

Drainage Diagram for 8163.01_hydrocad_prop_SEND
 Prepared by {enter your company name here} 3/27/2015
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Area Listing (all nodes)

<u>Area (acres)</u>	<u>CN</u>	<u>Description (subcats)</u>
0.102	73	Brush, Good, HSG D (15S,17S)
0.023	74	>75% Grass cover, Good, HSG C (16S)
0.102	80	>75% Grass cover, Good, HSG D (15S)
0.362	98	Paved parking & roofs (3S,4S,5S,7S,14S,16S,17S)
<hr/>		
0.589		

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Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: House Runoff Area=868 sf Runoff Depth>2.82"
Flow Length=12' Slope=1.0000 '/' Tc=0.1 min CN=98 Runoff=0.10 cfs 0.005 af

Subcatchment 4S: Sidewalk Runoff Area=38 sf Runoff Depth>2.82"
Flow Length=12' Slope=0.0500 '/' Tc=0.2 min CN=98 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: Parking Lot Runoff Area=4,443 sf Runoff Depth>2.81"
Flow Length=122' Slope=0.0300 '/' Tc=1.5 min CN=98 Runoff=0.50 cfs 0.024 af

Subcatchment 7S: New Building Runoff Area=4,600 sf Runoff Depth>2.81"
Flow Length=100' Slope=0.0100 '/' Tc=1.9 min CN=98 Runoff=0.51 cfs 0.025 af

Subcatchment 14S: Parking Lot Runoff Area=1,222 sf Runoff Depth>2.81"
Flow Length=57' Slope=0.0020 '/' Tc=2.3 min CN=98 Runoff=0.13 cfs 0.007 af

Subcatchment 15S: Existing natural area Runoff Area=8,161 sf Runoff Depth>1.10"
Flow Length=128' Tc=1.8 min CN=77 Runoff=0.44 cfs 0.017 af

Subcatchment 16S: New Paved Parking Runoff Area=4,329 sf Runoff Depth>2.20"
Flow Length=128' Tc=1.8 min CN=92 Runoff=0.42 cfs 0.018 af

Subcatchment 17S: West side to Street Runoff Area=2,000 sf Runoff Depth>1.94"
Tc=2.0 min CN=89 Runoff=0.18 cfs 0.007 af

Reach 8R: Engelsby Avg. Depth=0.60' Max Vel=0.58 fps Inflow=1.30 cfs 0.066 af
n=0.035 L=152.0' S=0.0007 '/' Capacity=396.22 cfs Outflow=1.10 cfs 0.066 af

Reach 16R: roof drain leader Avg. Depth=0.23' Max Vel=4.73 fps Inflow=0.51 cfs 0.025 af
D=8.0" n=0.010 L=63.0' S=0.0159 '/' Capacity=1.98 cfs Outflow=0.50 cfs 0.025 af

Pond 1CB: Flynn Ave CB Peak Elev=132.71' Inflow=0.24 cfs 0.011 af
18.0" x 10.0' Culvert Outflow=0.24 cfs 0.011 af

Pond 1MH: Flynn Ave MH Peak Elev=131.31' Inflow=0.24 cfs 0.011 af
18.0" x 257.0' Culvert Outflow=0.24 cfs 0.011 af

Pond 7P: Flow Reducing Tank Peak Elev=135.57' Storage=161 cf Inflow=0.52 cfs 0.033 af
Outflow=0.48 cfs 0.030 af

Pond 10P: Bioretention Peak Elev=138.78' Storage=780 cf Inflow=0.92 cfs 0.042 af
Discarded=0.05 cfs 0.034 af Primary=0.02 cfs 0.008 af Outflow=0.07 cfs 0.042 af

Link 8L: Total Site Inflow=0.86 cfs 0.049 af
Primary=0.86 cfs 0.049 af

Total Runoff Area = 0.589 ac Runoff Volume = 0.103 af Average Runoff Depth = 2.10"

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Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

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38.62% Pervious Area = 0.228 ac 61.38% Impervious Area = 0.362 ac

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Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

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Subcatchment 3S: House

Runoff = 0.10 cfs @ 11.89 hrs, Volume= 0.005 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
868	98	Paved parking & roofs
868		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	12	1.0000	3.57		Sheet Flow, Roof Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 4S: Sidewalk

Runoff = 0.00 cfs @ 11.89 hrs, Volume= 0.000 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
38	98	Paved parking & roofs
38		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0500	1.08		Sheet Flow, Walk Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 5S: Parking Lot

