PLAPC
PARISI LAW ASSOCIATES, P.C.

APPLICATION FOR
SPECIAL PERMIT
(Planning Board)
AND
PETITION FOR VARIANCE
(Zoning Board of Appeals)
FOR
WIRELESS COMMUNICATION FACILITY

SUPPLEMENT No. 1

Applicant:	**Vertex Tower Assets, LLC**	
Site Id:	**VT-MA-0090I**	
Property Address:	**1356 Ashfield Road, Conway, MA 01341**	
Tax Assessors:	**Facility:**	**409-013-001**
	Access:	**401-013-000**
Property Owner:	**Theodore H. Lefkowitz and Barbara Melville**	
Date:	**April 7, 2022**	

1. Drainage Report for 1356 Ashfield Road, Conway, MA 01341
2. Photos from other Vertex sites showing erosion control measures
3. Excerpts from EPA NPTES Form re erosion control (Appendix D and E)
4. Vertex Towers Assets, LLC Construction References
5. Example Form of Construction Control Affidavit (from Monterey, MA site)

Respectfully submitted,

Francis D. Parisi, Esq.
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Providence, RI 02903
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ProTerra
DESIGN GROUP, LLC

April 7, 2022

Conway Planning Board
Town Office Building
32 Main Street
Conway, MA 01341

RE: Wireless Communications Facility Drainage Summary for:
Applicant: Vertex Tower Assets, LLC
Site Name: Conway 2
Site Number: VT-MA-0090I
Site Address: 1356 Ashfield Road
Conway, MA 01341

Members of the Planning Board,

Vertex Tower Assets, LLC ("Applicant") proposes to construct an unmanned wireless telecommunications facility within in the northwestern corner of the property designated as Assessor's Parcel 409-013-001 located off Ashfield Road (MA 116) in Conway, Massachusetts. This stormwater drainage summary is intended to provide a description of the proposed project's stormwater and erosion control design for the telecommunications facility and gravel access driveway.

Background Information

The parcel is owned by Barbara M. Lefkowitz. Vehicular access to the property is off of Ashfield Road (MA 116) via an existing driveway curb cut and shared driveway located within Assessor's Parcel 409-013-000 (property with common ownership).

A wetland resource area was located within the property by Lucas Environmental, LLC during a site investigation on April 14, 2020. Wetland flags were re-established by project surveyors on 4-1-22 and confirmed during a stie walk with the Conway Conservation Commission on 4-5-2022.

- A 100-Foot BVW Buffer is associated with this wetland.

See Site Plans for vicinity map and existing conditions.

Proposed Improvements

Tower Compound & Access Improvements

The Applicant intends to construct the proposed unmanned wireless telecommunications facility within a 75'x75' square (5,625 SF) lease area in the northwestern portion of the parcel. Trees bordering the extents of the new facility will be minimally cleared. A proposed 2,067-foot long, 12-foot wide gravel access drive extension (18% maximum slope) through the property will be used for access to and from the facility. All vehicular access will utilize the existing curb cut off of Ashfield Road (MA 116) and will consist of one or two vehicle visits per carrier per month for inspections.

The facility itself will be constructed of a 60'x60' (3,600 SF) fenced-in compound with a surface consisting of 4-inch depth clean stone over filter fabric. The stone voids create a reservoir of 475± cubic feet which is equal to storage of 1.6± inches of rainfall. A galvanized steel monopole tower supporting antenna equipment will be placed on a reinforced concrete foundation below grade. Ground and tower space will be allotted for up to four carriers estimated to be about 1,085 SF of impervious area at full build-out. Development of the tower compound creates small, disconnected, impervious areas comparable to a single-family house with a garage. Clean, granular, structural fill will be installed to raise the compound surface elevation as shown on the site plans.

Stormwater Management Improvements

The project seeks to avoid drainage impacts to surrounding resources by directing sheet flow runoff through existing vegetated areas that promotes sediment removal through filtering, absorption, and settling as the velocity of flow and resultant energy is reduced. Structural Best Management Practices (BMPs) along the tower compound and gravel driveway include stone diaphragms, vegetated or riprap-lined swales, riprap check dams, ditch turnouts with level spreaders, plunge pools, culvert outlet energy dissipation, and water bars.

Erosion control will be provided between the improvements and the existing surrounding wooded or wetland resource areas. During construction, silt-laden stormwater runoff or discharge from dewatering operations (if necessary) will be prevented from exiting the construction area untreated. Siltation barriers consisting of a filter fabric silt fence, straw bales, or silt socks will be erected in advance of construction along the down-gradient edge of all disturbed areas and maintained through the construction period. The control of soil erosion during the construction period will be managed using BMPs as shown on the site plans.

Hydrologic & Hydraulic Method

The goal of the calculations is to mitigate erosive conditions generated by the addition of the 60'x60' fenced compound and 2,067-foot long, 12-foot wide gravel access driveway.

The HydroCAD Stormwater Modeling System computer program (version 10.00-24) by Applied Microcomputer Systems, Inc. is used to develop stormwater runoff rates and volumes for the proposed conditions at the project site. The HydroCAD software utilized the Rational Method to generate peak runoff flows based on rainfall intensity-duration data derived from NOAA Atlas 14. Information regarding the equations and calculation procedures utilized in HydroCAD will be made available upon request. A drainage basin map is attached.

An assumed minimum time of concentration of six minutes (conservative) was utilized to calculate peak flows for proposed conditions.

Driveway Drainage Analysis

Because of the relatively small stormwater flows expected throughout the site, a design storm for the 25-year occurrence interval was used for the design of the structural BMPs

along the proposed access driveway. This storm event meets or exceeds MA DOT guidance for design of open channels and storm drain systems for rural local collectors and exceeds that for general driveway standards. The 25 year event is conservative for a driveway design and the results of calculations show additional capacity is available in the BMP's proposed. See summary in Table 1 below and attached calculation spreadsheets for reference.

Table 1: Driveway Swale Flow Rates

Drainage Sub-Catchment Area	25 – Year Flow Rates (CFS) (For Swale Capacity)
P-1 (Driveway – STA. 4+00 Right)	1.15
P-2 (Driveway – STA. 6+50 Right)	0.18
P-3 (Driveway – STA. 6+50 Left)	0.92
P-4 (Driveway – STA. 12+30 Right)	0.13
P-5 (Driveway – STA. 14+80 Right)	0.14
P-6 (Driveway – STA. 14+80 Left)	0.44
P-7 (Driveway – STA. 16+50 Right/Left)	0.96
P-8 (Driveway – STA. 18+00 Right/Left)	0.17
P-9 (Driveway – STA. 20+30 Left)	0.49

Stormwater generated along the driveway will be collected within vegetated or riprap-lined swales along the sides of the driveway. Each swale is sized to contain the 25-year storm event with 1-foot of freeboard. The swales will convey stormwater runoff to low points at locations where the topography allows for ditch turnouts with level spreaders or plunge pools. These BMPs are constructed at zero grade across the slope and consist of riprap stone to disperse or spread concentrated flow thinly over the receiving area. Stormwater flows are slowed and spread out to reduce potential for erosion in the surrounding wooded areas. See attached swale capacity and plunge pool / level spreader calculations.

The design approach utilized on this site is similar to that of the Vertex tower recently approved on South Deerfield Road (Rt 116) in Conway. Multiple non-point source turn-outs with low flow spreaders have been incorporated as opposed to a larger basin structure with piped discharge. These turnouts have also been placed outside of wetland buffers to provide sufficient filter area for the stormwater. We believe that this approach is

best suited for the site based upon the linear nature of the project, limited impervious surfaces, and the terrain involved. It also avoids the tree clearing associated with a larger central basin and concentration of runoff into a point-source. The approach was developed during the South Deerfield Road (Rt 116) conservation commission permitting process based upon feedback and consultation from MA DEP reviewers.

Along the driveway, water bars are placed in accordance with industry standards and published guidelines dependent on the slope of the driveway. These water bars will direct stormwater flows into the vegetated or riprap lined swales to help reduce the amount of direct stormwater flow down the driveway and prevent washout. See Site Plans for locations.

Riprap check dams within the swales are also placed in accordance with industry standards and published guidelines dependent on the swale longitudinal slope. The check dams provide a mechanism to slow stormwater flow down the swale and reduce the erosive potential of the water. See Site Plans for locations.

Summary and Conclusion

Based on the scope of the proposed improvements (<6% of the entire property), limited vehicular access, and small disconnected areas of impervious surface at the compound, it is our opinion the Applicant has provided adequate BMPs to control stormwater generated by the tower compound and gravel access driveway. Stormwater management associated with the compound and access drive will provide BMPs for sheet flow runoff into the existing vegetated areas to promote sediment removal through filtering, absorption, and settling as the velocity and resultant energy is reduced. The compound stone surface will also provide 475± cubic feet of reservoir storage to help mitigate runoff volume. A combined series of ditch turnouts or plunge pools with level spreaders and approximately 1,560 linear feet of vegetated or riprap-lined swales collect, convey, and disperse stormwater along the driveway through the site. In our opinion, the limited stormwater runoff generated by the telecommunications facility will not have a negative impact on the adjacent wetlands and/or abutting properties.

If you have any questions or need further information, please do not hesitate to call us at (413) 320-4918.

Sincerely,
ProTerra Design Group, LLC

Jesse Moreno, PE
Digitally signed by Jesse Moreno, PE
Date: 2022.04.07 11:01:59 -04'00'

Jesse Moreno, PE
Managing Partner
Enclosures

Reference Tables & Figures

NOAA Atlas 14, Volume 10, Version 3
Location name: Conway, Massachusetts, USA*
Latitude: 42.5175°, Longitude: -72.7427°
Elevation: 1026.53 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	3.85 (3.04-4.87)	4.50 (3.54-5.70)	5.57 (4.36-7.07)	6.46 (5.02-8.22)	7.67 (5.75-10.1)	8.59 (6.31-11.6)	9.54 (6.76-13.2)	10.5 (7.13-15.0)	11.9 (7.73-17.6)	12.9 (8.20-19.5)
10-min	2.73 (2.15-3.45)	3.19 (2.51-4.04)	3.95 (3.08-5.01)	4.57 (3.55-5.83)	5.43 (4.07-7.18)	6.09 (4.47-8.20)	6.76 (4.79-9.38)	7.46 (5.05-10.7)	8.42 (5.47-12.4)	9.17 (5.80-13.8)
15-min	2.14 (1.68-2.71)	2.50 (1.96-3.17)	3.09 (2.42-3.92)	3.58 (2.79-4.57)	4.26 (3.20-5.63)	4.77 (3.50-6.43)	5.30 (3.76-7.36)	5.85 (3.96-8.36)	6.60 (4.29-9.74)	7.19 (4.55-10.8)
30-min	1.49 (1.17-1.89)	1.75 (1.37-2.21)	2.16 (1.69-2.74)	2.50 (1.95-3.19)	2.97 (2.23-3.93)	3.33 (2.45-4.49)	3.70 (2.62-5.14)	4.09 (2.77-5.85)	4.62 (3.00-6.82)	5.04 (3.19-7.58)
60-min	0.958 (0.753-1.21)	1.12 (0.880-1.42)	1.39 (1.08-1.76)	1.61 (1.25-2.05)	1.91 (1.43-2.53)	2.14 (1.57-2.89)	2.38 (1.69-3.30)	2.63 (1.78-3.75)	2.97 (1.93-4.38)	3.24 (2.05-4.87)
2-hr	0.610 (0.482-0.766)	0.716 (0.566-0.898)	0.888 (0.699-1.12)	1.03 (0.806-1.31)	1.23 (0.928-1.62)	1.38 (1.02-1.85)	1.53 (1.10-2.12)	1.70 (1.15-2.41)	1.94 (1.27-2.85)	2.14 (1.36-3.19)
3-hr	0.465 (0.370-0.581)	0.547 (0.434-0.685)	0.681 (0.538-0.854)	0.792 (0.622-1.00)	0.945 (0.718-1.24)	1.06 (0.788-1.42)	1.18 (0.850-1.64)	1.32 (0.896-1.86)	1.51 (0.987-2.21)	1.67 (1.07-2.49)
6-hr	0.292 (0.234-0.363)	0.346 (0.276-0.430)	0.434 (0.346-0.541)	0.507 (0.401-0.635)	0.608 (0.465-0.794)	0.683 (0.511-0.911)	0.763 (0.553-1.05)	0.856 (0.584-1.20)	0.991 (0.648-1.44)	1.10 (0.704-1.63)
12-hr	0.180 (0.145-0.221)	0.215 (0.173-0.265)	0.272 (0.218-0.337)	0.320 (0.255-0.398)	0.386 (0.296-0.500)	0.434 (0.327-0.576)	0.487 (0.355-0.669)	0.548 (0.375-0.764)	0.639 (0.420-0.920)	0.715 (0.458-1.05)
24-hr	0.107 (0.087-0.131)	0.130 (0.105-0.159)	0.167 (0.135-0.205)	0.198 (0.159-0.244)	0.240 (0.186-0.310)	0.272 (0.206-0.359)	0.306 (0.225-0.420)	0.347 (0.238-0.480)	0.409 (0.269-0.585)	0.462 (0.297-0.673)
2-day	0.062 (0.050-0.075)	0.076 (0.062-0.092)	0.099 (0.080-0.121)	0.118 (0.095-0.145)	0.144 (0.113-0.186)	0.164 (0.125-0.216)	0.185 (0.138-0.254)	0.212 (0.146-0.292)	0.254 (0.168-0.361)	0.291 (0.187-0.421)
3-day	0.045 (0.037-0.054)	0.055 (0.045-0.067)	0.073 (0.059-0.088)	0.087 (0.070-0.106)	0.106 (0.083-0.136)	0.121 (0.093-0.159)	0.137 (0.102-0.187)	0.157 (0.108-0.215)	0.189 (0.125-0.268)	0.218 (0.140-0.313)
4-day	0.036 (0.030-0.044)	0.045 (0.037-0.054)	0.058 (0.048-0.071)	0.070 (0.057-0.085)	0.085 (0.067-0.109)	0.097 (0.075-0.127)	0.110 (0.082-0.150)	0.126 (0.087-0.172)	0.152 (0.101-0.214)	0.175 (0.113-0.251)
7-day	0.025 (0.021-0.030)	0.030 (0.025-0.036)	0.039 (0.032-0.047)	0.046 (0.038-0.056)	0.056 (0.044-0.071)	0.063 (0.049-0.082)	0.071 (0.053-0.096)	0.081 (0.056-0.110)	0.097 (0.065-0.136)	0.111 (0.072-0.158)
10-day	0.020 (0.017-0.024)	0.024 (0.020-0.029)	0.031 (0.025-0.037)	0.036 (0.029-0.043)	0.043 (0.034-0.054)	0.048 (0.037-0.062)	0.054 (0.041-0.073)	0.061 (0.043-0.083)	0.072 (0.048-0.101)	0.081 (0.053-0.116)
20-day	0.015 (0.012-0.017)	0.017 (0.014-0.020)	0.020 (0.017-0.024)	0.023 (0.019-0.027)	0.027 (0.021-0.033)	0.029 (0.023-0.037)	0.032 (0.024-0.042)	0.036 (0.025-0.048)	0.041 (0.027-0.056)	0.044 (0.029-0.062)
30-day	0.012 (0.010-0.014)	0.014 (0.011-0.016)	0.016 (0.013-0.019)	0.018 (0.015-0.021)	0.020 (0.016-0.025)	0.023 (0.017-0.028)	0.025 (0.018-0.032)	0.027 (0.019-0.035)	0.029 (0.020-0.041)	0.032 (0.021-0.044)
45-day	0.010 (0.009-0.012)	0.011 (0.009-0.013)	0.013 (0.011-0.015)	0.014 (0.012-0.017)	0.016 (0.013-0.020)	0.017 (0.014-0.022)	0.019 (0.014-0.024)	0.020 (0.014-0.027)	0.022 (0.015-0.030)	0.023 (0.015-0.033)
60-day	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.014)	0.014 (0.011-0.017)	0.015 (0.011-0.018)	0.016 (0.012-0.020)	0.017 (0.012-0.022)	0.018 (0.012-0.025)	0.019 (0.013-0.027)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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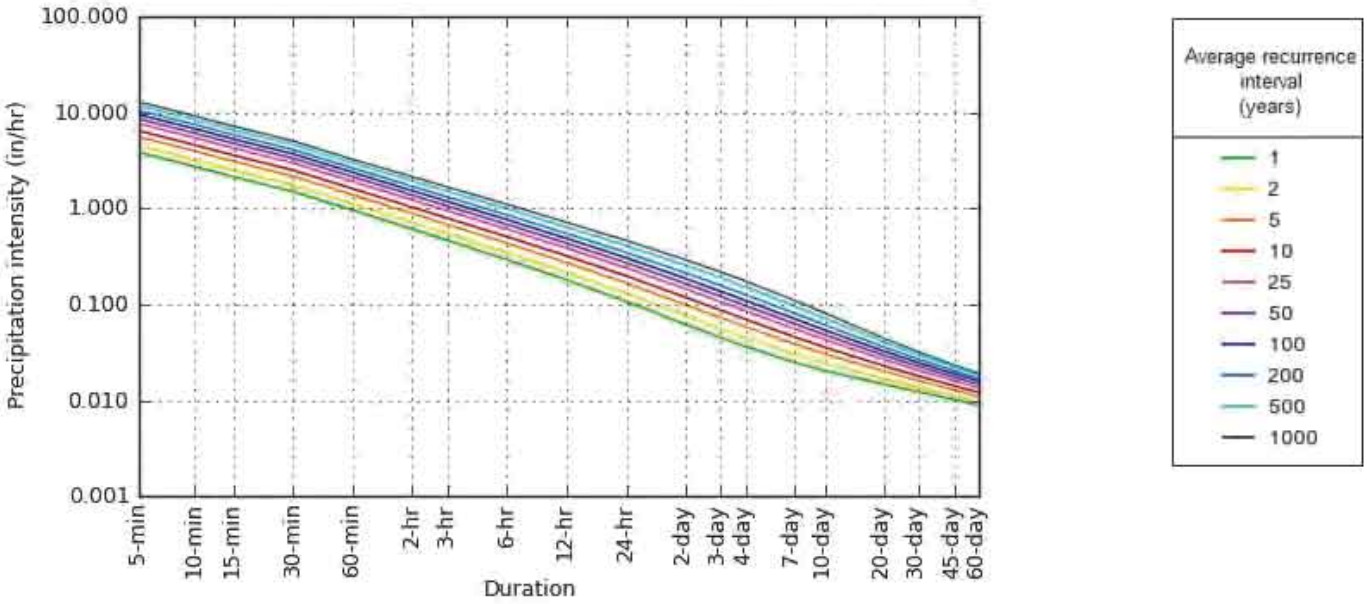
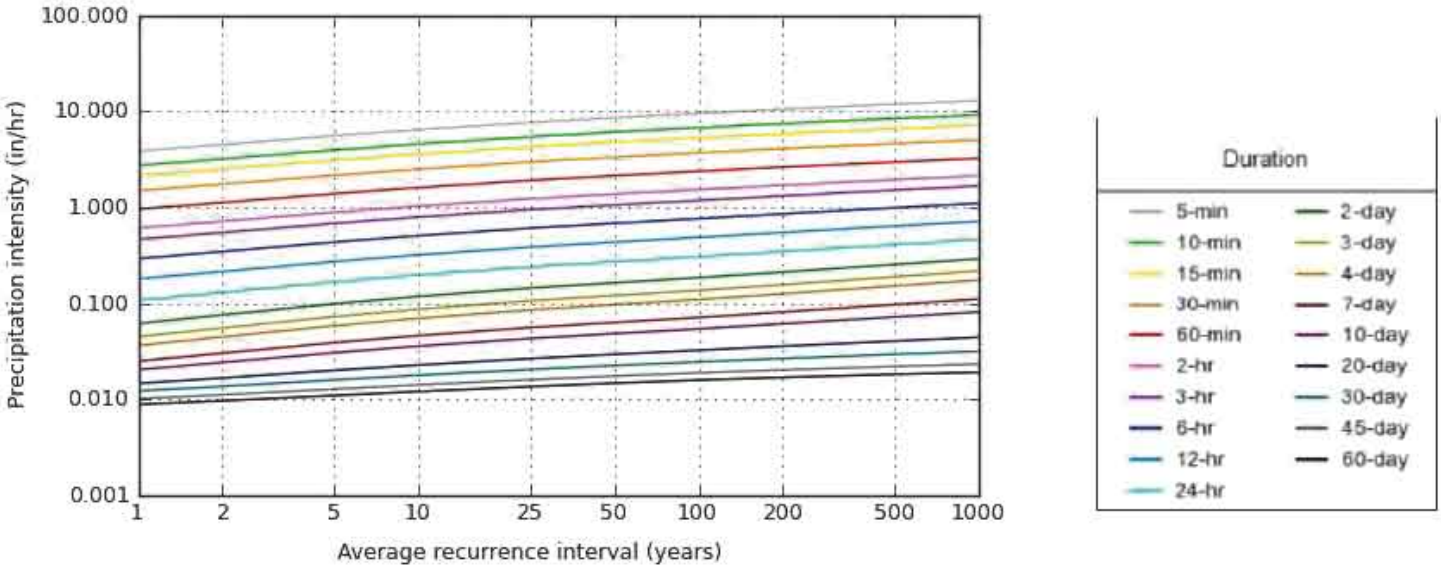
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 42.5175°, Longitude: -72.7427°





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Created (GMT): Wed Apr 6 17:04:17 2022

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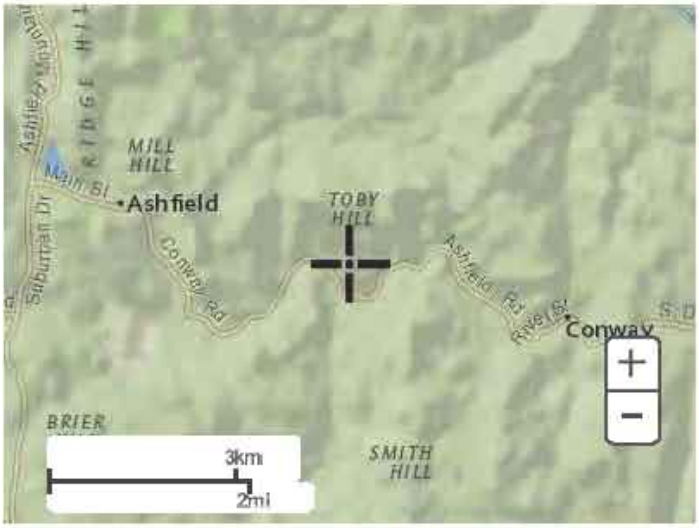
Maps & aerials

Small scale terrain



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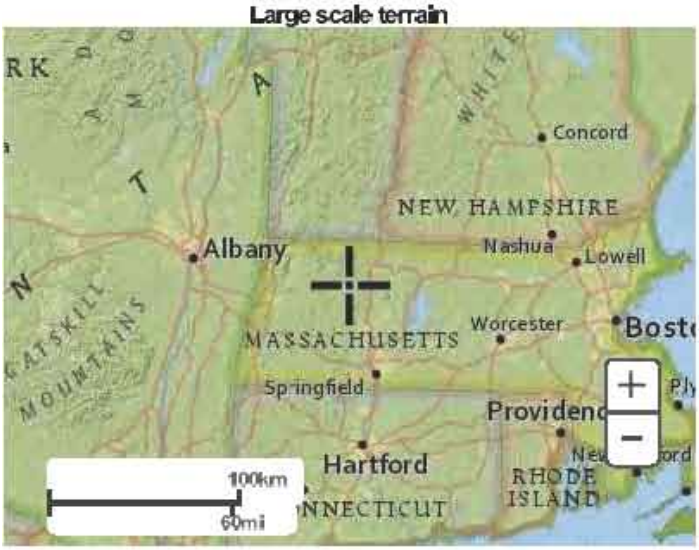
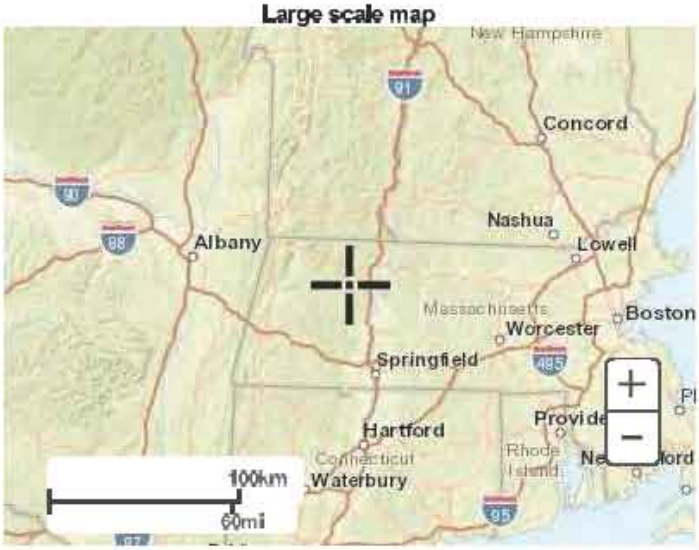


Large scale map



Large scale aerial

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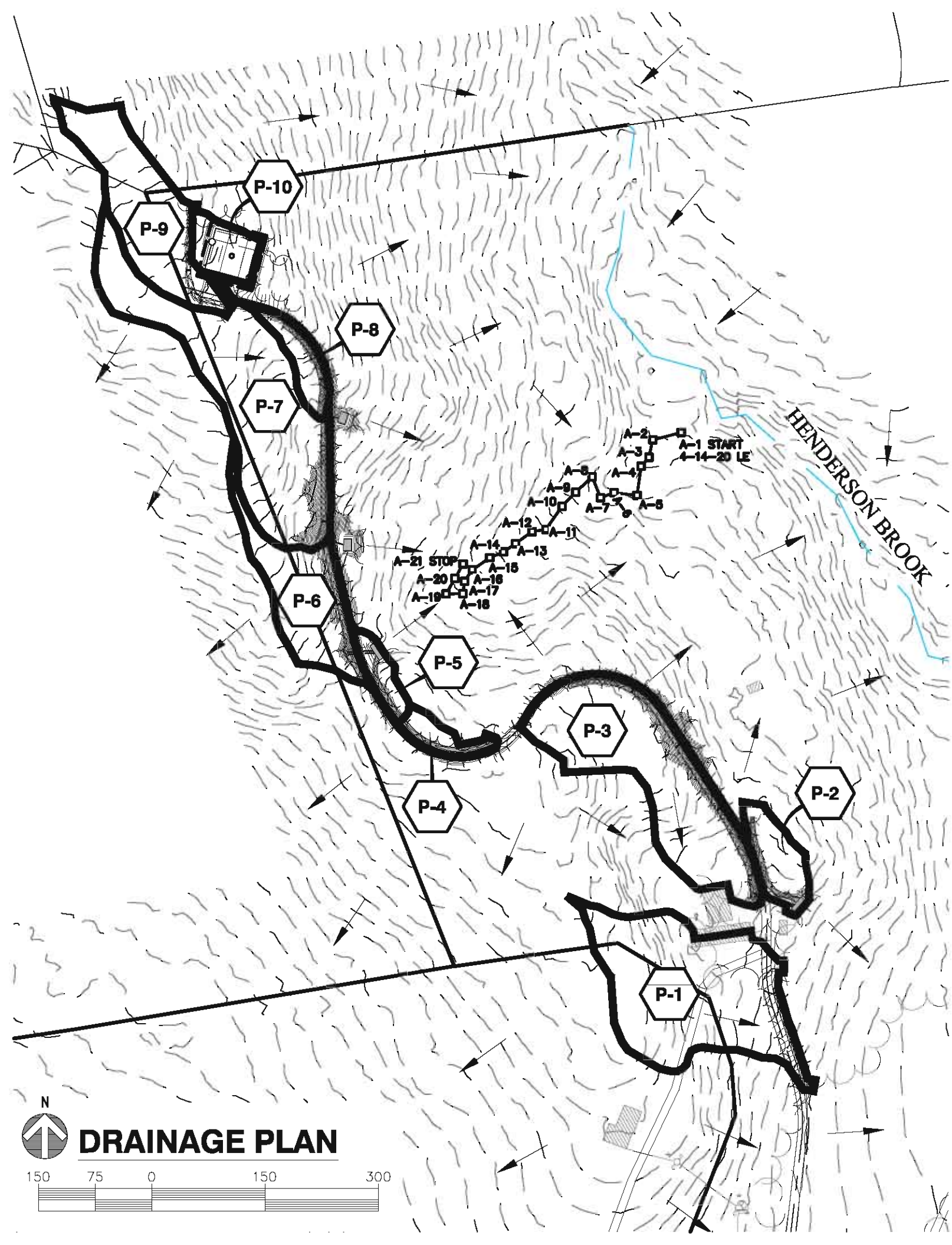
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov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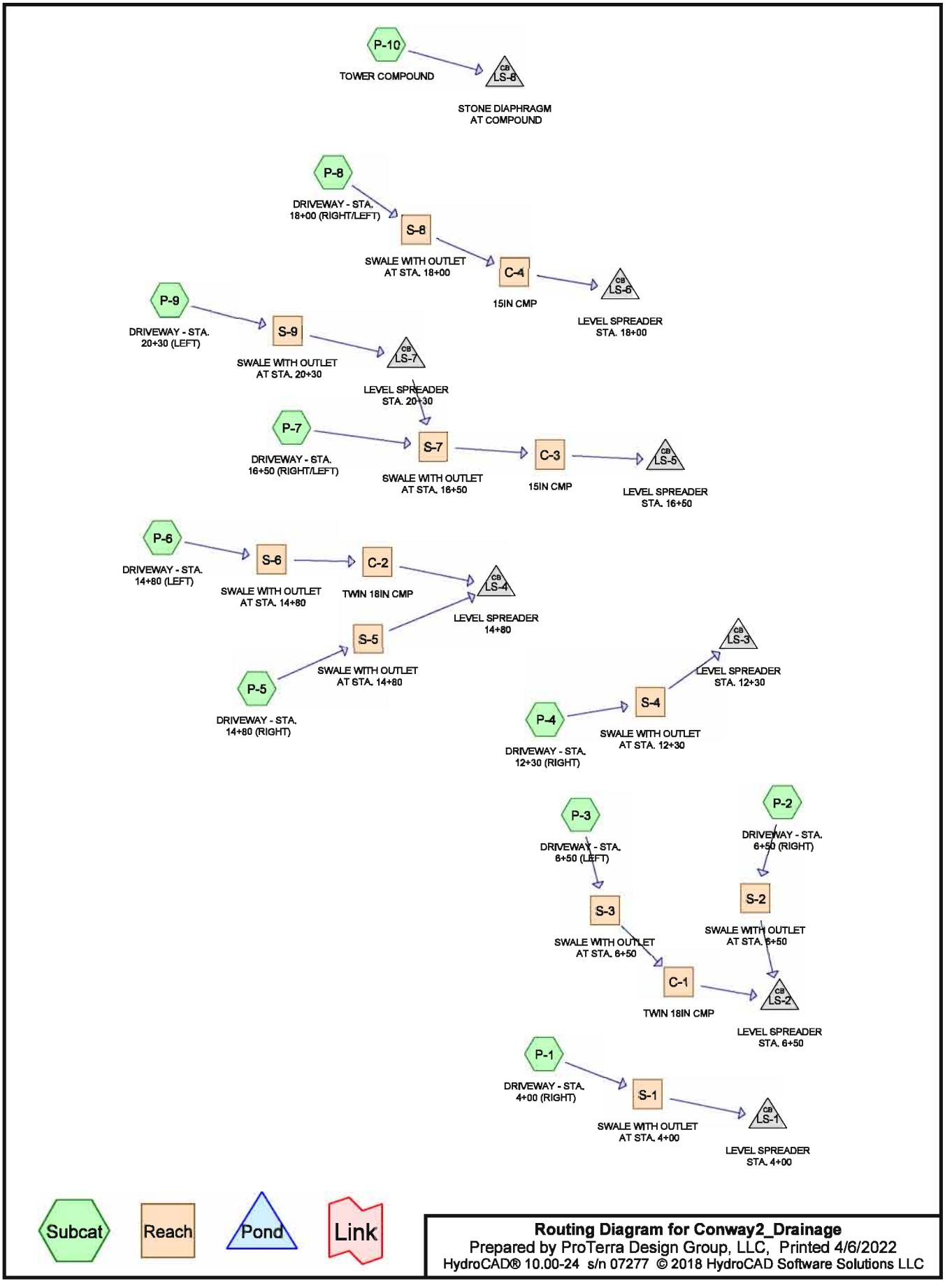
Hydrologic & Hydraulic Calculations



Routing Diagram for Conway2_Drainage

Prepared by ProTerra Design Group, LLC, Printed 4/6/2022

Time span=0.00-1.00 hrs, dt=0.01 hrs, 101 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: DRIVEWAY - STA. 4+00 Runoff Area=41,788 sf 0.00% Impervious Runoff Depth=0.12"
Tc=6.0 min C=0.17 Runoff=1.15 cfs 415 cf

Subcatchment P-10: TOWER COMPOUND Runoff Area=6,005 sf 0.00% Impervious Runoff Depth=0.27"
Tc=6.0 min C=0.39 Runoff=0.38 cfs 137 cf

Subcatchment P-2: DRIVEWAY - STA. 6+50 Runoff Area=7,520 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min C=0.15 Runoff=0.18 cfs 66 cf

Subcatchment P-3: DRIVEWAY - STA. 6+50 Runoff Area=37,812 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min C=0.15 Runoff=0.92 cfs 331 cf

Subcatchment P-4: DRIVEWAY - STA. 12+30 Runoff Area=3,813 sf 0.00% Impervious Runoff Depth=0.15"
Tc=6.0 min C=0.21 Runoff=0.13 cfs 47 cf

Subcatchment P-5: DRIVEWAY - STA. 14+80 Runoff Area=3,917 sf 0.00% Impervious Runoff Depth=0.15"
Tc=6.0 min C=0.22 Runoff=0.14 cfs 50 cf

Subcatchment P-6: DRIVEWAY - STA. 14+80 Runoff Area=18,142 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min C=0.15 Runoff=0.44 cfs 159 cf

Subcatchment P-7: DRIVEWAY - STA. 16+50 Runoff Area=45,505 sf 0.00% Impervious Runoff Depth=0.09"
Tc=6.0 min C=0.13 Runoff=0.96 cfs 345 cf

Subcatchment P-8: DRIVEWAY - STA. 18+00 Runoff Area=5,359 sf 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min C=0.20 Runoff=0.17 cfs 63 cf

Subcatchment P-9: DRIVEWAY - STA. 20+30 Runoff Area=23,347 sf 0.00% Impervious Runoff Depth=0.09"
Tc=6.0 min C=0.13 Runoff=0.49 cfs 177 cf

Reach C-1: TWIN 18IN CMP Avg. Flow Depth=0.25' Max Vel=1.98 fps Inflow=0.78 cfs 331 cf
18.0" Round Pipe x 2.00 n=0.025 L=52.0' S=0.0135 '/' Capacity=12.68 cfs Outflow=0.77 cfs 331 cf

