STORMWATER MANAGEMENT & ENGINEERING DESIGN REPORT

For:

PROPOSED
RACHEL'S MEDITERRANEAN GRILL

310 Orchard Park Road
Town of West Seneca, NY

LMA Project #21034

November 18, 2022

Prepared for:

Rachel's Grill
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Project Description and Background:

The proposed project is the redevelopment of the existing commercial parcel at 310 Orchard Park Road (aka NYS Route 240) in the Town of West Seneca, NY. The former insurance agency building located on this site has been demolished. In its place, a new Rachel's Mediterranean Grill is proposed to be constructed in a slightly different location on the site. The proposed one-story restaurant building has a footprint area of approximately 1,749 square feet, has a 37 seat capacity, and includes vertical elements on the exterior façade that reach a maximum height of 25 feet.

A new accessory trash enclosure will be located behind the restaurant building, adjacent to the northern property line.

The project site is a 0.35 acre +/- parcel that is located on the north side of Orchard Park Road east of the intersection with Slade Avenue. **The proposed redevelopment area of disturbance is 0.47 acres +/-.** This area includes the entire project parcel plus additional off-site disturbance areas within the state right-of-way and for the provision of an emergency access connection to the adjacent KeyBank parking area. The project parcel is currently zoned "C-2(S)", a Commercial District which allows the proposed use. The applicant, Rachel's Grill, is requesting Site Plan approval from the Town of West Seneca.

The existing site has one vehicular access point which is an undefined curb cut onto Orchard Park Road (NYS Rt. 240). The proposed site layout will preserve this connection with a modified curb cut alignment designed to NYSDOT specifications for a commercial driveway. Access for emergency vehicles only will be provided by a segment of turf pavers that connects the project site with the adjacent bank parking area. Access will be restricted to prevent public use through the use of collapsible bollards.

The existing project parcel contains approximately 7,407 square feet of permeable landscape area, or about 49% of the property. The proposed development will decrease the amount of permeable landscape area (3,070 sf.; 20% of the site). The required stormwater management practices necessary to control the site run-off volume and discharge rate, along with water quality provisions, will be provided.

Site development work associated with the proposed restaurant construction will include both temporary and permanent erosion control and stabilization measures, new vehicular and pedestrian pavements, new site lighting, new landscaping and new signage. The proposed project signage will include new building mounted business identification elements and a pole sign proposed along the Orchard Park Road (NYS Rt. 240) frontage.

As noted above, the former building located on the project parcel has already undergone a complete structural demolition along with the disconnection of utility services. A detailed description of how this project plans to address the proposed connections to an existing private storm sewer network and private sanitary sewer system, new public water supply and natural gas services along with underground electrical and cable routing are the basis of the Engineering Design Report that follows.

This design report is intended to be a supplement to the Site Development drawing package entitled "Rachel's Grill" as prepared by Lauer-Manguso & Associates Architects.

Stormwater Management Summary:

The proposed development includes a new one-story (±1,749 square-foot) Rachel's Mediterranean Grill restaurant building with associated pavements for vehicular site circulation, parking and pedestrian access. For the purposes of this design report, existing conditions will be assumed to be the conditions as shown on the Boundary and Topographic Survey prepared by Millard, MacKay & Delles Land Surveyors, LLP on October 8, 2021.

The 0.35 acre +/- project parcel is bounded by Orchard Park Road to the west, a Goodyear auto service facility to the north, a small area of vacant undeveloped land to the east and a Wegmans supermarket plaza to the south (which includes KeyBank as an outparcel tenant).

This design report will include the necessary stormwater management design calculations to demonstrate that the existing private storm sewer system located in the adjacent Wegmans plaza has the capacity to accept the stormwater discharge from the proposed redevelopment project. In particular, the capacity of an existing 15" storm sewer pipe that currently discharges flows from the eastern corner of the project site into the Wegmans storm sewer system will be analyzed for acceptance of the proposed discharge.

The proposed site drainage plan includes the provision of a new detention basin with a 6" outlet pipe connected to the existing drain structure that collects surface run-off into the 15" storm pipe referenced above. Two new storm drain inlets within the proposed paved area of the site discharge into the proposed detention basin via a 12" pipe. One yard drain has also been proposed to drain a low area adjacent to the detention basin. The roof drain leader from the new building discharges into a proposed rain garden before exiting the site through the detention basin outlet structure.

The proposed storm drain system has been designed in order to:

- Efficiently collect runoff from impervious areas and discharge it quickly to alleviate the threat of flooding and nuisance insects;
- Minimize erosion and sedimentation on the proposed site to prevent degradation of water quality in downstream waters receiving discharged runoff;
- Reduce the rate of runoff and the volume of stormwater discharging from the proposed site so that it is less than or equal to the rate and volume of runoff discharging from the existing site;
- Detain the difference between the 10-yr pre-developed storm and the 25-yr post-developed storm.

Our review of the Soil Survey (USDA – Erie County, NY) reveals that the site soils are mapped as Hamlin silt loam (Hm). This soil is non-hydric and classified as HSG Group B (well drained, moderate permeability). The seasonal water table depth is greater than 40". The typical depth to bedrock is greater than 60".

Existing Drainage Conditions

The existing project area is composed of two sub-watersheds that discharge flows off-site. The largest of the two watersheds includes the former building and drains to the existing catch basin located in the eastern corner of the site (see Design Point No. 1 on the Pre-Development Watershed Map that follows). This drain structure was reputedly placed in this location as part of the Wegmans plaza development in order to provide an outlet for a low area created on the current project site. The existing project area also includes a smaller sub-watershed that surface drains to the western corner of the site and the Orchard Park Road right-of-way (see Design Point No. 2 on the Pre-Development Watershed Map that follows). The southern corner of the site represents the high point of the project use area (approx. elevation 616) with the existing site dropping down to an approximate low point elevation of 610 at the eastern end of the property.

A description of the existing discharge points for the sub-watershed groupings, including peak runoff rates, is summarized below:

Tributary Area – Design Point No. 1
The entire existing drainage area (0.404 acres) discharges stormwater runoff to an existing catch basin adjacent to the eastern property line. This catch basin contains a segment of 15" pipe that acts as a connection point for the project to an existing private storm water system owned and maintained by Wegmans.

Other than the former building, the total tributary area consists primarily of lawn and vegetated meadow. Approximately 34% of the drainage area consists of impervious surfaces. Slopes range from 1% around the former building location to approximately 15% at the eastern end of the site.

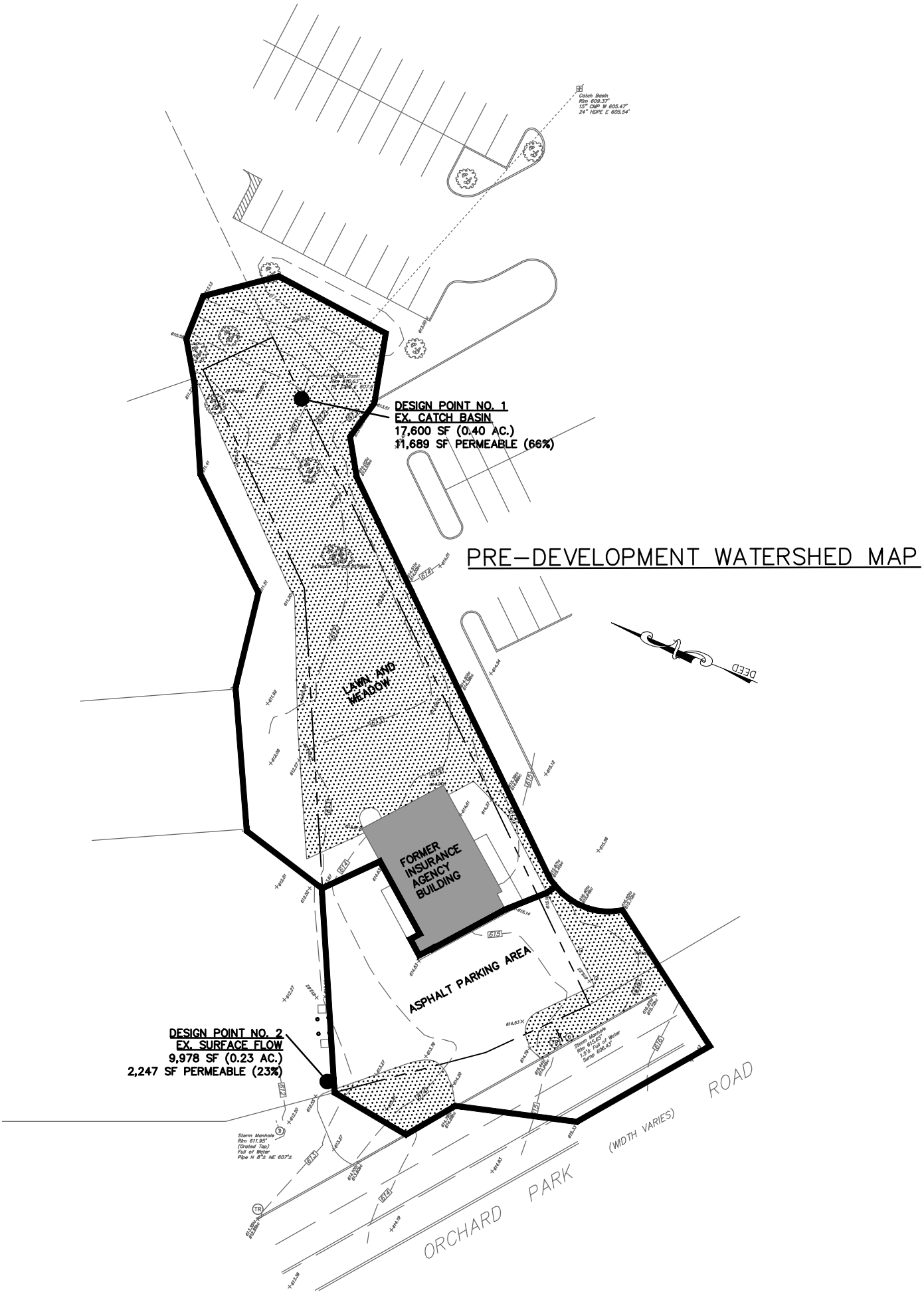
The maximum runoff potential from this project drainage area is approximately 0.136 acre-feet at 2.10 cfs using 2020 HydroCAD Software Solutions LLC program (assuming a 100-year design storm which discharges 5.23 inches of rainfall in 24 hours).

Tributary Area – Design Point No. 2
The entire existing drainage area (0.229 acres) discharges stormwater runoff via surface flow towards the Orchard Park Road right-of-way and the adjacent Goodyear automotive facility. Stormwater continues to flow to the north.

The total tributary area is developed and consists of both vehicular pavement and lawn/landscape areas. Approximately 78% of the drainage area consists of impervious pavements. Slopes range from 1% to 6%.

The maximum runoff potential from the project drainage area is approximately 0.085 acre-feet at 1.41 cfs using 2020 HydroCAD Software Solutions LLC program (assuming a 100-year design storm which discharges 5.23 inches of rainfall in 24 hours).

The Pre-Development drainage calculations and hydrographs are provided in Appendix A of this report.



PRE-DEVELOPMENT WATERSHED MAP

Proposed Drainage Conditions

The proposed project area is composed of four sub-watersheds, two of which discharge flows off-site. The largest of the two watershed groupings includes the proposed building and drains the vast majority of the site to the existing catch basin located in the eastern corner of the property (see Design Point No. 1 on the Post-Development Watershed Map that follows). This watershed grouping also includes a proposed detention basin for stormwater quantity control and a proposed rain garden for stormwater quality control. The proposed project area also includes a smaller sub-watershed that surface drains to the western corner of the site and the Orchard Park Road right-of-way (see Design Point No. 2 on the Post-Development Watershed Map that follows). The southern corner of the site represents the high point of the project use area (approx. elevation 616) with the existing site dropping down to a proposed low point elevation of 609.5 near the eastern end of the property. A description of the proposed discharge points for the sub-watershed groupings, including peak runoff rates, is summarized below:

Tributary Area – Design Point No. 1
The entire proposed drainage area (0.593 acres) discharges stormwater runoff to an existing catch basin adjacent to the eastern property line. This catch basin contains a segment of 15" pipe that acts as a connection point for the project to an existing private storm water system owned and maintained by Wegmans.

The total tributary area contains most of the proposed development area. Approximately 59% of the drainage area consists of impervious surfaces. Slopes range from approximately 1% around the proposed building location to approximately 33% at the proposed detention basin.

The maximum runoff potential from this project drainage area is approximately 0.185 acre-feet at 2.07 cfs using 2020 HydroCAD Software Solutions LLC program (assuming a 100-year design storm which discharges 5.23 inches of rainfall in 24 hours).

Tributary Area – Design Point No. 2
The entire proposed drainage area (0.038 acres) discharges stormwater runoff via surface flow towards the Orchard Park Road right-of-way and the adjacent Goodyear automotive facility. Stormwater continues to flow to the north.

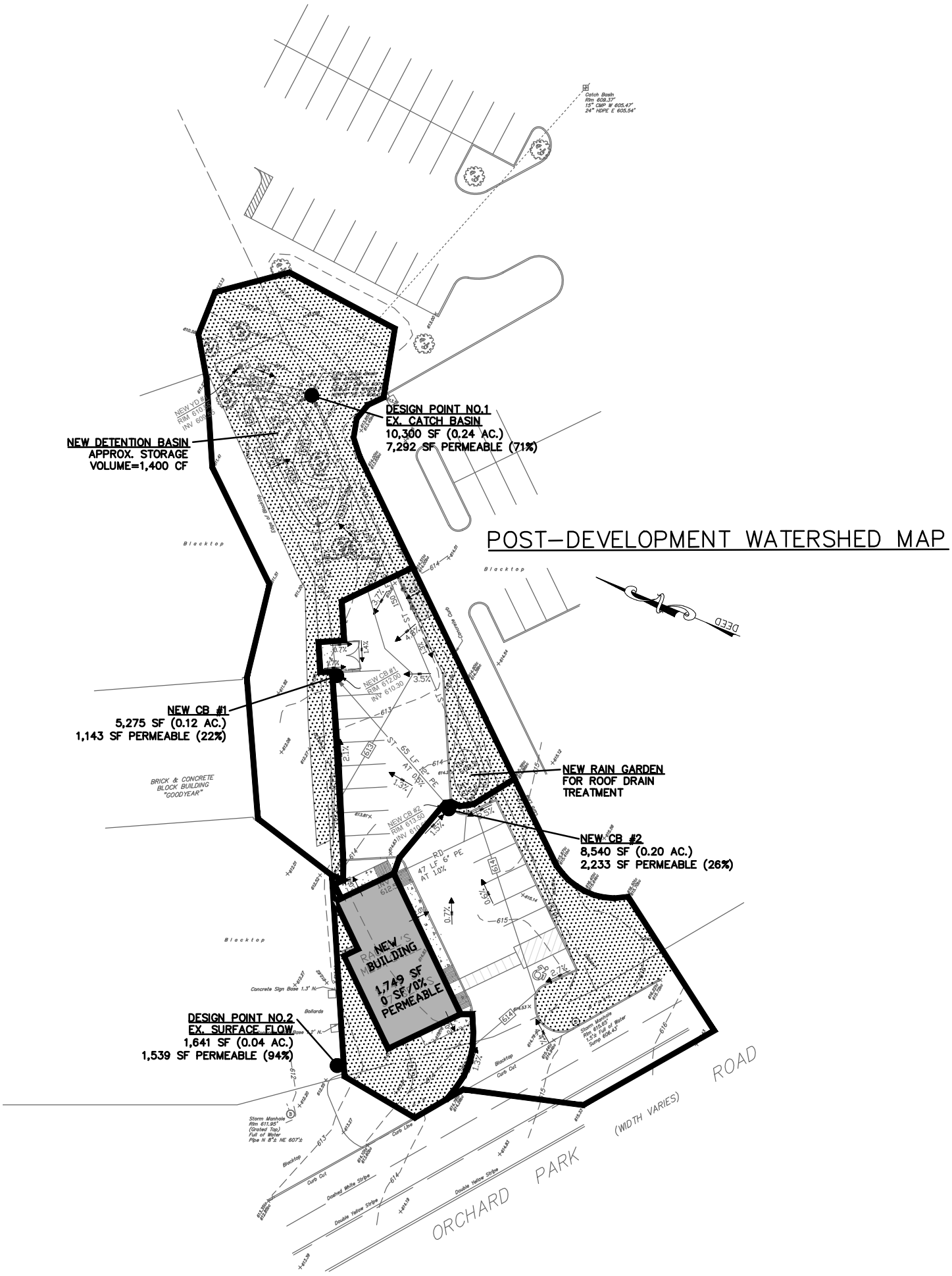
The total tributary area is developed and consists primarily of lawn/landscape areas. Approximately 6% of the drainage area consists of impervious pavements. Slopes range from 1% to 6%.

The maximum runoff potential from the project drainage area is approximately 0.012 acre-feet at 0.22 cfs using 2020 HydroCAD Software Solutions LLC program (assuming a 100-year design storm which discharges 5.23 inches of rainfall in 24 hours).

As shown on the Stormwater Management Summary sheet that follows, the cumulative Post-Development flow rates are less than or equal to the Pre-Development flow rates. This summary also indicates compliance with the Town's detention requirements for projects with less than one acre of disturbance. Therefore, the proposed development shall have a negligible effect on the current storm hydraulics within both the Wegmans storm sewer system and the Orchard Park Road right-of-way.

The Post-Development drainage calculations and hydrographs are provided in Appendix B.

POST-DEVELOPMENT WATERSHED MAP



PROPOSED RACHEL'S GRILL RESTAURANT DEVELOPMENT -310 ORCHARD PARK ROAD, TOWN OF WEST SENECA, NY

STORMWATER MANAGEMENT SUMMARY

DESIGN POINT	DESIGN STORM							
	2-YEAR		10-YEAR		25-YEAR		100-YEAR	
	EXISTING RUNOFF	PROPOSED RUNOFF	EXISTING RUNOFF	PROPOSED RUNOFF	EXISTING RUNOFF	PROPOSED RUNOFF	EXISTING RUNOFF	PROPOSED RUNOFF
DESIGN POINT NO. 1 - EXISTING CATCH BASIN	0.73 CFS	0.82 CFS	1.16 CFS	1.23 CFS	1.47 CFS	1.52 CFS	2.1 CFS	2.07 CFS
DESIGN POINT NO. 2 - SURFACE FLOW IN SW CNR	0.56 CFS	0.07 CFS	0.83 CFS	0.12 CFS	1.02 CFS	0.15 CFS	1.41 CFS	0.22 CFS
TOTAL SITE RUNOFF (CFS) =	1.29	0.89	1.99	1.35	2.49	1.67	3.51	2.29

DETENTION SUMMARY

Project Site Disturbance Area = 0.47 acres +/- (20,370 sf)

* Detention required = Difference between the 10-yr Pre-Developed Storm (1.16 cfs) and the 25-yr Post-Developed Storm (1.52 cfs)
= 0.36 cfs

* Detention provided = 0.72 cfs

Detention Basin Inflow (25-yr Post-Developed Storm) = 1.40 cfs
Detention Basin Outflow (25-yr Post-Developed Strom) = 0.68 cfs
0.72 cfs detained

Storage volume required = 605 cf; Storage volume provided = 1,368 cf

Water Supply

The project site is located within the jurisdiction of the Erie County Water District.

A 24" water main is located on the opposite side of the road from the project parcel within the Orchard Park Road (NYS Rt. 240) right-of-way. The former insurance agency building was supplied by a 3/4" tap on the main for domestic water supply service.

This project proposes to abandon the existing 3/4" service tap, along with the existing curb stop valve. A new 1.5" domestic service tap, curb stop valve and lateral (approx. 107 LF of Type K Copper pipe) will be required to reach the water supply connection location in the northern corner of the new Rachel's building.

Fire protection for the project parcel is currently, and will continue to be, provided by an existing hydrant located on the opposite side of the road from the adjacent Goodyear curb cut. The proposed occupant load for the new restaurant (46 total; 40 customers, 6 employees) does not require an internal fire protection system, however a smoke detection system will be provided.

As shown on the Site Utility Plan, the new 1.5" domestic waterline enters the proposed restaurant in the northern corner of the building where a new 1.5" meter and RPZ backflow prevention device will be located prior to connection with the interior plumbing system. This water supply network has been designed in order to:

- Safely supply and meter water service to the new building
- Ensure that adequate water pressure and required flow demands are satisfied
- Eliminate the potential of contamination of the public water supply system in the event of backflow pressure within the new waterlines

The new waterlines, meter and backflow prevention devices have been designed, and shall be installed, in conformance with:

- Ten-State and A.W.W.A. Standards
- Erie County Water District design requirements
- State of New York Plumbing Codes
- Erie County Department of Health design standards

The Erie County Water District and Town of West Seneca shall inspect all waterline and interior plumbing work. The contractor shall contact these agencies to set up an inspection and testing schedule, and to set up and coordinate inspection appointments.

Domestic Service Calculations

For the purposes of the design calculations that follow, the estimated maximum domestic water demand for a food service facility of this type has been determined to be 25 GPM. The flow data used was obtained from an Erie County Water Authority Hydrant Flow Test conducted on the 24" water main near the project site (115 Slade Avenue) on July 25, 2019.

The Domestic water line design calculations are as follows:

- Residual pressure in existing 24" water main = 84 PSI
- Static pressure in existing 24" water main = 90 PSI
- Estimated maximum domestic demand = 25 GPM
- Friction head loss @ 25 GPM demand for new domestic segment = 3.0 PSI (Hazen-Williams Eq.; C = 135, 107 feet equivalent pipe length with bends and minor losses, assumed Type K Copper pipe, diameter = 1.5")
- Existing ground elevation at tap in point = 615 (approximately)
- Highest proposed water line elevation at farthest point = 629 (approximately)
- Total feet of elevation loss = 629 – 615 = 14.0 ft.
- Elevation head loss = (14.0 ft.) x (0.434 PSI/ft.) = 6.1 PSI
- Head loss through 1.5" Watts 009M2QT-S backflow prevention device = 13.5 PSI
- Head loss through 1.5" water meter = 1.3 PSI
- Total head loss = 3.0 PSI + 6.1 PSI + 13.5 PSI + 1.3 PSI = 23.9 PSI
- Water pressure at highest elevation in new building = existing static pressure at main – total head loss = 90.0 PSI – 23.9 PSI **= 66.1 PSI**

Backflow Prevention

The new 1.5" water meter shall be supplied, owned, and maintained by the Erie County Water District and installed by the contractor. The new domestic water service lateral and the new RPZ backflow prevention device shall be privately owned and maintained by the operator of the restaurant. The backflow prevention device shall be installed along the exterior wall in the northern corner of the new building. This location is approximately 66' from the Orchard Park Road right-of-way. This area of the restaurant shall be heated and insulated to prevent the RPZ device from freezing. The necessary lighting and floor drains for testing and maintenance of the RPZ device shall also be provided.

Within 45 days of the backflow prevention device installation, the approved devices shall be tested by a New York State certified backflow prevention device tester, and the completed installation shall be certified by the water supplier.

Sanitary Sewer

The new restaurant building shall be serviced by a new 4" diameter PVC (SDR-26) sanitary sewer lateral, which shall discharge via gravity to an existing 8" private sanitary sewer main owned by Wegmans. From this point, the sanitary discharge shall continue to flow via gravity though the 8" main and a series of manholes into an existing 36" public sanitary sewer main located adjacent to Cazenovia Creek.

The new restaurant building shall also be serviced by a new 4" diameter PVC (SDR=36) greasy waste lateral which shall discharge into a precast concrete grease trap prior to a proposed wye connection with the 4" sanitary sewer lateral described above. The grease trap shall be installed outside the building, below grade and accessible for pumping equipment.

The proposed sanitary and greasy waste sewer laterals were designed, and shall be installed, in conformance with:

- Ten-State design standards
- Town of West Seneca construction specifications
- Erie County Health Department

Sanitary lateral design calculations are as follows:

- Average sewer load for restaurant = 35 GPD/seat x 37 seats = **1,295 GPD = 0.9 GPM**
- Peaking Factor (based on 10-State Standards) = 4.08
- Peak sewer load = 1,295 GPD x 4.08 = **5,284 GPD = 3.7 GPM**

Grease trap design calculations are as follows:
Based on the formula for grease trap sizing where –

- D = the number of seats in dining area
- GL = gallons of wastewater per meal
- ST = storage capacity factor (offsite disposal = 1.7; onsite disposal = 2.5)
- HR = number of hours facility is open per day
- LF = loading factor for restaurants
- Therefore, grease interceptor size = D x GL x ST x (HR/2) x LF
  = 37 x 1 x 1.7 x 10/2 x 0.5 = 157.3
  = 350 gallon minimum capacity required

- **Use one (1) 1,000-Gallon traffic-rated grease trap**

The new sanitary sewer, greasy waste laterals, and grease interceptor shall be privately owned and maintained.

The Town of West Seneca shall review and approve all plans and the above calculations for permit. The contractor/plumber shall obtain all necessary permits prior to the construction of the proposed sanitary sewer system.

Service Utilities

Natural Gas

A 4” plastic natural gas main runs through the southern end of the project parcel adjacent to the Orchard Park Road right-of-way. The former insurance agency was serviced by a supply line that runs from the main to the former meter location on the south side of the building. This building has been demolished and the gas line terminated and abandoned in place.

This project proposes a new tap on the main, curb stop, and natural gas service line for the proposed restaurant building. This will be done in conjunction with National Grid, who will provide any services they are required to perform during the proposed natural gas system shut-down and re-connection. National Grid will also review the current and anticipated gas loads and provide an adequately sized meter in response. The new gas meter is proposed to be located on the north wall of the new Rachel’s restaurant.

Electricity

Existing overhead electrical lines are located along the northern edge of the Orchard Park Road right-of-way. The former insurance agency was serviced by overhead power lines which connected to the western (front) side of the building.

This project proposes to eliminate the existing overhead electrical service in lieu of a new underground service originating from the same utility pole that was formerly the power source for the site. The new underground service line will connect to the proposed meter location on the north wall of the new Rachel’s restaurant. This work would be done in conjunction with NYSEG who will provide any services they are required to perform during the proposed electrical system shut-down, re-alignment and re-connection.

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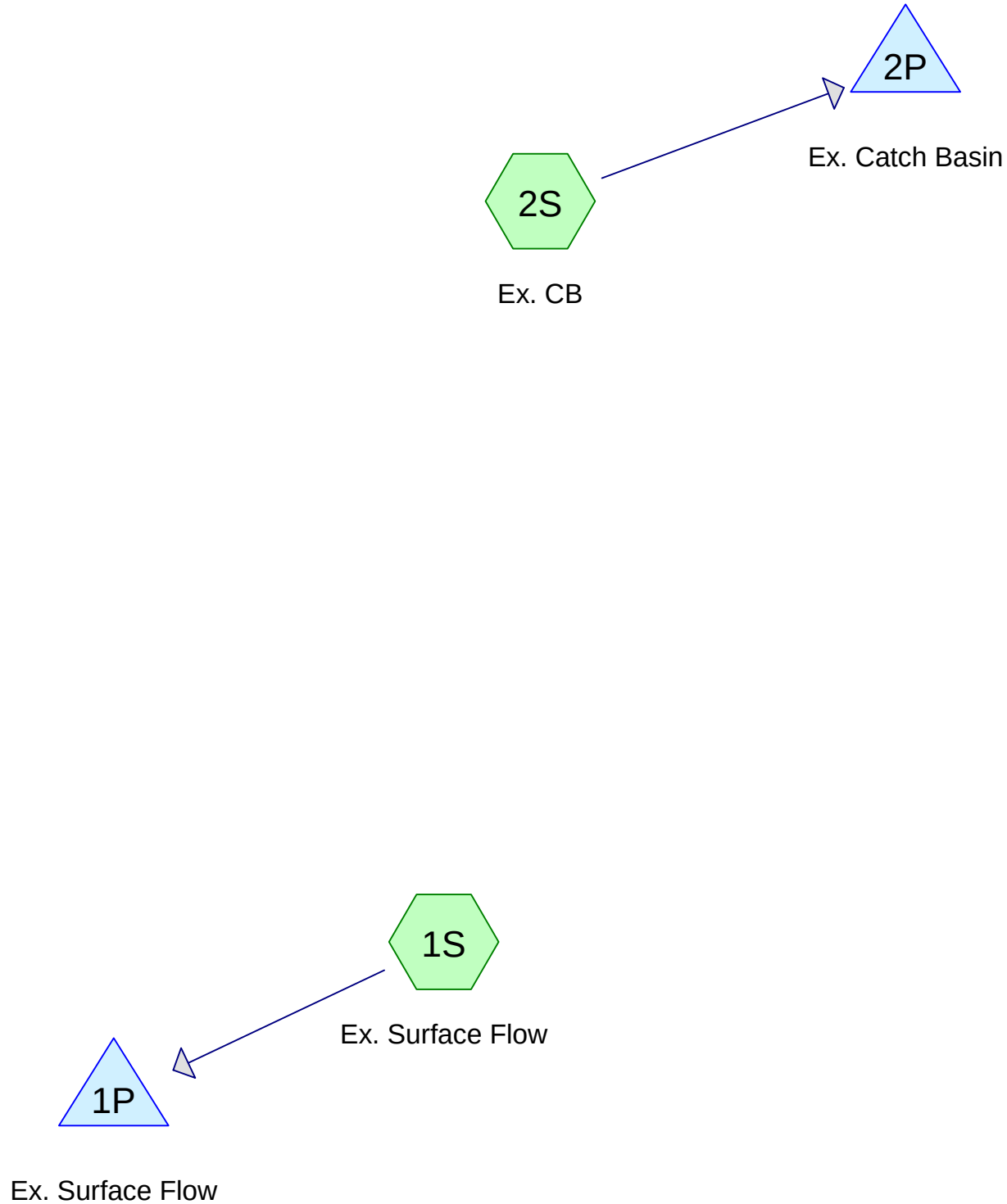
APPENDIX ‘A’



