #22

Runoff = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af, Depth= 7.12"

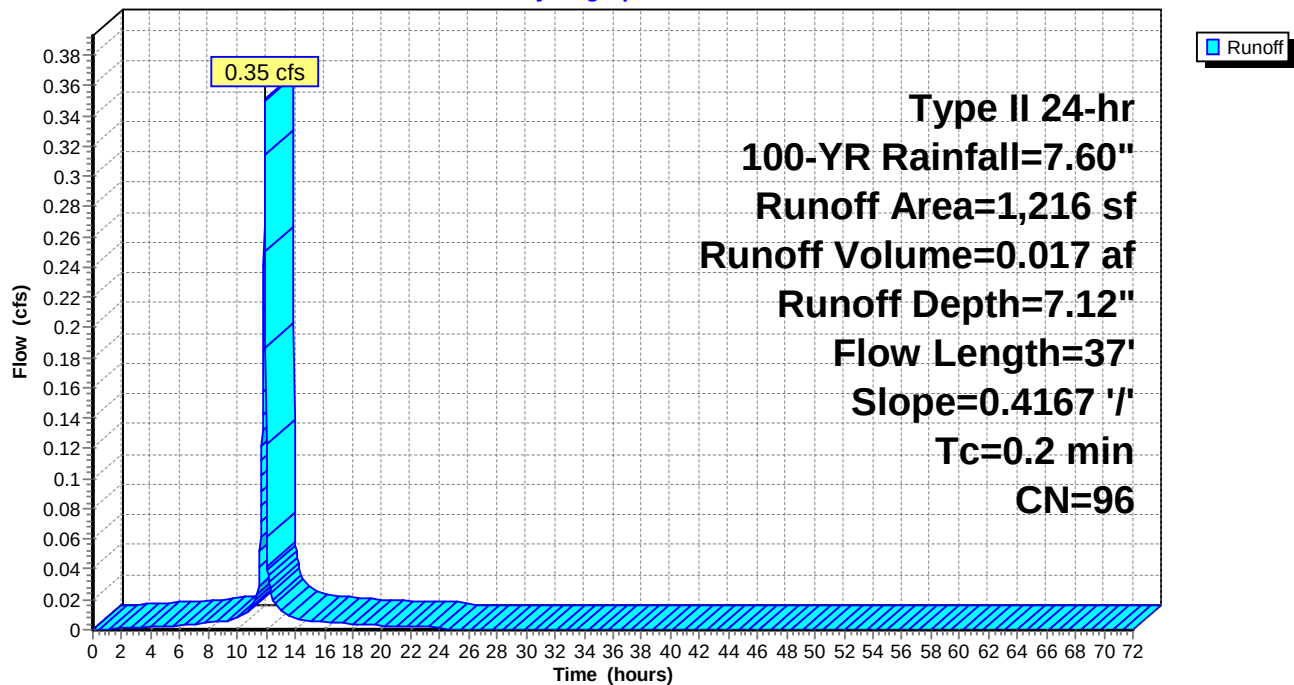
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 22: Rooftop #22

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 23: Rooftop #23

Runoff = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 7.12"

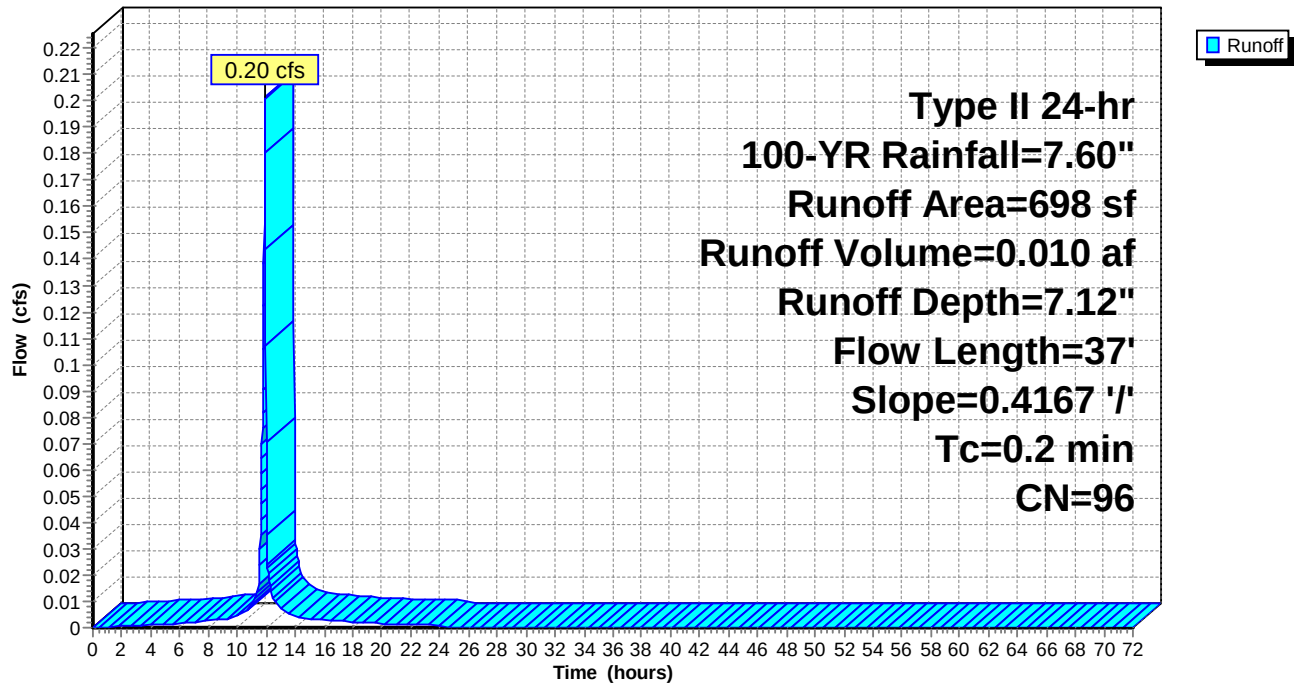
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 23: Rooftop #23

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 24: Rooftop #24

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

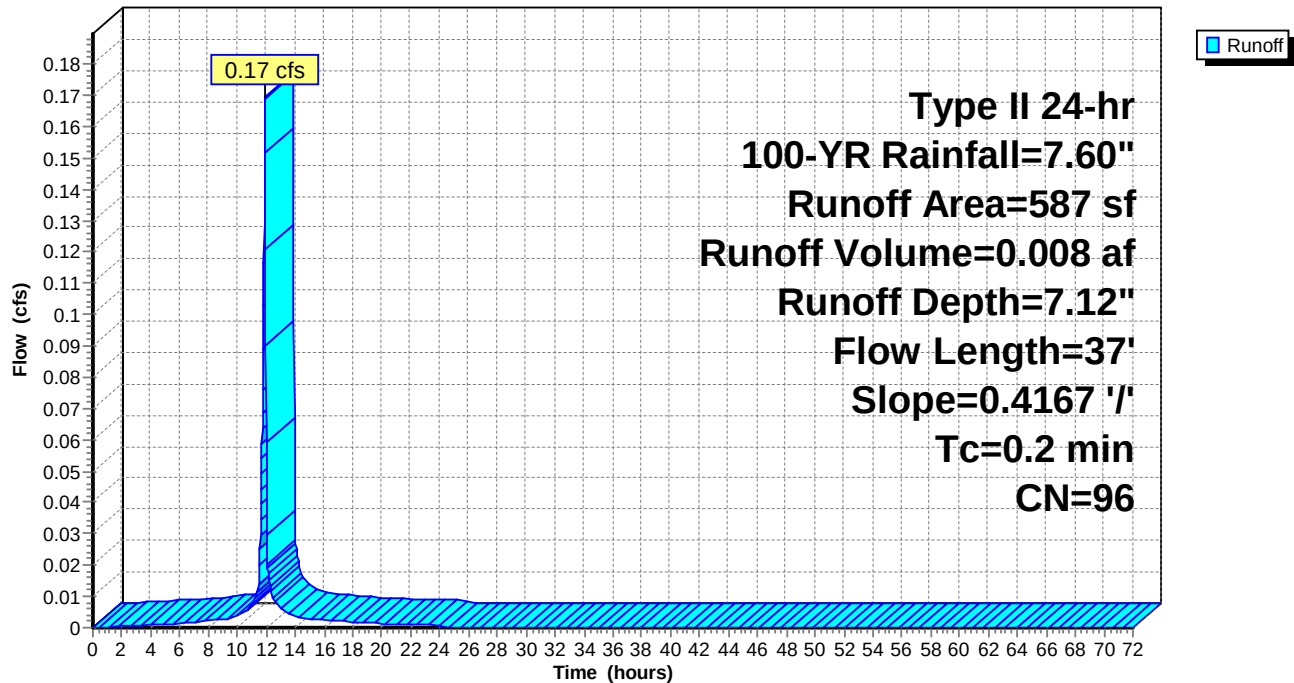
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 24: Rooftop #24

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 25: Rooftop #25

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

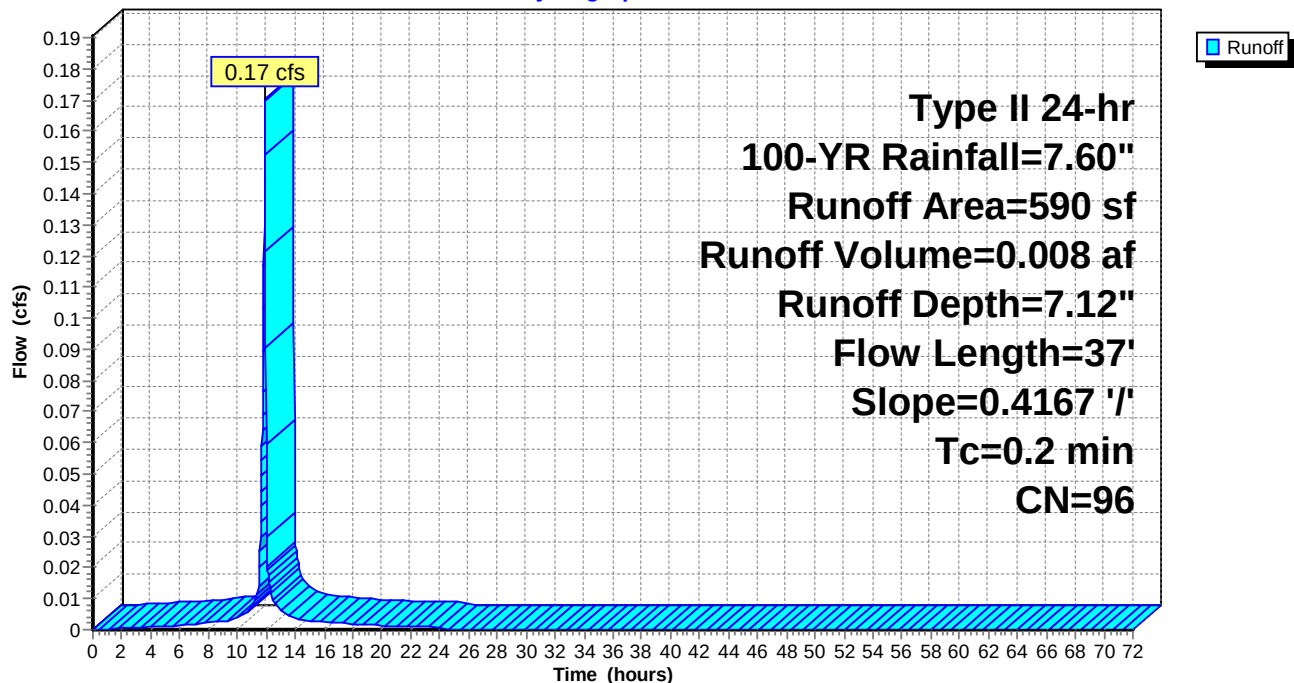
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 25: Rooftop #25

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 26: Rooftop #26

Runoff = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af, Depth= 7.12"

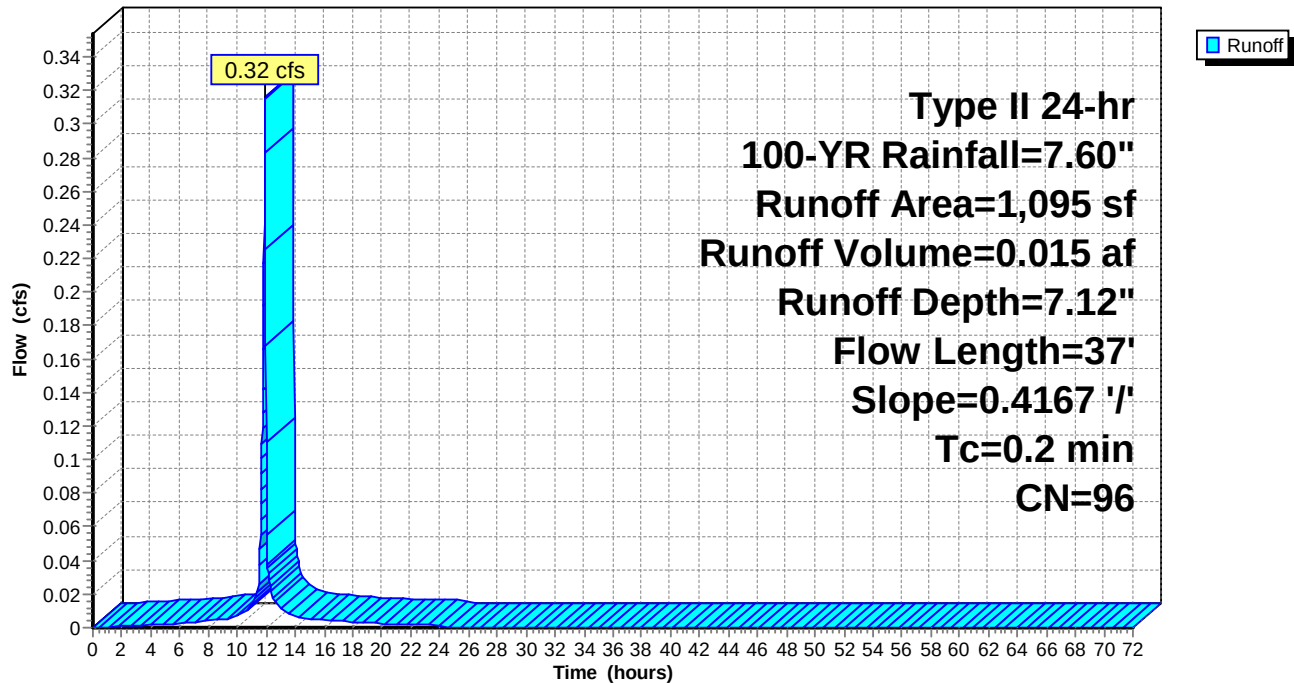
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 26: Rooftop #26

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 27: Rooftop #27

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

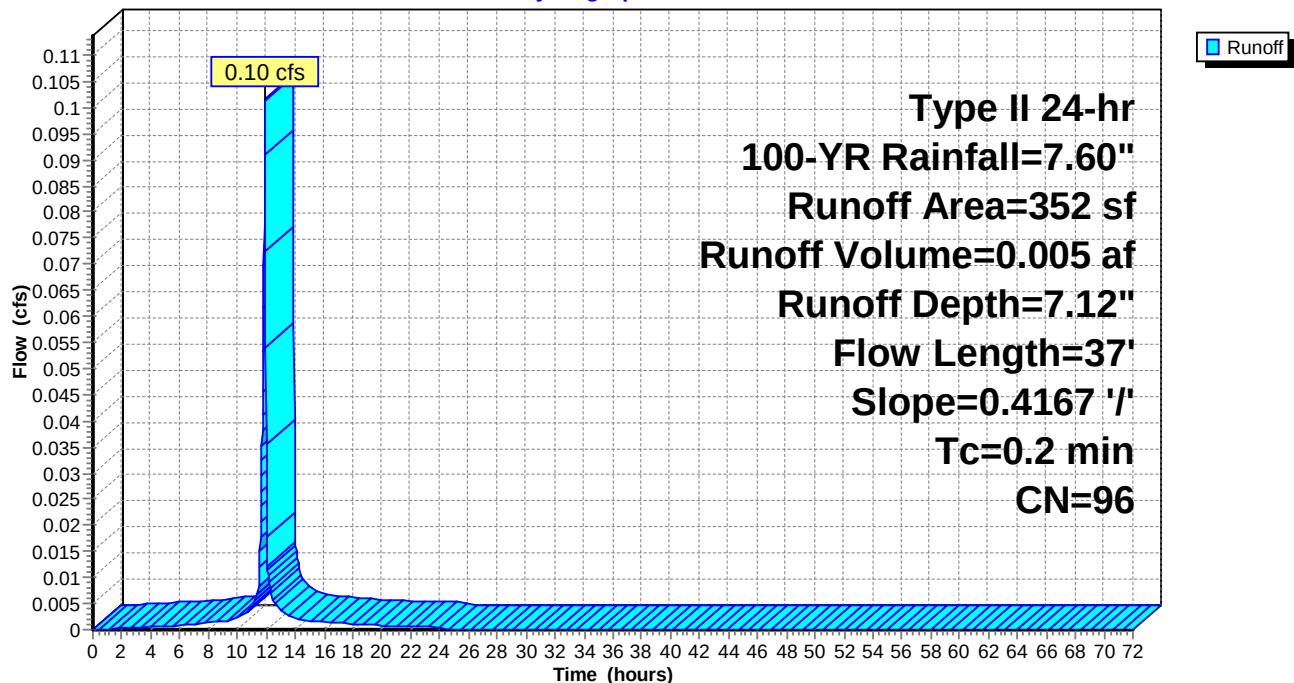
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 27: Rooftop #27

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 28: Rooftop #28

Runoff = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 7.12"

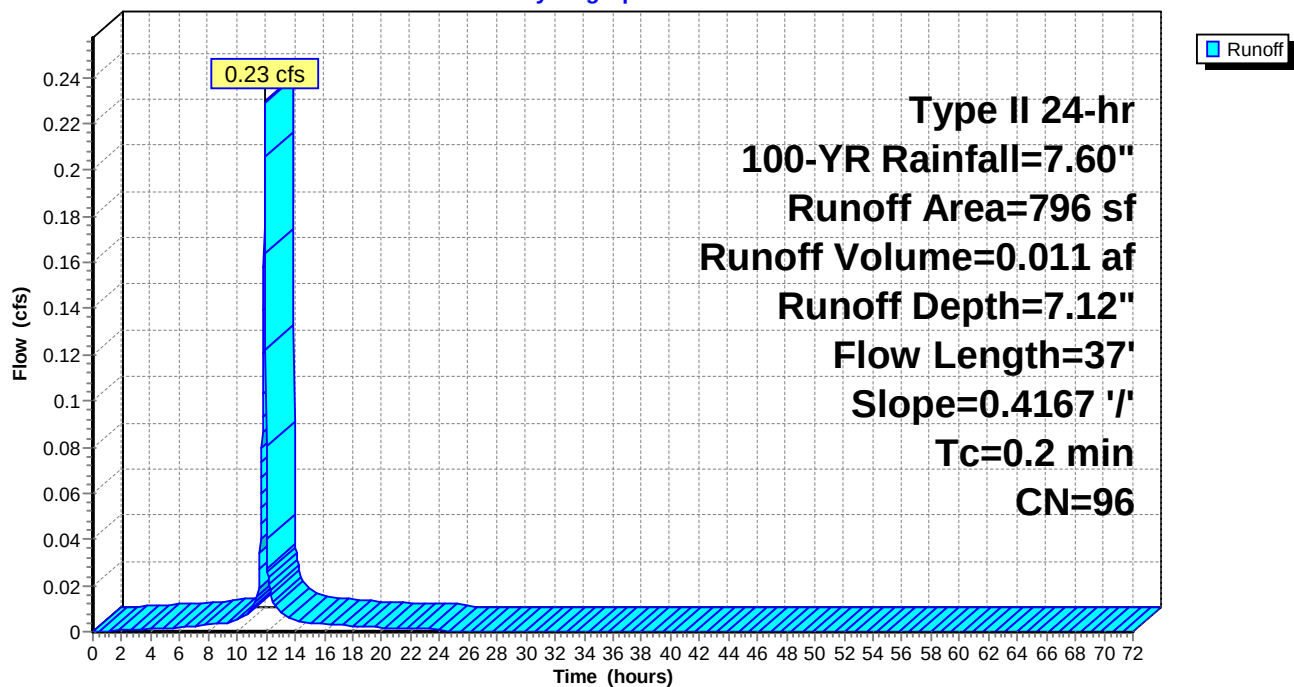
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 28: Rooftop #28

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 29: Rooftop #29

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

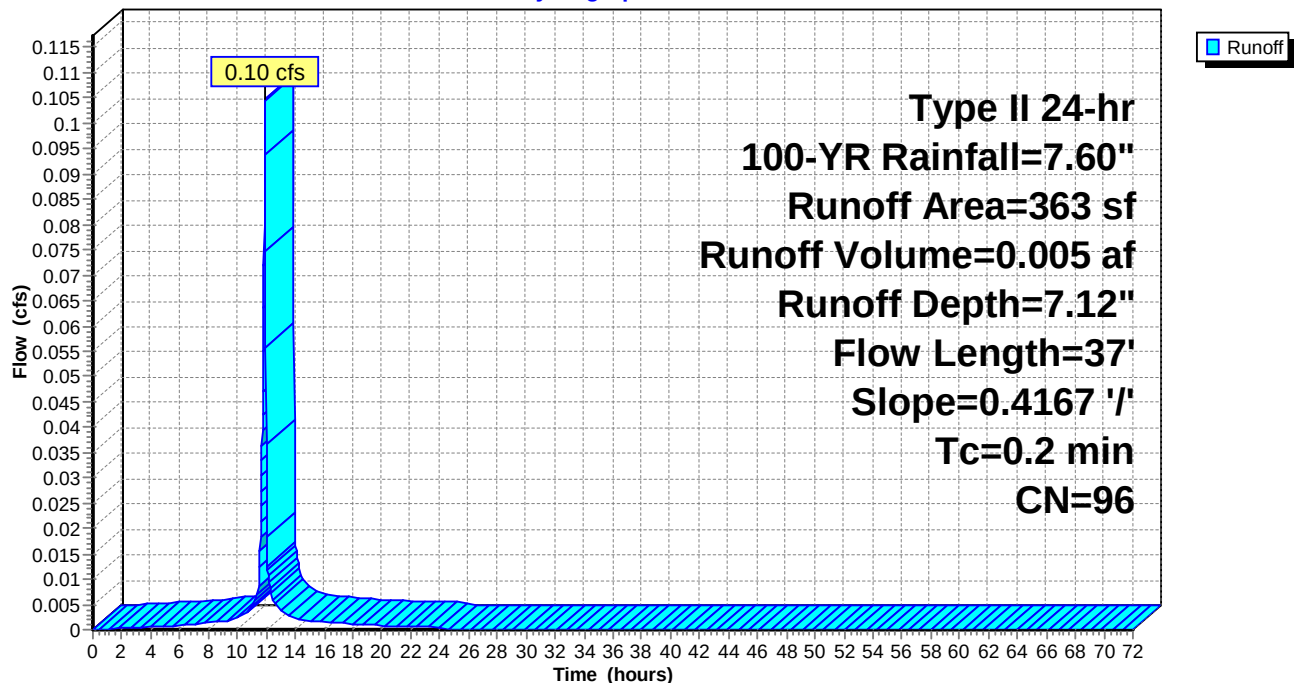
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 29: Rooftop #29

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 30: Rooftop #30

Runoff = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 7.12"

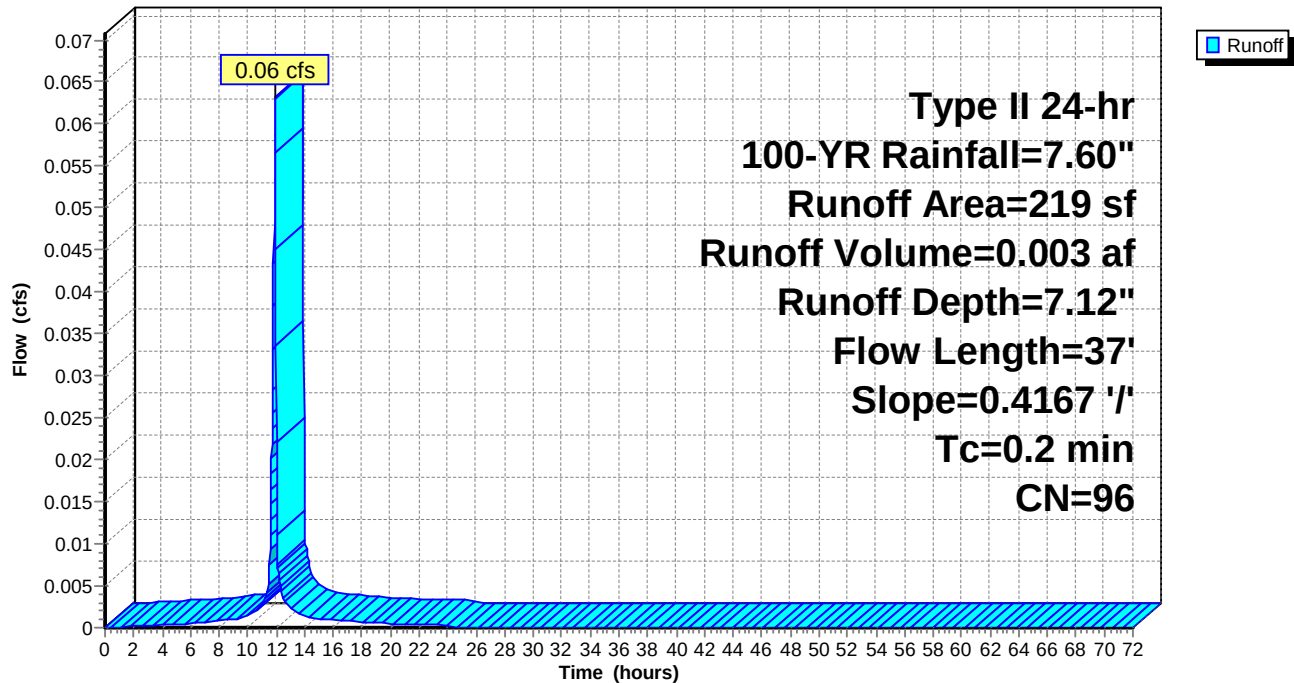
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 30: Rooftop #30

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 31: Rooftop #31

Runoff = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af, Depth= 7.12"

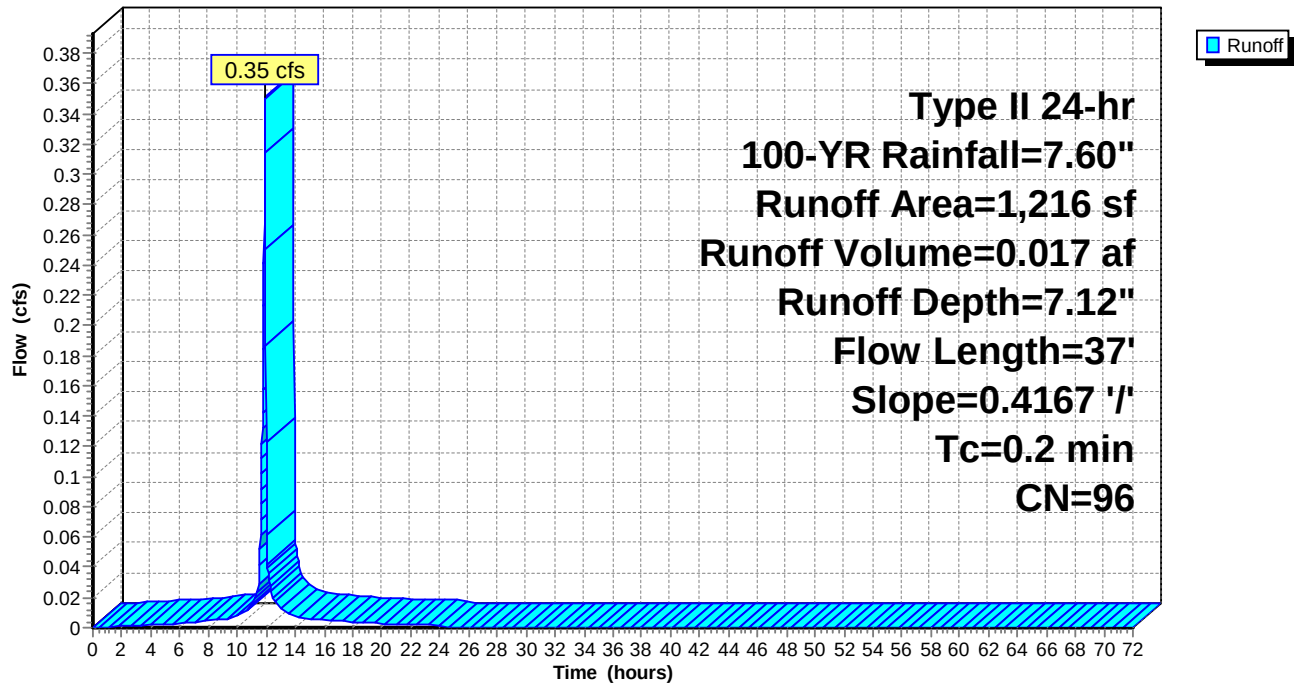
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 31: Rooftop #31

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 32: Rooftop #32

Runoff = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 7.12"

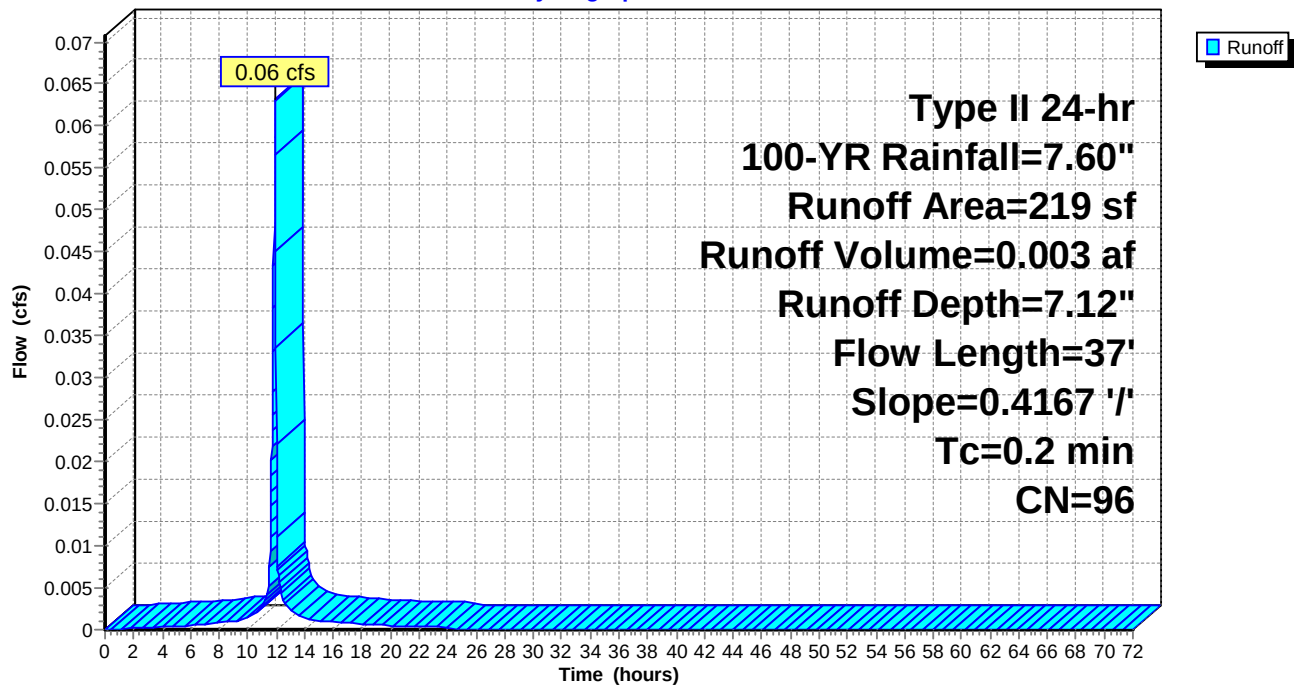
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 32: Rooftop #32

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 33: Rooftop #33

Runoff = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af, Depth= 7.12"

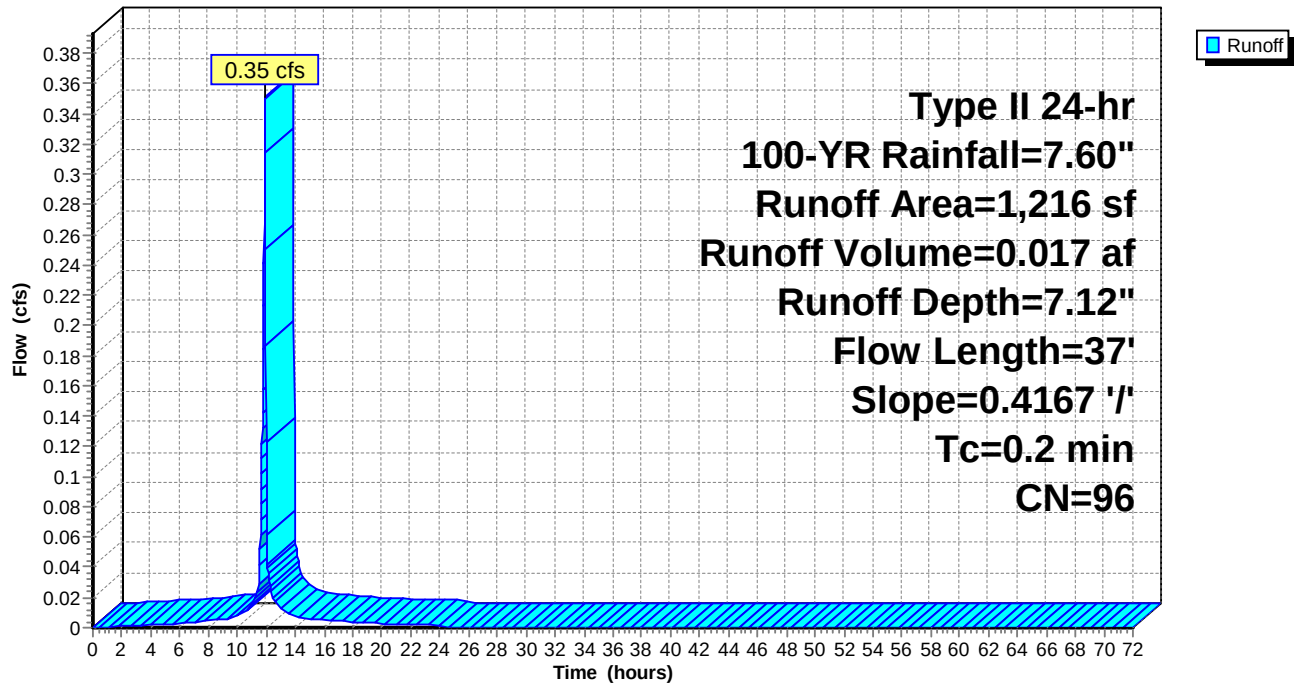
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 33: Rooftop #33

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 34: Rooftop #34

Runoff = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 7.12"

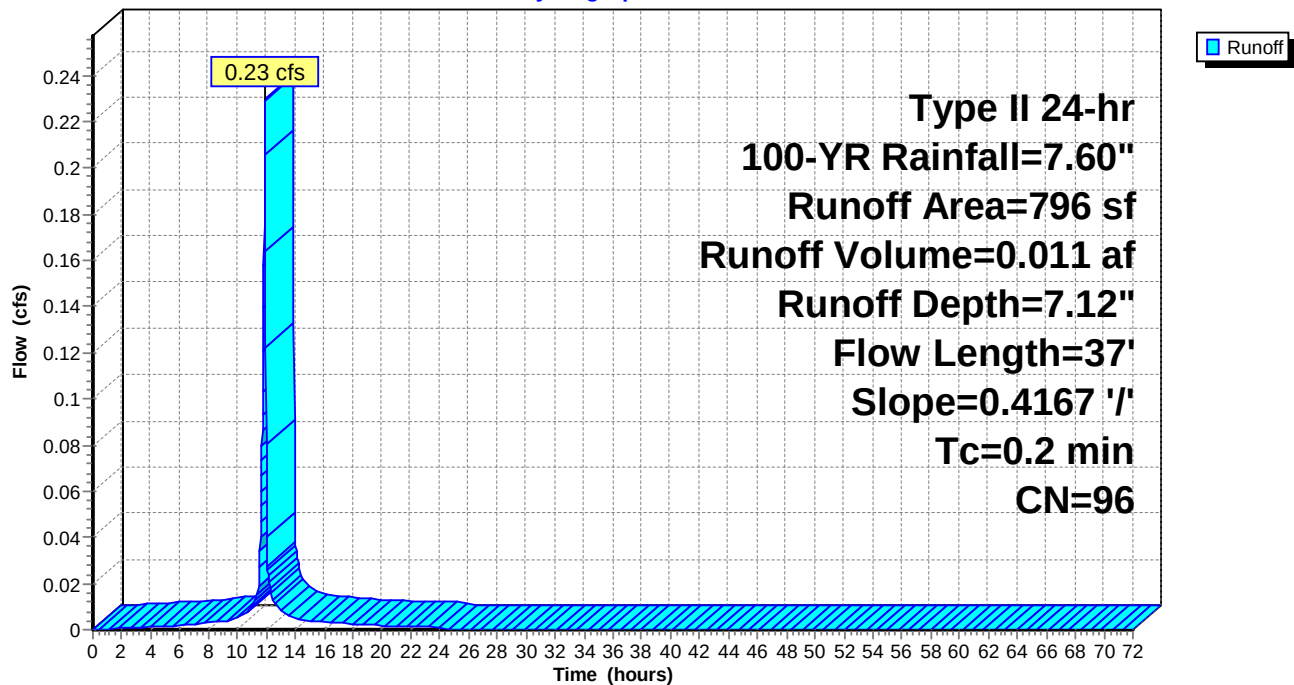
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 34: Rooftop #34

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 35: Rooftop #35

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

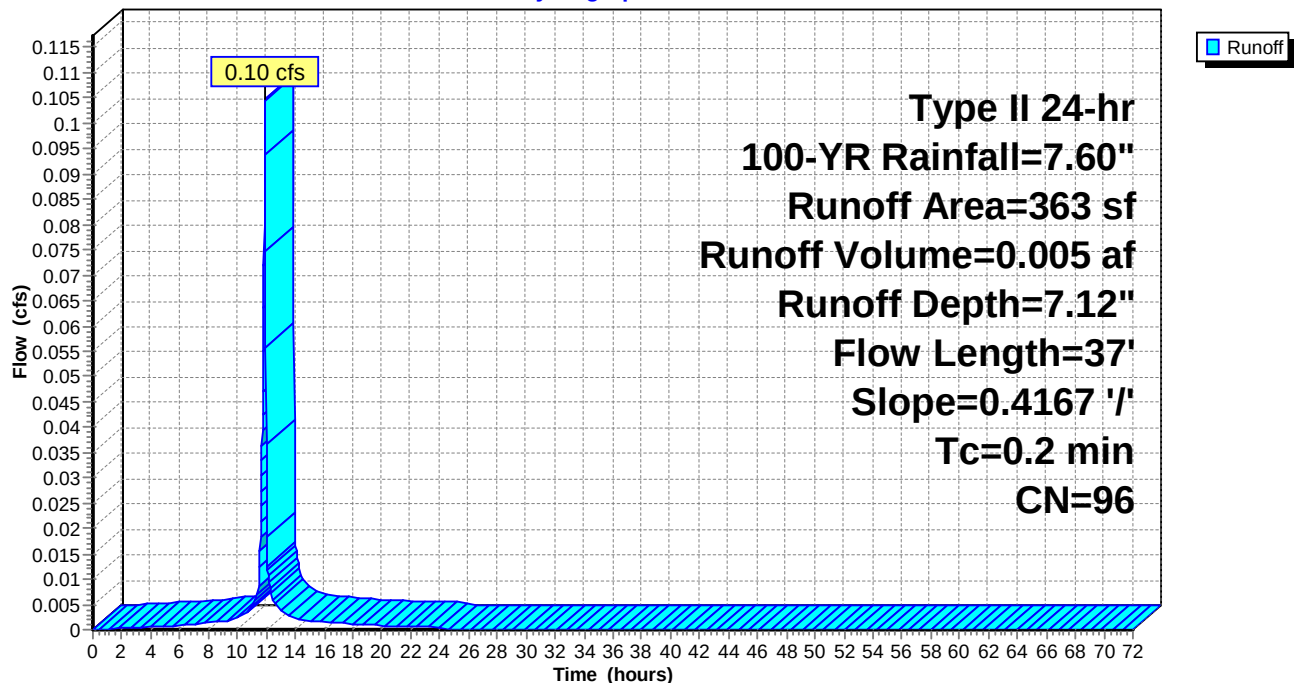
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 35: Rooftop #35

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 36: Rooftop #36

Runoff = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 7.12"

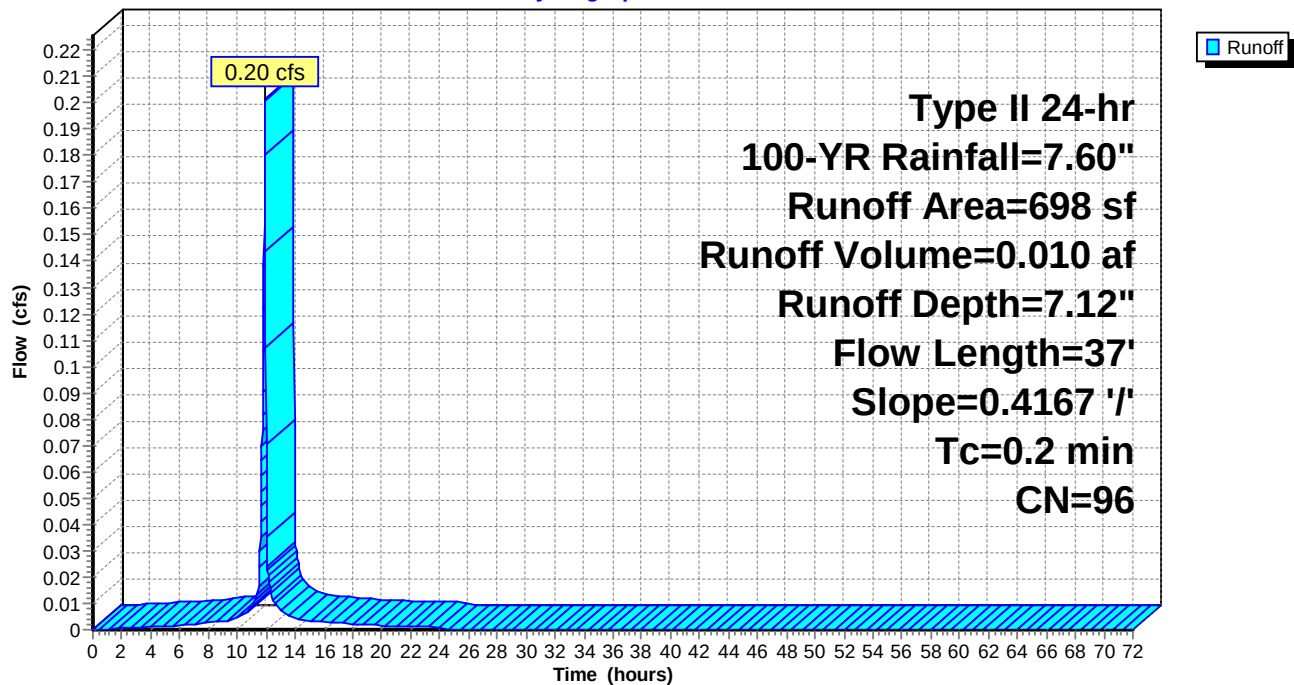
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 36: Rooftop #36

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 37: Rooftop #37

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

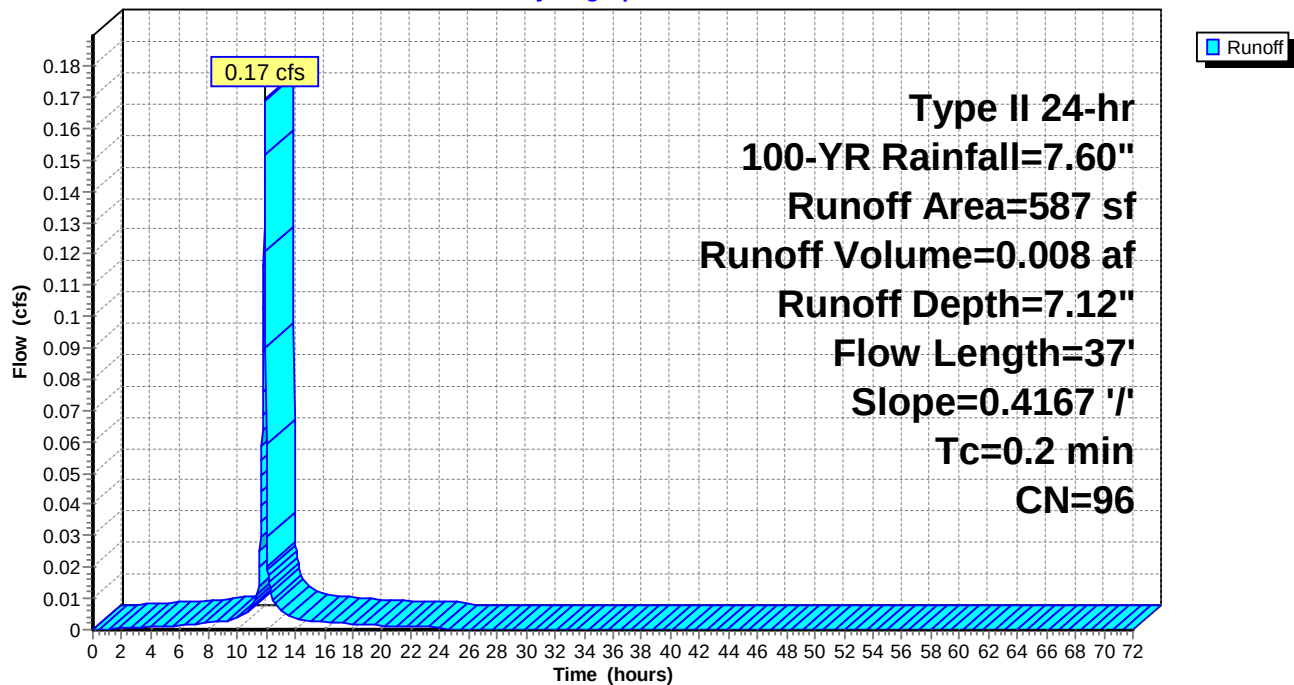
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 37: Rooftop #37

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 38: Rooftop #38

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

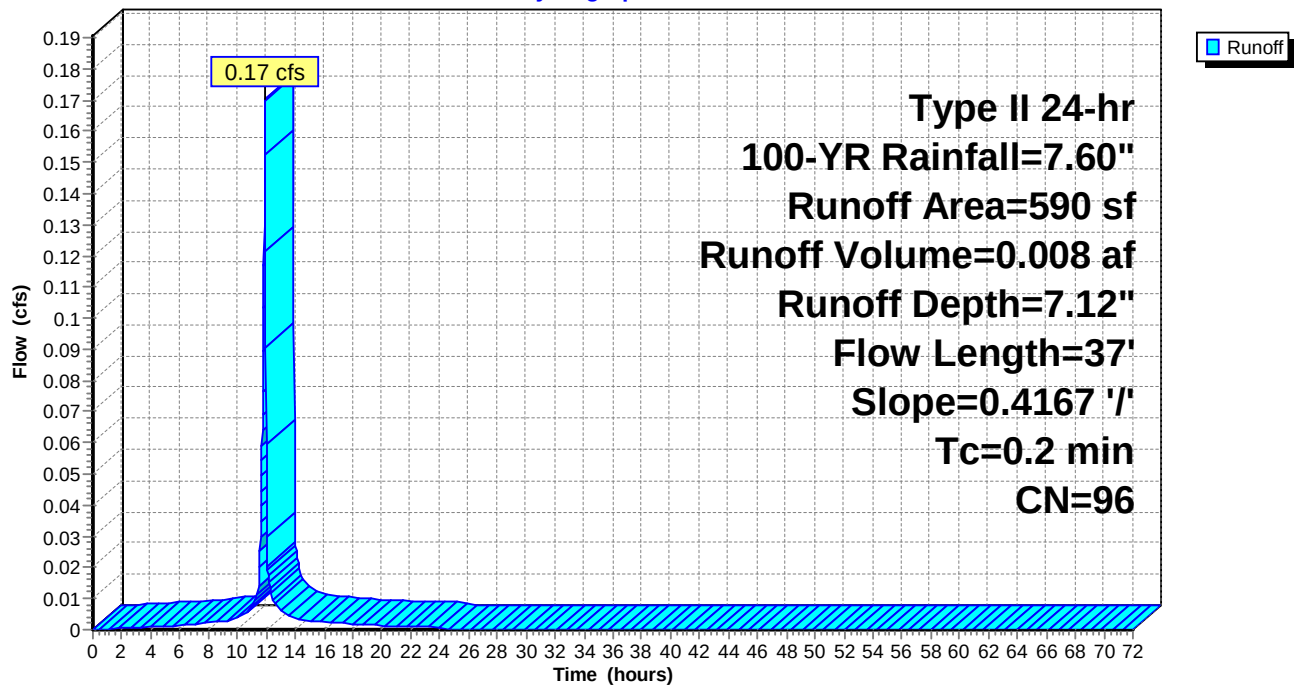
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 38: Rooftop #38

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 39: Rooftop #39

Runoff = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af, Depth= 7.12"

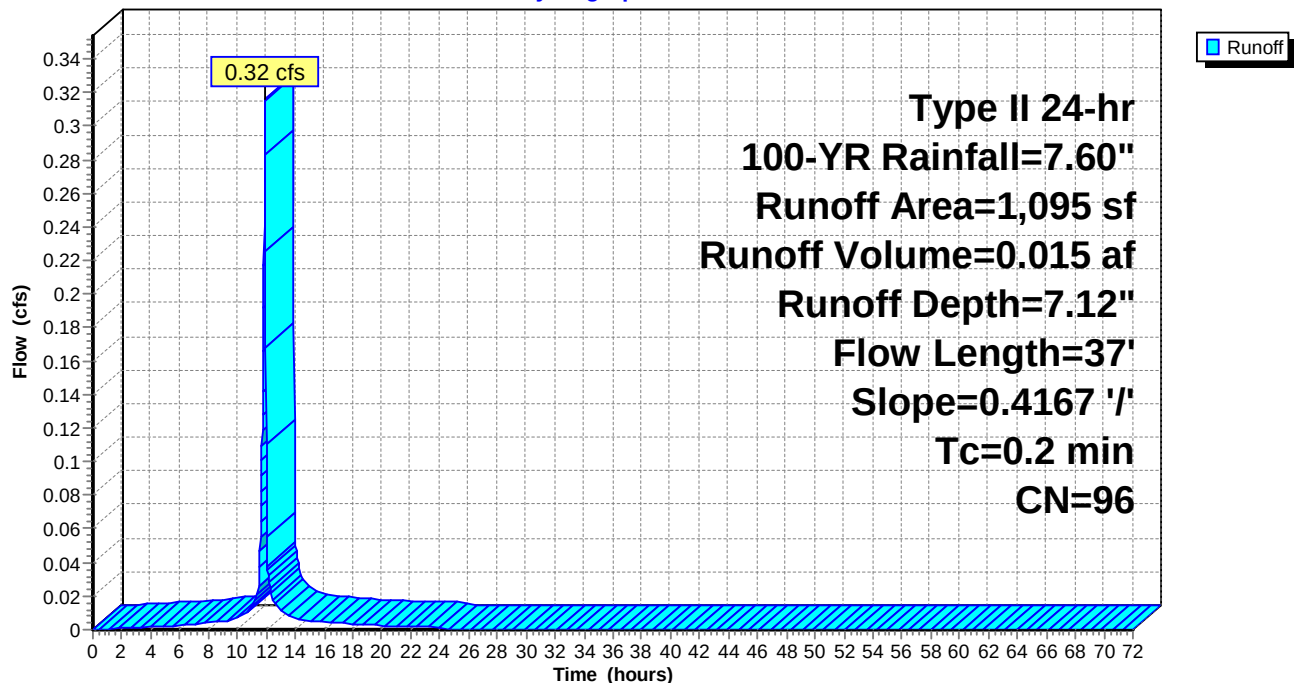
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 39: Rooftop #39

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 40: Rooftop #40

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

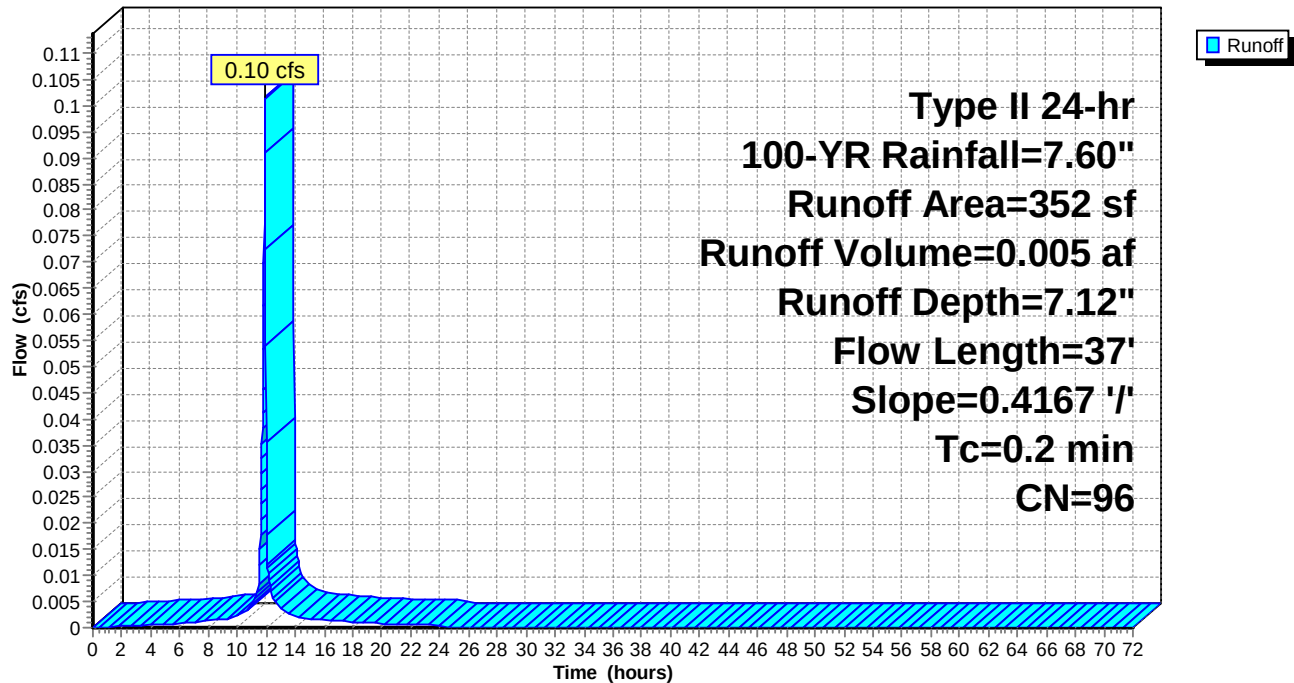
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 40: Rooftop #40

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 41: Rooftop #41

Runoff = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af, Depth= 7.12"

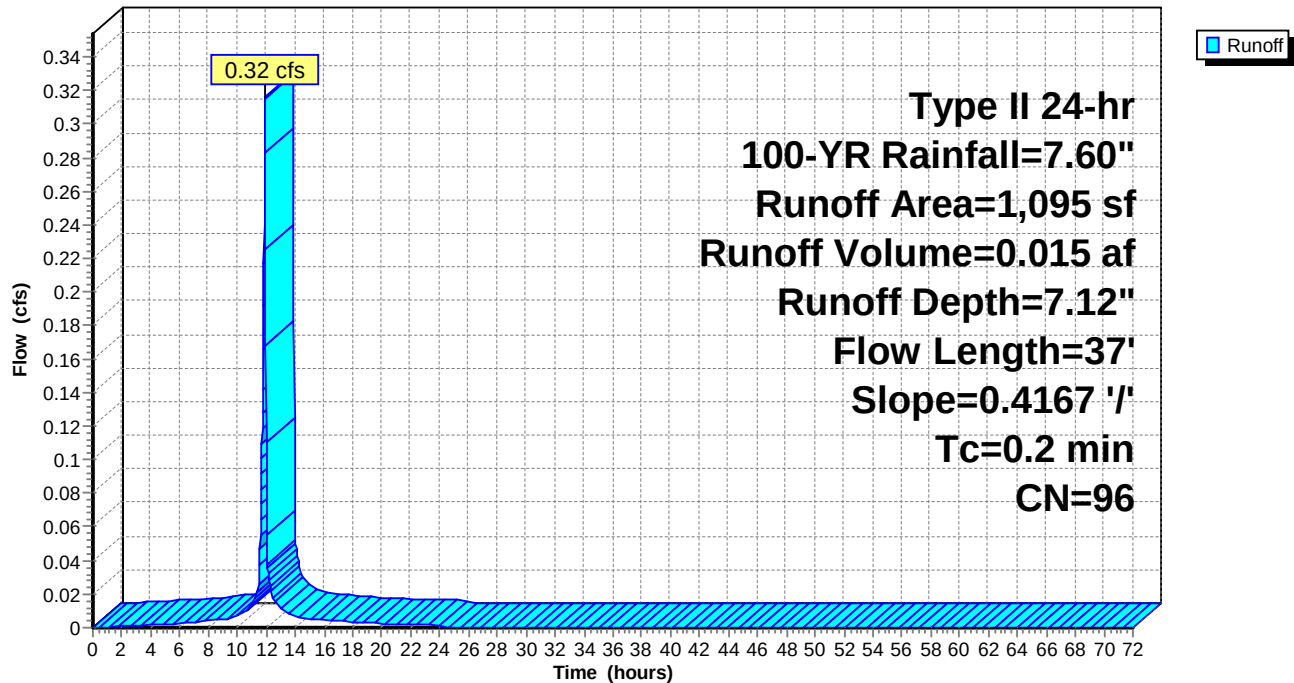
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 41: Rooftop #41

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 42: Rooftop #42

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

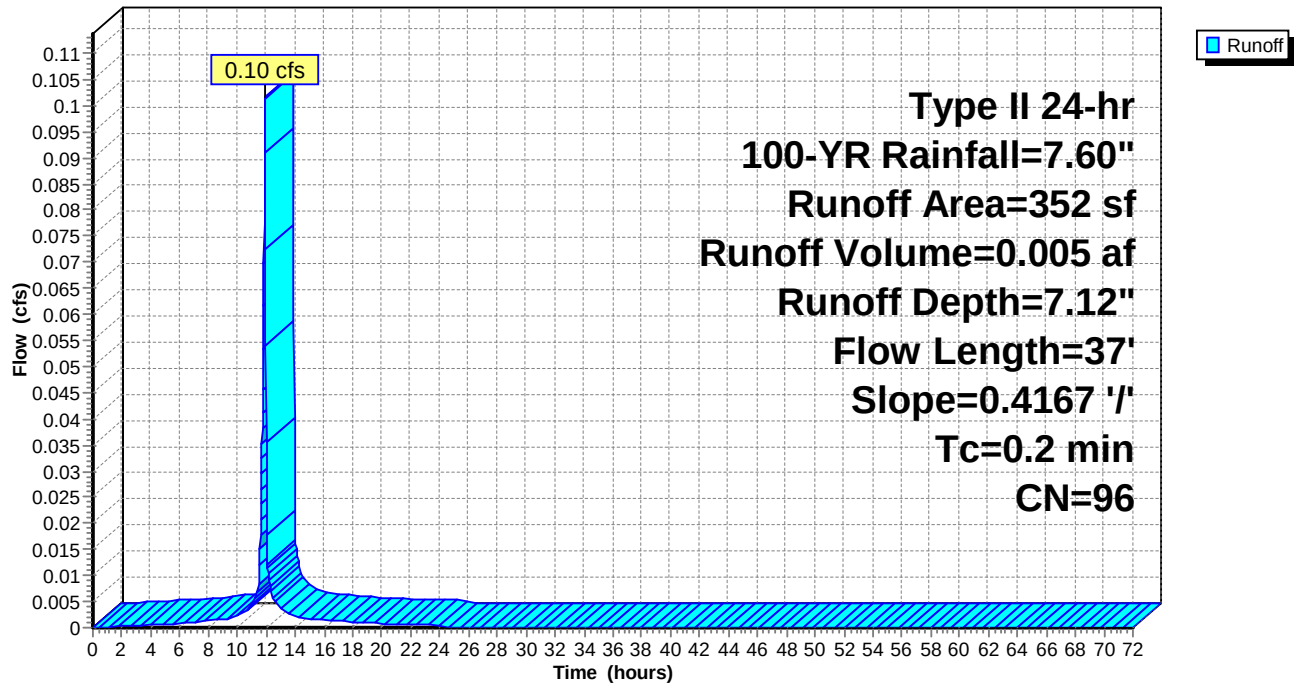
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 42: Rooftop #42

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 43: Rooftop #43

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

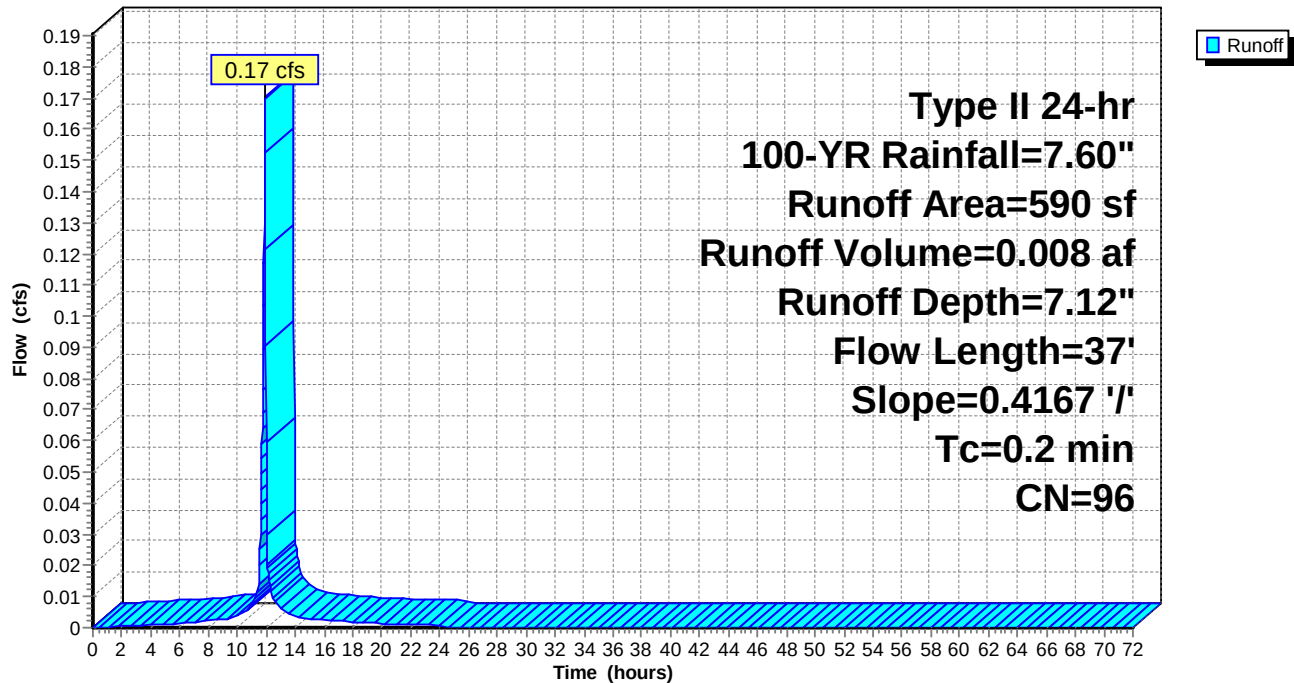
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 43: Rooftop #43

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 44: Rooftop #44

Runoff = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 7.12"

