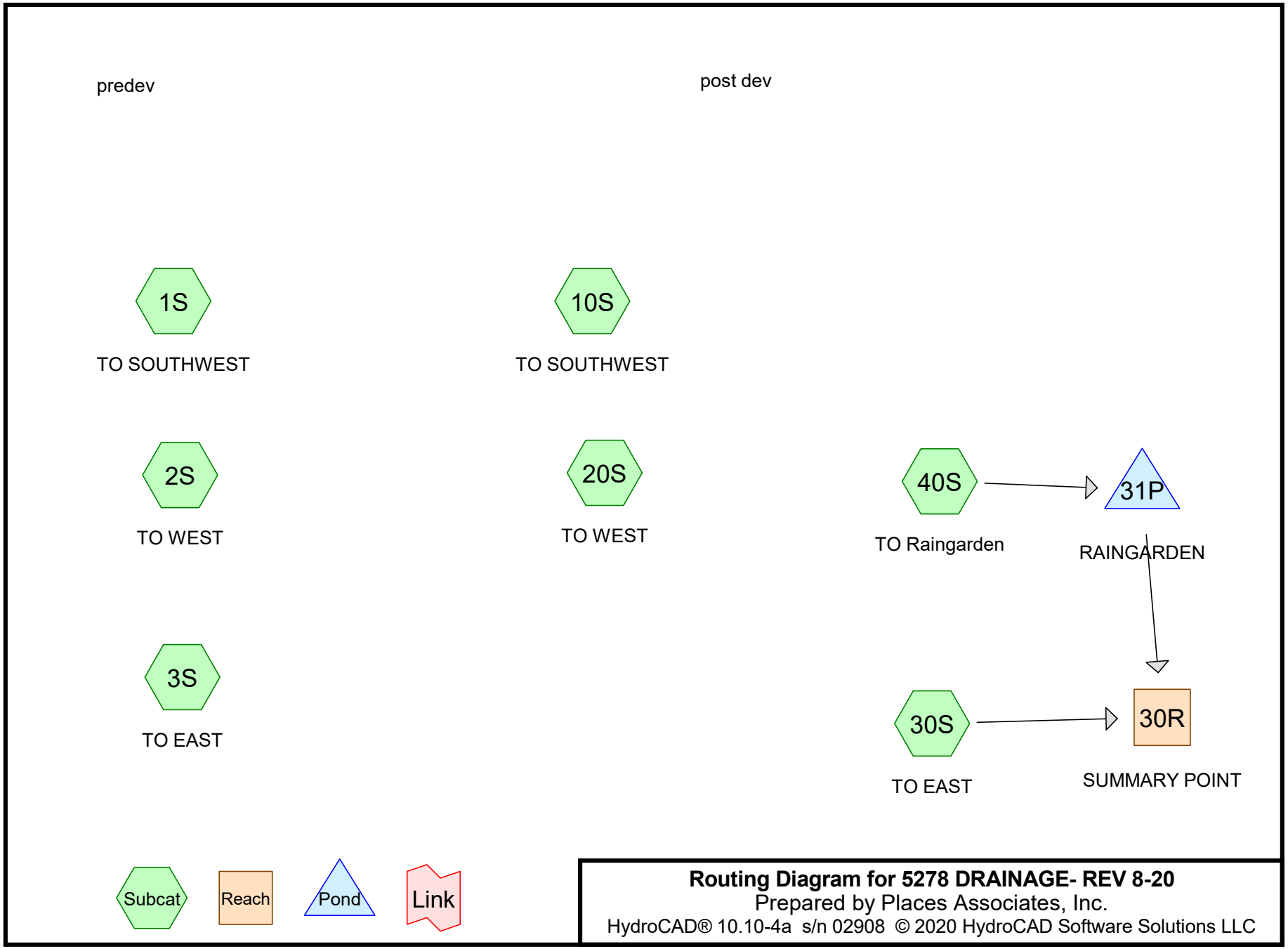

Routing Diagram for 5278 DRAINAGE- REV 8-20
Prepared by Places Associates, Inc.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.500	80	>75% Grass cover, Good, HSG D (40S)
1.100	98	Paved parking, HSG D (40S)
1.400	98	Unconnected pavement, HSG D (10S, 20S, 30S)
12.100	82	Woods/grass comb., Fair, HSG D (1S, 2S, 3S, 10S, 20S, 30S)
15.100	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
15.100	HSG D	1S, 2S, 3S, 10S, 20S, 30S, 40S
0.000	Other	
15.100		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.500	0.000	0.500	>75% Grass cover, Good	40S
0.000	0.000	0.000	1.100	0.000	1.100	Paved parking	40S
0.000	0.000	0.000	1.400	0.000	1.400	Unconnected pavement	10S, 20S, 30S
0.000	0.000	0.000	12.100	0.000	12.100	Woods/grass comb., Fair	1S, 2S, 3S, 10S, 20S, 30S
0.000	**0.000**	**0.000**	**15.100**	**0.000**	**15.100**	**TOTAL AREA**	

Time span=1.00-30.00 hrs, dt=0.01 hrs, 2901 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: TO SOUTHWEST Runoff Area=1.700 ac 0.00% Impervious Runoff Depth=4.45"
Flow Length=150' Slope=0.0400 '/' Tc=11.0 min CN=82 Runoff=7.4 cfs 0.630 af

Subcatchment 2S: TO WEST Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=4.45"
Flow Length=160' Slope=0.0400 '/' Tc=11.1 min CN=82 Runoff=10.9 cfs 0.927 af

Subcatchment 3S: TO EAST Runoff Area=3.400 ac 0.00% Impervious Runoff Depth=4.45"
Flow Length=300' Slope=0.0400 '/' Tc=13.5 min CN=82 Runoff=13.8 cfs 1.261 af

Subcatchment 10S: TO SOUTHWEST Runoff Area=1.300 ac 23.08% Impervious Runoff Depth=4.67"
Flow Length=300' Tc=6.0 min UI Adjusted CN=84 Runoff=7.0 cfs 0.506 af

Subcatchment 20S: TO WEST Runoff Area=2.100 ac 28.57% Impervious Runoff Depth=4.67"
Flow Length=350' Slope=0.0100 '/' Tc=13.5 min UI Adjusted CN=84 Runoff=8.9 cfs 0.817 af

Subcatchment 30S: TO EAST Runoff Area=2.500 ac 20.00% Impervious Runoff Depth=4.67"
Flow Length=300' Slope=0.0400 '/' Tc=13.5 min UI Adjusted CN=84 Runoff=10.6 cfs 0.972 af

Subcatchment 40S: TO Raingarden Runoff Area=1.600 ac 68.75% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=92 Runoff=9.7 cfs 0.742 af

Reach 30R: SUMMARY POINT Inflow=12.9 cfs 1.714 af
Outflow=12.9 cfs 1.714 af

Pond 31P: RAINGARDEN Peak Elev=161.84' Storage=9,575 cf Inflow=9.7 cfs 0.742 af
Outflow=3.7 cfs 0.742 af

Total Runoff Area = 15.100 ac Runoff Volume = 5.854 af Average Runoff Depth = 4.65"
83.44% Pervious = 12.600 ac 16.56% Impervious = 2.500 ac

Summary for Subcatchment 1S: TO SOUTHWEST

Runoff = 7.4 cfs @ 12.15 hrs, Volume= 0.630 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Description
1.700	82	Woods/grass comb., Fair, HSG D
1.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	100	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.0	150	Total			

Summary for Subcatchment 2S: TO WEST

Runoff = 10.9 cfs @ 12.15 hrs, Volume= 0.927 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Description
2.500	82	Woods/grass comb., Fair, HSG D
2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	110	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	160	Total			

Summary for Subcatchment 3S: TO EAST

Runoff = 13.8 cfs @ 12.18 hrs, Volume= 1.261 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Description
3.400	82	Woods/grass comb., Fair, HSG D
3.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
4.2	250	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.5	300	Total			

Summary for Subcatchment 10S: TO SOUTHWEST

Runoff = 7.0 cfs @ 12.09 hrs, Volume= 0.506 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Adj	Description
1.000	82		Woods/grass comb., Fair, HSG D
0.300	98		Unconnected pavement, HSG D
1.300	86	84	Weighted Average, UI Adjusted
1.000			76.92% Pervious Area
0.300			23.08% Impervious Area
0.300			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0130	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	100	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	150	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	300	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 20S: TO WEST

Runoff = 8.9 cfs @ 12.18 hrs, Volume= 0.817 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Adj	Description
1.500	82		Woods/grass comb., Fair, HSG D
0.600	98		Unconnected pavement, HSG D
2.100	87	84	Weighted Average, UI Adjusted
1.500			71.43% Pervious Area
0.600			28.57% Impervious Area
0.600			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.4	100	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	100	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
3.3	100	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.5	350	Total			

Summary for Subcatchment 30S: TO EAST

Runoff = 10.6 cfs @ 12.18 hrs, Volume= 0.972 af, Depth= 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Adj	Description
2.000	82		Woods/grass comb., Fair, HSG D
0.500	98		Unconnected pavement, HSG D
2.500	85	84	Weighted Average, UI Adjusted
2.000			80.00% Pervious Area
0.500			20.00% Impervious Area
0.500			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
4.2	250	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.5	300	Total			

Summary for Subcatchment 40S: TO Raingarden

Runoff = 9.7 cfs @ 12.08 hrs, Volume= 0.742 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.50"

Area (ac)	CN	Description
0.500	80	>75% Grass cover, Good, HSG D
1.100	98	Paved parking, HSG D
1.600	92	Weighted Average
0.500		31.25% Pervious Area
1.100		68.75% Impervious Area

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

Summary for Reach 30R: SUMMARY POINT

Inflow Area = 4.100 ac, 39.02% Impervious, Inflow Depth = 5.02" for 100 year event
Inflow = 12.9 cfs @ 12.22 hrs, Volume= 1.714 af
Outflow = 12.9 cfs @ 12.22 hrs, Volume= 1.714 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 31P: RAINGARDEN

Inflow Area = 1.600 ac, 68.75% Impervious, Inflow Depth = 5.56" for 100 year event
Inflow = 9.7 cfs @ 12.08 hrs, Volume= 0.742 af
Outflow = 3.7 cfs @ 12.32 hrs, Volume= 0.742 af, Atten= 62%, Lag= 14.3 min
Primary = 3.7 cfs @ 12.32 hrs, Volume= 0.742 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 161.84' @ 12.32 hrs Surf.Area= 7,541 sf Storage= 9,575 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 72.7 min (847.5 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	10,850 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,800	0	0
161.00	6,200	4,000	4,000
161.50	6,600	3,200	7,200
162.00	8,000	3,650	10,850

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**12.0" Round Culvert** L= 30.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 158.00' / 157.70' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	158.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	161.65'	**15.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=3.7 cfs @ 12.32 hrs HW=161.84' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.8 cfs of 6.9 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.8 cfs @ 9.22 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 2.8 cfs @ 1.02 fps)