



**Town of Easton/Talbot County
Joint Planning Commission Meeting
Poplar Hill Supplemental Growth Allocation
Tuesday, April 4, 2023 – 5:30 PM
40 E. Dover Street, Avalon Theater**

This meeting will be live streamed to the MCTV YouTube channel:

[youtube.com/midshorecommunitytelevision](https://www.youtube.com/midshorecommunitytelevision)

It will also be rebroadcast at a later time on MCTV: Channel 15 on Easton Cable.

1. Call to Order

2. New Business

- a. Applicant:** 501 SHR, L.C.
Agent: Ryan Showalter, MDSW
Location: Oxford Road, Poplar Hill
Tax Map 42, Grid 004, Parcel 0057
Zoning District: R-10A
Request: The applicant is seeking a recommendation from the Planning Commission to the Town Council for the granting of supplemental growth allocation from Talbot County for the purpose of reclassifying approximately 65.977 acres of land located in the Critical Area, designated as Resource Conservation Area to be reclassified as Intensely Developed Area. The area of land is part of a proposed Planned Unit Development that includes 456 residential units, a commercial area consisting of two office buildings and two retail buildings, a public park to be dedicated to the Town of Easton, community open space, walking trails, two community clubhouses and swimming pools, and a satellite fire department building.

3. Adjournment



TOWN OF EASTON

PLANNING & ZONING

PO Box 520

Easton, Maryland 21601

(410)-822-2526

Date of Hearing: April 4, 2023

**TOWN OF EASTON/TALBOT COUNTY
JOINT PLANNING COMMISSION MEETING
JOINT PUBLIC HEARING
STAFF REPORT**

SUBJECT: Supplemental Growth Allocation Request for Poplar Hill

ELECTION WARD: Ward 3

STAFF CONTACT: Miguel Salinas, Director of Planning and Zoning

APPLICANT: 5001 SHR, L.C.

PURPOSE: The applicant is seeking a recommendation from the Planning Commission to the Town Council for the granting of supplemental growth allocation for the purpose of reclassifying approximately 65.977 acres of land located in the Critical Area, designated as Resource Conservation Area (RCA) to be reclassified as Intensely Developed Area (IDA).

RECOMMENDATION:

Staff: Staff supports a Planning Commission recommendation to the Town Council of approval of the request to reclassify the land management designation of Tax Map 42, Parcel 57, also known as Poplar Hill, from Resource Conservation Area to Intensely Developed Area, subject to conditions (see below).

APPLICATION INFORMATION:	
APPLICANT: 501 SHR, L.C. 9161 Liberia Avenue Manassas, Virginia 20110	REPRESENTATIVE: Ryan Showalter MDSW 100 N. West Street Easton, MD 21601

PARCELS/ACREAGE:	
Parcel Information	Acreage
Tax Map 42, Grid 04, Parcel 57	120.4760 acres
ACCEPTANCE DATE: July 7, 2022 Revised, October 21, 2022 Revised, January	LOCATION: Oxford Road Easton, Maryland 21601
EXISTING ZONING Residential District (R-10A)	EXISTING LAND USE: Vacant
HISTORIC DISTRICT: Not Applicable	FUTURE PLANNED LAND USE: Residential

CONTEXT:

Location/Site Access – The subject property is located adjacent to the Easton Parkway (Route 322) and Oxford Road (Route 333). Current site access from Tristan Drive which is further accessed from Route 322).

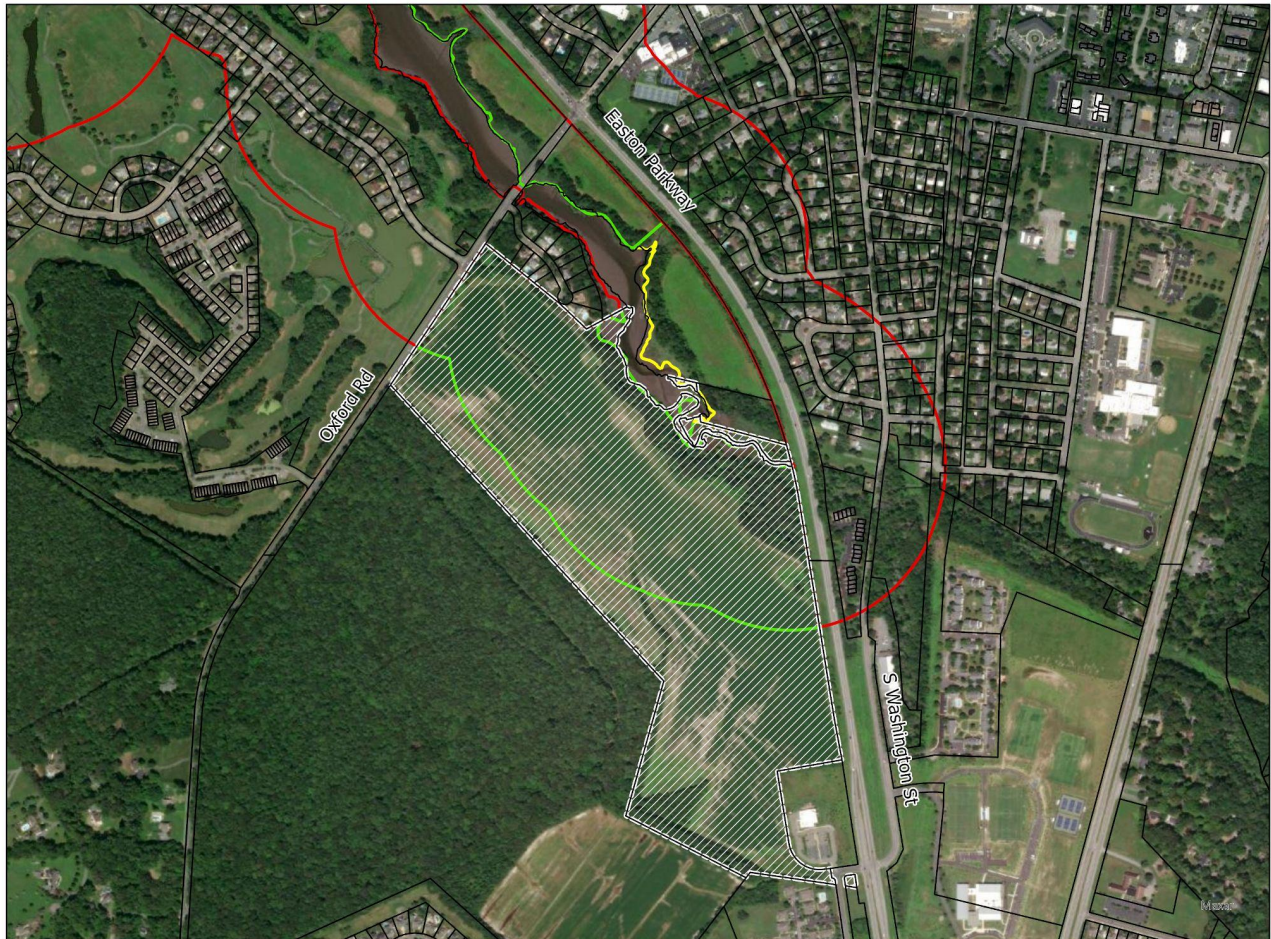
Existing Conditions – The subject property is vacant and can generally be described as an open field with minimal peripheral forest cover with the exception of the aforementioned Critical Area Shoreline Development Buffer (Buffer). There are nontidal wetlands dispersed along the subject property’s western boundary and a nontidal wetland located at the northeast corner of the subject property adjacent to an open space for the purpose of stormwater management (SWM) in the Papermill Crossing subdivision. The subject property contains a 100-foot Buffer associated with Windmill Branch. A portion of the Buffer is expanded for steep slopes and highly erodible soils. There is also a nontidal wetland adjacent to the southern end of the expanded Buffer adjacent to Route 322. There is forest cover associated with Windmill Branch. Lastly, there is a Special Flood Hazard Area (AE-5) located along the edge of Mean High Water (MHW) of Windmill Branch.

Surrounding Properties –

	<i>Land Use</i>	<i>Zoning District(s)</i>	<i>Future Planned Land Use</i>
<i>North</i>	Residential	R-10A	Residential
<i>South</i>	Institutional Residential	R-10A R-10A	Residential
<i>East</i>	Residential	R-10A	Residential

West	Vacant	R-10A	
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Figure 1: Vicinity Map



PROPOSAL: 501 SHR, L.C. (applicant) is seeking a recommendation from the Planning Commission to the Town Council for the granting of supplemental growth allocation from Talbot County for the purpose of reclassifying approximately 65.977 acres of land located in the Critical Area and on the subject property, designated as Resource Conservation Area, to be reclassified as Intensely Developed Area. The area of land is part of a proposed mixed-use Planned Unit Development (PUD) called Poplar Hill that includes 456 residential units, a commercial area consisting of two office buildings and two retail buildings, a public park to be dedicated to the Town of Easton, community open space, walking trails, two community clubhouses and swimming pools, and a satellite fire department building¹.

¹ Residential consists of 108 single-family detached homes, 138 single-family attached villa townhomes, and 210 multi-family apartments.

Per the requirements of COMAR Sec, 27.01.02.06-1, the applicant submitted:

- Conceptual Site Plan (Plan)
- Environmental Features Map that indicates the delineated nontidal wetlands were verified by the Maryland Department of the Environment (MDE) and the U.S. Army Corps of Engineers
- Environmental Report
- Map showing the area of the requested growth allocation (Aerial Context Plan and Sheet 2 of the Plan)
- A growth allocation application that includes a supplemental narrative addressing growth allocation criteria
- Maryland Department of Natural Resources (DNR) letter indicating a determination there are no official State or Federal records for listed plant or animal species within the RCA
- MDE letter (included in the applicant's supplemental narrative)

Staff verified that the amount of the proposed growth allocation indicated on the Environmental Features Map and the Plan is accurate and equal to the amount of growth allocation to be deducted from Talbot County's existing total allotment of growth allocation.

Stormwater Management (SWM) information submitted includes a Concept SWM Report, Fifteen Percent (15%) Phosphorus Removal Worksheet, Proposed Conditions Drainage Area Map, and Maryland Environmental Site Design (ESD) Computations.

Other information submitted includes a Buffer Management Plan, Preliminary Intermediate Forest Stand Delineation and Forest Conservation Plan, and Non-Tidal Wetland Impact Worksheet.

BACKGROUND: The applicant submitted a PUD - General application on September 1, 2021 that included a Sketch Plan per the requirements of Section 28-701 of the Town Code (Zoning Ordinance). The submission was reviewed by the Easton Staff Development Review Committee (ESDR Committee) on September 22, 2021. The submission was forwarded to the Planning Commission for discussion at their October 21, 2021 meeting. Updates to the application were submitted on July 6, 2022 and the updated application was reviewed by the ESDR Committee at their July 27, 2022 meeting. Additional updates to the application were provided in August and October and ESDR Committee meetings were held on August 24, 2022 and October 26, 2022. The submission was again forwarded to the Planning Commission for discussion at their November 17, 2022 meeting. An update to the Transportation Impact Analysis was submitted on January 17, 2023 and an update to the PUD Sketch Plan was submitted on February 13, 2023.

As stated in the applicant's revised Supplemental Narrative for the PUD application, and as shown on the their Plan, the applicant proposes to improve the 120-acre Property with: a) residential units consisting of single-family detached homes, villa townhomes, and apartment units; b) neighborhood commercial consisting of two office buildings and two retail buildings; c) a public park to be dedicated to the Town of Easton with three multipurpose sports fields, a dog park, and parking area; d) community features, including community open spaces with walking trails and two community clubhouses with swimming pools; e) a satellite fire department building; f) public and private streets and parking areas; and g) ESD stormwater management features. The Development will include a

mix of lot sizes, home designs and uses and will have passive and active open space consisting of approximately 39 acres and buffer yards. The overall site will include 13.42 acres of forested area.

Growth Allocation

Supplemental growth allocation is required from the County's allocation to implement the PUD. A growth allocation application was submitted to the Town on July 6, 2022. The Critical Area Commission received the application on July 7, 2022. The Critical Area Commission provided comments in a letter dated July 20, 2022. Revised plans were submitted by the Town to the Critical Area Commission on October 21, 2022.

The Critical Area includes three types of land management designations: 1) Intensely Developed Areas (IDA), 2) Limited Development Areas (LDA), and 3) Resource Conservation Areas (RCA). In brief, intense development is directed within lands classified as IDA where residential, commercial, institutional, and/or industrial, developed land uses predominate or where public sewer and water collection and distribution systems are currently serving the area and housing density is greater than three dwelling units per acre². There is no Critical Area lot coverage limitation on development in the IDA (except when required by local zoning). However, new development must demonstrate a reduction in pollutant loadings by at least ten percent (10%) from pre-development levels to help improve the quality of stormwater runoff from developed areas that enter the Chesapeake and its tributary streams.

Development in low or moderate intensity uses that also contain areas of natural plant and animal habitats, and where the quality of runoff from these areas has not been substantially altered or impaired, is directed within lands designated as LDA. Development within the RCA is designated primarily for very low density residential, agriculture, forestry, fisheries activities, and for habitat protection³. Main regulatory features for development in the LDA and RCA is that lot coverage is generally limited to fifteen percent (15%) and the alteration of forest and developed woodlands is restricted and mitigated.

Growth Allocation means the number of acres of land in the Critical Area that the Town of Easton may use, or the County may allocate to municipal jurisdictions to use, to create new IDAs and new LDAs. The purpose is to authorize a change in the Critical Area classification to develop at a higher density or use than the current classification allows. A growth allocation changes the designation of land in the Critical Area from a less intense to a more intense land management designation (for example RCA to LDA or IDA). The Town was granted growth allocation equal to five percent (5%) of the RCA acreage located within the Town at the time of local Critical Area law adoption in 1985. As of this date, the Town has utilized all of its growth allocation.

Talbot County was granted a growth allocation of 2,554 acres, which also equaled five percent (5%) of the RCA acreage within the County at the time of the original Critical Area Program adoption. In 1985, Talbot County provided a portion of their growth allocation to the Towns of Easton, Oxford,

² The density requirement is in-line with the PFA requirement of 2.5 du's per acre for existing residential communities within municipal boundaries and the PFA requirement of 3.5 du's for areas within a locally designated growth area (see PFA footnote 6).

³ Density is restricted to one dwelling unit per 20 acres.

and St. Michaels. The County provided 155 acres of growth allocation to the Town of Easton to allow properties to be reclassified from RCA to LDA or IDA⁴. An additional 508 acres of growth allocation was provided to the Towns of Oxford and St. Michaels, leaving the County with a remaining 1,872.38 acres that may be used for growth allocation⁵.

To date, the Town has used the 155 acres granted by the County for reclassification from RCA to LDA or IDA and has 16.49 acres left for reclassification from LDA to IDA. Chapter 190 of the County's Code (County Code) allows for a property owner, through the Town, to apply for a supplemental growth allocation if the Town has used all of its allocation. Applications are reviewed on a case-by-case basis following the procedures outlined in the County Code § 190-55.I, which includes a joint hearing by the Planning Commissions of both jurisdictions. Upon recommendations from both Commissions to their respective Councils, a joint hearing is held by the two Councils who will make their respective decisions separately. § 190-55.I of the County Code also specifies the submission and review procedures and standards for evaluation by the County. The standards for evaluation by the Town of Easton are specified in § 28-401.8.E and F of the Town Code.

OUTSTANDING ISSUES: There are no outstanding issues.

ANALYSIS:

I. Criteria for Approval - § 28-401.8.F of Town Code (Zoning Code) states that for the use of Growth Allocation, the Town of Easton shall consider the factors below, followed by staff's analysis.

A. Consistency with Town of Easton's adopted comprehensive plan and whether the Growth Allocation would implement the goals and objectives of the adopted plan.

Analysis – The State of Maryland, Talbot County (County), and the Town of Easton (Town) growth policies all approach growth management in the county by concentrating that growth in and around the Towns of Easton, Oxford, St. Michaels, and Trappe. The County's land use policies specifically promote growth management by directing new residential, institutional, commercial, business, and industrial development in designated growth areas and incorporated towns. Focusing compact growth in incorporated towns is a logical strategy; these locations are where municipalities possess and invest in public facilities and services.

The subject property is within the Town's municipal limits and is designated as a Priority Growth Area. The existing land use is vacant and agriculture with a planned future land use of residential (*2010 Comprehensive Plan, Future Land Use Map*). To limit the geographic outward expansion of

⁴ The County also allocated 24 acres to the Town of Easton to be used for properties to be reclassified from LDA to IDA. There are 16.49 acres remaining in this category.

⁵ The County added 5.38 acres from the original allocation due to the reclassification of property from LDA to RCA. With the County's comprehensive plan's growth management strategy to concentrate and focus development within or near municipal boundaries (growth and development areas), combined with the County's very low-density zoning of one dwelling unit per 20 acres (with the exception of villages, established residential subdivisions, and limited commercially-zoned properties), the likelihood of the County using a majority of their growth allocation is extremely low.

the Town and to slow the demand for more land, the Town supports the objective of a minimum net density of 3.5 dwelling units per acre for new development located within Priority Funding Areas (PFA)⁶ (*2010 Comprehensive Plan, Land Use, p. 45*). The Plan's overall gross density is 3.78 dwelling units per acre. When factoring out areas that include open space, parks, buffers, SWM, forested areas, and other amenities, the net density is 5.6 acres.

Given that the State, County, and Town growth policies assert that growth should be concentrated in and around Easton, there needs to be a delicate balance between new development and sensitive areas. The quality of rivers and streams within the Town are protected through a number of measures, including stream buffers, adherence to limited development within the Buffer and SWM (*2010 Comprehensive Plan, Sensitive Areas, Text, pp. 158-159*). A goal of the Town is to protect and, where possible, enhance the natural environment of the Town and its environs while recognizing its role as a regional growth center. The objectives to achieving this goal are to: a) identify and protect environmentally sensitive areas during the initial stages of the development review process, b) direct development, whenever possible, away from environmentally sensitive areas so that impacts are avoided to the greatest extent possible, and c) coordinate, and where necessary enhance, sensitive areas protection with other Town environmental programs such as the Critical Area Program, the Forest Conservation Ordinance, the Floodplain Ordinance, and the SWM Ordinance (*2010 Comprehensive Plan, Sensitive Areas, p. 167*). Additional goals include to minimize and mitigate adverse impacts to water quality, protect the 100-year floodplain, and identify and protect Habitats of Threatened and Endangered Species (*2010 Comprehensive Plan, Sensitive Areas, p. 169*).

The applicant proposes a balance in the Plan between the proposed land uses and sensitive areas through a proposed mixed-use, compact, and walkable development that identifies and enhances the sensitive areas associated with Windmill Branch. Buffers have a dual function of protecting streams from disturbance and encroachment from adjacent land uses while playing a role in filtering pollutants. The applicant submitted a Buffer Management Plan that proposes to fully establish the 100-foot expanded Buffer and further extend the fully established Buffer to 200 feet. The Plan also proposes to provide an enhanced 300' Buffer with additional vegetation with the exception of areas either associated with SWM facilities and a corner of the multipurpose field within the proposed active park⁷. Plantings include a combination of 2" caliper canopy trees and bare-root seedlings at 700 stems per acre. The nontidal wetland and wetland buffer located adjacent to Route 322 will also remain undisturbed and the same located adjacent to Route 333 at the northeastern corner of the subject property will remain undisturbed.

⁶ PFA's are designated and certified by local jurisdictions where local governments prefer growth to occur and where collaboration with State agencies to direct resources and investments into that area are desired. They generally include lands within municipal boundaries that are zoned for industrial or employment uses and where average residential densities are a minimum 2 dwelling units per acre and are on a public sewer system. Lands annexed by a municipality that are within a locally designated growth area, planned to be served under an approved 10-year water and sewer plan, and where there is permitted an average density of not less than 3.5 units per acre in areas designated for residential use or development are also eligible for PFA certification.

⁷ The SWM ponds are designed to capture and manage 2-year and 10-year storm events. Best practices for stream protection are to locate these ponds at a minimum 100 feet from streams. In this case, the applicant's Plan proposes the location of the ponds between 200 and 300 feet from the stream with a 200-foot forested buffer that can provide additional filtration for stormwater runoff.

Applicant's Response

The applicant's supplemental narrative provides thorough responses to this criterion. The applicant states that the Community Character Chapter of the Town's Comprehensive Plan promotes certain design principles, including integrated uses and the preservation of natural features: "Above all else, neighborhood development can be environmentally responsible by providing adequate opportunities for walking to jobs, convenient retail, and community facilities." The applicant notes that the proposed PUD is designed to achieve these design goals by creating a walkable community with foot-path access to public open space and appropriately scaled neighborhood commercial. The applicant points out that development is also configured to avoid the most environmentally sensitive features near existing tidal areas. Lastly, the applicant states that the site of the proposed PUD is adjacent to the existing Easton Club neighborhood, creating continuity from neighborhood to neighborhood.

The applicant states that The Housing Chapter of the Town's Plan contains several goals and objectives aimed at promoting a mix of housing types. The first goal is to ensure that "housing in Easton is safe, sanitary, structurally sound and safeguards or upgrades neighborhood design." The applicant states the Plan proposes to accomplish this goal by achieving "a density that creates a sense of place, uses infrastructure efficiently, produces pedestrian-friendly neighborhoods and accommodates plans for transit" and further, by providing "open spaces; using landscaping to accentuate the natural environment and giving visual connectivity; preserving natural assets, community identity and environmental and health standards."

Another goal the applicant notes is to ensure "a more heterogeneous mix of price points in future residential projects" by, among other things, providing "density bonuses in projects for the inclusion of low and moderate-income housing units." The applicant states the proposed growth allocation will help the Town meet these goals by offering three distinct types of housing at different price points, single family residences, townhomes, and multifamily apartments, and that the development will create a unique sense of place with limited neighborhood commercial uses, significant open space, and pedestrian trails while being configured to preserve sensitive environmental areas near tidal waters.

The applicant states that the Parks, Recreation, and Open Space Chapter includes the goal of providing "a system of green infrastructure (see Future Land Use Map)" and the objective of identifying "appropriate open space areas to serve as green centers or anchors and connect them through a series of pathways and green corridors." The applicant notes the proposed development plan for Poplar Hill calls for the establishment of substantial open space, including playing fields and creates a new open space anchor in south Easton. The applicant points out that the location of the proposed open spaces also offers potential future connectivity to other Town parks and trails. The applicant also notes that the location is extremely close to the Talbot County YMCA, which is listed in Table 12 of the Parks, Recreation, and Opens Space Chapter as a quasi-public special park area.

Regarding the Transportation Chapter of the Comprehensive Plan, the applicant states the following objective: "Require future development to occur based on a gridded street system which includes accommodations for pedestrians and bicycles." The applicant notes the Town's Proposed Bicycle

Routes Map shows a planned bicycle connection running past the Oxford Road entrance to the Poplar Hill site through the intersection of Oxford Road and Easton Parkway and continuing into downtown via Peachblossom Road. The applicant further notes that the proposed development adheres to the objective of promoting pedestrian and bicycle activity, as shown in the PUD plans submitted to the Town.

The applicant concludes that the Poplar Hill project is consistent with the timing of Plan implementation; the timing of development; the timing of rezoning; development patterns; land uses; and densities and intensities. The applicant notes that the property is recognized as an area of potential development by the Town and an application for a PUD floating zoning district is currently pending. The proposed project is also consistent with development patterns within the Town, being adjacent to the Easton Club and across the parkway from downtown Easton. In terms of densities or intensities, the applicant states the Poplar Hill project seeks to make the most efficient use of the land by offering a variety of housing types and options while preserving open space and protecting sensitive environmental areas; and the proposed densities are consistent with the designation of the subject property as a PFA.

B. For a map amendment or refinement involving a new LDA, whether the development is: (a) to be served by a public wastewater system or septic system that uses the best available nitrogen removal technology; (b) a completion of an existing subdivision; (c) an expansion of an existing business; or (d) to be clustered.

Analysis – This factor is not applicable.

C. For a map amendment or refinement involving a new IDA, whether the development is: (a) to be served by a public wastewater system; (b) if greater than 20 acres, to be located in a designated Priority Funding Area; and (c) to have a demonstrable economic benefit.

Analysis – The subject property is designated a Priority Funding Area⁸. Easton Utilities reviewed the PUD Sketch Plan submittal and confirmed that the property will be served by their public wastewater system; capital charges were estimated.

The applicant's Environmental Report states that the proposed growth allocation for Poplar Hill is consistent with the policies in the Town of Easton's Comprehensive Plan where the Land Use Chapter of the Comprehensive Plan contains the following goals: "to limit the geographic outward expansion of" the Town and "to achieve a more balanced and integrated mix of land uses within the Town" by, among other things, promoting neighborhoods with "an integrated mix of residential, neighborhood-scale commercial, civic, and open space uses". The Applicant notes that the proposed growth allocation helps the Town achieve these goals and objectives by concentrating new development within the Town's existing boundaries, which reduces pressure for additional annexations, and by establishing a planned, mixed-use community featuring a variety of housing types, substantial open space, public park areas, and appropriately scaled neighborhood commercial uses.

⁸ <https://mdpgis.mdp.state.md.us/PFA/publicinfotemplate/index.html>

The applicant also notes that The Property is identified in the Comprehensive Plan's Municipal Growth Chapter as an area of potential infill/redevelopment within a Priority Development Area, as identified in the 2004 Comprehensive Plan (*2010 Comprehensive Plan, Municipal Growth, p. 53*). They further state that, of the four remaining Priority Development Areas, the Property has the greatest infill/redevelopment potential in terms of the potential number of units. Thus, the Comprehensive Plan anticipates build out of the Poplar Hill site on the scale envisioned by the applicant.

The applicant also states in their supplemental narrative that the proposed growth allocation will have a demonstrable economic benefit to the area by creating temporary jobs associated with construction along with permanent jobs to operate the limited neighborhood commercial uses and to maintain the residences and other improvements within the development. The applicant adds that job creation or retention may also occur in connection with the addition of playing fields, which require athletic program direction and maintenance. The applicant notes that the proposed growth allocation will also provide a mix of single family, townhome, and multi-family housing options, including affordable housing, and will enhance the Town's appeal through increased public open space and walking trails. The applicant states that expanded housing choices benefit the local economy through increased job retention and financial stability. They further state that additional open space also provides benefits by promoting active lifestyles, enhanced property values, and recreational activities.

D. The use of existing public infrastructure, where practical.

Analysis – The property is mapped W-1/S-1 immediate priority service. The proposed development will access public water and sewer served by Easton Utilities. Easton Utilities will also serve the development for dry utilities including electric gas, and internet. Solid waste management and recycling is provided through the Town of Easton. The subject site is near the intersection of two arterial roads - Routes 322 and 333 - and will be accessed from both state roads. A Traffic Impact Analysis (TIA) was submitted by the applicant and reviewed and approved by the Maryland Department of Transportation's State Highway Administration with one comment. Further review will occur as part of the PUD Sketch Plan process.

E. Consistency with State and regional environmental protection policies concerning the protection of threatened and endangered species and species in need of conservation that may be located on- or off-site.

Analysis – The Maryland DNR's Wildlife and Heritage Service determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, there are no specific concerns regarding potential impacts or recommendations for protection measures at this time.

F. Impacts on a priority preservation area.

Analysis – This factor is not applicable.

G. Environmental impacts associated with wastewater and stormwater management practices and wastewater and stormwater discharges to tidal waters, tidal wetlands, and tributary streams.

Analysis – COMAR 27.01.02.06-1 specifies the growth allocation submittal requirements to include an environmental report that demonstrates that the project has been designed and will be constructed in compliance with all requirements of the proposed Critical Area land classification. COMAR 27.01.02.06-2 specifies the contents of the report, including the method and description of proposed stormwater management, all qualitative and quantitative management measures; and the preliminary plan for compliance with the ten percent (10%) pollutant reduction rule with all worksheets and supporting documentation. The Plan has to meet the Critical Area Commission's requirement for IDA's that stormwater management technologies reduce pollution loadings by at least ten percent (10%) below the level of pollution on the site prior to development, with SWM preferred onsite.

The applicant submitted a Concept SWM Report, an ESD Calculations and 15% Phosphorus Removal worksheet, a Proposed Conditions Drainage Map, and Maryland ESD Computations, to address the Town's SWM Ordinance and the ten percent (10%) rule requirement. As described in the applicant's Environmental Report, the SWM features proposed to be utilized are shown on the Plan & SWM Plan and include Best Management Practices such as micro infiltration, non-roof top disconnection, bioswales, and grass swales. Per MDE's growth allocation review recommendations, the applicant redesigned the plans to completely avoid existing nontidal wetlands at the northeastern end of the site near the Easton Parkway and the Commercial use area. The report concludes that the proposed SWM plan results in a fifteen percent (15%) phosphorus post-development, exceeding the minimum required.

In a comment letter dated October 25, 2022, the Engineering Department approved the sketch SWM with conditions.

H. Environmental impacts associated with location in a coastal hazard area or an increased risk of severe flooding attributable to the proposed development.

Analysis – The proposed development is not located in a coastal hazard area and will not cause any increased risk of severe flooding.

II. Consistent with § 8-1808.1 of the Annotated Code of Maryland, § 28-401.8.E of the Town's Zoning Code lists the location requirements for a new IDA.

A. A new IDA shall only be located in an LDA or adjacent to an existing IDA.

Analysis – The proposed new IDA is adjacent to existing IDAs mapped in the Easton Club PUD and on the east side of Route 322.

B. The new IDA shall be located in a manner that minimizes impacts to Habitat Protection Areas and in an area and manner that optimizes benefits to water quality.

Analysis – Historic Waterfowl Staging and Concentration Areas are areas of open water and adjacent marshes where waterfowl gather during migration and throughout the winter season. According to the Maryland Living Resources iMap data catalog, there are no historic waterfowl staging and concentration areas on or adjacent to the subject property. There are no Habitat Protection Areas where development is proposed. As previously stated, the Maryland DNR's Wildlife and Heritage Service determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. The letter concludes that there are no specific concerns regarding potential impacts or recommendations for protection measures at this time.

C. A new IDAs shall only be located where they minimize their impacts to the defined land uses of the RCA.

Analysis – The proposed IDA is at the intersection of two arterial roads and impacts are minimized through an enhanced buffer and forest protection area adjacent to Windmill Branch. The applicant's supplemental narrative notes that the proposed IDA will be adjacent to, and located in between, two existing IDAs within the Town. They further state that locating the proposed IDA in this area minimizes impacts to defined land uses of the RCA by concentrating new development in an area with existing development. In addition, they state the proposed configuration of the project retains substantial open space in the most environmentally sensitive areas of the property, namely those areas near tidal waters. The applicant points out that the Buffer Management Plan protects the 100' Buffer (including expanded buffer areas) and enhances the 200' buffer area with additional plantings. Lastly, the applicant states that the proposed growth allocation will minimize impacts to agricultural land in Talbot County by concentrating new development within the Town of Easton where greater density is permitted instead of creating sprawl in outlying, lower density agricultural areas.

D. New IDA's shall be at least 20 acres in size unless they are contiguous to an existing IDA or located in an LDA.

Analysis – The proposed new IDA is 65.977 acres.

E. A new IDA shall be located at least 300 feet beyond the landward edge of tidal wetlands or tidal waters.

Analysis – In response to Critical Area Commission comments and after a site visit with their staff and Town staff on August 4, 2022, the applicant states that the Plan and Buffer Management Plan delineates the 300-foot setback. The proposed improvements within the 300-foot setback total 1.15 acres, which include a portion of a grass sports field, SWM features, and a community walking path. Of these, only the community walking path comprising 0.06 acres is considered lot coverage. The applicant proposes to offset the 1.15 acre impacts to the 300-foot setback with: 1) an enhanced 200' and 300' planting offset establishment consisting of 3.35 acres of plantings (2" caliper trees and seedlings), or 2.9 times the proposed impacts to the 300' setback, and 2) educational signage for SWM features. The applicant states that although they may elect to treat stormwater in excess of the

10% pollution reduction standard, they recognize that the Critical Area Commission may not accept this as an offset for impacts to the 300-foot setback area. The applicant notes the enhanced 200-foot and 300-foot Planting Offset Establishment is an addition to 1.46 acres of buffer establishment within the Buffer and expanded Buffer.

F. The new IDA shall conform to all criteria of The Town of Easton for such areas, shall be so designated on The Town of Easton Critical Area Maps and shall constitute an amendment to this Chapter subject to review and approval by The Town of Easton Planning and Zoning Commission, the Mayor and Council and the Critical Area Commission as provided herein.

Analysis – The procedure for the change in the land use management designation for the subject property is following the procedures as specified in COMAR, the Town Zoning Ordinance, and the County Code. The analysis of conforming to the criteria for the location of a new IDA is outlined above.

RECOMMENDED CONDITION:

Staff supports the following condition should the Planning Commission recommend to the Town Council approval of the supplemental growth allocation request:

1. The Conceptual Site Plan submitted with the supplemental growth allocation application is conceptual in nature and was assessed by staff for conformance to § 28-401.8.E and § 28-401.8.F of the Town Code. Approval of the supplemental growth allocation shall not infer Town of Easton Sketch Plan or PUD approval. Prior to any approval, the proposed development will be evaluated by the applicable reviewing agencies for conformance to all applicable Zoning; Subdivision; Forest Conservation; Stormwater Management; Erosion and Sediment Control; and other applicable regulations. Such review may result in modifications to the conceptual site plan.

DRAFT MOTIONS:

1. I move that the Planning Commission recommend to the Town Council approval of CC-22-1, Supplemental Growth Allocation Request for, based on the Findings for Approval and subject to the staff condition.

OR

2. I move that the Planning Commission recommend to the Town Council denial of CC-22-1, Supplemental Growth Allocation Request for, based on the following findings.....

OR

3. I move an alternate motion.

ATTACHMENTS:

1. Growth Allocation Application Supplemental Narrative dated July 6, 2022
2. Aerial Context Plan, revised November 1, 2022
3. Poplar Hill PUD Sketch Plan, revised January 27, 2023
4. Elevation - Apartments dated September 23, 2021
5. Exhibit (Oxford Road Perspective)
6. Exhibit (Oxford Road Section)
7. Environmental Features Plan dated July 6, 2022
8. Critical Area Environmental Report, revised October 5, 2022
9. Concept Stormwater Management Report, revised October 5, 2022
10. Stormwater Management Narrative, revised November 1, 2022
11. Maryland ESD Calculations and 15% Phosphorus Removal Worksheet dated November 1, 2022
12. Maryland Environmental Site Design Computations dated November 1, 2022
13. Proposed Conditions Drainage Area Map
14. Buffer Management Plan, revised October 5, 2022
15. Intermediate Forest Stand Delineation and Preliminary Intermediate Forest Conservation Plan, revised October 5, 2022
16. Nontidal Wetland Impact Worksheet, revised October 5, 2022
17. Applicant Response to Critical Area Commission Staff Comments Letter dated October 5, 2022
18. DNR Heritage Review Letter dated March 26, 2021
19. SHA Response Letter dated December 12, 2022
20. Transportation Impact Analysis, revised January 17, 2023 (revised in response to SHA comments)
21. Poplar Hill Design Guidelines dated March 27, 2023



**TALBOT COUNTY/TOWN OF EASTON PLANNING COMMISSION
JOINT PUBLIC HEARING
STAFF REPORT**

SUBJECT: Supplemental Growth Allocation Request for Poplar Hill

STAFF CONTACTS: Brennan Tarleton, Planning Director

APPLICANT: 5001 SHR, L.C. c/o Kevin M. Sills

PURPOSE: The applicant is seeking a Planning Commission recommendation to the County Council to award supplemental Growth Allocation for the reclassification of 65.977 acres of land located within the Critical Area, designated Resource Conservation Area (RCA) to Intensely Developed Area (IDA).

RECOMMENDATIONS:

Staff: Staff supports a favorable recommendation from the Planning Commission (PC) to the County Council (Council) for the supplemental growth allocation based on the Findings of Fact and subject to conditions.

APPLICATION INFORMATION:	
APPLICANTS: 5001 SHR, L.C. c/o Kevin Sills 9161 Liberia Avenue #201 Manassas, VA 20110	AGENT: Ryan Showalter McAllister, DeTar, Showalter & Walker 100 N. West Street Easton, Maryland 21601 rshowalter@mdswlaw.com
PARCELS/ACREAGE:	
Tax Map Number	Acreage
Tax Map 42, Grid 4, Parcel 57	120.476 acres
ACCEPTANCE DATE: July 8, 2022	
LOCATION: Oxford Road, Easton, Maryland, 21601	
EXISTING ZONING: Residential District (R-10A)	PROPOSED LAND USE: Residential, Mixed Use Residential, Commercial and Community Park

CONTEXT:

Location/Site Access – The property is located adjacent to Easton Parkway (Route 322) as well as Oxford Road (Route 333). Current site access is from Tristian Drive which is further accessed from Route 322.

Existing Conditions – Parcel 57 is predominantly encompassed by active farmlands with portions of perimeter of the parcel containing forested areas and nontidal wetlands. The northeastern portion of the parcel does contain areas of both tidal and nontidal wetlands as well as the Shoreline Development Buffer (“the” Buffer) and its expanded buffers for steep slopes and hydric soils.

Surrounding Properties –

North – Improved parcels within the Town of Easton zoned R-10A and Route 333.

South – Improved parcels within the Town of Easton zoned R-10A.

East – Route 322

West – Vacant lands that are predominantly forested zoned R-10A within the Town of Easton.

Figure 1: Vicinity Map



PROPOSAL: The applicant is seeking a Planning Commission recommendation to the County Council to award supplemental Growth Allocation for the reclassification of 65.977 acres of land located within the Critical Area, designated Resource Conservation Area (RCA) to Intensely Developed Area (IDA).

The supplemental growth allocation, if approved, will reclassify lands owned by 5001 SHR, L.C. in the Critical Area from RCA (Resource Conservation Area) to IDA (Intensely Developed Area). The proposed reclassification would allow for the applicant to proceed through the rezoning process with the Town of Easton, for the purposed of establishing a Planned Unit Development (PUD) consisting of :

1. 456 dwelling units
 - a. 108 single-family dwelling units
 - b. 138 villa/ townhomes
 - c. 210 apartment units
2. Community park, to include ball fields, a dog park, clubhouse, pool and associated parking
3. Commercial building (15,000 sq. ft.)
4. Commercial building (15,000 sq. ft.)
5. Retail building (24,000 sq. ft.)
6. Retail building (40,000 sq. ft.)
7. A satellite firehouse (8,300 sq. ft.)

BACKGROUND: The applicant submitted a concept plan for a proposed PUD development that included the entire ±120 acre parcel to the Town of Easton in 2021. Due to the fact that over 50% of the parcel is encumbered by the Critical Area, Town of Easton staff noted that growth allocation would be necessary in order to allow the proposed development plan to proceed further through the development review process.

In July of 2022 the applicant formally submitted a supplemental growth allocation application request to the Town of Easton for the proposed development plan. As required by Code, the Town Easton then forwarded the supplemental growth allocation application to Talbot County for review and consideration. In working with the Town of Easton development review staff, the applicant supplied revised plans for this proposed request in January of 2023. County staff then evaluated this application for general completeness and compliance prior to scheduling for a joint work session meeting with both the County and Town Planning Commissions.

The procedures for the processing of a reclassification by Growth Allocation for Critical Area Land Management Designation in Talbot County is provided in § 190-55.5 of the *Talbot County Code* (the Code). When the Talbot County's Critical Area Program was originally adopted in 1985 it was limited to a total of 2,554 acres (5% of the existing RCA designated lands within the County) of land area to be reclassified to a more intensified land management designation. The County assigned a portion of this acreage to each of the incorporated towns (Easton, Oxford and St. Michaels), leaving the remainder of this acreage (1,872.38 acres) for future use in the unincorporated areas of the County.

Table VII-3 of the Code depicts the original growth allocation acreages assigned to each of the three Towns, as well as the remaining acreages as of January 1, 2018. Currently, the Town of Easton has 0 acres remaining for purposes of reclassifying lands designated as RCA to either LDA or IDA, and approximately 16.49 acres remaining for purposes of reclassifying lands designated as LDA to IDA. While the Town of Easton has utilized the entirety of its reserved acreage for growth allocation from RCA to LDA or IDA, the Code permits for

Towns to request supplemental growth allocation under § 190-55.5.I. Supplemental growth allocation granted by the County would be subtracted directly from the County's remaining total growth allocation. Additionally, the Code stipulates that supplemental growth allocation shall not exceed a cumulative total of 618 acres.

Once a supplemental growth allocation application is submitted to the applicable jurisdiction, in this instance the Town of Easton, the application must follow the review process outlined in § 190-55.5.I.3. of the Code. This process includes a joint hearing between Planning Commissions of both the Town and County, in which each Commission must vote separately and make its recommendation to its respective Council. The County and Town Councils must then hold a joint hearing where they must make their respective decisions separately based on their evaluation of the application. The standards for this evaluation are specified within § 190-55.5.F. of the Code.

OUTSTANDING ISSUES:

No additional outstanding issues were identified.

POLICY AND ZONING ANALYSIS:

Criteria for location of new LDA and IDA areas:

a. Minimizes impacts to habitat protection areas;

Analysis – According to review and correspondence provided by Maryland Department of Natural Resources (DNR) Wildlife and Heritage Service, there are no records or documentation of any State or Federally listed species within the areas of proposed impacts for this development. As a result, they have indicated that there are no specific concerns or recommended protection measures at this time.

The parcel contains several small pockets of nontidal wetlands, as well as forested areas of nontidal wetlands adjacent to the Buffer. The original proposed development plan for this application proposed approximately 47, 429 sq. ft. of nontidal wetland area disturbance. Based upon review and guidance provided by the Maryland Department of the Environment (MDE) it was suggested to redesign areas proposed for Storm Water Management (SWM) treatment. In doing so, the applicant has submitted a revised SWM concept plan that reduces overall nontidal wetland impacts to approximately 13, 546 sq. ft.

b. Optimizes benefits to water quality; and

Analysis – As part of the submittal requirements under the *Talbot County Code* an applicant submitting a request for growth allocation must also supply an environmental report addressing all items and requirements listed in COMAR 27.01.02.06-2 which includes proposed methods to be utilized for stormwater management and all qualitative and quantitative management measures. This plan must also demonstrate an overall 10% pollutant reduction.

Proposed methods for treatment of stormwater for the project include non-roof top disconnect and several submerged gravel wetland areas. Based upon the calculations provided in the conceptual report, the plans will exceed the 10% phosphorus removal requirements with a target of roughly 15% based on the existing design. The plans are conceptual at this stage and have been reviewed and approved at this level by the Town of Easton's Engineering Department.

Should the project move forward to the development stage, additional modifications to the design may be proposed, and will be required to meet the minimum requirements under COMAR. Final review and approval of these plans will be conducted by the Critical Area Commission and the Town of Easton during the site plan review process.

c. Minimizes impacts to agricultural land and forests.

Analysis – The Critical Area portion of the property contains approximately 9.590 acres of forested areas. Most of which is within the Buffer and expanded Buffer areas, which are not proposed to be impacted as part of this proposed development plan. The applicant indicates that proposed forest clearing calculations are subject to change as the design process moves forward.

Land designated as IDA are not required to meet the Critical Area afforestation requirements, however, Buffer establishment is required. The applicant notes that the proposed 200' - 300' enhanced planting area depicted on the plans, encompasses roughly 3.35 acres of land area, which would be in addition to the Buffer establishment of 1.46 acres that is required.

The property is predominantly encompassed by agricultural land which will no longer be in production based on the proposed development scale. While the plan will result in a loss of the agricultural lands on the subject property, it is important to note that the property is currently mapped as W-1/S-1 under the Comprehensive Water and Sewer Plan (CWSP) with available utility services available from Easton Utilities. Adjacent to two principal arterial highways and existing residential development, this area has also been identified as a priority development area within the Town of Easton's Comprehensive Plan. Directing future growth to areas and concentrating development efforts within the Town reduces further development pressures on unincorporated areas of the County that are actively farmed.

Criteria for deciding whether to approve or disapprove an application for amendment to the land management designation and/or growth allocation – §190-55.5.F. The Council shall evaluate the applicable components of the application: the Zoning Map amendment, the revision to the Critical Area land management designation, requested growth allocation, and the concept plan. All of the standards given below shall be used in evaluating the application.

1. The standards and factors for amendments to the Official Zoning Map (§ 190-55.2.B and C) shall be used to evaluate any proposed rezoning.

Analysis – The standards and factors for zone map amendments are not applicable in this instance, as this application does not propose rezoning within the County.

2. In addition, the Council shall consider the following factors as applicable:

a. Whether applicable requirements of the County's Critical Area Program, Zoning Ordinance and Subdivision Regulations have been met, including the standards for establishment of RCA, LDA and IDA areas established in § 190-15.3.

Analysis – Staff analysis of these specific criteria are provided above.

- b. In addition to meeting the minimum requirements of the Critical Area Regulations, the project design shall enhance the habitat value or improve water quality in the area. For example, afforestation may exceed the 15% requirement or best management practices for stormwater management may be installed on portions of the site to remain in agricultural use.**

Analysis – As noted previously DNR Wildlife and Heritage has confirmed there are no records or documentation of any State or Federally listed species within the areas of proposed impacts for this development. As a result, they have indicated that there are no specific concerns or recommended protection measures at this time.

The applicant has stated that overall lot coverage within the 1000' Critical Area Boundary on the site will be approximately 19.12 acres. Proposed forest clearing within the Critical Area will be 1.385 acres and disturbance and impacts to nontidal wetlands and their respective buffers are 0.311 acres and 0.329 acres respectively.

A revised Buffer Management Plan was submitted as part of the application depicting the proposed 300-foot setback from the landward edge of tidal wetlands. The proposed plans depict a 1.15 acre area of disturbance to this 300-foot buffer for proposed improvements related to the community park facility and proposed SWM features. In an effort to offset this disturbance the applicant is proposing a planting offset which would include 3.35 acres of planting in addition to the 1.46 acres of Buffer establishment required for the proposed development as well as providing educational signage for the proposed SWM features. Additional consideration is being given for designing treatment of stormwater to be in excess of the 10% pollutant reduction criteria. Consideration of these options must be reviewed and approved by the Critical Area Commission as the project moves through the review process.

- c. For residential development, a community pier shall be provided rather than individual piers.**

Not applicable. There is no proposal for the inclusion of a pier with this development.

- d. The location, nature, and timing of the proposed growth allocation in relation to the public interest in ordered, efficient, and productive development and land use.**

Analysis – The proposed Poplar Hill development is consistent with the ordered, efficient, and productive development and land use in terms of its location, nature, and timing. This property was originally slated for development as a medical campus for Shore Health under the Town's Planned Healthcare District.

The establishment of a new mixed-use residential community provides three (3) different housing types (townhomes, single-family units, and apartments) to allow for variation in price range and affordability. Overall scale and location of the residential and commercial components of the development ensure adequate buffering from existing sensitive areas, while also supplying adequate space for both active and passive recreation internal to the site. All the above noted elements are highlighted and incentivized throughout the Town of Easton's Comprehensive Plan and are consistent with the policies and objectives related to future land use and new development within Talbot County's Comprehensive Plan.

- e. Whether the proposed growth allocation, subject to the proposed concept site plan, will fulfill public purposes through the provision of public facilities, implementation of Comprehensive Plan strategies, or advancement of the land use policies and objectives of the Comprehensive Plan.**

Analysis – A great deal of the 2016 Comprehensive Plan strategies, policies and objectives are centered around ensuring that the unique and rural landscape remain positive defining characteristics of what makes Talbot County so unique. In order to achieve this the County has developed various policies and strategies to facilitate future growth while retaining the rural character. Many of these strategies and policies are centered on ensuring that future growth and development is directed towards the incorporated Towns where it has been identified that that well-planned development can be accommodated. Furthermore, the density proposed for this project is 3.78 dwelling units per acre which exceeds the Maryland Department of Planning's (MDP) 3.5 dwelling unit per acre under the smart growth guidelines.

Safe and efficient means of transportation are vital to the quality of life and the economic vitality of the community. New roads serving residential developments should be designed to ensure safety and convenience for all users including motorists, cyclists, pedestrians and emergency vehicles. (Regional and Local Roads Policies, 3.14) A Traffic Impact Analysis (TIA) was submitted for the proposed development. This study evaluated and took into account notable recent residential developments and traffic volumes within the Town of Easton; as well as an overall analysis of anticipated peak hour volumes for the Poplar Hill Development. The scoping letter indicated that six (6) individual intersections were required to be included as part of the review to ensure an adequate level of service was existing and maintained. According to the calculations included in this report, all six (6) intersections will maintain an adequate level of service after the proposed developments construction. The TIA was reviewed by the State Highway Administration (SHA) noting only one comment for revisions of the proposed traffic design for the development.

Availability and affordability of community services are important indicators of the County's quality of life. Ensuring that proper analysis of existing and proposed facilities is considered when reviewing proposed development projects or any future planned development is imperative. Development projects should be contemplated and targeted to areas where these service improvements already exist to ensure that these facilities remain at an operating capacity that is sufficient to meet both the County's and Town's needs. (2016 Comprehensive Plan, Countywide Community Service and Facility Policies, 4.6). The applicant with responsible for acquisition of sewer and water allocation from the Town of Easton. Waste collection and recycling would also be provided for by the Town of Easton. Utilities such as electric, gas and internet services will be supplied by Easton Utilities.

3. The Council may approve the application only if it finds that the proposed concept site plan will:

- a. Create lots or parcels that maximize opportunities for clustered development that protect habitat and agricultural resources;**

The overall development plan depicts three (3) different housing types as noted above, to allow for a total of 456 units. Based on the acreage of the parcel, and the number of units proposed, the overall resulting density proposal for this PUD is 3.78 dwelling units per acre, which exceeds the smart growth guidelines. The layout of the plan concentrates the residential development to the west (rear) of the parcel in small clustered lots. Additional commercial space is accommodated along Route 322. The location of this mixed-use development project within the Town, ensures that development patterns remain

consistent and do not result in pockets of residential developments without interconnectivity across the landscape of the County.

b. Locate structures to minimize impact on habitat protection areas and agricultural areas;

Analysis – DNR Wildlife and Heritage has confirmed there are no records or documentation of any State or Federally listed species within the areas of proposed impacts for this development. As a result, they have indicated that there are no specific concerns or recommended protection measures at this time.

While the property is actively farmed today, the proposed parcel is within the Town of Easton and planning for future development to be directed towards the Towns where utilities and water and sewer services are already available is one of the main guiding policies within the Land Use Section of the Talbot County Comprehensive Plan. Planning for new development on lots both within the Town and also designated W-1/S-1 ensures that development pressure does not generate a sprawling effect into unincorporated areas of the County.

c. Avoid or provide a minimally disturbed Shoreline Development Buffer;

A revised Buffer Management Plan was submitted as part of the application depicting the proposed 300-foot setback from the landward edge of tidal wetlands. The proposed plans depict a 1.15 acre area of disturbance to this 300-foot buffer for proposed improvements related to the community park facility and proposed SWM features. In an effort to offset this disturbance the applicant is proposing a planting offset which would include 3.35 acres of planting in addition to the 1.46 acres of Buffer establishment required for the proposed development as well as providing educational signage for the proposed SWM features. Additional consideration is being given for designing treatment of stormwater to be in excess of the 10% pollutant reduction criteria. Consideration of these options must be reviewed and approved by the Critical Area Commission as the project moves through the review process.

d. Minimize soil erosion and runoff;

Analysis – The conceptual stormwater management plan will be reviewed in accordance with the Town of Easton's Stormwater Management Ordinance and will also be required to meet the Critical Areas 10% pollutant reduction criteria. Should the plan move forward through the review process with the Town of Easton, Town Engineering staff and Critical Area staff will review any plan revisions or modifications to ensure compliance with these requirements. Furthermore, all construction plans will be reviewed and approved by the Talbot County Soil Conservation District to ensure minimization of soil erosion and runoff.

e. Maximize protection of eroding shorelines;

As part of the Buffer Management Plan submitted with this application the applicant will provide enhanced areas of planting within the 200' shoreline development buffer. The enhancement of plantings within this area along with the review and approval of an erosion and sediment control plan will ensure protective measures are in place to eliminate potential impacts to the shoreline and wetland areas on the parcel.

- f. Have a minimal impact or cause an improvement to stormwater, floodplain and stream characteristics;**

Analysis – Enhanced Buffer plantings in conjunction with a compliant stormwater management plan will result in minimal if any negative impact to stormwater, floodplain and stream characteristics. No new development is proposed within special flood hazard areas.

RECOMMENDED CONDITIONS:

Staff supports a positive recommendation from the Planning Commission to the County Council for approval of the supplemental growth allocation, with no additional conditions.

DRAFT MOTIONS:

1. I move that the Planning Commission recommend to the County Council approval of CC-22-1, Supplemental Growth Allocation Request for 5001 SHR, L.C., based on the Findings for Approval and subject to the conditions of approval.

OR

2. I move that the Planning Commission recommend to the County Council denial of CC-22-2, Supplemental Growth Allocation Request for 5001 SHR, L.C., based on the following findings....

OR

3. I move that the Planning Commission defer a recommendation to the County Council for CC-22-2, Supplemental Growth Allocation Request for 5001 SHR, L.C..

OR

4. I move an alternate motion.

ATTACHMENTS:

1. Supplemental Growth Allocation Application (CC-22-1)
2. Conceptual Site Plan, revised January 27, 2023
3. Aerial Context Plan, November 1, 2022
4. Apartment Elevations, September 23, 2021
5. Exhibit (Oxford Rd. Perspective)
6. Exhibit (Oxford Rd. Section)
7. Environmental Features Plan, July 6, 2022
8. Critical Area Environmental Report, October 5, 2022
9. Concept SWM Report, October 5, 2022
10. SWM Narrative, November 1, 2022

11. Maryland ESD Calcs and 15% Phosphorous Removal Worksheet, November 1, 2022
12. Maryland ESD Computations, November 1, 2022
13. Proposed Drainage Area Map
14. BMP, October 5, 2022
15. Intermediate FSD and Preliminary FCP, October 5, 2022
16. Nontidal Wetlands Impact Worksheet, October 5, 2022
17. Applicant Response to CAC Comments, October 5, 2022
18. DNR Heritage Review Letter, March 26, 2021
19. SHA Comment Letter, December 12, 2022
20. TIA, January 17, 2023
21. Poplar Hill Design Guidelines, March 27, 2023



MCALLISTER
DETAR
SHOWALTER
& WALKER

Anthony Kupersmith
akupersmith@mdswlaw.com
(410) 934-3910 Direct

July 6, 2022

VIA HAND DELIVERY AND EMAIL to jmayer@EastonMD.gov

Town of Easton
Engineering, Planning and Zoning
Attn: Joe Mayer
14 South Harrison Street
Easton, Maryland 21601

Re: Poplar Hill – Application for Growth Allocation

Dear Joe:

On behalf of our client, 5001 SHR, L.C. (the “Applicant”), this is to formally request an award of Growth Allocation for the Poplar Hill project pursuant to Town of Easton Code § 28-401.8 C. Specifically, the Applicant is requesting an award of Growth Allocation to reclassify 65.977 acres, more or less, from RCA to IDA on the Applicant’s property, which is described as Tax Map 42, Grid 4, Parcel 57. This Application for Growth Allocation will require joint review with Talbot County. We respectfully request that the Town forward this Application to Talbot County in accordance with Talbot County Code § 190-55.5 I(3)(a).

In support of this Application, please find the following enclosed herewith: (i) a conceptual site development plan for the Poplar Hill project included in the Applicant’s “Poplar Hill PUD Sketch Plan”, prepared by Lane Engineering, Inc., and dated July 6, 2022; (ii) an environmental features map entitled “Environmental Features Plan”, prepared by Lane Engineering, Inc., and dated July 6, 2022; (iii) an environmental report entitled “Environmental Report for Critical Area Growth Allocation”, prepared by Lane Engineering, Inc.; (iv) a buffer management plan entitled “Major Buffer Management Plan on the Lands of 5001 SHR, L.C., prepared by Lane Engineering, Inc., and dated July 6, 2022; (v) a supplemental narrative addressing the Growth Allocation standards and factors prepared by McAllister, DeTar, Showalter & Walker; and, (vi) preliminary agency comments from DNR, MHT, and MDE. A stormwater management report prepared by Lane Engineering will be submitted to the Town directly by Lane Engineering contemporaneously with this Application. If you have any questions or need additional information, do not hesitate to contact me.

Very truly yours,

Anthony P. Kupersmith

Enclosures (6)

GROWTH ALLOCATION APPLICATION

5001 SHR, L.C.

SUPPLEMENTAL NARRATIVE

July 6, 2022

Owner

5001 SHR, L.C.
9161 Liberia Ave.
Manassas, Virginia 20110

Agent

McAllister, DeTar, Showalter & Walker LLC
100 N. West Street
Easton, Maryland 21601
Attn: Ryan D. Showalter, Esq.

Engineer

Lane Engineering, Inc.
117 Bay Street
Easton, Maryland 21601
Attn: Brett C. Ewing

I. INTRODUCTION

5001 SHR, L.C. (“**Applicant**”) owns that certain parcel of land within the Town of Easton, Maryland (“**Town**”) identified as Tax Map 42, Grid 4, Parcel 57, consisting of 120.476 acres+/- (the “**Property**”), of which 65.977 acres+/- are in the Critical Area and classified as Resource Conservation Area (“**RCA**”). The Property is known as Poplar Hill Farm. Applicant hereby requests an award of Growth Allocation to reclassify all 65.977 acres of RCA on the Property to Intensely Developed Area (“**IDA**”) as shown on a plan entitled “ENVIRONMENTAL FEATURES PLAN”, prepared by Lane Engineering, Inc., dated July 6, 2022, and included with this Application.

Applicant has applied to the Town for a Planned Unit Development (“**PUD**”) on the Property pursuant to Section 28-701 of the Town of Easton Code. As proposed, the PUD would establish a mixed use, planned community comprised of: (i) a total of 439 residential units consisting of 109 single-family detached homes, 138 villa townhomes, and 192 apartment units; (ii) neighborhood commercial consisting of two office buildings and two retail buildings; (iii) a public park to be dedicated to the Town of Easton with three multipurpose sports fields, a dog park, and parking area; (iv) community features, including community open spaces with walking trails and two community clubhouses with swimming pools; (v) a satellite fire department building; (vi) public and private streets and parking areas; and, (vii) Environmental Site Design stormwater management features.

This Supplemental Narrative addresses the criteria for establishing the proposed growth allocation in accordance with the Town of Easton Code, Talbot County Code, and applicable State Law.

II. LEGAL CONTEXT

A. CHESAPEAKE BAY CRITICAL AREA PROGRAM

The Chesapeake Bay Critical Area Program was enacted by the Maryland General Assembly in 1984 in response to growing concern over the decline of the quality and productivity of the waters of the Chesapeake Bay and its tributaries. The General Assembly enacted the Critical Area Act for the following purposes:

1. To establish a resource protection program for the Chesapeake Bay and Atlantic Coastal Bays and their tributaries by fostering more sensitive development activity for certain shoreline areas so as to minimize impacts to water quality and natural habitats; and
2. To implement a resource protection program on a cooperative basis between the State and affected local governments, with local governments establishing and implementing their programs in a consistent and uniform manner subject to State criteria and oversight.

The goals of the Critical Area Program are to accomplish the following:

1. Minimize adverse impacts on water quality resulting from land uses and practices;
2. Conserve fish, wildlife, and plant habitat; and
3. Establish land use policies that accommodate growth and address environmental impacts caused by human activities.

The program is implemented through local land use regulations, with oversight by the State Critical Area Commission. In the Town of Easton and Talbot County, the Critical Area Program is implemented through local zoning ordinances and subdivision regulations.

As required by State law, the Town of Easton and Talbot County classify lands located within 1,000 feet landward of the Chesapeake Bay, its tributaries to the head of tide, and tidal wetlands, into one of three land use categories based on the land uses that existed as of 1985. These categories, Resource Conservation (RCA), Limited Development (LDA), and Intensely Developed (IDA), each specify land use policies and regulations that permit increasing intensities of land uses. Some types of new development within areas designated as RCA or LDA require a higher land use classification. The process and area by which the location and/or uses of these areas may be expanded or intensified are known as “growth allocation”.

B. JOINT TOWN-COUNTY GROWTH ALLOCATION REVIEW

There is currently no specific acreage of growth allocation allotted to the Town of Easton to redesignate RCA lands. As a result, the Town of Easton Code provides that Talbot County will review potential growth allocation requests on a case-by-case basis. See Town of Easton Code § 28-501.8 A(3). The Talbot County Code establishes the process for such requests, beginning with the submission of the growth allocation request to the Town, which then forwards it to the County for joint review. See Talbot County Code § 190-55.5 I(3)(a). The joint Town-County review involves a joint hearing conducted by the Planning Commissions for the Town and County and recommendations to the respective Town and County Councils. *Id.* at § 190-55.5 I(3)(b). The Town and County Councils then conduct a joint hearing but make independent decisions on whether to approve the growth allocation request. *Id.* at § 190-55.5 I(3)(c). This hearing may be coordinated with the Critical Area Commission’s review. *Id.*

III. GROWTH ALLOCATION STANDARDS AND FACTORS

The Growth Allocation Standards and Factors (the “Standards and Factors”) refer to those standards and factors under which the Critical Area Commission, Town of Easton, and Talbot County review the Applicant’s growth allocation request. The Standards and Factors are set forth in State law in Natural Resources Article § 8-1808.1 and COMAR 27.01.02.06-3 and are implemented at the local level in Town of Easton Code § 28-501.8¹ and Talbot County Code §

¹ References herein are to the 2018 Edition of the Town of Easton Code. At the time of submission, the Town website had been updated to include the DRAFT 2021 Edition of the Code, which recodifies the Town’s Growth Allocation provisions in Code § 28-401.8.

190-15.3. The Standards and Factors are set forth below in the format used by the Critical Area Commission staff for reviewing growth allocation requests. Where applicable, footnotes to corresponding Town of Easton and Talbot County code sections are included for ease of reference.

GROWTH ALLOCATION STANDARDS

The statutory requirements for growth allocation organized under COMAR 27.01.02.06-3, *Requirements for New Intensely Developed Areas and Limited Development Areas*:

- 1. *A new intensely developed area shall be at least 20 acres.*²**

The proposed IDA at Poplar Hill is 65.977 acres in size and, therefore, meets the 20-acre minimum lot size requirement.

- 2. *A local jurisdiction may not use more than 1/2 of its total allotted growth allocation acreage to convert a RCA into a new LDA or IDA, except in Calvert, Caroline, Cecil, Charles, Dorchester, Kent, Queen Anne's, St. Mary's, Somerset, Talbot, Wicomico, and Worcester Counties. If these counties are unable to utilize a portion of their growth allocation under this regulation then these counties may use a standard that varies from that above if the standard is consistent with the County's adopted comprehensive plan, the Critical Area Commission has approved the alternative standard as part of a local jurisdiction's program, and the local jurisdiction requires an applicant for growth allocation to cluster development in the growth allocation area.*³**

The proposed Poplar Hill growth allocation would not exceed 50% of the County's allotted growth allocation for reclassification of RCA lands. Even assuming it did (which it does not), the proposed growth allocation would satisfy the alternative standard approved by the Critical Area Commission for Talbot County. Talbot County currently has approximately 1,872.38 acres of available growth allocation. See Talbot County Code § 190-55.5 D. The 65.977 acres for reclassification sought by this Application is far below the 50% threshold of 936.19 acres. However, even if the threshold were exceeded, the proposed growth allocation would satisfy the Critical Area Commission-approved alternative standards for the reclassification of RCA lands in Talbot County, which are set forth below:

No more than 50% of the County's growth allocation may be utilized on lands located in the RCA, unless the following standards are met:

- a. Any development will be served by public sewer;
- b. The area is located in a priority funding area or municipal growth area;
- c. Development is consistent with the Comprehensive Plan;
- d. The development will have an overall economic benefit to the community, or implements a specific goal, objective or policy;

² COMAR 27.01.02.06-3 B; Town of Easton Code § 28-501.8 C(3); Talbot County Code § 190-15.3 I(3)(a).

³ COMAR 27.01.02.06-3 C-D; Town of Easton Code § 28-501.8 C(4); Talbot County Code § 190-15.3 I(7).

- e. Development must be clustered.

Talbot County Code § 190-15.3 I(7). The Poplar Hill project will be served by public sewer; it is located in a Municipal Priority Funding Area; it is consistent with the Town of Easton's Comprehensive Plan; it will have an overall economic benefit to the community through the creation of new jobs, providing housing at different price points, additional public park/open space/playing fields, and a new satellite firehouse; and, finally, the development will be clustered.

The Town of Easton Code also contains a version of the 50% RCA standard in § 28-501.8 C(4), but the Town standard would not apply since the Town currently does not have remaining RCA growth allocation to allow a calculation under this standard.

3. *Locate a new Intensely Developed Area in a Limited Development Area or adjacent to an existing Intensely Developed Area.*⁴

The proposed IDA at Poplar Hill is adjacent to existing IDAs, consisting of (i) the lands comprising the Easton Club and Papermill Crossing immediately to the north and west of the Property are designated IDA, and (ii) the lands comprising the Easton Bypass to the east and beyond, and adjacent to, the Bypass, the Mallard Ridge subdivision and surrounding areas.⁵

4. *Locate a new Limited Development Area adjacent to an existing Limited Development Area or an Intensely Developed Area.*⁶

This standard is not applicable. The Subject Property is proposed to be designated IDA, not LDA.

5. *Locate a new Intensely Developed Area in a manner that minimizes impacts to habitat protection areas as defined in COMAR 27.01.09, and in an area and manner that optimizes benefits to water quality and impacts to the defined land uses of the Resource Conservation Areas.*⁷

HPAs - The Maryland Department of Natural Resources confirmed in a letter dated August 20, 2021, that there are no official State or Federal records for listed plant or animal species in the affected area. In addition, the Applicant has submitted a Buffer Management Plan to not only protect the 100' shoreline development buffer (including expanded buffer areas) but also enhance the 200' buffer area with additional plantings. The project has also sought to avoid and minimize impacts to nontidal wetlands as shown on the Applicant's PUD Sketch Plan entitled "POPLAR HILL PUD SKETCH PLAN", prepared by Lane Engineering, Inc., and dated July 6, 2022.

⁴ COMAR 27.01.02.06-3 E(1); Town of Easton Code § 28-501.8 C(1); Talbot County Code § 190-15.3 I(3)(a).

⁵ See Town of Easton Critical Area Map, available at <https://eastonmd.gov/DocumentCenter/View/302/Critical-Area-Map-PDF>.

⁶ COMAR 27.01.02.06-3 E(2); Town of Easton Code § 28-501.8 C(2); Talbot County Code § 190-15.3 I(4)(b).

⁷ COMAR 27.01.02.06-3 E(3); Town of Easton Code § 28-501.8 C(5)-(6); Talbot County Code § 190-15.3 I(5).

Water Quality – As noted above, the Poplar Hill project proposes to establish enhanced plantings in the 200’ buffer area pursuant to an approved Buffer Management Plan, which significantly exceeds the minimum requirement for the establishment of a 100’ shoreline buffer. The Applicant also proposes to enhance water quality through approved stormwater management plans, forest conservation plans, and pollution reduction measures exceeding the minimum 10% standard for IDAs.

Defined Land Uses of the RCA – The proposed IDA will be adjacent to, and located in between, two existing IDAs within the Town of Easton. Locating the proposed Poplar Hill IDA in this area minimizes impacts to defined land uses of the RCA by concentrating new development in an area with existing development. In addition, the proposed configuration of the Poplar Hill project retains substantial open space in the most environmentally sensitive areas of the property, namely those areas near tidal waters.

Agricultural Land and Forest – In Talbot County, new LDAs or IDAs must also be located in a manner that minimizes impacts to agricultural land and forests. See Talbot County Code § 190-15.3 I (5)(c). The proposed Poplar Hill growth allocation will minimize impacts to agricultural land by concentrating new development within the Town of Easton where greater density is permitted instead of creating sprawl in outlying, lower density agricultural areas. The Poplar Hill project will also comply with all applicable forest conservation requirements.

- 6. *Locate a new intensely developed area or limited development area in a resource conservation area at least 300 feet beyond the landward boundary of tidal wetlands or tidal waters, unless the local jurisdiction proposes, and the Commission approves, alternative measures for enhancement of water quality and habitat that provide greater benefits to the resources.*⁸**

The proposed growth allocation will provide alternative measures for enhancement of water quality and habitat to offset the reclassification of the 300’ setback from RCA to IDA. The Applicant proposes to establish enhanced plantings in the 200’ shoreline development buffer area pursuant to an approved Buffer Management Plan. These additional plantings would exceed the minimum requirement for the establishment of a 100’ shoreline buffer. The Applicant also proposes enhanced stormwater management features, which will provide treatment in excess of the 10% stormwater reduction standard for IDA reclassifications and to refrain from establishing community piers that would impact tidal areas. The Applicant may be willing to consider additional offset measures that have been accepted by the Critical Area Commission in other cases, such as the removal of impervious surfaces encroaching in the buffer (in this case, which a landowner in the adjacent subdivision known as Papermill Crossing installed without the Applicant’s permission) and the establishment of interpretive and educational signage for on-site stormwater management, native plantings and wildlife, and riparian buffers; an invasive species management program for the site; and, a rubbish/refuse cleanup project along the shoreline area.

GROWTH ALLOCATION FACTORS

⁸ COMAR 27.01.02.06-3 E(4); Town of Easton Code § 28-501.8 C(7); Talbot County Code § 190-15.3 I(6).

In accordance with Natural Resources Article § 8-1808.1(c)(4) and COMAR 27.01.02.06-3(G), the Commission shall consider the following factors when reviewing a map amendment or refinement involving the use of growth allocation:

1. *Consistency with the jurisdiction’s adopted comprehensive plan and whether the growth allocation would implement the goals and objectives of the adopted plan.*⁹

The proposed growth allocation for Poplar Hill is consistent with the policies in the Town of Easton’s Comprehensive Plan. The Land Use Chapter of the Town of Easton’s Comprehensive Plan contains the following goals: “to limit the geographic outward expansion of” the Town and “to achieve a more balanced and integrated mix of land uses within the Town” by, among other things, promoting neighborhoods with “an integrated mix of residential, neighborhood-scale commercial, civic, and open space uses”. See Town of Easton 2009 Comprehensive Plan (the “Comprehensive Plan”), at p. 45-46. The Applicant’s proposed growth allocation helps the Town achieve these goals and objectives by (i) concentrating new development within the Town’s existing boundaries, which reduces pressure for additional annexations, and (ii) establishing a planned, mixed-use community featuring a variety of housing types, substantial open space and public park areas, and appropriately scaled neighborhood commercial uses.

In addition, the Poplar Hill property is identified in the Plan’s Municipal Growth Chapter as an area of potential infill/redevelopment within a Priority Development Area (as identified in the 2004 Comprehensive Plan). *Id.* at p. 53. In fact, of the four remaining Priority Development Areas, the Poplar Hill property has the greatest infill/redevelopment potential in terms of the potential number of units. *Id.* Thus, the Plan anticipates build out of the Poplar Hill site on the scale envisioned by the Applicant.

The Community Character Chapter of the Town’s Comprehensive Plan promotes certain design principles, including integrated uses and the preservation of natural features: “Above all else, neighborhood development can be environmentally responsible by providing adequate opportunities for walking to jobs, convenient retail, and community facilities.” *Id.* at p. 98. The proposed Poplar Hill PUD is designed to achieve these design goals by creating a walkable community with foot-path access to public open space and appropriately scaled neighborhood commercial. The development is also configured to avoid the most environmentally sensitive features near existing tidal areas. Finally, the site of the proposed PUD is adjacent to the existing Easton Club neighborhood, creating continuity from neighborhood to neighborhood.

The Housing Chapter of the Town’s Plan contains several goals and objectives aimed at promoting a mix of housing types. The first goal is to ensure that “housing in Easton is safe, sanitary, structurally sound and safeguards or upgrades neighborhood design.” *Id.* at p. 140. The Plan proposes to accomplish this goal by achieving “a density that creates a sense of place, uses

⁹ COMAR 27.01.02.06-3 G(1); Town of Easton Code § 28-501.8 D(1); This Application includes an analysis of consistency with the Town of Easton Comprehensive Plan only since the proposed Poplar Hill project is located within the Town. To the extent a review of consistency with the Talbot County Comprehensive Plan is deemed necessary, the Applicant reserves the right to supplement this Narrative with an analysis demonstrating the consistency of the proposed growth allocation with the County Comprehensive Plan, which, consistent with Smart Growth principles, seeks to direct new development to existing municipalities.

infrastructure efficiently, produces pedestrian-friendly neighborhoods and accommodates plans for transit” and further, by providing “open spaces; use landscaping to accentuate the natural environment and give visual connectivity; preserve natural assets, community identify and environmental and health standards.” *Id.* Another goal is to ensure “a more heterogenous mix of price points in future residential projects” by, among other things, providing “density bonuses in projects for the inclusion of low and moderate-income housing units.” *Id.* at p. 141. The Applicant’s proposed growth allocation will help the Town meet these goals by offering three distinct types of housing at different price points: single family residences, townhomes, and multifamily apartments. The development will create a unique sense of place with limited neighborhood commercial uses, significant open space, and pedestrian trails. The development will be configured to preserve sensitive environmental areas near tidal waters.

The Parks, Recreation, and Open Space Chapter includes the goal of providing “a system of green infrastructure (see Future Land Use Map)” and the objective of identifying “appropriate open space areas to serve as green centers or anchors and connect them through a series of pathways and green corridors.” *Id.* at p. 155. The Applicant’s proposed development plan for Poplar Hill calls for the establishment of substantial open space, including playing fields, creating a new open space anchor in south Easton. The location of the proposed open spaces also offers potential future connectivity to other Town parks and trails. The location is extremely close to the Talbot County YMCA, which is listed in Table 12 of the Parks, Recreation, and Opens Space Chapter as a quasi-public special park area. *Id.* at p. 147.

The Transportation Chapter of the Town Plan includes the following objective: “Require future development to occur based on a gridded street system which includes accommodations for pedestrians and bicycles.” *Id.* at 225. The Town’s Proposed Bicycle Routes Map shows a planned bicycle connection running past the Oxford Road entrance to the Poplar Hill site through the intersection of Oxford Road and the Easton Bypass and continuing into downtown via Peachblossom Road. The proposed Poplar Hill development adheres to the objective of promoting pedestrian and bicycle activity, as shown in the PUD plans submitted to the Town.

The Mineral Resources Chapter of the Town Plan contains the following goal: “To ensure that home sites contain topsoil of a quantity and quality necessary to support lawns, gardens, and/or landscaping.” *Id.* at 245. The Applicant is aware of the Town’s desire to ensure that new development contains soil that can support typical residential plantings and will comply with all applicable Town standards in this regard.

The Implementation Chapter of the Town Plan discusses the possibility of new healthcare development at the Poplar Hill site while acknowledging that Shore Health’s plans had evolved to include a new site on the north side of Town. *Id.* at 261-63. Since the Town Plan was adopted in 2010, Shore Health has committed to the north Easton location and determined that the Poplar Hill site is no longer needed to achieve its healthcare services vision for the area. The Poplar Hill property is mapped “Residential” and identified as “Area 3” on the Town’s Future Land Use Map. The Plan states that Area 3, along with the other six identified “Areas”, are “envisioned by this Plan as the primary location of any development not already ‘on the books’ at this time during the upcoming Planning Period.” *Id.* at 263. With respect to residential character for new development, the Plan provides that neighborhoods “should contain a variety of housing types, as well as limited,

neighborhood-scale commercial development.” *Id.* at 259. This is precisely what the Applicant proposes for Poplar Hill.

In addition to being consistent with the policies of the Comprehensive Plan as described above, the Poplar Hill project is consistent with the timing of Plan implementation; the timing of development; the timing of rezoning; development patterns; land uses; and, densities and intensities. The Poplar Hill property is recognized as an area of potential development by the Town and an application for a Planned Unit Development overlay zoning district is currently pending. The proposed project is also consistent with development patterns within the Town, being adjacent to the Easton Club and across the Bypass from downtown Easton. In terms of densities or intensities, the Poplar Hill project seeks to make the most efficient use of the land by offering a variety of housing types and options while preserving open space and protecting sensitive environmental areas. The proposed densities are consistent with the designation of the Property as a Priority Funding Area (at least 3.5 dwelling units per acre).

2. For a new Intensely Developed Area, whether the development will:¹⁰

(a) Be served by a public wastewater system.

The Subject Property is located within the Town of Easton, which is served by Easton Utilities. The Property is mapped S-1, immediate priority service, in the Talbot County Comprehensive Water and Sewer Plan, and is expected to receive service from the Town of Easton’s wastewater treatment plant.

(b) Have an allowed average density of at least 3.5 units per acre, as calculated under State Finance and Procurement Article, § 5-7B-03(h), Annotated Code of Maryland.

The Applicant intends to develop the Subject Property as a Planned Unit Development District (“PUD”) under the Town of Easton Code. The overall residential density of a PUD generally allows up to sixteen (16) residential units per gross residential acre. See Town of Easton Code § 28-801 G. The base zoning district for the Property, R10A – Residential Medium Density, allows a maximum density of 3.5 dwelling units per acre for single family dwellings, subject to increase where the subdivision proposal provides on-site or off-site housing opportunities for low- or moderate-income households. *Id.* at § 28-303.2 G. The development proposed in connection with the Poplar Hill growth allocation will have an allowed average density of approximately 3.66 units per acre (439 units / 120 acres).

(c) For a new intensely developed area that is greater than 20 acres, be located in a priority funding area.

¹⁰ COMAR 27.01.02.06-3 G(2). The Town of Easton Code contains a similar standard in § 28-501.8 D(3), but it applies to Limited Development Areas (LDAs) and there is no corresponding provision for Intensely Developed Areas (IDAs). The Town Code’s reference to LDAs in this Section, instead of IDAs, may be in error. The Talbot County Code includes a discussion of these factors in Talbot County Code § 190-15.3 J(3)(f)-(g).

The proposed IDA is greater than 20 acres and located in a Municipal PFA.

(d) *Have a demonstrable economic benefit to the area.*

The proposed growth allocation will have a demonstrable economic benefit to the area by creating temporary jobs associated with construction and permanent jobs to operate the limited neighborhood commercial uses and to maintain the residences and other improvements within the development. Job creation or retention may also occur in connection with the addition of playing fields, which require athletic program direction and maintenance. The proposed growth allocation will also provide a mix of single family, townhome, and multi-family housing options, including affordable housing, and will enhance the Town's appeal through increased public open space and walking trails. Expanded housing choice benefits the local economy through increased job retention and financial stability. Additional open space also provides benefits by promoting active lifestyles, enhanced property values, and recreational activities.

3. *For a new limited development area, whether the development will be served by a public wastewater system or septic system that uses best available nitrogen removal technology, complete an existing subdivision, expand an existing business, or be clustered.*¹¹

This standard is not applicable. The Subject Property is proposed to be designated IDA, not LDA. However, the Property is expected to be served by public sewer. For a discussion of the availability of public sewer, see Response to Factor 2(a) above.

4. *The use of existing public infrastructure, where practical.*¹²

As discussed above, the Subject Property is expected to connect to public sewer. The Property will also connect to and utilize existing public water, electricity, telecommunications, roads, and waste disposal services maintained or offered by Easton Utilities and/or the Town of Easton.

5. *Consistency with State and regional environmental protection policies concerning the protection of threatened and endangered species and species in need of conservation that may be located onsite or offsite.*¹³

No impacts to threatened or endangered species in need of conservation are proposed by this Application.

6. *Impacts on a priority preservation area, as defined under Agriculture Article, § 2-518, Annotated Code of Maryland.*¹⁴

¹¹ COMAR 27.01.02.06-3 G(3); Town of Easton Code § 28-501.8 D(2); Talbot County Code § 190-15.3 J(3)(f).

¹² COMAR 27.01.02.06-3 G(4); Town of Easton Code § 28-501.8 D(4).

¹³ COMAR 27.01.02.06-3 G(5); Town of Easton Code § 28-501.8 D(5); Talbot County Code § 190-15.3 J(3)(b).

¹⁴ COMAR 27.01.02.06-3 G(6); Town of Easton Code § 28-501.8 D(6); Talbot County Code § 190-15.3 J(3)(c).

The Property is not designated a priority preservation area.

7. ***Environmental impacts associated with wastewater and stormwater management practices and wastewater and stormwater discharges to tidal waters, tidal wetlands, and tributary streams.***¹⁵

The proposed Poplar Hill project's wastewater and stormwater practices have been designed and will be implemented based on the current regulatory requirements and are expected to be approved by the appropriate agencies. A Concept Stormwater Management ("SWM") Plan has been prepared by Lane Engineering to address the Town Stormwater Management Ordinance and Critical Area 10% Rule requirements. The SWM proposes certain Best Management Practices ("BMPs") such as Micro infiltration, non-roof top disconnection, bioswales, and grass swales.

8. ***Environmental impacts associated with location in a coastal hazard area or an increased risk of severe flooding attributable to the proposed development.***¹⁶

The proposed development is not located in a coastal hazard area and will not cause any increased risk of severe flooding.

ADDITIONAL STATUTORY AND REGULATORY REQUIREMENTS

In addition to the Growth Allocation Standards and Growth Allocation Factors discussed above, a statute must also address the following requirements for growth allocation:

1. ***Intensely Developed or Limited Development Areas shall conform to all criteria of the Commission for Intensely Developed or Limited Development Areas and shall be designated on the comprehensive zoning map submitted by the local jurisdiction as part of its application to the Commission for program approval or at a later date in compliance with Section 8-1809(g).***¹⁷

Upon approval of the proposed IDA growth allocation, the Town of Easton would submit a revised comprehensive zoning map to the Commission.

2. ***The area of expansion of Intensely Developed or Limited Development Areas, or both, may not exceed an area equal to 5 percent of the county's portion of the Resource Conservation Area lands that are not tidal wetland or federally owned.***¹⁸

¹⁵ COMAR 27.01.02.06-3 G(7); Town of Easton Code § 28-501.8 D(7).

¹⁶ COMAR 27.01.02.06-3 G(8); Town of Easton Code § 28-501.8 D(8); Talbot County Code § 190-15.3 J(3)(d).

¹⁷ Natural Resources Article § 8-1808.1(c)(2)(vii); Town of Easton Code § 28-501.8 C(8).

¹⁸ Natural Resources Article § 8-1808.1(b); Town of Easton Code §§ 28-501.8 A(1)-(2); Talbot County Code § 190-55.5 D(1)

The proposed area of expansion of IDA will not exceed 5% of the County's portion of RCA lands that are not tidal wetlands or federally owned. The County has approximately 1,872.38 acres of remaining growth allocation for RCAs, a portion of which may be granted to towns without remaining acreage on a supplemental, project-by-project basis. See Talbot County Code § 190-55.5 D(3). The proposed allocation of 65.977 acres for the Poplar Hill project is well within the available acreage that may be awarded to towns through the supplemental growth allocation process.

IV. ADDITIONAL TALBOT COUNTY STANDARDS

The Talbot County Code requires the County Council to evaluate applications for supplemental growth allocation within towns in accordance with Section 190-55.5 F of the Talbot County Code:

The County and town councils or commissions shall hold a joint hearing on the application, co-chaired by the designated Chairperson of each council or commission which may be coordinated jointly with the Critical Area Commission. The County and municipal councils or commissions shall make their respective decision separately as independent entities. **The County Council shall evaluate the application in accordance with § 190-55.5 F, Standards in this section.**

See Talbot County Code § 190-55.5 I(3)(c) (emphasis added). Talbot County Code § 190-55.5 F in turn provides:

In deciding whether to approve or disapprove an application for amendment to the land management designation and/or growth allocation, the County Council shall evaluate the applicable components of the application: the Zoning Map amendment, the revision to the Critical Area land management designation, requested growth allocation, and the concept plan. **All of the standards below shall be used in evaluating the application.**

The additional standards in § 190-55.5 F are addressed below:

- 1. The standards and factors for amendments to the Official Zoning Map (§ 190-55.2 B and C) shall be used to evaluate any proposed rezoning.***

The Poplar Hill project is not seeking a rezoning. The Applicant has applied to the Town of Easton for a Planned Unit Development ("PUD") floating zone, which, if approved, will apply the PUD floating zone over the underlying Town of Easton residential R-10A and Planned Healthcare ("HC") districts. The placement of a new overlay does not entail a rezoning of the underlying land. Thus, no Town of Easton rezoning is involved. Nor is a Talbot County rezoning involved since the Subject Property is located entirely within the Town of Easton. Therefore, this Application does not involve an amendment to the County's Official Zoning Map and, thus, the standards and factors in Talbot County Code § 190-55.2 B and C do not apply.

- 2. *Whether applicable requirements of the County's Critical Area Program, Zoning Ordinance and Subdivision Regulations have been met, including the standards for establishment of RCA, LDA, and IDA areas established in § 190-15.3.***

The Standards and Factors for the establishment of a new IDA on the Subject Property are discussed in Section III of this Supplemental Narrative, above. This discussion includes the relevant Standards and Factors from Talbot County Code § 190-15.3, as identified in the footnotes to Section III. The Applicant hereby incorporates its Responses from Section III, above.

- 3. *In addition to meeting the minimum requirements of the Critical Area Regulations, the project design shall enhance the habitat value or improve water quality in the area. For example, afforestation may exceed the 15% requirement or best management practices for stormwater management may be installed on portions of the site to remain in agricultural use.***

The Applicant proposes to enhance habitat value and improve water quality through the establishment of enhanced plantings within the 200' buffer area (in addition to protecting the 100' buffer), stormwater management features meeting or exceeding applicable requirements, compliance with applicable forest conservation requirements, and the clustering of development away from the most sensitive environmental features on the site.

- 4. *For residential development, a community pier shall be provided rather than individual piers.***

No piers are proposed as part of the Poplar Hill project.

- 5. *The location, nature, and timing of the proposed growth allocation in relation to the public interest in ordered, efficient, and productive development and land use.***

The proposed Poplar Hill growth allocation is consistent with the ordered, efficient, and productive development and land use in terms of its location, nature, and timing. The Subject Property was previously slated for development as a medical campus for Shore Health under the Town's Planned Healthcare District. The establishment of a new mixed-use residential community at the site is recognized by the Town's Comprehensive Plan and helps to direct new development away from the unincorporated areas of the County. The project will provide a variety of housing types, at different price points, along with reasonably scaled neighborhood commercial and ample open space, as envisioned in the Town's Comprehensive Plan and implemented through the Town's zoning ordinance. Thus, the project promotes the ordered, efficient, and productive use of land within the Town of Easton and Talbot County.

- 6. *Whether the proposed growth allocation, subject to the proposed concept site plan, will fulfill public purposes through the provision of public facilities, implementation of Comprehensive Plan strategies, or advancement of the land use policies and objectives of the Comprehensive Plan.***

The proposed Poplar Hill growth allocation and concept plan are consistent with the Town's Comprehensive Plan, will utilize existing public facilities and provide new ones. See Response to Growth Allocation Factor 1, above. Specifically, the project proposes to establish a new satellite firehouse and new public park with multi-purpose playing fields, a dog park, playground, and public restrooms. There will also be pedestrian and bike paths connecting the public park to the limited, neighborhood commercial area. The addition of these new public facilities will promote the public purpose of expanding public open space and implement key policies in the Town's Comprehensive Plan.

7. The Council may approve the application only if it finds that the proposed concept site plan will:

a. Create lots or parcels that maximize opportunities for clustered development that protect habitat and agricultural resources;

The proposed concept plan for Poplar Hill maximizes opportunities for clustered development and the protection of habitat and agricultural resources by locating new units away from the most sensitive environmental areas, utilizing small lots for single family dwellings, as well as attached townhouses and clustered multifamily apartment housing units. The project protects the County's agricultural resources by concentrating development within the Town of Easton, thereby reducing development pressure on agricultural lands in the unincorporated area of the County. No impacts to threatened or endangered species in need of conservation are proposed by this Application.

b. Locate structures to minimize impact on habitat protection areas and agricultural areas;

The Poplar Hill project proposes to locate structures in a manner to minimize impacts on habitat protection areas and agricultural areas. Structures are generally located away from the most sensitive environmental features on the Subject Property comprising the shoreline buffer area. The location of the project helps to protect the County's agricultural resources by concentrating development within the Town of Easton, thereby reducing development pressure on agricultural lands in the unincorporated area of the County.

c. Avoid or provide a minimally disturbed Shoreline Development Buffer;

The Polar Hill project proposes to establish enhanced plantings within 200' buffer area, which significantly exceeds the minimum 100' shoreline buffer requirement. A copy of the Applicant's proposed Buffer Management Plan is included with the Application.

d. Minimize soil erosion and runoff;

The Poplar Hill project will minimize soil erosion and runoff by implementing approved sediment and erosion control and stormwater management plans.

e. Maximize protection of eroding shorelines;

The Poplar Hill project will maximize protection of eroding shorelines, if any, by establishing enhanced plantings within the 200' shoreline buffer area, which exceeds the minimum 100' buffer requirement. The Applicant will also implement approved sediment and erosion control and stormwater management plans.

f. Have a minimal impact or cause an improvement to stormwater, floodplain and stream characteristics;

The Poplar Hill project will have a minimal impact, or cause an improvement, to stormwater, floodplain and stream characteristics by implementing approved stormwater management plans, clustering development away from the shoreline, and establishing enhanced plantings within the 200' shoreline buffer. In addition, new development will not be located within special flood hazard areas.

g. Avoid or minimize impacts on nontidal wetlands;

The Poplar Hill project will avoid or minimize impacts to nontidal wetlands to the extent possible by following existing natural boundaries and obtaining applicable permits and approvals for any nontidal wetlands that are impacted.

h. Maximize protection of plant and wildlife habitats, particularly for threatened and endangered species, plant and wildlife common to the Chesapeake Bay Region, and anadromous fish propagation waters; and

No impacts to threatened or endangered species in need of conservation are proposed by this Application.

i. Maximize protection of forests.

The Poplar Hill project will maximize protection of forest by implementing an approved forest conservation plan and Buffer Management Plan. The proposed layout of the development seeks to follow existing natural boundaries without undue disturbance to forested areas, including maintaining approximately 13.42 acres of existing forest.

8. The County Council shall also make findings based on the growth allocation standards of the Maryland Natural Resources Article § 8-1808.1(c) and may establish conditions of approval that are consistent with the intent of the County's Critical Area Program.

Natural Resources Article § 8-1808.1(c) establishes standards for locating new IDAs and LDAs. These standards are addressed in this Application above as part of the Growth Allocation Standards and Factors in Section III. The Applicant hereby incorporates its Responses from Section III herein.

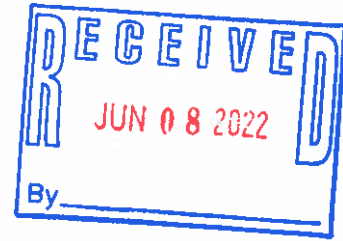
V. CONCLUSION

The Applicant hereby requests that the Poplar Hill project be awarded growth allocation to reclassify 65.977 acres of the Subject Property from RCA to IDA.



MCALLISTER
DETAR
SHOWALTER
& WALKER

Anthony Kupersmith
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410-934-3910



DMC
DLN

June 7, 2022

Via Email to beth.cole@maryland.gov
Beth Cole
Administrator, Review and Compliance
Maryland Historical Trust
100 Community Place, 3rd Floor
Crownsville, MD 21032

The Maryland Historical Trust has determined
that there are no historic properties affected by
this undertaking.

Diya Henry Date *6/7/22*

Re: Request for Project Review for Poplar Hill (Easton, MD)

Dear Ms. Cole:

This firm represents the developer of a certain lot or parcel of land located in the Town of Easton, Talbot County, Maryland, known as "Poplar Hill." I am writing to request preliminary comments from MHT to supplement a growth allocation application for the project.

The proposed project site is located on 105.4 acres± of land, being a portion of Tax Map 42, Grid 4, Parcel 57, which is bounded by Oxford Road (Md. Route 333) and the Easton Bypass (Md. Route 322). The proposed project involves the establishment of a mixed-use development, including single family dwellings, townhomes, multi-family housing, neighborhood commercial, a public park, and open space. The developer will be seeking an award of Critical Area growth allocation in connection with the project.

Under COMAR, an applicant for growth allocation must include with its application preliminary comments from certain agencies, including MHT:

(6) For the following resources, as appropriate for the project site and each government agency, a preliminary review and comment from the Department of the Environment, Department of Natural Resources, Maryland Historical Trust, and U.S. Army Corps of Engineers regarding:

- (a) Rare, threatened, and endangered species;
- (b) Forest interior dwelling birds and colonial water birds;
- (c) Anadromous fish and their propagation waters and any other aquatic species located onsite;
- (d) Plant and wildlife habitat and historic waterfowl staging and concentration areas;
- (e) Submerged aquatic vegetation;
- (f) Riparian forests and tidal and nontidal wetlands; and
- (g) Natural heritage areas and other historical and cultural resources;

COMAR 27.01.02.05-1.



Maryland

Department of the Environment

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor

Horacio Tablada, Secretary
Suzanne E. Dorsey, Deputy Secretary

June 30, 2022

Mr. Anthony P. Kupersmith
McAllister, DeTar, Showalter & Walker LLC
706 Giddings Ave., Suite 305
Annapolis, Maryland 21401

RE: ES20220616-002
Environmental Review for Polar Hill located at Oxford Road, Easton - 126 Acres,
Tax Map 42, Parcel 57, Talbot County, Maryland

Dear Mr. Kupersmith,

Below are the comments from the Maryland Department of the Environment regarding the above referenced project.

1. Any above ground or underground petroleum storage tanks, which may be utilized, must be installed and maintained in accordance with applicable State and federal laws and regulations. Underground storage tanks must be registered and the installation must be conducted and performed by a contractor certified to install underground storage tanks by the Land and Materials Administration in accordance with COMAR 26.10. Contact the Oil Control Program at (410) 537-3442 for additional information.
2. Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible. Contact the Solid Waste Program at (410) 537-3315 for additional information regarding solid waste activities and contact the Resource Management Program at (410) 537-3314 for additional information regarding recycling activities.
3. The Solid Waste Program should be contacted directly at (410) 537-3315 by those facilities which generate or propose to generate or handle hazardous wastes to ensure these activities are being conducted in compliance with applicable State and federal laws and regulations. The Program should also be contacted prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable State and federal laws and regulations.
4. The proposed project may involve rehabilitation, redevelopment, revitalization, or property acquisition of commercial, industrial property. Accordingly, MDE's Brownfields Site Assessment and Voluntary Cleanup Programs (VCP) may provide valuable assistance to you in this project.

These programs involve environmental site assessment in accordance with accepted industry and financial institution standards for property transfer. For specific information about these programs and eligibility, please Land Restoration Program at (410) 537-3437.

5. Borrow areas used to provide clean earth back fill material may require a surface mine permit. Disposal of excess cut material at a surface mine may requires site approval. Contact the Mining Program at (410) 537-3557 for further details.
6. Construction, renovation and/or demolition of buildings and roadways must be performed in conformance with State regulations pertaining to "Particulate Matter from Materials Handling and Construction" (COMAR 26.11.06.03D), requiring that during any construction and/or demolition work, reasonable precaution must be taken to prevent particulate matter, such as fugitive dust, from becoming airborne.
7. During the duration of the project, soil excavation/grading/site work will be performed; there is a potential for encountering soil contamination. If soil contamination is present, a permit for soil remediation is required from MDE's Air and Radiation Management Administration. Please contact the New Source Permits Division, Air and Radiation Management Administration at (410) 537-3230 to learn about the State's requirements for these permits.
8. If any project can be considered regionally significant, such as a shopping mall, a sports arena, industrial complex, or an office complex, the project may need to be identified to the regional Metropolitan Planning Organization (MPO). Project managers who need a permit to connect their projects to a State or federal highway should contact the Planning Division of the Planning and Monitoring Program, Air and Radiation Administration, at (410) 537-3240 for further guidance.
9. If a project receives federal funding, approvals and/or permits, and will be located in a nonattainment area or maintenance area for ozone or carbon monoxide, the applicant needs to determine whether emissions from the project will exceed the thresholds identified in the federal rule on general conformity. If the project emissions will be greater than 25 tons per year, contact the Air Quality Planning Program of the Air and Radiation Administration, at (410) 537-4125 for further information regarding threshold limits.
10. Wetlands provide important socio-economic benefits and ecosystem services such as storing and conveying flood waters, recharging groundwater, improving water quality by filtering and storing nutrients, and providing shoreline protection and critical habitat for a multitude of plant and animal species. The Maryland Department of the Environment's Wetlands and Waterways Program protects Maryland wetlands and waterways from loss and degradation. This protection is achieved through the regulation of the draining, dredging and filling of tidal and nontidal wetlands, the nontidal wetland buffer and waterways, including the nontidal 100-year floodplain through a permitting or authorization process implemented in close coordination with the federal government (specifically, the Army Corps of Engineers).

Persons proposing activities in tidal wetlands, nontidal wetlands and their 25- or 100-foot buffers, or nontidal waterways and their 100-year floodplain must submit a Joint Permit Application and

supporting information to the Wetlands and Waterways Program. Early coordination with the Program is encouraged to discuss regulatory requirements and minimization of adverse impacts to the regulated resources.

The proposed project is a mixed-use development adjacent Oxford Road and Easton Parkway. The site includes tidal wetlands, a stream, and nontidal wetlands. The Wetlands and Waterways Program has the following comments:

Tidal Wetlands: Activities in tidal wetlands to construct or reconstruct structures, or to dredge or fill a State or private tidal wetland, shall obtain a license from the Board of Public Works or a permit from Maryland Department of the Environment. The construction, reconstruction, alteration, or addition to any conduit, cable, pipeline, intake or discharge pipe, trestle, or other similar device, structure, or apparatus, over, on, in, or under tidal wetlands or waters of the State requires an applicant to submit a Joint Permit Application and supporting information to MDE's Wetlands and Waterways Program. The Program will review the application and supporting information to make a determination which will be provided in a Report and Recommendation to the Board for their use in making a decision to grant or deny a license for proposed work over, on, in, or under State tidal wetlands. The Program will review the application and supporting information to make a determination to issue or deny a permit for proposed work over, on, in, or under private tidal wetlands.

A person submitting a Joint Permit Application to obtain a license or permit shall be the riparian landowner of upland adjoining the affected area of State or private tidal wetlands, an agent of the riparian landowner, the State, any unit of the State, a public service company, a municipality, or a political subdivision.

Contact: Michaela Harrington, Tidal Wetlands Division (410) 537-3571

Nontidal Wetlands: MDE regulates the following activities in nontidal wetlands and their 25-foot or expanded 100-foot buffers: (i) Removal, excavation, or dredging of soil, sand, gravel, minerals, organic matter, or materials of any kind; (ii) Changing existing drainage characteristics, sedimentation patterns, flow patterns, or flood retention characteristics; (iii) Disturbance of the water level or water table by drainage, impoundment, or other means; (iv) Dumping, discharging of material, or filling with material, including the driving of piles, and placing of obstructions; (v) Grading or removal of material that would alter existing topography, and (vi) Destruction or removal of plant life that would alter the character of a nontidal wetland.

Contact: Mieko Camp, Nontidal Wetlands Division (410) 713-3685

Nontidal Waterways and 100-year Floodplain: MDE regulates construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction or any change of the course, current, or cross section of a stream or body of water within the State including any changes to the 100-year frequency floodplain of free-flowing waters.

Contact: Bill Seiger, Waterway Construction Division (410) 537-3821

The Wetlands and Waterways Program encourages a site design which avoids, or if avoidance is not practicable, minimizes impacts from activities in regulated stream or wetland resources. Early coordination with the Program during planning stages for the project is strongly encouraged to avoid or minimize adverse impacts from regulated activities. If there are activities proposed for new sewer or water projects in regulated resources, the applicant is encouraged to contact the Wetlands and Waterways Program.

Compensatory mitigation may be required for permanent wetland losses, including conversion of forested wetlands to other wetland types and permanent access roads, and other structures. Early coordination with the Program regarding mitigation requirements is strongly encouraged.

Contact: Kelly Neff, Mitigation Section (410) 537-4018

An evaluation of the site and its vicinity using the Watershed Resources Registry shows the presence of sensitive resources. Portions of the site contain a Targeted Ecological Area. The site is also adjacent to areas with sensitive species, Biodiversity Conservation Network, and Forest Interior Species habitat. Contact MDE or the Maryland Department of Natural Resources for recommendations or requirements to avoid or minimize adverse impacts to these resources.

Specific comments:

Where practicable, stormwater management facilities should be located outside nontidal wetlands and their regulated 25-foot buffer. Redesign of the facility within forested nontidal wetlands along the northern property line is encouraged.

Climate Change Resiliency and Flooding. In addition, consideration of measures to address climate change are highly encouraged. This may include designing stormwater management facilities to treat storm events beyond generating more than 1" of runoff in 24 hours, and instead treat more frequent, higher intensity, shorter duration events. Roads crossings over waters may need to be designed to different standards to pass storm flows without infrastructure damage or discharges to aquatic life. Retention or re-establishment of forests is also highly desirable.

The County or applicant is advised to contact Dave Guignet, State NFIP Coordinator, of MDE's Stormwater, Dam Safety, and Flood Management Program, at (410) 537-3775 for additional information regarding the regulatory requirements for Floodplains and Storm Surges.

The County or applicant is advised to contact Matthew C. Rowe, CC-P, Assistant Director of MDE's Water and Science Administration, at (410) 537-3578 for additional information regarding Climate Change and Resiliency

Please let me know if you have any questions or concerns.

Mr. Anthony P. Kupersmith
June 30, 2022
Page 5

Sincerely,

Amanda R. Redmiles

Amanda R. Redmiles
Interdepartmental Information Liaison
Maryland Department of the Environment



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Charles Glass, Deputy Secretary

March 26, 2021

Ms. Natalie Hurley
Lane Engineering, LLC
P.O. Box 1767
117 Bay Street
Easton, MD 21601

RE: Environmental Review for Oxford Road, Easton - 126 Acres, Tax Map 42, Parcel 57, Lane Engineering, LLC Job No# 200574, Talbot County, Maryland.

Dear Ms. Hurley:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2021.0217.ta
Cc: C. Jones, CAC

MID-ATLANTIC REAL ESTATE

INVESTMENTS, INC
9161 LIBERIA AVENUE, SUITE 201
MANASSAS, VA 20110
703-257-1188

TRUIST BANK
8650 CENTREVILLE RD
MANASSAS, VA 20110

6725

65-270/550

PAY ***** FIVE THOUSAND AND 00/100 DOLLARS

TO THE
ORDER OF

DATE
06/23/22

AMOUNT
\$5,000.00***

TOWN OF EASTON
14 S. HARRISON STREET
EASTON, MD 21601



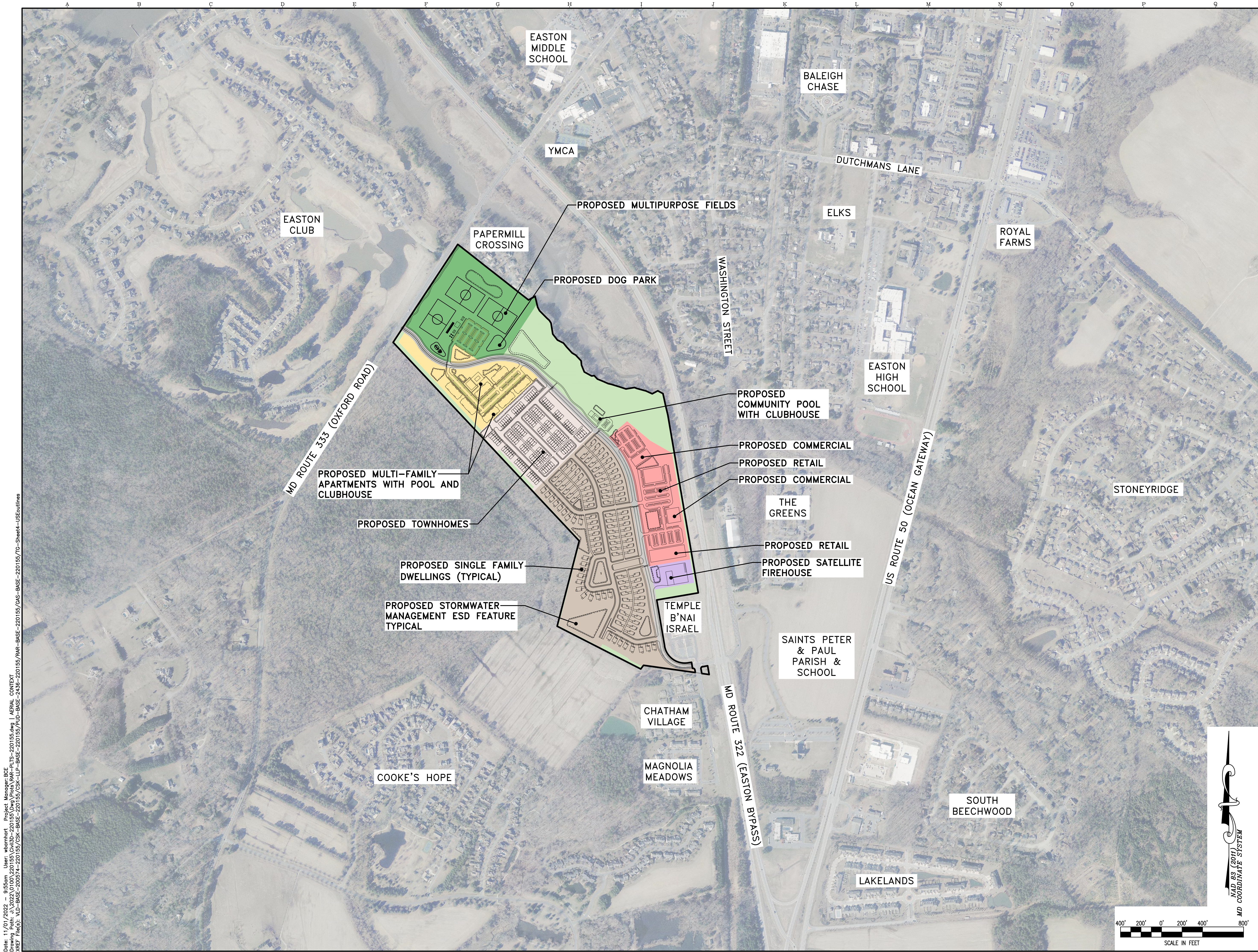
[Handwritten signature in blue ink]

SECURITY FEATURES INCLUDE FOIL HOLOGRAM • HEAT SENSITIVE ICON • MICROPRINT • MULTI-COLOR BACKGROUND

⑈006725⑈ ⑆055002707⑆ 1000152392360⑈

DATE:06/23/22 CK#:6725 TOTAL:\$5,000.00*** BANK:SUNTRUST MID-ATLANTIC(suntmida)
PAYEE:TOWN OF EASTON

Property Address	Invoice - Date	Description	Amount
OXFORD ROAD	06/23/2022	Growth Allocation Fee	5,000.00
			5,000.00



Date: 11/01/2022 - 9:55am User: wbornhorst Project Manager: BCE
Drawing Path: J:\2022\0100\220155\Civil\3D-220155\Draw\Plan\VAR-PLT-220155.dwg | AERIAL CONTEXT
XREF File(s): VLD-BASE-200574-220155\OSK-BASE-220155\LP-BASE-220155\PU-BASE-220155\OSK-BASE-220155\VAR-BASE-220155\OSK-BASE-220155\70-Sheet-1-USOutline

REVISIONS TO APPROVED PLANS			
No.	DATE	DESCRIPTION	BY

WARNING!!
THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE QUANTITIES SHOWN ON THIS PLAN ARE FOR INFORMATIONAL AND PERMITTING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES TO HIS OWN SATISFACTION PRIOR TO BEGINNING CONSTRUCTION.
THE CONTRACTOR SHALL TEST PIT AND LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF ANY WORK ON-SITE. THE CONTRACTOR SHALL NOTIFY DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF THE EXISTING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK ON-SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION EXPENSE.



Lane Engineering, LLC
Established 1986
Civil Engineers • Land Planning • Land Surveyors
E-mail: general@laneinc.com
117 Bay St. Easton, MD 21613 (410) 822-8003
15 Washington St. Centreville, MD 21613 (410) 221-0818
354 Pennsylvania Ave. Centreville, MD 21617 (410) 758-2095

SEAL

DATE

AERIAL CONTEXT PLAN

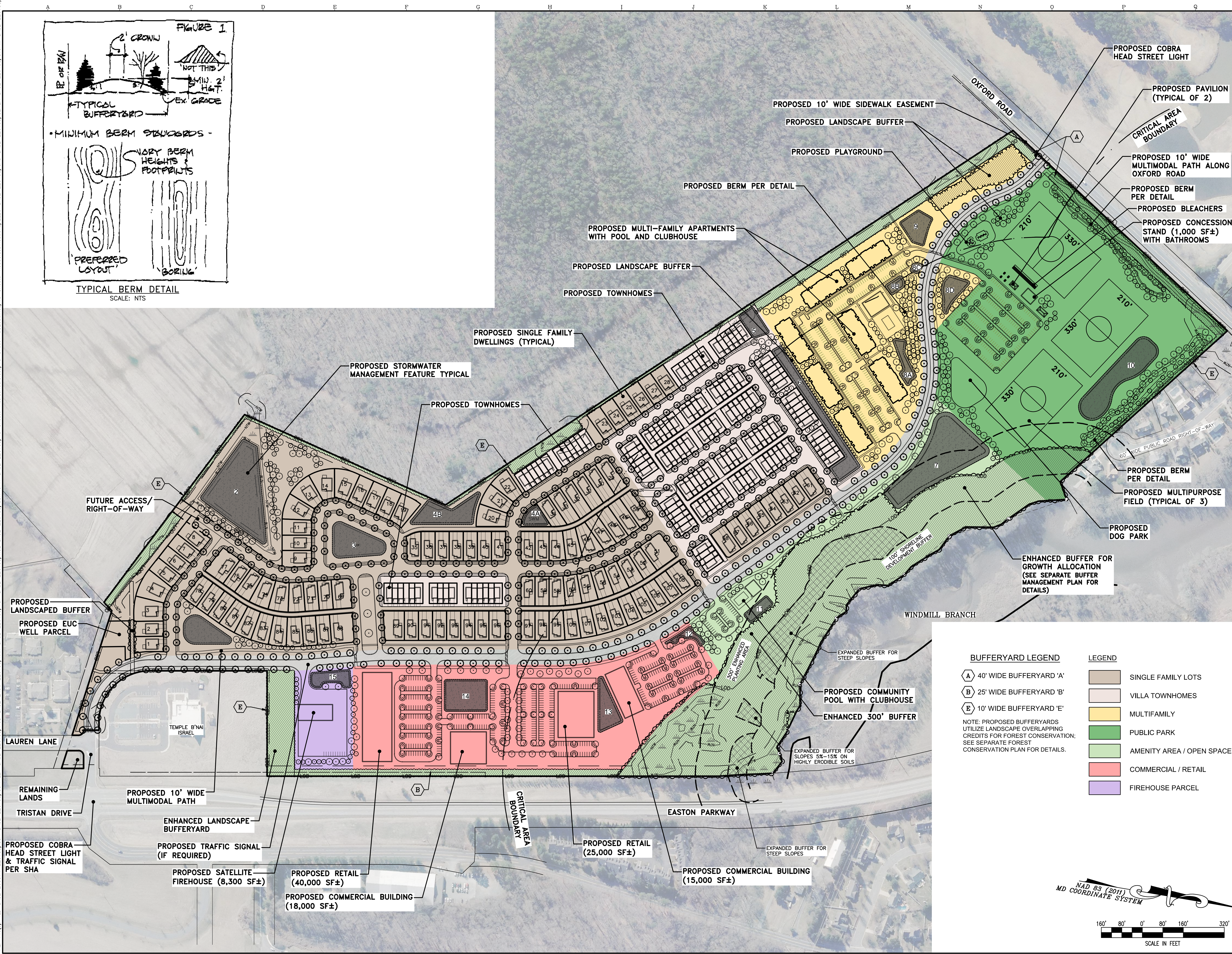
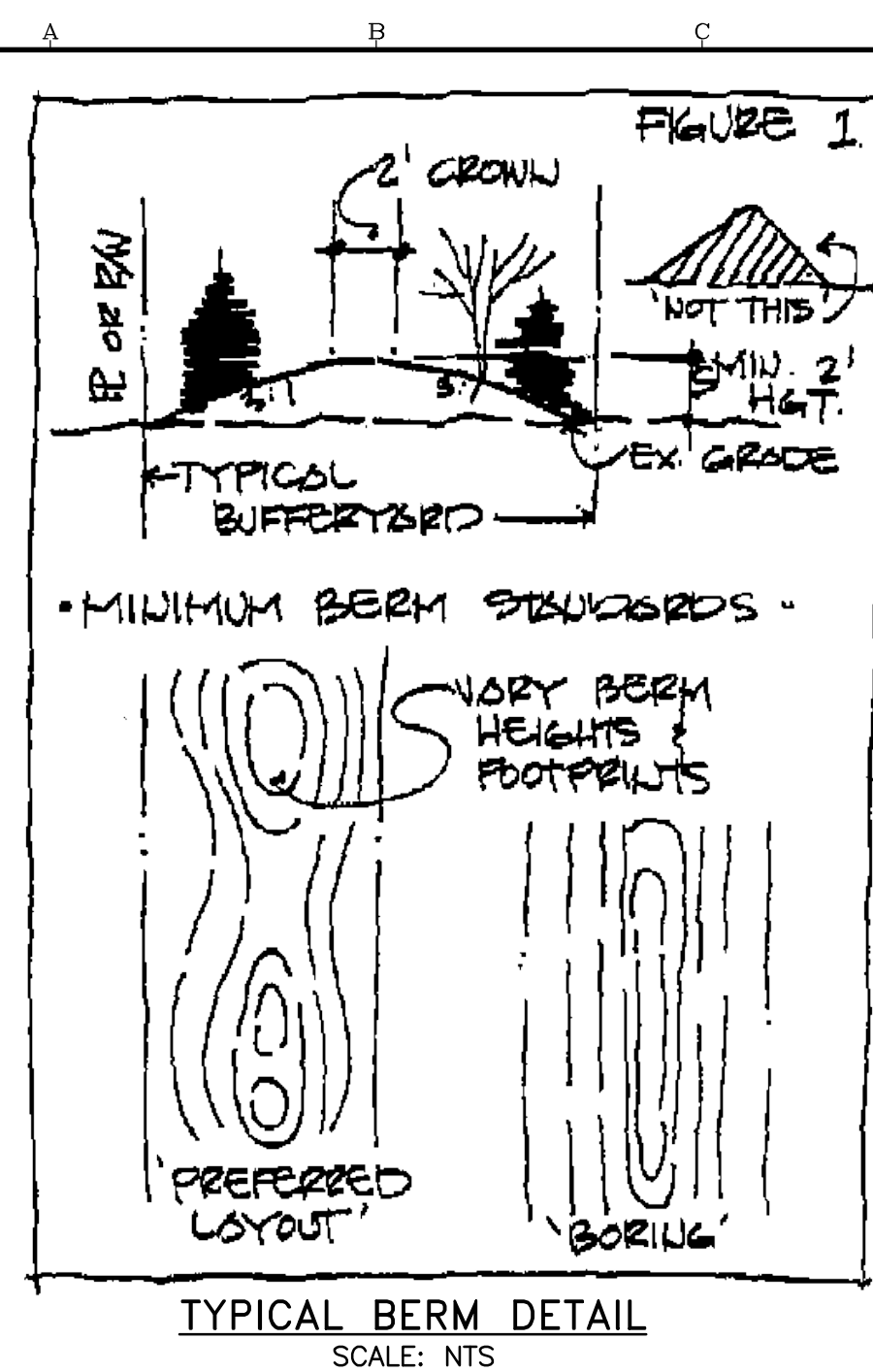
POPLAR HILL
PUD SKETCH PLAN
IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 TAX PARCEL 57

ISSUED/REVISED FOR:	DATE:	BY:
AGENCY REVIEW	7/06/22	BCE
AGENCY REVIEW	8/03/22	BCE
AGENCY REVIEW	10/05/22	BCE
AGENCY REVIEW	11/01/22	BCE

SHEET No.	1 OF 1	7/06/22
SCALE:	AS NOTED	JOB No. 220155
		FILE No. 1324

Page 53 of 56

Page 54 of 56



PLANS ARE
ISSUED FOR
REVIEW ONLY

PLANS ARE NOT
APPROVED FOR
CONSTRUCTION

[illegible]

WARNING!!

THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL ALLOW FOR THIS PLAN ARE FOR INFORMATIONAL AND PERMITTING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES TO HIS OWN SATISFACTION PRIOR TO BEGINNING CONSTRUCTION.

THE CONTRACTOR SHALL TEST PIT AND LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF THE EXISTING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION EXPENSE.



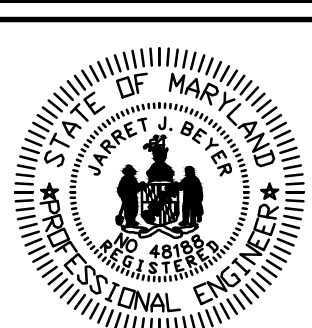
Lane Engineering, LLC

Established 1986
Civil Engineers • Land Planning • Land Surveyors



E-mail: general@leinc.com
117 Bay St. Easton, MD 21601 (410) 822-8003
15 Washington St. Cambridge, MD 21613 (410) 221-0818
354 Pennsylvania Ave. Centreville, MD 21617 (410) 758-2095

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. 48188, Expiration Date: 12/28/2023.



DATE _____

CONCEPT PLAN

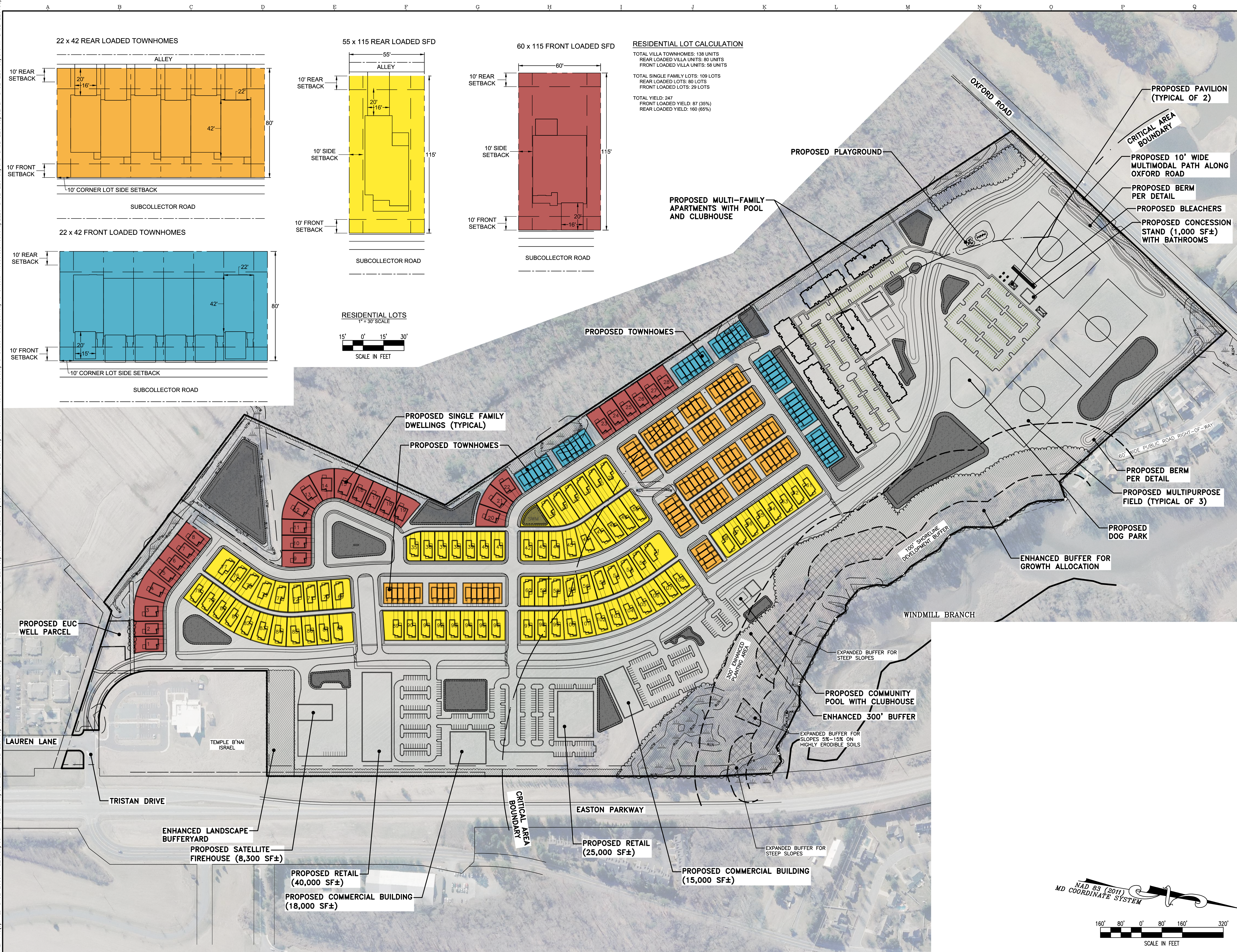
POPLAR HILL
PUD SKETCH PLAN

IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 TAX PARCEL 57

ISSUED/REVISED FOR:	DATE:	BY:
AGENCY REVIEW	7/06/22	BCE
AGENCY REVIEW	8/03/22	BCE
AGENCY REVIEW	10/05/22	BCE
AGENCY REVIEW	11/01/22	BCE
AGENCY REVIEW	01/27/23	BCE

SHEET No. 3 OF 5 7/06/22

SCALE:	JOB No. 220155
AS NOTED	FILE No. 1324



Page 57 of 566



THERMAL ENVELOPE

IECC 2015

C402.5 AIR LEAKAGE - THERMAL ENVELOPE (MANDATORY)

THE THERMAL ENVELOPE OF BUILDINGS SHALL COMPLY WITH SECTIONS 402.5.1 THROUGH C402.5.8, OR THE BUILDING THERMAL ENVELOPE SHALL BE TESTED IN ACCORDANCE WITH ASTM 3119 AT A PRESSURE DIFFERENTIAL OF 0.3 INCH WATER GAUGE (15 PA) OR AN EQUIVALENT METHOD APPROVED BY THE CODE OFFICIAL AND DEEMED TO COMPLY WITH THE PROVISIONS OF THIS SECTION WHEN THE TESTED RATE OF THE BUILDING THERMAL ENVELOPE IS NOT GREATER THAN 0.40 CFM/FT² (0.2 l/s/m²) WHERE COMPLIANCE IS BASED ON SUCH TESTING, THE BUILDING SHALL ALSO COMPLY WITH SECTIONS C402.5.5, C402.5.6, C402.5.1

C402.5.1 AIR BARRIERS

A CONTINUOUS AIR BARRIER SHALL BE PROVIDED THROUGHOUT THE BUILDING THERMAL ENVELOPE. THE AIR BARRIERS SHALL BE PERMITTED TO BE LOCATED ON THE INSIDE OR THE OUTSIDE OF THE BUILDING ENVELOPE, LOCATED WITHIN THE ASSEMBLIES COMPOSING THE ENVELOPE, OR ANY COMBINATIONS THEREOF. THE AIR BARRIER SHALL COMPLY WITH SECTIONS C402.5.1.1 AND C402.5.1.2

C402.5.1.1 AIR BARRIER CONSTRUCTION

THE CONTINUOUS AIR BARRIER SHALL BE CONSTRUCTED TO COMPLY WITH THE FOLLOWING:

- THE AIR BARRIER SHALL BE CONTINUOUS FOR ALL ASSEMBLIES THAT THE THERMAL ENVELOPE OF THE BUILDING AND ACROSS THE JOINTS AND ASSEMBLIES
- AIR BARRIER JOINTS AND SEAMS SHALL BE SEALED, INCLUDING SEALING TRANSITIONS IN PLACES AND CHANGES OF MATERIALS. THE JOINTS AND SEALS SHALL BE SECURELY INSTALLED IN OR ON THE JOINT FOR ITS ENTIRE LENGTH SO AS NOT TO DISLODGE, LOOSEN OR OTHERWISE IMPAIR ITS ABILITY TO RESIST POSITIVE AND NEGATIVE PRESSURE FROM WIND, STACK EFFECT AND MECHANICAL VENTILATION
- PENETRATIONS OF THE AIR BARRIER SHALL BE CAULKED, GASKETED OR OTHERWISE SEALED IN A MANNER COMPATIBLE WITH THE CONSTRUCTION MATERIALS AND LOCATION. JOINTS AND SEALS ASSOCIATED WITH PENETRATIONS SHALL BE SECURELY INSTALLED AROUND THE PENETRATION SO AS TO NOT DISLODGE, LOOSEN, OR OTHERWISE IMPAIR THE PENETRATIONS ABILITY TO RESIST POSITIVE AND NEGATIVE PRESSURE FROM WIND, STACK EFFECT AND MECHANICAL VENTILATION. SEALING OF CONCEALED FIRE SPRINKLERS, WHERE REQUIRED, SHALL BE IN A MANNER THAT IS RECOMMENDED BY THE MANUFACTURER. CAULKING OR OTHER ADHESIVE SEALANTS SHALL NOT BE USED TO FILL VOIDS BETWEEN FIRE SPRINKLER COVER PLATES AND WALLS OR CEILINGS.
- RECESSED LIGHTING FIXTURES SHALL COMPLY WITH SECTION C402.5.8. WHERE SIMILAR OBJECTS ARE INSTALLED THAT PENETRATE THE AIR BARRIER, PROVISIONS SHALL BE MADE TO MAINTAIN THE INTEGRITY OF THE AIR BARRIER.

ELEVATION NOTES

- G.C. TO VERIFY ALL FINAL GRADE ELEVATIONS PRIOR TO EXTERIOR MATERIAL INSTALLATION
- ALL MATERIALS USED ON THE BUILDING EXTERIOR TO BE SUBMITTED TO ARCHITECT/OWNER. VERIFY NECESSARY WATERPROOFING AND FLASHING FOR SYSTEMS
- ALL PENETRATIONS IN THE BUILDINGS THERMAL BARRIER TO BE SEALED. ALL WIRES, PIPES, FIXTURES AND FASTENERS TO BE SEALED SO THAT NO GAPS EXIST
- FILL AND PAINT ALL EXPOSED NAIL AND FASTENERS THAT EXIST EXTERIOR TRIM
- VERIFY ALL FASTENERS IN BUILDING EXTERIOR ARE RATED FOR EXTERIOR EXPOSURE
- VERIFY ALL METALS ARE COMPLIANT FOR THE USE AND ARE EXPOSED FOR USE WITH ADJACENT MATERIALS
- CAULK AND SEAL AT INTERSECTION OF ALL DISSIMILAR MATERIALS
- SEE 'GENERAL NOTES' THERMAL ENVELOPE' ON A201/202

ENERGY CODE REQUIREMENTS

2018 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

TABLE R402.1.2 - INSULATION AND PENETRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE = 4

ROOF:

ATTIC & OTHER = R-49+

WALLS (ABOVE GRADE):

WOOD FRAMED & OTHER = R-20 (OR R13+R-5CI)

FLOORS:

JOIST/STAIRING = R-19

SLAB = R-10

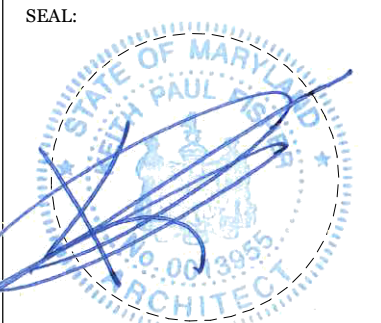
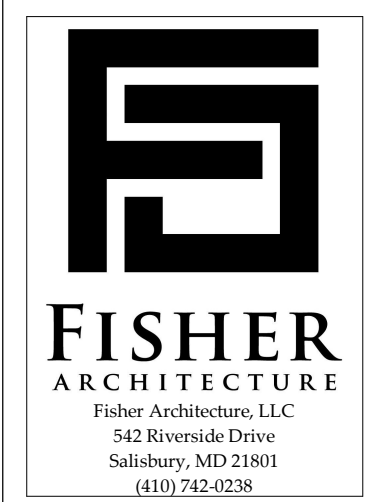
PENETRATION:

U-FACTOR = 0.2

S.H.G.C. = 40

R-402.2.1

WHERE SECTION R402.2.1 REQUIRES R-49 INSULATION IN THE CEILING, INSTALLING R-38 OVER 100 PERCENT OF THE CEILING AREA REQUIRING INSULATION SHALL SATISFY THE REQUIREMENT FOR R-49 INSULATION WHEREVER THE FULL HEIGHT OF UNCOMPRESSED R-38 INSULATION EXTENDS OVER THE WALL TOP PLATE AT THE EAVES.



PROFESSIONAL CERTIFICATION:
I CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND THAT I AM
A LICENSED ARCHITECT UNDER THE LAWS
OF THE STATE OF MARYLAND.

LICENSE NO.: 001955
EXPIRATION NO.: 09.23.2022

THE DOCUMENTS PREPARED BY FISHER
ARCHITECTURE, LLC, ARE SOLELY FOR
THE PURPOSES OF THE SPECIFIED
PROJECT. THEY ARE NOT EXTENDED OR
AUTHORIZED FOR USE ON ANY OTHER
PROJECT. FISHER ARCHITECTURE, LLC
MAKES NO REPRESENTATION AS TO
THEIR SUITABILITY FOR ANY OTHER USE.
ALL DOCUMENTS PREPARED BY FISHER
ARCHITECTURE, LLC ARE INSTRUMENTS
OF PROFESSIONAL SERVICE. THE PROPERTY
OF THE PROJECT, THESE DOCUMENTS
ARE, AND SHALL REMAIN, THE PROPERTY
OF FISHER ARCHITECTURE, LLC.

CONSULTANTS:

EASTON APARTMENTS

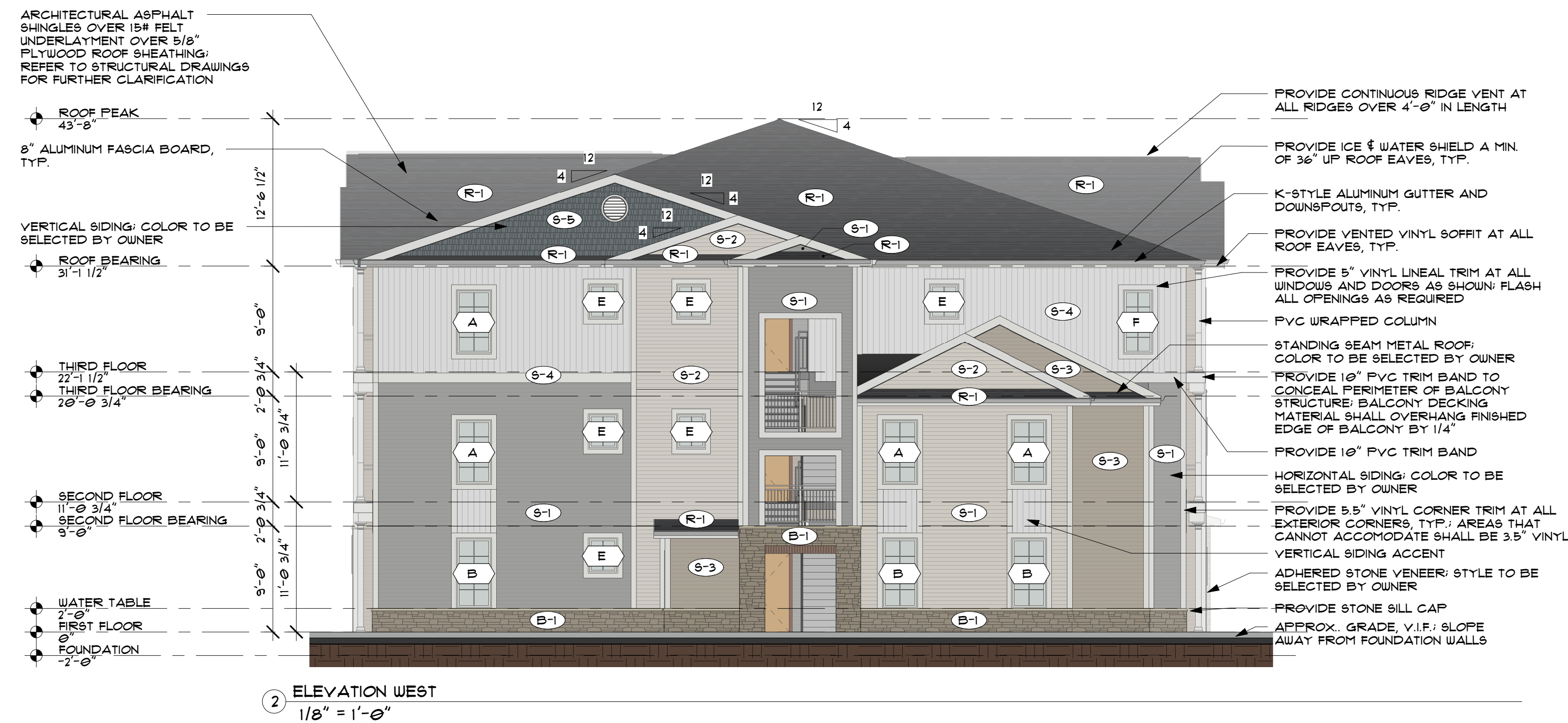
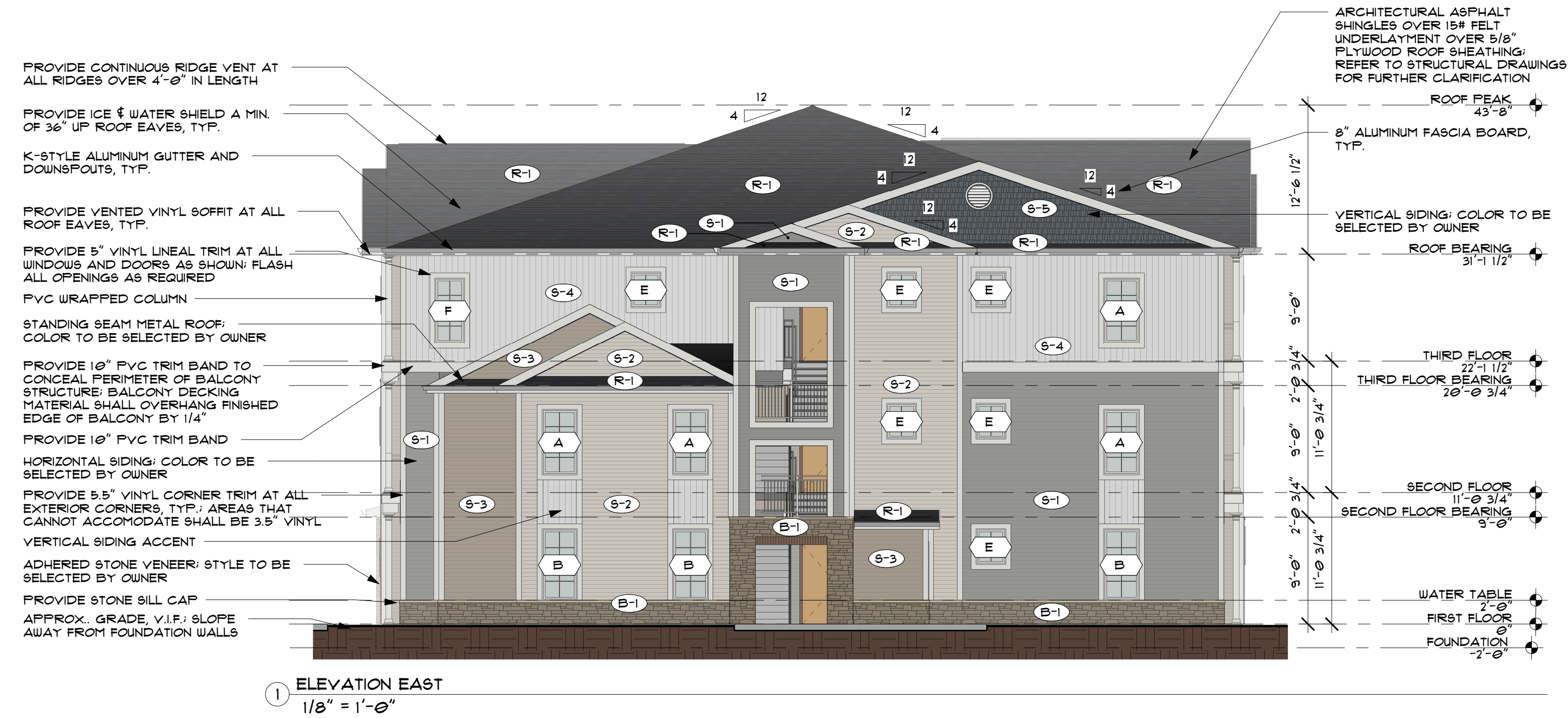
ELLIOT RD
EASTON, MD, 21601

SHEET INFO:

ELEVATIONS

REV	REV DATE	DESCRIPTION
1	2021.09.23	DATE
2	2021.10.07	PROJECT NO.
3	As indicated	SCALE
4	HAM	PROJ MGR.
5	Author	DRAWN BY
SHEET NUMBER:		

A-201



THERMAL ENVELOPE

IECC 2015

C402.5 AIR LEAKAGE - THERMAL ENVELOPE (MANDATORY)

THE THERMAL ENVELOPE OF BUILDINGS SHALL COMPLY WITH SECTIONS 402.5.1 THROUGH C402.5.8, OR THE BUILDING THERMAL ENVELOPE SHALL BE TESTED IN ACCORDANCE WITH ASTM 3119 AT A PRESSURE DIFFERENTIAL OF 0.3 INCH WATER GAUGE (7.5 PA) OR AN EQUIVALENT METHOD APPROVED BY THE CODE OFFICIAL, AND DEEMED TO COMPLY WITH THE PROVISIONS OF THIS SECTION WHEN THE TESTED RATE OF THE BUILDING THERMAL ENVELOPE IS NOT GREATER THAN 0.40 CFM/FT (0.2 l/s/m) WHERE COMPLIANCE IS BASED ON SUCH TESTING, THE BUILDING SHALL ALSO COMPLY WITH SECTIONS C402.5.5, C402.5.6, C402.5.1

C402.5.1 AIR BARRIERS

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C402.5.1.1 AIR BARRIER CONSTRUCTION

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ELEVATION NOTES

- G.C. TO VERIFY ALL FINAL GRADE ELEVATIONS PRIOR TO EXTERIOR MATERIAL INSTALLATION
- ALL MATERIALS USED ON THE BUILDING EXTERIOR TO BE SUBMITTED TO ARCHITECT/OWNER. VERIFY NECESSARY WATERPROOFING AND FLASHING FOR SYSTEMS
- ALL PENETRATIONS IN THE BUILDINGS THERMAL BARRIER TO BE SEALED. ALL WIRES, PIPES, FIXTURES AND FASTENERS TO BE SEALED SO THAT NO GAPS EXIST
- FILL AND PAINT. ALL EXPOSED NAIL AND FASTENERS THAT EXIST IN EXTERIOR TRIM
- VERIFY ALL FASTENERS IN BUILDING EXTERIOR ARE RATED FOR EXTERIOR EXPOSURE
- VERIFY ALL METALS ARE COMPLIANT FOR THE USE AND ARE EXPOSED FOR USE WITH ADJACENT MATERIALS
- CAULK AND SEAL AT INTERSECTION OF ALL DISSIMILAR MATERIALS
- SEE 'GENERAL NOTES' THERMAL ENVELOPE' ON A2011202

ENERGY CODE REQUIREMENTS

2018 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

TABLE R402.1.2 - INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE = 4

ROOF:

ATTIC & OTHER = R-49+

WALLS (ABOVE GRADE):

WOOD FRAMED & OTHER = R-20 (OR R13+R-5CI)

FLOORS:

JOIST FRAMING = R-19

SLAB = R-10

FENESTRATION:

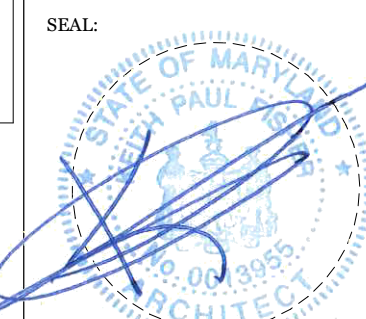
U-FACTOR = .32

S.H.G.C. = .40

***R402.2.1**

WHERE SECTION R402.1.2 REQUIRES R-49 INSULATION IN THE CEILING, INSTALLING R-38 OVER 100 PERCENT OF THE CEILING AREA REQUIRING INSULATION SHALL SATISFY THE REQUIREMENT FOR R-49 INSULATION WHEREVER THE FULL HEIGHT OF UNCOMPRESSED R-38 INSULATION EXTENDS OVER THE WALL TOP PLATE AT THE EAVES.

ELEVATION MATERIAL SCHEDULE		
(B-1)	ADHERED STONE VENEER	
(R-1)	ASPHALT SHINGLE ROOF	
(R-2)	STANDING SEAM METAL ROOF	
(S-1)	6" HORIZONTAL SIDING	
(S-2)	6" HORIZONTAL SIDING	
(S-3)	6" HORIZONTAL SIDING	
(S-4)	6" BOARD & BATTEN	
(S-5)	SHAKE SIDING	



PROFESSIONAL CERTIFICATION:

I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A PROFESSIONAL ARCHITECT UNDER THE LAW OF THE STATE OF MARYLAND.

LICENSE NO.: 001955

EXPIRATION NO.: 09.23.2022

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CONSULTANTS:

EASTON APARTMENTS

ELLIOT RD
EASTON, MD, 21601

SHEET INFO:

ELEVATIONS

REV	REV DATE	DESCRIPTION
1	2021.09.23	DATE: 2021.09.23
2	2021.10.07	PROJECT NO. 2021107
3	As indicated	SCALE: As indicated
4	HAM	PROJ MGR: HAM
5	Author	DRAWN BY: Author

SHEET NUMBER:

A-202



OXFORD RD BEFORE



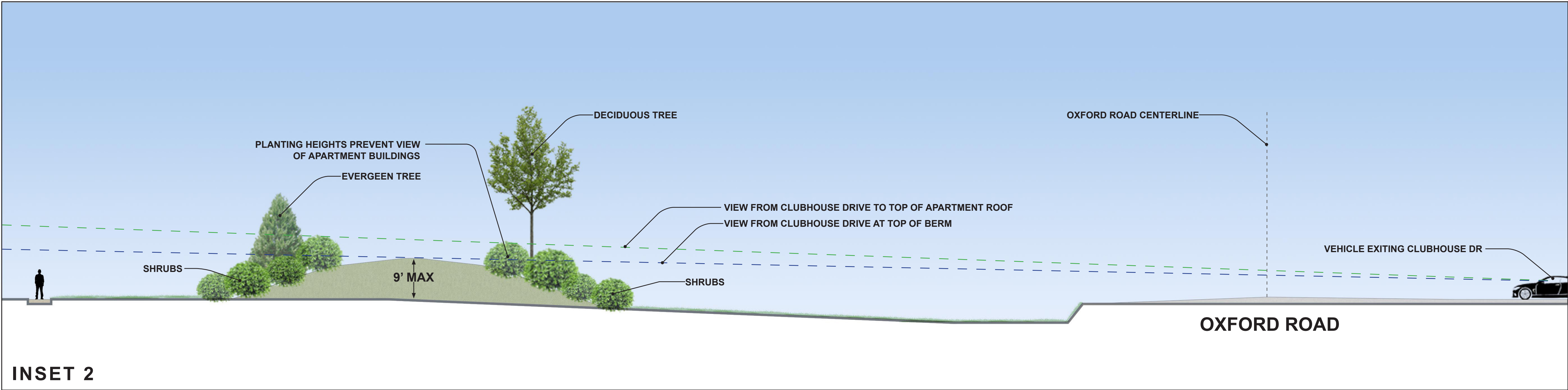
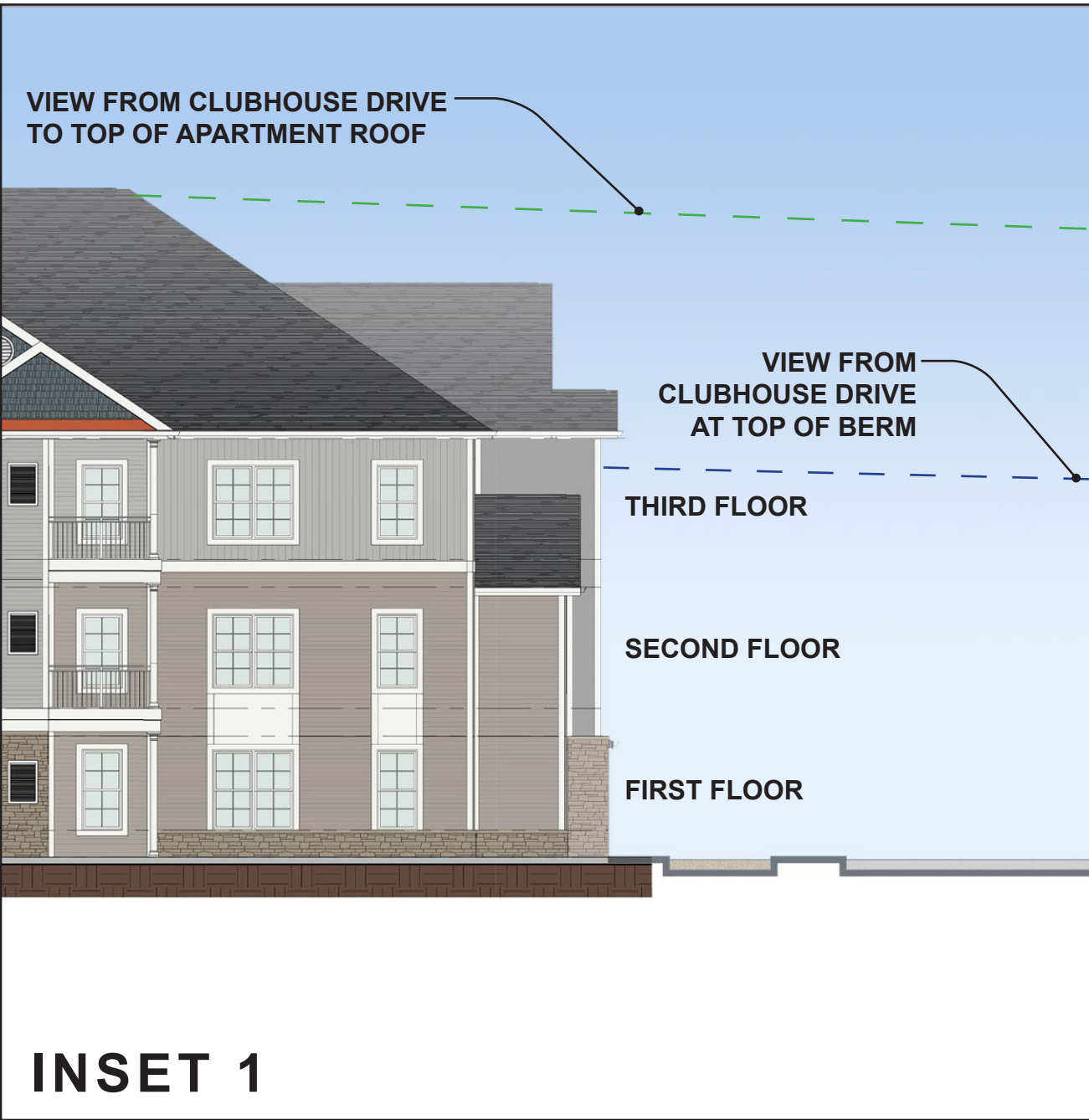
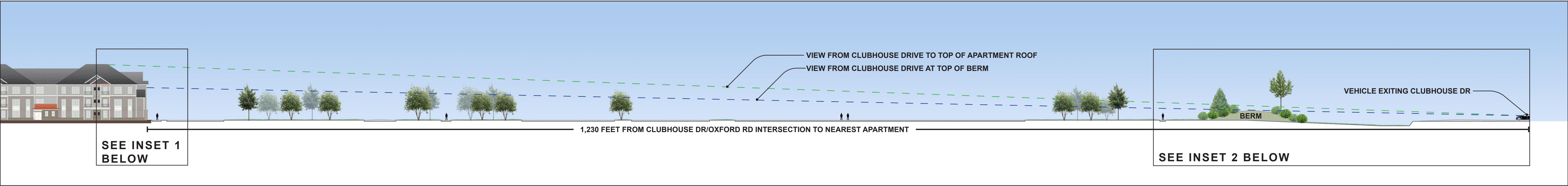
OXFORD RD AFTER

POPLAR HILL

LANDSCAPE IMPROVEMENTS

POPLAR HILL

OXFORD ROAD SECTION



* POSSIBLE SMALL AREAS OF HYDRIC SOIL INCLUSIONS SUBJECT TO FIELD VERIFICATION.

ERODIBLE SOILS

INING LANDS
120.476 AC.±
AREA: 65.977 AC.±)
AL AREA: 54.499 AC.±)

**GROWTH ALLOCATION
AREA (65.977 AC.) – RCA TO IDA**

1. TAX MAP 34, PARCEL 218
PAPERMILL CROSSING HOMEOWNERS
ASSOCIATION, INC
DEED: 943/920
PLAT: 3/23FF
2. TAX MAP 34, PARCEL 218, LOT 12
SCOTT J. BEST AND MARLA G. BEST
DEED: 2313/1
PLAT: 3/23FF
3. TAX MAP 34, PARCEL 218, LOT 11
DEBRA L. GIBSON AND DEANA M. VILLANI
DEED: 2361/169
PLAT 2/23FF
4. TAX MAP 34, PARCEL 218, LOT 10
DUDLEY F. SOULSMAN AND RENEE P. SOULSMAN
DEED: 836/283
PLAT: 3/23FF
5. TAX MAP 34, PARCEL 218, LOT 9
ANITA W. MACEY
DEED: 2731/281
PLAT: 3/23FF
6. TAX MAP 34, PARCEL 218, LOT 8
BONNIE W. WHEELER
DEED: 1286/524
PLAT: 3/23FF

Page 62 of 62

Environmental Report for Critical Area Growth Allocation

**Poplar Hill
Easton, Maryland**
Job # 220155

Lands of
5001 SHR, L. C.

Prepared for
5001 SHR, L.C.
9161 Liberia Ave., #201
Manassas, VA 20110

Revised 10-05-22

Prepared by
Lane Engineering, LLC
117 Bay Street
Easton, MD 21601

Purpose

This report is intended to address the requirements of COMAR 27.01.02.06-2 pertaining to Critical Area Growth Allocation. Site and plan information used in this report is taken from an Environmental Features Plan prepared by Lane Engineering, LLC dated June 28, 2022, a PUD General Plan and a Conceptual Stormwater Management Plan prepared by Lane Engineering and submitted for Town review with this report on July 6, 2022, and *revised 10-5-22*. These plans are incorporated with this report by reference.

Information in this report follows the order and content prescribed in COMAR 27.01.02.06-2.

Project Description

- The subject property where the project will be located is described as Tax Map 42, Grid 4, Parcel, 57 (the “Property”).
- The Property is located in the Southwest portion of the Town of Easton adjacent to Oxford Rd (Md. Rt. 333), the Easton Bypass (Md. Rt. 322) and Windmill Branch, a tidal headwater tributary of the Tred Avon River.
- The Property is a 120.476-acre site used for agricultural production with a fully forested shoreline. Several small pockets of non-tidal wetlands exist throughout the site. Tidal wetlands are mainly consistent with the mean high water line. The Wetlands as shown on the Environmental Features Plan were reviewed and confirmed by Chris Pajak, Maryland Department of Environment and Mary Phipps Dickerson, Maryland Department of Environment on February 25, 2021, and by Jason Peters, U.S. Army Corp of Engineers on May 13, 2022. William Seiger, Maryland Department of Environment reviewed the site and confirmed no streams exist on February 25, 2021.
- The Property includes a 100’ buffer onsite totaling 4.247 acres (the “Buffer”) and an expanded buffer onsite that is 2.181 acres (the “Expanded Buffer”). All steep slopes 15 percent or greater, highly erodible soils and tidal wetlands are protected by the Buffer and Expanded Buffers. Tidal wetlands are not included in the Expanded Buffer. The methodology and calculations used for Buffer Expansion for Steep Slopes and Highly Erodible Soils is consistent with State and Local regulations outlined in COMAR and specified in detail on the Environmental Features Plan.
- Site elevations in the areas of proposed development activities range from approximately 30 feet to 10 feet as shown on the Environmental Features Plan. About half of the site drains towards the Southwest, and the remaining portions of the site drain towards Windmill Branch.
- As shown on the Environmental Features Plan the 100-year Flood Zone (AE elevation 5 ft) is located along the edge of Mean High Water (“MHW”) and does not impact the proposed development.
- The entire 120.476-acre Property is located within Town of Easton limits, of which 65.977 acres is located within the Critical Area. The entire 65.977 acres of Critical Area are designated as Resource Conservation Area (RCA) under the Town of Easton’s Critical Area Program.
- The proposed project (“Project”), as shown and described in the Applicant’s Planned Unit Development (“PUD”) application pending before the Town, includes a mixed use residential and commercial design, with: (i) a total of 456 residential units consisting of 108 single-family detached homes, 138 villa townhomes, and 210 apartment units; (ii)

neighborhood commercial consisting of two commercial buildings and two retail buildings; (iii) a public park to be dedicated to the Town of Easton with three multipurpose sports fields, a dog park, and parking area; (iv) community features, including community open spaces with walking trails, a 10' wide multimodal path and two community clubhouses with pools; (v) a satellite fire department building for use by the Town of Easton Volunteer Fire Company; (vi) public and private streets and parking areas; and, (vii) Environmental Site Design stormwater management features. The Project is proposed to be constructed in several phases.

- The Applicant is requesting an award of Growth Allocation from RCA to IDA for the entire 65.977 acres of Critical Area located onsite.

Development History

- In 1979, The Memorial Hospital at Easton Maryland, Inc. (predecessor to Shore Health System, Inc.) acquired the Property pursuant to a Deed recorded among the Land Records of Talbot County, Maryland (the "Land Records") in Liber JTB No. 531, folio 494. The Property was initially slated as the potential new location for the Easton Hospital then (and still now) located on Washington St. in the Town of Easton.
- In 2016, Shore Health System, Inc. ("Shore Health") completed the subdivision of a 6-acre non-Critical Area lot from the Property pursuant to a plat entitled "TEMPLE B'NAI ISRAEL, A MINOR SUBDIVISION ON THE LANDS OF SHORE HEALTH SYSTEM, INC.", prepared by Lane Engineering, Inc., dated February 26, 2015, and recorded among the Plat Records of Talbot County, Maryland, in Plat Book MAS 84, folio 22. Shore Health transferred the 6-acre parcel to the Temple B'Nai Israel Congregation of Easton, Maryland ("Temple B'Nai"), pursuant to a Deed recorded among the Land Records in Liber 2355, folio 253. Temple B'Nai constructed the House of Worship located on the 6-acre parcel today.
- In 2021, the Applicant acquired the remainder of the Property, comprising 120.476 acres, pursuant to a Deed recorded among the Land Records in Liber 2827, folio 90. The Property is undeveloped and used for agricultural production.

Project Narrative Overview

- The proposed PUD is designed as an environmentally sensitive traditional neighborhood design (TND) with alleys and non-residential uses meant to service the community. The Project is developed around a protected, forested Critical Area Buffer and other community open spaces. The proposed community is pedestrian-friendly with a hierarchy of public streets, multimodal pathways and sidewalks connecting all parts of the community. All residential homes have compliant access for delivery, service and emergency response vehicles.
- A completely forested 100' Critical Area Buffer including expanded buffer areas is proposed with additional buffer enhancement plantings of the entire 200' and portions of the 300' area from MHW and tidal wetlands.
- Proposed development is outside 300' from MHW/ Tidal Wetlands ("TW"), except for portions of certain SWM facilities, a multimodal path, and one corner of a grass sports field.
- The proposed growth allocation for Poplar Hill is consistent with the policies in the Town of Easton's Comprehensive Plan. The Land Use Chapter of the Town of Easton's

Comprehensive Plan contains the following goals: “to limit the geographic outward expansion of” the Town and “to achieve a more balanced and integrated mix of land uses within the Town” by, among other things, promoting neighborhoods with “an integrated mix of residential, neighborhood-scale commercial, civic, and open space uses”. See Town of Easton 2009 Comprehensive Plan (the “Comprehensive Plan”), at p. 45-46 (Attachment #1). The Applicant’s proposed growth allocation helps the Town achieve these goals and objectives by concentrating new development within the Town’s existing boundaries, which reduces pressure for additional annexations, and by establishing a planned, mixed-use community featuring a variety of housing types, substantial open space and public park areas, and appropriately scaled neighborhood commercial uses.

- The maximum density permitted in the PUD Zoning District is 16 dwelling units per acre. The proposed density for the Project is 3.78 dwelling units per acre (456 units/120 AC total site area).
- The Town’s base zoning of R-10A and Maryland Department of Planning (“MDP”) guidelines for smart growth promote 3.5 dwelling units per acre. The Project is consistent with State and Local smart growth strategies.
- The Property is identified in the Comprehensive Plan’s Municipal Growth Chapter as an area of potential infill/redevelopment within a Priority Development Area (as identified in the 2004 Comprehensive Plan). Comprehensive Plan, at p. 53 (Attachment #2). In fact, of the four remaining Priority Development Areas, the Property has the greatest infill/redevelopment potential in terms of the potential number of units. *Id.* Thus, the Comprehensive Plan anticipates build out of the Poplar Hill site on the scale envisioned by the Applicant.
- The Project will be served by public water and sewer. The Talbot County Comprehensive Water & Sewer Plan (the “CWSP”) classifies the Property as W-1/S-1, immediate priority for water and sewer. Town Staff has indicated that the Town’s wastewater treatment plant (the “Easton WWTP”) currently has capacity for the proposed development. While no preliminary engineering has been performed to date, it is anticipated that a gravity collection system will be used on site with conveyance to the Easton WWTP via an on-site pump station with shellfish protection measures and a force main. Public water would be a loop system into the Town’s existing water mains. The Applicant will be responsible for acquisition of sewer and water allocation from the Town and for all on-site and off-site public water and sewer improvements necessary to serve the project.
- The proposed Growth Allocation from Resource Conservation Area (“RCA”) to Intensely Developed Area (“IDA”) is consistent with the Town’s Comprehensive Plan, the CWSP, and the Town’s zoning ordinance.

Critical Area and Growth Allocation Acreage

- The Property consists of 120.476 acres, more or less, of which 65.977 acres are within the Critical Area.
- The entire 65.977-acre Critical Area portion of the Property is designated as RCA.
- 2.181 acres of the site have Expanded Buffer (Steep Slopes - 2.053 acres; Highly Erodible Soils - 0.128 acres).
- The Applicant is requesting an award of Growth Allocation to reclassify the entire 65.977-acre portion of the Property from RCA to IDA.

- Although the Town has no remaining Growth Allocation, Talbot County has approximately 1,872.38 acres available for Growth Allocation pursuant to Talbot County Code § 190-55 D., allocations of which may be transferred to the Town in accordance with the County's supplemental Growth Allocation process set forth in Talbot County Code § 190-55 I.

Proposed Forest Clearing

- Total forested area within the Critical Area on the Property is 9.590 acres and is predominantly located within the Shoreline Buffer and Expanded Buffer. As shown on the PUD General Plan. The project improvement design is still conceptual at this point and proposed removals may change as the project proceeds through the review process.

Non-tidal Wetland Impacts

- Several small pockets of non-tidal wetlands exist throughout the site. The Wetlands as shown on the Environmental Features Plan were reviewed and confirmed by Chris Pajak, Maryland Department of Environment and Mary Phipps Dickerson, Maryland Department of Environment on February 25, 2021, and by Jason Peters, U.S. Army Corp of Engineers on May 13, 2022. William Seiger, Maryland Department of Environment reviewed the site and confirmed no streams exist on February 25, 2021.
- The original concept site improvements and SWM design proposed approximately 47,429 sf of NTW impacts within the Critical Area; per MDE's growth allocation review recommendations, Page 4, we have redesigned SWM to completely avoid the existing NTW on the northeastern end of the site near the Easton Bypass and the Commercial use area, reducing our overall impact by 3.5 times, down to 13,546 sf (.31 acre).

Stormwater Management Concept

- A Concept Stormwater Management (SWM) Plan has been prepared by Lane Engineering to address the Town Stormwater Management Ordinance and Critical Area 10 Percent Rule requirements. The SWM features proposed to be utilized are shown on the Concept Site & SWM Plan and include Best Management Practices (BMPs) such as Micro infiltration, non-roof top disconnection, bioswales, and grass swales.
- The original concept SWM design proposed impacts to a 33,883 sf NTW pocket on the northeastern end of the site near the Easton Bypass and the Commercial use area; per MDE's growth allocation review recommendations, Page 4, we have redesigned to completely avoid the existing NTW.
- Engineering and construction plans for SWM and a complete SWM report will be reviewed and approved by the Town and Critical Area staff as a condition of final development approval.

Ten (10) Percent Pollution Reduction

- The Project will exceed the Critical Area 10 Percent Rule for IDA development, which requires that pollutant loads from a development site be reduced to a level at least 10 percent below the same load generated by the site prior to development. We anticipate reductions up to 15%. See SWM report enclosed.

- Preliminary calculations prepared for the Concept SWM Plan indicate that phosphorous loads will be reduced by more than 10 percent from pre-development levels and that Environmental Site Design treatment volume requirements will be met.
- Engineering and construction plans for SWM and a complete SWM report will be reviewed and approved by the Town and Critical Area staff as a condition of final development approval.

Soil Erosion and Sediment Control

- A Limit of Disturbance (LOD) will be established for the area proposed for development construction activity. This LOD will not encroach on the Expanded Buffers.
- A detailed Sediment and Erosion Control (SEC) Plan will be prepared and approved by the Talbot County Soil Conservation District (SCD). This SEC Plan will detail measures and a sequence of construction to be used to minimize sediment and erosion while the site is under construction and before it is properly stabilized.
- The Town of Easton Engineering Department will issue a grading permit and all sediment and erosion control devices will be per the approved plans.
- A pre-construction meeting is required with Town and State officials to confirm sediment and erosion control methods to be used and the sequence of construction.
- During construction there will be regular reporting and inspection requirements consistent with the Maryland Department of Environment Notice of Intent (NOI) standards.

Critical Area Lot/Site Coverage

- Although 19.12 acres of lot coverage is proposed, lot coverage limitations will not apply to the IDA portion of the development.
- No development activities or lot coverage are proposed within the Expanded Buffer areas of the site.

Mitigation for Forest Clearing

- Mitigation for limited clearing for the SWM features will be required based on amount of clearing proposed.
- Mitigation planting amounts will be determined with the final design of the proposed SWM and will be reflected on the Buffer Management Plan for the project. See enclosed BMP.

Proposed Afforestation

- No afforestation is required for IDA development other than that which is required within the Expanded Buffer as part of an approved Buffer Management Plan. The proposed development will be required to comply with Town Landscaping and Tree Canopy regulations.
- The total area of the “300’ enhanced planting area” to offset the growth allocation request is 3.35 ac+/- (145,926 sf+/-); this is above and beyond the minimum requirement of planting the 100’ buffer and expanded buffer areas.

Local Zoning

- The Property is currently zoned as Residential R10A and Healthcare (HC). A Planned Unit Development (PUD) is proposed.
- The Project is designed to be consistent with the Town's adopted PUD-general regulations; maximum density allowed is 16 dwelling units per acre. Proposed density for the Project is 3.78 dwelling units per acre (456 units/120 AC total site area).
- The Town's R10A base zoning and MDP guidelines for smart growth promote 3.5 dwelling units per acre. The Project is consistent with State and Local smart growth strategies.
- The Town's zoning code and comprehensive plan promote mixed use development with commercial services that serve the community.

Buffer Management Plan

- The Buffer Management Plan for this project will require complete afforestation/establishment of the 100' buffers and expanded buffer. These Buffer Areas will be required to be afforested using native species plantings and per the quantities and plant mixes as prescribed by Critical Area Buffer Management Plan regulations.
- Proposed plantings for afforestation of this area include native canopy trees, understory trees and large shrubs creating a multi-tiered canopy.
- The total area of the "300' enhanced planting area" to offset the growth allocation request is 3.35 ac+/- (145,926 sf+/-); this is above and beyond the minimum requirement of planting the 100' buffer and expanded buffer areas.

Habitat Protection Plan

- The Maryland Department of Natural Resources (DNR) Wildlife Heritage Service has determined in a letter dated March 26, 2021, that there are no State or Federal records for rare, threatened or endangered species within the boundaries of the project site as delineated. (Attachment #3)
- Based on the above information a Habitat Protection Plan should not be required with this proposed Growth Allocation request.

Attachments

- Attachment #1 – Town Comprehensive Plan - Land Use Objectives
- Attachment #2 – Town Comprehensive Plan – Anticipated Growth Chart
- Attachment #3 - DNR letter dated 3/26/2021

- Increase the safety of the neighborhood by putting more eyes on the street.

LAND USE GOALS AND OBJECTIVES

Goal: To limit the geographic outward expansion of the Town of Easton.

Objectives:

- ✓ Reaffirm the Urban Growth Boundary around the Town defining the ultimate geographic size of Easton.
- ✓ Work in association with Talbot County and various land preservation organizations to secure easements and other long-term protection devices on properties along and in close proximity to the Urban Growth Boundary on the County side of the line.
- ✓ Limit annexation in the six-year planning period to only those areas that will “clean-up” the existing Town boundary.
- ✓ Explore incentive annexation to gain control of land on the town’s border and to implement a strict pattern which will guide growth in the future.
- ✓ Slow the demand for more land by increasing the density of future residential areas. At a minimum, the “Smart Growth” Priority Funding Area net density of 3.5 units per acre should be achieved in these developments.
- ✓ Consider implementation of an Adequate Public Facilities Ordinance (APFO) to assure the availability of public services is sufficient to meet the resulting needs of growth.
- ✓ Follow a Capital Improvement Program which will allow the Town to provide a rational basis for implementing improvements and increase funding opportunities.

Goal: To achieve a more balanced and integrated mix of land uses within the Town.

Objectives:

- ✓ Develop future areas of the Town in a series of well-defined connected neighborhoods. Such neighborhoods should contain an integrated mix of residential, neighborhood-scale commercial, civic, and open space uses.
- ✓ Begin to “retro-fit” developed subdivisions within the Town by adding much greater flexibility to add neighborhood-scale retail, civic and open space elements to existing residential subdivisions.
- ✓ Amend the Town’s Zoning Ordinance to change the focus from regulation by building use, to building type and site impact.

Goal: To improve the appearance of all aspects of development in the Town of Easton.

Objectives:

- ✓ Continue to refine and work with Design Standards that ensure that Easton stands out as a unique place rather than looking like “Anyplace USA.”
- ✓ Utilize the Town’s Forest Conservation Account and other sources to add landscaping along heavily traveled corridors.
- ✓ Use the Special Exception review process to impose design improvements as a condition of approval.
- ✓ Explore options to expedite permit approvals for permitted uses if extraordinary design improvements are included.
- ✓ Develop an Urban Forestry Plan to expand the Town’s tree canopy.

Estimating Residential Development Potential in Easton

A. Estimate Infill/Redevelopment/Build-out Potential (i.e. what we could get with no additional annexations)

Look back at the "Priority Development Areas" from current (2004) Comp Plan

Area 1 – ~~SSPP—non-residential (institutional)~~

Area 2 – **Brooks Farm** (in-Town portion)

Area 3 – **Hospital-owned Oxford Road site** (possible quasi-residential development on a portion of site)

Area 4 – **Ashby Commons** (89 du approved)

Area 5 – ~~Easton Commons Site (non-residential)~~

Area 6 – ~~Waterside Village (non-residential)~~

Area 7 – **Alvin Lapides Property**

Area 2 (100.187 ac x 3.5 du/ac x .75 (underbuild factor recommended by MDP)) = 262 units

Area 3 (using same factor as above for half of site and Londonderry density for half of site (4.0 du/ac)) = 404 units

Area 4 – 89 units already approved

Area 7 – (56 ac x 3.5 du/ac x .75) = 147 units

Total estimated possible units from Priority Development Areas in 2004 Plan = 902

B. Other Parcels with Infill Potential

Unimproved parcels ≥ 5 acres (using same build-out factors as above) = 455 units

Unimproved parcels ≥ 1 acre in the PR District (substituting the PR density of a max. 20 du/ac for 3.5 in the equation above) = 305 units

Total estimated possible "other" infill units = 760

C. Completion of Approved or Pending Project

Residential Projects Under Construction = 347 units

Residential Projects Under Review = 355 units (excludes Ashby Commons which is already counted above)

Total Units in Approved/Pending Projects = 702

D. Downtown Residential Development Potential (per AKRF study) = **100**

E. Redevelopment Potential (Parcels w/ improvements assessed at $\leq \$50,000$; ≈ 47 acres x 3.5 du/ac x 0.75) = 123 –

95 existing units = **28** (net new units)

Total Infill/Redevelopment/Build-out Potential (A+B+C+D+E) = 2,492 units



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Charles Glass, Deputy Secretary

March 26, 2021

Ms. Natalie Hurley
Lane Engineering, LLC
P.O. Box 1767
117 Bay Street
Easton, MD 21601

RE: Environmental Review for Oxford Road, Easton - 126 Acres, Tax Map 42, Parcel 57, Lane Engineering, LLC Job No# 200574, Talbot County, Maryland.

Dear Ms. Hurley:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2021.0217.ta
Cc: C. Jones, CAC

CONCEPT STORMWATER MANAGEMENT REPORT

For

**Poplar Hill
PUD**

Developer

5001 SHR, L.C.
9161 Liberia Avenue, Suite 201
Manassas, VA 20110

Design Professional

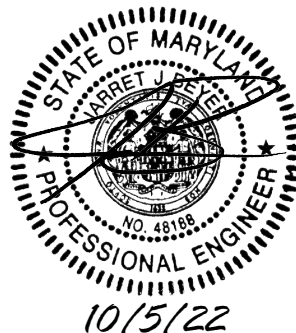
Lane Engineering, LLC
117 Bay Street
Easton, Maryland 21601
410-822-8003

Date Prepared

July 6, 2022
Revised October 5, 2022

Prepared by

Jarret J. Beyer, P.E.



PROFESSIONAL CERTIFICATION: I hereby certify that this document was prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 48188, Expiration Date: 12/28/2023.

TABLE OF CONTENTS

SECTIONS LIST

1. Introduction
2. General Site Information
3. Proposed Project
4. Stormwater Management
 - 4.1 Stormwater Quantity Management
 - 4.2 Stormwater Quality Management
 - 4.3 Critical Area Phosphorus Removal
5. Conclusion

APPENDIX LIST

- APPENDIX A – Maryland Environmental Site Design (ESD) Calculations
- APPENDIX B – Stormwater Quantity Calculations
- APPENDIX C – 15% Phosphorus Removal Calculations
- APPENDIX D – Pre-development Drainage Area Map
- APPENDIX E – Post-development Drainage Area Map

Poplar Hill PUD

STORMWATER MANAGEMENT REPORT

1. INTRODUCTION

This report addresses the stormwater management requirements of the *2000 Maryland Stormwater Design Manual Volumes I and II* (Manual) as currently updated. Development projects are required to be reviewed during the concept, preliminary site development, and final design stages. This narrative addresses the requirements pertaining to the concept design stage and meets the intent of the guidelines and methodologies presented in the MDE document *Environmental Site Design (ESD) Process & Computations* dated July 2010.

2. GENERAL SITE INFORMATION

The site is a 120.5 acre parcel located along Oxford Road across from Easton Club, and partially fronting the Easton Bypass. The site is currently in agricultural use. Surrounding lands consist of residential development, forest, and Temple B’Nai Israel.

The parcel discharges to three main points, two of which discharge to tidal waters. Geo-Technology Associates, Inc. have done soils borings. Soils on the south end of the site are mixtures of sand and silty sand to about 5 feet, with clay/silty clay/clayey silt below 5 feet. Moving north on the site towards the middle, silty sand/silt/silty clay extend to depths of about 3 to 4 feet. Below this elevation soils become sand and silty sand for a few feet before becoming silty clay/clayey silt. Groundwater elevations are generally high on the south half of the site and drop down at the central part of the site. Additional borings will be necessary on the north end of the site and for proposed stormwater features. USDA soil maps classify site soils as B and C soils.

3. PROPOSED PROJECT

The proposed Planned Unit Development (PUD) will consist of mixed use residential, commercial sites, and a community park with ball fields. The residential portion will be a mix of single-family homes, townhomes, and apartments. Roads, parking, and sidewalks will be constructed to serve the improvements. In addition, a community pools and clubhouses will serve the residential portion. Surrounding the buildings and amenities will be forest conservation area and open spaces. Stormwater management features are proposed throughout the entire site.

4. STORMWATER MANAGEMENT

Stormwater management is conceptual at this point and has been analyzed to meet quality, quantity, and Critical Area Commission requirements. Since this is a concept level analysis, treatment volumes are calculated by ponding volume only. We believe this is a conservative approach giving us a good starting point for discussion and refinement. Additional soils testing and discussion with the Town Engineer will lead to placement of an assortment of features.

4.1 STORMWATER QUANTITY MANAGEMENT

The 2-year and 10-year storm events are required to be managed onsite, with the 100-year storm event safely conveyed for discharge at the southwest and northeast corners of the site (POI-1 and POI-2.) An additional point of discharge along the east property line of the site is to Windmill

Branch, routed to tidal waters (POI-3.) This discharge point is not required to be managed to the 2 and 10-year storm events. Additional analysis will be needed at POI-3 as the commercial parcels develop further.

STORMWATER DISCHARGE (cfs)						
	Pre 2-yr	Post 2-yr	Pre 10-yr	Post 10-yr	Pre 100-yr	Post 100-yr
POI-1	28.95	10.17	69.81	39.04	125.31	80.16
POI-2	18.47	11.57	44.38	42.05	79.43	89.49
POI-3	3.68	6.57	14.68	19.79	32.10	40.83

The existing site is currently an open farm field. The stormwater discharge to the surrounding ditches is significantly reduced with this development. And, as a component of the PUD project a significant portion of the site perimeter will be planted with forest conservation shrubbery. Given time and appropriate maintenance, these areas will develop into woods in good condition. The Runoff Curve Number in these areas will be converted from 86 – 88 for row crops in C soils to 70 for woods in good condition. This change in runoff characteristics will further reduce the overall quantity of water leaving the site.

4.2 STORMWATER QUALITY MANAGEMENT

This project is classified as new development. ESD requirements must be addressed for the project's entire limits of disturbance (LOD.) For a conservative approach, all soils are assumed as group C soils, resulting in a higher Pe. All proposed stormwater features adequately address ESD requirements. Drainage areas 17 and 18 will be treated via non-rooftop disconnect. Adequate pervious area is available and contributing impervious area is minimal or non-existent. The relocated stormwater feature for drainage area 10 will require a diversion feature to route runoff from drainage area 18 around the feature.

4.3 CRITICAL AREA PHOSPHORUS REMOVAL

This project must meet Critical Area Commission phosphorus removal requirements. As part of the Growth Allocation process, the Commission has requested additional treatment, if possible. We have thus increased the phosphorus removal to 15% from the typically required 10%. All proposed stormwater features adequately address, and significantly exceed, the 15% removal target.

