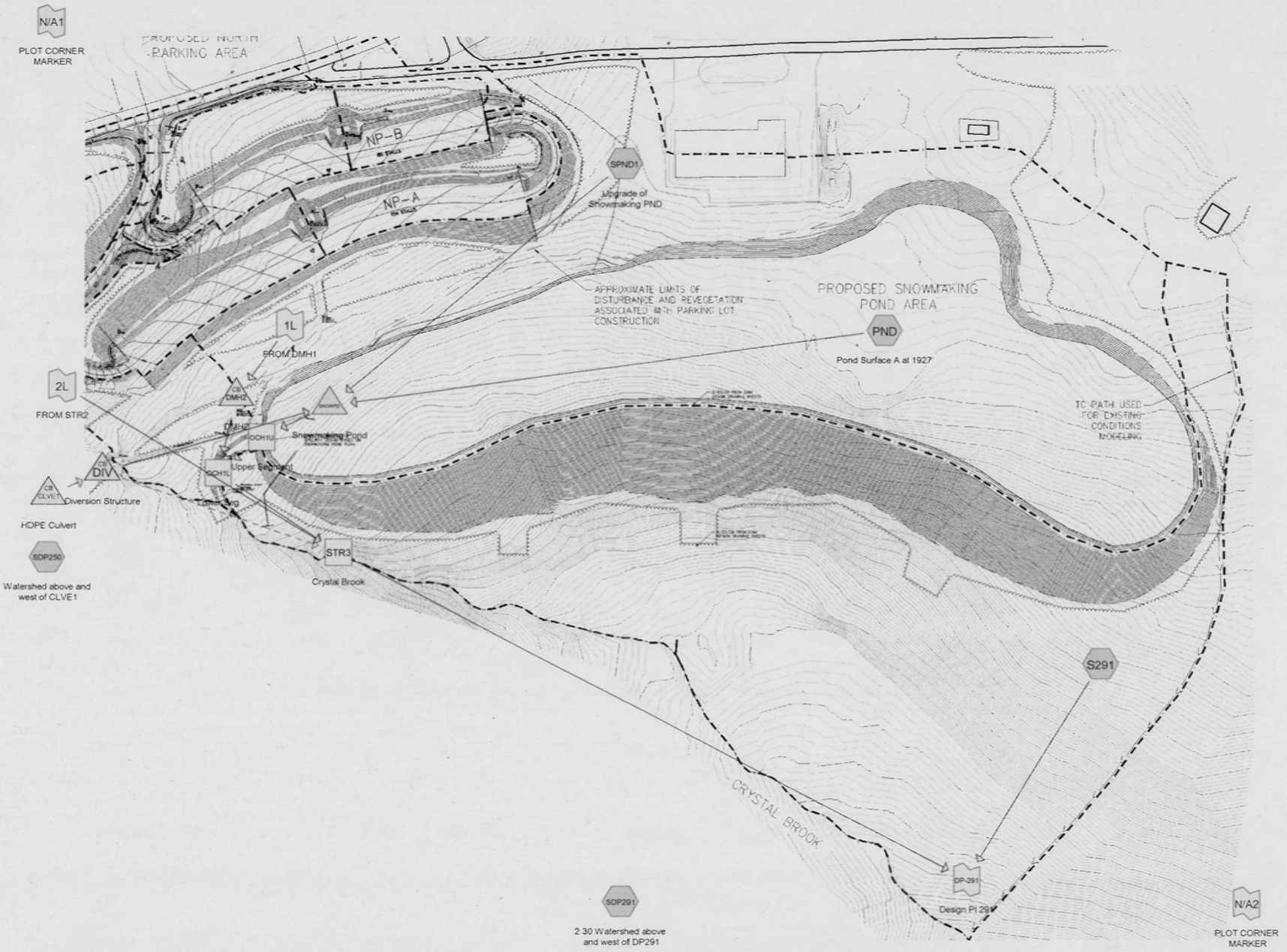

Subcat Reach Pond Link

Drainage Diagram for PR North Parking TIER A-B 2of2

Prepared by NYSDEC DOP BD&C, Printed 12/28/2009

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
11.540	70	Woods, Good, HSG C (S291,SPND1)
86.811	71	(SDP291)
205.097	72	From Satelite MRCL Data (SDP250)
10.334	74	grassland, good (S291,SPND1)
0.383	98	Paved parking 60x360 (SPND1)
8.143	100	Normal Pool at 1927 (PND)
322.309		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PND: Pond Surface A at 1927 Runoff Area=354,721 sf 100.00% Impervious Runoff Depth=6.00"
Tc=6.0 min CN=100 Runoff=68.01 cfs 4.072 af

Subcatchment S291: Runoff Area=640,017 sf 0.00% Impervious Runoff Depth=2.90"
Flow Length=1,194' Tc=44.0 min CN=71 Runoff=28.05 cfs 3.549 af

Subcatchment SDP250: Watershed above and west of Runoff Area=8,934,007 sf 0.00% Impervious Runoff Depth=2.99"
Flow Length=8,357' Tc=55.2 min CN=72 Runoff=344.59 cfs 51.158 af

Subcatchment SDP291: 2.30 Watershed above and west of Runoff Area=3,781,494 sf 0.00% Impervious Runoff Depth=2.90"
Flow Length=4,311' Tc=45.1 min CN=71 Runoff=162.76 cfs 20.970 af

Subcatchment SPND1: Upgrade of Snowmaking PND Runoff Area=329,539 sf 5.06% Impervious Runoff Depth=3.18"
Flow Length=100' Tc=18.8 min CN=74 Runoff=27.62 cfs 2.008 af

Reach OCH1L: Lower Seg Avg. Depth=0.08' Max Vel=1.60 fps Inflow=3.64 cfs 1.509 af
n=0.035 L=67.0' S=0.0442 '/' Capacity=879.92 cfs Outflow=3.64 cfs 1.509 af