Reach C-2: TWIN 18IN CMP Avg. Flow Depth=0.15' Max Vel=2.15 fps Inflow=0.41 cfs 159 cf
18.0" Round Pipe x 2.00 n=0.025 L=34.0' S=0.0294 '/' Capacity=18.74 cfs Outflow=0.40 cfs 159 cf

Reach C-3: 15IN CMP Avg. Flow Depth=0.39' Max Vel=3.94 fps Inflow=1.28 cfs 522 cf
15.0" Round Pipe n=0.025 L=30.0' S=0.0333 '/' Capacity=6.13 cfs Outflow=1.26 cfs 522 cf

Reach C-4: 15IN CMP Avg. Flow Depth=0.14' Max Vel=2.01 fps Inflow=0.16 cfs 63 cf
15.0" Round Pipe n=0.025 L=25.0' S=0.0280 '/' Capacity=5.62 cfs Outflow=0.16 cfs 63 cf

Reach S-1: SWALE WITH OUTLET AT Avg. Flow Depth=0.20' Max Vel=4.04 fps Inflow=1.15 cfs 415 cf
n=0.035 L=136.0' S=0.1195 '/' Capacity=48.86 cfs Outflow=1.09 cfs 415 cf

Reach S-2: SWALE WITH OUTLET AT STA. Avg. Flow Depth=0.07' Max Vel=2.09 fps Inflow=0.18 cfs 66 cf
n=0.035 L=138.0' S=0.1004 '/' Capacity=44.78 cfs Outflow=0.17 cfs 66 cf

Reach S-3: SWALE WITH OUTLET AT Avg. Flow Depth=0.15' Max Vel=3.89 fps Inflow=0.92 cfs 331 cf
n=0.035 L=408.0' S=0.1439 '/' Capacity=53.62 cfs Outflow=0.78 cfs 331 cf

Reach S-4: SWALE WITH OUTLET AT STA. Avg. Flow Depth=0.07' Max Vel=1.31 fps Inflow=0.13 cfs 47 cf
n=0.035 L=133.0' S=0.0376 '/' Capacity=27.41 cfs Outflow=0.11 cfs 47 cf

Reach S-5: SWALE WITH OUTLET AT STA. Avg. Flow Depth=0.06' Max Vel=2.03 fps Inflow=0.14 cfs 50 cf
n=0.035 L=93.0' S=0.1177 '/' Capacity=48.50 cfs Outflow=0.13 cfs 50 cf

Reach S-6: SWALE WITH OUTLET AT Avg. Flow Depth=0.11' Max Vel=2.97 fps Inflow=0.44 cfs 159 cf
n=0.035 L=147.0' S=0.1173 '/' Capacity=48.42 cfs Outflow=0.41 cfs 159 cf

Reach S-7: SWALE WITH OUTLET AT Avg. Flow Depth=0.20' Max Vel=4.58 fps Inflow=1.32 cfs 522 cf
n=0.035 L=158.0' S=0.1497 '/' Capacity=54.69 cfs Outflow=1.28 cfs 522 cf

Reach S-8: SWALE WITH OUTLET AT STA. Avg. Flow Depth=0.06' Max Vel=2.60 fps Inflow=0.17 cfs 63 cf
n=0.035 L=138.0' S=0.2014 '/' Capacity=63.45 cfs Outflow=0.16 cfs 63 cf

Reach S-9: SWALE WITH OUTLET AT Avg. Flow Depth=0.13' Max Vel=2.91 fps Inflow=0.49 cfs 177 cf
n=0.035 L=164.0' S=0.1006 '/' Capacity=44.84 cfs Outflow=0.45 cfs 177 cf

Pond LS-1: LEVEL SPREADER STA. 4+00 Peak Elev=864.58' Inflow=1.09 cfs 415 cf
Outflow=1.09 cfs 415 cf

Pond LS-2: LEVEL SPREADER STA. 6+50 Peak Elev=877.06' Inflow=0.90 cfs 397 cf
Outflow=0.90 cfs 397 cf

Pond LS-3: LEVEL SPREADER STA. 12+30 Peak Elev=945.02' Inflow=0.11 cfs 47 cf
Outflow=0.11 cfs 47 cf

Pond LS-4: LEVEL SPREADER 14+80 Peak Elev=940.04' Inflow=0.53 cfs 209 cf
Outflow=0.53 cfs 209 cf

Pond LS-5: LEVEL SPREADER STA. 16+50 Peak Elev=955.59' Inflow=1.26 cfs 522 cf
Outflow=1.26 cfs 522 cf

Pond LS-6: LEVEL SPREADER STA. 18+00 Peak Elev=979.02' Inflow=0.16 cfs 63 cf
Outflow=0.16 cfs 63 cf

Pond LS-7: LEVEL SPREADER STA. 20+30 Peak Elev=1,020.04' Inflow=0.45 cfs 177 cf
Outflow=0.45 cfs 177 cf

Pond LS-8: STONE DIAPHRAGM AT COMPOUND Peak Elev=1,022.37' Inflow=0.38 cfs 137 cf
Outflow=0.38 cfs 137 cf

Total Runoff Area = 193,208 sf Runoff Volume = 1,789 cf Average Runoff Depth = 0.11"
100.00% Pervious = 193,208 sf 0.00% Impervious = 0 sf

Summary for Subcatchment P-1: DRIVEWAY - STA. 4+00 (RIGHT)

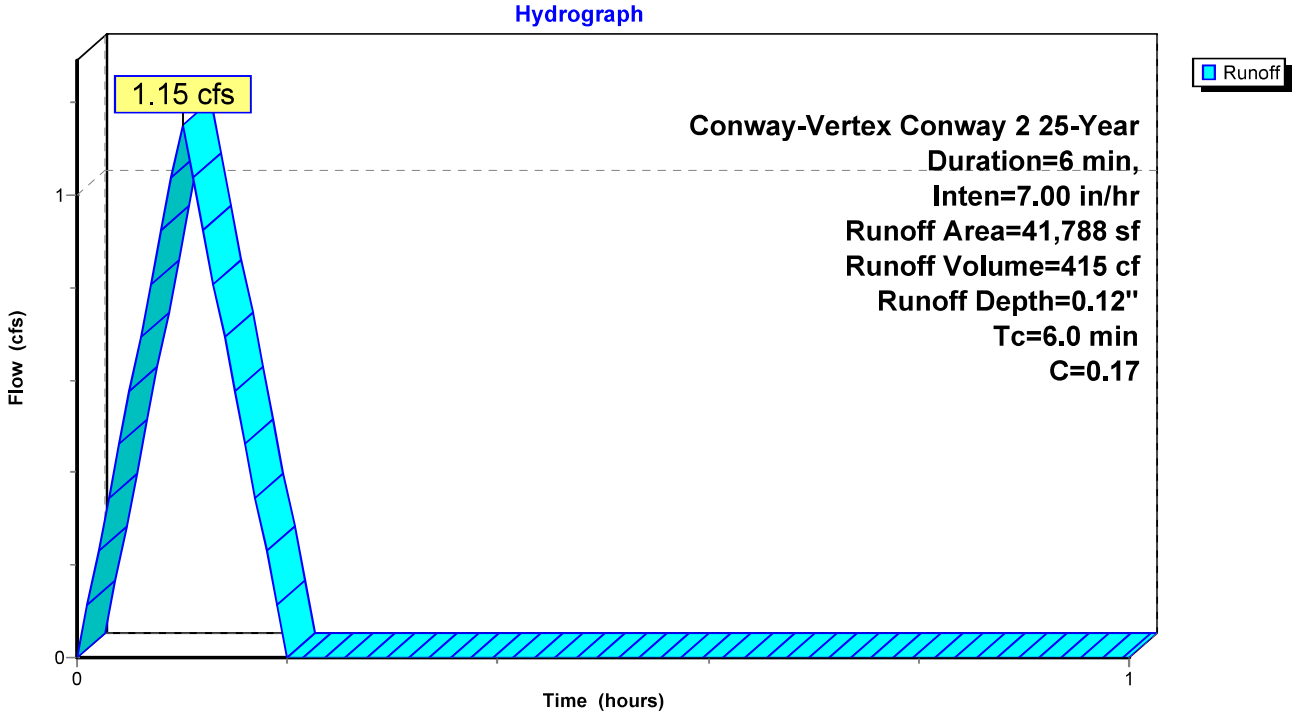
Runoff = 1.15 cfs @ 0.10 hrs, Volume= 415 cf, Depth= 0.12"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
1,000	0.88	Ex. Unconnected roofs, HSG B
4,785	0.18	>75% Grass cover, Good, HSG B
4,195	0.39	Gravel roads, HSG B
836	0.22	Riprap, HSG B
30,972	0.11	Woods, Good, HSG B
41,788	0.17	Weighted Average
41,788		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-1: DRIVEWAY - STA. 4+00 (RIGHT)



Summary for Subcatchment P-10: TOWER COMPOUND

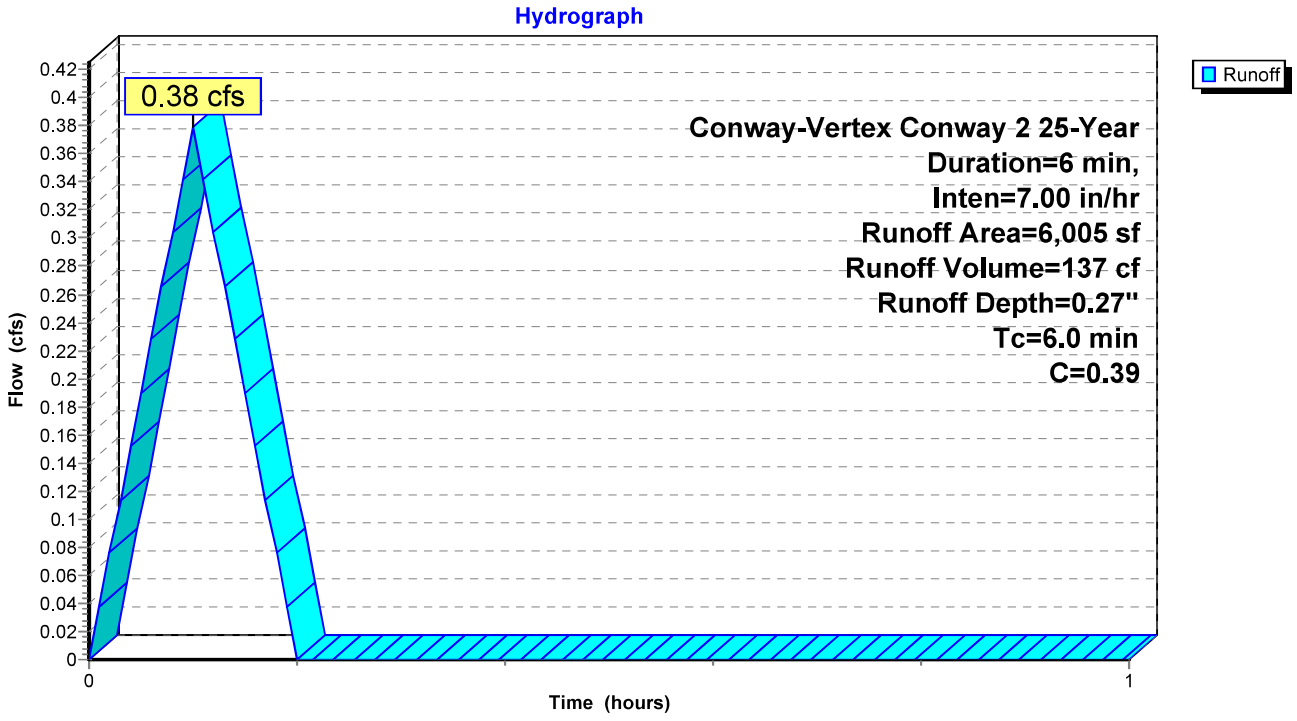
Runoff = 0.38 cfs @ 0.10 hrs, Volume= 137 cf, Depth= 0.27"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
1,085	0.88	Pr. Unconnected roofs, HSG B
2,168	0.18	>75% Grass cover, HSG B
2,516	0.39	Gravel roads, HSG B
60	0.22	Riprap, HSG B
176	0.11	Woods, Good, HSG B
6,005	0.39	Weighted Average
6,005		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-10: TOWER COMPOUND



Summary for Subcatchment P-2: DRIVEWAY - STA. 6+50 (RIGHT)

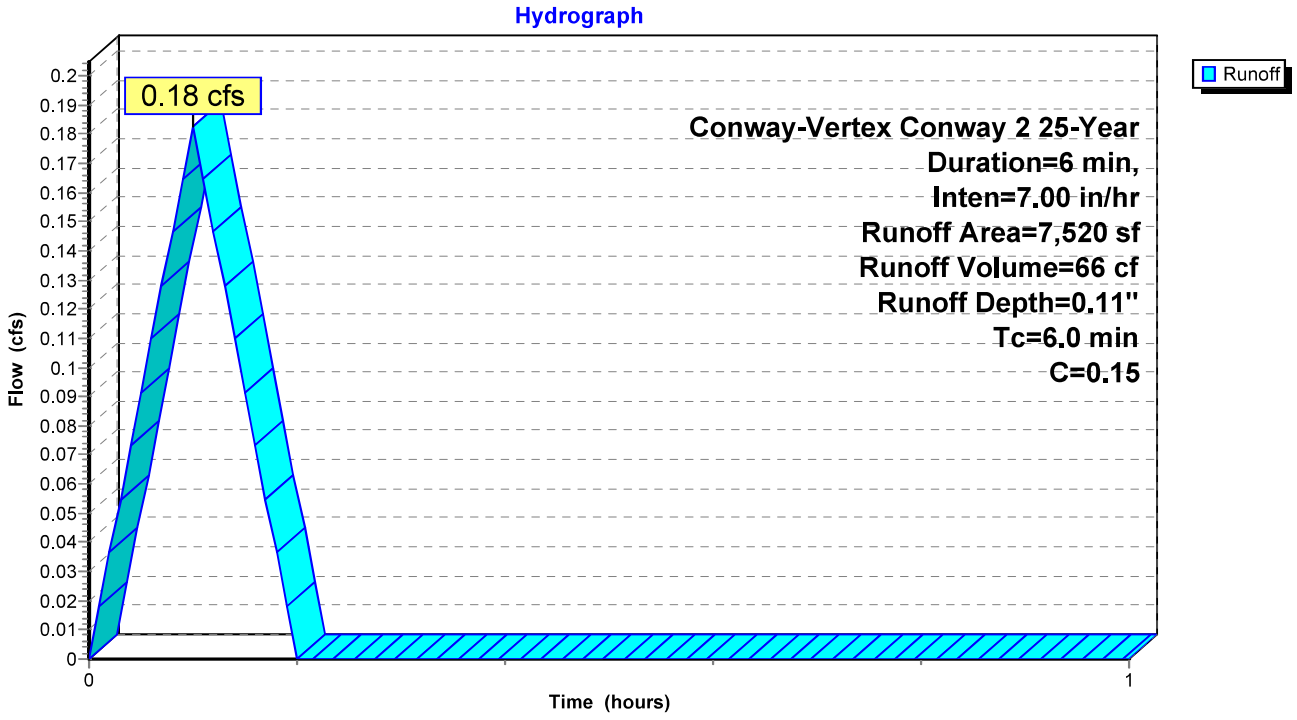
Runoff = 0.18 cfs @ 0.10 hrs, Volume= 66 cf, Depth= 0.11"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
2,428	0.18	>75% Grass cover, Good, HSG B
462	0.39	Gravel roads, HSG B
200	0.22	Riprap, HSG B
4,430	0.11	Woods, Good, HSG B
7,520	0.15	Weighted Average
7,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-2: DRIVEWAY - STA. 6+50 (RIGHT)



Summary for Subcatchment P-3: DRIVEWAY - STA. 6+50 (LEFT)

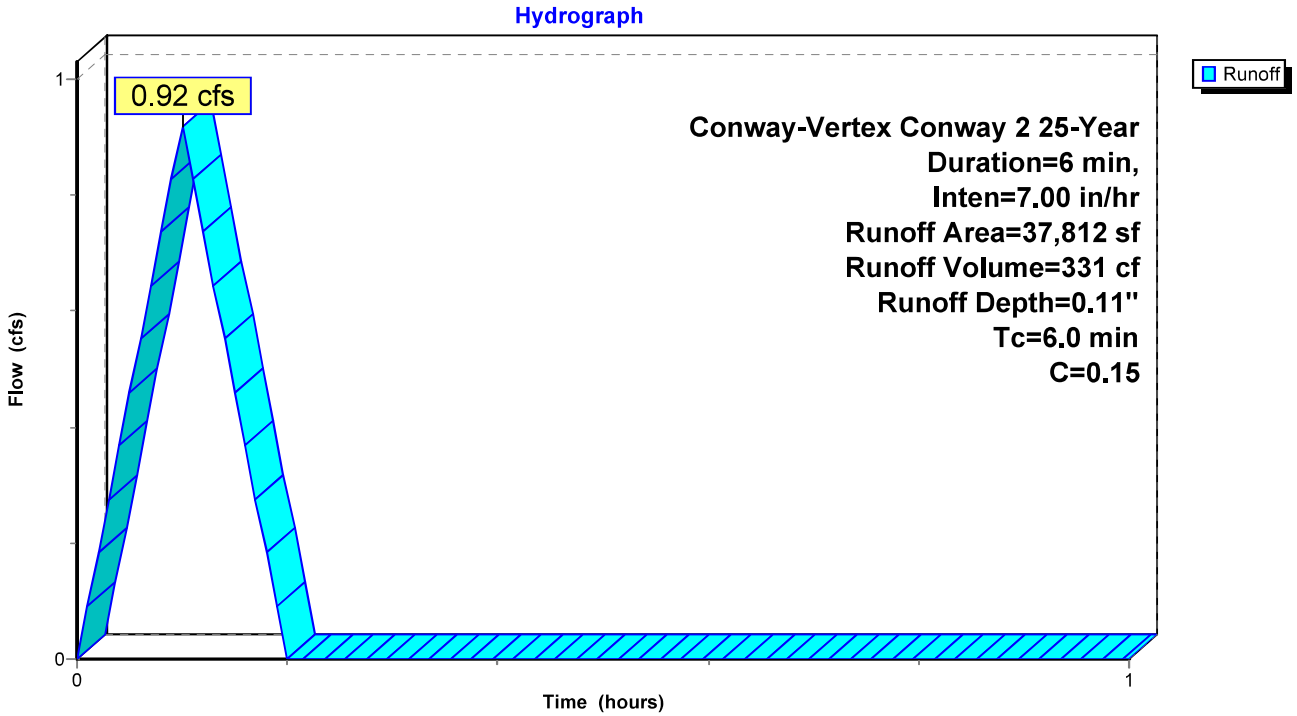
Runoff = 0.92 cfs @ 0.10 hrs, Volume= 331 cf, Depth= 0.11"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
3,774	0.18	>75% Grass cover, Good, HSG B
3,094	0.39	Gravel roads, HSG B
2,810	0.22	Riprap, HSG B
28,134	0.11	Woods, Good, HSG B
37,812	0.15	Weighted Average
37,812		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-3: DRIVEWAY - STA. 6+50 (LEFT)



Summary for Subcatchment P-4: DRIVEWAY - STA. 12+30 (RIGHT)

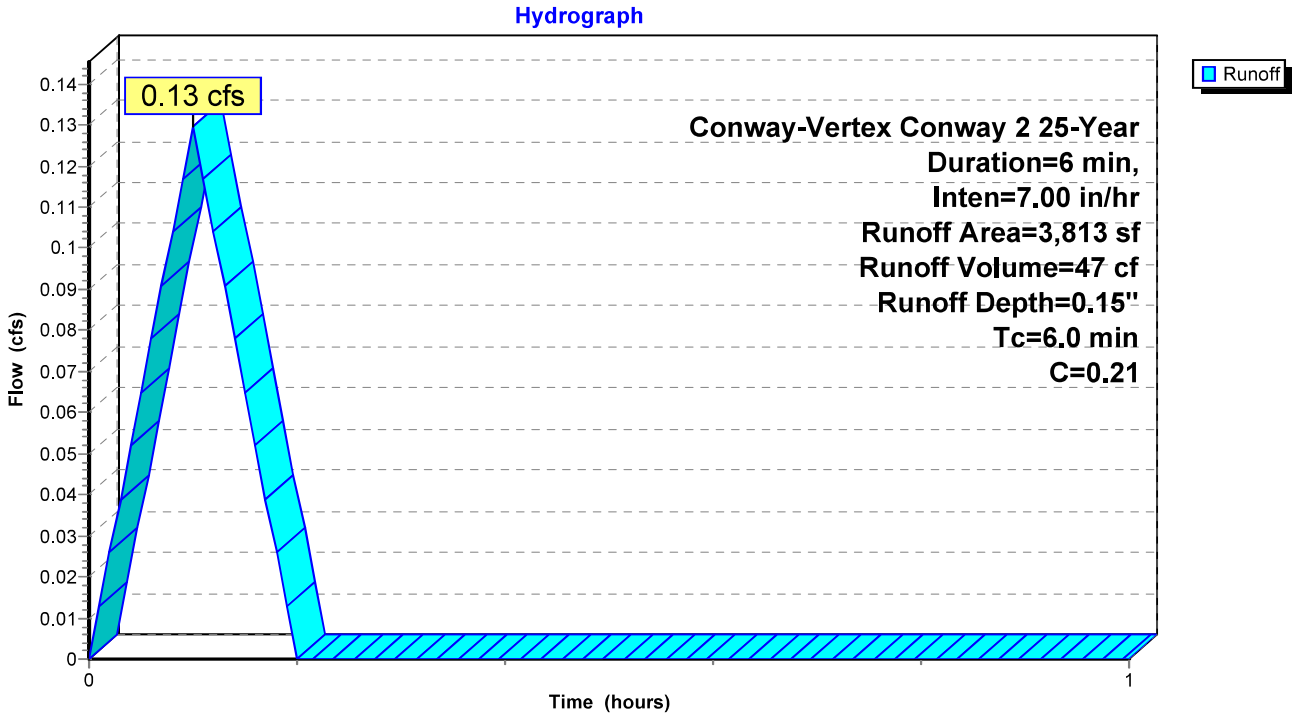
Runoff = 0.13 cfs @ 0.10 hrs, Volume= 47 cf, Depth= 0.15"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
1,601	0.18	>75% Grass cover, Good, HSG B
881	0.39	Gravel roads, HSG B
113	0.22	Riprap, HSG B
1,218	0.11	Woods, Good, HSG B
3,813	0.21	Weighted Average
3,813		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-4: DRIVEWAY - STA. 12+30 (RIGHT)



Summary for Subcatchment P-5: DRIVEWAY - STA. 14+80 (RIGHT)

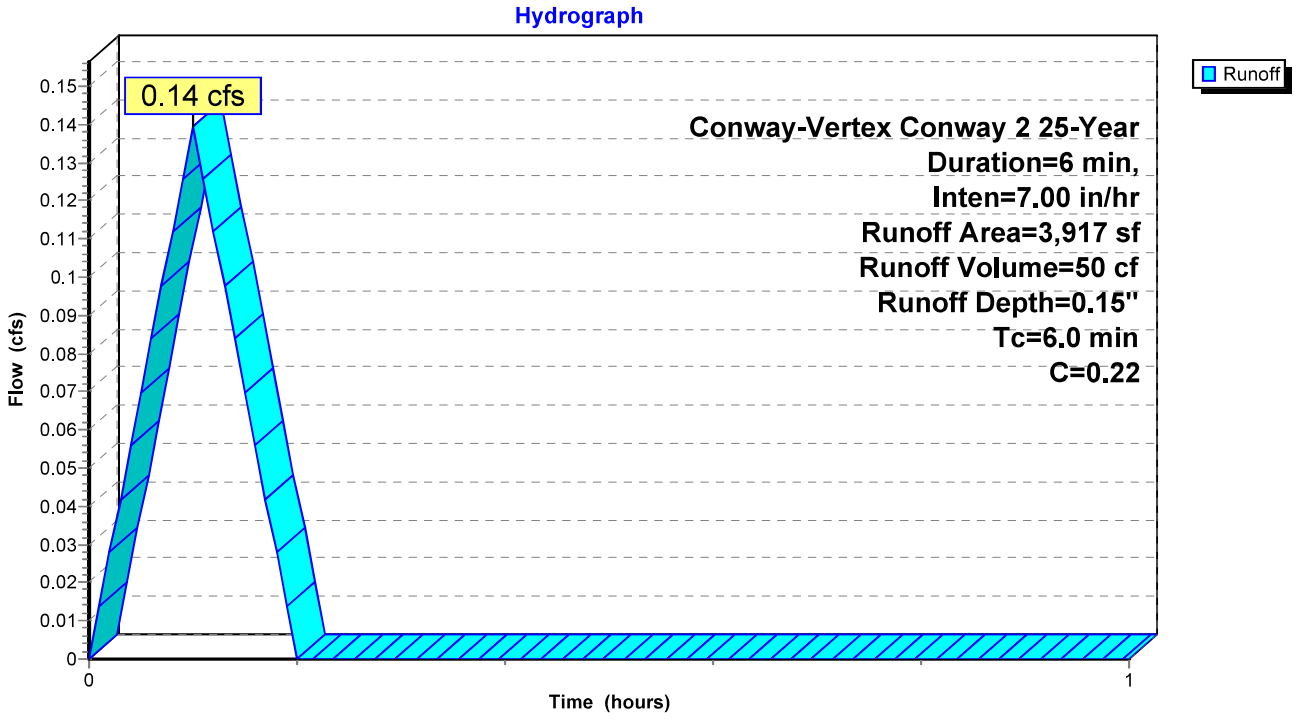
Runoff = 0.14 cfs @ 0.10 hrs, Volume= 50 cf, Depth= 0.15"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
1,535	0.18	>75% Grass cover, Good, HSG B
856	0.39	Gravel roads, HSG B
639	0.22	Riprap, HSG B
887	0.11	Woods, Good, HSG B
3,917	0.22	Weighted Average
3,917		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-5: DRIVEWAY - STA. 14+80 (RIGHT)



Summary for Subcatchment P-6: DRIVEWAY - STA. 14+80 (LEFT)

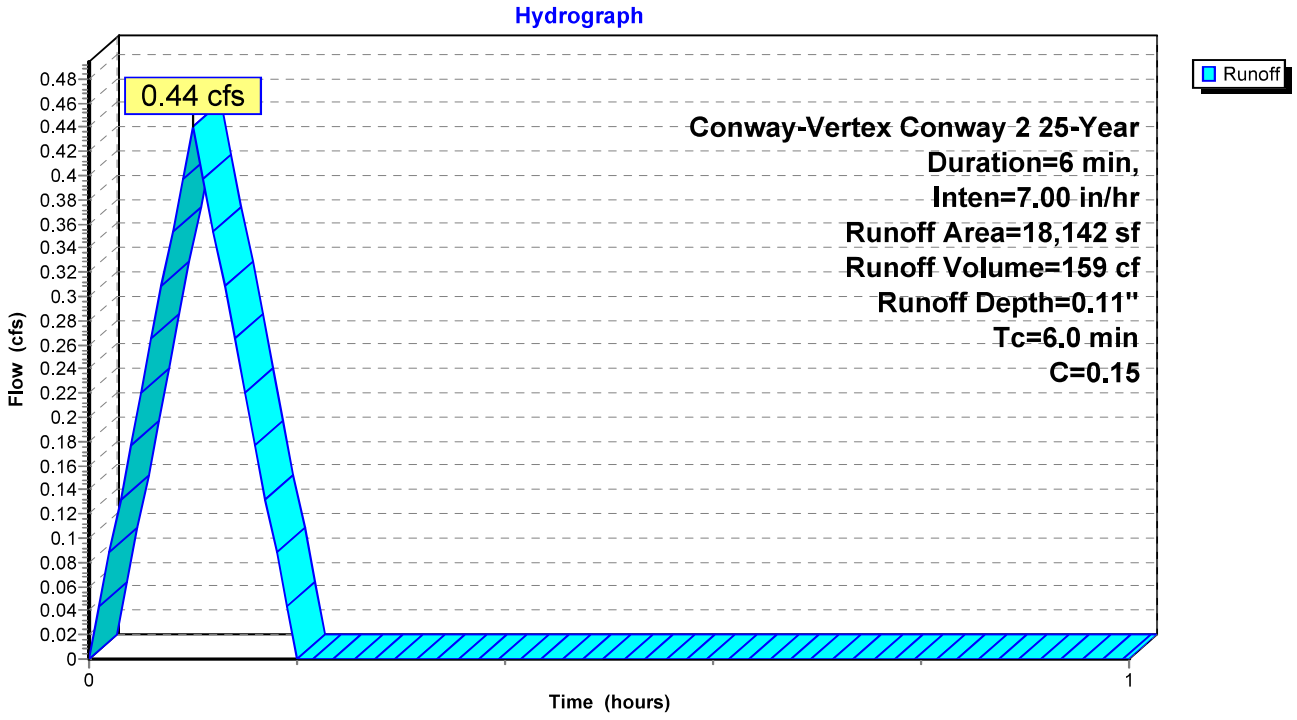
Runoff = 0.44 cfs @ 0.10 hrs, Volume= 159 cf, Depth= 0.11"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
2,318	0.18	>75% Grass cover, Good, HSG B
1,265	0.39	Gravel roads, HSG B
1,272	0.22	Riprap, HSG B
13,287	0.11	Woods, Good, HSG B
18,142	0.15	Weighted Average
18,142		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-6: DRIVEWAY - STA. 14+80 (LEFT)



Summary for Subcatchment P-7: DRIVEWAY - STA. 16+50 (RIGHT/LEFT)

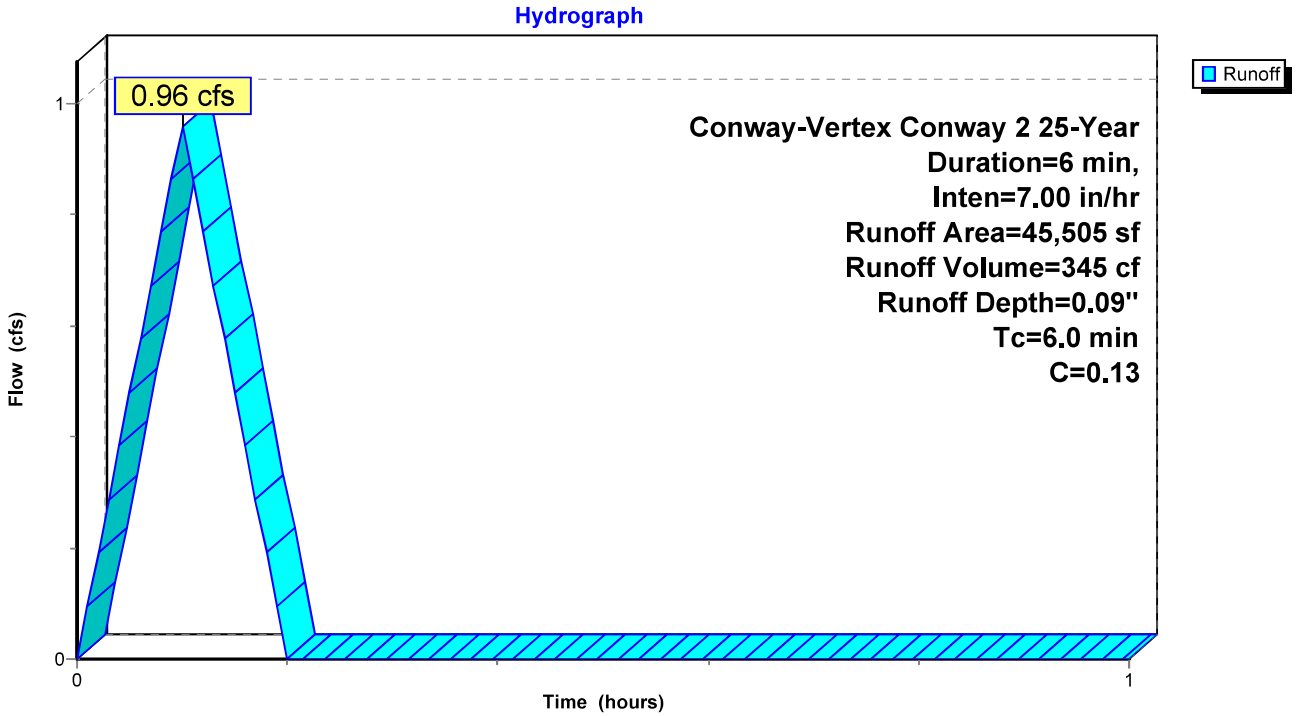
Runoff = 0.96 cfs @ 0.10 hrs, Volume= 345 cf, Depth= 0.09"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
3,242	0.18	>75% Grass cover, Good, HSG B
1,597	0.39	Gravel roads, HSG B
1,063	0.22	Riprap, HSG B
39,603	0.11	Woods, Good, HSG B
45,505	0.13	Weighted Average
45,505		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-7: DRIVEWAY - STA. 16+50 (RIGHT/LEFT)



Summary for Subcatchment P-8: DRIVEWAY - STA. 18+00 (RIGHT/LEFT)

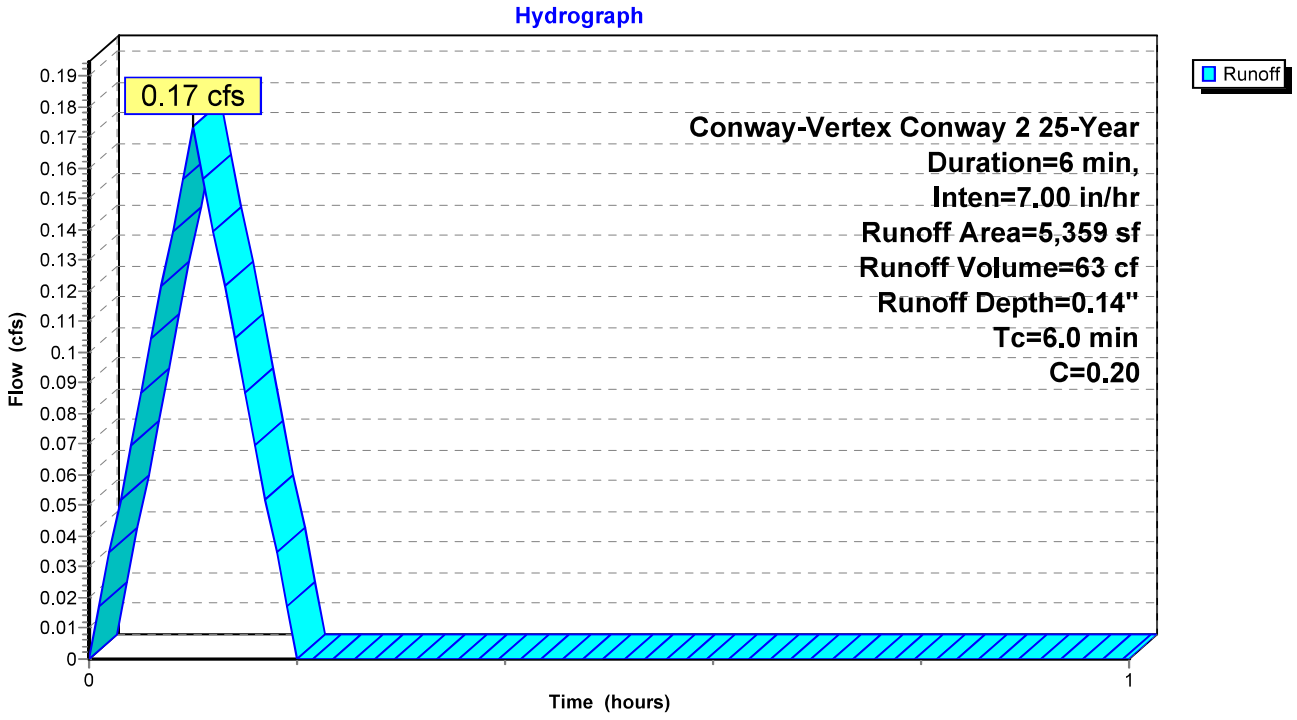
Runoff = 0.17 cfs @ 0.10 hrs, Volume= 63 cf, Depth= 0.14"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
855	0.18	>75% Grass cover, Good, HSG B
1,146	0.39	Gravel roads, HSG B
953	0.22	Riprap, HSG B
2,405	0.11	Woods, Good, HSG B
5,359	0.20	Weighted Average
5,359		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-8: DRIVEWAY - STA. 18+00 (RIGHT/LEFT)



