Appendix F

Preliminary Stormwater Requirements and Peer Review

Preliminary Stormwater Management Requirements for Old Town Village at South Kellogg Ave & Ekwill Street

Goleta, CA

April 2, 2014

CLIENT: City Ventures Homebuilding, LLC

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WORK ORDER NO.: 21053.01

PROJECT MANAGER: David Rundle, P.E.
PROJECT ENGINEER: Adam Forouzandeh, P.E.

PURPOSE OF REPORT

The purpose of this report is to outline the stormwater management requirements for the development of the property located between S. Kellogg Avenue and Ekwill Street.

BACKGROUND

Penfield & Smith has been requested to analyze the stormwater management requirements for a property that is to be developed into a residential neighborhood. The project site is located within the City of Goleta, California, between S. Kellogg Avenue and the future site of Ekwill Street (see Figure 1). The site Assessor Parcel number is 071-130-023. The total developable area (not including property dedicated to Ekwill Street) is 9.84 Acres (see Exhibit 1).

Figure 1- Project Location

STORMWATER MANAGEMENT REQUIREMENTS

The requirements for this site will be based on the Regional Water Quality Control Board (RWQCB) Stormwater Management Requirements for the Central Coast Region (Resolution No. R3-2013-0032, July 12, 2013). The size and location of the project dictate that the development must follow the Performance Requirements #1-4 as needed for Watershed Management Zone 1. Requirements include stormwater control measures for runoff reduction, water quality treatment, runoff retention, and peak flow reduction.

Performance Requirement No. 1 - Runoff Reduction

The project should implement the following design strategies:

- Limit disturbance of creeks and natural drainage features
- Conserve natural areas and existing trees
- Setback construction from creeks, wetlands and riparian zones
- Identify areas which are to be left undisturbed
- Conform to site landforms and avoid excessive grading
- Limit compaction of highly permeable soils
- Limit clearing of natural vegetation to areas of construction
- Concentrate improvements on the least-sensitive portions of the site

In addition to design strategies, *one or more* of the following must be implemented in the design:

- Collection of roof runoff into cisterns or rain barrels for reuse (harvesting)
- Direct runoff from roofs, pathways, roadways, patios, or other impervious surfaces on to vegetated areas safely away from building foundations
- Construct pathways, roadways, or uncovered parking, patios, or other appropriate impervious surfaces with permeable surfaces.

Since the project site is currently used for agriculture and already has some paved areas there is little natural area to conserve.

Performance Requirement No. 2 - Water Quality Treatment

Runoff from new or replaced impervious surfaces should be treated to improve water quality. The water quality treatment methods must be capable of treating the volume of runoff produced by an 85th percentile storm event, or capable of treating the flow of runoff from a rain event with an intensity equal to two times the hourly intensity of an 85th percentile storm event (with a minimum intensity of 0.2 in/hr). The 85th percentile storm event in the project area is equal to a rainfall depth of 1.38 inches in 24 hours.

There are several options for water quality treatment methods. Multiple methods can be used as long as calculations and a report are provided which can support that the requirements for treatment volumes and/or flows have been met. The following methods are suggested by the RWQCB in order of preference:

- Low Impact Development (LID) Treatment Systems including harvesting, infiltration, and/or evapotranspiration stormwater control measures
- Biofiltration treatment systems
- Non-retention based treatment systems.

Under all conditions, one hundred percent of the water quality treatment requirement must be satisfied on site.

Performance Requirement No. 3 - Runoff Retention

The runoff from a 95th percentile storm event must be retained onsite. Infiltration of the retained volume should be optimized, but waters which cannot be infiltrated may be retained via storage, rainwater harvesting, and/or evapotranspiration. Any runoff from impervious areas which is directed to natural, undisturbed areas and does not produce runoff to a storm drain or waterbody does not need to be retained.

If full retention is technically infeasible, there is a potential adjustment available. In this case, at least ten percent of the Equivalent Impervious Surface Area must be dedicated to the retention based stormwater control measures. If the ten percent adjustment is not possible, offsite mitigation is required.

Performance Requirement No. 4 - Peak Management

The project must demonstrate that the post-project peak flows do not exceed the peak flow value for the pre-project conditions or the 2-10 year storm events. However, the City of Goleta will require the reduction of peak flows up to the 100-year storm events as a flood control measure. If this requirement cannot be met onsite, offsite compliance options may be available.

METHOD OF ANALYSIS

The required volumes for treatment, retention, and detention were determined for this site under different residential densities. HydroCAD v10.00, a hydrologic modeling program, was used to model the pre-project and post-project conditions and to determine the necessary size of stormwater control measures. The Santa Barbara Unit Hydrograph routing method was used with the standard 2-year through 100-year storm event rainfall depths for the Central Coast region. The rainfall values for an 85th and 95th percentile storm event were determined based on the RWQCB rainfall depth maps for the central coast. The rainfall depths are 1.38 in. for an 85th percentile storm event and 2.23 in. for a 95th percentile storm event.

The total project site, less the Ekwill right of way, has an area of 9.84 Acres (428,544 SF). The pre-project condition was assumed to be straight-row cultivation with minimal crop residue. Soils for the project site are Hydrologic Soil Group B with a saturated hydrologic conductivity of 0.6-2.0 in/hr (for modeling purposes, 1.25 in/hr was used). Post-project conditions were modeled under a range of residential densities. Table 1 presents the developed site conditions.

Table 1 – Development Conditions

Development Type	Lot Size, AC	Percent Impervious, %	Total Impervious Area, SF	Total Impervious Area, Ac
Condominiums	9.84	77	329,801	7.57

HydroCAD was used to determine the volume of stormwater runoff, volume of treatment, retention, and detention on site. Water quality treatment and retention requirements are based on the volumes of runoff from the entire site which are produced by an 85th and 95th percentile storm, respectively. Detention volumes were found by modeling a detention pond collecting runoff from the net project site. The outlets of the detention pond were modeled as a three

stage outfall structure to control the peak flow from the basin. The required detention volume is the capacity needed to contain the runoff volume from a 100-year storm event less the flow out of the three-stage outfall structure.

FINDINGS

The required treatment volumes as satisfied by infiltration are presented in Table 2. Alternatively, using bioretention, the treatment surface area requirements are shown in Table 3. These two treatment methods are preferred. Treatment methods may be interchanged or mixed to accommodate the entire requirement. The required retention volume is presented in Table 4, and the required detention volume is presented in Table 5. Retention volume concurrently satisfies the stormwater treatment, therefore if the entire retention requirement can be satisfied, it concurrently satisfies the entire treatment requirement (which is a lesser volume) shown in Table 2.

Table 2 – Required Water Quality Treatment Volumes

Property Type	Lot AC	Volume, AF	Volume, FT^3	Volume, GAL
Condominiums	9.84	0.444	19,341	144,668

Table 3 – Required Water Quality Treatment Volumes

Property Type	Lot AC	Percent Impervious, %	Total Impervious Area, SF	Bioretention Surface Area, SF
Condominiums	9.84	77	330,045	7,990

Table 4 – Required Retention Volumes

Property Type	Lot AC	Volume, AF	Volume, FT^3	Volume, GAL
Condominiums	9.84	1.002	43,647	326,480

Table 5 – Required Detention Volumes

Property Type	Lot AC	Volume, AF	Volume, FT^3	Volume, GAL
Condominiums	9.84	0.962	41,905	313,447

CONCLUSIONS

The required volumes for stormwater treatment, retention, and detention have been determined for the development of the property at S. Kellogg Avenue and Ekwill Street. These volumes for stormwater control measures have been taken into consideration during site design for this property.

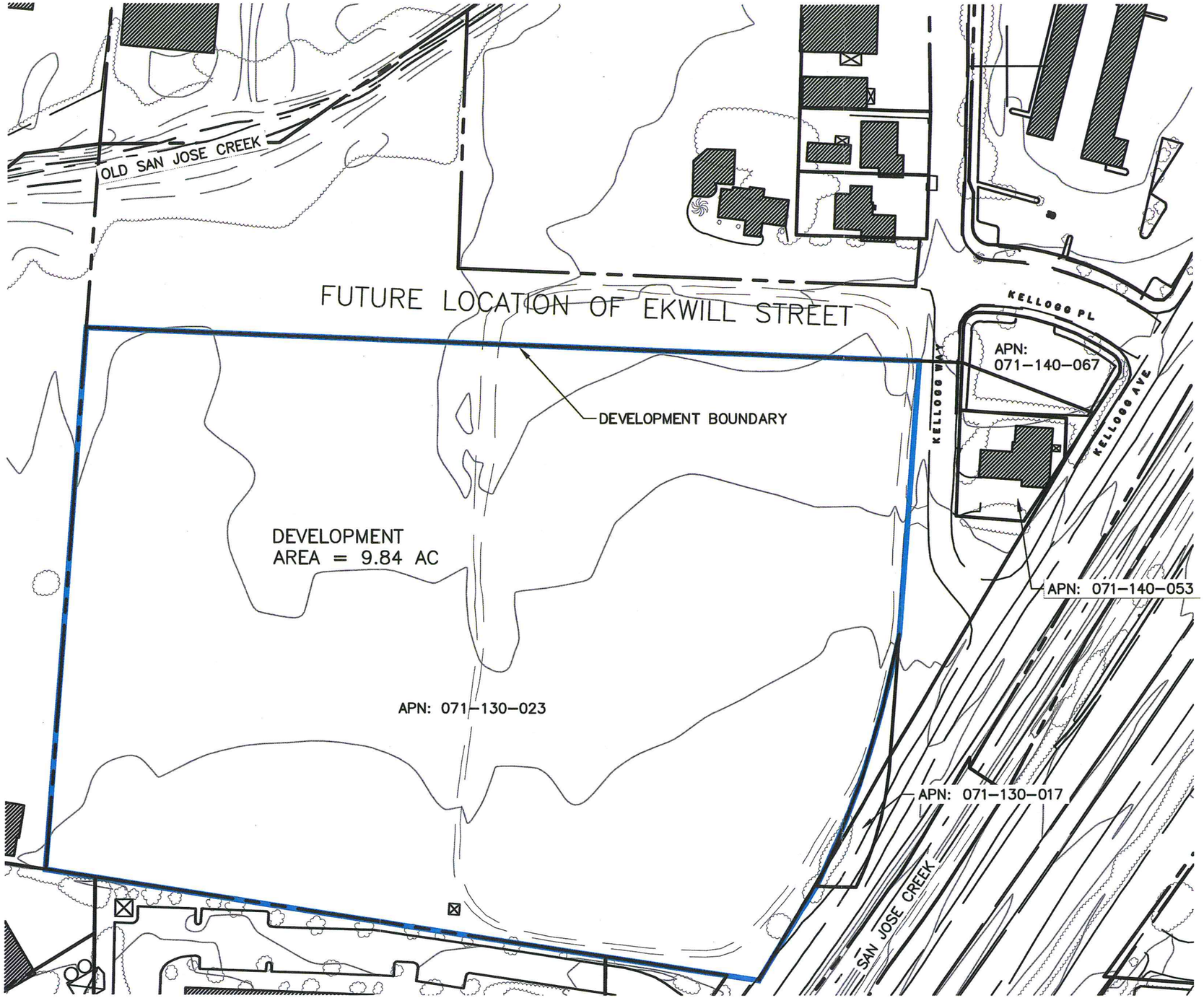
The developers have also included the following design strategies to help reduce site runoff from impervious areas.

