Appendix G

Preliminary Hydrology Study

Preliminary Hydrology Study

VESTING TTM 72608

Long Beach, CA

Prepared for:

The Long Beach Project, LLC
888 San Clemente, Suite 100
New Port Beach, CA

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REGISTERED PROFESSIONAL ENGINEER
DAVID W LARSON
C052991
Exp. 12-31-16
CIVIL
STATE OF CALIFORNIA

Kimley»Horn

INVESTIGATION REPORT

PURPOSE AND SCOPE

This study has been performed to determine the amount of storm flow that will develop on-site and flow through the proposed project site such that adequate flood protection can be provided for the project. All drainage is conveyed around through the project within the local streets. These streets convey the storm flows to a group of catch basins located at the intersection of 20th and 26th Streets that shall be designed to receive the peak Capital Storm Event and transport these flows to a local retention/detention basin which shall be designed to retain 85th percentile 24□hour runoff event and release flows at no more than the pre-developed storm flow rate.

METHODOLOGY

1. This study was performed using CivilSoft LAR04 Software based on the January 2006 Los Angeles County Department of Public Works Hydrology Manual 50-year Capital Storm event days 1-4 to size the basin and the 25-year Urban Storm Event day 4 to size the storm drain system.

2. The State of California Regional Water Quality Control Board Los Angeles Region Waste Discharge Requirements for Municipal Separate Storm Sewer System Discharges from the City of Long Beach Los Angeles County which limits the minimum discharge flow from a basin to the pre-developed Q.

3. The Long Beach Development Services Low Development Design Manual that requires the reduction of measured infiltration rates by a factor of 3.

LOCATION/ON-SITE TRIBUTARY WATERSHED

The project is located in Long Beach California, on the east side of the Los Angeles River and south of West 48th Street. Most if not all off-site drainage is being conveyed around the site into the local Dominguez Gap Barrier Basin and the LADWP Project No. 130 channel improvements. The On-Site watershed, although developed as a Camp for scouts consisting of a parking lot, pool, lodging and recreation hall, will be considered as undeveloped for the purpose of sizing a drainage basin for this project.

The Pre-developed site drains from the northern edge of the lot toward the center into a depressed elevation area that acts as a drainage conveyance to an existing storm culvert under the railroad tracts along the southern boundary of the project. At this point the property is at a sump elevation of 30 with the storm culvert at an invert elevation of 32 feet above sea level, and the neighboring Project 130 channel improvements along the southern edge of the property having a water surface elevation of 31.8 and a flow line of 25.1 at the connection point. Since the site survey and the channel improvement plans are on the same datum, the project will not see channel flows enter onto the site unless the Project 130 channel flows exceed its design elevation of 31.8 and reach 32 or more feet above sea level, which would exceed the Capital Storm event that projects are required to be designed too.

HYDROLOGY

After reviewing the Long Beach 50-year 24-Hour Isohyet Figure –H1.5 (Figure 1), it was determined that the site falls within the 015 soils group and produces 5.9 inches of rainfall in a 24-hour period during the 50-year storm event.

The pre-developed site was analyzed as single water shed draining from the northwest corner of the property to the drainage culvert along the southern property line. The site is approximately 10.5 acres in size. This data was entered into the LAR04 software that calculated the pre-developed 50-year storm flow as a Q of 6.25 cubic feet per second (CFS) and a volume of 0.96 acre feet. (See Figure 5)

The developed on-site watershed was broken down into six (6) subareas dividing the project up into half street flows along “A Street and “C” Street. The area north of C Street is Area A and on the south side of C Street is Subarea B. Subarea C consists of the north portion of B Street and the north half of A Street. Subarea D is the west alleyway and Subarea E is the east alleyway both of which confluence with subarea C to form combined flows on the north side of C Street. The south side of C Street is designated as Subarea F. (See figure 5)

The initial areas for each subarea were entered into the program as overland flow conveyed by a valley channel. These flows then enter street conveyances that confluence with other subareas ultimately combining into pipe flows at the intersection of C Street and A Street where the flows enter into four catch basins.

The 25-year storm event was analyzed to determine street and storm drain capacities. From this analysis it was determined that the 25-year event will produce approximately 16.2 CFS on the 4th day of the storm.

The 50-year storm event was analyzed to determine the retention/detention basin size. From this analysis it was determined that the 50-year event will produce approximately 18.9 CFS on the 4th day of the storm with a volume of 2.86 acre feet.

HYDRAULICS

Figure 10 shows the calculated street capacity for A Street and C Street. B Street and the Alleyways were not analyzed since the flows associated with these conveyances are very small.

From this information this report has been determined that the 25-year and 50-year storm flows will not reach the capacity of the streets. Furthermore, during the 25-year Storm Event, a lane straddling the centerline of the street will be travelable without entering the confluence flows within the gutters.

In summary, Subarea A generates 4.62 cfs along the north half of C Street at the intersection of A Street. The capacity of the north sided of C street has been determined to be 12.32 cfs which is 2.67 times the required capacity.

Subarea B generates 1.98 cfs along the south half of C Street that has a capacity of 9.62 cfs and is almost 5 times the capacity required. Subarea C after the confluence with Subareas D and E generates 5.24 cfs along the North side of A Street that has a capacity of 8.84 cfs and is 1.7 times the required capacity.

Subarea F generates 7.16 cfs along the south side of A Street that has a capacity of 11.25 cfs which is over 1.5 times the capacity required.

The catch basin capacities for the four catch basins located at the intersection of A Street and C Street were evaluated in this report using LACFCD STD D-26 "Catch Basin Capacities for Sump Conditions" and it was determined that a standard three (3) foot wide catch basin in an eight (8) inch curb face would accept 7.58 cfs when the streets are flowing full and 2.71 cfs when the streets are flowing two (3) inches deep. Considering all four (4) catch basins have a capacity of (7.58*4 =) 30.32 cfs, then the system has can accept the 50-year storm flows with a (30.32/18.9 cfs =) 1.6 factor of safety.

RETENTION/DETENTION BASIN

The Basin design is based on the Capital Storm Event per Los Angeles County Hydrology Manual Section 4.2 Capital Flood Protection and Section 4.3 Urban Flood Protection that states the following:

> The Capital Flood level of protection applies to all facilities, including open channels, closed conduits, bridges, dams, and debris basins not under State of California jurisdiction.
>
> All drainage facilities in developed areas not covered under the Capital Flood protection conditions must meet the Urban Flood level of protection. The Urban Flood is runoff from a 25-year frequency design storm falling on a saturated watershed.

The Retention Volume for the basin is governed by the State of California Regional Water Quality Control Board Los Angeles Region Waste Discharge Requirements for Municipal Separate Storm Sewer System Discharges from the City of Long Beach Los Angeles County and Long Beach Development Services Low Development Design Manual that state: (Long Beach LID Design Manual)

> At a minimum, peak runoff rates cannot exceed pre-development levels, for developments where the potential for increased storm water discharge rates can result in an increase in downstream erosion potential. (Order No. 99-060 Part 4 Special and Standard Provisions: 1 Special Provisions D Development Planning Item 6. page 17)
>
> Stormwater runoff will be infiltrated, evapotranspired, and/or captured and used through stormwater management techniques…. The onsite stormwater management techniques must be properly sized, at a minimum, to infiltrate, evapotranspire, store for use, without any stormwater runoff leaving the site to the maximum extent feasible, for at least the volume of water produced by the water quality design storm event that results from:
>
> a. The 85th percentile 24-hour runoff event (Figure 2) determined as the maximized capture stormwater volume for the area using a 48 to 72 hour drawdown time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

b. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in the California Stormwater Best Management Practices Handbook –Industrial/Commercial, (2003); or

c. The volume of runoff produced from a 0.75 inch storm event.

In addition, Infiltration rates used for design must be divided by the appropriate factors of safety as expressed in the following equation:

$$K_{sat,design} = K_{sat,measured}/FS$$

Where:

FS = Infiltration factor of safety = 3

The soils engineer percolation tests determined the infiltration rate as 95gallons/day/sf. This is can be re-expressed as 0.7327 cfs/sf. Reducing this rate by the above factor of safety allows us to use and infiltration rate of (0.7327/3=) 0.2442 cfs/sf.

It was also determined that the 85th percentile 24-hour runoff event produces a 0.75 Isohyet. Based on this a TC Volume calculation determine the required retention volume to be 0.48 acre feet. (see Figure 4)

A HANCOR underground storage infiltration system was used and sized to meet this volume requirement. The system consists of 672 lf of 60 inch perforated storm drain pipe embedded in a gravel backfill.

Using this storage capacity and the unit hydrograph from the 50-year storm event, a retention/detention basin was sized using CivilSoft Retard software. The out flow Q was limited to 85% of the pre-developed storm flow equal to (6.25*0.85=) 5.325 cfs. (see Figure 4, Pre-Developed Storm Q)

The routing calculation is provided here in incorporating all the constraints discussed above. The results show that the area designated on the VTTM for the basin will be sufficient with an above ground detention volume at a depth of 2.5 feet. (see depth vs storage chart Figure 9)

CONCLUSION AND RECOMMENDATIONS

The existing on-site watershed will deliver a 50-year Capital Storm event of approximately 18.9 cubic feet per second (cfs) to a retention/detention basin that has been designed to mitigate the peak Q to 85% the pre-developed Q or 5.325 cfs max and store the LID and SUSMP required 0.48 acre feet of storm water volume. This 50-year storm event will create flood water depths in the streets at less than 66% of their capacity. Four three-foot wide Catch Basin inlets are designed to receive this flow at almost double the capacity required.

Based on the requirements set forth in this report, adequate flood protection has been achieved.

APPENDIX

Soil Classification and Rainfall / 24-Hour Isohyet	Figure 1
85th Percentile 24-hour Rainfall Isohyet Map	Figure 2
LID / SUSUMP Storage Requirement	Figure 3
On-Site 50-year Pre Developed Q and Hydrograph	Firgure4
On-Site Developed Tributary Watershed Map	Figure 5
24-Year Day 4 Developed Storm Q	Figure 6
50-Year Days 1-4 Developed Storm Q	Figure 7
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50-Year Days 1-4 Basin Volume	Figure 9
Half-Street Capacity Calculation	Figure 10
Catch Basin Inlet Capacity Calculations	Figure 11

Figure 1

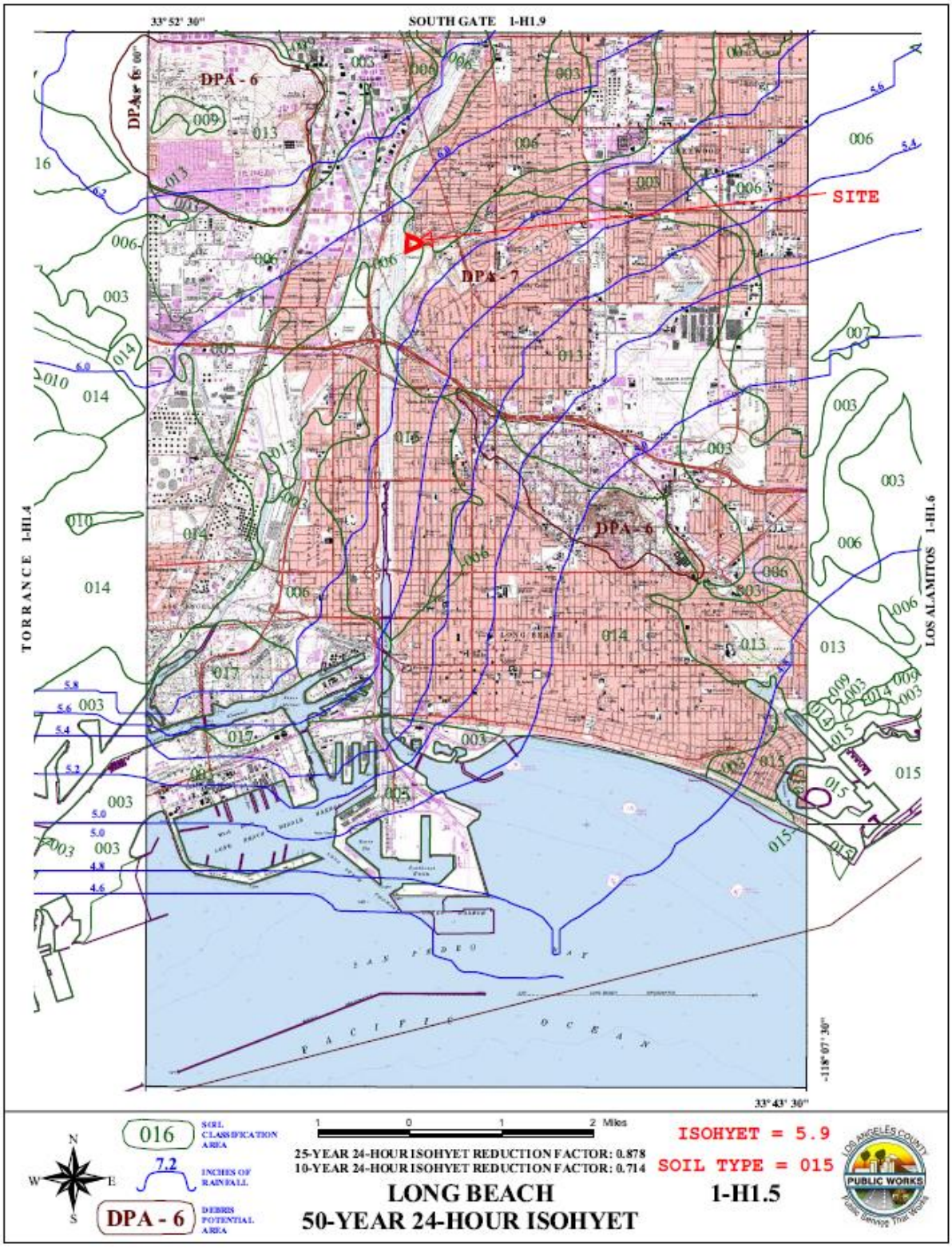
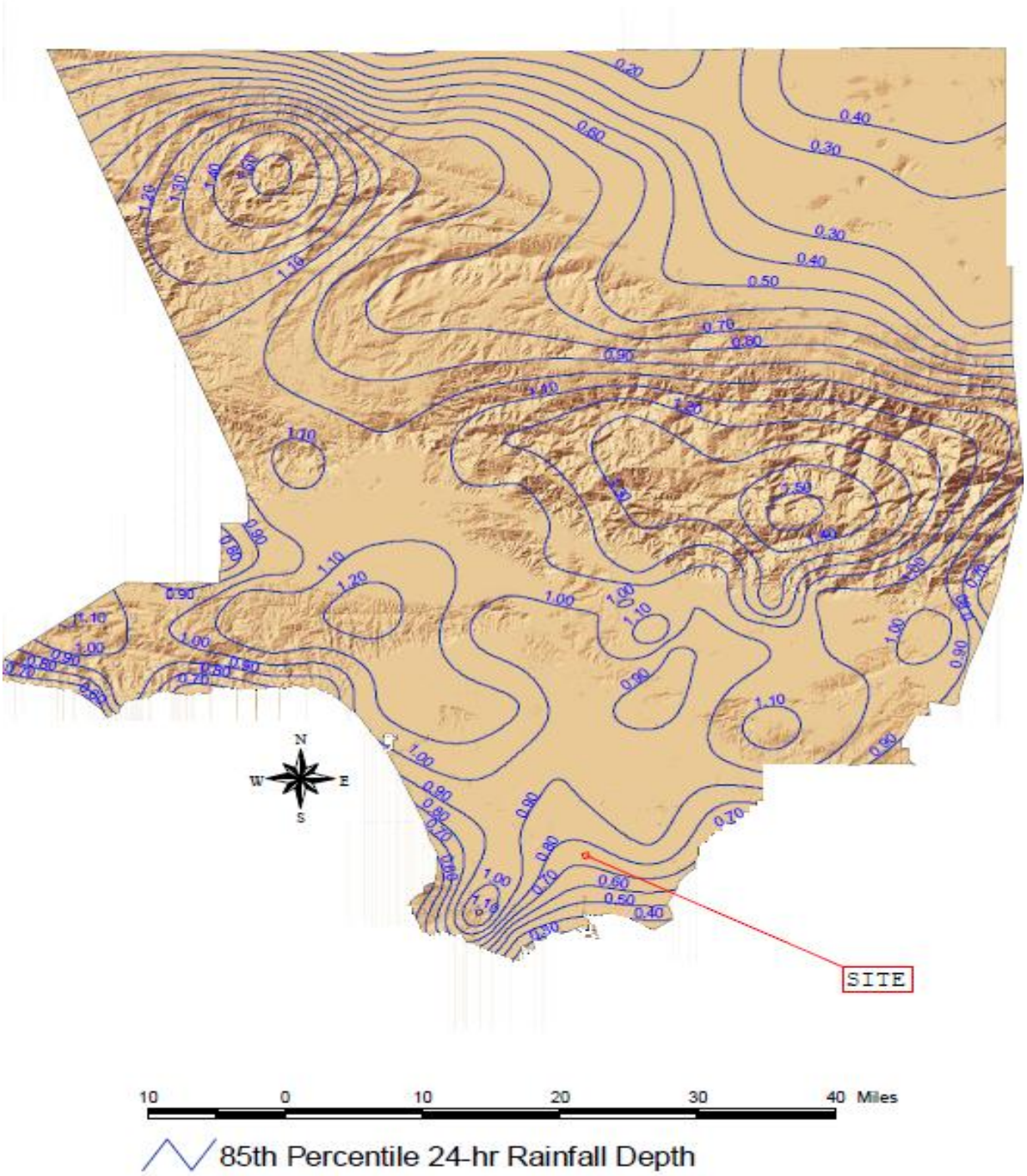

33° 52' 30"
SOUTH GATE 1-H1.9
DPA - 6
DPA - 7
SITE
TORRANCE 1-H1.4
LOS ALAMITOS 1-H1.6
33° 43' 30"
-118° 07' 30"
016
SOIL CLASSIFICATION AREA
7.2
INCHES OF RAINFALL
DPA - 6
DEBRIS POTENTIAL AREA
1 0 1 2 Miles
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714
ISOHYET = 5.9
SOIL TYPE = 015
LONG BEACH
50-YEAR 24-HOUR ISOHYET
1-H1.5
LOS ANGELES COUNTY
PUBLIC WORKS

Figure 2

85th Percentile 24-hr Rainfall Isohyetal Map



DAISY

Figure 3

LID / SUSUMP STORAGE REQUIREMENT

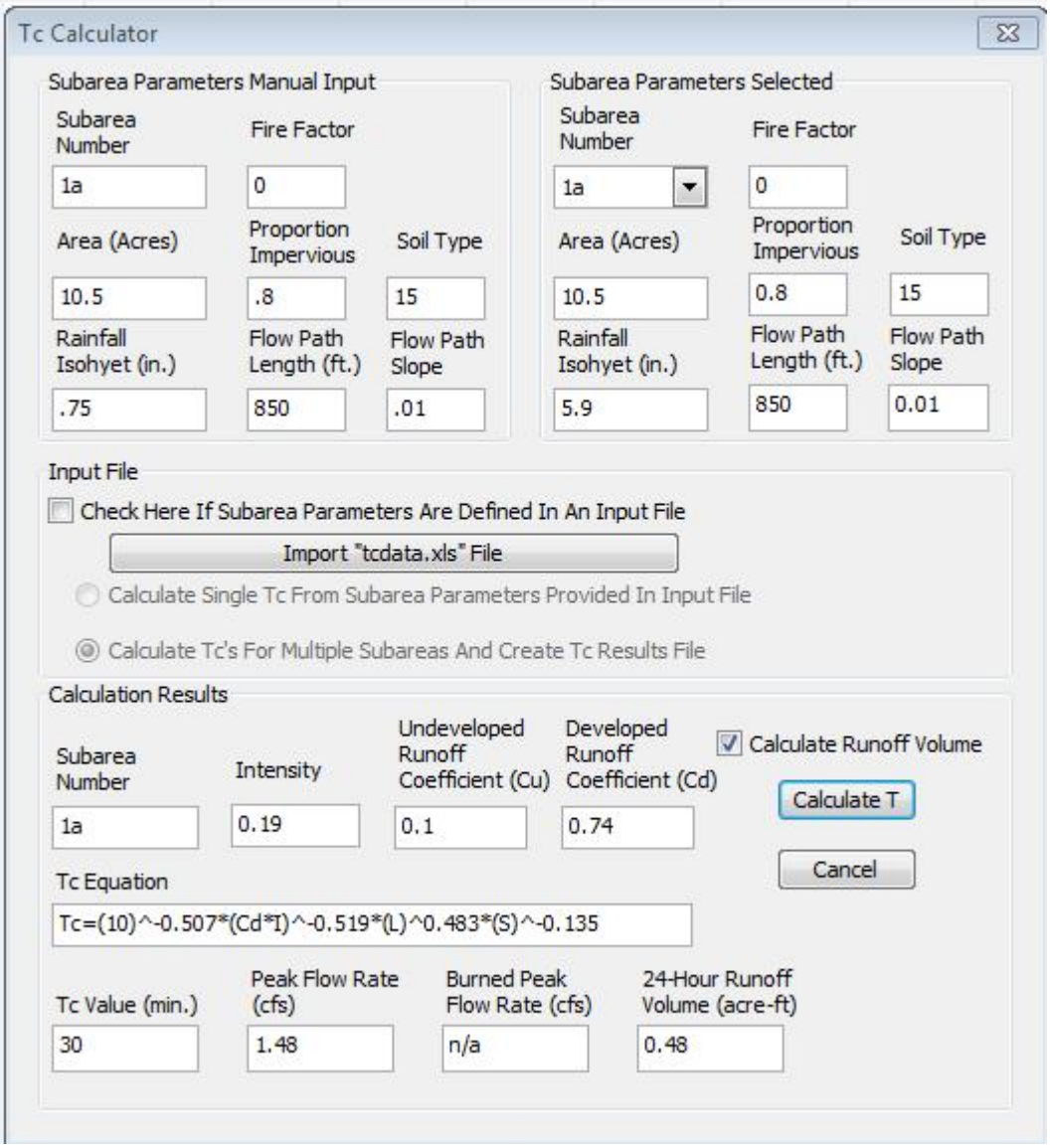


Figure 4

Pre-Developed Storm Q and Hydrograph

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                                        LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                        PROG F0601M

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        UNDEVELOPE SITE                                                                                          STORM DAY 4
                   SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION   AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z     Q(CFS) NAME  TC  ZONE  IMPV
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           5    2A     .1        .18      10.6      5.38   2      10.   .00727      .00   .00        0.   15   5   A29   .10
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                                        LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                        PROG F0601M

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                                UNDEVELOPED HYDROGRAPH
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                       0      .00     100      .25     200      .26     300      .27     400      .29
                     500      .30     600      .33     700      .36     800      .39     900      .45
                    1000      .54    1050      .64    1100      .82    1110      .87    1120      .95
                    1130     1.08    1131     1.10    1132     1.11    1133     1.13    1134     1.15
                    1135     1.17    1136     1.18    1137     1.20    1138     1.22    1139     1.23
                    1140     1.25    1141     1.27    1142     1.30    1143     1.32    1144     1.34
                    1145     1.37    1146     1.40    1147     1.43    1148     1.46    1149     1.52
                    1150     1.58    1151     1.64    1152     1.70    1153     1.78    1154     1.82
                    1155     1.93    1156     2.15    1157     2.47    1158     2.88    1159     3.32
                    1160     3.74    1161     4.11    1162     4.43    1163     4.70    1164     4.92
                    1165     5.10    1166     5.23    1167     5.32    1168     5.37    1169     5.38
                    1170     5.36    1171     5.30    1172     5.20    1173     5.08    1174     4.93
                    1175     4.70    1176     4.42    1177     4.10    1178     3.77    1179     3.46
                    1180     3.17    1181     2.91    1182     2.67    1183     2.45    1184     2.27
                    1185     2.11    1186     1.96    1187     1.84    1188     1.73    1189     1.63
                    1190     1.54    1191     1.46    1192     1.38    1193     1.32    1194     1.26
                    1195     1.21    1196     1.16    1197     1.11    1198     1.07    1199     1.03
                    1200     1.00    1201      .97    1202      .94    1203      .91    1204      .89
                    1205      .86    1206      .84    1207      .82    1208      .80    1209      .79
                    1210      .77    1211      .75    1212      .74    1213      .72    1214      .71
                    1215      .70    1216      .69    1217      .68    1218      .67    1219      .66
                    1220      .65    1221      .64    1222      .63    1223      .62    1224      .61
                    1225      .61    1226      .60    1227      .59    1228      .58    1229      .58
                    1230      .57    1231      .57    1232      .56    1233      .55    1234      .55
                    1235      .54    1236      .54    1237      .53    1238      .53    1239      .52
                    1240      .52    1241      .52    1242      .51    1243      .51    1244      .50
                    1245      .50    1246      .50    1247      .49    1248      .49    1249      .49
                    1250      .48    1251      .48    1252      .48    1253      .47    1254      .47
                    1255      .47    1256      .46    1257      .46    1258      .46    1259      .45
                    1260      .45    1261      .45    1262      .45    1263      .44    1264      .44
                    1265      .44    1266      .44    1267      .43    1268      .43    1269      .43
                    1270      .43    1271      .42    1272      .42    1273      .42    1274      .42
                    1275      .42    1276      .41    1277      .41    1278      .41    1279      .41
                    1280      .40    1281      .40    1282      .40    1283      .40    1284      .40
                    1285      .40    1286      .39    1287      .39    1288      .39    1289      .39
                    1290      .39    1291      .39    1292      .38    1293      .38    1294      .38
                    1295      .38    1296      .38    1297      .38    1298      .37    1299      .37
                    1300      .37    1310      .36    1320      .35    1330      .34    1340      .33
                    1350      .31    1360      .31    1370      .30    1380      .29    1390      .29
                    1400      .28    1420      .27    1440      .26    1460      .25    1500      .25

                    TOTAL VOLUME THIS HYDROGRAPH  =          .96(Ac.Ft)
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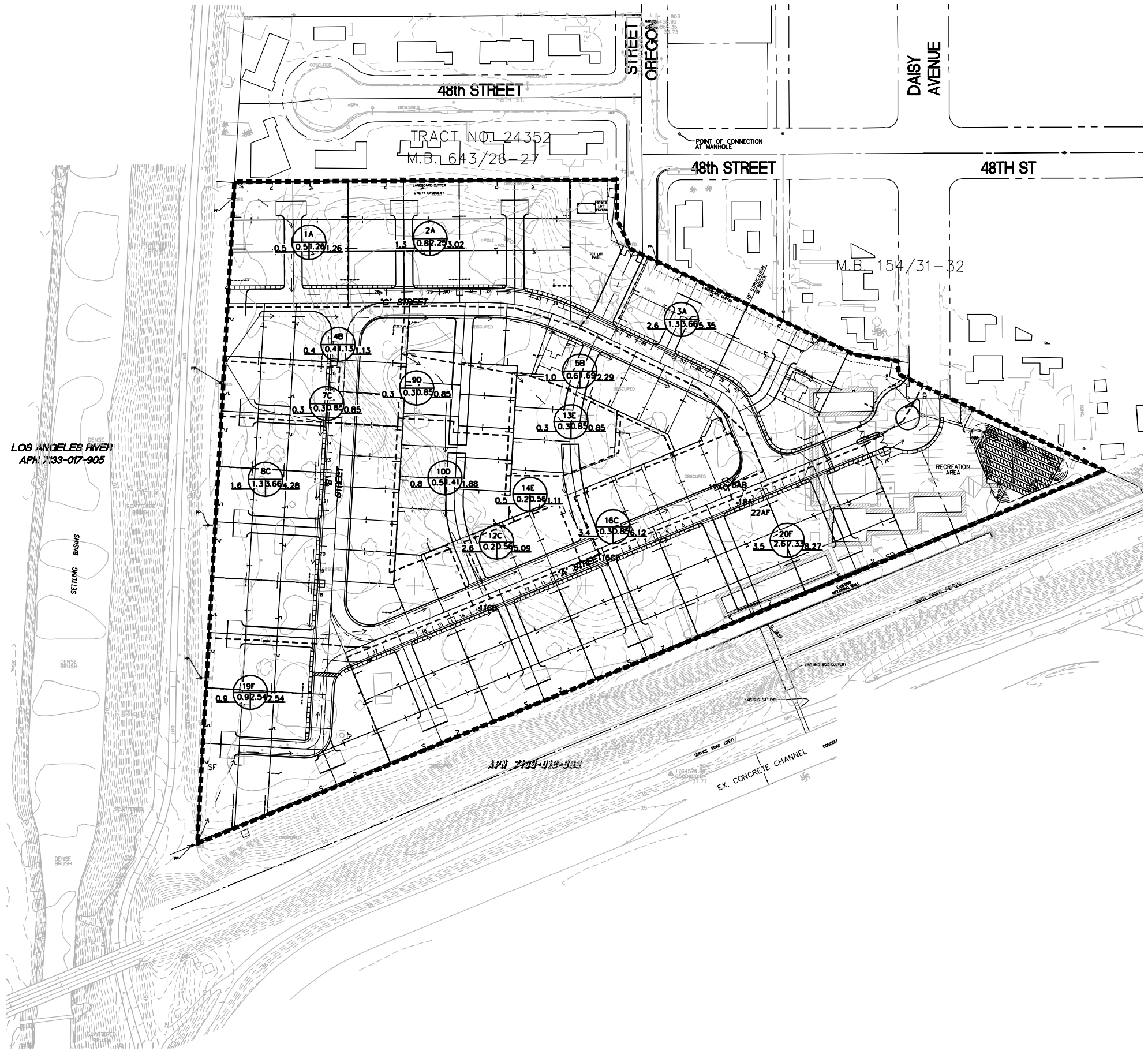
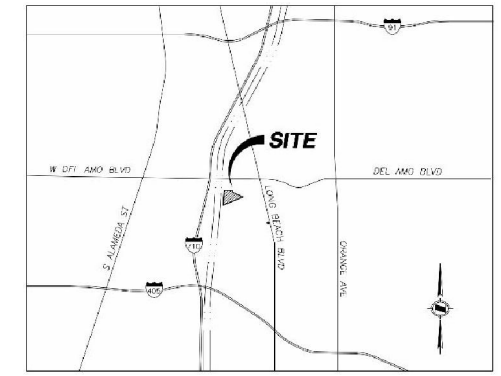
Figure 5

SEE ATTACHED HYDROLOGY MAP

HYDROLOGY WATERSHED MAP





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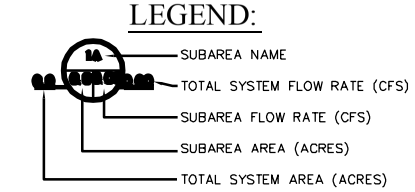

GRAPHIC SCALE IN FEET
0 30 60 120

FIGURE 5

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Figure 6

24-Year 4th Day Developed Storm Q

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                                   LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                          PROG F0601M

        Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25  SOIL DATA FILE: C:\civild\sgr_soilx_71.dat
        DAISY                                                                                                          STORM DAY 4
                     SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION     AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE LNGTH(Ft) SLOPE  SIZE(Ft)  Z    Q(CFS) NAME  TC  ZONE  IMPV
           5   1A      .5      1.10       .5      1.10   2     233.   .01070     .00   .00      0.   15   6   A29   .80
           5   2A      .8      1.96      1.3      2.61   3     283.   .00495     .00   .00      0.   15   5   A29   .80
           5   3A     1.3      3.18      2.6      4.62   3     362.   .00415     .00   .00      0.   15   5   A29   .80
           5   4B      .4       .98       .4       .98   2     230.   .00826     .00   .00      0.   15   5   A29   .80
           5   5B      .6      1.47      1.0      1.98   3     489.   .00654     .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
    *                                                   CONFLUENCE Q'S

    *      5    6A  TA 1158 QA     4.01 QAB     5.51 QB     1.50       5    6B  TB 1160 QB     1.56 QBA     5.41 QA     3.85

    *                                5    6AB TAB 1159 QAB     5.55 QA     3.99 QB     1.56

**********************************************************************************************************************
                     SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION     AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE LNGTH(Ft) SLOPE  SIZE(Ft)  Z    Q(CFS) NAME  TC  ZONE  IMPV
           5   6AB     1.0      1.56      3.6      5.55   0       0.   .00000     .00   .00      0.   15   0   A29   .00
           5   7C      .3       .73       .3       .73   2     136.   .01221     .00   .00      0.   15   5   A29   .80
           5   8C     1.3      3.18      1.6      3.71   3     464.   .00500     .00   .00      0.   15   5   A29   .80
           5   9D      .3       .73       .3       .73   2     170.   .00589     .00   .00      0.   15   5   A29   .80
           5  10D      .5      1.22       .8      1.62   3     206.   .00729     .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
    *                                                   CONFLUENCE Q'S

    *      5   11C  TC 1158 QC     2.82 QCD     4.19 QD     1.37       5   11D  TD 1156 QD     1.47 QDC     3.89 QC     2.42

    *                                5   11CD TCD 1158 QCD     4.19 QC     2.82 QD     1.37

**********************************************************************************************************************
                     SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION     AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE LNGTH(Ft) SLOPE  SIZE(Ft)  Z    Q(CFS) NAME  TC  ZONE  IMPV
           5  11CD     .8      1.47      2.4      4.19   0       0.   .00000     .00   .00      0.   15   0   A29   .00
           5   12C     .2       .49      2.6      4.36   3     140.   .00569     .00   .00      0.   15   5   A29   .80
           5   13E     .3       .73       .3       .73   2     145.   .00620     .00   .00      0.   15   5   A29   .80
           5   14E     .2       .49       .5       .96   3      92.   .00761     .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
    *                                                   CONFLUENCE Q'S

    *      5   15C  TC 1159 QC     4.29 QCE     5.02 QE      .73       5   15E  TE 1156 QE      .95 QEC     4.49 QC     3.54

    *                                5   15CE TCE 1158 QCE     5.03 QC     4.19 QE      .84

**********************************************************************************************************************
                     SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION     AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE LNGTH(Ft) SLOPE  SIZE(Ft)  Z    Q(CFS) NAME  TC  ZONE  IMPV
           5  15CE     .5       .95      3.1      5.03   0       0.   .00000     .00   .00      0.   15   0   A29   .00
           5   16C     .3       .73      3.4      5.24   3     170.   .00707     .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
    *                                                   CONFLUENCE Q'S

    *      5   17A  TA 1159 QA     5.55 QAC    10.68 QC     5.13       5   17C  TC 1160 QC     5.18 QCA    10.59 QA     5.41

    *                                5   17AC TAC 1159 QAC    10.68 QA     5.55 QC     5.13

**********************************************************************************************************************
                     SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION     AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE LNGTH(Ft) SLOPE  SIZE(Ft)  Z    Q(CFS) NAME  TC  ZONE  IMPV
           5  17AC     3.4      5.18      7.0     10.68   0       0.   .00000     .00   .00      0.   15   0   A29   .00
           5   18A      .0       .00      7.0     10.68   4      40.   .01000    2.00   .00      0.   15   1   A29   .80
           5   19F      .9      2.20       .9      2.20   2     350.   .00514     .00   .00      0.   15   5   A29   .80
           5   20F     2.6      6.36      3.5      7.16   3     490.   .00877     .00   .00      0.   15   5   A29   .80
           5   21F      .0       .00      3.5      5.95   4      10.   .10000    2.00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
    *                                                   CONFLUENCE Q'S

    *      5   22A  TA 1159 QA    10.66 QAF    16.12 QF     5.46       5   22F  TF 1157 QF     5.95 QFA    15.79 QA     9.85

    *                                5   22AF TAF 1158 QAF    16.20 QA    10.39 QF     5.80

**********************************************************************************************************************
                     SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION     AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE LNGTH(Ft) SLOPE  SIZE(Ft)  Z    Q(CFS) NAME  TC  ZONE  IMPV
           5  22AF     3.5      5.95     10.5     16.20   4     110.   .10000    2.00   .00      0.   15   0   A29   .00
           5   23A      .0       .00     10.5     16.15   0       0.   .00000     .00   .00      0.   15  90   A29   .00
```

Figure 7

50-Year Days 1-4 Developed Storm Q

```
Program Package Serial Number:  2187
05/27/14   FILE: day3     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                     LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                                  PROG F0601M

        Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50  SOIL DATA FILE: C:\civild\sgr_soilx_71.dat
        DAISY                                                                                                                  STORM DAY 4
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    1A         .5       1.26        .5       1.26   2     233.   .01070     .00    .00      0.   15   6   A29   .80
           5    2A         .8       2.25       1.3       3.02   3     283.   .00495     .00    .00      0.   15   5   A29   .80
           5    3A        1.3       3.66       2.6       5.35   3     362.   .00415     .00    .00      0.   15   5   A29   .80
           5    4B         .4       1.13        .4       1.13   2     230.   .00826     .00    .00      0.   15   5   A29   .80
           5    5B         .6       1.69       1.0       2.29   3     489.   .00654     .00    .00      0.   15   5   A29   .80

**********************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    6A  TA 1158 QA     4.69 QAB     6.45 QB     1.76       5    6B  TB 1159 QB     1.82 QBA     6.46 QA     4.64
*
     *                                  5    6AB TAB 1159 QAB     6.46 QA     4.64 QB     1.82
*

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    6AB        1.0       1.82       3.6       6.46   0       0.   .00000     .00    .00      0.   15   0   A29   .00
           5    7C         .3        .85        .3        .85   2     136.   .01221     .00    .00      0.   15   5   A29   .80
           5    8C        1.3       3.66       1.6       4.28   3     464.   .00500     .00    .00      0.   15   5   A29   .80
           5    9D         .3        .85        .3        .85   2     170.   .00589     .00    .00      0.   15   5   A29   .80
           5    10D        .5       1.41        .8       1.88   3     206.   .00729     .00    .00      0.   15   5   A29   .80

**********************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    11C  TC 1158 QC     3.28 QCD     4.85 QD     1.57       5   11D  TD 1156 QD     1.70 QDC     4.57 QC     2.86
*
     *                                  5   11CD TCD 1158 QCD     4.85 QC     3.28 QD     1.57
*

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    11CD       .8       1.70       2.4       4.85   0       0.   .00000     .00    .00      0.   15   0   A29   .00
           5    12C        .2        .56       2.6       5.09   3     140.   .00569     .00    .00      0.   15   5   A29   .80
           5    13E        .3        .85        .3        .85   2     145.   .00620     .00    .00      0.   15   5   A29   .80
           5    14E        .2        .56        .5       1.11   3      92.   .00761     .00    .00      0.   15   5   A29   .80

**********************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    15C  TC 1159 QC     4.99 QCE     5.82 QE      .83       5   15E  TE 1156 QE     1.09 QEC     5.29 QC     4.19
*
     *                                  5   15CE TCE 1158 QCE     5.87 QC     4.92 QE      .96
*

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    15CE       .5       1.09       3.1       5.87   0       0.   .00000     .00    .00      0.   15   0   A29   .00
           5    16C        .3        .85       3.4       6.12   3     170.   .00707     .00    .00      0.   15   5   A29   .80

**********************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    17A  TA 1159 QA     6.46 QAC    12.48 QC     6.02       5   17C  TC 1160 QC     6.03 QCA    12.29 QA     6.26
*
     *                                  5   17AC TAC 1159 QAC    12.48 QA     6.46 QC     6.02
*

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    17AC       3.4       6.03       7.0      12.48   0       0.   .00000     .00    .00      0.   15   0   A29   .00
           5    18A        .0        .00        7.0      12.48   4      40.   .01000    2.00    .00      0.   15   1   A29   .80
           5    19F        .9       2.54        .9       2.54   2     350.   .00514     .00    .00      0.   15   5   A29   .80
           5    20F       2.6       7.33       3.5       8.27   3     490.   .00877     .00    .00      0.   15   5   A29   .80
           5    21F        .0        .00       3.5       8.89   4      10.   .10000    2.00    .00      0.   15   5   A29   .80

**********************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    22A  TA 1159 QA    12.46 QAF    18.72 QF     6.27       5   22F  TF 1157 QF     6.89 QFA    18.50 QA    11.61
*
     *                                  5   22AF TAF 1158 QAF    18.90 QA    12.21 QF     6.69
*

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV   CONTROL SOIL      RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    22AF       3.5       6.89      10.5      18.90   4     110.   .10000    2.00    .00      0.   15   0   A29   .00
           5    23A        .0        .00       10.5      18.86   0       0.   .00000     .00    .00      0.   15  90   A29   .00
```

```
Program Package Serial Number:  2187
05/27/14   FILE: day3     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units      PAGE      4
                                          LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                                  PROG F0601M

        Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50  SOIL DATA FILE: C:\civild\agr_soilx_71.dat
        DAISY                                                                                                                  STORM DAY 3
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV    CONV      CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE   SIZE(Ft)  %     Q(CFS) NAME  TC  ZONE  IMPV
           5    1A          .5       .41        .5       .41   2     233.   .01070      .00   .00      0.   15   6  A29   .80
           5    2A          .8       .73       1.3       .96   3     283.   .00495      .00   .00      0.   15   5  A29   .80
           5    3A         1.3      1.19       2.6      1.66   3     362.   .00415      .00   .00      0.   15   5  A29   .80
           5    4B          .4       .37        .4       .37   2     230.   .00826      .00   .00      0.   15   5  A29   .80
           5    5B          .6       .55       1.0       .73   3     489.   .00654      .00   .00      0.   15   5  A29   .80

**********************************************************************************************************************************
      *                                                    CONFLUENCE Q'S

      *     5    6A  TA 1159 QA     1.37 QAB     1.87 QB      .50       5    6B  TB 1161 QB      .54 QBA     1.87 QA     1.34

      *                                  5    6AB TAB 1160 QAB     1.90 QA     1.37 QB      .52

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV    CONV      CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE   SIZE(Ft)  %     Q(CFS) NAME  TC  ZONE  IMPV
           5    6AB        1.0       .54       3.6      1.90   0       0.   .00000      .00   .00      0.   15   0  A29   .00
           5    7C          .3       .27        .3       .27   2     136.   .01221      .00   .00      0.   15   5  A29   .80
           5    8C         1.3      1.19       1.6      1.38   3     464.   .00500      .00   .00      0.   15   5  A29   .80
           5    9D          .3       .27        .3       .27   2     170.   .00589      .00   .00      0.   15   5  A29   .80
           5   10D          .5       .46        .8       .60   3     206.   .00729      .00   .00      0.   15   5  A29   .80

**********************************************************************************************************************************
      *                                                    CONFLUENCE Q'S

      *     5   11C  TC 1160 QC      .97 QCD     1.41 QD      .44       5   11D  TD 1157 QD      .52 QDC     1.34 QC      .82

      *                                  5   11CD TCD 1159 QCD     1.44 QC      .96 QD      .49

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV    CONV      CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE   SIZE(Ft)  %     Q(CFS) NAME  TC  ZONE  IMPV
           5   11CD        .8       .52       2.4      1.44   0       0.   .00000      .00   .00      0.   15   0  A29   .00
           5   12C         .2       .18       2.6      1.49   3     140.   .00569      .00   .00      0.   15   5  A29   .80
           5   13E         .3       .27        .3       .27   2     145.   .00620      .00   .00      0.   15   5  A29   .80
           5   14E         .2       .18        .5       .35   3      92.   .00761      .00   .00      0.   15   5  A29   .80

**********************************************************************************************************************************
      *                                                    CONFLUENCE Q'S

      *     5   15C  TC 1161 QC     1.46 QCE     1.70 QE      .23       5   15E  TE 1156 QE      .34 QEC     1.37 QC     1.03

      *                                  5   15CE TCE 1160 QCE     1.71 QC     1.45 QE      .26

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV    CONV      CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE   SIZE(Ft)  %     Q(CFS) NAME  TC  ZONE  IMPV
           5   15CE        .5       .34       3.1      1.71   0       0.   .00000      .00   .00      0.   15   0  A29   .00
           5   16C         .3       .27       3.4      1.77   3     170.   .00707      .00   .00      0.   15   5  A29   .80

**********************************************************************************************************************************
      *                                                    CONFLUENCE Q'S

      *     5   17A  TA 1160 QA     1.90 QAC     3.56 QC     1.66       5   17C  TC 1162 QC     1.75 QCA     3.57 QA     1.82

      *                                  5   17AC TAC 1161 QAC     3.59 QA     1.87 QC     1.72

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV    CONV      CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE   SIZE(Ft)  %     Q(CFS) NAME  TC  ZONE  IMPV
           5   17AC        3.4      1.75       7.0      3.59   0       0.   .00000      .00   .00      0.   15   0  A29   .00
           5   18A         .0       .00       7.0      3.59   4      40.   .01000     2.00   .00      0.   15   1  A29   .80
           5   19F         .9       .82        .9       .82   2     350.   .00514      .00   .00      0.   15   5  A29   .80
           5   20F        2.6      2.37       3.5      2.66   3     490.   .00877      .00   .00      0.   15   5  A29   .80
           5   21F         .0       .00       3.5      2.09   4      10.   .10000     2.00   .00      0.   15   5  A29   .80

**********************************************************************************************************************************
      *                                                    CONFLUENCE Q'S

      *     5   22A  TA 1161 QA     3.59 QAF     5.39 QF     1.80       5   22F  TF 1158 QF     2.09 QFA     5.34 QA     3.26

      *                                  5   22AF TAF 1160 QAF     5.48 QA     3.54 QF     1.94

**********************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV    CONV      CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE   SIZE(Ft)  %     Q(CFS) NAME  TC  ZONE  IMPV
           5   22AF        3.5      2.09      10.5      5.48   4     110.   .10000     2.00   .00      0.   15   0  A29   .00
           5   23A         .0       .00      10.5      5.48   0       0.   .00000      .00   .00      0.   15  90  A29   .00
```

```
 Program Package Serial Number:  2187
05/27/14   FILE: day3     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units      PAGE      7
                                          LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                          PROG F0601M

          Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50  SOIL DATA FILE: C:\civild\sgr_soilx_71.dat
          DAISY                                                                                                                STORM DAY 2
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
          LOCATION        AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
             5    1A        .5       .47        .5       .47   2     233.   .01070      .00   .00       0.   15   6  A29   .80
             5    2A        .8       .84       1.3      1.11   3     283.   .00495      .00   .00       0.   15   5  A29   .80
             5    3A       1.3      1.37       2.6      1.93   3     362.   .00415      .00   .00       0.   15   5  A29   .80
             5    4B        .4       .42        .4       .42   2     230.   .00828      .00   .00       0.   15   5  A29   .80
             5    5B        .6       .63       1.0       .84   3     489.   .00654      .00   .00       0.   15   5  A29   .80

*****************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    6A  TA 1159 QA     1.61 QAB     2.20 QB      .60       5    6B  TB 1161 QB      .63 QBA     2.18 QA     1.55
*
     *                                 5    6AB TAB 1160 QAB     2.22 QA     1.60 QB      .62
*

*****************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
          LOCATION        AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
             5    6AB       1.0       .63       3.6      2.22   0       0.   .00000      .00   .00       0.   15   0  A29   .00
             5    7C        .3       .32        .3       .32   2     136.   .01221      .00   .00       0.   15   5  A29   .80
             5    8C       1.3      1.37       1.6      1.59   3     464.   .00500      .00   .00       0.   15   5  A29   .80
             5    9D        .3       .32        .3       .32   2     170.   .00589      .00   .00       0.   15   5  A29   .80
             5    10D       .5       .53        .8       .69   3     206.   .00729      .00   .00       0.   15   5  A29   .80

*****************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    11C  TC 1160 QC     1.13 QCD     1.64 QD      .51       5    11D  TD 1157 QD      .61 QDC     1.59 QC      .99
*
     *                                 5    11CD TCD 1159 QCD     1.69 QC     1.13 QD      .56
*

*****************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
          LOCATION        AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
             5    11CD      .8       .61       2.4      1.69   0       0.   .00000      .00   .00       0.   15   0  A29   .00
             5    12C       .2       .21       2.6      1.74   3     140.   .00569      .00   .00       0.   15   5  A29   .80
             5    13E       .3       .32        .3       .32   2     145.   .00620      .00   .00       0.   15   5  A29   .80
             5    14E       .2       .21        .5       .40   3      92.   .00761      .00   .00       0.   15   5  A29   .80

*****************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    15C  TC 1161 QC     1.71 QCE     1.97 QE      .26       5    15E  TE 1156 QE      .39 QEC     1.65 QC     1.26
*
     *                                 5    15CE TCE 1160 QCE     2.00 QC     1.71 QE      .30
*

*****************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
          LOCATION        AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
             5    15CE      .5       .39       3.1      2.00   0       0.   .00000      .00   .00       0.   15   0  A29   .00
             5    16C       .3       .32       3.4      2.08   3     170.   .00707      .00   .00       0.   15   5  A29   .80

*****************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    17A  TA 1160 QA     2.22 QAC     4.21 QC     1.99       5    17C  TC 1162 QC     2.05 QCA     4.16 QA     2.10
*
     *                                 5    17AC TAC 1161 QAC     4.22 QA     2.18 QC     2.04
*

*****************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
          LOCATION        AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
             5    17AC      3.4      2.05       7.0      4.22   0       0.   .00000      .00   .00       0.   15   0  A29   .00
             5    18A       .0       .00       7.0      4.22   4      40.   .01000     2.00   .00       0.   15   1  A29   .80
             5    19F       .9       .95        .9       .95   2     350.   .00514      .00   .00       0.   15   5  A29   .80
             5    20F      2.6      2.74       3.5      3.07   3     490.   .00877      .00   .00       0.   15   5  A29   .80
             5    21F       .0       .00       3.5      2.42   4      10.   .10000     2.00   .00       0.   15   5  A29   .80

*****************************************************************************************************************************
     *                                                    CONFLUENCE Q'S
*
     *     5    22A  TA 1161 QA     4.22 QAF     6.27 QF     2.05       5    22F  TF 1158 QF     2.42 QFA     6.32 QA     3.90
*
     *                                 5    22AF TAF 1159 QAF     6.43 QA     4.08 QF     2.35
*

*****************************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV   CONV   CONTROL SOIL        RAIN  PCT
          LOCATION        AREA(Ac)  Q(CFS)     AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
             5    22AF      3.5      2.42      10.5      6.43   4     110.   .10000     2.00   .00       0.   15   0  A29   .00
             5    23A       .0       .00       10.5      6.42   0       0.   .00000      .00   .00       0.   15  90  A29   .00
```

```
 Program Package Serial Number:  2187
05/27/14   FILE: day3     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE    10
                                     LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                                  PROG F0601M

        Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50  SOIL DATA FILE: C:\civild\sgr_soilx_71.dat
        DAISY                                                                                                                STORM DAY 1
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE    SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    1A          .5       .12        .5       .12   2     233.   .01070      .00   .00      0.   15   6   A29   .80
           5    2A          .8       .21       1.3       .28   3     283.   .00495      .00   .00      0.   15   5   A29   .80
           5    3A         1.3       .33       2.6       .43   3     362.   .00415      .00   .00      0.   15   5   A29   .80
           5    4B          .4       .10        .4       .10   2     230.   .00826      .00   .00      0.   15   5   A29   .80
           5    5B          .6       .15       1.0       .22   3     489.   .00654      .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
      *                                                  CONFLUENCE Q'S
*
      *     5    6A  TA 1162 QA      .29 QAB      .42 QB      .13       5    6B  TB 1165 QB      .14 QBA      .42 QA      .28
*
      *                                  5    6AB TAB 1164 QAB      .42 QA      .28 QB      .14
*

**********************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE    SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5    6AB        1.0       .14       3.6       .42   0       0.   .00000      .00   .00      0.   15   0   A29   .00
           5    7C          .3       .08        .3       .08   2     136.   .01221      .00   .00      0.   15   5   A29   .80
           5    8C         1.3       .33       1.6       .33   3     464.   .00500      .00   .00      0.   15   5   A29   .80
           5    9D          .3       .08        .3       .08   2     170.   .00589      .00   .00      0.   15   5   A29   .80
           5   10D          .5       .13        .8       .13   3     206.   .00729      .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
      *                                                  CONFLUENCE Q'S
*
      *     5   11C  TC 1162 QC      .21 QCD      .31 QD      .10       5   11D  TD 1157 QD      .11 QDC      .26 QC      .15
*
      *                                  5   11CD TCD 1162 QCD      .31 QC      .21 QD      .10
*

**********************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE    SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5   11CD        .8       .11       2.4       .31   0       0.   .00000      .00   .00      0.   15   0   A29   .00
           5   12C         .2       .05       2.6       .32   3     140.   .00569      .00   .00      0.   15   5   A29   .80
           5   13E         .3       .08        .3       .08   2     145.   .00620      .00   .00      0.   15   5   A29   .80
           5   14E         .2       .05        .5       .05   3      92.   .00761      .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
      *                                                  CONFLUENCE Q'S
*
      *     5   15C  TC 1165 QC      .32 QCE      .32 QE      .00       5   15E  TE    0 QE      .00 QEC      .00 QC      .00
*
      *                                  5   15CE TCE 1165 QCE      .32 QC      .32 QE      .00
*

**********************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE    SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5   15CE        .5       .00       3.1       .32   0       0.   .00000      .00   .00      0.   15   0   A29   .00
           5   16C         .3       .08       3.4       .33   3     170.   .00707      .00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
      *                                                  CONFLUENCE Q'S
*
      *     5   17A  TA 1164 QA      .42 QAC      .72 QC      .29       5   17C  TC 1168 QC      .32 QCA      .74 QA      .41
*
      *                                  5   17AC TAC 1167 QAC      .74 QA      .42 QC      .32
*

**********************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE    SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5   17AC        3.4       .32       7.0       .74   0       0.   .00000      .00   .00      0.   15   0   A29   .00
           5   18A         .0       .00       7.0       .74   4      40.   .01000     2.00   .00      0.   15   1   A29   .80
           5   19F         .9       .23        .9       .23   2     350.   .00514      .00   .00      0.   15   5   A29   .80
           5   20F        2.6       .67       3.5       .69   3     490.   .00877      .00   .00      0.   15   5   A29   .80
           5   21F         .0       .00       3.5       .50   4      10.   .10000     2.00   .00      0.   15   5   A29   .80

**********************************************************************************************************************
      *                                                  CONFLUENCE Q'S
*
      *     5   22A  TA 1167 QA      .74 QAF      1.11 QF      .37       5   22F  TF 1160 QF      .50 QFA      1.11 QA      .61
*
      *                                  5   22AF TAF 1163 QAF      1.16 QA      .70 QF      .46
*

**********************************************************************************************************************
                          SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV   CONTROL SOIL        RAIN  PCT
        LOCATION          AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE    SIZE(Ft)  Z     Q(CFS) NAME  TC  ZONE  IMPV
           5   22AF        3.5       .50      10.5      1.16   4     110.   .10000     2.00   .00      0.   15   0   A29   .00
           5   23A         .0       .00      10.5      1.16   0       0.   .00000      .00   .00      0.   15  90   A29   .00
```

Figure 8

50-Year Day 4 Developed Storm Volume

Program Package Serial Number: 2187
05/27/14 FILE: dsy3 INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 3

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

PROG F0601M

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE:

DAISY DEVELOPED HYDROGRAPH

HYDROGRAPH AT 5 23A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	.00	100	.55	200	.57	300	.60	400	.72
500	.79	600	.92	700	1.04	800	1.13	900	1.41
1000	1.87	1050	2.38	1100	3.35	1110	3.76	1120	4.36
1130	5.07	1131	5.14	1132	5.22	1133	5.30	1134	5.39
1135	5.48	1136	5.58	1137	5.70	1138	5.83	1139	5.96
1140	6.11	1141	6.26	1142	6.42	1143	6.60	1144	6.80
1145	7.03	1146	7.27	1147	7.54	1148	7.86	1149	8.22
1150	8.65	1151	9.26	1152	10.24	1153	11.63	1154	13.37
1155	15.38	1156	17.21	1157	18.38	1158	18.86	1159	18.77
1160	18.13	1161	17.13	1162	15.98	1163	14.79	1164	13.61
1165	12.47	1166	11.39	1167	10.40	1168	9.52	1169	8.74
1170	8.04	1171	7.45	1172	6.92	1173	6.46	1174	6.06
1175	5.70	1176	5.39	1177	5.12	1178	4.88	1179	4.67
1180	4.48	1181	4.30	1182	4.15	1183	4.01	1184	3.88
1185	3.77	1186	3.67	1187	3.58	1188	3.49	1189	3.41
1190	3.34	1191	3.27	1192	3.21	1193	3.15	1194	3.10
1195	3.05	1196	3.00	1197	2.95	1198	2.91	1199	2.86
1200	2.82	1201	2.79	1202	2.75	1203	2.70	1204	2.66
1205	2.61	1206	2.56	1207	2.52	1208	2.48	1209	2.44
1210	2.41	1211	2.39	1212	2.36	1213	2.34	1214	2.31
1215	2.28	1216	2.25	1217	2.19	1218	2.13	1219	2.08
1220	2.04	1221	2.01	1222	1.99	1223	1.97	1224	1.95
1225	1.93	1226	1.92	1227	1.90	1228	1.88	1229	1.86
1230	1.85	1231	1.84	1232	1.84	1233	1.82	1234	1.80
1235	1.78	1236	1.75	1237	1.72	1238	1.70	1239	1.69
1240	1.68	1241	1.67	1242	1.66	1243	1.65	1244	1.63
1245	1.62	1246	1.61	1247	1.60	1248	1.59	1249	1.58
1250	1.57	1251	1.55	1252	1.52	1253	1.49	1254	1.47
1255	1.44	1256	1.42	1257	1.40	1258	1.38	1259	1.36
1260	1.35	1261	1.33	1262	1.32	1263	1.31	1264	1.30
1265	1.29	1266	1.28	1267	1.27	1268	1.26	1269	1.25
1270	1.25	1271	1.24	1272	1.24	1273	1.23	1274	1.23
1275	1.22	1276	1.21	1277	1.21	1278	1.21	1279	1.20
1280	1.20	1281	1.19	1282	1.18	1283	1.18	1284	1.17
1285	1.17	1286	1.17	1287	1.17	1288	1.16	1289	1.16
1290	1.15	1291	1.14	1292	1.14	1293	1.13	1294	1.13
1295	1.12	1296	1.12	1297	1.12	1298	1.11	1299	1.11
1300	1.11	1310	1.08	1320	1.06	1330	.94	1340	.87
1350	.81	1360	.76	1370	.75	1380	.73	1390	.71
1400	.70	1420	.64	1440	.56	1460	.55	1500	.55

TOTAL VOLUME THIS HYDROGRAPH = 2.86(Ac.Ft)

Figure 9

50-Year Days 1-4 Basin Volume

```
                                        4DAY50.out

  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
---------------------------------------------------------------------
Study Date : 05/28/14 Input hydrograph file name : DSY3.HYD
Output hydrograph file name: 4day50.hin


User entry of depth-outflow-storage data
---------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
---------------------------------------------------------------------
---------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
---------------------------------------------------------------------
---------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)     (Ac.Ft)
---------------------------------------------------------------------
  0.000      0.000      0.000      0.000       0.000
  1.000      0.086      0.244      0.085       0.086
  2.000      0.113      0.258      0.113       0.113
  3.000      0.200      0.272      0.199       0.200
  4.000      0.291      0.285      0.291       0.291
  5.000      0.378      0.299      0.377       0.378
  6.000      0.448      1.500      0.446       0.449
  7.000      0.490      4.000      0.488       0.493
  8.000      0.586      5.630      0.582       0.590
  9.000      0.694      5.631      0.690       0.698
 10.000      0.816      5.632      0.812       0.820
 11.000      0.952      5.633      0.948       0.956
---------------------------------------------------------------------
                  Hydrograph Detention Basin Routing
Hydrograph at 5 23 A Storm Day: 1 Drainage Area =   10.50
Total flood hydrograph volume this storm day =    0.13 Ac. Ft.
---------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                   Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       0.3     0.6     0.9     1.2 (Ft.)
   0     0.0     0.0      0.000  O        |       |       |       |     0.0
 100     0.0     0.0      0.000  O        |       |       |       |     0.0
 200     0.0     0.0      0.000  O        |       |       |       |     0.0
 300     0.0     0.0      0.000  O        |       |       |       |     0.0
 400     0.0     0.0      0.000  O        |       |       |       |     0.0
 500     0.0     0.0      0.000  O        |       |       |       |     0.0
 600     0.0     0.0      0.000  O        |       |       |       |     0.0
 700     0.0     0.0      0.000  O        |       |       |       |     0.0
 800     0.0     0.0      0.000  O        |       |       |       |     0.0
 900     0.0     0.0      0.000  O        |       |       |       |     0.0
1000     0.0     0.0      0.000  O        |       |       |       |     0.0
1050     0.0     0.0      0.000  O        |       |       |       |     0.0
1100     0.0     0.0      0.000  O        |       |       |       |     0.0
1110     0.1     0.0      0.001  O I      |       |       |       |     0.0
1120     0.1     0.0      0.002  O I      |       |       |       |     0.0
1130     0.1     0.0      0.003  O I      |       |       |       |     0.0
1131     0.1     0.0      0.003  O I      |       |       |       |     0.0
1132     0.1     0.0      0.004  O I      |       |       |       |     0.0
1133     0.1     0.0      0.004  O I      |       |       |       |     0.0
1134     0.1     0.0      0.004  O I      |       |       |       |     0.0
1135     0.1     0.0      0.004  O I      |       |       |       |     0.0
1136     0.1     0.0      0.004  O I      |       |       |       |     0.0
1137     0.1     0.0      0.004  O I      |       |       |       |     0.0
1138     0.1     0.0      0.004  O I      |       |       |       |     0.1
1139     0.1     0.0      0.004  O I      |       |       |       |     0.1
1140     0.1     0.0      0.005  O I      |       |       |       |     0.1
1141     0.1     0.0      0.005  O I      |       |       |       |     0.1
1142     0.2     0.0      0.005  O    I   |       |       |       |     0.1
1143     0.2     0.0      0.005  O    I   |       |       |       |     0.1
1144     0.2     0.0      0.005  O    I   |       |       |       |     0.1
1145     0.2     0.0      0.006  O    I   |       |       |       |     0.1
1146     0.2     0.0      0.006  O    I   |       |       |       |     0.1
1147     0.3     0.0      0.006  O        I       |       |       |     0.1
1148     0.3     0.0      0.007  O        I       |       |       |     0.1

                                        Page 1
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```
1149    0.3    0.0    0.007  O       I        |        |        |        |      0.1
1150    0.3    0.0    0.008  O       I        |        |        |        |      0.1
1151    0.3    0.0    0.008  O       I        |        |        |        |      0.1
1152    0.3    0.0    0.008  O       I        |        |        |        |      0.1
1153    0.4    0.0    0.009  O       | I      |        |        |        |      0.1
1154    0.5    0.0    0.009  O       |    I   |        |        |        |      0.1
1155    0.6    0.0    0.010  O       |      I |        |        |        |      0.1
1156    0.7    0.0    0.011  O       |        | I      |        |        |      0.1
1157    0.8    0.0    0.012  O       |        |    I   |        |        |      0.1
1158    0.9    0.0    0.013  |O      |        |      I |        |        |      0.2
1159    1.0    0.0    0.015  |O      |        |        | I      |        |      0.2
1160    1.1    0.0    0.016  |O      |        |        |    I   |        |      0.2
1161    1.1    0.1    0.018  |O      |        |        |    I   |        |      0.2
1162    1.2    0.1    0.019  |O      |        |        |        |      I |      0.2
1163    1.2    0.1    0.021  |O      |        |        |        |      I |      0.2
1164    1.2    0.1    0.022  |O      |        |        |        |      I |      0.3
1165    1.1    0.1    0.024  |O      |        |        |    I   |        |      0.3
1166    1.1    0.1    0.025  |O      |        |        |    I   |        |      0.3
1167    1.1    0.1    0.027  | O     |        |        |    I   |        |      0.3
1168    1.1    0.1    0.028  | O     |        |        |    I   |        |      0.3
1169    1.1    0.1    0.029  | O     |        |        |    I   |        |      0.3
1170    1.1    0.1    0.031  | O     |        |        |    I   |        |      0.4
1171    1.0    0.1    0.032  | O     |        |        | I      |        |      0.4
1172    1.0    0.1    0.033  | O     |        |        | I      |        |      0.4
1173    1.0    0.1    0.035  | O     |        |        | I      |        |      0.4
1174    0.9    0.1    0.036  | O     |        |      I |        |        |      0.4
1175    0.9    0.1    0.037  | O     |        |      I |        |        |      0.4
1176    0.9    0.1    0.038  | O     |        |      I |        |        |      0.4
1177    0.9    0.1    0.039  | O     |        |      I |        |        |      0.5
1178    0.8    0.1    0.040  |  O    |        |    I   |        |        |      0.5
1179    0.8    0.1    0.041  |  O    |        |    I   |        |        |      0.5
1180    0.8    0.1    0.042  |  O    |        |    I   |        |        |      0.5
1181    0.8    0.1    0.043  |  O    |        |    I   |        |        |      0.5
1182    0.8    0.1    0.044  |  O    |        |    I   |        |        |      0.5
1183    0.8    0.1    0.045  |  O    |        |    I   |        |        |      0.5
1184    0.8    0.1    0.045  |  O    |        |    I   |        |        |      0.5
1185    0.7    0.1    0.046  |  O    |        | I      |        |        |      0.5
1186    0.7    0.1    0.047  |  O    |        | I      |        |        |      0.6
1187    0.7    0.1    0.048  |  O    |        | I      |        |        |      0.6
1188    0.7    0.1    0.049  |  O    |        | I      |        |        |      0.6
1189    0.7    0.1    0.049  |  O    |        | I      |        |        |      0.6
1190    0.7    0.1    0.050  |  O    |        | I      |        |        |      0.6
1191    0.7    0.1    0.051  |  O    |        | I      |        |        |      0.6
1192    0.7    0.1    0.052  |  O    |        | I      |        |        |      0.6
1193    0.7    0.1    0.052  |  O    |        | I      |        |        |      0.6
1194    0.6    0.2    0.053  |   O   |        I        |        |        |      0.6
1195    0.6    0.2    0.054  |   O   |        I        |        |        |      0.6
1196    0.6    0.2    0.054  |   O   |        I        |        |        |      0.6
1197    0.6    0.2    0.055  |   O   |        I        |        |        |      0.6
1198    0.6    0.2    0.055  |   O   |        I        |        |        |      0.6
1199    0.6    0.2    0.056  |   O   |        I        |        |        |      0.7
1200    0.6    0.2    0.057  |   O   |        I        |        |        |      0.7
1201    0.5    0.2    0.057  |   O   |      I  |        |        |        |      0.7
1202    0.5    0.2    0.058  |   O   |      I  |        |        |        |      0.7
1203    0.5    0.2    0.058  |   O   |      I  |        |        |        |      0.7
1204    0.5    0.2    0.059  |   O   |      I  |        |        |        |      0.7
1205    0.5    0.2    0.059  |   O   |      I  |        |        |        |      0.7
1206    0.5    0.2    0.059  |   O   |      I  |        |        |        |      0.7
1207    0.5    0.2    0.060  |   O   |      I  |        |        |        |      0.7
1208    0.5    0.2    0.060  |   O   |      I  |        |        |        |      0.7
1209    0.5    0.2    0.061  |   O   |      I  |        |        |        |      0.7
1210    0.5    0.2    0.061  |   O   |      I  |        |        |        |      0.7
1211    0.5    0.2    0.062  |   O   |      I  |        |        |        |      0.7
1212    0.5    0.2    0.062  |   O   |      I  |        |        |        |      0.7
1213    0.5    0.2    0.063  |   O   |      I  |        |        |        |      0.7
1214    0.5    0.2    0.063  |   O   |      I  |        |        |        |      0.7
1215    0.5    0.2    0.063  |   O   |      I  |        |        |        |      0.7
1216    0.5    0.2    0.064  |   O   |      I  |        |        |        |      0.7
1217    0.5    0.2    0.064  |   O   |      I  |        |        |        |      0.8
1218    0.5    0.2    0.065  |   O   |      I  |        |        |        |      0.8
1219    0.5    0.2    0.065  |   O   |      I  |        |        |        |      0.8
1220    0.5    0.2    0.066  |    O  |      I  |        |        |        |      0.8
1221    0.5    0.2    0.066  |    O  |      I  |        |        |        |      0.8
1222    0.5    0.2    0.067  |    O  |      I  |        |        |        |      0.8
1223    0.5    0.2    0.067  |    O  |      I  |        |        |        |      0.8
1224    0.5    0.2    0.067  |    O  |      I  |        |        |        |      0.8
1225    0.5    0.2    0.068  |    O  |      I  |        |        |        |      0.8
1226    0.5    0.2    0.068  |    O  |      I  |        |        |        |      0.8
1227    0.5    0.2    0.069  |    O  |      I  |        |        |        |      0.8
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1228    0.5     0.2     0.069  |    O  |    I  |       |       |     0.8
1229    0.5     0.2     0.069  |    O  |    I  |       |       |     0.8
1230    0.5     0.2     0.070  |    O  |    I  |       |       |     0.8
1231    0.5     0.2     0.070  |    O  |    I  |       |       |     0.8
1232    0.5     0.2     0.071  |    O  |    I  |       |       |     0.8
1233    0.5     0.2     0.071  |    O  |    I  |       |       |     0.8
1234    0.5     0.2     0.072  |    O  |    I  |       |       |     0.8
1235    0.5     0.2     0.072  |    O  |    I  |       |       |     0.8
1236    0.5     0.2     0.072  |    O  |    I  |       |       |     0.8
1237    0.5     0.2     0.073  |    O  |    I  |       |       |     0.9
1238    0.5     0.2     0.073  |    O  |    I  |       |       |     0.9
1239    0.5     0.2     0.074  |    O  |    I  |       |       |     0.9
1240    0.5     0.2     0.074  |    O  |    I  |       |       |     0.9
1241    0.5     0.2     0.074  |    O  |    I  |       |       |     0.9
1242    0.5     0.2     0.075  |    O  |    I  |       |       |     0.9
1243    0.5     0.2     0.075  |    O  |    I  |       |       |     0.9
1244    0.5     0.2     0.076  |    O  |    I  |       |       |     0.9
1245    0.5     0.2     0.076  |    O  |    I  |       |       |     0.9
1246    0.5     0.2     0.076  |    O  |    I  |       |       |     0.9
1247    0.5     0.2     0.077  |    O  |    I  |       |       |     0.9
1248    0.5     0.2     0.077  |    O  |    I  |       |       |     0.9
1249    0.5     0.2     0.077  |    O  |    I  |       |       |     0.9
1250    0.5     0.2     0.078  |    O  |    I  |       |       |     0.9
1251    0.5     0.2     0.078  |    O  |    I  |       |       |     0.9
1252    0.5     0.2     0.079  |    O  |    I  |       |       |     0.9
1253    0.4     0.2     0.079  |     O | I     |       |       |     0.9
1254    0.4     0.2     0.079  |     O | I     |       |       |     0.9
1255    0.4     0.2     0.079  |     O | I     |       |       |     0.9
1256    0.4     0.2     0.080  |     O | I     |       |       |     0.9
1257    0.4     0.2     0.080  |     O | I     |       |       |     0.9
1258    0.4     0.2     0.080  |     O | I     |       |       |     0.9
1259    0.4     0.2     0.080  |     O | I     |       |       |     0.9
1260    0.4     0.2     0.081  |     O | I     |       |       |     0.9
1261    0.4     0.2     0.081  |     O | I     |       |       |     0.9
1262    0.4     0.2     0.081  |     O | I     |       |       |     0.9
1263    0.4     0.2     0.081  |     O | I     |       |       |     0.9
1264    0.4     0.2     0.081  |     O | I     |       |       |     1.0
1265    0.4     0.2     0.082  |     O | I     |       |       |     1.0
1266    0.4     0.2     0.082  |     O | I     |       |       |     1.0
1267    0.4     0.2     0.082  |     O | I     |       |       |     1.0
1268    0.4     0.2     0.082  |     O | I     |       |       |     1.0
1269    0.4     0.2     0.083  |     O | I     |       |       |     1.0
1270    0.4     0.2     0.083  |     O | I     |       |       |     1.0
1271    0.4     0.2     0.083  |     O | I     |       |       |     1.0
1272    0.4     0.2     0.083  |     O | I     |       |       |     1.0
1273    0.4     0.2     0.083  |     O | I     |       |       |     1.0
1274    0.3     0.2     0.084  |     O I       |       |       |     1.0
1275    0.3     0.2     0.084  |     O I       |       |       |     1.0
1276    0.3     0.2     0.084  |     O I       |       |       |     1.0
1277    0.3     0.2     0.084  |     O I       |       |       |     1.0
1278    0.3     0.2     0.084  |     O I       |       |       |     1.0
1279    0.3     0.2     0.084  |     O I       |       |       |     1.0
1280    0.3     0.2     0.084  |     O I       |       |       |     1.0
1281    0.3     0.2     0.084  |     O I       |       |       |     1.0
1282    0.3     0.2     0.084  |     O I       |       |       |     1.0
1283    0.3     0.2     0.084  |     O I       |       |       |     1.0
1284    0.3     0.2     0.084  |     O I       |       |       |     1.0
1285    0.3     0.2     0.084  |     O I       |       |       |     1.0
1286    0.3     0.2     0.085  |     O I       |       |       |     1.0
1287    0.3     0.2     0.085  |     O I       |       |       |     1.0
1288    0.3     0.2     0.085  |     O I       |       |       |     1.0
1289    0.3     0.2     0.085  |     O I       |       |       |     1.0
1290    0.3     0.2     0.085  |     O I       |       |       |     1.0
1291    0.3     0.2     0.085  |     O I       |       |       |     1.0
1292    0.3     0.2     0.085  |     O I       |       |       |     1.0
1293    0.3     0.2     0.085  |     O I       |       |       |     1.0
1294    0.3     0.2     0.085  |     O I       |       |       |     1.0
1295    0.3     0.2     0.085  |     O I       |       |       |     1.0
1296    0.3     0.2     0.085  |     O I       |       |       |     1.0
1297    0.3     0.2     0.085  |     O I       |       |       |     1.0
1298    0.3     0.2     0.085  |     O I       |       |       |     1.0
1299    0.3     0.2     0.086  |     O I       |       |       |     1.0
1300    0.3     0.2     0.086  |     O I       |       |       |     1.0
1310    0.2     0.2     0.086  |    IO |       |       |       |     1.0
1320    0.1     0.2     0.084  | I   O |       |       |       |     1.0
1330    0.0     0.2     0.082  I     O |       |       |       |     1.0
1340    0.1     0.2     0.079  | I   O |       |       |       |     0.9
1350    0.0     0.2     0.077  I    O  |       |       |       |     0.9
1360    0.0     0.2     0.074  I    O  |       |       |       |     0.9
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 1370     0.0     0.2      0.071  I    O  |        |        |        |      0.8
 1380     0.0     0.2      0.068  I    O  |        |        |        |      0.8
 1390     0.0     0.2      0.066  I   O   |        |        |        |      0.8
 1400     0.0     0.2      0.063  I   O   |        |        |        |      0.7
 1420     0.0     0.2      0.058  I   O   |        |        |        |      0.7
 1440     0.0     0.2      0.054  I   O   |        |        |        |      0.6
 1460     0.0     0.1      0.050  I  O    |        |        |        |      0.6
 1500     0.1     0.1      0.045  | IO    |        |        |        |      0.5

      Remaining water in basin =    0.05 (Ac.Ft)
      Peak flow out of basin =     0.24(CFS)
      Peak flow time = 1310 Min., time interval # = 187
      Maximum depth in basin =    1.01(Ft.)

                    Hydrograph Detention Basin Routing
      Hydrograph at 5 23 A Storm Day: 2 Drainage Area =   10.50
      Total flood hydrograph volume this storm day =    0.80 Ac. Ft.
      ----------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------
Time   Inflow  Outflow    Storage                                   Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       1.6     3.2     4.8     6.4 (Ft.)
   0     0.0     0.1      0.045  O       |       |       |       |      0.5
 100     0.1     0.1      0.037  O       |       |       |       |      0.4
 200     0.1     0.1      0.036  O       |       |       |       |      0.4
 300     0.1     0.1      0.036  O       |       |       |       |      0.4
 400     0.1     0.1      0.036  O       |       |       |       |      0.4
 500     0.1     0.1      0.035  O       |       |       |       |      0.4
 600     0.1     0.1      0.035  O       |       |       |       |      0.4
 700     0.1     0.1      0.035  O       |       |       |       |      0.4
 800     0.2     0.1      0.041  OI      |       |       |       |      0.5
 900     0.2     0.1      0.051  OI      |       |       |       |      0.6
1000     0.5     0.2      0.075  |OI     |       |       |       |      0.9
1050     0.6     0.2      0.097  |O I    |       |       |       |      1.4
1100     0.9     0.3      0.131  |O  I   |       |       |       |      2.2
1110     1.1     0.3      0.141  |O   I  |       |       |       |      2.3
1120     1.3     0.3      0.154  |O    I |       |       |       |      2.5
1130     1.5     0.3      0.170  |O     I|       |       |       |      2.7
1131     1.6     0.3      0.172  |O      I       |       |       |      2.7
1132     1.6     0.3      0.174  |O      I       |       |       |      2.7
1133     1.6     0.3      0.176  |O      I       |       |       |      2.7
1134     1.7     0.3      0.178  |O      I       |       |       |      2.7
1135     1.7     0.3      0.180  |O      I       |       |       |      2.8
1136     1.8     0.3      0.182  |O      |I      |       |       |      2.8
1137     1.8     0.3      0.184  |O      |I      |       |       |      2.8
1138     1.9     0.3      0.186  |O      |I      |       |       |      2.8
1139     1.9     0.3      0.188  |O      |I      |       |       |      2.9
1140     2.0     0.3      0.191  |O      | I     |       |       |      2.9
1141     2.0     0.3      0.193  |O      | I     |       |       |      2.9
1142     2.1     0.3      0.196  |O      | I     |       |       |      3.0
1143     2.1     0.3      0.198  |O      | I     |       |       |      3.0
1144     2.2     0.3      0.201  |O      |  I    |       |       |      3.0
1145     2.3     0.3      0.204  |O      |  I    |       |       |      3.0
1146     2.4     0.3      0.206  |O      |   I   |       |       |      3.1
1147     2.5     0.3      0.210  |O      |   I   |       |       |      3.1
1148     2.6     0.3      0.213  |O      |    I  |       |       |      3.1
1149     2.8     0.3      0.216  |O      |     I |       |       |      3.2
1150     2.9     0.3      0.220  |O      |     I |       |       |      3.2
1151     3.1     0.3      0.224  |O      |      I|       |       |      3.3
1152     3.4     0.3      0.228  |O      |       |I      |       |      3.3
1153     3.7     0.3      0.233  |O      |       | I     |       |      3.4
1154     4.2     0.3      0.238  |O      |       |   I   |       |      3.4
1155     4.8     0.3      0.244  |O      |       |     I |       |      3.5
1156     5.4     0.3      0.251  |O      |       |       |  I    |      3.6
1157     5.9     0.3      0.259  |O      |       |       |    I  |      3.7
1158     6.3     0.3      0.267  |O      |       |       |     I|      3.7
1159     6.4     0.3      0.276  |O      |       |       |      I      3.8
1160     6.4     0.3      0.284  |O      |       |       |      I      3.9
1161     6.3     0.3      0.293  |O      |       |       |     I|      4.0
1162     6.1     0.3      0.301  |O      |       |       |    I |      4.1
1163     5.8     0.3      0.308  |O      |       |       |   I  |      4.2
1164     5.6     0.3      0.316  |O      |       |       |  I   |      4.3
1165     5.3     0.3      0.322  |O      |       |       | I    |      4.4
1166     5.0     0.3      0.329  |O      |       |       |I     |      4.4
1167     4.6     0.3      0.335  |O      |       |      I|      |      4.5
1168     4.3     0.3      0.340  |O      |       |    I  |      |      4.6
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1169	4.1	0.3	0.346	O			I			4.6
1170	3.8	0.3	0.350	O			I			4.7
1171	3.6	0.3	0.355	O			I			4.7
1172	3.3	0.3	0.359	O			I			4.8
1173	3.1	0.3	0.363	O			I			4.8
1174	3.0	0.3	0.367	O			I			4.9
1175	2.8	0.3	0.370	O			I			4.9
1176	2.6	0.3	0.373	O			I			5.0
1177	2.5	0.3	0.376	O			I			5.0
1178	2.4	0.3	0.379	O			I			5.0
1179	2.3	0.4	0.382	O			I			5.1
1180	2.2	0.4	0.384	O			I			5.1
1181	2.1	0.5	0.387	O		I				5.1
1182	2.1	0.5	0.389	O		I				5.2
1183	2.0	0.5	0.391	O		I				5.2
1184	1.9	0.6	0.393	O	I					5.2
1185	1.9	0.6	0.395	O	I					5.2
1186	1.8	0.6	0.396	O	I					5.3
1187	1.8	0.6	0.398	O	I					5.3
1188	1.7	0.7	0.399	O	I					5.3
1189	1.7	0.7	0.401	O	I					5.3
1190	1.7	0.7	0.402	O	I					5.4
1191	1.6	0.7	0.403	O	I					5.4
1192	1.6	0.8	0.404	O	I					5.4
1193	1.6	0.8	0.406	O	I					5.4
1194	1.6	0.8	0.407	O	I					5.4
1195	1.5	0.8	0.408	O	I					5.4
1196	1.5	0.8	0.409	O	I					5.4
1197	1.5	0.8	0.410	O	I					5.5
1198	1.4	0.9	0.410	O	I					5.5
1199	1.4	0.9	0.411	O	I					5.5
1200	1.4	0.9	0.412	O	I					5.5
1201	1.4	0.9	0.412	O	I					5.5
1202	1.4	0.9	0.413	O	I					5.5
1203	1.3	0.9	0.414	O	I					5.5
1204	1.3	0.9	0.414	O	I					5.5
1205	1.3	0.9	0.415	O	I					5.5
1206	1.3	0.9	0.415	O	I					5.5
1207	1.3	1.0	0.416	O	I					5.5
1208	1.3	1.0	0.416	O	I					5.6
1209	1.3	1.0	0.417	O	I					5.6
1210	1.2	1.0	0.417	O	I					5.6
1211	1.2	1.0	0.417	O	I					5.6
1212	1.2	1.0	0.418	O	I					5.6
1213	1.2	1.0	0.418	O	I					5.6
1214	1.2	1.0	0.418	O	I					5.6
1215	1.2	1.0	0.418	O	I					5.6
1216	1.2	1.0	0.419	O	I					5.6
1217	1.1	1.0	0.419	O						5.6
1218	1.1	1.0	0.419	O						5.6
1219	1.1	1.0	0.419	O						5.6
1220	1.1	1.0	0.419	O						5.6
1221	1.1	1.0	0.419	O						5.6
1222	1.1	1.0	0.419	O						5.6
1223	1.1	1.0	0.420	O						5.6
1224	1.1	1.0	0.420	O						5.6
1225	1.0	1.0	0.420	O						5.6
1226	1.0	1.0	0.420	O						5.6
1227	1.0	1.0	0.420	O						5.6
1228	1.0	1.0	0.420	O						5.6
1229	1.0	1.0	0.419	O						5.6
1230	1.0	1.0	0.419	O						5.6
1231	1.0	1.0	0.419	O						5.6
1232	1.0	1.0	0.419	O						5.6
1233	1.0	1.0	0.419	O						5.6
1234	1.0	1.0	0.419	O						5.6
1235	1.0	1.0	0.419	O						5.6
1236	1.0	1.0	0.419	O						5.6
1237	1.0	1.0	0.419	O						5.6
1238	1.0	1.0	0.419	O						5.6
1239	1.0	1.0	0.419	O						5.6
1240	1.0	1.0	0.419	O						5.6
1241	1.0	1.0	0.419	O						5.6
1242	1.0	1.0	0.419	O						5.6
1243	1.0	1.0	0.419	O						5.6
1244	1.0	1.0	0.419	O						5.6
1245	1.0	1.0	0.419	O						5.6
1246	1.0	1.0	0.419	O						5.6
1247	1.0	1.0	0.419	O						5.6

1248	0.9	1.0	0.419	IO				5.6
1249	0.9	1.0	0.419	IO				5.6
1250	0.9	1.0	0.419	IO				5.6
1251	0.9	1.0	0.419	IO				5.6
1252	0.9	1.0	0.418	O				5.6
1253	0.9	1.0	0.418	O				5.6
1254	0.9	1.0	0.418	O				5.6
1255	0.8	1.0	0.418	O				5.6
1256	0.8	1.0	0.418	O				5.6
1257	0.8	1.0	0.417	O				5.6
1258	0.8	1.0	0.417	O				5.6
1259	0.8	1.0	0.417	O				5.6
1260	0.8	1.0	0.417	O				5.6
1261	0.8	1.0	0.416	O				5.6
1262	0.8	1.0	0.416	O				5.6
1263	0.8	1.0	0.416	O				5.5
1264	0.8	1.0	0.416	O				5.5
1265	0.8	1.0	0.416	O				5.5
1266	0.8	0.9	0.415	O				5.5
1267	0.8	0.9	0.415	O				5.5
1268	0.8	0.9	0.415	O				5.5
1269	0.8	0.9	0.415	O				5.5
1270	0.8	0.9	0.415	O				5.5
1271	0.7	0.9	0.414	IO				5.5
1272	0.7	0.9	0.414	IO				5.5
1273	0.7	0.9	0.414	IO				5.5
1274	0.7	0.9	0.413	IO				5.5
1275	0.7	0.9	0.413	IO				5.5
1276	0.7	0.9	0.413	IO				5.5
1277	0.6	0.9	0.412	IO				5.5
1278	0.6	0.9	0.412	IO				5.5
1279	0.6	0.9	0.412	IO				5.5
1280	0.6	0.9	0.411	IO				5.5
1281	0.6	0.9	0.411	IO				5.5
1282	0.6	0.9	0.410	IO				5.5
1283	0.6	0.9	0.410	IO				5.5
1284	0.6	0.9	0.410	IO				5.5
1285	0.6	0.8	0.409	IO				5.5
1286	0.6	0.8	0.409	IO				5.4
1287	0.6	0.8	0.409	IO				5.4
1288	0.6	0.8	0.408	IO				5.4
1289	0.6	0.8	0.408	IO				5.4
1290	0.6	0.8	0.408	IO				5.4
1291	0.6	0.8	0.407	IO				5.4
1292	0.6	0.8	0.407	IO				5.4
1293	0.6	0.8	0.407	IO				5.4
1294	0.6	0.8	0.407	O				5.4
1295	0.6	0.8	0.406	O				5.4
1296	0.6	0.8	0.406	O				5.4
1297	0.6	0.8	0.406	O				5.4
1298	0.6	0.8	0.406	O				5.4
1299	0.6	0.8	0.405	O				5.4
1300	0.6	0.8	0.405	O				5.4
1310	0.6	0.7	0.403	O				5.4
1320	0.5	0.7	0.401	IO				5.3
1330	0.5	0.7	0.398	IO				5.3
1340	0.4	0.6	0.396	IO				5.3
1350	0.3	0.6	0.392	IO				5.2
1360	0.2	0.5	0.389	IO				5.2
1370	0.2	0.4	0.385	IO				5.1
1380	0.2	0.4	0.382	O				5.1
1390	0.2	0.3	0.380	O				5.0
1400	0.2	0.3	0.378	O				5.0
1420	0.2	0.3	0.376	O				5.0
1440	0.2	0.3	0.373	O				4.9
1460	0.2	0.3	0.370	O				4.9
1500	0.1	0.3	0.362	IO				4.8

```
Remaining water in basin =    0.36 (Ac.Ft)
Peak flow out of basin =     1.02(CFS)
Peak flow time = 1224 Min., time interval # = 110
Maximum depth in basin =    5.60(Ft.)

                Hydrograph Detention Basin Routing
Hydrograph at 5 23 A Storm Day: 3 Drainage Area =   10.50
Total flood hydrograph volume this storm day =    0.60 Ac. Ft.
-----------------------------------------------------------------------
```

4DAY50.out

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Min)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	Depth (Ft.)
0	0.0	0.3	0.362	4.8
100	0.0	0.3	0.322	4.4
200	0.0	0.3	0.282	3.9
300	0.0	0.3	0.244	3.5
400	0.1	0.3	0.212	3.1
500	0.1	0.3	0.189	2.9
600	0.1	0.3	0.166	2.6
700	0.1	0.3	0.143	2.3
800	0.1	0.3	0.121	2.1
900	0.2	0.3	0.106	1.8
1000	0.2	0.3	0.099	1.5
1050	0.5	0.3	0.106	1.7
1100	0.7	0.3	0.129	2.2
1110	0.8	0.3	0.136	2.3
1120	1.0	0.3	0.145	2.4
1130	1.3	0.3	0.158	2.5
1131	1.3	0.3	0.159	2.5
1132	1.3	0.3	0.160	2.5
1133	1.4	0.3	0.162	2.6
1134	1.4	0.3	0.164	2.6
1135	1.4	0.3	0.165	2.6
1136	1.4	0.3	0.167	2.6
1137	1.5	0.3	0.168	2.6
1138	1.5	0.3	0.170	2.7
1139	1.6	0.3	0.172	2.7
1140	1.6	0.3	0.174	2.7
1141	1.7	0.3	0.176	2.7
1142	1.7	0.3	0.178	2.7
1143	1.8	0.3	0.180	2.8
1144	1.8	0.3	0.182	2.8
1145	1.9	0.3	0.184	2.8
1146	2.0	0.3	0.187	2.9
1147	2.0	0.3	0.189	2.9
1148	2.1	0.3	0.191	2.9
1149	2.2	0.3	0.194	2.9
1150	2.4	0.3	0.197	3.0
1151	2.6	0.3	0.200	3.0
1152	2.8	0.3	0.204	3.0
1153	3.1	0.3	0.208	3.1
1154	3.5	0.3	0.212	3.1
1155	4.0	0.3	0.217	3.2
1156	4.5	0.3	0.223	3.3
1157	5.0	0.3	0.230	3.3
1158	5.3	0.3	0.236	3.4
1159	5.5	0.3	0.244	3.5
1160	5.5	0.3	0.251	3.6
1161	5.4	0.3	0.258	3.6
1162	5.3	0.3	0.265	3.7
1163	5.1	0.3	0.271	3.8
1164	4.9	0.3	0.278	3.9
1165	4.6	0.3	0.284	3.9
1166	4.4	0.3	0.289	4.0
1167	4.1	0.3	0.295	4.0
1168	3.9	0.3	0.300	4.1
1169	3.6	0.3	0.304	4.2
1170	3.4	0.3	0.309	4.2
1171	3.2	0.3	0.313	4.3
1172	3.0	0.3	0.316	4.3
1173	2.8	0.3	0.320	4.3
1174	2.7	0.3	0.323	4.4
1175	2.5	0.3	0.326	4.4
1176	2.4	0.3	0.329	4.4
1177	2.3	0.3	0.332	4.5
1178	2.2	0.3	0.334	4.5
1179	2.1	0.3	0.337	4.5
1180	2.0	0.3	0.339	4.6
1181	1.9	0.3	0.341	4.6
1182	1.9	0.3	0.344	4.6
1183	1.8	0.3	0.346	4.6
1184	1.8	0.3	0.348	4.7
1185	1.7	0.3	0.350	4.7
1186	1.7	0.3	0.352	4.7
1187	1.6	0.3	0.353	4.7
1188	1.6	0.3	0.355	4.7

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1189    1.6    0.3    0.357  |O      I|       |       |       |      4.8
1190    1.5    0.3    0.359  |O     I|       |       |       |      4.8
1191    1.5    0.3    0.360  |O     I|       |       |       |      4.8
1192    1.5    0.3    0.362  |O     I|       |       |       |      4.8
1193    1.4    0.3    0.364  |O     I|       |       |       |      4.8
1194    1.4    0.3    0.365  |O     I|       |       |       |      4.9
1195    1.4    0.3    0.367  |O     I|       |       |       |      4.9
1196    1.3    0.3    0.368  |O    I |       |       |       |      4.9
1197    1.3    0.3    0.369  |O    I |       |       |       |      4.9
1198    1.3    0.3    0.371  |O    I |       |       |       |      4.9
1199    1.3    0.3    0.372  |O    I |       |       |       |      4.9
1200    1.3    0.3    0.373  |O    I |       |       |       |      5.0
1201    1.2    0.3    0.375  |O    I |       |       |       |      5.0
1202    1.2    0.3    0.376  |O    I |       |       |       |      5.0
1203    1.2    0.3    0.377  |O    I |       |       |       |      5.0
1204    1.2    0.3    0.378  |O    I |       |       |       |      5.0
1205    1.1    0.3    0.380  |O   I  |       |       |       |      5.0
1206    1.1    0.4    0.381  |O   I  |       |       |       |      5.0
1207    1.1    0.4    0.382  |O   I  |       |       |       |      5.1
1208    1.0    0.4    0.382  |O   I  |       |       |       |      5.1
1209    1.0    0.4    0.383  |O   I  |       |       |       |      5.1
1210    1.0    0.4    0.384  | O  I  |       |       |       |      5.1
1211    1.0    0.4    0.385  | O  I  |       |       |       |      5.1
1212    1.0    0.4    0.386  | O  I  |       |       |       |      5.1
1213    1.0    0.5    0.386  | O  I  |       |       |       |      5.1
1214    1.0    0.5    0.387  | O  I  |       |       |       |      5.1
1215    0.9    0.5    0.388  | O I   |       |       |       |      5.1
1216    0.9    0.5    0.388  | O I   |       |       |       |      5.2
1217    0.9    0.5    0.389  | O I   |       |       |       |      5.2
1218    0.9    0.5    0.389  | O I   |       |       |       |      5.2
1219    0.9    0.5    0.390  | O I   |       |       |       |      5.2
1220    0.9    0.5    0.391  | O I   |       |       |       |      5.2
1221    0.9    0.5    0.391  | O I   |       |       |       |      5.2
1222    0.9    0.5    0.392  | O I   |       |       |       |      5.2
1223    0.9    0.5    0.392  | O I   |       |       |       |      5.2
1224    0.9    0.6    0.393  | O I   |       |       |       |      5.2
1225    0.9    0.6    0.393  | O I   |       |       |       |      5.2
1226    0.9    0.6    0.393  | O I   |       |       |       |      5.2
1227    0.9    0.6    0.394  | O I   |       |       |       |      5.2
1228    0.9    0.6    0.394  | O I   |       |       |       |      5.2
1229    0.8    0.6    0.395  | O I   |       |       |       |      5.2
1230    0.8    0.6    0.395  | O I   |       |       |       |      5.2
1231    0.8    0.6    0.395  |  OI   |       |       |       |      5.3
1232    0.8    0.6    0.395  |  OI   |       |       |       |      5.3
1233    0.8    0.6    0.396  |  OI   |       |       |       |      5.3
1234    0.8    0.6    0.396  |  OI   |       |       |       |      5.3
1235    0.8    0.6    0.396  |  OI   |       |       |       |      5.3
1236    0.8    0.6    0.396  |  OI   |       |       |       |      5.3
1237    0.8    0.6    0.397  |  OI   |       |       |       |      5.3
1238    0.8    0.6    0.397  |  OI   |       |       |       |      5.3
1239    0.8    0.6    0.397  |  OI   |       |       |       |      5.3
1240    0.8    0.6    0.397  |  OI   |       |       |       |      5.3
1241    0.8    0.6    0.398  |  OI   |       |       |       |      5.3
1242    0.8    0.6    0.398  |  OI   |       |       |       |      5.3
1243    0.8    0.7    0.398  |  OI   |       |       |       |      5.3
1244    0.8    0.7    0.398  |  OI   |       |       |       |      5.3
1245    0.8    0.7    0.398  |  OI   |       |       |       |      5.3
1246    0.8    0.7    0.399  |  OI   |       |       |       |      5.3
1247    0.8    0.7    0.399  |  OI   |       |       |       |      5.3
1248    0.8    0.7    0.399  |  OI   |       |       |       |      5.3
1249    0.8    0.7    0.399  |  OI   |       |       |       |      5.3
1250    0.8    0.7    0.399  |  OI   |       |       |       |      5.3
1251    0.8    0.7    0.400  |  OI   |       |       |       |      5.3
1252    0.8    0.7    0.400  |  OI   |       |       |       |      5.3
1253    0.8    0.7    0.400  |  OI   |       |       |       |      5.3
1254    0.8    0.7    0.400  |  OI   |       |       |       |      5.3
1255    0.8    0.7    0.400  |  OI   |       |       |       |      5.3
1256    0.8    0.7    0.400  |  OI   |       |       |       |      5.3
1257    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1258    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1259    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1260    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1261    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1262    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1263    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1264    0.8    0.7    0.401  |  OI   |       |       |       |      5.3
1265    0.8    0.7    0.402  |  OI   |       |       |       |      5.3
1266    0.8    0.7    0.402  |  OI   |       |       |       |      5.3
1267    0.8    0.7    0.402  |  OI   |       |       |       |      5.3
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1268	0.7	0.7	0.402	O				5.3
1269	0.7	0.7	0.402	O				5.3
1270	0.7	0.7	0.402	O				5.3
1271	0.7	0.7	0.402	O				5.3
1272	0.6	0.7	0.402	O				5.3
1273	0.6	0.7	0.401	O				5.3
1274	0.6	0.7	0.401	O				5.3
1275	0.6	0.7	0.401	O				5.3
1276	0.6	0.7	0.401	O				5.3
1277	0.6	0.7	0.401	O				5.3
1278	0.6	0.7	0.401	O				5.3
1279	0.6	0.7	0.401	O				5.3
1280	0.5	0.7	0.400	IO				5.3
1281	0.5	0.7	0.400	IO				5.3
1282	0.5	0.7	0.400	IO				5.3
1283	0.5	0.7	0.400	IO				5.3
1284	0.5	0.7	0.399	IO				5.3
1285	0.5	0.7	0.399	IO				5.3
1286	0.5	0.7	0.399	IO				5.3
1287	0.5	0.7	0.399	IO				5.3
1288	0.5	0.7	0.398	IO				5.3
1289	0.5	0.7	0.398	IO				5.3
1290	0.5	0.6	0.398	IO				5.3
1291	0.5	0.6	0.398	IO				5.3
1292	0.5	0.6	0.398	IO				5.3
1293	0.5	0.6	0.397	IO				5.3
1294	0.5	0.6	0.397	IO				5.3
1295	0.5	0.6	0.397	IO				5.3
1296	0.4	0.6	0.397	IO				5.3
1297	0.4	0.6	0.396	IO				5.3
1298	0.4	0.6	0.396	IO				5.3
1299	0.4	0.6	0.396	IO				5.3
1300	0.4	0.6	0.396	IO				5.3
1310	0.4	0.6	0.393	O				5.2
1320	0.4	0.5	0.391	O				5.2
1330	0.3	0.5	0.389	IO				5.2
1340	0.2	0.4	0.386	IO				5.1
1350	0.1	0.4	0.382	IO				5.1
1360	0.1	0.3	0.379	IO				5.0
1370	0.1	0.3	0.376	IO				5.0
1380	0.0	0.3	0.372	IO				4.9
1390	0.1	0.3	0.369	IO				4.9
1400	0.0	0.3	0.366	IO				4.9
1420	0.1	0.3	0.359	IO				4.8
1440	0.0	0.3	0.352	IO				4.7
1460	0.0	0.3	0.344	IO				4.6
1500	0.3	0.3	0.336	O				4.5

Remaining water in basin = 0.34 (Ac.Ft)
Peak flow out of basin = 0.72(CFS)
Peak flow time = 1267 Min., time interval # = 153
Maximum depth in basin = 5.35(Ft.)

Hydrograph Detention Basin Routing
Hydrograph at 5 23 A Storm Day: 4 Drainage Area = 10.50
Total flood hydrograph volume this storm day = 2.87 Ac. Ft.

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Min)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	4.7	9.4	14.2	18.9	Depth (Ft.)
0	0.0	0.3	0.336	O					4.5
100	0.6	0.3	0.338	OI					4.5
200	0.6	0.3	0.380	OI					5.0
300	0.6	0.6	0.394	OI					5.2
400	0.7	0.7	0.399	O					5.3
500	0.8	0.8	0.404	O					5.4
600	0.9	0.9	0.410	O					5.5
700	1.0	1.0	0.416	O					5.5
800	1.1	1.1	0.422	O					5.6
900	1.4	1.3	0.435	O					5.8
1000	1.9	1.8	0.453	O					6.1
1050	2.4	2.3	0.461	OI					6.3
1100	3.4	3.2	0.476	O					6.7
1110	3.8	3.4	0.481	OI					6.8
1120	4.4	3.8	0.488	OI					6.9

1130	5.1	4.1	0.498		7.1
1131	5.1	4.2	0.499		7.1
1132	5.2	4.2	0.501		7.1
1133	5.3	4.2	0.502		7.1
1134	5.4	4.2	0.504		7.1
1135	5.5	4.3	0.506		7.2
1136	5.6	4.3	0.508		7.2
1137	5.7	4.3	0.509		7.2
1138	5.8	4.4	0.511		7.2
1139	6.0	4.4	0.514		7.2
1140	6.1	4.4	0.516		7.3
1141	6.3	4.5	0.519		7.3
1142	6.4	4.5	0.521		7.3
1143	6.6	4.6	0.524		7.4
1144	6.8	4.6	0.527		7.4
1145	7.0	4.7	0.530		7.4
1146	7.3	4.7	0.534		7.5
1147	7.5	4.8	0.538		7.5
1148	7.9	4.9	0.542		7.5
1149	8.2	5.0	0.546		7.6
1150	8.7	5.0	0.551		7.6
1151	9.3	5.1	0.557		7.7
1152	10.2	5.3	0.564		7.8
1153	11.6	5.4	0.573		7.9
1154	13.4	5.6	0.584		8.0
1155	15.4	5.6	0.597		8.1
1156	17.2	5.6	0.613		8.3
1157	18.4	5.6	0.631		8.4
1158	18.9	5.6	0.649		8.6
1159	18.8	5.6	0.667		8.7
1160	18.1	5.6	0.684		8.9
1161	17.1	5.6	0.700		9.0
1162	16.0	5.6	0.714		9.2
1163	14.8	5.6	0.727		9.3
1164	13.6	5.6	0.738		9.4
1165	12.5	5.6	0.747		9.4
1166	11.4	5.6	0.755		9.5
1167	10.4	5.6	0.762		9.6
1168	9.5	5.6	0.767		9.6
1169	8.7	5.6	0.771		9.6
1170	8.0	5.6	0.775		9.7
1171	7.4	5.6	0.777		9.7
1172	6.9	5.6	0.779		9.7
1173	6.5	5.6	0.780		9.7
1174	6.1	5.6	0.781		9.7
1175	5.7	5.6	0.781		9.7
1176	5.4	5.6	0.780		9.7
1177	5.1	5.6	0.780		9.7
1178	4.9	5.6	0.779		9.7
1179	4.7	5.6	0.777		9.7
1180	4.5	5.6	0.776		9.7
1181	4.3	5.6	0.774		9.7
1182	4.2	5.6	0.772		9.6
1183	4.0	5.6	0.770		9.6
1184	3.9	5.6	0.767		9.6
1185	3.8	5.6	0.765		9.6
1186	3.7	5.6	0.762		9.6
1187	3.6	5.6	0.759		9.5
1188	3.5	5.6	0.757		9.5
1189	3.4	5.6	0.753		9.5
1190	3.3	5.6	0.750		9.5
1191	3.3	5.6	0.747		9.4
1192	3.2	5.6	0.744		9.4
1193	3.2	5.6	0.740		9.4
1194	3.1	5.6	0.737		9.3
1195	3.0	5.6	0.733		9.3
1196	3.0	5.6	0.730		9.3
1197	3.0	5.6	0.726		9.3
1198	2.9	5.6	0.722		9.2
1199	2.9	5.6	0.718		9.2
1200	2.8	5.6	0.715		9.2
1201	2.8	5.6	0.711		9.1
1202	2.7	5.6	0.707		9.1
1203	2.7	5.6	0.703		9.1
1204	2.7	5.6	0.699		9.0
1205	2.6	5.6	0.694		9.0
1206	2.6	5.6	0.690		9.0
1207	2.5	5.6	0.686		8.9
1208	2.5	5.6	0.682		8.9

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1209    2.4    5.6    0.677  |   I   |O      |       |       |     8.8
1210    2.4    5.6    0.673  |   I   |O      |       |       |     8.8
1211    2.4    5.6    0.668  |   I   |O      |       |       |     8.8
1212    2.4    5.6    0.664  |   I   |O      |       |       |     8.7
1213    2.3    5.6    0.659  |  I    |O      |       |       |     8.7
1214    2.3    5.6    0.655  |  I    |O      |       |       |     8.6
1215    2.3    5.6    0.650  |  I    |O      |       |       |     8.6
1216    2.2    5.6    0.645  |  I    |O      |       |       |     8.5
1217    2.2    5.6    0.641  |  I    |O      |       |       |     8.5
1218    2.1    5.6    0.636  |  I    |O      |       |       |     8.5
1219    2.1    5.6    0.631  |  I    |O      |       |       |     8.4
1220    2.0    5.6    0.626  |  I    |O      |       |       |     8.4
1221    2.0    5.6    0.621  |  I    |O      |       |       |     8.3
1222    2.0    5.6    0.616  |  I    |O      |       |       |     8.3
1223    2.0    5.6    0.611  |  I    |O      |       |       |     8.2
1224    1.9    5.6    0.606  |  I    |O      |       |       |     8.2
1225    1.9    5.6    0.601  |  I    |O      |       |       |     8.1
1226    1.9    5.6    0.595  |  I    |O      |       |       |     8.1
1227    1.9    5.6    0.590  |  I    |O      |       |       |     8.0
1228    1.9    5.6    0.585  |  I    |O      |       |       |     8.0
1229    1.9    5.5    0.580  |  I    |O      |       |       |     7.9
1230    1.9    5.4    0.575  |  I    |O      |       |       |     7.9
1231    1.8    5.4    0.570  |  I    |O      |       |       |     7.8
1232    1.8    5.3    0.565  |  I    O       |       |       |     7.8
1233    1.8    5.2    0.561  |  I    O       |       |       |     7.7
1234    1.8    5.1    0.556  |  I    O       |       |       |     7.7
1235    1.8    5.0    0.551  |  I    O       |       |       |     7.6
1236    1.7    5.0    0.547  | I     O       |       |       |     7.6
1237    1.7    4.9    0.542  | I     O       |       |       |     7.5
1238    1.7    4.8    0.538  | I     O       |       |       |     7.5
1239    1.7    4.7    0.534  | I     O       |       |       |     7.5
1240    1.7    4.7    0.530  | I    O|       |       |       |     7.4
1241    1.7    4.6    0.526  | I    O|       |       |       |     7.4
1242    1.7    4.5    0.522  | I    O|       |       |       |     7.3
1243    1.6    4.5    0.518  | I    O|       |       |       |     7.3
1244    1.6    4.4    0.514  | I    O|       |       |       |     7.2
1245    1.6    4.3    0.510  | I    O|       |       |       |     7.2
1246    1.6    4.3    0.506  | I    O|       |       |       |     7.2
1247    1.6    4.2    0.503  | I    O|       |       |       |     7.1
1248    1.6    4.2    0.499  | I    O|       |       |       |     7.1
1249    1.6    4.1    0.496  | I   O |       |       |       |     7.1
1250    1.6    4.0    0.492  | I   O |       |       |       |     7.0
1251    1.5    3.9    0.489  | I   O |       |       |       |     7.0
1252    1.5    3.7    0.486  | I   O |       |       |       |     6.9
1253    1.5    3.6    0.483  | I   O |       |       |       |     6.8
1254    1.5    3.4    0.480  | I  O  |       |       |       |     6.8
1255    1.4    3.2    0.477  | I  O  |       |       |       |     6.7
1256    1.4    3.1    0.475  | I  O  |       |       |       |     6.6
1257    1.4    3.0    0.473  | I  O  |       |       |       |     6.6
1258    1.4    2.8    0.471  | I O   |       |       |       |     6.5
1259    1.4    2.7    0.469  | I O   |       |       |       |     6.5
1260    1.3    2.6    0.467  | I O   |       |       |       |     6.4
1261    1.3    2.5    0.465  | I O   |       |       |       |     6.4
1262    1.3    2.4    0.463  | I O   |       |       |       |     6.4
1263    1.3    2.3    0.462  | IO    |       |       |       |     6.3
1264    1.3    2.3    0.461  | IO    |       |       |       |     6.3
1265    1.3    2.2    0.459  | IO    |       |       |       |     6.3
1266    1.3    2.1    0.458  | IO    |       |       |       |     6.2
1267    1.3    2.1    0.457  | IO    |       |       |       |     6.2
1268    1.3    2.0    0.456  | IO    |       |       |       |     6.2
1269    1.3    1.9    0.455  | IO    |       |       |       |     6.2
1270    1.2    1.9    0.454  | IO    |       |       |       |     6.2
1271    1.2    1.8    0.453  | IO    |       |       |       |     6.1
1272    1.2    1.8    0.452  | IO    |       |       |       |     6.1
1273    1.2    1.7    0.452  | O     |       |       |       |     6.1
1274    1.2    1.7    0.451  | O     |       |       |       |     6.1
1275    1.2    1.7    0.450  | O     |       |       |       |     6.1
1276    1.2    1.6    0.450  | O     |       |       |       |     6.0
1277    1.2    1.6    0.449  | O     |       |       |       |     6.0
1278    1.2    1.6    0.449  | O     |       |       |       |     6.0
1279    1.2    1.5    0.448  | O     |       |       |       |     6.0
1280    1.2    1.5    0.448  | O     |       |       |       |     6.0
1281    1.2    1.5    0.447  | O     |       |       |       |     6.0
1282    1.2    1.5    0.447  | O     |       |       |       |     6.0
1283    1.2    1.5    0.446  | O     |       |       |       |     6.0
1284    1.2    1.5    0.446  | O     |       |       |       |     6.0
1285    1.2    1.5    0.446  | O     |       |       |       |     6.0
1286    1.2    1.5    0.445  | O     |       |       |       |     6.0
1287    1.2    1.5    0.445  | O     |       |       |       |     6.0
```

1288	1.2	1.4	0.445	O					6.0
1289	1.2	1.4	0.444	O					6.0
1290	1.1	1.4	0.444	IO					5.9
1291	1.1	1.4	0.443	IO					5.9
1292	1.1	1.4	0.443	IO					5.9
1293	1.1	1.4	0.442	IO					5.9
1294	1.1	1.4	0.442	IO					5.9
1295	1.1	1.4	0.442	IO					5.9
1296	1.1	1.4	0.441	IO					5.9
1297	1.1	1.4	0.441	IO					5.9
1298	1.1	1.4	0.440	IO					5.9
1299	1.1	1.4	0.440	IO					5.9
1300	1.1	1.4	0.440	IO					5.9
1310	1.1	1.3	0.436	IO					5.8
1320	1.1	1.3	0.434	IO					5.8
1330	0.9	1.2	0.430	IO					5.8
1340	0.9	1.1	0.427	O					5.7
1350	0.8	1.1	0.423	O					5.6
1360	0.8	1.0	0.420	O					5.6
1370	0.7	1.0	0.416	O					5.6
1380	0.7	0.9	0.413	O					5.5
1390	0.7	0.9	0.410	O					5.5
1400	0.7	0.8	0.408	O					5.4
1420	0.6	0.8	0.404	O					5.4
1440	0.6	0.7	0.401	O					5.3
1460	0.6	0.7	0.399	O					5.3
1500	0.6	0.6	0.396	O					5.3

```
Remaining water in basin =    0.40 (Ac.Ft)
Peak flow out of basin =     5.63(CFS)
Peak flow time = 1175 Min., time interval # = 61
Maximum depth in basin =    9.71(Ft.)
```

Figure 10

Half Street Capacity Calculations

HALF STREET FLOW CALCULATIONS

A Street (north side)				C Street (North side)			
AREA	=	3.25		AREA	=	4.54	
WETTED PERIMETER	=	13.39		WETTED PERIMETER	=	21.51	
R= A/P	=	0.242718		R= A/P	=	0.211065	
SLOPE	=	0.005		SLOPE	=	0.006	
n	=	0.015		n	=	0.015	
		3					
Q	=	8.84061		Q	=	12.31927	
	25 yr	5.24	1.687139		25 yr	4.62	2.666508
	50yr	6.12	1.444544		50yr	5.35	2.302667

A Street (South side)				C Street (south side)			
AREA	=	4.54		AREA	=	3.25	
WETTED PERIMETER	=	21.51		WETTED PERIMETER	=	13.51	
R= A/P	=	0.211065		R= A/P	=	0.240563	
SLOPE	=	0.005		SLOPE	=	0.006	
n	=	0.015		n	=	0.015	
Q	=	11.2459		Q	=	9.626685	
	25 yr	7.16	1.570656		25 yr	1.98	4.861962
	50yr	8.27	1.359843		50yr	2.29	4.203793

Figure 11

Catch Basin Inlet Calculations

SUMP FORMULA -LOS ANGELES COUNTY FLOOD CONTROL DISTRICT		
PER CATCH BASIN CAPACITIES FOR SUMP CONDITION STD D-26		
8-INCH CURB FACE		
W=	LENGTH (FEET) OFCATCH BASIN OPENING =	3
A=	AREA OF OPENING (Wx0.656) =	1.97
D=	DEPTH (FEET) OF FLOW ABOVE NORMAL GUTTER GRADE=	0.833
Q=	4.3*A*D^0.6 (COMPLETE SUBMERGENCE)	7.58
8-INCH CURB FACE		
W=	LENGTH (FEET) OFCATCH BASIN OPENING =	3
A=	AREA OF OPENING (Wx0.656) =	1.97
D=	DEPTH (FEET) OF FLOW ABOVE NORMAL GUTTER GRADE=	0.15
Q=	4.3*A*D^0.6 (COMPLETE SUBMERGENCE)	2.71