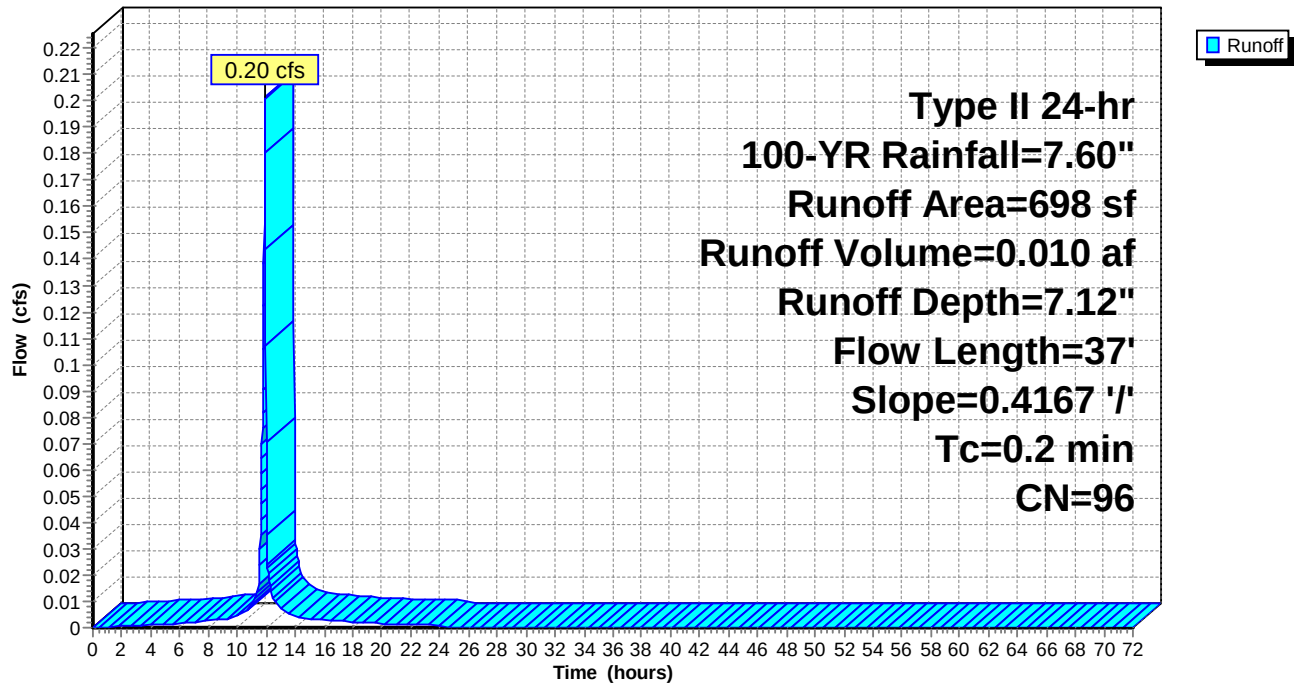
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 44: Rooftop #44

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 45: Rooftop #45

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

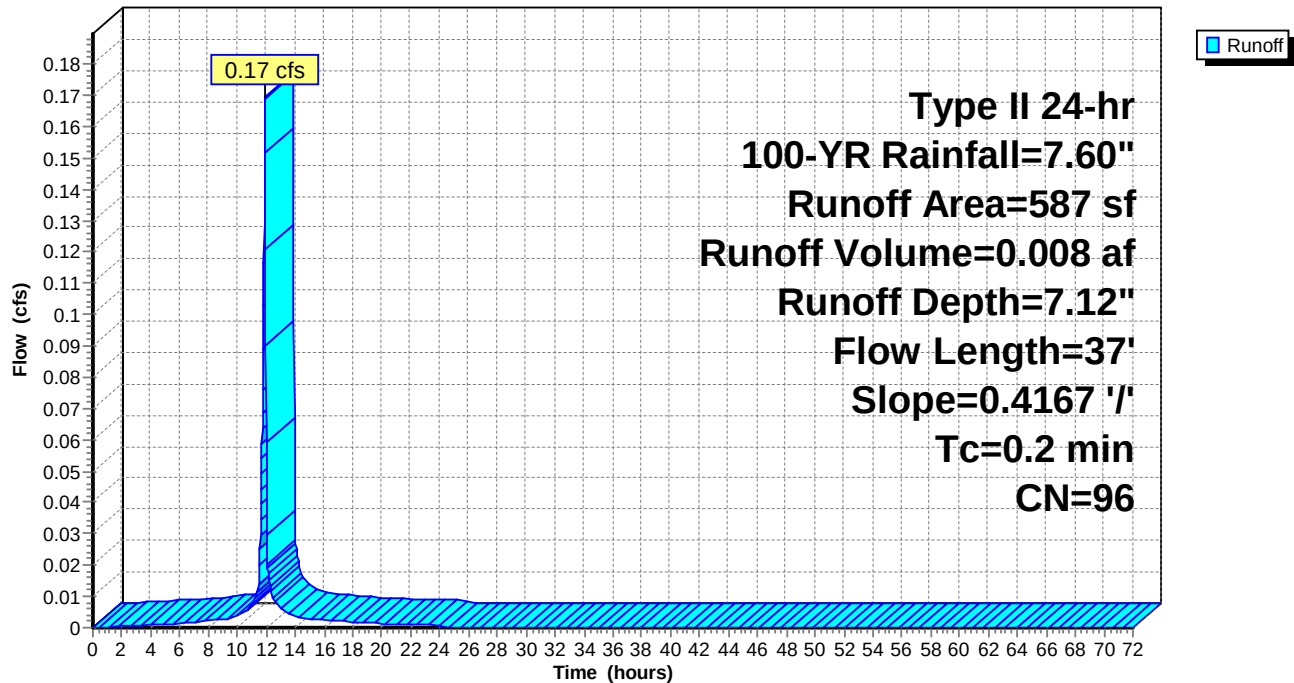
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 45: Rooftop #45

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 46: Rooftop #46

Runoff = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af, Depth= 7.12"

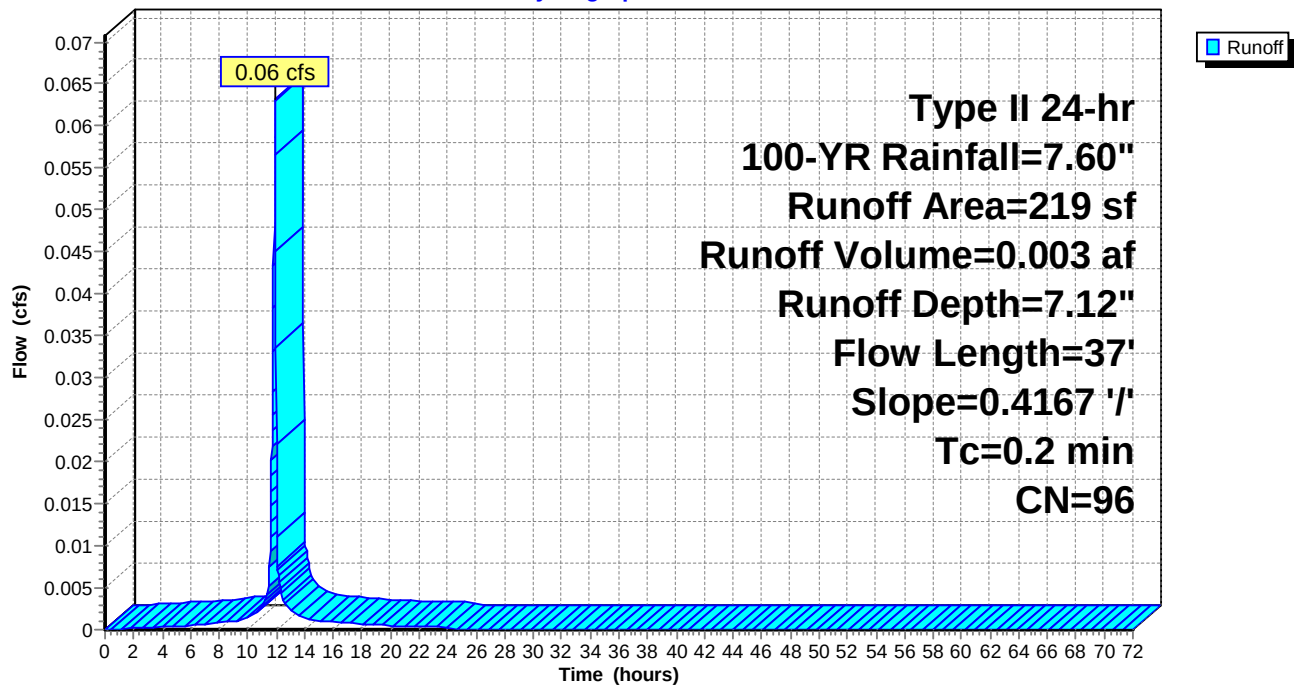
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
199	98	Roofs, HSG C
20	74	>75% Grass cover, Good, HSG C
219	96	Weighted Average
20		9.13% Pervious Area
199		90.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 46: Rooftop #46

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 47: Rooftop #47

Runoff = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af, Depth= 7.12"

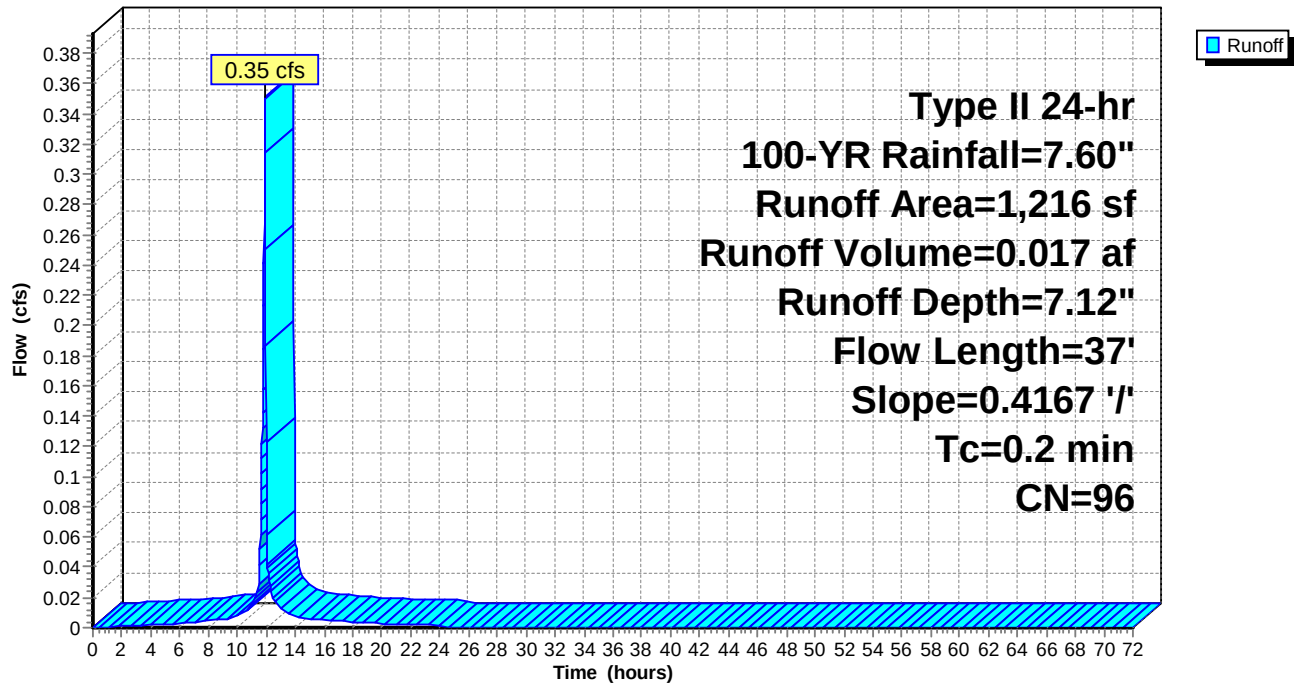
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,136	98	Roofs, HSG C
80	74	>75% Grass cover, Good, HSG C
1,216	96	Weighted Average
80		6.58% Pervious Area
1,136		93.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 47: Rooftop #47

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 48: Rooftop #48

Runoff = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 7.12"

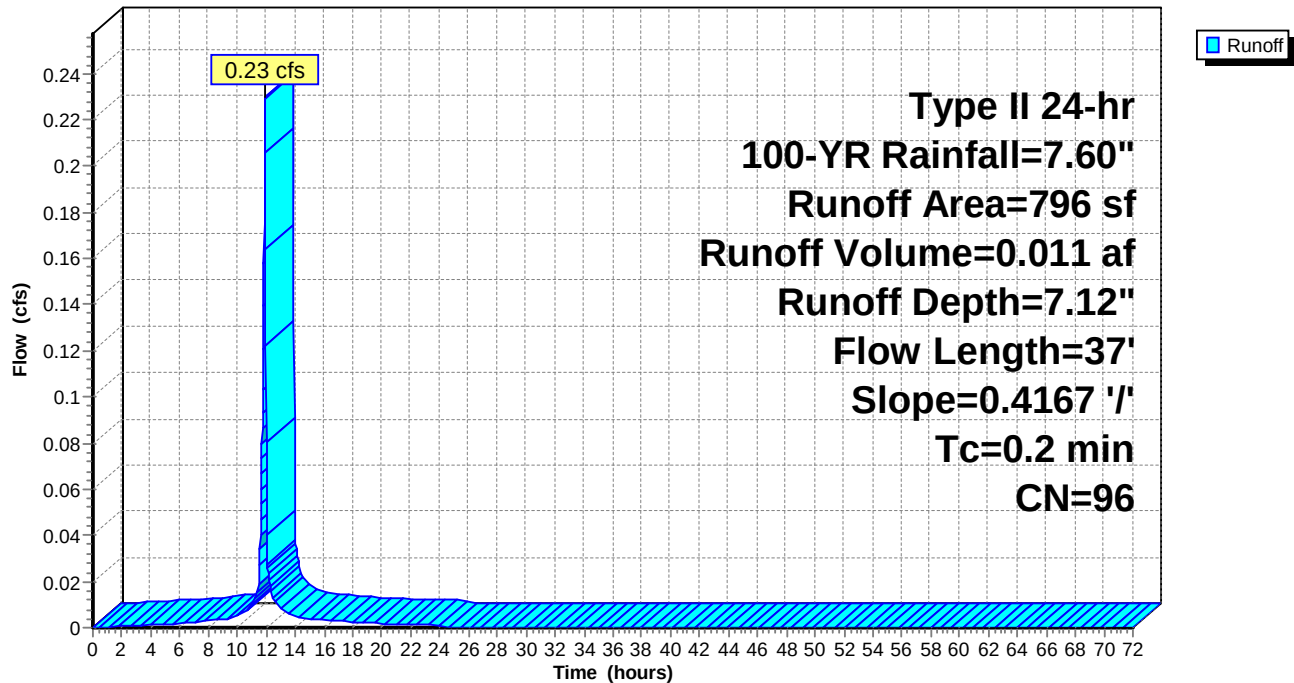
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
741	98	Roofs, HSG C
55	74	>75% Grass cover, Good, HSG C
796	96	Weighted Average
55		6.91% Pervious Area
741		93.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 48: Rooftop #48

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 49: Rooftop #49

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

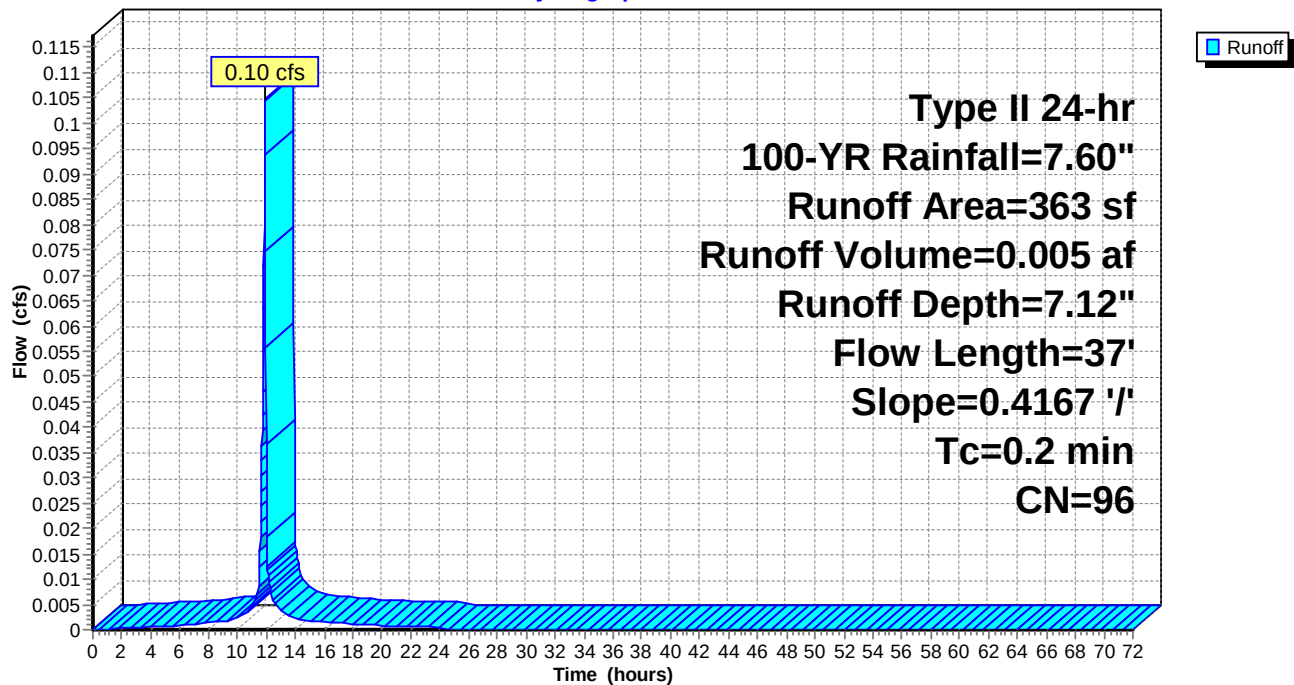
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
333	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
363	96	Weighted Average
30		8.26% Pervious Area
333		91.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 49: Rooftop #49

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 50: Rooftop #50

Runoff = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 7.12"

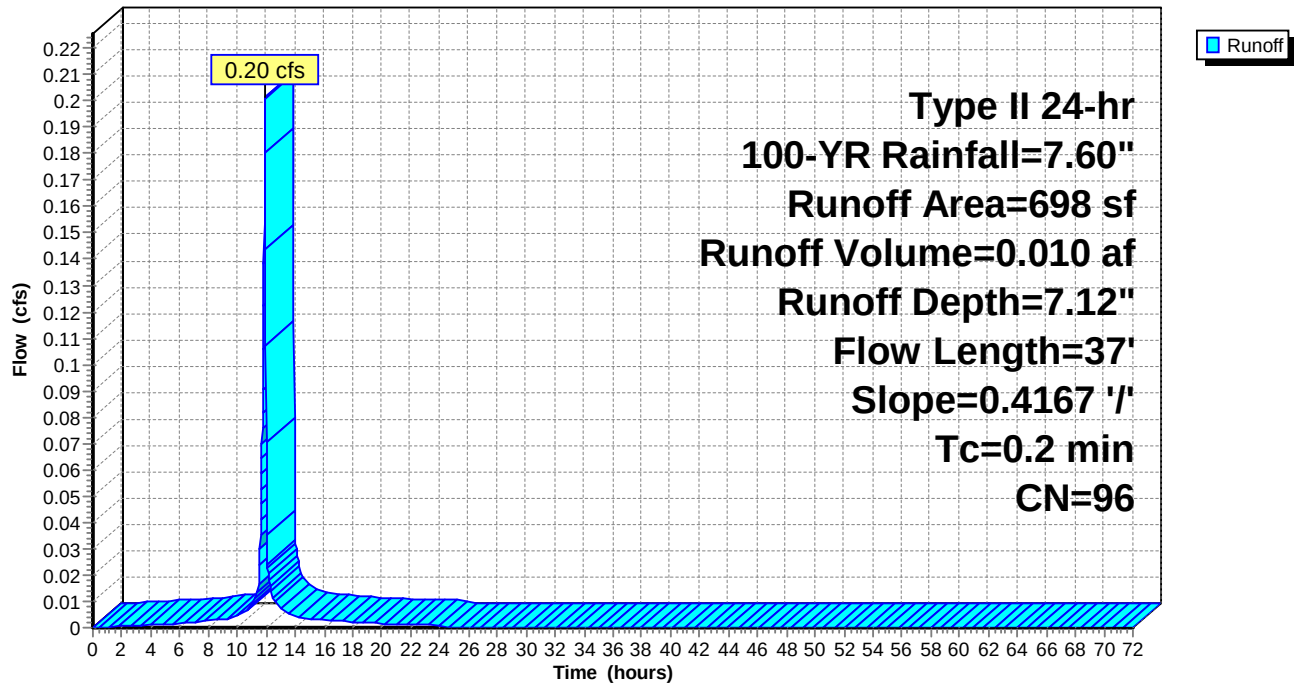
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
648	98	Roofs, HSG C
50	74	>75% Grass cover, Good, HSG C
698	96	Weighted Average
50		7.16% Pervious Area
648		92.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.40"

Subcatchment 50: Rooftop #50

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 51: Rooftop #51

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

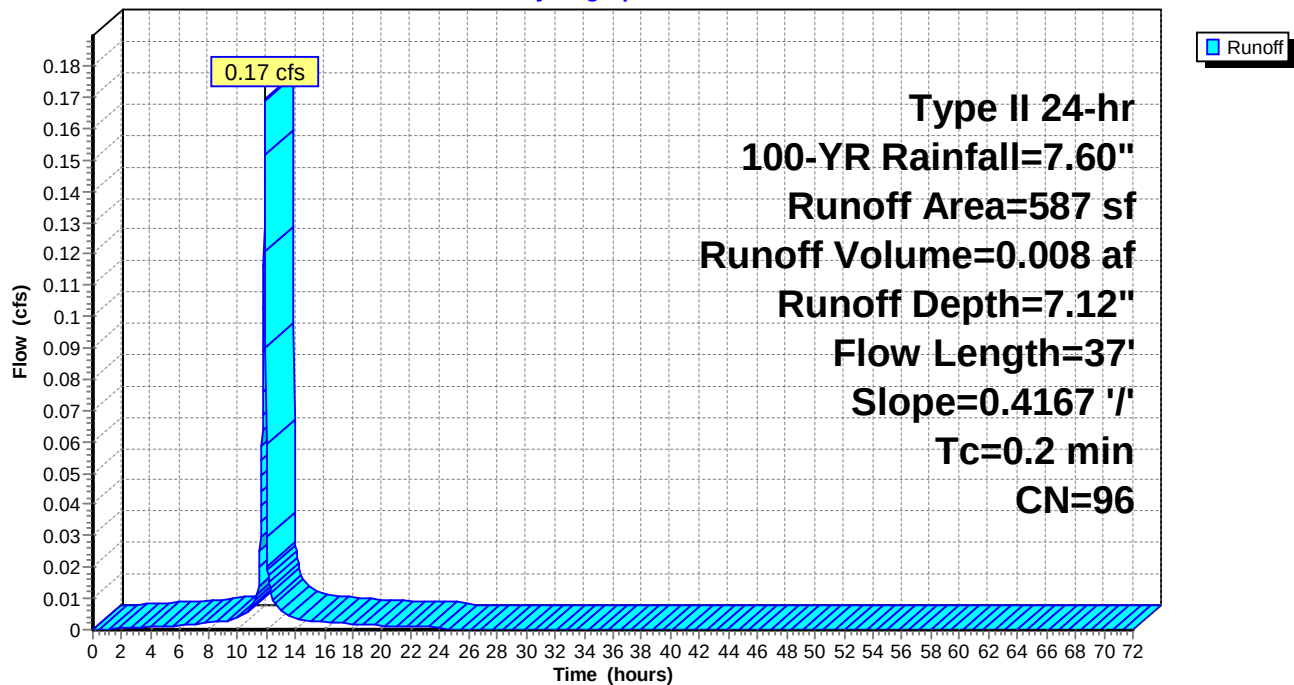
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
547	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
587	96	Weighted Average
40		6.81% Pervious Area
547		93.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 51: Rooftop #51

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 52: Rooftop #52

Runoff = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Depth= 7.12"

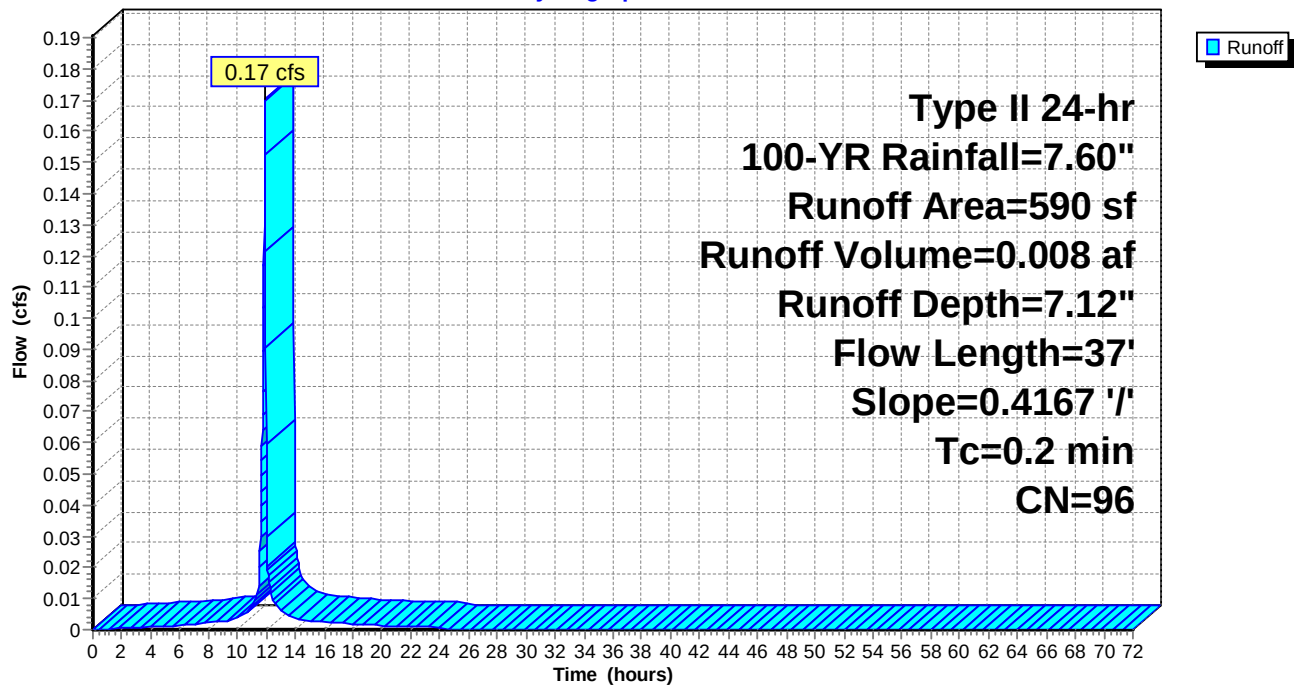
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
550	98	Roofs, HSG C
40	74	>75% Grass cover, Good, HSG C
590	96	Weighted Average
40		6.78% Pervious Area
550		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 52: Rooftop #52

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Subcatchment 53: Rooftop #53

Runoff = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af, Depth= 7.12"

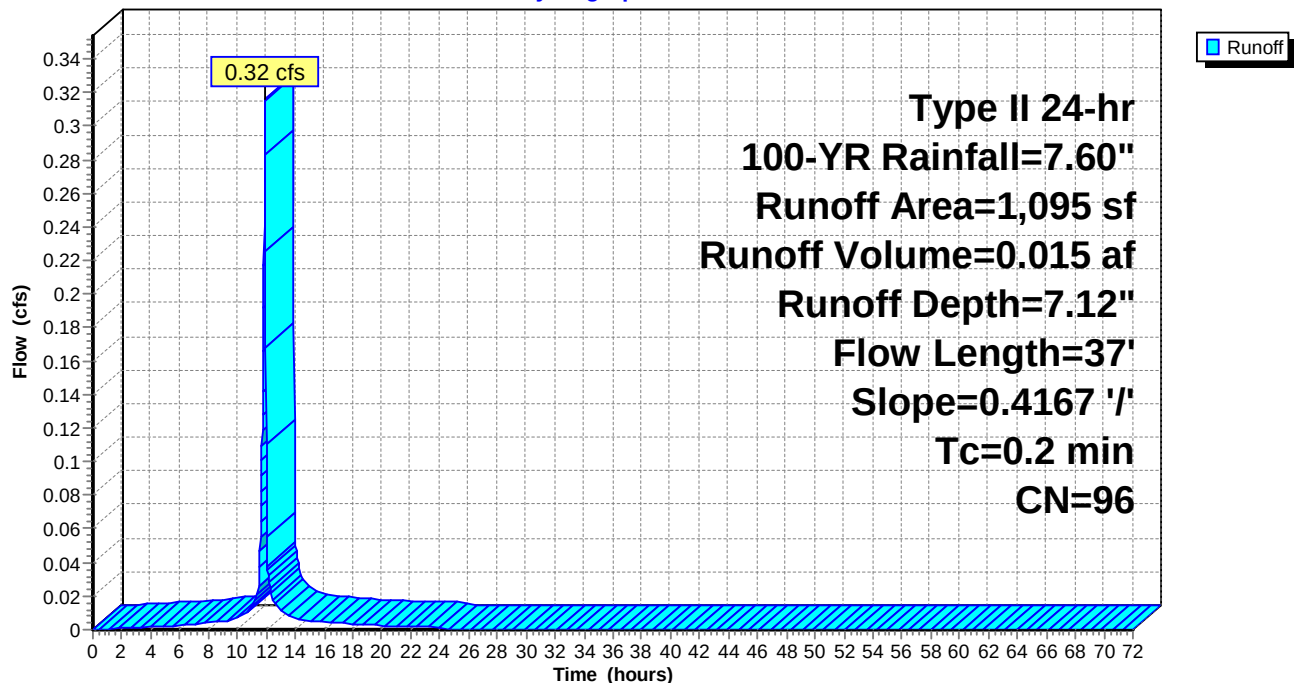
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,025	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
1,095	96	Weighted Average
70		6.39% Pervious Area
1,025		93.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 53: Rooftop #53

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 54: Rooftop #54

Runoff = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Depth= 7.12"

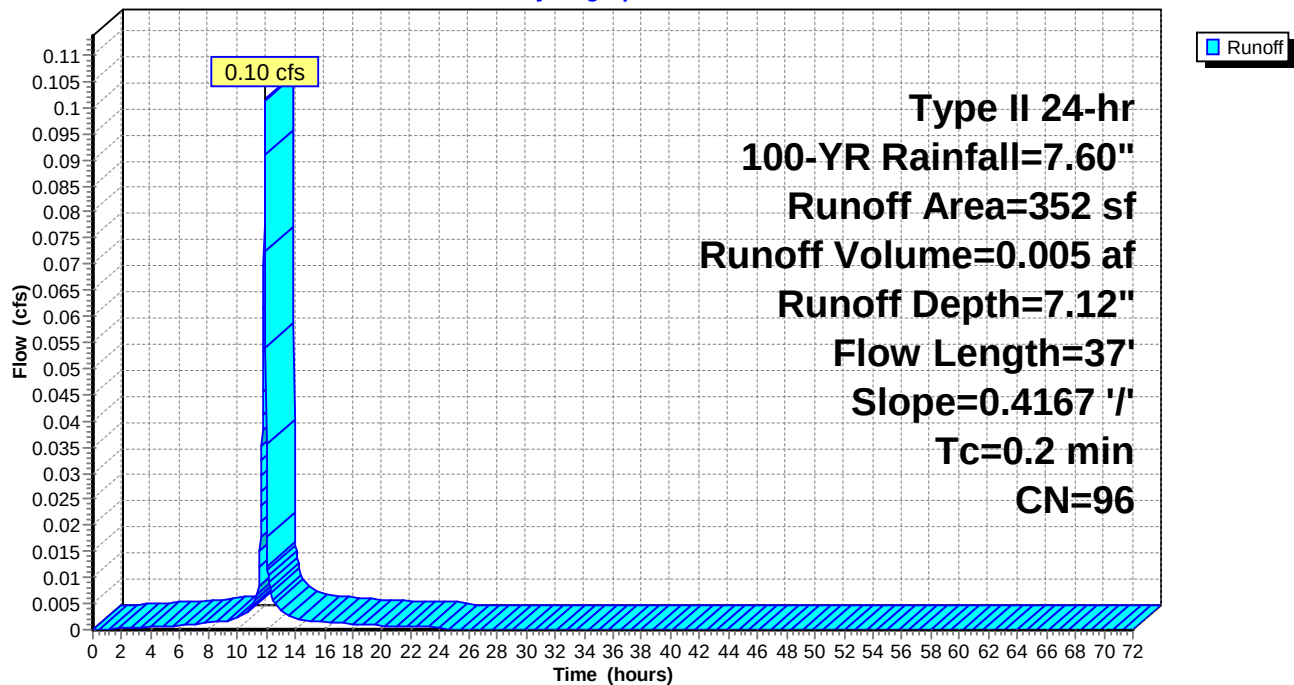
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
322	98	Roofs, HSG C
30	74	>75% Grass cover, Good, HSG C
352	96	Weighted Average
30		8.52% Pervious Area
322		91.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	37	0.4167	3.92		Sheet Flow, Roof
Smooth surfaces n= 0.011 P2= 3.40"					

Subcatchment 54: Rooftop #54

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 55: Non-RT DA to PA-2

Runoff = 0.58 cfs @ 11.99 hrs, Volume= 0.038 af, Depth= 6.65"

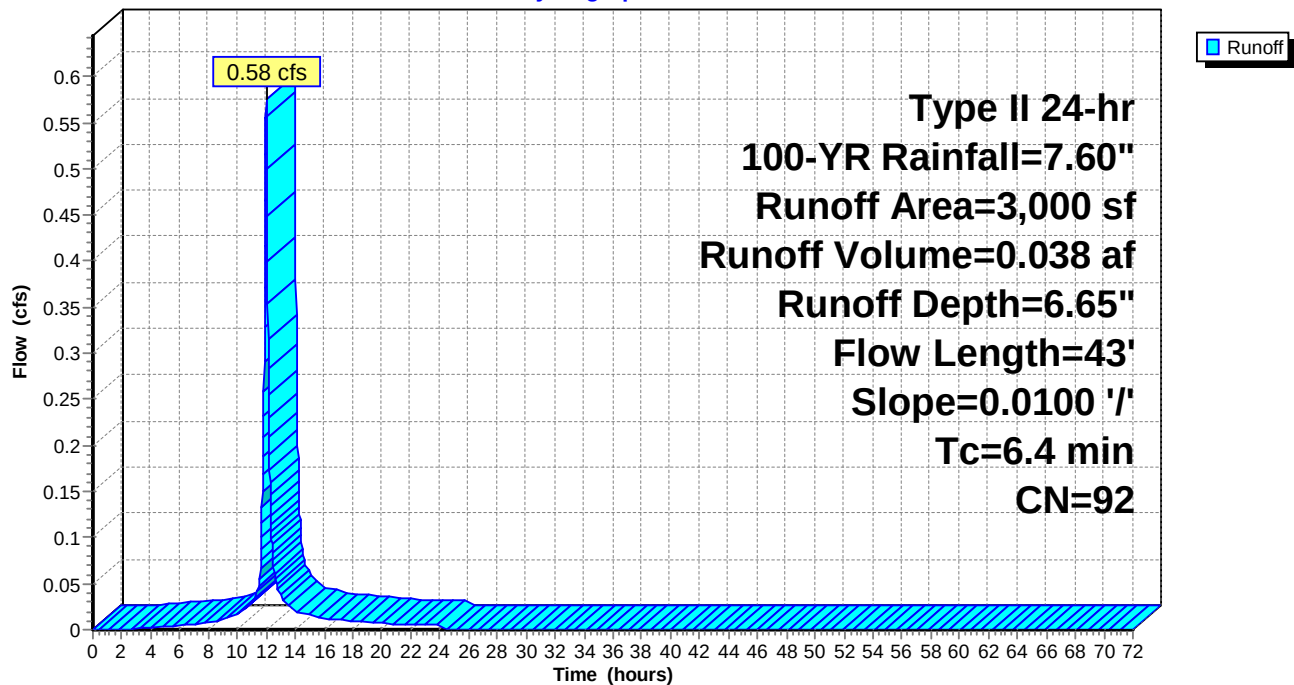
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
733	74	>75% Grass cover, Good, HSG C
* 2,267	98	Impervious
3,000	92	Weighted Average
733		24.43% Pervious Area
2,267		75.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	43	0.0100	0.11		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 55: Non-RT DA to PA-2

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 56: Non-RT DA to PA-3

Runoff = 0.73 cfs @ 12.00 hrs, Volume= 0.051 af, Depth= 6.06"

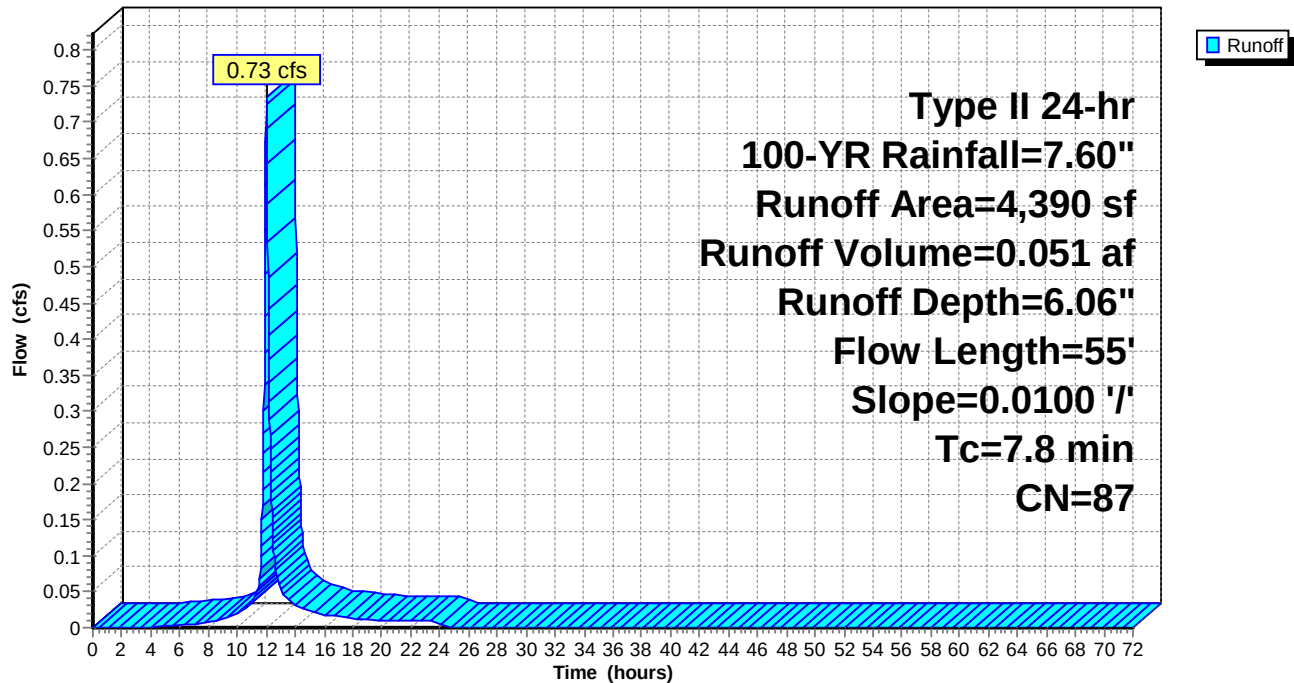
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,989	74	>75% Grass cover, Good, HSG C
2,401	98	Paved parking, HSG C
4,390	87	Weighted Average
1,989		45.31% Pervious Area
2,401		54.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	55	0.0100	0.12		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 56: Non-RT DA to PA-3

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 57: Non-RT DA to PA-4

Runoff = 0.74 cfs @ 12.01 hrs, Volume= 0.054 af, Depth= 6.18"

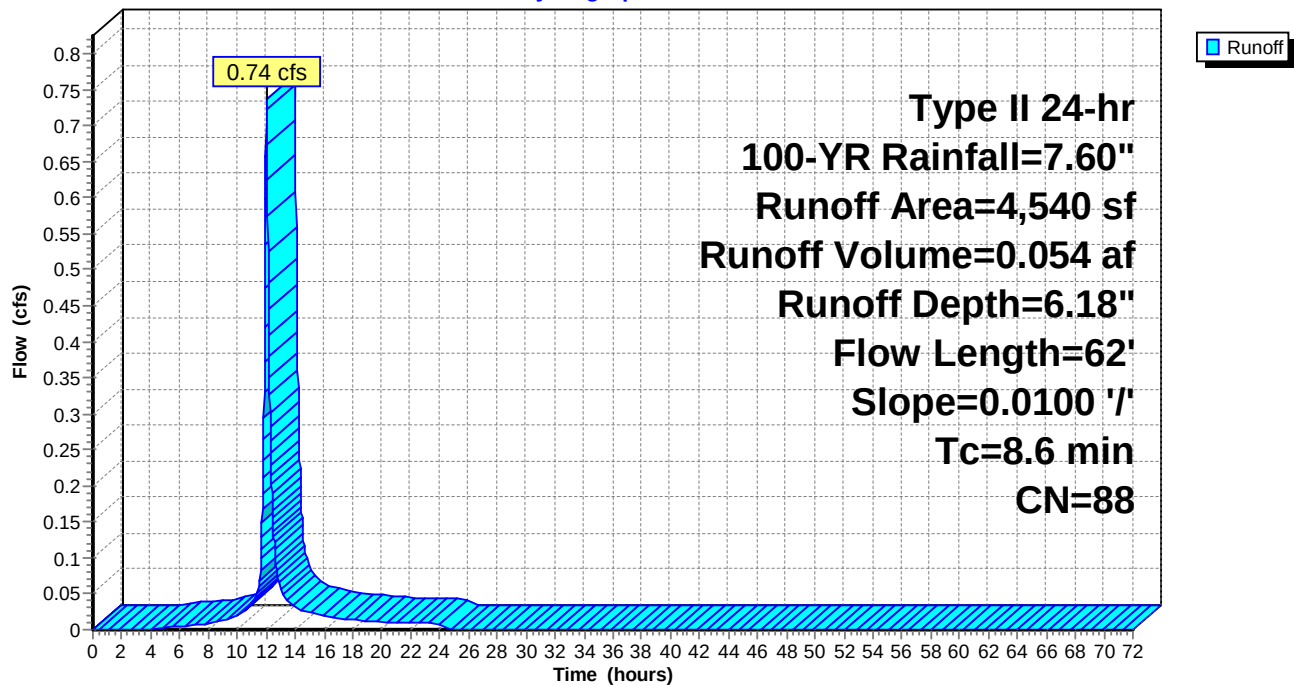
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,939	74	>75% Grass cover, Good, HSG C
2,601	98	Paved parking, HSG C
4,540	88	Weighted Average
1,939		42.71% Pervious Area
2,601		57.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	62	0.0100	0.12		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 57: Non-RT DA to PA-4

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 58: Non-RT DA to PA-5

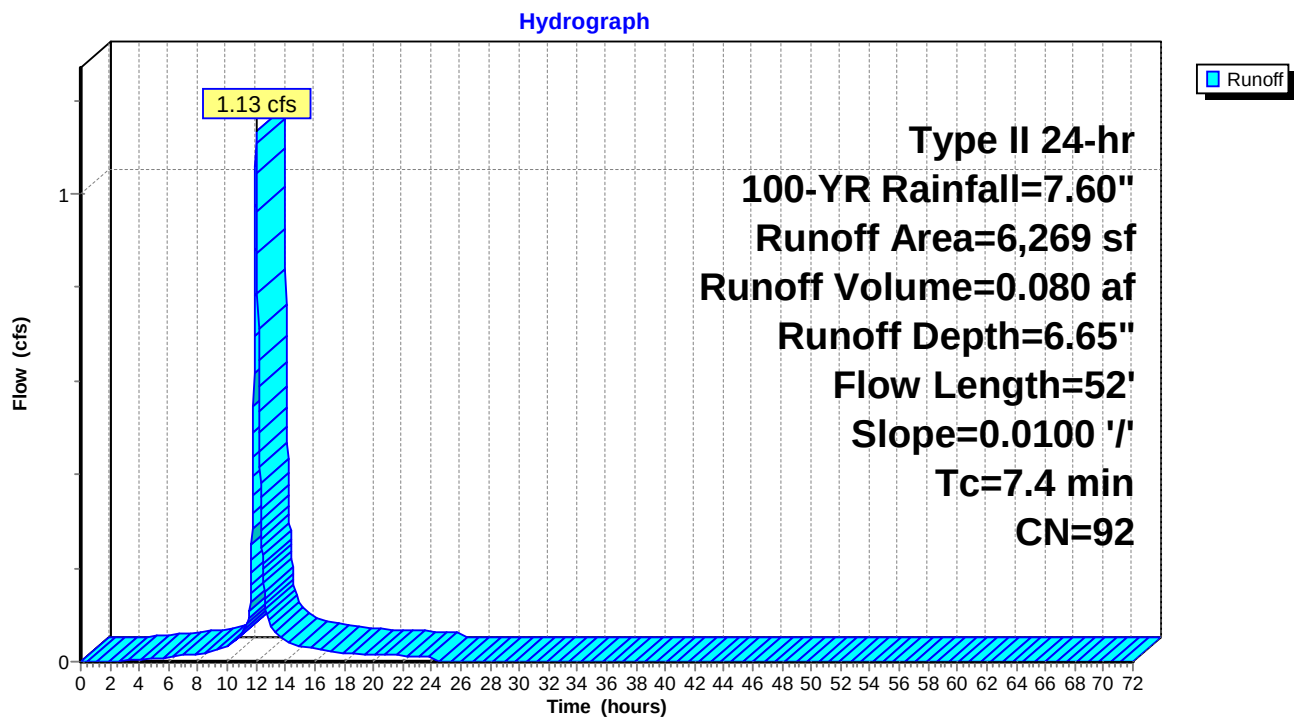
Runoff = 1.13 cfs @ 12.00 hrs, Volume= 0.080 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
1,645	74	>75% Grass cover, Good, HSG C
4,624	98	Paved parking, HSG C
6,269	92	Weighted Average
1,645		26.24% Pervious Area
4,624		73.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	52	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 58: Non-RT DA to PA-5



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 59: Non-RT DA to PA-6

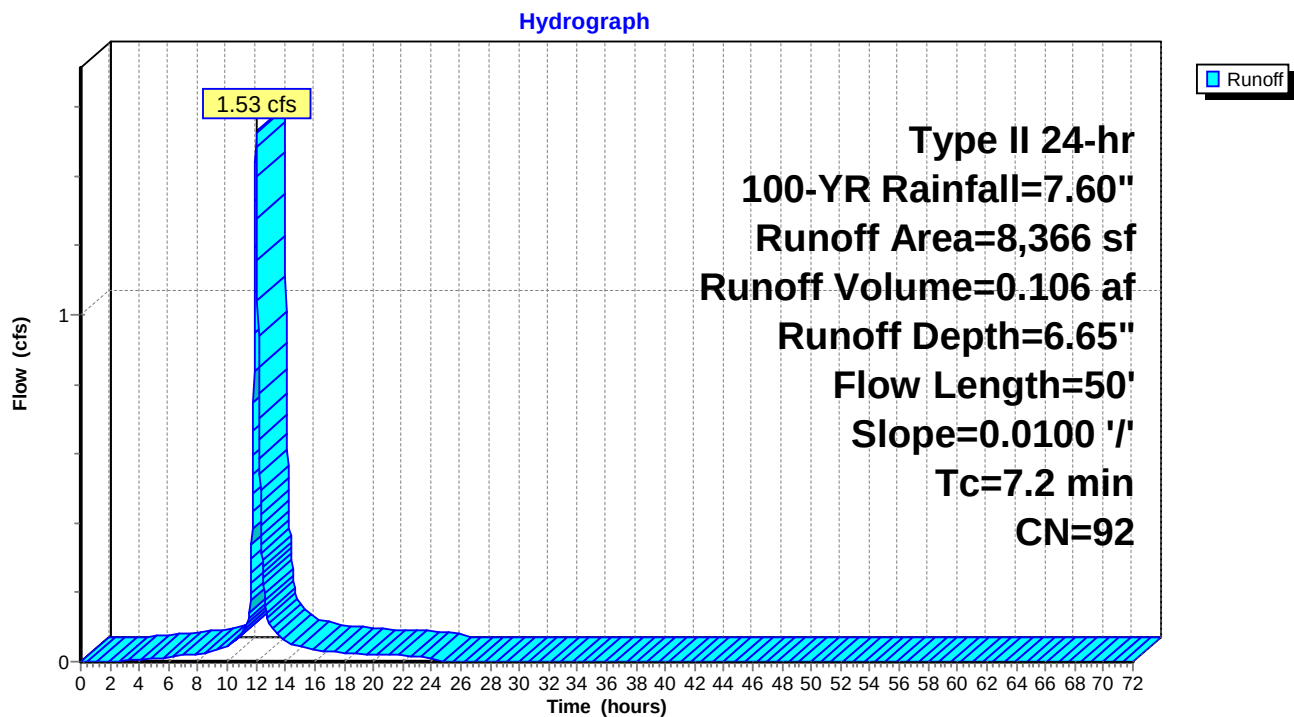
Runoff = 1.53 cfs @ 12.00 hrs, Volume= 0.106 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
2,213	74	>75% Grass cover, Good, HSG C
6,153	98	Paved parking, HSG C
8,366	92	Weighted Average
2,213		26.45% Pervious Area
6,153		73.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		Sheet Flow, Sideyard
Grass: Short n= 0.150 P2= 3.40"					

Subcatchment 59: Non-RT DA to PA-6



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 60: Non-RT DA to PA-7

Runoff = 0.21 cfs @ 11.99 hrs, Volume= 0.014 af, Depth= 6.53"

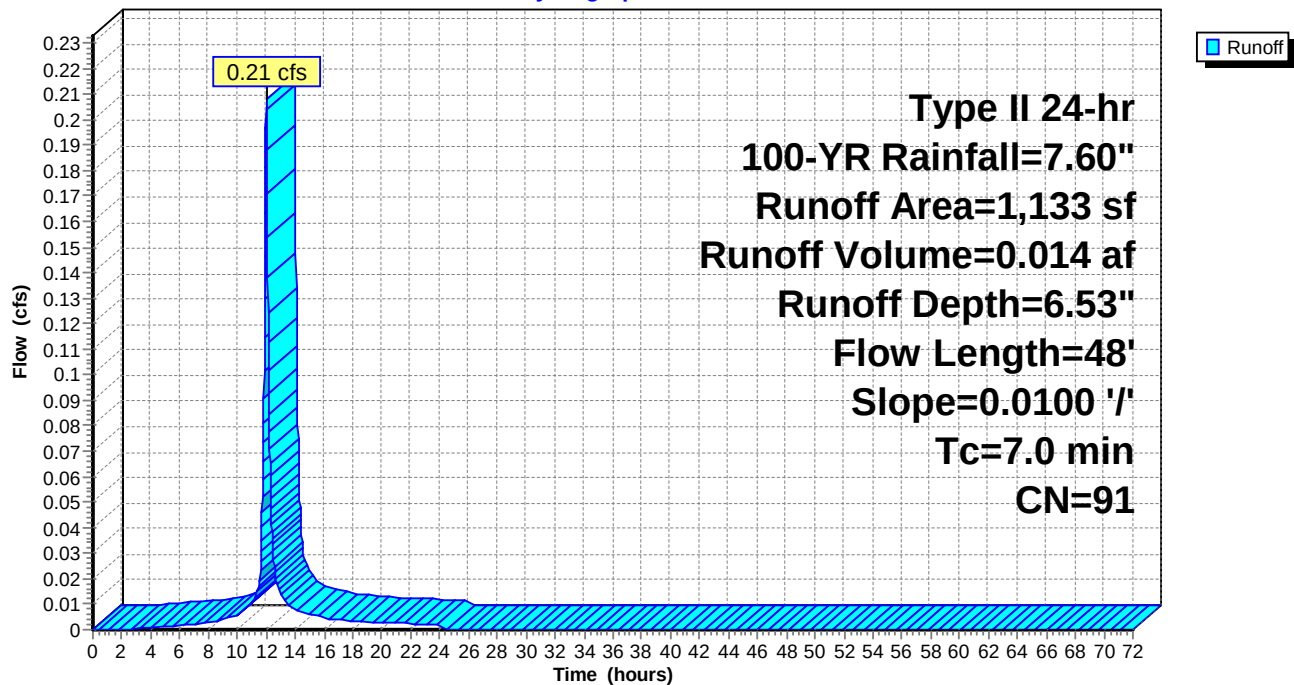
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
330	74	>75% Grass cover, Good, HSG C
803	98	Paved parking, HSG C
1,133	91	Weighted Average
330		29.13% Pervious Area
803		70.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	48	0.0100	0.11		Sheet Flow, Sideyard
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 60: Non-RT DA to PA-7

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Subcatchment 61: West DA to Jowite

Runoff = 1.40 cfs @ 12.08 hrs, Volume= 0.127 af, Depth= 4.57"

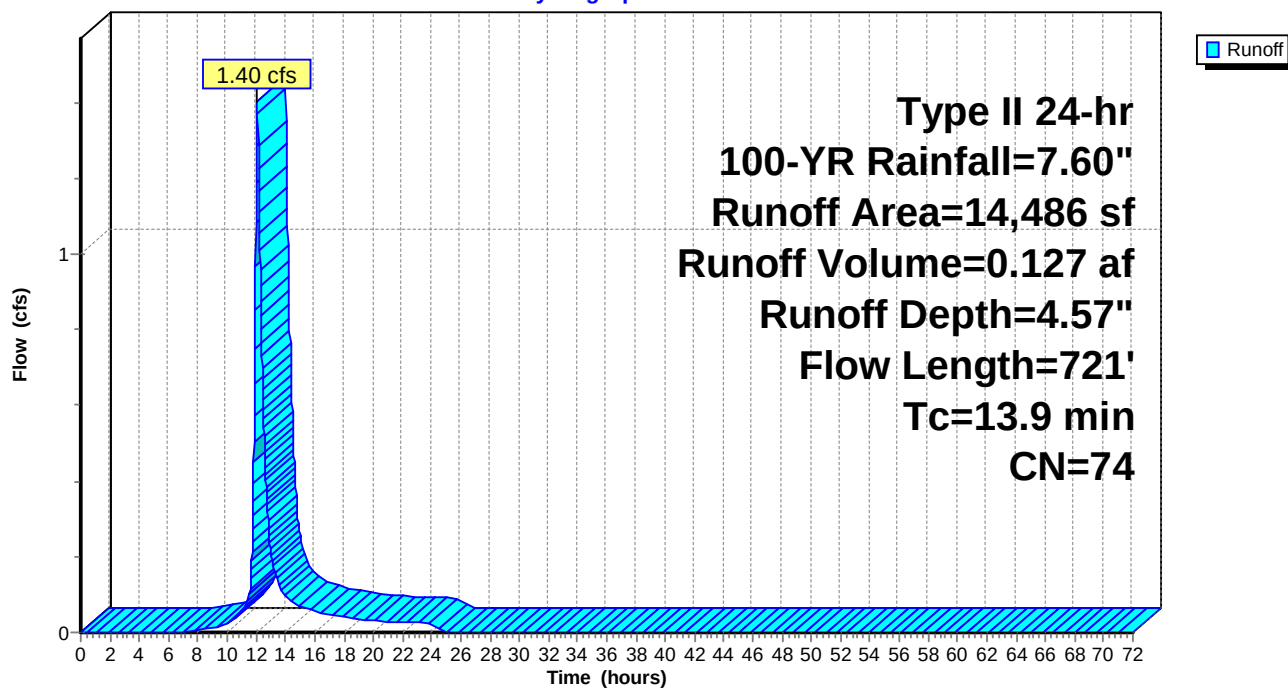
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-YR Rainfall=7.60"

Area (sf)	CN	Description
14,486	74	>75% Grass cover, Good, HSG C
14,486		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	55	0.0100	0.12		Sheet Flow, Sideyard Grass: Short n= 0.150 P2= 3.40"
5.6	496	0.0053	1.48		Shallow Concentrated Flow, Gutter Pan Paved Kv= 20.3 fps
0.5	170	0.0087	5.80	7.12	Pipe Channel, Pipe from CI on West Side of Jowite to SDMH-20201 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
13.9	721	Total			

Subcatchment 61: West DA to Jowite

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Reach VG-2: Valley Gutter 2

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

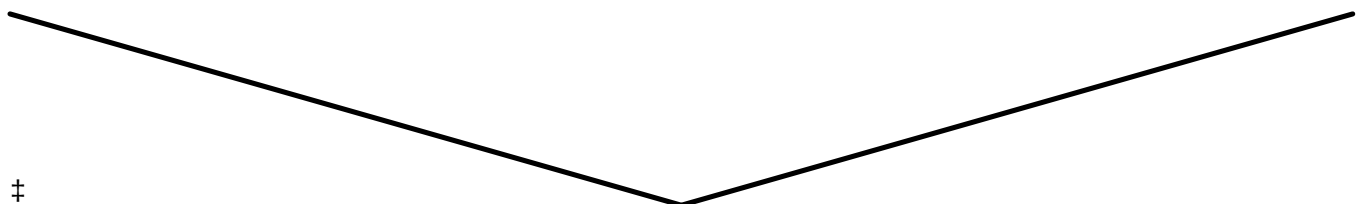
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.14 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean

Side Slope Z-value= 18.0 '/' Top Width= 2.88'

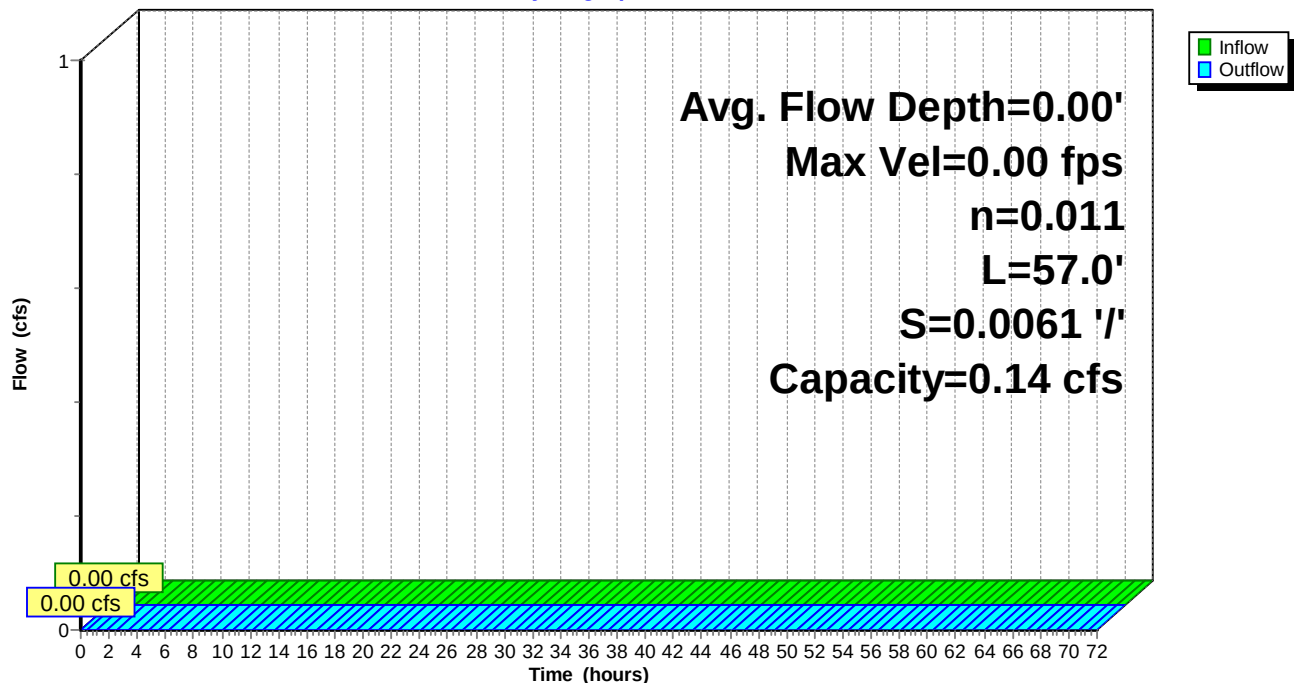
Length= 57.0' Slope= 0.0061 '/'

Inlet Invert= 15.10', Outlet Invert= 14.75'



Reach VG-2: Valley Gutter 2

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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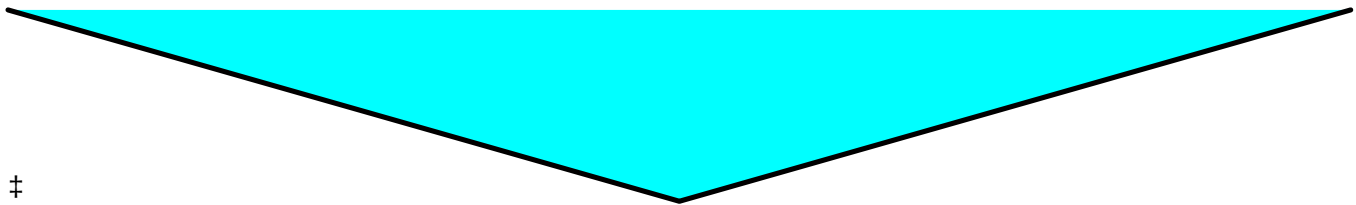
Summary for Reach VG-3: Valley Gutter 3

Inflow = 1.89 cfs @ 12.13 hrs, Volume= 0.023 af
Outflow = 1.51 cfs @ 12.14 hrs, Volume= 0.023 af, Atten= 20%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Max. Velocity= 1.51 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 1.6 min

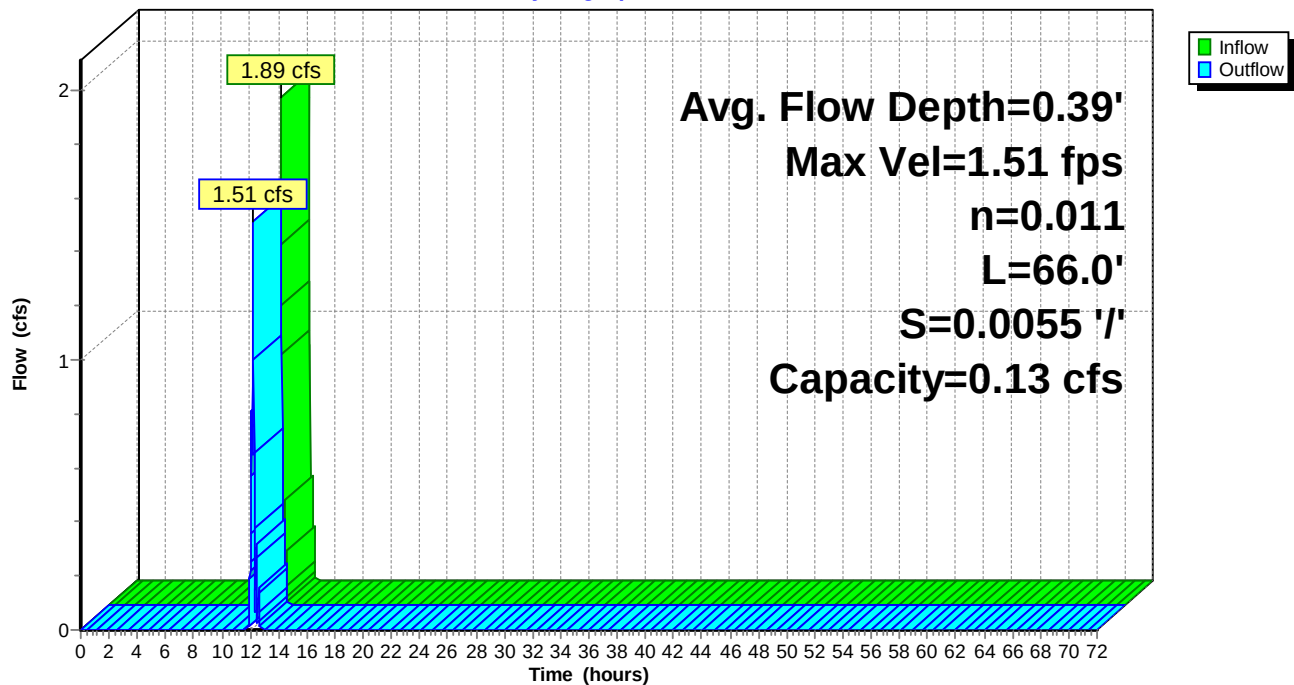
Peak Storage= 66 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.13 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean
Side Slope Z-value= 18.0 ' Top Width= 2.88'
Length= 66.0' Slope= 0.0055 '
Inlet Invert= 15.11', Outlet Invert= 14.75'



Reach VG-3: Valley Gutter 3

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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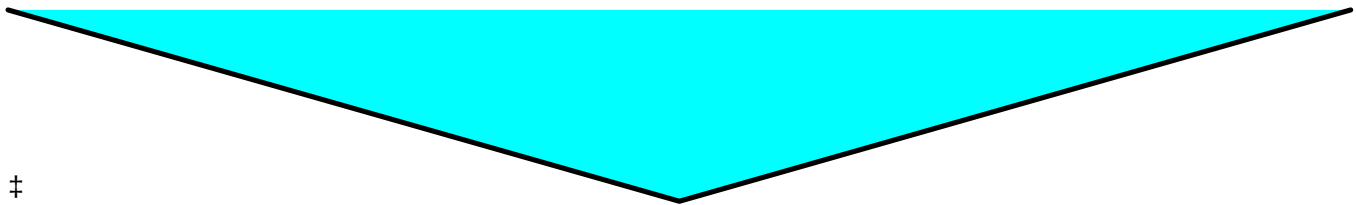
Summary for Reach VG-4: Valley Gutter 4

Inflow = 3.04 cfs @ 12.12 hrs, Volume= 0.015 af
Outflow = 1.37 cfs @ 12.14 hrs, Volume= 0.015 af, Atten= 55%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Max. Velocity= 1.53 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 2.9 min