- Using pervious paving and landscape areas.
- Increasing time of concentration by discharging roof drainage to vegetated surfaces.
- Concurrently meeting treatment and retention requirements.
- Providing open space that will used for bioretention and establishing a storm drain network that can receive underdrains from these features.
- Draining as much paved traffic surface as possible to bioretention, bioswales and landscaped areas

CALCULATIONS AND ATTACHMENTS

EXISTING SITE CONDITIONS

OLD TOWN VILLAGE
AT S. KELLOGG AVE & EKWILL ST
GOLETA, CA



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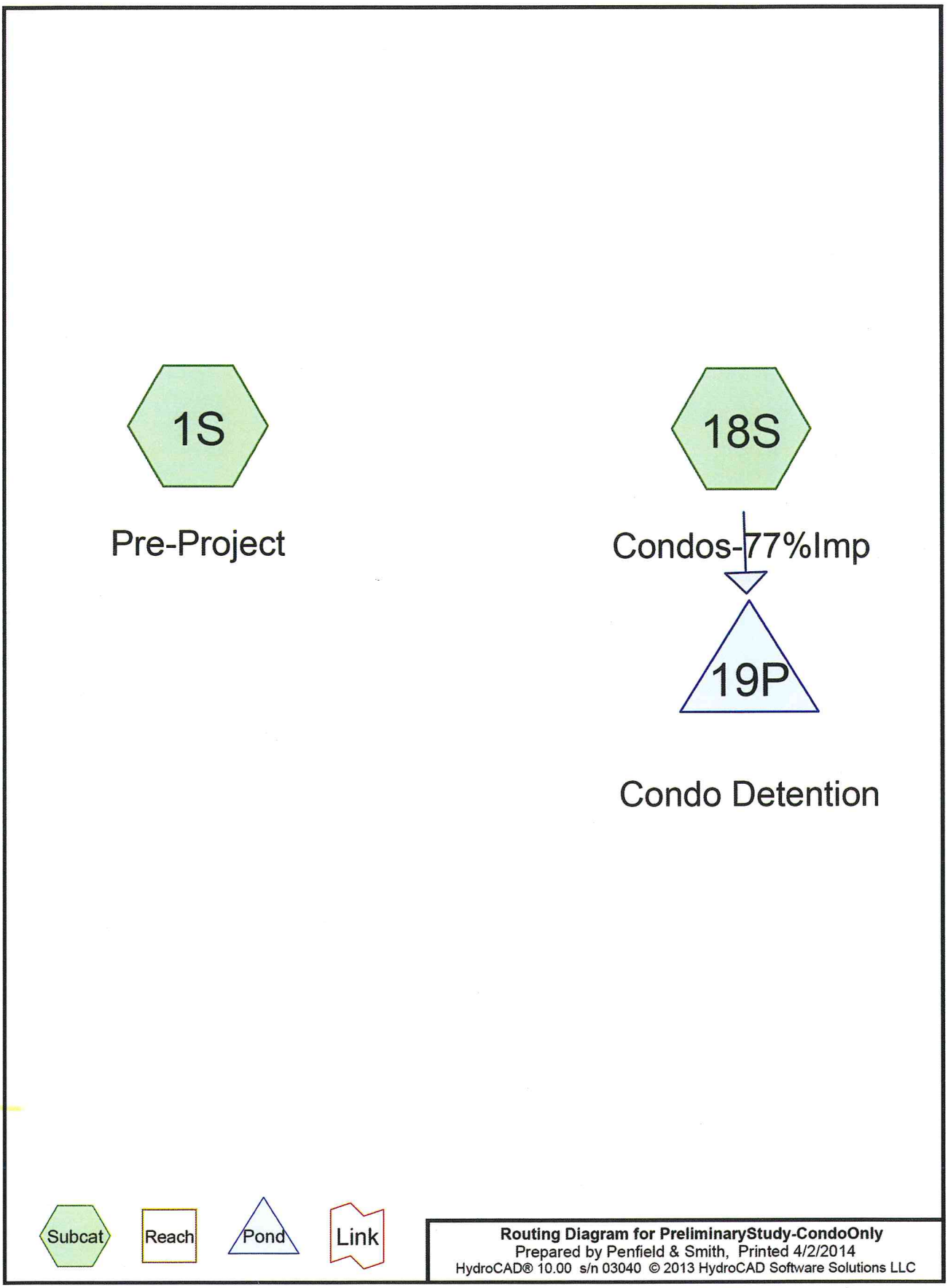
21053.01 SCALE 1"=100'

EXHIBIT 1



Routing Diagram for PreliminaryStudy-CondoOnly
Prepared by Penfield & Smith, Printed 4/2/2014

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.840	78	Row crops, straight row, Good, HSG B (1S)
9.840	89	Ventura (18S)
19.680	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
9.840	HSG B	1S
0.000	HSG C	
0.000	HSG D	
9.840	Other	18S
19.680		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=0.18"
Flow Length=535' Tc=24.9 min CN=78/0 Runoff=0.20 cfs 0.150 af

Subcatchment 18S: Condos-77%Imp Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=0.54"
Tc=12.0 min CN=89/0 Runoff=2.49 cfs 0.444 af

Pond 19P: Condo Detention Peak Elev=100.60' Storage=0.047 af Inflow=2.49 cfs 0.444 af
Outflow=1.38 cfs 0.444 af

Total Runoff Area = 19.680 ac Runoff Volume = 0.594 af Average Runoff Depth = 0.36"
100.00% Pervious = 19.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Project

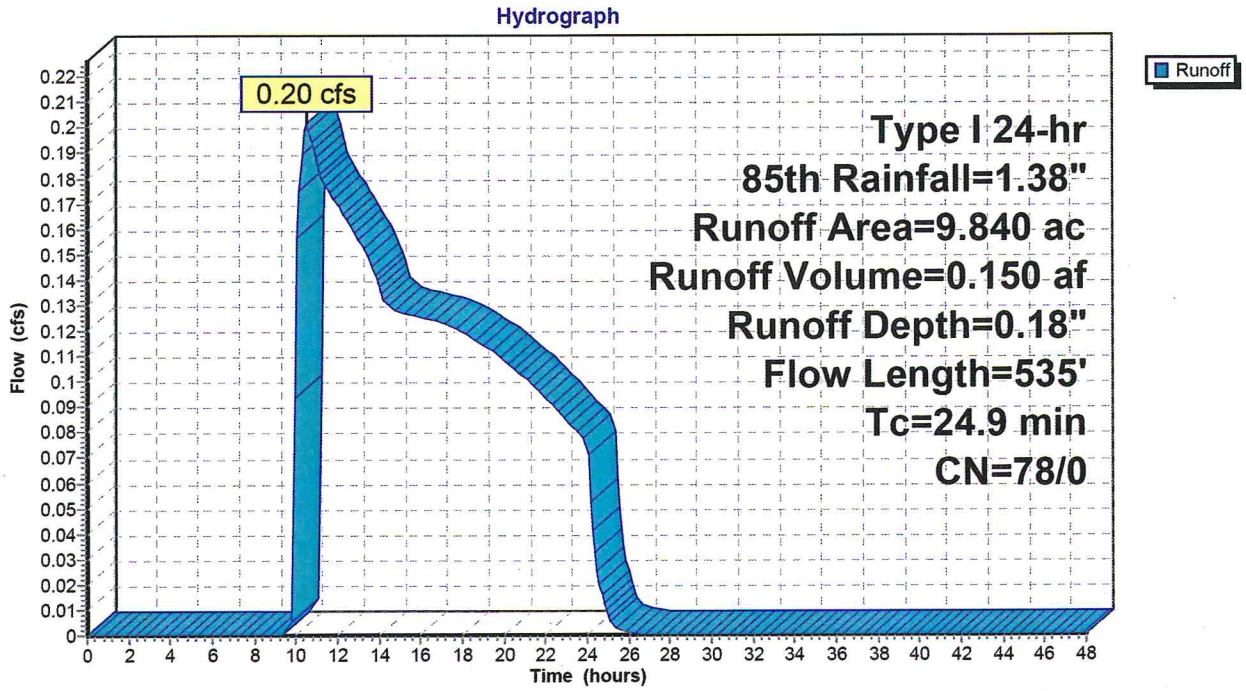
Runoff = 0.20 cfs @ 10.52 hrs, Volume= 0.150 af, Depth= 0.18"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr 85th Rainfall=1.38"

Area (ac)	CN	Description
9.840	78	Row crops, straight row, Good, HSG B
9.840	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	300	0.0050	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.20"
5.2	235	0.0070	0.75		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.9	535	Total			

Subcatchment 1S: Pre-Project



Summary for Subcatchment 18S: Condos-77%Imp

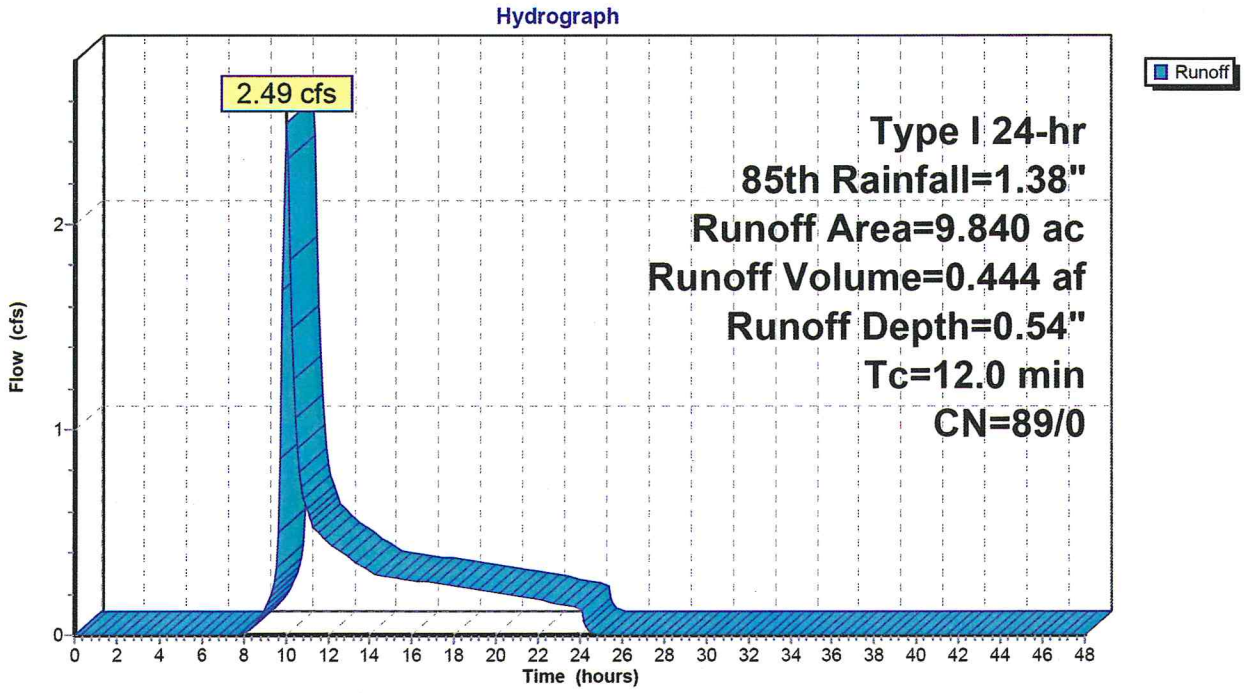
Runoff = 2.49 cfs @ 10.04 hrs, Volume= 0.444 af, Depth= 0.54"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr 85th Rainfall=1.38"

