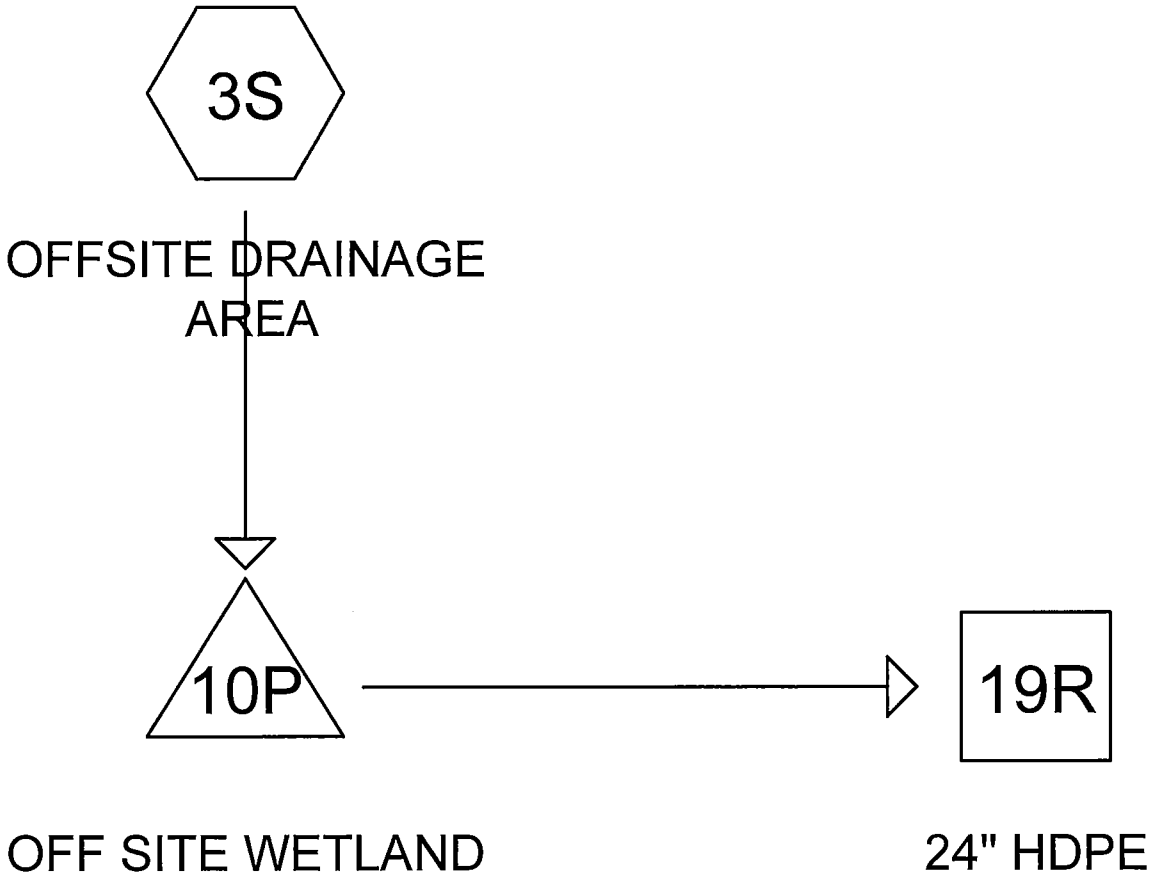
Artis Senior Living
Sizing For 24" Ø Pipe
January 7, 2019



Subcat Reach Pond Link

Routing Diagram for ART100-OFFSITE
Prepared by Kellard Sessions Consulting, P.C., Printed 1/3/2019

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.000	61	1/2 Acre Residential Lots, HSG B (3S)
0.200	98	Paved parking, HSG C (3S)
8.900	55	Woods, Good, HSG B (3S)
16.100	**58**	**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	7.000	0.000	0.000	0.000	7.000	1/2 Acre Residential Lots	3S
0.000	0.000	0.200	0.000	0.000	0.200	Paved parking	3S
0.000	8.900	0.000	0.000	0.000	8.900	Woods, Good	3S
0.000	**15.900**	**0.200**	**0.000**	**0.000**	**16.100**	**TOTAL AREA**	