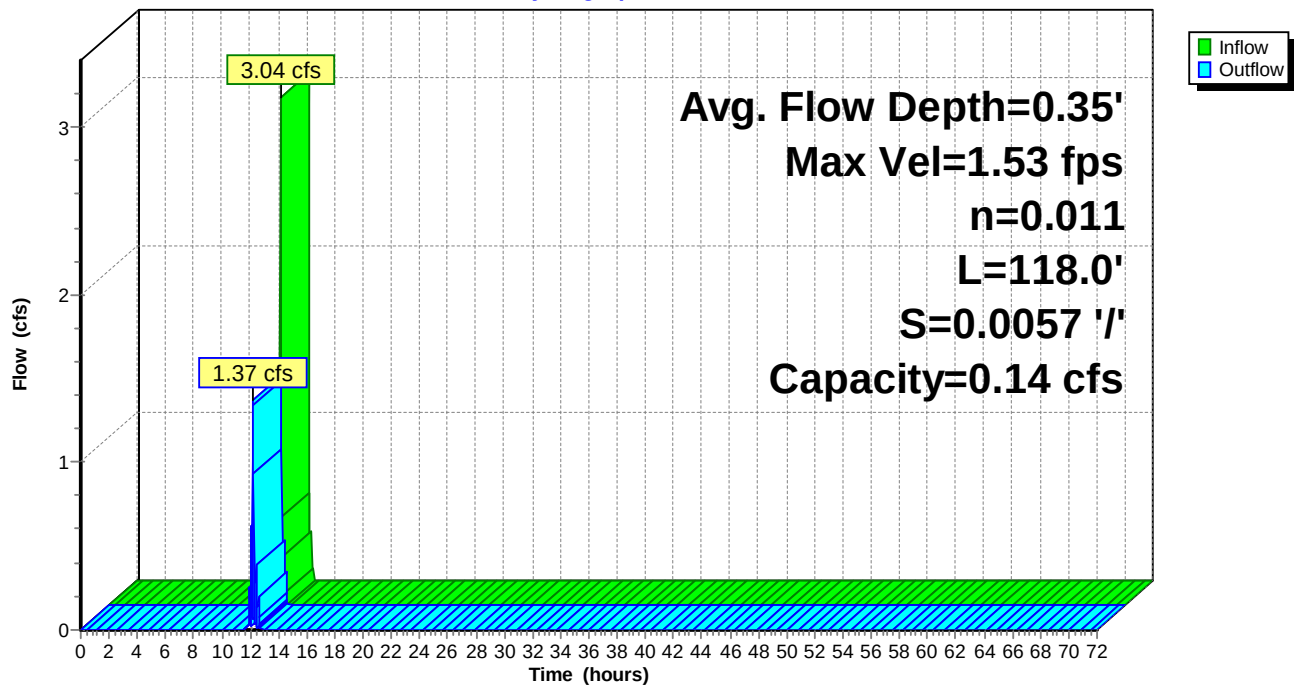
Peak Storage= 106 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.14 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean
Side Slope Z-value= 18.0 ' / ' Top Width= 2.88'
Length= 118.0' Slope= 0.0057 ' / '
Inlet Invert= 15.78', Outlet Invert= 15.11'



Reach VG-4: Valley Gutter 4

Hydrograph



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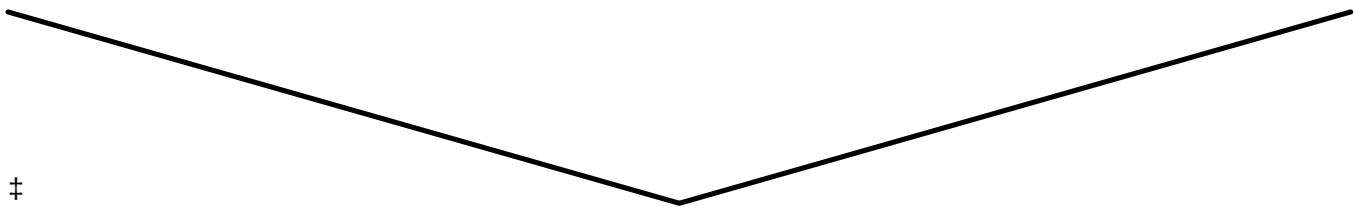
Summary for Reach VG-5: Valley Gutter 5

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

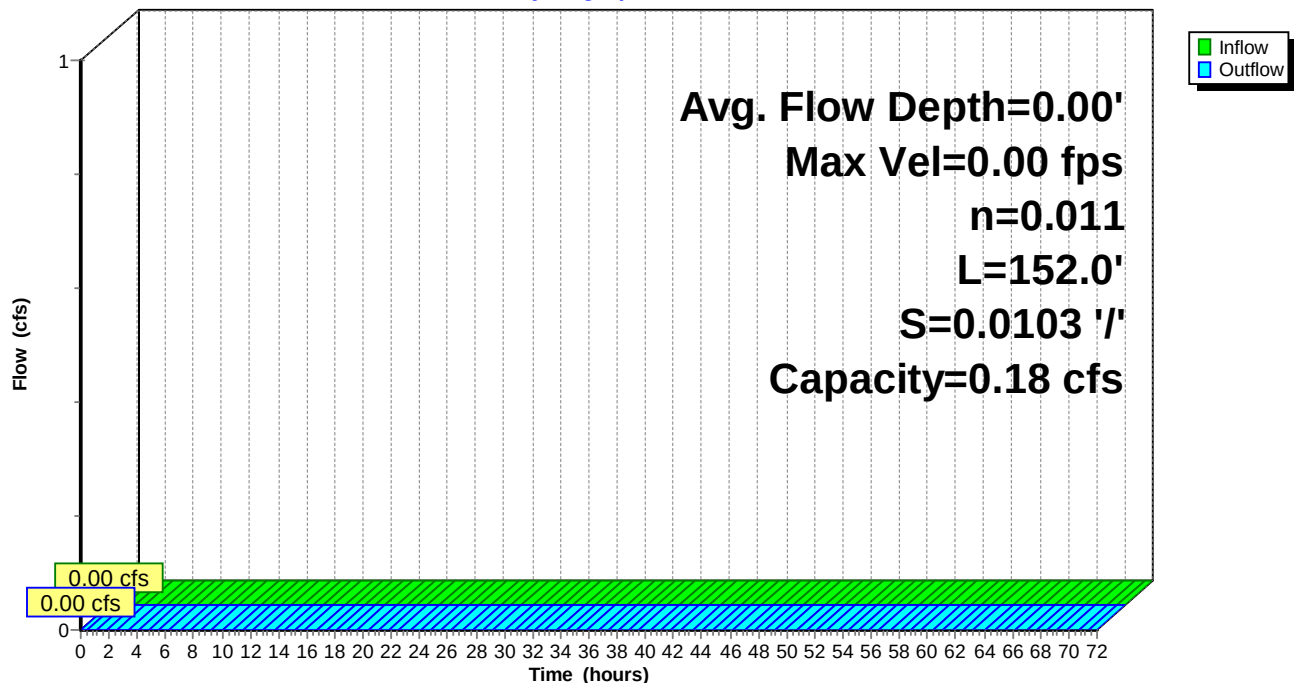
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.08' Flow Area= 0.1 sf, Capacity= 0.18 cfs

0.00' x 0.08' deep channel, n= 0.011 Concrete pipe, straight & clean
Side Slope Z-value= 18.0 '/' Top Width= 2.88'
Length= 152.0' Slope= 0.0103 '/'
Inlet Invert= 17.34', Outlet Invert= 15.78'



Reach VG-5: Valley Gutter 5

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond EX-I-2: EX-I-2

Inflow Area = 0.921 ac, 75.76% Impervious, Inflow Depth = 6.67" for 100-YR event
Inflow = 4.43 cfs @ 12.14 hrs, Volume= 0.512 af
Outflow = 4.43 cfs @ 12.14 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min
Primary = 4.43 cfs @ 12.14 hrs, Volume= 0.512 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 14.66' @ 12.14 hrs

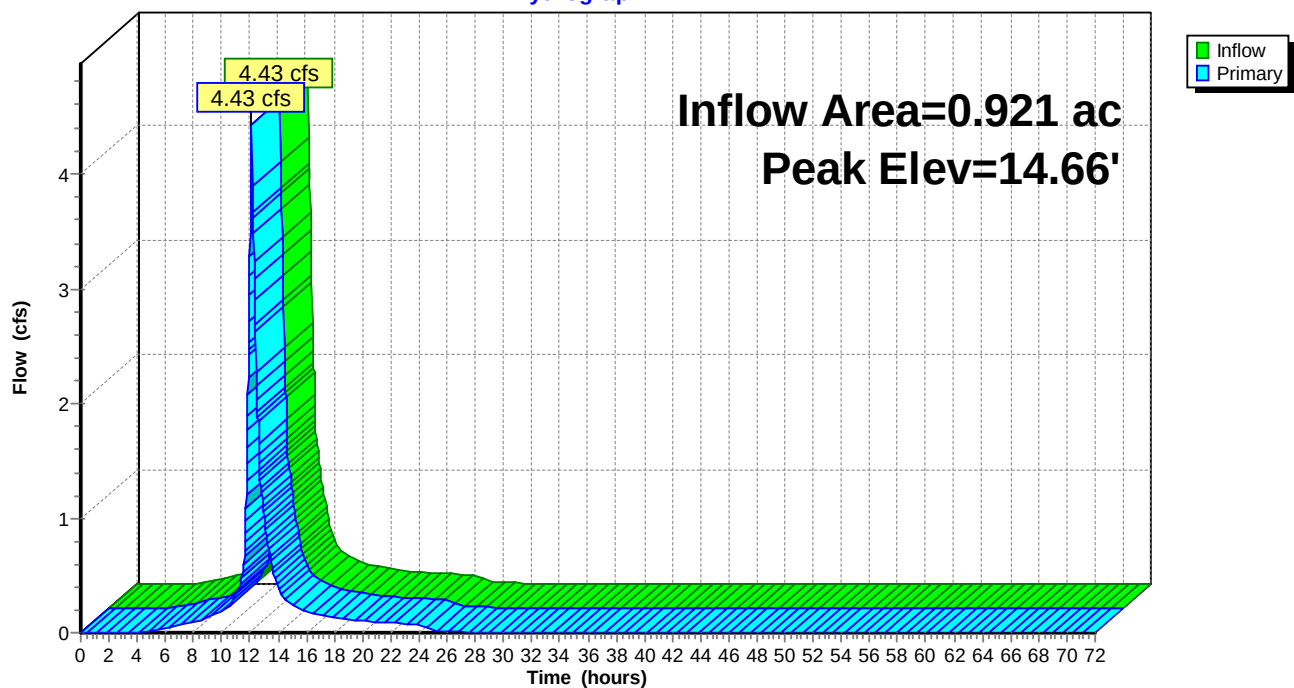
Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	2.0" x 2.0" Horiz. Orifice/Grate X 11.00 columns X 11 rows C= 0.600 in 24.0" x 24.0" Grate (84% open area) Limited to weir flow at low heads
#2	Primary	12.30'	12.0" Round CMP_Round 12" L= 172.1' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 12.30' / 12.00' S= 0.0017 ' ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.37 cfs @ 12.14 hrs HW=14.66' TW=13.63' (Dynamic Tailwater)

1=Orifice/Grate (Weir Controls 1.62 cfs @ 1.29 fps)
2=CMP_Round 12" (Outlet Controls 2.75 cfs @ 3.51 fps)

Pond EX-I-2: EX-I-2

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P19: Planter #19

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.19 cfs @ 11.88 hrs, Volume= 0.011 af, Atten= 15%, Lag= 0.0 min
 Primary = 0.19 cfs @ 11.88 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.14' @ 11.93 hrs Surf.Area= 55 sf Storage= 20 cf

Plug-Flow detention time= 15.7 min calculated for 0.011 af (99% of inflow)
 Center-of-Mass det. time= 8.7 min (752.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	55	0.0	0	0
13.25	55	40.0	0	0
16.99	55	40.0	82	82
17.00	55	100.0	1	83
18.00	55	100.0	55	138
18.01	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 26.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.10' S= 0.0131 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.19 cfs @ 11.88 hrs HW=13.96' TW=13.53' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.19 cfs @ 2.23 fps)

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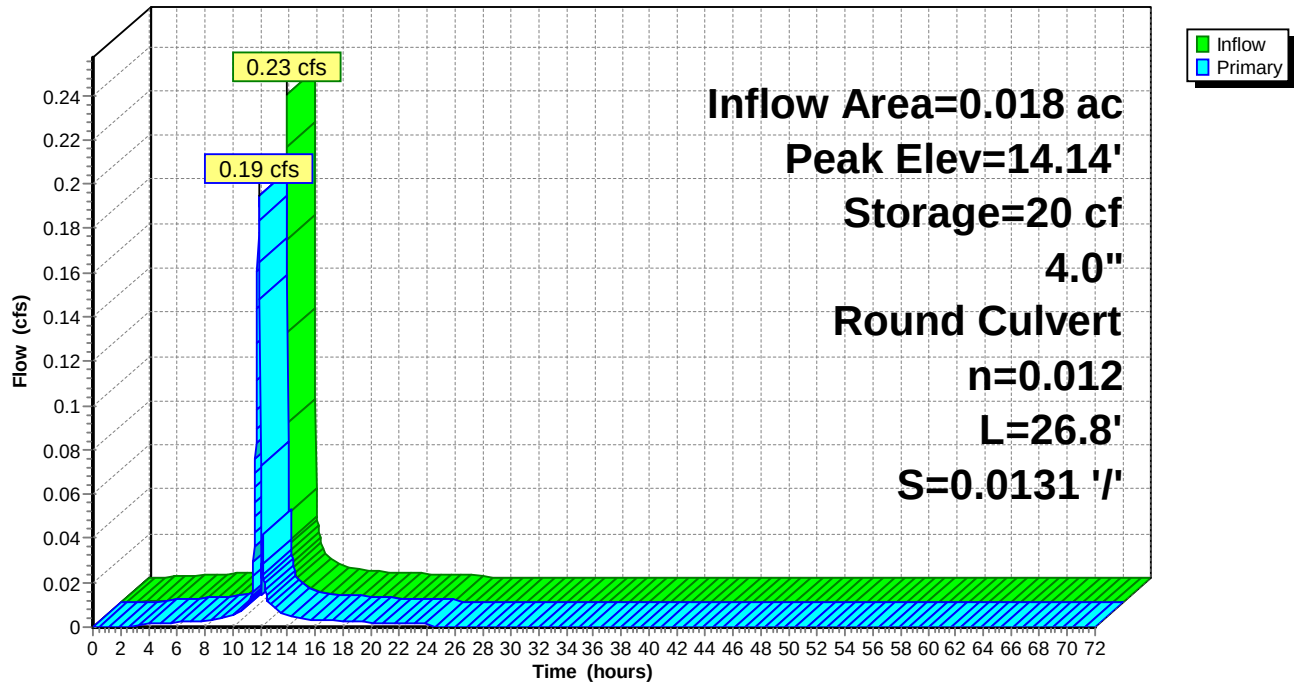
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P19: Planter #19

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P20: Planter #20

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.80' Surf.Area= 30 sf Storage= 31 cf

Peak Elev= 16.06' @ 11.90 hrs Surf.Area= 30 sf Storage= 34 cf (3 cf above start)

Plug-Flow detention time= 120.4 min calculated for 0.004 af (86% of inflow)

Center-of-Mass det. time= 2.2 min (746.3 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	30	0.0	0	0
13.25	30	40.0	0	0
16.99	30	40.0	45	45
17.00	30	100.0	0	45
18.00	30	100.0	30	75
18.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.80'	4.0" Round Culvert L= 20.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.80' S= -0.1169 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=16.06' TW=14.71' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.38 fps)

Naima - Phase 2 - Proposed HydroCAD

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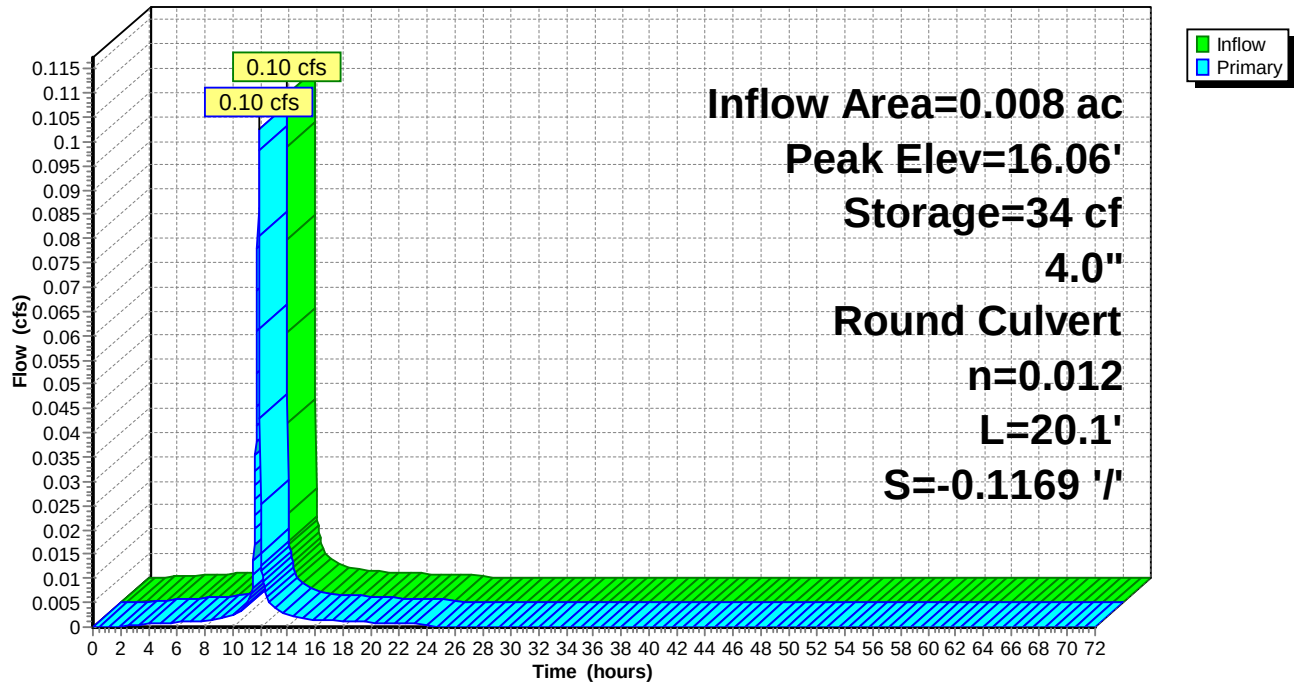
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P20: Planter #20

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P21: Planter #21

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.06 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 12%, Lag= 0.5 min
 Primary = 0.06 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.81' @ 11.93 hrs Surf.Area= 20 sf Storage= 5 cf

Plug-Flow detention time= 18.5 min calculated for 0.003 af (99% of inflow)

Center-of-Mass det. time= 9.5 min (753.6 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	20	0.0	0	0
13.25	20	40.0	0	0
16.99	20	40.0	30	30
17.00	20	100.0	0	30
18.00	20	100.0	20	50
18.01	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 30.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 12.89' S= 0.0185 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.08 cfs @ 11.91 hrs HW=13.76' TW=13.66' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.08 cfs @ 1.16 fps)

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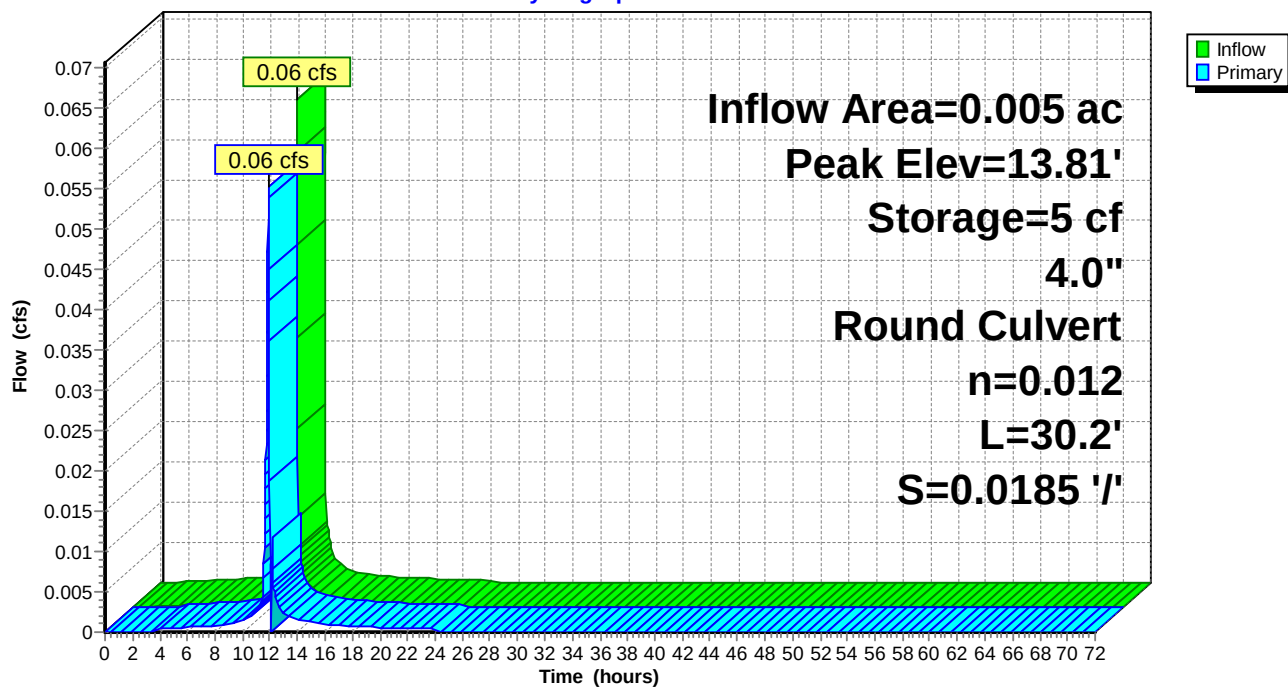
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Pond P21: Planter #21

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P22: Planter #22

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af
 Outflow = 0.28 cfs @ 11.93 hrs, Volume= 0.017 af, Atten= 20%, Lag= 2.0 min
 Primary = 0.28 cfs @ 11.93 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.54' Surf.Area= 80 sf Storage= 74 cf

Peak Elev= 16.96' @ 11.93 hrs Surf.Area= 80 sf Storage= 119 cf (45 cf above start)

Plug-Flow detention time= 98.1 min calculated for 0.015 af (90% of inflow)

Center-of-Mass det. time= 3.7 min (747.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	80	0.0	0	0
13.25	80	40.0	0	0
16.99	80	40.0	120	120
17.00	80	100.0	1	121
18.00	80	100.0	80	201
18.01	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices	
#1	Primary	15.54'	4.0" Round Culvert L= 59.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.54' S= -0.0350 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.28 cfs @ 11.93 hrs HW=16.94' TW=14.82' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.28 cfs @ 3.20 fps)

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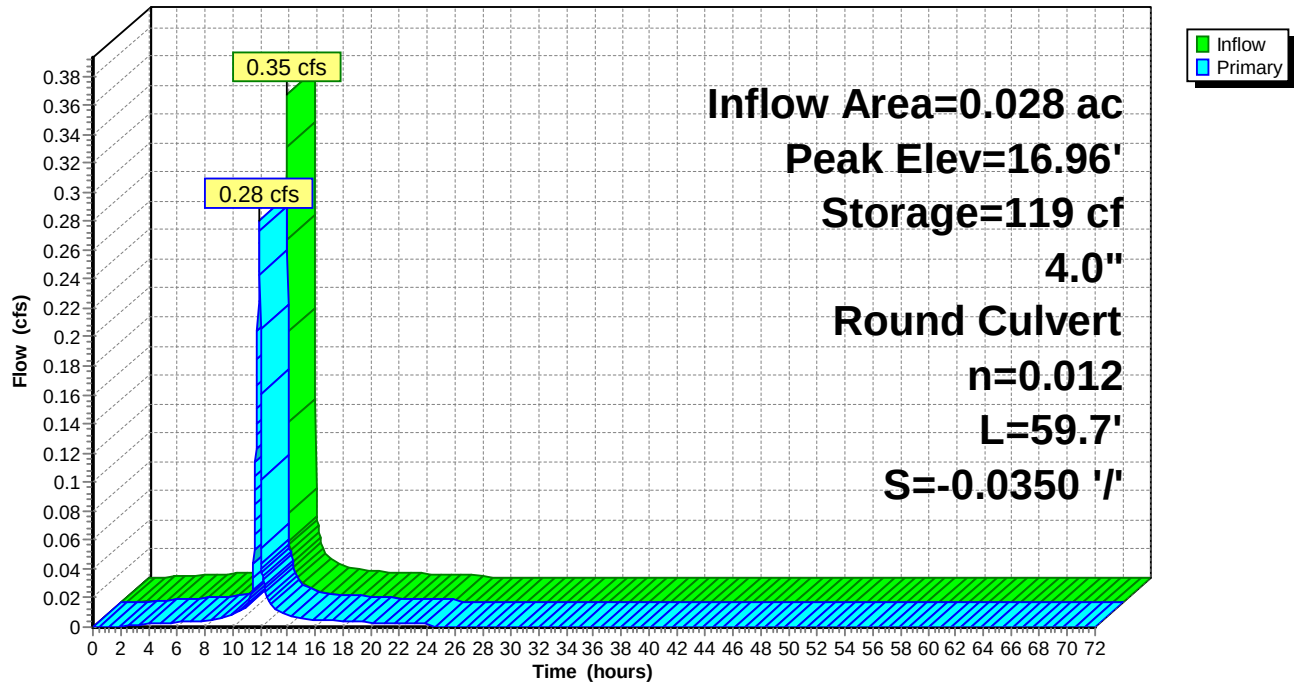
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P22: Planter #22

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P23: Planter #23

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.17 cfs @ 11.92 hrs, Volume= 0.009 af, Atten= 16%, Lag= 1.4 min
 Primary = 0.17 cfs @ 11.92 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.02' @ 11.93 hrs Surf.Area= 50 sf Storage= 26 cf

Plug-Flow detention time= 16.2 min calculated for 0.009 af (99% of inflow)
 Center-of-Mass det. time= 9.4 min (753.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	50	0.0	0	0
12.75	50	40.0	0	0
16.49	50	40.0	75	75
16.50	50	100.0	1	76
17.50	50	100.0	50	126
17.51	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	12.95'	4.0" Round Culvert L= 20.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 12.81' S= 0.0068 ' S= 0.0068 ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.18 cfs @ 11.92 hrs HW=14.01' TW=13.72' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.18 cfs @ 2.05 fps)

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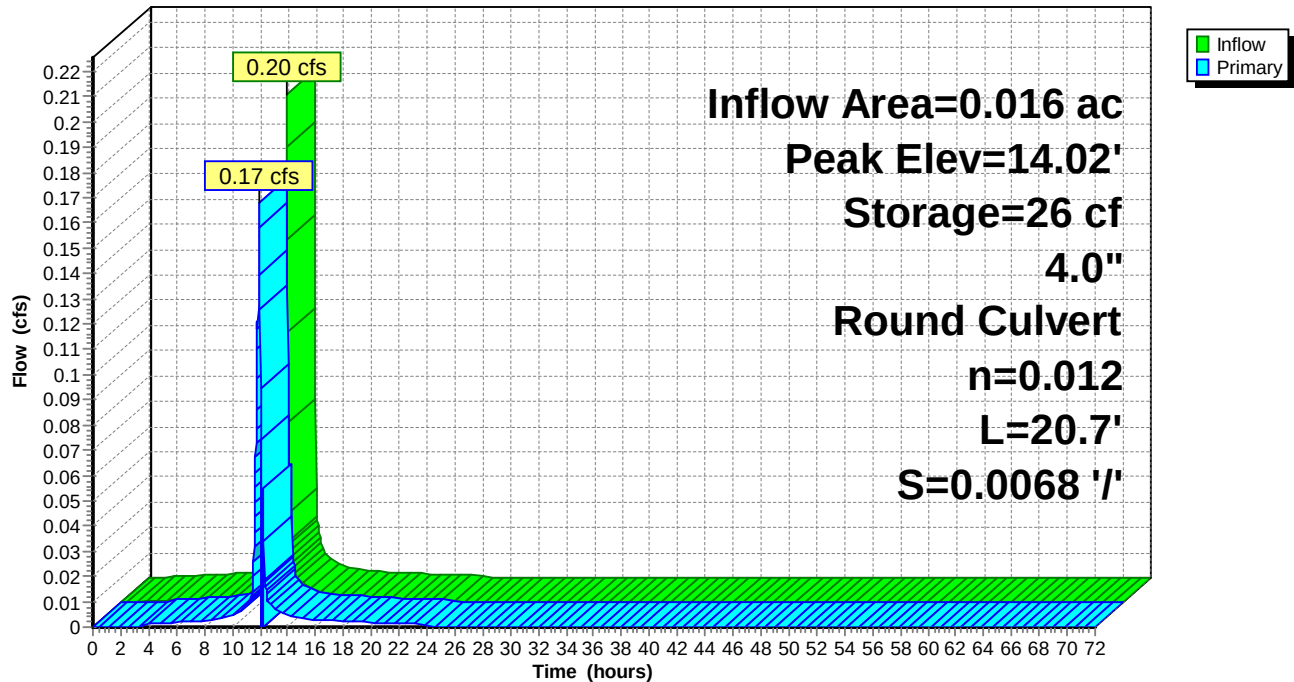
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Pond P23: Planter #23

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P24: Planter #24

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.45' Surf.Area= 40 sf Storage= 43 cf

Peak Elev= 15.86' @ 11.91 hrs Surf.Area= 40 sf Storage= 50 cf (7 cf above start)

Plug-Flow detention time= 110.5 min calculated for 0.007 af (88% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	40	0.0	0	0
12.75	40	40.0	0	0
16.49	40	40.0	60	60
16.50	40	100.0	0	60
17.50	40	100.0	40	100
17.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.45'	4.0" Round Culvert L= 36.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.45' S= -0.0683 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=15.85' TW=14.77' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

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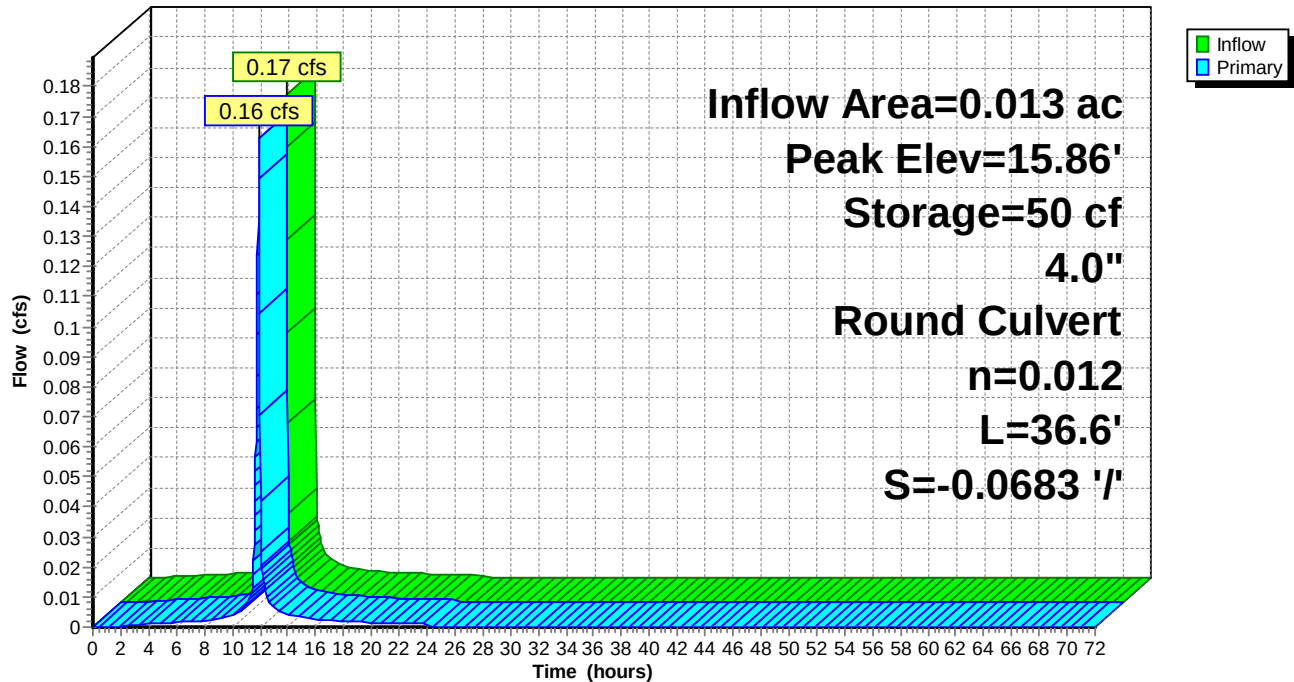
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Pond P24: Planter #24

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P25: Planter #25

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.32' Surf.Area= 40 sf Storage= 41 cf

Peak Elev= 15.73' @ 11.91 hrs Surf.Area= 40 sf Storage= 48 cf (7 cf above start)

Plug-Flow detention time= 106.7 min calculated for 0.007 af (88% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	12.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	40	0.0	0	0
12.75	40	40.0	0	0
16.49	40	40.0	60	60
16.50	40	100.0	0	60
17.50	40	100.0	40	100
17.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.32'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.32' S= -0.0820 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=15.72' TW=14.77' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

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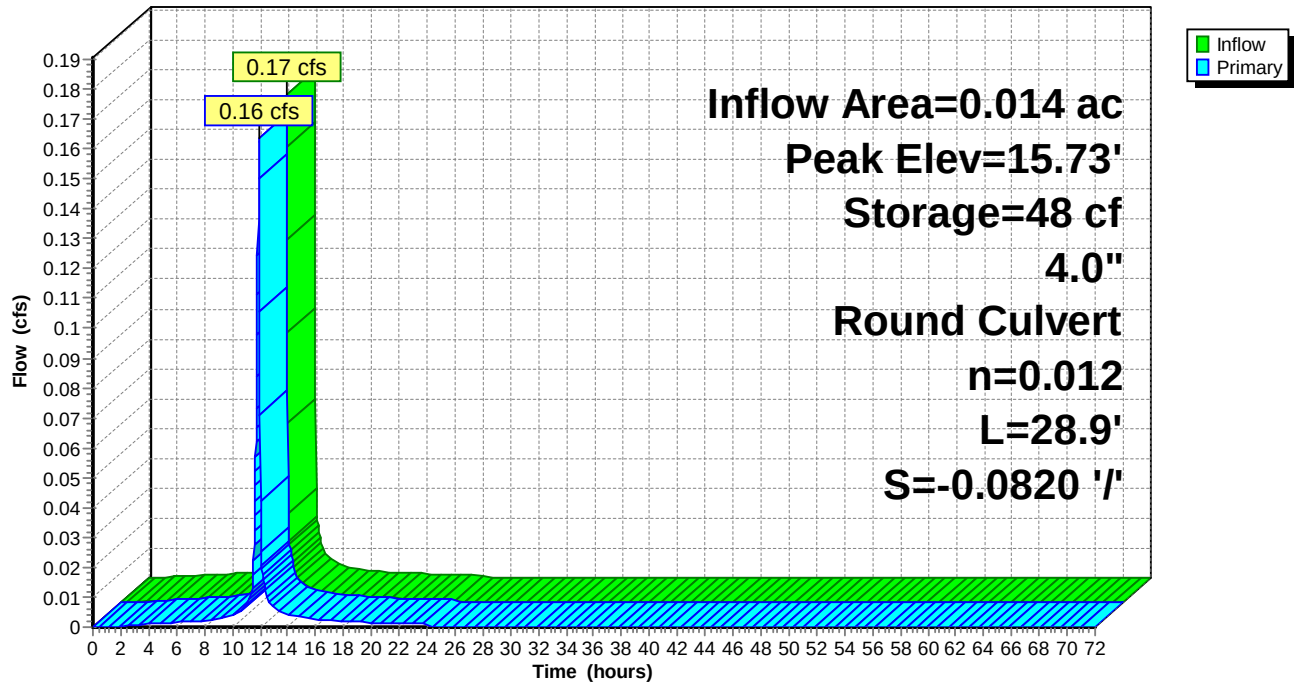
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Pond P25: Planter #25

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Summary for Pond P26: Planter #26

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af
 Outflow = 0.25 cfs @ 11.93 hrs, Volume= 0.015 af, Atten= 21%, Lag= 1.8 min
 Primary = 0.25 cfs @ 11.93 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.37' @ 11.93 hrs Surf.Area= 70 sf Storage= 46 cf

Plug-Flow detention time= 15.1 min calculated for 0.015 af (99% of inflow)
 Center-of-Mass det. time= 9.0 min (753.1 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	70	0.0	0	0
12.75	70	40.0	0	0
16.49	70	40.0	105	105
16.50	70	100.0	1	106
17.50	70	100.0	70	176
17.51	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	12.95'	4.0" Round Culvert L= 24.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 12.56' S= 0.0159 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.25 cfs @ 11.93 hrs HW=14.35' TW=13.73' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 0.25 cfs @ 2.92 fps)

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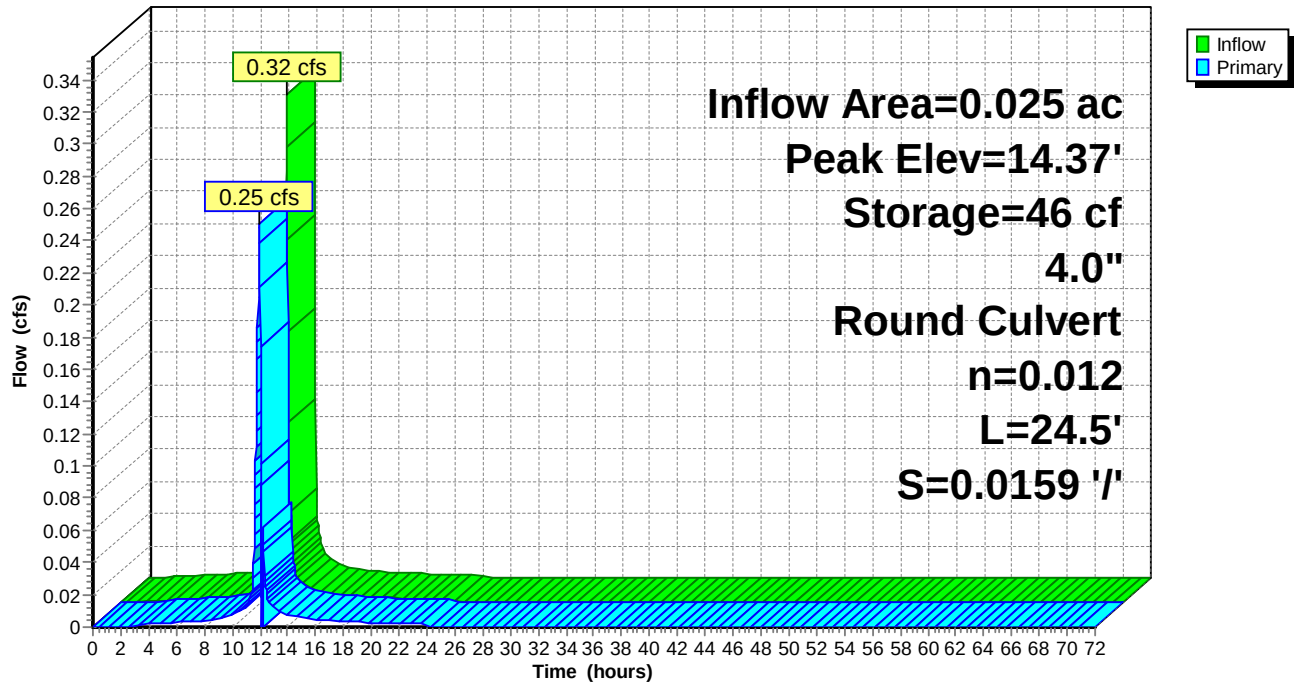
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Pond P26: Planter #26

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P27: Planter #27

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.08' Surf.Area= 30 sf Storage= 28 cf

Peak Elev= 15.34' @ 11.90 hrs Surf.Area= 30 sf Storage= 31 cf (3 cf above start)

Plug-Flow detention time= 116.1 min calculated for 0.004 af (87% of inflow)

Center-of-Mass det. time= 2.3 min (746.4 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	12.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.74	30	0.0	0	0
12.75	30	40.0	0	0
16.49	30	40.0	45	45
16.50	30	100.0	0	45
17.50	30	100.0	30	75
17.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.08'	4.0" Round Culvert L= 10.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.95' / 15.08' S= -0.1972 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=15.34' TW=14.72' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.36 fps)

Naima - Phase 2 - Proposed HydroCAD

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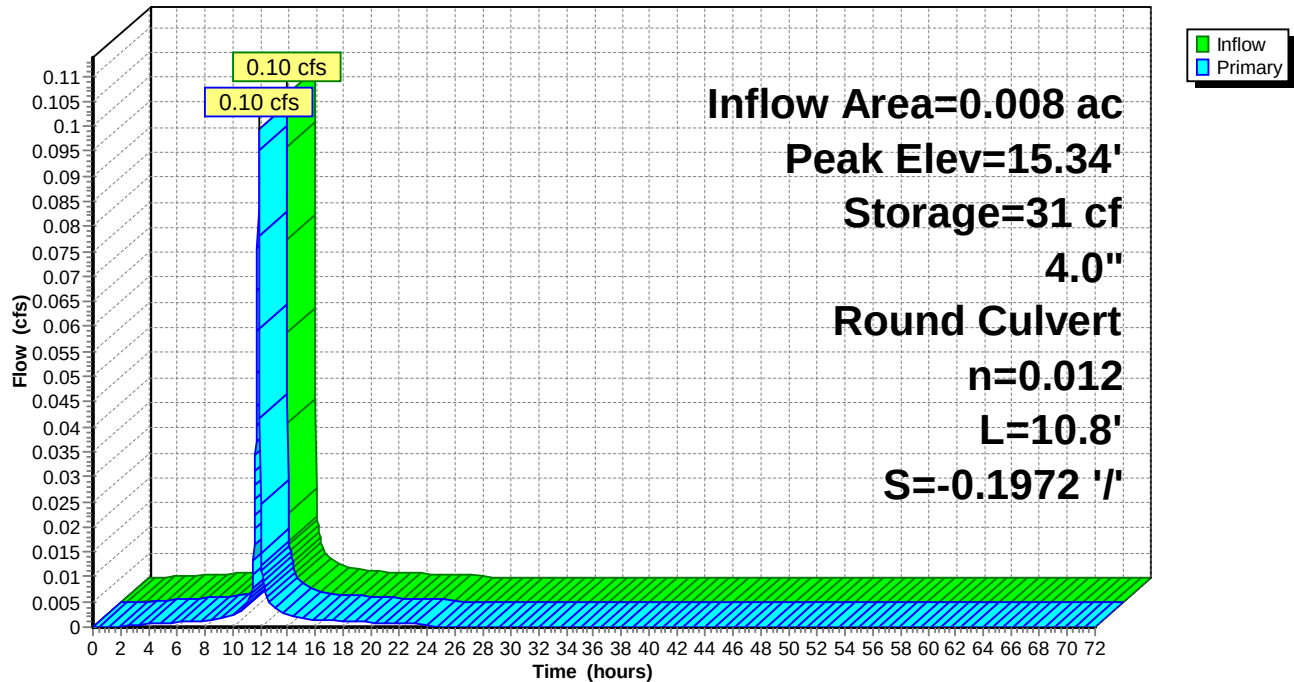
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Pond P27: Planter #27

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Summary for Pond P28: Planter #28

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.20 cfs @ 11.91 hrs, Volume= 0.011 af, Atten= 14%, Lag= 0.6 min
 Primary = 0.20 cfs @ 11.91 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.11' @ 11.93 hrs Surf.Area= 55 sf Storage= 19 cf

Plug-Flow detention time= 15.7 min calculated for 0.011 af (99% of inflow)
 Center-of-Mass det. time= 8.7 min (752.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	55	0.0	0	0
13.25	55	40.0	0	0
16.99	55	40.0	82	82
17.00	55	100.0	1	83
18.00	55	100.0	55	138
18.01	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 14.3' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.10' S= 0.0245 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.21 cfs @ 11.91 hrs HW=14.07' TW=13.67' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.21 cfs @ 2.40 fps)

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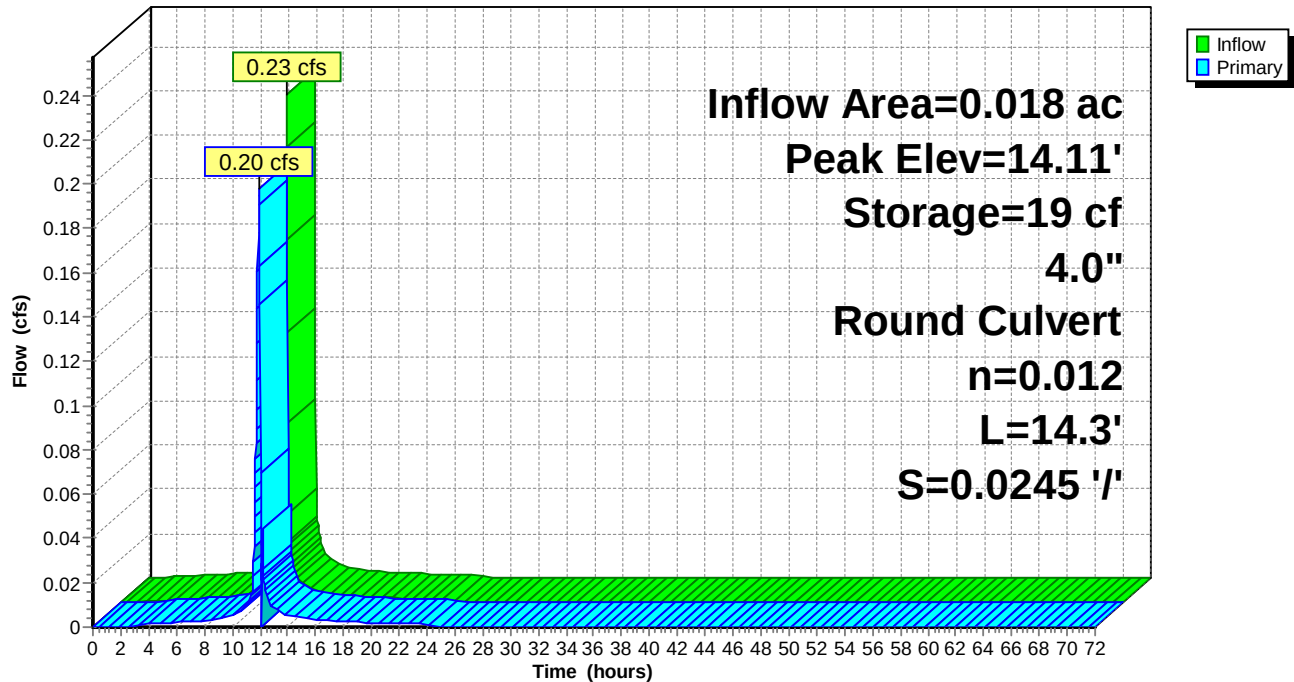
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Pond P28: Planter #28

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Summary for Pond P29: Planter #29

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 14.99' Surf.Area= 30 sf Storage= 21 cf

Peak Elev= 15.25' @ 11.90 hrs Surf.Area= 30 sf Storage= 24 cf (3 cf above start)

Plug-Flow detention time= 93.8 min calculated for 0.004 af (90% of inflow)

Center-of-Mass det. time= 2.2 min (746.3 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	30	0.0	0	0
13.25	30	40.0	0	0
16.99	30	40.0	45	45
17.00	30	100.0	0	45
18.00	30	100.0	30	75
18.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	14.99'	4.0" Round Culvert L= 32.3' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 14.99' S= -0.0477 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=15.25' TW=14.91' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.10 cfs @ 1.38 fps)

Naima - Phase 2 - Proposed HydroCAD

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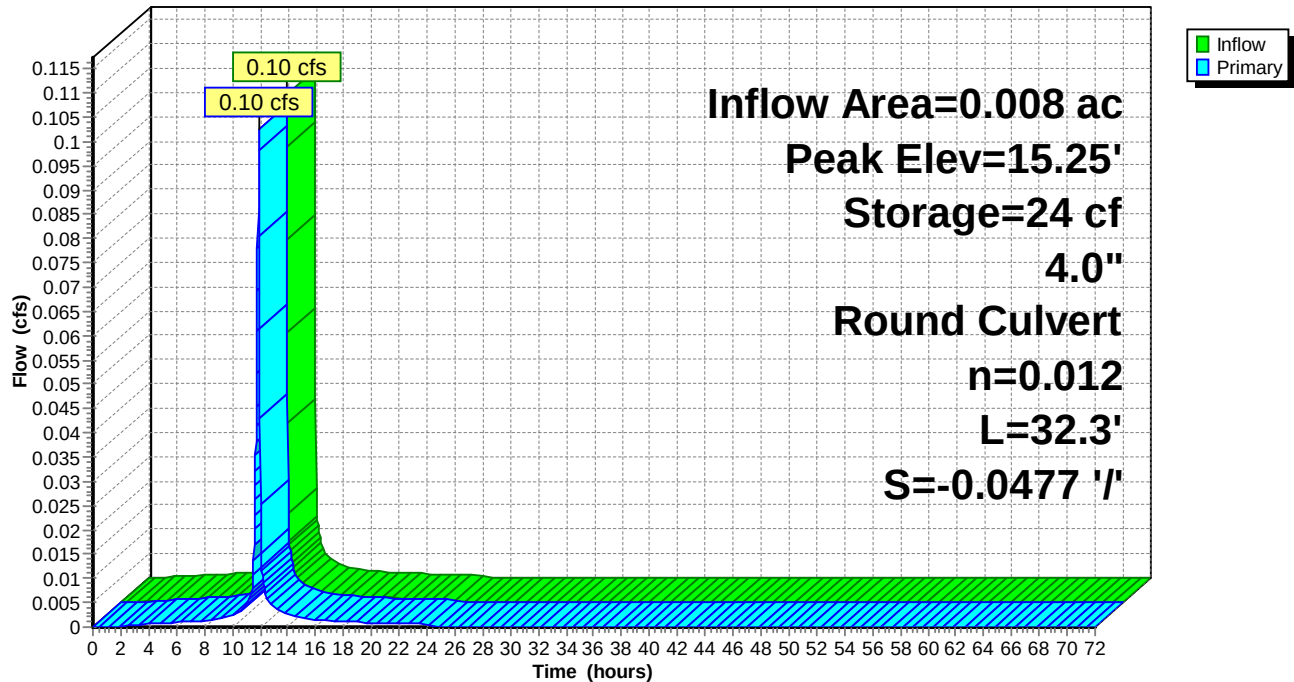
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Pond P29: Planter #29

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Summary for Pond P30: Planter #30

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.05 cfs @ 11.91 hrs, Volume= 0.003 af, Atten= 14%, Lag= 0.7 min
 Primary = 0.05 cfs @ 11.91 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 13.80' @ 11.94 hrs Surf.Area= 20 sf Storage= 4 cf

Plug-Flow detention time= 18.2 min calculated for 0.003 af (99% of inflow)

Center-of-Mass det. time= 9.6 min (753.7 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	20	0.0	0	0
13.25	20	40.0	0	0
16.99	20	40.0	30	30
17.00	20	100.0	0	30
18.00	20	100.0	20	50
18.01	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.45'	4.0" Round Culvert L= 18.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 13.29' S= 0.0088 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.08 cfs @ 11.91 hrs HW=13.76' TW=13.68' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.08 cfs @ 1.22 fps)

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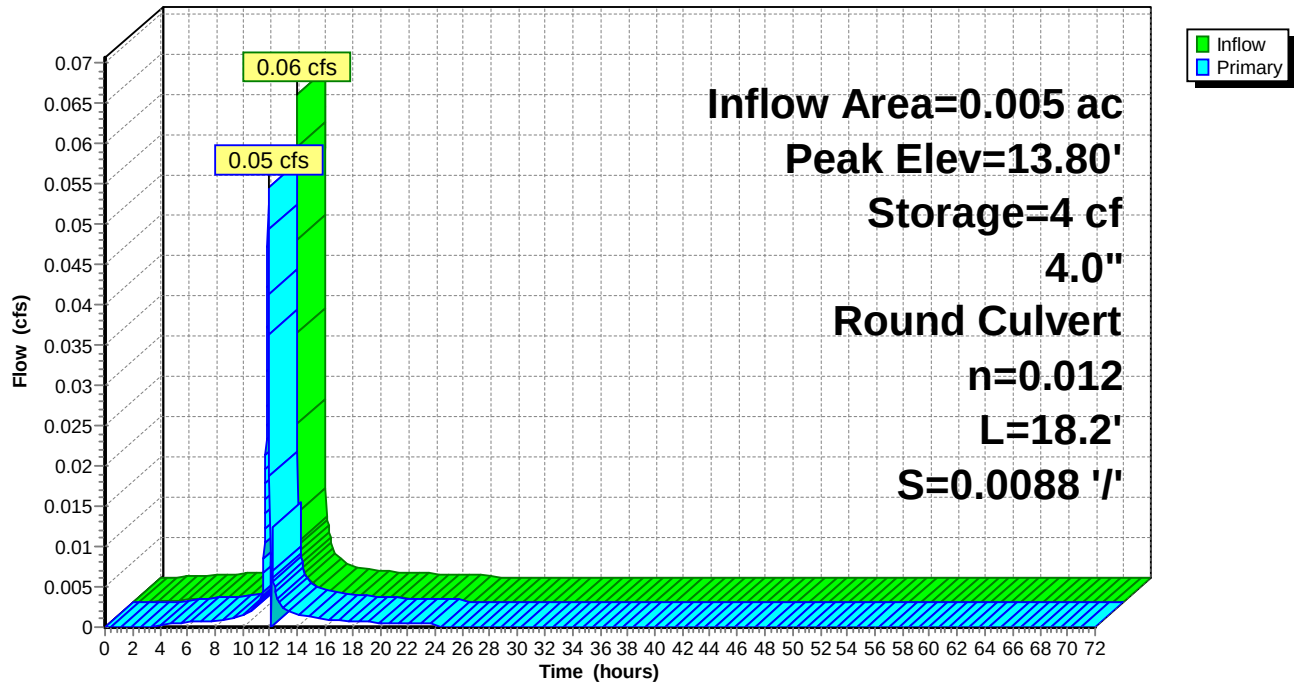
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Pond P30: Planter #30

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Summary for Pond P31: Planter #31

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af
 Outflow = 0.27 cfs @ 11.93 hrs, Volume= 0.017 af, Atten= 22%, Lag= 2.1 min
 Primary = 0.27 cfs @ 11.93 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.21' Surf.Area= 80 sf Storage= 63 cf

Peak Elev= 16.77' @ 11.93 hrs Surf.Area= 80 sf Storage= 113 cf (50 cf above start)

Plug-Flow detention time= 88.3 min calculated for 0.015 af (91% of inflow)

Center-of-Mass det. time= 3.8 min (747.9 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.24'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.24	80	0.0	0	0
13.25	80	40.0	0	0
16.99	80	40.0	120	120
17.00	80	100.0	1	121
18.00	80	100.0	80	201
18.01	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.21'	4.0" Round Culvert L= 71.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.45' / 15.21' S= -0.0246 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.27 cfs @ 11.93 hrs HW=16.75' TW=15.02' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.27 cfs @ 3.12 fps)

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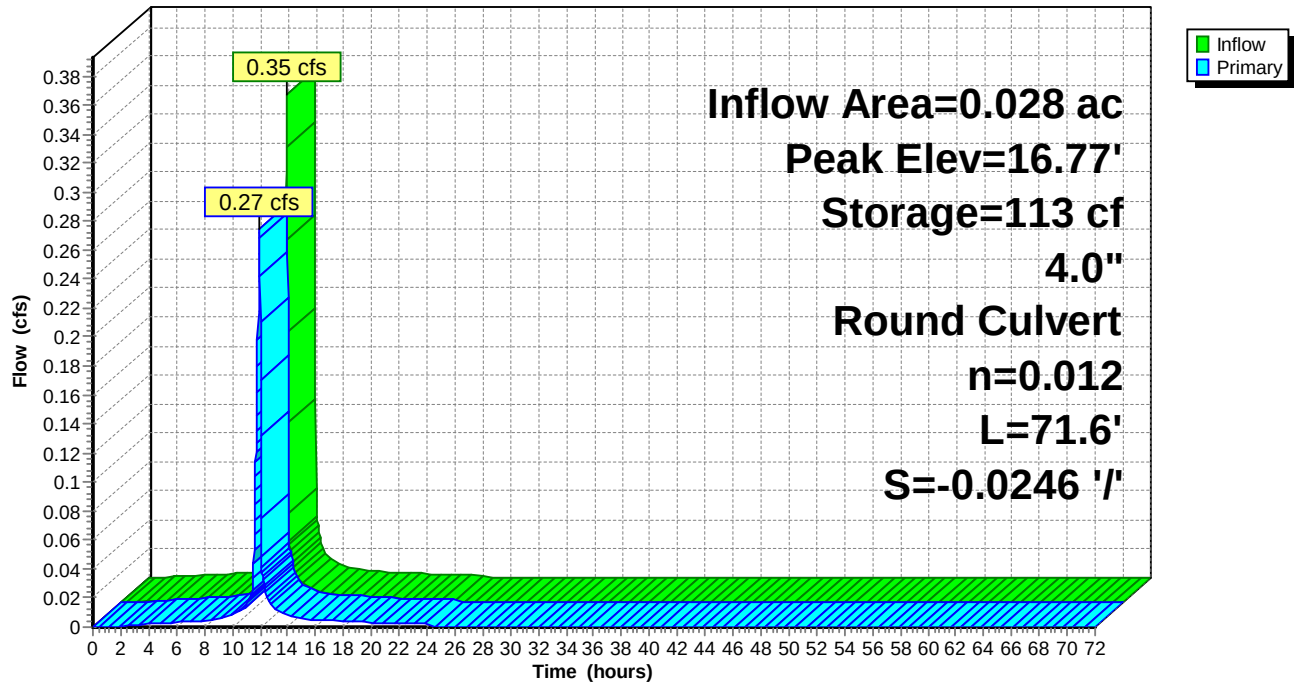
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Pond P31: Planter #31

Hydrograph



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Summary for Pond P32: Planter #32

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 1%, Lag= 0.2 min
 Primary = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.14' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 18.1 min calculated for 0.003 af (99% of inflow)
 Center-of-Mass det. time= 9.4 min (753.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	20	0.0	0	0
13.75	20	40.0	0	0
17.49	20	40.0	30	30
17.50	20	100.0	0	30
18.50	20	100.0	20	50
18.51	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	13.95'	4.0" Round Culvert L= 29.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 13.36' S= 0.0199 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.06 cfs @ 11.90 hrs HW=14.14' TW=13.64' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.06 cfs @ 1.18 fps)

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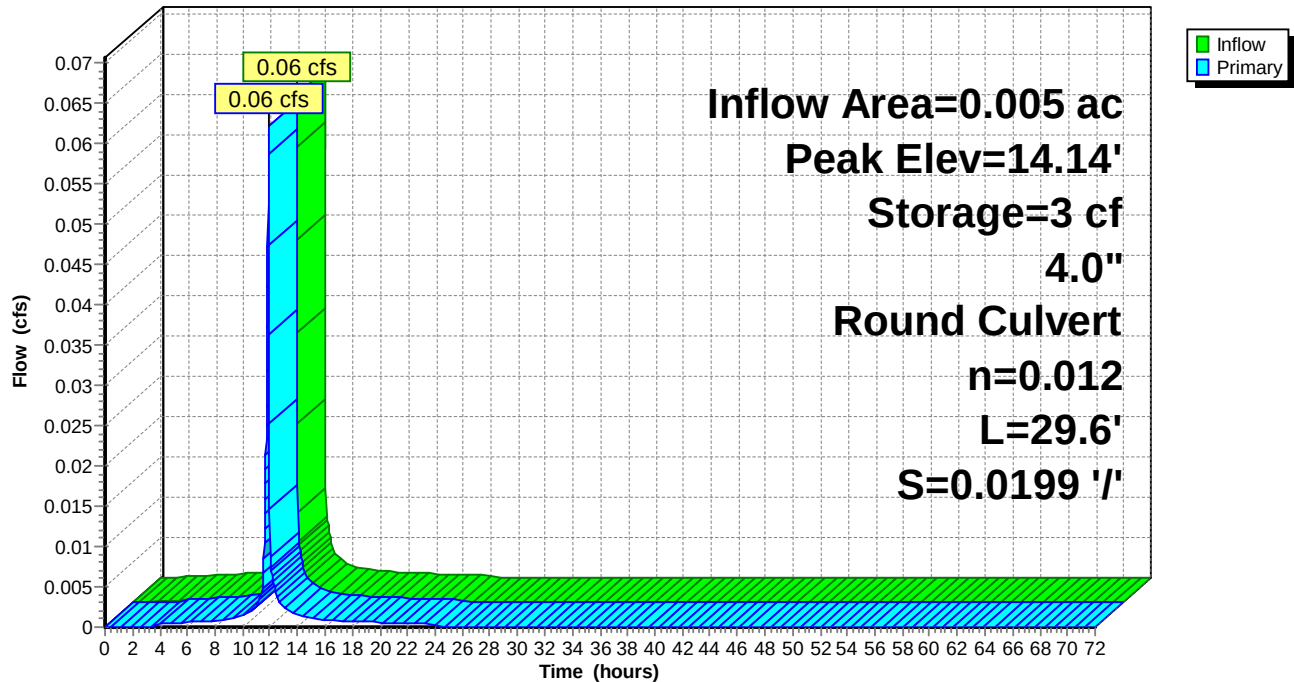
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Pond P32: Planter #32

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P33: Planter #33

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af
 Outflow = 0.28 cfs @ 11.93 hrs, Volume= 0.017 af, Atten= 20%, Lag= 2.0 min
 Primary = 0.28 cfs @ 11.93 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.24' Surf.Area= 80 sf Storage= 48 cf

Peak Elev= 16.67' @ 11.93 hrs Surf.Area= 80 sf Storage= 94 cf (46 cf above start)

Plug-Flow detention time= 72.8 min calculated for 0.015 af (93% of inflow)

Center-of-Mass det. time= 3.7 min (747.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	80	0.0	0	0
13.75	80	40.0	0	0
17.49	80	40.0	120	120
17.50	80	100.0	1	121
18.50	80	100.0	80	201
18.51	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	15.24'	4.0" Round Culvert L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 15.24' S= -0.0211 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.28 cfs @ 11.93 hrs HW=16.66' TW=15.02' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.28 cfs @ 3.19 fps)

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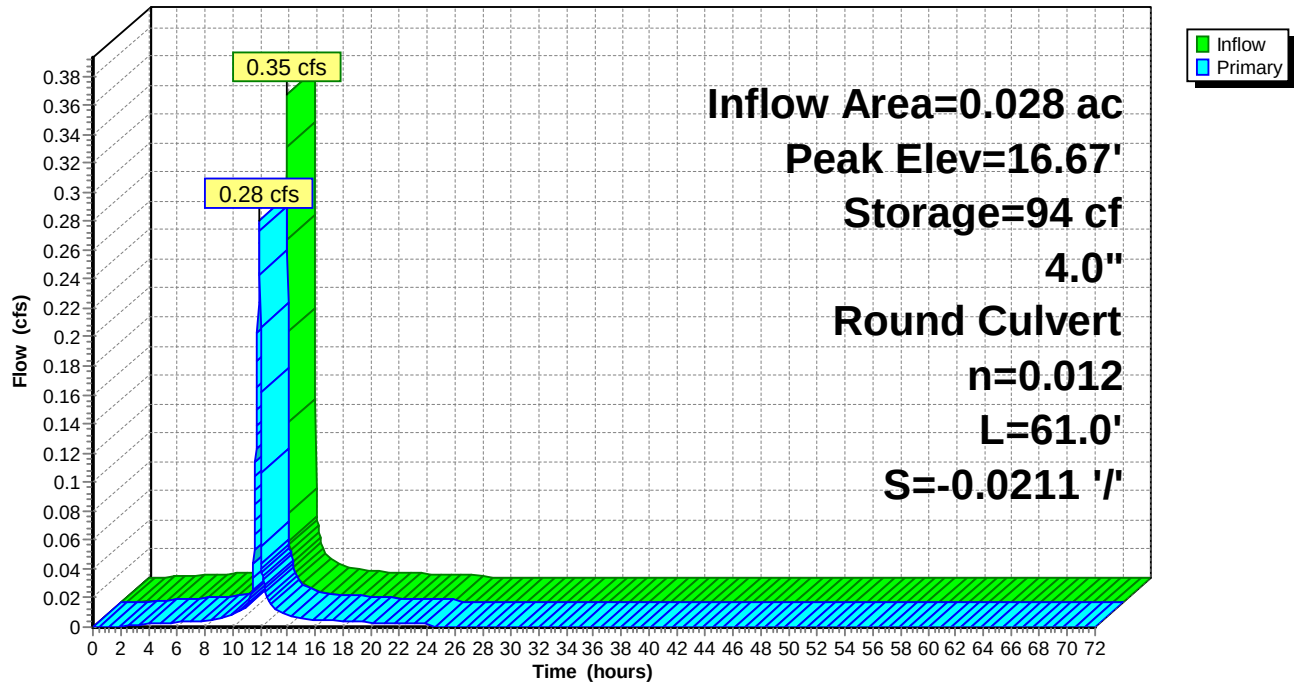
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Pond P33: Planter #33

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Summary for Pond P34: Planter #34

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.22 cfs @ 11.91 hrs, Volume= 0.011 af, Atten= 6%, Lag= 0.9 min
 Primary = 0.22 cfs @ 11.91 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.54' @ 11.91 hrs Surf.Area= 55 sf Storage= 18 cf

Plug-Flow detention time= 15.6 min calculated for 0.011 af (99% of inflow)
 Center-of-Mass det. time= 8.6 min (752.7 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.74'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	55	0.0	0	0
13.75	55	40.0	0	0
17.49	55	40.0	82	82
17.50	55	100.0	1	83
18.50	55	100.0	55	138
18.51	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	13.95'	4.0" Round Culvert L= 26.1' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 13.56' S= 0.0149 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.21 cfs @ 11.91 hrs HW=14.53' TW=13.69' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.21 cfs @ 2.45 fps)