Runoff = 0.50 cfs @ 11.90 hrs, Volume= 0.024 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
4,443	98	Paved parking & roofs
4,443		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	122	0.0300	1.40		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 7S: New Building

Runoff = 0.51 cfs @ 11.91 hrs, Volume= 0.025 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
4,600	98	Paved parking & roofs
4,600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.86		Sheet Flow, roof Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 14S: Parking Lot

Runoff = 0.13 cfs @ 11.92 hrs, Volume= 0.007 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
1,222	98	Paved parking & roofs
1,222		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	57	0.0020	0.41		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 15S: Existing natural area

Runoff = 0.44 cfs @ 11.92 hrs, Volume= 0.017 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
3,706	73	Brush, Good, HSG D
4,455	80	>75% Grass cover, Good, HSG D
8,161	77	Weighted Average
8,161		Pervious Area

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Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0200	1.03		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"
0.4	30	0.0400	1.18		Sheet Flow, grass Smooth surfaces n= 0.011 P2= 2.20"
0.4	38	0.3400	1.46		Shallow Concentrated Flow, bank Forest w/Heavy Litter Kv= 2.5 fps
1.8	128	Total			

Subcatchment 16S: New Paved Parking

Runoff = 0.42 cfs @ 11.91 hrs, Volume= 0.018 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
3,329	98	Paved parking & roofs
1,000	74	>75% Grass cover, Good, HSG C
4,329	92	Weighted Average
1,000		Pervious Area
3,329		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0200	1.03		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"
0.4	30	0.0400	1.18		Sheet Flow, grass Smooth surfaces n= 0.011 P2= 2.20"
0.4	38	0.3400	1.46		Shallow Concentrated Flow, bank Forest w/Heavy Litter Kv= 2.5 fps
1.8	128	Total			

Subcatchment 17S: West side to Street

Runoff = 0.18 cfs @ 11.92 hrs, Volume= 0.007 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

Area (sf)	CN	Description
1,250	98	Paved parking & roofs
750	73	Brush, Good, HSG D
2,000	89	Weighted Average
750		Pervious Area
1,250		Impervious Area

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Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					Direct Entry, landscape areas

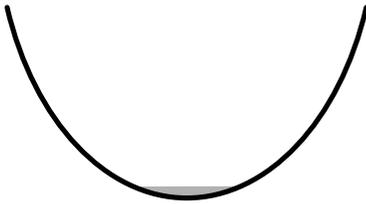
Reach 8R: Engelsby

Inflow Area = 0.589 ac, Inflow Depth > 1.35" for Chit-10yr-24hr event
 Inflow = 1.30 cfs @ 11.92 hrs, Volume= 0.066 af
 Outflow = 1.10 cfs @ 12.04 hrs, Volume= 0.066 af, Atten= 15%, Lag= 6.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.58 fps, Min. Travel Time= 4.4 min
 Avg. Velocity = 0.21 fps, Avg. Travel Time= 12.2 min

Peak Storage= 300 cf @ 11.96 hrs, Average Depth at Peak Storage= 0.60'
 Bank-Full Depth= 10.00', Capacity at Bank-Full= 396.22 cfs

20.00' x 10.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
 Length= 152.0' Slope= 0.0007 '/'
 Inlet Invert= 0.10', Outlet Invert= 0.00'



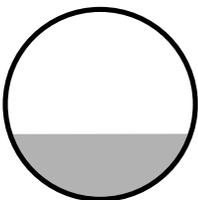
Reach 16R: roof drain leader

Inflow Area = 0.106 ac, Inflow Depth > 2.81" for Chit-10yr-24hr event
 Inflow = 0.51 cfs @ 11.91 hrs, Volume= 0.025 af
 Outflow = 0.50 cfs @ 11.92 hrs, Volume= 0.025 af, Atten= 2%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.73 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 1.41 fps, Avg. Travel Time= 0.7 min

Peak Storage= 7 cf @ 11.91 hrs, Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.98 cfs

8.0" Diameter Pipe, n= 0.010 PVC, smooth interior
 Length= 63.0' Slope= 0.0159 '/'
 Inlet Invert= 140.00', Outlet Invert= 139.00'



Pond 1CB: Flynn Ave CB

Inflow Area = 0.049 ac, Inflow Depth > 2.81" for Chit-10yr-24hr event
 Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 132.71' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	132.50'	18.0" x 10.0' long Culvert CMP, square edge headwall, Ke= 0.500 Outlet Invert= 132.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior

Primary OutFlow Max=0.23 cfs @ 11.90 hrs HW=132.71' (Free Discharge)

↑**1=Culvert** (Inlet Controls 0.23 cfs @ 1.56 fps)

Pond 1MH: Flynn Ave MH

Inflow Area = 0.049 ac, Inflow Depth > 2.81" for Chit-10yr-24hr event
 Inflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af
 Outflow = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.24 cfs @ 11.90 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 131.31' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.06'	18.0" x 257.0' long Culvert CMP, square edge headwall, Ke= 0.500 Outlet Invert= 128.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior

Primary OutFlow Max=0.23 cfs @ 11.90 hrs HW=131.31' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.23 cfs @ 1.79 fps)

Pond 7P: Flow Reducing Tank

Inflow Area = 0.307 ac, Inflow Depth > 1.28" for Chit-10yr-24hr event
 Inflow = 0.52 cfs @ 11.92 hrs, Volume= 0.033 af
 Outflow = 0.48 cfs @ 11.94 hrs, Volume= 0.030 af, Atten= 7%, Lag= 1.5 min
 Primary = 0.48 cfs @ 11.94 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 135.57' @ 11.94 hrs Surf.Area= 72 sf Storage= 161 cf

Plug-Flow detention time= 59.3 min calculated for 0.030 af (92% of inflow)
 Center-of-Mass det. time= 33.0 min (778.7 - 745.8)

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Type II 24-hr Chit-10yr-24hr Rainfall=3.20"

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Volume	Invert	Avail.Storage	Storage Description
#1	133.33'	408 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.33	72	0	0
139.00	72	408	408

Device	Routing	Invert	Outlet Devices
#1	Primary	134.83'	5.0" Vert. Orifice/Grate C= 0.600
#2	Primary	138.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.47 cfs @ 11.94 hrs HW=135.55' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.47 cfs @ 3.46 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Bioretention

Inflow Area = 0.201 ac, Inflow Depth > 2.51" for Chit-10yr-24hr event
 Inflow = 0.92 cfs @ 11.91 hrs, Volume= 0.042 af
 Outflow = 0.07 cfs @ 12.39 hrs, Volume= 0.042 af, Atten= 92%, Lag= 29.3 min
 Discarded = 0.05 cfs @ 11.55 hrs, Volume= 0.034 af
 Primary = 0.02 cfs @ 12.39 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 138.78' @ 12.39 hrs Surf.Area= 0 sf Storage= 780 cf

Plug-Flow detention time= 88.5 min calculated for 0.042 af (100% of inflow)
 Center-of-Mass det. time= 86.4 min (820.5 - 734.0)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	3,000 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	0	0
141.00	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	0.05 cfs Exfiltration at all elevations
#2	Primary	143.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Primary	138.00'	1.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.05 cfs @ 11.55 hrs HW=138.05' (Free Discharge)

└─1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.02 cfs @ 12.39 hrs HW=138.78' (Free Discharge)

└─2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

└─3=Orifice/Grate (Orifice Controls 0.02 cfs @ 4.14 fps)

Link 8L: Total Site

Inflow Area = 0.402 ac, Inflow Depth > 1.47" for Chit-10yr-24hr event

Inflow = 0.86 cfs @ 11.92 hrs, Volume= 0.049 af

Primary = 0.86 cfs @ 11.92 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: House

Runoff Area=868 sf Runoff Depth>1.77"

Flow Length=12' Slope=1.0000 '/' Tc=0.1 min CN=98 Runoff=0.07 cfs 0.003 af

Subcatchment 4S: Sidewalk

Runoff Area=38 sf Runoff Depth>1.77"

Flow Length=12' Slope=0.0500 '/' Tc=0.2 min CN=98 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: Parking Lot

Runoff Area=4,443 sf Runoff Depth>1.77"

Flow Length=122' Slope=0.0300 '/' Tc=1.5 min CN=98 Runoff=0.32 cfs 0.015 af

Subcatchment 7S: New Building

Runoff Area=4,600 sf Runoff Depth>1.77"

Flow Length=100' Slope=0.0100 '/' Tc=1.9 min CN=98 Runoff=0.33 cfs 0.016 af

Subcatchment 14S: Parking Lot

Runoff Area=1,222 sf Runoff Depth>1.77"