Summary for Subcatchment P-9: DRIVEWAY - STA. 20+30 (LEFT)

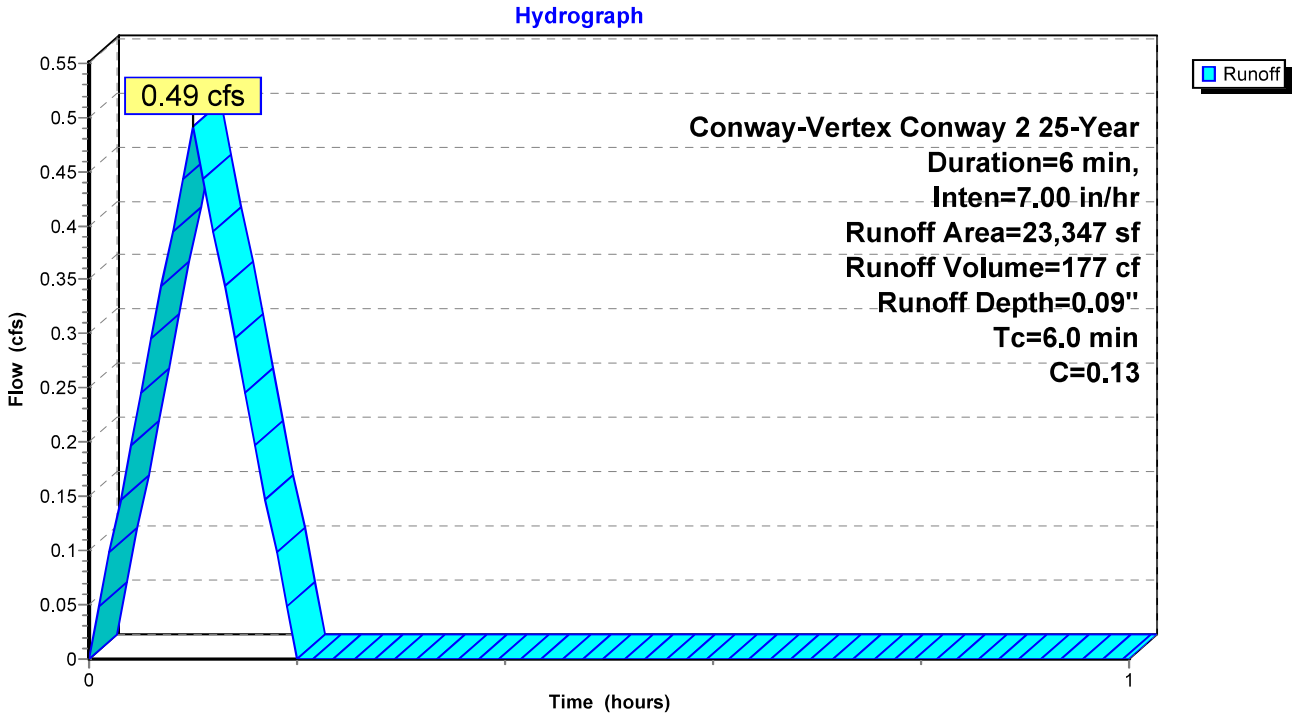
Runoff = 0.49 cfs @ 0.10 hrs, Volume= 177 cf, Depth= 0.09"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Conway-Vertex Conway 2 25-Year Duration=6 min, Inten=7.00 in/hr

Area (sf)	C	Description
1,594	0.18	>75% Grass cover, Good, HSG B
476	0.39	Gravel roads, HSG B
1,100	0.22	Riprap, HSG B
20,177	0.11	Woods, Good, HSG B
23,347	0.13	Weighted Average
23,347		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, ASSUMED MIN.**

Subcatchment P-9: DRIVEWAY - STA. 20+30 (LEFT)



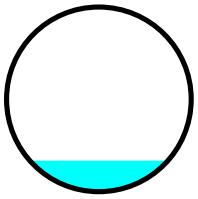
Summary for Reach C-1: TWIN 18IN CMP

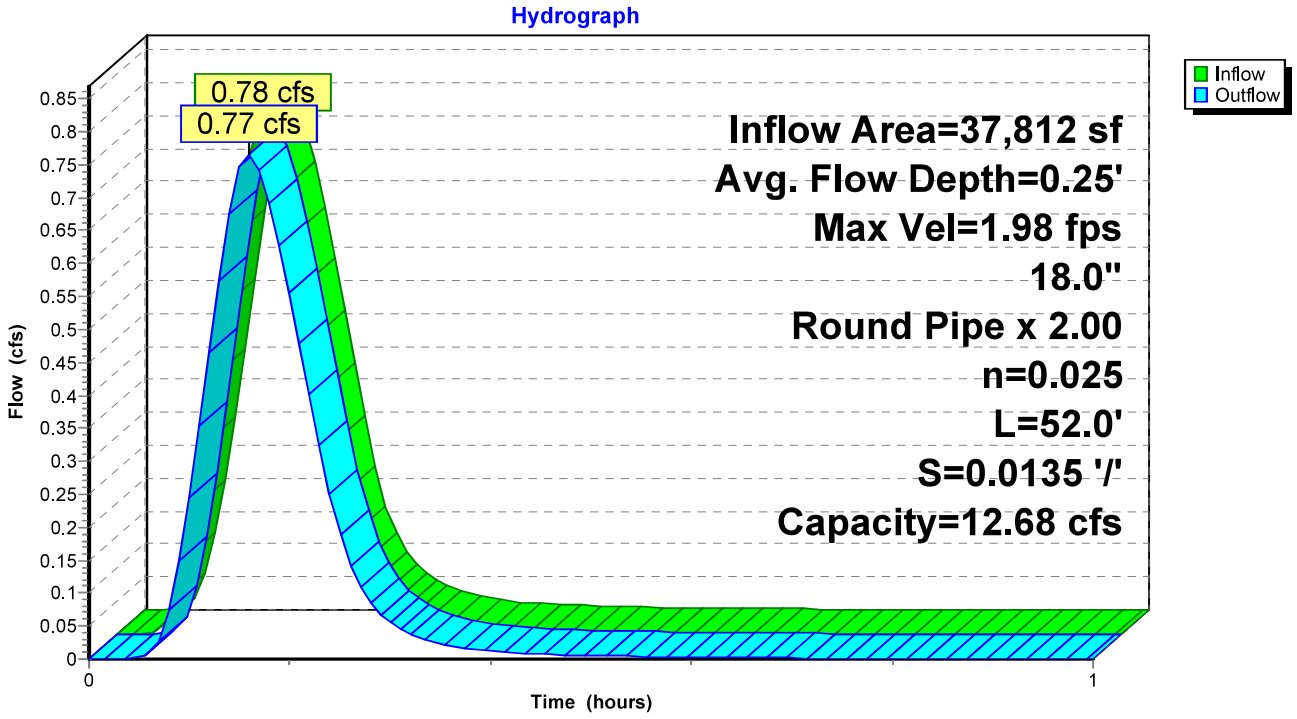
Inflow Area = 37,812 sf, 0.00% Impervious, Inflow Depth > 0.11" for 25-Year event
Inflow = 0.78 cfs @ 0.15 hrs, Volume= 331 cf
Outflow = 0.77 cfs @ 0.16 hrs, Volume= 331 cf, Atten= 1%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.98 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 1.3 min

Peak Storage= 20 cf @ 0.15 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.50' Flow Area= 3.5 sf, Capacity= 12.68 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
18.0" Round Pipe
n= 0.025 Corrugated metal
Length= 52.0' Slope= 0.0135 '/'
Inlet Invert= 887.70', Outlet Invert= 887.00'





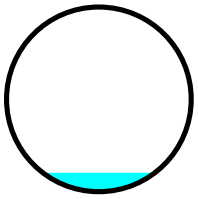
Summary for Reach C-2: TWIN 18IN CMP

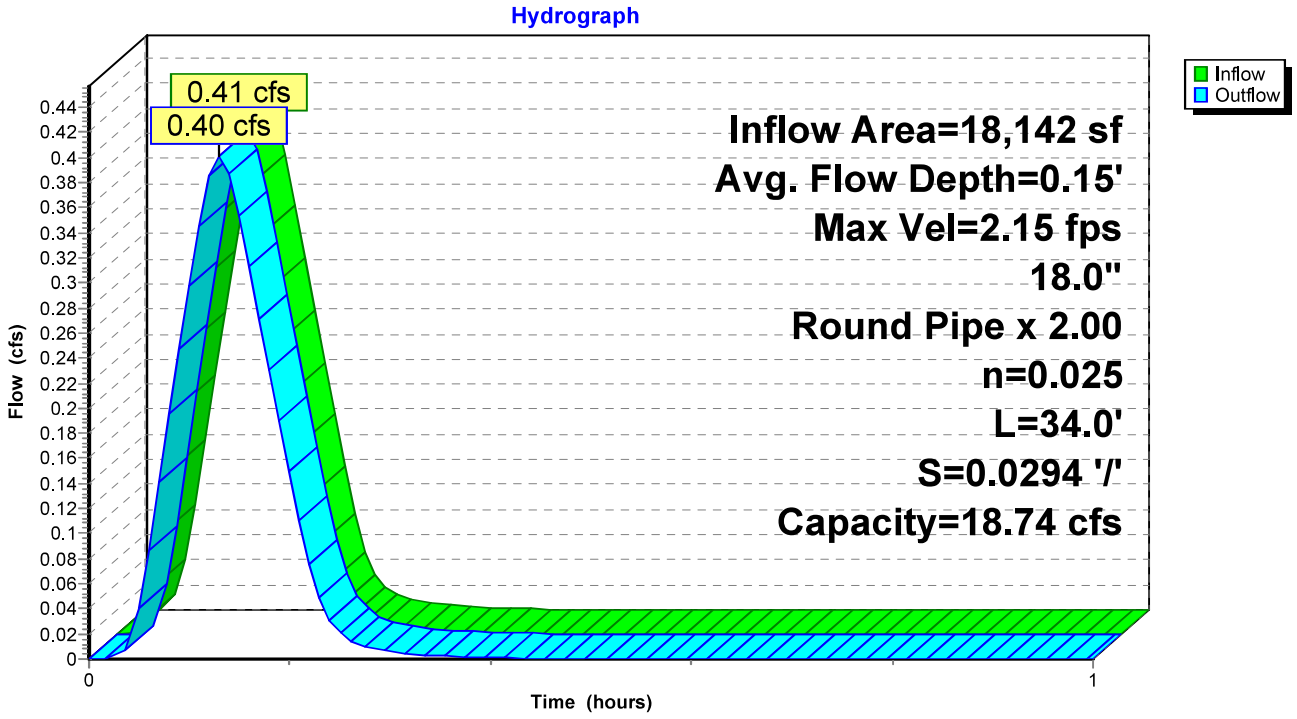
Inflow Area = 18,142 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.41 cfs @ 0.12 hrs, Volume= 159 cf
Outflow = 0.40 cfs @ 0.13 hrs, Volume= 159 cf, Atten= 2%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 0.6 min

Peak Storage= 6 cf @ 0.13 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.50' Flow Area= 3.5 sf, Capacity= 18.74 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
18.0" Round Pipe
n= 0.025 Corrugated metal
Length= 34.0' Slope= 0.0294 '/'
Inlet Invert= 941.00', Outlet Invert= 940.00'





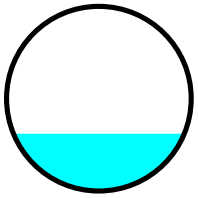
Summary for Reach C-3: 15IN CMP

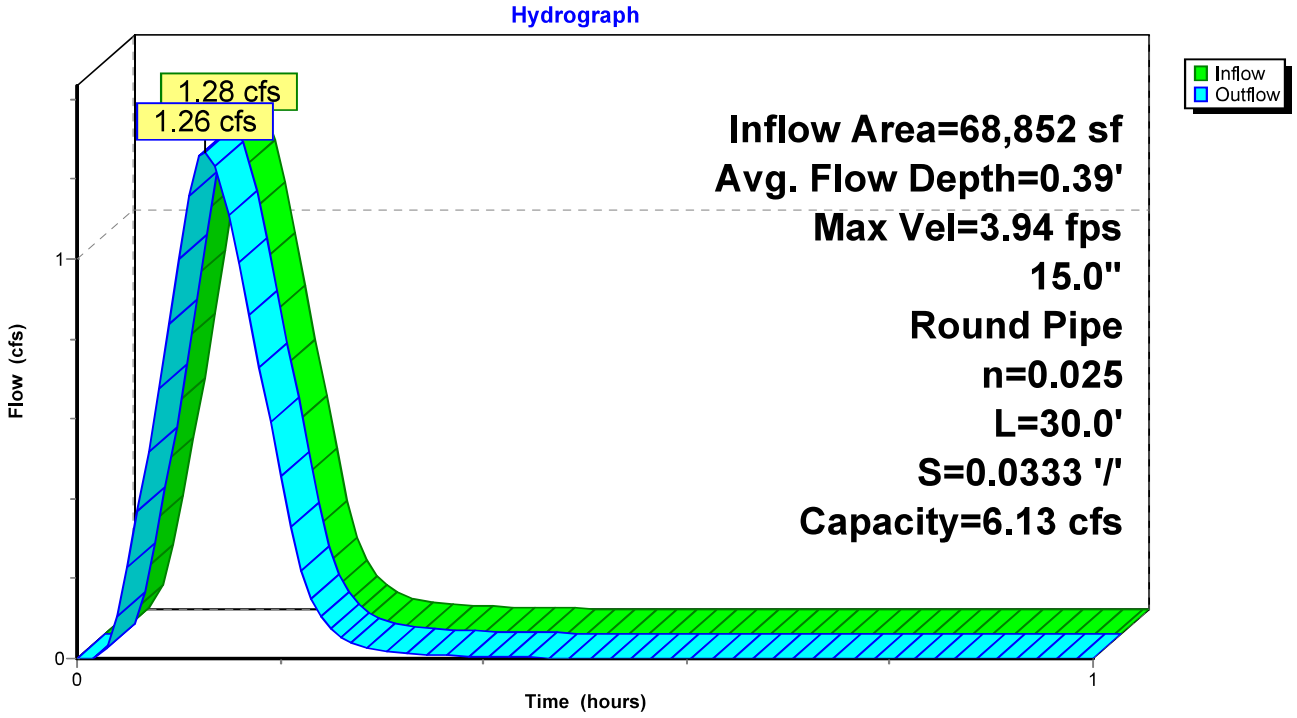
Inflow Area = 68,852 sf, 0.00% Impervious, Inflow Depth = 0.09" for 25-Year event
Inflow = 1.28 cfs @ 0.12 hrs, Volume= 522 cf
Outflow = 1.26 cfs @ 0.13 hrs, Volume= 522 cf, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.94 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 0.4 min

Peak Storage= 10 cf @ 0.12 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.13 cfs

15.0" Round Pipe
n= 0.025 Corrugated metal
Length= 30.0' Slope= 0.0333 '/'
Inlet Invert= 957.00', Outlet Invert= 956.00'





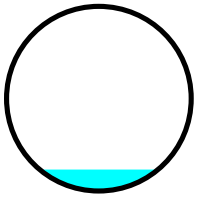
Summary for Reach C-4: 15IN CMP

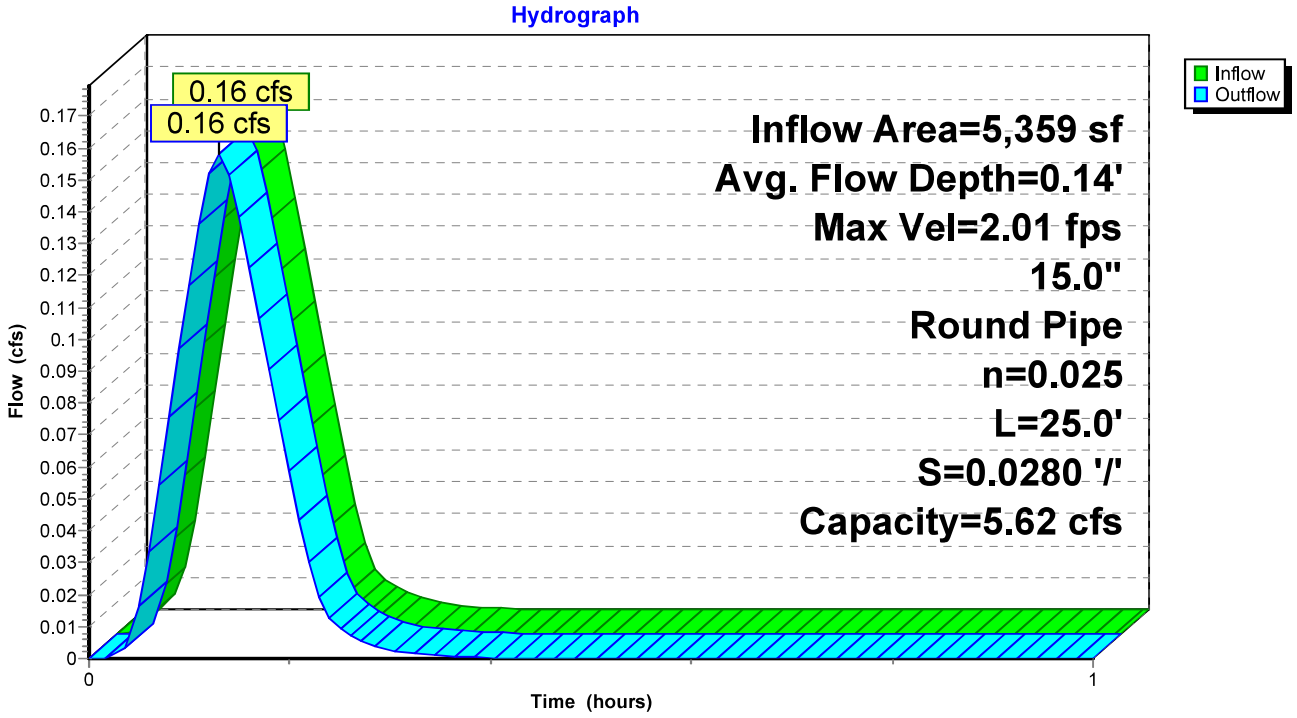
Inflow Area = 5,359 sf, 0.00% Impervious, Inflow Depth = 0.14" for 25-Year event
Inflow = 0.16 cfs @ 0.12 hrs, Volume= 63 cf
Outflow = 0.16 cfs @ 0.13 hrs, Volume= 63 cf, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.01 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 0.4 min

Peak Storage= 2 cf @ 0.13 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 5.62 cfs

15.0" Round Pipe
n= 0.025 Corrugated metal
Length= 25.0' Slope= 0.0280 '/'
Inlet Invert= 979.70', Outlet Invert= 979.00'





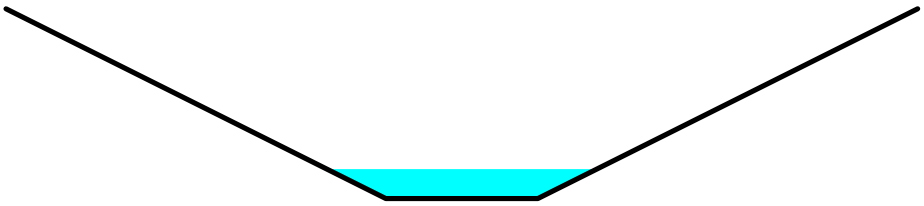
Summary for Reach S-1: SWALE WITH OUTLET AT STA. 4+00

Inflow Area = 41,788 sf, 0.00% Impervious, Inflow Depth = 0.12" for 25-Year event
Inflow = 1.15 cfs @ 0.10 hrs, Volume= 415 cf
Outflow = 1.09 cfs @ 0.12 hrs, Volume= 415 cf, Atten= 5%, Lag= 1.0 min

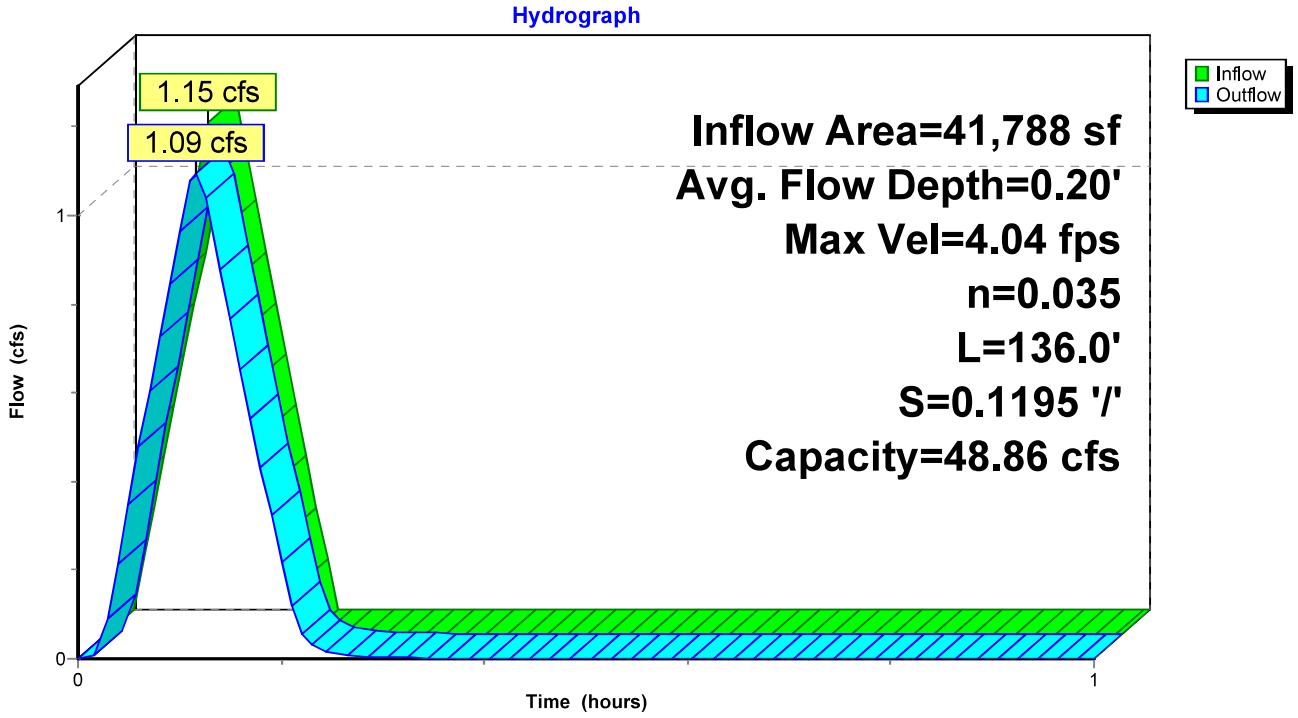
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 1.3 min

Peak Storage= 37 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 48.86 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 136.0' Slope= 0.1195 '/'
Inlet Invert= 882.75', Outlet Invert= 866.50'



Reach S-1: SWALE WITH OUTLET AT STA. 4+00



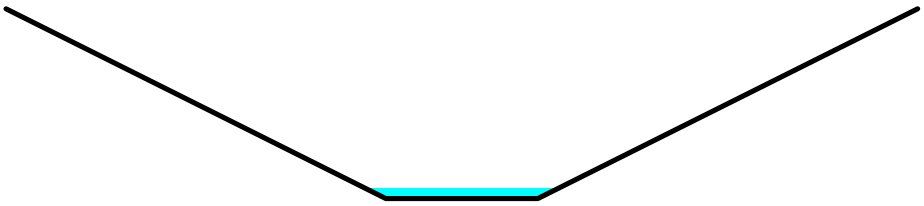
Summary for Reach S-2: SWALE WITH OUTLET AT STA. 6+50

Inflow Area = 7,520 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.18 cfs @ 0.10 hrs, Volume= 66 cf
Outflow = 0.17 cfs @ 0.13 hrs, Volume= 66 cf, Atten= 9%, Lag= 1.8 min

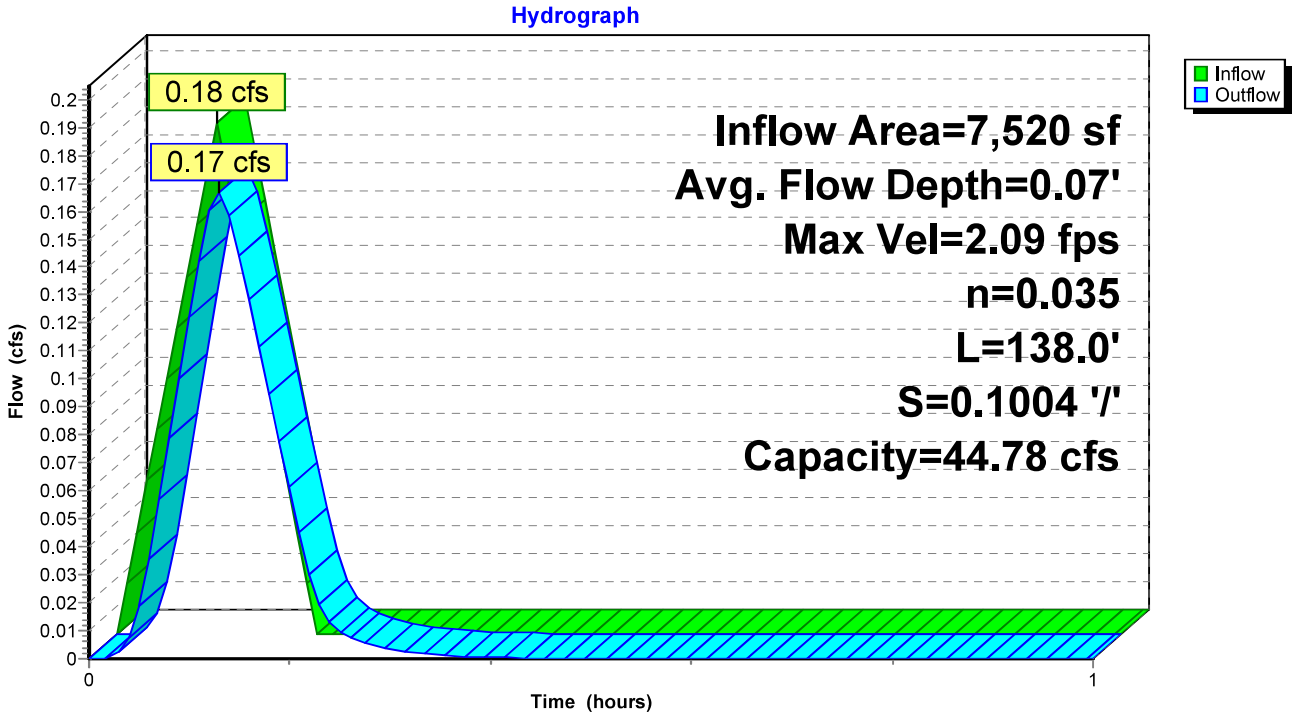
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.09 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 2.2 min

Peak Storage= 11 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 44.78 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 138.0' Slope= 0.1004 '/'
Inlet Invert= 900.85', Outlet Invert= 887.00'



Reach S-2: SWALE WITH OUTLET AT STA. 6+50



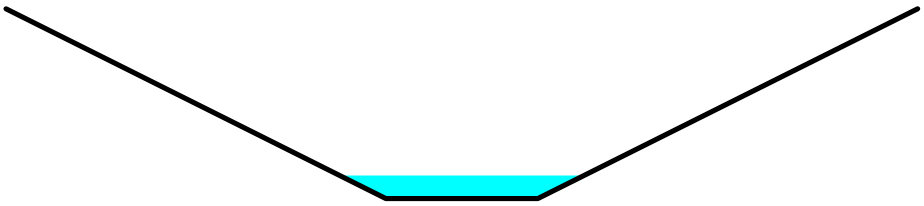
Summary for Reach S-3: SWALE WITH OUTLET AT STA. 6+50

Inflow Area = 37,812 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.92 cfs @ 0.10 hrs, Volume= 331 cf
Outflow = 0.78 cfs @ 0.15 hrs, Volume= 331 cf, Atten= 16%, Lag= 2.7 min

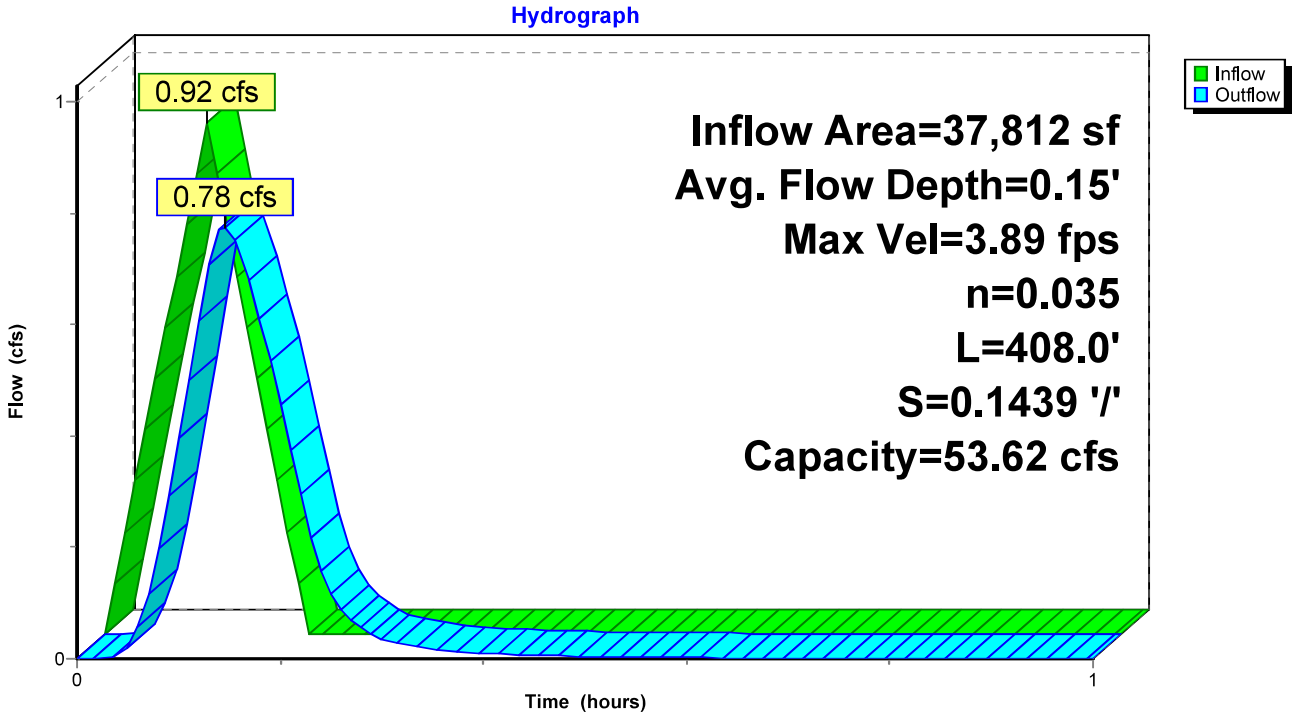
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 5.0 min

Peak Storage= 82 cf @ 0.12 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 53.62 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 408.0' Slope= 0.1439 '/'
Inlet Invert= 936.40', Outlet Invert= 877.70'



Reach S-3: SWALE WITH OUTLET AT STA. 6+50



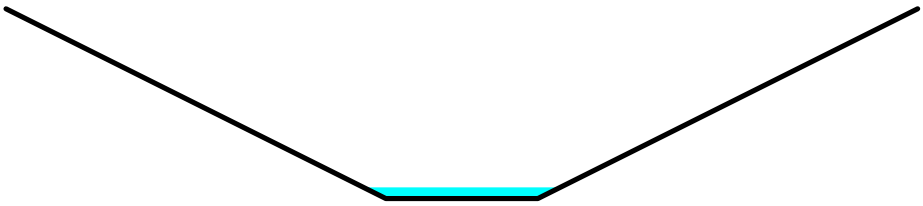
Summary for Reach S-4: SWALE WITH OUTLET AT STA. 12+30

Inflow Area = 3,813 sf, 0.00% Impervious, Inflow Depth = 0.15" for 25-Year event
Inflow = 0.13 cfs @ 0.10 hrs, Volume= 47 cf
Outflow = 0.11 cfs @ 0.14 hrs, Volume= 47 cf, Atten= 14%, Lag= 2.6 min

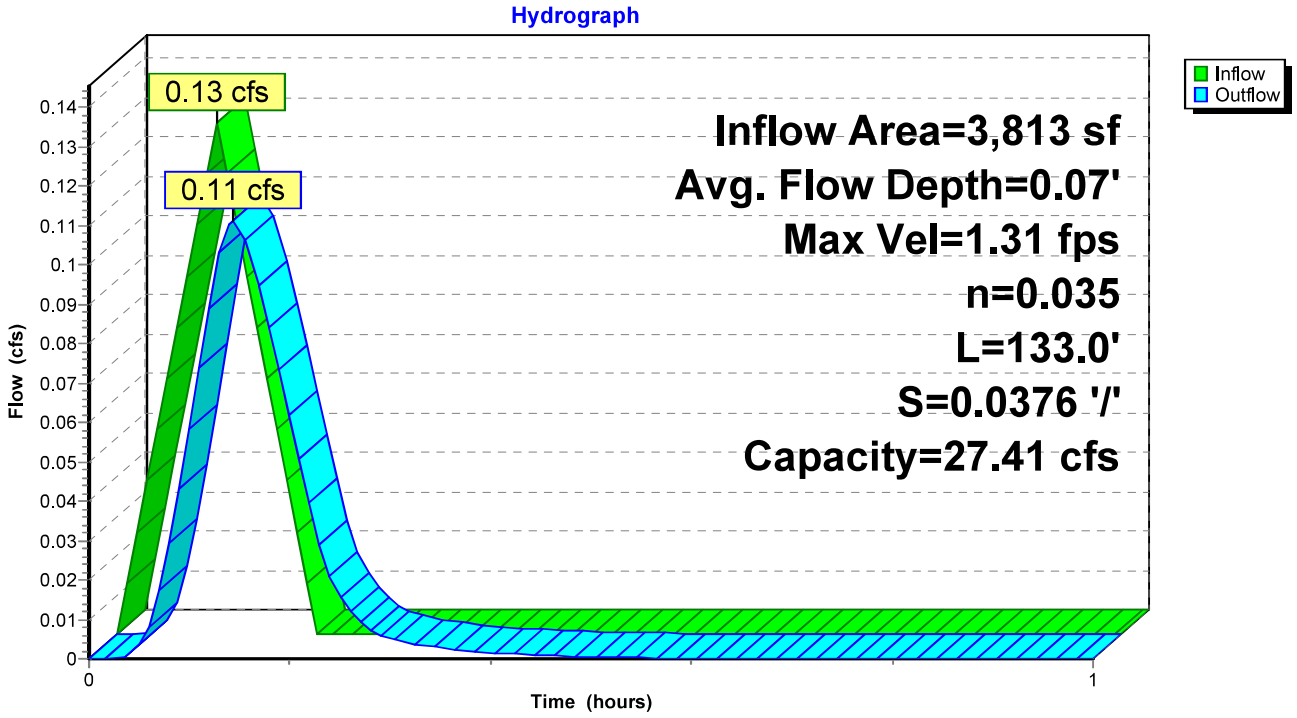
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.31 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 3.6 min

Peak Storage= 11 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 27.41 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 133.0' Slope= 0.0376 '/'
Inlet Invert= 950.95', Outlet Invert= 945.95'



Reach S-4: SWALE WITH OUTLET AT STA. 12+30



Summary for Reach S-5: SWALE WITH OUTLET AT STA. 14+80

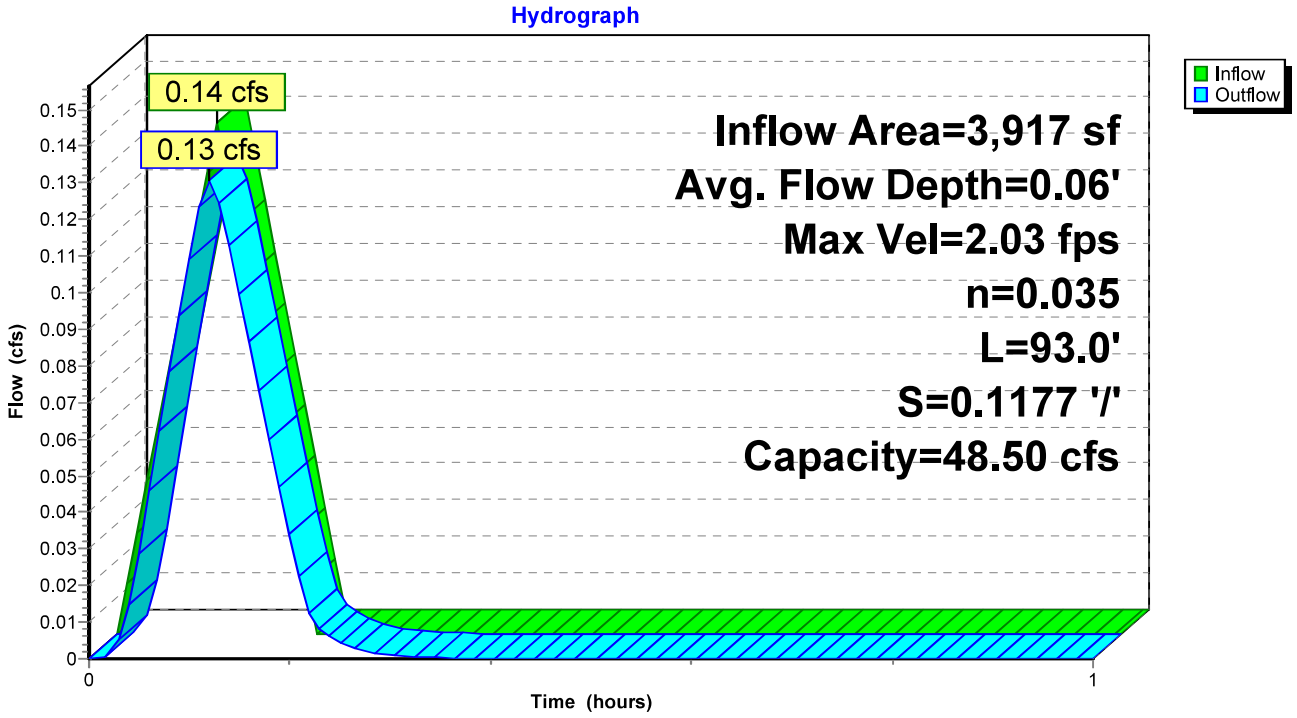
Inflow Area = 3,917 sf, 0.00% Impervious, Inflow Depth = 0.15" for 25-Year event
Inflow = 0.14 cfs @ 0.10 hrs, Volume= 50 cf
Outflow = 0.13 cfs @ 0.12 hrs, Volume= 50 cf, Atten= 7%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.03 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 1.3 min

Peak Storage= 6 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 48.50 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 93.0' Slope= 0.1177 '/'
Inlet Invert= 950.95', Outlet Invert= 940.00'

Reach S-5: SWALE WITH OUTLET AT STA. 14+80



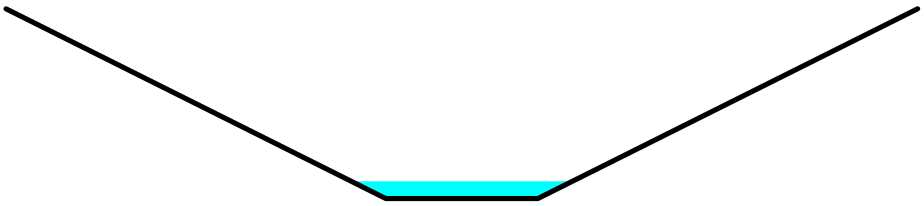
Summary for Reach S-6: SWALE WITH OUTLET AT STA. 14+80

Inflow Area = 18,142 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.44 cfs @ 0.10 hrs, Volume= 159 cf
Outflow = 0.41 cfs @ 0.12 hrs, Volume= 159 cf, Atten= 8%, Lag= 1.3 min

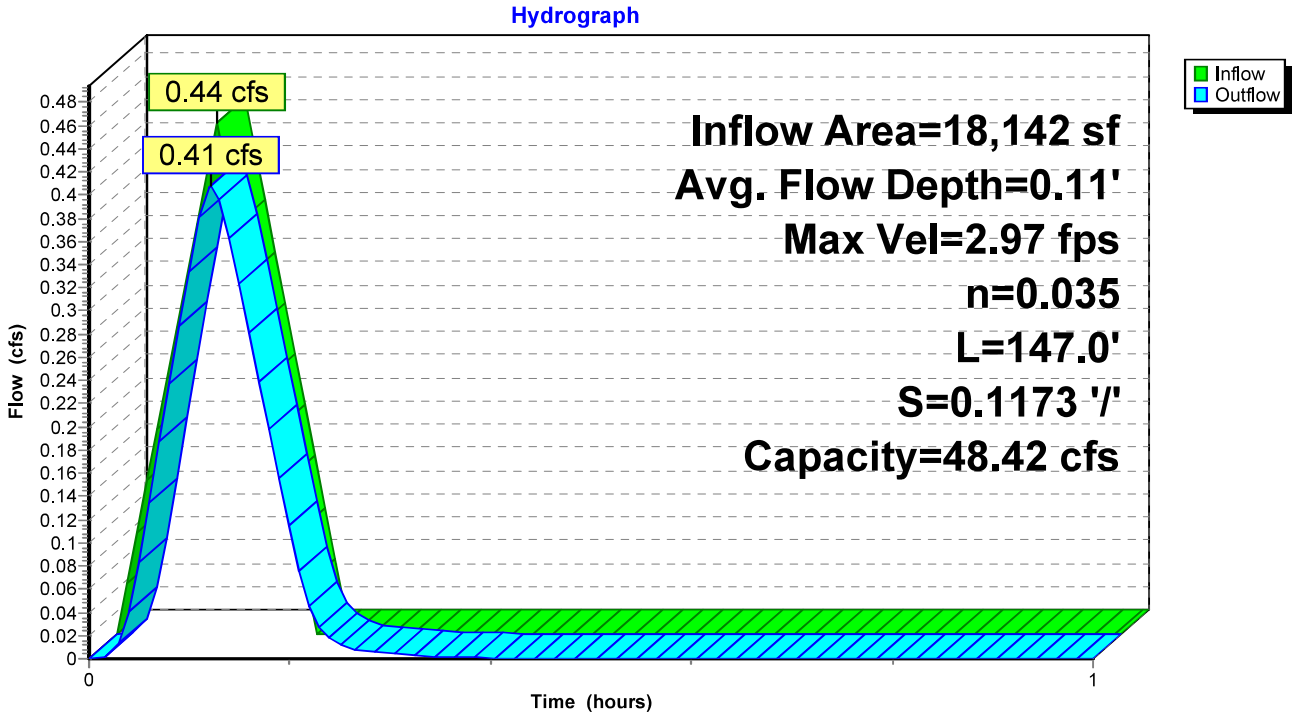
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.97 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 1.8 min

Peak Storage= 20 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 48.42 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 147.0' Slope= 0.1173 '/'
Inlet Invert= 958.25', Outlet Invert= 941.00'



Reach S-6: SWALE WITH OUTLET AT STA. 14+80



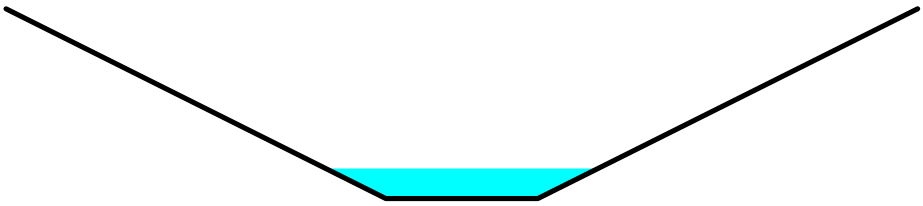
Summary for Reach S-7: SWALE WITH OUTLET AT STA. 16+50

Inflow Area = 68,852 sf, 0.00% Impervious, Inflow Depth = 0.09" for 25-Year event
Inflow = 1.32 cfs @ 0.10 hrs, Volume= 522 cf
Outflow = 1.28 cfs @ 0.12 hrs, Volume= 522 cf, Atten= 3%, Lag= 1.1 min

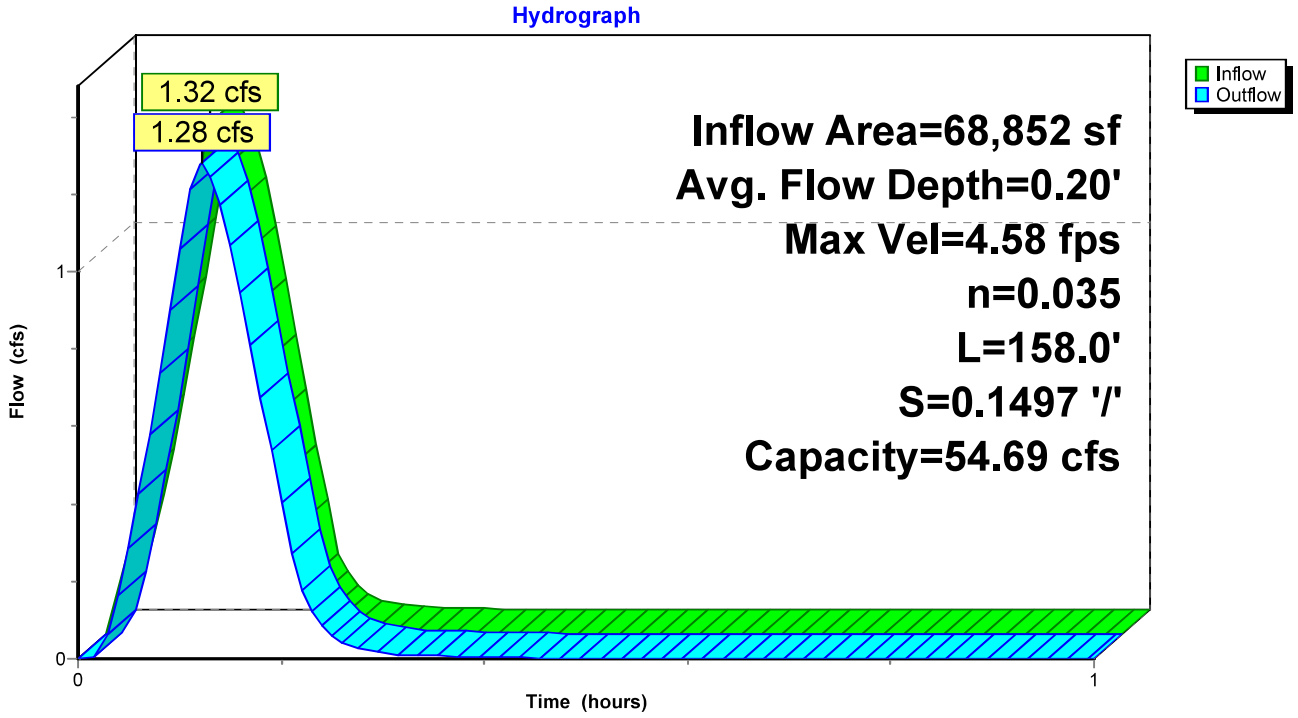
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.58 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 1.5 min

Peak Storage= 44 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 54.69 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 158.0' Slope= 0.1497 '/'
Inlet Invert= 980.65', Outlet Invert= 957.00'



Reach S-7: SWALE WITH OUTLET AT STA. 16+50



Summary for Reach S-8: SWALE WITH OUTLET AT STA. 18+00

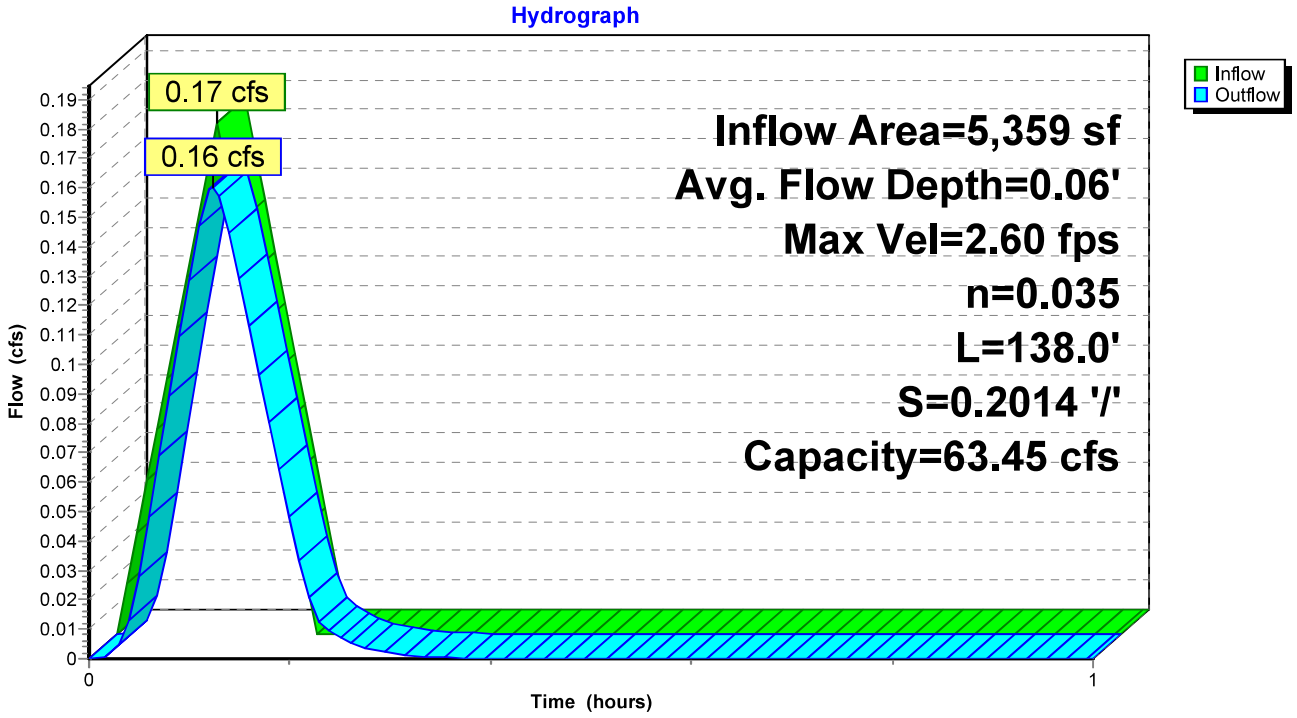
Inflow Area = 5,359 sf, 0.00% Impervious, Inflow Depth = 0.14" for 25-Year event
Inflow = 0.17 cfs @ 0.10 hrs, Volume= 63 cf
Outflow = 0.16 cfs @ 0.12 hrs, Volume= 63 cf, Atten= 8%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.60 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 1.5 min

Peak Storage= 9 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 63.45 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 138.0' Slope= 0.2014 '/'
Inlet Invert= 1,007.50', Outlet Invert= 979.70'

Reach S-8: SWALE WITH OUTLET AT STA. 18+00



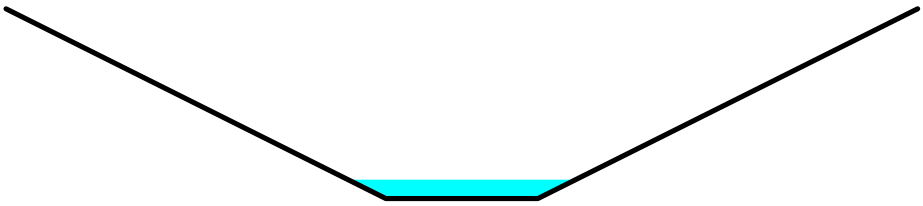
Summary for Reach S-9: SWALE WITH OUTLET AT STA. 20+30

Inflow Area = 23,347 sf, 0.00% Impervious, Inflow Depth = 0.09" for 25-Year event
Inflow = 0.49 cfs @ 0.10 hrs, Volume= 177 cf
Outflow = 0.45 cfs @ 0.13 hrs, Volume= 177 cf, Atten= 9%, Lag= 1.5 min

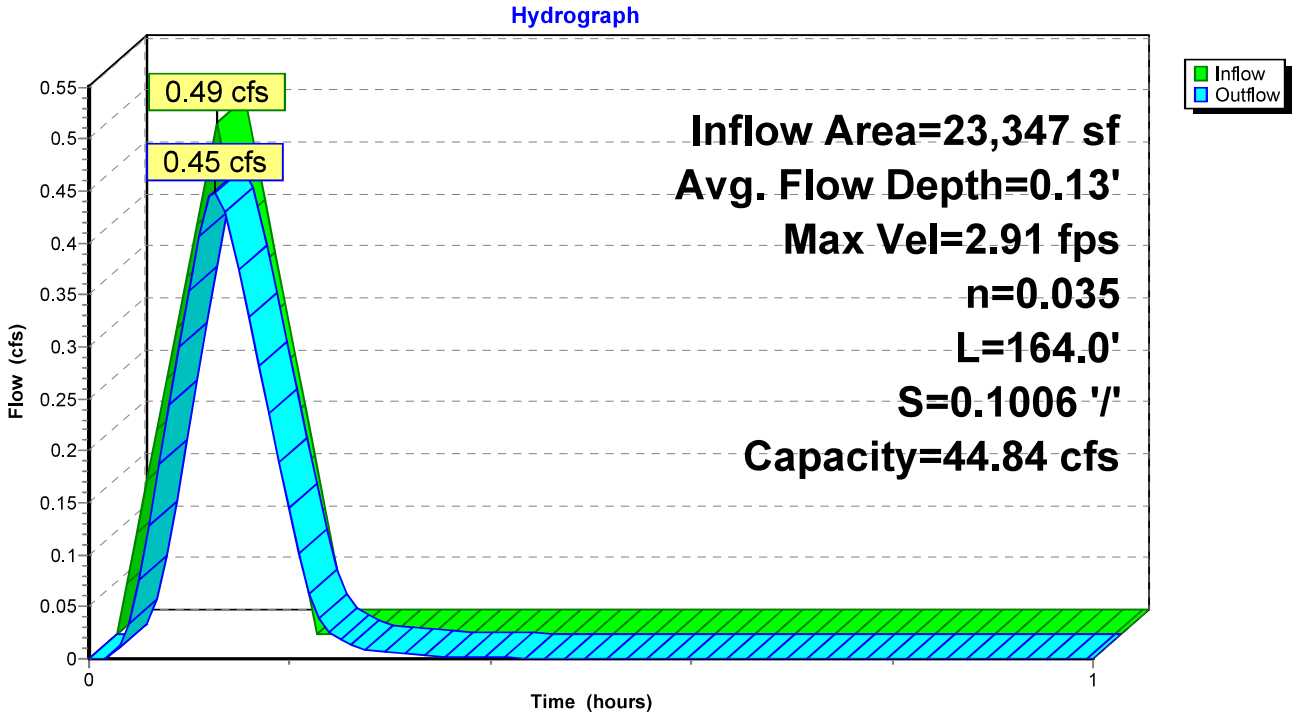
Routing by Stor-Ind+Trans method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 2.2 min

Peak Storage= 26 cf @ 0.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.25' Flow Area= 4.4 sf, Capacity= 44.84 cfs

1.00' x 1.25' deep channel, n= 0.035 Riprap
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 164.0' Slope= 0.1006 '/'
Inlet Invert= 1,037.00', Outlet Invert= 1,020.50'



Reach S-9: SWALE WITH OUTLET AT STA. 20+30



Summary for Pond LS-1: LEVEL SPREADER STA. 4+00

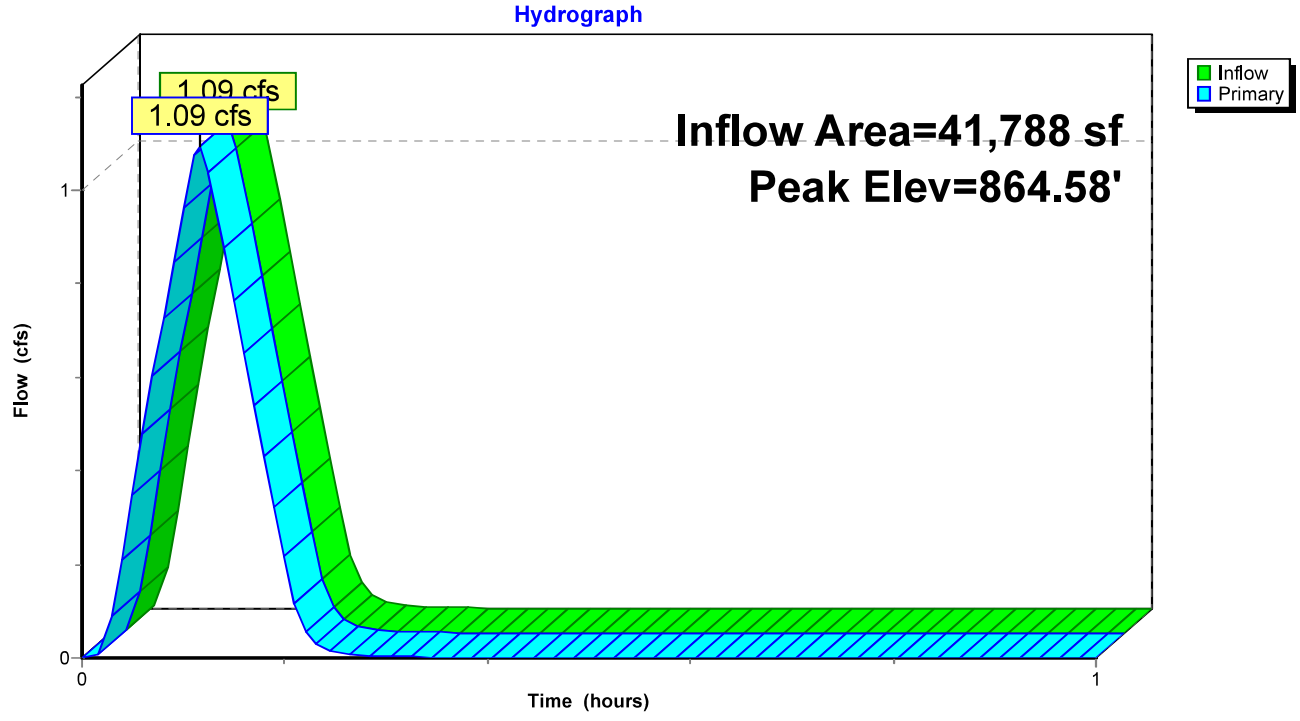
Inflow Area = 41,788 sf, 0.00% Impervious, Inflow Depth = 0.12" for 25-Year event
Inflow = 1.09 cfs @ 0.12 hrs, Volume= 415 cf
Outflow = 1.09 cfs @ 0.12 hrs, Volume= 415 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.09 cfs @ 0.12 hrs, Volume= 415 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 864.58' @ 0.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	864.50'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.08 cfs @ 0.12 hrs HW=864.58' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.08 cfs @ 0.92 fps)

Pond LS-1: LEVEL SPREADER STA. 4+00



Summary for Pond LS-2: LEVEL SPREADER STA. 6+50

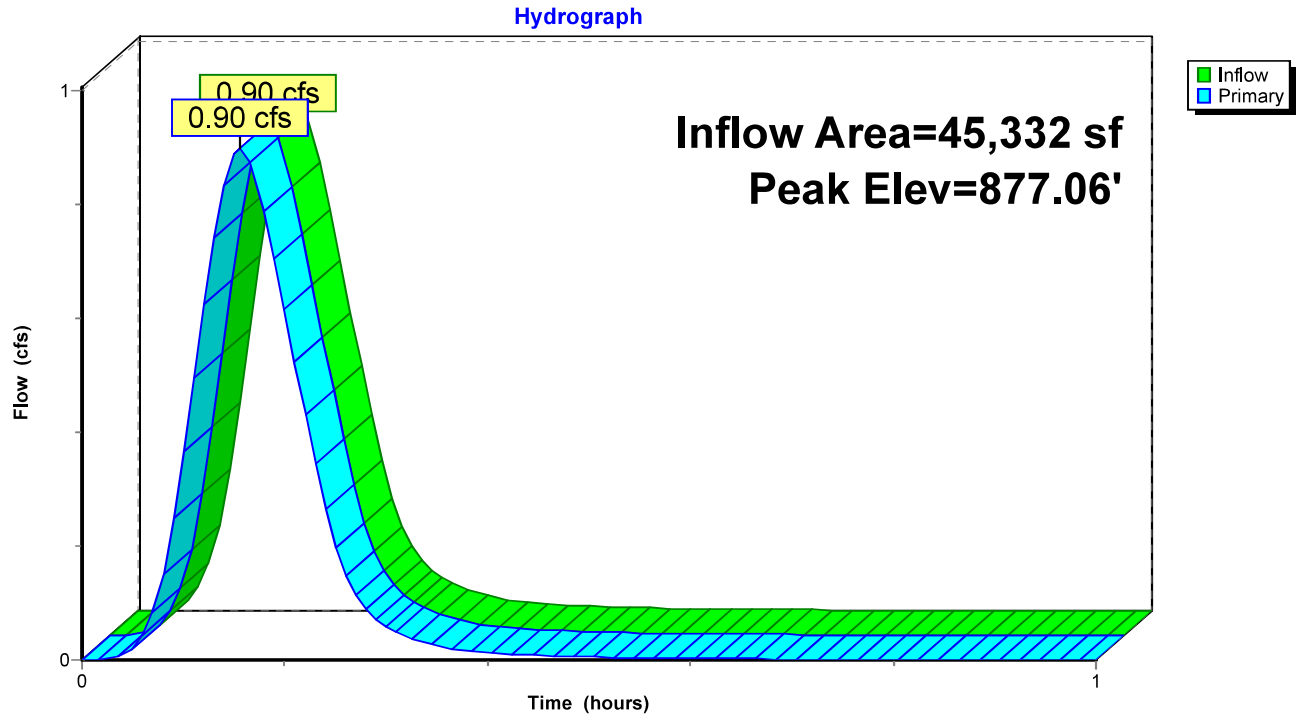
Inflow Area = 45,332 sf, 0.00% Impervious, Inflow Depth > 0.11" for 25-Year event
Inflow = 0.90 cfs @ 0.16 hrs, Volume= 397 cf
Outflow = 0.90 cfs @ 0.16 hrs, Volume= 397 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.90 cfs @ 0.16 hrs, Volume= 397 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 877.06' @ 0.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	877.00'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.89 cfs @ 0.16 hrs HW=877.06' (Free Discharge)
↳**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.89 cfs @ 0.78 fps)

Pond LS-2: LEVEL SPREADER STA. 6+50



Summary for Pond LS-3: LEVEL SPREADER STA. 12+30

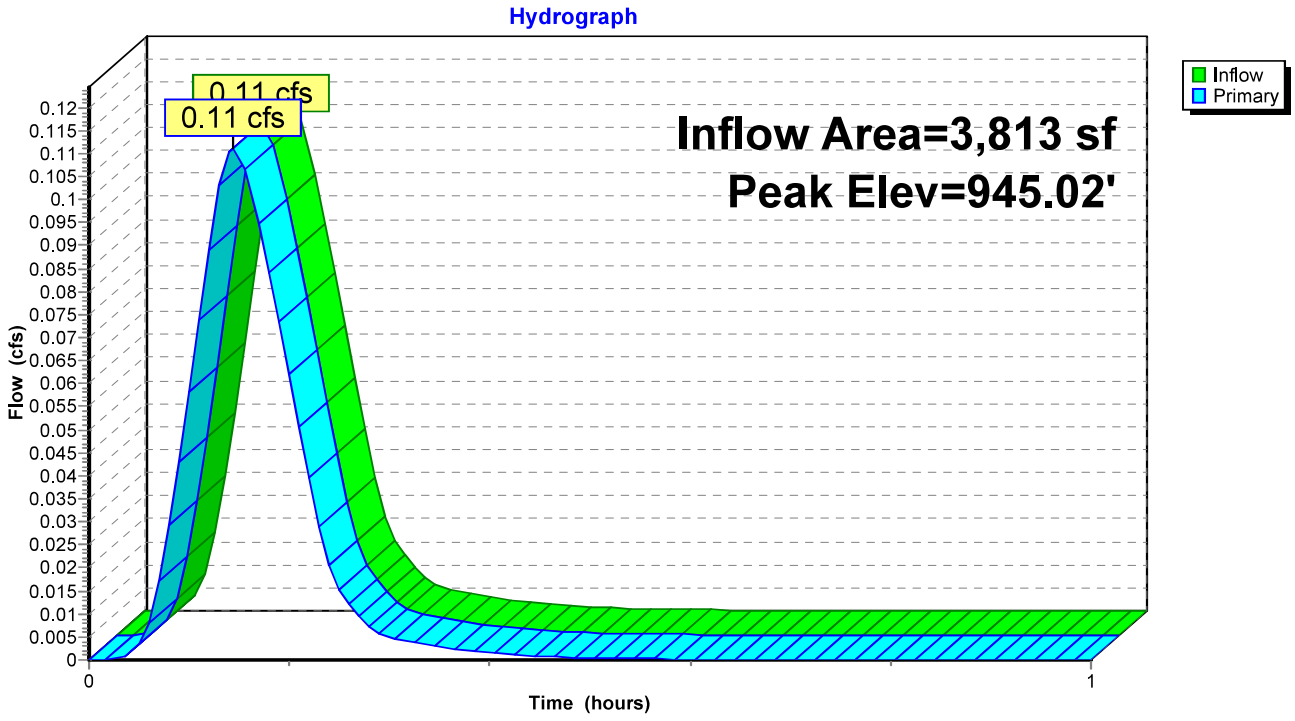
Inflow Area = 3,813 sf, 0.00% Impervious, Inflow Depth = 0.15" for 25-Year event
Inflow = 0.11 cfs @ 0.14 hrs, Volume= 47 cf
Outflow = 0.11 cfs @ 0.14 hrs, Volume= 47 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 0.14 hrs, Volume= 47 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 945.02' @ 0.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	945.00'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.11 cfs @ 0.14 hrs HW=945.02' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.42 fps)

Pond LS-3: LEVEL SPREADER STA. 12+30



Summary for Pond LS-4: LEVEL SPREADER 14+80

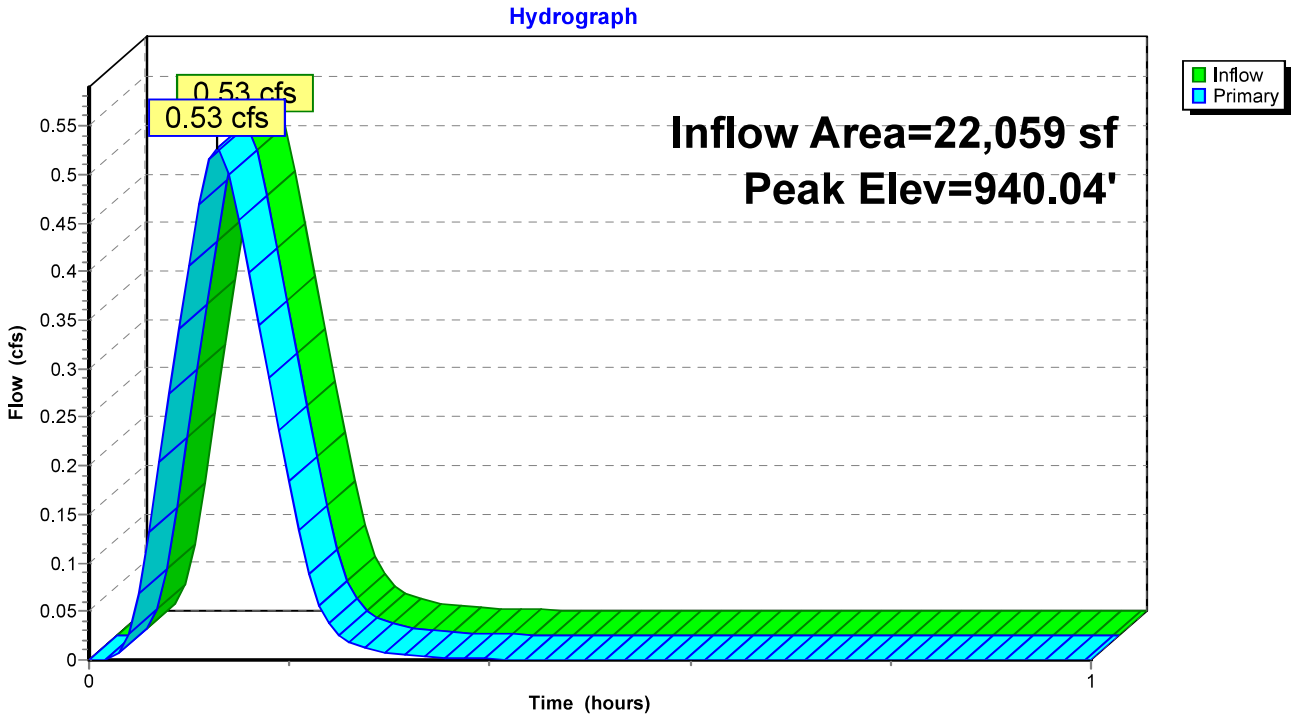
Inflow Area = 22,059 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.53 cfs @ 0.13 hrs, Volume= 209 cf
Outflow = 0.53 cfs @ 0.13 hrs, Volume= 209 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 0.13 hrs, Volume= 209 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 940.04' @ 0.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	940.00'	**23.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.52 cfs @ 0.13 hrs HW=940.04' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.52 cfs @ 0.62 fps)

Pond LS-4: LEVEL SPREADER 14+80



Summary for Pond LS-5: LEVEL SPREADER STA. 16+50

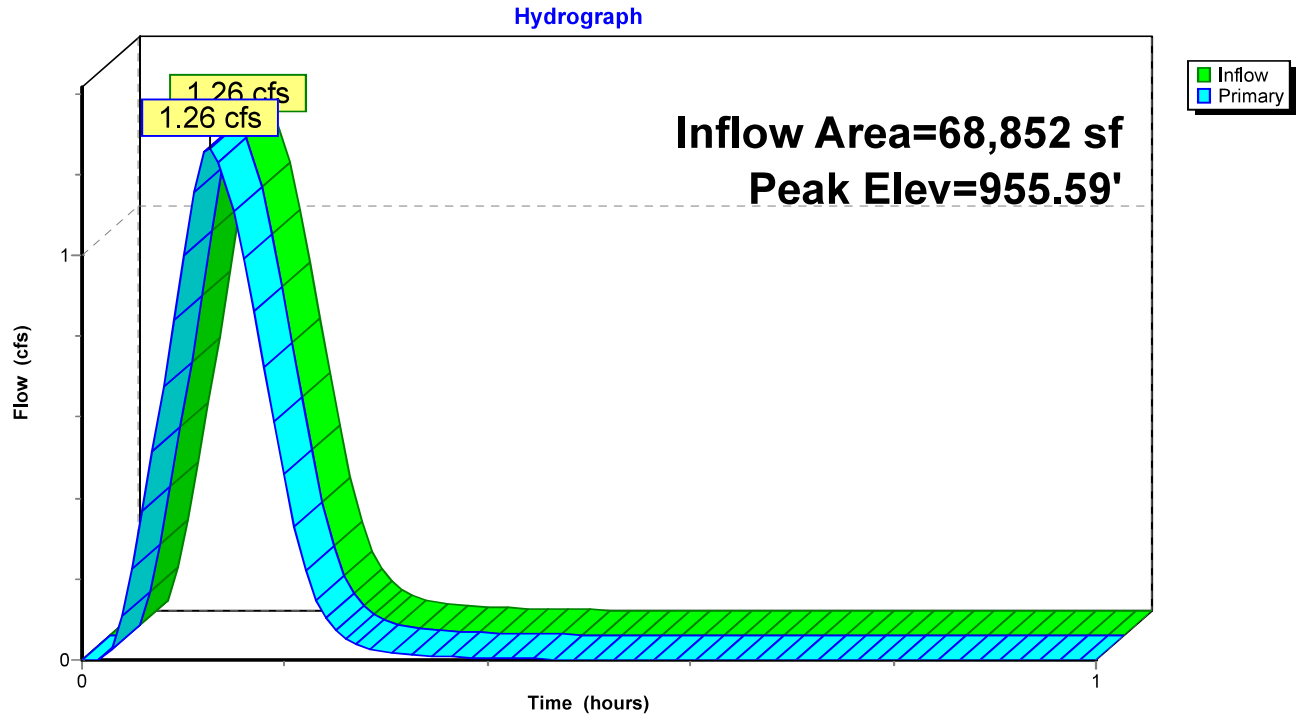
Inflow Area = 68,852 sf, 0.00% Impervious, Inflow Depth = 0.09" for 25-Year event
Inflow = 1.26 cfs @ 0.13 hrs, Volume= 522 cf
Outflow = 1.26 cfs @ 0.13 hrs, Volume= 522 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.26 cfs @ 0.13 hrs, Volume= 522 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 955.59' @ 0.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	955.50'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.26 cfs @ 0.13 hrs HW=955.59' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.26 cfs @ 0.96 fps)

Pond LS-5: LEVEL SPREADER STA. 16+50



Summary for Pond LS-6: LEVEL SPREADER STA. 18+00

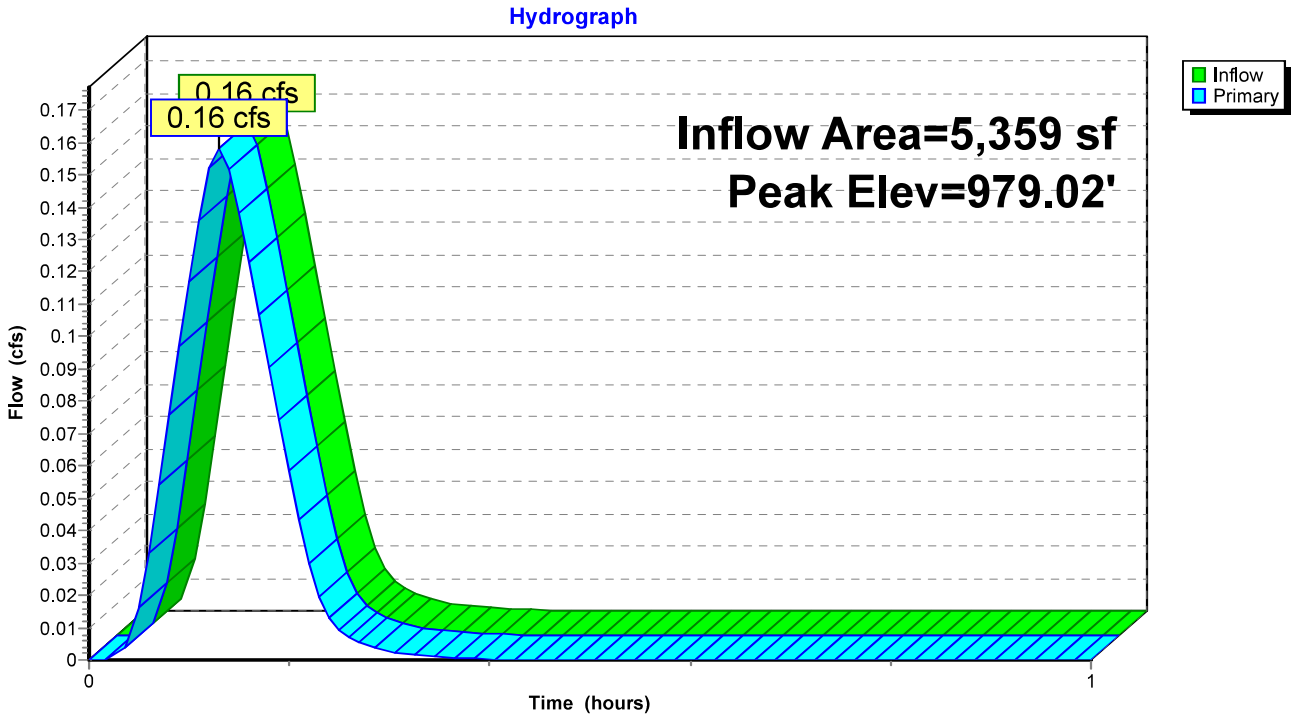
Inflow Area = 5,359 sf, 0.00% Impervious, Inflow Depth = 0.14" for 25-Year event
Inflow = 0.16 cfs @ 0.13 hrs, Volume= 63 cf
Outflow = 0.16 cfs @ 0.13 hrs, Volume= 63 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.16 cfs @ 0.13 hrs, Volume= 63 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 979.02' @ 0.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	979.00'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.16 cfs @ 0.13 hrs HW=979.02' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.16 cfs @ 0.48 fps)

Pond LS-6: LEVEL SPREADER STA. 18+00



Summary for Pond LS-7: LEVEL SPREADER STA. 20+30

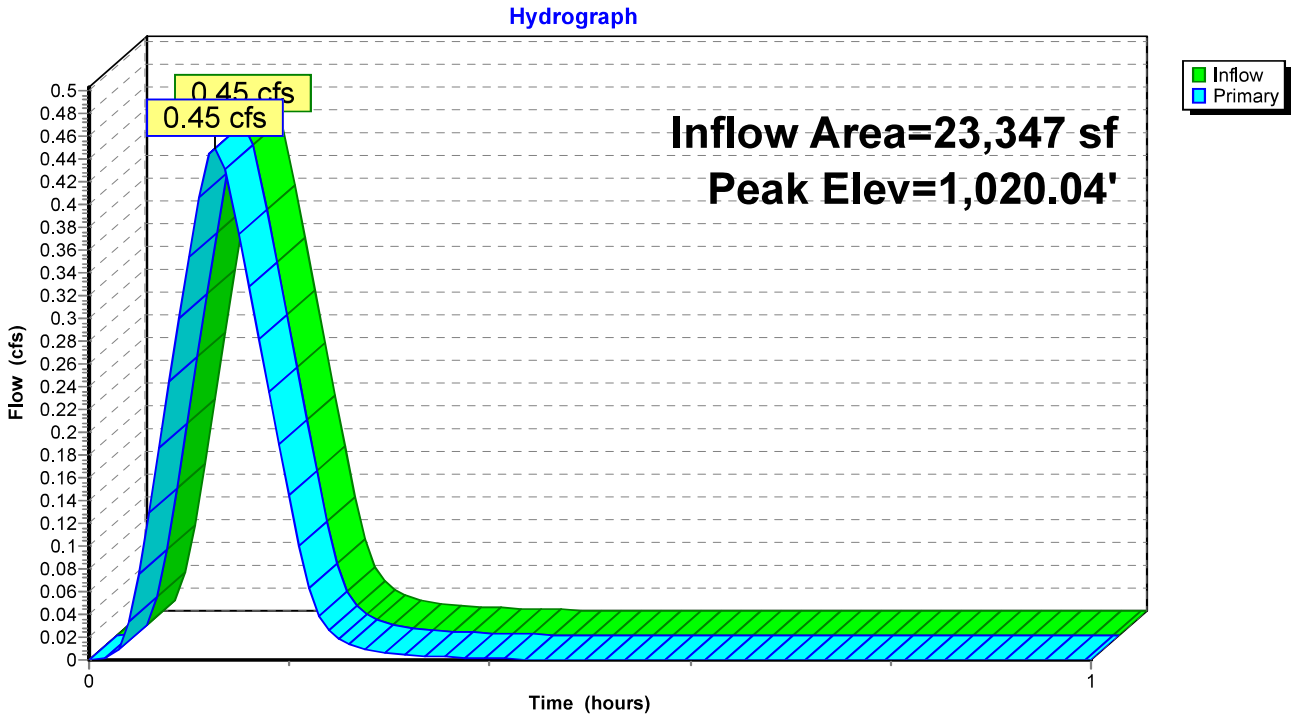
Inflow Area = 23,347 sf, 0.00% Impervious, Inflow Depth = 0.09" for 25-Year event
Inflow = 0.45 cfs @ 0.13 hrs, Volume= 177 cf
Outflow = 0.45 cfs @ 0.13 hrs, Volume= 177 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 0.13 hrs, Volume= 177 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 1,020.04' @ 0.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,020.00'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.44 cfs @ 0.13 hrs HW=1,020.04' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.44 cfs @ 0.68 fps)

Pond LS-7: LEVEL SPREADER STA. 20+30



Summary for Pond LS-8: STONE DIAPHRAGM AT COMPOUND

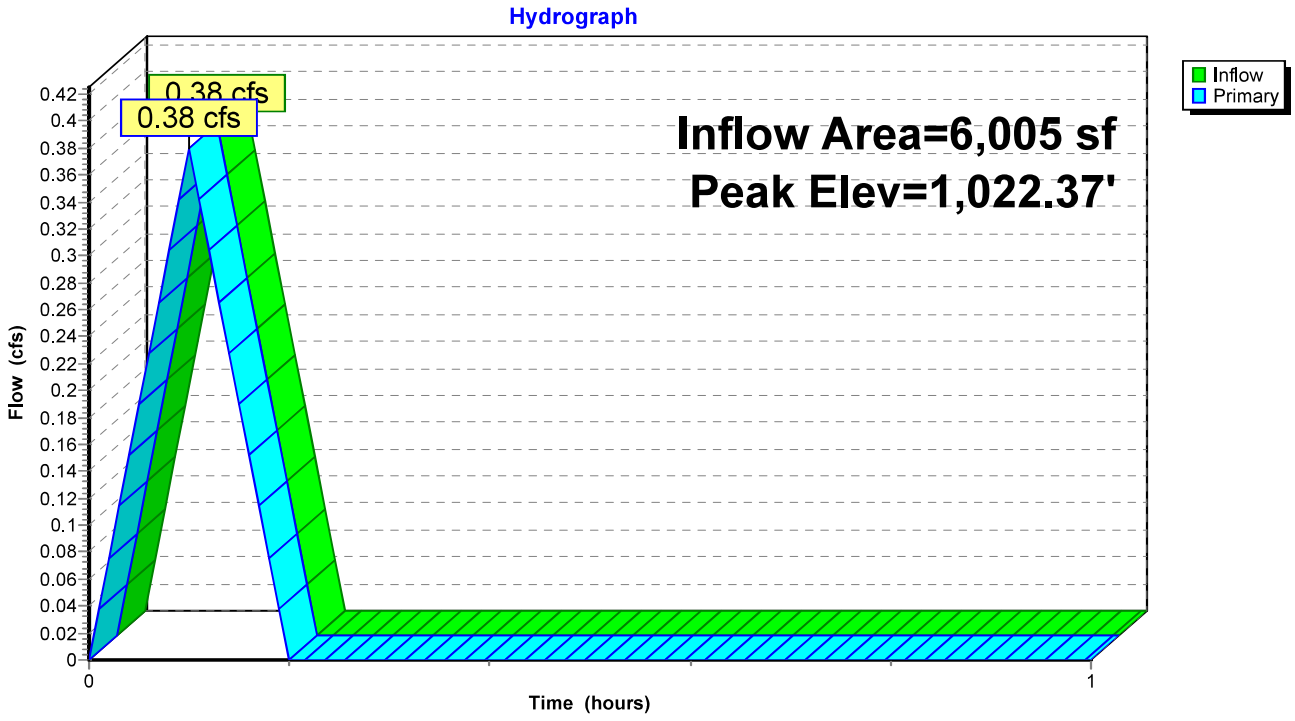
Inflow Area = 6,005 sf, 0.00% Impervious, Inflow Depth = 0.27" for 25-Year event
Inflow = 0.38 cfs @ 0.10 hrs, Volume= 137 cf
Outflow = 0.38 cfs @ 0.10 hrs, Volume= 137 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 0.10 hrs, Volume= 137 cf

Routing by Stor-Ind method, Time Span= 0.00-1.00 hrs, dt= 0.01 hrs
Peak Elev= 1,022.37' @ 0.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,022.35'	**60.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.36 cfs @ 0.10 hrs HW=1,022.37' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.36 cfs @ 0.40 fps)

Pond LS-8: STONE DIAPHRAGM AT COMPOUND



LEVEL SPREADER DESIGN

Based upon Level Spreader Design Guidelines from the Massachusetts Stormwater Handbook, Volume 2, Chapter 2

Location	25-YR Max Flow (cfs)	Sharp-crested Weir Width[1] Calculated (ft)	Design Width (ft)
(LS-1) Level Spreader @ Station 4+00	1.09	4.5	15
(LS-2) Level Spreader @ Station 6+50	0.90	3.7	20
(LS-3) Level Spreader @ Station 12+30	0.11	0.5	15
(LS-4) Level Spreader @ Station 14+80	0.53	2.2	23
(LS-5) Level Spreader @ Station 16+50	1.26	5.2	15
(LS-6) Level Spreader @ Station 18+00	0.16	0.7	15
(LS-7) Level Spreader @ Station 20+30	0.45	1.9	15
(LS-8) Stone Diaphragm @ Tower Compound	0.38	1.6	60

[1] calculated weir width for max 2-3" Height over sharp crested weir on 25-year event

Q = CLe H ^ (3/2) = 25 yr SCS 24-hr Design Storm

C = Coefficient, 3.47
Le= Effective Length Variable, Solve
H = 0.17' (2" height over spreader)

Soil Data

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Franklin County, Massachusetts

April 6, 2022

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

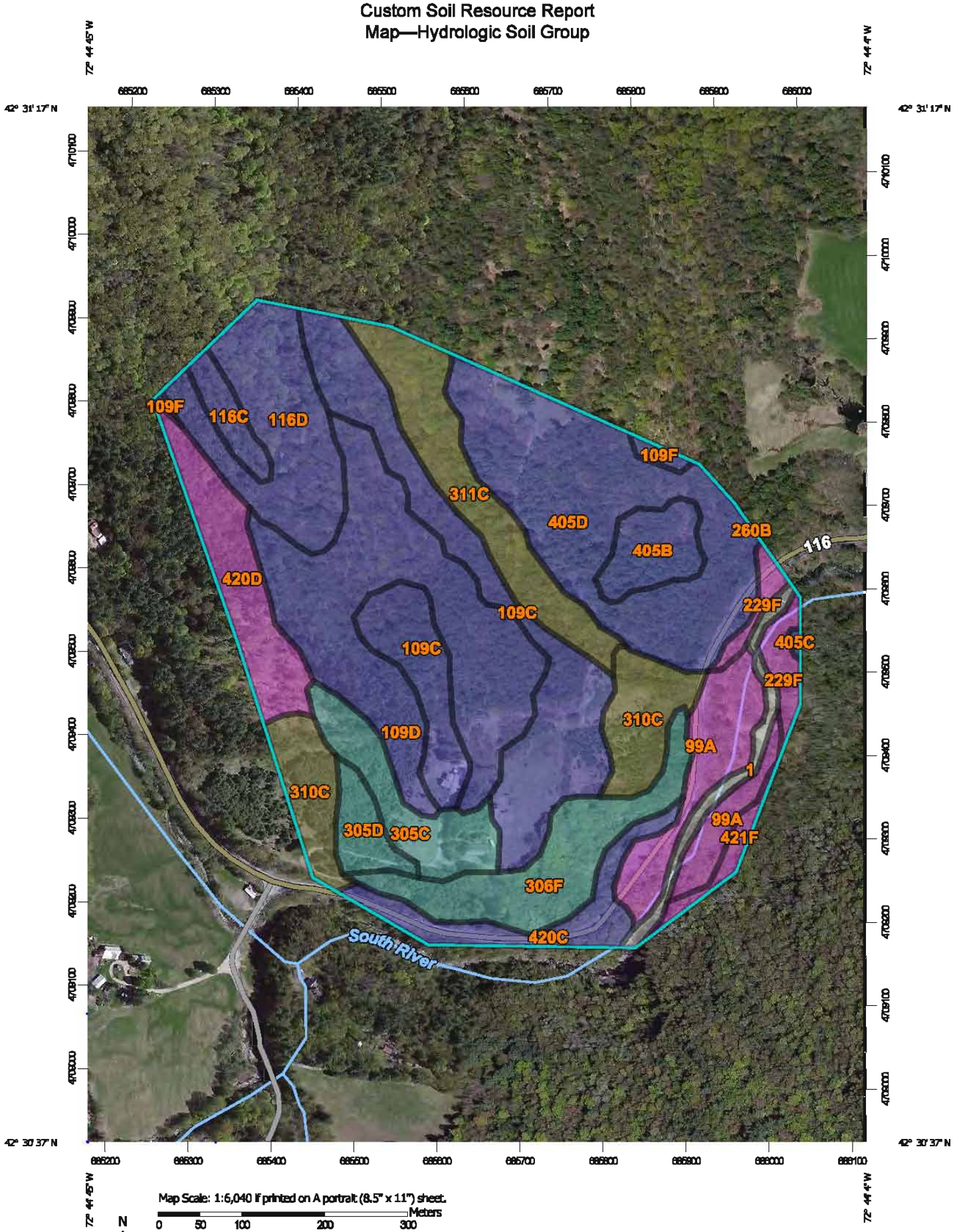
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Massachusetts
Survey Area Data: Version 16, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 9, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		1.7	1.7%
99A	Occum fine sandy loam, 0 to 3 percent slopes, occasionally flooded	A	6.1	5.8%
109C	Chatfield-Hollis complex, 8 to 15 percent slopes, rocky	B	14.7	14.1%
109D	Chatfield-Hollis complex, 15 to 25 percent slopes, rocky	B	16.3	15.7%
109F	Chatfield-Hollis complex, 25 to 60 percent slopes, rocky	B	0.4	0.4%
116C	Millsite-Westminster complex, 8 to 15 percent slopes, rocky	B	1.4	1.4%
116D	Millsite-Westminster complex, 15 to 25 percent slopes, rocky	B	8.3	7.9%
229F	Windsor and Merrimac soils, 25 to 60 percent slopes	A	2.0	1.9%
260B	Sudbury sandy loam, 3 to 8 percent slopes	C/D	0.0	0.0%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	C	4.2	4.0%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	C	1.8	1.7%
306F	Paxton fine sandy loam, 15 to 35 percent slopes, very stony	C	6.6	6.3%
310C	Woodbridge fine sandy loam, 8 to 15 percent slopes	C/D	6.2	5.9%
311C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	C/D	6.8	6.5%
405B	Charlton fine sandy loam, 3 to 8 percent slopes	B	2.6	2.5%
405C	Charlton fine sandy loam, 8 to 15 percent slopes	B	0.1	0.1%
405D	Charlton fine sandy loam, 15 to 25 percent slopes	B	15.5	14.9%
420C	Canton fine sandy loam, 8 to 15 percent slopes	B	3.5	3.4%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
420D	Canton fine sandy loam, 15 to 25 percent slopes	A	5.1	4.9%
421F	Canton fine sandy loam, 25 to 45 percent slopes, very stony	A	0.9	0.9%
Totals for Area of Interest			**104.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

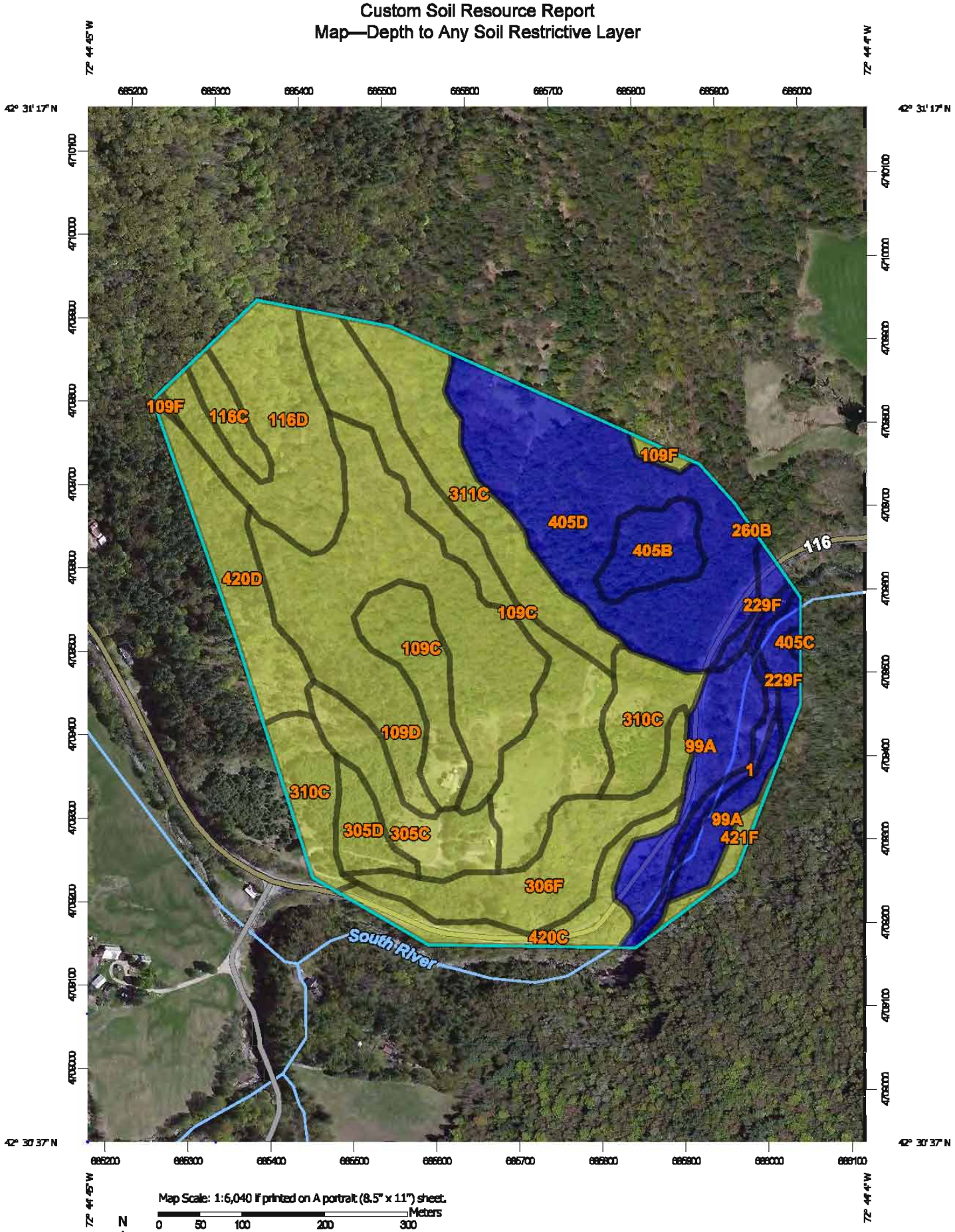
Depth to Any Soil Restrictive Layer

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "greater than 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Massachusetts
Survey Area Data: Version 16, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 9, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
1	Water	>200	1.7	1.7%
99A	Occum fine sandy loam, 0 to 3 percent slopes, occasionally flooded	>200	6.1	5.8%
109C	Chatfield-Hollis complex, 8 to 15 percent slopes, rocky	76	14.7	14.1%
109D	Chatfield-Hollis complex, 15 to 25 percent slopes, rocky	94	16.3	15.7%
109F	Chatfield-Hollis complex, 25 to 60 percent slopes, rocky	94	0.4	0.4%
116C	Millsite-Westminster complex, 8 to 15 percent slopes, rocky	84	1.4	1.4%
116D	Millsite-Westminster complex, 15 to 25 percent slopes, rocky	84	8.3	7.9%
229F	Windsor and Merrimac soils, 25 to 60 percent slopes	>200	2.0	1.9%
260B	Sudbury sandy loam, 3 to 8 percent slopes	>200	0.0	0.0%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	66	4.2	4.0%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	66	1.8	1.7%
306F	Paxton fine sandy loam, 15 to 35 percent slopes, very stony	71	6.6	6.3%
310C	Woodbridge fine sandy loam, 8 to 15 percent slopes	76	6.2	5.9%
311C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	81	6.8	6.5%
405B	Charlton fine sandy loam, 3 to 8 percent slopes	>200	2.6	2.5%
405C	Charlton fine sandy loam, 8 to 15 percent slopes	>200	0.1	0.1%
405D	Charlton fine sandy loam, 15 to 25 percent slopes	>200	15.5	14.9%
420C	Canton fine sandy loam, 8 to 15 percent slopes	66	3.5	3.4%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
420D	Canton fine sandy loam, 15 to 25 percent slopes	71	5.1	4.9%
421F	Canton fine sandy loam, 25 to 45 percent slopes, very stony	71	0.9	0.9%
Totals for Area of Interest			**104.3**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

2

Bath, NH – Gravel Driveway with Riprap Ditch

Bath, NH – Disturbed Areas with Mulch Stabilization until Vegetation Establishment

ProTerra
DESIGN GROUP, LLC

Bristol, NH – Driveway Culvert Outlet Protection

Bristol, NH – Driveway Culvert Outlet Protection

ProTerra
DESIGN GROUP, LLC

Henniker, NH – Wood Mulch Stabilization along Driveway

Henniker, NH – Wood Mulch Stabilization along Driveway

ProTerra
DESIGN GROUP, LLC

Colrain, MA – Gravel Driveway with Riprap Ditch

Colrain, MA – Driveway, Tower Compound, & Utility Run

ProTerra
DESIGN GROUP, LLC

Monterey, MA – Gravel Driveway with Perimeter Erosion Control Log

Monterey, MA – Culvert Inlet in Riprap Ditch

ProTerra
DESIGN GROUP, LLC

Monterey, MA – Gravel Driveway with Boulder Protection Barrier

Monterey, MA – Disturbed Area Mulch Stabilization and Downhill Erosion Control

ProTerra
DESIGN GROUP, LLC

Monterey, MA – Culvert Outlet Protection and Woodchip Stabilization

Monterey, MA – Perimeter Erosion Control until Final Stabilization

3

General Information (see reverse for instructions)					
Name of Project		**NPDES ID No.**		**Inspection Date**	
Weather conditions during inspection		**Inspection start time**		**Inspection end time**	
Inspector Name, Title & Contact Information					
Present Phase of Construction					
Inspection Location (if multiple inspections are required, specify location where this inspection is being conducted)					

Inspection Frequency *(Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply)*

Standard Frequency:

☐ Every 7 days

☐ Every 14 days and within 24 hours of a 0.25" rain or the occurrence of runoff from snowmelt sufficient to cause a discharge

Increased Frequency:

☐ Every 7 days and within 24 hours of a 0.25" rain (for areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3)

Reduced Frequency:

☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month; (for stabilized areas)

☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a 0.25" rain (for stabilized areas on "linear construction sites")

☐ Once per month and within 24 hours of a 0.25" rain (for arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought)

☐ Once per month (for frozen conditions where earth-disturbing activities are being conducted)

Was this inspection triggered by a 0.25" storm event? ☐ Yes ☐ No

If yes, how did you determined whether a 0.25" storm event has occurred?

☐ Rain gauge on site ☐ Weather station representative of site. Specify weather station source:

Total rainfall amount that triggered the inspection (in inches)**:**

Was this inspection triggered by the occurrence of runoff from snowmelt sufficient to cause a discharge? ☐ Yes ☐ No

Unsafe Conditions for Inspection

Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? ☐ Yes ☐ No

If "yes", complete the following:

- Describe the conditions that prevented you from conducting the inspection in this location:

- Location(s) where conditions were found:

Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2) (see reverse for instructions)				
Type/Location of E&S Control [Add an additional sheet if necessary]	**Maintenance Needed?***	**Corrective Action Required?***	**Date on Which Maintenance or Corrective Action First Identified?**	**Notes**
1.	☐Yes ☐No	☐Yes ☐No		
2.	☐Yes ☐No	☐Yes ☐No		
3.	☐Yes ☐No	☐Yes ☐No		
4.	☐Yes ☐No	☐Yes ☐No		
5.	☐Yes ☐No	☐Yes ☐No		
6.	☐Yes ☐No	☐Yes ☐No		
7.	☐Yes ☐No	☐Yes ☐No		
8.	☐Yes ☐No	☐Yes ☐No		
9.	☐Yes ☐No	☐Yes ☐No		
10.	☐Yes ☐No	☐Yes ☐No		

*** Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources. See Part 5 of the permit for more information.

Condition and Effectiveness of Pollution Prevention (P2) Practices (CGP Part 2.3) (see reverse for instructions)				
Type/Location of P2 Practices [Add an additional sheet if necessary]	**Maintenance Needed?***	**Corrective Action Required?***	**Date on Which Maintenance or Corrective Action First Identified?**	**Notes**
1.	☐Yes ☐No	☐Yes ☐No		
2.	☐Yes ☐No	☐Yes ☐No		
3.	☐Yes ☐No	☐Yes ☐No		
4.	☐Yes ☐No	☐Yes ☐No		
5.	☐Yes ☐No	☐Yes ☐No		
6.	☐Yes ☐No	☐Yes ☐No		
7.	☐Yes ☐No	☐Yes ☐No		
8.	☐Yes ☐No	☐Yes ☐No		
9.	☐Yes ☐No	☐Yes ☐No		
10.	☐Yes ☐No	☐Yes ☐No		

*** Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources. See Part 5 of the permit for more information.

Stabilization of Exposed Soil (CGP Part 2.2.14) (see reverse for instructions)			
Stabilization Area **[Add an additional sheet if necessary]**	**Stabilization Method**	**Have You Initiated Stabilization?**	**Notes**
1.		☐ YES ☐ NO If yes, provide date:	
2.		☐ YES ☐ NO If yes, provide date:	
3.		☐ YES ☐ NO If yes, provide date:	
4.		☐ YES ☐ NO If yes, provide date:	
5.		☐ YES ☐ NO If yes, provide date:	

Description of Discharges (CGP Part 4.6.6) (see reverse for instructions)	
Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection? ☐ Yes ☐ No **If "yes", provide the following information for each point of discharge:**	
Discharge Location **[Add an additional sheet if necessary]**	**Observations**
1.	Describe the discharge: At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? ☐ Yes ☐ No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
2.	Describe the discharge: At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? ☐ Yes ☐ No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:

Contractor or Subcontractor Signature and Certification
(see reverse for instructions)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Contractor or Subcontractor: _____ **Date:**

Printed Name and Affiliation: _____

Operator Signature and Certification
(see reverse for instructions)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Operator or "Duly Authorized Representative": _____ **Date:**

Printed Name and Affiliation: _____

Section A – Initial Report (CGP Part 5.4.1) (Complete this section within 24 hours of identifying the condition that triggered corrective action)					
Name of Project		**NPDES ID No.**		**Today's Date**	
Date Problem First Discovered		**Time Problem First Discovered**			
Name and Contact Information of Individual Completing this Form					

What site conditions triggered the requirement to conduct corrective action *(check the box that applies)*:

- ☐ A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4)
- ☐ A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly
- ☐ A discharge is causing an exceedance of applicable water quality standards
- ☐ A Part 1.3 prohibited discharge has occurred
- ☐ EPA requires corrective action as a result of permit violations found during an EPA inspection carried out under Part 4.8

Provide a description of the problem:

Deadline for completing corrective action *(check the box that applies)*:

- ☐ Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events
- ☐ Complete by close of the next business day when problem does not require a new or replacement control or significant repair
- ☐ No later than 7 calendar days from the time of discovery for problems that require a new or replacement control or significant repair
- ☐ Infeasible to complete the installation or repair within 7 calendar days. Explain why it is infeasible and document schedule for installing control:

Enter date of corrective action completion: _____

Section B – Corrective Action Completion (CGP Part 5.4.2)

(Complete this section no later than 24 hours after completing the corrective action)

Section B.1 – Why the Problem Occurred

Cause(s) of Problem (Add an additional sheet if necessary)	**How You Determined the Cause and the Date You Determined the Cause**
1.	**1.**
2.	**2.**

Section B.2 – Stormwater Control Modifications Implemented to Correct the Problem

List of Stormwater Control Modification(s) Needed to Correct Problem (Add an additional sheet if necessary)	**Date of Completion**	**SWPPP Update Necessary?**	**Notes**
1.		☐Yes ☐No If yes, provide date SWPPP modified:	
2.		☐Yes ☐No If yes, provide date SWPPP modified:	

Section C –Signature and Certification (CGP Part 5.4.3)

Section C.1 – Contractor or Subcontractor Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Contractor or Subcontractor: _____

Date:

Printed Name and Affiliation: _____

Section C.2 – Operator Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Operator or "Duly Authorized Representative": _____

Date:

Printed Name and Affiliation: _____

4

Vertex Towers Assets, LLC

Construction References

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Town Administrator
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Bristol, NH 03222
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townadmin@townofbristolnh.org

Donald Torrico
Inspector of Buildings, Building Commissioner and Code Enforcement Officer
P.O. Box 308
Monterey, MA 01245
413-528-1443 x118
413-854-3959

5

Final Construction Control Document

To be submitted at completion of construction by a

Registered Design Professional

for work per the ninth edition of the

Massachusetts State Building Code, 780 CMR, Section 107

Project Title: Vertex Towers, LLC – VT-MA 0001A – Monterey Hume Lake

Permit No.: C-19-0014 (Foundation) & C-19-0016 (Tower Stacking) Date: 10/14/2020

Property Address: 73 Chestnut Hill Road, Monterey, MA 01245

Project: Check (x) one or both as applicable: ☒ New construction ☐ Existing Construction

Project description: Vertex Towers proposed to erect a 130'+/- steel monopole tower, (installation by Berkshire Wireless) atop a concrete mat foundation, (installed by Tryon/CVS Foundations) as shown in plan set by Nello Corporation May 09, 2019. Site access roadway and compound area (installed by Tryon) as shown in latest construction drawings by ProTerra Design Group, LLC issued 08/30/2019 Rev2.

I Jesse M. Moreno MA Registration Number: 47315 Expiration date: 06/30/2022, am a *registered design professional*, and I have prepared or directly supervised the preparation of all design plans, computations and specifications concerning[1]:

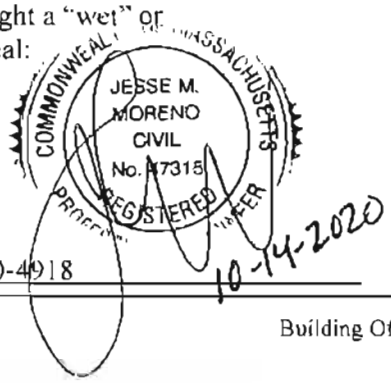
☐ Entire Project (Site Plan) ☐ Architectural ☐ Structural ☐ Mechanical
☐ Fire Protection ☐ Electrical ☒ Other: Telecommunications Facility Installation

for the above named project. I, or my designee, have performed the necessary professional services, in accordance with the Professional Standard of Care, and was present at the construction site on a regular and periodic basis. To the best of my knowledge, information, and belief the work proceeded in accordance with the requirements of 780 CMR and the design documents approved as part of the building permit and that I or my designee:

1. **Have reviewed**, for conformance to this code and the design concept, shop drawings, samples and other submittals by the contractor in accordance with the requirements of the construction documents. Such review shall not diminish or relieve the contractor of its submittal and other responsibilities.
2. **Have performed** the duties for registered design professionals in 780 CMR Chapter 17, as applicable.
3. **Have been present** at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the work and to determine if the work was performed in a manner consistent with the construction documents and this code. The contractor is responsible for the performance of the work in accordance with the contract documents and shall be exclusively responsible for its construction means, methods, sequences and procedures, and for construction safety.

Nothing in this document relieves the contractor of its responsibility regarding the provisions of 780 CMR 107.

Enter in the space to the right a "wet" or electronic signature and seal:



Phone number: (413) 320-4918 Email: jmoreno@proterra-design.com

Building Official Use Only

Building Official Name: _____ Permit No.: _____ Date: _____

ProTerra DESIGN GROUP, LLC

PREPARED BY: ProTerra Design Group, LLC
4 Bay Road
Building A; Suite 200
Hadley, MA 01035

SUBMITTED TO: Donald Torrico
Building Commissioner
435 Main Road
PO Box 308
Monterey, MA 01245

FIELD INSPECTION REPORT

INSPECTION DATE October 28, 2019	**JOB NO.** 17-051

REPORT ISSUE DATE	REVISION	COMMENTS
August 04, 2020	0	Interim Field Inspection Report

PROJECT

Vertex New Build
Building Permit No.: C-19-0014 & C-19-0016
Vertex Site ID: VT-MA 0001A
Vertex Site Name: Monterey Hume Lake
Site Address: 73 Chestnut Hill Road Monterey, MA 01245

CONTRACTOR	TOWER OWNER
Tryon Construction (Civil) & Caldon Construction and Blasting	Vertex Towers
PRESENT AT SITE	**ORGANIZATION**
Victor Moreno	ProTerra Design Group, LLC

Pursuant to the Massachusetts State Building Code, 9th edition (780 CMR) with Massachusetts Amendments to the IBC 2015, the following report documents a visual inspection from ground level for the general conformance with the construction drawings from Proterra Design Group, LLC dated 08/30/2019 (Rev2) for the above referenced project.

The following items below have been completed in general conformance to plans:

1) Site clearing has taken place for the construction of access road and compound area.
2) Erosion control measures have been put in place.
3) Access road has been roughed in.
4) Blasting was required in the compound area for the tower foundation. Blasting performed by Caldon Construction Drilling & Blasting.
5) Foundation hole has been cleared and reviewed by the Geotech, Gifford Engineering on 10-30-2019. ProTerra Design Group, LLC has issued and updated geotechnical memo based upon the as-built site conditions found in the field. The as-built geotechnical memo date 12-10-2019 has been attached to this report.

The comments in this field report are a record of observations made on site. If there are any errors or omissions please notify ProTerra Design Group, LLC in writing or all comments and all parties shall consider this report factual and acceptable.

COPIES TO: File

SUBMITTED: _____
Peter Nute, Project Engineer

REVIEWED: _____
Jesse Moreno, P.E. Managing Partner

Site clearing

Access road roughed in

Access road

Blasting set up

Foundation hole-post blast

Erosion controls

ProTerra
DESIGN GROUP, LLC

December 10, 2019

Stephen Kelleher
Vertex Tower Assets, LLC
155 South Street
Suite 205
Wrentham, MA 02093

RE: As-Built Geotechnical Memorandum
Site Name: Monterey Hume Lake
Site Number: VT-MA-0001A
Project Location: 73 Chestnut Hill Road
Monterey, MA

Mr. Kelleher,

This memorandum is intended to amend the previous geotechnical report provided by ProTerra Design Group, LLC dated January 28, 2019 based upon the as-built conditions of the tower foundation subgrade at the above mentioned site.

The following information shall serve as the record of as-built design parameters:

- The bedrock material encountered during excavation activities were consistent with the previous geotechnical report.
- Groundwater was not observed during excavation and should be considered to be below a depth 8' from grade and below the bottom of the tower foundation.
- The existing parent bedrock material was blasted and excavated. The over blast depth varied from 2' to 6' in depth below the base of the foundation.
- A (2) two inch minus compacted crushed stone material was placed and bears upon bedrock. This is judged adequate to support the foundation load with settlements of less than one inch total or differential. [1]
- The maximum net allowable bearing capacity at the bottom of footing due to overturning should be considered 5000 psf. [1]

[1]*Based upon correspondence and site inspection on October 30, 2019 by record Geotechnical Engineer, Gregory P Gifford, PhD, PE and ProTerra Design Group, LLC*.

If you have any questions or need further information, please do not hesitate to call us at (413) 320-4918.

Sincerely,
ProTerra Design Group, LLC

Thomas Johnson, PE
Managing Partner

ProTerra DESIGN GROUP, LLC

FIELD INSPECTION REPORT

INSPECTION DATE November 08, 2019		**JOB NO.** 17-051
REPORT ISSUE DATE	**REVISION**	**COMMENTS**
August 04, 2020	0	Field Inspection Report Tower Foundation

PROJECT

Vertex New Build
Building Permit No.: C-19-0014 & C-19-0016
Vertex Site ID: VT-MA 0001A
Vertex Site Name: Monterey Hume Lake
Site Address: 73 Chestnut Hill Road Monterey, MA 01245

CONTRACTOR	**TOWER OWNER**
Tryon Construction (Civil) & CVS Foundations (Foundation)	Vertex Towers
PRESENT AT SITE	**ORGANIZATION**
Jesse Moreno & Jamie Gruber	ProTerra Design Group, LLC

PREPARED BY: ProTerra Design Group, LLC
4 Bay Road
Building A; Suite 200
Hadley, MA 01035

SUBMITTED TO: Donald Torrico
Building Commissioner
435 Main Road
PO Box 308
Monterey, MA 01245

Pursuant to the Massachusetts State Building Code, 9th edition (780 CMR) with Massachusetts Amendments to the IBC 2015, the following report documents a visual inspection from ground level for the general conformance with the construction drawings from ProTerra Design Group, LLC dated 08/30/2019 (Rev2) for the above referenced project.

The following items below have been completed in general conformance to plans:

1) Foundation areas has been excavated and 1 ½" stone sample review by geotech inspector & used as sub-base for the foundation. The stone was laid and rolled to compaction in lifts as required.
2) Foundation forms installed for the tower foundation and have been checked for size and location.
3) Foundation rebar installed maintaining minimum edge distances to the sides of the foundation forms. Anchor bolts have been set within the foundation pier rebar cage. *Note:* Original plans called for 52 bars and only 48 bars were installed instead. The discrepancy was reviewed with the tower manufacturer and the tower foundation calculation was rerun to confirm that the tower foundation is not overstressed as installed. Nello Corporation issued the attached as-built tower foundation design for the site date 01-24-2020.
4) 4000psi concrete mix has been poured in the prepared forms per the attached mix design. Concrete was vibrated into place.
5) Heat blankets were placed over the concrete and a Heat King mobile heating unit was used to protect the concrete from the cold during initial curing.
6) Concrete testing performed by R.W. Gillespie Associates, Inc. (See attached testing reports).

The comments in this field report are a record of observations made on site. If there are any errors or omissions please notify ProTerra Design Group, LLC in writing or all comments and all parties shall consider this report factual and acceptable.

COPIES TO: File

SUBMITTED: _____
Peter Nute, Project Engineer

REVIEWED: _____
Jesse Moreno, P.E. Managing Partner

Tower foundation base compacted with a roller

Monopole anchor bolts

Rebar cage spacing

Foundation pour in progress

Concrete heat blankets on foundation

Foundation complete

Century Acquisition, Inc.

A Clemente Group, LTD Company
PO Box 189 • Watervliet, NY 12189
518-273-5800 • Fax 518-273-6134

November 5, 2019

Mr. Carey Simons

Re: Cell Tower – 73 Chestnut Hill Rd, Monterey

CEMENT: ASTM C-150 Type I/II cement, as manufactured by Lafarge North America of Ravena, NY.
FINE AGGREGATE: ASTM C-33 Concrete Sand, as produced by Century Acquisition, Inc. of Canaan, CT.
COARSE AGGREGATE: #67 gradation per ASTM C-33, as produced by Century Acquisition, Inc. of Canaan, CT.
WATER REDUCER: ASTM C-494, Sikament 475 as produced by Sika Chemical Co. of Lyndhurst, NJ.
AIR ENTRAINMENT: ASTM C-260, Sika AEA-14 as produced by Sika Chemical Co.

4,000 P.S.I. Concrete (Air-Entrained) – "40CNF"

CEMENT	611#
FINE AGGREGATE	1348# S.S.D.
COARSE AGGREGATE	1760# S.S.D.
SIKAMENT 475	6.0 Oz. per 100 weight
SIKA AEA-14	As Required
WATER	33.0 Gals.

Slump: 4" Max.* Air Content: 6.0% +/- 1.5% W/C Ratio: 0.45

* Additional Sikament 475 full-range water-reducer may be added to increase slump for improved pumping and workability without effecting the water-cement ratio or strength.

NOTE: Non-Chloride Accelerator may be added, upon customer request, without ill effect upon the mix design. The addition of accelerator does not negate the need for proper cold weather concrete practices as directed by ACI.

Century Acquisition is not responsible for any requested changes made to mix design without written approval. **All designed strengths are dependent upon strict adherence of ASTM Standards pertaining to testing procedures.** ASTM C31 Standard Practice for Making and Curing test cylinders requires immediate after molding that the cylinders be stored for a period of 24-48 hours in a temperature range from 60 to 80 deg F and in an environment preventing moisture loss from the cylinders.

ATLANTIC TESTING LABORATORIES

CONCRETE COMPRESSION TEST REPORT AT961C-860C-02-16

CLIENT: Bonded Concrete
PROJECT: Mix Design Verifications

PLACEMENT DATE: February 1, 2016 (Monday)
CYLINDERS FABRICATED BY: Client
SUPPLIER: Century Acquisitions
PLANT LOCATION: Pittsfield, Massachusetts

CONTRACTOR: Not Specified

MIX DESIGN DATA

MIX DATA OBTAINED FROM: Client

Mix Designation: CT;AIR; PT 2

DESIGN STRENGTH AT 28-DAYS:		---	**psi**	
PER cy:	CEMENT (lbs.):	611	CEMENT BRAND:	Lafarge - Type I/II
	WATER (gals):	33.0	W/C RATIO:	0.45
	FINE AGG (lbs.):	1348	FINE SOURCE:	Century State Sand, Canaan, CT
	#67 COARSE AGG (lbs):	1760	COARSE SOURCE:	Century Aggregates, Falls Village, CT
	AEA (oz):	2.44	AEA BRAND:	Sika Chemical Co. - Sika AEA-14
	WRA (oz):	36.7	WRA BRAND:	Sika Chemical Co. - Sika 686

LABORATORY DATA (ASTM C 39, C 511, and C 1231)

Cylinder Number	Client Provided Information	Density[(1)] (pcf)	Date of Test	Age (days)	Cylinder Diameter (in)	Cylinder Area (in^2)	Fracture Type (1-6)	Total Load (lbs.)	**Unit Load (psi)**
961C5392	Slump=4¼ " Air=7.2% Unit Weight=146.8 pcf	149	2/8/16	7	3.99	12.50	2	77,270	**6180**
961C5393		149	2/8/16	7	3.99	12.50	2	79,670	**6370**
961C5394		150	2/29/16	28	4.00	12.57	3	99,210	**7890**
961C5395		149	2/29/16	28	4.00	12.57	3	97,650	**7770**
961C5396		150	2/29/16	28	4.00	12.57	2	100,520	**8000**
961C5397		149	3/28/16	56	4.01	12.63	5	98,170	**7770**

REMARKS

Cylinders were received on February 3, 2016.
[(1)] Densities are approximate and are calculated based on cylinder weights and volumes determined in the laboratory.

Reviewed by: Christopher J. Crowin Date: April 6, 2016

Material Certification Report

Material: Portland Cement
Type: I-II

Test Period: 01-Jul-2019 to 31-Jul-2019
Date Issued: 15-Aug-2019

Certification

This cement meets the specifications of ASTM C150 and AASHTO M85 for Type I-II cement.

General Information

Supplier:	Holcim (US) Inc. d/b/a LafargeHolcim US	Source Location:	Ravena Plant Silo: C1-C16, B1-B6
Address:	8700 West Bryn Mawr Ave Chicago, IL 60631		P.O. Box 3 Ravena, NY 12143
Contact:		Contact:	Scott Derhammer / (518) 756-5000

The following is based on average test data during the test period. The data is typical of product shipped from this source; individual shipments may vary.

Test Data on ASTM Standard Requirements

Chemical			Physical		
Item	**Limit [1]**	**Result**	**Item**	**Limit [1]**	**Result**
SiO_2 (%)	-	19.9	Air Content (%)	12 max	9
Al_2O_3 (%)	6.0 max	4.7	Blaine Fineness (m^2/kg)	260 min	391
Fe_2O_3 (%)	6.0 max	3.3			
CaO (%)	-	62.5	Autoclave Expansion (%) (C151)	0.80 max	0.04
MgO (%)	6.0 max	3.3	Compressive Strength MPa (psi)		
SO_3 (%) [2]	3.0 max	3.5	3 day	10.0 (1450) min	25.9 (3760)
Loss on Ignition (%) [5]	3.5 max	1.7	7 day	17.0 (2470) min	31.8 (4610)
Insoluble Residue (%)	1.50 max	0.25	28 day (previous month's data)	-	38.7 (5610)
CO_2 (%)	-	0.8			
$CaCO_3$ in Limestone (%)	70 min	95	Initial Vicat (minutes)	45-375	126
Potential Phase Compositions [3]:					
C_3S (%)	-	54	Mortar Bar Expansion (%) (C1038)	0.020 max	0.006
C_2S (%)	-	16			
C_3A (%)	8 max	5			
C_4AF (%)	-	7			
$C_3S + 4.75C_3A$ (%)	-	87			

Test Data on ASTM Optional Requirements

Chemical			Physical		
Item	**Limit [1]**	**Result**	**Item**	**Limit [1]**	**Result**
Equivalent Alkalies (%)	-	0.59			

Notes (*1-9)

1 - Dashes in the Limit / Result columns mean Not Applicable.
2 - It is permissible to exceed the specification limit provided that ASTM C1038 Mortar Bar Expansion does not exceed 0.020% at 14 days.
3 - Adjusted per Annex A1.6 of ASTM C150 and AASHTO M85.
5 - Limit = 3.0 when limestone is not an ingredient in the final cement product

Additional Data

Item	Limestone	Inorganic Processing Addition	Base Cement Phase Composition	Result
Amount (%)	1.9	-	C_3S (%)	55
SiO_2 (%)	3.3	-	C_2S (%)	16
Al_2O_3 (%)	0.9	-	C_3A (%)	5
Fe_2O_3 (%)	0.2	-	C_4AF (%)	7
CaO (%)	52.7	-		
SO_3 (%)	0.1	-		

Printed: 8/15/2019 4:12:37 PM
Version: 180412

Scott Derhammer, Quality Manager

Century Acquisitions

Gradation Test Report

MATERIAL: Concrete Sand

Date:	11/17/17	Lab/Location:	Sheffield, MA
Source:	Century Acquistions	Sample #:	1
Plant Type:		Sample Location:	Stockpile
Facility #:		Sampled By/Cert. #:	

Moisture Content

Wet Mass(W):	
Original Dry Mass(D):	633.5
Moisture Loss (W - D):	
% Moisture (100 x (W - D) / D):	

Materials Finer than #200 Sieve by Washing

Dry Mass after wash (Dw):	
Mass of Fines lost by washing (D - Dw):	0.0
% -75 µm Sieve (100 x (D - Dw)/D):	

Mechanical Analysis of Extracted Aggregate

Sieve	Mass per Sieve		% Retained per Sieve		% Passing		Specification
	Unwashed	Washed	Unwashed	Washed	Unwashed	Washed	ASTM
1/4"	0.0		0.0		100.0		
#4	12.7		2.0		98.0		95/100
#8	94.9		15.0		85.0		80/100
#16	204.9		32.3		67.7		50/85
#30	332.3		52.5		47.5		25/60
#50	467.4		73.8		26.2		10/30
#100	580.1		91.6		8.4		2/10
#200	624.4		98.6		1.4		
Pan	633.5		100.0		0		
Loss on Washing (D - Dw)					**Fineness Modulus (FM) =**		**2.671**
Total	633.5						

Comments:	

Tested by:	MDGlwski	Reviewed by:	
Certification #:	652m	Certification #:	
Date:	11/17/2017	Date:	

Century Acquisitions

Gradation Test Report

MATERIAL: #67 White

Date:	11/17/17	Lab/Location:	Sheffield, MA.
Source:	Century Acquisitions	Sample #:	1
Plant Type:		Sample Location:	Stockpile
Facility #:	Falls Village	Sampled By/Cert. #:	MDGliwski - 652m

Moisture Content

Wet Mass(W):	
Original Dry Mass(D):	6120.0
Moisture Loss (W - D):	
% Moisture (100 x (W - D) / D):	

Materials Finer than #200 Sieve by Washing

Dry Mass after wash (Dw):	
Mass of Fines lost by washing (D - Dw):	0.0
% -75 µm Sieve (100 x (D - Dw)/D):	

Mechanical Analysis of Extracted Aggregate

Sieve	Mass per Sieve		% Retained per Sieve		% Passing		Specification
	Unwashed	Washed	Unwashed	Washed	Unwashed	Washed	ASTM #67
1"	0.0		0.0		100.0		100
3/4"	600.0		9.8		90.2		90/100
3/8"	4200.0		68.6		31.4		20/55
#8	5860.0		95.8		4.2		0/5
Pan	6120.0		100.0		0		
Loss on Washing (D - Dw)							
Total	6120.0						

Comments:

Tested by:	MDGliwski	Reviewed by:	
Certification #:	652M	Certification #:	
Date:	11/17/2017	Date:	

BUILDING TRUST

PRODUCT DATA SHEET
Sikament®-475

MULTI RANGE WATER REDUCING ADMIXTURE

PRODUCT DESCRIPTION

Sikament®-475 is a multi range water reducing and slump retaining admixture utilizing Sika's ViscoCrete® Technology. Sikament®-475 is designed to meet the requirements for ASTM C-494 Types A and F.

USES

Sikament®-475 is recommended for use in the production of conventional ready mixed concrete. Addition of Sikament®-475 to concrete enables water reduction and workability retention. Concrete containing Sikament®-475 can be used for any applications including slabs, paving, footings, wall panels, beams, columns and other concrete elements.

CHARACTERISTICS / ADVANTAGES

- Enables water reduction.
- Improves workability retention without significantly delaying the set time of concrete.
- Improves early and later age strength and durability of concrete.
- Minimizes potential for bleeding and segregation in concrete.
- Improves pumpability and reduces stickiness in concrete.
- Improves finishability and surface appearance of concrete.

Sikament®-475 does not contain calcium chloride or any other intentionally added chlorides and will not contribute to corrosion on steel reinforcement present in the concrete.

PRODUCT INFORMATION

Packaging	Sikament®-475 is available in 55 gallon drums (208 liters), 275 gallon totes (1040 liters) and bulk delivery.
Appearance / Color	Light Gray Liquid
Shelf Life	Shelf life when stored in dry warehouse conditions between 40 °F and 80 °F (5–27 °C) is 12 months.
Storage Conditions	Sikament®-475 should be stored at above 40 °F (5 °C). If frozen, thaw and agitate thoroughly to return to normal state. Protect from direct sunlight.
Specific Gravity	Approx. 1.05

Concrete

Sika® AEA-14

Air Entraining Admixture

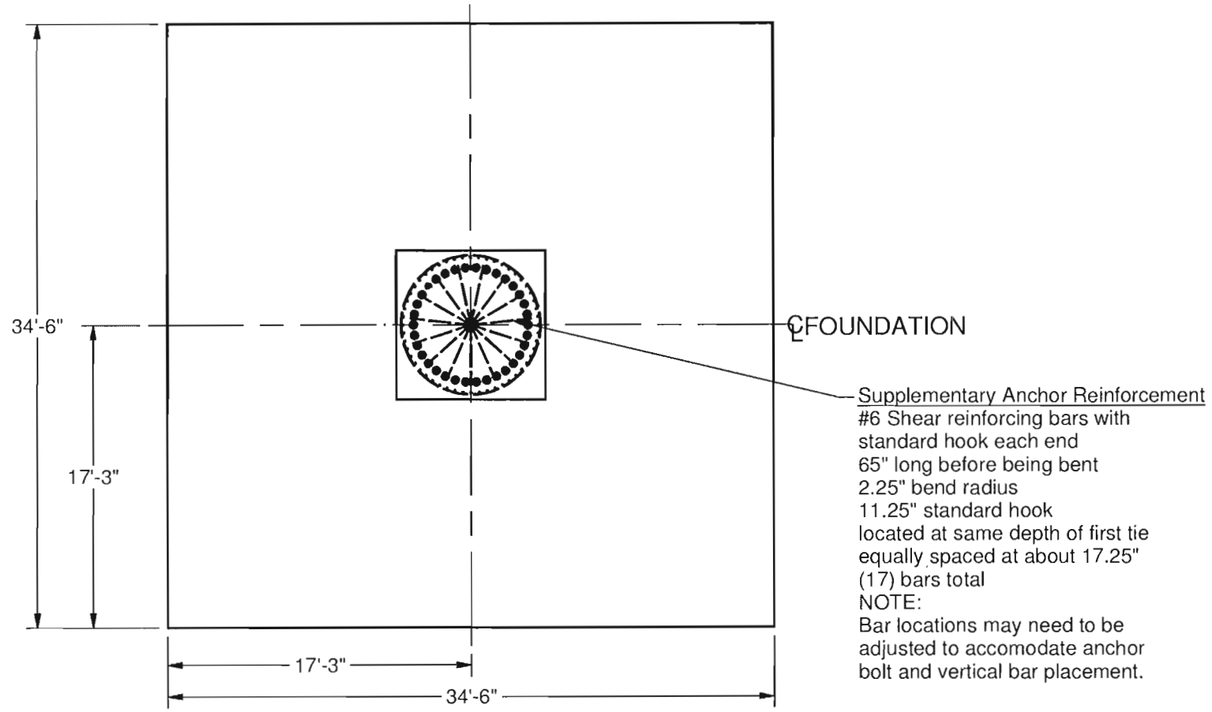
Description	Sika® AEA-14 admixture is an aqueous solution of organic materials. Sika® AEA-14 meets the requirements of ASTM C-260 for air entraining admixtures.
Applications	Sika® AEA-14 is recommended for use whenever air entrained concrete is desired. Ready-mix, precast and block producers can achieve predictable and uniform entrained air contents in concrete, even where harsh lean mixes are used or fly-ash is added to the concrete.
Benefits	**Durability:** ■ Air entrainment is recognized as the most effective prevention against concrete scaling in exposed environments. Air entrained concrete delivers particular benefits in the form of increased concrete durability. This is important in colder climates where frost and freeze-thaw cycles can cause scaling and damage to the concrete surface. ■ Air entraining agents help to prevent scaling by creating microscopic air voids that water trapped in the concrete can expand into when the concrete freezes, thus preventing cracks caused by the natural expansion. Entrained air voids in the concrete will also increase durability in harsh environments where concrete is exposed to deicing salts, marine salts and sulfates. ■ Workability and placeability are also improved by the lubricating action of the microscopic bubbles in the concrete. Concrete flows better, and bleeding and shrinkage is reduced because less water is needed to obtain the desired workability.
How to Use	
Dosage	Dosage rates for Sika® AEA-14 will typically fall between 1 and 3 fl. oz. per 100 lbs. (65 - 195 ml/100 kg) of cement to entrain between 4 and 6 percent air. Higher air contents may be obtained by increasing the dosage rate. Dosage rates will vary depending on the air content required for a particular project. Typically air contents will be specified in the range of 4 to 8 percent by volume. Other factors that may affect the amount of air entrained into the concrete include, but are not limited to: total cementitious content, type of pozzolanic materials, sand gradation, temperature and water content. Sika recommends that trial mixes be performed whenever material or any other changes are made that may affect the amount of entrained air.

Concrete

SikaSet® NC

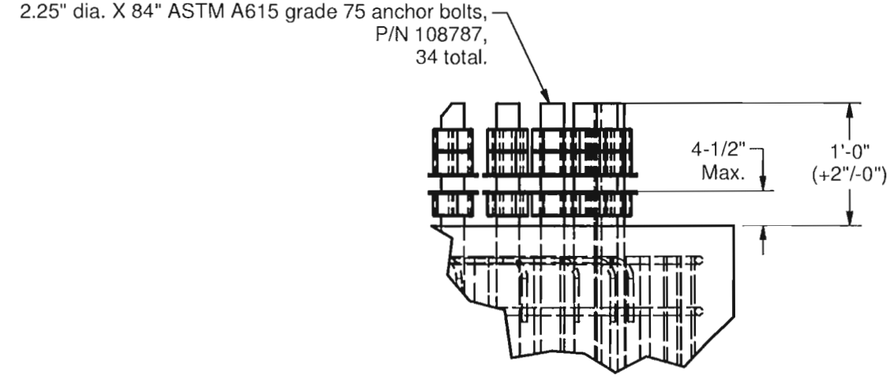
Accelerating Admixture

Description	SikaSet® NC is a non-chloride, water reducing and accelerating admixture. SikaSet® NC meets the requirements of ASTM C-494 Types C and E admixtures.
Applications	SikaSet® NC is an effective accelerator where high early strength concrete is desired and the use of calcium chloride is prohibited.
Benefits	**Accelerated Set Times and Strength Development:** SikaSet® NC may be used to accelerate set times and increase early strength gain where job-site efficiency is important in order to meet construction deadlines. SikaSet® NC saves time and money by allowing faster finishing and stripping of concrete surfaces. ■ Accelerated setting time across a wide range of temperatures. ■ Increased early and ultimate compressive and flexural strengths. ■ Insulation and heating costs during curing time are reduced. ■ Accelerated set times allow crews to finish concrete earlier, saving on labor costs. ■ Earlier stripping and reuse of forms increases labor productivity. ■ Accelerated strength gain allows earlier structural use and speeds completion time. **Cold Weather Concreting:** At the recommended dosage rate SikaSet® NC will protect concrete from freezing in most sub-freezing temperature conditions and may reduce the need for cold weather concreting practices as specified in ACI 306 - Standard Specification for Cold Weather Concreting. SikaSet® NC does not contain calcium chloride or any other intentionally added chlorides and will not initiate or promote the corrosion of steel members present in the concrete.
How to Use	
Dosage	To accelerate set times dosage at the rate of 10-45 fl. oz. per 100 lbs. (650-2940 ml / 100 kg.) of cement is recommended. When used to protect concrete from freezing, dosage will vary with different brands of cement and ambient temperatures and higher dosages may be necessary. Sika recommends that trial mixes be performed to determine the most efficient dosage. When using 16 fl. oz. / 100 lbs. or more, adjust mixing water accordingly.

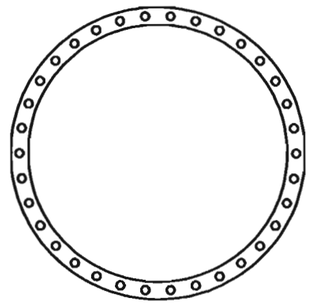


Supplementary Anchor Reinforcement
#6 Shear reinforcing bars with
standard hook each end
65" long before being bent
2.25" bend radius
11.25" standard hook
located at same depth of first tie
equally spaced at about 17.25"
(17) bars total
NOTE:
Bar locations may need to be
adjusted to accomodate anchor
bolt and vertical bar placement.

PLAN VIEW
(REINFORCEMENT NOT SHOWN FOR CLARITY)



ANCHOR BOLT DETAIL



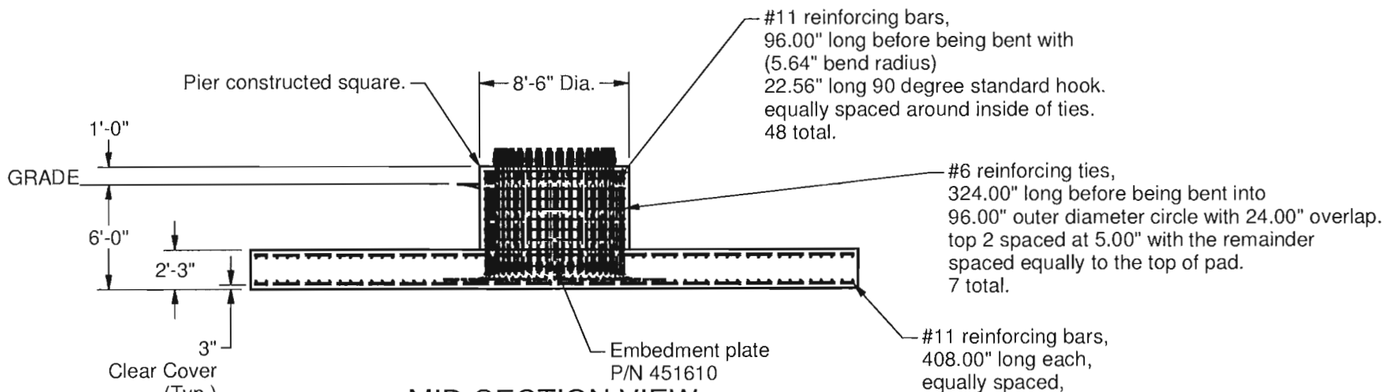
83.5 in EMBEDMENT PLATE O.D.

(34.0) 2-5/16" HOLES
ON A 78.5 in DIAMETER BOLT CIRCLE

73.5 in EMBEDMENT PLATE I.D.

EMBEDMENT PLATE DETAIL

Concrete Compressive Strength, f'c = 4000 psi



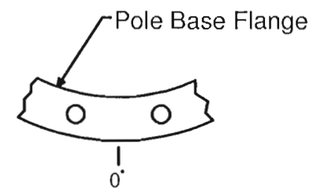
#11 reinforcing bars,
96.00" long before being bent with
(5.64" bend radius)
22.56" long 90 degree standard hook.
equally spaced around inside of ties.
48 total.

#6 reinforcing ties,
324.00" long before being bent into
96.00" outer diameter circle with 24.00" overlap.
top 2 spaced at 5.00" with the remainder
spaced equally to the top of pad.
7 total.

#11 reinforcing bars,
408.00" long each,
equally spaced,
58 per direction per layer,
232 total.

MID-SECTION VIEW

PIER AND PAD FOUNDATION
(CONCRETE VOLUME: 109.2 CU. YD.)



Anchor Bolt Holes
Are on Either Side of
the 0 Degree Azimuth

Anchor Bolt Azimuth

JAN 24 2020

REV	BY	DATE	DESCRIPTION
3	DF	1/22/2020	Revised Pier to be square per ECO 7024

ORIG. DATE: 5/7/2019 | DWG NO: 451608
DWG. PROG: v1.06 | SHEET: 1 OF 2

TITLE:
Vertex Towers, LLC
NTP 72" X 129'
VT-MA 0001A Monterey
Hume Lake
Berkshire Co., MA

NELLO CORPORATION
1201 S. Sheridan St.
South Bend, IN 46619
Bus: (574)288-3632
Fax: (574)288-5860

Foundation Notes

1. This foundation has been designed for the following reactions.

ASCE 7-05		ASCE 7-10	
Shear:	108.4 kips	Shear:	112.5 kips
Moment:	11422.3 ft-kips	Moment:	11857.5 ft-kips
Weight:	74.7 kips	Weight:	74.7 kips

2. Foundation design is based on the Geotechnical As-Built Memorandum dated 12/10/2019, by ProTerra Desing Group, LLC to amend Geotechnical Report dated 01/28/2019, by ProTerra Desing Group, LLC; Project No. 1182.
3. A field inspection shall be performed in order to verify that the actual site soil parameters meet or exceed the assumed soil parameters and that the depth of standard foundations are adequate based on the frost penetration and groundwater depth. Local frost depth must be no deeper than the bottom of the base foundation.
4. Reinforcement shall be deformed and conform to the requirements of ASTM A615 Grade 60 unless otherwise noted. Splices in reinforcement shall not be allowed unless otherwise noted.
5. Welding is prohibited on reinforcing steel and anchorage.
6. Structural fill placed below pad must be compacted in 8" loose lifts to a 98% of maximum dry density at optimum moisture content in accordance with ASTM D698. Backfill must be clean and free of organic and frozen soils and foreign materials.
7. Backfill above foundation should be compacted to 95% of maximum dry density at water content within 2 percent of optimum per ASTM D698. Backfill must be clean and free of organic and frozen soils and foreign materials.
8. Finished grade shall be leveled over the entire foundation footprint. Backfill is recommended to slope to native grade using a 2:1 (H:V) slope.
9. Loose material shall be removed from bottom of excavation prior to concrete placement.
10. Concrete cover from exposed surface of concrete to surface of reinforcement shall not be less than 3".
11. Concrete and reinforcement installation must conform to ACI 318, "Building Code Requirements for Structual Concrete."
12. Concrete shall develop a minimum compressive strength of 4000 psi in 28 days.
13. Concrete shall be placed as soon as practical after excavating to avoid disturbance of bearing and side wall surfaces.
14. Concrete contractor shall be responsible for properly aligning anchor bolts and materials before and after placing concrete, regardless of whether an anchor bolt template is provided.
15. Positive drainage shall be maintained during construction and throughout the life of the facility to minimize the potential for surface water infiltration.
16. Overexcavation of unsuitable soils for compacted backfill placement below footings should extend laterally beyond all edges of the footings at least 12 inches per foot of overexcavation depth below footing base elevation.
17. It shall be the contractor's responsibility to locate and prevent damage to any existing underground utilities, foundations or other buried objects that might be damaged or interfered with during construction of the foundation.
18. Cold joint is not permissible.
19. Groundwater may be encountered at 4.5 feet bgs at this site based on the geotechnical investigation. The need for dewatering should be anticipated below this depth.
20. Rock conditions were encountered about 3.5 feet bgs in the geotechnical investigation (see geo report for details). The contractor should anticipate difficult excavation below this depth and be prepared with the necessary equipment to remove such material in order to create a level bearing surface. The depth to rock material may vary across the foundation footprint. The entire footing shall bear on leveled, competent rock or bear on a layer of lean concrete (2000 psi) placed in direct contact with competent rock.
21. This mat design assumes an ultimate bearing capacity of 10,000 psf (allowable bearing capacity of 5,000 psf) based on the amend as-built geotechnical report. The bearing surface shall be inspected prior to concrete placement.
22. During placement, concrete shall be suitably consolidated. Proper curing methods shall be used directly following concrete placement as established by the contractor. Concrete shall develop a minimum compressive strength of 3000 psi prior to backfill and compaction operations, and backfill shall be compacted to a minimum moist unit weight of 100 pcf.

COMMONWEALTH OF MASSACHUSETTS
JASON M. LAMBERT
TITLE CIVIL
NO. 48803
REGISTERED PROFESSIONAL ENGINEER

JAN 24 2020

REV	BY	DATE	DESCRIPTION
3	DF	1/22/2020	Revised Pier to be square per ECO 7024

ORIG. DATE: 5/7/2019
DWG NO: 451608
DWG. PROG: v1.06
SHEET: 2 OF 2

TITLE:
Vertex Towers, LLC
NTP 72" X 129'
VT-MA 0001A Monterey
Hume Lake
Berkshire Co., MA

NELLO CORPORATION
1201 S. Sheridan St.
South Bend, IN 46619
Bus: (574)288-3632
Fax: (574)288-5860

R.W. GILLESPIE ASSOCIATES, INC.
Geotechnical Engineering - Geohydrology - Materials Testing Services

Corporate Office
20 Pomerleau St., Suite 100,
Biddeford, ME 04005
207-286-8008 ~ Fax 207-286-2882

177 Shattuck Way, Suite 1 West,
Newington, NH 03801
603-427-0244

CONCRETE REINFORCING STEEL OBSERVATION REPORT

Project Name: 130' Monopole Tower **Date:** November 8, 2019

Client/Project Number: Vertex Towers, LLC / 1724-012 **Time:** 7:15 AM

General Contractor: CVS Foundations **Weather:** Snow 22

Approved Documents Referenced: Nello Corporation Revired Foundation per ECO 6862 5/21/2019

Document Sheets/Details Referenced: DWG No. 451608 Sheet 1 Mid-Section View

Placement Location: Cell Tower Foundation

ITEMS CHECKED

Item	In Accordance with Documents	Not In Accordance with Documents	Not Applicable
Bar Size	X		
Bar Grade	X		
Number of Bars	X		
Spacing Before and After Placement	X		
End & Side Clearances	X		
Top & Bottom Clearances	X		
Bars are Clean and Free of Dirt, Oil, Rust, Paint, Ect.	X		
Bar Junctions Adequately Tied	X		
Placement and Adequacy of Supports	X		
Vertical Embedment to Assure Proper Lap Length	X		
Horozontal Bars for Minimum Lap Length	X		

OTHER COMMENTS AND OBSERVATIONS

THIS DFR IS PRELIMINARY

A preliminary report is provided solely as evidence that field activities were conducted and documented. Observations and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those indicated in a preliminary report.

FIELD REPRESENTATIVE DATE 11/11/19

REVIEWED BY DATE 11/15/19

R. W. Gillespie & Associates, Inc.
20 Pomerleau St., Suite 100, Biddeford, ME 04005 207-286-8008
177 Shattuck Way, Suite 1 West, Newington NH 03801 603-427-0244
44 Wood Avenue, Suite I, Mansfield, MA 508-623-0101

LETTER OF TRANSMITTAL

Date:	Project No.:
December 9, 2019	1724-012

Attention: Stephen Kelleher (stephen@vertextowers.com)

Re: Concrete Testing
130' Monopole Tower
Monterey, MA

Vertex Towers, LLC

155 South St., Suite 205

Wrentham, MA 02093

We are sending you attached Concrete Cylinder Test Results.

Cylinder No. (s)	Age (Days)
99323	28
99324	28
99325	28
99327	28
99328	28
99329	28
99331	28
99332	28
99333	28

Remarks:

Copy to: Andrew Gilbert (andrew@vertextowers.com)

If enclosures are not noted, kindly notify us at once.

R.W. GILLESPIE & ASSOCIATES
CONCRETE TEST/PLACEMENT REPORT

Project Name: 130' Monopole Tower
Project No: 1724-012
Client: Vertex Towers, LLC
Weather Conditions: Snow
Placement Method: Pump - Direct

Date Cylinders Cast: Friday, November 8, 2019
Concrete Supplier: Century Acquisition
Design Strength: 4000 psi
Max. Aggregate Size: 3/4 inch
Admixtures: AEA 14
WR

Placement Location:
Cell Tower Foundation

Test Cylinder Location:
West Side

ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete

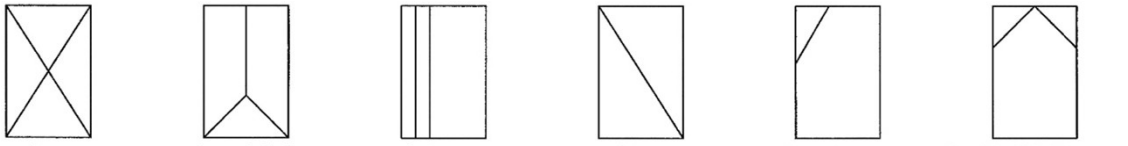
Date Report Issued:

Load Number:	2 of 12	Number of 4x8 Cylinders:		4
Ticket Number:	8020202	Tested By:		Mateus C. Medeiros
Truck Number:	668	Slump:	ASTM C 143	6.50 in.
Cubic Yards:	10	Air Temperature:		25 ºF
Total Yardage:	120	Concrete Temperature:	ASTM C1064	61 ºF
Total Time (minutes):	83	Air Content:	ASTM C 231	5.9 %

Specimen Storage ASTM C 31
Field Cure Days: 1
Date Received: 11/9/2019
Condition of Cylinders: Good

ASTM C 39, ASTM C1231 (ASTM C617 if noted)

Lab No.	Test Date	Ave. Dia. (in)	Ave. Area (in^2)	Age (days)	Load (lbs)	Compressive Strength (psi)	Break Type	Tested By
99322	11/15/2019	4.00	12.56	7	60930	4850	2	BTR
99323	12/6/2019	3.99	12.48	28	67740	5430	1	NRP
99324	12/6/2019	3.99	12.48	28	69440	5560	5	NRP
99325	12/6/2019	3.99	12.48	28	71650	5740	1	NRP



Remarks:

Checked by: Matthew T. Grady, Manager of MTS

R.W. GILLESPIE & ASSOCIATES
CONCRETE TEST/PLACEMENT REPORT

Project Name: 130' Monopole Tower
Project No: 1724-012
Client: Vertex Towers, LLC
Weather Conditions: Snow
Placement Method: Pump - Direct

Date Cylinders Cast: Friday, November 8, 2019
Concrete Supplier: Century Acquisition
Design Strength: 4000 psi
Max. Aggregate Size: 3/4 inch
Admixtures: AEA 14
WR

Placement Location:
Cell Tower Foundation

Test Cylinder Location:
Center

ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete

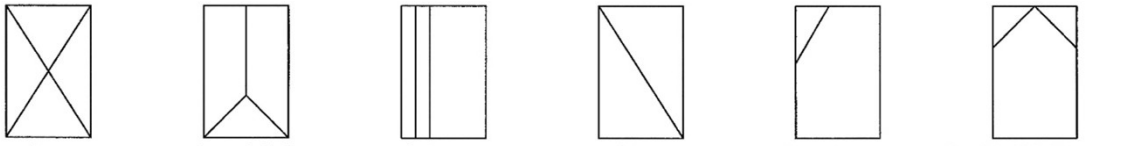
Date Report Issued:

Load Number:	6 of 12	Number of 4x8 Cylinders:		4
Ticket Number:	8020207	Tested By:		Mateus C. Medeiros
Truck Number:	663	Slump:	ASTM C 143	4.00 in.
Cubic Yards:	10	Air Temperature:		22 ºF
Total Yardage:	120	Concrete Temperature:	ASTM C1064	62 ºF
Total Time (minutes):	68	Air Content:	ASTM C 231	5.8 %

Specimen Storage ASTM C 31
Field Cure Days: 1
Date Received: 11/9/2019
Condition of Cylinders: Good

ASTM C 39, ASTM C1231 (ASTM C617 if noted)

Lab No.	Test Date	Ave. Dia. (in)	Ave. Area (in^2)	Age (days)	Load (lbs)	Compressive Strength (psi)	Break Type	Tested By
99326	11/15/2019	4.00	12.56	7	65250	5200	3	BTR
99327	12/6/2019	3.99	12.48	28	74850	6000	1	NRP
99328	12/6/2019	3.99	12.48	28	80550	6450	2	NRP
99329	12/6/2019	3.99	12.48	28	78300	6270	2	NRP



Remarks:

Checked by: Matthew T. Grady, Manager of MTS

R.W. GILLESPIE & ASSOCIATES
CONCRETE TEST/PLACEMENT REPORT

Project Name: 130' Monopole Tower
Project No: 1724-012
Client: Vertex Towers, LLC
Weather Conditions: Snow
Placement Method: Pump - Direct

Date Cylinders Cast: Friday, November 8, 2019
Concrete Supplier: Century Acquisition
Design Strength: 4000 psi
Max. Aggregate Size: 3/4 inch
Admixtures: AEA 14
WR

Placement Location:
Cell Tower Foundation

Test Cylinder Location:
East Side

ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete

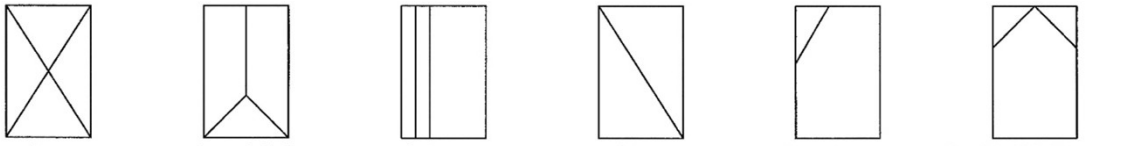
Date Report Issued:

Load Number:	11 of 12	Number of 4x8 Cylinders:		4
Ticket Number:	8020213	Tested By:		Mateus C. Medeiros
Truck Number:	670	Slump:	ASTM C 143	4.25 in.
Cubic Yards:	662	Air Temperature:		30 ºF
Total Yardage:	120	Concrete Temperature:	ASTM C1064	63 ºF
Total Time (minutes):	76	Air Content:	ASTM C 231	5.0 %

Specimen Storage ASTM C 31
Field Cure Days: 1
Date Received: 11/9/2019
Condition of Cylinders: Good

ASTM C 39, ASTM C1231 (ASTM C617 if noted)

Lab No.	Test Date	Ave. Dia. (in)	Ave. Area (in^2)	Age (days)	Load (lbs)	Compressive Strength (psi)	Break Type	Tested By
99330	11/15/2019	4.00	12.56	7	64750	5160	2	BTR
99331	12/6/2019	3.99	12.48	28	77940	6240	2	NRP
99332	12/6/2019	3.99	12.48	28	73080	5850	2	NRP
99333	12/6/2019	3.99	12.48	28	74670	5980	2	NRP



Remarks:

Checked by: Matthew T. Grady, Manager of MTS

ProTerra DESIGN GROUP, LLC

FIELD INSPECTION REPORT

INSPECTION DATE November 19, 2019		**JOB NO.** 17-051
REPORT ISSUE DATE	**REVISION**	**COMMENTS**
August 12, 2020	0	Field Inspection Report Tower Stacking

PROJECT

Vertex New Build
Building Permit No.: C-19-0014 & C-19-0016
Vertex Site ID: VT-MA 0001A
Vertex Site Name: Monterey Hume Lake
Site Address: 73 Chestnut Hill Road Monterey, MA 01245

CONTRACTOR	**TOWER OWNER**
Berkshire Wireless (Tower Stack)	Vertex Towers
PRESENT AT SITE	**ORGANIZATION**
Victor Moreno	ProTerra Design Group, LLC

PREPARED BY: ProTerra Design Group, LLC
4 Bay Road
Building A; Suite 200
Hadley, MA 01035

SUBMITTED TO: Donald Torrico
Building Commissioner
435 Main Road
PO Box 308
Monterey, MA 01245

Pursuant to the Massachusetts State Building Code, 9th edition (780 CMR) with Massachusetts Amendments to the IBC 2015, the following report documents a visual inspection from ground level for the general conformance with the construction drawings from ProTerra Design Group, LLC dated 08/30/2019 (Rev2) for the above referenced project.

The following items below have been completed in general conformance to plans:

1) Tower foundation has been backfilled and compacted with structural fill approved by the geotechnical inspector. See attached reports by Gifford Engineering and Advance Testing.
2) Tower ground ring has been installed with lead for the new monopole.
3) New 130' monopole tower has been set over anchor rods and bolts have been tightened.
4) Remaining two tower sections have been stacked over the bottom tower section and minimum splice overlap met for each section. Additional settling is expected with the installation of carrier equipment.
5) Safety climb was installed in general conformance with the tower manufacturers design. Since the monopole is expected to settle, the safety climb shall be monitored and adjusted as needed.

The comments in this field report are a record of observations made on site. If there are any errors or omissions please notify ProTerra Design Group, LLC in writing or all comments and all parties shall consider this report factual and acceptable.

COPIES TO: File

SUBMITTED: _____
Peter Nute, Project Engineer

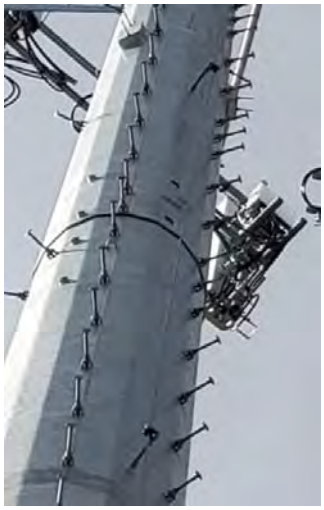
REVIEWED: _____
Jesse Moreno, P.E. Managing Partner

Tower foundation and bolts in place

Preparing for stacking

Stacking in progress

Tower stacking in progress


Safety climb installed (photo from a later inspection)

Tower base on anchor rods, bolts tightened

GIFFORD ENGINEERING
Geotechnical & Geoenvironmental Services

December 4, 2019

ProTerra Design Group, LLC
Attn: Mr. Thomas Johnson, SE #1141
4 Bay Road, Building A, Suite 200
Hadley, MA 01035

Re: Special Inspection Reports, Cell Tower at Hume Lake, 73 Chestnut Hill Rd, Monterey, MA, File No. 1182

Gentlemen:

Special inspection visits were performed by Gifford Engineering personnel and are reported herein. Services are beyond those outlined in my proposal dated November 18, 2011 and were performed at current rates per your direction.

Date: Thursday, November 14, 2019
Personnel: G. Gifford
A site visit was conducted to observe in place density testing by Advance Testing of the first lift of backfill. Wet density of the compacted fill varied from 135pcf to 137pcf with moisture contents of 3 to 4 %. We are waiting for modified Proctor maximum density test results from the lab.

Date: Monday, November 18, 2019
Personnel: J. Bazan
Modified Proctor and Grain Size Analysis test results from Advance Testing were received and reviewed.

Date: Tuesday, November 19, 2019
Personnel: J. Bazan
The following Advance Testing report was reviewed:

- In Place Moisture/Density Testing dated 11/14/19: Passing, no issues noted.

If I can be any further assistance in this matter, please contact me.

Truly yours,
Gifford Engineering LLC

Gregory P Gifford PhD PE
President

865 Pearse Road Niskayuna, NY 12309 Tel: (518) 382-2545 email: giffeng@nycap.rr.com

3348 Route 208, Campbell Hall, NY 10916
Phone: 845-496-1600 Fax: 845-496-1398
12960 Commerce Lake Drive, A14, Fort Myers, FL 33913
42 Day Farm Road, West Stockbridge, MA 01266
1813 State Route 7, Harpursville, NY 13787

Client:	**Vertex Tower Assets LLC**	**Project:**	Cell Tower, Monterey MA
Item:	Crushed 1.5" Process Gravel	**Project Number:**	191284
Source:	Tryon Gravel Pit	**Lab Number:**	19-1424
Date Sampled:	11/12/2019	**Sampled By:**	Client
Date Tested:	10/14/2019	**Tested By:**	Scott Starsiak/Zach Hector

GRADATION (SIEVE ANALYSIS) OF SOIL OR AGGREGATE

Test Method(s): ASTM D422, C136, C117; AASHTO T88, T27, T11

Lab Number	Sample Type	Sampling Location	Specification
19-1424	Crushed 1.5" Process Gravel	Stockpile	No Specification

Sieve Size		%	%	Spec. %
mm	Inches	Retained	Passing	Pass
100.0 mm	4"	0.0	100	
75.0 mm	3"	0.0	100	
63.0 mm	2 1/2"	0.0	100	
50.0 mm	2"	0.0	100	
37.5 mm	1 1/2"	0.0	100	
25.0 mm	1"	10.9	89	
19.0 mm	3/4"	7.7	81	
12.5 mm	1/2"	10.7	71	
6.3 mm	1/4"	13.8	57	
4.75 mm	#4	4.3	53	
2.00 mm	#10	10.6	42	
0.850 mm	#20	13.6	28	
0.600 mm	#30	5.6	23	
0.425 mm	#40	4.0	19	
0.150 mm	#100	10.8	8	
0.075 mm	#200	4.3	3.7	
Pan		3.7		

Comments:

Minus #200 by wash-sieve method.

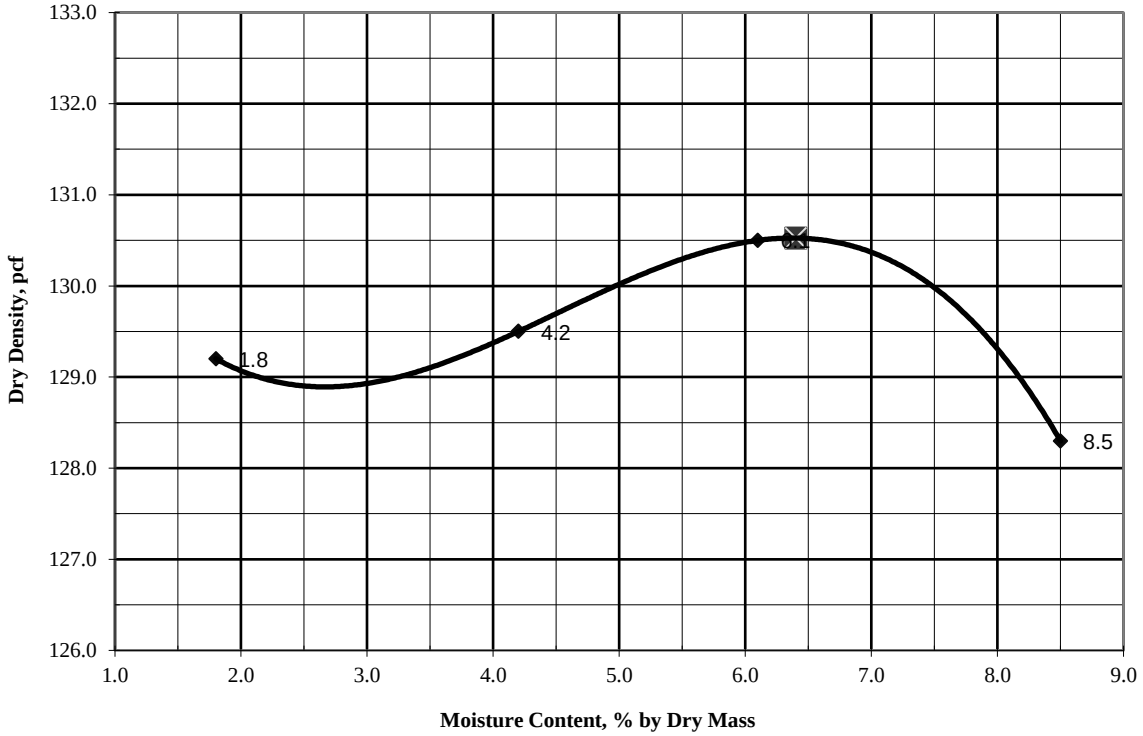
Report Reviewed By: Emily J. Rodriguez

PDF

3348 Route 208, Campbell Hall, NY 10916
Phone: 845-496-1600 Fax: 845-496-1398
12960 Commerce Lake Drive, A14, Fort Myers, FL 33
42 Day Farm Road, West Stockbridge, MA 01266
1813 State Route 7, Harpursville, NY 13787

CLIENT:	Vertex Tower Assets LLC		PROJECT NO.:	191284
PROJECT:	Cell Tower, Monterey MA		LAB NUMBER:	19-1424
TEST METHOD:	ASTM D 1557 'Modified Proctor'		Method: C	
SOIL ID NUMBER:	2			
ITEM:	Crushed 1.5" Process Gravel			
SOURCE:	Tryon Gravel Pit			
SOIL DESCRIPTION:	Brown Sand w/ Crushed Gravel			
DATE SAMPLED:	11/12/2019	SAMPLED BY:	Client	
DATE TESTED:	11/14/2019	TESTED BY:	Jarrod Sims	

REPORT OF MOISTURE DENSITY RELATIONSHIP



Individual Test Points	
Percent Moisture	Dry Density
1.8	129.2
4.2	129.5
6.1	130.5
8.5	128.3

Uncorrected Maximum Dry Density:	130.5	lb/cu. ft.
Uncorrected Optimum Moisture Content:	6.4	%
Specific Gravity of Soils *:	2.65	
Percent Oversize Particles:	18.6	%
Specific Gravity of Oversize*:	2.67	
Corrected* Maximum Dry Density:	**136.0**	**lb/cu. ft.**
Corrected* Opt. Moisture Content:	**5.4**	**%**

***Corrected for oversize, when oversize particles exceed 5% of sample.*
****Material was over-saturated at 8.5% moisture****

Report Reviewed By: Emily J. Rodriguez PDF

*Specific Gravity of Soils Estimated and Specific Gravity of Oversize Estimated.

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12960 Commerce Lake Drive, A14, Fort Myers, FL 33913
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1813 State Route 7, Harpursville, NY 13787

Client:	**Vertex Tower Assets LLC**	**Project:**	Cell Tower, Monterey MA
Item:	Bankrun Gravel	**Project Number:**	191284
Source:	In-Place- Vertex Tower Assets LLC	**Lab Number:**	19-1425
Date Sampled:	11/12/2019	**Sampled By:**	Client
Date Tested:	11/14/2019	**Tested By:**	Scott Starsiak/Zach Hector

GRADATION (SIEVE ANALYSIS) OF SOIL OR AGGREGATE

Test Method(s): ASTM D422, C136, C117; AASHTO T88, T27, T11

Lab Number	Sample Type	Sampling Location	Specification
19-1425	Bankrun Gravel	Stockpile	No Specification

Sieve Size		%	%	Spec. %
mm	Inches	Retained	Passing	Pass
100.0 mm	4"	0.0	100	
75.0 mm	3"	0.0	100	
63.0 mm	2 1/2"	0.0	100	
50.0 mm	2"	4.7	95	
37.5 mm	1 1/2"	1.3	94	
25.0 mm	1"	2.6	91	
19.0 mm	3/4"	3.1	88	
12.5 mm	1/2"	6.2	82	
6.3 mm	1/4"	9.6	73	
4.75 mm	#4	4.7	68	
2.00 mm	#10	13.4	54	
0.850 mm	#20	14.4	40	
0.600 mm	#30	5.7	34	
0.425 mm	#40	6.0	28	
0.150 mm	#100	17.8	11	
0.075 mm	#200	6.7	3.8	
Pan		3.8		

Comments:

Minus #200 by wash-sieve method.

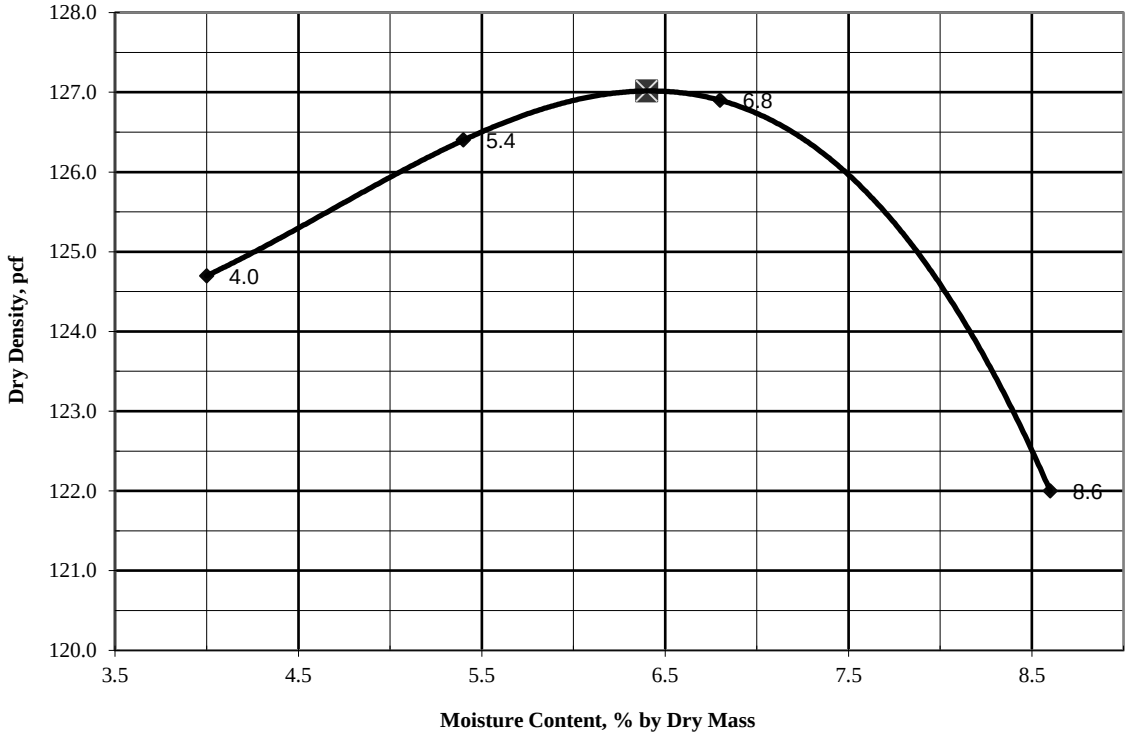
Report Reviewed By: Emily J. Rodriguez

PDF

3348 Route 208, Campbell Hall, NY 10916
Phone: 845-496-1600 Fax: 845-496-1398
12960 Commerce Lake Drive, A14, Fort Myers, FL 33
42 Day Farm Road, West Stockbridge, MA 01266
1813 State Route 7, Harpursville, NY 13787

CLIENT:	Vertex Tower Assets LLC	PROJECT NO.:	191284
PROJECT:	Cell Tower, Monterey MA	LAB NUMBER:	19-1425
TEST METHOD:	ASTM D 1557 'Modified Proctor'	Method: C	
SOIL ID NUMBER:	1		
ITEM:	Bankrun Gravel		
SOURCE:	In-Place- Vertex Tower Assets LLC		
SOIL DESCRIPTION:	Orange-Brown Sand w/ Crushed Stone		
DATE SAMPLED:	11/12/2019	SAMPLED BY:	Client
DATE TESTED:	11/14/2019	TESTED BY:	Robert Sanborn

REPORT OF MOISTURE DENSITY RELATIONSHIP



Individual Test Points	
Percent Moisture	Dry Density
4.0	124.7
5.4	126.4
6.8	126.9
8.6	122.0

Uncorrected Maximum Dry Density:	127.0	lb/cu. ft.
Uncorrected Optimum Moisture Content:	6.4	%
Specific Gravity of Soils *:	2.65	
Percent Oversize Particles:	11.7	%
Specific Gravity of Oversize*:	2.67	
Corrected* Maximum Dry Density:	**130.7**	**lb/cu. ft.**
Corrected* Opt. Moisture Content:	**5.8**	**%**

***Corrected for oversize, when oversize particles exceed 5% of sample.*
****Material was Over-Saturated at 8.6% moisture*

Report Reviewed By: Emily J. Rodriguez PDF

*Specific Gravity of Soils Estimated and Specific Gravity of Oversize Estimated.

Advance Testing

3348 Route 208, Campbell Hall, NY 10916 ■ Phone: 845-496-1600 ■ Fax: 845-496-1398

12960 Commerce Lake Dr #14, Ft Myers, FL 33913 ■ Phone: 239-204-4569

1813 State Route 7, Harpursville, NY 13787 ■ Phone: 607-235-2006 ■ Fax: 607-235-2007

Soil Fill Placement - In Place Moisture/Density Testing (ASTM D6938)

Client:	Vertex Tower Assets LLC	**Date:**	Thursday, November 14, 2019		
Client Rep.:	Steve Kelleher	**Weather:**	Partly Cloudy		
Project:	Cell Tower, Monterey MA	**Temperature: AM**	20-32 °F	**PM**	20-32 °F
Project Number:	191284	**Technician:**	John-Luke Kanzler		
Contractor:	Tryon Construction	**Arrival Time:**	9:00 AM		
Contractor Rep.:	Steve Kelleher	**Departure Time:**	3:30 PM		

General Location of Work:

Base of the cell tower located up the mountain (Dirt) road from the Camp Maintenance center

Camp @ 73 Chestnut Hill Road, Monterey Mass 01245

Elevation Reference(s):Site excavated 8+- feet for the cell tower base: filled in lifts

Maximum Dry Density And Optimum Moisture Content Source On File At Advance Testing

Specification & Soil/Fill Information

Soil ID	Item Material[1]	Item/Material Placement Location	Visual Description of Soil/Fill	Supplier/ Source	Optimum % Moisture	Maximum Dry Density	Required % Compaction
1	Common Fill	Cell tower base	Brown dirt and sand	Onsite sample	5.1%	136.0	95.0%

Test Information

Test No.	Test Location	Soil ID	Test Mode[2]	Lift Thick-ness	Probe Depth	Elevation	In Place % Moisture	In Place Dry Density (pcf)	% of Maximum Dry Density	Pass/Fail
1	South side (middle)	1	A	12 in.	10 in.	Lift 1	3.8%	135.6	99.7%	Pass
2	West side (middle)	1	A	12 in.	10 in.	Lift 1	3.6%	134.8	99.1%	Pass
3	North side (middle)	1	A	12 in.	10 in.	Lift 1	3.8%	137.6	101.1%	Pass
4	East side (middle)	1	A	12 in.	10 in.	Lift 1	3.2%	136.7	100.5%	Pass
5	SouthWest Corner	1	A	12 in.	10 in.	Lift 2	4.4%	134.9	99.1%	Pass
6	NorthWest Corner	1	A	12 in.	10 in.	Lift 2	4.4%	135.5	99.6%	Pass
7	NorthEast Corner	1	A	12 in.	10 in.	Lift 2	4.2%	138.6	101.9%	Pass
8	SouthEast Corner	1	A	12 in.	10 in.	Lift 2	4.3%	138.9	102.1%	Pass
9	South side (middle)	1	A	12 in.	10 in.	Lift 3	4.7%	133.8	98.3%	Pass
10	West side (middle)	1	A	12 in.	10 in.	Lift 3	3.8%	135.6	99.7%	Pass
11	North side (middle)	1	A	12 in.	10 in.	Lift 3	4.5%	132.7	97.5%	Pass
12	East side (middle)	1	A	12 in.	10 in.	Lift 3	4.6%	133.5	98.1%	Pass
13	SouthWest corner	1	A	12 in.	10 in.	Lift 4	4.5%	137.7	101.3%	Pass
14	NorthWest corner	1	A	12 in.	10 in.	Lift4	4.4%	135.6	99.7%	Pass
15	NorthEast corner	1	A	12 in.	10 in.	Lift 4	4.1%	136.2	101.2%	Pass
16	SouthEast corner	1	A	12 in.	10 in.	Lift 4	4.4%	134.4	98.8%	Pass

[1] Common Fill; Select/Structural Fill; Subgrade; Base; Subbase

[2] Test Mode: A - Direct Transmission, B - Backscatter

Comments:
Area being tested is around a 20x20 concrete cell tower base.

Nuclear Gauge Information

ID Number:	CT#53
Serial Number:	37184
Make & Model:	Troxler 3440, 12 Inch
Density Standard:	1974.0
Moisture Standard:	732.0

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12960 Commerce Lake Dr #14, Ft Myers, FL 33913 ■ Phone: 239-204-4569
1813 State Route 7, Harpursville, NY 13787 ■ Phone: 607-235-2006 ■ Fax: 607-235-2007

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Contractor:	Tryon Construction	**Arrival Time:**	9:00 AM		
Contractor Rep.:	Steve Kelleher	**Departure Time:**	3:30 PM		

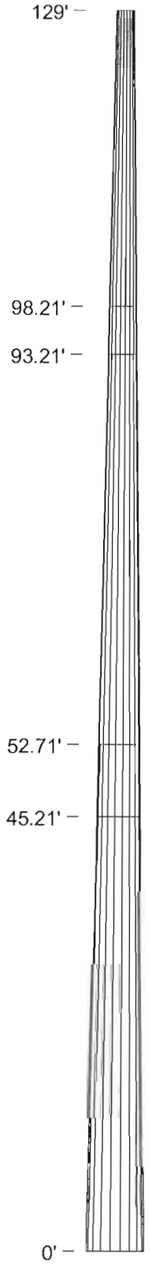
Technician Signature: 

Date: Thursday, November 14, 2019

Report Reviewed by: Kassie Thelman

Pole Section Data

Section	Bottom Height (ft)	Top Height (ft)	Length (ft)	Number of Sides	Bottom OD (in)	Top OD (in)	Wall Thickness (in)	Material	Approximate Weight (lb)	Design Overlap (in)	Minimum Overlap (in)	Maximum Overlap (in)	Design Distance to Top Jacking Nut (in)	Maximum Distance to Top Jacking Nut (in)	Minimum Distance to Top Jacking Nut (in)
1	93.21	129	35.79	18	36.3285	21.9800	0.3750	A572-65	5350	60	53 3/16	66	15	21 13/16	9
2	45.21	98.21	53	18	54.6345	33.3864	0.5000	A572-65	13570	90	80 3/8	99	15	24 5/8	6
3	0	52.71	52.71	18	71.5720	50.4402	0.5625	A572-65	23320			0			



Tower Reactions Rev G - ASCE7-10

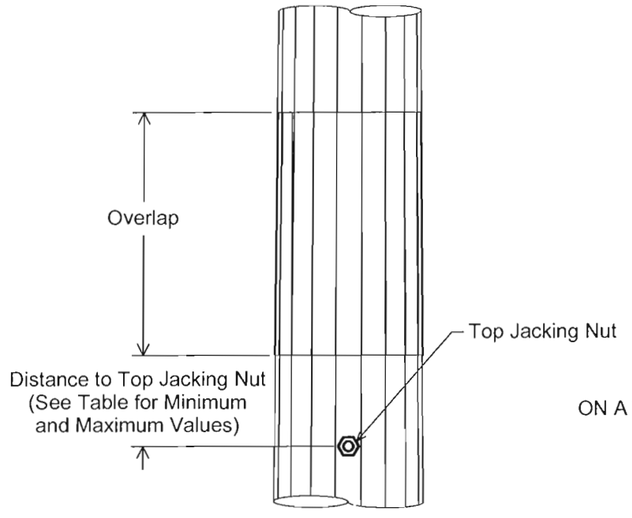
No Ice
Shear: 91.9 kips
Moment: 8994.92 ft-kips
Weight: 68.3 kips

With Ice
Shear: 22.4 kips
Moment: 2240.34 ft-kips
Weight: 114.1 kips

Tower Reactions Rev G - ASCE7-05

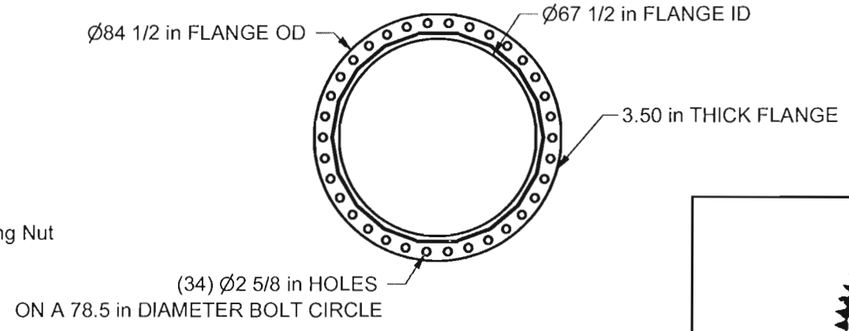
No Ice
Shear: 88.5 kips
Moment: 8663.98 ft-kips
Weight: 68.3 kips

With Ice
Shear: 22.4 kips
Moment: 2240.34 ft-kips
Weight: 114.1 kips



A jacking nut is placed near the top of each section which will have another section placed on top. The distance from this nut to the bottom of the next section must not exceed the value given in the column labeled "Maximum Distance to Top Jacking Nut."

Pole Splice Detail



BASE FLANGE DETAIL

REV	BY	DATE	DESCRIPTION

ORIG. DATE: 5/7/2019
DWG NO: 451607
DWG. PROG: v2.05
SHEET: 1 OF 4

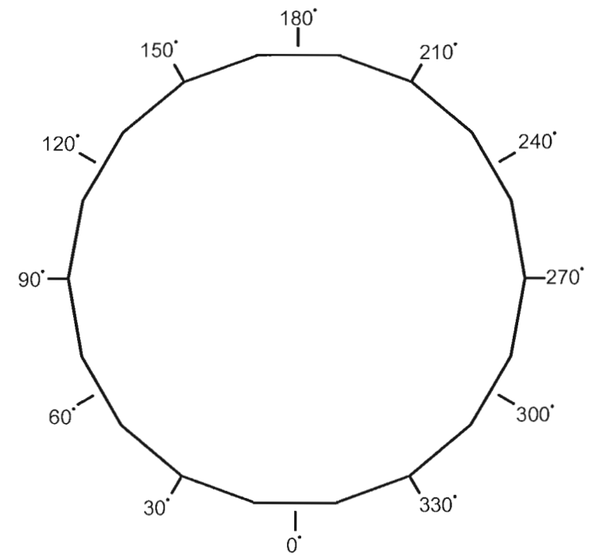
TITLE:
Vertex Towers, LLC

NTP 72" X 129'
VT-MA 0001A Monterey
Hume Lake
Berkshire Co., MA

N E L L O CORPORATION
1201 S. Sheridan St.
South Bend, IN 46619
Bus: (574)288-3632
Fax: (574)288-5860

Portholes

Elevation (ft)	Qty	Size (in)	Azimuth (deg)
125	3	6 x 12	60, 180, 300
116.5	3	6 x 12	60, 180, 300
106.5	3	6 x 12	60, 180, 300
71.5	3	6 x 12	60, 180, 300
7.5	1	9 x 24	0
7.5	1	9 x 24	90
7.5	1	9 x 24	180
7.5	1	9 x 24	270
3.5	1	9 x 24	0
3.5	1	9 x 24	90



Step Bolts on This Side of Pole

Note:
The azimuths referenced here are only to illustrate where the pole features are in relation to each other. The azimuths are not to indicate which cardinal direction the anchor bolts or the pole should be positioned.

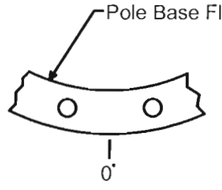
Pole Reference Azimuths

Antenna Loading

Height	Qty.	Description
129'	1	5' Lightning Rod
125'	1	250 ft2 (EPA)
115'	1	245 ft2 (EPA)
105'	1	225 ft2 (EPA)
73'	1	45 ft2 (EPA)

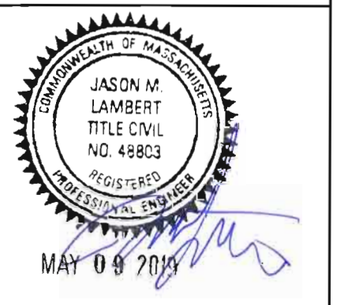
Feedline Loading

Height	Qty.	Description
0' - 125'	12	LDF7-50A (1-5/8 FOAM)
0' - 115'	12	LDF7-50A (1-5/8 FOAM)
0' - 105'	12	LDF7-50A (1-5/8 FOAM)
0' - 73'	6	LDF7-50A (1-5/8 FOAM)



Anchor Bolt Holes Are on Either Side of the 0 Degree Azimuth

Anchor Bolt Azimuth



REV	BY	DATE	DESCRIPTION

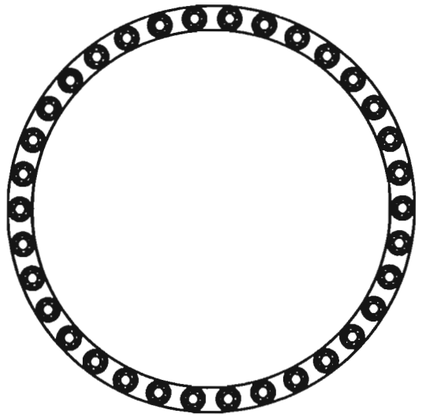
ORIG. DATE: 5/7/2019 | DWG NO: 451607

DWG. PROG: v2.05 | SHEET: 2 OF 4

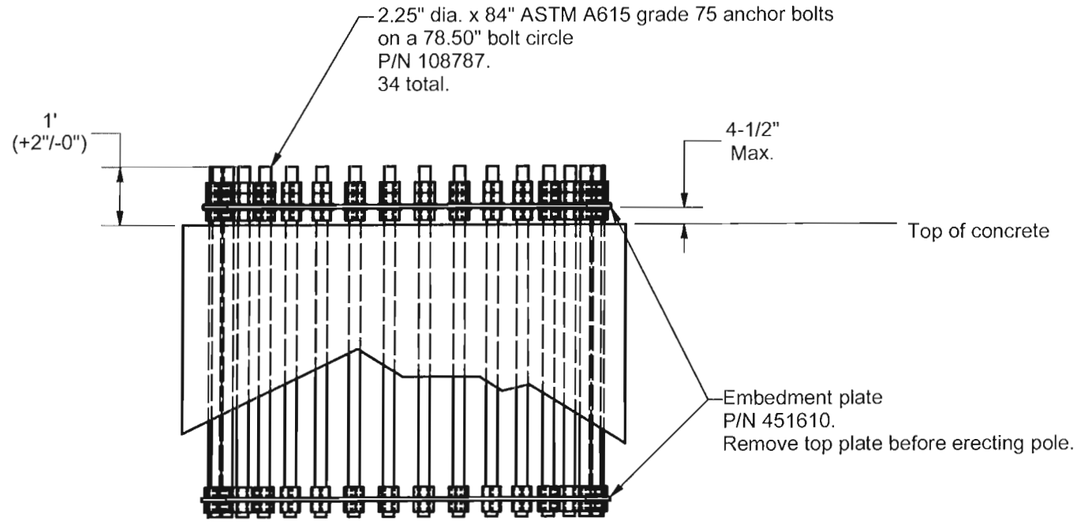
TITLE:
Vertex Towers, LLC

NTP 72" X 129'
VT-MA 0001A Monterey
Hume Lake
Berkshire Co., MA

NELLO CORPORATION
1201 S. Sheridan St.
South Bend, IN 46619
Bus: (574)288-3632
Fax: (574)288-5860



PLAN VIEW



ANCHOR BOLT DETAIL

Note:
Anchor bolt embedment depth shall be verified by foundation engineering.

COMMONWEALTH OF MASSACHUSETTS
JASON M. LAMBERT
TITLE CIVIL
NO. 48803
REGISTERED PROFESSIONAL ENGINEER
MAY 06 2019

REV	BY	DATE	DESCRIPTION

ORIG. DATE: 5/7/2019
DWG NO: 451607
DWG. PROG: v2.05
SHEET: 3 OF 4

TITLE:
Vertex Towers, LLC
NTP 72" X 129'
VT-MA 0001A Monterey
Hume Lake
Berkshire Co., MA

NELLO CORPORATION
1201 S. Sheridan St.
South Bend, IN 46619
Bus: (574)288-3632
Fax: (574)288-5860

Tower Notes:

1. Tower is designed per TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas," for the following loading conditions:
   90 mph 3-second gust basic wind speed with no ice (Equivalent to 116 mph 3-second gust ultimate design wind speed) per ASCE 7-05
   40 mph 3-second gust basic wind speed with 3/4 inch basic ice thickness per ASCE 7-05
   Structure Class: II
   Exposure Category: C
   Topographic Category: 3
   Crest Height: 560 feet
2. Tower is designed per TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas," for the following loading conditions:
   116 mph 3-second gust ultimate wind speed with no ice per ASCE 7-10
   40 mph 3-second gust basic wind speed with 3/4 inch basic ice thickness per ASCE 7-10
   Risk Category: II
   Exposure Category: C
   Topographic Category: 3
   Crest Height: 560 feet
3. A tower field inspection shall be performed in order to verify that design exposure and topographic parameters are consistent with the existing tower site conditions.
4. Tower design includes the antennas, dishes, and/or lines listed in the appurtenance loading tables on sheet 2.
5. Antenna mounting pipes may need to be field cut to match the lengths listed in the appurtenance loading tables on sheet 2.
6. Tower member design does not include stresses due to erection since erection equipment and procedures are unknown. Tower installation shall be performed by competent and qualified erectors in accordance with TIA-222-G and OSHA standards and all applicable building codes.
7. Field connections shall be bolted. No field welds shall be allowed unless otherwise noted.
8. Structural bolts shall conform to ASTM A325, except for 1/2 inch diameter and smaller bolts, which shall conform to ASTM A449 or SAE J429 Grade 5.
9. Structural steel and connection bolts shall be galvanized after fabrication in accordance with TIA-222-G.
10. All high strength bolts shall be tightened to a "snug tight" condition as defined in the RCSC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
11. Tower shall be marked and lighted in conformance with local building codes, FAA regulations, and TIA-222-G.
12. Tower shall be grounded in conformance with local building codes and TIA-222-G. Evaluation of protective grounding and consideration for special grounding systems shall be performed by others.
13. Allowable tolerance on as-built tower steel height is plus 1% or minus 1/2%.
14. Maintenance and inspection shall be performed over the life of the structure in accordance with TIA-222-G.
15. Material specifications:
    NTP 18-Sided Pole - ASTM A572 Grade 65
    Pole Flange - ASTM A572 Grade 50
    Pole Porthole Rim - ASTM A572 Grade 65
16. A jacking nut is placed near the top of each section which will have another section placed on top. The distance from this top jacking nut to the bottom of the next section must not exceed the value given in the column labeled "Maximum Distance to Top Jacking Nut." Jacking may be required to achieve the proper overlap.
17. The horizontal distance between the vertical centerlines at any two elevations shall not exceed 0.25 percent of the vertical distance between the two elevations. Measure early in the morning before the sunward side of the pole expands.
18. Sections must be erected with the 0 degree azimuth lined up to ensure proper fit.
19. Remove anchor bolt template before erecting pole.
20. Concrete contractor shall be responsible for properly aligning anchor bolts and materials before and after placing concrete, regardless of whether an anchor bolt template is provided.

REV	BY	DATE	DESCRIPTION

ORIG. DATE: 5/7/2019 | DWG NO: 451607
DWG. PROG: v2.05 | SHEET: 4 OF 4

TITLE:
Vertex Towers, LLC
NTP 72" X 129'
VT-MA 0001A Monterey
Hume Lake
Berkshire Co., MA

NELLO CORPORATION
1201 S. Sheridan St.
South Bend, IN 46619
Bus: (574)288-3632
Fax: (574)288-5860

STRAIGHT BILL OF LADING - SHORT FORM
ORIGINAL - NOT NEGOTIABLE

Load#	2
Delivery Time	Monday 11/18 @ 9AM
BOL#	3084
Shipper #	25869
Departure Date	11/16/2019

N E L L O

1201 S. Sheridan St., South Bend, IN 46619 (574)288-3632

AT **SOUTH BEND, INDIANA** FROM **EXP** 19-482

THE PROPERTY DESCRIBED BELOW, IN APPARENTLY GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF CONTENTS OF PACKAGES UNKNOWN) MARKED, CONSIGNED, AND DESTINED AS INDICATED BELOW, WHICH SAID CARRIER (THE WORD CARRIER BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON OR CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT) AGREES TO CARRY TO ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION IF ON ITS ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION. IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION, AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY OF SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE TERMS AND CONDITIONS OF THE UNIFORM DOMESTIC STRAIGHT BILL OF LADING SET FORTH (1) IN UNIFORM FREIGHT CLASSIFICATIONS IN EFFECT ON THE DATE HEREOF, IF THIS IS RAIL OR RAIL-WATER SHIPMENT, OR (2) IN THE APPLICABLE MOTOR CARRIER CLASSIFICATION OR TARIFF IF THIS IS A MOTOR CARRIER SHIPMENT.

SHIPPER HEREBY CERTIFIES THAT IS FAMILIAR WITH ALL THE TERMS AND CONDITIONS OF THE SAID BILL OF LADING, INCLUDING THOSE ON THE BACK THEREOF, SET FORTH IN THE CLASSIFICATION OR TARIFF WHICH GOVERNS THE TRANSPORTATION OF THIS SHIPMENT, AND THE SAID TERMS AND CONDITIONS ARE HEREBY AGREED TO BY THE SHIPPER AND ACCEPTED FOR HIMSELF AND HIS ASSIGNS.

CONSIGNED TO	Hume Lake Christian Camps Inc	Contact Name	Stephen Kelleher
DESTINATION	73 Chestnut Hill Ave	Contact Phone	617-817-8564
	Monterey, MA 01245	Contact Name	**Call when loaded**
		Contact Phone	

DELIVERING CARRIER CAR OR VEHICLE INITIALS NO.

NO. PACKAGES	PACKAGE DESCRIPTION	WEIGHT (SUBJECT TO CORRECTION)	CLASS OR RATE	CK COL.
1	Skid: Parts; Hardware; Safety Climb	345		
1	452449 Weldment PL 1/2" x 33.3864" FF x 54.6345" FF x 53'	12445		
1	452447 Weldment PL 3/8" x 21.9800" FF x 36.3285" FF x 35'-9 1/2" ; (3) Gr Rods; (1) 6' Lightning Rod	4745		
	Total Weight	17535		

SUBJECT TO SECTION 7 CONDITIONS OF APPLICABLE BILL OF LADING, IF THIS SHIPMENT IS TO BE DELIVERED TO THE CONSIGNEE WITHOUT RECOURSE ON THE CONSIGNOR, THE CONSIGNOR SHALL SIGN THE FOLLOWING STATEMENT:

THE CARRIER SHALL NOT MAKE DELIVERY OF THIS SHIPMENT WITHOUT PAYMENT OF FREIGHT AND ALL OTHER LAWFUL

(SIGNATURE OF CONSIGNOR)

IF CHARGES ARE TO BE PREPAID, WRITE OR STAMP HERE, "TO BE PREPAID"

RECEIVED $ _____ TO APPLY IN PREPAYMENT OF THE CHARGES ON THE PROPERTY DESCRIBED HEREIN

AGENT OR CASHIER

PER _____
(THE SIGNATURE HERE ACKNOWLEDGES ONLY THE AMOUNT PREPAID)

CHARGES ADVANCED.

C.O.D. SHIPMENT

C.O.D.Amt. _____
Collection Fee _____
Total Charges _____

Note: Delivery Time is FIRM - if arrival will differ from delivery time contact Nello (800) 806-3556 Crystal (ext. 1253) or Steve (ext. 1255) - Delayed deliveries will incur charges.

Driver Signature _____

Driver Name _____

Driver Cell # _____

Truck Name _____ Truck# _____

Arrival Time _____ Departure Time _____

Freight Co. TMC Logistics

Special Instructions:
Site name: MA 0001A Monterey Hume Lake

IF THE SHIPMENT MOVES BETWEEN TWO PORTS BY A CARRIER BY WATER, THE LAW REQUIRES THE BILL OF LADING SHALL STATE WHETHER IT IS "CARRIER'S OR SHIPPER'S WEIGHT."
NOTE: WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY.
THE AGREED OR DECLARED VALUE OF THE PROPERTY IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING

THE FIBRE BOXES USED FOR THIS SHIPMENT CONFORM TO THE SPECIFICATIONS SET FORTH IN THE BOX MAKER'S CERTIFICATE THEREON, AND ALL OTHER REQUIREMENTS OF CONSOLIDATED FREIGHT CLASSIFICATION. SHIPPER'S IMPRINT IN LIEU OF STAMP NOT PART OF BILL OF LADING APPROVED BY THE INTERSTATE COMMERCE COMMISSION

NELLO CORPORATION SHIPPER, PER Crystal Barth

EXP AGENT PER

1201 S. Sheridan St., St. Joseph County, South Bend, IN 46619

ProTerra DESIGN GROUP, LLC

FIELD INSPECTION REPORT

INSPECTION DATE June 04, 2020 & October 06, 2020	**JOB NO.** 17-051

REPORT ISSUE DATE	REVISION	COMMENTS
October 14, 2020	0	Final Field Inspection Report

PROJECT

Vertex New Build
Building Permit No.: C-19-0014 & C-19-0016
Vertex Site ID: VT-MA 0001A
Vertex Site Name: Monterey Hume Lake
Site Address: 73 Chestnut Hill Road Monterey, MA 01245

CONTRACTOR	TOWER OWNER
Tryon Construction (Civil) & Berkshire Wireless (Compound fence, gates etc.)	Vertex Towers
PRESENT AT SITE	**ORGANIZATION**
Victor Moreno	ProTerra Design Group, LLC

PREPARED BY: ProTerra Design Group, LLC
4 Bay Road
Building A; Suite 200
Hadley, MA 01035

SUBMITTED TO: Donald Torrico
Building Commissioner
435 Main Road
PO Box 308
Monterey, MA 01245

Pursuant to the Massachusetts State Building Code, 9th edition (780 CMR) with Massachusetts Amendments to the IBC 2015, the following report documents a visual inspection from ground level for the general conformance with the construction drawings from ProTerra Design Group, LLC dated 08/30/2019 (Rev2) for the above referenced project.

The following items below have been completed in general conformance to plans:

1) Top layer of crushed stone has been placed on access road and graded as required.
2) Boulders were placed along-side the road in lieu of installing a wooden guard rail. This is an adequate substitution in this case.
3) Stone lined swales have been installed along the access road in general conformance with plans.
4) Culverts were installed as required, running under the new access road. Field stone headwalls placed at culverts were noted in the plans.
5) Plunge pools and outlet spreaders installed with rip rap lining per plan.
6) A sediment trap/basin placed next to the new compound.
7) Finish grading complete. Disturbed areas have been seeded and hay laid over the seeding.
8) Utility poles installed and new lines pulled along the new poles to the new compound. Transformer also installed on the last utility pole located by the compound. Underground conduit run from the terminal pole to the meter bank per local utility requirements.
9) Meter bank installed.

10) Ground ring installed.

11) Site backfilling complete and stone finishing applied over the compound.

12) Chain link fence installed per plan and the fence posts/gates have been grounded as required.

13) A Certificate of Compliance has been issued for this site by the Town of Monterey Conservation Commission to close out the Berkshire Scenic Mountain Act file # SMA11-07.

The comments in this field report are a record of observations made on site. If there are any errors or omissions please notify ProTerra Design Group, LLC in writing or all comments and all parties shall consider this report factual and acceptable.

COPIES TO: File

SUBMITTED: _____
Peter Nute, Project Engineer

REVIEWED: _____
Jesse Moreno, P.E. Managing Partner

Access road, swales and boulders

Access road, swales and boulders

Culverts and stone headwalls

Culverts and stone headwalls

Plunge pool and underground conduit

Swale installed beside compound

Utility pole and transformer

Chain link fence insrtalled

Meter bank back

Meter bank front

Ground ring installation (prior to backfill)

Electrolytic ground rod

Fence gate grounding

Typical fence grounding

Disturbed areas seeded and hayed

Disturbed areas seeded and hayed

Stone Finishing placed within compound.

Locking nuts installed on all anchor bolts.
Monopole has been grounded.

Town of Monterey
Monterey Town Hall
435 Main Rd P.O. Box 308,
Monterey, MA 01245
Phone: 413-528-1443
Fax: 413-528-9452
www.montereyma.gov

Permit# *C-19-0014* Date *10/31/2019*

Application to	*C-19-0014*				Permit to	*Future Tower 35'x35' Reinforced Concrete Mat Foundation with Pier extending 1ft +/- above grade.*		
Permit Address					Map	*235 1 0*	Parcel	*235 1 0*
Zoning District	*AR*	Dwl Units		Stories		Class		Occ/Use
Property Owner	*HUME NEW ENGLAND*				Address	*P O BOX 156*		
Type of Construction					Est cost of Construction		Public Water? ☐	Public Sewer? ☐
Architect	*Jesse Moreno*				Engineer	*Jesse Moreno*		
Contractor	*Leigh Tryon*				Fee Amt.	*$280.00*		
Remarks								

This permit is subject to all Federal, State and Local laws and regulations and may be revoked if their requirements are violated.

- ☑ FOOTING AND STEEL
- ☑ FOUNDATION AND STEEL
- ☐ FRAMING AND FIRE CAULK
- ☐ INSULATION
- ☐ FINAL INSPECTION / COI

Address:-

Monterey, Massachusetts
Inspector of Buildings
780 CMR Ninth Edition

Permit # *C-19-0014*
Date *10/31/2019*

Application to:- *C-19-0014*

BUILDING INSPECTOR

	Approved	Disapproved
FOOTING AND STEEL	●	●
FOUNDATION AND STEEL	●	●
FRAMING AND FIRE CAULK	●	●
INSULATION	●	●
FINAL INSPECTION / COI	●	●

PLUMBING AND GAS INSPECTOR

	Approved	Disapproved
Underground	●	●
Rough Piping	●	●
Gas Test	●	●
C of O/FINAL	●	●

FIRE DEPARTMENT

	Approved	Disapproved
Oil burner	●	●
Smoke detector	●	●
C of O/FINAL	●	●

CONSERVATION

C of O/FINAL	●	●

ELECTRICAL INSPECTOR

	Approved	Disapproved
Service	●	●
Roughing wiring	●	●
C of O/FINAL	●	●

HEALTH DEPARTMENT

	Approved	Disapproved
Septic field	●	●
C of O/FINAL	●	●

Date _____

PUBLIC UTILITIES

C of O/FINAL	●	●

Comments

Signature Donald R. Torrico, C.B.O.

Town of Monterey

Monterey Town Hall
436 Main Rd P.O. Box 308,
Monterey, MA 01246
Phone: 413-528-1443
Fax: 413-528-9462
www.montereyma.gov

Permit# C-19-0016 Date 11/14/2019

Application to	C-19-0016			Permit to	Tower installation and AT&T cell equipment install		
Permit Address	73 CHESTNUT HILL RD			Map	235 1 0	Parcel	235 1 0
Zoning District		Dwl Units	Stories		Class		Occ/Use
Property Owner	HUME NEW ENGLAND			Address	P O BOX 156		
Type of Construction				Est cost of Construction		Public Water? ☐	Public Sewer? ☐
Architect	ProTerra Design Group LLC			Engineer	ProTerra Design Group LLC		
Contractor				Fee Amt.	$620.00		
Remarks	Construction Control required for this project. Refer to Special Permit, SBRD Bk: Pg:						
This permit is subject to all Federal, State and Local laws and regulations and may be revoked if their requirements are violated.							

☐ FOOTING AND STEEL	Monterey, Massachusetts Inspector of Buildings 780 CMR Ninth Edition	Permit # C-19-0016
☐ FOUNDATION AND STEEL		Date 11/14/2019
☑ FRAMING AND FIRE CAULK		
☐ INSULATION		
☑ FINAL INSPECTION / COI		
Address:- 73 CHESTNUT HILL RD		Application to:- C-19-0016

BUILDING INSPECTOR

	Approved	Disapproved
FOOTING AND STEEL	○	○
FOUNDATION AND STEEL	○	○
FRAMING AND FIRE CAULK	○	○
INSULATION	○	○
FINAL INSPECTION / COI	○	○

PLUMBING AND GAS INSPECTOR

	Approved	Disapproved
Underground	○	○
Rough Piping	○	○
Gas Test	○	○
C of O/FINAL	○	○

FIRE DEPARTMENT

	Approved	Disapproved
Oil burner	○	○
Smoke detector	○	○
C of O/FINAL	○	○

CONSERVATION

C of O/FINAL	○	○

ELECTRICAL INSPECTOR

	Approved	Disapproved
Service	○	○
Roughing wiring	○	○
C of O/FINAL	○	○

HEALTH DEPARTMENT

	Approved	Disapproved
Septic field	○	○
C of O/FINAL	○	○
Date		

PUBLIC UTILITIES

C of O/FINAL	○	○

Comments	
Signature	Donald R. Tonico, C.B.O.

Print Exit

ProTerra
DESIGN GROUP, LLC

July 14, 2020

Town of Monterey Conservation Commission
435 Main Road, P.O. Box 308
Monterey, MA 01245

RE: Request for Berkshire Scenic Mountain Act Certificate of Compliance
Vertex Tower Assets, LLC Raw Land Telecommunications Facility

Vertex Towers Site ID:	**VT-MA 0001A**
Vertex Towers Site Name:	**Monterey Hume Lake**
Site Address:	**73 Chestnut Hill Road**
	Monterey, MA 01245
Scenic Mountain Act File #	**SMA11-07**
Recorded in Berkshire South:	**Book 2525, Page 229**

On behalf of Vertex Tower Assets, LLC, we hereby submit this letter as notification that construction for the aforementioned raw land telecommunications facility in Monterey, Massachusetts has been substantially completed by the Applicant and his Contractor. We respectfully request a certificate of for SMA11-07 as recorded in Book 2525, Page 229 of the Berkshire Scenic Mountain Act Issued by the Monterey Conservation Commission.

ProTerra Design Group, LLC has reviewed submittal documents and progress photos provided by the contractor, 3rd party inspection data, an as-built survey, and performed onsite inspections at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the work consistent with the professional standard of care in our industry. To the best of our knowledge and belief, the site is stabilized and has been constructed in general conformance with the permitting plans and Amendment as described on the Commission's memo to the file dated 4-10-2019.

If you have any questions or need further information, please do not hesitate to call.

Sincerely,
ProTerra Design Group, LLC

COMMONWEALTH OF MASSACHUSETTS
JESSE M. MORENO
CIVIL
No 47315
REGISTERED

Jesse Moreno, PE

cc: File, Vertex Tower Assets, LLC
155 South Street; Suite 205
Wrentham, MA 02093

Enclosure

Town of Monterey Conservation Commission

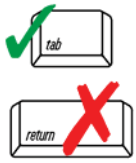
Request for Certificate of Compliance under the Berkshire Scenic Mountain Act

DEP File Number:

SMA11-07
Provided by DEP

A. Project Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. This request is being made by:

Vertex Towers, LLC
Name

155 South Street, Suite 205
Mailing Address

Wrentham | MA | 02093
City/Town | State | Zip Code

617-817-8564
Phone Number

2. This request is in reference to work regulated by a final Order of Conditions issued to:

Vertex Towers, LLC
Applicant

November 4, 2018 | SMA11-07
Dated | DEP File Number

Upon completion of the work authorized in an Order of Conditions, the property owner must request a Certificate of Compliance from the issuing authority stating that the work or portion of the work has been satisfactorily completed.

3. The project site is located at:

73 Chestnut Hill Ave | Monterey
Street Address | City/Town

235 | 1
Assessors Map/Plat Number | Parcel/Lot Number

4. The final Order of Conditions was recorded at the Registry of Deeds for:

Hume Lake Christian Camp, Inc.
Property Owner (if different)

Berkshire | 2525 | 229
County | Book | Page

Certificate (if registered land)

5. This request is for certification that (check one):

☒ the work regulated by the above-referenced Order of Conditions has been satisfactorily completed.

☐ the following portions of the work regulated by the above-referenced Order of Conditions have been satisfactorily completed (use additional paper if necessary).

☐ the above-referenced Order of Conditions has lapsed and is therefore no longer valid, and the work regulated by it was never started.

A. Project Information (cont.)

6. Did the Order of Conditions for this project, or the portion of the project subject to this request, contain an approval of any plans stamped by a registered professional engineer, architect, landscape architect, or land surveyor?

☒ Yes — If yes, attach a written statement by such a professional certifying substantial compliance with the plans and describing what deviation, if any, exists from the plans approved in the Order.

☐ No

B. Submittal Requirements

Requests for Certificates of Compliance should be directed to the issuing authority that issued the final Order of Conditions (OOC). If the project received an OOC from the Conservation Commission, submit this request to that Commission. If the project was issued a Superseding Order of Conditions or was the subject of an Adjudicatory Hearing Final Decision, submit this request to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/find-the-massdep-regional-office-for-your-city-or-town.html).

Berkshire Southern District Registry of Deeds

Electronically Recorded Document

This is the first page of the document - Do not remove

Recording Information

Document Number	: 260059
Document Type	: COMPL
Recorded Date	: September 21, 2020
Recorded Time	: 04:25:47 PM
Recorded Book and Page	: 02623 / 344
Number of Pages(including cover sheet)	: 4
Receipt Number	: 59096
Recording Fee	: $105.00

Berkshire Southern District Registry of Deeds
Michelle Laramee-Jenny, Register
334 Main Street, Suite 2
Great Barrington, MA 01230-1894
413-528-0146
http://www.masslandrecords.com/BerkSouth/

Town of Monterey Conservation Commission

SMA Form H – Certificate of Compliance

Massachusetts Scenic Mountain Act MGL c. 131, § 39a

A. Project Information

SMAOOC # 11-07

1. This Certificate of Compliance is issued for work regulated by a final Order of Conditions issued to:

Name VERTEX TOWERS

Mailing Address 155 SOUTH ST, SUITE 205

City/Town WRENTHAM State MA Zip 02093

2. The project site is located at: 73 CHESTNUT HILL RD, MONTEREY, MA
Assessors Map Number 235 Parcel/Lot Number 1

3. The final Order of Conditions was recorded at the Registry of Deeds for:

Property Owner (if different):

County SOUTHERN BERKSHIRE Book # ~~2525~~ 2090 Page # ~~229~~ 92

Certificate

4. A site inspection was made in the presence of the applicant, or the applicant's agent, on:

Date 8.5.2020

B. Certification

Check all that apply:

☒ **Complete Certification:** It is hereby certified that the work regulated by the above-referenced Order of Conditions has been satisfactorily completed.

☐ **Partial Certification:** It is hereby certified that the following portions of work regulated by the above-referenced Order of Conditions have been satisfactorily completed. The project areas or work subject to this partial certification that have been completed and are released from this Order are:

_____

_____

☐ **Invalid Order of Conditions:** It is hereby certified that the work regulated by the above-referenced Order of Conditions never commenced. The Order of Conditions has lapsed and is therefore

Town of Monterey Conservation Commission

SMA Form H – Certificate of Compliance

Massachusetts Scenic Mountain Act MGL c. 131, § 39a

no longer valid. No future work subject to regulation under the Scenic Mountains Act may commence without filing a new Notice of Intent and receiving a new Order of Conditions.

☐ **Ongoing Conditions:** The following conditions of the Order shall continue: (Include any conditions contained in the Final Order, such as maintenance or monitoring, that should continue for a longer period.)

Conditions:

C. **Authorization**

Issued by Monterey Conservation Commission on

Signatures: Kimberly Wetherell

Commonwealth of Massachusetts, Berkshire County

On 26 of AUGUST 2020 before me personally appeared Kimberly Wetherell of the Monterey Conservation Commission, to me known to be the person described in and who executed the foregoing instrument and acknowledged that he/she executed the same as his/her free act and deed.

Notary Public My Commission Expires:

MELISSA A. ROE
NOTARY PUBLIC
Commonwealth of Massachusetts
My Commission Expires
July 31, 2025

TOWN OF MONTEREY
Conservation Commission

435 Main Rd. P.O. Box 308
Monterey, MA 01245

By vote on 8.20.2020, the individuals listed below have authorized the Monterey Conservation Commission Monterey Conservation Commission to accept the following policy during the current State of Emergency, resulting from the presence of COVID- 19:

To authorize the Agent to sign on behalf of the commissioners any and all documents for any entity that accepts electronic signatures for a period of 45 days after termination of the Governor's March 10, 2020 Declaration of a State of Emergency. The Commissioners recognize and accept the provisions of M.G.L. c. 110G regarding electronic signatures and the Commissioners will henceforth execute documents either with electronic signatures or with wet ink signatures and that both will carry the same legal weight and effect.

Jeremy Rawitz
Margo Drohan
Peter Close
Nancy Tomasovich

Kimberly Wetherell, Agent