	Area (ac)	CN	Description
*	9.840	89	Ventura
	9.840	89	100.00% Pervious Area

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

Subcatchment 18S: Condos-77%Imp



Summary for Pond 19P: Condo Detention

Inflow Area = 9.840 ac, 0.00% Impervious, Inflow Depth = 0.54" for 85th event
Inflow = 2.49 cfs @ 10.04 hrs, Volume= 0.444 af
Outflow = 1.38 cfs @ 10.35 hrs, Volume= 0.444 af, Atten= 45%, Lag= 18.8 min
Primary = 1.38 cfs @ 10.35 hrs, Volume= 0.444 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 100.60' @ 10.35 hrs Surf.Area= 0.181 ac Storage= 0.047 af

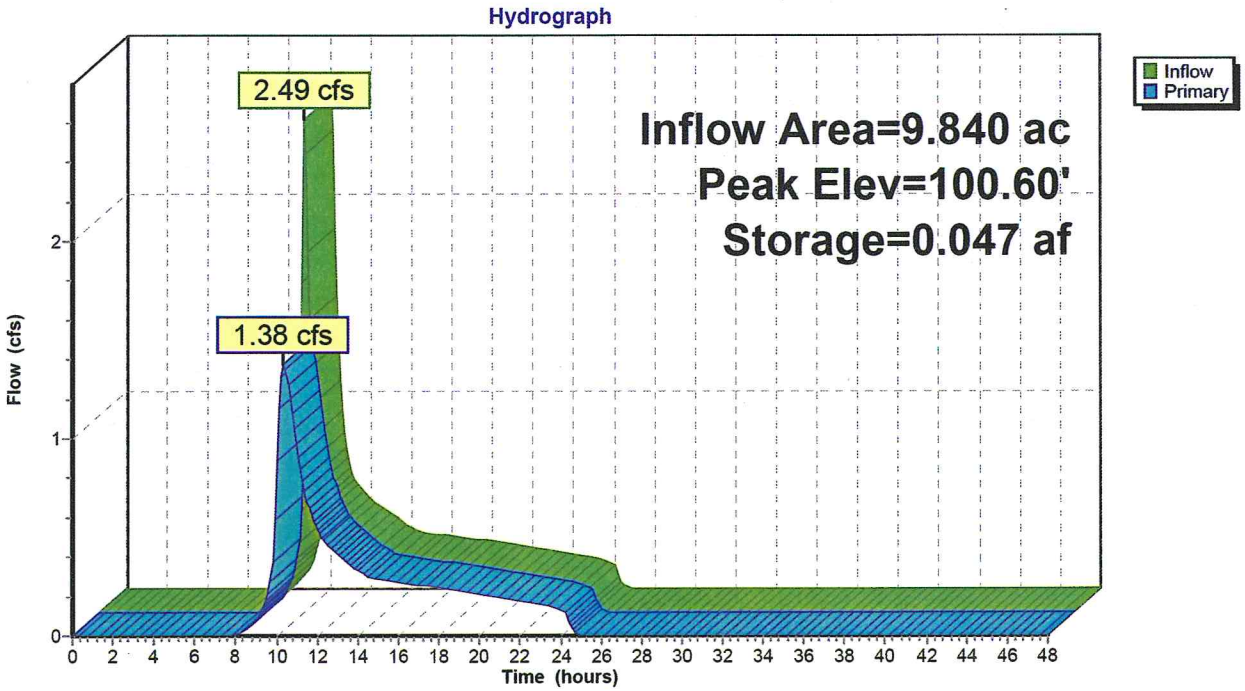
Plug-Flow detention time= 17.3 min calculated for 0.443 af (100% of inflow)
Center-of-Mass det. time= 17.3 min (865.3 - 848.0)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.039 af	**48.0" Round Pipe Storage** x 36 L= 100.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 99.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	100.00'	**13.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	101.70'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	103.00'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.37 cfs @ 10.35 hrs HW=100.60' (Free Discharge)
└**1=Culvert** (Passes 1.37 cfs of 2.07 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.37 cfs @ 2.63 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 19P: Condo Detention



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=535' Tc=24.9 min CN=78/0 Runoff=1.62 cfs 0.507 af

Subcatchment 18S: Condos-77%Imp Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=1.22"
Tc=12.0 min CN=89/0 Runoff=6.22 cfs 1.002 af

Pond 19P: Condo Detention Peak Elev=101.01' Storage=0.138 af Inflow=6.22 cfs 1.002 af
Outflow=3.05 cfs 1.002 af

Total Runoff Area = 19.680 ac Runoff Volume = 1.509 af Average Runoff Depth = 0.92"
100.00% Pervious = 19.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Project

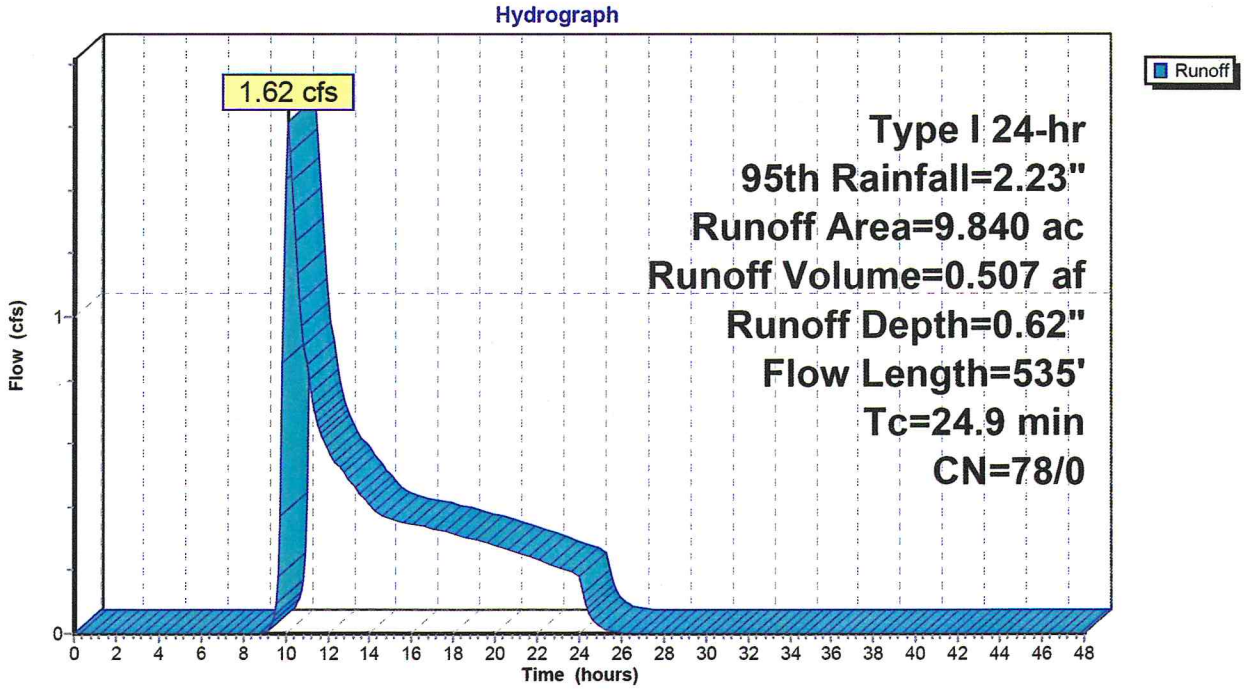
Runoff = 1.62 cfs @ 10.12 hrs, Volume= 0.507 af, Depth= 0.62"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr 95th Rainfall=2.23"

Area (ac)	CN	Description
9.840	78	Row crops, straight row, Good, HSG B
9.840	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	300	0.0050	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.20"
5.2	235	0.0070	0.75		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.9	535	Total			

Subcatchment 1S: Pre-Project



Summary for Subcatchment 18S: Condos-77%Imp

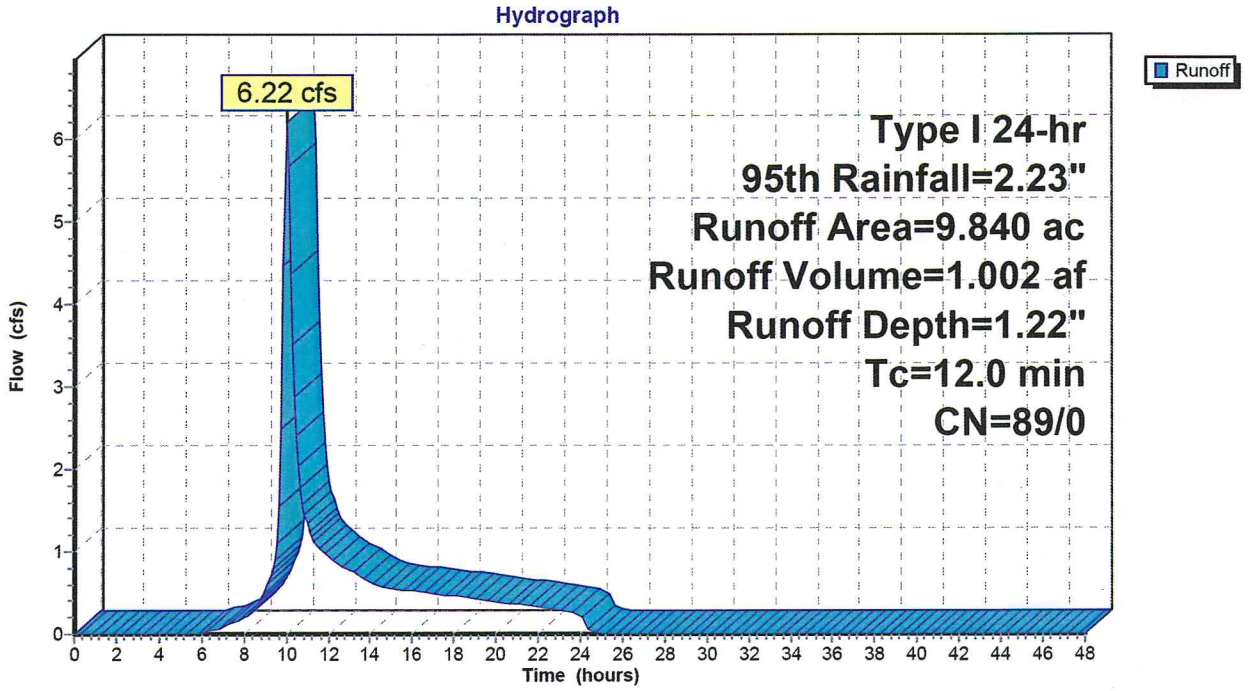
Runoff = 6.22 cfs @ 10.03 hrs, Volume= 1.002 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr 95th Rainfall=2.23"

	Area (ac)	CN	Description
*	9.840	89	Ventura
	9.840	89	100.00% Pervious Area

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

Subcatchment 18S: Condos-77%Imp



Summary for Pond 19P: Condo Detention

Inflow Area = 9.840 ac, 0.00% Impervious, Inflow Depth = 1.22" for 95th event
Inflow = 6.22 cfs @ 10.03 hrs, Volume= 1.002 af
Outflow = 3.05 cfs @ 10.38 hrs, Volume= 1.002 af, Atten= 51%, Lag= 21.1 min
Primary = 3.05 cfs @ 10.38 hrs, Volume= 1.002 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 101.01' @ 10.38 hrs Surf.Area= 0.257 ac Storage= 0.138 af

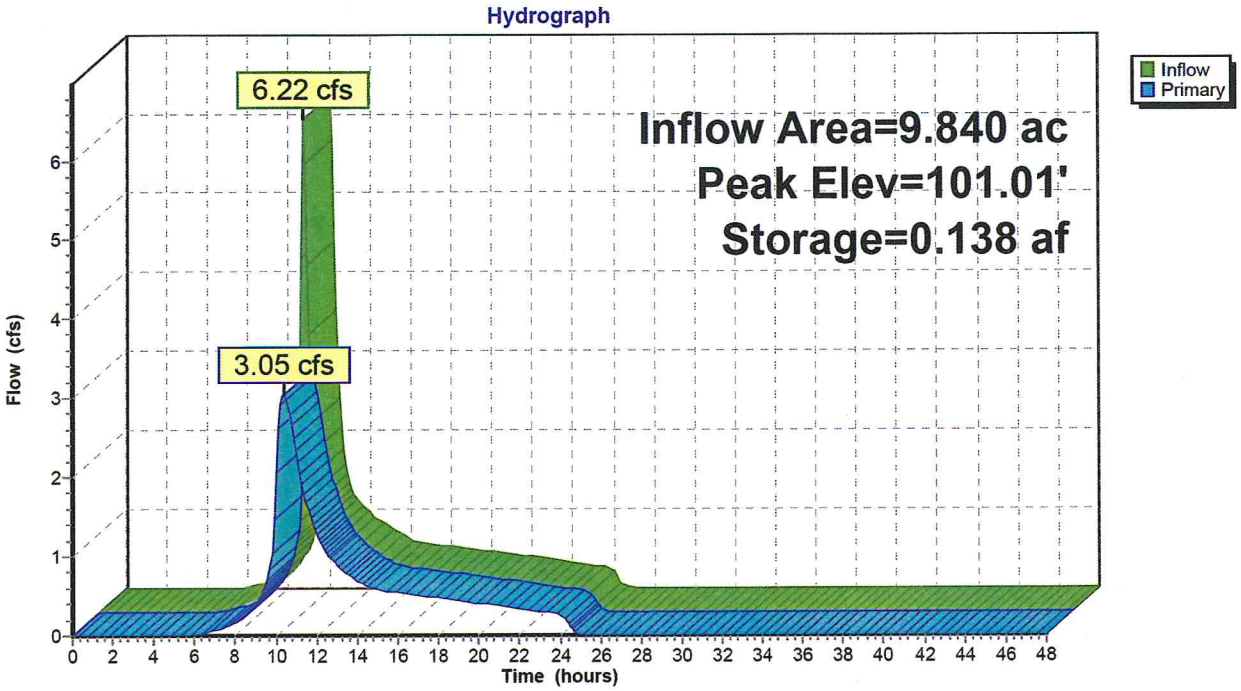
Plug-Flow detention time= 22.5 min calculated for 0.999 af (100% of inflow)
Center-of-Mass det. time= 22.5 min (832.7 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.039 af	**48.0" Round Pipe Storage** x 36 L= 100.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 99.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	100.00'	**13.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	101.70'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	103.00'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.04 cfs @ 10.38 hrs HW=101.00' (Free Discharge)
└**1=Culvert** (Passes 3.04 cfs of 5.39 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 3.04 cfs @ 3.41 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 19P: Condo Detention



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=1.27"
Flow Length=535' Tc=24.9 min CN=78/0 Runoff=4.10 cfs 1.044 af

Subcatchment 18S: Condos-77%Imp Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=2.08"
Tc=12.0 min CN=89/0 Runoff=10.92 cfs 1.707 af

Pond 19P: Condo Detention Peak Elev=101.52' Storage=0.286 af Inflow=10.92 cfs 1.707 af
Outflow=4.40 cfs 1.707 af

Total Runoff Area = 19.680 ac Runoff Volume = 2.751 af Average Runoff Depth = 1.68"
100.00% Pervious = 19.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Project

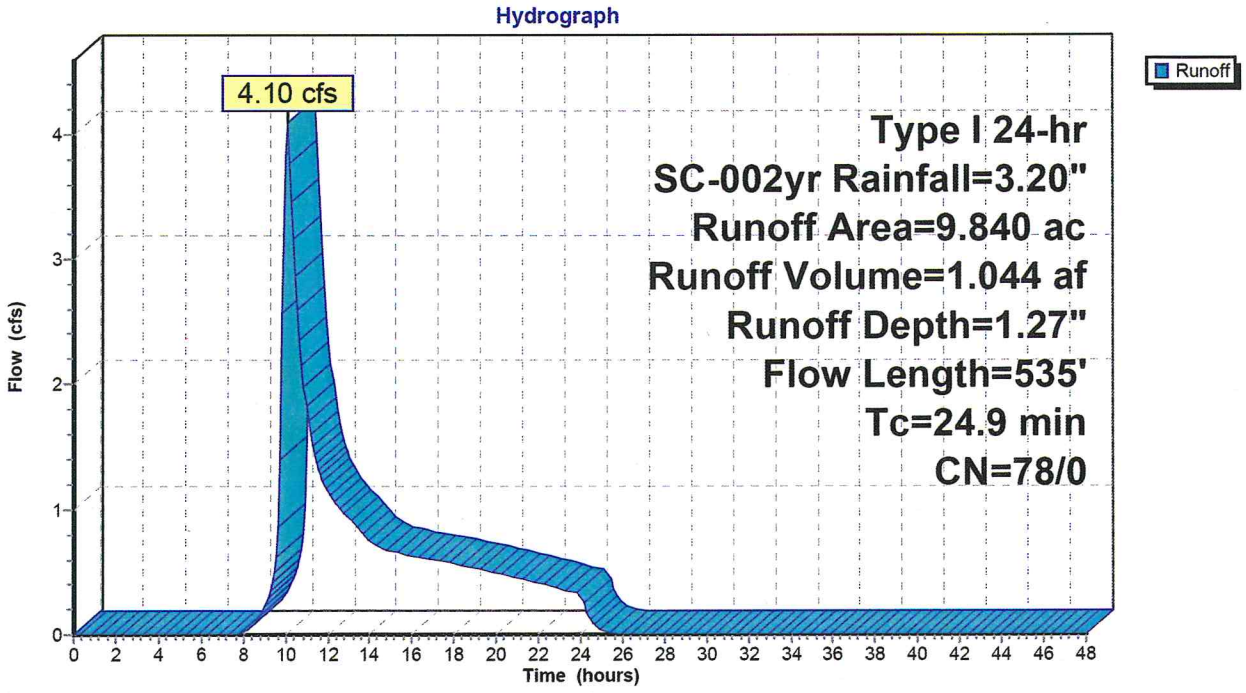
Runoff = 4.10 cfs @ 10.09 hrs, Volume= 1.044 af, Depth= 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (ac)	CN	Description
9.840	78	Row crops, straight row, Good, HSG B
9.840	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	300	0.0050	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.20"
5.2	235	0.0070	0.75		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.9	535	Total			

Subcatchment 1S: Pre-Project



Summary for Subcatchment 18S: Condos-77%Imp

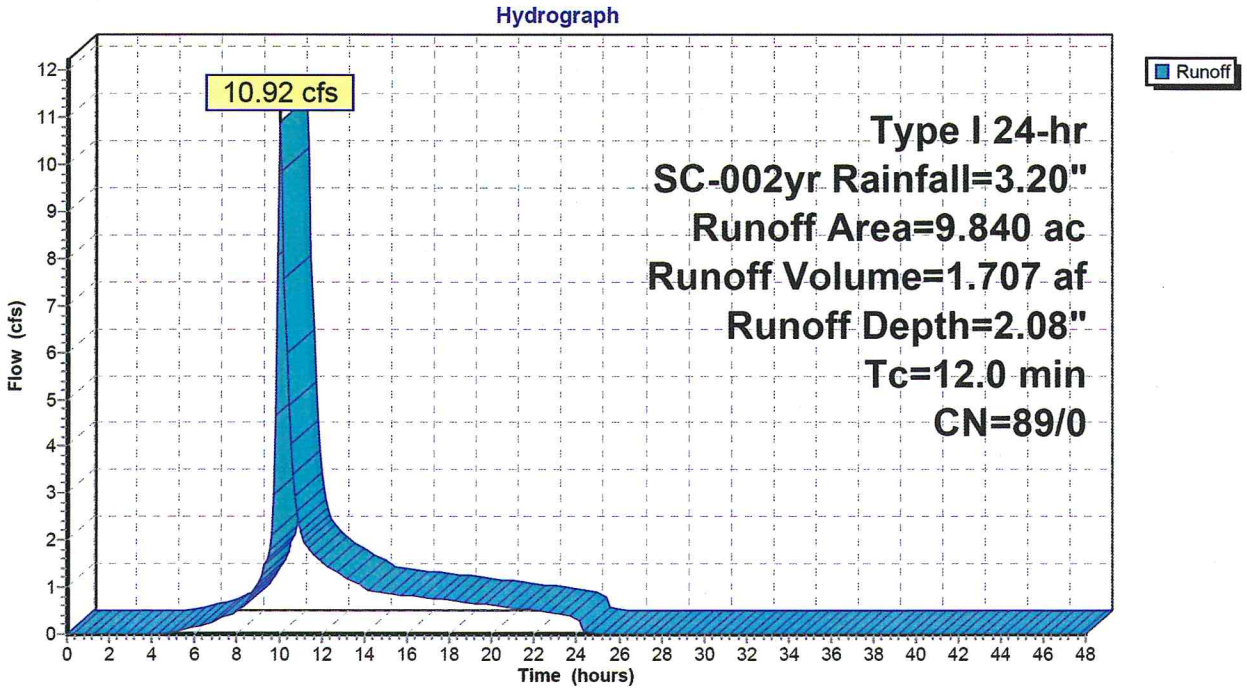
Runoff = 10.92 cfs @ 10.02 hrs, Volume= 1.707 af, Depth= 2.08"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

	Area (ac)	CN	Description
*	9.840	89	Ventura
	9.840	89	100.00% Pervious Area

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

Subcatchment 18S: Condos-77%Imp



Summary for Pond 19P: Condo Detention

Inflow Area = 9.840 ac, 0.00% Impervious, Inflow Depth = 2.08" for SC-002yr event
Inflow = 10.92 cfs @ 10.02 hrs, Volume= 1.707 af
Outflow = 4.40 cfs @ 10.46 hrs, Volume= 1.707 af, Atten= 60%, Lag= 26.2 min
Primary = 4.40 cfs @ 10.46 hrs, Volume= 1.707 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 101.52' @ 10.46 hrs Surf.Area= 0.307 ac Storage= 0.286 af

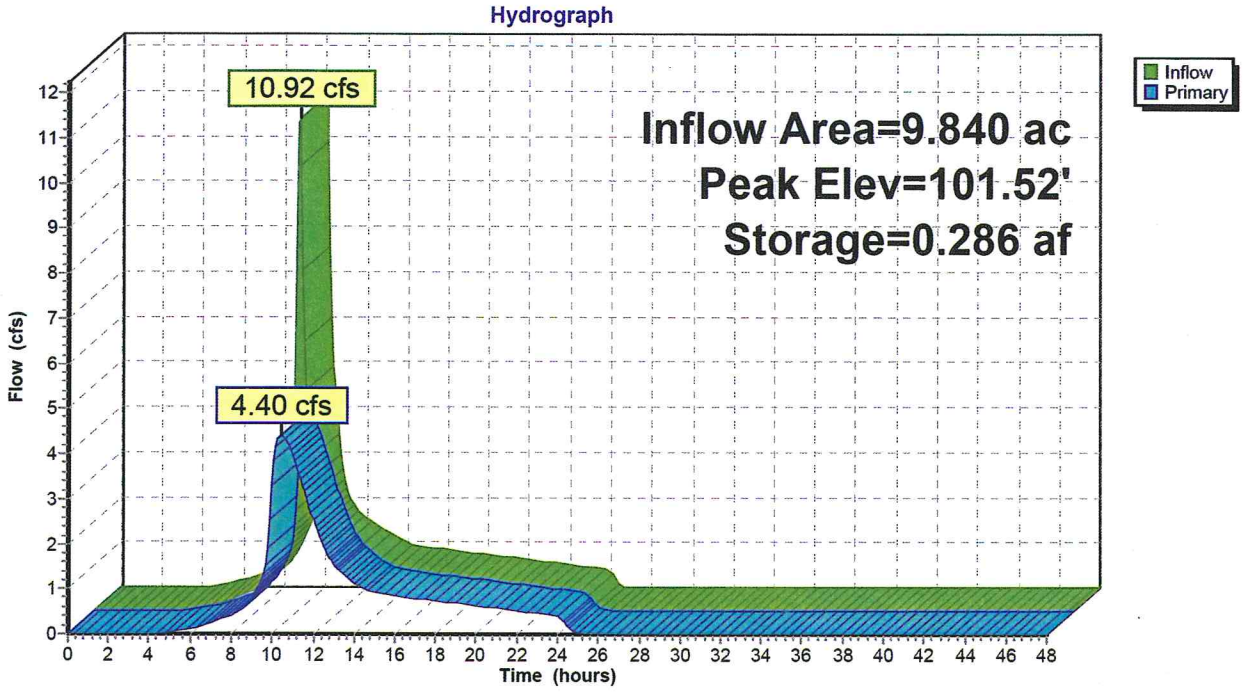
Plug-Flow detention time= 28.6 min calculated for 1.707 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (815.6 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.039 af	**48.0" Round Pipe Storage** x 36 L= 100.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 99.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	100.00'	**13.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	101.70'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	103.00'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=4.40 cfs @ 10.46 hrs HW=101.52' (Free Discharge)
└**1=Culvert** (Passes 4.40 cfs of 10.78 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 4.40 cfs @ 4.77 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 19P: Condo Detention



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Pre-Project Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=535' Tc=24.9 min CN=78/0 Runoff=8.42 cfs 1.955 af

Subcatchment18S: Condos-77%Imp Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=3.40"
Tc=12.0 min CN=89/0 Runoff=17.98 cfs 2.788 af

Pond 19P: Condo Detention Peak Elev=102.17' Storage=0.492 af Inflow=17.98 cfs 2.788 af
Outflow=8.22 cfs 2.788 af

Total Runoff Area = 19.680 ac Runoff Volume = 4.743 af Average Runoff Depth = 2.89"
100.00% Pervious = 19.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Project

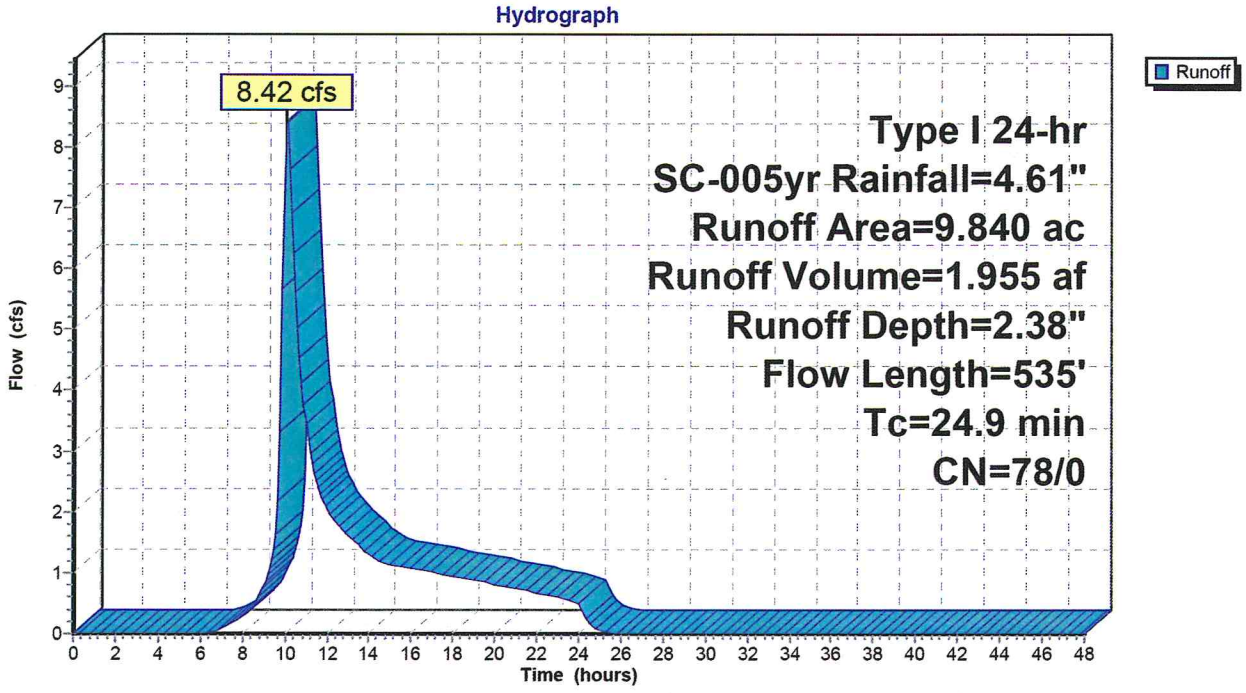
Runoff = 8.42 cfs @ 10.08 hrs, Volume= 1.955 af, Depth= 2.38"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (ac)	CN	Description
9.840	78	Row crops, straight row, Good, HSG B
9.840	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	300	0.0050	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.20"
5.2	235	0.0070	0.75		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.9	535	Total			

Subcatchment 1S: Pre-Project



Summary for Subcatchment 18S: Condos-77%Imp

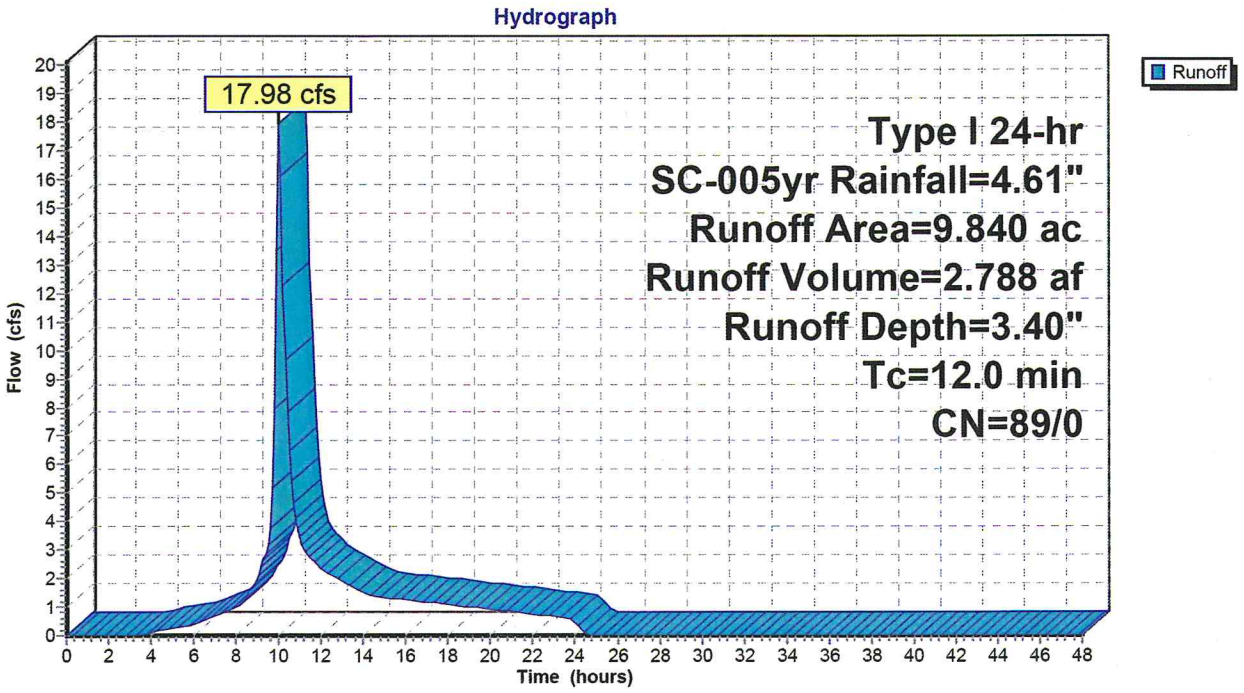
Runoff = 17.98 cfs @ 10.02 hrs, Volume= 2.788 af, Depth= 3.40"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

	Area (ac)	CN	Description
*	9.840	89	Ventura
	9.840	89	100.00% Pervious Area

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

Subcatchment 18S: Condos-77%Imp



Summary for Pond 19P: Condo Detention

Inflow Area = 9.840 ac, 0.00% Impervious, Inflow Depth = 3.40" for SC-005yr event
Inflow = 17.98 cfs @ 10.02 hrs, Volume= 2.788 af
Outflow = 8.22 cfs @ 10.39 hrs, Volume= 2.788 af, Atten= 54%, Lag= 22.1 min
Primary = 8.22 cfs @ 10.39 hrs, Volume= 2.788 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 102.17' @ 10.39 hrs Surf.Area= 0.329 ac Storage= 0.492 af

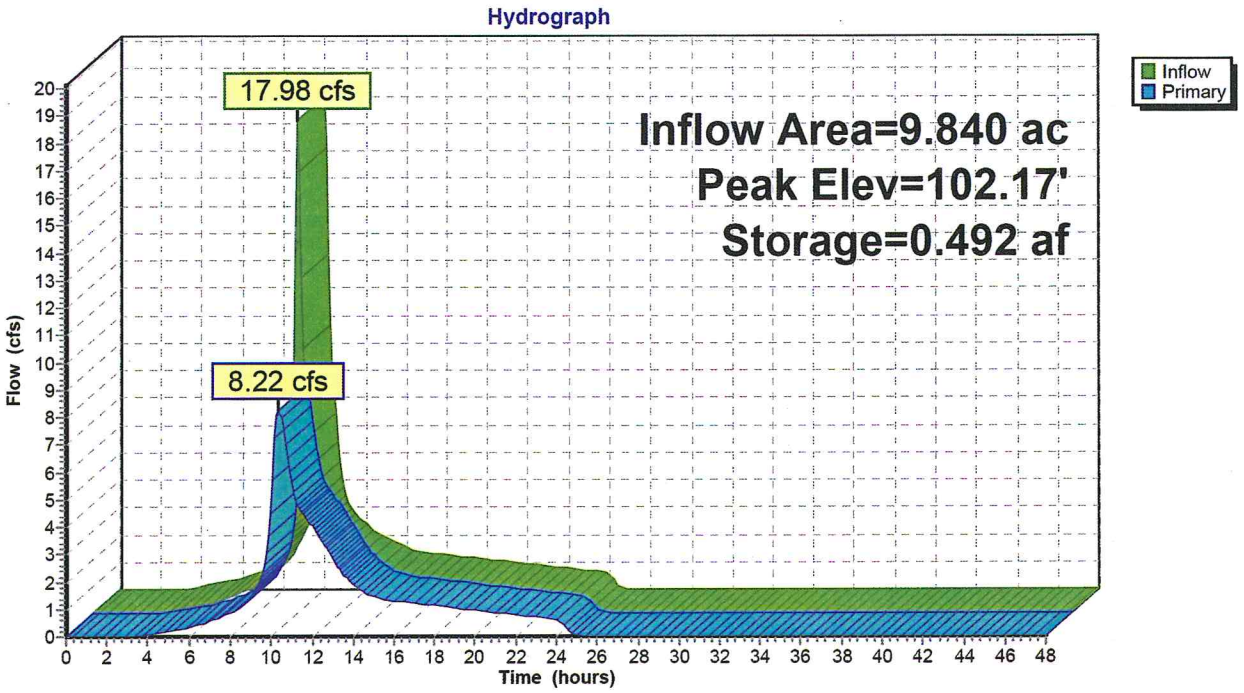
Plug-Flow detention time= 33.6 min calculated for 2.782 af (100% of inflow)
Center-of-Mass det. time= 33.6 min (800.3 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.039 af	**48.0" Round Pipe Storage** x 36 L= 100.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 99.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	100.00'	**13.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	101.70'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	103.00'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=8.21 cfs @ 10.39 hrs HW=102.17' (Free Discharge)
└**1=Culvert** (Passes 8.21 cfs of 16.33 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 5.66 cfs @ 6.14 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.55 cfs @ 2.19 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 19P: Condo Detention



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=535' Tc=24.9 min CN=78/0 Runoff=11.56 cfs 2.611 af

Subcatchment 18S: Condos-77%Imp Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=4.30"
Tc=12.0 min CN=89/0 Runoff=22.70 cfs 3.526 af

Pond 19P: Condo Detention Peak Elev=102.53' Storage=0.613 af Inflow=22.70 cfs 3.526 af
Outflow=10.83 cfs 3.526 af

Total Runoff Area = 19.680 ac Runoff Volume = 6.138 af Average Runoff Depth = 3.74"
100.00% Pervious = 19.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Project

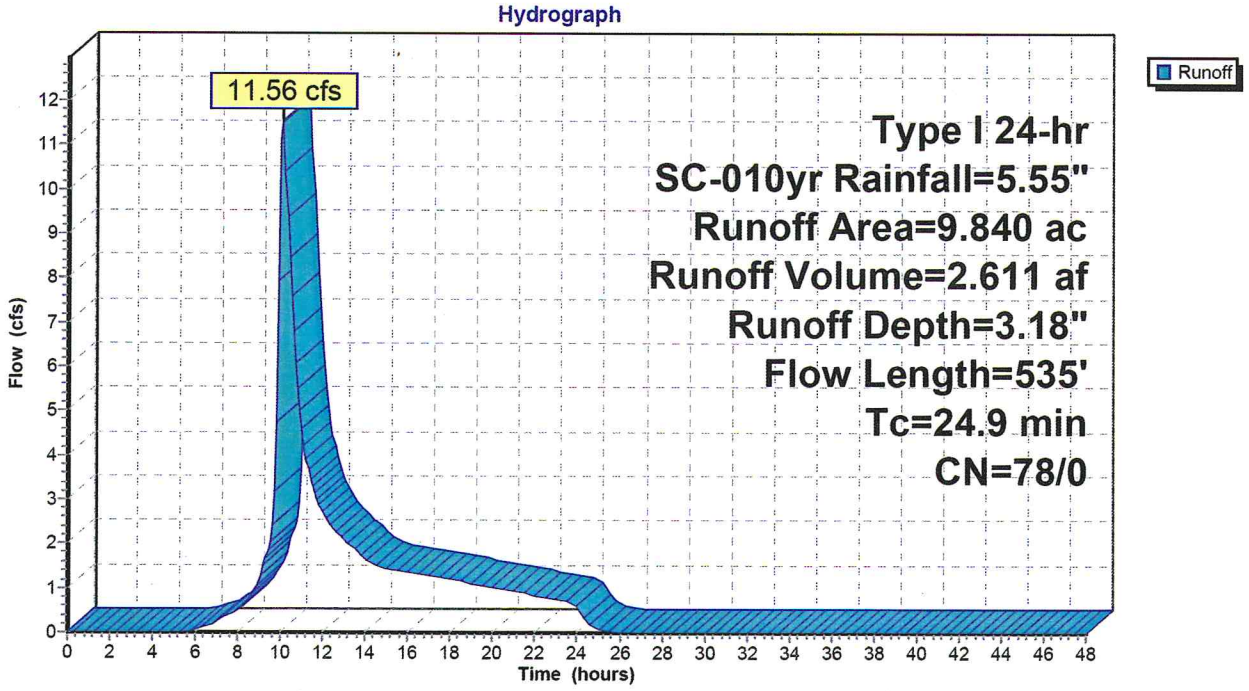
Runoff = 11.56 cfs @ 10.08 hrs, Volume= 2.611 af, Depth= 3.18"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (ac)	CN	Description
9.840	78	Row crops, straight row, Good, HSG B
9.840	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	300	0.0050	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.20"
5.2	235	0.0070	0.75		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.9	535	Total			

Subcatchment 1S: Pre-Project



Summary for Subcatchment 18S: Condos-77%Imp

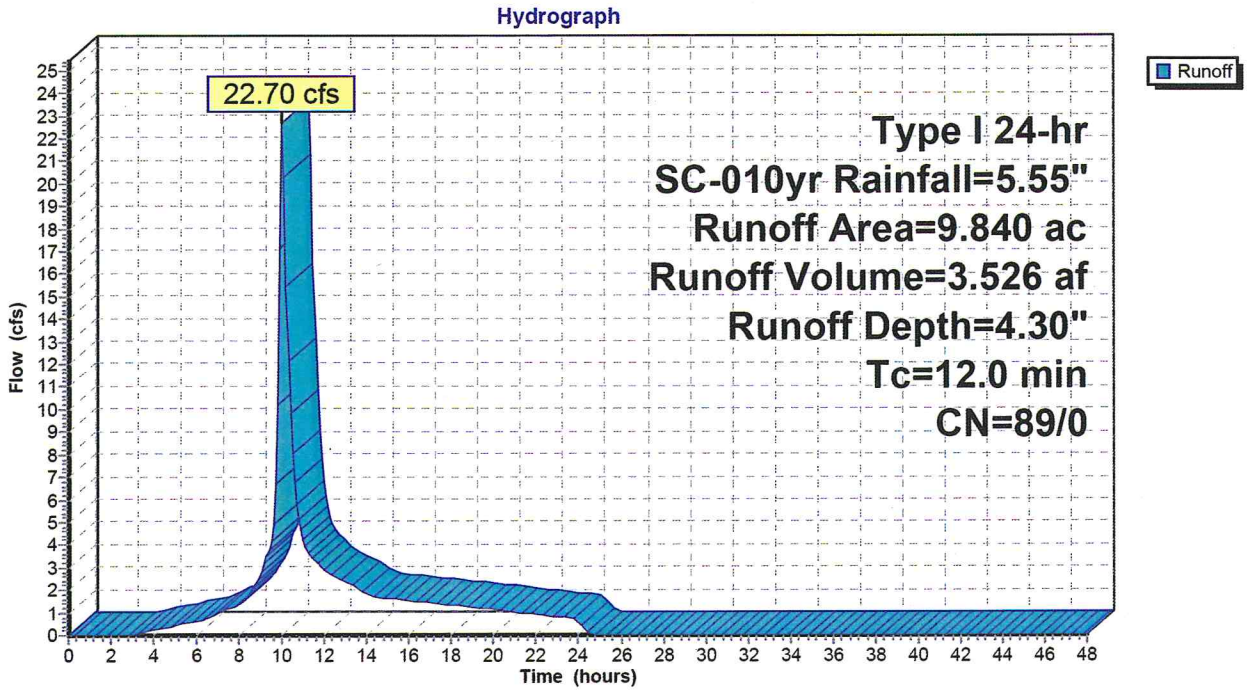
Runoff = 22.70 cfs @ 10.02 hrs, Volume= 3.526 af, Depth= 4.30"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

	Area (ac)	CN	Description
*	9.840	89	Ventura
	9.840	89	100.00% Pervious Area

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

Subcatchment 18S: Condos-77%Imp



Summary for Pond 19P: Condo Detention

Inflow Area = 9.840 ac, 0.00% Impervious, Inflow Depth = 4.30" for SC-010yr event
Inflow = 22.70 cfs @ 10.02 hrs, Volume= 3.526 af
Outflow = 10.83 cfs @ 10.36 hrs, Volume= 3.526 af, Atten= 52%, Lag= 20.4 min
Primary = 10.83 cfs @ 10.36 hrs, Volume= 3.526 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 102.53' @ 10.36 hrs Surf.Area= 0.326 ac Storage= 0.613 af

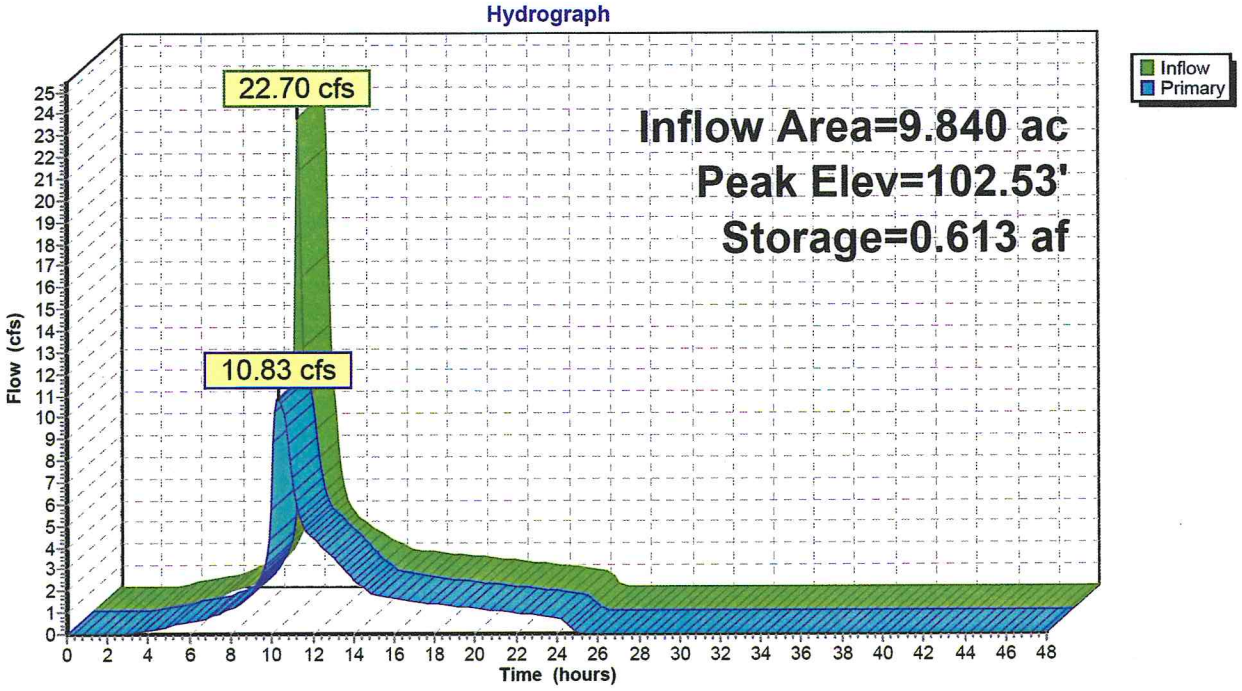
Plug-Flow detention time= 34.5 min calculated for 3.519 af (100% of inflow)
Center-of-Mass det. time= 34.5 min (792.0 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.039 af	**48.0" Round Pipe Storage** x 36 L= 100.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 99.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	100.00'	**13.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	101.70'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	103.00'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=10.80 cfs @ 10.36 hrs HW=102.53' (Free Discharge)
└**1=Culvert** (Passes 10.80 cfs of 18.70 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 6.26 cfs @ 6.79 fps)
  ├**3=Orifice/Grate** (Orifice Controls 4.54 cfs @ 3.63 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 19P: Condo Detention



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=5.74"
Flow Length=535' Tc=24.9 min CN=78/0 Runoff=21.51 cfs 4.710 af

Subcatchment 18S: Condos-77%Imp Runoff Area=9.840 ac 0.00% Impervious Runoff Depth=7.06"
Tc=12.0 min CN=89/0 Runoff=36.84 cfs 5.789 af

Pond 19P: Condo Detention Peak Elev=103.75' Storage=0.962 af Inflow=36.84 cfs 5.789 af
Outflow=21.07 cfs 5.789 af

Total Runoff Area = 19.680 ac Runoff Volume = 10.499 af Average Runoff Depth = 6.40"
100.00% Pervious = 19.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Project

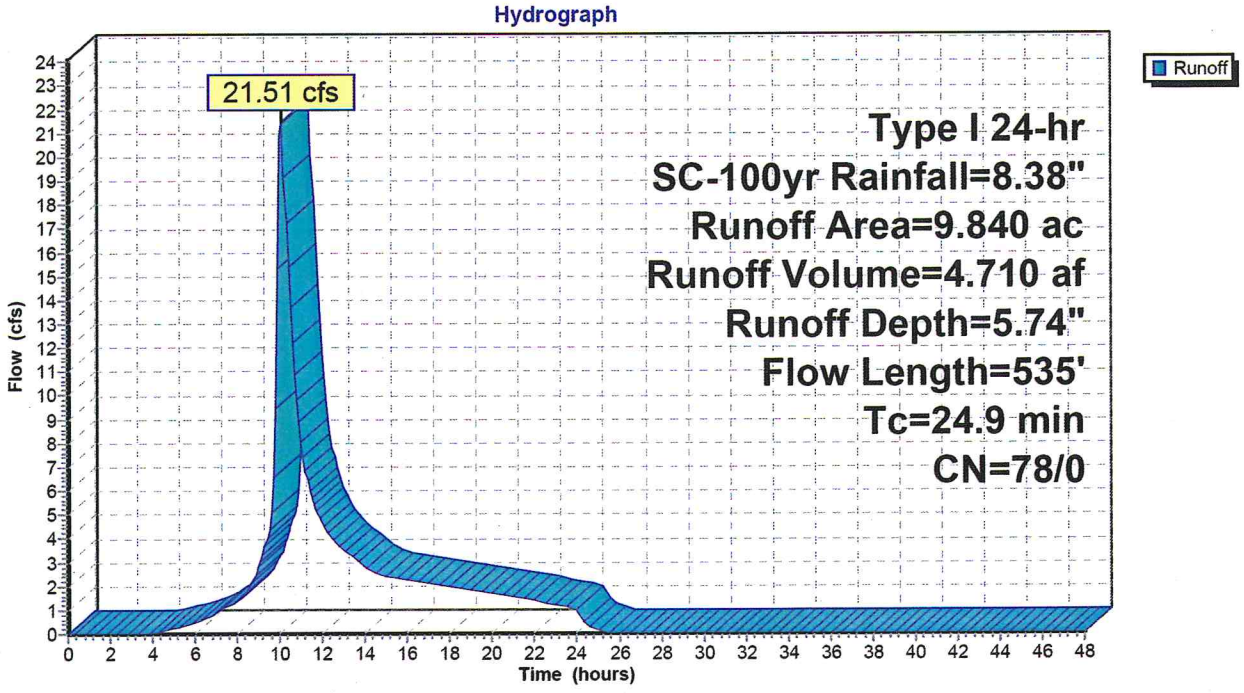
Runoff = 21.51 cfs @ 10.07 hrs, Volume= 4.710 af, Depth= 5.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (ac)	CN	Description
9.840	78	Row crops, straight row, Good, HSG B
9.840	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	300	0.0050	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.20"
5.2	235	0.0070	0.75		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
24.9	535	Total			

Subcatchment 1S: Pre-Project



Summary for Subcatchment 18S: Condos-77%Imp

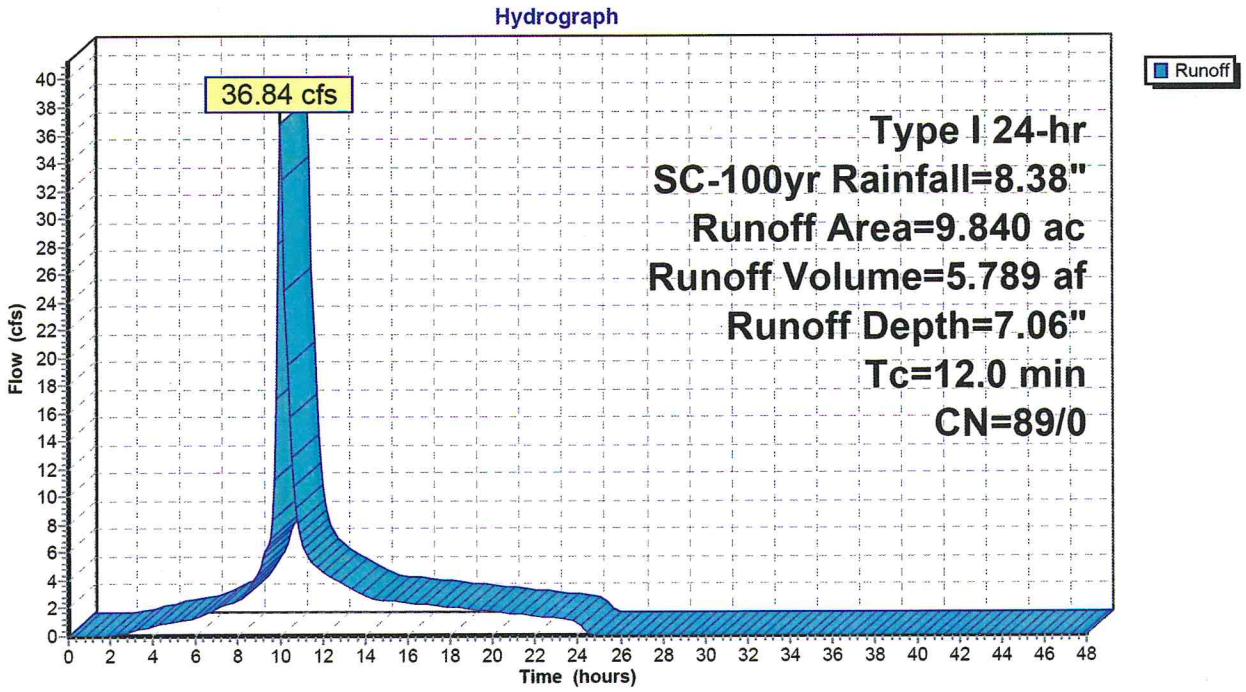
Runoff = 36.84 cfs @ 10.02 hrs, Volume= 5.789 af, Depth= 7.06"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

	Area (ac)	CN	Description
*	9.840	89	Ventura
	9.840	89	100.00% Pervious Area

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

Subcatchment 18S: Condos-77%Imp



Summary for Pond 19P: Condo Detention

Inflow Area = 9.840 ac, 0.00% Impervious, Inflow Depth = 7.06" for SC-100yr event
Inflow = 36.84 cfs @ 10.02 hrs, Volume= 5.789 af
Outflow = 21.07 cfs @ 10.28 hrs, Volume= 5.789 af, Atten= 43%, Lag= 15.7 min
Primary = 21.07 cfs @ 10.28 hrs, Volume= 5.789 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 103.75' @ 10.28 hrs Surf.Area= 0.215 ac Storage= 0.962 af

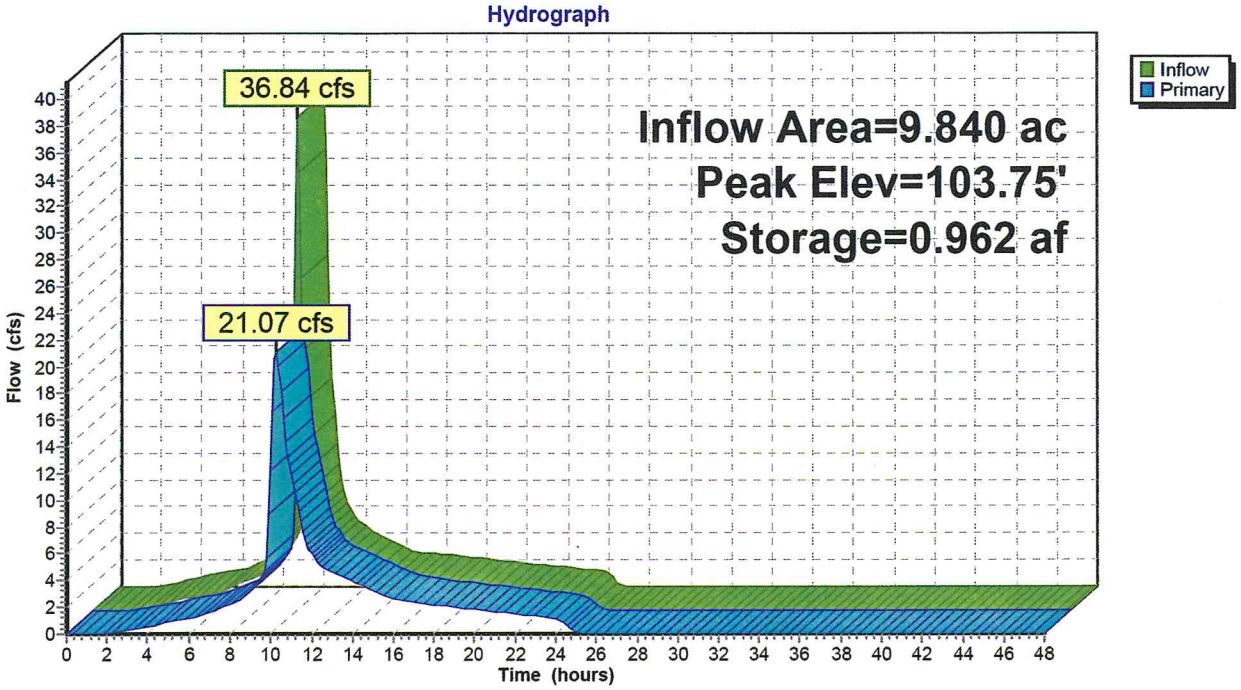
Plug-Flow detention time= 36.2 min calculated for 5.789 af (100% of inflow)
Center-of-Mass det. time= 36.3 min (776.0 - 739.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.039 af	**48.0" Round Pipe Storage** x 36 L= 100.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 99.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Device 1	100.00'	**13.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	101.70'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	103.00'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=20.96 cfs @ 10.28 hrs HW=103.74' (Free Discharge)
└**1=Culvert** (Passes 20.96 cfs of 25.03 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 7.93 cfs @ 8.61 fps)
├**3=Orifice/Grate** (Orifice Controls 8.04 cfs @ 6.43 fps)
└**4=Orifice/Grate** (Orifice Controls 4.99 cfs @ 3.33 fps)

Pond 19P: Condo Detention



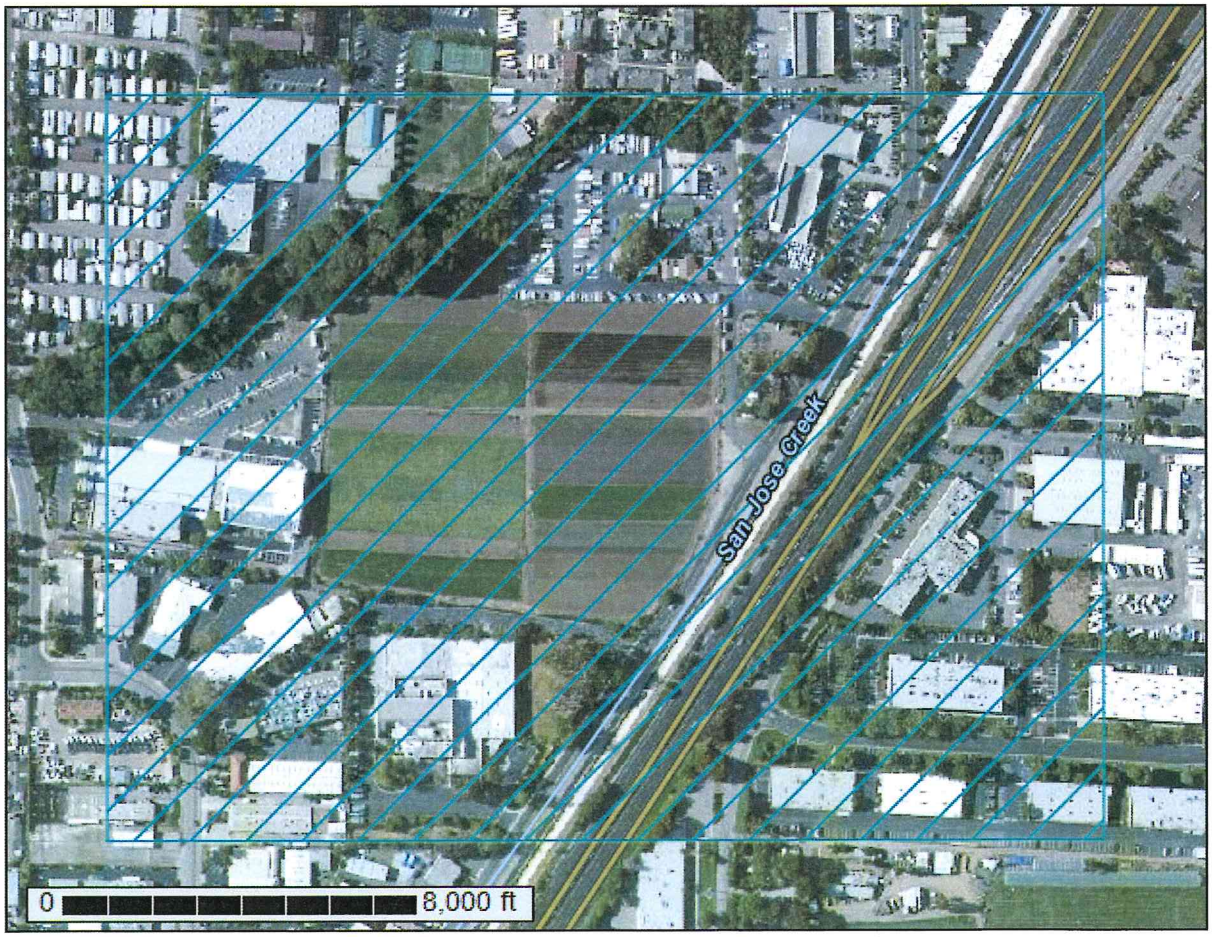
United States Department of Agriculture

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 Santa Barbara County, California, South Coastal Part



September 25, 2013

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 5, Jan 3, 2008

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

Date(s) aerial images were photographed: May 5, 2010—Aug 31, 2010

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.

Map Unit Legend

Santa Barbara County, California, South Coastal Part (CA673)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Ca	CAMARILLO FINE SANDY LOAM	0.3	0.4%
EaA	ELDER SANDY LOAM, 0 TO 2 PERCENT SLOPES	69.7	99.6%
Totals for Area of Interest		**70.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Santa Barbara County, California, South Coastal Part

Ca—CAMARILLO FINE SANDY LOAM

Map Unit Setting

Elevation: 10 to 50 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 310 to 330 days

Map Unit Composition

Camarillo and similar soils: 85 percent
Minor components: 15 percent

Description of Camarillo

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from calcareous sedimentary rock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 3w
Land capability (nonirrigated): 3w
Hydrologic Soil Group: C

Typical profile

0 to 19 inches: Fine sandy loam
19 to 57 inches: Loam

Minor Components

Unnamed loamy sand

Percent of map unit: 5 percent

Goleta fsl

Percent of map unit: 5 percent
Landform: Valleys

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Camarillo. ponded
Percent of map unit: 5 percent
Landform: Depressions

EaA—ELDER SANDY LOAM, 0 TO 2 PERCENT SLOPES

Map Unit Setting
Elevation: 30 to 400 feet
Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 310 to 330 days

Map Unit Composition
Elder and similar soils: 85 percent
Minor components: 15 percent

Description of Elder

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified alluvium derived from sedimentary rock

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 7.8 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 3c
Hydrologic Soil Group: B

Typical profile
0 to 30 inches: Sandy loam
30 to 72 inches: Stratified loamy sand to loam

Minor Components

Unnamed, sandy surface
Percent of map unit: 8 percent

Unnamed, gravelly surface
Percent of map unit: 7 percent

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Land Development & Planning
Storm Water Management & Engineering
Hydrology/ Flood Control
Soil BioEngineering & Stream Restoration
Airport Engineering Design & Support
Public Agency/ Municipality Consultant

January 14, 2015
PPN. 6003.75

RINCON CONSULTANTS, INC.
180 North Ashwood Avenue
Ventura, California 93003

Attention: Mr. Joe Powers

Subject: **INDEPENDENT EIR REVIEW**
STORMWATER MANAGEMENT PLAN

Property: **OLD TOWN VILLAGE**
SOUTH KELLOGG AVENUE & EKWILL STREET
GOLETA, CALIFORNIA

Dear Mr. Powers:

As requested, RJR Engineering Group (RJR) has reviewed the preliminary Design Report prepared by Penfield Smith (P-S) entitled: Preliminary Stormwater Management Requirements for the Old Town Village at South Kellogg Ave & Ekwill Street in Goleta, California, dated April 2, 2014. The purpose of this review was to perform a third party independent review, from a CEQA perspective, as part of the EIR process being performed by Rincon Consultants.

Hydrology and Hydraulics

P-S has modeled the site in accordance with the County of Santa Barbara and City of Goleta requirements for purposes of assessing stormwater mitigation. They have classified the on-site soils to be Hydrologic Soil Type B, with a conductivity for modeling of 1.25 inches per hour. The post construction conditions were based on a range of residential densities. Based on this analysis they utilized Hydrocad as to assess treatment volumes, and corresponding retention and detention values.

Based on the analysis presented, RJR concurs with the methodology and conclusions for purposes of CEQA approval.

The City of Goleta will require a detailed Hydrology and Drainage study as part of the project construction and design phase.

Stormwater Mitigation

P-S have proposed the use of detention ponds, pervious pavers, and bioretention, as well as a suite of other approaches and structural and non-structural controls on Pages 2 – 5 of the P-S Report.

The proposed improvements will satisfy and ensure, if properly designed, implemented, and maintained, the State of California and County MS4 requirements.

RJR recommends the following conditions be incorporated into the project.

1) The applicant shall prepare and submit for approval, to the City of Goleta (to satisfy the Municipal Permit) and State Water Resource Control Board, and construction Storm Water Pollution Prevention Plan (SWPPP) for construction to minimize onsite-sedimentation, erosion, and non-point source pollution. Under the provisions of the Federal Water Pollution Control Act, the National Pollutant Discharge Elimination System (NPDES) Program requires that disturbed areas greater than 1 acre or certain construction uses, implement a SWPPP using best management practices and monitor and maintain storm water pollution control facilities identified in the SWPPP. The plans and report should also ensure that the appropriate BMP's are implemented to ensure that runoff and potential non-point source pollution is mitigated from all access roads, building pads, and staging area to reduce or eliminate contamination to the adjacent drainages and off-site properties.

2) The applicant shall implement mitigation measures, which requires the development of a Wet Weather and Dry Weather Erosion and Sediment Control Plan which addresses all local storm water management plan requirements and Phase 2 MS4 requirements.

3) The applicant shall provide pollutant loading assessment and calculations for the existing and proposed conditions. The assessment and calculations should address pollutants of concern typically associated with the specific type of construction.

4) In accordance with the local State Construction General Permit, an Operation and Maintenance (O&M) Manual will be required to address all post construction BMP's for a period of at least five (5) years. The applicant shall provide a life cycle economic analysis to

ensure the City of funding, and provide the necessary easements to the City in the event that the project does not perform the necessary O&M. The O&M Manual should identify all elements including non-structural elements, frequency of inspections, checklists, maintenance trigger thresholds, and the qualifications of the inspectors. We recommend the City of Goleta require annual reporting for submittal and approval, and such activities are properly addresses in the funding component.

We look forward to the opportunity to meet with the Committee and to discuss this proposal. If you have any questions please do not hesitate to give us a call at (805) 485.3935.

Sincerely,

RJR ENGINEERING GROUP

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STATE OF CALIFORNIA

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Storm Sewer System
DUMP NO WASTE
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CMS4S #0223

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