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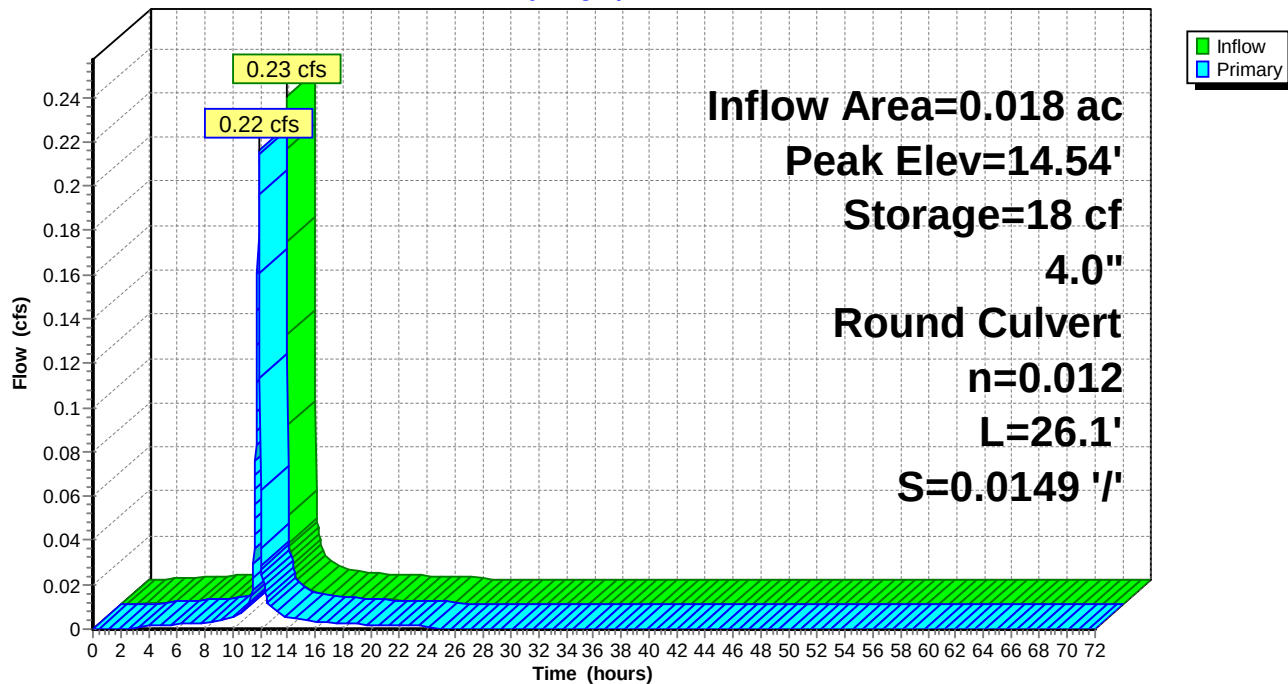
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Pond P34: Planter #34

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Summary for Pond P35: Planter #35

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.73' Surf.Area= 30 sf Storage= 24 cf

Peak Elev= 15.99' @ 11.90 hrs Surf.Area= 30 sf Storage= 27 cf (3 cf above start)

Plug-Flow detention time= 102.6 min calculated for 0.004 af (89% of inflow)

Center-of-Mass det. time= 2.2 min (746.3 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.74	30	0.0	0	0
13.75	30	40.0	0	0
17.49	30	40.0	45	45
17.50	30	100.0	0	45
18.50	30	100.0	30	75
18.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.73'	4.0" Round Culvert L= 31.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.95' / 15.73' S= -0.0565 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=15.99' TW=15.00' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.10 cfs @ 1.38 fps)

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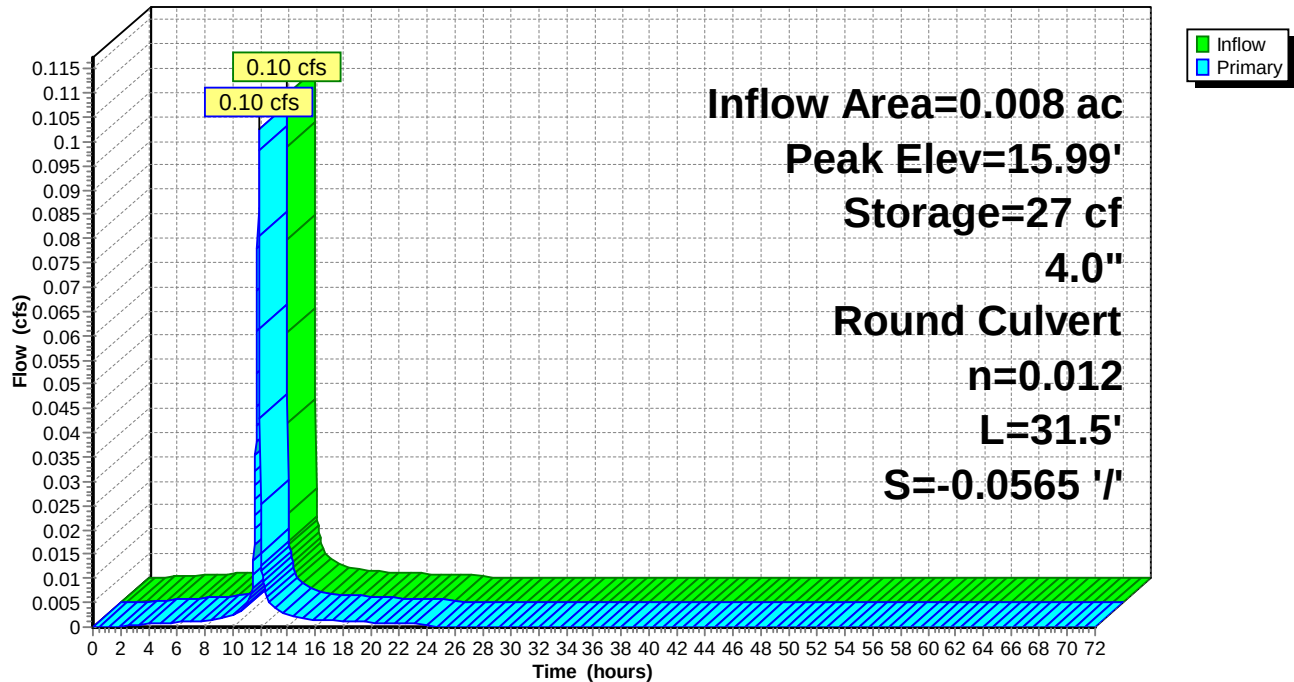
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Pond P35: Planter #35

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Summary for Pond P36: Planter #36

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.19 cfs @ 11.91 hrs, Volume= 0.009 af, Atten= 5%, Lag= 0.8 min
 Primary = 0.19 cfs @ 11.91 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.65' @ 11.91 hrs Surf.Area= 50 sf Storage= 14 cf

Plug-Flow detention time= 15.5 min calculated for 0.009 af (99% of inflow)
 Center-of-Mass det. time= 8.7 min (752.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.94'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	50	0.0	0	0
13.95	50	40.0	0	0
17.69	50	40.0	75	75
17.70	50	100.0	0	75
18.70	50	100.0	50	125
18.71	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	14.15'	4.0" Round Culvert L= 20.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 13.65' S= 0.0248 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.19 cfs @ 11.91 hrs HW=14.64' TW=13.68' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.19 cfs @ 2.17 fps)

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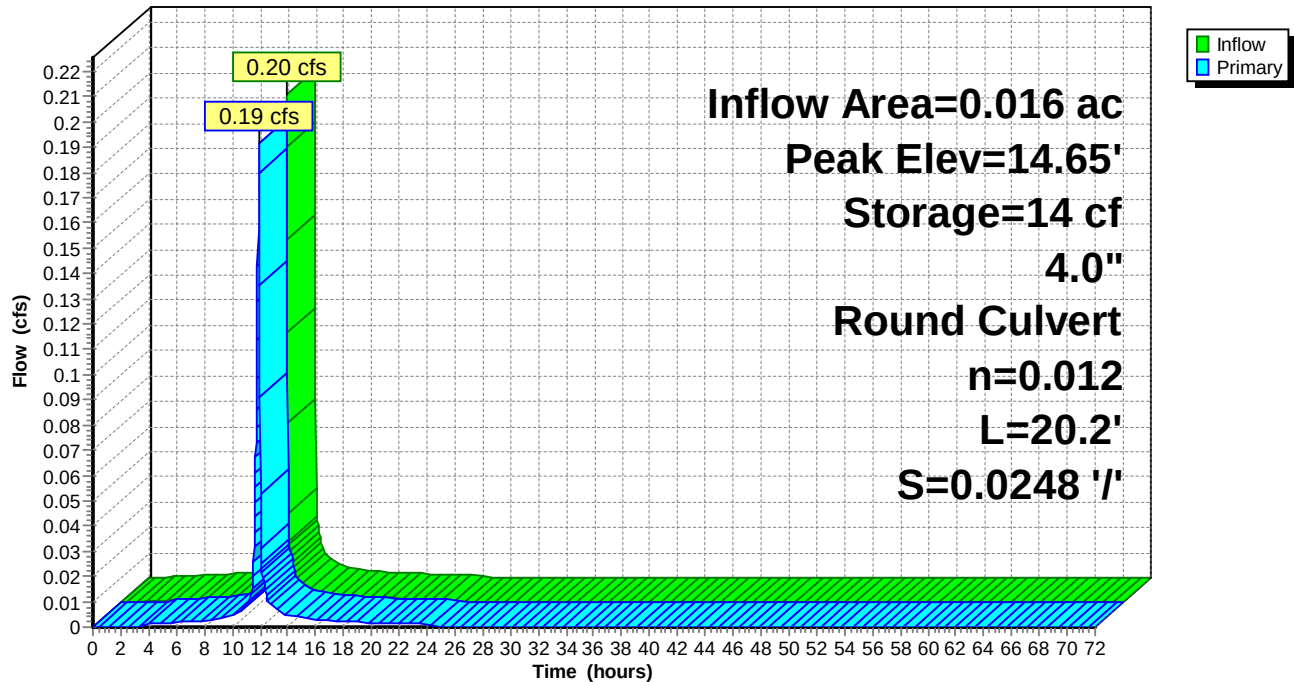
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Pond P36: Planter #36

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Summary for Pond P37: Planter #37

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.73' Surf.Area= 40 sf Storage= 29 cf

Peak Elev= 16.14' @ 11.91 hrs Surf.Area= 40 sf Storage= 35 cf (7 cf above start)

Plug-Flow detention time= 83.5 min calculated for 0.007 af (92% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	40	0.0	0	0
13.95	40	40.0	0	0
17.69	40	40.0	60	60
17.70	40	100.0	0	60
18.70	40	100.0	40	100
18.71	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.73'	4.0" Round Culvert L= 37.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.73' S= -0.0418 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=16.13' TW=15.04' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

Naima - Phase 2 - Proposed HydroCAD

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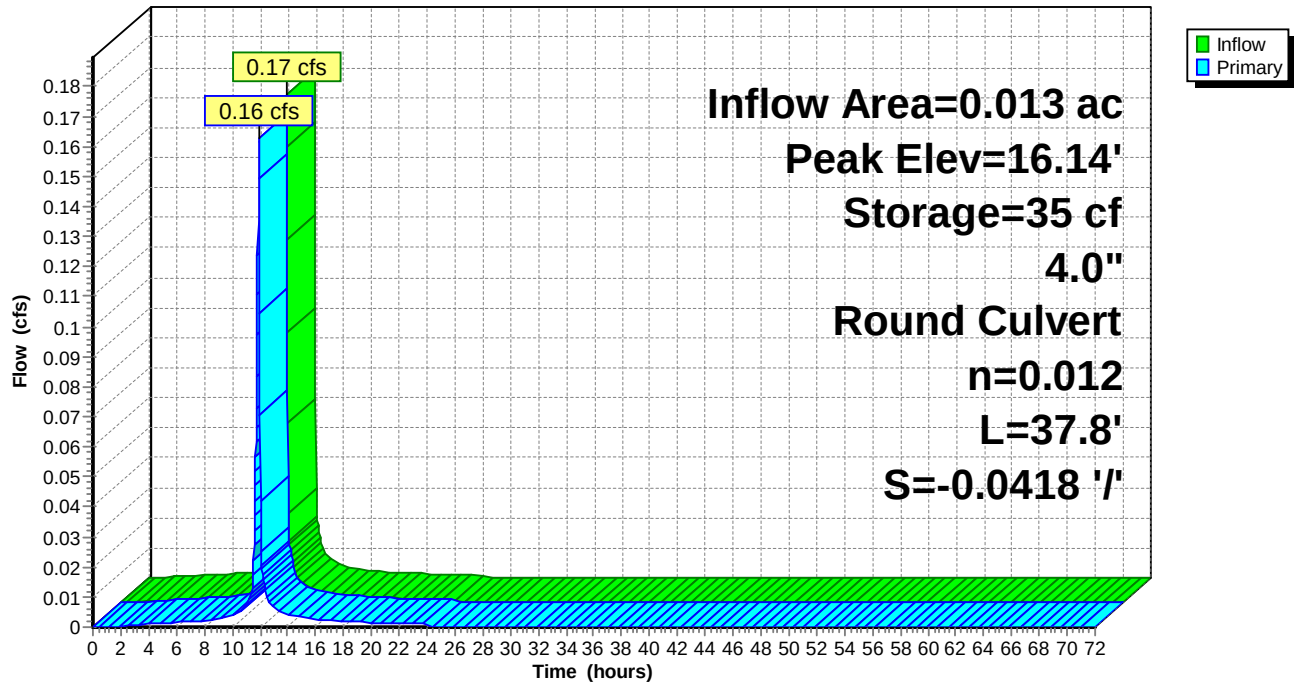
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Pond P37: Planter #37

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Summary for Pond P38: Planter #38

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.85' Surf.Area= 40 sf Storage= 31 cf

Peak Elev= 16.26' @ 11.91 hrs Surf.Area= 40 sf Storage= 37 cf (7 cf above start)

Plug-Flow detention time= 86.9 min calculated for 0.007 af (91% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	40	0.0	0	0
13.95	40	40.0	0	0
17.69	40	40.0	60	60
17.70	40	100.0	0	60
18.70	40	100.0	40	100
18.71	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	15.85'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.85' S= -0.0588 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=16.25' TW=15.04' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

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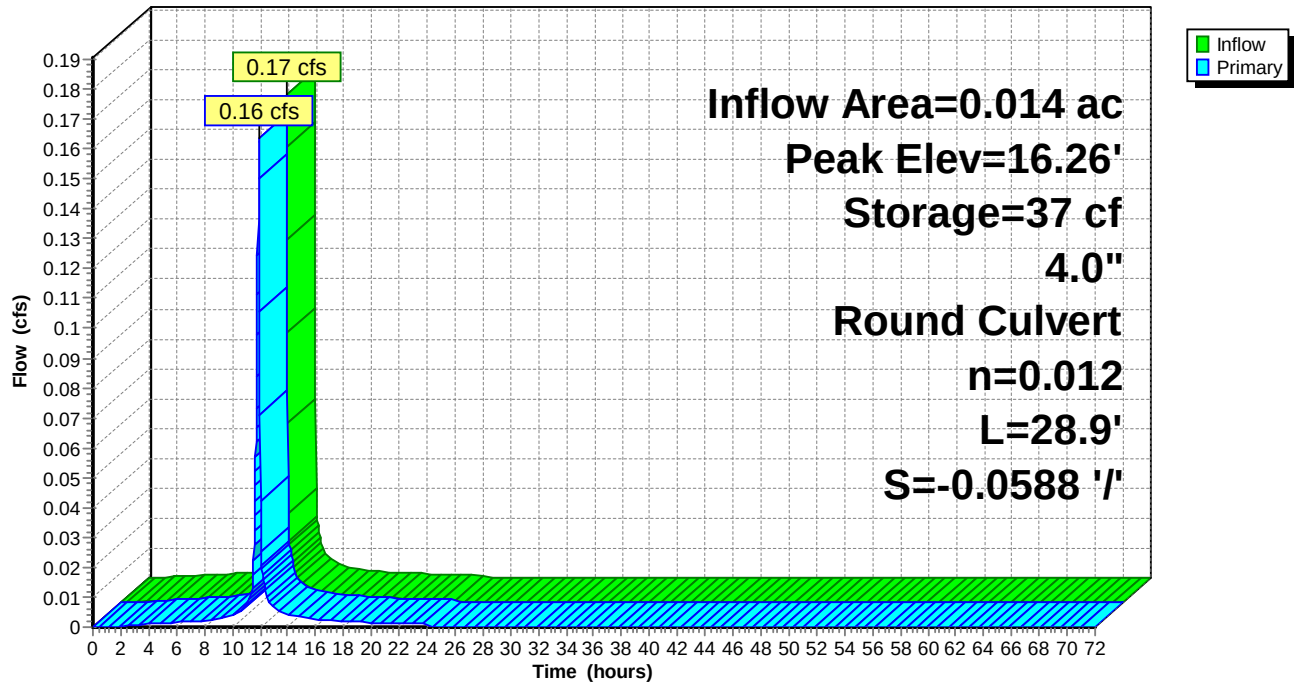
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Pond P38: Planter #38

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Summary for Pond P39: Planter #39

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af
 Outflow = 0.28 cfs @ 11.92 hrs, Volume= 0.015 af, Atten= 10%, Lag= 1.2 min
 Primary = 0.28 cfs @ 11.92 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.05' @ 11.92 hrs Surf.Area= 70 sf Storage= 31 cf

Plug-Flow detention time= 14.7 min calculated for 0.015 af (99% of inflow)

Center-of-Mass det. time= 8.6 min (752.7 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	13.94'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	70	0.0	0	0
13.95	70	40.0	0	0
17.69	70	40.0	105	105
17.70	70	100.0	1	106
18.70	70	100.0	70	176
18.71	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	14.15'	4.0" Round Culvert L= 23.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 13.88' S= 0.0113 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.28 cfs @ 11.92 hrs HW=15.05' TW=13.71' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.28 cfs @ 3.25 fps)

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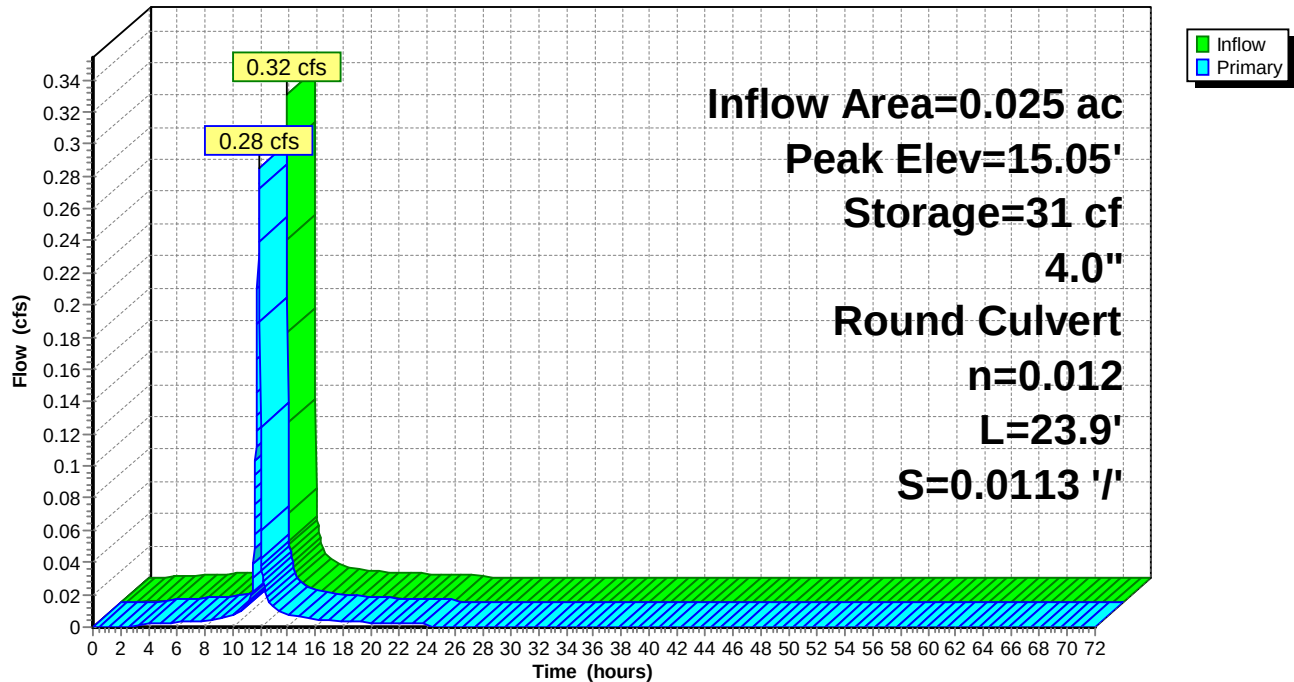
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Pond P39: Planter #39

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Summary for Pond P40: Planter #40

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 15.99' Surf.Area= 30 sf Storage= 25 cf

Peak Elev= 16.25' @ 11.90 hrs Surf.Area= 30 sf Storage= 28 cf (3 cf above start)

Plug-Flow detention time= 106.5 min calculated for 0.004 af (88% of inflow)

Center-of-Mass det. time= 2.3 min (746.4 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.94'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.94	30	0.0	0	0
13.95	30	40.0	0	0
17.69	30	40.0	45	45
17.70	30	100.0	0	45
18.70	30	100.0	30	75
18.71	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	15.99'	4.0" Round Culvert L= 11.2' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.15' / 15.99' S= -0.1643 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=16.25' TW=15.00' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.36 fps)

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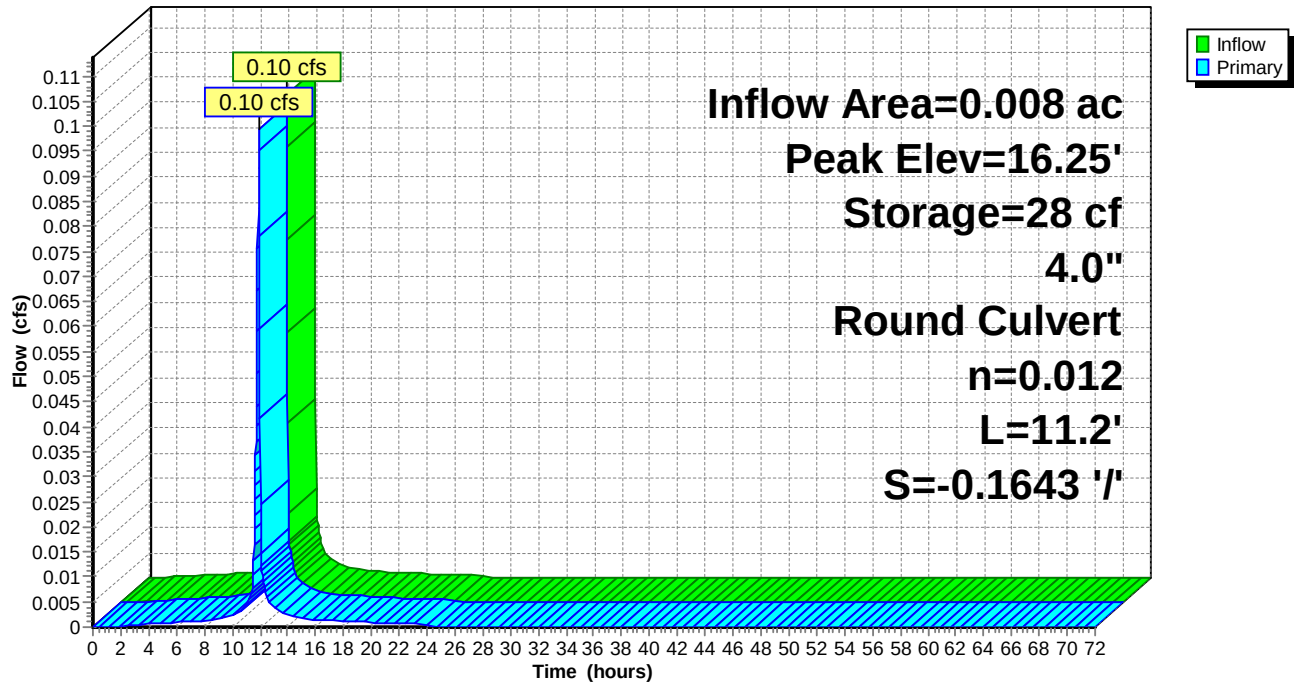
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Pond P40: Planter #40

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Summary for Pond P41: Planter #41

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af
 Outflow = 0.28 cfs @ 11.92 hrs, Volume= 0.015 af, Atten= 10%, Lag= 1.2 min
 Primary = 0.28 cfs @ 11.92 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.35' @ 11.92 hrs Surf.Area= 70 sf Storage= 31 cf

Plug-Flow detention time= 14.7 min calculated for 0.015 af (99% of inflow)

Center-of-Mass det. time= 8.6 min (752.7 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.24'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	70	0.0	0	0
14.25	70	40.0	0	0
17.99	70	40.0	105	105
18.00	70	100.0	1	106
19.00	70	100.0	70	176
19.01	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices	
#1	Primary	14.45'	4.0" Round Culvert L= 23.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 13.95' S= 0.0210 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf	

Primary OutFlow Max=0.28 cfs @ 11.92 hrs HW=15.35' TW=13.71' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.28 cfs @ 3.25 fps)

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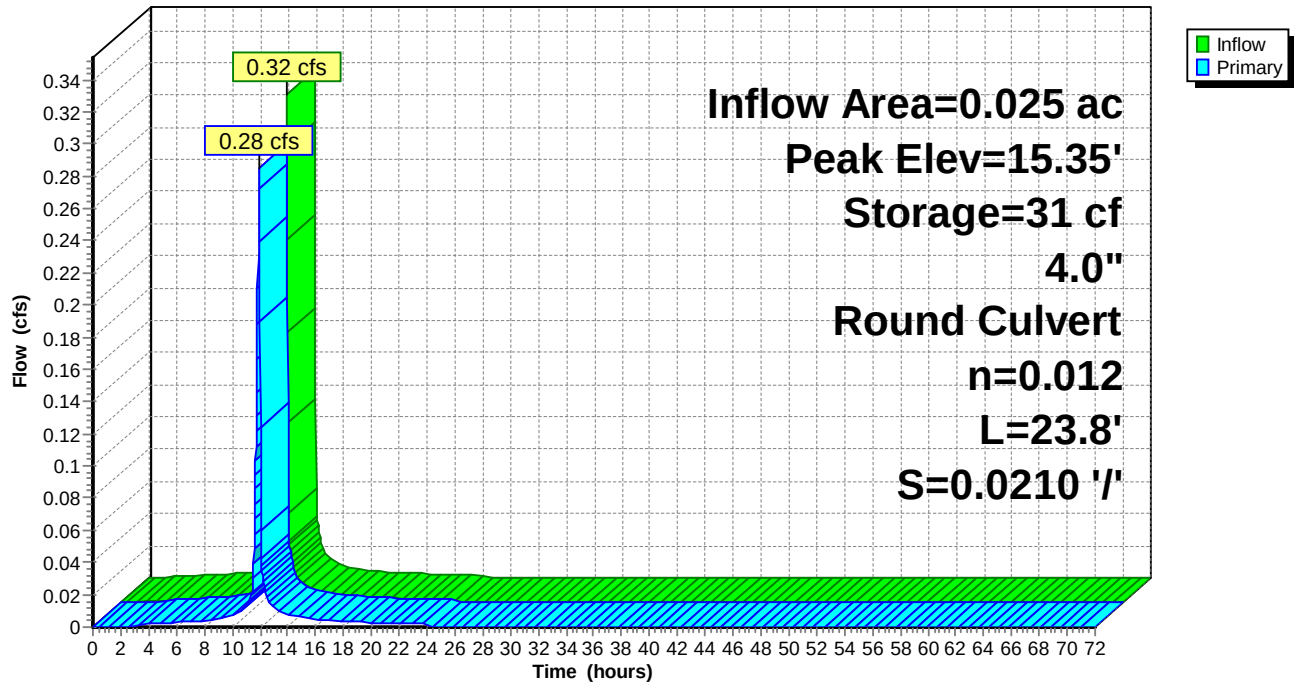
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Pond P41: Planter #41

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P42: Planter #42

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.14' Surf.Area= 30 sf Storage= 23 cf

Peak Elev= 16.40' @ 11.90 hrs Surf.Area= 30 sf Storage= 26 cf (3 cf above start)

Plug-Flow detention time= 101.6 min calculated for 0.004 af (89% of inflow)

Center-of-Mass det. time= 2.3 min (746.4 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.24'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	30	0.0	0	0
14.25	30	40.0	0	0
17.99	30	40.0	45	45
18.00	30	100.0	0	45
19.00	30	100.0	30	75
19.01	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	16.14'	4.0" Round Culvert L= 19.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.14' S= -0.0854 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=16.40' TW=15.76' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.10 cfs @ 1.36 fps)

Naima - Phase 2 - Proposed HydroCAD

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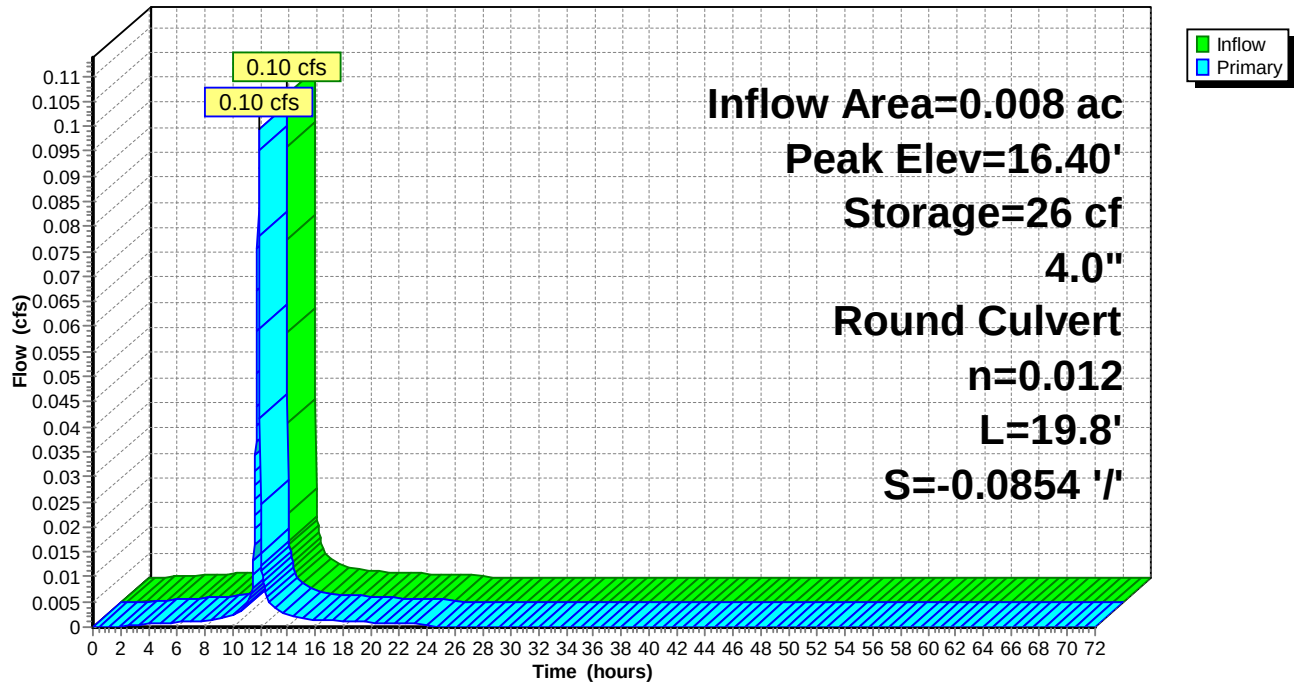
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P42: Planter #42

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P43: Planter #43

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.31' Surf.Area= 40 sf Storage= 33 cf

Peak Elev= 16.72' @ 11.91 hrs Surf.Area= 40 sf Storage= 40 cf (7 cf above start)

Plug-Flow detention time= 92.0 min calculated for 0.007 af (91% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.24'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	40	0.0	0	0
14.25	40	40.0	0	0
17.99	40	40.0	60	60
18.00	40	100.0	0	60
19.00	40	100.0	40	100
19.01	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	16.31'	4.0" Round Culvert L= 28.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.31' S= -0.0648 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=16.71' TW=15.77' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

Naima - Phase 2 - Proposed HydroCAD

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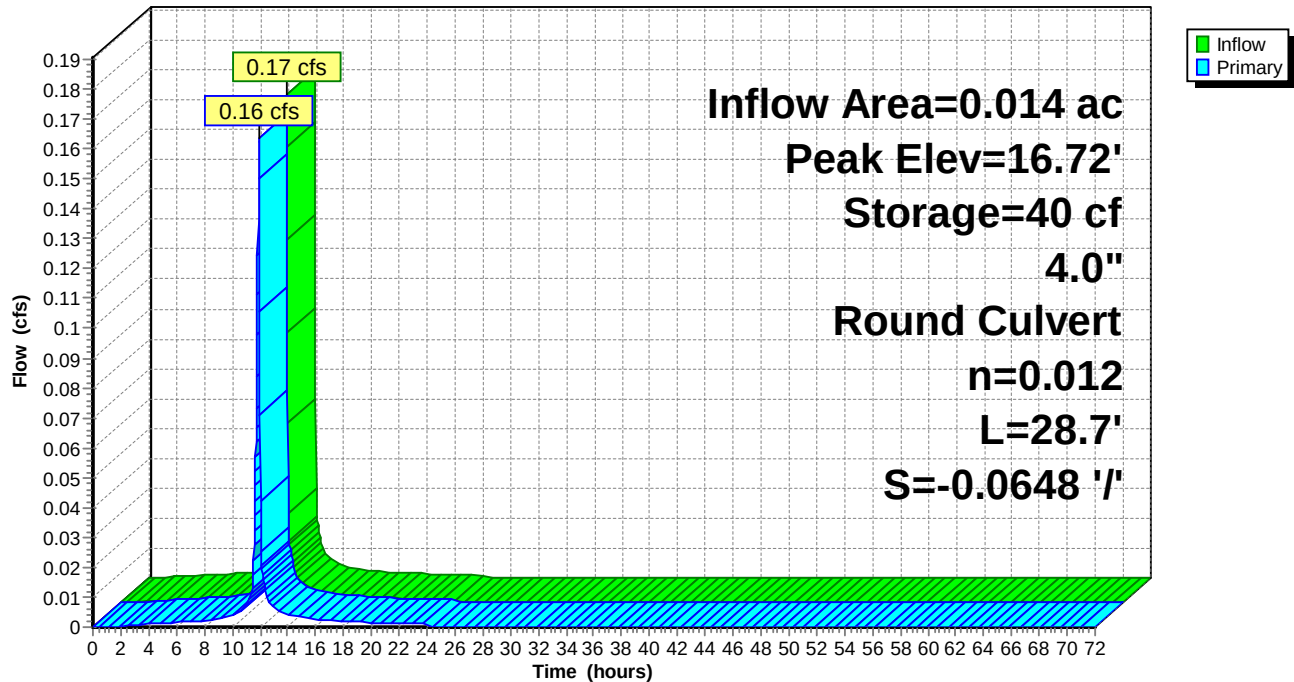
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P43: Planter #43

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P44: Planter #44

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.19 cfs @ 11.91 hrs, Volume= 0.010 af, Atten= 5%, Lag= 0.8 min
 Primary = 0.19 cfs @ 11.91 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 14.95' @ 11.91 hrs Surf.Area= 50 sf Storage= 4 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (744.3 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	121 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	50	0.0	0	0
14.75	50	40.0	0	0
17.99	50	40.0	65	65
18.00	50	100.0	1	66
19.00	50	100.0	50	116
19.01	1,000	100.0	5	121

Device	Routing	Invert	Outlet Devices
#1	Primary	14.45'	4.0" Round Culvert L= 19.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 14.18' S= 0.0136 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.19 cfs @ 11.91 hrs HW=14.94' TW=13.68' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.19 cfs @ 2.17 fps)

Naima - Phase 2 - Proposed HydroCAD

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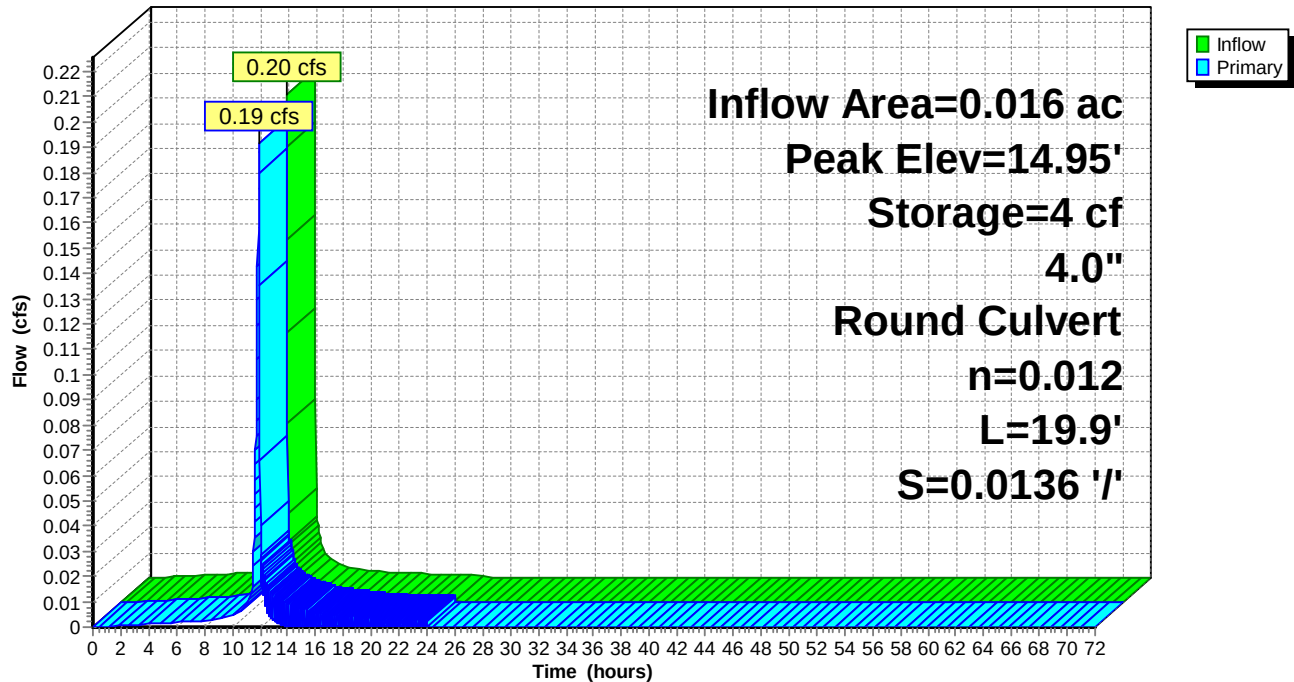
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P44: Planter #44

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P45: Planter #45

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.46' Surf.Area= 40 sf Storage= 36 cf

Peak Elev= 16.87' @ 11.91 hrs Surf.Area= 40 sf Storage= 42 cf (7 cf above start)

Plug-Flow detention time= 96.8 min calculated for 0.007 af (90% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.24'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.24	40	0.0	0	0
14.25	40	40.0	0	0
17.99	40	40.0	60	60
18.00	40	100.0	0	60
19.00	40	100.0	40	100
19.01	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	16.46'	4.0" Round Culvert L= 36.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.45' / 16.46' S= -0.0552 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=16.86' TW=15.77' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

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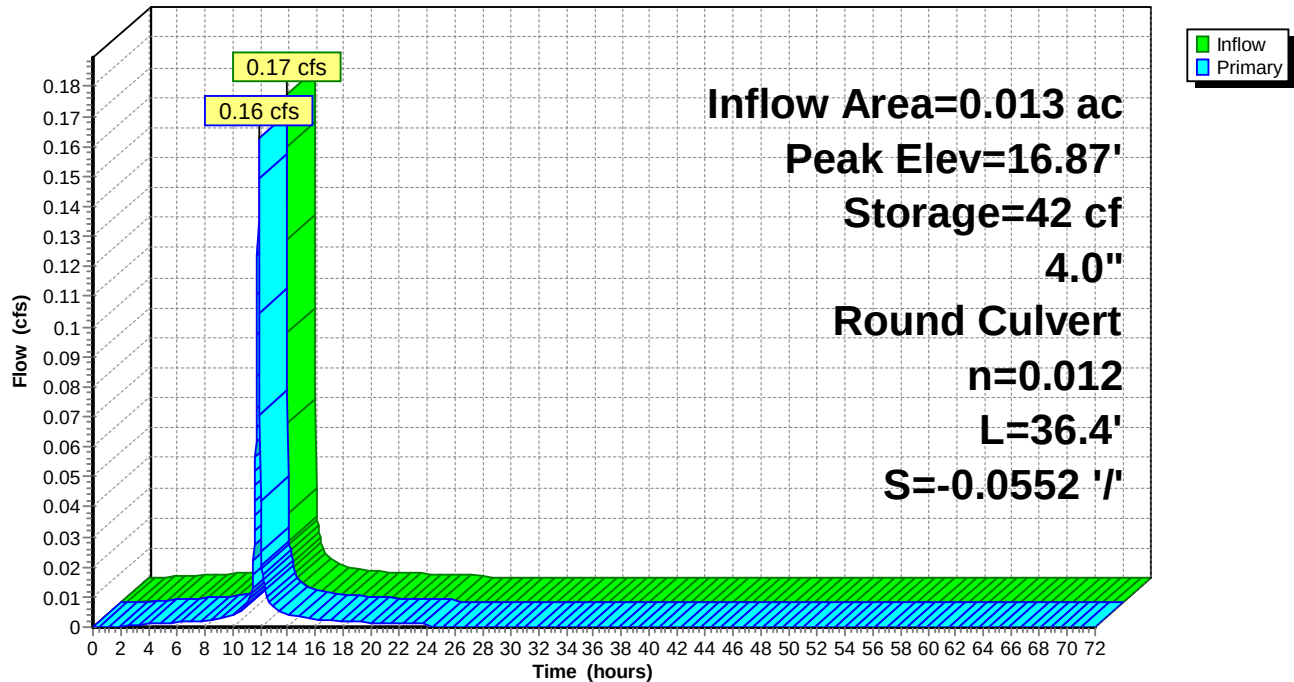
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P45: Planter #45

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P46: Planter #46

Inflow Area = 0.005 ac, 90.87% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af
 Outflow = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af, Atten= 1%, Lag= 0.2 min
 Primary = 0.06 cfs @ 11.90 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.14' @ 11.90 hrs Surf.Area= 20 sf Storage= 3 cf

Plug-Flow detention time= 18.1 min calculated for 0.003 af (99% of inflow)

Center-of-Mass det. time= 9.4 min (753.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	55 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	20	0.0	0	0
14.75	20	40.0	0	0
18.49	20	40.0	30	30
18.50	20	100.0	0	30
19.50	20	100.0	20	50
19.51	1,000	100.0	5	55

Device	Routing	Invert	Outlet Devices
#1	Primary	14.95'	4.0" Round Culvert L= 28.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 14.24' S= 0.0248 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.06 cfs @ 11.90 hrs HW=15.14' TW=13.64' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.06 cfs @ 1.18 fps)

Naima - Phase 2 - Proposed HydroCAD

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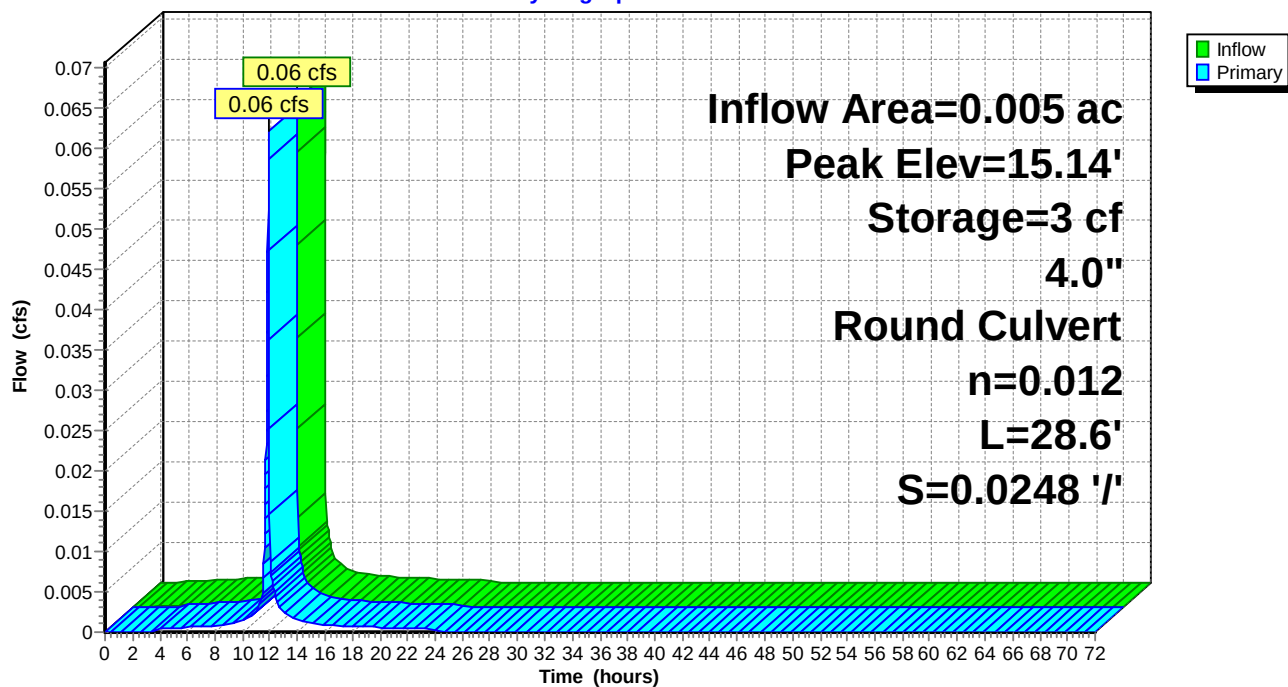
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P46: Planter #46

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Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P47: Planter #47

Inflow Area = 0.028 ac, 93.42% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.35 cfs @ 11.90 hrs, Volume= 0.017 af
 Outflow = 0.28 cfs @ 11.93 hrs, Volume= 0.017 af, Atten= 20%, Lag= 2.0 min
 Primary = 0.28 cfs @ 11.93 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 16.60' Surf.Area= 80 sf Storage= 60 cf

Peak Elev= 18.02' @ 11.93 hrs Surf.Area= 80 sf Storage= 105 cf (45 cf above start)

Plug-Flow detention time= 84.7 min calculated for 0.015 af (92% of inflow)

Center-of-Mass det. time= 3.7 min (747.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	206 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	80	0.0	0	0
14.75	80	40.0	0	0
18.49	80	40.0	120	120
18.50	80	100.0	1	121
19.50	80	100.0	80	201
19.51	1,000	100.0	5	206

Device	Routing	Invert	Outlet Devices
#1	Primary	16.60'	4.0" Round Culvert L= 59.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 16.60' S= -0.0277 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.28 cfs @ 11.93 hrs HW=18.00' TW=15.78' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.28 cfs @ 3.20 fps)

Naima - Phase 2 - Proposed HydroCAD

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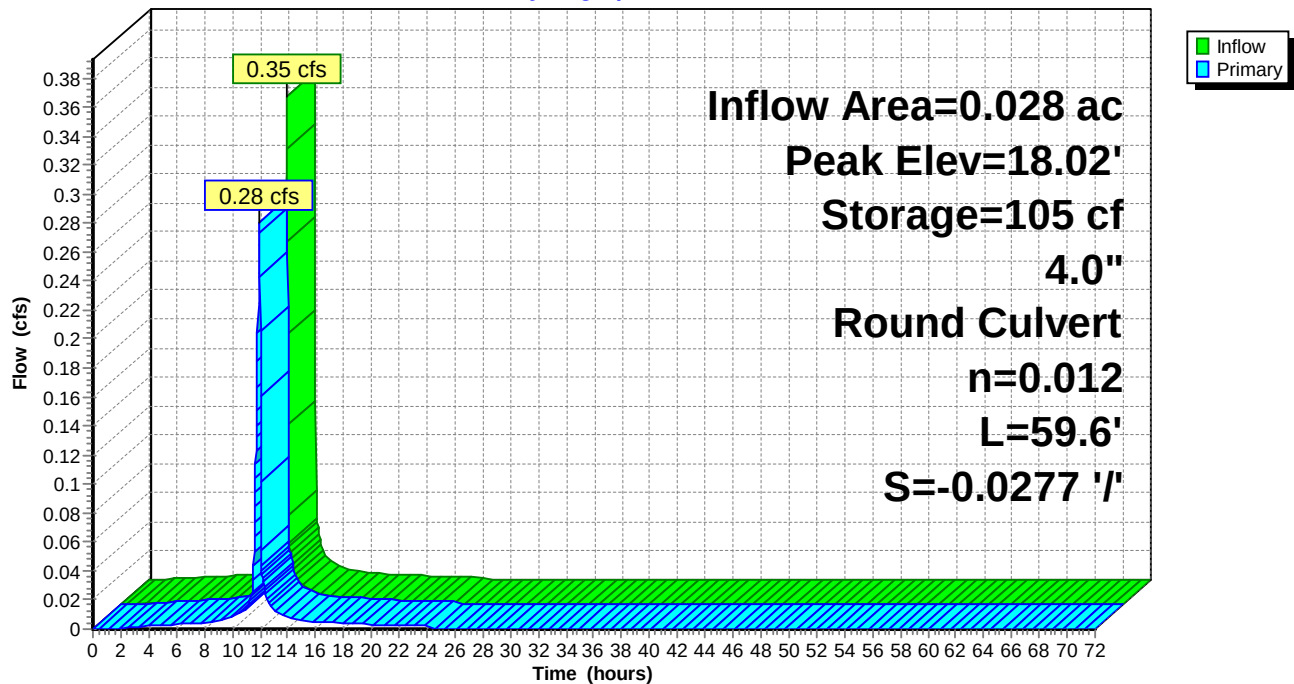
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Pond P47: Planter #47

Hydrograph



Naima - Phase 2 - Proposed HydroCAD

Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P48: Planter #48

Inflow Area = 0.018 ac, 93.09% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.23 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.22 cfs @ 11.91 hrs, Volume= 0.010 af, Atten= 6%, Lag= 0.9 min
 Primary = 0.22 cfs @ 11.91 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 17.49' @ 11.91 hrs Surf.Area= 55 sf Storage= 61 cf

Plug-Flow detention time= 96.6 min calculated for 0.010 af (90% of inflow)
 Center-of-Mass det. time= 43.8 min (787.9 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.74'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	55	0.0	0	0
14.75	55	40.0	0	0
18.49	55	40.0	82	82
18.50	55	100.0	1	83
19.50	55	100.0	55	138
19.51	1,000	100.0	5	143

Device	Routing	Invert	Outlet Devices
#1	Primary	16.90'	4.0" Round Culvert L= 24.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.44' / 16.90' S= -0.0992 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.21 cfs @ 11.91 hrs HW=17.48' TW=13.69' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.21 cfs @ 2.45 fps)

Naima - Phase 2 - Proposed HydroCAD

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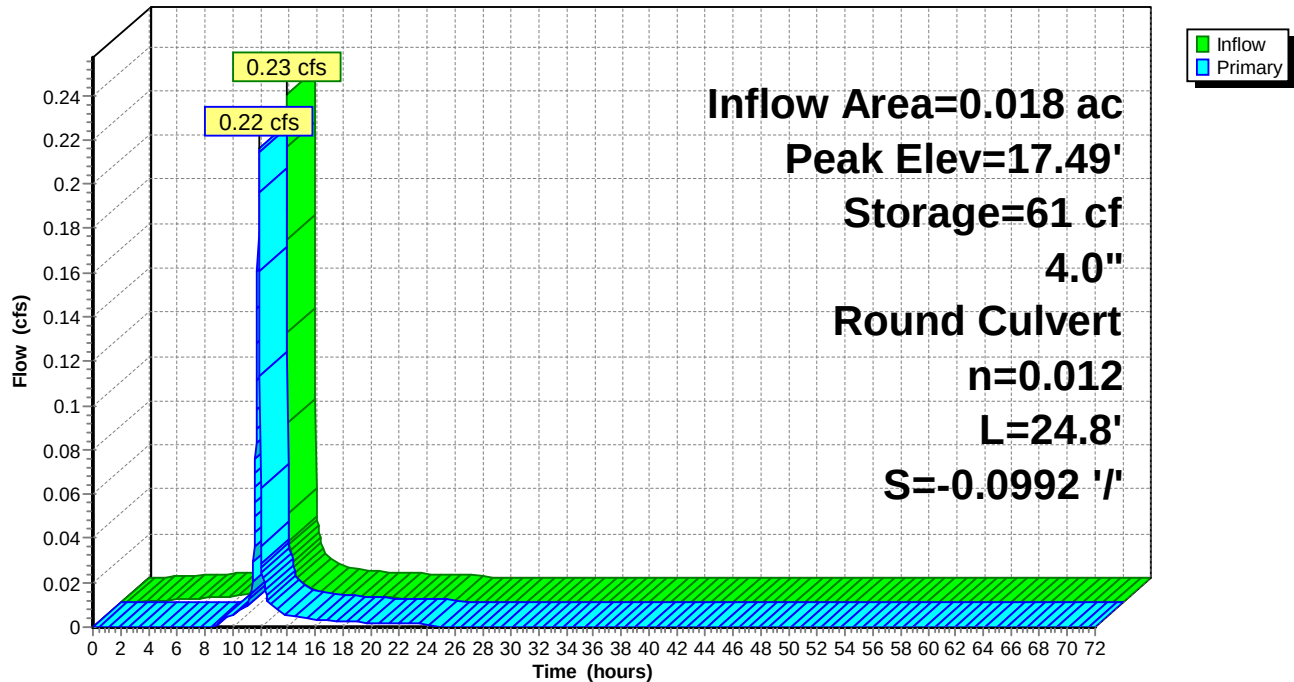
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Pond P48: Planter #48

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P49: Planter #49

Inflow Area = 0.008 ac, 91.74% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.12' Surf.Area= 30 sf Storage= 29 cf

Peak Elev= 17.38' @ 11.90 hrs Surf.Area= 30 sf Storage= 32 cf (3 cf above start)

Plug-Flow detention time= 115.2 min calculated for 0.004 af (87% of inflow)

Center-of-Mass det. time= 2.2 min (746.3 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.74	30	0.0	0	0
14.75	30	40.0	0	0
18.49	30	40.0	45	45
18.50	30	100.0	0	45
19.50	30	100.0	30	75
19.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	17.12'	4.0" Round Culvert L= 19.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.95' / 17.12' S= -0.1090 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=17.38' TW=15.76' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.10 cfs @ 1.38 fps)

Naima - Phase 2 - Proposed HydroCAD

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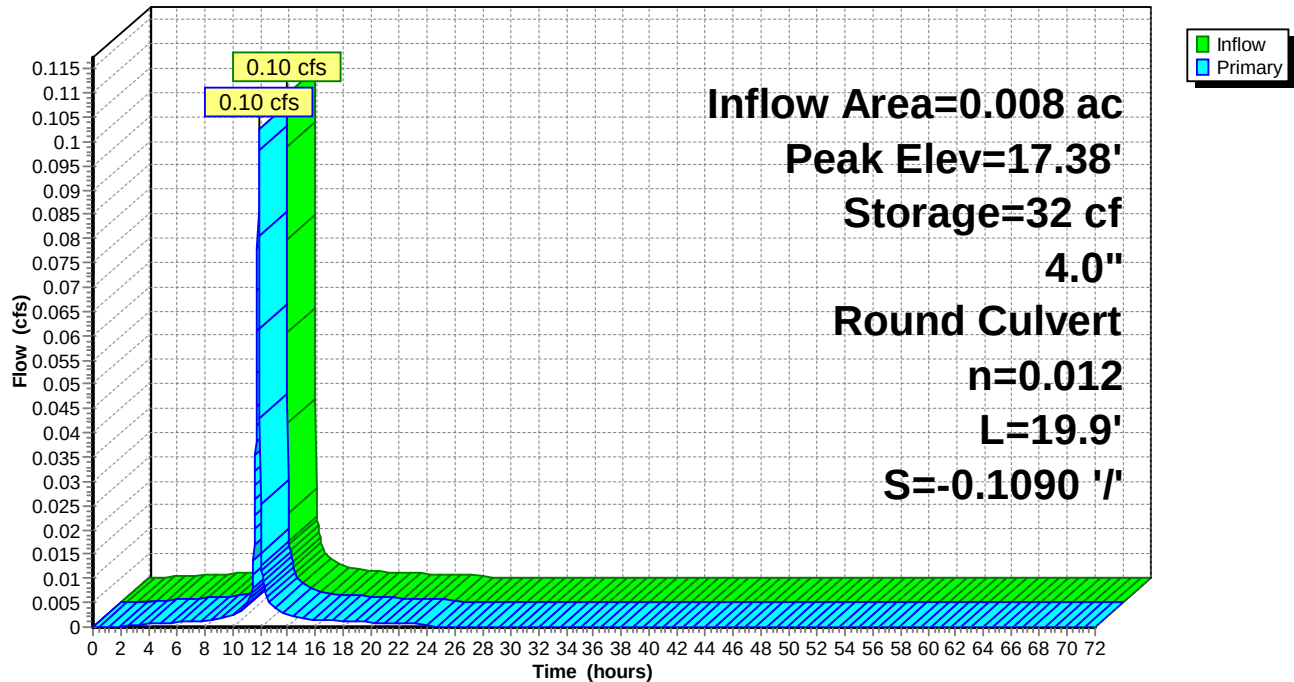
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Pond P49: Planter #49

Hydrograph



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Summary for Pond P50: Planter #50

Inflow Area = 0.016 ac, 92.84% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.20 cfs @ 11.90 hrs, Volume= 0.010 af
 Outflow = 0.19 cfs @ 11.91 hrs, Volume= 0.009 af, Atten= 5%, Lag= 0.8 min
 Primary = 0.19 cfs @ 11.91 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 16.45' @ 11.91 hrs Surf.Area= 50 sf Storage= 14 cf

Plug-Flow detention time= 15.5 min calculated for 0.009 af (99% of inflow)
 Center-of-Mass det. time= 8.7 min (752.8 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	131 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	50	0.0	0	0
15.75	50	40.0	0	0
19.49	50	40.0	75	75
19.50	50	100.0	1	76
20.50	50	100.0	50	126
20.51	1,000	100.0	5	131

Device	Routing	Invert	Outlet Devices
#1	Primary	15.95'	4.0" Round Culvert L= 19.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 14.55' S= 0.0722 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.19 cfs @ 11.91 hrs HW=16.44' TW=13.68' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.19 cfs @ 2.17 fps)

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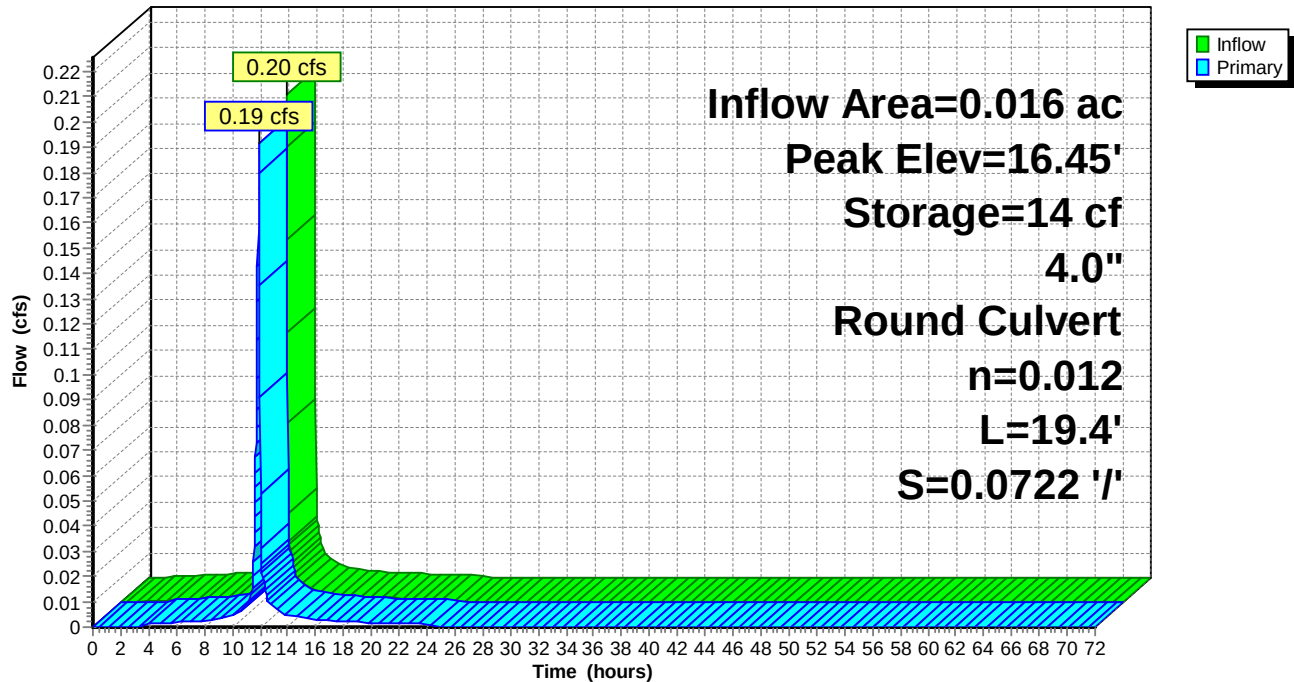
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Pond P50: Planter #50

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P51: Planter #51

Inflow Area = 0.013 ac, 93.19% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.31' Surf.Area= 40 sf Storage= 25 cf

Peak Elev= 17.72' @ 11.91 hrs Surf.Area= 40 sf Storage= 32 cf (7 cf above start)

Plug-Flow detention time= 76.1 min calculated for 0.007 af (93% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	40	0.0	0	0
15.75	40	40.0	0	0
19.49	40	40.0	60	60
19.50	40	100.0	0	60
20.50	40	100.0	40	100
20.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	17.31'	4.0" Round Culvert L= 36.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 17.31' S= -0.0370 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=17.71' TW=15.77' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

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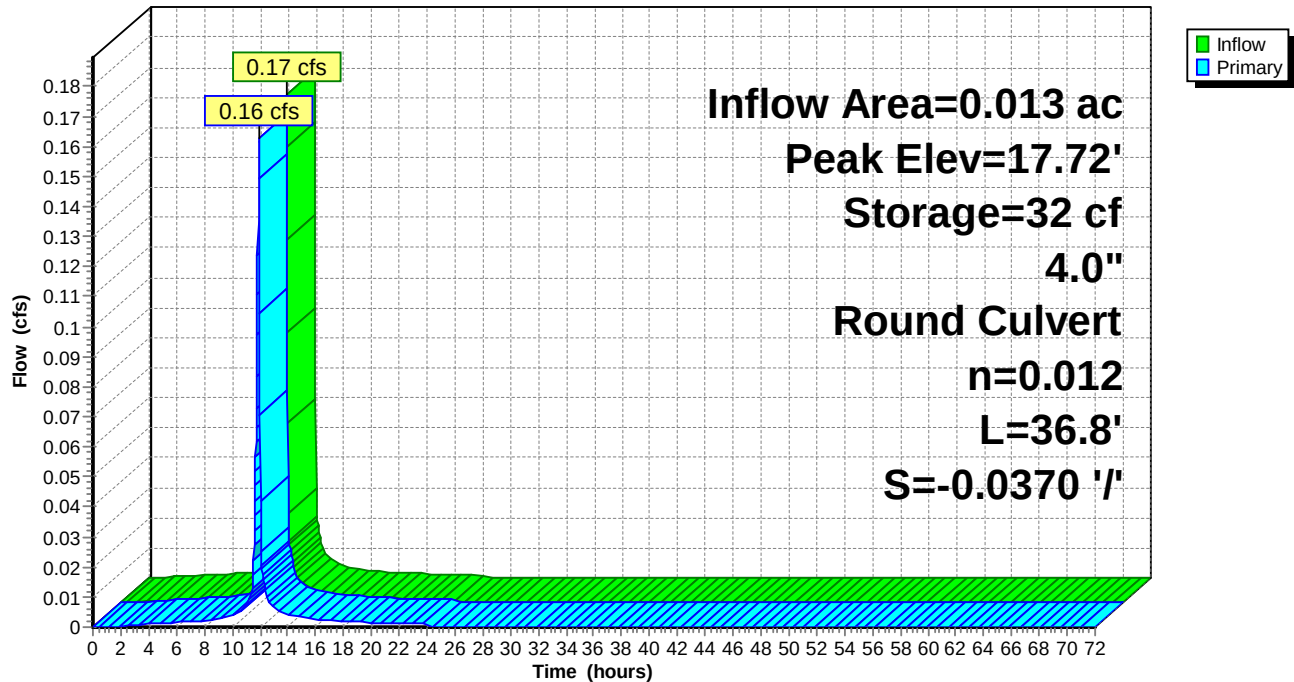
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P51: Planter #51

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P52: Planter #52

Inflow Area = 0.014 ac, 93.22% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af, Atten= 4%, Lag= 0.6 min
 Primary = 0.16 cfs @ 11.91 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 17.54' Surf.Area= 40 sf Storage= 29 cf