5. CONCLUSION

This stormwater management analysis indicates that the proposed design will successfully meet, and exceed, stormwater quality, quantity, and phosphorus removal requirements. The ESD volume provided is greater than the ESD volume required for all drainage areas, proposed site runoff is significantly less than existing conditions, and phosphorus removal has been exceeded at a higher percentage than required. Planning and design analysis indicates that stormwater quality and quantity management can be accomplished as described. Please see the attached appendices for detailed calculations and drainage area maps.

APPENDIX A

MARYLAND ENVIRONMENTAL SITE DESIGN (ESD) CALCULATIONS

Maryland Environmental Site Design (ESD) Computations

Project Poplar Hill By JJB
 Location Oxford Road/Easton Bypass Date 8/2/2022

Determine Target ESDv

Initial Site Assessment (Site Data):

Existing Conditions

Total LOD Area: 4,860,766 sf
 Soil Types:

HSG	A	B	C	D
Area			4,860,766	
Percent			100.0	

Proposed Layout

Impervious Cover: 1,738,627 sf
 Percent Impervious (I) 36 %

Determine RCNs for Wooded Conditions:

HSG	A	B	C	D
Area			4,860,766	
Percent			100.0	
RCN	38	55	70	77

Weighted RCN: 70

Determine ESD Targets:

= 0.37

From Table 5.3 and
 %I = 36

HSG	A	B	C	D
Area			4,860,766	
Target P _E			2.00	

Composite Target P_E (in.): 2.00

$$\text{ESDv} = \frac{(P_E)(R_v)(A)}{12}$$

= 301,300 cf

Drainage Area 1

Total Area	210,281 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	86,472 sf	
Percent Impervious (I)	41 %	= 11,779 cf
$R_v = 0.05 + 0.009(I)$	0.42	75% of target= 8,834 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 20,612 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 12,823 \text{ cf} \end{aligned}$$

Surface Area=	11,885 sf	Media Depth=	3 ft
Ponding Area=	13,760 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **12,823 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 2

Total Area	405,742 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	159,036 sf	
Percent Impervious (I)	39 %	= 21,789 cf
Rv = 0.05 + 0.009(I)	0.40	75% of target = 16,342 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 38,131 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 51,872 \text{ cf} \end{aligned}$$

Surface Area=	49,862 sf	Media Depth=	3 ft
Ponding Area=	53,881 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **38,131 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 3

Total Area	258,095 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	129,485 sf	
Percent Impervious (I)	50 %	= 17,259 cf
Rv = 0.05 + 0.009(I)	0.50	75% of target = 12,944 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 30,203 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 18,076 \text{ cf} \end{aligned}$$

Surface Area=	16,961 sf	Media Depth=	3 ft
Ponding Area=	19,190 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **18,076 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 4A

Total Area	62,363 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	32,714 sf	
Percent Impervious (I)	52 %	= 4,341 cf
Rv = 0.05 + 0.009(I)	0.52	75% of target = 3,256 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 7,598 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 4,217 \text{ cf} \end{aligned}$$

Surface Area=	3,692 sf	Media Depth=	3 ft
Ponding Area=	4,742 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **4,217 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 4B

Total Area	233,002 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	103,239 sf	
Percent Impervious (I)	44 %	= 13,942 cf
Rv = 0.05 + 0.009(I)	0.45	75% of target = 10,457 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 24,399 \text{ cf}$$

The computed ESDv provided is:

$$\text{ESDv} = (\text{Ponding storage ONLY}) \\ = 16,151 \text{ cf}$$

Surface Area=	14,777 sf	Media Depth=	3 ft
Ponding Area=	17,525 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **16,151 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 5

Total Area	76,080 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	49,340 sf	
Percent Impervious (I)	65 %	= 6,428 cf
Rv = 0.05 + 0.009(I)	0.63	75% of target = 4,821 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 11,249 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 6,702 \text{ cf} \end{aligned}$$

Surface Area=	6,038 sf	Media Depth=	3 ft
Ponding Area=	7,366 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **6,702 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 6

Total Area	232,674 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	124,340 sf	
Percent Impervious (I)	53 %	= 16,472 cf
Rv = 0.05 + 0.009(I)	0.53	75% of target = 12,354 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 28,826 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 17,975 \text{ cf} \end{aligned}$$

Surface Area=	15,353 sf	Media Depth=	3 ft
Ponding Area=	20,596 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **17,975 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 7

Total Area	750,267 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	335,358 sf	
Percent Impervious (I)	45 %	= 45,245 cf
Rv = 0.05 + 0.009(I)	0.45	75% of target = 33,934 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 79,178 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 47,865 \text{ cf} \end{aligned}$$

Surface Area=	45,723 sf	Media Depth=	3 ft
Ponding Area=	50,007 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **47,865 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 8

Total Area	331,820 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	175,511 sf	
Percent Impervious (I)	53 %	= 23,273 cf
Rv = 0.05 + 0.009(I)	0.53	75% of target = 17,455 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 40,729 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 23,622 \text{ cf} \end{aligned}$$

Surface Area=	21,431 sf	Media Depth=	3 ft
Ponding Area=	25,813 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **23,622 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 9

Total Area	86,772 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	49,067 sf	
Percent Impervious (I)	57 %	= 6,467 cf
Rv = $0.05 + 0.009(I)$	0.56	75% of target= 4,850 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 11,316 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 9,593 \text{ cf} \end{aligned}$$

Surface Area=	8,828 sf	Media Depth=	3 ft
Ponding Area=	10,358 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **9,593 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 10

Total Area	677,943 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	125,614 sf	
Percent Impervious (I)	19 %	= 19,593 cf
Rv = 0.05 + 0.009(I)	0.22	75% of target= 14,695 cf

Site Development Design:

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 34,288 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 19,895 \text{ cf} \end{aligned}$$

Surface Area=	18,938 sf	Media Depth=	3 ft
Ponding Area=	20,851 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **19,895 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 11

Total Area	51,380 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	19,690 sf	
Percent Impervious (I)	38 %	= 2,705 cf
Rv = 0.05 + 0.009(I)	0.39	75% of target = 2,029 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 4,734 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 4,292 \text{ cf} \end{aligned}$$

Surface Area=	3,711 sf	Media Depth=	3 ft
Ponding Area=	4,873 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **4,292 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 12

Total Area	21,055 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	15,983 sf	
Percent Impervious (I)	76 %	= 2,058 cf
Rv = 0.05 + 0.009(I)	0.73	75% of target = 1,544 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 3,602 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 2,162 \text{ cf} \end{aligned}$$

Surface Area=	1,695 sf	Media Depth=	3 ft
Ponding Area=	2,628 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **2,162 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 13

Total Area	202,941 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	117,942 sf	
Percent Impervious (I)	58 %	= 15,506 cf
Rv = $0.05 + 0.009(I)$	0.57	75% of target= 11,629 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 27,135 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 15,549 \text{ cf} \end{aligned}$$

Surface Area=	14,301 sf	Media Depth=	3 ft
Ponding Area=	16,797 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **15,549 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 14

Total Area	168,928 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	104,653 sf	
Percent Impervious (I)	62 %	= 13,685 cf
$R_v = 0.05 + 0.009(I)$	0.61	75% of target= 10,263 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 23,948 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 13,959 \text{ cf} \end{aligned}$$

Surface Area=	12,709 sf	Media Depth=	3 ft
Ponding Area=	15,208 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **13,959 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 15

Total Area	90,352 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	38,263 sf	
Percent Impervious (I)	42 %	= 5,194 cf
Rv = 0.05 + 0.009(I)	0.43	75% of target = 3,895 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 9,089 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 5,923 \text{ cf} \end{aligned}$$

Surface Area=	4,927 sf	Media Depth=	3 ft
Ponding Area=	6,918 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **5,923 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 16

Total Area	159,083 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	51,127 sf	
Percent Impervious (I)	32 %	= 7,196 cf
Rv = 0.05 + 0.009(I)	0.34	75% of target = 5,397 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 12,593 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 7,658 \text{ cf} \end{aligned}$$

Surface Area=	6,875 sf	Media Depth=	3 ft
Ponding Area=	8,440 sf		
Ponding depth=	1 ft	Porosity=	0.4

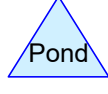
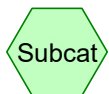
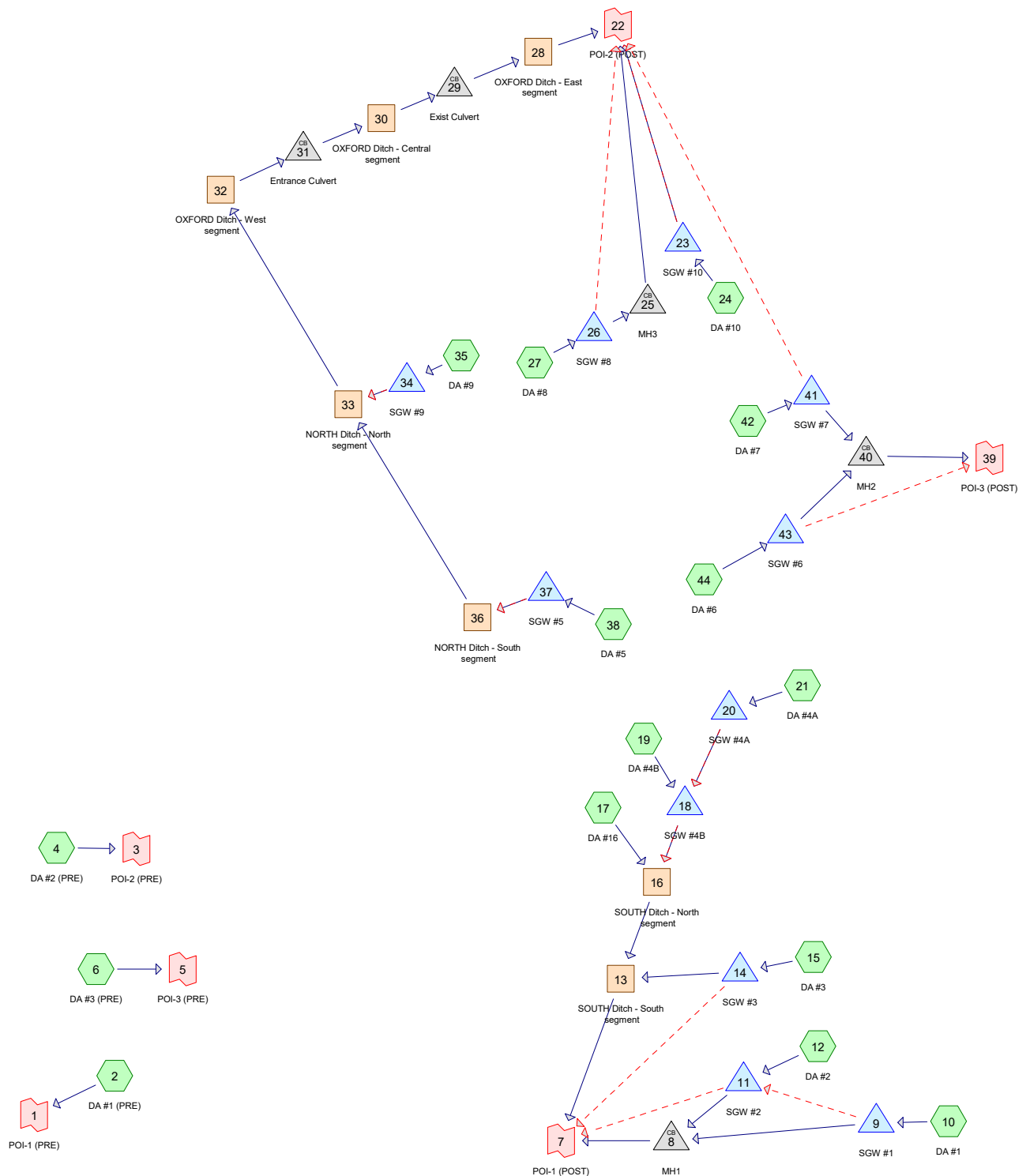
Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **7,658 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

APPENDIX B

STORMWATER QUANTITY CALCULATIONS



Routing Diagram for Poplar Hill-220155
 Prepared by {enter your company name here}, Printed 10/5/2022
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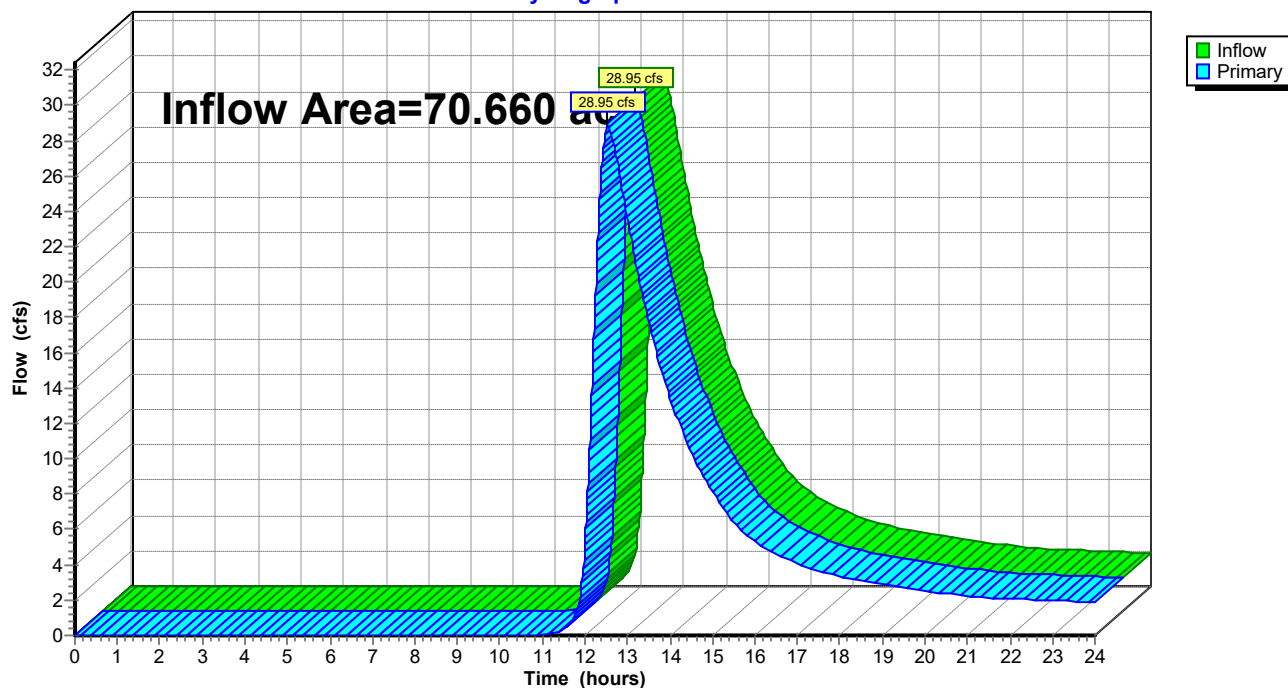
Summary for Link 1: POI-1 (PRE)

Inflow Area = 70.660 ac, 0.00% Impervious, Inflow Depth > 1.14" for 2-Yr event
 Inflow = 28.95 cfs @ 12.51 hrs, Volume= 6.707 af
 Primary = 28.95 cfs @ 12.51 hrs, Volume= 6.707 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1: POI-1 (PRE)

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 2: DA #1 (PRE)

Runoff = 28.95 cfs @ 12.51 hrs, Volume= 6.707 af, Depth> 1.14"

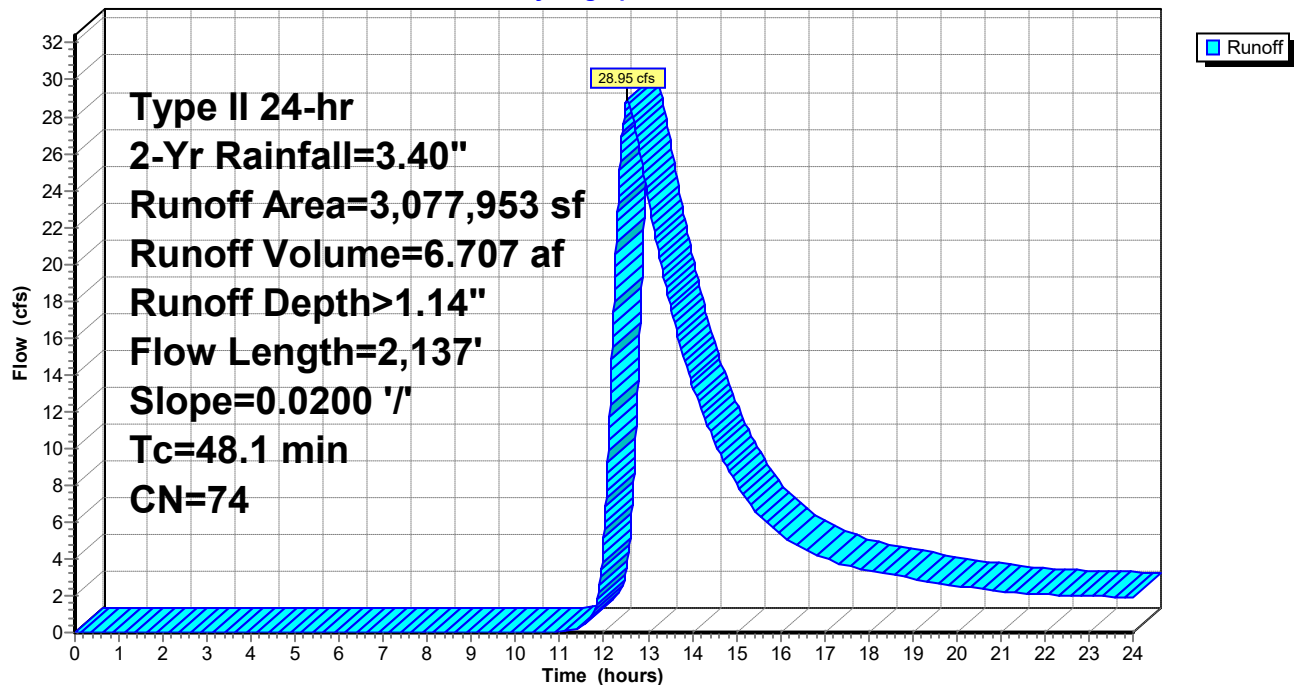
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
3,077,953	74	>75% Grass cover, Good, HSG C
3,077,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.40"
34.3	2,037	0.0200	0.99		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
48.1	2,137	Total			

Subcatchment 2: DA #1 (PRE)

Hydrograph



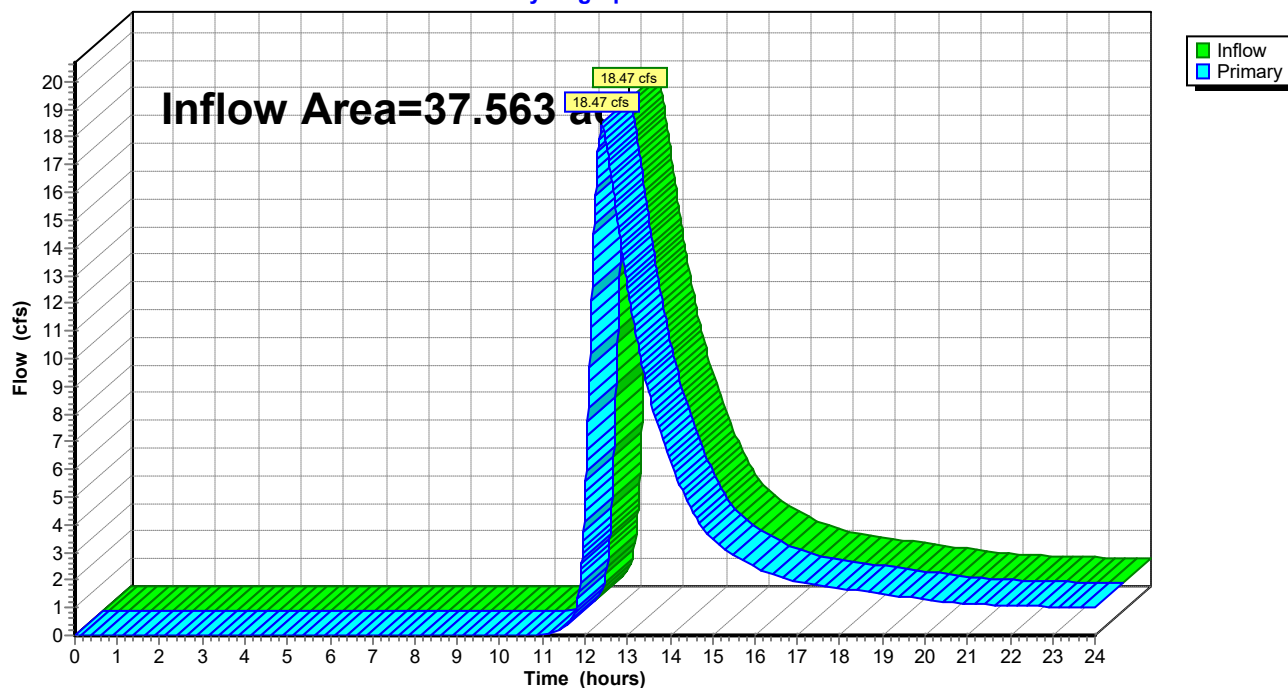
Summary for Link 3: POI-2 (PRE)

Inflow Area = 37.563 ac, 0.00% Impervious, Inflow Depth > 1.15" for 2-Yr event
 Inflow = 18.47 cfs @ 12.38 hrs, Volume= 3.588 af
 Primary = 18.47 cfs @ 12.38 hrs, Volume= 3.588 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 3: POI-2 (PRE)

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 4: DA #2 (PRE)

Runoff = 18.47 cfs @ 12.38 hrs, Volume= 3.588 af, Depth> 1.15"

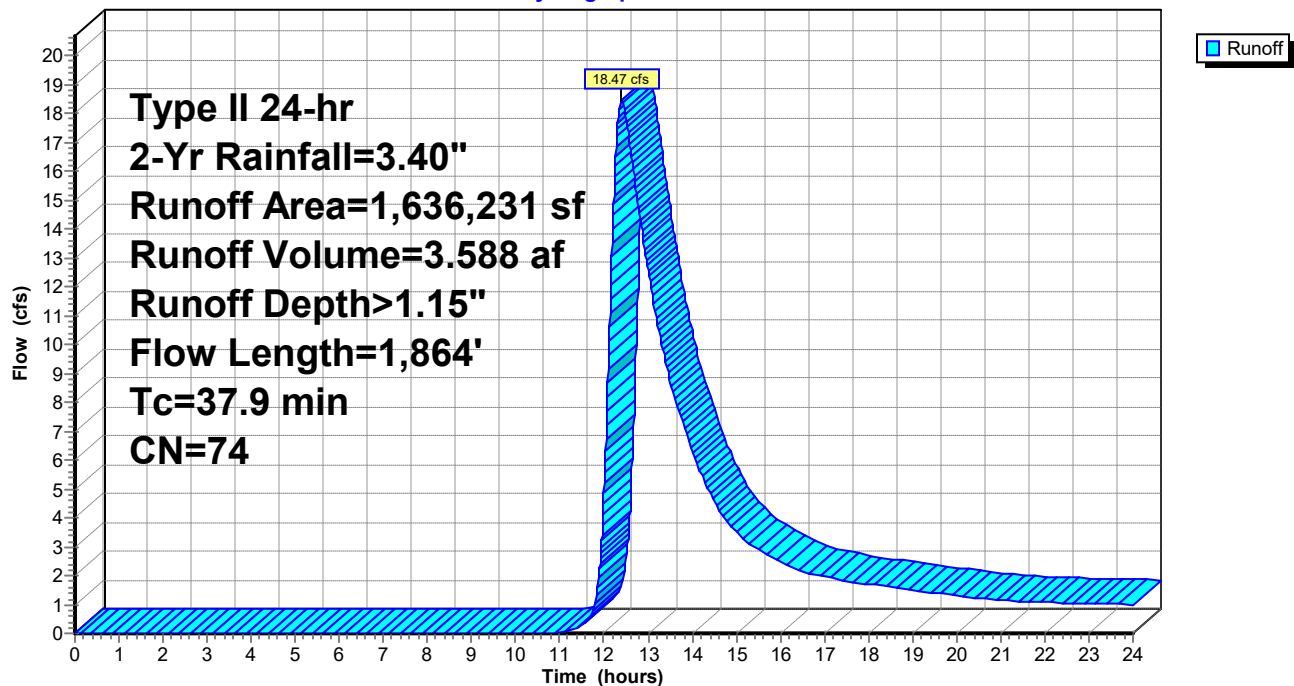
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
1,636,231	74	>75% Grass cover, Good, HSG C
1,636,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.40"
10.5	482	0.0120	0.77		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
13.6	1,282	0.0110	1.57		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
37.9	1,864	Total			

Subcatchment 4: DA #2 (PRE)

Hydrograph



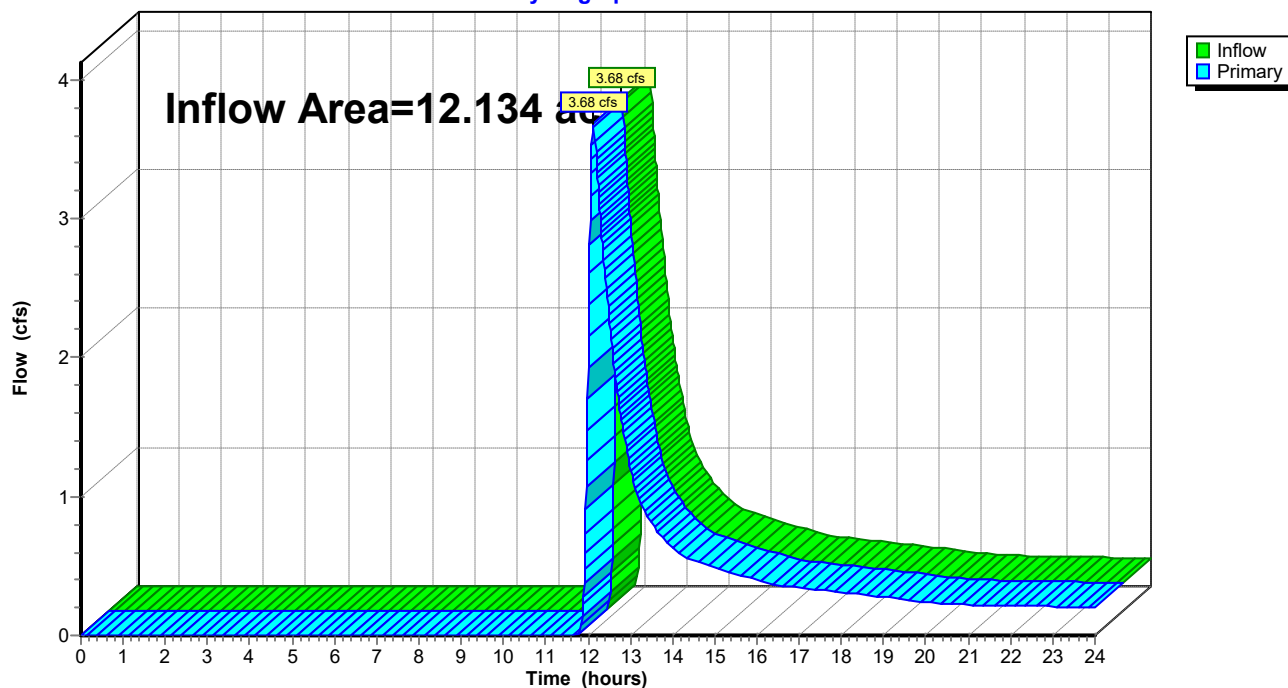
Summary for Link 5: POI-3 (PRE)

Inflow Area = 12.134 ac, 0.00% Impervious, Inflow Depth > 0.52" for 2-Yr event
 Inflow = 3.68 cfs @ 12.13 hrs, Volume= 0.528 af
 Primary = 3.68 cfs @ 12.13 hrs, Volume= 0.528 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 5: POI-3 (PRE)

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 6: DA #3 (PRE)

Runoff = 3.68 cfs @ 12.13 hrs, Volume= 0.528 af, Depth> 0.52"

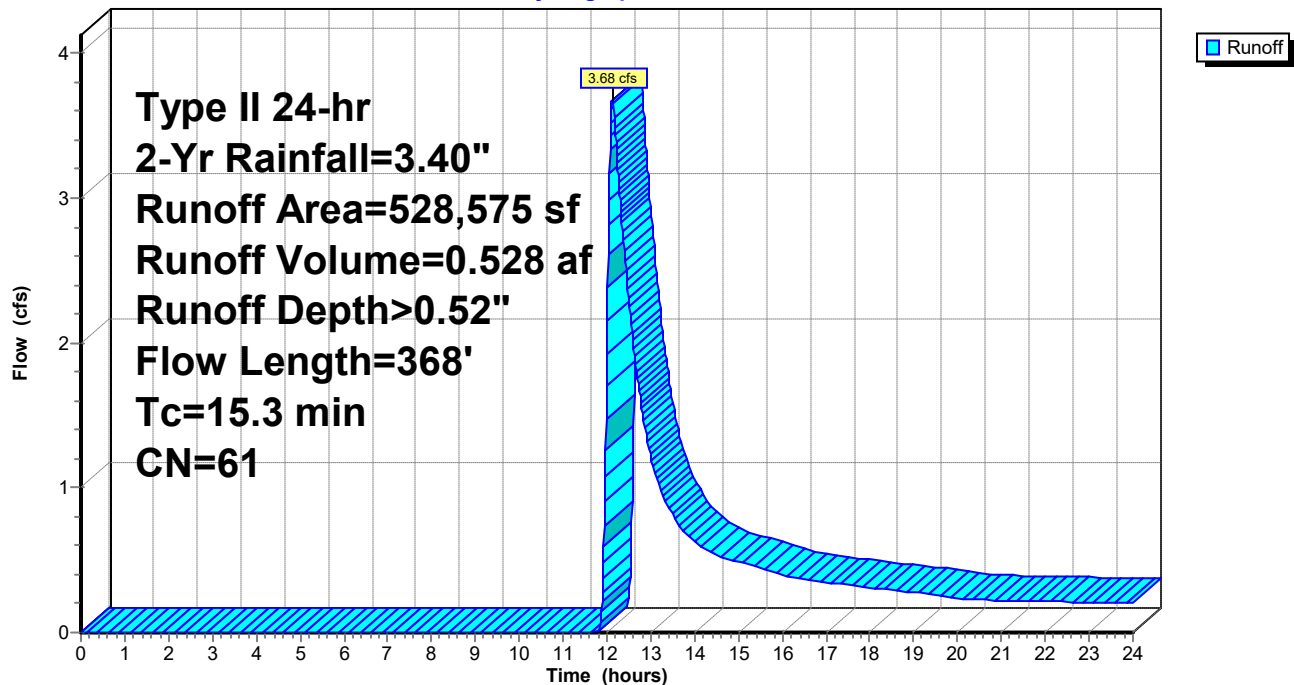
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
528,575	61	>75% Grass cover, Good, HSG B
528,575		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0230	0.13		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.40"
2.2	268	0.0810	1.99		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
15.3	368	Total			

Subcatchment 6: DA #3 (PRE)

Hydrograph



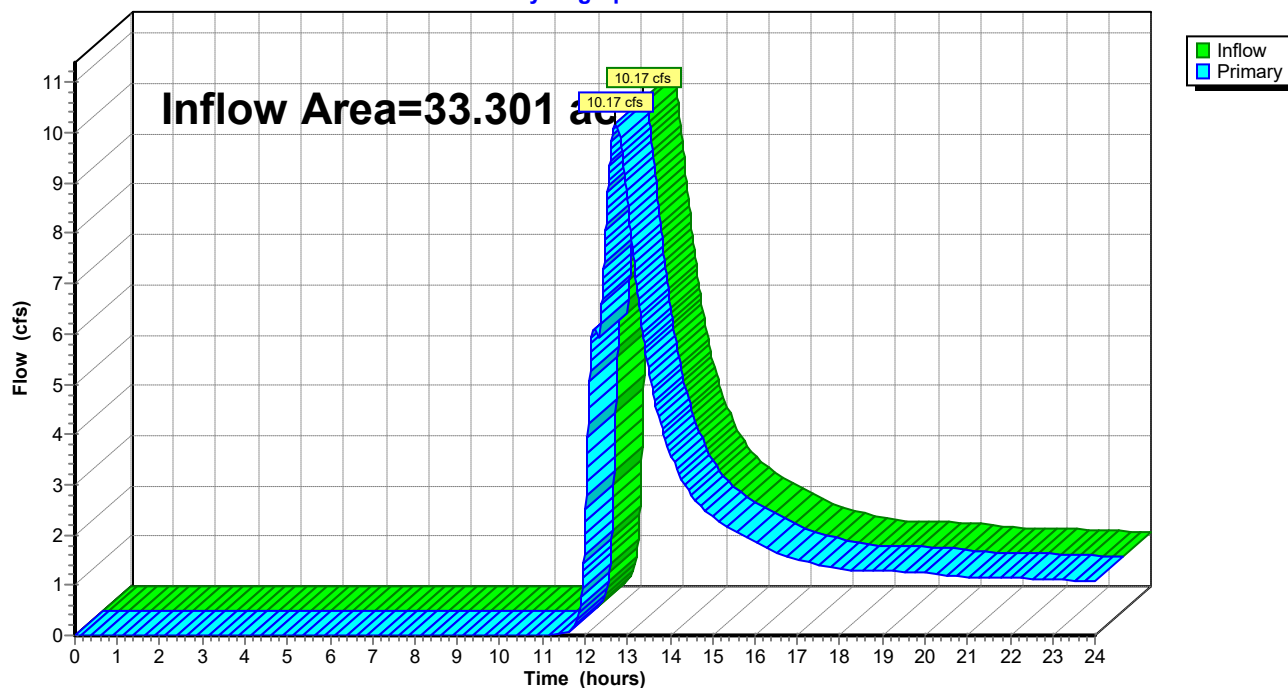
Summary for Link 7: POI-1 (POST)

Inflow Area = 33.301 ac, 35.63% Impervious, Inflow Depth > 0.85" for 2-Yr event
 Inflow = 10.17 cfs @ 12.73 hrs, Volume= 2.366 af
 Primary = 10.17 cfs @ 12.73 hrs, Volume= 2.366 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 7: POI-1 (POST)

Hydrograph



Summary for Pond 8: MH1

Inflow Area = 14.142 ac, 39.85% Impervious, Inflow Depth > 0.47" for 2-Yr event
 Inflow = 2.64 cfs @ 12.61 hrs, Volume= 0.551 af
 Outflow = 2.64 cfs @ 12.61 hrs, Volume= 0.551 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.64 cfs @ 12.61 hrs, Volume= 0.551 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

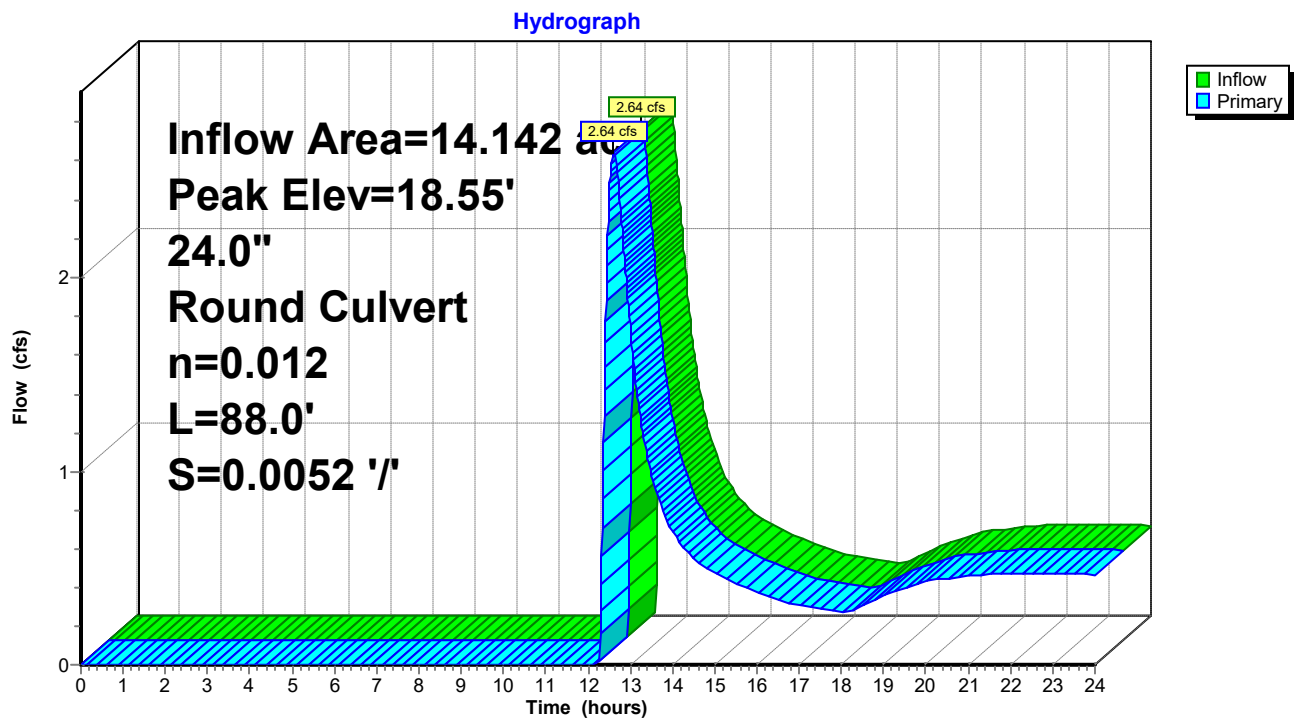
Peak Elev= 18.55' @ 12.61 hrs

Flood Elev= 20.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	17.80'	24.0" Round Culvert L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 17.80' / 17.34' S= 0.0052 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.64 cfs @ 12.61 hrs HW=18.55' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Barrel Controls 2.64 cfs @ 3.63 fps)

Pond 8: MH1



Summary for Pond 9: SGW #1

Inflow Area = 4.827 ac, 41.12% Impervious, Inflow Depth > 1.84" for 2-Yr event
 Inflow = 8.31 cfs @ 12.07 hrs, Volume= 0.740 af
 Outflow = 2.64 cfs @ 12.61 hrs, Volume= 0.437 af, Atten= 68%, Lag= 32.3 min
 Primary = 2.64 cfs @ 12.61 hrs, Volume= 0.437 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 26.68' @ 12.61 hrs Surf.Area= 14,104 sf Storage= 15,300 cf

Plug-Flow detention time= 208.0 min calculated for 0.437 af (59% of inflow)
 Center-of-Mass det. time= 96.9 min (932.3 - 835.3)

Volume	Invert	Avail.Storage	Storage Description
#1	25.50'	38,053 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.50	11,885	456.3	0.0	0	0	11,885
26.50	13,760	481.5	100.0	12,811	12,811	13,823
27.20	15,133	499.1	100.0	10,109	22,920	15,239
28.20	15,133	499.1	100.0	15,133	38,053	15,738

Device	Routing	Invert	Outlet Devices
#1	Primary	25.17'	24.0" Round Culvert L= 936.0' Ke= 0.500 Inlet / Outlet Invert= 25.17' / 17.90' S= 0.0078 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	26.50'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	27.20'	46.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.64 cfs @ 12.61 hrs HW=26.68' TW=18.55' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.64 cfs of 10.63 cfs potential flow)

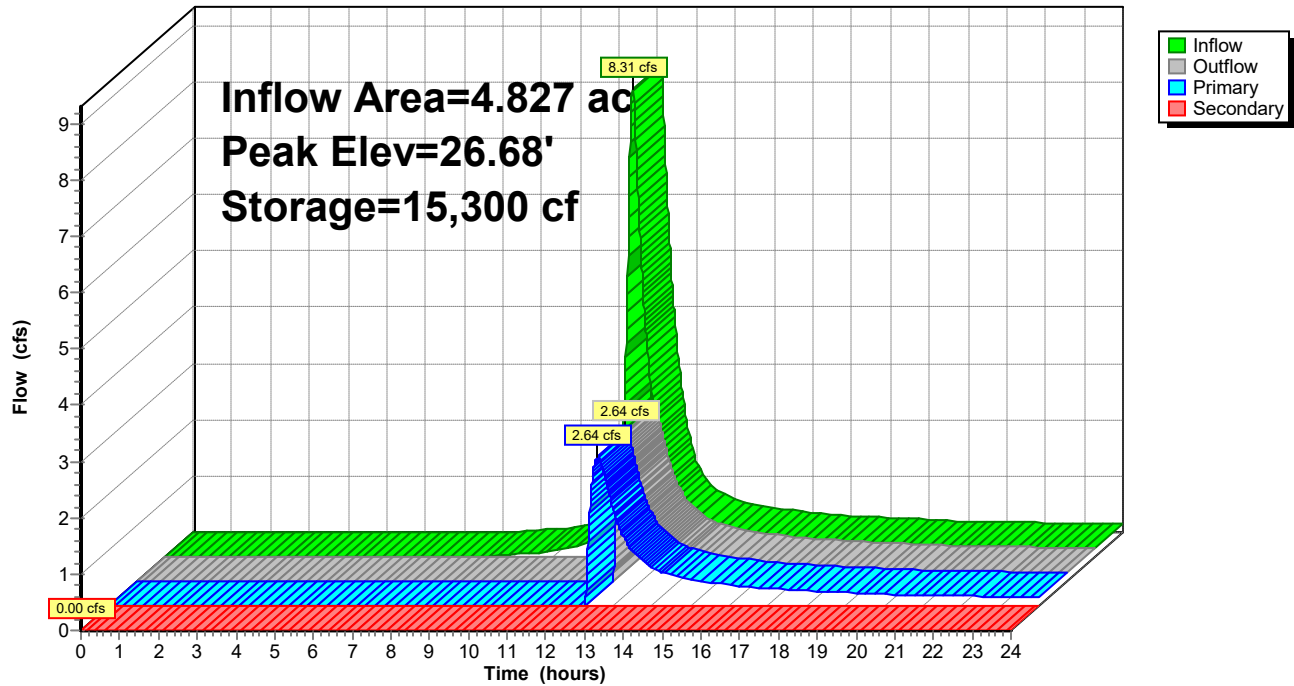
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.64 cfs @ 1.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.50' TW=18.50' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 9: SGW #1

Hydrograph



Poplar Hill-220155

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

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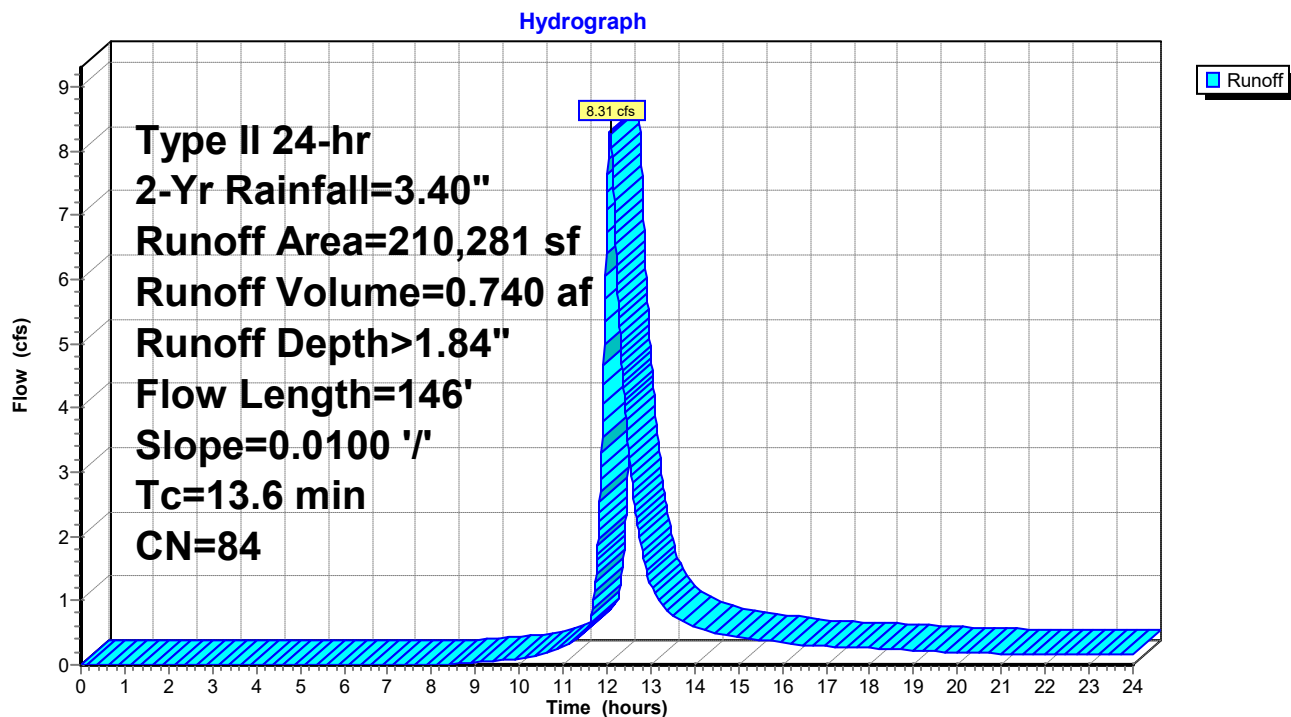
Summary for Subcatchment 10: DA #1

Runoff = 8.31 cfs @ 12.07 hrs, Volume= 0.740 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
86,472	98	Paved parking, HSG C
123,809	74	>75% Grass cover, Good, HSG C
210,281	84	Weighted Average
123,809		58.88% Pervious Area
86,472		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0100	0.13		Sheet Flow, Swale
					Grass: Short n= 0.150 P2= 3.40"
1.1	46	0.0100	0.70		Shallow Concentrated Flow, Swale
					Short Grass Pasture Kv= 7.0 fps
13.6	146	Total			

Subcatchment 10: DA #1

Summary for Pond 11: SGW #2

Inflow Area = 9.315 ac, 39.20% Impervious, Inflow Depth > 1.76" for 2-Yr event
 Inflow = 14.36 cfs @ 12.09 hrs, Volume= 1.368 af
 Outflow = 0.31 cfs @ 23.30 hrs, Volume= 0.114 af, Atten= 98%, Lag= 672.4 min
 Primary = 0.31 cfs @ 23.30 hrs, Volume= 0.114 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 19.55' @ 23.30 hrs Surf.Area= 54,090 sf Storage= 54,645 cf

Plug-Flow detention time= 625.0 min calculated for 0.114 af (8% of inflow)
 Center-of-Mass det. time= 457.9 min (1,298.4 - 840.5)

Volume	Invert	Avail.Storage	Storage Description
#1	18.50'	165,786 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
18.50	49,862	992.1	0.0	0	0	49,862
19.50	53,881	1,017.3	100.0	51,859	51,859	54,015
20.50	58,000	1,042.4	100.0	55,928	107,786	58,256
21.50	58,000	1,042.4	100.0	58,000	165,786	59,298

Device	Routing	Invert	Outlet Devices
#1	Primary	18.17'	18.0" Round Culvert L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 18.17' / 17.90' S= 0.0123 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	19.50'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	20.50'	48.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.31 cfs @ 23.30 hrs HW=19.55' TW=18.11' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.31 cfs of 6.15 cfs potential flow)

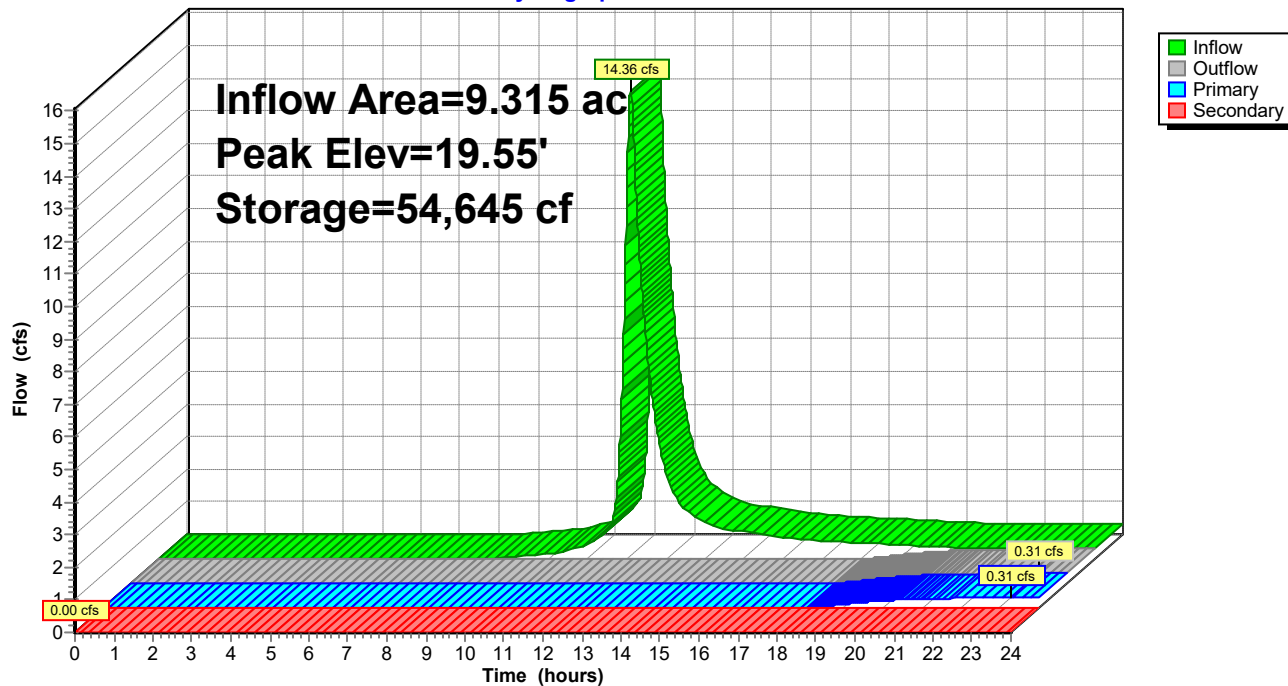
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.31 cfs @ 0.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=18.50' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11: SGW #2

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 12: DA #2

Runoff = 14.36 cfs @ 12.09 hrs, Volume= 1.368 af, Depth> 1.76"

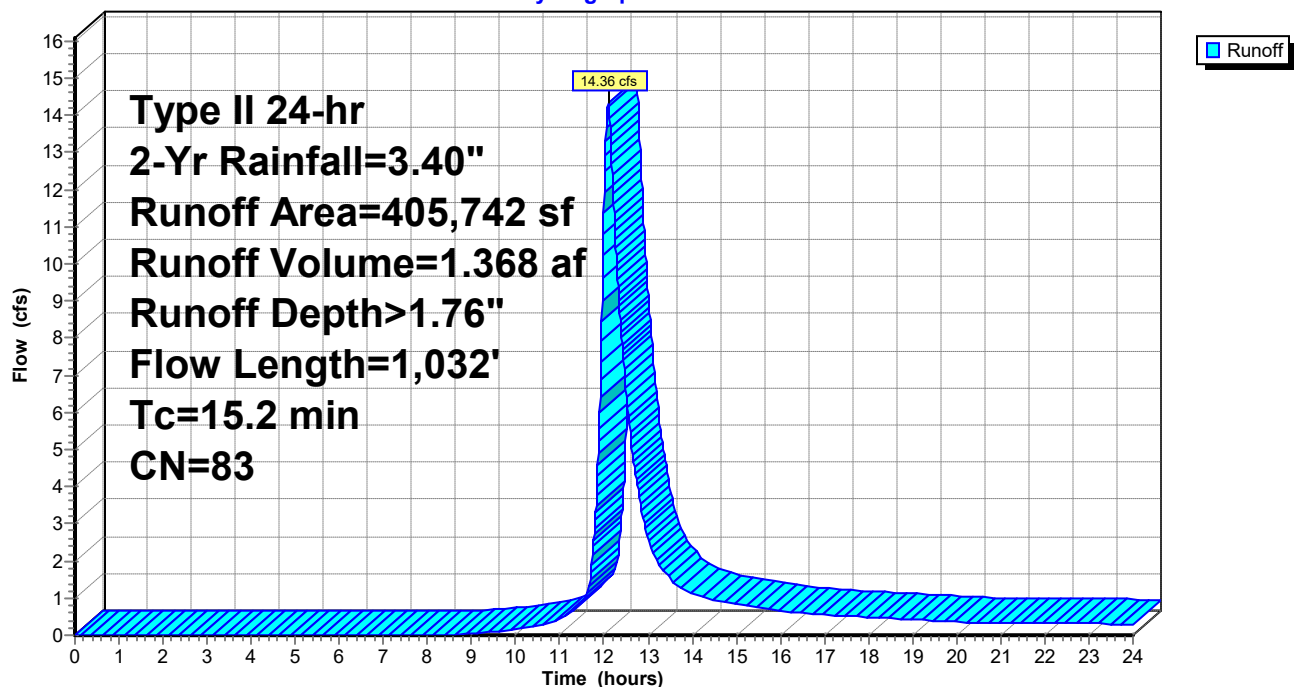
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
159,036	98	Paved parking, HSG C
246,706	74	>75% Grass cover, Good, HSG C
405,742	83	Weighted Average
246,706		60.80% Pervious Area
159,036		39.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	72	0.0200	0.11		Sheet Flow, A-B Median
					Grass: Dense n= 0.240 P2= 3.40"
0.1	18	0.0200	2.87		Shallow Concentrated Flow, B-C Road
					Paved Kv= 20.3 fps
4.5	942	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
15.2	1,032	Total			

Subcatchment 12: DA #2

Hydrograph



Summary for Reach 13: SOUTH Ditch - South segment

Inflow Area = 19.159 ac, 32.52% Impervious, Inflow Depth > 1.14" for 2-Yr event
 Inflow = 7.84 cfs @ 12.71 hrs, Volume= 1.824 af
 Outflow = 7.76 cfs @ 12.77 hrs, Volume= 1.814 af, Atten= 1%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.19 fps, Min. Travel Time= 4.7 min
 Avg. Velocity= 0.63 fps, Avg. Travel Time= 8.9 min

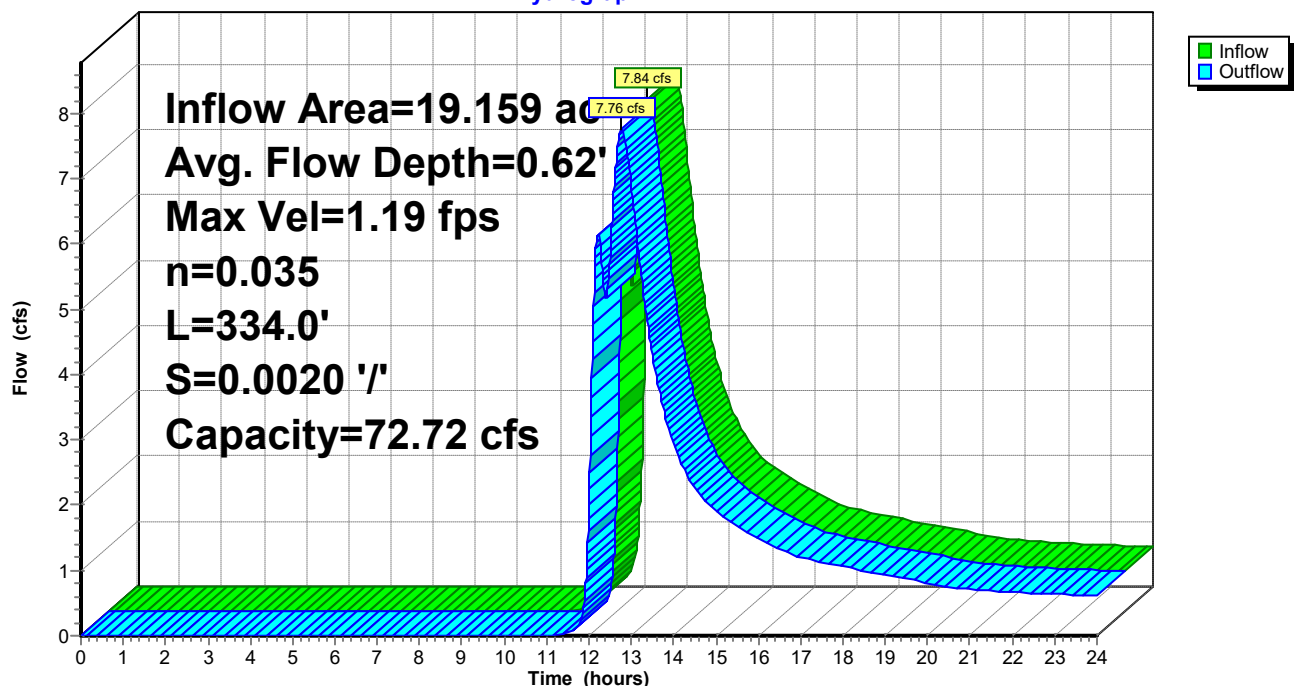
Peak Storage= 2,174 cf @ 12.77 hrs
 Average Depth at Peak Storage= 0.62'
 Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 72.72 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 24.00'
 Length= 334.0' Slope= 0.0020 '/'
 Inlet Invert= 18.42', Outlet Invert= 17.75'



Reach 13: SOUTH Ditch - South segment

Hydrograph



Summary for Pond 14: SGW #3

Inflow Area = 5.925 ac, 50.17% Impervious, Inflow Depth > 2.00" for 2-Yr event
 Inflow = 10.53 cfs @ 12.08 hrs, Volume= 0.986 af
 Outflow = 2.97 cfs @ 12.72 hrs, Volume= 0.557 af, Atten= 72%, Lag= 38.2 min
 Primary = 2.97 cfs @ 12.72 hrs, Volume= 0.557 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.99' @ 12.72 hrs Surf.Area= 19,629 sf Storage= 21,812 cf

Plug-Flow detention time= 218.1 min calculated for 0.557 af (56% of inflow)
 Center-of-Mass det. time= 107.6 min (937.7 - 830.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.80'	59,926 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.80	16,961	544.6	0.0	0	0	16,961
20.80	19,190	569.8	100.0	18,064	18,064	19,264
21.80	21,519	594.9	100.0	20,343	38,407	21,662
22.80	21,519	594.9	100.0	21,519	59,926	22,257

Device	Routing	Invert	Outlet Devices
#1	Primary	19.47'	18.0" Round Culvert L= 264.0' Ke= 0.500 Inlet / Outlet Invert= 19.47' / 18.42' S= 0.0040 ' S= 0.0040 ' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.80'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.80'	53.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.97 cfs @ 12.72 hrs HW=20.99' TW=19.04' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.97 cfs of 6.40 cfs potential flow)

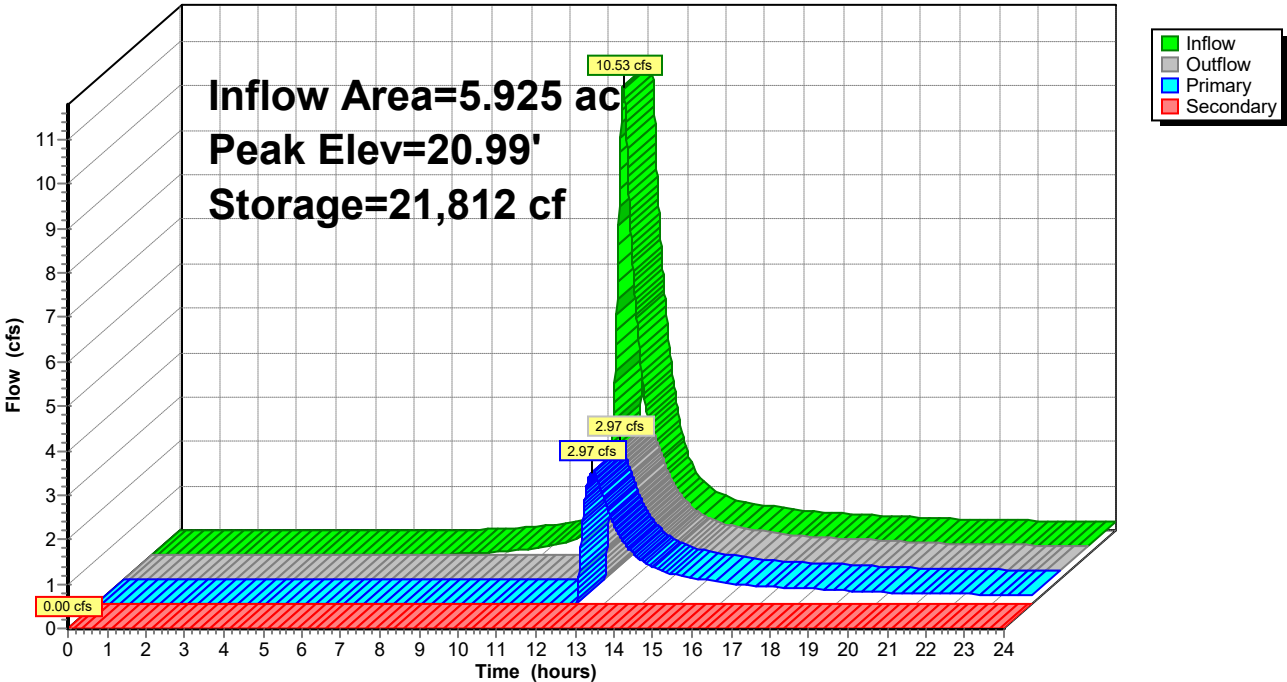
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.97 cfs @ 1.44 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.80' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 14: SGW #3

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 15: DA #3

Runoff = 10.53 cfs @ 12.08 hrs, Volume= 0.986 af, Depth> 2.00"

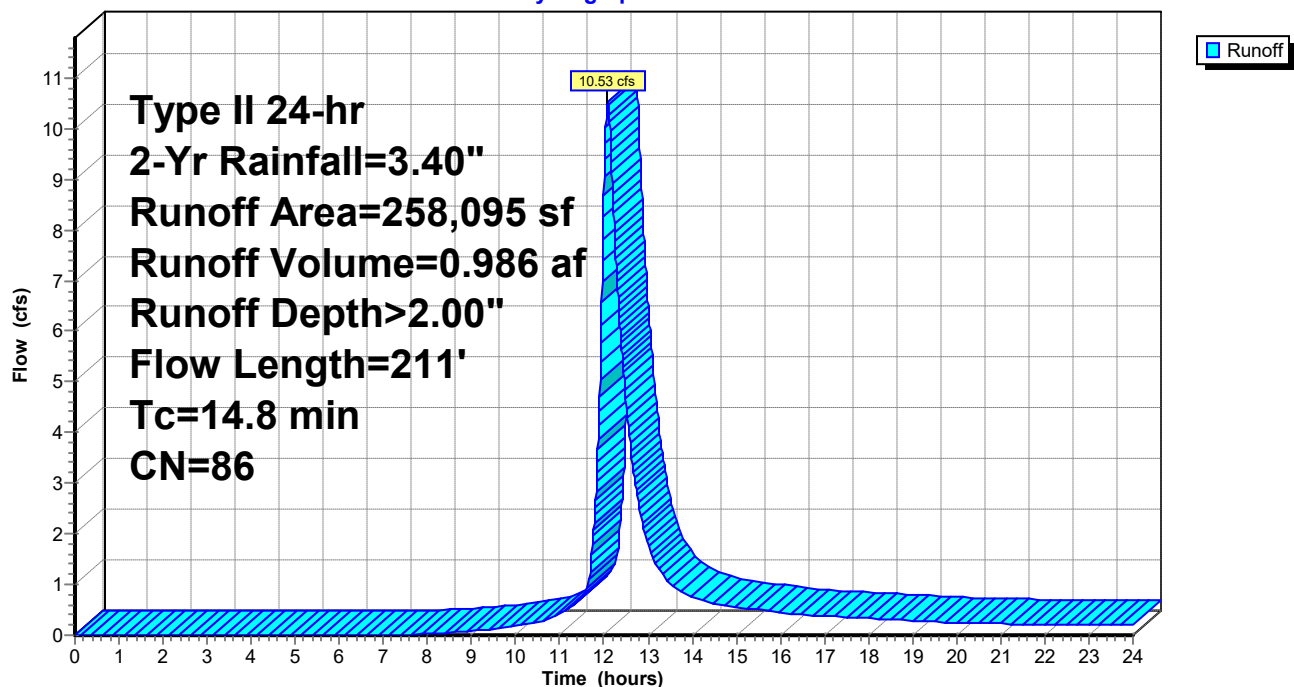
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
129,485	98	Paved parking, HSG C
128,610	74	>75% Grass cover, Good, HSG C
258,095	86	Weighted Average
128,610		49.83% Pervious Area
129,485		50.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B Median Grass: Dense n= 0.240 P2= 3.40"
0.6	38	0.0200	0.99		Shallow Concentrated Flow, B-C Median Short Grass Pasture Kv= 7.0 fps
0.4	73	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
14.8	211	Total			

Subcatchment 15: DA #3

Hydrograph



Summary for Reach 16: SOUTH Ditch - North segment

Inflow Area = 13.234 ac, 24.62% Impervious, Inflow Depth > 1.16" for 2-Yr event
 Inflow = 7.33 cfs @ 12.07 hrs, Volume= 1.275 af
 Outflow = 6.62 cfs @ 12.14 hrs, Volume= 1.267 af, Atten= 10%, Lag= 4.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.15 fps, Min. Travel Time= 5.5 min
 Avg. Velocity= 0.56 fps, Avg. Travel Time= 11.4 min

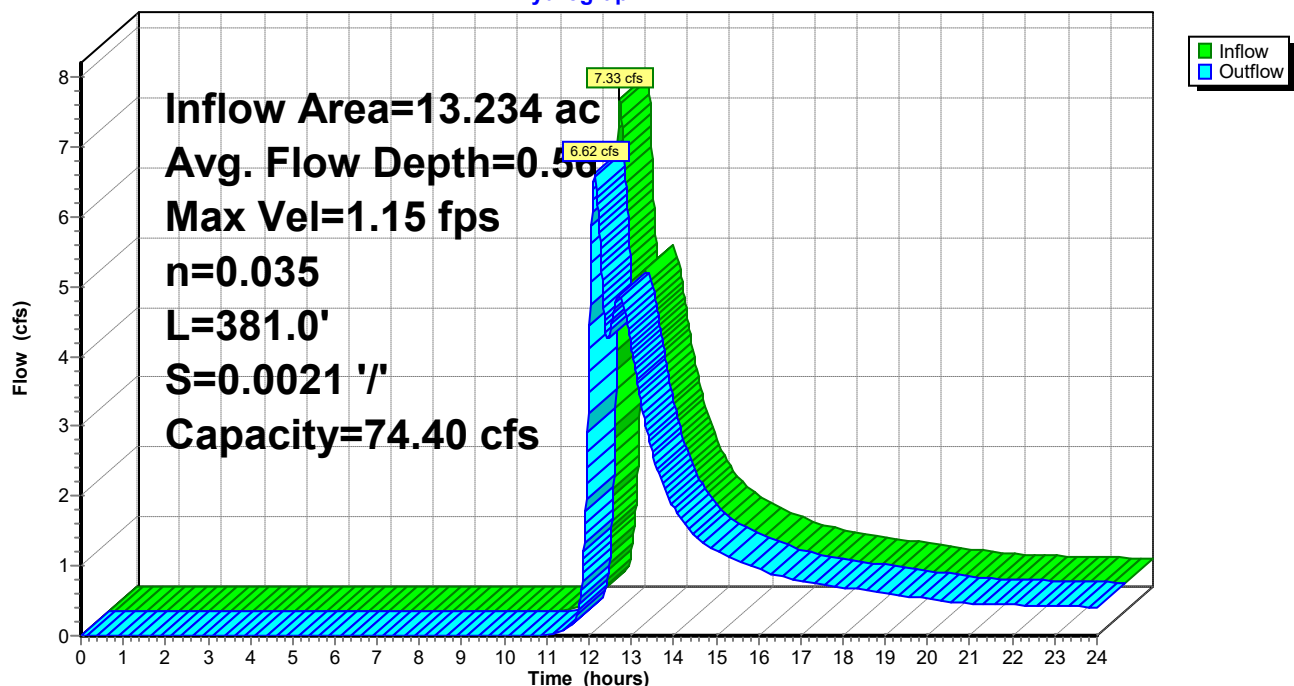
Peak Storage= 2,191 cf @ 12.14 hrs
 Average Depth at Peak Storage= 0.56'
 Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 74.40 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 24.00'
 Length= 381.0' Slope= 0.0021 '/'
 Inlet Invert= 19.22', Outlet Invert= 18.42'



Reach 16: SOUTH Ditch - North segment

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 17: DA #16

Runoff = 7.33 cfs @ 12.07 hrs, Volume= 0.658 af, Depth> 1.22"

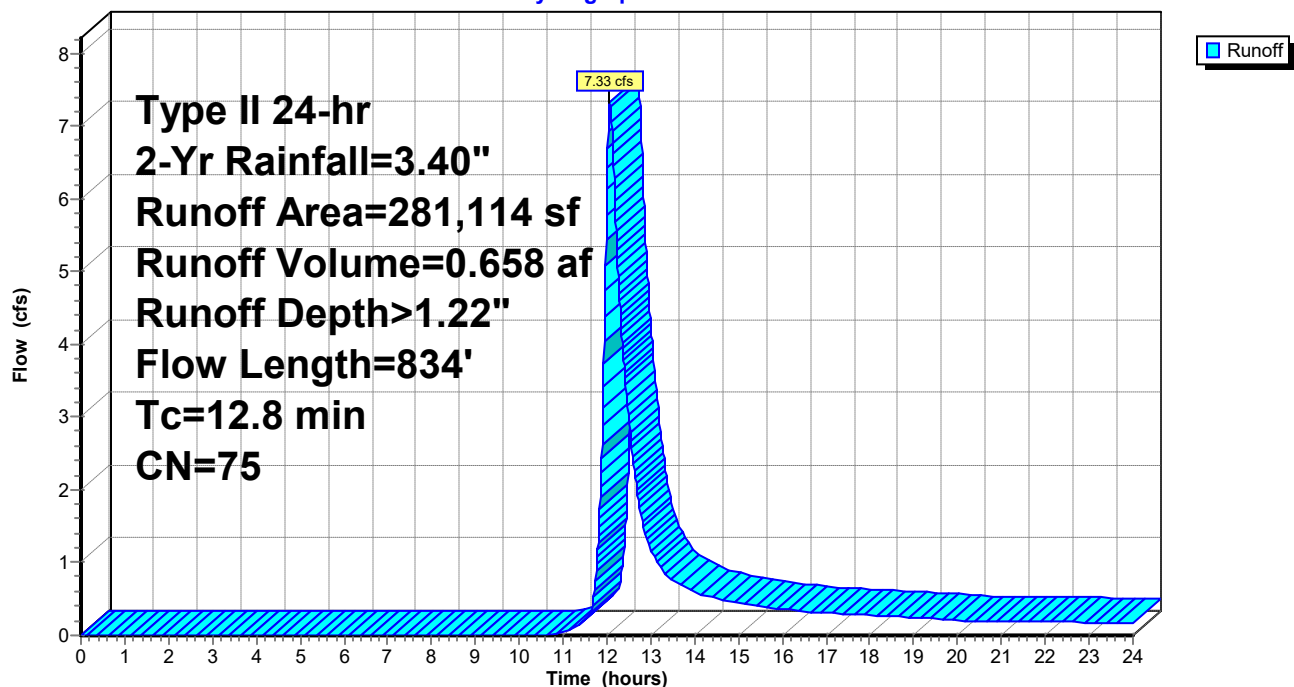
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
5,965	98	Paved parking, HSG C
275,149	74	>75% Grass cover, Good, HSG C
281,114	75	Weighted Average
275,149		97.88% Pervious Area
5,965		2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	51	0.0200	0.15		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
7.3	783	0.0030	1.79	12.56	Trap/Vee/Rect Channel Flow, B-C Existing Ditch
					Bot.W=4.00' D=1.00' Z= 3.0 ' /' Top.W=10.00'
					n= 0.035 Earth, dense weeds
12.8	834	Total			

Subcatchment 17: DA #16

Hydrograph



Summary for Pond 18: SGW #4B

Inflow Area = 6.781 ac, 46.03% Impervious, Inflow Depth > 1.78" for 2-Yr event
 Inflow = 8.94 cfs @ 12.10 hrs, Volume= 1.005 af
 Outflow = 3.04 cfs @ 12.78 hrs, Volume= 0.617 af, Atten= 66%, Lag= 41.2 min
 Primary = 3.04 cfs @ 12.78 hrs, Volume= 0.617 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.89' @ 12.78 hrs Surf.Area= 18,184 sf Storage= 20,383 cf

Plug-Flow detention time= 211.6 min calculated for 0.617 af (61% of inflow)
 Center-of-Mass det. time= 98.7 min (944.2 - 845.5)

Volume	Invert	Avail.Storage	Storage Description
#1	19.65'	55,436 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.65	14,777	674.3	0.0	0	0	14,777
20.65	17,525	699.5	100.0	16,131	16,131	17,616
21.65	20,373	724.6	100.0	18,931	35,063	20,549
22.65	20,373	724.6	100.0	20,373	55,436	21,273

Device	Routing	Invert	Outlet Devices
#1	Primary	19.32'	18.0" Round Culvert L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 19.32' / 19.22' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.65'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.65'	24.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.04 cfs @ 12.78 hrs HW=20.89' TW=19.69' (Dynamic Tailwater)

↑1=Culvert (Passes 3.04 cfs of 6.32 cfs potential flow)

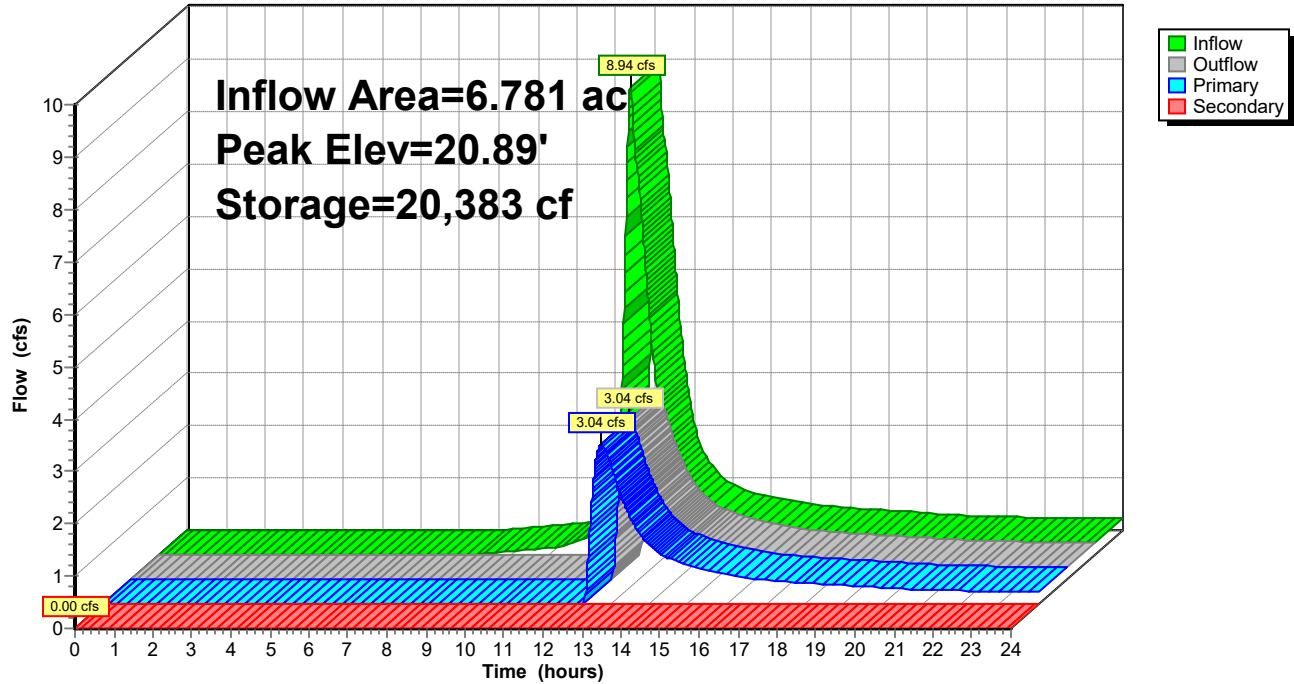
↑2=Sharp-Crested Rectangular Weir (Weir Controls 3.04 cfs @ 1.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.65' TW=19.22' (Dynamic Tailwater)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 18: SGW #4B

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 19: DA #4B

Runoff = 8.94 cfs @ 12.10 hrs, Volume= 0.854 af, Depth> 1.92"

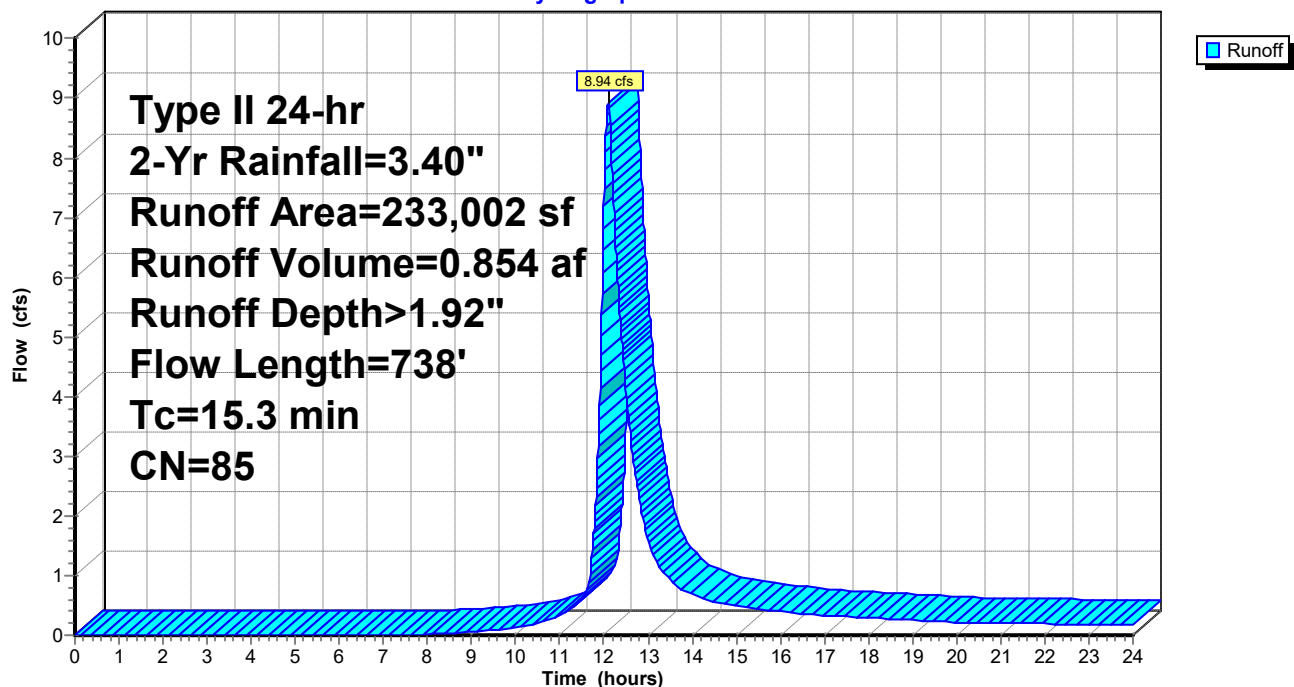
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
103,239	98	Paved parking, HSG C
129,763	74	>75% Grass cover, Good, HSG C
233,002	85	Weighted Average
129,763		55.69% Pervious Area
103,239		44.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
5.9	506	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.7	143	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
15.3	738	Total			

Subcatchment 19: DA #4B

Hydrograph



Summary for Pond 20: SGW #4A

Inflow Area = 1.432 ac, 52.46% Impervious, Inflow Depth > 2.08" for 2-Yr event
 Inflow = 3.00 cfs @ 12.05 hrs, Volume= 0.248 af
 Outflow = 1.28 cfs @ 12.40 hrs, Volume= 0.150 af, Atten= 57%, Lag= 20.7 min
 Primary = 1.28 cfs @ 12.40 hrs, Volume= 0.150 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.23' @ 12.40 hrs Surf.Area= 4,890 sf Storage= 4,852 cf

Plug-Flow detention time= 193.8 min calculated for 0.150 af (60% of inflow)
 Center-of-Mass det. time= 86.8 min (910.0 - 823.2)

Volume	Invert	Avail.Storage	Storage Description
#1	21.10'	12,021 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.10	3,692	250.0	0.0	0	0	3,692
22.10	4,742	275.2	100.0	4,206	4,206	4,777
22.60	5,305	287.7	100.0	2,510	6,716	5,355
23.60	5,305	287.7	100.0	5,305	12,021	5,642

Device	Routing	Invert	Outlet Devices
#1	Primary	20.77'	18.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 20.77' / 20.36' S= 0.0055 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	22.10'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	22.60'	83.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.28 cfs @ 12.40 hrs HW=22.23' TW=20.71' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.28 cfs of 6.30 cfs potential flow)

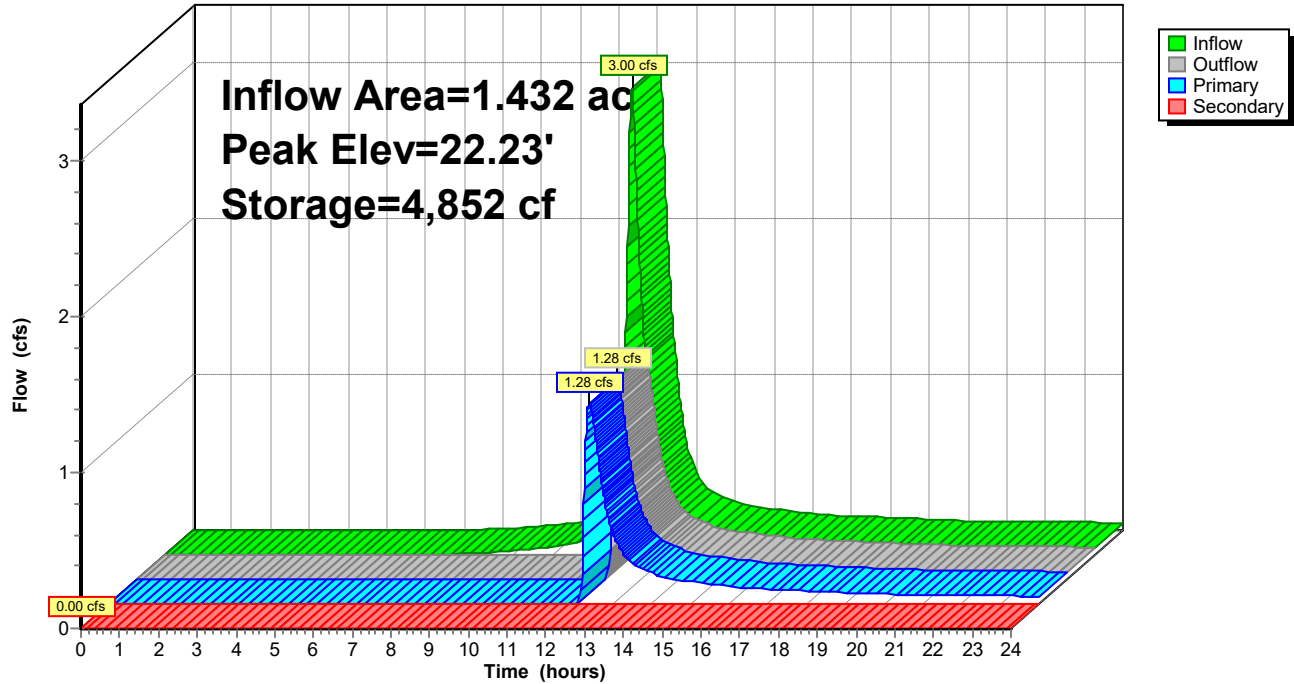
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.28 cfs @ 1.20 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=21.10' TW=19.65' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 20: SGW #4A

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 21: DA #4A

Runoff = 3.00 cfs @ 12.05 hrs, Volume= 0.248 af, Depth> 2.08"

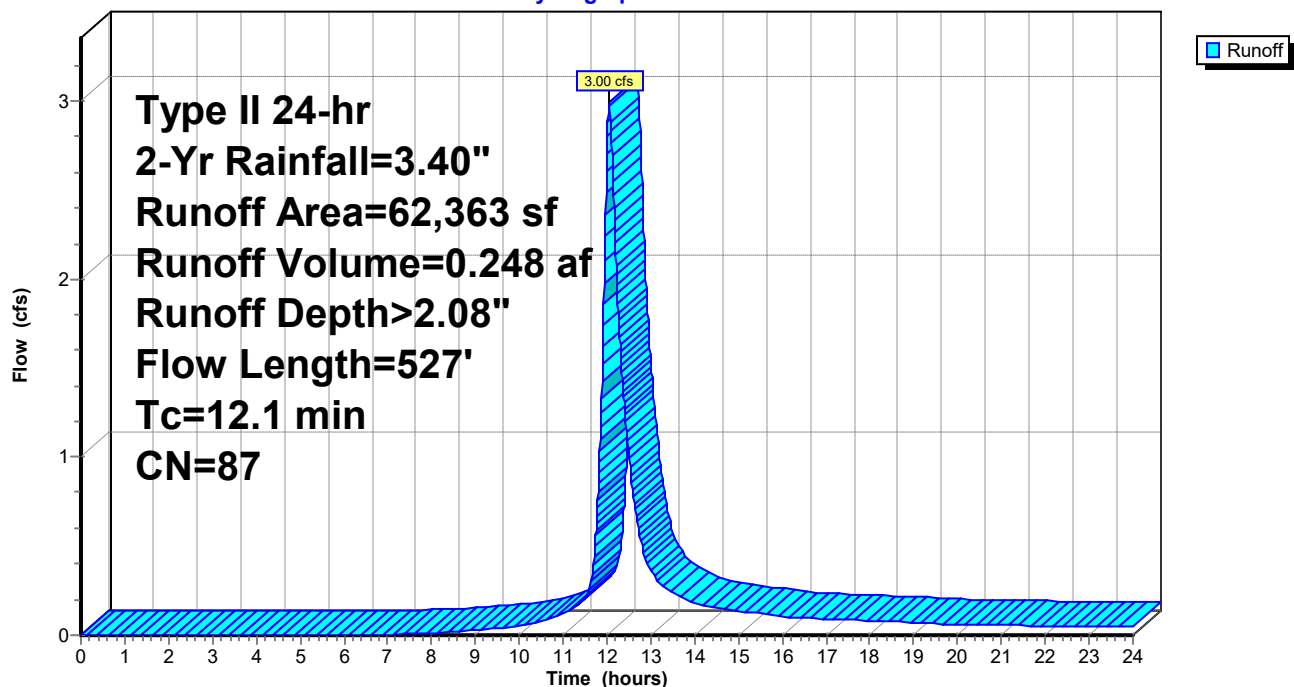
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
32,714	98	Paved parking, HSG C
29,649	74	>75% Grass cover, Good, HSG C
62,363	87	Weighted Average
29,649		47.54% Pervious Area
32,714		52.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"
2.2	188	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter Paved Kv= 20.3 fps
1.2	250	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
12.1	527	Total			

Subcatchment 21: DA #4A

Hydrograph



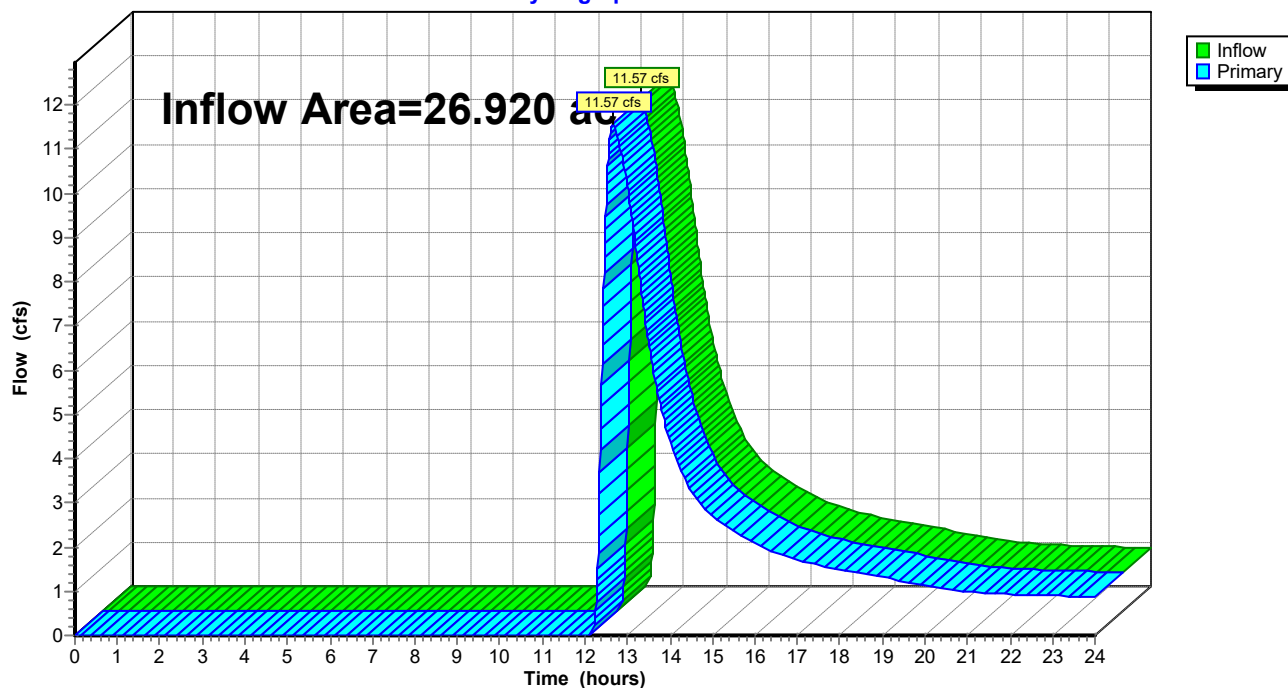
Summary for Link 22: POI-2 (POST)

Inflow Area = 26.920 ac, 34.07% Impervious, Inflow Depth > 1.08" for 2-Yr event
 Inflow = 11.57 cfs @ 12.67 hrs, Volume= 2.421 af
 Primary = 11.57 cfs @ 12.67 hrs, Volume= 2.421 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 22: POI-2 (POST)

Hydrograph



Summary for Pond 23: SGW #10

Inflow Area = 15.563 ac, 18.53% Impervious, Inflow Depth > 1.41" for 2-Yr event
 Inflow = 14.61 cfs @ 12.16 hrs, Volume= 1.824 af
 Outflow = 7.65 cfs @ 12.69 hrs, Volume= 1.353 af, Atten= 48%, Lag= 31.8 min
 Primary = 7.65 cfs @ 12.69 hrs, Volume= 1.353 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.36' @ 12.69 hrs Surf.Area= 20,232 sf Storage= 26,686 cf

Plug-Flow detention time= 156.8 min calculated for 1.353 af (74% of inflow)
 Center-of-Mass det. time= 61.3 min (925.0 - 863.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	17.00'	60,625 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.00	18,938	465.8	0.0	0	0	18,938
19.00	20,851	516.1	100.0	39,774	39,774	22,989
20.00	20,851	516.1	100.0	20,851	60,625	23,505

Device	Routing	Invert	Outlet Devices													
#1	Primary	16.67'	24.0" Round Culvert L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 16.67' / 16.55' S= 0.0086 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf													
#2	Device 1	18.00'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)													
#3	Secondary	19.00'	17.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88													

Primary OutFlow Max=7.65 cfs @ 12.69 hrs HW=18.36' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 7.65 cfs of 9.76 cfs potential flow)

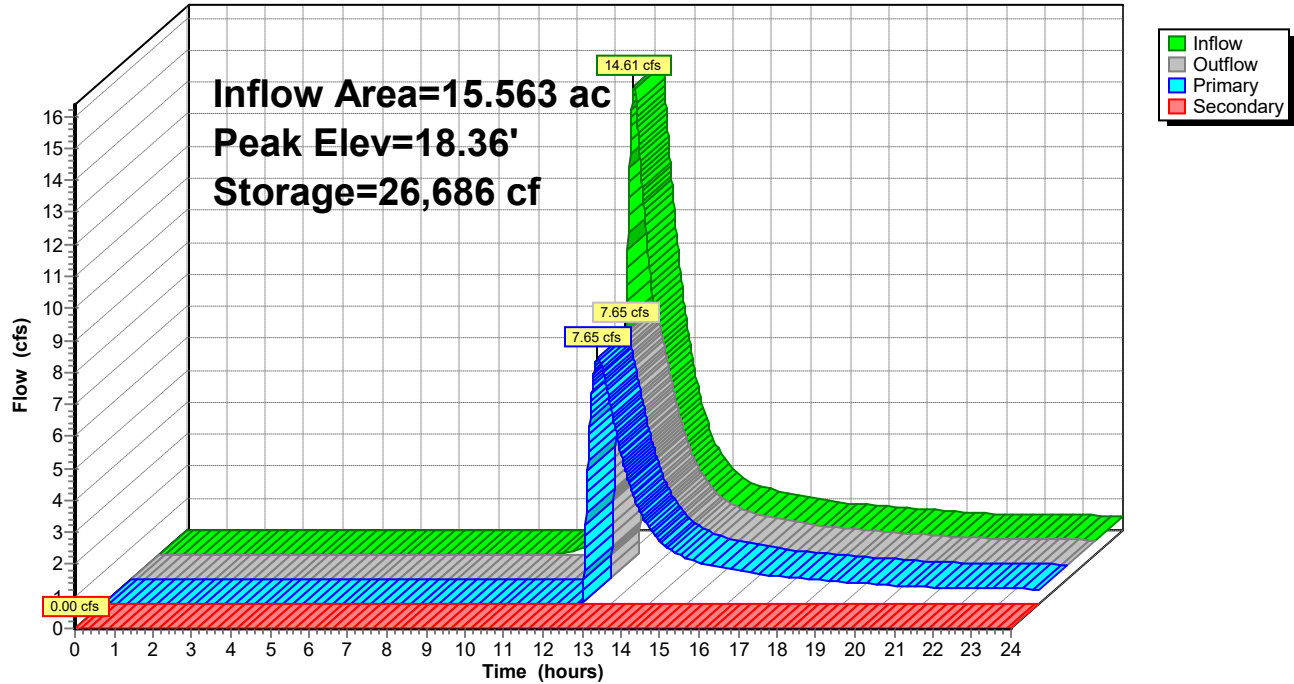
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 7.65 cfs @ 1.97 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 23: SGW #10

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 24: DA #10

Runoff = 14.61 cfs @ 12.16 hrs, Volume= 1.824 af, Depth> 1.41"

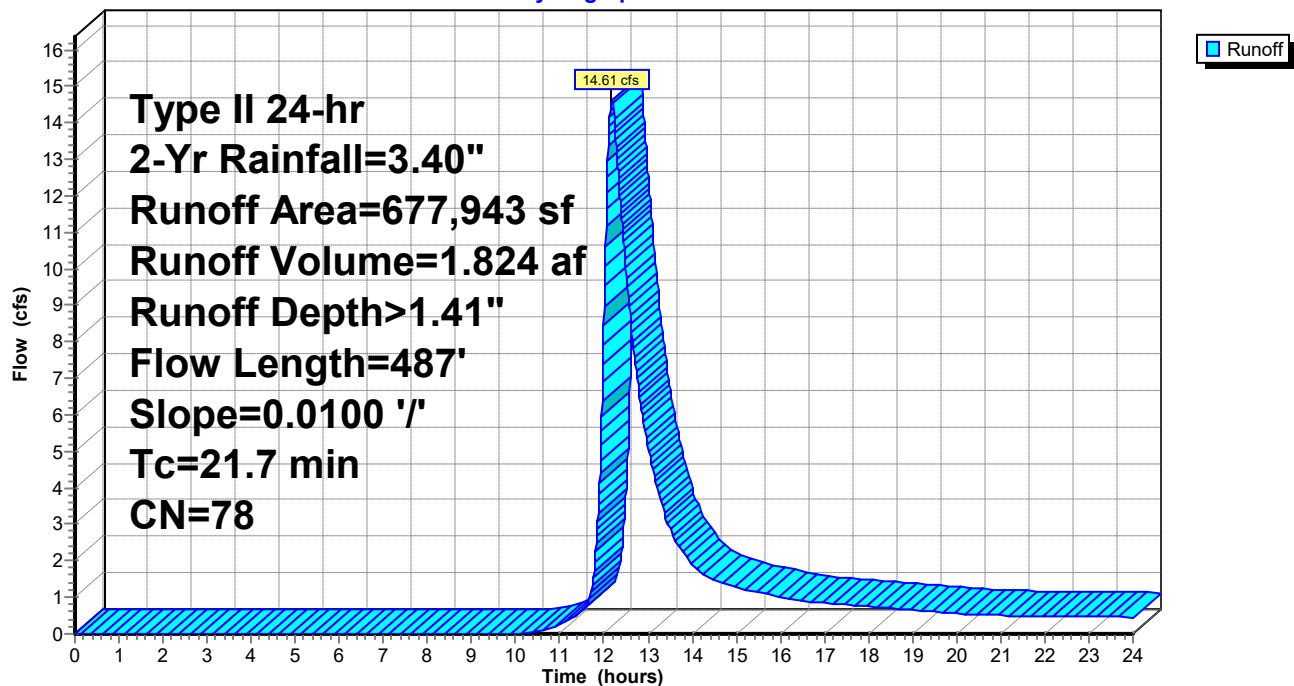
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
125,614	98	Paved parking, HSG C
552,329	74	>75% Grass cover, Good, HSG C
677,943	78	Weighted Average
552,329		81.47% Pervious Area
125,614		18.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0100	0.13		Sheet Flow, A-B Field
					Grass: Short n= 0.150 P2= 3.40"
9.2	387	0.0100	0.70		Shallow Concentrated Flow, B-C Grass
					Short Grass Pasture Kv= 7.0 fps
21.7	487	Total			

Subcatchment 24: DA #10

Hydrograph



Summary for Pond 25: MH3

Inflow Area = 7.618 ac, 52.89% Impervious, Inflow Depth > 1.19" for 2-Yr event
 Inflow = 3.99 cfs @ 12.61 hrs, Volume= 0.758 af
 Outflow = 3.99 cfs @ 12.61 hrs, Volume= 0.758 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.99 cfs @ 12.61 hrs, Volume= 0.758 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 17.19' @ 12.61 hrs

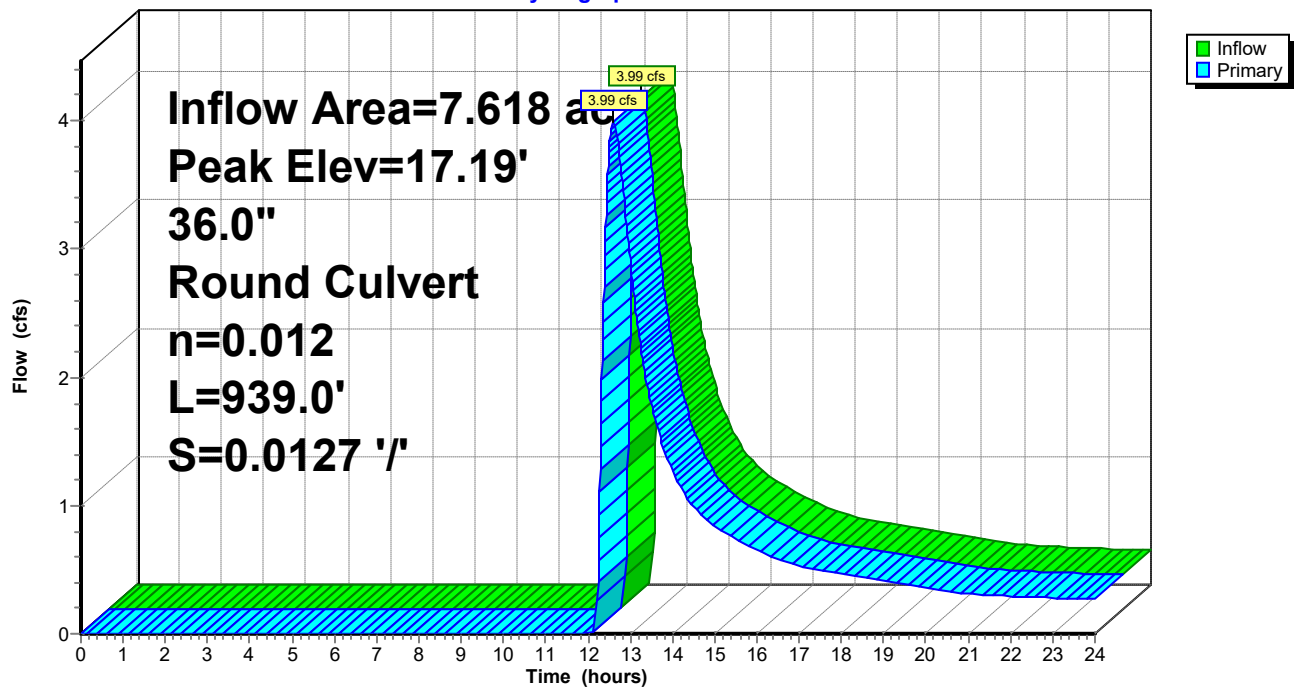
Flood Elev= 19.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	16.45'	36.0" Round Culvert L= 939.0' Ke= 0.500 Inlet / Outlet Invert= 16.45' / 4.50' S= 0.0127 '/ Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=3.99 cfs @ 12.61 hrs HW=17.19' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 3.99 cfs @ 2.93 fps)

Pond 25: MH3

Hydrograph



Summary for Pond 26: SGW #8

Inflow Area = 7.618 ac, 52.89% Impervious, Inflow Depth > 2.08" for 2-Yr event
 Inflow = 16.24 cfs @ 12.04 hrs, Volume= 1.322 af
 Outflow = 3.99 cfs @ 12.61 hrs, Volume= 0.758 af, Atten= 75%, Lag= 33.7 min
 Primary = 3.99 cfs @ 12.61 hrs, Volume= 0.758 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.24' @ 12.61 hrs Surf.Area= 26,834 sf Storage= 29,775 cf

Plug-Flow detention time= 217.4 min calculated for 0.758 af (57% of inflow)
 Center-of-Mass det. time= 108.1 min (930.8 - 822.7)

Volume	Invert	Avail.Storage	Storage Description
#1	19.00'	81,907 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.00	21,431	1,082.9	0.0	0	0	21,431
20.00	25,813	1,108.0	100.0	23,588	23,588	25,942
21.00	30,295	1,133.2	100.0	28,024	51,612	30,574
22.00	30,295	1,133.2	100.0	30,295	81,907	31,707

Device	Routing	Invert	Outlet Devices
#1	Primary	18.67'	24.0" Round Culvert L= 355.0' Ke= 0.500 Inlet / Outlet Invert= 18.67' / 16.55' S= 0.0060 '/ Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	20.00'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.30'	439.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.99 cfs @ 12.61 hrs HW=20.24' TW=17.19' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 3.99 cfs of 11.09 cfs potential flow)

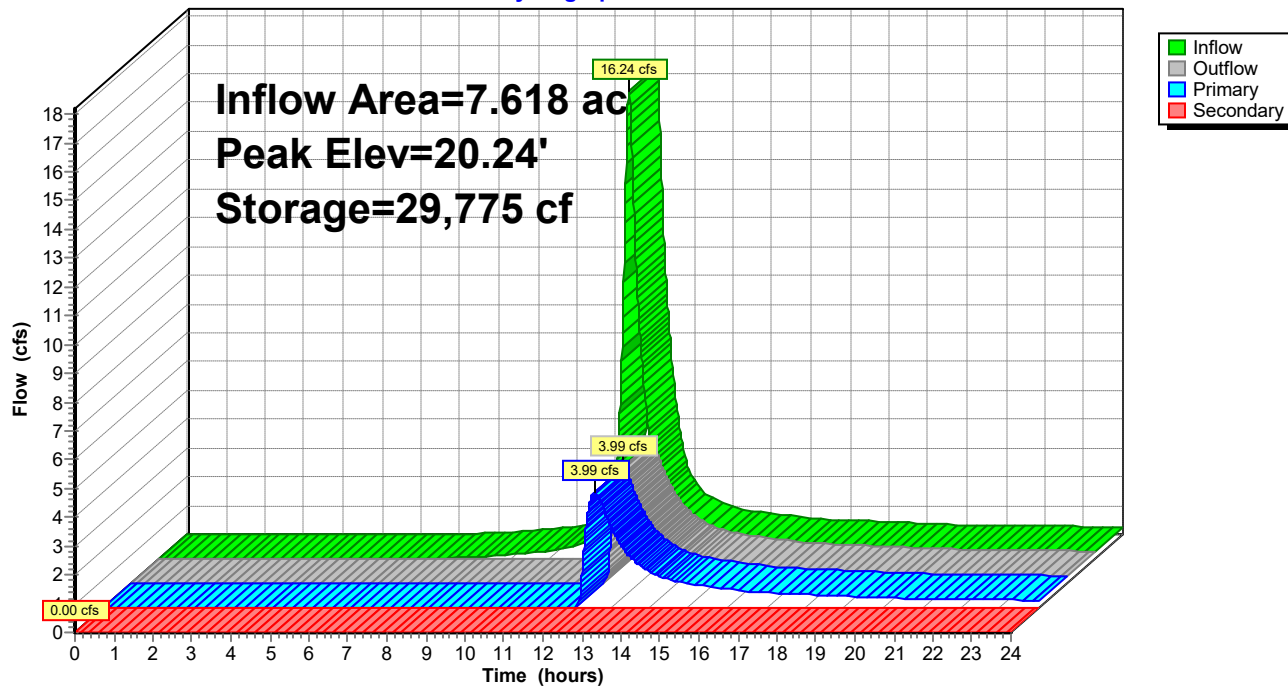
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 3.99 cfs @ 1.59 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 26: SGW #8

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 27: DA #8

Runoff = 16.24 cfs @ 12.04 hrs, Volume= 1.322 af, Depth> 2.08"

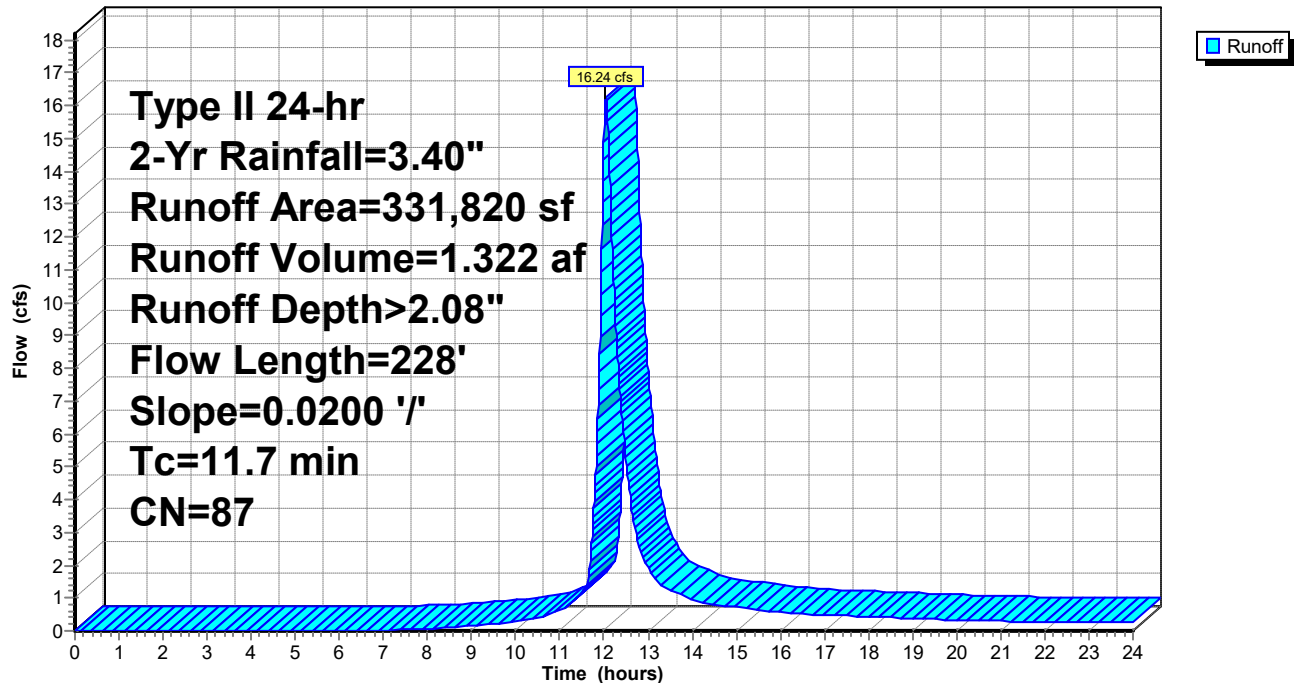
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
175,511	98	Paved parking, HSG C
156,309	74	>75% Grass cover, Good, HSG C
331,820	87	Weighted Average
156,309		47.11% Pervious Area
175,511		52.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0200	0.18		Sheet Flow, A-B Open Space
					Grass: Short n= 0.150 P2= 3.40"
2.2	128	0.0200	0.99		Shallow Concentrated Flow, B-C Open Space
					Short Grass Pasture Kv= 7.0 fps
11.7	228	Total			

Subcatchment 27: DA #8

Hydrograph



Summary for Reach 28: OXFORD Ditch - East segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 1.00" for 2-Yr event
 Inflow = 1.28 cfs @ 13.17 hrs, Volume= 0.313 af
 Outflow = 1.27 cfs @ 13.22 hrs, Volume= 0.311 af, Atten= 1%, Lag= 3.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.75 fps, Min. Travel Time= 4.0 min
 Avg. Velocity = 1.08 fps, Avg. Travel Time= 6.4 min

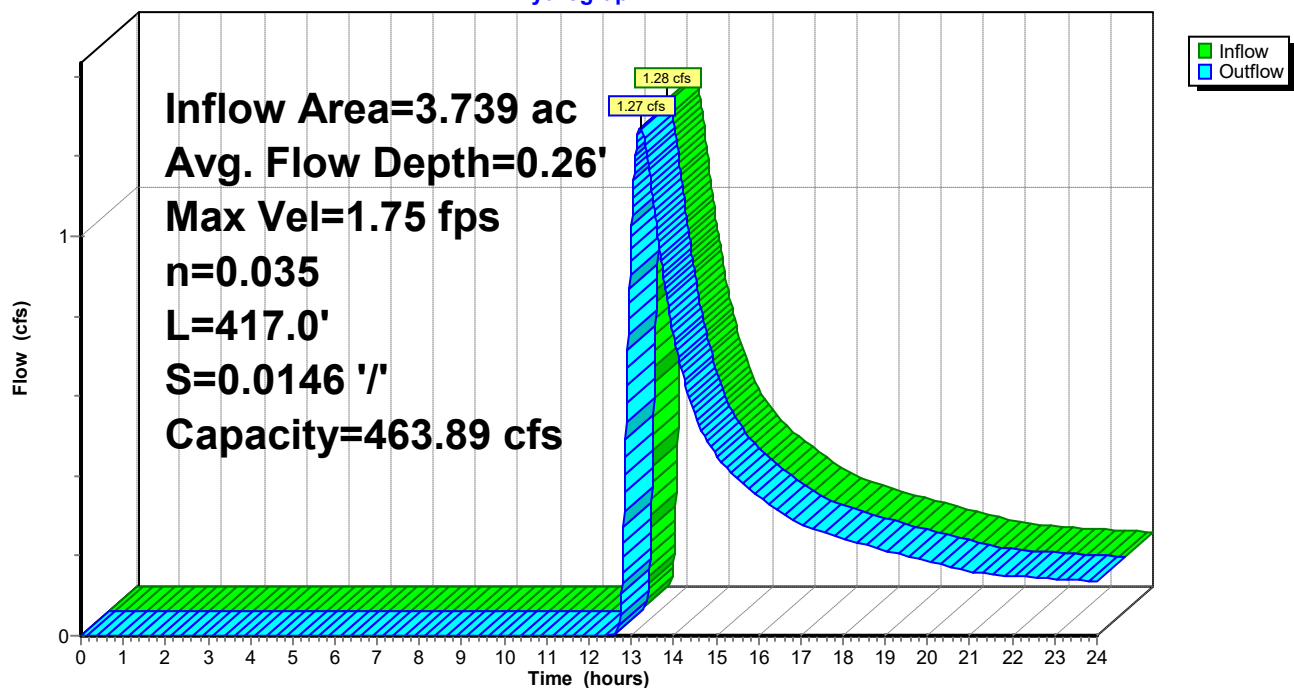
Peak Storage= 302 cf @ 13.22 hrs
 Average Depth at Peak Storage= 0.26'
 Bank-Full Depth= 4.00' Flow Area= 56.0 sf, Capacity= 463.89 cfs

2.00' x 4.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 26.00'
 Length= 417.0' Slope= 0.0146 '/'
 Inlet Invert= 11.19', Outlet Invert= 5.10'



Reach 28: OXFORD Ditch - East segment

Hydrograph



Summary for Pond 29: Exist Culvert

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 1.00" for 2-Yr event
 Inflow = 1.28 cfs @ 13.17 hrs, Volume= 0.313 af
 Outflow = 1.28 cfs @ 13.17 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.28 cfs @ 13.17 hrs, Volume= 0.313 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

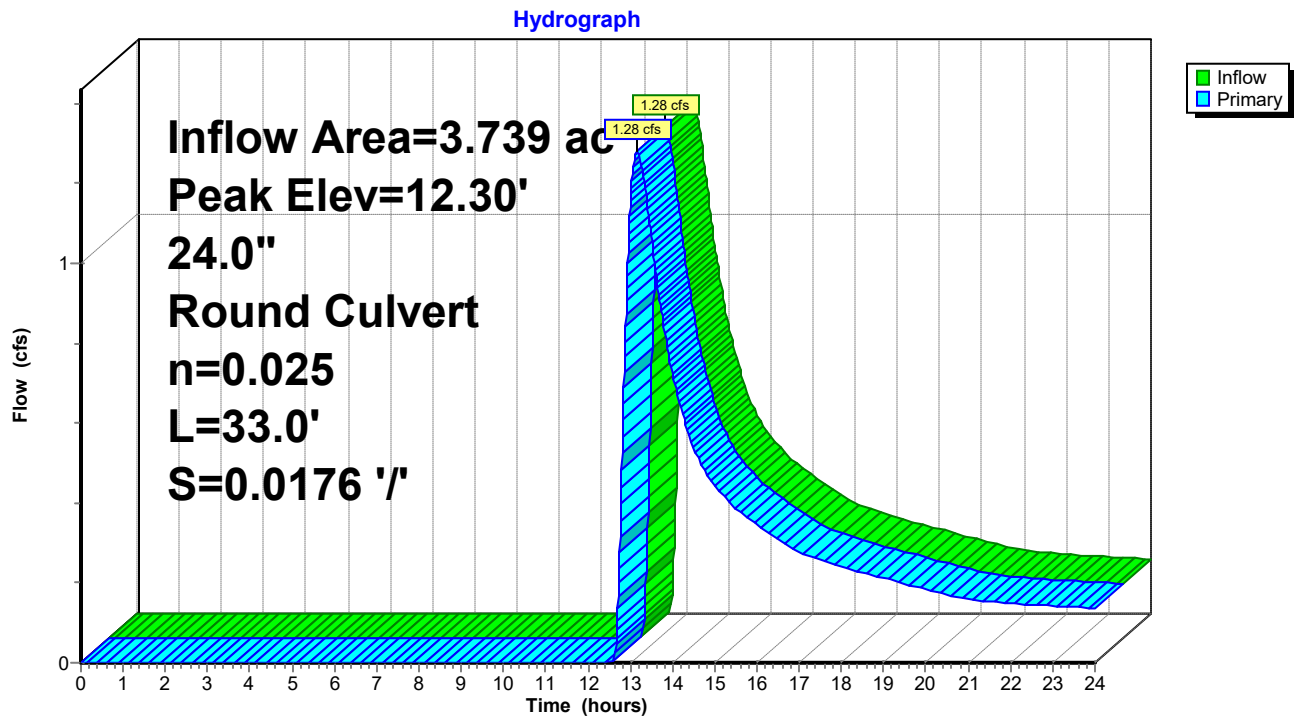
Peak Elev= 12.30' @ 13.17 hrs

Flood Elev= 15.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	11.77'	24.0" Round Culvert L= 33.0' Ke= 0.500 Inlet / Outlet Invert= 11.77' / 11.19' S= 0.0176 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=1.28 cfs @ 13.17 hrs HW=12.30' TW=11.45' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 1.28 cfs @ 2.88 fps)

Pond 29: Exist Culvert



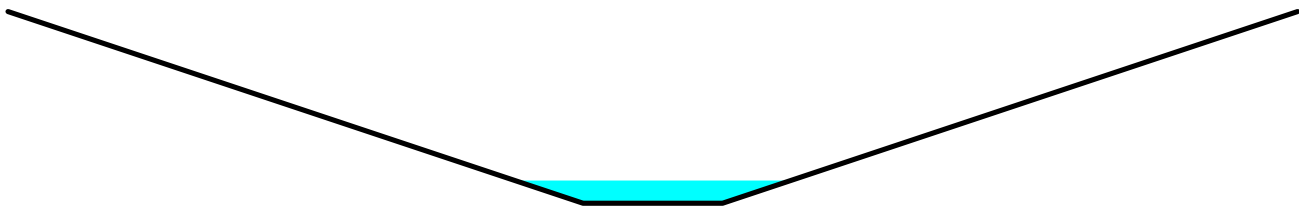
Summary for Reach 30: OXFORD Ditch - Central segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 1.01" for 2-Yr event
 Inflow = 1.29 cfs @ 13.11 hrs, Volume= 0.314 af
 Outflow = 1.28 cfs @ 13.17 hrs, Volume= 0.313 af, Atten= 1%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.33 fps, Min. Travel Time= 4.2 min
 Avg. Velocity = 0.82 fps, Avg. Travel Time= 6.8 min

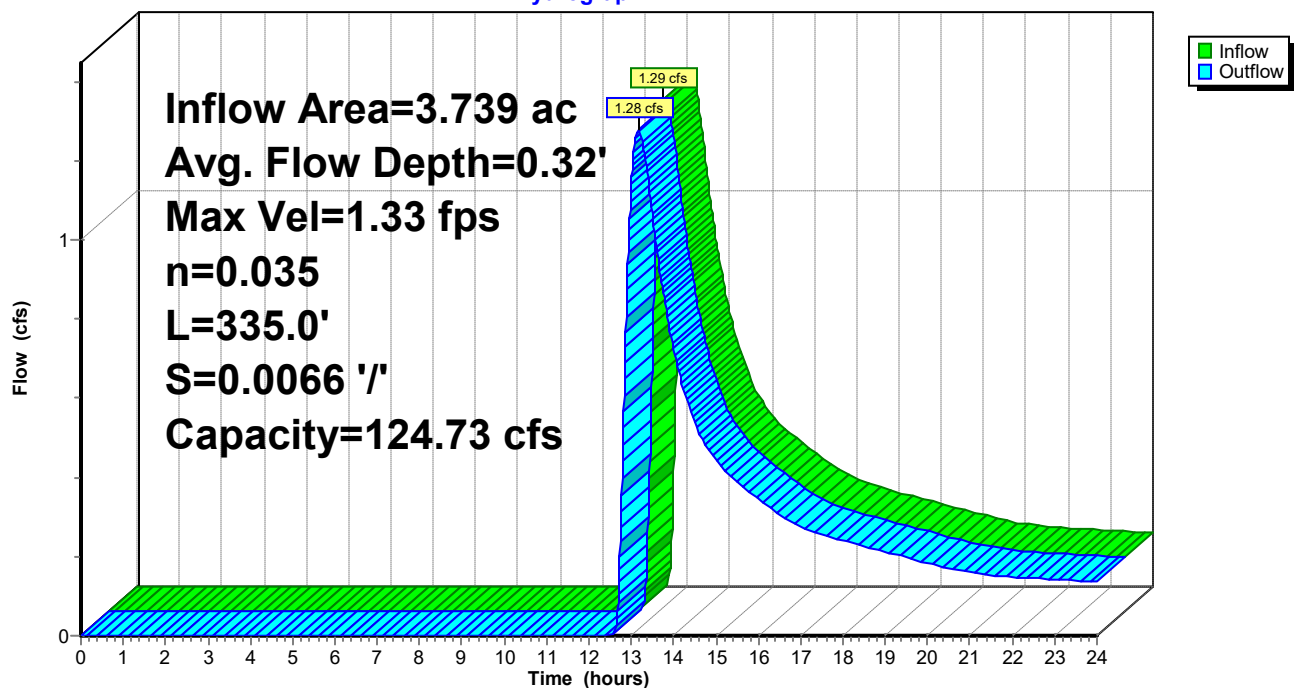
Peak Storage= 323 cf @ 13.17 hrs
 Average Depth at Peak Storage= 0.32'
 Bank-Full Depth= 2.75' Flow Area= 28.2 sf, Capacity= 124.73 cfs

2.00' x 2.75' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 18.50'
 Length= 335.0' Slope= 0.0066 '/'
 Inlet Invert= 13.98', Outlet Invert= 11.77'



Reach 30: OXFORD Ditch - Central segment

Hydrograph



Summary for Pond 31: Entrance Culvert

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 1.01" for 2-Yr event
 Inflow = 1.29 cfs @ 13.11 hrs, Volume= 0.314 af
 Outflow = 1.29 cfs @ 13.11 hrs, Volume= 0.314 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.29 cfs @ 13.11 hrs, Volume= 0.314 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

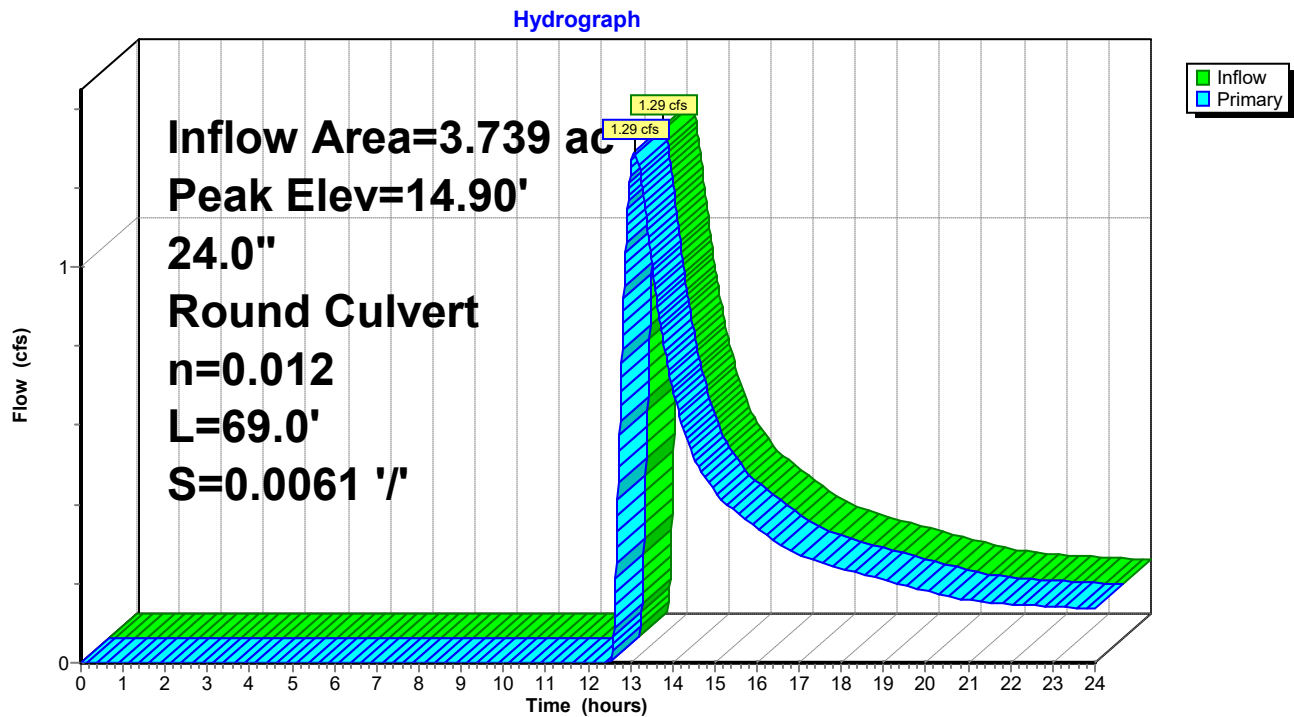
Peak Elev= 14.90' @ 13.11 hrs

Flood Elev= 18.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	24.0" Round Culvert L= 69.0' Ke= 0.500 Inlet / Outlet Invert= 14.40' / 13.98' S= 0.0061 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=1.29 cfs @ 13.11 hrs HW=14.90' TW=14.30' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 1.29 cfs @ 3.14 fps)

Pond 31: Entrance Culvert



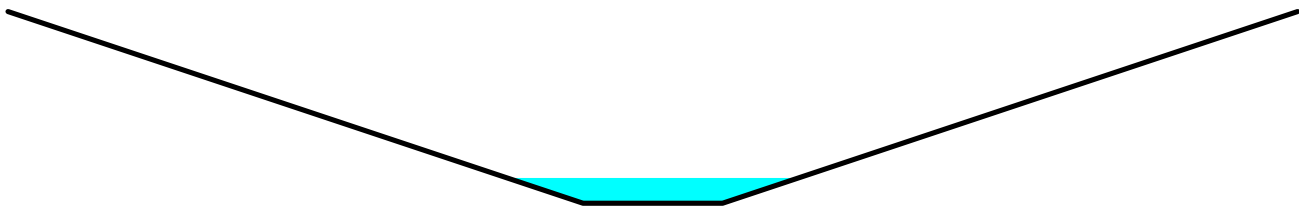
Summary for Reach 32: OXFORD Ditch - West segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 1.01" for 2-Yr event
 Inflow = 1.29 cfs @ 13.09 hrs, Volume= 0.315 af
 Outflow = 1.29 cfs @ 13.11 hrs, Volume= 0.314 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.16 fps, Min. Travel Time= 1.8 min
 Avg. Velocity = 0.72 fps, Avg. Travel Time= 2.9 min

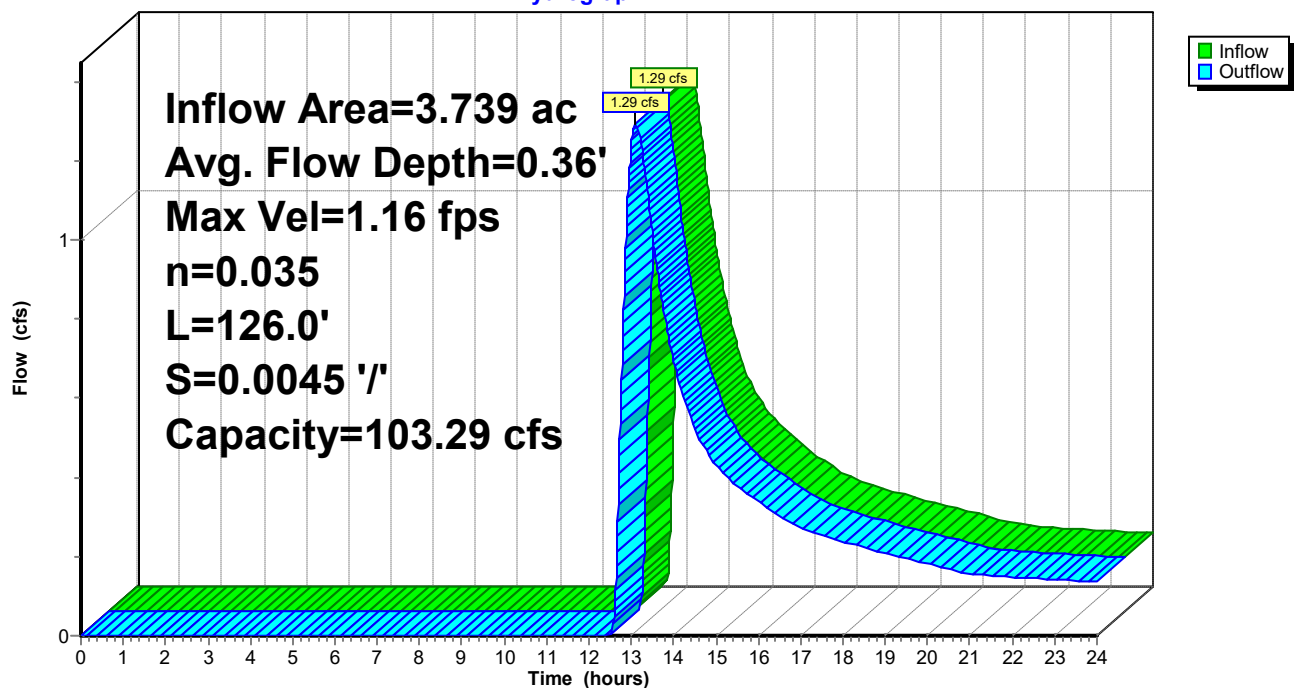
Peak Storage= 140 cf @ 13.11 hrs
 Average Depth at Peak Storage= 0.36'
 Bank-Full Depth= 2.75' Flow Area= 28.2 sf, Capacity= 103.29 cfs

2.00' x 2.75' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 18.50'
 Length= 126.0' Slope= 0.0045 '/'
 Inlet Invert= 14.97', Outlet Invert= 14.40'



Reach 32: OXFORD Ditch - West segment

Hydrograph



Summary for Reach 33: NORTH Ditch - North segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 1.02" for 2-Yr event
 Inflow = 1.32 cfs @ 13.00 hrs, Volume= 0.318 af
 Outflow = 1.29 cfs @ 13.09 hrs, Volume= 0.315 af, Atten= 2%, Lag= 5.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.30 fps, Min. Travel Time= 6.4 min
 Avg. Velocity = 0.77 fps, Avg. Travel Time= 10.8 min

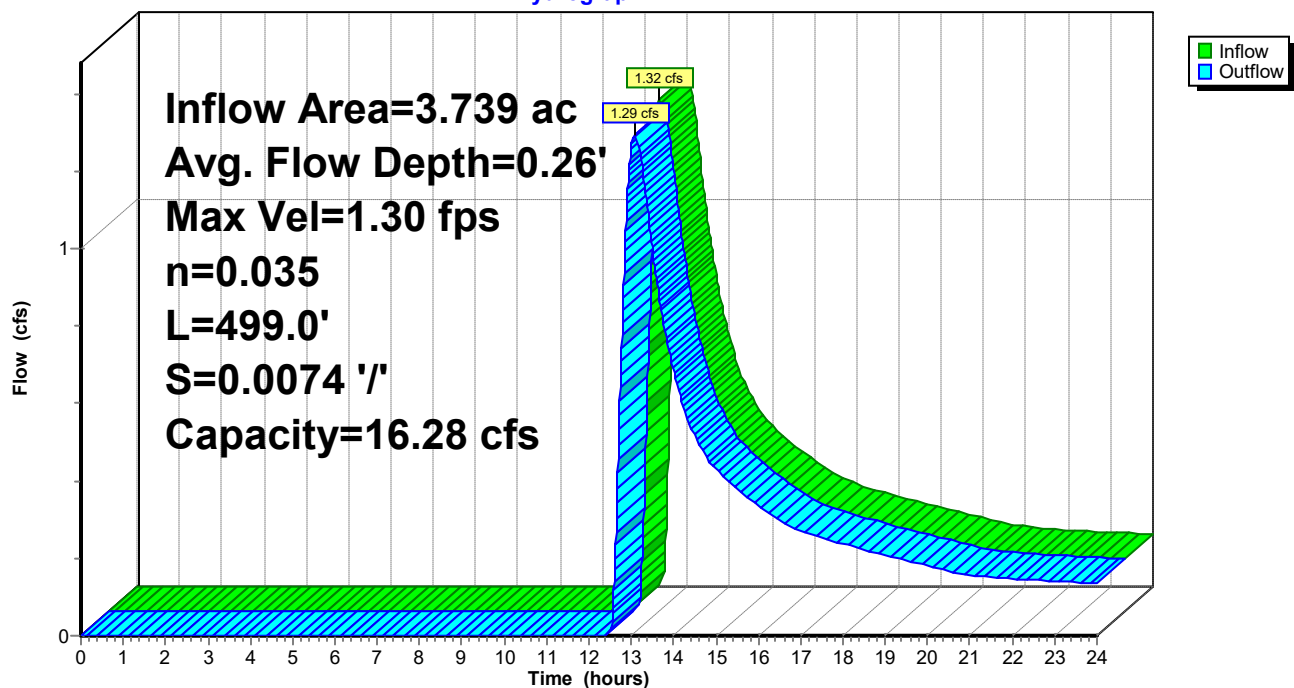
Peak Storage= 496 cf @ 13.09 hrs
 Average Depth at Peak Storage= 0.26'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 16.28 cfs

3.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 9.00'
 Length= 499.0' Slope= 0.0074 '/'
 Inlet Invert= 18.73', Outlet Invert= 15.06'



Reach 33: NORTH Ditch - North segment

Hydrograph



Summary for Pond 34: SGW #9

Inflow Area = 1.992 ac, 56.55% Impervious, Inflow Depth > 2.17" for 2-Yr event
 Inflow = 4.26 cfs @ 12.06 hrs, Volume= 0.360 af
 Outflow = 0.41 cfs @ 13.23 hrs, Volume= 0.136 af, Atten= 90%, Lag= 70.3 min
 Primary = 0.41 cfs @ 13.23 hrs, Volume= 0.136 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.55' @ 13.23 hrs Surf.Area= 10,439 sf Storage= 10,120 cf

Plug-Flow detention time= 306.0 min calculated for 0.136 af (38% of inflow)
 Center-of-Mass det. time= 183.1 min (1,002.9 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	26,121 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.50	8,828	369.8	0.0	0	0	8,828
20.50	10,358	394.9	100.0	9,583	9,583	10,403
21.00	11,160	407.5	100.0	5,378	14,961	11,232
22.00	11,160	407.5	100.0	11,160	26,121	11,639

Device	Routing	Invert	Outlet Devices
#1	Primary	19.17'	18.0" Round Culvert L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 19.17' / 18.80' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.50'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.00'	77.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.41 cfs @ 13.23 hrs HW=20.55' TW=18.99' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.41 cfs of 5.63 cfs potential flow)

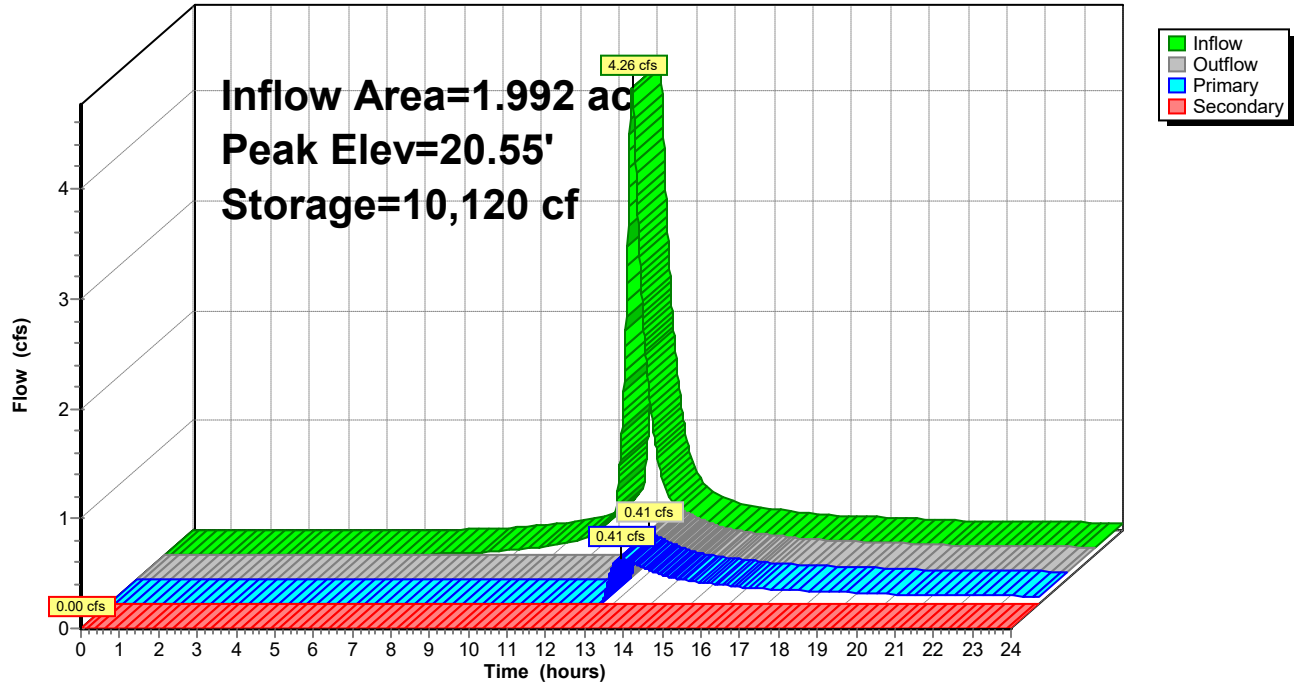
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.50' TW=18.73' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 34: SGW #9

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 35: DA #9

Runoff = 4.26 cfs @ 12.06 hrs, Volume= 0.360 af, Depth> 2.17"

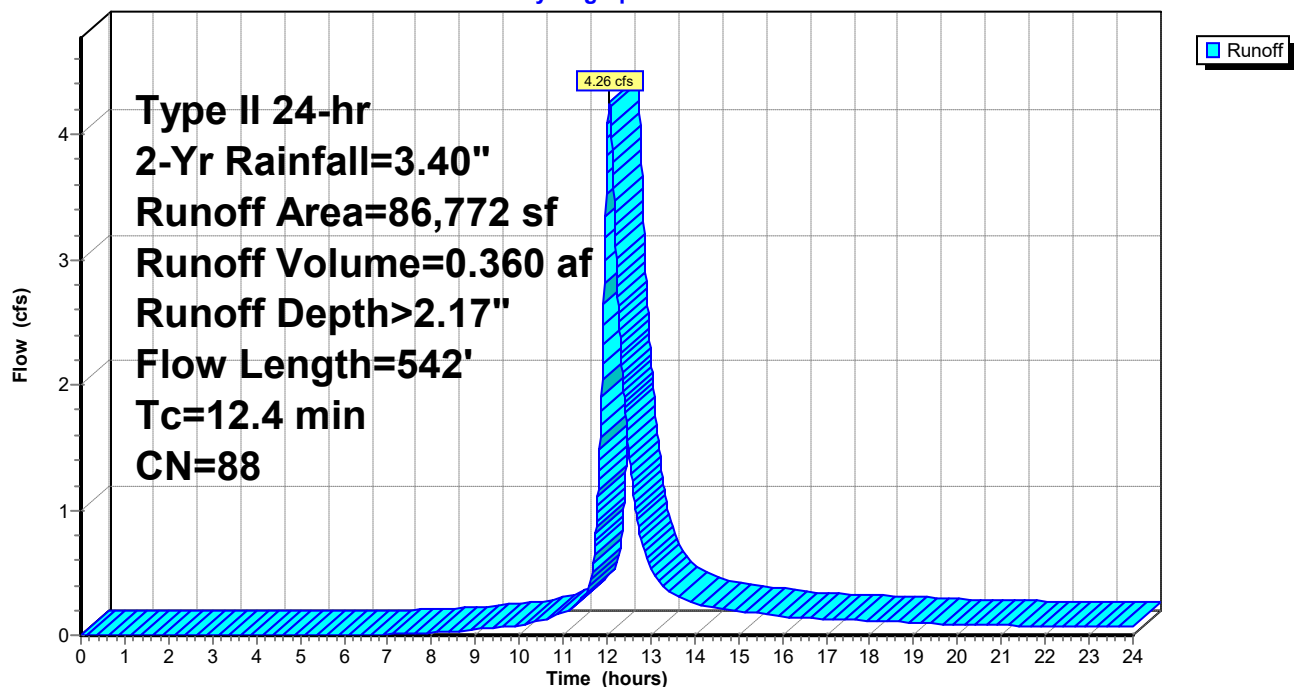
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
49,067	98	Paved parking, HSG C
37,705	74	>75% Grass cover, Good, HSG C
86,772	88	Weighted Average
37,705		43.45% Pervious Area
49,067		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	71	0.0200	0.16		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
5.0	432	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.2	39	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
12.4	542	Total			

Subcatchment 35: DA #9

Hydrograph



Summary for Reach 36: NORTH Ditch - South segment

Inflow Area = 1.747 ac, 64.85% Impervious, Inflow Depth > 1.27" for 2-Yr event
 Inflow = 1.27 cfs @ 12.65 hrs, Volume= 0.184 af
 Outflow = 1.04 cfs @ 12.87 hrs, Volume= 0.182 af, Atten= 18%, Lag= 13.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.98 fps, Min. Travel Time= 12.6 min
 Avg. Velocity= 0.54 fps, Avg. Travel Time= 23.1 min

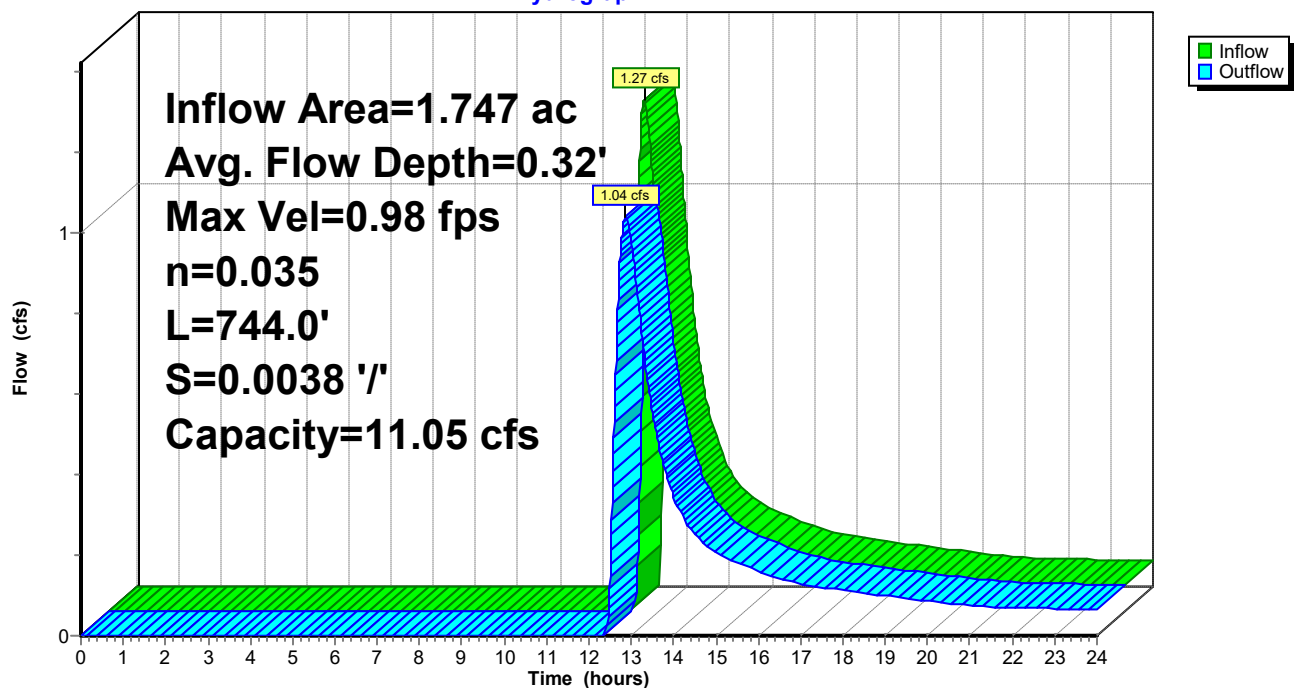
Peak Storage= 789 cf @ 12.87 hrs
 Average Depth at Peak Storage= 0.32'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 11.05 cfs

2.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 10.00'
 Length= 744.0' Slope= 0.0038 '/'
 Inlet Invert= 21.59', Outlet Invert= 18.73'



Reach 36: NORTH Ditch - South segment

Hydrograph



Summary for Pond 37: SGW #5

Inflow Area = 1.747 ac, 64.85% Impervious, Inflow Depth > 2.34" for 2-Yr event
 Inflow = 3.31 cfs @ 12.12 hrs, Volume= 0.340 af
 Outflow = 1.27 cfs @ 12.65 hrs, Volume= 0.184 af, Atten= 62%, Lag= 31.7 min
 Primary = 1.27 cfs @ 12.65 hrs, Volume= 0.184 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 23.21' @ 12.65 hrs Surf.Area= 7,517 sf Storage= 7,508 cf

Plug-Flow detention time= 217.2 min calculated for 0.184 af (54% of inflow)
 Center-of-Mass det. time= 107.6 min (925.6 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	22.10'	18,616 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.10	6,038	319.6	0.0	0	0	6,038
23.10	7,366	344.7	100.0	6,691	6,691	7,406
23.60	8,068	357.3	100.0	3,857	10,548	8,131
24.60	8,068	357.3	100.0	8,068	18,616	8,489

Device	Routing	Invert	Outlet Devices
#1	Primary	21.77'	18.0" Round Culvert L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 21.77' / 21.65' S= 0.0044 ' / Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	23.10'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	23.60'	51.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.27 cfs @ 12.65 hrs HW=23.21' TW=21.85' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.27 cfs of 5.59 cfs potential flow)

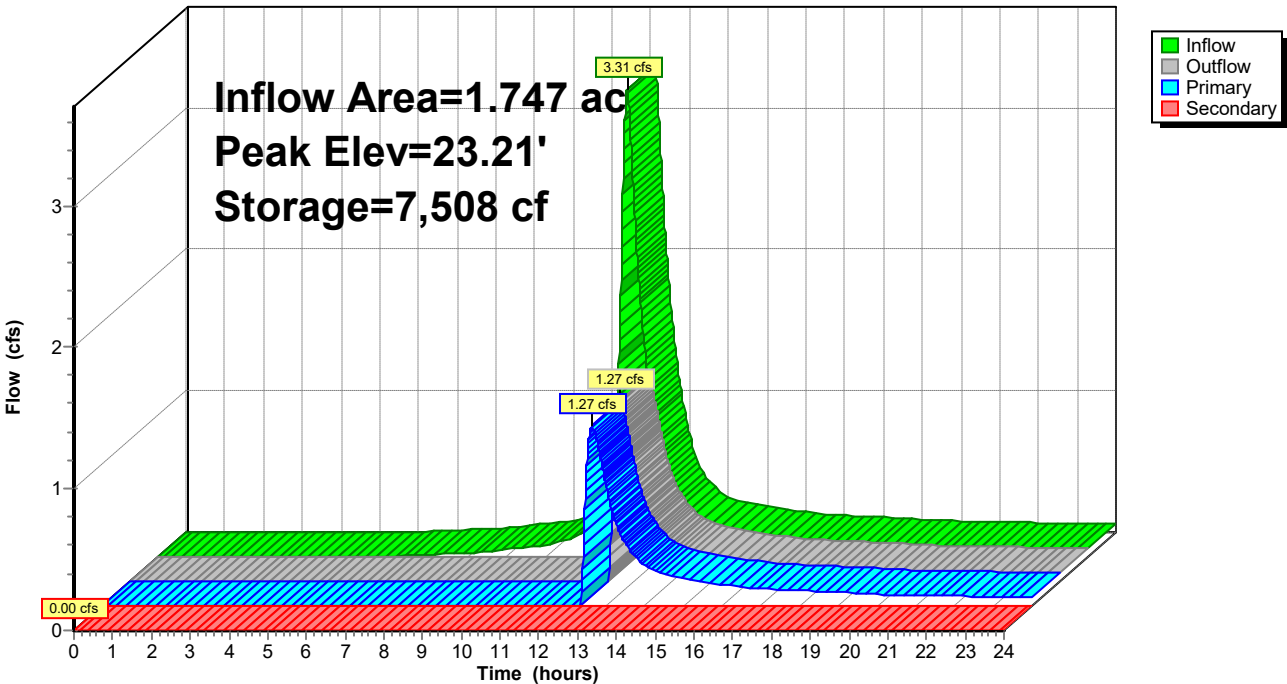
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.27 cfs @ 1.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.10' TW=21.59' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 37: SGW #5

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 38: DA #5

Runoff = 3.31 cfs @ 12.12 hrs, Volume= 0.340 af, Depth> 2.34"

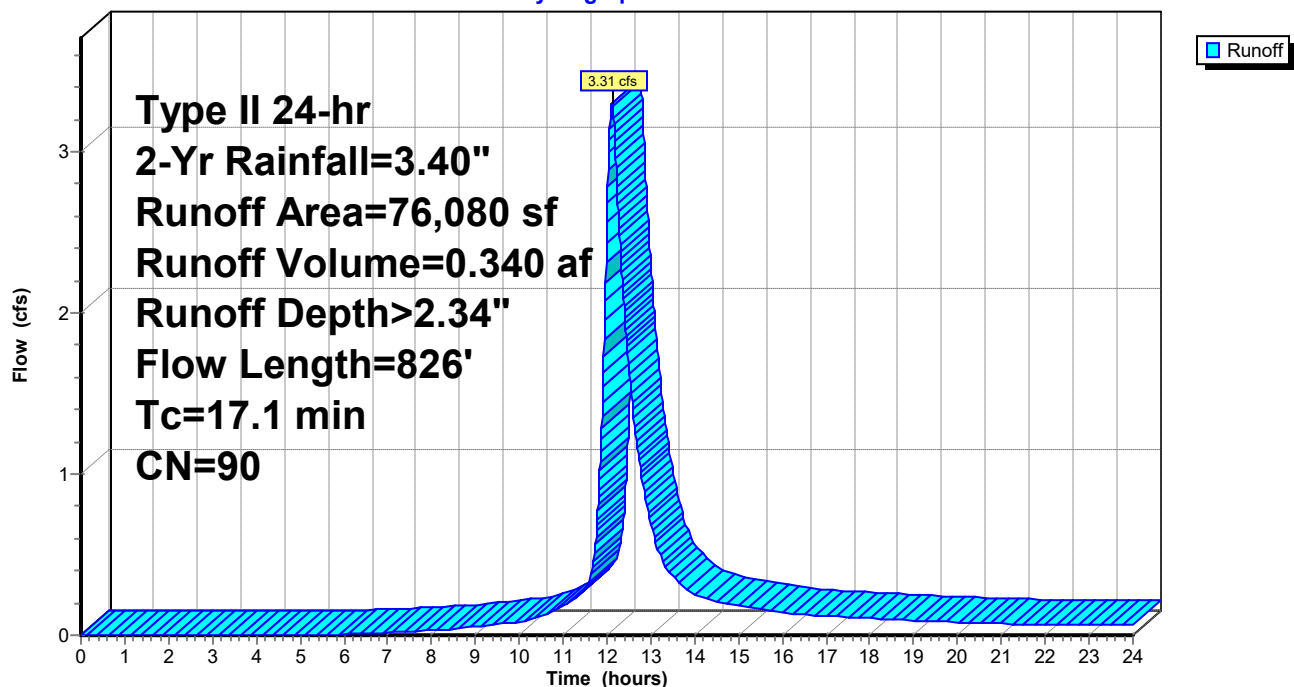
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
49,340	98	Paved parking, HSG C
26,740	74	>75% Grass cover, Good, HSG C
76,080	90	Weighted Average
26,740		35.15% Pervious Area
49,340		64.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	91	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
8.2	704	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.1	31	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
17.1	826	Total			

Subcatchment 38: DA #5

Hydrograph



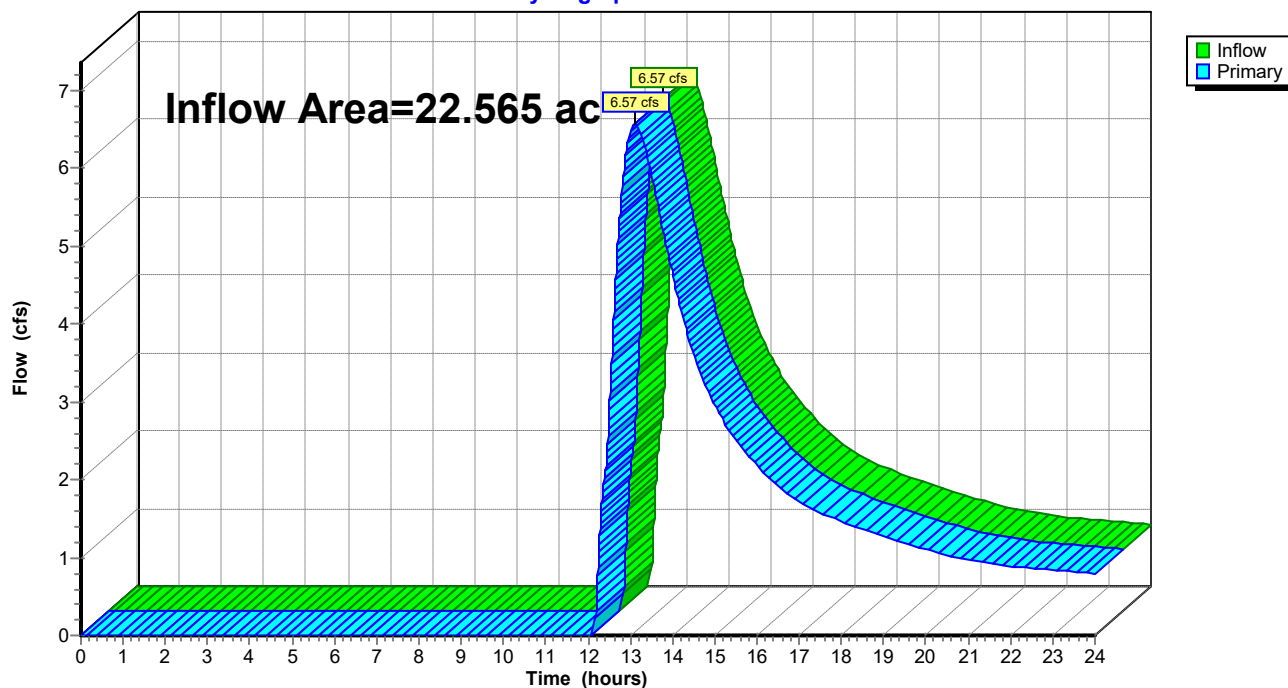
Summary for Link 39: POI-3 (POST)

Inflow Area = 22.565 ac, 46.77% Impervious, Inflow Depth > 1.09" for 2-Yr event
 Inflow = 6.57 cfs @ 13.12 hrs, Volume= 2.053 af
 Primary = 6.57 cfs @ 13.12 hrs, Volume= 2.053 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 39: POI-3 (POST)

Hydrograph



Summary for Pond 40: MH2

Inflow Area = 22.565 ac, 46.77% Impervious, Inflow Depth > 1.09" for 2-Yr event
 Inflow = 6.57 cfs @ 13.12 hrs, Volume= 2.053 af
 Outflow = 6.57 cfs @ 13.12 hrs, Volume= 2.053 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.57 cfs @ 13.12 hrs, Volume= 2.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 19.43' @ 13.12 hrs

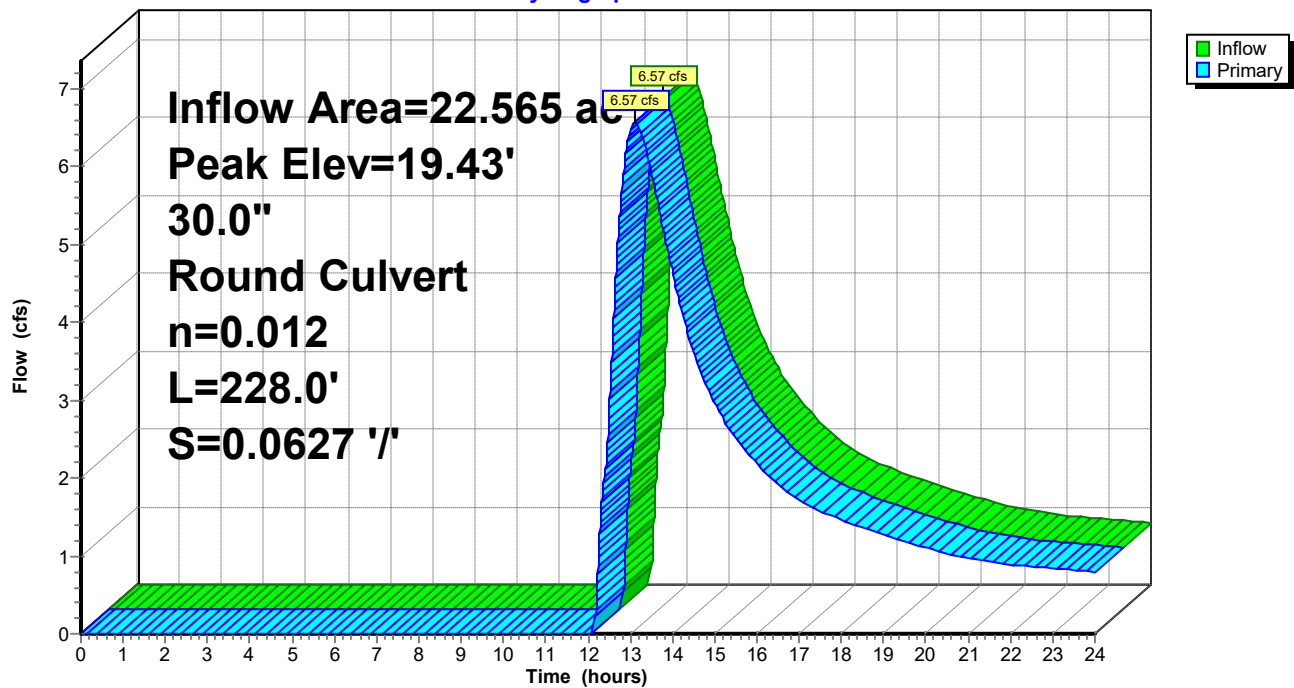
Flood Elev= 22.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	30.0" Round Culvert L= 228.0' Ke= 0.500 Inlet / Outlet Invert= 18.40' / 4.10' S= 0.0627 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=6.57 cfs @ 13.12 hrs HW=19.43' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 6.57 cfs @ 3.45 fps)

Pond 40: MH2

Hydrograph



Summary for Pond 41: SGW #7

Inflow Area = 17.224 ac, 44.70% Impervious, Inflow Depth > 1.91" for 2-Yr event
 Inflow = 24.21 cfs @ 12.16 hrs, Volume= 2.746 af
 Outflow = 5.14 cfs @ 13.21 hrs, Volume= 1.553 af, Atten= 79%, Lag= 63.3 min
 Primary = 5.14 cfs @ 13.21 hrs, Volume= 1.553 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.34' @ 13.21 hrs Surf.Area= 51,467 sf Storage= 64,986 cf

Plug-Flow detention time= 239.5 min calculated for 1.553 af (57% of inflow)
 Center-of-Mass det. time= 128.1 min (968.1 - 840.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	19.00'	215,526 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.00	45,723	1,058.3	0.0	0	0	45,723
20.00	50,007	1,083.4	100.0	47,849	47,849	50,133
21.00	54,391	1,108.6	100.0	52,184	100,033	54,663
22.00	58,875	1,133.7	100.0	56,618	156,651	59,280
23.00	58,875	1,133.7	100.0	58,875	215,526	60,414

Device	Routing	Invert	Outlet Devices
#1	Primary	18.67'	24.0" Round Culvert L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 18.67' / 18.50' S= 0.0071 ' S= 0.0071 ' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	20.00'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	22.00'	177.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.14 cfs @ 13.21 hrs HW=20.34' TW=19.42' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 5.14 cfs of 9.70 cfs potential flow)

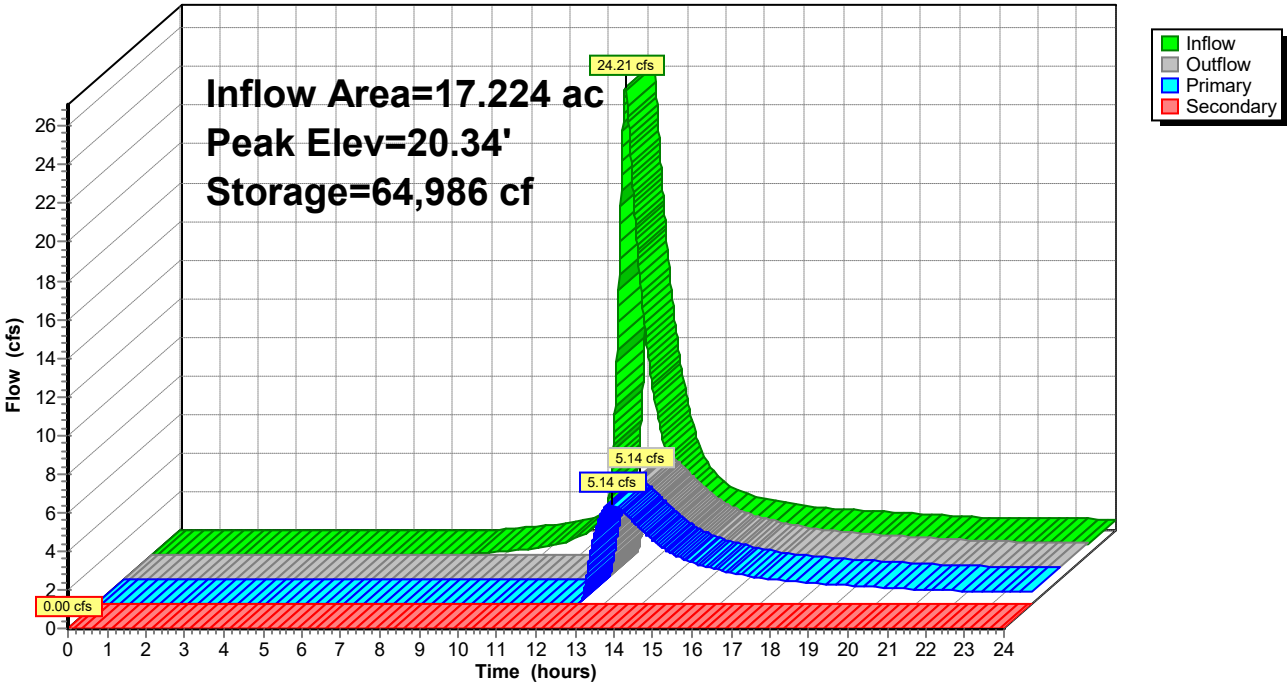
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 5.14 cfs @ 1.90 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 41: SGW #7

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 42: DA #7

Runoff = 24.21 cfs @ 12.16 hrs, Volume= 2.746 af, Depth> 1.91"

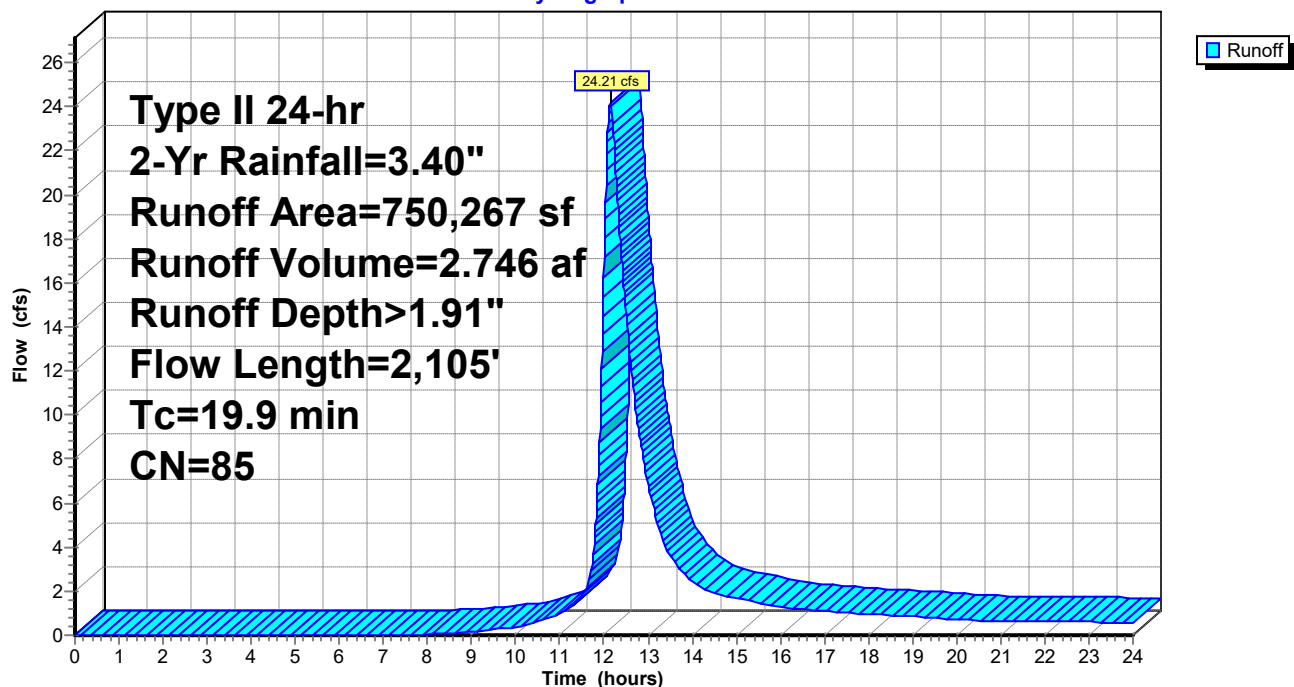
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
335,358	98	Paved parking, HSG C
414,909	74	>75% Grass cover, Good, HSG C
750,267	85	Weighted Average
414,909		55.30% Pervious Area
335,358		44.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
2.7	236	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
8.5	1,780	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
19.9	2,105	Total			

Subcatchment 42: DA #7

Hydrograph



Summary for Pond 43: SGW #6

Inflow Area = 5.341 ac, 53.44% Impervious, Inflow Depth > 2.09" for 2-Yr event
 Inflow = 13.79 cfs @ 12.01 hrs, Volume= 0.929 af
 Outflow = 2.27 cfs @ 12.53 hrs, Volume= 0.500 af, Atten= 84%, Lag= 31.3 min
 Primary = 2.27 cfs @ 12.53 hrs, Volume= 0.500 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.20' @ 12.53 hrs Surf.Area= 21,596 sf Storage= 22,051 cf

Plug-Flow detention time= 232.9 min calculated for 0.499 af (54% of inflow)
 Center-of-Mass det. time= 121.1 min (939.2 - 818.1)

Volume	Invert	Avail.Storage	Storage Description
#1	21.00'	67,069 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.00	15,353	1,298.4	0.0	0	0	15,353
22.00	20,596	1,323.5	100.0	17,910	17,910	20,752
23.00	25,941	1,348.6	100.0	23,217	41,128	26,253
24.00	25,941	1,348.6	100.0	25,941	67,069	27,602

Device	Routing	Invert	Outlet Devices
#1	Primary	20.67'	24.0" Round Culvert L= 213.0' Ke= 0.500 Inlet / Outlet Invert= 20.67' / 18.50' S= 0.0102 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	22.00'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	23.10'	86.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.27 cfs @ 12.53 hrs HW=22.20' TW=19.09' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.27 cfs of 10.82 cfs potential flow)

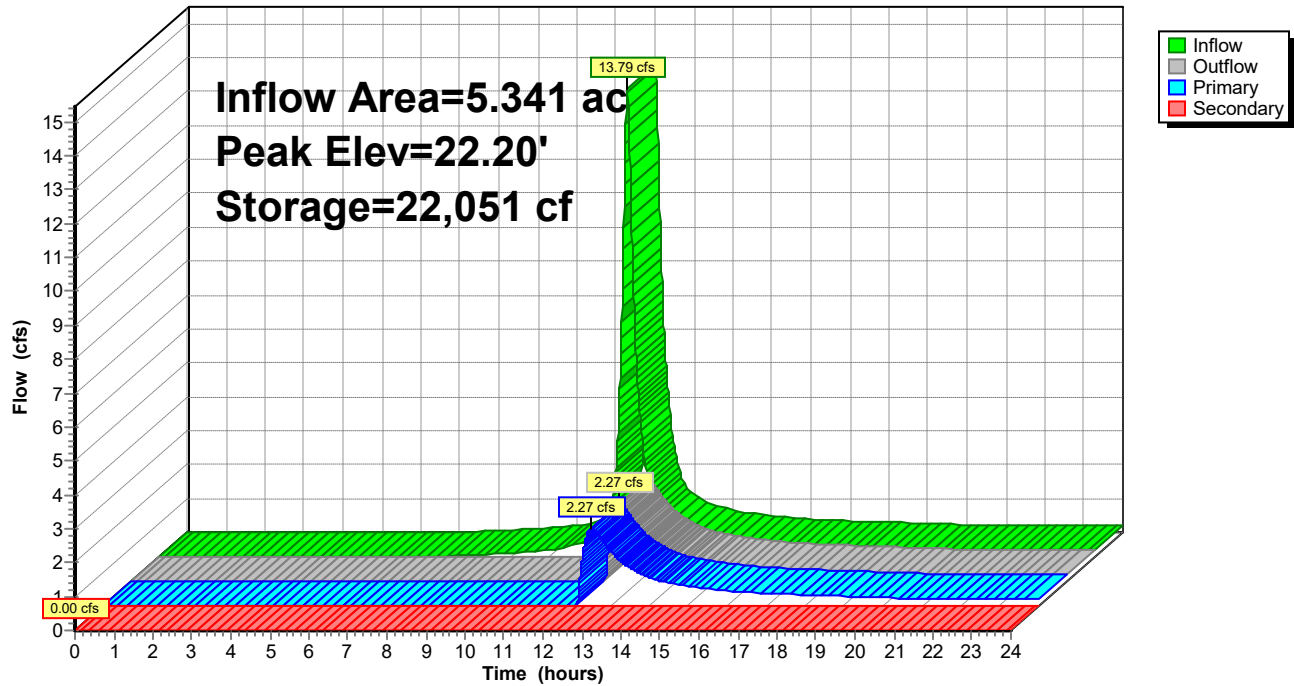
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.27 cfs @ 1.45 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=21.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 43: SGW #6

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 44: DA #6

Runoff = 13.79 cfs @ 12.01 hrs, Volume= 0.929 af, Depth> 2.09"

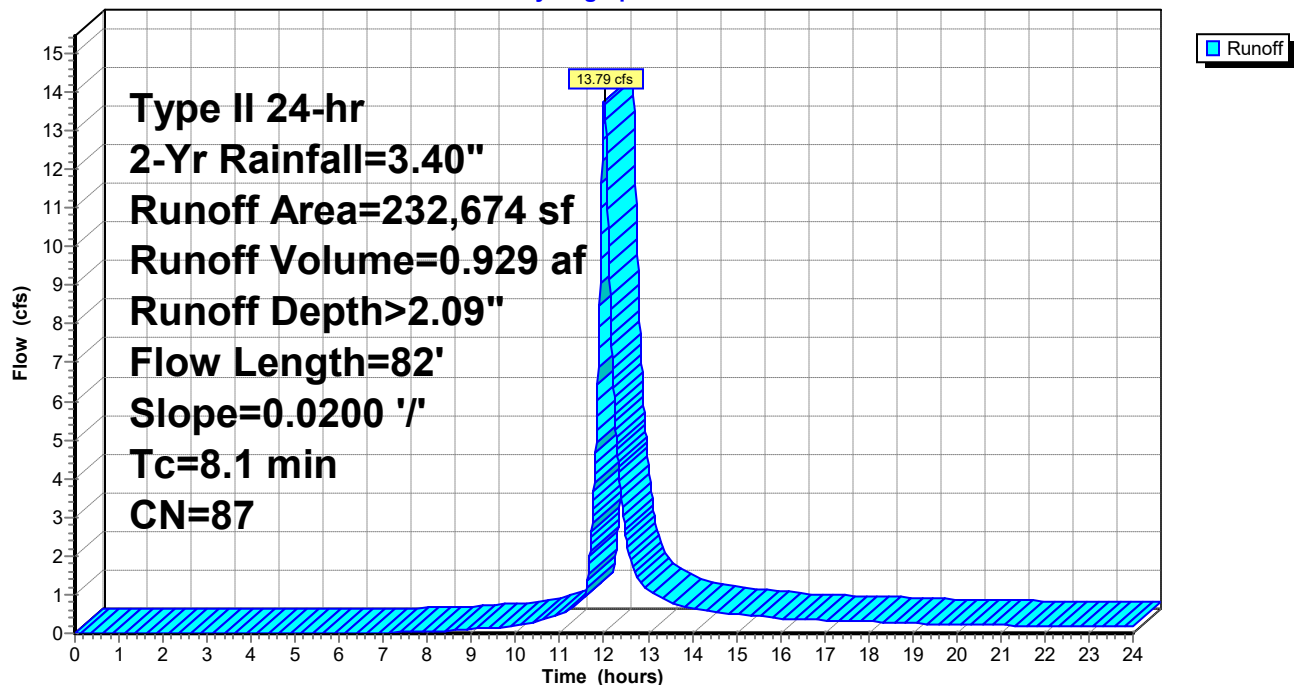
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Yr Rainfall=3.40"

Area (sf)	CN	Description
124,340	98	Paved parking, HSG C
108,334	74	>75% Grass cover, Good, HSG C
232,674	87	Weighted Average
108,334		46.56% Pervious Area
124,340		53.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	82	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"

Subcatchment 44: DA #6

Hydrograph



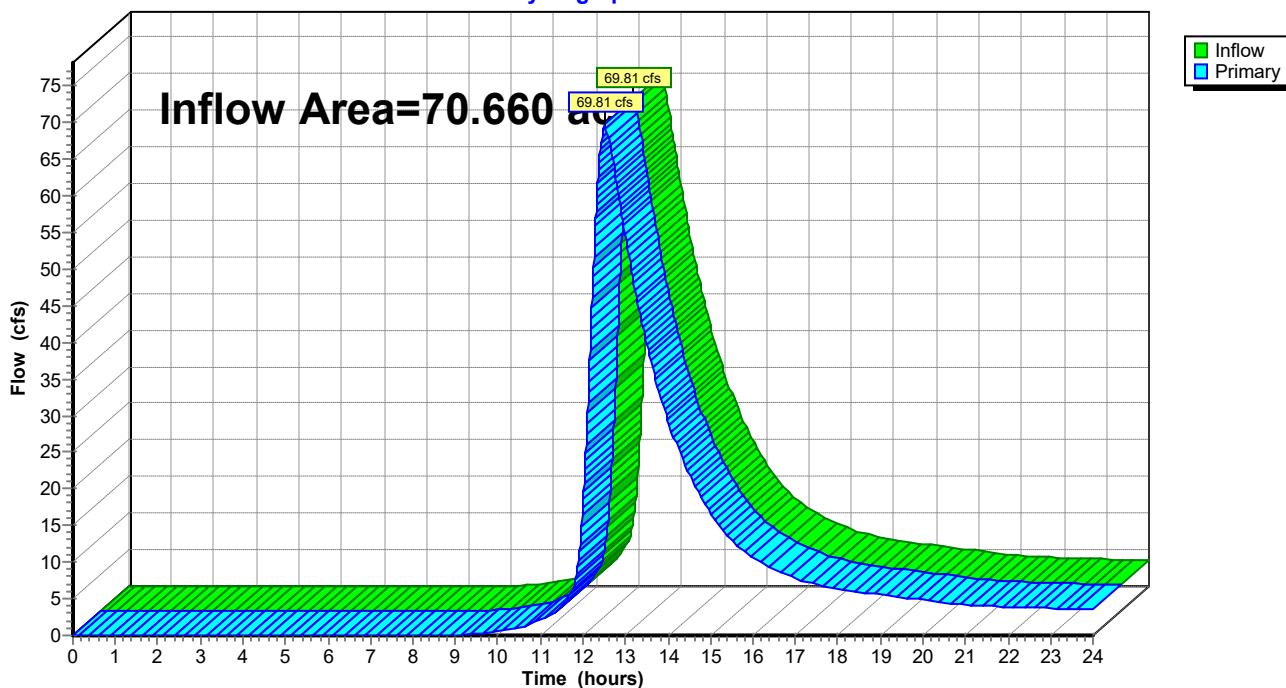
Summary for Link 1: POI-1 (PRE)