Summary for Subcatchment 3S: OFFSITE DRAINAGE AREA

Runoff = 30.60 cfs @ 12.73 hrs, Volume= 5.172 af, Depth= 3.86"

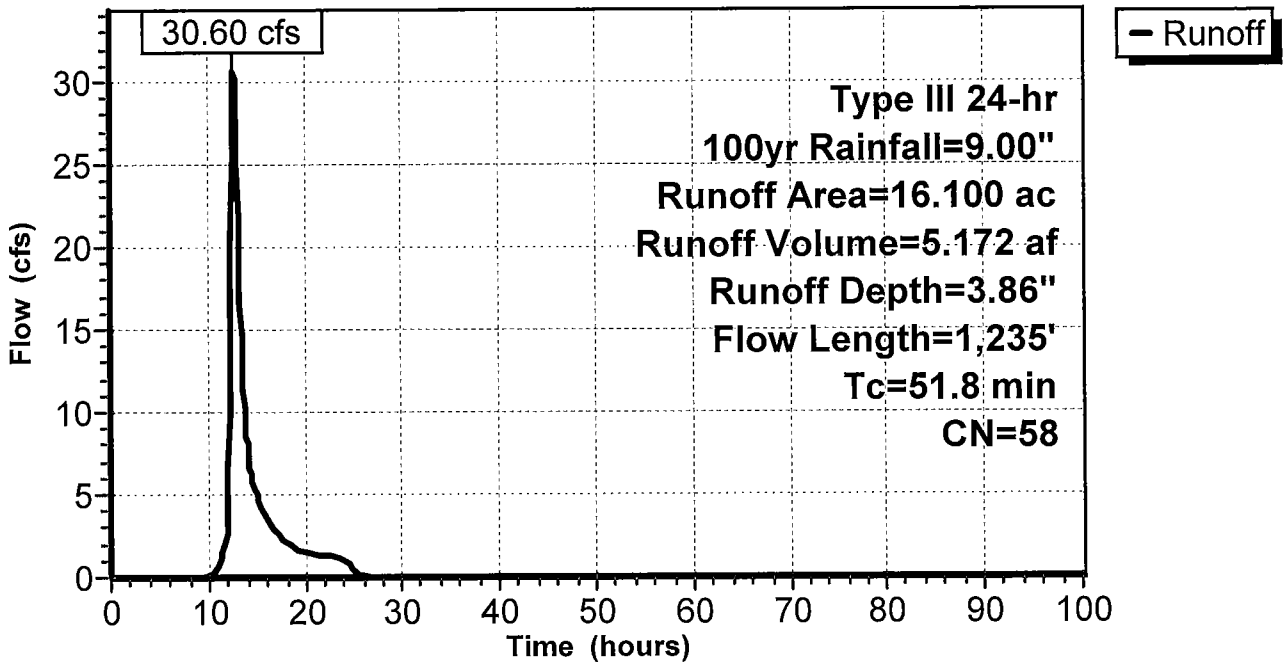
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.10 hrs
Type III 24-hr 100yr Rainfall=9.00"

	Area (ac)	CN	Description
	8.900	55	Woods, Good, HSG B
	0.200	98	Paved parking, HSG C
*	7.000	61	1/2 Acre Residential Lots, HSG B
	16.100	58	Weighted Average
	15.900		98.76% Pervious Area
	0.200		1.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	100	0.0500	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
15.1	640	0.0800	0.71		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
0.1	25	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.8	470	0.0700	0.66		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
51.8	1,235	Total			