Reach OCH1U: Upper Segment Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=83.0' S=0.0100 '/' Capacity=219.51 cfs Outflow=0.00 cfs 0.000 af

Reach STR3: Crystal Brook Avg. Depth=0.14' Max Vel=2.89 fps Inflow=4.78 cfs 1.807 af
n=0.040 L=1,444.0' S=0.0843 '/' Capacity=2,413.68 cfs Outflow=4.05 cfs 1.807 af

Pond CLVE1: HDPE Culvert Peak Elev=0.00'
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Pond DIV: Diversion Structure Peak Elev=1,939.00' Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond DMH2: DMH2 Peak Elev=1,931.51' Inflow=3.64 cfs 1.509 af
15.0" x 70.0' Culvert Outflow=3.64 cfs 1.509 af

Pond SNOWPD: Snowmaking Pond Peak Elev=1,925.78' Storage=264,822 cf Inflow=84.42 cfs 6.079 af
Outflow=0.00 cfs 0.000 af

Link 1L: FROM Q10 Primary Outflow Imported from PR North Parking TIER A-B 1of2~Pond DMH1.hce Inflow=3.64 cfs 1.509 af
Area= 4.891 ac 31.62% Imperv. Primary=3.64 cfs 1.509 af

Link 2L: FROM STR2 Q10 Outflow Imported from PR North Parking TIER A-B 1of2~Reach STR2.hce Inflow=4.65 cfs 0.298 af
Area= 1.057 ac 16.30% Imperv. Primary=4.65 cfs 0.298 af

Link DP-291: Design Pt 291 Inflow=30.18 cfs 5.356 af
Primary=30.18 cfs 5.356 af

Link N/A1: PLOT CORNER MARKER
Primary=0.00 cfs 0.000 af

Link N/A2: PLOT CORNER MARKER
Primary=0.00 cfs 0.000 af

Total Runoff Area = 322.309 ac Runoff Volume = 81.757 af Average Runoff Depth = 3.04"
97.35% Pervious = 313.783 ac 2.65% Impervious = 8.526 ac