Inflow Area = 70.660 ac, 0.00% Impervious, Inflow Depth > 2.55" for 10-Yr event
 Inflow = 69.81 cfs @ 12.51 hrs, Volume= 14.989 af
 Primary = 69.81 cfs @ 12.51 hrs, Volume= 14.989 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1: POI-1 (PRE)

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 2: DA #1 (PRE)

Runoff = 69.81 cfs @ 12.51 hrs, Volume= 14.989 af, Depth> 2.55"

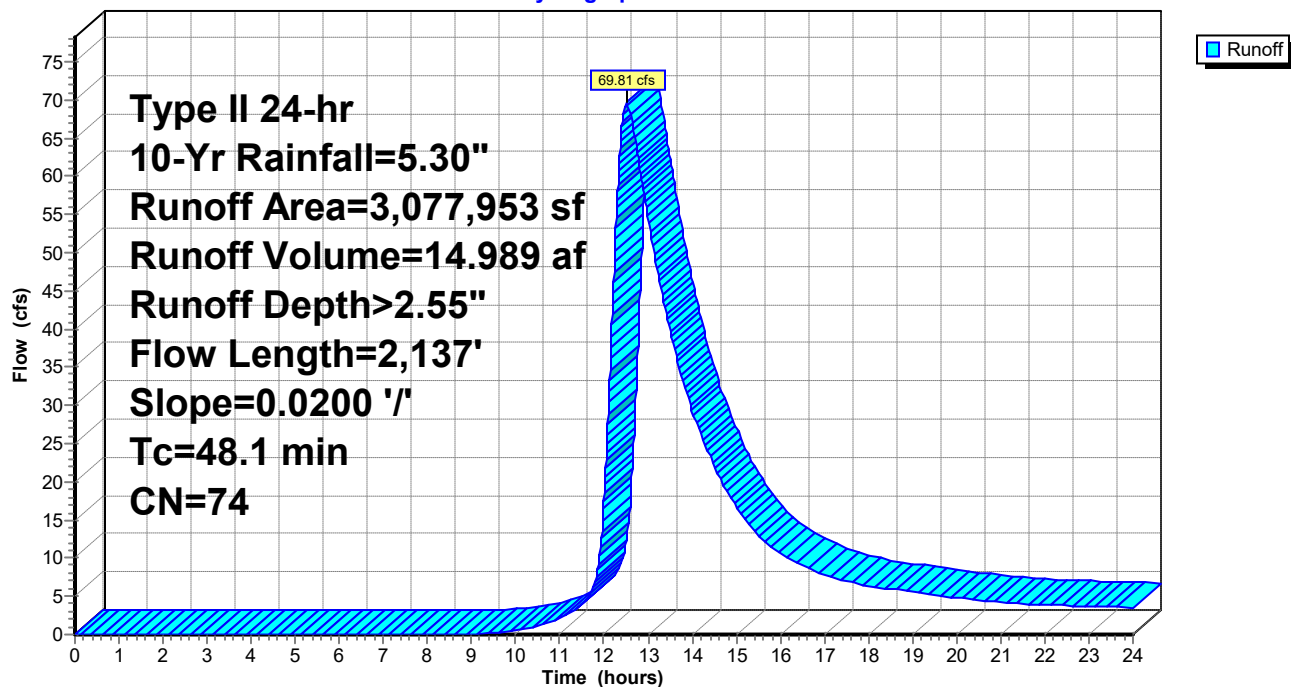
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
3,077,953	74	>75% Grass cover, Good, HSG C
3,077,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.40"
34.3	2,037	0.0200	0.99		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
48.1	2,137	Total			

Subcatchment 2: DA #1 (PRE)

Hydrograph



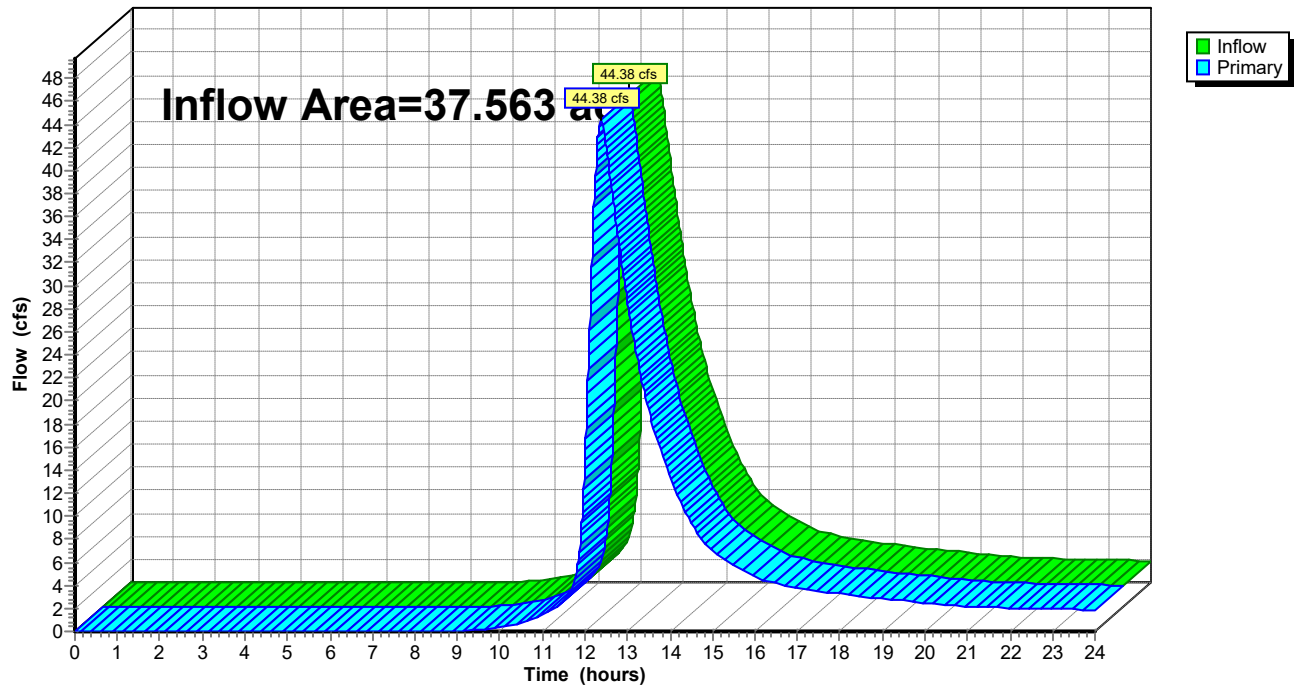
Summary for Link 3: POI-2 (PRE)

Inflow Area = 37.563 ac, 0.00% Impervious, Inflow Depth > 2.56" for 10-Yr event
 Inflow = 44.38 cfs @ 12.38 hrs, Volume= 8.009 af
 Primary = 44.38 cfs @ 12.38 hrs, Volume= 8.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 3: POI-2 (PRE)

Hydrograph



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

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Summary for Subcatchment 4: DA #2 (PRE)

Runoff = 44.38 cfs @ 12.38 hrs, Volume= 8.009 af, Depth> 2.56"

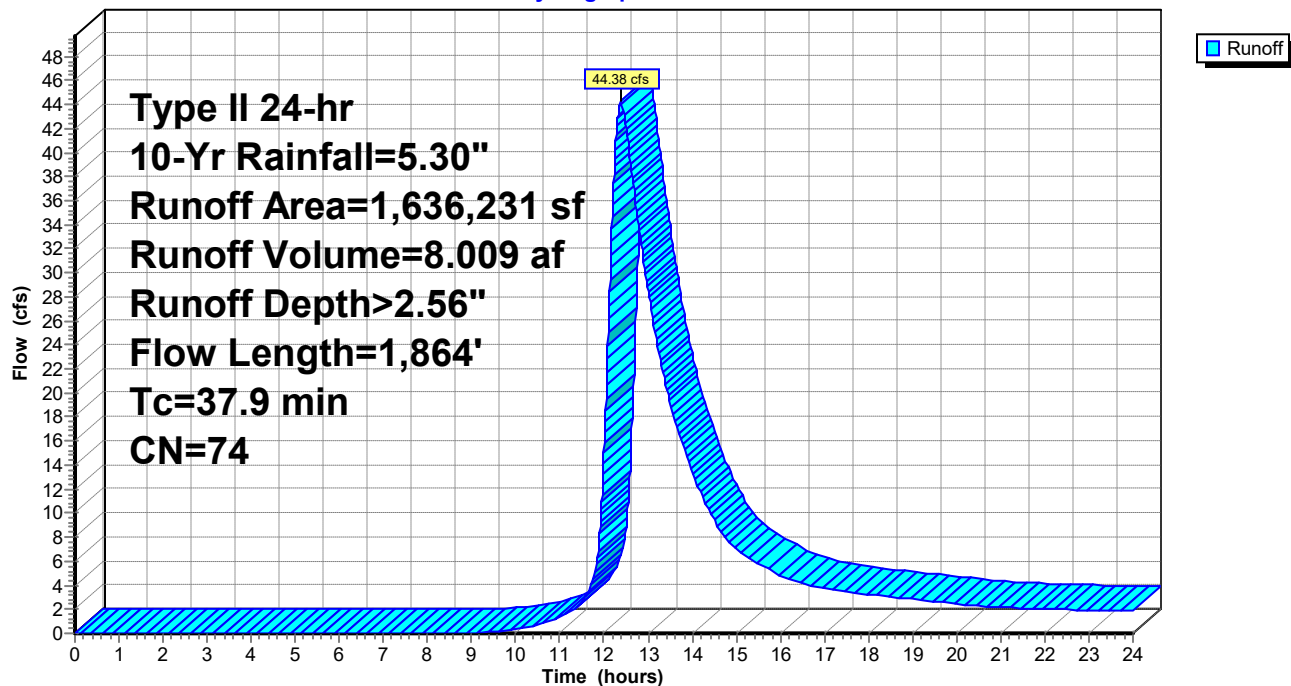
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
1,636,231	74	>75% Grass cover, Good, HSG C
1,636,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.40"
10.5	482	0.0120	0.77		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
13.6	1,282	0.0110	1.57		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
37.9	1,864	Total			

Subcatchment 4: DA #2 (PRE)

Hydrograph



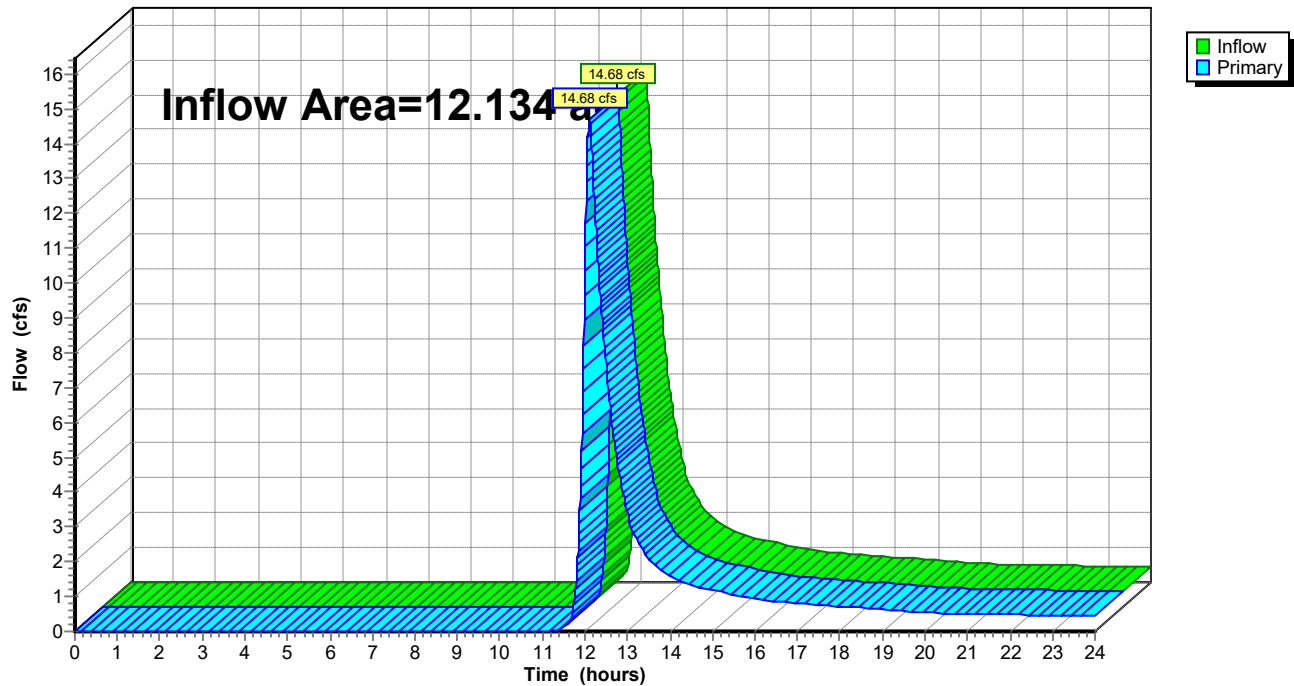
Summary for Link 5: POI-3 (PRE)

Inflow Area = 12.134 ac, 0.00% Impervious, Inflow Depth > 1.54" for 10-Yr event
 Inflow = 14.68 cfs @ 12.11 hrs, Volume= 1.556 af
 Primary = 14.68 cfs @ 12.11 hrs, Volume= 1.556 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 5: POI-3 (PRE)

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 6: DA #3 (PRE)

Runoff = 14.68 cfs @ 12.11 hrs, Volume= 1.556 af, Depth> 1.54"

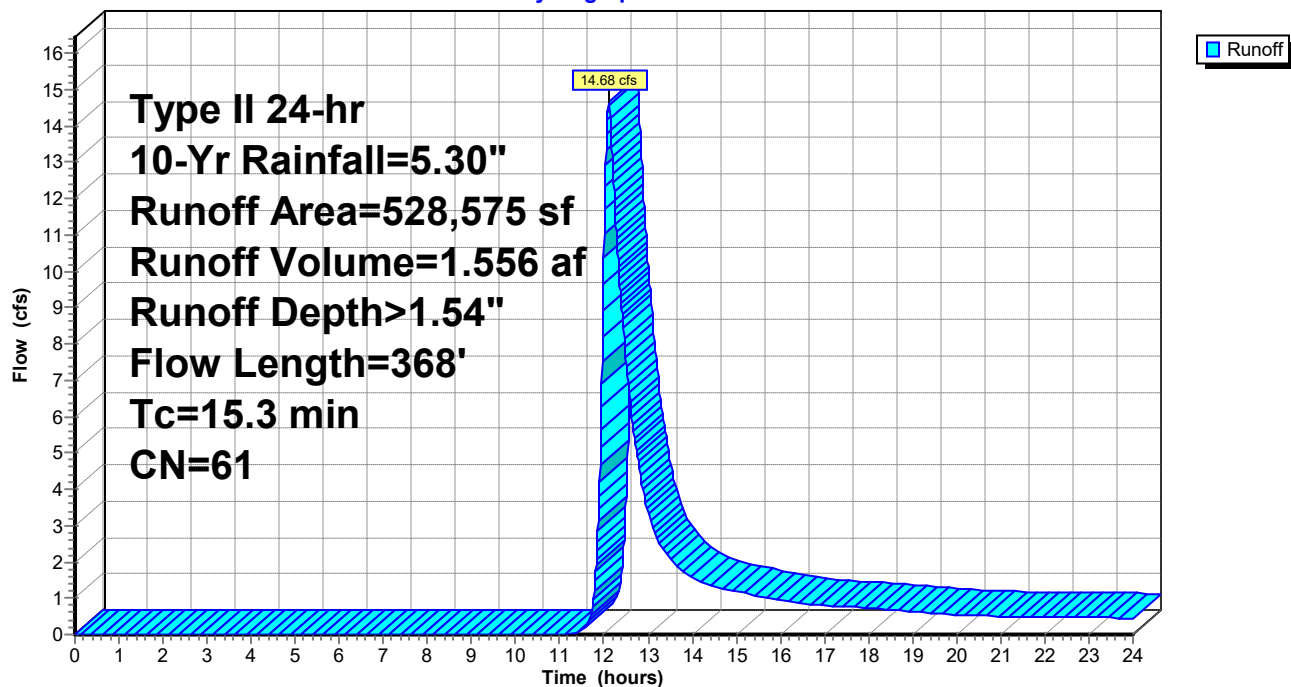
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
528,575	61	>75% Grass cover, Good, HSG B
528,575		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0230	0.13		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.40"
2.2	268	0.0810	1.99		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
15.3	368	Total			

Subcatchment 6: DA #3 (PRE)

Hydrograph



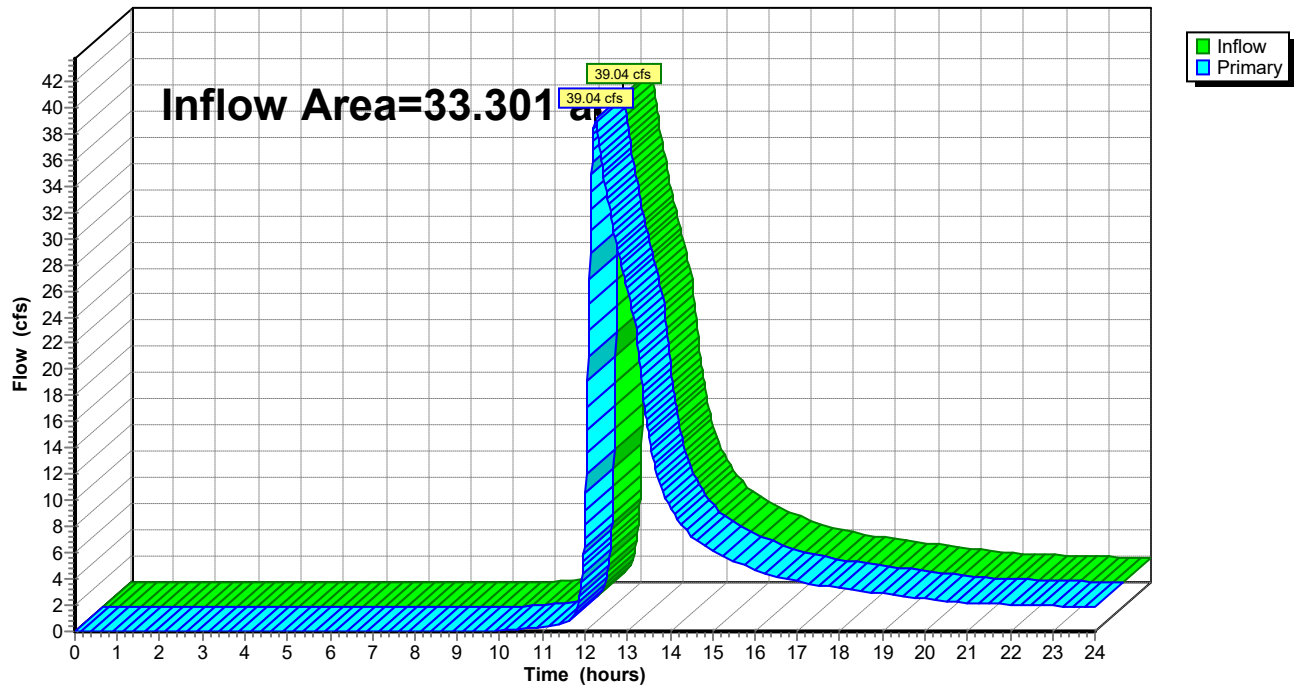
Summary for Link 7: POI-1 (POST)

Inflow Area = 33.301 ac, 35.63% Impervious, Inflow Depth > 2.48" for 10-Yr event
 Inflow = 39.04 cfs @ 12.25 hrs, Volume= 6.888 af
 Primary = 39.04 cfs @ 12.25 hrs, Volume= 6.888 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 7: POI-1 (POST)

Hydrograph



Summary for Pond 8: MH1

Inflow Area = 14.142 ac, 39.85% Impervious, Inflow Depth > 2.11" for 10-Yr event
 Inflow = 11.24 cfs @ 12.24 hrs, Volume= 2.487 af
 Outflow = 11.24 cfs @ 12.24 hrs, Volume= 2.487 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.24 cfs @ 12.24 hrs, Volume= 2.487 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

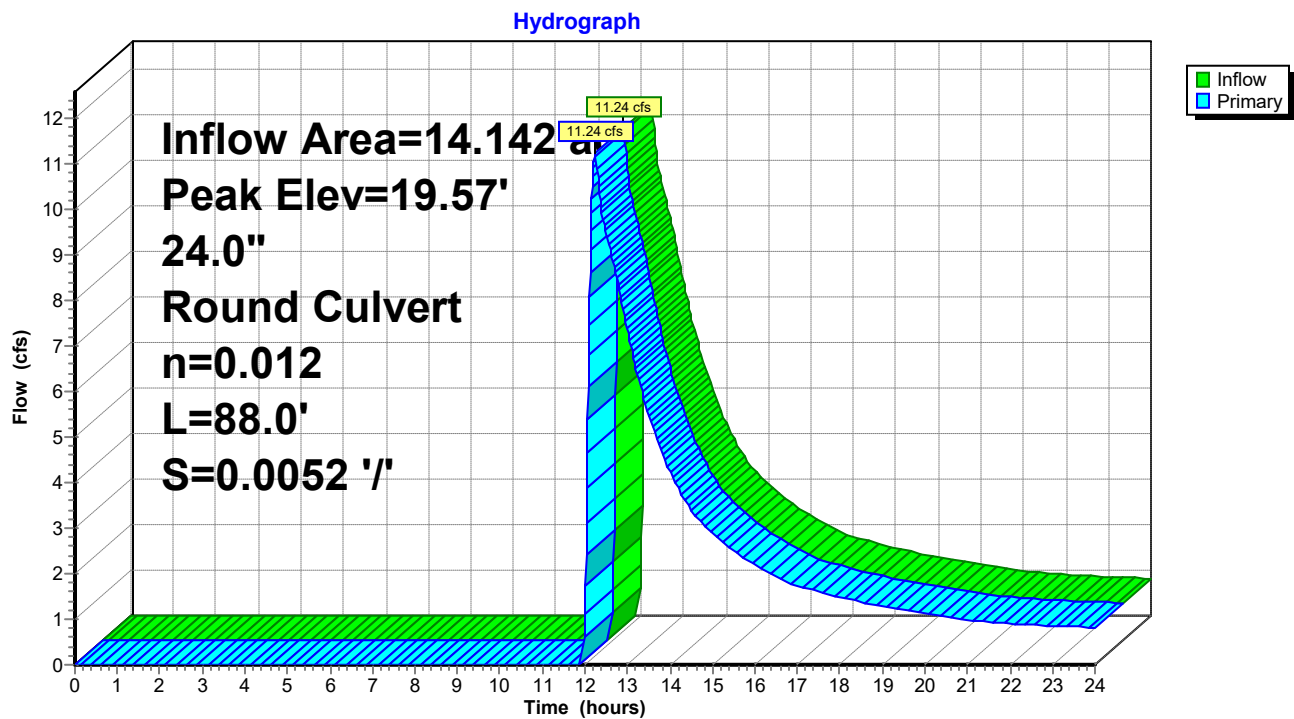
Peak Elev= 19.57' @ 12.24 hrs

Flood Elev= 20.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	17.80'	24.0" Round Culvert L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 17.80' / 17.34' S= 0.0052 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=11.24 cfs @ 12.24 hrs HW=19.57' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Barrel Controls 11.24 cfs @ 5.07 fps)

Pond 8: MH1



Summary for Pond 9: SGW #1

Inflow Area = 4.827 ac, 41.12% Impervious, Inflow Depth > 3.53" for 10-Yr event
 Inflow = 15.92 cfs @ 12.06 hrs, Volume= 1.419 af
 Outflow = 11.24 cfs @ 12.24 hrs, Volume= 1.113 af, Atten= 29%, Lag= 10.4 min
 Primary = 11.24 cfs @ 12.24 hrs, Volume= 1.113 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 26.97' @ 12.24 hrs Surf.Area= 14,673 sf Storage= 19,478 cf

Plug-Flow detention time= 132.5 min calculated for 1.112 af (78% of inflow)
 Center-of-Mass det. time= 50.3 min (867.4 - 817.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	25.50'	38,053 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.50	11,885	456.3	0.0	0	0	11,885
26.50	13,760	481.5	100.0	12,811	12,811	13,823
27.20	15,133	499.1	100.0	10,109	22,920	15,239
28.20	15,133	499.1	100.0	15,133	38,053	15,738

Device	Routing	Invert	Outlet Devices													
#1	Primary	25.17'	24.0" Round Culvert L= 936.0' Ke= 0.500 Inlet / Outlet Invert= 25.17' / 17.90' S= 0.0078 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf													
#2	Device 1	26.50'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)													
#3	Secondary	27.20'	46.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32													

Primary OutFlow Max=11.24 cfs @ 12.24 hrs HW=26.97' TW=19.57' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 11.24 cfs of 13.59 cfs potential flow)

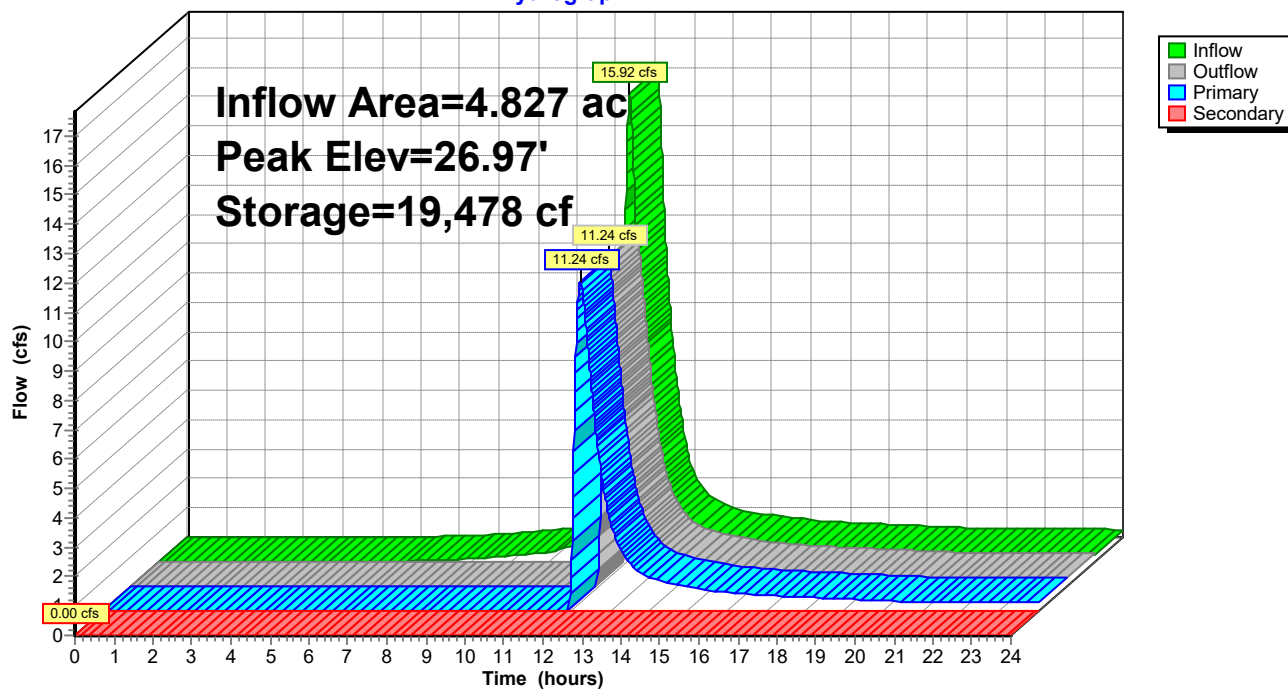
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 11.24 cfs @ 2.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.50' TW=18.50' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 9: SGW #1

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 10: DA #1

Runoff = 15.92 cfs @ 12.06 hrs, Volume= 1.419 af, Depth> 3.53"

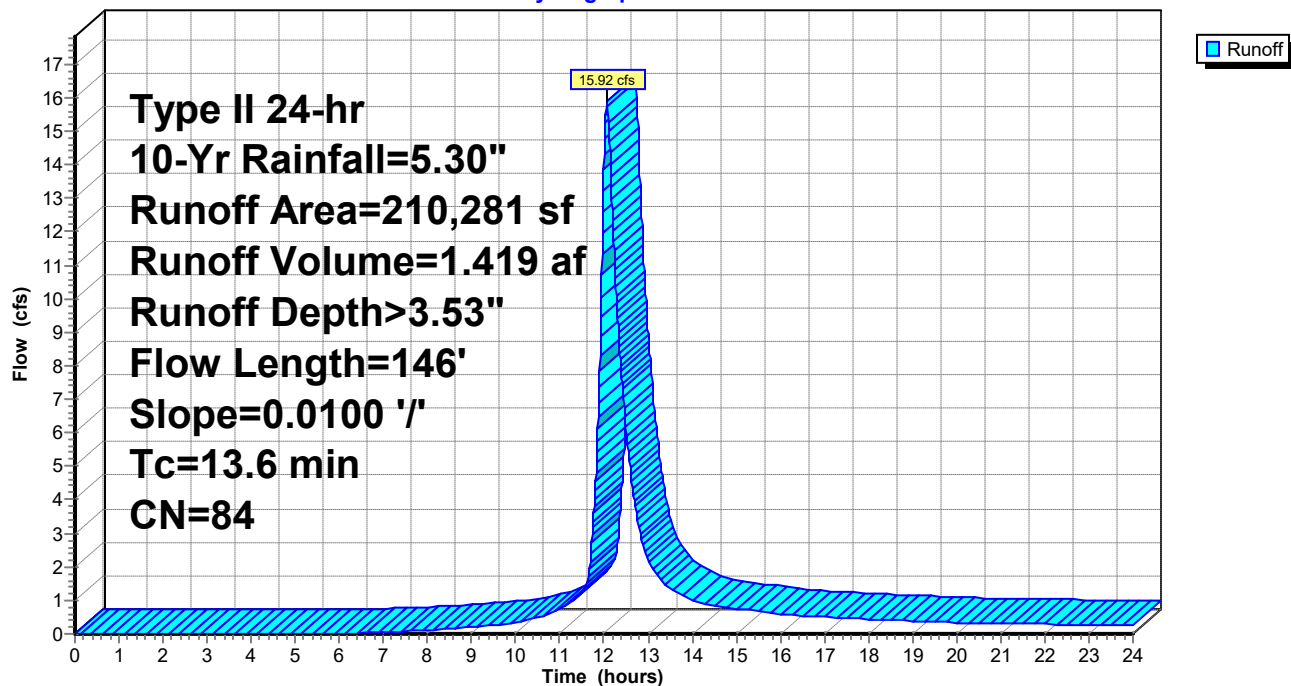
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
86,472	98	Paved parking, HSG C
123,809	74	>75% Grass cover, Good, HSG C
210,281	84	Weighted Average
123,809		58.88% Pervious Area
86,472		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0100	0.13		Sheet Flow, Swale
					Grass: Short n= 0.150 P2= 3.40"
1.1	46	0.0100	0.70		Shallow Concentrated Flow, Swale
					Short Grass Pasture Kv= 7.0 fps
13.6	146	Total			

Subcatchment 10: DA #1

Hydrograph



Summary for Pond 11: SGW #2

Inflow Area = 9.315 ac, 39.20% Impervious, Inflow Depth > 3.43" for 10-Yr event
 Inflow = 27.97 cfs @ 12.09 hrs, Volume= 2.659 af
 Outflow = 4.27 cfs @ 13.07 hrs, Volume= 1.375 af, Atten= 85%, Lag= 58.7 min
 Primary = 4.27 cfs @ 13.07 hrs, Volume= 1.375 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 19.80' @ 13.07 hrs Surf.Area= 55,096 sf Storage= 68,139 cf

Plug-Flow detention time= 258.5 min calculated for 1.374 af (52% of inflow)
 Center-of-Mass det. time= 146.4 min (968.4 - 822.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	18.50'	165,786 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
18.50	49,862	992.1	0.0	0	0	49,862
19.50	53,881	1,017.3	100.0	51,859	51,859	54,015
20.50	58,000	1,042.4	100.0	55,928	107,786	58,256
21.50	58,000	1,042.4	100.0	58,000	165,786	59,298

Device	Routing	Invert	Outlet Devices														
#1	Primary	18.17'	18.0" Round Culvert L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 18.17' / 17.90' S= 0.0123 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf														
#2	Device 1	19.50'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)														
#3	Secondary	20.50'	48.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32														

Primary OutFlow Max=4.27 cfs @ 13.07 hrs HW=19.80' TW=19.12' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.27 cfs of 7.03 cfs potential flow)

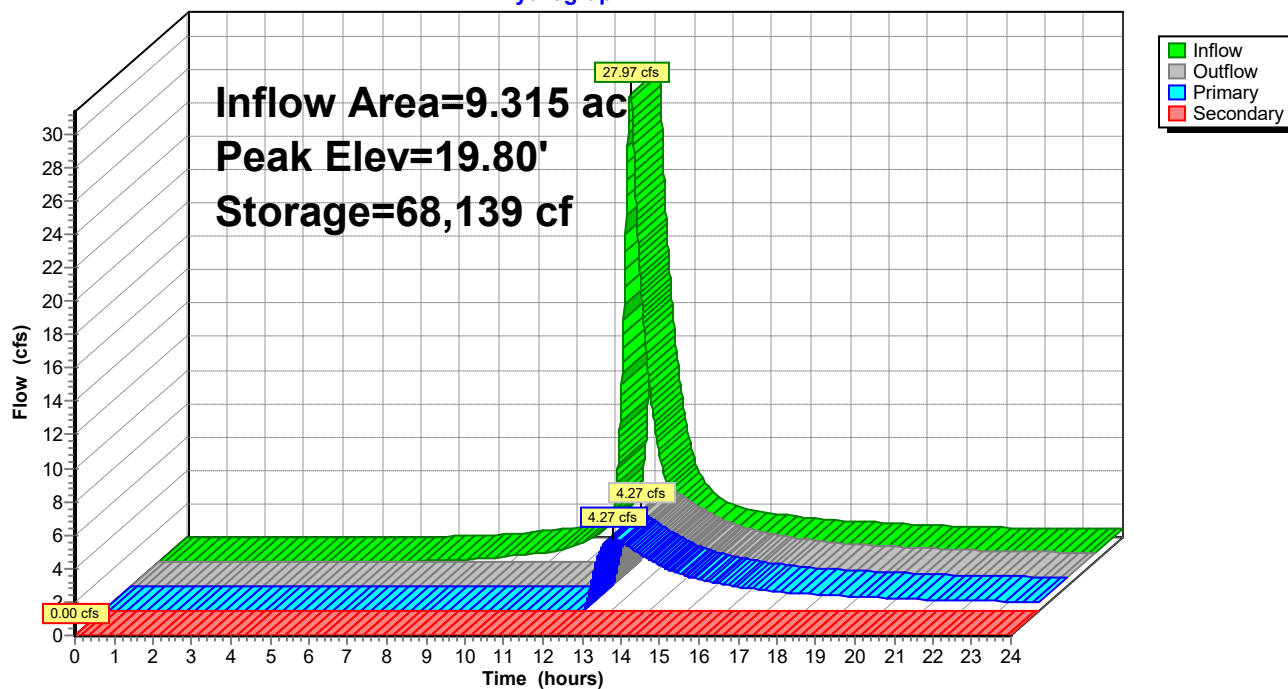
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.27 cfs @ 1.79 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=18.50' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11: SGW #2

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 12: DA #2

Runoff = 27.97 cfs @ 12.09 hrs, Volume= 2.659 af, Depth> 3.43"

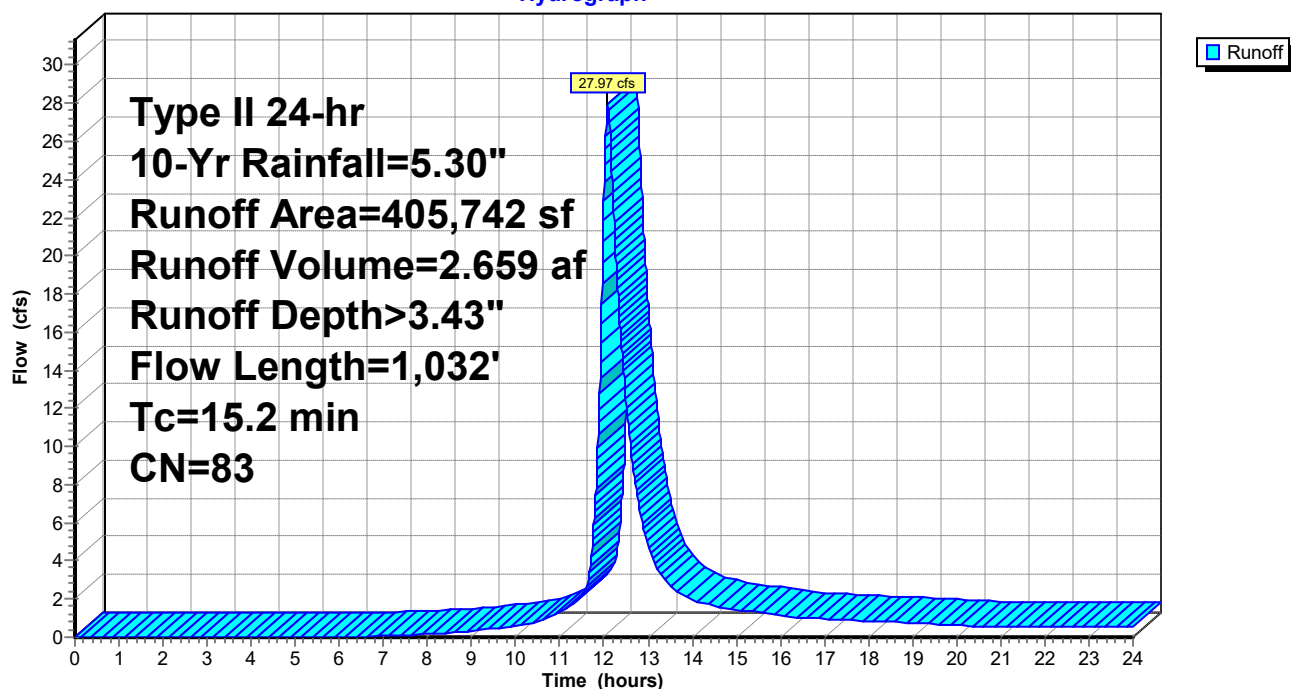
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
159,036	98	Paved parking, HSG C
246,706	74	>75% Grass cover, Good, HSG C
405,742	83	Weighted Average
246,706		60.80% Pervious Area
159,036		39.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	72	0.0200	0.11		Sheet Flow, A-B Median Grass: Dense n= 0.240 P2= 3.40"
0.1	18	0.0200	2.87		Shallow Concentrated Flow, B-C Road Paved Kv= 20.3 fps
4.5	942	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
15.2	1,032	Total			

Subcatchment 12: DA #2

Hydrograph



Summary for Reach 13: SOUTH Ditch - South segment

Inflow Area = 19.159 ac, 32.52% Impervious, Inflow Depth > 2.76" for 10-Yr event
 Inflow = 28.40 cfs @ 12.20 hrs, Volume= 4.414 af
 Outflow = 27.83 cfs @ 12.25 hrs, Volume= 4.401 af, Atten= 2%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.74 fps, Min. Travel Time= 3.2 min
 Avg. Velocity= 0.73 fps, Avg. Travel Time= 7.6 min

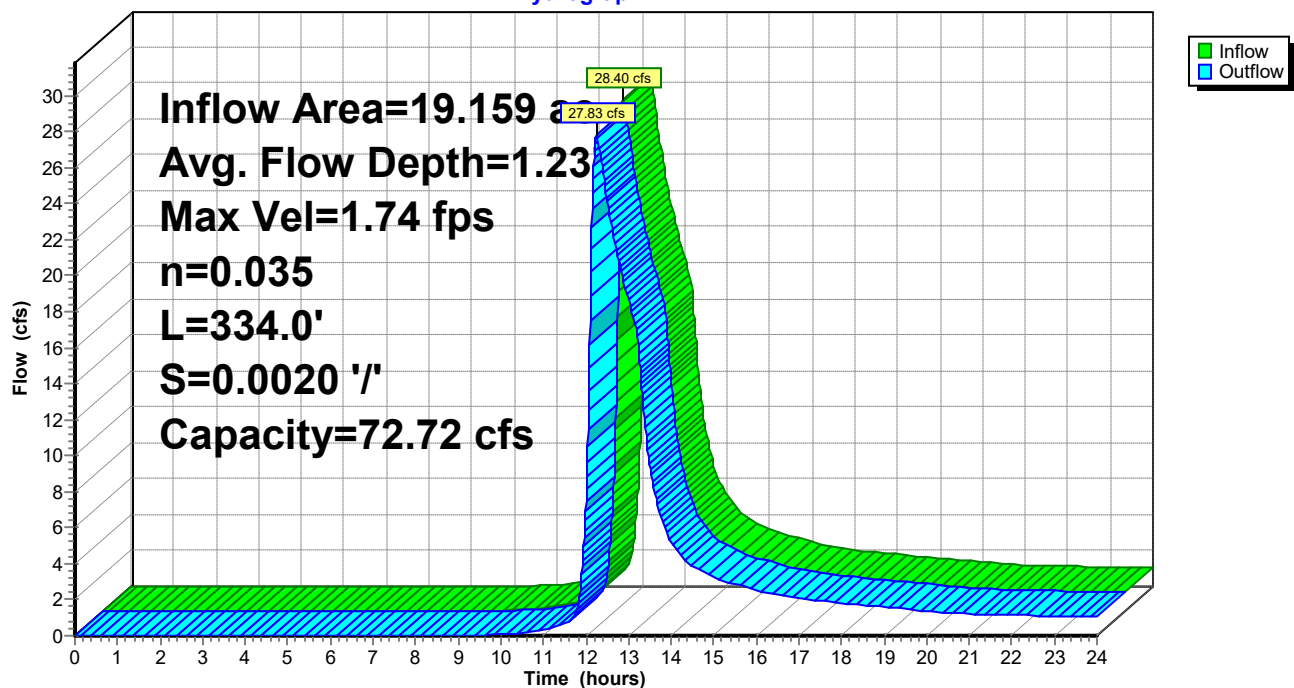
Peak Storage= 5,330 cf @ 12.25 hrs
 Average Depth at Peak Storage= 1.23'
 Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 72.72 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 24.00'
 Length= 334.0' Slope= 0.0020 '/'
 Inlet Invert= 18.42', Outlet Invert= 17.75'



Reach 13: SOUTH Ditch - South segment

Hydrograph



Summary for Pond 14: SGW #3

Inflow Area = 5.925 ac, 50.17% Impervious, Inflow Depth > 3.73" for 10-Yr event
 Inflow = 19.52 cfs @ 12.07 hrs, Volume= 1.840 af
 Outflow = 7.75 cfs @ 12.29 hrs, Volume= 1.406 af, Atten= 60%, Lag= 12.9 min
 Primary = 7.75 cfs @ 12.29 hrs, Volume= 1.406 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 21.50' @ 12.55 hrs Surf.Area= 20,808 sf Storage= 32,076 cf

Plug-Flow detention time= 148.5 min calculated for 1.406 af (76% of inflow)
 Center-of-Mass det. time= 63.2 min (875.9 - 812.8)

Volume	Invert	Avail.Storage	Storage Description
#1	19.80'	59,926 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.80	16,961	544.6	0.0	0	0	16,961
20.80	19,190	569.8	100.0	18,064	18,064	19,264
21.80	21,519	594.9	100.0	20,343	38,407	21,662
22.80	21,519	594.9	100.0	21,519	59,926	22,257

Device	Routing	Invert	Outlet Devices
#1	Primary	19.47'	18.0" Round Culvert L= 264.0' Ke= 0.500 Inlet / Outlet Invert= 19.47' / 18.42' S= 0.0040 ' S Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.80'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.80'	53.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=7.75 cfs @ 12.29 hrs HW=21.39' TW=19.65' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 7.75 cfs @ 4.44 fps)

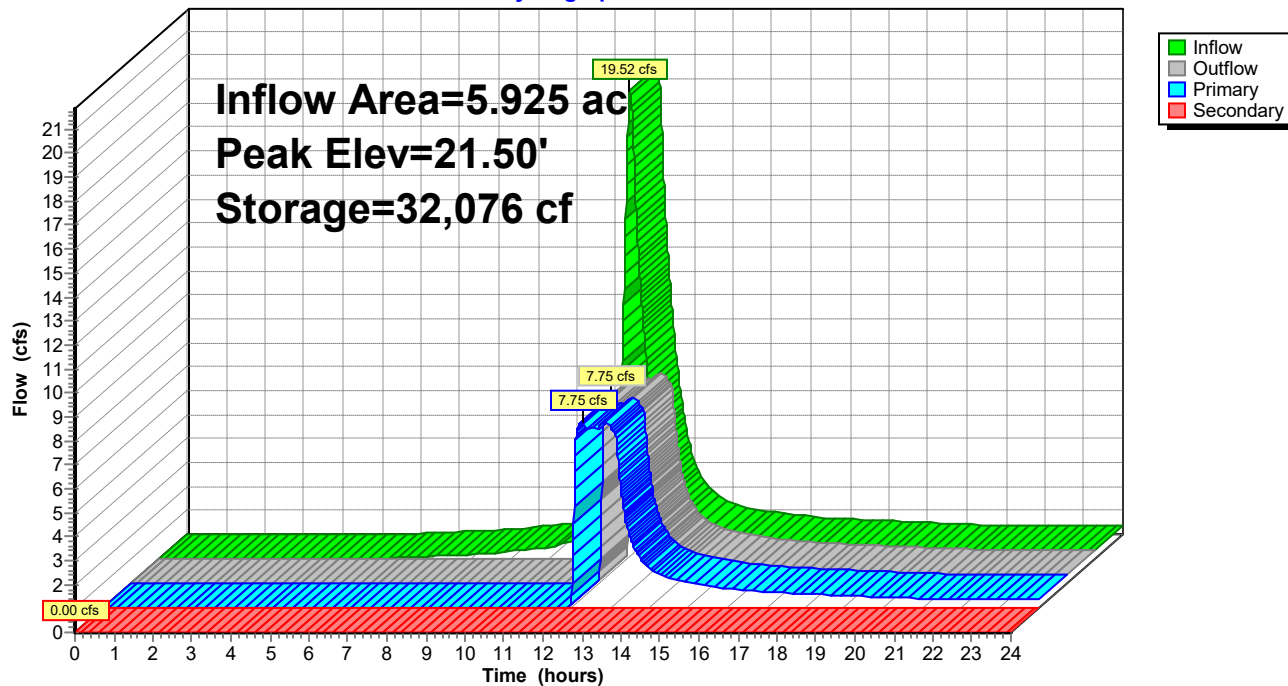
↑2=Sharp-Crested Rectangular Weir (Passes 7.75 cfs of 16.01 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.80' TW=0.00' (Dynamic Tailwater)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 14: SGW #3

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 15: DA #3

Runoff = 19.52 cfs @ 12.07 hrs, Volume= 1.840 af, Depth> 3.73"

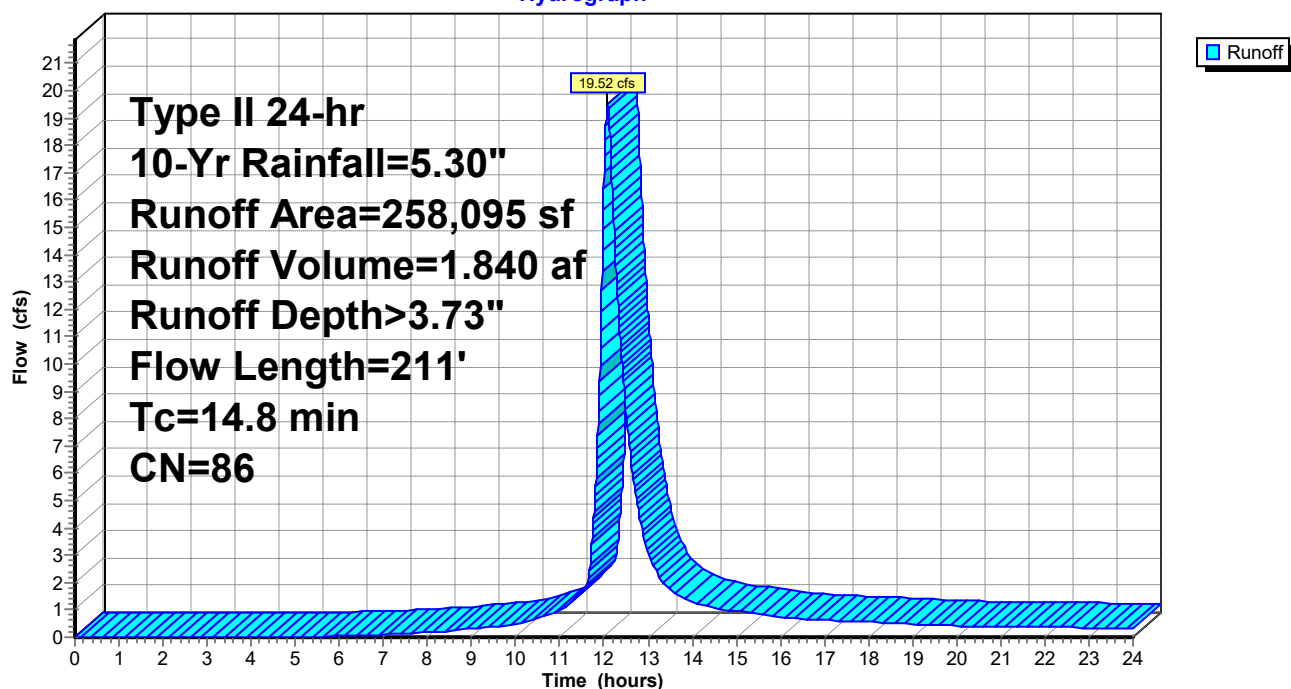
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
129,485	98	Paved parking, HSG C
128,610	74	>75% Grass cover, Good, HSG C
258,095	86	Weighted Average
128,610		49.83% Pervious Area
129,485		50.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B Median Grass: Dense n= 0.240 P2= 3.40"
0.6	38	0.0200	0.99		Shallow Concentrated Flow, B-C Median Short Grass Pasture Kv= 7.0 fps
0.4	73	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
14.8	211	Total			

Subcatchment 15: DA #3

Hydrograph



Summary for Reach 16: SOUTH Ditch - North segment

Inflow Area = 13.234 ac, 24.62% Impervious, Inflow Depth > 2.74" for 10-Yr event
 Inflow = 22.03 cfs @ 12.14 hrs, Volume= 3.020 af
 Outflow = 20.83 cfs @ 12.19 hrs, Volume= 3.009 af, Atten= 5%, Lag= 2.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.63 fps, Min. Travel Time= 3.9 min
 Avg. Velocity= 0.66 fps, Avg. Travel Time= 9.6 min

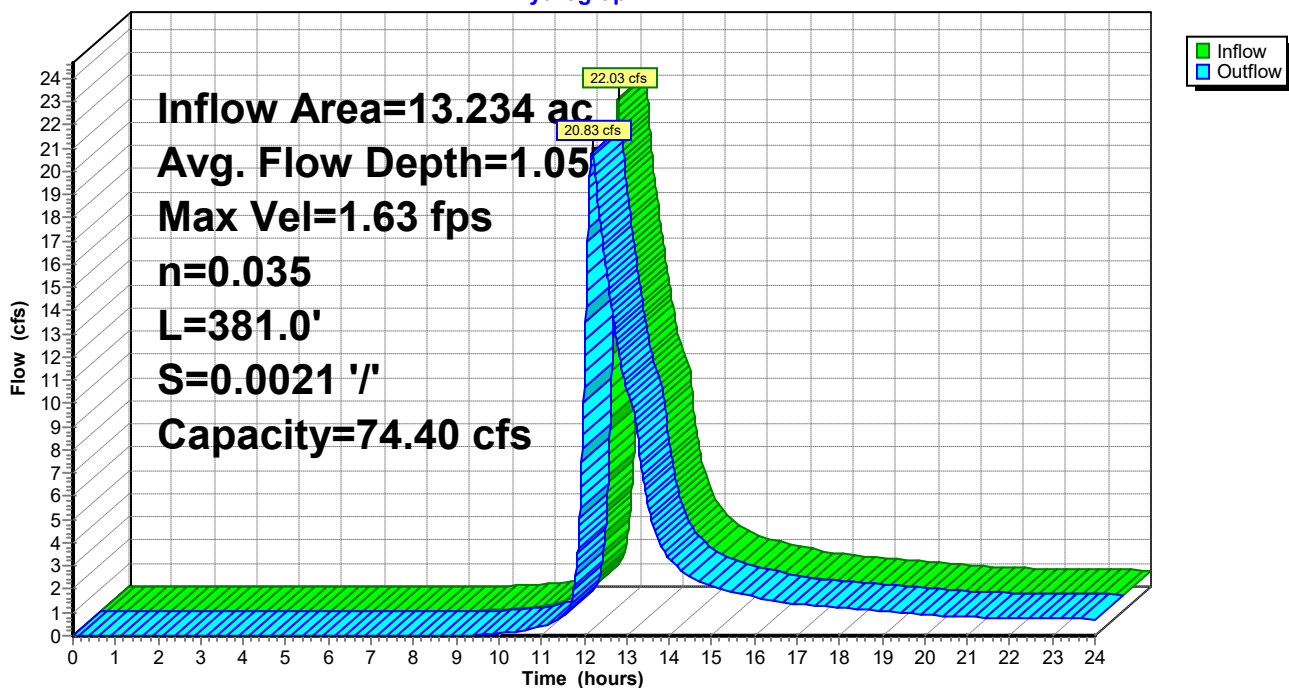
Peak Storage= 4,865 cf @ 12.19 hrs
 Average Depth at Peak Storage= 1.05'
 Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 74.40 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 24.00'
 Length= 381.0' Slope= 0.0021 '/'
 Inlet Invert= 19.22', Outlet Invert= 18.42'



Reach 16: SOUTH Ditch - North segment

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 17: DA #16

Runoff = 16.77 cfs @ 12.06 hrs, Volume= 1.441 af, Depth> 2.68"

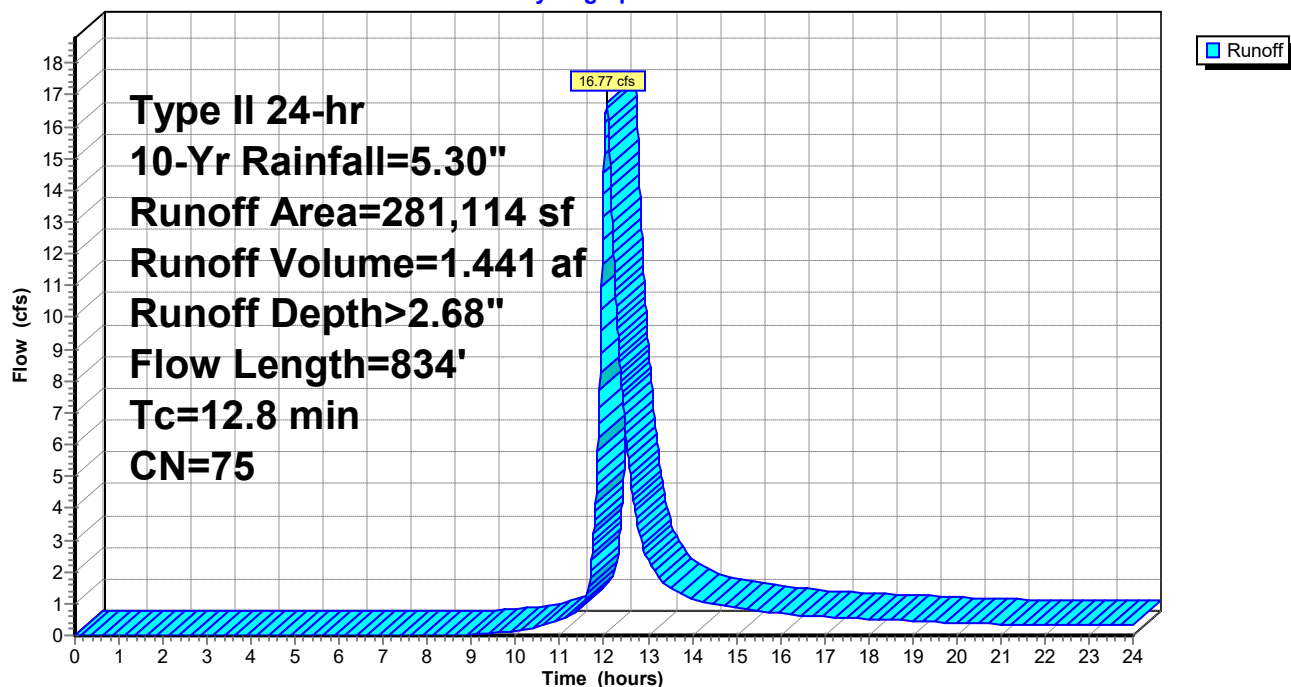
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
5,965	98	Paved parking, HSG C
275,149	74	>75% Grass cover, Good, HSG C
281,114	75	Weighted Average
275,149		97.88% Pervious Area
5,965		2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	51	0.0200	0.15		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
7.3	783	0.0030	1.79	12.56	Trap/Vee/Rect Channel Flow, B-C Existing Ditch
					Bot.W=4.00' D=1.00' Z= 3.0 '/' Top.W=10.00'
					n= 0.035 Earth, dense weeds
12.8	834	Total			

Subcatchment 17: DA #16

Hydrograph



Summary for Pond 18: SGW #4B

Inflow Area = 6.781 ac, 46.03% Impervious, Inflow Depth > 3.49" for 10-Yr event
 Inflow = 21.30 cfs @ 12.10 hrs, Volume= 1.974 af
 Outflow = 9.15 cfs @ 12.52 hrs, Volume= 1.580 af, Atten= 57%, Lag= 25.4 min
 Primary = 9.15 cfs @ 12.52 hrs, Volume= 1.580 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 21.48' @ 12.52 hrs Surf.Area= 19,874 sf Storage= 31,646 cf

Plug-Flow detention time= 134.5 min calculated for 1.580 af (80% of inflow)
 Center-of-Mass det. time= 55.4 min (878.8 - 823.4)

Volume	Invert	Avail.Storage	Storage Description
#1	19.65'	55,436 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.65	14,777	674.3	0.0	0	0	14,777
20.65	17,525	699.5	100.0	16,131	16,131	17,616
21.65	20,373	724.6	100.0	18,931	35,063	20,549
22.65	20,373	724.6	100.0	20,373	55,436	21,273

Device	Routing	Invert	Outlet Devices
#1	Primary	19.32'	18.0" Round Culvert L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 19.32' / 19.22' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.65'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.65'	24.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=9.15 cfs @ 12.52 hrs HW=21.48' TW=20.12' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 9.15 cfs @ 5.18 fps)

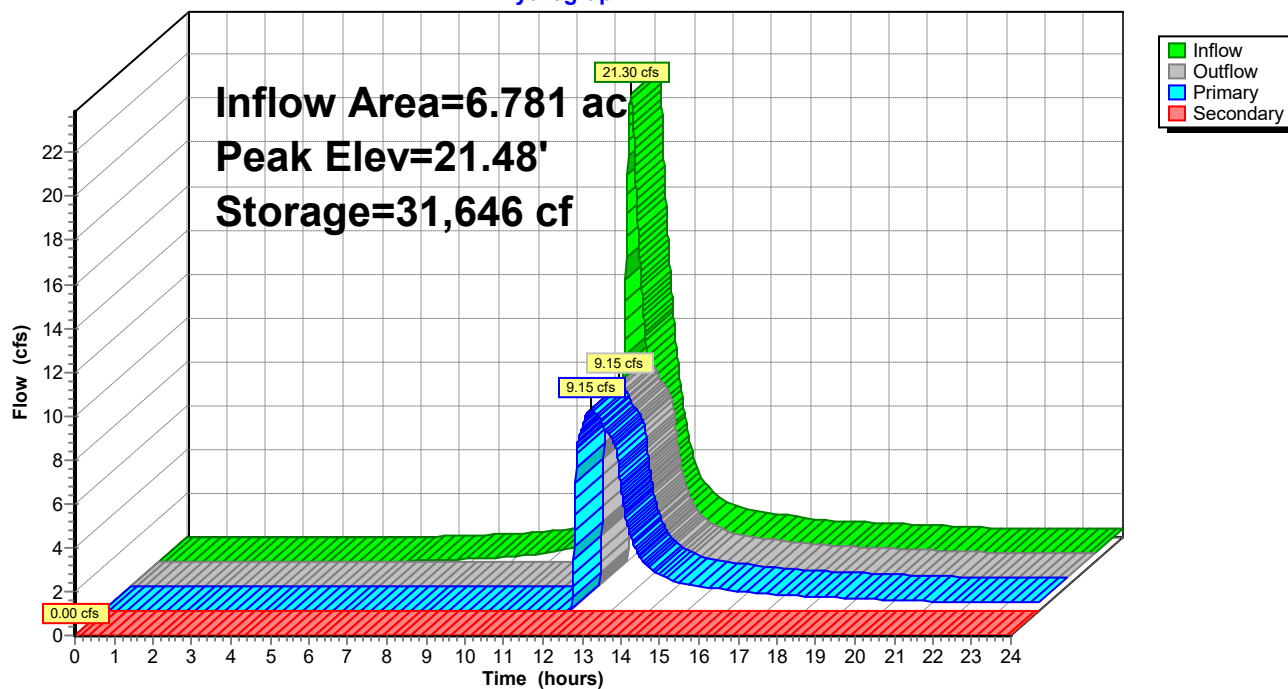
↑ **2=Sharp-Crested Rectangular Weir** (Passes 9.15 cfs of 19.79 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.65' TW=19.22' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 18: SGW #4B

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 19: DA #4B

Runoff = 16.79 cfs @ 12.10 hrs, Volume= 1.616 af, Depth> 3.63"

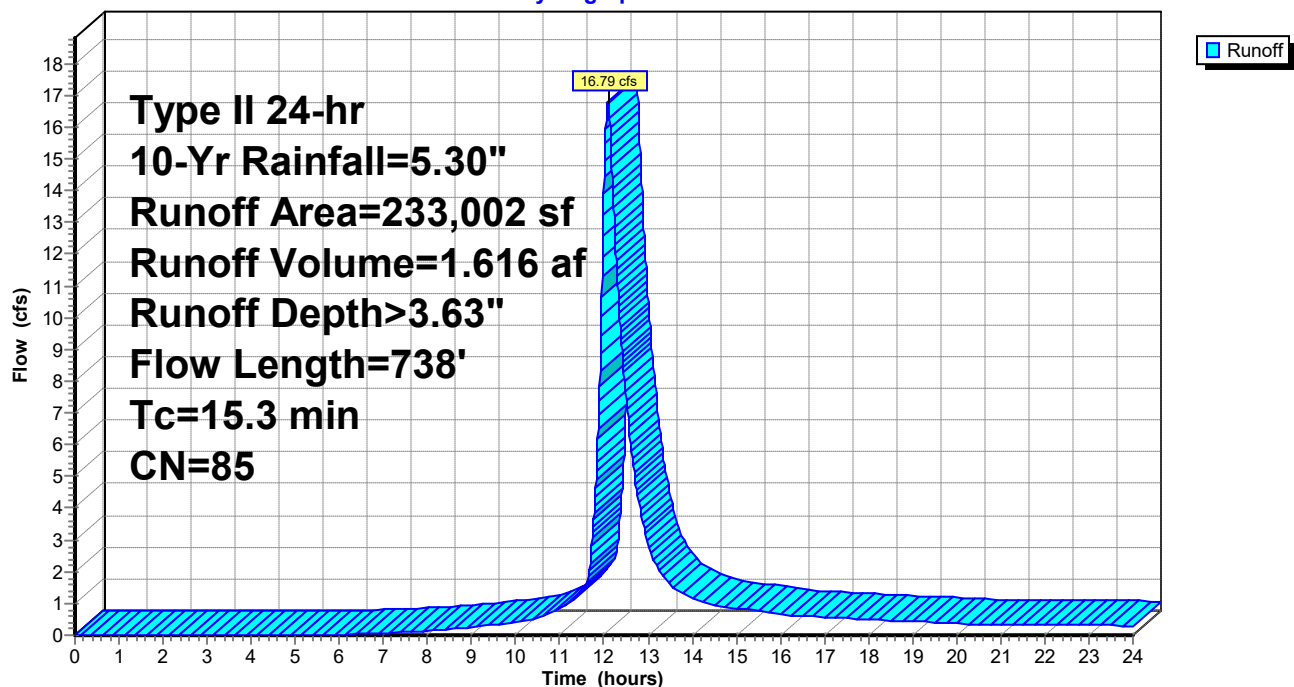
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
103,239	98	Paved parking, HSG C
129,763	74	>75% Grass cover, Good, HSG C
233,002	85	Weighted Average
129,763		55.69% Pervious Area
103,239		44.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"
5.9	506	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter Paved Kv= 20.3 fps
0.7	143	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
15.3	738	Total			

Subcatchment 19: DA #4B

Hydrograph



Summary for Pond 20: SGW #4A

Inflow Area = 1.432 ac, 52.46% Impervious, Inflow Depth > 3.83" for 10-Yr event
 Inflow = 5.44 cfs @ 12.05 hrs, Volume= 0.457 af
 Outflow = 4.66 cfs @ 12.13 hrs, Volume= 0.358 af, Atten= 14%, Lag= 5.1 min
 Primary = 4.66 cfs @ 12.13 hrs, Volume= 0.358 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.42' @ 12.13 hrs Surf.Area= 5,095 sf Storage= 5,762 cf

Plug-Flow detention time= 130.5 min calculated for 0.358 af (78% of inflow)
 Center-of-Mass det. time= 48.8 min (854.9 - 806.1)

Volume	Invert	Avail.Storage	Storage Description
#1	21.10'	12,021 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.10	3,692	250.0	0.0	0	0	3,692
22.10	4,742	275.2	100.0	4,206	4,206	4,777
22.60	5,305	287.7	100.0	2,510	6,716	5,355
23.60	5,305	287.7	100.0	5,305	12,021	5,642

Device	Routing	Invert	Outlet Devices
#1	Primary	20.77'	18.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 20.77' / 20.36' S= 0.0055 ' / Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	22.10'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	22.60'	83.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.66 cfs @ 12.13 hrs HW=22.42' TW=21.06' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.66 cfs of 7.31 cfs potential flow)

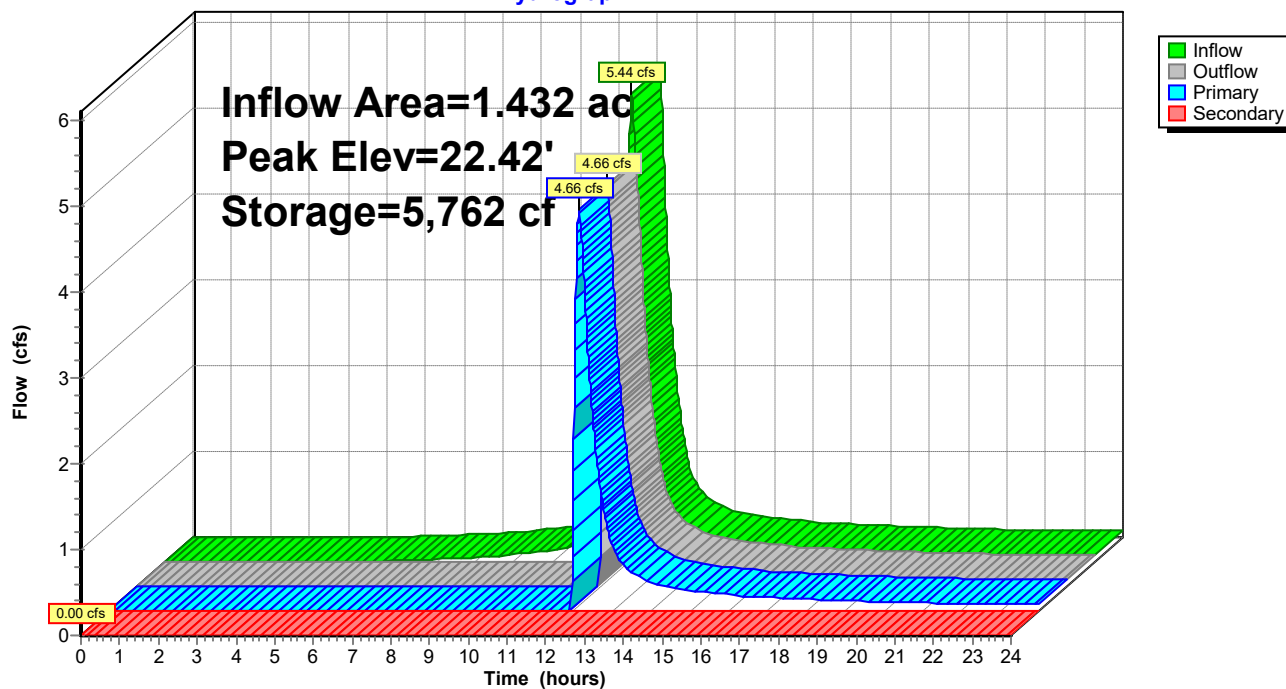
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.66 cfs @ 1.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=21.10' TW=19.65' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 20: SGW #4A

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 21: DA #4A

Runoff = 5.44 cfs @ 12.05 hrs, Volume= 0.457 af, Depth> 3.83"

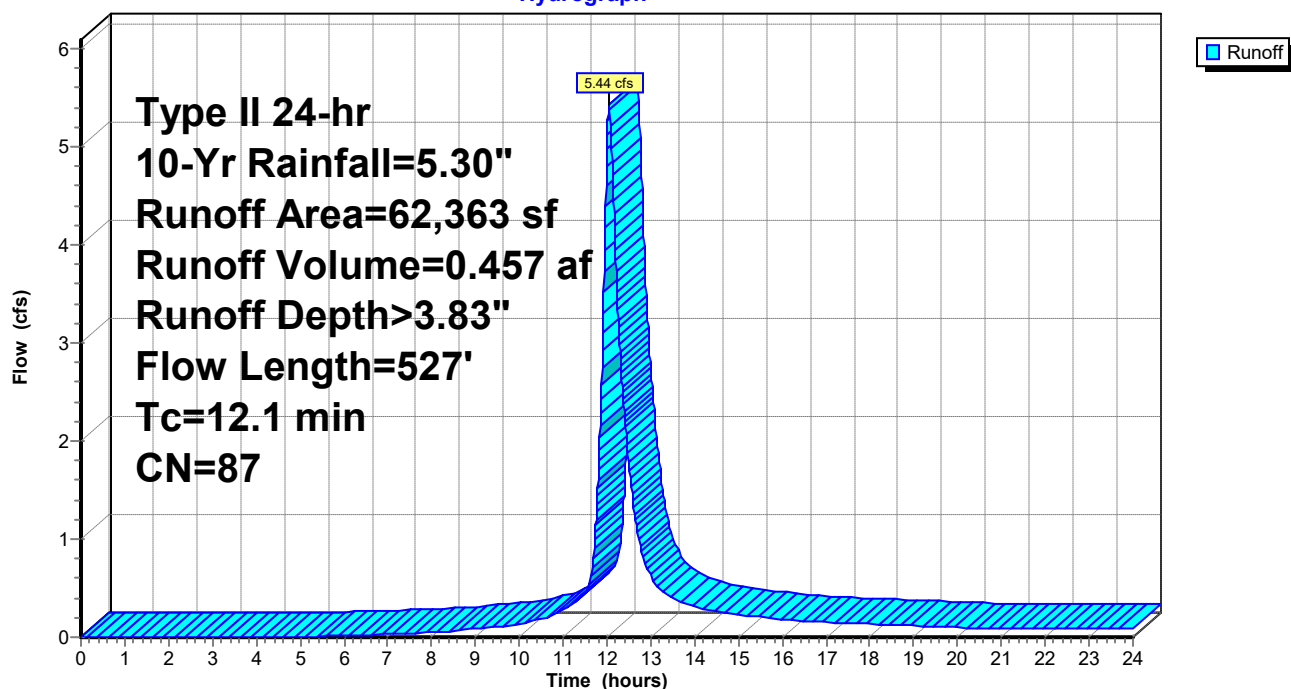
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
32,714	98	Paved parking, HSG C
29,649	74	>75% Grass cover, Good, HSG C
62,363	87	Weighted Average
29,649		47.54% Pervious Area
32,714		52.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
2.2	188	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
1.2	250	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
12.1	527	Total			

Subcatchment 21: DA #4A

Hydrograph

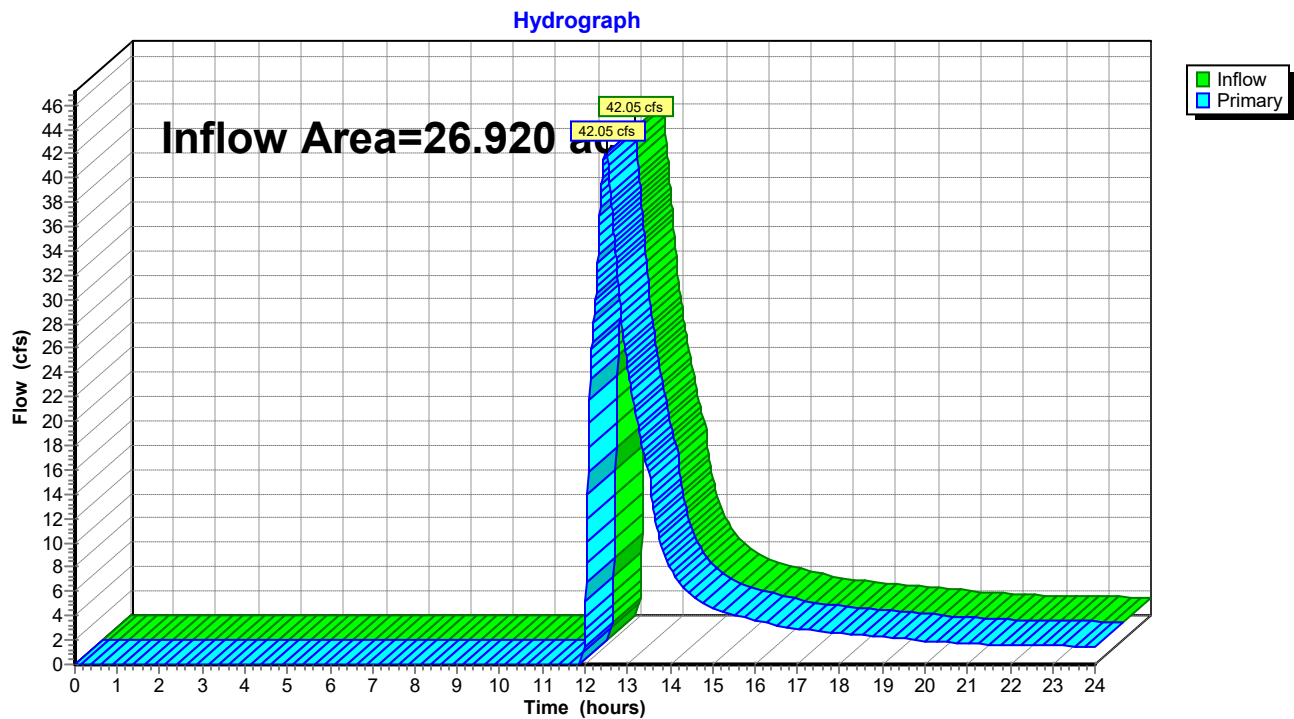


Summary for Link 22: POI-2 (POST)

Inflow Area = 26.920 ac, 34.07% Impervious, Inflow Depth > 2.70" for 10-Yr event
 Inflow = 42.05 cfs @ 12.50 hrs, Volume= 6.052 af
 Primary = 42.05 cfs @ 12.50 hrs, Volume= 6.052 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 22: POI-2 (POST)



Summary for Pond 23: SGW #10

Inflow Area = 15.563 ac, 18.53% Impervious, Inflow Depth > 2.94" for 10-Yr event
 Inflow = 31.67 cfs @ 12.16 hrs, Volume= 3.813 af
 Outflow = 20.21 cfs @ 12.52 hrs, Volume= 3.330 af, Atten= 36%, Lag= 21.6 min
 Primary = 16.80 cfs @ 12.52 hrs, Volume= 3.232 af
 Secondary = 3.42 cfs @ 12.52 hrs, Volume= 0.098 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 19.19' @ 12.52 hrs Surf.Area= 20,851 sf Storage= 43,833 cf

Plug-Flow detention time= 95.4 min calculated for 3.330 af (87% of inflow)
 Center-of-Mass det. time= 37.1 min (880.4 - 843.3)

Volume	Invert	Avail.Storage	Storage Description			
#1	17.00'	60,625 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.00	18,938	465.8	0.0	0	0	18,938
19.00	20,851	516.1	100.0	39,774	39,774	22,989
20.00	20,851	516.1	100.0	20,851	60,625	23,505

Device	Routing	Invert	Outlet Devices													
#1	Primary	16.67'	24.0" Round Culvert L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 16.67' / 16.55' S= 0.0086 ' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf													
#2	Device 1	18.00'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)													
#3	Secondary	19.00'	17.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88													

Primary OutFlow Max=16.80 cfs @ 12.52 hrs HW=19.19' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 16.80 cfs @ 5.46 fps)

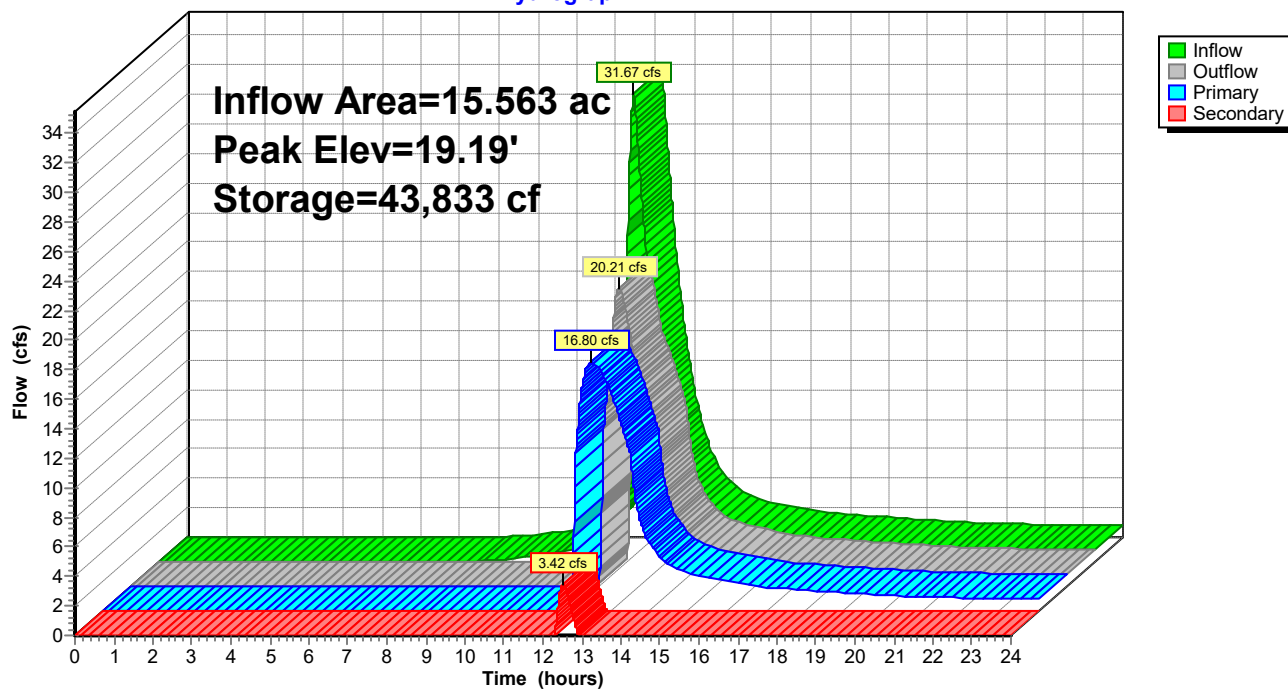
↑ **2=Sharp-Crested Rectangular Weir** (Passes 16.80 cfs of 45.69 cfs potential flow)

Secondary OutFlow Max=3.42 cfs @ 12.52 hrs HW=19.19' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 3.42 cfs @ 1.03 fps)

Pond 23: SGW #10

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 24: DA #10

Runoff = 31.67 cfs @ 12.16 hrs, Volume= 3.813 af, Depth> 2.94"

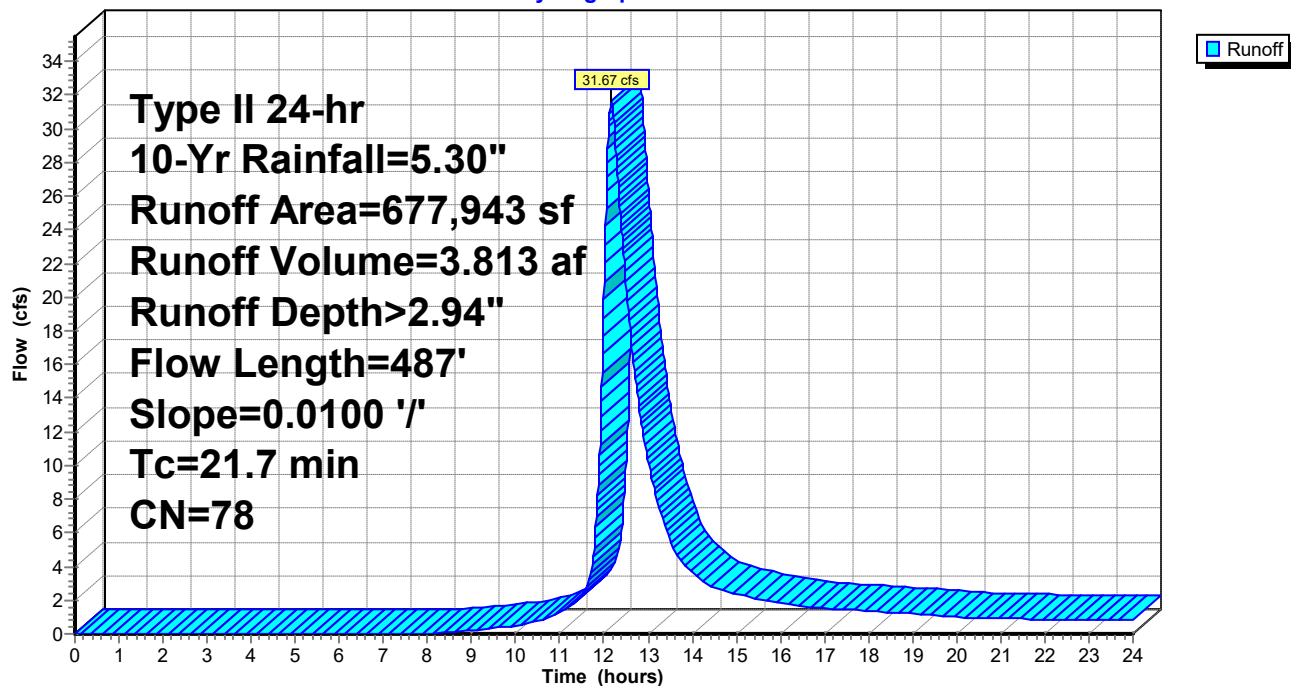
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
125,614	98	Paved parking, HSG C
552,329	74	>75% Grass cover, Good, HSG C
677,943	78	Weighted Average
552,329		81.47% Pervious Area
125,614		18.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0100	0.13		Sheet Flow, A-B Field
					Grass: Short n= 0.150 P2= 3.40"
9.2	387	0.0100	0.70		Shallow Concentrated Flow, B-C Grass
					Short Grass Pasture Kv= 7.0 fps
21.7	487	Total			

Subcatchment 24: DA #10

Hydrograph



Summary for Pond 25: MH3

Inflow Area = 7.618 ac, 52.89% Impervious, Inflow Depth > 2.93" for 10-Yr event
 Inflow = 14.93 cfs @ 12.31 hrs, Volume= 1.860 af
 Outflow = 14.93 cfs @ 12.31 hrs, Volume= 1.860 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.93 cfs @ 12.31 hrs, Volume= 1.860 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 17.96' @ 12.31 hrs

Flood Elev= 19.10'

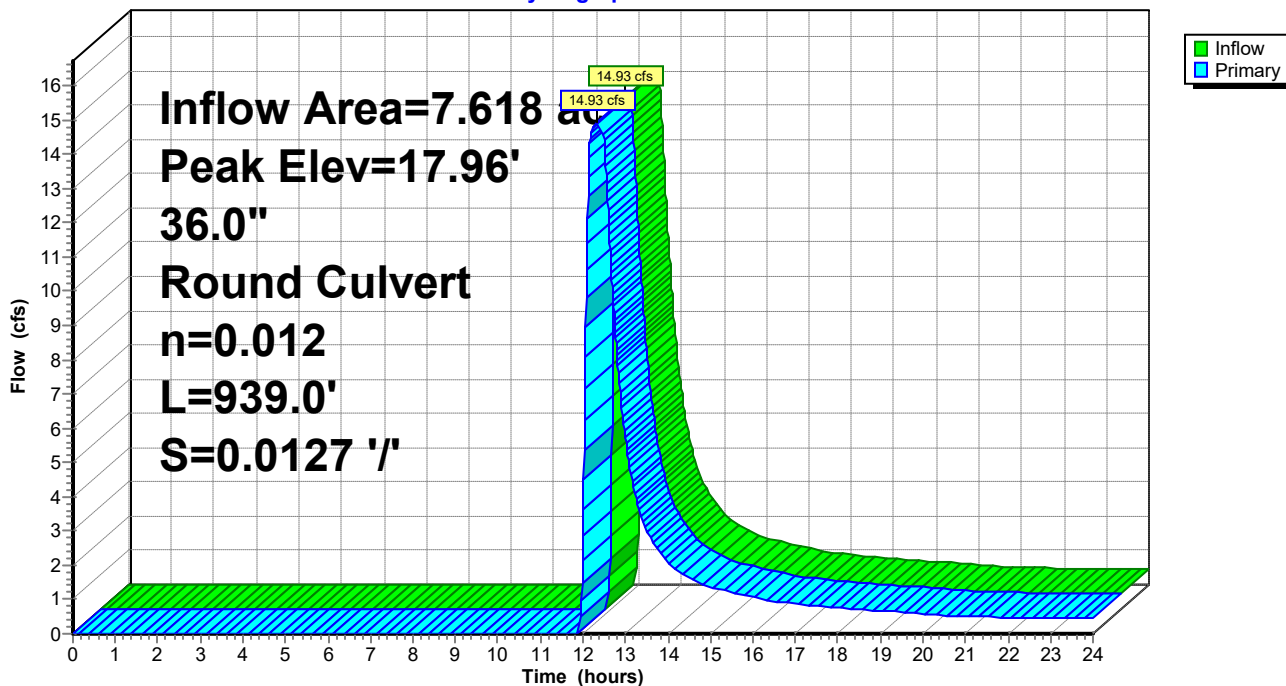
Device	Routing	Invert	Outlet Devices
#1	Primary	16.45'	36.0" Round Culvert L= 939.0' Ke= 0.500 Inlet / Outlet Invert= 16.45' / 4.50' S= 0.0127 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=14.93 cfs @ 12.31 hrs HW=17.96' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 14.93 cfs @ 4.19 fps)

Pond 25: MH3

Hydrograph



Summary for Pond 26: SGW #8

Inflow Area = 7.618 ac, 52.89% Impervious, Inflow Depth > 3.83" for 10-Yr event
 Inflow = 29.49 cfs @ 12.04 hrs, Volume= 2.434 af
 Outflow = 14.93 cfs @ 12.31 hrs, Volume= 1.860 af, Atten= 49%, Lag= 15.9 min
 Primary = 14.93 cfs @ 12.31 hrs, Volume= 1.860 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.63' @ 12.31 hrs Surf.Area= 28,616 sf Storage= 40,850 cf

Plug-Flow detention time= 147.8 min calculated for 1.859 af (76% of inflow)
 Center-of-Mass det. time= 62.5 min (868.1 - 805.6)

Volume	Invert	Avail.Storage	Storage Description
#1	19.00'	81,907 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.00	21,431	1,082.9	0.0	0	0	21,431
20.00	25,813	1,108.0	100.0	23,588	23,588	25,942
21.00	30,295	1,133.2	100.0	28,024	51,612	30,574
22.00	30,295	1,133.2	100.0	30,295	81,907	31,707

Device	Routing	Invert	Outlet Devices
#1	Primary	18.67'	24.0" Round Culvert L= 355.0' Ke= 0.500 Inlet / Outlet Invert= 18.67' / 16.55' S= 0.0060 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	20.00'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.30'	439.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.93 cfs @ 12.31 hrs HW=20.63' TW=17.96' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 14.93 cfs @ 4.77 fps)

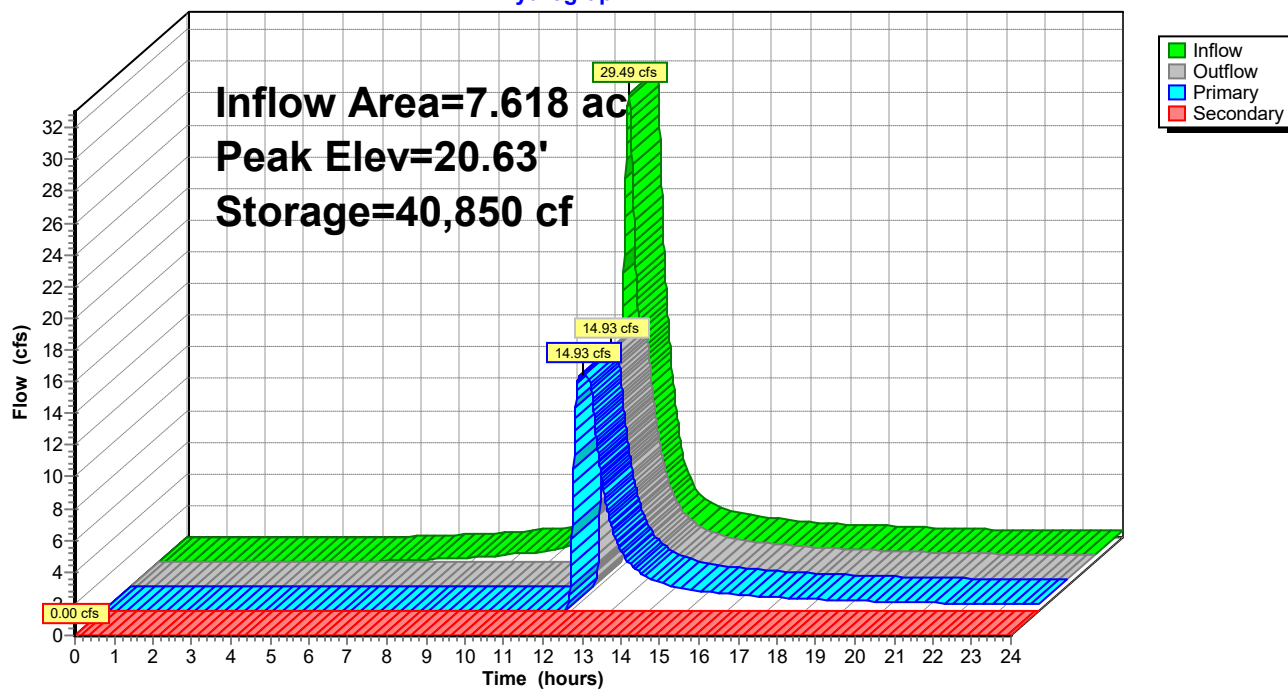
↑ **2=Sharp-Crested Rectangular Weir** (Passes 14.93 cfs of 17.69 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 26: SGW #8

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 27: DA #8

Runoff = 29.49 cfs @ 12.04 hrs, Volume= 2.434 af, Depth> 3.83"

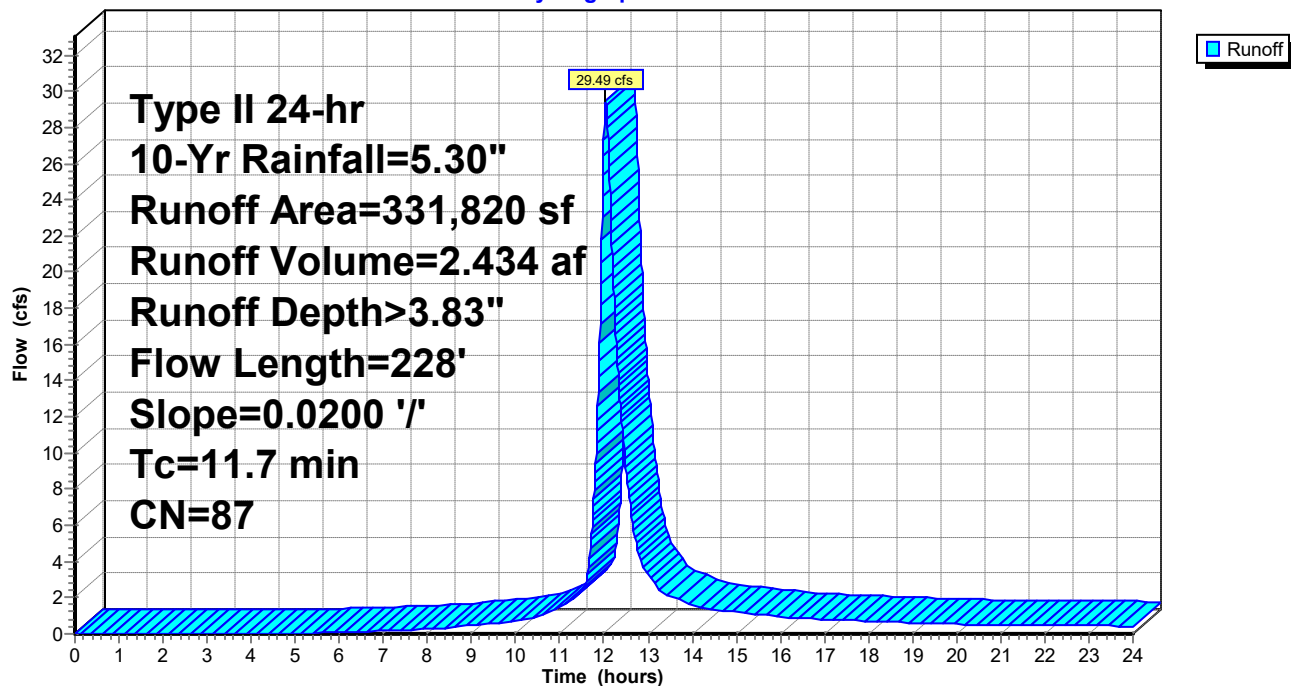
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
175,511	98	Paved parking, HSG C
156,309	74	>75% Grass cover, Good, HSG C
331,820	87	Weighted Average
156,309		47.11% Pervious Area
175,511		52.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0200	0.18		Sheet Flow, A-B Open Space
					Grass: Short n= 0.150 P2= 3.40"
2.2	128	0.0200	0.99		Shallow Concentrated Flow, B-C Open Space
					Short Grass Pasture Kv= 7.0 fps
11.7	228	Total			

Subcatchment 27: DA #8

Hydrograph



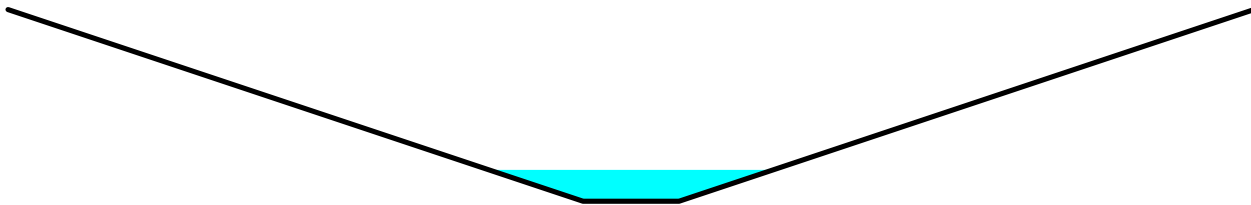
Summary for Reach 28: OXFORD Ditch - East segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 2.77" for 10-Yr event
 Inflow = 7.53 cfs @ 12.47 hrs, Volume= 0.864 af
 Outflow = 7.47 cfs @ 12.51 hrs, Volume= 0.861 af, Atten= 1%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.89 fps, Min. Travel Time= 2.4 min
 Avg. Velocity = 1.36 fps, Avg. Travel Time= 5.1 min

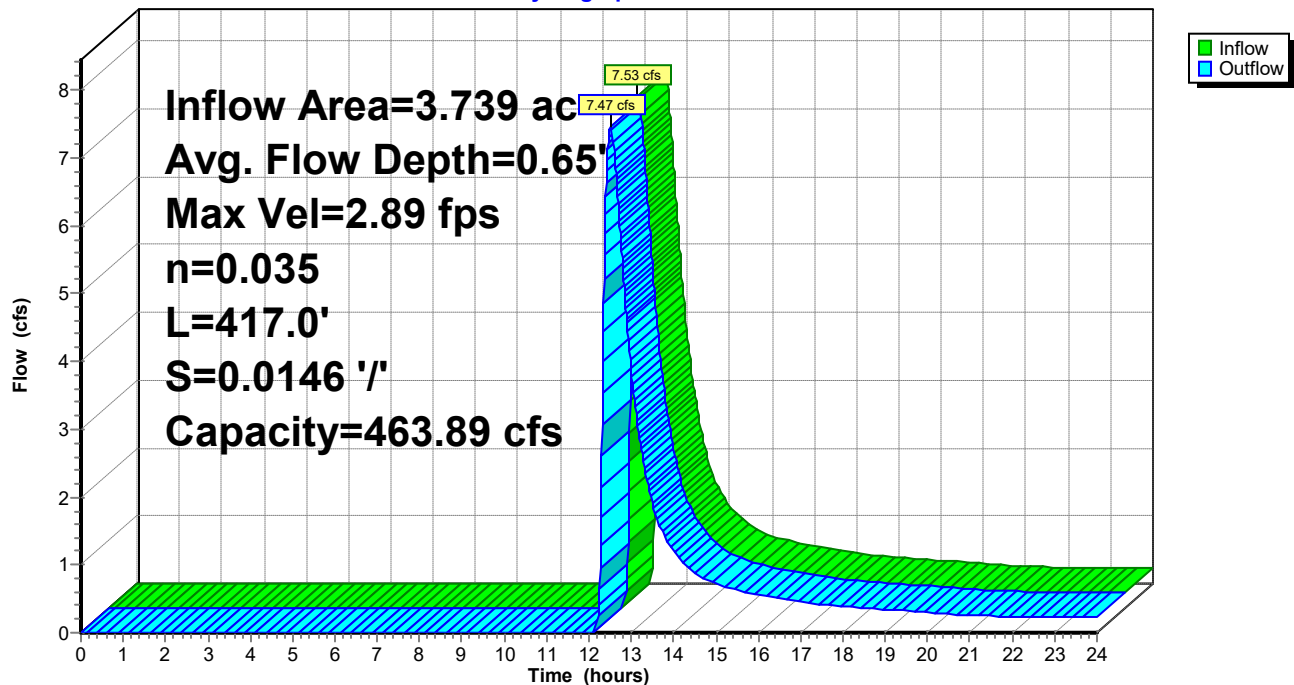
Peak Storage= 1,078 cf @ 12.51 hrs
 Average Depth at Peak Storage= 0.65'
 Bank-Full Depth= 4.00' Flow Area= 56.0 sf, Capacity= 463.89 cfs

2.00' x 4.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 26.00'
 Length= 417.0' Slope= 0.0146 '/'
 Inlet Invert= 11.19', Outlet Invert= 5.10'



Reach 28: OXFORD Ditch - East segment

Hydrograph



Summary for Pond 29: Exist Culvert

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 2.77" for 10-Yr event
 Inflow = 7.53 cfs @ 12.47 hrs, Volume= 0.864 af
 Outflow = 7.53 cfs @ 12.47 hrs, Volume= 0.864 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.53 cfs @ 12.47 hrs, Volume= 0.864 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 13.17' @ 12.47 hrs

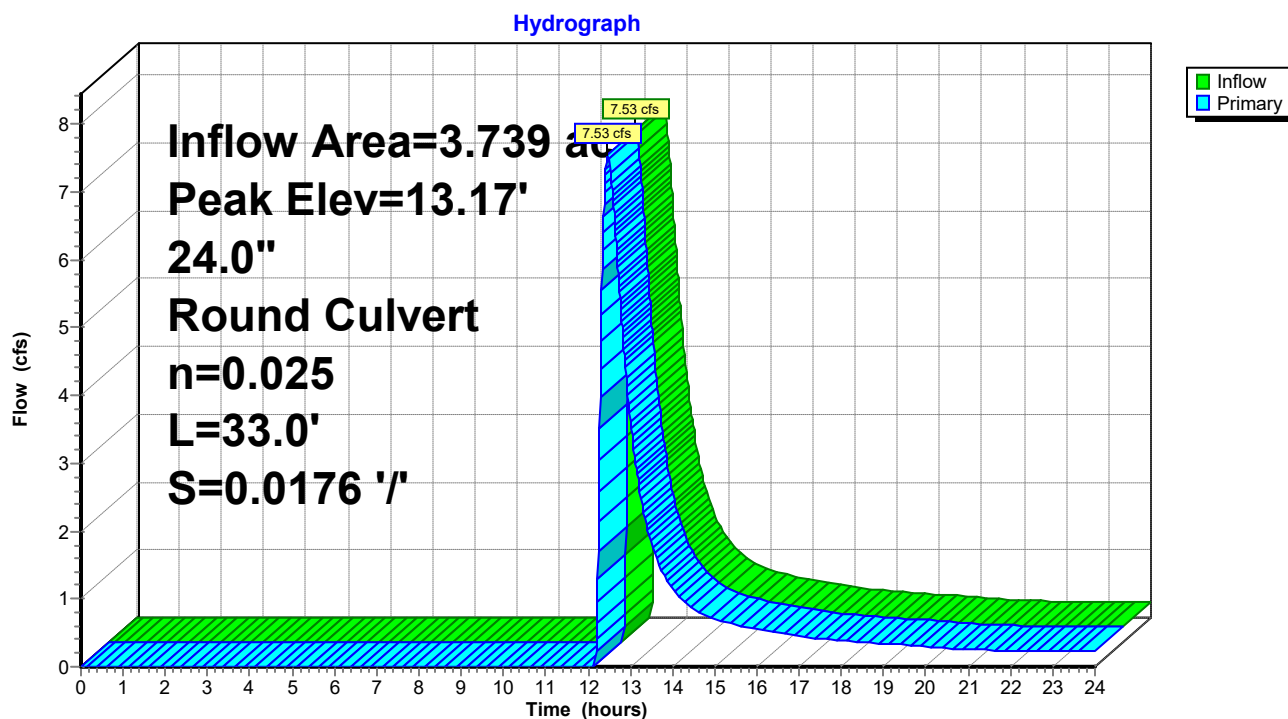
Flood Elev= 15.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	11.77'	24.0" Round Culvert L= 33.0' Ke= 0.500 Inlet / Outlet Invert= 11.77' / 11.19' S= 0.0176 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=7.53 cfs @ 12.47 hrs HW=13.17' TW=11.84' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 7.53 cfs @ 4.50 fps)

Pond 29: Exist Culvert



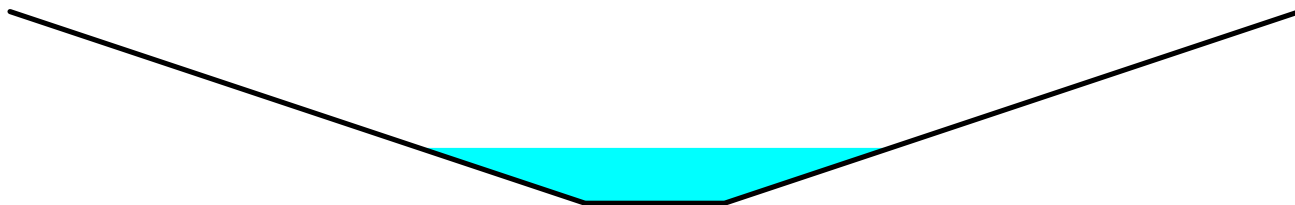
Summary for Reach 30: OXFORD Ditch - Central segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 2.78" for 10-Yr event
 Inflow = 7.62 cfs @ 12.43 hrs, Volume= 0.866 af
 Outflow = 7.53 cfs @ 12.47 hrs, Volume= 0.864 af, Atten= 1%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.16 fps, Min. Travel Time= 2.6 min
 Avg. Velocity = 1.03 fps, Avg. Travel Time= 5.4 min

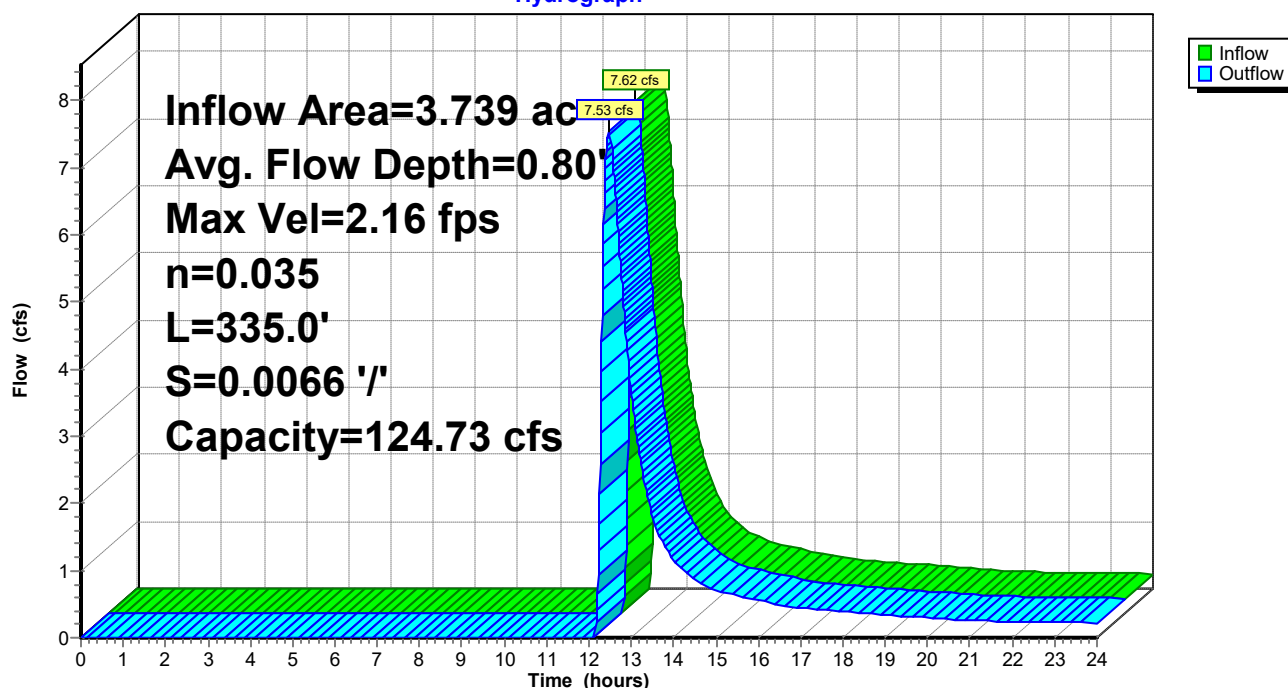
Peak Storage= 1,168 cf @ 12.47 hrs
 Average Depth at Peak Storage= 0.80'
 Bank-Full Depth= 2.75' Flow Area= 28.2 sf, Capacity= 124.73 cfs

2.00' x 2.75' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 18.50'
 Length= 335.0' Slope= 0.0066 '/'
 Inlet Invert= 13.98', Outlet Invert= 11.77'



Reach 30: OXFORD Ditch - Central segment

Hydrograph



Summary for Pond 31: Entrance Culvert

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 2.78" for 10-Yr event
 Inflow = 7.62 cfs @ 12.43 hrs, Volume= 0.866 af
 Outflow = 7.62 cfs @ 12.43 hrs, Volume= 0.866 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.62 cfs @ 12.43 hrs, Volume= 0.866 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

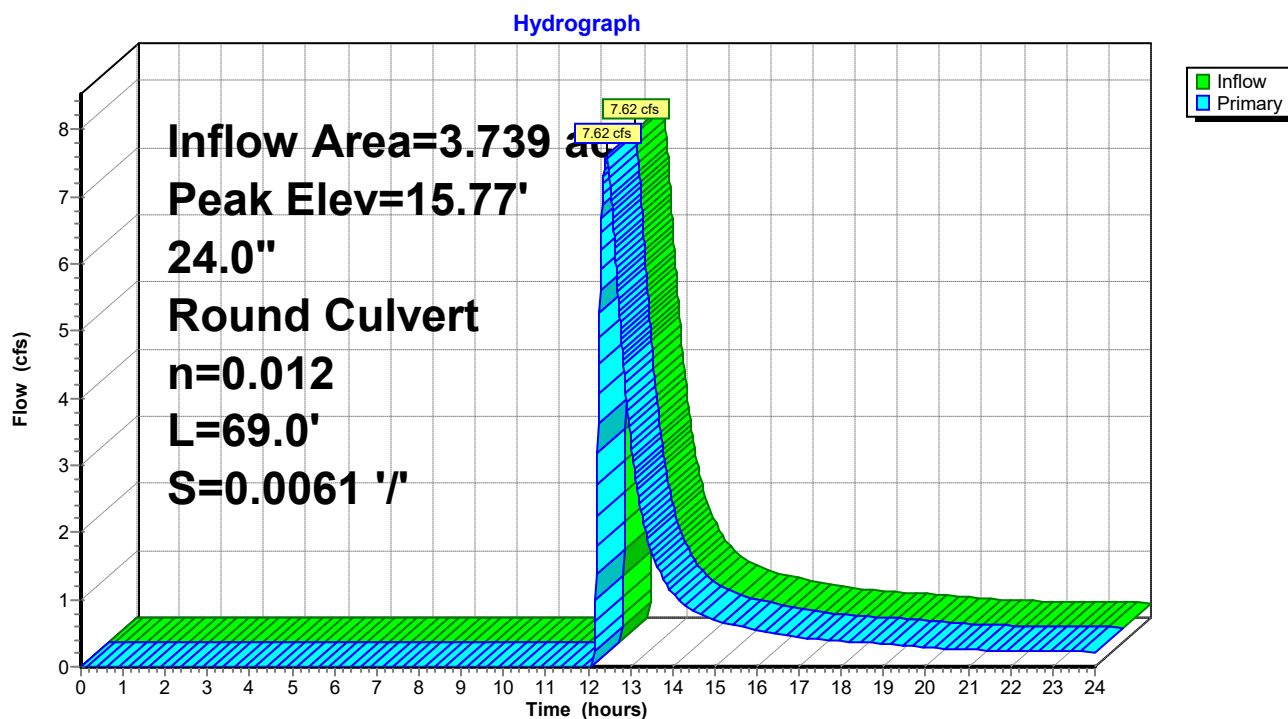
Peak Elev= 15.77' @ 12.43 hrs

Flood Elev= 18.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	24.0" Round Culvert L= 69.0' Ke= 0.500 Inlet / Outlet Invert= 14.40' / 13.98' S= 0.0061 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=7.61 cfs @ 12.43 hrs HW=15.77' TW=14.77' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 7.61 cfs @ 4.70 fps)

Pond 31: Entrance Culvert



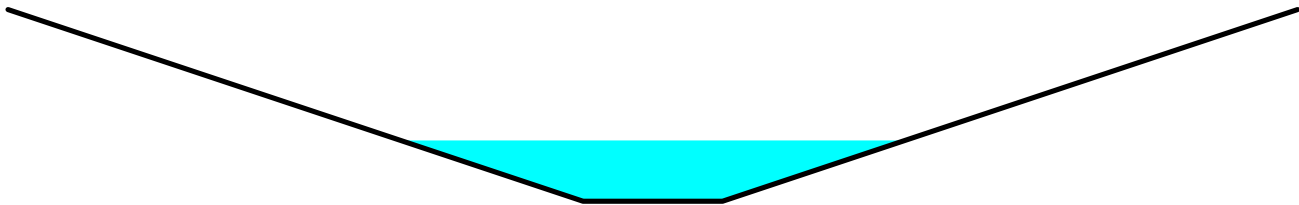
Summary for Reach 32: OXFORD Ditch - West segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 2.78" for 10-Yr event
 Inflow = 7.63 cfs @ 12.42 hrs, Volume= 0.867 af
 Outflow = 7.62 cfs @ 12.43 hrs, Volume= 0.866 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.89 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 0.90 fps, Avg. Travel Time= 2.3 min

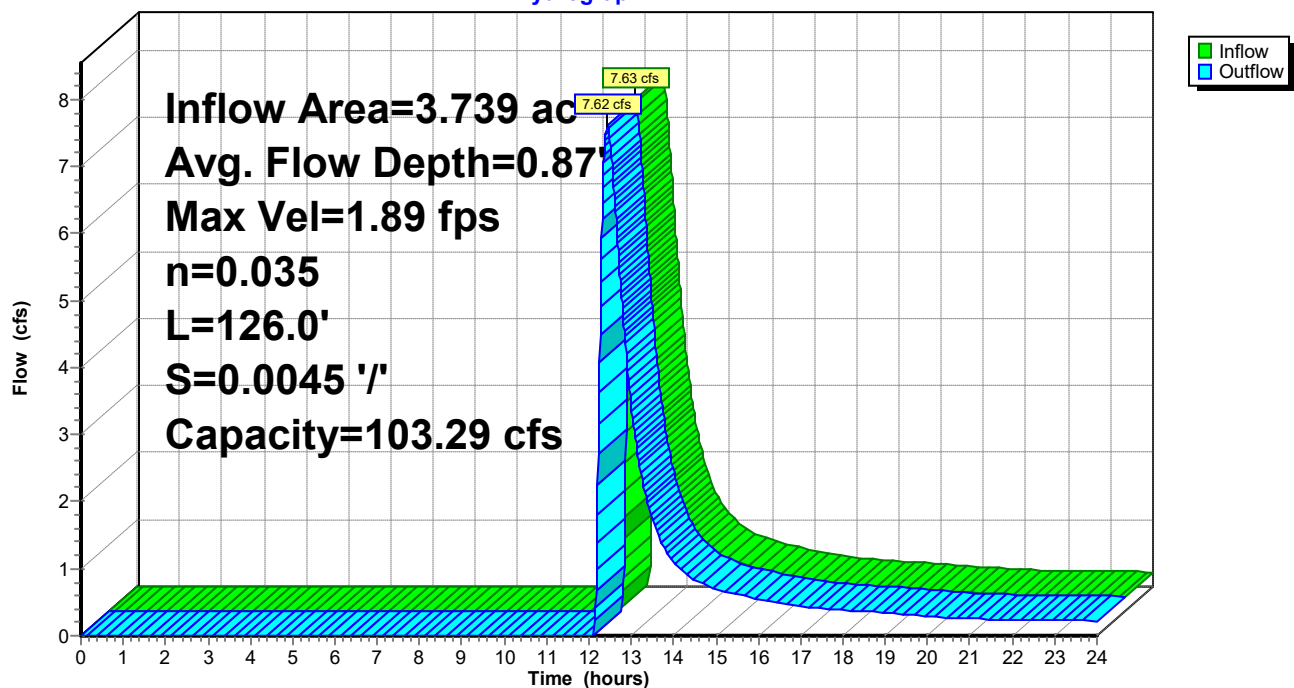
Peak Storage= 509 cf @ 12.43 hrs
 Average Depth at Peak Storage= 0.87'
 Bank-Full Depth= 2.75' Flow Area= 28.2 sf, Capacity= 103.29 cfs

2.00' x 2.75' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 18.50'
 Length= 126.0' Slope= 0.0045 '/'
 Inlet Invert= 14.97', Outlet Invert= 14.40'



Reach 32: OXFORD Ditch - West segment

Hydrograph



Summary for Reach 33: NORTH Ditch - North segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 2.79" for 10-Yr event
 Inflow = 7.81 cfs @ 12.36 hrs, Volume= 0.870 af
 Outflow = 7.63 cfs @ 12.42 hrs, Volume= 0.867 af, Atten= 2%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.21 fps, Min. Travel Time= 3.8 min
 Avg. Velocity= 0.98 fps, Avg. Travel Time= 8.5 min

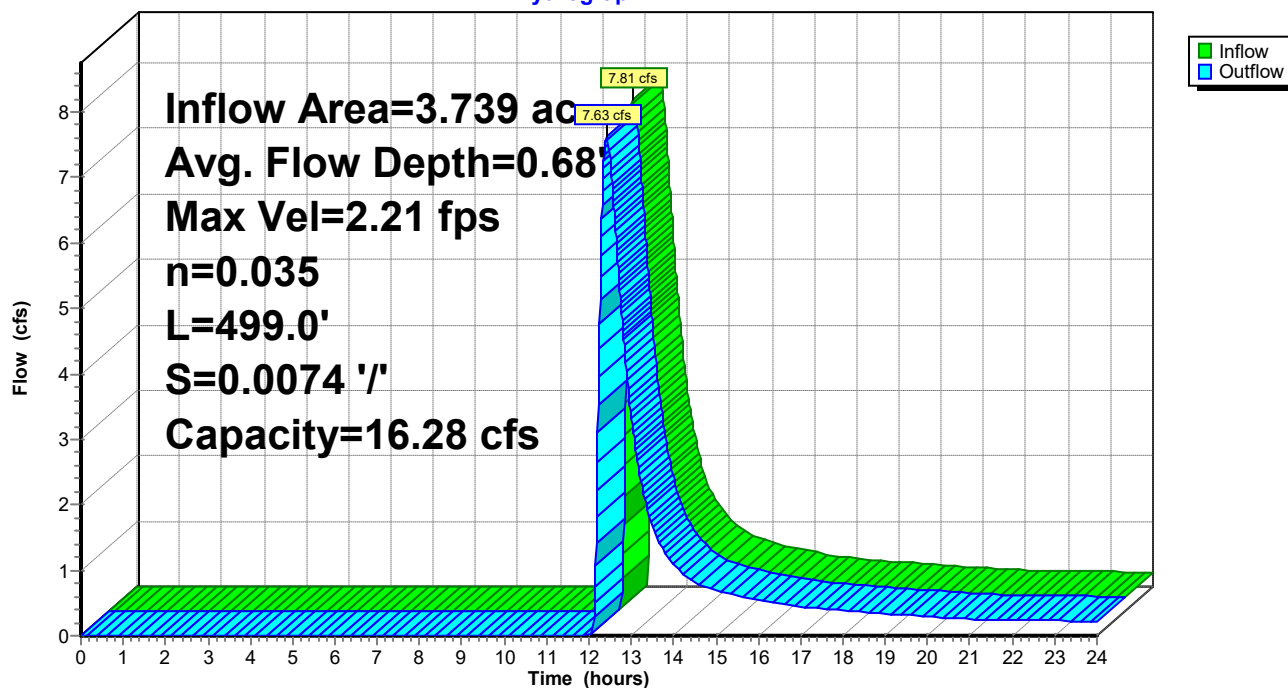
Peak Storage= 1,725 cf @ 12.42 hrs
 Average Depth at Peak Storage= 0.68'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 16.28 cfs

3.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 9.00'
 Length= 499.0' Slope= 0.0074 '/'
 Inlet Invert= 18.73', Outlet Invert= 15.06'



Reach 33: NORTH Ditch - North segment

Hydrograph



Summary for Pond 34: SGW #9

Inflow Area = 1.992 ac, 56.55% Impervious, Inflow Depth > 3.94" for 10-Yr event
 Inflow = 7.62 cfs @ 12.05 hrs, Volume= 0.654 af
 Outflow = 4.16 cfs @ 12.30 hrs, Volume= 0.428 af, Atten= 45%, Lag= 15.0 min
 Primary = 4.16 cfs @ 12.30 hrs, Volume= 0.428 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.74' @ 12.30 hrs Surf.Area= 10,742 sf Storage= 12,132 cf

Plug-Flow detention time= 177.2 min calculated for 0.428 af (66% of inflow)
 Center-of-Mass det. time= 78.5 min (881.8 - 803.2)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	26,121 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.50	8,828	369.8	0.0	0	0	8,828
20.50	10,358	394.9	100.0	9,583	9,583	10,403
21.00	11,160	407.5	100.0	5,378	14,961	11,232
22.00	11,160	407.5	100.0	11,160	26,121	11,639

Device	Routing	Invert	Outlet Devices
#1	Primary	19.17'	18.0" Round Culvert L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 19.17' / 18.80' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.50'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.00'	77.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.15 cfs @ 12.30 hrs HW=20.74' TW=19.36' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.15 cfs of 6.70 cfs potential flow)

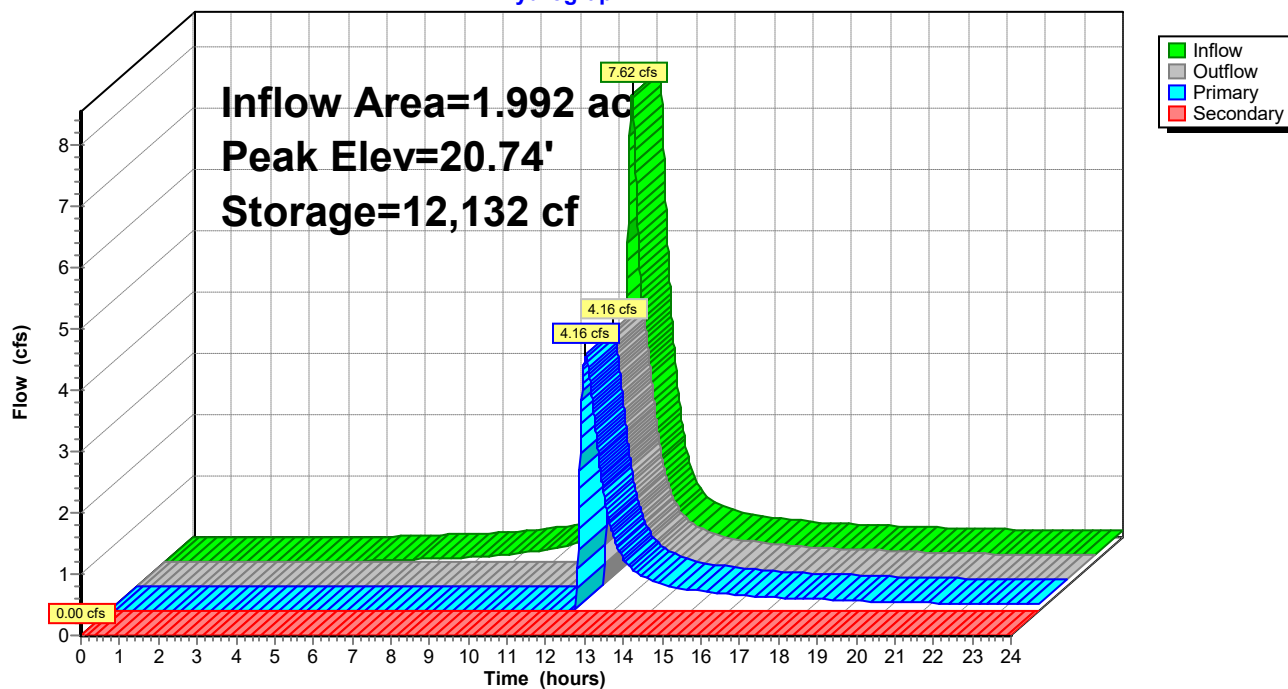
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.15 cfs @ 1.61 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.50' TW=18.73' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 34: SGW #9

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 35: DA #9

Runoff = 7.62 cfs @ 12.05 hrs, Volume= 0.654 af, Depth> 3.94"

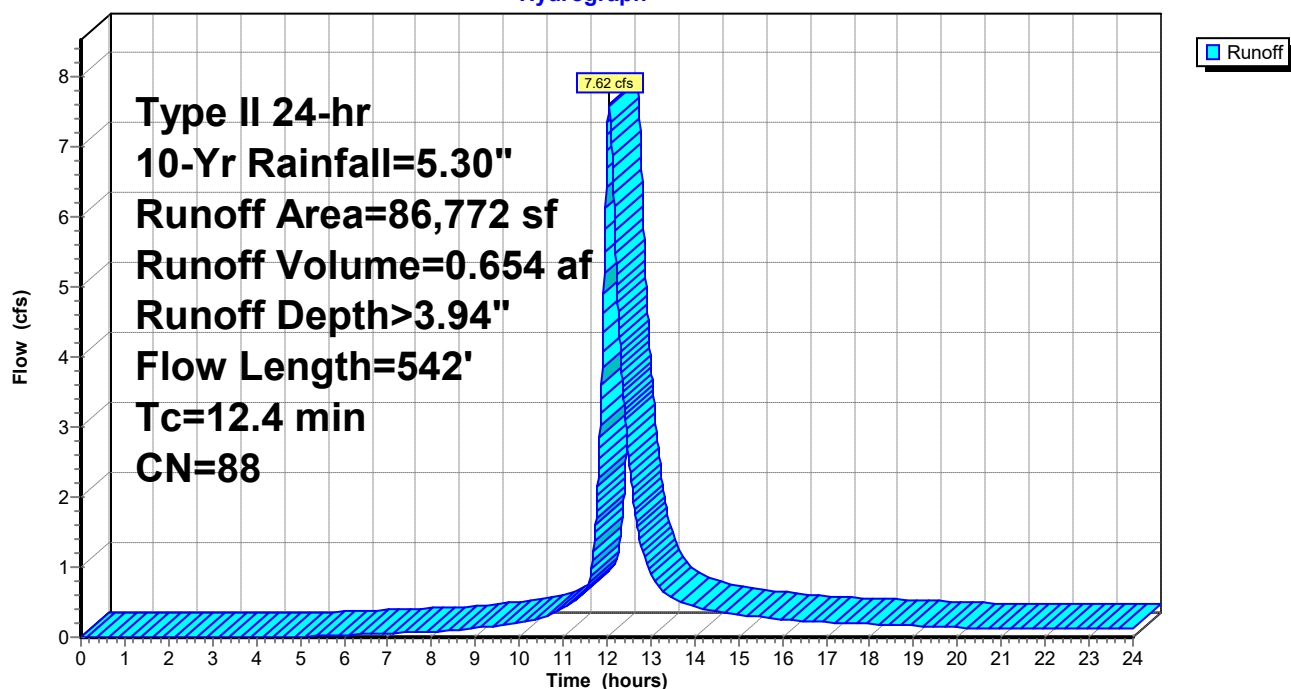
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
49,067	98	Paved parking, HSG C
37,705	74	>75% Grass cover, Good, HSG C
86,772	88	Weighted Average
37,705		43.45% Pervious Area
49,067		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	71	0.0200	0.16		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
5.0	432	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.2	39	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
12.4	542	Total			

Subcatchment 35: DA #9

Hydrograph



Summary for Reach 36: NORTH Ditch - South segment

Inflow Area = 1.747 ac, 64.85% Impervious, Inflow Depth > 3.06" for 10-Yr event
 Inflow = 4.61 cfs @ 12.25 hrs, Volume= 0.446 af
 Outflow = 3.87 cfs @ 12.41 hrs, Volume= 0.442 af, Atten= 16%, Lag= 9.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.40 fps, Min. Travel Time= 8.8 min
 Avg. Velocity= 0.66 fps, Avg. Travel Time= 18.9 min

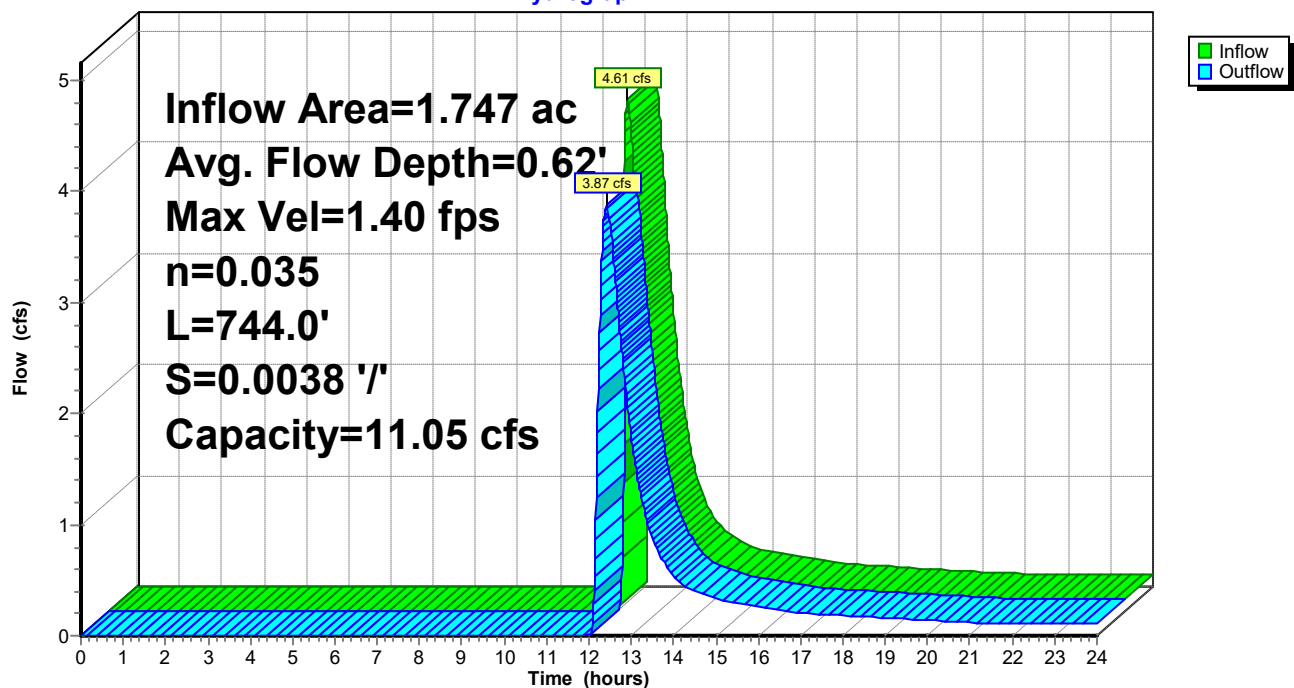
Peak Storage= 2,054 cf @ 12.41 hrs
 Average Depth at Peak Storage= 0.62'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 11.05 cfs

2.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 10.00'
 Length= 744.0' Slope= 0.0038 '/'
 Inlet Invert= 21.59', Outlet Invert= 18.73'



Reach 36: NORTH Ditch - South segment

Hydrograph



Summary for Pond 37: SGW #5

Inflow Area = 1.747 ac, 64.85% Impervious, Inflow Depth > 4.14" for 10-Yr event
 Inflow = 5.74 cfs @ 12.12 hrs, Volume= 0.603 af
 Outflow = 4.61 cfs @ 12.25 hrs, Volume= 0.446 af, Atten= 20%, Lag= 8.1 min
 Primary = 4.61 cfs @ 12.25 hrs, Volume= 0.446 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 23.36' @ 12.25 hrs Surf.Area= 7,725 sf Storage= 8,643 cf

Plug-Flow detention time= 149.1 min calculated for 0.446 af (74% of inflow)
 Center-of-Mass det. time= 61.5 min (863.8 - 802.3)

Volume	Invert	Avail.Storage	Storage Description			
#1	22.10'	18,616 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.10	6,038	319.6	0.0	0	0	6,038
23.10	7,366	344.7	100.0	6,691	6,691	7,406
23.60	8,068	357.3	100.0	3,857	10,548	8,131
24.60	8,068	357.3	100.0	8,068	18,616	8,489

Device	Routing	Invert	Outlet Devices													
#1	Primary	21.77'	18.0" Round Culvert L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 21.77' / 21.65' S= 0.0044 ' / Cc= 0.900 n= 0.012, Flow Area= 1.77 sf													
#2	Device 1	23.10'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)													
#3	Secondary	23.60'	51.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88													

Primary OutFlow Max=4.60 cfs @ 12.25 hrs HW=23.36' TW=22.11' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.60 cfs of 6.43 cfs potential flow)

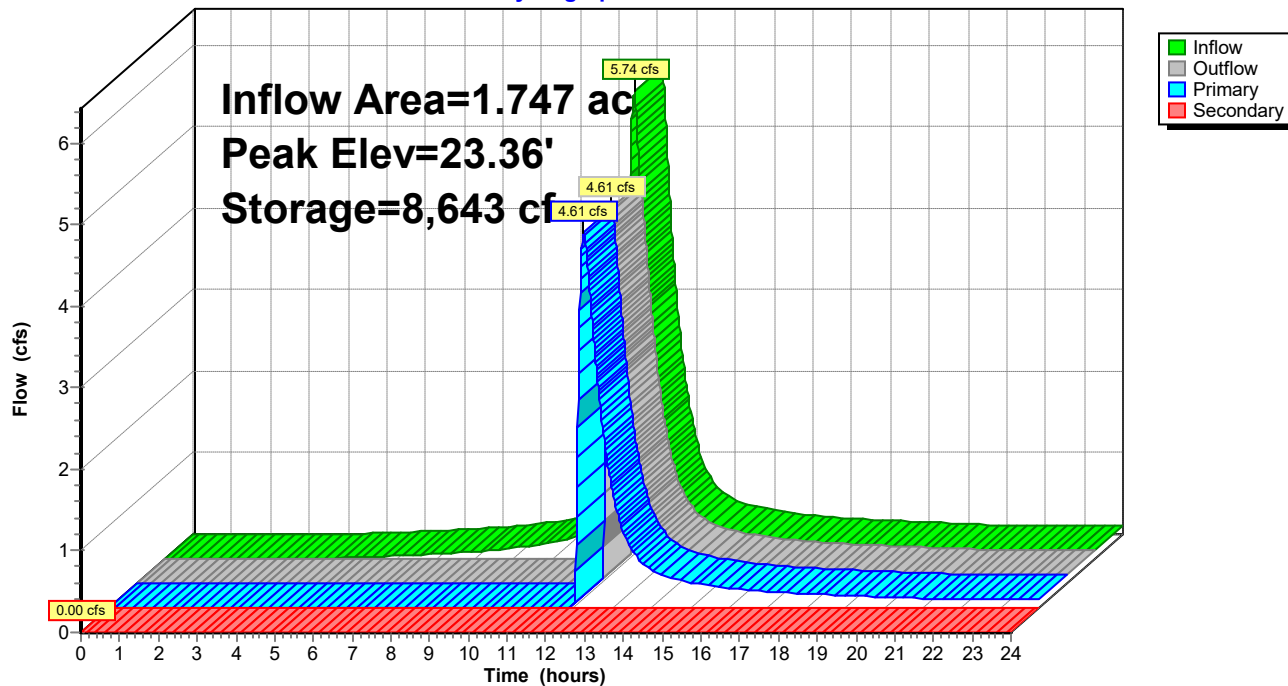
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.60 cfs @ 1.66 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.10' TW=21.59' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 37: SGW #5

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

Printed 10/5/2022

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Summary for Subcatchment 38: DA #5

Runoff = 5.74 cfs @ 12.12 hrs, Volume= 0.603 af, Depth> 4.14"

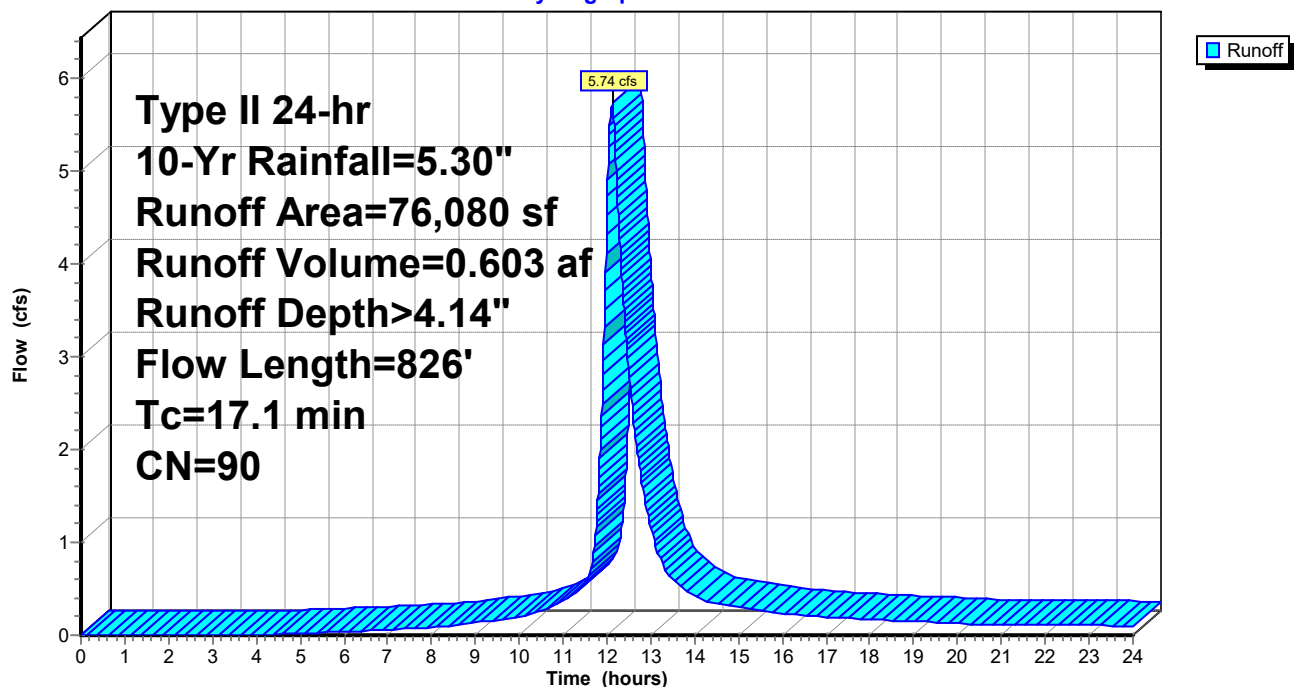
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
49,340	98	Paved parking, HSG C
26,740	74	>75% Grass cover, Good, HSG C
76,080	90	Weighted Average
26,740		35.15% Pervious Area
49,340		64.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	91	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
8.2	704	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.1	31	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
17.1	826	Total			

Subcatchment 38: DA #5

Hydrograph



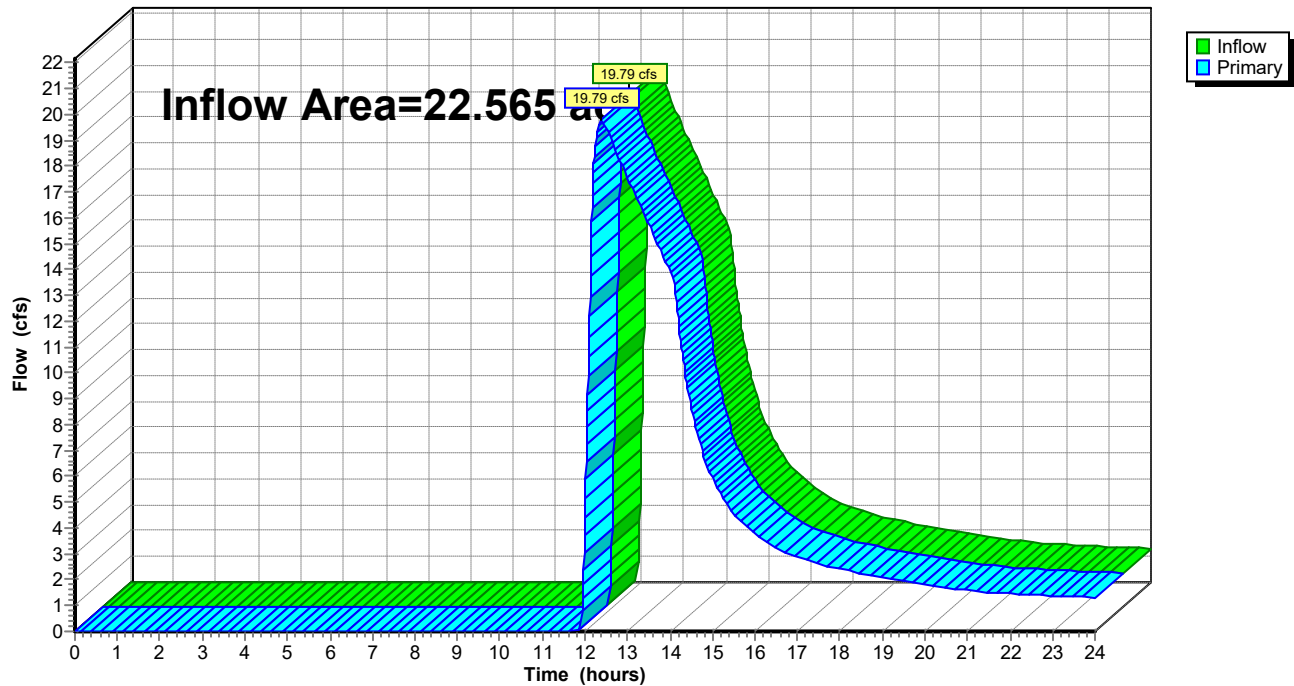
Summary for Link 39: POI-3 (POST)

Inflow Area = 22.565 ac, 46.77% Impervious, Inflow Depth > 2.78" for 10-Yr event
 Inflow = 19.79 cfs @ 12.39 hrs, Volume= 5.236 af
 Primary = 19.79 cfs @ 12.39 hrs, Volume= 5.236 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 39: POI-3 (POST)

Hydrograph



Summary for Pond 40: MH2

Inflow Area = 22.565 ac, 46.77% Impervious, Inflow Depth > 2.78" for 10-Yr event
 Inflow = 19.79 cfs @ 12.39 hrs, Volume= 5.236 af
 Outflow = 19.79 cfs @ 12.39 hrs, Volume= 5.236 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.79 cfs @ 12.39 hrs, Volume= 5.236 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 20.37' @ 12.39 hrs

Flood Elev= 22.00'

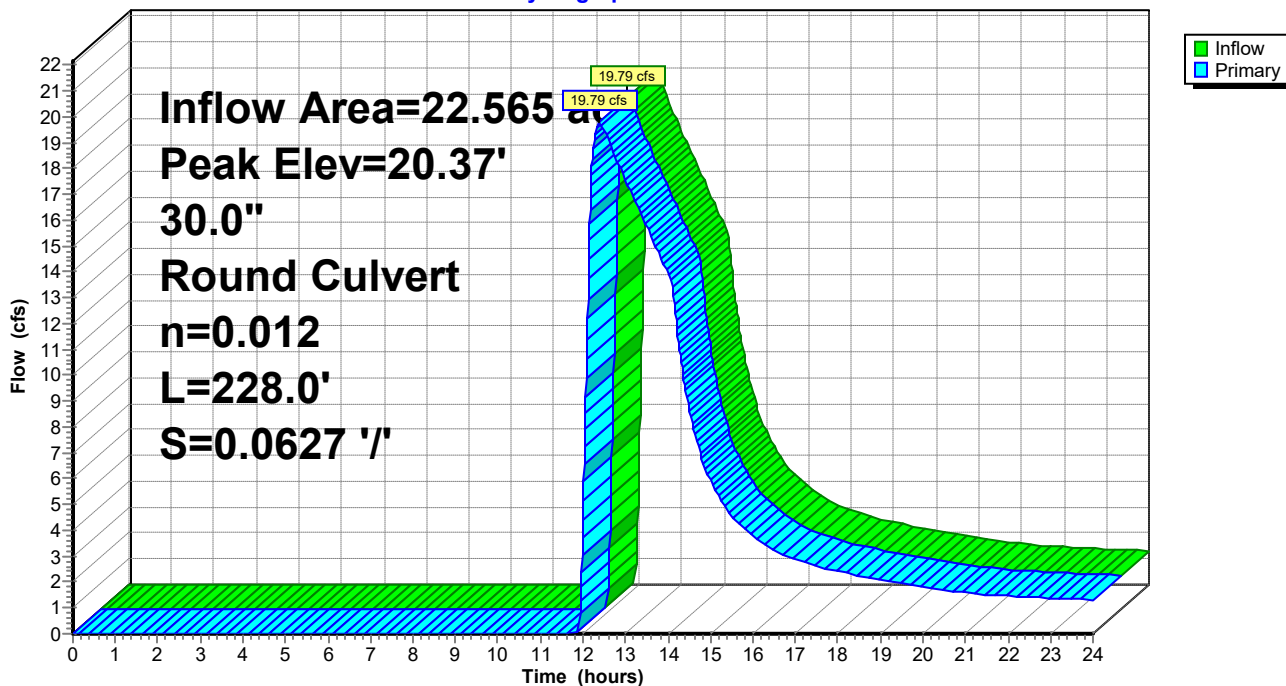
Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	30.0" Round Culvert L= 228.0' Ke= 0.500 Inlet / Outlet Invert= 18.40' / 4.10' S= 0.0627 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=19.79 cfs @ 12.39 hrs HW=20.37' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 19.79 cfs @ 4.78 fps)

Pond 40: MH2

Hydrograph



Summary for Pond 41: SGW #7

Inflow Area = 17.224 ac, 44.70% Impervious, Inflow Depth > 3.62" for 10-Yr event
 Inflow = 45.63 cfs @ 12.15 hrs, Volume= 5.194 af
 Outflow = 14.28 cfs @ 13.10 hrs, Volume= 3.963 af, Atten= 69%, Lag= 57.1 min
 Primary = 14.28 cfs @ 13.10 hrs, Volume= 3.963 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 21.11' @ 12.91 hrs Surf.Area= 54,884 sf Storage= 106,144 cf

Plug-Flow detention time= 171.4 min calculated for 3.963 af (76% of inflow)
 Center-of-Mass det. time= 86.5 min (908.8 - 822.3)

Volume	Invert	Avail.Storage	Storage Description			
#1	19.00'	215,526 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.00	45,723	1,058.3	0.0	0	0	45,723
20.00	50,007	1,083.4	100.0	47,849	47,849	50,133
21.00	54,391	1,108.6	100.0	52,184	100,033	54,663
22.00	58,875	1,133.7	100.0	56,618	156,651	59,280
23.00	58,875	1,133.7	100.0	58,875	215,526	60,414

Device	Routing	Invert	Outlet Devices	
#1	Primary	18.67'	24.0" Round Culvert L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 18.67' / 18.50' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf	
#2	Device 1	20.00'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)	
#3	Secondary	22.00'	177.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32	

Primary OutFlow Max=14.30 cfs @ 13.10 hrs HW=21.09' TW=20.19' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 14.30 cfs @ 4.55 fps)

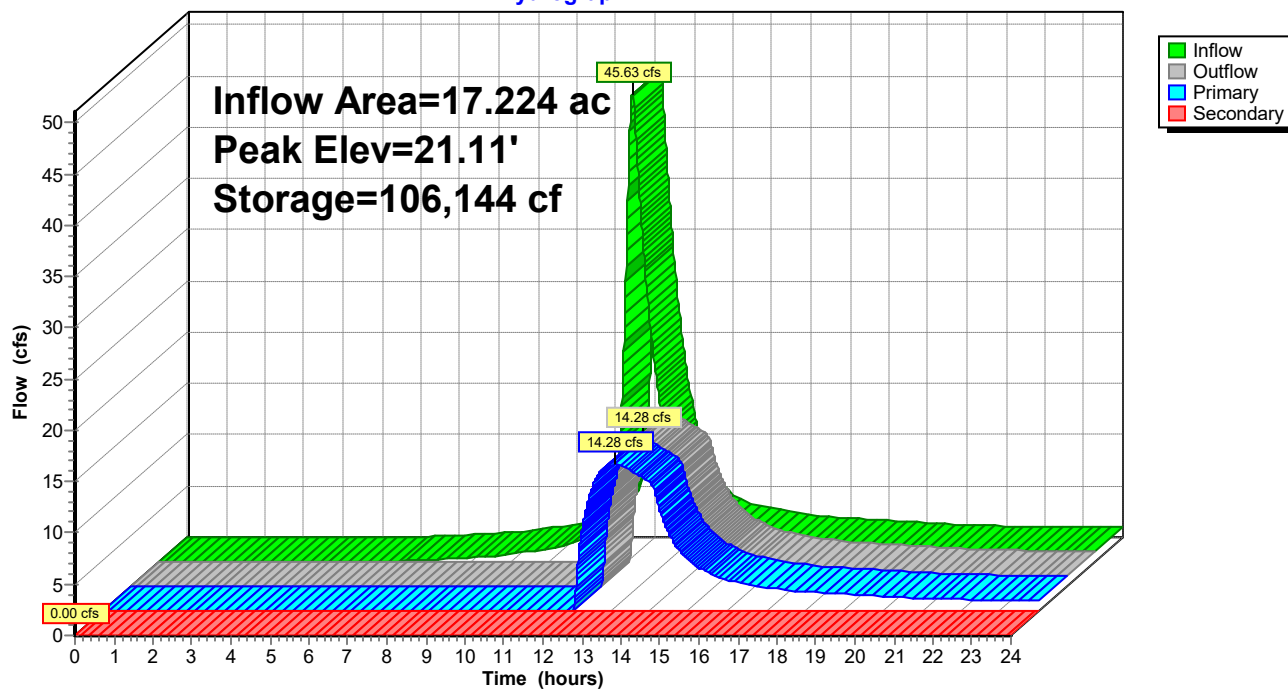
↑ **2=Sharp-Crested Rectangular Weir** (Passes 14.30 cfs of 28.79 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 41: SGW #7

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 42: DA #7

Runoff = 45.63 cfs @ 12.15 hrs, Volume= 5.194 af, Depth> 3.62"

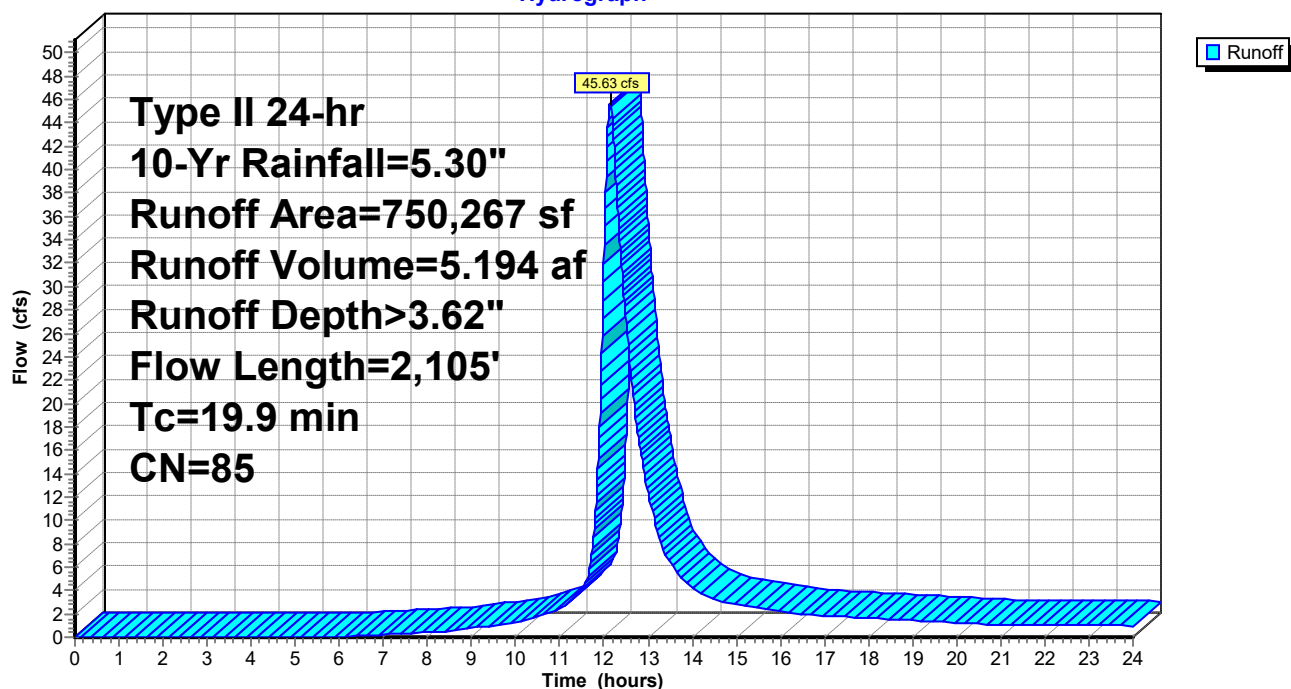
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
335,358	98	Paved parking, HSG C
414,909	74	>75% Grass cover, Good, HSG C
750,267	85	Weighted Average
414,909		55.30% Pervious Area
335,358		44.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"
2.7	236	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter Paved Kv= 20.3 fps
8.5	1,780	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
19.9	2,105	Total			

Subcatchment 42: DA #7

Hydrograph



Summary for Pond 43: SGW #6

Inflow Area = 5.341 ac, 53.44% Impervious, Inflow Depth > 3.84" for 10-Yr event
 Inflow = 24.89 cfs @ 12.01 hrs, Volume= 1.709 af
 Outflow = 12.03 cfs @ 12.20 hrs, Volume= 1.273 af, Atten= 52%, Lag= 11.6 min
 Primary = 12.03 cfs @ 12.20 hrs, Volume= 1.273 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.60' @ 12.20 hrs Surf.Area= 23,706 sf Storage= 31,093 cf

Plug-Flow detention time= 156.1 min calculated for 1.273 af (74% of inflow)
 Center-of-Mass det. time= 67.1 min (868.0 - 800.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	21.00'	67,069 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.00	15,353	1,298.4	0.0	0	0	15,353
22.00	20,596	1,323.5	100.0	17,910	17,910	20,752
23.00	25,941	1,348.6	100.0	23,217	41,128	26,253
24.00	25,941	1,348.6	100.0	25,941	67,069	27,602

Device	Routing	Invert	Outlet Devices															
#1	Primary	20.67'	24.0" Round Culvert L= 213.0' Ke= 0.500 Inlet / Outlet Invert= 20.67' / 18.50' S= 0.0102 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf															
#2	Device 1	22.00'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)															
#3	Secondary	23.10'	86.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88															

Primary OutFlow Max=12.02 cfs @ 12.20 hrs HW=22.60' TW=20.24' (Dynamic Tailwater)

↑1=Culvert (Passes 12.02 cfs of 14.66 cfs potential flow)

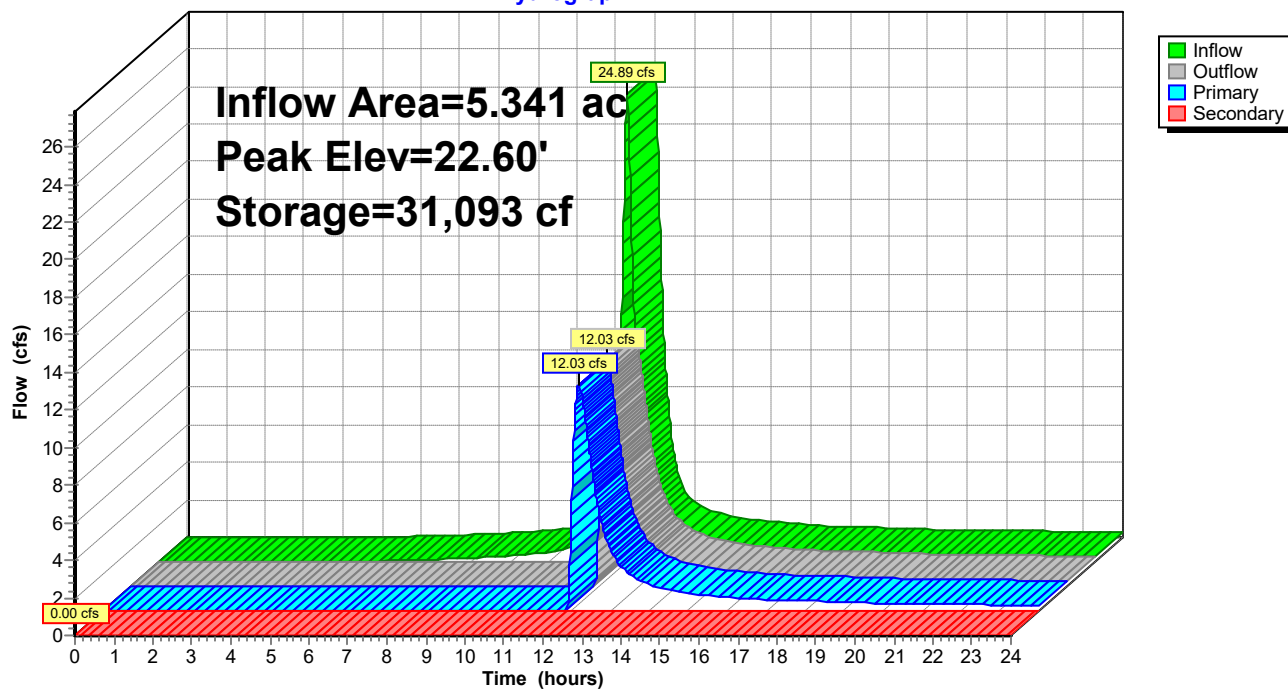
↑2=Sharp-Crested Rectangular Weir (Weir Controls 12.02 cfs @ 2.52 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=21.00' TW=0.00' (Dynamic Tailwater)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 43: SGW #6

Hydrograph



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

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Summary for Subcatchment 44: DA #6

Runoff = 24.89 cfs @ 12.01 hrs, Volume= 1.709 af, Depth> 3.84"

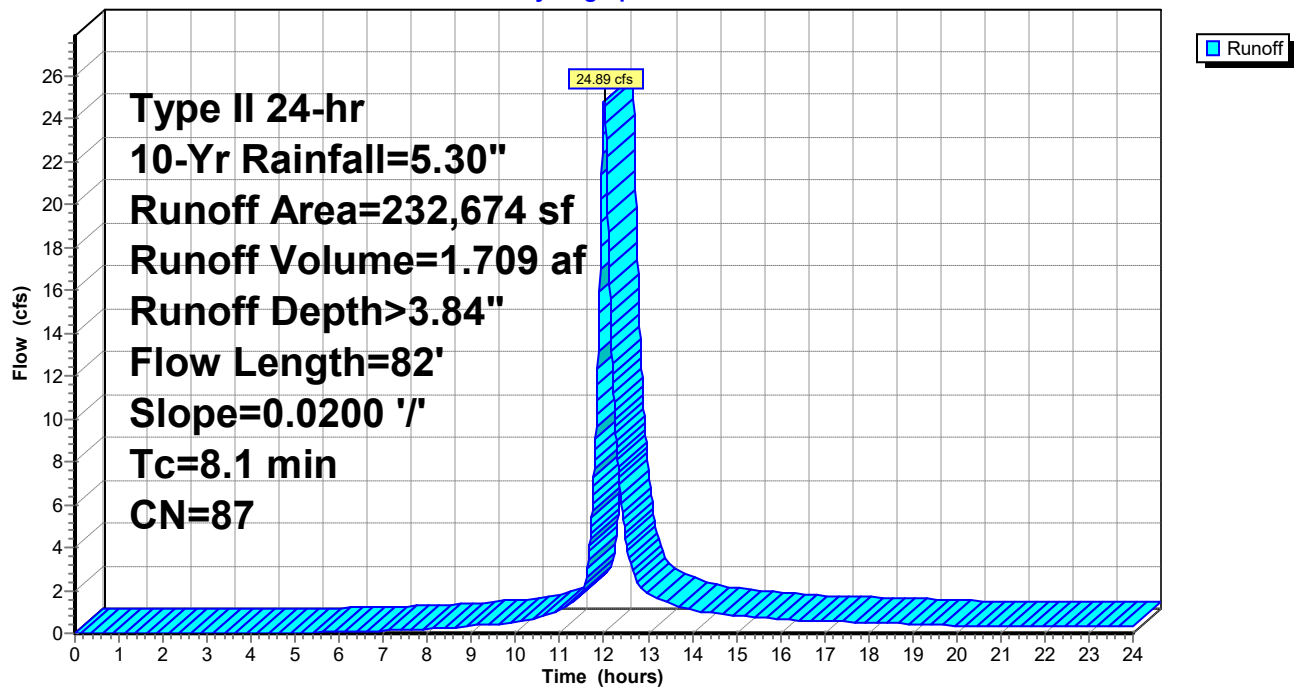
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Yr Rainfall=5.30"

Area (sf)	CN	Description
124,340	98	Paved parking, HSG C
108,334	74	>75% Grass cover, Good, HSG C
232,674	87	Weighted Average
108,334		46.56% Pervious Area
124,340		53.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	82	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"

Subcatchment 44: DA #6

Hydrograph



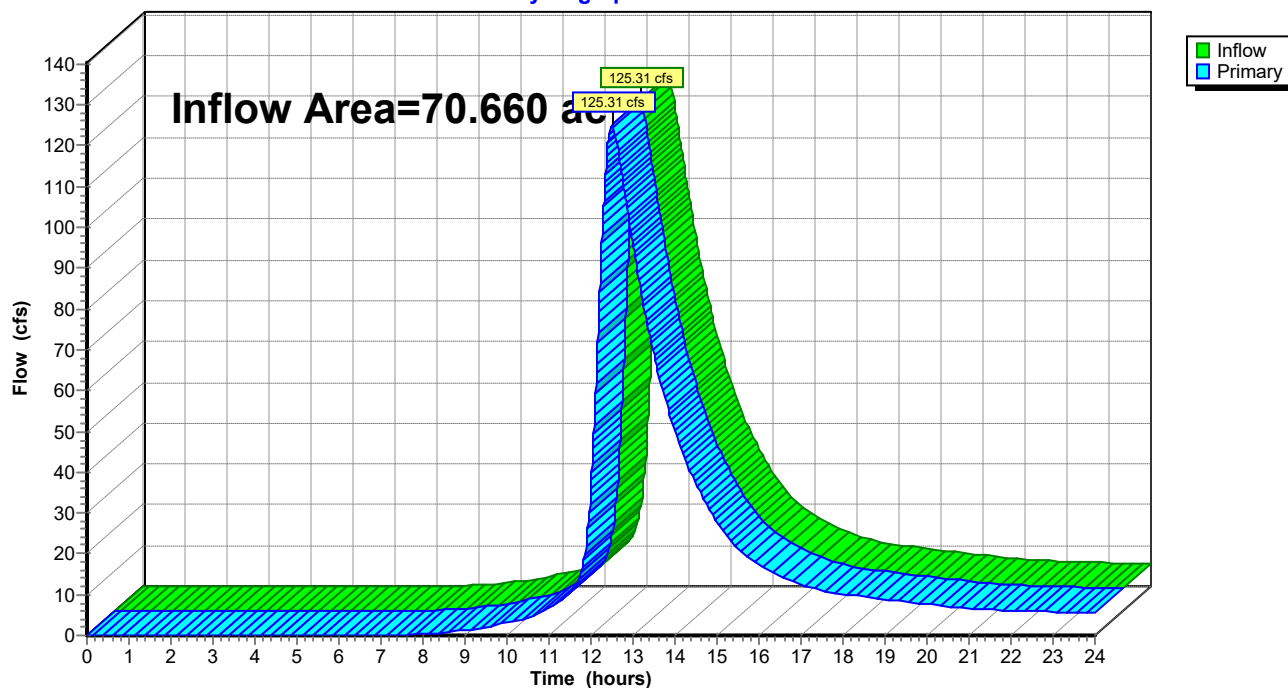
Summary for Link 1: POI-1 (PRE)

Inflow Area = 70.660 ac, 0.00% Impervious, Inflow Depth > 4.48" for 100-Yr event
 Inflow = 125.31 cfs @ 12.51 hrs, Volume= 26.351 af
 Primary = 125.31 cfs @ 12.51 hrs, Volume= 26.351 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1: POI-1 (PRE)

Hydrograph



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

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Summary for Subcatchment 2: DA #1 (PRE)

Runoff = 125.31 cfs @ 12.51 hrs, Volume= 26.351 af, Depth> 4.48"

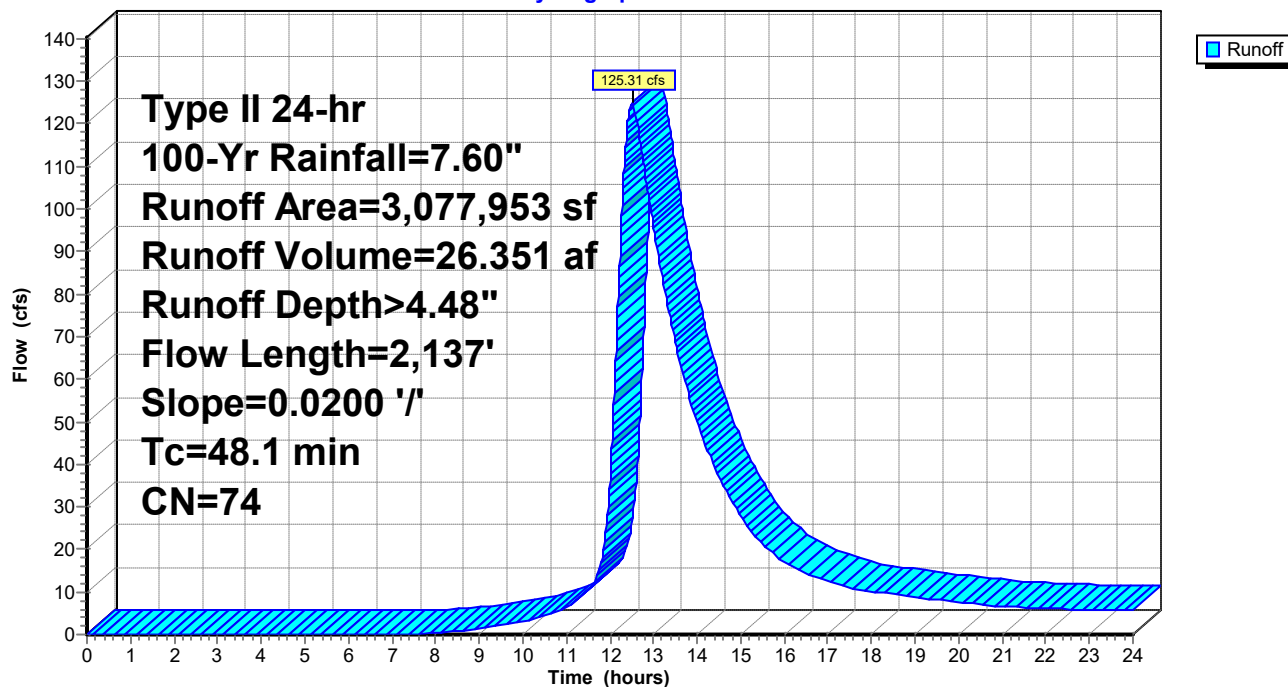
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
3,077,953	74	>75% Grass cover, Good, HSG C
3,077,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.40"
34.3	2,037	0.0200	0.99		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
48.1	2,137	Total			

Subcatchment 2: DA #1 (PRE)

Hydrograph



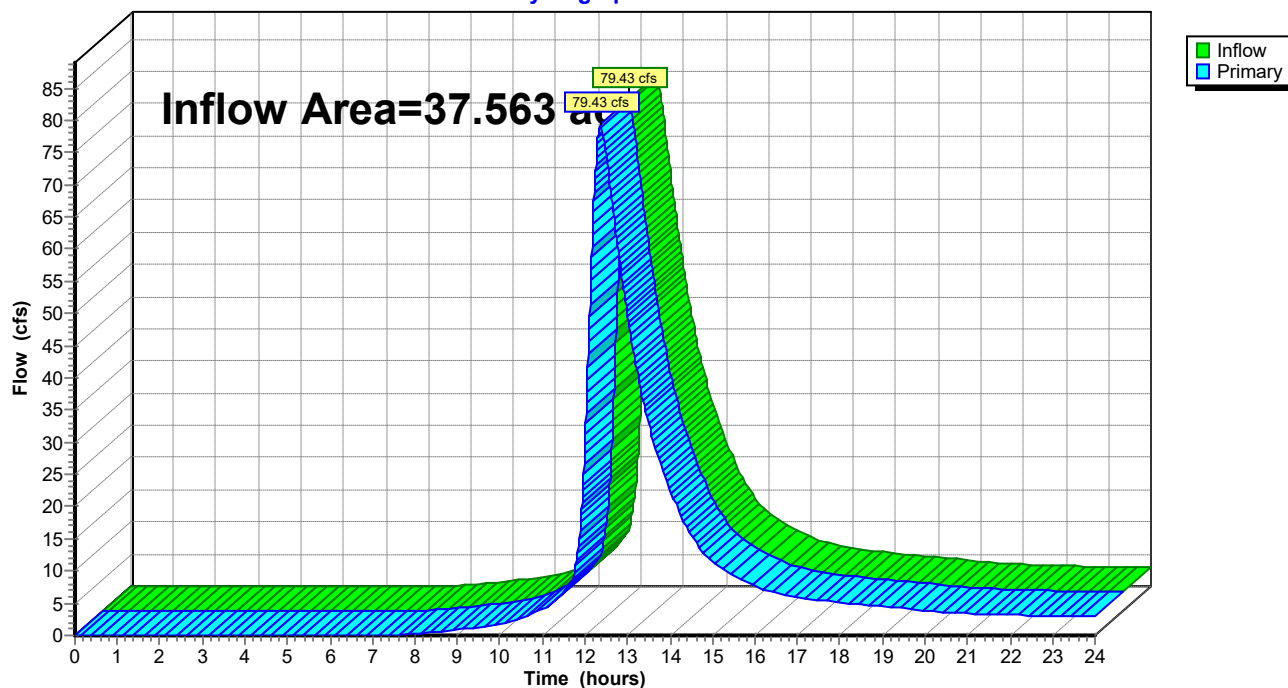
Summary for Link 3: POI-2 (PRE)

Inflow Area = 37.563 ac, 0.00% Impervious, Inflow Depth > 4.50" for 100-Yr event
 Inflow = 79.43 cfs @ 12.38 hrs, Volume= 14.073 af
 Primary = 79.43 cfs @ 12.38 hrs, Volume= 14.073 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 3: POI-2 (PRE)

Hydrograph



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

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Summary for Subcatchment 4: DA #2 (PRE)

Runoff = 79.43 cfs @ 12.38 hrs, Volume= 14.073 af, Depth> 4.50"

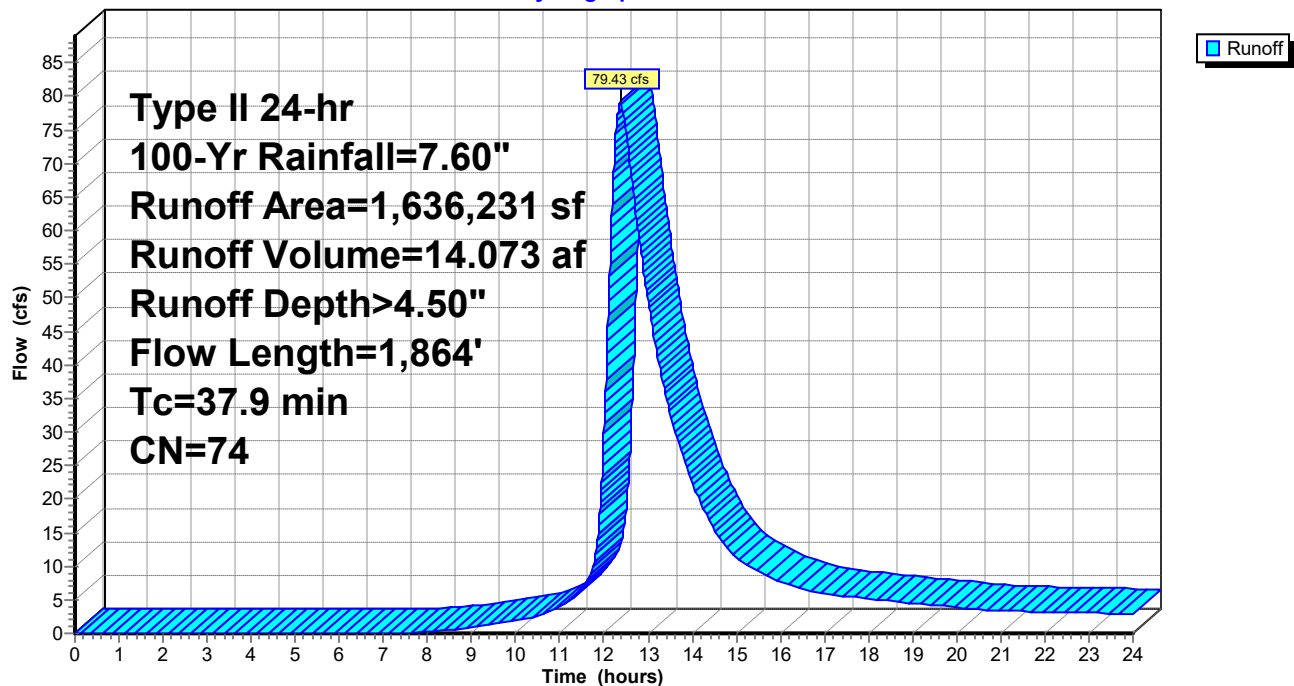
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
1,636,231	74	>75% Grass cover, Good, HSG C
1,636,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.40"
10.5	482	0.0120	0.77		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
13.6	1,282	0.0110	1.57		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
37.9	1,864	Total			

Subcatchment 4: DA #2 (PRE)

Hydrograph



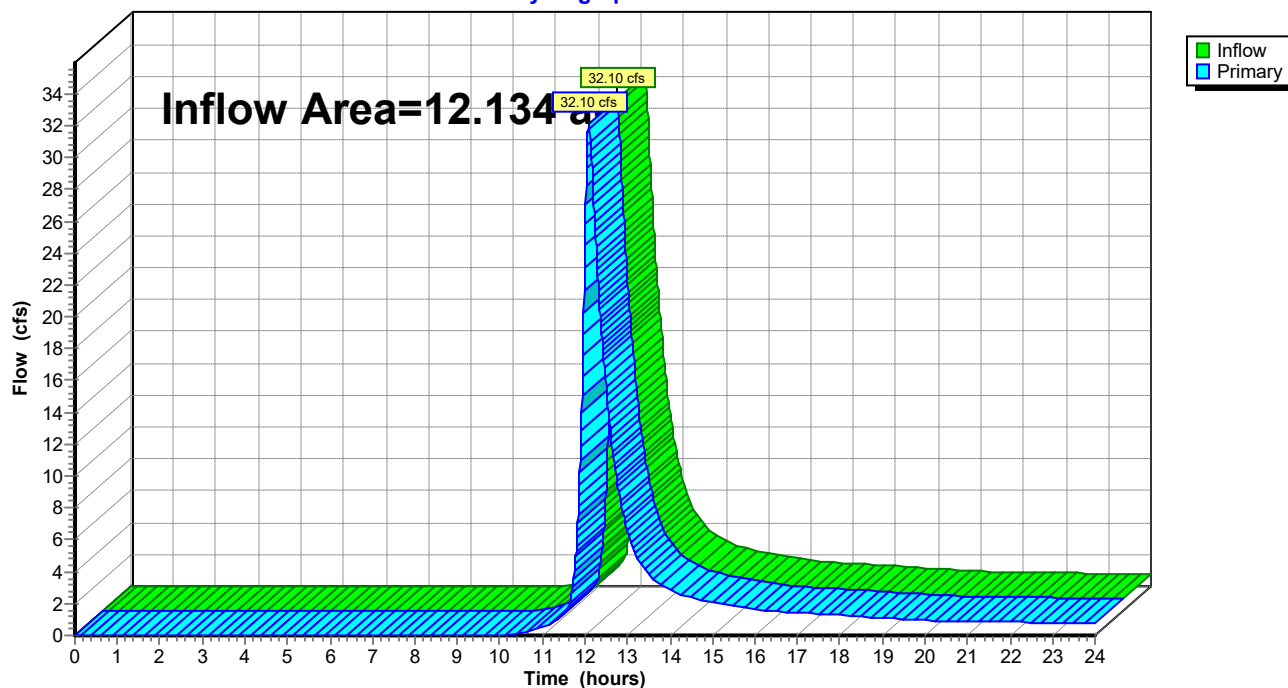
Summary for Link 5: POI-3 (PRE)

Inflow Area = 12.134 ac, 0.00% Impervious, Inflow Depth > 3.12" for 100-Yr event
 Inflow = 32.10 cfs @ 12.10 hrs, Volume= 3.153 af
 Primary = 32.10 cfs @ 12.10 hrs, Volume= 3.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 5: POI-3 (PRE)

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 6: DA #3 (PRE)

Runoff = 32.10 cfs @ 12.10 hrs, Volume= 3.153 af, Depth> 3.12"

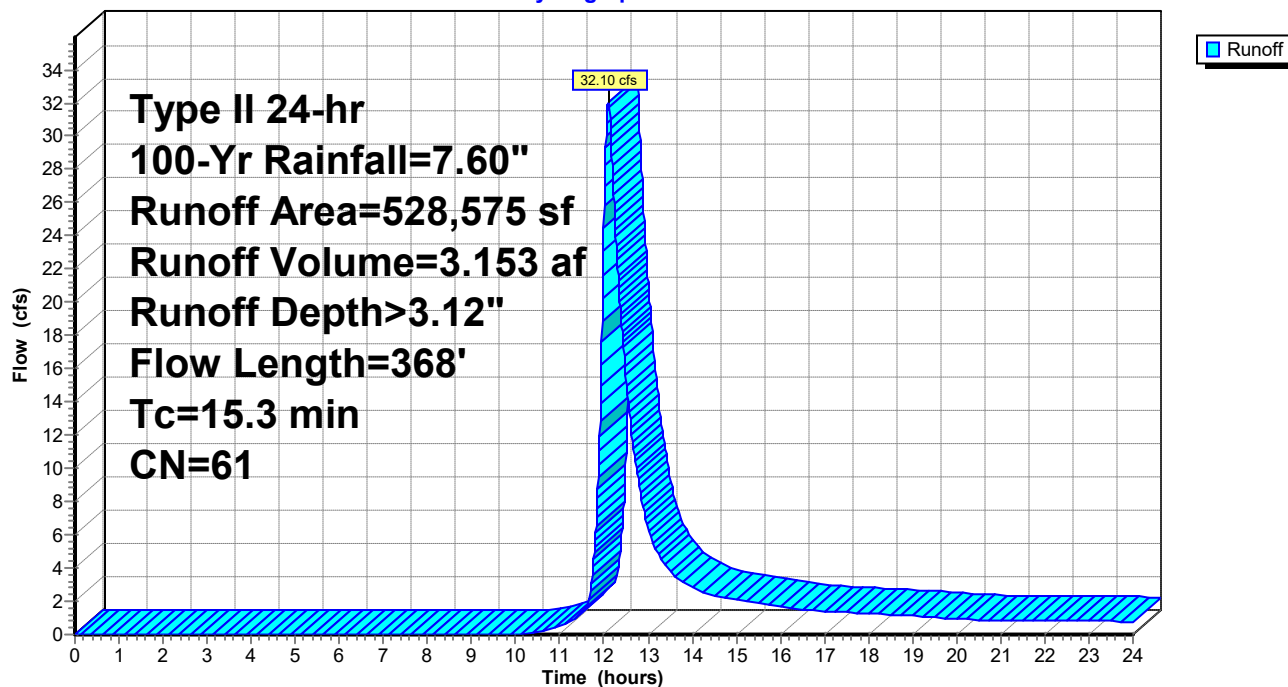
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
528,575	61	>75% Grass cover, Good, HSG B
528,575		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0230	0.13		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.40"
2.2	268	0.0810	1.99		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
15.3	368	Total			

Subcatchment 6: DA #3 (PRE)

Hydrograph



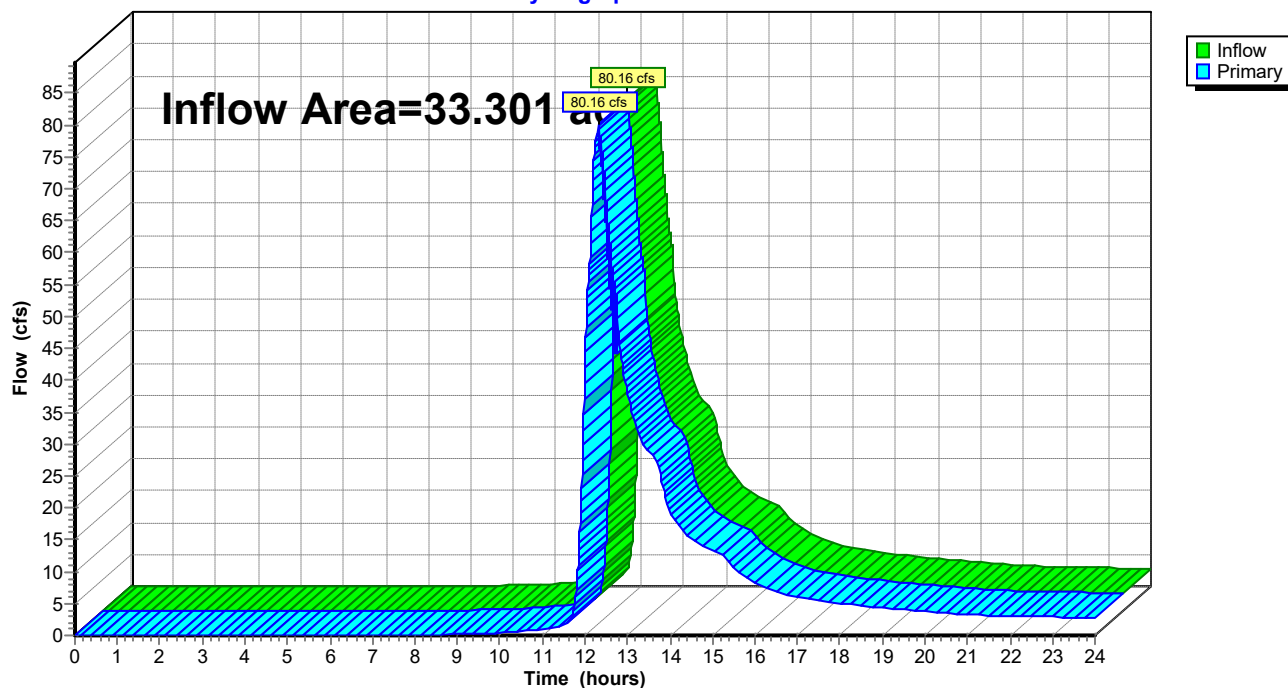
Summary for Link 7: POI-1 (POST)

Inflow Area = 33.301 ac, 35.63% Impervious, Inflow Depth > 4.59" for 100-Yr event
 Inflow = 80.16 cfs @ 12.31 hrs, Volume= 12.738 af
 Primary = 80.16 cfs @ 12.31 hrs, Volume= 12.738 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 7: POI-1 (POST)

Hydrograph



Summary for Pond 8: MH1

Inflow Area = 14.142 ac, 39.85% Impervious, Inflow Depth > 4.12" for 100-Yr event
 Inflow = 20.61 cfs @ 12.53 hrs, Volume= 4.857 af
 Outflow = 20.61 cfs @ 12.53 hrs, Volume= 4.857 af, Atten= 0%, Lag= 0.0 min
 Primary = 20.61 cfs @ 12.53 hrs, Volume= 4.857 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

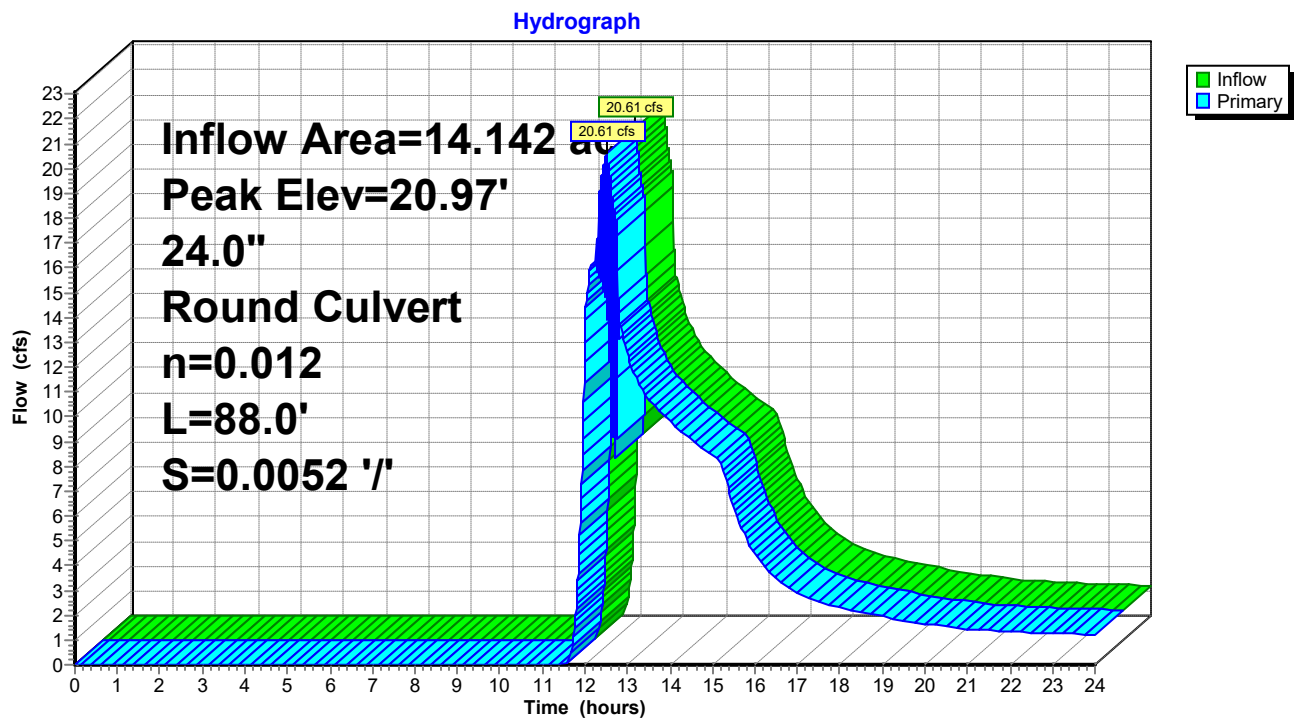
Peak Elev= 20.97' @ 12.53 hrs

Flood Elev= 20.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	17.80'	24.0" Round Culvert L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 17.80' / 17.34' S= 0.0052 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=20.48 cfs @ 12.53 hrs HW=20.95' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 20.48 cfs @ 6.52 fps)

Pond 8: MH1



Summary for Pond 9: SGW #1

Inflow Area = 4.827 ac, 41.12% Impervious, Inflow Depth > 5.68" for 100-Yr event
 Inflow = 25.30 cfs @ 12.06 hrs, Volume= 2.287 af
 Outflow = 20.48 cfs @ 12.18 hrs, Volume= 1.976 af, Atten= 19%, Lag= 7.1 min
 Primary = 16.16 cfs @ 12.18 hrs, Volume= 1.915 af
 Secondary = 4.32 cfs @ 12.18 hrs, Volume= 0.061 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 27.31' @ 12.18 hrs Surf.Area= 15,133 sf Storage= 24,599 cf

Plug-Flow detention time= 102.2 min calculated for 1.976 af (86% of inflow)
 Center-of-Mass det. time= 40.5 min (844.3 - 803.9)

Volume	Invert	Avail.Storage	Storage Description
#1	25.50'	38,053 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.50	11,885	456.3	0.0	0	0	11,885
26.50	13,760	481.5	100.0	12,811	12,811	13,823
27.20	15,133	499.1	100.0	10,109	22,920	15,239
28.20	15,133	499.1	100.0	15,133	38,053	15,738

Device	Routing	Invert	Outlet Devices
#1	Primary	25.17'	24.0" Round Culvert L= 936.0' Ke= 0.500 Inlet / Outlet Invert= 25.17' / 17.90' S= 0.0078 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	26.50'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	27.20'	46.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=16.16 cfs @ 12.18 hrs HW=27.31' TW=20.16' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 16.16 cfs @ 5.14 fps)

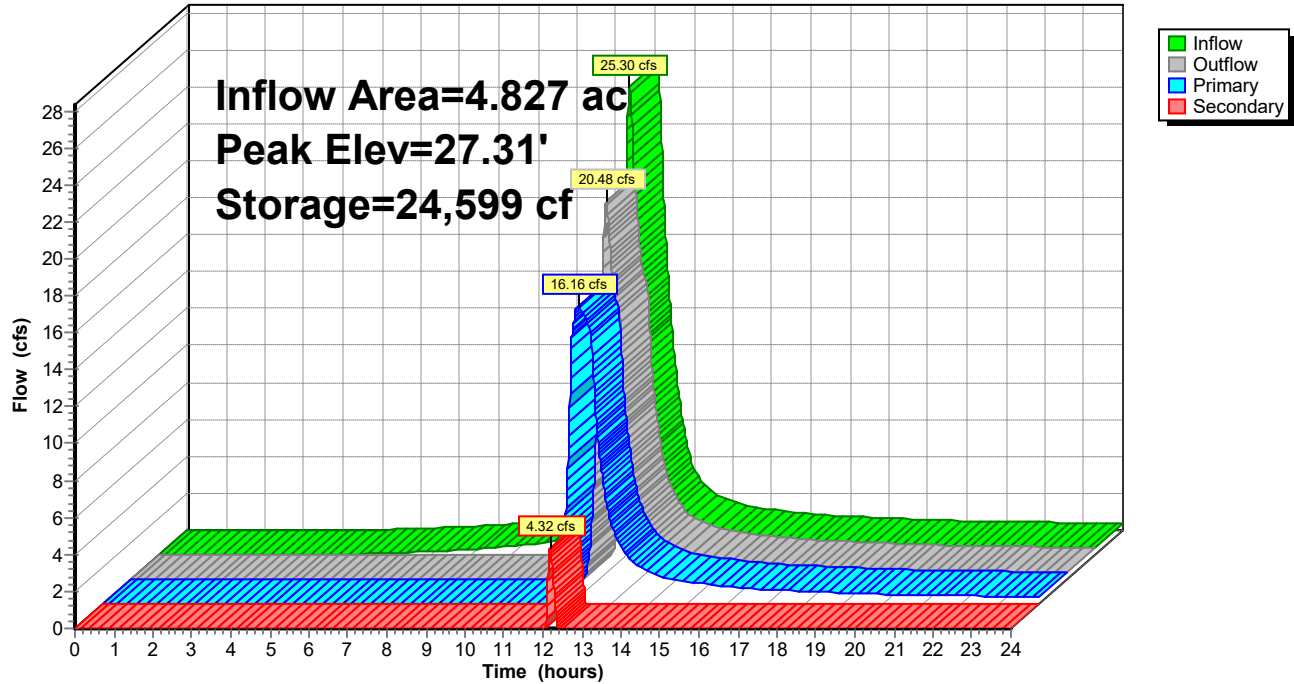
↑ **2=Sharp-Crested Rectangular Weir** (Passes 16.16 cfs of 25.55 cfs potential flow)

Secondary OutFlow Max=4.32 cfs @ 12.18 hrs HW=27.31' TW=19.88' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 4.32 cfs @ 0.85 fps)

Pond 9: SGW #1

Hydrograph



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

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Summary for Subcatchment 10: DA #1

Runoff = 25.30 cfs @ 12.06 hrs, Volume= 2.287 af, Depth> 5.68"

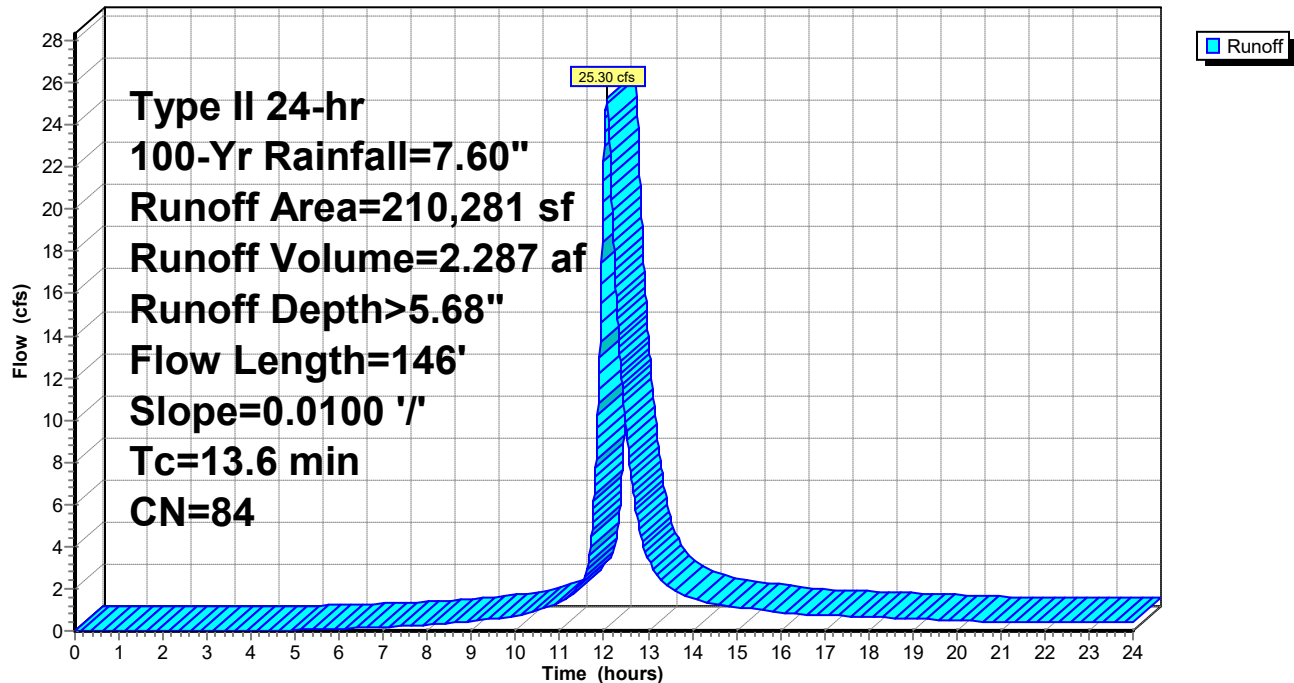
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
86,472	98	Paved parking, HSG C
123,809	74	>75% Grass cover, Good, HSG C
210,281	84	Weighted Average
123,809		58.88% Pervious Area
86,472		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0100	0.13		Sheet Flow, Swale
					Grass: Short n= 0.150 P2= 3.40"
1.1	46	0.0100	0.70		Shallow Concentrated Flow, Swale
					Short Grass Pasture Kv= 7.0 fps
13.6	146	Total			

Subcatchment 10: DA #1

Hydrograph



Summary for Pond 11: SGW #2

Inflow Area = 9.315 ac, 39.20% Impervious, Inflow Depth > 5.64" for 100-Yr event
 Inflow = 46.31 cfs @ 12.12 hrs, Volume= 4.381 af
 Outflow = 13.18 cfs @ 12.73 hrs, Volume= 3.069 af, Atten= 72%, Lag= 36.4 min
 Primary = 9.83 cfs @ 12.73 hrs, Volume= 2.942 af
 Secondary = 3.69 cfs @ 12.79 hrs, Volume= 0.127 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.60' @ 12.79 hrs Surf.Area= 58,000 sf Storage= 113,416 cf

Plug-Flow detention time= 217.7 min calculated for 3.067 af (70% of inflow)
 Center-of-Mass det. time= 125.1 min (932.6 - 807.5)

Volume	Invert	Avail.Storage	Storage Description
#1	18.50'	165,786 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
18.50	49,862	992.1	0.0	0	0	49,862
19.50	53,881	1,017.3	100.0	51,859	51,859	54,015
20.50	58,000	1,042.4	100.0	55,928	107,786	58,256
21.50	58,000	1,042.4	100.0	58,000	165,786	59,298

Device	Routing	Invert	Outlet Devices
#1	Primary	18.17'	18.0" Round Culvert L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 18.17' / 17.90' S= 0.0123 ' S= 0.0123 ' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	19.50'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	20.50'	48.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.01 cfs @ 12.73 hrs HW=20.59' TW=20.54' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 2.01 cfs @ 1.14 fps)

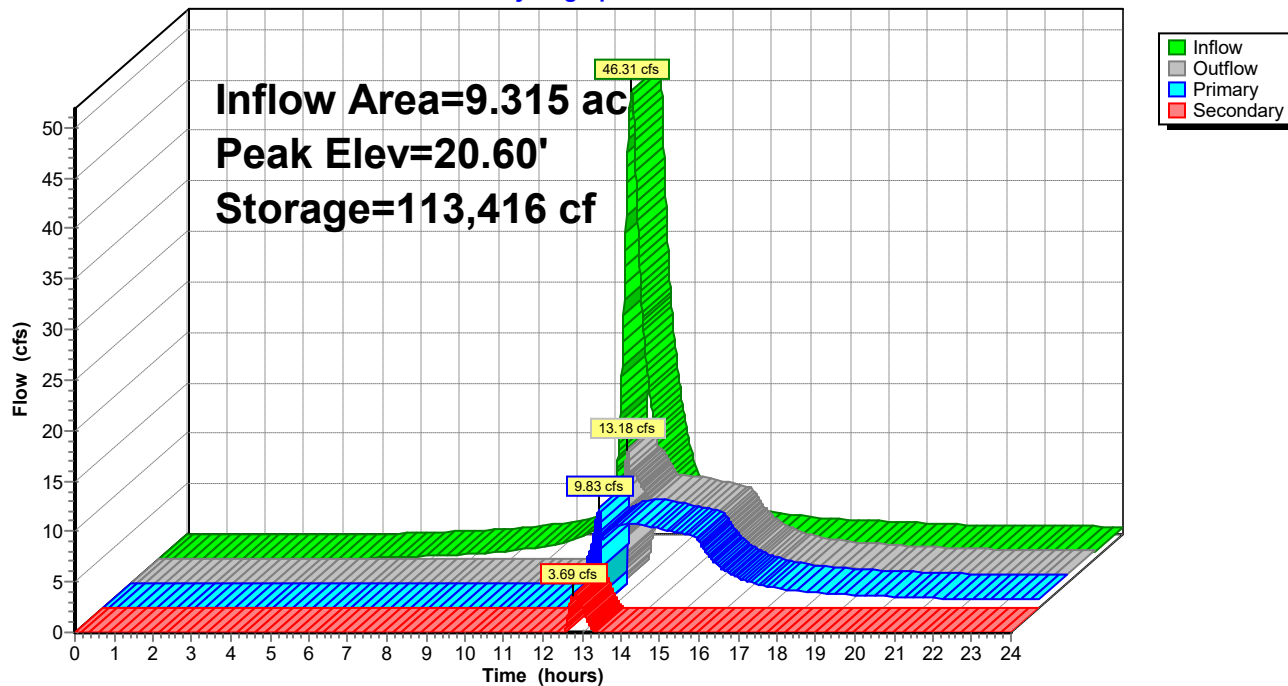
↑ **2=Sharp-Crested Rectangular Weir** (Passes 2.01 cfs of 11.04 cfs potential flow)

Secondary OutFlow Max=3.68 cfs @ 12.79 hrs HW=20.60' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 3.68 cfs @ 0.79 fps)

Pond 11: SGW #2

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 12: DA #2

Runoff = 44.89 cfs @ 12.09 hrs, Volume= 4.320 af, Depth> 5.57"

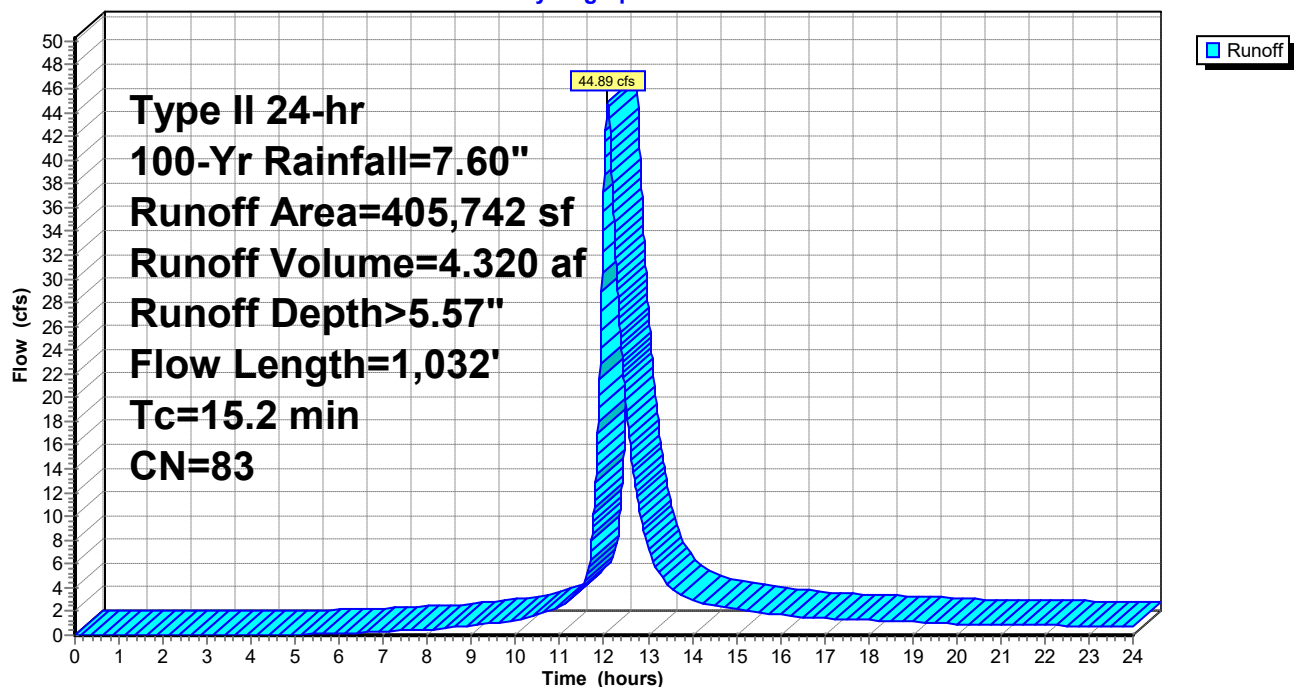
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
159,036	98	Paved parking, HSG C
246,706	74	>75% Grass cover, Good, HSG C
405,742	83	Weighted Average
246,706		60.80% Pervious Area
159,036		39.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	72	0.0200	0.11		Sheet Flow, A-B Median
					Grass: Dense n= 0.240 P2= 3.40"
0.1	18	0.0200	2.87		Shallow Concentrated Flow, B-C Road
					Paved Kv= 20.3 fps
4.5	942	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
15.2	1,032	Total			

Subcatchment 12: DA #2

Hydrograph



Summary for Reach 13: SOUTH Ditch - South segment

Inflow Area = 19.159 ac, 32.52% Impervious, Inflow Depth > 4.64" for 100-Yr event
 Inflow = 50.42 cfs @ 12.26 hrs, Volume= 7.407 af
 Outflow = 50.05 cfs @ 12.29 hrs, Volume= 7.390 af, Atten= 1%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.05 fps, Min. Travel Time= 2.7 min
 Avg. Velocity= 0.81 fps, Avg. Travel Time= 6.9 min

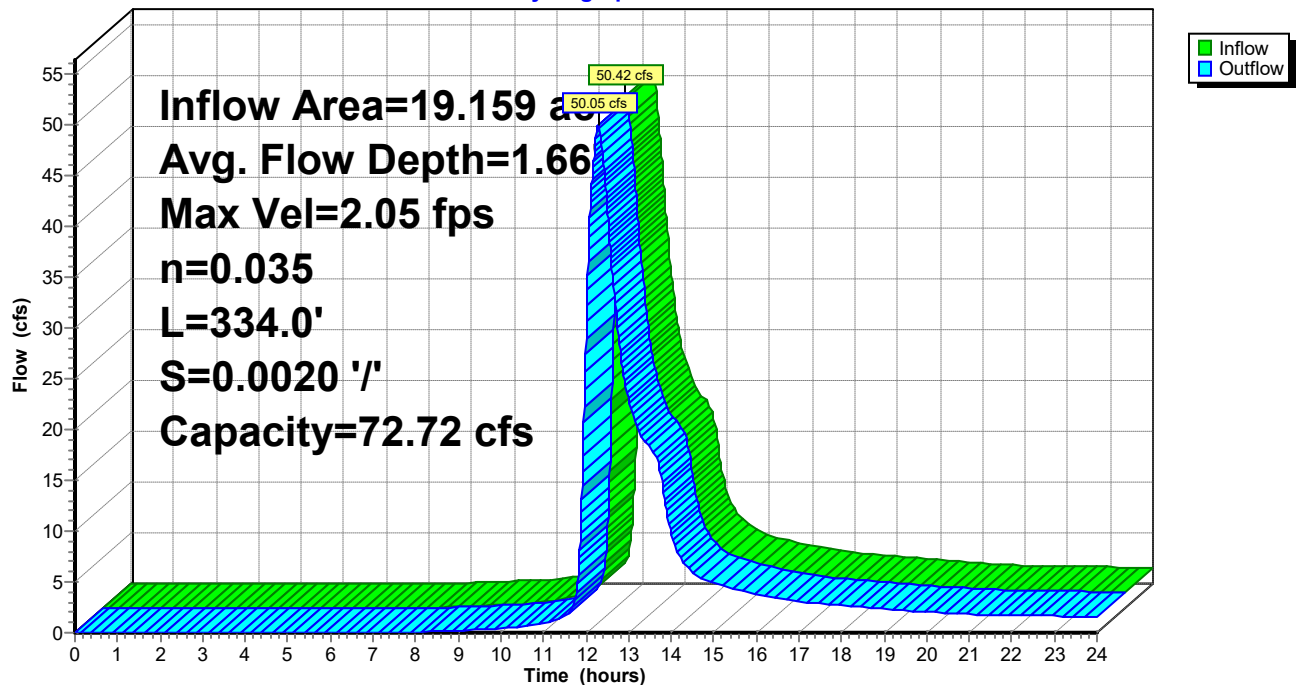
Peak Storage= 8,140 cf @ 12.29 hrs
 Average Depth at Peak Storage= 1.66'
 Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 72.72 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 ' Top Width= 24.00'
 Length= 334.0' Slope= 0.0020 '
 Inlet Invert= 18.42', Outlet Invert= 17.75'



Reach 13: SOUTH Ditch - South segment

Hydrograph



Summary for Pond 14: SGW #3

Inflow Area = 5.925 ac, 50.17% Impervious, Inflow Depth > 5.91" for 100-Yr event
 Inflow = 30.48 cfs @ 12.07 hrs, Volume= 2.920 af
 Outflow = 20.81 cfs @ 12.27 hrs, Volume= 2.479 af, Atten= 32%, Lag= 12.0 min
 Primary = 8.47 cfs @ 12.53 hrs, Volume= 2.115 af
 Secondary = 12.50 cfs @ 12.27 hrs, Volume= 0.364 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.00' @ 12.27 hrs Surf.Area= 21,519 sf Storage= 42,818 cf

Plug-Flow detention time= 122.1 min calculated for 2.478 af (85% of inflow)
 Center-of-Mass det. time= 56.3 min (856.4 - 800.0)

Volume	Invert	Avail.Storage	Storage Description
#1	19.80'	59,926 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.80	16,961	544.6	0.0	0	0	16,961
20.80	19,190	569.8	100.0	18,064	18,064	19,264
21.80	21,519	594.9	100.0	20,343	38,407	21,662
22.80	21,519	594.9	100.0	21,519	59,926	22,257

Device	Routing	Invert	Outlet Devices
#1	Primary	19.47'	18.0" Round Culvert L= 264.0' Ke= 0.500 Inlet / Outlet Invert= 19.47' / 18.42' S= 0.0040 ' S Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.80'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.80'	53.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=8.47 cfs @ 12.53 hrs HW=21.92' TW=19.91' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 8.47 cfs @ 4.79 fps)

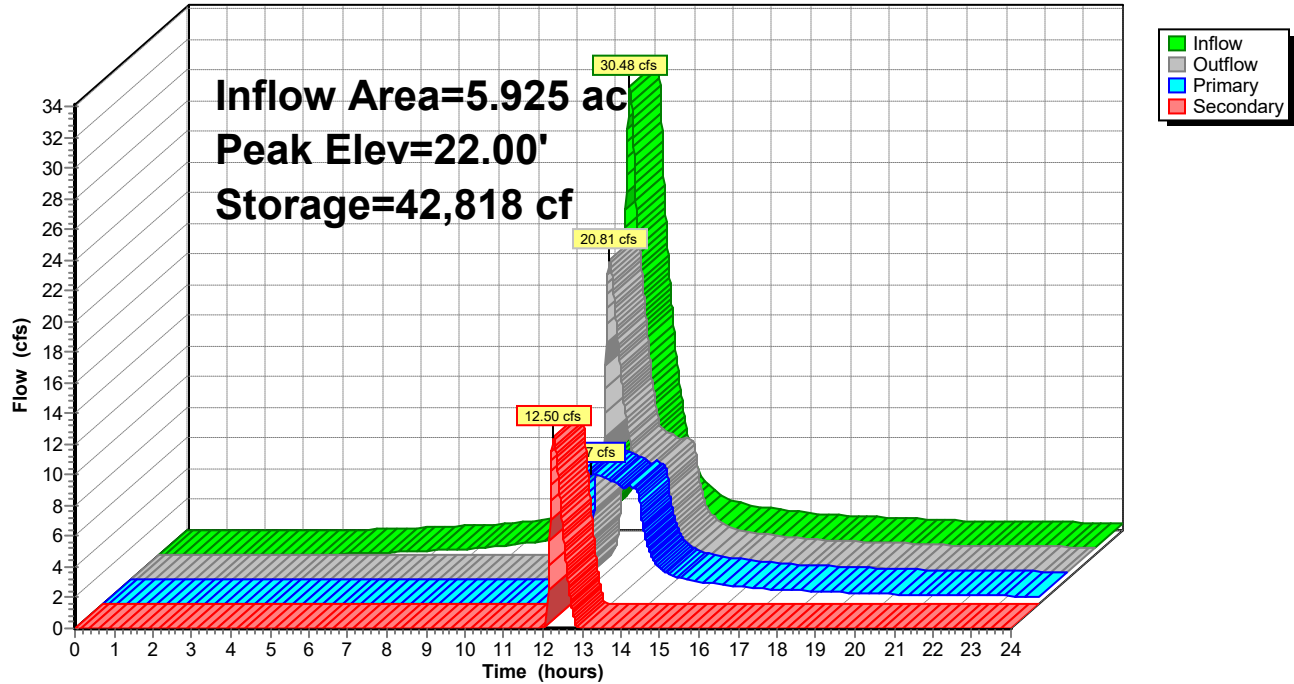
↑ **2=Sharp-Crested Rectangular Weir** (Passes 8.47 cfs of 41.59 cfs potential flow)

Secondary OutFlow Max=12.49 cfs @ 12.27 hrs HW=22.00' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 12.49 cfs @ 1.15 fps)

Pond 14: SGW #3

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 15: DA #3

Runoff = 30.48 cfs @ 12.07 hrs, Volume= 2.920 af, Depth> 5.91"

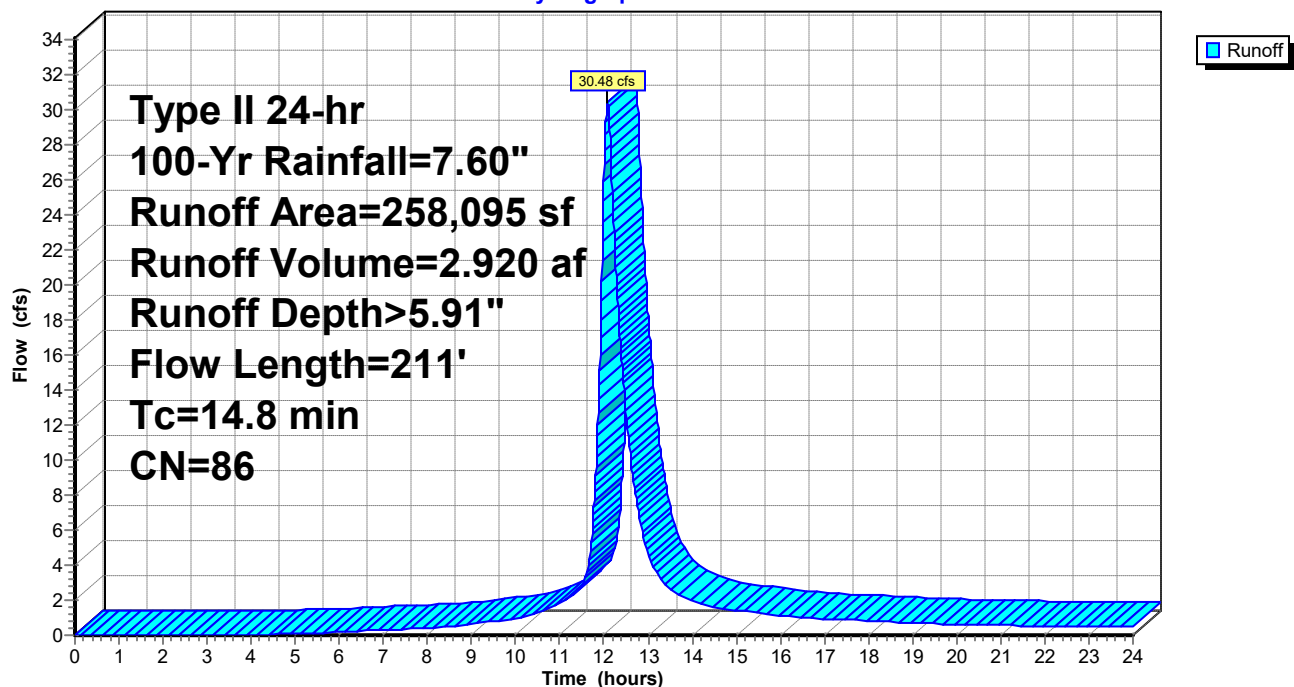
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
129,485	98	Paved parking, HSG C
128,610	74	>75% Grass cover, Good, HSG C
258,095	86	Weighted Average
128,610		49.83% Pervious Area
129,485		50.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	100	0.0200	0.12		Sheet Flow, A-B Median
					Grass: Dense n= 0.240 P2= 3.40"
0.6	38	0.0200	0.99		Shallow Concentrated Flow, B-C Median
					Short Grass Pasture Kv= 7.0 fps
0.4	73	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
14.8	211	Total			

Subcatchment 15: DA #3

Hydrograph



Summary for Reach 16: SOUTH Ditch - North segment

Inflow Area = 13.234 ac, 24.62% Impervious, Inflow Depth > 4.81" for 100-Yr event
 Inflow = 42.66 cfs @ 12.22 hrs, Volume= 5.307 af
 Outflow = 42.10 cfs @ 12.26 hrs, Volume= 5.292 af, Atten= 1%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.99 fps, Min. Travel Time= 3.2 min
 Avg. Velocity= 0.74 fps, Avg. Travel Time= 8.6 min

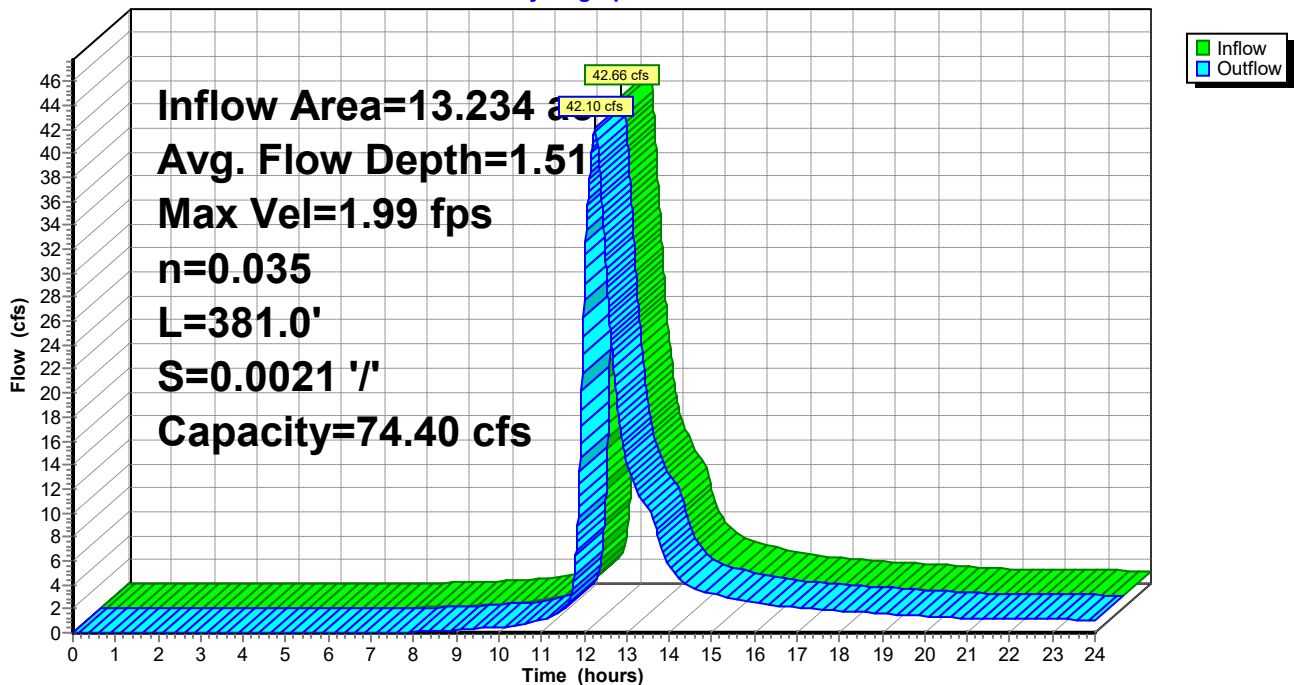
Peak Storage= 8,057 cf @ 12.26 hrs
 Average Depth at Peak Storage= 1.51'
 Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 74.40 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 24.00'
 Length= 381.0' Slope= 0.0021 '/'
 Inlet Invert= 19.22', Outlet Invert= 18.42'



Reach 16: SOUTH Ditch - North segment

Hydrograph



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

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Summary for Subcatchment 17: DA #16

Runoff = 29.28 cfs @ 12.06 hrs, Volume= 2.505 af, Depth> 4.66"

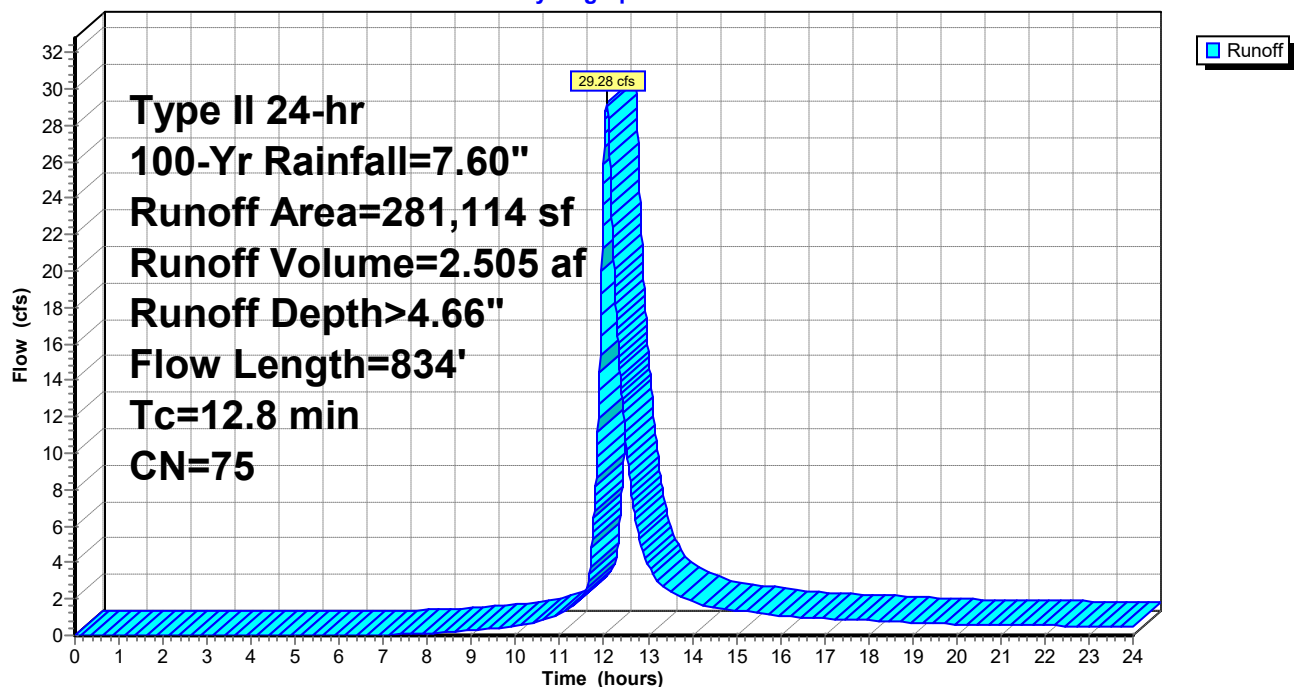
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
5,965	98	Paved parking, HSG C
275,149	74	>75% Grass cover, Good, HSG C
281,114	75	Weighted Average
275,149		97.88% Pervious Area
5,965		2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	51	0.0200	0.15		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
7.3	783	0.0030	1.79	12.56	Trap/Vee/Rect Channel Flow, B-C Existing Ditch
					Bot.W=4.00' D=1.00' Z= 3.0 '/' Top.W=10.00'
					n= 0.035 Earth, dense weeds
12.8	834	Total			

Subcatchment 17: DA #16

Hydrograph



Summary for Pond 18: SGW #4B

Inflow Area = 6.781 ac, 46.03% Impervious, Inflow Depth > 5.67" for 100-Yr event
 Inflow = 34.23 cfs @ 12.10 hrs, Volume= 3.204 af
 Outflow = 23.65 cfs @ 12.29 hrs, Volume= 2.802 af, Atten= 31%, Lag= 11.8 min
 Primary = 10.48 cfs @ 12.81 hrs, Volume= 2.337 af
 Secondary = 13.93 cfs @ 12.29 hrs, Volume= 0.465 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.03' @ 12.29 hrs Surf.Area= 20,373 sf Storage= 42,791 cf

Plug-Flow detention time= 104.8 min calculated for 2.802 af (87% of inflow)
 Center-of-Mass det. time= 46.7 min (856.0 - 809.3)

Volume	Invert	Avail.Storage	Storage Description
#1	19.65'	55,436 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.65	14,777	674.3	0.0	0	0	14,777
20.65	17,525	699.5	100.0	16,131	16,131	17,616
21.65	20,373	724.6	100.0	18,931	35,063	20,549
22.65	20,373	724.6	100.0	20,373	55,436	21,273

Device	Routing	Invert	Outlet Devices
#1	Primary	19.32'	18.0" Round Culvert L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 19.32' / 19.22' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.65'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.65'	24.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=10.51 cfs @ 12.81 hrs HW=21.72' TW=20.20' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 10.51 cfs @ 5.95 fps)

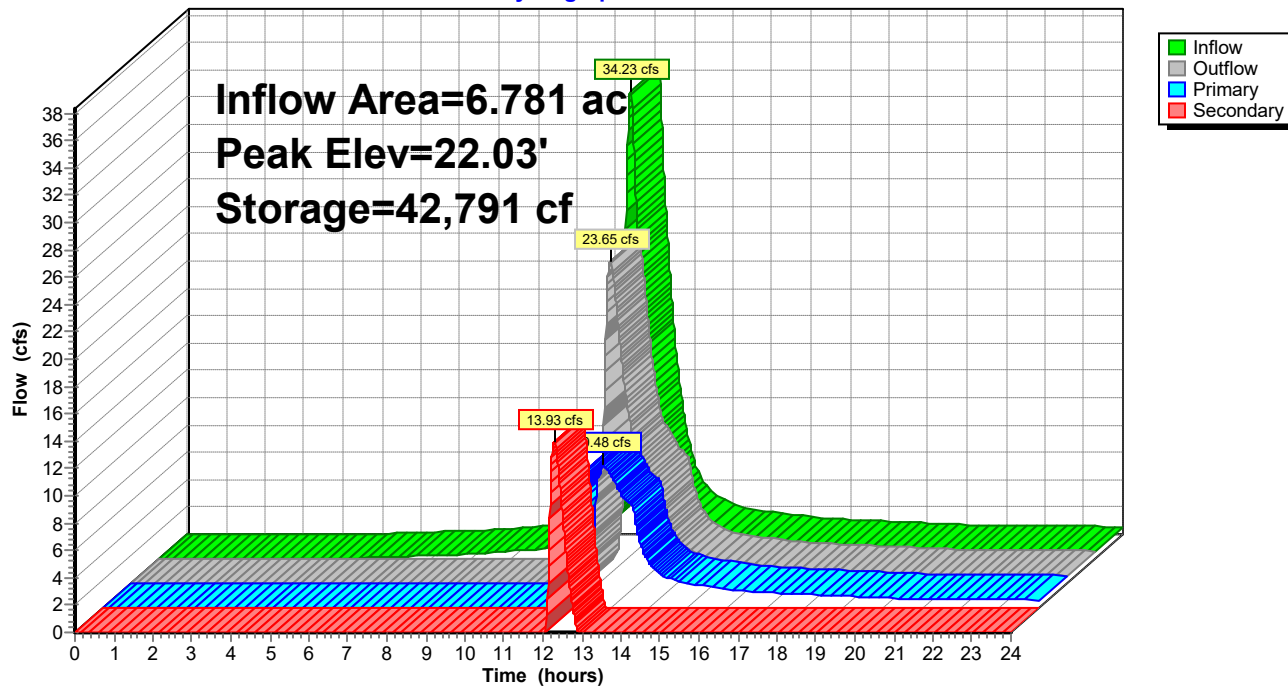
↑ **2=Sharp-Crested Rectangular Weir** (Passes 10.51 cfs of 29.09 cfs potential flow)

Secondary OutFlow Max=13.93 cfs @ 12.29 hrs HW=22.03' TW=20.72' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 13.93 cfs @ 1.53 fps)

Pond 18: SGW #4B

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 19: DA #4B

Runoff = 26.47 cfs @ 12.08 hrs, Volume= 2.584 af, Depth> 5.80"

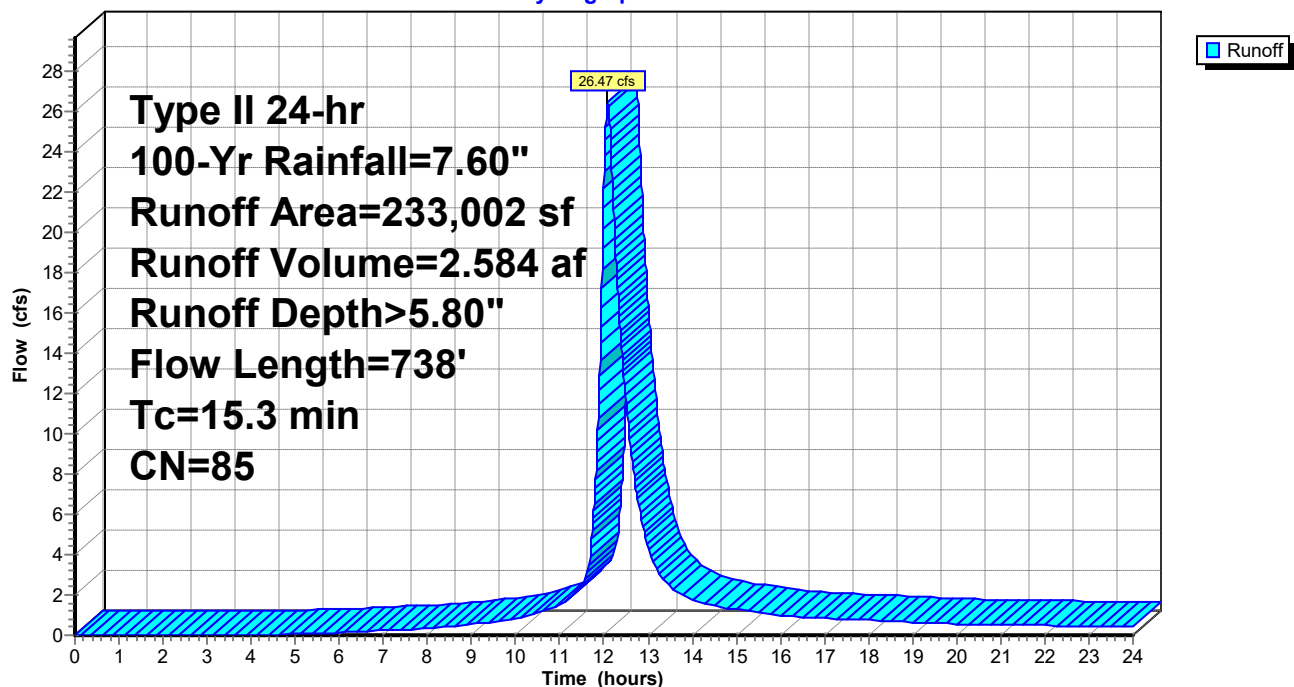
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
103,239	98	Paved parking, HSG C
129,763	74	>75% Grass cover, Good, HSG C
233,002	85	Weighted Average
129,763		55.69% Pervious Area
103,239		44.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
5.9	506	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.7	143	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
15.3	738	Total			

Subcatchment 19: DA #4B

Hydrograph



Summary for Pond 20: SGW #4A

Inflow Area = 1.432 ac, 52.46% Impervious, Inflow Depth > 6.04" for 100-Yr event
 Inflow = 8.40 cfs @ 12.05 hrs, Volume= 0.720 af
 Outflow = 7.79 cfs @ 12.10 hrs, Volume= 0.621 af, Atten= 7%, Lag= 3.3 min
 Primary = 7.79 cfs @ 12.10 hrs, Volume= 0.621 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.55' @ 12.10 hrs Surf.Area= 5,242 sf Storage= 6,431 cf

Plug-Flow detention time= 102.9 min calculated for 0.621 af (86% of inflow)
 Center-of-Mass det. time= 40.3 min (834.0 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	21.10'	12,021 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.10	3,692	250.0	0.0	0	0	3,692
22.10	4,742	275.2	100.0	4,206	4,206	4,777
22.60	5,305	287.7	100.0	2,510	6,716	5,355
23.60	5,305	287.7	100.0	5,305	12,021	5,642

Device	Routing	Invert	Outlet Devices
#1	Primary	20.77'	18.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 20.77' / 20.36' S= 0.0055 ' / Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	22.10'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	22.60'	83.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.78 cfs @ 12.10 hrs HW=22.55' TW=21.71' (Dynamic Tailwater)

↑1=Culvert (Passes 7.78 cfs of 7.79 cfs potential flow)

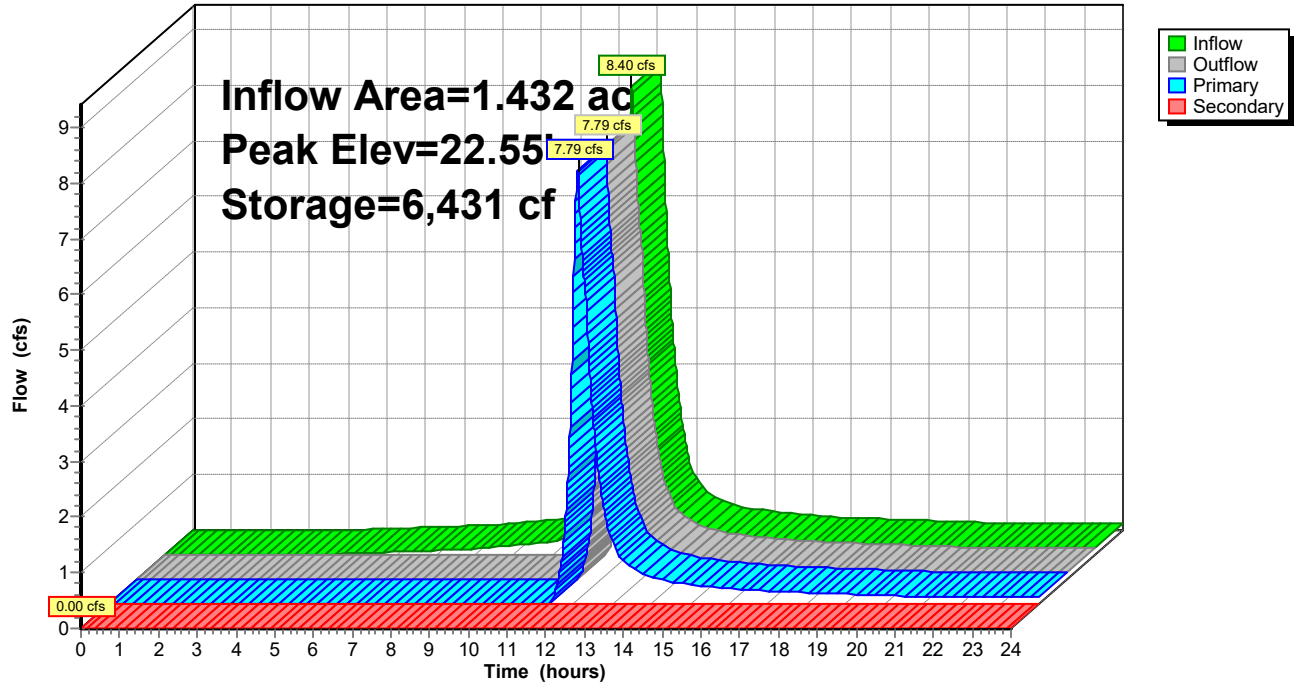
↑2=Sharp-Crested Rectangular Weir (Weir Controls 7.78 cfs @ 2.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=21.10' TW=19.65' (Dynamic Tailwater)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 20: SGW #4A

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 21: DA #4A

Runoff = 8.40 cfs @ 12.05 hrs, Volume= 0.720 af, Depth> 6.04"

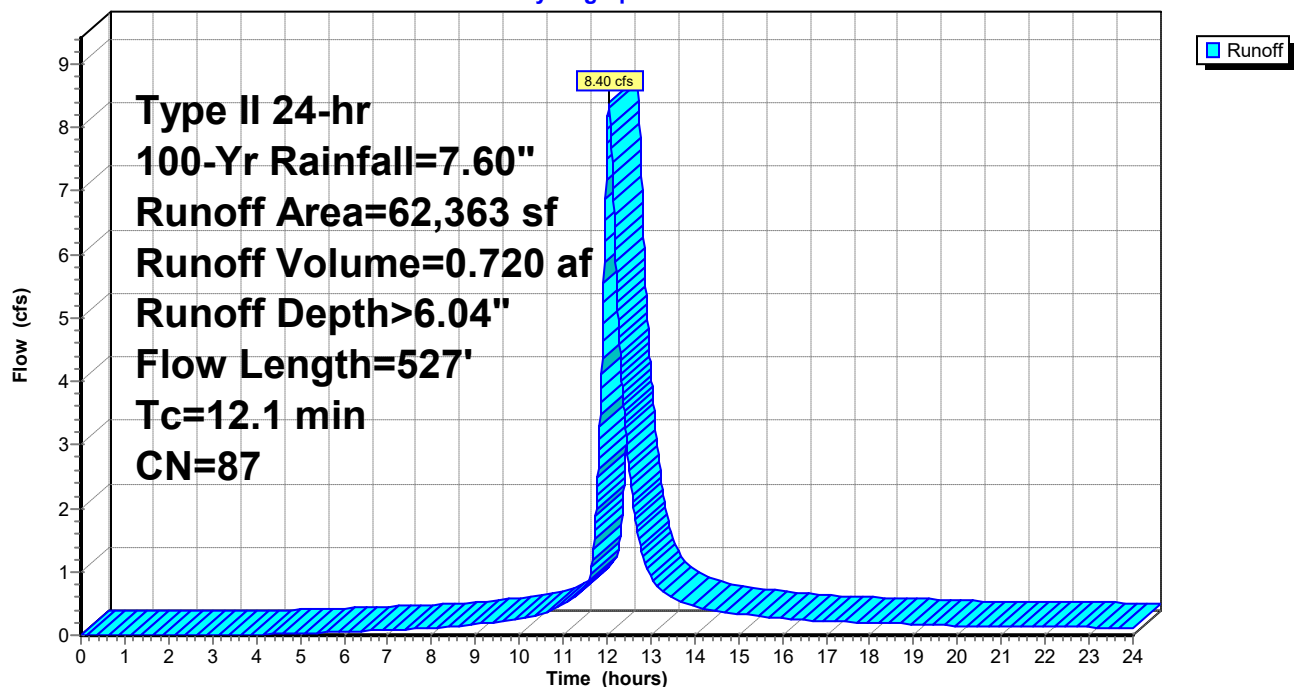
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
32,714	98	Paved parking, HSG C
29,649	74	>75% Grass cover, Good, HSG C
62,363	87	Weighted Average
29,649		47.54% Pervious Area
32,714		52.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"
2.2	188	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter Paved Kv= 20.3 fps
1.2	250	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
12.1	527	Total			

Subcatchment 21: DA #4A

Hydrograph

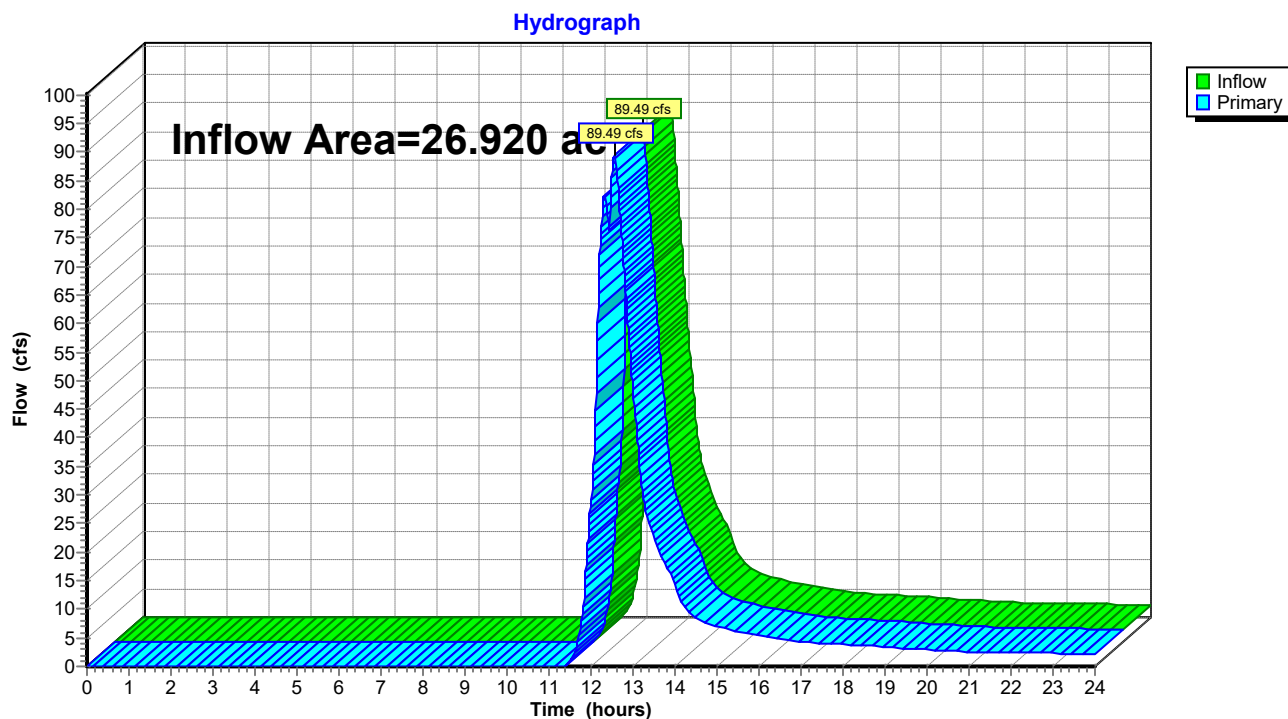


Summary for Link 22: POI-2 (POST)

Inflow Area = 26.920 ac, 34.07% Impervious, Inflow Depth > 5.15" for 100-Yr event
 Inflow = 89.49 cfs @ 12.56 hrs, Volume= 11.542 af
 Primary = 89.49 cfs @ 12.56 hrs, Volume= 11.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 22: POI-2 (POST)



Summary for Pond 23: SGW #10

Inflow Area = 15.563 ac, 18.53% Impervious, Inflow Depth > 4.98" for 100-Yr event
 Inflow = 53.88 cfs @ 12.15 hrs, Volume= 6.458 af
 Outflow = 46.30 cfs @ 12.30 hrs, Volume= 5.963 af, Atten= 14%, Lag= 8.9 min
 Primary = 20.84 cfs @ 12.30 hrs, Volume= 4.811 af
 Secondary = 25.46 cfs @ 12.30 hrs, Volume= 1.152 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 19.68' @ 12.30 hrs Surf.Area= 20,851 sf Storage= 53,877 cf

Plug-Flow detention time= 69.5 min calculated for 5.960 af (92% of inflow)
 Center-of-Mass det. time= 30.2 min (858.9 - 828.8)

Volume	Invert	Avail.Storage	Storage Description			
#1	17.00'	60,625 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.00	18,938	465.8	0.0	0	0	18,938
19.00	20,851	516.1	100.0	39,774	39,774	22,989
20.00	20,851	516.1	100.0	20,851	60,625	23,505

Device	Routing	Invert	Outlet Devices													
#1	Primary	16.67'	24.0" Round Culvert L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 16.67' / 16.55' S= 0.0086 ' S= 0.0086 ' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf													
#2	Device 1	18.00'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)													
#3	Secondary	19.00'	17.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88													

Primary OutFlow Max=20.84 cfs @ 12.30 hrs HW=19.68' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 20.84 cfs @ 6.63 fps)

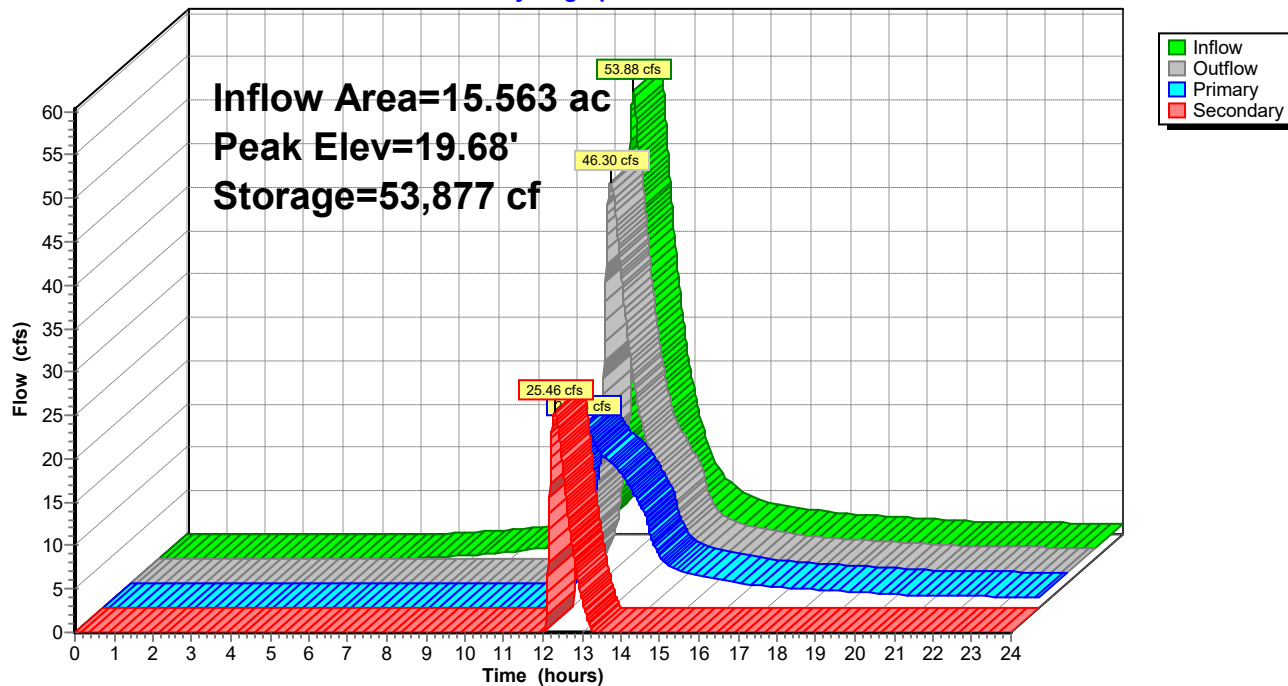
↑ **2=Sharp-Crested Rectangular Weir** (Passes 20.84 cfs of 75.93 cfs potential flow)

Secondary OutFlow Max=25.45 cfs @ 12.30 hrs HW=19.68' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 25.45 cfs @ 2.21 fps)

Pond 23: SGW #10

Hydrograph



Poplar Hill-220155

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

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Summary for Subcatchment 24: DA #10

Runoff = 53.88 cfs @ 12.15 hrs, Volume= 6.458 af, Depth> 4.98"

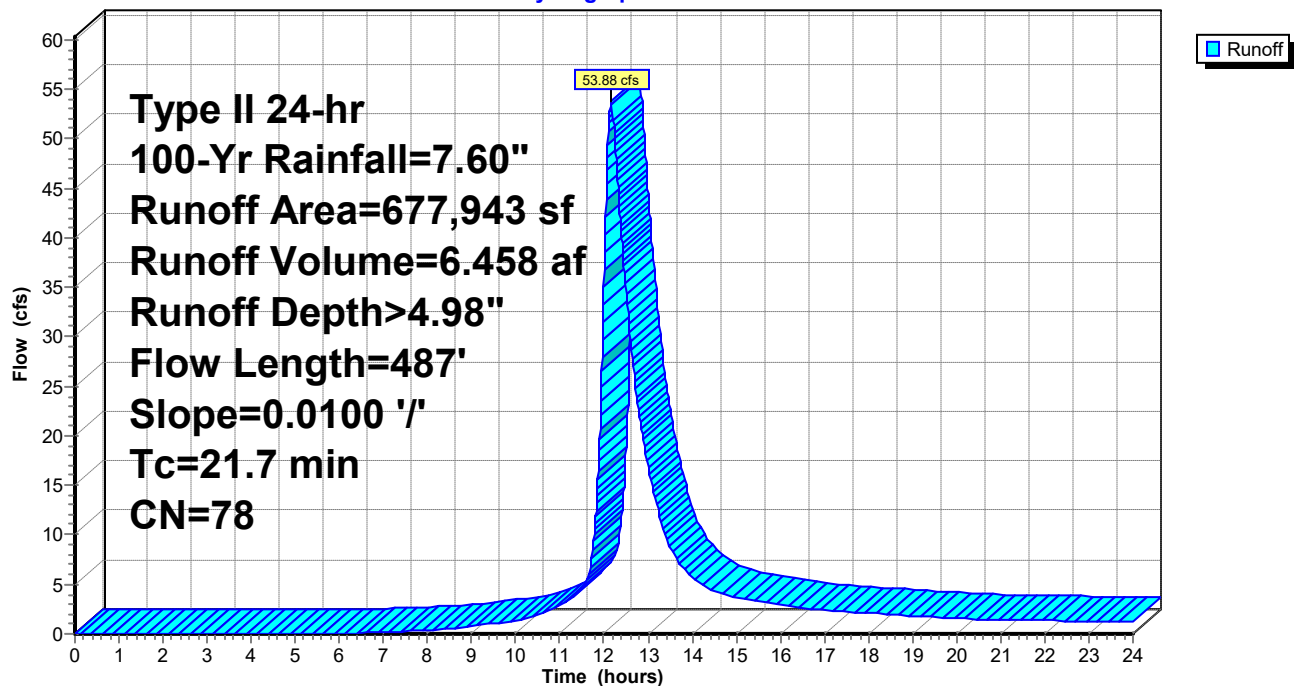
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
125,614	98	Paved parking, HSG C
552,329	74	>75% Grass cover, Good, HSG C
677,943	78	Weighted Average
552,329		81.47% Pervious Area
125,614		18.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0100	0.13		Sheet Flow, A-B Field
					Grass: Short n= 0.150 P2= 3.40"
9.2	387	0.0100	0.70		Shallow Concentrated Flow, B-C Grass
					Short Grass Pasture Kv= 7.0 fps
21.7	487	Total			

Subcatchment 24: DA #10

Hydrograph



Summary for Pond 25: MH3

Inflow Area = 7.618 ac, 52.89% Impervious, Inflow Depth > 5.07" for 100-Yr event
 Inflow = 19.05 cfs @ 12.52 hrs, Volume= 3.219 af
 Outflow = 19.05 cfs @ 12.52 hrs, Volume= 3.219 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.05 cfs @ 12.52 hrs, Volume= 3.219 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 18.19' @ 12.52 hrs

Flood Elev= 19.10'

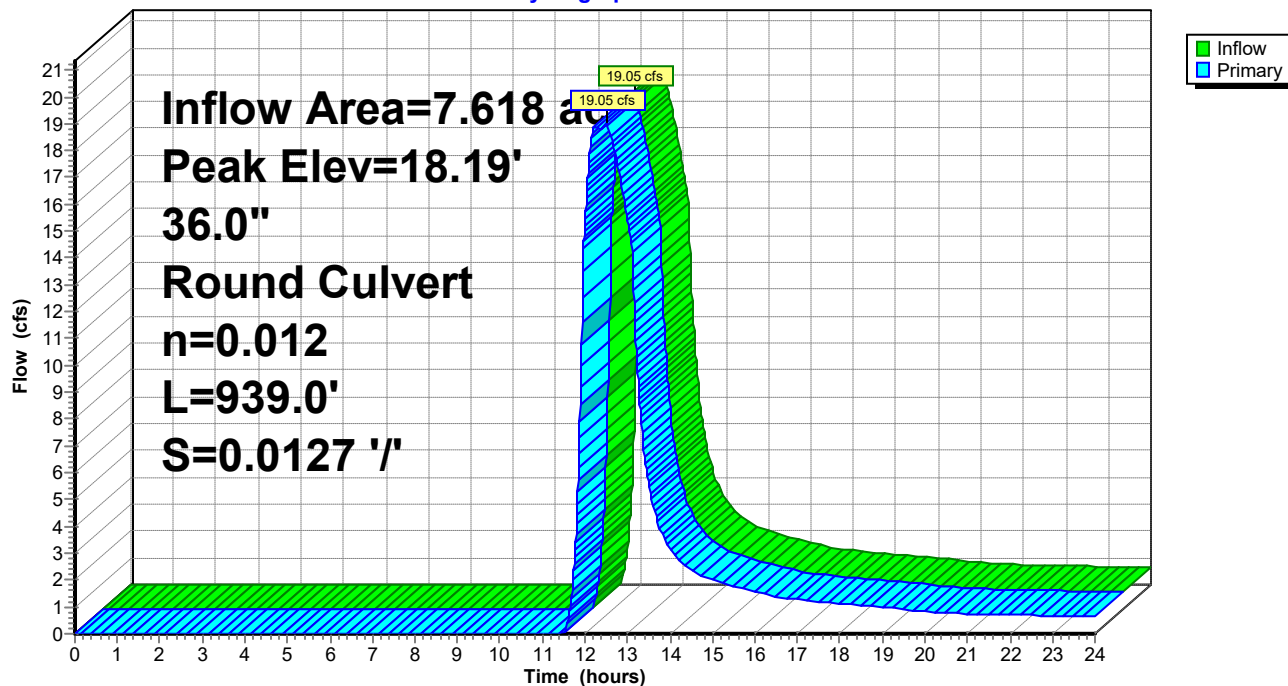
Device	Routing	Invert	Outlet Devices
#1	Primary	16.45'	36.0" Round Culvert L= 939.0' Ke= 0.500 Inlet / Outlet Invert= 16.45' / 4.50' S= 0.0127 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=19.05 cfs @ 12.52 hrs HW=18.19' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 19.05 cfs @ 4.49 fps)

Pond 25: MH3

Hydrograph



Summary for Pond 26: SGW #8

Inflow Area = 7.618 ac, 52.89% Impervious, Inflow Depth > 6.04" for 100-Yr event
 Inflow = 45.54 cfs @ 12.04 hrs, Volume= 3.832 af
 Outflow = 22.36 cfs @ 12.32 hrs, Volume= 3.249 af, Atten= 51%, Lag= 16.4 min
 Primary = 19.05 cfs @ 12.52 hrs, Volume= 3.219 af
 Secondary = 3.63 cfs @ 12.32 hrs, Volume= 0.030 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 21.32' @ 12.32 hrs Surf.Area= 30,295 sf Storage= 61,366 cf

Plug-Flow detention time= 123.8 min calculated for 3.249 af (85% of inflow)
 Center-of-Mass det. time= 57.2 min (850.3 - 793.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.00'	81,907 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.00	21,431	1,082.9	0.0	0	0	21,431
20.00	25,813	1,108.0	100.0	23,588	23,588	25,942
21.00	30,295	1,133.2	100.0	28,024	51,612	30,574
22.00	30,295	1,133.2	100.0	30,295	81,907	31,707

Device	Routing	Invert	Outlet Devices
#1	Primary	18.67'	24.0" Round Culvert L= 355.0' Ke= 0.500 Inlet / Outlet Invert= 18.67' / 16.55' S= 0.0060 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	20.00'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.30'	439.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=19.05 cfs @ 12.52 hrs HW=21.26' TW=18.19' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 19.05 cfs @ 6.11 fps)

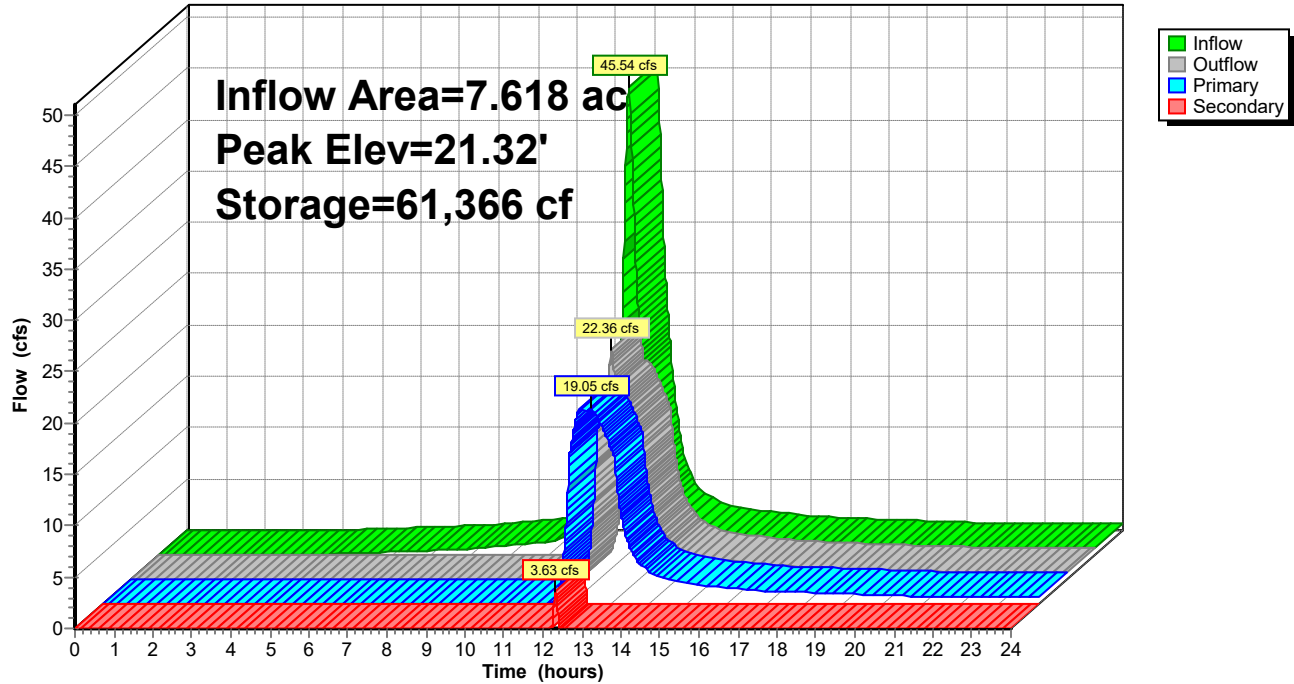
↑ **2=Sharp-Crested Rectangular Weir** (Passes 19.05 cfs of 49.40 cfs potential flow)

Secondary OutFlow Max=3.61 cfs @ 12.32 hrs HW=21.32' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 3.61 cfs @ 0.38 fps)

Pond 26: SGW #8

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 27: DA #8

Runoff = 45.54 cfs @ 12.04 hrs, Volume= 3.832 af, Depth> 6.04"

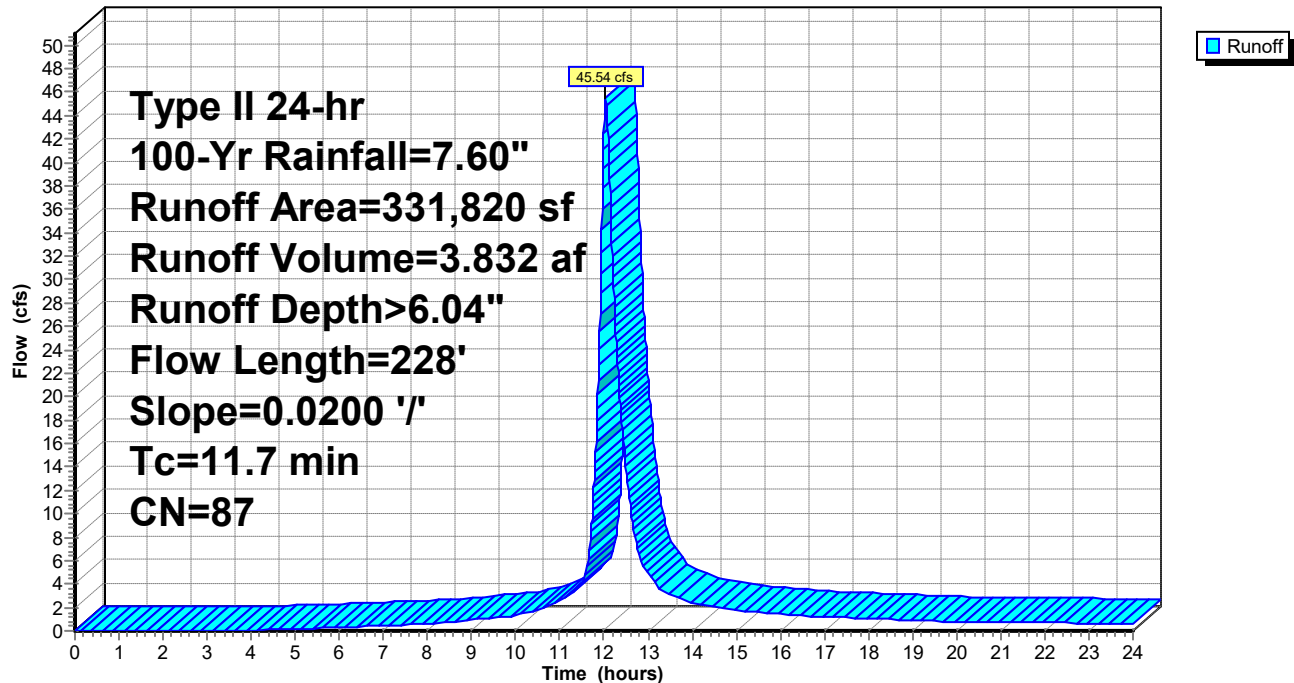
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
175,511	98	Paved parking, HSG C
156,309	74	>75% Grass cover, Good, HSG C
331,820	87	Weighted Average
156,309		47.11% Pervious Area
175,511		52.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0200	0.18		Sheet Flow, A-B Open Space
					Grass: Short n= 0.150 P2= 3.40"
2.2	128	0.0200	0.99		Shallow Concentrated Flow, B-C Open Space
					Short Grass Pasture Kv= 7.0 fps
11.7	228	Total			

Subcatchment 27: DA #8

Hydrograph



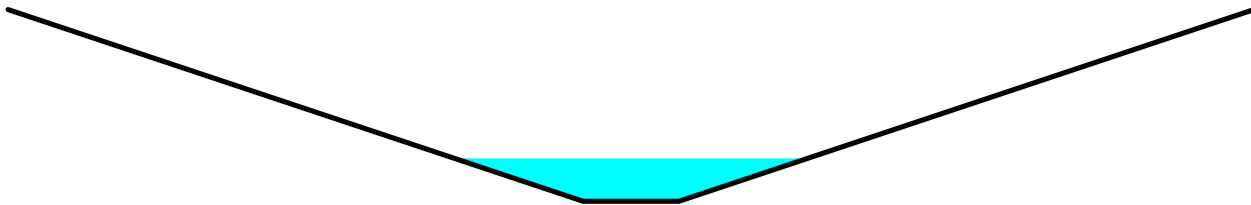
Summary for Reach 28: OXFORD Ditch - East segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 4.98" for 100-Yr event
 Inflow = 14.53 cfs @ 12.40 hrs, Volume= 1.551 af
 Outflow = 14.51 cfs @ 12.43 hrs, Volume= 1.548 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 3.44 fps, Min. Travel Time= 2.0 min
 Avg. Velocity = 1.55 fps, Avg. Travel Time= 4.5 min

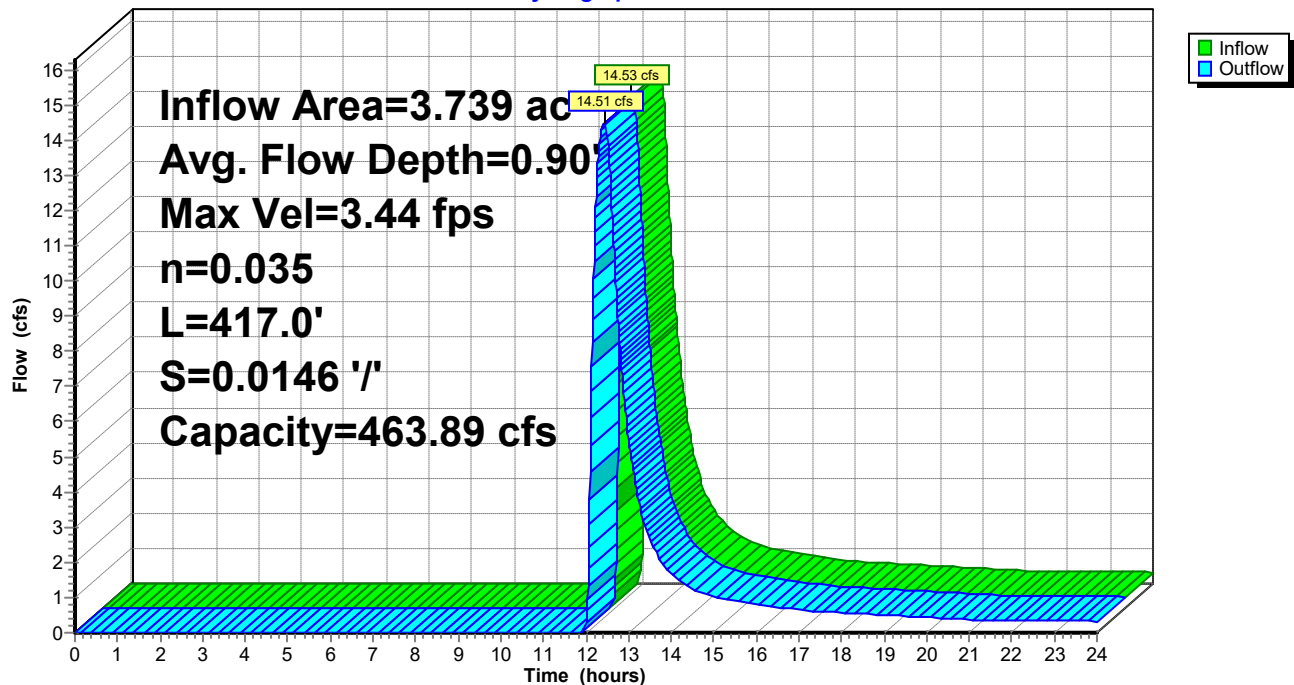
Peak Storage= 1,758 cf @ 12.43 hrs
 Average Depth at Peak Storage= 0.90'
 Bank-Full Depth= 4.00' Flow Area= 56.0 sf, Capacity= 463.89 cfs

2.00' x 4.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 26.00'
 Length= 417.0' Slope= 0.0146 '/'
 Inlet Invert= 11.19', Outlet Invert= 5.10'



Reach 28: OXFORD Ditch - East segment

Hydrograph



Summary for Pond 29: Exist Culvert

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 4.98" for 100-Yr event
 Inflow = 14.53 cfs @ 12.40 hrs, Volume= 1.551 af
 Outflow = 14.53 cfs @ 12.40 hrs, Volume= 1.551 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.53 cfs @ 12.40 hrs, Volume= 1.551 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

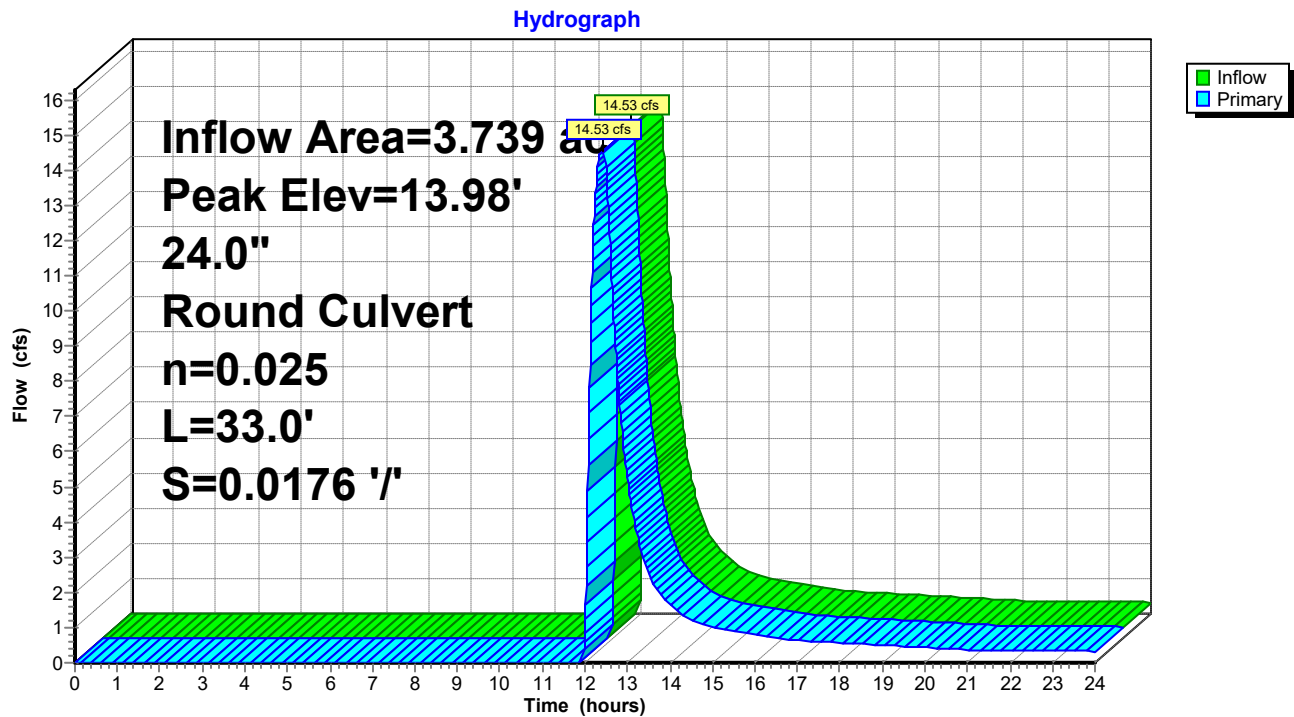
Peak Elev= 13.98' @ 12.40 hrs

Flood Elev= 15.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	11.77'	24.0" Round Culvert L= 33.0' Ke= 0.500 Inlet / Outlet Invert= 11.77' / 11.19' S= 0.0176 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=14.53 cfs @ 12.40 hrs HW=13.98' TW=12.09' (Dynamic Tailwater)
 1=Culvert (Barrel Controls 14.53 cfs @ 5.22 fps)

Pond 29: Exist Culvert



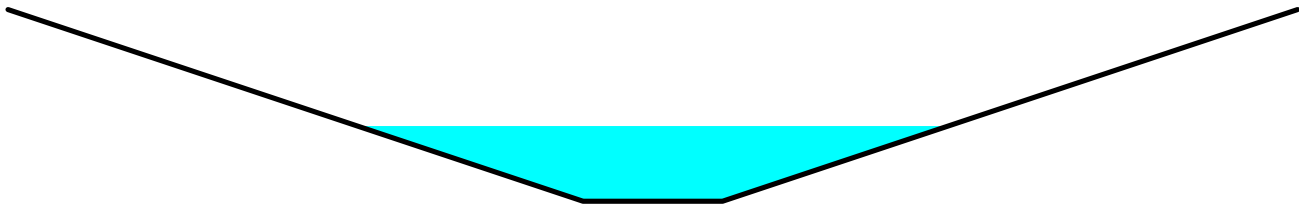
Summary for Reach 30: OXFORD Ditch - Central segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 4.99" for 100-Yr event
 Inflow = 14.56 cfs @ 12.38 hrs, Volume= 1.554 af
 Outflow = 14.53 cfs @ 12.40 hrs, Volume= 1.551 af, Atten= 0%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.56 fps, Min. Travel Time= 2.2 min
 Avg. Velocity = 1.17 fps, Avg. Travel Time= 4.8 min

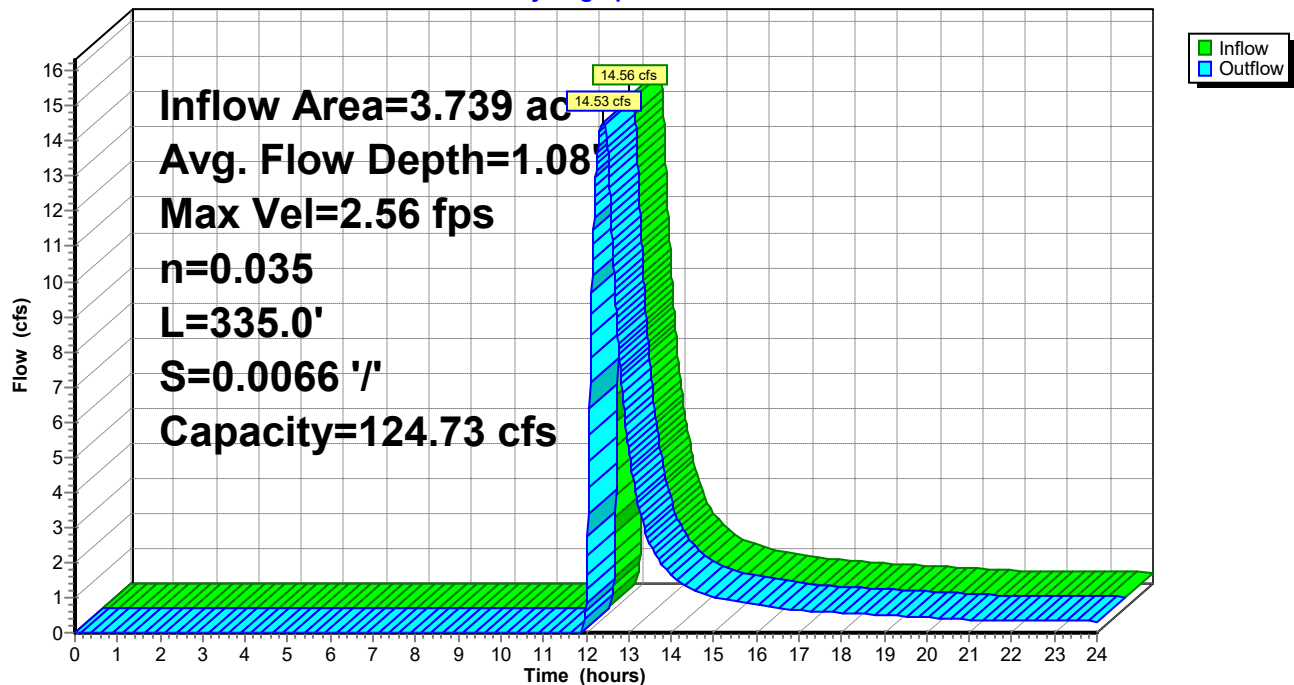
Peak Storage= 1,898 cf @ 12.40 hrs
 Average Depth at Peak Storage= 1.08'
 Bank-Full Depth= 2.75' Flow Area= 28.2 sf, Capacity= 124.73 cfs

2.00' x 2.75' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 18.50'
 Length= 335.0' Slope= 0.0066 '/'
 Inlet Invert= 13.98', Outlet Invert= 11.77'



Reach 30: OXFORD Ditch - Central segment

Hydrograph



Summary for Pond 31: Entrance Culvert

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 4.99" for 100-Yr event
 Inflow = 14.56 cfs @ 12.38 hrs, Volume= 1.554 af
 Outflow = 14.56 cfs @ 12.38 hrs, Volume= 1.554 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.56 cfs @ 12.38 hrs, Volume= 1.554 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

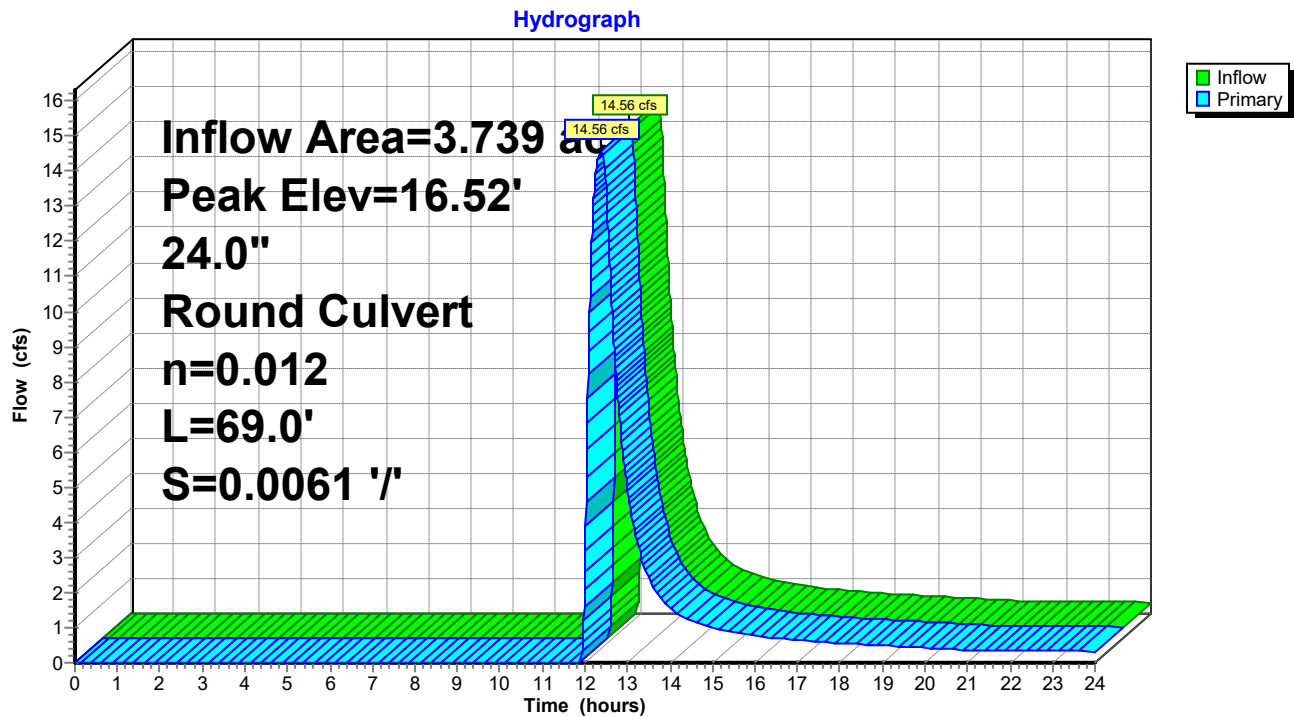
Peak Elev= 16.52' @ 12.38 hrs

Flood Elev= 18.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	24.0" Round Culvert L= 69.0' Ke= 0.500 Inlet / Outlet Invert= 14.40' / 13.98' S= 0.0061 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=14.56 cfs @ 12.38 hrs HW=16.52' TW=15.06' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 14.56 cfs @ 5.44 fps)

Pond 31: Entrance Culvert



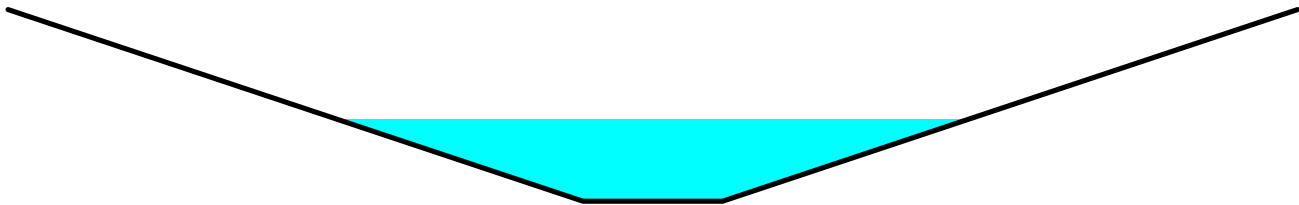
Summary for Reach 32: OXFORD Ditch - West segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 4.99" for 100-Yr event
 Inflow = 14.57 cfs @ 12.36 hrs, Volume= 1.555 af
 Outflow = 14.56 cfs @ 12.38 hrs, Volume= 1.554 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.23 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 1.02 fps, Avg. Travel Time= 2.1 min

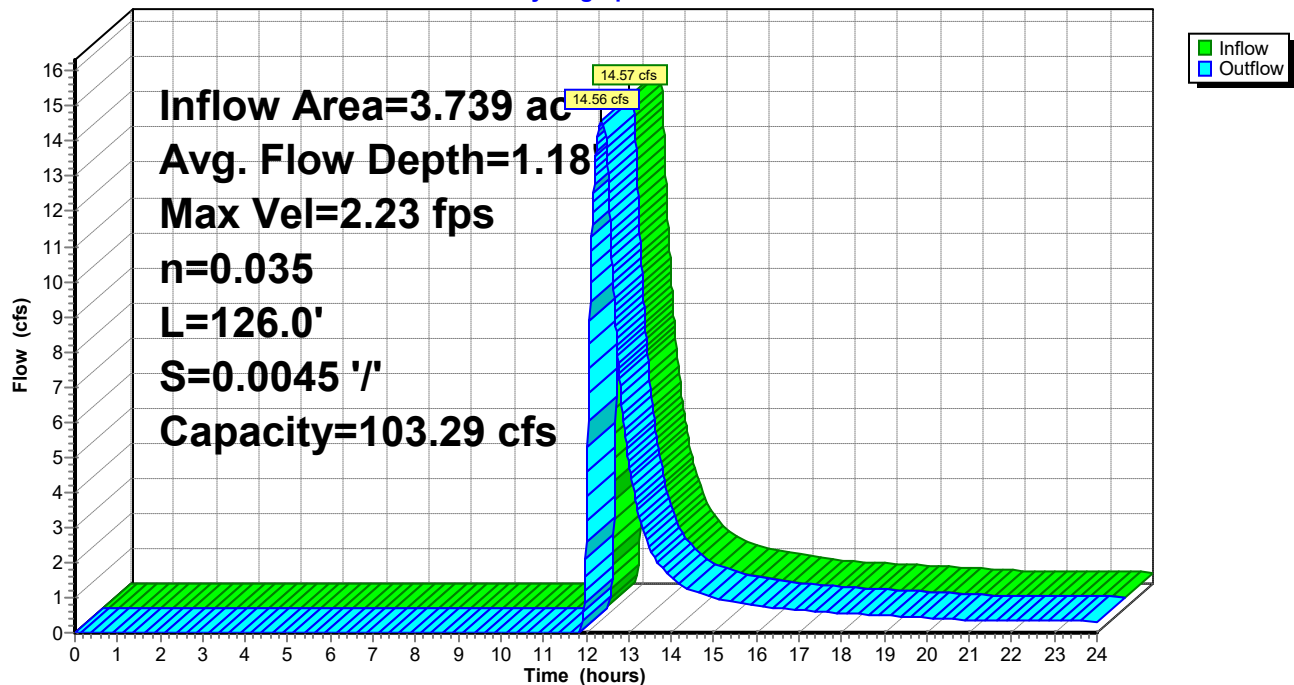
Peak Storage= 823 cf @ 12.38 hrs
 Average Depth at Peak Storage= 1.18'
 Bank-Full Depth= 2.75' Flow Area= 28.2 sf, Capacity= 103.29 cfs

2.00' x 2.75' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 ' Top Width= 18.50'
 Length= 126.0' Slope= 0.0045 '
 Inlet Invert= 14.97', Outlet Invert= 14.40'



Reach 32: OXFORD Ditch - West segment

Hydrograph



Summary for Reach 33: NORTH Ditch - North segment

Inflow Area = 3.739 ac, 60.43% Impervious, Inflow Depth > 5.01" for 100-Yr event
 Inflow = 14.63 cfs @ 12.32 hrs, Volume= 1.560 af
 Outflow = 14.57 cfs @ 12.36 hrs, Volume= 1.555 af, Atten= 0%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.63 fps, Min. Travel Time= 3.2 min
 Avg. Velocity= 1.13 fps, Avg. Travel Time= 7.4 min

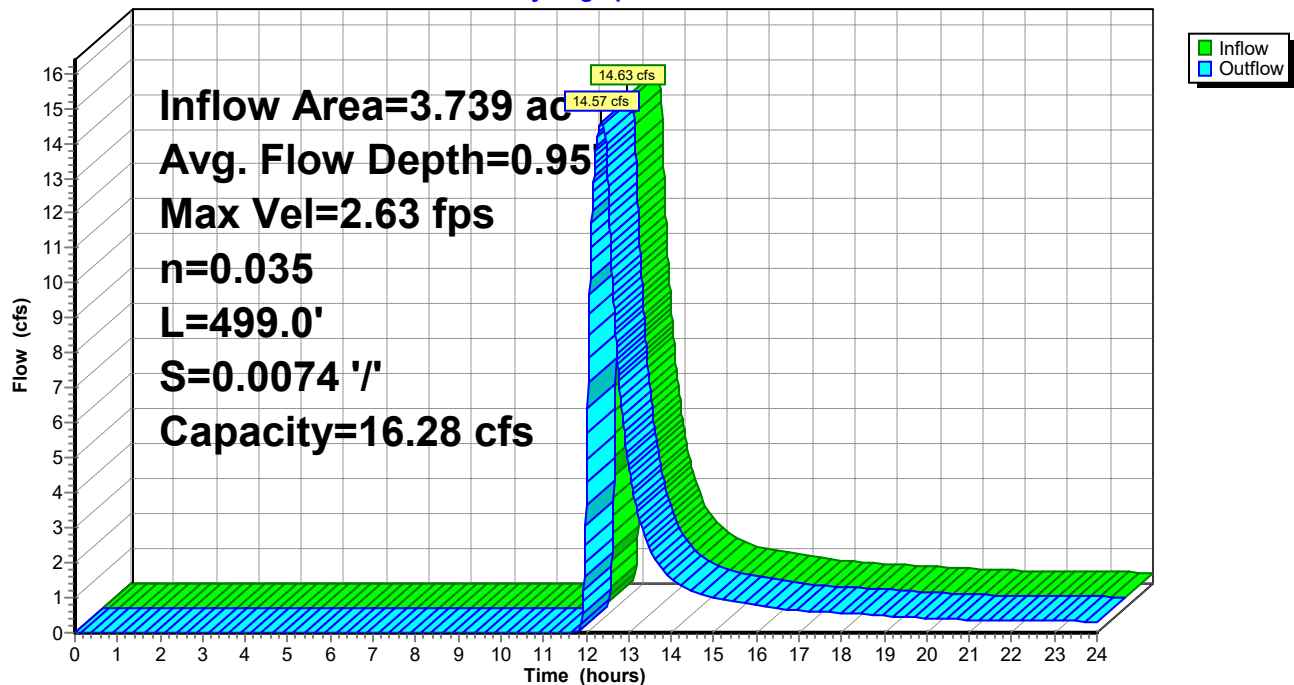
Peak Storage= 2,760 cf @ 12.36 hrs
 Average Depth at Peak Storage= 0.95'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 16.28 cfs

3.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 3.0 '/' Top Width= 9.00'
 Length= 499.0' Slope= 0.0074 '/'
 Inlet Invert= 18.73', Outlet Invert= 15.06'



Reach 33: NORTH Ditch - North segment

Hydrograph



Summary for Pond 34: SGW #9

Inflow Area = 1.992 ac, 56.55% Impervious, Inflow Depth > 6.15" for 100-Yr event
 Inflow = 11.67 cfs @ 12.05 hrs, Volume= 1.021 af
 Outflow = 7.83 cfs @ 12.22 hrs, Volume= 0.794 af, Atten= 33%, Lag= 10.3 min
 Primary = 7.83 cfs @ 12.22 hrs, Volume= 0.794 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 20.98' @ 12.22 hrs Surf.Area= 11,135 sf Storage= 14,792 cf

Plug-Flow detention time= 140.3 min calculated for 0.794 af (78% of inflow)
 Center-of-Mass det. time= 58.5 min (849.6 - 791.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	26,121 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.50	8,828	369.8	0.0	0	0	8,828
20.50	10,358	394.9	100.0	9,583	9,583	10,403
21.00	11,160	407.5	100.0	5,378	14,961	11,232
22.00	11,160	407.5	100.0	11,160	26,121	11,639

Device	Routing	Invert	Outlet Devices
#1	Primary	19.17'	18.0" Round Culvert L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 19.17' / 18.80' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	20.50'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	21.00'	77.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.83 cfs @ 12.22 hrs HW=20.98' TW=19.65' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 7.83 cfs @ 4.65 fps)

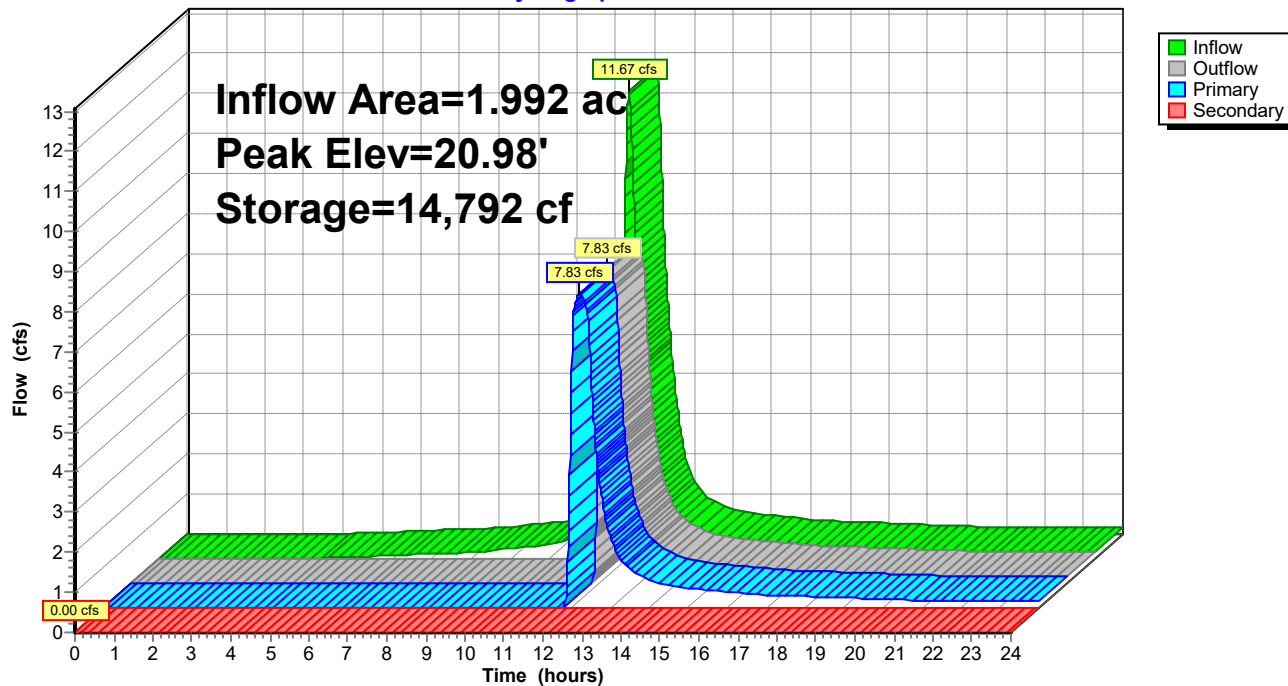
↑ **2=Sharp-Crested Rectangular Weir** (Passes 7.83 cfs of 11.81 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.50' TW=18.73' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 34: SGW #9

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 35: DA #9

Runoff = 11.67 cfs @ 12.05 hrs, Volume= 1.021 af, Depth> 6.15"

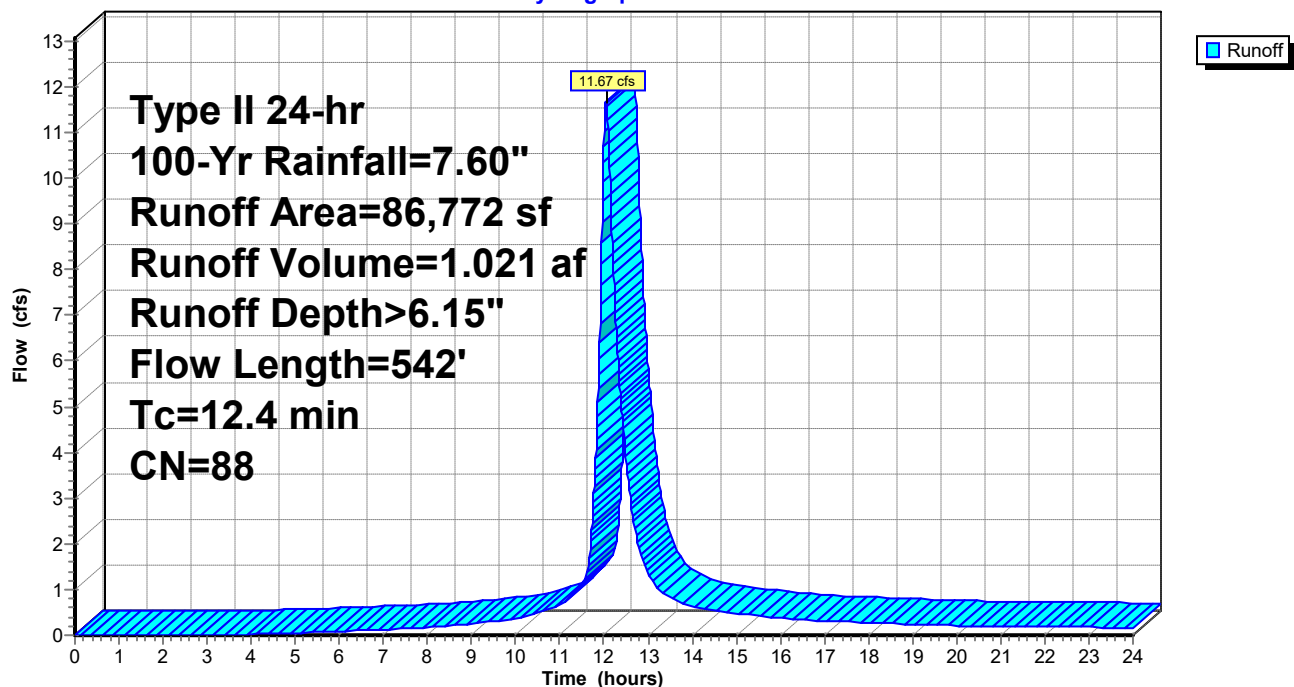
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
49,067	98	Paved parking, HSG C
37,705	74	>75% Grass cover, Good, HSG C
86,772	88	Weighted Average
37,705		43.45% Pervious Area
49,067		56.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	71	0.0200	0.16		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"
5.0	432	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter Paved Kv= 20.3 fps
0.2	39	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
12.4	542	Total			

Subcatchment 35: DA #9

Hydrograph



Summary for Reach 36: NORTH Ditch - South segment

Inflow Area = 1.747 ac, 64.85% Impervious, Inflow Depth > 5.29" for 100-Yr event
 Inflow = 7.23 cfs @ 12.23 hrs, Volume= 0.770 af
 Outflow = 6.96 cfs @ 12.37 hrs, Volume= 0.765 af, Atten= 4%, Lag= 8.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.64 fps, Min. Travel Time= 7.6 min
 Avg. Velocity= 0.75 fps, Avg. Travel Time= 16.6 min

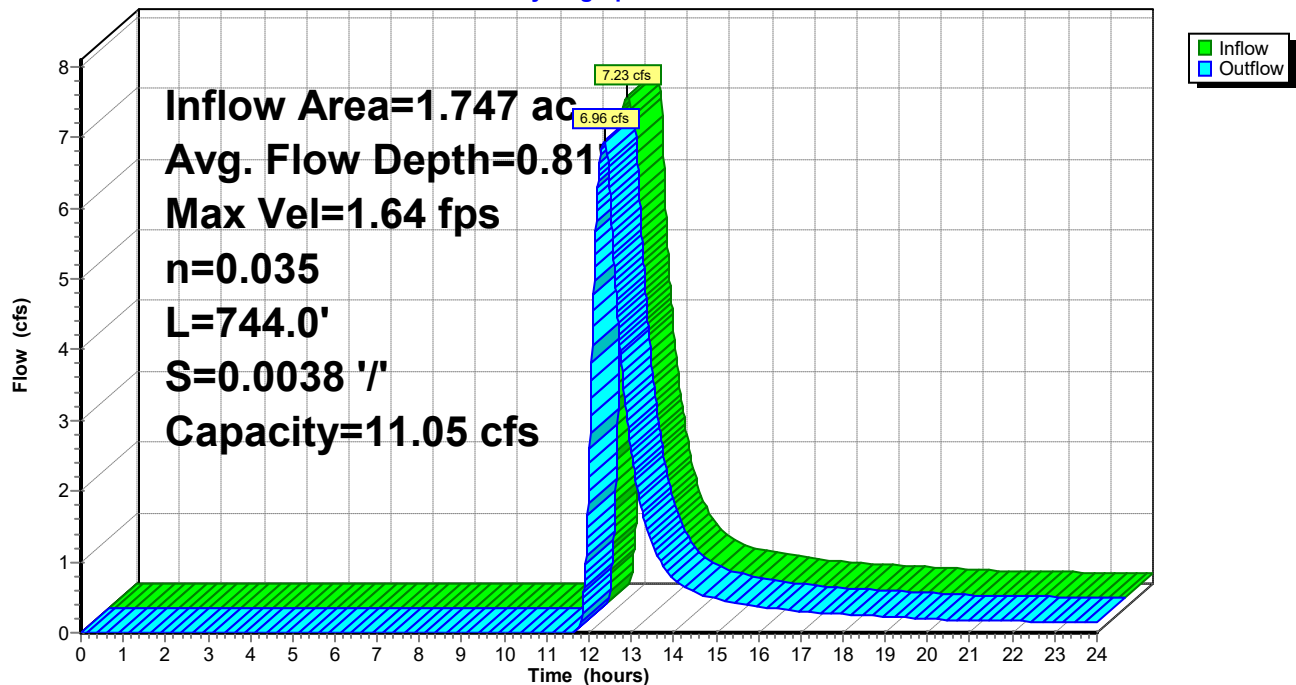
Peak Storage= 3,166 cf @ 12.37 hrs
 Average Depth at Peak Storage= 0.81'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 11.05 cfs

2.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
 Side Slope Z-value= 4.0 '/' Top Width= 10.00'
 Length= 744.0' Slope= 0.0038 '/'
 Inlet Invert= 21.59', Outlet Invert= 18.73'



Reach 36: NORTH Ditch - South segment

Hydrograph



Summary for Pond 37: SGW #5

Inflow Area = 1.747 ac, 64.85% Impervious, Inflow Depth > 6.38" for 100-Yr event
 Inflow = 8.66 cfs @ 12.11 hrs, Volume= 0.928 af
 Outflow = 7.23 cfs @ 12.23 hrs, Volume= 0.770 af, Atten= 16%, Lag= 7.1 min
 Primary = 7.23 cfs @ 12.23 hrs, Volume= 0.770 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 23.51' @ 12.23 hrs Surf.Area= 7,942 sf Storage= 9,845 cf

Plug-Flow detention time= 121.0 min calculated for 0.770 af (83% of inflow)
 Center-of-Mass det. time= 50.6 min (841.5 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1	22.10'	18,616 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.10	6,038	319.6	0.0	0	0	6,038
23.10	7,366	344.7	100.0	6,691	6,691	7,406
23.60	8,068	357.3	100.0	3,857	10,548	8,131
24.60	8,068	357.3	100.0	8,068	18,616	8,489

Device	Routing	Invert	Outlet Devices
#1	Primary	21.77'	18.0" Round Culvert L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 21.77' / 21.65' S= 0.0044 ' S= 0.0044 ' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	23.10'	10.7' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	23.60'	51.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.23 cfs @ 12.23 hrs HW=23.51' TW=22.37' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 7.23 cfs @ 4.42 fps)

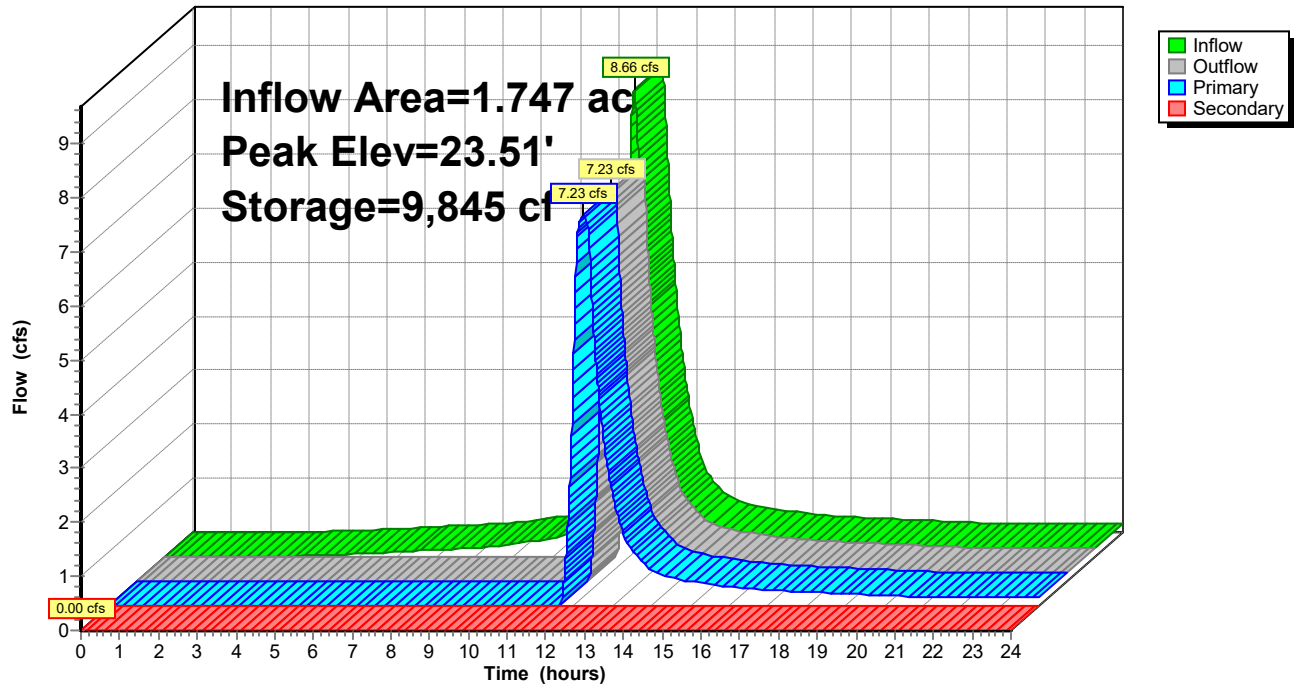
↑2=Sharp-Crested Rectangular Weir (Passes 7.23 cfs of 9.26 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.10' TW=21.59' (Dynamic Tailwater)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 37: SGW #5

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 38: DA #5

Runoff = 8.66 cfs @ 12.11 hrs, Volume= 0.928 af, Depth> 6.38"

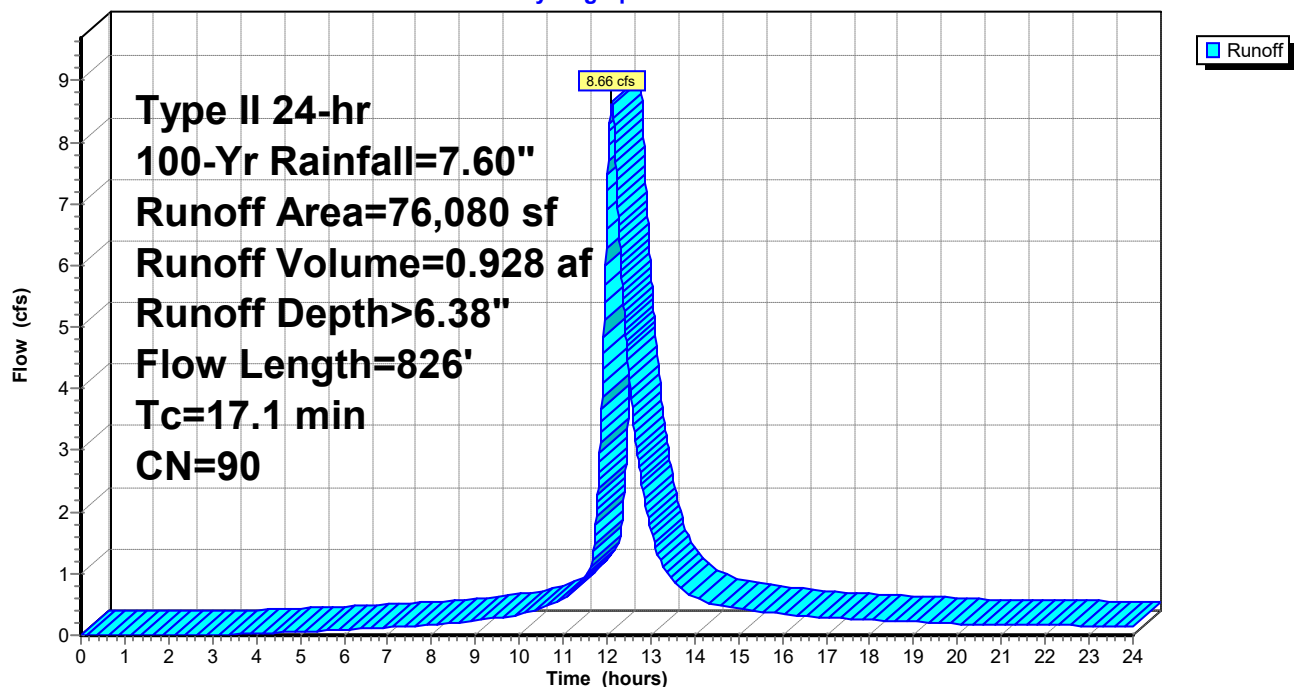
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
49,340	98	Paved parking, HSG C
26,740	74	>75% Grass cover, Good, HSG C
76,080	90	Weighted Average
26,740		35.15% Pervious Area
49,340		64.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	91	0.0200	0.17		Sheet Flow, A-B Lot
					Grass: Short n= 0.150 P2= 3.40"
8.2	704	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter
					Paved Kv= 20.3 fps
0.1	31	0.0050	3.47	2.73	Pipe Channel, C-D
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.012
17.1	826	Total			

Subcatchment 38: DA #5

Hydrograph

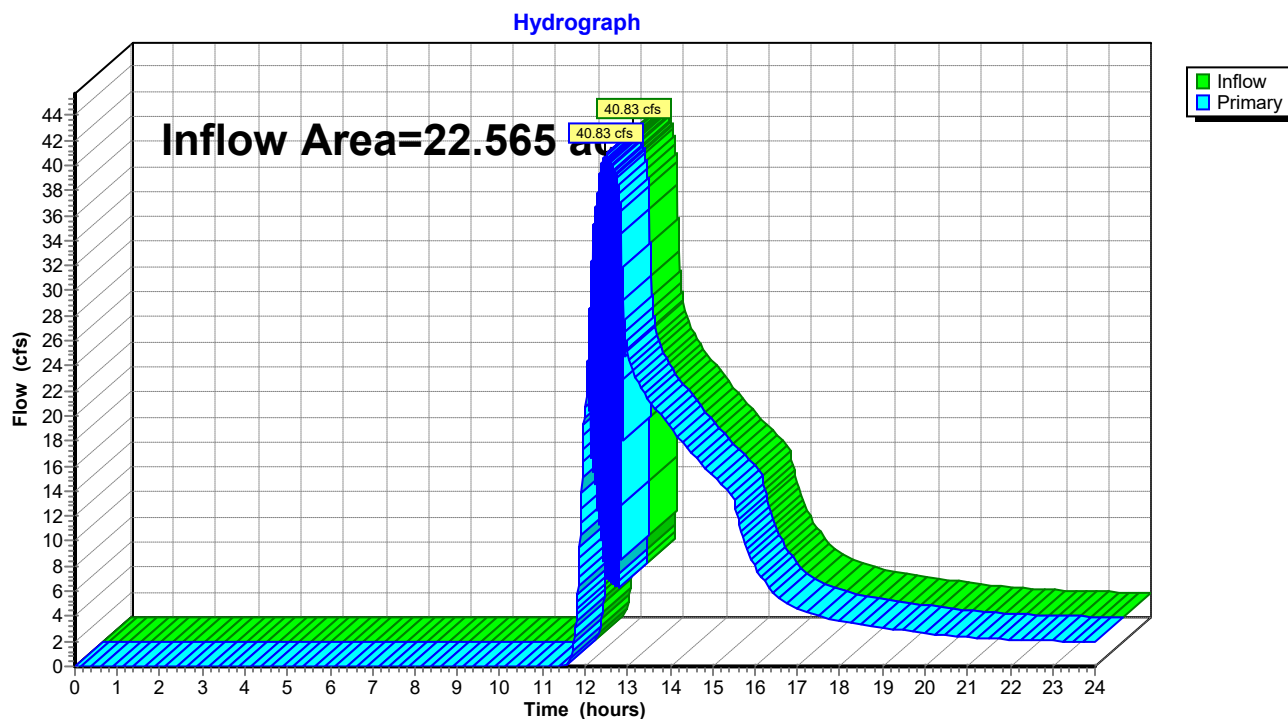


Summary for Link 39: POI-3 (POST)

Inflow Area = 22.565 ac, 46.77% Impervious, Inflow Depth > 4.52" for 100-Yr event
 Inflow = 40.83 cfs @ 12.49 hrs, Volume= 8.501 af
 Primary = 40.83 cfs @ 12.49 hrs, Volume= 8.501 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 39: POI-3 (POST)



Summary for Pond 40: MH2

Inflow Area = 22.565 ac, 46.77% Impervious, Inflow Depth > 4.52" for 100-Yr event
 Inflow = 40.83 cfs @ 12.49 hrs, Volume= 8.500 af
 Outflow = 40.83 cfs @ 12.49 hrs, Volume= 8.500 af, Atten= 0%, Lag= 0.0 min
 Primary = 40.83 cfs @ 12.49 hrs, Volume= 8.500 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 22.63' @ 12.49 hrs

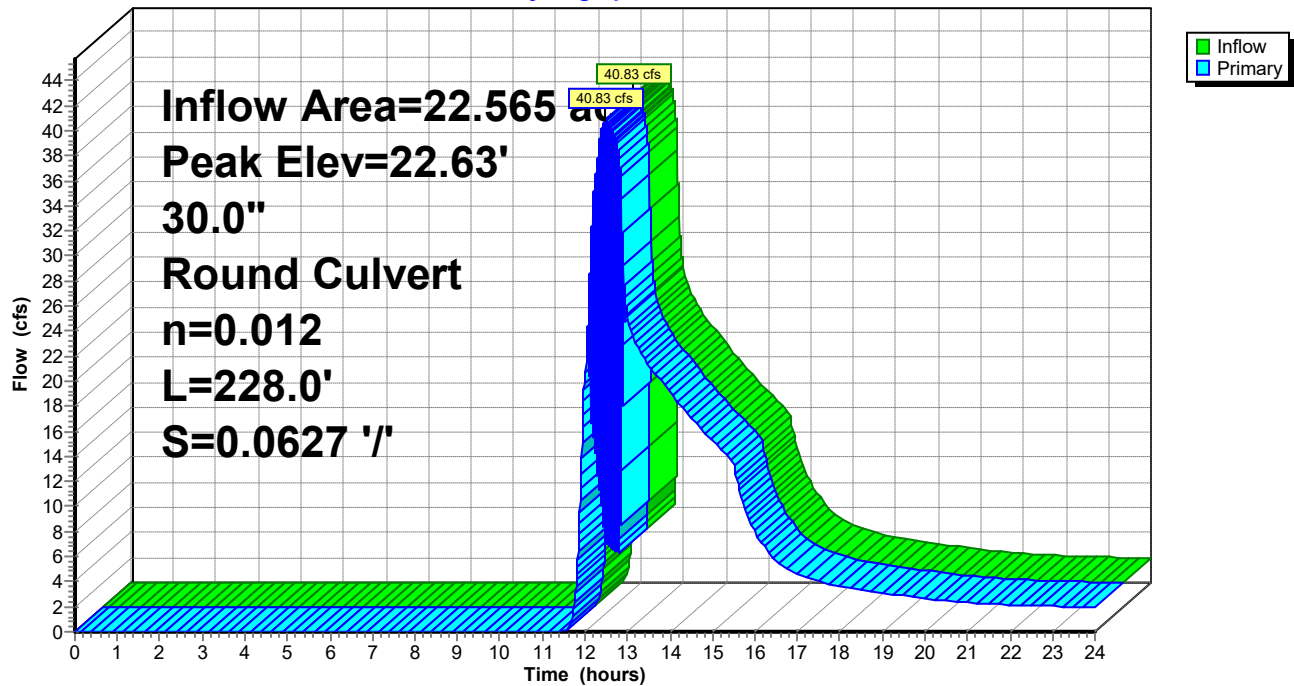
Flood Elev= 22.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	30.0" Round Culvert L= 228.0' Ke= 0.500 Inlet / Outlet Invert= 18.40' / 4.10' S= 0.0627 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=40.79 cfs @ 12.49 hrs HW=22.63' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 40.79 cfs @ 8.31 fps)

Pond 40: MH2

Hydrograph



Summary for Pond 41: SGW #7

Inflow Area = 17.224 ac, 44.70% Impervious, Inflow Depth > 5.79" for 100-Yr event
 Inflow = 72.04 cfs @ 12.13 hrs, Volume= 8.306 af
 Outflow = 46.77 cfs @ 12.61 hrs, Volume= 7.036 af, Atten= 35%, Lag= 28.8 min
 Primary = 23.79 cfs @ 12.61 hrs, Volume= 6.254 af
 Secondary = 22.98 cfs @ 12.61 hrs, Volume= 0.782 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 22.14' @ 12.61 hrs Surf.Area= 58,875 sf Storage= 165,120 cf

Plug-Flow detention time= 157.4 min calculated for 7.036 af (85% of inflow)
 Center-of-Mass det. time= 91.6 min (901.0 - 809.4)

Volume	Invert	Avail.Storage	Storage Description			
#1	19.00'	215,526 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.00	45,723	1,058.3	0.0	0	0	45,723
20.00	50,007	1,083.4	100.0	47,849	47,849	50,133
21.00	54,391	1,108.6	100.0	52,184	100,033	54,663
22.00	58,875	1,133.7	100.0	56,618	156,651	59,280
23.00	58,875	1,133.7	100.0	58,875	215,526	60,414

Device	Routing	Invert	Outlet Devices
#1	Primary	18.67'	24.0" Round Culvert L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 18.67' / 18.50' S= 0.0071 ' / Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	20.00'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	22.00'	177.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 12.61 hrs HW=22.14' TW=22.57' (Dynamic Tailwater)

↑ **1=Culvert** (Controls 0.00 cfs)

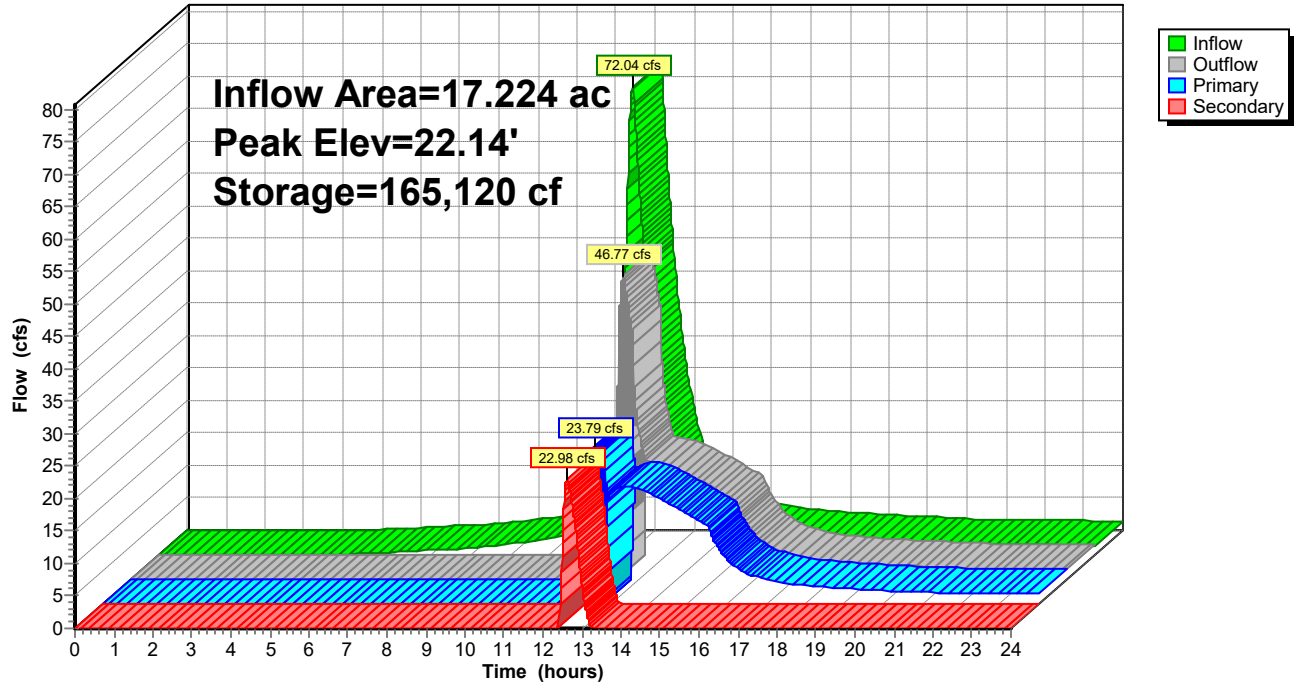
↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=22.97 cfs @ 12.61 hrs HW=22.14' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 22.97 cfs @ 0.90 fps)

Pond 41: SGW #7

Hydrograph



Poplar Hill-220155

Prepared by {enter your company name here}

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

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Summary for Subcatchment 42: DA #7

Runoff = 72.04 cfs @ 12.13 hrs, Volume= 8.306 af, Depth> 5.79"

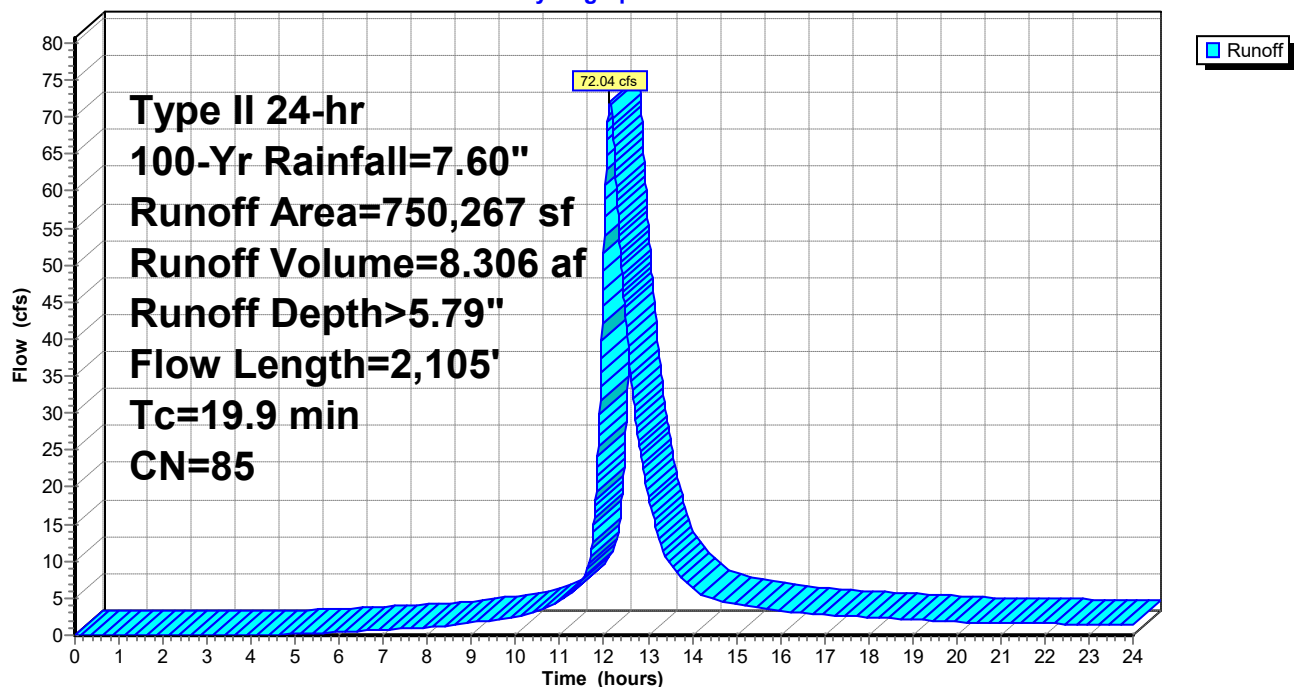
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
335,358	98	Paved parking, HSG C
414,909	74	>75% Grass cover, Good, HSG C
750,267	85	Weighted Average
414,909		55.30% Pervious Area
335,358		44.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	89	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"
2.7	236	0.0050	1.44		Shallow Concentrated Flow, B-C Gutter Paved Kv= 20.3 fps
8.5	1,780	0.0050	3.47	2.73	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
19.9	2,105	Total			

Subcatchment 42: DA #7

Hydrograph



Summary for Pond 43: SGW #6

Inflow Area = 5.341 ac, 53.44% Impervious, Inflow Depth > 6.04" for 100-Yr event
 Inflow = 38.32 cfs @ 12.01 hrs, Volume= 2.690 af
 Outflow = 18.35 cfs @ 12.23 hrs, Volume= 2.247 af, Atten= 52%, Lag= 13.3 min
 Primary = 18.16 cfs @ 12.23 hrs, Volume= 2.246 af
 Secondary = 0.19 cfs @ 12.23 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 23.11' @ 12.23 hrs Surf.Area= 25,941 sf Storage= 43,976 cf

Plug-Flow detention time= 129.1 min calculated for 2.247 af (84% of inflow)
 Center-of-Mass det. time= 58.6 min (847.1 - 788.4)

Volume	Invert	Avail.Storage	Storage Description
#1	21.00'	67,069 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.00	15,353	1,298.4	0.0	0	0	15,353
22.00	20,596	1,323.5	100.0	17,910	17,910	20,752
23.00	25,941	1,348.6	100.0	23,217	41,128	26,253
24.00	25,941	1,348.6	100.0	25,941	67,069	27,602

Device	Routing	Invert	Outlet Devices
#1	Primary	20.67'	24.0" Round Culvert L= 213.0' Ke= 0.500 Inlet / Outlet Invert= 20.67' / 18.50' S= 0.0102 ' / Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	22.00'	8.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#3	Secondary	23.10'	86.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=14.78 cfs @ 12.23 hrs HW=23.11' TW=21.87' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 14.78 cfs @ 4.90 fps)

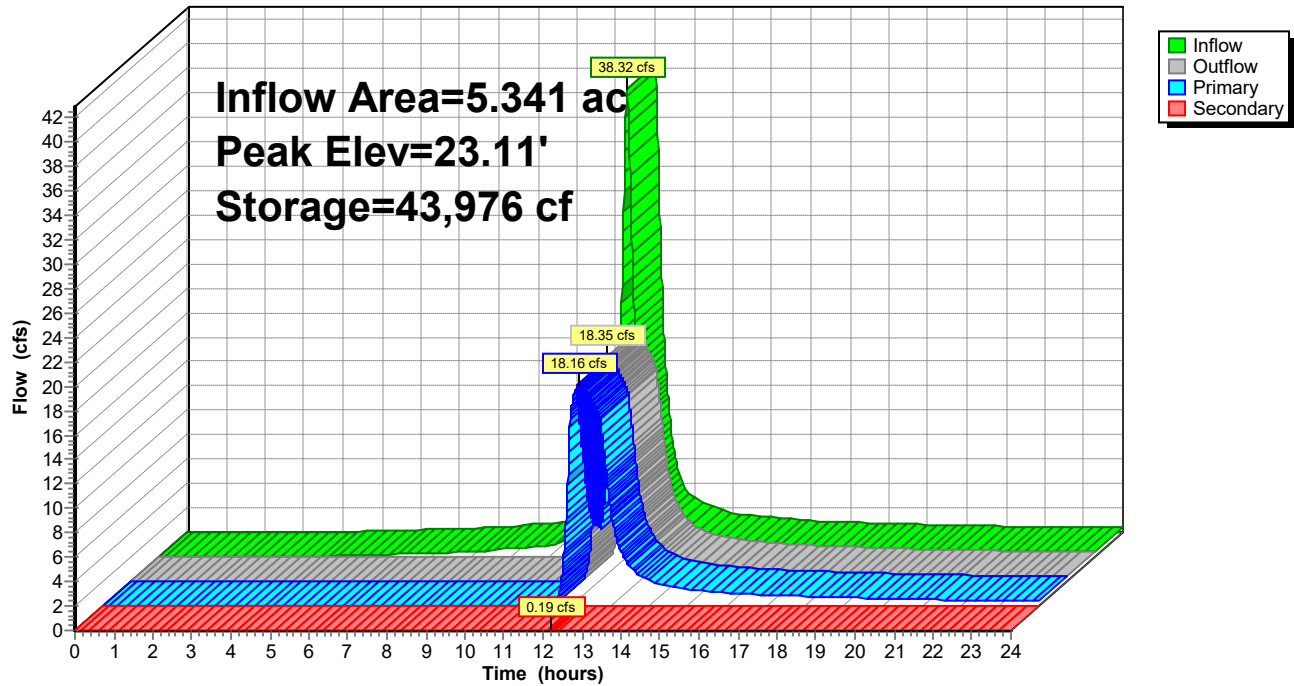
↑ **2=Sharp-Crested Rectangular Weir** (Passes 14.78 cfs of 30.58 cfs potential flow)

Secondary OutFlow Max=0.19 cfs @ 12.23 hrs HW=23.11' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 0.19 cfs @ 0.23 fps)

Pond 43: SGW #6

Hydrograph



Poplar Hill-220155

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

Prepared by {enter your company name here}

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Summary for Subcatchment 44: DA #6

Runoff = 38.32 cfs @ 12.01 hrs, Volume= 2.690 af, Depth> 6.04"

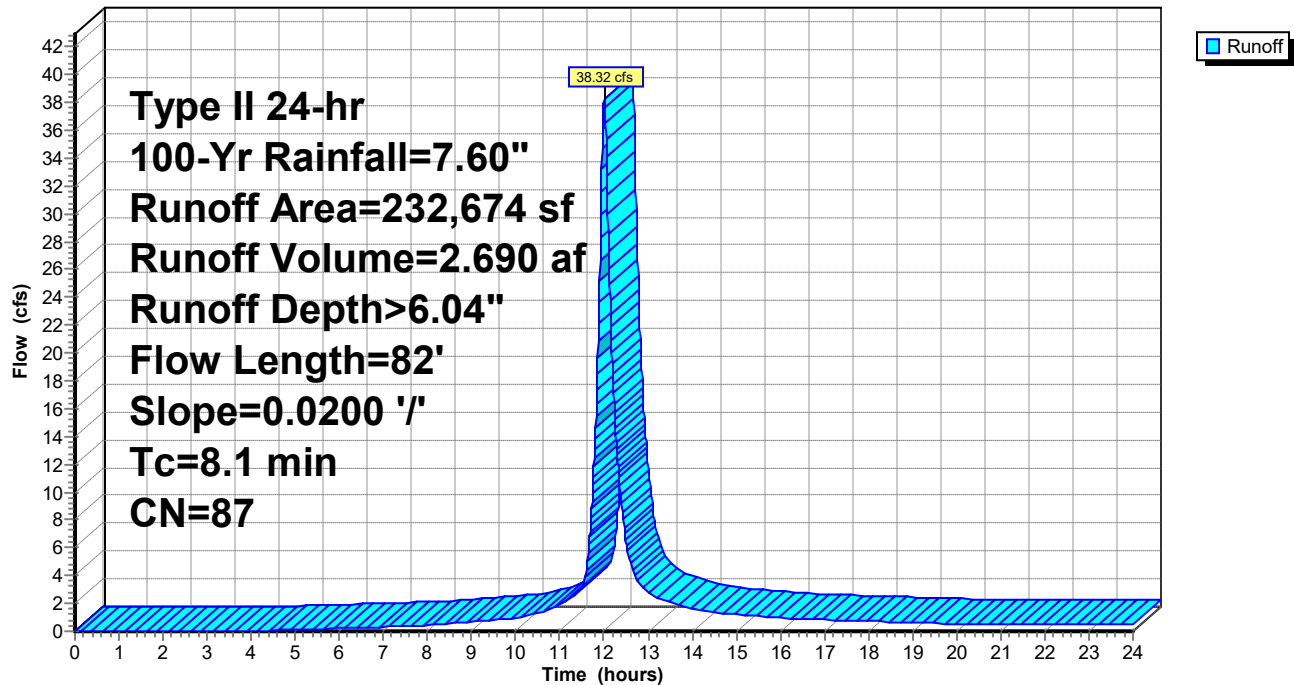
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Yr Rainfall=7.60"

Area (sf)	CN	Description
124,340	98	Paved parking, HSG C
108,334	74	>75% Grass cover, Good, HSG C
232,674	87	Weighted Average
108,334		46.56% Pervious Area
124,340		53.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	82	0.0200	0.17		Sheet Flow, A-B Lot Grass: Short n= 0.150 P2= 3.40"

Subcatchment 44: DA #6

Hydrograph



APPENDIX C

15% PHOSPHORUS REMOVAL CALCULATIONS

Calculation Summary

Critical Area 15% Calculations

Removal Requirement, RR (lbs P / yr)	54.17
after non-structural and micro-scale BMPs (Steps 5 and 6)	
Total Load Reduction (lbs P / year)	75.22
Total Load Reduction Remaining (lbs P / yr)	0.00
after structural practices (Step 9)	
Total Load Reduction (lbs P / year)	75.22
Total Load Reduction Remaining (lbs P / yr)	0.00

MDE's ESD to the MEP Calculations

ESD Runoff Volume, ESDv (cf)	271170.00
Total Treatment Volume (cf)	271170.00
WQv or ESDv Treated (cf)	376430.25
PE achieved (inches)	2.50
Entire ESDv Treated Through Environmental Site Design?	YES
ESDv Remaining? (cf)	0.00
If ESDV is not fully treated, is ESD to MEP achieved?	0.00
Redevelopment WQv Requirements Met Through Environmental Site Design?	N/A
WQv Remaining? (cf)	0.00
New Development WQv Requirements Met Through Environmental Site Design?	YES
WQv Remaining? (cf)	0.00

Micro-Scale Practices	P _E Credit Description	Contributing Drainage Area (sf)	% Impervious Cover	ESDv Received by Practice	ESDv from Up-Gradient Practices	Practice Specific Parameter(s)			WQv or ESDv credit (cf)	Runoff Volume Remaining (cf)	Down-Gradient Practice
SGW #1	ESDv credit is based on design storage volume	210,281	41%	19,876	0	Surface Area (sf)	ding Depth	dia Depth	19,876	0	
						11,885	1	3			
SGW #2	ESDv credit is based on design storage volume	405,742	39%	36,769	0	Surface Area (sf)	ding Depth	dia Depth	36,769	0	
						49,862	1	3			
SGW #3	ESDv credit is based on design storage volume	258,095	50%	29,124	0	Surface Area (sf)	ding Depth	dia Depth	29,124	0	
						16,961	1	3			
SGW #4A	ESDv credit is based on design storage volume	62,363	52%	7,326	0	Surface Area (sf)	ding Depth	dia Depth	7,326	0	
						3,692	1	3			
SGW #4B	ESDv credit is based on design storage volume	233,002	44%	23,527	0	Surface Area (sf)	ding Depth	dia Depth	23,527	0	
						14,777	1	3			
SGW #5	ESDv credit is based on design storage volume	76,080	65%	10,847	0	Surface Area (sf)	ding Depth	dia Depth	10,847	0	
						6,038	1	3			
SGW #6	ESDv credit is based on design storage volume	232,674	53%	27,796	0	Surface Area (sf)	ding Depth	dia Depth	27,796	0	
						15,353	1	3			
SGW #7	ESDv credit is based on design storage volume	750,267	45%	76,350	0	Surface Area (sf)	ding Depth	dia Depth	76,350	0	
						45,723	1	3			
SGW #8	ESDv credit is based on design storage volume	331,820	53%	39,274	0	Surface Area (sf)	ding Depth	dia Depth	27,401	11,873	
						12,455	1	3			
SGW #9	ESDv credit is based on design storage volume	86,772	57%	10,912	0	Surface Area (sf)	ding Depth	dia Depth	10,912	0	
						8,828	1	3			
SGW #11	ESDv credit is based on design storage volume	51,380	38%	4,532	0	Surface Area (sf)	ding Depth	dia Depth	4,532	0	
						3,711	1	3			
SGW #12	ESDv credit is based on design storage volume	21,055	76%	3,477	0	Surface Area (sf)	ding Depth	dia Depth	3,477	0	
						1,695	1	3			
SGW #13	ESDv credit is based on design storage volume	202,941	58%	26,119	0	Surface Area (sf)	ding Depth	dia Depth	26,119	0	
						14,301	1	3			
SGW #14	ESDv credit is based on design storage volume	168,928	62%	23,109	0	Surface Area (sf)	ding Depth	dia Depth	23,109	0	
						12,709	1	3			
SGW #15	ESDv credit is based on design storage volume	90,352	42%	8,701	0	Surface Area (sf)	ding Depth	dia Depth	8,701	0	
						4,927	1	3			
SGW #16	ESDv credit is based on design storage volume	159,083	32%	12,098	0	Surface Area (sf)	ding Depth	dia Depth	12,098	0	
						6,875	1	3			
Total		3,340,835		359,840	0				347,967	11,873	

Phosphorous Removal Efficiency	Adjusted Removal Efficiency Rate	P Load to Practice (lbs/yr)	Load Reduction (lbs/yr)	Remaining Load (lbs/yr)
60%	79%	4.96	3.90	1.06
60%	79%	9.18	7.22	1.96
60%	79%	7.27	5.72	1.56
60%	79%	1.83	1.44	0.39
60%	79%	5.88	4.62	1.26
60%	79%	2.71	2.13	0.58
60%	79%	6.94	5.46	1.48
60%	79%	19.07	14.99	4.08
60%	72%	9.81	7.05	2.76
60%	79%	2.73	2.14	0.58
60%	79%	1.13	0.89	0.24
60%	79%	0.87	0.68	0.19
60%	79%	6.52	5.13	1.39
60%	79%	5.77	4.54	1.23
60%	79%	2.17	1.71	0.46
60%	79%	3.02	2.38	0.65
60%	78%	89.88	70.00	19.88

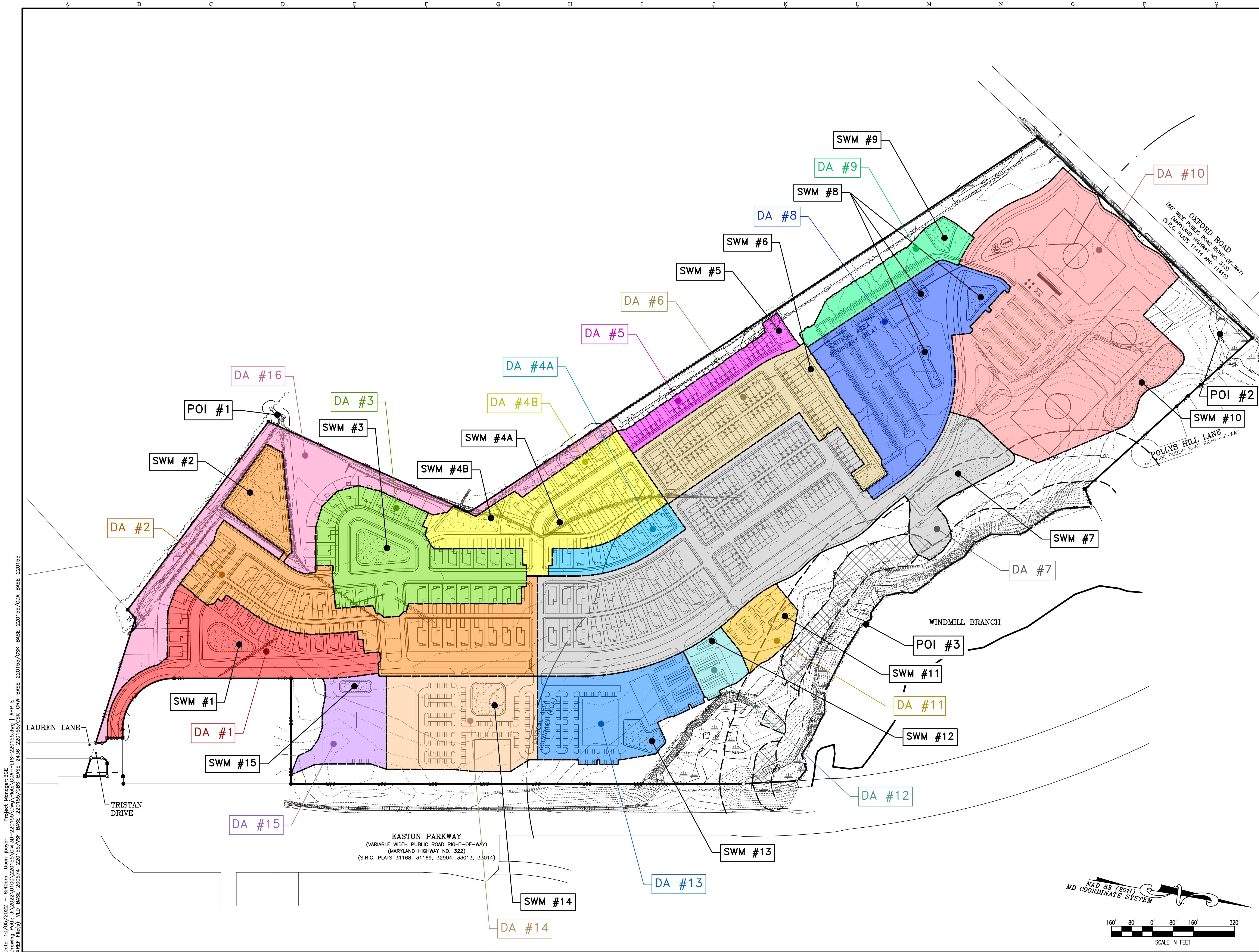
Micro-Scale Practices	P _E Credit Description	Contributing Drainage Area (sf)	% Imperviou s Cover	ESDv Received by Practice	ESDv from Up- Gradient Practices	Practice Specific Parameter(s)			WQv or ESDv credit (cf)	Runoff Volume Remainin g (cf)	Down-Gradient Practice	Phosphor ous Removal Efficiency	Adjusted Removal Efficiency Rate	P Load to Practice (lbs/yr)	Load Reductio n (lbs/yr)	Remainin g Load (lbs/yr)
MBr #10	ESDv credit is based on design storage volume	677,943	19%	33,064	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	28,464	4,600		50%	63%	8.26	5.22	3.04
						12,938	1	3								
Micro-Bioretenction (C/D Soils)	ESDv credit is based on design storage volume			0	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	0	0		50%		0.00	0.00	0.00
Micro-Bioretenction (C/D Soils)	ESDv credit is based on design storage volume			0	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	0	0		50%		0.00	0.00	0.00
Micro-Bioretenction (C/D Soils)	ESDv credit is based on design storage volume			0	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	0	0		50%		0.00	0.00	0.00
Micro-Bioretenction (C/D Soils)	ESDv credit is based on design storage volume			0	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	0	0		50%		0.00	0.00	0.00
Micro-Bioretenction (C/D Soils)	ESDv credit is based on design storage volume			0	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	0	0		50%		0.00	0.00	0.00
Micro-Bioretenction (C/D Soils)	ESDv credit is based on design storage volume			0	0	Surface Area (sf)	Ponding Depth (ft)	Media Depth (ft)	0	0		50%		0.00	0.00	0.00
Total		677,943		33,064	0				28,464	4,600		50%	63%	8.26	5.22	3.04

APPENDIX D

PRE-DEVELOPMENT DRAINAGE AREA MAP

APPENDIX E

POST-DEVELOPMENT DRAINAGE AREA MAP



Date: 10/05/2022 - 8:00am User: jibayer Project Manager: BCE
Drawing Path: J:\2022\0100\220155\Civil\3D-220155\Draw\Plots\DA-PLT-220155.dwg | APP E
XREF File(s): VLD-BASE-200574-220155\VF-BASE-220155\VF-BASE-2436-220155\CSK-CRW-BASE-220155\CSK-BASE-220155\DA-BASE-220155

PLANS ARE
ISSUED FOR
REVIEW ONLY

PLANS ARE NOT
APPROVED FOR
CONSTRUCTION

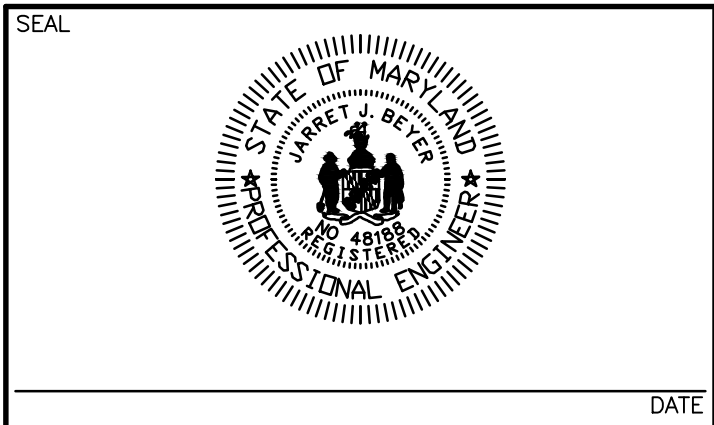
REVISIONS TO APPROVED PLANS			
No.	DATE	DESCRIPTION	BY

WARNING!!
THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE QUANTITIES SHOWN ON THIS PLAN ARE FOR INFORMATIONAL AND PERMITTING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES TO HIS OWN SATISFACTION PRIOR TO BEGINNING CONSTRUCTION.
THE CONTRACTOR SHALL TEST PIT AND LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF ANY WORK ON-SITE. THE CONTRACTOR SHALL NOTIFY DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF THE EXISTING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK ON-SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION EXPENSE.



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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. 45188 - Expiration Date: 12/28/2023



PROPOSED CONDITIONS
DRAINAGE AREA MAP

POPLAR HILL
PUD PLAN
IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 PARCEL 57

ISSUED/REVISED FOR:	DATE:	BY:
SHEET No. APPENDIX E	JOB No. 220155	
SCALE: AS NOTED	FILE No. 1324	

CONCEPT STORMWATER MANAGEMENT REPORT

For

**Poplar Hill
PUD**

Developer

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9161 Liberia Avenue, Suite 201
Manassas, VA 20110

Design Professional

Lane Engineering, LLC
117 Bay Street
Easton, Maryland 21601
410-822-8003

Date Prepared

July 6, 2022
Revised November 1, 2022

Prepared by

Jarret J. Beyer, P.E.

PROFESSIONAL CERTIFICATION: I hereby certify that this document was prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 48188, Expiration Date: 12/28/2023.

TABLE OF CONTENTS

SECTIONS LIST

1. Introduction
2. General Site Information
3. Proposed Project
4. Stormwater Management
 - 4.1 Stormwater Quantity Management
 - 4.2 Stormwater Quality Management
 - 4.3 Critical Area Phosphorus Removal
5. Conclusion

APPENDIX LIST

- APPENDIX A – Maryland Environmental Site Design (ESD) Calculations
- APPENDIX B – Stormwater Quantity Calculations
- APPENDIX C – 15% Phosphorus Removal Calculations
- APPENDIX D – Pre-development Drainage Area Map
- APPENDIX E – Post-development Drainage Area Map

Poplar Hill PUD

STORMWATER MANAGEMENT REPORT

1. INTRODUCTION

This report addresses the stormwater management requirements of the *2000 Maryland Stormwater Design Manual Volumes I and II* (Manual) as currently updated. Development projects are required to be reviewed during the concept, preliminary site development, and final design stages. This narrative addresses the requirements pertaining to the concept design stage and meets the intent of the guidelines and methodologies presented in the MDE document *Environmental Site Design (ESD) Process & Computations* dated July 2010.

2. GENERAL SITE INFORMATION

The site is a 120.5 acre parcel located along Oxford Road across from Easton Club, and partially fronting the Easton Bypass. The site is currently in agricultural use. Surrounding lands consist of residential development, forest, and Temple B’Nai Israel.

The parcel discharges to three main points, two of which discharge to tidal waters. Geo-Technology Associates, Inc. have done soils borings. Soils on the south end of the site are mixtures of sand and silty sand to about 5 feet, with clay/silty clay/clayey silt below 5 feet. Moving north on the site towards the middle, silty sand/silt/silty clay extend to depths of about 3 to 4 feet. Below this elevation soils become sand and silty sand for a few feet before becoming silty clay/clayey silt. Groundwater elevations are generally high on the south half of the site and drop down at the central part of the site. Additional borings will be necessary on the north end of the site and for proposed stormwater features. USDA soil maps classify site soils as B and C soils.

3. PROPOSED PROJECT

The proposed Planned Unit Development (PUD) will consist of mixed use residential, commercial sites, and a community park with ball fields. The residential portion will be a mix of single-family homes, townhomes, and apartments. Roads, parking, and sidewalks will be constructed to serve the improvements. In addition, a community pools and clubhouses will serve the residential portion. Surrounding the buildings and amenities will be forest conservation area and open spaces. Stormwater management features are proposed throughout the entire site.

4. STORMWATER MANAGEMENT

Stormwater management is conceptual at this point and has been analyzed to meet quality, quantity, and Critical Area Commission requirements. Since this is a concept level analysis, treatment volumes are calculated by ponding volume only. We believe this is a conservative approach giving us a good starting point for discussion and refinement. Additional soils testing and discussion with the Town Engineer will lead to placement of an assortment of features.

4.1 STORMWATER QUANTITY MANAGEMENT

The 2-year and 10-year storm events are required to be managed onsite, with the 100-year storm event safely conveyed for discharge at the southwest and northeast corners of the site (POI-1 and POI-2.) An additional point of discharge along the east property line of the site is to Windmill Branch, routed to tidal waters (POI-3.) This discharge point is not required to be managed to the 2 and 10-year storm events. Additional analysis will be needed at POI-3 as the commercial parcels develop further.

STORMWATER DISCHARGE (cfs)						
	Pre 2-yr	Post 2-yr	Pre 10-yr	Post 10-yr	Pre 100-yr	Post 100-yr
POI-1	28.95	9.99	69.81	38.18	125.31	79.13
POI-2	18.47	5.86	44.38	36.29	79.43	93.29
POI-3	3.68	6.57	14.68	19.79	32.10	40.83

The existing site is currently an open farm field. The stormwater discharge to the surrounding ditches is significantly reduced with this development. And, as a component of the PUD project a significant portion of the site perimeter will be planted with forest conservation shrubbery. Given time and appropriate maintenance, these areas will develop into woods in good condition. The Runoff Curve Number in these areas will be converted from 86 – 88 for row crops in C soils to 70 for woods in good condition. This change in runoff characteristics will further reduce the overall quantity of water leaving the site.

4.2 STORMWATER QUALITY MANAGEMENT

This project is classified as new development. ESD requirements must be addressed for the project's entire limits of disturbance (LOD.) For a conservative approach, all soils are assumed as group C soils, resulting in a higher Pe. All proposed stormwater features adequately address ESD requirements. Drainage area 16 will be treated via non-rooftop disconnect. Adequate pervious area is available and contributing impervious area is minimal or non-existent.

ESD_v SUMMARY						
Drainage Area	Type of ESD Practice	Name of ESD Practice	Drainage Area (sq. feet)	Impervious Area (sq. feet)	Target ESD _v (cu. feet)	ESD _v Provided (cu. Feet)
1	SGW	SWM #1	210,281	86,472	11,779	12,823
2	SGW	SWM #2	405,742	159,036	21,789	38,131
3	SGW	SWM #3	258,095	129,485	17,259	18,076
4A	SGW	SWM #4A	62,363	32,714	4,341	4,217
4B	SGW	SWM #4B	233,002	103,239	13,942	16,151
5	SGW	SWM #5	76,080	49,340	6,428	6,702
6	SGW	SWM #6	232,674	124,340	16,472	17,975
7	SGW	SWM #7	750,267	335,217	45,228	47,865
8	SGW	SWM #8	331,820	175,511	23,273	23,868
9	SGW	SWM #9	86,772	49,067	6,467	9,593
10	SGW	SWM #10	677,943	106,609	17,313	30,297
11	SGW	SWM #11	57,439	19,953	2,777	4,292
12	SGW	SWM #12	40,772	19,949	2,666	2,709
13	SGW	SWM #13	194,438	118,369	15,501	15,843
14	SGW	SWM #14	213,229	135,291	17,656	18,908
15	SGW	SWM #15	93,273	51,992	6,861	7,077
16	Non-rooftop Disconnect	-	272,963	4,800	26	380

4.3 CRITICAL AREA PHOSPHORUS REMOVAL

This project must meet Critical Area Commission phosphorus removal requirements. As part of the Growth Allocation process, the Commission has requested additional treatment, if possible. We have thus increased the phosphorus removal to 15% from the typically required 10%. All proposed stormwater features adequately address, and significantly exceed, the 15% removal target.

5. CONCLUSION

This stormwater management analysis indicates that the proposed design will successfully meet, and exceed, stormwater quality, quantity, and phosphorus removal requirements. The ESD volume provided is greater than the ESD volume required for all drainage areas, proposed site runoff is significantly less than existing conditions, and phosphorus removal has been exceeded at a higher percentage than required. Planning and design analysis indicates that stormwater quality and quantity management can be accomplished as described. Please see the attached appendices for detailed calculations and drainage area maps.

[illegible]

Calculation Summary

Critical Area 15% Calculations

Removal Requirement, RR (lbs P / yr)	54.77
after non-structural and micro-scale BMPs (Steps 5 and 6)	
Total Load Reduction (lbs P / year)	75.31
Total Load Reduction Remaining (lbs P / yr)	0.00
after structural practices (Step 9)	
Total Load Reduction (lbs P / year)	75.31
Total Load Reduction Remaining (lbs P / yr)	0.00

MDE's ESD to the MEP Calculations

ESD Runoff Volume, ESDv (cf)	263464.00
Total Treatment Volume (cf)	263464.00
WQv or ESDv Treated (cf)	372489.33
PE achieved (inches)	2.54
Entire ESDv Treated Through Environmental Site Design?	YES
ESDv Remaining? (cf)	0.00
If ESDV is not fully treated, is ESD to MEP achieved?	0.00
Redevelopment WQv Requirements Met Through Environmental Site Design?	N/A
WQv Remaining? (cf)	0.00
New Development WQv Requirements Met Through Environmental Site Design?	YES
WQv Remaining? (cf)	0.00

		Contributin g Drainage Area (sf)	% Impervious Cover	ESDv Received by Practice	ESDv from Up- Gradient Practices	Practice Specific Parameter(s)			WQv or ESDv credit (cf)	Runoff Volume Remainin g (cf)	Down- Gradient Practice
Micro-Scale Practices	P _E Credit Description					Surface Area (sf)	ading Depth	dia Depth			
SWM #1	ESDv credit is based on design storage volume	210,281	41%	19,876	0	11,885	1	3	19,876	0	
SWM #2	ESDv credit is based on design storage volume	405,742	39%	36,769	0	Surface Area (sf)	ading Depth	dia Depth	36,769	0	
						49,862	1	3			
SWM #3	ESDv credit is based on design storage volume	258,095	50%	29,124	0	Surface Area (sf)	ading Depth	dia Depth	29,124	0	
						16,961	1	3			
SWM #4A	ESDv credit is based on design storage volume	62,363	52%	7,326	0	Surface Area (sf)	ading Depth	dia Depth	7,326	0	
						3,692	1	3			
SWM #4B	ESDv credit is based on design storage volume	233,002	44%	23,527	0	Surface Area (sf)	ading Depth	dia Depth	23,527	0	
						14,777	1	3			
SWM #5	ESDv credit is based on design storage volume	76,080	65%	10,847	0	Surface Area (sf)	ading Depth	dia Depth	10,847	0	
						6,038	1	3			
SWM #6	ESDv credit is based on design storage volume	232,674	53%	27,796	0	Surface Area (sf)	ading Depth	dia Depth	27,796	0	
						15,353	1	3			
SWM #7	ESDv credit is based on design storage volume	750,267	45%	76,322	0	Surface Area (sf)	ading Depth	dia Depth	76,322	0	
						45,723	1	3			
SWM #8A, 8B, 8C, 8D	ESDv credit is based on design storage volume	331,820	53%	39,274	0	Surface Area (sf)	ading Depth	dia Depth	27,401	11,873	
						12,455	1	3			
SWM #9	ESDv credit is based on design storage volume	86,772	57%	10,912	0	Surface Area (sf)	ading Depth	dia Depth	10,912	0	
						8,828	1	3			
SWM #10	ESDv credit is based on design storage volume	677,943	16%	29,215	0	Surface Area (sf)	ading Depth	dia Depth	29,215	0	
						29,822	1	3			
SWM #11	ESDv credit is based on design storage volume	57,439	35%	4,687	0	Surface Area (sf)	ading Depth	dia Depth	4,687	0	
						3,711	1	3			
SWM #12	ESDv credit is based on design storage volume	40,772	49%	4,498	0	Surface Area (sf)	ading Depth	dia Depth	3,729	769	
						1,695	1	3			
SWM #13	ESDv credit is based on design storage volume	194,438	61%	26,157	0	Surface Area (sf)	ading Depth	dia Depth	26,157	0	
						14,301	1	3			
SWM #14	ESDv credit is based on design storage volume	213,229	63%	29,795	0	Surface Area (sf)	ading Depth	dia Depth	27,960	1,835	
						12,709	1	3			
SWM #15	ESDv credit is based on design storage volume	93,273	56%	11,578	0	Surface Area (sf)	ading Depth	dia Depth	10,839	738	
						4,927	1	3			
Total		3,924,190		387,705	0				372,489	15,216	

Phosphorous Removal Efficiency	Adjusted Removal Efficiency Rate	P Load to Practice (lbs/yr)	Load Reduction (lbs/yr)	Remaining Load (lbs/yr)
60%	79%	4.96	3.90	1.06
60%	79%	9.18	7.22	1.96
60%	79%	7.27	5.72	1.56
60%	79%	1.83	1.44	0.39
60%	79%	5.88	4.62	1.26
60%	79%	2.71	2.13	0.58
60%	79%	6.94	5.46	1.48
60%	79%	19.06	14.99	4.08
60%	72%	9.81	7.05	2.76
60%	79%	2.73	2.14	0.58
60%	79%	7.30	5.74	1.56
60%	79%	1.17	0.92	0.25
60%	75%	1.12	0.84	0.28
60%	79%	6.53	5.14	1.40
60%	77%	7.44	5.76	1.68
60%	77%	2.89	2.24	0.65
60%	78%	96.84	75.31	21.53

Maryland Environmental Site Design (ESD) Computations

Project Poplar Hill By JJB
 Location Oxford Road/Easton Bypass Date 11/1/2022

Determine Target ESDv

Initial Site Assessment (Site Data):

Existing Conditions

Total LOD Area: 4,503,638 sf
 Soil Types:

HSG	A	B	C	D
Area			4,503,638	
Percent			100.0	

Proposed Layout

Impervious Cover: 1,701,384 sf
 Percent Impervious (I) 38 %

Determine RCNs for Wooded Conditions:

HSG	A	B	C	D
Area			4,503,638	
Percent			100.0	
RCN	38	55	70	77

Weighted RCN: 70

Determine ESD Targets:

= 0.39

From Table 5.3 and
 %I = 38

HSG	A	B	C	D
Area			4,503,638	
Target P _E			2.00	

Composite Target P_E (in.): 2.00

$$\text{ESDv} = \frac{(P_E)(R_v)(A)}{12}$$

= 292,738 cf

Drainage Area 1

Total Area	210,281 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	86,472 sf	
Percent Impervious (I)	41 %	= 11,779 cf
Rv = 0.05 + 0.009(I)	0.42	75% of target = 8,834 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 20,612 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 12,823 \text{ cf} \end{aligned}$$

Surface Area=	11,885 sf	Media Depth=	3 ft
Ponding Area=	13,760 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **12,823 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 2

Total Area	405,742 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	159,036 sf	
Percent Impervious (I)	39 %	= 21,789 cf
Rv = $0.05 + 0.009(I)$	0.40	75% of target= 16,342 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 38,131 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 51,872 \text{ cf} \end{aligned}$$

Surface Area=	49,862 sf	Media Depth=	3 ft
Ponding Area=	53,881 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **38,131 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 3

Total Area	258,095 sf	Target ESDv = $\frac{(P_e)(R_v)(A)}{12}$
Impervious Area	129,485 sf	
Percent Impervious (I)	50 %	= 17,259 cf
Rv = 0.05 + 0.009(I)	0.50	75% of target = 12,944 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 30,203 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 18,076 \text{ cf} \end{aligned}$$

Surface Area=	16,961 sf	Media Depth=	3 ft
Ponding Area=	19,190 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **18,076 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 4A

Total Area	62,363 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	32,714 sf	
Percent Impervious (I)	52 %	= 4,341 cf
Rv = 0.05 + 0.009(I)	0.52	75% of target = 3,256 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 7,598 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 4,217 \text{ cf} \end{aligned}$$

Surface Area=	3,692 sf	Media Depth=	3 ft
Ponding Area=	4,742 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **4,217 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 4B

Total Area	233,002 sf	Target ESDv = $\frac{(P_e)(R_v)(A)}{12}$
Impervious Area	103,239 sf	
Percent Impervious (I)	44 %	= 13,942 cf
Rv = 0.05 + 0.009(I)	0.45	75% of target = 10,457 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 24,399 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 16,151 \text{ cf} \end{aligned}$$

Surface Area=	14,777 sf	Media Depth=	3 ft
Ponding Area=	17,525 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **16,151 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 5

Total Area	76,080 sf	Target ESDv = $\frac{(P_e)(R_v)(A)}{12}$
Impervious Area	49,340 sf	
Percent Impervious (I)	65 %	= 6,428 cf
Rv = $0.05 + 0.009(I)$	0.63	75% of target= 4,821 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 11,249 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 6,702 \text{ cf} \end{aligned}$$

Surface Area=	6,038 sf	Media Depth=	3 ft
Ponding Area=	7,366 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **6,702 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 6

Total Area	232,674 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	124,340 sf	
Percent Impervious (I)	53 %	= 16,472 cf
Rv = 0.05 + 0.009(I)	0.53	75% of target= 12,354 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 28,826 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 17,975 \text{ cf} \end{aligned}$$

Surface Area=	15,353 sf	Media Depth=	3 ft
Ponding Area=	20,596 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **17,975 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 7

Total Area	750,267 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	335,217 sf	
Percent Impervious (I)	45 %	= 45,228 cf
Rv = 0.05 + 0.009(I)	0.45	75% of target= 33,921 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 79,149 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 47,865 \text{ cf} \end{aligned}$$

Surface Area=	45,723 sf	Media Depth=	3 ft
Ponding Area=	50,007 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **47,865 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 8

Total Area	331,820 sf	Target ESDv = $\frac{(P_e)(R_v)(A)}{12}$
Impervious Area	175,511 sf	
Percent Impervious (I)	53 %	= 23,273 cf
Rv = 0.05 + 0.009(I)	0.53	75% of target= 17,455 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 40,729 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 23,868 \text{ cf} \end{aligned}$$

Surface Area=	12,539 sf	Media Depth=	3 ft
Ponding Area=	19,285 sf		
Ponding depth=	1.5 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **23,868 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 9

Total Area	86,772 sf	Target ESDv = $\frac{(P_e)(R_v)(A)}{12}$
Impervious Area	49,067 sf	
Percent Impervious (I)	57 %	= 6,467 cf
Rv = 0.05 + 0.009(I)	0.56	75% of target = 4,850 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 11,316 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 9,593 \text{ cf} \end{aligned}$$

Surface Area=	8,828 sf	Media Depth=	3 ft
Ponding Area=	10,358 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **9,593 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 10

Total Area	677,943 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	106,609 sf	
Percent Impervious (I)	16 %	= 17,313 cf
Rv = 0.05 + 0.009(I)	0.19	75% of target= 12,985 cf

Site Development Design:

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 30,297 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 31,645 \text{ cf} \end{aligned}$$

Surface Area=	29,822 sf	Media Depth=	3 ft
Ponding Area=	33,467 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **30,297 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 11

Total Area	57,439 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	19,953 sf	
Percent Impervious (I)	35 %	= 2,777 cf
Rv = 0.05 + 0.009(I)	0.36	75% of target = 2,083 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 4,860 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 4,292 \text{ cf} \end{aligned}$$

Surface Area=	3,711 sf	Media Depth=	3 ft
Ponding Area=	4,873 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **4,292 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 12

Total Area	40,772 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	19,949 sf	
Percent Impervious (I)	49 %	= 2,666 cf
Rv = 0.05 + 0.009(I)	0.49	75% of target = 1,999 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 4,665 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 2,709 \text{ cf} \end{aligned}$$

Surface Area=	1,969 sf	Media Depth=	3 ft
Ponding Area=	3,449 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **2,709 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 13

Total Area	194,438 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	118,369 sf	
Percent Impervious (I)	61 %	= 15,501 cf
Rv = 0.05 + 0.009(I)	0.60	75% of target= 11,625 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 27,126 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 15,843 \text{ cf} \end{aligned}$$

Surface Area=	9,066 sf	Media Depth=	3 ft
Ponding Area=	12,058 sf		
Ponding depth=	1.5 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **15,843 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 14

Total Area	213,229 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	135,291 sf	
Percent Impervious (I)	63 %	= 17,656 cf
Rv = 0.05 + 0.009(I)	0.62	75% of target= 13,242 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 30,899 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 18,908 \text{ cf} \end{aligned}$$

Surface Area=	17,813 sf	Media Depth=	3 ft
Ponding Area=	20,002 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **18,908 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Drainage Area 15

Total Area	93,273 sf	Target ESDv = $\frac{(P_E)(R_v)(A)}{12}$
Impervious Area	51,992 sf	
Percent Impervious (I)	56 %	= 6,861 cf
Rv = $0.05 + 0.009(I)$	0.55	75% of target= 5,146 cf

Site Development Design - Submerged Gravel Wetland (M-2):

Based on the Cpv storm (2.8 in.): Max allowable ESDv that can be used:

$$V = \frac{(P)(R_v)(A)}{12} = 12,007 \text{ cf}$$

The computed ESDv provided is:

$$\begin{aligned} \text{ESDv} &= (\text{Ponding storage ONLY}) \\ &= 7,077 \text{ cf} \end{aligned}$$

Surface Area=	6,231 sf	Media Depth=	3 ft
Ponding Area=	7,922 sf		
Ponding depth=	1 ft	Porosity=	0.4

Therefore, when assessing compliance with the MEP standard, the volume of runoff treated by this submerged gravel wetland practice is **7,077 cf.**

Now check for compliance with design criteria:

Submerged Gravel Wetland Design Criteria:	Provided
Runoff shall enter, flowthrough, and exit in safe and non-erosive manner	✓
Drainage area to practice is large to maintain submerged flow	✓
Appropriate soils and/or high groundwater is present	✓
Section dimensions of soil media layers greater than minimum	✓
Distribution and collection piping / underdrains provided	✓
Flow paths through gravel greater than 15 ft	✓
Riser pipes provided and spaced at 15 ft or less apart	✓
Cleanouts provided	✓

Non-Rooftop Disconnection Areas

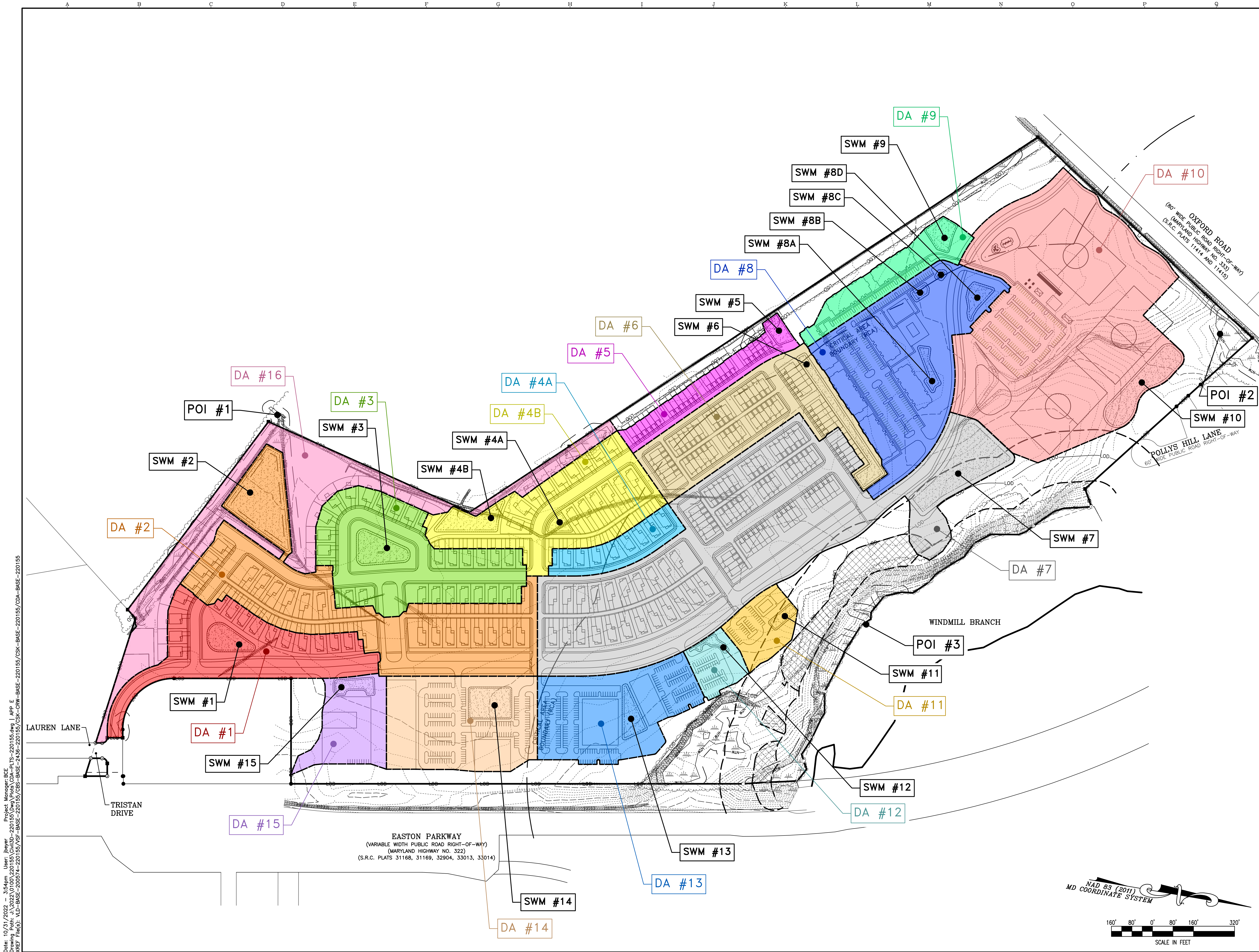
House Patios

Impervious Area	4,800 sf	Target ESDv = $(P_E)(R_v)(A)/12$
Percent Impervious (I)	1.8 %	= 26 cf
$R_v = 0.05 + 0.009(I)$	0.07	
Pe	1 in	
Disconnection Length		12 feet minimum
Contributing Length		12 feet
Ratio of Disconnection Length to Contributing Length		1:1
Pe		1.0 in

$$\begin{aligned} \text{ESDv} &= (P_E)(R_v)(A)/12 \\ &= \mathbf{380 \text{ cf}} \end{aligned}$$

Check for compliance with design criteria:

Non-Rooftop Disconnect Design Criteria:	Provided
Vegetated flowpath available downstream of impervious area	✓
Topography is 5% or less along disconnected flowpaths	✓
Site is not a hot spot	✓
Maximum contributing flowpath is less than 75 feet	✓
Runoff will drain in a safe and non-erosive manner	✓
Sizing factor/length ratio supports Pe value used	✓
Disconnections are > 10 ft from impervious surfaces	✓
Receiving areas are vegetated and discharge to no-disturbance buffer areas	✓
Erosion and sediment control practices are not located in receiving areas	✓



Date: 10/31/2022 - 3:54pm User: jibayer Project Manager: BCE
Drawing Path: J:\2022\0100\220155\Draw\Plots\ODA-PLTS-220155.dwg | APP E
XREF File(s): VLD-BASE-200574-220155\VF-BASE-220155\VF-BASE-2436-220155\CSK-CRW-BASE-220155\ODA-BASE-220155

PLANS ARE
ISSUED FOR
REVIEW ONLY

PLANS ARE NOT
APPROVED FOR
CONSTRUCTION

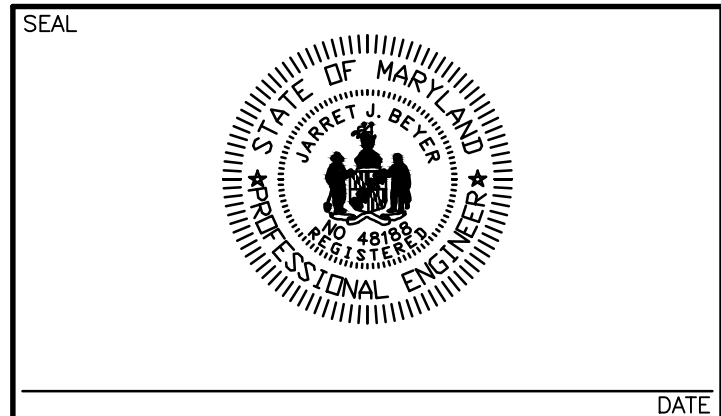
REVISIONS TO APPROVED PLANS			
No.	DATE	DESCRIPTION	BY

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THE CONTRACTOR SHALL TEST PIT AND LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF ANY WORK ON-SITE. THE CONTRACTOR SHALL NOTIFY DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF THE EXISTING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK ON-SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION EXPENSE.



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15 Washington St. Centerville, MD 21613 (410) 221-0818
354 Pennsylvania Ave. Centerville, MD 21617 (410) 758-2095

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. 45188 - Expiration Date: 12/28/2023



PROPOSED CONDITIONS
DRAINAGE AREA MAP

POPLAR HILL
PUD PLAN
IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 PARCEL 57

ISSUED/REVISED FOR: DATE: BY:

SHEET No. **APPENDIX E**
SCALE: **AS NOTED**
JOB No. 220155
FILE No. 1324

Date: 10/04/2022 - 8:43am User: wbornhort Project Manager: BCE
Drawing Path: J:\2022\0100\220155\Civil3D-220155\Draw Plots\HBP-PTS-220155.dwg | 1
XREF File(s): RAR-BASE-200574\MD-BASE-200574-220155\VF-BASE-200574\HBP-BASE-220155\CSK-BASE-220155

PROPERTY OWNER
OWNER: 5001 SHR, L. C.
9161 LIBERIA AVE #201
MANASSAS, VA 20110
PROPERTY ADDRESS: OXFORD ROAD
EASTON, MARYLAND 21601
DEED REFERENCE: 2827/90
PLAT REFERENCE: 84/22

ZONING CLASSIFICATION: R10A (RESIDENTIAL DISTRICT) & HC (PLANNED HEALTHCARE DISTRICT)
SETBACKS: R10A HC
FRONT: 15' 50'
SIDE: 8' 15'
REAR: 30' 20'
STATE HIGHWAY: 40' 40'
MEAN HIGH WATER 100' N/A
TIDAL WETLANDS: 100' N/A
NON-TIDAL WETLANDS: 25' 25'

GENERAL NOTES

THE PROPERTY SHOWN HEREON LIES PARTIALLY WITHIN THE CHESAPEAKE BAY CRITICAL AREA AS SHOWN ON THE TALBOT COUNTY CRITICAL AREA MAPS IN ACCORDANCE WITH TALBOT COUNTY BILL No. 1295, ENACTED AUGUST 12, 2014.

MEAN HIGH WATER WAS NOT ESTABLISHED BY THIS SURVEY. MEAN HIGH WATER IS DEFINED BY ELEVATION REFERENCED TO A TIDAL BENCH MARK. THE SHORELINE WAS LOCATED TO THE EDGE OF TIDAL VEGETATION. THE BOUNDARY IS SUBJECT TO CHANGE DUE TO NATURAL CAUSES AND IT MAY NOT REPRESENT THE ACTUAL LOCATION OF THE LIMIT OF TITLE.

THE WETLANDS SHOWN HEREON WERE DELINEATED BY SEAN CALLAHAN, A QUALIFIED PROFESSIONAL WITH LANE ENGINEERING, LLC, SURVEY LOCATED ON FEBRUARY 9, 2021 AND VERIFIED BY CHRIS PAJAK, MDE, MARY PHIPPS DICKERSON, MDE, AND WILLIAM SEIGER, MDE ON FEBRUARY 25, 2021 AND JASON PETERSON, USACE ON MAY 13, 2022.

LANE ENGINEERING, LLC HAS REVIEWED THE MAPPED SOILS AND TOPOGRAPHIC INFORMATION FOR THIS PROPERTY RELATED TO POSSIBLE BUFFER EXPANSION REQUIREMENTS DUE TO STEEP SLOPES AND/OR HYDRIC AND HIGHLY ERODIBLE SOILS AND HAS DETERMINED THAT EXPANSION IS REQUIRED UNDER THE STATE AND COUNTY REGULATIONS AS OF THE DATE OF THIS PLAN.

THE IMPROVEMENTS SHOWN HEREON WERE FIELD LOCATED BY LANE ENGINEERING, LLC ON FEBRUARY 10, 2021.

THE DIMENSIONS OF BUILDINGS, STRUCTURES AND SETBACKS WERE MEASURED TO THE NEAREST 0.1 FOOT.

THE TREE LINE SHOWN HEREON WAS TAKEN FROM THE 2019 TALBOT COUNTY AERIALS AND IS APPROXIMATE ONLY.

NOTE: SEE SHEET 2 OF 2 FOR BUFFER MANAGEMENT DETAILS & SPECIFICATIONS.

REMAINING LANDS
AREA: 120.476 AC.±
(CRITICAL AREA: 65.977 AC.±)
(NON-CRITICAL AREA: 54.499 AC.±)

SEEDLING PLANTING AREA
(188,521 SF)

425-AC, 425-CC, 378-DV, 378-JV,
525-PTA, 450-PO, 450-QR
(SEEDLINGS TO BE RANDOMLY MIXED)

LIMITS OF ENHANCED BUFFER PLANTING/
PROTECTION FOR GROWTH ALLOCATION

REMAINING LANDS
AREA: 120.476 AC.±
(CRITICAL AREA: 65.977 AC.±)
(NON-CRITICAL AREA: 54.499 AC.±)

FUTURE
DEVELOPMENT

ZONING (R10A)
ZONING (HC)

NAD 83 (2011)
MD COORDINATE SYSTEM

LEGEND

TELEPHONE PEDESTAL
GUY WIRE ANCHOR
UTILITY POLE
NON-TIDAL WETLAND
NON TIDAL WETLAND
TIDAL WETLAND
TIDAL WETLAND
IRON ROD FOUND
CONCRETE MONUMENT FOUND
CONCRETE MONUMENT SET
IRON ROD SET
COMPUTED POINT
APPROXIMATE TREE LINE

ADJOINING OWNERS

- TAX MAP 34, PARCEL 218
PAPERMILL CROSSING HOMEOWNERS ASSOCIATION, INC
DEED: 943/920
PLAT: 3/23FF
- TAX MAP 34, PARCEL 218, LOT 12
SCOTT J. BEST AND MARLA G. BEST
DEED: 2313/1
PLAT: 3/23FF
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DEED: 2731/281
PLAT: 3/23FF
- TAX MAP 34, PARCEL 218, LOT 8
BONNIE W. WHEELER
DEED: 1286/524
PLAT: 3/23FF

ENHANCED BUFFER PLANTING PLAN

SCALE: 1" = 100'
50' 0' 50' 100'
SCALE IN FEET

BUFFER ESTABLISHMENT STOCKING & SPECIES CHART
(SEE SHEET 2 OF 2 FOR BUFFER MANAGEMENT DETAILS & SPECIFICATIONS)

LANDSCAPE STOCK

SYM	QUAN	SCIENTIFIC NAME	COMMON NAME	SPECIFICATION
AR	20	ACER RUBRUM	RED MAPLE	2" CAL.
FG	15	FAGUS GRANDIFOLIA	AMERICAN BEECH	2" CAL.
LT	20	LIRIODENDRON TULIPIFERA	TULIP POPLAR	2" CAL.
MG	20	MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	2" CAL.
PT	30	PINUS TAEDA	LOBLOLLY PINE	2" CAL.
(105 - 2" CALIPER CANOPY TREES @ 200 SQ.FT. CREDIT EACH = 21,000 SF CREDIT PROVIDED)				

SEEDLING STOCK PLANT LIST (3031 STEMS MINIMUM REQUIRED)

AC	425	AMELANCHIER CANADENSIS	SERVICEBERRY	SEEDLING
CC	425	CERCIS CANADENSIS	REDBUD	SEEDLING
DV	378	DIOSPYROS VIRGINIANA	PERSIMMON	SEEDLING
JV	378	JUNIPERUS VIRGINIANA	RED CEDAR	SEEDLING
PTa	525	PINUS TAEDA	LOBLOLLY PINE	SEEDLING
PO	450	PLATANUS OCCIDENTALIS	SYCAMORE	SEEDLING
QR	450	QUERCUS RUBRA	RED OAK	SEEDLING
(3031 STEMS @ 700 STEMS/ACRE = 188,521 SF CREDIT PROVIDED)				

BUFFER ESTABLISHMENT TIME-FRAME PROVISION

THE BUFFER ESTABLISHMENT PLANTING SPECIFIED HEREON SHALL BE COMPLETED ONE (1) YEAR IMMEDIATELY FOLLOWING THE CHANGE IN LAND USE. THE OWNER MAY REQUEST AN EXTENSION FROM THE TOWN OF EASTON - PLANNING AND ZONING IF THE PLANTINGS CANNOT BE ACCOMPLISHED WITHIN THIS TIME-FRAME.

OWNER CERTIFICATION

WE, 5001 SHR, L.C., HEREBY ACCEPT THE TERMS AND CONDITIONS OF THIS BUFFER MANAGEMENT PLAN AND AGREE TO PROVIDE A WRITTEN CERTIFICATION OF COMPLETION WHENEVER THE BUFFER ESTABLISHMENT PLANTING AND RELATED WORK IS COMPLETED.

5001 SHR, L.C.

BY: KEVIN SILLS

DATE

Lane Engineering, LLC

Established 1986
Civil Engineers • Land Planning • Land Surveyors

E-mail: general@laneinc.com
117 Bay St. Easton, MD 21601 (410) 822-8003
15 Washington St. Centerville, MD 21613 (410) 221-0818
354 Pennsylvania Ave. Centerville, MD 21617 (410) 758-2095

SEAL

DATE

MAJOR BUFFER MANAGEMENT PLAN ON THE LANDS OF 5001 SHR, L.C.

TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42, GRID 4, PARCEL 57

ISSUED FOR: AGENCY REVIEW
DATE: 7/6/22
BY: BCE
AGENCY REVIEW
DATE: 10/5/22
BY: BCE

SHEET No.
1 OF 2
SCALE:
AS NOTED

DATE: 7/6/22
JOB No. 220155
FILE No. 1324

Date: 10/05/2022 - 8:14am User: wbornhart Project Manager: BCE
Drawing Path: J:\2022\1000\220155\Civil3D-220155\Draw\Title\FCP-PTS-220155.dwg | 2-FCP
XREF File(s): VLD-BASE-200574-220155\PU-BASE-2436-220155\PAR-BASE-220155\WATER-BASE-220155\SEWER-BASE-220155\GAS-BASE-220155\HSL-BASE-220155\HFC-BASE-220155\CSK-LRP-BASE-220155

FOREST CONSERVATION REQUIREMENTS

PRELIMINARY INTERMEDIATE FOREST CONSERVATION NARRATIVE

THE OWNER PROPOSES TO DEVELOP THE PROPERTY FOR RESIDENTIAL AND COMMERCIAL MIXED USES, CONTAINING RESIDENTIAL SINGLE FAMILY LOTS, VILLA TOWNHOMES, WORKFORCE HOUSING, RETAIL/COMMERCIAL AREAS WITH AN MULTIPURPOSE FILED/PARK AREA FOR THE SURROUNDING AREA. THE NET TRACT CONSISTS OF THE SUBJECT PROPERTY (120.48 ACRES) LESS THE CRITICAL AREA PORTION OF THE SITE (65.98 ACRES) EQUALING 54.50 ACRES FOR PURPOSES OF FOREST CONSERVATION FOR THIS PROJECT. EXISTING FOREST WILL BE REMOVED (3.39 ACRES) FOR THE CONSTRUCTION OF STORMWATER MANAGEMENT FEATURES. THE OWNER/APPLICANT IS REQUIRED TO PLANT A TOTAL OF 9,64 ACRES TO MEET FOREST CONSERVATION REQUIREMENTS. THE AFFORESTATION REQUIREMENTS SHALL BE MET THROUGH BUFFERYARD AND STREET TREE AFFORESTATION CREDITS PER THE FOREST CONSERVATION OVERLAPPING REQUIREMENTS (SECTION 1014.5), AND PROVIDED OFF-SITE AND SHALL BE PLACED UNDER A LONG TERM PROTECTIVE EASEMENT AND RECORDED WITHIN THE LAND RECORDS OF TALBOT COUNTY.

FOREST CONSERVATION AFFORESTATION CALCULATIONS

STREET TREES

426 - DECIDUOUS SHADE/CANOPY TREES @ 400 SF EACH = 170,400 SF CREDIT

40' WIDE LANDSCAPE BUFFERYARD 'A' (ALONG OXFORD ROAD)

41 - DECIDUOUS SHADE/CANOPY TREES @ 400 SF EACH = 16,400 SF CREDIT

41 - EVERGREEN TREES @ 250 SF EACH = 10,250 SF CREDIT

25' WIDE LANDSCAPE BUFFERYARD 'B' (ALONG MD ROUTE 322-BYPASS)

56 - DECIDUOUS SHADE/CANOPY TREES @ 400 SF EACH = 22,400 SF CREDIT

28 - EVERGREEN TREES @ 250 SF EACH = 7,000 SF CREDIT

10' WIDE LANDSCAPE BUFFERYARD 'C' (ALONG PROPOSED PARK & SUBDIVISION)

13 - DECIDUOUS SHADE/CANOPY TREES @ 400 SF EACH = 5,200 SF CREDIT

40 - EVERGREEN TREES @ 250 SF EACH = 10,000 SF CREDIT

10' WIDE LANDSCAPE BUFFERYARD 'D' (ALONG TEMPLE B'NAI & RETAIL)

8 - DECIDUOUS SHADE/CANOPY TREES @ 400 SF EACH = 3,200 SF CREDIT

23 - EVERGREEN TREES @ 250 SF EACH = 5,750 SF CREDIT

10' WIDE LANDSCAPE BUFFERYARD 'E' (ALONG SOUTH & WEST PROPERTY LINE)

44 - DECIDUOUS SHADE/CANOPY TREES @ 400 SF EACH = 17,600 SF CREDIT

131 - EVERGREEN TREES @ 250 SF EACH = 32,750 SF CREDIT

ON-SITE FOREST RETENTION = 118,919 SF CREDIT

AFFORESTATION CREDIT CALCULATIONS

STREET TREES = 170,400 SF; (3.91 AC)

BUFFERYARDS = 130,550 SF; (3.00 AC)

ON-SITE FOREST RETENTION = 118,919 SF; (2.73 AC)

TOTAL AFFORESTATION CREDIT PROVIDED = 419,869 SF; (9.64 AC)

Forest Conservation Worksheet 2.2

Net Tract Area

A.	Total Tract Area	A =	120.48
B.	Deductions	B =	65.98
C.	Net Tract Area	C =	54.50

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	0	1	0

D.	Afforestation Threshold (Net Tract Area x 15%)	D =	8.17
E.	Conservation Threshold (Net Tract Area x 15%)	E =	8.17

F.	Existing Forest Cover within the Net Tract Area	F =	5.31
G.	Area of Forest Above Conservation Threshold	G =	0.00

H.	Break Even Point	H =	5.31
I.	Forest Clearing Permitted Without Mitigation	I =	0.00

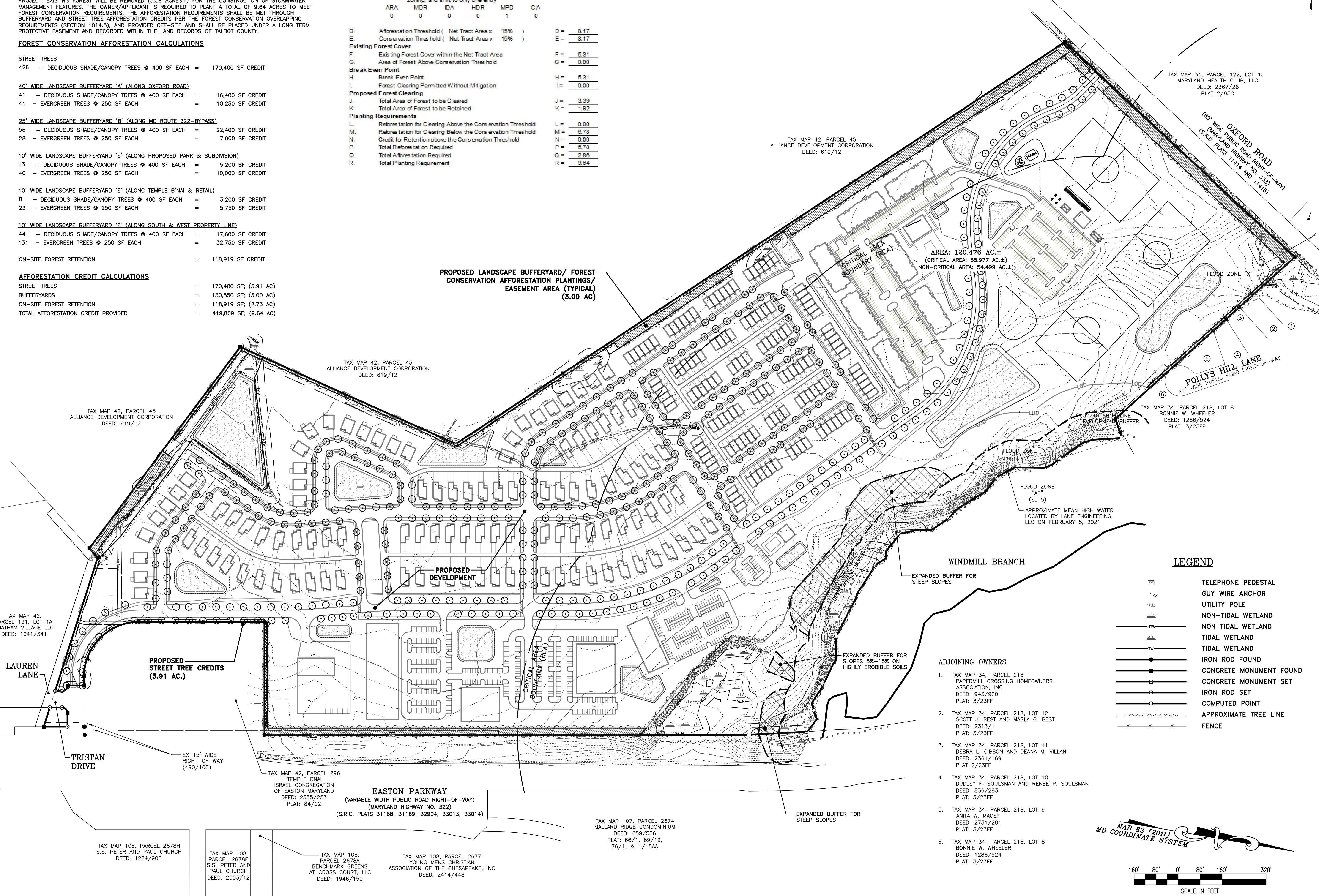
J.	Total Area of Forest to be Cleared	J =	3.39
K.	Total Area of Forest to be Retained	K =	1.92

L.	Reforestation for Clearing Above the Conservation Threshold	L =	0.00
M.	Reforestation for Clearing Below the Conservation Threshold	M =	6.78

N.	Credit for Retention above the Conservation Threshold	N =	0.00
P.	Total Reforestation Required	P =	6.78

Q.	Total Afforestation Required	Q =	2.88
R.	Total Planting Requirement	R =	9.64

PROPOSED LANDSCAPE BUFFERYARD/ FOREST CONSERVATION AFFORESTATION PLANTINGS/ EASEMENT AREA (TYPICAL) (3.00 AC)

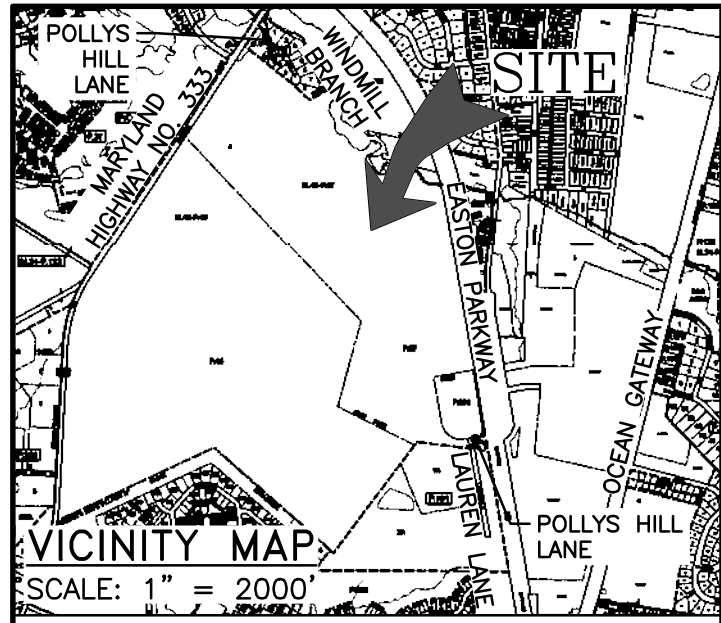
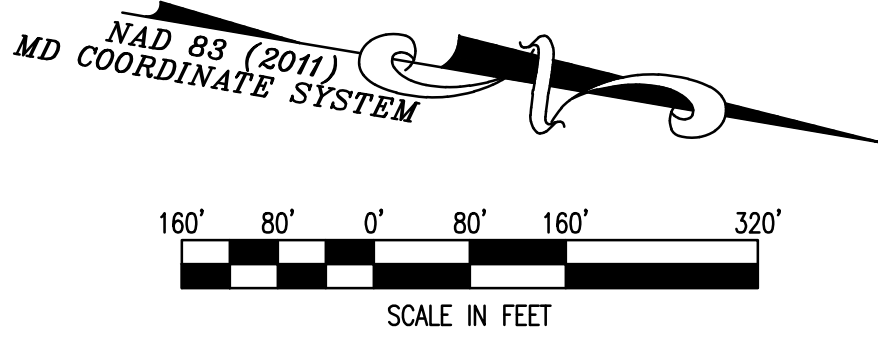


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PLAT: 3/23FF
- TAX MAP 34, PARCEL 218, LOT 12
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DEED: 2731/281
PLAT: 3/23FF
- TAX MAP 34, PARCEL 218, LOT 8
BONNIE W. WHEELER
DEED: 1286/524
PLAT: 3/23FF

LEGEND

- TELEPHONE PEDESTAL
- GUY WIRE ANCHOR
- UTILITY POLE
- NON-TIDAL WETLAND
- NON TIDAL WETLAND
- TIDAL WETLAND
- TIDAL WETLAND
- IRON ROD FOUND
- CONCRETE MONUMENT FOUND
- CONCRETE MONUMENT SET
- IRON ROD SET
- COMPUTED POINT
- APPROXIMATE TREE LINE
- FENCE



REVISIONS TO APPROVED PLANS			
No.	DATE	DESCRIPTION	BY

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SEAL
This Plan was prepared by a qualified professional in accordance with the requirements of the Maryland Forest Conservation Act of 1991 (COMAR 08.19.06.01) and Qualification letter dated MARCH 1, 2007
10/5/22
DAVID W. BARNHART DATE

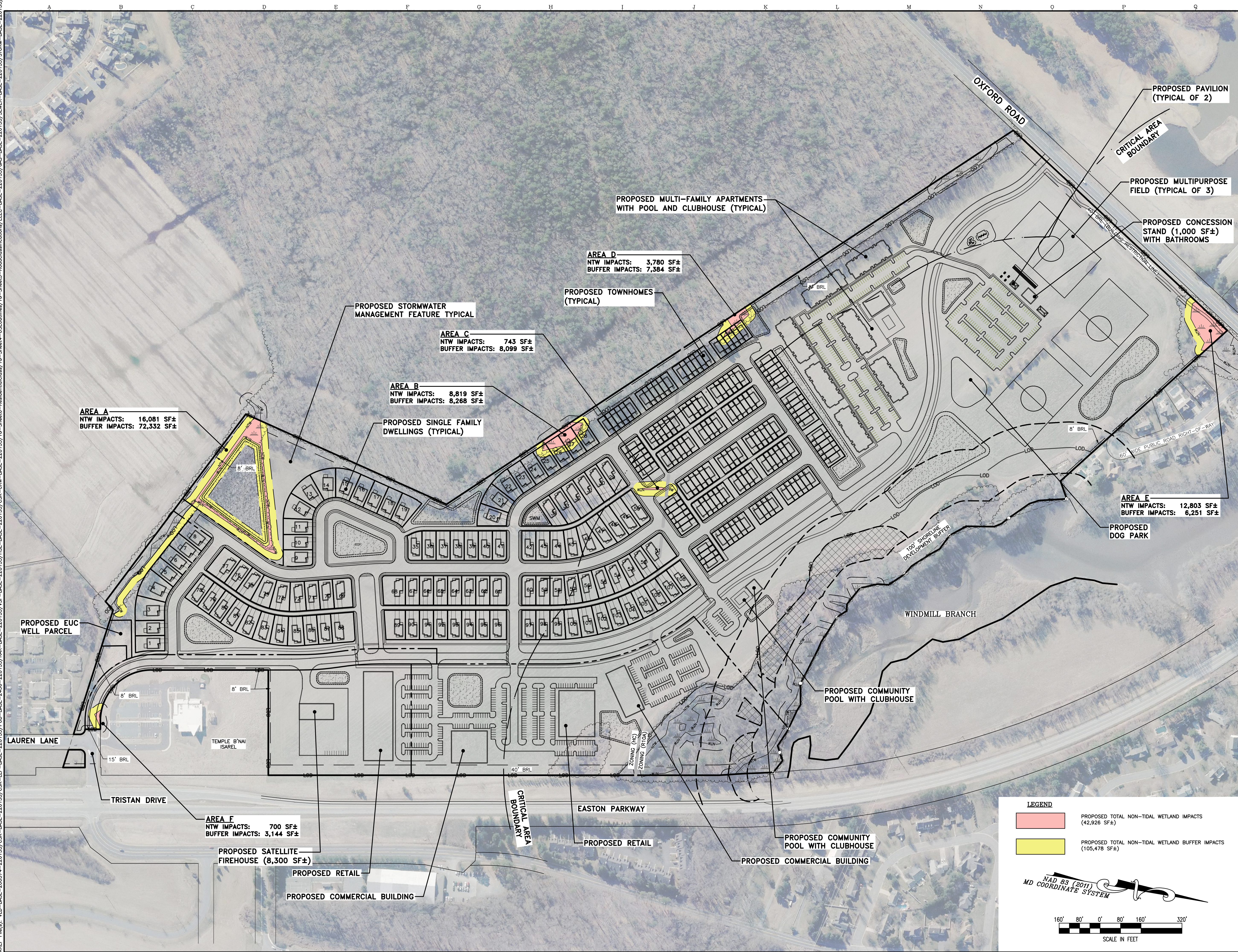
PRELIMINARY INTERMEDIATE FCP

POPLAR HILL PUD SKETCH PLAN

IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 TAX PARCEL 57

ISSUED/REVISED FOR: DATE: BY:
AGENCY REVIEW 7/06/22 BCE
AGENCY REVIEW 8/03/22 BCE
AGENCY REVIEW 10/05/22 BCE

SHEET No. 2 OF 2
SCALE: AS NOTED
JOB No. 220155
FILE No. 1324



PLANS ARE
ISSUED FOR
REVIEW ONLY

PLANS ARE NOT
APPROVED FOR
CONSTRUCTION

[illegible]

WARNING!!

THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL ALLOW FOR THIS PLAN ARE FOR INFORMATIONAL AND PERMITTING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES TO HIS OWN SATISFACTION PRIOR TO BEGINNING CONSTRUCTION.

THE CONTRACTOR SHALL TEST PIT AND LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF THE EXISTING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION EXPENSE.



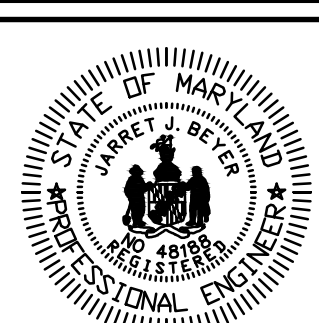
Lane Engineering, LLC

Civil Engineers • Land Planning • Land Surveyors



E-mail: general@leinc.com
117 Bay St. Easton, MD 21601 (410) 822-8003
15 Washington St. Cambridge, MD 21613 (410) 221-0818
354 Pennsylvania Ave. Centreville, MD 21617 (410) 758-2095

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. 48188, Expiration Date: 12/28/2023.



NON-TIDAL WETLAND IMPACT WORKSHEET

POPLAR HILL
PUD SKETCH PLAN

IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 TAX PARCEL 57

ISSUED/REVISED FOR:	DATE:	BY:
AGENCY REVIEW	7/06/22	BCE
AGENCY REVIEW	8/03/22	BCE
AGENCY REVIEW	10/05/22	BCE

SHEET No. 1 OF 1 7/06/22

SCALE:	JOB No. 220155
AS NOTED	FILE No. 1324



MCALLISTER
DETAR
SHOWALTER
& WALKER

Ryan D. Showalter
rshowalter@mdswlaw.com
(410) 820-0259 Direct

October 5, 2022

VIA EMAIL DELIVERY to jmayer@eastonmd.gov

Joseph A. Mayer
Plan Reviewer
Town of Easton
14 S. Harrison St.
Easton, Maryland 21601

**Re: Applicant Response to Critical Area Commission Staff Comments
Poplar Hill Farm**

Dear Mr. Mayer:

On behalf of 5001 SRH, LLC (the “Applicant”), this will respond to the letter from Critical Area Commission staff dated July 20, 2022, commenting on the Applicant’s proposed Growth Allocation award for the Poplar Hill Farm project. The Commission staff’s comments are set forth below with my responses in bold.

1. *Prior to Critical Area Commission review and approval, the growth allocation component of the project must go through the supplemental growth allocation process which includes approval from both the Town of Easton and Talbot County.*

Response: Acknowledged. The Applicant has submitted Growth Allocation applications to both the County and Town and has engaged staff in preliminary discussions about the joint Growth Allocation award process.

2. *The sketch site plans include the 1,000-foot Critical Area boundary and Critical Area designation. Future plans must quantify impacts within the Critical Area portion of the site, including proposed impervious surfaces, proposed clearing, and any impacts to Habitat Protection Areas (HPAs). Application materials, such as the project notification form, currently indicate that the total lot coverage will be 120 acres, or the entire site. Based on the description of the development plan, this value is not consistent with the proposed PUD. Please revise application materials for consistency.*

Response: The total Critical Area portion of the Property is 65.977 acres. Per the PUD Sketch Plan for Poplar Hill revised 10/5/22, the proposed lot coverage within the 1000’ Critical Area is 19.12 acres; proposed forest clearing within the 1000’ Critical Area is 1.385 acres; and, proposed impacts to nontidal wetlands and their



Mr. Joseph A. Mayer
October 5, 2022
Page 2 of 4

buffers within the Critical Area are 0.311 acres and 0.329 acres respectively. No other impacts to HPAs are currently proposed.

3. *The applicant proposes to treat stormwater for the project using environmental site design (ESD) features. Based on the 10% worksheets, 55.05 pounds of phosphorus removal is required. The applicant proposes to treat 75 pounds of phosphorus. We request that the applicant provide the Excel spreadsheet with calculations in lieu of pdfs of the worksheets. Commission staff will review the worksheets and provide additional follow-up to the town and applicant.*

Response: A copy of the SWM 15% Excel spreadsheet attached.

4. *The applicant has provided a description of how the proposed growth allocation meets the required standards and factors as per Natural Resources Article 8-1808.1 and COMAR 27.01.02.06. The following are clarifications provided to the applicant's responses:*
 - a. *For Standard #2: The County was allocated 2,554 acres of growth allocation. The County can use up to 1,227 acres of growth allocation in the RCA before it exceeds the 50% threshold outline in the Critical Area Law. The County, including all Towns, has currently used 690.45 acres of growth allocation in the RCA. Therefore, the County can grant an additional 536.55 acres of growth allocation acreage in the RCA before being required to use its alternative standard. The current growth allocation proposal (65.97 acres) will not exceed this limit.*

Response: Acknowledged.

5. *A 100-foot Buffer and an "enhanced" 200-foot Buffer area (which includes areas of expanded Buffer for steep slopes and highly erodible soils) has been delineated on the Buffer Management Plan (BMP). The Buffer and expanded Buffer are proposed to be fully established. We request that the applicant provide a conceptual Buffer Management Plan once it is available.*

Response: A concept Buffer Management Plan was provided with the 7/6/22 submittal to the Town of Easton. A copy of the revised BMP dated 10/5/22, is attached hereto for ease of reference.

6. *Per Natural Resources Article 8-1808.1(c)(2)(iv) and COMAR 27.01.02.06-1.B (18), a 300- foot setback beyond the landward edge of tidal wetlands or waters must be provided. Please have the applicant delineate the 300-foot setback on the site plans and quantify the total area of the setback as well as quantify the impacts proposed within the setback.*



Mr. Joseph A. Mayer
October 5, 2022
Page 3 of 4

The 300-foot setback may be reduced if the Town proposes - and the Critical Area Commission approves - alternative measures for enhancement of water quality and habitat that provide greater benefits to the resources. The application notes that stormwater management beyond the 10% requirement will be provided as an offset, as well as a seedling mix in the area of the setback. It also mentions that the applicant may be willing to consider additional offset measures such as educational signage, invasive species management, and a shoreline cleanup project. Please provide additional details regarding these alternatives, and please consider that the proffered offset should be in proportion to the magnitude of disturbance to the 300-foot setback habitat. We note that additional stormwater management as an offset may not be accepted by the Critical Area Commission, based on previous discussions held by the Critical Area Commission regarding this alternative on previous growth allocation requests.

Per our conversation on June 29, 2022, Commission staff is willing to meet the applicant and Town onsite to discuss alternatives to the 300-foot setback.

Response: The 300' setback is delineated on the PUD Sketch Plan and Buffer Management Plan revised 10/5/22, a copy of which is attached. The total 300' setback area is 14.08 acres. The proposed improvements within the 300' setback total 1.15 acres, which include a portion of a grass sports field, SWM features, and a community walking path. Of these, only the community walking path comprising 0.06 acres within the 300' setback is considered lot coverage.

We propose to offset the 1.15 acre impacts to the 300' setback described above with (1) an "Enhanced 200' & 300' Planting Offset Establishment" consisting of 3.35 acres of plantings (2" caliper trees and seedlings), or 2.9 times the proposed impacts to the 300' setback, and (2) educational signage for SWM features. We may also elect to treat stormwater in excess of the 10% pollution reduction standard but recognize that the Critical Area Commission may not accept this as an offset for impacts to the 300' setback area. The "Enhanced 200' & 300' Planting Offset Establishment" is in addition to 1.46 acres of buffer establishment within the 100' shoreline buffer and expanded buffer.

The Applicant's representatives met with staff from the Critical Area Commission and the Town of Easton on August 4, 2022, at the Poplar Hill property for a site visit.

7. *It is unclear if removal of trees is proposed at this time. If no clearing is proposed, please include a note on the site plan stating such, and if any planting is proposed.*



Mr. Joseph A. Mayer
October 5, 2022
Page 4 of 4

Response: Critical Area Forest to be removed totals is 1.385 acres as depicted on the Intermediate Forest Stand Delineation revised 10/5/22, a copy of which is attached.

* * *

Thank you for considering our responses to the Critical Area Commission staff's July 20th comment letter. If you have any questions or wish to discuss this further, please do not hesitate to contact me.

Very truly yours,

/s/
Ryan D. Showalter

Enclosures

cc: Alexandra DeWeese, Critical Area Commission
Nick Kelly, Critical Area Commission



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Charles Glass, Deputy Secretary

March 26, 2021

Ms. Natalie Hurley
Lane Engineering, LLC
P.O. Box 1767
117 Bay Street
Easton, MD 21601

RE: Environmental Review for Oxford Road, Easton - 126 Acres, Tax Map 42, Parcel 57, Lane Engineering, LLC Job No# 200574, Talbot County, Maryland.

Dear Ms. Hurley:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2021.0217.ta
Cc: C. Jones, CAC

December 12, 2022

Mr. Mike Lenhart
Lenhart Traffic Consulting, Inc.
645 Baltimore Annapolis Boulevard, Suite 214
Severna Park, MD 21146

RE: Talbot County
MD 333, St. Michaels Road
Poplar Hill Farm
SHA Tracking No. 22apta001xx
Mile Point: 0.35

Dear Mr. Lenhart:

Thank you for the opportunity to review the Traffic Impact Study (TIS) submittal for the proposed Poplar Hill Farm Development located on MD 333 within the town limits of Easton in Talbot County. The Maryland Department of Transportation State Highway Administration (MDOT SHA) has reviewed the plans and we are pleased to advise of **TIS Approval with the following comment.**

District Traffic:

- This bypass lane will need to be combined with the acceleration lane from the golf club to basically create an auxiliary lane.

District Access Comments:

Plan submittals should reflect the above comments. Please submit (two) (2) sets of plans, a flash-drive and/or electronic submittal containing the plans and supporting documentation in PDF format, a point-by-point response to reflect the comments noted above directly to Mr. Ken Fender at 615 Morgnec Road, Chestertown, MD 21620, attention of Mr. Henry R. Dierker III. Please reference the MDOT SHA tracking number on future submissions. Please keep in mind that you can view the reviewer and project status via the MDOT SHA Access Management web page at <http://www.roads.maryland.gov/pages/amd.aspx>. If you have any questions or require additional information, please contact Mr. Henry R. Dierker III at 410-778-3061, by using our toll-free number (in Maryland only) at 1-800-637-9740 (x3244), or via hdierker@mdot.maryland.gov.

.

Sincerely,



Richard Baker
Assistant District Two Engineer-Traffic

TRAFFIC IMPACT ANALYSIS

FOR

POPLAR HILL FARM

Prepared for:

**Mid Atlantic Real Estate Investments
9161 Liberia Avenue
Manassas, VA 20110**

Prepared by:

LENHART TRAFFIC CONSULTING, INC.
TRAFFIC ENGINEERING & TRANSPORTATION PLANNING

September 15, 2021

Revised: May 26, 2022

Revised: November 3, 2022

Revised: January 17, 2023



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Section 1 Introduction

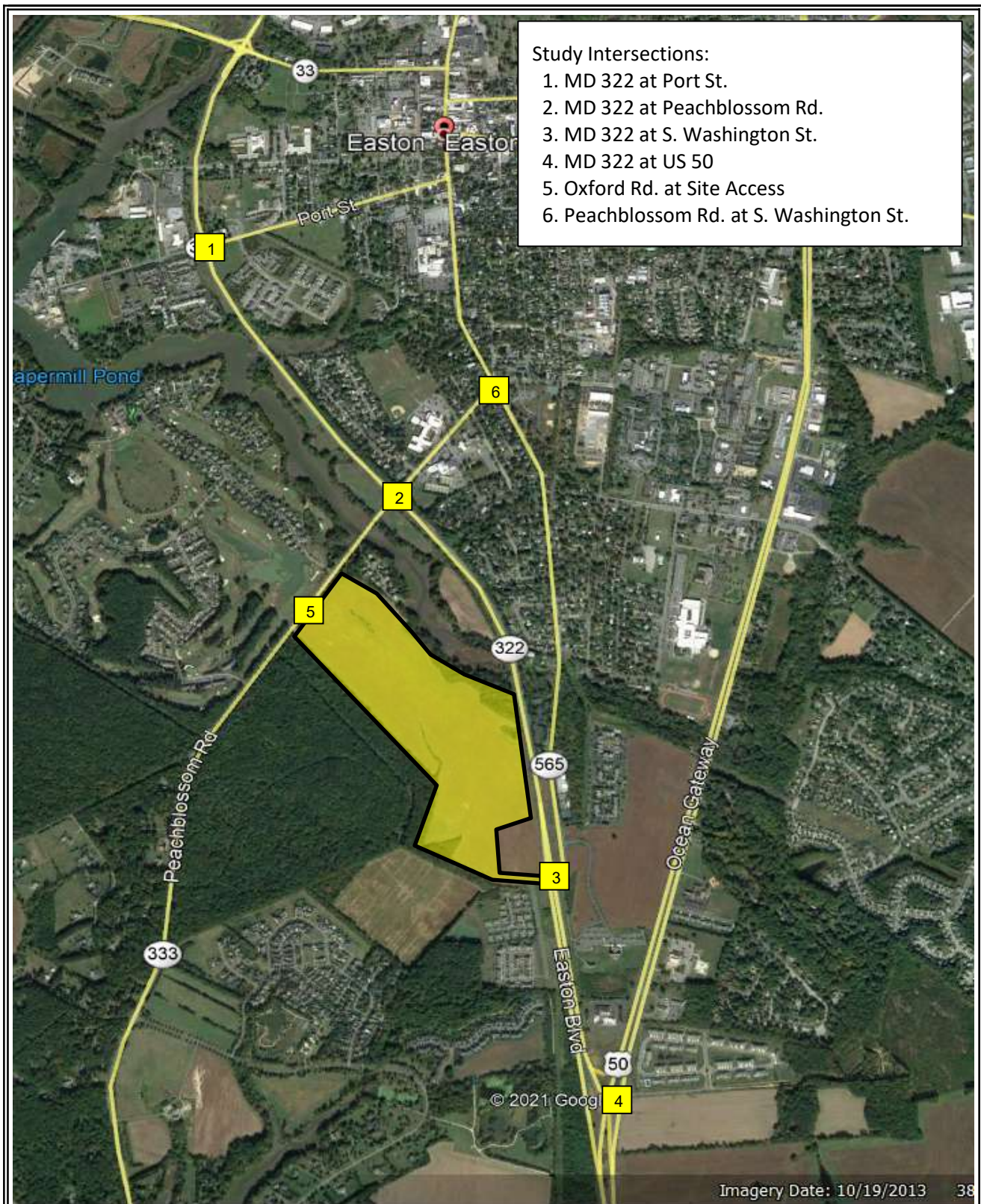
1.1 Project Description

This Traffic Impact Analysis (TIA) has been prepared for the proposed Poplar Hill Farm development located along the west side of MD 322 just south of MD 333 (Oxford Road) as shown on **Exhibit 1**. The site is proposed to be developed with 109 single-family estates, 138 villa townhomes, 210 units of workforce housing, 40,000 square feet of general commercial/retail, 58,000 square feet of general office, a 5,700 square foot satellite firehouse, and a 3-field sports complex. The site will have access via Tristan Drive and MD 333 (Oxford Road).

It should be noted that MDOT SHA has previously approved the Traffic Impact Study for the Poplar Hill Development in their approval letter dated December 12th, 2022. As part of the approval letter, MDOT SHA requested that the bypass lane for the site access along westbound MD 333 be combined with the acceleration lane which currently serves Clubhouse Drive. The applicant will continue to work with MDOT SHA to ensure that the bypass lane for the site access along MD 333 is constructed per their request.

1.2 Scope of Study

This TIA has been prepared in accordance with a scoping agreement coordinated with the Maryland Department of Transportation State Highway Administration (MDOT SHA) and the Town of Easton. Note that per MDOT SHA's Access Permits Manual, all study intersections were evaluated using the Critical Lane Volume (CLV) methodology and must maintain Level-of-Service (LOS) D or better to be considered adequate.



Traffic Impact Analysis



LENHART TRAFFIC CONSULTING, INC.
 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
 SEVERNA PARK, MD 21146
www.lenharttraffic.com

Site Location
 Map

**Exhibit
 1**

Section 2 Existing Conditions

2.1 Description of Road Network

The key roads in the study area are:

- US 50 – A four-lane principal arterial with a posted speed limit of 55 MPH.
- MD 322 – A two to four-lane principal arterial with a posted speed limit of 50 MPH in the vicinity of the site.
- MD 333 (Oxford Road) – A two-lane major collector with a posted speed limit of 40 MPH in the vicinity of the site.
- MD 565 (S. Washington Street) – A two-lane local roadway with a posted speed limit of 40 MPH.

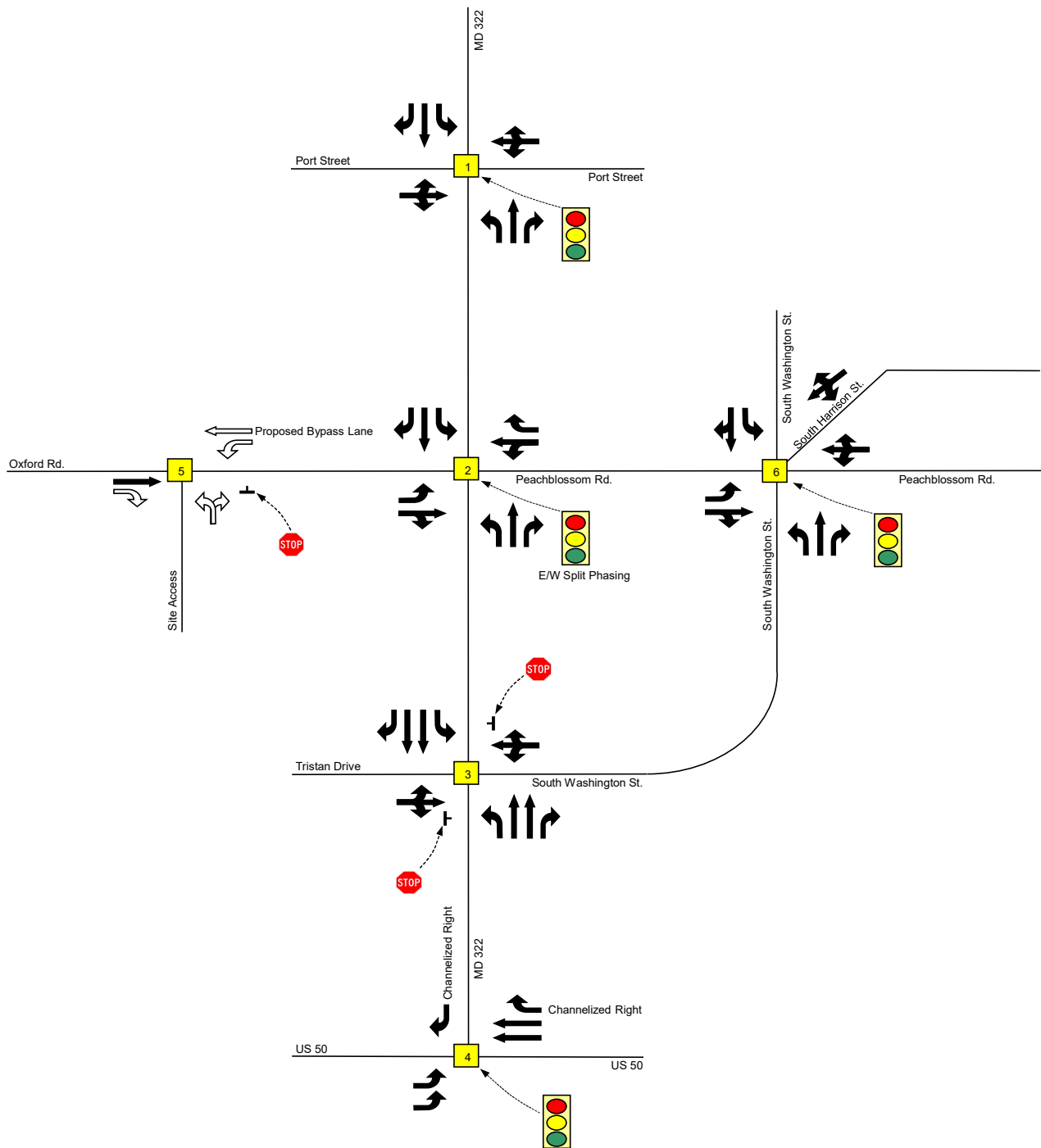
2.2 Existing Lane Configurations

The Lane Use & Traffic Control Devices are shown on **Exhibit 2**.

2.3 Existing Traffic Counts

Turning movement counts were conducted on Thursday, May 13, 2021, and Saturday, May 15, 2021. It should be noted that the weekday counts were conducted on a Thursday given that nearby Easton High School was open to students on this day. Additionally, the count conducted at MD 322 & MD 565 on May 13, 2021 was compared to a count conducted by MDOT SHA at the same location on March 11, 2020 prior to the closure of schools and the governors “Stay at Home” order. The results of this comparison indicate that the counts are comparable and therefore, the weekday traffic counts conducted as part of this study are representative of typical traffic conditions. The traffic count worksheets for each study intersection can be found in Appendix A.

The existing peak hour traffic volumes are shown on **Exhibit 3** and were evaluated using the CLV methodology per MDOT SHA Guidelines. The results of the CLV analyses are shown on Exhibit 10 and indicate that all intersections operate at LOS D or better under existing conditions.



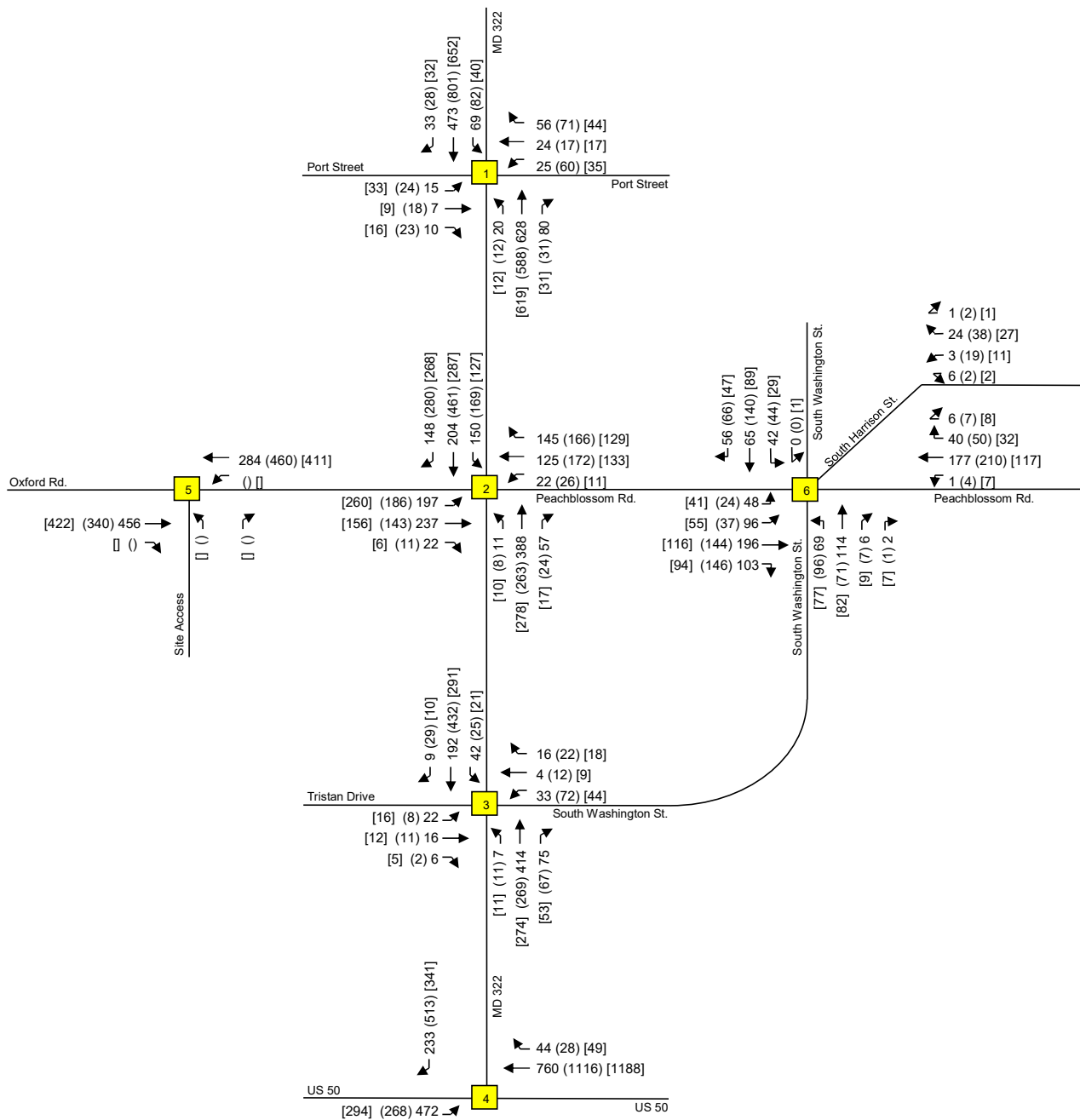
Traffic Impact Analysis

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 SEVERNA PARK, MD 21146
 www.lenharttraffic.com

Lane Use &
 Traffic Control Devices

→ - Existing Lane Use → - Proposed Lane Use

Exhibit
2



Traffic Impact Analysis

LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Existing Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

Exhibit 3

Section 3 Background Conditions

3.1 Annual Growth

The Maryland Department of Transportation State Highway Administration's Average Daily Traffic Volumes (ADT's) have been reviewed for the past ten years and it was determined that average yearly growth in the area is approximately 1.5%. Therefore, the regional traffic growth has been applied at 1.5% per year for a six-year study period. The base peak hour volumes are shown on **Exhibit 4**.

3.2 Approved Background Developments

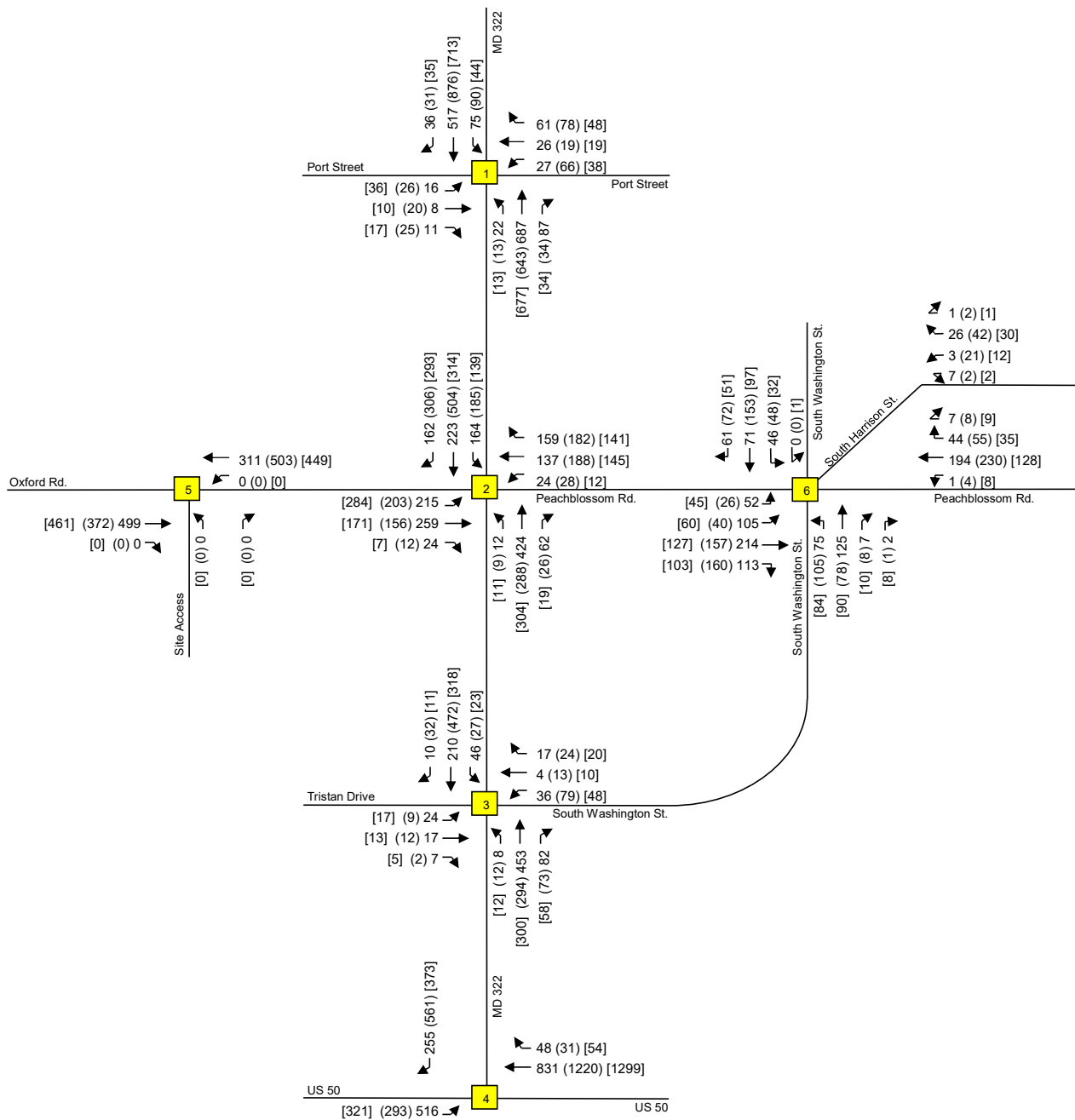
The following background developments were considered as part of this study:

- | | |
|-----------------------|---------------------------------|
| 1. Easton Village | 7. Londonberry |
| 2. Cookes Hope | 8. Douglas Landing |
| 3. The Lakelands | 9. Ratcliffe Farm |
| 4. Waterside Village | 10. Shore Health Systems Campus |
| 5. Ashbury Commons | 11. St. Peters and Paul |
| 6. Easton Marketplace | 12. Easton Club Golf Course |

The trip generation and assignment for all background developments is shown in Appendix C and the combined trips generated by all background developments are shown in **Exhibit 5**. It should be noted that the Easton Club Golf Course is existing but is not currently operational. Given this is an existing approved use, the golf course has been included as a background development to account for vested trips.

3.3 Background Traffic Volumes

Exhibit 6 shows the background peak hour traffic volumes, including the anticipated growth discussed in Section 3.1 and the background development volumes shown on Exhibit 5. The background peak hour traffic volumes were evaluated using the CLV methodology per MDOT SHA Guidelines. The results of the CLV analyses are shown on Exhibit 10 and indicate that all intersections operate at LOS D or better under background conditions.



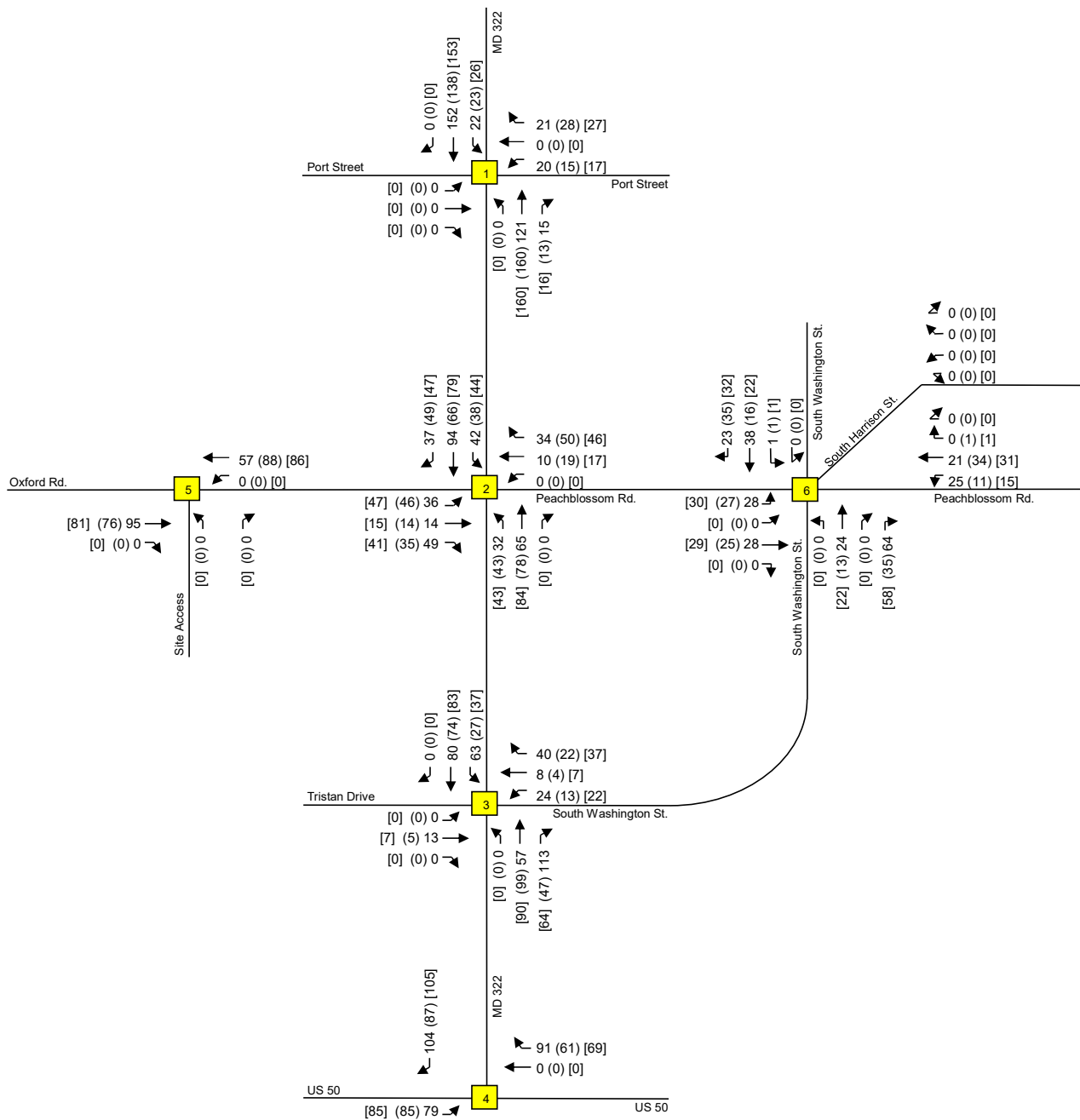
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Base Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

Exhibit 4



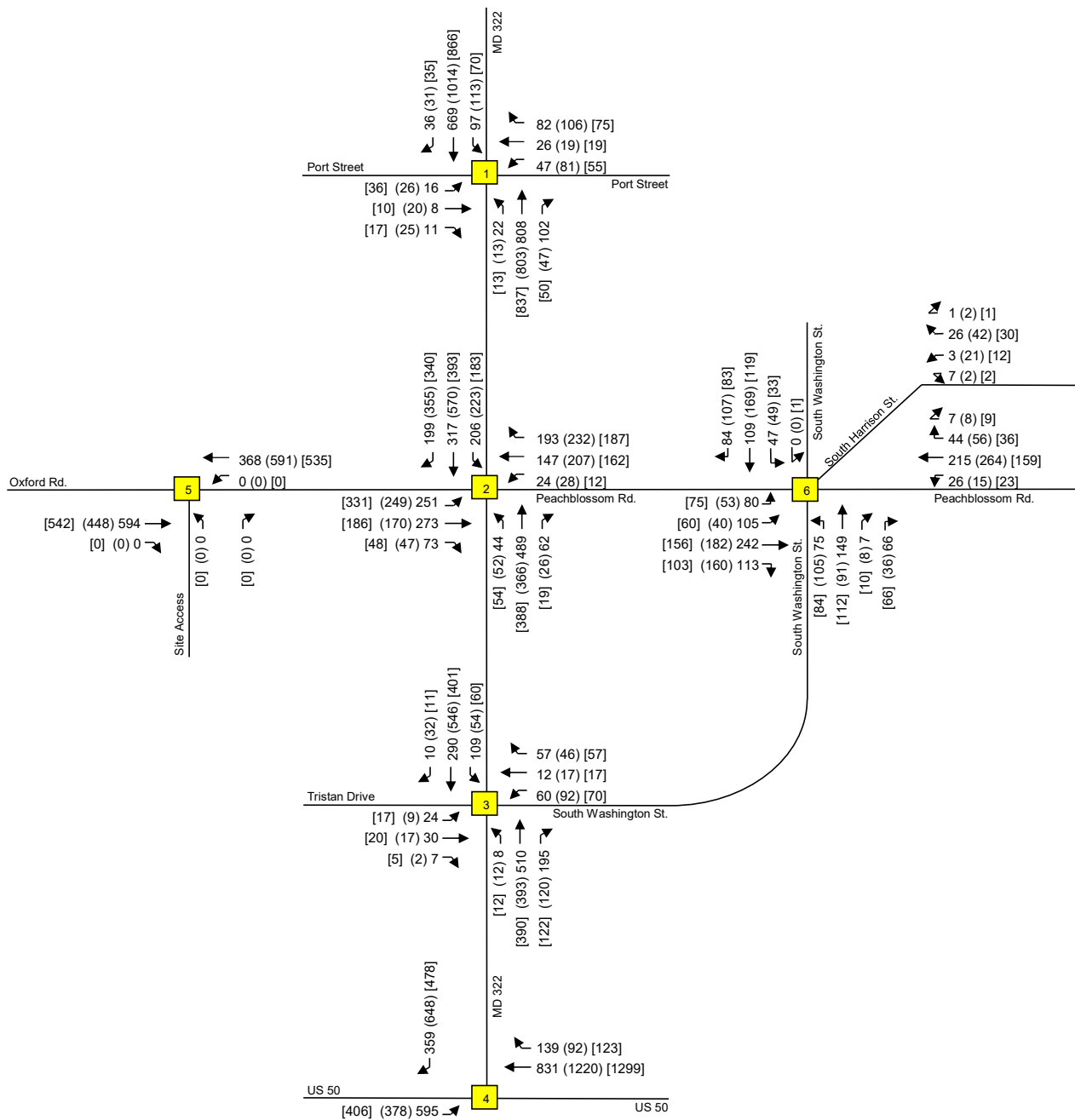
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Combined Trips Generated by Background Developments

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

Exhibit 5



Traffic Impact Analysis


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Background Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

Exhibit 6

Section 4 Projected Conditions with Site

4.1 Site Trip Generation

The site is proposed to be developed with 109 single-family estates, 138 villa townhomes, 210 units of workforce housing, 40,000 square feet of general commercial/retail, 58,000 square feet of general office, a 5,700 square foot satellite firehouse, and a 3-field sports complex.

The trip generation for the proposed development is detailed on **Exhibit 7**. Trip generation rates were obtained from the ITE Trip Generation Manual, 10th Edition. Note that for the purposes of the analyses and to be conservative, trips generated by the 5,700 square foot satellite firehouse were estimated using trip generation rates for office.

It should also be noted that since the proposed site is mixed use, internal capture has been calculated for the retail and residential uses. The internal capture worksheets are contained in Appendix B.

4.2 Site Trip Distribution & Trip Assignment

The trip assignment for the proposed development is shown on **Exhibits 8a-j**.

4.3 Total Traffic Volumes

The Total Peak Hour Volumes are shown on **Exhibit 9**.

4.4 Projected Level of Service

The total peak hour traffic volumes shown on Exhibit 9 were evaluated using the CLV methodology per MDOT SHA Guidelines. The results of the CLV analyses are shown on **Exhibit 10** and indicate that all intersections operate at LOS D or better under total conditions.

In addition to the CLV analysis, a left-turn queuing analysis was also conducted for total traffic conditions. The analysis utilized MDOT SHA's Queuing Formula and the results indicate that left-turn queues do not exceed available storage, resulting in the blockage of through traffic. It should be noted that available left-turn storage length was noted at locations with dedicated left-turn lanes that are either unsignalized, or signalized and operate under exclusive and/or permissive phasing. At locations where left-turns operate under split phasing, the available storage was not reported given that all movements operate concurrently along split phased approaches and therefore, left-turn queues will not block through movements for any extended period of time.

Trip Generation Rates

Single-Family Detached (ITE-210, Units)		Trip Distribution (In/Out)	
Morning Trips = $0.71 \times (\text{Units}) + 4.80$		25/75	
$\text{Ln}(\text{Evening Trips}) = 0.96 \times \text{Ln}(\text{Units}) + 0.20$		63/37	
Midday Sat. Trips = $0.84 \times \text{Units} + 17.99$		54/46	
Villas ... Multifamily Housing, Low-Rise (ITE-220, Units)		Trip Distribution (In/Out)	
$\text{Ln}(\text{Morning Trips}) = 0.95 \times \text{Ln}(\text{Units}) - 0.51$		23/77	
$\text{Ln}(\text{Evening Trips}) = 0.89 \times \text{Ln}(\text{Units}) - 0.02$		63/37	
Midday Sat. Trips = $1.08 \times \text{Units} - 33.24$		50/50	
Multifamily Housing, Mid-Rise (ITE-221 Urban/Suburban, Units)		Trip Distribution (In/Out)	
$\text{Ln}(\text{Morning Trips}) = 0.98 \times \text{Ln}(\text{Units}) - 0.98$		26/74	
$\text{Ln}(\text{Evening Trips}) = 0.96 \times \text{Ln}(\text{Units}) - 0.63$		61/39	
Midday Sat. Trips = $0.42 \times \text{Units} + 6.73$		49/51	
General Commercial / Retail (General Urban/Suburban, ksf, ITE-820)		Trip Distribution (In/Out)	
Morning Trips = $0.5 \times \text{ksf} + 151.78$		62/38	
$\text{Ln}(\text{Evening Trips}) = 0.74 \times \text{Ln}(\text{ksf}) + 2.89$		48/52	
$\text{Ln}(\text{Midday Sat. Trips}) = 0.79 \times \text{Ln}(\text{ksf}) + 2.79$		52/48	
General Office Building (General Urban/Suburban, ksf, ITE-710)		Trip Distribution (In/Out)	
Morning Trips = $0.94 \times \text{ksf} + 26.49$		86/14	
$\text{Ln}(\text{Evening Trips}) = 0.95 \times \text{Ln}(\text{ksf}) + 0.36$		16/84	
Midday Sat. Trips = $0.53 \times \text{ksf}$		54/46	
Soccer Complex (fields, ITE-488)		Trip Distribution (In/Out)	
Morning Trips = $0.99 \times \text{fields}$		61/39	
Evening Trips = $16.43 \times \text{fields}$		66/34	
Midday Sat. Trips = $40.10 \times \text{fields}$		48/52	

Trip Generation for Proposed Residential Uses

			AM Peak			PM Peak			Sat Mid-day Peak		
			In	Out	Total	In	Out	Total	In	Out	Total
Single Family Estates	Single-Family Detached (ITE-210, Units)	109 units	20	62	82	69	41	110	59	51	110
Villa Townhomes	Multifamily Housing, Low-Rise (ITE-220, Units)	138 units	15	50	65	50	29	79	58	58	116
Workforce Housing	Multifamily Housing, Mid-Rise (ITE-221 Urban/Suburban, Units)	210 units	18	53	71	55	35	90	47	48	95
Internal Trips for Residential Uses:			-1	-4	-5	-32	-13	-45	-31	-16	-47
Primary Residential Trips:			52	161	213	142	92	234	133	141	274

Trip Generation for Proposed Commercial / Retail Uses

			AM Peak			PM Peak			Sat Mid-day Peak		
			In	Out	Total	In	Out	Total	In	Out	Total
Commercial / Retail Area	General Commercial / Retail (General Urban/Suburban, ksf, ITE-820)	40,000 sq.ft.	107	65	172	132	144	276	156	144	300
Internal Trips for Commercial / Retail Uses:			-5	-4	-9	-17	-34	-51	-13	-34	-47
External Commercial / Retail Trips:			102	61	163	115	110	225	143	110	253
Pass-by Trips for Commercial / Retail Uses (0% AM / 34% PM / 34% Sat.):			0	0	0	-39	-37	-76	-49	-37	-86
Primary Commercial / Retail Trips:			102	61	163	76	73	149	94	73	167

Trip Generation for Proposed Office Uses

			AM Peak			PM Peak			Sat Mid-day Peak		
			In	Out	Total	In	Out	Total	In	Out	Total
General Office	General Office Building (General Urban/Suburban, ksf, ITE-710)	63,700 sq.ft.	74	12	86	12	62	74	18	16	34
Internal Trips for General Office Uses:			-5	-3	-8	-7	-9	-16	-9	-3	-12
External General Office Trips:			69	9	78	5	53	58	9	13	22
Primary General Office Trips:			69	9	78	5	53	58	9	13	22

Trip Generation for Proposed Town Park

			AM Peak			PM Peak			Sat Mid-day Peak		
			In	Out	Total	In	Out	Total	In	Out	Total
Town Park	Soccer Complex (fields, ITE-488)	3 Fields	2	1	3	32	17	49	58	62	120
Primary Park Trips:			2	1	3	32	17	49	58	62	120

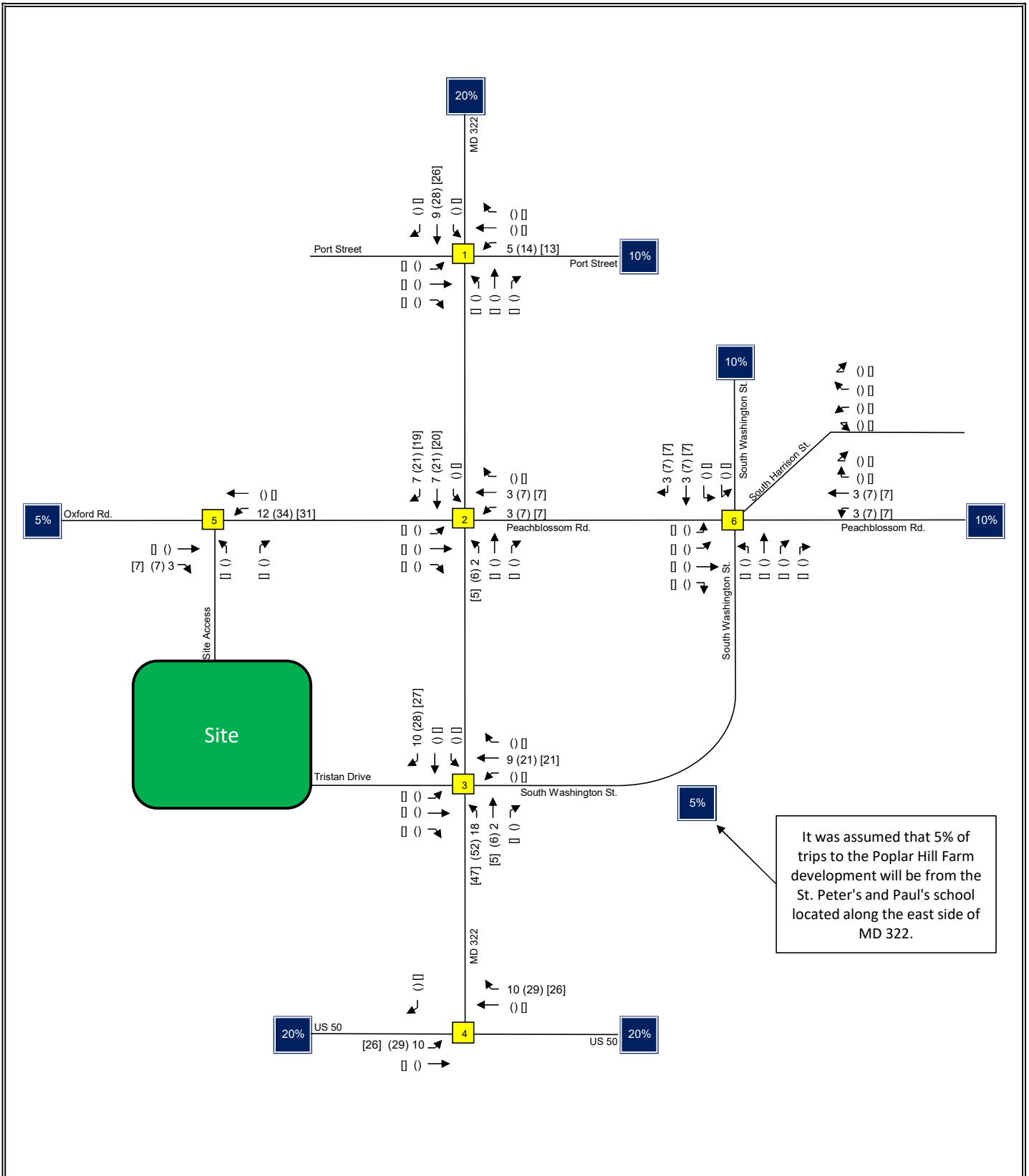
Total Primary Trips Generated by Proposed Site

			AM Peak			PM Peak			Sat Mid-day Peak		
			In	Out	Total	In	Out	Total	In	Out	Total
Total Primary Trips Generated by Proposed Site:			225	232	457	255	235	490	294	289	583

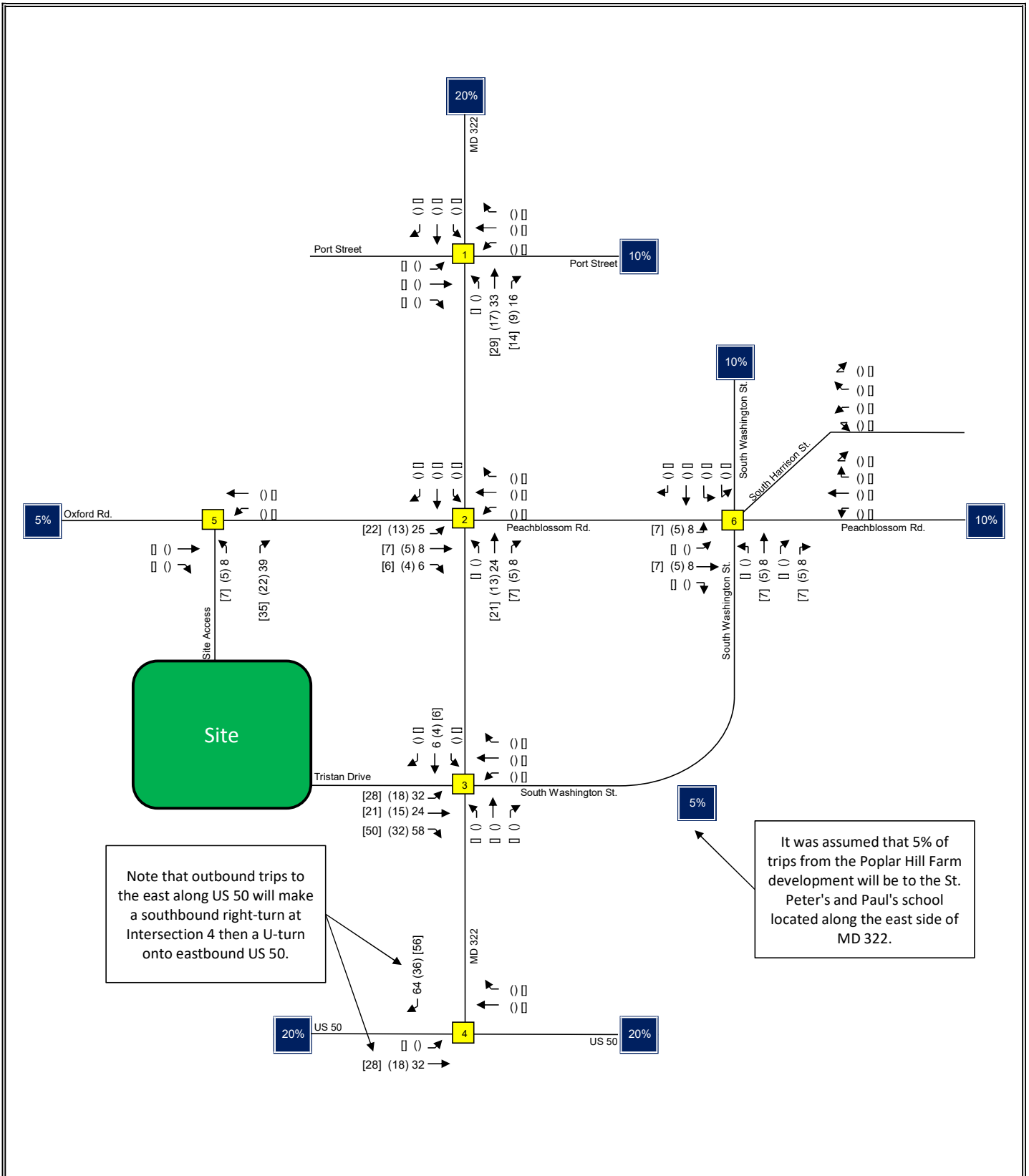
NOTES:

1. Trip Generation Rates obtained from the ITE Trip Generation Manual, 10th Edition.
2. Internal capture has been calculated for retail and residential uses only. The detailed calculations are shown in Appendix B.

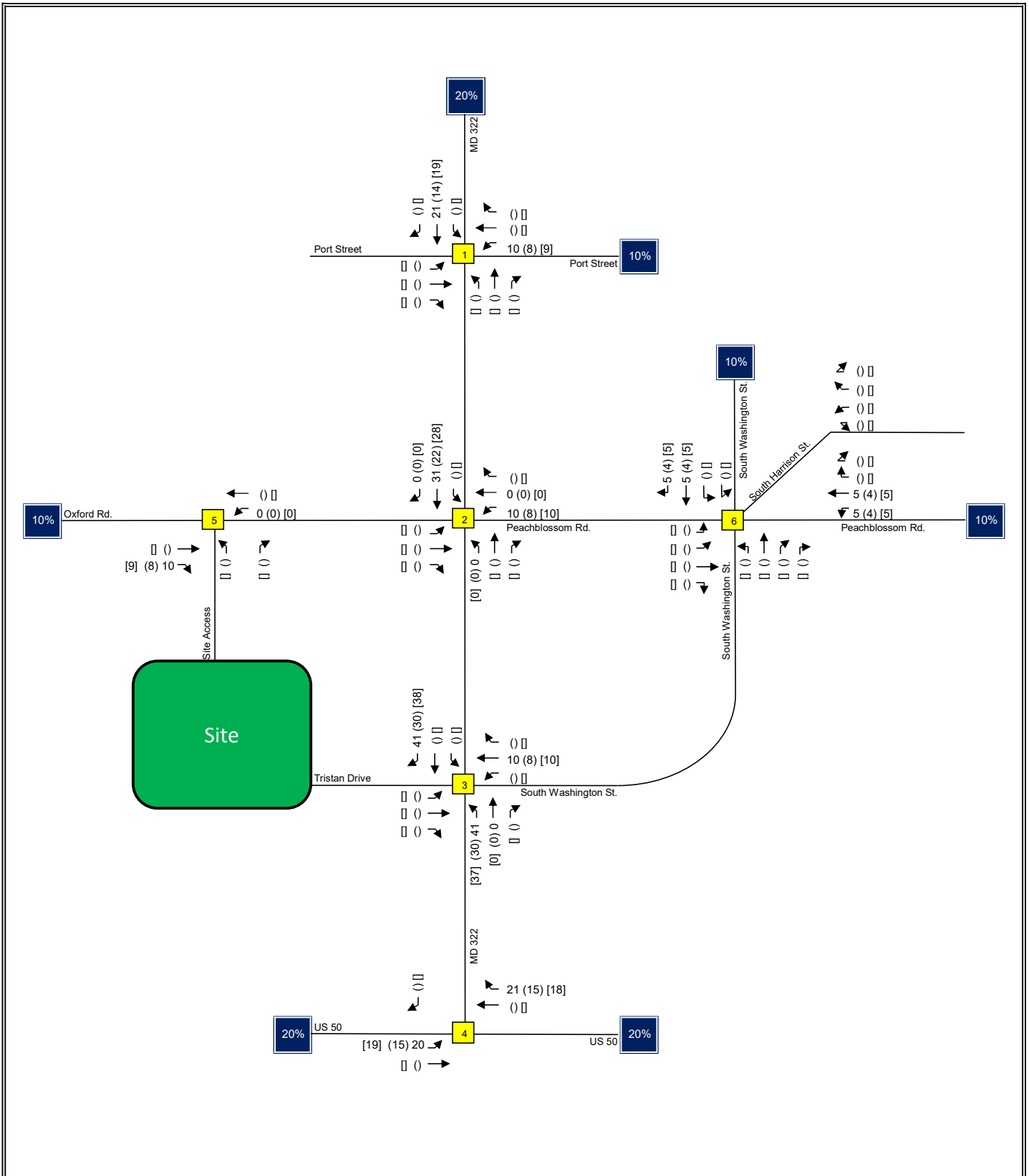
Traffic Impact Analysis  LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Trip Generation for Site	Exhibit 7



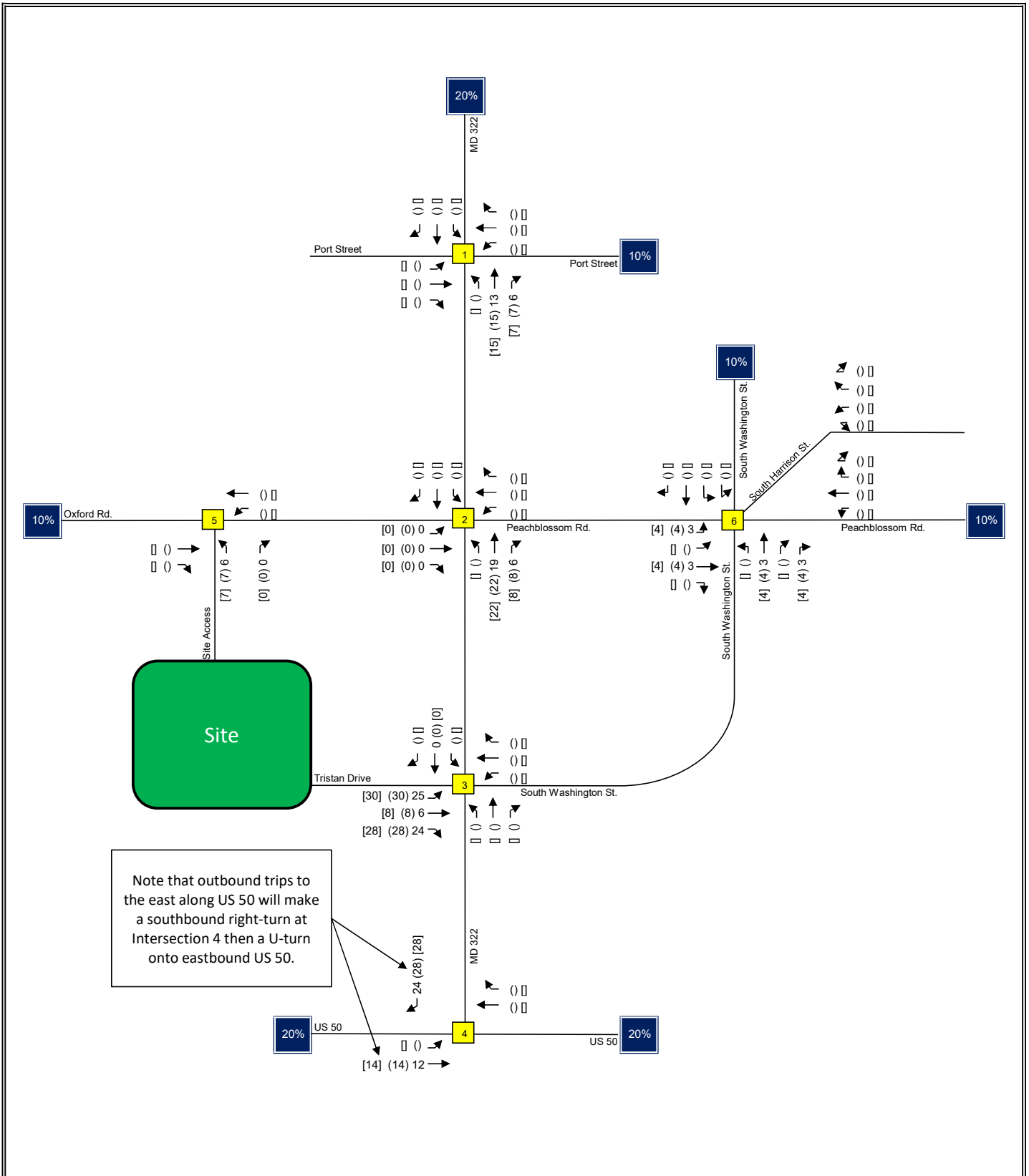
Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Inbound Trip Assignment for Residential Uses Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8a
--	--	--------------------------



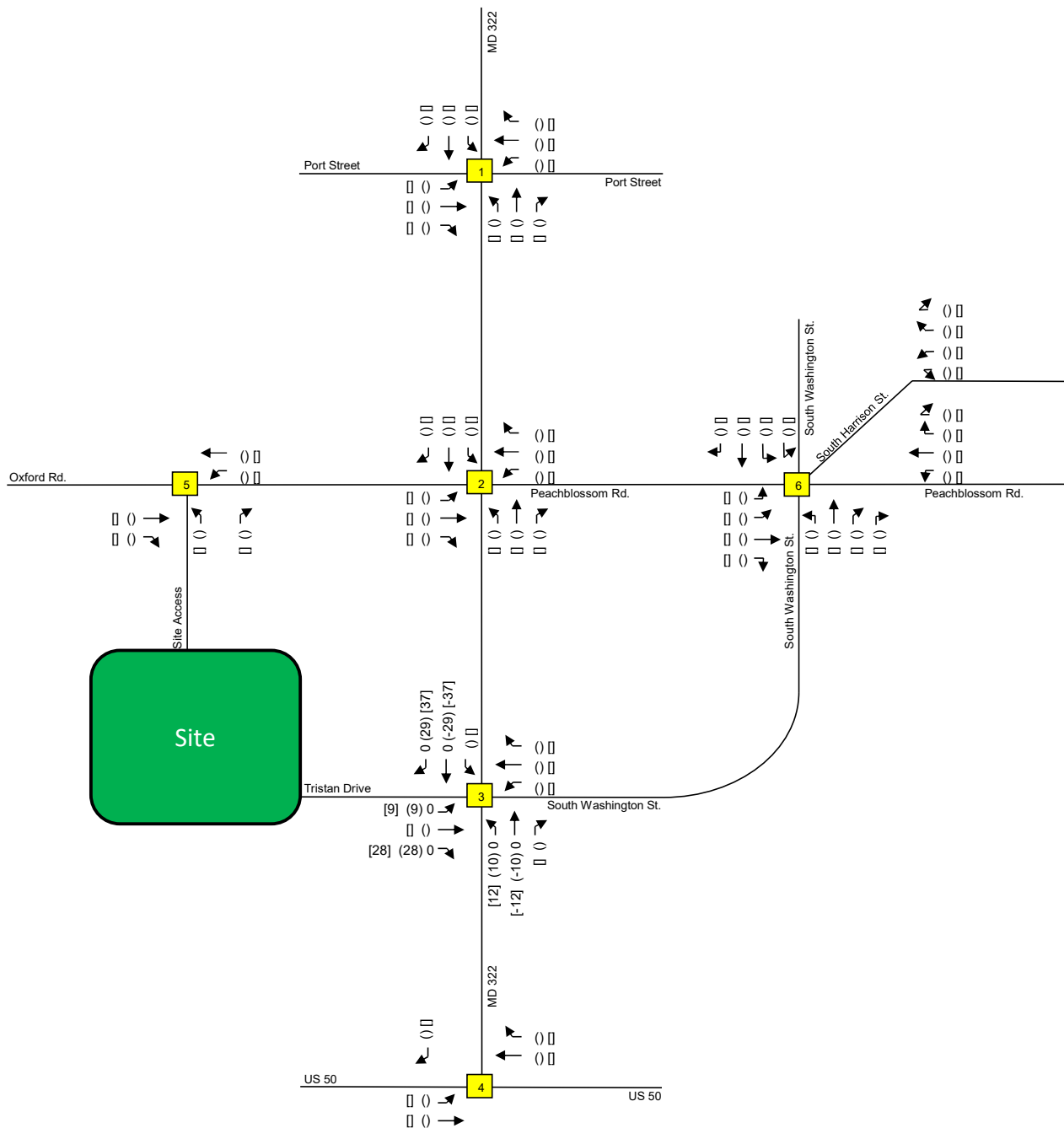
Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Outbound Trip Assignment for Residential Uses Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8b
--	---	--------------------------



Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Inbound Trip Assignment for Retail Uses Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8c
--	---	------------------------------



Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Outbound Trip Assignment for Retail Uses Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8d
--	--	--------------------------



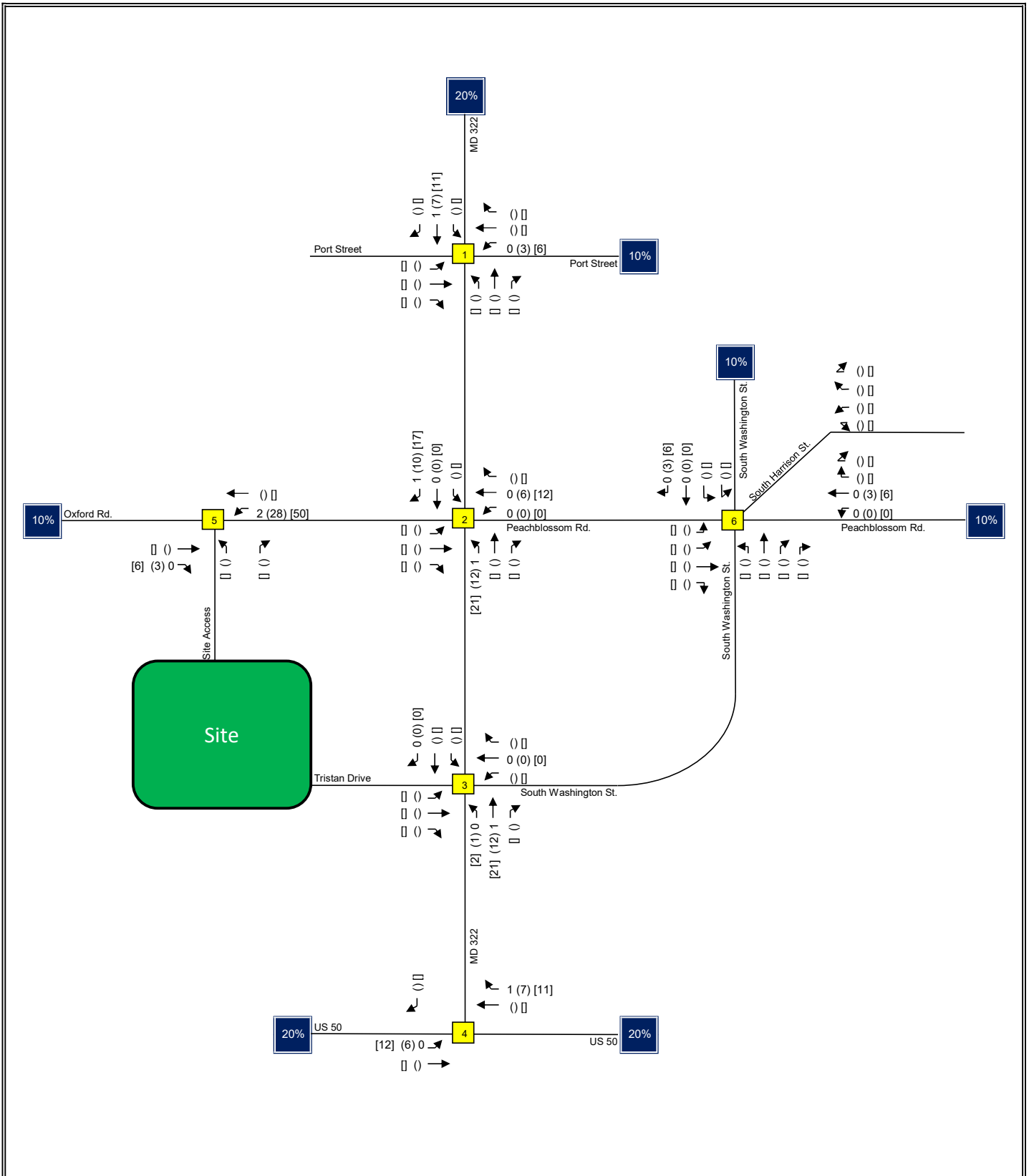
Traffic Impact Analysis

LENHART TRAFFIC CONSULTING, INC.
 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
 SEVERNA PARK, MD 21146
 www.lenharttraffic.com

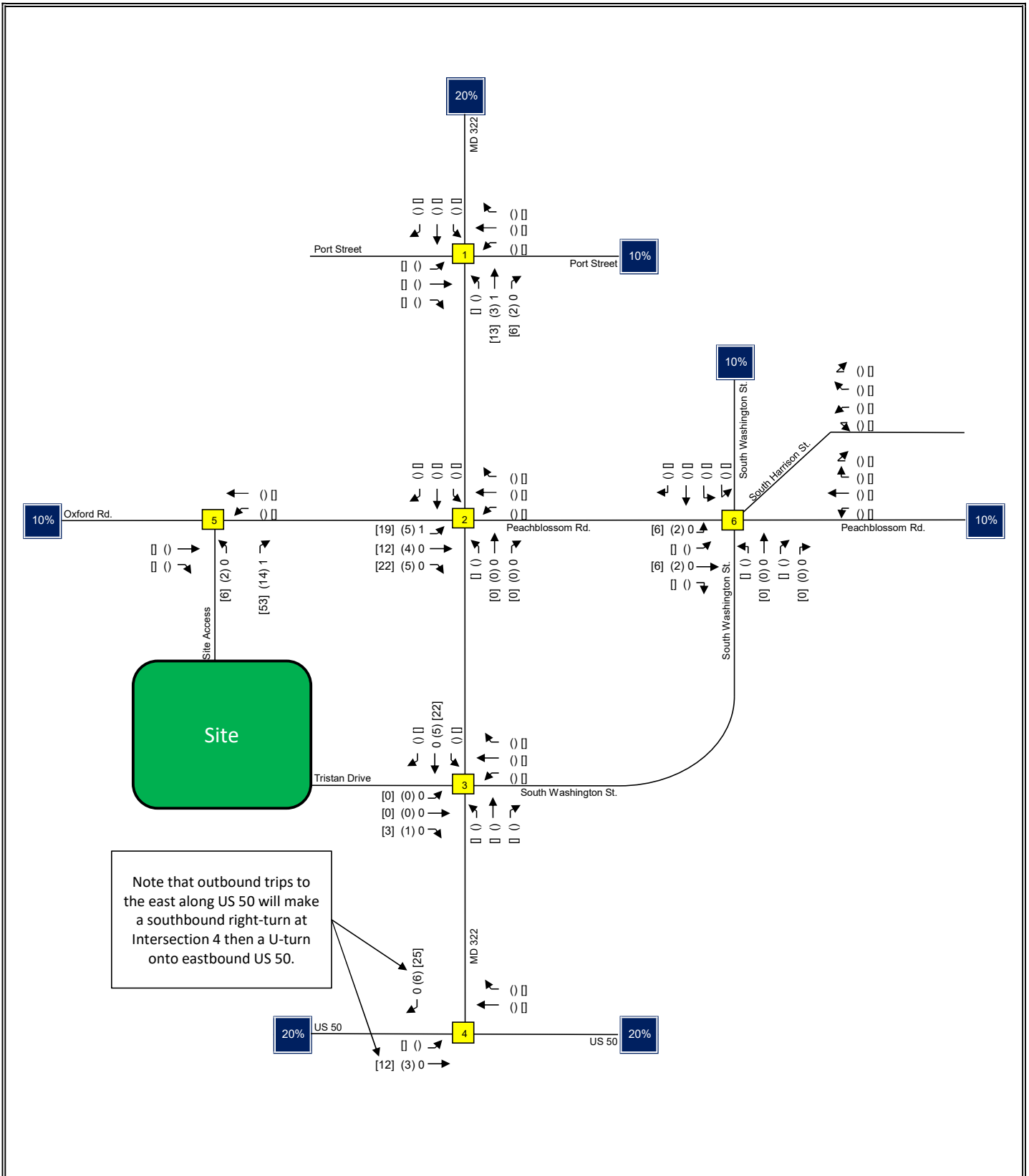
Pass-by Trip Assignment for
 Retail Uses

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

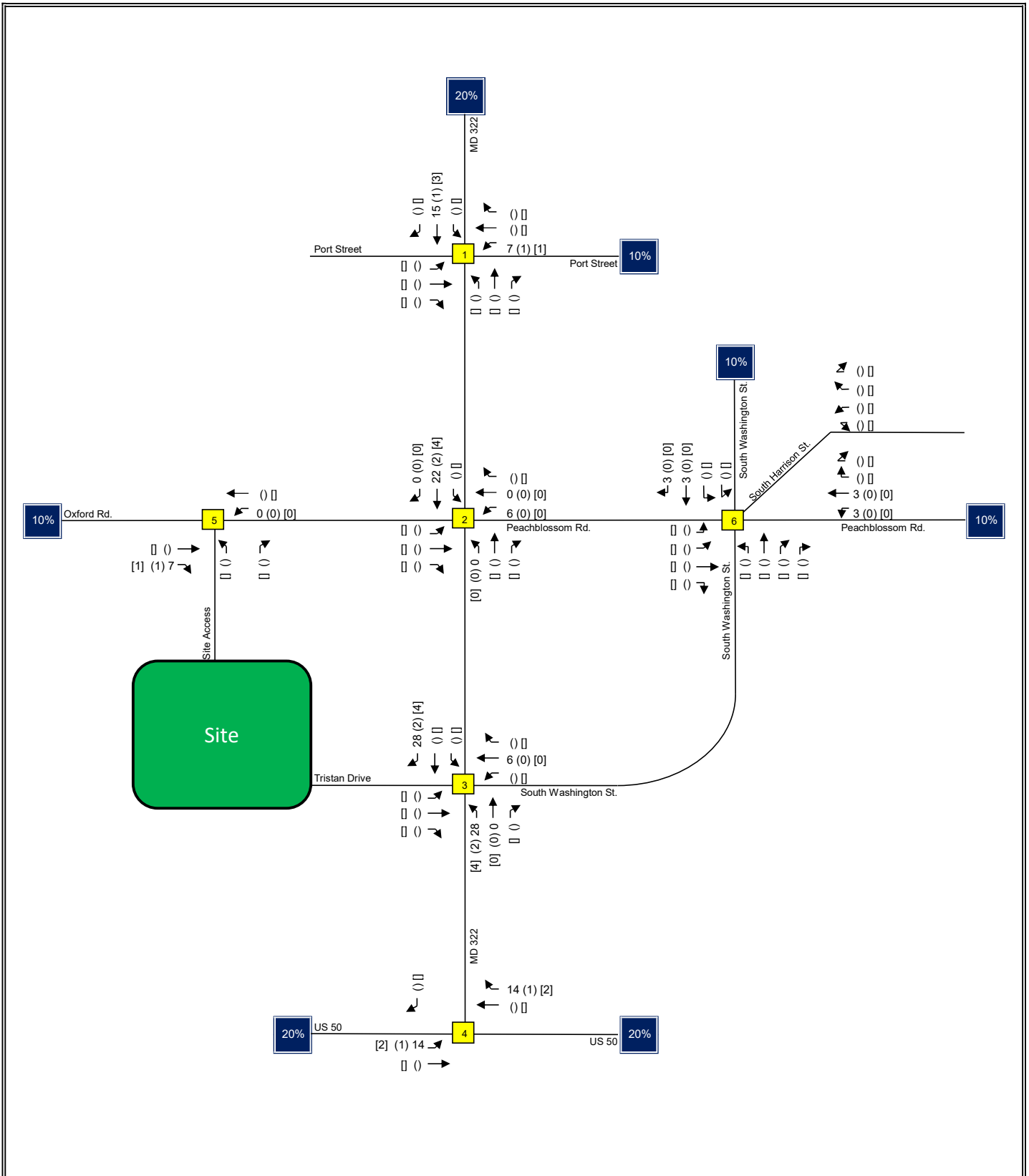
**Exhibit
 8e**



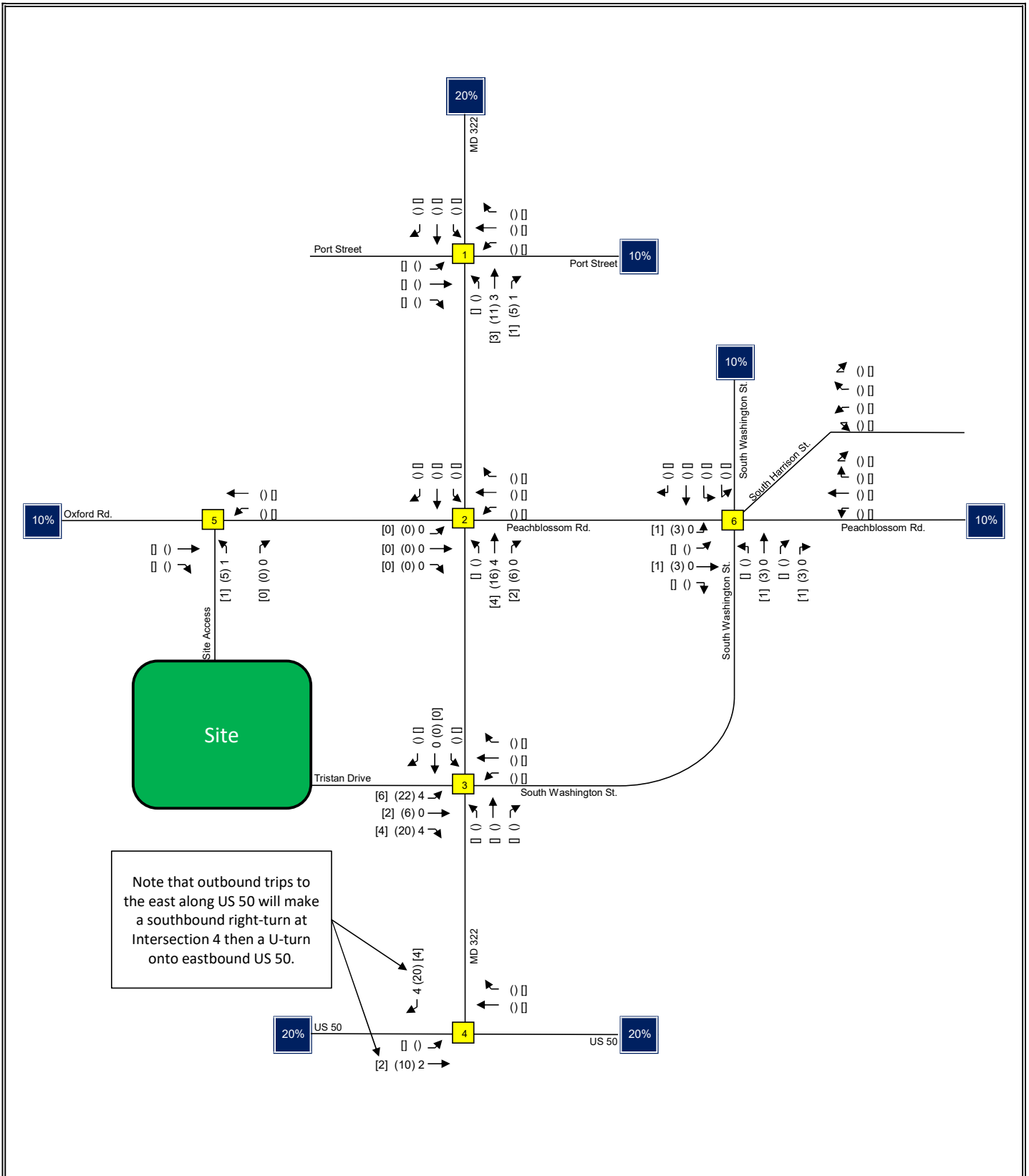
Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Inbound Trip Assignment for Town Park Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8f
--	---	------------------------------



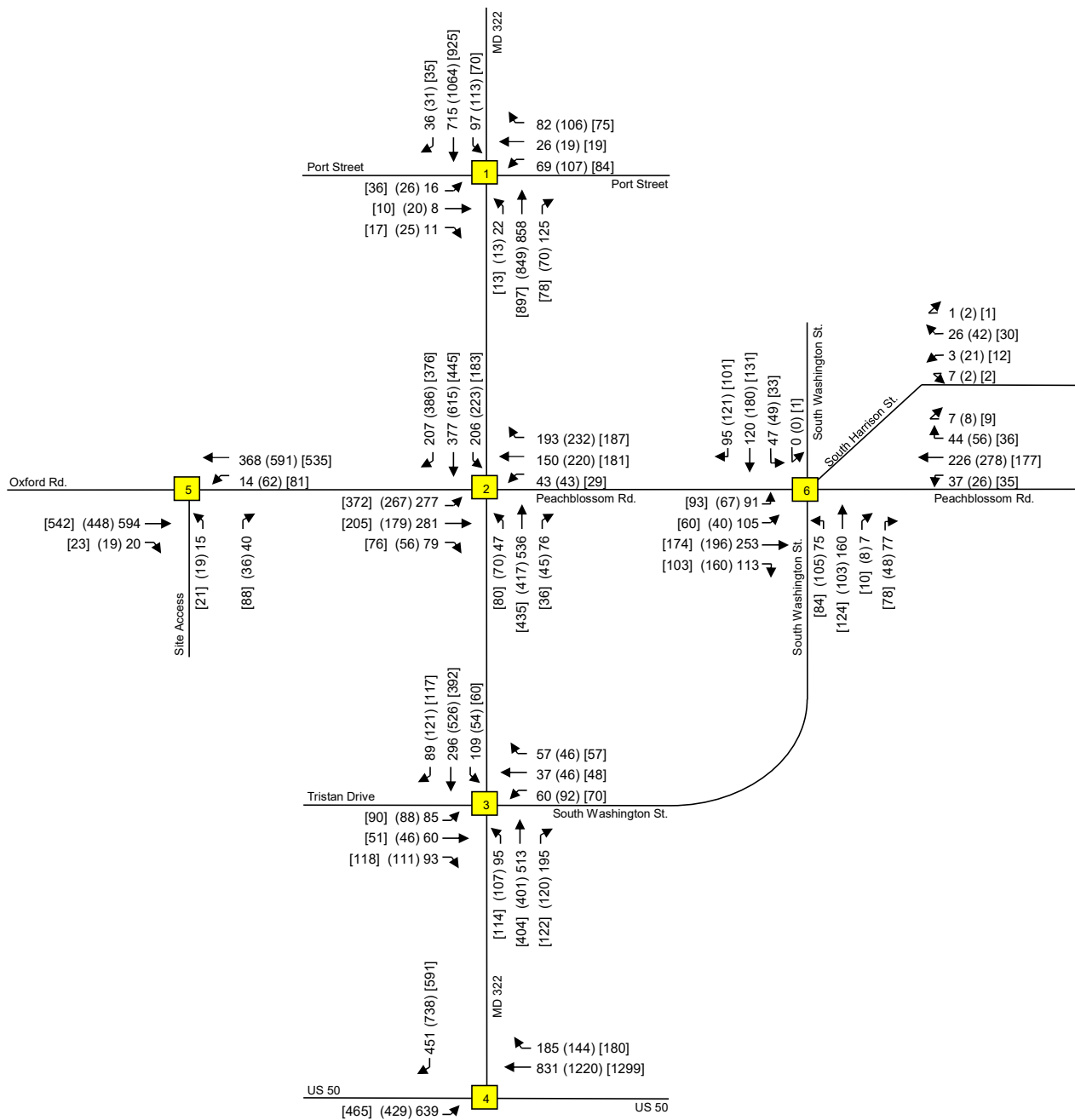
Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Outbound Trip Assignment for Town Park Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8g
--	--	------------------------------



Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Inbound Trip Assignment for Office Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8h
--	---	------------------------------



Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Outbound Trip Assignment for Office Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit 8i
--	---	--------------------------



Traffic Impact Analysis

LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Total Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

Exhibit 9

Level-of-Service Results

Morning Peak Hour	Existing CLV	Background CLV	Total CLV	LOS D or better?
1). MD 322 at Port Street	A / 820	B / 1081	C / 1155	Y
2). MD 322 at Peachblossom Road	A / 944	C / 1212	C / 1295	Y
3). MD 322 at S. Washington Street	A / 349	A / 549	A / 698	Y
4). MD 322 at US 50	A / 701	A / 814	A / 840	Y
5). Oxford Road at Site Access	--	--	A / 663	Y
6). Peachblossom Road at S. Washington Street	A / 747	A / 952	B / 1007	Y
Evening Peak Hour	Existing CLV	Background CLV	Total CLV	LOS D or better?
1). MD 322 at Port Street	A / 991	C / 1267	D / 1346	Y
2). MD 322 at Peachblossom Road	A / 853	B / 1106	C / 1215	Y
3). MD 322 at S. Washington Street	A / 370	A / 485	A / 742	Y
4). MD 322 at US 50	A / 775	A / 898	A / 928	Y
5). Oxford Road at Site Access	--	--	A / 646	Y
6). Peachblossom Road at S. Washington Street	A / 924	B / 1133	C / 1197	Y
Saturday Midday Peak Hour	Existing CLV	Background CLV	Total CLV	LOS D or better?
1). MD 322 at Port Street	A / 797	B / 1098	C / 1189	Y
2). MD 322 at Peachblossom Road	A / 809	B / 1076	C / 1200	Y
3). MD 322 at S. Washington Street	A / 263	A / 443	A / 668	Y
4). MD 322 at US 50	A / 829	A / 958	A / 993	Y
5). Oxford Road at Site Access	--	--	A / 732	Y
6). Peachblossom Road at S. Washington Street	A / 628	A / 817	A / 895	Y

NOTES:

1. All intersections satisfy MD SHA Guidelines of LOS "D" or better.

Traffic Impact Analysis	Results of CLV Level-of-Service Analyses	Exhibit 10
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com		

Section 5 Conclusions / Recommendations

5.1 Results of Analyses

This Traffic Impact Analysis (TIA) has been prepared for the proposed Poplar Hill Farm development located along the west side of MD 322 just south of MD 333 (Oxford Road) as shown on Exhibit 1. The site is proposed to be developed with 109 single-family estates, 138 villa townhomes, 210 units of workforce housing, 40,000 square feet of general commercial/retail, 58,000 square feet of general office, a 5,700 square foot satellite firehouse, and a 3-field sports complex. The site will have access via Tristan Drive and MD 333 (Oxford Road).

Based on the analyses contained in this report:

- All study intersections operate at LOS D or better under existing, background, and total conditions. Per MDOT SHA Guidelines, all study intersections must operate at LOS D or better to be considered adequate.
- At the proposed intersection of MD 333 and Site Access (Intersection 5), the following frontage improvements are recommended:
 - Construct a bypass lane along westbound MD 333. The posted speed limit at the beginning of the bypass lane is 40 MPH and the speed limit transitions to 50 MPH along the proposed bypass lane. Therefore, it is recommended that the approach taper be designed for 40 MPH and the remainder of the bypass lane be designed for 50 MPH. Per MDOT SHA's Access Permits Manual, it is recommended that the approach taper be 200', the approach lane be 200', the departure lane be 200', and the departure taper be 300'. This results in a total bypass lane length of 900'.
 - Given the proximity of the acceleration lane along westbound MD 333 which currently serves Clubhouse Drive (approximately 500'), it is recommended that the bypass lane for the site access be combined with the acceleration lane which currently serves Clubhouse Drive. This request was made by MDOT SHA in their approval letter dated December 12th, 2022 and exceeds the recommendations contained in MDOT SHA's Access Permits Manual.
 - Construct a deceleration (right-turn) lane along eastbound MD 333. MD 333 transitions from a posted eastbound speed of 50 MPH to 40 MPH in the vicinity of the proposed site and it is likely that eastbound vehicles will be traveling at 50 MPH in the vicinity of the site access. Per MDOT SHA's Access Permits Manual, it is recommended that the partial deceleration lane be 350' (100' taper + 250' of full width lane).
 - Construct a partial acceleration lane along eastbound MD 333. Note

that vehicles making a northbound right-turn will be immediately enter into a 40 MPH posted zone. Per MDOT SHA's Access Permits Manual, it is recommended that the partial acceleration lane be 250' (100' full width lane + 150' taper length).

- It should be noted that with the recommendations above, the proposed site access along MD 333 (Oxford) meets all MDOT SHA requirements. Specifically, acceleration/deceleration lanes will be provided as detailed above, and the proposed intersection is located approximately 800' from Clubhouse Drive which exceeds the minimum intersection spacing of 750' recommended in MDOT SHA Guidelines.
- In addition to the intersections included as part of the study, nearby residents have expressed concern over operations at other nearby intersections along MD 333 (Oxford Road). These intersections included MD 333 at Polly's Hill Lane, MD 333 at Clubhouse Drive, and MD 333 at Tour Drive. Note that these intersections were not included in the project scope which has been approved by both MDOT SHA and the Town of Easton. However, additional analysis has been conducted to determine Level-of-Service (LOS) at these intersections to address citizen concerns. In order to conduct this additional analysis, traffic counts were conducted on Thursday, December 1st, 2022 (Thursday) and Saturday, December 3rd, 2022. See below for the results of this additional analysis:
 - MD 333 at Polly's Hill Lane – Total traffic volumes were developed at this intersection which included existing traffic, regional growth, traffic associated with nearby background developments, and traffic associated with the Poplar Hill development. The total traffic volumes at this location were evaluated using the Critical Lane Volume methodology per MDOT SHA Guidelines, and the results indicate that the intersection operates at LOS A during all peak hours. Detailed analysis of this intersection is contained in Appendix F.
 - MD 333 at Clubhouse Drive – Total traffic volumes were developed at this intersection at this intersection which included existing traffic, regional growth, traffic associated with nearby background developments, and traffic associated with the Poplar Hill development. The total traffic volumes at this location were evaluated using the Critical Lane Volume methodology per MDOT SHA Guidelines, and the results indicate that the intersection operates at LOS A during all peak hours. Detailed analysis of this intersection is contained in Appendix G.

- MD 333 at Tour Drive – Total traffic volumes were developed at this intersection which included existing traffic, regional growth, traffic associated with nearby background developments, and traffic associated with the Poplar Hill development. The total traffic volumes at this location were evaluated using the Critical Lane Volume methodology per MDOT SHA Guidelines, and the results indicate that the intersection operates at LOS A during all peak hours. Detailed analysis of this intersection is contained in Appendix H.
- It should be noted that MDOT SHA has previously approved the Traffic Impact Study for the Poplar Hill Development in their approval letter dated December 12th, 2022. As part of the approval letter, MDOT SHA requested that the bypass lane for the site access along westbound MD 333 be combined with the acceleration lane which currently serves Clubhouse Drive. This recommendation is included as part of this report and the applicant will continue to work with MDOT SHA to ensure that the bypass lane for the site access along westbound MD 333 is constructed per their request.

With the above recommendations, all intersections will operate at acceptable Levels-of-Service.

Appendix A

Supplemental Information
Turning Movement Counts

PLANS ARE NOT
APPROVED FOR
CONSTRUCTION

[illegible]

WARNING!
THE LOCATIONS OF DIEDING UTILITIES AS SHOWN ON THIS PLAN ARE APPROPRIATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF DIEDING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL INFORMATION AND PERMITS PURPOSES ONLY. THE CONTRACTOR SHALL BURY ALL UTILITIES TO HIS OWN SATISFACTION PRIOR TO BEGINNING CONSTRUCTION.

THE CONTRACTOR SHALL TEST, FIT AND LOCATE DIEDING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL AFFECTED AGENCIES AND A CITY DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF ANY DIEDING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION DECISION.



Civil Engineers • Land Planning • Land Surveyors

Book conditions:
117 5th St. Camd., MD 21613 14100 MS-0000
15 Middle St. Gerritt, MD 21613 14100 MS-0000
204 Pennsylvania Ave. Centreville, MD 21617 14100 MS-0000

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or dictated by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 48100. Expiration Date: 12/31/2023.



CONCEPT PLAN

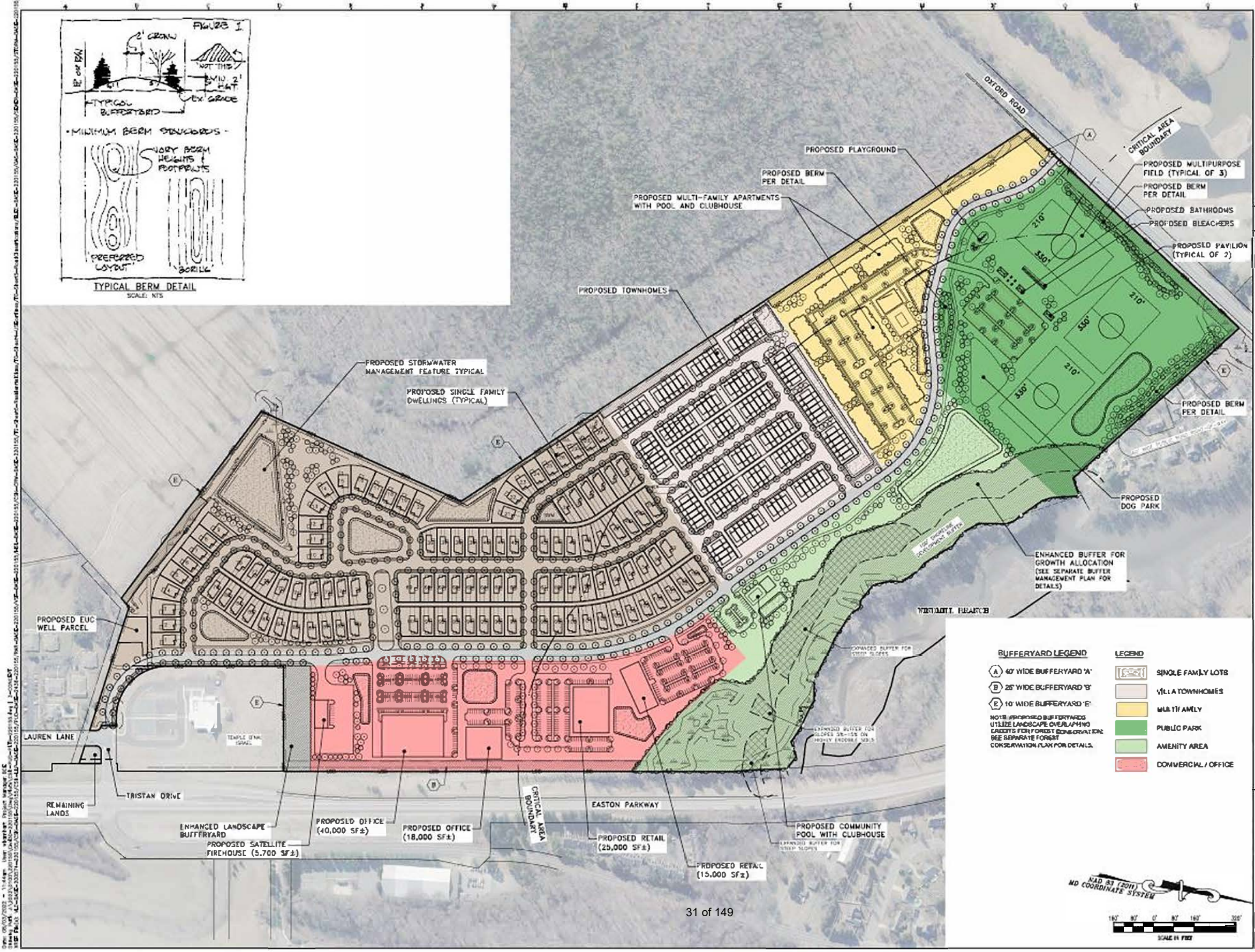
POPLAR HILL
PUD SKETCH PLAN

IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 TAX PARCEL 57

EXCLUDED/REMOVED FOR	DATE	BY
AGENCY REVIEW	7/26/22	DCE
AGENCY REVIEW	8/03/22	DCE

3 OF 5

Page 341 of 566
AS NOTED FILE 3324



Ryan Wingate

To: mlenhart
Subject: RE: TIA Scoping Request: Poplar Hill Farm

From: mlenhart <mlenhart@LENHARTTRAFFIC.COM>
Sent: Thursday, April 22, 2021 12:23 PM
To: Henry Dierker <HDierker@mdot.maryland.gov>; Rick Van Emburgh <rvanemburgh@EastonMD.gov>;
RBaker@mdot.maryland.gov
Cc: Nick Driban <ndriban@LENHARTTRAFFIC.COM>; mlenhart <mlenhart@LENHARTTRAFFIC.COM>
Subject: TIA Scoping Request: Poplar Hill Farm

Hi Rick, Rich, and Henry,

I have been contracted to prepare a Traffic Impact Study for the Poplar Hill Farm, and am submitting this scoping email for your review and feedback/approval.

The applicant is working on the concept plan, but the current proposal includes 84 single family dwelling units, 120 residential villas, and 120 multi-family dwelling units.

I called and spoke to the Easton High School to get information regarding the current COVID school schedule. They are only open to students on four days a week. Monday-Tuesday, and Thursday-Friday. They are currently in a hybrid situation where some kids come two days and are virtual two days, but they said that more kids are actually now attending in person for four days a week. Furthermore, buses and teachers are running all four of those days, so if we were to count on a Tuesday or Thursday it should provide a fairly good estimate of things returning somewhat to normal. Please let us know if this sounds ok to you.

1. The attached "Site Location Map and Study Intersections" provides the six (6) intersections that we are proposing for this TIA along with the estimated trip assignments. Please confirm that this scope is acceptable.
2. I've attached a trip generation worksheet showing that the proposal will generate 162 AM trips, 208 PM trips, and 242 Saturday mid-day tris.
3. Based on the discussion above, we will conduct counts on a Tuesday or Thursday from 7-9 AM and 4-6 PM. Please advise if you will require Saturday counts and analyses as well.
4. Finally, please advise if there are any background developments to be included in the TIA and any information related to those developments.

Thanks,
Mike

Mike Lenhart, P.E., PTOE
President

PLEASE NOTE NEW PHONE AND ADDRESS

Office: [\(410\) 216-3333](tel:(410)216-3333) (Ext. 1)
Mobile: [\(410\) 980-2367](tel:(410)980-2367)
Fax: [\(443\) 782-2288](tel:(443)782-2288)



LENHART TRAFFIC CONSULTING, INC.

645 BALTIMORE ANNAPOLIS BLVD, SUITE 214

SEVERNA PARK, MD 21146

www.lenharttraffic.com

The information contained herein is confidential and intended for the exclusive use of the addressee(s). If you are not the intended recipient, you are hereby notified that any review, use, dissemination, distribution or copying of this message is strictly prohibited. If you received this e-mail in error, please notify the sender immediately and delete the message.

PROJECT NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	MD			

EXISTING SIGN

20, 21, 22
NO TURN ON RED
R10-11B
24" X 24"

PROPOSED SIGNS

15
Oxford Rd.
Harrison St.
32" X VARIABLE

17
Idlewild Ave.
Oxford Rd.
32" X VARIABLE

18
Harrison St.
Washington St.
32" X VARIABLE

19
Washington St.

16
LEFT TURN YIELD ON GREEN
R 10-12
36" X 48"

PROPOSED SIGNALS

1 12" R
2 12" Y
3 12" G

5 12" R
6 12" Y
7 12" G

2, 3, 4 6, 9, 10 12" R
5 12" Y
6 12" G

8, 12 12" R
9 12" Y
10 12" G

7, 11 12" R
8 12" Y
9 12" G

OPTICALLY PROGRAMED

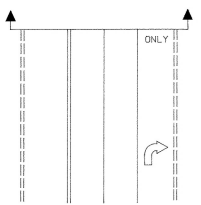
NEMA PHASING

Ø1 Ø2 Ø3 Ø4 Ø5 Ø6 Ø7

Ø4 ALT

PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY
PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY
RING 11 SEQUENTIAL

- UTILITY LEGEND
- G — GAS MAIN
 - W — WATER MAIN
 - S — SEWER MAIN
 - E — ELECTRIC CABLES
 - A — AERIAL CABLES
 - T — TELEPHONE CABLES



REVISIONS	APPROVALS	REVISIONS	MARYLAND DOT - STATE HIGHWAY ADMINISTRATION Office of Traffic & Safety TRAFFIC ENGINEERING DESIGN DIVISION MD 333 AND MD 565A (WASHINGTON STREET)
	CHIEF, DESIGN SECTION ASST. DISTRICT ENGINEER, TRAFFIC CHIEF, TRAFFIC ENGINEERING DESIGN SECTION DIRECTOR, TRAFFIC & SAFETY		

DRAWN BY: D. DICKERSON	F.A.P. NO.	PLAN SHEET NO. 1	SHEET NO.
CHECK BY: [Signature]	S.H.A. NO.	TS-3452	OF
SCALE: 1" = 20'	COUNTY	TALBOT	

200033309 79

December 12, 2022

Mr. Mike Lenhart
Lenhart Traffic Consulting, Inc.
645 Baltimore Annapolis Boulevard, Suite 214
Severna Park, MD 21146

RE: Talbot County
MD 333, St. Michaels Road
Poplar Hill Farm
SHA Tracking No. 22apta001xx
Mile Point: 0.35

Dear Mr. Lenhart:

Thank you for the opportunity to review the Traffic Impact Study (TIS) submittal for the proposed Poplar Hill Farm Development located on MD 333 within the town limits of Easton in Talbot County. The Maryland Department of Transportation State Highway Administration (MDOT SHA) has reviewed the plans and we are pleased to advise of **TIS Approval with the following comment.**

District Traffic:

- This bypass lane will need to be combined with the acceleration lane from the golf club to basically create an auxiliary lane.

District Access Comments:

Plan submittals should reflect the above comments. Please submit (two) (2) sets of plans, a flash-drive and/or electronic submittal containing the plans and supporting documentation in PDF format, a point-by-point response to reflect the comments noted above directly to Mr. Ken Fender at 615 Morgnec Road, Chestertown, MD 21620, attention of Mr. Henry R. Dierker III. Please reference the MDOT SHA tracking number on future submissions. Please keep in mind that you can view the reviewer and project status via the MDOT SHA Access Management web page at <http://www.roads.maryland.gov/pages/amd.aspx>. If you have any questions or require additional information, please contact Mr. Henry R. Dierker III at 410-778-3061, by using our toll-free number (in Maryland only) at 1-800-637-9740 (x3244), or via hdierker@mdot.maryland.gov.

.

Sincerely,



Richard Baker
Assistant District Two Engineer-Traffic

TRAFFIC GROWTH PROJECTION

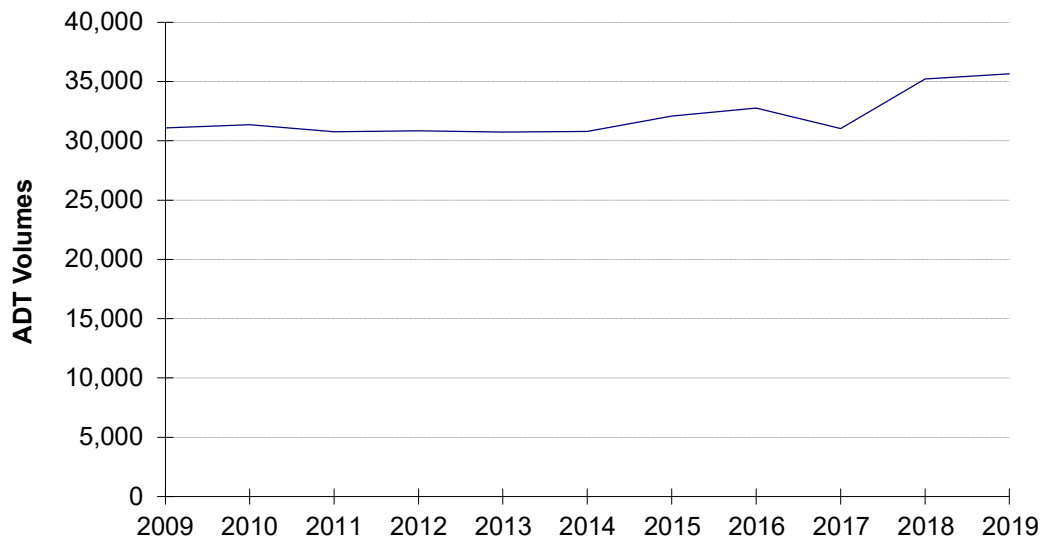
LOCATION: US 50 South of MD 322

REPORT DATE: 21-May-21

AVERAGE GROWTH: 1.48%

MATHEMATICAL GROWTH: 1.38%

Year	ADT Volume	Vol. increase	% increase	Average %
2009	31,091			
2010	31,342	251	0.81%	0.81%
2011	30,753	-589	-1.88%	-0.54%
2012	30,854	101	0.33%	-0.25%
2013	30,735	-119	-0.39%	-0.28%
2014	30,800	65	0.21%	-0.18%
2015	32,091	1,291	4.19%	0.55%
2016	32,772	681	2.12%	0.77%
2017	31,020	-1,752	-5.35%	0.01%
2018	35,220	4,200	13.54%	1.51%
2019	35,641	421	1.20%	1.48%



TRAFFIC GROWTH
US 50 South of MD 322

Time:	Weekday Morning Peak Hour (7 am - 9 am)																				Total
	MD 322 Northbound					MD 322 Southbound					Port Street Eastbound					Port Street Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
7:00-7:15	0	1	108	1	0	0	15	84	11	0	0	1	3	5	0	0	2	2	17	0	250
7:15-7:30	0	1	133	11	0	0	13	78	2	0	0	3	5	3	0	0	7	3	10	0	269
7:30-7:45	0	5	177	25	0	0	19	131	8	0	0	3	0	1	0	0	9	10	20	0	408
7:45-8:00	0	10	172	22	0	0	17	110	6	0	0	6	3	3	0	0	8	7	14	0	378
8:00-8:15	0	2	127	16	0	0	16	120	8	0	0	4	1	4	0	0	2	2	10	0	312
8:15-8:30	0	3	152	17	0	0	17	112	11	0	0	2	3	2	0	0	6	5	12	0	342
8:30-8:45	0	9	141	11	0	0	9	108	7	0	0	8	2	5	0	0	12	5	16	0	333
8:45-9:00	0	11	149	14	0	0	13	96	12	0	0	8	4	5	0	0	10	3	9	0	334

Hourly Totals																					
7:00-8:00	0	17	590	59	0	0	64	403	27	0	0	13	11	12	0	0	26	22	61	0	1305
7:15-8:15	0	18	609	74	0	0	65	439	24	0	0	16	9	11	0	0	26	22	54	0	1367
7:30-8:30	0	20	628	80	0	0	69	473	33	0	0	15	7	10	0	0	25	24	56	0	1440
7:45-8:45	0	24	592	66	0	0	59	450	32	0	0	20	9	14	0	0	28	19	52	0	1365
8:00-9:00	0	25	569	58	0	0	55	436	38	0	0	22	10	16	0	0	30	15	47	0	1321

AM	Northbound					Southbound					Eastbound					Westbound					Total
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:30-8:30	0	20	628	80	0	0	69	473	33	0	0	15	7	10	0	0	25	24	56	0	1440

Time:		Weekday Evening Peak Hour (4 pm - 6 pm)																			Total	
		MD 322 Northbound					MD 322 Southbound					Port Street Eastbound					Port Street Westbound					
		U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right		Peds
4:00-4:15	0	2	135	13	0	0	26	227	10	0	0	11	7	6	0	0	20	5	17	0	479	
4:15-4:30	0	5	155	6	0	0	17	196	6	0	0	8	5	7	0	0	14	7	16	0	442	
4:30-4:45	0	2	154	4	0	0	19	176	8	0	0	3	3	5	0	0	11	3	16	0	404	
4:45-5:00	0	3	144	8	0	0	20	202	4	0	0	2	3	5	0	0	15	2	22	0	430	
5:00-5:15	0	3	146	5	0	0	15	221	6	0	0	17	3	5	0	0	15	2	10	0	448	
5:15-5:30	0	1	136	9	0	0	15	239	5	0	0	8	2	3	1	0	24	1	16	0	459	
5:30-5:45	0	6	107	8	0	0	13	156	5	0	0	6	2	1	0	0	9	4	20	0	337	
5:45-6:00	0	4	103	2	0	0	17	154	6	0	0	4	4	5	0	0	14	2	12	0	327	

Hourly Totals																					
4:00-5:00	0	12	588	31	0	0	82	801	28	0	0	24	18	23	0	0	60	17	71	0	1755
4:15-5:15	0	13	599	23	0	0	71	795	24	0	0	30	14	22	0	0	55	14	64	0	1724
4:30-5:30	0	9	580	26	0	0	69	838	23	0	0	30	11	18	1	0	65	8	64	0	1741
4:45-5:45	0	13	533	30	0	0	63	818	20	0	0	33	10	14	1	0	63	9	68	0	1674
5:00-6:00	0	14	492	24	0	0	60	770	22	0	0	35	11	14	1	0	62	9	58	0	1571

PM	Northbound					Southbound					Eastbound					Westbound					Total
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:00-5:00	0	12	588	31	0	0	82	801	28	0	0	24	18	23	0	0	60	17	71	0	1755

Peak Hour
Turning Movement Count



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Intersection: MD 322 @ Port Street
Weather: Clear
Count by: DSS
Count Day/Date: Thursday, May 13, 2021
County: Talbot

	Saturday Peak Hour (10:00 am - 2:00 pm)																				
	MD 322 Northbound					MD 322 Southbound					Port Street Eastbound					Port Street Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
10:00-10:15	0	3	154	7	0	0	9	142	14	0	0	4	3	3	0	0	3	6	15	0	363
10:15-10:30	0	4	151	9	0	0	9	140	7	0	0	8	4	5	0	0	5	4	5	0	351
10:30-10:45	0	4	142	7	0	0	12	128	8	0	0	10	7	5	0	0	3	5	12	0	343
10:45-11:00	0	4	157	5	1	0	11	146	7	1	0	7	2	8	0	0	8	0	11	2	366
11:00-11:15	0	4	153	10	0	0	13	154	6	0	0	6	3	1	4	0	9	5	13	1	377
11:15-11:30	0	3	170	12	0	0	10	162	12	0	0	7	3	4	0	0	10	7	7	0	407
11:30-11:45	0	1	139	4	0	0	6	190	7	0	0	13	1	3	2	0	8	5	13	0	390
11:45-12:00	0	1	130	5	1	0	12	151	13	0	0	6	7	4	0	0	9	1	9	0	348
12:00-12:15	0	2	165	7	0	0	13	162	11	0	0	6	7	5	1	0	7	6	10	0	401
12:15-12:30	0	1	150	4	0	0	8	164	10	1	0	5	1	5	1	0	4	5	11	0	368
12:30-12:45	1	3	130	5	0	0	12	170	5	0	0	8	1	0	0	0	9	1	12	1	357
12:45-1:00	0	5	110	5	0	0	11	162	7	0	0	14	3	5	0	0	15	6	14	1	357
1:00-1:15	0	4	122	10	0	0	13	185	11	0	0	8	4	3	0	0	5	3	6	0	374
1:15-1:30	0	5	148	4	0	0	10	151	8	0	0	7	2	2	0	0	7	2	15	0	361
1:30-1:45	0	5	119	6	1	0	14	171	14	0	0	5	6	4	0	0	3	4	8	0	359
1:45-2:00	0	1	119	6	0	0	14	140	7	0	0	8	2	5	0	0	12	6	20	2	340

Hourly Totals																					
10:00-11:00	0	15	604	28	1	0	41	556	36	1	0	29	16	21	0	0	19	15	43	2	1427
10:15-11:15	0	16	603	31	1	0	45	568	28	1	0	31	16	19	4	0	25	14	41	3	1446
10:30-11:30	0	15	622	34	1	0	46	590	33	1	0	30	15	18	4	0	30	17	43	3	1502
10:45-11:45	0	12	619	31	1	0	40	652	32	1	0	33	9	16	6	0	35	17	44	3	1551
11:00-12:00	0	9	592	31	1	0	41	657	38	0	0	32	14	12	6	0	36	18	42	1	1530
11:15-12:15	0	7	604	28	1	0	41	665	43	0	0	32	18	16	3	0	34	19	39	0	1550
11:30-12:30	0	5	584	20	1	0	39	667	41	1	0	30	16	17	4	0	28	17	43	0	1513
11:45-12:45	1	7	575	21	1	0	45	647	39	1	0	25	16	14	2	0	29	13	42	1	1479
12:00-1:00	1	11	555	21	0	0	44	658	33	1	0	33	12	15	2	0	35	18	47	2	1488
12:15-1:15	1	13	512	24	0	0	44	681	33	1	0	35	9	13	1	0	33	15	43	2	1460
12:30-1:30	1	17	510	24	0	0	46	668	31	0	0	37	10	10	0	0	36	12	47	2	1451
12:45-1:45	0	19	499	25	1	0	48	669	40	0	0	34	15	14	0	0	30	15	43	1	1453
1:00-2:00	0	15	508	26	1	0	51	647	40	0	0	28	14	14	0	0	27	15	49	2	1437

Sat.	Northbound					Southbound					Eastbound					Westbound					Total
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
10:45-11:45	0	12	619	31	1	0	40	652	32	1	0	33	9	16	6	0	35	17	44	1	1551

Peak Hour
Turning Movement Count



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Intersection: MD 322 at Port Street

Weather: Clear

Count by: DSS

Count Day/Date: 5/15/2021

County: Talbot County

	Weekday Morning Peak Hour (7 am - 9 am)																				
	MD 322 Northbound					MD 322 Southbound					Oxford Road Eastbound					Peachblossom Road Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:00-7:15	0	1	60	11	0	0	24	35	25	0	0	30	20	3	0	0	0	14	19	0	242
7:15-7:30	0	2	100	22	0	0	30	46	22	0	0	36	36	2	0	0	3	18	26	0	343
7:30-7:45	0	4	96	22	0	0	39	44	38	0	0	42	60	2	0	0	6	25	57	0	435
7:45-8:00	0	3	129	16	0	0	43	41	38	0	0	55	54	6	0	0	10	32	27	0	454
8:00-8:15	0	2	61	11	0	0	34	49	35	0	0	51	71	3	0	0	3	39	30	0	389
8:15-8:30	0	2	102	8	0	0	34	70	37	0	0	49	52	11	0	0	3	29	31	0	428
8:30-8:45	0	2	76	7	0	0	28	50	40	0	0	47	43	4	0	0	2	38	26	0	363
8:45-9:00	0	2	97	9	0	0	25	37	50	0	0	52	34	2	0	0	2	34	34	0	378

Hourly Totals																					
7:00-8:00	0	10	385	71	0	0	136	166	123	0	0	163	170	13	0	0	19	89	129	0	1474
7:15-8:15	0	11	386	71	0	0	146	180	133	0	0	184	221	13	0	0	22	114	140	0	1621
7:30-8:30	0	11	388	57	0	0	150	204	148	0	0	197	237	22	0	0	22	125	145	0	1706
7:45-8:45	0	9	368	42	0	0	139	210	150	0	0	202	220	24	0	0	18	138	114	0	1634
8:00-9:00	0	8	336	35	0	0	121	206	162	0	0	199	200	20	0	0	10	140	121	0	1558
AM	Northbound					Southbound					Eastbound					Westbound					Total
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
7:30-8:30	0	11	388	57	0	0	150	204	148	0	0	197	237	22	0	0	22	125	145	0	1706

	Weekday Evening Peak Hour (4 pm - 6 pm)																				
	MD 322 Northbound					MD 322 Southbound					Oxford Road Eastbound					Peachblossom Road Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:00-4:15	0	2	54	6	0	0	48	117	66	0	0	56	41	3	0	0	7	34	46	0	480
4:15-4:30	0	1	54	3	0	0	52	120	64	0	0	58	46	8	0	0	5	39	50	0	500
4:30-4:45	0	0	60	3	0	0	28	100	54	0	0	57	40	2	0	0	6	51	45	0	446
4:45-5:00	0	2	68	2	0	0	42	110	80	0	0	44	35	3	0	0	5	48	42	0	481
5:00-5:15	0	4	64	7	0	0	39	119	72	0	0	43	32	2	0	0	7	40	46	0	475
5:15-5:30	0	2	71	12	0	0	60	132	74	0	0	42	36	4	0	0	8	33	33	0	507
5:30-5:45	0	0	48	10	0	0	29	87	43	0	0	32	24	3	0	0	7	48	37	0	368
5:45-6:00	0	2	37	4	0	0	32	92	56	0	0	37	37	1	0	0	4	26	39	0	367

Hourly Totals																					
4:00-5:00	0	5	236	14	0	0	170	447	264	0	0	215	162	16	0	0	23	172	183	0	1907
4:15-5:15	0	7	246	15	0	0	161	449	270	0	0	202	153	15	0	0	23	178	183	0	1902
4:30-5:30	0	8	263	24	0	0	169	461	280	0	0	186	143	11	0	0	26	172	166	0	1909
4:45-5:45	0	8	251	31	0	0	170	448	269	0	0	161	127	12	0	0	27	169	158	0	1831
5:00-6:00	0	8	220	33	0	0	160	430	245	0	0	154	129	10	0	0	26	147	155	0	1717
PM	Northbound					Southbound					Eastbound					Westbound					Total
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
4:30-5:30	0	8	263	24	0	0	169	461	280	0	0	186	143	11	0	0	26	172	166	0	1909

Peak Hour Turning Movement Count		Intersection:	MD 322 @ Peachblossom Road
		Weather:	Clear
		Count by:	DSS
		Count Day/Date:	Thursday, May 13, 2021
		County:	Talbot



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Time:	Saturday Peak Hour (10:00 am - 2:00 pm)																				Total
	MD 322 Northbound					MD 322 Southbound					Oxford Road Eastbound					Peachblossom Road Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
10:00-10:15	0	2	76	5	0	0	33	52	65	0	0	57	31	2	0	0	4	31	36	0	394
10:15-10:30	0	2	75	6	0	0	24	65	56	0	0	53	33	3	0	0	2	17	24	0	360
10:30-10:45	0	4	69	2	0	0	25	59	55	0	0	62	23	3	0	0	4	33	23	0	362
10:45-11:00	0	6	68	3	0	0	29	59	61	0	0	67	48	1	0	0	1	25	32	0	400
11:00-11:15	0	1	80	4	0	0	36	61	67	0	0	62	35	5	0	0	5	34	37	0	427
11:15-11:30	0	0	73	3	0	0	24	87	69	0	0	70	42	0	0	0	3	35	31	0	437
11:30-11:45	0	3	57	7	1	0	38	80	71	0	0	61	31	0	3	0	2	39	29	0	418
11:45-12:00	0	3	64	5	0	0	25	71	73	0	0	46	39	4	0	0	3	33	27	0	393
12:00-12:15	0	5	59	4	0	0	30	74	78	0	0	56	39	2	0	0	2	40	38	0	427
12:15-12:30	0	6	71	7	0	0	26	73	68	0	0	59	34	9	0	0	2	46	31	0	432
12:30-12:45	0	4	53	3	0	0	28	71	82	0	0	53	34	0	0	0	2	37	26	0	393
12:45-1:00	0	3	48	5	0	0	34	81	75	0	0	59	33	5	0	0	4	34	18	0	399
1:00-1:15	0	5	56	4	0	0	33	81	75	0	0	54	28	2	0	0	3	32	28	0	401
1:15-1:30	0	2	69	5	0	0	25	78	66	0	0	58	39	5	0	0	2	34	36	0	419
1:30-1:45	0	1	49	2	0	0	19	79	68	0	0	49	23	4	0	0	3	36	22	0	355
1:45-2:00	0	2	64	5	0	0	25	65	79	0	0	46	27	2	0	0	1	28	20	0	364

Hourly Totals																					
10:00-11:00	0	14	288	16	0	0	111	235	237	0	0	239	135	9	0	0	11	106	115	0	1516
10:15-11:15	0	13	292	15	0	0	114	244	239	0	0	244	139	12	0	0	12	109	116	0	1549
10:30-11:30	0	11	290	12	0	0	114	266	252	0	0	261	148	9	0	0	13	127	123	0	1626
10:45-11:45	0	10	278	17	1	0	127	287	268	0	0	260	156	6	3	0	11	133	129	0	1686
11:00-12:00	0	7	274	19	1	0	123	299	280	0	0	239	147	9	3	0	13	141	124	0	1679
11:15-12:15	0	11	253	19	1	0	117	312	291	0	0	233	151	6	3	0	10	147	125	0	1679
11:30-12:30	0	17	251	23	1	0	119	298	290	0	0	222	143	15	3	0	9	158	125	0	1674
11:45-12:45	0	18	247	19	0	0	109	289	301	0	0	214	146	15	0	0	9	156	122	0	1645
12:00-1:00	0	18	231	19	0	0	118	299	303	0	0	227	140	16	0	0	10	157	113	0	1651
12:15-1:15	0	18	228	19	0	0	121	306	300	0	0	225	129	16	0	0	11	149	103	0	1625
12:30-1:30	0	14	226	17	0	0	120	311	298	0	0	224	134	12	0	0	11	137	108	0	1612
12:45-1:45	0	11	222	16	0	0	111	319	284	0	0	220	123	16	0	0	12	136	104	0	1574
1:00-2:00	0	10	238	16	0	0	102	303	288	0	0	207	117	13	0	0	9	130	106	0	1539
Sat.	Northbound					Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
10:45-11:45	0	10	278	17	1	0	127	287	268	0	0	260	156	6	3	0	11	133	129	0	1686

Peak Hour
Turning Movement Count



Intersection: MD 322 at Peachblossom Road

Weather: Clear

Count by: DSS

Count Day/Date: 5/15/2021

County: Talbot County

	Weekday Morning Peak Hour (7 am - 9 am)																				
	MD 322 Northbound					MD 322 Southbound					Tristan Drive Eastbound					S. Washington Street Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:00-7:15	0	0	73	16	0	0	1	30	3	0	0	4	1	1	0	0	5	2	3	0	139
7:15-7:30	0	2	116	22	0	0	3	42	0	0	0	6	5	1	0	0	10	0	4	0	211
7:30-7:45	1	2	112	22	0	0	4	54	1	0	0	6	0	1	0	0	10	0	6	0	219
7:45-8:00	0	1	121	22	0	0	8	46	1	0	0	6	6	2	0	0	8	1	8	0	230
8:00-8:15	0	2	74	10	0	0	6	46	2	0	0	5	6	2	0	0	10	1	1	0	165
8:15-8:30	0	1	107	21	0	0	24	46	5	0	1	4	4	1	0	0	5	2	1	0	222
8:30-8:45	2	0	80	11	0	0	4	53	4	0	0	9	3	0	0	0	11	2	0	0	179
8:45-9:00	0	1	90	11	0	0	2	27	2	0	0	5	5	3	0	0	8	2	7	0	163

Hourly Totals																					
7:00-8:00	1	5	422	82	0	0	16	172	5	0	0	22	12	5	0	0	33	3	21	0	799
7:15-8:15	1	7	423	76	0	0	21	188	4	0	0	23	17	6	0	0	38	2	19	0	825
7:30-8:30	1	6	414	75	0	0	42	192	9	0	1	21	16	6	0	0	33	4	16	0	836
7:45-8:45	2	4	382	64	0	0	42	191	12	0	1	24	19	5	0	0	34	6	10	0	796
8:00-9:00	2	4	351	53	0	0	36	172	13	0	1	23	18	6	0	0	34	7	9	0	729
AM	Northbound					Southbound					Eastbound					Westbound					Total
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
7:30-8:30	1	6	414	75	0	0	42	192	9	0	1	21	16	6	0	0	33	4	16	0	

		Weekday Evening Peak Hour (4 pm - 6 pm)																			Total
		MD 322 Northbound					MD 322 Southbound					Tristan Drive Eastbound					S. Washington Street Westbound				
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
4:00-4:15	0	3	58	11	0	0	2	123	2	0	0	4	2	2	0	0	23	6	4	0	
4:15-4:30	0	1	52	13	0	0	8	104	10	0	0	3	4	4	0	0	24	3	4	0	
4:30-4:45	0	3	60	10	0	0	3	103	9	0	0	4	5	0	0	0	23	5	5	0	
4:45-5:00	0	2	61	16	0	0	5	94	8	0	0	2	2	0	1	0	13	0	5	0	
5:00-5:15	0	2	74	19	0	2	4	119	6	0	0	1	1	1	0	0	19	4	4	0	
5:15-5:30	0	4	74	22	0	0	11	116	6	0	0	1	3	1	0	0	17	3	8	0	
5:30-5:45	0	0	51	12	0	2	2	95	4	1	0	3	2	0	0	0	18	2	1	0	
5:45-6:00	0	1	32	8	0	2	4	82	5	0	0	1	4	0	0	0	18	3	3	0	

Hourly Totals																					
4:00-5:00	0	9	231	50	0	0	18	424	29	0	0	13	13	6	1	0	83	14	18	0	908
4:15-5:15	0	8	247	58	0	2	20	420	33	0	0	10	12	5	1	0	79	12	18	0	924
4:30-5:30	0	11	269	67	0	2	23	432	29	0	0	8	11	2	1	0	72	12	22	0	960
4:45-5:45	0	8	260	69	0	4	22	424	24	1	0	7	8	2	1	0	67	9	18	0	922
5:00-6:00	0	7	231	61	0	6	21	412	21	1	0	6	10	2	0	0	72	12	16	0	877
PM	Northbound					Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:30-5:30	0	11	269	67	0	2	23	432	29	0	0	8	11	2	1	0	72	12	22	0	960

Peak Hour Turning Movement Count		Intersection:	MD 322 @ S Washington Street
		Weather:	Clear
		Count by:	DSS
		Count Day/Date:	Thursday, May 13, 2021
		County:	Talbot



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Time:	Saturday Peak Hour (10:00 am - 2:00 pm)																				Total
	MD 322 Northbound					MD 322 Southbound					Tristan Drive Eastbound					S. Washington Road Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
10:00-10:15	0	0	76	8	0	0	6	53	1	0	0	1	4	1	0	0	9	0	5	0	164
10:15-10:30	0	1	75	10	0	0	2	66	0	0	0	4	1	0	0	0	7	0	6	0	172
10:30-10:45	1	0	65	11	0	1	4	59	2	0	0	2	7	3	0	0	3	1	3	0	162
10:45-11:00	0	2	62	10	0	1	2	56	2	0	0	3	4	1	1	0	6	6	6	0	161
11:00-11:15	1	0	76	10	0	0	2	70	0	0	0	4	2	1	0	0	10	4	16	0	196
11:15-11:30	0	1	59	12	0	0	3	70	8	0	0	4	4	1	0	0	4	2	6	0	174
11:30-11:45	1	2	67	14	0	0	8	81	1	0	0	4	2	2	0	1	10	1	2	0	196
11:45-12:00	0	3	70	14	0	0	3	74	1	0	0	2	5	1	0	0	9	1	6	0	189
12:00-12:15	1	3	63	13	0	0	5	62	4	0	0	4	4	0	0	0	11	6	5	0	181
12:15-12:30	0	1	74	12	0	1	4	74	4	0	0	6	1	2	0	0	13	1	5	0	198
12:30-12:45	1	2	46	5	0	0	4	64	5	1	0	5	3	2	1	0	9	4	4	0	154
12:45-1:00	0	3	51	16	0	0	5	68	6	0	0	3	5	1	0	0	10	6	3	0	177
1:00-1:15	0	1	61	10	0	0	9	79	3	0	0	2	1	0	0	0	9	3	5	0	183
1:15-1:30	0	4	60	10	0	0	4	78	3	0	0	2	8	2	0	0	9	1	5	0	186
1:30-1:45	0	1	50	7	0	0	4	78	3	0	0	3	0	0	0	0	12	3	3	0	164
1:45-2:00	0	4	67	11	0	0	1	64	1	0	0	2	2	1	0	0	11	0	3	0	167

Hourly Totals																					
10:00-11:00	1	3	278	39	0	2	14	234	5	0	0	10	16	5	1	0	25	7	20	0	660
10:15-11:15	2	3	278	41	0	2	10	251	4	0	0	13	14	5	1	0	26	11	31	0	692
10:30-11:30	2	3	262	43	0	2	11	255	12	0	0	13	17	6	1	0	23	13	31	0	694
10:45-11:45	2	5	264	46	0	1	15	277	11	0	0	15	12	5	1	1	30	13	30	0	728
11:00-12:00	2	6	272	50	0	0	16	295	10	0	0	14	13	5	0	1	33	8	30	0	755
11:15-12:15	2	9	259	53	0	0	19	287	14	0	0	14	15	4	0	1	34	10	19	0	740
11:30-12:30	2	9	274	53	0	1	20	291	10	0	0	16	12	5	0	1	43	9	18	0	764
11:45-12:45	2	9	253	44	0	1	16	274	14	1	0	17	13	5	1	0	42	12	20	0	724
12:00-1:00	2	9	234	46	0	1	18	268	19	1	0	18	13	5	1	0	43	17	17	0	712
12:15-1:15	1	7	232	43	0	1	22	285	18	1	0	16	10	5	1	0	41	14	17	0	714
12:30-1:30	1	10	218	41	0	0	22	289	17	1	0	12	17	5	1	0	37	14	17	0	702
12:45-1:45	0	9	222	43	0	0	22	303	15	0	0	10	14	3	0	0	40	13	16	0	710
1:00-2:00	0	10	238	38	0	0	18	299	10	0	0	9	11	3	0	0	41	7	16	0	700
Sat. Peak Hour	Northbound					Southbound					Eastbound					Westbound					Total
11:30-12:30	2	9	274	53	0	1	20	291	10	0	0	16	12	5	0	1	43	9	18	0	764

Peak Hour
Turning Movement Count



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Intersection: MD 322 at S. Washington Street

Weather: Clear

Count by: DSS

Count Day/Date: 5/15/2021

County: Talbot County

Weekday Morning Peak Hour (7 am - 9 am)																				
Time:	N/A Northbound					MD 322 Southbound					US 50 Eastbound					US 50 Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
7:00-7:15									36	0	0	87			0			147	8	0
7:15-7:30									53	0	0	128			0			182	11	0
7:30-7:45									66	0	0	125			0			188	7	0
7:45-8:00									56	0	0	132			0			192	14	0
8:00-8:15									58	0	0	87			0			198	12	0
8:15-8:30									52	0	0	109			0			177	9	0
8:30-8:45									66	0	0	90			0			189	11	0
8:45-9:00									38	0	0	105			0			179	6	0

Hourly Totals																				
7:00-8:00									211	0	0	472			0			709	40	0
7:15-8:15									233	0	0	472			0			760	44	0
7:30-8:30									232	0	0	453			0			755	42	0
7:45-8:45									232	0	0	418			0			756	46	0
8:00-9:00									214	0	0	391			0			743	38	0
AM	Northbound					Southbound					Eastbound					Westbound				
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
7:15-8:15									233	0	0	472			0			760	44	0
																				1509

Weekday Evening Peak Hour (4 pm - 6 pm)																				
Time:	N/A Northbound					MD 322 Southbound					US 50 Eastbound					US 50 Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
4:00-4:15									148	0	0	71			0			289	10	0
4:15-4:30									132	0	0	59			0			276	4	0
4:30-4:45									126	0	0	66			0			271	6	0
4:45-5:00									107	0	0	72			0			280	8	0
5:00-5:15									139	0	0	84			0			281	8	0
5:15-5:30									134	0	0	80			0			215	11	0
5:30-5:45									113	0	0	54			0			270	16	0
5:45-6:00									100	0	0	44			0			271	6	0