Flow Length=57' Slope=0.0020 '/' Tc=2.3 min CN=98 Runoff=0.09 cfs 0.004 af

Subcatchment 15S: Existing natural area

Runoff Area=8,161 sf Runoff Depth>0.45"

Flow Length=128' Tc=1.8 min CN=77 Runoff=0.18 cfs 0.007 af

Subcatchment 16S: New Paved Parking

Runoff Area=4,329 sf Runoff Depth>1.24"

Flow Length=128' Tc=1.8 min CN=92 Runoff=0.25 cfs 0.010 af

Subcatchment 17S: West side to Street

Runoff Area=2,000 sf Runoff Depth>1.03"

Tc=2.0 min CN=89 Runoff=0.10 cfs 0.004 af

Reach 8R: Engelsby

Avg. Depth=0.45' Max Vel=0.48 fps Inflow=0.74 cfs 0.035 af

n=0.035 L=152.0' S=0.0007 '/' Capacity=396.22 cfs Outflow=0.60 cfs 0.034 af

Reach 16R: roof drain leader

Avg. Depth=0.18' Max Vel=4.18 fps Inflow=0.33 cfs 0.016 af

D=8.0" n=0.010 L=63.0' S=0.0159 '/' Capacity=1.98 cfs Outflow=0.32 cfs 0.016 af

Pond 1CB: Flynn Ave CB

Peak Elev=132.67' Inflow=0.15 cfs 0.007 af

18.0" x 10.0' Culvert Outflow=0.15 cfs 0.007 af

Pond 1MH: Flynn Ave MH

Peak Elev=131.27' Inflow=0.15 cfs 0.007 af

18.0" x 257.0' Culvert Outflow=0.15 cfs 0.007 af

Pond 7P: Flow Reducing Tank

Peak Elev=135.28' Storage=140 cf Inflow=0.34 cfs 0.019 af

Outflow=0.32 cfs 0.017 af

Pond 10P: Bioretention

Peak Elev=138.42' Storage=425 cf Inflow=0.57 cfs 0.025 af

Discarded=0.05 cfs 0.022 af Primary=0.02 cfs 0.004 af Outflow=0.07 cfs 0.025 af

Link 8L: Total Site

Inflow=0.55 cfs 0.028 af

Primary=0.55 cfs 0.028 af

Total Runoff Area = 0.589 ac Runoff Volume = 0.059 af Average Runoff Depth = 1.20"

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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38.62% Pervious Area = 0.228 ac 61.38% Impervious Area = 0.362 ac

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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Subcatchment 3S: House

Runoff = 0.07 cfs @ 11.89 hrs, Volume= 0.003 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
868	98	Paved parking & roofs
868		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	12	1.0000	3.57		Sheet Flow, Roof Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 4S: Sidewalk

Runoff = 0.00 cfs @ 11.89 hrs, Volume= 0.000 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
38	98	Paved parking & roofs
38		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0500	1.08		Sheet Flow, Walk Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 5S: Parking Lot

Runoff = 0.32 cfs @ 11.90 hrs, Volume= 0.015 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
4,443	98	Paved parking & roofs
4,443		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	122	0.0300	1.40		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 7S: New Building

Runoff = 0.33 cfs @ 11.91 hrs, Volume= 0.016 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
4,600	98	Paved parking & roofs
4,600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.86		Sheet Flow, roof Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 14S: Parking Lot

Runoff = 0.09 cfs @ 11.92 hrs, Volume= 0.004 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
1,222	98	Paved parking & roofs
1,222		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	57	0.0020	0.41		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 15S: Existing natural area

Runoff = 0.18 cfs @ 11.93 hrs, Volume= 0.007 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
3,706	73	Brush, Good, HSG D
4,455	80	>75% Grass cover, Good, HSG D
8,161	77	Weighted Average
8,161		Pervious Area

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0200	1.03		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"
0.4	30	0.0400	1.18		Sheet Flow, grass Smooth surfaces n= 0.011 P2= 2.20"
0.4	38	0.3400	1.46		Shallow Concentrated Flow, bank Forest w/Heavy Litter Kv= 2.5 fps
1.8	128	Total			

Subcatchment 16S: New Paved Parking

Runoff = 0.25 cfs @ 11.91 hrs, Volume= 0.010 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
3,329	98	Paved parking & roofs
1,000	74	>75% Grass cover, Good, HSG C
4,329	92	Weighted Average
1,000		Pervious Area
3,329		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0200	1.03		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"
0.4	30	0.0400	1.18		Sheet Flow, grass Smooth surfaces n= 0.011 P2= 2.20"
0.4	38	0.3400	1.46		Shallow Concentrated Flow, bank Forest w/Heavy Litter Kv= 2.5 fps
1.8	128	Total			