Subcatchment 3S: OFFSITE DRAINAGE AREA

Hydrograph



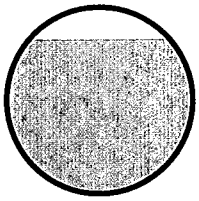
Summary for Reach 19R: 24" HDPE

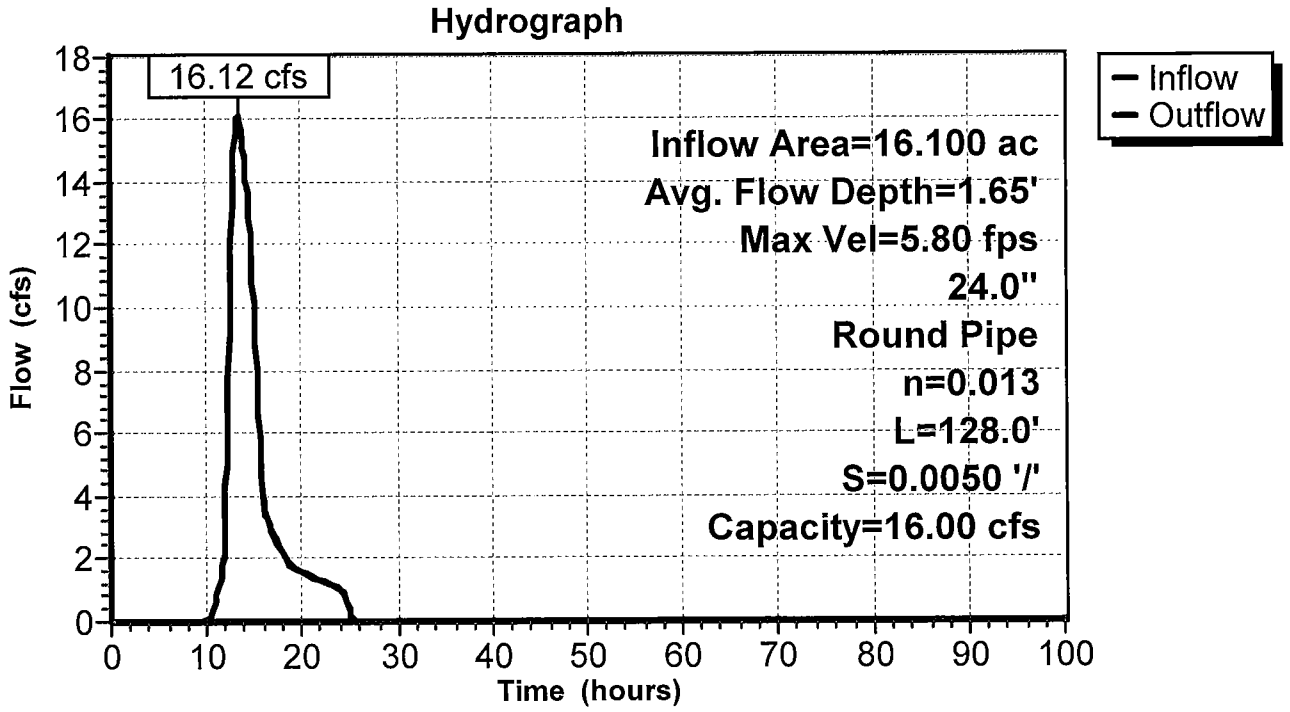
Inflow Area = 16.100 ac, 1.24% Impervious, Inflow Depth = 3.86" for 100yr event
Inflow = 16.12 cfs @ 13.33 hrs, Volume= 5.172 af
Outflow = 16.12 cfs @ 13.34 hrs, Volume= 5.172 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.80 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 0.6 min

Peak Storage= 356 cf @ 13.33 hrs
Average Depth at Peak Storage= 1.65'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 128.0' Slope= 0.0050 '/'
Inlet Invert= 343.65', Outlet Invert= 343.01'





Summary for Pond 10P: OFF SITE WETLAND

Inflow Area = 16.100 ac, 1.24% Impervious, Inflow Depth = 3.86" for 100yr event
Inflow = 30.60 cfs @ 12.73 hrs, Volume= 5.172 af
Outflow = 16.12 cfs @ 13.33 hrs, Volume= 5.172 af, Atten= 47%, Lag= 35.8 min
Primary = 16.12 cfs @ 13.33 hrs, Volume= 5.172 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.10 hrs
Peak Elev= 349.34' @ 13.33 hrs Surf.Area= 19,847 sf Storage= 43,136 cf

Plug-Flow detention time= 20.6 min calculated for 5.167 af (100% of inflow)
Center-of-Mass det. time= 20.6 min (907.3 - 886.8)

Volume	Invert	Avail.Storage	Storage Description
#1	346.00'	57,000 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
346.00	4,000	0	0
348.00	15,500	19,500	19,500
350.00	22,000	37,500	57,000

Device	Routing	Invert	Outlet Devices
#1	Primary	345.00'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 345.00' / 343.65' S= 0.0750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=16.11 cfs @ 13.33 hrs HW=349.33' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 16.11 cfs @ 9.11 fps)

Pond 10P: OFF SITE WETLAND

Hydrograph