Summary for Subcatchment PND: Pond Surface A at 1927

Runoff = 68.01 cfs @ 11.96 hrs, Volume= 4.072 af, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr Q10 Rainfall=6.00"

	Area (sf)	CN	Description
*	354,721	100	Normal Pool at 1927
	354,721		Impervious Area

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

Summary for Subcatchment S291:

Runoff = 28.05 cfs @ 12.43 hrs, Volume= 3.549 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr Q10 Rainfall=6.00"

	Area (sf)	CN	Description
*	216,419	74	grassland, good
	401,804	70	Woods, Good, HSG C
	21,794	70	Woods, Good, HSG C
	640,017	71	Weighted Average
	640,017		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	100	0.0500	0.07		**Sheet Flow, SHT begins in forest** Woods: Dense underbrush n= 0.800 P2= 4.00"
20.8	1,094	0.1234	0.88		**Shallow Concentrated Flow, SCF** Forest w/Heavy Litter Kv= 2.5 fps
44.0	1,194	Total			

Summary for Subcatchment SDP250: Watershed above and west of CLVE1

This area is the entire watershed tributary to the diversion structure. OCF stretches are simplified using mountain stream.

Runoff = 344.59 cfs @ 12.57 hrs, Volume= 51.158 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr Q10 Rainfall=6.00"

	Area (sf)	CN	Description
*	8,934,007	72	From Satelite MRCL Data
	8,934,007		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					**Direct Entry, From TL calculations - could try 30**
29.8	150	0.0600	0.08		**Sheet Flow, Upper Wooded area**
					Woods: Dense underbrush n= 0.800 P2= 4.00"
14.9	3,119	0.2500	3.50		**Shallow Concentrated Flow, SCF**
					Short Grass Pasture Kv= 7.0 fps
8.3	4,049	0.1300	8.08	60.63	**Trap/Vee/Rect Channel Flow, OCF above Discovery Culverts**
					Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.060
2.2	1,039	0.1200	7.77	58.25	**Trap/Vee/Rect Channel Flow, OCF**
					Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.060
55.2	8,357	Total			

Summary for Subcatchment SDP291: 2.30 Watershed above and west of DP291

This area is the upland watershed tributary to DP 291 west of crystal brook and below that triubutary to DP 250. OCF stretches are simplified using mountain stream.

Runoff = 162.76 cfs @ 12.44 hrs, Volume= 20.970 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr Q10 Rainfall=6.00"

	Area (sf)	CN	Description
*	3,781,494	71	
	3,781,494		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	150	0.1533	0.12		**Sheet Flow, Upper Wooded area**
					Woods: Dense underbrush n= 0.800 P2= 4.00"
23.9	3,884	0.1500	2.71		**Shallow Concentrated Flow, SCF**
					Short Grass Pasture Kv= 7.0 fps
0.7	277	0.0500	6.48	38.91	**Channel Flow, OCF**
					Area= 6.0 sf Perim= 8.7' r= 0.69'
					n= 0.040 Mountain streams
45.1	4,311	Total			

Summary for Subcatchment SPND1: Upgrade of Snowmaking PND

see acad layout

Runoff = 27.62 cfs @ 12.11 hrs, Volume= 2.008 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr Q10 Rainfall=6.00"

	Area (sf)	CN	Description
*	16,686	98	Paved parking 60x360
*	233,751	74	grassland, good
	35,747	70	Woods, Good, HSG C
	21,205	70	Woods, Good, HSG C
	14,452	70	Woods, Good, HSG C
	6,747	70	Woods, Good, HSG C
	951	70	Woods, Good, HSG C
	329,539	74	Weighted Average
	312,853		Pervious Area
	16,686		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	86	0.0698	0.08		**Sheet Flow, SHT begins in forest** Woods: Dense underbrush n= 0.800 P2= 4.00"
0.8	14	0.3571	0.28		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.00"
18.8	100	Total			

Summary for Reach OCH1L: Lower Seg

Inflow Area = 20.600 ac, 48.90% Impervious, Inflow Depth > 0.88" for Q10 event
Inflow = 3.64 cfs @ 12.79 hrs, Volume= 1.509 af
Outflow = 3.64 cfs @ 12.80 hrs, Volume= 1.509 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.60 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 1.6 min

Peak Storage= 153 cf @ 12.80 hrs, Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 879.92 cfs

30.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 38.00'
Length= 67.0' Slope= 0.0442 '/'
Inlet Invert= 1,925.66', Outlet Invert= 1,922.70'

‡

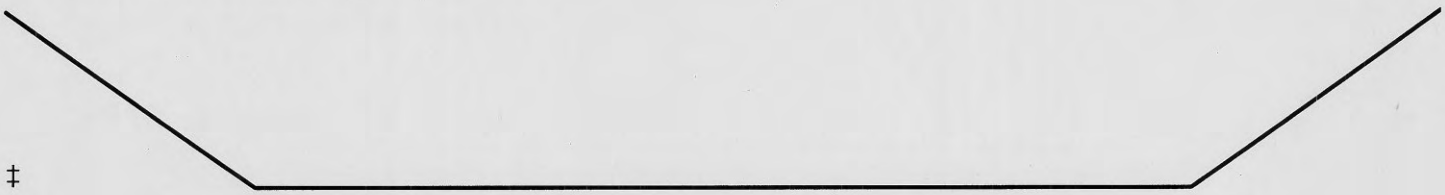
Summary for Reach OCH1U: Upper Segment

Inflow Area = 15.708 ac, 54.28% Impervious, Inflow Depth = 0.00" for Q10 event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 219.51 cfs

15.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 83.0' Slope= 0.0100 '/'
Inlet Invert= 1,926.50', Outlet Invert= 1,925.67'



‡

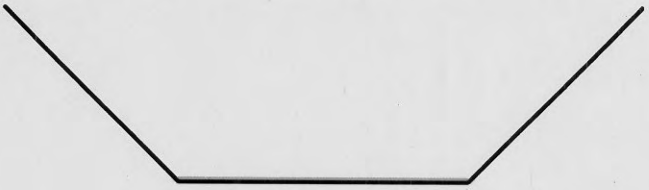
Summary for Reach STR3: Crystal Brook

Inflow Area = 21.656 ac, 47.31% Impervious, Inflow Depth > 1.00" for Q10 event
Inflow = 4.78 cfs @ 12.09 hrs, Volume= 1.807 af
Outflow = 4.05 cfs @ 12.87 hrs, Volume= 1.807 af, Atten= 15%, Lag= 46.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 14.4 min

Peak Storage= 2,021 cf @ 12.87 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 2,413.68 cfs

10.00' x 6.00' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 22.00'
Length= 1,444.0' Slope= 0.0843 '/'
Inlet Invert= 1,922.70', Outlet Invert= 1,801.00'



Summary for Pond CLVE1: HDPE Culvert

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 0.00' @ 0.00 hrs
Flood Elev= 1,946.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.00'	**60.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,939.00' S= 0.0222 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior
#2	Secondary	1,946.00'	**Weirover Flow, C= 2.62** Head (feet) 0.00 1.00 2.00 Width (feet) 2.00 30.00 60.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=1,935.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=1,935.00' (Dynamic Tailwater)
↑—**2=Weirover Flow** (Controls 0.00 cfs)

Summary for Pond DIV: Diversion Structure

Inflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 1,939.00' @ 1.85 hrs
Flood Elev= 1,946.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,935.00'	**24.0" x 300.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,910.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,940.00'	**East Side Weir to Culvert X 0.00, C= 2.62** Head (feet) 0.00 1.00 1.00 6.00 Width (feet) 6.00 6.00 7.00 7.00
#3	Secondary	1,939.00'	**0.50' W x 2.00' H Vert. Slotted Baseflow Weir** C= 0.600
#4	Secondary	1,939.00'	**In Channel Weir, C= 2.62** Head (feet) 0.00 2.00 2.00 7.00 Width (feet) 0.50 0.50 10.00 10.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,935.00' TW=1,925.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=East Side Weir to Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,935.00' TW=1,922.70' (Dynamic Tailwater)
├─**3=Slotted Baseflow Weir** (Controls 0.00 cfs)
└─**4=In Channel Weir** (Controls 0.00 cfs)

Summary for Pond DMH2: DMH2

Inflow Area =		4.891 ac, 31.62% Impervious, Inflow Depth > 3.70" for Q10 event			
Inflow	=	3.64 cfs @	12.79 hrs,	Volume=	1.509 af
Outflow	=	3.64 cfs @	12.79 hrs,	Volume=	1.509 af, Atten= 0%, Lag= 0.0 min
Primary	=	3.64 cfs @	12.79 hrs,	Volume=	1.509 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 1,931.51' @ 12.79 hrs
Flood Elev= 1,934.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,930.50'	**15.0" x 70.0' long Culvert** CMP, square edge headwall, Ke= 0.500 Outlet Invert= 1,926.00' S= 0.0643 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior

Primary OutFlow Max=3.63 cfs @ 12.79 hrs HW=1,931.51' TW=1,925.74' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.63 cfs @ 3.42 fps)

Summary for Pond SNOWPD: Snowmaking Pond

Pond Data as of 8/27/09 convo RJP/TL

Inflow Area =		15.708 ac, 54.28% Impervious, Inflow Depth = 4.64" for Q10 event			
Inflow	=	84.42 cfs @	11.98 hrs,	Volume=	6.079 af
Outflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af, Atten= 100%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 1,925.78' @ 25.10 hrs Surf.Area= 342,145 sf Storage= 264,822 cf
Flood Elev= 1,929.00' Surf.Area= 375,582 sf Storage= 1,419,054 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	1,925.00'	1,419,054 cf	**Stage Storage from EL 1925 up (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,925.00	334,087	0	0
1,926.00	344,375	339,231	339,231
1,927.00	354,721	349,548	688,779
1,928.00	365,123	359,922	1,048,701
1,929.00	375,582	370,353	1,419,054

Device	Routing	Invert	Outlet Devices
#1	Primary	1,927.00'	**Special & User-Defined** Head (feet) 0.00 0.50 1.00 1.50 2.00 Disch. (cfs) 0.000 13.600 38.000 68.800 104.400

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,925.00' TW=1,926.50' (Dynamic Tailwater)
└─**1=Special & User-Defined** (Controls 0.00 cfs)

Summary for Link 1L: FROM DMH1

Inflow Area = 4.891 ac, 31.62% Impervious, Inflow Depth > 3.70" for Q10 event
Inflow = 3.64 cfs @ 12.79 hrs, Volume= 1.509 af
Primary = 3.64 cfs @ 12.79 hrs, Volume= 1.509 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Q10 Primary Outflow Imported from PR North Parking TIER A-B 1of2~Pond DMH1.hce

Summary for Link 2L: FROM STR2

Inflow Area = 1.057 ac, 16.30% Impervious, Inflow Depth = 3.38" for Q10 event
Inflow = 4.65 cfs @ 12.09 hrs, Volume= 0.298 af
Primary = 4.65 cfs @ 12.09 hrs, Volume= 0.298 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Q10 Outflow Imported from PR North Parking TIER A-B 1of2~Reach STR2.hce

Summary for Link DP-291: Design Pt 291

Inflow Area = 36.349 ac, 28.18% Impervious, Inflow Depth > 1.77" for Q10 event
Inflow = 30.18 cfs @ 12.42 hrs, Volume= 5.356 af
Primary = 30.18 cfs @ 12.42 hrs, Volume= 5.356 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link N/A1: PLOT CORNER MARKER

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link N/A2: PLOT CORNER MARKER

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs