mfsengineers.com

Memorandum

MFS ENGINEERS & SURVEYORS

TO: Village of Dobbs Ferry Board of Trustees

CC: Marvel, Zarin & Steinmetz

DATE: 15 June 2021

RE: Stormwater Memorandum
Innovation & Entrepreneurship Center
Masters School
Dobbs Ferry, NY
MFS Project No.: 1120062

In support of the Village's review of Site Plan documentation for the proposed Innovation & Entrepreneurship Center (IEC) at Masters School, Dobbs Ferry, NY, this Stormwater Memorandum is intended to describe proposed stormwater management features for the Project. This report is accompanied by hydrologic output from Hydrographs software, for both pre- and post-construction conditions.

Existing drainage patterns convey a tributary area of between 0.83 and approximately 1.0 acres to the new building area, and is graded to generally split drainage between two drainage areas. One portion of drainage drains overland towards the Carriage House and ultimately splits between flow into the wooded area east of the House, and flow along the circulation road towards the track and Estherwood Avenue. The other drains overland to a catch basin in the parking area just north of the Middle School, ultimately being conveyed via pipes to precast drywells in the adjacent lawn.

The total area of disturbance for the Project will exceed 1 acre because of additional areas of work in support of the new building.

Proposed upgrades around the proposed IEC include landscaping, pathways, ADA-accessible parking, and regrading. The introduction of new impervious area brings with it the need to further study stormwater flow patterns to ensure

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that the post-construction runoff quality and rates are less than or equal to those of the pre-construction condition. Based on a modeled study of the existing conditions and the NYS DEC requirements for stormwater analysis, the proposed improvements at the site will result in a net increase in peak discharge rates and therefore requires the introduction of stormwater detention features.

The NYS DEC requires both water quality and quantity considerations when designing new impervious area. As shown on C-600 Grading & Drainage Plan, this Project proposes to address water quality via a bioretention system that is integrated into the site landscaping. Stormwater from the site hardscape – which generally collects the most pollutants – will be collected and conveyed to this system via site grading where it will be slowly filtered through engineered media and infiltrated to the extent possible. Preliminary infiltration tests at the location of bioretention show the soil to be favorable to infiltration, refer to Appendix A.

Drainage from the roof, and overflow from the bioretention system, will be conveyed to a subsurface detention system located beneath the site patio. This system, comprised of open-bottom HDPE arch sections within a gravel bed, will store up to 3,200 cubic feet of stormwater while releasing it via a controlled-flow outlet at rates less than or equal to pre-construction conditions. A stormwater pipe from the outlet control structure (O.C.S) will be connected to the existing on-site, campus-maintained catch basin – which presently captures flow from the site– located just north of the Middle School.

As the design of the Project and site develops, we look forward to continuing to work with the Village and its engineering consultant to further coordinate this stormwater design and provide additional requested information. Ultimately, a full SWPPP will be prepared for the Project, and coverage will be obtained under the SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-20-001).

Project Notes

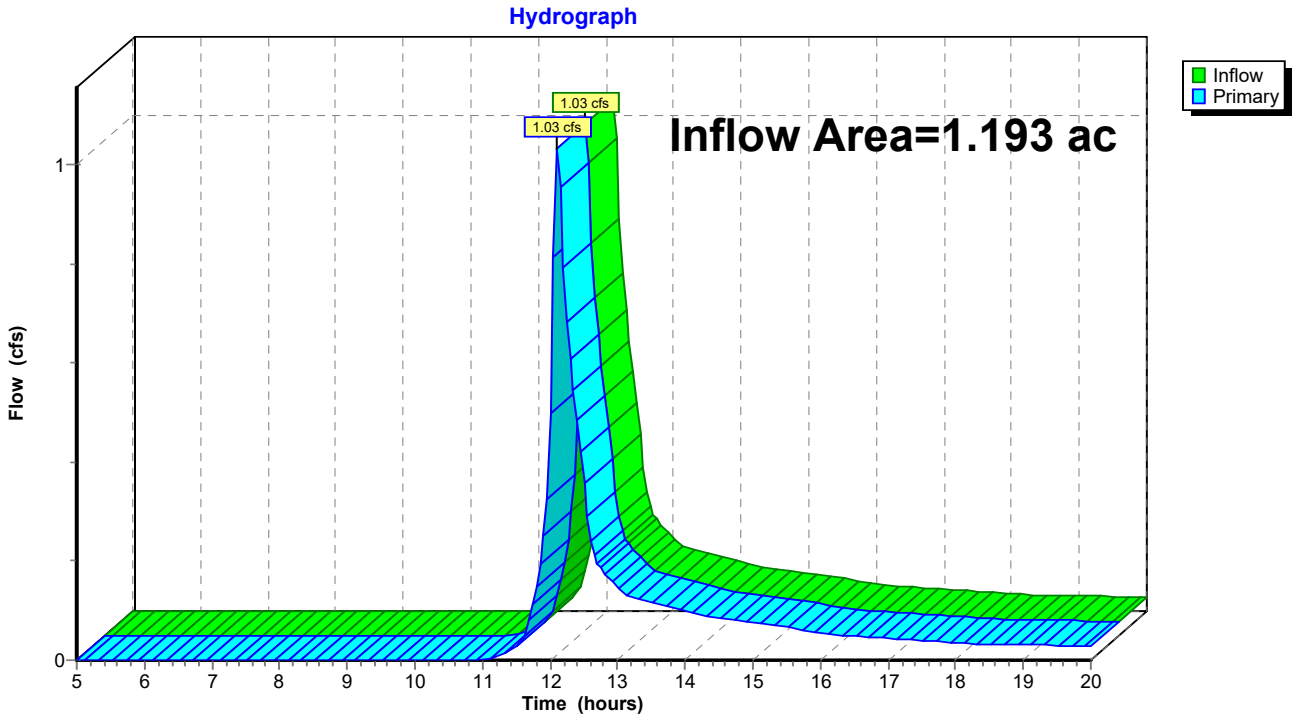
Defined 10 rainfall events from NY-Westchester IDF

Summary for Link 5L: Pre

Inflow Area = 1.193 ac, 0.00% Impervious, Inflow Depth > 0.78" for 1-yr event
Inflow = 1.03 cfs @ 12.11 hrs, Volume= 0.078 af
Primary = 1.03 cfs @ 12.11 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 5L: Pre

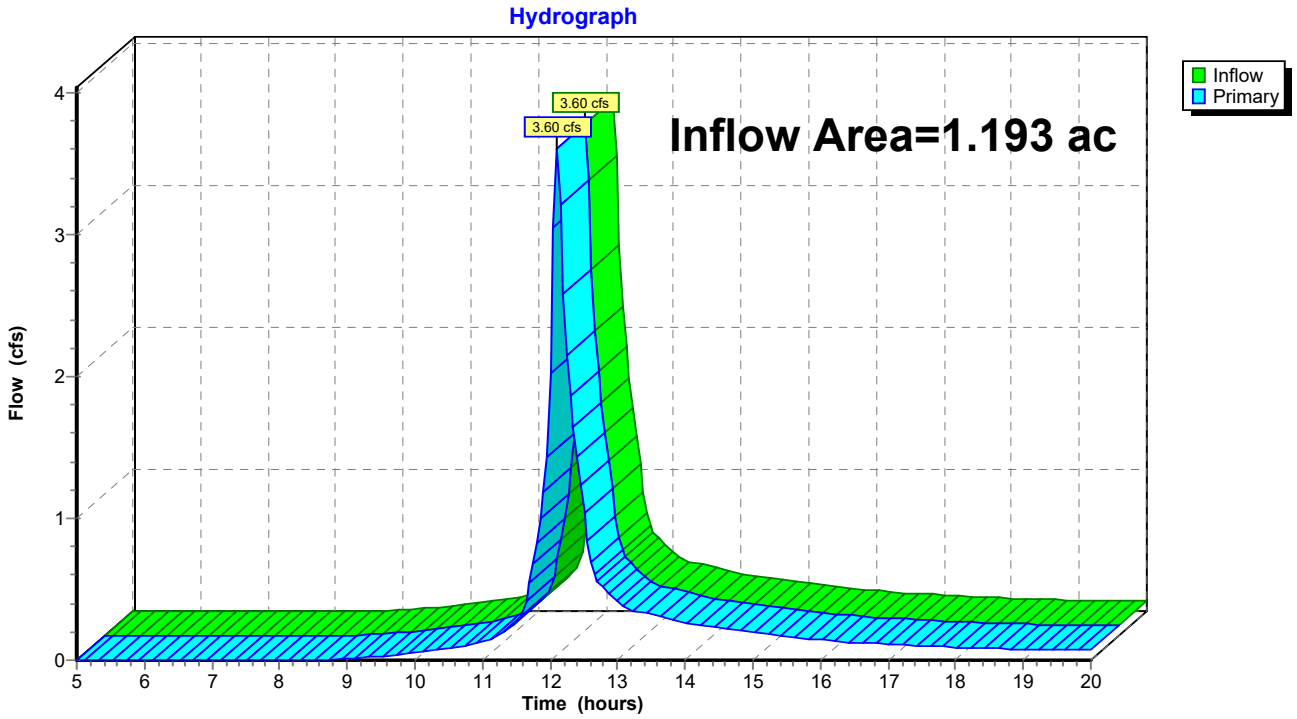


Summary for Link 5L: Pre

Inflow Area = 1.193 ac, 0.00% Impervious, Inflow Depth > 2.59" for 10-yr event
Inflow = 3.60 cfs @ 12.10 hrs, Volume= 0.258 af
Primary = 3.60 cfs @ 12.10 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 5L: Pre

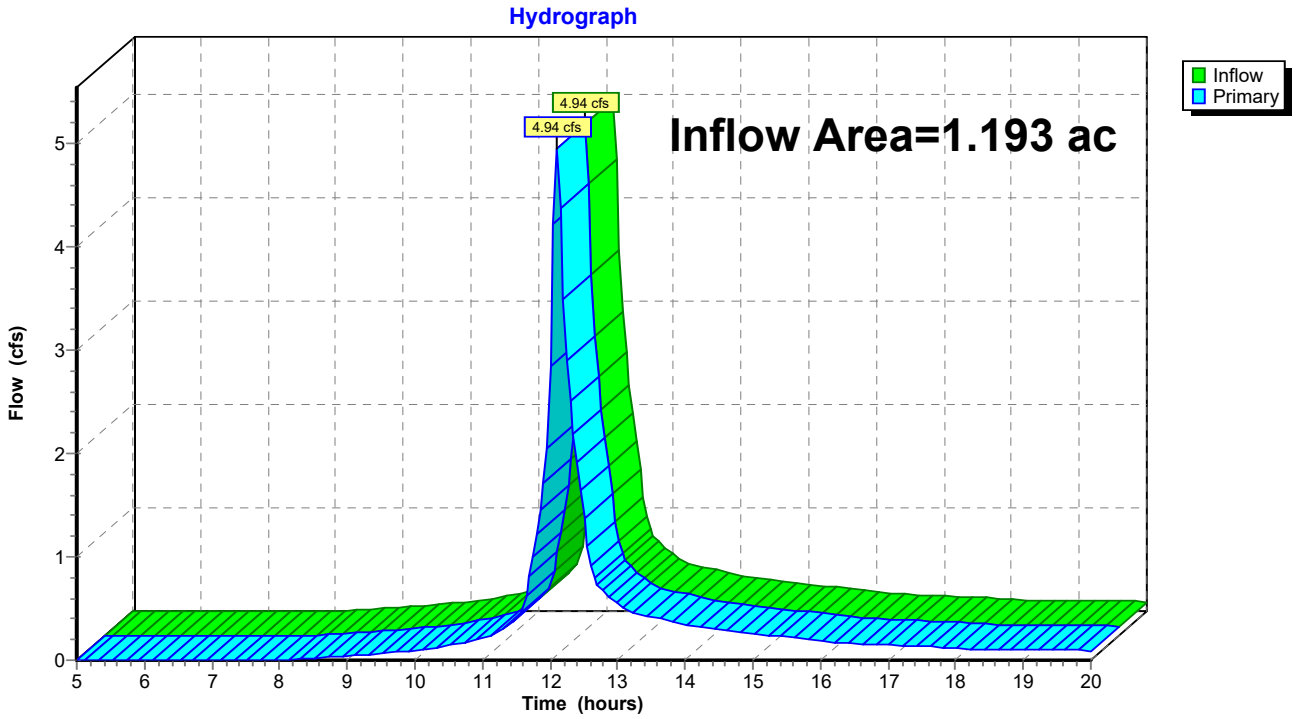


Summary for Link 5L: Pre

Inflow Area = 1.193 ac, 0.00% Impervious, Inflow Depth > 3.57" for 25-yr event
Inflow = 4.94 cfs @ 12.10 hrs, Volume= 0.355 af
Primary = 4.94 cfs @ 12.10 hrs, Volume= 0.355 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 5L: Pre

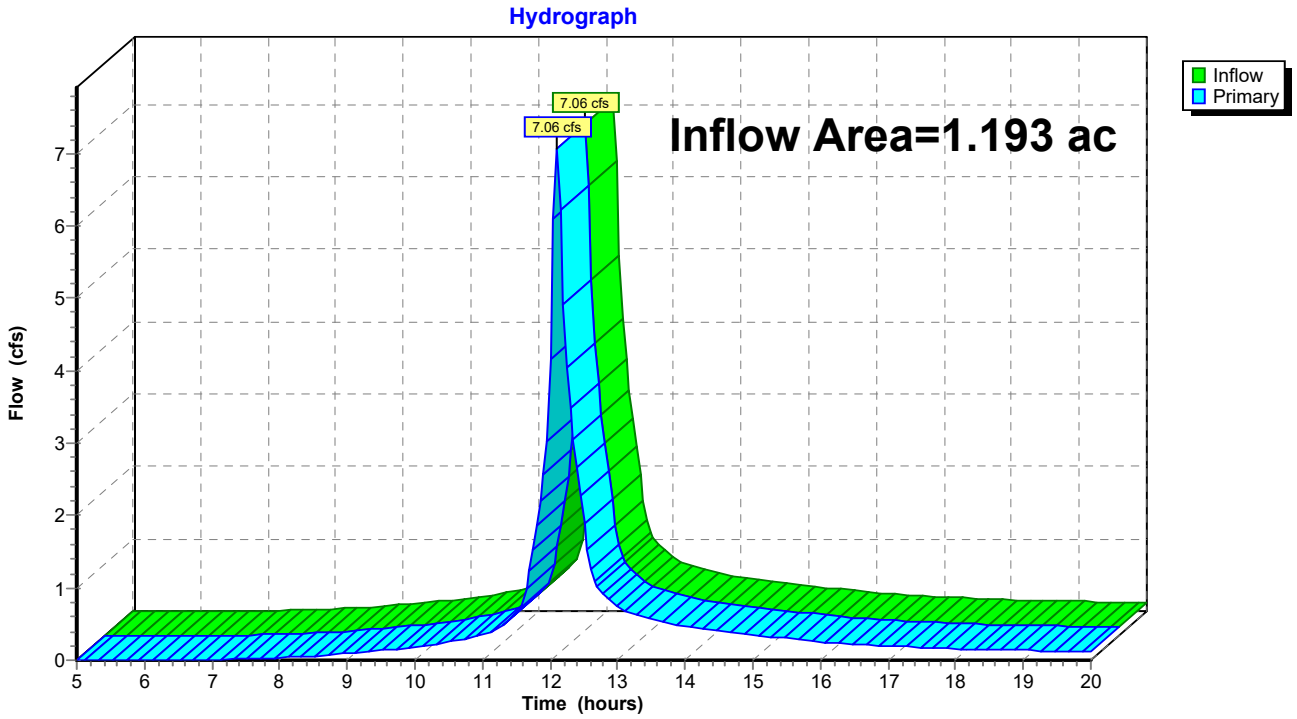


Summary for Link 5L: Pre

Inflow Area = 1.193 ac, 0.00% Impervious, Inflow Depth > 5.15" for 100-yr event
Inflow = 7.06 cfs @ 12.10 hrs, Volume= 0.512 af
Primary = 7.06 cfs @ 12.10 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 5L: Pre



Project Notes

Defined 10 rainfall events from NY-Westchester IDF

Summary for Pond 7P: Chambers

Inflow Area = 1.190 ac, 28.57% Impervious, Inflow Depth > 1.16" for 1-yr event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.115 af
Outflow = 1.11 cfs @ 12.21 hrs, Volume= 0.107 af, Atten= 35%, Lag= 6.9 min
Discarded = 0.02 cfs @ 12.21 hrs, Volume= 0.016 af
Primary = 1.09 cfs @ 12.21 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 124.89' @ 12.21 hrs Surf.Area= 0.023 ac Storage= 0.028 af

Plug-Flow detention time= 50.4 min calculated for 0.107 af (93% of inflow)
Center-of-Mass det. time= 25.3 min (830.1 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.00'	0.034 af	**37.08'W x 27.21'L x 5.50'H Field A** 0.127 af Overall - 0.041 af Embedded = 0.086 af x 40.0% Voids
#2A	123.75'	0.041 af	**ADS_StormTech MC-3500 d +Cap**x 15 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 15 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 115.00'
#2	Primary	123.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	128.05'	**1.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	124.45'	**10.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.02 cfs @ 12.21 hrs HW=124.89' (Free Discharge)
└**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=1.07 cfs @ 12.21 hrs HW=124.89' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.41 cfs @ 4.74 fps)
├**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└**4=Orifice/Grate** (Orifice Controls 0.65 cfs @ 2.25 fps)

Pond 7P: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

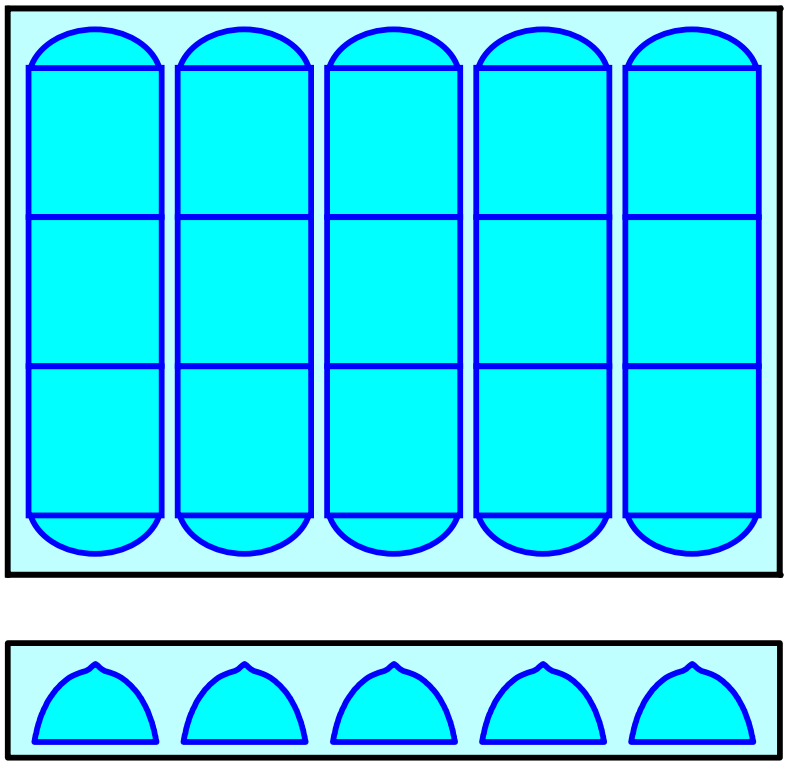
3 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 25.21' Row Length +12.0" End Stone x 2 = 27.21' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

15 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 1,798.3 cf Chamber Storage

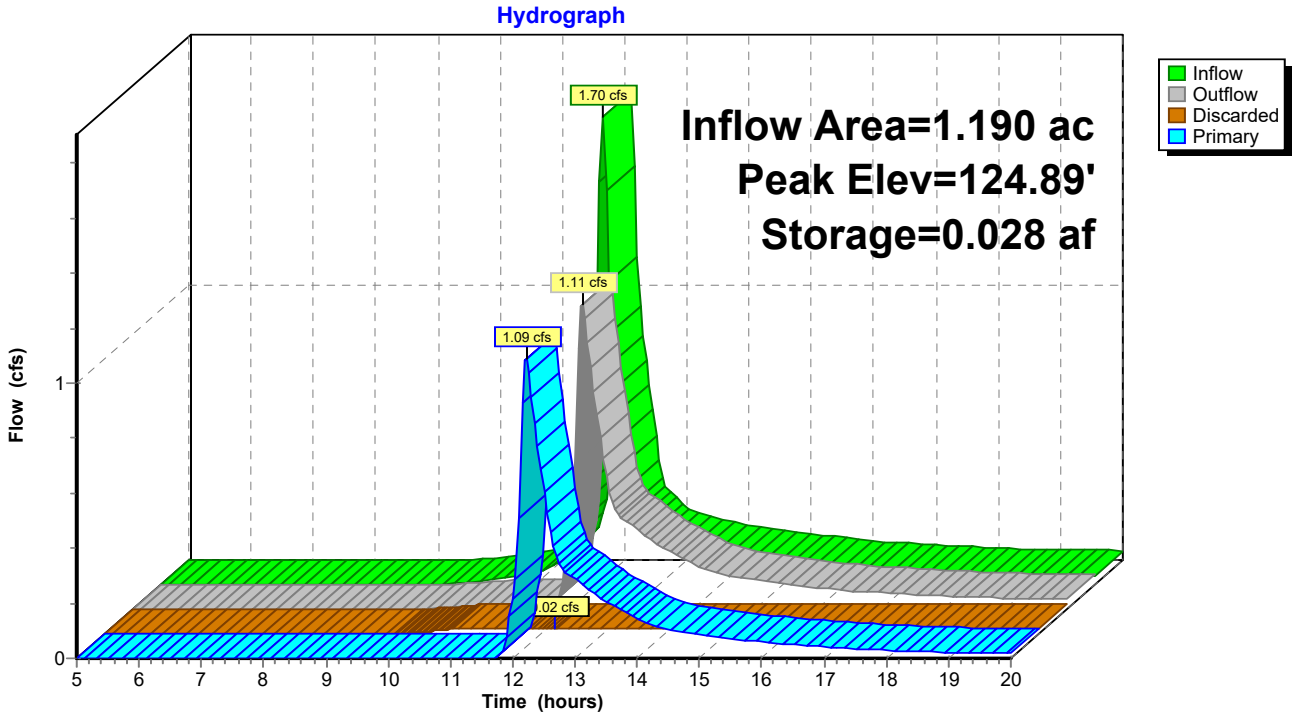
5,549.7 cf Field - 1,798.3 cf Chambers = 3,751.4 cf Stone x 40.0% Voids = 1,500.6 cf Stone Storage

Chamber Storage + Stone Storage = 3,298.9 cf = 0.076 af
Overall Storage Efficiency = 59.4%
Overall System Size = 27.21' x 37.08' x 5.50'

15 Chambers
205.5 cy Field
138.9 cy Stone



Pond 7P: Chambers



Summary for Pond 7P: Chambers

Inflow Area = 1.190 ac, 28.57% Impervious, Inflow Depth > 3.24" for 10-yr event
Inflow = 4.69 cfs @ 12.09 hrs, Volume= 0.321 af
Outflow = 3.56 cfs @ 12.17 hrs, Volume= 0.311 af, Atten= 24%, Lag= 4.5 min
Discarded = 0.02 cfs @ 12.17 hrs, Volume= 0.020 af
Primary = 3.53 cfs @ 12.17 hrs, Volume= 0.291 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.09' @ 12.17 hrs Surf.Area= 0.023 ac Storage= 0.048 af

Plug-Flow detention time= 30.3 min calculated for 0.310 af (97% of inflow)
Center-of-Mass det. time= 18.3 min (799.8 - 781.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.00'	0.034 af	**37.08'W x 27.21'L x 5.50'H Field A** 0.127 af Overall - 0.041 af Embedded = 0.086 af x 40.0% Voids
#2A	123.75'	0.041 af	**ADS_StormTech MC-3500 d +Cap**x 15 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 15 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 115.00'
#2	Primary	123.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	128.05'	**1.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	124.45'	**10.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.02 cfs @ 12.17 hrs HW=126.06' (Free Discharge)
└**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=3.49 cfs @ 12.17 hrs HW=126.06' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.62 cfs @ 7.06 fps)
├**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└**4=Orifice/Grate** (Orifice Controls 2.87 cfs @ 5.27 fps)

Pond 7P: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

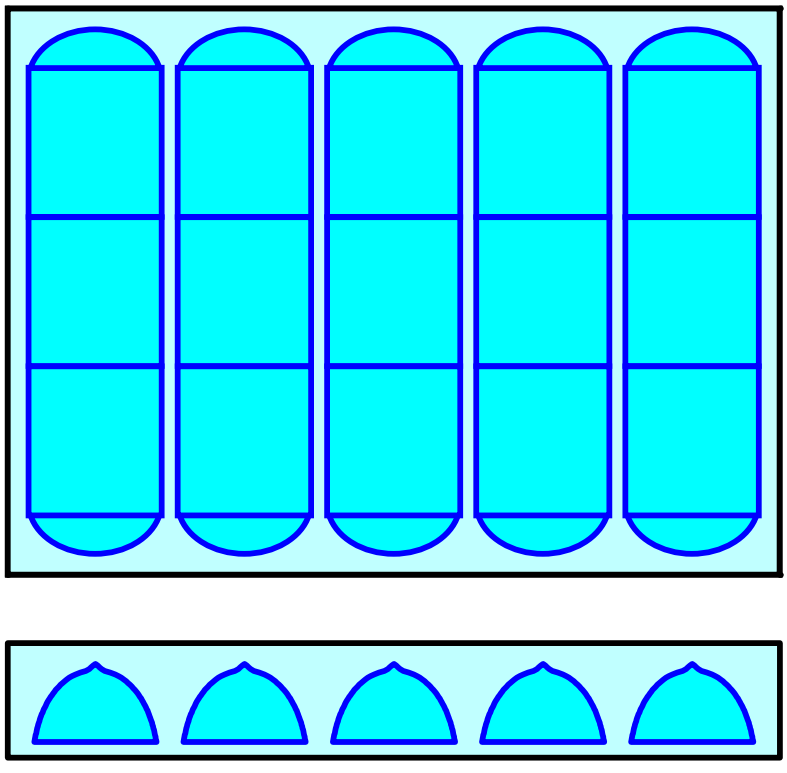
3 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 25.21' Row Length +12.0" End Stone x 2 = 27.21' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

15 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 1,798.3 cf Chamber Storage

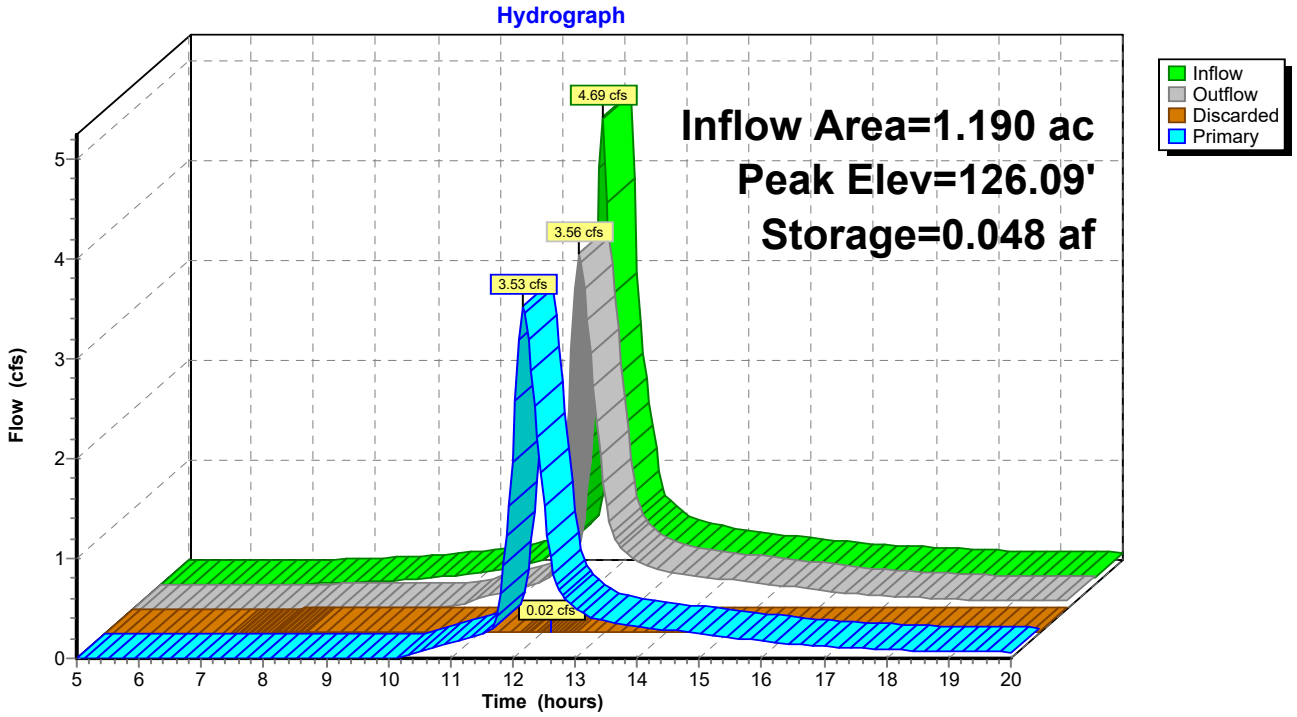
5,549.7 cf Field - 1,798.3 cf Chambers = 3,751.4 cf Stone x 40.0% Voids = 1,500.6 cf Stone Storage

Chamber Storage + Stone Storage = 3,298.9 cf = 0.076 af
Overall Storage Efficiency = 59.4%
Overall System Size = 27.21' x 37.08' x 5.50'

15 Chambers
205.5 cy Field
138.9 cy Stone



Pond 7P: Chambers



Summary for Pond 7P: Chambers

Inflow Area = 1.190 ac, 28.57% Impervious, Inflow Depth > 4.30" for 25-yr event
Inflow = 6.15 cfs @ 12.09 hrs, Volume= 0.426 af
Outflow = 4.49 cfs @ 12.17 hrs, Volume= 0.416 af, Atten= 27%, Lag= 4.8 min
Discarded = 0.03 cfs @ 12.17 hrs, Volume= 0.022 af
Primary = 4.47 cfs @ 12.17 hrs, Volume= 0.394 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.89' @ 12.17 hrs Surf.Area= 0.023 ac Storage= 0.060 af

Plug-Flow detention time= 27.1 min calculated for 0.414 af (97% of inflow)
Center-of-Mass det. time= 17.3 min (792.1 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.00'	0.034 af	**37.08'W x 27.21'L x 5.50'H Field A** 0.127 af Overall - 0.041 af Embedded = 0.086 af x 40.0% Voids
#2A	123.75'	0.041 af	**ADS_StormTech MC-3500 d +Cap**x 15 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 15 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 115.00'
#2	Primary	123.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	128.05'	**1.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	124.45'	**10.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.03 cfs @ 12.17 hrs HW=126.84' (Free Discharge)
└**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=4.41 cfs @ 12.17 hrs HW=126.84' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 8.24 fps)
├**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└**4=Orifice/Grate** (Orifice Controls 3.69 cfs @ 6.77 fps)

Pond 7P: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

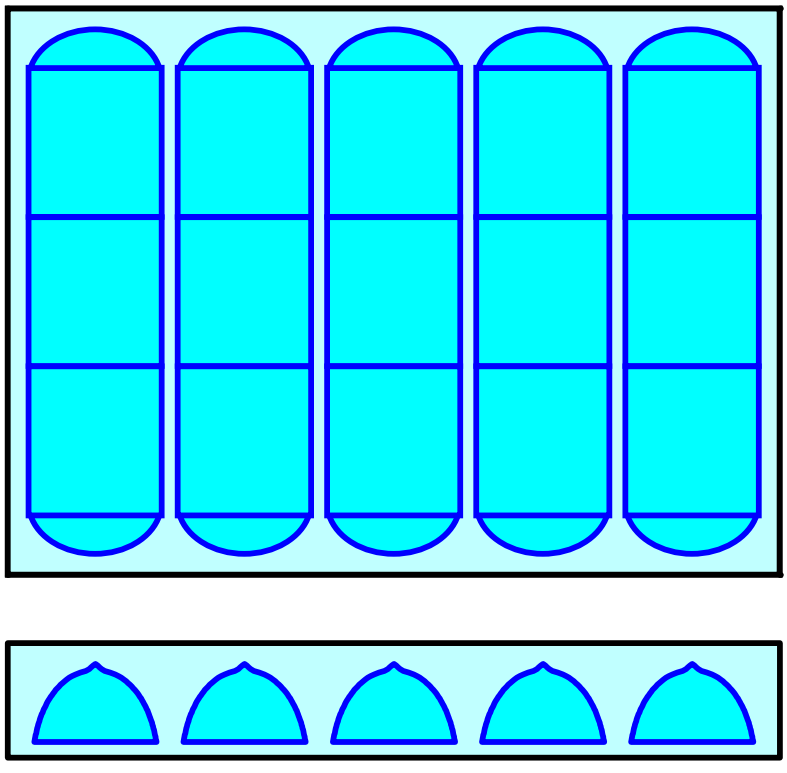
3 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 25.21' Row Length +12.0" End Stone x 2 = 27.21' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

15 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 1,798.3 cf Chamber Storage

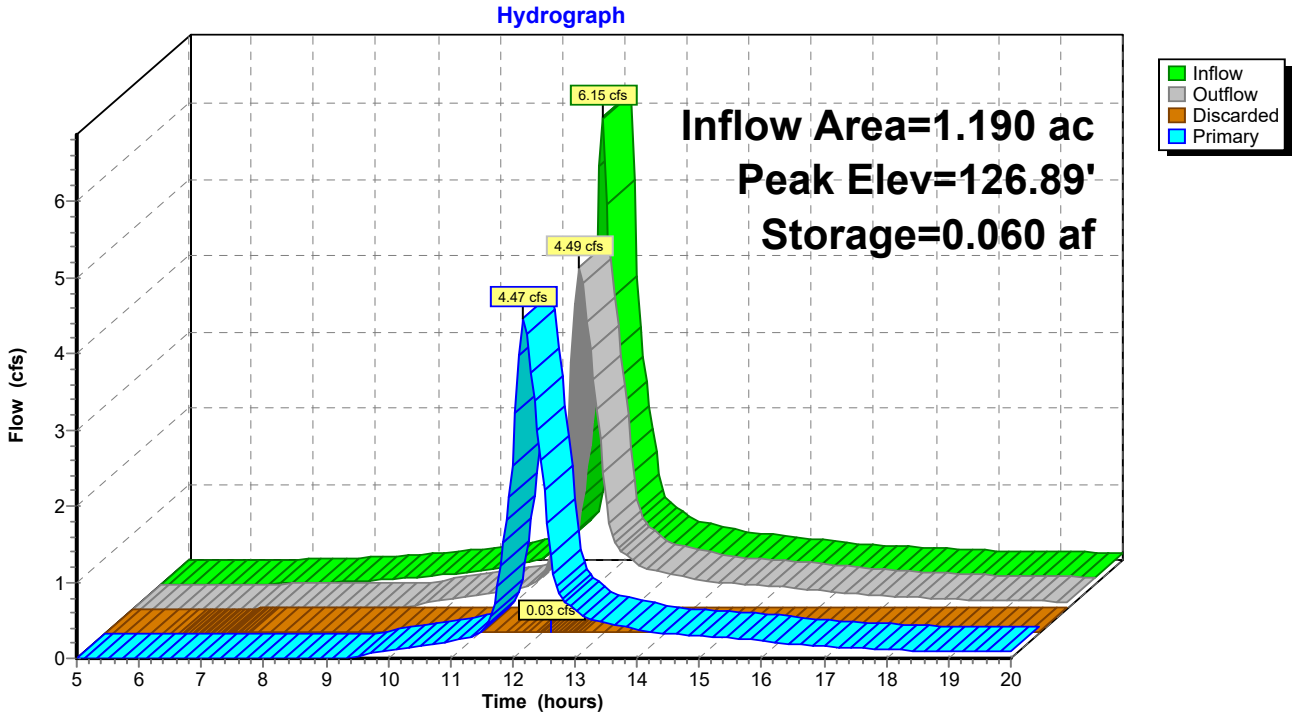
5,549.7 cf Field - 1,798.3 cf Chambers = 3,751.4 cf Stone x 40.0% Voids = 1,500.6 cf Stone Storage

Chamber Storage + Stone Storage = 3,298.9 cf = 0.076 af
Overall Storage Efficiency = 59.4%
Overall System Size = 27.21' x 37.08' x 5.50'

15 Chambers
205.5 cy Field
138.9 cy Stone



Pond 7P: Chambers



Summary for Pond 7P: Chambers

Inflow Area = 1.190 ac, 28.57% Impervious, Inflow Depth > 5.98" for 100-yr event
Inflow = 8.41 cfs @ 12.09 hrs, Volume= 0.593 af
Outflow = 7.06 cfs @ 12.16 hrs, Volume= 0.581 af, Atten= 16%, Lag= 3.8 min
Discarded = 0.03 cfs @ 12.16 hrs, Volume= 0.024 af
Primary = 7.03 cfs @ 12.16 hrs, Volume= 0.558 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 128.48' @ 12.16 hrs Surf.Area= 0.023 ac Storage= 0.076 af

Plug-Flow detention time= 23.9 min calculated for 0.580 af (98% of inflow)
Center-of-Mass det. time= 16.1 min (782.9 - 766.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.00'	0.034 af	**37.08'W x 27.21'L x 5.50'H Field A** 0.127 af Overall - 0.041 af Embedded = 0.086 af x 40.0% Voids
#2A	123.75'	0.041 af	**ADS_StormTech MC-3500 d +Cap**x 15 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 15 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 115.00'
#2	Primary	123.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	128.05'	**1.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	124.45'	**10.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.03 cfs @ 12.16 hrs HW=128.41' (Free Discharge)
└**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=6.89 cfs @ 12.16 hrs HW=128.43' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.89 cfs @ 10.23 fps)
├**3=Broad-Crested Rectangular Weir**(Weir Controls 1.03 cfs @ 1.80 fps)
└**4=Orifice/Grate** (Orifice Controls 4.96 cfs @ 9.09 fps)

Pond 7P: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

3 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 25.21' Row Length +12.0" End Stone x 2 = 27.21' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

15 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 1,798.3 cf Chamber Storage

5,549.7 cf Field - 1,798.3 cf Chambers = 3,751.4 cf Stone x 40.0% Voids = 1,500.6 cf Stone Storage

Chamber Storage + Stone Storage = 3,298.9 cf = 0.076 af
Overall Storage Efficiency = 59.4%
Overall System Size = 27.21' x 37.08' x 5.50'

15 Chambers
205.5 cy Field
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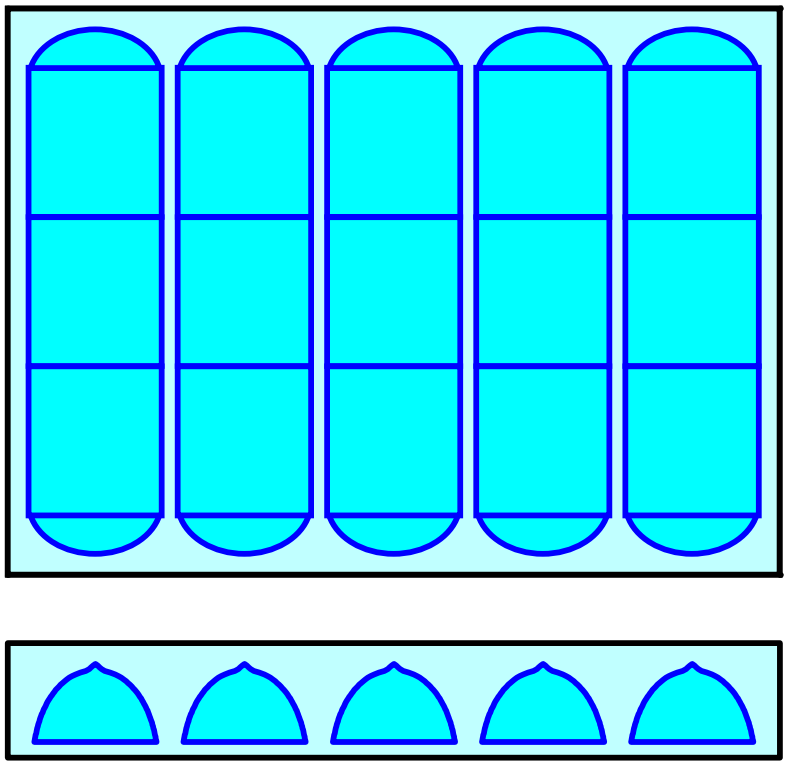
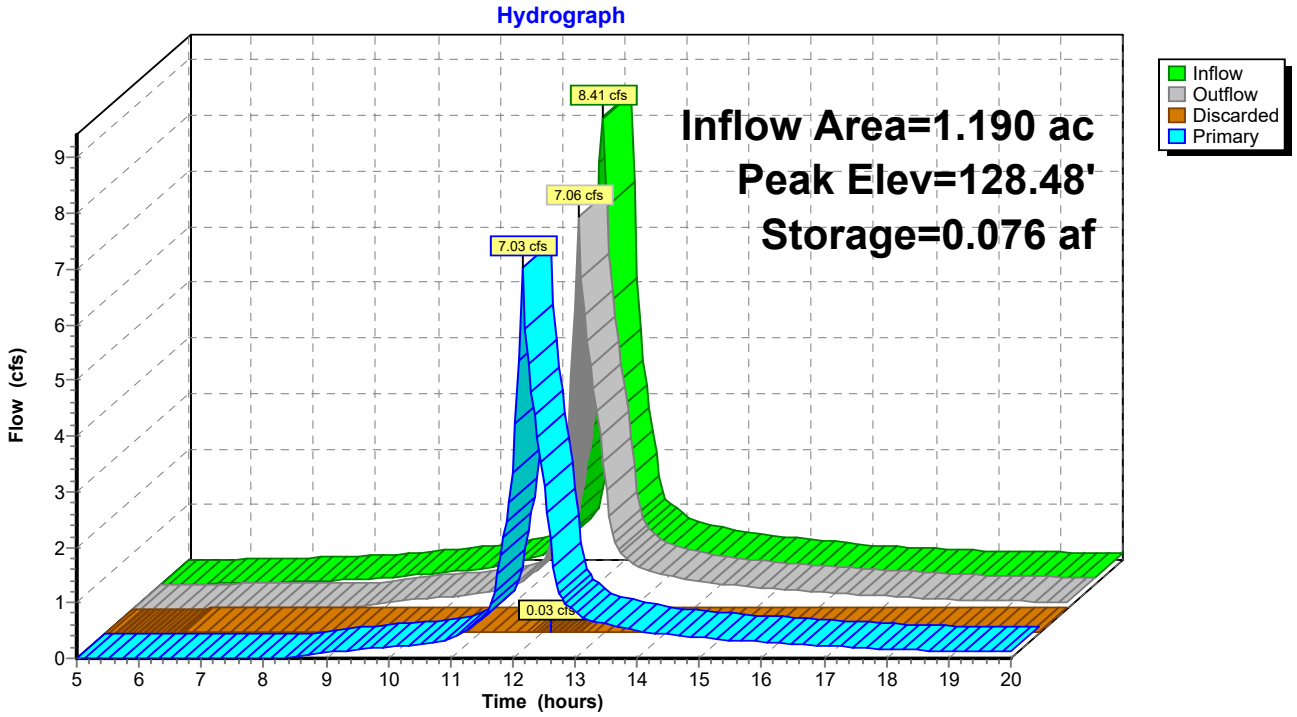


Pond 7P: Chambers



Summary for Pond 7P: Chambers

Inflow Area = 1.190 ac, 28.57% Impervious, Inflow Depth > 0.28" for Custom event
Inflow = 0.36 cfs @ 12.11 hrs, Volume= 0.028 af
Outflow = 0.07 cfs @ 12.74 hrs, Volume= 0.022 af, Atten= 80%, Lag= 37.5 min
Discarded = 0.02 cfs @ 12.74 hrs, Volume= 0.013 af
Primary = 0.05 cfs @ 12.74 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 123.90' @ 12.74 hrs Surf.Area= 0.023 ac Storage= 0.010 af

Plug-Flow detention time= 129.4 min calculated for 0.022 af (78% of inflow)
Center-of-Mass det. time= 70.5 min (908.3 - 837.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.00'	0.034 af	**37.08'W x 27.21'L x 5.50'H Field A** 0.127 af Overall - 0.041 af Embedded = 0.086 af x 40.0% Voids
#2A	123.75'	0.041 af	**ADS_StormTech MC-3500 d +Cap**x 15 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 15 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 115.00'
#2	Primary	123.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	128.05'	**1.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	124.45'	**10.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.02 cfs @ 12.74 hrs HW=123.90' (Free Discharge)
└**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.05 cfs @ 12.74 hrs HW=123.90' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.32 fps)
├**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 7P: Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

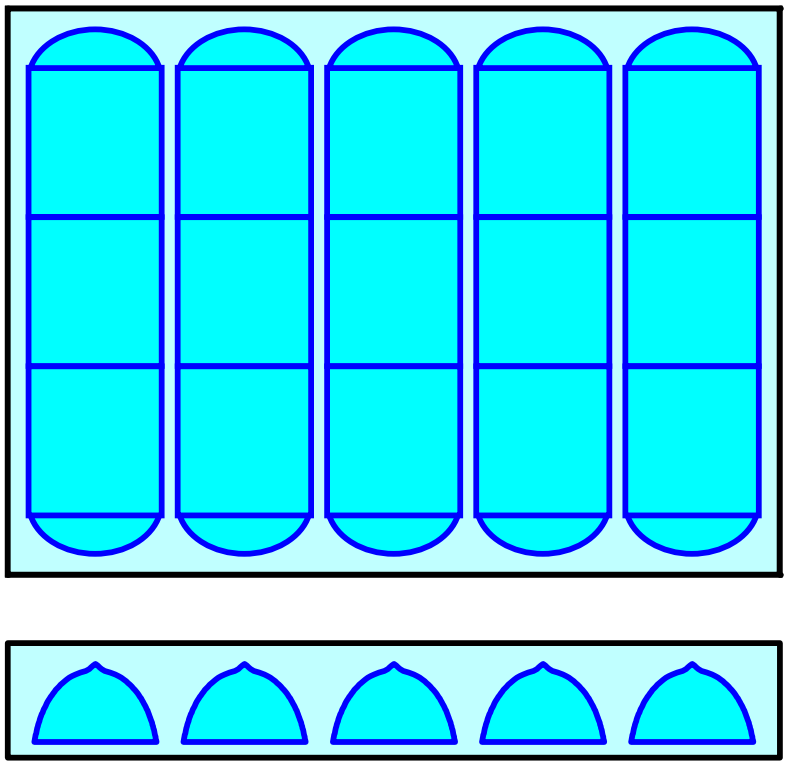
3 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 25.21' Row Length +12.0" End Stone x 2 = 27.21' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

15 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 1,798.3 cf Chamber Storage

5,549.7 cf Field - 1,798.3 cf Chambers = 3,751.4 cf Stone x 40.0% Voids = 1,500.6 cf Stone Storage

Chamber Storage + Stone Storage = 3,298.9 cf = 0.076 af
Overall Storage Efficiency = 59.4%
Overall System Size = 27.21' x 37.08' x 5.50'

15 Chambers
205.5 cy Field
138.9 cy Stone



Pond 7P: Chambers