Subcat Reach Pond Link

Routing Diagram for 21034C Pre-Development

Prepared by HydroCAD www.hydrocad.net, Printed 1/25/2022

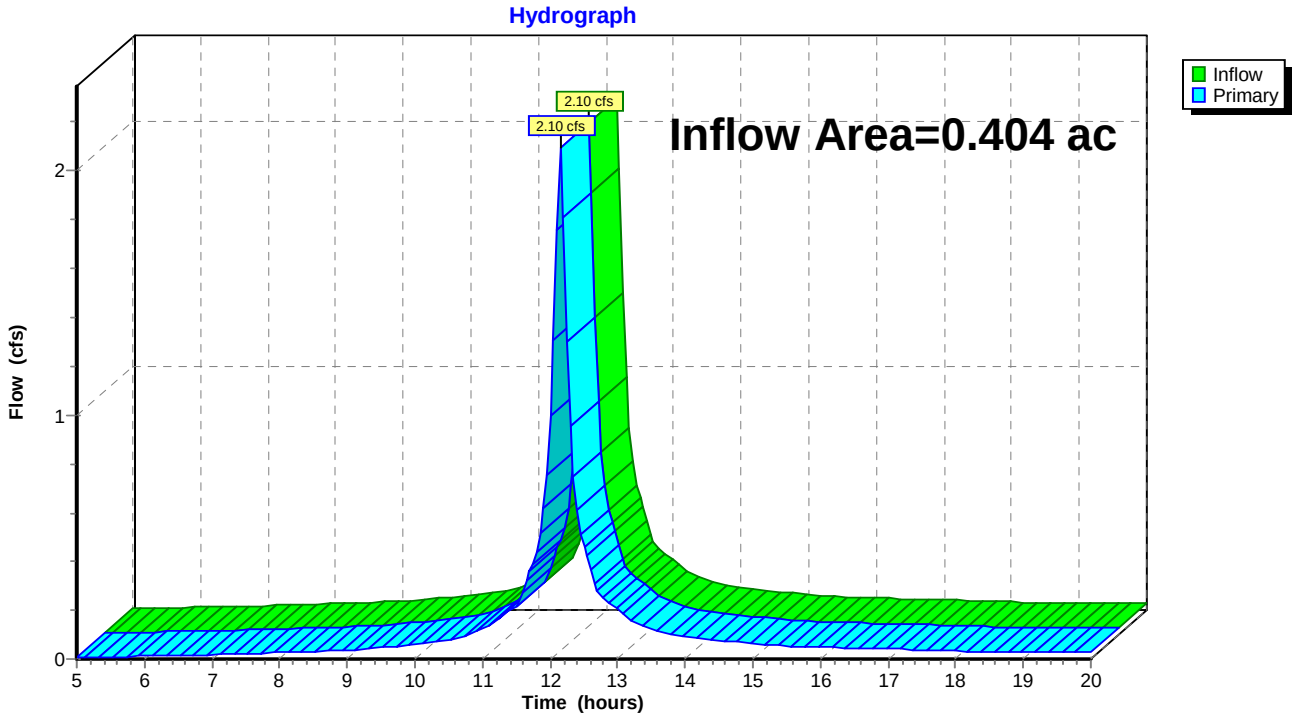
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.404 ac, 33.59% Impervious, Inflow Depth > 4.05" for 100-Year event
Inflow = 2.10 cfs @ 12.15 hrs, Volume= 0.136 af
Primary = 2.10 cfs @ 12.15 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



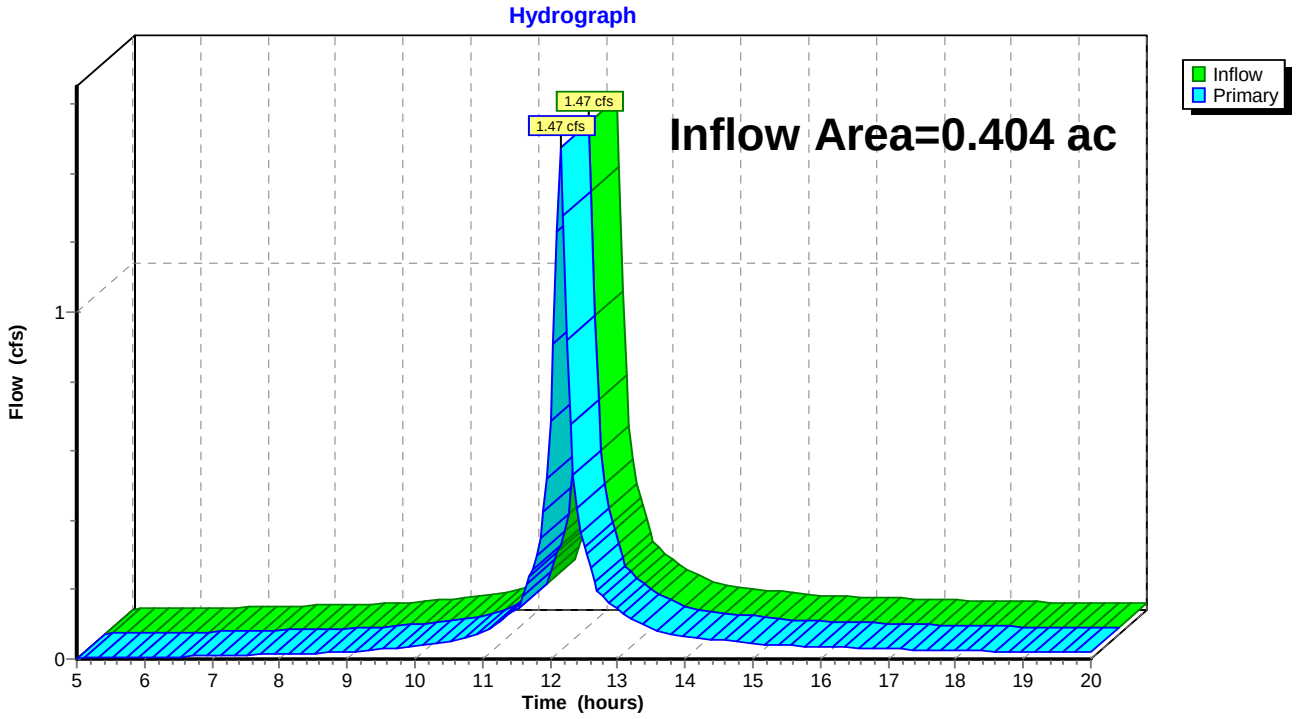
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.404 ac, 33.59% Impervious, Inflow Depth > 2.78" for 25-Year event
Inflow = 1.47 cfs @ 12.15 hrs, Volume= 0.094 af
Primary = 1.47 cfs @ 12.15 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



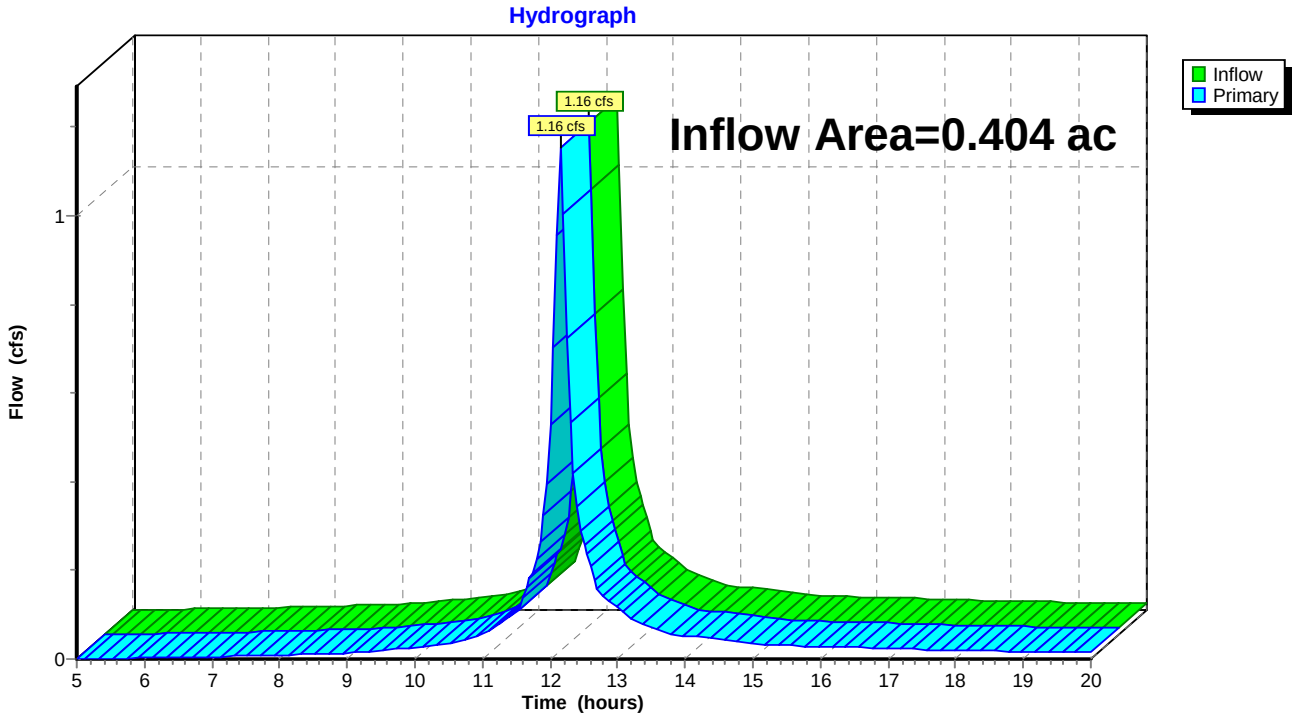
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.404 ac, 33.59% Impervious, Inflow Depth > 2.15" for 10-Year event
Inflow = 1.16 cfs @ 12.15 hrs, Volume= 0.072 af
Primary = 1.16 cfs @ 12.15 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



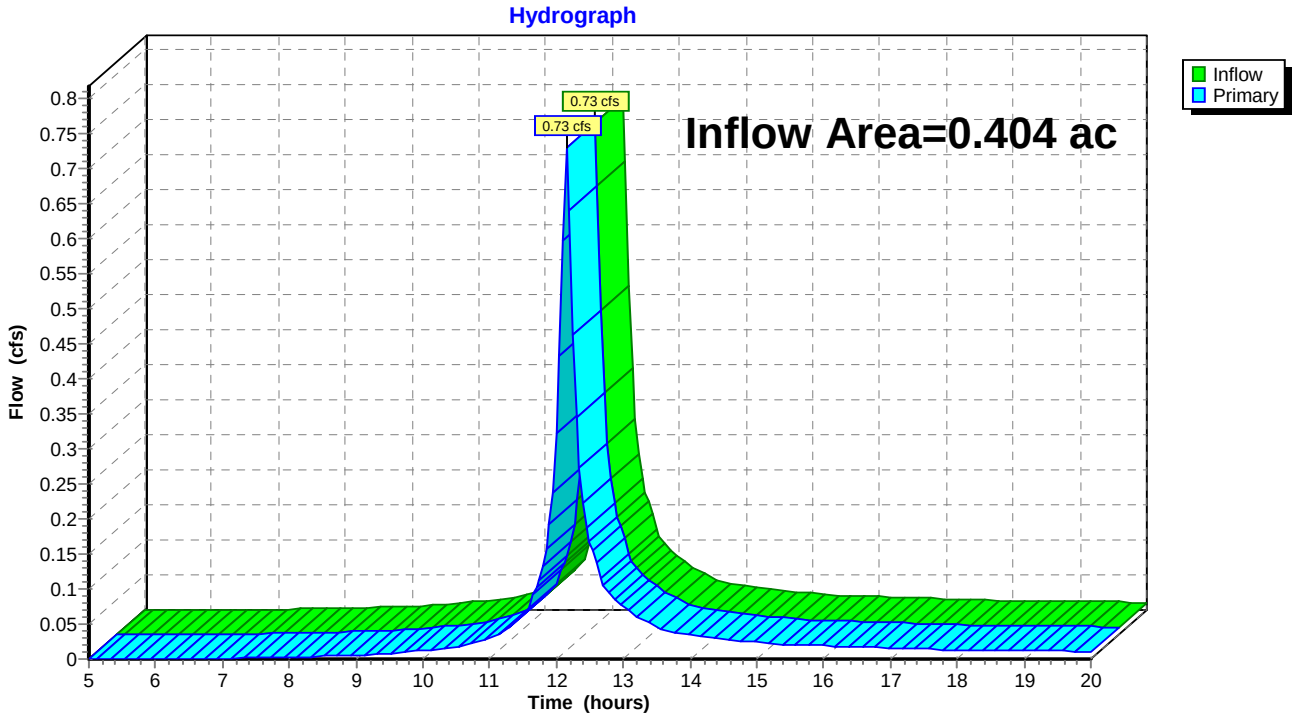
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.404 ac, 33.59% Impervious, Inflow Depth > 1.32" for 2-Year event
Inflow = 0.73 cfs @ 12.15 hrs, Volume= 0.045 af
Primary = 0.73 cfs @ 12.15 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



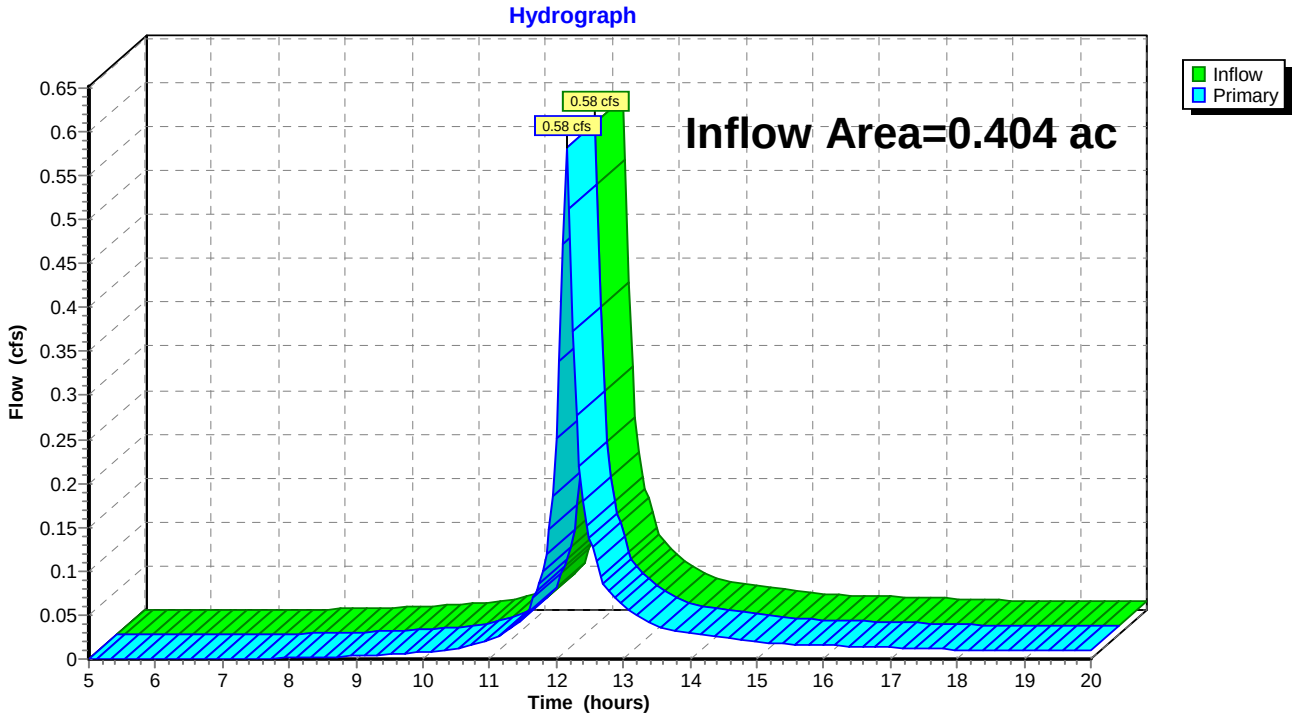
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.404 ac, 33.59% Impervious, Inflow Depth > 1.04" for 1-Year event
Inflow = 0.58 cfs @ 12.16 hrs, Volume= 0.035 af
Primary = 0.58 cfs @ 12.16 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



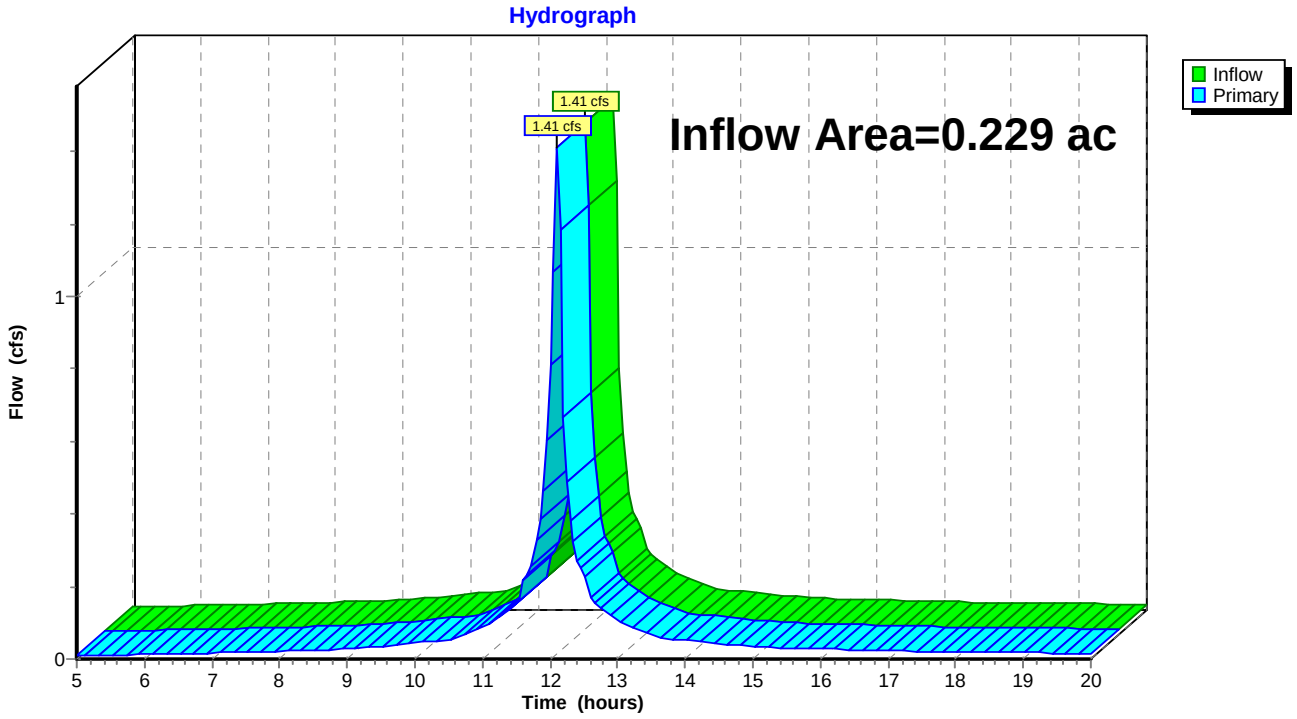
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.229 ac, 77.48% Impervious, Inflow Depth > 4.44" for 100-Year event
Inflow = 1.41 cfs @ 12.11 hrs, Volume= 0.085 af
Primary = 1.41 cfs @ 12.11 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



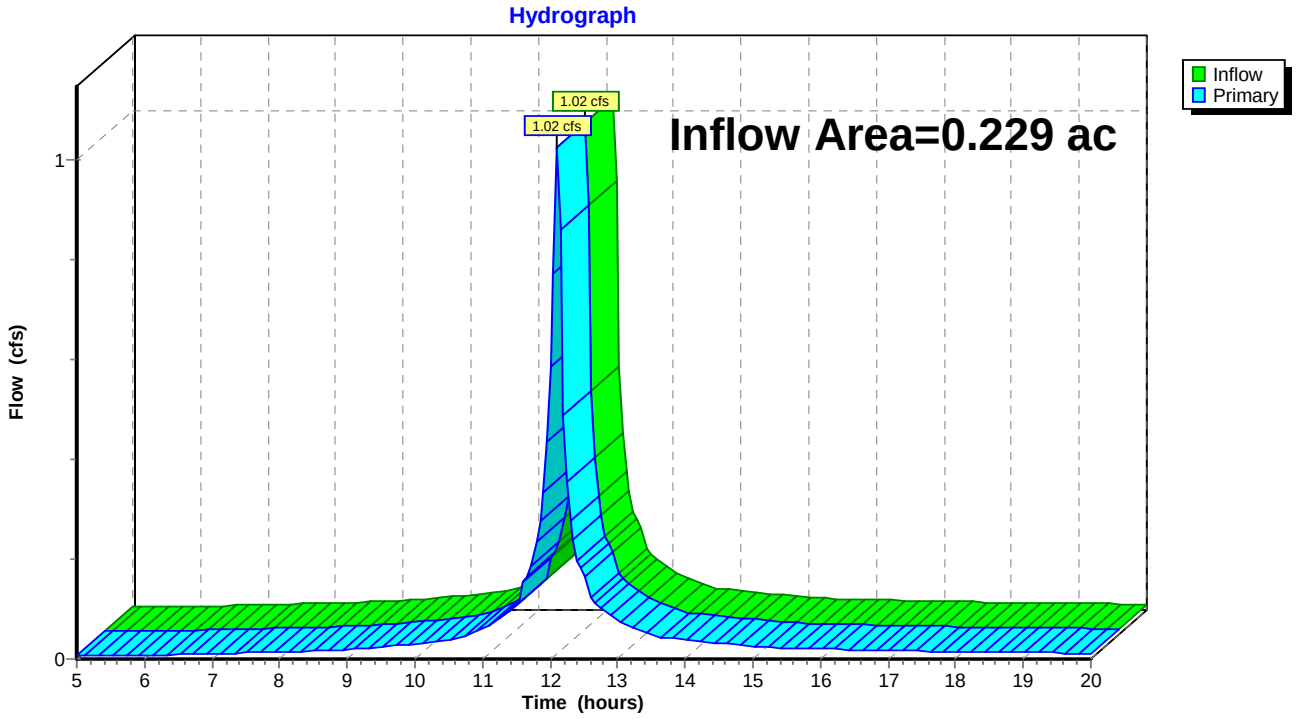
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.229 ac, 77.48% Impervious, Inflow Depth > 3.17" for 25-Year event
Inflow = 1.02 cfs @ 12.11 hrs, Volume= 0.060 af
Primary = 1.02 cfs @ 12.11 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



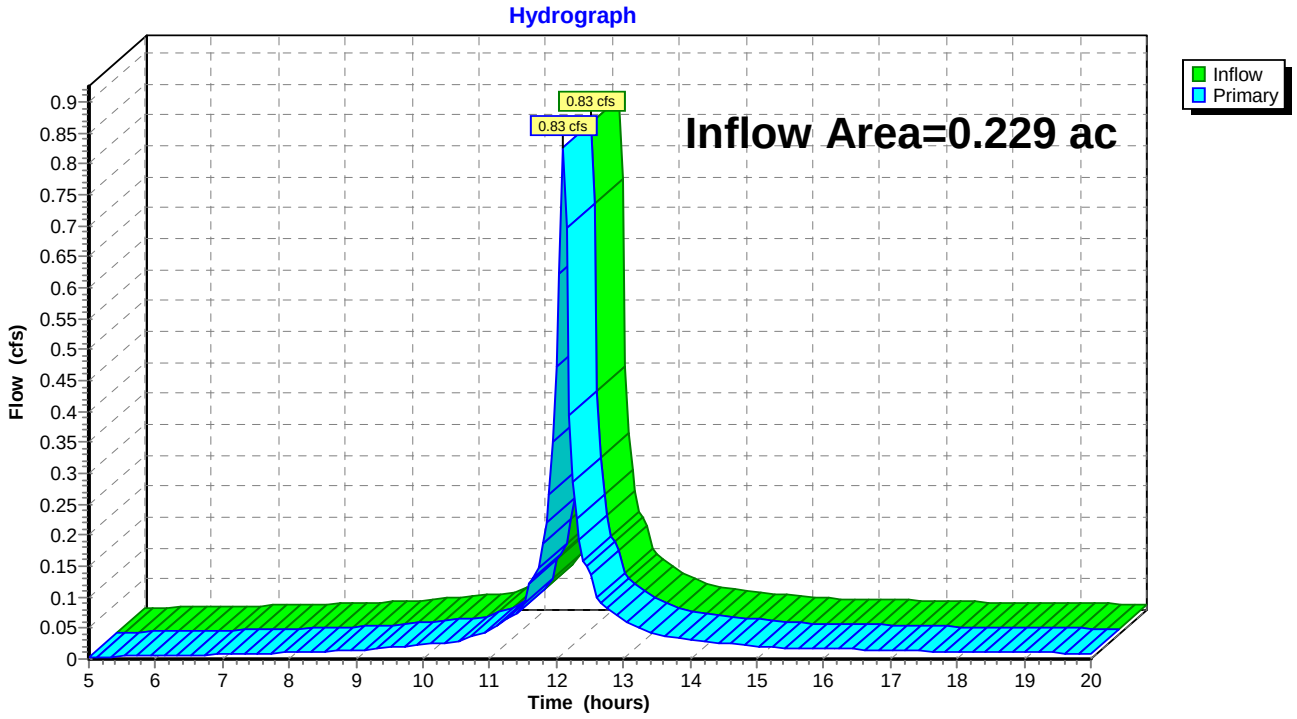
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.229 ac, 77.48% Impervious, Inflow Depth > 2.53" for 10-Year event
Inflow = 0.83 cfs @ 12.11 hrs, Volume= 0.048 af
Primary = 0.83 cfs @ 12.11 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



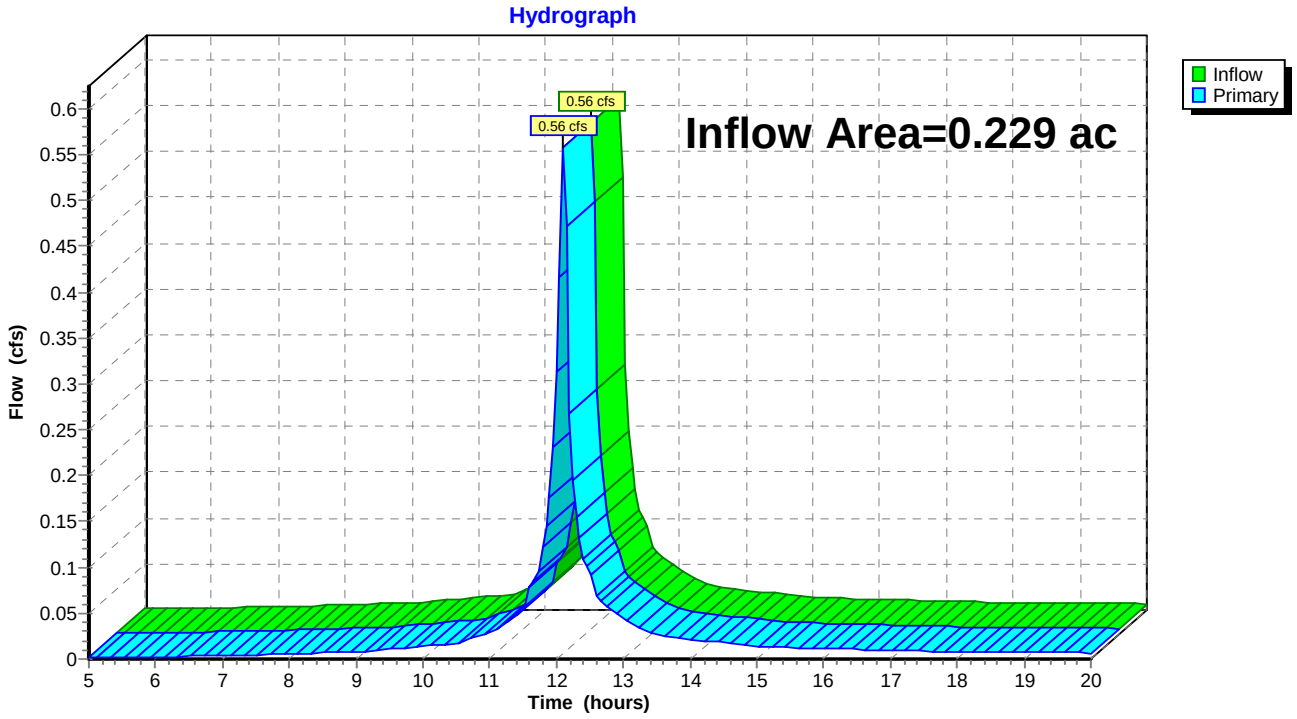
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.229 ac, 77.48% Impervious, Inflow Depth > 1.66" for 2-Year event
Inflow = 0.56 cfs @ 12.11 hrs, Volume= 0.032 af
Primary = 0.56 cfs @ 12.11 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



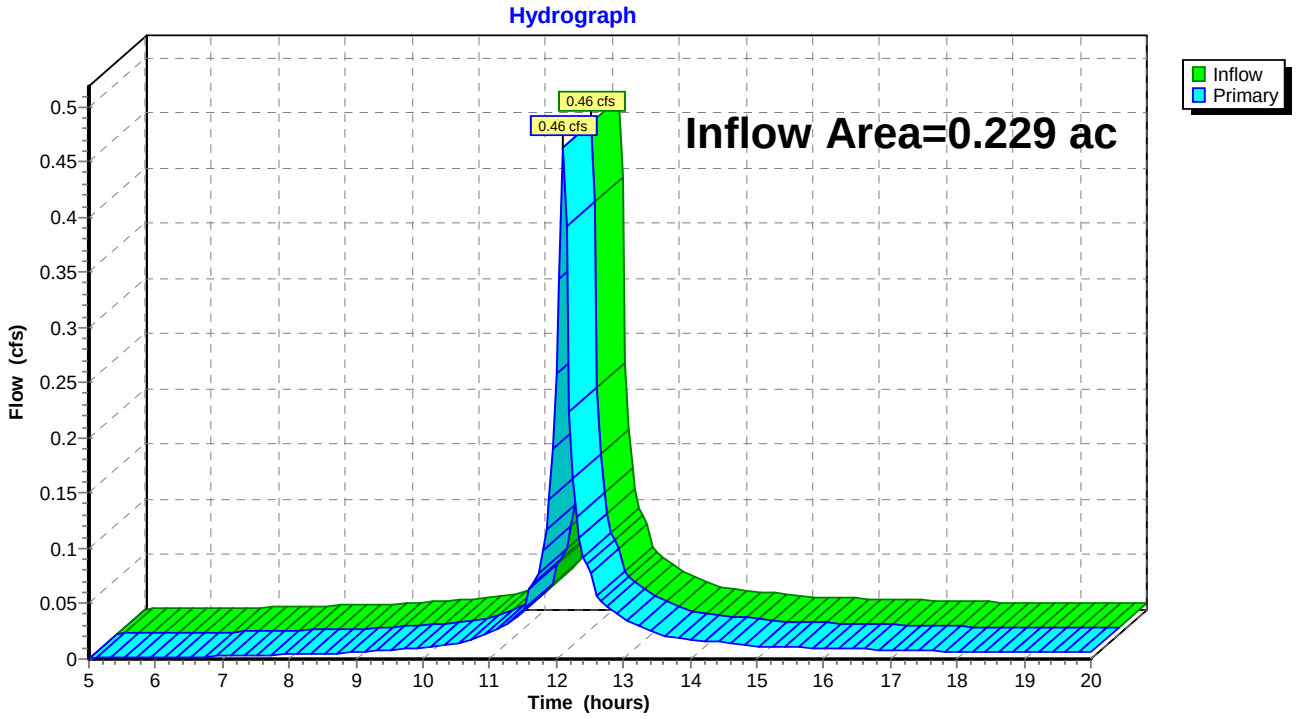
Summary for Pond 1P: Ex. Surface Flow

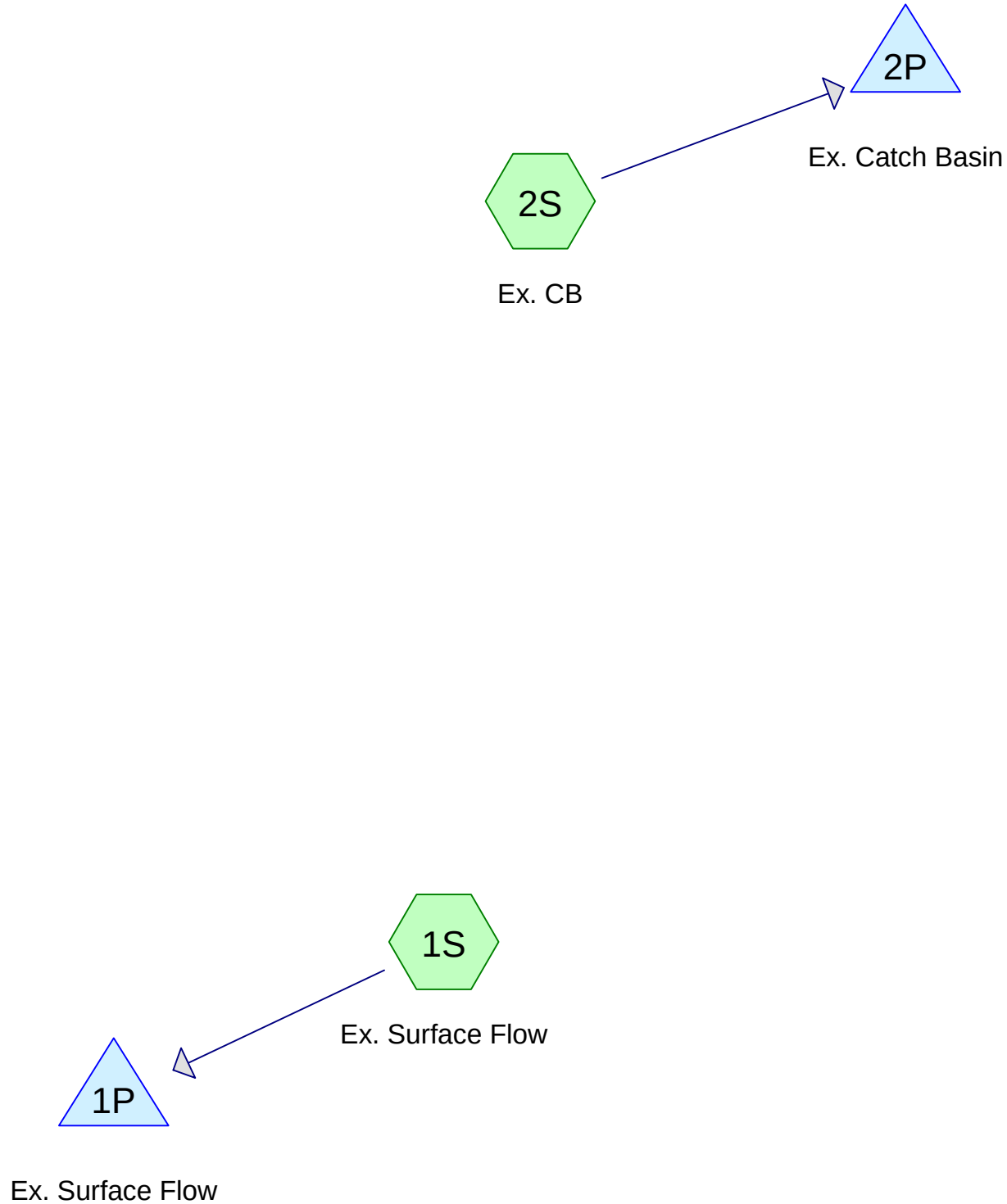
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.229 ac, 77.48% Impervious, Inflow Depth > 1.36" for 1-Year event
Inflow = 0.46 cfs @ 12.11 hrs, Volume= 0.026 af
Primary = 0.46 cfs @ 12.11 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow





Subcat Reach Pond Link

Routing Diagram for 21034C Pre-Development

Prepared by HydroCAD www.hydrocad.net, Printed 1/25/2022

APPENDIX ‘B’

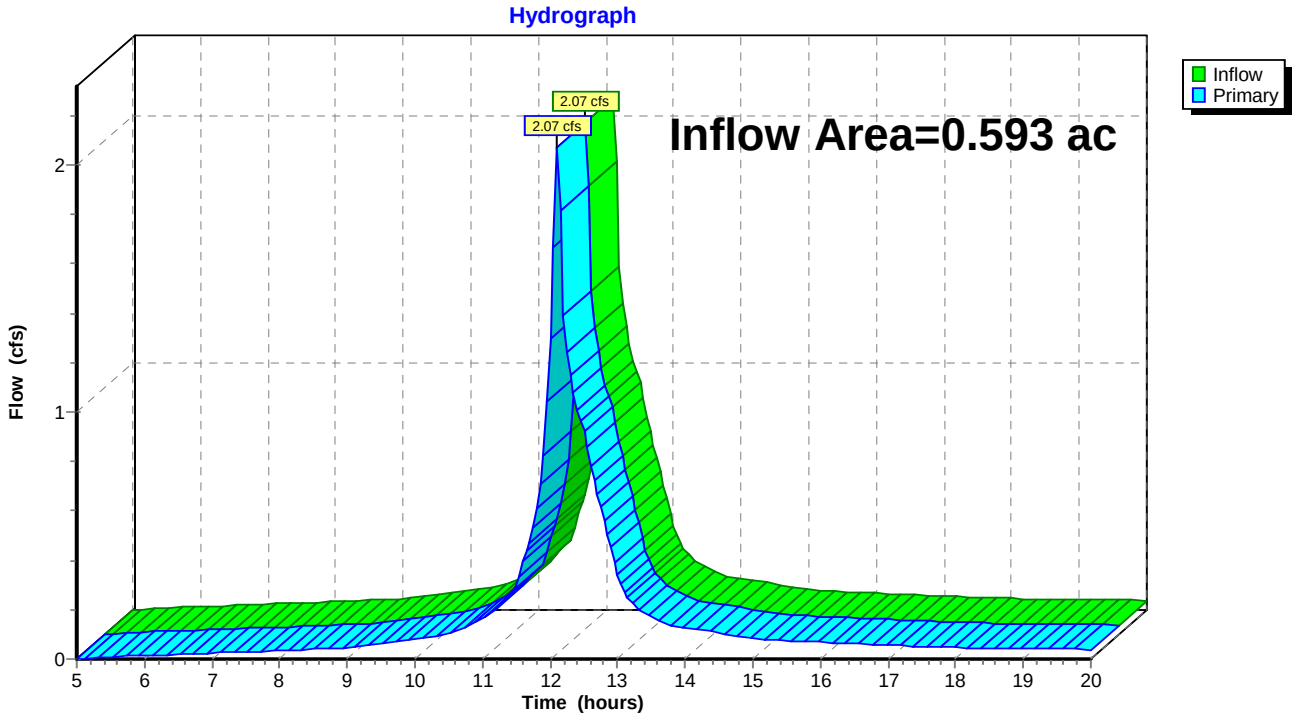
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.593 ac, 58.73% Impervious, Inflow Depth > 3.73" for 100-Year event
Inflow = 2.07 cfs @ 12.11 hrs, Volume= 0.185 af
Primary = 2.07 cfs @ 12.11 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



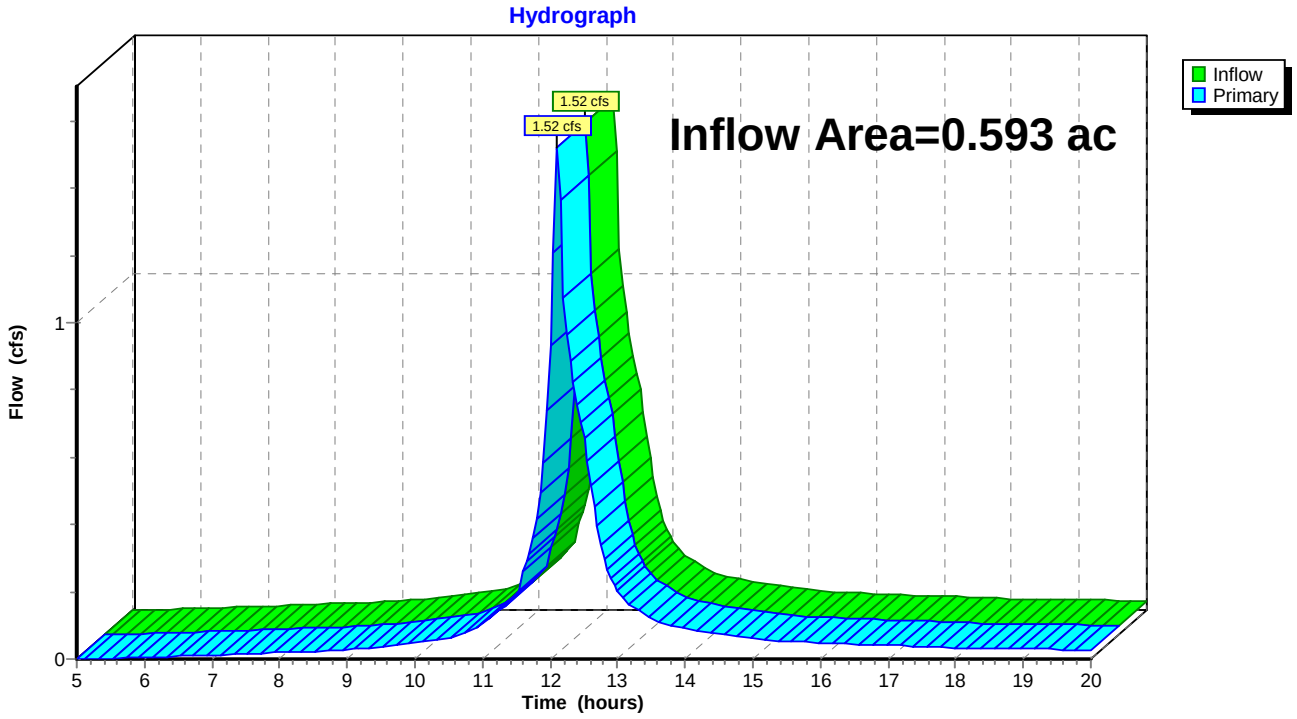
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.593 ac, 58.73% Impervious, Inflow Depth > 2.56" for 25-Year event
Inflow = 1.52 cfs @ 12.11 hrs, Volume= 0.127 af
Primary = 1.52 cfs @ 12.11 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



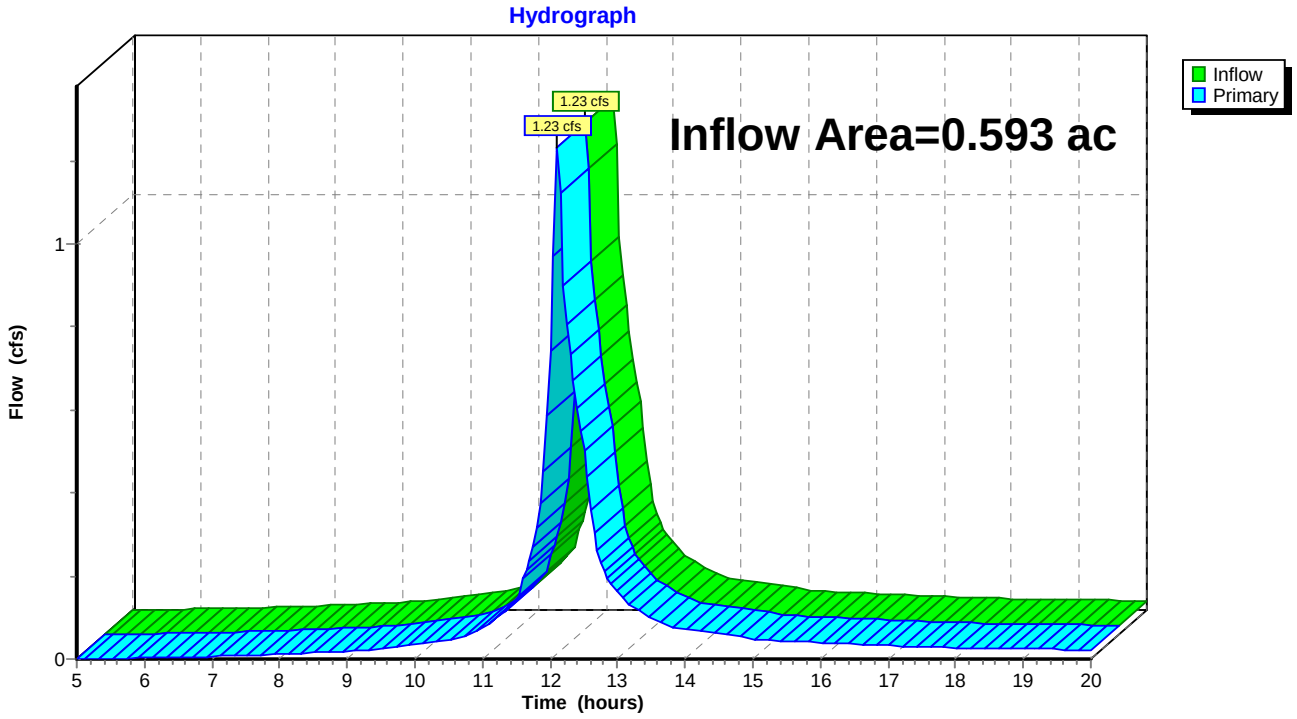
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.593 ac, 58.73% Impervious, Inflow Depth > 1.98" for 10-Year event
Inflow = 1.23 cfs @ 12.11 hrs, Volume= 0.098 af
Primary = 1.23 cfs @ 12.11 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



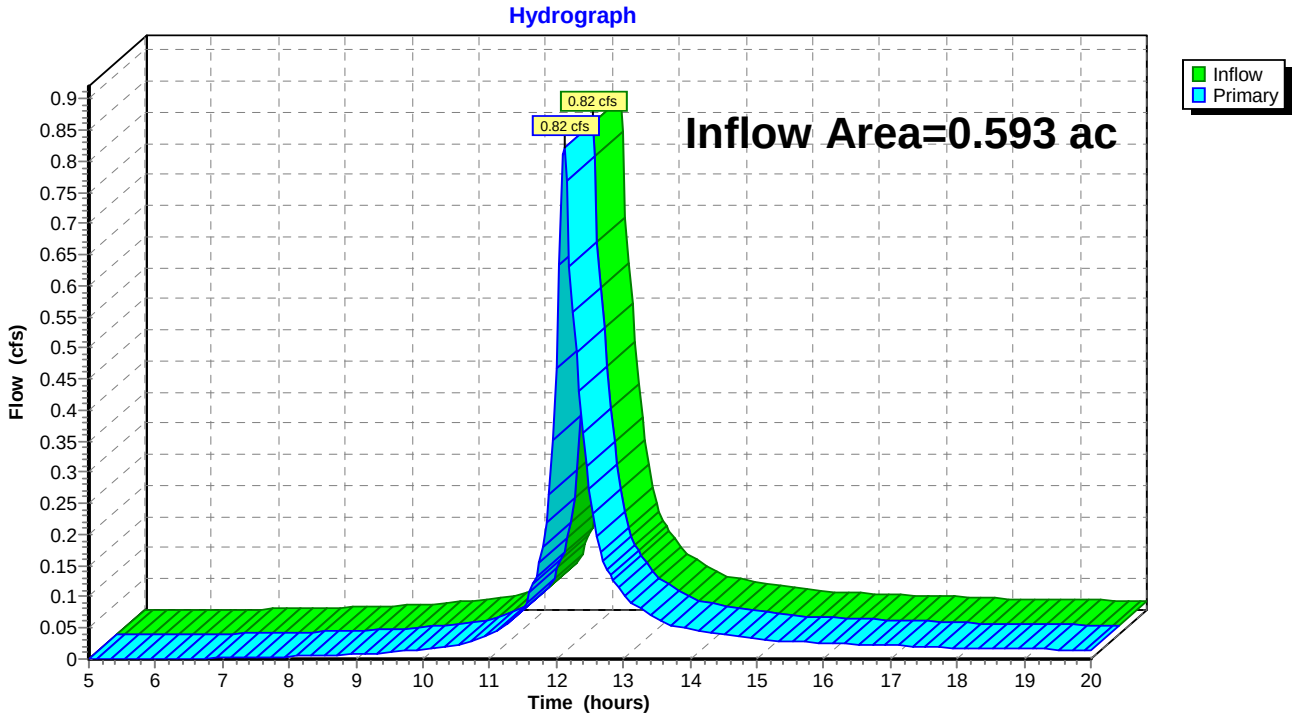
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.593 ac, 58.73% Impervious, Inflow Depth > 1.22" for 2-Year event
Inflow = 0.82 cfs @ 12.12 hrs, Volume= 0.060 af
Primary = 0.82 cfs @ 12.12 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



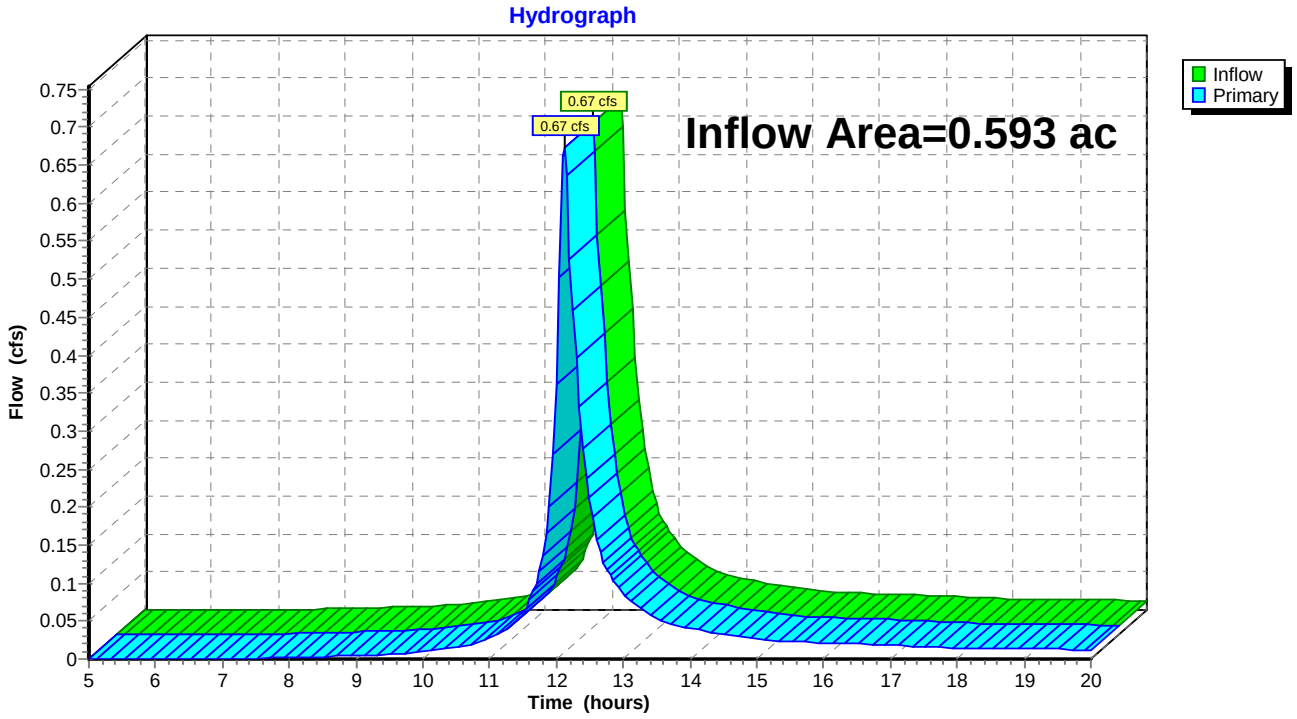
Summary for Pond 2P: Ex. Catch Basin

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

Inflow Area = 0.593 ac, 58.73% Impervious, Inflow Depth > 0.96" for 1-Year event
Inflow = 0.67 cfs @ 12.12 hrs, Volume= 0.048 af
Primary = 0.67 cfs @ 12.12 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Ex. Catch Basin



Summary for Pond 8P: Detention

[82] Warning: Early inflow requires earlier time span
[81] Warning: Exceeded Pond 4P by 0.36' @ 12.25 hrs

Inflow Area = 0.317 ac, 75.56% Impervious, Inflow Depth > 4.29" for 100-Year event
Inflow = 1.96 cfs @ 12.10 hrs, Volume= 0.113 af
Outflow = 0.82 cfs @ 12.22 hrs, Volume= 0.113 af, Atten= 58%, Lag= 7.2 min
Primary = 0.82 cfs @ 12.22 hrs, Volume= 0.113 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 611.09' @ 12.22 hrs Surf.Area= 925 sf Storage= 949 cf

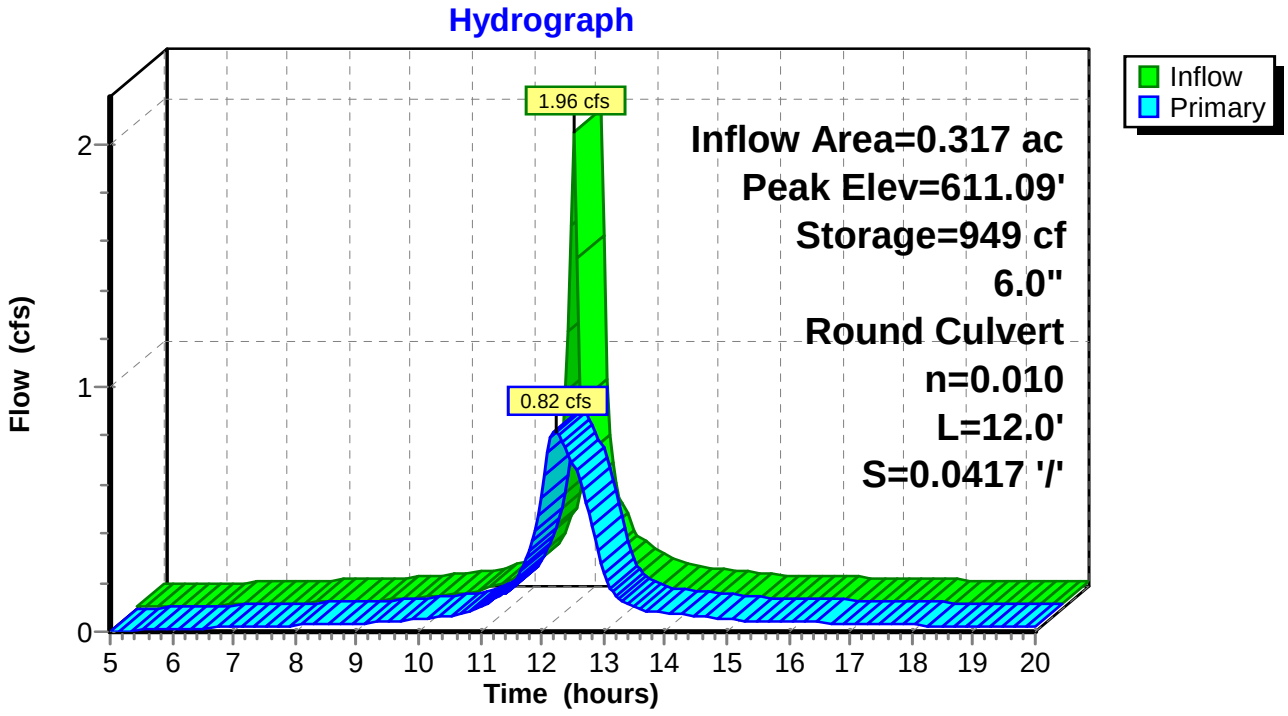
Plug-Flow detention time= 15.1 min calculated for 0.113 af (99% of inflow)
Center-of-Mass det. time= 12.0 min (755.7 - 743.7)

Volume	Invert	Avail.Storage	Storage Description
#1	609.50'	1,368 cf	**6.00'W x 50.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	609.50'	**6.0" Round Culvert** L= 12.0' Ke= 1.000 Inlet / Outlet Invert= 609.50' / 609.00' S= 0.0417 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.82 cfs @ 12.22 hrs HW=611.08' (Free Discharge)
1=Culvert (Inlet Controls 0.82 cfs @ 4.17 fps)

Pond 8P: Detention



Summary for Pond 8P: Detention

[82] Warning: Early inflow requires earlier time span
[79] Warning: Submerged Pond 4P Primary device # 1 INLET by 0.38'

Inflow Area = 0.317 ac, 75.56% Impervious, Inflow Depth > 3.02" for 25-Year event
Inflow = 1.40 cfs @ 12.10 hrs, Volume= 0.080 af
Outflow = 0.68 cfs @ 12.20 hrs, Volume= 0.079 af, Atten= 51%, Lag= 6.2 min
Primary = 0.68 cfs @ 12.20 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 610.68' @ 12.20 hrs Surf.Area= 745 sf Storage= 605 cf

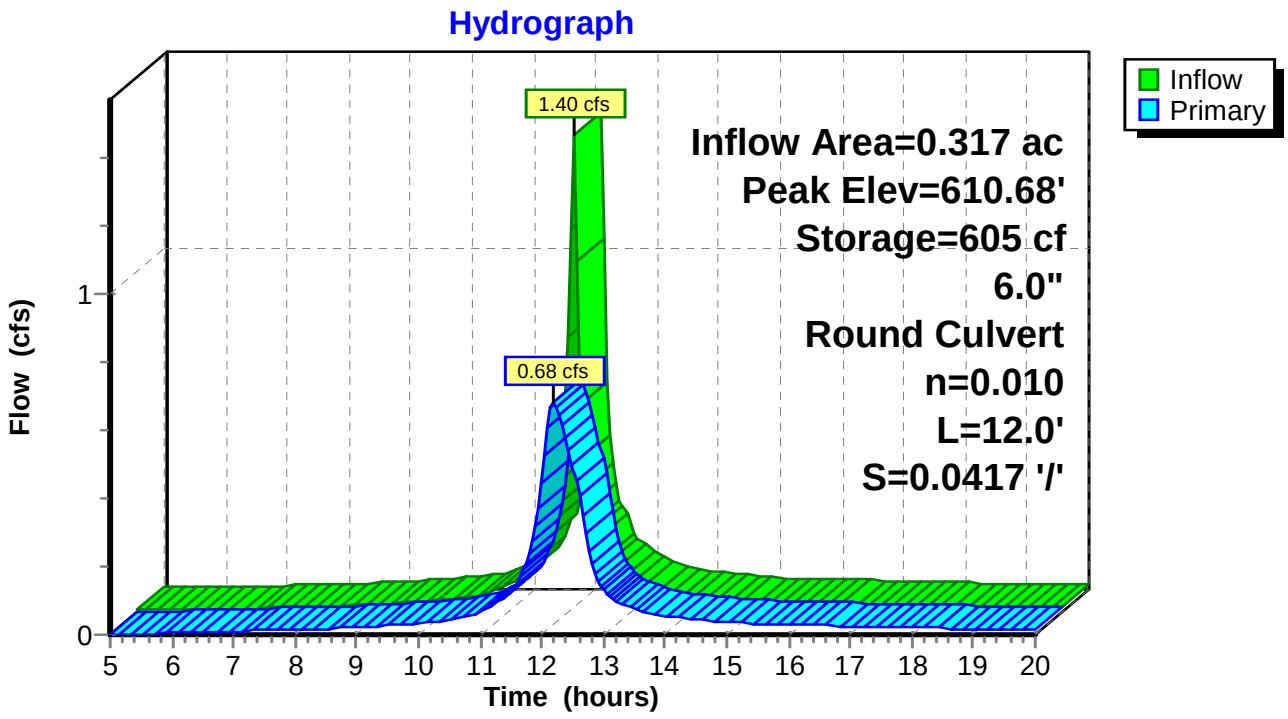
Plug-Flow detention time= 14.8 min calculated for 0.079 af (99% of inflow)
Center-of-Mass det. time= 11.3 min (760.4 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1	609.50'	1,368 cf	**6.00'W x 50.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	609.50'	**6.0" Round Culvert** L= 12.0' Ke= 1.000 Inlet / Outlet Invert= 609.50' / 609.00' S= 0.0417 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.68 cfs @ 12.20 hrs HW=610.68' (Free Discharge)
1=Culvert (Inlet Controls 0.68 cfs @ 3.48 fps)

Pond 8P: Detention



Summary for Pond 8P: Detention

[82] Warning: Early inflow requires earlier time span
[79] Warning: Submerged Pond 4P Primary device # 1 INLET by 0.16'

Inflow Area = 0.317 ac, 75.56% Impervious, Inflow Depth > 2.37" for 10-Year event
Inflow = 1.12 cfs @ 12.10 hrs, Volume= 0.063 af
Outflow = 0.60 cfs @ 12.19 hrs, Volume= 0.062 af, Atten= 47%, Lag= 5.6 min
Primary = 0.60 cfs @ 12.19 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 610.46' @ 12.19 hrs Surf.Area= 654 sf Storage= 451 cf

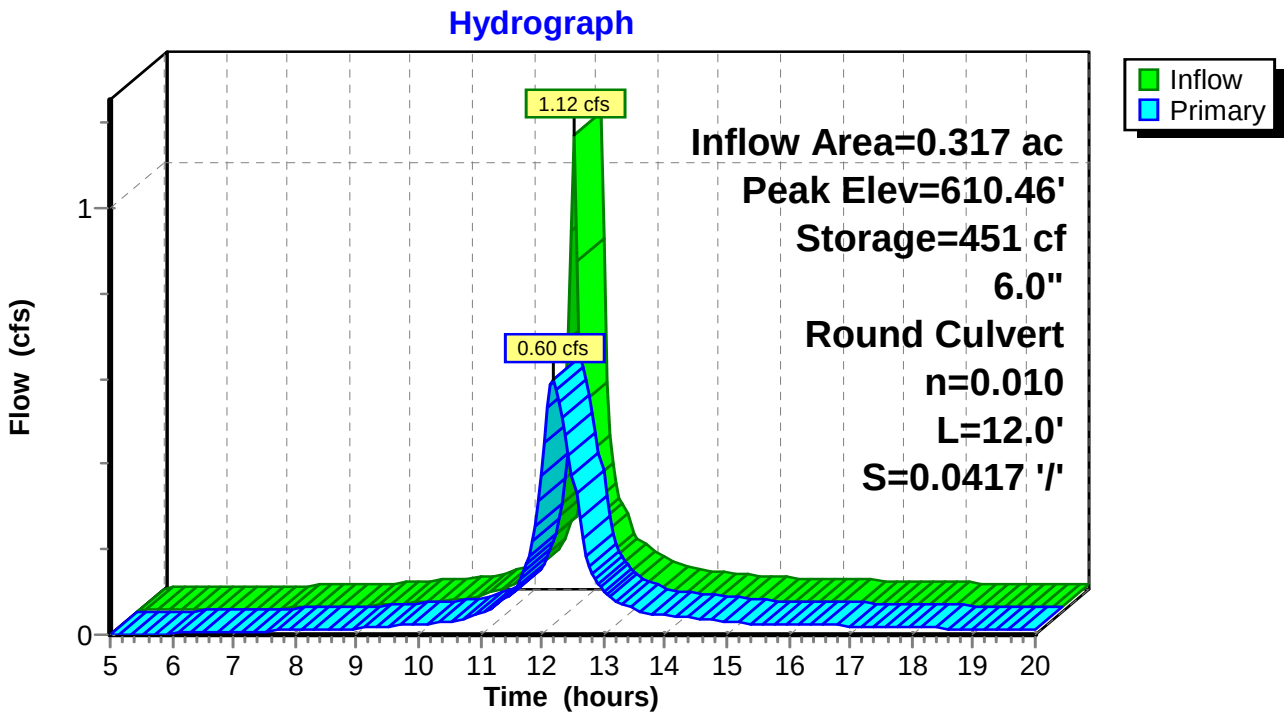
Plug-Flow detention time= 15.0 min calculated for 0.062 af (99% of inflow)
Center-of-Mass det. time= 11.2 min (764.5 - 753.4)

Volume	Invert	Avail.Storage	Storage Description
#1	609.50'	1,368 cf	**6.00'W x 50.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	609.50'	**6.0" Round Culvert** L= 12.0' Ke= 1.000 Inlet / Outlet Invert= 609.50' / 609.00' S= 0.0417 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.59 cfs @ 12.19 hrs HW=610.45' (Free Discharge)
1=Culvert (Inlet Controls 0.59 cfs @ 3.02 fps)

Pond 8P: Detention



Summary for Pond 8P: Detention

[79] Warning: Submerged Pond 4P Primary device # 1 OUTLET by 0.15'

Inflow Area = 0.317 ac, 75.56% Impervious, Inflow Depth > 1.52" for 2-Year event
Inflow = 0.74 cfs @ 12.10 hrs, Volume= 0.040 af
Outflow = 0.45 cfs @ 12.17 hrs, Volume= 0.040 af, Atten= 39%, Lag= 4.5 min
Primary = 0.45 cfs @ 12.17 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 610.16' @ 12.17 hrs Surf.Area= 537 sf Storage= 274 cf

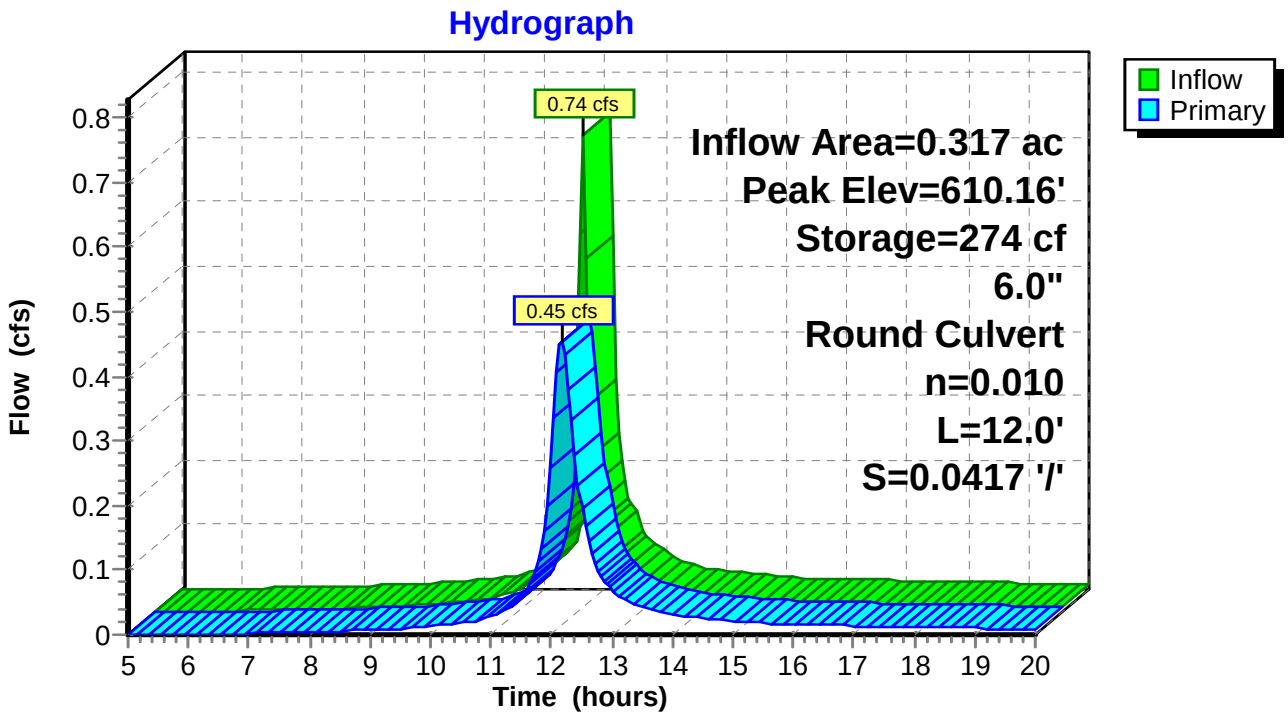
Plug-Flow detention time= 16.3 min calculated for 0.040 af (99% of inflow)
Center-of-Mass det. time= 11.6 min (774.0 - 762.5)

Volume	Invert	Avail.Storage	Storage Description
#1	609.50'	1,368 cf	**6.00'W x 50.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	609.50'	**6.0" Round Culvert** L= 12.0' Ke= 1.000 Inlet / Outlet Invert= 609.50' / 609.00' S= 0.0417 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.45 cfs @ 12.17 hrs HW=610.15' (Free Discharge)
1=Culvert (Inlet Controls 0.45 cfs @ 2.28 fps)

Pond 8P: Detention



Summary for Pond 8P: Detention

[79] Warning: Submerged Pond 4P Primary device # 1 OUTLET by 0.05'

Inflow Area = 0.317 ac, 75.56% Impervious, Inflow Depth > 1.23" for 1-Year event
Inflow = 0.60 cfs @ 12.10 hrs, Volume= 0.032 af
Outflow = 0.39 cfs @ 12.17 hrs, Volume= 0.032 af, Atten= 35%, Lag= 4.2 min
Primary = 0.39 cfs @ 12.17 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 610.06' @ 12.17 hrs Surf.Area= 498 sf Storage= 221 cf

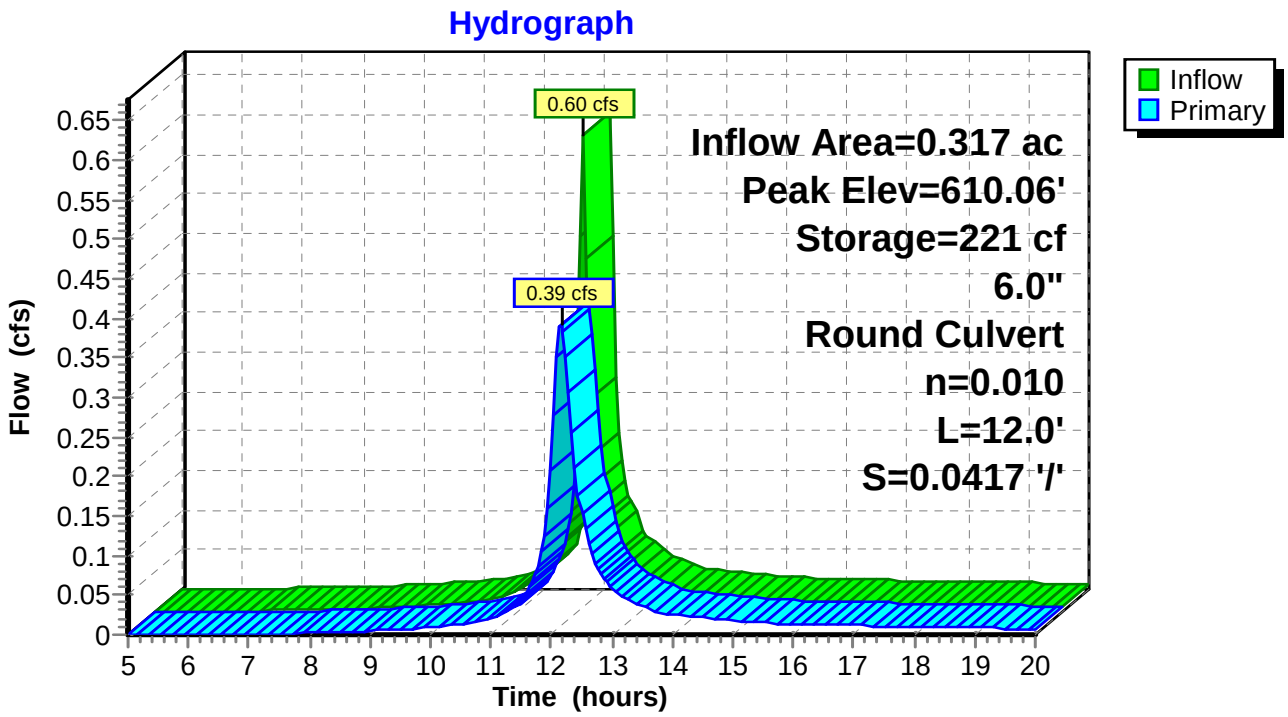
Plug-Flow detention time= 17.2 min calculated for 0.032 af (99% of inflow)
Center-of-Mass det. time= 11.9 min (779.2 - 767.3)

Volume	Invert	Avail.Storage	Storage Description
#1	609.50'	1,368 cf	**6.00'W x 50.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	609.50'	**6.0" Round Culvert** L= 12.0' Ke= 1.000 Inlet / Outlet Invert= 609.50' / 609.00' S= 0.0417 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.39 cfs @ 12.17 hrs HW=610.05' (Free Discharge)
1=Culvert (Inlet Controls 0.39 cfs @ 1.97 fps)

Pond 8P: Detention



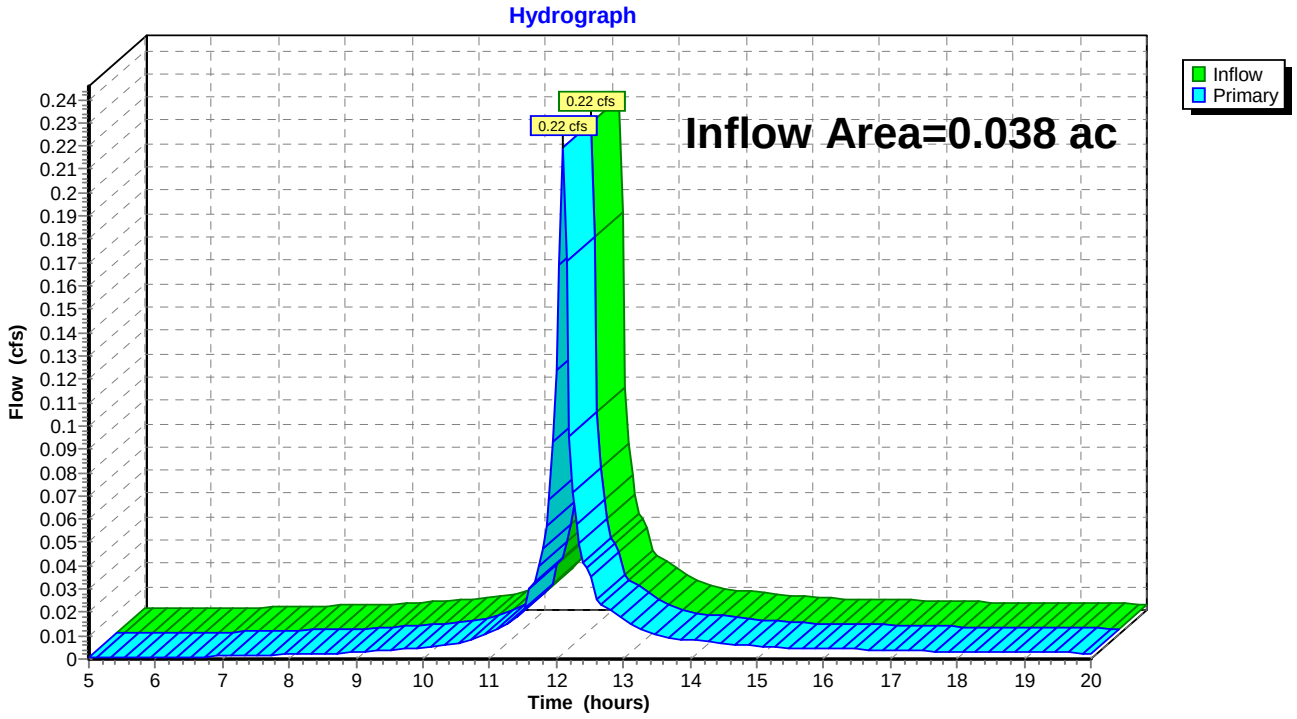
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.038 ac, 6.22% Impervious, Inflow Depth > 3.86" for 100-Year event
Inflow = 0.22 cfs @ 12.10 hrs, Volume= 0.012 af
Primary = 0.22 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



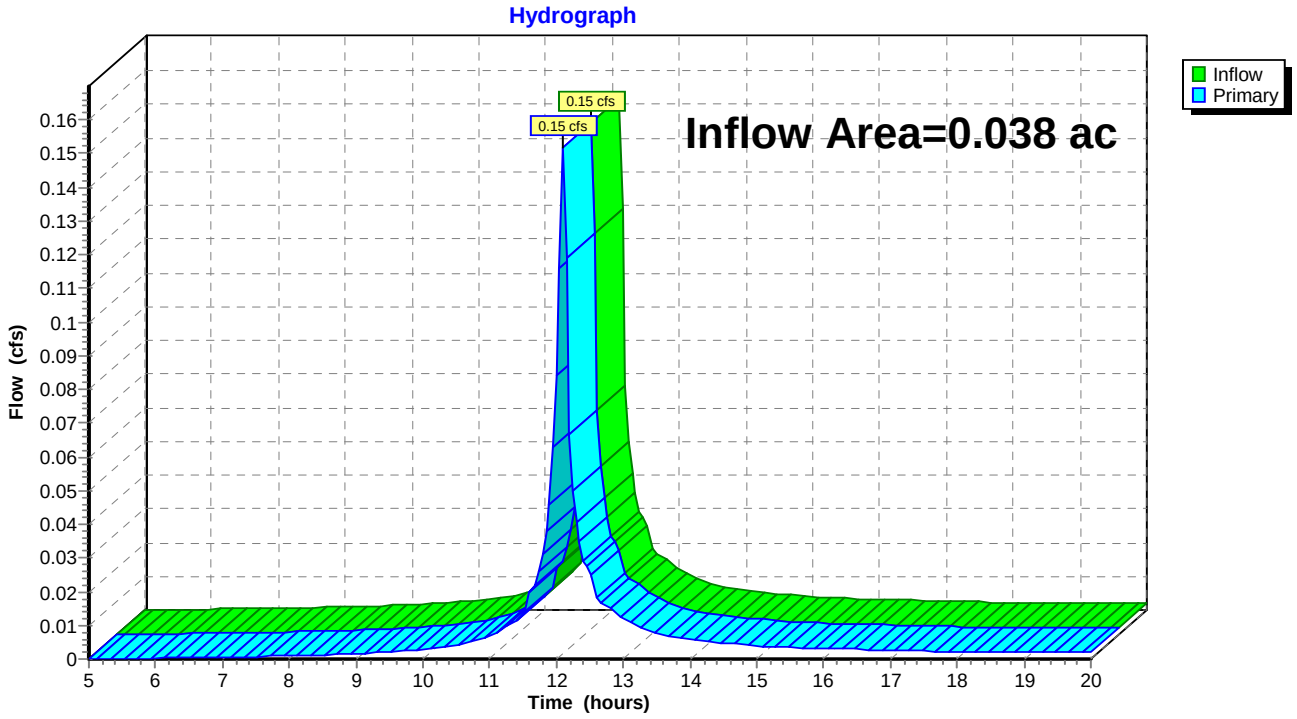
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.038 ac, 6.22% Impervious, Inflow Depth > 2.60" for 25-Year event
Inflow = 0.15 cfs @ 12.10 hrs, Volume= 0.008 af
Primary = 0.15 cfs @ 12.10 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



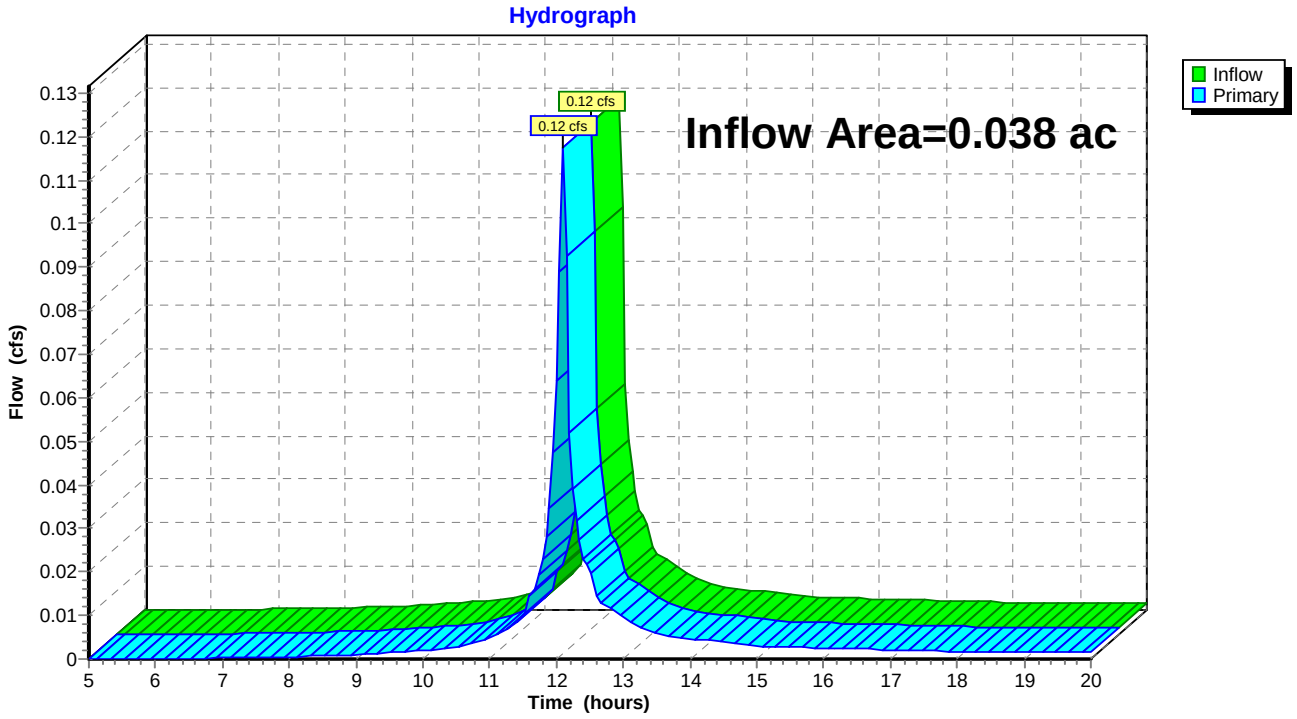
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.038 ac, 6.22% Impervious, Inflow Depth > 1.98" for 10-Year event
Inflow = 0.12 cfs @ 12.10 hrs, Volume= 0.006 af
Primary = 0.12 cfs @ 12.10 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



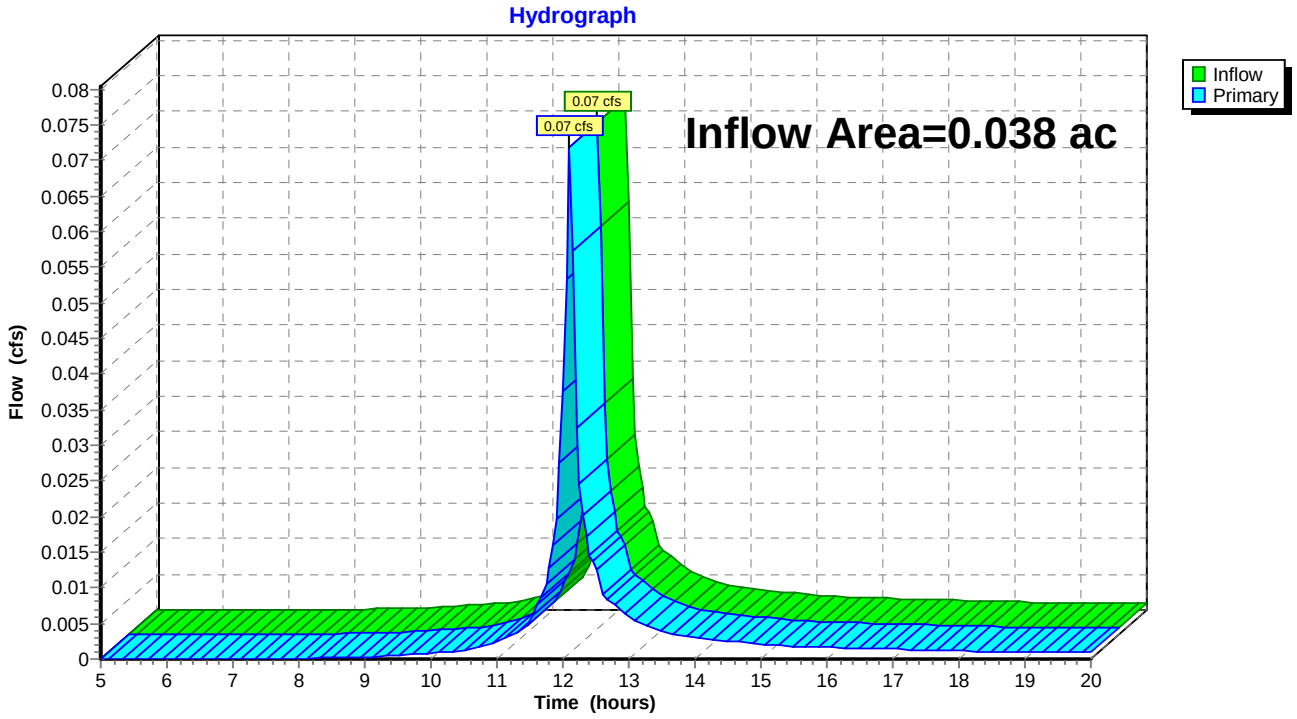
Summary for Pond 1P: Ex. Surface Flow

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

Inflow Area = 0.038 ac, 6.22% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 0.07 cfs @ 12.10 hrs, Volume= 0.004 af
Primary = 0.07 cfs @ 12.10 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow



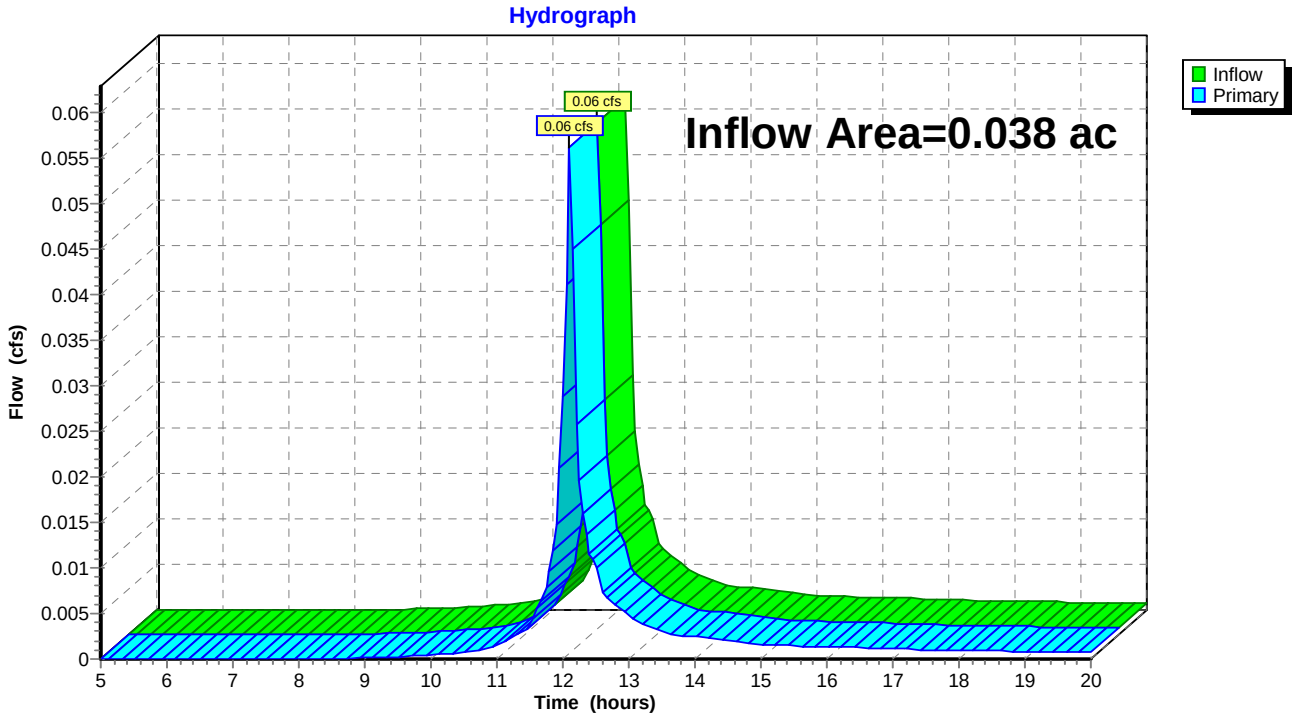
Summary for Pond 1P: Ex. Surface Flow

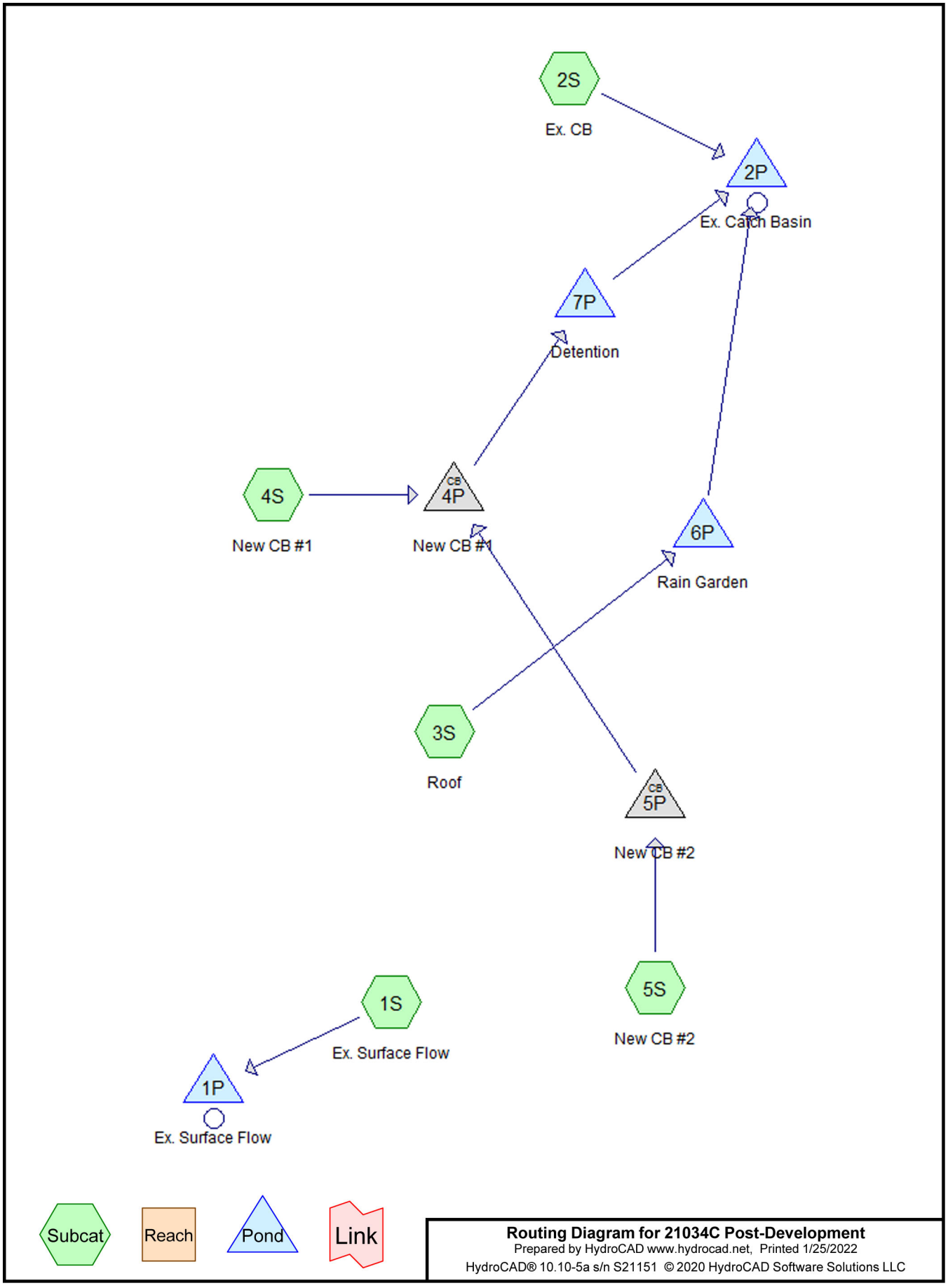
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.038 ac, 6.22% Impervious, Inflow Depth > 0.91" for 1-Year event
Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.003 af
Primary = 0.06 cfs @ 12.10 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 1P: Ex. Surface Flow





Routing Diagram for 21034C Post-Development

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