Subcatchment 17S: West side to Street

Runoff = 0.10 cfs @ 11.92 hrs, Volume= 0.004 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

Area (sf)	CN	Description
1,250	98	Paved parking & roofs
750	73	Brush, Good, HSG D
2,000	89	Weighted Average
750		Pervious Area
1,250		Impervious Area

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					Direct Entry, landscape areas

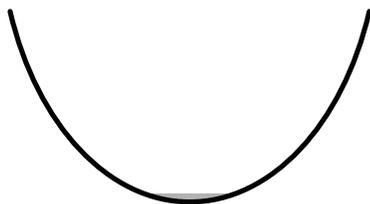
Reach 8R: Engelsby

Inflow Area = 0.589 ac, Inflow Depth > 0.71" for Chit-1yr-24hr event
Inflow = 0.74 cfs @ 11.93 hrs, Volume= 0.035 af
Outflow = 0.60 cfs @ 12.06 hrs, Volume= 0.034 af, Atten= 19%, Lag= 7.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.48 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 13.1 min

Peak Storage= 194 cf @ 11.97 hrs, Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 10.00', Capacity at Bank-Full= 396.22 cfs

20.00' x 10.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 152.0' Slope= 0.0007 '/'
Inlet Invert= 0.10', Outlet Invert= 0.00'



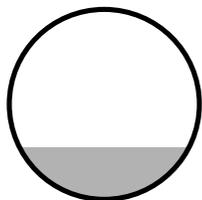
Reach 16R: roof drain leader

Inflow Area = 0.106 ac, Inflow Depth > 1.77" for Chit-1yr-24hr event
Inflow = 0.33 cfs @ 11.91 hrs, Volume= 0.016 af
Outflow = 0.32 cfs @ 11.92 hrs, Volume= 0.016 af, Atten= 2%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.18 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.9 min

Peak Storage= 5 cf @ 11.91 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.98 cfs

8.0" Diameter Pipe, n= 0.010 PVC, smooth interior
Length= 63.0' Slope= 0.0159 '/'
Inlet Invert= 140.00', Outlet Invert= 139.00'



Pond 1CB: Flynn Ave CB

Inflow Area = 0.049 ac, Inflow Depth > 1.77" for Chit-1yr-24hr event
 Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 132.67' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	132.50'	18.0" x 10.0' long Culvert CMP, square edge headwall, Ke= 0.500 Outlet Invert= 132.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior

Primary OutFlow Max=0.15 cfs @ 11.90 hrs HW=132.67' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.15 cfs @ 1.40 fps)

Pond 1MH: Flynn Ave MH

Inflow Area = 0.049 ac, Inflow Depth > 1.77" for Chit-1yr-24hr event
 Inflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af
 Outflow = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 11.90 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 131.27' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.06'	18.0" x 257.0' long Culvert CMP, square edge headwall, Ke= 0.500 Outlet Invert= 128.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior

Primary OutFlow Max=0.15 cfs @ 11.90 hrs HW=131.27' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.15 cfs @ 1.58 fps)

Pond 7P: Flow Reducing Tank

Inflow Area = 0.307 ac, Inflow Depth > 0.75" for Chit-1yr-24hr event
 Inflow = 0.34 cfs @ 11.92 hrs, Volume= 0.019 af
 Outflow = 0.32 cfs @ 11.94 hrs, Volume= 0.017 af, Atten= 4%, Lag= 1.1 min
 Primary = 0.32 cfs @ 11.94 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 135.28' @ 11.94 hrs Surf.Area= 72 sf Storage= 140 cf

Plug-Flow detention time= 79.1 min calculated for 0.017 af (87% of inflow)
 Center-of-Mass det. time= 39.7 min (778.0 - 738.2)

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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Volume	Invert	Avail.Storage	Storage Description
#1	133.33'	408 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.33	72	0	0
139.00	72	408	408

Device	Routing	Invert	Outlet Devices
#1	Primary	134.83'	5.0" Vert. Orifice/Grate C= 0.600
#2	Primary	138.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.31 cfs @ 11.94 hrs HW=135.26' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.31 cfs @ 2.29 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Bioretention