Peak Elev= 17.95' @ 11.91 hrs Surf.Area= 40 sf Storage= 35 cf (7 cf above start)

Plug-Flow detention time= 83.3 min calculated for 0.007 af (92% of inflow)

Center-of-Mass det. time= 2.4 min (746.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	106 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	40	0.0	0	0
15.75	40	40.0	0	0
19.49	40	40.0	60	60
19.50	40	100.0	0	60
20.50	40	100.0	40	100
20.51	1,000	100.0	5	106

Device	Routing	Invert	Outlet Devices
#1	Primary	17.54'	4.0" Round Culvert L= 28.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 17.54' S= -0.0550 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.16 cfs @ 11.91 hrs HW=17.94' TW=15.77' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.16 cfs @ 1.85 fps)

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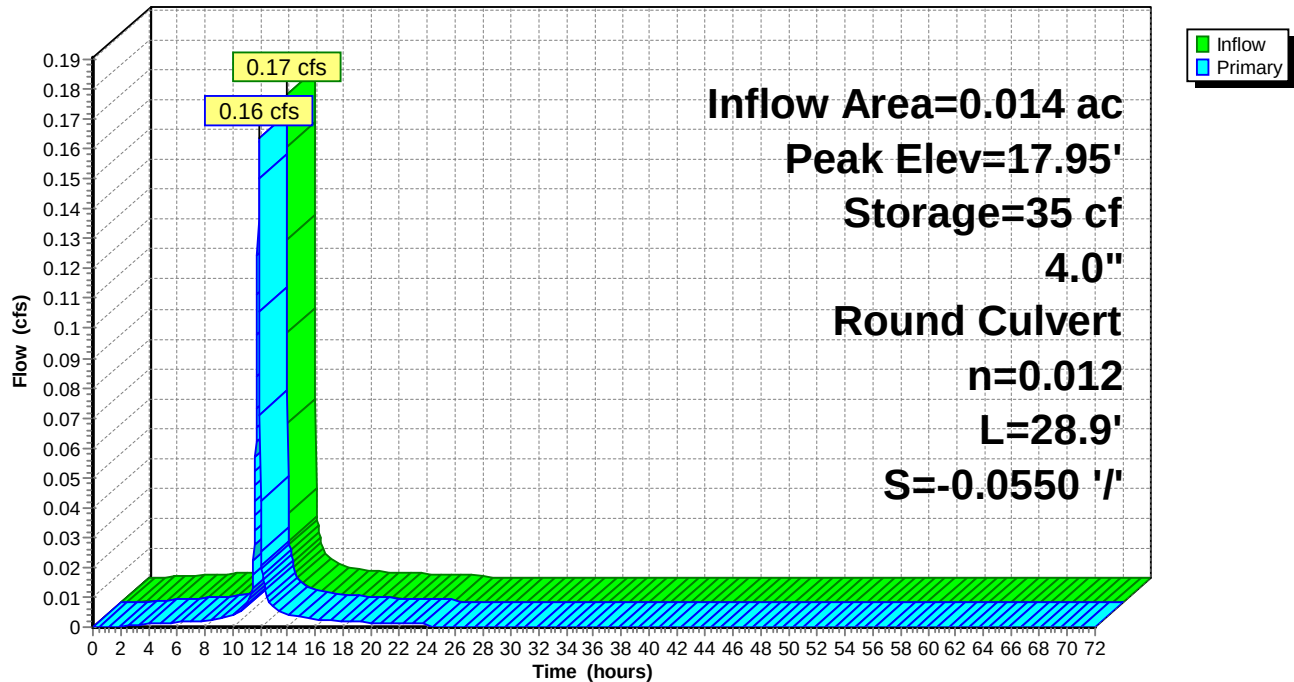
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P52: Planter #52

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P53: Planter #53

Inflow Area = 0.025 ac, 93.61% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af
 Outflow = 0.28 cfs @ 11.92 hrs, Volume= 0.015 af, Atten= 10%, Lag= 1.2 min
 Primary = 0.28 cfs @ 11.92 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 16.85' @ 11.92 hrs Surf.Area= 70 sf Storage= 31 cf

Plug-Flow detention time= 15.1 min calculated for 0.015 af (99% of inflow)

Center-of-Mass det. time= 8.6 min (752.7 - 744.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	15.74'	181 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	70	0.0	0	0
15.75	70	40.0	0	0
19.49	70	40.0	105	105
19.50	70	100.0	1	106
20.50	70	100.0	70	176
20.51	1,000	100.0	5	181

Device	Routing	Invert	Outlet Devices
#1	Primary	15.95'	4.0" Round Culvert L= 22.8' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 14.78' S= 0.0513 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.28 cfs @ 11.92 hrs HW=16.85' TW=13.71' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.28 cfs @ 3.25 fps)

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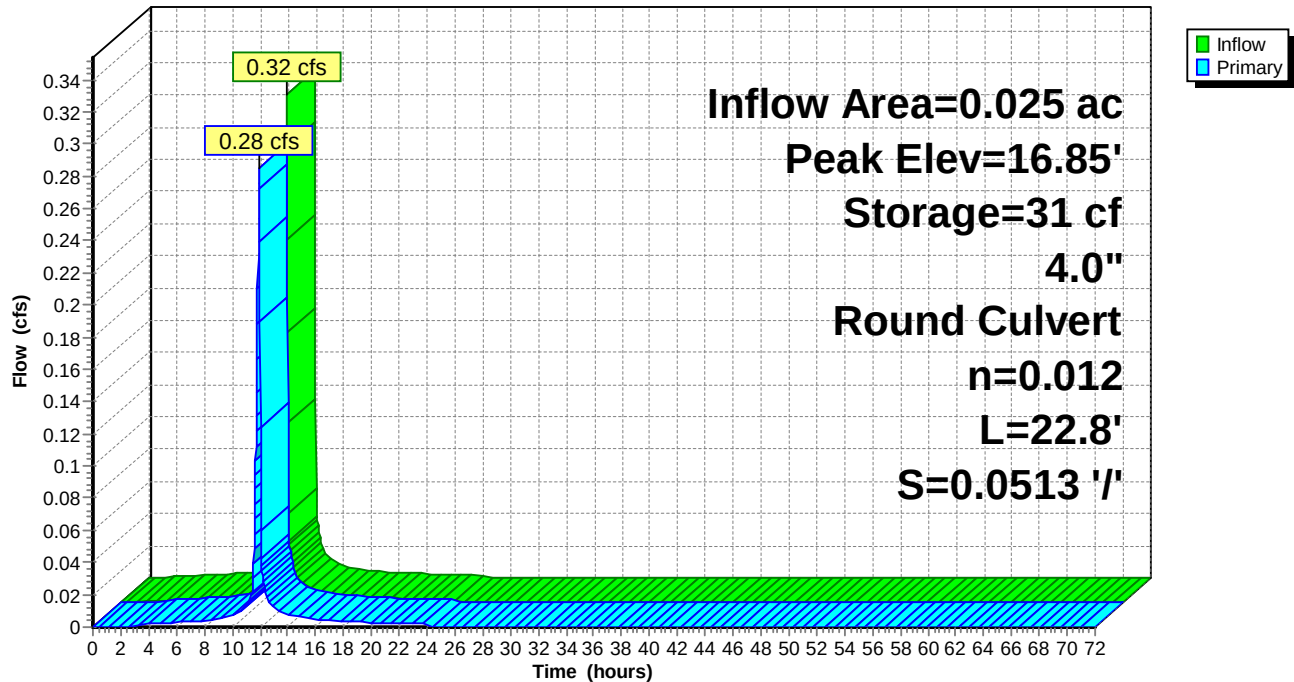
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P53: Planter #53

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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond P54: Planter #54

Inflow Area = 0.008 ac, 91.48% Impervious, Inflow Depth = 7.12" for 100-YR event
 Inflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af
 Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 2%, Lag= 0.3 min
 Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 18.58' Surf.Area= 30 sf Storage= 34 cf

Peak Elev= 18.84' @ 11.90 hrs Surf.Area= 30 sf Storage= 37 cf (3 cf above start)

Plug-Flow detention time= 130.0 min calculated for 0.004 af (84% of inflow)

Center-of-Mass det. time= 2.3 min (746.4 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	15.74'	80 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.74	30	0.0	0	0
15.75	30	40.0	0	0
19.49	30	40.0	45	45
19.50	30	100.0	0	45
20.50	30	100.0	30	75
20.51	1,000	100.0	5	80

Device	Routing	Invert	Outlet Devices
#1	Primary	18.58'	4.0" Round Culvert L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.95' / 18.58' S= -0.2023 ' / ' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.10 cfs @ 11.90 hrs HW=18.84' TW=16.73' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 0.10 cfs @ 1.36 fps)

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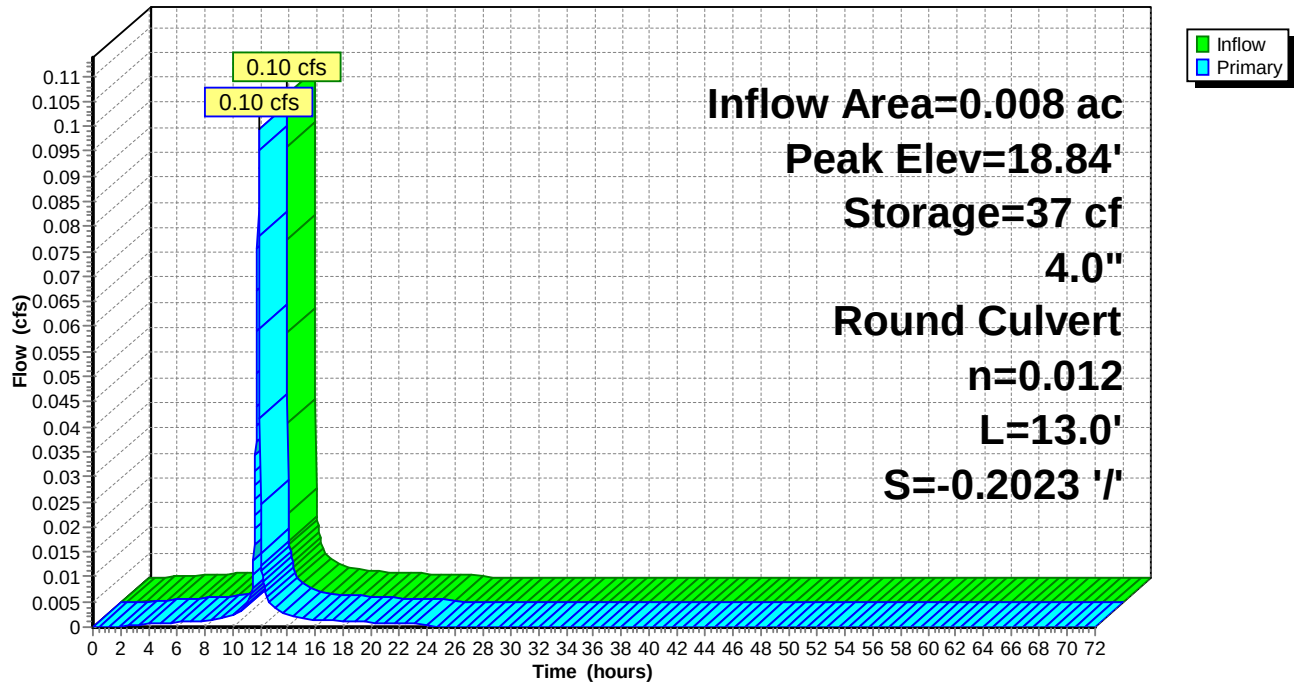
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Type II 24-hr 100-YR Rainfall=7.60"

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Pond P54: Planter #54

Hydrograph



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond PA-2: Porous Asphalt #2

Inflow Area = 0.105 ac, 81.59% Impervious, Inflow Depth = 6.81" for 100-YR event
 Inflow = 0.88 cfs @ 11.95 hrs, Volume= 0.060 af
 Outflow = 0.59 cfs @ 12.02 hrs, Volume= 0.059 af, Atten= 34%, Lag= 4.0 min
 Primary = 0.59 cfs @ 12.02 hrs, Volume= 0.059 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.21' @ 12.05 hrs Surf.Area= 5,642 sf Storage= 466 cf

Plug-Flow detention time= 38.4 min calculated for 0.059 af (99% of inflow)

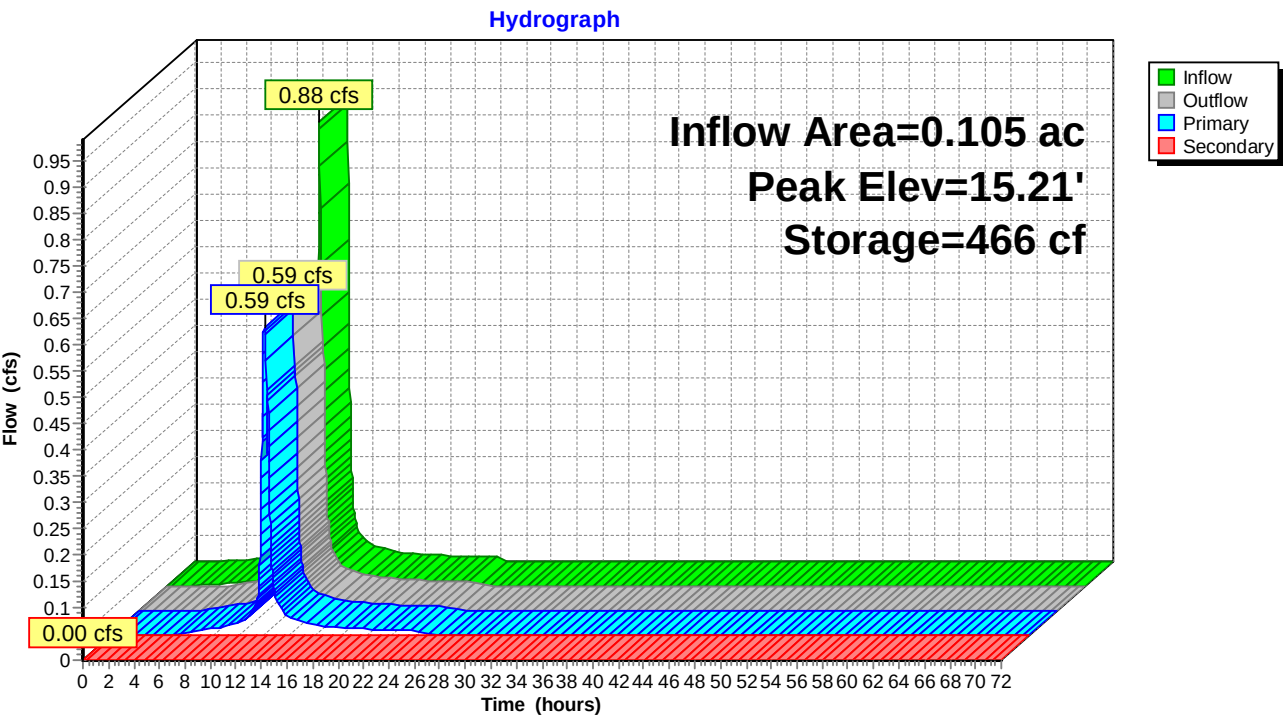
Center-of-Mass det. time= 32.0 min (794.7 - 762.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.04'	4,998 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.04	1,172	0.0	0	0
14.05	1,172	40.0	5	5
14.80	1,172	40.0	352	356
14.81	1,172	20.0	2	359
15.21	1,172	20.0	94	452
15.22	12,000	100.0	66	518
15.50	20,000	100.0	4,480	4,998

Device	Routing	Invert	Outlet Devices
#1	Primary	14.09'	6.0" Round Culvert L= 55.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.09' / 13.90' S= 0.0035 ' / S= 0.0035 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.36'	55.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.59 cfs @ 12.02 hrs HW=15.21' TW=14.58' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.59 cfs @ 3.01 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.04' TW=15.10' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PA-2: Porous Asphalt #2



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond PA-3: Porous Asphalt #3

Inflow Area = 0.136 ac, 64.54% Impervious, Inflow Depth = 6.33" for 100-YR event
 Inflow = 0.97 cfs @ 11.93 hrs, Volume= 0.072 af
 Outflow = 0.67 cfs @ 12.32 hrs, Volume= 0.071 af, Atten= 31%, Lag= 23.2 min
 Primary = 0.67 cfs @ 12.32 hrs, Volume= 0.070 af
 Secondary = 0.09 cfs @ 12.10 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.05' @ 12.10 hrs Surf.Area= 12,127 sf Storage= 501 cf

Plug-Flow detention time= 25.3 min calculated for 0.071 af (99% of inflow)

Center-of-Mass det. time= 21.8 min (799.0 - 777.2)

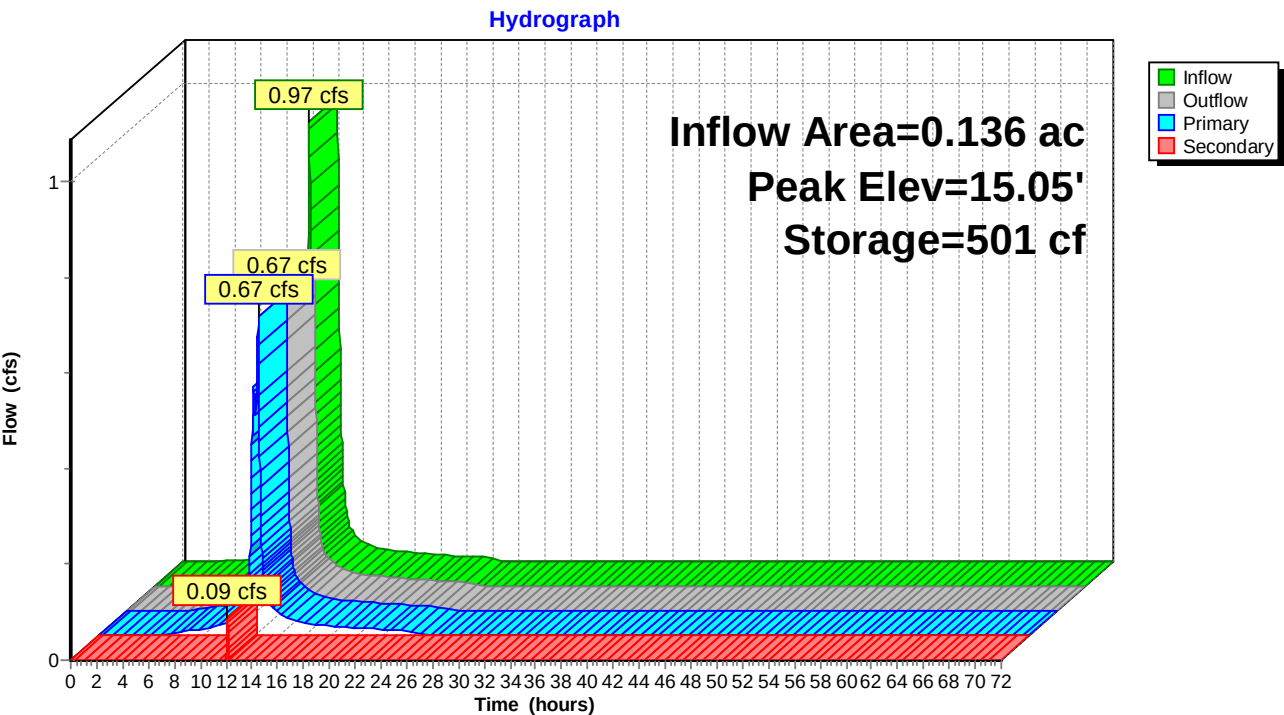
Volume	Invert	Avail.Storage	Storage Description
#1	13.86'	7,773 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.86	903	0.0	0	0
13.87	903	40.0	4	4
14.62	903	40.0	271	275
14.63	903	20.0	2	276
15.03	903	20.0	72	349
15.04	12,000	100.0	65	413
15.50	20,000	100.0	7,360	7,773

Device	Routing	Invert	Outlet Devices
#1	Primary	13.91'	6.0" Round Culvert L= 43.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.91' / 13.70' S= 0.0049 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.04'	43.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.60 cfs @ 12.32 hrs HW=15.03' TW=14.40' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.60 cfs @ 3.03 fps)**Secondary OutFlow** Max=0.09 cfs @ 12.10 hrs HW=15.05' TW=14.60' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.09 cfs @ 0.28 fps)

Pond PA-3: Porous Asphalt #3



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond PA-4: Porous Asphalt #4

Inflow Area = 0.168 ac, 70.97% Impervious, Inflow Depth = 6.54" for 100-YR event
 Inflow = 1.25 cfs @ 11.96 hrs, Volume= 0.092 af
 Outflow = 0.82 cfs @ 12.07 hrs, Volume= 0.091 af, Atten= 34%, Lag= 6.7 min
 Primary = 0.68 cfs @ 12.36 hrs, Volume= 0.086 af
 Secondary = 0.33 cfs @ 12.06 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.04' @ 12.06 hrs Surf.Area= 12,260 sf Storage= 678 cf

Plug-Flow detention time= 28.5 min calculated for 0.091 af (99% of inflow)

Center-of-Mass det. time= 24.6 min (795.8 - 771.3)

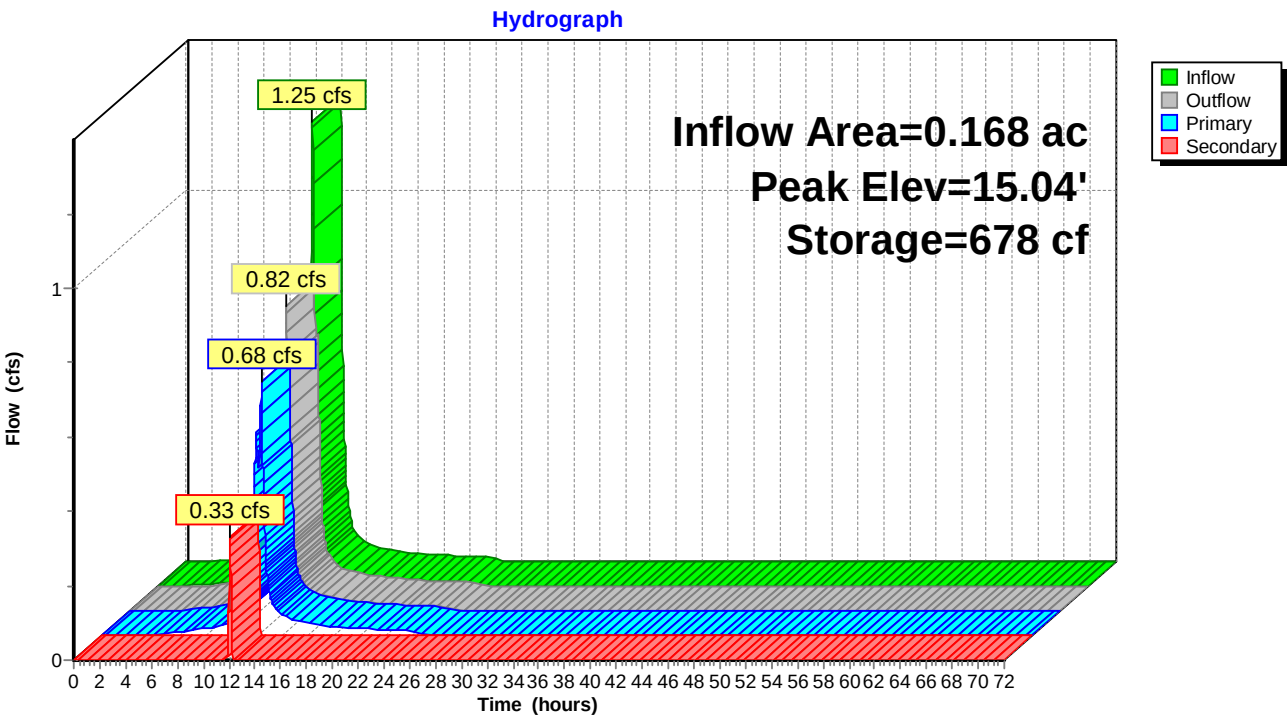
Volume	Invert	Avail.Storage	Storage Description
#1	13.84'	8,169 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.84	1,097	0.0	0	0
13.85	1,097	40.0	4	4
14.60	1,097	40.0	329	333
14.61	1,097	20.0	2	336
15.01	1,097	20.0	88	423
15.02	12,000	100.0	65	489
15.50	20,000	100.0	7,680	8,169

Device	Routing	Invert	Outlet Devices
#1	Primary	13.89'	6.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.89' / 13.70' S= 0.0037 ' / S= 0.0037 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.02'	52.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.68 cfs @ 12.36 hrs HW=15.01' TW=14.19' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.68 cfs @ 3.45 fps)**Secondary OutFlow** Max=0.33 cfs @ 12.06 hrs HW=15.04' TW=14.62' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.33 cfs @ 0.41 fps)

Pond PA-4: Porous Asphalt #4



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Type II 24-hr 100-YR Rainfall=7.60"

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Summary for Pond PA-5: Porous Asphalt #5

Inflow Area = 0.187 ac, 78.13% Impervious, Inflow Depth = 6.76" for 100-YR event
 Inflow = 1.41 cfs @ 11.94 hrs, Volume= 0.106 af
 Outflow = 1.30 cfs @ 12.08 hrs, Volume= 0.104 af, Atten= 8%, Lag= 8.4 min
 Primary = 0.52 cfs @ 12.28 hrs, Volume= 0.097 af
 Secondary = 0.81 cfs @ 12.08 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 15.28' @ 12.09 hrs Surf.Area= 12,579 sf Storage= 1,186 cf

Plug-Flow detention time= 64.3 min calculated for 0.104 af (99% of inflow)

Center-of-Mass det. time= 57.6 min (823.8 - 766.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	14.08'	4,812 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.08	2,333	0.0	0	0
14.09	2,333	40.0	9	9
14.84	2,333	40.0	700	709
14.85	2,333	20.0	5	714
15.25	2,333	20.0	187	901
15.26	12,000	100.0	72	972
15.50	20,000	100.0	3,840	4,812

Device	Routing	Invert	Outlet Devices
#1	Primary	14.13'	6.0" Round Culvert L= 109.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.13' / 14.00' S= 0.0012 ' / S= 0.0012 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.26'	109.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.52 cfs @ 12.28 hrs HW=15.27' TW=14.51' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 0.52 cfs @ 2.63 fps)**Secondary OutFlow** Max=0.00 cfs @ 12.08 hrs HW=15.28' TW=15.34' (Dynamic Tailwater)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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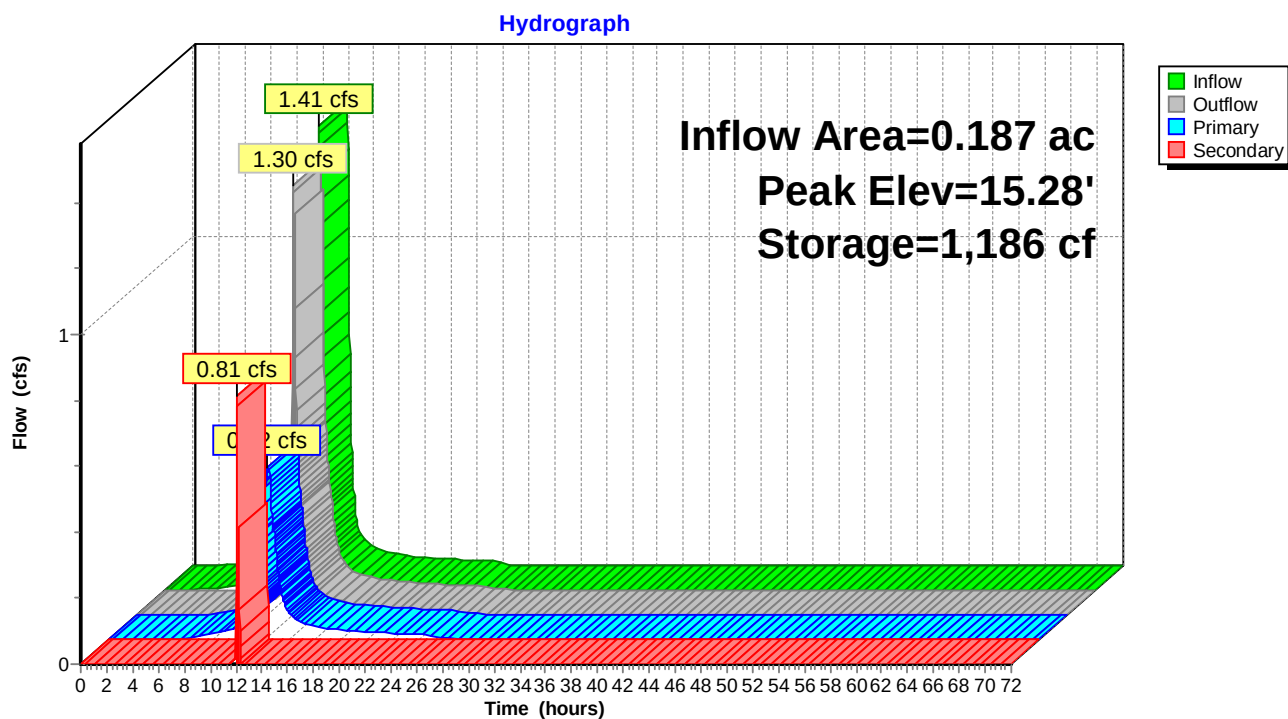
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Pond PA-5: Porous Asphalt #5



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Summary for Pond PA-6: Porous Asphalt #6

Inflow Area = 0.290 ac, 80.14% Impervious, Inflow Depth = 6.81" for 100-YR event
 Inflow = 2.33 cfs @ 11.93 hrs, Volume= 0.165 af
 Outflow = 3.58 cfs @ 12.12 hrs, Volume= 0.163 af, Atten= 0%, Lag= 11.3 min
 Primary = 0.55 cfs @ 12.10 hrs, Volume= 0.152 af
 Secondary = 3.04 cfs @ 12.12 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 15.84' @ 12.10 hrs Surf.Area= 14,511 sf Storage= 2,265 cf

Plug-Flow detention time= 66.6 min calculated for 0.163 af (99% of inflow)
 Center-of-Mass det. time= 60.9 min (824.2 - 763.3)

Volume	Invert	Avail.Storage	Storage Description
#1	14.58'	5,106 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.58	3,085	0.0	0	0
14.59	3,085	40.0	12	12
15.34	3,085	40.0	926	938
15.35	3,085	20.0	6	944
15.75	3,085	20.0	247	1,191
15.76	12,000	100.0	75	1,266
16.00	20,000	100.0	3,840	5,106

Device	Routing	Invert	Outlet Devices
#1	Primary	14.63'	6.0" Round Culvert L= 144.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.63' / 14.30' S= 0.0023 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Secondary	15.76'	144.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.55 cfs @ 12.10 hrs HW=15.84' TW=14.60' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 0.55 cfs @ 2.78 fps)

Secondary OutFlow Max=0.00 cfs @ 12.12 hrs HW=15.83' TW=16.05' (Dynamic Tailwater)

↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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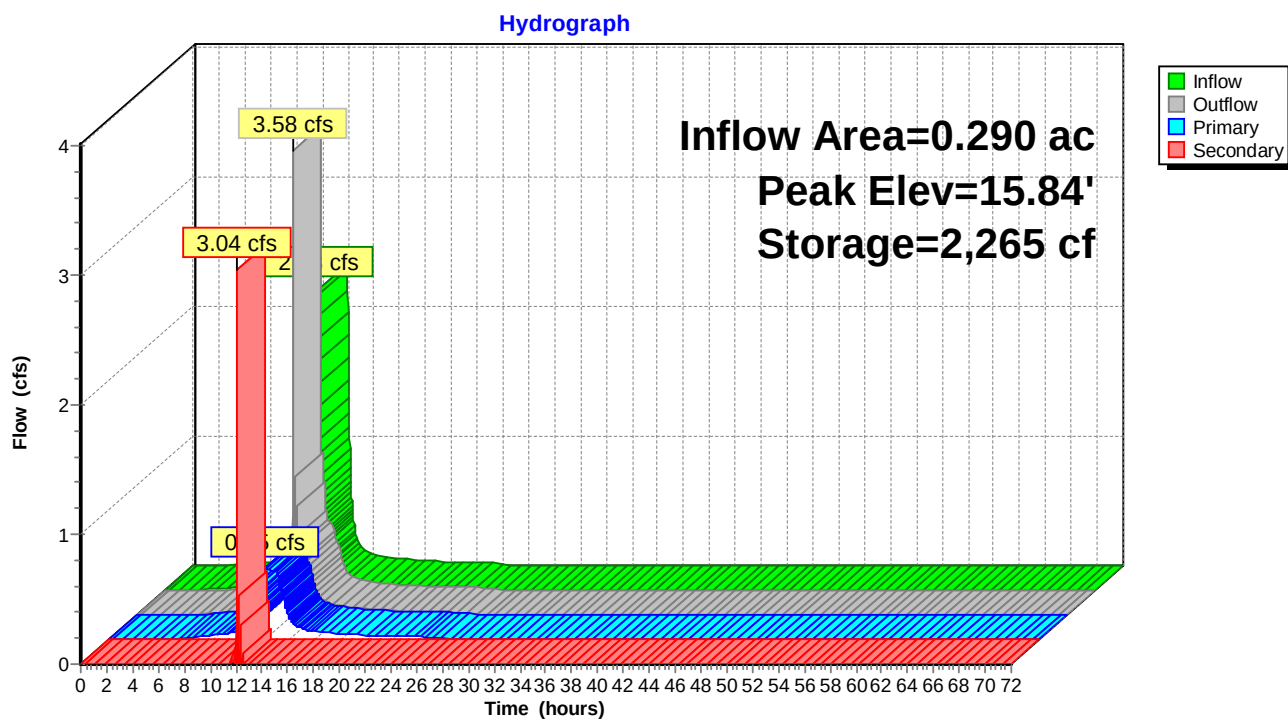
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Pond PA-6: Porous Asphalt #6



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Summary for Pond PA-7: Porous Asphalt #7

Inflow Area = 0.034 ac, 75.76% Impervious, Inflow Depth = 6.67" for 100-YR event
 Inflow = 0.26 cfs @ 11.93 hrs, Volume= 0.019 af
 Outflow = 0.21 cfs @ 12.03 hrs, Volume= 0.019 af, Atten= 20%, Lag= 5.9 min
 Primary = 0.21 cfs @ 12.03 hrs, Volume= 0.019 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 16.89' @ 12.03 hrs Surf.Area= 387 sf Storage= 94 cf

Plug-Flow detention time= 26.5 min calculated for 0.019 af (99% of inflow)

Center-of-Mass det. time= 20.6 min (788.9 - 768.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.28'	4,851 cf	Porous Asphalt Section (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.28	387	0.0	0	0
16.29	387	40.0	2	2
17.04	387	40.0	116	118
17.05	387	20.0	1	118
17.45	387	20.0	31	149
17.46	12,000	100.0	62	211
17.75	20,000	100.0	4,640	4,851

Device	Routing	Invert	Outlet Devices
#1	Primary	16.33'	4.0" Round Culvert L= 18.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 16.33' / 16.20' S= 0.0072 ' / S= 0.0072 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	17.46'	18.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.21 cfs @ 12.03 hrs HW=16.89' TW=14.60' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.21 cfs @ 2.38 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=16.28' TW=17.34' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Naima - Phase 2 - Proposed HydroCAD

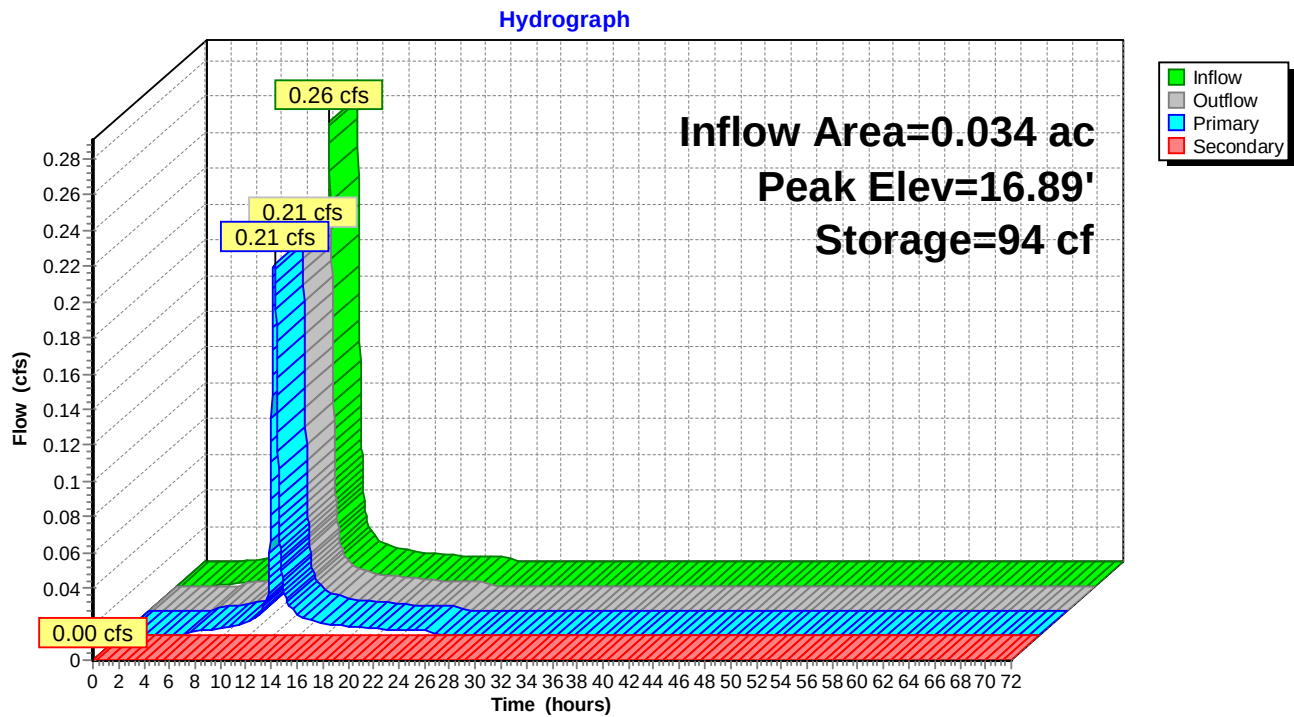
Prepared by RAUCH inc.

HydroCAD® 10.00-26 s/n 02413 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Pond PA-7: Porous Asphalt #7



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

Printed 02/22/23

Summary for Pond SDMH-1: Proposed SDMH West of Bldgs

Inflow Area = 1.512 ac, 62.04% Impervious, Inflow Depth = 6.27" for 100-YR event
Inflow = 6.25 cfs @ 11.94 hrs, Volume= 0.789 af
Outflow = 6.25 cfs @ 11.94 hrs, Volume= 0.789 af, Atten= 0%, Lag= 0.0 min
Primary = 6.25 cfs @ 11.94 hrs, Volume= 0.789 af

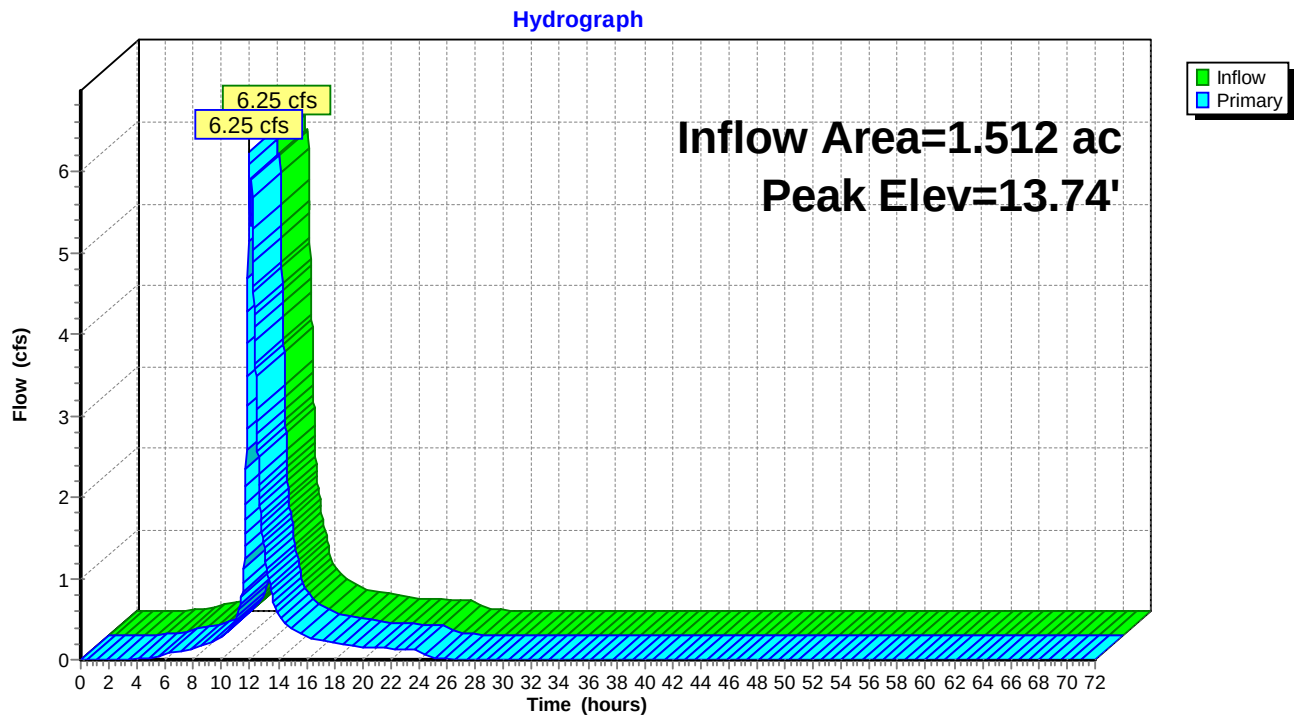
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 13.74' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	2.0" x 2.0" Horiz. Orifice/Grate X 11.00 columns X 11 rows C= 0.600 in 24.0" x 24.0" Grate (84% open area) Limited to weir flow at low heads
#2	Primary	12.00'	15.0" Round Culvert L= 172.1' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 12.00' / 10.14' S= 0.0108 ' ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=6.24 cfs @ 11.94 hrs HW=13.74' TW=0.00' (Dynamic Tailwater)

1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Inlet Controls 6.24 cfs @ 5.09 fps)

Pond SDMH-1: Proposed SDMH West of Bldgs



Naima - Phase 2 - Proposed HydroCAD

Prepared by RAUCH inc.

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Type II 24-hr 100-YR Rainfall=7.60"

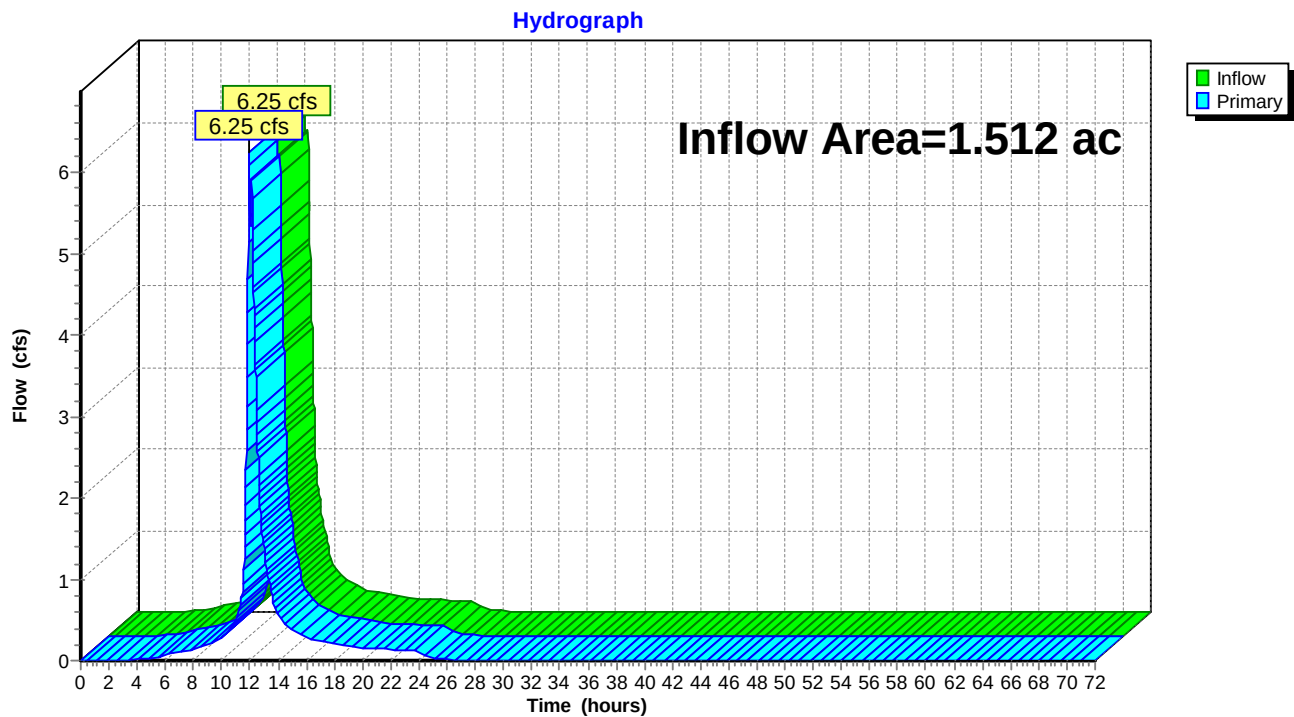
Printed 02/22/23

Summary for Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton

Inflow Area = 1.512 ac, 62.04% Impervious, Inflow Depth = 6.27" for 100-YR event
Inflow = 6.25 cfs @ 11.94 hrs, Volume= 0.789 af
Primary = 6.25 cfs @ 11.94 hrs, Volume= 0.789 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link SP-1: SDMH 20201 - At Intersection of Jowite and Moton





Section 5 – Web Soil Survey Report



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for

NAIMA



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Talbot County, Maryland
Survey Area Data: Version 17, Jun 11, 2020

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

Date(s) aerial images were photographed: Jun 16, 2014—Oct 20, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MtcA	Mattapex silt loam, 0 to 2 percent slopes, Mid-Atlantic Coastal Plain	9.7	56.3%
OtA	Othello silt loams, 0 to 2 percent slopes, Mid-Atlantic Coastal Plain	6.0	34.9%
UbB	Udorthents, borrow area, 0 to 5 percent slopes	1.5	8.8%
Totals for Area of Interest		17.3	100.0%

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Talbot County, Maryland

MtcA—Mattapex silt loam, 0 to 2 percent slopes, Mid-Atlantic Coastal Plain

Map Unit Setting

National map unit symbol: 2thwt
Elevation: 0 to 90 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 55 to 59 degrees F
Frost-free period: 190 to 260 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Mattapex and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mattapex

Setting

Landform: Swales, flats, depressions
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Silty eolian deposits over fluviomarine sediments

Typical profile

Ap - 0 to 11 inches: silt loam
BE - 11 to 15 inches: silt loam
Bt - 15 to 36 inches: silt loam
2C1 - 36 to 60 inches: fine sandy loam
2C2 - 60 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Nassawango

Percent of map unit: 10 percent

Landform: Flats, terraces
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Othello, drained

Percent of map unit: 5 percent
Landform: Depressions, swales, flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Crosiadore

Percent of map unit: 5 percent
Landform: Depressions, flats
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

OtA—Othello silt loams, 0 to 2 percent slopes, Mid-Atlantic Coastal Plain

Map Unit Setting

National map unit symbol: 2thwn
Elevation: 0 to 100 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Othello, drained, and similar soils: 48 percent
Othello, undrained, and similar soils: 28 percent
Minor components: 24 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Othello, Drained

Setting

Landform: Flats, depressions, swales
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Silty eolian deposits over fluviomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam
Btg - 9 to 29 inches: silt loam
2BCg - 29 to 34 inches: sandy loam
2Cg - 34 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 10 to 20 inches
Frequency of flooding: None
Frequency of ponding: Rare
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Othello, Undrained

Setting

Landform: Swales, drainageways, flats, depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Silty eolian deposits over fluviomarine deposits

Typical profile

Oe - 0 to 2 inches: peat
A - 2 to 4 inches: silt loam
Eg - 4 to 10 inches: silt loam
Btg - 10 to 29 inches: silt loam
2BCg - 29 to 35 inches: sandy loam
2Cg - 35 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w

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Hydrologic Soil Group: C/D

Hydric soil rating: Yes

Minor Components

Crosiadore

Percent of map unit: 7 percent

Landform: Fluvio-marine terraces, depressions, flats

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Tread, dip, talf

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Hydric soil rating: No

Mattapex

Percent of map unit: 7 percent

Landform: Broad interstream divides, flats, depressions, swales

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Talf, dip

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Hydric soil rating: No

Fallsington, undrained

Percent of map unit: 5 percent

Landform: Flats, depressions, swales, drainageways

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Talf, dip

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Hydric soil rating: Yes

Kentuck, undrained

Percent of map unit: 5 percent

Landform: Flats, depressions, swales

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Talf, dip

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Hydric soil rating: Yes

UbB—Udorthents, borrow area, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1vh0s

Elevation: 0 to 150 feet

Mean annual precipitation: 42 to 48 inches

Mean annual air temperature: 52 to 58 degrees F

Frost-free period: 180 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, borrow area, and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Borrow Area

Setting

Landform: Flats, knolls

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Fluvio-marine sediments fluvio-marine deposits

Typical profile

AC - 0 to 2 inches: loam

C - 2 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)

Depth to water table: About 20 to 40 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Udorthents, loamy

Percent of map unit: 10 percent

Landform: Broad interstream divides

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Askecksy, drained

Percent of map unit: 5 percent

Landform: Swales, flats, depressions

Landform position (three-dimensional): Talf

Down-slope shape: Concave, linear

Across-slope shape: Linear, concave

Hydric soil rating: Yes

Klej

Percent of map unit: 5 percent

Landform: Flats, depressions

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

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Hydric soil rating: No

Water

Percent of map unit: 5 percent

Hydric soil rating: No

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Custom Soil Resource Report

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Forest Conservation Worksheet 2.2									
PROJECT:		NAIMA Phase - 2					Date:	2/27/2023	
Net Tract Area									
A.	Total Tract Area						A =	1.32	
B.	Deductions						B =	0.00	
C.	Net Tract Area						C =	1.32	
Land Use Category									
Input the number "1" under the appropriate land use									
zoning, and limit to only one entry									
	ARA	MDR	IDA	HDR	MPD	CIA			
	0	0	0	1	0	0			
D.	Afforestation Threshold (Net Tract Area x				15%	)	D =	0.20	
E.	Conservation Threshold (Net Tract Area x				20%	)	E =	0.26	
Existing Forest Cover									
F.	Existing Forest Cover within the Net Tract Area						F =	0.00	
G.	Area of Forest Above Conservation Threshold						G =	0.00	
Break Even Point									
H.	Break Even Point						H =	0.00	
I.	Forest Clearing Permitted Without Mitigation						I =	0.00	
Proposed Forest Clearing									
J.	Total Area of Forest to be Cleared						J =	0.00	
K.	Total Area of Forest to be Retained						K =	0.00	
Planting Requirements									
L.	Reforestation for Clearing Above the Conservation Threshold						L =	0.00	
M.	Reforestation for Clearing Below the Conservation Threshold						M =	0.00	
N.	Credit for Retention above the Conservation Threshold						N =	0.00	
P.	Total Reforestation Required						P =	0.00	
Q.	Total Afforestation Required						Q =	0.20	
R.	Total Planting Requirement						R =	0.20	
**PIL Calculation		Convert Planting Requirement to: Sq. Ft.						8640.00	
		If Project is inside a Priority Funding Area:						2592.00	
		If Project is outside of a Priority Funding Area:						3110.40	

Your ref: [0000]
Our ref: 12578222

01 March 2023

Joseph Mayer
Town of Easton
Engineering, Planning and Zoning
14 South Harrison Street
Easton, MD 21601

Easton Commerce Water Treatment Plant

Dear Mr. Mayer

The Easton Commerce Water Treatment Plant is in compliance with applicable Recommended Design Principles for Easton set forth in the Comprehensive Plan. As the project is a water treatment plant and not a commercial or residential development, principles regarding Integrated Use, Open Spaces and Neighborhoods, Residential Developments, and Neighborhood Connectivity are not applicable to this project.

The Easton Commerce Water Treatment Plant is in compliance with:

Principle #2 Natural features should determine design: The new Easton Commerce Water Treatment Plant was designed such that the surrounding environmental features will not be impacted. There are no environmentally sensitive areas within the site limits or immediately surrounding the site, including wetlands, floodplain, streams, critical area, or protected forested areas. The site will include a submerged gravel wetland with required landscaping and a fence around the property to provide a screen for surrounding properties. The existing site is already mostly cleared and includes concrete parking and storage and a warehouse, the proposed site design will include additional plantings and will not impact the existing drainage patterns.

Principle #3 Automobiles should not determine design: The treatment plant will be in the back of an existing warehouse and includes new tree plantings along Commerce Drive to screen from the public streets. The new pavement uses only the land necessary to park utility vehicles and allow for future storage needs in the fenced in facility.

Principle #5 Architecture should respect Easton's historical development: The water treatment plant control building to be constructed will emulate Easton's architectural design standards. The provided building elevations show the design intent and proposed features.

Regards



Madeline Selick Barbalace
Environmental Engineer

240-206-0492
Madeline.selick@ghd.com

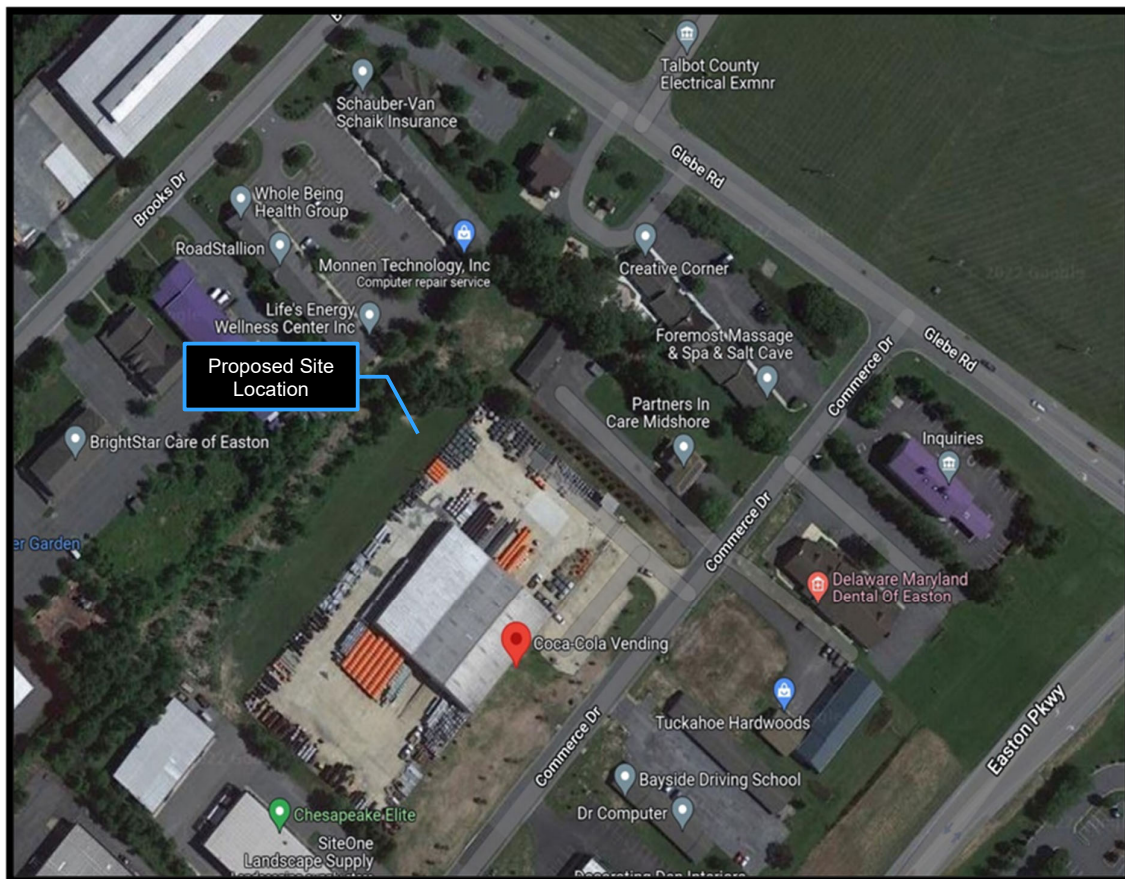


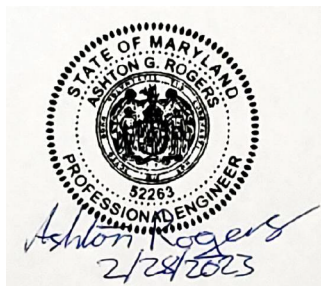
Easton Commerce Water Treatment Plant Concept Stormwater Management Plan Report

Easton Utilities

28 February 2023

➔ The Power of Commitment





Professional Certification. I hereby certify that these documents
were prepared or approved by me, and that I am a duly licensed
professional engineer under the laws of the State of Maryland.
License No. 52263, Expiration Date: 2024-02-06

Project name		Easton Commerce Water Treatment Plant					
Document title		Easton Commerce Water Treatment Plant Concept Stormwater Management Plan Report					
Project number		12578222					
File name		Easton Concept SWM Report					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
[Status code]							
[Status code]							
[Status code]							
[Status code]							
[Status code]							

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Executive Summary

The Town of Easton owns and operates its public water system through Easton Utilities (EU), and EU has been operating the Glebe Water Treatment Plant (WTP) since its construction in 1989. The main purpose of this plant was to reduce the concentration of iron contaminant in the groundwater; however, the continuously backwashing sand filtration method has been decreasing in effectiveness and is not removing iron to the degree desired by EU. GHD was contracted by EU to prepare a Preliminary Engineering Report (PER) to recommend solutions, and a new WTP located on Commerce Drive, the lot adjacent to the Glebe WTP, was proposed. This property would also allow for further expansion of the facility if necessary. The project site is located at 8670 Commerce Dr, Easton, MD 21601.

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Appendices

Appendix A – Stormwater Management Quality Calculations
Appendix B – Geotechnical Report

1. Site and Resource Mapping

1.1 Property Description and Project Background

The Easton Commerce site is located on a 5.089-acre site located at 8670 Commerce Dr, Easton, MD 21601. (Parcel 0004, Lot 0003) and is in Election Ward 1. The site is owned and operated by Easton Utilities and is used for EU's operation and storage. See Sheet G001 of the attached drawings for a vicinity map.

The Easton Commerce Water Treatment Plant project involves providing a new water treatment plant processing building on the existing previously developed Easton Utilities "Commerce Drive Property" across the street from the existing Glebe Water Treatment Plant. The new WTP will utilize new pressure filters and new chemical dosing systems within the new building, the existing Glebe WTP Process tankage will be utilized for storage of filter backwash. Along with the proposed building, new underground utility work will take place as well as new asphalt parking and access area are proposed and a stormwater management facility.

1.2 Existing Stormwater Management

The existing site does not have stormwater management devices, as the area is pervious green space and runoff sheet flows to an existing ditch at the rear of the property or flows overland to the existing storm drain inlets on the site.

1.3 Wetlands and Waterways

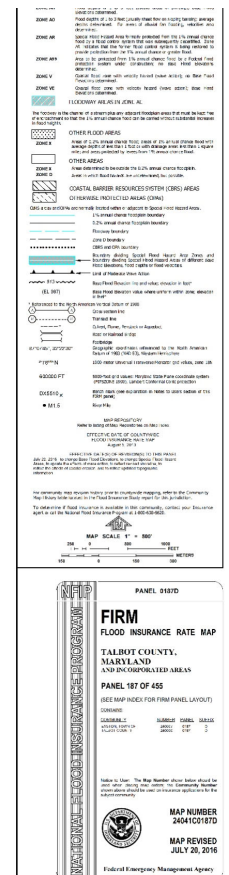
According to the US Environmental Protection Agency (EPA), wetlands are defined as "lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface." There are no wetlands present on the site.

There are no major waterways within or adjacent to the Easton Commerce site. Runoff from the site currently infiltrates into the ground or flows overland towards the storm drain inlets and to the road.

1.4 Floodplains

The project site is in an area of minimal flood risk, according to FEMA flood maps. Much of the Town of Easton is also located in low-risk areas.

Per the FEMA FIRM Panel 24041C0187D effective 7/20/2016 for Town of Easton 240067, the area of interest is Zone X and is not in the floodplain (Figure 01). The 100-yr flood Base Flood Elevation (BFE) for the closest flood area to the site is at an elevation of 5.00. All grades within this project are more than 2 feet above the closest BFE.

[illegible]

The Chesapeake Bay Critical Area Boundary is defined as all land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands and all waters of and lands under the Chesapeake Bay and its tributaries. The Easton Commerce Water Treatment Plant site is not designated as part of the Critical Area. The project LOD is about 2,000ft away from the Critical Area as shown on the Town of Easton Mapper (Eye Over Easton).

According to the Town of Easton Mapper there are no protected forests within the LOD or property boundary for the Easton Commerce site.

Soil information was determined by a review of the “Web Soil Survey” operated by the USDA Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>). All of the disturbed area is classified Urban Land (Up) which has no hydric soil rating.

GHD | Easton Utilities | 12578222 | Easton Commerce Water Treatment Plant

stormwater management location. The subsurface soils for the proposed stormwater management area were visually classified in accordance with USCS as interbedded layers of Silty Sand (SM), Clay (CL,CH), and Clayey Elastic Silt (MH). The USDA classifications for these materials were Loamy sand, Sandy Loam, Silty clay loam, and Clay. These soil features can be representative of seasonal high groundwater or a restrictive soil layer which indicates slowly infiltrating groundwater. The soil boring logs along with a map of the boring locations are located in Appendix B.

The existing site area consists of a large concrete parking lot with a warehouse located within the lot. The northwest of the site is grass with no steep slopes within the property lines. There are no steep slopes within the project site LOD, the topography of the site generally slopes downhill from north east to north west. The existing grade in the disturbed area ranges in elevation from 21 feet to 16 feet. The majority of the existing site is at a 2-5% slope. According to the Maryland Erosion and Sediment Control Handbook steep slopes are considered those with gradients of 20% or more and highly erodible soils are those with a slope greater than 15% or a soil erodibility factor K great than 0.35

2. Development Layout

2.1 Proposed Development

The proposed WTP is to be located on the northwest portion of the Easton Utilities site. The area is to be paved around the proposed treatment plant for access and additional parking and storage. New underground utilities and a backwash supply tank are proposed as well as a concrete valley gutter to convey flow to the proposed submerged gravel wetland.

2.2 Stormwater Management Requirements

Section 5.5 of the MDE SWM Manual defines redevelopment as any construction, alteration, or improvement performed on sites where the existing land use is commercial, or multifamily residential and site impervious area exceeds 40%.

When redevelopment requirements apply, 50% of existing impervious surfaces located within the disturbed drainage areas must be removed, treated by ESD, or some combination thereof. If the existing impervious area is less than 40%, the project is not classified as redevelopment, and all existing impervious surfaces located within the disturbed drainage areas are required to be treated through ESD to the maximum extent practicable (MEP). In both cases, all proposed impervious surfaces are required to be treated through ESD to the MEP.

From the areas in Table 1, the existing imperviousness for this projects parcel drainage areas makes up 51.5% of the disturbed area. Therefore, the project is defined as re-development, and 50% of existing impervious surfaces located within the disturbed drainage areas must be treated through ESD to the MEP.

Table 1 - Site Impervious Surfaces

Surface Type	Pre-Development LOD		Post-Development LOD	
	Area (SF)	% of Total	Area (SF)	% of Total
Total Pervious Area	94,815	48.5%	60,709	31.0%
Total Impervious Area	100,787	51.5%	134,893	69.0%
Total Site Drainage Area	195,602		195,602	

2.3 Evaluating Environmental Site Design (ESD) Practices

The goal of ESD is to reduce total site imperviousness as much as possible and to treat runoff from remaining impervious surfaces using natural areas and landscape features. Structural BMPs are to be used only when ESD has been implemented to the maximum extent practicable (MEP).

Reducing impervious surfaces is the first step in implementing ESD. This is typically accomplished by removing unnecessary impervious surfaces by replacing proposed impervious areas with alternative surfaces. Examples of alternative surfaces include vegetated green roof systems (green roofs) and permeable pavement. Alternative surfaces were not proposed due to the nature and intended use of the site.

Disconnecting runoff from rooftop and non-rooftop sources is the second step in ESD planning. Rooftop disconnects were not applied on this project due to limited overland space for additional treatment and the drainage area is too large.

Using micro-scale and non-structural BMPs is the final step in implementing ESD. These practices are typically designed for small drainage areas and are not suitable to treat large flows. These practices also require a moderate footprint of their own. Examples of micro-scale practices include treatment swales, submerged gravel wetlands, rain gardens, and micro-bioretention basins. The only micro-scale practice proposed for this project is a submerged gravel wetland (M-2).

A submerged gravel wetland was chosen due to the high groundwater table and low infiltration rates (as a result of clayey soils) encountered during soil borings. There is adequate space for pre-treatment measures and relatively flat slopes. Based on the limits of disturbed area and viability of land and lack of environmentally protected areas such as floodplain, wetlands and the associated buffer areas, one submerged gravel wetland has been selected to provide stormwater management for this project.

The drainage area associated with the submerged gravel wetland treatment is DA-1 which includes the proposed WTP addition and expansion of the parking lot as shown on Drawing C-301.

The proposed ESD practices discussed above are shown on Drawing C-002.

3. Stormwater Management Plan

3.1 Drainage Area Analysis

Majority of the stormwater runoff on the existing site is conveyed via overland flow to a storm drain inlet on the northwest side of the site and off-site. The proposed measures for the site will follow the existing drainage patterns and flow will be directed to the exiting storm drain inlet, yet the stormwater will be filtered by the proposed submerged gravel wetland. The proposed measures to meet stormwater management are described in the following sections. Refer to Drawing C002.

Drainage Area 1 (pre and post development): Impervious areas within the existing conditions DA-1 include the existing Warehouse Facility and concrete parking and storage pad which drain to the existing storm drain inlets on site. In the post development conditions DA-1 includes all of the impervious area that will drain to the proposed submerged gravel wetland. The drainage patterns are not altered as the proposed site directs storm water flow via a concrete valley gutter and small drainage swale to the proposed submerged gravel wetland to the existing storm drain system. DA-1 proposed work includes the new Commerce Water Treatment Plant, underground utility installation, backwash supply tank, additional pavement for parking and storage and the proposed submerged gravel wetland.

Drainage Area 2 (pre and post development): DA-2 includes the existing impervious concrete pad and Commerce Drive. The LOD is only a small portion of the drainage area and only minimal proposed work will take place which includes the installation of a gas line and electrical duct banks. Drainage patterns will not be altered and will flow off site to the storm drain system on Commerce Drive.

Drainage Areas 3, 4, and 5 (pre and post development): No work is proposed in these drainage areas yet they are part of the existing site parcel and include the storm drain system where inlet protection is proposed. No drainage patterns will be altered.

Drainage Area 6 (pre and post development): DA-6 includes minimal impervious surface and the only work proposed includes underground utility installation. No drainage patterns will be altered.

Table 2 shows the target ESDv that is required to be treated for the drainage areas within the LOD for the site and the ESDv treated by the proposed submerged gravel wetland (M-2). Overall, the treated ESDv for the 3 impacted drainage areas is **213** cubic feet greater than the target ESDv; thus the stormwater management plan meets and exceeds stormwater management requirements for the site. The proposed SWM-1 is within Drainage Area 1 which has a max ESDv treatment volume of 15,083 cf, the proposed submerged gravel wetland ESDv volume is 43 cf less than the maximum.

Table 2 - Stormwater Management ESDv Summary

Drainage Areas (LOD)	SWM Practice Proposed	ESDv Target Volume (CF)	ESDv Treated (CF)	Drainage Area Credit / Deficit (CF)
DA-1	Submerged Gravel Wetland	10,774	15,040	4,266
DA-2	N/A	4,031	-	-4,031
DA-6	N/A	23	-	-23
Site Total				213

On approval of the sketch stormwater management plan a Bentley® CivilStorm model will be developed to analyse the impacts of larger storm flows.

Appendix A

STORMWATER MANAGEMENT QUALITY CALCULATIONS

SWM Offset Summary				
	Easton Commerce Water Treatment Plant		2/28/2023	12578222
	Project		Updated	Job No.
	Stormwater Management Calculations		MJS	AGR
	Subject		Comp. By	Checked By

Objective: To establish ESD to the MEP for the drainage area following the steps outlined in guidebooks developed by MDE.

Sources: [1] "Environmental Site Design (ESD) Process & Computations," July, 2010.
[2] "2000 Maryland Stormwater Design Manual Volumes I & II," Including 2009 revisions to the 2007 Stormwater Management Act.
[3] "Maryland Stormwater Management Guidelines for State and Federal Projects" April 15, 2010.

Assumptions: These calculations are based off of the ESD Plan prepared February 2023.

SWM Summary

ESD Stormwater Management Requirements Per Site Drainage Areas				
Drainage Areas	SWM Practice Proposed	ESD _v Target Volume (CF)	ESD _v Treated (CF)	Sub-Drainage Area Credit / Deficit (CF)
DA-1	Submerged Gravel Wetland	10774	15,040	4266
DA-2	None	4031	N/A	-4031
DA-6	None	23	N/A	-23
Site Total		14827	0	213

ESD Stormwater Management Requirements for the Site as a Whole					
Total Site Drainage Area (sf)	Total Impervious Area (sf)	MDE Designation	SWM Practice Proposed	ESD _v Target Volume (CF)	ESD _v Treated (CF)
146,781	90,845	M-2	Submerged Gravel Wetland (SWM-1)	14,850	15,040
Total ESD _v Credit for Site as a Whole				100	

STORM WATER MANAGEMENT TABLE				
SWM Facility	Type	MDE Designation	Contributing Drainage Area (SF)	Contributing Drainage Area (ACRES)
SWM-1	Submerged Gravel Wetland	M-2	112,047	2.57

Site ESD Calculations			
	Easton Commerce Water Treatment Plant		9/22/2022
	Project		12578222
			Job No.
Stormwater Management Calculations for Site as a Whole		MJS	AGR
Subject		Comp. By	Checked By

Objective: To establish ESD to the MEP for the drainage area following the steps outlined in guidebooks developed by MDE.

Sources: [1] "Environmental Site Design (ESD) Process & Computations," July, 2010.
 [2] "2000 Maryland Stormwater Design Manual Volumes I & II," Including 2009 revisions to the 2007 Stormwater Management Act.

Instructions: Complete all input boxes in green: Input
 Key outputs are in bold text and bold border: Output

Assumptions: These calculations are based off of the ESD Plan prepared February 2023.

Calculations

General Site Information:

	Area (SF)	% of Total	
Total Area =	146,781		includes DA-1, DA-2 and DA-6

Hydrologic Soil Group Areas:

Type A =	0	0%
Type B =	0	0%
Type C =	146,781	100%
Type D =	0	0%

Proposed Covers:

Existing Impervious Area =	67,853	46%	
New Impervious Area =	22,992	16%	
Reconstruction Area (Portion of New over Existing) =	0	0%	
Pervious Paving =	0	0%	
Grass =	52,375	36%	
Trees =	3,561	2%	

100%

Stormwater Management Design and Computations

Step 1 Determine Stormwater Management Requirements

Step 1a Determine Runoff Curve Number (RCN) to mimic "woods in good condition"

HSG:	RCN ¹	Area (SF)	Percent
Type A	38	-	0%
Type B	55	-	0%
Type C	70	146,781	100%
Type D	77	-	0%
Total		146,781	100%

If there is more than one HSG in the Drainage Area, a composite RCN will be calculated:

----> RCN = 70.00

Step 1b Determine ESD Targets

Compute Imperviousness (%I)

All existing impervious areas are counted at 100%
 All new impervious areas located over existing open space are counted at 100%
 All new impervious areas located over existing impervious areas (Reconstruction Area) are counted at 100%
 All proposed permeable pavers are counted at 50%
 All open tanks are not included in runoff calculations since these structures collect and treat runoff

Existing Impervious Contribution =	67,853	sf
New Impervious Contribution =	22,992	sf
Reconstruction Impervious Contribution =	-	sf
Pervious Paving Contribution =	-	sf

Total Proposed Impervious for Runoff Calcs =	90,845	sf
%I =	61.9%	

----> Round to nearest increment of 5: %I = 65.0%

Compute dimensionless volumetric runoff coefficient (R_v)

R_v = 0.05 + 0.009(I) where I = %I x 100

----> R_v = 0.61

Site ESD Calculations



Easton Commerce Water Treatment Plant

9/22/2022

12578222

Project

Updated

Job No.

Stormwater Management Calculations for Site as a Whole

MJS

AGR

Subject

Comp. By

Checked By

Determine target rainfall (P_E)

Find P_E for each soil type using %I and Table 5.3 in [2], then calculate an average P_E for the Drainage Area

HSG	% of DA	%I	PE
Type A	0%	65%	2.2
Type B	0%	65%	2.0
Type C	100%	65%	2.0
Type D	0%	65%	1.8

--->

$P_E = 2.00$ inches

Estimate Target ESD Volume (ESD_v)

$$ESD_v = [P_E \times R_v \times A] / 12$$

--->

$ESD_v = 14,849.9$ cf

Compute Runoff depth used to size ESD practices (Q_E)

$$Q_E = [P_E \times R_v]$$

--->

$Q_E = 1.2$ inches

Step 4

ESD Design Revisions per Review Comments

List Revisions to Design Calculations from Concept Plan

Issue	Date	Title	Revisions

Footnotes:

¹[2] Table 5.3 p 5.21

²[2] Fig 2.1 p 2.3

³[2] p 2.5

⁴[2] p 3.39-3.40

DA-1 ESD Calculations			
	Easton Commerce Water Treatment Plant	2/28/2023	12578222
	Project	Updated	Job No.
	ESD DA-1 Calculations	MJS	AGR
Subject	Comp. By	Checked By	

Objective: To establish ESD to the MEP for the drainage area following the steps outlined in guidebooks developed by MDE.

Sources: [1] "Environmental Site Design (ESD) Process & Computations," July, 2010.
 [2] "2000 Maryland Stormwater Design Manual Volumes I & II," Including 2009 revisions to the 2007 Stormwater Management Act.

Instructions: Complete all input boxes in green: Input
 Key outputs are in bold text and bold border: Output

Assumptions: These calculations are based off of the ESD Plan prepared February 2023.

Calculations

General Site Information:		Area (SF)	% of Total	
Total Area =		112,047		
Hydrologic Soil Group Areas:				
Type A =		0	0%	
Type B =		0	0%	
Type C =		112,047	100%	
Type D =		0	0%	
Proposed Covers:				
Existing Impervious Area =		42,607	38%	
New Impervious Area =		22,992	21%	
Reconstruction Area (Portion of New over Existing) =		0	0%	
Pervious Paving =		0	0%	
Existing Grass =		42,887	38%	
Existing Trees =		3,561	3%	100%

Stormwater Management Design and Computations

Step 1 Determine Stormwater Management Requirements

Step 1a Determine Runoff Curve Number (RCN) to mimic "woods in good condition"
--

HSG:	RCN ¹	Area (SF)	Percent
Type A	38	-	0%
Type B	55	-	0%
Type C	70	112,047	100%
Type D	77	-	0%
Total		112,047	100%

----> If there is more than one HSG in the Drainage Area, a composite RCN will be calculated:
RCN = 70.00

Step 1b Determine ESD Targets

Compute Imperviousness (%I)

All existing impervious areas are counted at 100%
 All new impervious areas located over existing open space are counted at 100%
 All new impervious areas located over existing impervious areas (Reconstruction Area) are counted at 100%
 All proposed permeable pavers are counted at 50%
 All open tanks are not included in runoff calculations since these structures collect and treat runoff

Existing Impervious Contribution = 42,607 sf
 New Impervious Contribution = 22,992 sf
 Reconstruction Impervious Contribution = - sf
 Pervious Paving Contribution = - sf

Total Proposed Impervious for Runoff Calcs = 65,599 sf
 %I = 58.5%

----> Round to nearest increment of 5: %I = 60.0%

Compute dimensionless volumetric runoff coefficient (R_v)

R_v = 0.05 + 0.009(I) where I = %I x 100

DA-1 ESD Calculations			
	Easton Commerce Water Treatment Plant		2/28/2023
	Project		12578222
			Job No.
ESD DA-1 Calculations		MJS	AGR
Subject		Comp. By	Checked By

----> **$R_v = 0.58$**

Determine target rainfall (P_E)

Find P_E for each soil type using %I and Table 5.3 in [2], then calculate an average P_E for the Drainage Area

HSG	% of DA	%I	PE
Type A	0%	60%	2.0
Type B	0%	60%	2.0
Type C	100%	60%	2.0
Type D	0%	60%	1.8

----> **$P_E = 2.00$ inches**

Estimate Target ESD Volume (ESD_v)

$$ESD_v = [P_E \times R_v \times A] / 12$$

Cpv Storage Volume

$$Cpv = Q_1 \times A$$

----> **$ESD_v = 10773.6$ cf**

Compute Runoff depth used to size ESD practices (Q_E)

$$Q_E = [P_E \times R_v]$$

----> **$Q_E = 1.2$ inches**

Step 2 ESD Options

List ESD practices that were conceptually evaluated and why implementation could or could not be feasible

Non-Structural Runoff Disconnects

Adequate area to perform runoff disconnects is not available in this drainage area.

Alternative Surfaces for Pavement and Rooftops

Alternative surfaces were not investigated for this drainage area because most of the impervious surface in this drainage area is existing impervious and proposed and existing buildings

Micro-Scale Practices

A rain garden or micro-bioretenention basin was considered, but the soil type of the site does not allow for infiltration so a Submerged Gravel Wetland is proposed.

Structural Practices

No structural practices are provided as micro-scale practices can be utilized for this site.

Step 3 Complete Stormwater Management Design

Step 3a Compute Implementation of ESD to the MEP

Submerged Gravel Wetland (SGW-1) M-2

SGW shall meet the following conditions (pg 5.77)

- The soils shall be HSG C or D or a high groundwater table
- Drainage Area should be large enough (e.g. one acre) to maintain submerged flow conditions
- Pretreatment shall be provided for 10% of the total ESD_v
- Storage of 75% of ESD_v for the entire DA contributing to the wetland shall be provided
- The gravel substrate shall be no deeper than 4 feet
- An observation well consisting of an anchored, 6-inch diameter perforated pipe shall be required. The top of the OW shall be at least 18 inches above the gravel
- The aggregate shall be composed of an 18 to 48 inch layer of clean washed uniformly graded material with a porosity of 40%.

ESD Summary

Required ESD_v =	10,774	cf
Total =	10,774	cf
Site ESD_v Total =	14,850	
ESD_v met?	NO	

Submerged Gravel Wetland

Surface Area, A_f

Proposed Surface Area, A_p = 4,500 sf

Basin Dimensions

Ponding Depth = 2.00 ft
Gravel Depth = 1.50 ft
Porosity of media, n = 0.40 ft

Temporary ponding depth shall not be greater than the tolerance levels of the wetland vegetation. ([5] page 5.78)

Assumed a max vegetation height of 2-feet
An increase of 1 ft of gravel allowed with increase of 1 ft of ponding.
Gravel Media shall have a porosity of 40% ([5] page 5.80)

Forebay Requirement

Impervious Area = 65,599
Sizing: 0.00833 ft per impervious acres of contributing drainage
Storage Requirement = 547 cf
Size = 1,670 sf
Forebay Volume = 3,340 cf
10% Site ESD Total Volume = 1077 cf
Requirement Met = YES

Treatment Capacity

Treatment Capacity, $ESD_v = (A_p) * (\text{Ponding Depth}) + (A_f) * (\text{Filter Media Depth}) * (\text{Porosity}) + \text{Forebay Volume}$

ESD_v = 15,040 cf
75% Storage Requirement = 8,080 cf
Ponding Storage = 6,750 cf
Requirement Met = YES

ESD Summary

Required ESD_v =	10,774
Maximum ESD_v Treatment Volume =	15,083
Submerged Gravel Wetland ESD_v =	15,040
Total =	-4,266

ESD_v Remaining = (4266.4) CF

ESD_v met? NO

Environmental Site Design Practices are achieved via implementation of a submerged gravel wetland and existing flow patterns maintained in all drainage areas.

Step 4 ESD Design Revisions per Review Comments

Footnotes:

- ¹[2] Table 5.3 p 5.21
²[2] Fig 2.1 p 2.3 *List Revisions to Design Calculations from Concept Plan*
³[2] p 2.5
⁴[2] p 3.39-3.40

Issue	Date	Title	Revisions

DA-2 SWM-1 ESD Calculations			
	Easton Commerce Water Treatment Plant	2/28/2023	12578222
	Project	Updated	Job No.
	ESD DA-2 Calcs	MJS	AGR
Subject	Comp. By	Checked By	

Objective: To establish ESD to the MEP for the drainage area following the steps outlined in guidebooks developed by MDE.

Sources: [1] "Environmental Site Design (ESD) Process & Computations," July, 2010.
 [2] "2000 Maryland Stormwater Design Manual Volumes I & II," Including 2009 revisions to the 2007 Stormwater Management Act.

Instructions: Complete all input boxes in green: Input
 Key outputs are in bold text and bold border: Output

Assumptions: These calculations are based off of the ESD Plan prepared February 2023.

Calculations

General Site Information:		Area (SF)	% of Total	
Total Area =		32,511	 	
Hydrologic Soil Group Areas:				
Type A =		0	0%	
Type B =		0	0%	
Type C =		32,511	100%	
Type D =		0	0%	0.746 AC
Proposed Covers:				
Existing Impervious Area =		25,069	77%	
New Impervious Area =		0	0%	
Reconstruction Area (Portion of New over Existing) =		0	0%	
Pervious Pavement =		0	0%	
Existing Grass =		7,442	23%	
Existing Trees =		0	0%	100%

Stormwater Management Design and Computations

Step 1	Determine Stormwater Management Requirements
--------	--

Step 1a	Determine Runoff Curve Number (RCN) to mimic "woods in good condition"
---------	--

HSG:	RCN ¹	Area (SF)	Percent
Type A	38	-	0%
Type B	55	-	0%
Type C	70	32,511	100%
Type D	77	-	0%
Total		32,511	100%

----> If there is more than one HSG in the Drainage Area, a composite RCN will be calculated:
RCN = 70.00

Step 1b	Determine ESD Targets
---------	-----------------------

Compute Imperviousness (%I)

All existing impervious areas are counted at 100%
 All new impervious areas located over existing open space are counted at 100%
 All new impervious areas located over existing impervious areas (Reconstruction Area) are counted at 100%
 All proposed permeable pavers are counted at 50%
 All open tanks are not included in runoff calculations since these structures collect and treat runoff

Existing Impervious Contribution = 25,069 sf

New Impervious Contribution = - sf

Reconstruction Impervious Contribution = - sf

Pervious Paving Contribution = - sf

Total Proposed Impervious for Runoff Calcs = 25,069 sf

%I = 77.1%

----> Round to nearest increment of 5: %I = 80.0%

Compute dimensionless volumetric runoff coefficient (R_v)

R_v = 0.05 + 0.009(I) where I = %I x 100

----> R_v = 0.74 WQ_v = 0.046 ac-ft
2015.6375

Determine target rainfall (P_E)

Find P_E for each soil type using %I and Table 5.3 in [2], then calculate an average P_E for the Drainage Area

HSG	% of DA	%I	PE
Type A	0%	80%	2.4
Type B	0%	80%	2.2
Type C	100%	80%	2.0
Type D	0%	80%	2.0

----> P_E = 2.00 inches

Estimate Target ESD Volume (ESD_v)

$$ESD_v = [P_E \times R_v \times A] / 12$$

----> ESD_v = 4031.3 cf 75% of this should be provided on the surface

Compute Runoff depth used to size ESD practices (Q_E)

$$Q_E = [P_E \times R_v]$$

----> Q_E = 1.5 inches

Step 2 ESD Options

List ESD practices that were conceptually evaluated and why implementation could or could not be feasible

Non-Structural Runoff Disconnects

Adequate area to perform runoff disconnects is not available in this drainage area.

Alternative Surfaces for Pavement and Rooftops

Alternative surfaces were not investigated for this drainage area because a Submerged Gravel Wetland proposed in DA-1

Micro-Scale Practices

Non implemented in this area

Structural Practices

None implemented in this drainage area.

Step 4 ESD Design Revisions per Review Comments

List Revisions to Design Calculations from Concept Plan

Issue	Date	Title	Revisions

Footnotes:

¹[2] Table 5.3 p 5.21

²[2] Fig 2.1 p 2.3

³[2] p 2.5

⁴[2] p 3.39-3.40

DA-3 ESD Calculations			
	Easton Commerce Water Treatment Plant	2/28/2023	12578222
	Project	Updated	Job No.
	ESD DA-6 Calcs	MJS	AGR
Subject	Comp. By	Checked By	

Objective: To establish ESD to the MEP for the drainage area following the steps outlined in guidebooks developed by MDE.

Sources: [1] "Environmental Site Design (ESD) Process & Computations," July, 2010.
 [2] "2000 Maryland Stormwater Design Manual Volumes I & II," Including 2009 revisions to the 2007 Stormwater Management Act.

Instructions: Complete all input boxes in green: Input
 Key outputs are in bold text and bold border: Output

Assumptions: These calculations are based off of the ESD Plan prepared February 2023.

Calculations

General Site Information:

	Area (SF)	% of Total
Total Area =	2,223	

Hydrologic Soil Group Areas:

Type A =	0	0%
Type B =	0	0%
Type C =	2,223	100%
Type D =	0	0%

Proposed Covers:

Existing Impervious Area =	177	8%
New Impervious Area =	0	0%
Reconstruction Area (Portion of New over Existing) =	0	0%
Pervious Pavement =	0	0%
Existing Grass =	2,046	92%
Existing Trees =	0	0%

100%

Stormwater Management Design and Computations

Step 1	Determine Stormwater Management Requirements
--------	--

Step 1a	Determine Runoff Curve Number (RCN) to mimic "woods in good condition"
---------	--

HSG:	RCN ¹	Area (SF)	Percent
Type A	38	-	0%
Type B	55	-	0%
Type C	70	2,223	100%
Type D	77	-	0%
Total		2,223	100%

If there is more than one HSG in the Drainage Area, a composite RCN will be calculated:

----> RCN = 70.00

Step 1b	Determine ESD Targets
---------	-----------------------

Compute Imperviousness (%I)

All existing impervious areas are counted at 100%
 All new impervious areas located over existing open space are counted at 100%
 All new impervious areas located over existing impervious areas (Reconstruction Area) are counted at 100%
 All proposed permeable pavers are counted at 50%
 All open tanks are not included in runoff calculations since these structures collect and treat runoff

Existing Impervious Contribution =	177	sf
New Impervious Contribution =	-	sf
Reconstruction Impervious Contribution =	-	sf
Pervious Paving Contribution =	-	sf

Total Proposed Impervious for Runoff Calcs =	177	sf
%I =	8.0%	

----> Round to nearest increment of 5: %I = 10.0%

Compute dimensionless volumetric runoff coefficient (R_v)

R_v = 0.05 + 0.009(I) where I = %I x 100

---->

R_v = 0.12

Determine target rainfall (P_E)

Find P_E for each soil type using %I and Table 5.3 in [2], then calculate an average P_E for the Drainage Area

HSG	% of DA	%I	PE
Type A	0%	10%	1.0
Type B	0%	10%	1.0
Type C	100%	10%	1.0
Type D	0%	10%	1.0

---->

P_E = 1.00 inches

Estimate Target ESD Volume (ESD_v)

$$ESD_v = [P_E \times R_v \times A] / 12$$

---->

ESD_v = 22.5 cf

75% of this should be provided on the surface

Compute Runoff depth used to size ESD practices (Q_E)

$$Q_E = [P_E \times R_v]$$

---->

Q_E = 0.1 inches

Step 2

ESD Options

List ESD practices that were conceptually evaluated and why implementation could or could not be feasible

Non-Structural Runoff Disconnects

Adequate area to perform runoff disconnects is not available in this drainage area.

Alternative Surfaces for Pavement and Rooftops

Alternative surfaces were not investigated for this drainage area because only a small portion of this drainage area is impervious.

Micro-Scale Practices

NA

Structural Practices

None implemented in this drainage area.

Step 3

Complete Stormwater Management Design

Step 3a Compute Implementation of ESD to the MEP

ESD Summary

Required ESD_v = 22.5 cf
Total = 22.5 cf

---->

ESD_v met? NO

Environmental Site Design Practices could not be implemented in this area. Therefore the Unified Sizing Criteria will be used to calculate treatment volumes in this Drainage Area.

Step 4

ESD Design Revisions per Review Comments

List Revisions to Design Calculations from Concept Plan

Issue	Date	Title	Revisions

DA-3 ESD Calculations			
	Easton Commerce Water Treatment Plant		2/28/2023
	Project		Job No. 12578222
	ESD DA-6 Calcs		MJS
Subject		Comp. By	Checked By AGR

Footnotes:

- ¹[2] Table 5.3 p 5.21
- ²[2] Fig 2.1 p 2.3
- ³[2] p 2.5
- ⁴[2] p 3.39-3.40
- ¹[2] Table 5.3 p 5.21
- ²[2] Fig 2.1 p 2.3
- ³[2] p 2.5
- ⁴[2] p 3.39-3.40

Appendix B

Geotechnical Report



JOHN D. HYNES & ASSOCIATES, INC.

*Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing*

January 26, 2023

Andrew Thron
GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Re: Report of Subsurface Exploration and Geotechnical Consulting Services
Easton Utilities-CDP WTP Project
Easton, Maryland
Project No.: JDH-10/22/261

Dear Mr. Thron:

John D. Hynes & Associates, Inc. has completed the authorized subsurface exploration and geotechnical consulting services for the Easton Utilities-CDP WTP project located in Easton, Maryland. Our services were performed, generally, in accordance with our proposal dated March 16, 2022.

This report describes the exploration methods employed, exhibits the data obtained, and presents our evaluations and recommendations for the proposed new building and aquastone tank. In summary, we recommend that the building's structural elements be supported by spread footing foundations bearing on firm, natural soils or compacted structural fill. We recommend that the tank be supported by a slab and ring foundation. Refer to the Building Foundation section of the report for our specific recommendations.

We appreciate the opportunity to be of service to you. If you have any questions regarding the contents of this report or if we may be of further assistance, please contact our office.

Respectfully,

JOHN D. HYNES & ASSOCIATES, INC.

Evan H. Cross
Geologist

EHC: JDH/kc

John D. Hynes, P.E.
President



**REPORT OF
SUBSURFACE EXPLORATION
AND
GEOTECHNICAL CONSULTING SERVICES**

**EASTON UTILITIES-CDP WTP PROJECT
EASTON, MARYLAND**

**PREPARED FOR
GHD, INC.**

**JANUARY 26, 2023
PROJECT NO.: JDH-10/22/261**



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PURPOSE AND SCOPE

The subsurface exploration study was performed to evaluate the subsurface conditions with respect to the following:

1. General site and subgrade preparation;
2. Fill and backfill construction;
3. Foundation recommendations, including allowable bearing capacity, and estimated foundation settlement;
4. Frost depth;
5. Foundation construction and inspection procedures;
6. Seismic site classification;
7. Soil and groundwater conditions, and infiltration rates at stormwater structure locations;
8. Floor slab support;
9. Location of groundwater and applicable construction dewatering control procedures; and
10. Other aspects of the design and construction for the proposed structures indicated by the exploration.

An evaluation of the site, with respect to potential construction problems and recommendations dealing with earthwork and inspection during construction, is included. The inspection is considered necessary both to confirm the subsurface conditions and to verify that the soils related construction phases are performed properly.

EXISTING SITE CONDITIONS

As shown on the Project Location Map (Drawing JDH-10/22/261-A) in the Appendix, the project site is located at 8670 Commerce Drive in Easton, Maryland. At the time of our exploration, the project site consisted of the existing Easton Utilities equipment and supplies facility. The project site for the water treatment facility is located in the landscaped area on the west side of the existing Easton Utilities building. The building and storage yard have a perimeter fence. The project site is bounded by light residential to the northeast, by Commerce Drive to the east, by commercial properties to the southwest, and by a tree line and commercial properties to the west. Topographically, the site is relatively flat. A shallow swale currently exists along the fence line.

PROJECT CHARACTERISTICS

The Easton Utilities CDP WTP project includes the construction of a 5,550 sf building. The building will be constructed with CMU block walls, steel trusses, and will be finished with metal-faced exterior. Based on conversations with GHD, wall footings are assumed to be 3 feet wide resulting in a maximum bearing pressure of approximately 1,000 psf for the exterior bearing walls and no equipment areas should create a bearing pressure that exceeds 1,000 psf. The building will have a concrete slab on grade. The project, also, includes the construction of a backwash supply tank and stormwater management structures. The backwash supply tank will measure 19.6 feet in diameter, 19.26 feet in sidewall height, will have a liquid level height of 17.26 feet and a capacity of 38,885 gallons. We understand the tank manufacturer will provide their own foundation package for the tank that will consist of a 6 inch thick reinforced concrete floor that is designed to accommodate 0.16 inches of differential settlement.

FIELD EXPLORATION AND STUDY

In order to determine the nature of the subsurface conditions at the site, 6 test borings were drilled at the site on December 21, 2022 at the approximate locations shown on our Boring Location Plan (Drawing No. JDH-10/22/261-B) in the Appendix. One test boring, designated as SB-1, was drilled in the center of the proposed tank location to a



depth of 25.5 feet below existing grade. Three test borings, designated as SB-2, SB-3, and SB-4, were drilled at the footprint of the proposed structure to depths of 25.5 feet below existing grade using a track mounted Geoprobe 3230 DT drill rig. The tank and building borings were drilled using Standard Penetration Testing (SPT) procedures. Two test borings, depicted as IT-1 and IT-2, were drilled at the approximate location of the proposed stormwater management structures to depths of 10 feet below existing grade using a hand auger.

Soil sampling and testing for the SPT borings were carried out in accordance with ASTM Specification D-1586 for the test borings. A brief description of our field procedures is included in the Appendix. The results of all boring and sampling operations are shown on the boring logs.

Samples of the subsurface soils were examined by our engineering staff and were visually classified in accordance with the Unified Soil Classification System (USCS) and ASTM Specification D-2488. The estimated USCS symbols and descriptions appear on the boring logs (where applicable) and keys to the systems' nomenclature are provided in the Appendix of this report. Also included are reference sheets which define the terms and symbols used on the boring logs and explain the Standard Penetration Test procedures.

We note that the test boring records represent our interpretation of the field data based on visual examination and selected soil classification tests. Indicated interfaces between materials may be gradual.

The field exploration data was supplemented with laboratory testing data. The laboratory at John D. Hynes & Associates, Inc. performed 3 Atterberg Limits (Liquid and Plastic) tests and 3 Natural Moisture Content tests. The test results are noted on the boring logs in the Appendix.

SUBSURFACE CONDITIONS

At the time of our field exploration, approximately 6 to 12 inches of organic bearing soil were encountered at Boring locations SB-1 through SB-4. Approximately 15 inches of organic bearing soil were encountered at Boring locations IT-1 and IT-2. Varying thicknesses of organic bearing soil or other surficial materials may be encountered at other locations on site.

The subsurface soils were visually classified in accordance with the USCS as interbedded layers of low-Silt SAND Silty SAND (SM), Clayey SILT (ML, MH), and Silty CLAY (CL, CH) to the boring termination depths. The granular soil layers were characterized by Standard Penetration Test (SPT) values (N-values) ranging from 8 to 12 blows per foot indicating in-place relative densities of loose to medium dense. Cohesive soils were characterized by N-values ranging from 4 to 28 blows per foot, indicating in-place consistencies of soft to very stiff.

In test borings SB-1, IT-1 and IT-2, we encountered a thin layer of SAND at varying depths between 2 and 5 feet below grade. This layer contains organic SILT. This material is likely buried "topsoil," which means the soil above it, is fill material. The layer with organic SILT may be fill.

Groundwater was encountered at depths of 5 to 8 feet below existing grade at the boring locations. Groundwater elevations may vary at other times during the year depending upon the amount of precipitation, seasonal variations, and the extent of local surface development.



RECOMMENDATIONS

The following recommendations and considerations are based on our understanding of the proposed construction, the data obtained from the exploration, and our previous experience with similar subsurface conditions and projects. If there are any significant changes to the project characteristics, such as structural loadings differing significantly from those assumed above, structure geometry, structure location, elevations, etc., we request that this office be advised so the recommendations of this report can be re-evaluated.

A. Site Preparation

Prior to the installation of foundations, ground slabs, or the placement of fill in any structural areas, all existing organic materials, frozen or wet, excessively soft or loose soils, abandoned utility lines, and other deleterious materials should be removed and wasted. Any existing organic bearing soil in the building area should be stripped and can be stockpiled for reuse in landscape areas, or should be removed from the site. If perched water is encountered during any grading or excavation process, Hynes & Associates should be consulted for additional recommendations regarding the stabilization of the bases of the excavations and backfilling.

Hynes & Associates encountered a Silty SAND layer containing organic SILT in boring SB-1 at the tank location. This appears to be buried fill material. We recommend excavating 2 or 3 test pits at the tank foundation area to depths of 5 feet. If the soils are good, and are firm then no overexcavation will be required. If organic soils are encountered in the test excavations, then the organic soils and the materials above the organic bearing soils should be removed and replaced. The soils that are placed shall be installed in accordance with Section B below.

After the stripping operations have been completed, the exposed subgrade soils should be inspected. The inspector should verify that organic matter has been removed from structural subgrade areas. The inspector should require the exposed subgrade materials be proofrolled utilizing a heavily-loaded dump truck or other pneumatic-tired vehicle of similar size and weight. The purpose of the proofrolling would be to provide surficial densification and to locate any potential isolated areas of soft or loose soils requiring undercutting. Proofrolling is not advised in wet areas which may deteriorate under repeated vehicular loading. Wet areas should be drained and allowed to dry prior to proofrolling. Precipitation may result in standing water (perched water) at low areas. If the water is allowed to pond, the natural soils may deteriorate and overexcavation or subgrade improvements may be necessary at those areas. The Geotechnical Engineer should be consulted to evaluate poor subgrade conditions during construction.

Care should be exercised during the grading operations at the site. Shallow SM, CL, and ML materials were identified at the boring locations. These materials are moderately (SM) to highly (ML, CL) sensitive to changes in moisture conditions and should therefore be protected. If earthwork is performed in the presence of moisture, the traffic of heavy equipment, including heavy compaction equipment, may create pumping and a general deterioration of the subgrade soils. The contractor should be very careful to minimize construction traffic in the subgrade areas. Overexcavated areas resulting from the removal of organic matter, rubble, old foundations, or otherwise unacceptable materials should be backfilled with properly compacted materials in accordance with the procedures discussed in the following sections.



B. Fill Selection, Placement and Compaction

It is recommended that all materials to be used as structural fill be inspected, tested and approved by the Geotechnical Engineer prior to use. The native SM soils that do not contain organics may be re-used for structural fill. Acceptable borrow material should include GW, SM, SW and SP classified in accordance with the USCS. Furthermore, the material to be utilized as structural fill should have a Plasticity Index (PI) less than 20. The native ML, CL, CH and MH soils should not be used for structural fill.

The importation of high quality, granular material should be allowed, and acceptable unit rates for importation and placement should be established. Sand, gravel or sand/gravel mixtures would be appropriate for wet weather placement. Otherwise, the materials noted above will be acceptable for use as structural fill. Native or imported SM soils will be sensitive to alteration in moisture content and will become unworkable during and following periods of precipitation. For this reason, if earthwork is attempted in late autumn, winter or early spring, the above mentioned high quality imported granular material should be limited to those soils better than SM. SM materials become unworkable at moisture contents greater than 3 percentage points above optimum. The contractor would have to dry these materials or set them aside for use in landscaping areas.

Structural fill should be placed in lifts which are 8 inches or less in loose thickness and should be compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557). Adjustments to the natural moisture content of the soils may be required in order to obtain specified compaction levels. Should utility construction be performed after earthwork, the Contractor should be responsible for achieving 95 percent compaction in all trench backfill. These guidelines should be set for all structural fill at the site including, but not limited to building, pavement, and ground slab fills.

For the fill compaction operations, fill limits should be extended at least 5 feet beyond the building exterior foundations, and ground slab boundaries. A sufficient number of in-place density tests should be performed by an engineering technician to verify that the proper degree of compaction is being obtained in all fill soils.

C. Building Foundation

Considering the subsurface conditions and the structural loading conditions, we recommend that the proposed building be supported on spread footing foundations bearing on firm natural soils, or controlled structural fill. Footings for the proposed building may be proportioned based upon a maximum allowable soil bearing pressure not in excess of 1,500 psf. Using this bearing pressure, we estimate total settlement of 1 inch or less, and differential settlement of ½ inch or less. Because the foundation subgrade soils are CLAYs, it is important to slope the site to direct stormwater away from the building.

Minimum dimensions of 30 inches for square footings and 24 inches for continuous or rectangular footings should be used in foundation design to minimize the possibility of a local shear failure. All foundation excavations should be inspected by the Geotechnical Engineer or his approved representative prior to the placement of concrete. The purpose of the inspection would be to verify that the exposed bearing materials are acceptable for the design soil bearing pressure and that loose, wet, frozen or compressible soils are not present. If soft or loose soils are encountered at footing subgrades, compaction in the foundation excavation may be necessary, or minor overexcavation may yield greater soil support.



Continuous wall footings may need to be raised in elevation in a direction away from and perpendicular to other footings. Footings may be gradually raised or lowered to the desired elevation using step construction procedures with a 2H:1V, or more gentle, slope. In addition, discrete column or pier footings bearing at a higher elevation than lower footings should be located at a distance apart which is equal to or greater than the difference in the elevations of the footings. If the building is to be constructed during the winter months or if the building will be subjected to freezing temperatures after footing construction, then all footings should be adequately protected during freezing periods.

In Easton, exterior footings and footings in unheated areas should be located at a depth of at least 24 inches to bottom of footing below the outside final grade to provide adequate frost cover protection. If the building is to be constructed during the winter months or if the building will be subjected to freezing temperatures after footing construction, then all footings should be adequately protected during freezing periods.

Soils exposed at the bases of all satisfactory foundation excavations should be protected against any detrimental change in condition, such as disturbance from rain or frost. Surface runoff should be drained away from the excavations and not be allowed to pond.

D. Tank Foundation

Considering the subsurface conditions and loading conditions, we recommend that the proposed backwash supply tank be supported on a mat (slab) foundation with a perimeter ring foundation bearing on firm natural soils, or controlled structural fill. Considering the loads provided, and a 6 inch thick slab on 6 inches of gravel, we estimated the ring and mat foundation to bear less than 1200 psf. In consideration of the tank size and contents and using a 20 foot diameter foundation, we estimated the total tank foundation settlement to be 0.9 inch. We note that we drilled four structural borings at the site and the soils below 5 feet were very similar in type and consistency. If our recommendations regarding inspecting the foundation subgrades, and removing and replacing old, poor fill materials if present are followed, then we expect negligible differential settlement of the tank foundation.

As discussed in Section A, we recommend excavating test pits at the tank foundation area to explore for poor soils. If poor and/or organic bearing soils are encountered, they should be removed and be replaced with compacted structural fill material. All foundation excavations should be inspected by the Geotechnical Engineer or his approved representative prior to the placement of concrete.

E. Seismic Site Classification

Hynes & Associates is providing below, the seismic site classification in accordance with the International Building Code (IBC) 2018. The code stipulates that we evaluate the strength of soil to a depth of 100 feet below grade. We used the soil properties indicated in the test borings, which were drilled to depths of up to 30.5 feet and our experiences locally. In consideration of the test boring data and our experience locally, it is our opinion that the average properties of the soils in the upper 100 feet of the local subsurface stratigraphy meet Site Classification "D" criteria.



We recommend using the following spectral design coefficients for seismic design for the Easton site:

Seismic Design Coefficients for Easton, Maryland	
$F_a=$	1.6
$F_v=$	2.4
$S_s=$	0.012
$S_1=$	0.041
$S_{DS}=$	0.013
$S_{D1}=$	0.066

These values were obtained and calculated in accordance with the IBC 2018 and ASCE 7. These are site specific design values and are based on a Site Classification of D.

F. Floor Slab Support

The ground supported slabs on grade may be supported on the approved subgrade constructed as described in Sections A and B above. It is, also, recommended that a 4 inch clean, granular, leveling and load-distributing material such as washed gravel, or screened crushed stone, be used beneath the slabs. This material will require acquisition from off-site sources. Prior to placing the leveling and load distributing material, the slab subgrade should be free of standing water or mud. An acceptable moisture barrier should, also, be provided for the slab. These procedures will help to prevent capillary rise and damp floor slab conditions. We recommend using a value of modulus of subgrade reaction of 150 pci.

G. Stormwater Management Areas

Test borings IT-1 and IT-2 were drilled at proposed stormwater management areas. The subsurface soils were visually classified as interbedded layers of Silty SAND (SM), CLAY (CL,CH), and Clayey Elastic SILT (MH) to the boring termination depths. The USDA classifications for these materials were Loamy sand, Sandy loam, Silty clay loam, and Clay. Redoximorphic features, which can be representative of seasonal high groundwater or a restrictive soil layer, were observed in some of the boring locations. These features are likely an indication of slowly infiltrating groundwater in the potentially restrictive layers encountered at these locations. It is our opinion that the redoximorphic features do not indicate seasonal high groundwater levels. In consideration of our site observations and regional groundwater conditions, it is our opinion that seasonal high water levels are similar to the levels observed in the stormwater and structural borings at the time of drilling.

The SM materials that are excavated from the stormwater management areas can be reused as structural fill at the site, as long as the soils are of the appropriate moisture content, and are free of organic materials and debris. The native MH, CH, and CL material should not be reused as structural fill.



H. Infiltration Testing

After discussing the subsurface soil and groundwater conditions with the Civil Engineer, single ring, falling head infiltration tests were performed at depths of 6.35 to 6.55 feet below the ground surface at the boring locations. The testing was completed in general accordance with Maryland Department of the Environment (MDE) guidelines. Surface elevations were estimated based on contour maps provided by GHD. The test locations, depths to groundwater, infiltration test depths, and last hour infiltration rates are summarized in the table below:

Table 1: Summary of Infiltration Test Results

Test Boring Location	Surface Elevation (ft.)	Depth to Groundwater (ft.)	Potentially Restrictive Soil Layers (ft.)	Infiltration Test Depth (ft.)	Infiltration Test Elevation	Infiltration Rate (in./hr.)
IT-1	17.0	5.0	0 to 3, 5 to 10	6.35	10.65	0.0
IT-2	17.0	6.0	0 to 2, 3 to 10	6.55	10.85	0.6

Infiltration did not occur at the test depth of 6.55 feet below existing grade at infiltration testing location IT-1. Therefore, Hynes & Associates does not recommend infiltration practices at test location IT-1.

I. Groundwater and Drainage

Groundwater was encountered at depths of 5 to 8 feet at the boring locations. Considering the proposed construction, the contractor will not likely experience construction problems relating to the groundwater in foundation excavations. The Contractor should be prepared to dewater the lowest excavations in the event of the infiltration of precipitation. If required, acceptable measures for dewatering should be implemented. These methods may include sumping and pumping, etc. Efforts should be made to keep exposed subgrade areas dry during construction, primarily, because the soils will be susceptible to deterioration and loss of strength in the presence of moisture. Adequate drainage should be provided at the site to minimize any increase in moisture content of the foundation and pavement subgrade soils. All pavements and site grades should be sloped away from the building and the water storage tank to prevent ponding of water around them. The final site drainage should, also, be designed such that run-off onto adjacent properties is controlled properly.

ADDITIONAL SERVICES RECOMMENDED

Additional engineering, testing and consulting services recommended for this project are summarized below.

A. Site Preparation and Proofrolling Monitoring

The Geotechnical Engineer or experienced soils inspector should inspect the site after it has been stripped and excavated. The inspector should determine if any undercutting or in-place densification is necessary to prepare a subgrade for fill placement, or slab and pavement support. The inspector should verify that organic soils, organic matter, tree stumps, old foundations abandoned utilities, and demolition debris have been removed from all structural subgrade areas prior to filling operations.



B. Fill Placement and Compaction Monitoring

The Geotechnical Engineer or experienced soils inspector should witness all fill operations and take sufficient in-place density tests to verify that the specified degree of fill compaction is achieved. The inspector should observe and approve borrow materials used and should determine if their existing moisture contents are acceptable.

C. Foundation Excavation Inspections

The Geotechnical Engineer should inspect all foundation excavations for the structure. He should verify that the design bearing pressures are available and that no loose or soft areas exist beneath the bearing surfaces of the foundation excavations.

REMARKS

This report has been prepared solely and exclusively for GHD, Inc. to provide guidance to design professionals in developing facilities plans for the Easton Utilities – CDP WTP project located in Easton, Maryland. It has not been developed to meet the needs of others, and application of this report for other than its intended purpose could result in substantial difficulties. The Consulting Engineer cannot be held accountable for any problems which occur due to the application of this report to other than its intended purpose. This report in its entirety should be attached to the project specifications.

These analyses and recommendations are, of necessity, based on the concepts made available to us at the time of the writing of this report, and on-site conditions, surface and subsurface that existed at the time the exploratory borings were drilled. Further assumption has been made that the limited exploratory borings, in relation both to the areal extent of the site and to depth, are representative of conditions across the site. It is, also, recommended that we be given the opportunity to review all plans for the project in order to comment on the interaction of soil conditions as described herein and the design requirements.

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted engineering principles and practices.



APPENDIX

1. Investigative Procedures
2. Project Location Map
3. Boring Location Plan
4. Boring Logs
5. Infiltration Test Results
6. Single Ring Falling Head Infiltration Test Procedures
7. Unified Soil Classification Sheet
8. USDA Soil Classification Sheet
9. Field Classification Sheet
10. Important Information Sheet



INVESTIGATIVE PROCEDURES

SOIL TEST BORINGS

Soil drilling and sampling operations were performed in accordance with ASTM Specification D-1586. The borings were advanced by mechanically turning continuous hollow stem auger flights into the ground. At regular intervals, samples were obtained with a standard 1.4 inch I.D., 2.0 inch O.D. splitspoon sampler. The sampler was first seated 6 inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is the "Standard Penetration Resistance". The penetration resistance, when properly evaluated, is an index to the soil's strength, density and behavior under applied loads. The soil descriptions and penetration resistances for each boring are presented on the Test Boring Records in the Appendix.

HAND AUGER SOIL TEST BORINGS

Test borings were performed using a hand auger. The auger is manually advanced by rotating the shaft of the auger. The auger is withdrawn at short intervals for inspection of soils collected in the auger head. Soil samples are taken when soil conditions are noted to change. The soil descriptions for each boring are presented on the boring logs in the Appendix.

SOIL CLASSIFICATION

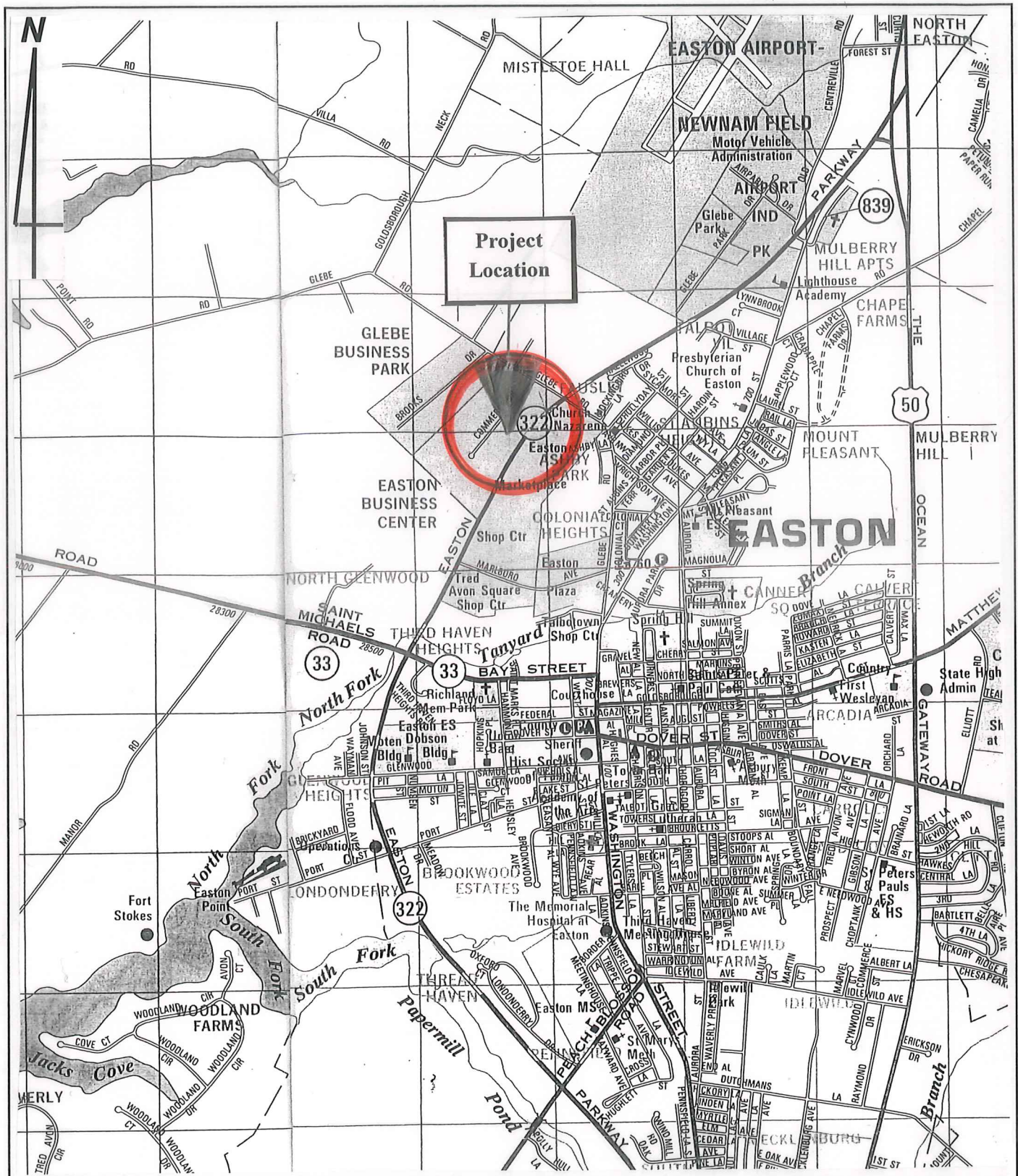
Soil classifications provide a general guide to the engineering properties of various soil types and enable the engineer to apply his past experience to current problems. In our investigation, jar samples obtained during drilling operations are examined in our laboratory and visually classified by the geotechnical engineer in accordance with ASTM Specification D-2488. The soils are classified according to the Unified Classification System (ASTM D-2487). Each of these classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior.

ATTERBERG LIMITS TEST

Portions from representative soil samples obtained during drilling operations were selected for Atterberg Limits tests. The Atterberg Limits are indicative of the soil's plasticity characteristics. The liquid limit is the moisture content at which the soil will flow as a heavy viscous fluid and is determined in accordance with ASTM Specification D-4318. The plastic limit is the moisture content at which the soil begins to lose its plasticity and is determined in accordance with ASTM Specification D-4318.

NATURAL MOISTURE

Portions from representative soil samples obtained during drilling operations were selected for Natural Moisture Content tests. The Natural Moisture Content Test determines the water content of soils by drying into an oven with a standard drying temperature of 110 °C. The loss of mass drying the sample, determines the water content into the soil. The water content of the sample is calculated in percentage. The water content of soils (natural moisture) is determined in accordance with ASTM Specification D-2216.



JOHN D. HYNES & ASSOCIATES, INC.

32185 Beaver Run Drive • Salisbury, Maryland 21804
410-546-6462 / Fax: 410-548-5346

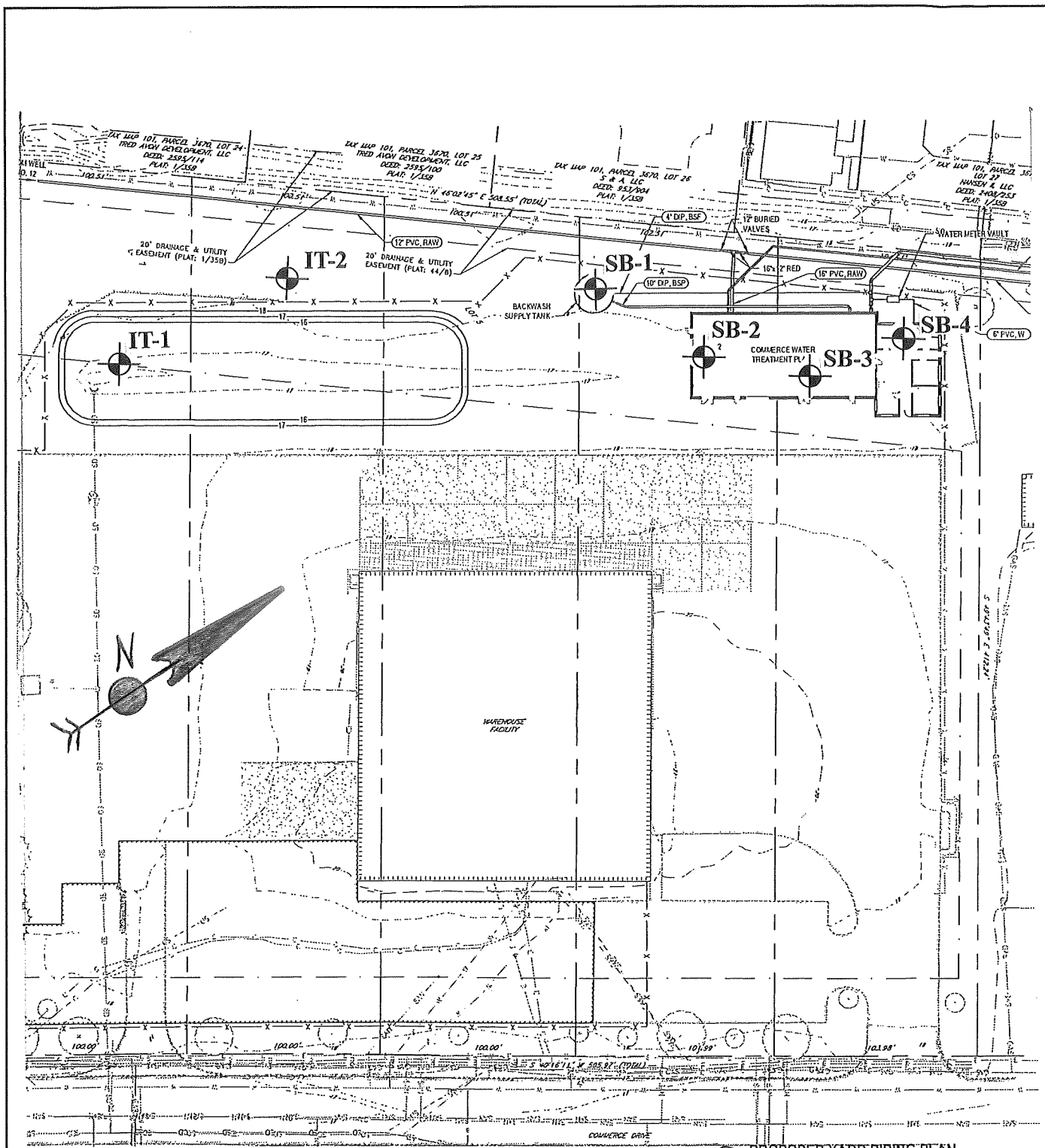
Date: January 10, 2023

Scale: 1" = 2,000 ft.

Drawn: ADC Maps

Project Location Map
Easton Utilities CDP WTP Project
Easton, Maryland

DWG. No.
JDH-10/22/261-A



1 PROPOSED YARD PIPING PLAN
SCALE: 1" = 30'-0"



JOHN D. HYNES & ASSOCIATES, INC.

32185 Beaver Run Drive • Salisbury, Maryland 21804
410-546-6462 / Fax: 410-548-5346

Date: January 10, 2023

Scale: Not to Scale

Drawn: GHD, Inc.

Boring Location Plan
Easton Utilities CDP WTP Project
Easton, Maryland

DWG. No.
JDH-10/22/261-B



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LOG OF BORING SB-1

(Page 1 of 1)

GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Easton Utilities - CDP WTP Project

Project No.: JDH-10/22/261

Date Completed: : December 21, 2022
Logged By: : R. Culbertson
Drilled By: : B. Hynes
Drilling Method: : HSA (Geoprobe 3230)
Total Depth: : 25.5 feet

Depth in Feet	Surf. Elev. 18.0	DESCRIPTION	GRAPHIC	USCS	Sample	Blow Count	REMARKS
0	18	Gray and brown, wet, medium stiff, silty CLAY, with trace sand (mottled, fill)		CL	1	2-3-4-5	Scale 1" ~ 4.5 feet
2	16						Approximately 12 inches of organic bearing soil was encountered at the ground surface.
4	14	Dark gray, wet, loose, fine to medium SAND, with little silt, little clay, little organic silt (fill)		SM	2	2-3-5	Groundwater was encountered at 8 feet during drilling operations.
6	12	Light gray and brown, clayey SILT, with trace sand (mottled)		MH	3	2-2-3	Boring caved in at 6 feet.
8	10						Laboratory Test Results
10	8	Gray, wet to saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH	4	2-3-7	Sample No. 4 From 9 to 10.5 feet
12	6						Natural Moisture = 59.8%
14	4				5	2-5-5	
16	2						
18	0	Gray, saturated, very stiff, clayey elastic SILT, with trace sand (shell fossils)		MH	6	5-7-9	
20	-2						
22	-4						
24	-6				7	7-10-11	
26	-8	Boring terminated at 25.5 feet.					
28	-10						
30							



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LOG OF BORING SB-2

(Page 1 of 1)

GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Easton Utilities - CDP WTP Project

Project No.: JDH-10/22/261

Date Completed: : December 21, 2022
Logged By: : R. Culbertson
Drilled By: : B. Hynes
Drilling Method: : HSA (Geoprobe 3230)
Total Depth: : 25.5 feet

Depth in Feet	Surf. Elev. 18.0	DESCRIPTION	GRAPHIC	USCS	Sample	Blow Count	REMARKS
0	18	Light gray and brown, wet, soft to to medium stiff, silty CLAY, with trace fine sand (mottled)		CL	1	3-5-2-2	Scale 1" ~ 4.5 feet
2	16				2	3-3-3	Approximately 6 inches of organic bearing soil was encountered at the ground surface.
4	14				3	2-2-3	Groundwater was encountered at 8 feet during drilling operations.
6	12			MH	4	2-2-3	Boring caved in at 7 feet.
8	10	Gray, wet to saturated, soft, clayey elastic SILT (shell fragments and fossils)					Laboratory Test Results
10	8						Sample No. 2 From 3 to 4.5 feet
12	6	Gray, saturated, very stiff, clayey elastic SILT, with trace sand (shell fossils)		MH	5	10-14-14	Natural Moisture = 54.2%
14	4				6	4-7-10	Sample No. 5 From 14 to 15.5 feet
16	2				7	7-12-11	Natural Moisture = 56.6%
18	0						
20	-2						
22	-4						
24	-6						
26	-8	Boring terminated at 25.5 feet.					
28	-10						
30							



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LOG OF BORING SB-3

(Page 1 of 1)

GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Easton Utilities - CDP WTP Project

Project No.: JDH-10/22/261

Date Completed: : December 21, 2022
Logged By: : R. Culbertson
Drilled By: : B. Hynes
Drilling Method: : HSA (Geoprobe 3230)
Total Depth: : 25.5 feet

Depth in Feet	Surf. Elev. 18.0	DESCRIPTION	GRAPHIC	USCS	Sample	Blow Count	REMARKS
0	18	Gray, wet, stiff, silty CLAY, with trace sand		CL	1	7-6-6-6	Scale 1" ~ 4.5 feet
2	16	Gray, wet, medium dense, fine to medium SAND, with trace silt, trace clay		SM			Approximately 6 inches of organic bearing soil was encountered at the ground surface.
4	14	Gray to orange-brown, wet, medium stiff, silty CLAY, with trace sand (mottled)		CL	2	2-3-4	Groundwater was encountered at 8 feet during drilling operations.
6	12	Brown, wet, soft, clayey SILT, with some sand (abundant shell fragments)		ML	3	3-2-2	Boring caved in at 5 feet.
8	10	Gray, saturated, medium stiff, clayey elastic SILT (shell fossils)			4	2-3-3	Laboratory Test Results Sample No. 4 From 9 to 10.5 feet Atterberg Limits Liquid Limit = 94 Plasticity Index = 39 Natural Moisture = 55.8%
10	8						
12	6						
14	4			MH	5	3-3-4	
16	2						
18	0						
20	-2				6	2-3-5	
22	-4	Gray, saturated, very stiff, clayey elastic SILT (shell fossils)		MH	7	4-7-12	
24	-6						
26	-8	Boring terminated at 25.5 feet.					
28	-10						
30							



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LOG OF BORING SB-4

(Page 1 of 1)

GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Easton Utilities - CDP WTP Project

Project No.: JDH-10/22/261

Date Completed: : December 21, 2022
Logged By: : R. Culbertson
Drilled By: : B. Hynes
Drilling Method: : HSA (Geoprobe 3230)
Total Depth: : 25.5 feet

Depth in Feet	Surf. Elev. 18.0	DESCRIPTION	GRAPHIC	USCS	Sample	Blow Count	REMARKS
0	18	Gray, wet, very stiff, clayey SILT, with trace fine sand (mottled)		ML	1	9-11-12-12	Scale 1" ~ 4.5 feet
2	16	Dark gray, wet, soft, silty CLAY, with little sand, trace organic silt		CL	2	3-3-2	Approximately 6 inches of organic bearing soil was encountered at the ground surface.
4	14	Light gray and brown, wet, soft, silty CLAY, with trace fine sand (mottled)		CL	3	2-2-3	Groundwater was encountered at 8 feet during drilling operations.
6	12	Gray, wet, soft, clayey elastic SILT (shell fossils)		MH	4	1-2-2	Boring caved in at 7 feet.
8	10	Gray, wet, soft, clayey elastic SILT (shell fossils)		MH	5	3-4-4	Laboratory Test Results
10	8	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH	6	2-3-3	Sample No. 6 From 19 to 20.5 feet
12	6	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH	7	4-6-12	Atterberg Limits Liquid Limit = 64 Plasticity Index = 21 Natural Moisture = 47.5%
14	4	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH			
16	2	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH			
18	0	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH			
20	-2	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH			
22	-4	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH			
24	-6	Gray, saturated, medium stiff, clayey elastic SILT, with trace sand (shell fossils)		MH			
26	-8	Boring terminated at 25.5 feet.					
28	-10						
30							



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LOG OF BORING IT-1

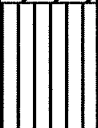
(Page 1 of 1)

GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Easton Utilities - CDP WTP Project

Project No.: JDH-10/22/261

Date Completed: : December 21, 2022
Logged By: : R. Culbertson
Drilled By: : B. Hynes
Drilling Method: : Hand Auger
Total Depth: : 10 feet

Depth in Feet	Surf. Elev. 17.0	DESCRIPTION	GRAPHIC	USCS	Sample	REMARKS
0	17	Light gray and brown, wet, silty CLAY, with trace sand (10 YR 8/1, Clay, mottled, fill)		CL	1	Scale 1" ~ 4.5 feet
2	15				2	Approximately 15 inches of organic bearing soil was encountered at the ground surface.
					3	
4	13	Dark gray, wet, fine to medium SAND, with little silt, trace clay, trace organic silt (10 YR 4/1, Sandy loam, fill)		SM	4	Groundwater was encountered at 5 feet during drilling operations.
					5	
6	11	Light gray and brown, saturated, silty CLAY, with trace sand (10 YR 7/2, Clay, mottled)		CH	6	Laboratory Test Results
					7	Sample No. 7
8	9	Dark gray, saturated, clayey elastic SILT, with trace fine sand (10 YR 5/1, Silty clay loam, shell fossils)		MH	8	From 6 to 7 feet
					9	Atterberg Limits
10	7	Boring terminated at 10 feet.			10	Liquid Limit = 54 Plasticity Index = 28 Natural Moisture = 32.5%
12	5					
14	3					
16	1					
18	-1					
20	-3					
22	-5					
24	-7					
26	-9					
28	-11					
30						



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LOG OF BORING IT-2

(Page 1 of 1)

GHD, Inc.
16701 Melford Boulevard, Suite 300
Bowie, Maryland 20715

Easton Utilities - CDP WTP Project

Project No.: JDH-10/22/261

Date Completed: : December 21, 2022
Logged By: : R. Culbertson
Drilled By: : B. Hynes
Drilling Method: : Hand Auger
Total Depth: : 10 feet

Depth in Feet	Surf. Elev. 17.0	DESCRIPTION	GRAPHIC	USCS	Sample	REMARKS
0	17	Gray, wet, silty CLAY, with trace sand (10 YR 8/1, Clay, mottled, fill)		CL	1	Scale 1" ~ 4.5 feet
2	15	Dark gray, wet, fine to medium SAND, with little silt, trace clay (10 YR 4/1, Loamy sand, fill)		SM	2	Approximately 15 inches of organic bearing soil was encountered at the ground surface.
4	13	Brown, wet, silty CLAY, with some sand (10 YR 6/3, Clay)		CL	3	Groundwater was encountered at a depth of 6 feet during augering operations.
6	11	Grayish brown, wet, silty CLAY, with trace sand (10 YR 6/1, Clay, mottled)		CL	4	
8	9	Grayish brown, saturated, silty CLAY, with trace sand (10 YR 7/2, Clay, mottled)		CH	5	
10	7	Dark gray, saturated, clayey elastic SILT, with trace sand (10 YR 5/1, Silty clay loam, mottled)		MH	6	
12	5	Dark gray, saturated, clayey elastic SILT, with trace sand (10 YR 5/1, Silty clay loam)		MH	7	
14	3	Boring terminated at 10 feet.			8	
16	1				9	
18	-1				10	
20	-3					
22	-5					
24	-7					
26	-9					
28	-11					
30						

INFILTRATION TEST DATA SHEET

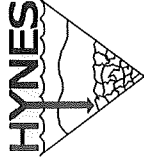
JOB NAME: Easton Utilities CDP SWP Project

PROJECT NUMBER: JDH-10/22/261

TEST LOCATION: IT-1

TEST DATE: December 22, 2023

TEST DEPTH: 6.35 ft



TIME	DEPTH TO WATER BELOW TOP OF CASING	HYDRAULIC HEAD	Δ HYDRAULIC HEAD	PERMEABILITY (K _m)	COMMENTS
Pre-soak	5.85 ft	2.00 ft			
	7.29 ft	0.56 ft	1.44 ft		24-hour presoak
Test Hour 1	5.85 ft	2.00 ft	0.00 ft		Start Test
	5.85 ft	2.00 ft	0.00 ft		
	5.85 ft	2.00 ft	0.00 ft		
	5.85 ft	2.00 ft	0.00 ft		
	5.85 ft	2.00 ft	0.00 ft	0.00 ft/hr	
Test Hour 2	5.85 ft	2.00 ft	0.00 ft		Start Test
	5.85 ft	2.00 ft	0.00 ft		
	5.85 ft	2.00 ft	0.00 ft		
	5.85 ft	2.00 ft	0.00 ft		
	5.85 ft	2.00 ft	0.00 ft	0.00 ft/hr	
Test Hour 3	5.85 ft	2.00 ft	0.00 ft		Start Test
Test Hour 4					Start Test

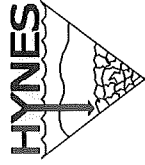
There are generally two acceptable methods to calculate steady state infiltration rates:

1. Time Weighted Average: 0.00 in/hr
2. Final Test Hour Reading: 0.00 in/hr

INFILTRATION TEST DATA SHEET

JOB NAME: Easton Utilities CDP SWP Project

PROJECT NUMBER: JDH-10/22/261 TEST LOCATION: IT-2
TEST DATE: December 22, 2023 TEST DEPTH: 6.55 ft



TIME	DEPTH TO WATER BELOW TOP OF CASING	HYDRAULIC HEAD	Δ HYDRAULIC HEAD	PERMEABILITY (K _m)	COMMENTS
Presoak	5.65 ft	2.00 ft			
	6.57 ft	1.08 ft	0.92 ft		24-hour presoak
Test Hour 1	5.65 ft	2.00 ft	0.00 ft		Start Test
	5.70 ft	1.95 ft	0.05 ft		
	5.75 ft	1.90 ft	0.05 ft		
	5.80 ft	1.85 ft	0.05 ft		
	5.85 ft	1.80 ft	0.05 ft	0.20 ft/hr	2.40 in/hr
Test Hour 2	5.65 ft	2.00 ft	0.00 ft		Start Test
	5.67 ft	1.98 ft	0.02 ft		
	5.69 ft	1.96 ft	0.02 ft		
	5.71 ft	1.94 ft	0.02 ft		
	5.73 ft	1.92 ft	0.02 ft	0.08 ft/hr	0.96 in/hr
Test Hour 3	5.65 ft	2.00 ft	0.00 ft		Start Test
	5.66 ft	1.99 ft	0.01 ft		
	5.67 ft	1.98 ft	0.01 ft		
	5.69 ft	1.96 ft	0.02 ft		
	5.70 ft	1.95 ft	0.01 ft	0.05 ft/hr	0.60 in/hr
Test Hour 4	5.65 ft	2.00 ft	0.00 ft		Start Test
	5.67 ft	1.98 ft	0.02 ft		
	5.69 ft	1.96 ft	0.02 ft		
	5.69 ft	1.96 ft	0.00 ft		
	5.70 ft	1.95 ft	0.01 ft	0.05 ft/hr	0.60 in/hr

There are generally two acceptable methods to calculate steady state infiltration rates:

1. Time Weighted Average: 1.14 in/hr
2. Final Test Hour Reading: 0.60 in/hr

**Falling Head
Single Ring Infiltration Test
(Maryland)**



Tools and Supplies:

- | | |
|---|--|
| ☐ 10 gallons of clean water per test | ☐ Driving Block and Cap |
| ☐ 3 in. and 5 in. hand augers/extensions | ☐ Purge Pump, tubing, and buckets |
| ☐ One 4 in. ring per test | ☐ Battery |
| ☐ Well Sand | ☐ Drill, 5/8 in. bit and 12 to 18 in. length of 1/2in. rebar for extraction of PVC pipe |
| ☐ Shovels Flat/Round | ☐ Gator/ATV (as necessary) |
| ☐ Hand Rake | ☐ Concrete cylinder for pouring water |
| ☐ Sledge Hammer | ☐ 4 inch thin wall PVC (at least one foot longer than test depth) |

Note: 1 test period equals 1 hour maximum or until water empties out of ring. Contact Project Manager with pre-soak information. **Please read these procedures carefully and completely before starting the first test.**

Procedure:

- A. (Only if soil borings and infiltration testing are to be completed on the same day)
Advance one soil boring at each test location. The boring should extend to groundwater. Accurately measure depth to groundwater and depth of each soil change. Pay close attention to soils for mottling. Contact office for test depth if depth not provided. **Check boring log to ensure that soil at bottom of excavation is soil type to be tested.**
- B. Set up ring (4 inch thin wall PVC permeameter)/Pre-soak
1. Advance a 5-inch diameter soil boring to the specified test depth. Check boring log to ensure that soil at bottom of excavation is soil type to be tested. **Jar/bag soil sample at the bottom of the boring to bring back to office to ensure desired material was tested in.**
 2. Cut thin wall PVC to length (approximately 1 to 2' longer than desired test depth). Measure PVC length and record on test sheet. Drive Casing 3 inches into bottom of boring.
 3. Collect initial test information using a tape measure. **Be very precise with measurements (within an 1/8 of an inch).**
 4. Determine the total depth to the bottom of the hole from top of pipe and record.
 5. Determine riser height above ground and record.
 6. Subtract riser height (Step B.5.) from total depth (Step B.4.) to get the test depth, and ensure that this is the desired depth as listed on assignment sheet.
 7. **If measured test depth varies from test depth listed on assignment sheet, contact Project Manager.**
 8. Fill ring with approximately 24 inches of water (For reference, the Test depth (in feet – See Step B.6.) minus 2 will give you the required depth to water measured from top of casing to ensure that there is 24 inches of water in pipe). Be careful

**Falling Head
Single Ring Infiltration Test
(Maryland)**



not to erode soil at bottom. Use a concrete cylinder if necessary for a slower water flow.

9. Measure using tape measure distance from top of ring to water surface for shallow tests. You may also use water level indicator device for deeper tests.
10. Monitor water drop every 15 minutes for 1 hour or until ring runs dry.
11. Contact project manager after pre-soak with infiltration data.

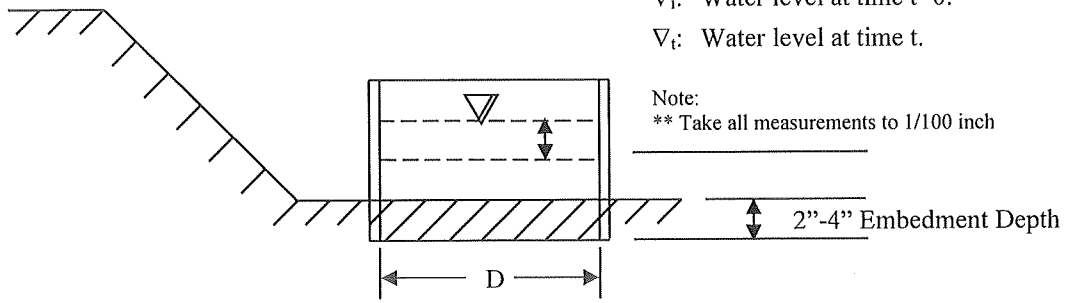
C. Run Test (4 one hour test periods AFTER initial pre-soak)

1. Readings are to be collected no more than 15 minutes apart. **If running multiple tests at the same time, make sure that you can move between test locations in less than 15 minutes.**
2. For each test period, there must be 24 inches of water at the start of the test period (As described in Step B.8.).
3. Run 4 test periods. Each test period is one hour, or until test runs dry, whichever occurs first.
4. Run test for entire hour (double check your times) unless test runs dry.
5. If ring runs dry in less than 15 minutes, contact project manager.
6. **Check your data at the end of each test and before leaving the site.**

Falling Head Single Ring Infiltration Test (Maryland)



- D: Diameter of Ring.
 H_c : Distance from bottom of Drop Tube to Soil.
 ∇ : Water level in infiltration Ring.
 ∇_i : Water level at time $t=0$.
 ∇_t : Water level at time t .





JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

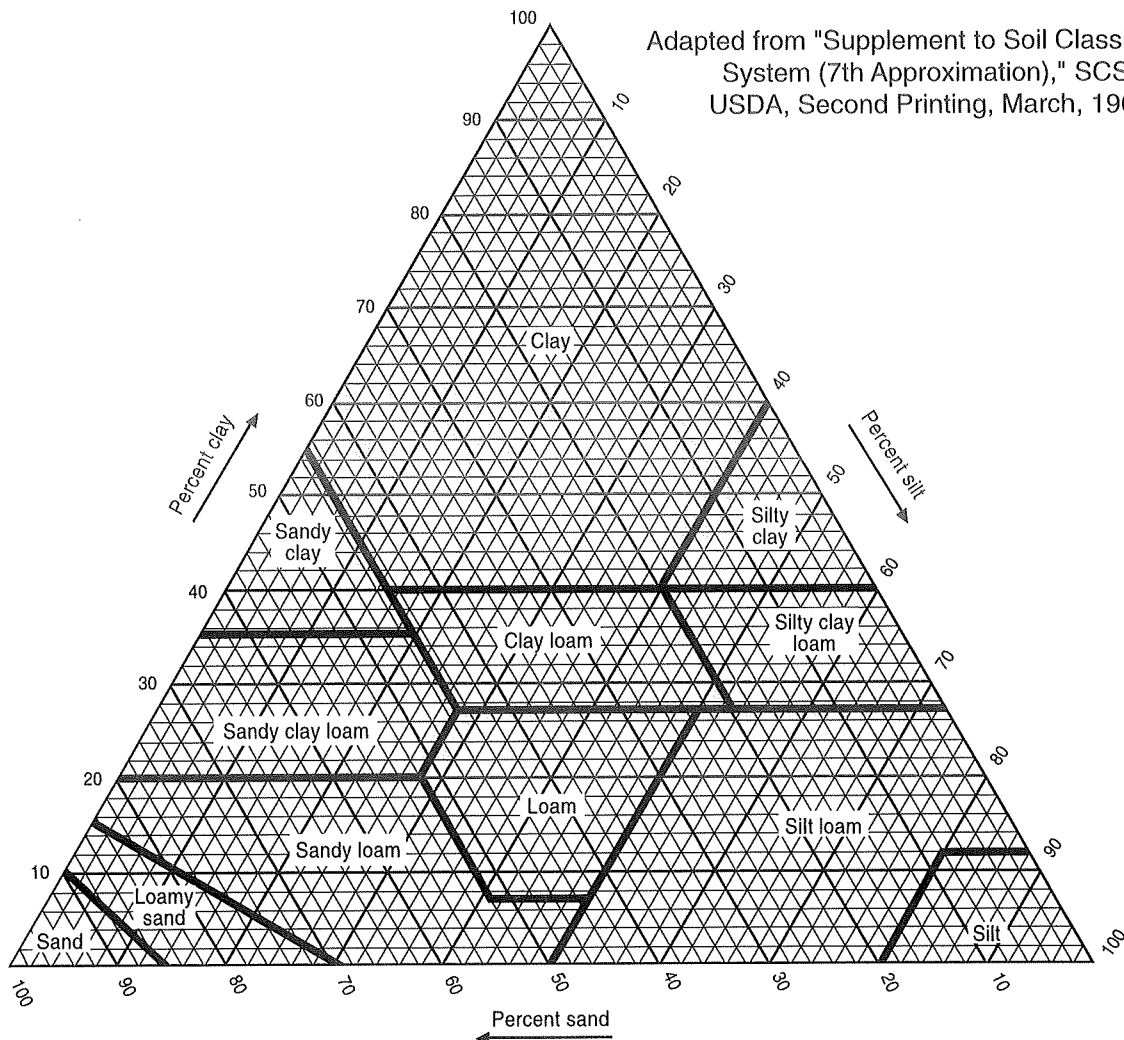
UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria						
Coarse-grained soils (More than half of material is larger than No 200 sieve size)	Gravels (More than half of coarse fraction is larger than No 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No 200 sieve size), coarse grained soils are classified as follows: Less than 5 percent More than 12 percent 5 to 12 percent	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3					
			GP	Poorly graded gravels, gravel sand mixtures, little or no fines		Not meeting all gradation requirements for GW					
		Gravels with fines (Appreciable amount of fines)	GMA ^a d u	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4		Above "A" line with P.I. between 4 and 7 are <i>border-line</i> cases requiring use of dual symbols			
						GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7		
	Sands (More than half of coarse fraction is smaller than No 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands,		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3					
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW					
		Sands with fines (Appreciable amount of fines)	SM ^a d u	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4		Above "A" line with P.I. between 4 and 7 are <i>border-line</i> cases requiring use of dual symbols.			
						SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7		
			Fine-grained soils (More than half material is smaller than No 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity				
						CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
OL	Organic silts and organic silty clays of low plasticity										
Silts and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts									
	CH	Inorganic clays of high plasticity, fat clays									
	OH	Organic clays of medium to high plasticity, organic silts									
Highly organic soils	Pt	Peat and other highly organic soils									

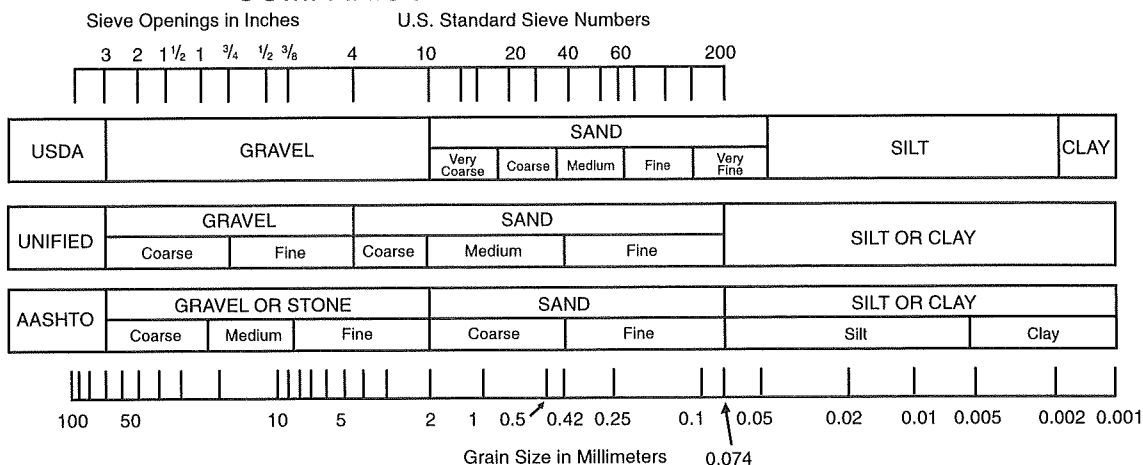


USDA SOIL CLASSIFICATION SYSTEM

Adapted from "Supplement to Soil Classification System (7th Approximation)," SCS, USDA, Second Printing, March, 1967



COMPARISON OF PARTICLE - SIZE SCALES



Soil triangle of the basic soil textural classes. (U.S. Soil Conservation Service.) 288-D-2782.



FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

NON-COHESIVE SOILS

(Silt, Sand, Gravel and Combinations)

DENSITY

Very Loose	- 5 blows/ft. or less
Loose	- 6 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

PARTICLE SIZE IDENTIFICATION

Boulders	- 8 inch diameter or more
Cobbles	- 3 to 8 inch diameter
Gravel	- Coarse - 1 to 3 inch - Medium - 1/2 to 1 inch - Fine - 4.75 mm to 1/2 inch
Sand	- Coarse - 2.0 mm to 4.75 mm - Medium - 0.425 mm to 2.0 mm - Fine - 0.075 mm to 0.425 mm
Silt	- 0.075 mm to 0.002 mm

RELATIVE PROPORTIONS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS

(Clay, Silt and Combinations)

CONSISTENCY

Very Soft	- 3 blows/ft. or less
Soft	- 4 to 5 blows/ft.
Medium Stiff	- 6 to 10 blows/ft.
Stiff	- 11 to 15 blows/ft.
Very Stiff	- 16 to 30 blows/ft.
Hard	- 31 blows/ft. or more

PLASTICITY

Degree of Plasticity	Plasticity Index
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	over 22

Classification on logs are made by visual inspection of samples unless a sample has been subjected to laboratory classification testing.

Standard Penetration Test - Driving a 2.0" O.D., 1-3/8" I.D., splitspoon sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the test are recorded for each 6 inches of penetration on the drill log (Example - 6/8/9). The standard penetration test value (N - value) can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.). (ASTM D-1586)

Strata Changes - In the column "Soil Descriptions," on the drill log, the horizontal lines represent strata changes. A solid line (—) represents an actually observed change, a dashed line (----) represents an estimated change.

Groundwater - Observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc. may cause changes in the water levels indicated on the logs.

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.*

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.*

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910

Telephone: 301/565-2733 Facsimile: 301/589-2017

e-mail: info@geoprofessional.org www.geoprofessional.org

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**Town of Easton**

Engineering, Planning and Zoning

14 South Harrison Street, Easton, MD 21601

Easton Staff Development Review**Property Information**

Address	8670 Commerce Drive, Easton, MD 21601						
Tax Map	0101	Grid	0002	Parcel	4	Lot	3
Deed Reference:	Liber	02667	Folio	00171			
Plat Reference:	Liber	44	Folio	8			
Base Zoning District		Historic District	Y ☐ N ☒	Planning Redevelopment	Y ☐ N ☒		

Purpose of Application / Description of Work:

A new water treatment plant processing building is proposed on the existing previously developed Easton Utilities "Commerce Drive Property" across the street from the existing Glebe Water Treatment Plant. The new WTP will utilize new pressure filters and new chemical dosing systems within the new building, the existing Glebe WTP Process tankage will be utilized for storage of filter backwash. Along with the proposed building, new underground utility work will take place as well as new asphalt parking and access area are proposed and a stormwater management facility

Owner

Name	Easton Utilities Commission		
Mailing Address	201 N. Washington Street, Easton, MD 21601		
Telephone No.	410.822.6110	Email	

Applicant / Agent

Name	Madeline Selick Barbalace		
Mailing Address	16701 Melford Blvd. Suite 330, Bowie, MD 2071		
Telephone No.	240-206-0492	Email	Madeline.selick@ghd.com

Surveyor / Engineer

Name	GHD Inc.	License No.	552263	Expiration Date	2024-02-06
Mailing Address	16701 Melford Blvd, Suite 330, Bowie, MD 20715				
Telephone No.	240-206-0464	Email	Ashton.Rogers@ghd.com		

Any modifications during review shall warrant an updated application.

I do hereby solemnly declare and affirm that the information provided by this application and the documents attached hereto accurately represent the conditions of the request and that submission of an incomplete application will be returned for correction prior to processing.

Signature of Applicant or Agent

Date 02-28-2023

Printed Name of Applicant or Agent

Madeline Selick Barbalace

For Office Use Only

Easton Staff Development Review Meeting Required Y ☐ N ☐

Easton Staff Development Review Meeting Date

Completeness Check Date

Revisions/Resubmissions Required Y ☐ N ☐

Resubmission Date

Documents Received Y ☐ N ☐

Staff Determination

Planning Commission Required Y ☐ N ☐

BOZA Required Y ☐ N ☐

Historic District Commission Required Y ☐ N ☐

Resubmission for ESDR Required Y ☐ N ☐

Staff Signature

Date

Revised 02-2019

**Town of Easton**

Engineering, Planning and Zoning

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Resubmission Date

Documents Received Y ☐ N ☐

Staff Determination

Planning Commission Required Y ☐ N ☐

BOZA Required Y ☐ N ☐

Historic District Commission Required Y ☐ N ☐

Resubmission for ESDR Required Y ☐ N ☐

Staff Signature

Date

RECEIVED
MAR 01 2023
TOWN OF EASTON

Revised 02-2019

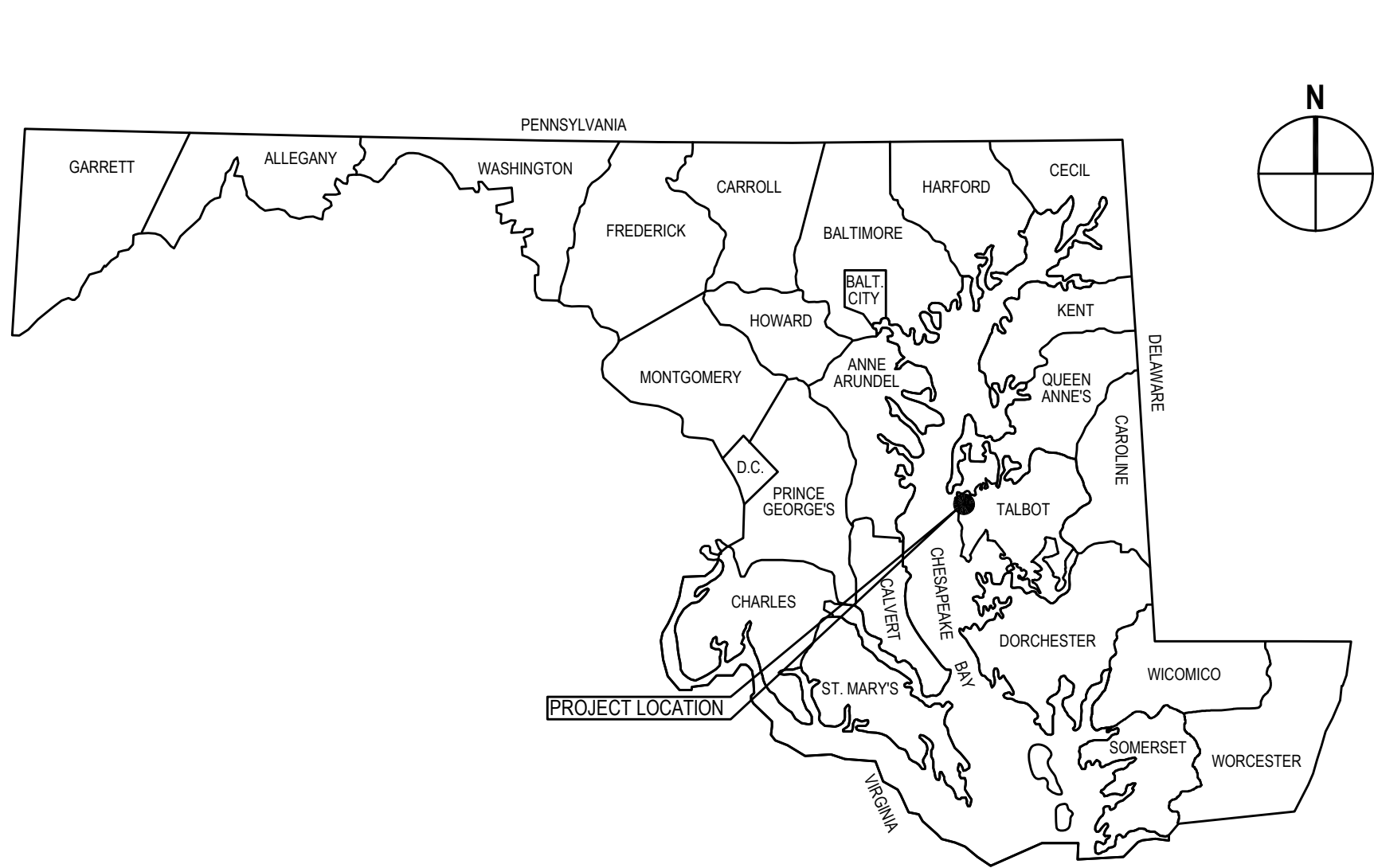


EASTON UTILITIES, MARYLAND

COMMERCE WATER TREATMENT PLANT

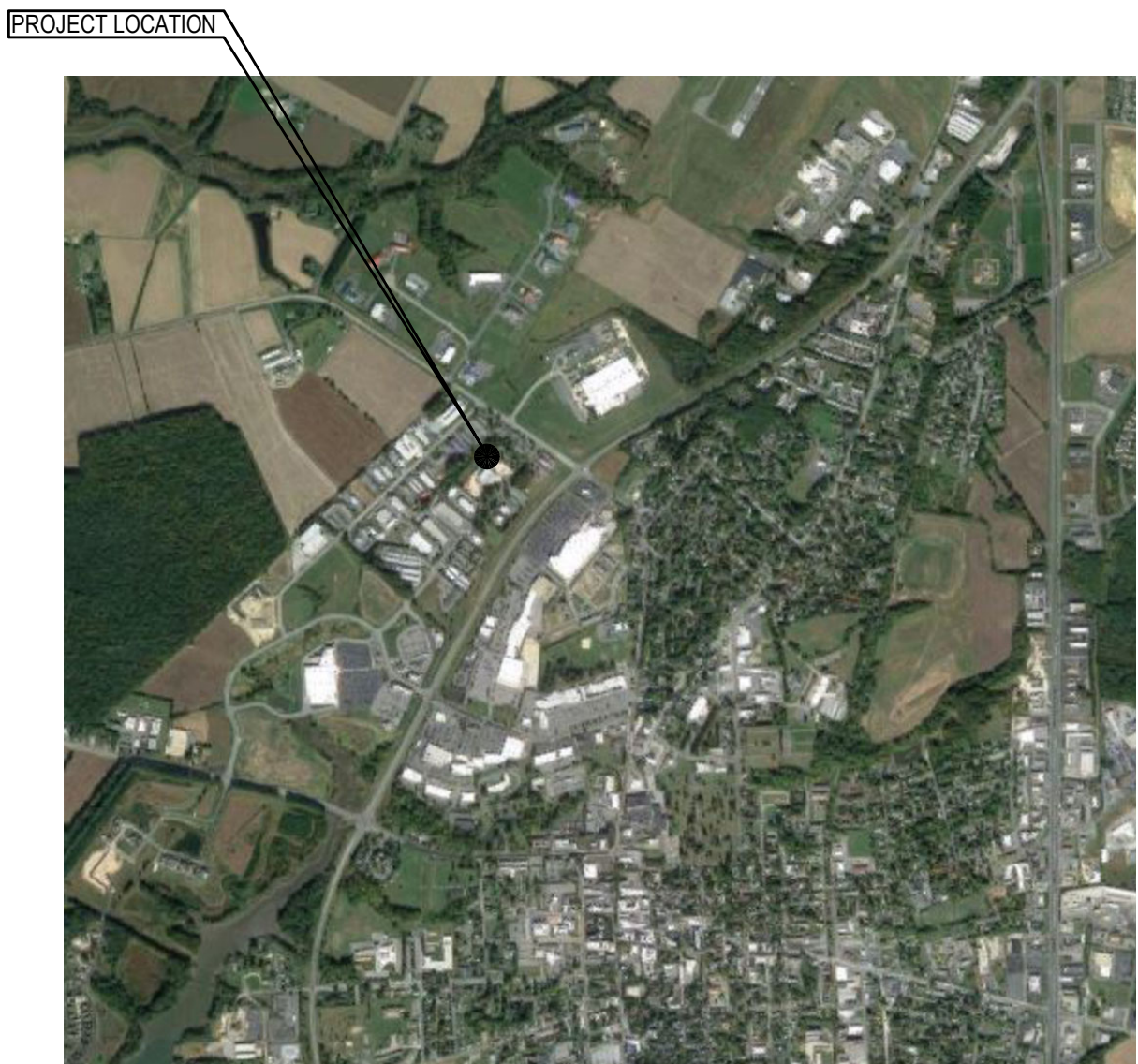
60% DESIGN REVIEW

JANUARY 2023



VICINTY MAP

NOT TO SCALE



LOCATION MAP

1" = 2000'

GENERAL NOTES:

1.

LOT ADDRESSES:

8670 COMMERCE DRIVE, EASTON, MD 21601
2.

OWNER:

EASTON UTILITIES
3.

TAX MAP/ GRID/
PARCEL/ BLOCK:

PARCEL 4, LOT 3
4.

ZONING

I1 (SELECT INDUSTRIAL)
5.

LOT SIZE:

5.089 ACRES
IMPERVIOUS: 2.73 AC
PERVIOUS: 2.35 AC
6.

DEED REFERENCES:

2667/171
7.

TAX ACCOUNT ID:

054244
8.

VERTICAL DATUM:

NAVD 88
9.

HORIZONTAL DATUM:

NAD 83
10.

STANDARD RESPONSIBILITY NOTES, CONSULTANTS CERTIFICATION, AND SITE
ANALYSIS ARE LOCATED ON DESIGN CRITERIA, PUMP CURVES, AND NOTES ON
SHEET XXXX.

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:	
TOWN OF EASTON - TOWN PLANNER	DATE
APPROVED:	
TOWN OF EASTON - TOWN ENGINEER	DATE
APPROVED:	
EASTON UTILITIES - MANAGER OF ENGINEERING	DATE

B	60% SUBMITTAL	ALT	JHC	2023 01 19	
A	30% SUBMITTAL	ALT	JHC	2022 08 19	
No.	Issue	Checked	Approved	Date	
Author	K. LARSON	Drafting Check	K. LARSON	Project Manager	J. CANNON
Designer	A. THRON	Design Check	J. CANNON	Project Director	K. GEORGE

Bar is one inch on
original size sheet

0 1"



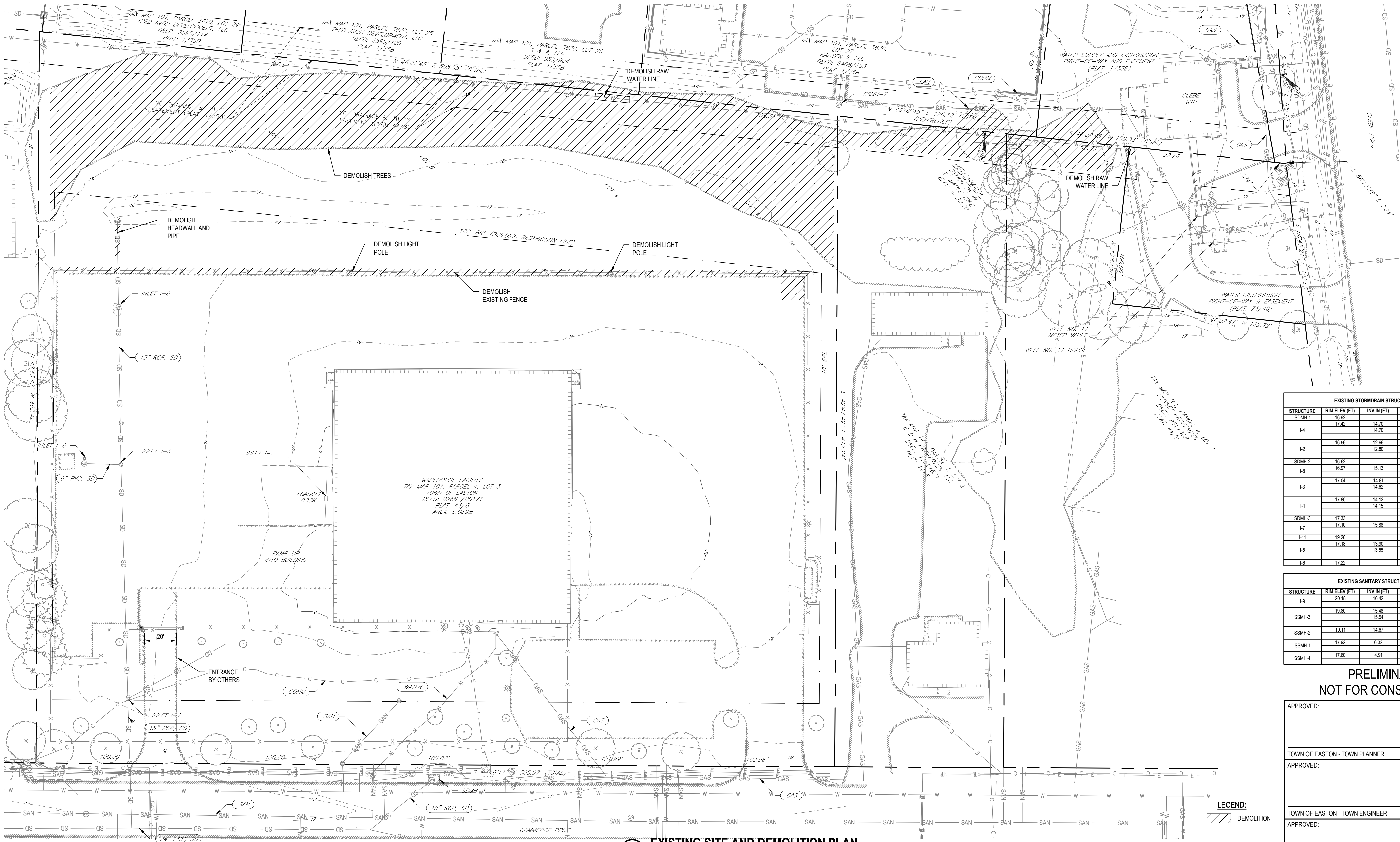
GHD Inc.
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Client EASTON UTILITIES		
Project COMMERCE WATER TREATMENT PLANT		
Project No. 12578222	Date 01/2023	Scale NOT TO SCALE

Title COVER SHEET		Size ANSI D
		Status Code
		Sheet No. G001
		Sheet of



EXISTING STORMDRAIN STRUCTURE TABLE				
STRUCTURE	RIM ELEV (FT)	INV IN (FT)	INV OUT (FT)	NOTES
SDMH-1	16.62		14.22	18" RCP
	17.42	14.70		18" RCP
		14.70		18" RCP
I-4			14.65	24" RCP
	16.56	12.66		24" RCP
		12.80		15" RCP
I-2			12.65	28" RCP
			14.32	18" RCP
				12" RCP
SDMH-2	16.62	16.13		12" RCP
	16.97		15.19	12" RCP
		14.81		12" RCP
I-3			14.62	8" PVC
			14.63	12" RCP
	17.80	14.12		12" RCP
I-1			14.15	10" PVC
			13.92	15" RCP
			15.30	8" PVC
SDMH-3	17.33			8" PVC
	17.10	15.88		8" PVC
			15.75	8" PVC
I-7			15.98	18" PVC
	19.26	13.90		21" CMP
	17.18	13.55		18" HDPE
I-5			13.45	24" HDPE
			12.36	SUMP
	17.22			

EXISTING SANITARY STRUCTURE TABLE				
STRUCTURE	RIM ELEV (FT)	INV IN (FT)	INV OUT (FT)	NOTES
I-9	20.18	16.42		4" TCP
		15.48	15.99	8" TCP
	19.80		15.54	8" TCP
SSMH-3			15.53	8" TCP
	19.11	14.67		8" TCP
		14.64		8" TCP
SSMH-2		6.32	14.64	12" TCP
	17.92		6.30	12" TCP
		6.30		12" TCP
SSMH-1			4.99	12" TCP
	17.60	4.91		12" TCP
				12" TCP

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:

TOWN OF EASTON - TOWN PLANNER

DATE

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

B 60% SUBMITTAL					ALT	JHC	2023 01 19
A 30% SUBMITTAL					ALT	JHC	2022 08 19
No.	Issue	Checked	Approved	Date			
Author	K. LARSON	Drafting Check	K. LARSON	Project Manager	J. CANNON		
Designer	A. THRON	Design Check	A. THRON	Project Director	K. GEORGE		

Plot Date: 28 February 2023 - 2:40 PM

Plotted By: Kristopher Larson

Path and Filename: G:\5651\2578222\Digital_Design\ACAD\Sheets\Civil\2578222-GHD-DWG-C-001.dwg

Bar is one inch on
original size sheet

0 15 30 45
SCALE 1"=30' AT ORIGINAL SIZE



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Client **EASTON UTILITIES**

Project **COMMERCE WATER TREATMENT PLANT**

Project No.
12578222

Date
01/2023

Scale
1" = 30'-0"

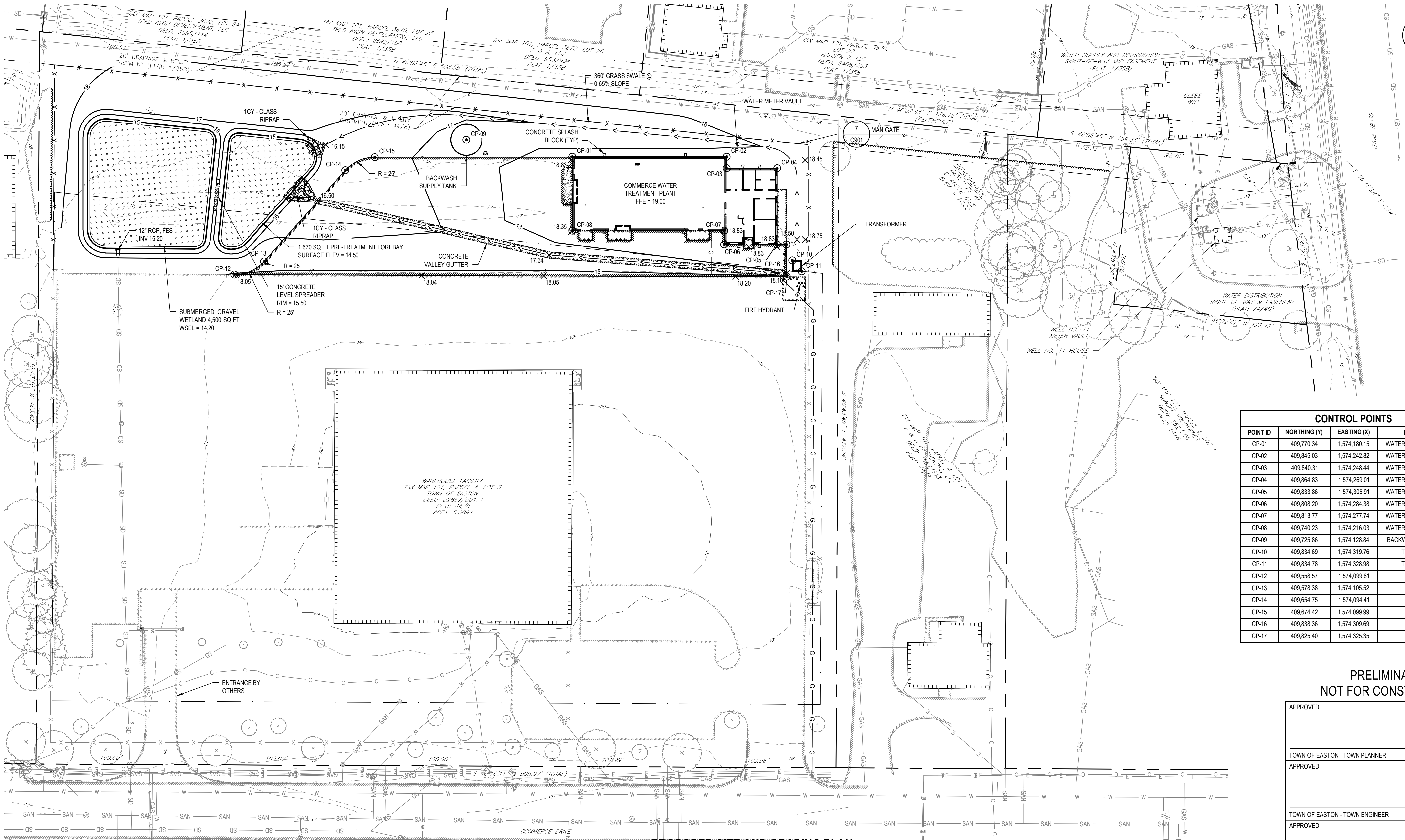
Title **EXISTING SITE AND DEMOLITION PLAN**

Size
ANSI D

Status Code

Sheet No.
C-001

Sheet
of



1 PROPOSED SITE AND GRADING PLAN

SCALE: 1" = 30'-0"

CONTROL POINTS			
POINT ID	NORTHING (Y)	EASTING (X)	DESCRIPTION
CP-01	409,770.34	1,574,180.15	WATER TREATMENT PLANT
CP-02	409,845.03	1,574,242.82	WATER TREATMENT PLANT
CP-03	409,840.31	1,574,248.44	WATER TREATMENT PLANT
CP-04	409,864.83	1,574,269.01	WATER TREATMENT PLANT
CP-05	409,833.86	1,574,305.91	WATER TREATMENT PLANT
CP-06	409,808.20	1,574,284.38	WATER TREATMENT PLANT
CP-07	409,813.77	1,574,277.74	WATER TREATMENT PLANT
CP-08	409,740.23	1,574,216.03	WATER TREATMENT PLANT
CP-09	409,725.86	1,574,128.84	BACKWASH SUPPLY TANK
CP-10	409,834.69	1,574,319.76	TRANSFORMER
CP-11	409,834.78	1,574,328.98	TRANSFORMER
CP-12	409,558.57	1,574,099.81	ROAD POINT
CP-13	409,578.38	1,574,105.52	ROAD POINT
CP-14	409,654.75	1,574,094.41	ROAD POINT
CP-15	409,674.42	1,574,099.99	ROAD POINT
CP-16	409,838.36	1,574,309.69	ROAD POINT
CP-17	409,825.40	1,574,325.35	ROAD POINT

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:

TOWN OF EASTON - TOWN PLANNER

DATE

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

Title PROPOSED SITE AND GRADING
PLAN

Size
ANSI D

Status Code

Client EASTON UTILITIES

Project COMMERCE WATER TREATMENT
PLANT

Project No.
12578222

Date
01/2023

Scale
1" = 30'-0"

Sheet No.
C-002

Sheet
of



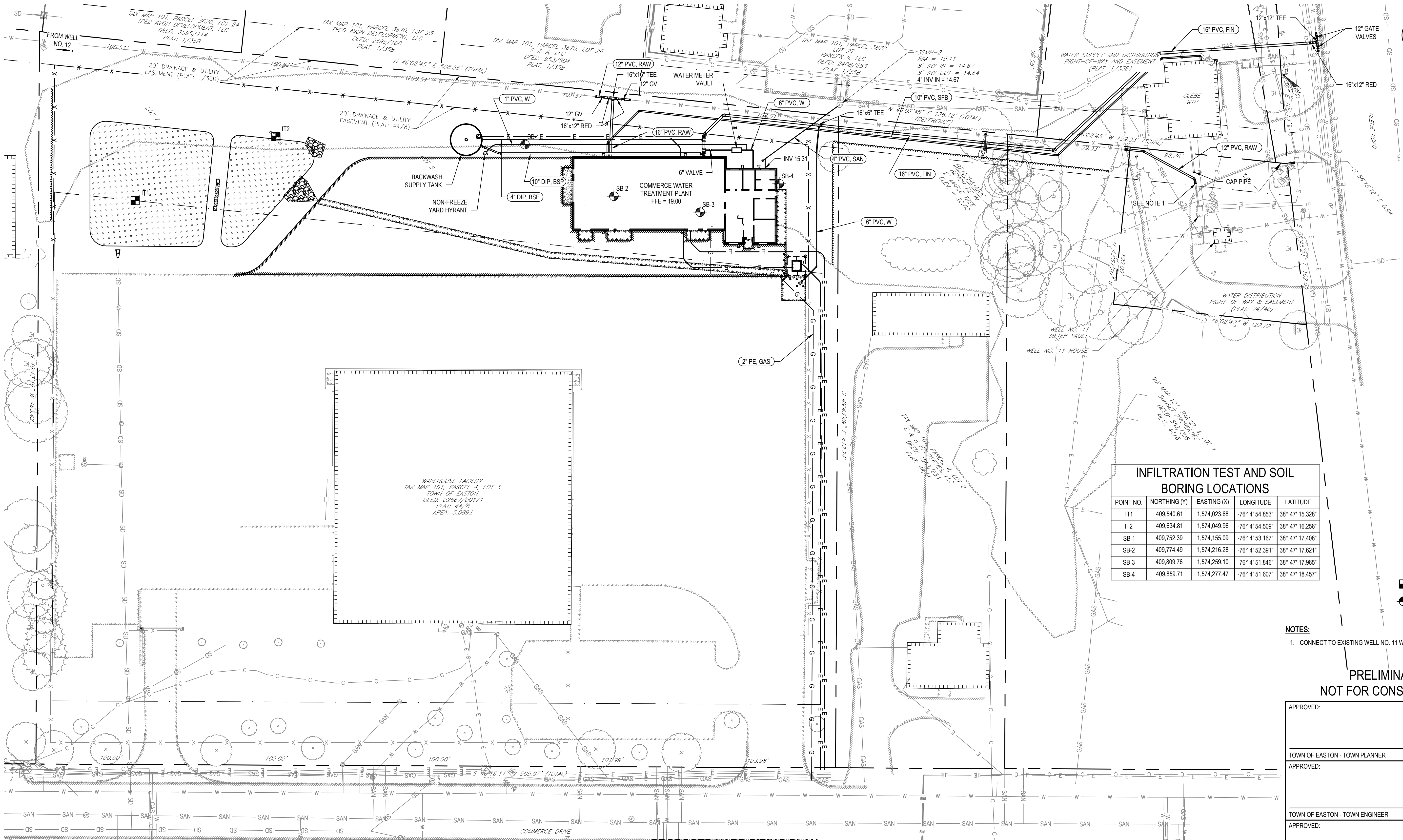
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1 PROPOSED YARD PIPING PLAN
SCALE: 1" = 30'-0"

INFILTRATION TEST AND SOIL BORING LOCATIONS				
POINT NO.	NORTHING (Y)	EASTING (X)	LONGITUDE	LATITUDE
IT1	409,540.61	1,574,023.68	-76° 4' 54.853"	38° 47' 15.328"
IT2	409,634.81	1,574,049.96	-76° 4' 54.509"	38° 47' 16.256"
SB-1	409,752.39	1,574,155.09	-76° 4' 53.167"	38° 47' 17.408"
SB-2	409,774.49	1,574,216.28	-76° 4' 52.391"	38° 47' 17.621"
SB-3	409,809.76	1,574,259.10	-76° 4' 51.846"	38° 47' 17.965"
SB-4	409,859.71	1,574,277.47	-76° 4' 51.607"	38° 47' 18.457"

- LEGEND
- IT# INFILTRATION TEST
 - SB-# SOIL BORING

- NOTES:
- CONNECT TO EXISTING WELL NO. 11 WATER LINE IN YARD.

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:

TOWN OF EASTON - TOWN PLANNER

DATE

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

B 60% SUBMITTAL					ALT	JHC	2023 01 19
A 30% SUBMITTAL					ALT	JHC	2022 08 19
No.	Issue	Checked	Approved	Date			
Author	K. LARSON	Drafting Check	K. LARSON	Project Manager	J. CANNON		
Designer	A. THRON	Design Check	A. THRON	Project Director	K. GEORGE		

Bar is one inch on original size sheet

0 1"

0 15' 30' 45'

SCALE 1"=30' AT ORIGINAL SIZE



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Client EASTON UTILITIES

Project COMMERCE WATER TREATMENT PLANT

Project No. 12578222

Date 01/2023

Scale 1" = 30'-0"

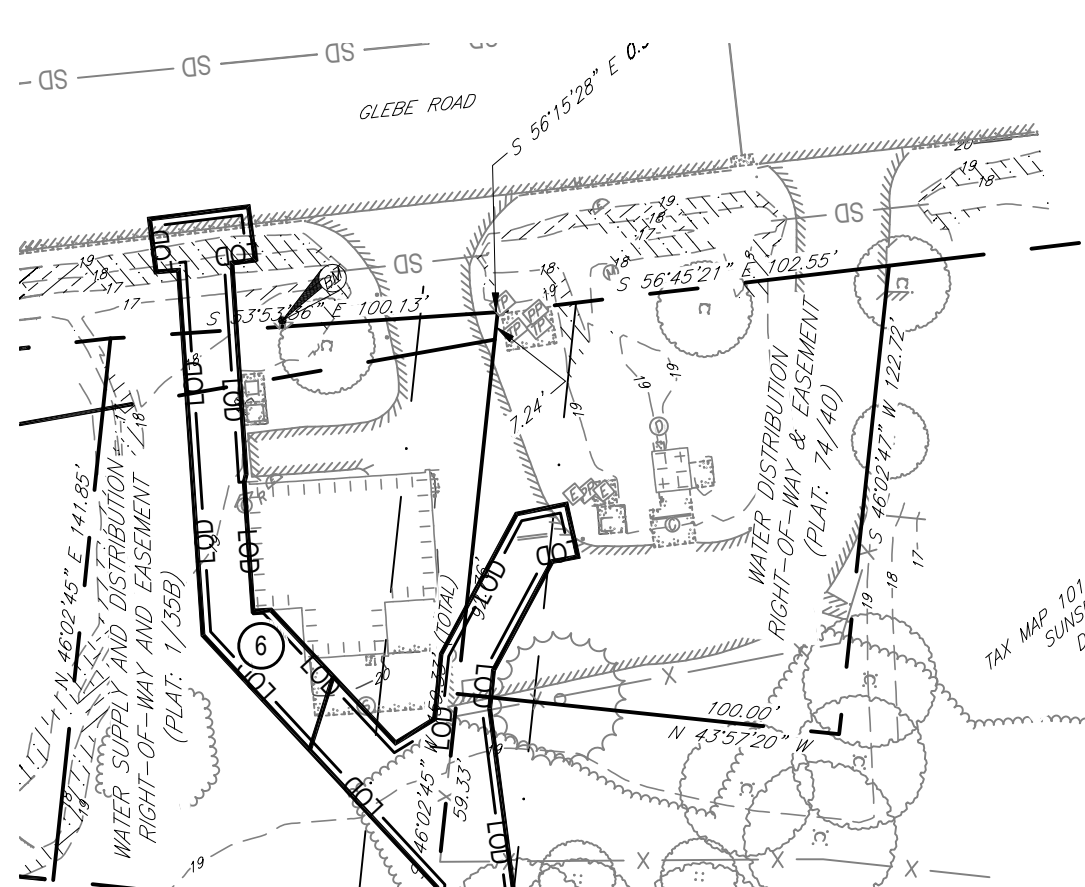
Title OVERALL YARD PIPING PLAN

Size ANSI D

Status Code

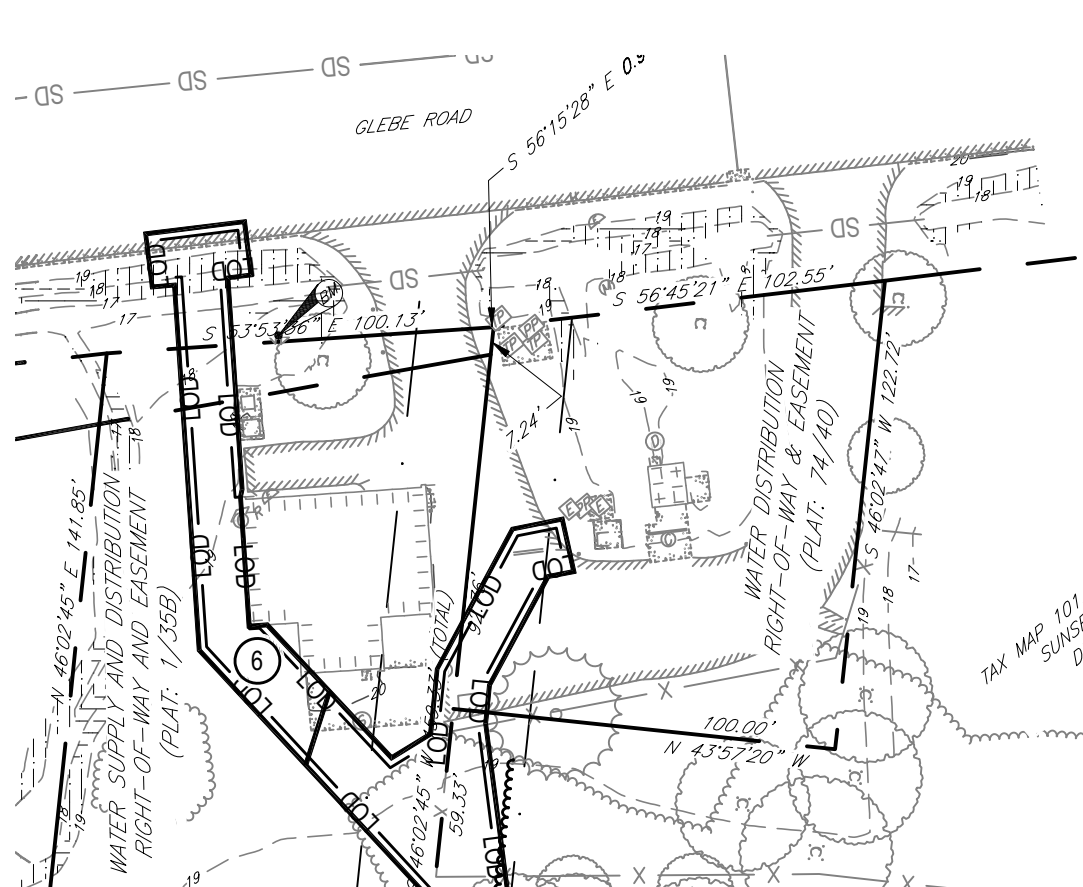
Sheet No. C-003

Sheet of



PRE-DEVELOPMENT LOD DRAINAGE AREA IMPACTS				
DA	Pervious Area (SF)	Impervious Area (SF)	TOTAL AREA (SF)	TOTAL AREA (AC)
1	64,812	5,368	70,179	1.61
2	4,653	9,358	14,011	0.32
6	1,554	110	1,664	0.04
TOTAL	71,018	14,836	85,854	1.97

PRE-DEVELOPMENT						
DA	FOREST AREA (SF)	MANAGED TURF (SF)	IMPERVIOUS AREA (SF)	TOTAL AREA (SF)	TOTAL AREA (AC)	ESC DEVICE
1	30,696	38,744	42,607	112,047	2.57	SF
2	0	7,442	25,069	32,511	0.75	-
3	1,496	11,528	1,917	14,941	0.34	IP
4	950	525	20,130	21,605	0.50	IP
5	415	973	10,887	12,275	0.28	SF, IP
6	0	2,046	177	2,223	0.05	-
TOTAL	33,557	61,258	100,787	195,602	4.49	



POST DEVELOPMENT LOD DRAINAGE AREA IMPACTS				
DA	Pervious Area (SF)	Impervious Area (SF)	TOTAL AREA (SF)	TOTAL AREA (AC)
1	41,788	28,391	70,179	1.61
2	4,653	9,358	14,011	0.32
6	1,554	110	1,664	0.04
TOTAL	47,995	37,859	85,854	1.97

POST DEVELOPMENT						
DA	FOREST AREA (SF)	MANAGED TURF (SF)	IMPERVIOUS AREA (SF)	TOTAL AREA (SF)	TOTAL AREA (AC)	ESC DEVICE
1	3,561	42,887	65,599	112,047	2.57	SF
2	0	7,442	25,069	32,511	0.75	-
3	1,273	637	13,031	14,941	0.34	IP
4	950	525	20,130	21,605	0.50	IP
5	415	973	10,887	12,275	0.28	SF, IP
6	0	2,046	177	2,223	0.05	-
TOTAL	6,199	54,510	134,893	195,602	4.49	

SITE/LOD ANALYSIS:	
TOTAL SITE AREA	5.63 ±AC.
DISTURBED AREA	2.01 ±AC.
EXISTING IMPERVIOUS AREA	2.87 ±AC.
PROPOSED IMPERVIOUS AREA	3.91 ±AC.
NET INCREASE IN IMPERVIOUS AREA	1.04 ±AC.
TOTAL CUT	xx ±CY.
TOTAL FILL	xx ±CY.

NOTES:

1. SOIL IS PREDOMINATELY Up - URBAN LAND WHICH IS CLASSIFIED AS CLASS C SOIL TYPE.

EROSION AND SEDIMENT CONTROL LEGEND

- RWD: TEMPORARY RIGHT-OF-WAY DIVERSION
- IP: STORM DRAIN INLET PROTECTION
- TS: TEMPORARY SEEDING
- DC: DUST CONTROL
- DD: DIVERSION DIKE
- LOD: LIMIT OF DISTURBANCE
- SF: SILT FENCE
- LOD-SSF: SILT FENCE (WITH WIRE BACKING - LIMIT OF DISTURBANCE)
- SF: TEMPORARY CHAIN-LINK CONST. SAFETY FENCE
- LOD-TP: TREE PROTECTION (LIMIT OF DISTURBANCE)
- TEMPORARY DIVERSION DIKE
- 100-YR FLOOD PLAIN
- RPA BUFFER
- DRAINAGE AREA BOUNDARY
- SOIL DIVIDE
- #: DRAINAGE AREA LABEL
- #@: SOIL LABEL
- CE: CONSTRUCTION ENTRANCE
- Sanitary Manhole Identifier
- Storm Drain Structure Identifier
- Stockpile Area
- Tree Removal and Grubbing
- 15% - 25% Slopes
- >25% Slopes

PRELIMINARY - NOT FOR CONSTRUCTION

APPROVED:	
TOWN OF EASTON - TOWN PLANNER	DATE
APPROVED:	
TOWN OF EASTON - TOWN ENGINEER	DATE
APPROVED:	
EASTON UTILITIES - MANAGER OF ENGINEERING	DATE

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0 1"	
0 25 50 75	
SCALE 1"=50' AT ORIGINAL SIZE	

Bar is one inch on original size sheet	
0 1"	
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Client	EASTON UTILITIES		
Project	COMMERCE WATER TREATMENT PLANT		
Project No.	12578222	Date	01/2023
Scale	1" = 50'-0"		

Title	EROSION AND SEDIMENT CONTROL PRE AND POST DEVELOPMENT PLANS		Size ANSI D
Status Code			
Sheet No.	C-301	Sheet of	

DETAIL E-1SILT FENCE JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW) 1 OF 2	DETAIL E-1SILT FENCE CONSTRUCTION SPECIFICATIONS - USE WOOD POSTS 1 1/2 X 1 1/2 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT. - USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART. - USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION. - PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS. - EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC. - WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. - EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE. - REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE. 2 OF 2	DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION CONSTRUCTION SPECIFICATIONS - USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS. - USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL. - SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM. - PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN. - UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING. - KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END. - OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT. - STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS. - ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION. 2 OF 2	DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION CONSTRUCTION SPECIFICATIONS - USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS. - USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL. - SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM. - PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN. - UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING. - OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT. - KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY. - STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS. - IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT. - ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.	TOPSOIL AND STOCKPILE NOTES INSTALLATION NOTES - AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE. - MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2 AND MAXIMUM HEIGHT SHALL BE 15'. - UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH SUPER SILT FENCING, THEN STABILIZED WITH VEGETATION OR COVERED. - NO STOCKPILING ALLOWED ON ASPHALT. - ALL STOCKPILES LEFT AT THE END OF THE DAY NEED TO BE STABILIZED UNTIL NEXT REDISTURBANCE. FINISH GRADE - AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE. - MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2 AND MAXIMUM HEIGHT SHALL BE 15'. - UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH SUPER SILT FENCING, THEN STABILIZED WITH VEGETATION OR COVERED. - NO STOCKPILING ALLOWED ON ASPHALT. - ALL STOCKPILES LEFT AT THE END OF THE DAY NEED TO BE STABILIZED UNTIL NEXT REDISTURBANCE. SPECIAL EROSION CONTROLS DETAILS INCLUDED AS PART OF THIS PROJECT
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION	MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION	MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION	MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION	MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE	DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE	DETAIL B-4-6-B PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION	DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION	PRELIMINARY - NOT FOR CONSTRUCTION APPROVED: TOWN OF EASTON - TOWN PLANNER DATE APPROVED: TOWN OF EASTON - TOWN ENGINEER DATE APPROVED: EASTON UTILITIES - MANAGER OF ENGINEERING DATE
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Author K. LARSON Drafting Check K. LARSON Project Manager J. CANNON Designer M. SELICK Design Check A. ROGERS Project Director K. GEORGE	Bar is one inch on original size sheet 0 1"	Conditions of Use This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD. This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.	Client EASTON UTILITIES Project COMMERCE WATER TREATMENT PLANT Project No. 12578222 Date 01/2023 Scale NOT TO SCALE	Title EROSION AND SEDIMENT CONTROL DETAILS Sheet No. C-303 Sheet of

Y:\0000\CADD STANDARDS\DETAILS\Civil Details\Easton Model Details\SPW-106.dwg Sep 13, 2012 - 12:23pm, (hub)

19.5mm SUPERPAVE ASPHALT
PLACED IN 2"-3" LIFTS

TACK COAT

EXISTING
SURFACE COURSE

EXISTING
BASE COURSE

UNDISTURBED
EARTH

CR-6 SUB-BASE
COMPACTED TO 95%
MODIFIED PROCTOR
(PATCH REPAIR ONLY)

PLACE AND MECHANICALLY TAMP
BACKFILL IN 8" LAYERS OF LOOSE
MATERIAL. COMPACT EACH LAYER TO
95% OF THE MODIFIED PROCTOR AT
±2% OPTIMUM MOISTURE CONTENT
PER ASTM D1557. UTILIZE SUITABLE
MATERIAL FROM THE EXCAVATION OR
SHA QUALITY SELECT BORROW.

MSHA SELECT BORROW
COMPACTED TO 95%
MODIFIED PROCTOR AT
±2% OPTIMUM
MOISTURE CONTENT

BEDDING, HAUNCHING AND INITIAL
FILL PER APPROPRIATE UTILITY DETAIL

SEE NOTE 3 FOR OVERLAY
REQUIREMENT

6" MIN.

12" MIN.

6" MIN.

NOTES:

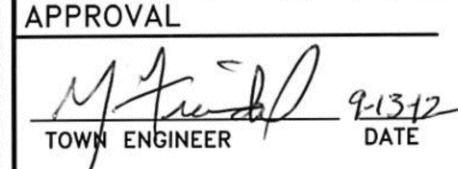
1. PAVEMENT SHALL BE SAW CUT FULL DEPTH OF THE EXISTING PAVEMENT SECTION. ALL
CUTS SHALL BE MADE IN STRAIGHT LINES.

2. WHEN STREET OPENING IS WITHIN MD STATE HIGHWAY ADMINISTRATION OR TALBOT
COUNTY RIGHT-OF-WAY, E.U.C. IS REQUIRED TO OBTAIN AN SHA OR TALBOT COUNTY
PERMIT AND APPLICABLE STATE OR COUNTY STANDARDS SHALL APPLY.

3. SURFACE RESTORATION ON ROAD CROSSINGS SHALL INCLUDE MILL AND OVERLAY 15"
ON EITHER SIDE OF TRENCH CENTERLINE. LONGITUDINAL TRENCHES SHALL INCLUDE MILL
AND OVERLAY FOR 1' FULL LANE WIDTH FOR 15' BEYOND EITHER END OF THE
EXCAVATION. SEE PW-1.07 AND PW-1.08 FOR DETAILS. SEE PW-1.09 FOR NOTES.

4. IF PATCH FALLS WITHIN 2' OF EXISTING CURB OR EDGE OF PAVING, CONTINUE
RESTORATION TO EDGE OF PAVE.

APPROVAL



TOWN ENGINEER

REVISED

JAN 1, 01

AUG 1, 01

SEP 1, 02

OCT 8, 10

JAN 1, 11

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

TEMPORARY TRENCH
RESTORATION DETAIL

ISSUED: MAY 1, 1986

SEP 14, 12

STANDARD NO.

PW-1.06

2'-0" 1"

Finished Grade
See PW-3.00

18"

32"

30"

24" Min.

30" MIN.

1" Elbow

10 Gauge Coated
Tracer Wire

PVC Pipe

Bricks

Provide Firm Base
For Box And Stone
For Drainage

1" Type K"
Copper Tubing
Water Service Pipe

1" Corporation
AWWA Taper Threads
Equivalent To Ford F1000-4

Stainless Steel Saddle
For PVC Main

Q PVC Water Main

45'

PROVIDE METER PER 2" WATER
METER SERVICE STANDARD W-7.03
TO ALLOW ACCESS TO INSTALLED
PRESSURE TRANSDUCER

Curb &
Gutter

Notes:

1. Stainless Steel Saddle Shall Be Equivalent To Ford FS303 Or
PowerSeal 3412AST.

2. PVC Main Shall Be Tapped With A Shell Type Cutter (Hole Cutter) That Will Retain
The Coupon In Accordance With UNI-BELL Plastic Pipe Association UNI-B-3.

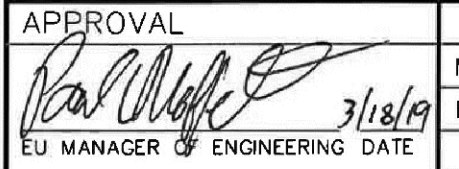
3. Meter Box (Ford No. PSBHC-488-20-36-18) Or An Approved Equal Furnished And
Installed By Contractor. Cover Must Be Polymer Nylon 12-25 Wall Type A
(Read-Rite) Lid With Water-Lock, Worm Gear And Bracket For Iron 100W ERT
Under Lid Or Equivalent. No Electronic Meter Reading Lid Hole.

4. Backfill And Tamp With Select Material To Pad Pipe. See Detail W-1.00.

5. 10 Gauge Coated Solid Copper Tracer Wire (Blue Jacket).

6. Thoroughly Tape Mechanical Connections With Electrical Tape.

APPROVAL



TOWN ENGINEER

REVISED

MAR 9, 95

MAR 1, 98

SEP 1, 09

NOV 1, 10

JUL 20, 11

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

1" WATER SERVICE
INSTALLATION - PVC WATER MAIN

ISSUED: AUG 1, 1994

MAR 18, 19

STANDARD NO.

W-7.02

CONSTRUCTION INSPECTIONS

CALL THE TOWN OF EASTON ENGINEERING DEPARTMENT AT
410-820-8822 PRIOR TO CONSTRUCTION AND IMMEDIATELY
FOLLOWING EACH OF THE FOLLOWING PHASES:

1. CONSTRUCTION OF PLANTER WALLS AND UNDER DRAIN AND BEFORE
BACKFILLING OVER LINER.

2. INSTALLATION OF PLANT MATERIALS.

SITE PLAN SYMBOL

FTP-###

TREATED AREA
(SQ. FT.)

CUT (TYP.)

FOLD (TYP.)

DISCARD

CUT OFF FOR FRONT

TURN DOWN

FOLD UP: SIDE

PLANTER

FOLD UP: BACK

FOLD UP: SIDE

(HOUSE NOT SHOWN
FOR CLARITY)

DIRECTION OF DOWNSPOUT FILTER
(IF USED)

TURN DOWN
DOWNSPOUT
WITH ELBOW

SPLASHBLOCK

GUTTER INFLOW DETAIL

LINER CUT/FOLD DETAIL

PLANTER WALL MATERIAL
PER OWNER'S
SPECIFICATION

EL: 3'-0" **

EL: 2'-6"

EL: 2'-3"

EL: 2'-0"

DAYLIGHT EMITTER
AT OR BELOW
BOTTOM OF
PLANTING SOIL

FINISHED GRADE

EL: 0'-0"

4" PVC TO
GRATE EMITTER

45 MIL. M-CLASS
RUBBER MEMBRANE
UNDER ASTM STD.
D-1418 OR APPROVED
EQUAL LINER. TURN
LINER DOWN TO FOOTER
ELEVATION.

12"x6"
CR-6
BASE

++ 18" DEPTH AFTER SETTLING
ONE WEEK MIN.

PLANTER CROSS SECTION

INSPECTION PORT
WITH CAP

3" TOPSOIL

AFFIX LINER 3"
FROM TOP

6" MIN.

FINISHED
GRADE

HOUSE

APPROVAL



TOWN ENGINEER

DATE

1/2020

ISSUED: JANUARY 2020

STANDARD NO:

TOE-SWM-5.01-1

TOWN OF EASTON
STANDARD DETAILS

FLOW-THROUGH PLANTER
PLAN AND SECTION

NOTE: ALL DIMENSIONS ARE
INTERIOR

4" SOLID PVC

GRATE EMITTER

45 MIL. EPDM LINER.
TURN DOWN TO FOOTER
ELEVATION

4" PVC PERF.
UNDERDRAIN &
INSPECTION PORT

LENGTH

WIDTH

HOUSE

6" MIN.

FOLD EPDM
LINER INTO
CORNER

PLAN VIEW

NOTE: ADDITIONAL WALL TYPES MAY
BE APPROVED BY THE TOWN
ENGINEER.

SURROUNDING
GRADE 2% MIN

SLOPE TOP OF BRICK
OR PRE-
CAST CAP BLOCK

PARGE OR INSTALL
STONE/BRICK VENEER

SURROUNDING
GRADE 2% MIN

8"x8"x16" CMU -
FOUR COURSES. FILL
BOTTOM 2 COURSES
WITH CONCRETE

24" LONG #4
REIN. BASE @
30" O.C.

8"x8" TREATED
LANDSCAPE TIMBERS, 6
COURSES TIED TOGETHER
WITH GALVANIZED SPIKES

TIMBER PLANTER

MASONRY PLANTER

WALL CONSTRUCTION DETAILS

MORTARED
STONE WALL

SURROUNDING
GRADE 2% MIN

STONE PLANTER

APPROVAL



TOWN ENGINEER

DATE

1/2020

ISSUED: JANUARY 2020

STANDARD NO:

TOE-SWM-5.01-2

TOWN OF EASTON
STANDARD DETAILS

FLOW-THROUGH PLANTER
CONSTRUCTION DETAIL

PLANT SELECTION

1. THE HOMEOWNER IS ENCOURAGED TO WORK WITH A
REGISTERED LANDSCAPE ARCHITECT OR NURSERY TO
CREATE AN ATTRACTIVE AND FUNCTIONAL MIX OF NATIVE
PLANT SPECIES THAT ARE TOLERANT OF BOTH
SATURATED AND DRY CONDITIONS.

2. INFORMATION ON APPROPRIATE SPECIES IS AVAILABLE BY
TYPING "BAYSCAPES NATIVE PLANTS" INTO YOUR
FAVORITE SEARCH ENGINE.

3. THE SCHEDULE AND TYPICAL DETAIL BELOW CAN BE USED
AS A BASIS FOR PLANT SELECTION AND GROUPINGS, IF
DESIRED.

CONSTRUCTION NOTES

1. PLANTERS SHALL BE CONSTRUCTED AFTER EXTERIOR
SIDING HAS BEEN INSTALLED.

2. LANDSCAPING MATERIALS SHOULD BE INSTALLED DURING
THE SPRING OR FALL FALL IF POSSIBLE.

3. GUTTER SCREENS AND/OR DOWNSPOUT FILTERS SHALL BE
PROVIDED TO PRE-TREAT ANY ROOF AREAS THAT FLOW
INTO A PLANTER. DOWNSPOUT FILTERS SHALL BE
ORIENTED SO LEAVES AND DEBRIS FALL OUTSIDE THE
PLANTER. (TYPE "DOWNSPOUT FILTER" IN YOUR FAVORITE
SEARCH ENGINE TO FIND EXAMPLES FOR PURCHASE.)

FLOW-THROUGH PLANTER LANDSCAPE SCHEDULE

BOTANICAL NAME	COMMON NAME	SIZE	PLANTER SIZE (SQ. FT.)			
			70	140	210	280
QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.
SHRUBS:						
ILEX GLABRA (MALE ONLY)	INKBERRY	2 GAL.	PICK	PICK	PICK	PICK
ARONIA MELANOCARPA	BLACK CHOKEBERRY	2 GAL.	ONE	ONE	TWO	TWO
MYRICA CERIFERA	BAYBERRY	2 GAL.				
GROUND COVER:						
ANDROPOGON VIRGINICUS	BROOMSEDGE	PLUG	3	4	6	8
LIATRIS SPICATA	BLAZING STAR	PLUG	0	2	3	4
SEMPERVIVUM GLOBIFERUM	HENS & CHICKS	PLUG	3	4	6	8

SOIL SPECIFICATIONS

1. THE PLANTING SOIL SHALL HAVE A COMPOSITION OF 50%
SAND, 20% COMPOSTED LEAVES, AND 30% TOPSOIL.

2. TOPSOIL SHALL BE OF UNIFORM COMPOSITION, FREE OF
STONES, DEBRIS, STUMPS, ROOTS OR SIMILAR OBJECTS
LARGER THAN ONE INCH.

3. TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF
BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS,
MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE.

SIZING CHART

TREATED AREA (SQ. FT.)	PLANTER AREA (SQ. FT.)	SUGGESTED INTERIOR DIMENSIONS	
		LENGTH	WIDTH
250	10	4	3
500	20	7	3
750	30	8	4
1000	40	10	4

MAINTENANCE CRITERIA:

1. WATER PLANTS LIBERALLY THE FIRST GROWING SEASON
AND DURING PERIODS OF DROUGHT THEREAFTER.

2. REMOVE ACCUMULATED TRASH AND VEGETATIVE DEBRIS
EVERY FEW MONTHS.

3. PRUNE AND REMOVE DEAD VEGETATION PERIODICALLY.
AS WITH ANY LANDSCAPE BED, IF SPECIFIC PLANTS ARE
NOT SURVIVING, REPLACE WITH A DIFFERENT SPECIES.
WATERING MAY BE REQUIRED DURING PROLONGED DRY
PERIODS.

4. SILT AND SEDIMENT SHOULD BE REMOVED FROM THE
SURFACE OF THE FILTER BED WHEN ACCUMULATION
EXCEEDS ONE INCH.

5. THE TOPSOIL AND FILTER MEDIA SHOULD BE REMOVED
AND REPLACED WHEN WATER PONDING FOR MORE THAN
48 HOURS. EXISTING PLANT MATERIAL CAN BE
TEMPORARILY REMOVED AND RE-PLANTED IN THE NEW
SOIL.

APPROVAL



TOWN ENGINEER

DATE

1/2020

ISSUED: JANUARY 2020

STANDARD NO:

TOE-SWM-5.01-3

TOWN OF EASTON
STANDARD DETAILS

FLOW-THROUGH
PLANTER NOTES

8'-0" MIN.
REPAIR WIDTH

1'-0" MIN.

1'-0" MIN.

PORTLAND CEMENT CONCRETE

CR-6

NOTES:

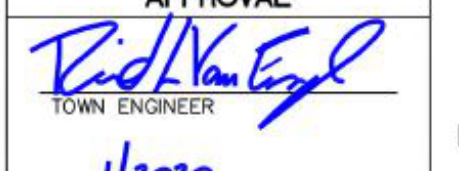
1. PAVEMENT SHALL BE SAW CUT FULL DEPTH OF THE EXISTING PAVEMENT SECTION. ALL CUTS SHALL BE
MADE IN STRAIGHT LINES.

2. IF PATCH FALLS WITHIN 2' OF EXISTING CURB OR EDGE OF PAVING, CONTINUE RESTORATION TO EDGE OF
PAVE.

3. ADDITIONAL MILL AND OVERLAY MAY BE REQUIRED WHEN MULTIPLE PAVEMENT REPAIRS ARE LOCATED IN
THE SAME RELATIVE VICINITY. LIMITS OF MILL AND OVERLAY, WHEN REQUIRED, WILL BE DETERMINED BY THE
TOWN ENGINEER.

4. WHEN SURFACE AREAS OF REPAIR EXCEEDS 100 SF, THE 2" SURFACE COURSE SHALL EXTEND ENTIRE WIDTH
OF TRAVEL LANE(S) AND/OR SHOULDER. LIMITS OF MILL AND OVERLAY, WHEN REQUIRED, WILL BE
DETERMINED BY THE TOWN ENGINEER.

APPROVAL



TOWN ENGINEER

DATE

1/2020

ISSUED: JANUARY 2020

STANDARD NO:

TOE-R-5.01-5

TOWN OF EASTON
STANDARD DETAILS

PERMANENT CONCRETE PAVEMENT
REPAIR FOR UTILITY TRENCHES

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:

TOWN OF EASTON - TOWN PLANNER

DATE

APPROVED:

TOWN OF EASTON - TOWN ENGINEER

DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING

DATE

B 60% SUBMITTAL				ALT	JHC	2023 01 19
A 30% SUBMITTAL				ALT	JHC	2022 08 19
No.	Issue	Checked	Approved	Date		
Author	K. LARSON	Drafting Check	K. LARSON	Project Manager	J. CANNON	
Designer	A. THRON	Design Check	A. THRON	Project Director	K. GEORGE	

Bar is one inch on
original size sheet
0 1"



GHD Inc.

16701 Melford Boulevard, Suite 330

Bowie MD 20715 USA

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Client

EASTON UTILITIES

Project

COMMERCE WATER TREATMENT
PLANT

Project No.

12578222

Date

01/2023

Scale

NOT TO SCALE

Title

MISCELLANEOUS CIVIL DETAILS 2

Size

ANSI D

Status Code

Sheet No.

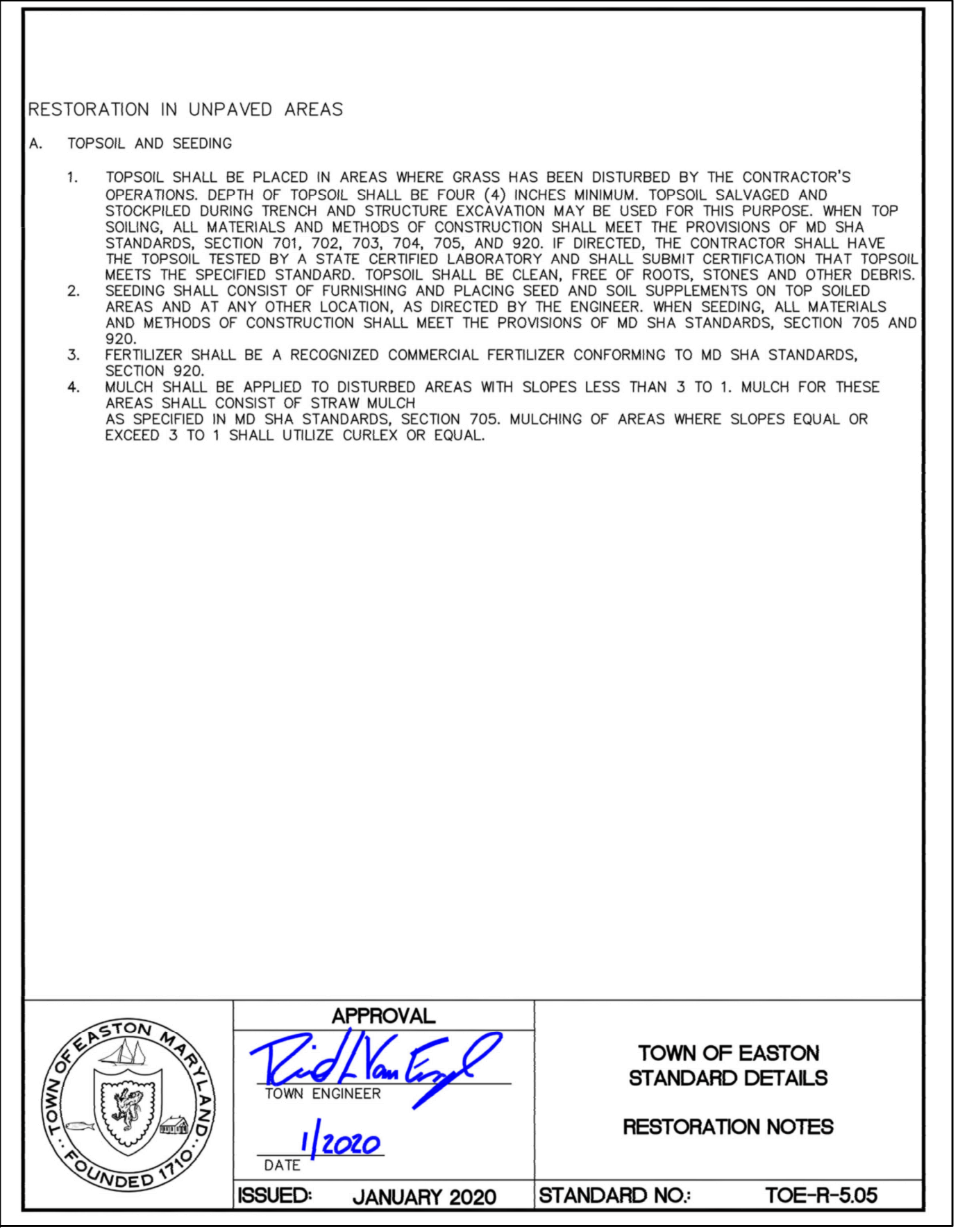
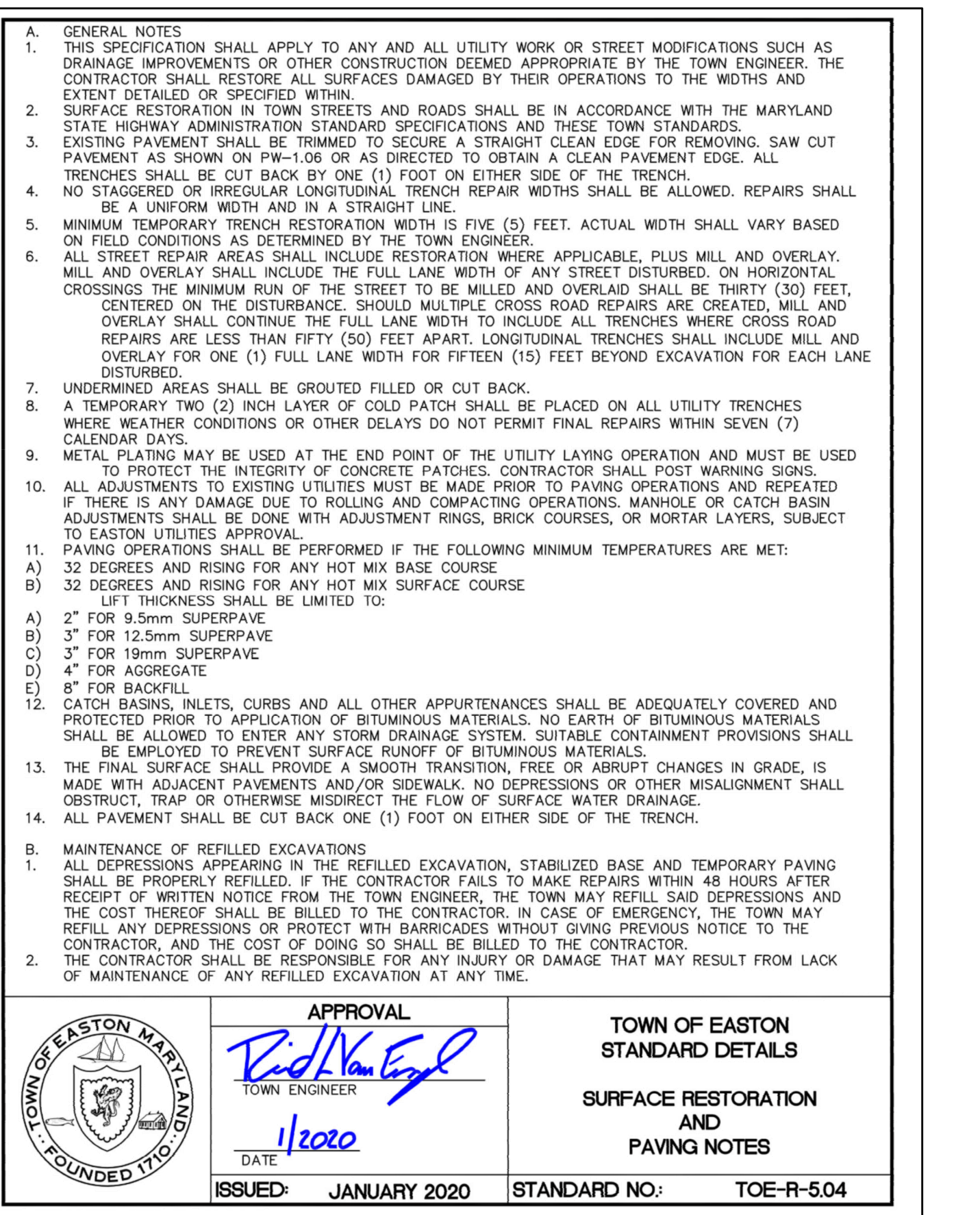
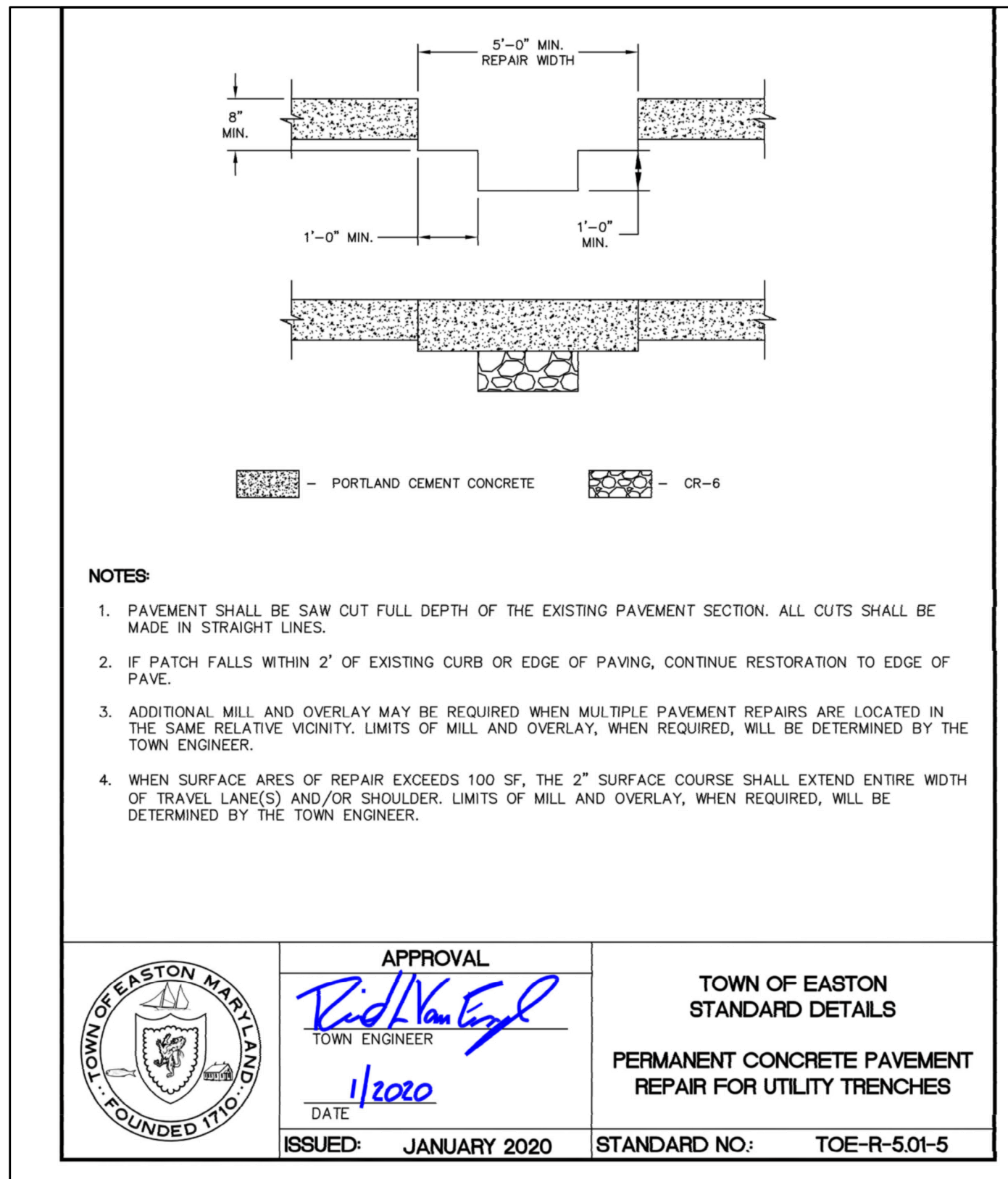
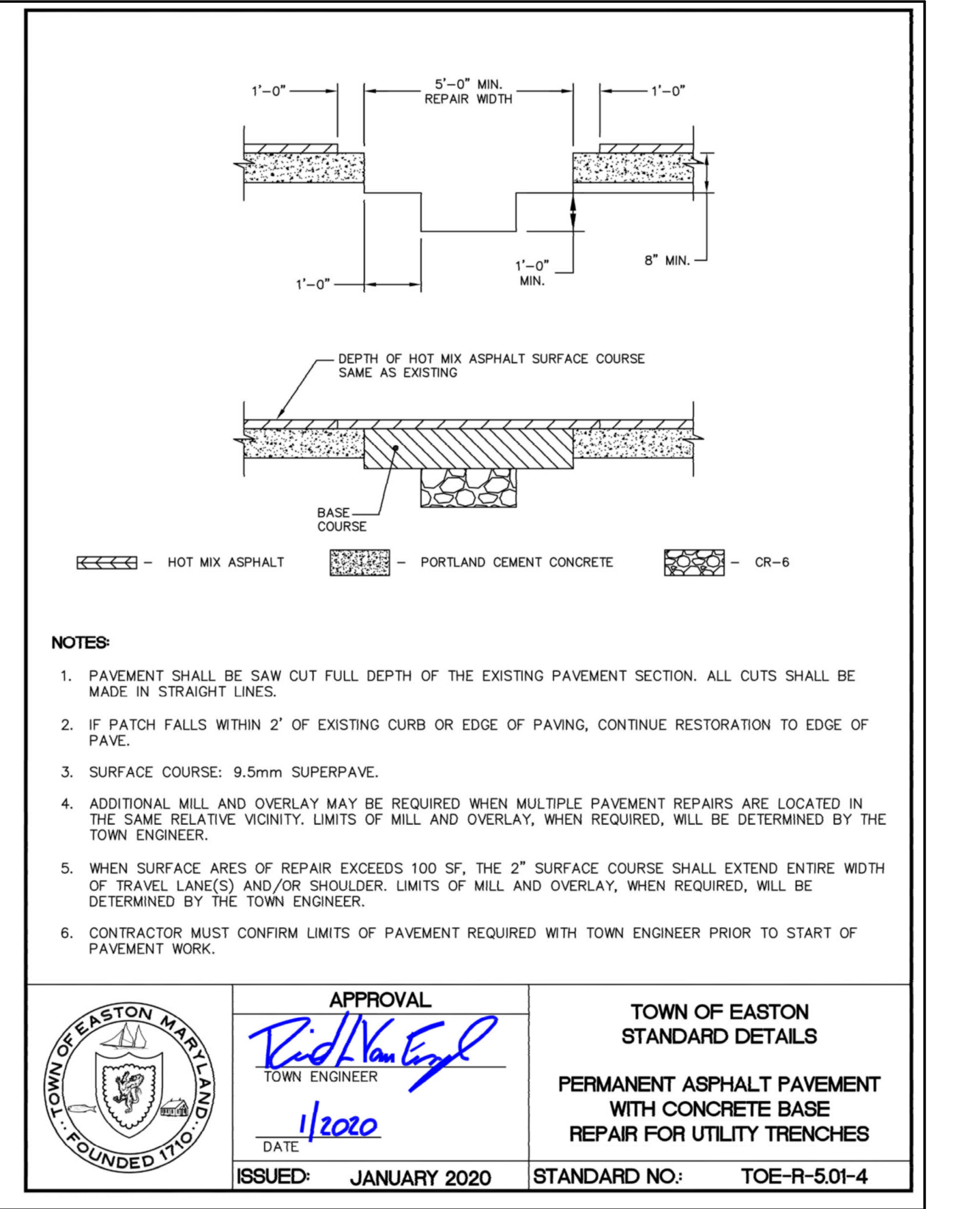
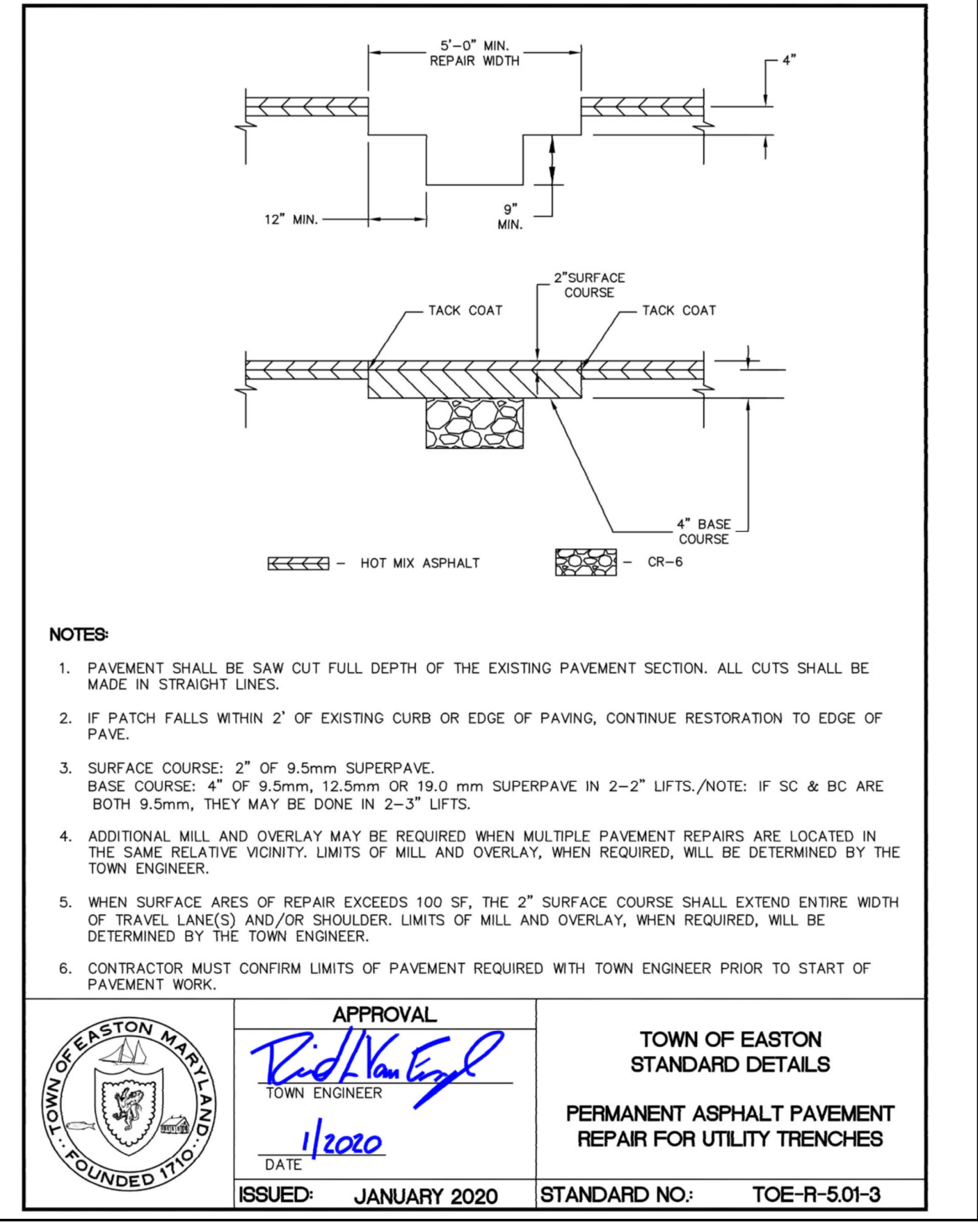
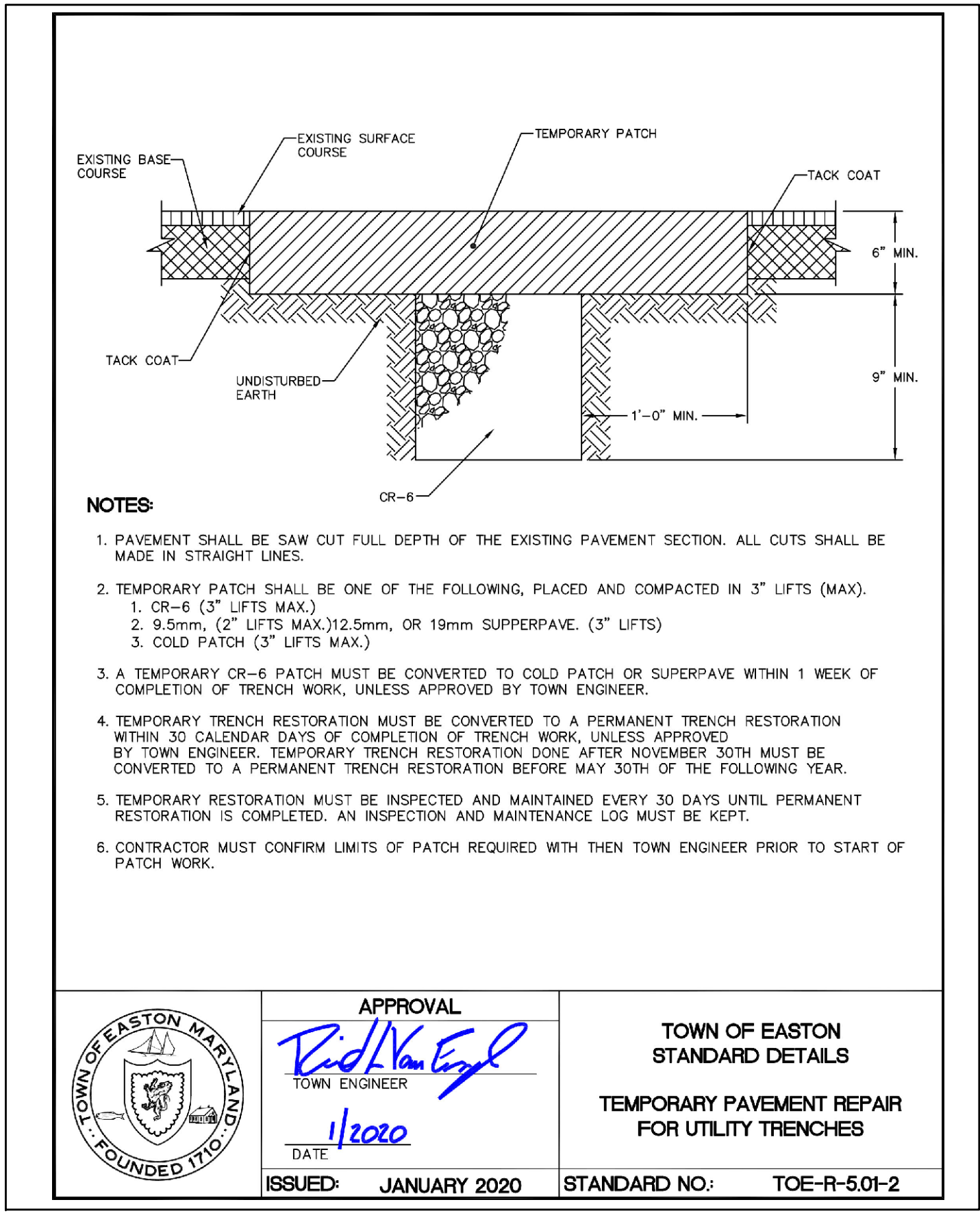
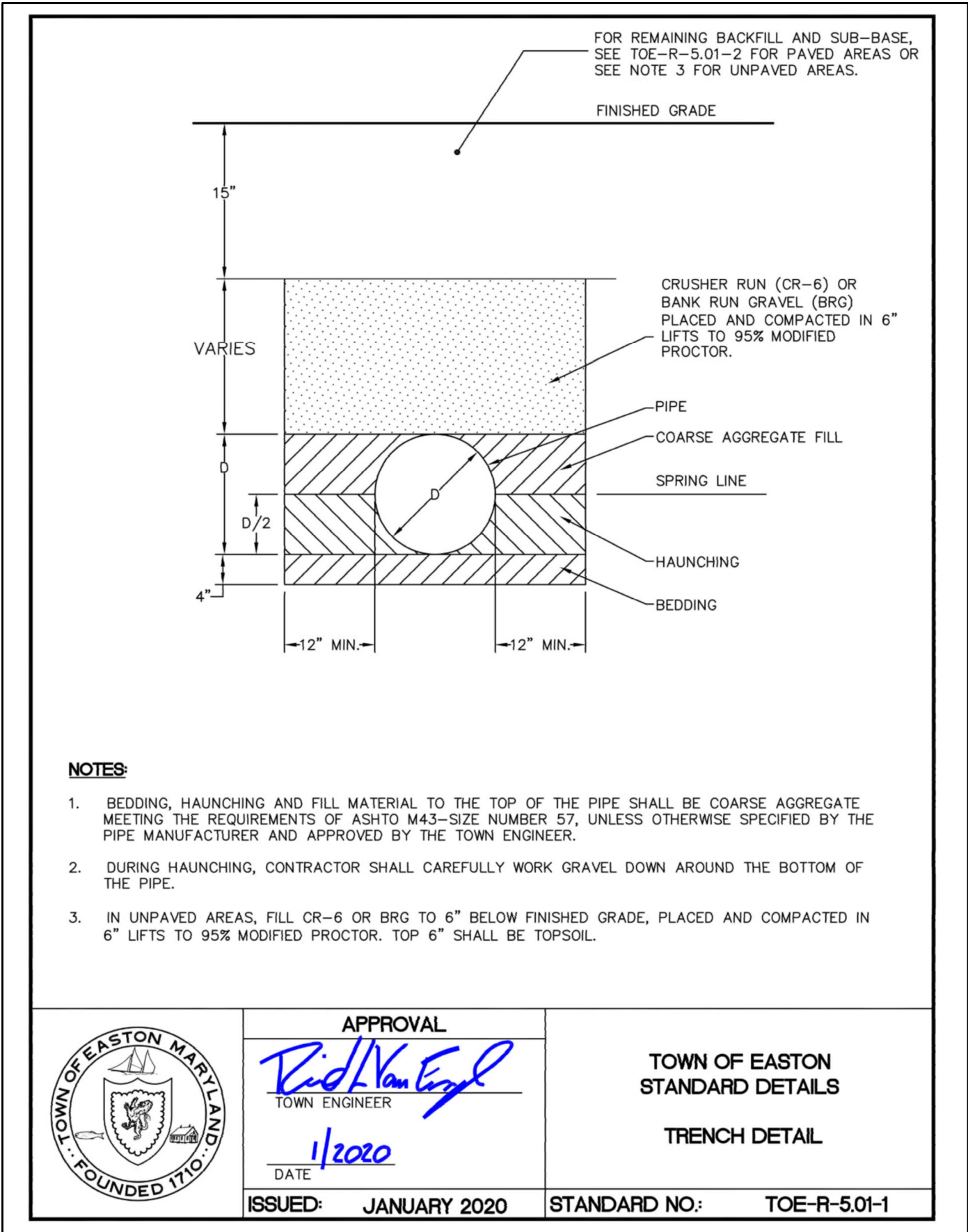
C-902

Sheet

of

Plot Date: 28 February 2023 - 2:41 PM Plotted By: Kristopher Larson Path and Filename: G:\5651\12578222\Digital_Design\ACAD\Sheets\Civil\12578222-GHD-DWG-C-902.dwg

Page 588 of 595



PRELIMINARY - NOT FOR CONSTRUCTION

APPROVED:

TOWN OF EASTON - TOWN PLANNER DATE

APPROVED:

TOWN OF EASTON - TOWN ENGINEER DATE

APPROVED:

EASTON UTILITIES - MANAGER OF ENGINEERING DATE

B	60% SUBMITTAL	ALT	JHC	2023 01 19	
A	30% SUBMITTAL	ALT	JHC	2022 08 19	
No.	Issue	Checked	Approved	Date	
Author	K. LARSON	Drafting Check	K. LARSON	Project Manager	J. CANNON
Designer	A. THRON	Design Check	A. THRON	Project Director	K. GEORGE

Plot Date: 28 February 2023 - 2:42 PM

Plotted By: Kristopher Larson

Path and Filename: G:\56912578222\Digital_Design\ACAD\Sheets\Civil\12578222-GHD-DWG-C-903.dwg

Bar is one inch on original size sheet

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Client **EASTON UTILITIES**

Project **COMMERCE WATER TREATMENT PLANT**

Project No.
12578222

Date
01/2023

Scale
NOT TO SCALE

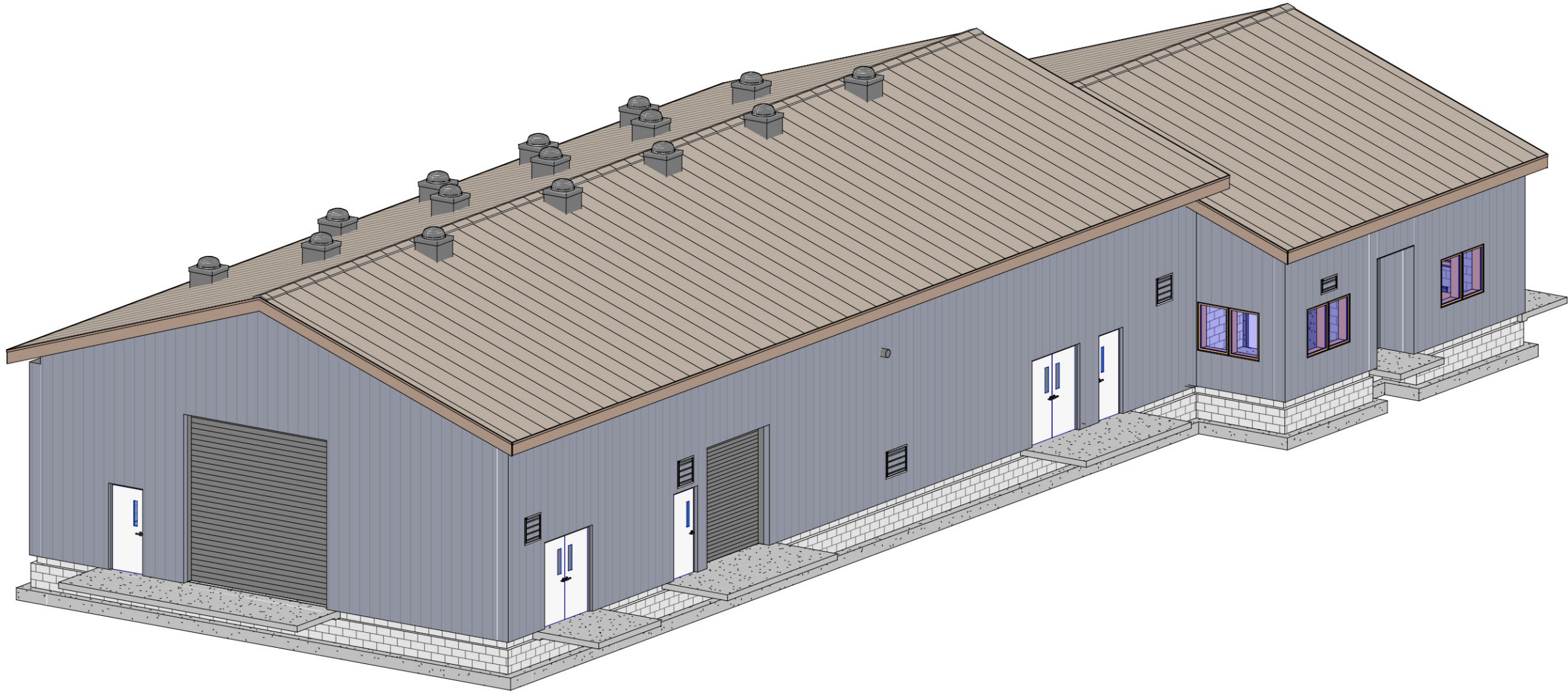
Title **MISCELLANEOUS CIVIL DETAILS 3**

Size
ANSI D

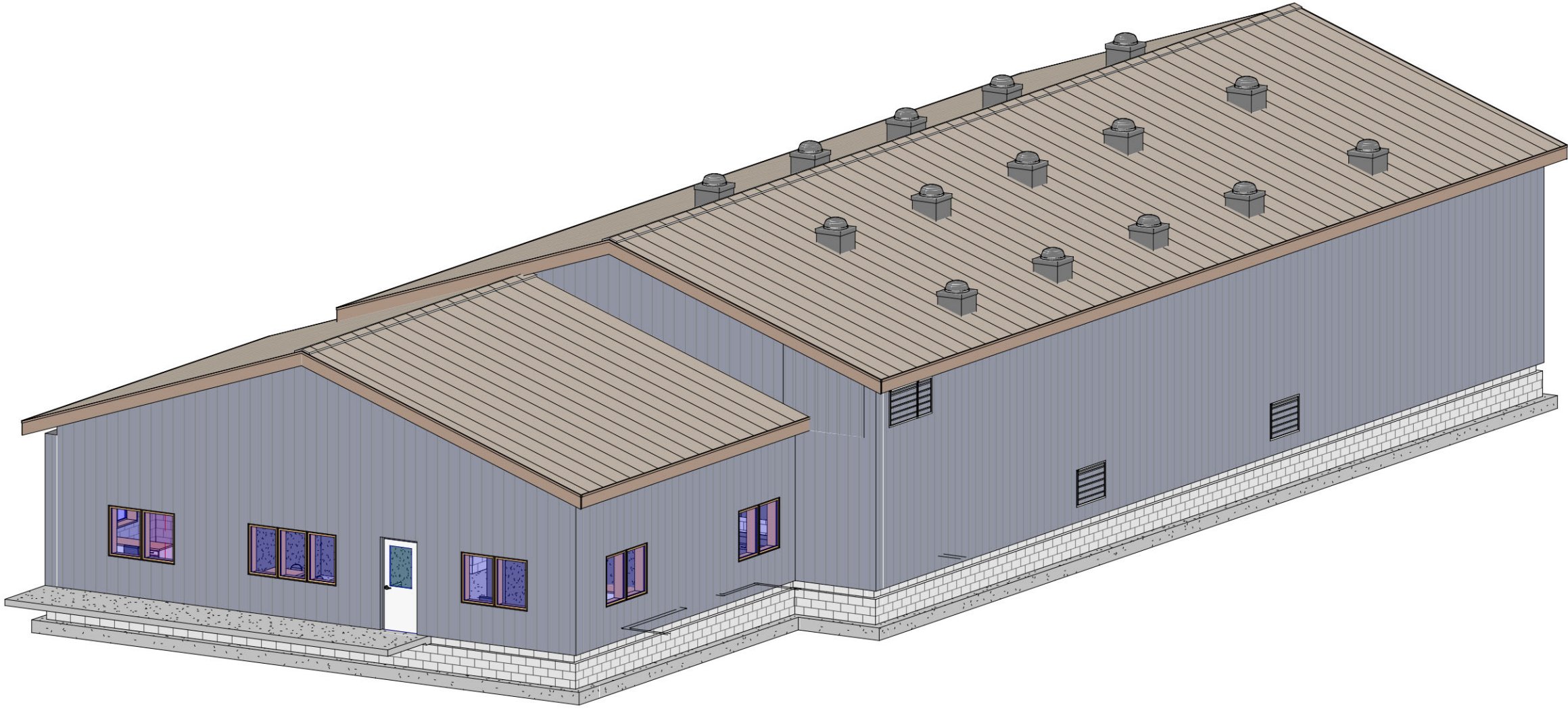
Status Code

Sheet No.
C-903

Sheet
of



2 VIEW FROM SOUTH-WEST



1 VIEW FROM NORTH-EAST

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:	
TOWN OF EASTON - TOWN PLANNER	DATE
APPROVED:	
TOWN OF EASTON - TOWN ENGINEER	DATE
APPROVED:	
EASTON UTILITIES - MANAGER OF ENGINEERING	DATE

B 60% SUBMTTAL		ALT		JHC	2023 01 19
A 30% SUBMTTAL		ALT		JHC	2022 08 19
No.	Issue	Checked		Approved	Date
Author	H. GOWDA	Drafting Check	K. LARSON	Project Manager	J. CANNON
Designer	H. GOWDA	Design Check	E. RUSTEN	Project Director	K. GEORGE

Bar is one inch on
original size sheet

0 1"



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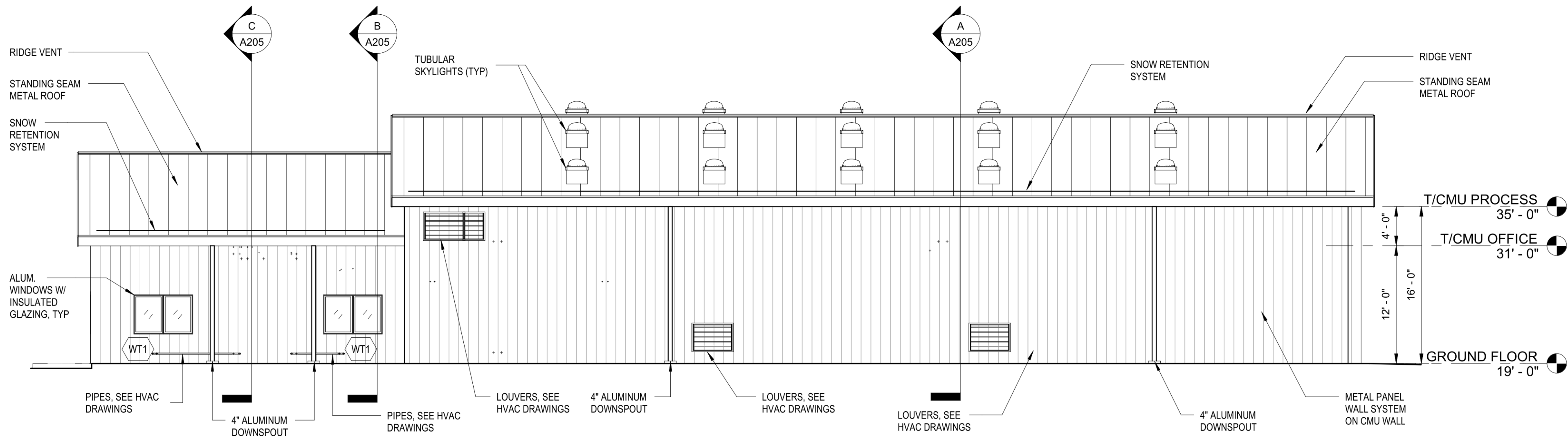
Client **EASTON UTILITIES**
Project **COMMERCE WATER TREATMENT PLANT**

Project No. **12578222** Date **Jan. 19, 2023** Scale

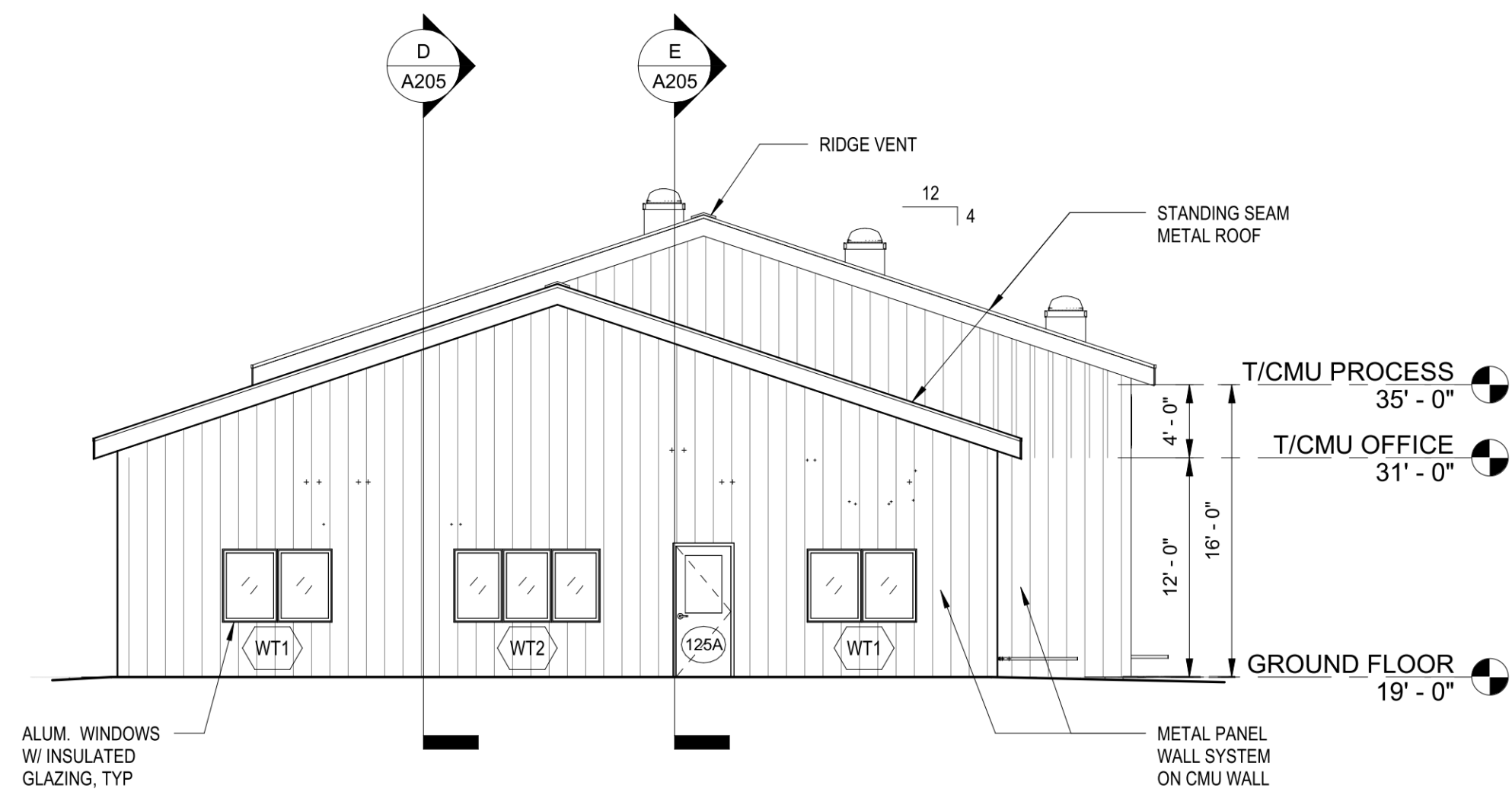
Title **WTP BUILDING ISOMETRIC VIEWS**

Sheet No. **A202**

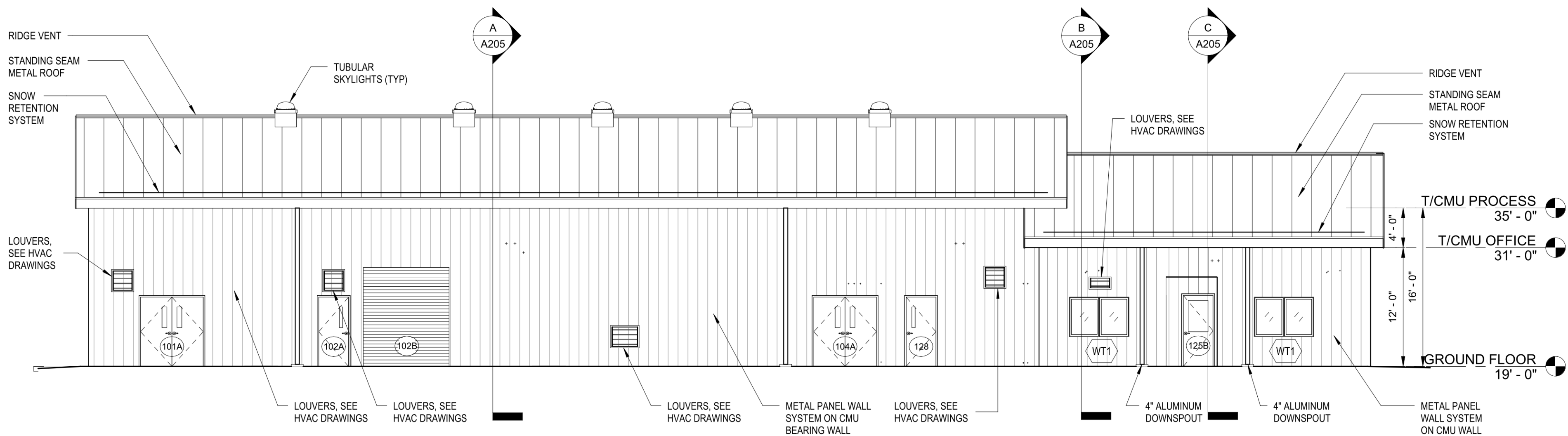
Size **ANSI D**
Status Code



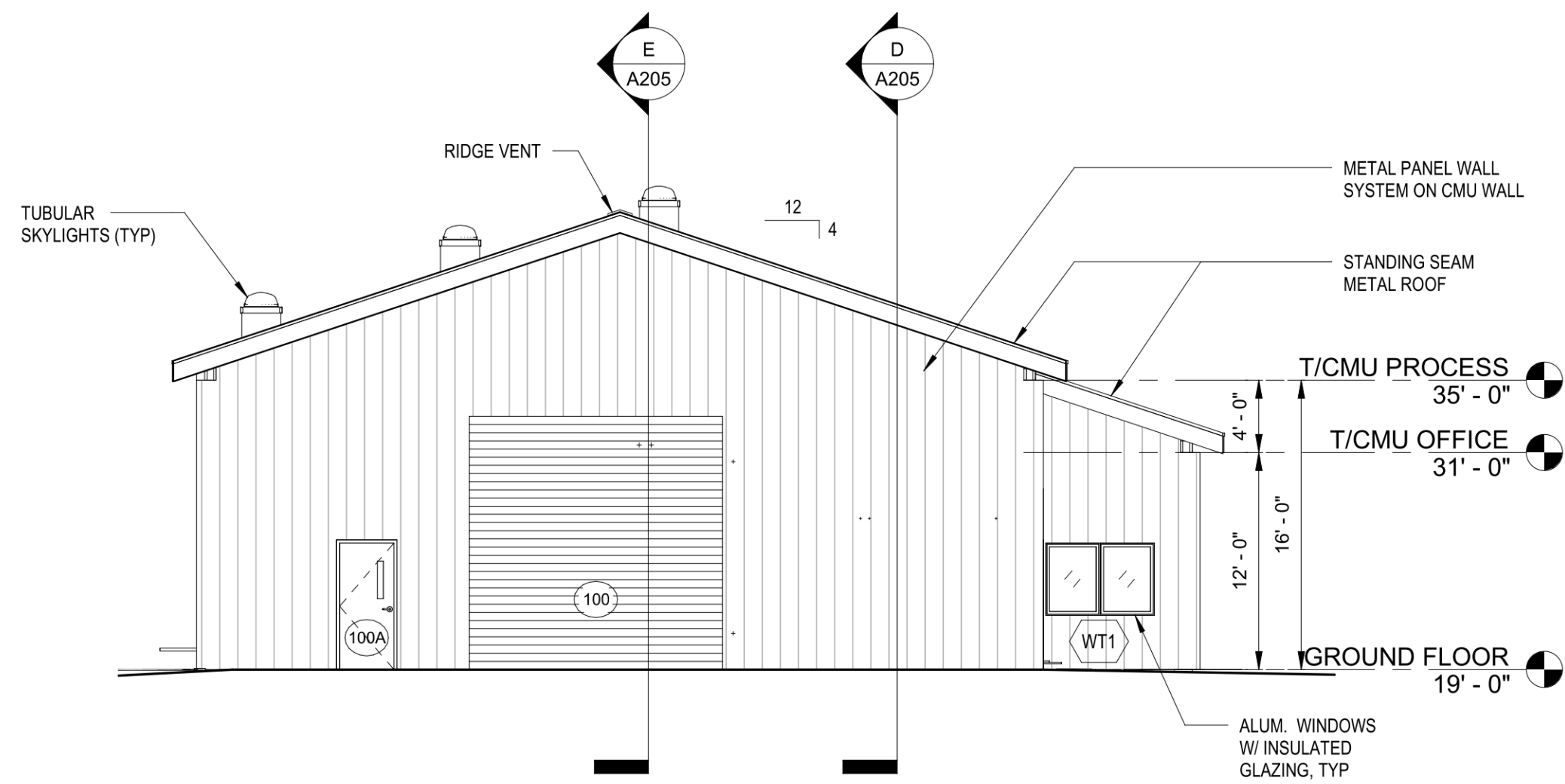
1 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
SCALE: 1/8" = 1'-0"



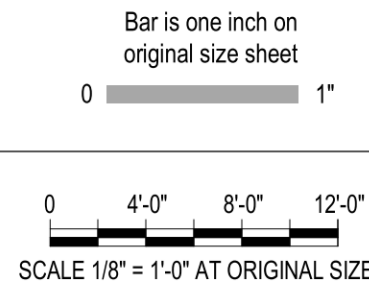
3 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



4 WEST ELEVATION
SCALE: 1/8" = 1'-0"

PRELIMINARY -
NOT FOR CONSTRUCTION

APPROVED:	
TOWN OF EASTON - TOWN PLANNER	DATE
APPROVED:	
TOWN OF EASTON - TOWN ENGINEER	DATE
APPROVED:	
EASTON UTILITIES - MANAGER OF ENGINEERING	DATE



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Client **EASTON UTILITIES**
Project **COMMERCE WATER TREATMENT PLANT**

Project No. **12578222** Date **Jan. 19, 2023** Scale **1/8" = 1'-0"**

Title **WTP BUILDING EXTERIOR ELEVATIONS**

Size **ANSI D**
Status Code
Sheet No. **A204**

APPENDIX B

SKETCH PLAN SUBMITTAL CHECKLIST

NOTE: THIS CHECKLIST REPRESENTS THE MINIMUM INFORMATION TO BE SUBMITTED ON A SITE PLAN. ADDITIONAL INFORMATION MAY BE REQUIRED FOR UNIQUE SITUATIONS.

COMPLETE THE CHECKLIST AND SUBMIT IT WITH THE PLAN. IF AN ITEM IS NOT APPLICABLE, ENTER "N/A".

- | | |
|--|------------|
| 1. Location map, | <u>X</u> |
| 2. Boundary, | <u>X</u> |
| 3. Topography, | <u>X</u> |
| 4. General proposed land uses drawn to scale, and | <u>X</u> |
| 5. The Forest Stand Delineation as detailed in the Town of Easton's Forest Conservation Ordinance. | <u>N/A</u> |
| 6. The location of any easements, rights-of-way or any other encumbrances which pertain to the property subject to the site plan review. | <u>X</u> |
| 7. Conditions of concern, for example, water courses, wetlands, floodplains, or other environmentally sensitive features. | <u>X</u> |
| 8. Location of refuse collection, exterior lighting, fencing, and all pedestrian walkways and sidewalks. | <u>N/A</u> |
| 9. General location and description (r.e. intended function, proposed species, etc.) of proposed landscaping. | <u>N/A</u> |
| 10. Location of parking including layout and landscaping. | <u>N/A</u> |
| 11. Conceptual building elevations or renderings illustrating the character, scale, and materials of all proposed structures. Such elevations or renderings shall be sealed by a licensed professional as described above. | <u>X</u> |
| 12. A statement describing the extent to which the application complies with the Recommended Design Principles for Easton set forth on pages 29-31 of the Comprehensive Plan. | <u>X</u> |

APPENDIX B-2

SKETCH STORMWATER MANAGEMENT PLAN SUBMITTAL CHECKLIST

EFFECTIVE MAY 4, 2010

NOTE: THE FOLLOWING CHECKLIST REPRESENTS THE MINIMUM INFORMATION TO BE SUBMITTED FOR SUPPORT OF A STORMWATER MANAGEMENT CONCEPT PLAN, SITE DEVELOPMENT PLAN, AND/OR FINAL DESIGN PLAN. THE TOWN MAY REQUEST ADDITIONAL INFORMATION AS DEEMED NECESSARY.

COMPLETE THE APPROPRIATE CHECKLIST AND SUBMIT IT WITH THE PLANS, APPLICATION FORM, NARRATIVE OR REPORT, AND FEE. ITEMS IN BOLD ARE REQUIRED FOR CONCEPT AND/OR SITE DEVELOPMENT PHASE REVIEW.

I. Sketch Plan Submittal

A. Site and Resource Map

Natural Resources Identified on Plan, including, but not limited to:

Please use these responses for the following:

(Provided = P; Not Provided = NP; Not Applicable = N/A)

Tidal and Non-Tidal Wetland Boundaries	N/A	
Wetland Buffers		N/A
Floodplain Boundaries and Elevations	N/A	
Streams and other Waterways	N/A	
Stream Buffers	N/A	
Forest Boundaries		N/A
Forest Buffers	N/A	
Critical Areas	N/A	
Steep Slopes (>25%)	P	
Erodible Soils	P	
Areas of High Recharge	N/A	
Springs		N/A
Soil Types and Hydrologic Soil Groups	P	
Bedrock and/or other Geologic Features	N/A	
Vegetative Cover		P
Existing Drainage Areas and Flow Patterns	P	
Existing Stormwater Outfalls	P	
Site and Resource Map field verified by a properly licensed design professional.	P	

Existing contours (1' max intervals) and utilities shown. P

Large tracts of contiguous open spaces, forested areas and other important resources protected by conservation easements.

N/A

Opportunities for afforestation identified.

N/A

Wetland, stream and forest buffers enhanced and/or

expanded.

N/A

B. Site Fingerprinting and Development Layout

Locations of proposed impervious areas provided.

P

Proposed contours (1' max intervals) and utilities shown.

P

Preliminary locations of proposed Environmental Site Design (ESD) practices provided.

P

Locations of stormwater outfalls and conveyance provided with offsite storm drains, culverts and grass channels with size and slope.

P

Limit of disturbance and extent of clearing & grading.

P

Site natural resources protected during construction.
If site natural resources must be disturbed during construction, please include an explanation in the stormwater narrative.

P

Better Site Design Techniques incorporated, including:

Sheetflow and overland flow provided wherever possible

P

Building footprint and site layout designed to protect conservation areas

N/A

Proposed streets, rights of way, and/or sidewalks with modifications to reduce impervious area

N/A

Landscaped medians and/or cul-de-sacs

N/A

Stormwater management features in medians or cul-de-sacs

N/A

Private open road section with grass channels and/or biofilters

N/A

Minimize numbers of parking spaces and sizes

N/A

Narrow frontages to reduce road length

N/A

Site graded to encourage runoff from impervious areas to pervious areas or other natural conveyance systems

P

C. Stormwater Narrative

Title Page includes:

Job Name

P

Owner/Developer

P

Design Professional

P

Date Prepared

P

Seal and Signature (properly licensed Design Professional)

P

Project is identified as new development or redevelopment.
(Redevelopment projects have $\geq 40\%$ total site imperviousness)

P

Project and streets designed for 2-year and 10-year quantitative management. N/A

Project is identified as being within the Tanyard Branch Watershed. (Projects within this watershed must manage proposed 10-year storm flows to the existing 2-year storm discharge rate.) N/A

A narrative that supports the concept and describes how the design will achieve:

Natural resource protection and enhancement	<u>P</u>
Maintenance of natural flow patterns	<u>P</u>
Reduction of impervious areas through better site design, alternative surfaces, and non-structural practices	<u>P</u>
Implementation of ESD planning techniques and practices to the Maximum Extent Practicable (MEP)	<u>P</u>
Preliminary ESD sizing calculations provided	<u>P</u>
Integration of erosion and sediment controls (ESC) into the stormwater strategy	<u>P</u>

D. Sketch Plan Meeting

Following the Sketch Plan submittal, a meeting will be scheduled between the Town of Easton Planning & Zoning, Town Engineer, the Talbot County Soil Conservation District (SCD) ESC reviewer, the owner/developer, the SWM and ESC designer(s), and any other reviewers deemed necessary by the Town of Easton and/or the Talbot County SCD. Official Minutes from the Sketch Plan Meeting must be submitted for review and acceptance by all parties. These minutes must accompany all future submittals. _____

This checklist completed by Madeline Selick Barbalance Date 02/28/2023