Hourly Totals																				
4:00-5:00									513	0	0	268			0			1116	28	0
4:15-5:15									504	0	0	281			0			1108	26	0
4:30-5:30									506	0	0	302			0			1047	33	0
4:45-5:45									493	0	0	290			0			1046	43	0
5:00-6:00									486	0	0	262			0			1037	41	0
PM	Northbound					Southbound					Eastbound					Westbound				
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
4:00-5:00									513	0	0	268			0			1116	28	0
																				1925

Peak Hour Turning Movement Count		Intersection:	MD 322 @ US 50
		Weather:	Clear
		Count by:	DSS
		Count Day/Date:	Thursday, May 13, 2021
		County:	Talbot



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
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	Saturday Peak Hour (10:00 am - 2:00 pm)																				
	N/A Northbound					MD 322 Southbound					US 50 Eastbound					US 50 Westbound					Total
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
Time:																					
10:00-10:15									63	0	0	72						260	12	0	407
10:15-10:30									73	0	0	81						263	5	0	422
10:30-10:45									66	0	0	70						273	7	0	416
10:45-11:00									63	0	0	74						294	9	0	440
11:00-11:15									82	0	0	68						258	19	0	427
11:15-11:30									75	0	0	64						329	8	0	476
11:30-11:45									94	0	0	78						260	6	0	438
11:45-12:00									84	0	0	78						314	14	0	490
12:00-12:15									74	0	0	62						309	18	0	463
12:15-12:30									89	0	0	76						305	11	0	481
12:30-12:45									76	0	0	53						257	7	0	393
12:45-1:00									79	0	0	60						267	10	0	416
1:00-1:15									88	0	0	67						268	5	0	428
1:15-1:30									89	0	0	64						272	10	0	435
1:30-1:45									90	0	0	50						268	8	0	416
1:45-2:00									76	0	0	72						223	10	0	381

Hourly Totals																				
10:00-11:00						265	0	0	297						1090	33	0	1685		
10:15-11:15						284	0	0	293						1088	40	0	1705		
10:30-11:30						286	0	0	276						1154	43	0	1759		
10:45-11:45						314	0	0	284						1141	42	0	1781		
11:00-12:00						335	0	0	288						1161	47	0	1831		
11:15-12:15						327	0	0	282						1212	46	0	1867		
11:30-12:30						341	0	0	294						1188	49	0	1872		
11:45-12:45						323	0	0	269						1185	50	0	1827		
12:00-1:00						318	0	0	251						1138	46	0	1753		
12:15-1:15						332	0	0	256						1097	33	0	1718		
12:30-1:30						332	0	0	244						1064	32	0	1672		
12:45-1:45						346	0	0	241						1075	33	0	1695		
1:00-2:00						343	0	0	253						1031	33	0	1660		
Sat.	Northbound					Southbound					Eastbound					Westbound				
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
11:30-12:30																				
					</															

Weekday Morning Peak Hour (7 am - 9 am)																													
South Washington Street Northbound						South Washington Street Southbound Street #1						South Harrison Street Southbound Street #2						Peachblossom Road Eastbound Street						Idlewild Avenue Westbound					
Time:	Left to PB	Thru to S. Wash.	Right to S. Harrison	Right to Idlewild	Peds	Left to S. Harrison	Left to Idlewild	Thru to S. Wash.	Right to PB	Peds	Left to Idlewild	Left to S. Wash.	Right to PB	Right to S. Wash.	Peds	Left to S. Wash.	Left to S. Harrison	Thru to Idlewild	Right to S. Wash.	Peds	Left to S. Wash.	Thru to PB	Right to S. Wash.	Right to S. Harrison	Peds	Total			
7:00-7:15	13	16	0	2	1	0	6	12	1	0	0	1	4	0	0	2	7	25	5	0	0	31	6	1	1	132			
7:15-7:30	14	15	4	0	0	0	8	13	15	9	0	2	8	0	9	15	11	34	17	0	0	37	5	0	0	198			
7:30-7:45	22	21	2	0	0	0	14	19	18	2	1	0	6	1	2	13	13	38	46	0	1	48	9	2	0	274			
7:45-8:00	14	39	0	2	1	0	8	20	16	1	3	1	8	0	4	12	29	49	27	0	0	40	5	1	0	274			
8:00-8:15	16	29	2	0	0	0	9	14	14	0	2	2	5	0	0	12	30	54	14	0	0	54	14	2	1	273			
8:15-8:30	17	25	2	0	0	0	11	12	8	1	0	0	5	0	1	11	24	55	16	0	0	35	12	1	0	234			
8:30-8:45	13	34	1	0	0	0	7	22	9	2	2	1	4	0	0	15	9	39	16	0	0	41	15	2	0	230			
8:45-9:00	18	24	5	2	0	0	8	19	9	1	1	1	6	0	0	9	11	36	9	0	0	47	10	0	0	215			
Hourly Totals																													
7:00-8:00	63	91	6	4	2	0	36	64	50	12	4	4	26	1	15	42	60	146	95	0	1	156	25	4	1	878			
7:15-8:15	66	104	8	2	1	0	39	66	63	12	6	5	27	1	15	52	83	175	104	0	1	179	33	5	1	1019			
7:30-8:30	69	114	6	2	1	0	42	65	56	4	6	3	24	1	7	48	96	196	103	0	1	177	40	6	1	1055			
7:45-8:45	60	127	5	2	1	0	35	68	47	4	7	4	22	0	5	50	92	197	73	0	0	170	46	6	1	1011			
8:00-9:00	64	112	10	2	0	0	35	67	40	4	5	4	20	0	1	47	74	184	55	0	0	177	51	5	1	952			
AM Peak Hour	Northbound					Southbound Street #1					Southbound Street #2					Eastbound					Westbound					Total			
	Left to PB	Thru to S. Wash.	Right to S. Harrison	Right to Idlewild	Peds	Left to S. Harrison	Left to Idlewild	Thru to S. Wash.	Right to PB	Peds	Left to Idlewild	Left to S. Wash.	Right to PB	Right to S. Wash.	Peds	Left to S. Wash.	Left to S. Harrison	Thru to Idlewild	Right to S. Wash.	Peds	Left to S. Wash.	Thru to PB	Right to S. Wash.	Right to S. Harrison	Peds				
7:30-8:30	69	114	6	2	1	0	42	65	56	4	6	3	24	1	7	48	96	196	103	0	1	177	40	6	1	1055			

Weekday Evening Peak Hour (4 pm - 6 pm)																													
South Washington Street Northbound						South Washington Street Southbound Street #1						South Harrison Street Southbound Street #2						Peachblossom Road Eastbound Street						Idlewild Avenue Westbound					
Time:	Left to PB	Thru to S. Wash.	Right to S. Harrison	Right to Idlewild	Peds	Left to S. Harrison	Left to Idlewild	Thru to S. Wash.	Right to PB	Peds	Left to Idlewild	Left to S. Wash.	Right to PB	Right to S. Wash.	Peds	Left to S. Wash.	Left to S. Harrison	Thru to Idlewild	Right to S. Wash.	Peds	Left to S. Wash.	Thru to PB	Right to S. Wash.	Right to S. Harrison	Peds	Total			
4:00-4:15	28	18	2	0	1	0	12	37	17	0	0	6	5	2	3	7	9	41	48	0	1	50	16	1	0	300			
4:15-4:30	17	17	3	1	2	0	13	32	13	1	1	4	11	0	1	5	10	31	34	0	0	57	9	1	1	259			
4:30-4:45	27	22	0	0	0	0	12	45	17	0	0	7	9	0	2	5	14	42	28	2	2	49	15	1	0	295			
4:45-5:00	24	14	2	0	0	0	7	26	19	1	1	2	13	0	0	7	4	30	36	0	1	54	10	4	0	254			
5:00-5:15	32	23	1	2	0	0	10	45	24	0	2	2	6	1	0	8	3	21	25	0	2	54	8	0	3	269			
5:15-5:30	14	19	0	1	1	0	4	33	14	0	1	2	6	1	0	16	9	34	55	1	0	46	7	0	0	262			
5:30-5:45	26	16	4	1	2	0	6	29	17	2	1	3	6	0	1	5	13	15	25	1	1	59	15	2	2	244			
5:45-6:00	35	14	3	2	0	0	7	25	11	2	1	1	7	0	2	9	9	23	25	0	0	32	5	2	2	211			
Hourly Totals																													
4:00-5:00	96	71	7	1	3	0	44	140	66	2	2	19	38	2	6	24	37	144	146	2	4	210	50	7	1	1108			
4:15-5:15	100	76	6	3	2	0	42	148	73	2	4	15	39	1	3	25	31	124	123	2	5	214	42	6	4	1077			
4:30-5:30	97	78	3	3	1	0	33	149	74	1	4	13	34	2	2	36	30	127	144	3	5	203	40	5	3	1080			
4:45-5:45	96	72	7	4	3	0	27	133	74	3	5	9	31	2	1	36	29	100	141	2	4	213	40	6	5	1029			
5:00-6:00	107	72	8	6	3	0	27	132	66	4	5	8	25	2	3	38	34	93	130	2	3	191	35	4	7	986			
PM Peak Hour	Northbound					Southbound Street #1					Southbound Street #2					Eastbound					Westbound					Total			
	Left to PB	Thru to S. Wash.	Right to S. Harrison	Right to Idlewild	Peds	Left to S. Harrison	Left to Idlewild	Thru to S. Wash.	Right to PB	Peds	Left to Idlewild	Left to S. Wash.	Right to PB	Right to S. Wash.	Peds	Left to S. Wash.	Left to S. Harrison	Thru to Idlewild	Right to S. Wash.	Peds	Left to S. Wash.	Thru to PB	Right to S. Wash.	Right to S. Harrison	Peds				
4:00-5:00	96	71	7	1	3	0	44	140	66	2	2	19	38	2	6	24	37	144	146	2	4	210	50	7	1	1108			

Peak Hour		Intersection: Peachblossom Road at SWashington Street	
Turning Movement Count		Weather: Clear	
		Count by: DSS	
		Count Day/Date: Thursday, May 13, 2021	
		County: Talbot	



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOUS BLVD, SUITE 214
SEVERNA PARK, MD 21146
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Peak Hour
Turning Movement Count



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645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
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Intersection: Peachblossom Road at S Washington Street
Weather: Clear
Count by: DSS
Count Day/Date: Thursday, May 13, 2021
County: Talbot

Weekend Peak Hour (10:00 am - 2:00 PM)																											
Time:	South Washington Street Northbound					South Washington Street Southbound Street #1					South Harrison Street Southbound Street #2					Peachblossom Road Eastbound Street					Idlewild Avenue Westbound						Total
	Left to PB	Thru to S. Wash.	Right to S. Harrison	Right to Idlewild	Peds	Left to S. Harrison	Left to Idlewild	Thru to S. Wash.	Right to PB	Peds	Left to Idlewild	Left to S. Wash.	Right to PB	Right to S. Wash.	Peds	Left to S. Wash.	Left to S. Harrison	Thru to Idlewild	Right to S. Wash.	Peds	Left to S. Wash.	Thru to PB	Right to S. Wash.	Right to S. Harrison	Peds		
10:00-10:15	25	19	4	2	0	0	6	25	16	2	3	4	8	1	1	6	10	27	20	0	0	35	11	3	1	225	
10:15-10:30	18	19	3	4	0	0	5	17	7	0	1	2	2	0	0	8	10	24	25	0	2	19	8	0	0	174	
10:30-10:45	14	27	5	1	3	0	5	26	13	0	1	4	4	0	1	6	11	23	12	2	3	25	7	2	1	189	
10:45-11:00	18	23	2	1	1	0	4	28	11	1	1	4	10	1	1	16	15	31	26	2	2	27	11	1	1	232	
11:00-11:15	23	15	1	1	0	0	6	15	6	1	1	0	6	0	2	8	15	27	35	0	2	28	8	4	2	201	
11:15-11:30	19	17	4	3	0	1	10	26	13	0	0	2	6	0	0	5	14	27	14	0	1	29	7	1	0	199	
11:30-11:45	17	27	2	2	0	0	9	20	17	1	0	5	5	0	1	12	11	31	19	2	2	33	6	2	2	220	
11:45-12:00	16	28	5	1	1	0	4	21	10	1	1	3	5	0	1	12	21	20	18	0	1	30	11	0	0	207	
12:00-12:15	19	19	3	3	0	0	6	25	13	0	2	3	11	1	0	5	13	26	21	0	2	29	7	2	0	210	
12:15-12:30	22	8	3	2	0	0	2	13	12	0	3	2	5	1	0	13	13	29	26	1	2	28	4	1	0	189	
12:30-12:45	18	20	2	2	3	0	7	25	16	1	1	2	4	1	0	12	9	30	22	0	3	31	6	2	3	213	
12:45-1:00	16	17	5	5	0	1	5	16	8	0	1	2	13	0	0	7	11	30	21	0	2	25	5	4	0	194	
1:00-1:15	22	11	0	2	1	1	5	32	20	0	5	2	7	0	0	11	7	24	14	0	3	25	7	1	0	199	
1:15-1:30	24	13	2	6	0	0	7	24	7	2	0	5	2	0	0	7	7	28	15	0	3	33	4	1	2	188	
1:30-1:45	13	16	3	1	0	0	5	23	13	0	0	2	6	0	0	8	10	18	18	2	1	27	3	3	1	170	
1:45-2:00	9	15	0	0	1	0	6	25	5	1	1	3	6	0	2	10	9	21	17	0	3	25	5	0	0	160	
Hourly Totals																											
10:00-11:00	75	88	14	8	4	0	20	96	47	3	6	14	24	2	3	36	46	105	83	4	7	106	37	6	3	820	
10:15-11:15	73	84	11	7	4	0	20	86	37	2	4	10	22	1	4	38	51	105	98	4	9	99	34	7	4	796	
10:30-11:30	74	82	12	6	4	1	25	95	43	2	3	10	26	1	4	35	55	108	87	4	8	109	33	8	4	821	
10:45-11:45	77	82	9	7	1	1	29	89	47	3	2	11	27	1	4	41	55	116	94	4	7	117	32	8	5	852	
11:00-12:00	75	87	12	7	1	1	29	82	46	3	2	10	22	0	4	37	61	105	86	2	6	120	32	7	4	827	
11:15-12:15	71	91	14	9	1	1	29	92	53	2	3	13	27	1	2	34	59	104	72	2	6	121	31	5	2	836	
11:30-12:30	74	82	13	8	1	0	21	79	52	2	6	13	26	2	2	42	58	106	84	3	7	120	28	5	2	826	
11:45-12:45	75	75	13	8	4	0	19	84	51	2	7	10	25	3	1	42	56	105	87	1	8	118	28	5	3	819	
12:00-1:00	75	64	13	12	3	1	20	79	49	1	7	9	33	3	0	37	46	115	90	1	9	113	22	9	3	806	
12:15-1:15	78	56	10	11	4	2	19	86	56	1	10	8	29	2	0	43	40	113	83	1	10	109	22	8	3	795	
12:30-1:30	80	61	9	15	4	2	24	97	51	3	7	11	26	1	0	37	34	112	72	0	11	114	22	8	5	794	
12:45-1:45	75	57	10	14	1	2	22	95	48	2	6	11	28	0	0	33	35	100	68	2	9	110	19	9	3	751	
1:00-2:00	68	55	5	9	2	1	23	104	45	3	6	12	21	0	2	36	33	91	64	2	10	110	19	5	3	717	
Sat. Peak Hour 10:45-11:45	Northbound					Peds	Southbound Street #1				Peds	Southbound Street #2				Peds	Eastbound				Peds	Westbound				Total	
	Left to PB	Thru to S. Wash.	Right to S. Harrison	Right to Idlewild	Left to S. Harrison		Left to Idlewild	Thru to S. Wash.	Right to PB	Left to Idlewild		Left to S. Wash.	Right to PB	Right to S. Wash.	Left to S. Wash.		Left to S. Harrison	Thru to Idlewild	Right to S. Wash.	Left to S. Wash.		Thru to PB	Right to S. Wash.	Right to S. Harrison			
	77	82	9	7	1	1	29	89	47	3	2	11	27	1	4	41	55	116	94	4	7	117	32	8	5	852	

Peak Hour

Turning Movement Count

LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Intersection: Peachblossom Road at S Washington Street

Weather: Clear

Count by: DSS

Count Day/Date: Saturday, May 15, 2021

County: Talbot

Appendix B

Internal Capture Calculations

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	Poplar Hill			Organization:	Lenhart Traffic Consulting
Project Location:	Easton, MD			Performed By:	RMW
Scenario Description:				Date:	13-Oct-22
Analysis Year:	2027			Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	ITE-710	63,700		86	74	12
Retail	ITE-820	40,000		172	107	65
Restaurant				0		
Cinema/Entertainment				0		
Residential	Various		457	218	53	165
Hotel				0		
All Other Land Uses ²				0		
Total				476	234	242

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant						
Cinema/Entertainment						
Residential	1.00	0%	0%	1.00	0%	0%
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	0	0	0	0
Retail	3		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	2	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	476	234	242
Internal Capture Percentage	5%	5%	5%
External Vehicle-Trips ³	454	223	231
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	7%	25%
Retail	5%	6%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	2%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Poplar Hill
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	74	74	1.00	12	12
Retail	1.00	107	107	1.00	65	65
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	53	53	1.00	165	165
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	8	0	0	0
Retail	19		8	0	9	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	2	33	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		34	0	0	0	0
Retail	3		0	0	1	0
Restaurant	10	9		0	3	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	18	0	0		0
Hotel	2	4	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	5	69	74	69	0	0
Retail	5	102	107	102	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	52	53	52	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	3	9	12	9	0	0
Retail	4	61	65	61	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	4	161	165	161	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	Poplar Hill			Organization:	Lenhart Traffic Consulting
Project Location:	Easton, MD			Performed By:	RMW
Scenario Description:				Date:	10/13/2022
Analysis Year:	2027			Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	ITE-710	63,700		74	12	62
Retail	ITE-820	40,000		276	132	144
Restaurant				0		
Cinema/Entertainment				0		
Residential	Various		457	279	174	105
Hotel				0		
All Other Land Uses ²				0		
Total				629	318	311

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant						
Cinema/Entertainment						
Residential	1.00	0%	0%	1.00	0%	0%
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		925			1800	
Retail					1300	
Restaurant						
Cinema/Entertainment						
Residential		1300				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	0	0	1	0
Retail	3		0	0	31	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	9	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	629	318	311
Internal Capture Percentage	18%	18%	18%
External Vehicle-Trips ³	517	262	255
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	58%	15%
Retail	13%	24%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	18%	12%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Poplar Hill
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	12	12	1.00	62	62
Retail	1.00	132	132	1.00	144	144
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	174	174	1.00	105	105
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		10	2	0	1	0
Retail	3		42	6	31	7
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	30	22	0		3
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	0	0	7	0
Retail	4		0	0	80	0
Restaurant	4	66		0	28	0
Cinema/Entertainment	1	5	0		7	0
Residential	7	9	0	0		0
Hotel	0	3	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	7	5	12	5	0	0
Retail	17	115	132	115	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	32	142	174	142	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	9	53	62	53	0	0
Retail	34	110	144	110	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	13	92	105	92	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	Poplar Hill			Organization:	Lenhart Traffic Consulting
Project Location:	Easton, MD			Performed By:	RMW
Scenario Description:				Date:	10/13/2022
Analysis Year:	2027			Checked By:	
Analysis Period:	Saturday Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	ITE-710	63,700		34	18	16
Retail	ITE-820	40,000		300	156	144
Restaurant				0		
Cinema/Entertainment				0		
Residential	Various		457	321	164	157
Hotel				0		
All Other Land Uses ²				0		
Total				655	338	317

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant						
Cinema/Entertainment						
Residential	1.00	0%	0%	1.00	0%	0%
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		925			1800	
Retail					1300	
Restaurant						
Cinema/Entertainment						
Residential		1300				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	0	0	0	0
Retail	3		0	0	31	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	6	10	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	655	338	317
Internal Capture Percentage	16%	16%	17%
External Vehicle-Trips ³	549	285	264
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	50%	19%
Retail	8%	24%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	19%	10%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Poplar Hill
Analysis Period:	Saturday Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	18	18	1.00	16	16
Retail	1.00	156	156	1.00	144	144
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	164	164	1.00	157	157
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	1	0	0	0
Retail	3		42	6	31	7
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	6	44	33	0		5
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		10	0	0	7	0
Retail	6		0	0	75	0
Restaurant	5	78		0	26	0
Cinema/Entertainment	1	6	0		7	0
Residential	10	10	0	0		0
Hotel	0	3	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	9	9	18	9	0	0
Retail	13	143	156	143	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	31	133	164	133	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	3	13	16	13	0	0
Retail	34	110	144	110	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	16	141	157	141	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Table 7.1a Adjusted Internal Trip Capture Rates for Trip Origins within a Multi-Use Development			
Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
From OFFICE	To Office	0.0%	0.0%
	To Retail	28.0%	15.7%
	To Restaurant	63.0%	4.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	1.0%	1.4%
	To Hotel	0.0%	0.0%
From RETAIL	To Office	29.0%	2.0%
	To Retail	0.0%	0.0%
	To Restaurant	13.0%	29.0%
	To Cinema/Entertainment	0.0%	4.0%
	To Residential	14.0%	21.8%
	To Hotel	0.0%	5.0%
From RESTAURANT	To Office	31.0%	3.0%
	To Retail	14.0%	41.0%
	To Restaurant	0.0%	0.0%
	To Cinema/Entertainment	0.0%	8.0%
	To Residential	4.0%	18.0%
	To Hotel	3.0%	7.0%
From CINEMA/ENTERTAINMENT	To Office	0.0%	2.0%
	To Retail	0.0%	21.0%
	To Restaurant	0.0%	31.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	8.0%
	To Hotel	0.0%	2.0%
From RESIDENTIAL	To Office	2.0%	4.0%
	To Retail	1.0%	28.1%
	To Restaurant	20.0%	21.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	0.0%
	To Hotel	0.0%	3.0%
From HOTEL	To Office	75.0%	0.0%
	To Retail	14.0%	16.0%
	To Restaurant	9.0%	68.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	2.0%
	To Hotel	0.0%	0.0%

Table 7.2a Adjusted Internal Trip Capture Rates for Trip Destinations within a Multi-Use Development

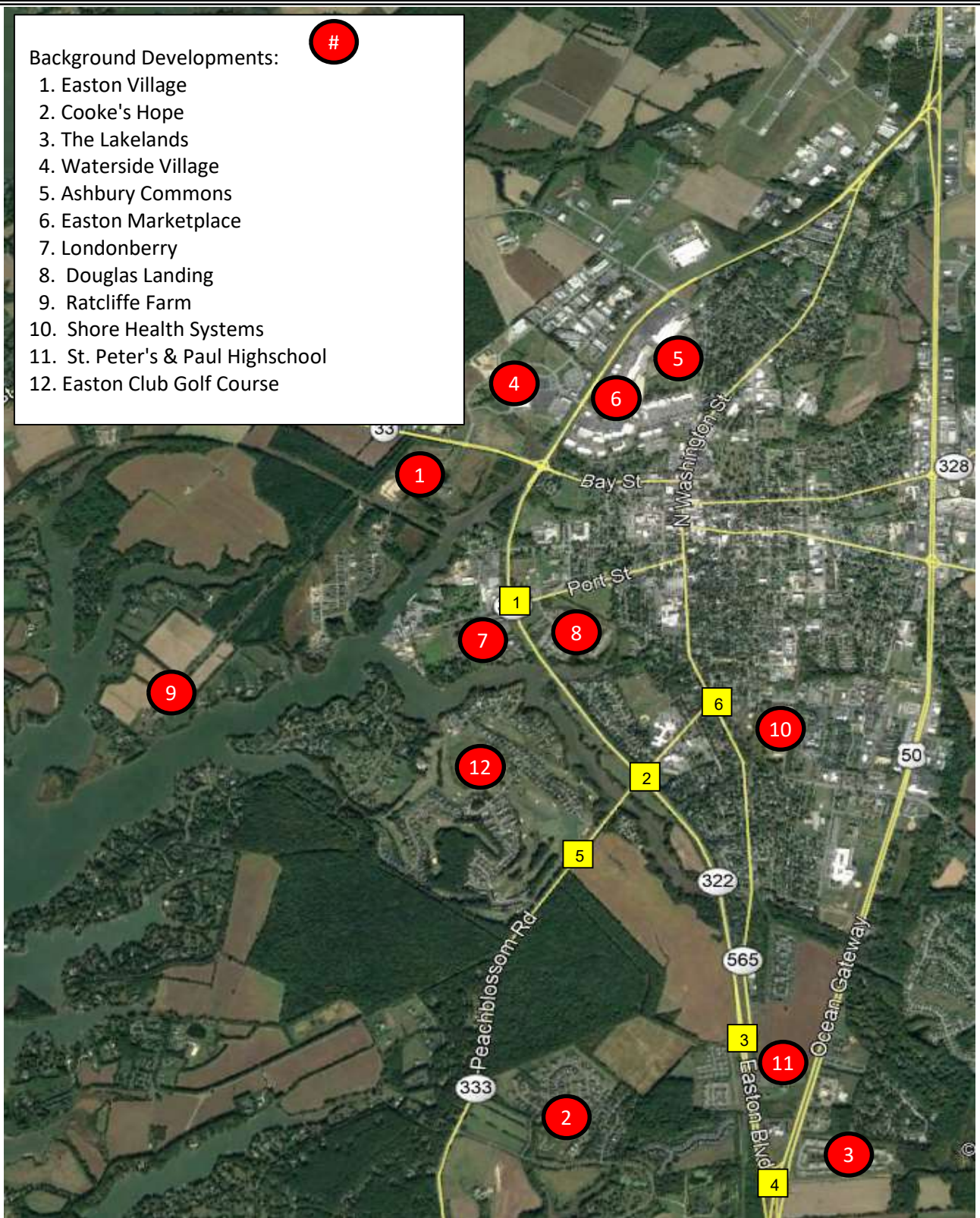
Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
To OFFICE	From Office	0.0%	0.0%
	From Retail	4.0%	31.0%
	From Restaurant	14.0%	30.0%
	From Cinema/Entertainment	0.0%	6.0%
	From Residential	3.0%	57.0%
	From Hotel	3.0%	0.0%
To RETAIL	From Office	32.0%	6.3%
	From Retail	0.0%	0.0%
	From Restaurant	8.0%	50.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	17.0%	6.7%
	From Hotel	4.0%	2.0%
To RESTAURANT	From Office	23.0%	2.0%
	From Retail	50.0%	29.0%
	From Restaurant	0.0%	0.0%
	From Cinema/Entertainment	0.0%	3.0%
	From Residential	20.0%	14.0%
	From Hotel	6.0%	5.0%
To CINEMA/ENTERTAINMENT	From Office	0.0%	1.0%
	From Retail	0.0%	26.0%
	From Restaurant	0.0%	32.0%
	From Cinema/Entertainment	0.0%	0.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To RESIDENTIAL	From Office	0.0%	4.0%
	From Retail	2.0%	46.0%
	From Restaurant	5.0%	16.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To HOTEL	From Office	0.0%	0.0%
	From Retail	0.0%	17.0%
	From Restaurant	4.0%	71.0%
	From Cinema/Entertainment	0.0%	1.0%
	From Residential	0.0%	12.0%
	From Hotel	0.0%	0.0%

Appendix C

Background Developments

Background Developments:

1. Easton Village
2. Cooke's Hope
3. The Lakelands
4. Waterside Village
5. Ashbury Commons
6. Easton Marketplace
7. Londonberry
8. Douglas Landing
9. Ratcliffe Farm
10. Shore Health Systems
11. St. Peter's & Paul Highschool
12. Easton Club Golf Course



Traffic Impact Analysis

Location of
Background Devs.

**Exhibit
C1**



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Trip Generation Rates

Single-Family Detached (ITE-210, Units)	Morning Trips = $0.74 \times \text{Units}$	<u>Trip Distribution (In/Out)</u> 25/75
	Evening Trips = $0.99 \times \text{Units}$	63/37
	Midday Sat. Trips = $0.93 \times \text{Units}$	54/46
High Turnover (Sit-Down) Rest. (ksf, ITE-932)	Morning Trips = $9.94 \times \text{ksf}$	<u>Trip Distribution (In/Out)</u> 55/45
	Evening Trips = $9.77 \times \text{ksf}$	62/38
	Midday Sat. Trips = $11.19 \times \text{ksf}$	51/49
Multifamily Housing, Mid-Rise (ITE-221 Urban/Suburban, Units)	Morning Trips = $0.36 \times \text{Units}$	<u>Trip Distribution (In/Out)</u> 26/74
	Evening Trips = $0.44 \times \text{Units}$	61/39
	Midday Sat. Trips = $0.44 \times \text{Units}$	49/51
Shopping Center (General Urban/Suburban, ksf, ITE-820)	Morning Trips = $0.94 \times \text{ksf}$	<u>Trip Distribution (In/Out)</u> 62/38
	Evening Trips = $3.81 \times \text{ksf}$	48/52
	Midday Sat. Trips = $4.50 \times \text{ksf}$	52/48
Multifamily Housing, Low-Rise (ITE-220, Units)	Morning Trips = $0.46 \times \text{Units}$	<u>Trip Distribution (In/Out)</u> 23/77
	Evening Trips = $0.56 \times \text{Units}$	63/37
	Midday Sat. Trips = $0.70 \times \text{Units}$	50/50
Pharmacy/Drugstore w/Drive Thru (ksf, ITE-881)	Morning Trips = $3.84 \times \text{ksf}$	<u>Trip Distribution (In/Out)</u> 52/48
	Evening Trips = $10.29 \times \text{ksf}$	50/50
	Midday Sat. Trips = $8.75 \times \text{ksf}$	49/51
Private School (K-12) (Students, ITE-536)	Morning Trips = $0.80 \times \text{Students}$	<u>Trip Distribution (In/Out)</u> 61/39
	Evening Trips = $0.17 \times \text{Students}$	43/57
	Midday Sat. Trips - Not Applicable	--
Soccer Complex (fields, ITE-488)	Morning Trips = $0.99 \times \text{fields}$	<u>Trip Distribution (In/Out)</u> 61/39
	Evening Trips = $16.43 \times \text{fields}$	66/34
	Midday Sat. Trips = $40.10 \times \text{fields}$	48/52
Church (ksf, ITE-560)	Morning Trips = $0.33 \times \text{ksf}$	<u>Trip Distribution (In/Out)</u> 60/40
	Evening Trips = $0.49 \times \text{ksf}$	45/55
	Midday Sat. Trips = $2.78 \times \text{ksf}$	59/41
General Office (ksf, ITE-710)	Morning Trips = $0.94 \times (\text{ksf}) + 26.49$	<u>Trip Distribution (In/Out)</u> 86/14
	$\text{Ln}(\text{Evening Trips}) = 0.95 \times \text{Ln}(\text{ksf}) + 0.36$	16/84
	Midday Sat. Trips = $0.53 \times \text{ksf}$	54/46
Golf Course (holes, ITE-430)	Morning Trips = $1.76 \times \text{holes}$	<u>Trip Distribution (In/Out)</u> 79/21
	Evening Trips = $2.91 \times \text{holes}$	53/47
	Midday Sat. Trips = $3.03 \times \text{holes}$	49/51

Traffic Impact Analysis

ITE Formulas Utilized
for Background Developments

Exhibit
C2

Trip Generation for Background Developments

			AM Peak			PM Peak			Sat Mid-day Peak		
			In	Out	Total	In	Out	Total	In	Out	Total
1 - Easton Village	250 Single-Family Units Less 107 Built	143 units remaining	26	80	106	89	53	142	72	61	133
2 - Cookes Hope	288 Single-Family Units Less 185 Built	103 units remaining	19	57	76	64	38	102	52	44	96
3 - The Lakelands	158 Townhouse Units (All Built)	0 units remaining	Built								
4. Waterside Village	Phase 1 - 203,878 SF of Retail (All Built)	0 square feet remaining	Built								
	Phase 1 - 38,157 SF of Office (All Built)	0 square feet remaining	Built								
	Phase 1 - 24,901 SF of Restaurant (Approx. 50% Built)	12,451 square feet remaining	68	56	124	76	46	122	71	68	139
	Pass-by Trips for Phase 1 Restaurant (0% AM, 49% PM, 49% Saturday):		0	0	0	-37	-23	-60	-35	-33	-68
	Primary Off-Site Trips for Phase 1 Restaurant:		68	56	124	39	23	62	36	35	71
	Phase 1 - 3,651 SF of Bank (All Built)	0 square feet remaining	Built								
	Phase 2A - 40,000 SF of Retail (All Built)	0 square feet remaining	Built								
	Phase 2B - 60 Mid-rise Multifamily Units (Not Built)	60 units	6	16	22	16	10	26	13	13	26
	Phase 2C - 37,500 SF of Retail (Not Built)	37,500 square feet	22	13	35	69	74	143	88	81	169
	Pass-by Trips for Phase 2C Retail (0% AM, 34% PM, 34% Saturday):		0	0	0	-23	-25	-48	-30	-28	-58
	Primary Off-Site Trips for Phase 2 Retail:		22	13	35	46	49	95	58	53	111
	Phase 2D - 81,500 SF of Retail Less 76,500 SF Built	5,000 square feet remaining	3	2	5	9	10	19	12	11	23
5. Ashbury Commons	64 Townhouse Units Less 40 Built	24 units remaining	3	8	11	8	5	13	8	9	17
	26 Single-Family Units Less 13 built	13 units remaining	2	8	10	8	5	13	6	6	12
6. Easton Marketplace	15,000 SF Pharmacy (Not Built)	15,000 square feet	31	27	58	77	77	154	64	67	131
	Pass-by Trips for Pharmacy (0% AM, 53% PM, 53% Saturday):		0	0	0	-41	-41	-82	-34	-36	-70
	Primary Off-Site Trips for Pharmacy:		31	27	58	36	36	72	30	31	61
7. Londonberry	41 Single-Family Units Less 38 Built	3 units remaining	0	2	2	2	1	3	2	1	3
8. Douglas Landing	91 Townhouse Units Less 64 Built	27 units remaining	3	9	12	9	6	15	9	10	19
	48 Single-Family Units Less 43 built	5 units remaining	1	3	4	3	2	5	3	2	5
9 - Ratcliffe Farm	15 Single-Family Units (All Built)	0 units remaining	Built								
10 - Shore Health Systems Medical Campus	352,000 SF of Hospital (All Built)	0 square feet remaining	Built								
	500 Student Private School	500 students	244	156	400	37	48	85	0	0	0
11. St. Peters and Paul	6 Field Soccer Complex	6 fields	4	2	6	65	34	99	116	125	241
	18,000 SF Family Life Center	18,000 square feet	4	2	6	4	5	9	29	21	50
12. Easton Club Golf Course	18 Hole Golf Course	18 holes	25	7	32	28	24	52	27	28	55
Total Primary Trips for All Background Developments:			516	457	973	468	386	854	480	456	936

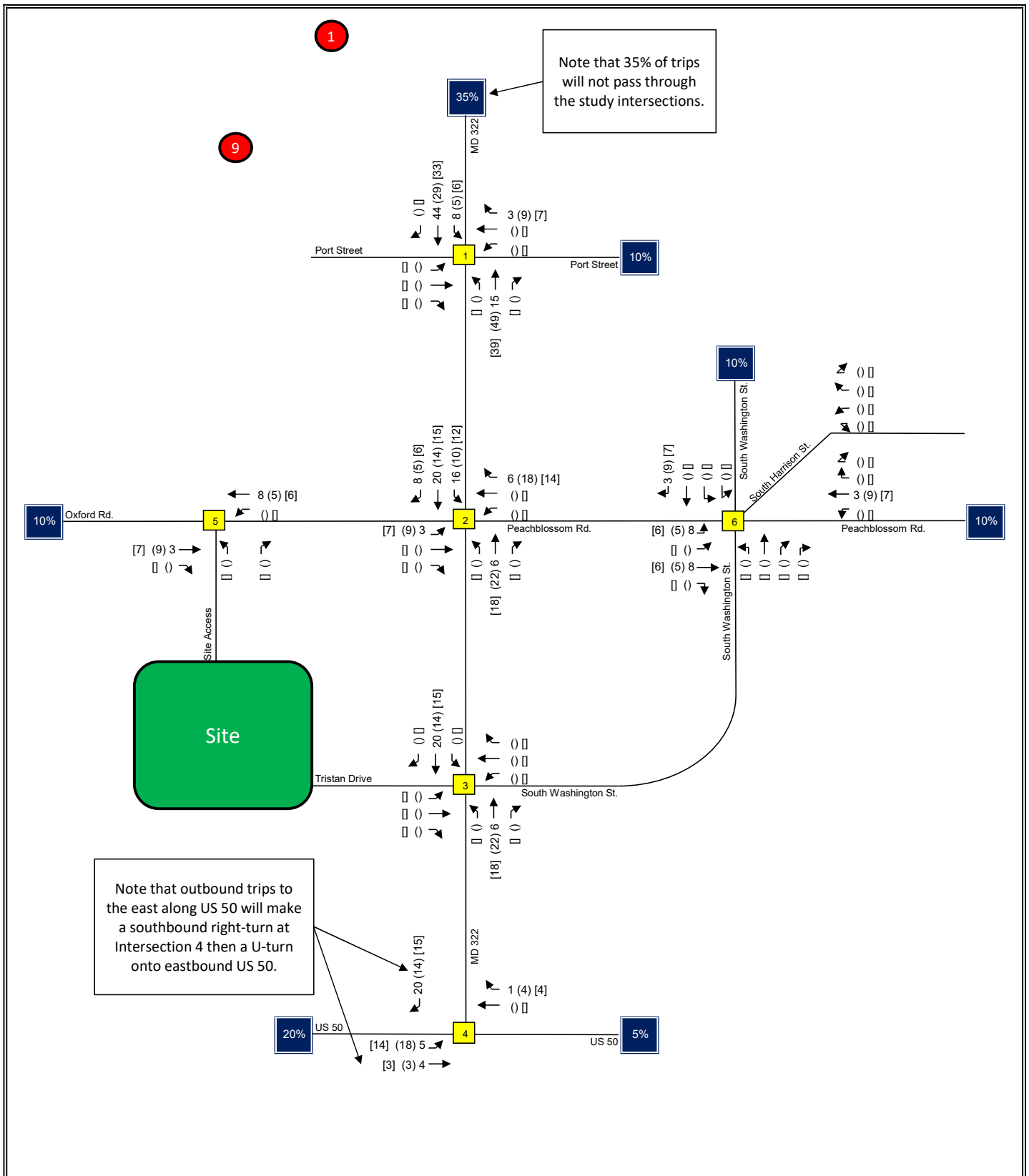
NOTES:

Trip Generation for Background Developments

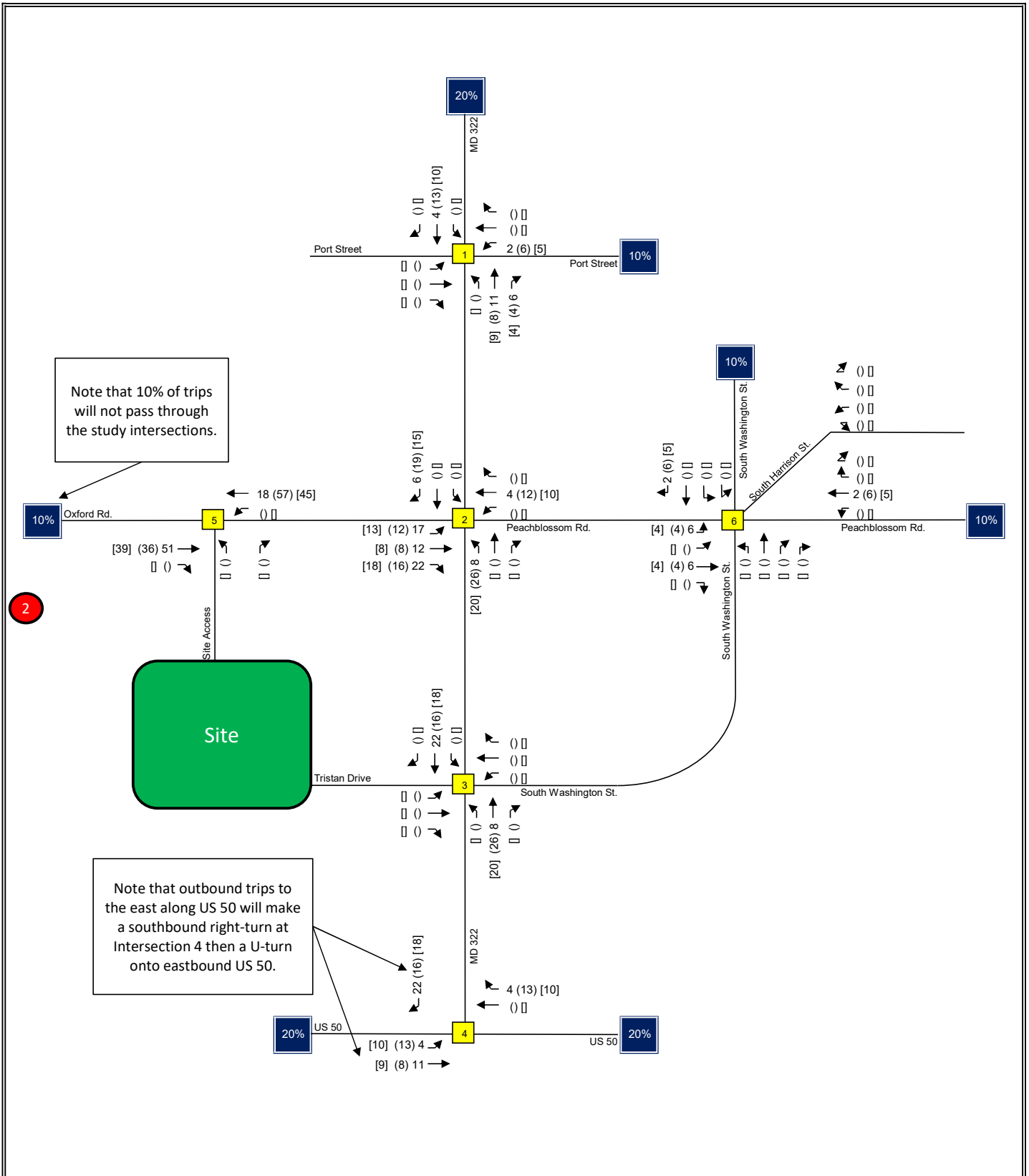
**Exhibit
C3**

Traffic Impact Analysis

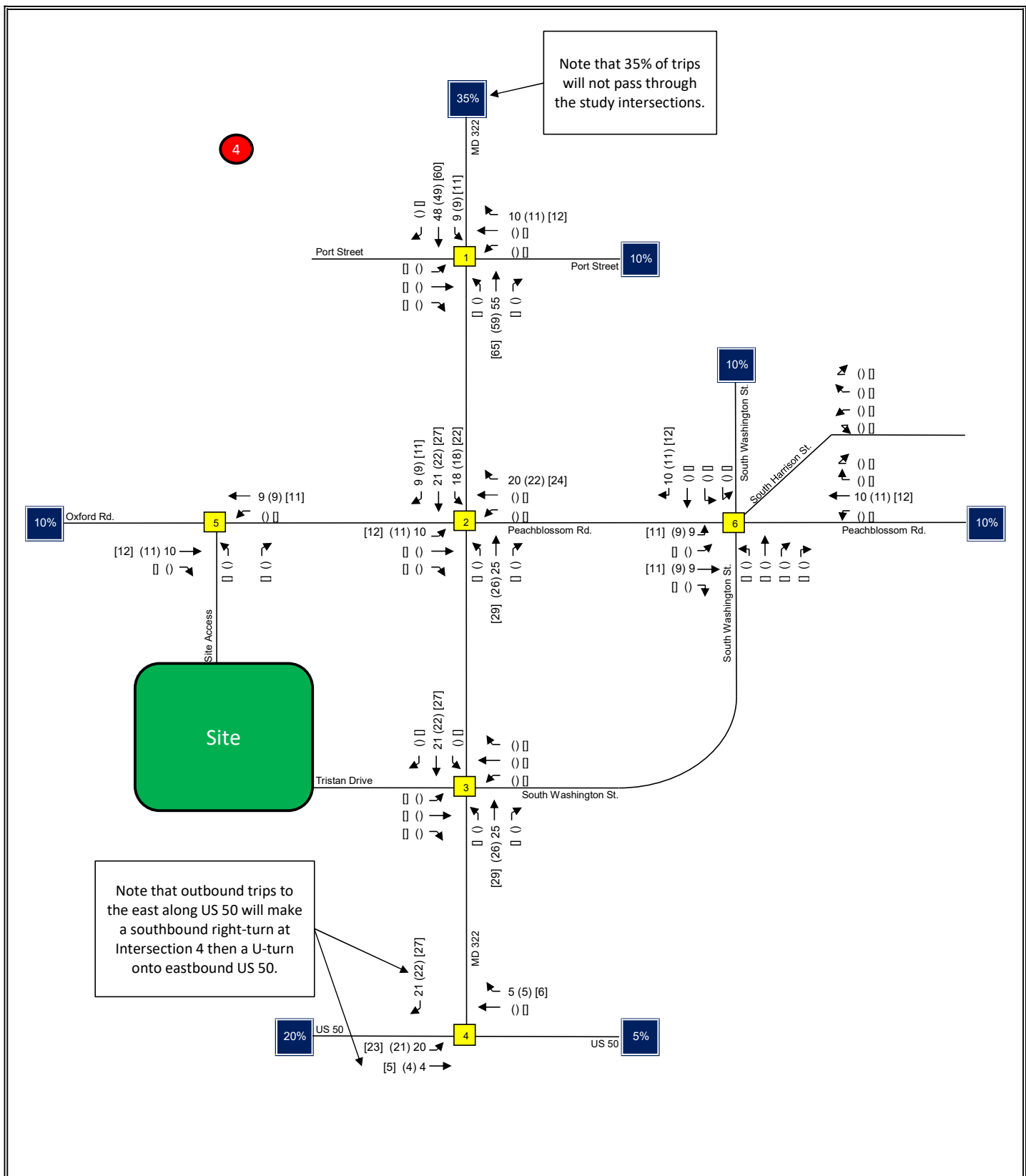
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Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Trip Assignment for Background Developments 1 and 9 Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit C4
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Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Trip Assignment for Background Development 2 Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit C5
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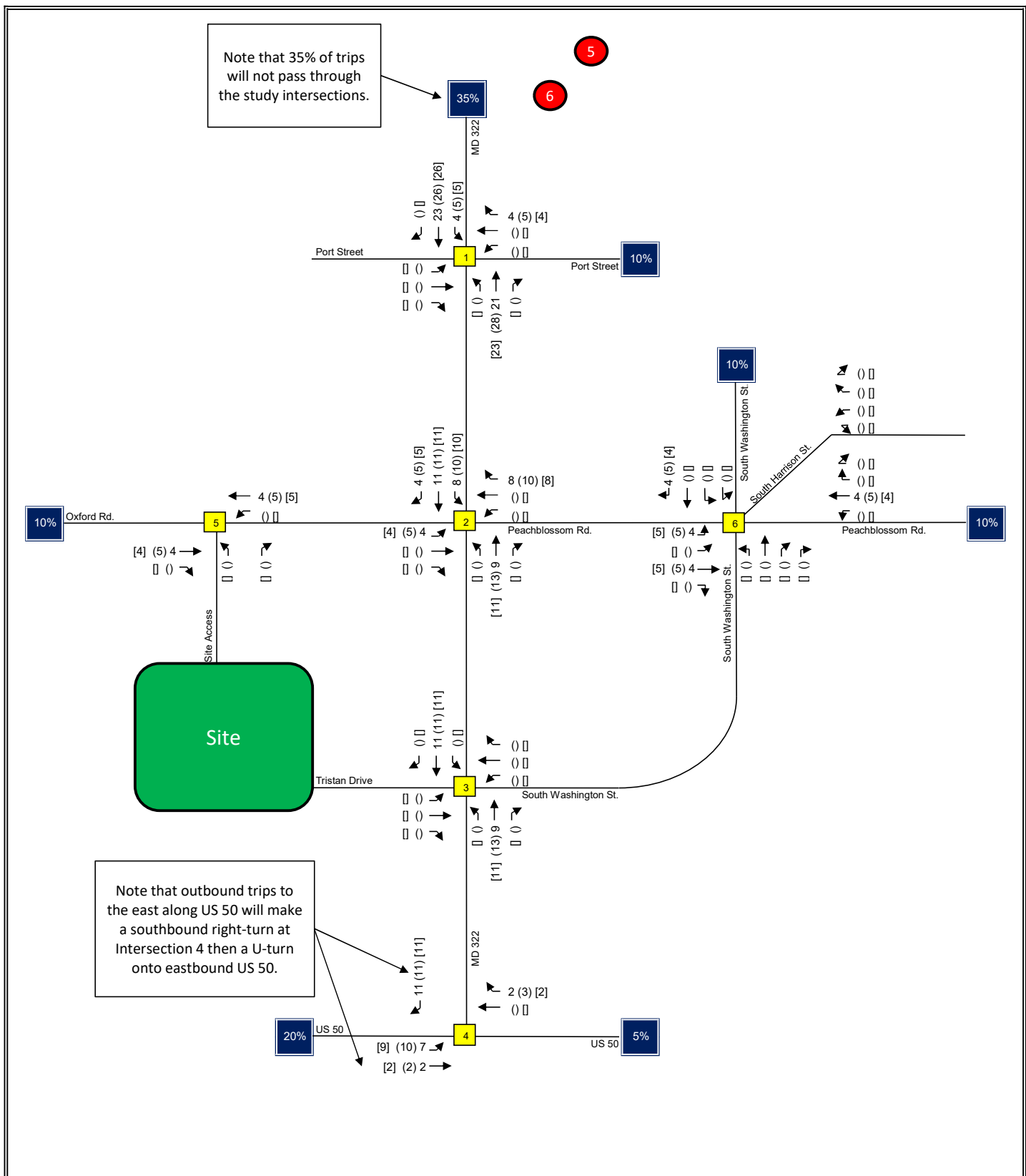
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Trip Assignment for Background Development 4

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

**Exhibit
C6**



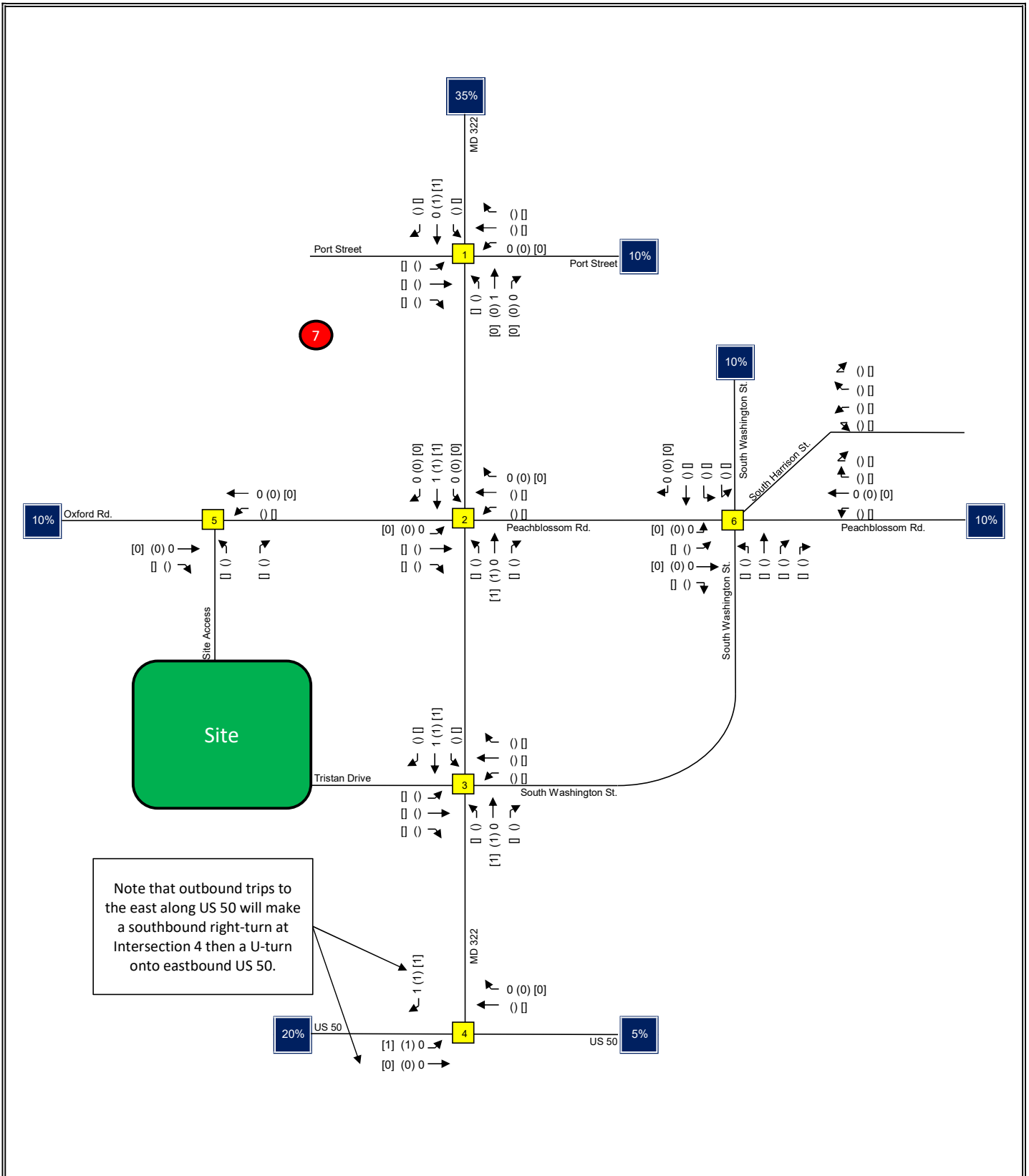
Traffic Impact Analysis

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Trip Assignment for Background Developments 5 and 6

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

**Exhibit
C7**



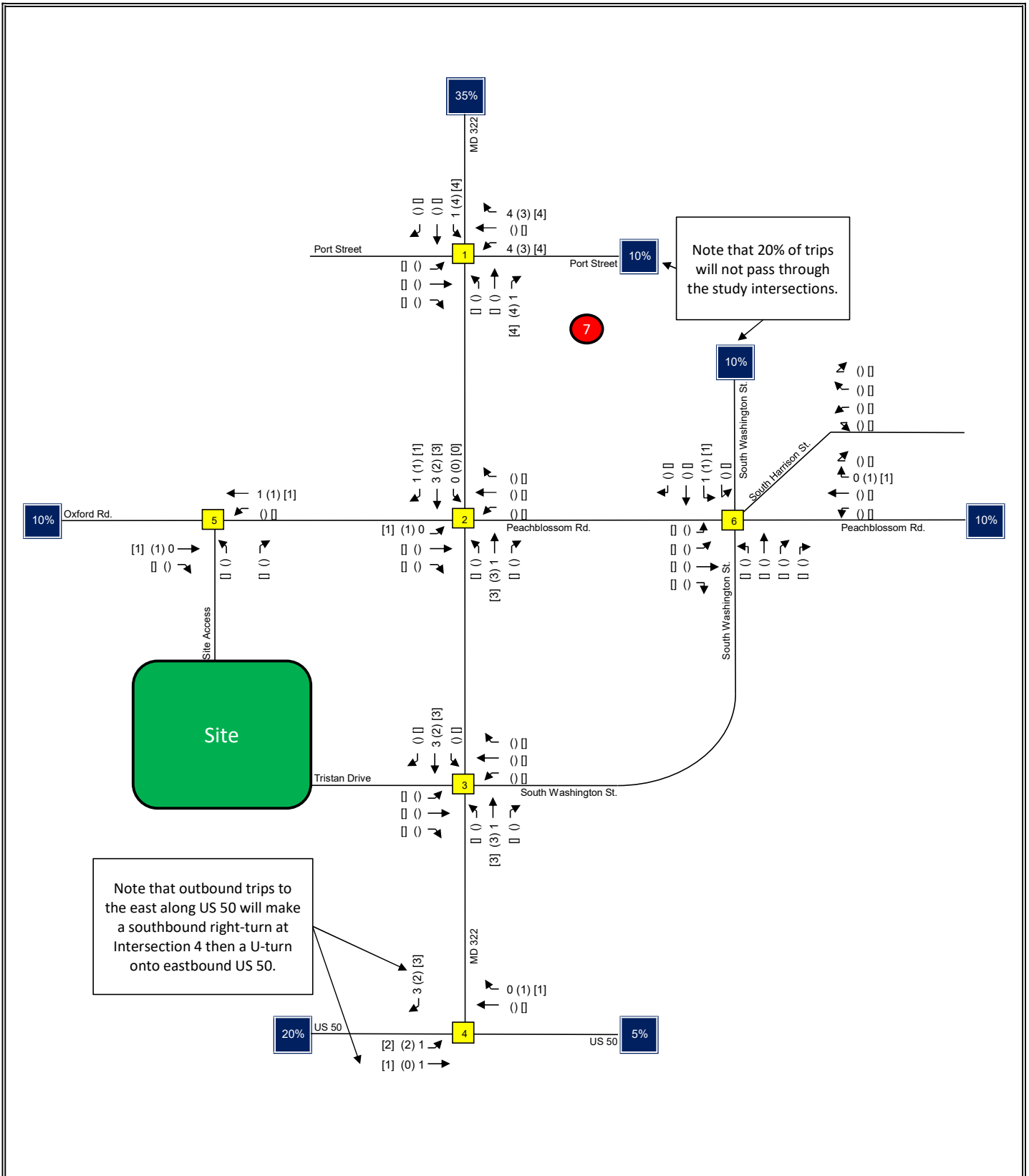
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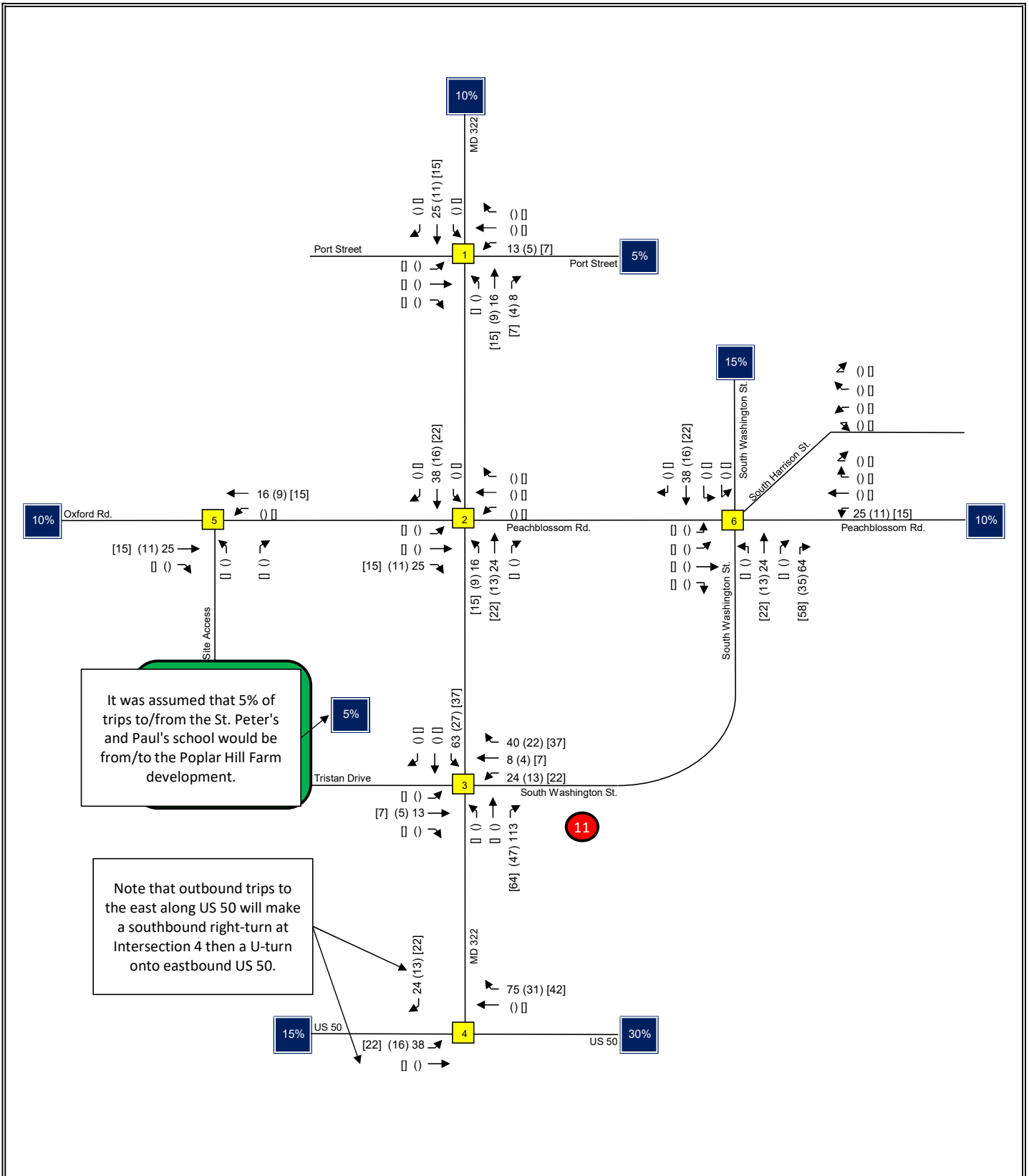
Trip Assignment for Background Development 7

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's

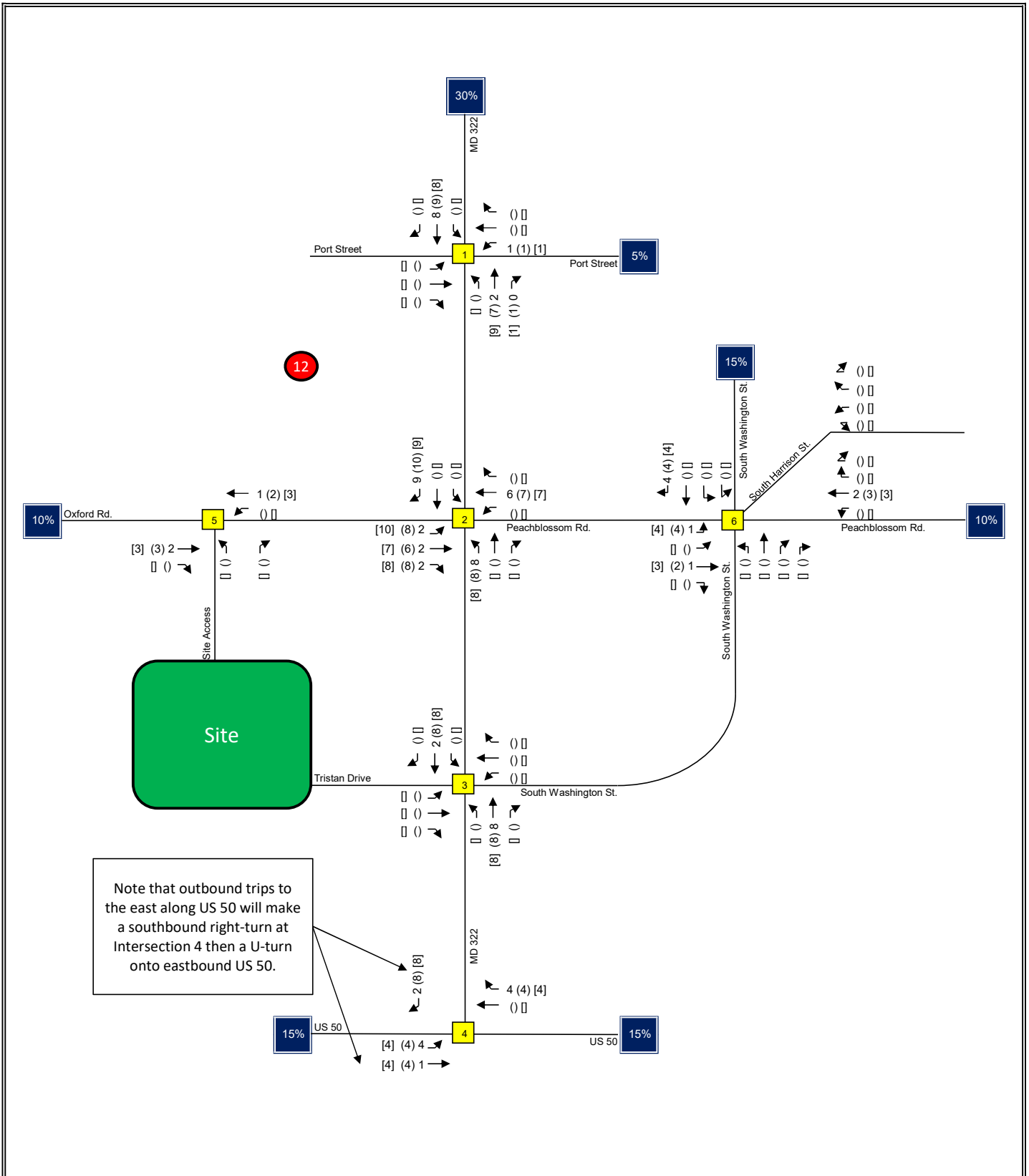
**Exhibit
C8**



Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Trip Assignment for Background Development 8 Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit C9
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Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Trip Assignment for Background Development 11 Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit C10
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Traffic Impact Analysis LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com	Trip Assignment for Background Development 12 Key: xx = AM Peak Vol's (xx) = PM Peak Vol's [xx] = Saturday Midday Peak Vol's	Exhibit C11
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Appendix D

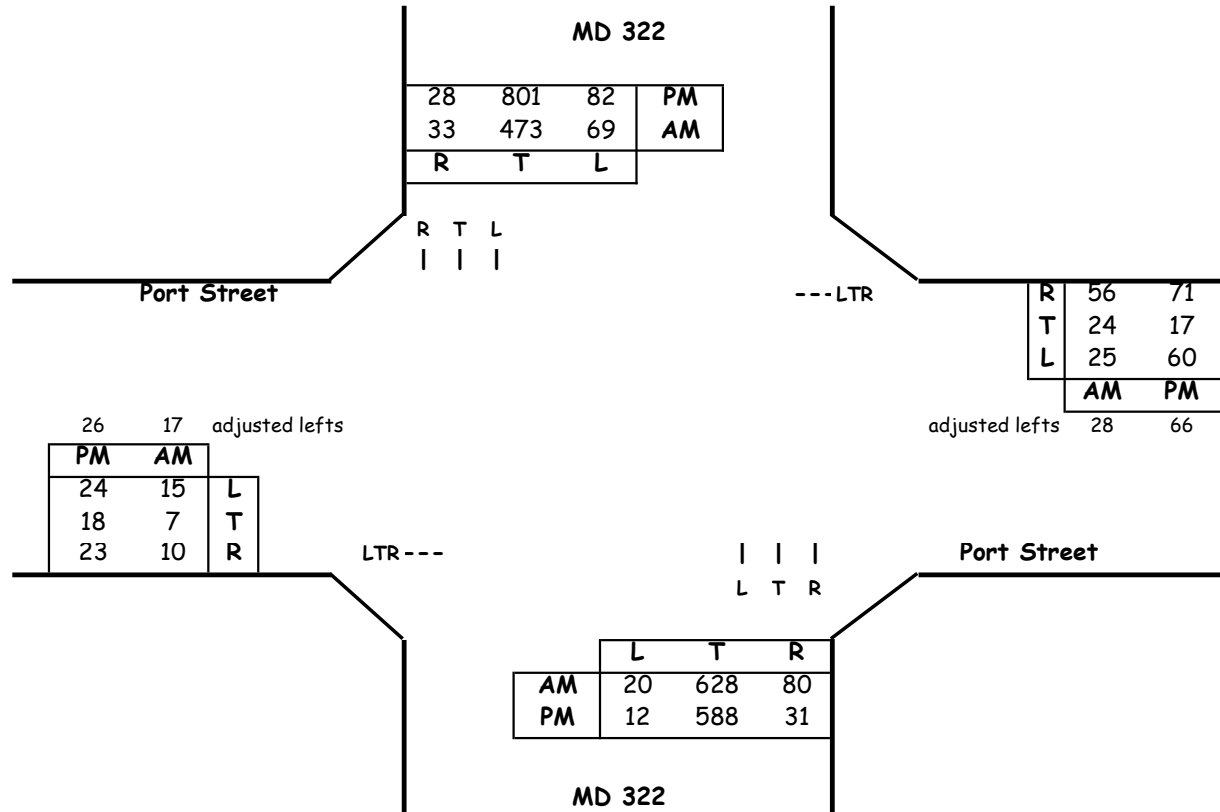
CLV Worksheets

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: Port Street
Study Period: EXISTING TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	628	1.00	628	69	1	69	697
SB	473	1.00	473	20	1	20	
EB	34	1	34	25	1	25	123
WB	108	1	108	15	1	15	
CLV TOTAL=							820
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	588	1.00	588	82	1	82	813
SB	801	1.00	801	12	1	12	
EB	67	1	67	60	1	60	178
WB	154	1	154	24	1	24	
CLV TOTAL=							991
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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MD 322 &
Port Street
(EXISTING TRAFFIC)

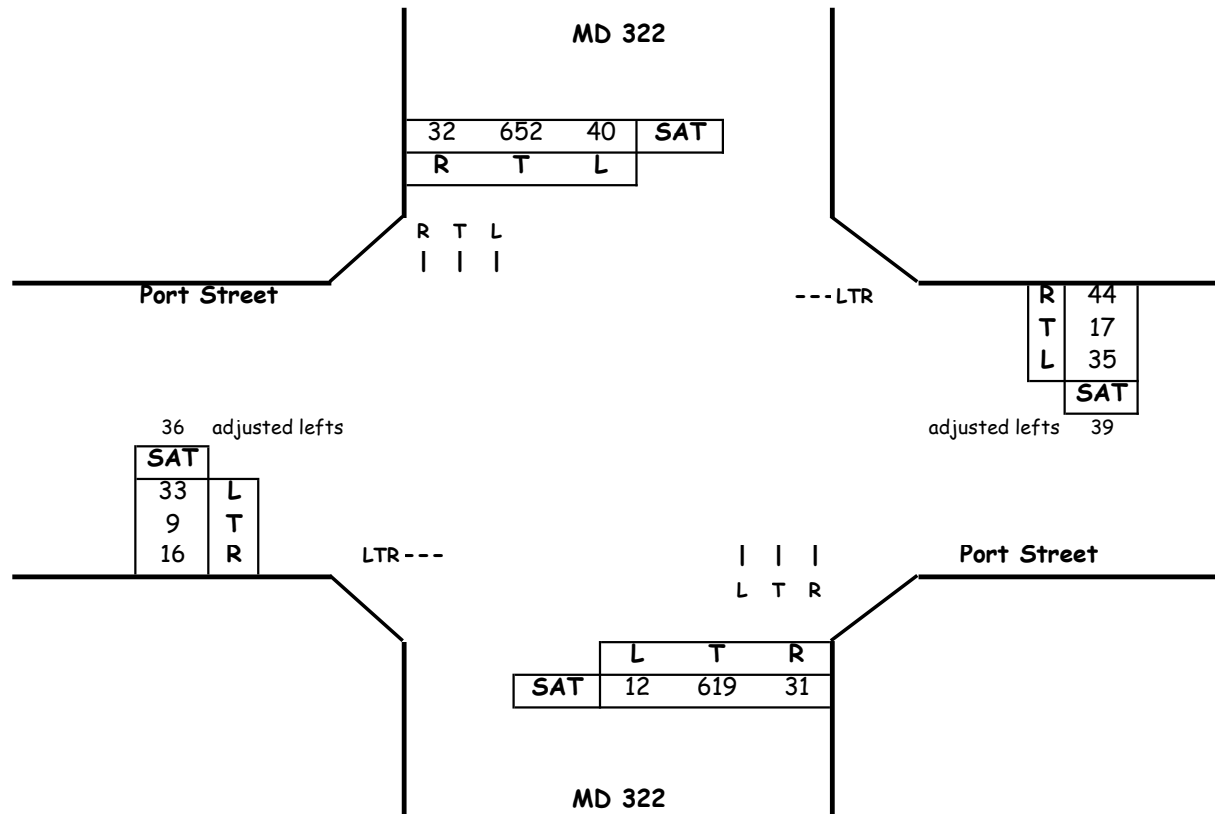
Intersection
1

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: Port Street
Study Period: EXISTING TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	619	1.00	619	40	1	40
SB	652	1.00	652	12	1	12
EB	61	1	61	35	1	35
WB	100	1	100	33	1	33
CLV TOTAL=						797
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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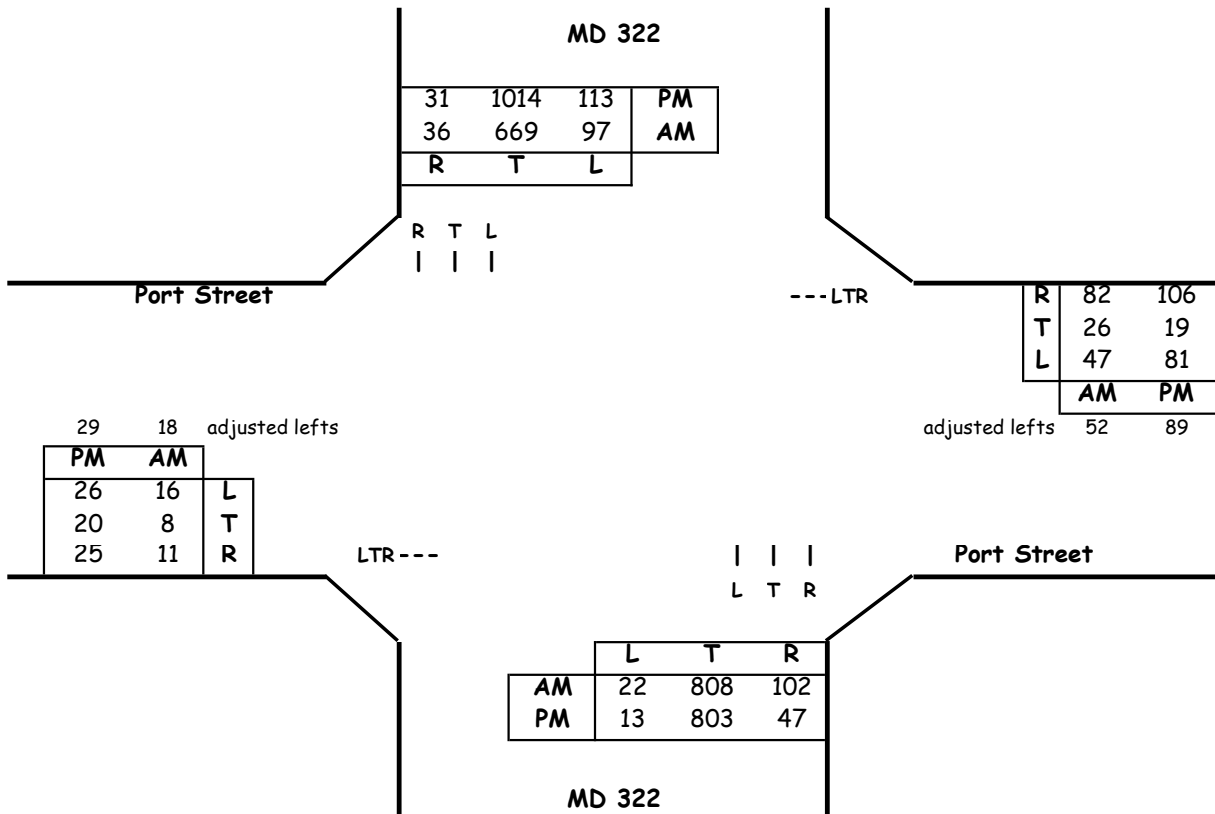
Intersection
1

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: Port Street
Study Period: BACKGROUND TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour									
Dir	Thru Volumes			+ Opposing Lefts			AM		
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV		
NB	808	1.00	808	97	1	97	905		
SB	669	1.00	669	22	1	22			
EB	37	1	37	47	1	47	176		
WB	160	1	160	16	1	16			
CLV TOTAL=							1081		
Level of Service (LOS) =							B		

Evening Peak Hour									
Dir	Thru Volumes			+ Opposing Lefts			PM		
	VOL	x LUF = Total		VOL	x LUF = Total		CLV		
NB	803	1.00	803	113	1	113	1027		
SB	1014	1.00	1014	13	1	13			
EB	74	1	74	81	1	81	240		
WB	214	1	214	26	1	26			
CLV TOTAL=							1267		
Level of Service (LOS) =							C		

Critical Lane Volume Analysis



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**MD 322 &
 Port Street
 (BACKGROUND TRAFFIC)**

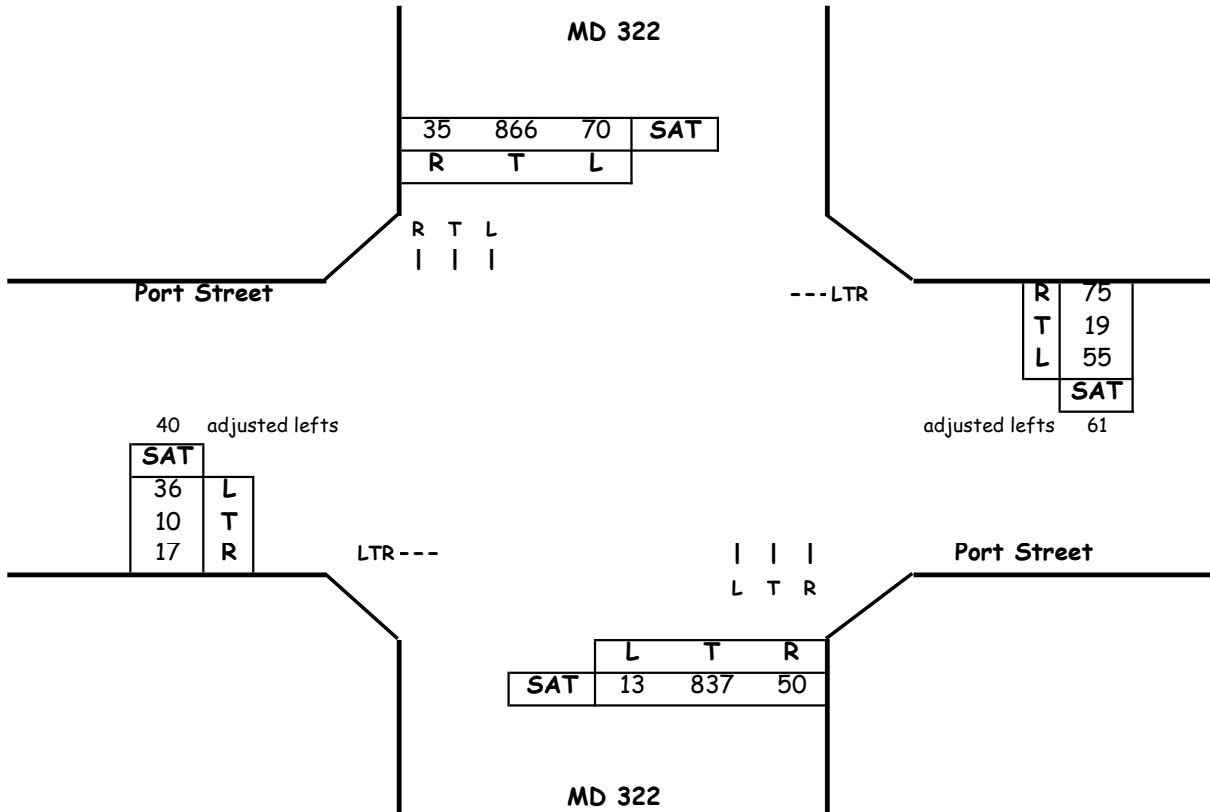
**Intersection
 1**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: Port Street
Study Period: BACKGROUND TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	837	1.00	837	70	1	70
SB	866	1.00	866	13	1	13
EB	67	1	67	55	1	55
WB	155	1	155	36	1	36
CLV TOTAL=						1098
Level of Service (LOS) =						B

Critical Lane Volume Analysis



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MD 322 &
Port Street
(BACKGROUND TRAFFIC)

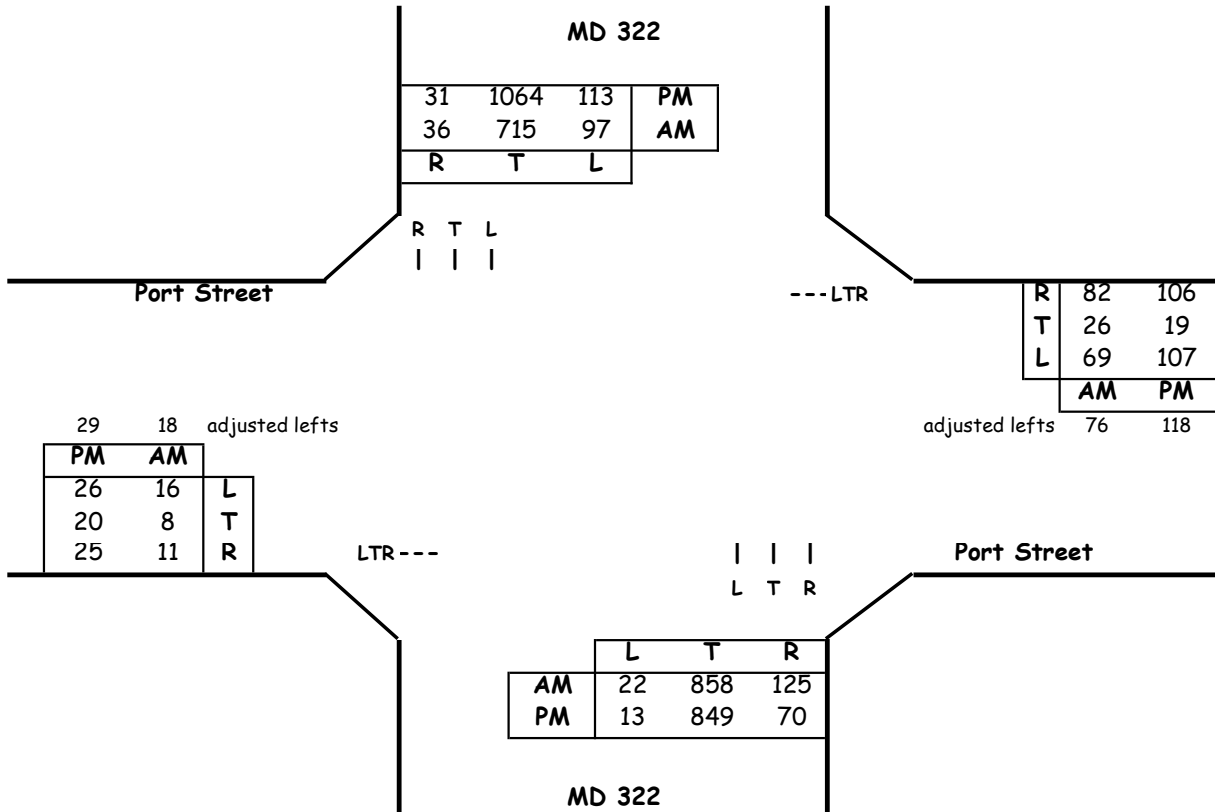
Intersection
1

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: Port Street
Study Period: TOTAL TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	858	1.00	858	97	1	97
SB	715	1.00	715	22	1	22
EB	37	1	37	69	1	69
WB	184	1	184	16	1	16
CLV TOTAL=						1155
Level of Service (LOS) =						C

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	849	1.00	849	113	1	113
SB	1064	1.00	1064	13	1	13
EB	74	1	74	107	1	107
WB	243	1	243	26	1	26
CLV TOTAL=						1346
Level of Service (LOS) =						D

Critical Lane Volume Analysis



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MD 322 &
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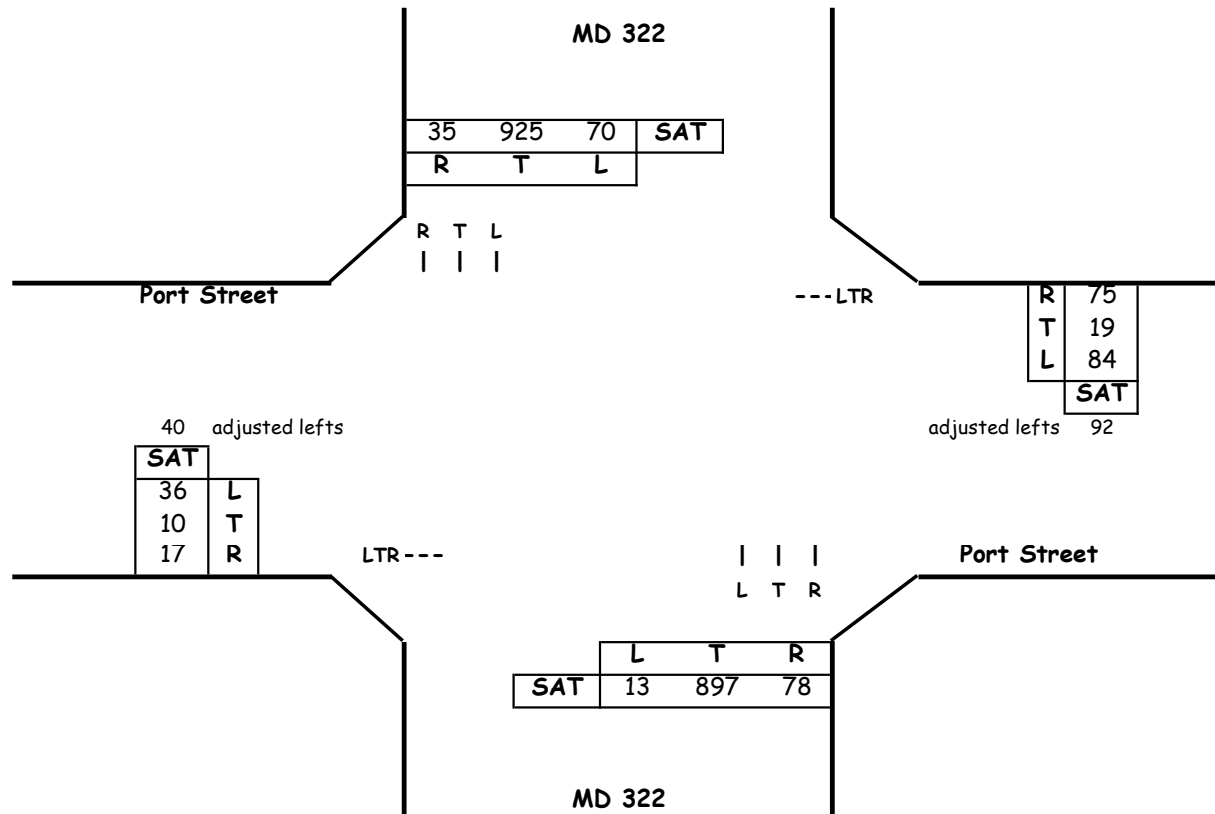
Intersection
1

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: Port Street
Study Period: TOTAL TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	897	1.00	897	70	1	70
SB	925	1.00	925	13	1	13
EB	67	1	67	84	1	84
WB	186	1	186	36	1	36
CLV TOTAL=						1189
Level of Service (LOS) =						C

Critical Lane Volume Analysis



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MD 322 &
Port Street
(TOTAL TRAFFIC)

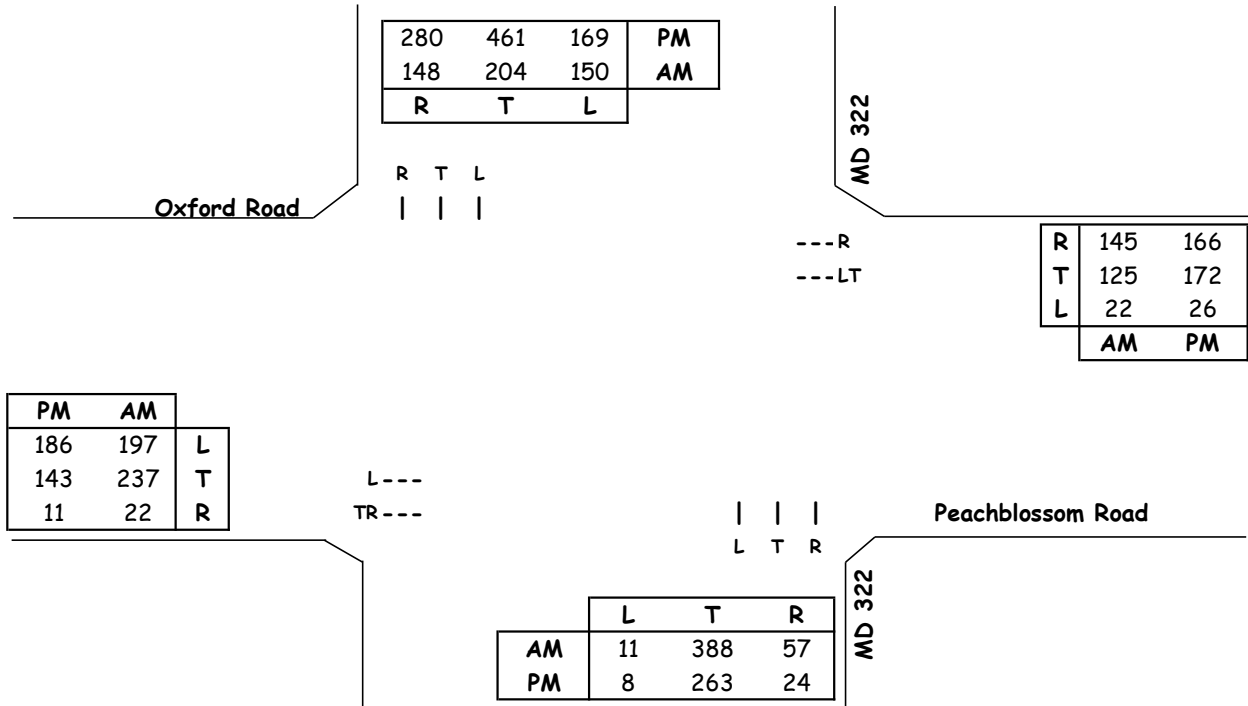
Intersection
1

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: MD 322
Minor Street: Peachblossom Road
Study Period: Existing Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Traffic Signal Phasing includes East/West Split Phase

AM Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	259	1.00	259				259
WB	147	1.00	147				147
NB	388	1.00	388	150	1.00	150	538
SB	204	1.00	204	11	1.00	11	
CLV TOTAL=							944
Level of Service (LOS)=							A

PM Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	186	1.00	186				186
WB	198	1.00	198				198
NB	263	1.00	263	169	1.00	169	469
SB	461	1.00	461	8	1.00	8	
CLV TOTAL=							853
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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**MD 322 &
 Peachblossom Road**
 (Existing Traffic)

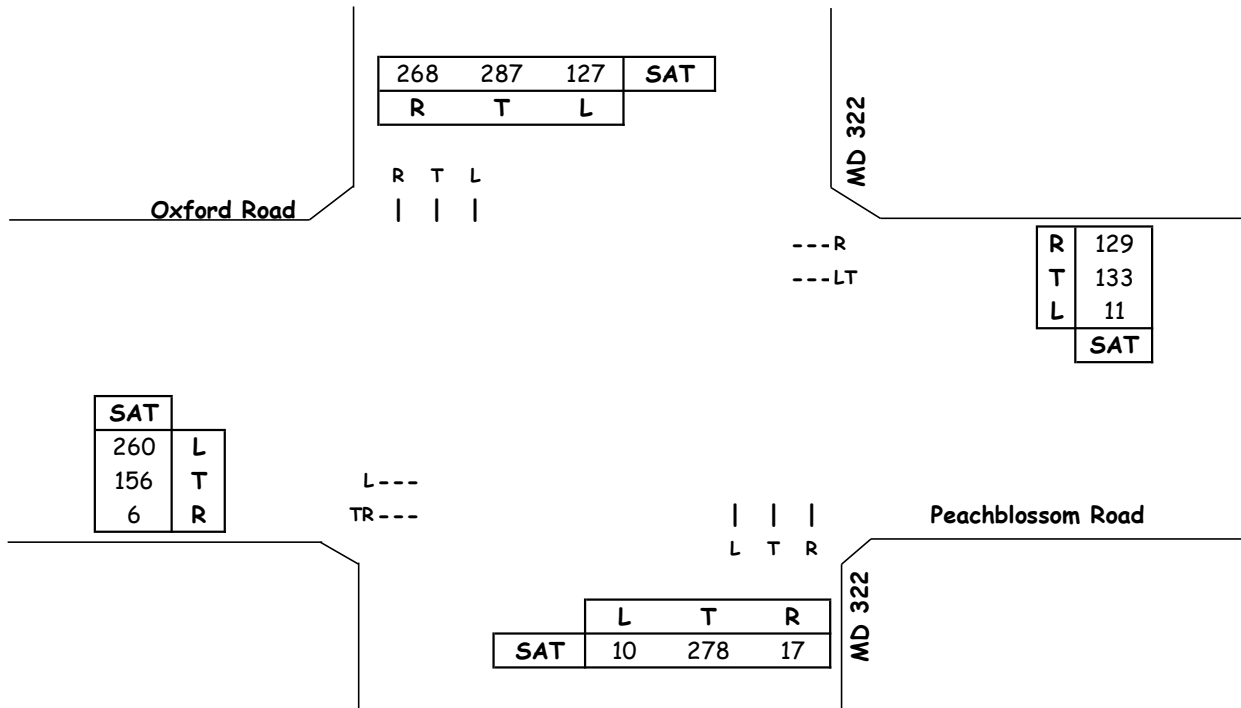
**Intersection
 2**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: MD 322
Minor Street: Peachblossom Road
Study Period: Existing Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Traffic Signal Phasing includes East/West Split Phase

Sat. Midday Peak Hour						
Dir	Through Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
EB	260	1.00	260			
WB	144	1.00	144			
NB	278	1.00	278	127	1.00	127
SB	287	1.00	287	10	1.00	10
CLV TOTAL=						809
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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**MD 322 &
 Peachblossom Road
 (Existing Traffic)**

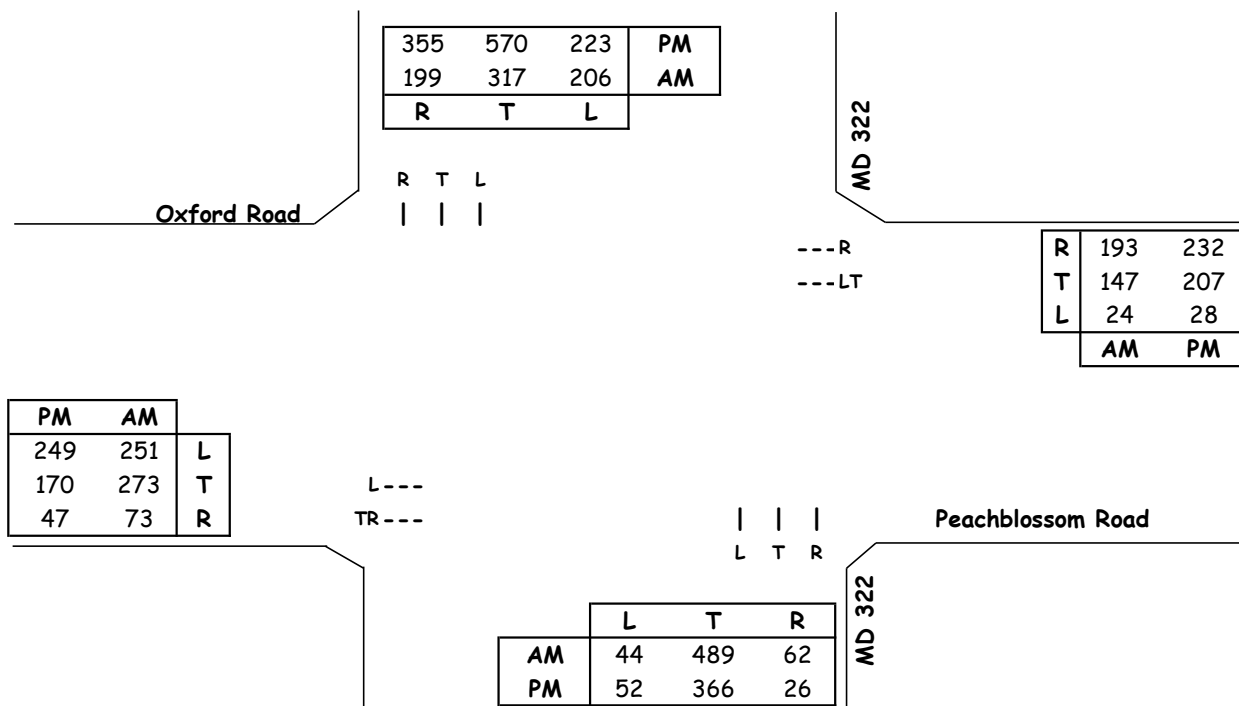
**Intersection
 2**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: MD 322
Minor Street: Peachblossom Road
Study Period: Background Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Traffic Signal Phasing includes East/West Split Phase

AM Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	346	1.00	346				346
WB	171	1.00	171				171
NB	489	1.00	489	206	1.00	206	695
SB	317	1.00	317	44	1.00	44	
CLV TOTAL=							1212
Level of Service (LOS)=							C

PM Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	249	1.00	249				249
WB	235	1.00	235				235
NB	366	1.00	366	223	1.00	223	622
SB	570	1.00	570	52	1.00	52	
CLV TOTAL=							1106
Level of Service (LOS)=							B

Critical Lane Volume Analysis



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**MD 322 &
 Peachblossom Road**
 (Background Traffic)

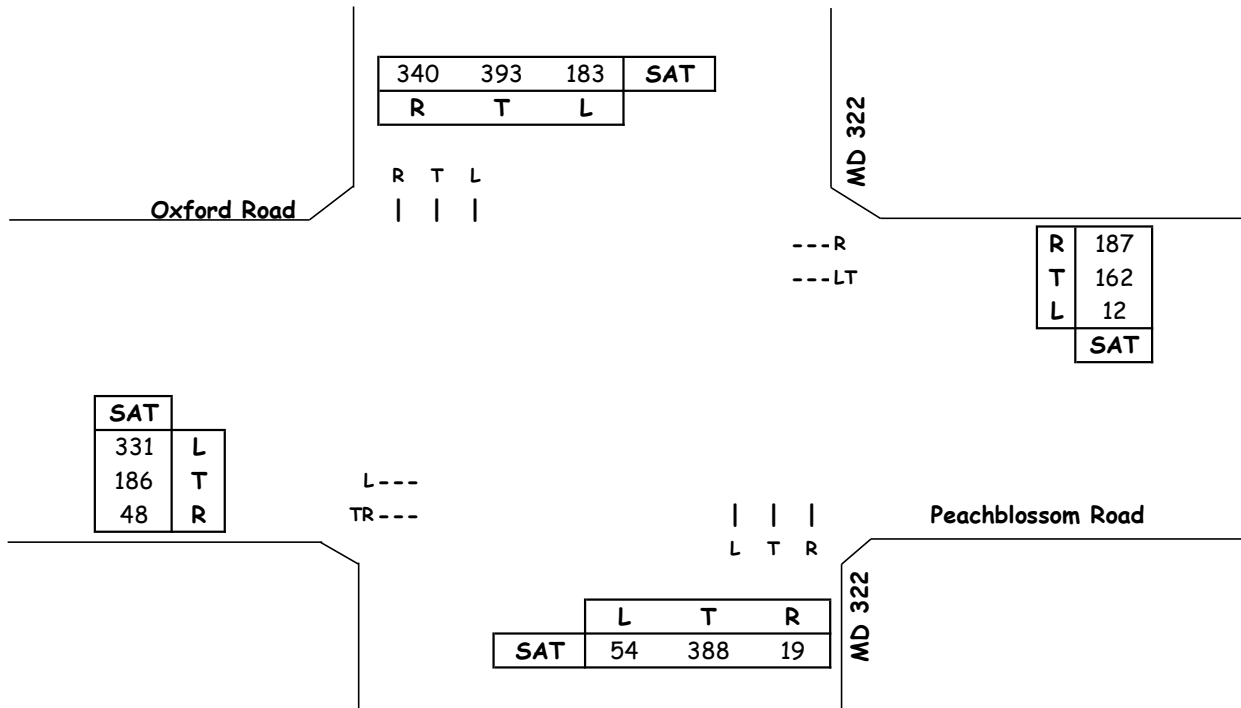
**Intersection
 2**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: MD 322
Minor Street: Peachblossom Road
Study Period: Background Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Traffic Signal Phasing includes East/West Split Phase

Sat. Midday Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			SAT
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	331	1.00	331				331
WB	174	1.00	174				174
NB	388	1.00	388	183	1.00	183	571
SB	393	1.00	393	54	1.00	54	
CLV TOTAL=							1076
Level of Service (LOS)=							B

Critical Lane Volume Analysis



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**MD 322 &
 Peachblossom Road**
 (Background Traffic)

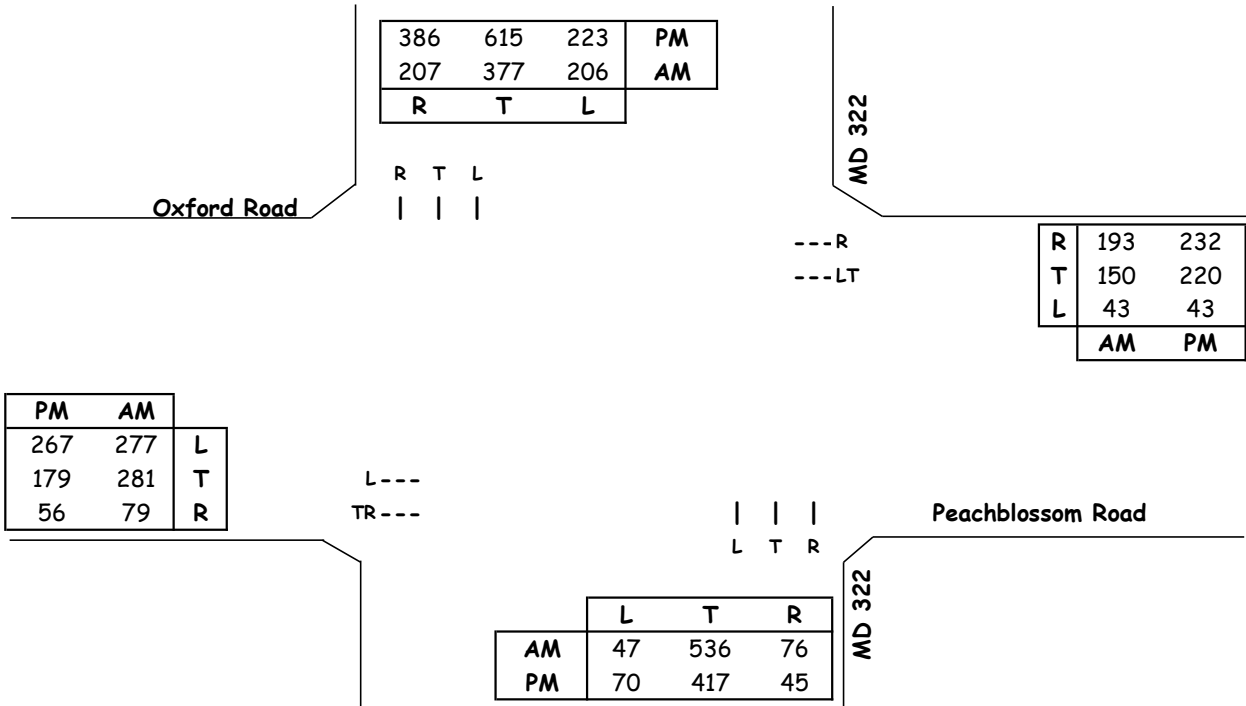
**Intersection
 2**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: MD 322
Minor Street: Peachblossom Road
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Traffic Signal Phasing includes East/West Split Phase

AM Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	360	1.00	360				360
WB	193	1.00	193				193
NB	536	1.00	536	206	1.00	206	742
SB	377	1.00	377	47	1.00	47	
CLV TOTAL=							1295
Level of Service (LOS)=							C

PM Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	267	1.00	267				267
WB	263	1.00	263				263
NB	417	1.00	417	223	1.00	223	685
SB	615	1.00	615	70	1.00	70	
CLV TOTAL=							1215
Level of Service (LOS)=							C

Critical Lane Volume Analysis



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**MD 322 &
 Peachblossom Road**
 (Total Traffic)

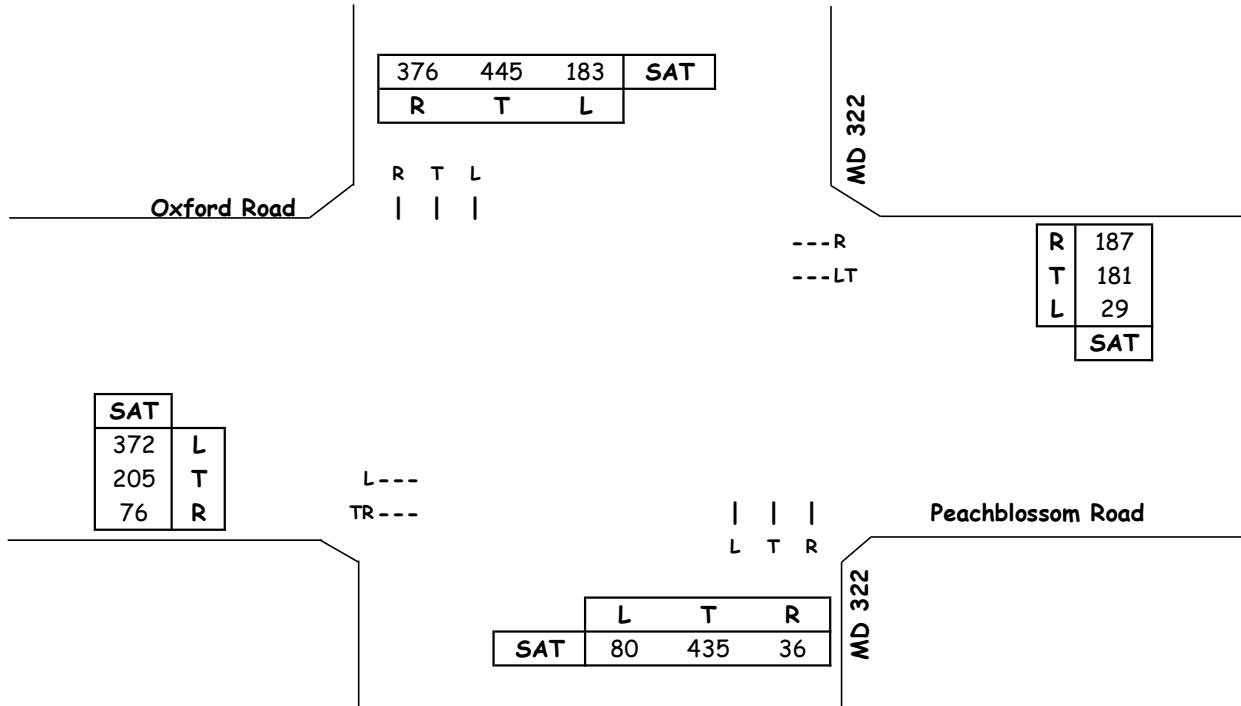
**Intersection
 2**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: MD 322
Minor Street: Peachblossom Road
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Traffic Signal Phasing includes East/West Split Phase

Sat. Midday Peak Hour							
Dir	Through Volumes			+ Opposing Lefts			SAT
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	372	1.00	372				372
WB	210	1.00	210				210
NB	435	1.00	435	183	1.00	183	618
SB	445	1.00	445	80	1.00	80	
CLV TOTAL=							1200
Level of Service (LOS)=							C

Critical Lane Volume Analysis



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**MD 322 &
 Peachblossom Road**
 (Total Traffic)

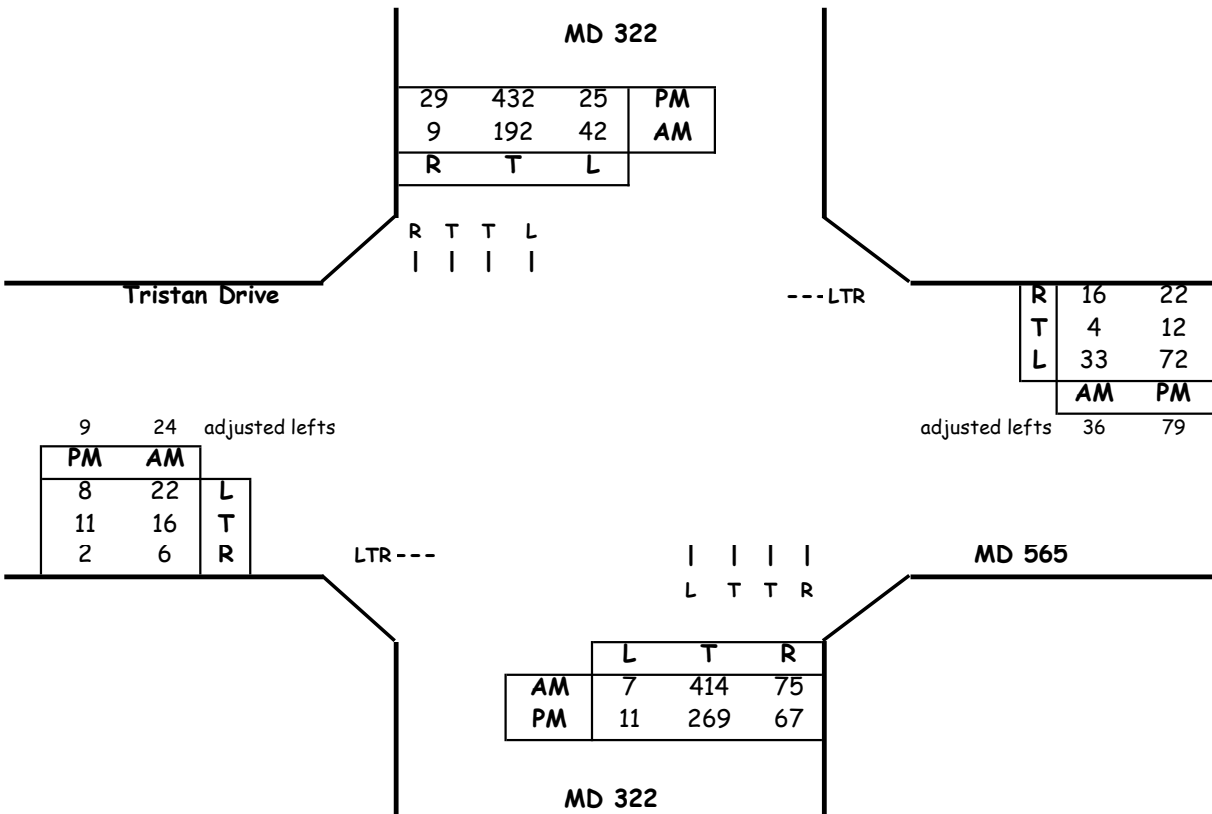
**Intersection
 2**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: MD 565
Study Period: EXISTING TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	414	0.55	228	42	1	42
SB	192	0.55	106	7	1	7
EB	46	1	46	33	1	33
WB	56	1	56	22	1	22
CLV TOTAL=						349
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	269	0.55	148	25	1	25
SB	432	0.55	238	11	1	11
EB	22	1	22	72	1	72
WB	113	1	113	8	1	8
CLV TOTAL=						370
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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MD 322 &
MD 565
(EXISTING TRAFFIC)

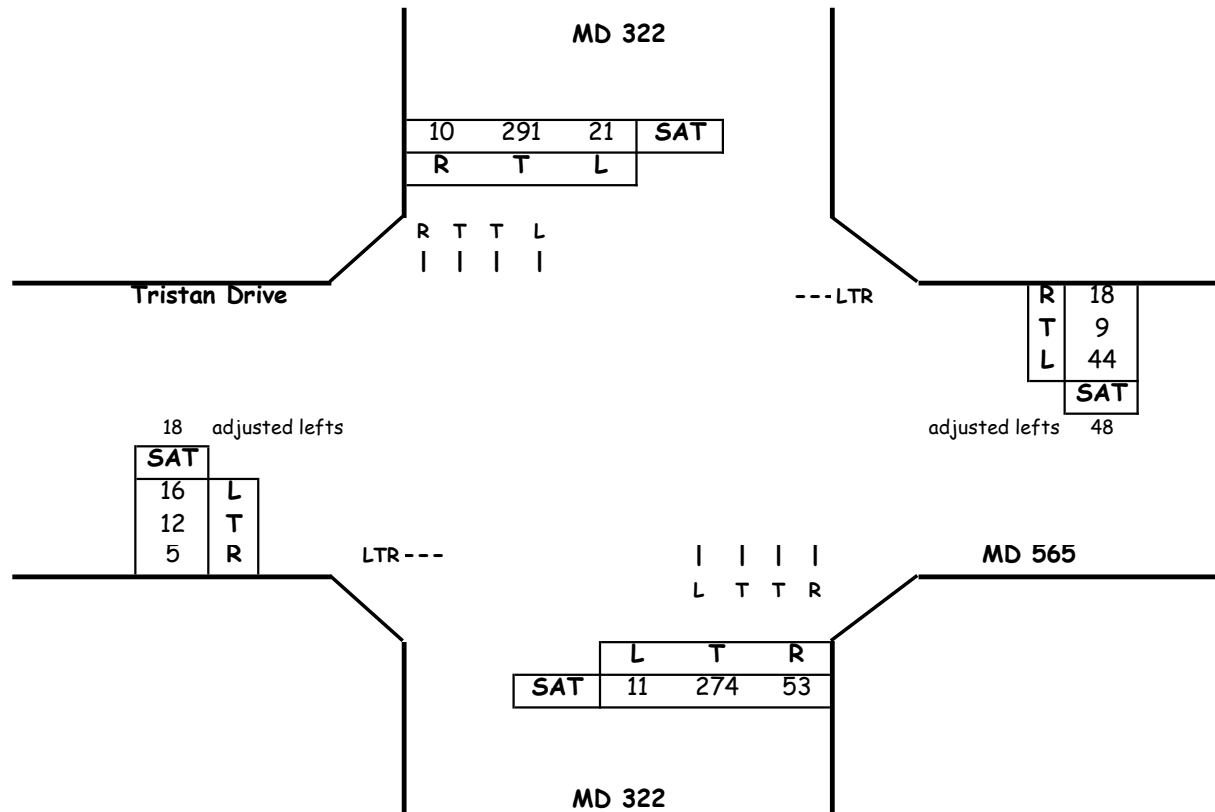
Intersection
3

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: MD 565
Study Period: EXISTING TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	274	0.55	151	21	1	21
SB	291	0.55	160	11	1	11
EB	35	1	35	44	1	44
WB	75	1	75	16	1	16
CLV TOTAL=						263
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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MD 322 &
MD 565
(EXISTING TRAFFIC)

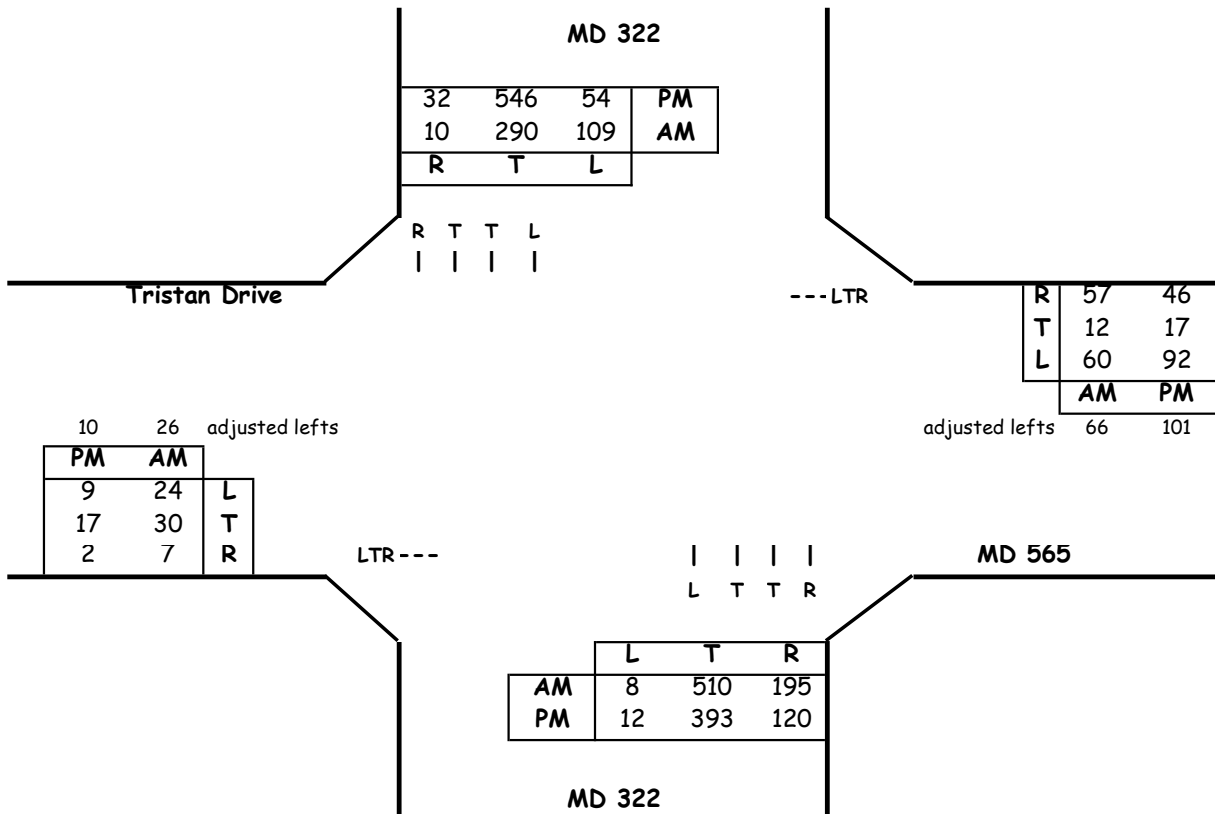
Intersection
3

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: MD 565
Study Period: BACKGROUND TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour									
Dir	Thru Volumes			+ Opposing Lefts			AM		
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV		
NB	510	0.55	281	109	1	109	390		
SB	290	0.55	160	8	1	8			
EB	63	1	63	60	1	60	159		
WB	135	1	135	24	1	24			
CLV TOTAL=							549		
Level of Service (LOS) =							A		

Evening Peak Hour									
Dir	Thru Volumes			+ Opposing Lefts			PM		
	VOL	x LUF = Total		VOL	x LUF = Total		CLV		
NB	393	0.55	216	54	1	54	312		
SB	546	0.55	300	12	1	12			
EB	29	1	29	92	1	92	173		
WB	164	1	164	9	1	9			
CLV TOTAL=							485		
Level of Service (LOS) =							A		

Critical Lane Volume Analysis



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**MD 322 &
 MD 565**
 (BACKGROUND TRAFFIC)

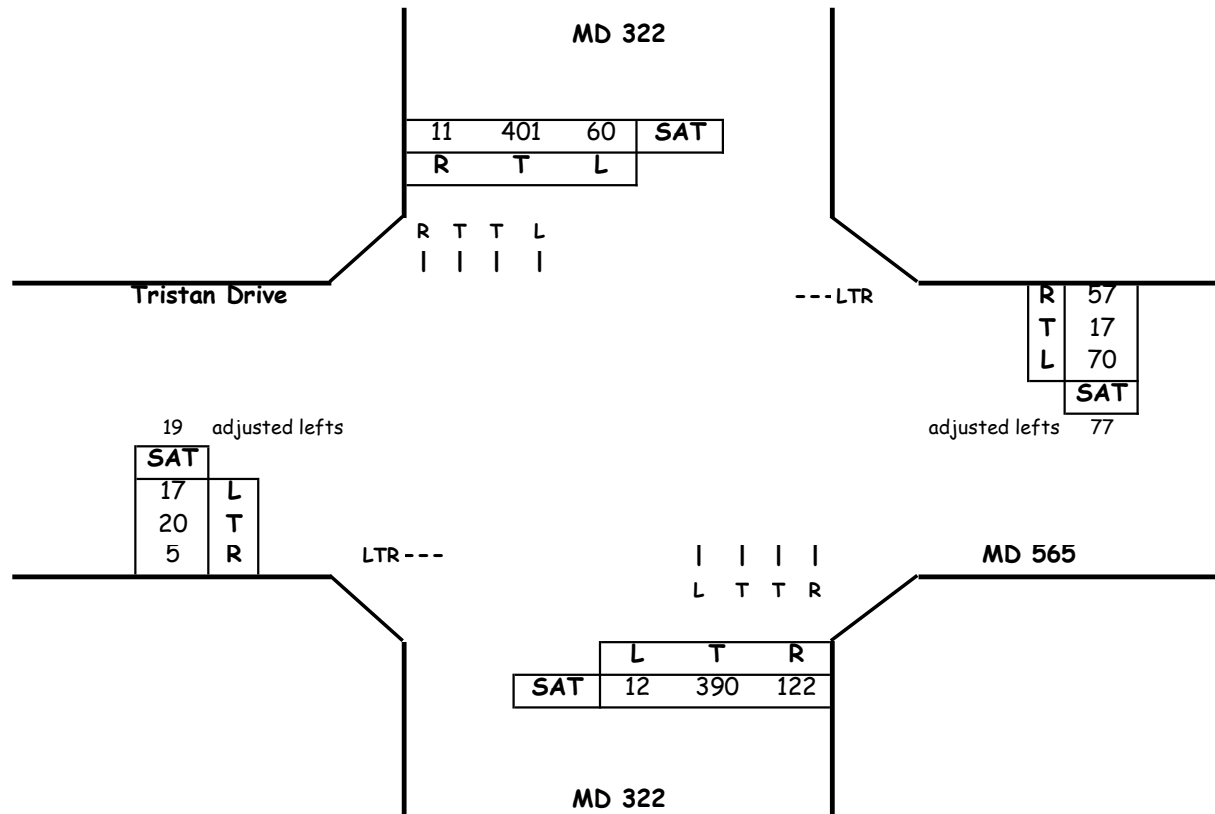
**Intersection
 3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: MD 565
Study Period: BACKGROUND TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	390	0.55	215	60	1	60
SB	401	0.55	221	12	1	12
EB	44	1	44	70	1	70
WB	151	1	151	17	1	17
CLV TOTAL=						443
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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**MD 322 &
MD 565**
 (BACKGROUND TRAFFIC)

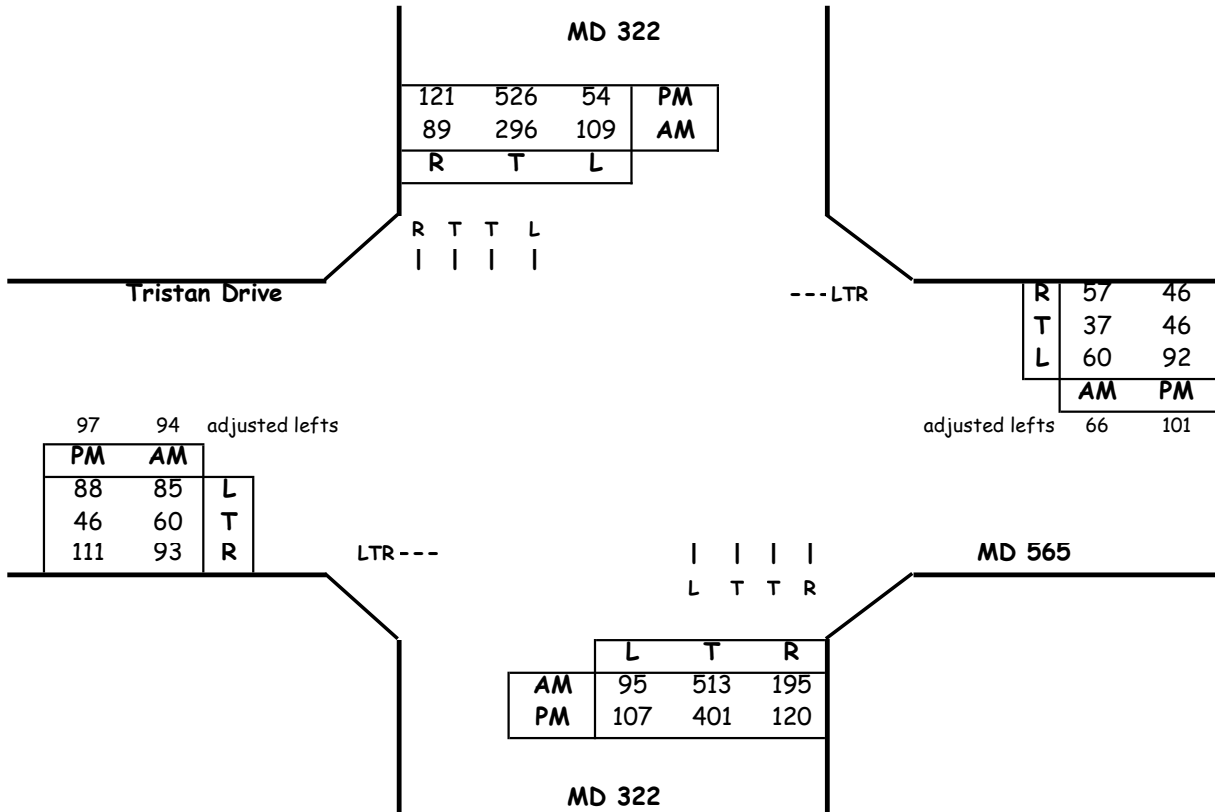
**Intersection
3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: MD 565
Study Period: TOTAL TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	513	0.55	282	109	1	109	391
SB	296	0.55	163	95	1	95	
EB	247	1	247	60	1	60	307
WB	160	1	160	85	1	85	
CLV TOTAL=							698
Level of Service (LOS) =							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	401	0.55	221	54	1	54	396
SB	526	0.55	289	107	1	107	
EB	254	1	254	92	1	92	346
WB	193	1	193	88	1	88	
CLV TOTAL=							742
Level of Service (LOS) =							A

Critical Lane Volume Analysis



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**MD 322 &
 MD 565
 (TOTAL TRAFFIC)**

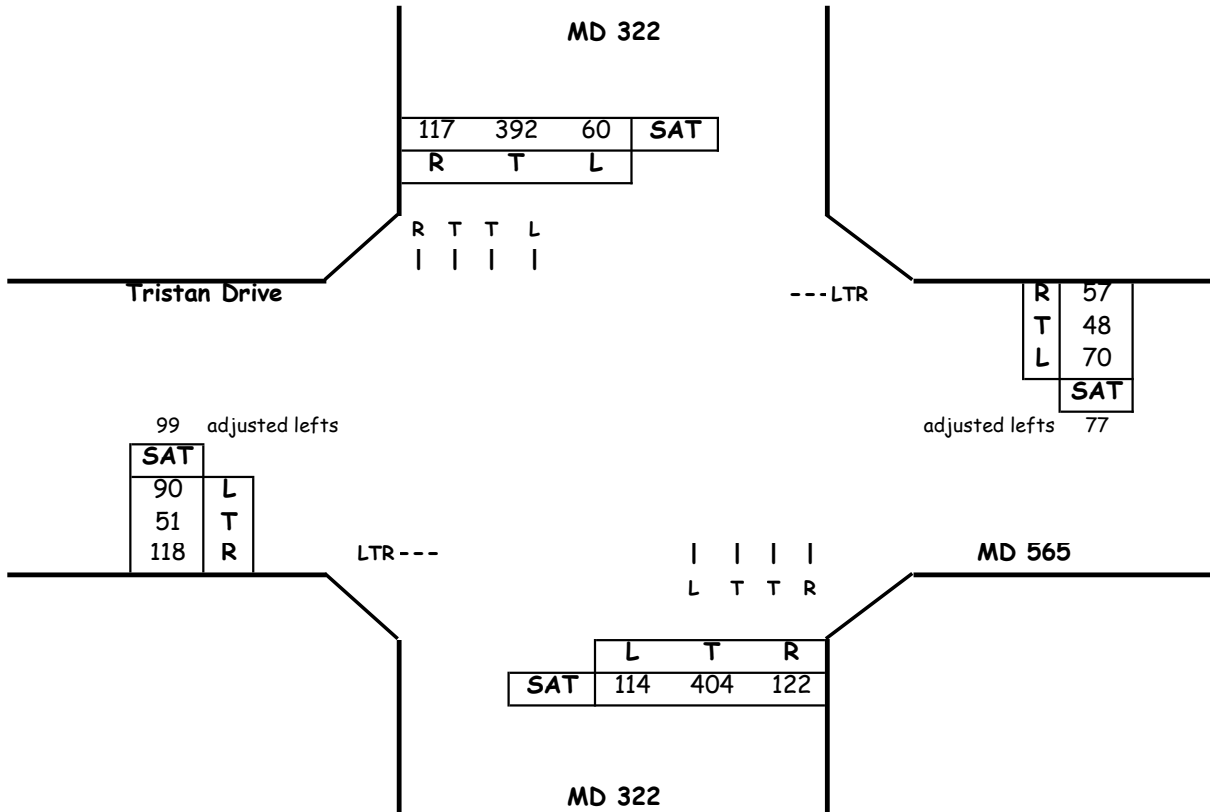
**Intersection
 3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: MD 322
Minor Street: MD 565
Study Period: TOTAL TRAFFIC

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	404	0.55	222	60	1	60
SB	392	0.55	216	114	1	114
EB	268	1	268	70	1	70
WB	182	1	182	90	1	90
CLV TOTAL=						668
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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MD 322 &
MD 565
(TOTAL TRAFFIC)

Intersection
3

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

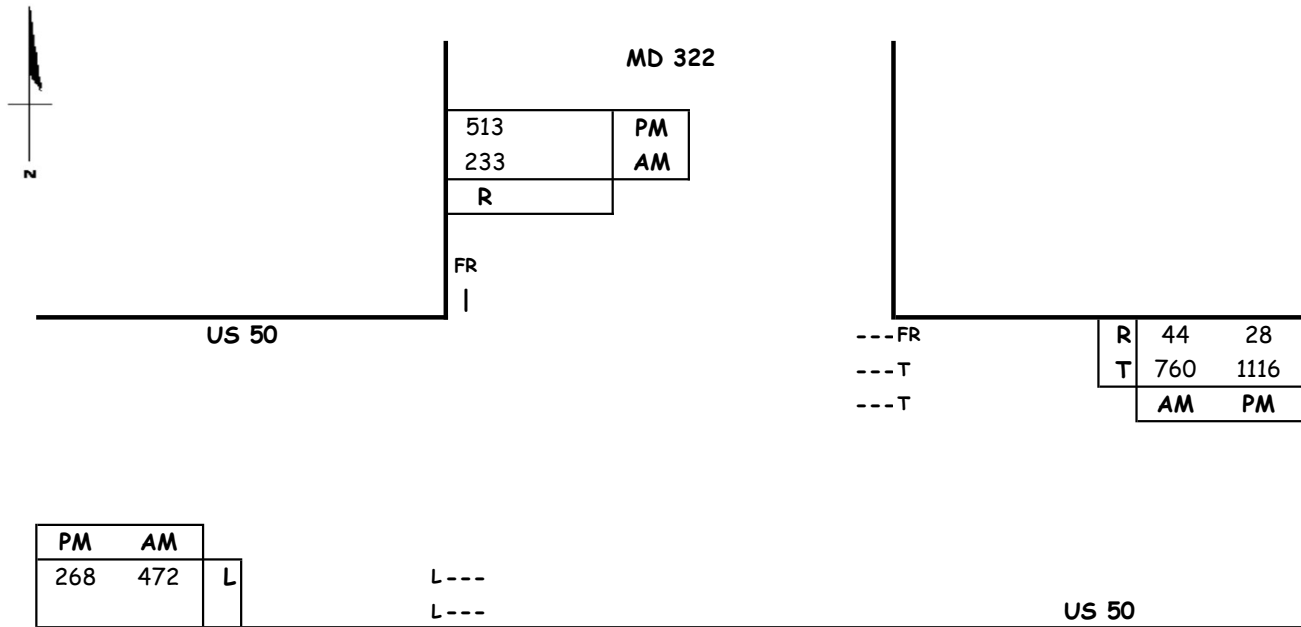
Intersection of: US 50

and: MD 322

Conditions: Existing Traffic

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB						
EB						
WB	760	0.55	418	472	0.60	283
CLV TOTAL=						701
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB						
EB						
WB	1116	0.55	614	268	0.60	161
CLV TOTAL=						775
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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US 50 &
MD 322
(Existing Traffic)

**Intersection
4**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

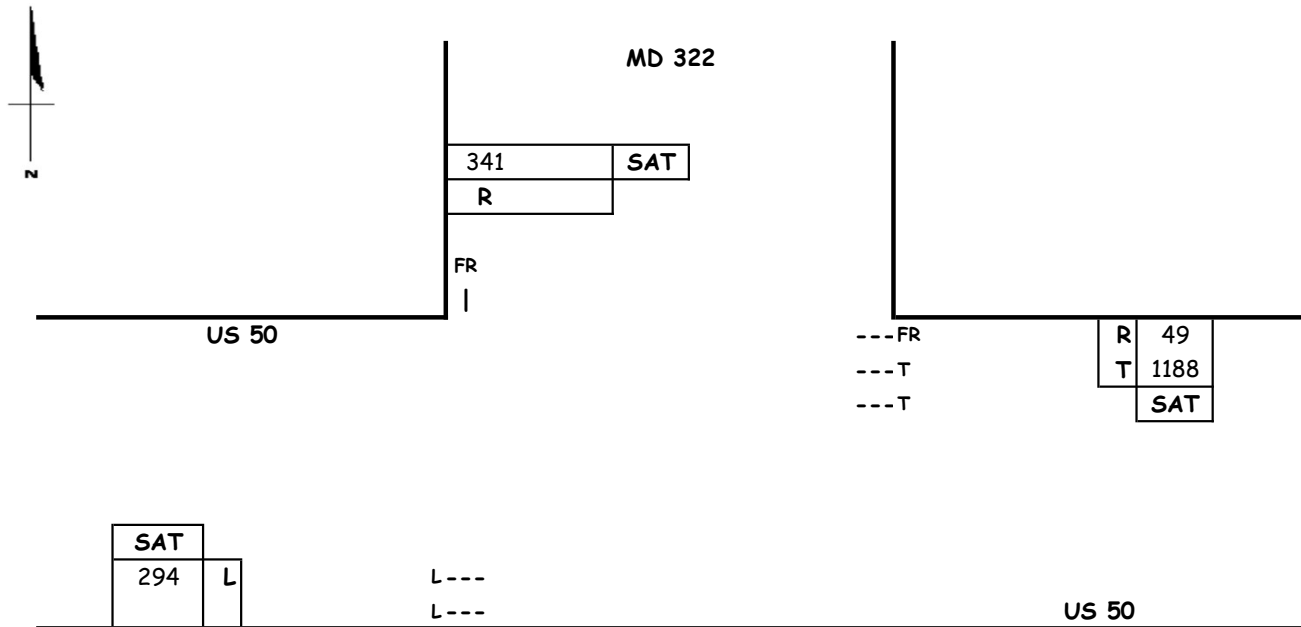
Intersection of: US 50

and: MD 322

Analyst: Lenhart Traffic

Conditions: Existing Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Sat. Midday Peak Hour

Dir	Thru Volumes			+ Opposing Lefts			SAT
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
SB							
EB							829
WB	1188	0.55	653	294	0.60	176	
CLV TOTAL=							829
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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US 50 &
MD 322
(Existing Traffic)

Intersection
4

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

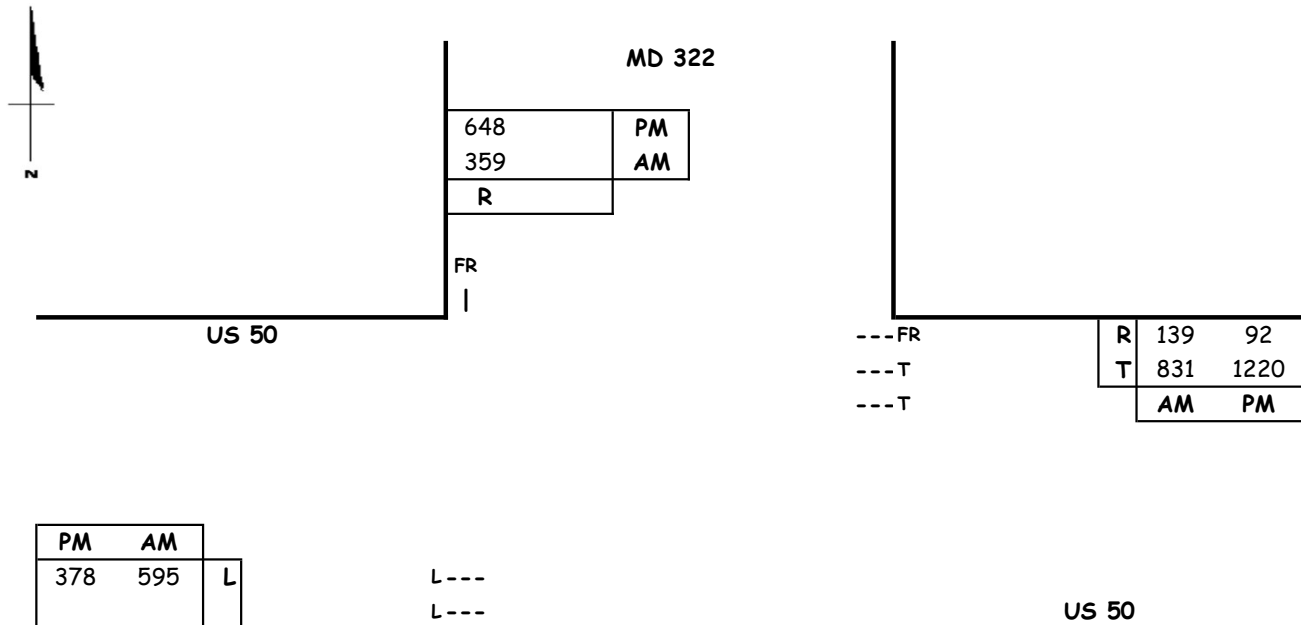
Intersection of: US 50

and: MD 322

Analyst: Lenhart Traffic

Conditions: Background Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB						
EB						
WB	831	0.55	457	595	0.60	357
CLV TOTAL=						814
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB						
EB						
WB	1220	0.55	671	378	0.60	227
CLV TOTAL=						898
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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US 50 &
MD 322
(Background Traffic)

**Intersection
4**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

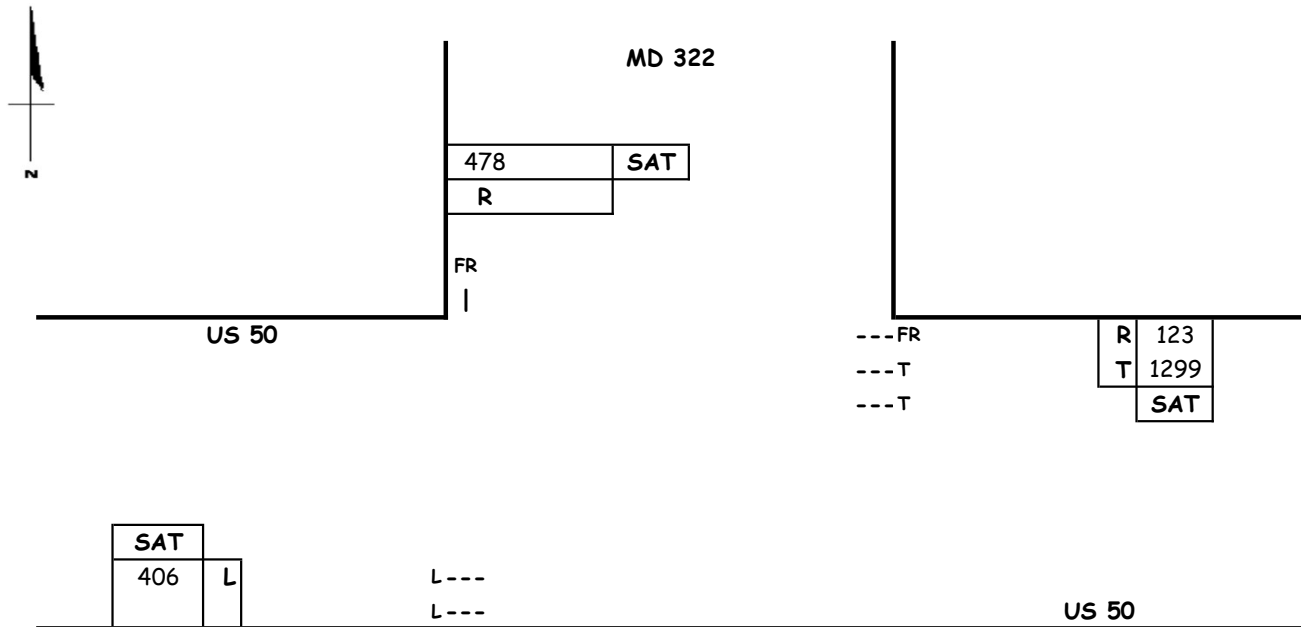
Intersection of: US 50

and: MD 322

Analyst: Lenhart Traffic

Conditions: Background Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Sat. Midday Peak Hour

Dir	Thru Volumes			+ Opposing Lefts			SAT CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
SB							
EB							958
WB	1299	0.55	714	406	0.60	244	
CLV TOTAL=							958
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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US 50 &
MD 322
(Background Traffic)

**Intersection
4**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

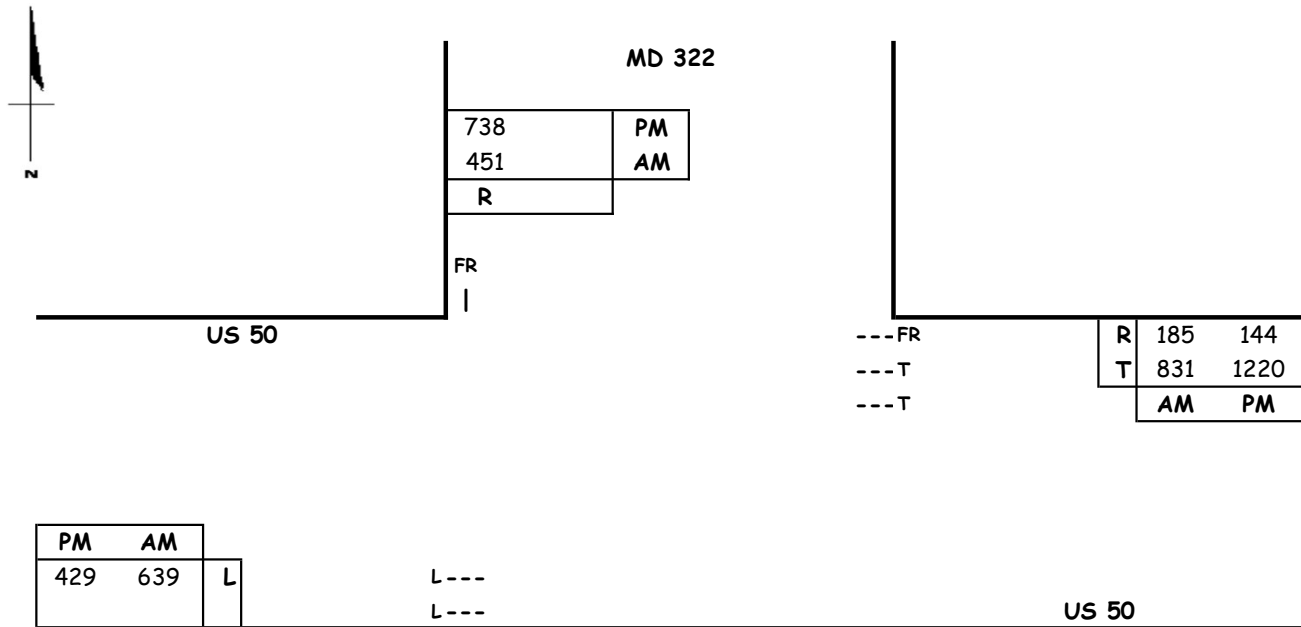
Intersection of: US 50

and: MD 322

Conditions: Total Traffic

Analyst: Lenhart Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
SB							
EB							840
WB	831	0.55	457	639	0.60	383	
CLV TOTAL=							840
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
SB							
EB							928
WB	1220	0.55	671	429	0.60	257	
CLV TOTAL=							928
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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US 50 &
MD 322
(Total Traffic)

**Intersection
4**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

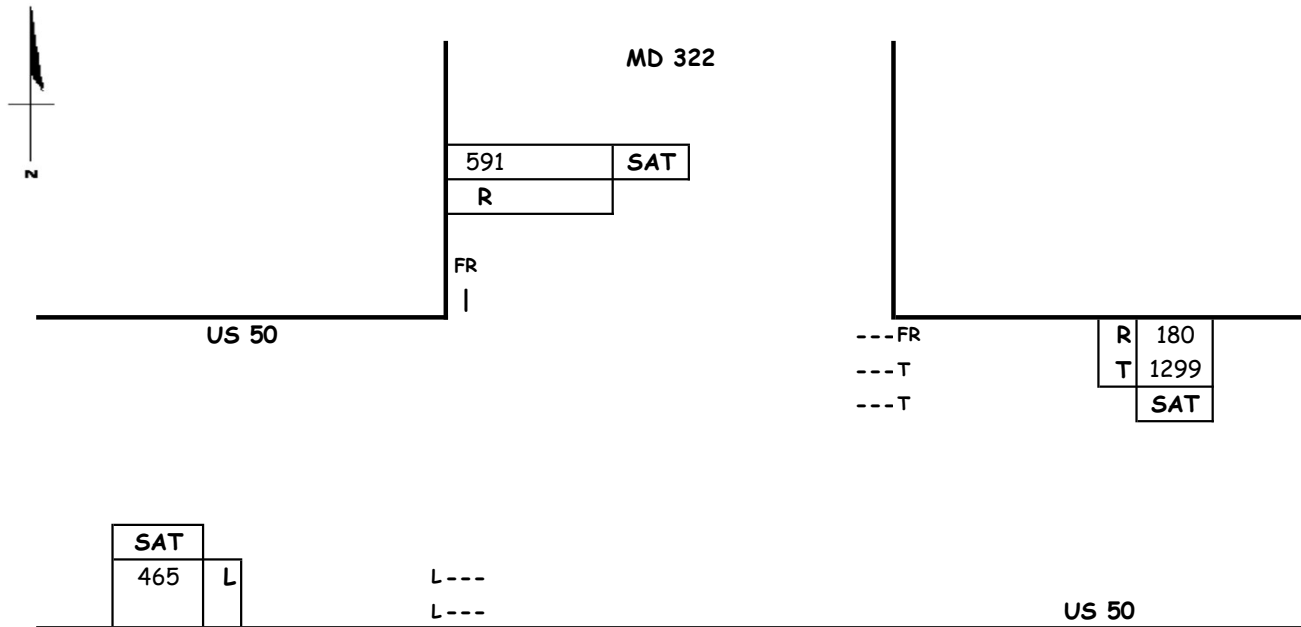
Intersection of: US 50

and: MD 322

Analyst: Lenhart Traffic

Conditions: Total Traffic

Lane Use + Traffic Volumes



Capacity Analysis

Sat. Midday Peak Hour

Dir	Thru Volumes			+ Opposing Lefts			SAT CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
SB							
EB							993
WB	1299	0.55	714	465	0.60	279	
CLV TOTAL=							993
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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US 50 &
MD 322
(Total Traffic)

**Intersection
4**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: Oxford Road
Minor Street: Proposed Site Access
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

OXFORD ROAD

--- T
 --- L

Proposed Bypass Lane

	AM	PM
T	368	591
L	14	62

PM	AM	
448	594	T
19	20	R

T ---
 R ---

OXFORD ROAD

I
 LR

	L	R
AM	15	40
PM	19	36

Proposed Site Access

Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	55	1.00	55			
EB	594	1.00	594	14	1.00	14
WB	368	1.00	368			
CLV TOTAL=						663
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	55	1.00	55			
EB	448	1.00	448	62	1.00	62
WB	591	1.00	591			
CLV TOTAL=						646
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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Oxford Road &
 Proposed Site Access
 (Total Traffic)

Intersection
5

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: Oxford Road
Minor Street: Proposed Site Access
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

OXFORD ROAD

---	T		SAT
---	L		
Proposed Bypass Lane			
	T		535
	L		81

SAT	
542	T
23	R

T ---
 R ---

OXFORD ROAD

|
 LR

	L	R
SAT	21	88

Proposed Site Access

Critical Lane Volume Analysis

Sat. Midday Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			SAT CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	109	1.00	109				109
EB	542	1.00	542	81	1.00	81	623
WB	535	1.00	535				
CLV TOTAL=							732
Level of Service (LOS) =							A

Critical Lane Volume Analysis



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Oxford Road &
 Proposed Site Access
 (Total Traffic)

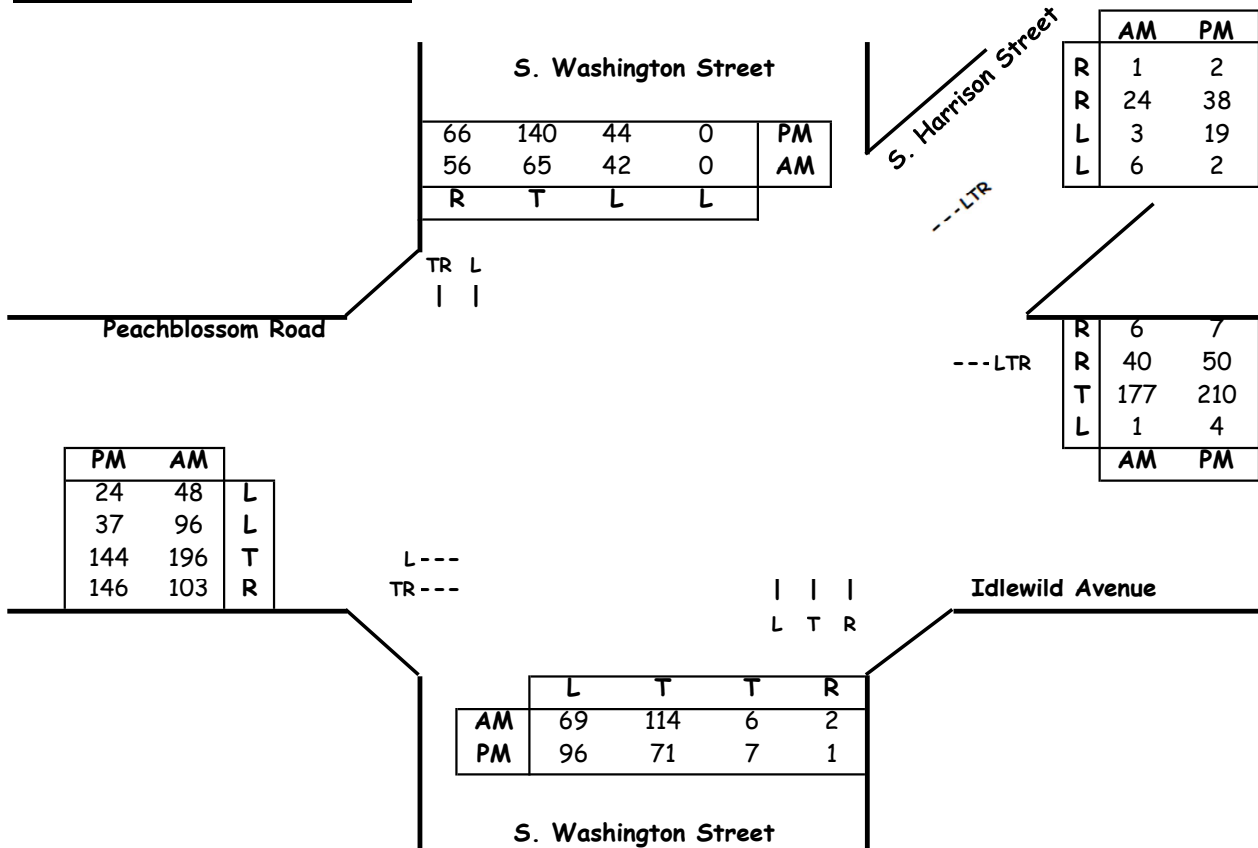
Intersection
5

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: S. Washington Street
Minor Street: Peachblossom Road
Study Period: EXISTING TRAFFIC

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	120	1	120	42	1	42
SB	121	1	121	69	1	69
EB	299	1	299			
WB	224	1	224			
SWB	34	1	34			
CLV TOTAL=						747
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	78	1	78	44	1	44
SB	206	1	206	96	1	96
EB	290	1	290			
WB	271	1	271			
SWB	61	1	61			
CLV TOTAL=						924
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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**S. Washington Street &
 Peachblossom Road
 (EXISTING TRAFFIC)**

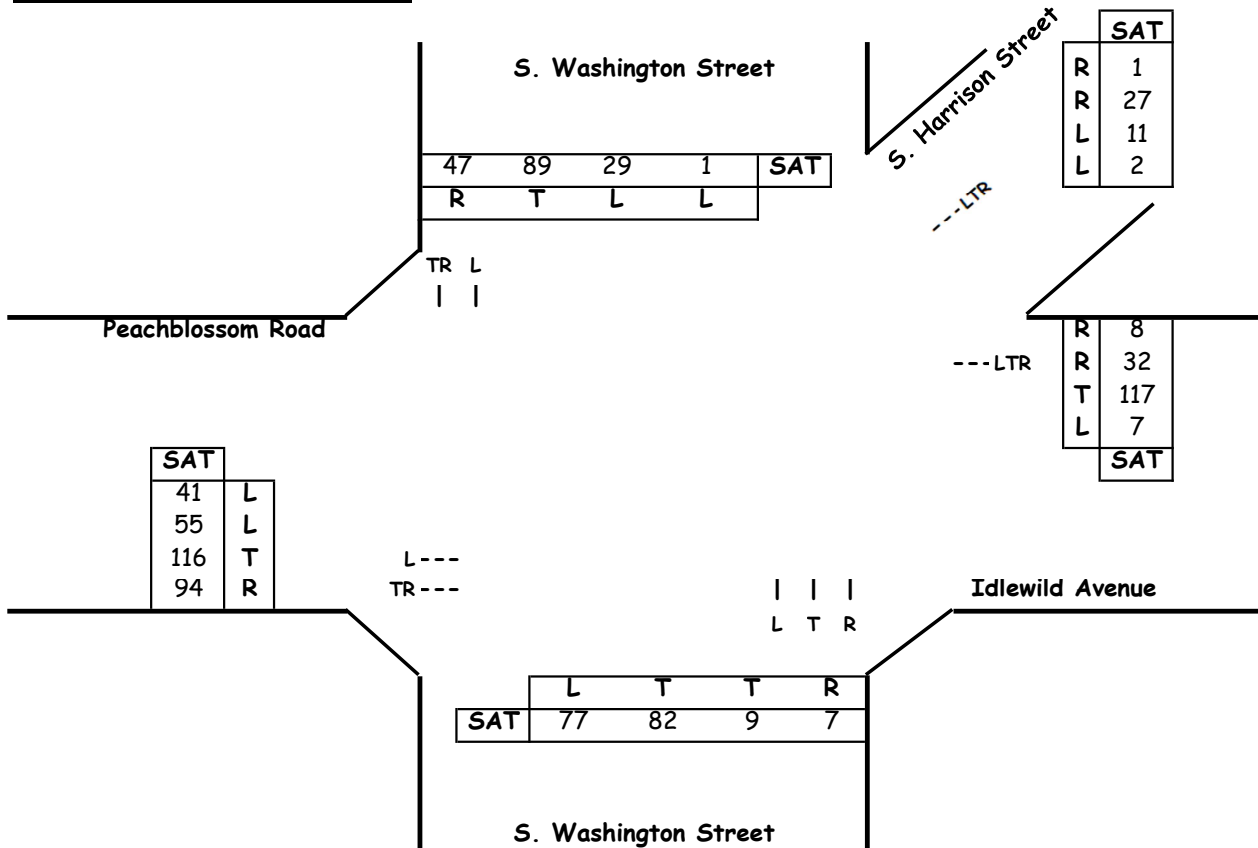
**Intersection
 6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: S. Washington Street
Minor Street: Idlewild Avenue
Study Period: EXISTING TRAFFIC

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			SAT CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	91	1	91	30	1	30	213
SB	136	1	136	77	1	77	
EB	210	1	210				210
WB	164	1	164				164
SWB	41	1	41				41
CLV TOTAL=							628
Level of Service (LOS) =							A

Critical Lane Volume Analysis



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**S. Washington Street &
 Idlewild Avenue
 (EXISTING TRAFFIC)**

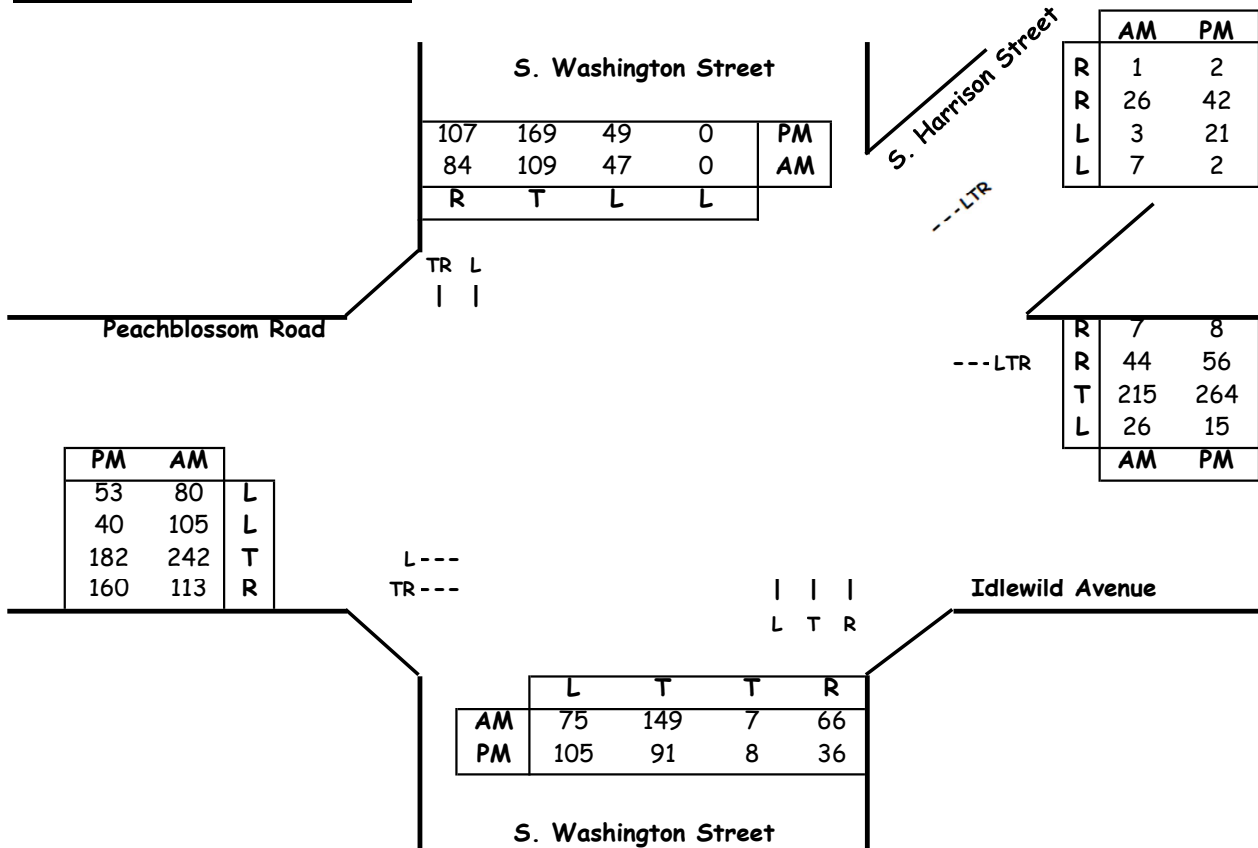
**Intersection
 6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: S. Washington Street
Minor Street: Idlewild Avenue
Study Period: BACKGROUND TRAFFIC

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	156	1	156	47	1	47
SB	193	1	193	75	1	75
EB	355	1	355			
WB	292	1	292			
SWB	37	1	37			
CLV TOTAL=						952
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	99	1	99	49	1	49
SB	276	1	276	105	1	105
EB	342	1	342			
WB	343	1	343			
SWB	67	1	67			
CLV TOTAL=						1133
Level of Service (LOS) =						B

Critical Lane Volume Analysis



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**S. Washington Street &
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 (BACKGROUND TRAFFIC)

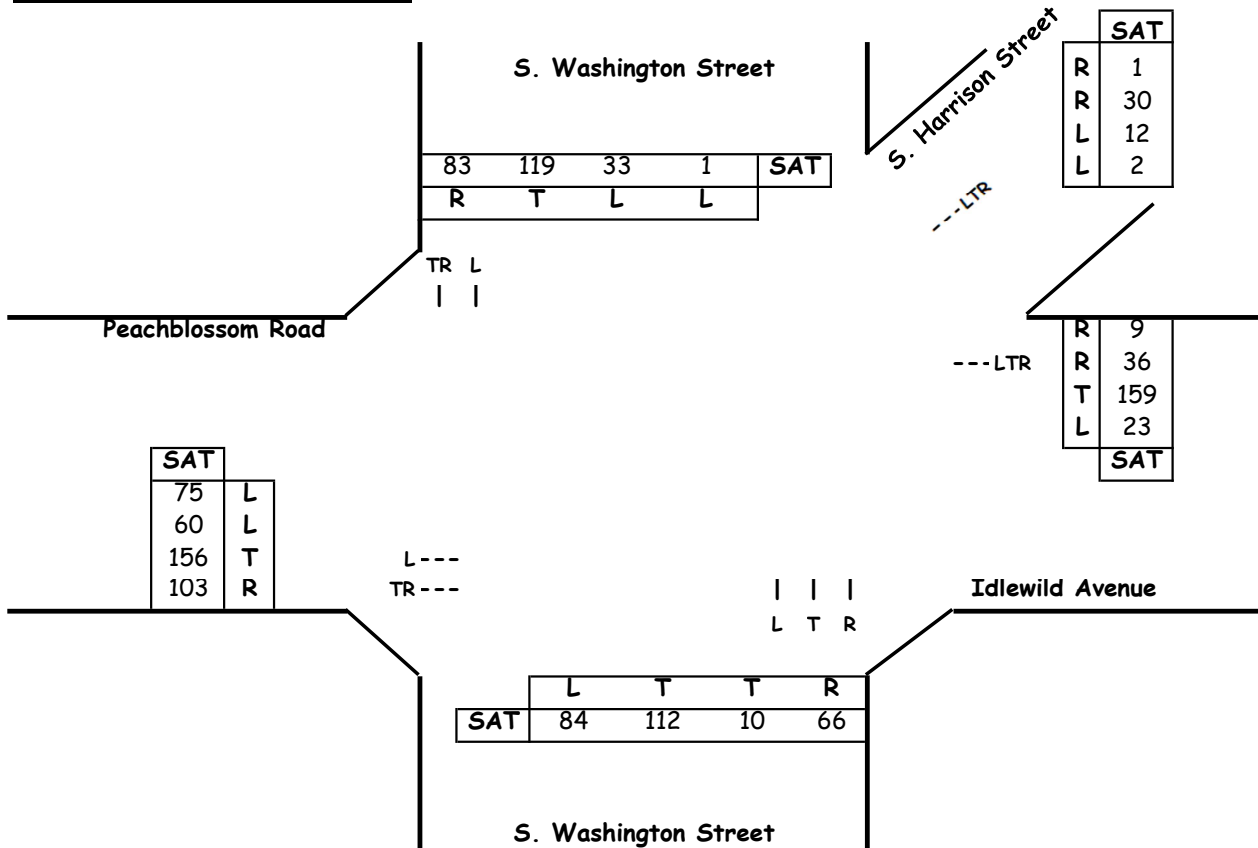
**Intersection
 6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: S. Washington Street
Minor Street: Idlewild Avenue
Study Period: BACKGROUND TRAFFIC

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	122	1	122	34	1	34
SB	202	1	202	84	1	84
EB	259	1	259			
WB	227	1	227			
SWB	45	1	45			
CLV TOTAL=						817
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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**S. Washington Street &
 Idlewild Avenue**
 (BACKGROUND TRAFFIC)

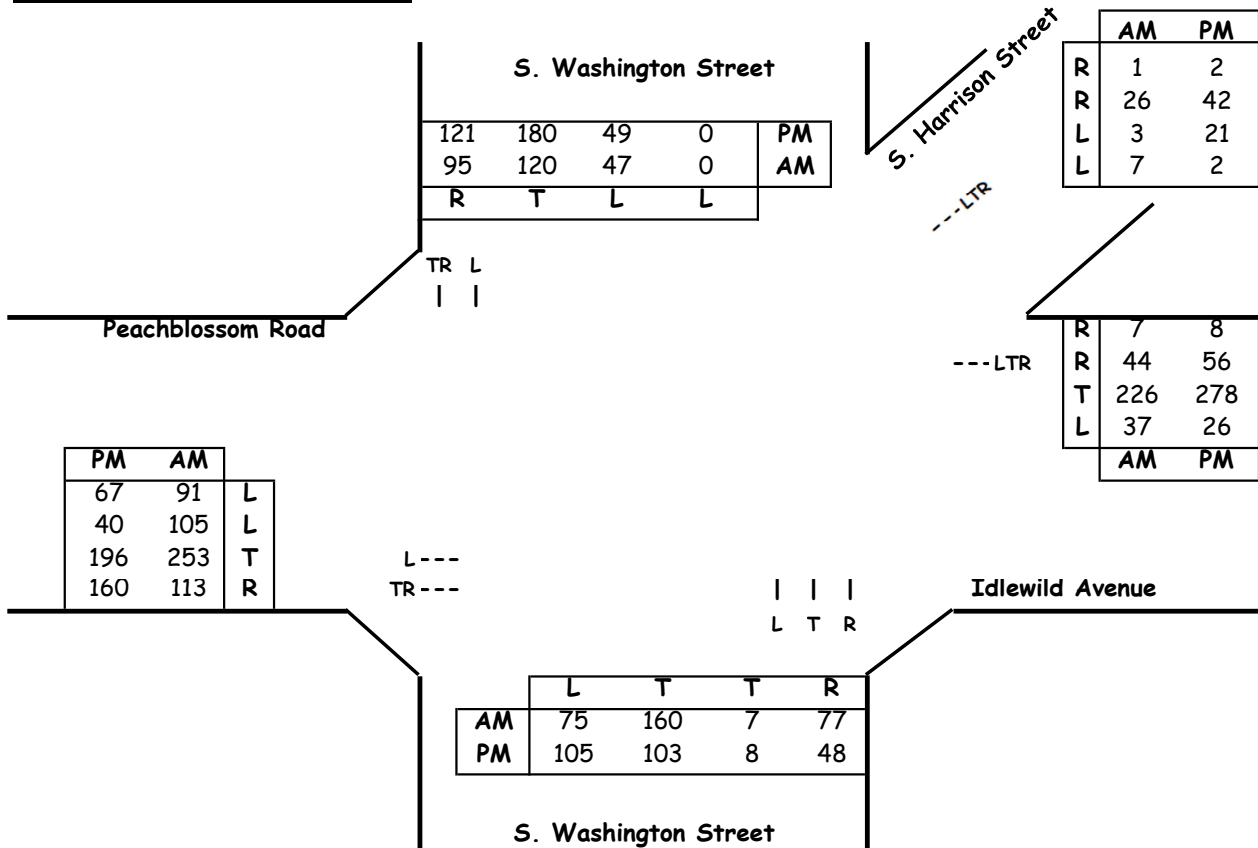
**Intersection
 6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: S. Washington Street
Minor Street: Idlewild Avenue
Study Period: TOTAL TRAFFIC

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	167	1	167	47	1	47
SB	215	1	215	75	1	75
EB	366	1	366			
WB	314	1	314			
SWB	37	1	37			
CLV TOTAL=						1007
Level of Service (LOS) =						B

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	111	1	111	49	1	49
SB	301	1	301	105	1	105
EB	356	1	356			
WB	368	1	368			
SWB	67	1	67			
CLV TOTAL=						1197
Level of Service (LOS) =						C

Critical Lane Volume Analysis



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**S. Washington Street &
 Idlewild Avenue
 (TOTAL TRAFFIC)**

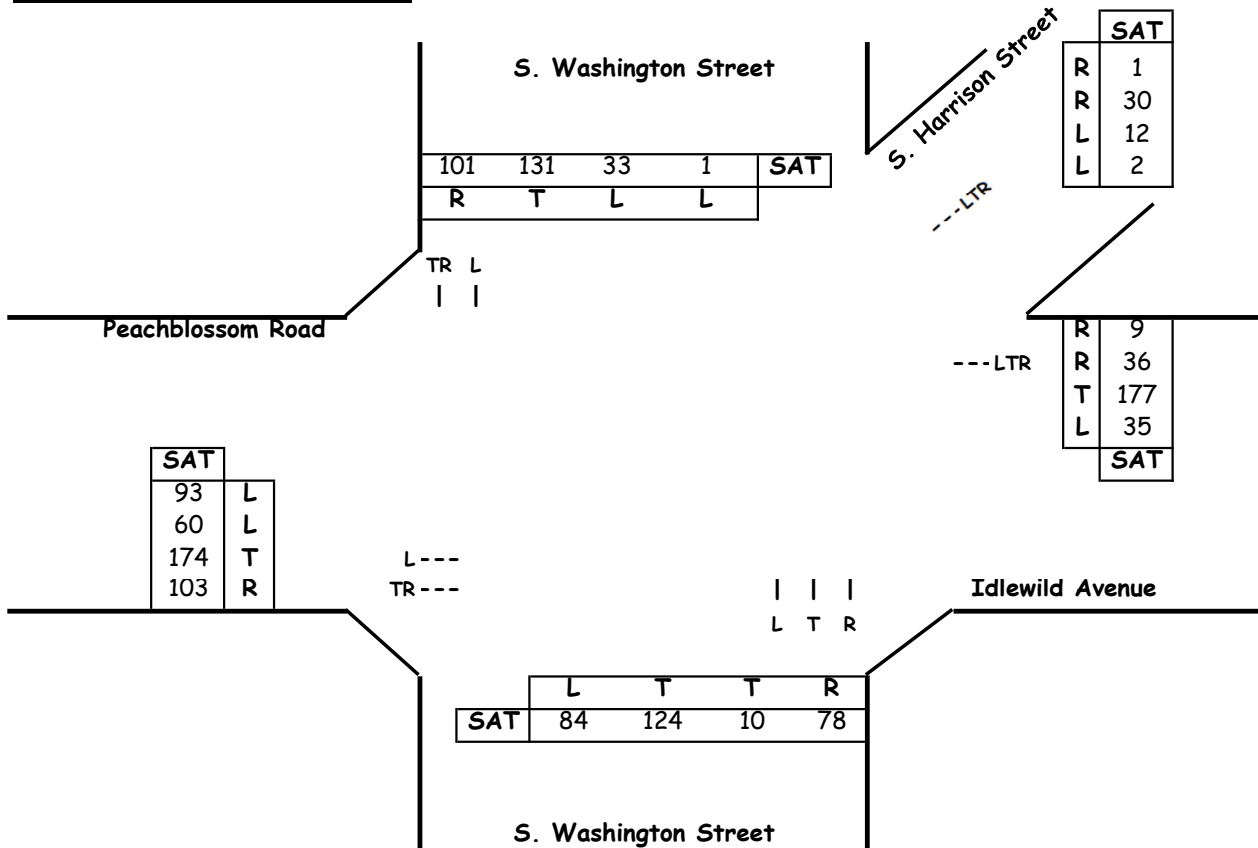
**Intersection
 6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Main Line: S. Washington Street
Minor Street: Idlewild Avenue
Study Period: TOTAL TRAFFIC

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Critical Lane Volume Analysis

Sat. Midday Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			SAT CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	134	1	134	34	1	34	316
SB	232	1	232	84	1	84	
EB	277	1	277				277
WB	257	1	257				257
SWB	45	1	45				45
CLV TOTAL=							895
Level of Service (LOS) =							A

Critical Lane Volume Analysis



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**S. Washington Street &
 Idlewild Avenue
 (TOTAL TRAFFIC)**

**Intersection
 6**

Appendix E

Queuing Analysis

MDOT State Highway Administration Queuing Analysis Formula for Signalized Intersections (Total - AM Peak Hour)

<u>Int 1: MD 322 at Port Street</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Port Street Left/Thru/Right	Total	N/A	41	35	1	120	3600	25	1.4
Westbound Port Street Left/Thru/Right	Total	N/A	207	177	1	120	3600	25	1.4
Northbound MD 322 Left-Turn	Total	225'	26	22	1	120	3600	25	1.4
Southbound MD MD 322 Left-Turn	Total	225'	113	97	1	120	3600	25	1.4
<u>Int 2: MD 322 at Peachblossom Road</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Oxford Road Left-Turn	Total	SPLIT	323	277	1	120	3600	25	1.4
Westbound Peachblossom Rd. Thru/Left	Total	N/A	225	193	1	120	3600	25	1.4
Northbound MD 322 Left-Turn	Total	325'	55	47	1	120	3600	25	1.4
Southbound MD MD 322 Left-Turn	Total	325'	240	206	1	120	3600	25	1.4
<u>Int 4: US 50 at MD 322</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound US 50 Left-Turn	Total	825'	335	639	0.6	90	3600	25	1.4
<u>Int 6: Peachblossom Road at S. Washington Street</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Peachblossom Rd. Left-Turn	Total	SPLIT	191	196	1	100	3600	25	1.4
Westbound Peachblossom St. Left/Thru/Right	Total	N/A	305	314	1	100	3600	25	1.4
Southwest S. Harrison St. Left/Thru/Right	Total	N/A	36	37	1	100	3600	25	1.4
Northbound S. Washington St. Left-Turn	Total	300'	73	75	1	100	3600	25	1.4
Southbound S. Washington St. Left-Turn	Total	75'	46	47	1	100	3600	25	1.4

Notes:

- Lane Use Factor applied as follows: 1 indicates single turn lane, 0.6 indicates a double left turn lane.
- Available queues were field measured.
- Maximum Queue (Ft) =
$$\frac{\text{Turning Volume (veh per hour)} \times \text{Lane Use Factor} \times \text{Cycle Length (Seconds)}}{3600 \text{ (Seconds per hour)}} \times 25 \text{ Feet/Vehicle} \times 1.4 \text{ Surge Factor}$$
- Cycle length was assumed based on CLV analyses and MDOT SHA's recommended maximum cycle lengths.
- Available queue not reported along approaches with split phasing given all movements along the approach operate simultaneously.