Inflow Area = 0.201 ac, Inflow Depth > 1.51" for Chit-1yr-24hr event
 Inflow = 0.57 cfs @ 11.91 hrs, Volume= 0.025 af
 Outflow = 0.07 cfs @ 12.16 hrs, Volume= 0.025 af, Atten= 88%, Lag= 15.0 min
 Discarded = 0.05 cfs @ 11.65 hrs, Volume= 0.022 af
 Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 138.42' @ 12.16 hrs Surf.Area= 0 sf Storage= 425 cf

Plug-Flow detention time= 51.1 min calculated for 0.025 af (100% of inflow)
 Center-of-Mass det. time= 48.9 min (793.0 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	3,000 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	0	0
141.00	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	0.05 cfs Exfiltration at all elevations
#2	Primary	143.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Primary	138.00'	1.0" Vert. Orifice/Grate C= 0.600

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Type II 24-hr Chit-1yr-24hr Rainfall=2.10"

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Discarded OutFlow Max=0.05 cfs @ 11.65 hrs HW=138.05' (Free Discharge)

└─1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.02 cfs @ 12.16 hrs HW=138.42' (Free Discharge)

└─2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

└─3=Orifice/Grate (Orifice Controls 0.02 cfs @ 2.98 fps)

Link 8L: Total Site

Inflow Area = 0.402 ac, Inflow Depth > 0.83" for Chit-1yr-24hr event

Inflow = 0.55 cfs @ 11.92 hrs, Volume= 0.028 af

Primary = 0.55 cfs @ 11.92 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: House

Runoff Area=868 sf Runoff Depth>1.96"

Flow Length=12' Slope=1.0000 '/' Tc=0.1 min CN=98 Runoff=0.07 cfs 0.003 af

Subcatchment 4S: Sidewalk

Runoff Area=38 sf Runoff Depth>1.96"

Flow Length=12' Slope=0.0500 '/' Tc=0.2 min CN=98 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: Parking Lot

Runoff Area=4,443 sf Runoff Depth>1.96"

Flow Length=122' Slope=0.0300 '/' Tc=1.5 min CN=98 Runoff=0.36 cfs 0.017 af

Subcatchment 7S: New Building

Runoff Area=4,600 sf Runoff Depth>1.96"

Flow Length=100' Slope=0.0100 '/' Tc=1.9 min CN=98 Runoff=0.36 cfs 0.017 af

Subcatchment 14S: Parking Lot

Runoff Area=1,222 sf Runoff Depth>1.96"

Flow Length=57' Slope=0.0020 '/' Tc=2.3 min CN=98 Runoff=0.09 cfs 0.005 af

Subcatchment 15S: Existing natural area

Runoff Area=8,161 sf Runoff Depth>0.55"

Flow Length=128' Tc=1.8 min CN=77 Runoff=0.22 cfs 0.009 af

Subcatchment 16S: New Paved Parking

Runoff Area=4,329 sf Runoff Depth>1.41"

Flow Length=128' Tc=1.8 min CN=92 Runoff=0.28 cfs 0.012 af

Subcatchment 17S: West side to Street

Runoff Area=2,000 sf Runoff Depth>1.19"

Tc=2.0 min CN=89 Runoff=0.11 cfs 0.005 af

Reach 8R: Engelsby

Avg. Depth=0.48' Max Vel=0.50 fps Inflow=0.84 cfs 0.040 af

n=0.035 L=152.0' S=0.0007 '/' Capacity=396.22 cfs Outflow=0.69 cfs 0.040 af

Reach 16R: roof drain leader

Avg. Depth=0.19' Max Vel=4.29 fps Inflow=0.36 cfs 0.017 af

D=8.0" n=0.010 L=63.0' S=0.0159 '/' Capacity=1.98 cfs Outflow=0.35 cfs 0.017 af

Pond 1CB: Flynn Ave CB

Peak Elev=132.68' Inflow=0.17 cfs 0.008 af

18.0" x 10.0' Culvert Outflow=0.17 cfs 0.008 af

Pond 1MH: Flynn Ave MH

Peak Elev=131.28' Inflow=0.17 cfs 0.008 af

18.0" x 257.0' Culvert Outflow=0.17 cfs 0.008 af

Pond 7P: Flow Reducing Tank

Peak Elev=135.32' Storage=144 cf Inflow=0.37 cfs 0.021 af

Outflow=0.35 cfs 0.019 af

Pond 10P: Bioretention

Peak Elev=138.49' Storage=486 cf Inflow=0.63 cfs 0.028 af

Discarded=0.05 cfs 0.024 af Primary=0.02 cfs 0.004 af Outflow=0.07 cfs 0.028 af

Link 8L: Total Site

Inflow=0.61 cfs 0.031 af

Primary=0.61 cfs 0.031 af

Total Runoff Area = 0.589 ac Runoff Volume = 0.067 af Average Runoff Depth = 1.36"

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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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38.62% Pervious Area = 0.228 ac 61.38% Impervious Area = 0.362 ac

Subcatchment 3S: House

Runoff = 0.07 cfs @ 11.89 hrs, Volume= 0.003 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
868	98	Paved parking & roofs
868		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	12	1.0000	3.57		Sheet Flow, Roof Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 4S: Sidewalk

Runoff = 0.00 cfs @ 11.89 hrs, Volume= 0.000 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
38	98	Paved parking & roofs
38		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0500	1.08		Sheet Flow, Walk Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 5S: Parking Lot

Runoff = 0.36 cfs @ 11.90 hrs, Volume= 0.017 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
4,443	98	Paved parking & roofs
4,443		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	122	0.0300	1.40		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 7S: New Building

Runoff = 0.36 cfs @ 11.91 hrs, Volume= 0.017 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
4,600	98	Paved parking & roofs
4,600		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0100	0.86		Sheet Flow, roof Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 14S: Parking Lot

Runoff = 0.09 cfs @ 11.92 hrs, Volume= 0.005 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
1,222	98	Paved parking & roofs
1,222		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	57	0.0020	0.41		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"

Subcatchment 15S: Existing natural area

Runoff = 0.22 cfs @ 11.93 hrs, Volume= 0.009 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
3,706	73	Brush, Good, HSG D
4,455	80	>75% Grass cover, Good, HSG D
8,161	77	Weighted Average
8,161		Pervious Area

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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0200	1.03		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"
0.4	30	0.0400	1.18		Sheet Flow, grass Smooth surfaces n= 0.011 P2= 2.20"
0.4	38	0.3400	1.46		Shallow Concentrated Flow, bank Forest w/Heavy Litter Kv= 2.5 fps
1.8	128	Total			

Subcatchment 16S: New Paved Parking

Runoff = 0.28 cfs @ 11.91 hrs, Volume= 0.012 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
3,329	98	Paved parking & roofs
1,000	74	>75% Grass cover, Good, HSG C
4,329	92	Weighted Average
1,000		Pervious Area
3,329		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0200	1.03		Sheet Flow, parking lot Smooth surfaces n= 0.011 P2= 2.20"
0.4	30	0.0400	1.18		Sheet Flow, grass Smooth surfaces n= 0.011 P2= 2.20"
0.4	38	0.3400	1.46		Shallow Concentrated Flow, bank Forest w/Heavy Litter Kv= 2.5 fps
1.8	128	Total			

Subcatchment 17S: West side to Street

Runoff = 0.11 cfs @ 11.92 hrs, Volume= 0.005 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

Area (sf)	CN	Description
1,250	98	Paved parking & roofs
750	73	Brush, Good, HSG D
2,000	89	Weighted Average
750		Pervious Area
1,250		Impervious Area

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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					Direct Entry, landscape areas

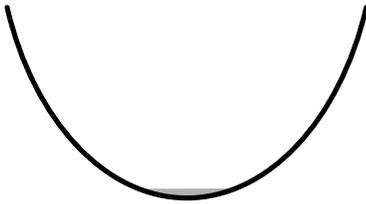
Reach 8R: Engelsby

Inflow Area = 0.589 ac, Inflow Depth > 0.82" for Chitt-2 yr-24hr event
 Inflow = 0.84 cfs @ 11.93 hrs, Volume= 0.040 af
 Outflow = 0.69 cfs @ 12.05 hrs, Volume= 0.040 af, Atten= 18%, Lag= 7.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.50 fps, Min. Travel Time= 5.1 min
 Avg. Velocity = 0.20 fps, Avg. Travel Time= 13.0 min

Peak Storage= 214 cf @ 11.97 hrs, Average Depth at Peak Storage= 0.48'
 Bank-Full Depth= 10.00', Capacity at Bank-Full= 396.22 cfs

20.00' x 10.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
 Length= 152.0' Slope= 0.0007 '/'
 Inlet Invert= 0.10', Outlet Invert= 0.00'



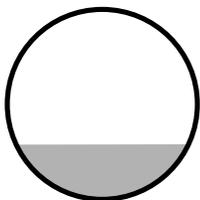
Reach 16R: roof drain leader

Inflow Area = 0.106 ac, Inflow Depth > 1.96" for Chitt-2 yr-24hr event
 Inflow = 0.36 cfs @ 11.91 hrs, Volume= 0.017 af
 Outflow = 0.35 cfs @ 11.92 hrs, Volume= 0.017 af, Atten= 2%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.29 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 1.27 fps, Avg. Travel Time= 0.8 min

Peak Storage= 5 cf @ 11.91 hrs, Average Depth at Peak Storage= 0.19'
 Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.98 cfs

8.0" Diameter Pipe, n= 0.010 PVC, smooth interior
 Length= 63.0' Slope= 0.0159 '/'
 Inlet Invert= 140.00', Outlet Invert= 139.00'



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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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Pond 1CB: Flynn Ave CB

Inflow Area = 0.049 ac, Inflow Depth > 1.96" for Chitt-2 yr-24hr event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 132.68' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	132.50'	18.0" x 10.0' long Culvert CMP, square edge headwall, Ke= 0.500 Outlet Invert= 132.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior

Primary OutFlow Max=0.17 cfs @ 11.90 hrs HW=132.68' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.17 cfs @ 1.43 fps)

Pond 1MH: Flynn Ave MH

Inflow Area = 0.049 ac, Inflow Depth > 1.96" for Chitt-2 yr-24hr event
 Inflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af
 Outflow = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 11.90 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 131.28' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	131.06'	18.0" x 257.0' long Culvert CMP, square edge headwall, Ke= 0.500 Outlet Invert= 128.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior

Primary OutFlow Max=0.17 cfs @ 11.90 hrs HW=131.28' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.17 cfs @ 1.62 fps)

Pond 7P: Flow Reducing Tank

Inflow Area = 0.307 ac, Inflow Depth > 0.84" for Chitt-2 yr-24hr event
 Inflow = 0.37 cfs @ 11.92 hrs, Volume= 0.021 af
 Outflow = 0.35 cfs @ 11.94 hrs, Volume= 0.019 af, Atten= 5%, Lag= 1.2 min
 Primary = 0.35 cfs @ 11.94 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 135.32' @ 11.94 hrs Surf.Area= 72 sf Storage= 144 cf

Plug-Flow detention time= 73.9 min calculated for 0.019 af (88% of inflow)
 Center-of-Mass det. time= 38.4 min (777.1 - 738.8)

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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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Volume	Invert	Avail.Storage	Storage Description
#1	133.33'	408 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.33	72	0	0
139.00	72	408	408

Device	Routing	Invert	Outlet Devices
#1	Primary	134.83'	5.0" Vert. Orifice/Grate C= 0.600
#2	Primary	138.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.34 cfs @ 11.94 hrs HW=135.31' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.34 cfs @ 2.51 fps)
- 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Bioretention

Inflow Area = 0.201 ac, Inflow Depth > 1.69" for Chitt-2 yr-24hr event
 Inflow = 0.63 cfs @ 11.91 hrs, Volume= 0.028 af
 Outflow = 0.07 cfs @ 12.22 hrs, Volume= 0.028 af, Atten= 89%, Lag= 18.7 min
 Discarded = 0.05 cfs @ 11.65 hrs, Volume= 0.024 af
 Primary = 0.02 cfs @ 12.22 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 138.49' @ 12.22 hrs Surf.Area= 0 sf Storage= 486 cf

Plug-Flow detention time= 57.7 min calculated for 0.028 af (100% of inflow)
 Center-of-Mass det. time= 55.6 min (797.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	3,000 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	0	0
141.00	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	0.05 cfs Exfiltration at all elevations
#2	Primary	143.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Primary	138.00'	1.0" Vert. Orifice/Grate C= 0.600

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Type II 24-hr Chitt-2 yr-24hr Rainfall=2.30"

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Discarded OutFlow Max=0.05 cfs @ 11.65 hrs HW=138.06' (Free Discharge)

└1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.02 cfs @ 12.22 hrs HW=138.49' (Free Discharge)

└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

└3=Orifice/Grate (Orifice Controls 0.02 cfs @ 3.21 fps)

Link 8L: Total Site

Inflow Area = 0.402 ac, Inflow Depth > 0.94" for Chitt-2 yr-24hr event

Inflow = 0.61 cfs @ 11.92 hrs, Volume= 0.031 af

Primary = 0.61 cfs @ 11.92 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs