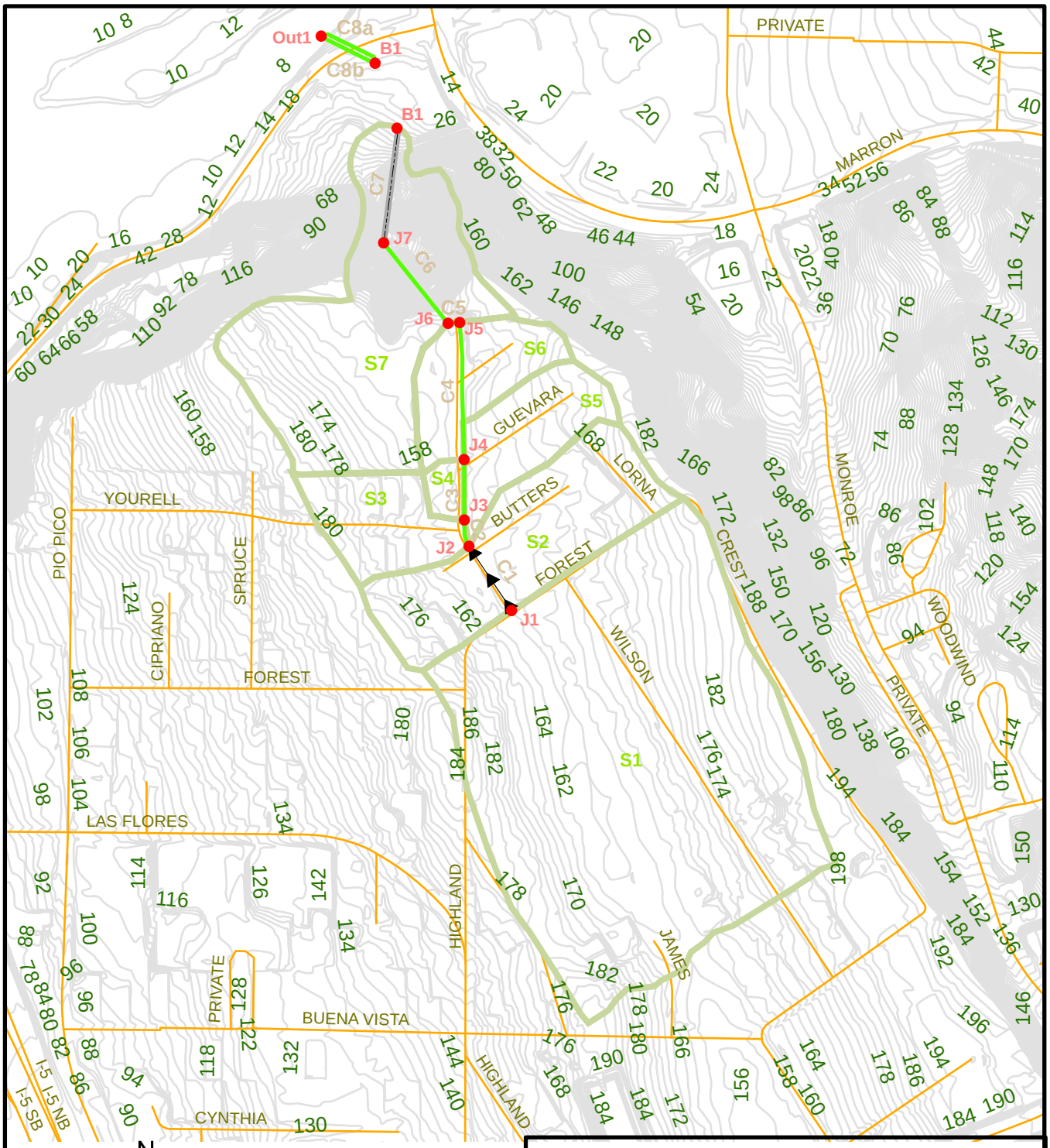
APPENDIX A

HYDRAULIC MODELING INFORMATION – SWMM 5.0

- Project Maps
- Input and Output – 100 year 6 hour storm
- Input and Output – 25 year 6 hour storm

Project AC –
Highland Drive Project



N
W E
S

0 500 1,000 Feet

LEGEND

- JUNCTIONS
- CONCRETE CULVERT
- GUTTER
- RCP
- SUBCATCHMENTS
- ROADS
- CONTOURS

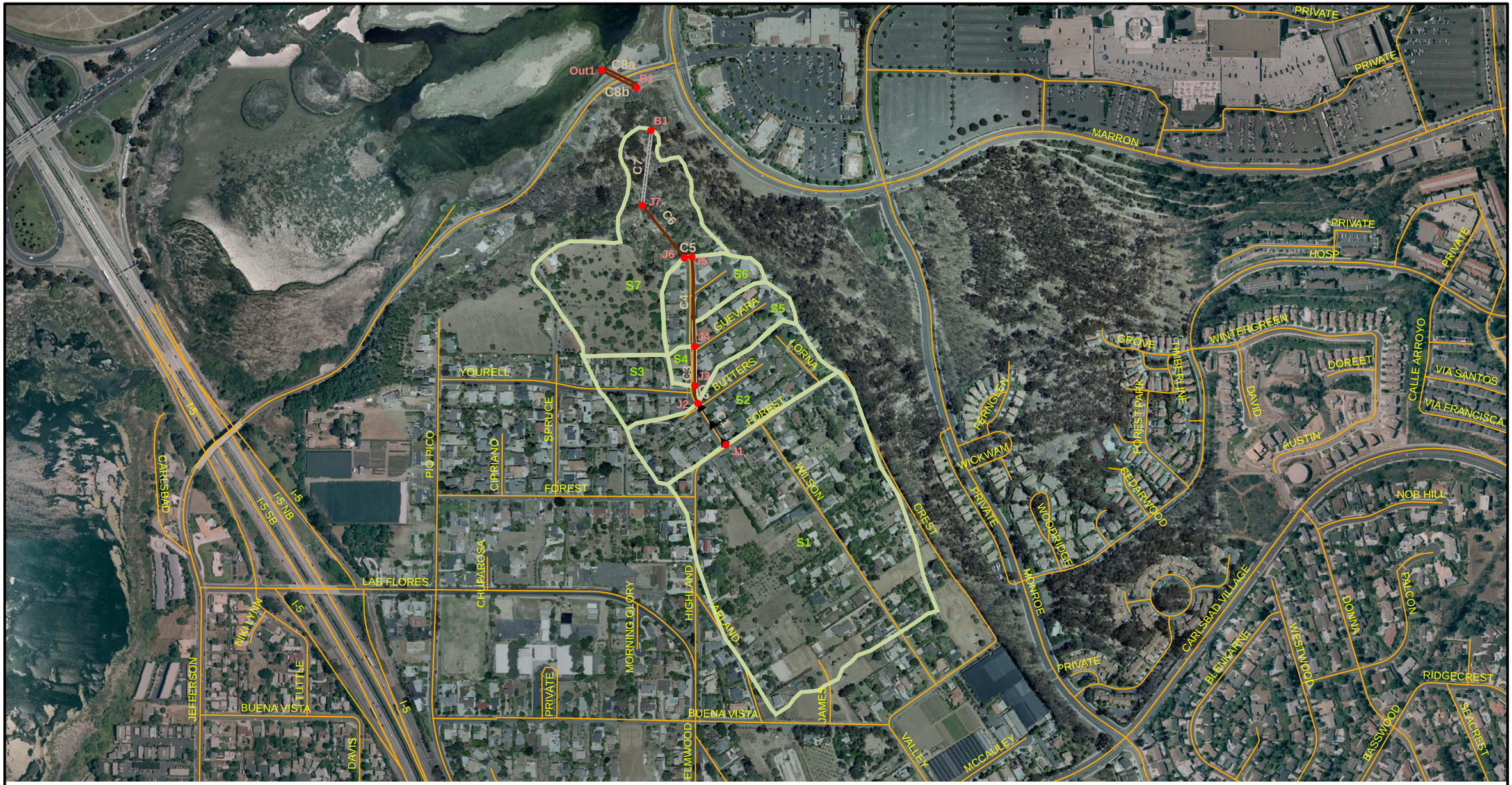
DATE	PROJECT NUMBER
FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

PROJECT AC

PROJECT LOCATION

HIGHLAND DRIVE
CARLSBAD, CALIFORNIA



N
W E
S

0 500 1,000
Feet

LEGEND

- JUNCTIONS
- CONCRETE CULVERT
- GUTTER
- RCP
- SUBCATCHMENTS
- ROADS

PROJECT AC

PROJECT LOCATION	DATE	PROJECT NUMBER
HIGHLAND DRIVE CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project AC

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project AC (Highland Drive)

```
[TITLE]
Drainage Project AC (Highland Drive)
100 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS            CFS
 INFILTRATION          GREEN_AMPT
 FLOW_ROUTING          KINWAVE
 START_DATE            09/30/2005
 START_TIME            23:00:00
 REPORT_START_DATE     09/30/2005
 REPORT_START_TIME     23:00:00
 END_DATE              10/02/2005
 END_TIME              00:00:00
 SWEEP_START           01/01
 SWEEP_END             12/31
 DRY_DAYS              0
 REPORT_STEP           00:15:00
 WET_STEP              00:15:00
 DRY_STEP              01:00:00
 ROUTING_STEP          0:00:30
 ALLOW_PONDING         NO
 INERTIAL_DAMPING      PARTIAL
 VARIABLE_STEP         0.75
 LENGTHENING_STEP      0
 MIN_SURFAREA          0
 NORMAL_FLOW_LIMITED   NO
 SKIP_STEADY_STATE     NO

[RAINGAGES]
;;                 Rain      Recd.  Snow   Data      Source          Station   Rain
;;Name             Type      Freq.  Catch  Source    Name            ID        Units
;;-------------------------------------------------------------------------------
;Rain gage does not exist. Use SD Hydrology Manual SCS
;Type II rainfall curve. Place rain gage in central location.
  R1               CUMULATIVE 0:15   1.0    TIMESERIES 100year6hr-2.7Max

[SUBCATCHMENTS]
;;                                                  Total    Pcnt.            Pcnt.    Curb     Snow
;;Name             Raingage         Outlet          Area     Imperv   Width   Slope    Length   Pack
;;-----------------------------------------------------------------------------------------------------
  S1               R1               J1              32       62       996     2.4      0
  S2               R1               J2              7.88     43       458     3.7      0
  S3               R1               J3              3.27     46       238     3.8      0
  S4               R1               J4              0.54     60       124     2.1      0
  S5               R1               J4              3.36     46       261     3.8      0
  S6               R1               J5              3.38     50       300     1.2      0
  S7               R1               BasinB1         12.38    3        413     12.2     0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------
  S1               0.011      0.15       0.05       0.05       100        OUTLET
  S2               0.011      0.15       0.05       0.05       100        OUTLET
  S3               0.011      0.15       0.05       0.05       100        OUTLET
  S4               0.011      0.15       0.05       0.05       100        OUTLET
  S5               0.011      0.15       0.05       0.05       100        OUTLET
  S6               0.011      0.15       0.05       0.05       100        OUTLET
  S7               0.011      0.015      0.05       0.05       100        OUTLET

[INFILTRATION]
;;Subcatchment     Suction    HydCon     IMDmax
;;-----------------------------------------------
  S1               2.4        1.18       0
  S2               2.4        1.18       0
  S3               2.4        1.18       0
  S4               2.4        1.18       0
  S5               2.4        1.18       0
  S6               2.4        1.18       0
  S7               1.18       2.4        0

[JUNCTIONS]
```

Drainage Project AC (Highland Drive)

```
;;                  Invert     Max.       Init.      Surcharge  Ponded
;;Name              Elev.      Depth      Depth      Depth      Area
;;-------------------------------------------------------------------------
;Confluence from S1, begin gutter flow.
  J1                158        1          0.5        0          0
;Created Manhole, H=6.00'
  J2                151        7          0          0          0
;Created Manhole, H= 6.00'
  J3                150        7          0          0          0
;Created Manhole, H=6.00'
  J4                147.5      8          0          0          0
;Existing Manhole, H=5.00
  J5                143        5          0          0          0
;Existing Manhole, H=5.66'
  J6                141.68     5.66       0          0          0
  J7                61         0          0          0          0

[OUTFALLS]
;;                  Invert     Outfall    Stage/Table      Tide
;;Name              Elev.      Type       Time Series      Gate
;;-----------------------------------------------------------------
;Outfall (Two parallel 18 inch RCP) to Buena Vista Lagoon
  OUT1              6          FREE                        NO

[STORAGE]
;;                  Invert   Max.     Init.    Shape      Shape                        Ponded   Evap.
;;Name              Elev.    Depth    Depth    Curve      Parameters                   Area     Frac.
;;-----------------------------------------------------------------------------------------------------
;Natural Settling Basin - Estimate surface area = 60,000 ft2
  BasinB1           14       4        0        FUNCTIONAL 495.6    1        58016    600000   0

[CONDUITS]
;;                  Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Ma
;;Name              Node             Node             Length     N          Height     Height     Flow       Fl
;;-------------------------------------------------------------------------------------------------------------
;Gutter Flow along Highland Drive
  C1                J1               J2               257.5      0.013      0          0          0          0
;AC: RCP -36"
  C2                J2               J3               93.6       0.013      0          0          0          0
;AC: RCP -36"
  C3                J3               J4               202.2      0.013      0          0          0          0
;AC: RCP -36"
  C4                J4               J5               461.2      0.013      0          0          0          0
;AC: RCP -36"
  C5                J5               J6               39.6       0.013      0          0          0          0
;AC: RCP -36"
  C6                J6               J7               350        0.013      0          0          0          0
  C7                J7               BasinB1          600        0.013      0          0          0          0
;18" RCP Existing
  C8a               BasinB1          OUT1             125        0.013      0          0          0          0
;AC:18" inch proposed parallel RCP culvert
  C8b               BasinB1          OUT1             125        0.013      0          0          0          0

[XSECTIONS]
;;Link              Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-----------------------------------------------------------------------------
  C1                RECT_OPEN    1          40         0          0          1
  C2                CIRCULAR     3          0          0          0          1
  C3                CIRCULAR     3          0          0          0          1
  C4                CIRCULAR     3          0          0          0          1
  C5                CIRCULAR     3          0          0          0          1
  C6                CIRCULAR     3          0          0          0          1
  C7                TRAPEZOIDAL  1          8          0.5        0.5        1
  C8a               CIRCULAR     1.5        0          0          0          1
  C8b               CIRCULAR     1.5        0          0          0          1

[TIMESERIES]
;;Name              Date         Time       Value
;;-----------------------------------------------
;100 year 6 hour Type B SCS Design Storm P Max = 2.7 iinches
  100year6hr-2.7Max 10/1/2005    10:00      0
  100year6hr-2.7Max              10:15      0.0486
```

```
 100year6hr-2.7Max          10:30      0.0945
 100year6hr-2.7Max          10:45      0.1566
 100year6hr-2.7Max          11:00      0.216
 100year6hr-2.7Max          11:15      0.2916
 100year6hr-2.7Max          11:30      0.3645
 100year6hr-2.7Max          11:45      0.4941
 100year6hr-2.7Max          12:00      0.621
 100year6hr-2.7Max          12:15      1.1205
 100year6hr-2.7Max          12:30      1.62
 100year6hr-2.7Max          12:45      1.755
 100year6hr-2.7Max          13:00      1.89
 100year6hr-2.7Max          13:15      1.998
 100year6hr-2.7Max          13:30      2.106
 100year6hr-2.7Max          13:45      2.1816
 100year6hr-2.7Max          14:00      2.2545
 100year6hr-2.7Max          14:15      2.3166
 100year6hr-2.7Max          14:30      2.376
 100year6hr-2.7Max          14:45      2.43
 100year6hr-2.7Max          15:00      2.484
 100year6hr-2.7Max          15:15      2.538
 100year6hr-2.7Max          15:30      2.592
 100year6hr-2.7Max          15:45      2.646
 100year6hr-2.7Max          16:00      2.7

[REPORT]
 INPUT      YES
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project AC

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project AC (Highland Drive)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project AC (Highland Drive)
100 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 23:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 7
Number of nodes ........... 9
Number of links ........... 9
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                          Data        Interval
Name                 Data Source          Type           hours
-----------------------------------------------------------------
R1                   100year6hr-2.7Max    CUMULATIVE      0.00


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope    Rain Gage
-----------------------------------------------------------------------------
S1                         32.00    996.00     62.00    2.4000    R1
S2                          7.88    458.00     43.00    3.7000    R1
S3                          3.27    238.00     46.00    3.8000    R1
S4                          0.54    124.00     60.00    2.1000    R1
S5                          3.36    261.00     46.00    3.8000    R1
S6                          3.38    300.00     50.00    1.2000    R1
S7                         12.38    413.00      3.00   12.2000    R1


************
Node Summary
************
Name                 Type                 Invert     Depth
-------------------------------------------------------------
J1                   JUNCTION             158.00      1.00
J2                   JUNCTION             151.00      7.00
J3                   JUNCTION             150.00      7.00
J4                   JUNCTION             147.50      8.00
J5                   JUNCTION             143.00      5.00
J6                   JUNCTION             141.68      5.66
J7                   JUNCTION              61.00      3.00
OUT1                 OUTFALL                6.00      1.50
BasinB1              STORAGE               14.00      4.00


************
```

Drainage Project AC (Highland Drive)

Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	N
C1	J1	J2	CONDUIT	258	2.7184	0.0130
C2	J2	J3	CONDUIT	94	1.0684	0.0130
C3	J3	J4	CONDUIT	202	1.2364	0.0130
C4	J4	J5	CONDUIT	461	0.9757	0.0130
C5	J5	J6	CONDUIT	40	3.3334	0.0130
C6	J6	J7	CONDUIT	350	23.0514	0.0130
C7	J7	BasinB1	CONDUIT	600	7.8333	0.0130
C8a	BasinB1	OUT1	CONDUIT	125	6.4000	0.0130
C8b	BasinB1	OUT1	CONDUIT	125	6.4000	0.0130

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	Full Flow
C1	RECT_OPEN	1.00	40.00	0.95	40.00	729.74
C2	CIRCULAR	3.00	7.07	0.75	3.00	68.94
C3	CIRCULAR	3.00	7.07	0.75	3.00	74.16
C4	CIRCULAR	3.00	7.07	0.75	3.00	65.88
C5	CIRCULAR	3.00	7.07	0.75	3.00	121.77
C6	CIRCULAR	3.00	7.07	0.75	3.00	320.23
C7	TRAPEZOIDAL	1.00	8.50	0.83	9.00	240.25
C8a	CIRCULAR	1.50	1.77	0.38	1.50	26.57
C8b	CIRCULAR	1.50	1.77	0.38	1.50	26.57

********** Runoff Quantity Continuity **********	Volume acre-feet ---------	Depth inches -------
Total Precipitation	14.132	2.700
Evaporation Loss	0.000	0.000
Infiltration Loss	7.487	1.430
Surface Runoff	6.713	1.283
Final Surface Storage	0.002	0.000
Continuity Error (%)	-0.490	

********** Flow Routing Continuity **********	Volume acre-feet ---------	Volume Mgallons ---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	6.719	2.190
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	6.660	2.170
Surface Flooding	0.000	0.000
Evaporation Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.060	0.020
Continuity Error (%)	-0.012	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Runoff Coeff
S1	2.700	0.000	0.000	0.993	1.724	0.639
S2	2.700	0.000	0.000	1.472	1.242	0.460
S3	2.700	0.000	0.000	1.382	1.332	0.493
S4	2.700	0.000	0.000	0.989	1.731	0.641

S5	2.700	0.000	0.000	1.379	1.335	0.494
S6	2.700	0.000	0.000	1.291	1.423	0.527
S7	2.700	0.000	0.000	2.619	0.081	0.030
Totals	2.700	0.000	0.000	1.430	1.283	0.475

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.02	0.18	158.18	0 13:45	0	0
J2	0.20	1.94	152.94	0 13:45	0	0
J3	0.20	1.94	151.94	0 13:45	0	0
J4	0.22	2.26	149.76	0 13:45	0	0
J5	0.22	2.25	145.25	0 13:45	0	0
J6	0.17	1.55	143.23	0 13:45	0	0
J7	0.10	0.91	61.91	0 13:45	0	0
OUT1	0.81	1.50	7.50	0 11:29	0	0
BasinB1	0.14	1.15	15.15	0 13:52	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	43.14	0 13:45	6.01	1.00	0.06	0
C2	51.66	0 13:45	10.71	1.00	0.75	0
C3	55.41	0 13:45	11.52	1.00	0.75	0
C4	60.11	0 13:45	10.65	1.00	0.91	0
C5	64.07	0 13:45	17.44	1.00	0.53	0
C6	64.05	0 13:45	35.36	1.00	0.20	0
C7	64.02	0 13:46	17.55	1.00	0.27	0
C8a	24.94	0 13:52	17.08	1.00	0.94	0
C8b	24.94	0 13:52	17.08	1.00	0.94	0

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.09

Analysis begun on: Tue Jun 06 09:48:41 2006
Total elapsed time: < 1 sec

Project AC

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project AC (Highland Drive)

```
[TITLE]
Drainage Project AC (Highland Drive)
25 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS            CFS
 INFILTRATION          GREEN_AMPT
 FLOW_ROUTING          KINWAVE
 START_DATE            09/30/2005
 START_TIME            23:00:00
 REPORT_START_DATE     09/30/2005
 REPORT_START_TIME     23:00:00
 END_DATE              10/02/2005
 END_TIME              00:00:00
 SWEEP_START           01/01
 SWEEP_END             12/31
 DRY_DAYS              0
 REPORT_STEP           00:15:00
 WET_STEP              00:15:00
 DRY_STEP              01:00:00
 ROUTING_STEP          0:00:30
 ALLOW_PONDING         NO
 INERTIAL_DAMPING      PARTIAL
 VARIABLE_STEP         0.75
 LENGTHENING_STEP      0
 MIN_SURFAREA          0
 NORMAL_FLOW_LIMITED   NO
 SKIP_STEADY_STATE     NO

[RAINGAGES]
;;                 Rain      Recd.  Snow   Data       Source           Station    Rain
;;Name             Type      Freq.  Catch  Source     Name             ID         Units
;;-----------------------------------------------------------------------------------
;Rain gage does not exist. Use SD Hydrology Manual SCS
;Type II rainfall curve. Place rain gage in central location.
  R1               CUMULATIVE 0:15   1.0    TIMESERIES 25year6hr-2.1Max

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.            Pcnt.    Curb     Snow
;;Name             Raingage         Outlet           Area     Imperv   Width   Slope    Length   Pack
;;-----------------------------------------------------------------------------------------------------
  S1               R1               J1               32       58       996     2.4      0
  S2               R1               J2               7.88     36       458     3.7      0
  S3               R1               J3               3.27     40       238     3.8      0
  S4               R1               J4               0.54     55       124     2.1      0
  S5               R1               J4               3.36     40       261     3.8      0
  S6               R1               J5               3.38     44       300     1.2      0
  S7               R1               BasinB1          12.38    3        413     12.2     0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1               0.011      0.15       0.05       0.05       100        OUTLET
  S2               0.011      0.15       0.05       0.05       100        OUTLET
  S3               0.011      0.15       0.05       0.05       100        OUTLET
  S4               0.011      0.15       0.05       0.05       100        OUTLET
  S5               0.011      0.15       0.05       0.05       100        OUTLET
  S6               0.011      0.15       0.05       0.05       100        OUTLET
  S7               0.011      0.015      0.05       0.05       100        OUTLET

[INFILTRATION]
;;Subcatchment     Suction    HydCon     IMDmax
;;-----------------------------------------------
  S1               2.4        1.18       0
  S2               2.4        1.18       0
  S3               2.4        1.18       0
  S4               2.4        1.18       0
  S5               2.4        1.18       0
  S6               2.4        1.18       0
  S7               1.18       2.4        0

[JUNCTIONS]
```

Drainage Project AC (Highland Drive)

```
;;                  Invert     Max.       Init.      Surcharge  Ponded
;;Name              Elev.      Depth      Depth      Depth      Area
;;-------------------------------------------------------------------------
;Confluence from S1, begin gutter flow.
  J1                158        1          0.5        0          0
;Created Manhole, H=6.00'
  J2                151        7          0          0          0
;Created Manhole, H= 6.00'
  J3                150        7          0          0          0
;Created Manhole, H=6.00'
  J4                147.5      8          0          0          0
;Existing Manhole, H=5.00
  J5                143        5          0          0          0
;Existing Manhole, H=5.66'
  J6                141.68     5.66       0          0          0
  J7                61         0          0          0          0

[OUTFALLS]
;;                  Invert     Outfall    Stage/Table      Tide
;;Name              Elev.      Type       Time Series      Gate
;;-----------------------------------------------------------------
;Outfall (Two parallel 18 inch RCP) to Buena Vista Lagoon
  OUT1              6          FREE                        NO

[STORAGE]
;;                  Invert   Max.     Init.    Shape      Shape                        Ponded   Evap.
;;Name              Elev.    Depth    Depth    Curve      Parameters                   Area     Frac.
;;-----------------------------------------------------------------------------------------------------
;Natural Settling Basin - Estimate surface area = 60,000 ft2
  BasinB1           14       4        0        FUNCTIONAL 495.6    1        58016    600000   0

[CONDUITS]
;;                  Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Ma
;;Name              Node             Node             Length     N          Height     Height     Flow       Fl
;;-------------------------------------------------------------------------------------------------------------
;Gutter Flow along Highland Drive
  C1                J1               J2               257.5      0.013      0          0          0          0
;AC: RCP -36"
  C2                J2               J3               93.6       0.013      0          0          0          0
;AC: RCP -36"
  C3                J3               J4               202.2      0.013      0          0          0          0
;AC: RCP -36"
  C4                J4               J5               461.2      0.013      0          0          0          0
;AC: RCP -36"
  C5                J5               J6               39.6       0.013      0          0          0          0
;AC: RCP -36"
  C6                J6               J7               350        0.013      0          0          0          0
  C7                J7               BasinB1          600        0.013      0          0          0          0
;18" RCP Existing
  C8a               BasinB1          OUT1             125        0.013      0          0          0          0
;AC:18" inch parallel structure
  C8b               BasinB1          OUT1             125        0.013      0          0          0          0

[XSECTIONS]
;;Link              Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-----------------------------------------------------------------------------------
  C1                RECT_OPEN    1          40         0          0          1
  C2                CIRCULAR     3          0          0          0          1
  C3                CIRCULAR     3          0          0          0          1
  C4                CIRCULAR     3          0          0          0          1
  C5                CIRCULAR     3          0          0          0          1
  C6                CIRCULAR     3          0          0          0          1
  C7                TRAPEZOIDAL  1          8          0.5        0.5        1
  C8a               CIRCULAR     1.5        0          0          0          1
  C8b               CIRCULAR     1.5        0          0          0          1

[TIMESERIES]
;;Name              Date         Time       Value
;;-----------------------------------------------------
;100 year 6 hour Type B SCS Design Storm P Max = 2.7 iinches
  100year6hr-2.7Max 10/1/2005    10:00      0
  100year6hr-2.7Max              10:15      0.0486
```

```
 100year6hr-2.7Max          10:30      0.0945
 100year6hr-2.7Max          10:45      0.1566
 100year6hr-2.7Max          11:00      0.216
 100year6hr-2.7Max          11:15      0.2916
 100year6hr-2.7Max          11:30      0.3645
 100year6hr-2.7Max          11:45      0.4941
 100year6hr-2.7Max          12:00      0.621
 100year6hr-2.7Max          12:15      1.1205
 100year6hr-2.7Max          12:30      1.62
 100year6hr-2.7Max          12:45      1.755
 100year6hr-2.7Max          13:00      1.89
 100year6hr-2.7Max          13:15      1.998
 100year6hr-2.7Max          13:30      2.106
 100year6hr-2.7Max          13:45      2.1816
 100year6hr-2.7Max          14:00      2.2545
 100year6hr-2.7Max          14:15      2.3166
 100year6hr-2.7Max          14:30      2.376
 100year6hr-2.7Max          14:45      2.43
 100year6hr-2.7Max          15:00      2.484
 100year6hr-2.7Max          15:15      2.538
 100year6hr-2.7Max          15:30      2.592
 100year6hr-2.7Max          15:45      2.646
 100year6hr-2.7Max          16:00      2.7

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
 25year6hr-2.1Max           10:00      0
 25year6hr-2.1Max           10:15      0.0378
 25year6hr-2.1Max           10:30      0.0735
 25year6hr-2.1Max           10:45      0.1218
 25year6hr-2.1Max           11:00      0.168
 25year6hr-2.1Max           11:15      0.2268
 25year6hr-2.1Max           11:30      0.2835
 25year6hr-2.1Max           11:45      0.3843
 25year6hr-2.1Max           12:00      0.483
 25year6hr-2.1Max           12:15      0.8715
 25year6hr-2.1Max           12:30      1.26
 25year6hr-2.1Max           12:45      1.365
 25year6hr-2.1Max           13:00      1.47
 25year6hr-2.1Max           13:15      1.554
 25year6hr-2.1Max           13:30      1.638
 25year6hr-2.1Max           13:45      1.6968
 25year6hr-2.1Max           14:00      1.7535
 25year6hr-2.1Max           14:15      1.8018
 25year6hr-2.1Max           14:30      1.848
 25year6hr-2.1Max           14:45      1.89
 25year6hr-2.1Max           15:00      1.932
 25year6hr-2.1Max           15:15      1.974
 25year6hr-2.1Max           15:30      2.016
 25year6hr-2.1Max           15:45      2.058
 25year6hr-2.1Max           16:00      2.1

[REPORT]
 INPUT      YES
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project AC

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project AC (Highland Drive)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project AC (Highland Drive)
25 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 23:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 7
Number of nodes ........... 9
Number of links ........... 9
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                          Data        Interval
Name                 Data Source          Type           hours
-----------------------------------------------------------------
R1                   25year6hr-2.1Max     CUMULATIVE      0.00


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope    Rain Gage
-----------------------------------------------------------------------------
S1                         32.00    996.00     58.00    2.4000    R1
S2                          7.88    458.00     36.00    3.7000    R1
S3                          3.27    238.00     40.00    3.8000    R1
S4                          0.54    124.00     55.00    2.1000    R1
S5                          3.36    261.00     40.00    3.8000    R1
S6                          3.38    300.00     44.00    1.2000    R1
S7                         12.38    413.00      3.00   12.2000    R1


************
Node Summary
************
Name                 Type                 Invert     Depth
-------------------------------------------------------------
J1                   JUNCTION             158.00      1.00
J2                   JUNCTION             151.00      7.00
J3                   JUNCTION             150.00      7.00
J4                   JUNCTION             147.50      8.00
J5                   JUNCTION             143.00      5.00
J6                   JUNCTION             141.68      5.66
J7                   JUNCTION              61.00      3.00
OUT1                 OUTFALL                6.00      1.50
BasinB1              STORAGE               14.00      4.00


************
```

Drainage Project AC (Highland Drive)

Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	N
C1	J1	J2	CONDUIT	258	2.7184	0.0130
C2	J2	J3	CONDUIT	94	1.0684	0.0130
C3	J3	J4	CONDUIT	202	1.2364	0.0130
C4	J4	J5	CONDUIT	461	0.9757	0.0130
C5	J5	J6	CONDUIT	40	3.3334	0.0130
C6	J6	J7	CONDUIT	350	23.0514	0.0130
C7	J7	BasinB1	CONDUIT	600	7.8333	0.0130
C8a	BasinB1	OUT1	CONDUIT	125	6.4000	0.0130
C8b	BasinB1	OUT1	CONDUIT	125	6.4000	0.0130

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	Full Flow
C1	RECT_OPEN	1.00	40.00	0.95	40.00	729.74
C2	CIRCULAR	3.00	7.07	0.75	3.00	68.94
C3	CIRCULAR	3.00	7.07	0.75	3.00	74.16
C4	CIRCULAR	3.00	7.07	0.75	3.00	65.88
C5	CIRCULAR	3.00	7.07	0.75	3.00	121.77
C6	CIRCULAR	3.00	7.07	0.75	3.00	320.23
C7	TRAPEZOIDAL	1.00	8.50	0.83	9.00	240.25
C8a	CIRCULAR	1.50	1.77	0.38	1.50	26.57
C8b	CIRCULAR	1.50	1.77	0.38	1.50	26.57

********** Runoff Quantity Continuity **********	Volume acre-feet	Depth inches
Total Precipitation	10.992	2.100
Evaporation Loss	0.000	0.000
Infiltration Loss	6.383	1.219
Surface Runoff	4.658	0.890
Final Surface Storage	0.001	0.000
Continuity Error (%)	-0.461	

********** Flow Routing Continuity **********	Volume acre-feet	Volume Mgallons
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.660	1.518
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	4.608	1.501
Surface Flooding	0.000	0.000
Evaporation Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.053	0.017
Continuity Error (%)	-0.015	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Runoff Coeff
S1	2.100	0.000	0.000	0.878	1.234	0.587
S2	2.100	0.000	0.000	1.336	0.774	0.369
S3	2.100	0.000	0.000	1.250	0.861	0.410
S4	2.100	0.000	0.000	0.927	1.189	0.566

S5	2.100	0.000	0.000	1.250	0.862	0.411
S6	2.100	0.000	0.000	1.169	0.942	0.448
S7	2.100	0.000	0.000	2.037	0.063	0.030
Totals	2.100	0.000	0.000	1.219	0.890	0.424

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.01	0.14	158.14	0 12:45	0	0
J2	0.17	1.50	152.50	0 12:45	0	0
J3	0.17	1.50	151.50	0 12:45	0	0
J4	0.18	1.68	149.18	0 12:45	0	0
J5	0.18	1.68	144.68	0 12:45	0	0
J6	0.14	1.22	142.90	0 12:45	0	0
J7	0.09	0.73	61.73	0 12:45	0	0
OUT1	0.87	1.50	7.50	0 10:30	0	0
BasinB1	0.12	0.86	14.86	0 12:52	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	29.67	0 12:45	5.18	1.00	0.04	0
C2	34.52	0 12:45	9.75	1.00	0.50	0
C3	36.74	0 12:45	10.47	1.00	0.50	0
C4	39.56	0 12:45	9.79	1.00	0.60	0
C5	41.99	0 12:45	15.63	1.00	0.34	0
C6	41.99	0 12:45	31.36	1.00	0.13	0
C7	41.97	0 12:46	14.97	1.00	0.17	0
C8a	16.62	0 12:52	15.86	1.00	0.63	0
C8b	16.62	0 12:52	15.86	1.00	0.63	0

****
Routing Time Step Summary
****

```
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.05
```

Analysis begun on: Tue Jun 06 09:56:23 2006
Total elapsed time: < 1 sec

Project BB – 1
Project BB – 2
Washington Street Project

LEGEND

- JUNCTIONS
- CONDUITS
- SUBCATCHMENTS
- ROADS
- CONTOUR

PROJECTS BB-1 AND BB-2

PROJECT LOCATION	DATE	PROJECT NUMBER
WASHINGTON STREET CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

N
W E
S

0 250 500 1,000
Feet

LEGEND

- JUNCTIONS
- CONDUITS
- SUBCATCHMENTS
- ROADS

PROJECTS BB-1 AND BB-2

PROJECT LOCATION	DATE	PROJECT NUMBER
WASHINGTON STREET CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project BB – 1

Project BB – 2

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project BB (Washington Street Drainage Improvements)

```
[TITLE]
Drainage Project BB (Washington Street Drainage Improvements)
100 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS            CFS
 INFILTRATION          GREEN_AMPT
 FLOW_ROUTING          KINWAVE
 START_DATE            09/30/2005
 START_TIME            22:00:00
 REPORT_START_DATE     09/30/2005
 REPORT_START_TIME     22:00:00
 END_DATE              10/02/2005
 END_TIME              00:00:00
 SWEEP_START           01/01
 SWEEP_END             12/31
 DRY_DAYS              0
 REPORT_STEP           00:15:00
 WET_STEP              00:15:00
 DRY_STEP              01:00:00
 ROUTING_STEP          0:00:30
 ALLOW_PONDING         NO
 INERTIAL_DAMPING      PARTIAL
 VARIABLE_STEP         0.75
 LENGTHENING_STEP      0
 MIN_SURFAREA          0
 NORMAL_FLOW_LIMITED   NO
 SKIP_STEADY_STATE     NO

[RAINGAGES]
;;                 Rain       Recd.  Snow   Data       Source           Station    Rain
;;Name             Type       Freq.  Catch  Source     Name             ID         Units
;;-----------------------------------------------------------------------------------------
  R1               CUMULATIVE 0:15   1.0    TIMESERIES 100yr6hrCum2.6

[SUBCATCHMENTS]
;;                                                Total    Pcnt.              Pcnt.    Curb     Snow
;;Name             Raingage         Outlet        Area     Imperv   Width     Slope    Length   Pack
;;-----------------------------------------------------------------------------------------------------
  S1               R1               J1            2.4      80       246       0.941    0
  S2               R1               J2            5.12     77       743       3        0
  S3               R1               J4            1.89     69       206       2.2      0
  S4               R1               J5            1.98     68       207       1.9      0
  S5               R1               J6            1.56     68       181       2.1      0
  S6               R1               J7            2.18     68       292       3.1      0
  S7               R1               J8            7.19     68       696       2.2      0
  S8               R1               J9            3.7      67       383       1.9      0
  S9               R1               J10           2.49     67       252       2.8      0
  S10              R1               J11           2.21     67       241       3        0
  S11              R1               J10           1.17     65       221       2.8      0
  S12              R1               J11           1.88     69       182       2.2      0
  S13              R1               J13           0.19     65       24        1.14     0
  S14              R1               J14           0.79     66       104       1.2      0
  S15              R1               J16           1.47     66       169       2.9      0
  S16              R1               J16           0.84     67       108       2.6      0
  S17              R1               J18           6.25     67       340       2        0
  S18              R1               J20           1.46     65       193       1.2      0
  S19              R1               J21           0.93     68       144       2.1      0
  S20              R1               J22           2.96     65       24        0.189    0
  S21              R1               J22           3.22     68       255       1.8      0
  S22              R1               J25           0.72     65       116       1.5      0
  S23              R1               J26           1.84     67       211       3.68     0
  S24              R1               J28           2.59     67       245       2.2      0
  S25              R1               J29           3.08     68       280       2.5      0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1               0.011      0.015      0.05       0.05       100        OUTLET
  S2               0.011      0.015      0.05       0.05       100        OUTLET
  S3               0.011      0.015      0.05       0.05       100        OUTLET
  S4               0.011      0.015      0.05       0.05       100        OUTLET
```

S5	0.011	0.015	0.05	0.05	100	OUTLET
S6	0.011	0.015	0.05	0.05	100	OUTLET
S7	0.011	0.015	0.05	0.05	100	OUTLET
S8	0.011	0.015	0.05	0.05	100	OUTLET
S9	0.011	0.015	0.05	0.05	100	OUTLET
S10	0.011	0.015	0.05	0.05	100	OUTLET
S11	0.011	0.015	0.05	0.05	100	OUTLET
S12	0.011	0.015	0.05	0.05	100	OUTLET
S13	0.011	0.015	0.05	0.05	100	OUTLET
S14	0.011	0.015	0.05	0.05	100	OUTLET
S15	0.011	0.015	0.05	0.05	100	OUTLET
S16	0.011	0.015	0.05	0.05	100	OUTLET
S17	0.011	0.015	0.05	0.05	100	OUTLET
S18	0.011	0.015	0.05	0.05	100	OUTLET
S19	0.011	0.015	0.05	0.05	100	OUTLET
S20	0.011	0.015	0.05	0.05	100	OUTLET
S21	0.011	0.015	0.05	0.05	100	OUTLET
S22	0.011	0.015	0.05	0.05	100	OUTLET
S23	0.011	0.015	0.05	0.05	100	OUTLET
S24	0.011	0.015	0.05	0.05	100	OUTLET
S25	0.011	0.015	0.05	0.05	100	OUTLET

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	2.4	1.18	0
S2	2.4	1.18	0
S3	2.4	1.18	0
S4	2.4	1.18	0
S5	2.4	1.18	0
S6	2.4	1.18	0
S7	2.4	1.18	0
S8	2.4	1.18	0
S9	2.4	1.18	0
S10	2.4	1.18	0
S11	2.4	1.18	0
S12	2.4	1.18	0
S13	2.4	1.18	0
S14	2.4	1.18	0
S15	2.4	1.18	0
S16	2.4	1.18	0
S17	2.4	1.18	0
S18	2.4	1.18	0
S19	2.4	1.18	0
S20	2.4	1.18	0
S21	2.4	1.18	0
S22	2.4	1.18	0
S23	2.4	1.18	0
S24	2.4	1.18	0
S25	2.4	1.18	0

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	49.5	3	0	0	0
J2	44.9	7	0	0	0
J3	40	4	0	0	0
J4	49	2.5	0	0	0
J5	47.8	2.25	0	0	0
J6	47.63	4	0	0	0
J7	37.62	10.38	0	0	0
J8	48.62	2.5	0	0	0
J9	33	14	0	0	0
J10	48	2	0	0	0
J11	48	2	0	0	0
J12	47	3	0	0	0
J13	54.25	1.75	0	0	0
J14	53.5	1.5	0	0	0
J15	46	5	0	0	0
J16	37.34	9.42	0	0	0
J17	37	10	0	0	0

J18	42	6	0	0	0
J19	33.64	11.36	0	0	0
J20	50.5	4.5	0	0	0
J21	50	5	0	0	0
J22	48.5	6.5	0	0	0
J23	45	5	0	0	0
J24	32.18	12.82	0	0	0
J25	41.7	6.58	0	0	0
J26	44.2	5.75	0	0	0
J27	40.6	9.5	0	0	0
J28	35.6	5.92	0	0	0
J29	35.6	5.25	0	0	0
J30	33.5	7.5	0	0	0
J31	31.8	9.42	0	0	0
J32	31.45	12.55	0	0	0
J33	28.9	14.9	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	29.77	FIXED	32.77	NO
OUT2	21.64	FIXED	24.71	NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;12" RCP C1	J1	J2	481	0.011	0	0	0	0
;18" RCP C2	J2	J3	481	0.011	0	0	0	0
;18" RCP C3	J3	J7	475	0.011	0	0	0	0
;12" RCP C4	J4	J6	97	0.011	0	0	0	0
;12" RCP C5	J5	J6	74	0.011	0	0	0	0
;12" RCP C6	J6	J7	289	0.011	0	0	0	0
;18" RCP C7	J7	J9	468	0.011	0	0	0	0
;12" PVC C8	J8	J9	407	0.011	0	0	0	0
;18" RCP C9	J9	OUT1	144	0.011	0	0	0	0
;18" RCP C10	J10	J12	42	0.011	0	0	0	0
;12" RCP C11	J11	J12	28	0.011	0	0	0	0
;12" RCP C12	J12	J15	300	0.011	0	0	0	0
;18" RCP C13	J13	J15	13	0.011	0	0	0	0
;18" RCP C14	J14	J15	23	0.011	0	0	0	0
;24" RCP C15	J15	J16	112	0.011	0	0	0	0
;24" RCP C16	J16	J17	39	0.011	0	0	0	0
;36" RCP C17	J17	J19	673	0.011	0	0	0	0
;18" RCP C18	J18	J19	41	0.011	0	0	0	0
;36" RCP C19	J19	J24	291	0.011	0	0	0	0
;12" PVC C20	J20	J22	30	0.011	0	0	0	0
;12" PVC C21	J21	J22	41	0.011	0	0	0	0
;12" RCP C22	J22	J23	476	0.011	0	0	0	0

```
;12" RCP
  C23              J23              J24              52        0.011     0         0         0         0
;36" RCP
  C24              J24              J33              656       0.011     0         0         0         0
;18" RCP
  C25              J25              J27              45        0.011     0         0         0         0
;18" RCP
  C26              J26              J27              21        0.011     0         0         0         0
;18" RCP
  C27              J27              J30              405       0.011     0         0         0         0
;18" RCP
  C28              J28              J30              41        0.011     0         0         0         0
;18" RCP
  C29              J29              J30              28        0.011     0         0         0         0
;36" RCP
  C30              J30              J31              107       0.011     0         0         0         0
;36" RCP
  C31              J31              J32              70        0.011     0         0         0         0
;36" RCP
  C32              J32              J33              22        0.011     0         0         0         0
;36" RCP
  C33              J33              OUT2             104       0.011     0         0         0         0

[XSECTIONS]
;;Link             Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-----------------------------------------------------------------------------------
  C1               CIRCULAR     1          0          0          0          1
  C2               CIRCULAR     1.5        0          0          0          1
  C3               CIRCULAR     2          0          0          0          1
  C4               CIRCULAR     1          0          0          0          1
  C5               CIRCULAR     1          0          0          0          1
  C6               CIRCULAR     1          0          0          0          1
  C7               CIRCULAR     2          0          0          0          1
  C8               CIRCULAR     1          0          0          0          1
  C9               CIRCULAR     2          0          0          0          1
  C10              CIRCULAR     1.5        0          0          0          1
  C11              CIRCULAR     1          0          0          0          1
  C12              CIRCULAR     1          0          0          0          1
  C13              CIRCULAR     1.5        0          0          0          1
  C14              CIRCULAR     1.5        0          0          0          1
  C15              CIRCULAR     2          0          0          0          1
  C16              CIRCULAR     2          0          0          0          1
  C17              CIRCULAR     3          0          0          0          1
  C18              CIRCULAR     1.5        0          0          0          1
  C19              CIRCULAR     3          0          0          0          1
  C20              CIRCULAR     1          0          0          0          1
  C21              CIRCULAR     1          0          0          0          1
  C22              CIRCULAR     1          0          0          0          1
  C23              CIRCULAR     1          0          0          0          1
  C24              CIRCULAR     3          0          0          0          1
  C25              CIRCULAR     1.5        0          0          0          1
  C26              CIRCULAR     1.5        0          0          0          1
  C27              CIRCULAR     1.5        0          0          0          1
  C28              CIRCULAR     1.5        0          0          0          1
  C29              CIRCULAR     1.5        0          0          0          1
  C30              CIRCULAR     3          0          0          0          1
  C31              CIRCULAR     3          0          0          0          1
  C32              CIRCULAR     3          0          0          0          1
  C33              CIRCULAR     3          0          0          0          1

[TIMESERIES]
;;Name             Date         Time       Value
;;-----------------------------------------------
;100 year 6 hour Type B SCS Design Storm Max Precip = 2.6
  100yr6hrCum2.6   10/01/2005 10:00       0.0
  100yr6hrCum2.6               10:15       0.0468
  100yr6hrCum2.6               10:30       0.091
  100yr6hrCum2.6               10:45       0.1508
  100yr6hrCum2.6               11:00       0.208
  100yr6hrCum2.6               11:15       0.2808
  100yr6hrCum2.6               11:30       0.351
  100yr6hrCum2.6               11:45       0.4758
```

```
 100yr6hrCum2.6                12:00      0.598
 100yr6hrCum2.6                12:15      1.079
 100yr6hrCum2.6                12:30      1.56
 100yr6hrCum2.6                12:45      1.69
 100yr6hrCum2.6                13:00      1.82
 100yr6hrCum2.6                13:15      1.924
 100yr6hrCum2.6                13:30      2.028
 100yr6hrCum2.6                13:45      2.1008
 100yr6hrCum2.6                14:00      2.171
 100yr6hrCum2.6                14:15      2.2308
 100yr6hrCum2.6                14:30      2.288
 100yr6hrCum2.6                14:45      2.34
 100yr6hrCum2.6                15:00      2.392
 100yr6hrCum2.6                15:15      2.444
 100yr6hrCum2.6                15:30      2.496
 100yr6hrCum2.6                15:45      2.548
 100yr6hrCum2.6                16:00      2.6

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BB – 1

Project BB – 2

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project BB (Washington Street Drainage Improvements)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BB (Washington Street Drainage Improvements)
100 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        13.024         2.600
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         3.704         0.740
Surface Runoff ...........         9.468         1.890
Final Surface Storage ....         0.008         0.002
Continuity Error (%) .....        -1.203

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         9.502         3.096
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         8.697         2.834
Surface Flooding .........         0.807         0.263
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.024

***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
-------------------------------------------------------------------------------
S1                    2.600      0.000      0.000      0.468      2.160      0.831
S2                    2.600      0.000      0.000      0.533      2.088      0.803
S3                    2.600      0.000      0.000      0.725      1.906      0.733
S4                    2.600      0.000      0.000      0.750      1.883      0.724
S5                    2.600      0.000      0.000      0.748      1.883      0.724
S6                    2.600      0.000      0.000      0.744      1.883      0.724
S7                    2.600      0.000      0.000      0.750      1.887      0.726
S8                    2.600      0.000      0.000      0.774      1.860      0.715
S9                    2.600      0.000      0.000      0.772      1.860      0.715
S10                   2.600      0.000      0.000      0.770      1.860      0.715
S11                   2.600      0.000      0.000      0.812      1.815      0.698
S12                   2.600      0.000      0.000      0.726      1.906      0.733
S13                   2.600      0.000      0.000      0.822      1.813      0.697
S14                   2.600      0.000      0.000      0.797      1.837      0.706
S15                   2.600      0.000      0.000      0.794      1.837      0.707
```

S16	2.600	0.000	0.000	0.769	1.860	0.716
S17	2.600	0.000	0.000	0.783	1.855	0.713
S18	2.600	0.000	0.000	0.821	1.813	0.697
S19	2.600	0.000	0.000	0.745	1.883	0.724
S20	2.600	0.000	0.000	0.889	1.690	0.650
S21	2.600	0.000	0.000	0.754	1.882	0.724
S22	2.600	0.000	0.000	0.817	1.814	0.698
S23	2.600	0.000	0.000	0.769	1.860	0.715
S24	2.600	0.000	0.000	0.774	1.860	0.715
S25	2.600	0.000	0.000	0.750	1.887	0.726
Totals	2.600	0.000	0.000	0.740	1.890	0.727

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.07	0.81	50.31	0 14:45	0	0
J2	0.14	7.00	51.90	0 14:36	0.01	10
J3	0.12	1.50	41.50	0 14:37	0	0
J4	0.05	0.55	49.55	0 14:45	0	0
J5	0.11	2.25	50.05	0 14:24	0.37	29
J6	0.09	1.00	48.63	0 14:25	0	0
J7	0.14	1.46	39.08	0 14:46	0	0
J8	0.11	2.50	51.12	0 14:25	0.95	26
J9	0.14	1.53	34.53	0 14:45	0	0
J10	0.06	0.56	48.56	0 14:45	0	0
J11	0.06	0.68	48.68	0 14:45	0	0
J12	0.27	3.00	50.00	0 13:58	4.93	86
J13	0.01	0.06	54.31	0 14:45	0	0
J14	0.01	0.14	53.64	0 14:45	0	0
J15	0.15	1.00	47.00	0 14:03	0	0
J16	0.10	0.75	38.09	0 14:45	0	0
J17	0.10	0.75	37.75	0 14:45	0	0
J18	0.04	0.42	42.42	0 14:45	0	0
J19	0.14	1.14	34.78	0 14:45	0	0
J20	0.03	0.31	50.81	0 14:45	0	0
J21	0.03	0.29	50.29	0 14:45	0	0
J22	0.35	6.50	55.00	0 14:17	3.42	56
J23	0.15	1.00	46.00	0 14:23	0	0
J24	0.18	1.27	33.45	0 14:45	0	0
J25	0.02	0.24	41.94	0 14:45	0	0
J26	0.02	0.24	44.44	0 14:45	0	0
J27	0.05	0.50	41.10	0 14:45	0	0
J28	0.04	0.38	35.98	0 14:45	0	0
J29	0.04	0.38	35.98	0 14:45	0	0
J30	0.07	0.73	34.23	0 14:45	0	0
J31	0.10	0.98	32.78	0 14:45	0	0
J32	0.10	0.98	32.43	0 14:45	0	0
J33	0.18	1.27	30.17	0 14:46	0	0
OUT1	0.90	2.00	31.77	0 12:16	0	0
OUT2	1.58	3.00	24.64	0 12:17	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	4.10	0 14:45	6.12	1.00	0.99	0
C2	13.55	0 14:46	8.43	1.00	1.08	10
C3	13.14	0 14:46	6.63	1.00	0.69	0

C4	2.97	0	14:45	6.65	1.00	0.59	0
C5	2.10	0	14:52	3.05	1.00	1.04	28
C6	7.42	0	14:45	11.40	1.00	0.95	0
C7	23.34	0	14:45	9.63	1.00	0.88	0
C8	8.68	0	14:51	12.50	1.00	1.05	24
C9	37.31	0	14:45	14.48	1.00	0.93	0
C10	5.64	0	14:45	9.42	1.00	0.29	0
C11	6.37	0	14:45	11.26	1.00	0.80	0
C12	2.62	0	15:24	3.64	1.00	1.08	84
C13	0.29	0	14:45	12.37	1.00	0.00	0
C14	1.21	0	14:45	15.07	1.00	0.02	0
C15	3.93	0	14:45	12.54	1.00	0.05	0
C16	7.49	0	14:45	6.94	1.00	0.30	0
C17	7.51	0	14:45	5.56	1.00	0.13	0
C18	9.65	0	14:45	23.71	1.00	0.17	0
C19	17.11	0	14:45	6.97	1.00	0.31	0
C20	2.22	0	14:45	10.87	1.00	0.20	0
C21	1.45	0	14:45	7.75	1.00	0.18	0
C22	3.89	0	15:13	5.39	1.00	1.08	53
C23	3.86	0	15:13	20.33	1.00	0.18	0
C24	20.73	0	14:46	7.35	1.00	0.37	0
C25	1.10	0	14:45	5.94	1.00	0.06	0
C26	2.85	0	14:45	15.63	1.00	0.06	0
C27	3.94	0	14:45	7.70	1.00	0.24	0
C28	4.01	0	14:45	11.26	1.00	0.14	0
C29	4.80	0	14:45	13.59	1.00	0.14	0
C30	12.75	0	14:45	9.67	1.00	0.13	0
C31	12.75	0	14:45	6.39	1.00	0.23	0
C32	12.75	0	14:45	19.54	1.00	0.05	0
C33	33.42	0	14:45	21.59	1.00	0.16	0

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.05

Analysis begun on:  Wed Jun 07 16:03:14 2006
Total elapsed time: < 1 sec
```

Project BB – 1

Project BB – 2

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project BB (Washington Street Drainage Improvements)

```
[TITLE]
Drainage Project BB (Washington Street Drainage Improvements)
25 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS            CFS
 INFILTRATION          GREEN_AMPT
 FLOW_ROUTING          KINWAVE
 START_DATE            09/30/2005
 START_TIME            22:00:00
 REPORT_START_DATE     09/30/2005
 REPORT_START_TIME     22:00:00
 END_DATE              10/02/2005
 END_TIME              00:00:00
 SWEEP_START           01/01
 SWEEP_END             12/31
 DRY_DAYS              0
 REPORT_STEP           00:15:00
 WET_STEP              00:15:00
 DRY_STEP              01:00:00
 ROUTING_STEP          0:00:30
 ALLOW_PONDING         NO
 INERTIAL_DAMPING      PARTIAL
 VARIABLE_STEP         0.75
 LENGTHENING_STEP      0
 MIN_SURFAREA          0
 NORMAL_FLOW_LIMITED   NO
 SKIP_STEADY_STATE     NO

[RAINGAGES]
;;                  Rain       Recd.  Snow   Data       Source            Station    Rain
;;Name              Type       Freq.  Catch  Source     Name              ID         Units
;;-------------------------------------------------------------------------------------------
  R1                CUMULATIVE 0:15   1.0    TIMESERIES 25yr6hrCum2.1

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.              Pcnt.    Curb     Snow
;;Name              Raingage          Outlet         Area     Imperv   Width     Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------------
  S1                R1                J1             2.4      80       246       0.941    0
  S2                R1                J2             5.12     77       743       3        0
  S3                R1                J4             1.89     69       206       2.2      0
  S4                R1                J5             1.98     68       207       1.9      0
  S5                R1                J6             1.56     68       181       2.1      0
  S6                R1                J7             2.18     68       292       3.1      0
  S7                R1                J8             7.19     68       696       2.2      0
  S8                R1                J9             3.7      67       383       1.9      0
  S9                R1                J10            2.49     67       252       2.8      0
  S10               R1                J11            2.21     67       241       3        0
  S11               R1                J10            1.17     65       221       2.8      0
  S12               R1                J11            1.88     69       182       2.2      0
  S13               R1                J13            0.19     65       24        1.14     0
  S14               R1                J14            0.79     66       104       1.2      0
  S15               R1                J16            1.47     66       169       2.9      0
  S16               R1                J16            0.84     67       108       2.6      0
  S17               R1                J18            6.25     67       340       2        0
  S18               R1                J20            1.46     65       193       1.2      0
  S19               R1                J21            0.93     68       144       2.1      0
  S20               R1                J22            2.96     65       24        0.189    0
  S21               R1                J22            3.22     68       255       1.8      0
  S22               R1                J25            0.72     65       116       1.5      0
  S23               R1                J26            1.84     67       211       3.68     0
  S24               R1                J28            2.59     67       245       2.2      0
  S25               R1                J29            3.08     68       280       2.5      0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------------------------------------------------------------------------------------
  S1                0.011      0.015      0.05       0.05       100        OUTLET
  S2                0.011      0.015      0.05       0.05       100        OUTLET
  S3                0.011      0.015      0.05       0.05       100        OUTLET
  S4                0.011      0.015      0.05       0.05       100        OUTLET
```

S5	0.011	0.015	0.05	0.05	100	OUTLET
S6	0.011	0.015	0.05	0.05	100	OUTLET
S7	0.011	0.015	0.05	0.05	100	OUTLET
S8	0.011	0.015	0.05	0.05	100	OUTLET
S9	0.011	0.015	0.05	0.05	100	OUTLET
S10	0.011	0.015	0.05	0.05	100	OUTLET
S11	0.011	0.015	0.05	0.05	100	OUTLET
S12	0.011	0.015	0.05	0.05	100	OUTLET
S13	0.011	0.015	0.05	0.05	100	OUTLET
S14	0.011	0.015	0.05	0.05	100	OUTLET
S15	0.011	0.015	0.05	0.05	100	OUTLET
S16	0.011	0.015	0.05	0.05	100	OUTLET
S17	0.011	0.015	0.05	0.05	100	OUTLET
S18	0.011	0.015	0.05	0.05	100	OUTLET
S19	0.011	0.015	0.05	0.05	100	OUTLET
S20	0.011	0.015	0.05	0.05	100	OUTLET
S21	0.011	0.015	0.05	0.05	100	OUTLET
S22	0.011	0.015	0.05	0.05	100	OUTLET
S23	0.011	0.015	0.05	0.05	100	OUTLET
S24	0.011	0.015	0.05	0.05	100	OUTLET
S25	0.011	0.015	0.05	0.05	100	OUTLET

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	2.4	1.18	0
S2	2.4	1.18	0
S3	2.4	1.18	0
S4	2.4	1.18	0
S5	2.4	1.18	0
S6	2.4	1.18	0
S7	2.4	1.18	0
S8	2.4	1.18	0
S9	2.4	1.18	0
S10	2.4	1.18	0
S11	2.4	1.18	0
S12	2.4	1.18	0
S13	2.4	1.18	0
S14	2.4	1.18	0
S15	2.4	1.18	0
S16	2.4	1.18	0
S17	2.4	1.18	0
S18	2.4	1.18	0
S19	2.4	1.18	0
S20	2.4	1.18	0
S21	2.4	1.18	0
S22	2.4	1.18	0
S23	2.4	1.18	0
S24	2.4	1.18	0
S25	2.4	1.18	0

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	49.5	3	0	0	0
J2	44.9	7	0	0	0
J3	40	4	0	0	0
J4	49	2.5	0	0	0
J5	47.8	2.25	0	0	0
J6	47.63	4	0	0	0
J7	37.62	10.38	0	0	0
J8	48.62	2.5	0	0	0
J9	33	14	0	0	0
J10	48	2	0	0	0
J11	48	2	0	0	0
J12	47	3	0	0	0
J13	54.25	1.75	0	0	0
J14	53.5	1.5	0	0	0
J15	46	5	0	0	0
J16	37.34	9.42	0	0	0
J17	37	10	0	0	0

J18	42	6	0	0	0
J19	33.64	11.36	0	0	0
J20	50.5	4.5	0	0	0
J21	50	5	0	0	0
J22	48.5	6.5	0	0	0
J23	45	5	0	0	0
J24	32.18	12.82	0	0	0
J25	41.7	6.58	0	0	0
J26	44.2	5.75	0	0	0
J27	40.6	9.5	0	0	0
J28	35.6	5.92	0	0	0
J29	35.6	5.25	0	0	0
J30	33.5	7.5	0	0	0
J31	31.8	9.42	0	0	0
J32	31.45	12.55	0	0	0
J33	28.9	14.9	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	29.77	FIXED	32.77	NO
OUT2	21.64	FIXED	24.71	NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;12" RCP C1	J1	J2	481	0.011	0	0	0	0
;18" RCP C2	J2	J3	481	0.011	0	0	0	0
;18" RCP C3	J3	J7	475	0.011	0	0	0	0
;12" RCP C4	J4	J6	97	0.011	0	0	0	0
;12" RCP C5	J5	J6	74	0.011	0	0	0	0
;12" RCP C6	J6	J7	289	0.011	0	0	0	0
;18" RCP C7	J7	J9	468	0.011	0	0	0	0
;12" PVC C8	J8	J9	407	0.011	0	0	0	0
;18" RCP C9	J9	OUT1	144	0.011	0	0	0	0
;18" RCP C10	J10	J12	42	0.011	0	0	0	0
;12" RCP C11	J11	J12	28	0.011	0	0	0	0
;12" RCP C12	J12	J15	300	0.011	0	0	0	0
;18" RCP C13	J13	J15	13	0.011	0	0	0	0
;18" RCP C14	J14	J15	23	0.011	0	0	0	0
;24" RCP C15	J15	J16	112	0.011	0	0	0	0
;24" RCP C16	J16	J17	39	0.011	0	0	0	0
;36" RCP C17	J17	J19	673	0.011	0	0	0	0
;18" RCP C18	J18	J19	41	0.011	0	0	0	0
;36" RCP C19	J19	J24	291	0.011	0	0	0	0
;12" PVC C20	J20	J22	30	0.011	0	0	0	0
;12" PVC C21	J21	J22	41	0.011	0	0	0	0
;12" RCP C22	J22	J23	476	0.011	0	0	0	0

;12" RCP								
C23	J23	J24	52	0.011	0	0	0	0
;36" RCP								
C24	J24	J33	656	0.011	0	0	0	0
;18" RCP								
C25	J25	J27	45	0.011	0	0	0	0
;18" RCP								
C26	J26	J27	21	0.011	0	0	0	0
;18" RCP								
C27	J27	J30	405	0.011	0	0	0	0
;18" RCP								
C28	J28	J30	41	0.011	0	0	0	0
;18" RCP								
C29	J29	J30	28	0.011	0	0	0	0
;36" RCP								
C30	J30	J31	107	0.011	0	0	0	0
;36" RCP								
C31	J31	J32	70	0.011	0	0	0	0
;36" RCP								
C32	J32	J33	22	0.011	0	0	0	0
;36" RCP								
C33	J33	OUT2	104	0.011	0	0	0	0

[XSECTIONS]

;;Link	Type	Geom1	Geom2	Geom3	Geom4	Barrels
C1	CIRCULAR	1	0	0	0	1
C2	CIRCULAR	1.5	0	0	0	1
C3	CIRCULAR	2	0	0	0	1
C4	CIRCULAR	1	0	0	0	1
C5	CIRCULAR	1	0	0	0	1
C6	CIRCULAR	1	0	0	0	1
C7	CIRCULAR	2	0	0	0	1
C8	CIRCULAR	1	0	0	0	1
C9	CIRCULAR	2	0	0	0	1
C10	CIRCULAR	1.5	0	0	0	1
C11	CIRCULAR	1	0	0	0	1
C12	CIRCULAR	1	0	0	0	1
C13	CIRCULAR	1.5	0	0	0	1
C14	CIRCULAR	1.5	0	0	0	1
C15	CIRCULAR	2	0	0	0	1
C16	CIRCULAR	2	0	0	0	1
C17	CIRCULAR	3	0	0	0	1
C18	CIRCULAR	1.5	0	0	0	1
C19	CIRCULAR	3	0	0	0	1
C20	CIRCULAR	1	0	0	0	1
C21	CIRCULAR	1	0	0	0	1
C22	CIRCULAR	1	0	0	0	1
C23	CIRCULAR	1	0	0	0	1
C24	CIRCULAR	3	0	0	0	1
C25	CIRCULAR	1.5	0	0	0	1
C26	CIRCULAR	1.5	0	0	0	1
C27	CIRCULAR	1.5	0	0	0	1
C28	CIRCULAR	1.5	0	0	0	1
C29	CIRCULAR	1.5	0	0	0	1
C30	CIRCULAR	3	0	0	0	1
C31	CIRCULAR	3	0	0	0	1
C32	CIRCULAR	3	0	0	0	1
C33	CIRCULAR	3	0	0	0	1

[TIMESERIES]

;;Name	Date	Time	Value
;100 year 6 hour Type B SCS Design Storm Max Precip = 2.6			
100yr6hrCum2.6	10/01/2005	10:00	0.0
100yr6hrCum2.6		10:15	0.0468
100yr6hrCum2.6		10:30	0.091
100yr6hrCum2.6		10:45	0.1508
100yr6hrCum2.6		11:00	0.208
100yr6hrCum2.6		11:15	0.2808
100yr6hrCum2.6		11:30	0.351
100yr6hrCum2.6		11:45	0.4758

```
 100yr6hrCum2.6                12:00      0.598
 100yr6hrCum2.6                12:15      1.079
 100yr6hrCum2.6                12:30      1.56
 100yr6hrCum2.6                12:45      1.69
 100yr6hrCum2.6                13:00      1.82
 100yr6hrCum2.6                13:15      1.924
 100yr6hrCum2.6                13:30      2.028
 100yr6hrCum2.6                13:45      2.1008
 100yr6hrCum2.6                14:00      2.171
 100yr6hrCum2.6                14:15      2.2308
 100yr6hrCum2.6                14:30      2.288
 100yr6hrCum2.6                14:45      2.34
 100yr6hrCum2.6                15:00      2.392
 100yr6hrCum2.6                15:15      2.444
 100yr6hrCum2.6                15:30      2.496
 100yr6hrCum2.6                15:45      2.548
 100yr6hrCum2.6                16:00      2.6

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
  25yr6hrCum2.1                10:00      0
  25yr6hrCum2.1                10:15      0.0378
  25yr6hrCum2.1                10:30      0.0735
  25yr6hrCum2.1                10:45      0.1218
  25yr6hrCum2.1                11:00      0.168
  25yr6hrCum2.1                11:15      0.2268
  25yr6hrCum2.1                11:30      0.2835
  25yr6hrCum2.1                11:45      0.3843
  25yr6hrCum2.1                12:00      0.483
  25yr6hrCum2.1                12:15      0.8715
  25yr6hrCum2.1                12:30      1.26
  25yr6hrCum2.1                12:45      1.365
  25yr6hrCum2.1                13:00      1.47
  25yr6hrCum2.1                13:15      1.554
  25yr6hrCum2.1                13:30      1.638
  25yr6hrCum2.1                13:45      1.6968
  25yr6hrCum2.1                14:00      1.7535
  25yr6hrCum2.1                14:15      1.8018
  25yr6hrCum2.1                14:30      1.848
  25yr6hrCum2.1                14:45      1.89
  25yr6hrCum2.1                15:00      1.932
  25yr6hrCum2.1                15:15      1.974
  25yr6hrCum2.1                15:30      2.016
  25yr6hrCum2.1                15:45      2.058
  25yr6hrCum2.1                16:00      2.1

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BB – 1

Project BB – 2

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project BB (Washington Street Drainage Improvements)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BB (Washington Street Drainage Improvements)
25 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        10.519         2.100
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         3.164         0.632
Surface Runoff ...........         7.442         1.486
Final Surface Storage ....         0.006         0.001
Continuity Error (%) .....        -0.882

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         7.465         2.432
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         7.035         2.292
Surface Flooding .........         0.431         0.140
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.021

***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap       Infil     Runoff      Coeff
Subcatchment            in         in         in          in         in
-------------------------------------------------------------------------------
S1                    2.100      0.000      0.000      0.401      1.718      0.818
S2                    2.100      0.000      0.000      0.457      1.658      0.789
S3                    2.100      0.000      0.000      0.621      1.498      0.713
S4                    2.100      0.000      0.000      0.642      1.478      0.704
S5                    2.100      0.000      0.000      0.641      1.478      0.704
S6                    2.100      0.000      0.000      0.638      1.479      0.704
S7                    2.100      0.000      0.000      0.642      1.477      0.704
S8                    2.100      0.000      0.000      0.662      1.457      0.694
S9                    2.100      0.000      0.000      0.661      1.458      0.694
S10                   2.100      0.000      0.000      0.660      1.458      0.694
S11                   2.100      0.000      0.000      0.697      1.421      0.676
S12                   2.100      0.000      0.000      0.622      1.498      0.713
S13                   2.100      0.000      0.000      0.703      1.417      0.675
S14                   2.100      0.000      0.000      0.682      1.437      0.684
S15                   2.100      0.000      0.000      0.680      1.439      0.685
```

S16	2.100	0.000	0.000	0.659	1.459	0.695
S17	2.100	0.000	0.000	0.668	1.454	0.692
S18	2.100	0.000	0.000	0.703	1.417	0.675
S19	2.100	0.000	0.000	0.639	1.479	0.704
S20	2.100	0.000	0.000	0.732	1.352	0.644
S21	2.100	0.000	0.000	0.644	1.476	0.703
S22	2.100	0.000	0.000	0.700	1.419	0.676
S23	2.100	0.000	0.000	0.659	1.459	0.695
S24	2.100	0.000	0.000	0.662	1.457	0.694
S25	2.100	0.000	0.000	0.642	1.478	0.704
Totals	2.100	0.000	0.000	0.632	1.486	0.707

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.06	0.66	50.16	0 12:45	0	0
J2	0.10	1.00	45.90	0 12:45	0	0
J3	0.10	1.02	41.02	0 12:45	0	0
J4	0.05	0.47	49.47	0 12:45	0	0
J5	0.10	2.25	50.05	0 12:28	0.08	20
J6	0.08	1.00	48.63	0 12:30	0	0
J7	0.12	1.23	38.85	0 12:45	0	0
J8	0.08	2.50	51.12	0 12:35	0.02	11
J9	0.13	1.32	34.32	0 12:45	0	0
J10	0.05	0.48	48.48	0 12:45	0	0
J11	0.05	0.56	48.56	0 12:45	0	0
J12	0.19	3.00	50.00	0 12:16	3.17	45
J13	0.01	0.05	54.30	0 12:45	0	0
J14	0.01	0.12	53.62	0 12:45	0	0
J15	0.14	1.00	47.00	0 12:21	0	0
J16	0.09	0.68	38.02	0 12:45	0	0
J17	0.10	0.68	37.68	0 12:45	0	0
J18	0.04	0.36	42.36	0 12:45	0	0
J19	0.12	1.01	34.65	0 12:45	0	0
J20	0.03	0.27	50.77	0 12:45	0	0
J21	0.03	0.25	50.25	0 12:45	0	0
J22	0.28	6.50	55.00	0 12:20	1.90	40
J23	0.14	1.00	46.00	0 12:25	0	0
J24	0.17	1.14	33.32	0 12:45	0	0
J25	0.02	0.21	41.91	0 12:45	0	0
J26	0.02	0.21	44.41	0 12:45	0	0
J27	0.04	0.43	41.03	0 12:45	0	0
J28	0.04	0.33	35.93	0 12:45	0	0
J29	0.04	0.33	35.93	0 12:45	0	0
J30	0.07	0.63	34.13	0 12:45	0	0
J31	0.09	0.85	32.65	0 12:45	0	0
J32	0.09	0.85	32.30	0 12:45	0	0
J33	0.17	1.14	30.04	0 12:46	0	0
OUT1	0.90	2.00	31.77	0 10:16	0	0
OUT2	1.81	3.00	24.64	0 10:18	0	0

****
Conduit Flow Summary
****

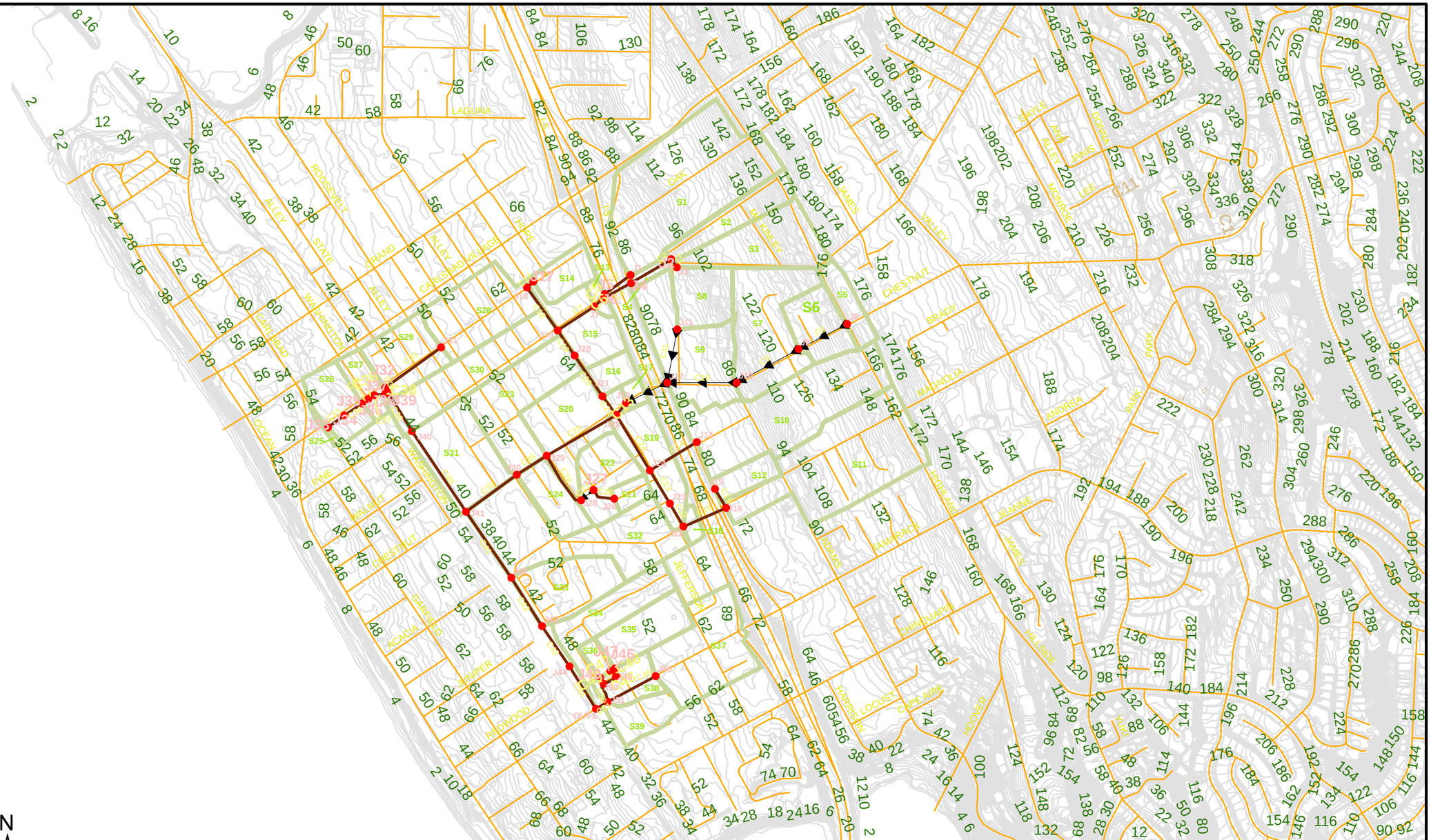
Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	3.19	0 12:45	5.87	1.00	0.77	0
C2	9.80	0 12:45	7.92	1.00	0.78	0
C3	9.79	0 12:46	6.13	1.00	0.52	0

C4	2.26	0	12:45	6.22	1.00	0.45	0
C5	2.11	0	12:48	3.04	1.00	1.05	19
C6	6.12	0	12:45	11.07	1.00	0.78	0
C7	18.47	0	12:45	9.16	1.00	0.70	0
C8	8.69	0	12:46	12.46	1.00	1.05	10
C9	31.04	0	12:45	14.09	1.00	0.78	0
C10	4.27	0	12:45	8.72	1.00	0.22	0
C11	4.84	0	12:45	10.62	1.00	0.61	0
C12	2.63	0	13:00	3.70	1.00	1.08	41
C13	0.22	0	12:45	11.33	1.00	0.00	0
C14	0.92	0	12:45	13.95	1.00	0.01	0
C15	3.57	0	12:45	12.21	1.00	0.05	0
C16	6.26	0	12:45	6.61	1.00	0.25	0
C17	6.27	0	12:45	5.27	1.00	0.11	0
C18	7.27	0	12:45	21.90	1.00	0.13	0
C19	13.49	0	12:45	6.52	1.00	0.24	0
C20	1.68	0	12:45	10.03	1.00	0.15	0
C21	1.10	0	12:45	7.18	1.00	0.14	0
C22	3.89	0	13:00	5.65	1.00	1.08	36
C23	3.86	0	13:00	20.25	1.00	0.18	0
C24	17.10	0	12:46	6.98	1.00	0.31	0
C25	0.83	0	12:45	5.48	1.00	0.04	0
C26	2.16	0	12:45	14.44	1.00	0.04	0
C27	2.99	0	12:45	7.11	1.00	0.18	0
C28	3.04	0	12:45	10.40	1.00	0.11	0
C29	3.65	0	12:45	12.56	1.00	0.11	0
C30	9.66	0	12:45	8.92	1.00	0.10	0
C31	9.66	0	12:45	5.90	1.00	0.17	0
C32	9.66	0	12:45	17.97	1.00	0.04	0
C33	26.69	0	12:45	20.27	1.00	0.13	0

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.04

Analysis begun on:  Wed Jun 07 16:03:32 2006
Total elapsed time: < 1 sec
```

Project BB 84 INCH
Backwater Check
Washington Street Project



N
W E
S

0 500 1,000 2,000
Feet

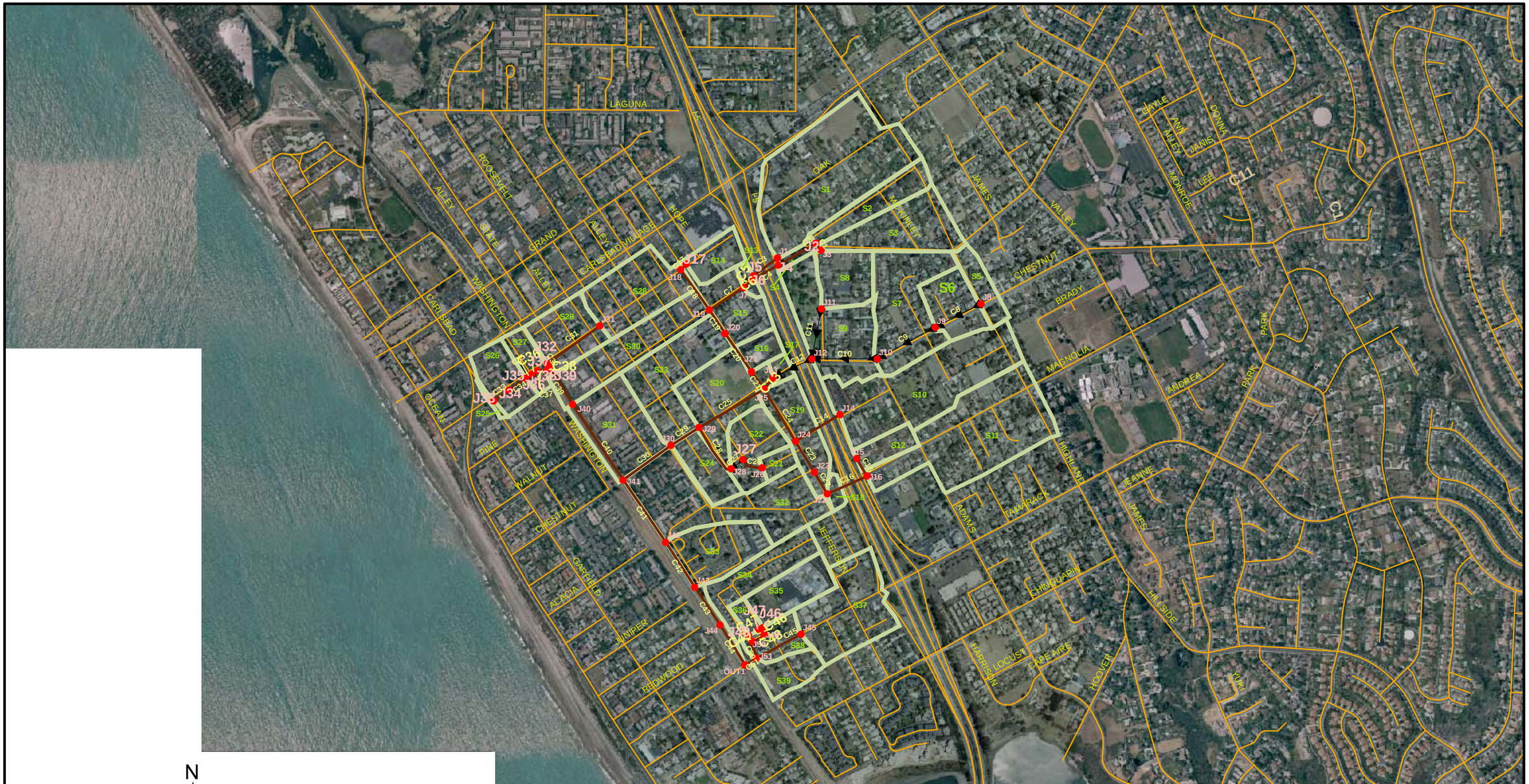
LEGEND

- JUNCTIONS
- CMP
- GUTTER
- RCP
- OVERLAND FLOW
- SUBCATCHMENTS
- ROADS
- CONTOURS

PROJECT BB
84 INCH PIPE

PROJECT LOCATION	DATE	PROJECT NUMBER
WASHINGTON STREET CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA



N
W E
S

0 500 1,000 2,000
Feet

LEGEND

- JUNCTIONS
- CMP
- GUTTER
- Gutter
- RCP
- OVERLAND FLOW
- SUBCATCHMENTS
- ROADS

PROJECT BB
84 INCH PIPE

PROJECT LOCATION	DATE	PROJECT NUMBER
WASHINGTON STREET CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project BB 84 INCH

Backwater Check

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
[TITLE]
Drainage Project BB - 84 inch (Washington St. Drainage Improvements)
100 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS            CFS
 INFILTRATION          GREEN_AMPT
 FLOW_ROUTING          KINWAVE
 START_DATE            09/30/2005
 START_TIME            22:00:00
 REPORT_START_DATE     09/30/2005
 REPORT_START_TIME     22:00:00
 END_DATE              10/03/2005
 END_TIME              00:00:00
 SWEEP_START           01/01
 SWEEP_END             12/31
 DRY_DAYS              0
 REPORT_STEP           00:15:00
 WET_STEP              00:15:00
 DRY_STEP              01:00:00
 ROUTING_STEP          0:00:30
 ALLOW_PONDING         NO
 INERTIAL_DAMPING      PARTIAL
 VARIABLE_STEP         0.75
 LENGTHENING_STEP      0
 MIN_SURFAREA          0
 NORMAL_FLOW_LIMITED   NO
 SKIP_STEADY_STATE     NO

[RAINGAGES]
;;
;;Name            Rain       Recd.  Snow   Data       Source          Station    Rain
                  Type       Freq.  Catch  Source     Name            ID         Units
;;----------------------------------------------------------------------------------
  R1              CUMULATIVE 0:15   1.0    TIMESERIES 100yr6hrCum2.6

[SUBCATCHMENTS]
;;
;;Name            Raingage         Outlet           Total    Pcnt.    Width    Pcnt.    Curb     Snow
                                                    Area     Imperv           Slope    Length   Pack
;;----------------------------------------------------------------------------------------------------
  S1              R1               J1               32.31    25       757      5.59     0
  S2              R1               J2               6.9      25       220      6.72     0
  S3              R1               J3               12.52    25       376      6.3      0
  S4              R1               J4               1.25     12       127      2.33     0
  S5              R1               J8               4.17     25       319      2.28     0
  S6              R1               J9               7.32     25       490      5.08     0
  S7              R1               J10              17.14    25       439      4.35     0
  S8              R1               J11              7.14     26       404      5.71     0
  S9              R1               J12              16.07    23       700      3.6      0
  S10             R1               J14              25.97    32       586      4.97     0
  S11             R1               J16              27.11    27       570      4.83     0
  S12             R1               J15              3.53     47       237      2.92     0
  S13             R1               J7               1.1      40       174      1.45     0
  S14             R1               J18              4.4      49       325      1.36     0
  S15             R1               J20              8.27     41       554      0.92     0
  S16             R1               J21              2.83     40       257      1.25     0
  S17             R1               J13              1.12     40       188      1.15     0
  S18             R1               J22              1.06     33       231      1.5      0
  S19             R1               J25              9.29     37       337      25       0
  S20             R1               J29              13.07    47       662      1.05     0
  S21             R1               J26              1.9      3        251      91       0
  S22             R1               J28              7.73     37       561      1.5      0
  S23             R1               J30              14.76    53       367      0.8      0
  S24             R1               J30              5.91     31       322      0.63     0
  S25             R1               J33              0.46     25       106      1        0
  S26             R1               J35              6.55     65       476      1        0
  S27             R1               J39              5        60       292      0.5      0
  S28             R1               J31              13.2     69       575      1.4      0
  S29             R1               J32              8.71     85       480      1.27     0
  S30             R1               J40              13.46    63       345      1.41     0
  S31             R1               J41              13.21    75       548      0.76     0
  S32             R1               J42              22.49    38       516      0.95     0
  S33             R1               J43              10.4     42       503      1.78     0
```

S34	R1	J49	9.46	42	259	0.38	0
S35	R1	J46	7.56	51	366	1.11	0
S36	R1	J47	1.41	40	166	0.54	0
S37	R1	J45	15.73	46	571	1.67	0
S38	R1	J51	4.78	36	353	1.36	0
S39	R1	OUT1	5.23	28	268	0.94	0

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
S1	0.011	0.15	0.05	0.1	100	OUTLET	
S2	0.011	0.15	0.05	0.1	100	OUTLET	
S3	0.011	0.15	0.05	0.1	100	OUTLET	
S4	0.011	0.15	0.05	0.1	100	OUTLET	
S5	0.011	0.15	0.05	0.1	100	OUTLET	
S6	0.011	0.15	0.05	0.1	100	OUTLET	
S7	0.011	0.15	0.05	0.1	100	OUTLET	
S8	0.011	0.15	0.05	0.1	100	OUTLET	
S9	0.011	0.15	0.05	0.1	100	OUTLET	
S10	0.011	0.15	0.05	0.1	100	OUTLET	
S11	0.011	0.15	0.05	0.1	100	OUTLET	
S12	0.011	0.15	0.05	0.1	100	OUTLET	
S13	0.011	0.15	0.05	0.1	100	OUTLET	
S14	0.011	0.15	0.05	0.1	100	OUTLET	
S15	0.011	0.15	0.05	0.1	100	OUTLET	
S16	0.011	0.15	0.05	0.1	100	OUTLET	
S17	0.011	0.15	0.05	0.1	100	OUTLET	
S18	0.011	0.15	0.05	0.1	100	OUTLET	
S19	0.011	0.15	0.05	0.1	100	OUTLET	
S20	0.011	0.15	0.05	0.1	100	OUTLET	
S21	0.011	0.15	0.05	0.1	100	OUTLET	
S22	0.011	0.15	0.05	0.1	100	OUTLET	
S23	0.011	0.15	0.05	0.1	100	OUTLET	
S24	0.011	0.15	0.05	0.1	100	OUTLET	
S25	0.011	0.15	0.05	0.1	100	OUTLET	
S26	0.011	0.15	0.05	0.05	100	OUTLET	
S27	0.011	0.015	0.05	0.05	100	OUTLET	
S28	0.011	0.15	0.05	0.1	100	OUTLET	
S29	0.011	0.15	0.05	0.1	100	OUTLET	
S30	0.011	0.15	0.05	0.1	100	OUTLET	
S31	0.011	0.15	0.05	0.1	100	OUTLET	
S32	0.011	0.15	0.05	0.1	100	OUTLET	
S33	0.011	0.15	0.05	0.1	100	OUTLET	
S34	0.011	0.15	0.05	0.1	100	OUTLET	
S35	0.011	0.15	0.05	0.1	100	OUTLET	
S36	0.011	0.15	0.05	0.1	100	OUTLET	
S37	0.011	0.15	0.05	0.1	100	OUTLET	
S38	0.011	0.15	0.05	0.1	100	OUTLET	
S39	0.011	0.15	0.05	0.1	100	OUTLET	

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	2.4	1.18	0
S2	2.4	1.18	0
S3	2.4	1.18	0
S4	2.4	1.18	0
S5	2.4	1.18	0
S6	2.4	1.18	0
S7	2.4	1.18	0
S8	2.4	1.18	0
S9	2.4	1.18	0
S10	2.4	1.18	0
S11	2.4	1.18	0
S12	2.4	1.18	0
S13	2.4	1.18	0
S14	2.4	1.18	0
S15	2.4	1.18	0
S16	2.4	1.18	0
S17	2.4	1.18	0
S18	2.4	1.18	0
S19	2.4	1.18	0

S20	2.4	1.18	0
S21	2.4	1.18	0
S22	2.4	1.18	0
S23	2.4	1.18	0
S24	2.4	1.18	0
S25	2.4	1.18	0
S26	2.4	1.18	0
S27	2.4	1.18	0
S28	2.4	1.18	0
S29	2.4	1.18	0
S30	2.4	1.18	0
S31	2.4	1.18	0
S32	2.4	1.18	0
S33	2.4	1.18	0
S34	2.4	1.18	0
S35	2.4	1.18	0
S36	2.4	1.18	0
S37	2.4	1.18	0
S38	2.4	1.18	0
S39	2.4	1.18	0

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	71.4	0	0	0	0
J2	77.2	0	0	0	0
J3	81.4	0	0	0	0
J4	71.4	0	0	0	0
J5	66	6	0	0	0
J6	65	6	0	0	0
J7	62	6	0	0	0
J8	167	0	0	0	0
J9	131	0	0	0	0
J10	92	0	0	0	0
J11	81	0	0	0	0
J12	72	0	0	0	0
J13	59	6	0	0	0
J14	69	0	0	0	0
J15	73	0	0	0	0
J16	69	0	0	0	0
J17	59	0	0	0	0
J18	58	4	0	0	0
J19	56.5	6.5	0	0	0
J20	56	7	0	0	0
J21	54.2	7.8	0	0	0
J22	53	8.3	0	0	0
J23	52	9	0	0	0
J24	49	11	0	0	0
J25	47	16	0	0	0
J26	54.52	0	0	0	0
J27	53.2	0	0	0	0
J28	51.2	0	0	0	0
J29	39.5	12	0	0	0
J30	36	14	0	0	0
J31	40.9	0	0	0	0
J32	35	0	0	0	0
J33	46	4	0	0	0
J34	45.04	1.5	0	0	0
J35	38.6	4	0	0	0
J36	37.4	4	0	0	0
J37	37.09	0	0	0	0
J38	36.57	0	0	0	0
J39	34.93	0	0	0	0
J40	34.4	0	0	0	0
J41	29.77	8.23	0	0	0
J42	25.94	0	0	0	0
J43	24.78	0	0	0	0
J44	23.62	0	0	0	0
J45	42.1	0	0	0	0
J46	46.8	0	0	0	0
J47	46.8	0	0	0	0

J48	46.4	0	0	0	0
J49	46.8	0	0	0	0
J50	45.4	0	0	0	0
J51	34.4	0	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	21.64	FREE		NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;18" RCP C1	J3	J2	91	0.011	0	0	0	0
;24" RCP C2	J2	J4	445	0.011	0	0	0	0
;24" RCP C3	J4	J6	313	0.011	0	0	0	0
;24" RCP C4	J1	J5	307	0.011	0	0	0	0
;18" RCP C5	J5	J6	51	0.011	0	0	0	0
;18" RCP C6	J6	J7	111	0.011	0	0	0	0
;24" RCP C7	J7	J19	415	0.011	0	0	0	0
;Gutter C8	J8	J9	523	0.011	0	0	0	0
;Gutter C9	J9	J10	671	0.011	0	0	0	0
;Gutter C10	J10	J12	666	0.011	0	0	0	0
;Gutter C11	J11	J12	517	0.011	0	0	0	0
;Gutter C12	J12	J13	439	0.011	0	0	0	0
;18" RCP C13	J13	J25	151	0.011	0	0	0	0
;24" RCP C14	J14	J24	527	0.011	0	0	0	0
;18" RCP C15	J15	J16	210	0.011	0	0	0	0
;18" RCP C16	J16	J22	446	0.011	0	0	0	0
;24" RCP C17	J17	J18	84	0.011	0	0	0	0
;24" RCP C18	J18	J19	502	0.011	0	0	0	0
;24" RCP C19	J19	J20	292	0.011	0	0	0	0
;24" RCP C20	J20	J21	471	0.011	0	0	0	0
;24" RCP C21	J21	J25	222	0.011	0	0	0	0
;18" RCP C22	J22	J23	254	0.011	0	0	0	0
;24" RCP C23	J23	J24	371	0.011	0	0	0	0
;24" RCP C24	J24	J25	618	0.011	0	0	0	0
;24" RCP C25	J25	J29	771	0.011	0	0	0	0
;18" RCP C26	J26	J27	238	0.011	0	0	0	0
;Gutter C27	J27	J28	153	0.011	0	0	0	0
;18" RCP C28	J28	J29	560	0.011	0	0	0	0
;24" RCP								

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

C29	J29	J30	338	0.011	0	0	0	0
;24" RCP								
C30	J30	J41	602	0.011	0	0	0	0
;24" RCP								
C31	J31	J32	661	0.011	0	0	0	0
;72" RCP								
C32	J32	J39	55.95	0.011	0	0	0	0
;12" CMP								
C33	J33	J34	191.79	0.011	0	0	0	0
;18" RCP								
C34	J34	J35	205.97	0.011	0	0	0	0
;18" RCP								
C35	J35	J36	73.18	0.011	0	0	0	0
;18" RCP								
C36	J36	J37	67	0.011	0	0	0	0
;36" CMP								
C37	J37	J38	103	0.011	0	0	0	0
;Sheet Flow								
C38	J38	J39	33.32	0.15	0	0	0	0
;72" RCP								
C39	J39	J40	400	0.011	0	0	0	0
;24" RCP								
C40	J40	J41	926	0.011	0	0	0	0
;84" RCP								
C41	J41	J42	766	0.011	0	0	0	0
;84" RCP								
C42	J42	J43	549	0.011	0	0	0	0
;84" RCP								
C43	J43	J44	464	0.011	0	0	0	0
;84" RCP								
C44	J44	OUT1	479	0.011	0	0	0	0
;36" RCP								
C45	J45	J51	520	0.011	0	0	0	0
;18" RCP								
C46	J46	J48	69	0.011	0	0	0	0
;18" RCP								
C47	J47	J48	69	0.011	0	0	0	0
;24" RCP								
C48	J48	J50	143	0.011	0	0	0	0
;18" RCP								
C49	J49	J50	70	0.011	0	0	0	0
;24" RCP								
C50	J50	J51	189	0.011	0	0	0	0
;36" RCP								
C51	J51	OUT1	133	0.011	0	0	0	0

[XSECTIONS]

;;Link	Type	Geom1	Geom2	Geom3	Geom4	Barrels
;;----------						
C1	CIRCULAR	1.5	0	0	0	1
C2	CIRCULAR	2	0	0	0	1
C3	CIRCULAR	2	0	0	0	1
C4	CIRCULAR	2	0	0	0	1
C5	CIRCULAR	2	0	0	0	1
C6	CIRCULAR	2	0	0	0	1
C7	CIRCULAR	2	0	0	0	1
C8	RECT_OPEN	0.1667	5	0	0	1
C9	RECT_OPEN	0.3	30	0	0	1
C10	RECT_OPEN	0.3	30	0	0	1
C11	RECT_OPEN	0.3	40	0	0	1
C12	RECT_OPEN	0.3	30	0	0	1
C13	CIRCULAR	1.5	0	0	0	1
C14	CIRCULAR	2	0	0	0	1
C15	CIRCULAR	1.5	0	0	0	1
C16	CIRCULAR	1.5	0	0	0	1
C17	CIRCULAR	2	0	0	0	1
C18	CIRCULAR	2	0	0	0	1
C19	CIRCULAR	2	0	0	0	1
C20	CIRCULAR	2	0	0	0	1
C21	CIRCULAR	2	0	0	0	1
C22	CIRCULAR	2	0	0	0	1
C23	CIRCULAR	2	0	0	0	1

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
 C24                CIRCULAR     2          0          0          0          1
 C25                CIRCULAR     3          0          0          0          1
 C26                CIRCULAR     1.5        0          0          0          1
 C27                RECT_OPEN    0.1667     5          0          0          1
 C28                CIRCULAR     1.5        0          0          0          1
 C29                CIRCULAR     3          0          0          0          1
 C30                CIRCULAR     3          0          0          0          1
 C31                CIRCULAR     2          0          0          0          1
 C32                CIRCULAR     6          0          0          0          1
 C33                CIRCULAR     1          0          0          0          1
 C34                CIRCULAR     1.5        0          0          0          1
 C35                CIRCULAR     1.5        0          0          0          1
 C36                CIRCULAR     1.5        0          0          0          1
 C37                CIRCULAR     36         0          0          0          1
 C38                RECT_OPEN    0.5        50         0          0          1
 C39                CIRCULAR     6          0          0          0          1
 C40                CIRCULAR     6          0          0          0          1
 C41                CIRCULAR     7          0          0          0          1
 C42                CIRCULAR     7          0          0          0          1
 C43                CIRCULAR     7          0          0          0          1
 C44                CIRCULAR     7          0          0          0          1
 C45                CIRCULAR     3          0          0          0          1
 C46                CIRCULAR     1.5        0          0          0          1
 C47                CIRCULAR     1.5        0          0          0          1
 C48                CIRCULAR     2          0          0          0          1
 C49                CIRCULAR     1.5        0          0          0          1
 C50                CIRCULAR     2          0          0          0          1
 C51                CIRCULAR     3          0          0          0          1

[LOSSES]
;;Link              Inlet      Outlet     Average    Flap Gate
;;-------------------------------------------------------------
  C32               0.5        0.5        0          NO
  C39               0.5        0.5        0          NO

[INFLOWS]
;;                                                   Concen    Conversion
;;Node               Parameter          Time Series   /Mass     Factor
;;-----------------------------------------------------------------------
  J41                FLOW               Out1-BB

[TIMESERIES]
;;Name               Date       Time       Value
;;-----------------------------------------------
;100 year 6 hr Type B SCS Storm Cum Max Precip 2.6 inches
  100yr6hrCum2.6                10:15      0.0468
  100yr6hrCum2.6                10:30      0.091
  100yr6hrCum2.6                10:45      0.1508
  100yr6hrCum2.6                11:00      0.208
  100yr6hrCum2.6                11:15      0.2808
  100yr6hrCum2.6                11:30      0.351
  100yr6hrCum2.6                11:45      0.4758
  100yr6hrCum2.6                12:00      0.598
  100yr6hrCum2.6                12:15      1.079
  100yr6hrCum2.6                12:30      1.56
  100yr6hrCum2.6                12:45      1.69
  100yr6hrCum2.6                13:00      1.82
  100yr6hrCum2.6                13:15      1.924
  100yr6hrCum2.6                13:30      2.028
  100yr6hrCum2.6                13:45      2.1008
  100yr6hrCum2.6                14:00      2.171
  100yr6hrCum2.6                14:15      2.2308
  100yr6hrCum2.6                14:30      2.288
  100yr6hrCum2.6                14:45      2.34
  100yr6hrCum2.6                15:00      2.392
  100yr6hrCum2.6                15:15      2.444
  100yr6hrCum2.6                15:30      2.496
  100yr6hrCum2.6                15:45      2.548
  100yr6hrCum2.6                16:00      2.6

;Table - Node OUT1
  Out1-BB           09/30/2005 22:15:00   0.00
```

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

Out1-BB	09/30/2005 22:30:00	0.00
Out1-BB	09/30/2005 22:45:00	0.00
Out1-BB	09/30/2005 23:00:00	0.00
Out1-BB	09/30/2005 23:15:00	0.00
Out1-BB	09/30/2005 23:30:00	0.00
Out1-BB	09/30/2005 23:45:00	0.00
Out1-BB	10/01/2005 00:00:00	0.00
Out1-BB	10/01/2005 00:15:00	0.00
Out1-BB	10/01/2005 00:30:00	0.00
Out1-BB	10/01/2005 00:45:00	0.00
Out1-BB	10/01/2005 01:00:00	0.00
Out1-BB	10/01/2005 01:15:00	0.00
Out1-BB	10/01/2005 01:30:00	0.00
Out1-BB	10/01/2005 01:45:00	0.00
Out1-BB	10/01/2005 02:00:00	0.00
Out1-BB	10/01/2005 02:15:00	0.00
Out1-BB	10/01/2005 02:30:00	0.00
Out1-BB	10/01/2005 02:45:00	0.00
Out1-BB	10/01/2005 03:00:00	0.00
Out1-BB	10/01/2005 03:15:00	0.00
Out1-BB	10/01/2005 03:30:00	0.00
Out1-BB	10/01/2005 03:45:00	0.00
Out1-BB	10/01/2005 04:00:00	0.00
Out1-BB	10/01/2005 04:15:00	0.00
Out1-BB	10/01/2005 04:30:00	0.00
Out1-BB	10/01/2005 04:45:00	0.00
Out1-BB	10/01/2005 05:00:00	0.00
Out1-BB	10/01/2005 05:15:00	0.00
Out1-BB	10/01/2005 05:30:00	0.00
Out1-BB	10/01/2005 05:45:00	0.00
Out1-BB	10/01/2005 06:00:00	0.00
Out1-BB	10/01/2005 06:15:00	0.00
Out1-BB	10/01/2005 06:30:00	0.00
Out1-BB	10/01/2005 06:45:00	0.00
Out1-BB	10/01/2005 07:00:00	0.00
Out1-BB	10/01/2005 07:15:00	0.00
Out1-BB	10/01/2005 07:30:00	0.00
Out1-BB	10/01/2005 07:45:00	0.00
Out1-BB	10/01/2005 08:00:00	0.00
Out1-BB	10/01/2005 08:15:00	0.00
Out1-BB	10/01/2005 08:30:00	0.00
Out1-BB	10/01/2005 08:45:00	0.00
Out1-BB	10/01/2005 09:00:00	0.00
Out1-BB	10/01/2005 09:15:00	0.00
Out1-BB	10/01/2005 09:30:00	0.00
Out1-BB	10/01/2005 09:45:00	0.00
Out1-BB	10/01/2005 10:00:00	0.00
Out1-BB	10/01/2005 10:15:00	0.00
Out1-BB	10/01/2005 10:30:00	2.08
Out1-BB	10/01/2005 10:45:00	3.09
Out1-BB	10/01/2005 11:00:00	4.14
Out1-BB	10/01/2005 11:15:00	4.26
Out1-BB	10/01/2005 11:30:00	5.16
Out1-BB	10/01/2005 11:45:00	5.23
Out1-BB	10/01/2005 12:00:00	8.70
Out1-BB	10/01/2005 12:15:00	9.08
Out1-BB	10/01/2005 12:30:00	34.63
Out1-BB	10/01/2005 12:45:00	37.31
Out1-BB	10/01/2005 13:00:00	13.46
Out1-BB	10/01/2005 13:15:00	9.76
Out1-BB	10/01/2005 13:30:00	8.05
Out1-BB	10/01/2005 13:45:00	7.75
Out1-BB	10/01/2005 14:00:00	5.85
Out1-BB	10/01/2005 14:15:00	5.29
Out1-BB	10/01/2005 14:30:00	4.62
Out1-BB	10/01/2005 14:45:00	4.31
Out1-BB	10/01/2005 15:00:00	3.96
Out1-BB	10/01/2005 15:15:00	3.88
Out1-BB	10/01/2005 15:30:00	3.87
Out1-BB	10/01/2005 15:45:00	3.86
Out1-BB	10/01/2005 16:00:00	3.86
Out1-BB	10/01/2005 16:15:00	3.86

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
 Out1-BB          10/01/2005 16:30:00   1.35
 Out1-BB          10/01/2005 16:45:00   0.42
 Out1-BB          10/01/2005 17:00:00   0.20
 Out1-BB          10/01/2005 17:15:00   0.11
 Out1-BB          10/01/2005 17:30:00   0.07
 Out1-BB          10/01/2005 17:45:00   0.05
 Out1-BB          10/01/2005 18:00:00   0.03
 Out1-BB          10/01/2005 18:15:00   0.02
 Out1-BB          10/01/2005 18:30:00   0.02
 Out1-BB          10/01/2005 18:45:00   0.01
 Out1-BB          10/01/2005 19:00:00   0.01
 Out1-BB          10/01/2005 19:15:00   0.00
 Out1-BB          10/01/2005 19:30:00   0.00
 Out1-BB          10/01/2005 19:45:00   0.00
 Out1-BB          10/01/2005 20:00:00   0.00
 Out1-BB          10/01/2005 20:15:00   0.00
 Out1-BB          10/01/2005 20:30:00   0.00
 Out1-BB          10/01/2005 20:45:00   0.00
 Out1-BB          10/01/2005 21:00:00   0.00
 Out1-BB          10/01/2005 21:15:00   0.00
 Out1-BB          10/01/2005 21:30:00   0.00
 Out1-BB          10/01/2005 21:45:00   0.00
 Out1-BB          10/01/2005 22:00:00   0.00
 Out1-BB          10/01/2005 22:15:00   0.00
 Out1-BB          10/01/2005 22:30:00   0.00
 Out1-BB          10/01/2005 22:45:00   0.00
 Out1-BB          10/01/2005 23:00:00   0.00
 Out1-BB          10/01/2005 23:15:00   0.00
 Out1-BB          10/01/2005 23:30:00   0.00
 Out1-BB          10/01/2005 23:45:00   0.00
 Out1-BB          10/02/2005 00:00:00   0.00

[REPORT]
 INPUT     NO
 CONTROLS  NO

[OPTIONS]
 TEMPDIR   "C:\Carlsbad\DMP\"
```

Project BB 84 INCH

Backwater Check

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)
100 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-03-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        80.279         2.600
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........        47.604         1.542
Surface Runoff ...........        33.005         1.069
Final Surface Storage ....         0.001         0.000
Continuity Error (%) .....        -0.413

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......        33.042        10.767
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         4.098         1.335
External Outflow .........        34.493        11.240
Surface Flooding .........         2.657         0.866
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.028

***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap       Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
-------------------------------------------------------------------------------
S1                    2.600      0.000      0.000      1.926      0.681      0.262
S2                    2.600      0.000      0.000      1.917      0.691      0.266
S3                    2.600      0.000      0.000      1.919      0.688      0.265
S4                    2.600      0.000      0.000      2.232      0.377      0.145
S5                    2.600      0.000      0.000      1.907      0.701      0.270
S6                    2.600      0.000      0.000      1.898      0.712      0.274
S7                    2.600      0.000      0.000      1.927      0.680      0.261
S8                    2.600      0.000      0.000      1.876      0.733      0.282
S9                    2.600      0.000      0.000      1.968      0.639      0.246
S10                   2.600      0.000      0.000      1.746      0.862      0.331
S11                   2.600      0.000      0.000      1.878      0.729      0.281
S12                   2.600      0.000      0.000      1.339      1.272      0.489
S13                   2.600      0.000      0.000      1.504      1.108      0.426
S14                   2.600      0.000      0.000      1.294      1.317      0.506
S15                   2.600      0.000      0.000      1.508      1.102      0.424
```

S16	2.600	0.000	0.000	1.523	1.087	0.418
S17	2.600	0.000	0.000	1.506	1.105	0.425
S18	2.600	0.000	0.000	1.671	0.943	0.363
S19	2.600	0.000	0.000	1.582	1.029	0.396
S20	2.600	0.000	0.000	1.357	1.255	0.483
S21	2.600	0.000	0.000	2.384	0.288	0.111
S22	2.600	0.000	0.000	1.604	1.005	0.387
S23	2.600	0.000	0.000	1.212	1.400	0.538
S24	2.600	0.000	0.000	1.775	0.833	0.320
S25	2.600	0.000	0.000	1.881	0.731	0.281
S26	2.600	0.000	0.000	0.875	1.741	0.670
S27	2.600	0.000	0.000	0.971	1.673	0.643
S28	2.600	0.000	0.000	0.787	1.829	0.703
S29	2.600	0.000	0.000	0.374	2.245	0.864
S30	2.600	0.000	0.000	0.949	1.665	0.640
S31	2.600	0.000	0.000	0.636	1.980	0.762
S32	2.600	0.000	0.000	1.602	1.008	0.388
S33	2.600	0.000	0.000	1.482	1.128	0.434
S34	2.600	0.000	0.000	1.500	1.109	0.427
S35	2.600	0.000	0.000	1.253	1.359	0.523
S36	2.600	0.000	0.000	1.527	1.083	0.416
S37	2.600	0.000	0.000	1.384	1.227	0.472
S38	2.600	0.000	0.000	1.631	0.978	0.376
S39	2.600	0.000	0.000	1.850	0.757	0.291
Totals	2.600	0.000	0.000	1.542	1.069	0.411

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.05	1.03	72.43	0 12:45	0	0
J2	0.04	0.86	78.06	0 12:45	0	0
J3	0.03	0.55	81.95	0 12:45	0	0
J4	0.04	0.86	72.26	0 12:45	0	0
J5	0.05	1.03	67.03	0 12:45	0	0
J6	0.06	1.23	66.23	0 12:45	0	0
J7	0.08	6.00	68.00	0 12:42	0.04	5
J8	0.00	0.08	167.08	0 12:45	0	0
J9	0.00	0.08	131.08	0 12:45	0	0
J10	0.00	0.11	92.11	0 12:45	0	0
J11	0.00	0.05	81.05	0 12:45	0	0
J12	0.01	0.16	72.16	0 12:45	0	0
J13	0.05	1.13	60.13	0 12:46	0	0
J14	0.04	0.82	69.82	0 12:45	0	0
J15	0.03	0.48	73.48	0 12:45	0	0
J16	0.05	1.06	70.06	0 12:45	0	0
J17	0.00	0.00	59.00	0 00:00	0	0
J18	0.04	0.78	58.78	0 12:45	0	0
J19	0.19	6.50	63.00	0 12:19	10.79	43
J20	0.17	7.00	63.00	0 12:26	0.50	25
J21	0.12	2.00	56.20	0 12:31	0	0
J22	0.13	8.30	61.30	0 12:29	0.90	22
J23	0.08	2.00	54.00	0 12:31	0	0
J24	0.24	11.00	60.00	0 12:20	8.80	40
J25	0.13	2.37	49.37	0 12:45	0	0
J26	0.01	0.39	54.91	0 12:45	0	0
J27	0.01	0.39	53.59	0 12:45	0	0
J28	0.03	0.69	51.89	0 12:45	0	0
J29	0.22	12.00	51.50	0 12:30	3.34	23
J30	0.28	14.00	50.00	0 12:26	7.38	31
J31	0.07	1.27	42.17	0 12:45	0	0
J32	0.11	1.76	36.76	0 12:45	0	0
J33	0.01	0.23	46.23	0 12:45	0	0
J34	0.01	0.23	45.27	0 12:45	0	0
J35	0.04	0.83	39.43	0 12:45	0	0

J36	0.08	4.00	41.40	0	12:30	0.14	18
J37	0.06	1.50	38.59	0	12:31	0	0
J38	0.02	0.41	36.98	0	12:48	0	0
J39	0.12	2.12	37.05	0	12:45	0	0
J40	0.12	2.12	36.52	0	12:45	0	0
J41	0.21	3.00	32.77	0	12:29	0	0
J42	0.26	3.63	29.57	0	12:45	0	0
J43	0.26	3.63	28.41	0	12:46	0	0
J44	0.26	3.55	27.17	0	12:46	0	0
J45	0.05	0.81	42.91	0	12:45	0	0
J46	0.05	1.07	47.87	0	12:45	0	0
J47	0.02	0.37	47.17	0	12:45	0	0
J48	0.05	1.07	47.47	0	12:45	0	0
J49	0.04	0.70	47.50	0	12:45	0	0
J50	0.05	0.90	46.30	0	12:45	0	0
J51	0.05	0.81	35.21	0	12:45	0	0
OUT1	3.04	7.00	28.64	0	10:15	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days	hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	7.54	0	12:45	12.97	1.00	0.28	0
C2	11.72	0	12:45	9.13	1.00	0.38	0
C3	12.26	0	12:45	10.85	1.00	0.32	0
C4	18.51	0	12:45	11.46	1.00	0.52	0
C5	18.50	0	12:45	11.88	1.00	0.49	0
C6	30.71	0	12:45	15.13	1.00	0.70	0
C7	32.85	0	12:47	11.58	1.00	1.07	4
C8	2.71	0	12:45	6.62	1.00	0.32	0
C9	7.70	0	12:46	4.74	1.00	0.06	0
C10	17.30	0	12:46	5.34	1.00	0.19	0
C11	4.92	0	12:46	2.48	1.00	0.05	0
C12	31.11	0	12:46	6.69	1.00	0.34	0
C13	32.17	0	12:46	22.46	1.00	0.92	0
C14	18.18	0	12:45	15.18	1.00	0.35	0
C15	3.75	0	12:45	7.80	1.00	0.22	0
C16	19.95	0	12:45	15.02	1.00	0.85	0
C17	0.00	0	00:00	0.00	1.00	0.00	0
C18	4.72	0	12:45	4.22	1.00	0.32	0
C19	11.84	0	13:01	4.30	1.00	1.07	39
C20	17.86	0	12:51	6.24	1.00	1.08	22
C21	19.31	0	12:52	14.59	1.00	0.40	0
C22	17.72	0	12:50	6.37	1.00	1.06	20
C23	17.39	0	12:51	8.52	1.00	0.72	0
C24	16.43	0	13:00	6.09	1.00	1.08	34
C25	74.91	0	12:46	12.61	1.00	0.96	0
C26	1.35	0	12:45	3.77	1.00	0.15	0
C27	1.34	0	12:46	3.02	1.00	0.36	0
C28	7.84	0	12:45	9.87	1.00	0.44	0
C29	84.06	0	12:53	13.39	1.00	1.05	22
C30	85.14	0	12:56	13.53	1.00	1.06	28
C31	18.56	0	12:45	8.89	1.00	0.73	0
C32	33.30	0	12:45	4.80	1.00	0.19	0
C33	0.35	0	12:45	2.57	1.00	0.12	0
C34	0.35	0	12:46	4.60	1.00	0.02	0
C35	9.38	0	12:45	9.36	1.00	0.59	0
C36	8.74	0	12:47	5.53	1.00	1.04	18
C37	8.62	0	12:48	3.84	1.00	0.00	0
C38	8.56	0	12:48	0.80	1.00	0.25	0
C39	48.83	0	12:45	5.49	1.00	0.27	0
C40	65.39	0	12:46	9.60	1.00	0.18	0
C41	167.83	0	12:46	12.29	1.00	0.31	0
C42	184.64	0	12:46	9.17	1.00	0.53	0
C43	193.72	0	12:46	9.88	1.00	0.51	0
C44	193.67	0	12:46	11.91	1.00	0.40	0

C45	15.15	0	12:45	9.98	1.00	0.16	0
C46	8.06	0	12:45	6.02	1.00	0.85	0
C47	1.27	0	12:45	3.74	1.00	0.13	0
C48	9.32	0	12:45	6.80	1.00	0.42	0
C49	7.80	0	12:45	9.63	1.00	0.44	0
C50	17.09	0	12:45	17.35	1.00	0.27	0
C51	36.16	0	12:45	24.75	1.00	0.15	0

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.03

Analysis begun on:  Tue Jun 06 13:53:30 2006
Total elapsed time: 00:00:01
```

Project BB 84 INCH

Backwater Check

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
[TITLE]
Drainage Project BB - 84 inch (Washington St. Drainage Improvements)
25 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS            CFS
 INFILTRATION          GREEN_AMPT
 FLOW_ROUTING          KINWAVE
 START_DATE            09/30/2005
 START_TIME            22:00:00
 REPORT_START_DATE     09/30/2005
 REPORT_START_TIME     22:00:00
 END_DATE              10/03/2005
 END_TIME              00:00:00
 SWEEP_START           01/01
 SWEEP_END             12/31
 DRY_DAYS              0
 REPORT_STEP           00:15:00
 WET_STEP              00:15:00
 DRY_STEP              01:00:00
 ROUTING_STEP          0:00:30
 ALLOW_PONDING         NO
 INERTIAL_DAMPING      PARTIAL
 VARIABLE_STEP         0.75
 LENGTHENING_STEP      0
 MIN_SURFAREA          0
 NORMAL_FLOW_LIMITED   NO
 SKIP_STEADY_STATE     NO

[RAINGAGES]
;;                     Rain      Recd.  Snow   Data       Source            Station   Rain
;;Name                 Type      Freq.  Catch  Source     Name              ID        Units
;;--------------------------------------------------------------------------------------------
  R1                   CUMULATIVE 0:15   1.0    TIMESERIES 25yr6hr2.1Max

[SUBCATCHMENTS]
;;                                                Total    Pcnt.              Pcnt.    Curb     Snow
;;Name                 Raingage          Outlet   Area     Imperv   Width     Slope    Length   Pack
;;--------------------------------------------------------------------------------------------------
  S1                   R1                J1       32.31    25       757       5.59     0
  S2                   R1                J2       6.9      25       220       6.72     0
  S3                   R1                J3       12.52    25       376       6.3      0
  S4                   R1                J4       1.25     12       127       2.33     0
  S5                   R1                J8       4.17     25       319       2.28     0
  S6                   R1                J9       7.32     25       490       5.08     0
  S7                   R1                J10      17.14    25       439       4.35     0
  S8                   R1                J11      7.14     26       404       5.71     0
  S9                   R1                J12      16.07    23       700       3.6      0
  S10                  R1                J14      25.97    32       586       4.97     0
  S11                  R1                J16      27.11    27       570       4.83     0
  S12                  R1                J15      3.53     47       237       2.92     0
  S13                  R1                J7       1.1      40       174       1.45     0
  S14                  R1                J18      4.4      49       325       1.36     0
  S15                  R1                J20      8.27     41       554       0.92     0
  S16                  R1                J21      2.83     40       257       1.25     0
  S17                  R1                J13      1.12     40       188       1.15     0
  S18                  R1                J22      1.06     33       231       1.5      0
  S19                  R1                J25      9.29     37       337       25       0
  S20                  R1                J29      13.07    47       662       1.05     0
  S21                  R1                J26      1.9      3        251       91       0
  S22                  R1                J28      7.73     37       561       1.5      0
  S23                  R1                J30      14.76    53       367       0.8      0
  S24                  R1                J30      5.91     31       322       0.63     0
  S25                  R1                J33      0.46     25       106       1        0
  S26                  R1                J35      6.55     65       476       1        0
  S27                  R1                J39      5        60       292       0.5      0
  S28                  R1                J31      13.2     69       575       1.4      0
  S29                  R1                J32      8.71     85       480       1.27     0
  S30                  R1                J40      13.46    63       345       1.41     0
  S31                  R1                J41      13.21    75       548       0.76     0
  S32                  R1                J42      22.49    38       516       0.95     0
  S33                  R1                J43      10.4     42       503       1.78     0
```

S34	R1	J49	9.46	42	259	0.38	0
S35	R1	J46	7.56	51	366	1.11	0
S36	R1	J47	1.41	40	166	0.54	0
S37	R1	J45	15.73	46	571	1.67	0
S38	R1	J51	4.78	36	353	1.36	0
S39	R1	OUT1	5.23	28	268	0.94	0

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
S1	0.011	0.15	0.05	0.1	100	OUTLET	
S2	0.011	0.15	0.05	0.1	100	OUTLET	
S3	0.011	0.15	0.05	0.1	100	OUTLET	
S4	0.011	0.15	0.05	0.1	100	OUTLET	
S5	0.011	0.15	0.05	0.1	100	OUTLET	
S6	0.011	0.15	0.05	0.1	100	OUTLET	
S7	0.011	0.15	0.05	0.1	100	OUTLET	
S8	0.011	0.15	0.05	0.1	100	OUTLET	
S9	0.011	0.15	0.05	0.1	100	OUTLET	
S10	0.011	0.15	0.05	0.1	100	OUTLET	
S11	0.011	0.15	0.05	0.1	100	OUTLET	
S12	0.011	0.15	0.05	0.1	100	OUTLET	
S13	0.011	0.15	0.05	0.1	100	OUTLET	
S14	0.011	0.15	0.05	0.1	100	OUTLET	
S15	0.011	0.15	0.05	0.1	100	OUTLET	
S16	0.011	0.15	0.05	0.1	100	OUTLET	
S17	0.011	0.15	0.05	0.1	100	OUTLET	
S18	0.011	0.15	0.05	0.1	100	OUTLET	
S19	0.011	0.15	0.05	0.1	100	OUTLET	
S20	0.011	0.15	0.05	0.1	100	OUTLET	
S21	0.011	0.15	0.05	0.1	100	OUTLET	
S22	0.011	0.15	0.05	0.1	100	OUTLET	
S23	0.011	0.15	0.05	0.1	100	OUTLET	
S24	0.011	0.15	0.05	0.1	100	OUTLET	
S25	0.011	0.15	0.05	0.1	100	OUTLET	
S26	0.011	0.15	0.05	0.05	100	OUTLET	
S27	0.011	0.015	0.05	0.05	100	OUTLET	
S28	0.011	0.15	0.05	0.1	100	OUTLET	
S29	0.011	0.15	0.05	0.1	100	OUTLET	
S30	0.011	0.15	0.05	0.1	100	OUTLET	
S31	0.011	0.15	0.05	0.1	100	OUTLET	
S32	0.011	0.15	0.05	0.1	100	OUTLET	
S33	0.011	0.15	0.05	0.1	100	OUTLET	
S34	0.011	0.15	0.05	0.1	100	OUTLET	
S35	0.011	0.15	0.05	0.1	100	OUTLET	
S36	0.011	0.15	0.05	0.1	100	OUTLET	
S37	0.011	0.15	0.05	0.1	100	OUTLET	
S38	0.011	0.15	0.05	0.1	100	OUTLET	
S39	0.011	0.15	0.05	0.1	100	OUTLET	

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	2.4	1.18	0
S2	2.4	1.18	0
S3	2.4	1.18	0
S4	2.4	1.18	0
S5	2.4	1.18	0
S6	2.4	1.18	0
S7	2.4	1.18	0
S8	2.4	1.18	0
S9	2.4	1.18	0
S10	2.4	1.18	0
S11	2.4	1.18	0
S12	2.4	1.18	0
S13	2.4	1.18	0
S14	2.4	1.18	0
S15	2.4	1.18	0
S16	2.4	1.18	0
S17	2.4	1.18	0
S18	2.4	1.18	0
S19	2.4	1.18	0

S20	2.4	1.18	0
S21	2.4	1.18	0
S22	2.4	1.18	0
S23	2.4	1.18	0
S24	2.4	1.18	0
S25	2.4	1.18	0
S26	2.4	1.18	0
S27	2.4	1.18	0
S28	2.4	1.18	0
S29	2.4	1.18	0
S30	2.4	1.18	0
S31	2.4	1.18	0
S32	2.4	1.18	0
S33	2.4	1.18	0
S34	2.4	1.18	0
S35	2.4	1.18	0
S36	2.4	1.18	0
S37	2.4	1.18	0
S38	2.4	1.18	0
S39	2.4	1.18	0

[JUNCTIONS]

;; ;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	71.4	0	0	0	0
J2	77.2	0	0	0	0
J3	81.4	0	0	0	0
J4	71.4	0	0	0	0
J5	66	6	0	0	0
J6	65	6	0	0	0
J7	62	6	0	0	0
J8	167	0	0	0	0
J9	131	0	0	0	0
J10	92	0	0	0	0
J11	81	0	0	0	0
J12	72	0	0	0	0
J13	59	6	0	0	0
J14	69	0	0	0	0
J15	73	0	0	0	0
J16	69	0	0	0	0
J17	59	0	0	0	0
J18	58	4	0	0	0
J19	56.5	6.5	0	0	0
J20	56	7	0	0	0
J21	54.2	7.8	0	0	0
J22	53	8.3	0	0	0
J23	52	9	0	0	0
J24	49	11	0	0	0
J25	47	16	0	0	0
J26	54.52	0	0	0	0
J27	53.2	0	0	0	0
J28	51.2	0	0	0	0
J29	39.5	12	0	0	0
J30	36	14	0	0	0
J31	40.9	0	0	0	0
J32	35	0	0	0	0
J33	46	4	0	0	0
J34	45.04	1.5	0	0	0
J35	38.6	4	0	0	0
J36	37.4	4	0	0	0
J37	37.09	0	0	0	0
J38	36.57	0	0	0	0
J39	34.93	0	0	0	0
J40	34.4	0	0	0	0
J41	29.77	8.23	0	0	0
J42	25.94	0	0	0	0
J43	24.78	0	0	0	0
J44	23.62	0	0	0	0
J45	42.1	0	0	0	0
J46	46.8	0	0	0	0
J47	46.8	0	0	0	0

J48	46.4	0	0	0	0
J49	46.8	0	0	0	0
J50	45.4	0	0	0	0
J51	34.4	0	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	21.64	FREE		NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;18" RCP C1	J3	J2	91	0.011	0	0	0	0
;24" RCP C2	J2	J4	445	0.011	0	0	0	0
;24" RCP C3	J4	J6	313	0.011	0	0	0	0
;24" RCP C4	J1	J5	307	0.011	0	0	0	0
;18" RCP C5	J5	J6	51	0.011	0	0	0	0
;18" RCP C6	J6	J7	111	0.011	0	0	0	0
;24" RCP C7	J7	J19	415	0.011	0	0	0	0
;Gutter C8	J8	J9	523	0.011	0	0	0	0
;Gutter C9	J9	J10	671	0.011	0	0	0	0
;Gutter C10	J10	J12	666	0.011	0	0	0	0
;Gutter C11	J11	J12	517	0.011	0	0	0	0
;Gutter C12	J12	J13	439	0.011	0	0	0	0
;18" RCP C13	J13	J25	151	0.011	0	0	0	0
;24" RCP C14	J14	J24	527	0.011	0	0	0	0
;18" RCP C15	J15	J16	210	0.011	0	0	0	0
;18" RCP C16	J16	J22	446	0.011	0	0	0	0
;24" RCP C17	J17	J18	84	0.011	0	0	0	0
;24" RCP C18	J18	J19	502	0.011	0	0	0	0
;24" RCP C19	J19	J20	292	0.011	0	0	0	0
;24" RCP C20	J20	J21	471	0.011	0	0	0	0
;24" RCP C21	J21	J25	222	0.011	0	0	0	0
;18" RCP C22	J22	J23	254	0.011	0	0	0	0
;24" RCP C23	J23	J24	371	0.011	0	0	0	0
;24" RCP C24	J24	J25	618	0.011	0	0	0	0
;24" RCP C25	J25	J29	771	0.011	0	0	0	0
;18" RCP C26	J26	J27	238	0.011	0	0	0	0
;Gutter C27	J27	J28	153	0.011	0	0	0	0
;18" RCP C28	J28	J29	560	0.011	0	0	0	0
;24" RCP								

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

C29	J29	J30	338	0.011	0	0	0	0
;24" RCP								
C30	J30	J41	602	0.011	0	0	0	0
;24" RCP								
C31	J31	J32	661	0.011	0	0	0	0
;72" RCP								
C32	J32	J39	55.95	0.011	0	0	0	0
;12" CMP								
C33	J33	J34	191.79	0.011	0	0	0	0
;18" RCP								
C34	J34	J35	205.97	0.011	0	0	0	0
;18" RCP								
C35	J35	J36	73.18	0.011	0	0	0	0
;18" RCP								
C36	J36	J37	67	0.011	0	0	0	0
;36" CMP								
C37	J37	J38	103	0.011	0	0	0	0
;Sheet Flow								
C38	J38	J39	33.32	0.15	0	0	0	0
;72" RCP								
C39	J39	J40	400	0.011	0	0	0	0
;24" RCP								
C40	J40	J41	926	0.011	0	0	0	0
;84" RCP								
C41	J41	J42	766	0.011	0	0	0	0
;84" RCP								
C42	J42	J43	549	0.011	0	0	0	0
;84" RCP								
C43	J43	J44	464	0.011	0	0	0	0
;84" RCP								
C44	J44	OUT1	479	0.011	0	0	0	0
;36" RCP								
C45	J45	J51	520	0.011	0	0	0	0
;18" RCP								
C46	J46	J48	69	0.011	0	0	0	0
;18" RCP								
C47	J47	J48	69	0.011	0	0	0	0
;24" RCP								
C48	J48	J50	143	0.011	0	0	0	0
;18" RCP								
C49	J49	J50	70	0.011	0	0	0	0
;24" RCP								
C50	J50	J51	189	0.011	0	0	0	0
;36" RCP								
C51	J51	OUT1	133	0.011	0	0	0	0

[XSECTIONS]

;;Link	Type	Geom1	Geom2	Geom3	Geom4	Barrels
C1	CIRCULAR	1.5	0	0	0	1
C2	CIRCULAR	2	0	0	0	1
C3	CIRCULAR	2	0	0	0	1
C4	CIRCULAR	2	0	0	0	1
C5	CIRCULAR	2	0	0	0	1
C6	CIRCULAR	2	0	0	0	1
C7	CIRCULAR	2	0	0	0	1
C8	RECT_OPEN	0.1667	5	0	0	1
C9	RECT_OPEN	0.3	30	0	0	1
C10	RECT_OPEN	0.3	30	0	0	1
C11	RECT_OPEN	0.3	40	0	0	1
C12	RECT_OPEN	0.3	30	0	0	1
C13	CIRCULAR	1.5	0	0	0	1
C14	CIRCULAR	2	0	0	0	1
C15	CIRCULAR	1.5	0	0	0	1
C16	CIRCULAR	1.5	0	0	0	1
C17	CIRCULAR	2	0	0	0	1
C18	CIRCULAR	2	0	0	0	1
C19	CIRCULAR	2	0	0	0	1
C20	CIRCULAR	2	0	0	0	1
C21	CIRCULAR	2	0	0	0	1
C22	CIRCULAR	2	0	0	0	1
C23	CIRCULAR	2	0	0	0	1

```
 C24              CIRCULAR     2          0          0          0          1
 C25              CIRCULAR     3          0          0          0          1
 C26              CIRCULAR     1.5        0          0          0          1
 C27              RECT_OPEN    0.1667     5          0          0          1
 C28              CIRCULAR     1.5        0          0          0          1
 C29              CIRCULAR     3          0          0          0          1
 C30              CIRCULAR     3          0          0          0          1
 C31              CIRCULAR     2          0          0          0          1
 C32              CIRCULAR     6          0          0          0          1
 C33              CIRCULAR     1          0          0          0          1
 C34              CIRCULAR     1.5        0          0          0          1
 C35              CIRCULAR     1.5        0          0          0          1
 C36              CIRCULAR     1.5        0          0          0          1
 C37              CIRCULAR     36         0          0          0          1
 C38              RECT_OPEN    0.5        50         0          0          1
 C39              CIRCULAR     6          0          0          0          1
 C40              CIRCULAR     6          0          0          0          1
 C41              CIRCULAR     7          0          0          0          1
 C42              CIRCULAR     7          0          0          0          1
 C43              CIRCULAR     7          0          0          0          1
 C44              CIRCULAR     7          0          0          0          1
 C45              CIRCULAR     3          0          0          0          1
 C46              CIRCULAR     1.5        0          0          0          1
 C47              CIRCULAR     1.5        0          0          0          1
 C48              CIRCULAR     2          0          0          0          1
 C49              CIRCULAR     1.5        0          0          0          1
 C50              CIRCULAR     2          0          0          0          1
 C51              CIRCULAR     3          0          0          0          1

[LOSSES]
;;Link             Inlet      Outlet     Average    Flap Gate
;;-----------------------------------------------------------
  C32              0.5        0.5        0          NO
  C39              0.5        0.5        0          NO

[INFLOWS]
;;                                                   Concen   Conversion
;;Node             Parameter        Time Series      /Mass    Factor
;;-----------------------------------------------------------------------
  J41              FLOW             Out1-BB

[TIMESERIES]
;;Name             Date       Time       Value
;;-----------------------------------------------
;100 year 6 hr Type B SCS Storm Cum Max Precip 2.6 inches
  100yr6hrCum2.6              10:15      0.0468
  100yr6hrCum2.6              10:30      0.091
  100yr6hrCum2.6              10:45      0.1508
  100yr6hrCum2.6              11:00      0.208
  100yr6hrCum2.6              11:15      0.2808
  100yr6hrCum2.6              11:30      0.351
  100yr6hrCum2.6              11:45      0.4758
  100yr6hrCum2.6              12:00      0.598
  100yr6hrCum2.6              12:15      1.079
  100yr6hrCum2.6              12:30      1.56
  100yr6hrCum2.6              12:45      1.69
  100yr6hrCum2.6              13:00      1.82
  100yr6hrCum2.6              13:15      1.924
  100yr6hrCum2.6              13:30      2.028
  100yr6hrCum2.6              13:45      2.1008
  100yr6hrCum2.6              14:00      2.171
  100yr6hrCum2.6              14:15      2.2308
  100yr6hrCum2.6              14:30      2.288
  100yr6hrCum2.6              14:45      2.34
  100yr6hrCum2.6              15:00      2.392
  100yr6hrCum2.6              15:15      2.444
  100yr6hrCum2.6              15:30      2.496
  100yr6hrCum2.6              15:45      2.548
  100yr6hrCum2.6              16:00      2.6

;Table - Node OUT1
  Out1-BB          09/30/2005 22:15:00   0.00
```

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

Out1-BB	09/30/2005 22:30:00	0.00
Out1-BB	09/30/2005 22:45:00	0.00
Out1-BB	09/30/2005 23:00:00	0.00
Out1-BB	09/30/2005 23:15:00	0.00
Out1-BB	09/30/2005 23:30:00	0.00
Out1-BB	09/30/2005 23:45:00	0.00
Out1-BB	10/01/2005 00:00:00	0.00
Out1-BB	10/01/2005 00:15:00	0.00
Out1-BB	10/01/2005 00:30:00	0.00
Out1-BB	10/01/2005 00:45:00	0.00
Out1-BB	10/01/2005 01:00:00	0.00
Out1-BB	10/01/2005 01:15:00	0.00
Out1-BB	10/01/2005 01:30:00	0.00
Out1-BB	10/01/2005 01:45:00	0.00
Out1-BB	10/01/2005 02:00:00	0.00
Out1-BB	10/01/2005 02:15:00	0.00
Out1-BB	10/01/2005 02:30:00	0.00
Out1-BB	10/01/2005 02:45:00	0.00
Out1-BB	10/01/2005 03:00:00	0.00
Out1-BB	10/01/2005 03:15:00	0.00
Out1-BB	10/01/2005 03:30:00	0.00
Out1-BB	10/01/2005 03:45:00	0.00
Out1-BB	10/01/2005 04:00:00	0.00
Out1-BB	10/01/2005 04:15:00	0.00
Out1-BB	10/01/2005 04:30:00	0.00
Out1-BB	10/01/2005 04:45:00	0.00
Out1-BB	10/01/2005 05:00:00	0.00
Out1-BB	10/01/2005 05:15:00	0.00
Out1-BB	10/01/2005 05:30:00	0.00
Out1-BB	10/01/2005 05:45:00	0.00
Out1-BB	10/01/2005 06:00:00	0.00
Out1-BB	10/01/2005 06:15:00	0.00
Out1-BB	10/01/2005 06:30:00	0.00
Out1-BB	10/01/2005 06:45:00	0.00
Out1-BB	10/01/2005 07:00:00	0.00
Out1-BB	10/01/2005 07:15:00	0.00
Out1-BB	10/01/2005 07:30:00	0.00
Out1-BB	10/01/2005 07:45:00	0.00
Out1-BB	10/01/2005 08:00:00	0.00
Out1-BB	10/01/2005 08:15:00	0.00
Out1-BB	10/01/2005 08:30:00	0.00
Out1-BB	10/01/2005 08:45:00	0.00
Out1-BB	10/01/2005 09:00:00	0.00
Out1-BB	10/01/2005 09:15:00	0.00
Out1-BB	10/01/2005 09:30:00	0.00
Out1-BB	10/01/2005 09:45:00	0.00
Out1-BB	10/01/2005 10:00:00	0.00
Out1-BB	10/01/2005 10:15:00	0.00
Out1-BB	10/01/2005 10:30:00	2.08
Out1-BB	10/01/2005 10:45:00	3.09
Out1-BB	10/01/2005 11:00:00	4.14
Out1-BB	10/01/2005 11:15:00	4.26
Out1-BB	10/01/2005 11:30:00	5.16
Out1-BB	10/01/2005 11:45:00	5.23
Out1-BB	10/01/2005 12:00:00	8.70
Out1-BB	10/01/2005 12:15:00	9.08
Out1-BB	10/01/2005 12:30:00	34.63
Out1-BB	10/01/2005 12:45:00	37.31
Out1-BB	10/01/2005 13:00:00	13.46
Out1-BB	10/01/2005 13:15:00	9.76
Out1-BB	10/01/2005 13:30:00	8.05
Out1-BB	10/01/2005 13:45:00	7.75
Out1-BB	10/01/2005 14:00:00	5.85
Out1-BB	10/01/2005 14:15:00	5.29
Out1-BB	10/01/2005 14:30:00	4.62
Out1-BB	10/01/2005 14:45:00	4.31
Out1-BB	10/01/2005 15:00:00	3.96
Out1-BB	10/01/2005 15:15:00	3.88
Out1-BB	10/01/2005 15:30:00	3.87
Out1-BB	10/01/2005 15:45:00	3.86
Out1-BB	10/01/2005 16:00:00	3.86
Out1-BB	10/01/2005 16:15:00	3.86

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
 Out1-BB          10/01/2005 16:30:00   1.35
 Out1-BB          10/01/2005 16:45:00   0.42
 Out1-BB          10/01/2005 17:00:00   0.20
 Out1-BB          10/01/2005 17:15:00   0.11
 Out1-BB          10/01/2005 17:30:00   0.07
 Out1-BB          10/01/2005 17:45:00   0.05
 Out1-BB          10/01/2005 18:00:00   0.03
 Out1-BB          10/01/2005 18:15:00   0.02
 Out1-BB          10/01/2005 18:30:00   0.02
 Out1-BB          10/01/2005 18:45:00   0.01
 Out1-BB          10/01/2005 19:00:00   0.01
 Out1-BB          10/01/2005 19:15:00   0.00
 Out1-BB          10/01/2005 19:30:00   0.00
 Out1-BB          10/01/2005 19:45:00   0.00
 Out1-BB          10/01/2005 20:00:00   0.00
 Out1-BB          10/01/2005 20:15:00   0.00
 Out1-BB          10/01/2005 20:30:00   0.00
 Out1-BB          10/01/2005 20:45:00   0.00
 Out1-BB          10/01/2005 21:00:00   0.00
 Out1-BB          10/01/2005 21:15:00   0.00
 Out1-BB          10/01/2005 21:30:00   0.00
 Out1-BB          10/01/2005 21:45:00   0.00
 Out1-BB          10/01/2005 22:00:00   0.00
 Out1-BB          10/01/2005 22:15:00   0.00
 Out1-BB          10/01/2005 22:30:00   0.00
 Out1-BB          10/01/2005 22:45:00   0.00
 Out1-BB          10/01/2005 23:00:00   0.00
 Out1-BB          10/01/2005 23:15:00   0.00
 Out1-BB          10/01/2005 23:30:00   0.00
 Out1-BB          10/01/2005 23:45:00   0.00
 Out1-BB          10/02/2005 00:00:00   0.00

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
 25yr6hr2.1Max                10:00      0
 25yr6hr2.1Max                10:15      0.0378
 25yr6hr2.1Max                10:30      0.0735
 25yr6hr2.1Max                10:45      0.1218
 25yr6hr2.1Max                11:00      0.168
 25yr6hr2.1Max                11:15      0.2268
 25yr6hr2.1Max                11:30      0.2835
 25yr6hr2.1Max                11:45      0.3843
 25yr6hr2.1Max                12:00      0.483
 25yr6hr2.1Max                12:15      0.8715
 25yr6hr2.1Max                12:30      1.26
 25yr6hr2.1Max                12:45      1.365
 25yr6hr2.1Max                13:00      1.47
 25yr6hr2.1Max                13:15      1.554
 25yr6hr2.1Max                13:30      1.638
 25yr6hr2.1Max                13:45      1.6968
 25yr6hr2.1Max                14:00      1.7535
 25yr6hr2.1Max                14:15      1.8018
 25yr6hr2.1Max                14:30      1.848
 25yr6hr2.1Max                14:45      1.89
 25yr6hr2.1Max                15:00      1.932
 25yr6hr2.1Max                15:15      1.974
 25yr6hr2.1Max                15:30      2.016
 25yr6hr2.1Max                15:45      2.058
 25yr6hr2.1Max                16:00      2.1

[REPORT]
 INPUT     NO
 CONTROLS  NO

[OPTIONS]
 TEMPDIR   "C:\Carlsbad\DMP\"
```

Project BB 84 INCH

Backwater Check

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BB - 84 inch (Washington St. Drainage Improvements)
25 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-03-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        64.841         2.100
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........        39.034         1.264
Surface Runoff ...........        26.045         0.844
Final Surface Storage ....         0.001         0.000
Continuity Error (%) .....        -0.368

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......        26.050         8.489
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         4.098         1.335
External Outflow .........        29.031         9.460
Surface Flooding .........         1.123         0.366
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.021

***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
-------------------------------------------------------------------------------
S1                    2.100      0.000      0.000      1.574      0.531      0.253
S2                    2.100      0.000      0.000      1.573      0.532      0.253
S3                    2.100      0.000      0.000      1.573      0.532      0.253
S4                    2.100      0.000      0.000      1.845      0.261      0.125
S5                    2.100      0.000      0.000      1.572      0.533      0.254
S6                    2.100      0.000      0.000      1.572      0.535      0.255
S7                    2.100      0.000      0.000      1.574      0.531      0.253
S8                    2.100      0.000      0.000      1.551      0.555      0.264
S9                    2.100      0.000      0.000      1.615      0.490      0.233
S10                   2.100      0.000      0.000      1.427      0.679      0.323
S11                   2.100      0.000      0.000      1.532      0.573      0.273
S12                   2.100      0.000      0.000      1.110      0.998      0.475
S13                   2.100      0.000      0.000      1.256      0.853      0.406
S14                   2.100      0.000      0.000      1.069      1.040      0.495
S15                   2.100      0.000      0.000      1.238      0.870      0.414
```

S16	2.100	0.000	0.000	1.258	0.850	0.405
S17	2.100	0.000	0.000	1.256	0.852	0.406
S18	2.100	0.000	0.000	1.401	0.709	0.337
S19	2.100	0.000	0.000	1.319	0.789	0.376
S20	2.100	0.000	0.000	1.112	0.997	0.475
S21	2.100	0.000	0.000	2.015	0.113	0.054
S22	2.100	0.000	0.000	1.321	0.786	0.374
S23	2.100	0.000	0.000	0.986	1.122	0.534
S24	2.100	0.000	0.000	1.448	0.658	0.313
S25	2.100	0.000	0.000	1.570	0.539	0.257
S26	2.100	0.000	0.000	0.730	1.384	0.659
S27	2.100	0.000	0.000	0.820	1.302	0.620
S28	2.100	0.000	0.000	0.650	1.463	0.697
S29	2.100	0.000	0.000	0.314	1.801	0.858
S30	2.100	0.000	0.000	0.776	1.334	0.635
S31	2.100	0.000	0.000	0.524	1.589	0.756
S32	2.100	0.000	0.000	1.301	0.805	0.383
S33	2.100	0.000	0.000	1.217	0.891	0.424
S34	2.100	0.000	0.000	1.218	0.889	0.423
S35	2.100	0.000	0.000	1.028	1.082	0.515
S36	2.100	0.000	0.000	1.258	0.849	0.404
S37	2.100	0.000	0.000	1.133	0.976	0.465
S38	2.100	0.000	0.000	1.342	0.765	0.364
S39	2.100	0.000	0.000	1.511	0.594	0.283
Totals	2.100	0.000	0.000	1.264	0.844	0.402

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.05	0.84	72.24	0 12:45	0	0
J2	0.04	0.70	77.90	0 12:45	0	0
J3	0.02	0.45	81.85	0 12:45	0	0
J4	0.04	0.70	72.10	0 12:45	0	0
J5	0.05	0.84	66.84	0 12:45	0	0
J6	0.05	0.98	65.98	0 12:45	0	0
J7	0.06	1.25	63.25	0 12:45	0	0
J8	0.00	0.06	167.06	0 12:45	0	0
J9	0.00	0.06	131.06	0 12:45	0	0
J10	0.00	0.09	92.09	0 12:45	0	0
J11	0.00	0.04	81.04	0 12:45	0	0
J12	0.01	0.12	72.12	0 12:45	0	0
J13	0.05	0.85	59.85	0 12:45	0	0
J14	0.04	0.69	69.69	0 12:45	0	0
J15	0.02	0.40	73.40	0 12:45	0	0
J16	0.04	0.85	69.85	0 12:45	0	0
J17	0.00	0.00	59.00	0 00:00	0	0
J18	0.04	0.66	58.66	0 12:45	0	0
J19	0.17	6.50	63.00	0 12:21	6.08	38
J20	0.12	2.00	58.00	0 12:25	0	0
J21	0.10	1.70	55.90	0 12:45	0	0
J22	0.07	1.48	54.48	0 12:45	0	0
J23	0.07	1.48	53.48	0 12:45	0	0
J24	0.21	11.00	60.00	0 12:22	5.08	35
J25	0.12	2.01	49.01	0 12:46	0	0
J26	0.01	0.23	54.75	0 12:45	0	0
J27	0.01	0.23	53.43	0 12:45	0	0
J28	0.03	0.55	51.75	0 12:45	0	0
J29	0.13	2.32	41.82	0 12:45	0	0
J30	0.22	14.00	50.00	0 12:30	2.32	21
J31	0.06	1.08	41.98	0 12:45	0	0
J32	0.10	1.55	36.55	0 12:45	0	0
J33	0.01	0.18	46.18	0 12:44	0	0
J34	0.01	0.18	45.22	0 12:45	0	0
J35	0.04	0.70	39.30	0 12:45	0	0

J36	0.05	1.05	38.45	0	12:45	0	0
J37	0.05	1.05	38.14	0	12:45	0	0
J38	0.02	0.38	36.95	0	12:45	0	0
J39	0.11	1.86	36.79	0	12:45	0	0
J40	0.11	1.86	36.26	0	12:45	0	0
J41	0.19	3.00	32.77	0	12:33	0	0
J42	0.24	3.36	29.30	0	12:45	0	0
J43	0.24	3.36	28.14	0	12:46	0	0
J44	0.24	3.28	26.90	0	12:46	0	0
J45	0.04	0.70	42.80	0	12:45	0	0
J46	0.05	0.88	47.68	0	12:45	0	0
J47	0.02	0.31	47.11	0	12:45	0	0
J48	0.05	0.88	47.28	0	12:45	0	0
J49	0.04	0.61	47.41	0	12:45	0	0
J50	0.05	0.77	46.17	0	12:45	0	0
J51	0.04	0.70	35.10	0	12:45	0	0
OUT1	3.00	7.00	28.64	0	10:15	0	0

****
Conduit Flow Summary
****

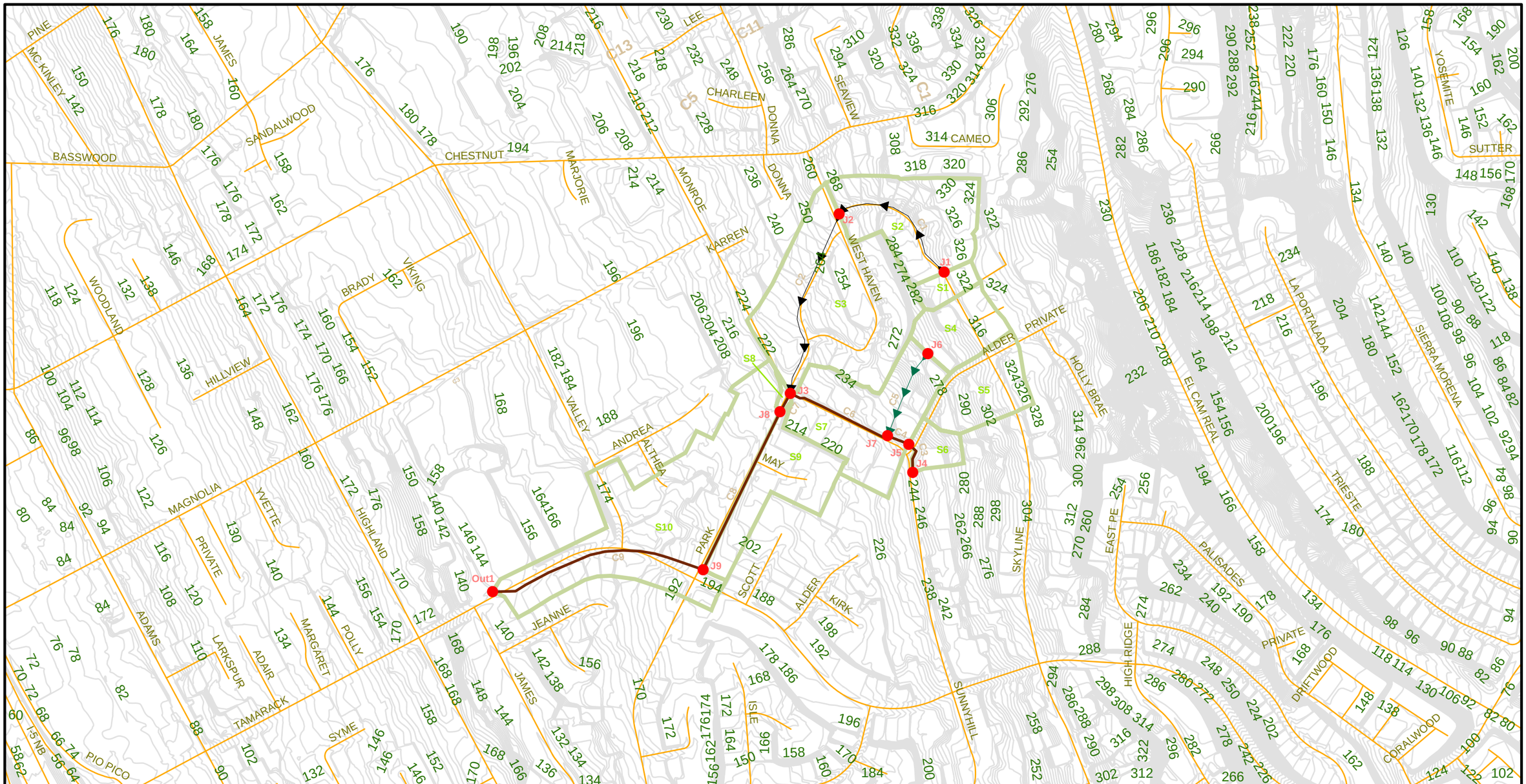
Conduit	Maximum Flow CFS	Time of Max Occurrence days	hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	5.15	0	12:45	11.66	1.00	0.19	0
C2	7.98	0	12:45	8.24	1.00	0.26	0
C3	8.26	0	12:45	9.74	1.00	0.22	0
C4	13.11	0	12:45	10.48	1.00	0.37	0
C5	13.11	0	12:45	10.85	1.00	0.35	0
C6	21.35	0	12:45	13.89	1.00	0.49	0
C7	22.08	0	12:45	10.70	1.00	0.72	0
C8	1.76	0	12:45	5.58	1.00	0.20	0
C9	4.89	0	12:46	3.96	1.00	0.04	0
C10	11.79	0	12:45	4.59	1.00	0.13	0
C11	3.16	0	12:46	2.08	1.00	0.03	0
C12	20.95	0	12:45	5.71	1.00	0.23	0
C13	21.68	0	12:45	20.84	1.00	0.62	0
C14	13.34	0	12:45	13.95	1.00	0.26	0
C15	2.70	0	12:45	7.10	1.00	0.16	0
C16	14.48	0	12:45	14.05	1.00	0.62	0
C17	0.00	0	00:00	0.00	1.00	0.00	0
C18	3.49	0	12:45	3.88	1.00	0.24	0
C19	11.94	0	12:59	4.30	1.00	1.08	35
C20	17.04	0	12:45	6.11	1.00	1.03	2
C21	18.86	0	12:46	14.48	1.00	0.39	0
C22	15.08	0	12:45	6.09	1.00	0.90	0
C23	15.06	0	12:46	8.12	1.00	0.63	0
C24	16.38	0	12:57	5.97	1.00	1.08	30
C25	60.97	0	12:46	12.23	1.00	0.78	0
C26	0.47	0	12:45	2.79	1.00	0.05	0
C27	0.47	0	12:46	2.00	1.00	0.13	0
C28	5.08	0	12:45	8.79	1.00	0.28	0
C29	75.62	0	12:45	12.93	1.00	0.94	0
C30	86.37	0	12:51	13.41	1.00	1.08	19
C31	14.35	0	12:45	8.38	1.00	0.57	0
C32	25.89	0	12:45	4.47	1.00	0.15	0
C33	0.21	0	12:45	2.19	1.00	0.07	0
C34	0.20	0	12:45	3.90	1.00	0.01	0
C35	7.09	0	12:45	8.73	1.00	0.45	0
C36	7.08	0	12:45	5.36	1.00	0.84	0
C37	7.07	0	12:45	3.52	1.00	0.00	0
C38	7.07	0	12:45	0.73	1.00	0.21	0
C39	38.09	0	12:45	5.13	1.00	0.21	0
C40	50.95	0	12:46	8.97	1.00	0.14	0
C41	149.15	0	12:46	11.91	1.00	0.28	0
C42	162.08	0	12:46	8.87	1.00	0.47	0
C43	168.74	0	12:46	9.54	1.00	0.45	0
C44	168.70	0	12:46	11.47	1.00	0.35	0

C45	11.49	0	12:45	9.20	1.00	0.12	0
C46	6.12	0	12:45	5.69	1.00	0.65	0
C47	0.91	0	12:45	3.40	1.00	0.10	0
C48	7.03	0	12:45	6.31	1.00	0.31	0
C49	6.06	0	12:45	9.01	1.00	0.35	0
C50	13.08	0	12:45	16.09	1.00	0.20	0
C51	27.34	0	12:45	22.81	1.00	0.11	0

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.02

Analysis begun on:  Tue Jun 06 14:13:04 2006
Total elapsed time: < 1 sec
```

Project BCA
Park Drive/Tamarack Avenue Project



N
W E
S

0 250 500 1,000
Feet

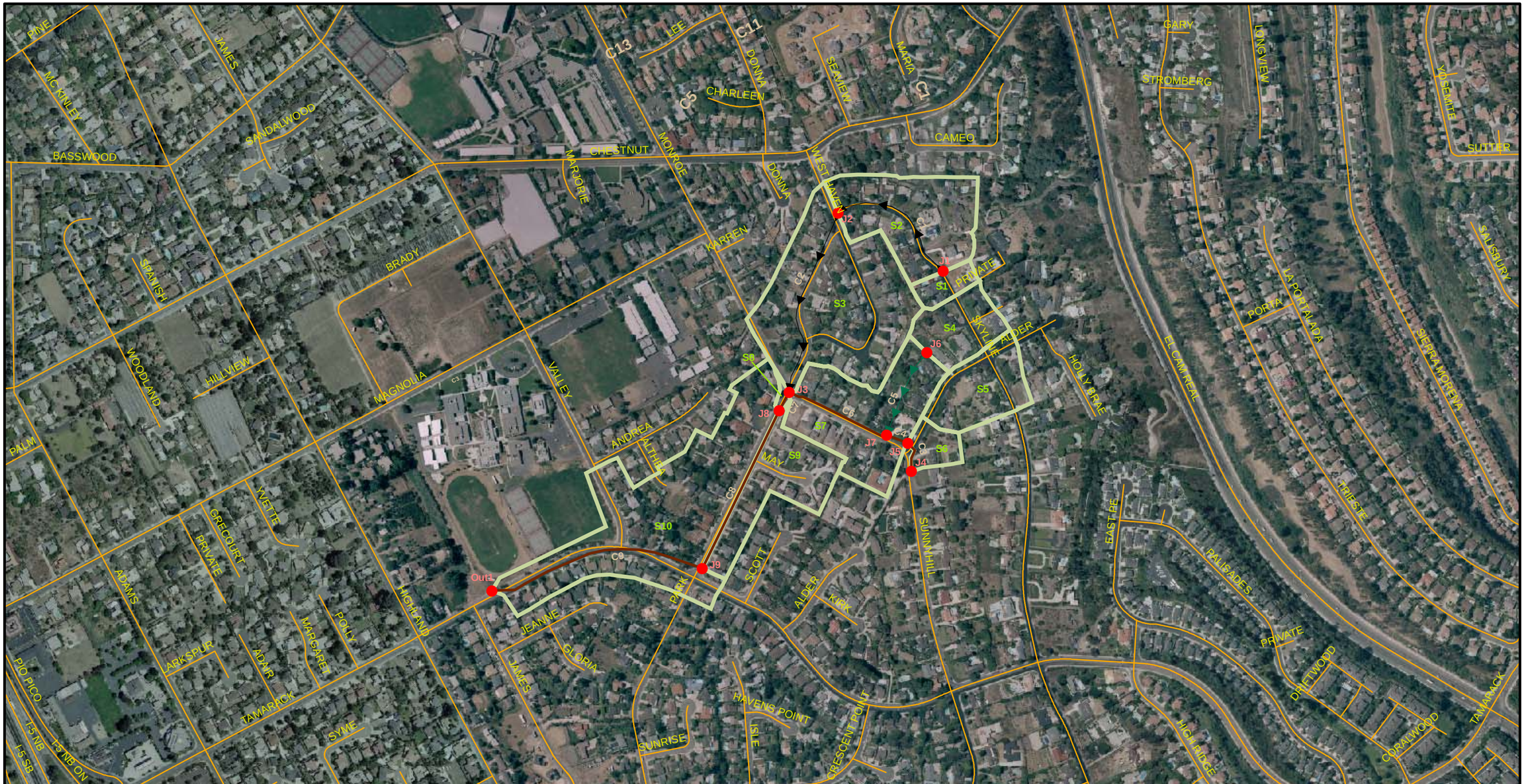
LEGEND

- JUNCTIONS
- GUTTER FLOW
- OVERLAND FLOW
- CONTOURS
- CONDUITS
- SUBCATCHMENTS
- ROADS

PROJECT BCA

PROJECT LOCATION	DATE	PROJECT NUMBER
TAMARACK AVE CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA



N
W E
S

0 250 500 1,000
Feet

Legend

- JUNCTIONS
- GUTTER FLOW
- OVERLAND FLOW
- CONDUITS
- SUBCATCHMENTS
- ROADS

PROJECT BCA

PROJECT LOCATION	DATE	PROJECT NUMBER
TAMARACK AVE CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project BCA

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project BCA (Park Drive/Tamarack Avenue)

```
[TITLE]
Drainage Project BCA (Park Drive/Tamarack Avenue)
100 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       22:00:00
 END_DATE                10/02/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain      Recd.  Snow   Data       Source            Station   Rain
;;Name              Type      Freq.  Catch  Source     Name              ID        Units
;;-------------------------------------------------------------------------------------
  R1                CUMULATIVE 0:15   1.0    TIMESERIES 100yr6hr2.6Max

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.              Pcnt.    Curb     Snow
;;Name              Raingage          Outlet         Area     Imperv   Width     Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------------
  S1                R1                J1             1.02     35       234       1        0
  S2                R1                J2             6.77     35       368       7        0
  S3                R1                J3             12.49    35       544       5        0
  S4                R1                J6             2.97     38       238       8        0
  S5                R1                S7             3.74     25       207       8        0
  S6                R1                J4             1.16     35       169       11       0
  S7                R1                J3             7.65     35       333       7        0
  S8                R1                J8             0.18     100      40        4        0
  S9                R1                J9             4.69     38       189       2        0
  S10               R1                OUT1           14.97    38       326       4        0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1                0.011      0.15       0.05       0.1        100        OUTLET
  S2                0.011      0.15       0.05       0.1        100        OUTLET
  S3                0.011      0.15       0.05       0.1        100        OUTLET
  S4                0.011      0.15       0.05       0.1        100        OUTLET
  S5                0.011      0.15       0.05       0.1        100        OUTLET
  S6                0.011      0.15       0.05       0.1        100        OUTLET
  S7                0.011      0.15       0.05       0.1        100        OUTLET
  S8                0.011      0.15       0.05       0.1        100        OUTLET
  S9                0.011      0.15       0.05       0.1        100        OUTLET
  S10               0.011      0.15       0.05       0.1        100        OUTLET

[INFILTRATION]
;;Subcatchment     Suction    HydCon     IMDmax
;;-------------------------------------------------
  S1                2.4        1.18       0
  S2                2.4        1.18       0
  S3                2.4        1.18       0
  S4                2.4        1.18       0
  S5                2.4        1.18       0
```

```
 S6                2.4         1.18        0
 S7                2.4         1.18        0
 S8                2.4         1.18        0
 S9                2.4         1.18        0
 S10               2.4         1.18        0

[JUNCTIONS]
;;                 Invert      Max.        Init.       Surcharge   Ponded
;;Name             Elev.       Depth       Depth       Depth       Area
;;-------------------------------------------------------------------------
 J1                317         1           0           0           0
 J2                267.5       1           0           0           0
 J3                215         6           0           0           0
 J4                248         1           0           0           0
 J5                243         6           0           0           0
 J6                289         1           0           0           0
 J7                239         3           0           0           0
 J8                212         6           0           0           0
 J9                184.5       9           0           0           0

[OUTFALLS]
;;                 Invert      Outfall     Stage/Table     Tide
;;Name             Elev.       Type        Time Series     Gate
;;-----------------------------------------------------------
;Connection to a 60 inch
 OUT1              131.3       FIXED       133.3 NO

[CONDUITS]
;;                 Inlet       Outlet                      Manning     Inlet       Outlet      Init.       Ma
;;Name             Node        Node        Length          N           Height      Height      Flow        Fl
;;-----------------------------------------------------------------------------------------------------------
;Gutter - Box
 C1                J1          J2          727.18          0.013       0           0           0           0
;Gutter - Box
 C2                J2          J3          981.82          0.013       0           0           0           0
;Pipe - RCP 18"
 C3                J4          J5          164.69          0.013       0           0           0           0
;BCA: Pipe - RCP 24"
 C4                J5          J7          116.38          0.013       0           0           0           0
;Swale - Trapezoid
 C5                J6          J7          470.27          0.024       0           0           0           0
;BCA: Pipe - RCP 24"
 C6                J7          J3          551.44          0.013       0           0           0           0
;BCA: Pipe - RCP 24"
 C7                J3          J8          108.15          0.013       0           0           0           0
;BCA: Pipe - RCP 24"
 C8                J8          J9          896.07          0.013       0           0           0           0
;Pipe - RCP 24"
 C9                J9          OUT1        1135.8          0.013       0           0           0           0

[XSECTIONS]
;;Link             Type        Geom1       Geom2       Geom3       Geom4       Barrels
;;-----------------------------------------------------------------------------------
 C1                RECT_OPEN   0.5         2           0           0           1
 C2                RECT_OPEN   0.5         30          0           0           1
 C3                CIRCULAR    1.5         0           0           0           1
 C4                CIRCULAR    2           0           0           0           1
 C5                TRAPEZOIDAL 1.5         3           0.5         0.5         1
 C6                CIRCULAR    2           0           0           0           1
 C7                CIRCULAR    2           0           0           0           1
 C8                CIRCULAR    2           0           0           0           1
 C9                CIRCULAR    2           0           0           0           1

[TIMESERIES]
;;Name             Date        Time        Value
;;-----------------------------------------------
;100 Year 6 Hr SCS Type B Desgin Storm Max Precip = 2.6 inches
 100yr6hr2.6Max    10/01/2005 10:00        0.0
 100yr6hr2.6Max               10:15        0.0468
 100yr6hr2.6Max               10:30        0.091
 100yr6hr2.6Max               10:45        0.1508
 100yr6hr2.6Max               11:00        0.208
```

```
 100yr6hr2.6Max              11:15      0.2808
 100yr6hr2.6Max              11:30      0.351
 100yr6hr2.6Max              11:45      0.4758
 100yr6hr2.6Max              12:00      0.598
 100yr6hr2.6Max              12:15      1.079
 100yr6hr2.6Max              12:30      1.56
 100yr6hr2.6Max              12:45      1.69
 100yr6hr2.6Max              13:00      1.82
 100yr6hr2.6Max              13:15      1.924
 100yr6hr2.6Max              13:30      2.028
 100yr6hr2.6Max              13:45      2.1008
 100yr6hr2.6Max              14:00      2.171
 100yr6hr2.6Max              14:15      2.2308
 100yr6hr2.6Max              14:30      2.288
 100yr6hr2.6Max              14:45      2.34
 100yr6hr2.6Max              15:00      2.392
 100yr6hr2.6Max              15:15      2.444
 100yr6hr2.6Max              15:30      2.496
 100yr6hr2.6Max              15:45      2.548
 100yr6hr2.6Max              16:00      2.6

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BCA

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project BCA (Park Drive/Tamarack Avenue)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
---------------------------------------------------------------

Drainage Project BCA (Park Drive/Tamarack Avenue)
100 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        12.055         2.600
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         7.695         1.660
Surface Runoff ...........         4.409         0.951
Final Surface Storage ....         0.000         0.000
Continuity Error (%) .....        -0.410

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         4.417         1.439
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         4.418         1.440
Surface Flooding .........         0.000         0.000
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.034

****************************
Subcatchment Runoff Summary
****************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
-------------------------------------------------------------------------------
S1                    2.600      0.000      0.000      1.625      0.987      0.380
S2                    2.600      0.000      0.000      1.641      0.968      0.372
S3                    2.600      0.000      0.000      1.653      0.956      0.368
S4                    2.600      0.000      0.000      1.549      1.063      0.409
S5                    2.600      0.000      0.000      1.896      0.713      0.274
S6                    2.600      0.000      0.000      1.620      1.024      0.394
S7                    2.600      0.350      0.000      1.837      1.122      0.380
S8                    2.600      0.000      0.000      0.000      2.606      1.002
S9                    2.600      0.000      0.000      1.588      1.021      0.393
S10                   2.600      0.000      0.000      1.593      1.016      0.391
-------------------------------------------------------------------------------
Totals                2.600      0.048      0.000      1.660      0.999      0.377

******************
```

Drainage Project BCA (Park Drive/Tamarack Avenue)

Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.01	0.09	317.09	0 14:45	0	0
J2	0.01	0.09	267.59	0 14:45	0	0
J3	0.12	1.31	216.31	0 14:45	0	0
J4	0.02	0.27	248.27	0 14:45	0	0
J5	0.02	0.26	243.26	0 14:45	0	0
J6	0.01	0.17	289.17	0 14:45	0	0
J7	0.04	0.40	239.40	0 14:45	0	0
J8	0.12	1.30	213.30	0 14:45	0	0
J9	0.11	1.27	185.77	0 14:46	0	0
OUT1	0.91	2.00	133.30	0 12:15	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	0.96	0 14:45	5.59	1.00	0.07	0
C2	6.79	0 14:46	4.02	1.00	0.03	0
C3	1.22	0 14:45	5.89	1.00	0.07	0
C4	1.22	0 14:45	5.94	1.00	0.03	0
C5	2.94	0 14:45	5.79	1.00	0.03	0
C6	4.14	0 14:46	9.32	1.00	0.09	0
C7	28.64	0 14:45	13.20	1.00	0.76	0
C8	28.88	0 14:46	13.85	1.00	0.73	0
C9	32.58	0 14:46	16.78	1.00	0.67	0

****
Routing Time Step Summary
****

```
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.02
```

Analysis begun on: Thu Jun 15 09:06:59 2006
Total elapsed time: < 1 sec

Project BCA

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project BCA (Park Drive/Tamarack Avenue)

```
[TITLE]
Drainage Project BCA (Park Drive/Tamarack Avenue)
25 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       22:00:00
 END_DATE                10/02/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain       Recd.  Snow   Data       Source           Station    Rain
;;Name              Type       Freq.  Catch  Source     Name             ID         Units
;;-------------------------------------------------------------------------------------
  R1                CUMULATIVE 0:15   1.0    TIMESERIES 25yr6hr2.1Max

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.              Pcnt.    Curb     Snow
;;Name              Raingage          Outlet         Area     Imperv   Width     Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------------
  S1                R1                J1             1.02     35       234       1        0
  S2                R1                J2             6.77     35       368       7        0
  S3                R1                J3             12.49    35       544       5        0
  S4                R1                J6             2.97     38       238       8        0
  S5                R1                S7             3.74     25       207       8        0
  S6                R1                J4             1.16     35       169       11       0
  S7                R1                J3             7.65     35       333       7        0
  S8                R1                J8             0.18     100      40        4        0
  S9                R1                J9             4.69     38       189       2        0
  S10               R1                OUT1           14.97    38       326       4        0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1                0.011      0.15       0.05       0.1        100        OUTLET
  S2                0.011      0.15       0.05       0.1        100        OUTLET
  S3                0.011      0.15       0.05       0.1        100        OUTLET
  S4                0.011      0.15       0.05       0.1        100        OUTLET
  S5                0.011      0.15       0.05       0.1        100        OUTLET
  S6                0.011      0.15       0.05       0.1        100        OUTLET
  S7                0.011      0.15       0.05       0.1        100        OUTLET
  S8                0.011      0.15       0.05       0.1        100        OUTLET
  S9                0.011      0.15       0.05       0.1        100        OUTLET
  S10               0.011      0.15       0.05       0.1        100        OUTLET

[INFILTRATION]
;;Subcatchment     Suction    HydCon     IMDmax
;;-------------------------------------------------
  S1                2.4        1.18       0
  S2                2.4        1.18       0
  S3                2.4        1.18       0
  S4                2.4        1.18       0
  S5                2.4        1.18       0
```

```
  S6                2.4         1.18        0
  S7                2.4         1.18        0
  S8                2.4         1.18        0
  S9                2.4         1.18        0
  S10               2.4         1.18        0

[JUNCTIONS]
;;                  Invert      Max.        Init.       Surcharge   Ponded
;;Name              Elev.       Depth       Depth       Depth       Area
;;-------------------------------------------------------------------------
  J1                317         1           0           0           0
  J2                267.5       1           0           0           0
  J3                215         6           0           0           0
  J4                248         1           0           0           0
  J5                243         6           0           0           0
  J6                289         1           0           0           0
  J7                239         3           0           0           0
  J8                212         6           0           0           0
  J9                184.5       9           0           0           0

[OUTFALLS]
;;                  Invert      Outfall     Stage/Table       Tide
;;Name              Elev.       Type        Time Series       Gate
;;-----------------------------------------------------------------
;Connection to a 60 inch
  OUT1              131.3       FIXED       133.3 NO

[CONDUITS]
;;                  Inlet                   Outlet                      Manning     Inlet       Outlet      Init.       Ma
;;Name              Node                    Node                Length  N           Height      Height      Flow        Fl
;;-----------------------------------------------------------------------------------------------------------------------
;Gutter - Box
  C1                J1                      J2                  727.18  0.013       0           0           0           0
;Gutter - Box
  C2                J2                      J3                  981.82  0.013       0           0           0           0
;Pipe - RCP 18"
  C3                J4                      J5                  164.69  0.013       0           0           0           0
;BCA: Pipe - RCP 24"
  C4                J5                      J7                  116.38  0.013       0           0           0           0
;Swale - Trapezoid
  C5                J6                      J7                  470.27  0.024       0           0           0           0
;BCA: Pipe - RCP 24"
  C6                J7                      J3                  551.44  0.013       0           0           0           0
;BCA: Pipe - RCP 24"
  C7                J3                      J8                  108.15  0.013       0           0           0           0
;BCA: Pipe - RCP 24"
  C8                J8                      J9                  896.07  0.013       0           0           0           0
;Pipe - RCP 24"
  C9                J9                      OUT1                1135.8  0.013       0           0           0           0

[XSECTIONS]
;;Link              Type          Geom1       Geom2       Geom3       Geom4       Barrels
;;-----------------------------------------------------------------------------------------
  C1                RECT_OPEN     0.5         2           0           0           1
  C2                RECT_OPEN     0.5         30          0           0           1
  C3                CIRCULAR      1.5         0           0           0           1
  C4                CIRCULAR      2           0           0           0           1
  C5                TRAPEZOIDAL   1.5         3           0.5         0.5         1
  C6                CIRCULAR      2           0           0           0           1
  C7                CIRCULAR      2           0           0           0           1
  C8                CIRCULAR      2           0           0           0           1
  C9                CIRCULAR      2           0           0           0           1

[TIMESERIES]
;;Name              Date        Time        Value
;;-----------------------------------------------
;100 Year 6 Hr SCS Type B Desgin Storm Max Precip = 2.6 inches
  100yr6hr2.6Max    10/01/2005 10:00        0.0
  100yr6hr2.6Max               10:15        0.0468
  100yr6hr2.6Max               10:30        0.091
  100yr6hr2.6Max               10:45        0.1508
  100yr6hr2.6Max               11:00        0.208
```

```
 100yr6hr2.6Max                11:15      0.2808
 100yr6hr2.6Max                11:30      0.351
 100yr6hr2.6Max                11:45      0.4758
 100yr6hr2.6Max                12:00      0.598
 100yr6hr2.6Max                12:15      1.079
 100yr6hr2.6Max                12:30      1.56
 100yr6hr2.6Max                12:45      1.69
 100yr6hr2.6Max                13:00      1.82
 100yr6hr2.6Max                13:15      1.924
 100yr6hr2.6Max                13:30      2.028
 100yr6hr2.6Max                13:45      2.1008
 100yr6hr2.6Max                14:00      2.171
 100yr6hr2.6Max                14:15      2.2308
 100yr6hr2.6Max                14:30      2.288
 100yr6hr2.6Max                14:45      2.34
 100yr6hr2.6Max                15:00      2.392
 100yr6hr2.6Max                15:15      2.444
 100yr6hr2.6Max                15:30      2.496
 100yr6hr2.6Max                15:45      2.548
 100yr6hr2.6Max                16:00      2.6

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
 25yr6hr2.1Max                 10:00      0
 25yr6hr2.1Max                 10:15      0.0378
 25yr6hr2.1Max                 10:30      0.0735
 25yr6hr2.1Max                 10:45      0.1218
 25yr6hr2.1Max                 11:00      0.168
 25yr6hr2.1Max                 11:15      0.2268
 25yr6hr2.1Max                 11:30      0.2835
 25yr6hr2.1Max                 11:45      0.3843
 25yr6hr2.1Max                 12:00      0.483
 25yr6hr2.1Max                 12:15      0.8715
 25yr6hr2.1Max                 12:30      1.26
 25yr6hr2.1Max                 12:45      1.365
 25yr6hr2.1Max                 13:00      1.47
 25yr6hr2.1Max                 13:15      1.554
 25yr6hr2.1Max                 13:30      1.638
 25yr6hr2.1Max                 13:45      1.6968
 25yr6hr2.1Max                 14:00      1.7535
 25yr6hr2.1Max                 14:15      1.8018
 25yr6hr2.1Max                 14:30      1.848
 25yr6hr2.1Max                 14:45      1.89
 25yr6hr2.1Max                 15:00      1.932
 25yr6hr2.1Max                 15:15      1.974
 25yr6hr2.1Max                 15:30      2.016
 25yr6hr2.1Max                 15:45      2.058
 25yr6hr2.1Max                 16:00      2.1

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BCA

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project BCA (Park Drive/Tamarack Avenue)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BCA (Park Drive/Tamarack Avenue)
25 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......         9.737         2.100
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         6.350         1.370
Surface Runoff ...........         3.424         0.738
Final Surface Storage ....         0.000         0.000
Continuity Error (%) .....        -0.383

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         3.425         1.116
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         3.426         1.116
Surface Flooding .........         0.000         0.000
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.039

****************************
Subcatchment Runoff Summary
****************************
```

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Runoff Coeff
S1	2.100	0.000	0.000	1.360	0.749	0.357
S2	2.100	0.000	0.000	1.362	0.746	0.355
S3	2.100	0.000	0.000	1.363	0.744	0.354
S4	2.100	0.000	0.000	1.297	0.812	0.387
S5	2.100	0.000	0.000	1.572	0.535	0.255
S6	2.100	0.000	0.000	1.356	0.759	0.361
S7	2.100	0.262	0.000	1.529	0.845	0.358
S8	2.100	0.000	0.000	0.000	2.105	1.003
S9	2.100	0.000	0.000	1.301	0.806	0.384
S10	2.100	0.000	0.000	1.301	0.806	0.384
Totals	2.100	0.036	0.000	1.370	0.774	0.363

```
******************
```

Drainage Project BCA (Park Drive/Tamarack Avenue)

Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.01	0.07	317.07	0 12:45	0	0
J2	0.01	0.07	267.57	0 12:45	0	0
J3	0.10	1.02	216.02	0 12:45	0	0
J4	0.02	0.21	248.21	0 12:45	0	0
J5	0.02	0.21	243.21	0 12:45	0	0
J6	0.01	0.13	289.13	0 12:45	0	0
J7	0.03	0.32	239.32	0 12:45	0	0
J8	0.10	1.02	213.02	0 12:45	0	0
J9	0.10	1.00	185.50	0 12:45	0	0
OUT1	0.91	2.00	133.30	0 10:15	0	0

****
Conduit Flow Summary
****

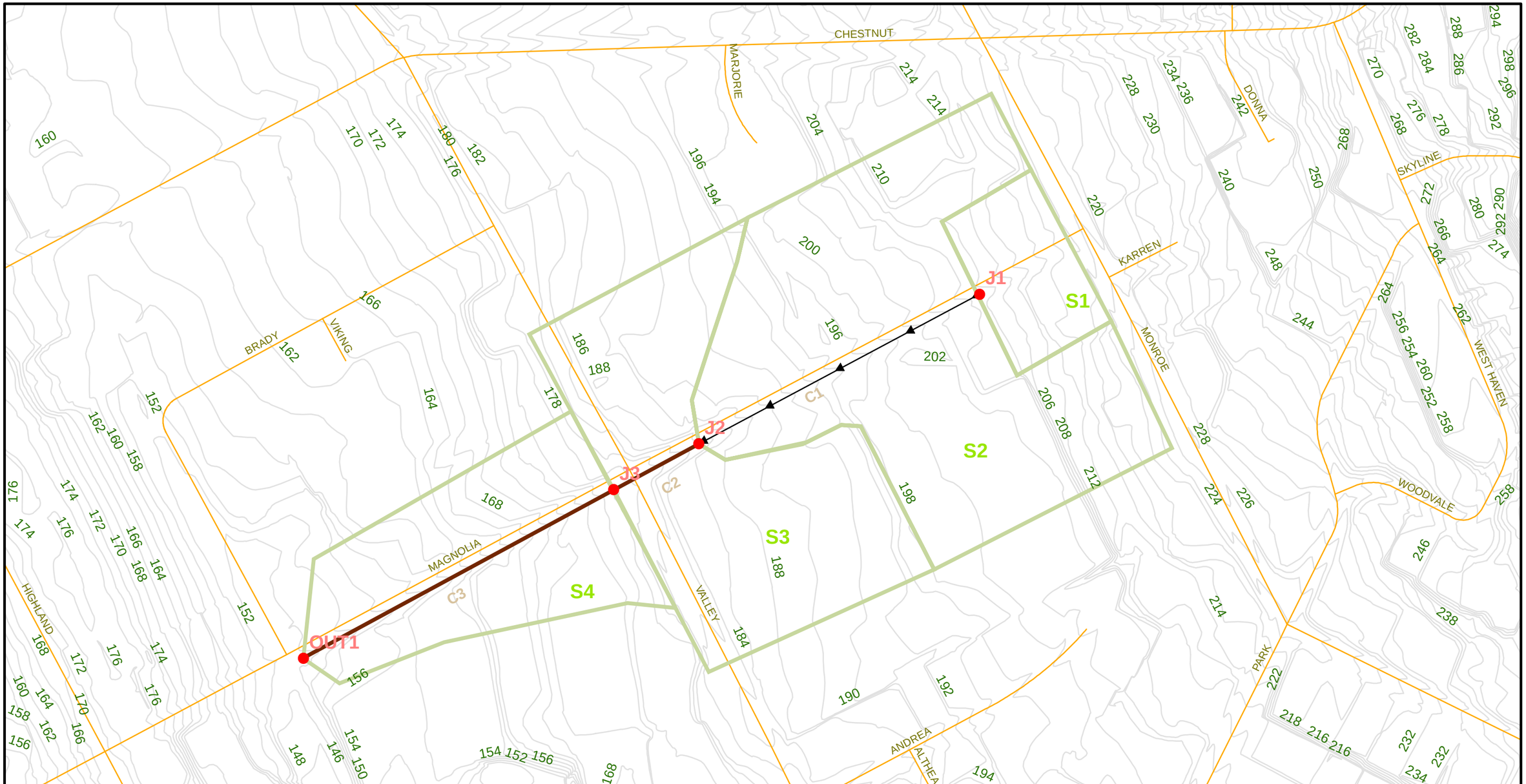
Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	0.61	0 12:45	4.73	1.00	0.04	0
C2	4.58	0 12:46	3.44	1.00	0.02	0
C3	0.75	0 12:45	5.11	1.00	0.04	0
C4	0.74	0 12:45	5.08	1.00	0.02	0
C5	1.92	0 12:45	4.94	1.00	0.02	0
C6	2.66	0 12:46	8.18	1.00	0.06	0
C7	19.50	0 12:45	12.09	1.00	0.52	0
C8	19.75	0 12:45	12.68	1.00	0.50	0
C9	22.53	0 12:46	15.34	1.00	0.46	0

****
Routing Time Step Summary
****

```
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.02
```

Analysis begun on: Thu Jun 15 09:06:30 2006
Total elapsed time: < 1 sec

Project BCB
Magnolia Avenue Project



N
W E
S

0 200 400
Feet

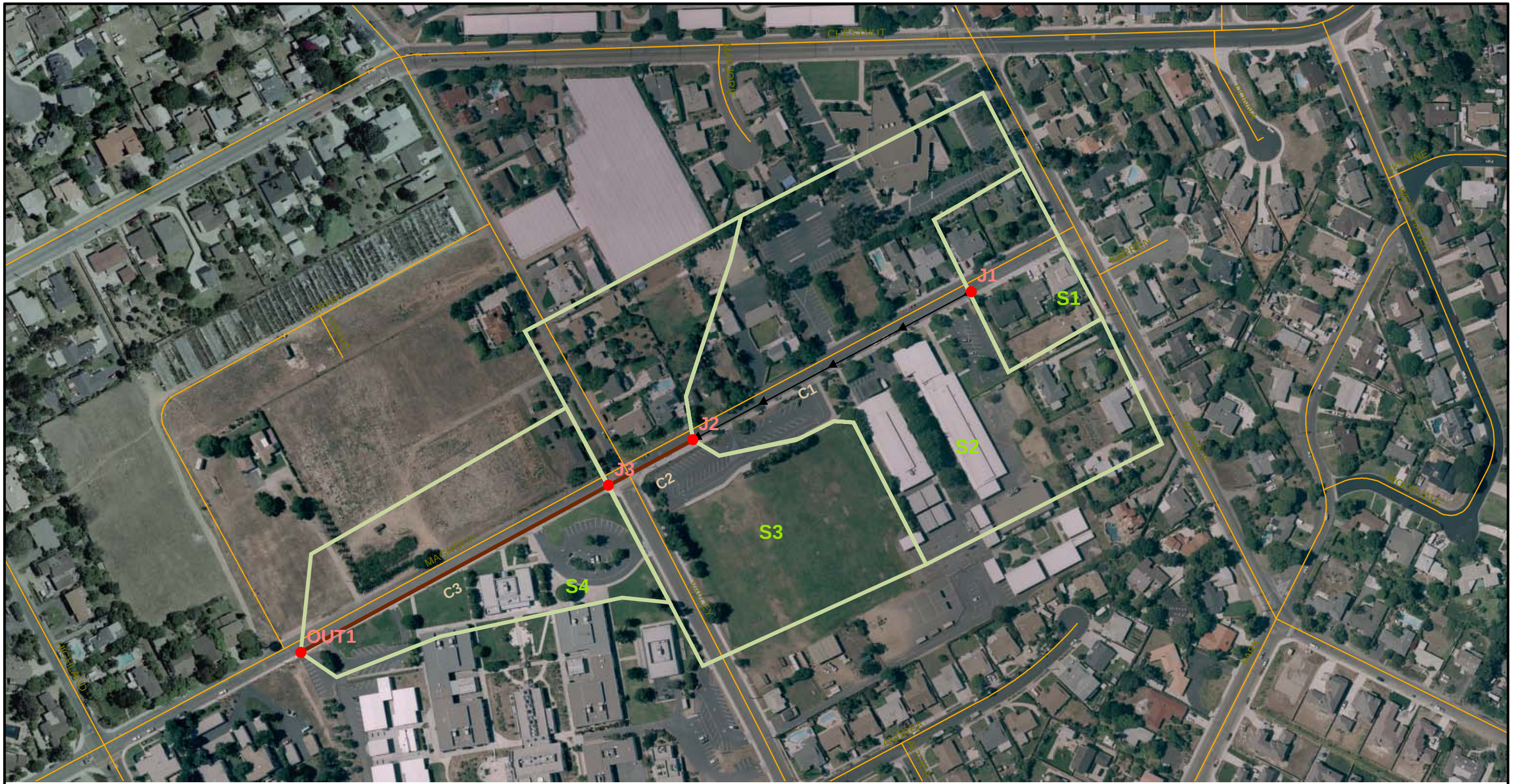
LEGEND

- JUNCTIONS
- CONDUITS
- GUTTER FLOW
- SUBCATCHMENTS
- CONTOURS
- ROADS

PROJECT BCB

PROJECT LOCATION	DATE	PROJECT NUMBER
MAGNOLIA AVE CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA



0 200 400 Feet

LEGEND

- JUNCTIONS
- GUTTER FLOW
- CONDUITS
- SUBCATCHMENTS
- ROADS

PROJECT BCB

PROJECT LOCATION	DATE	PROJECT NUMBER
MAGNOLIA AVE CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project BCB

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project BCB (Magnolia Avenue)

```
[TITLE]
Drainage Project BCB (Magnolia Avenue)
100 Year 6 Hour

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       22:00:00
 END_DATE                10/03/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain      Recd.  Snow   Data       Source           Station    Rain
;;Name              Type      Freq.  Catch  Source     Name             ID         Units
;;-------------------------------------------------------------------------------------
;Rain gage does not exist. Use SD Hydrology Manual SCS
;Type II rainfall curve. Place rain gage in central location.
  R1                CUMULATIVE 0:15   1.0    TIMESERIES 100year6hrCumulative

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.              Pcnt.    Curb     Snow
;;Name              Raingage          Outlet         Area     Imperv   Width     Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------------
  S1                R1                J1             1.73     42       274       4        0
  S2                R1                J2             10.60    50       474       4        0
  S3                R1                J3             7.25     38       472       3        0
  S4                R1                OUT1           5.02     33       278       3        0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1                0.011      0.15       0.05       0.05       100        OUTLET
  S2                0.011      0.15       0.05       0.05       100        OUTLET
  S3                0.011      0.15       0.05       0.05       100        OUTLET
  S4                0.011      0.15       0.05       0.05       100        OUTLET

[INFILTRATION]
;;Subcatchment     Suction    HydCon     IMDmax
;;-----------------------------------------------
  S1                2.4        1.18       0
  S2                2.4        1.18       0
  S3                2.4        1.18       0
  S4                2.4        1.18       0

[JUNCTIONS]
;;                  Invert     Max.       Init.      Surcharge  Ponded
;;Name              Elev.      Depth      Depth      Depth      Area
;;-----------------------------------------------------------------------
;Gutter flow junction
  J1                207        0          0          0          0
;Created Manhole
  J2                175        9          0          0          0
;Created Manhole
  J3                168        8          0          0          0
```

Drainage Project BCB (Magnolia Avenue)

```
[OUTFALLS]
;;                      Invert     Outfall    Stage/Table      Tide
;;Name                  Elev.      Type       Time Series      Gate
;;-----------------------------------------------------------------
;Created Outlet/Manhole
  OUT1                  139.8      FIXED      142.3 NO

[CONDUITS]
;;                      Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Ma
;;Name                  Node             Node             Length     N          Height     Height     Flow       Fl
;;-----------------------------------------------------------------------------------------------------------------
;Gutter Flow
  C1                    J1               J2               650.7      0.013      0          0          0          0
;30" RCP - BCB
  C2                    J2               J3               197.78     0.013      0          0          0          0
;30" RCP - BCB
  C3                    J3               OUT1             723.48     0.013      0          0          0          0

[XSECTIONS]
;;Link                  Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-----------------------------------------------------------------------------------------
  C1                    RECT_OPEN    0.5        3          0          0          1
  C2                    CIRCULAR     2.5        0          0          0          1
  C3                    CIRCULAR     2.5        0          0          0          1

[TIMESERIES]
;;Name                  Date         Time       Value
;;-----------------------------------------------------
;100 year 6 hr SCS Type B Design Storm Max Precip = 2.6 inches
  100year6hrCumulative 10/01/2005 10:00      0.0
  100year6hrCumulative            10:15      0.0468
  100year6hrCumulative            10:30      0.091
  100year6hrCumulative            10:45      0.1508
  100year6hrCumulative            11:00      0.208
  100year6hrCumulative            11:15      0.2808
  100year6hrCumulative            11:30      0.351
  100year6hrCumulative            11:45      0.4758
  100year6hrCumulative            12:00      0.598
  100year6hrCumulative            12:15      1.079
  100year6hrCumulative            12:30      1.56
  100year6hrCumulative            12:45      1.69
  100year6hrCumulative            13:00      1.82
  100year6hrCumulative            13:15      1.924
  100year6hrCumulative            13:30      2.028
  100year6hrCumulative            13:45      2.1008
  100year6hrCumulative            14:00      2.171
  100year6hrCumulative            14:15      2.2308
  100year6hrCumulative            14:30      2.288
  100year6hrCumulative            14:45      2.34
  100year6hrCumulative            15:00      2.392
  100year6hrCumulative            15:15      2.444
  100year6hrCumulative            15:30      2.496
  100year6hrCumulative            15:45      2.548
  100year6hrCumulative            16:00      2.6

[REPORT]
 INPUT     NO
 CONTROLS  NO

[OPTIONS]
 TEMPDIR   "C:\Carlsbad\DMP\"
```

Project BCB

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project BCB (Magnolia Avenue)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BCB (Magnolia Avenue)
100 Year 6 Hour

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-03-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......         5.330         2.600
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.957         1.443
Surface Runoff ...........         2.398         1.170
Final Surface Storage ....         0.000         0.000
Continuity Error (%) .....        -0.473

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.402         0.783
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.402         0.783
Surface Flooding .........         0.000         0.000
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.010

****************************
Subcatchment Runoff Summary
****************************

--------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment             in         in         in         in         in
--------------------------------------------------------------------------------
S1                    2.600      0.000      0.000      1.411      1.207      0.464
S2                    2.600      0.000      0.000      1.254      1.359      0.523
S3                    2.600      0.000      0.000      1.555      1.057      0.406
S4                    2.600      0.000      0.000      1.689      0.921      0.354
--------------------------------------------------------------------------------
Totals                2.600      0.000      0.000      1.443      1.170      0.450

******************
Node Depth Summary
******************

--------------------------------------------------------------------------------
                  Average    Maximum    Maximum   Time of Max      Total      Total
                    Depth      Depth        HGL    Occurrence    Flooding    Minutes
```

Drainage Project BCB (Magnolia Avenue)

Node	Feet	Feet	Feet	days hr:min	in/acre	Flooded
J1	0.00	0.12	207.12	0 14:45	0	0
J2	0.04	0.72	175.72	0 14:45	0	0
J3	0.05	0.86	168.86	0 14:45	0	0
OUT1	0.49	2.50	142.30	0 12:15	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	1.98	0 14:45	5.79	1.00	0.10	0
C2	13.87	0 14:45	11.90	1.00	0.18	0
C3	20.57	0 14:45	13.85	1.00	0.25	0

****
Routing Time Step Summary
****

```
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.02
```

Analysis begun on: Thu Jun 15 09:10:00 2006
Total elapsed time: < 1 sec

Project BCB

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project BCB (Magnolia Avenue)

```
[TITLE]
Drainage Project BCB (Magnolia Avenue)
25 Year 6 Hour

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       22:00:00
 END_DATE                10/03/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain      Recd.  Snow   Data      Source          Station   Rain
;;Name              Type      Freq.  Catch  Source    Name            ID        Units
;;-------------------------------------------------------------------------------------
;Rain gage does not exist. Use SD Hydrology Manual SCS
;Type II rainfall curve. Place rain gage in central location.
  R1                CUMULATIVE 0:15   1.0    TIMESERIES 25yr6hr2.1max

[SUBCATCHMENTS]
;;                                                  Total     Pcnt.            Pcnt.    Curb     Snow
;;Name              Raingage          Outlet        Area      Imperv   Width   Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------------
  S1                R1                J1            1.73      42       274     4        0
  S2                R1                J2            10.60     50       474     4        0
  S3                R1                J3            7.25      38       472     3        0
  S4                R1                OUT1          5.02      33       278     3        0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------------------------------------------------------------------------------------
  S1                0.011      0.15       0.05       0.05       100        OUTLET
  S2                0.011      0.15       0.05       0.05       100        OUTLET
  S3                0.011      0.15       0.05       0.05       100        OUTLET
  S4                0.011      0.15       0.05       0.05       100        OUTLET

[INFILTRATION]
;;Subcatchment     Suction    HydCon     IMDmax
;;-----------------------------------------------
  S1                2.4        1.18       0
  S2                2.4        1.18       0
  S3                2.4        1.18       0
  S4                2.4        1.18       0

[JUNCTIONS]
;;                  Invert     Max.       Init.      Surcharge  Ponded
;;Name              Elev.      Depth      Depth      Depth      Area
;;-----------------------------------------------------------------------
;Gutter flow junction
  J1                207        0          0          0          0
;Created Manhole
  J2                175        9          0          0          0
;Created Manhole
  J3                168        8          0          0          0
```

Drainage Project BCB (Magnolia Avenue)

```
[OUTFALLS]
;;                      Invert     Outfall    Stage/Table      Tide
;;Name                  Elev.      Type       Time Series      Gate
;;-----------------------------------------------------------------
;Created Outlet/Manhole
  OUT1                  139.8      FIXED      142.3 NO

[CONDUITS]
;;                      Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Ma
;;Name                  Node             Node             Length     N          Height     Height     Flow       Fl
;;-----------------------------------------------------------------------------------------------------------------
;Gutter Flow
  C1                    J1               J2               650.7      0.013      0          0          0          0
;30" RCP - BCB
  C2                    J2               J3               197.78     0.013      0          0          0          0
;30" RCP - BCB
  C3                    J3               OUT1             723.48     0.013      0          0          0          0

[XSECTIONS]
;;Link                  Type        Geom1      Geom2      Geom3      Geom4      Barrels
;;-----------------------------------------------------------------------------------
  C1                    RECT_OPEN   0.5        3          0          0          1
  C2                    CIRCULAR    2.5        0          0          0          1
  C3                    CIRCULAR    2.5        0          0          0          1

[TIMESERIES]
;;Name                  Date        Time       Value
;;-----------------------------------------------------
;100 year 6 hr SCS Type B Design Storm Max Precip = 2.6 inches
  100year6hrCumulative 10/01/2005 10:00      0.0
  100year6hrCumulative            10:15      0.0468
  100year6hrCumulative            10:30      0.091
  100year6hrCumulative            10:45      0.1508
  100year6hrCumulative            11:00      0.208
  100year6hrCumulative            11:15      0.2808
  100year6hrCumulative            11:30      0.351
  100year6hrCumulative            11:45      0.4758
  100year6hrCumulative            12:00      0.598
  100year6hrCumulative            12:15      1.079
  100year6hrCumulative            12:30      1.56
  100year6hrCumulative            12:45      1.69
  100year6hrCumulative            13:00      1.82
  100year6hrCumulative            13:15      1.924
  100year6hrCumulative            13:30      2.028
  100year6hrCumulative            13:45      2.1008
  100year6hrCumulative            14:00      2.171
  100year6hrCumulative            14:15      2.2308
  100year6hrCumulative            14:30      2.288
  100year6hrCumulative            14:45      2.34
  100year6hrCumulative            15:00      2.392
  100year6hrCumulative            15:15      2.444
  100year6hrCumulative            15:30      2.496
  100year6hrCumulative            15:45      2.548
  100year6hrCumulative            16:00      2.6

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
  25yr6hr2.1max                   10:00      0
  25yr6hr2.1max                   10:15      0.0378
  25yr6hr2.1max                   10:30      0.0735
  25yr6hr2.1max                   10:45      0.1218
  25yr6hr2.1max                   11:00      0.168
  25yr6hr2.1max                   11:15      0.2268
  25yr6hr2.1max                   11:30      0.2835
  25yr6hr2.1max                   11:45      0.3843
  25yr6hr2.1max                   12:00      0.483
  25yr6hr2.1max                   12:15      0.8715
  25yr6hr2.1max                   12:30      1.26
  25yr6hr2.1max                   12:45      1.365
  25yr6hr2.1max                   13:00      1.47
  25yr6hr2.1max                   13:15      1.554
  25yr6hr2.1max                   13:30      1.638
```

```
 25yr6hr2.1max                13:45      1.6968
 25yr6hr2.1max                14:00      1.7535
 25yr6hr2.1max                14:15      1.8018
 25yr6hr2.1max                14:30      1.848
 25yr6hr2.1max                14:45      1.89
 25yr6hr2.1max                15:00      1.932
 25yr6hr2.1max                15:15      1.974
 25yr6hr2.1max                15:30      2.016
 25yr6hr2.1max                15:45      2.058
 25yr6hr2.1max                16:00      2.1

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BCB

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project BCB (Magnolia Avenue)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
---------------------------------------------------------------

Drainage Project BCB (Magnolia Avenue)
25 Year 6 Hour

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-03-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......         4.305         2.100
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.462         1.201
Surface Runoff ...........         1.865         0.910
Final Surface Storage ....         0.000         0.000
Continuity Error (%) .....        -0.525

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         1.867         0.608
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         1.867         0.608
Surface Flooding .........         0.000         0.000
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.011

****************************
Subcatchment Runoff Summary
****************************

--------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
--------------------------------------------------------------------------------
S1                    2.100      0.000      0.000      1.199      0.917      0.437
S2                    2.100      0.000      0.000      1.044      1.068      0.509
S3                    2.100      0.000      0.000      1.294      0.816      0.389
S4                    2.100      0.000      0.000      1.400      0.709      0.338
--------------------------------------------------------------------------------
Totals                2.100      0.000      0.000      1.201      0.910      0.433

******************
Node Depth Summary
******************

--------------------------------------------------------------------------------
                  Average   Maximum   Maximum   Time of Max     Total     Total
                    Depth     Depth       HGL    Occurrence   Flooding   Minutes
```

Drainage Project BCB (Magnolia Avenue)

Node	Feet	Feet	Feet	days	hr:min	in/acre	Flooded
J1	0.00	0.09	207.09	0	12:45	0	0
J2	0.03	0.61	175.61	0	12:45	0	0
J3	0.04	0.72	168.72	0	12:44	0	0
OUT1	0.49	2.50	142.30	0	10:15	0	0

****
Conduit Flow Summary
****

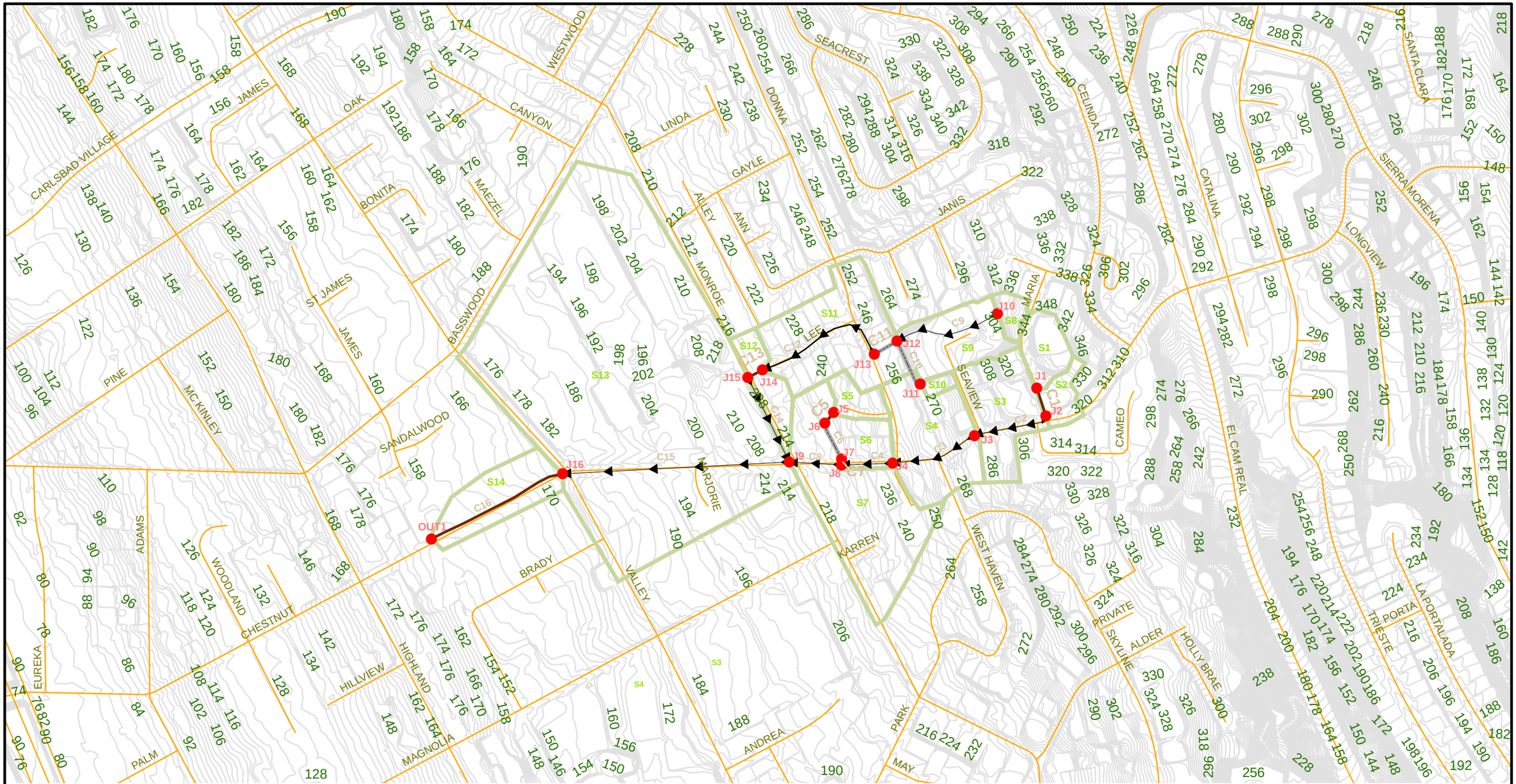
Conduit	Maximum Flow CFS	Time of Max Occurrence days	hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	1.34	0	12:45	4.98	1.00	0.07	0
C2	10.08	0	12:45	10.89	1.00	0.13	0
C3	14.78	0	12:45	12.62	1.00	0.18	0

****
Routing Time Step Summary
****

```
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.01
```

Analysis begun on: Thu Jun 15 09:09:37 2006
Total elapsed time: < 1 sec

Project BCC
Chestnut Avenue Project



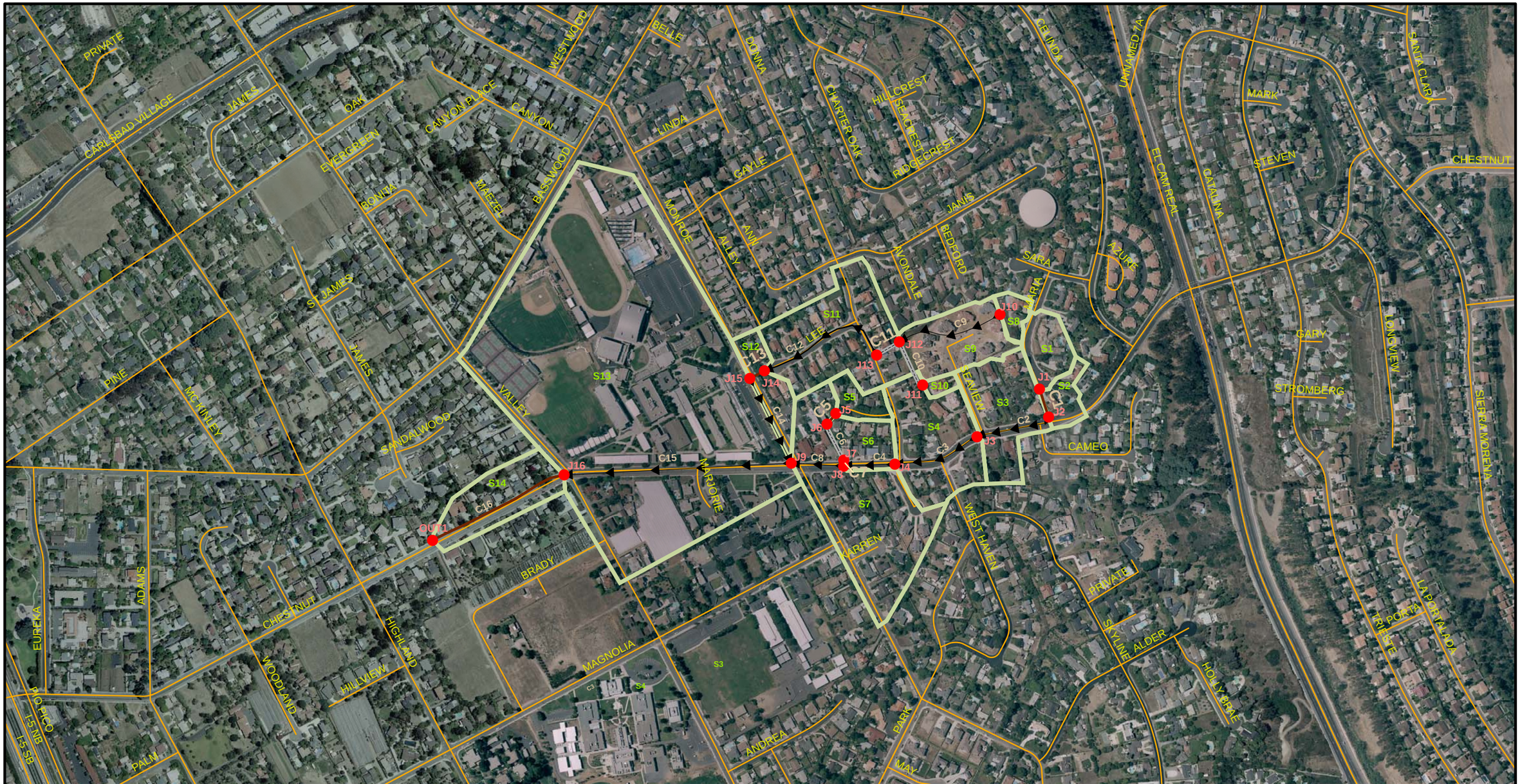
LEGEND

- JUNCTIONS
- CONDUITS
- GUTTER FLOW
- SUBCATCHMENTS
- CONTOURS
- ROADS

PROJECT BCC

PROJECT LOCATION	DATE	PROJECT NUMBER
CHESTNUT AVENUE PROJECT CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA



N
W E
S

0 250 500 1,000
Feet

LEGEND

- JUNCTIONS
- GUTTER FLOW
- CONDUITS
- SUBCATCHMENTS
- ROADS

PROJECT BCC

PROJECT LOCATION	DATE	PROJECT NUMBER
CHESTNUT AVENUE PROJECT CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project BCC

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project BCC (Chestnut Avenue)

```
[TITLE]
Drainage Project BCC (Chestnut Avenue)
100 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       22:00:00
 END_DATE                10/02/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain       Recd.   Snow   Data       Source          Station    Rain
;;Name              Type       Freq.   Catch  Source     Name            ID         Units
;;-------------------------------------------------------------------------------------
  RG1               CUMULATIVE 0:15    1.0    TIMESERIES 100yr6hr

[SUBCATCHMENTS]
;;                                                Total    Pcnt.              Pcnt.    Curb     Snow
;;Name              Raingage         Outlet       Area     Imperv   Width     Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------
  S1                RG1              J1           1.76     46       207       6.8      0
  S2                RG1              J2           1.11     44       146       7.9      0
  S3                RG1              J3           4.44     40       386       9.2      0
  S4                RG1              J4           5.57     41       485       9.2      0
  S5                RG1              J5           1.13     30       176       7.1      0
  S6                RG1              J8           1.8      50       238       7.3      0
  S7                RG1              J9           9.35     48       491       5.1      0
  S8                RG1              J10          0.7      25       173       16       0
  S9                RG1              J12          3.59     36       272       10.4     0
  S10               RG1              J11          .33      38       80        10       0
  S11               RG1              J14          7.37     35       431       7        0
  S12               RG1              J9           1.89     66       126       1.2      0
  S13               RG1              J16          45.86    43       1272      1.9      0
  S14               RG1              OUT1         3.75     45       233       2.3      0

[SUBAREAS]
;;Subcatchment      N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1                0.011      0.15       0.05       0.05       100        OUTLET
  S2                0.011      0.15       0.05       0.05       100        OUTLET
  S3                0.011      0.15       0.05       0.05       100        OUTLET
  S4                0.011      0.15       0.05       0.05       100        OUTLET
  S5                0.011      0.15       0.05       0.05       100        OUTLET
  S6                0.011      0.15       0.05       0.05       100        OUTLET
  S7                0.011      0.15       0.05       0.05       100        OUTLET
  S8                0.011      0.15       0.05       0.05       100        OUTLET
  S9                0.011      0.15       0.05       0.05       100        OUTLET
  S10               0.011      0.15       0.05       0.05       100        OUTLET
  S11               0.011      0.15       0.05       0.05       100        OUTLET
  S12               0.011      0.15       0.05       0.05       100        OUTLET
  S13               0.011      0.15       0.05       0.05       100        OUTLET
  S14               0.011      0.15       0.05       0.05       100        OUTLET
```

Drainage Project BCC (Chestnut Avenue)

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	2.4	1.18	0
S2	2.4	1.18	0
S3	2.4	1.18	0
S4	2.4	1.18	0
S5	2.4	1.18	0
S6	2.4	1.18	0
S7	2.4	1.18	0
S8	2.4	1.18	0
S9	2.4	1.18	0
S10	2.4	1.18	0
S11	2.4	1.18	0
S12	2.4	1.18	0
S13	2.4	1.18	0
S14	2.4	1.18	0

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	324	0	0	0	0
J2	312	0	0	0	0
J3	288	0	0	0	0
J4	246	0	0	0	0
J5	233	0	0	0	0
J6	230	0	0	0	0
J7	229	0	0	0	0
J8	228.7	0	0	0	0
J9	213	0	0	0	0
J10	306	0	0	0	0
J11	273	0	0	0	0
J12	264	0	0	0	0
J13	256	0	0	0	0
J14	218	0	0	0	0
J15	216	0	0	0	0
J16	174.5	0	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	148.5	FIXED	151.5	NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;RCP - 18" C1	J1	J2	152	0.013	0	0	0	0
;Gutter C2	J2	J3	392	0.013	0	0	0	0
;Gutter C3	J3	J4	456	0.013	0	0	0	0
;Gutter C4	J4	J8	263	0.013	0	0	0	0
;RCP - 12" C5	J5	J6	71	0.013	0	0	0	0
;Concrete Ditch 2' x 1' C6	J6	J7	206	0.013	0	0	0	0
;Gutter C7	J7	J8	30	0.013	0	0	0	0
;Gutter C8	J8	J9	269	0.013	0	0	0	0
;Gutter C9	J10	J12	558	0.013	0	0	0	0
;Concrete Ditch 2'x1' C10	J11	J12	262	0.013	0	0	0	0
;Concrete Ditch 2'x1' C11	J12	J13	135	0.013	0	0	0	0
;Gutter								

```
 C12                J13              J14              720        0.013      0          0          0          0
;RCP 24"
 C13                J14              J15              85         0.013      0          0          0          0
;Gutter
 C15                J9               J16              1167       0.013      0          0          0          0
;Gutter
 C14                J15              J9               482        0.013      0          0          0          0
;RCP - 36" (BCC)
 C16                J16              OUT1             756        0.013      0          0          0          0

[XSECTIONS]
;;Link              Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-------------------------------------------------------------------------------------
 C1                 CIRCULAR     1.5        0          0          0          1
 C2                 RECT_OPEN    0.5        5          0          0          1
 C3                 RECT_OPEN    0.5        5          0          0          1
 C4                 RECT_OPEN    0.5        30         0          0          1
 C5                 CIRCULAR     1          0          0          0          1
 C6                 TRAPEZOIDAL  1          2          0.5        0.5        1
 C7                 RECT_OPEN    0.5        5          0          0          1
 C8                 RECT_OPEN    0.5        30         0          0          1
 C9                 RECT_OPEN    0.5        5          0          0          1
 C10                RECT_OPEN    1          2          0          0          1
 C11                RECT_OPEN    1          2          0          0          1
 C12                RECT_OPEN    0.5        5          0          0          1
 C13                CIRCULAR     2          0          0          0          1
 C15                RECT_OPEN    0.5        30         0          0          1
 C14                RECT_OPEN    0.5        30         0          0          1
 C16                CIRCULAR     3          0          0          0          1

[TIMESERIES]
;;Name              Date         Time       Value
;;-----------------------------------------------
;100 year 6 hour SCS Type Design Storm Max Precip = 2.6 inches
 100yr6hr           10/01/2005 10:00      0.0
 100yr6hr                      10:15      0.0468
 100yr6hr                      10:30      0.091
 100yr6hr                      10:45      0.1508
 100yr6hr                      11:00      0.208
 100yr6hr                      11:15      0.2808
 100yr6hr                      11:30      0.351
 100yr6hr                      11:45      0.4758
 100yr6hr                      12:00      0.598
 100yr6hr                      12:15      1.079
 100yr6hr                      12:30      1.56
 100yr6hr                      12:45      1.69
 100yr6hr                      13:00      1.82
 100yr6hr                      13:15      1.924
 100yr6hr                      13:30      2.028
 100yr6hr                      13:45      2.1008
 100yr6hr                      14:00      2.171
 100yr6hr                      14:15      2.2308
 100yr6hr                      14:30      2.288
 100yr6hr                      14:45      2.34
 100yr6hr                      15:00      2.392
 100yr6hr                      15:15      2.444
 100yr6hr                      15:30      2.496
 100yr6hr                      15:45      2.548
 100yr6hr                      16:00      2.6

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BCC

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project BCC (Chestnut Avenue)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BCC (Chestnut Avenue)
100 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************          Volume         Depth
Runoff Quantity Continuity      acre-feet        inches
**************************      ---------       -------
Total Precipitation ......         19.207         2.600
Evaporation Loss .........          0.000         0.000
Infiltration Loss ........         10.628         1.439
Surface Runoff ...........          8.679         1.175
Final Surface Storage ....          0.002         0.000
Continuity Error (%) .....         -0.528

**************************          Volume        Volume
Flow Routing Continuity         acre-feet      Mgallons
**************************      ---------      ---------
Dry Weather Inflow .......          0.000         0.000
Wet Weather Inflow .......          8.693         2.833
Groundwater Inflow .......          0.000         0.000
RDII Inflow ..............          0.000         0.000
External Inflow ..........          0.000         0.000
External Outflow .........          8.697         2.834
Surface Flooding .........          0.000         0.000
Evaporation Loss .........          0.000         0.000
Initial Stored Volume ....          0.000         0.000
Final Stored Volume ......          0.000         0.000
Continuity Error (%) .....         -0.045

***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap       Infil     Runoff      Coeff
Subcatchment            in         in         in          in         in
-------------------------------------------------------------------------------
S1                    2.600      0.000      0.000      1.312      1.306      0.502
S2                    2.600      0.000      0.000      1.355      1.265      0.486
S3                    2.600      0.000      0.000      1.469      1.147      0.441
S4                    2.600      0.000      0.000      1.443      1.172      0.451
S5                    2.600      0.000      0.000      1.699      0.923      0.355
S6                    2.600      0.000      0.000      1.207      1.412      0.543
S7                    2.600      0.000      0.000      1.296      1.316      0.506
S8                    2.600      0.000      0.000      1.808      0.854      0.328
S9                    2.600      0.000      0.000      1.573      1.042      0.401
S10                   2.600      0.000      0.000      1.497      1.154      0.444
S11                   2.600      0.000      0.000      1.618      0.993      0.382
S12                   2.600      0.000      0.000      0.849      1.767      0.680
S13                   2.600      0.000      0.000      1.457      1.154      0.444
S14                   2.600      0.000      0.000      1.381      1.231      0.473
-------------------------------------------------------------------------------
```

Totals	2.600	0.000	0.000	1.439	1.175	0.452

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.03	0.27	324.27	0 14:45	0	0
J2	0.03	0.27	312.27	0 14:45	0	0
J3	0.01	0.17	288.17	0 14:45	0	0
J4	0.01	0.16	246.16	0 14:45	0	0
J5	0.02	0.27	233.27	0 14:45	0	0
J6	0.02	0.26	230.26	0 14:45	0	0
J7	0.01	0.21	229.21	0 14:45	0	0
J8	0.01	0.10	228.80	0 14:45	0	0
J9	0.02	0.20	213.20	0 14:45	0	0
J10	0.00	0.04	306.04	0 14:45	0	0
J11	0.00	0.06	273.06	0 14:45	0	0
J12	0.02	0.25	264.25	0 14:45	0	0
J13	0.02	0.25	256.25	0 14:45	0	0
J14	0.07	0.79	218.79	0 14:45	0	0
J15	0.07	0.79	216.79	0 14:45	0	0
J16	0.18	1.80	176.30	0 14:45	0	0
OUT1	1.59	3.00	151.50	0 12:15	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	2.12	0 14:45	9.71	1.00	0.07	0
C2	3.44	0 14:45	6.32	1.00	0.09	0
C3	8.25	0 14:45	10.03	1.00	0.17	0
C4	14.37	0 14:45	5.66	1.00	0.05	0
C5	1.13	0 14:45	6.75	1.00	0.15	0
C6	1.12	0 14:45	2.56	1.00	0.08	0
C7	1.12	0 14:46	2.34	1.00	0.07	0
C8	17.74	0 14:45	5.93	1.00	0.07	0
C9	0.71	0 14:45	3.65	1.00	0.02	0
C10	0.39	0 14:45	3.19	1.00	0.01	0
C11	4.71	0 14:45	9.48	1.00	0.13	0
C12	4.70	0 14:46	6.84	1.00	0.13	0
C13	11.44	0 14:45	9.90	1.00	0.33	0
C15	41.81	0 14:46	7.09	1.00	0.22	0
C14	11.37	0 14:46	2.57	1.00	0.14	0
C16	82.91	0 14:45	18.78	1.00	0.67	0

****
Routing Time Step Summary
****

```
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.04
```

Analysis begun on: Fri Jun 16 07:42:47 2006
Total elapsed time: < 1 sec

Project BCC

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project BCC (Chestnut Avenue)

```
[TITLE]
Drainage Project BCC (Chestnut Avenue)
25 Year 6 Hour Storm

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       22:00:00
 END_DATE                10/02/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain       Recd.   Snow   Data       Source           Station    Rain
;;Name              Type       Freq.   Catch  Source     Name             ID         Units
;;-------------------------------------------------------------------------------------------
  RG1               CUMULATIVE 0:15    1.0    TIMESERIES 25yr6hr2.1Cum

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.                Pcnt.    Curb     Snow
;;Name              Raingage          Outlet         Area     Imperv   Width       Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------------
  S1                RG1               J1             1.76     46       207         6.8      0
  S2                RG1               J2             1.11     44       146         7.9      0
  S3                RG1               J3             4.44     40       386         9.2      0
  S4                RG1               J4             5.57     41       485         9.2      0
  S5                RG1               J5             1.13     30       176         7.1      0
  S6                RG1               J8             1.8      50       238         7.3      0
  S7                RG1               J9             9.35     48       491         5.1      0
  S8                RG1               J10            0.7      25       173         16       0
  S9                RG1               J12            3.59     36       272         10.4     0
  S10               RG1               J11            .33      38       80          10       0
  S11               RG1               J14            7.37     35       431         7        0
  S12               RG1               J9             1.89     66       126         1.2      0
  S13               RG1               J16            45.86    43       1272        1.9      0
  S14               RG1               OUT1           3.75     45       233         2.3      0

[SUBAREAS]
;;Subcatchment     N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-----------------------------------------------------------------------------------------------
  S1                0.011      0.15       0.05       0.05       100        OUTLET
  S2                0.011      0.15       0.05       0.05       100        OUTLET
  S3                0.011      0.15       0.05       0.05       100        OUTLET
  S4                0.011      0.15       0.05       0.05       100        OUTLET
  S5                0.011      0.15       0.05       0.05       100        OUTLET
  S6                0.011      0.15       0.05       0.05       100        OUTLET
  S7                0.011      0.15       0.05       0.05       100        OUTLET
  S8                0.011      0.15       0.05       0.05       100        OUTLET
  S9                0.011      0.15       0.05       0.05       100        OUTLET
  S10               0.011      0.15       0.05       0.05       100        OUTLET
  S11               0.011      0.15       0.05       0.05       100        OUTLET
  S12               0.011      0.15       0.05       0.05       100        OUTLET
  S13               0.011      0.15       0.05       0.05       100        OUTLET
  S14               0.011      0.15       0.05       0.05       100        OUTLET
```

Drainage Project BCC (Chestnut Avenue)

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	2.4	1.18	0
S2	2.4	1.18	0
S3	2.4	1.18	0
S4	2.4	1.18	0
S5	2.4	1.18	0
S6	2.4	1.18	0
S7	2.4	1.18	0
S8	2.4	1.18	0
S9	2.4	1.18	0
S10	2.4	1.18	0
S11	2.4	1.18	0
S12	2.4	1.18	0
S13	2.4	1.18	0
S14	2.4	1.18	0

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	324	0	0	0	0
J2	312	0	0	0	0
J3	288	0	0	0	0
J4	246	0	0	0	0
J5	233	0	0	0	0
J6	230	0	0	0	0
J7	229	0	0	0	0
J8	228.7	0	0	0	0
J9	213	0	0	0	0
J10	306	0	0	0	0
J11	273	0	0	0	0
J12	264	0	0	0	0
J13	256	0	0	0	0
J14	218	0	0	0	0
J15	216	0	0	0	0
J16	174.5	0	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	148.5	FIXED	151.5	NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;RCP - 18" C1	J1	J2	152	0.013	0	0	0	0
;Gutter C2	J2	J3	392	0.013	0	0	0	0
;Gutter C3	J3	J4	456	0.013	0	0	0	0
;Gutter C4	J4	J8	263	0.013	0	0	0	0
;RCP - 12" C5	J5	J6	71	0.013	0	0	0	0
;Concrete Ditch 2' x 1' C6	J6	J7	206	0.013	0	0	0	0
;Gutter C7	J7	J8	30	0.013	0	0	0	0
;Gutter C8	J8	J9	269	0.013	0	0	0	0
;Gutter C9	J10	J12	558	0.013	0	0	0	0
;Concrete Ditch 2'x1' C10	J11	J12	262	0.013	0	0	0	0
;Concrete Ditch 2'x1' C11	J12	J13	135	0.013	0	0	0	0
;Gutter								

```
  C12                J13              J14              720        0.013      0          0          0          0
;RCP 24"
  C13                J14              J15              85         0.013      0          0          0          0
;Gutter
  C15                J9               J16              1167       0.013      0          0          0          0
;Gutter
  C14                J15              J9               482        0.013      0          0          0          0
;RCP - 36" (BCC)
  C16                J16              OUT1             756        0.013      0          0          0          0

[XSECTIONS]
;;Link              Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-------------------------------------------------------------------------------------
  C1                 CIRCULAR     1.5        0          0          0          1
  C2                 RECT_OPEN    0.5        5          0          0          1
  C3                 RECT_OPEN    0.5        5          0          0          1
  C4                 RECT_OPEN    0.5        30         0          0          1
  C5                 CIRCULAR     1          0          0          0          1
  C6                 TRAPEZOIDAL  1          2          0.5        0.5        1
  C7                 RECT_OPEN    0.5        5          0          0          1
  C8                 RECT_OPEN    0.5        30         0          0          1
  C9                 RECT_OPEN    0.5        5          0          0          1
  C10                RECT_OPEN    1          2          0          0          1
  C11                RECT_OPEN    1          2          0          0          1
  C12                RECT_OPEN    0.5        5          0          0          1
  C13                CIRCULAR     2          0          0          0          1
  C15                RECT_OPEN    0.5        30         0          0          1
  C14                RECT_OPEN    0.5        30         0          0          1
  C16                CIRCULAR     3          0          0          0          1

[TIMESERIES]
;;Name              Date         Time       Value
;;-----------------------------------------------
;100 year 6 hour SCS Type Design Storm Max Precip = 2.6 inches
  100yr6hr           10/01/2005 10:00      0.0
  100yr6hr                      10:15      0.0468
  100yr6hr                      10:30      0.091
  100yr6hr                      10:45      0.1508
  100yr6hr                      11:00      0.208
  100yr6hr                      11:15      0.2808
  100yr6hr                      11:30      0.351
  100yr6hr                      11:45      0.4758
  100yr6hr                      12:00      0.598
  100yr6hr                      12:15      1.079
  100yr6hr                      12:30      1.56
  100yr6hr                      12:45      1.69
  100yr6hr                      13:00      1.82
  100yr6hr                      13:15      1.924
  100yr6hr                      13:30      2.028
  100yr6hr                      13:45      2.1008
  100yr6hr                      14:00      2.171
  100yr6hr                      14:15      2.2308
  100yr6hr                      14:30      2.288
  100yr6hr                      14:45      2.34
  100yr6hr                      15:00      2.392
  100yr6hr                      15:15      2.444
  100yr6hr                      15:30      2.496
  100yr6hr                      15:45      2.548
  100yr6hr                      16:00      2.6

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
  25yr6hr2.1Cum                 10:00      0
  25yr6hr2.1Cum                 10:15      0.0378
  25yr6hr2.1Cum                 10:30      0.0735
  25yr6hr2.1Cum                 10:45      0.1218
  25yr6hr2.1Cum                 11:00      0.168
  25yr6hr2.1Cum                 11:15      0.2268
  25yr6hr2.1Cum                 11:30      0.2835
  25yr6hr2.1Cum                 11:45      0.3843
  25yr6hr2.1Cum                 12:00      0.483
  25yr6hr2.1Cum                 12:15      0.8715
  25yr6hr2.1Cum                 12:30      1.26
```

```
 25yr6hr2.1Cum                12:45      1.365
 25yr6hr2.1Cum                13:00      1.47
 25yr6hr2.1Cum                13:15      1.554
 25yr6hr2.1Cum                13:30      1.638
 25yr6hr2.1Cum                13:45      1.6968
 25yr6hr2.1Cum                14:00      1.7535
 25yr6hr2.1Cum                14:15      1.8018
 25yr6hr2.1Cum                14:30      1.848
 25yr6hr2.1Cum                14:45      1.89
 25yr6hr2.1Cum                15:00      1.932
 25yr6hr2.1Cum                15:15      1.974
 25yr6hr2.1Cum                15:30      2.016
 25yr6hr2.1Cum                15:45      2.058
 25yr6hr2.1Cum                16:00      2.1

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project BCC

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project BCC (Chestnut Avenue)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project BCC (Chestnut Avenue)
25 Year 6 Hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        15.514         2.100
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         8.821         1.194
Surface Runoff ...........         6.777         0.917
Final Surface Storage ....         0.001         0.000
Continuity Error (%) .....        -0.550

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         6.782         2.210
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         6.785         2.211
Surface Flooding .........         0.000         0.000
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.051

***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
-------------------------------------------------------------------------------
S1                    2.100      0.000      0.000      1.116      1.000      0.476
S2                    2.100      0.000      0.000      1.155      0.962      0.458
S3                    2.100      0.000      0.000      1.244      0.871      0.415
S4                    2.100      0.000      0.000      1.223      0.892      0.425
S5                    2.100      0.000      0.000      1.446      0.673      0.320
S6                    2.100      0.000      0.000      1.030      1.086      0.517
S7                    2.100      0.000      0.000      1.084      1.028      0.489
S8                    2.100      0.000      0.000      1.532      0.594      0.283
S9                    2.100      0.000      0.000      1.328      0.786      0.374
S10                   2.100      0.000      0.000      1.268      0.854      0.407
S11                   2.100      0.000      0.000      1.354      0.757      0.361
S12                   2.100      0.000      0.000      0.709      1.405      0.669
S13                   2.100      0.000      0.000      1.194      0.915      0.436
S14                   2.100      0.000      0.000      1.148      0.963      0.458
-------------------------------------------------------------------------------
```

Totals	2.100	0.000	0.000	1.194	0.917	0.437

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.02	0.23	324.23	0 12:45	0	0
J2	0.02	0.23	312.23	0 12:45	0	0
J3	0.01	0.13	288.13	0 12:45	0	0
J4	0.01	0.13	246.13	0 12:45	0	0
J5	0.02	0.21	233.21	0 12:45	0	0
J6	0.02	0.21	230.21	0 12:45	0	0
J7	0.01	0.16	229.16	0 12:45	0	0
J8	0.01	0.08	228.78	0 12:45	0	0
J9	0.01	0.16	213.16	0 12:45	0	0
J10	0.00	0.03	306.03	0 12:45	0	0
J11	0.00	0.05	273.05	0 12:45	0	0
J12	0.01	0.19	264.19	0 12:45	0	0
J13	0.01	0.19	256.19	0 12:45	0	0
J14	0.06	0.64	218.64	0 12:45	0	0
J15	0.06	0.64	216.64	0 12:45	0	0
J16	0.16	1.48	175.98	0 12:45	0	0
OUT1	1.79	3.00	151.50	0 10:15	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	1.46	0 12:45	8.71	1.00	0.05	0
C2	2.36	0 12:45	5.46	1.00	0.06	0
C3	5.59	0 12:45	8.63	1.00	0.12	0
C4	9.72	0 12:45	4.84	1.00	0.04	0
C5	0.70	0 12:45	5.88	1.00	0.10	0
C6	0.69	0 12:45	2.16	1.00	0.05	0
C7	0.69	0 12:46	1.94	1.00	0.04	0
C8	11.99	0 12:45	5.07	1.00	0.05	0
C9	0.43	0 12:46	3.00	1.00	0.01	0
C10	0.26	0 12:45	2.72	1.00	0.01	0
C11	3.06	0 12:45	8.14	1.00	0.09	0
C12	3.05	0 12:46	5.79	1.00	0.08	0
C13	7.59	0 12:45	8.84	1.00	0.22	0
C15	28.90	0 12:46	6.12	1.00	0.15	0
C14	7.56	0 12:46	2.19	1.00	0.09	0
C16	60.23	0 12:45	17.42	1.00	0.49	0

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.03

Analysis begun on: Mon Jul 24 11:14:02 2006
Total elapsed time: 00:00:01

Project C – 1
Carlsbad Boulevard South Project

Project C – 2
Paseo Del Norte Project

LEGEND

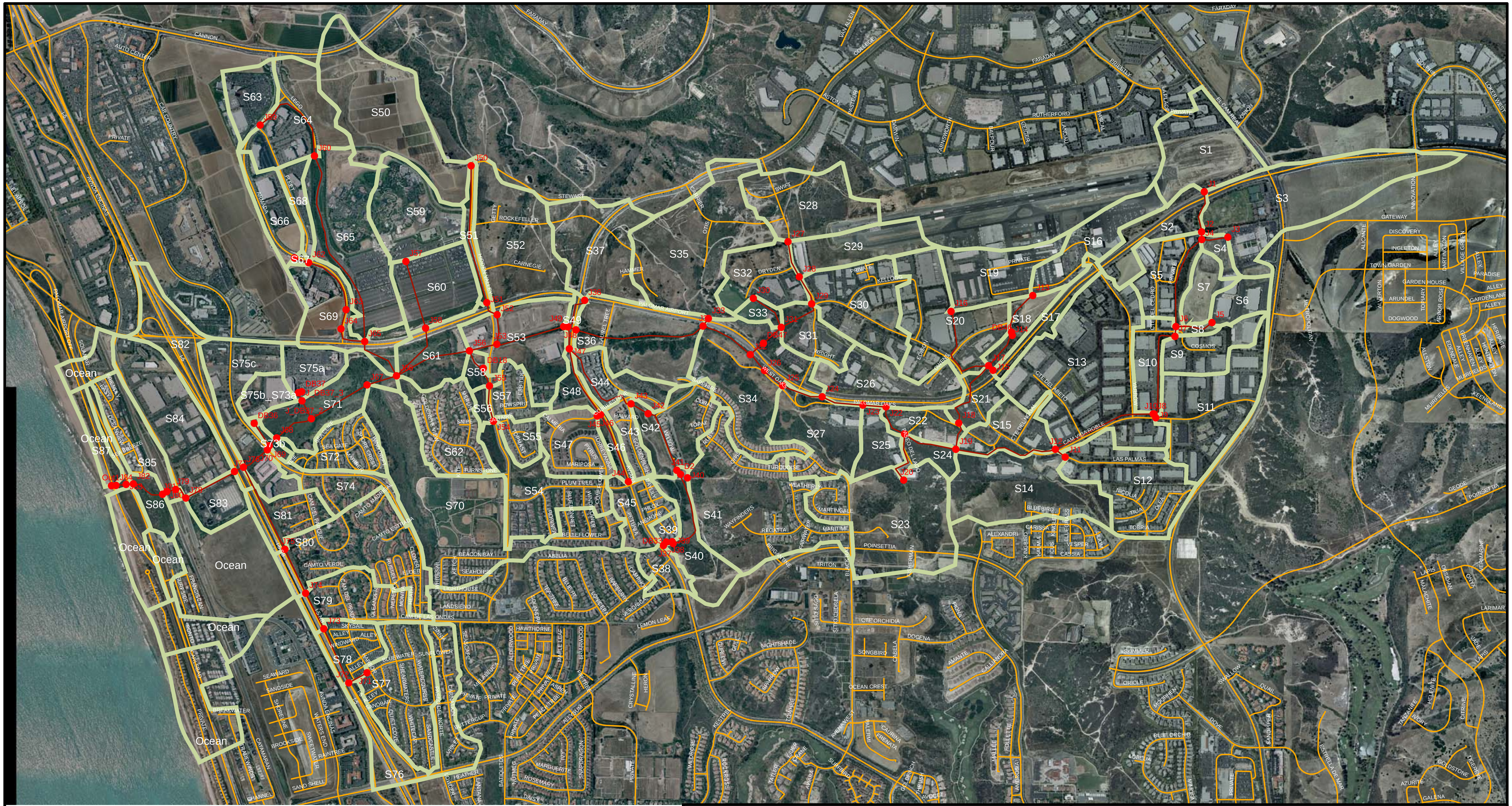
- JUNCTIONS
- FLOWLINE
- CONCRETE CULVERT
- GUTTER
- RCP
- SUBCATCHMENTS
- ROADS

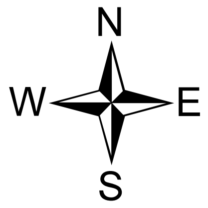
PROJECTS C1 AND C2

BASIN C
WATERSHED MODEL

PROJECT LOCATION	DATE	PROJECT NUMBER
CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA





0 | 0.375 | 0.75 | 1.5 Miles

LEGEND

- ● JUNCTIONS
- FLOWLINE
- CONCRETE CULVERT
- GUTTER
- RCP
- SUBCATCHMENTS
- ROADS

PROJECTS C1 AND C2
BASIN C
WATERSHED MODEL

PROJECT LOCATION	DATE	PROJECT NUMBER
CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project C – 1

Project C – 2

SWMM 5.0 – Input

100 Year 6 Hour Storm

Basin C Model including Sedimentation Basins

```
[TITLE]
Basin C Model including Sedimentation Basins

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              22:00:00
 REPORT_START_DATE       10/01/2005
 REPORT_START_TIME       00:00:00
 END_DATE                10/03/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO
 IGNORE_RAINFALL         NO

[RAINGAGES]
;;                 Rain       Recd.   Snow   Data       Source          Station    Rain
;;Name             Type       Freq.   Catch  Source     Name            ID         Units
;;-----------------------------------------------------------------------------------------
  G2               CUMULATIVE 0:15    1.0    TIMESERIES G2-100yr6hr
  G1               CUMULATIVE 0:15    1.0    TIMESERIES G1-100yr6r

[SUBCATCHMENTS]
;;                                                Total    Pcnt.                Pcnt.    Curb     Snow
;;Name             Raingage         Outlet        Area     Imperv   Width       Slope    Length   Pack
;;-----------------------------------------------------------------------------------------------------
  S1               G1               J1            39       85       891         2        0
  S2               G1               J2            22       85       553         3        0
  S3               G1               J3            73       85       775         4        0
  S4               G1               J4            5        88       236         5        0
  S5               G1               J6            24       85       724         8        0
  S6               G1               J5            12       85       291         1        0
  S7               G1               J6            12       85       394         2        0
  S8               G1               J7            2        85       255         5        0
  S9               G1               J7            19       85       418         4        0
  S10              G1               J8            16       85       484         2        0
  S11              G1               J9            49       85       1130        5        0
  S12              G1               J11           46       56       924         6        0
  S13              G1               J12           91       85       1368        4        0
  S14              G1               J19           50       34       1046        7        0
  S15              G1               J19           20       85       687         7        0
  S16              G1               J13           26       85       415         1        0
  S17              G1               J17           11       57       380         7        0
  S18              G1               J15           11       85       205         4        0
  S19              G1               J16           29       86       762         2        0
  S20              G1               J17           50       83       745         4        0
  S21              G1               J18           12       75       456         5        0
  S22              G2               J22           12       85       678         2        0
  S23              G2               J20           66       22       1428        9        0
  S24              G2               J21           9        62       314         12       0
  S25              G2               J23           13       72       402         14       0
  S26              G1               J24           33       75       890         6        0
  S27              G2               J25           34       59       706         11       0
  S28              G2               J27           39       85       854         5        0
  S29              G2               J28           25       85       672         7        0
  S30              G2               J29           39       84       1043        6        0
  S31              G2               J31           16       72       506         7        0
  S32              G2               J30           25       84       928         6        0
```

Basin C Model including Sedimentation Basins

S33	G2	J31	5	60	256	5	0
S34	G2	J34	59	39	828	7	0
S35	G2	J33	70	84	1223	8	0
S36	G2	J35	45	38	971	8	0
S37	G2	J36	41	80	1085	6	0
S38	G2	J37	10	25	449	2	0
S39	G2	DB33	3	25	250	3	0
S40	G2	DB2	22	23	436	6	0
S41	G2	J41	74	25	1011	5	0
S42	G2	J43	29	25	542	7	0
S43	G2	J43	10	25	308	7	0
S44	G2	J47	17	26	331	7	0
S45	G2	J44	18	25	640	6	0
S46	G2	J46	6	25	234	6	0
S47	G2	J45	23	27	346	3	0
S48	G2	J47	8	24	314	6	0
S49	G2	J49	3	50	269	2	0
S50	G2	J50	67	62	1335	2	0
S51	G2	J51	8	83	144	7	0
S52	G2	J52	52	84	564	4	0
S53	G2	J56	38	48	929	8	0
S54	G2	J54	37	28	647	5	0
S55	G2	J54	8	30	359	68	0
S56	G2	J55	3	30	183	9	0
S57	G2	J55	12	25	363	3	0
S58	G2	J56	5	18	327	18	0
S59	G2	J57	37	85	910	2	0
S60	G2	J58	30	85	1326	7	0
S61	G2	J66	23	40	495	5	0
S62	G2	J67	32	28	581	5	0
S63	G2	J59	17	80	803	2	0
S64	G2	J60	37	58	1079	1	0
S65	G2	J65	28	85	768	24	0
S66	G2	J61	8	80	407	1	0
S67	G2	J62	1	86	183	2	0
S68	G2	J62	9	90	259	2	0
S69	G2	J65	32	65	522	4	0
S70	G2	J67	93	13	879	3	0
S71	G2	J68	20	22	647	1	0
S72	G2	J68	21	29	416	6	0
S73b	G2	J69	2.39	33	316	4.8	0
S74	G2	J70	17	36	281	5	0
S75a	G2	DB37	5	25	514.67	2.5	0
S75b_S73a	G2	DB36	5	81	471.23	3.7	0
S75c	G2	J70	37.5	81	710.12	1.96	0
S76	G2	J72	37	54	354	2	0
S77	G2	J71	44	30	795	3	0
S78	G2	J73	17	49	535	2	0
S79	G2	J74	27	35	522	4	0
S80	G2	J75	54	33	781	4	0
S81	G2	J76	18	56	477	3	0
S82	G2	J77	31	98	457	97	0
S83	G2	J78	13	53	570	3	0
S84	G2	J79	48	78	831	2	0
S85	G2	J80	23	62	502	2	0
S86	G2	J82	9	14	356	4	0
S87	G2	J84	5	31	129	3	0

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
S1	0.011	0.015	0.05	0.1	100	IMPERVIOUS	100
S2	0.011	0.015	0.05	0.1	100	OUTLET	
S3	0.011	0.015	0.05	0.1	100	OUTLET	
S4	0.011	0.015	0.05	0.1	100	OUTLET	
S5	0.011	0.015	0.05	0.1	100	OUTLET	
S6	0.011	0.015	0.05	0.1	100	OUTLET	
S7	0.011	0.015	0.05	0.1	100	OUTLET	
S8	0.011	0.015	0.05	0.1	100	OUTLET	
S9	0.011	0.015	0.05	0.1	100	OUTLET	
S10	0.011	0.015	0.05	0.1	100	OUTLET	
S11	0.011	0.015	0.05	0.1	100	OUTLET	

Basin C Model including Sedimentation Basins

S12	0.011	0.015	0.05	0.1	100	OUTLET
S13	0.011	0.015	0.05	0.1	100	OUTLET
S14	0.011	0.015	0.05	0.1	100	OUTLET
S15	0.011	0.015	0.05	0.1	100	OUTLET
S16	0.011	0.015	0.05	0.1	100	OUTLET
S17	0.011	0.015	0.05	0.1	100	OUTLET
S18	0.011	0.015	0.05	0.1	100	OUTLET
S19	0.011	0.015	0.05	0.1	100	OUTLET
S20	0.011	0.015	0.05	0.1	100	OUTLET
S21	0.011	0.015	0.05	0.1	100	OUTLET
S22	0.011	0.015	0.05	0.1	100	OUTLET
S23	0.011	0.015	0.05	0.1	100	OUTLET
S24	0.011	0.015	0.05	0.1	100	OUTLET
S25	0.011	0.015	0.05	0.1	100	OUTLET
S26	0.011	0.015	0.05	0.1	100	OUTLET
S27	0.011	0.015	0.05	0.1	100	OUTLET
S28	0.011	0.015	0.05	0.1	100	OUTLET
S29	0.011	0.015	0.05	0.1	100	OUTLET
S30	0.011	0.015	0.05	0.1	100	OUTLET
S31	0.011	0.015	0.05	0.1	100	OUTLET
S32	0.011	0.015	0.05	0.1	100	OUTLET
S33	0.011	0.015	0.05	0.1	100	OUTLET
S34	0.011	0.015	0.05	0.1	100	OUTLET
S35	0.011	0.015	0.05	0.1	100	OUTLET
S36	0.011	0.015	0.05	0.1	100	OUTLET
S37	0.011	0.015	0.05	0.1	100	OUTLET
S38	0.011	0.015	0.05	0.1	100	OUTLET
S39	0.011	0.015	0.05	0.1	100	OUTLET
S40	0.011	0.015	0.05	0.1	100	OUTLET
S41	0.011	0.015	0.05	0.1	100	OUTLET
S42	0.011	0.015	0.05	0.1	100	OUTLET
S43	0.011	0.015	0.05	0.1	100	OUTLET
S44	0.011	0.015	0.05	0.1	100	OUTLET
S45	0.011	0.015	0.05	0.1	100	OUTLET
S46	0.011	0.015	0.05	0.1	100	OUTLET
S47	0.011	0.015	0.05	0.1	100	OUTLET
S48	0.011	0.015	0.05	0.1	100	OUTLET
S49	0.011	0.015	0.05	0.1	100	OUTLET
S50	0.011	0.015	0.05	0.1	100	OUTLET
S51	0.011	0.015	0.05	0.1	100	OUTLET
S52	0.011	0.015	0.05	0.1	100	OUTLET
S53	0.011	0.015	0.05	0.1	100	OUTLET
S54	0.011	0.015	0.05	0.1	100	OUTLET
S55	0.011	0.015	0.05	0.1	100	OUTLET
S56	0.011	0.015	0.05	0.1	100	OUTLET
S57	0.011	0.015	0.05	0.1	100	OUTLET
S58	0.011	0.015	0.05	0.1	100	OUTLET
S59	0.011	0.015	0.05	0.1	100	OUTLET
S60	0.011	0.015	0.05	0.1	100	OUTLET
S61	0.011	0.015	0.05	0.1	100	OUTLET
S62	0.011	0.015	0.05	0.1	100	OUTLET
S63	0.011	0.015	0.05	0.1	100	OUTLET
S64	0.011	0.015	0.05	0.1	100	OUTLET
S65	0.011	0.015	0.05	0.1	100	OUTLET
S66	0.011	0.015	0.05	0.1	100	OUTLET
S67	0.011	0.015	0.05	0.1	100	OUTLET
S68	0.011	0.015	0.05	0.1	100	OUTLET
S69	0.011	0.015	0.05	0.1	100	OUTLET
S70	0.011	0.015	0.05	0.1	100	OUTLET
S71	0.011	0.015	0.05	0.1	100	OUTLET
S72	0.011	0.015	0.05	0.1	100	OUTLET
S73b	0.011	0.015	0.05	0.1	100	OUTLET
S74	0.011	0.015	0.05	0.1	100	OUTLET
S75a	0.011	0.015	0.05	0.1	100	OUTLET
S75b_S73a	0.011	0.015	0.05	0.1	25	OUTLET
S75c	0.011	0.015	0.05	0.1	100	OUTLET
S76	0.011	0.015	0.05	0.1	100	OUTLET
S77	0.011	0.015	0.05	0.1	100	OUTLET
S78	0.011	0.015	0.05	0.1	100	OUTLET
S79	0.011	0.015	0.05	0.1	100	OUTLET
S80	0.011	0.015	0.05	0.1	100	OUTLET
S81	0.011	0.015	0.05	0.1	100	OUTLET

```
 S82                0.011      0.015      0.05       0.1        100        OUTLET
 S83                0.011      0.015      0.05       0.1        100        OUTLET
 S84                0.011      0.015      0.05       0.1        100        OUTLET
 S85                0.011      0.015      0.05       0.1        100        OUTLET
 S86                0.011      0.015      0.05       0.1        100        OUTLET
 S87                0.011      0.015      0.05       0.1        100        OUTLET

[INFILTRATION]
;;Subcatchment      Suction    HydCon     IMDmax
;;-----------------------------------------------
 S1                 3.5        0.13       0
 S2                 3.5        0.13       0
 S3                 8.66       0.06       0
 S4                 2.4        1.18       0
 S5                 2.4        1.18       0
 S6                 2.4        1.18       0
 S7                 2.4        1.18       0
 S8                 3.5        0.13       0
 S9                 3.5        0.13       0
 S10                2.4        1.18       0
 S11                3.5        0.13       0
 S12                4.33       0.43       0
 S13                4.33       0.43       0
 S14                4.33       0.43       0
 S15                3.5        0.13       0
 S16                3.5        0.13       0
 S17                3.5        0.13       0
 S18                3.5        0.13       0
 S19                3.5        0.13       0
 S20                3.5        0.13       0
 S21                3.5        0.13       0
 S22                4.33       0.43       0
 S23                4.33       0.43       0
 S24                3.5        0.13       0
 S25                4.33       0.43       0
 S26                3.5        0.13       0
 S27                4.33       0.43       0
 S28                3.5        0.13       0
 S29                3.5        0.13       0
 S30                3.5        0.13       0
 S31                2.4        1.18       0
 S32                4.33       0.43       0
 S33                2.4        1.18       0
 S34                8.66       0.06       0
 S35                2.4        1.18       0
 S36                8.27       0.04       0
 S37                2.4        1.18       0
 S38                4.33       0.43       0
 S39                4.33       0.43       0
 S40                4.33       0.43       0
 S41                4.33       0.43       0
 S42                8.66       0.06       0
 S43                8.66       0.06       0
 S44                8.27       0.04       0
 S45                4.33       0.43       0
 S46                3.37       0.81       0
 S47                2.4        1.18       0
 S48                8.66       0.06       0
 S49                4.33       0.43       0
 S50                2.4        1.18       0
 S51                2.4        1.18       0
 S52                2.4        1.18       0
 S53                4.33       0.43       0
 S54                4.33       0.43       0
 S55                4.33       0.43       0
 S56                2.4        1.18       0
 S57                4.33       0.43       0
 S58                2.4        1.18       0
 S59                2.4        1.18       0
 S60                2.4        1.18       0
 S61                2.4        1.18       0
 S62                3.37       0.81       0
```

S63	2.4	1.18	0
S64	2.4	1.18	0
S65	2.4	1.18	0
S66	2.4	1.18	0
S67	2.4	1.18	0
S68	2.4	1.18	0
S69	2.4	1.18	0
S70	5.92	0.51	0
S71	8.27	0.04	0
S72	2.4	1.18	0
S73b	2.4	1.18	0
S74	3.37	0.81	0
S75a	7.5	0.6	0
S75b_S73a	7.5	0.6	0
S75c	7.5	0.6	0
S76	2.4	1.18	0
S77	2.4	1.18	0
S78	4.33	0.43	0
S79	3.37	0.81	0
S80	4.33	0.43	0
S81	4.33	0.43	0
S82	2.4	1.18	0
S83	5.8	0.79	0
S84	7.5	0.6	0
S85	2.4	1.18	0
S86	4.33	0.43	0
S87	2.4	1.18	0

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	260.5	0	0	0	0
J2	246	0	0	0	0
J3	275.11	0	0	0	0
J4	243	0	0	0	0
J5	274.31	0	0	0	0
J6	216	0	0	0	0
J7	212.9	0	0	0	0
J8	198	0	0	0	0
J9	199.8	9	0	0	0
J10	194.7	9	0	0	0
J11	179.42	0	0	0	0
J12	177.45	0	0	0	0
J13	276	0	0	0	0
J15	213	0	0	0	0
J16	279	0	0	0	0
J17	189	0	0	0	0
J18	157.54	0	0	0	0
J19	157	0	0	0	0
J20	193	0	0	0	0
J21	143.34	0	0	0	0
J22	134.13	9	0	0	0
J23	128	9	0	0	0
J24	126	9	0	0	0
J25	117.65	9	0	0	0
J26	115.87	9	0	0	0
J27	223.88	9	0	0	0
J28	202.9	9	0	0	0
J29	190.3	9	0	0	0
J30	157.03	9	0	0	0
J31	130.5	9	0	0	0
J32	114.6	9	0	0	0
J33	103.58	9	0	0	0
J34	97	9	0	0	0
J35	74.2	9	0	0	0
J36	84.3	9	0	0	0
J37	271	9	0	0	0
J39	244	9	0	0	0
J41	164	9	0	0	0
J42	140.34	9	0	0	0
J43	123	9	0	0	0

```
 J44                226.85     9          0          0          0
 J45                159.67     9          0          0          0
 J46                154.41     9          0          0          0
 J47                79.05      9          0          0          0
 J48                72.7       9          0          0          0
 J49                70         9          0          0          0
 J50                235        9          0          0          0
 J51                76.8       9          0          0          0
 J52                65         9          0          0          0
 J53                63         9          0          0          0
 J54                121.08     9          0          0          0
 J55                97.88      9          0          0          0
 J56                61         9          0          0          0
 J57                134        9          0          0          0
 J58                71         9          0          0          0
 J59                149        9          0          0          0
 J60                142.07     9          0          0          0
 J61                143.69     9          0          0          0
 J62                141.18     9          0          0          0
 J63                101.67     9          0          0          0
 J64                78.8       9          0          0          0
 J65                75         9          0          0          0
 J66                55         9          0          0          0
 J67                50         9          0          0          0
 J68                34         9          0          0          0
 J69                26.7       9          0          0          0
 J70                26.1       9          0          0          0
 J71                70.11      9          0          0          0
 J72                67         9          0          0          0
 J73                60.41      9          0          0          0
 J74                55.28      9          0          0          0
 J75                49.55      9          0          0          0
 J76                24         9          0          0          0
 J77                22         9          0          0          0
 J78                21         9          0          0          0
 J79                19         9          0          0          0
 J80                18         9          0          0          0
 J81                17         9          0          0          0
 J82                15         9          0          0          0
 J83                12         9          0          0          0
 J84                10         9          0          0          0
 J_DB37_1           52.54      6          0          0          0
 J_DB37_2           50         6          0          0          0
 J_DB37_3           42         6          0          0          0

[OUTFALLS]
;;                  Invert     Outfall    Stage/Table      Tide
;;Name              Elev.      Type       Time Series      Gate
;;-------------------------------------------------------------
 OUT1               0          FREE                        NO

[STORAGE]
;;                  Invert     Max.       Init.      Shape      Shape                          Ponded     Evap.
;;Name              Elev.      Depth      Depth      Curve      Parameters                     Area       Frac.
;;-----------------------------------------------------------------------------------------------------------
;Desilting Basin DB2
;A=2,000  H=8
 DB2                164        8          0          FUNCTIONAL 73         1          1409       0          0
;Desilting Basin DB18
;A=19,000  H=8
 DB18               84         8          0          FUNCTIONAL 251        1          18993      0          0
;Desilting Basin DB33
;A=1,100  H=5
 DB33               254        5          0          FUNCTIONAL 68         1          1097       0          0
;Desilting Basin DB36
;A=3,700  H=5
 DB36               46         5          0          FUNCTIONAL 103        0          3078       0          0
;Desilting Basin DB37
;A=5,400  H=8
 DB37               64         8          0          FUNCTIONAL 124        1          4401       0          0
;Desilting Basin DB46
;A=90,000 H=11
```

```
  DB46              218       11        0        FUNCTIONAL 531      1        84323    0        0
;Desilting Basin DB47
;A=74,000  H=16
  DB47              124       16        0        FUNCTIONAL 469      1        65995    0        0

[CONDUITS]
;;                  Inlet             Outlet                         Manning    Inlet      Outlet     Init.      Ma
;;Name               Node              Node              Length       N          Height     Height     Flow       Fl
;;-------------------------------------------------------------------------------------------------------------------
;Open Channel Flow
;Model as a trapizodial open channel B=30, H=1 2:1
  C1                J1                J2                651.62       0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=35, H=1
  C2                J2                J4                119.82       0.15       0          0          0          0
;36 inch RCP
  C3                J3                J4                408.21       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=35, H=2 2:1
  C4                J4                J6                1477.76      0.03       0          0          0          0
;36 inch RCP
  C5                J5                J6                595.55       0.013      0          0          0          0
;Sheet Flow over street
;Model as a rectangular open channel B=45, H=0.5
  C6                J6                J7                152.59       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=40, H=2.2 2:1
  C7                J7                J8                1477.81      0.03       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=40, H=3 2:1
  C8                J8                J10               11.81        0.03       0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=35, H=2 2:1
  C9                J9                J10               74.55        0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=40, H=3 2:1
  C10               J10               J12               1641.17      0.03       0          0          0          0
;36 inch RCP
  C11               J11               J12               192.65       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=40, H=3.6 2:1
  C12               J12               J19               1639.62      0.03       0          0          0          0
;36 inch RCP
  C13               J13               DB46              698.46       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=20, H=1 2:1
  C14               DB46              J17               642.72       0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=20, H=0.5 2:1
  C15               J15               J17               97.43        0.15       0          0          0          0
;36 inch RCP
  C16               J16               J17               1445.08      0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=30, H=2 2:1
  C17               J17               J18               1178.96      0.15       0          0          0          0
;60 inch RCP
  C18               J18               J19               436.23       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=40, H=4 2:1
  C19               J19               J21               845.47       0.03       0          0          0          0
;36 inch RCP
  C20               J20               J21               892.73       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=45, H=4 2:1
  C21               J21               J22               559.4        0.03       0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=45, H=4 2:1
  C22               J22               J23               359.68       0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=45, H=4 2:1
  C23               J23               J24               650.59       0.03       0          0          0          0
;Open Channel Flow
```

Basin C Model including Sedimentation Basins

```
;Model as a trapizodial open channel B=45, H=4 2:1
 C24            J24            J25            643.28     0.03       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=50, H=5.6 1:1
;The channel is significantly larger than reality to allow
;for the complete volume to pass through the system. The
;downstream culvert is sufficient.
 C25            J25            J26            365.4      0.15       0          0          0          0
;Box Culvert - 1 Barrel, H=7 B=12
 C26            J26            J32            333.37     0.013      0          0          0          0
;36 inch RCP
 C27            J27            J28            580.25     0.013      0          0          0          0
;36 inch RCP
 C28            J28            J29            466.92     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=25, H=1.5 2:1
 C29            J29            J31            673.22     0.15       0          0          0          0
;36 inch RCP
 C30            J30            J31            649.94     0.013      0          0          0          0
;Open Channel Flow - Street
;Model as a trapizodal open channel B=30, H=2 2:1
 C31a           J31            DB47           373.93     0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=30, H=2 2:1
 C31b           DB47           J32            270.53     0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=48, H=4.5 2:1
 C32            J32            J34            864.25     0.15       0          0          0          0
;36 inch RCP
 C33            J33            J34            145.75     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=50, H=5 2:1
 C34            J34            J35            2036.30    0.15       0          0          0          0
;Box Culvert 1 Barrel - H=8, B=8
 C35            J35            J48            131.58     0.013      0          0          0          0
;42 inch RCP
 C36            J36            J48            556.52     0.013      0          0          0          0
;Sheet Flow
;Model as a rectangular open channel B=5, H=0.1667
 C37            J37            J39            152.86     0.013      0          0          0          0
;Sheet Flow
;Model as a rectangular open channel B=5, H=0.5
 C38            DB33           J39            112.84     0.013      0          0          0          0
;Open Channel Flow
;Model as a rectangular open channel B=10, H=0.5
 C39            J39            DB2            1318.43    0.15       0          0          0          0
;66 inch RCP
 C40            DB2            J41            84         0.013      0          0          0          0
;66 inch RCP
 C41            J41            J42            1022.90    0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=30, H=2, 2:1
 C42            J42            J43            304.3      0.15       0          0          0          0
;66 inch RCP
 C43            J43            J47            1503.1     0.013      0          0          0          0
;36 inch RCP
 C44            J44            J46            1121.12    0.013      0          0          0          0
;Sheet Flow
;Model as a rectangular open channel B=8, H=0.1667
 C45            J45            J46            57.32      0.013      0          0          0          0
;36 inch RCP
 C46            J46            J47            1142.75    0.15       0          0          0          0
;72 inch RCP
 C47            J47            J48            344.94     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=48, H=5, 2:1
 C48            J48            J49            67         0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=65, H=5.5, 1:1
 C49            J49            J53            1076.33    0.15       0          0          0          0
;Sheet Flow
;Model as a rectangular open channel B=30, H=0.1667
```

Basin C Model including Sedimentation Basins

```
 C50              J50              J51              2154.63    0.013      0          0          0          0
;Sheet Flow
;Model as a rectangular open channel B=40, H=0.1667
 C51              J51              J52              277.82     0.013      0          0          0          0
;78 inch RCP
 C52              J52              J53              460.14     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=70, H=5.5, 1
;These dimensions are do not represent reality but they
;minimize flooding to below 60 minutes.
 C53              J53              J56              433.74     0.15       0          0          0          0
;36 inch RCP
 C54              J54              J55              556.64     0.013      0          0          0          0
;42 inch RCP
 C55a             J55              DB18             296.95     0.013      0          0          0          0
;42 inch RCP
 C55b             DB18             J56              360.08     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=75, H=6 1:1
;These dimensions are do not represent reality but they
;minimize flooding to below 60 minutes.
 C56              J56              J66              1208.71    0.15       0          0          0          0
;36 inch RCP
 C57              J57              J58              1075       0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=30, H=1.5 2:1
 C58              J58              J66              941.84     0.15       0          0          0          0
;42 inch RCP
 C59              J59              J60              1536.84    0.013      0          0          0          0
;60 inch RCP
 C60              J60              J65              3092.76    0.013      0          0          0          0
;42 inch RCP
 C61              J61              J62              232.44     0.013      0          0          0          0
;42 inch RCP
 C62              J62              J63              1015.48    0.013      0          0          0          0
;42 inch RCP
 C63              J63              J64              309.45     0.013      0          0          0          0
;48 inch RCP
 C64              J64              J65              494.79     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=30, H=1.5 2:1
 C65              J65              J66              796.73     0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=70, H=6 2:1
 C66              J66              J67              479.76     0.15       0          0          0          0
 C_DB37_1         DB37             J_DB37_1         400        0.01       0          0          0          0
 C_DB37_2         J_DB37_1         J_DB37_2         127.93     0.013      0          0          0          0
 C_DB37_3         J_DB37_2         J_DB37_3         317.52     0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=75, H=6 2:1
 C67a             J67              J_DB37_3         1011.04    0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizodal open channel B=75, H=6 2:1
 C67b             J_DB37_3         J68              400        0.15       0          0          0          0
 C_DB36_1         DB36             J69              400        0.01       0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=60, H=5 2:1
 C68              J68              J69              166.25     0.15       0          0          0          0
;Box Culvert, 1 Barrel, B=20, H=5
 C69              J69              J70              67.08      0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=85, H=6 2:1
 C70              J70              J76              459.52     0.15       0          0          0          0
;36 inch RCP
 C71              J71              J72              321.22     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=20, H=1.5 2:1
 C72              J72              J73              917.62     0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=20, H=2 2:1
 C73              J73              J74              619.12     0.15       0          0          0          0
;Open Channel Flow
```

Basin C Model including Sedimentation Basins

```
;Model as a trapizoidal open channel B=20, H=2 2:1
  C74              J74              J75              751.13     0.15       0          0          0          0
;Open Channel Flow
;Model as a trapizoidal open channel B=20, H=2 2:1
  C75              J75              J76              1420.58    0.15       0          0          0          0
;Box Culvert, 1 Barrel H=6, B = 10
  C76              J76              J77              155.29     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel real dimensions
;B=10, H=8 2:1, model as B=120, H =10 1:1 to allow flow to
;pass through
  C77              J77              J78              860.88     0.15       0          0          0          0
;Model as Box Culvert B=12, H=6
;Pipe in reality much smaller
;Make larger to allow flow that normally splits at
;this junction to pass to outlet
  C78              J78              J79              240.39     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=150, H=4 1:1
;Exaggerated greatly to allow flow to pass through conduit
  C79              J79              J80              141.21     0.15       0          0          0          0
;Box Culvert B=12, H=6
;Exaggerated scale for flow
  C80              J80              J81              77.06      0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=200, H=4 2:1
;Exaggerated greatly to allow flow through channel
  C81              J81              J82              514.21     0.15       0          0          0          0
;Box Culvert
;Model as a 5 barrel box with B=54, H=6
;Exaggerated scale for flow
  C82              J82              J83              114.96     0.013      0          0          0          0
;Open Channel Flow
;Model as a trapizodial open channel B=200, H=4 2:1
;Exaggerated greatly to allow flow through channel
  C83              J83              J84              159.02     0.15       0          0          0          0
;Box Culvert
;Model as a 5 barrel box with B=54, H=6
  C84              J84              OUT1             400        0.013      0          0          0          0

[XSECTIONS]
;;Link            Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-----------------------------------------------------------------------------------
  C1               TRAPEZOIDAL  1          30         0.5        0.5        1
  C2               TRAPEZOIDAL  1          35         0.5        0.5        1
  C3               CIRCULAR     3          0          0          0          1
  C4               TRAPEZOIDAL  2          35         0.5        0.5        1
  C5               CIRCULAR     3          0          0          0          1
  C6               RECT_OPEN    0.5        45         0          0          1
  C7               TRAPEZOIDAL  3          40         0.5        0.5        1
  C8               TRAPEZOIDAL  3          40         0.5        0.5        1
  C9               TRAPEZOIDAL  2          35         0.5        0.5        1
  C10              TRAPEZOIDAL  3          40         0.5        0.5        1
  C11              CIRCULAR     3          0          0          0          1
  C12              TRAPEZOIDAL  3.6        40         0.5        0.5        1
  C13              CIRCULAR     3          0          0          0          1
  C14              TRAPEZOIDAL  1          20         0.5        0.5        1
  C15              TRAPEZOIDAL  0.5        20         0.5        0.5        1
  C16              CIRCULAR     3          0          0          0          1
  C17              TRAPEZOIDAL  2          30         0.5        0.5        1
  C18              CIRCULAR     5          0          0          0          1
  C19              TRAPEZOIDAL  4          40         0.5        0.5        1
  C20              CIRCULAR     3          0          0          0          1
  C21              TRAPEZOIDAL  4          45         0.5        0.4        1
  C22              TRAPEZOIDAL  4          45         0.5        0.5        1
  C23              TRAPEZOIDAL  5          50         0.5        0.5        1
  C24              TRAPEZOIDAL  4          45         0.5        0.5        1
  C25              TRAPEZOIDAL  5.6        50         1          1          1
  C26              RECT_CLOSED  7          12         0          0          1
  C27              CIRCULAR     3          0          0          0          1
  C28              CIRCULAR     3          0          0          0          1
  C29              TRAPEZOIDAL  1.5        25         0.5        0.5        1
```

Basin C Model including Sedimentation Basins

```
 C30                CIRCULAR     3          0          0          0          1
 C31a               TRAPEZOIDAL  2          30         0.5        0.5        1
 C31b               TRAPEZOIDAL  2          30         0.5        0.5        1
 C32                TRAPEZOIDAL  4.5        48         0.5        0.5        1
 C33                CIRCULAR     3          0          0          0          1
 C34                TRAPEZOIDAL  5          50         0.5        0.5        1
 C35                RECT_CLOSED  8          8          0          0          1
 C36                CIRCULAR     3.5        0          0          0          1
 C37                RECT_OPEN    0.1667     5          0          0          1
 C38                RECT_OPEN    0.1667     5          0          0          1
 C39                RECT_OPEN    0.5        10         0          0          1
 C40                CIRCULAR     5.5        0          0          0          1
 C41                CIRCULAR     5.5        0          0          0          1
 C42                TRAPEZOIDAL  2          30         0.5        0.5        1
 C43                CIRCULAR     5.5        0          0          0          1
 C44                CIRCULAR     3          0          0          0          1
 C45                RECT_OPEN    0.1667     8          0          0          1
 C46                CIRCULAR     3          0          0          0          1
 C47                CIRCULAR     6          0          0          0          1
 C48                TRAPEZOIDAL  5          48         0.5        0.5        1
 C49                TRAPEZOIDAL  5.5        65         1          1          1
 C50                RECT_OPEN    0.1667     30         0          0          1
 C51                RECT_OPEN    0.1667     40         0          0          1
 C52                CIRCULAR     6.5        0          0          0          1
 C53                TRAPEZOIDAL  6          70         1          1          1
 C54                CIRCULAR     3          0          0          0          1
 C55a               CIRCULAR     3.5        0          0          0          1
 C55b               CIRCULAR     3.5        0          0          0          1
 C56                TRAPEZOIDAL  6          75         1          1          1
 C57                CIRCULAR     3          0          0          0          1
 C58                TRAPEZOIDAL  1.5        30         0.5        0.5        1
 C59                CIRCULAR     5.5        0          0          0          1
 C60                CIRCULAR     5          0          0          0          1
 C61                CIRCULAR     3.5        0          0          0          1
 C62                CIRCULAR     3.5        0          0          0          1
 C63                CIRCULAR     3.5        0          0          0          1
 C64                CIRCULAR     4          0          0          0          1
 C65                TRAPEZOIDAL  1.5        30         0.5        0.5        1
 C66                TRAPEZOIDAL  6          70         0.5        0.5        1
 C_DB37_1           CIRCULAR     2          0          0          0          1
 C_DB37_2           CIRCULAR     5          0          0          0          1
 C_DB37_3           TRAPEZOIDAL  2          30         0.5        0.5        1
 C67a               TRAPEZOIDAL  6          75         0.5        0.5        1
 C67b               TRAPEZOIDAL  6          75         0.5        0.5        1
 C_DB36_1           TRAPEZOIDAL  1.5        20         0.5        0.5        1
 C68                TRAPEZOIDAL  5          60         0.5        0.5        1
 C69                RECT_CLOSED  5          20         0          0          1
 C70                TRAPEZOIDAL  6          100        1          1          1
 C71                CIRCULAR     3          0          0          0          1
 C72                TRAPEZOIDAL  1.5        20         0.5        0.5        1
 C73                TRAPEZOIDAL  2          20         0.5        0.5        1
 C74                TRAPEZOIDAL  2          20         0.5        0.5        1
 C75                TRAPEZOIDAL  2          20         0.5        0.5        1
 C76                RECT_CLOSED  10         8          0          0          1
 C77                TRAPEZOIDAL  10         120        1          1          1
 C78                RECT_CLOSED  6          12         0          0          2
 C79                TRAPEZOIDAL  4          150        1          1          1
 C80                RECT_CLOSED  6          12         0          0          2
 C81                TRAPEZOIDAL  4          200        1          1          1
 C82                RECT_CLOSED  6          56         0          0          5
 C83                TRAPEZOIDAL  4          200        0.5        0.5        1
 C84                RECT_CLOSED  6          54         0          0          5

[TIMESERIES]
;;Name              Date       Time       Value
;;-----------------------------------------------
;For Rain Gage 1 (RG1)
  RG1               01/01/2005 0:00       0
  RG1                          0:30       0.045
  RG1                          1:00       0.035
  RG1                          1:30       0.045
  RG1                          2:00       0.045
```

```
 RG1                          2:30        0.055
 RG1                          3:00        0.045
 RG1                          3:30        0.055
 RG1                          4:00        0.06
 RG1                          4:30        0.065
 RG1                          5:00        0.07
 RG1                          5:30        0.08
 RG1                          6:00        0.085
 RG1                          6:30        0.1
 RG1                          7:00        0.115
 RG1                          7:30        0.15
 RG1                          8:00        0.225
 RG1                          8:30        0.335
 RG1                          9:00        0.44
 RG1                          9:30        0.48
 RG1                          10:00       0.41
 RG1                          10:30       0.205
 RG1                          11:00       0.135
 RG1                          11:30       0.115
 RG1                          12:00       0.105
 RG1                          12:30       0.1
 RG1                          13:00       0.095
 RG1                          13:30       0.085
 RG1                          14:00       0.08
 RG1                          14:30       0.09
 RG1                          15:00       0.05
 RG1                          15:30       0.08
 RG1                          16:00       0.075
 RG1                          16:30       0.07
 RG1                          17:00       0.075
 RG1                          17:30       0.06
 RG1                          18:00       0.065
 RG1                          18:30       0.05
 RG1                          19:00       0.05
 RG1                          19:30       0.045
 RG1                          20:00       0.05
 RG1                          20:30       0.055
 RG1                          21:00       0.05
 RG1                          21:30       0.045
 RG1                          22:00       0.045
 RG1                          22:30       0.045
 RG1                          23:00       0.045
 RG1                          23:30       0.05
 RG1                01/02/2005 0:00       0.045

;For Rain Gage 2 (RG2)
 RG2                01/01/2005 0:00       0
 RG2                          0:30        0.0405
 RG2                          1:00        0.0315
 RG2                          1:30        0.0405
 RG2                          2:00        0.0405
 RG2                          2:30        0.0495
 RG2                          3:00        0.0405
 RG2                          3:30        0.0495
 RG2                          4:00        0.054
 RG2                          4:30        0.0585
 RG2                          5:00        0.063
 RG2                          5:30        0.072
 RG2                          6:00        0.0765
 RG2                          6:30        0.09
 RG2                          7:00        0.1035
 RG2                          7:30        0.135
 RG2                          8:00        0.2025
 RG2                          8:30        0.3015
 RG2                          9:00        0.396
 RG2                          9:30        0.432
 RG2                          10:00       0.369
 RG2                          10:30       0.1845
 RG2                          11:00       0.1215
 RG2                          11:30       0.1035
 RG2                          12:00       0.0945
 RG2                          12:30       0.09
```

```
 RG2                          13:00      0.0855
 RG2                          13:30      0.0765
 RG2                          14:00      0.072
 RG2                          14:30      0.081
 RG2                          15:00      0.045
 RG2                          15:30      0.072
 RG2                          16:00      0.0675
 RG2                          16:30      0.063
 RG2                          17:00      0.0675
 RG2                          17:30      0.054
 RG2                          18:00      0.0585
 RG2                          18:30      0.045
 RG2                          19:00      0.045
 RG2                          19:30      0.0405
 RG2                          20:00      0.045
 RG2                          20:30      0.0495
 RG2                          21:00      0.045
 RG2                          21:30      0.0405
 RG2                          22:00      0.0405
 RG2                          22:30      0.0405
 RG2                          23:00      0.0405
 RG2                          23:30      0.045
 RG2                01/02/2005 0:00      0.0405

;100 Year 6 hour event 2.6 inches
 G2-100yr6hr        10/01/2005 10:00     0.00
 G2-100yr6hr                   10:15     0.0468
 G2-100yr6hr                   10:30     0.091
 G2-100yr6hr                   10:45     0.1508
 G2-100yr6hr                   11:00     0.208
 G2-100yr6hr                   11:15     0.2808
 G2-100yr6hr                   11:30     0.351
 G2-100yr6hr                   11:45     0.4758
 G2-100yr6hr                   12:00     0.598
 G2-100yr6hr                   12:15     1.079
 G2-100yr6hr                   12:30     1.56
 G2-100yr6hr                   12:45     1.69
 G2-100yr6hr                   13:00     1.82
 G2-100yr6hr                   13:15     1.924
 G2-100yr6hr                   13:30     2.028
 G2-100yr6hr                   13:45     2.1008
 G2-100yr6hr                   14:00     2.171
 G2-100yr6hr                   14:15     2.2308
 G2-100yr6hr                   14:30     2.288
 G2-100yr6hr                   14:45     2.34
 G2-100yr6hr                   15:00     2.392
 G2-100yr6hr                   15:15     2.444
 G2-100yr6hr                   15:30     2.496
 G2-100yr6hr                   15:45     2.548
 G2-100yr6hr                   16:00     2.6

;100  year 6 hr 2.8 inches
 G1-100yr6r         10/01/2005 10:00     0.00
 G1-100yr6r                    10:15     0.0504
 G1-100yr6r                    10:30     0.098
 G1-100yr6r                    10:45     0.1624
 G1-100yr6r                    11:00     0.224
 G1-100yr6r                    11:15     0.3024
 G1-100yr6r                    11:30     0.378
 G1-100yr6r                    11:45     0.5124
 G1-100yr6r                    12:00     0.644
 G1-100yr6r                    12:15     1.162
 G1-100yr6r                    12:30     1.68
 G1-100yr6r                    12:45     1.82
 G1-100yr6r                    13:00     1.96
 G1-100yr6r                    13:15     2.072
 G1-100yr6r                    13:30     2.184
 G1-100yr6r                    13:45     2.2624
 G1-100yr6r                    14:00     2.338
 G1-100yr6r                    14:15     2.4024
 G1-100yr6r                    14:30     2.464
 G1-100yr6r                    14:45     2.52
```

```
 G1-100yr6r                    15:00      2.576
 G1-100yr6r                    15:15      2.632
 G1-100yr6r                    15:30      2.688
 G1-100yr6r                    15:45      2.744
 G1-100yr6r                    16:00      2.8

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\DOCUME~1\CHEREN~1\LOCALS~1\Temp\"
```

Project C – 1

Project C – 2

SWMM 5.0 – Output

100 Year 6 Hour Storm

Basin C Model including Sedimentation Basins

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.009)
--------------------------------------------------------------

Basin C Model including Sedimentation Basins

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 22:00:00
Ending Date .............. OCT-03-2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************          Volume         Depth
Runoff Quantity Continuity      acre-feet        inches
**************************      ---------       -------
Total Precipitation ......        527.376         2.655
Evaporation Loss .........          0.000         0.000
Infiltration Loss ........        146.647         0.738
Surface Runoff ...........        384.957         1.938
Final Surface Storage ....          0.046         0.000
Continuity Error (%) .....         -0.810

**************************          Volume        Volume
Flow Routing Continuity         acre-feet      Mgallons
**************************      ---------     ---------
Dry Weather Inflow .......          0.000         0.000
Wet Weather Inflow .......        386.152       125.834
Groundwater Inflow .......          0.000         0.000
RDII Inflow ..............          0.000         0.000
External Inflow ..........          0.000         0.000
External Outflow .........        300.200        97.825
Surface Flooding .........         49.141        16.013
Evaporation Loss .........          0.000         0.000
Initial Stored Volume ....          0.000         0.000
Final Stored Volume ......          0.533         0.174
Continuity Error (%) .....          9.395

****************************
Subcatchment Runoff Summary
****************************
```

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Peak Runoff CFS	Runoff Coeff
S1	2.800	0.000	0.000	0.136	2.397	67.63	0.856
S2	2.800	0.000	0.000	0.136	2.686	45.11	0.959
S3	2.800	0.000	0.000	0.074	2.745	144.45	0.980
S4	2.800	0.000	0.000	0.300	2.526	9.73	0.902
S5	2.800	0.000	0.000	0.378	2.453	45.81	0.876
S6	2.800	0.000	0.000	0.388	2.443	21.93	0.872
S7	2.800	0.000	0.000	0.382	2.451	22.73	0.875
S8	2.800	0.000	0.000	0.133	2.676	4.14	0.956
S9	2.800	0.000	0.000	0.136	2.686	38.97	0.959
S10	2.800	0.000	0.000	0.382	2.450	30.24	0.875
S11	2.800	0.000	0.000	0.135	2.686	100.84	0.959
S12	2.800	0.000	0.000	0.872	1.965	86.81	0.702
S13	2.800	0.000	0.000	0.296	2.530	179.68	0.904
S14	2.800	0.000	0.000	1.311	1.527	88.55	0.545
S15	2.800	0.000	0.000	0.134	2.684	41.37	0.958

Basin C Model including Sedimentation Basins

S16	2.800	0.000	0.000	0.137	2.680	49.50	0.957
S17	2.800	0.000	0.000	0.391	2.429	22.36	0.867
S18	2.800	0.000	0.000	0.136	2.685	22.44	0.959
S19	2.800	0.000	0.000	0.127	2.694	59.16	0.962
S20	2.800	0.000	0.000	0.154	2.666	101.01	0.952
S21	2.800	0.000	0.000	0.226	2.593	24.67	0.926
S22	2.600	0.000	0.000	0.282	2.340	22.47	0.900
S23	2.600	0.000	0.000	1.490	1.149	102.57	0.442
S24	2.600	0.000	0.000	0.342	2.272	17.01	0.874
S25	2.600	0.000	0.000	0.528	2.097	23.64	0.807
S26	2.800	0.000	0.000	0.226	2.594	67.77	0.926
S27	2.600	0.000	0.000	0.776	1.857	59.79	0.714
S28	2.600	0.000	0.000	0.135	2.484	74.32	0.955
S29	2.600	0.000	0.000	0.134	2.484	47.90	0.955
S30	2.600	0.000	0.000	0.144	2.475	74.63	0.952
S31	2.600	0.000	0.000	0.675	1.959	25.66	0.753
S32	2.600	0.000	0.000	0.301	2.321	46.73	0.893
S33	2.600	0.000	0.000	0.965	1.673	7.30	0.644
S34	2.600	0.000	0.000	0.311	2.310	110.85	0.888
S35	2.600	0.000	0.000	0.385	2.243	121.44	0.863
S36	2.600	0.000	0.000	0.232	2.387	85.92	0.918
S37	2.600	0.000	0.000	0.481	2.149	69.55	0.827
S38	2.600	0.000	0.000	1.433	1.206	15.71	0.464
S39	2.600	0.000	0.000	1.418	1.226	4.84	0.472
S40	2.600	0.000	0.000	1.478	1.157	33.41	0.445
S41	2.600	0.000	0.000	1.456	1.172	105.79	0.451
S42	2.600	0.000	0.000	0.380	2.239	54.27	0.861
S43	2.600	0.000	0.000	0.371	2.247	18.90	0.864
S44	2.600	0.000	0.000	0.282	2.337	32.15	0.899
S45	2.600	0.000	0.000	1.425	1.216	28.74	0.468
S46	2.600	0.000	0.000	1.676	0.961	7.79	0.369
S47	2.600	0.000	0.000	1.825	0.792	18.85	0.305
S48	2.600	0.000	0.000	0.374	2.244	15.13	0.863
S49	2.600	0.000	0.000	0.944	1.690	5.17	0.650
S50	2.600	0.000	0.000	0.934	1.690	94.02	0.650
S51	2.600	0.000	0.000	0.410	2.219	13.77	0.853
S52	2.600	0.000	0.000	0.393	2.233	85.48	0.859
S53	2.600	0.000	0.000	0.987	1.649	64.83	0.634
S54	2.600	0.000	0.000	1.386	1.244	56.17	0.479
S55	2.600	0.000	0.000	1.318	1.317	13.09	0.507
S56	2.600	0.000	0.000	1.692	0.963	3.29	0.370
S57	2.600	0.000	0.000	1.436	1.199	18.55	0.461
S58	2.600	0.000	0.000	1.972	0.692	4.80	0.266
S59	2.600	0.000	0.000	0.364	2.264	63.72	0.871
S60	2.600	0.000	0.000	0.356	2.269	52.83	0.873
S61	2.600	0.000	0.000	1.493	1.155	26.09	0.444
S62	2.600	0.000	0.000	1.646	0.979	38.76	0.377
S63	2.600	0.000	0.000	0.481	2.149	28.85	0.827
S64	2.600	0.000	0.000	1.034	1.590	49.90	0.612
S65	2.600	0.000	0.000	0.356	2.269	49.32	0.873
S66	2.600	0.000	0.000	0.484	2.147	13.51	0.826
S67	2.600	0.000	0.000	0.330	2.288	1.77	0.880
S68	2.600	0.000	0.000	0.240	2.385	16.12	0.917
S69	2.600	0.000	0.000	0.868	1.770	46.85	0.681
S70	2.600	0.000	0.000	1.858	0.760	88.03	0.292
S71	2.600	0.000	0.000	0.309	2.310	36.80	0.888
S72	2.600	0.000	0.000	1.748	0.877	20.22	0.337
S73b	2.600	0.000	0.000	1.604	1.050	2.73	0.404
S74	2.600	0.000	0.000	1.462	1.163	22.03	0.447
S75a	2.600	0.000	0.000	1.558	1.089	7.41	0.419
S75b_S73a	2.600	0.000	0.000	0.390	2.201	9.13	0.846
S75c	2.600	0.000	0.000	0.397	2.227	66.11	0.857
S76	2.600	0.000	0.000	1.155	1.461	42.48	0.562
S77	2.600	0.000	0.000	1.741	0.879	39.81	0.338
S78	2.600	0.000	0.000	0.974	1.660	28.72	0.639
S79	2.600	0.000	0.000	1.483	1.142	34.87	0.439
S80	2.600	0.000	0.000	1.299	1.330	80.84	0.511
S81	2.600	0.000	0.000	0.838	1.796	31.17	0.691
S82	2.600	0.000	0.000	0.047	2.569	59.39	0.988
S83	2.600	0.000	0.000	1.039	1.593	20.23	0.613
S84	2.600	0.000	0.000	0.462	2.163	83.37	0.832
S85	2.600	0.000	0.000	0.945	1.693	32.54	0.651

S86	2.600	0.000	0.000	1.640	1.003	13.74	0.386
S87	2.600	0.000	0.000	1.701	0.924	4.91	0.355
System	2.655	0.000	0.000	0.738	1.938	3971.66	0.730

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Node Depth Summary
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Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding acre-in	Total Minutes Flooded
J1	JUNCTION	0.06	1.00	261.50	0 14:25	7.37	30
J2	JUNCTION	0.07	1.00	247.00	0 14:24	12.57	35
J3	JUNCTION	0.12	1.98	277.09	0 14:45	0	0
J4	JUNCTION	0.12	1.98	244.98	0 14:45	0	0
J5	JUNCTION	0.04	0.66	274.97	0 14:45	0	0
J6	JUNCTION	0.08	3.00	219.00	0 14:28	16.97	25
J7	JUNCTION	0.08	1.22	214.12	0 14:45	0	0
J8	JUNCTION	0.08	1.41	199.41	0 14:31	0	0
J9	JUNCTION	0.05	1.08	200.88	0 14:45	0	0
J10	JUNCTION	0.09	1.67	196.37	0 14:31	0	0
J11	JUNCTION	0.12	3.00	182.42	0 14:27	2.85	23
J12	JUNCTION	0.13	3.00	180.45	0 14:29	0	0
J13	JUNCTION	0.07	1.04	277.04	0 14:45	0	0
J15	JUNCTION	0.02	0.42	213.42	0 14:45	0	0
J16	JUNCTION	0.07	1.24	280.24	0 14:45	0	0
J17	JUNCTION	0.15	3.00	192.00	0 14:26	23.08	31
J18	JUNCTION	0.43	5.00	162.54	0 14:23	35.60	57
J19	JUNCTION	0.42	5.00	162.00	0 14:26	0	7
J20	JUNCTION	0.06	1.77	194.77	0 14:45	0	0
J21	JUNCTION	0.13	2.14	145.48	0 14:46	0	0
J22	JUNCTION	0.37	9.00	143.13	0 14:28	163.96	38
J23	JUNCTION	0.31	4.00	132.00	0 14:41	0	0
J24	JUNCTION	0.18	2.73	128.73	0 14:28	0	0
J25	JUNCTION	0.47	9.00	126.65	0 14:28	33.04	29
J26	JUNCTION	0.44	5.60	121.47	0 14:29	0	0
J27	JUNCTION	0.09	1.65	225.53	0 14:45	0	0
J28	JUNCTION	0.15	9.00	211.90	0 14:38	0.25	9
J29	JUNCTION	0.19	9.00	199.30	0 14:25	15.13	27
J30	JUNCTION	0.07	1.22	158.25	0 14:45	0	0
J31	JUNCTION	0.23	9.00	139.50	0 14:21	39.86	37
J32	JUNCTION	0.33	4.24	118.84	0 15:01	0	0
J33	JUNCTION	0.11	2.14	105.72	0 14:45	0	0
J34	JUNCTION	0.48	9.00	106.00	0 14:29	64.26	42
J35	JUNCTION	0.41	5.00	79.20	0 14:29	0	0
J36	JUNCTION	0.09	1.71	86.01	0 14:45	0	0
J37	JUNCTION	0.07	9.00	280.00	0 14:29	0.77	22
J39	JUNCTION	0.13	9.00	253.00	0 14:21	4.21	38
J41	JUNCTION	0.34	5.50	169.50	0 15:39	0	0
J42	JUNCTION	0.09	1.79	142.13	0 14:45	0	0
J43	JUNCTION	0.11	2.15	125.15	0 14:45	0	0
J44	JUNCTION	0.03	0.84	227.69	0 14:45	0	0
J45	JUNCTION	0.06	9.00	168.67	0 14:32	0.81	19
J46	JUNCTION	0.24	9.00	163.41	0 14:20	14.19	40
J47	JUNCTION	0.16	3.00	82.05	0 14:59	0	0
J48	JUNCTION	0.36	5.21	77.91	0 14:35	0	0
J49	JUNCTION	0.49	9.00	79.00	0 14:30	19.37	19
J50	JUNCTION	0.11	9.00	244.00	0 14:22	15.51	35
J51	JUNCTION	0.11	9.00	85.80	0 14:26	5.52	34
J52	JUNCTION	0.20	2.80	67.80	0 14:45	0	0
J53	JUNCTION	0.54	9.00	72.00	0 14:31	7.35	18
J54	JUNCTION	0.06	1.52	122.60	0 14:45	0	0
J55	JUNCTION	0.06	1.58	99.46	0 14:45	0	0
J56	JUNCTION	0.53	9.00	70.00	0 14:33	1.88	6
J57	JUNCTION	0.08	1.31	135.31	0 14:45	0	0
J58	JUNCTION	0.17	9.00	80.00	0 14:24	13.65	30
J59	JUNCTION	0.08	1.33	150.33	0 14:45	0	0
J60	JUNCTION	0.09	1.53	143.60	0 14:45	0	0

J61	JUNCTION	0.05	0.85	144.54	0	14:45	0	0
J62	JUNCTION	0.06	0.94	142.12	0	14:45	0	0
J63	JUNCTION	0.06	0.94	102.61	0	14:45	0	0
J64	JUNCTION	0.08	1.36	80.16	0	14:45	0	0
J65	JUNCTION	0.21	9.00	84.00	0	14:22	44.09	38
J66	JUNCTION	0.51	6.00	61.00	0	14:34	0	0
J67	JUNCTION	0.50	9.00	59.00	0	14:40	5.16	6
J68	JUNCTION	0.37	4.29	38.29	0	14:56	0	0
J69	JUNCTION	0.34	3.94	30.64	0	14:56	0	0
J70	JUNCTION	0.50	5.76	31.86	0	14:56	0	0
J71	JUNCTION	0.08	1.69	71.80	0	14:45	0	0
J72	JUNCTION	0.21	9.00	76.00	0	14:21	17.35	39
J73	JUNCTION	0.16	9.00	69.41	0	14:38	0.50	12
J74	JUNCTION	0.22	9.00	64.28	0	14:31	7.41	29
J75	JUNCTION	0.22	9.00	58.55	0	14:28	7.27	28
J76	JUNCTION	0.52	6.72	30.72	0	14:58	0	0
J77	JUNCTION	0.71	8.08	30.08	0	14:58	0	0
J78	JUNCTION	0.72	7.75	28.75	0	15:04	0	0
J79	JUNCTION	0.37	4.00	23.00	0	15:04	0	0
J80	JUNCTION	0.37	3.99	21.99	0	15:05	0	0
J81	JUNCTION	0.38	9.00	26.00	0	15:04	0.29	2
J82	JUNCTION	0.38	4.00	19.00	0	15:06	0	0
J83	JUNCTION	0.27	3.03	15.03	0	15:06	0	0
J84	JUNCTION	0.27	2.79	12.79	0	15:08	0	0
J_DB37_1	JUNCTION	0.02	0.52	53.06	0	14:46	0	0
J_DB37_2	JUNCTION	0.02	0.48	50.48	0	14:46	0	0
J_DB37_3	JUNCTION	0.49	6.00	48.00	0	14:41	0	2
OUT1	OUTFALL	4.51	6.00	6.00	0	12:24	0	0
DB2	STORAGE	0.41	8.00	172.00	0	14:34	9.39	39
DB18	STORAGE	0.06	1.42	85.42	0	14:46	0	0
DB33	STORAGE	0.00	0.12	254.12	0	14:45	0	0
DB36	STORAGE	0.00	0.08	46.08	0	14:45	0	0
DB37	STORAGE	0.02	0.52	64.52	0	14:45	0	0
DB46	STORAGE	0.07	0.84	218.84	0	14:57	0	0
DB47	STORAGE	0.12	1.57	125.57	0	15:01	0	0

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Node Flow Summary
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min		Maximum Flooding Overflow CFS	Time of Max Occurrence days hr:min	
J1	JUNCTION	67.63	67.63	0	14:45	24.04	0	14:45
J2	JUNCTION	45.11	88.45	0	14:45	34.47	0	14:45
J3	JUNCTION	144.45	144.45	0	14:45	0.00		
J4	JUNCTION	9.73	207.77	0	14:45	0.00		
J5	JUNCTION	21.93	21.93	0	14:45	0.00		
J6	JUNCTION	68.55	294.16	0	14:45	66.55	0	14:45
J7	JUNCTION	43.11	270.68	0	14:45	0.00		
J8	JUNCTION	30.24	371.68	0	14:31	0.00		
J9	JUNCTION	100.84	100.84	0	14:45	0.00		
J10	JUNCTION	0.00	463.82	0	14:31	0.00		
J11	JUNCTION	86.81	86.81	0	14:45	13.83	0	14:45
J12	JUNCTION	179.68	645.15	0	14:45	0.00		
J13	JUNCTION	49.50	49.50	0	14:45	0.00		
J15	JUNCTION	22.44	22.44	0	14:45	0.00		
J16	JUNCTION	59.16	59.16	0	14:45	0.00		
J17	JUNCTION	123.37	225.35	0	14:45	76.36	0	14:45
J18	JUNCTION	24.67	172.23	0	14:45	73.19	0	14:45
J19	JUNCTION	129.91	866.88	0	14:45	0.00		
J20	JUNCTION	102.57	102.57	0	14:45	0.00		
J21	JUNCTION	17.01	983.57	0	14:45	0.00		
J22	JUNCTION	22.47	1004.11	0	14:46	444.63	0	14:46
J23	JUNCTION	23.64	582.54	0	14:45	0.00		
J24	JUNCTION	67.77	769.20	0	14:28	0.00		
J25	JUNCTION	59.79	733.28	0	14:28	103.26	0	14:45
J26	JUNCTION	0.00	606.55	0	14:29	0.00		

Basin C Model including Sedimentation Basins

J27	JUNCTION	74.32	74.32	0	14:45	0.00		
J28	JUNCTION	47.90	122.07	0	14:45	3.61	0	14:45
J29	JUNCTION	74.63	187.98	0	14:34	47.64	0	14:34
J30	JUNCTION	46.73	46.73	0	14:45	0.00		
J31	JUNCTION	32.96	218.35	0	14:45	98.33	0	14:45
J32	JUNCTION	0.00	718.77	0	15:01	0.00		
J33	JUNCTION	121.44	121.44	0	14:45	0.00		
J34	JUNCTION	110.85	921.59	0	14:33	188.46	0	14:45
J35	JUNCTION	85.92	809.78	0	14:35	0.00		
J36	JUNCTION	69.55	69.55	0	14:45	0.00		
J37	JUNCTION	15.71	15.71	0	14:45	4.03	0	14:45
J39	JUNCTION	0.00	16.44	0	14:45	9.22	0	14:45
J41	JUNCTION	105.79	117.38	0	14:45	0.00		
J42	JUNCTION	0.00	116.82	0	14:45	0.00		
J43	JUNCTION	73.17	186.16	0	14:45	0.00		
J44	JUNCTION	28.74	28.74	0	14:45	0.00		
J45	JUNCTION	18.85	18.85	0	14:45	5.14	0	14:45
J46	JUNCTION	7.79	49.90	0	14:45	33.84	0	14:45
J47	JUNCTION	47.28	247.46	0	14:45	0.00		
J48	JUNCTION	0.00	1157.24	0	14:35	0.00		
J49	JUNCTION	5.17	1130.54	0	14:35	236.32	0	14:35
J50	JUNCTION	94.02	94.02	0	14:45	47.11	0	14:45
J51	JUNCTION	13.77	60.35	0	14:45	13.00	0	14:45
J52	JUNCTION	85.48	132.79	0	14:45	0.00		
J53	JUNCTION	0.00	1008.15	0	14:39	82.02	0	14:39
J54	JUNCTION	69.26	69.26	0	14:45	0.00		
J55	JUNCTION	21.85	90.73	0	14:45	0.00		
J56	JUNCTION	69.63	1072.23	0	14:40	40.79	0	14:41
J57	JUNCTION	63.72	63.72	0	14:45	0.00		
J58	JUNCTION	52.83	116.15	0	14:45	42.04	0	14:45
J59	JUNCTION	28.85	28.85	0	14:45	0.00		
J60	JUNCTION	49.90	78.33	0	14:45	0.00		
J61	JUNCTION	13.51	13.51	0	14:45	0.00		
J62	JUNCTION	17.89	31.36	0	14:45	0.00		
J63	JUNCTION	0.00	31.31	0	14:45	0.00		
J64	JUNCTION	0.00	31.25	0	14:45	0.00		
J65	JUNCTION	96.17	203.34	0	14:45	113.03	0	14:45
J66	JUNCTION	26.09	1217.64	0	14:44	0.00		
J67	JUNCTION	126.78	1448.10	0	14:40	104.36	0	14:40
J68	JUNCTION	57.01	1181.03	0	14:56	0.00		
J69	JUNCTION	2.73	1184.18	0	14:56	0.00		
J70	JUNCTION	88.14	1229.62	0	14:56	0.00		
J71	JUNCTION	39.81	39.81	0	14:45	0.00		
J72	JUNCTION	42.48	81.96	0	14:45	49.93	0	14:45
J73	JUNCTION	28.72	59.25	0	14:45	4.83	0	14:45
J74	JUNCTION	34.87	81.14	0	14:49	28.60	0	14:50
J75	JUNCTION	80.84	121.79	0	14:38	40.35	0	14:38
J76	JUNCTION	31.17	1287.09	0	14:58	0.00		
J77	JUNCTION	59.39	1308.74	0	14:58	0.00		
J78	JUNCTION	20.23	1223.86	0	15:04	0.00		
J79	JUNCTION	83.37	1253.52	0	15:04	0.00		
J80	JUNCTION	32.54	1257.43	0	15:05	0.00		
J81	JUNCTION	0.00	1257.77	0	15:05	15.22	0	15:05
J82	JUNCTION	13.74	1243.63	0	15:06	0.00		
J83	JUNCTION	0.00	1395.67	0	15:06	0.00		
J84	JUNCTION	4.91	1217.85	0	15:08	0.00		
J_DB37_1	JUNCTION	0.00	7.27	0	14:46	0.00		
J_DB37_2	JUNCTION	0.00	7.27	0	14:46	0.00		
J_DB37_3	JUNCTION	0.00	1259.84	0	14:49	0.00		
OUT1	OUTFALL	0.00	1216.94	0	15:09	0.00		
DB2	STORAGE	33.41	40.36	0	14:45	28.61	0	14:45
DB18	STORAGE	0.00	90.48	0	14:45	0.00		
DB33	STORAGE	4.84	4.84	0	14:45	0.00		
DB36	STORAGE	9.13	9.13	0	14:45	0.00		
DB37	STORAGE	7.41	7.41	0	14:45	0.00		
DB46	STORAGE	0.00	49.25	0	14:45	0.00		
DB47	STORAGE	0.00	119.76	0	14:25	0.00		

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Storage Volume Summary
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Basin C Model including Sedimentation Basins

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
DB2	0.634	5	13.608	100	0 14:34	12.51
DB18	1.225	1	27.173	17	0 14:46	87.64
DB33	0.004	0	0.132	2	0 14:45	4.83
DB36	0.011	0	0.246	2	0 14:45	9.12
DB37	0.099	0	2.290	6	0 14:45	7.28
DB46	5.733	1	71.045	7	0 14:57	30.71
DB47	7.932	1	103.873	9	0 15:01	113.34

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Outfall Loading Summary
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Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS
OUT1	75.13	96.70	1216.94
System	75.13	96.70	1216.94

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Link Flow Summary
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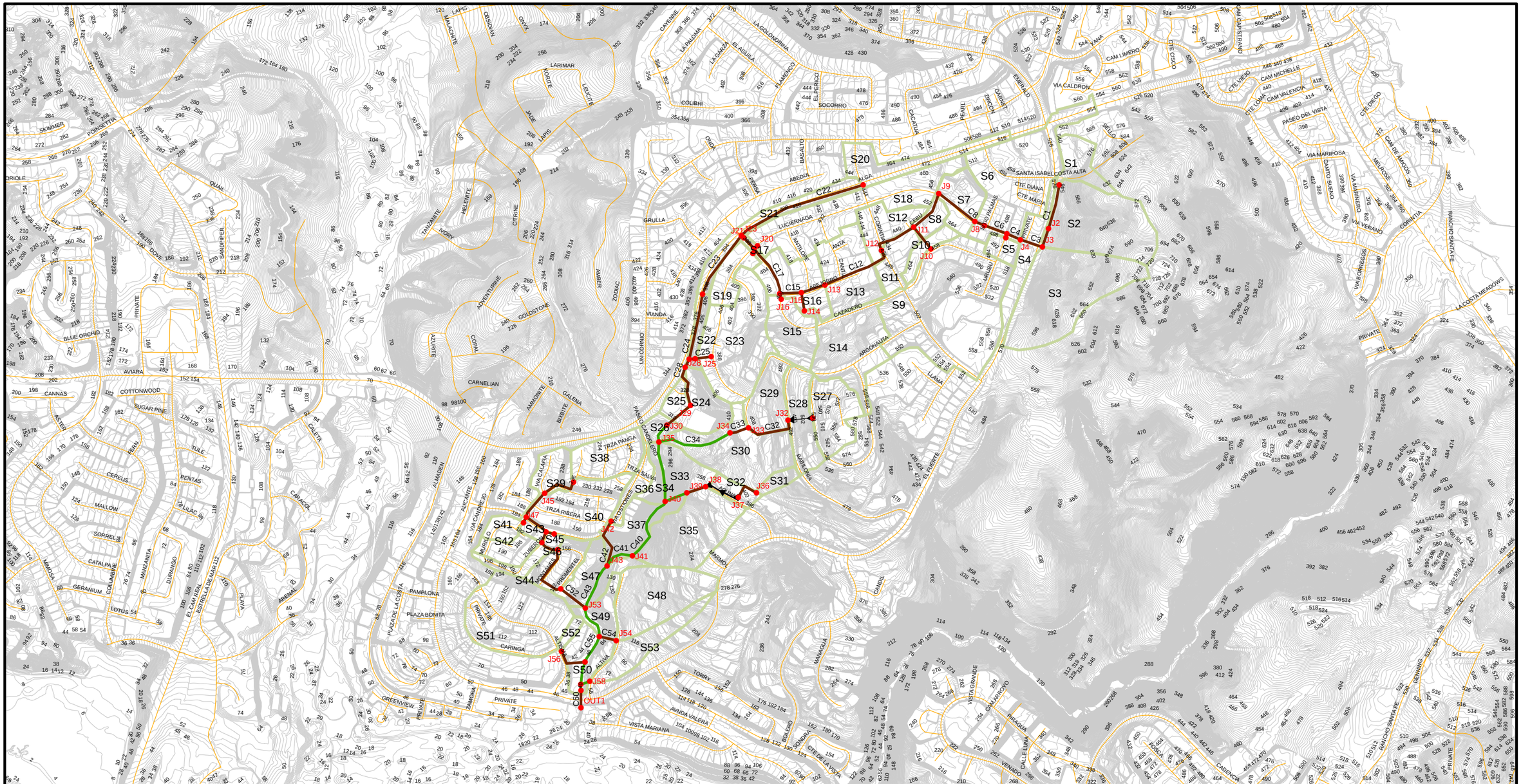
Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Max/ Full Flow	Max/ Full Depth	Total Minutes Surcharged
C1	CONDUIT	43.44	0 14:54	1.51	1.00	11.77	32
C2	CONDUIT	53.90	0 14:25	1.77	1.00	13.60	35
C3	CONDUIT	144.14	0 14:45	29.26	0.77	0.66	0
C4	CONDUIT	206.96	0 14:46	6.30	0.29	0.47	0
C5	CONDUIT	21.83	0 14:45	19.21	0.10	0.22	0
C6	CONDUIT	227.58	0 14:29	10.26	1.00	11.75	25
C7	CONDUIT	344.63	0 14:31	9.51	0.29	0.41	0
C8	CONDUIT	369.52	0 14:31	17.03	0.06	0.18	0
C9	CONDUIT	100.71	0 14:45	2.63	0.36	0.54	0
C10	CONDUIT	400.86	0 14:46	6.89	0.33	0.51	0
C11	CONDUIT	70.62	0 14:49	11.20	1.05	1.00	23
C12	CONDUIT	642.88	0 14:46	8.18	0.36	0.54	0
C13	CONDUIT	49.25	0 14:45	22.85	0.26	0.35	0
C14	CONDUIT	30.57	0 15:01	1.80	0.75	0.84	0
C15	CONDUIT	22.39	0 14:45	2.68	0.73	0.83	0
C16	CONDUIT	59.08	0 14:45	21.69	0.35	0.41	0
C17	CONDUIT	148.39	0 14:56	2.55	1.00	16.17	30
C18	CONDUIT	98.96	0 14:46	6.94	1.08	1.00	54
C19	CONDUIT	866.24	0 14:46	9.87	0.36	0.53	0
C20	CONDUIT	102.01	0 14:45	23.84	0.65	0.59	0
C21	CONDUIT	982.69	0 14:46	10.02	0.36	0.53	0
C22	CONDUIT	558.90	0 14:41	2.99	1.00	28.58	39
C23	CONDUIT	710.33	0 14:28	9.16	0.37	0.48	0
C24	CONDUIT	682.05	0 14:28	9.46	0.28	0.45	0
C25	CONDUIT	606.55	0 14:29	2.20	1.00	26.16	28
C26	CONDUIT	606.55	0 15:00	21.66	0.60	0.57	0
C27	CONDUIT	74.17	0 14:45	18.73	0.58	0.55	0
C28	CONDUIT	116.39	0 14:48	18.13	1.06	1.00	18
C29	CONDUIT	140.14	0 14:38	4.36	1.00	12.19	28
C30	CONDUIT	46.69	0 14:45	17.42	0.35	0.41	0
C31a	CONDUIT	119.76	0 14:25	2.37	1.00	16.17	35
C31b	CONDUIT	113.23	0 15:03	2.36	0.67	0.78	0
C32	CONDUIT	718.17	0 15:03	5.21	0.91	0.94	0
C33	CONDUIT	121.36	0 14:45	22.52	0.86	0.71	0

C34	CONDUIT	726.58	0	14:29	3.11	1.00	32.96	46
C35	CONDUIT	875.86	0	14:35	22.09	0.71	0.63	0
C36	CONDUIT	69.37	0	14:45	15.01	0.48	0.49	0
C37	CONDUIT	11.62	0	14:29	15.20	1.00	0.99	21
C38	CONDUIT	4.82	0	14:45	8.03	0.59	0.72	0
C39	CONDUIT	7.21	0	14:58	1.62	1.00	3.00	40
C40	CONDUIT	12.44	0	15:43	0.60	1.07	1.00	74
C41	CONDUIT	116.82	0	14:45	17.53	0.23	0.32	0
C42	CONDUIT	115.96	0	14:46	2.79	0.53	0.68	0
C43	CONDUIT	185.73	0	14:46	21.66	0.32	0.39	0
C44	CONDUIT	28.67	0	14:45	18.00	0.17	0.28	0
C45	CONDUIT	13.61	0	14:32	10.26	1.00	1.17	19
C46	CONDUIT	16.02	0	14:58	2.72	1.08	1.00	32
C47	CONDUIT	247.34	0	14:45	19.57	0.43	0.46	0
C48	CONDUIT	1125.48	0	14:35	4.98	0.85	0.91	0
C49	CONDUIT	883.13	0	14:31	2.93	1.00	32.90	21
C50	CONDUIT	46.57	0	14:57	9.68	1.00	3.00	36
C51	CONDUIT	47.32	0	15:00	9.29	1.00	3.83	34
C52	CONDUIT	132.47	0	14:45	10.49	0.38	0.43	0
C53	CONDUIT	925.81	0	14:33	3.23	1.00	35.70	20
C54	CONDUIT	68.88	0	14:45	19.42	0.51	0.50	0
C55a	CONDUIT	90.48	0	14:45	21.59	0.42	0.45	0
C55b	CONDUIT	87.60	0	14:46	23.97	0.34	0.41	0
C56	CONDUIT	1029.13	0	14:34	3.71	1.00	37.59	11
C57	CONDUIT	63.52	0	14:45	21.60	0.39	0.44	0
C58	CONDUIT	73.93	0	14:54	1.78	1.00	14.43	33
C59	CONDUIT	28.92	0	14:46	6.71	0.13	0.24	0
C60	CONDUIT	77.83	0	14:46	15.62	0.20	0.30	0
C61	CONDUIT	13.48	0	14:45	7.52	0.13	0.24	0
C62	CONDUIT	31.31	0	14:45	15.16	0.16	0.27	0
C63	CONDUIT	31.25	0	14:45	18.90	0.11	0.23	0
C64	CONDUIT	31.20	0	14:46	8.35	0.25	0.34	0
C65	CONDUIT	89.86	0	14:59	2.04	1.00	14.43	39
C66	CONDUIT	1338.21	0	14:40	4.77	1.00	0.92	1
C_DB37_1	CONDUIT	7.27	0	14:46	11.32	0.15	0.26	0
C_DB37_2	CONDUIT	7.27	0	14:46	7.29	0.02	0.10	0
C_DB37_3	CONDUIT	7.25	0	14:49	0.77	0.05	0.16	0
C67a	CONDUIT	1252.59	0	14:41	3.71	1.00	49.60	7
C67b	CONDUIT	1151.92	0	14:56	6.65	0.58	0.71	0
C_DB36_1	CONDUIT	9.12	0	14:45	5.92	0.01	0.05	0
C68	CONDUIT	1178.80	0	14:56	5.28	0.68	0.79	0
C69	CONDUIT	1184.45	0	14:56	19.17	0.69	0.62	0
C70	CONDUIT	1202.75	0	14:58	2.50	0.91	0.94	0
C71	CONDUIT	39.53	0	14:45	9.78	0.60	0.56	0
C72	CONDUIT	31.65	0	14:59	1.08	1.00	9.95	40
C73	CONDUIT	54.29	0	14:49	1.32	1.00	11.15	12
C74	CONDUIT	52.09	0	14:38	1.46	1.00	11.16	31
C75	CONDUIT	79.99	0	14:31	2.10	1.00	11.15	27
C76	CONDUIT	1286.77	0	14:58	23.94	0.73	0.67	0
C77	CONDUIT	1219.86	0	15:04	1.44	0.65	0.75	0
C78	CONDUIT	1222.36	0	15:04	16.69	0.51	0.51	0
C79	CONDUIT	1247.49	0	15:05	2.04	0.99	1.00	0
C80	CONDUIT	1257.77	0	15:05	19.62	0.42	0.45	0
C81	CONDUIT	1240.90	0	15:06	1.56	1.00	90.40	3
C82	CONDUIT	1395.67	0	15:06	13.17	0.02	0.07	0
C83	CONDUIT	1216.99	0	15:08	3.89	0.55	0.70	0
C84	CONDUIT	1216.94	0	15:09	11.43	0.02	0.07	0

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    28.81 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00


Analysis begun on:  Sun Nov 26 23:30:37 2006
Total elapsed time: 00:00:03
```

Project DH
Alga Road Restoration and Enhancement Project



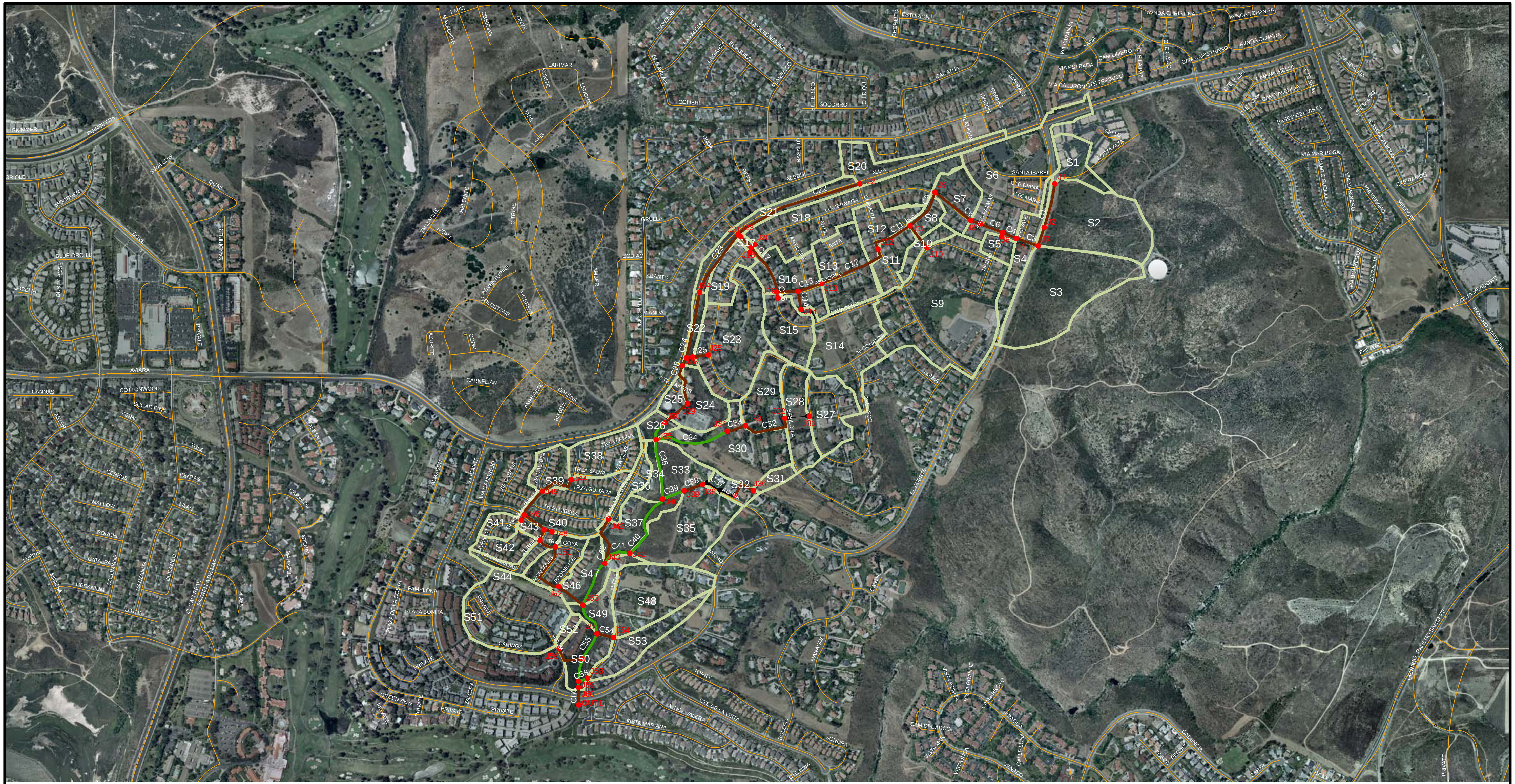
LEGEND

- JUNCTIONS
- CHANNEL
- CHANNEL TRIBUTARY
- GUTTER
- OVERLAND FLOW
- PVC
- RCP
- SUBCATCHMENTS
- roads
- CONTOURS

PROJECT DH

PROJECT LOCATION	DATE	PROJECT NUMBER
ALTIVA PLACE RESTORATION AND ENHANCEMENT CARLSBAD, CALIFORNIA	FEB 2007	128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA



N
W E
S

0 500 1,000 2,000 3,000 4,000 Feet

LEGEND

- JUNCTIONS
- CHANNEL
- CHANNEL TRIBUTARY
- GUTTER
- OVERLAND FLOW
- PVC
- RCP
- SUBCATCHMENTS
- roads

PROJECT DH

PROJECT LOCATION

ALTIVA PLACE RESTORATION AND ENHANCEMENT
CARLSBAD, CALIFORNIA

DATE
FEB 2007

PROJECT NUMBER
128290

BROWN AND CALDWELL
SAN DIEGO, CALIFORNIA

Project DH

SWMM 5.0 – Input

100 Year 6 Hour Storm

Drainage Project DH (Alga Road Restoration and Enhancement)

```
[TITLE]
Drainage Project DH (Alga Road Restoration and Enhancement)
100 Year 6 hour Storm

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              20:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       20:00:00
 END_DATE                10/02/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;
;;Name            Rain      Recd.  Snow   Data      Source          Station   Rain
                  Type      Freq.  Catch  Source    Name            ID        Units
;;----------------------------------------------------------------------------------
  R1              CUMULATIVE 0:15   1.0    TIMESERIES 100yr6hr2.9Cum

[SUBCATCHMENTS]
;;                                                  Total   Pcnt.          Pcnt.   Curb    Snow
;;Name            Raingage          Outlet          Area    Imperv  Width  Slope   Length  Pack
;;----------------------------------------------------------------------------------------------
  S1              R1                J1              4.17    36.6    267    6.47    0
  S2              R1                J3              16.08   3       652    19.16   0
  S3              R1                J3              19.3    3       747    19.56   0
  S4              R1                J4              5.36    30.02   212    6.18    0
  S5              R1                J5              1.76    30.4    247    11.61   0
  S6              R1                J8              19.49   39.37   449    4.97    0
  S7              R1                J9              5.2     38.47   453    9.2     0
  S8              R1                J11             1.95    30.22   226    3.73    0
  S9              R1                J10             29.81   39.61   764    6.71    0
  S10             R1                J11             2.26    30      164    5       0
  S11             R1                J12             3.98    30      386    5.78    0
  S12             R1                J12             5.13    30      372    2       0
  S13             R1                J13             9.5     27.88   608    7.9     0
  S14             R1                J14             12.26   20.5    396    11.11   0
  S15             R1                J16             6.57    23.13   381    13.2    0
  S16             R1                J18             7.67    30      334    2.6     0
  S17             R1                J21             0.31    80      89     0.67    0
  S18             R1                J20             16.68   32      316    5       0
  S19             R1                J19             3.86    30      240    1.14    0
  S20             R1                J22             6.74    57      186    5       0
  S21             R1                J24             5.98    71      130    2.7     0
  S22             R1                J28             2.06    39      121    4       0
  S23             R1                J25             15.88   27.69   629    8.55    0
  S24             R1                J29             5.35    24.37   583    7       0
  S25             R1                J29             1.76    26      202    6.32    0
  S26             R1                J35             1.83    4.54    266    13.33   0
  S27             R1                J31             7.26    20      633    10      0
  S28             R1                J32             6.36    20      513    10.37   0
  S29             R1                J33             6.23    20      271    7.2     0
  S30             R1                J35             13.04   13.67   406    12.71   0
  S31             R1                J36             1.37    12.39   130    20.43   0
  S32             R1                J38             2.09    20      175    7.31    0
  S33             R1                J40             4.71    11      342    10.54   0
```

S34	R1	J40	2.01	3.05	146	12	0
S35	R1	J41	12.36	17.11	432	19.92	0
S36	R1	J42	2.51	61	123	8.76	0
S37	R1	J43	6.15	8.81	268	21.8	0
S38	R1	J44	6.67	26.5	330	6.59	0
S39	R1	J45	3.56	30	282	4.36	0
S40	R1	J48	10.37	30	443	9.22	0
S41	R1	J47	1.90	30	191	0.47	0
S42	R1	J50	3.13	29.5	204	2.39	0
S43	R1	J50	0.91	30	141	3.57	0
S44	R1	J51	2.01	17.5	95	2.61	0
S45	R1	J50	0.64	30	103	1.48	0
S46	R1	J52	4.55	27.8	412	12.92	0
S47	R1	J53	6.01	14.16	291	15.56	0
S48	R1	J54	11.86	19.35	431	16.17	0
S49	R1	J55	3.47	21.02	229	14.24	0
S50	R1	J60	5.17	40	311	7.72	0
S51	R1	J56	16.14	25	586	10.33	0
S52	R1	J56	0.84	40	105	2.29	0
S53	R1	J58	5.99	27.77	168	14.06	0

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
S1	0.011	0.15	0.05	0.05	100	OUTLET	
S2	0.011	0.15	0.05	0.05	100	OUTLET	
S3	0.011	0.15	0.05	0.05	100	OUTLET	
S4	0.011	0.15	0.05	0.05	100	OUTLET	
S5	0.011	0.15	0.05	0.05	100	OUTLET	
S6	0.011	0.15	0.05	0.05	100	OUTLET	
S7	0.011	0.15	0.05	0.05	100	OUTLET	
S8	0.011	0.15	0.05	0.05	100	OUTLET	
S9	0.011	0.15	0.05	0.05	100	OUTLET	
S10	0.011	0.15	0.05	0.05	100	OUTLET	
S11	0.011	0.15	0.05	0.05	100	OUTLET	
S12	0.011	0.15	0.05	0.05	100	OUTLET	
S13	0.011	0.15	0.05	0.05	100	OUTLET	
S14	0.011	0.15	0.05	0.05	100	OUTLET	
S15	0.011	0.15	0.05	0.05	100	OUTLET	
S16	0.011	0.15	0.05	0.05	100	OUTLET	
S17	0.011	0.15	0.05	0.05	100	OUTLET	
S18	0.011	0.15	0.05	0.05	100	OUTLET	
S19	0.011	0.15	0.05	0.05	100	OUTLET	
S20	0.011	0.15	0.05	0.05	100	OUTLET	
S21	0.011	0.15	0.05	0.05	100	OUTLET	
S22	0.011	0.15	0.05	0.05	100	OUTLET	
S23	0.011	0.15	0.05	0.05	100	OUTLET	
S24	0.011	0.15	0.05	0.05	100	OUTLET	
S25	0.011	0.15	0.05	0.05	100	OUTLET	
S26	0.011	0.15	0.05	0.05	100	OUTLET	
S27	0.011	0.15	0.05	0.05	100	OUTLET	
S28	0.011	0.15	0.05	0.05	100	OUTLET	
S29	0.011	0.15	0.05	0.05	100	OUTLET	
S30	0.011	0.15	0.05	0.05	100	OUTLET	
S31	0.011	0.15	0.05	0.05	100	OUTLET	
S32	0.011	0.15	0.05	0.05	100	OUTLET	
S33	0.011	0.15	0.05	0.05	100	OUTLET	
S34	0.011	0.15	0.05	0.05	100	OUTLET	
S35	0.011	0.15	0.05	0.05	100	OUTLET	
S36	0.011	0.15	0.05	0.05	100	OUTLET	
S37	0.011	0.15	0.05	0.05	100	OUTLET	
S38	0.011	0.15	0.05	0.05	100	OUTLET	
S39	0.011	0.15	0.05	0.05	100	OUTLET	
S40	0.011	0.15	0.05	0.05	100	OUTLET	
S41	0.011	0.15	0.05	0.05	100	OUTLET	
S42	0.011	0.15	0.05	0.05	100	OUTLET	
S43	0.011	0.15	0.05	0.05	100	OUTLET	
S44	0.011	0.15	0.05	0.05	100	OUTLET	
S45	0.011	0.15	0.05	0.05	100	OUTLET	
S46	0.011	0.15	0.05	0.05	100	OUTLET	
S47	0.011	0.15	0.05	0.05	100	OUTLET	
S48	0.011	0.15	0.05	0.05	100	OUTLET	

S49	0.011	0.15	0.05	0.05	100	OUTLET
S50	0.011	0.15	0.05	0.05	100	OUTLET
S51	0.011	0.15	0.05	0.05	100	OUTLET
S52	0.011	0.15	0.05	0.05	100	OUTLET
S53	0.011	0.15	0.05	0.05	100	OUTLET

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	6.69	0.26	0
S2	6.69	0.26	0
S3	6.69	0.26	0
S4	6.69	0.26	0
S5	6.69	0.26	0
S6	6.69	0.26	0
S7	6.69	0.26	0
S8	6.69	0.26	0
S9	6.69	0.26	0
S10	6.69	0.26	0
S11	6.69	0.26	0
S12	6.69	0.26	0
S13	6.69	0.26	0
S14	6.69	0.26	0
S15	6.69	0.26	0
S16	6.69	0.26	0
S17	6.69	0.26	0
S18	6.69	0.26	0
S19	6.69	0.26	0
S20	6.69	0.26	0
S21	6.69	0.26	0
S22	6.69	0.26	0
S23	6.69	0.26	0
S24	6.69	0.26	0
S25	6.69	0.26	0
S26	6.69	0.26	0
S27	6.69	0.26	0
S28	6.69	0.26	0
S29	6.69	0.26	0
S30	6.69	0.26	0
S31	6.69	0.26	0
S32	6.69	0.26	0
S33	6.69	0.26	0
S34	6.69	0.26	0
S35	6.69	0.26	0
S36	6.69	0.26	0
S37	6.69	0.26	0
S38	6.69	0.26	0
S39	6.69	0.26	0
S40	6.69	0.26	0
S41	6.69	0.26	0
S42	6.69	0.26	0
S43	6.69	0.26	0
S44	6.69	0.26	0
S45	6.69	0.26	0
S46	6.69	0.26	0
S47	6.69	0.26	0
S48	6.69	0.26	0
S49	6.69	0.26	0
S50	6.69	0.26	0
S51	6.69	0.26	0
S52	6.69	0.26	0
S53	6.69	0.26	0

[JUNCTIONS]

;; ;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	516.1	5.17	0	0	0
J2	501.27	6.33	0	0	0
J3	499.82	7.58	0	0	0
J4	491.49	7.58	0	0	0
J5	479.25	4.75	0	0	0

J6	476.08	7.92	0	0	0
J7	456.62	7	0	0	0
J8	455.25	4.75	0	0	0
J9	440.63	11.37	0	0	0
J10	446	6.42	0	0	0
J11	424.4	14	0	0	0
J12	420	14	0	0	0
J13	401.5	8.5	0	0	0
J14	407	3	0	0	0
J15	394.02	11.98	0	0	0
J16	395.16	4.83	0	0	0
J17	391.45	9.33	0	0	0
J18	386.8	8.57	0	0	0
J19	389.11	5.17	0	0	0
J20	394.42	5.58	0	0	0
J21	385.11	12.89	0	0	0
J22	429.27	3.92	0	0	0
J23	384.73	13.27	0	0	0
J24	367.03	11.25	0	0	0
J25	379.68	6.75	0	0	0
J26	357.5	6.5	0	0	0
J27	343.79	10.6	0	0	0
J28	335.31	10.5	0	0	0
J29	305.7	21.3	0	0	0
J30	284	5	0	0	0
J31	527.6	6.08	0	0	0
J32	469.22	7.67	0	0	0
J33	398.77	4.67	0	0	0
J34	364.05	3.97	0	0	0
J35	258	4	0	0	0
J36	400	4	0	0	0
J37	388	0.25	0	0	0
J38	360	4	0	0	0
J39	330	1	0	0	0
J40	218	4	0	0	0
J41	132	4	0	0	0
J42	207	1.5	0	0	0
J43	104	4	0	0	0
J44	223.1	8.17	0	0	0
J45	184	9.25	0	0	0
J46	167.7	9.58	0	0	0
J47	169.25	8.25	0	0	0
J48	163.44	6.33	0	0	0
J49	161	10.25	0	0	0
J50	159.13	9.33	0	0	0
J51	145.19	8.54	0	0	0
J52	98.1	9.75	0	0	0
J53	62	4	0	0	0
J54	93.5	7.92	0	0	0
J55	50	4	0	0	0
J56	62.78	5.83	0	0	0
J57	41	4	0	0	0
J58	46.67	8.67	0	0	0
J59	35	4	0	0	0
J60	34	8	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	34	FREE		NO

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;24" RCP C1	J1	J2	463.64	0.013	0	0	0	0
;36" RCP C2	J2	J3	198.98	0.013	0	0	0	0
;30" RCP C3	J3	J4	238	0.013	0	0	0	0

Drainage Project DH (Alga Road Restoration and Enhancement)

;30" PVC								
C4	J4	J6	151.84	0.013	0	0	0	0
;18" PVC								
C5	J5	J6	41.82	0.013	0	0	0	0
;30" PVC								
C6	J6	J7	243.35	0.013	0	0	0	0
;42" RCP								
C7	J7	J8	107.82	0.013	0	0	0	0
;42" RCP								
C8	J8	J9	467.63	0.013	0	0	0	0
;36" RCP								
C9	J9	J11	447.38	0.013	0	0	0	0
;24" RCP								
C10	J10	J11	283.42	0.013	0	0	0	0
;54" RCP								
C11	J11	J12	486.87	0.013	0	0	0	0
;54" RCP								
C12	J12	J13	752.69	0.013	0	0	0	0
;54" RCP								
C13	J13	J15	254.83	0.013	0	0	0	0
;24" RCP								
C14	J14	J15	188.91	0.013	0	0	0	0
;54" RCP								
C15	J15	J17	221.99	0.013	0	0	0	0
;18" RCP								
C16	J16	J17	62.67	0.013	0	0	0	0
;60" RCP								
C17	J17	J18	541.89	0.013	0	0	0	0
;18" RCP								
C18	J19	J18	53.09	0.013	0	0	0	0
;18" RCP								
C19	J20	J18	43.2	0.013	0	0	0	0
;60" RCP								
C20	J18	J21	152.6	0.013	0	0	0	0
;60" RCP								
C21	J21	J23	34.87	0.013	0	0	0	0
;24" RCP								
C22	J22	J23	1368.83	0.013	0	0	0	0
;54" RCP								
C23	J23	J24	721.22	0.013	0	0	0	0
;54" RCP								
C24	J24	J27	680.67	0.013	0	0	0	0
;24" RCP								
C25	J25	J26	165.52	0.013	0	0	0	0
;24" RCP								
C26	J26	J27	61.1	0.013	0	0	0	0
;54" RCP								
C27	J27	J28	91.78	0.013	0	0	0	0
;54" RCP								
C28	J28	J29	429.82	0.013	0	0	0	0
;54" RCP								
C29	J29	J30	314.36	0.013	0	0	0	0
;DH: Natural Channel - Trap Channel B = 15' H = 5' S = 0.5								
C30	J30	J35	204.77	0.15	0	0	0	0
;Overland Flow								
C31	J31	J32	254.87	0.15	0	0	0	0
;24" RCP								
C32	J32	J33	533.43	0.013	0	0	0	0
;24" RCP								
C33	J33	J34	198.01	0.013	0	0	0	0
;Channel Tributary								
C34	J34	J35	170.83	0.15	0	0	0	0
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5								
C35	J35	J40	616.63	0.15	0	0	0	0
;18" RCP								
C36	J36	J37	275.48	0.013	0	0	0	0
;Gutter								
C37	J37	J38	370.46	0.013	0	0	0	0
;24" RCP								
C38	J38	J39	203.83	0.013	0	0	0	0
;Channel Tributary								
C39	J39	J40	238.43	0.15	0	0	0	0

Drainage Project DH (Alga Road Restoration and Enhancement)

;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5									
C40	J40	J41	711.69	0.15	0	0	0	0
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5									
C41	J41	J43	313.65	0.15	0	0	0	0
;18" RCP									
C42	J42	J43	517.38	0.013	0	0	0	0
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5									
C43	J43	J53	488.25	0.15	0	0	0	0
;24" RCP									
C44	J44	J45	363.01	0.013	0	0	0	0
;24" RCP									
C45	J45	J46	289.39	0.013	0	0	0	0
;18" RCP									
C46	J47	J46	63.44	0.013	0	0	0	0
;30" RCP									
C47	J46	J49	255.67	0.013	0	0	0	0
;18" RCP									
C48	J48	J49	85.41	0.013	0	0	0	0
;30" RCP									
C49	J49	J50	118.41	0.013	0	0	0	0
;30" RCP									
C50	J50	J51	190.09	0.013	0	0	0	0
;30" RCP									
C51	J51	J52	600.19	0.013	0	0	0	0
;30" RCP									
C52	J52	J53	317.94	0.013	0	0	0	0
;DH: Natural Channel - Trap Channel B = 28' H = 4' S = 0.5									
C53	J53	J55	353.62	0.15	0	0	0	0
;24" RCP									
C54	J54	J55	177.14	0.013	0	0	0	0
;DH: Natural Channel - Trap Channel B = 30' H = 4' S = 0.5									
C55	J55	J57	302.08	0.15	0	0	0	0
;24" RCP									
C56	J56	J57	322.12	0.013	0	0	0	0
;DH: Natural Channel - Trap Channel B = 34' H = 4' S = 0.5									
C57	J57	J59	232.37	0.15	0	0	0	0
;Channel Tributary									
C58	J58	J59	98.41	0.15	0	0	0	0
;DH: Natural Channel - Trap Channel B = 46' H = 4' S = 0.333									
C59	J59	J60	60.7	0.15	0	0	0	0
;3 Box Culvert: 8' x 12'									
C60	J60	OUT1	180.01	0.013	0	0	0	0

[XSECTIONS]

;;Link	Type	Geom1	Geom2	Geom3	Geom4	Barrels
C1	CIRCULAR	2	0	0	0	1
C2	CIRCULAR	3	0	0	0	1
C3	CIRCULAR	2.5	0	0	0	1
C4	CIRCULAR	2.5	0	0	0	1
C5	CIRCULAR	1.5	0	0	0	1
C6	CIRCULAR	2.5	0	0	0	1
C7	CIRCULAR	3.5	0	0	0	1
C8	CIRCULAR	3.5	0	0	0	1
C9	CIRCULAR	3	0	0	0	1
C10	CIRCULAR	2	0	0	0	1
C11	CIRCULAR	4.5	0	0	0	1
C12	CIRCULAR	4.5	0	0	0	1
C13	CIRCULAR	4.5	0	0	0	1
C14	CIRCULAR	2	0	0	0	1
C15	CIRCULAR	4.5	0	0	0	1
C16	CIRCULAR	1.5	0	0	0	1
C17	CIRCULAR	5	0	0	0	1
C18	CIRCULAR	1.5	0	0	0	1
C19	CIRCULAR	1.5	0	0	0	1
C20	CIRCULAR	5	0	0	0	1
C21	CIRCULAR	5	0	0	0	1
C22	CIRCULAR	2	0	0	0	1
C23	CIRCULAR	4.5	0	0	0	1
C24	CIRCULAR	4.5	0	0	0	1
C25	CIRCULAR	2	0	0	0	1
C26	CIRCULAR	2	0	0	0	1

```
 C27                CIRCULAR     4.5          0            0            0            1
 C28                CIRCULAR     4.5          0            0            0            1
 C29                CIRCULAR     4.5          0            0            0            1
 C30                TRAPEZOIDAL  5            15           0.5          0.5          1
 C31                RECT_OPEN    0.5          30           0            0            1
 C32                CIRCULAR     2            0            0            0            1
 C33                CIRCULAR     2            0            0            0            1
 C34                RECT_OPEN    1            20           0            0            1
 C35                TRAPEZOIDAL  4            20           0.5          0.5          1
 C36                CIRCULAR     1.5          0            0            0            1
 C37                RECT_OPEN    0.25         8            0            0            1
 C38                CIRCULAR     2            0            0            0            1
 C39                RECT_OPEN    1            20           0            0            1
 C40                TRAPEZOIDAL  4            20           0.5          0.5          1
 C41                TRAPEZOIDAL  4            20           0.5          0.5          1
 C42                CIRCULAR     1.5          0            0            0            1
 C43                TRAPEZOIDAL  4            40           0.5          0.5          1
 C44                CIRCULAR     2            0            0            0            1
 C45                CIRCULAR     2            0            0            0            1
 C46                CIRCULAR     1.5          0            0            0            1
 C47                CIRCULAR     2.5          0            0            0            1
 C48                CIRCULAR     1.5          0            0            0            1
 C49                CIRCULAR     2.5          0            0            0            1
 C50                CIRCULAR     2.5          0            0            0            1
 C51                CIRCULAR     2.5          0            0            0            1
 C52                CIRCULAR     2.5          0            0            0            1
 C53                TRAPEZOIDAL  4            28           0.5          0.5          1
 C54                CIRCULAR     2            0            0            0            1
 C55                TRAPEZOIDAL  4            30           0.5          0.5          1
 C56                CIRCULAR     2            0            0            0            1
 C57                TRAPEZOIDAL  4            34           0.5          0.5          1
 C58                RECT_OPEN    1            5            0            0            1
 C59                TRAPEZOIDAL  4            46           0.333        0.333        1
 C60                RECT_CLOSED  8            36           0            0            3

[TIMESERIES]
;;Name              Date        Time        Value
;;-----------------------------------------------
;100 year 6 hour SCS Type B Design Storm Max Precip = 2.9 inches
  100yr6hr2.9Cum   10/01/2005 10:00       0.0
  100yr6hr2.9Cum               10:15       0.0522
  100yr6hr2.9Cum               10:30       0.1015
  100yr6hr2.9Cum               10:45       0.1682
  100yr6hr2.9Cum               11:00       0.232
  100yr6hr2.9Cum               11:15       0.3132
  100yr6hr2.9Cum               11:30       0.3915
  100yr6hr2.9Cum               11:45       0.5307
  100yr6hr2.9Cum               12:00       0.667
  100yr6hr2.9Cum               12:15       1.2035
  100yr6hr2.9Cum               12:30       1.74
  100yr6hr2.9Cum               12:45       1.885
  100yr6hr2.9Cum               13:00       2.03
  100yr6hr2.9Cum               13:15       2.146
  100yr6hr2.9Cum               13:30       2.262
  100yr6hr2.9Cum               13:45       2.3432
  100yr6hr2.9Cum               14:00       2.4215
  100yr6hr2.9Cum               14:15       2.4882
  100yr6hr2.9Cum               14:30       2.552
  100yr6hr2.9Cum               14:45       2.61
  100yr6hr2.9Cum               15:00       2.668
  100yr6hr2.9Cum               15:15       2.726
  100yr6hr2.9Cum               15:30       2.784
  100yr6hr2.9Cum               15:45       2.842
  100yr6hr2.9Cum               16:00       2.9

[REPORT]
 INPUT     NO
 CONTROLS  NO

[OPTIONS]
 TEMPDIR   "C:\Carlsbad\DMP\"
```

Project DH

SWMM 5.0 – Output

100 Year 6 Hour Storm

Drainage Project DH (Alga Road Restoration and Enhancement)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project DH (Alga Road Restoration and Enhancement)
100 Year 6 hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 20:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
**************************     ---------       -------
Total Precipitation ......        86.577         2.900
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........        35.775         1.198
Surface Runoff ...........        51.359         1.720
Final Surface Storage ....         0.002         0.000
Continuity Error (%) .....        -0.646

**************************        Volume        Volume
Flow Routing Continuity        acre-feet      Mgallons
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......        51.375        16.741
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........        51.363        16.738
Surface Flooding .........         0.038         0.012
Evaporation Loss .........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.023         0.008
Continuity Error (%) .....        -0.096

***************************
Subcatchment Runoff Summary
***************************

--------------------------------------------------------------------------------
                      Total      Total      Total      Total      Total     Runoff
                     Precip      Runon       Evap      Infil     Runoff      Coeff
Subcatchment            in         in         in         in         in
--------------------------------------------------------------------------------
S1                     2.900      0.000      0.000      1.009      1.909      0.658
S2                     2.900      0.000      0.000      1.562      1.359      0.469
S3                     2.900      0.000      0.000      1.565      1.357      0.468
S4                     2.900      0.000      0.000      1.142      1.775      0.612
S5                     2.900      0.000      0.000      1.087      1.835      0.633
S6                     2.900      0.000      0.000      1.023      1.892      0.653
S7                     2.900      0.000      0.000      0.968      1.952      0.673
S8                     2.900      0.000      0.000      1.105      1.816      0.626
S9                     2.900      0.000      0.000      0.999      1.917      0.661
S10                    2.900      0.000      0.000      1.118      1.801      0.621
S11                    2.900      0.000      0.000      1.107      1.814      0.625
S12                    2.900      0.000      0.000      1.139      1.778      0.613
S13                    2.900      0.000      0.000      1.149      1.771      0.611
S14                    2.900      0.000      0.000      1.300      1.618      0.558
S15                    2.900      0.000      0.000      1.222      1.700      0.586
```

S16	2.900	0.000	0.000	1.165	1.749	0.603
S17	2.900	0.000	0.000	0.311	2.603	0.898
S18	2.900	0.000	0.000	1.180	1.733	0.597
S19	2.900	0.000	0.000	1.170	1.744	0.601
S20	2.900	0.000	0.000	0.701	2.219	0.765
S21	2.900	0.000	0.000	0.477	2.444	0.843
S22	2.900	0.000	0.000	0.981	1.937	0.668
S23	2.900	0.000	0.000	1.172	1.746	0.602
S24	2.900	0.000	0.000	1.193	1.730	0.597
S25	2.900	0.000	0.000	1.166	1.756	0.606
S26	2.900	0.000	0.000	1.496	1.435	0.495
S27	2.900	0.000	0.000	1.264	1.659	0.572
S28	2.900	0.000	0.000	1.266	1.657	0.571
S29	2.900	0.000	0.000	1.302	1.615	0.557
S30	2.900	0.000	0.000	1.416	1.502	0.518
S31	2.900	0.000	0.000	1.375	1.552	0.535
S32	2.900	0.000	0.000	1.270	1.652	0.570
S33	2.900	0.000	0.000	1.416	1.508	0.520
S34	2.900	0.000	0.000	1.543	1.382	0.477
S35	2.900	0.000	0.000	1.334	1.586	0.547
S36	2.900	0.000	0.000	0.615	2.303	0.794
S37	2.900	0.000	0.000	1.458	1.464	0.505
S38	2.900	0.000	0.000	1.187	1.731	0.597
S39	2.900	0.000	0.000	1.117	1.802	0.621
S40	2.900	0.000	0.000	1.127	1.791	0.618
S41	2.900	0.000	0.000	1.167	1.747	0.603
S42	2.900	0.000	0.000	1.149	1.768	0.610
S43	2.900	0.000	0.000	1.102	1.820	0.628
S44	2.900	0.000	0.000	1.382	1.532	0.528
S45	2.900	0.000	0.000	1.112	1.808	0.624
S46	2.900	0.000	0.000	1.135	1.788	0.616
S47	2.900	0.000	0.000	1.373	1.549	0.534
S48	2.900	0.000	0.000	1.300	1.619	0.558
S49	2.900	0.000	0.000	1.251	1.672	0.576
S50	2.900	0.000	0.000	0.953	1.966	0.678
S51	2.900	0.000	0.000	1.217	1.701	0.586
S52	2.900	0.000	0.000	0.950	1.969	0.679
S53	2.900	0.000	0.000	1.176	1.742	0.601
Totals	2.900	0.000	0.000	1.198	1.720	0.593

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.05	0.59	516.69	0 16:45	0	0
J2	0.06	0.74	502.01	0 16:45	0	0
J3	0.11	1.64	501.46	0 16:45	0	0
J4	0.11	1.63	493.12	0 16:45	0	0
J5	0.03	0.35	479.60	0 16:45	0	0
J6	0.10	1.40	477.48	0 16:45	0	0
J7	0.14	1.99	458.61	0 16:45	0	0
J8	0.15	1.99	457.24	0 16:45	0	0
J9	0.16	2.12	442.75	0 16:45	0	0
J10	0.11	1.27	447.27	0 16:45	0	0
J11	0.25	3.21	427.61	0 16:45	0	0
J12	0.25	3.20	423.20	0 16:46	0	0
J13	0.20	2.42	403.92	0 16:46	0	0
J14	0.06	0.75	407.75	0 16:45	0	0
J15	0.27	3.62	397.64	0 16:46	0	0
J16	0.05	0.71	395.87	0 16:45	0	0
J17	0.28	3.73	395.18	0 16:46	0	0
J18	0.29	3.79	390.59	0 16:46	0	0
J19	0.05	0.50	389.61	0 16:45	0	0
J20	0.07	0.72	395.14	0 16:45	0	0
J21	0.29	3.83	388.94	0 16:46	0	0

J22	0.07	0.75	430.02	0	16:45	0	0
J23	0.29	3.83	388.56	0	16:46	0	0
J24	0.26	3.22	370.25	0	16:47	0	0
J25	0.06	0.76	380.44	0	16:45	0	0
J26	0.06	0.76	358.26	0	16:45	0	0
J27	0.24	2.93	346.72	0	16:47	0	0
J28	0.21	2.48	337.79	0	16:47	0	0
J29	0.21	2.54	308.24	0	16:47	0	0
J30	0.23	3.07	287.07	0	16:47	0	0
J31	0.01	0.24	527.84	0	16:45	0	0
J32	0.05	0.74	469.96	0	16:45	0	0
J33	0.06	0.82	399.59	0	16:45	0	0
J34	0.06	0.82	364.87	0	16:45	0	0
J35	0.24	3.45	261.45	0	16:46	0	0
J36	0.02	0.35	400.35	0	16:45	0	0
J37	0.02	0.34	388.34	0	16:45	0	0
J38	0.03	0.36	360.36	0	16:45	0	0
J39	0.03	0.36	330.36	0	16:45	0	0
J40	0.25	3.45	221.45	0	16:48	0	0
J41	0.23	3.29	135.29	0	16:49	0	0
J42	0.03	0.33	207.33	0	16:45	0	0
J43	0.23	3.29	107.29	0	16:49	0	0
J44	0.04	0.51	223.61	0	16:45	0	0
J45	0.06	0.77	184.77	0	16:45	0	0
J46	0.08	0.93	168.63	0	16:45	0	0
J47	0.04	0.41	169.66	0	16:45	0	0
J48	0.08	1.19	164.63	0	16:45	0	0
J49	0.12	1.55	162.55	0	16:45	0	0
J50	0.12	1.55	160.68	0	16:45	0	0
J51	0.09	1.11	146.30	0	16:45	0	0
J52	0.09	1.11	99.21	0	16:45	0	0
J53	0.28	3.92	65.92	0	16:49	0	0
J54	0.04	0.55	94.05	0	16:45	0	0
J55	0.29	4.00	54.00	0	16:49	0.02	3
J56	0.08	0.94	63.72	0	16:45	0	0
J57	0.29	4.00	45.00	0	16:51	0	1
J58	0.05	0.77	47.44	0	16:45	0	0
J59	0.29	3.96	38.96	0	16:51	0	0
J60	0.45	8.00	42.00	0	16:48	0.44	7
OUT1	3.83	8.00	42.00	0	14:36	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min		Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	7.52	0	16:45	9.90	1.00	0.19	0
C2	7.50	0	16:45	5.61	1.00	0.13	0
C3	58.40	0	16:45	17.25	1.00	0.76	0
C4	66.59	0	16:45	26.75	1.00	0.51	0
C5	3.44	0	16:45	10.98	1.00	0.12	0
C6	70.05	0	16:45	24.73	1.00	0.60	0
C7	70.05	0	16:45	12.40	1.00	0.62	0
C8	97.69	0	16:45	18.94	1.00	0.55	0
C9	107.28	0	16:46	20.19	1.00	0.84	0
C10	45.80	0	16:45	21.75	1.00	0.73	0
C11	159.85	0	16:46	13.25	1.00	0.86	0
C12	174.45	0	16:46	20.02	1.00	0.57	0
C13	190.33	0	16:46	21.82	1.00	0.56	0
C14	17.67	0	16:45	16.47	1.00	0.30	0
C15	207.43	0	16:46	15.19	1.00	0.98	0
C16	11.54	0	16:45	14.09	1.00	0.45	0
C17	218.32	0	16:46	13.97	1.00	0.90	0
C18	5.31	0	16:45	10.21	1.00	0.24	0
C19	20.51	0	16:45	24.50	1.00	0.46	0
C20	253.20	0	16:46	15.84	1.00	0.92	0
C21	253.80	0	16:46	15.72	1.00	0.93	0

C22	12.01	0	16:45	11.44	1.00	0.29	0
C23	265.52	0	16:47	21.83	1.00	0.86	0
C24	275.85	0	16:47	25.16	1.00	0.76	0
C25	25.10	0	16:45	23.08	1.00	0.30	0
C26	25.09	0	16:45	27.82	1.00	0.23	0
C27	299.35	0	16:47	37.59	1.00	0.50	0
C28	302.69	0	16:47	33.72	1.00	0.59	0
C29	314.81	0	16:47	34.06	1.00	0.61	0
C30	314.65	0	16:47	6.19	1.00	0.46	0
C31	13.05	0	16:45	1.83	1.00	0.30	0
C32	24.26	0	16:45	22.78	1.00	0.30	0
C33	33.35	0	16:45	27.52	1.00	0.35	0
C34	33.30	0	16:45	4.15	1.00	0.23	0
C35	366.27	0	16:48	4.92	1.00	0.79	0
C36	2.53	0	16:45	8.31	1.00	0.12	0
C37	2.53	0	16:46	4.99	1.00	0.11	0
C38	6.16	0	16:45	16.00	1.00	0.07	0
C39	6.13	0	16:46	1.97	1.00	0.05	0
C40	381.44	0	16:49	6.13	1.00	0.60	0
C41	398.05	0	16:49	5.60	1.00	0.73	0
C42	5.01	0	16:45	17.37	1.00	0.11	0
C43	410.00	0	16:50	4.61	1.00	0.37	0
C44	10.66	0	16:45	16.83	1.00	0.14	0
C45	16.82	0	16:45	15.14	1.00	0.31	0
C46	2.64	0	16:45	6.81	1.00	0.16	0
C47	19.46	0	16:45	11.76	1.00	0.29	0
C48	17.18	0	16:45	11.47	1.00	0.97	0
C49	36.52	0	16:45	11.39	1.00	0.71	0
C50	44.15	0	16:45	21.34	1.00	0.40	0
C51	46.57	0	16:45	22.22	1.00	0.41	0
C52	55.03	0	16:45	26.55	1.00	0.40	0
C53	464.63	0	16:50	3.96	1.00	0.97	0
C54	18.63	0	16:45	26.40	1.00	0.17	0
C55	483.85	0	16:51	3.79	1.00	1.00	1
C56	26.47	0	16:45	18.27	1.00	0.45	0
C57	505.26	0	16:51	3.55	1.00	0.98	0
C58	9.20	0	16:45	2.40	1.00	0.67	0
C59	512.78	0	16:51	2.84	1.00	0.93	0
C60	628.08	0	16:54	0.86	1.00	1.22	4

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.06

Analysis begun on:  Tue Jul 25 12:29:07 2006
Total elapsed time: < 1 sec
```

Project DH

SWMM 5.0 – Input

25 Year 6 Hour Storm

Drainage Project DH (Alga Road Restoration and Enhancement)

```
[TITLE]
Drainage Project DH (Alga Road Restoration and Enhancement)
25 Year 6 hour Storm

[OPTIONS]
 FLOW_UNITS              CFS
 INFILTRATION            GREEN_AMPT
 FLOW_ROUTING            KINWAVE
 START_DATE              09/30/2005
 START_TIME              20:00:00
 REPORT_START_DATE       09/30/2005
 REPORT_START_TIME       20:00:00
 END_DATE                10/02/2005
 END_TIME                00:00:00
 SWEEP_START             01/01
 SWEEP_END               12/31
 DRY_DAYS                0
 REPORT_STEP             00:15:00
 WET_STEP                00:15:00
 DRY_STEP                01:00:00
 ROUTING_STEP            0:00:30
 ALLOW_PONDING           NO
 INERTIAL_DAMPING        PARTIAL
 VARIABLE_STEP           0.75
 LENGTHENING_STEP        0
 MIN_SURFAREA            0
 NORMAL_FLOW_LIMITED     NO
 SKIP_STEADY_STATE       NO

[RAINGAGES]
;;                  Rain       Recd.  Snow   Data       Source          Station    Rain
;;Name              Type       Freq.  Catch  Source     Name            ID         Units
;;-------------------------------------------------------------------------------------
  R1                CUMULATIVE 0:15   1.0    TIMESERIES 25yr6hr2.1Cum

[SUBCATCHMENTS]
;;                                                Total    Pcnt.                Pcnt.    Curb     Snow
;;Name              Raingage          Outlet      Area     Imperv   Width       Slope    Length   Pack
;;-------------------------------------------------------------------------------------------------
  S1                R1                J1          4.17     36.6     267         6.47     0
  S2                R1                J3          16.08    3        652         19.16    0
  S3                R1                J3          19.3     3        747         19.56    0
  S4                R1                J4          5.36     30.02    212         6.18     0
  S5                R1                J5          1.76     30.4     247         11.61    0
  S6                R1                J8          19.49    39.37    449         4.97     0
  S7                R1                J9          5.2      38.47    453         9.2      0
  S8                R1                J11         1.95     30.22    226         3.73     0
  S9                R1                J10         29.81    39.61    764         6.71     0
  S10               R1                J11         2.26     30       164         5        0
  S11               R1                J12         3.98     30       386         5.78     0
  S12               R1                J12         5.13     30       372         2        0
  S13               R1                J13         9.5      27.88    608         7.9      0
  S14               R1                J14         12.26    20.5     396         11.11    0
  S15               R1                J16         6.57     23.13    381         13.2     0
  S16               R1                J18         7.67     30       334         2.6      0
  S17               R1                J21         0.31     80       89          0.67     0
  S18               R1                J20         16.68    32       316         5        0
  S19               R1                J19         3.86     30       240         1.14     0
  S20               R1                J22         6.74     57       186         5        0
  S21               R1                J24         5.98     71       130         2.7      0
  S22               R1                J28         2.06     39       121         4        0
  S23               R1                J25         15.88    27.69    629         8.55     0
  S24               R1                J29         5.35     24.37    583         7        0
  S25               R1                J29         1.76     26       202         6.32     0
  S26               R1                J35         1.83     4.54     266         13.33    0
  S27               R1                J31         7.26     20       633         10       0
  S28               R1                J32         6.36     20       513         10.37    0
  S29               R1                J33         6.23     20       271         7.2      0
  S30               R1                J35         13.04    13.67    406         12.71    0
  S31               R1                J36         1.37     12.39    130         20.43    0
  S32               R1                J38         2.09     20       175         7.31     0
  S33               R1                J40         4.71     11       342         10.54    0
```

S34	R1	J40	2.01	3.05	146	12	0
S35	R1	J41	12.36	17.11	432	19.92	0
S36	R1	J42	2.51	61	123	8.76	0
S37	R1	J43	6.15	8.81	268	21.8	0
S38	R1	J44	6.67	26.5	330	6.59	0
S39	R1	J45	3.56	30	282	4.36	0
S40	R1	J48	10.37	30	443	9.22	0
S41	R1	J47	1.90	30	191	0.47	0
S42	R1	J50	3.13	29.5	204	2.39	0
S43	R1	J50	0.91	30	141	3.57	0
S44	R1	J51	2.01	17.5	95	2.61	0
S45	R1	J50	0.64	30	103	1.48	0
S46	R1	J52	4.55	27.8	412	12.92	0
S47	R1	J53	6.01	14.16	291	15.56	0
S48	R1	J54	11.86	19.35	431	16.17	0
S49	R1	J55	3.47	21.02	229	14.24	0
S50	R1	J60	5.17	40	311	7.72	0
S51	R1	J56	16.14	25	586	10.33	0
S52	R1	J56	0.84	40	105	2.29	0
S53	R1	J58	5.99	27.77	168	14.06	0

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
S1	0.011	0.15	0.05	0.05	100	OUTLET	
S2	0.011	0.15	0.05	0.05	100	OUTLET	
S3	0.011	0.15	0.05	0.05	100	OUTLET	
S4	0.011	0.15	0.05	0.05	100	OUTLET	
S5	0.011	0.15	0.05	0.05	100	OUTLET	
S6	0.011	0.15	0.05	0.05	100	OUTLET	
S7	0.011	0.15	0.05	0.05	100	OUTLET	
S8	0.011	0.15	0.05	0.05	100	OUTLET	
S9	0.011	0.15	0.05	0.05	100	OUTLET	
S10	0.011	0.15	0.05	0.05	100	OUTLET	
S11	0.011	0.15	0.05	0.05	100	OUTLET	
S12	0.011	0.15	0.05	0.05	100	OUTLET	
S13	0.011	0.15	0.05	0.05	100	OUTLET	
S14	0.011	0.15	0.05	0.05	100	OUTLET	
S15	0.011	0.15	0.05	0.05	100	OUTLET	
S16	0.011	0.15	0.05	0.05	100	OUTLET	
S17	0.011	0.15	0.05	0.05	100	OUTLET	
S18	0.011	0.15	0.05	0.05	100	OUTLET	
S19	0.011	0.15	0.05	0.05	100	OUTLET	
S20	0.011	0.15	0.05	0.05	100	OUTLET	
S21	0.011	0.15	0.05	0.05	100	OUTLET	
S22	0.011	0.15	0.05	0.05	100	OUTLET	
S23	0.011	0.15	0.05	0.05	100	OUTLET	
S24	0.011	0.15	0.05	0.05	100	OUTLET	
S25	0.011	0.15	0.05	0.05	100	OUTLET	
S26	0.011	0.15	0.05	0.05	100	OUTLET	
S27	0.011	0.15	0.05	0.05	100	OUTLET	
S28	0.011	0.15	0.05	0.05	100	OUTLET	
S29	0.011	0.15	0.05	0.05	100	OUTLET	
S30	0.011	0.15	0.05	0.05	100	OUTLET	
S31	0.011	0.15	0.05	0.05	100	OUTLET	
S32	0.011	0.15	0.05	0.05	100	OUTLET	
S33	0.011	0.15	0.05	0.05	100	OUTLET	
S34	0.011	0.15	0.05	0.05	100	OUTLET	
S35	0.011	0.15	0.05	0.05	100	OUTLET	
S36	0.011	0.15	0.05	0.05	100	OUTLET	
S37	0.011	0.15	0.05	0.05	100	OUTLET	
S38	0.011	0.15	0.05	0.05	100	OUTLET	
S39	0.011	0.15	0.05	0.05	100	OUTLET	
S40	0.011	0.15	0.05	0.05	100	OUTLET	
S41	0.011	0.15	0.05	0.05	100	OUTLET	
S42	0.011	0.15	0.05	0.05	100	OUTLET	
S43	0.011	0.15	0.05	0.05	100	OUTLET	
S44	0.011	0.15	0.05	0.05	100	OUTLET	
S45	0.011	0.15	0.05	0.05	100	OUTLET	
S46	0.011	0.15	0.05	0.05	100	OUTLET	
S47	0.011	0.15	0.05	0.05	100	OUTLET	
S48	0.011	0.15	0.05	0.05	100	OUTLET	

S49	0.011	0.15	0.05	0.05	100	OUTLET
S50	0.011	0.15	0.05	0.05	100	OUTLET
S51	0.011	0.15	0.05	0.05	100	OUTLET
S52	0.011	0.15	0.05	0.05	100	OUTLET
S53	0.011	0.15	0.05	0.05	100	OUTLET

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
S1	6.69	0.26	0
S2	6.69	0.26	0
S3	6.69	0.26	0
S4	6.69	0.26	0
S5	6.69	0.26	0
S6	6.69	0.26	0
S7	6.69	0.26	0
S8	6.69	0.26	0
S9	6.69	0.26	0
S10	6.69	0.26	0
S11	6.69	0.26	0
S12	6.69	0.26	0
S13	6.69	0.26	0
S14	6.69	0.26	0
S15	6.69	0.26	0
S16	6.69	0.26	0
S17	6.69	0.26	0
S18	6.69	0.26	0
S19	6.69	0.26	0
S20	6.69	0.26	0
S21	6.69	0.26	0
S22	6.69	0.26	0
S23	6.69	0.26	0
S24	6.69	0.26	0
S25	6.69	0.26	0
S26	6.69	0.26	0
S27	6.69	0.26	0
S28	6.69	0.26	0
S29	6.69	0.26	0
S30	6.69	0.26	0
S31	6.69	0.26	0
S32	6.69	0.26	0
S33	6.69	0.26	0
S34	6.69	0.26	0
S35	6.69	0.26	0
S36	6.69	0.26	0
S37	6.69	0.26	0
S38	6.69	0.26	0
S39	6.69	0.26	0
S40	6.69	0.26	0
S41	6.69	0.26	0
S42	6.69	0.26	0
S43	6.69	0.26	0
S44	6.69	0.26	0
S45	6.69	0.26	0
S46	6.69	0.26	0
S47	6.69	0.26	0
S48	6.69	0.26	0
S49	6.69	0.26	0
S50	6.69	0.26	0
S51	6.69	0.26	0
S52	6.69	0.26	0
S53	6.69	0.26	0

[JUNCTIONS]

;; ;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	516.1	5.17	0	0	0
J2	501.27	6.33	0	0	0
J3	499.82	7.58	0	0	0
J4	491.49	7.58	0	0	0
J5	479.25	4.75	0	0	0

J6	476.08	7.92	0	0	0
J7	456.62	7	0	0	0
J8	455.25	4.75	0	0	0
J9	440.63	11.37	0	0	0
J10	446	6.42	0	0	0
J11	424.4	14	0	0	0
J12	420	14	0	0	0
J13	401.5	8.5	0	0	0
J14	407	3	0	0	0
J15	394.02	11.98	0	0	0
J16	395.16	4.83	0	0	0
J17	391.45	9.33	0	0	0
J18	386.8	8.57	0	0	0
J19	389.11	5.17	0	0	0
J20	394.42	5.58	0	0	0
J21	385.11	12.89	0	0	0
J22	429.27	3.92	0	0	0
J23	384.73	13.27	0	0	0
J24	367.03	11.25	0	0	0
J25	379.68	6.75	0	0	0
J26	357.5	6.5	0	0	0
J27	343.79	10.6	0	0	0
J28	335.31	10.5	0	0	0
J29	305.7	21.3	0	0	0
J30	284	5	0	0	0
J31	527.6	6.08	0	0	0
J32	469.22	7.67	0	0	0
J33	398.77	4.67	0	0	0
J34	364.05	3.97	0	0	0
J35	258	4	0	0	0
J36	400	4	0	0	0
J37	388	0.25	0	0	0
J38	360	4	0	0	0
J39	330	1	0	0	0
J40	218	4	0	0	0
J41	132	4	0	0	0
J42	207	1.5	0	0	0
J43	104	4	0	0	0
J44	223.1	8.17	0	0	0
J45	184	9.25	0	0	0
J46	167.7	9.58	0	0	0
J47	169.25	8.25	0	0	0
J48	163.44	6.33	0	0	0
J49	161	10.25	0	0	0
J50	159.13	9.33	0	0	0
J51	145.19	8.54	0	0	0
J52	98.1	9.75	0	0	0
J53	62	4	0	0	0
J54	93.5	7.92	0	0	0
J55	50	4	0	0	0
J56	62.78	5.83	0	0	0
J57	41	4	0	0	0
J58	46.67	8.67	0	0	0
J59	35	4	0	0	0
J60	34	8	0	0	0

[OUTFALLS]

;; ;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OUT1	34	FREE		NO

[CONDUITS]

;; ;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Height	Outlet Height	Init. Flow	Ma Fl
;24" RCP C1	J1	J2	463.64	0.013	0	0	0	0
;36" RCP C2	J2	J3	198.98	0.013	0	0	0	0
;30" RCP C3	J3	J4	238	0.013	0	0	0	0

Drainage Project DH (Alga Road Restoration and Enhancement)

;30" PVC C4	J4	J6	151.84	0.013	0	0	0	0
;18" PVC C5	J5	J6	41.82	0.013	0	0	0	0
;30" PVC C6	J6	J7	243.35	0.013	0	0	0	0
;42" RCP C7	J7	J8	107.82	0.013	0	0	0	0
;42" RCP C8	J8	J9	467.63	0.013	0	0	0	0
;36" RCP C9	J9	J11	447.38	0.013	0	0	0	0
;24" RCP C10	J10	J11	283.42	0.013	0	0	0	0
;54" RCP C11	J11	J12	486.87	0.013	0	0	0	0
;54" RCP C12	J12	J13	752.69	0.013	0	0	0	0
;54" RCP C13	J13	J15	254.83	0.013	0	0	0	0
;24" RCP C14	J14	J15	188.91	0.013	0	0	0	0
;54" RCP C15	J15	J17	221.99	0.013	0	0	0	0
;18" RCP C16	J16	J17	62.67	0.013	0	0	0	0
;60" RCP C17	J17	J18	541.89	0.013	0	0	0	0
;18" RCP C18	J19	J18	53.09	0.013	0	0	0	0
;18" RCP C19	J20	J18	43.2	0.013	0	0	0	0
;60" RCP C20	J18	J21	152.6	0.013	0	0	0	0
;60" RCP C21	J21	J23	34.87	0.013	0	0	0	0
;24" RCP C22	J22	J23	1368.83	0.013	0	0	0	0
;54" RCP C23	J23	J24	721.22	0.013	0	0	0	0
;54" RCP C24	J24	J27	680.67	0.013	0	0	0	0
;24" RCP C25	J25	J26	165.52	0.013	0	0	0	0
;24" RCP C26	J26	J27	61.1	0.013	0	0	0	0
;54" RCP C27	J27	J28	91.78	0.013	0	0	0	0
;54" RCP C28	J28	J29	429.82	0.013	0	0	0	0
;54" RCP C29	J29	J30	314.36	0.013	0	0	0	0
;DH: Natural Channel - Trap Channel B = 15' H = 5' S = 0.5 C30	J30	J35	204.77	0.15	0	0	0	0
;Overland Flow C31	J31	J32	254.87	0.15	0	0	0	0
;24" RCP C32	J32	J33	533.43	0.013	0	0	0	0
;24" RCP C33	J33	J34	198.01	0.013	0	0	0	0
;Channel Tributary C34	J34	J35	170.83	0.15	0	0	0	0
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5 C35	J35	J40	616.63	0.15	0	0	0	0
;18" RCP C36	J36	J37	275.48	0.013	0	0	0	0
;Gutter C37	J37	J38	370.46	0.013	0	0	0	0
;24" RCP C38	J38	J39	203.83	0.013	0	0	0	0
;Channel Tributary C39	J39	J40	238.43	0.15	0	0	0	0

```
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5
  C40              J40              J41              711.69     0.15       0          0          0          0
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5
  C41              J41              J43              313.65     0.15       0          0          0          0
;18" RCP
  C42              J42              J43              517.38     0.013      0          0          0          0
;DH: Natural Channel - Trap Channel B = 20' H = 4' S = 0.5
  C43              J43              J53              488.25     0.15       0          0          0          0
;24" RCP
  C44              J44              J45              363.01     0.013      0          0          0          0
;24" RCP
  C45              J45              J46              289.39     0.013      0          0          0          0
;18" RCP
  C46              J47              J46              63.44      0.013      0          0          0          0
;30" RCP
  C47              J46              J49              255.67     0.013      0          0          0          0
;18" RCP
  C48              J48              J49              85.41      0.013      0          0          0          0
;30" RCP
  C49              J49              J50              118.41     0.013      0          0          0          0
;30" RCP
  C50              J50              J51              190.09     0.013      0          0          0          0
;30" RCP
  C51              J51              J52              600.19     0.013      0          0          0          0
;30" RCP
  C52              J52              J53              317.94     0.013      0          0          0          0
;DH: Natural Channel - Trap Channel B = 28' H = 4' S = 0.5
  C53              J53              J55              353.62     0.15       0          0          0          0
;24" RCP
  C54              J54              J55              177.14     0.013      0          0          0          0
;DH: Natural Channel - Trap Channel B = 30' H = 4' S = 0.5
  C55              J55              J57              302.08     0.15       0          0          0          0
;24" RCP
  C56              J56              J57              322.12     0.013      0          0          0          0
;DH: Natural Channel - Trap Channel B = 34' H = 4' S = 0.5
  C57              J57              J59              232.37     0.15       0          0          0          0
;Channel Tributary
  C58              J58              J59              98.41      0.15       0          0          0          0
;DH: Natural Channel - Trap Channel B = 46' H = 4' S = 0.333
  C59              J59              J60              60.7       0.15       0          0          0          0
;3 Box Culvert: 8' x 12'
  C60              J60              OUT1             180.01     0.013      0          0          0          0

[XSECTIONS]
;;Link             Type         Geom1      Geom2      Geom3      Geom4      Barrels
;;-------------------------------------------------------------------------------------
  C1               CIRCULAR     2          0          0          0          1
  C2               CIRCULAR     3          0          0          0          1
  C3               CIRCULAR     2.5        0          0          0          1
  C4               CIRCULAR     2.5        0          0          0          1
  C5               CIRCULAR     1.5        0          0          0          1
  C6               CIRCULAR     2.5        0          0          0          1
  C7               CIRCULAR     3.5        0          0          0          1
  C8               CIRCULAR     3.5        0          0          0          1
  C9               CIRCULAR     3          0          0          0          1
  C10              CIRCULAR     2          0          0          0          1
  C11              CIRCULAR     4.5        0          0          0          1
  C12              CIRCULAR     4.5        0          0          0          1
  C13              CIRCULAR     4.5        0          0          0          1
  C14              CIRCULAR     2          0          0          0          1
  C15              CIRCULAR     4.5        0          0          0          1
  C16              CIRCULAR     1.5        0          0          0          1
  C17              CIRCULAR     5          0          0          0          1
  C18              CIRCULAR     1.5        0          0          0          1
  C19              CIRCULAR     1.5        0          0          0          1
  C20              CIRCULAR     5          0          0          0          1
  C21              CIRCULAR     5          0          0          0          1
  C22              CIRCULAR     2          0          0          0          1
  C23              CIRCULAR     4.5        0          0          0          1
  C24              CIRCULAR     4.5        0          0          0          1
  C25              CIRCULAR     2          0          0          0          1
  C26              CIRCULAR     2          0          0          0          1
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C27                 CIRCULAR     4.5          0            0            0            1
C28                 CIRCULAR     4.5          0            0            0            1
C29                 CIRCULAR     4.5          0            0            0            1
C30                 TRAPEZOIDAL  5            15           0.5          0.5          1
C31                 RECT_OPEN    0.5          30           0            0            1
C32                 CIRCULAR     2            0            0            0            1
C33                 CIRCULAR     2            0            0            0            1
C34                 RECT_OPEN    1            20           0            0            1
C35                 TRAPEZOIDAL  4            20           0.5          0.5          1
C36                 CIRCULAR     1.5          0            0            0            1
C37                 RECT_OPEN    0.25         8            0            0            1
C38                 CIRCULAR     2            0            0            0            1
C39                 RECT_OPEN    1            20           0            0            1
C40                 TRAPEZOIDAL  4            20           0.5          0.5          1
C41                 TRAPEZOIDAL  4            20           0.5          0.5          1
C42                 CIRCULAR     1.5          0            0            0            1
C43                 TRAPEZOIDAL  4            40           0.5          0.5          1
C44                 CIRCULAR     2            0            0            0            1
C45                 CIRCULAR     2            0            0            0            1
C46                 CIRCULAR     1.5          0            0            0            1
C47                 CIRCULAR     2.5          0            0            0            1
C48                 CIRCULAR     1.5          0            0            0            1
C49                 CIRCULAR     2.5          0            0            0            1
C50                 CIRCULAR     2.5          0            0            0            1
C51                 CIRCULAR     2.5          0            0            0            1
C52                 CIRCULAR     2.5          0            0            0            1
C53                 TRAPEZOIDAL  4            28           0.5          0.5          1
C54                 CIRCULAR     2            0            0            0            1
C55                 TRAPEZOIDAL  4            30           0.5          0.5          1
C56                 CIRCULAR     2            0            0            0            1
C57                 TRAPEZOIDAL  4            34           0.5          0.5          1
C58                 RECT_OPEN    1            5            0            0            1
C59                 TRAPEZOIDAL  4            46           0.333        0.333        1
C60                 RECT_CLOSED  8            36           0            0            3

[TIMESERIES]
;;Name              Date        Time        Value
;;-----------------------------------------------
;100 year 6 hour SCS Type B Design Storm Max Precip = 2.9 inches
  100yr6hr2.9Cum    10/01/2005 10:00       0.0
  100yr6hr2.9Cum               10:15       0.0522
  100yr6hr2.9Cum               10:30       0.1015
  100yr6hr2.9Cum               10:45       0.1682
  100yr6hr2.9Cum               11:00       0.232
  100yr6hr2.9Cum               11:15       0.3132
  100yr6hr2.9Cum               11:30       0.3915
  100yr6hr2.9Cum               11:45       0.5307
  100yr6hr2.9Cum               12:00       0.667
  100yr6hr2.9Cum               12:15       1.2035
  100yr6hr2.9Cum               12:30       1.74
  100yr6hr2.9Cum               12:45       1.885
  100yr6hr2.9Cum               13:00       2.03
  100yr6hr2.9Cum               13:15       2.146
  100yr6hr2.9Cum               13:30       2.262
  100yr6hr2.9Cum               13:45       2.3432
  100yr6hr2.9Cum               14:00       2.4215
  100yr6hr2.9Cum               14:15       2.4882
  100yr6hr2.9Cum               14:30       2.552
  100yr6hr2.9Cum               14:45       2.61
  100yr6hr2.9Cum               15:00       2.668
  100yr6hr2.9Cum               15:15       2.726
  100yr6hr2.9Cum               15:30       2.784
  100yr6hr2.9Cum               15:45       2.842
  100yr6hr2.9Cum               16:00       2.9

;SCS II Storm SD Hydrology Manual - 2.1 Cumulative 6 Hour 25 yr Storm
  25yr6hr2.1Cum                10:00       0
  25yr6hr2.1Cum                10:15       0.0378
  25yr6hr2.1Cum                10:30       0.0735
  25yr6hr2.1Cum                10:45       0.1218
  25yr6hr2.1Cum                11:00       0.168
  25yr6hr2.1Cum                11:15       0.2268
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 25yr6hr2.1Cum                11:30      0.2835
 25yr6hr2.1Cum                11:45      0.3843
 25yr6hr2.1Cum                12:00      0.483
 25yr6hr2.1Cum                12:15      0.8715
 25yr6hr2.1Cum                12:30      1.26
 25yr6hr2.1Cum                12:45      1.365
 25yr6hr2.1Cum                13:00      1.47
 25yr6hr2.1Cum                13:15      1.554
 25yr6hr2.1Cum                13:30      1.638
 25yr6hr2.1Cum                13:45      1.6968
 25yr6hr2.1Cum                14:00      1.7535
 25yr6hr2.1Cum                14:15      1.8018
 25yr6hr2.1Cum                14:30      1.848
 25yr6hr2.1Cum                14:45      1.89
 25yr6hr2.1Cum                15:00      1.932
 25yr6hr2.1Cum                15:15      1.974
 25yr6hr2.1Cum                15:30      2.016
 25yr6hr2.1Cum                15:45      2.058
 25yr6hr2.1Cum                16:00      2.1

[REPORT]
 INPUT      NO
 CONTROLS   NO

[OPTIONS]
 TEMPDIR    "C:\Carlsbad\DMP\"
```

Project DH

SWMM 5.0 – Output

25 Year 6 Hour Storm

Drainage Project DH (Alga Road Restoration and Enhancement)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.005b)
--------------------------------------------------------------

Drainage Project DH (Alga Road Restoration and Enhancement)
25 Year 6 hour Storm

****************
Analysis Options
****************
Flow Units ............... CFS
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ SEP-30-2005 20:00:00
Ending Date .............. OCT-02-2005 00:00:00
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec

**************************          Volume         Depth
Runoff Quantity Continuity      acre-feet        inches
**************************      ---------       -------
Total Precipitation ......         62.694         2.100
Evaporation Loss .........          0.000         0.000
Infiltration Loss ........         31.501         1.055
Surface Runoff ...........         31.600         1.058
Final Surface Storage ....          0.001         0.000
Continuity Error (%) .....         -0.652

**************************          Volume        Volume
Flow Routing Continuity         acre-feet      Mgallons
**************************      ---------      ---------
Dry Weather Inflow .......          0.000         0.000
Wet Weather Inflow .......         31.605        10.299
Groundwater Inflow .......          0.000         0.000
RDII Inflow ..............          0.000         0.000
External Inflow ..........          0.000         0.000
External Outflow .........         31.635        10.309
Surface Flooding .........          0.000         0.000
Evaporation Loss .........          0.000         0.000
Initial Stored Volume ....          0.000         0.000
Final Stored Volume ......          0.011         0.004
Continuity Error (%) .....         -0.131

***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Runoff Coeff
S1	2.100	0.000	0.000	0.884	1.231	0.586
S2	2.100	0.000	0.000	1.376	0.740	0.352
S3	2.100	0.000	0.000	1.379	0.736	0.351
S4	2.100	0.000	0.000	1.009	1.103	0.525
S5	2.100	0.000	0.000	0.940	1.181	0.563
S6	2.100	0.000	0.000	0.907	1.203	0.573
S7	2.100	0.000	0.000	0.841	1.276	0.608
S8	2.100	0.000	0.000	0.964	1.153	0.549
S9	2.100	0.000	0.000	0.886	1.226	0.584
S10	2.100	0.000	0.000	0.980	1.134	0.540
S11	2.100	0.000	0.000	0.965	1.152	0.549
S12	2.100	0.000	0.000	1.006	1.105	0.526
S13	2.100	0.000	0.000	1.007	1.109	0.528
S14	2.100	0.000	0.000	1.149	0.962	0.458
S15	2.100	0.000	0.000	1.068	1.048	0.499

S16	2.100	0.000	0.000	1.034	1.076	0.513
S17	2.100	0.000	0.000	0.268	1.845	0.878
S18	2.100	0.000	0.000	1.045	1.064	0.507
S19	2.100	0.000	0.000	1.038	1.072	0.510
S20	2.100	0.000	0.000	0.619	1.495	0.712
S21	2.100	0.000	0.000	0.422	1.692	0.806
S22	2.100	0.000	0.000	0.863	1.250	0.595
S23	2.100	0.000	0.000	1.034	1.078	0.514
S24	2.100	0.000	0.000	1.038	1.081	0.515
S25	2.100	0.000	0.000	1.015	1.104	0.526
S26	2.100	0.000	0.000	1.296	0.832	0.396
S27	2.100	0.000	0.000	1.102	1.017	0.484
S28	2.100	0.000	0.000	1.104	1.014	0.483
S29	2.100	0.000	0.000	1.150	0.961	0.458
S30	2.100	0.000	0.000	1.252	0.859	0.409
S31	2.100	0.000	0.000	1.193	0.931	0.443
S32	2.100	0.000	0.000	1.110	1.007	0.479
S33	2.100	0.000	0.000	1.239	0.879	0.419
S34	2.100	0.000	0.000	1.351	0.769	0.366
S35	2.100	0.000	0.000	1.174	0.940	0.448
S36	2.100	0.000	0.000	0.536	1.580	0.752
S37	2.100	0.000	0.000	1.280	0.837	0.399
S38	2.100	0.000	0.000	1.046	1.067	0.508
S39	2.100	0.000	0.000	0.980	1.135	0.540
S40	2.100	0.000	0.000	0.992	1.121	0.534
S41	2.100	0.000	0.000	1.035	1.075	0.512
S42	2.100	0.000	0.000	1.015	1.096	0.522
S43	2.100	0.000	0.000	0.958	1.161	0.553
S44	2.100	0.000	0.000	1.226	0.883	0.420
S45	2.100	0.000	0.000	0.972	1.144	0.545
S46	2.100	0.000	0.000	0.985	1.134	0.540
S47	2.100	0.000	0.000	1.205	0.911	0.434
S48	2.100	0.000	0.000	1.145	0.969	0.461
S49	2.100	0.000	0.000	1.091	1.027	0.489
S50	2.100	0.000	0.000	0.833	1.282	0.610
S51	2.100	0.000	0.000	1.074	1.038	0.494
S52	2.100	0.000	0.000	0.829	1.286	0.613
S53	2.100	0.000	0.000	1.039	1.073	0.511
Totals	2.100	0.000	0.000	1.055	1.058	0.504

****
Node Depth Summary
****

Node	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Total Flooding in/acre	Total Minutes Flooded
J1	0.04	0.47	516.57	0 12:45	0	0
J2	0.05	0.60	501.87	0 12:45	0	0
J3	0.08	1.18	501.00	0 12:45	0	0
J4	0.08	1.17	492.66	0 12:45	0	0
J5	0.02	0.29	479.54	0 12:45	0	0
J6	0.07	1.04	477.12	0 12:45	0	0
J7	0.10	1.47	458.09	0 12:45	0	0
J8	0.11	1.47	456.72	0 12:45	0	0
J9	0.12	1.54	442.17	0 12:45	0	0
J10	0.09	0.97	446.97	0 12:45	0	0
J11	0.19	2.34	426.74	0 12:45	0	0
J12	0.19	2.34	422.34	0 12:46	0	0
J13	0.16	1.85	403.35	0 12:46	0	0
J14	0.05	0.58	407.58	0 12:45	0	0
J15	0.21	2.54	396.56	0 12:46	0	0
J16	0.04	0.55	395.71	0 12:45	0	0
J17	0.22	2.69	394.14	0 12:46	0	0
J18	0.23	2.72	389.52	0 12:46	0	0
J19	0.04	0.39	389.50	0 12:45	0	0
J20	0.06	0.56	394.98	0 12:45	0	0
J21	0.23	2.74	387.85	0 12:46	0	0

J22	0.06	0.60	429.87	0	12:45	0	0
J23	0.23	2.74	387.47	0	12:46	0	0
J24	0.20	2.36	369.39	0	12:47	0	0
J25	0.05	0.59	380.27	0	12:45	0	0
J26	0.05	0.59	358.09	0	12:45	0	0
J27	0.19	2.19	345.98	0	12:47	0	0
J28	0.17	1.89	337.20	0	12:47	0	0
J29	0.17	1.93	307.63	0	12:47	0	0
J30	0.18	2.31	286.31	0	12:47	0	0
J31	0.01	0.19	527.79	0	12:45	0	0
J32	0.04	0.59	469.81	0	12:45	0	0
J33	0.05	0.64	399.41	0	12:45	0	0
J34	0.05	0.64	364.69	0	12:45	0	0
J35	0.18	2.58	260.58	0	12:47	0	0
J36	0.02	0.28	400.28	0	12:45	0	0
J37	0.02	0.28	388.28	0	12:45	0	0
J38	0.02	0.29	360.29	0	12:45	0	0
J39	0.02	0.29	330.29	0	12:45	0	0
J40	0.18	2.58	220.58	0	12:48	0	0
J41	0.18	2.46	134.46	0	12:49	0	0
J42	0.03	0.28	207.28	0	12:45	0	0
J43	0.18	2.46	106.46	0	12:50	0	0
J44	0.03	0.41	223.51	0	12:45	0	0
J45	0.05	0.60	184.60	0	12:45	0	0
J46	0.06	0.73	168.43	0	12:45	0	0
J47	0.03	0.32	169.57	0	12:45	0	0
J48	0.07	0.85	164.29	0	12:45	0	0
J49	0.09	1.17	162.17	0	12:45	0	0
J50	0.09	1.17	160.30	0	12:45	0	0
J51	0.07	0.86	146.05	0	12:45	0	0
J52	0.07	0.86	98.96	0	12:45	0	0
J53	0.21	2.92	64.92	0	12:51	0	0
J54	0.03	0.43	93.93	0	12:45	0	0
J55	0.22	2.98	52.98	0	12:51	0	0
J56	0.06	0.72	63.50	0	12:45	0	0
J57	0.22	2.98	43.98	0	12:52	0	0
J58	0.04	0.56	47.23	0	12:45	0	0
J59	0.22	2.95	37.95	0	12:53	0	0
J60	0.33	4.63	38.63	0	12:53	0	0
OUT1	4.96	8.00	42.00	0	10:38	0	0

****
Conduit Flow Summary
****

Conduit	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Velocity ft/sec	Length Factor	Maximum /Design Flow	Total Minutes Surcharged
C1	4.91	0 12:45	8.74	1.00	0.12	0
C2	4.90	0 12:46	4.94	1.00	0.09	0
C3	34.34	0 12:45	15.23	1.00	0.45	0
C4	39.48	0 12:45	23.32	1.00	0.30	0
C5	2.36	0 12:45	9.86	1.00	0.08	0
C6	41.82	0 12:45	21.70	1.00	0.36	0
C7	41.79	0 12:45	10.88	1.00	0.37	0
C8	59.42	0 12:45	16.66	1.00	0.33	0
C9	65.97	0 12:46	18.16	1.00	0.52	0
C10	29.35	0 12:45	19.60	1.00	0.47	0
C11	99.61	0 12:46	11.97	1.00	0.53	0
C12	108.94	0 12:46	17.74	1.00	0.35	0
C13	119.09	0 12:46	19.35	1.00	0.35	0
C14	10.66	0 12:45	14.29	1.00	0.18	0
C15	129.40	0 12:46	13.96	1.00	0.61	0
C16	7.37	0 12:45	12.50	1.00	0.29	0
C17	136.28	0 12:47	12.69	1.00	0.56	0
C18	3.29	0 12:45	8.92	1.00	0.15	0
C19	12.89	0 12:45	21.66	1.00	0.29	0
C20	157.98	0 12:46	14.44	1.00	0.58	0
C21	158.40	0 12:46	14.37	1.00	0.58	0

C22	8.05	0	12:46	10.24	1.00	0.20	0
C23	166.29	0	12:47	19.76	1.00	0.54	0
C24	173.31	0	12:47	22.59	1.00	0.48	0
C25	15.66	0	12:45	20.23	1.00	0.19	0
C26	15.65	0	12:45	24.34	1.00	0.15	0
C27	187.99	0	12:47	33.25	1.00	0.31	0
C28	190.09	0	12:47	29.96	1.00	0.37	0
C29	198.03	0	12:47	30.31	1.00	0.38	0
C30	197.96	0	12:47	5.32	1.00	0.29	0
C31	8.41	0	12:46	1.54	1.00	0.19	0
C32	15.57	0	12:45	20.13	1.00	0.19	0
C33	21.06	0	12:45	24.26	1.00	0.22	0
C34	21.03	0	12:46	3.46	1.00	0.14	0
C35	229.60	0	12:48	4.21	1.00	0.49	0
C36	1.67	0	12:45	7.37	1.00	0.08	0
C37	1.66	0	12:46	4.22	1.00	0.07	0
C38	3.95	0	12:45	14.07	1.00	0.05	0
C39	3.93	0	12:46	1.65	1.00	0.03	0
C40	238.89	0	12:50	5.22	1.00	0.38	0
C41	248.74	0	12:50	4.78	1.00	0.46	0
C42	3.46	0	12:45	15.62	1.00	0.07	0
C43	255.95	0	12:51	3.86	1.00	0.23	0
C44	6.65	0	12:45	14.70	1.00	0.09	0
C45	10.61	0	12:45	13.32	1.00	0.20	0
C46	1.64	0	12:45	5.94	1.00	0.10	0
C47	12.23	0	12:45	10.31	1.00	0.18	0
C48	10.87	0	12:45	10.54	1.00	0.61	0
C49	23.03	0	12:45	10.21	1.00	0.45	0
C50	27.89	0	12:45	18.84	1.00	0.25	0
C51	29.28	0	12:45	19.60	1.00	0.25	0
C52	34.91	0	12:45	23.47	1.00	0.25	0
C53	289.03	0	12:52	3.36	1.00	0.60	0
C54	11.41	0	12:45	22.92	1.00	0.10	0
C55	300.74	0	12:52	3.21	1.00	0.62	0
C56	16.41	0	12:45	16.09	1.00	0.28	0
C57	313.11	0	12:53	3.00	1.00	0.61	0
C58	5.72	0	12:45	2.04	1.00	0.42	0
C59	317.39	0	12:53	2.38	1.00	0.57	0
C60	320.68	0	12:56	0.65	1.00	0.62	0

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.05

Analysis begun on:  Tue Jul 25 12:29:37 2006
Total elapsed time: < 1 sec
```