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MDOT SHA 95th Percentile Queues
For Signalized Intersections

EXHIBIT
E1a

MDOT State Highway Administration Queuing Analysis Formula (Total - AM Peak Hour)

Intersection	Available Queue (Ft)	Maximum Queue (Ft)	Basic Critical Gap	Opposing Volume	Average Gap Opposing Vehicle	Avg Gap > Critical Gap?	Maximum Queue (ft)	Max Veh / Hour	Lane Use Factor	Cycle Length (seconds)*	Seconds / Hour	Feet / Vehicle	Surge Factor
Int 3: MD 322 at S. Washington Street													
Eastbound Tristan Dr. Left/Thru/Right	TBD	231	8.5	1362	2.64	No	231	238	1	100	3600	25	1.4
Westbound S. Washington St.. Left/Thru/Right	N/A	150	8.5	1340	2.69	No	150	154	1	100	3600	25	1.4
Northbound MD 322 Left-Turn	325'	9	5.5	385	9.35	Yes	9	95	1	9.5	3600	25	1.4
Southbound MD 322 Left-Turn	325'	10	5.5	608	5.92	Yes	10	109	1	9.5	3600	25	1.4
Intersection	Available Queue (Ft)	Maximum Queue (Ft)	Basic Critical Gap	Opposing Volume	Average Gap Opposing Vehicle	Avg Gap > Critical Gap?	Maximum Queue (ft)	Max Veh / Hour	Lane Use Factor	Cycle Length (seconds)*	Seconds / Hour	Feet / Vehicle	Surge Factor
Int 5: Oxford Rd. at Site Access													
Westbound Oxford Rd. Left/Thru	N/A	1	5.0	614	5.86	Yes	1	14	1	9	3600	25	1.4
Northbound Site Access Left/Right	TBD	48	6.5	976	3.69	No	48	55	1	90	3600	25	1.4

- NOTES: 1. MDOT SHA Queuing Methodology above obtained from Appendix E-1 (for Unsignalized Intersections) of the MDOT SHA Access Permits Manual.
2. Available queues were field measured.
3. Maximum Queue (Ft) =
$$\frac{\text{Turning Volume (veh per hour)} \times \text{Lane Use Factor} \times \text{Cycle Length (Seconds)}}{3600 \text{ (Seconds per hour)}}$$
 x 25 Feet/Vehicle x 1.4 Surge Factor
4. If the Avg Gap is greater than the Critical Gap, then the cycle length is the Critical Gap plus 4 seconds. If the Avg Gap is less than Critical Gap, then analyze as if a signal were in place.



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MDOT SHA 95th Percentile Queues
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EXHIBIT
 E1b

MDOT State Highway Administration Queuing Analysis Formula for Signalized Intersections (Total - PM Peak Hour)

<u>Int 1: MD 322 at Port Street</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Port Street Left/Thru/Right	Total	N/A	93	71	1	135	3600	25	1.4
Westbound Port Street Left/Thru/Right	Total	N/A	305	232	1	135	3600	25	1.4
Northbound MD 322 Left-Turn	Total	225'	17	13	1	135	3600	25	1.4
Southbound MD MD 322 Left-Turn	Total	225'	148	113	1	135	3600	25	1.4
<u>Int 2: MD 322 at Peachblossom Road</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Oxford Road Left-Turn	Total	SPLIT	312	267	1	120	3600	25	1.4
Westbound Peachblossom Rd. Thru/Left	Total	N/A	307	263	1	120	3600	25	1.4
Northbound MD 322 Left-Turn	Total	325'	82	70	1	120	3600	25	1.4
Southbound MD MD 322 Left-Turn	Total	325'	260	223	1	120	3600	25	1.4
<u>Int 4: US 50 at MD 322</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound US 50 Left-Turn	Total	825'	225	429	0.6	90	3600	25	1.4
<u>Int 6: Peachblossom Road at S. Washington Street</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Peachblossom Rd. Left-Turn	Total	SPLIT	125	107	1	120	3600	25	1.4
Westbound Peachblossom St. Left/Thru/Right	Total	N/A	429	368	1	120	3600	25	1.4
Southwest S. Harrison St. Left/Thru/Right	Total	N/A	78	67	1	120	3600	25	1.4
Northbound S. Washington St. Left-Turn	Total	300'	123	105	1	120	3600	25	1.4
Southbound S. Washington St. Left-Turn	Total	75'	57	49	1	120	3600	25	1.4

Notes:

- Lane Use Factor applied as follows: 1 indicates single turn lane, 0.6 indicates a double left turn lane.
- Available queues were field measured.
- Maximum Queue (Ft) =
$$\frac{\text{Turning Volume (veh per hour)} \times \text{Lane Use Factor} \times \text{Cycle Length (Seconds)}}{3600 \text{ (Seconds per hour)}} \times 25 \text{ Feet/Vehicle} \times 1.4 \text{ Surge Factor}$$
- Cycle length was assumed based on CLV analyses and MDOT SHA's recommended maximum cycle lengths.
- Available queue not reported along approaches with split phasing given all movements along the approach operate simultaneously.



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MDOT SHA 95th Percentile Queues
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EXHIBIT
E2a

MDOT State Highway Administration Queuing Analysis Formula (Total - PM Peak Hour)

Intersection	Available Queue (Ft)	Maximum Queue (Ft)	Basic Critical Gap	Opposing Volume	Average Gap Opposing Vehicle	Avg Gap > Critical Gap?	Maximum Queue (ft)	Max Veh / Hour	Lane Use Factor	Cycle Length (seconds)*	Seconds / Hour	Feet / Vehicle	Surge Factor
Int 3: MD 322 at S. Washington Street													
Eastbound Tristan Dr. Left/Thru/Right	TBD	238	8.5	1392	2.59	No	238	245	1	100	3600	25	1.4
Westbound S. Washington St.. Left/Thru/Right	N/A	179	8.5	1454	2.48	No	179	184	1	100	3600	25	1.4
Northbound MD 322 Left-Turn	325'	10	5.5	647	5.56	Yes	10	107	1	9.5	3600	25	1.4
Southbound MD 322 Left-Turn	325'	5	5.5	508	7.09	Yes	5	54	1	9.5	3600	25	1.4
Intersection	Available Queue (Ft)	Maximum Queue (Ft)	Basic Critical Gap	Opposing Volume	Average Gap Opposing Vehicle	Avg Gap > Critical Gap?	Maximum Queue (ft)	Max Veh / Hour	Lane Use Factor	Cycle Length (seconds)*	Seconds / Hour	Feet / Vehicle	Surge Factor
Int 5: Oxford Rd. at Site Access													
Westbound Oxford Rd. Left/Thru	N/A	5	5.0	467	7.71	Yes	5	62	1	9	3600	25	1.4
Northbound Site Access Left/Right	TBD	48	6.5	1101	3.27	No	48	55	1	90	3600	25	1.4

- NOTES: 1. MDOT SHA Queuing Methodology above obtained from Appendix E-1 (for Unsignalized Intersections) of the MDOT SHA Access Permits Manual.
2. Available queues were field measured.
3. Maximum Queue (Ft) = $\frac{\text{Turning Volume (veh per hour)} \times \text{Lane Use Factor} \times \text{Cycle Length (Seconds)}}{3600 \text{ (Seconds per hour)}}$ x 25 Feet/Vehicle x 1.4 Surge Factor
4. If the Avg Gap is greater than the Critical Gap, then the cycle length is the Critical Gap plus 4 seconds. If the Avg Gap is less than Critical Gap, then analyze as if a signal were in place.



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MDOT SHA 95th Percentile Queues
 For Unsignalized Intersections

EXHIBIT
 E1b

MDOT State Highway Administration Queuing Analysis Formula for Signalized Intersections (Total - Sat Midday Peak Hour)

<u>Int 1: MD 322 at Port Street</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Port Street Left/Thru/Right	Total	N/A	74	63	1	120	3600	25	1.4
Westbound Port Street Left/Thru/Right	Total	N/A	208	178	1	120	3600	25	1.4
Northbound MD 322 Left-Turn	Total	225'	15	13	1	120	3600	25	1.4
Southbound MD MD 322 Left-Turn	Total	225'	82	70	1	120	3600	25	1.4
<u>Int 2: MD 322 at Peachblossom Road</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Oxford Road Left-Turn	Total	SPLIT	434	372	1	120	3600	25	1.4
Westbound Peachblossom Rd. Thru/Left	Total	N/A	245	210	1	120	3600	25	1.4
Northbound MD 322 Left-Turn	Total	325'	93	80	1	120	3600	25	1.4
Southbound MD MD 322 Left-Turn	Total	325'	214	183	1	120	3600	25	1.4
<u>Int 4: US 50 at MD 322</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound US 50 Left-Turn	Total	825'	244	465	0.6	90	3600	25	1.4
<u>Int 6: Peachblossom Road at S. Washington Street</u>		<u>Available Queue</u>	<u>Maximum Queue (ft)</u>	<u>Veh / Hour</u>	<u>Lane Use Factor</u>	<u>Cycle Length (seconds)*</u>	<u>Seconds / Hour</u>	<u>Feet / Vehicle</u>	<u>Surge Factor</u>
Eastbound Peachblossom Rd. Left-Turn	Total	SPLIT	149	153	1	100	3600	25	1.4
Westbound Peachblossom St. Left/Thru/Right	Total	N/A	250	257	1	100	3600	25	1.4
Southwest S. Harrison St. Left/Thru/Right	Total	N/A	44	45	1	100	3600	25	1.4
Northbound S. Washington St. Left-Turn	Total	300'	82	84	1	100	3600	25	1.4
Southbound S. Washington St. Left-Turn	Total	75'	33	34	1	100	3600	25	1.4

Notes:

- Lane Use Factor applied as follows: 1 indicates single turn lane, 0.6 indicates a double left turn lane.
- Available queues were field measured.
- Maximum Queue (Ft) =
$$\frac{\text{Turning Volume (veh per hour)} \times \text{Lane Use Factor} \times \text{Cycle Length (Seconds)}}{3600 \text{ (Seconds per hour)}} \times 25 \text{ Feet/Vehicle} \times 1.4 \text{ Surge Factor}$$
- Cycle length was assumed based on CLV analyses and MDOT SHA's recommended maximum cycle lengths.
- Available queue not reported along approaches with split phasing given all movements along the approach operate simultaneously.



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MDOT SHA 95th Percentile Queues
For Signalized Intersections

EXHIBIT
E3a

MDOT State Highway Administration Queuing Analysis Formula (Total - Saturday Midday Peak Hour)

Intersection	Available Queue (Ft)	Maximum Queue (Ft)	Basic Critical Gap	Opposing Volume	Average Gap Opposing Vehicle	Avg Gap > Critical Gap?	Maximum Queue (ft)	Max Veh / Hour	Lane Use Factor	Cycle Length (seconds)*	Seconds / Hour	Feet / Vehicle	Surge Factor
Int 3: MD 322 at S. Washington Street													
Eastbound Tristan Dr. Left/Thru/Right	TBD	252	8.5	1267	2.84	No	252	259	1	100	3600	25	1.4
Westbound S. Washington St.. Left/Thru/Right	N/A	170	8.5	1346	2.67	No	170	175	1	100	3600	25	1.4
Northbound MD 322 Left-Turn	325'	11	5.5	509	7.07	Yes	11	114	1	9.5	3600	25	1.4
Southbound MD 322 Left-Turn	325'	6	5.5	518	6.95	Yes	6	60	1	9.5	3600	25	1.4
Intersection	Available Queue (Ft)	Maximum Queue (Ft)	Basic Critical Gap	Opposing Volume	Average Gap Opposing Vehicle	Avg Gap > Critical Gap?	Maximum Queue (ft)	Max Veh / Hour	Lane Use Factor	Cycle Length (seconds)*	Seconds / Hour	Feet / Vehicle	Surge Factor
Int 5: Oxford Rd. at Site Access													
Westbound Oxford Rd. Left/Thru	N/A	7	5.0	565	6.37	Yes	7	81	1	9	3600	25	1.4
Northbound Site Access Left/Right	TBD	95	6.5	1158	3.11	No	95	109	1	90	3600	25	1.4

- NOTES: 1. MDOT SHA Queuing Methodology above obtained from Appendix E-1 (for Unsignalized Intersections) of the MDOT SHA Access Permits Manual.
2. Available queues were field measured.
3. Maximum Queue (Ft) = $\frac{\text{Turning Volume (veh per hour)} \times \text{Lane Use Factor} \times \text{Cycle Length (Seconds)}}{3600 \text{ (Seconds per hour)}}$ x 25 Feet/Vehicle x 1.4 Surge Factor
4. If the Avg Gap is greater than the Critical Gap, then the cycle length is the Critical Gap plus 4 seconds. If the Avg Gap is less than Critical Gap, then analyze as if a signal were in place.



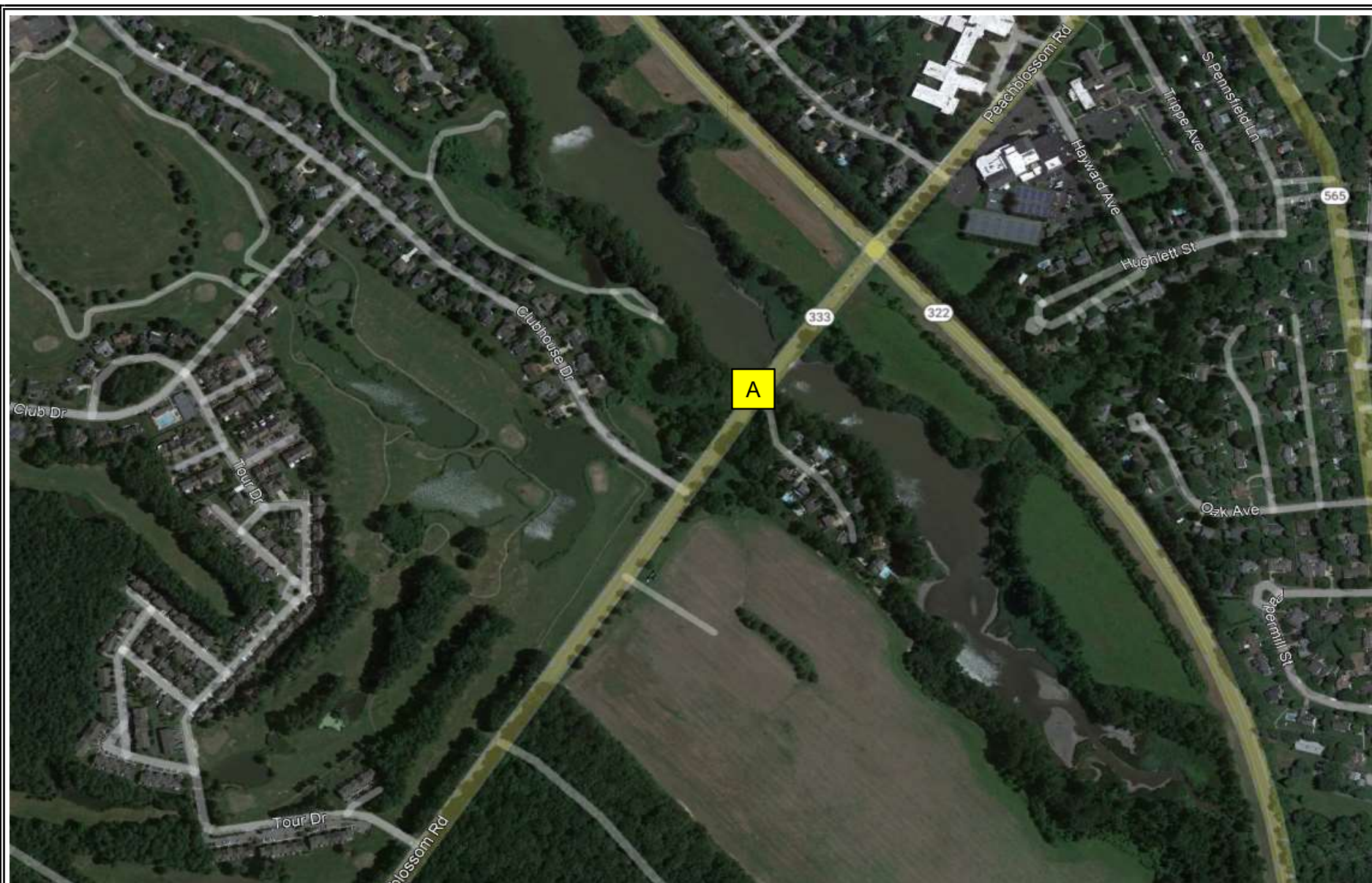
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MDOT SHA 95th Percentile Queues
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EXHIBIT
 E3b

Appendix F

Analysis of
Oxford Road at Pollys Hill Lane



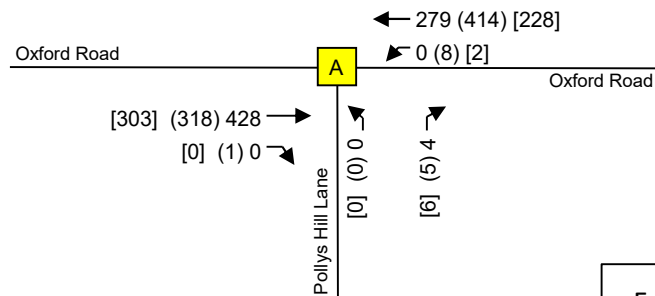
Traffic Impact Analysis

Pollys Hill Lane Location Map

**Exhibit
F1**

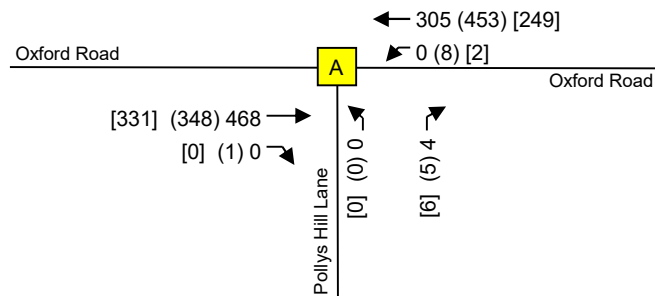


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Existing traffic volumes are based on an actual traffic count conducted on December 1st, 2022 (Thursday) and December 3rd, 2022 (Saturday).

Traffic Impact Analysis	Existing Peak Hour Volumes	Exhibit F2
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1.5%	Annual Growth
6	Year Build-out
1.09	Growth Factor

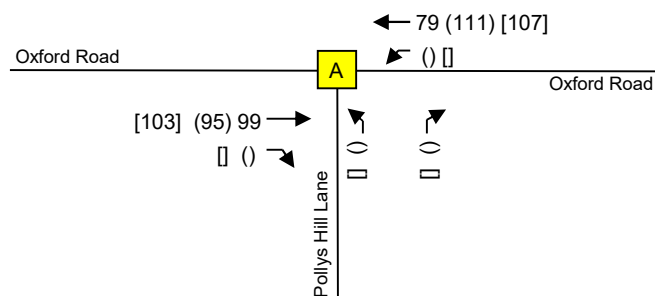
Traffic Impact Analysis



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Base
Peak Hour Volumes

**Exhibit
F3**



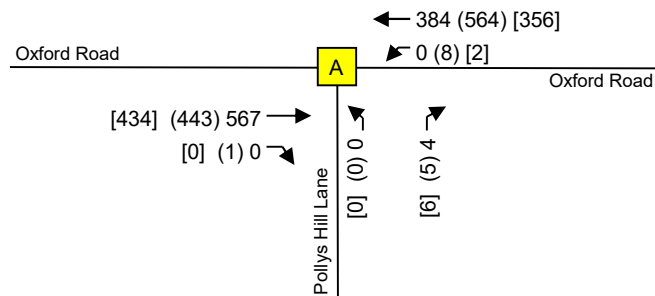
Traffic Impact Analysis



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Combined Trips Generated by
Background Developments

**Exhibit
F4**



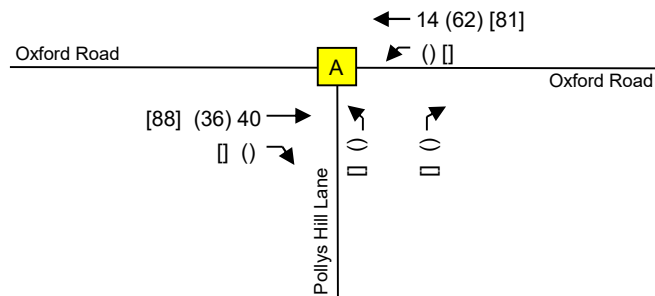
Traffic Impact Analysis



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Background
 Peak Hour Volumes

**Exhibit
 F5**



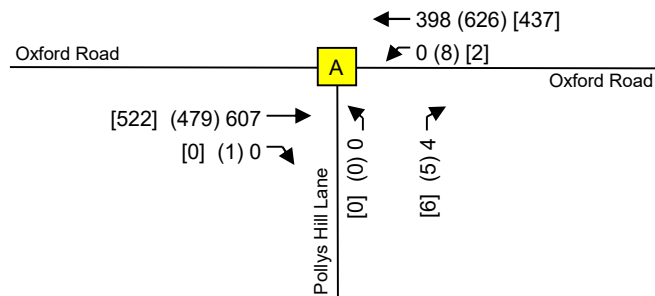
Traffic Impact Analysis



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Combined Trips Generated by
Poplar Hill Development

**Exhibit
F6**



Traffic Impact Analysis		Total Peak Hour Volumes	Exhibit F8
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Traffic Count Worksheets for Oxford Road at Pollys Hill Lane

	Weekday Morning Peak Hour (7 am - 9 am)																				
	Pollys Hill Ln Northbound					N/A Southbound					Oxford Road Eastbound					Oxford Road Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:00-7:15	0	0		0	0					0	0		66	0	0	0	0	0	32	0	98
7:15-7:30	0	0		1	0					0	0		86	0	0	0	0	0	45	0	132
7:30-7:45	0	0		0	0					0	0		81	0	0	0	0	2	64	0	147
7:45-8:00	0	0		2	0					0	0		129	0	0	0	0	0	85	0	216
8:00-8:15	0	0		0	0					0	0		111	0	0	0	0	0	61	0	172
8:15-8:30	0	0		1	0					0	0		110	0	0	0	0	0	62	0	173
8:30-8:45	0	0		1	0					0	0		78	0	0	0	0	0	71	0	150
8:45-9:00	0	0		0	0					0	0		98	0	0	0	0	0	93	0	191

Hourly Totals																			
7:00-8:00	0	0	3	0	0	0	362	0	0	0	2	226	0	593					
7:15-8:15	0	0	3	0	0	0	407	0	0	0	2	255	0	667					
7:30-8:30	0	0	3	0	0	0	431	0	0	0	2	272	0	708					
7:45-8:45	0	0	4	0	0	0	428	0	0	0	0	279	0	711					
8:00-9:00	0	0	2	0	0	0	397	0	0	0	0	287	0	686					

AM	Northbound					Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:45-8:45	0	0		4	0					0	0		428	0	0	0	0	279		0	711

Time:	Weekday Evening Peak Hour (4 pm - 6 pm)																			Total	
	Pollys Hill Ln Northbound					N/A Southbound					Oxford Road Eastbound					Oxford Road Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right		Peds
4:00-4:15	0	0		1	0					0	0		88	0	0	0	1	109		0	199
4:15-4:30	0	0		2	0					0	0		76	0	0	0	0	88		0	166
4:30-4:45	0	0		1	0					0	0		101	0	0	0	3	106		0	211
4:45-5:00	0	0		3	0					0	0		76	0	0	0	3	83		0	165
5:00-5:15	0	0		1	0					0	0		81	0	0	0	1	120		0	203
5:15-5:30	0	0		0	0					0	0		60	1	0	0	1	105		0	167
5:30-5:45	0	0		0	0					0	0		50	0	0	0	1	100		0	151
5:45-6:00	0	0		0	0					0	0		48	0	0	0	0	88		0	136

Hourly Totals																				
4:00-5:00	0	0	7	0	0	0	341	0	0	0	7	386	0	741						
4:15-5:15	0	0	7	0	0	0	334	0	0	0	7	397	0	745						
4:30-5:30	0	0	5	0	0	0	318	1	0	0	8	414	0	746						
4:45-5:45	0	0	4	0	0	0	267	1	0	0	6	408	0	686						
5:00-6:00	0	0	1	0	0	0	239	1	0	0	3	413	0	657						
PM	Northbound				Southbound				Eastbound				Westbound							
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total				
4:30-5:30	0	0		5	0					0	0		318	1	0	0	8	414	0	746

Peak Hour
Turning Movement Count



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Intersection: Oxford Road & Pollys Hill Ln
Weather: Clear
Count by: DSS
Count Day/Date: Thursday, December 1, 2022
County: Talbot

Time:	Saturday Peak Hour (10:00 am - 2:00 pm)																			Total		
	Pollys Hill Ln Northbound					N/A Southbound					Oxford Road Eastbound					Oxford Road Westbound						
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right		Peds	
10:00-10:15	0	0		0	0					0	0		72	1	0	0	0	1	44		0	118
10:15-10:30	0	0		0	0					0	0		53	0	0	0	0	1	43		0	97
10:30-10:45	0	0		0	0					0	0		64	0	0	0	0	0	46		0	110
10:45-11:00	0	0		5	0					0	0		93	0	0	0	0	0	45		0	143
11:00-11:15	0	0		1	0					0	0		72	0	0	0	0	0	64		0	137
11:15-11:30	0	0		0	0					0	0		71	0	0	0	0	1	48		0	120
11:30-11:45	0	0		0	0					0	0		67	0	0	0	0	1	71		0	139
11:45-12:00	0	1		0	0					0	0		69	0	0	0	0	0	67		0	137
12:00-12:15	0	0		0	0					0	0		65	0	0	0	0	0	72		0	137
12:15-12:30	0	1		0	0					0	0		64	0	0	0	0	2	54		0	121
12:30-12:45	0	0		1	0					0	0		63	0	0	0	0	0	57		0	121
12:45-1:00	0	0		1	0					0	0		59	1	0	0	0	2	53		0	116
1:00-1:15	0	0		0	0					0	0		50	0	0	0	0	0	70		0	120
1:15-1:30	0	0		0	0					0	0		49	0	0	0	0	1	78		0	128
1:30-1:45	0	0		2	0					0	0		70	0	0	0	0	1	71		0	144
1:45-2:00	0	0		2	0					0	0		60	0	0	0	0	1	48		0	111

Hourly Totals																						
10:00-11:00	0	0		5	0					0	0		282	1	0		0	2	178		0	468
10:15-11:15	0	0		6	0					0	0		282	0	0	0	0	1	198		0	487
10:30-11:30	0	0		6	0					0	0		300	0	0	0	0	1	203		0	510
10:45-11:45	0	0		6	0					0	0		303	0	0	0	0	2	228		0	539
11:00-12:00	0	1		1	0					0	0		279	0	0	0	0	2	250		0	533
11:15-12:15	0	1		0	0					0	0		272	0	0	0	0	2	258		0	533
11:30-12:30	0	2		0	0					0	0		265	0	0	0	0	3	264		0	534
11:45-12:45	0	2		1	0					0	0		261	0	0	0	0	2	250		0	516
12:00-1:00	0	1		2	0					0	0		251	1	0	0	0	4	236		0	495
12:15-1:15	0	1		2	0					0	0		236	1	0	0	0	4	234		0	478
12:30-1:30	0	0		2	0					0	0		221	1	0	0	0	3	258		0	485
12:45-1:45	0	0		3	0					0	0		228	1	0	0	0	4	272		0	508
1:00-2:00	0	0		4	0					0	0		229	0	0	0	0	3	267		0	503
Sat.	Northbound					Southbound					Eastbound					Westbound						
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total	
10:45-11:45	0	0		6	0					0	0		303	0	0	0	0	2	228		0	539

Peak Hour
Turning Movement Count



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Intersection: Oxford Road & Pollys Hill Ln

Weather: Clear

Count by: DSS

Count Day/Date: Saturday, December 3, 2022

County: Talbot

CLV Worksheets for Oxford Road at Pollys Hill Lane

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: Oxford Road
Minor Street: Pollys Hill Lane
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

OXFORD ROAD

--- TL

	AM	PM
T	398	626
L	0	8

adjusted lefts 0 16

PM	AM	
479	607	T
1	0	R

TR ---

OXFORD ROAD

|
LR

Pollys Hill Lane

	L	R
AM	0	4
PM	0	5

Critical Lane Volume Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	4	1.00	4				4
EB	607	1.00	607	0	1.00	0	607
WB	398	1.00	398				
CLV TOTAL=							611
Level of Service (LOS) =							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	5	1.00	5				5
EB	480	1.00	480	8	1.00	8	642
WB	642	1.00	642				
CLV TOTAL=							647
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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**Oxford Road &
 Pollys Hill Lane**
 (Total Traffic)

**Intersection
 A**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: Oxford Road
Minor Street: Pollys Hill Lane
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

OXFORD ROAD

--- TL

	SAT	
T	437	
L	2	

adjusted lefts 4

	SAT	
	522	T
	0	R

TR ---

OXFORD ROAD

|
LR

Pollys Hill Lane

	L	R
SAT	0	6

Critical Lane Volume Analysis

Sat. Midday Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	6	1.00	6			
EB	522	1.00	522	2	1.00	2
WB	441	1.00	441			
CLV TOTAL=						530
Level of Service (LOS) =						A

Critical Lane Volume Analysis



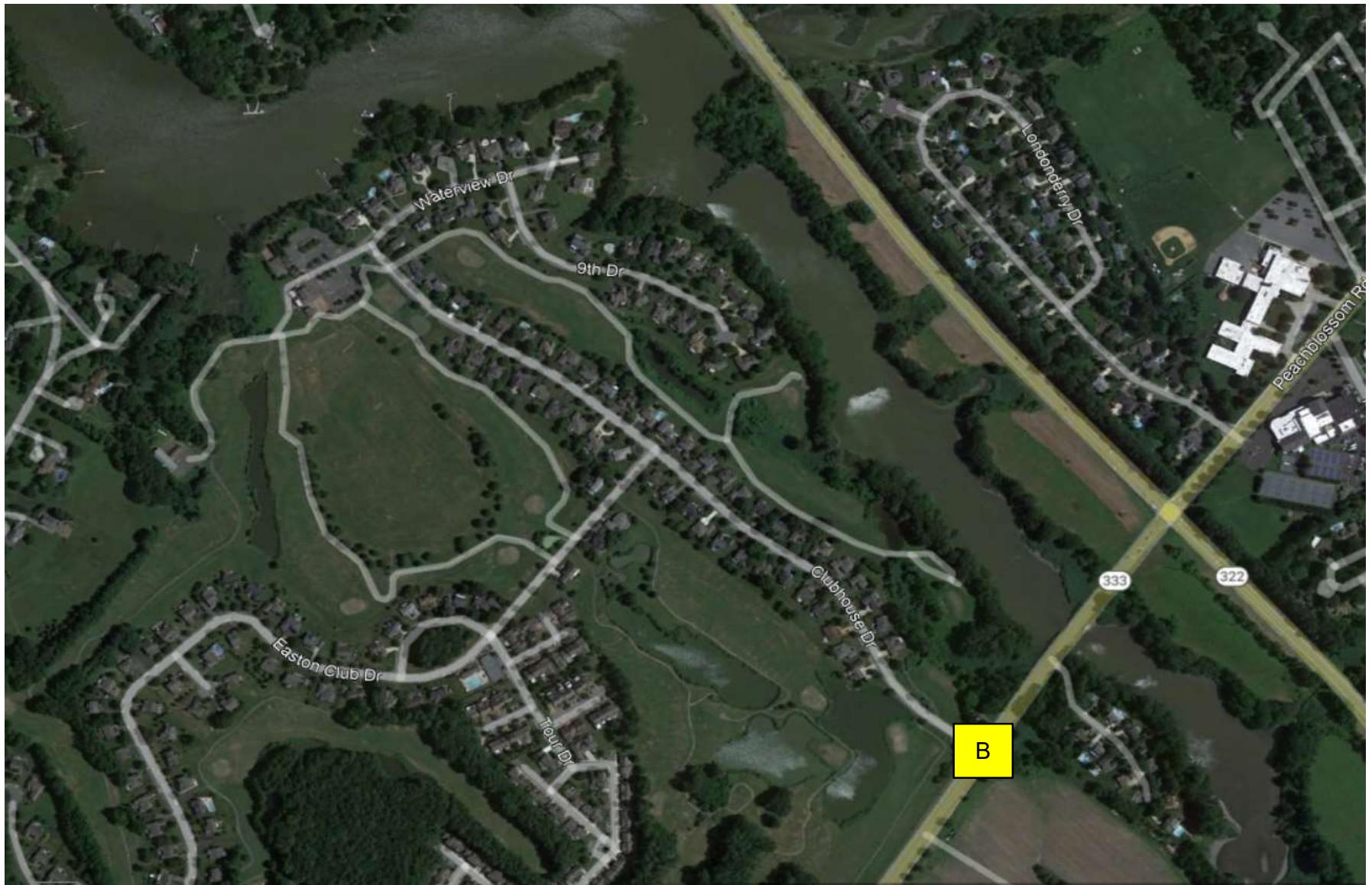
LENHART TRAFFIC CONSULTING, INC.
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Oxford Road &
 Pollys Hill Lane
 (Total Traffic)

Intersection
A

Appendix G

Analysis of
Oxford Road at Clubhouse Drive



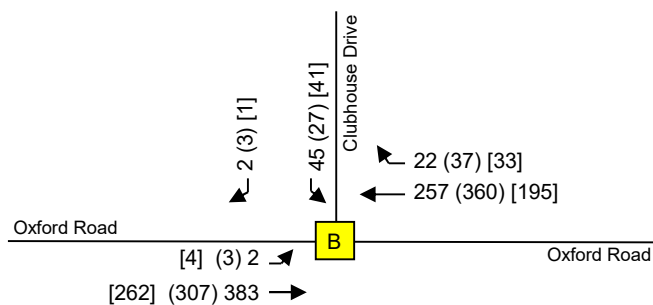
Traffic Impact Analysis



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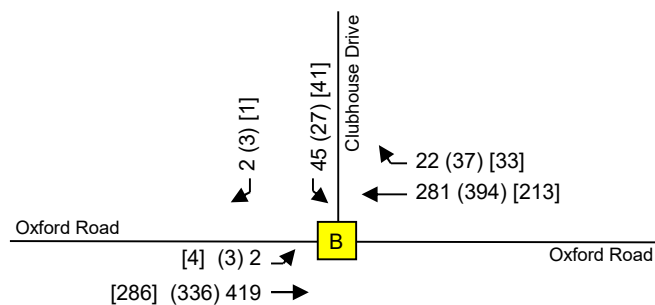
Clubhouse Drive Location Map

**Exhibit
G1**



Existing traffic volumes are based on an actual traffic count conducted on December 1st, 2022 (Thursday) and December 3rd, 2022 (Saturday).

Traffic Impact Analysis	Existing Peak Hour Volumes	Exhibit G2
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com		



1.5%	Annual Growth
6	Year Build-out
1.09	Growth Factor

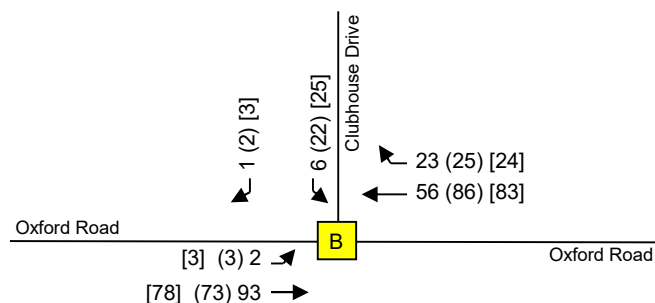
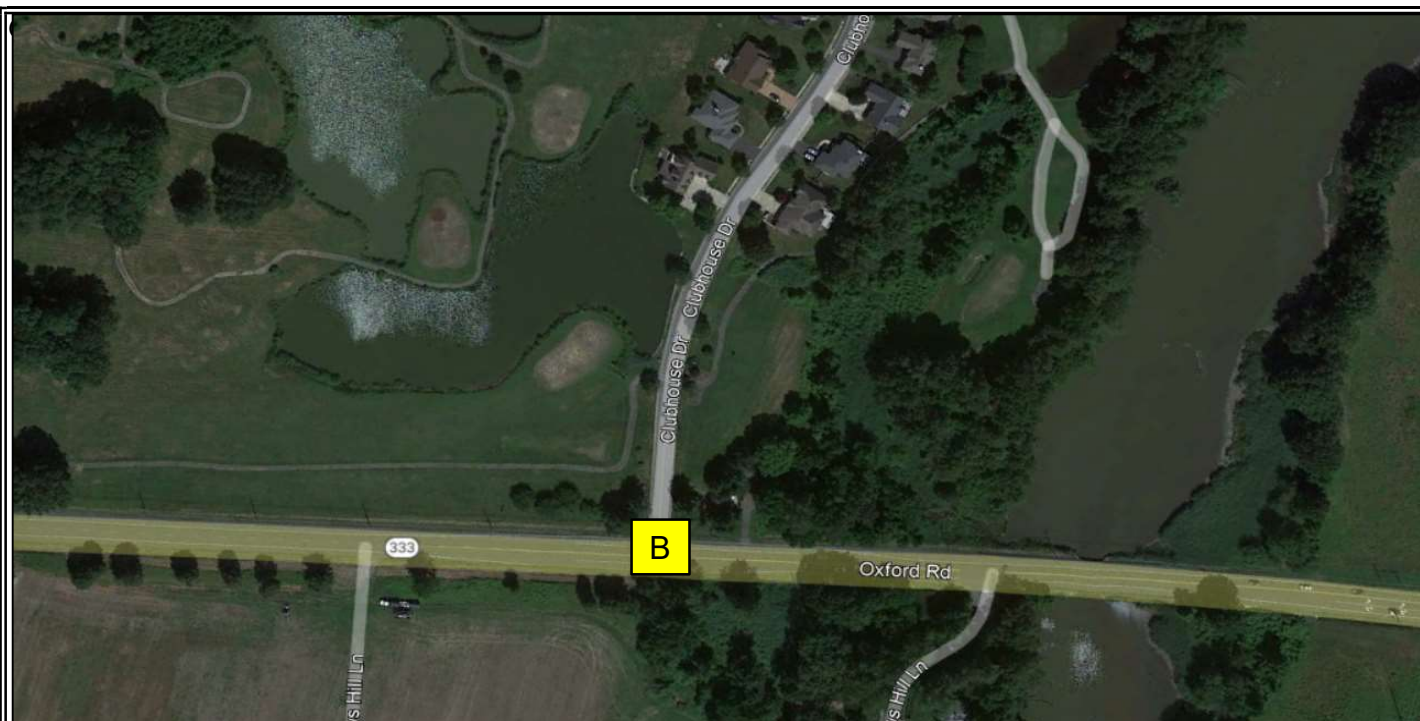
Traffic Impact Analysis



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Base
Peak Hour Volumes

**Exhibit
G3**



Note: At the time traffic counts were conducted, the Easton Club Golf Course was not operational. Given this is an approved use, the golf course was included under background conditions to account for "vested" trips.

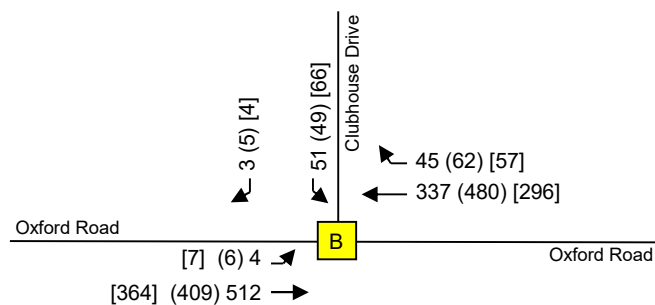
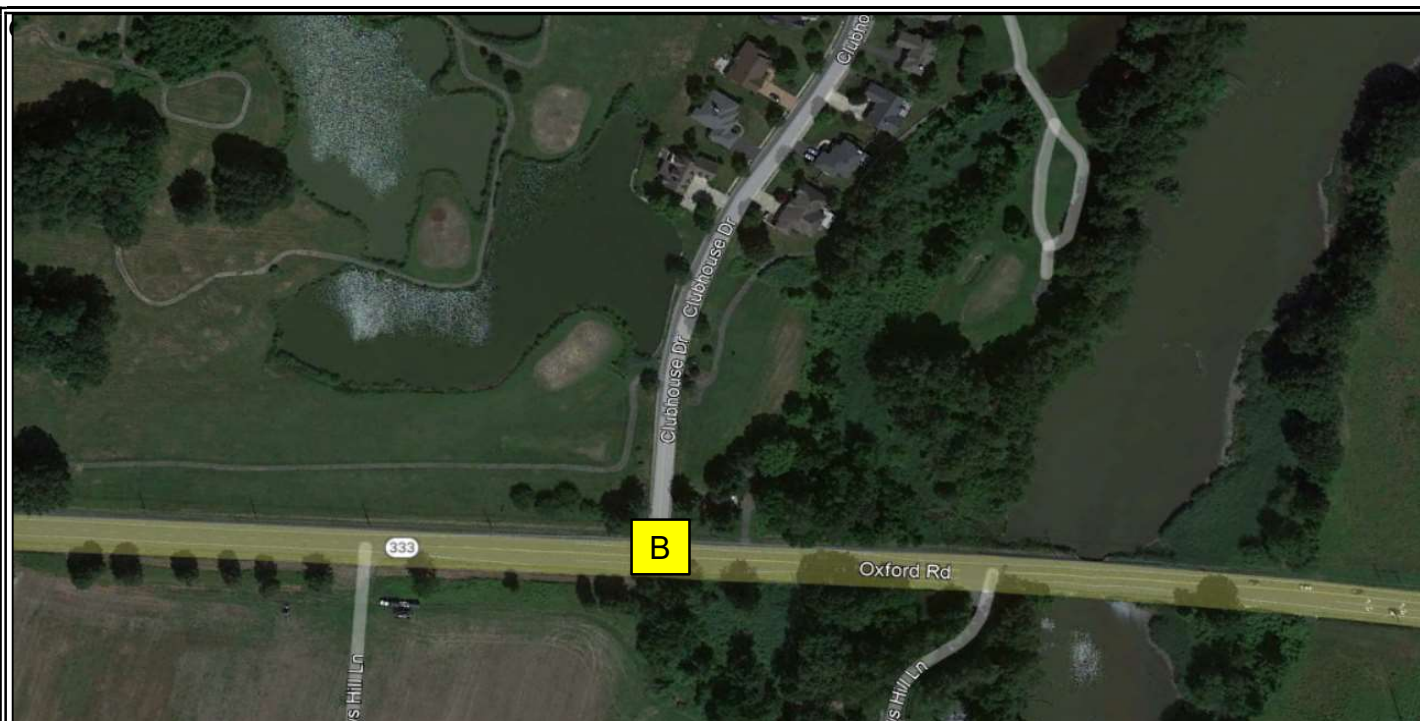
Traffic Impact Analysis



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Combined Trips Generated by Background Developments

Exhibit G4



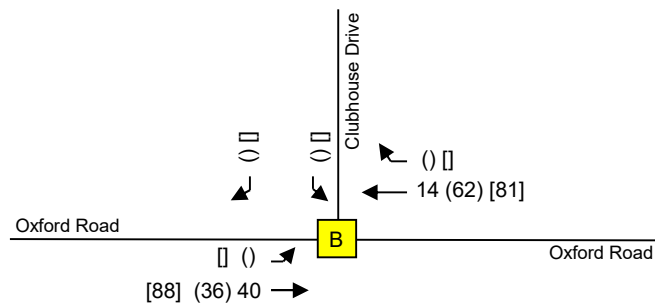
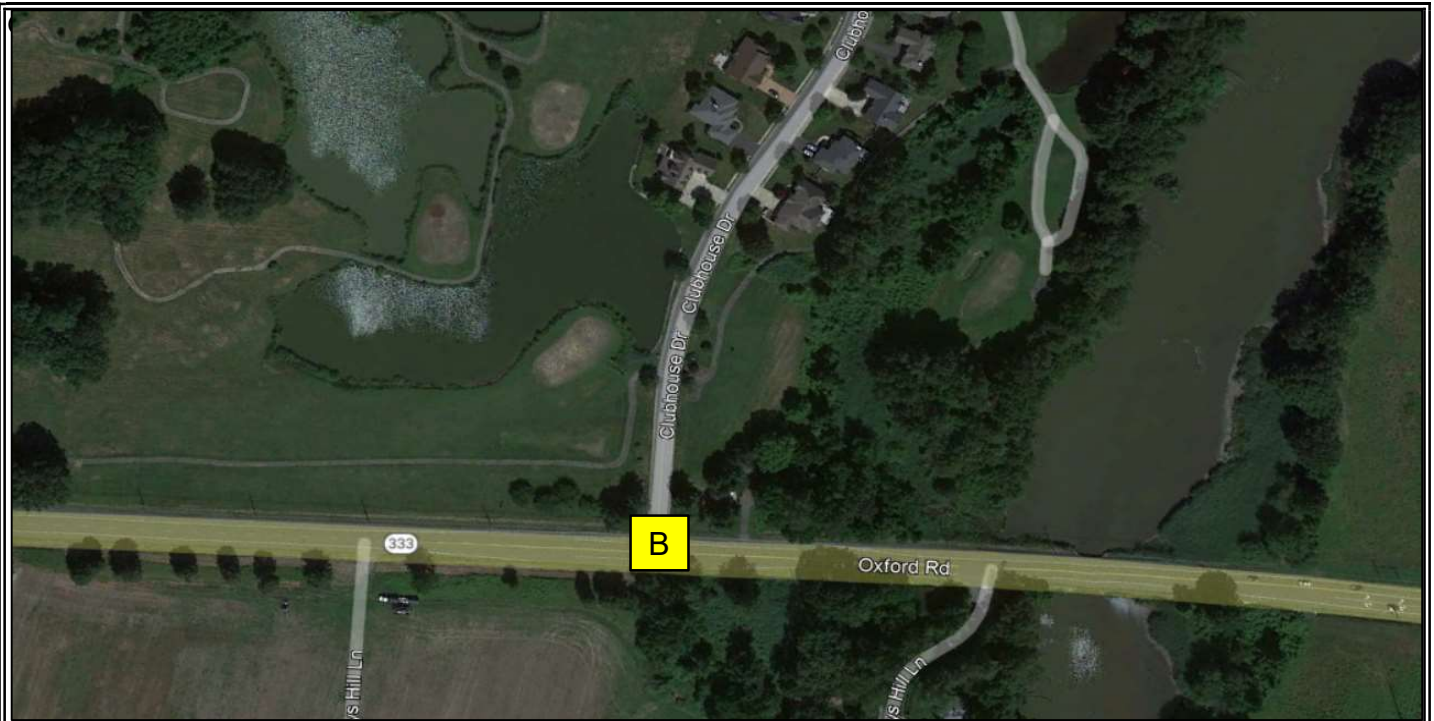
Traffic Impact Analysis



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Background
Peak Hour Volumes

**Exhibit
G5**



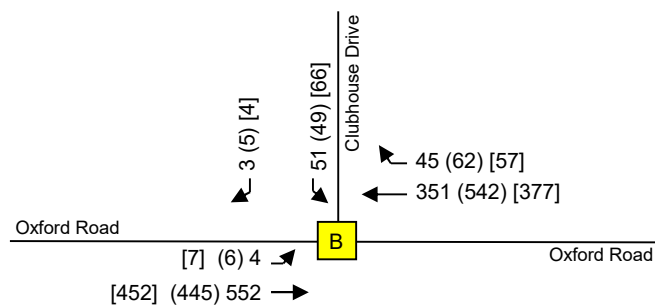
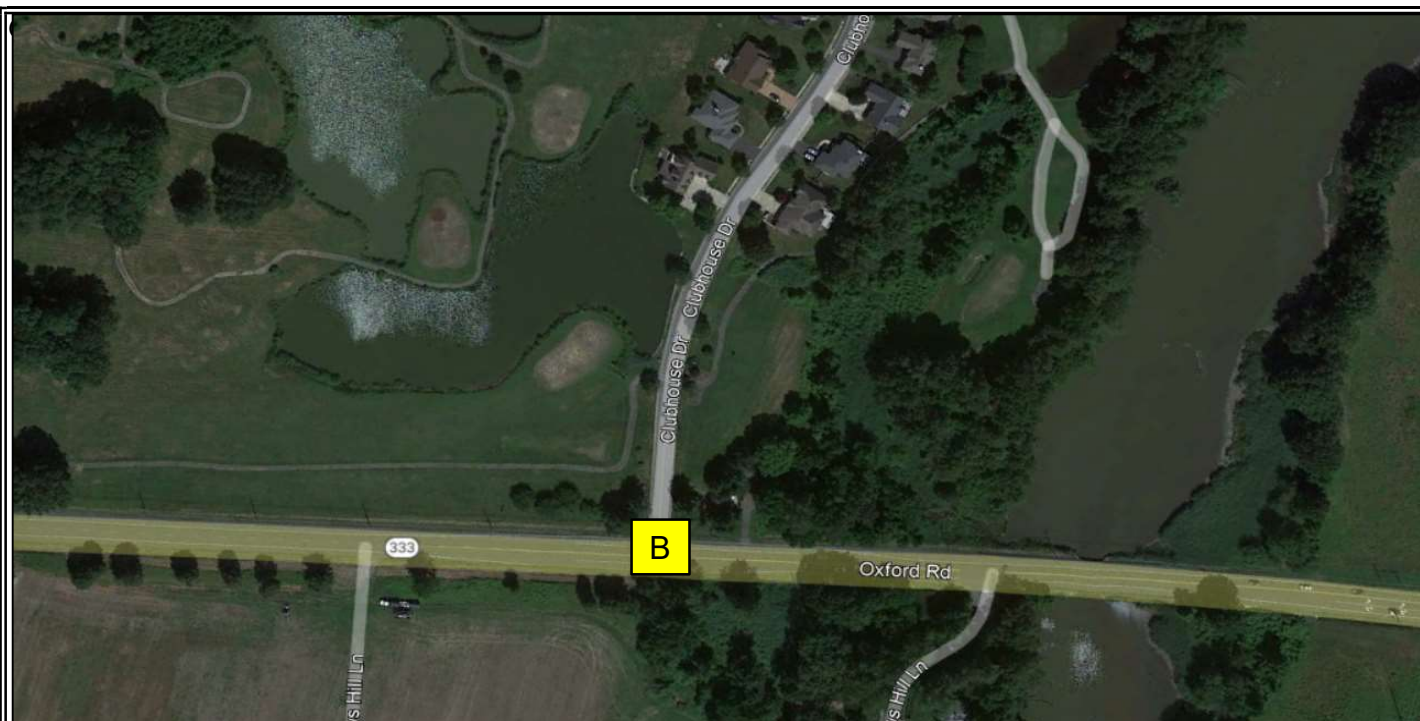
Traffic Impact Analysis



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Combined Trips Generated by Poplar Hill Development

Exhibit G6



Traffic Impact Analysis



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Total
Peak Hour Volumes

**Exhibit
G7**

Traffic Count Worksheets for Oxford Road at Clubhouse Drive

Weekday Morning Peak Hour (7 am - 9 am)																				
Time:	N/A Northbound					Clubhouse Dr Southbound					Oxford Road Eastbound					Oxford Road Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
7:00-7:15					0	0	8		0	0	0	1	58		0	0		29	3	0
7:15-7:30					0	0	14		0	0	0	0	72		0	0		43	2	0
7:30-7:45					0	0	5		0	0	0	0	76		0	0		62	2	0
7:45-8:00					0	0	12		0	0	0	0	117		0	0		78	7	0
8:00-8:15					0	0	12		0	0	0	0	99		0	0		55	6	0
8:15-8:30					0	0	13		1	0	0	0	97		0	0		56	6	0
8:30-8:45					0	0	8		1	0	0	2	70		0	0		68	3	0
8:45-9:00					0	0	11		0	0	0	0	87		0	0		88	5	0

Hourly Totals																				
7:00-8:00					0	0	39		0	0	0	1	323		0	0		212	14	0
7:15-8:15					0	0	43		0	0	0	0	364		0	0		238	17	0
7:30-8:30					0	0	42		1	0	0	0	389		0	0		251	21	0
7:45-8:45					0	0	45		2	0	0	2	383		0	0		257	22	0
8:00-9:00					0	0	44		2	0	0	2	353		0	0		267	20	0
AM																				
Peak Hour	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
7:45-8:45					0	0	45		2	0	0	2	383		0	0		257	22	0

Weekday Evening Peak Hour (4 pm - 6 pm)																				
Time:	N/A Northbound					Clubhouse Dr Southbound					Oxford Road Eastbound					Oxford Road Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
4:00-4:15					0	0	7		1	0	0	1	81		0	0		95	14	0
4:15-4:30					0	0	5		2	0	0	1	71		0	0		79	9	0
4:30-4:45					0	0	6		0	0	0	0	95		0	0		100	6	0
4:45-5:00					0	0	13		0	0	0	2	63		0	0		75	8	0
5:00-5:15					0	0	3		1	0	0	0	78		0	0		106	14	0
5:15-5:30					0	0	4		0	0	0	0	57		0	0		90	15	0
5:30-5:45					0	0	5		0	0	0	0	45		0	0		90	10	0
5:45-6:00					0	0	3		1	0	0	2	45		0	0		80	8	0

Hourly Totals																				
4:00-5:00					0	0	31		3	0	0	4	310		0	0		349	37	0
4:15-5:15					0	0	27		3	0	0	3	307		0	0		360	37	0
4:30-5:30					0	0	26		1	0	0	2	293		0	0		371	43	0
4:45-5:45					0	0	25		1	0	0	2	243		0	0		361	47	0
5:00-6:00					0	0	15		2	0	0	2	225		0	0		366	47	0
PM																				
Peak Hour	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
4:15-5:15					0	0	27		3	0	0	3	307		0	0		360	37	0

Peak Hour Turning Movement Count		Intersection: Oxford Road & Clubhouse Dr Weather: Clear Count by: DSS Count Day/Date: Thursday, December 1, 2022 County: Talbot	
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com			

Saturday Peak Hour (10:00 am - 2:00 pm)																				
Time:	N/A Northbound					Clubhouse Dr Southbound					Oxford Road Eastbound					Oxford Road Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
10:00-10:15					0	0	8		0	0	0	0	65		0	0		38	6	0
10:15-10:30					0	0	6		0	0	0	0	47		0	0		37	6	0
10:30-10:45					0	0	11		0	0	0	0	53		0	0		40	6	0
10:45-11:00					0	0	14		1	0	0	0	79		0	0		41	4	0
11:00-11:15					0	0	9		0	0	0	0	63		0	0		55	9	0
11:15-11:30					0	0	7		0	0	0	1	64		0	0		39	9	0
11:30-11:45					0	0	11		0	0	0	3	56		0	0		60	11	0
11:45-12:00					0	0	12		0	0	0	0	57		0	0		54	14	0
12:00-12:15					0	0	8		0	0	0	0	57		0	0		68	4	0
12:15-12:30					0	0	5		0	0	0	0	59		0	0		46	9	0
12:30-12:45					0	0	12		0	0	0	0	51		0	0		49	8	0
12:45-1:00					0	0	13		0	0	0	0	47		0	0		46	7	0
1:00-1:15					0	0	5		2	0	0	1	45		0	0		66	4	0
1:15-1:30					0	0	6		0	0	0	0	43		0	0		65	13	0
1:30-1:45					0	0	10		0	0	0	1	60		0	0		62	9	0
1:45-2:00					0	0	9		1	0	0	0	51		0	0		41	7	0

Hourly Totals																				
10:00-11:00					0	0	39		1	0	0	0	244		0	0		156	22	0
10:15-11:15					0	0	40		1	0	0	0	242		0	0		173	25	0
10:30-11:30					0	0	41		1	0	0	1	259		0	0		175	28	0
10:45-11:45					0	0	41		1	0	0	4	262		0	0		195	33	0
11:00-12:00					0	0	39		0	0	0	4	240		0	0		208	43	0
11:15-12:15					0	0	38		0	0	0	4	234		0	0		221	38	0
11:30-12:30					0	0	36		0	0	0	3	229		0	0		228	38	0
11:45-12:45					0	0	37		0	0	0	0	224		0	0		217	35	0
12:00-1:00					0	0	38		0	0	0	0	214		0	0		209	28	0
12:15-1:15					0	0	35		2	0	0	1	202		0	0		207	28	0
12:30-1:30					0	0	36		2	0	0	1	186		0	0		226	32	0
12:45-1:45					0	0	34		2	0	0	2	195		0	0		239	33	0
1:00-2:00					0	0	30		3	0	0	2	199		0	0		234	33	0
Sat.	Northbound					Southbound					Eastbound					Westbound				
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
10:45-11:45					0	0	41		1	0	0	4	262		0	0		195	33	0

Peak Hour
Turning Movement Count



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SEVERNA PARK, MD 21146
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Intersection: Oxford Road & Clubhouse Dr

Weather: Clear

Count by: DSS

Count Day/Date: Saturday, December 3, 2022

County: Talbot

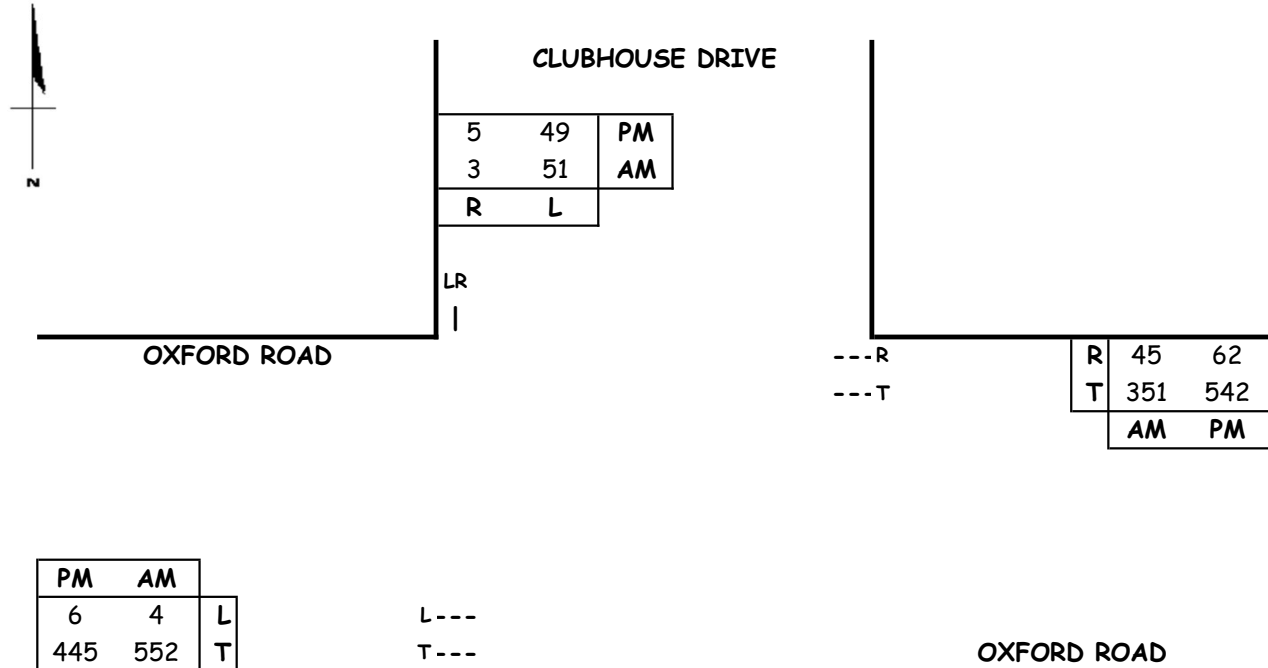
CLV Worksheets for Oxford Road at Clubhouse Drive

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Oxford Road
and: Clubhouse Drive
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	54	1.00	54			
EB	552	1.00	552			
WB	351	1.00	351	4	1.00	4
CLV TOTAL=						606
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	54	1.00	54			
EB	445	1.00	445			
WB	542	1.00	542	6	1.00	6
CLV TOTAL=						602
Level of Service (LOS) =						A

Critical Lane Volume Analysis



Oxford Road &
Clubhouse Drive
(Total Traffic)

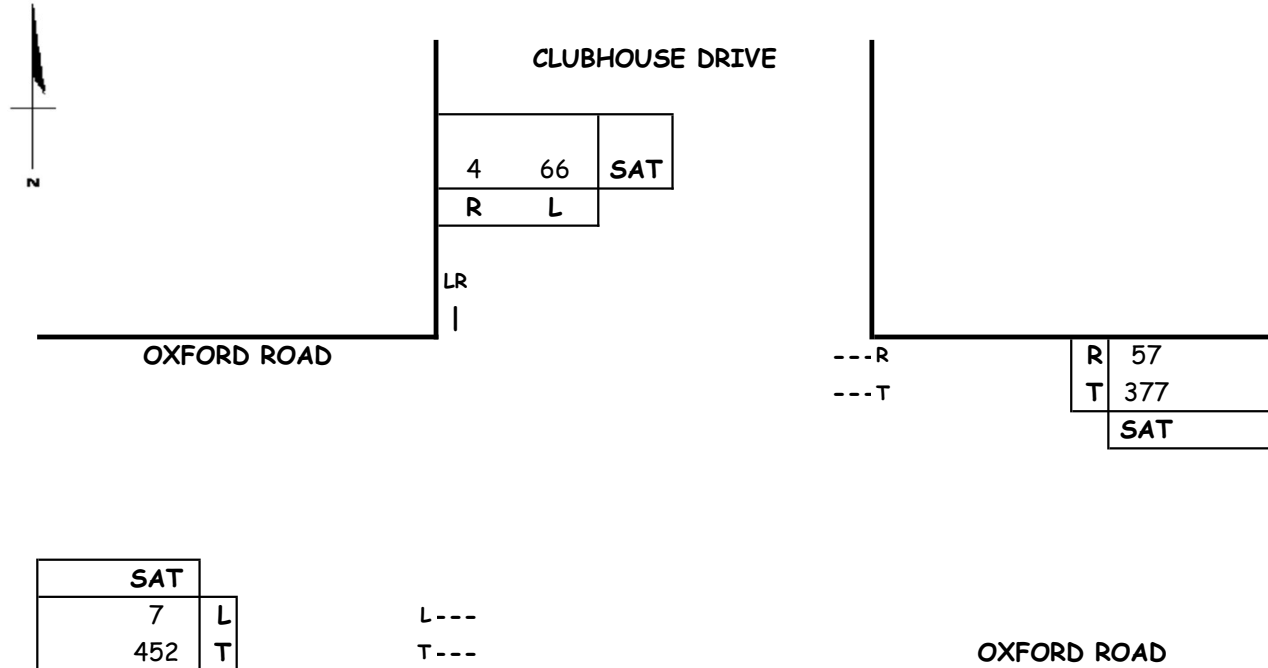
**Intersection
B**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Oxford Road
and: Clubhouse Drive
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Saturday Midday Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	70	1.00	70		
EB	452	1.00	452		
WB	377	1.00	377	7	1.00 7
CLV TOTAL=					522
Level of Service (LOS)=					A

Critical Lane Volume Analysis

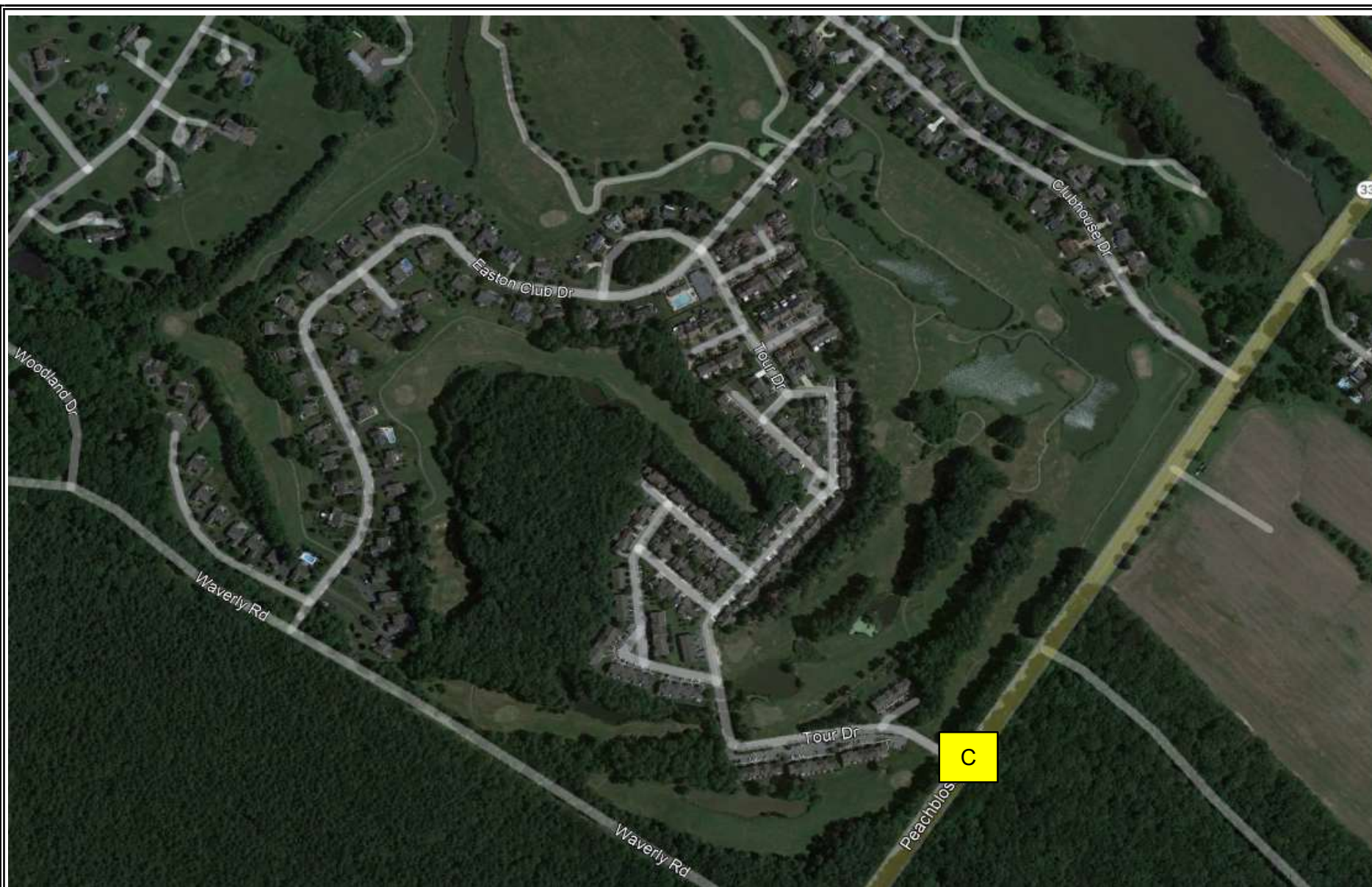
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Oxford Road &
Clubhouse Drive
(Total Traffic)

**Intersection
B**

Appendix H

Analysis of
Oxford Road at Tour Drive



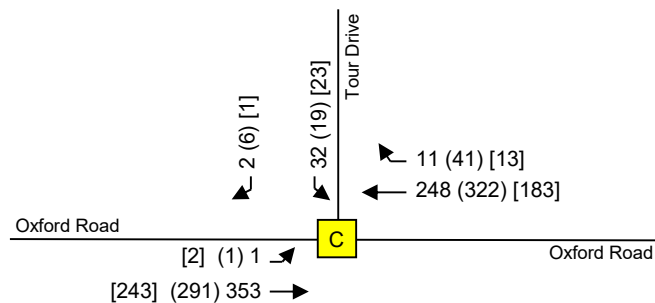
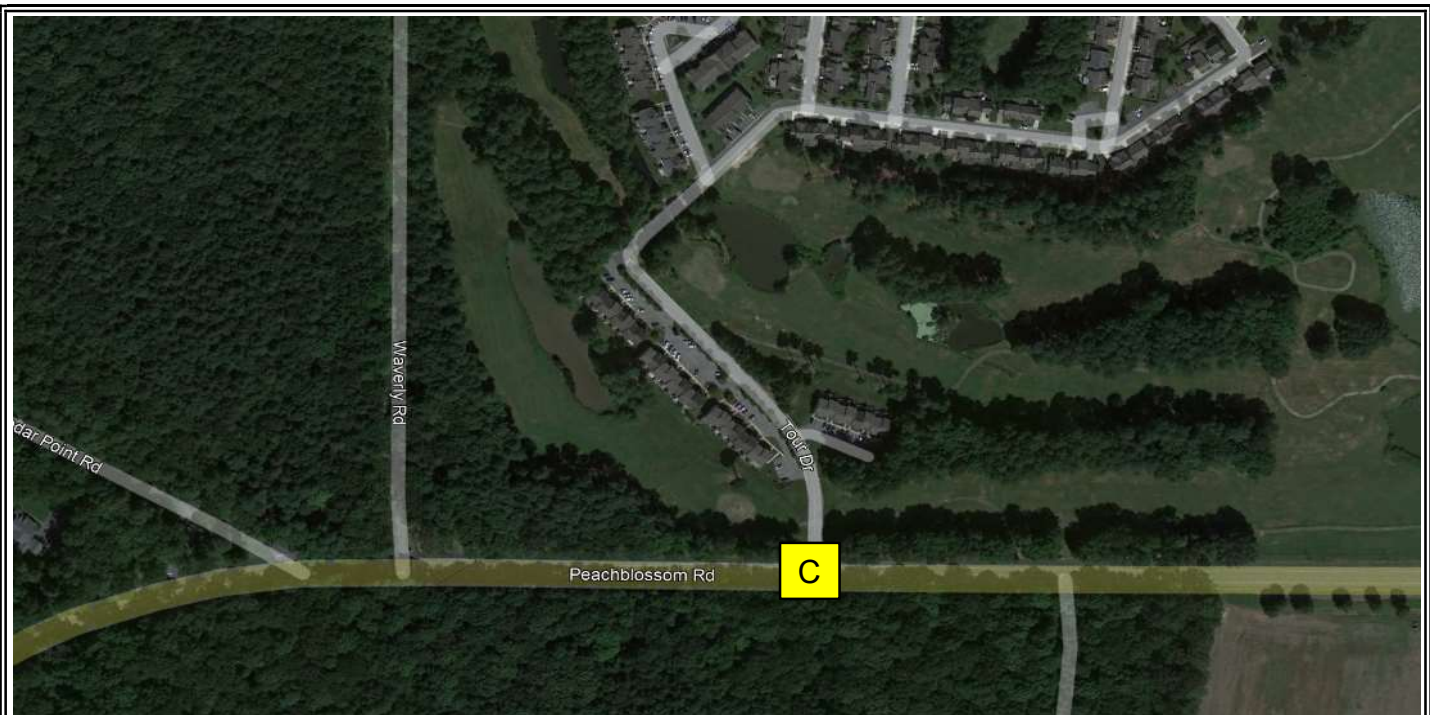
Traffic Impact Analysis



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Tour Drive Location Map

**Exhibit
H1**



Existing traffic volumes are based on an actual traffic count conducted on December 1st, 2022 (Thursday) and December 3rd, 2022 (Saturday).

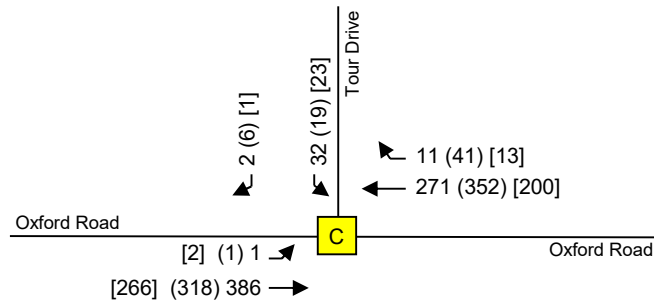
Traffic Impact Analysis



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Existing Peak Hour Volumes

Exhibit H2



1.5%	Annual Growth
6	Year Build-out
1.09	Growth Factor

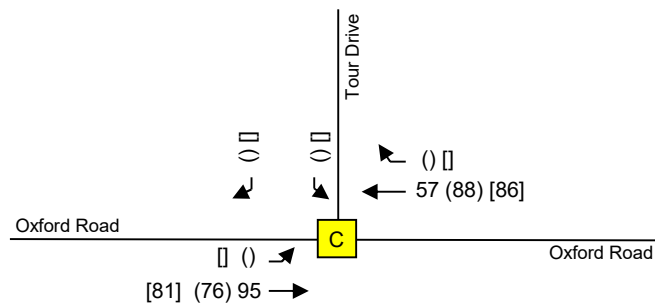
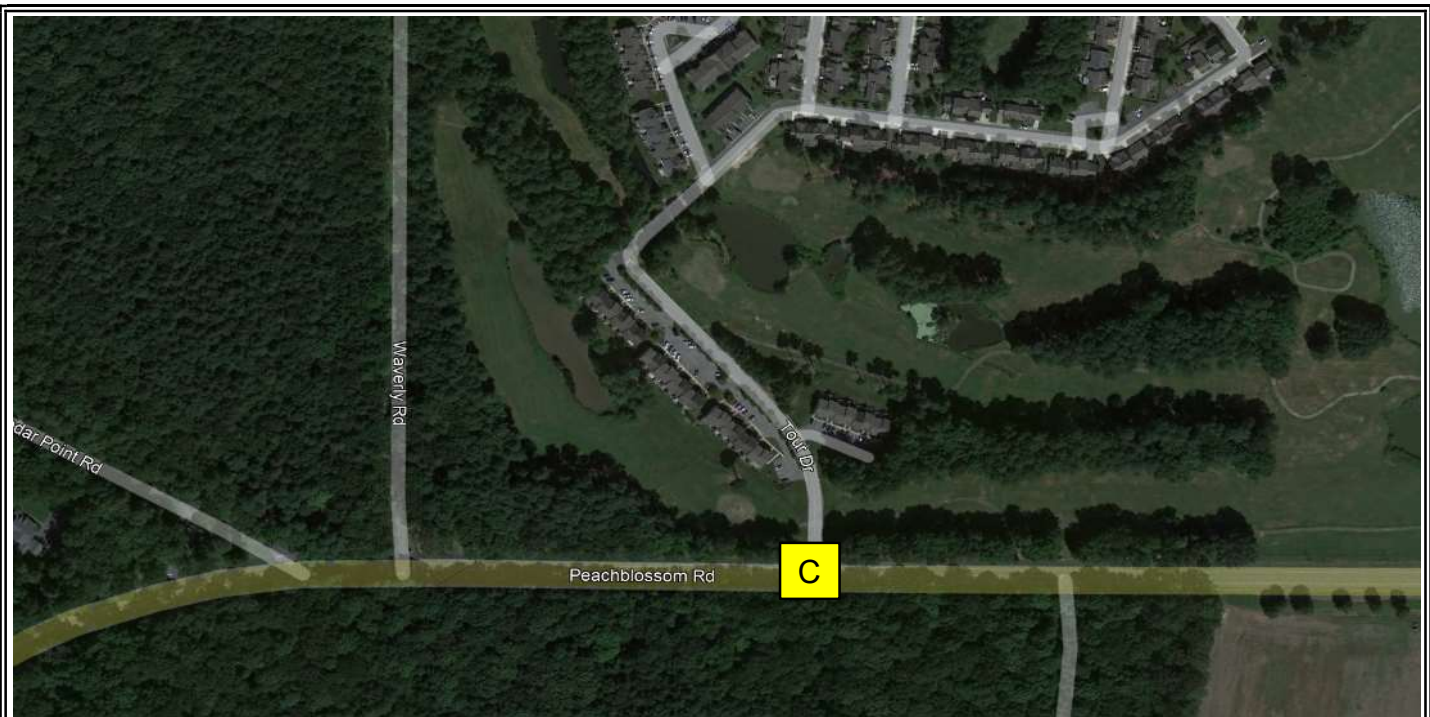
Traffic Impact Analysis



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Base
Peak Hour Volumes

**Exhibit
H3**



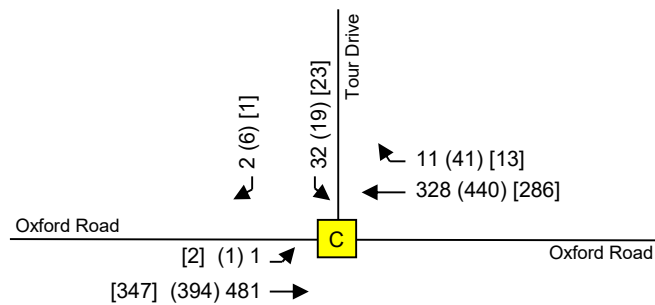
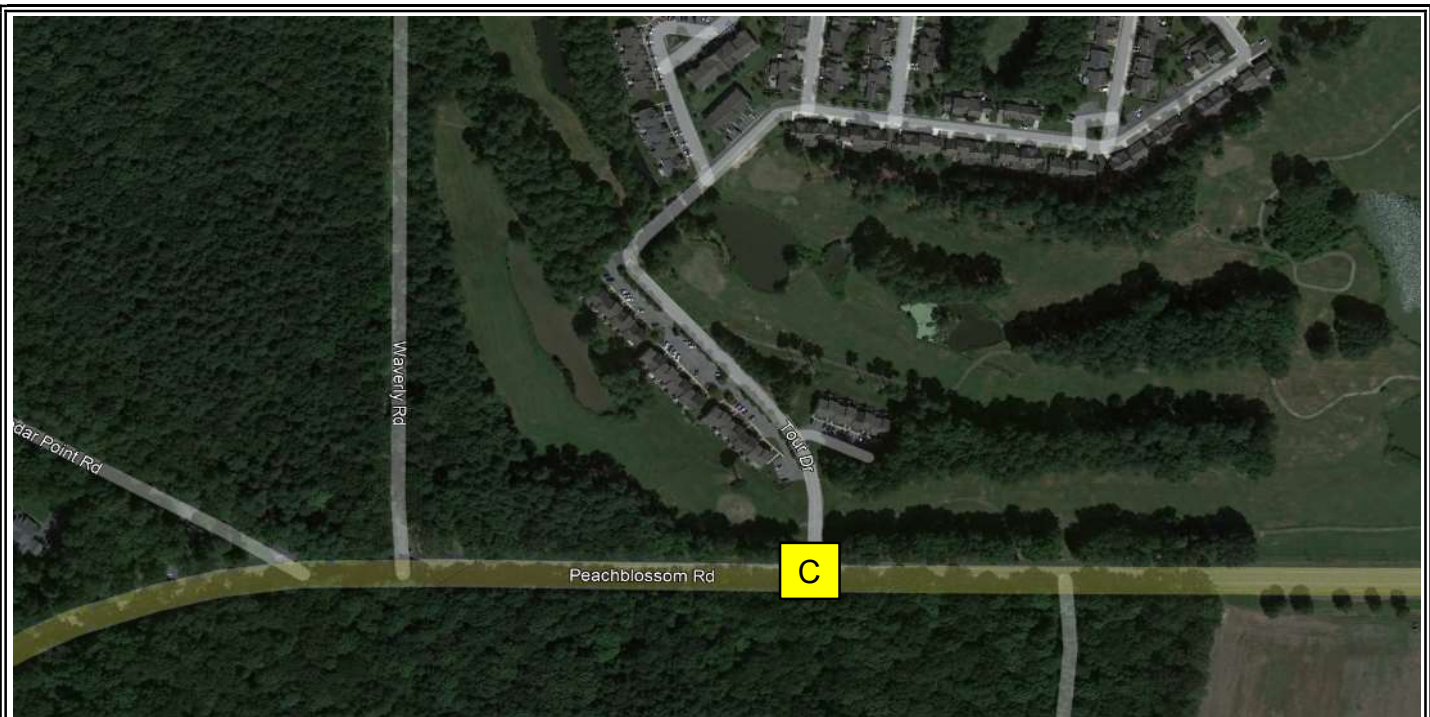
Traffic Impact Analysis



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Combined Trips Generated by Background Developments

Exhibit H4



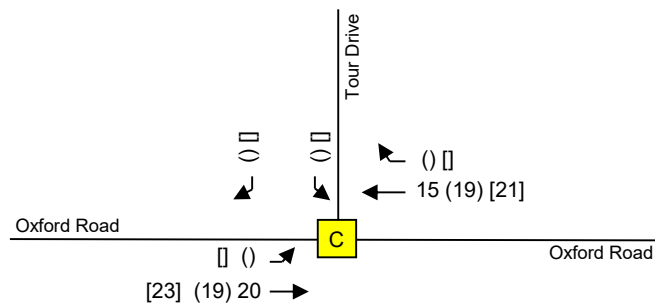
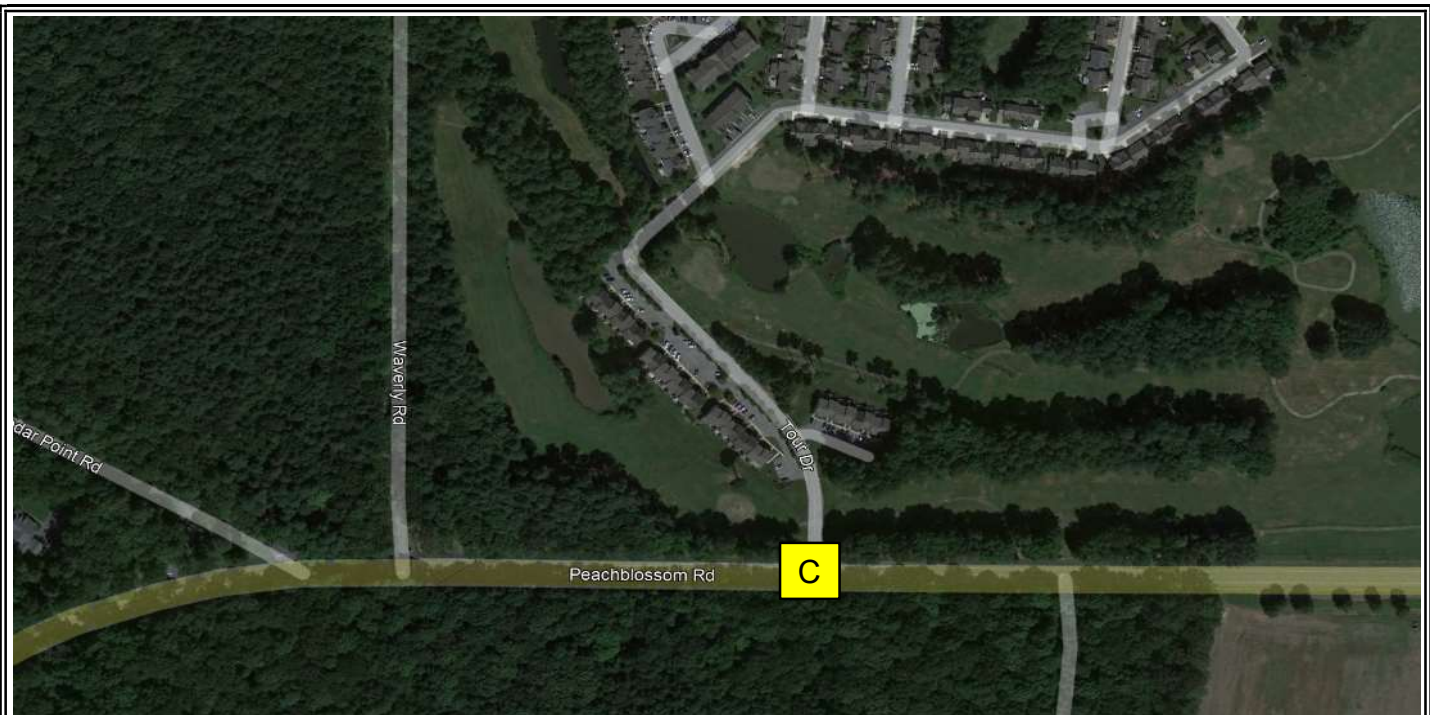
Traffic Impact Analysis



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Background
 Peak Hour Volumes

**Exhibit
 H5**



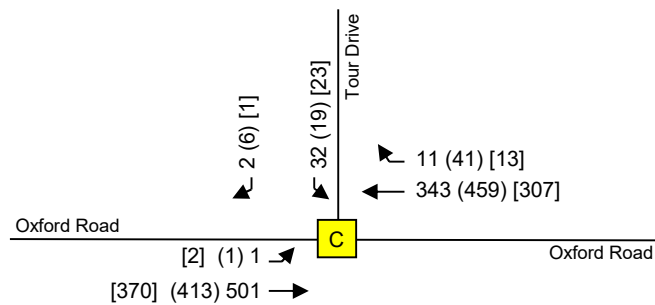
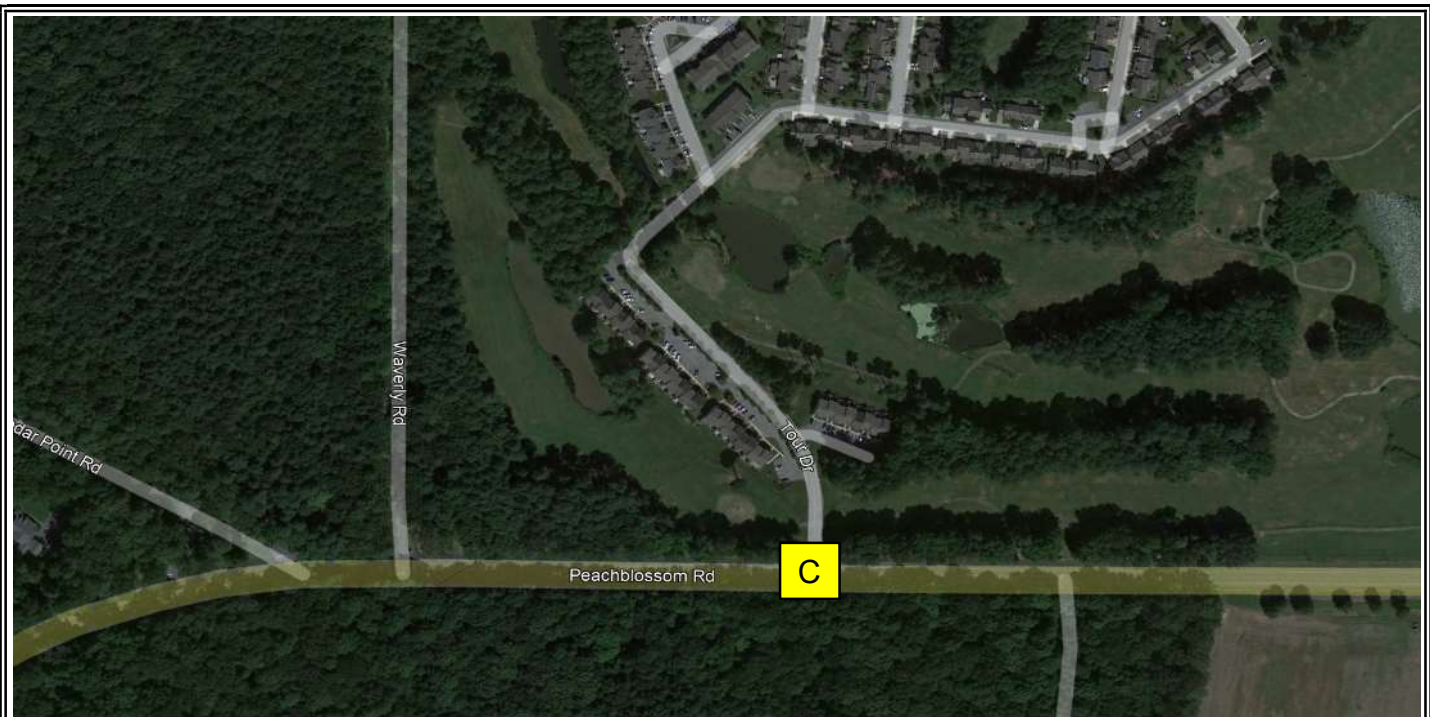
Traffic Impact Analysis



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Combined Trips Generated by Poplar Hill Development

Exhibit H6



Traffic Impact Analysis



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 SEVERNA PARK, MD 21146
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Total
Peak Hour Volumes

**Exhibit
H7**

Traffic Count Worksheets for Oxford Road at Clubhouse Drive

Weekday Morning Peak Hour (7 am - 9 am)																				
Time:	N/A Northbound					Tour Dr Southbound					Oxford Road Eastbound					Oxford Road Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
7:00-7:15					0	0	8		0	0	0	1	51		0	0		28	1	0
7:15-7:30					0	0	12		0	0	0	0	60		0	0		41	2	0
7:30-7:45					0	0	8		1	0	0	0	68		0	0		58	4	0
7:45-8:00					0	0	4		0	0	0	0	113		0	0		73	5	0
8:00-8:15					0	0	6		1	0	0	0	93		0	0		53	2	0
8:15-8:30					0	0	10		1	0	0	0	87		0	0		56	1	0
8:30-8:45					0	0	12		0	0	0	1	60		0	0		66	3	0
8:45-9:00					0	0	5		2	0	0	0	82		0	0		84	4	0

Hourly Totals																				
7:00-8:00					0	0	32		1	0	0	1	292		0	0		200	12	0
7:15-8:15					0	0	30		2	0	0	0	334		0	0		225	13	0
7:30-8:30					0	0	28		3	0	0	0	361		0	0		240	12	0
7:45-8:45					0	0	32		2	0	0	1	353		0	0		248	11	0
8:00-9:00					0	0	33		4	0	0	1	322		0	0		259	10	0
AM Peak Hour	Northbound					Southbound					Eastbound					Westbound				
7:45-8:45	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
	0				0	0	32		2	0	0	1	353		0	0		248	11	0
																				Total
																				647

Weekday Evening Peak Hour (4 pm - 6 pm)																				
Time:	N/A Northbound					Tour Dr Southbound					Oxford Road Eastbound					Oxford Road Westbound				
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
4:00-4:15					0	0	5		0	0	0	2	77		0	0		88	8	0
4:15-4:30					0	0	2		1	0	0	0	70		0	0		69	12	0
4:30-4:45					0	0	5		0	0	0	0	90		0	0		90	10	0
4:45-5:00					0	0	6		3	0	0	1	59		0	0		66	9	0
5:00-5:15					0	0	6		2	0	0	0	72		0	0		97	10	0
5:15-5:30					0	0	3		0	0	0	2	54		0	0		81	9	0
5:30-5:45					0	0	9		0	0	0	1	36		0	0		82	8	0
5:45-6:00					0	0	2		2	0	0	0	45		0	0		76	5	0

Hourly Totals																				
4:00-5:00					0	0	18		4	0	0	3	296		0	0		313	39	0
4:15-5:15					0	0	19		6	0	0	1	291		0	0		322	41	0
4:30-5:30					0	0	20		5	0	0	3	275		0	0		334	38	0
4:45-5:45					0	0	24		5	0	0	4	221		0	0		326	36	0
5:00-6:00					0	0	20		4	0	0	3	207		0	0		336	32	0
PM Peak Hour	Northbound					Southbound					Eastbound					Westbound				
4:15-5:15	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds
	0				0	0	19		6	0	0	1	291		0	0		322	41	0
																				Total
																				680

Peak Hour		Intersection: Oxford Road & Tour Dr	
Turning Movement Count		Weather: Clear	
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com		Count by: DSS	
		Count Day/Date: Thursday, December 1, 2022	
		County: Talbot	

Time:	Saturday Peak Hour (10:00 am - 2:00 pm)																				Total
	N/A Northbound					Tour Dr Southbound					Oxford Road Eastbound					Oxford Road Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
10:00-10:15					0	0	2		1	0	0	1	63		0	0		33	5	0	105
10:15-10:30					0	0	1		1	0	0	1	46		0	0		35	2	0	86
10:30-10:45					0	0	4		0	0	0	0	49		0	0		37	3	0	93
10:45-11:00					0	0	12		0	0	0	0	67		0	0		41	1	0	121
11:00-11:15					0	0	3		0	0	0	0	60		0	0		53	2	0	118
11:15-11:30					0	0	3		1	0	0	1	62		0	0		39	0	0	106
11:30-11:45					0	0	5		0	0	0	1	54		0	0		50	10	0	120
11:45-12:00					0	0	6		0	0	0	0	51		0	0		49	5	0	111
12:00-12:15					0	0	7		0	0	0	0	50		0	0		59	9	0	125
12:15-12:30					0	0	2		0	0	0	2	57		0	0		45	1	0	107
12:30-12:45					0	0	4		1	0	0	1	47		0	0		47	2	0	102
12:45-1:00					0	0	1		3	0	0	0	46		0	0		42	4	0	96
1:00-1:15					0	0	6		0	0	0	1	40		0	0		61	7	0	115
1:15-1:30					0	0	3		0	0	0	0	40		0	0		63	2	0	108
1:30-1:45					0	0	4		1	0	0	0	57		0	0		58	4	0	124
1:45-2:00					0	0	3		0	0	0	0	48		0	0		36	6	0	93

Hourly Totals																					
10:00-11:00	0				0	19	2	0	0	2	225	0	0	146	11	0	405				
10:15-11:15	0				0	20	1	0	0	1	222	0	0	166	8	0	418				
10:30-11:30	0				0	22	1	0	0	1	238	0	0	170	6	0	438				
10:45-11:45	0				0	23	1	0	0	2	243	0	0	183	13	0	465				
11:00-12:00	0				0	17	1	0	0	2	227	0	0	191	17	0	455				
11:15-12:15	0				0	21	1	0	0	2	217	0	0	197	24	0	462				
11:30-12:30	0				0	20	0	0	0	3	212	0	0	203	25	0	463				
11:45-12:45	0				0	19	1	0	0	3	205	0	0	200	17	0	445				
12:00-1:00	0				0	14	4	0	0	3	200	0	0	193	16	0	430				
12:15-1:15	0				0	13	4	0	0	4	190	0	0	195	14	0	420				
12:30-1:30	0				0	14	4	0	0	2	173	0	0	213	15	0	421				
12:45-1:45	0				0	14	4	0	0	1	183	0	0	224	17	0	443				
1:00-2:00	0				0	16	1	0	0	1	185	0	0	218	19	0	440				
Sat.	Northbound				Southbound					Eastbound					Westbound					Total	
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
10:45-11:45					0	0	23		1	0	0	2	243		0	0		183	13	0	465

Peak Hour
Turning Movement Count



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Intersection: Oxford Road & Tour Dr

Weather: Clear

Count by: DSS

Count Day/Date: Saturday, December 3, 2022

County: Talbot

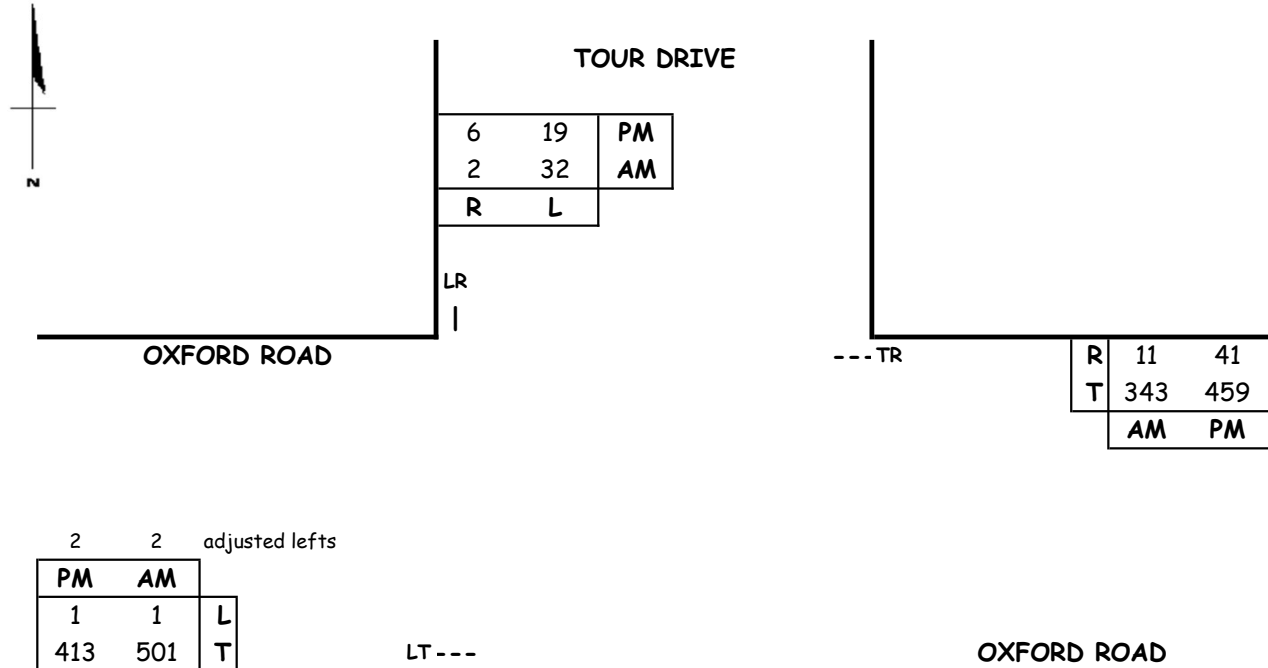
CLV Worksheets for Oxford Road at Clubhouse Drive

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Oxford Road
and: Tour Drive
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	34	1.00	34			
EB	503	1.00	503			
WB	354	1.00	354	1	1.00	1
CLV TOTAL=						537
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	25	1.00	25			
EB	415	1.00	415			
WB	500	1.00	500	1	1.00	1
CLV TOTAL=						526
Level of Service (LOS) =						A

Critical Lane Volume Analysis

LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Oxford Road &
Tour Drive
(Total Traffic)

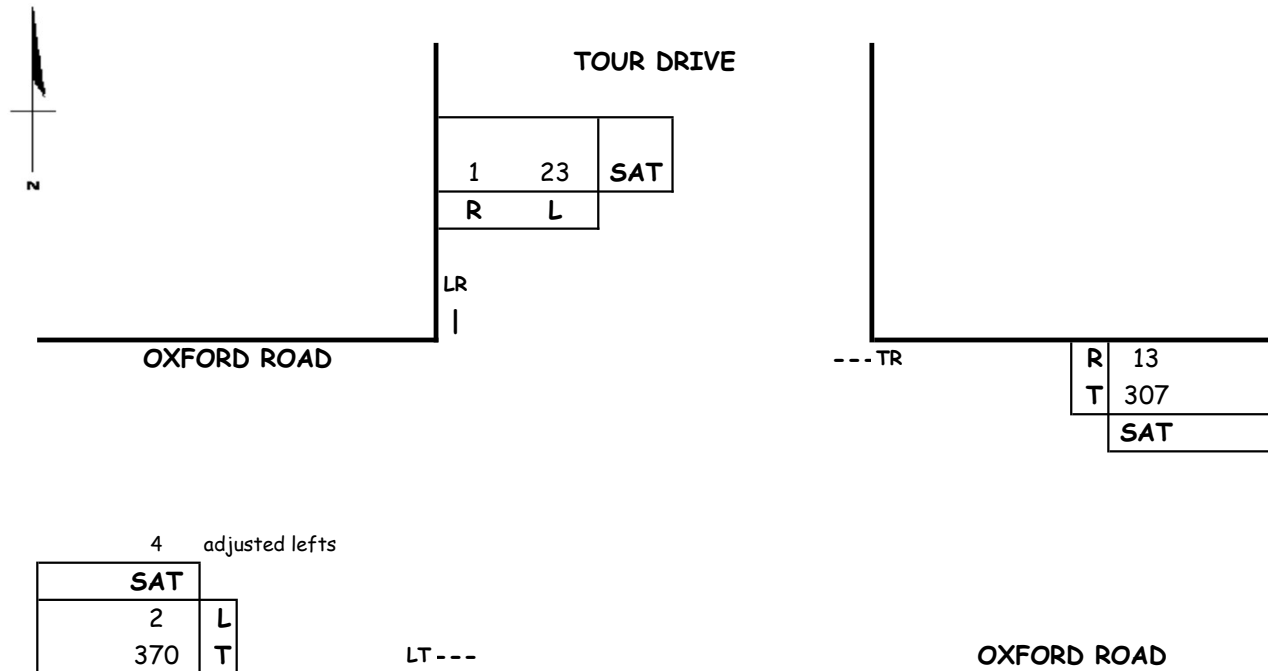
**Intersection
C**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Oxford Road
and: Tour Drive
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Saturday Midday Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			SAT
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
SB	24	1.00	24				24
EB	374	1.00	374				374
WB	320	1.00	320	2	1.00	2	
CLV TOTAL=							398
Level of Service (LOS)=							A

Critical Lane Volume Analysis



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SEVERNA PARK, MD 21146
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Oxford Road &
Tour Drive
(Total Traffic)

**Intersection
C**



POPLAR HILL

DESIGN GUIDELINES

Easton, MD | March 27, 2023



Poplar Hill Development



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I. Introduction

The Vision of Poplar Hill

Poplar Hill at Easton is envisioned as a complementary and fresh expansion in the Town of Easton, bringing the best in home construction and design and nearby outdoor recreation. Situated at the southern gateway to Easton at the crossroads of Oxford Road and Easton Parkway, this 120 acre community will combine opportunities for various life-stage living, neighborhood commercial uses, and significant parks and open space from which residents and shoppers alike will benefit.

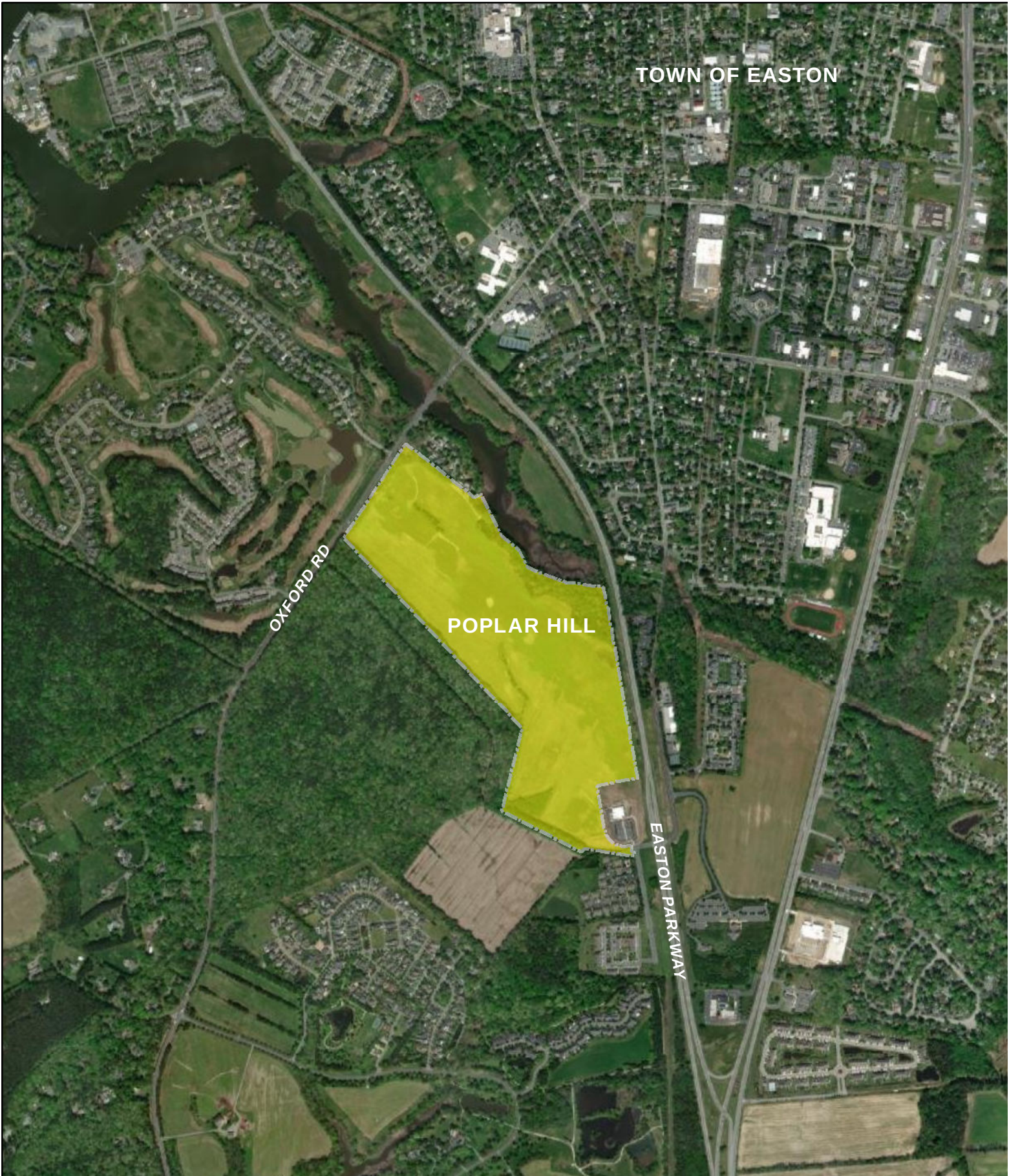
The homes in Easton will provide options for single-family living, villa style townhome, and market rate rental multifamily housing, accommodating a wide variety of living needs. From retirees to teachers, firefighters to entrepreneurs, there is a place at Poplar Hill that fits ones needs. Attention to details inside and outside the homes will ensure that the community feels like home, and active paths, sidewalks, and trails, ensure that the residents know they are welcome to enjoy the great outdoors of Easton. Poplar Hill will provide an important extension of the Easton Rail-To-Trail System, and create important linkages to the town.

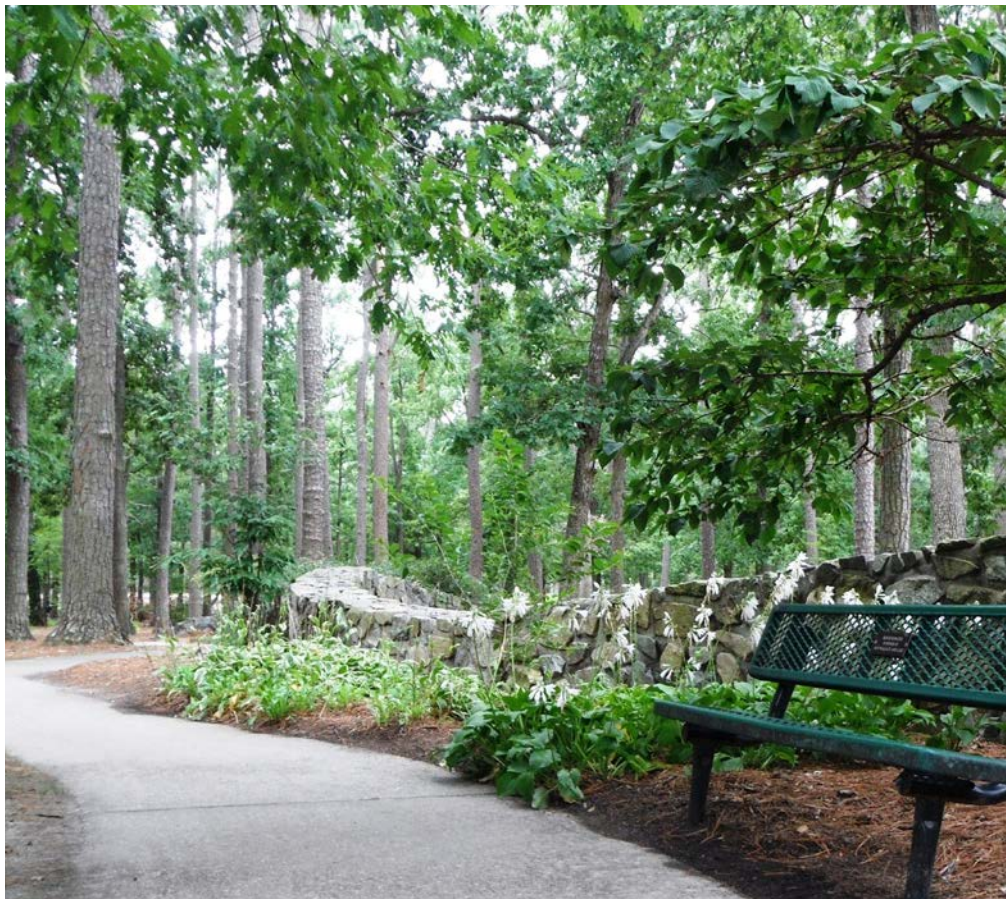
Environmentally, Poplar Hill is focused on leaving a light imprint on the land. Our approach to ecological stewardship begins with environmental protection, but it ends where the community sees and engages with the spaces in and around Poplar Hill. Tree preservation, bio-retention, and stormwater flow management all tie into the aesthetic and the practical uses of open space to create a seamless connection between homes and nature.

Poplar Hill adds commercial use that benefits not only the community’s residents, but nearby neighborhoods as well. Building on its convenient proximity to Easton Parkway, retailers here will fare well helping service the needs of the people at the town’s southern edge.

Most exciting for all of Easton is Poplar Hill Park, an active recreation space that will include multipurpose fields, playgrounds, trails, a dog park, and restroom facilities. This park will be constructed as part of the Poplar Hill community, then shared with the public for full access and enjoyment.

Poplar Hill will build on what the Town of Easton already is...an exceptional community.





II. Overall Plan

Legend

 Single Family Estates

The single family esates will consist of rear loaded and front loaded lots, creating a pedestrian focused residential neighborhood.

 Villa Townhomes

Villa townhomes will consist of rear loaded and front loaded lots and will share the high quality design of the single family estates.

 Multifamily

Multifamily apartments will create a rental option for individuals within Poplar Hill and provide amenities to its residents.

 Amenities

Amenities will be offered to Poplar Hill residents to allow for full enjoyment of their neighborhood, such as a pool area and bike path.

 Public Park

The Town of Easton Park will not only serve Poplar Hill residents, but expand the recreation opportunitites for all Easton residents.

 Commercial Center

A small scale commercial area will be provided for Poplar Hill residents with neighborhood friendly uses.



PLANS ARE NOT
APPROVED FOR
CONSTRUCTION

[illegible]

WARNING!
THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL SHOW THE LOCATION OF ALL UTILITIES INFORMATIONAL AND PERMITTING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES TO HIS OWN SATISFACTION PRIOR TO BEGINNING CONSTRUCTION.

THE CONTRACTOR SHALL TEST PIT AND LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE DEPT. OF PUBLIC WORKS OF ANY POSSIBLE CONFLICT AND REQUEST THE RELOCATION OF THE EXISTING UNDERGROUND UTILITIES BEFORE BEGINNING ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RELOCATION EXPENSE.



Established 1986
Civil Engineers • Land Planning • Land Surveyors


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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. 48188, Expiration Date: 12/28/2023.



IN THE TOWN OF EASTON
TALBOT COUNTY, MARYLAND
TAX MAP 42 GRID 4 TAX PARCEL 57

ISSUED/REVISED FOR:	DATE:	BY:
AGENCY REVIEW	7/06/22	BCE
AGENCY REVIEW	8/03/22	BCE
AGENCY REVIEW	10/05/22	BCE
AGENCY REVIEW	11/01/22	BCE
AGENCY REVIEW	01/27/23	BCE

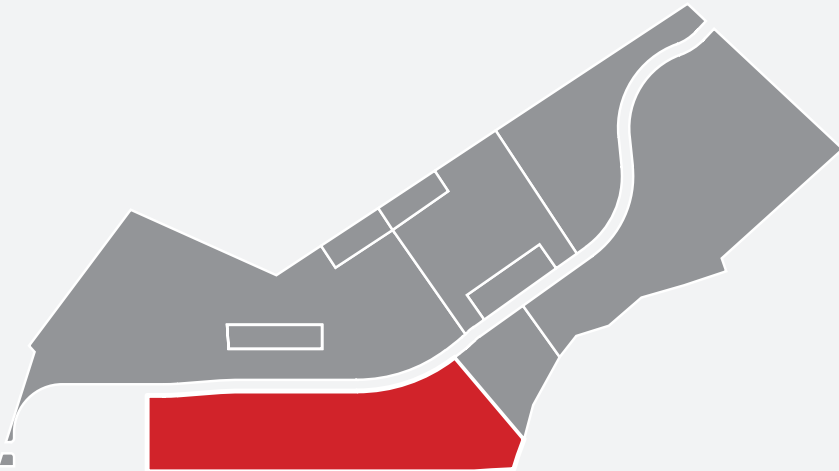
SHEET No. 3 OF 5	7/06/22
SCALE: AS NOTED	JOB No. 220155
	FILE No. 1324

III. Architecture

Commercial Guidelines

Though the commercial center on Easton Parkway is limited in scale, it is enormous in its impact at the southern edge of the town. It is both the first and last impression that motorists will have of the town, making architecture and landscape of this center critical to the success of the Poplar Hill brand. These commercial architectural guidelines, focused on quality materials and aesthetics, will ensure long-lasting relevance to the tenant spaces.

The commercial center of Poplar Hill is intended to serve residents of the development with friendly neighborhood uses, such as a neighborhood market, coffee shop, etc. The goal is to create an architecturally cohesive development with the proposed residential development. To do so, commercial buildings must use four sided architecture and other architectural elements to break up the building masses, creating a smaller feeling, pedestrian friendly retail space.



Architectural Guidelines

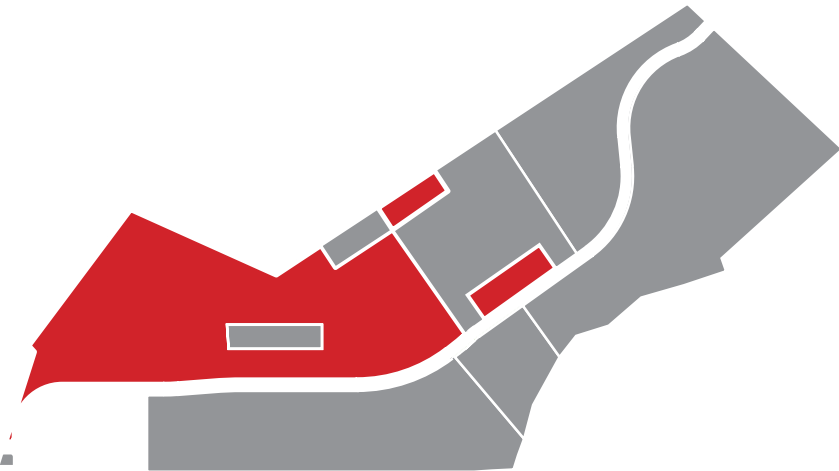
General

1. Foundation walls shall be built of the following materials: brick, stone, brick or stone veneer on concrete block, painted or color-coordinated stucco block form poured concrete, smooth-finished poured concrete, tabby, parged block, or stucco.
2. All roofing materials shall have a minimum thirty-year manufacturer’s warranty, and the following materials may be used for roofing: dimension shingles, natural slate, syntheric slate or shake, standing seam metal (including copper), membrane roofing (for flat roofs behind parapet).
3. Architectural detailing shall remain consistent on all elevations of the main body as viewed from the front street elevation and rear street elevation
4. Siding material when combined in a singular façade shall be constructed with the heavier material below the lighter material i.e. stone or brick, veneer below cementitious board or vinyl siding.
5. Keystones, architectural coins, and other brick or stone embellishments shall show a varied plane from the main body of the building where appropriate
6. Masonry piers shall be no less than 12” in width
7. All roof vents shall be comprised of the following types: Off-ridge vents when located on the rear lot side of ridge and where not visible from side street, Continuous ridge vents, Gable end vents.
8. Openings should not exceed 60% of the total building wall area with each unit façade being calculated independently.
9. Pitched roofs, if provided, should be symmetrically sloped no less than 5:12, except that roofs for porches and attached sheds may be no less than 2:12.
10. Flat roofs should be enclosed by parapets a minimum of 42 inches high, or as required to conceal mechanical equipment to the satisfaction of the Planning Department.
11. Skylights, solar panels, vent stacks, and other protrusions shall not be placed on a roofline visible from the front or side street. Skylights should be flat in profile.
12. Unless otherwise prohibited by building code and ADA site requirements, handicap ramps should be sited to minimize visibility from the street. Ramp locations shall be shown on the building plan for approval.

Single Family Estates

Anchoring the residential neighborhoods are the single family estate homes. These homes are and will continue to be in high demand as those from elsewhere seeking great communities in Easton also seek convenience and outdoor living. As the name implies, estate homes are of high quality and construction. But they don’t require large lots to accomplish their goal of attracting those seeking space. In fact, the value of being near so much open space is the perceived lower density that allows lots to be smaller and easier to maintain for the homeowner, while not compromising on keeping residents near the desired amenity spaces.

Estate home porches will front the parkway through Poplar Hill, and most will have rear-load garages that reduce the asphalt footprint in front of homes. This leaves more room where it matters for lush landscaping and pedestrian-level amenities, like trails, trees, and sitting spaces.



Architectural Guidelines

General

1. Foundation walls shall be built of the following materials: brick, stone, brick or stone veneer on concrete block, painted or color-coordinated stucco block form poured concrete, smooth-finished poured concrete, tabby, parged block, or stucco.
2. The following materials may be used for roofing: wood shingles, galvanized steel, galvalume, copper. Asphaltic or fiberglass shingles shall be architectural grade and submitted for approval.
3. Architectural detailing shall remain consistent on all elevations of the main body as viewed from the front street elevation and side street elevation.
4. Siding material when combined in a singular facade shall be constructed with the heavier material below the lighter material (i.e. stone or break, veneer below cementitious board siding).
5. Keystones, architectural coins, and other brick or stone embellishments shall show a varied plane from the main body of the building where appropriate.
6. All roof vents shall be comprised of the following types: off ridge vents when located on the rear lot side of ridge and where not visible from side street, continuous ridge vents, gable end vents.
7. Openings should not exceed 60% of the total building wall area with each unit facade being calculated independently.
8. Principal roofs shall be a symmetrical gable or hip with a slope of 6:12 to 10:12. Ancillary roofs may be shed slopes no less than 2:12. Roofs on towers shall be flat or have a slope of 4:12 to 8:12.
9. Flat roofs should be enclosed by parapets a minimum of 42” high, or as required to conceal mechanical equipment to the satisfaction of the Planning Department.
10. Porches should be made of brick, concrete, concrete slab with brick veneer underneath, stone, hardwood planks, or synthetic wood. Exposed aggregate finish shall be prohibited.
11. Balconies and porch railings shall be made of painted wood, steel, wrought iron, vinyl, powder coated aluminum, composite or other material approved by the Planning Department.
12. Stoops shall be made of brick, concrete, stamped concrete or stone. Exposed aggregate concrete finish shall be prohibited.
13. Front yard fencing should be of painted wood, iron, powder coated aluminum, composite or other comparable materials approved by the Planning Department. No fence shall be in excess of 48” in height (not including posts). Posts should be of like material to the fence or brick.
14. Skylights, solar panels, vent stack, and other protrusions shall not be place on a roof line visible from the front or side street. Skylights should be flat in profile.

Architectural Elements

Exterior Walls

1. Walls shall be finished in wood clapboard (sealed with paint or stain), board and barren, cedar shingles, “hardie plank”, stucco, brick, stone, or approved vinyl materials such as beaded siding.
2. Walls may be built of no more than two materials and shall only change material along a horizontal line. Exceptions may be submitted for review and approval.
3. Wood clapboard and shingles shall be horizontal.
4. Siding shall be horizontal, maximum 6” to the weather.
5. Boards with more than 6” to the weather shall show a 1”

variation from one board to the next.

6. Shingles shall be maximum 8” to the weather. Shingles shall be handsplit or machined cut with bottom edges aligned.
7. Stucco shall be smooth and sand finished.
8. Trim shall be 5/4 PVC at corners and around openings, except at the front door which may be any size or configuration.
9. Colors of all materials shall be selected from approved color package submitted by Builder.
10. All exterior smooth wood shall be painted. Wood shingles may be left to age naturally, or shall be stained.

Elements & Gutters

1. Gutters and downspouts shall be made of galvanized steel, copper (not copper-coated), anodized or ESP aluminum.
2. Flashing shall be copper, lead or anodized aluminum. Copper roofs, flashing, gutters and downspouts shall be approved to age naturally (not painted or sealed). Roof colors shall be charcoal, gray, brown, red, or green.
3. Eaves shall be continuous. Eaves which overhang less than 8” shall have a closed soffit. Eaves which overhang more than 16” shall have exposed rafters. Eaves which overhang between 8” and 16” shall have either a closed soffit or exposed rafters. Rafter trails may not exceed 8” in depth.
4. Standard K Style Gutters shall be permissible.
5. Roof penetrations shall be placed on the rear slope of the roof. Roof penetrations shall be painted to match the color of the roof, except those of metal which may be left unpainted.

Doors, Windows, & Shutters

1. Windows shall be construced of wood, vinyl-clad wood, or metal. Window shutters shall be made of wood or vinyl with louvers or raised panels.
2. Windows square or rectangular in configuration and vertical in orientaion shall have a proportion of 1:2, 2:3. Accent windows may be circular, half round or elliptical. Quarter round windows may be used in pairs flanking another architectural feature.
3. Window lites shall be sqaure or vertical in proportion and shall be in one of the following configurations: 6 over 6, 4 over 6, 6 over 1, 4 over 1, 3 over 1, 2 over 1, 4 over 1, 9 over 1.
4. Builders will use integrated muntins/grids between glass plans, not on the exterior surface
5. Bay windows on a first floor shall extend to the ground or be supported by architectural brackets.
6. All building openings shall be surrounded by a trim of a minimum of 4” wide on all walls constructed of siding.
7. Windows are required on all elevations.
8. Windows shall be single, double, or triple hung.
9. Surface mount windows wrapped in trim or masonry are permissible.
10. Accent windows may be permitted at gable ends.
11. Bay windows shall have no less than 3 sides and shall extend to the floor inside and to the ground outside, or be visually supported by brackets.
12. Upper story openings shall be centered above lower story openings. Openings in gabled ends must be centered.
13. Doors may be constructed of wood, metal clad, or wood veneer

fiberglass.

14. Builder will install decorative steel garage doors with fenestration and hardware ilo wood, embossed hardware, or wood veneer.
15. Shutters shall be operable or appear to be operated with hardware and shall be of sufficient size to cover the entire window if both sides are closed.
16. Shutters shall be applied to all or none of the windows of the main building.

Piers & Columns

1. Piers shall be made of brick, precast, concrete, wood, or concrete block finished in stucco.
2. All exterior stairs leading from the sidewalk to the building shall be made of brick, stone, or concrete. Stairs leading to a wood porch may be made of wood.
3. Wrought iron or steel railings shall be painted black.
4. All risers, railings, and trim for all porches shall be painted. Wood treads may be left unpainted.
5. Piers must be a minimum of 12” wide.
6. All arches shall be a minimum of 12” wide on the inside surface.
7. Columns shall be made of woods or precast concrete, or other materials so as to duplicate real wood.
8. 10” square columns with cap and base are allowed.
9. Multiple columns may be combined to create the appearance of one whole column.
10. All columns and piers constructed of wood shall be painted.

Walls & Fencing

1. Garden walls shall be made of brick and shall be compatible with the main building. Fences shall be built of wood.
2. When a building facade and its side yard face a street, garden walls shall be made of the same material as the main building.
3. Garden walls and fences, except “picket fences”, in the side yard shall be a minimum of 30” and a maximum of 5'-6’ high.
4. Garden walls or fences shall be placed at the rear lot line and side lot lines to maintain street continuity, unless otherwise noted.
5. Fences along frontages shall be wood pickets painted white or wrought iron. Side and rear yard fences shall be wood pickets or closed wood boards painted white or stained.
6. Lattice shall be wood. Vinyl is permitted only at crawl space enclosures.
7. Panelized materials are not permitted.
8. Gates for garden walls shall be made of wood.
9. Front and side yard wood “picket” type fences are permitted.
10. Picket and alley fences must be made of wood and painted white.
11. Picket fences shall not exceed 36” in height.
12. Rail road tie retaining walls are not permitted.
13. Garden walls or fences shall be placed at the rear lot lines to maintain street continuity, unless otherwise noted.

Porches/Patios & Decks

1. Porches shall be painted and a minimum of 6’ deep. Concrete porches do not require paint.
2. Outdoor patios are permitted in the rear or side yards and must be screened to a height of 5'-6’ when visible from a street.
3. No decks are permitted above the first floor of the main house. All other decks shall be made of pressure treated wood.
4. Rails and caps of decks visible from adjacent streets shall be painted to match the predominant color of the trim of the main building.

Lead Walks

1. Lead walks of all homes shall be made of brick, flagstone, or poured concrete and shall match the material of the front steps or stoop of the main building.
2. Lead walks shall be built flush with the ground. The maximum grade is 3%.

Garages

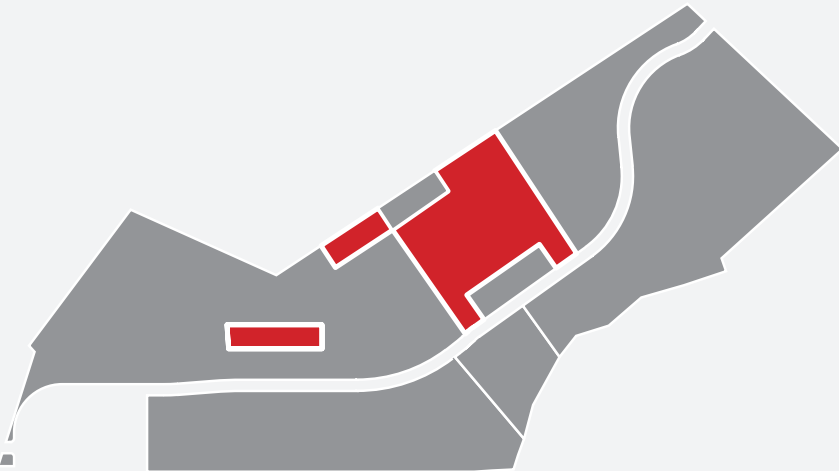
1. Garage doors shall be recessed a minimum of 6” from the exterior face of the garage wall.
2. Residential driveways for a two car garage shall be a maximum of 18’ wide to accommodate garage door trims.

Mechanical Equipment and Refuse Containers

1. All enclosures for mechanical equipment and refuse, visible from the street, shall be screened with materials compatible with those of the main building. Landscaping may be used for screening purposes.
2. Dryer vents shall be located in the side or rear yard and shall not be visible from the street frontage.
3. All mechanical equipment shall be set in an enclosed structure and screened. These enclosures shall be compatible with the main building.
4. Ground level enclosures for all mechanical equipment shall be screened from view.
5. All meters shall be located on the side or rear of the house.
6. Equipment including HVAC, utility meters and the like, shall be placed in rear yards and the rear half of the side yards.

Villa Townhomes

Villa Townhomes provide a more affordable homeownership opportunity in the midst of Poplar Hill than the Single Family Estate homes, while not compromising on the quality of materials and design. Smaller square footages and low maintenance provide the perfect balance of retirees and young professionals alike who want to reclaim one thing more than anything else ...their time. Centrally located in Poplar Hill, these villas allow for great opportunities to walk everywhere in the community, from the ball fields and dog parks to the shops and services.



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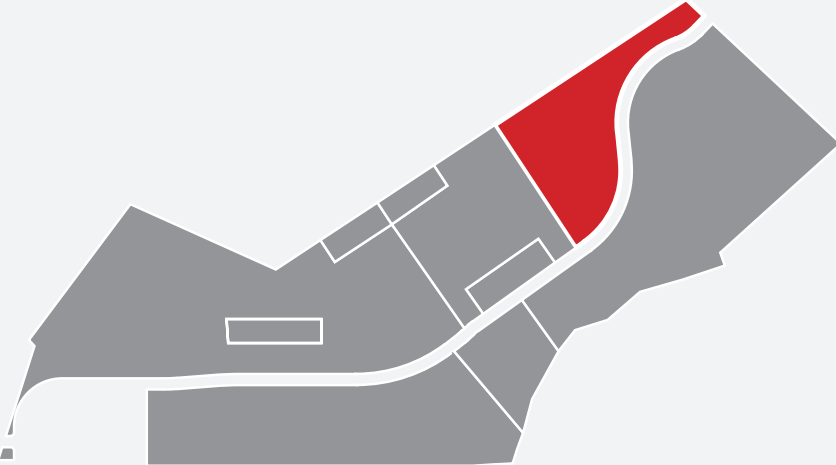
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- Ground level enclosures for all mechanical equipment shall be screened from view.
- All meters shall be located on the side or rear of the house.
- Equipment including HVAC, utility meters and the like, shall be placed in rear yards and the rear half of the side yards.

Multi-Family

Many residents of Easton want a rental option for their living choice. Some want the flexibility of moving if their work or circumstances require, others simply want the convenience of maintenance and upkeep to be done by others while they pursue their careers, families, and fun. Rental multi-family also provides an important option of affordability for young adults, small families, and many other valued members of the community. Located strategically nearest to Poplar Hill Park, multi-family housing allows for the choice of housing to not compromise activities and amenities available to the residents.



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1. Foundation walls shall be built of the following materials: brick, stone, brick or stone veneer on concrete block, painted or colored-coordinated stucco block form poured concrete, smooth-finished poured concrete, tabby, parged block, or stucco.
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4. Siding material when combined in a singular façade shall be constructed with the heavier material below the lighter material i.e. stone or brick, veneer below cementitious board or vinyl siding.
5. Keystones, architectural coins, and other brick or stone embellishments shall show a varied plane from the main body of the building where appropriate
6. Masonry piers shall be no less than 12" in width
7. Where chimneys, bay windows, and other extensions from the main body of the building are on the first floor, the foundation shall match these extensions.
8. All roof vents shall be comprised of the following types: Off-ridge vents when located on the rear lot side of ridge and where not visible from side street, Continuous ridge vents, Gable end vents.
9. Openings should not exceed 60% of the total building wall area with each unit façade being calculated independently.
10. Pitched roofs, if provided, should be symmetrically sloped no less than 5:12, except that roofs for porches and attached sheds may be no less than 2:12.
11. Flat roofs should be enclosed by parapets a minimum of 42 inches high, or as required to conceal mechanical equipment to the satisfaction of the Planning Department.
12. Porches should be made of brick, concrete, stone, hardwood planks, or synthetic wood. Exposed aggregate concrete finish shall be prohibited.
13. Balconies and porch railings shall be made of painted wood, wrought iron, powder coated aluminum, composite or other material approved by the Planning Department.
14. Stoops shall be made of brick, concrete, stamped concrete or stone. Exposed aggregate concrete finish shall be prohibited.
15. Front yard fencing should be of painted wood, iron, powder coated aluminum, composite or other comparable materials approved by Planning Department. No fence shall be in excess of 48 inches in height (not including posts). Posts should be of like material to the fence or brick.
16. Skylights, solar panels, vent stacks, and other protrusions shall not be placed on a roofline visible from the front or side street. Skylights should be flat in profile.
17. All multifamily buildings shall be designed and construed with a consistent architectural detail that is visible from all public roads.

Architectural Elements

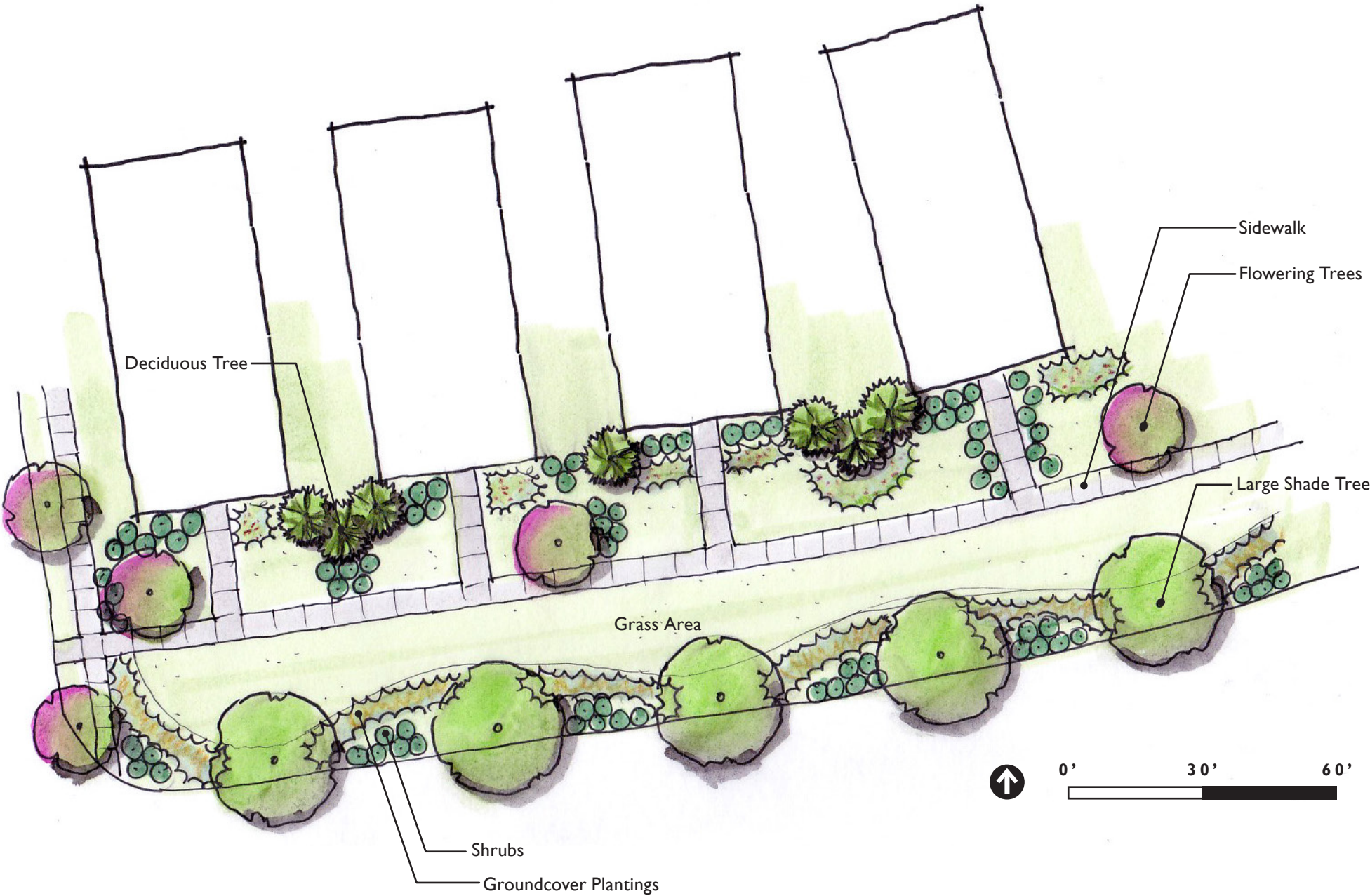
1. Individual buildings should not reference multiple building styles

- or eras.
2. Modern and post-modern architecture shall not be used.
3. Front porches and street porches must be open. Screened or enclosed porches are not permitted on the front façade of the building.
4. Clear glass should be used in all windows and doors. Stained glass is an allowable material in accent windows. Colored, tinted, or reflective glass should not be used. Clear low-emissivity glass is recommended. Painting the inside face of the glass (in false roof dormers) is not permitted.
5. Patterned or frosted glazing is allowed on side and rear façade of buildings where not readily visible from the street on which the building fronts.
6. Where shutters are used, shutter height should be equal to the window sash height.
7. Shutters should be installed operable or appear to be operable with appropriate hinges.
8. Louvered shutters should be installed so as to shed water away from the house when shutters are in a "closed" position.
9. Window muntins shall be between 5/8" and 7/8" wide and shall project out from the glass or set between glass to give the appearance of true divided lites
10. Building exteriors shall be clad in any combination of the following materials: wood (5"-6" exposed siding), cementitious board siding, excluding Dutch Lap siding, brick, stucco, synthetic stucco, Exterior Insulated Finish Systems (EIFS) except on ground floor, stone, sythentic stone, other materials must be comparable in quality and approved by the Planning Department.
11. All deck, porch, and entrance columns shall be square and have the same cross-sectional dimensions.
12. Brick accent bands, including sills, bands, and lentils, shall extend out from the face of the building a minimum of 1" nominal to provide variation in façade and shadow lines.

IV. Site Design & Landscaping

Streetscape

Streets serve as more than just a traffic corridor in a development. Streets are often the front yard of any community and a successful streetscape can beautify and unify the public corridors throughout the development. The area between the street and residential yard is an important transition area where landscaping opportunities should be maximized. Streetscape plantings provide a buffer between front yards and vehicular traffic. Understanding how to treat this area can create a safer environment for pedestrians and motorists. This includes foundation plantings, large canopy trees, selective screening, and ornamental plantings, typically laid out in an organized manner. Large canopy trees can provide shade and create vertical walls that can frame the streets. Ornamental plantings create visual appeal and screening provides privacy and separation where needed. All these elements should work together cohesively to provide a better defined edge for the streetscape corridor that can dramatically improve the aesthetic of the street and development.



Parkway Front Yards

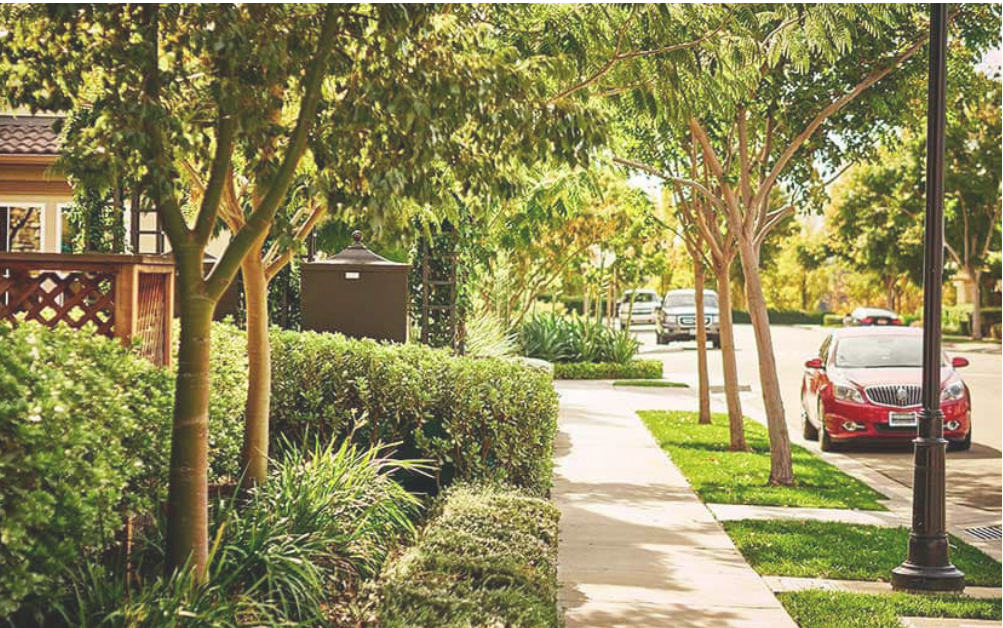
For the houses facing the Parkway, the front porches face toward a linear common greenspace. The planting here will help differentiate the individual homes while also using repetition and pattern to create a sense of unity. Shade trees along the parkway and curving ornamental shrubs and grasses brighten up the walk and buffer

the area from the street. These spaces are designed to feel more private on the house side of the sidewalk and more public and communal on the parkway side of the sidewalk.

plant palette

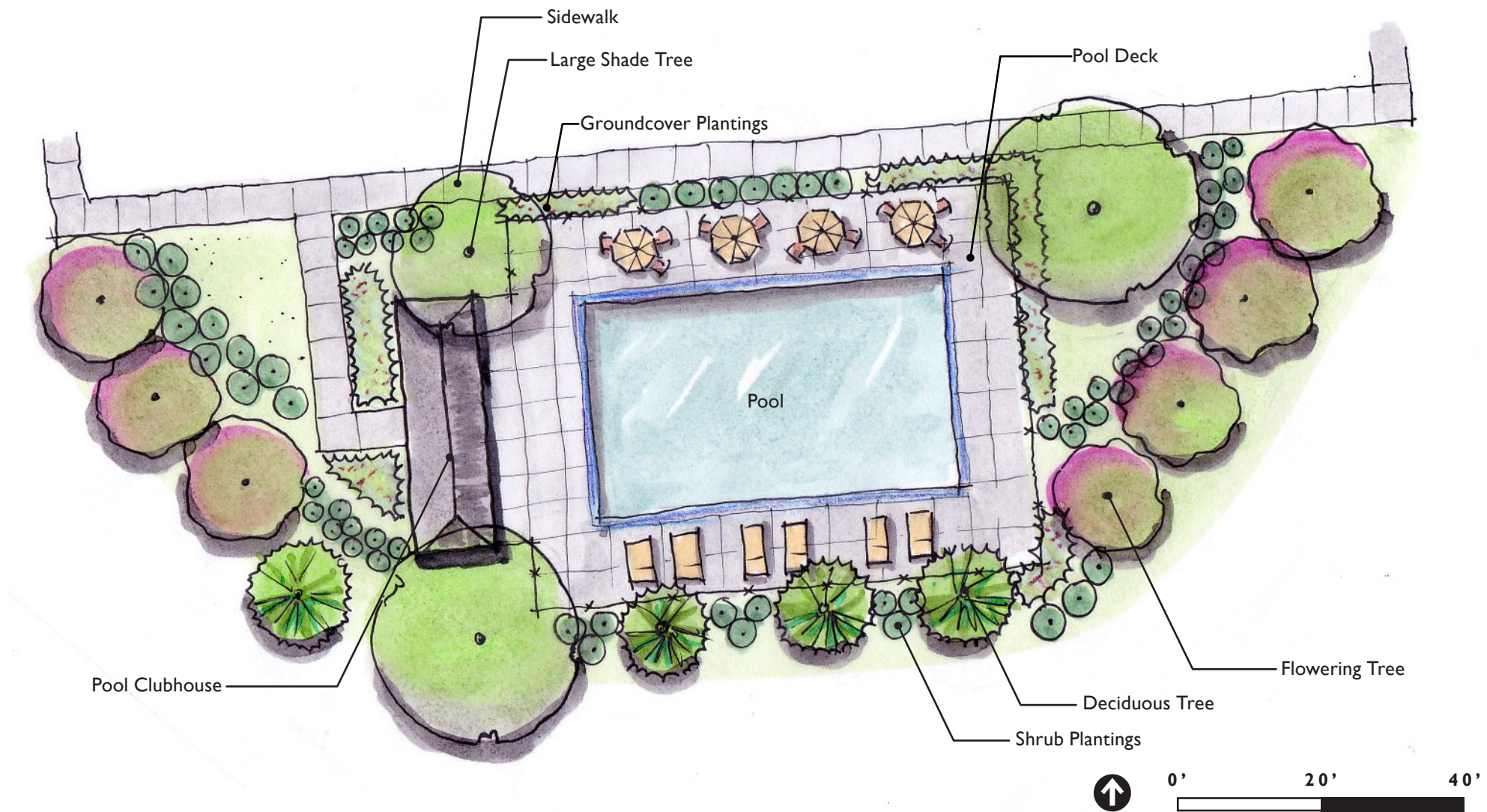
Parking Lot / Streetscape

Scientific Name	Common Name
TREES	
Liquidambar styraciflua 'Rotundiloba'	Sweetgum
Nyssa sylvatica 'Wildfire'	Black Gum
Platanus x acerifolia 'Bloodgood'	London Planetree
Quercus bicolor	Swamp White Oak
Quercus coccinea	Scarlet Oak
Quercus phellos	Willow Oak
Ulmus americana 'Valley Forge'	American Elm
SHRUBS	
Rhus aromatica 'Gro-Low'	Gro-Low Sumac
Itea virginica 'Little Henry'	Sweetspire
Ilex glabra 'Compacta'	Compact Inkberry
Ilex glabra 'Gem Box'	Gem Box Inkberry



Landscaping

Landscaping within the development can help define spaces and community identity. These aspects are important for creating a pleasant pedestrian experience. Well designed landscapes help manage stormwater, reduce heat island effects, provide shade, provide for natural habitat and wildlife. Large canopy trees should be located along parking area islands and buffer areas. Buffer area plantings should be more naturalized, while streetscape plantings are designed with more order and rhythm. In amenity spaces, plantings can be used to frame areas and provide necessary shade. A mix of species should be utilized with natives where applicable. All plantings should be in accordance with the zoning ordinance and standards.



Pool and Amenity Area

The pool and amenity area is centrally located and convenient for Poplar Hill residents. The pool deck is provided with umbrella-shaded tables and lounge chairs for a variety of poolside rest and recreation.

The pool and amenity area is framed with trees for shade, shrubs for screening and ornamental interest, and an arc of colorful flowering trees.

plant palette

Large Shade Trees

Scientific Name	Common Name
Acer saccharum	Sugar Maple
Nyssa sylvatica	Black Gum
Platanus occidentalis	American Sycamore
Quercus alba	White Oak
Quercus coccinea	Scarlet Oak
Quercus phellos	Willow Oak
Taxodium distichum	Bald Cypress
Ulmus americana 'Valley Forge'	American Elm

Ornamental Plants

Scientific Name	Common Name
TREES	
Acer japonicum	Japanese Maple
Amelanchier x grandiflora 'Autumn Brilliance'	Apple Serviceberry
Betula nigra 'Heritage'	River Birch
Carpinus betulus 'Frans Fontaine'	Columnar Hornbeam
Cercis canadensis 'Forest Pansy'	Redbud
Cornus florida 'Cloud Nine'	Flowering Dogwood
Juniperus virginana 'Skyrocket'	Skyrocket Juniper
Lagerstroemia	Crapemyrtle
Magnolia grandiflora 'Little Gem'	Southern Magnolia
Prunus okame	Flowering Cherry
SHRUBS	
Aronia arbutifolia 'Brilliantissima'	Red Chokeberry
Abelia x grandiflora 'Rose Creek'	Rose Creek Abelia
Hydrangea arborescens 'Annabelle'	Annabelle Hydrangea
Ilex glabra	Inkberry
GROUNDCOVER	
Liriope muscari	Lilyturf
Muhlenbergia capillaris	Pink Muhlygrass
Panicum virgatum 'Shenandoah'	Shenandoah Reed Switch Grass
Schizachyrium scoparium	Little Bluestem



Open Space

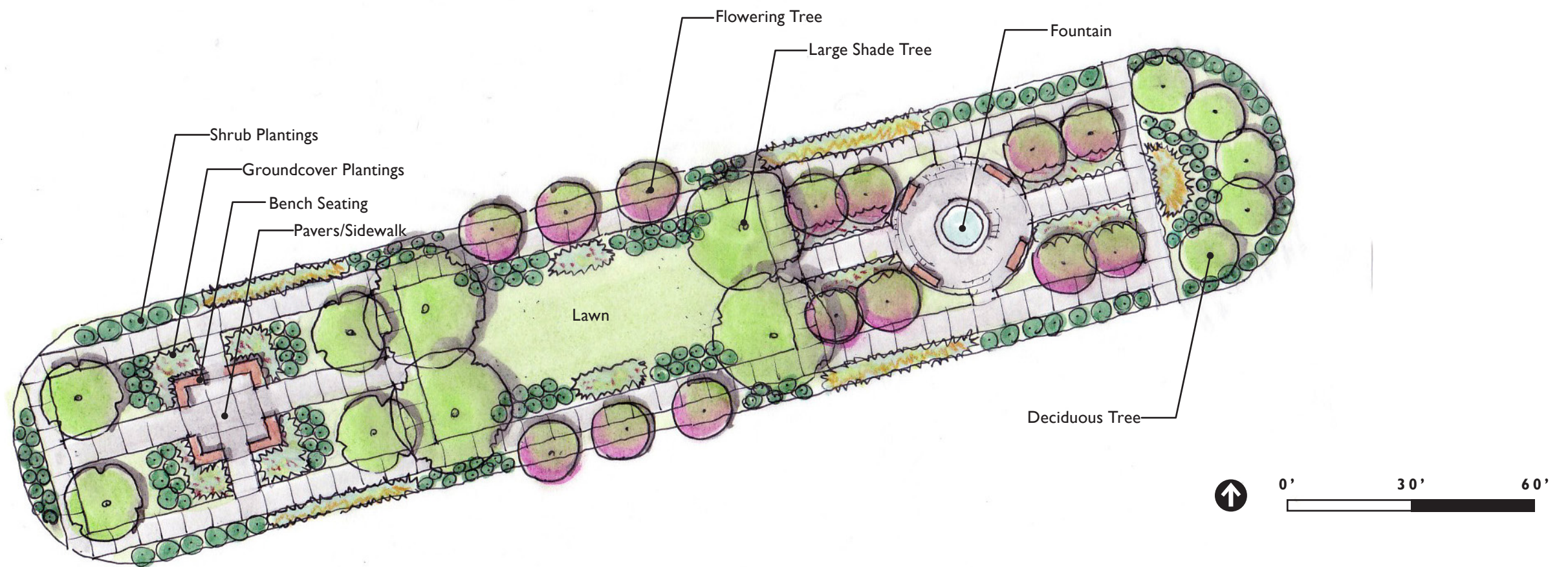
Open spaces within the development provide a connection to the natural surroundings and opportunities for large parks and small pocket parks. These spaces serve an important function within the neighborhood to bolster the feeling of belonging and community. Park space should be provided and located where access is convenient. These spaces should utilize existing trees where they can. Plantings for these spaces can include large shade trees, ornamental trees, shrubs and groundcovers. These plantings should be designed to create an aesthetically pleasing environment for the community while providing for a comfortable space for gathering and recreation.



Neighborhood Park

The neighborhood park serves as an informal gathering place for residents of Poplar Hill. The large oval lawn provides room for pickup games and picnic blankets, while the pathway around it invites strolling, dog walking, chatting, and children riding scooters. Smaller areas off to the side – a pergola-covered seating area, a small patio among

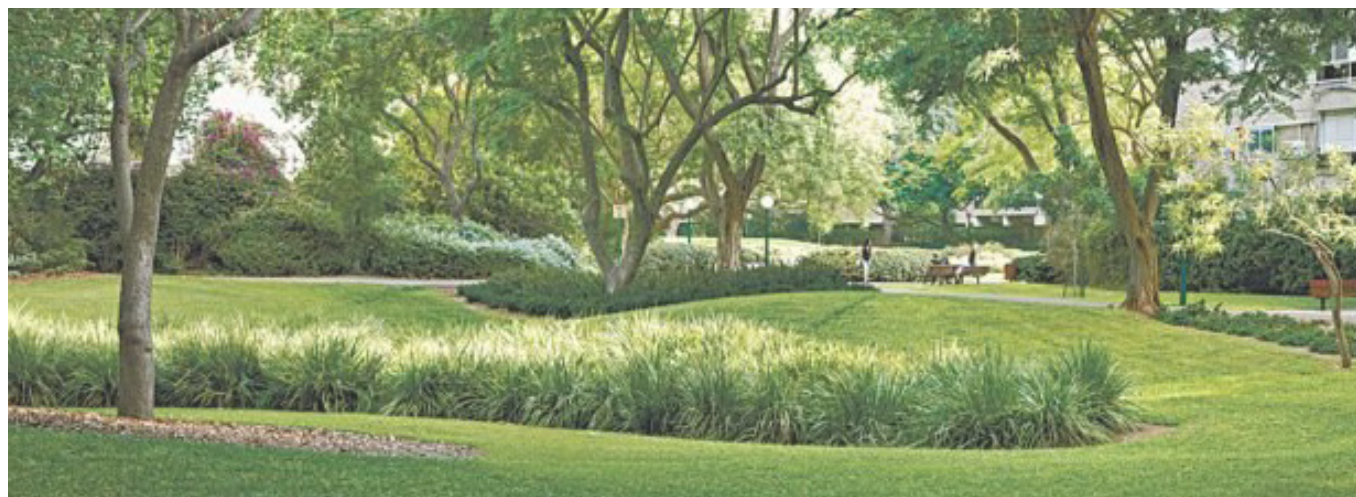
flowering trees, and a meandering path through ornamental flowers invite exploration and quiet reflection. This smaller park will become a destination for evening after-dinner walks as the lush native plantings demonstrate the seasons changing day by day.



Linear Park

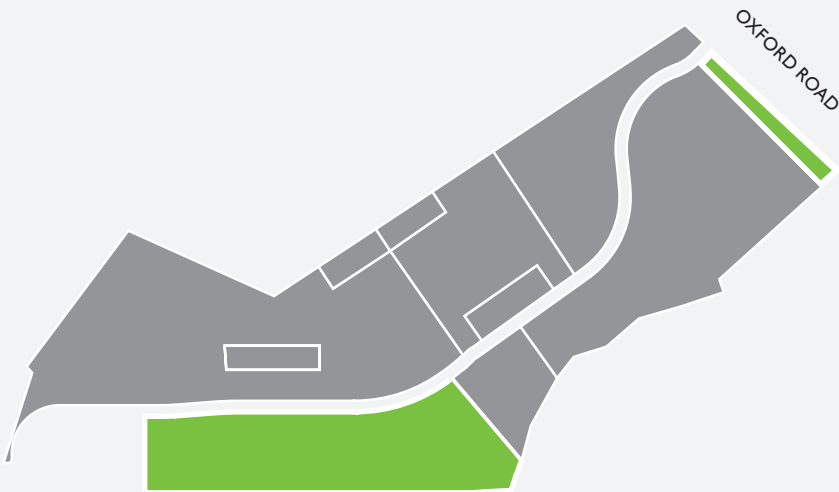
The linear park along the central boulevard serves as a formal, ornamental focal point and walking destination. Designed as series of three formal gardens, the native plantings will be lush and colorful and full of seasonal interest.

A small fountain in one courtyard focuses attention inwards and provides a gathering point, while seating interspersed throughout allows for moments of respite and reflection along the way.



Commercial Screening and Oxford Road Landscape

Plantings in commercial areas have a necessary function along many scales. In store front retail spaces, vegetation should be used to provide for transitions and foundation planting. Along larger development edges, buffers serve as a visual barrier between two different land uses. Vegetation in these areas can provide screening and visual appeal that also creates natural wildlife habitats.



Berm/Buffer Planting Along Oxford Road

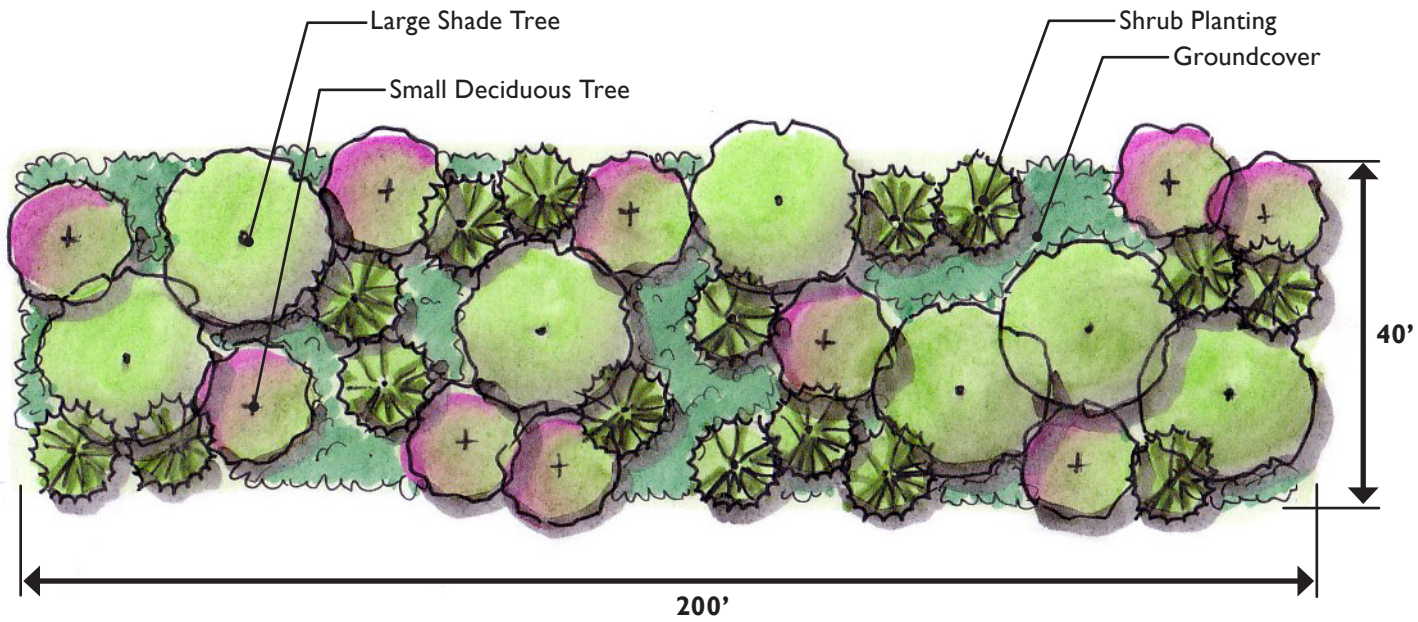
The buffer plantings along Oxford Road will be mounded and 40' wide measured from the edge of right-of-way. The plantings are a mix of large deciduous trees, evergreen trees, small ornamental trees, and shrubs. These plantings are spaced out in a natural pattern across the mound.

They will serve as a dense visual and sound barrier to the development and park from the nearby road. Appropriate buffers according to Town Ordinances will buffer neighboring properties.

plant palette

Screening Buffer Plants

Scientific Name	Common Name
TREES	
Cercis canadensis	Redbud
Ilex x attenuata 'Fosteri'	Foster holly
Ilex opaca	American Holly
Juniperus virginiana	Red Cedar
Magnolia grandiflora	Southern Magnolia
Magnolia virginiana	Sweetbay Magnolia
Pinus taeda	Loblolly pine
SHRUBS	
Ilex glabra	Inkberry
Lindera Benzoin	Spicebush
Myrica cerifera	Wax Myrtle
Viburnum dentatum	Viburnum





plant palette

Native Species

Scientific Name	Common Name
TREES	
Acer rubrum	Red Maple
Acer saccharum	Sugar Maple
Amelanchier canadensis	Serviceberry
Asimina triloba	Pawpaw
Betula nigra	River Birch
Carya alba	Mockernut Hickory
Celtis occidentalis	Hackberry
Cercis canadensis	Eastern Redbud
Cornus florida	Flowering Dogwood
Crataegus viridis	Green Hawthorn
Fagus grandifolia	American Beech
Ilex opaca	American Holly
Juniperus virginiana	Red Cedar
Liquidambar styraciflua	Sweetgum
Liriodendron tulipifera	Tulip Poplar
Magnolia virginiana	Sweetbay Magnolia
Morus rubra	Red Mulberry
Nyssa sylvatica	Black Gum
Pinus echinata	Shortleaf Pine
Pinus rigida	Pitch Pine
Pinus strobus	White Pine
Pinus taeda	Loblolly pine
Pinus virginiana	Virginia Pine
Platanus occidentalis	American Sycamore
Quercus alba	White Oak
Quercus bicolor	Swamp White Oak
Quercus coccinea	Scarlet Oak
Quercus palustris	Pin Oak
Quercus phellos	Willow Oak
Quercus rubra	Red Oak
Sassafras albidum	Sassafras
Taxodium distichum	Bald Cypress

SHRUBS

Alnus serrulata	Smooth Alder
Aralia spinosa	Devil's Walking Stick
Callicarpa americana	American Beautyberry
Cephalanthus occidentalis	Buttonbush
Clethra alnifolia	Sweet Pepperbush
Hamamelis virginiana	Witch Hazel
Ilex glabra	Inkberry
Ilex verticillata	Winterberry
Itea virginica	Virginia Sweetspire
Lindera benzoin	Spicebush
Myrica cerifera	Wax Myrtle
Rhododendron atlanticum	Dwarf Azalea
Rhododendron canescens	Sweet Azalea
Rhododendron periclymenoides	Pinxterbloom Azalea
Rhododendron viscosum	Swamp Azalea
Rhus glabra	Smooth Sumac
Rosa palustris	Swamp Rose
Sambucus canadensis	Elderberry
Spiraea tomentosa	Steeplebush
Vaccinium corymbosum	Highbush Blueberry
Viburnum dentatum	Southern Arrowood

GROUNDCOVERS

Agalinis purpurea	Purple False Foxglove
Aquilegia canadensis	Wild Columbine
Aralia nudicaulis	Wild Sarsaparilla
Asclepias incarnata	Swamp Milkweed
Asclepias tuberosa	Butterfly Milkweed
Baptisia tinctoria	Yellow Wild Indigo
Caltha palustris	Marsh Marigold
Chelone glabra	Turtlehead
Chimaphila maculata	Striped Wintergreen

GROUNDCOVERS (CONT.)

Chrysopsis mariana	Golden Aster
Claytonia virginica	Spring Beauty
Desmodium paniculatum	Panicked-leaf Ticktrefoil
Erigeron pulchellus	Robin's Plantain
Eupatorium dubium	Joe-Pye weed
Geranium maculatum	Wild Geranium
Helenium autumnale	Sneezeweed
Helianthus divaricatus	Woodland Sunflower
Heliopsis helianthoides	Oxeye Sunflower
Houstonia caerulea	Quaker Ladies
Impatiens capensis	Jewelweed
Liatris scariosa	Blazing Star
Lilium superbum	Turk's Cap Lily
Lobelia cardinalis	Cardinal Flower
Mertensia virginica	Virginia Bluebells
Packera aurea	Golden Ragwort
Penstemon digitalis	Beardtongue
Polygonatum biflorum	Solomon's Seal
Rudbeckia hirta	Black-eyed Susan
Solidago caesia	Bluestem Goldenrod
Symphyotrichum laeve var. laeve	Smooth Blue Aster
Tiarella cordifolia	Foamflower

GRASSES

Andropogon virginicus	Broomsedge
Carex pensylvanica	Pennsylvania Sedge
Carex stricta	Tussock Sedge
Chasmanthium latifolium	Wild Oats
Panicum virgatum	Switchgrass
Schizachyrium scoparium	Little Bluestem
Sorghastrum nutans	Indiangrass
Tripsacum dactyloides	Gama Grass



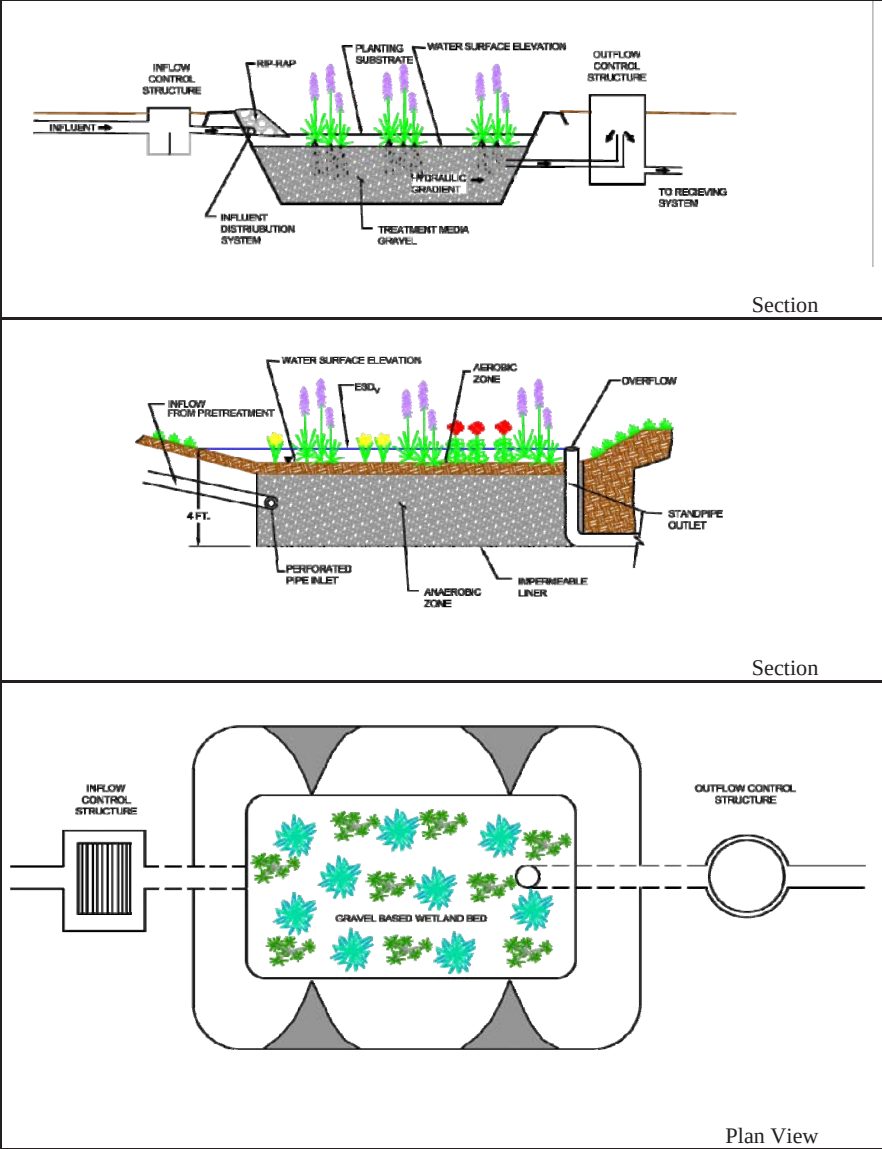
V. Environmental

Stormwater

Poplar Hill not only enhances the human experience in the Town of Easton, it enhances and protects the natural environment as well. Our community proposes not only to achieve the Maryland stormwater standards, it goes beyond to integrate stormwater and environmental protection into the active and passive landscape. The result is not only functional stormwater systems that remove damaging pollutants, but aesthetically pleasing spaces that invite discovery and learning how we can live with a lighter environmental footprint.

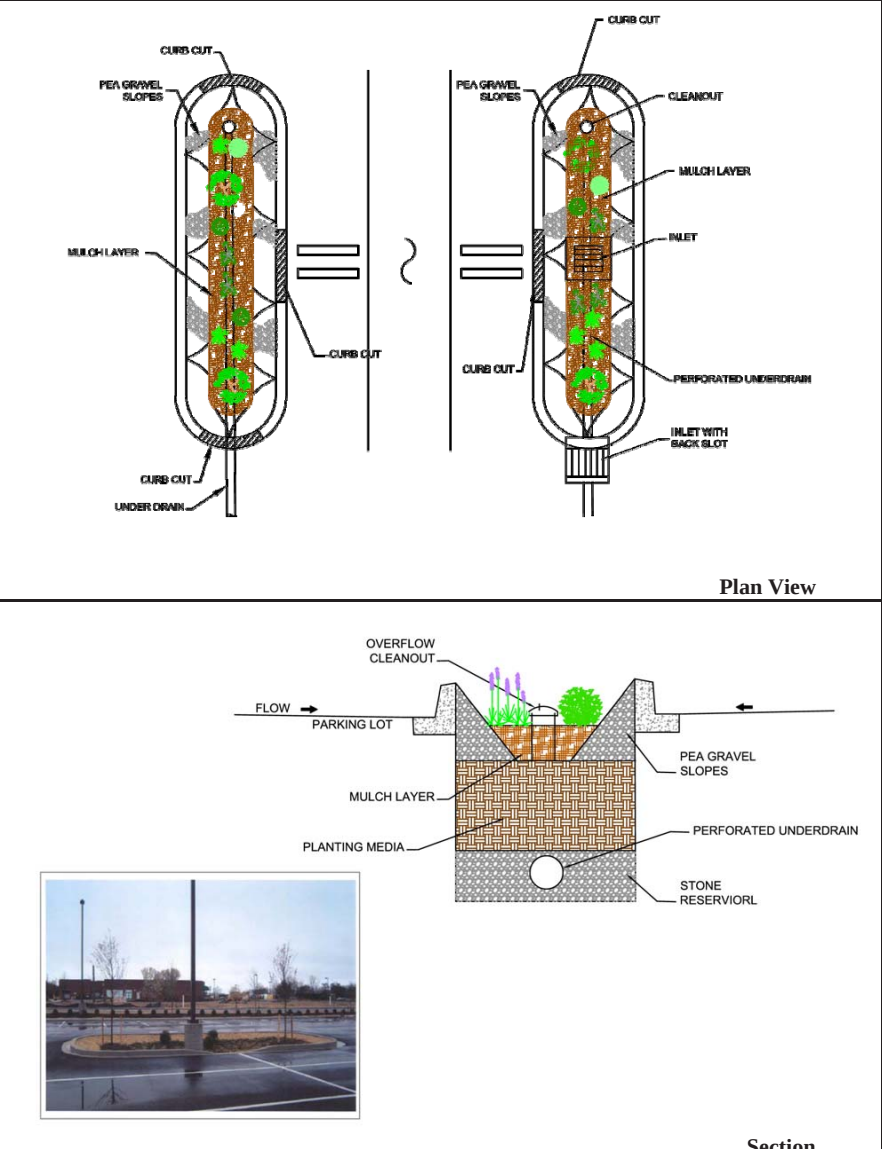


Figure 5.10 Submerged Gravel Wetland



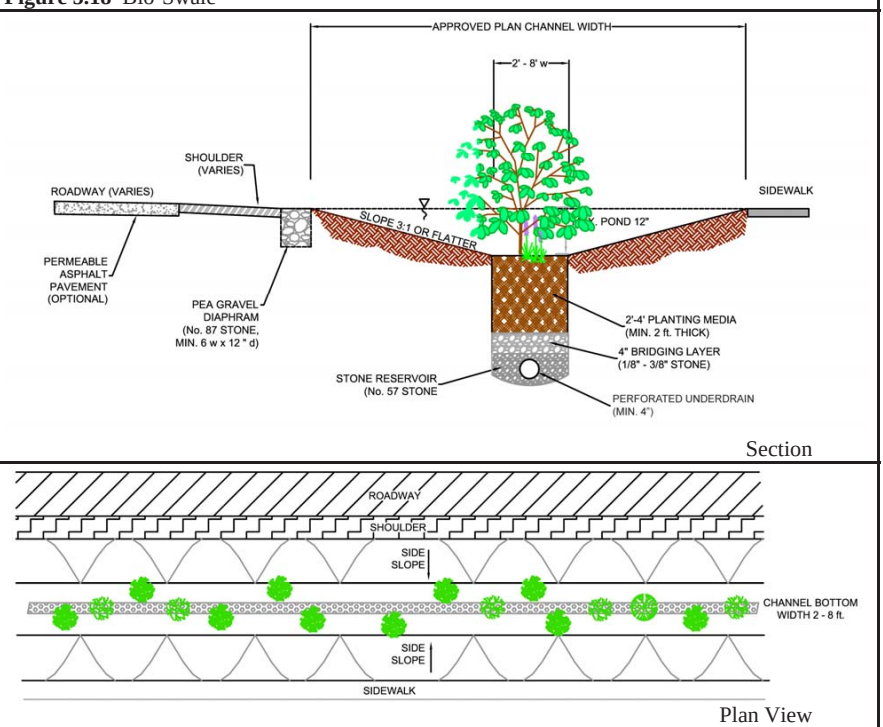
5.79 Supp.1

Figure 5.15 Micro-Bioretentention (Variation 2 - Parking Lot)



Supp. 1 5.100

Figure 5.18 Bio-Swale



Maintenance Criteria:

- The following items should be addressed to ensure proper maintenance and long-term performance of swales:
- For grassed swales, regular mowing (at least bi-annually) is critical in order to reduce competition from weeds and irrigation may be needed during dry weather to establish vegetation. Sparsely vegetated areas need to be re-seeded to maintain dense coverage.
 - If water does not drain within 48 hours, the bottom soil should be tilled and revegetated.
 - Inspections should be performed once a year to assess slope integrity, vegetative health, soil stability, compaction, erosion, ponding, and sedimentation. Periodic removal of sediment, litter, or obstructions should be done as needed. Eroded side slopes and the swale bottom should be repaired and stabilized where needed.

5.111 Supp.1

DETAILS DERIVED FROM THE MARYLAND STORMWATER DESIGN MANUAL CHAPTER 5, ENVIRONMENTAL SITE DESIGN.



plant palette

BMP Vegetation

Scientific Name	Common Name
TREES	
Acer rubrum	Red Maple
Betula nigra	River Birch
Liquidambar styraciflua	Sweetgum
Magnolia virginiana	Sweetbay Magnolia
Nyssa biflora	Swamp Tupelo
Platanus occidentalis	American Sycamore
Quercus nigra	Water Oak
Quercus nuttalli	Nuttall Oak
Quercus phellos	Willow Oak
Salix nigra	Black Willow
Taxodium distichum	Bald Cypress
SHRUBS	
Cephalanthus occidentalis	Buttonbush
Clethra alnifolia	Sweet Pepperbush
Hibiscus moscheutos	Rose Mallow
Ilex glabra	Inkberry
Ilex verticillata	Winterberry
Itea virginica	Virginia Sweetspire
Lindera benzoin	Spicebush
Rosa Palustris	Swamp Rose
Viburnum dentatum	Southern Arrowwood

AQUATIC BENCH 0-6”

Eupatorium purpureum	Joe Pye Weed
Iris versicolor	Blueflag Iris
Juncus spp	Common Rush
Peltandra virginica	Arrow Arum
Sagittaria latifolia	Duck Potato
Scipus pungens	Common Three Square

AQUATIC BENCH 6-12”

Acorus americanus	American sweet flag
Carex Stricta	Tussock Sedge
Lemna sp	Duckweed
Scirpus tabernaemontani	Softstem Bulrush
Typha	Broadleaf Cattail



Wes Moore
Governor
Aruna Miller
Lt. Governor



Charles C. Deegan
Chairman
Katherine Charbonneau
Executive Director

**STATE OF MARYLAND
CRITICAL AREA COMMISSION
CHESAPEAKE AND ATLANTIC COASTAL BAYS**

March 31, 2023

Mr. Miguel Salinas
Town of Easton Planning and Zoning
14 South Harrison Street
Easton, MD 21601

**Re: Poplar Hill PUD & Growth Allocation
Oxford Road, Easton (TM 42, P 57)**

Dear Mr. Salinas:

Thank you for submitting revised information regarding the above-referenced planned unit development (PUD) and growth allocation to this office for additional preliminary review. This letter is subsequent to our letter dated July 20, 2022. The applicant proposes to develop a 120-acre site with 456 residential units (108 single family dwellings, 138 townhouses, 210 apartment units); a commercial area consisting of two office buildings and two retail buildings; a public park with three multipurpose sports fields, a dog park, and parking area; private community open space with walking trails and two community clubhouses with pools; a satellite fire department building; and public and private streets and parking areas. To accommodate the proposed PUD, the applicant is requesting to redesignate all 65.97 acres of Critical Area on this property from Resource Conservation Area (RCA) to Intensely Developed Area (IDA). The property is currently used for agriculture and is waterfront to Windmill Branch. The Town's Comprehensive Plan identifies the site as a Priority Development Area as well as planned for residential land use.

It is our understanding that this growth allocation request is scheduled to be reviewed at the joint Planning Commission meeting with the Town of Easton and Talbot County on April 4, 2023. Based on our review of the revised supplemental materials provided, we have the following comments:

1. Prior to Critical Area Commission review and approval, the growth allocation component of the project must go through the supplemental growth allocation process which includes approval from both the Town of Easton and Talbot County. At the time of forwarding the growth allocation request to the Commission, all information outlined in the Commission's growth allocation submittal requirements (COMAR 27.01.02.06-1 and COMAR 27.01.02.06-2) must be submitted. In addition, the Town must submit a cover letter requesting that the Commission review the growth allocation request for approval. Please feel free to reach out to me if you have any questions regarding this submission process.

2. A 300-foot setback beyond the landward edge of tidal wetlands or waters has been delineated per Natural Resources Article 8-1808.1(c)(2)(iv) and COMAR 27.01.02.06-1.B (18). A total of 1.15 acres of the 300-foot setback is proposed to be impacted by a portion of the proposed grass sports field, stormwater management features, and a community walking path. Approximately 3.35 acres of native plantings within the 200-foot Buffer and 300-foot setback are proposed as offsets for the proposed development within the 300-foot setback. A Buffer Management Plan (BMP) has been provided showing full establishment of the 200-foot Buffer (including the 100-foot Buffer, which has been expanded for steep slopes and highly erodible soils) and additional plantings within the 300-foot setback. A note should be included on the site plan and BMP indicating that the 200-foot Buffer and the planting areas within the 300-foot setback will remain vegetated in perpetuity.
3. In addition to the full establishment of the 200-foot Buffer and additional plantings in the 300-foot setback, this office would recommend that the applicant consider using educational signage for stormwater management features as an additional offset for the impacts within the 300-foot setback. Please include more information about the educational signage as part of the final submittal package.
4. On the second page of the BMP under Maintenance Provisions, we recommend the note regarding bi-annual mowing of competing vegetation be adjusted to include a time frame (i.e. for 2-5 years until the seedlings become established).
5. Per the revised spreadsheet dated November 1, 2022, the Critical Area 10% pollutant reduction requirement is 54.77 pounds of phosphorus per year and the applicant is proposing to install stormwater management features that will treat 75.31 pounds of phosphorus per year. The proposed stormwater management plan must receive local approval. Please note, this office cannot accept the stormwater treatment in excess of the 10% requirement as an offset for the impacts to the 300-foot setback.
6. Approximately 1.38 acres of tree clearing is proposed. Please have the applicant indicate the area to be cleared on the site plan. Also, please have the applicant include in a Critical Area Notes section on the site plan that outlines the existing and proposed forest and developed woodland clearing in the Critical Area and Buffer, respectively.
7. Approximately 19.12 acres of new lot coverage is proposed in the Critical Area. Please have the applicant include in the Critical Area Notes section on the site plan the existing and proposed lot coverage in the Critical Area and Buffer, respectively.

Mr. Miguel Salinas
Poplar Hill PUD & Growth Allocation
March 31, 2023
Page 3 of 3

8. Authorization from the Maryland Department of the Environment (MDE) is required for impacts to nontidal wetlands and their buffers. A copy of the authorization, or information on the status of these permits, should be included with the growth allocation submission.

Thank you for the opportunity to provide preliminary comments. Please feel free to contact me at (410) 260-3466 or ann.sekerak@maryland.gov if you have any questions.

Sincerely,



Annie Sekerak
Natural Resources Planner

cc: Brennan Tarleton, Talbot County

file: EA 0234-22
EA 0255-22

Papermill Crossing Homeowners Assn.

7585 Pollys Hill Lane

Easton, Maryland

3 November 2022

Mr. Lynn B. Thomas, Jr.
Town Planner
Town of Easton
14 S. Harrison Street
P.O. Box 520
Easton, Maryland 21601

Mr. Brennan Tarleton
Planning Officer
Talbot County
215 Bay St # 2
Easton, Maryland 21601

Re: Request for Supplemental Growth Allocation for Development of Poplar Hill Farm

Dear Messrs. Thomas and Tarleton:

I am the President of the Papermill Crossing Homeowners Association, representing homeowners who are concerned about development of the former Poplar Hill Waterfowl Sanctuary. A Manassas, Virginia developer, 5001 SHR, L.C., has proposed a planned use development (PUD) that would place 456 dwelling units and four commercial/retail buildings totaling 98,000 square feet on the property. Of these, 272 dwelling units and 40,000 square feet of retail/office space would be built on the 66 acres of the property that are located within the Chesapeake Bay Critical Area. Because this would require use of growth allocation and the Town has used all its growth allocation, 5001 SHR, L.C. submitted a request for an additional growth allocation from Talbot County and the Town of Easton on 6 July 2022. This letter responds to that request and urges that it be denied.¹

1. Introduction.

The Maryland Critical Area Program has three goals:

- a. To minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances or that have run off from surrounding lands;
- b. To conserve fish, wildlife, and plant habitat; and

¹ SHR 5001, L.C. has separately submitted and subsequently revised a Planned Use Development (PUD) package for this development and then amended it again. Although there is considerable overlap in our objections to the application for an additional growth allocation and our objections to the PUD, this letter focuses primarily on the additional growth application and we may supplement our views on the PUD later.

c. To establish land use policies for development in the Chesapeake Bay Critical Area... which accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in that area can create adverse environmental impacts.²

The request for an additional growth allocation to change 66 acres of critical area now classified as Resource Conservation Area (RCA) to Intensely Developed Area (IDA) should not be approved because, if implemented as proposed, it does not advance any of the goals of the Maryland Critical Area Program.

5001 SHR, L.C. has submitted an application for an additional growth allocation for 66 acres of Critical Area designated as Resource Conservation Area (RCA), a label that aptly describes the original intention for this area when the Chesapeake Bay Critical Area Program was established. Among other protective measures, RCA designation only allows construction of 1 dwelling unit per 20 acres, or a total of 3 dwelling units in this case. 5001 SHR, L.C. asks that all 66 acres be redesignated as Intensely Developed Area (IDA), which also aptly describes the end state if this request is approved. In fact, 5001 SHR, L.C. proposes to build 272 dwelling units in just those 66 acres, and 184 more outside the Critical Area. The development will also include 98,000 square feet of retail/commercial buildings and associated parking, of which 40,000 square feet will be within the Critical Area.

The application recites compliance with a list of requirements, many of which are not in dispute. But even if the request were to meet every technical requirement (and the applicant has not demonstrated such compliance), a request for reallocation is an extraordinary request and should not be granted unless the planning commissions, governing councils, and Critical Area Commission, exercising their sound judgment, determine that the request will achieve the goals of the Maryland Critical Area Program.³

2. What Is at Stake for Future Generations.

Whether you call it Papermill Pond, the Tred Avon River, or Windmill Branch, the stream to the north and east of the project that the designated Critical Area protects is special. The water slowly ebbs and flows in broad, lazy, S-curves into the recesses of marsh. Upstream of Oxford Road, there are no piers or boatlifts, only nooks and crannies, mud, grasses, and reeds - the nurseries of the Chesapeake Bay. The stream is tidal, sometimes full, sometimes almost empty, always changing. One consequence of this is that even pollutants deposited downstream, at

² MD Natural Resources Art. § 8-1808(d)

³ Talbot County's state-approved program expressly makes this point: "The fact that an application for growth allocation complies with the specific requirements and standards shall not be deemed to create a presumption that the proposed growth allocation would be compatible with surrounding land uses, and is not, in itself, sufficient grounds to require approval." Talbot County Code 55.5.F.5 .

the marsh along Oxford Road, will be deposited back upstream in the nurseries and breeding areas twice a day. Other pollutants from this development will be discharged directly from outfalls planned for the upper reaches of Papermill Branch. It is home to perch in the spring, mud shad, carp, and recently, snakeheads. It contains snapping turtles, terrapins, and muskrats. From February to June, the shallows are full of minnows. Herons, ospreys, and bald eagles feast on all this. Five eagles perched in one of our community's trees to work the pond this past spring. On occasion, wild turkeys fly back and forth from one bank to the other and strut through the field.

The field previously known as the Poplar Hill Waterfowl Sanctuary is also special because it provides Easton residents a convenient, accessible location to see one of the spectacles of nature, which informs Easton's conservation values. Each fall, flocks of hundreds to thousands of migratory Canadian geese use the field to feed and to loaf where they are easily visible to passersby on Oxford Road. Because of its proximity to Papermill Pond and location within the Town of Easton, this field was treated as a wildlife habitat of local significance from sometime before 2005 until 2018, prominently proclaimed by a large sign on Oxford Road that labeled it as "Waterfowl Sanctuary - Project of Waterfowl Festival Inc., Easton MD."⁴ The sign was only removed after the property went up for sale. This is perhaps the last relatively large plot of Critical Area left within Easton, and affords Easton perhaps the last chance to protect this important resource within town boundaries.

3. The Request for Additional Growth Allocation Must Be Disapproved Because It will Not Achieve the Goals of the Maryland Critical Area Program.

A. The proposal will not achieve the core goals of the Maryland Critical Area Program because it will not minimize adverse impacts on water quality, a core goal of the Maryland Critical Area Program.⁵

While 5001 SHR, L.C.'s proposal contains some elements to reduce the impacts of the intense development planned for the Critical Area, it has not shown that it will minimize adverse impacts on water quality and will not minimize runoff.⁶ The issues start with fundamental design. The intensive development in the Critical Area speaks for itself as to the burden it will place on the environment. See Attachment E. 5001 SHR, L.C.'s proposal will build 272 dwelling units in the 65.9 acres of RCA Critical Area alone - substantially more than Gannon Estates will place (200 dwelling units) on its entire 76.3 acres, none of which is Critical Area. In fact 5001 SHR, L.C. will place 62% of its dwelling units in the Critical Area. 5001 SHR, L.C.'s development will also include 40,000 square feet of retail/commercial buildings and associated parking

⁴ See Attachment A,

⁵ MD Natural Resources Art. § 8-1808(d)

⁶ Talbot County Code 190-55.5.F.3.d.

within the Critical Area. This is not minimizing impacts.⁷ In fact, this proposal is the opposite of what Easton's Critical Area regulations require. Easton's Critical Area Program comes at the issue from a different direction, but the result is the same. Easton's Critical Area Program requires that a "new LDA or IDA shall be located ... in an area and manner that optimizes benefits to water quality." [emphasis added]⁸

The failure to optimize benefits and minimize adverse impacts on water quality is especially evident in the park complex. Rather than design a park that would mitigate these impacts, the proposed park complex will exacerbate them. Ironically, the active park complex does not even have to be located in the Critical Area. It is not enhanced by its location in the Critical Area and will primarily serve organized teams from all over Easton, likely through a reservation process, and not individuals or casual groups. The park complex is not dependent on the development and the development is not dependent on the park complex. The development and the park would just be co-located. A passive natural park, available to individuals without reservations would provide the open space the development requires and be more closely linked to unstructured use by the residents of the development and nearby communities.

5001 SHR, L.C. has not demonstrated that it has minimized impacts on water quality or optimized the benefits to water quality. Technical analyses start with basic data or empirical data. Even if an analysis is completed diligently, however, if the analysis is based on assumptions that are incorrect, too generous, or too strict, it can produce results that are less reliable than desired. 5001 SHR, L.C. has used unreasonable and worst case assumptions about the current condition of the agricultural field to project that its stormwater management plan for the intense development will reduce phosphorous pollution.

The analysis does not cite any field samples of nutrient levels to support the assumptions beyond soil type. A reduction of 10 or 15% of pollutant discharge would be a good result, but only if the actual condition and available nutrient load of the field at present is as bad/high as the assumptions in the tables used to compute the reduction. Reducing the release of a small nutrient load by the same percentage may not result in significant nutrient reductions in the real world despite how large they appear on paper. If the total pollutant load of the 120 acres of houses, townhomes, apartments, parking lots, commercial buildings, etc. is significantly higher than the current agricultural use, the result is a net increase in overall pollution. This is no different than a merchant advertising a sale with deep discounts based upon illusory list prices - prices at which the sale items never sell. There are no real savings. The design creates the very problem that is addressed by the third goal of the Maryland Critical Area Program.

⁷ The term "minimize" is commonly defined in the United States as "to reduce to a minimum; decrease to the least possible amount, degree, etc." <https://www.collinsdictionary.com/us/dictionary/english/minimize>

⁸ Town of Easton Code 28-501.C.5

Even if all the individual environmental requirements are met, the cumulative burden that the sheer numbers of dwellings, vehicles, buildings, pavement, pools, active playing fields, parking spaces, etc. will impose on the environment qualities of this particular part of the Critical Area will have adverse impacts.⁹

5001 SHR, L.C. also has not accounted for the additional pollutants that will be flushed with stormwater from the lawns, playing fields, streets, and parking lots when the former Pollys Hill Waterfowl Sanctuary is converted from agriculture. Moreover, it will be difficult or impossible to control the fertilizer and pollution contributions of the residents of those 456 dwelling units and the approximately 800 cars that will be parked in the project. Lawns require phosphorous fertilizers to start and nitrogen-rich fertilizers to grow thereafter. The proposed playing fields will require the same, on a grander scale. Internal combustion vehicles emit nitrogen gases that are a significant contributor to water pollution in the Chesapeake Bay. If that pollution is only moderately greater than the existing condition, approval of this growth allocation will increase water pollution despite proposed mitigation measures.

The analysis submitted by 5001 SHR, L.C. also requires additional review. The Surface Water Management Report submitted by 5001 SHR, L.C. uses the highest runoff curve numbers possible (86-88)¹⁰ for row crops, assuming the near worst soil is present and that there is no management of the soil to reduce nutrient release.¹¹ Nowhere in the proposal is there any discussion of the actual conditions in the field. This field is not a hypothetical. The analysis does not consider the possibility that the actual pollutant load of a field managed by an experienced farmer, using "no till" best practices, cover crops, and a state-approved nutrient management plan that is reviewed by state and local authorities, might be less than the assumed load built into the tables. The seminal reference, U.S. Department of Agriculture Technical Release-55, "Urban Hydrology for Small Watersheds" (USDA TR-55) provides that fields that retain crop residue, as does this "no-till" field, have a runoff curve number of 75-82 for the soil types present, significantly lower than assumed by 5001 SHR's analysis.¹² There also is no consideration that this field has been used primarily to grow soybeans, which require little phosphorous fertilizer and which, as a legume, actually fix nitrogen (from car exhausts, etc.) to the soil. In comparison, once developed as athletic fields, the soil will be bulldozed into a level but "crowned" condition, compacted, and planted with short turf grass that will require phosphorous fertilizers to become established and repeated fertilization with nitrogen-rich mixtures to maintain an optimum playing surface.

⁹ See generally, MD Natural Resources Art. § 8-1808(d)

¹⁰ Concept Stormwater Management Report (SWM), 6 July 2022, p. 4

¹¹ "Run off curve numbers" are used to calculate an estimate of runoff from storm rainfall. The higher the number, the higher the runoff. USDA TR-55, June 1986, p. 1-2. Runoff is associated with flushing pollutants, sediment, and nutrients from the soil to a receiving water body. The lower the number, the better for the environment.

¹² USDA TR- 55, June 1986, Table 2-2B, p.6.

If 5001 SHR, L.C.'s proposal for intense residential development of the Critical Area would reduce water pollution compared to a professionally managed agricultural use, then it would seem to follow that the answer to the Chesapeake Bay's pollution issues is to intensely develop those parts of the Critical Area that are now farmed. 5001 SHR, L.C. has produced no evidence to prove that strategy would work and the State of Maryland doesn't support it.

B. Contrary to the goals of the Maryland Critical Area Program, this development will result in such numbers, movements, and activities of persons that it will create adverse environmental impacts.

5001 SHR, L.C. has not tried to minimize water pollution and other adverse environmental impacts. In fact, it has ignored basic steps that would greatly mitigate the clear and present threat that it poses to Windmill Branch and the Chesapeake Bay. First, 5001 SHR, L.C. has vastly expanded the intensity of the planned development. In April 2021, it instructed its traffic consultant that the development would consist of 84 single-family homes, 120 townhomes, and 120 apartments.¹³ By September 2021, the project had grown by 35%. The added 115 dwelling units and the cars they will attract will increase, not reduce and certainly not minimize the attendant pollution. In October 2022, the project grew again, adding 17 dwelling units. Second, as discussed above at page 3, this project intensely develops the Critical Area, placing most of the dwelling units and their amenities in the Critical Area and then filling the remainder with a large sports complex.

5001 SHR, L.C. has tried to hold for ransom the Critical Area that will not be covered with residences and pavement, dangling creation of 3 large playing fields as incentives to the Town of Easton. This could be a generous offer if it would not further damage the remainder of the Critical Area in addition to the damage done elsewhere. Instead, it heaps environmental injury upon injury. There is no reason why those facilities must be developed in the Critical Area. They are not water dependent and the experience of attending a game there will not be heightened by proximity to Windmill Branch.

Before this development was unveiled, the Easton Park Advisory Board had not completed any study establishing the need for these fields, let alone fields that would unnecessarily damage the environment - and damage the environment they will. The areas proposed for the fields are on some of the most contoured portions of the field. They include a depression with a natural drainage course and a copse of mature trees in the middle of the Critical Area. The depression drains the field to the north to the tidal wetlands abutting Oxford Road. All this will fall to the bulldozer's blade. Playing fields must be level, except for a "crown" in the middle to encourage rapid runoff of rain or snow melt.

¹³ "Traffic Impact Analysis for Poplar Hill Farm," Lenhart Traffic Consulting, Inc., Sept. 15, 2021 at p.28.

Additionally, the plan calls for a building to house a snack bar and restrooms nearly as large as new affordable houses being built in Easton. A 125-foot grandstand will also be erected. A large parking lot, also carved out of the contours to be level, will accommodate 209 vehicles for the fields and perhaps overflow parking from the apartments in the evenings. Game starting and ending times will produce "episodic" traffic as large groups of people arrive and depart at the same time, increasing the existing traffic congestion on Oxford Road. This isn't minimizing pollution, it is maximizing it.

Creation of the large, active park complex comes with consequences. The Concept Stormwater Management Plan gives scant attention to these issues. The storm water management analysis accounts for storm water from most of the proposed development through 18 "Drainage Areas."¹⁴ The proposed stormwater plan tracks the amount and velocity and proposes various management controls. When it considers stormwater flows from Drainage Area 18, however, it summarily concludes that the flows can be managed by "non-rooftop disconnect," meaning that the stormwater is dispersed onto the ground. This might be adequate for water from the paved areas at the restrooms and snack bar, but given the size of Drainage Area 18, it seems wholly inadequate to deal with all the stormwater, laden with fertilizer, that will, by design, be draining off the playing fields and towards the tidal wetlands at the north end of the property. Much the same issue, but without the same contour problems, exists in Drainage Area 17.

Contradictions in 5001 SHR, L.C.'s plans for a multimodal path along Oxford Road also threaten to complicate stormwater management. More than a year after the proposal was first introduced to the Easton Planning Commission, the most recent amendment to the plans now includes the previously promised ten-foot pedestrian and bike path along Oxford Road from the Oxford Road entrance to the property's northern boundary. The path would be located between the proposed berm and the existing drainage ditch along Oxford Road. This amounts to approximately 9250 square feet of impermeable surface on the very edge of the drainage ditch. In addition, the water from the Oxford Road side of the berm, which could be seven feet above the path, also will drain immediately to the ditch. It does not appear that the berm can be located where it is drawn and accommodate the path without impinging on the drainage ditch.¹⁵ This additional stormwater does not appear to be addressed by the plan.

¹⁴ See Appendix E to Concept Stormwater Management Report, 6 July 2022.

¹⁵ The berm could be relocated further from Oxford Road, but this will reduce its effectiveness in obscuring the development from Oxford Road, particularly the seven, three-story apartment buildings located on an elevated portion of the property.

C. The proposed plan will not preserve wildlife habitat, a core goal of the Maryland Critical Area Program.

Minimizing water pollution from this portion of the development could mean keeping it in agriculture, perhaps as a real world agricultural laboratory for use by Easton High School (which once had such a facility), especially with a buffer of tall grasses between the field and the intermodal path. That would preserve a local feeding area for the thousand or more geese that loaf in Windmill Branch from October to March and provide a strong link to Easton's conservation ethic right in town.

If that is not feasible, 5001 SHR, L.C. could create a passive "natural park" similar to the Oxford Conservation Park.¹⁶ The Critical Area Commission encourages "the creation of opportunities for interaction between people and natural environments without destroying the fragile components of natural habitats."¹⁷ "Natural parks" are areas of natural habitat that provide opportunities for those recreational activities that are compatible with the maintenance of natural conditions.¹⁸ In fact, Easton and Talbot County are required to identify areas within their Critical Areas where natural parks can be established.¹⁹ Children who have never been in a natural area could learn that nature is amazing and beautiful and, while always to be respected, is not something that has to be feared. This also is a resource that is available to adults and children at a time of their choosing. It does not have to be reserved or scheduled, as will playing fields. Regimentation will give way to recreation.

Creation of a natural park involves a minimalist approach. A few trails, both gravel and mowed grass, would provide access for adults and children to immerse themselves in an emergent meadow environment of warm weather grasses, wildflowers, and short shrubs. Creation of a natural park at Poplar Hill would require little or no bulldozing because existing contours could be retained. The copse of mature trees that is currently growing in the depression in the middle of the field could be retained. Planting warm weather grasses and native bushes would provide valuable habitat for wildlife, including a wildlife corridor from the wooded areas along Windmill Branch to the nontidal wetlands and to the other wooded areas further southwest on Oxford Road. It could include milkweed and other native plants that support the endangered Monarch butterfly and other pollinators. Maintenance is simple and much less expensive than active playing fields. No fertilization is required. Once established, one-third of the park is bush-hogged each year to maintain the "emergent" quality. Herbicide use is drastically reduced compared with a turf playing field. Mowing requirements are a fraction of a playing field

¹⁶ See Appendix A at page 3.

¹⁷ COMAR 27.01.08.02

¹⁸ COMAR 27.01.08.01

¹⁹ COMAR 27.01.08.03

complex. Natural parks featuring meadow environments are increasingly being created on the Eastern Shore from former croplands for their benefits to the environment and wildlife.²⁰

A natural park is clearly superior to the proposed grass playing fields and even the woods to be planted under the stormwater management plan. USDA runoff curve numbers for a "good" grass park are 61 (Soil type B) and 74 (Soil type C).²¹ The SWMR uses a runoff curve of 70 for the woods, but plantings will take 20 years or more to reach that level of effectiveness.²² In contrast, a mixed grass and brush meadow used in a natural, emergent meadow park, has runoff curve numbers of 48 (Soil type B) and 65 (Soil type C) - better than even mature woods.²³ The State of Maryland advises that a mix of tall grasses, bushes, and small trees in a conservation park absorbs 14 times as much water as does turf grass - and likely more when compared to the low-growing grass used on Easton's playing fields.²⁴ The Natural Lands Project, headquartered at Washington College in Chestertown, found that tall grass buffers remove up to 50% of nutrients and pesticides and up to 75% of sediment.²⁵

A natural park is typically used intermittently by individuals, who arrive randomly. There would be no need for a snack bar. The restroom facility could be smaller, and the parking lot could be resized to hold several dozen cars or a few school buses (proximity to the Easton schools would allow visits to be incorporated into their programs). Random arrivals and departures ease the significant traffic issues that this project otherwise will exacerbate around game times.

Although the public favors more parks of all kinds in general, recent surveys reflect a strong preference for more passive parks as opposed to active parks (64% to 37%).²⁶ The cost of maintaining a passive, conservation park, which is not fertilized and requires minimal mowing

²⁰ [Natural Lands Project: https://storymaps.arcgis.com/stories/50ef1cb961af4f4eb9d5ac69afa8aa5c](https://storymaps.arcgis.com/stories/50ef1cb961af4f4eb9d5ac69afa8aa5c); <https://whatsupmag.com/culture/upland-gamebirds-coming-soon-farm-near/>; [Conquest Beach: https://www.youtube.com/watch?app=desktop&v=274v7Ttu36g](https://www.youtube.com/watch?app=desktop&v=274v7Ttu36g)

²¹ TR-55, Table 2-2A, p. 2-5

²² SWMR, p. 4

²³ TR-55, Table 2-2C, p. 2-7

²⁴ MDE "Facts About: Stormwater Conservation in Your Backyard," https://www.google.com/url?client=internal-element-cse&cx=007821330218074952993:jvmcacnyjwo&q=https://mde.maryland.gov/programs/Water/StormwaterManagementProgram/Documents/RAIN_BARREL%25202015.pdf&sa=U&ved=2ahUKEwig67WFhO35AhWpK1kFHZ0dBjwQFnoECAQQAQ&usg=AOvVaw1iQb9bop6fv283a88IKhnU

²⁵ <https://storymaps.arcgis.com/stories/50ef1cb961af4f4eb9d5ac69afa8aa5c>

²⁶ Easton has conducted 3 surveys of residents of both the town and Talbot County in connection with its revision of Easton's 2010 Comprehensive Plan (ECP 2010). Hereinafter these surveys will be referred to as "Survey 1," "Survey 2," and "Survey 3." See <https://eastonmd.gov/564/2023-Comprehensive-Plan-Update>. Survey results cited here are as of 22 July 2022. This question was in Survey 2.

and maintenance, will also please Easton taxpayers. Establishing a passive natural park would minimize water pollution and environmental damage, conserve fish, wildlife, and plant habitat even if the rest of the development is built. In contrast to the dangerous barrier that playing fields create for wildlife, a natural park would allow at least part of the property to continue as a wildlife habitat, forming a wildlife corridor between Windmill Branch and other undeveloped properties along the Oxford Road corridor - a "scenic Maryland byway." It would provide badly needed habitat for grassland bird species, which have suffered population losses of 50% since 1970 nationwide and even more severe losses on the Eastern Shore. This habitat is also used by Forest Interior Dwelling Species (FIDS), which also have declined 15% in the last two decades. Grassland areas - with tall grasses and shrubs provide the food, nesting sites, and cover these birds need. Playing fields provide none of these vital resources.²⁷ Creation of a similar "emerging meadow" habitat at Pickering Creek Audubon Sanctuary has also shown significant environmental benefits. The emergent meadow habitat recently created at Pickering Creek has already led to a dramatic increase in the population of American Woodcock, a species particularly in decline in Maryland. The new emergent meadow habitat has been an effective educational resource for use by local schools, and a resource closer to schools would be even more useful. It also has drawn significant numbers of both local and regional visitors.²⁸ A similar passive natural park would reinforce the reputation of Easton and Talbot County as a rural area with a strong conservation ethos, celebrated during the annual Waterfowl Festival that fills Easton and the surrounding area with visitors.

Maryland and the Town of Easton have already committed substantial time and resources to protecting the water quality of the Tred Avon River and the public supports these efforts.²⁹ Consider the time and cost of two recent stream recovery efforts designed to protect the water quality of the same stretch of the Tred Avon that becomes Windmill Branch/Papermill Pond. The rehabilitation of the Tanyard Branch near Bay Street and Papermill Branch south of Washington Street, both far less significant than Windmill Branch/Papermill Pond, have taken years to complete and cost \$1 million. Protecting an existing resource is far less expensive than recreating it. Requiring that this project, if approved, minimize pollution of the Tred Avon will save money for the Town in maintenance of an active park and not undo the investment just made only a short way downstream. Wildlife habitat will be preserved and improved. These are two of the primary goals of Maryland's Critical Area Program, which must control here.

²⁷ Dr. Wayne Bell letter to Town of Easton Planner and Talbot County Planning Officer, dated 1 Oct. 2022. Available at <https://1drv.ms/b/s!Ah5-loRLWM7HkQk6HRuuOsDbQugo?e=lmQgKc>

²⁸ Mark Scallion, Director, Pickering Creek Audubon Sanctuary, letter dated 3 Nov. 2022. Available at <https://1drv.ms/b/s!Ah5-loRLWM7HkQ52cKlFqS5BkzGo?e=Q3pxpx>. See also, "New Trail Meadow in the Back 40" at <https://pickeringcreek.org/wp-content/uploads/2021/11/PCK-VIEWS-21-22-FINAL-WEBpdf.pdf>

²⁹ 64% of respondents to Survey 2 were in favor of stream restoration projects.

4. The Development as Proposed Will Not Be "Ordered, Efficient, or Productive" as Required by Talbot County Regulations.

A. The project will create dramatic, new, unfunded demands for county services.

Approval of this large development, combined with other developments already approved or pending approval by the Town of Easton within the next few years, will not be "ordered, efficient, or productive" as required by Talbot County.³⁰ The timing and size of growth approved will overwhelm schools and town and county resources. Just considering imminent, major residential developments within the Town of Easton that have been approved, are under review, or have received preliminary approval, over 1350 dwelling units could be added to Easton within a few years.³¹

When considered with the 2501 homes in the massive Lakeside development already under construction in Trappe, Talbot County faces a crushing load to develop the infrastructure necessary to meet the educational, safety, health, and public services this explosive growth will require. A Housing Yield Study by the Talbot County School System for just Poplar Hill, Gannon Estates, and the Elliott Rd. Apartments raised "significant concerns" about the ability of the system to meet the increased student load.³² The study did not assess the impact of the other developments in Easton or, notably, the tidal wave of students from Lakeside. The impact to other public services is likely to be as or more severe. The increased traffic load on Oxford Road and the Bypass will also require significant investments to maintain safety and avoid backlogs that are even longer than now experienced. The impact will be immediate: When SHR 5001, L.C. introduced this project to the Easton Planning Commission last year, it said that it plans to build all the apartment buildings at once as soon as it completes the internal infrastructure (roads, utilities, etc.).

B. The project fails to enhance habitat or improve water quality as required by Talbot County.

This project design also conflicts with Talbot County regulations because, under careful review, it does not significantly enhance the habitat value or improve water quality.³³ Soil characterization in the northern portion of the field, closest to the nontidal wetlands that drain directly to Windmill Branch, are incomplete and that drainage area has no stormwater management control.³⁴ As explained above at pages 6 - 9, bulldozing the critical area adjoining

³⁰ Talbot County Code §190-55.5.F.2.d.

³¹ For a comparison of recent development activity in Easton, see Table 2, Attachment B.

³² Kevin Shafer, Director of Operations, Talbot County Public Schools letter to Lynn Thomas, Easton Town Planner dtd 21 December 2021.

³³ Talbot County Code §190-55.5.F.2.d.

³⁴ SWMR p. 3-4

the nontidal wetlands to build grass playing fields that have to be fertilized and groomed and will be accompanied by a 209-car parking lot, large snack bar, restrooms, and bleachers does not improve water quality and certainly does not improve water quality in comparison with a passive natural park.³⁵ In short, this design does not give protection to Windmill Branch/Papermill Pond, the sensitive areas up and downstream, or the wildlife that depend upon them as it could or should. Protection of these sensitive areas is vital to the conservation ethos for which Easton is known, as is recognized in the Town of Easton Comprehensive Plan (ECP 2010) and the Talbot County Code.³⁶ Similarly, Easton requires identification and special protection of other habitat areas, including "plant and wildlife habitats determined to be of local significance."³⁷

Apart from water quality, there is no provision to minimize the impact on habitat protection areas and agricultural areas. Instead they are needlessly consumed. The proposed plan clearly does not "maximize protection of plant and wildlife habitats for ... wildlife common to the Chesapeake Bay Region" [emphasis added] as is required by Talbot County Code for approval.³⁸ No provision is made for the wild turkeys or foxes that can be seen there. No provision is made to reduce the impact to the flocks of geese for which Easton is famous.³⁹ In summary, in its treatment of this special plot along Oxford Road, no attempt is made to preserve Easton's special conservation qualities, the celebration of which annually draws tens of thousands of visitors and millions of dollars to Easton and Talbot County.

Habitat value *could be* enhanced if the 25 acres now planned for an active park were instead used to create a natural park or to maintain the area in agriculture. A natural park could include a wildlife corridor that links the wooded areas along Windmill Branch and the forested areas on

³⁵ A proposed dog park has been moved from a most sensitive area closer to the apartment complex.

³⁶ "... Streams and their buffers are home to countless species of animals and plants; and streams themselves serve as lifelines to the Bay, transporting valuable nutrients, minerals, and vitamins to the Chesapeake. The floodplains, wetlands, and wooded slopes along streams are very important parts of the stream ecosystem, and in many ways determine the diversity and health of a stream. (From Managing Maryland's Growth: Models and Guidelines - Preparing a Sensitive Areas Element for the Comprehensive Plan, Maryland Office of Planning, May 1993).

The importance of streams is irrefutable. It is also perhaps better understood by residents, particularly long-time natives, of Maryland's Eastern Shore than the average citizen in any other part of the State. Streams have been of paramount importance on the Eastern Shore since the founding of the region." ECP 2010 at p. 156.

³⁷ Town of Easton Code 28-501.16. Poplar Hill Farm was proudly proclaimed as "Waterfowl Sanctuary - Project of Waterfowl Festival Inc., Easton MD" for decades. See Attachment A. In the absence of any formal effort by the Town to implement this part of the town's Critical Area Program, Poplar Hill Farm should be provided protection as a *de facto* Habitat Protection Area.

³⁸ Talbot County Code §190-55.F.3.h.

³⁹ See Anthony Kupersmith ltr of July 6, 2022 (hereinafter "Developer's Narrative") at p. 15.

Oxford Road. A natural park could include habitat for Monarch butterflies and other pollinators that could be easily accessible to Easton residents and students. A natural park could make use of the existing contours and mature trees to create a passive park favored in surveys. A natural park could provide suitable habitat to restore populations of grassland species and FIDS alike that are in serious decline, especially on the Eastern Shore.⁴⁰ Instead, the proposal includes an active park, large parking lot, snack bar, and bleachers that will increase the damage to the environment and provide no additional habitat - an active park that could be built in a more appropriate location elsewhere. When inserted into the scenic Oxford Road corridor, an active park full of fields, goals, stands, fences, etc., will create a far different impression for visitors than a natural park and will diminish Easton and Talbot County's reputation for rural beauty.⁴¹

5. The Proposed Development Is Inconsistent with the 2010 Easton Comprehensive Plan Because It Would Allow Unreasonable Growth and Adversely Impact Core Community Values.

In considering a request for supplemental growth allocation, a critical factor is whether the project for which the growth allocation is sought is consistent with the ECP 2010 and would implement the goals and objectives of the plan.⁴² One goal of the Critical Area Program is to accommodate growth, and we are not against reasonable growth within Easton and Talbot County. That said, growth must be reasonable and must not destroy the qualities that make the Town of Easton and Talbot County the desirable place to live that it is. Nor should development outpace infrastructure, requiring massive investments in infrastructure that will take years to complete. The project that is at the heart of this growth allocation, as proposed, is not sufficiently consistent with the ECP 2010 and will not adequately implement the goals and objectives of the plan. This consistency determination is not a "check-the-box" exercise, rather it lies within the sound discretion of the planning commissions, councils, and the Chesapeake Critical Area Commission.

A. The proposed development is not consistent with protection of the quality of life Easton's Comprehensive Plan aims to protect.

ECP 2010 recognizes that Easton's quality of life and attractiveness to residents and visitors is rooted in relevant part in its rural, small town character, historic Downtown area, the historic and contemporary neighborhoods that are within walking distance of downtown, and its public facilities like schools and parks. ECP 2010 recognizes that development will occur, but that

⁴⁰ See Dr. Wayne Bell letter cited in footnote 27

⁴¹ Compare photos at Attachment A, p. 3-4.

⁴² Town of Easton Code 28-501.8.D.

various types of development must be "balanced and controlled as to timing, location, appearance and impact upon surrounding properties as well as the Town as a whole."⁴³

Although the proposed development does contain many individual elements found in ECP 2010, many of the elements and the design as a whole are simply too much, too fast, and all in one small place.⁴⁴ It includes an apartment complex of 7 large, 3-story apartment buildings with 210 dwelling units that by itself dwarfs any other apartment complex in Easton.⁴⁵ Built on one of the highest parts of the field and rising almost another 48 feet, this complex will dominate the viewscape.⁴⁶ The apartment complex has separate amenities from the remainder of the development, creating what feels like a community separate from the "estates" and townhouse "villas." The rank upon rank of 138 three-story townhouses is likewise, based on the combined number of units and height, is not found elsewhere in Easton. Many of the single-family homes are found on identically-sized lots, quite different from Easton's historic neighborhoods. The plan substitutes bulldozed, manicured soccer fields, a large snack bar and restroom building, and a grandstand stretching 125 feet for the natural contours of soybean fields filled with migrating geese after the harvest. While the plan would be at home in Montgomery County or Prince William County, as a whole it simply is not consistent with Easton's rural, small town character placed where it is. Replacing what had been publicly proclaimed as a waterfowl sanctuary and adding almost 800 cars to a complex series of intersections on Oxford Road will dramatically impact surrounding properties, including the Temple Bnai Israel at the south end. On the north end, the Easton Club community and especially our small development, Papermill Crossing, will be impacted. Our neighborhood will go from rural to "anything but" as fast as construction can move. This sort of growth is neither reasonable nor "balanced and controlled."

1) Pedestrian, bicycle and traffic safety will be impaired, unreasonably impacting existing neighborhoods.

The proposed development will greatly exacerbate already significant safety hazards on Oxford Road from the Easton Bypass to Cedar Point Road and thus is not "balanced and controlled as to timing, location, appearance and impact upon surrounding properties as well as the Town as a whole."⁴⁷ This area is already congested during morning and afternoon rush periods and hosts a large number of bicyclists, particularly on weekends. It also hosts a number of pedestrians, but admittedly that number has dropped as the apparent safety risks force pedestrians into their cars, even to go to the

⁴³ ECP 2010 (2010) at p. 7-8.

⁴⁴ The third goal of the Maryland Critic Area Program recognizes that too much of a good thing can be bad. "[E]ven if pollution is controlled, the number, movement, and activities of persons in that area can create adverse environmental impacts." That is the case here.

⁴⁵ Table 1 in Attachment B compares Easton's apartment complexes.

⁴⁶ Our discussion of SHR 5001, L.C.'s dismissal of this problem is addressed at p.18 and Attachment D.

⁴⁷ ECP 2010 (2010) at p. 7-8.

nearby YMCA, schools, Idlewild Park, or downtown. Our residents have been rear-ended driving into the development and there have been many more close calls, especially during the morning and evening commute periods. Residents of Easton Club share some of these same problems.

We have obtained copies of several traffic studies for this development, but find them unpersuasive for a number of reasons. Even the updated report seems designed more to check a box than inquire about conditions on the ground.⁴⁸ It analyzes potential traffic congestion at major intersections, compares it to congestion in urban centers, and concludes that residents' everyday frustration with increased traffic on Oxford Road and the Easton Bypass doesn't really exist. Without an explanation of all the assumptions and choices that went into their preparation, one is left to trust the expertise and judgment of the consultant. The consultant states that it used "Methodology for Prince Georges County." See Traffic Impact Analysis at p. 71 - 76. This does not build trust. Unfamiliarity with local conditions and simple mistakes, even in the revised studies, raises concern about the detailed analysis elsewhere. Most striking, while the consultant looked at background developments far afield from the proposed site, the closest developments, Papermill Crossing and Easton Club, are treated as if they don't exist. See Traffic Analysis at p.9. There is also no mention of Pollys Hill Lane, Clubhouse Drive, and Tour Drive, which serve those developments. For example, see Traffic Analysis at p. 10 and throughout. None of these roads are mentioned in either of the traffic signal analyses.

If asked, local residents could have provided their years of experience with the particular area in question and the study could have been designed to provide much more useful information than it did: numbers of vehicle trips based on a single day's data (1 weekday, 1 weekend day) and extrapolations based on nationwide averages (including California, Montana, etc.). For example, we believe that three soccer fields, each with 22 players plus coaches, plus fans, will generate more than the 50 trips in and out at the peak time on Saturdays that the study projects. See Traffic Analysis at p. 22. We know that drivers turning onto Oxford Rd and driving west generally accelerate as fast as possible to get up to 50 mph (and more) as soon as possible. Distracted by phones or the beauty of Papermill Pond, they frequently are not anticipating our residents or visitors slowing to turn left into our development, despite early use of turn signals and pumping the brakes. When they wake up to the turn signal and brake lights, they swerve sharply onto the narrow right shoulder on the bridge over Papermill Pond to avoid a collision. Bicyclists, pedestrians, and recently fishermen, often accompanied by children, found on the bridge have nowhere to go. See Attachment C.

Drivers coming east on Oxford Road towards the Bypass are supposed to slow from the 50+ mph they are travelling to 40 mph before they get to Clubhouse Drive and then to 30 mph when they get to Pollys Hill Lane. This rarely happens, even when drivers can see that the light at the Bypass is red or has been green for a long time. Our experience is that hope springs eternal for many drivers and a great number of them accelerate past the roads to Easton Club and Papermill Crossing in an effort to make the light at

⁴⁸ The updated study is: Lenhart Traffic Consulting Inc., "Poplar Hill Farm Development - Traffic Impact Analysis," May 26, 2022 (Revised)(Traffic Impact Analysis); There have also been two analyses for traffic signals at either end of the proposed development: Lenhart Traffic Consulting Inc., "Poplar Hill Farm Development - Traffic Signal Warrant Analyses," Dec. 10, 2021: and Lenhart Traffic Consulting Inc., "Poplar Hill Farm Development - Traffic Signal Warrant Analyses," May 19, 2022.

the Bypass. If there are cars trying to turn into Easton Club, the through drivers swerve into an extra lane created out of the paved shoulder, leaving bicyclists or pedestrians to navigate a very narrow weed border between the extra lane and a deep drainage ditch. This game of "chicken," especially when played with dump trucks and pick-ups pulling trailers, discourages many pedestrians from walking to the YMCA, Easton Middle School, or into town.

All these traffic analyses focus on the access roads for the development, not on existing local roads. These broader studies look for chronic congestion, not the more acute threats that emerge when a number of roads intersecting Oxford Road interact. The addition of 456 new dwelling units and approximately 800 cars will make these problems much worse by introducing a huge new source of traffic and traffic turbulence at a critical point. Drivers turning left out of Easton Club and left into Papermill Crossing will especially be affected. Proposed development in Easton Club by the Maryland Health Club will surely add many more drivers to the mix, many unfamiliar with the area. As gaps in traffic moving east on Oxford Road come to the new access road into the Poplar Hill development, drivers turning right there will fill the existing gaps. Fewer or smaller gaps in traffic further east at Countryclub Drive and Pollys Hill Lane will make it much more dangerous to turn onto Oxford Road, particularly for the school buses that service Easton Club. Also, the multi-modal track will exit the development and then run northeast along Oxford Road to the end of the property. This would ordinarily be a good thing, but in this case, it will dump bicyclists and pedestrians onto Oxford Road at the same point that cars using the shoulder lane at Clubhouse Drive are swerving back off the shoulder lane and bicyclists and pedestrians are trying to navigate with no dedicated space. Attachment C illustrates that if this development is built as planned, there will be far too much going on in much too small a space, where cars, trucks, bikes, and pedestrians all have to make spit-second decisions. Tragedy is almost ensured.

The problems may be able to be solved, but the solution will not come cheap. The deep drainage ditches, the large culvert at Pollys Hill Lane, and the narrowed shoulders/bike lane on the bridge over Papermill Pond will likely have to be re-engineered and replaced. We are informed by MDOT that there is currently a six-year backlog to build new bridges. As with the challenges that explosive growth poses to schools, medical care, public safety resources, and similar governmental programs, already limited resources will be stretched again. The more dwelling units, the greater the hazard. The PUD as planned will not provide a sustainable, pedestrian and bike friendly result, forcing even short trips to require automobiles. Development should not proceed until the solutions to these issues are designed, approved, funded, and underway.

2) The growth that the proposal will produce, in conjunction with other pending proposals, will not be balanced and controlled as required by ECP 2010.

In determining what growth is reasonable and "balanced and controlled as to timing, location, appearance and impact upon surrounding properties as well as the Town as a whole," the views of the citizens of Easton and Talbot County must be considered. While the proposed development contains many attractive qualities, it tries to do too much, all in the same place,

and too quickly. What is proposed is contrary to what most Easton and Talbot County residents believe is compatible with the communities they love. The results of Surveys 1 and 2 provide unique and timely insight into the views of Easton and Talbot County on growth. In Survey 1, a strong majority (67.5%) believe that the current population of Easton, 17,101, is about right.⁴⁹ Easton's growth rate (0.7%) over the decade from 2010 to 2019, is overwhelmingly considered about right.⁵⁰ Over 65% of respondents believed that development along waterways should generally be prohibited. Survey 2 asked respondents to rate strategies for managing growth on a five-point scale from "strongly disagree" to "strongly agree." Respondents overwhelmingly were against sprawl outside the urban growth boundary⁵¹ and a majority favored increased density. But that doesn't mean that they favor the kind of large scale, intense development proposed by SHR 5001, L.C. When asked to rate whether the rate of growth in Easton should be restricted, only 15.5% of respondents disagreed or strongly disagreed. Confirming the results of Survey 1, over 57% of respondents to Survey 2 agreed or strongly agreed that the rate of growth should be restricted.

A survey conducted in July 2022 sponsored by the National Association of Realtors on the views of Easton and Talbot County on growth and housing also is instructive.⁵² Eighty-six percent of the respondents rated the quality of life in Talbot County as excellent or good. Overcrowding (too much housing and commercial development) was the most cited concern. Protecting the coast and its ecosystems, preserving rural areas and farmland, protecting the historic character of the county's towns and villages, and creating more affordable housing were ranked the top 4 priority issues (67%, 66%, 60%, 52%, respectively, rated them "4" or "5" out of 5 where 5 is the highest ranking). Limiting new housing developments to towns and villages was ranked 4 or 5 by only 45% of respondents. Respondents think maintaining character and making development more dense are both important (51% to 44%).⁵³ The vast majority (74%) strongly favor or somewhat support "infill development" in the Town of Easton - converting vacant lots and decaying properties into homes and businesses.⁵⁴

The proposed development squeezes 456 dwelling units into a moving target acreage that was 105.4 a year ago, then 120 in July, and now apparently is 114.6, resulting in densities from 4.2

⁴⁹ Survey 1.

⁵⁰ Survey 1.

⁵¹ Includes Poplar Hill.

⁵² The National Association of Realtors conducted a phone survey of 325 adult residents of Easton and Talbot County from 18 to 21 in July 2022. (Hereinafter "NAR Survey"). It was briefed to the Easton Planning Commission and Affordable Housing Board on 12 September 2022, but as of now, has not been posted. A copy of the presentation is available upon request.

⁵³ The overall margin of error for all respondents was +/- 5.4%.

⁵⁴ We reject SHR 5001, L.C.'s suggestion that this proposal is "infill" within the proper meaning of the term. If a massive development of 120 acres of agricultural field is "infill," any development within Easton's borders would be infill.

to now 3.8 dwelling units per acre. This easily exceeds the density in the recently approved Gannon Estates development or the proposed Four Seasons Development on Dutchman's Lane.⁵⁵ As discussed above, this proposal does not protect the environment to the extent it easily could by substituting a natural park. It does not preserve the farmland or waterfowl sanctuary, which track the conservation ethos for which Easton is famous. It does not preserve the historic look and feel of Easton. As discussed above at page 14, it is not readily accessible by walking or biking to Easton by Oxford Road because of traffic issues that have not been resolved, only "shushed" away by a standard study that didn't look at the real issues. It does include workforce housing, but not integrated with the rest of the planned community. All but nine units of the workforce housing will be market-priced.

3) The proposal is contrary to ECP 2010 because it fails to preserve Easton's valuable conservation ethos and scenic and environmental attributes.

The addition of 25 acres of active parkland is also contrary to the ECP 2010. That plan noted that "Natural features can be preserved as valuable scenic and environmental attributes of the Town."⁵⁶ And so it was with the Waterfowl Sanctuary at Poplar Hill for decades. The ECP 2010 found that Easton had a fairly large number of parks, 14. That number has grown to 16 in 2022.⁵⁷ Almost all of them were "active" parks used for sports, playgrounds, or picnic areas.⁵⁸ What the town lacks is sufficient "passive" parks, like the natural park that we addressed earlier, where adults and children could easily experience the rural atmosphere that is part of the identity of Easton and Talbot County without necessarily getting into a car.⁵⁹ Building more active parks on the western side of town is also contrary to the recommendation of ECP 2010, which recommended that new parks be located on the eastern side of town, closer to new residential development. Locating new parks there would, among other things, avoid forcing soccer moms from having to fight beach traffic on Route 50 to get to the game on time.⁶⁰

Moreover, a January 2022 survey of 516 Talbot County residents (which included a proportionate sampling of Easton residents) shows that desires as to parks continue to favor natural, passive parks over active parks. In assessing the availability of existing types of parks, the percentage of respondents who said that the availability of "Green Space-Passive parks that preserve natural open spaces" is "inadequate" (45%) was three times as great as for

⁵⁵ Gannon Estates will have 202 single family homes on 76 acres, for a density of 2.7 dwelling units per acre. Four Seasons will have 252 single family homes on 100 acres, for a density of 2.5 dwelling units per acre.

⁵⁶ ECP 2010 at p. 143.

⁵⁷ Talbot County 2022 Land Preservation, Parks & Recreation Plan, July 2022 (Talbot LPPRP 2022) at I-19. See <https://dnr.maryland.gov/land/Documents/Stewardship/Talbot-2022-LPPRP-Draft.pdf> Although marked "Draft" DNR has advised that it has been approved and posted it to the official state site.

⁵⁸ ECP 2010 at p. 143-147.

⁵⁹ ECP 2010 at p. 151.

⁶⁰ ECP 2010 at p. 152.

"Lacrosse Fields" (15%), and more than two and one-half times as great as "Soccer Fields."⁶¹ The Talbot LPPRP 2022 concluded that the features considered not adequate in Talbot County are 1) Longer hiking/walking trails, bike trails; 2) Additional water access; and 3) "Greenspace parks that preserve natural spaces."⁶² [emphasis added]

4) The dramatic change to the viewscape of the scenic Oxford Road corridor will impact the nearby communities and those on Oxford Road.

The proposed development is not "balanced and controlled as to timing, location, appearance and impact upon surrounding properties as well as the Town as a whole."⁶³ Even just considering apartments, at one stroke this proposal would create the most massive apartment complex in Easton. This development will have more units and more large, 3-story buildings than any other private apartment complex in Easton, 75% more than recently approved for the Easton Apartments on Elliott Road.⁶⁴ The apartments are set at one of the highest points of the site, where they will dominate the previously bucolic viewscape from Oxford Road, which is designated as a Maryland Scenic Highway. As seen from Oxford Road, they will stretch for 784 feet west to east. We believe that the commissions should presume that the apartments will not be screened from view from most portions of Oxford Road for most users for many years, and then only from April to October. This unfortunate first impression will diminish the benefits from historical efforts to protect this scenic highway with conservation and agricultural easements and will not be "ordered, efficient, or productive" as required by Talbot County regulations.

Contrary to the exhibits submitted by SHR 5001, L.C., the apartments will be prominent and visible from Oxford Road. During the initial presentation to the Easton Planning Commission in October, 2021, Commissioner McAndrews asked if the apartment buildings will be visible from Oxford Rd. Mr. Showalter said that although there would be a berm, the "top floors" of the buildings would be visible from Oxford Rd because the field is flat. Mr. Showalter promised to provide a visual representation. Responding in July 2022, SHR 5001, L.C. filed two exhibits: "Oxford Road Section," and "Oxford Road Perspective." The exhibits concluded that "Planting Heights Prevent View of Apartment Buildings." Well. Relying upon a strategically placed mature evergreen atop an earthen berm, this portrayal predicts that the 7 large, 3-story buildings will simply not be visible. Our analysis, set out in Attachment D, concludes otherwise.

No narrative explanation of the exhibits that were filed by SHR 5001, L.C. has been provided other than on the exhibits themselves, so our analysis is driven by the exhibits, topographical information from Google Maps, publicly available information on common vehicles and measurements, and other charts

⁶¹ Talbot LPPRP 2022 at Appendix E at p. 15-16.

⁶² Talbot LPPRP 2022 at II-17.

⁶³ ECP 2010 (2010) at p. 7-8.

⁶⁴ See Table 1, Attachment B, Comparison of Easton Apartment Complexes

filed by SHR 5001, L.C. The illustration provided looks at only one viewpoint and apparently relies upon assumptions that only occur in the best possible circumstances. The visibility of the apartment buildings and the effectiveness of any screen depends on factors that include the height of eye for the observer, the ground elevation of the observation point, the ground elevation of the apartment buildings, the height of the apartment buildings, the height of the berm, and the nature and height of the plantings. SHR 5001, L.C.'s representation depends on the best possible case of all these factors, and probably more. SHR 5001, L.C.'s exhibits apparently use a view point with the lowest possible ground elevation for the observer (10 feet above sea level (ASL)). SHR 5001, L.C.'s conclusion depends upon the viewer having a relatively low height of eye, consistent with being in a car rather than an equally common vehicle like a SUV or pickup truck, or even pedestrians, who typically have a height of eye higher than most vehicle occupants. It also depends upon the viewer being positioned where the highest part of the berm (which varies between 9 and 2 feet high) lies between the viewer and the apartments. The apartments are not a point in space, but 7 large buildings spread over hundreds of feet horizontally, all nearly 44 feet tall. It also depends upon the presence of virtually solid, mature, evergreen plantings. It is also not clear that the difference in ground elevation between the actual intersection used for SHR 5001, L.C.'s analysis and the ground height of the apartments was considered.

Some important considerations are not in dispute. First, there will be no berm to screen the apartments along approximately 280 feet along Oxford Road at the southwest portion of the property. The apartments will be visible from foundation to roof peak, save for incidental trees, parked cars, and perhaps the apartment pool building or the restroom facility. Second, even where there is a berm, it will vary between 2 and 9 feet high, with a slope of 3:1. That means that between two high points on the berm, there will be a point seven feet lower and the high points will be at least 42 feet apart (two slopes of 7 feet height spread over 21 feet horizontally). Everywhere the berm is below 9 feet, more of the apartments are visible. Because of the trigonometry, the increase in the apartment's visibility is much greater than the change in the height of the berm. Third, deciduous plantings will be largely bare half the year, from mid to late October until mid to late April. Fourth, most trees grow about 18 inches taller each year after becoming established, so it will take decades to establish a mature growth. Fifth, Oxford Road gains ground elevation going from the Countryclub Drive intersection and moving southwest, gaining 9 ft by the time it approaches the proposed entrance to the development. Again, because of the trigonometry, the increase in the apartment's visibility is much greater than the change in the height of the berm. Sixth, the apartments are not a point in space that can be obscured by a tree; the 7 apartment buildings will be spread out 784 feet (over two football fields) as seen from Oxford Road.

Other considerations in the proposal are not clear. Trigonometry determines that the effectiveness of a berm to mask the apartment buildings decreases as the berm is moved away from an observation point on Oxford Road. The farther the berm is from Oxford Road, the more of the apartment buildings can be seen. Page 3 of the latest PUD Sketch, dated 6 July 2022 (but marked "sealed" on 4 October 2022), includes the multi-modal path that SHR 5001, L.C. has said it would construct along Oxford Road to allow

bikers and pedestrians to access central Easton.⁶⁵ To allow room for a path, which typically is relatively level, the distance from the edge of Oxford Road to the center of a 9 foot berm with a 3:1 slope with a 10 foot path interposed is at least 37 feet, plus the width of the drainage ditch on Oxford Road. Any additional space needed to construct the berm to the planned specifications would require either moving the berm further from Oxford Road or reducing its height. Either one will make more of the apartments visible. Given resource limitations, our calculations and projections are undoubtedly imperfect, but they are far more representative than the "best case analysis" that SHR 5001, L.C. has provided.

6. Summary.

The Town of Easton and Talbot County are at an important crossroads. After a decade of little or no population growth, they are now faced with multiple proposals to quickly expand residential development on a vast scale, threatening the small town, rural nature of Easton, anchored in a conservation ethos and environmental values. Easton and Talbot County residents overwhelmingly say they enjoy a wonderful quality of life that should be protected. SHR 5001, L.C.'s proposal for Poplar Hill would place all that at risk by attempting to do too much, all at one place, too fast. Although change is inevitable, it can be done in a way that preserves the quality of life in Easton and Talbot County if it is carefully tailored.

The former Waterfowl Sanctuary at Poplar Hill is a special piece of property that, because of its proximity to the headwaters of the Tred Avon River and its historic links to Easton and Talbot County's conservation and environmental values, deserves special protection. There are no more areas like this within Easton where those values can be preserved as they can be here. There are other, less sensitive, areas within Easton where additional playing fields or additional apartments can be located. The Critical Area regulations of both the Town of Easton and Talbot County require the development be designed to minimize adverse impacts on water quality. The current design does not do that. The Town of Easton Code requires protection of wildlife habitats determined to be of local significance. The Talbot County Code requires that the development maximize protection of wildlife common to the Chesapeake Bay Region. The current design meets neither of those requirements.

The Town of Easton Comprehensive Plan requires that the development be balanced and controlled as to timing, location, appearance and impact upon surrounding properties as well as the Town as a whole. The Talbot County Code requires that the development be ordered, efficient, or productive. This development is neither balanced and controlled nor is it ordered, efficient, or productive. Instead, the proposed design will have a dramatic adverse impact on the surrounding properties and the scenic Oxford Road corridor. It will seriously add to existing traffic safety problems for our residents and those of Easton Club and provides no plan to mitigate them. It will contribute to a looming wave of fiscal requirements for new schools and other public resources when there is no plan

⁶⁵ As discussed at page 17, currently this is "the path to nowhere" because it terminates in a very congested spot and leaves a risky gauntlet to reach the northeast side of the Easton Bypass)

on how to meet those challenges. Hoping that someone will figure something out on these critical issues that won't destroy Easton and Talbot County's quality of life is not a plan.

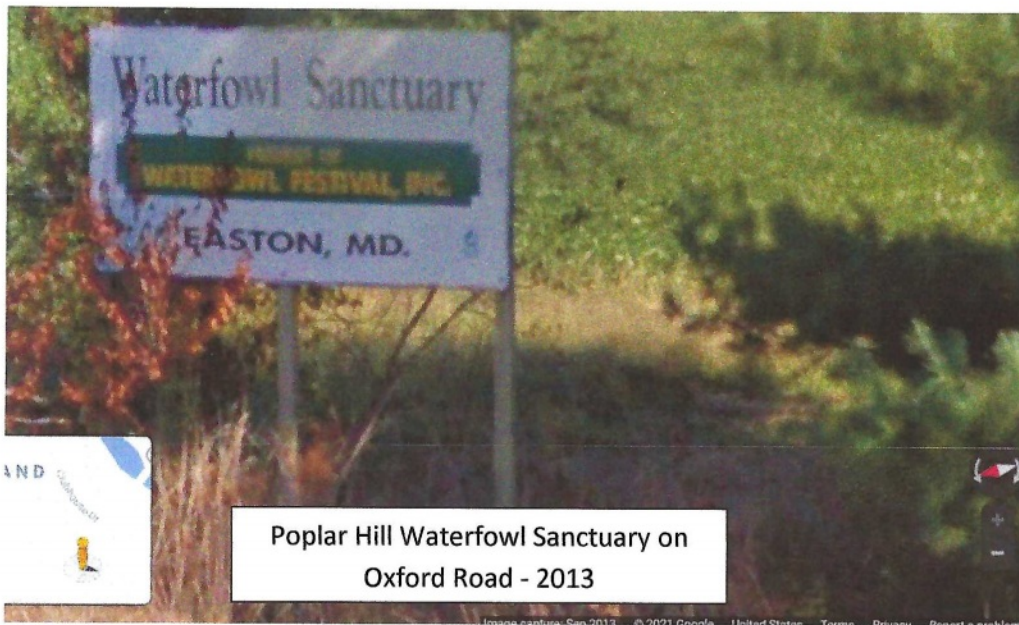
SHR 5001, L.C. is free to develop the property subject to the terms and restrictions to which the property was subject has been subject for years and when it was recently purchased, including the limitations on development in a RCA. The current design, however, seeks to go far beyond that in terms of density and design and location of physical features. A design that asks as much as this one does from the community, the environment, and the Chesapeake Bay truly must be exceptional in all regards to merit approval. This design could be, but is not now, the equal of what is required. Absent significant change, the request for additional growth allocation must be denied.

Respectfully,



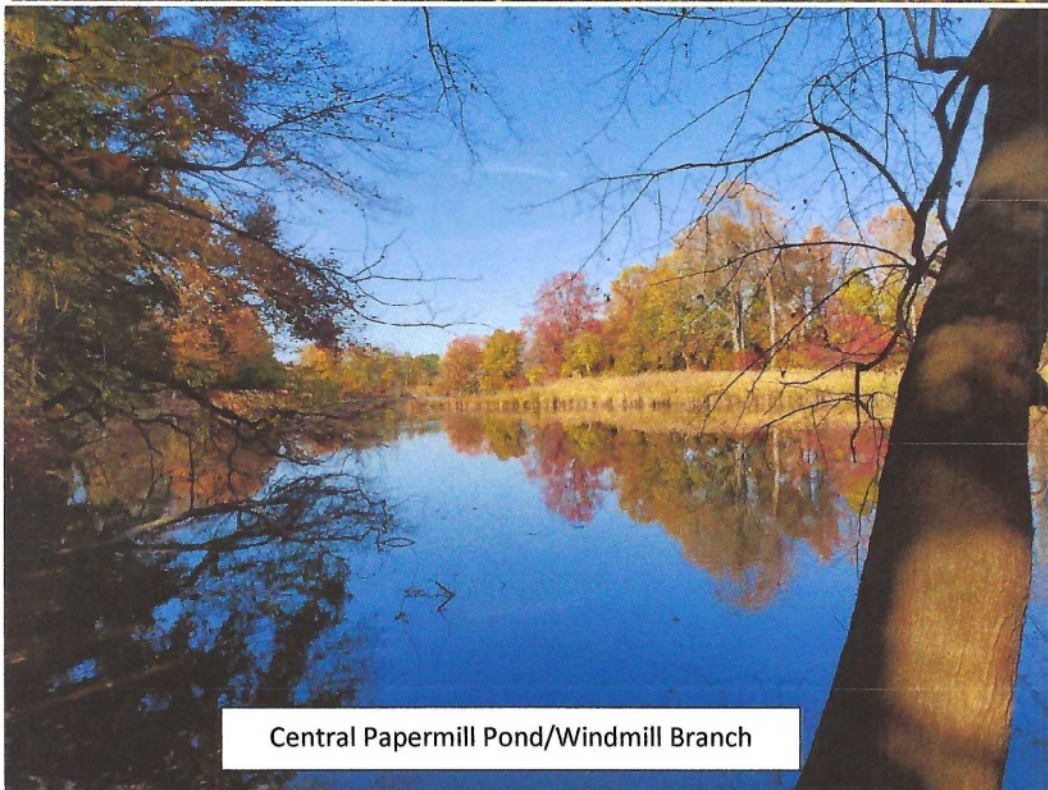
Thomas Ledvina
President

Attachment A





Goose Serengeti on Oxford Road



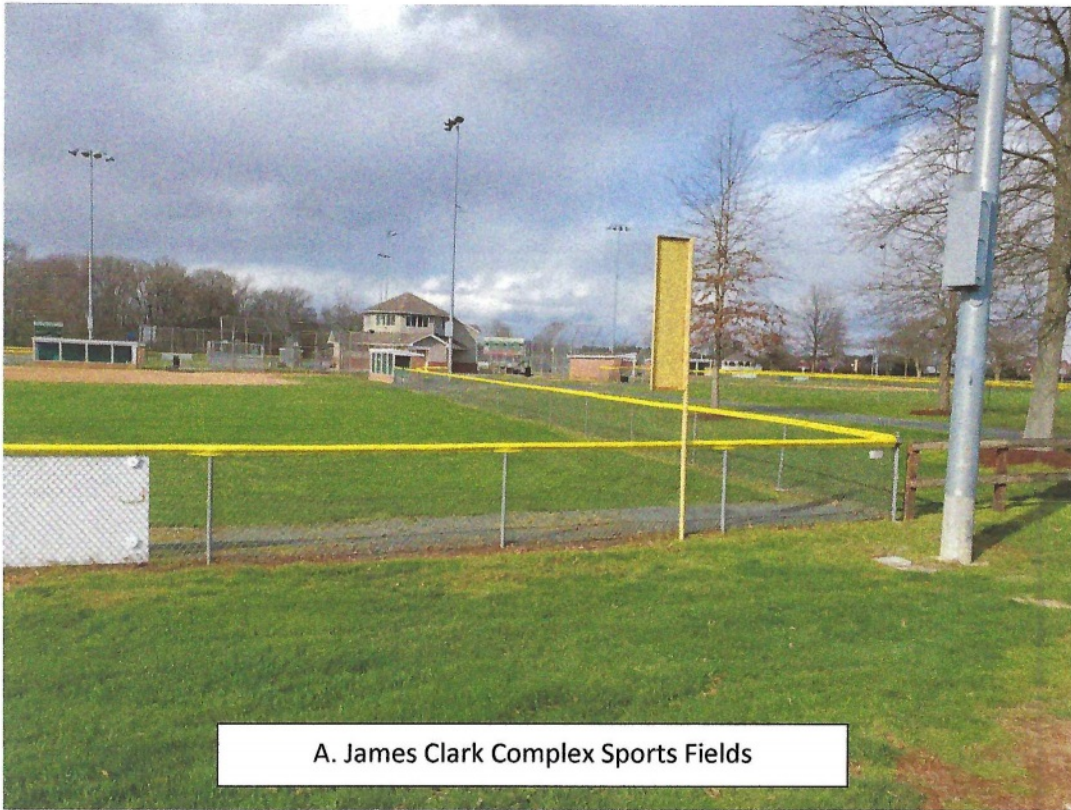
Central Papermill Pond/Windmill Branch



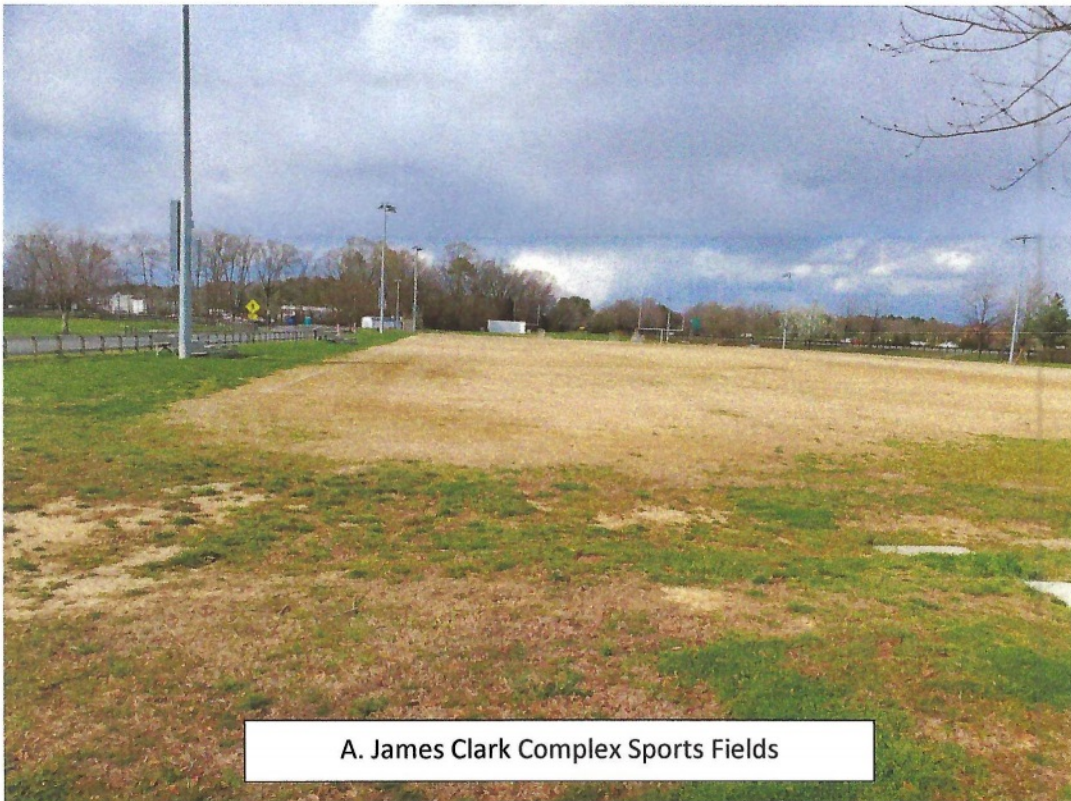
Poplar Hill Farm Looking South from Oxford Road



Oxford Conservation Park



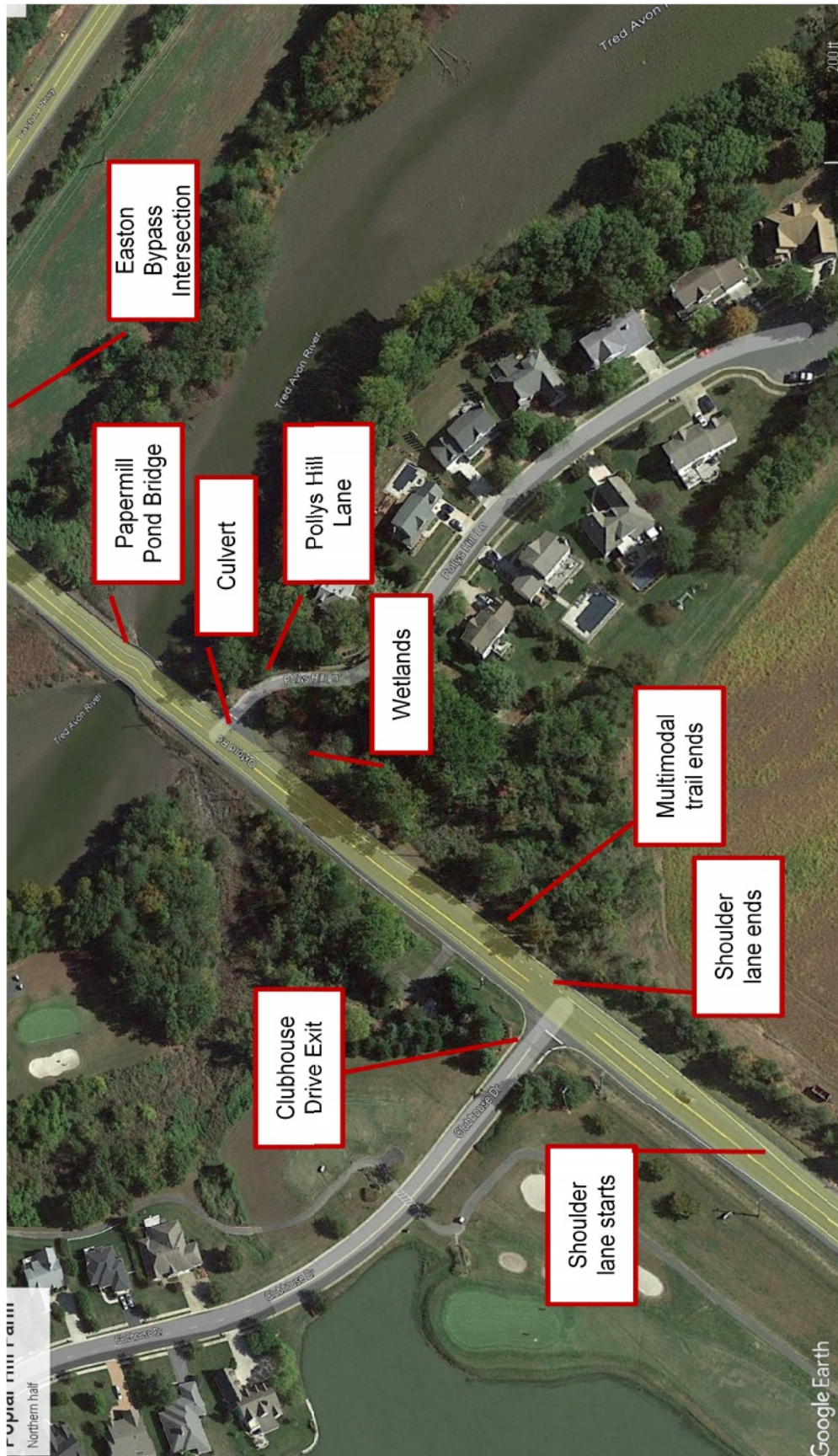
A. James Clark Complex Sports Fields



A. James Clark Complex Sports Fields

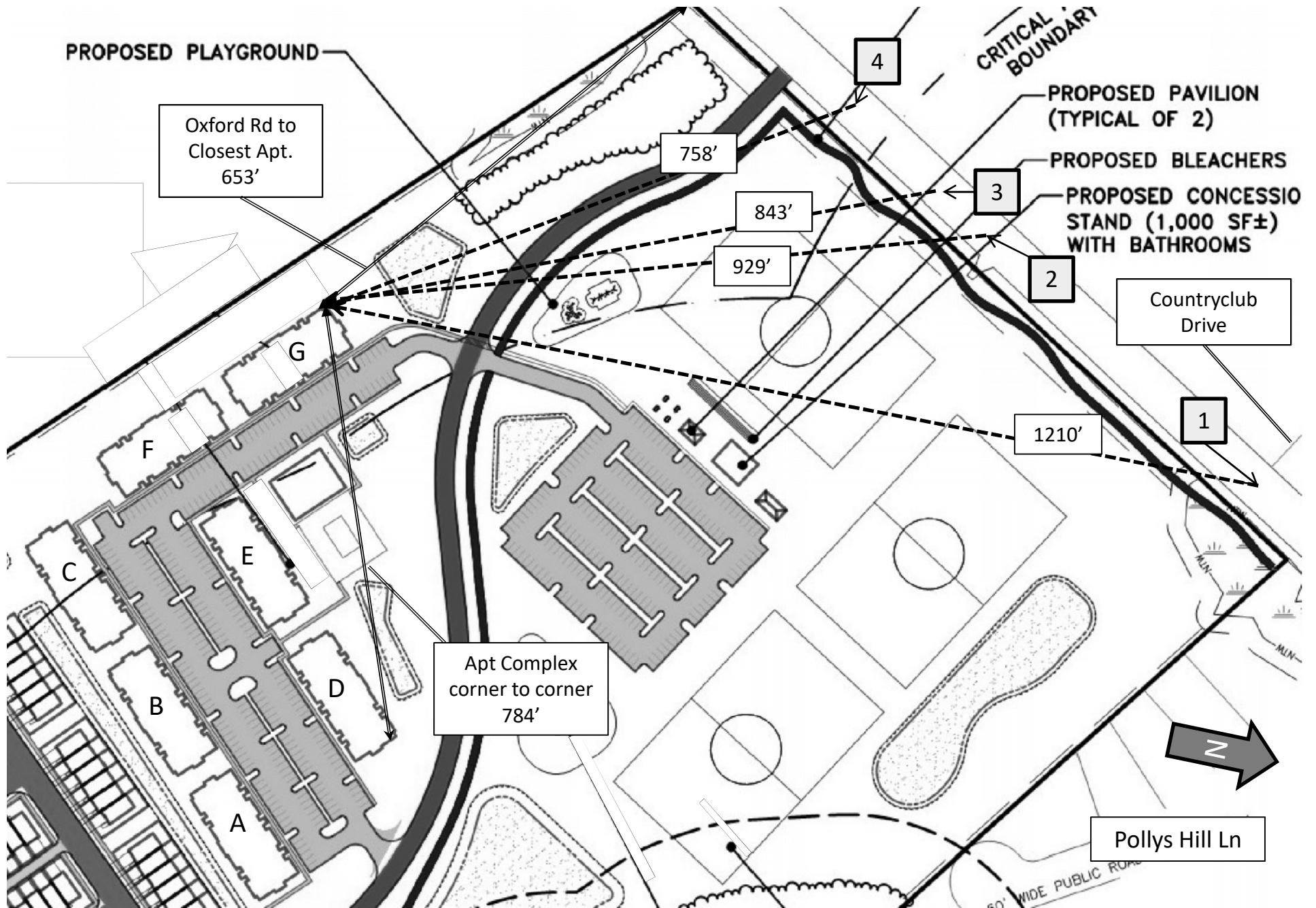
Table 1 Comparison of Easton Apartment Complexes				
Development	Total Apts.	1- Story Bldgs.	2- Story Bldgs.	3- Story Bldgs.
Chatham Village	94	18		
Magnolia Meadows	98		10	
Greens at Cross Court	144		17	
Park View at Cross Court	80			1
Easton Apartments (Elliott Rd)	120			4
Mulberry Estates	128		16	
Pippin Farms	144		11	
Quail Meadows	40		5	
Poplar Hill	210			7

Table 2 Recently Approved or Proposed Developments In Easton					
Development	Single Family	Townhomes	Apartments	Condominiums	Total Dwelling Units
Poplar Hill	108	138	210		456
Gannon Estates	200				200
Elliott Rd Apartments			120		120
Four Seasons					252
Port Street Small Area Plan				300	323
Totals	309	138	312	300	1351



Former Waterfowl Sanctuary at Poplar Hill

Visibility of Apartments from Oxford Road



10/25/2022

2

Percent Of Apt. G Visible for Berm
Heights from 9 to 3.5 Feet* from
Cars, Compact SUVs, and Trucks

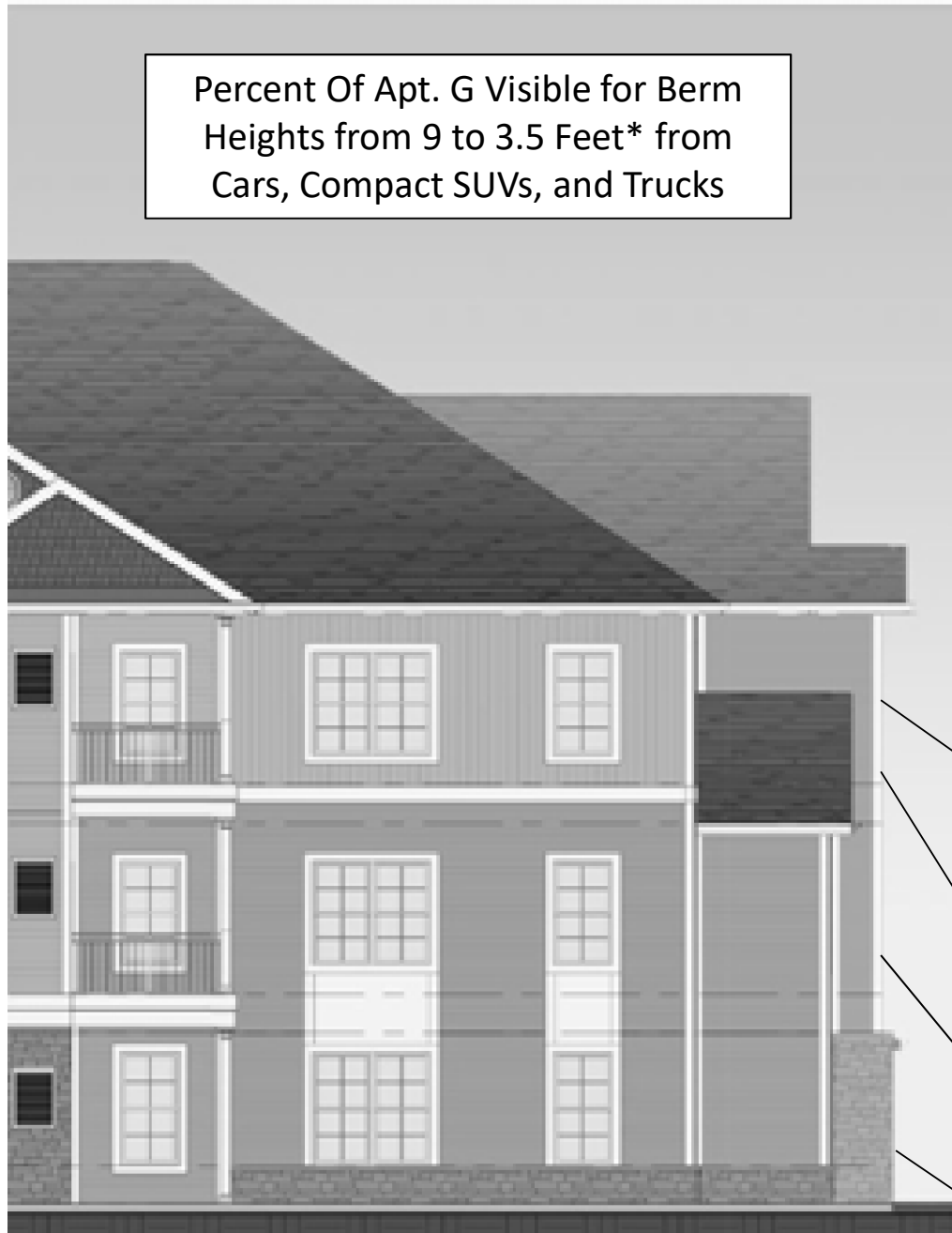
Point 1 – Clubhouse Dr. at
Oxford Road centerline

Roof
Peak
43'8"

3rd Fl 31'
1-1/2"

2nd Fl
22' 1-1/2"

1st Fl
11' 3/4"



Height of eye: 51" (Honda CRV)
Berm heights: 5.5' and 3.5'
Amt. visible: 100%

Height of eye: 64" (Ford F-150)
Berm height: 5.5' and 3.5'
Amt. visible: 100%

Height of eye: 41" (car)
Berm height: 3.5'
Amt. visible: 100%

Height of eye: 40" (car)
Berm height: 9'
Amt. visible: 41% (25.8' and up)

Height of eye: 51" (Honda CRV)
Berm height: 9'
Amt. visible: 52% (20.8' and up)

Height of eye: 64" (Ford F-150)
Berm height: 9'
Amt. visible: 69% (13.5' and up)

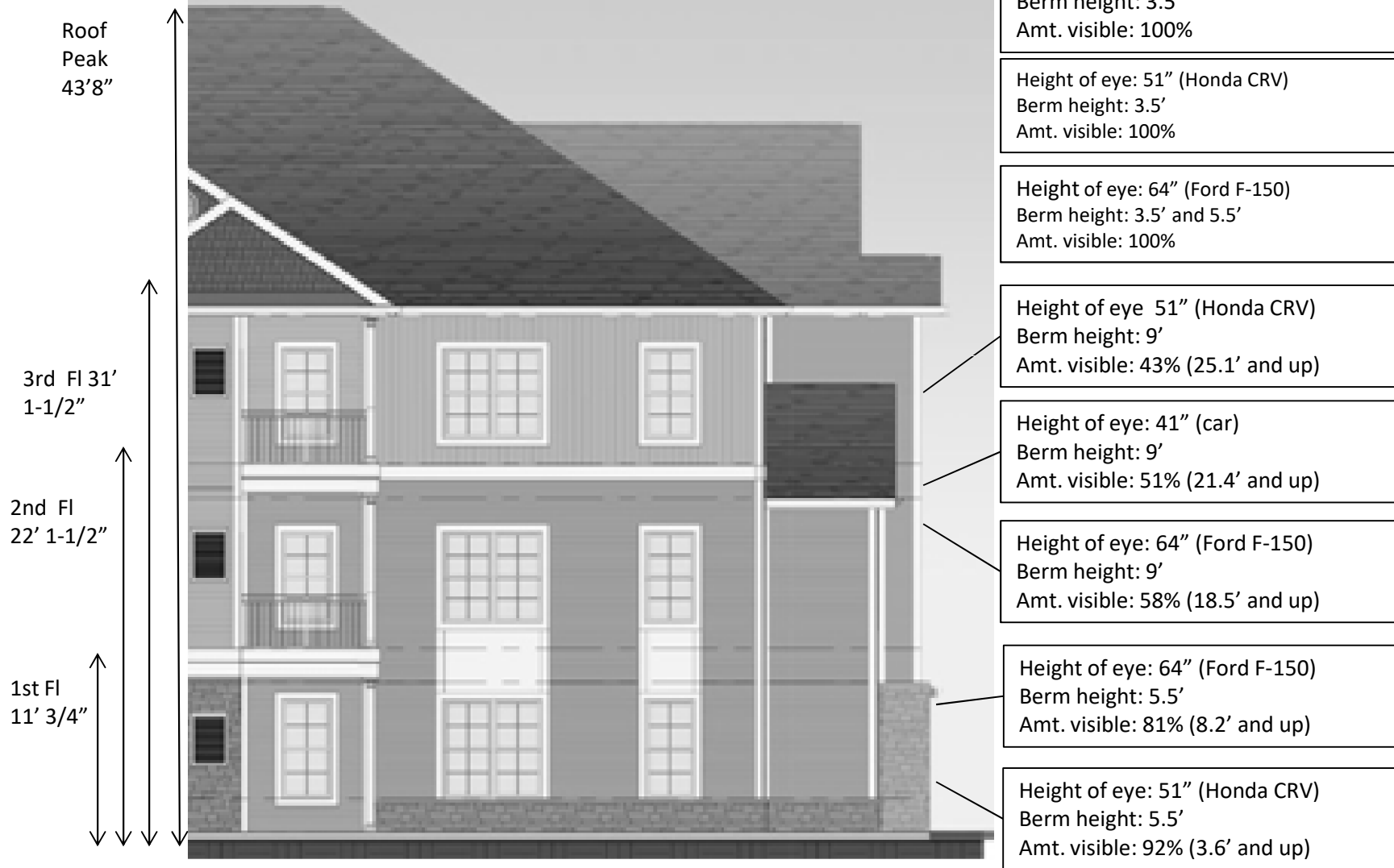
Height of eye: 41" (car)
Berm height: 5.5'
Amt. visible: 95% (2.4' and up)

10/25/2022

*Note: Although berm varies from 9 to 2 feet, a minimum height of 3.5 feet was used here to avoid overwhelming 100% visible results

Percent Of Apartment G Visible for
Berm Heights from 9 to 3.5 Feet*
from Cars, Compact SUVs, and Trucks

Point 2 – Midpoint of
Property at Oxford Road
centerline



10/25/2022

*Note: Although berm varies from 9 to 2 feet, minimum height of 3.5 feet was used here to avoid overwhelming 100% visible results

Percent Of Apartment G Visible for
Berm Heights from 9 to 3.5 Feet*
from Cars, Compact SUVs, and Trucks

Point 3 – Western End of Berm at
Centerline of Oxford Rd.

Roof
Peak
43'8"

Height of eye: 41" (car)
Berm height: 3.5'
Amt. visible: 100%

Height of eye: 51" (Honda CRV)
Berm height: 3.5'
Amt. visible: 100%

Height of eye: 64" (Ford F-150)
Berm height: 5.5', and 9'
Amt. visible: 100%

Height of eye: 41" (car)
Berm height: 9'
Amt. visible: 27% (31.9' and up)

Height of eye: 51" (Honda CRV)
Berm height: 9'
Amt. visible: 38% (27.1' and up)

Height of eye: 64" (Ford F-150)
Berm height: 9'
Amt. visible: 54% (20.3' and up)

Height of eye: 41" (car)
Berm height: 5.5'
Amt. visible: 78% (8.5' and up)

Height of eye: 51" (Honda CRV)
Berm height: 5.5'
Amt. visible: 89% (4.9' and up)

3rd Fl 31'
1-1/2"

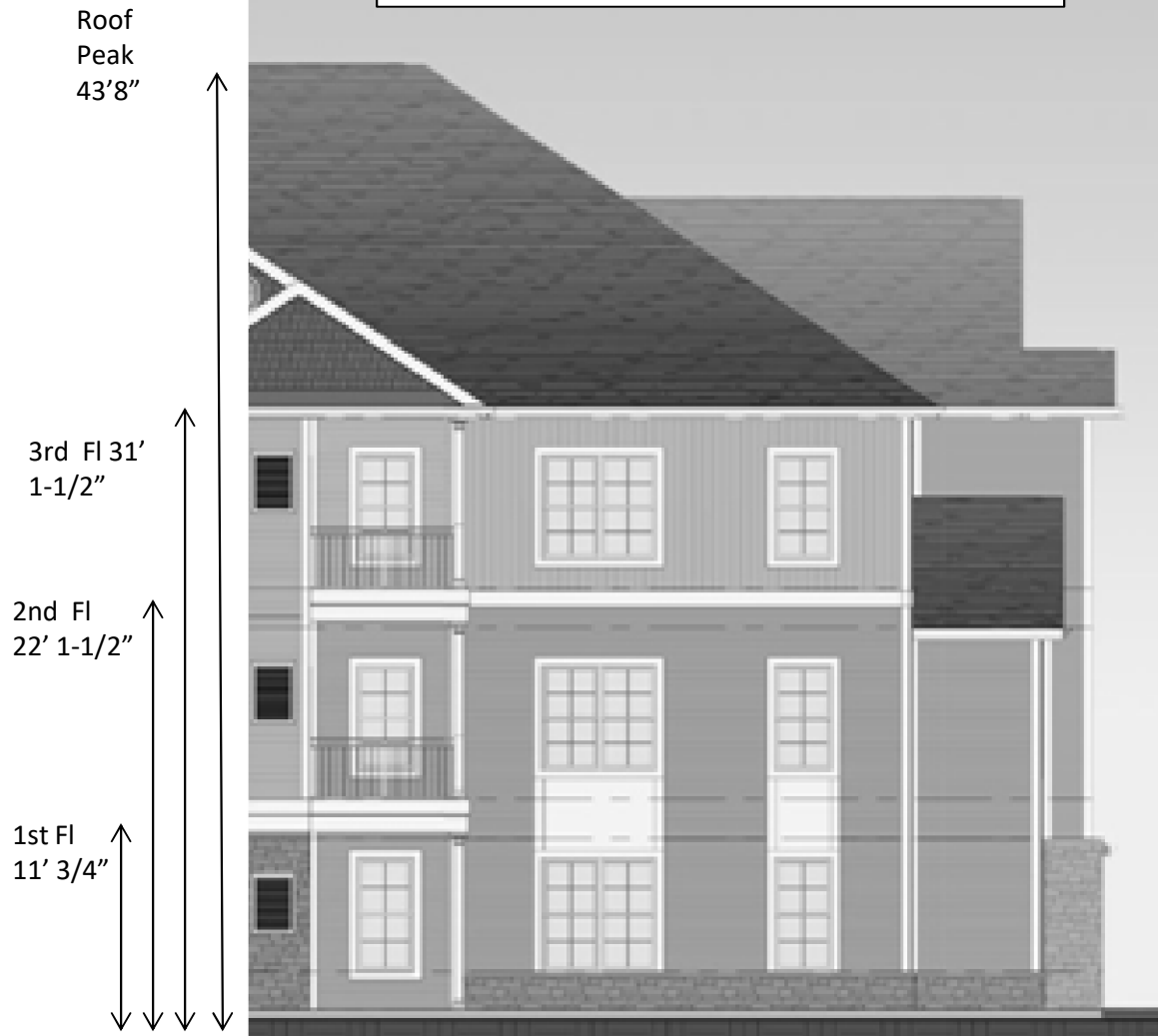
2nd Fl
22' 1-1/2"

1st Fl
11' 3/4"

10/25/2022

*Note: Although berm varies from 9 to 2 feet, minimum height of 3.5 feet was used here to avoid overwhelming 100% visible results

Percent Of Apartment G Visible for
Berm Heights from 9 to 3.5 Feet*
from Cars, Compact SUVs, and Trucks



10/25/2022

*Note: Although berm varies from 9 to 2 feet, minimum height of 3.5 feet was used here to avoid overwhelming 100% visible results

Point 4 – Access Rd at
Centerline of Oxford Rd.

Height of eye: 41" (car)
Berm heights: 9', 5.5' and 3.5'
Amt. visible: 100%

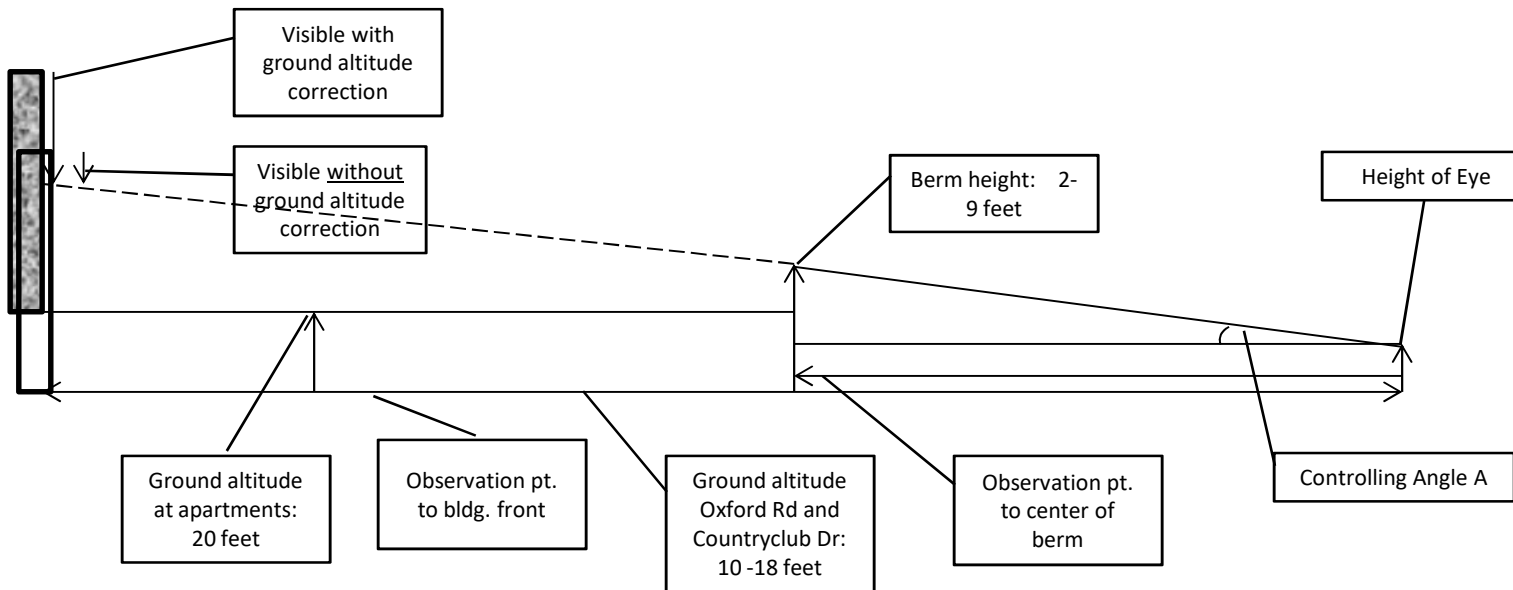
Height of eye: 51" (Honda CRV)
Berm height: 9', 5.5' and 3.5'
Amt. visible: 100%

Height of eye: 64" (Ford F-150)
Berm height: 9', 5.5' and 3.5'
Amt. visible: 100%

Attachment D

6

Poplar Hill Waterfowl Sanctuary Apartment Visibility Factors



Calculations

Berm Effectiveness Analysis - Former Waterfowl Sanctuary at Poplar Hill			
Point 1 Clubhouse Dr and Oxford W corner	938' East of Prop WB extended @ CL Oxford Rd		
Altitude of Point 1 (Center of Oxford Rd)	10	10	10
Apt C Alt.	21	21	21
Addl appt exposed considering alt	11	11	11
Berm Ht	9	5.5	3.5
Point 1 to berm crown on line to Apt C	181	181	181
Point 1 to corner of Apt 5	1210	1210	1210
Height of Eye - Car	3.5	3.5	3.5
Net height of berm versus - car	5.5	2	0
Viewer angle Angle A (to crown berm) (degrees)	1.74	0.53	0
Height of apt. obscured (level)	36.8	13.4	0
Height of apt. obscured (Corrected for appt alt.)	25.8	2.4	0
Percentage of bldg visible over berm	41%	95%	100%
Height of Eye - Honda CRV - female driver	4.25	4.25	4.25
Net height of berm versus - Honda CRV (compact crossover)	4.75	1.25	-0.75
Viewer angle Angle A (to crown berm) (degrees)	1.50	0.40	0.00
Height of apt. obscured (level)	31.8	8.36	0
Height of apt. obscured (Corrected for appt alt.)	20.8	0	0
Percentage of bldg visible over berm	52%	100%	100%
Height of Eye - Pickup truck	5.33	5.33	5.33
Net height - pickup truck	3.67	0.17	-1.83
Viewer angle Angle A (to crown berm) (degrees)	1.16	0.05	0.00
Height of apt. obscured (level)	24.5	1.1	0
Height of apt. obscured (Corrected for appt alt.)	13.5	0.0	0.00
Percentage of bldg visible over berm	69%	100%	100%
Point 2 - Midpoint of Property	565' East of Prop WB extended @ CL Oxford Rd		
Altitude of Point 2 (Center of Oxford Rd)	17	17	17
Apt C Alt.	21	21	21
Addl appt exposed considering alt	4	4	4
Berm Ht	9	5.5	3.5
Point 2 to berm crown	152	152	152
Point 2 to corner of Apt C	930	930	930
Height of Eye - Car	3.5	3.5	3.5
Net height of berm over car	5.5	2	0
Viewer angle Angle A (to crown berm) (degrees)	2.07	0.75	0
Height of apt. obscured (level)	33.7	12.2	0
Height of apt. obscured (Corrected for appt alt.)	21.4	8.2	0
Percentage of bldg visible over berm	51%	81%	100%
Height of Eye - Honda CRV - female driver	4.25	4.25	4.25
Net height of berm versus - Honda CRV (compact crossover)	4.75	1.25	-0.75
Viewer angle Angle A (to crown berm) (degrees)	1.79	0.47	-0.24
Height of apt. obscured (level)	29.1	7.6	0
Height of apt. obscured (Corrected for appt alt.)	25.1	3.6	0
Percentage of bldg visible over berm	43%	92%	100%
Height of Eye - Pickup truck	5.33	5.33	5.33
Net height - pickup truck	3.67	0.17	-1.83
Viewer angle Angle A (to crown berm) (degrees)	1.38	0.06	-0.48
Height of apt. obscured (level)	22.5	1.0	0.00
Height of apt. obscured (Corrected for appt alt.)	18.5	0.0	0.00
Percentage of bldg visible over berm	58%	100%	100%

Point 3 - Western end of berm	410' East of Prop WB extended @ CL Oxford Rd		
Altitude of Point 3 (Center of Oxford Rd)	18	18	18
Apt C Alt.	21	21	21
Addl appt exposed considering alt	3	3	3
Berm Ht	9	5.5	3.5
Point 3 to berm crown	133	133	133
Point 3 to NE corner of Apt C	843	843	843
Height of Eye - Car	3.5	3.5	3.5
Net height of berm over car	5.5	2	0
Viewer angle Angle A (to crown berm) (degrees)	2.37	0.86	0
Height of apt. obscured (level)	34.9	12.7	0
Height of apt. obscured (Corrected for appt alt.)	31.9	9.7	0
Percentage of bldg visible over berm	27%	78%	100%
Height of Eye - Honda CRV - female driver	4.25	4.25	4.25
Net height of berm versus - Honda CRV (compact crossover)	4.75	1.25	-0.75
Viewer angle Angle A (to crown berm) (degrees)	2.05	0.54	0.00
Height of apt. obscured (level)	30.1	7.9	0
Height of apt. obscured (Corrected for appt alt.)	27.1	4.9	0
Percentage of bldg visible over berm	38%	89%	100%
Height of Eye - Pickup truck	5.33	5.33	5.33
Net height - pickup truck	3.67	0.17	-1.83
Viewer angle Angle A (to crown berm) (degrees)	1.58	0.07	0.00
Height of apt. obscured (level)	23.3	1.1	0
Height of apt. obscured (Corrected for appt alt.)	20.3	0.0	0.00
Percentage of bldg visible over berm	54%	100%	100%

Point 4 -	242' East of Prop WB extended @ CL Oxford Rd		
Altitude of Point (Center of Oxford Rd)	19	19	19
Apt C Alt.	21	21	21
Addl appt exposed considering alt	2	2	2
Berm Ht (berm starts just to east of Point 3)	0	0	0
Point 4 to berm crown	123	123	130
Point 4 to NE corner of Apt C (closest to Oxford Rd)	740	740	740
Height of Eye - Car	3.5	3.5	3.5
Net height of berm versus - car	-3.5	-3.5	-3.5
Viewer angle Angle A (to crown berm) (degrees)	0.00	0.00	0.00
Height of apt. obscured (level)	0	0	0
Height of apt. obscured (Corrected for appt alt.)	0	0	0
Percentage of bldg visible over berm	100%	100%	100%

Apartment roof height	43.7		
Height of eye in car	3.5		
Height of eye in Honda CRV (female driver)	4.25		
Height of eye in F-150	5.33		
Center of Berm from south side (east bound) of Oxford	75		

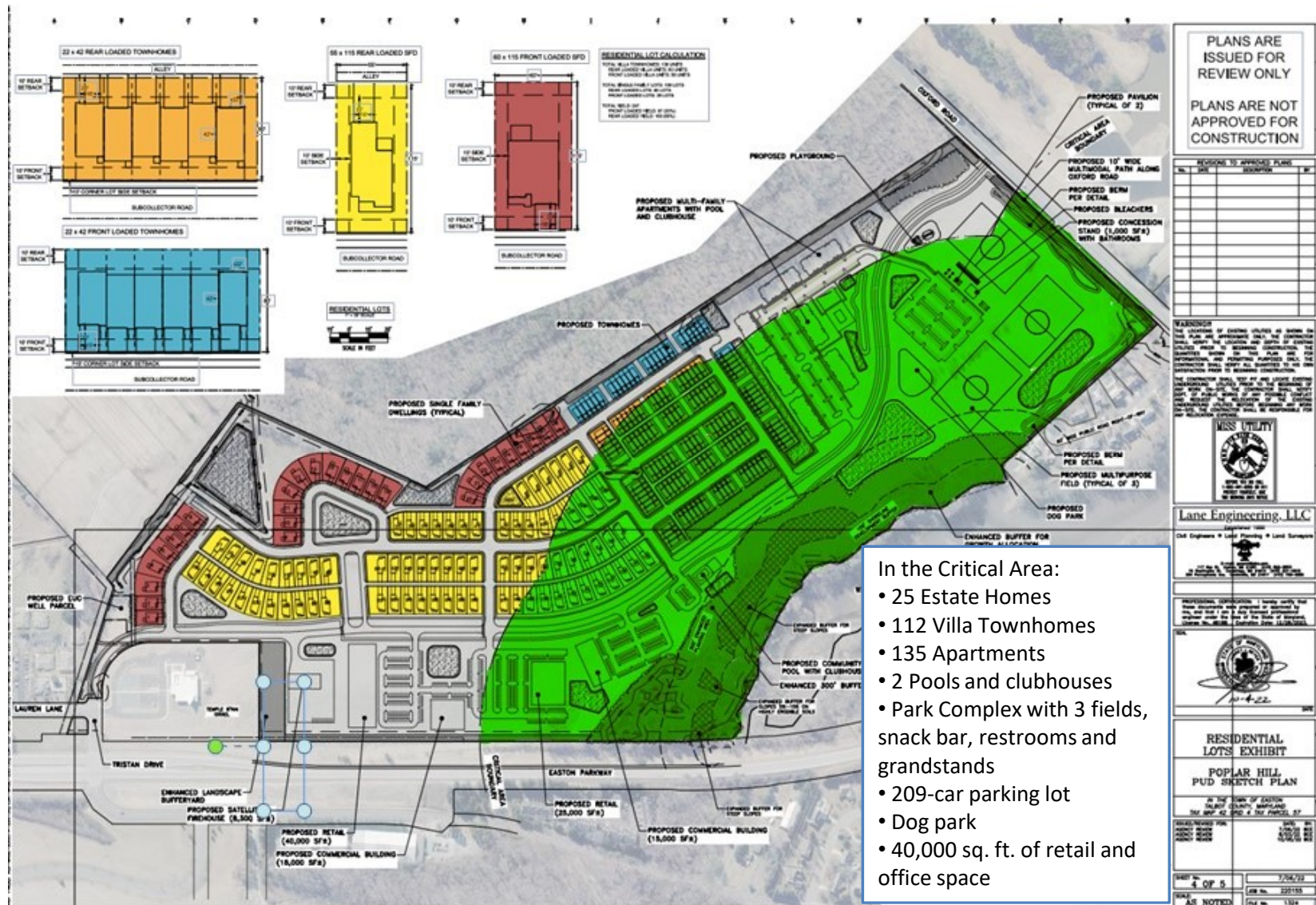
Notes:	Updated	25-Oct-22
1. All measurements in feet except angles.		
2. Berm height varies from 9 to 2 ft. with a 2 ft. wide crown and 3:1 slope (42 ft min. interval between 9 ft peaks)		
3. Middle berm: height of 5.5 ft. used - halfway between highest (9 feet) and lowest point (2 feet)		
4. Minimum berm: height of 3.5 used in calculations, 1.5 higher than planned, as conservative measure		

10/25/2022

Attachment D

9

Intense Development of the Critical Area



John and Clara Kelly
28495 Waterview Drive, P. O. Box 1094, Easton, MD 21601

November 14, 2022

Hand-Delivered

Town of Easton
Planning Commission
c/o Mr. Lynn Thomas, Town Planner
14 S. Washington Street
Easton, MD 21601

Re: Poplar Hill November 17, 2022 Planning Commission Considerations

Dear Commissioners:

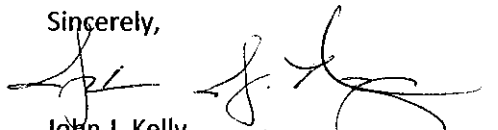
We are writing to you with respect to the March 26, 2021 letter from the Wildlife and Heritage Service, Maryland Department of Natural Resources (WHS). The letter is addressed to Lane Engineering and was part of Lane Engineering's 11-page Environmental Report for Critical Area Growth Allocation submitted to the Town for its review.

The WHS letter states, in relevant part, that, "The [WHS] has determined that there are no official State or Federal records for listed plant or animal species with the delineated area shown on the map provided."

The WHS letter is incomplete and may be misleading. See, for example, the enclosed November 2021 "List of Rare, Threatened and Endangered Species of Talbot County."

We respectfully ask that you take this information into account in addressing the developers' requests to (1) reclassify 65.977 of its 120.476 acres of property from Resource Conservation Area (RCA) to Intensely Developed Area (IDA) and (2) award them a growth allocation, which we strongly recommend be denied.

Sincerely,


John J. Kelly

Clara G. Kelly

cc: TOE Planning and Zoning, c/o Mr. Joseph Mayer ✓
Talbot County Council
Critical Area Commission, c/o Alexandra Deweese

Enclosures

PoplarHill11172022PlanningCommissionConsiderations11142022



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Charles Glass, Deputy Secretary

March 26, 2021

Ms. Natalie Hurley
Lane Engineering, LLC
P.O. Box 1767
117 Bay Street
Easton, MD 21601

RE: Environmental Review for Oxford Road, Easton - 126 Acres, Tax Map 42, Parcel 57, Lane Engineering, LLC Job No# 200574, Talbot County, Maryland.

Dear Ms. Hurley:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2021.0217.ta
Cc: C. Jones, CAC

Environmental Report for Critical Area Growth Allocation

**Poplar Hill
Easton, Maryland
Job # 220155**

Lands of
5001 SHR, L. C.

Prepared for
5001 SHR, L.C.
9161 Liberia Ave., #201
Manassas, VA 20110

Prepared by
Lane Engineering, LLC
117 Bay Street
Easton, MD 21601

List of Rare, Threatened, and Endangered Species of Talbot County

November 2021



Maryland

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary



Wildlife & Heritage Service

Natural Heritage Program
Tawes State Office Building, E-1
580 Taylor Avenue
Annapolis, MD 21401
410-260-8540
Fax 410-260-8596
dnr.maryland.gov/wildlife

Additional Telephone Contact Information:

Toll free in Maryland: 877-620-8DNR ext. 8540 OR
Individual unit/program toll-free number
Out of state call: 410-260-8540
Text Telephone (TTY) users call via the Maryland Relay

The facilities and services of the Maryland Department of Natural Resources are available to all without regard to race, color, religion, sex, sexual orientation, age, national origin or physical or mental disability. This document is available in alternative format upon request.

ACKNOWLEDGMENTS

The Maryland Department of Natural Resources would like to express sincere appreciation to the many scientists and naturalists who willingly share information and provide their expertise to further our mission of conserving Maryland's natural heritage.

Publication of this list is made possible by taxpayer donations to Maryland's Chesapeake Bay and Endangered Species Fund.

IMPORTANT NOTES

This list is a subset of the main reports:

Maryland Natural Heritage Program. 2021. List of Rare, Threatened, and Endangered Plants of Maryland DNR 03-030321-271 and

Maryland Natural Heritage Program. 2021. Rare, Threatened, and Endangered Plants of Maryland DNR 03-030321-270 and

Maryland Natural Heritage Program. 2021. List of Rare, Threatened, and Endangered Animals of Maryland DNR 03- 111921-291

Please refer to these for important information including grant, history, purpose, governing laws and regulations, understanding state and federal conservation status ranks and legal statuses, and for additional resources.

This list is derived from an extensive data collection effort and numerous field surveys to determine distribution and abundance of plants and animals native to Maryland. Although based on a large volume of information, this list should not be viewed as complete or definitive. While much is known about some species, very little is known about others. The Maryland Natural Heritage Program welcomes additional information or recommendations regarding any of the taxa listed herein.

HOW YOU CAN HELP

You can take an active part in conserving Maryland's rare species by contacting the Wildlife and Heritage Service with the following types of information:

1. Location details should be included (exact mapped location using GPS is preferred, but not required). Online applications such as Google Earth are invaluable but precise, written directions including driving and walking are acceptable.
2. Documentation that includes a photograph, description of the species, identification source, and habitat description should accompany the report.
3. Information on the ecology and or biology of the species including observed and/or identified pollinators should accompany the report.

****Additional information, including a downloadable PDF of our rare plant reporting form can be found at: dnr.maryland.gov/wildlife/Pages/plants_wildlife/rte_reportinginst.aspx**

Definitions of qualifiers used in the county distribution of species.

Distributional Qualifier	Definition
{species} [?]	Record for the county is reported but unverified or may indicate that the record occurs outside of the known range or in atypical habitat.
{species} ^h	Record for the county is based upon a historical collection but no extant population is known.
{species} ^l	Record for the county is the result of an introduction.

SCIENTIFIC NAME	COMMON NAME	STATE RANK	STATE STATUS	FEDERAL STATUS
Animals				
<i>Alasmodonta heterodon</i>	Dwarf Wedgemussel	S1	E	LE
<i>Alasmodonta undulata</i>	Triangle Floater	S1S2	T	
<i>Botaurus lentiginosus</i>	American Bittern	S1B	T	
<i>Egretta caerulea</i>	Little Blue Heron	S3B		
<i>Gallinula galeata</i>	Common Gallinule	S2S3B	I	
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S3S4		
<i>Hopierus planatus</i>	A Dytiscid Beetle	S2		
<i>Hydrochus spangleri</i>	Seth Forest Water Scavenger Beetle	S1	E	
<i>Ixobrychus exilis</i>	Least Bittern	S2S3B	I	
<i>Laterallus jamaicensis</i>	Black Rail	S1	E	LT
<i>Lithobates virgatipes</i>	Carpenter Frog	S3		
<i>Nicrophorus americanus</i>	American Burying Beetle	SX	X	LE
<i>Sciurus niger cinereus</i>	Delmarva Fox Squirrel	S1	I	
<i>Sternula antillarum</i>	Least Tern	S2B	T	
<i>Strophitus undulatus</i>	Creeper	S2S3	I	
<i>Stygobromus tenuis tenuis</i>	Slender Amphipod	SU		
Plants				
<i>Agalinis setacea</i> ^h	Thread-leaved Gerardia	S2	E	
<i>Antennaria solitaria</i>	Single-head Pussetoes	S2	T	
<i>Asclepias purpurascens</i>	Purple Milkweed	S2		
<i>Bartonia paniculata</i>	Twining Screwstem	S3		
<i>Bidens trichosperma</i> [?]	Tickseed Sunflower	S3S4		
<i>Carex barrattii</i>	Barratt's Sedge	S3		
<i>Carex jorii</i>	Joor's Sedge	S3		
<i>Carex lacustris</i>	Lake-bank Sedge	S2		
<i>Carex striatula</i>	Lined Sedge	S3		
<i>Carex venusta</i>	Dark Green Sedge	S3S4		
<i>Carex vestita</i>	Velvety Sedge	S2	T	
<i>Cirsium horridulum</i>	Yellow Thistle	S3		
<i>Cuscuta coryli</i> ^h	Hazel Dodder	S1		
<i>Cypripedium parviflorum</i> var. <i>pubescens</i> ^h	Large Yellow Lady's-slipper	S3		
<i>Desmodium laevigatum</i> ^h	Smooth Tick-trefoil	S3		
<i>Desmodium ochroleucum</i> ^h	Cream Tick-trefoil	S1	E	
<i>Dryopteris celsa</i>	Log Fern	S3		
<i>Eleocharis melanocarpa</i> ^h	Black-fruit Spikerush	S1	E	
<i>Galactia volubilis</i> ^h	Downy Milkpea	S3		
<i>Hottonia inflata</i>	Featherfoil	S1	E	
<i>Hylodesmum pauciflorum</i> ^h	Few-flowered Tick-trefoil	S2	E	
<i>Hypericum drummondii</i> ^h	Drummond's St. John's-wort	SH	X	
<i>Isoetes engelmannii</i>	Engelmann's Quillwort	S3		

SCIENTIFIC NAME	COMMON NAME	STATE RANK	STATE STATUS	FEDERAL STATUS
<i>Linum intercursum</i> ^h	Sandplain Flax	S2	T	
<i>Liparis liliifolia</i> ^h	Large Twayblade	S3		
<i>Malaxis unifolia</i> ^h	Green Adder's-mouth Orchid	S2		
<i>Matelea carolinensis</i>	Carolina Anglepod	S2S3	T	
<i>Panax quinquefolius</i> ^h	American Ginseng	S2S3		
<i>Panicum philadelphicum</i> ^h	Philadelphia Panicgrass	SU		
<i>Paspalum dissectum</i>	Walter's Paspalum	S2	T	
<i>Pedicularis lanceolata</i> ^h	Swamp Lousewort	S1	E	
<i>Persicaria robustior</i> [?]	Stout Smartweed	SU		
<i>Pilea fontana</i>	Springs Clearweed	S3		
<i>Pluchea camphorata</i> ^h	Marsh Fleabane	S2	E	
<i>Potamogeton amplifolius</i> ^h	Large-leaved Pondweed	S1S2		
<i>Ranunculus pusillus</i> ^h	Pursh's Buttercup	SU		
<i>Rudbeckia triloba</i>	Brown-eyed Susan	S3		
<i>Schoenoplectus novae-angliae</i>	Salt-marsh Bulrush	S2		
<i>Sphenopholis pensylvanica</i>	Swamp Wedgescale	S2	T	



Samantha Smith <ssmith@eastonmd.gov>

Fwd: Poplar Hill Development

1 message

Nicholas Johnson <njohnson@eastonmd.gov>
To: Samantha Smith <ssmith@eastonmd.gov>

Tue, Mar 28, 2023 at 8:14 AM

----- Forwarded message -----

From: **Lynn Thomas** <lthomas@eastonmd.gov>

Date: Tue, Mar 28, 2023 at 7:52 AM

Subject: Fwd: Poplar Hill Development

To: Joe Mayer <jmayer@eastonmd.gov>, Miguel Salinas <msalinas@eastonmd.gov>, Nicholas Johnson <njohnson@eastonmd.gov>

----- Forwarded message -----

From: **Tony Newell**

Date: Mon, Mar 27, 2023 at 4:21 PM

Subject: Poplar Hill Development

To: <lthomas@eastonmd.gov>

Oxford Roads designated Scenic Byway

should have a Natural Meadow Park as part of any possible Poplar Hill Development

Dear Mr Thomas ,

I am a 25 year resident of Easton and like all of us enjoy the unique nature of this beautiful area. While development and change is inevitable, it should be done in a way that embraces all the values of the Easton area and Eastern Shore life. As our local roadside signs declare, the Easton, Oxford Road, and St Michaels scenic byways are enjoyed by residents and visitors alike and are an integral part of what makes this area so special . It's an area that needs special protection that many local conservation groups are working hard to maintain. When I see a proposed development from a Virginia developer who wants to build 456 dwellings consisting of 108 homes, 138 townhouses and 7 three-story buildings containing 210 apartments on the 120 acres of the former Poplar Hill Waterfowl Sanctuary alongside Oxford Road, it deserves very some special attention. Moreover, 66 acres of the proposed buildings would actually be in the watershed designated "critical area" which is protected by Maryland as Critical Area to preserve the Chesapeake Bay. It is currently categorized as Resource Conservation Area (RCA). Building in the Critical Area is very restricted unless special "growth allocation" is used which would permit a massive 62% of these buildings in this Critical Area.

Easton already has 818 dwelling units just completed or previously approved and awaiting construction in the pipeline, which would house an additional 2000 residents.

As far as I know Easton and Talbot County have not explained how or where the already stressed schools, medical care, and government services could serve the new residents or be funded. Potential occupants from the new development would add over 800 vehicles to traffic in the vicinity, adding to existing concerns about traffic, pedestrian, and bicycle safety along Oxford Road. It would change the traffic dynamics completely for those using this road as the main arterial access route to and from their homes.

The developer offers to construct a sports complex off Oxford Road of 3 multi-purpose fields, snack bar, restrooms, stands, and a 209-car parking lot and turn it over to the town. Field lights, scoreboards, fences could well follow. At present, Easton has not documented the need for additional multipurpose fields and makes its existing fields available to teams from surrounding counties without charge. The sports complex would be located on about 20 acres of Critical Area along Oxford Road closest to wetlands draining to the Tred Avon. Geese, deer, turkeys, and foxes use the area.

If another complex is someday needed, it can be constructed more cheaply elsewhere, outside the Critical Area. Here it works against nature, requiring cutting down a copse of trees and bulldozing the sloping terrain flat. The multipurpose fields are

designed to shed water and would be planted with turf grass that requires regular fertilizer, herbicides, striping, and mowing, at town expense.

Rather than using the unbuilt 20 acres to reduce impacts to the Critical Area, the sports complex would hurt water quality, wildlife, and the scenic Oxford Road corridor. If the Poplar Hill development is allowed to go forward, creation of a passive, "emergent meadow park" in place of the sports complex should be required.

An emergent meadow park works with nature. It consists of tall native grasses and low bushes, using existing contours and features that would absorb run-off 14 times better than grass, reduce runoff of nutrients and herbicides by up to 50% and sediment release by 75%.

Instead of the sports complex's "environmental desert," the meadow park would create desperately needed habitat for grassland and forest birds, both of which are in steep decline on the Eastern Shore. A meadow park is available to anyone, without reservation or team membership, could be used by local schools, and would eliminate the traffic surges that a sports complex creates.

A meadow park would add habitat for wildlife, creating a corridor between the forest berm along Windmill Branch and the planned, adjoining Easton Forest Park. A meadow park maintains a rural, small town look along the Oxford Road corridor, preserving the conservation ethos that draws 20,000 visitors to the Waterfowl Festival. Maintenance of an emergent park is far less demanding and expensive than a sports complex. Recent surveys show more support for passive and natural parks - like the natural meadow park - than more active parks and multipurpose fields.

If Poplar Hill is developed, a "meadow park" must be substituted for the complex. A meadow park would use tall grasses, low bushes, existing trees and contours to create a peaceful retreat that all the public can enjoy. It would reduce polluted runoff, provide food, cover, and habitat for wildlife, and create a corridor linking Windmill Branch and the new Easton Woodland Park. Maintenance costs would be much less. It would produce no traffic surges on Oxford Road. The scenic Oxford Road corridor and Easton's rural feel would be preserved.

You have the ability to be a direct and positive decision maker in the process to protect and assure the future of this beautiful area at the forthcoming meeting planned between Town of Easton and Talbot County joint planning commissions at the Avalon Theatre Tuesday April 4th 2023.

Thank you on behalf of everyone who treasures this Easton Shore and Easton area.

Tony Newell Easton, MD

--

Lynn B. Thomas, Jr., AICP
Town Planner

[14 South Harrison Street](#)
[Easton, MD 21601](#)

(410) 822-2525

--

Nicholas Johnson

Planner
Town of Easton
Planning & Zoning

To: Mr. Brennan Tarleton Planning Officer Talbot County

3/12/2023

215 Bay St # 2

Easton, Maryland 21601

From: Michael and Michelle Roe 7571 Pollys Hill Lane Easton, Maryland

Reference: Poplar Hill Farm Proposed Development

The Town of Easton and Talbot County are at an important crossroads. After a decade of little or no population growth, they are now faced with multiple proposals to quickly expand residential development on a vast scale, threatening the small town, rural nature of Easton, anchored in a conservation ethos and environmental values. Easton and Talbot County residents overwhelmingly say they enjoy a wonderful quality of life that should be protected. The proposal for Poplar Hill would place all that at risk by attempting to do too much, all at one place, too fast. Although change is inevitable, it can be done in a way that preserves the quality of life in Easton and Talbot County if it is carefully tailored. The former Waterfowl Sanctuary at Poplar Hill is a special piece of property that, because of its proximity to the headwaters of the Tred Avon River and its historic links to Easton and Talbot County's conservation and environmental values, deserves special protection. There are no more areas like this within Easton where those values can be preserved as they can be here. There are other, less sensitive, areas within Easton where additional playing fields or additional apartments can be located. The Critical Area regulations of both the Town of Easton and Talbot County require the development be designed to minimize adverse impacts on water quality. The current design does not do that. The Town of Easton Code requires protection of wildlife habitats determined

to be of local significance. The Talbot County Code requires that the development maximize protection of wildlife common to the Chesapeake Bay Region. The current design meets neither of those requirements. The Town of Easton Comprehensive Plan requires that the development be balanced and controlled as to timing, location, appearance, and impact upon surrounding properties as well as the Town as a whole. The Talbot County Code requires that the development be ordered, efficient, or productive. This development is neither balanced and controlled nor is it ordered, efficient, or productive. Instead, the proposed design will have a dramatic adverse impact on the surrounding properties and the scenic Oxford Road corridor. It will seriously add to existing traffic safety problems for our residents and those of Easton Club and provides no plan to mitigate them. It will contribute to a looming wave of fiscal requirements for new schools and other public resources when there is no plan on how to meet those challenges. Hoping that someone will figure something out on these critical issues that won't destroy Easton and Talbot County's quality of life is not a plan. **The developer is free to develop the property subject to the terms and restrictions to which the property was subject for years and the restrictions that were in place when it was purchased by the developer, including the limitations on development within the Critical Area.** The current design, however, seeks to go far beyond that. A design that asks as much as this one does from the community, the environment, and the Chesapeake Bay truly must be exceptional in all regards to merit approval. This design could be, but is not now, the equal of what is required. The request for additional growth allocation within the critical area must be denied.

Thank You for your consideration.

 
Michael Roe / Michelle Roe

David & Sharon M. Perry
7418 Michael Avenue
Easton, Maryland 21601

March 19, 2023

Mr. Lynn Thomas
Town of Easton
14 South Harrison Street
Easton, MD 21601

RE: Proposed Poplar Hill Development

Dear Mr. Thomas:

We are writing to express our opposition to the current proposal for the Poplar Hill development to be located off the Oxford Road. As we understand it, the current proposal would put more than 450 new dwellings, tens of thousands of square feet of new retail, a new sports complex (!) and associated paved roads and parking on 115 acres of the former waterfowl preserve. To add insult to injury, more than half of the development will be on Critical Area land. This kind of high density "suburban sprawl" seems to us to be the exact opposite of the intended environmental protections established by the Critical Area Protection Program.

To encourage his project's approval, the developer has cleverly included "bonus" features of a firehouse substation and multipurpose sports complex at no capital cost to the Town. The sports complex is especially problematic as the current plan places the complex adjacent to Oxford Road (goodbye Scenic Byway) and where the present gently sloping topography drains to the Tred Avon River. The present plan would bulldoze the area to install manicured sports fields and a large parking area. If a new sports complex is truly needed in town, then there are other non-Critical Areas to place it (and still funded by the Poplar Hill developer).

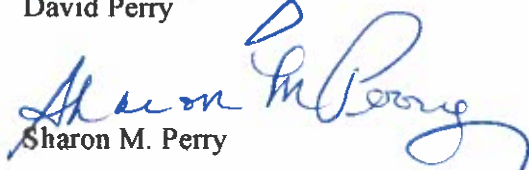
We understand that Easton needs growth and economic development, but we must do so in a thoughtful manner respecting our environment and small-town culture. We do not believe our Town needs to yield to the demands of any property developer, nor should we sacrifice environmental quality for growth. So, we respectfully ask that you stand-up for our community, the environment, and small-town culture to help force the developers to modify the proposed plan.

Thank you.

Sincerely,



David Perry



Sharon M. Perry

RECEIVED
MAR 22 2023
TOWN OF EASTON

Patricia Ledvina
7585 Polly's Hill Ln.
Easton, MD 21601
March 27, 2023

Mr. Brennan Tarleton
Planning Officer
Talbot County
215 Bay St # 2
Easton, Maryland 21601

Dear Mr. Tarleton:

My husband and I first experienced the rural beauty of the Eastern Shore 35 years ago when we attended the Waterfowl Festival and then the Chestertown Tea Party. Enchanted by the special small-town feeling that Easton and Talbot County evoke, we bought a home in Easton on Papermill Pond close to the Poplar Hill Waterfowl Sanctuary. I especially enjoy the beauty of the Oxford Road corridor, which until now has been protected from large scale development. I fear that the beauty, the quiet, and small-town charm are at risk. I know that growth is inevitable and don't oppose reasonable, well-planned growth, but what is proposed for development of Poplar Hill is not reasonable or well planned.

When Poplar Hill was sold to a developer, it was clear that almost half of it was classified as Critical Area. Surely the developer knew that Easton had used up all its allocation for growth in the Critical Area. Maryland created the Critical Area Program to protect the Chesapeake Bay by guarding how the land closest to the Bay and its tributaries is used. Caps on intense growth in the Critical Area are there for purpose – to improve water quality in the Bay for recreation and the fisheries for which it is famous.

Rather than comply with the rules and design the best development possible in the remaining 54 acres, however, the developer decided that someone else could protect the Bay – he would get an exception to permit a massive development. In my view, the caps on development in the Critical Area are important. They were created for good reason and when Easton used up its growth allocation, the caps should stand. This doesn't involve a minor amount of growth. The developer would put most of the dwellings in the Critical Area and much of the commercial space. Even Critical Area not to be used for buildings, the part closest to scenic Oxford Road and the Tred Avon, will be bulldozed and filled with playing fields, huge parking lot, snack bar and all the detritus that will turn this piece of the scenic Oxford corridor into generic suburbia, Anywhere, U.S.A. Traffic on Oxford Road is already worse than when I moved here. The addition of all this development will make it much more difficult to get into and out of my development safely. The rush to and from games and practices will make weekends and evening rush hours even more of a challenge.

This developer is asking for far more than that to which it is entitled and hasn't provided convincing reasons why the exceptions to the Critical Area caps required to achieve its goals

should be granted as the project is now proposed. The Critical Area at Poplar Hill is where we must protect the environment, the Bay, the scenic Oxford corridor, and Easton's rural, small-town values that make it so special.

Sincerely,

A handwritten signature in cursive script, appearing to read "Patricia LeVine". The signature is written in black ink and is positioned below the word "Sincerely,".

**Papermill Crossing Homeowners Assn.
7585 Pollys Hill Lane
Easton, Maryland
27 March 2023**

Mr. Lynn B. Thomas, Jr.
Town Planner
Town of Easton
14 S. Harrison Street
P.O. Box 520
Easton, Maryland 21601

Mr. Brennan Tarleton
Planning Officer
Talbot County
215 Bay St # 2
Easton, Maryland 21601

Re: Request for Supplemental Growth Allocation for Development of Poplar Hill Farm

Dear Messrs. Thomas and Tarleton:

Introduction and update. We previously submitted a comment letter dated November 3, 2022, which addressed a number of problems with the proposal of 5001 SHR, L.C. for development of Poplar Hill. Because of several developments since then, these additional comments are submitted. Achieving the essential goals of the Maryland Critical Area Program must remain the final criteria for deciding whether to approve the request. Granting a request for a supplemental allocation is never required, even if the applicant meets all the minimum requirements. It should be denied unless in your judgment it will best achieve the goals of the Maryland Critical Area Program. Without significant change, the proposed development does not meet that standard. To minimize duplication, we will address these points and where relevant, direct attention to discussion in our letter of 3 November for more detailed review.

1. Addition of Easton Woodland Park. The new developments include the acquisition of land for the new Easton Woodland Park. The Town of Easton and Talbot County have obtained a grant to purchase 198 acres of land just south of Poplar Hill for use as "Easton Woodland Park." The closing on the purchase is expected shortly. Establishment of this forest park does not reduce the need for a meadow park.

a. Minimizing impacts to water quality to save the Bay and preserve Easton's conservation values. Approximately 25 acres of Critical Area are not devoted to dwellings, amenities, and commercial development. Yet instead of using this area to achieve Critical Area goals, the plan does just the opposite. The stormwater features in the developer's plan may be technically sufficient, but they are nowhere near as effective as a meadow park would be. A meadow park will minimize impact to water quality.¹ A meadow park would provide far better protection to water quality, wildlife conservation, and preservation of Easton's rural feel conveyed by the scenic Oxford corridor.

b. Providing a wildlife corridor and badly needed grassland habitat. The developer's proposal does not even try to protect or enhance habitat, merely stating no endangered species is known to reside there – a low standard indeed. Foxes, deer, wild turkeys and many other species of birds, especially grassland birds, which are in steep decline on the Eastern Shore, would benefit from a meadow park. Even forest-dwelling birds in the new park would benefit from a meadow nearby. A meadow park provides food, cover, nesting sites and a safe corridor between Windmill Branch and Easton Woodland Park.ⁱⁱ

2. The rapid expansion of growth already underway or approved in Easton will overtax resources and harm the quality of life. Since November, developmental pressure has increased. Easton has no problem attracting developers. See Attachment 1. If no further development were approved, Easton and Talbot County will face very real challenges supporting the 818 dwelling units already in the pipeline. Almost 1000 more are under review or proposed. This project alone is hundreds of units larger than the other developments recently approved in Easton. Just the development planned for the Critical Area here exceeds that of recently approved major developments that are entirely outside the Critical Area. See Attachment 2. The density (units per acre) is also far more intense than recently approved developments. Answers on how to provide schools, government services, health care, and similar resources in time for the flood of new residents have not been explored, let alone designed or funded. If a sports complex is constructed, it will be unusable without regular maintenance for its life. A meadow park requires a fraction of the maintenance and is more forgiving of budget issues.ⁱⁱⁱ This is neither reasonable nor "ordered, efficient, or productive" development as required by Talbot County regulations.

a. The most important study of traffic hazards has been promised but not completed. 5001 SHR, L.C. appeared before the Easton Planning Commission on 17 November 2022 and promised to provide a traffic study of how the multiple intersections on the north end of Oxford Road interact and will be impacted by this development. Traditional analysis of traffic load intersection by intersection, does not address the real issue. To our knowledge, this has not been done. Traffic surges from the sports complex favored by the developer will make matters worse. A meadow park would mitigate traffic surges.

b. There is no need to duplicate Easton's sports complex now. In February, Easton confirmed that it has no long-range plan or study of the need for more fields. Talbot County's state-approved 2022 Land Preservation, Parks, and Recreation Plan, which includes Easton's parks, did not find any need for more active parks in Easton but did identify a public preference for more passive, natural parks.^{iv} A lengthy review by the Easton Park Advisory Board of field use at the North Easton Sports Complex, including significant public input, did not document any need for additional fields. Problems with field use at North Easton Park, to the extent they exist, stem from a policy that allowed teams, including travel teams, for-profit teams, and teams from outside Talbot County, to reserve blocks of time for an entire season, even if they didn't

use all of it. See Attachment 3. Unlike Talbot County and all other nearby entities on the Eastern and western shores, there is currently no charge for field reservations/use in Easton. Unsurprisingly, teams flock here. Easton is considering changes to these policies that likely reduce demand (Recreational teams will continue to be able to reserve and use fields for free). If another sports complex is needed in the future, choosing an appropriate site – outside the Critical Area - is much easier than finding a site as advantageous as this one for environmental protection, habitat creation, wildlife conservation, and preserving the scenic Oxford corridor.

c. A meadow park is more accessible and useable by most people. The recent review of park use confirms that, unlike a sports complex that is used by teams and which can only be used by reservation, a natural park can be used by individuals on their own schedule. It is much more available, and because it is typically used casually by individuals and small groups, it will not create traffic surges on Oxford Road and will not require a large parking lot, snack bar, large restrooms, bleachers, scoreboards, shacks, and other suburban detritus.

Summary. The Town of Easton and Talbot County are at an important crossroads. After a decade of little or no population growth, they are now faced with multiple proposals to quickly expand residential development on a vast scale, threatening the small town, rural nature of Easton, anchored in a conservation ethos and environmental values. Easton deserves the best utilization of this remaining Critical Area, not just “good enough.” A meadow park at the northeast corner of the proposed development would complement the new park and enhance the environmental, wildlife, and scenic benefits that this significant investment could provide. Absent significant change, especially substitution of a natural, emergent meadow park for the planned sports complex, the request for additional growth allocation must be denied.

Respectfully,



Thomas Ledvina
President

Attachments:

1. Critical Area superimposed on planned development
2. Spreadsheet
3. Easton Park Advisory Board letter

End Notes:

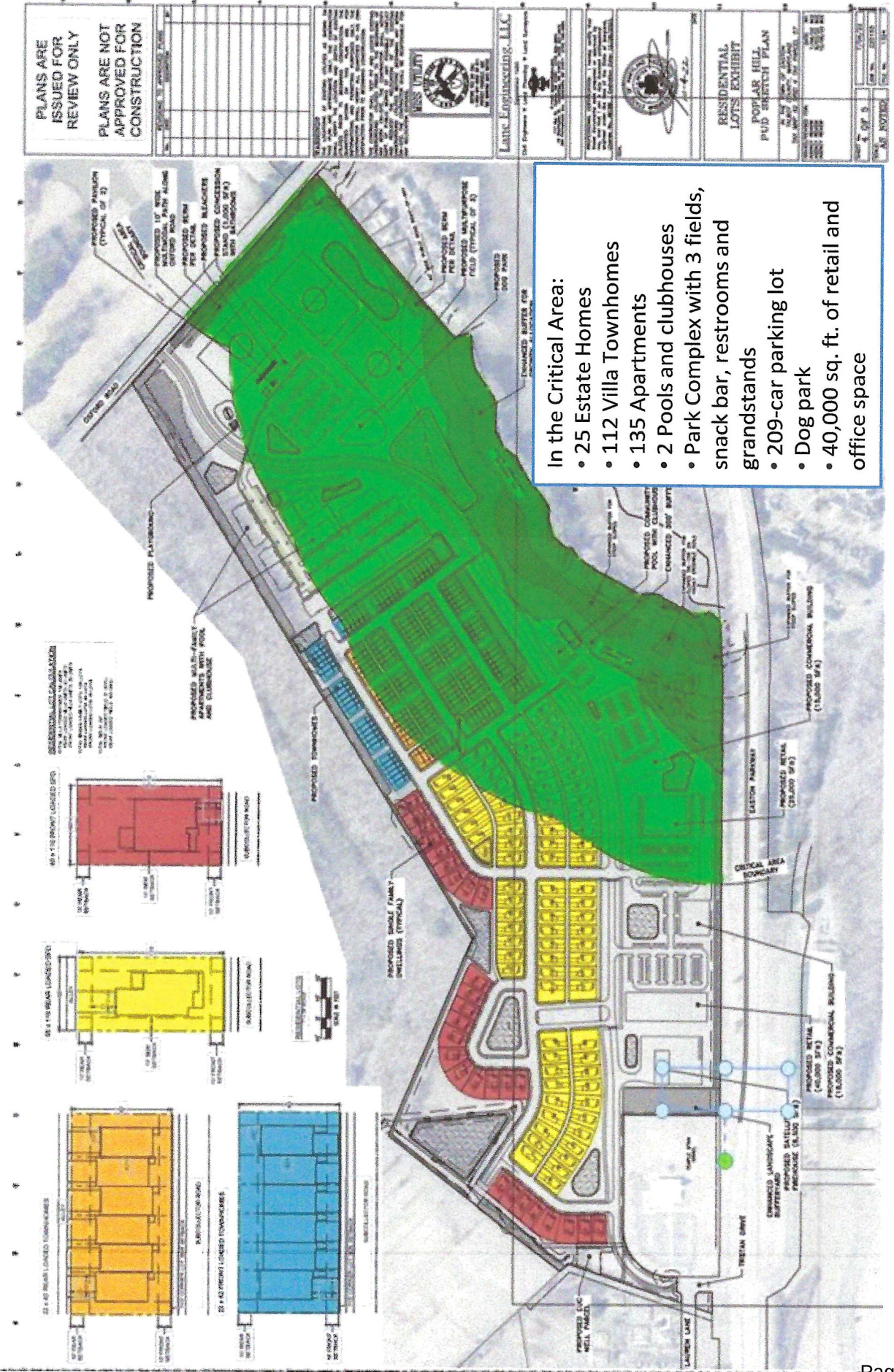
ⁱ 3 November letter (NOV ltr) at pp. 4-5, 9.

ⁱⁱ NOV ltr at pp. 8-13.

ⁱⁱⁱ NOV ltr at 9-10.

^{iv} NOV ltr at 18-19.

Intense Development of the Critical Area



Attachment 2

Developments In Easton Recently Approved, Under Formal Review, or Proposed/Under Development

Development	Single Family	Townhome	Apartments	Total Dwelling Units	Acres	Density	Notes
Approved							
Gannon Estates	200			200	76.274	2.6	
Elliott Rd Apartments			120	120	6.84	17.5	4 bldgs - 3 stories
Four Seasons at Easton	252			252	100	2.5	Likely more to come after annexation
807 N. Washington St.	10			10			
Brant Court			96	96			
Cookes Hope Phase VII	67			67			
Doverbrook Apts.			64	64			
Port Street Commons			5	5			
Habitat for Humanity Prospect St.	4			4			
Easton Village							number still to be built not available
Subtotal	533	0	285	818			
Under Review							
Poplar Hill	108	138	210	456	114.6	4.0	7 apt. bldgs - 3 stories
Aspire Apts.			162	162			
Subtotal	108	138	372	618	114.6		
Proposed/Under Development							
Daly Gardens (Naima)			26	26			Briefed to Planning Commission
Dixon Square		8		8			
Port Street Small Area Plan				323			Subject of recent \$1M grant request to State
Subtotal	0	8	26	357	0		
Total	641	146	683	1793			



TOWN OF EASTON

P.O. Box 520
Easton, Maryland 21601

February 28, 2023

Mayor Robert Willey
Easton Town Council
14 S. Harrison Street
Easton, MD 21601

Dear Mayor and Town Council Members:

Members of the Town of Easton Park Advisory Board have been discussing the possibility of Field Use Fees for a little more than a year. The two primary reasons are cost and scheduling.

Cost

The Town recently renovated two (2) multipurpose fields at North Easton Sports Complex. The fields were converted to Bermuda Grass and lights were installed. These two (2) fields are arguably the most desirable fields in the area because of the Bermuda Grass and lights allowing use in the evenings when other fields are dark. The additional use and wear on the fields requires increased maintenance.

Scheduling

The demand for the newly renovated multipurpose fields as well as the existing ones causes scheduling challenges. With no fee to reserve the fields, Easton youth organizations as well as travel, for profit and organizations from outside the area, reserve the fields at no cost. The issue we run into is they are reserved for times that are not actually used, and it blocks field use for other youth organizations. If there was a fee associated with reserving a field, we think the group reserving the field would be more accurate with their scheduling.

We also discussed that the fees should be applied to all fields at North Easton Sports Complex in the interest of fairness. In addition, Pavilion Use was discussed and the benefit of having fees to reserve them as well.

We discussed these concerns at the following Park Advisory Board Meetings and Workshops:

- 09/27/2021 – Park Board Meeting
- 10/26/2021 - Workshop
- 11/16/2021 - Workshop
- 01/24/2022 – Park Board Meeting
- 02/02/2022 – Workshop
- 11/16/2022 – Workshop
- 01/23/2023 – Park Board Meeting

02/16/2023 – Workshop
02/28/2023 – Park Board Meeting

However, after hearing feedback from our local youth organizations and discussions with the Mayor, Town Council and Staff, we feel that the Field Use and Light Use Fees are not something we should implement at this time to our Easton recreational youth organizations.

We do recommend Field Use fees for travel and out of Town organizations. Specifically, Easton Little League baseball, Talbot Softball, Talbot Lacrosse, Talbot Braves football and Shore Hawks football are considered Easton recreational youth organizations that would not be required to pay Field Use Fees. All others would. The Field Use Fee for others would be \$35/field/hour plus an additional \$25/field/hour for light usage. Our recommended fee amounts are in line with typical industry standards.

We do not recommend Pavilion Use Fees for anyone.

In summary, after much discussion, the Park Advisory Board does not recommend assessing a Park Pavilion Use Fee for anyone. We also do not recommend Field Use or Light Use Fees for Easton recreational youth organizations and a fee of \$35/field/hour plus \$25/field/hour light usage for travel organizations and organizations from outside of the area.

If you have questions or concerns, please feel free to contact me.

Regards,

A handwritten signature in black ink, appearing to read 'Michael Weise', is written over a diagonal line that extends from the signature area towards the bottom right of the page.

Mr. Michael Weise, Chairman
Town of Easton Park Advisory Board

David & Sharon M. Perry
7418 Michael Avenue
Easton, Maryland 21601

March 19, 2023

Mr. Lynn Thomas
Town of Easton
14 South Harrison Street
Easton, MD 21601

RE: Proposed Poplar Hill Development

Dear Mr. Thomas:

We are writing to express our opposition to the current proposal for the Poplar Hill development to be located off the Oxford Road. As we understand it, the current proposal would put more than 450 new dwellings, tens of thousands of square feet of new retail, a new sports complex (!) and associated paved roads and parking on 115 acres of the former waterfowl preserve. To add insult to injury, more than half of the development will be on Critical Area land. This kind of high density "suburban sprawl" seems to us to be the exact opposite of the intended environmental protections established by the Critical Area Protection Program.

To encourage his project's approval, the developer has cleverly included "bonus" features of a firehouse substation and multipurpose sports complex at no capital cost to the Town. The sports complex is especially problematic as the current plan places the complex adjacent to Oxford Road (goodbye Scenic Byway) and where the present gently sloping topography drains to the Tred Avon River. The present plan would bulldoze the area to install manicured sports fields and a large parking area. If a new sports complex is truly needed in town, then there are other non-Critical Areas to place it (and still funded by the Poplar Hill developer).

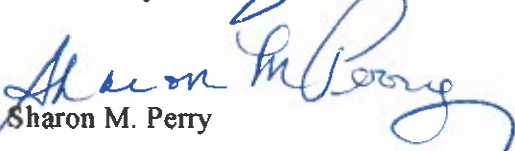
We understand that Easton needs growth and economic development, but we must do so in a thoughtful manner respecting our environment and small-town culture. We do not believe our Town needs to yield to the demands of any property developer, nor should we sacrifice environmental quality for growth. So, we respectfully ask that you stand-up for our community, the environment, and small-town culture to help force the developers to modify the proposed plan.

Thank you.

Sincerely,



David Perry



Sharon M. Perry

RECEIVED
MAR 22 2023
TOWN OF EASTON

The Talbot Spy.

Letter to Editor: Pay Attention to Poplar Hill Land Use

March 27, 2023 by [Letter to Editor 5 Comments](#)

Everything Everywhere All at Once. Not just the 2023 Oscar winner, this apparently is what developers have in mind for Easton. Despite 818 dwellings that have recently been completed or approved in Easton, another 618 are in the approval process. At 5:30 on April 4th at the Avalon Theater, a developer will ask the Easton and Talbot County Planning Commissions to allow development of the former Poplar Hill Waterfowl Sanctuary off Oxford Road, including 456 dwellings, 98,000 square feet of commercial space, and a sports complex, complete with 3 fields, snack bar, 209-car parking lot, stands, restrooms, etc.

Troublingly, the entire sports complex, 62% of the dwellings, and 41% of the commercial space will occupy Maryland Critical Area, designated to protect the Chesapeake. Because Easton exhausted its growth allowance, the developer is asking Talbot County to allow intense development of the 66 acres of Critical Area.

Sacrificing Critical Area for the sports complex is unreasonable. Easton has no park plan showing another complex is needed now. Building the complex requires bulldozing existing trees and contours flat and planting turf, creating an environmental desert. Once built, Easton will assume forever the costs of fertilizing, mowing, etc. Traffic surges will result before and after every event.

If Poplar Hill is developed, a “meadow park” must be substituted for the complex. A meadow park would use tall grasses, low bushes, existing trees and contours to create a peaceful retreat that all the public can enjoy. It would reduce polluted runoff, provide food, cover, and habitat for wildlife, and create a corridor linking Windmill Branch and the new Easton Woodland Park.

Maintenance costs would

be much less. It would produce no traffic surges on Oxford Road. The scenic Oxford Road corridor and Easton’s rural feel would be preserved.

Please let your voices be heard.

Tom Ledvina

President, Papermill Crossing Homeowners Association

28646 Clubhouse Drive
Easton, Maryland 21601
March 27, 2023

RECEIVED MAR 29 2023

Mr. Lynn B. Thomas, Jr.
Town Planner
Town of Easton
14 S. Harrison Street
P.O. Box 520
Easton, Maryland 21601

Mr. Brennan Tarleton
Planning Officer
Talbot County
215 Bay St # 2
Easton, Maryland 21601

RE: Proposed Poplar Hill Farm Development

Gentlemen:

My wife and I reside in Easton Club. We write to express our concerns with the residential Planned Unit Development (PUD) subdivision proposed for Poplar Hill Farm, located due south of Easton Club across Oxford Road. This letter supplements our October 15, 2021, letter, which we have attached.

In addition to reaffirming the comments we made in our 2021 letter, we take this opportunity to comment on the developer's offer to construct and donate to the Town of Easton a sports complex encompassing about 20 acres of designated Critical Area in the northeast corner of the Poplar Hill Farm property along Oxford Road.

The Critical Area Program exists: (1) to minimize the adverse impacts on water quality from stormwater runoff; and (2) to conserve fish, wildlife, and plant habitat. Clearly, the construction of a sports complex on a portion of Poplar Hill Farm currently designated Critical Area is completely at odds with both of these Critical Area Program goals. Putting aside whether the Town of Easton even needs another sports complex or wishes to assume the responsibility for managing and maintaining another one, the creation of a sports complex comprising several multi-purpose playing fields, a 200-car parking lot, and attendant restrooms, bleachers, maintenance sheds, and a concession stand will obviously increase the amount of impervious surface in this location, exacerbating both stormwater runoff velocity and volume. It is also obvious that a sports complex in this location will effectively prevent the use of these 20 acres by the birds, insects, and animals that have coexisted with agricultural use of this area for years.

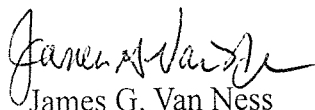
A far better and more appropriate use of this portion of the Poplar Hill Farm property would be to set it aside as a largely undisturbed natural area, such as an emergent meadow. This could provide a tranquil area where visitors and residents of the new development (presuming some development of the property is, sadly, inevitable) could quietly observe and enjoy nature. It could also be managed to provide needed habitat for both neotropical songbirds and insect pollinators, both of which are in steep decline due, in large part, to habitat loss.

Given that the section of Poplar Hill Farm proposed for the sports complex is adjacent to Oxford Road, setting it aside as a natural area would have the advantage of providing a partial buffer between Oxford Road and the proposed residential development. This would at least partially preserve the existing pastoral beginning of the much-loved scenic drive to Oxford. It would also eliminate the increase in noise, litter, inappropriate behavior, and traffic that would be the inevitable by-product of a public sports complex ill-suited for this location.

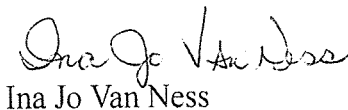
As we said in our October 2021 letter, while we reluctantly accept the fact that the owners of Poplar Hill Farm have a right to develop the property, we urge you to consider the concerns we have expressed and seek to achieve a balance in the design of this subdivision that does not overwhelm this site and diminish the very qualities that make people want to live here in Easton.

Thank you for giving us a chance to express our concerns.

Sincerely yours,



James G. Van Ness



Ina Jo Van Ness

hoodielvr@gmail.com

443-385-0548

28656 Clubhouse Drive
Easton, Maryland 21601
October 15, 2021

Mr. Lynn B. Thomas, Jr.
Town Planner, Town of Easton
14 S. Harrison Street
P.O. Box 520
Easton, Maryland 21601

RE: Proposed Development of Poplar Hill Farm

Dear Mr. Thomas:

My wife and I reside in Easton Club. We write to express our concerns with the residential Planned Unit Development (PUD) subdivision proposed for Poplar Hill Farm, due south of Easton Club across Oxford Road. We oppose the development as described in the application filed with the Easton Planning Commission on September 1, 2021, for the following reasons:

- The size of this proposed subdivision—439 units—is decidedly inappropriate for the site. Poplar Hill Farm sits at the gateway to the Oxford Road scenic byway, a pastoral drive characterized by largely undeveloped farmland, woodlands, and open space. Allowing this property—one of the last remaining open tracts of land within the Town of Easton—to be so densely developed is inconsistent with preserving the natural amenities that make living in and around Easton so desirable. We do not oppose development at a reasonable scale, but this subdivision, as proposed, would, we believe, substitute densely developed urban sprawl for what is now a wonderfully bucolic location enjoyed by Talbot County residents and visitors alike.
- Adding the automobile traffic associated with 439 residential units to busy Oxford Road invites two problems—one a significant inconvenience and the other potentially life-threatening. Oxford Road is already a well-travelled roadway. For those of us who must enter onto Oxford Road from Clubhouse Drive, we currently contend with oftentimes relatively steady traffic from both directions. While this is now only a minor inconvenience, the addition of the traffic from this proposed subdivision will almost certainly mean that we who reside in Easton Club will have a very difficult time exiting our neighborhood during certain high-volume times of the day. Far worse, however, is the very substantially increased risk of tragic accidents as residents, visitors, and service providers attempt to turn left from Clubhouse Drive onto Oxford Road. This is a potential problem that demands a thorough traffic study and the consideration of potential mitigating alternatives before a decision is made concerning this subdivision.
- Poplar Hill Farm lies in the watershed for Papermill Pond, which joins with the North Fork of the Tred Avon River to form the headwaters of the Tred Avon River itself. This area already has the highest amount of impervious surface in the Tred Avon River watershed. The amount of additional impervious surface associated with the construction of the

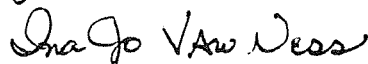
subdivision's high number of proposed housing units and associated roads and parking areas will only add to the existing surface runoff and increase the already high levels of sediment contamination present in this portion of the Tred Avon River. What effects this increased runoff may have on the finfish, shellfish, and other life in the river cannot be predicted with certainty at this time, but surely demands that all reasonable alternatives—a reduced number of housing units, permeable parking areas and driveways, etc.—be thoroughly considered before this subdivision is approved.

- For some time now, Poplar Hill Farm has been managed as a Waterfowl Sanctuary. Each winter, it has played host to large flock of resident and migratory Canada geese. In addition, the property supports and goodly number of deer often seen foraging in the field, as well as wild turkeys and other birds, including bald eagles. While our preference would be to have this special property remain altogether undeveloped, if development must occur it should be done in a way that preserves as much of the property's natural condition as possible. Consideration should be given to decreasing the number of housing units proposed for the development and designing the site plan to leave open space available for the wildlife and preserve migration corridors between the wooded areas along Papermill Pond and the wooded land on the west side of the property. We should never forget that part of what makes the Eastern Shore such a desirable place to visit and live is the opportunity to see and enjoy wildlife in a largely undisturbed setting.

My wife and I recently moved to Easton Club after visiting the Easton area for many years because we grew to love the look and feel of historic, small-town Easton and the surrounding mix of farmland and open space. While we reluctantly accept the fact that the owners of Poplar Hill Farm have a right to develop the property, we urge you to consider the concerns we have expressed and seek to achieve a balance in the design of this subdivision that does not overwhelm this site and diminish the very qualities that make people want to like here.

Thank you for giving us a chance to express our concerns.

Sincerely yours,



James G. & Ina Jo Van Ness

MARCH 22,2023

LYNN THOMAS, JR
TOWN PLANNER
P.O. BOX 520
EASTON, MARYLAND

BRENNAN TARLETON
PLANNING OFFICER
215 BAY ST. # 2
EASTON, MARYLAND

RE: Request for supplemental critical area growth allocation
Meeting April 4, 2023

Dear PLANNERS:

Please do not approve the project known as POPLAR HILL. I think it does not meet the existing regulations and therefore, the request should be denied.

Others, more up-to-date on these regulations and their requirements have made those facts known to you. Please listen to them and deny this project.

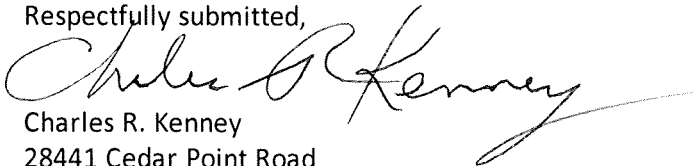
I have been a Talbot County tax-paying property owner since June 1975. We have owned houses in Tunis Mills, Woodland Farms and since 1987, Kings Woods. I retired from my CPA practice in June 2017. During my residence in Talbot County, Nancy and I have raised our children and sent them to Talbot County Public schools. I have participated in several community-oriented and charitable organizations such as Pickering Creek, YMCA, Easton Lions Club and Talbot United Fund.

We have built two custom homes in Talbot County and hope to remain here for our entire life. And, YES we have developed some of the very dear limited areas of Talbot County. Therefore, my current position is SELFISH.

However, this is a question of the current rate of growth. You must help to SLOW-IT-DOWN !

Another point is the proposed athletic fields. They are not needed. As you can see, the North Park (CLARK) fields are generally not in use. Once developed into grass fields they become high maintenance environmentally poor areas. At least in our three acres, two thirds have been left unspoiled old-growth woodland.

Respectfully submitted,



Charles R. Kenney
28441 Cedar Point Road
Easton, MD 21601

Crk@kennevwww.com

28420 Catalpa Point Road
Easton, MD 21601

RECEIVED MAR 29 2023

March 23, 2023

Mr. Brennan Tarleton
Planning Officer
Talbot County
215 Bay Street, #2
Easton, MD 21601

RE: Proposed Poplar Hill
Development

Dear Mr. Tarleton,

I am writing to you regarding the proposed Poplar Hill development on the Oxford Road.

As I understand it, whether this development can go forward hinges first and foremost, on whether Talbot County is willing to give the town of Easton some of its remaining allocations for building in a critical area as Easton has already used all its available allocations.

I would like to voice my concern about the idea of adding over 450 dwelling units to a parcel of land in which over 60% of the units would be built in a critical area. Why would we as a community want this? Areas are designated as critical for a reason. It feels like there is a parallel to carbon credits, with corporations trading credits for some other consideration. Shouldn't it be that when we've used our allocation, we're done? And if someone else hasn't used all of theirs, isn't that a good thing? Development of critical areas should be for emergency use only. With over 800 dwelling units already approved for construction in Easton, I can't see what the emergency is.

If the project does go ahead, something I am obviously not advocating for, I have heard that the developer is offering athletic facilities in the form of three multipurpose fields, bathrooms, a snack bar and parking for 200-plus vehicles which would be located in the area that was previously the

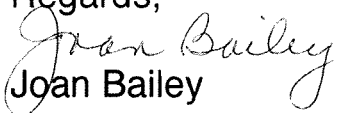
Waterfowl Wildlife Sanctuary adjacent to the Oxford Road. It seems more than a little ironic that the area would go from wildlife sanctuary to wildlife desert.

A number of people who have been following this issue have apparently been recommending that this area be looked at as a potential site for an emergent meadow park. Their arguments are compelling. First, such an endeavor would work to reduce the impact of the overall development on the environment. A meadow would reduce runoff whereas the turf of sports fields would increase it. It would not require the same level of fertilizers and herbicides indicated for a sports field. It would provide a free space where flora and fauna could be observed firsthand by the public. This would certainly be more in keeping with the claim of the Oxford Road to be a Chesapeake Country Scenic Byway. Over time, it would be less expensive to manage.

Already the proposed 450+ dwellings could add over 800 vehicles to the Oxford Road and the Easton Parkway. While the traffic study which was done did not indicate a problem, as someone who lives just off the Oxford Road and travels it almost daily, I am more than a little skeptical. The addition of a sports complex would surely have an additional major impact, particularly on the weekends and after school. Up to 12 teams could be intersecting at the same time, with the usual compliment of parents, siblings and friends. The idea that this particular portion of the Oxford Road could comfortably and safely handle that volume is perplexing.

Overall, having lived here for almost fourteen years, we have always appreciated the rural beauty of this area. The wildlife sanctuary preserved that beauty in a significant way. We often saw geese, deer and foxes in that field.

I'll stop here but appreciate your willingness to listen. I look forward to attending the meeting on April 4th at the Avalon.

Regards,

Joan Bailey

April 2, 2023

To Whom It May Concern:

Me, my husband and our daughter moved to Easton about 1 ½ year ago from Dallas, TX; a big change to say the least. We immediately fell in love with the Eastern shore; more-so the Town of Easton. The move here left behind the big-city feel that comes with an absorbent amount of traffic (and sirens due to constant vehicle accidents) and the countless housing and apartment complexes (current and new construction); not much of scenic beauty unless you like the concrete vibe. Soon after moving to Easton, we heard the land behind us (the Critical Area) was to be developed (more single-family homes/apartments/and a sports complex). My husband and I were immediately shocked and disappointed; as these items being proposed are the exact opposite of what the Town of Easton is, has been and should be.

The Town of Easton is very beautiful; minimal traffic/vehicle accidents and noise (can't tell you how rare and nice it is not to hear sirens every single day). Having said this, if the proposed plan to develop additional single-family homes/apartments/sports complex gets approved, it will take so much of these items away. The proposed dwelling units will bring an absorbent amount of traffic, on an already busy road (Oxford); and will make it extremely difficult for those in the Papermill Crossing and Easton Club to leave the residential streets. The sports complex will also bring additional traffic, noise and lighting (not to mention the trash/litter that typically comes with these locations). Our quiet and natural paradise will become just short of a theme park in our backyards.

In the event multipurpose playing fields are a must, let's at least put them somewhere other than the sensitive Critical Area; there's enough land here to consider a better location, that will not directly and negatively impact the residences and wildlife. Back to the concern about traffic....with these playing fields, will there be parking lots added in, or will the attendants be looking for parking throughout Papermill Crossing and the Easton Club? I see that as a huge concern as well.

The proposed development will also ruin so much of the natural wildlife and habitats; another huge part of Easton that we absolutely fell in love with. Our family enjoys seeing the Canadian geese each year; followed by the countless deer/foxes and even a few wolves we have seen! I was shocked when I walked out our backdoor one afternoon and saw about 7 giant turkeys right in our tree-line! Our daughter also gets a kick out of seeing all these animals; like our own personal zoo in the backyard.

My family and I have not been here long, but long enough to love and value of the Town of Easton, and all that it has to offer. Development of this land into anything other than a natural preserve/passive meadow is one step toward destroying what makes Easton, Easton.

Increased traffic will be a huge hindrance to current residents and make it unsafe for bicyclers and those who are out for a run, or a walk with their family. Just last week there was an unfortunate event of a child being hit off of Idlewild road (accidents can happen anywhere, but the more and more traffic on the road only increases the risk 10-fold). Also, with the increased residency, will there be new schools being developed; and if so, where would those be built? How are those being paid for? There are so many questions to what comes next if the proposed development gets approved; not to mention the cons outweigh the pros, 100%. I am actually curious (in the event this development passes), how many

current Easton residences will start to leave (as I am sure this development would only light a match for more to come).

I know this may not be the most technical of letters, with regard to a matter such as this. However, we hope this letter is read and taken to heart. All of us that call Easton home (citizens and animals alike) ask that our beautiful town not get destroyed. Do not let this plan pass, but to develop the Critical Area into a natural preserve/passive meadow.

We appreciate your time, and truly hope our voices are heard.

Thank you,

The Harris Family

To: Mr, Lynn Thomas
Town of Easton, Planner
14 Harrison St
PO Box 520
Easton MD 21601

Mr. Brennan Tarleton
Planning Office
Talbot County
215 Bay St #2
Easton MD 21601

Dear Sirs:

I'm writing you each at this moment asking you and your organizations to please help us neighbors to mitigate the impact of the proposed massive development impending for Poplar Hill nearby.

My concern, along with the residents of the adjacent Paper Mill Crossing community, is the apparent pending plan to devote a 25 acre parcel just behind our homes to a sports complex. This is one that would involve massive intrusion to the existing natural water-shed; involve leveling a large parking lot plus a playing field and tennis courts... including the accoutrements of restrooms and bleachers etc.

More appropriate would be for the town to devote this natural buffer area to open fields and walking pathways. Easton has more than enough existing non-intrusive athletic fields.

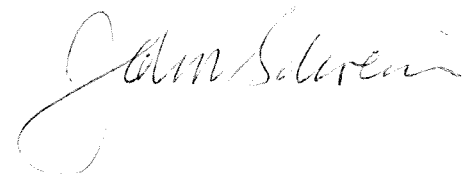
Better to leave this natural parcel for a meadow and preserve its useful drainage and beauty for a pleasant walkway available for all nearby residents.

Please consider this alternative usage for the good of our town.

Sincerely,

John Schreiner
7611 Polly's Hill Lane
Easton MD 21601

Jschreiner7611@gmail.com
410-310-1431



RECEIVED APR 03 2023



April 4, 2023

Talbot County and Town of Easton Planning Commissions, Joint Public Meeting
Re: Supplemental Growth Allocation Request for Poplar Hill
Sent via email to: PublicComment@talbotcountymd.gov

Thank you for the opportunity to provide comments on the proposed growth allocation request to reclassify 65.9 acres of land located in the Critical Area from Resource Conservation Area (RCA) to Intensely Developed Area (IDA), submitted by 5001 SHR, L.C. ShoreRivers is a nonprofit organization headquartered in Easton, MD, with a membership of more than 2,000 people. We are dedicated to the protection and restoration of the waterways of the Eastern Shore through science-based advocacy, education, and restoration. After reviewing the related documents, I'd like to submit the following information for you to consider as you process this request:

1. Water Quality Conditions are Poor in the Upper Tred Avon River

ShoreRivers Water Quality Data on the Upper Tred Avon River: ShoreRivers manages a water quality monitoring program where we collect information on nutrient levels (nitrogen and phosphorus), chlorophyll a levels, dissolved oxygen conditions, water clarity, and more, as a means of understanding baseline water quality conditions and where areas of poor water quality exists. ShoreRivers has been collecting this data on the Tred Avon River (TA) for more than 10 years, and what we've learned is that **the upper portion of this river (TA01) has some of the poorest water quality conditions of all the stations that we monitor.** This is primarily due to persistently high levels of phosphorus, nitrogen, and chlorophyll a (algae), and low dissolved oxygen levels, as indicated in Table 1 and Figure 1, which shows the 2022 water quality scores per sampling station per sampling parameter.

NOAA Water Quality Assessment of the Tred Avon River: In 2018, researchers from National Oceanic Atmospheric Administration (NOAA) commissioned a [Coastal Ecological Assessment of the Tred Avon River](#)¹ in support of the designation of the Choptank River Complex (including the Tred Avon River) as a Habitat Focus Area. The assessment concluded that, while the Tred Avon River ecosystem as whole is in good condition relative to the larger Choptank River, **clear signs of ecosystem degradation exist, "especially in areas affected by rapid growth and development."** The report goes on to further explain that **"signs of degradation were particularly evident in the sub-watershed nearest Easton (TA1), the most highly developed location...which was impacted by multiple stressors – low dissolved oxygen in bottom waters, the presence of chemical contaminants..., high levels of nutrients, high chlorophyll a concentration, high fecal bacteria counts, and poor water clarity."**

¹ Coastal Ecological Assessment to Support NOAA's Choptank River Complex Habitat Focus Area: Tred Avon River, McLaughlin, Shawn M.; Leight, A. (Andrew); Bricker, Suzanne B. (Suzanne Boyd); Jacobs, John M., 1970-; Messick, Gretchen A.; Skelley, Suzanne; Spires, Jason E.; Corporate Authors(s): National Centers for Coastal Ocean Science (U.S.), Published Date: 2018, Series: NOAA Technical Memorandum NOS NCCOS; 251, DOI: <https://doi.org/10.25923/k2xr-5n27>

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According to a study by the Department of Natural Resources (Uphoff et al. 2011)², watersheds having 10% of impervious surface or more are three times more likely to create hypoxic (low oxygen) conditions at the bottom of the river, which can have an impact on fish habitat that is not reversible using conventional restoration methods. **The NOAA study went on to hypothesize that “the absence of fish during frequent low dissolved oxygen events at Easton Point (TA1) may be related to the relatively high proportions of impervious surface (22%) in the urban sub-watershed” where Easton is located.**

The Critical Area protects against the impacts of development in an effort to protect water quality, therefore, **we can expect that if this growth allocation request is granted, water quality in the upper Tred Avon River will continue to degrade. This is inconsistent with the goals of Talbot County’s Comprehensive Plan, which explicitly states the need to (1) “conserve and protect Talbot County’s most valuable and attractive assets, its natural resources,” and (2) “take steps to protect and restore water quality, and to meet water quality requirements in rivers and streams”** (Goals statement, Chapter 6, Natural Resource Conservation).

Samplnig Station	Dissolved Oxygen Score	Nitrogen Score	Phosphorus Score	Secchi Depth Score	Chlorophyll a Score	Water Quality Index	2022 Grade
BBC01	92%	64%	48%	24%	40%	54%	C
BC02	92%	80%	80%	44%	73%	74%	B
BC05	92%	82%	76%	44%	83%	75%	B+
CR01	75%	94%	80%	51%	70%	74%	B
CR04	90%	80%	80%	51%	50%	70%	B
CR07	75%	80%	74%	49%	70%	70%	B
CR09	58%	64%	48%	38%	47%	51%	C
CR11	83%	55%	38%	20%	45%	48%	C
CR14	100%	80%	40%	40%	40%	60%	B-
CR15	83%	62%	58%	33%	48%	57%	C+
CR17	86%	58%	62%	40%	53%	60%	C+
CR19	86%	49%	62%	40%	46%	56%	C+
CR20	86%	36%	67%	40%	43%	54%	C
HC04	100%	91%	74%	40%	70%	75%	B+
IC01	100%	83%	73%	38%	60%	71%	B
LI01	92%	66%	50%	31%	43%	56%	C+
LI05	50%	60%	42%	29%	27%	42%	C-
TA01	43%	51%	20%	24%	37%	35%	D+
TA04	79%	78%	69%	38%	68%	66%	B
TA06	100%	80%	69%	47%	57%	70%	B
TR01	100%	40%	60%	36%	34%	54%	C
TR03	100%	8%	38%	68%	77%	58%	C+
TOTAL	85%	66%	59%	39%	54%	61%	B-

Table 1: 2022 Water Quality Index Score for ShoreRivers sampling stations. TA01 represents the sampling station located at Easton Point on the upper Tred Avon River.

2. Proposed Landuse in the Critical Area Will Have Negative Water Quality Impacts

The applicant is requesting growth allocation to convert nearly 66 acres of Critical Area currently designated as RCA to IDA for the purpose of building grass sports fields, stormwater management features, and a walking path. None of these landuses contributes to the protection of water quality, with the potential exception of the stormwater management features.

Grass Sports Fields: While slightly better than impervious surfaces, grass fields are not a sufficient substitute to filter pollutants in the absence of a well-vegetated, 1,000’ Critical Area zone filled with native plant species. The persistent mowing of grass sports fields lessens the water quality

² Uphoff, J.H., M. McGinty, R. Lukacovic, J. Mowrer and B. Pyle. Impervious surface, summer dissolved oxygen, and fish distribution in Chesapeake Bay subestuaries: Linking watershed development, habitat conditions, and fisheries management. North American Journal of Fisheries Management 31(3):554-566.



advantages associated with vegetation growing in the Critical Area. Grass sports fields will likely be fertilized with nutrients that are harmful to local waterways and already impairing in the Upper Tred Avon River. In fact, as illustrated in Figure 1, turf grass cover is the least beneficial type of vegetation when considering opportunities to capture and filter polluted runoff, prevent soil erosion, and provide wildlife habitat.

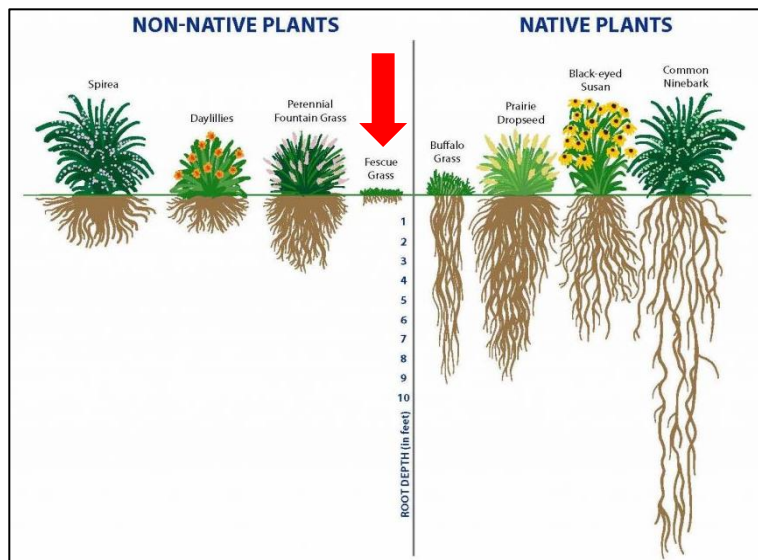


Figure 1: Image of root zones for non-native plants compared to native plants. Deeper roots provide benefits by protecting against polluted runoff and erosion.

Stormwater Management: Polluted stormwater runoff is a focus point in the State of Maryland's efforts to meet pollution reduction goals under the Chesapeake Bay Watershed Implementation Plan. Related, stormwater pollution is one of the sectors that needs the biggest investment and advancements in water quality protections in order to meet said goals. Currently, the Maryland Stormwater Manual used to determine the design standards for stormwater management in the Critical Area of this development are based on standards established in the year 2000. These standards do not include predictions for increased intensity and volume of stormwater as expected impacts from climate change. Even more concerning is that the 2000 Maryland Stormwater Manual carves out an exemption for the Eastern Shore to not have to consider storage volume criteria for the protection of stream channels. (Chapter 2, Unified Stormwater Sizing Criteria).³ **If the growth allocation request is granted, we suggest that the Commission require a special condition that stormwater design criteria include channel protection storage volume.**

The Commission should be aware that Maryland Department of Environment (MDE) has nearly finished a comprehensive review and update of the Maryland Stormwater Design Manual pursuant to [Senate Bill 227](https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/www.mde.state.md.us/asset/s/document/chapter2.pdf) (2021), which tasks MDE with developing plans to evaluate current flooding risks and update regulations to improve urban stormwater flood manual.⁴ MDE is expected to release new regulations in 2023 that reflect the results of this review. Approving the request for this growth allocation before the new regulations are due out later this year means that the proposed, outdated stormwater management facilities would be grandfathered in and not consistent with the more protective measures included with the update. **ShoreRivers suggests that the Commission**

³ Maryland Stormwater Design Manual, Chapter 2, Unified Stormwater Sizing Criteria <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/www.mde.state.md.us/asset/s/document/chapter2.pdf>

⁴ MDE: Advancing Stormwater Resiliency in Maryland: <https://sb-227-maryland.hub.arcgis.com/>



wait to make a final determination on the growth allocation request until the new design standards are established and reflected in the applicant's design plans.

Post-Development Flooding Impacts: It's our understanding that when reviewing application materials, the applicant did not submit results showing how they modeled the post-development flooding impacts to downstream properties, wetlands, and waterways, or how they plan to address those impacts. We're learning that because of inadequacies of the current MDE Stormwater Design Manual, flooding is occurring more often, even in areas where stormwater facilities are utilized—particularly downstream from those developments. In order to prevent flooding and damage to downstream properties and environments, developers should prove during the permit application phase that the proposed projects won't have downstream impacts. This is modeling that's readily available and well known by engineering consultants, and can be an important tool for ensuring that unintended consequences are avoided. Given that this request for growth allocation includes placing a stormwater management facility in the Critical Area, **ShoreRivers suggests that the Commission require the applicant to show post-development downstream flooding models before approving the use of any growth allocation.**

We feel it's important that the Commission consider the existing poor water quality conditions in the upper Tred Avon River and how the use of 66 acres of growth allocation will further contribute to its degradation and that of our local natural resources. We also want to emphasize that, given that the Town of Easton is out of their originally allotted growth allocations, how this proposal is handled sets a precedent for similar future proposals. There's no question that the Town of Easton, Talbot County, and much of the Eastern Shore is under immense development pressure. And as this proposal can be seen as the tip of the iceberg, it's important that the Commission establish a robust and highly-protective set of criteria for handling future requests of a similar nature.

Sincerely,



Matt Pluta
Director of Riverkeeper Programs
Choptank Riverkeeper
ShoreRivers Inc.



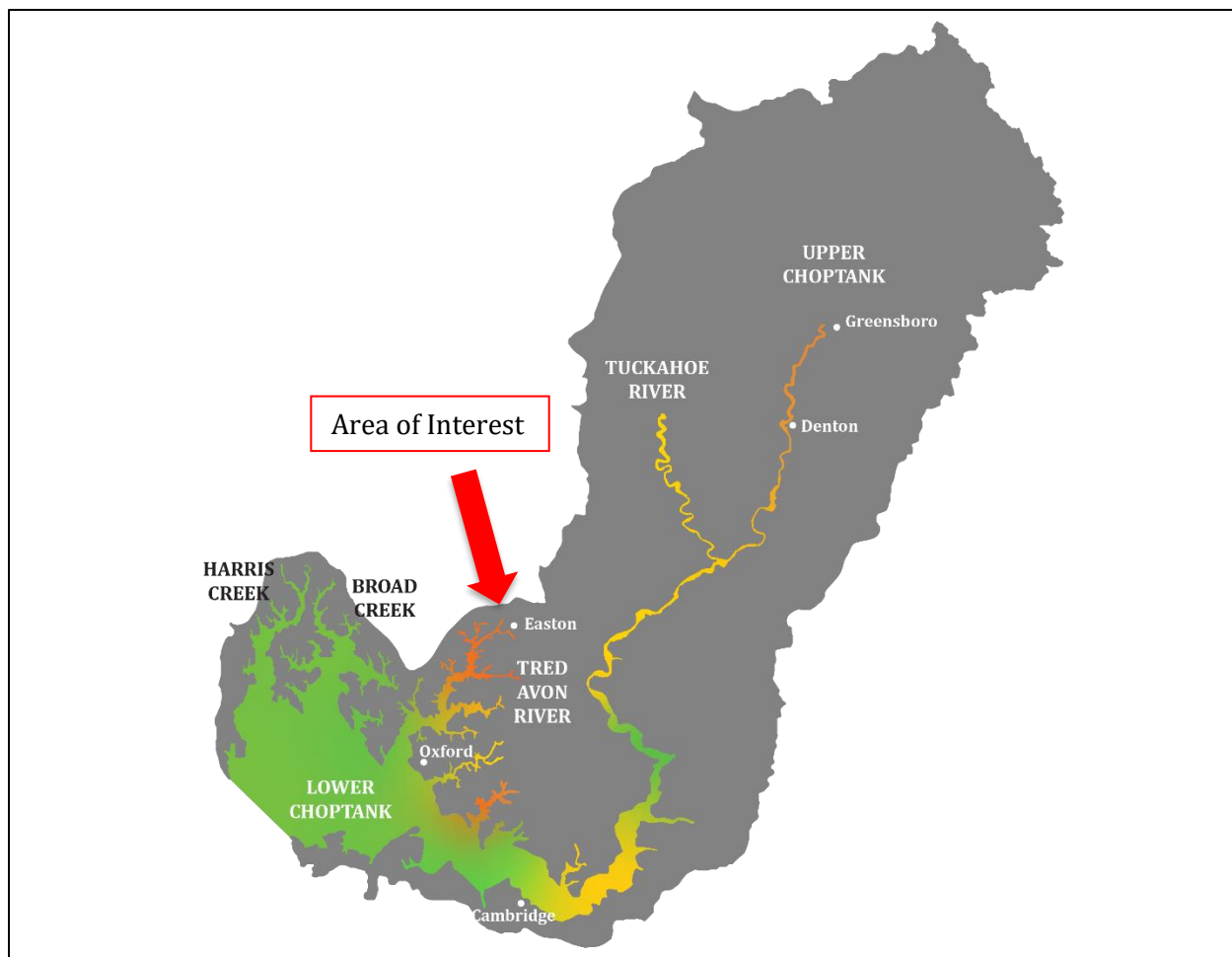


Figure 2: Map of the Choptank River Water Quality Index Scores for the 2022 ShoreRivers' sampling season. Areas in green show good water quality and areas in red show poor water quality.