OSBORN ROAD STORM DRAIN

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50% PLAN REVIEW DRAINAGE CALCULATIONS

AUGUST 13, 1999

DRAFT

Submitted to:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Submitted by:

PARSONS BRINCKERHOFF

Contract No. FCD 98-30

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Introduction

The enclosed calculations are submitted for review with the 50% plan submittal. The calculations do not represent the final design conditions of the proposed storm drain system between the Marriott Brighton Gardens detention basin and Indian Bend Wash. They are intended to support the information shown on the 50% plan submittal.

It is assumed the reader is familiar with the *Osborn Road Storm Drain, Final Alternative Analysis Report,* June 30, 1999 by Parsons Brinckerhoff. It is recommended that those unfamiliar with the report read it before continuing.

Hydrology

HEC-1 Models

The HEC-1 model developed for Alternative D, pbaltd.dat, was further modified as design continued on the project. Modifications included:

1) Addition of a hydrograph combine at the alley at 64th Street and Catalina Drive west of the Cross-Cut Canal. This hydrograph combination gives a design flow for proposed inlets in the alley.

2) Revision of the stage/storage/discharge curves for the Paiute Park detention basin.

3) Revision of the stage/storage/discharge curves for the Marriott Brighton Gardens detention basin.

4) Revision of routing cards to reflect changes in pipe roughness coefficients and pipe lengths.

It was necessary to create two HEC-1 models to estimate the performance of the Paiute Park detention basin. The performance of the basin is discussed in the next section. Printouts of both models are included.

Hydraulics

Paiute Park Detention Basin

While not yet finalized, the preliminary grading plan for the park has been refined and presented on the 50% plan submittal. The final grading of the detention basin will be finalized once the City of Scottsdale Recreation Department has approved the basin configuration. Issues to be resolved include the removal of the Scottsdale maintenance yard and the side slope treatments. The concept presented on the plans has the maintenance yard remaining in place and vertical retaining walls defining the north and south sides of the basin. The basin hydraulic calculations cannot be finalized until the final grading plan has been developed.

The stage/volume relationship has a significant impact on the operation of the detention basin. As graded, the detention basin has significantly more storage at lower elevations than the preliminary basin configuration used in the Alternative Analysis. The increase in storage at lower elevations causes the water level in the basin to rise more slowly during the storm. The water surface in the basin rises more slowly than the hydraulic grade line (HGL) in the storm drain downstream from the park. As a result, little or no outflow is expected in the basin during the first part of the storm.

Once the peak flows in the storm drain have begun to subside, outflow can be expected from the detention basin. This condition is confirmed using the HEC-1 model preald2.dat. In this model, the outflow from Paiute Park is modeled as a culvert under inlet control. The outflow curve was developed using HY8. The flows predicted by the HEC-1 model under these conditions are examined at discrete time steps. The flows calculated by the HEC-1 model are entered into the StormCad model of the system to evaluate hydraulic performance of the storm drain at discrete time steps.

Results of this analysis are included in a spreadsheet. The spreadsheet includes the time steps considered, flows at major inlets, the HGL at the Paiute Park inlet (as calculated by StormCad) and the water surface elevation in the detention basin (as calculated by HEC-1). The HGL at the inlet is compared to the water surface elevation in the park. If the water surface elevation in the park is lower than the HGL in the storm drain, the outflow calculated by HEC-1 cannot be as high as predicted by HEC-1. The spreadsheet shows the pipe hydraulics are controlling the situation during the first part of the storm. HEC-1 is not able to model changing downstream head conditions, so it is not possible to accurately model the outflow from the park.

A second HEC-1 model, preald.dat was developed to estimate the effect of the restricted outflow. In this model, the outflow from Paiute Park is set so that there is no outflow below elevation 1252.0. The lack of outflow causes the water surface in the basin to rise higher and faster than would be estimated in the model with an unrestricted outlet. The results of this model are used to estimate a maximum water surface in the basin.

In conclusion, the results of preald.dat (restricted outflow) should be used to estimate maximum water surface conditions in the Paiute Park detention basin. Results of this model are also used to predict flows in the storm drain downstream from the park. Backwater conditions in the storm drain are expected to nearly eliminate outflow from the park during the peak flows in the storm drain. Model preadl2.dat is useful for confirming the park does not have an unrestricted outflow. It also provides a relatively accurate idea of total basin drain time and peak flows at the outlet.

Marriott Brighton Gardens Detention Basin

The stage/storage relationship for the Marriott Brighton Gardens detention basin reflects the grading shown on the 50% plan submittal. The stage discharge relationship for the basin is the same relationship used in the original Kimley-Horn

hydrology study. The stage/storage/discharge relationships for the basin will be finalized once the grading plans have been reviewed. The outflow from this basin is 47 cfs, approximately half the outflow from Paiute Park. The storm drain between Marriott and the Cross-Cut Canal is relatively small diameter with minor constrains on the design. Few problems are anticipated in establishing a stage/discharge relationship at Marriott.

StormCad Models

The StormCad models have been updated for this submittal, but they have not been finalized. The models represent the trunk line as depicted on the plans. Inlets as shown on the plans are not included in the models. Inflows to the trunk line are represented as they were in the Alternative Analysis Report. Headloss calculations have not been revised from the Alternative Analysis. Headloss calculations will be revised as plan development progresses.

Once the grading plans are finalized for Paiute Park and Marriott Brighton Gardens, the HEC-1 models will be updated and the StormCad models finalized. Final StormCad models will include laterals and revised headloss calculations.

Inlets

Inlet design is finalized. Spreadsheets were used to calculate spread width, depth of flow, street capacities and inlet sizes. The spreadsheets identify the location of the inlets in the upper left corner.

Design flows at intersections were determined by proportioning the peak flows calculated by the HEC-1 models. Discrete areas were broken out of the original HEC-1 subbasins to determine flows at specific points of interest. The contributing areas were measured and proportional flows calculated. Spreadsheets and maps documenting these calculations are included with the calculations. For small areas (generally the south side of a street) the Rational Method was used to estimate peak flows. The calculations are included in the HEC-12 spreadsheets.

Inlets were designed to collect the 10-year flow while meeting spread criteria on streets where the trunk line parallels the centerline. These include 61st Street, Catalina Drive, Osborn Road, 71st Street and Earll Drive. On intersecting streets, (Pinto Lane, 68th Street, etc) inlets were designed to collect flow equal to the capacity of the street (curb full). The curb full collection criterion is intended to be an interim condition. Inlets on the intersecting streets will be connected to the trunk line with laterals sized to accommodate the 10-year design flow. In the future, the City of Scottsdale can connect additional inlets to the laterals to collect the full 10-year flow.

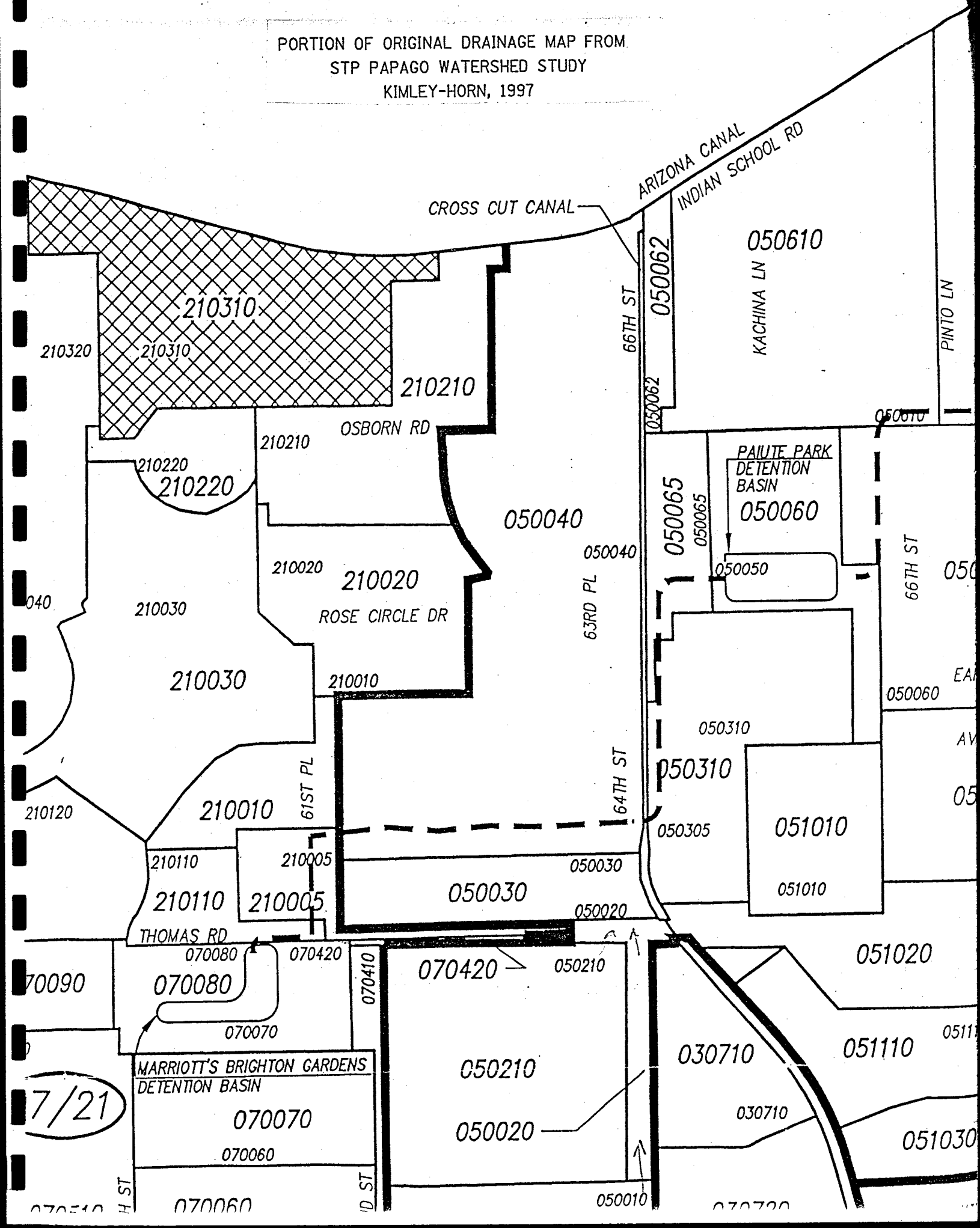
In most cases, the proposed inlets are City of Phoenix Standard Detail P-1569, wing length 17 feet. This is a 20-foot curb opening inlet with no grate. The maximum wing length of 17 feet is recommended in most locations to improve system performance during the interim condition. During the interim condition, large bypass flows are

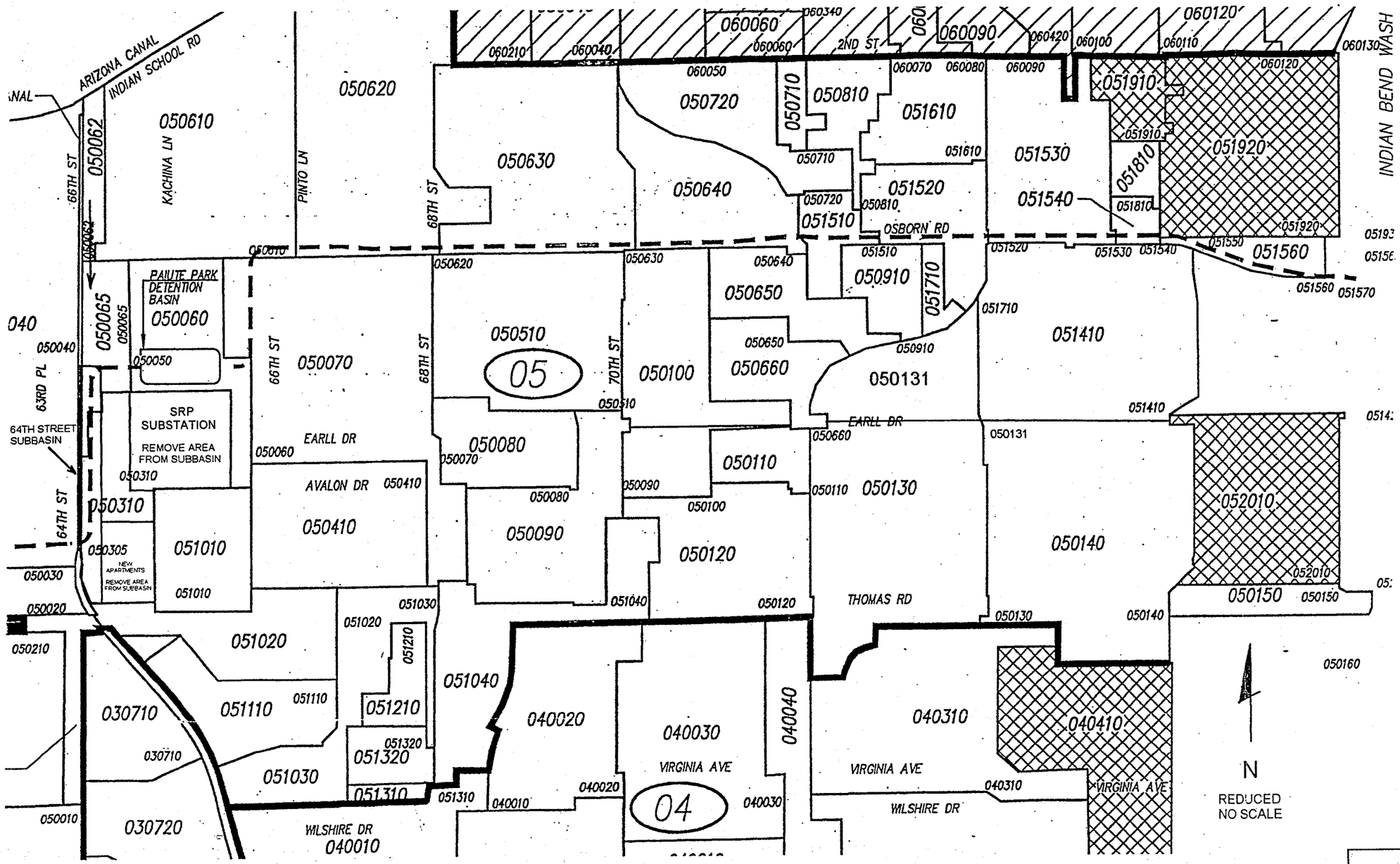
expected from the intersecting streets. Lengthening the wings on downstream catch basins will improve their interception of the bypass flows with very little increase in cost.

The inlets shown on Catalina Drive are not spaced to meet spread criteria. The street has such a low conveyance capacity that a nearly continuous inlet would be required to meet spread criteria. Two inlets are proposed on Catalina Drive to collect nuisance flows.

HEC-1 Models

PORTION OF ORIGINAL DRAINAGE MAP FROM
STP PAPAGO WATERSHED STUDY
KIMLEY-HORN, 1997





PORTION OF ORIGINAL DRAINAGE MAP FROM
STP PAPAGO WATERSHED STUDY
KIMLEY-HORN, 1997
PARSONS BRINCKERHOFF ANNOTATIONS IN RED

OSBORN OUTFALL ALTERNATIVE ANALYSIS
DRAINAGE MAP
PARSONS BRINCKERHOFF
FIGURE 7 PAGE

h:/osborn/bdrfig7.dgn May. 05, 1999 11:04:21

preald.dat

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*            VERSION 4.0.1E            *
*     Lahey F77L-EM/32 version 5.01    *
*       Dodson & Associates, Inc.      *
*  RUN DATE  08/11/99  TIME  14:17:05  *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              * ****************************************************************************
              * This is ALTERNATIVE D hydrology for Change Order #2
              *
              * - This model is based on the Recommended Plan - Part A for the Osborn Road
              *     Outfall with the following changes:
              *         Osborn Road Outfall has been modified to include a storm drain in
              *         Osborn Road running from the Paiute Basin to 71st Street, south on
```

```
*        71st Street to Earll Drive and east on Earll Dr. to Indian Bend Wash.
*        Use of the existing storm drain in Osborn Road for excess runoff has
*        not been included in this model, since the benefit of this alternative
*        is the elimination of any construction activities in Osborn Road east
*        of Scottsdale Road.
*
*
ID   ***************************************************************************
ID   STP-PAPAGO REGIONAL FLOOD CONTROL PROJECT
ID   SCOTTSDALE - TEMPE - PHOENIX
ID   ***************************************************************************
ID
ID   Kimley-Horn and Associates, Inc.
ID   KVL Consultants, Inc.
ID
ID   10-Year, 6-Hour Storm Event
ID   10/97
ID
ID   PARSONS BRINCKERHOFF MODIFICATIONS TO ORIGINAL KIMLEY HORN MODEL
ID   PREMIER ENGINEERING FILE NAME: PREALD.DAT
ID   FILE MODIFIED BY PARSONS BRINCKERHOFF TO BE USED IN DESIGN OF OSBORN OUTFALL
ID   MODIFICATIONS:
ID   1) SUBBASIN 050062 REROUTED DIRECTLY TO PAIUTE PARK- IMPROVEMENTS TO 64TH ST
ID      CONVEY FLOW TO DETENTION BASIN. AREA REDUCED TO 3.9 ACRES (0.0061 SM).
ID   2) PAIUTE PARK STAGE/DISCHARGE CURVE ADJUSTED TO REFLECT PRELIMINARY GRADING
ID      BY PREMIER ENGINEERING. ASSUME NO OUTFLOW FROM PAIUTE PARK DURING PEAK
ID      FLOW IN STORM DRAIN. CITY OF SCOTTSDALE MAINTENANCE YARD NOT USED AS
ID      PART OF DETENTION BASIN.
ID   3) SUBBASINS CONTRIBUTING TO 66" ADOT PIPE AND SCOTTSDALE ROAD SOUTH OF
ID      OSBORN ROAD REMOVED FROM MODEL (SUBBASINS 050710, 050720,058810, 050640,
ID      050910, and 050650. FLOWS COLLECTED AND CONVEYED BY SCOTTSDALE ROAD
ID      STORM DRAIN.
ID   4) REVISE AREA OF SUBBASIN 050310 FROM 0.041 SM TO 0.0063 SM.AND ROUTE TO
ID      EXISTING DETENTION BASIN. REMAINING AREA IS SRP PROPERTY WHICH DRAINS
ID      WEST.
ID      AREA REDUCTION DUE TO:
ID      REMOVE APARTMENTS AT THOMAS AND 64TH ST DUE TO ON-SITE RETENTION.
ID      REMOVE PORTION OF SRP SUBSTATION WHICH DRAINS EAST.
ID      COLLECT PAVEMENT FLOWS FROM 64TH ST (THOMAS TO PAIUTE PARK) IN LARGE PIPE
ID      COLLECT FLOWS FROM PAVED AREA BETWEEN SUBSTATION AND APARTMENTS IN LARGE
ID      PIPE.
ID   5) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050130.  INSERT CONCENTRATION
ID      POINT AT EARLL AND CIVIC CENTER
ID   6) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050100.  EARLL ALIGNMENT DIVIDES
ID      SUBBASIN. ROUTE FLOWS TO CONCENTRATION POINT AT EARLL AND SCOTTSDALE.
```

```
 39          ID    7) REVISE PIPE SIZES IN ROUTE CARDS TO REFLECT PB PRELIMINARY DESIGN
 40          ID
 41          ID    Parsons Brinckerhoff

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 42          ID    Alan Humphrey
 43          ID    5/5/99
 44          ID    Revised 8/11/99 FOR 50% SUBMITTAL
             *
             *DIAGRAM
 45          IT       2                     300
 46          IO       5

 47          KK  070808   BASIN
 48          BA   0.017
 49          PH       0       0    0.50    0.97    1.61    1.76    1.86    2.05
 50          LS       0      88       0       0      98       0
 51          UK     300  0.0100    0.20      99
 52          UK     100  0.0100    0.10       1
 53          RK    1600   0.214    0.03            TRAP       2     3.5
             *
             * The 10 year flows are diverted into a proposed storm drain along Oak Street.
             * In storm events greater than the 10 yr, the remaining flow will follow its
             * natural course across and sheet flow across Oak Street to the north.
             *

 54          KK   808PP  Divert 10-year flows into storm drain
 55          DT  808OUT
 56          DI       0      12      13      15      50     100
 57          DQ       0    0.01       1       3      38      88

 58          KK  070610 FROM  070808
 59          RK     240  0.0066   0.013            CIRC    3.00

 60          KK  070610   BASIN
 61          BA   0.007
 62          LS       0      88       0       0      98       0
 63          UK     300  0.0100    0.20      99
 64          UK     100  0.0100    0.10       1
 65          RK     500   0.054    0.03            TRAP       2     3.5

 66          KK   610PP  Divert 10-year flows into storm drain
 67          DT  610OUT
```

```
 68          DI       0       5       6      10      50     100
 69          DQ       0     .01       1       5      45      95

 70          KK  070610 COMBINE
 71          HC       2

 72          KK  070508    FROM  070610
 73          RK     420  0.0066   0.013            CIRC    3.00

 74          KK  070508   BASIN
 75          BA   0.008
 76          LS       0      85       0       0      98       0
 77          UK     300  0.0100    0.20      99
 78          UK     100  0.0100    0.10       1
 79          RK     600   0.048    0.03            TRAP       9     1.0
1                                          HEC-1 INPUT                                                    PAGE  3

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 80          KK   508PP  Divert 10-year flows into storm drain
 81          DT  508OUT
 82          DI       0       4       5      15      50     100
 83          DQ       0     .01       1      11      46      96

 84          KK  070508 COMBINE
 85          HC       2

 86          KK  070010    FROM  070508
 87          RK     270  0.0066   0.013            CIRC    3.00

 88          KK  070010   BASIN
 89          BA   0.009
 90          LS       0      88       0       0      98       0
 91          UK     300  0.0100    0.20      99
 92          UK     100  0.0100    0.10       1
 93          RK    1200   0.042    0.03            TRAP       2     3.5

 94          KK   010PP  Divert 10-year flows into storm drain
 95          DT  010OUT
 96          DI       0       7      10      15      50     100
 97          DQ       0     .01       3       8      43      93

 98          KK  070010 COMBINE
 99          HC       2
```

```
 100          KK  070210    FROM  070010
 101          RK     120  0.0033   0.013            CIRC    3.00

 102          KK  070209   BASIN
 103          BA   0.018
 104          LS       0      87       0       0      98       0
 105          UK     300  0.0100    0.20      99
 106          UK     100  0.0100    0.10       1
 107          RK    1200   0.252    0.03            TRAP       2     3.5

 108          KK  070210    FROM  070209
 109          RK     750   0.252   0.013            TRAP      10       1

 110          KK  070210   BASIN
 111          BA   0.008
 112          LS       0      87       0       0      98       0
 113          UK     300  0.0100    0.20      99
 114          UK     100  0.0100    0.10       1
 115          RK     600   0.043    0.03            TRAP       2     3.5

 116          KK  070210 COMBINE
 117          HC       2
1                                          HEC-1 INPUT                                                    PAGE  4

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 118          KK   210PP  Divert 10-year flows into storm drain
 119          DT  210OUT
 120          DI       0      17      20      30      50     100
 121          DQ       0     .01       3      13      33      83

 122          KK  070210 COMBINE
 123          HC       2

 124          KK  050005   FROM 070210
 125          RK     950   0.008   0.013            CIRC    3.00

 126          KK  050005   BASIN
 127          BA   0.038
 128          LS       0      85       0       0      98       0
 129          UK     300  0.0100    0.20      99
 130          UK     100  0.0100    0.10       1
 131          RK    1650    0.09    0.03            TRAP      30     1.0
```

```
132          KK   005PP  Divert 10-year flows into storm drain
133          DT  005OUT
134          DI       0      21      22     100     150     200
135          DQ       0     .01       1      79     129     179
             *
             * The start of the Osborn Road outfall hydrology
             *

136          KK  070010
137          KM    Retrieve overland flows at CP 070010
138          DR  010OUT

139          KK  070020    FROM  070010
140          RK     178  0.0131   0.013            CIRC     1.0

141          KK  070030    FROM  070020
142          RK     520  0.0146   0.025            TRAP     9.0       1

143          KK  070030   BASIN
144          BA   0.004
145          LS       0      85       0       0      98       0
146          UK     150  0.0100    0.30      65
147          UK      50  0.0100    0.10      35
148          RK     522  0.0146    0.03            TRAP       2     3.5

149          KK  070030 COMBINE
150          HC       2

151          KK  070040    FROM  070030
152          RK     177  0.0146   0.017            TRAP    54.8       1
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


153          KK  070210
154          KM    Retrieve overland flows at CP 070210
155          DR  210OUT

156          KK  070220    FROM  070210
157          RK     164  0.0131   0.013            CIRC     1.0

158          KK  070040    FROM  070220
159          RK     723  0.0146   0.017            TRAP    54.8       1
```

```
160          KK  070040   BASIN
161          BA   0.006
162          LS       0      86       0       0      98       0
163          UK     181  0.0100    0.28      72
164          UK      60  0.0100    0.10      28
165          RK    1946  0.0146    0.02            TRAP      30     1.0

166          KK  070040 COMBINE
167          HC       3

168          KK  070050    FROM  070040
169          RK     878  0.0146   0.025            TRAP    20.0     1.0

170          KK  070050   BASIN
171          BA   0.018
172          LS       0      86       0       0      98       0
173          UK     150  0.0100    0.30      65
174          UK      50  0.0100    0.10      35
175          RK     290  0.0058    0.02            TRAP      11     1.0
176          RK     981  0.0146    0.02            TRAP      11     1.0

177          KK  070050 COMBINE
178          HC       2

179          KK  070060    FROM  070050
180          RK     872  0.0058   0.025            TRAP     1.0     1.0

181          KK  070310   BASIN
182          BA   0.023
183          LS       0      86       0       0      98       0
184          UK     150  0.0100    0.30      65
185          UK      50  0.0100    0.10      35
186          RK     278  0.0058    0.02            TRAP      11     1.0
187          RK     986  0.0146    0.02            TRAP      11     1.0

188          KK  070060    FROM  070310
189          RK     745  0.0058   0.025            TRAP     1.0     1.0

190          KK  070060   BASIN
191          BA   0.020
192          LS       0      86       0       0      98       0
193          UK     150  0.0100    0.30      65
194          UK      50  0.0100    0.10      35
195          RK    1096  0.0058    0.03            TRAP       2     1.0
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 196          KK  070060 COMBINE
 197          HC       3

 198          KK  070070    FROM  070060
 199          RK     726  0.0146   0.025            TRAP    30.0     1.0

 200          KK  070070   BASIN
 201          BA   0.032
 202          LS       0      86       0       0      98       0
 203          UK     150  0.0100    0.30      65
 204          UK      50  0.0100    0.10      35
 205          RK    1209  0.0146    0.03            TRAP       2     1.0

 206          KK  070080   BASIN
 207          BA   0.021
 208          LS       0      83       0       0      98       0
 209          UK      29  0.0100    0.39       9
 210          UK     189  0.0100    0.10      91
 211          RK    1257  0.0058    0.02            TRAP      30     1.0

 212          KK  070080 COMBINE
 213          HC       3

 214          KK   07Det   Detention basin at Marriott's Brighton Gardens
 215          RS       1    STOR
              * SV CARD MODIFIED BY PREMIER ENGINEERING FOR 50% SUBMITTAL
 216          SV       0    0.53    1.22    2.03    3.07    4.37    5.92    6.77
 217          SE      66      67      68      69      70      71      72      73
 218          SQ       0      12      36      42      46      48      52     355
              *
              * Marriott's Brighton Gardens outfall - 07Qpip is the outflow in the storm drain
              * 07Qspl is the flow overtopping the basin
              *

 219          KK  07Qpip
 220          DT  07Qspl
 221          DI       0      71     112     172     245     329     420     518     623
 222          DQ       0     0.1      26      72     132     204     285     374     471

 223          KK  070420   FROM 07Qpip
```

```
                 * PB MODIFICATION FOR 50% SUBMITTAL
224              RK     369   0.005   0.012            CIRC     3.0
                 * RK  1000   0.005   0.013            CIRC     3.0

225              KK  070410   BASIN
226              BA   0.011
227              LS       0      84       0       0      98       0
228              UK     144  0.0100    0.32      44
229              UK     121  0.0100    0.10      56
230              RK    1816  0.0146    0.02            TRAP      23     1.0
1                                          HEC-1 INPUT                                                    PAGE  7

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


231              KK  070420    FROM  070410
232              RK     183  0.0058   0.017            TRAP    52.5       1

233              KK  070420   BASIN
234              BA   0.003
235              LS       0      79       0       0      98       0
236              UK     177  0.0100    0.31      25
237              UK     200  0.0100    0.10      75
238              RK    1046  0.0058    0.02            TRAP      49     1.0

239              KK  070420 COMBINE
240              HC       3

241              KK  210005  FROM 070420
                 * PB MODIFICATION FOR 50% SUBMITTAL
242              RK     487   0.005   0.012            CIRC     3.5
                 * RK   450   0.005   0.013            CIRC     3.5

243              KK  210005   BASIN
244              BA   0.008
245              LS       0      79       0       0      98       0
246              UK      94  0.0100    0.34      26
247              UK     116  0.0100    0.10      74
248              RK     523  0.0032    0.02            TRAP      38     1.0
249              RK    1250  0.0020    0.02            TRAP      45     1.0

250              KK  210005 COMBINE
251              KM    FLOW IN PIPE FROM MARRIOTT
252              HC       2
```

```
253          KK  050030   FROM 210005
             * PB MODIFICATION FOR 50% SUBMITTAL
254          RK    1232   0.005   0.012            CIRC       4
             * RK  1600   0.005   0.013            CIRC       4

255          KK  050005
256          KM    Retrieve overland flows at CP 050005
257          DR  005OUT

258          KK  050010   FROM 050005
259          RK    1300   0.015    0.02            TRAP      35       1

260          KK  050010   BASIN
261          BA   0.066
262          LS       0      81       0       0      98       0
263          UK     144  0.0100    0.30      52
264          UK      57  0.0100    0.10      48
265          RK    1189  0.0033    0.02            TRAP      30     1.0
266          RK    1197  0.0038    0.02            TRAP      60     1.0
1                                          HEC-1 INPUT                                                    PAGE  8

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


267          KK  050010   COMBINE
268          HC       2

269          KK  050020    FROM  050010
270          RK    1370  0.0038   0.017            TRAP    37.5       1

271          KK  050210   BASIN
272          BA   0.054
273          LS       0      79       0       0      98       0
274          UK     200  0.0100    0.30      28
275          UK     200  0.0100    0.10      72
276          RK     564  0.0038    0.02            TRAP      23     1.0
277          RK    1199  0.0033    0.02            TRAP      23     1.0

278          KK   210ST STORAGE
279          RS       1    STOR
280          SV    0.00    7.72    7.72
281          SE    0.00    1.00    2.00
282          SQ    0.00    0.01    0.01
283          ST     1.0     500     3.0     1.5
```

```
 284          KK  050020    FROM  050210
 285          RK     278  0.0033   0.017            TRAP    60.0       1

 286          KK  050020   BASIN
 287          BA   0.009
 288          LS       0      79       0       0      98       0
 289          UK     166  0.0100    0.30      39
 290          UK      98  0.0100    0.10      61
 291          RK    1304  0.0038    0.02            TRAP      60     1.0

 292          KK  050020 COMBINE
 293          HC       3

 294          KK  050030    FROM  050020
 295          RK     347  0.0038   0.017            TRAP    37.5       1

 296          KK  050030   BASIN
 297          BA   0.020
 298          LS       0      79       0       0      98       0
 299          UK     150  0.0100    0.30      15
 300          UK      50  0.0100    0.10      85
 301          RK     278  0.0038    0.02            TRAP       9     1.0
 302          RK    1468  0.0033    0.02            TRAP       9     1.0
              *
              * Scottsdale Executive Villas natural storage in parking lot
              *

 303          KK   030ST STORAGE
 304          RS       1    STOR
 305          SV       0    0.01    0.06    0.62    2.72    2.72
 306          SE      65      66      67      68      69      70
 307          SQ    0.00    0.01    0.01    0.01    0.01    0.01
 308          ST      68     150     3.0     1.5
1                                          HEC-1 INPUT                                                    PAGE  9

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 309          KK   ALLEY COMBINE
 310          KM    FLOW IN ALLEY AT CATALINA AND 64TH STREET
 311          KM    PB MODIFICATION FOR 50% SUBMITTAL
 312          HC       2

 313          KK  050030 COMBINE
 314          HC       2
```

```
315          KK  050305   FROM 050030
             * PB MODIFICATION FOR 50% SUBMITTAL
316          RK     943   0.002   0.012            CIRC     5.5
             * RK   150   0.002   0.013            CIRC     5.5

317          KK  050050   FROM 050305
318          RK    1500   0.001   0.013            TRAP       9     1.0

319          KK  050040   BASIN
320          BA   0.102
321          LS       0      79       0       0      98       0
322          UK     150  0.0100    0.30      57
323          UK      50  0.0100    0.10      43
324          RK    2230  0.0038    0.02            TRAP      38     1.0
325          RK    2654  0.0038    0.02            TRAP      38     1.0

326          KK  40STOR  Storage on west side of cross-cut canal
327          RS       1
328          SV       0       0       0       0     2.6    13.5    13.5
329          SE      58      59      60      61      62      63      64
330          SQ       0      10      22      32      40      50      55

331          KK  050050    FROM  050040
332          RK     491  0.0334   0.013            CIRC     2.5
             * ****************************************************************
             * PB Modification:
             * Reduce Area of Subbasin 050310 to 4.0 Acres (0.0063 SM)
             * Remaining area is west side of SRP substation
             * Remove one routing card for internal flows- this reduces route
             * length.
             * Add storage route through existing detention basin
             * Flows from other areas of original subbasin retained on-site or
             * collected by large pipe in 64th St.
             * ****************************************************************

333          KK  050310   BASIN
             * BA 0.041
334          BA   0.0063
335          LS       0      79       0       0      98       0
336          UK     200  0.0100    0.30      28
337          UK     200  0.0100    0.10      72
338          RK     816  0.0033    0.02            TRAP      30     1.0
             * RK   848  0.0038    0.02            TRAP      30     1.0
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 339          KK  SRPDet
 340          RS       1    STOR
 341          SA   0.152   0.207   0.207
 342          SE    53.4      56      57
 343          SQ       0       2       4       5       8      10      20      40
 344          SE    53.4    54.0    54.3    54.5    54.9    55.1   53.48      57
              * ******************************************************************
              * PB Modification:
              * Add subbasin to represent flows from pavement of 64th St south
              * of Paiute Park and paved area between SRP substation and new
              * apartments. Area to be collected by large pipe in 64th St.

 345          KK  S 64th   BASIN
 346          BA   0.011
 347          LS       0      79       0       0      83       0
 348          UK     100   0.004     0.1      53
 349          UK     100   0.008     0.1      47
 350          RK    1430   0.004   0.015            TRAP      35       1

 351          KK  050065   BASIN
 352          KO       2
 353          BA   0.014
 354          LS       0      79       0       0      98       0
 355          UK     100    0.01     0.3      15
 356          UK     100    0.01     0.1      85
 357          RK     500   0.005   0.012            TRAP      60       1
              * ******************************************************************
              * PB Modification
              * Relocate hydrograph and subsequent route for Basin 050060
              * Combine separately to get peak flow in main pipe
              * KK050060   BASIN
              * BA 0.029
              * LS     0      79       0       0      98       0
              * UK   105    0.01     0.3      20
              * UK   160    0.01     0.1      80
              * RK  1300  0.0038    0.03            TRAP     100     1.0
              *
              * ******************************************************************
              * PB Modification
              * Relocate hydrograph and subsequent route for Basin 050062
              * Modify pipe length to reflect storm drain route on 64th St
```

```
                 * Insert hydrographs at this location
                 * Revise basin area to 3.9 acres (0.0061 square miles)
                 * ******************************************************************

358              KK  050062   BASIN
359              BA   0.0061
                 * Original KH model had 2 BA cards. The 0.006 card was first, leaving
                 * the 0.014 card to be used in the model.
                 * BA 0.006
                 * BA 0.014
360              LS       0      79       0       0      98       0
361              UK     100    0.01     0.3      15
362              UK      50    0.01     0.1      85
1                                          HEC-1 INPUT                                                    PAGE 11

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

363              RK     900   0.005   0.012            TRAP      60       1

364              KK  050050   FROM 050062
365              KO       2
366              RK    1000   0.002   0.013            CIRC     2.5       1
                 *
                 * Flows combined from 050040, 050305, revised 050310 and 050065
                 * into main pipe above Paiute Park. PB- Add 050062 and S 64th
                 *

367              KK  050050 COMBINE
368              KM   Peak flow in main pipe above Paiute Park
369              KO       2
370              HC       6
                 * Revise Hydrograph combine count from 5 to 6
                 * Move Subbasin 050060 (Paiute Park) to combine here.

371              KK  050060   BASIN
372              BA   0.029
373              LS       0      79       0       0      98       0
374              UK     105    0.01     0.3      20
375              UK     160    0.01     0.1      80
376              RK    1300  0.0038    0.03            TRAP     100     1.0

377              KK  050050 COMBINE
378              KM   Paiute Park inflow
379              HC       2
                 * ******************************************************************
```

```
                 * PB Modification:
                 * Revise Kimley-Horn stage/storage/discharge curve
                 * Revisions based on iterative calculations which included effect of
                 * Paiute Park discharges on downstream pipe system.
                 * ****************************************************************

380              KK   05Det  Storage
381              KO       2
                 * Original KH Curve
                 * RS     1    STOR
                 * SV     0    0.64    2.37    5.14    8.40    11.7    15.1    18.5    22.1
                 *    22.1S
                 * SE    49      50      51      52      53      54      55      56      57
                 *      58
                 * SQ   4.5      22      37      47      56      65      73      81      88
                 *     156
                 * Revised Premier Curve 7/10/99 jjh
                 * SV Revised by Premier 7/22/99
                 * SV revised by Premier 8/6/99 to reflect no maintenance yard use in detention
                 * basin; SQ revised to reflect no flow from basin
382              RS       1    STOR
                 * SV     0    4.92    9.18   13.51   17.92   22.39   26.92   36.48
                 * SV     0    2.40    6.57   10.83   15.17   19.58   24.06   33.52
383              SV       0    2.09    5.26    8.49   11.79   15.16   18.60   25.68
384              SE   48.65      50      51      52      53      54      55      57
                 * SQ     0      15      38      70     110     115     125     140
385              SQ       0       0       0      10      70     115     125     140
                 *
                 * Revised PB Curve
                 * SA  1.20    1.84    3.17    3.21    3.31    3.35    3.42    3.49
                 * SE    50      51      52      53      54      55      56      57
                 * SQ     0      20      40      60      80     100     120     140
                 * SE    50    50.8   51.18   51.78   52.39   52.94   53.48   54.04
                 *
                 * Paiute Park outfall - 05Qpip is the outflow in the storm drain
                 * 05Qspl is the flow overtopping the basin
                 *
                 *
                 * Overflows to CP 050060
                 *
```



```
LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
```

```
KK  05Qpip
DT  05Qspl
DI       0     160     382     780    1292    1897
DQ       0    0.01     212     600    1102    1697
*
* Begin storm drain system in Osborn Road
*
* ******************************************************************
* PB Modification
* Relocate hydrograph and subsequent route for Basin 050062
* Remove hydrographs from this location
* ******************************************************************
* KK050062   BASIN
* BA 0.006
* BA 0.014
* LS     0      79       0       0      98       0
* UK   100    0.01     0.3      15
* UK    50    0.01     0.1      85
* RK   900   0.005   0.012            TRAP      60       1
* KK050610   FROM 050062
* RK  1500   0.003   0.013            TRAP      60       1

KK  050610   BASIN
BA   0.081
LS       0      79       0       0      98       0
UK     130  0.0100    0.32      56
UK      70  0.0100    0.10      44
RK    1450  0.0038    0.02            TRAP      45     1.0
RK    1240  0.0033    0.02            TRAP      60     1.0
* ******************************************************************
* PB Modification
* Revise combine operation from 3 to 2 hydrographs due to hydrograph
* relocation.
* ******************************************************************

KK  050610    COMBINE
KM   OSBORN & PINTO
KO       2
HC       2

KK  050620    FROM  050610
* ******************************************************************
* PB Modification
* FOR 50% SUBMITTAL
* Revise pipe size in routing card to reflect PB preliminary design.
```

```
                 * ****************************************************************
402              RK     980  0.0037   0.012            CIRC       5
                 * RK  1050  0.0037   0.013            CIRC       6
1                                                HEC-1 INPUT                                                    PAGE 13

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


403              KK  050620   BASIN
404              BA   0.099
405              LS       0      79       0       0      98       0
406              UK     147  0.0100    0.30      56
407              UK      53  0.0100    0.10      44
408              RK     940  0.0033    0.02            TRAP      41     1.0
409              RK    2545  0.0038    0.02            TRAP      60     1.0

410              KK  050620 COMBINE
411              KM   OSBORN AND 68TH STREET
412              KO       1       0
413              HC       2

414              KK  050630    FROM  050620
                 * ****************************************************************
                 * PB Modification
                 * FOR 50% SUBMITTAL
                 * Revise pipe size in routing card to reflect PB preliminary design.
                 * ****************************************************************
415              RK    1630  0.0028   0.012            CIRC       7
                 * RK  1440  0.0028   0.013            CIRC       7

416              KK  050630   BASIN
417              BA   0.062
418              LS       0      79       0       0      98       0
419              UK     138  0.0100    0.31      33
420              UK      64  0.0100    0.10      67
421              RK    1205  0.0038    0.02            TRAP      41     1.0
422              RK    1348  0.0033    0.02            TRAP      60     1.0

423              KK  050630 COMBINE
424              KM   OSBORN AND 70TH STREET
425              KO       1       0
426              HC       2

427              KK  050660    FROM  050630
                 * ****************************************************************
```

```
* PB Modification
* FOR 50% SUBMITTAL
* Revise pipe size in routing card to reflect PB preliminary design.
* ****************************************************************
428  RK    1954  0.0015   0.012            CIRC     7.5
     * RK  2600  0.0015   0.013            CIRC       7
     * ****************************************************************
     * PB Modification:
     * Remove flows and subsequent routes from Subbasins 050710, 050720,
     * 050810, 050640, 050910, and 050650 from model. Flows drain to
     * Scottsdale Road. Allow flows to be collected by Scottsdale Road
     * system. Do not collect in Earll Road system.
     * ****************************************************************
     * KK050710   BASIN
     * BA 0.005
     * LS     0      79       0       0      98       0
     * UK    21  0.0100    0.40      15
     * UK   200  0.0100    0.10      85
     * RK   610  0.0038    0.02            TRAP      55     1.0
     * KK050720    FROM  050710
     * RK   316  0.0045   0.013            CIRC     5.5
     * KK050720   BASIN
     * BA 0.028
     * LS     0      79       0       0      98       0
     * UK    57  0.0100    0.38      17
     * UK   188  0.0100    0.10      83
     * RK   580  0.0038    0.02            TRAP      45     1.0
     * RK  1594  0.0033    0.02            TRAP      55     1.0
     * KK050720   COMBINE
     * HC     2
     * KK050640    FROM  050720
     * RK   422  0.0045   0.013            CIRC     5.5
     * KK050810   BASIN
     * BA 0.013
     * LS     0      79       0       0      98       0
     * UK    88  0.0100    0.36      20
     * UK   200  0.0100    0.10      80
     * RK   164  0.0033    0.02            TRAP      28     1.0
     * RK  1031  0.0038    0.02            TRAP      55     1.0
     * KK050640    FROM  050810
     * RK   705  0.0025   0.013            CIRC     4.0
     * KK050640   BASIN
     * BA 0.032
     * LS     0      79       0       0      98       0
     * UK    64  0.0100    0.37      15
```

```
* UK   149  0.0100    0.10      85
* RK  1605  0.0038    0.02            TRAP      41     1.0
* RK  1168  0.0033    0.02            TRAP      60     1.0
* KK050640 COMBINE
* HC     3
* KK050650   FROM 050640
* RK   700  0.0029   0.013            CIRC       6
* KK050910   BASIN
* BA 0.012
* LS     0      79       0       0      98       0
* UK   170  0.0100    0.32      26
* UK   200  0.0100    0.10      74
* RK   837  0.0038    0.02            TRAP      38     1.0
* KK050650    FROM  050910
* RK   751  0.0045   0.013            DEEP     5.0
* KK050650   BASIN
* BA 0.019
* LS     0      79       0       0      98       0
* UK    29  0.0100    0.40      16
* UK   200  0.0100    0.10      84
* RK   598  0.0033    0.02            TRAP      23     1.0
* RK   566  0.0038    0.02            TRAP      90     1.0
* KK050650 COMBINE
* HC     3
* KK050660    FROM  050650
* RK   648  0.0027   0.013            CIRC     7.5
*
* This alternative includes a storm drain in 71st St.  This storm drain will
* intercept flows from the north part of the existing conditions subbasin
* 050100.  For this reason, subbasin 050100 has been split into two with 050100
* being north of Earll Drive and 050105 south of earll drive.  See drainage
* figure in the Appendix of the Final Report.
*
```

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```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 429          KK  050100   BASIN
 430          BA   0.034
 431          LS       0      79       0       0      98       0
 432          UK      20  0.0100    0.40       7
 433          UK     200  0.0100    0.10      93
 434          RK     505  0.0033    0.02            TRAP      30     1.0
 435          RK    1727  0.0038    0.02            TRAP      23     1.0
```

```
                * ****************************************************************
                * PB Modification:
                * Remove flows from Subbasin 050660 from model. Drains to Scottsdale Road.
                * Allow flows to be collected by Scottsdale Road system.
                * Adjust combine card from 4 to 2
                * ****************************************************************
                * KK050660   BASIN
                * BA 0.018
                * LS     0      79       0       0      98       0
                * UK    20  0.0100    0.40      15
                * UK   200  0.0100    0.10      85
                * RK   578  0.0033    0.02            TRAP      49     1.0
                * RK   582  0.0038    0.02            TRAP      90     1.0

436             KK  050660 COMBINE
437             KM   SCOTTSDALE ROAD AND EARL DRIVE
438             KO       1       0
439             HC       2
                * ****************************************************************
                * PB Modification:
                * Collect local flows into large pipe. Earll Drive divides subbasin
                * 50130.  Runoff generated north of Earll Drive to be collected
                * at Earll Drive.  New subbasin north of Earll to be 050131. Add
                * required combine and route cards. Modify routing card from 050660.
                * Revise KH routes from TRAP to CIRC.
                * ****************************************************************
                *

440             KK  050131   FROM 050660
                * KK051410   FROM 050660
                * KH routing card
                * RK  2640  0.0015   0.013            TRAP      16
                * PB MODIFICATION FOR 50% SUBMITTAL
441             RK    1414  0.0015   0.012            CIRC     7.5

442             KK  050131
                * BA 0.096
443             BA   0.024
444             LS       0      79       0       0      98       0
445             UK      45  0.0100    0.38      15
446             UK     171  0.0100    0.10      85
                * RK  1905  0.0038    0.02            TRAP      71     1.0
                * RK  1212  0.0033    0.02            TRAP      71     1.0
447             RK    1000   0.004    0.02            TRAP      71     1.0
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 448          KK  050131   COMBINE
 449          KM   EARL DRIVE AND 74TH STREET
 450          KO       1       0
 451          HC       2

 452          KK  051410   FROM 050131
 453          KM   ROUTE FROM CIVIC CENTER TO MILLER
              * PB MODIFICATION FOR 50% SUBMITTAL
 454          RK    1241  0.0015   0.012            CIRC       8
              * RK  1300  0.0015   0.013            CIRC       8

 455          KK  051410   BASIN
 456          BA   0.072
 457          LS       0      79       0       0      98       0
 458          UK      64  0.0100    0.37       9
 459          UK     150  0.0100    0.10      91
 460          RK    1170  0.0033    0.02            TRAP      38     1.0
 461          RK    1180  0.0038    0.02            TRAP      55     1.0

 462          KK  051410    COMBINE
 463          KM   EARL DRIVE AND MILLER ROAD
 464          KO       1       0
 465          HC       2
              *
              * EARLL DR OUTFALL TO INDIAN BEND WASH
              *
              * ****************************************************************
              * PB Modification:
              * Revise route to reflect storm drain from Miller to IBW
              * Use 105-inch pipe to represent 10' x 6' box culvert.
              * ****************************************************************

 466          KK  051420    FROM  051410
              * RK  1460  0.0015   0.013            TRAP      14
              * PB MODIFICATION FOR 50% SUBMITTAL
 467          RK    1471  0.0015   0.013            CIRC     8.7
              *
              * ****************************************************************
              * PB Modification:
              * End of area of interest. Remove subsequent hydrographs from model.
              * ****************************************************************
```

```
*
* FLOW IN BASIN 05 EAST OF 71ST STREET FOLLOWS DRAINAGE PATHS OF EXISTING
* CONDITIONS MODEL IN THIS ALTERNATIVE - FLOWS IN THIS SECTION ARE NORTH OF
* OSBORN RD WITH THE EXCEPTION OF BASIN 051710 AND FLOW NATURALLY TO THE EAST
*
* KK051510   BASIN
* BA 0.010
* LS     0      79       0       0      98       0
* UK    59  0.0100    0.38      18
* UK   200  0.0100    0.10      82
* RK   139  0.0038    0.02            TRAP      41     1.0
* RK   521  0.0033    0.02            TRAP      71     1.0
* KK051520    FROM  051510
* RK   680  0.0028   0.013            CIRC     9.5
* KK051610   BASIN
* BA 0.021
* LS     0      79       0       0      98       0
* UK   165  0.0100    0.32      25
* UK   200  0.0100    0.10      75
* RK   624  0.0038    0.02            TRAP      41     1.0
* RK   792  0.0033    0.02            TRAP      60     1.0
* KK051520    FROM  051610
* RK   601  0.0047   0.013            CIRC     5.0
* KK051710   BASIN
* BA 0.004
* LS     0      79       0       0      98       0
* UK   146  0.0100    0.33      24
* UK   200  0.0100    0.10      76
* RK   515  0.0038    0.02            TRAP      30     1.0
* RK   287  0.0033    0.02            TRAP      30     1.0
* KK051520    FROM  051710
* RK   567  0.0032   0.013            CIRC     4.0
* KK051520   BASIN
* BA 0.023
* LS     0      79       0       0      98       0
* UK   179  0.0100    0.31      26
* UK   198  0.0100    0.10      74
* RK   473  0.0038    0.02            TRAP      60     1.0
* RK   704  0.0033    0.02            TRAP      71     1.0
* KK051520 COMBINE
* HC     4
* KK051530    FROM  051520
* RK   926   0.001   0.013            CIRC     6.0
* KK051530   BASIN
* BA 0.041
```

```
* LS      0       79        0        0       98        0
* UK     26   0.0100     0.40       15
* UK    193   0.0100     0.10       85
* RK    889   0.0038     0.02             TRAP       38      1.0
* RK    860   0.0033     0.02             TRAP       60      1.0
* KK051530 COMBINE
* HC      2
* KK051540     FROM  051530
* RK    360    0.001    0.013             CIRC      6.0
* KK051810    BASIN
* BA 0.005
* LS      0       79        0        0       98        0
* UK     23   0.0100     0.40       16
* UK    196   0.0100     0.10       84
* RK    272   0.0033     0.02             TRAP       19      1.0
* RK    272   0.0038     0.02             TRAP       30      1.0
* KK051540     FROM  051810
* RK    218   0.0045    0.013             CIRC      4.5
* KK051540    BASIN
* BA 0.004
* LS      0       79        0        0       98        0
* UK     44   0.0100     0.38       16
* UK    172   0.0100     0.10       84
* RK    233   0.0038     0.02             TRAP       12      1.0
* RK    265   0.0033     0.02             TRAP       60      1.0
* KK051540 COMBINE
* HC      3
* KK051550     FROM  051540
* RK    273    0.001    0.013             TRAP      8.0      1.0
* KK051560     FROM  051550
* RK    800   0.0038    0.013             CIRC      7.0
* KK051560    BASIN
* BA 0.008
* LS      0       79        0        0       98        0
* UK    116   0.0100     0.33       47
* UK     89   0.0100     0.10       53
* RK   1126   0.0033     0.02             TRAP       60      1.0
* KK051560 COMBINE
* HC      2
*
* Osborn Rd outfall to Indian Bend Wash
*
* KK051570     FROM  051560
* RK    228    0.003    0.013             CIRC      7.0
*
```

```
* Begin Thomas Rd outfall
*
* KK05Qspl  Retrieve spill from Paiute Park detention basin
* DR05Qspl
* KK050060    Qspl FROM  05Det
* RK   500   0.002   0.027            TRAP       5       1
* KK050070    FROM  050060
* RK  1429  0.0033   0.030            TRAP     5.0     1.0
* KK050410   BASIN
* BA 0.041
* LS     0      79       0       0      98       0
* UK    77  0.0100    0.36      25
* UK   137  0.0100    0.10      75
* RK   694  0.0038    0.02            TRAP      38     1.0
* RK  1177  0.0033    0.02            TRAP      38     1.0
* KK050070    FROM  050410
* RK   187  0.0038   0.017            TRAP    60.0       1
* KK050070   BASIN
* BA 0.084
* LS     0      79       0       0      98       0
* UK    22  0.0100    0.40       8
* UK   198  0.0100    0.10      92
* RK  3223  0.0038    0.02            TRAP      38     1.0
* KK050070 COMBINE
* HC     3
* KK050080    FROM  050070
* RK  1112  0.0027   0.013            CIRC     4.5
* KK050080   BASIN
* BA 0.021
* LS     0      79       0       0      98       0
* UK   132  0.0100    0.31      60
* UK    71  0.0100    0.10      40
* RK  1365  0.0033    0.02            TRAP      38     1.0
* KK050080 COMBINE
* HC     2
* KK050090    FROM  050080
* RK   416  0.0052   0.013            CIRC     4.0
* KK050510   BASIN
* BA 0.054
* LS     0      79       0       0      98       0
* UK   109  0.0100    0.33      48
* UK    97  0.0100    0.10      52
* RK  1096  0.0038    0.02            TRAP      41     1.0
* RK  1304  0.0033    0.02            TRAP      41     1.0
* KK050090    FROM  050510
```

```
* RK   626  0.0052   0.013          CIRC     4.0
* KK050090   BASIN
* BA 0.037
* LS     0      79       0       0      98       0
* UK    44  0.0100    0.38      23
* UK   172  0.0100    0.10      77
* RK   965  0.0038    0.02            TRAP     23     1.0
* RK  1064  0.0033    0.02            TRAP     45     1.0
* KK050090 COMBINE
* HC     3
* KK050105    FROM  050090
* RK   609  0.0028   0.013            CIRC     4.5
*
* This alternative includes a storm drain in 71st St.  This storm drain will
* intercept flows from the north part of the existing conditions subbasin
* 050100.  For this reason, subbasin 050100 has been split into two with 050100
* being north of Earll Drive and 050105 south of Earll Drive.  See drainage
* figure in the appendix of the Final Report.
*
* KK050105   BASIN
* BA 0.011
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40       7
* UK   200  0.0100    0.10      93
* RK   587  0.0033    0.02            TRAP     30     1.0
* RK   410  0.0038    0.02            TRAP     23     1.0
* KK050105 COMBINE
* HC     2
* KK050110    FROM  050105
* RK   692  0.0058   0.013            CIRC     4.0
* KK050110   BASIN
* BA 0.010
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40      15
* UK   200  0.0100    0.10      85
* RK   587  0.0033    0.02            TRAP     46     1.0
* RK   406  0.0038    0.02            TRAP     77     1.0
* KK050110 COMBINE
* HC     2
* KK050120    FROM  050110
* RK   888  0.0027   0.013            CIRC     7.5
* KK051010   BASIN
* BA 0.023
* LS     0      79       0       0      98       0
* UK   200  0.0100    0.30      28
```

```
* UK   200  0.0100    0.10      72
* RK   517  0.0033    0.02            TRAP      30     1.0
* RK   822  0.0038    0.02            TRAP      30     1.0
* KK1010ST STORAGE
* RS     1    STOR
* SV     0    0.20    0.70    1.49    1.49
* SE    58      59      60      61      62
* SQ     0    0.01    0.01    0.01    0.01
* ST    61     800     3.0     1.5
* KK051020    FROM  051010
* RK   948  0.0033   0.017            TRAP    60.0       1
* KK051110   BASIN
* BA 0.025
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40      10
* UK   200  0.0100    0.10      90
* RK   326  0.0038    0.02            TRAP       9     1.0
* RK  1382  0.0033    0.02            TRAP      19     1.0
* KK051020    FROM  051110
* RK   541  0.0038   0.017            TRAP    33.0       1
* KK051020   BASIN
* BA 0.027
* LS     0      79       0       0      98       0
* UK    64  0.0100    0.37      22
* UK   174  0.0100    0.10      78
* RK   409  0.0038    0.02            TRAP      26     1.0
* RK  1595  0.0033    0.02            TRAP      60     1.0
* KK051020 COMBINE
* HC     3
* KK051030    FROM  051020
* RK   694  0.0033   0.017            TRAP    60.0       1
* KK051210   BASIN
* BA 0.008
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40      15
* UK   200  0.0100    0.10      85
* RK   682  0.0038    0.02            TRAP       9     1.0
* KK051030    FROM  051210
* RK   241  0.0038   0.017            TRAP    60.0       1
* KK051310   BASIN
* BA 0.003
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40       6
* UK   200  0.0100    0.10      94
* RK   544  0.0033    0.02            TRAP      18     1.0
```

```
* KK051320     FROM  051310
* RK   333  0.0038   0.017            TRAP    60.0       1
* KK051320   BASIN
* BA 0.009
* LS     0       79       0       0      98       0
* UK    20  0.0100    0.40       7
* UK   200  0.0100    0.10      93
* RK   254  0.0038    0.02            TRAP       9     1.0
* RK   543  0.0033    0.02            TRAP      18     1.0
* KK051320 COMBINE
* HC     2
* KK051030     FROM  051320
* RK   960  0.0038   0.017            TRAP    60.0       1
* KK051030   BASIN
* BA 0.031
* LS     0       79       0       0      98       0
* UK    28  0.0100    0.39      13
* UK   190  0.0100    0.10      87
* RK  2532  0.0033    0.02            TRAP      49     1.0
* KK051030 COMBINE
* HC     4
* KK051040     FROM  051030
* RK  1501  0.0033   0.017            TRAP    60.0       1
* KK051040   BASIN
* BA 0.036
* LS     0       79       0       0      98       0
* UK   105  0.0100    0.34      39
* UK   102  0.0100    0.10      61
* RK  1159  0.0038    0.02            TRAP      45     1.0
* RK  1501  0.0033    0.02            TRAP      65     1.0
* KK051040 COMBINE
* HC     2
* KK050120     FROM  051040
* RK  1222   0.003   0.013            TRAP       8
* KK050120   BASIN
* BA 0.039
* LS     0       79       0       0      98       0
* UK    24  0.0100    0.40      14
* UK   195  0.0100    0.10      86
* RK   763  0.0038    0.02            TRAP      23     1.0
* RK  1114  0.0033    0.02            TRAP      90     1.0
* KK050120 COMBINE
* HC     3
* KK050130     FROM  050120
* RK  1265  0.0027   0.013            DEEP     7.0
```

```
* KK050130   BASIN
* BA 0.096
* LS     0      79       0       0      98       0
* UK    45  0.0100    0.38      15
* UK   171  0.0100    0.10      85
* RK  1905  0.0038    0.02            TRAP      71     1.0
* RK  1212  0.0033    0.02            TRAP      71     1.0
* KK050130 COMBINE
* HC     2
* KK050140    FROM  050130
* RK  1319  0.0027   0.013            DEEP     7.0
* KK050140   BASIN
* BA 0.086
* LS     0      79       0       0      98       0
* UK    94  0.0100    0.35      25
* UK   154  0.0100    0.10      75
* RK  1224  0.0038    0.02            TRAP       9     1.0
* RK  1267  0.0033    0.02            TRAP      79     1.0
* KK050140 COMBINE
* HC     2
* KK050150    FROM  050140
* RK  1252  0.0006   0.013            DEEP     5.0
* KK050150   BASIN
* BA 0.011
* LS     0      79       0       0      98       0
* UK   159  0.0100    0.30      57
* UK    57  0.0100    0.10      43
* RK  1202  0.0033    0.02            TRAP      60     1.0
* KK050150 COMBINE
* HC     2
*
* Thomas Rd Outfall to Indian Bend Wash
*
* KK050160    FROM  050150
* RK   332  0.0048   0.013            DEEP     6.0
*
* Notice:
* This document, together with the concepts and designs presented herein, as an
* instrument of service, is intended for the specific purpose and client for
* which it was prepared.  Reuse of and improper reliance on this document
* without written authorization and adaptation by Kimley-Horn and Associates,
* Inc. shall be without liability to Kimley-Horn and Associates, Inc.
*
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 468          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   47      070808
                .
                .
   55           .-------> 808OUT
   54       808PP
                V
                V
   58      070610
                .
                .
   60           .      070610
                .           .
                .           .
   67           .           .-------> 610OUT
   66           .       610PP
                .           .
                .           .
   70      070610............
                V
                V
   72      070508
                .
                .
   74           .      070508
                .           .
                .           .
   81           .           .-------> 508OUT
   80           .       508PP
                .           .
                .           .
   84      070508............
                V
                V
   86      070010
                .
```

```
                .
 88             .      070010
                .           .
                .           .
 95             .           .-------> 010OUT
 94             .       010PP
                .           .
                .           .
 98        070010............
                V
                V
100        070210
                .
                .
102             .      070209
                .           V
                .           V
108             .      070210
                .           .
                .           .
110             .           .      070210
                .           .           .
                .           .           .
116             .      070210............
                .           .
                .           .
119             .           .-------> 210OUT
118             .       210PP
                .           .
                .           .
122        070210............
                V
                V
124        050005
                .
                .
126             .      050005
                .           .
                .           .
133             .           .-------> 005OUT
132             .       005PP
                .           .
                .           .
138             .           .           .<-------  010OUT
136             .           .      070010
```

```
                 .           .           V
                 .           .           V
  139            .           .      070020
                 .           .           V
                 .           .           V
  141            .           .      070030
                 .           .           .
                 .           .           .
  143            .           .           .      070030
                 .           .           .           .
                 .           .           .           .
  149            .           .      070030............
                 .           .           V
                 .           .           V
  151            .           .      070040
                 .           .           .
                 .           .           .
  155            .           .           .           .<-------  210OUT
  153            .           .           .      070210
                 .           .           .           V
                 .           .           .           V
  156            .           .           .      070220
                 .           .           .           V
                 .           .           .           V
  158            .           .           .      070040
                 .           .           .           .
                 .           .           .           .
  160            .           .           .           .      070040
                 .           .           .           .           .
                 .           .           .           .           .
  166            .           .      070040........................
                 .           .           V
                 .           .           V
  168            .           .      070050
                 .           .           .
                 .           .           .
  170            .           .           .      070050
                 .           .           .           .
                 .           .           .           .
  177            .           .      070050............
                 .           .           V
                 .           .           V
  179            .           .      070060
                 .           .           .
                 .           .           .
```

```
181                 .           .           .      070310
                    .           .           .           V
                    .           .           .           V
188                 .           .           .      070060
                    .           .           .           .
                    .           .           .           .
190                 .           .           .           .      070060
                    .           .           .           .           .
                    .           .           .           .           .
196                 .           .      070060.......................
                    .           .           V
                    .           .           V
198                 .           .      070070
                    .           .           .
                    .           .           .
200                 .           .           .      070070
                    .           .           .           .
                    .           .           .           .
206                 .           .           .           .      070080
                    .           .           .           .           .
                    .           .           .           .           .
212                 .           .      070080.......................
                    .           .           V
                    .           .           V
214                 .           .       07Det
                    .           .           .
                    .           .           .
220                 .           .           .-------> 07Qspl
219                 .           .      07Qpip
                    .           .           V
                    .           .           V
223                 .           .      070420
                    .           .           .
                    .           .           .
225                 .           .           .      070410
                    .           .           .           V
                    .           .           .           V
231                 .           .           .      070420
                    .           .           .           .
                    .           .           .           .
233                 .           .           .           .      070420
                    .           .           .           .           .
                    .           .           .           .           .
239                 .           .      070420.......................
                    .           .           V
```

```
                 .         .         V
241              .         .    210005
                 .         .         .
                 .         .         .
243              .         .         .      210005
                 .         .         .           .
                 .         .         .           .
250              .         .    210005............
                 .         .         V
                 .         .         V
253              .         .    050030
                 .         .         .
                 .         .         .
257              .         .         .           .<-------  005OUT
255              .         .         .      050005
                 .         .         .           V
                 .         .         .           V
258              .         .         .      050010
                 .         .         .           .
                 .         .         .           .
260              .         .         .           .      050010
                 .         .         .           .           .
                 .         .         .           .           .
267              .         .         .      050010............
                 .         .         .           V
                 .         .         .           V
269              .         .         .      050020
                 .         .         .           .
                 .         .         .           .
271              .         .         .           .      050210
                 .         .         .           .           V
                 .         .         .           .           V
278              .         .         .           .       210ST
                 .         .         .           .           V
                 .         .         .           .           V
284              .         .         .           .      050020
                 .         .         .           .           .
                 .         .         .           .           .
286              .         .         .           .           .      050020
                 .         .         .           .           .           .
                 .         .         .           .           .           .
292              .         .         .      050020........................
                 .         .         .           V
                 .         .         .           V
294              .         .         .      050030
```

```
                .         .         .         .
                .         .         .         .
296             .         .         .         .      050030
                .         .         .         .           V
                .         .         .         .           V
303             .         .         .         .       030ST
                .         .         .         .           .
                .         .         .         .           .
309             .         .         .     ALLEY............
                .         .         .         .
                .         .         .         .
313             .         .   050030............
                .         .         V
                .         .         V
315             .         .   050305
                .         .         V
                .         .         V
317             .         .   050050
                .         .         .
                .         .         .
319             .         .         .   050040
                .         .         .         V
                .         .         .         V
326             .         .         .   40STOR
                .         .         .         V
                .         .         .         V
331             .         .         .   050050
                .         .         .         .
                .         .         .         .
333             .         .         .         .      050310
                .         .         .         .           V
                .         .         .         .           V
339             .         .         .         .      SRPDet
                .         .         .         .           .
                .         .         .         .           .
345             .         .         .         .           .     S 64th
                .         .         .         .           .           .
                .         .         .         .           .           .
351             .         .         .         .           .           .     050065
                .         .         .         .           .           .           .
                .         .         .         .           .           .           .
358             .         .         .         .           .           .           .     050062
                .         .         .         .           .           .           .           V
                .         .         .         .           .           .           .           V
364             .         .         .         .           .           .           .     050050
```

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

```
367          050050.....................................................
371                                      050060
                                              .
                                              .
377          050050............
                  V
                  V
380           05Det
                  .
                  .
387                  .-------> 05Qspl
386          05Qpip
                  .
                  .
390                  .      050610
                  .           .
                  .           .
397          050610............
                  V
                  V
401          050620
                  .
                  .
403                  .      050620
                  .           .
                  .           .
410          050620............
                  V
                  V
414          050630
                  .
                  .
416                  .      050630
                  .           .
                  .           .
423          050630............
                  V
                  V
427          050660
                  .
                  .
```

```
429          .          .          .      050100
             .          .          .          .
             .          .          .          .
436          .          .     050660...........
             .          .          V
             .          .          V
440          .          .     050131
             .          .          .
             .          .          .
442          .          .          .      050131
             .          .          .          .
             .          .          .          .
448          .          .     050131...........
             .          .          V
             .          .          V
452          .          .     051410
             .          .          .
             .          .          .
455          .          .          .      051410
             .          .          .          .
             .          .          .          .
462          .          .     051410...........
             .          .          V
             .          .          V
466          .          .     051420
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *           VERSION 4.0.1E              *
 *     Lahey F77L-EM/32 version 5.01     *
 *       Dodson & Associates, Inc.       *
 *  RUN DATE  08/11/99  TIME  14:17:05   *
 *****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
*****************************************************************************
STP-PAPAGO REGIONAL FLOOD CONTROL PROJECT
SCOTTSDALE - TEMPE - PHOENIX
*****************************************************************************
```

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

Kimley-Horn and Associates, Inc.
KVL Consultants, Inc.

10-Year, 6-Hour Storm Event
10/97

PARSONS BRINCKERHOFF MODIFICATIONS TO ORIGINAL KIMLEY HORN MODEL
PREMIER ENGINEERING FILE NAME: PREALD.DAT
FILE MODIFIED BY PARSONS BRINCKERHOFF TO BE USED IN DESIGN OF OSBORN OUTFALL
MODIFICATIONS:

1) SUBBASIN 050062 REROUTED DIRECTLY TO PAIUTE PARK- IMPROVEMENTS TO 64TH ST CONVEY FLOW TO DETENTION BASIN. AREA REDUCED TO 3.9 ACRES (0.0061 SM).
2) PAIUTE PARK STAGE/DISCHARGE CURVE ADJUSTED TO REFLECT PRELIMINARY GRADING BY PREMIER ENGINEERING. ASSUME NO OUTFLOW FROM PAIUTE PARK DURING PEAK FLOW IN STORM DRAIN. CITY OF SCOTTSDALE MAINTENANCE YARD NOT USED AS PART OF DETENTION BASIN.
3) SUBBASINS CONTRIBUTING TO 66" ADOT PIPE AND SCOTTSDALE ROAD SOUTH OF OSBORN ROAD REMOVED FROM MODEL (SUBBASINS 050710, 050720,058810, 050640, 050910, and 050650. FLOWS COLLECTED AND CONVEYED BY SCOTTSDALE ROAD STORM DRAIN.
4) REVISE AREA OF SUBBASIN 050310 FROM 0.041 SM TO 0.0063 SM.AND ROUTE TO EXISTING DETENTION BASIN. REMAINING AREA IS SRP PROPERTY WHICH DRAINS WEST.
   AREA REDUCTION DUE TO:
   REMOVE APARTMENTS AT THOMAS AND 64TH ST DUE TO ON-SITE RETENTION.
   REMOVE PORTION OF SRP SUBSTATION WHICH DRAINS EAST.
   COLLECT PAVEMENT FLOWS FROM 64TH ST (THOMAS TO PAIUTE PARK) IN LARGE PIPE
   COLLECT FLOWS FROM PAVED AREA BETWEEN SUBSTATION AND APARTMENTS IN LARGE PIPE.
5) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050130. INSERT CONCENTRATION POINT AT EARLL AND CIVIC CENTER
6) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050100. EARLL ALIGNMENT DIVIDES SUBBASIN. ROUTE FLOWS TO CONCENTRATION POINT AT EARLL AND SCOTTSDALE.
7) REVISE PIPE SIZES IN ROUTE CARDS TO REFLECT PB PRELIMINARY DESIGN

Parsons Brinckerhoff
Alan Humphrey
5/5/99
Revised 8/11/99 FOR 50% SUBMITTAL

```
 46 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
```

```
IT          HYDROGRAPH TIME DATA
                  NMIN            2  MINUTES IN COMPUTATION INTERVAL
                 IDATE      1     0  STARTING DATE
                 ITIME         0000  STARTING TIME
                    NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                NDDATE      1     0  ENDING DATE
                NDTIME         0958  ENDING TIME
                ICENT           19  CENTURY MARK

            COMPUTATION INTERVAL    0.03 HOURS
                 TOTAL TIME BASE    9.97 HOURS

      ENGLISH UNITS
           DRAINAGE AREA          SQUARE MILES
           PRECIPITATION DEPTH    INCHES
           LENGTH, ELEVATION      FEET
           FLOW                   CUBIC FEET PER SECOND
           STORAGE VOLUME         ACRE-FEET
           SURFACE AREA           ACRES
           TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 351 KK   *    050065  *        BASIN
          *            *
          **************

 352 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           2  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              SUBBASIN RUNOFF DATA

 353 BA          SUBBASIN CHARACTERISTICS
                      TAREA        0.01  SUBBASIN AREA

                 PRECIPITATION DATA
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 49 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   0.50    0.97    1.61    1.76    1.86    2.05    0.00    0.00    0.00    0.00    0.00    0.00

                                                STORM AREA =    0.01

 354 LS           SCS LOSS RATE
                        STRTL        0.53  INITIAL ABSTRACTION
                       CRVNBR       79.00  CURVE NUMBER
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

                    LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT
                        STRTL        0.04  INITIAL ABSTRACTION
                       CRVNBR       98.00  CURVE NUMBER
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

                  KINEMATIC WAVE
 355 UK             OVERLAND-FLOW ELEMENT NO. 1
                            L        100.  OVERLAND FLOW LENGTH
                            S      0.0100  SLOPE
                            N       0.300  ROUGHNESS COEFFICIENT
                           PA        15.0  PERCENT OF SUBBASIN
                        DXMIN           5  MINIMUM NUMBER OF DX INTERVALS
 356 UK             OVERLAND-FLOW ELEMENT NO. 2
                            L        100.  OVERLAND FLOW LENGTH
                            S      0.0100  SLOPE
                            N       0.100  ROUGHNESS COEFFICIENT
                           PA        85.0  PERCENT OF SUBBASIN
                        DXMIN           5  MINIMUM NUMBER OF DX INTERVALS

                  KINEMATIC WAVE
 357 RK             MAIN CHANNEL
                            L        500.  CHANNEL LENGTH
                            S      0.0050  SLOPE
                            N       0.012  CHANNEL ROUGHNESS COEFFICIENT
                           CA        0.01  CONTRIBUTING AREA
                        SHAPE        TRAP  CHANNEL SHAPE
                           WD       60.00  BOTTOM WIDTH OR DIAMETER
                            Z        1.00  SIDE SLOPE
                       NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS
                       RUPSTQ          NO  ROUTE UPSTREAM HYDROGRAPH

                                                          ***
                                     COMPUTED KINEMATIC PARAMETERS
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VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
PLANE1	0.50	1.67	1.88	9.09	0.95	204.23	0.55	0.09
PLANE2	1.49	1.67	0.99	20.00	39.29	183.80	1.82	0.38
MAIN	0.68	1.61	0.57	166.67	37.43	184.88	1.63	5.64

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.0000E+00 EXCESS=0.1219E+01 OUTFLOW=0.1218E+01 BASIN STORAGE=0.1294E-02 PERCENT ERROR= 0.0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	0.68	1.61	2.00	36.96	184.00	1.63

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HYDROGRAPH AT STATION 050065

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	0.00	0.00	0.00	0.	*	1		0500	151	0.00	0.00	0.00	1.
1		0002	2	0.00	0.00	0.00	0.	*	1		0502	152	0.00	0.00	0.00	1.
1		0004	3	0.00	0.00	0.00	0.	*	1		0504	153	0.00	0.00	0.00	1.
1		0006	4	0.00	0.00	0.00	0.	*	1		0506	154	0.00	0.00	0.00	1.
1		0008	5	0.00	0.00	0.00	0.	*	1		0508	155	0.00	0.00	0.00	1.
1		0010	6	0.00	0.00	0.00	0.	*	1		0510	156	0.00	0.00	0.00	1.
1		0012	7	0.00	0.00	0.00	0.	*	1		0512	157	0.00	0.00	0.00	1.
1		0014	8	0.00	0.00	0.00	0.	*	1		0514	158	0.00	0.00	0.00	1.
1		0016	9	0.00	0.00	0.00	0.	*	1		0516	159	0.00	0.00	0.00	1.
1		0018	10	0.00	0.00	0.00	0.	*	1		0518	160	0.00	0.00	0.00	1.
1		0020	11	0.00	0.00	0.00	0.	*	1		0520	161	0.00	0.00	0.00	1.
1		0022	12	0.00	0.00	0.00	0.	*	1		0522	162	0.00	0.00	0.00	1.
1		0024	13	0.00	0.00	0.00	0.	*	1		0524	163	0.00	0.00	0.00	1.
1		0026	14	0.00	0.00	0.00	0.	*	1		0526	164	0.00	0.00	0.00	1.
1		0028	15	0.00	0.00	0.00	0.	*	1		0528	165	0.00	0.00	0.00	1.
1		0030	16	0.00	0.00	0.00	0.	*	1		0530	166	0.00	0.00	0.00	1.
1		0032	17	0.00	0.00	0.00	0.	*	1		0532	167	0.00	0.00	0.00	1.

1	0034	18	0.00	0.00	0.00	0.	*	1	0534	168	0.00	0.00	0.00	1.
1	0036	19	0.00	0.00	0.00	0.	*	1	0536	169	0.00	0.00	0.00	1.
1	0038	20	0.00	0.00	0.00	0.	*	1	0538	170	0.00	0.00	0.00	1.
1	0040	21	0.00	0.00	0.00	0.	*	1	0540	171	0.00	0.00	0.00	1.
1	0042	22	0.00	0.00	0.00	0.	*	1	0542	172	0.00	0.00	0.00	1.
1	0044	23	0.00	0.00	0.00	0.	*	1	0544	173	0.00	0.00	0.00	1.
1	0046	24	0.00	0.00	0.00	0.	*	1	0546	174	0.00	0.00	0.00	1.
1	0048	25	0.00	0.00	0.00	0.	*	1	0548	175	0.00	0.00	0.00	0.
1	0050	26	0.00	0.00	0.00	0.	*	1	0550	176	0.00	0.00	0.00	0.
1	0052	27	0.00	0.00	0.00	0.	*	1	0552	177	0.00	0.00	0.00	0.
1	0054	28	0.00	0.00	0.00	0.	*	1	0554	178	0.00	0.00	0.00	0.
1	0056	29	0.00	0.00	0.00	0.	*	1	0556	179	0.00	0.00	0.00	0.
1	0058	30	0.00	0.00	0.00	0.	*	1	0558	180	0.00	0.00	0.00	0.
1	0100	31	0.00	0.00	0.00	0.	*	1	0600	181	0.00	0.00	0.00	0.
1	0102	32	0.00	0.00	0.00	0.	*	1	0602	182	0.00	0.00	0.00	0.
1	0104	33	0.00	0.00	0.00	0.	*	1	0604	183	0.00	0.00	0.00	0.
1	0106	34	0.00	0.00	0.00	0.	*	1	0606	184	0.00	0.00	0.00	0.
1	0108	35	0.00	0.00	0.00	0.	*	1	0608	185	0.00	0.00	0.00	0.
1	0110	36	0.00	0.00	0.00	0.	*	1	0610	186	0.00	0.00	0.00	0.
1	0112	37	0.00	0.00	0.00	0.	*	1	0612	187	0.00	0.00	0.00	0.
1	0114	38	0.00	0.00	0.00	0.	*	1	0614	188	0.00	0.00	0.00	0.
1	0116	39	0.00	0.00	0.00	0.	*	1	0616	189	0.00	0.00	0.00	0.
1	0118	40	0.00	0.00	0.00	0.	*	1	0618	190	0.00	0.00	0.00	0.
1	0120	41	0.00	0.00	0.00	0.	*	1	0620	191	0.00	0.00	0.00	0.
1	0122	42	0.00	0.00	0.00	0.	*	1	0622	192	0.00	0.00	0.00	0.
1	0124	43	0.00	0.00	0.00	0.	*	1	0624	193	0.00	0.00	0.00	0.
1	0126	44	0.00	0.00	0.00	0.	*	1	0626	194	0.00	0.00	0.00	0.
1	0128	45	0.00	0.00	0.00	0.	*	1	0628	195	0.00	0.00	0.00	0.
1	0130	46	0.00	0.00	0.00	0.	*	1	0630	196	0.00	0.00	0.00	0.
1	0132	47	0.00	0.00	0.00	0.	*	1	0632	197	0.00	0.00	0.00	0.
1	0134	48	0.00	0.00	0.00	0.	*	1	0634	198	0.00	0.00	0.00	0.
1	0136	49	0.00	0.00	0.00	0.	*	1	0636	199	0.00	0.00	0.00	0.
1	0138	50	0.00	0.00	0.00	0.	*	1	0638	200	0.00	0.00	0.00	0.
1	0140	51	0.00	0.00	0.00	0.	*	1	0640	201	0.00	0.00	0.00	0.
1	0142	52	0.00	0.00	0.00	0.	*	1	0642	202	0.00	0.00	0.00	0.
1	0144	53	0.00	0.00	0.00	0.	*	1	0644	203	0.00	0.00	0.00	0.
1	0146	54	0.00	0.00	0.00	0.	*	1	0646	204	0.00	0.00	0.00	0.
1	0148	55	0.00	0.00	0.00	0.	*	1	0648	205	0.00	0.00	0.00	0.
1	0150	56	0.00	0.00	0.00	0.	*	1	0650	206	0.00	0.00	0.00	0.
1	0152	57	0.00	0.00	0.00	0.	*	1	0652	207	0.00	0.00	0.00	0.
1	0154	58	0.00	0.00	0.00	0.	*	1	0654	208	0.00	0.00	0.00	0.
1	0156	59	0.00	0.00	0.00	0.	*	1	0656	209	0.00	0.00	0.00	0.
1	0158	60	0.00	0.00	0.00	0.	*	1	0658	210	0.00	0.00	0.00	0.
1	0200	61	0.00	0.00	0.00	0.	*	1	0700	211	0.00	0.00	0.00	0.
1	0202	62	0.00	0.00	0.00	0.	*	1	0702	212	0.00	0.00	0.00	0.

1	0204	63	0.00	0.00	0.00	0.	*	1	0704	213	0.00	0.00	0.00	0.
1	0206	64	0.00	0.00	0.00	0.	*	1	0706	214	0.00	0.00	0.00	0.
1	0208	65	0.00	0.00	0.00	0.	*	1	0708	215	0.00	0.00	0.00	0.
1	0210	66	0.00	0.00	0.00	0.	*	1	0710	216	0.00	0.00	0.00	0.
1	0212	67	0.00	0.00	0.00	0.	*	1	0712	217	0.00	0.00	0.00	0.
1	0214	68	0.00	0.00	0.00	0.	*	1	0714	218	0.00	0.00	0.00	0.
1	0216	69	0.00	0.00	0.00	0.	*	1	0716	219	0.00	0.00	0.00	0.
1	0218	70	0.00	0.00	0.00	0.	*	1	0718	220	0.00	0.00	0.00	0.
1	0220	71	0.01	0.00	0.00	0.	*	1	0720	221	0.00	0.00	0.00	0.
1	0222	72	0.01	0.00	0.00	1.	*	1	0722	222	0.00	0.00	0.00	0.
1	0224	73	0.01	0.00	0.00	1.	*	1	0724	223	0.00	0.00	0.00	0.
1	0226	74	0.01	0.00	0.00	1.	*	1	0726	224	0.00	0.00	0.00	0.
1	0228	75	0.01	0.00	0.00	1.	*	1	0728	225	0.00	0.00	0.00	0.
1	0230	76	0.01	0.00	0.00	1.	*	1	0730	226	0.00	0.00	0.00	0.
1	0232	77	0.02	0.01	0.01	1.	*	1	0732	227	0.00	0.00	0.00	0.
1	0234	78	0.02	0.01	0.01	1.	*	1	0734	228	0.00	0.00	0.00	0.
1	0236	79	0.02	0.01	0.01	1.	*	1	0736	229	0.00	0.00	0.00	0.
1	0238	80	0.02	0.01	0.01	1.	*	1	0738	230	0.00	0.00	0.00	0.
1	0240	81	0.02	0.01	0.02	2.	*	1	0740	231	0.00	0.00	0.00	0.
1	0242	82	0.02	0.01	0.02	2.	*	1	0742	232	0.00	0.00	0.00	0.
1	0244	83	0.03	0.01	0.02	3.	*	1	0744	233	0.00	0.00	0.00	0.
1	0246	84	0.03	0.01	0.02	3.	*	1	0746	234	0.00	0.00	0.00	0.
1	0248	85	0.04	0.01	0.03	4.	*	1	0748	235	0.00	0.00	0.00	0.
1	0250	86	0.04	0.01	0.03	5.	*	1	0750	236	0.00	0.00	0.00	0.
1	0252	87	0.05	0.01	0.03	6.	*	1	0752	237	0.00	0.00	0.00	0.
1	0254	88	0.06	0.01	0.05	7.	*	1	0754	238	0.00	0.00	0.00	0.
1	0256	89	0.08	0.02	0.07	9.	*	1	0756	239	0.00	0.00	0.00	0.
1	0258	90	0.11	0.02	0.09	13.	*	1	0758	240	0.00	0.00	0.00	0.
1	0300	91	0.20	0.03	0.17	20.	*	1	0800	241	0.00	0.00	0.00	0.
1	0302	92	0.20	0.03	0.17	30.	*	1	0802	242	0.00	0.00	0.00	0.
1	0304	93	0.16	0.02	0.14	37.	*	1	0804	243	0.00	0.00	0.00	0.
1	0306	94	0.10	0.01	0.09	35.	*	1	0806	244	0.00	0.00	0.00	0.
1	0308	95	0.08	0.01	0.07	30.	*	1	0808	245	0.00	0.00	0.00	0.
1	0310	96	0.05	0.00	0.04	24.	*	1	0810	246	0.00	0.00	0.00	0.
1	0312	97	0.04	0.00	0.04	19.	*	1	0812	247	0.00	0.00	0.00	0.
1	0314	98	0.04	0.00	0.04	15.	*	1	0814	248	0.00	0.00	0.00	0.
1	0316	99	0.04	0.00	0.03	13.	*	1	0816	249	0.00	0.00	0.00	0.
1	0318	100	0.03	0.00	0.02	11.	*	1	0818	250	0.00	0.00	0.00	0.
1	0320	101	0.02	0.00	0.02	10.	*	1	0820	251	0.00	0.00	0.00	0.
1	0322	102	0.02	0.00	0.02	9.	*	1	0822	252	0.00	0.00	0.00	0.
1	0324	103	0.02	0.00	0.02	8.	*	1	0824	253	0.00	0.00	0.00	0.
1	0326	104	0.02	0.00	0.02	7.	*	1	0826	254	0.00	0.00	0.00	0.
1	0328	105	0.02	0.00	0.02	7.	*	1	0828	255	0.00	0.00	0.00	0.
1	0330	106	0.02	0.00	0.02	6.	*	1	0830	256	0.00	0.00	0.00	0.
1	0332	107	0.01	0.00	0.01	6.	*	1	0832	257	0.00	0.00	0.00	0.

1	0334	108	0.01	0.00	0.01	5.	*	1	0834	258	0.00	0.00	0.00	0.
1	0336	109	0.01	0.00	0.01	4.	*	1	0836	259	0.00	0.00	0.00	0.
1	0338	110	0.01	0.00	0.01	4.	*	1	0838	260	0.00	0.00	0.00	0.
1	0340	111	0.01	0.00	0.01	3.	*	1	0840	261	0.00	0.00	0.00	0.
1	0342	112	0.01	0.00	0.00	3.	*	1	0842	262	0.00	0.00	0.00	0.
1	0344	113	0.01	0.00	0.00	3.	*	1	0844	263	0.00	0.00	0.00	0.
1	0346	114	0.00	0.00	0.00	2.	*	1	0846	264	0.00	0.00	0.00	0.
1	0348	115	0.00	0.00	0.00	2.	*	1	0848	265	0.00	0.00	0.00	0.
1	0350	116	0.00	0.00	0.00	2.	*	1	0850	266	0.00	0.00	0.00	0.
1	0352	117	0.00	0.00	0.00	2.	*	1	0852	267	0.00	0.00	0.00	0.
1	0354	118	0.00	0.00	0.00	2.	*	1	0854	268	0.00	0.00	0.00	0.
1	0356	119	0.00	0.00	0.00	2.	*	1	0856	269	0.00	0.00	0.00	0.
1	0358	120	0.00	0.00	0.00	2.	*	1	0858	270	0.00	0.00	0.00	0.
1	0400	121	0.00	0.00	0.00	1.	*	1	0900	271	0.00	0.00	0.00	0.
1	0402	122	0.00	0.00	0.00	1.	*	1	0902	272	0.00	0.00	0.00	0.
1	0404	123	0.00	0.00	0.00	1.	*	1	0904	273	0.00	0.00	0.00	0.
1	0406	124	0.00	0.00	0.00	1.	*	1	0906	274	0.00	0.00	0.00	0.
1	0408	125	0.00	0.00	0.00	1.	*	1	0908	275	0.00	0.00	0.00	0.
1	0410	126	0.00	0.00	0.00	1.	*	1	0910	276	0.00	0.00	0.00	0.
1	0412	127	0.00	0.00	0.00	1.	*	1	0912	277	0.00	0.00	0.00	0.
1	0414	128	0.00	0.00	0.00	1.	*	1	0914	278	0.00	0.00	0.00	0.
1	0416	129	0.00	0.00	0.00	1.	*	1	0916	279	0.00	0.00	0.00	0.
1	0418	130	0.00	0.00	0.00	1.	*	1	0918	280	0.00	0.00	0.00	0.
1	0420	131	0.00	0.00	0.00	1.	*	1	0920	281	0.00	0.00	0.00	0.
1	0422	132	0.00	0.00	0.00	1.	*	1	0922	282	0.00	0.00	0.00	0.
1	0424	133	0.00	0.00	0.00	1.	*	1	0924	283	0.00	0.00	0.00	0.
1	0426	134	0.00	0.00	0.00	1.	*	1	0926	284	0.00	0.00	0.00	0.
1	0428	135	0.00	0.00	0.00	1.	*	1	0928	285	0.00	0.00	0.00	0.
1	0430	136	0.00	0.00	0.00	1.	*	1	0930	286	0.00	0.00	0.00	0.
1	0432	137	0.00	0.00	0.00	1.	*	1	0932	287	0.00	0.00	0.00	0.
1	0434	138	0.00	0.00	0.00	1.	*	1	0934	288	0.00	0.00	0.00	0.
1	0436	139	0.00	0.00	0.00	1.	*	1	0936	289	0.00	0.00	0.00	0.
1	0438	140	0.00	0.00	0.00	1.	*	1	0938	290	0.00	0.00	0.00	0.
1	0440	141	0.00	0.00	0.00	1.	*	1	0940	291	0.00	0.00	0.00	0.
1	0442	142	0.00	0.00	0.00	1.	*	1	0942	292	0.00	0.00	0.00	0.
1	0444	143	0.00	0.00	0.00	1.	*	1	0944	293	0.00	0.00	0.00	0.
1	0446	144	0.00	0.00	0.00	1.	*	1	0946	294	0.00	0.00	0.00	0.
1	0448	145	0.00	0.00	0.00	1.	*	1	0948	295	0.00	0.00	0.00	0.
1	0450	146	0.00	0.00	0.00	1.	*	1	0950	296	0.00	0.00	0.00	0.
1	0452	147	0.00	0.00	0.00	1.	*	1	0952	297	0.00	0.00	0.00	0.
1	0454	148	0.00	0.00	0.00	1.	*	1	0954	298	0.00	0.00	0.00	0.
1	0456	149	0.00	0.00	0.00	1.	*	1	0956	299	0.00	0.00	0.00	0.
1	0458	150	0.00	0.00	0.00	1.	*	1	0958	300	0.00	0.00	0.00	0.
							*							

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```
    TOTAL RAINFALL =    2.05, TOTAL LOSS =    0.42, TOTAL EXCESS =    1.63

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR      9.97-HR
+   (CFS)       (HR)
                                    (CFS)
+      37.      3.07                    2.          1.          1.          1.
                                 (INCHES)     1.626       1.631       1.631       1.631
                                  (AC-FT)        1.          1.          1.          1.

                                CUMULATIVE AREA =    0.01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  364 KK    *    050050  *        FROM 050062
            *            *
            **************

  365 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           2  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

  366 RK          KINEMATIC WAVE STREAM ROUTING
                            L       1000.  CHANNEL LENGTH
                            S      0.0020  SLOPE
                            N       0.013  CHANNEL ROUGHNESS COEFFICIENT
                           CA        0.00  CONTRIBUTING AREA
                        SHAPE        CIRC  CHANNEL SHAPE
                           WD        2.50  BOTTOM WIDTH OR DIAMETER
                            Z        1.00  SIDE SLOPE
                       NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS

                                                        ***
                                      COMPUTED KINEMATIC PARAMETERS
                                           VARIABLE TIME STEP
```

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	3.22	1.25	1.07	333.33	15.56	187.40	1.64	5.53

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5227E+00 EXCESS=0.0000E+00 OUTFLOW=0.5236E+00 BASIN STORAGE=0.4824E-04 PERCENT ERROR= -0.2

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	3.22	1.25	2.00	15.38	188.00	1.64

****

HYDROGRAPH AT STATION 050050

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	0.	1		0500	151	0.	1		0730	226	0.
1		0002	2	0.	1		0232	77	0.	1		0502	152	0.	1		0732	227	0.
1		0004	3	0.	1		0234	78	0.	1		0504	153	0.	1		0734	228	0.
1		0006	4	0.	1		0236	79	0.	1		0506	154	0.	1		0736	229	0.
1		0008	5	0.	1		0238	80	0.	1		0508	155	0.	1		0738	230	0.
1		0010	6	0.	1		0240	81	0.	1		0510	156	0.	1		0740	231	0.
1		0012	7	0.	1		0242	82	1.	1		0512	157	0.	1		0742	232	0.
1		0014	8	0.	1		0244	83	1.	1		0514	158	0.	1		0744	233	0.
1		0016	9	0.	1		0246	84	1.	1		0516	159	0.	1		0746	234	0.
1		0018	10	0.	1		0248	85	1.	1		0518	160	0.	1		0748	235	0.
1		0020	11	0.	1		0250	86	1.	1		0520	161	0.	1		0750	236	0.
1		0022	12	0.	1		0252	87	2.	1		0522	162	0.	1		0752	237	0.
1		0024	13	0.	1		0254	88	2.	1		0524	163	0.	1		0754	238	0.
1		0026	14	0.	1		0256	89	2.	1		0526	164	0.	1		0756	239	0.
1		0028	15	0.	1		0258	90	3.	1		0528	165	0.	1		0758	240	0.
1		0030	16	0.	1		0300	91	4.	1		0530	166	0.	1		0800	241	0.
1		0032	17	0.	1		0302	92	7.	1		0532	167	0.	1		0802	242	0.
1		0034	18	0.	1		0304	93	11.	1		0534	168	0.	1		0804	243	0.
1		0036	19	0.	1		0306	94	15.	1		0536	169	0.	1		0806	244	0.
1		0038	20	0.	1		0308	95	15.	1		0538	170	0.	1		0808	245	0.

1	0040	21	0.	*	1	0310	96	14.	*	1	0540	171	0.	*	1	0810	246	0.
1	0042	22	0.	*	1	0312	97	11.	*	1	0542	172	0.	*	1	0812	247	0.
1	0044	23	0.	*	1	0314	98	9.	*	1	0544	173	0.	*	1	0814	248	0.
1	0046	24	0.	*	1	0316	99	7.	*	1	0546	174	0.	*	1	0816	249	0.
1	0048	25	0.	*	1	0318	100	6.	*	1	0548	175	0.	*	1	0818	250	0.
1	0050	26	0.	*	1	0320	101	5.	*	1	0550	176	0.	*	1	0820	251	0.
1	0052	27	0.	*	1	0322	102	5.	*	1	0552	177	0.	*	1	0822	252	0.
1	0054	28	0.	*	1	0324	103	4.	*	1	0554	178	0.	*	1	0824	253	0.
1	0056	29	0.	*	1	0326	104	4.	*	1	0556	179	0.	*	1	0826	254	0.
1	0058	30	0.	*	1	0328	105	3.	*	1	0558	180	0.	*	1	0828	255	0.
1	0100	31	0.	*	1	0330	106	3.	*	1	0600	181	0.	*	1	0830	256	0.
1	0102	32	0.	*	1	0332	107	3.	*	1	0602	182	0.	*	1	0832	257	0.
1	0104	33	0.	*	1	0334	108	3.	*	1	0604	183	0.	*	1	0834	258	0.
1	0106	34	0.	*	1	0336	109	2.	*	1	0606	184	0.	*	1	0836	259	0.
1	0108	35	0.	*	1	0338	110	2.	*	1	0608	185	0.	*	1	0838	260	0.
1	0110	36	0.	*	1	0340	111	2.	*	1	0610	186	0.	*	1	0840	261	0.
1	0112	37	0.	*	1	0342	112	2.	*	1	0612	187	0.	*	1	0842	262	0.
1	0114	38	0.	*	1	0344	113	2.	*	1	0614	188	0.	*	1	0844	263	0.
1	0116	39	0.	*	1	0346	114	1.	*	1	0616	189	0.	*	1	0846	264	0.
1	0118	40	0.	*	1	0348	115	1.	*	1	0618	190	0.	*	1	0848	265	0.
1	0120	41	0.	*	1	0350	116	1.	*	1	0620	191	0.	*	1	0850	266	0.
1	0122	42	0.	*	1	0352	117	1.	*	1	0622	192	0.	*	1	0852	267	0.
1	0124	43	0.	*	1	0354	118	1.	*	1	0624	193	0.	*	1	0854	268	0.
1	0126	44	0.	*	1	0356	119	1.	*	1	0626	194	0.	*	1	0856	269	0.
1	0128	45	0.	*	1	0358	120	1.	*	1	0628	195	0.	*	1	0858	270	0.
1	0130	46	0.	*	1	0400	121	1.	*	1	0630	196	0.	*	1	0900	271	0.
1	0132	47	0.	*	1	0402	122	1.	*	1	0632	197	0.	*	1	0902	272	0.
1	0134	48	0.	*	1	0404	123	1.	*	1	0634	198	0.	*	1	0904	273	0.
1	0136	49	0.	*	1	0406	124	1.	*	1	0636	199	0.	*	1	0906	274	0.
1	0138	50	0.	*	1	0408	125	1.	*	1	0638	200	0.	*	1	0908	275	0.
1	0140	51	0.	*	1	0410	126	1.	*	1	0640	201	0.	*	1	0910	276	0.
1	0142	52	0.	*	1	0412	127	1.	*	1	0642	202	0.	*	1	0912	277	0.
1	0144	53	0.	*	1	0414	128	1.	*	1	0644	203	0.	*	1	0914	278	0.
1	0146	54	0.	*	1	0416	129	1.	*	1	0646	204	0.	*	1	0916	279	0.
1	0148	55	0.	*	1	0418	130	0.	*	1	0648	205	0.	*	1	0918	280	0.
1	0150	56	0.	*	1	0420	131	0.	*	1	0650	206	0.	*	1	0920	281	0.
1	0152	57	0.	*	1	0422	132	0.	*	1	0652	207	0.	*	1	0922	282	0.
1	0154	58	0.	*	1	0424	133	0.	*	1	0654	208	0.	*	1	0924	283	0.
1	0156	59	0.	*	1	0426	134	0.	*	1	0656	209	0.	*	1	0926	284	0.
1	0158	60	0.	*	1	0428	135	0.	*	1	0658	210	0.	*	1	0928	285	0.
1	0200	61	0.	*	1	0430	136	0.	*	1	0700	211	0.	*	1	0930	286	0.
1	0202	62	0.	*	1	0432	137	0.	*	1	0702	212	0.	*	1	0932	287	0.
1	0204	63	0.	*	1	0434	138	0.	*	1	0704	213	0.	*	1	0934	288	0.
1	0206	64	0.	*	1	0436	139	0.	*	1	0706	214	0.	*	1	0936	289	0.
1	0208	65	0.	*	1	0438	140	0.	*	1	0708	215	0.	*	1	0938	290	0.

```
    1     0210   66        0.   *    1     0440  141        0.   *    1     0710  216        0.   *    1     0940  291        0.
    1     0212   67        0.   *    1     0442  142        0.   *    1     0712  217        0.   *    1     0942  292        0.
    1     0214   68        0.   *    1     0444  143        0.   *    1     0714  218        0.   *    1     0944  293        0.
    1     0216   69        0.   *    1     0446  144        0.   *    1     0716  219        0.   *    1     0946  294        0.
    1     0218   70        0.   *    1     0448  145        0.   *    1     0718  220        0.   *    1     0948  295        0.
    1     0220   71        0.   *    1     0450  146        0.   *    1     0720  221        0.   *    1     0950  296        0.
    1     0222   72        0.   *    1     0452  147        0.   *    1     0722  222        0.   *    1     0952  297        0.
    1     0224   73        0.   *    1     0454  148        0.   *    1     0724  223        0.   *    1     0954  298        0.
    1     0226   74        0.   *    1     0456  149        0.   *    1     0726  224        0.   *    1     0956  299        0.
    1     0228   75        0.   *    1     0458  150        0.   *    1     0728  225        0.   *    1     0958  300        0.
                                *                                  *                                  *
*************************************************************************************************************************************

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR      9.97-HR
+   (CFS)       (HR)
                              (CFS)
+      15.      3.13                      1.          1.          1.          1.
                          (INCHES)     1.631       1.636       1.636       1.636
                           (AC-FT)        1.          1.          1.          1.

                          CUMULATIVE AREA =    0.01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             **************
             *            *
 367 KK      *    050050  *      COMBINE
             *            *
             **************

 369 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           2  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

 370 HC          HYDROGRAPH COMBINATION
                       ICOMP           6  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***
```

HYDROGRAPH AT STATION 050050
SUM OF 6 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	32.	1		0230	76	1.	1		0500	151	44.	1		0730	226	5.
1		0002	2	6.	1		0232	77	2.	1		0502	152	42.	1		0732	227	5.
1		0004	3	0.	1		0234	78	2.	1		0504	153	40.	1		0734	228	5.
1		0006	4	0.	1		0236	79	3.	1		0506	154	38.	1		0736	229	4.
1		0008	5	0.	1		0238	80	3.	1		0508	155	36.	1		0738	230	4.
1		0010	6	0.	1		0240	81	4.	1		0510	156	34.	1		0740	231	4.
1		0012	7	0.	1		0242	82	5.	1		0512	157	33.	1		0742	232	4.
1		0014	8	0.	1		0244	83	6.	1		0514	158	32.	1		0744	233	4.
1		0016	9	0.	1		0246	84	7.	1		0516	159	30.	1		0746	234	4.
1		0018	10	0.	1		0248	85	9.	1		0518	160	29.	1		0748	235	4.
1		0020	11	0.	1		0250	86	11.	1		0520	161	28.	1		0750	236	4.
1		0022	12	0.	1		0252	87	14.	1		0522	162	27.	1		0752	237	3.
1		0024	13	0.	1		0254	88	18.	1		0524	163	26.	1		0754	238	3.
1		0026	14	0.	1		0256	89	23.	1		0526	164	25.	1		0756	239	3.
1		0028	15	0.	1		0258	90	32.	1		0528	165	24.	1		0758	240	3.
1		0030	16	0.	1		0300	91	49.	1		0530	166	23.	1		0800	241	3.
1		0032	17	0.	1		0302	92	73.	1		0532	167	23.	1		0802	242	3.
1		0034	18	0.	1		0304	93	99.	1		0534	168	22.	1		0804	243	3.
1		0036	19	0.	1		0306	94	116.	1		0536	169	22.	1		0806	244	3.
1		0038	20	0.	1		0308	95	137.	1		0538	170	21.	1		0808	245	3.
1		0040	21	0.	1		0310	96	177.	1		0540	171	21.	1		0810	246	3.
1		0042	22	0.	1		0312	97	228.	1		0542	172	20.	1		0812	247	3.
1		0044	23	0.	1		0314	98	253.	1		0544	173	20.	1		0814	248	3.
1		0046	24	0.	1		0316	99	256.	1		0546	174	20.	1		0816	249	3.
1		0048	25	0.	1		0318	100	247.	1		0548	175	19.	1		0818	250	2.
1		0050	26	0.	1		0320	101	232.	1		0550	176	19.	1		0820	251	2.
1		0052	27	0.	1		0322	102	218.	1		0552	177	18.	1		0822	252	2.
1		0054	28	0.	1		0324	103	205.	1		0554	178	18.	1		0824	253	2.
1		0056	29	0.	1		0326	104	194.	1		0556	179	18.	1		0826	254	2.
1		0058	30	0.	1		0328	105	185.	1		0558	180	17.	1		0828	255	2.
1		0100	31	0.	1		0330	106	177.	1		0600	181	17.	1		0830	256	2.
1		0102	32	0.	1		0332	107	171.	1		0602	182	17.	1		0832	257	2.
1		0104	33	0.	1		0334	108	165.	1		0604	183	16.	1		0834	258	2.
1		0106	34	0.	1		0336	109	160.	1		0606	184	16.	1		0836	259	2.
1		0108	35	0.	1		0338	110	155.	1		0608	185	16.	1		0838	260	2.
1		0110	36	0.	1		0340	111	151.	1		0610	186	15.	1		0840	261	2.

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

1	0112	37	0.	*	1	0342	112	146.	*	1	0612	187	15.	*	1	0842	262	2.
1	0114	38	0.	*	1	0344	113	142.	*	1	0614	188	15.	*	1	0844	263	2.
1	0116	39	0.	*	1	0346	114	138.	*	1	0616	189	15.	*	1	0846	264	2.
1	0118	40	0.	*	1	0348	115	134.	*	1	0618	190	14.	*	1	0848	265	2.
1	0120	41	0.	*	1	0350	116	130.	*	1	0620	191	14.	*	1	0850	266	2.
1	0122	42	0.	*	1	0352	117	126.	*	1	0622	192	14.	*	1	0852	267	2.
1	0124	43	0.	*	1	0354	118	123.	*	1	0624	193	13.	*	1	0854	268	2.
1	0126	44	0.	*	1	0356	119	119.	*	1	0626	194	13.	*	1	0856	269	2.
1	0128	45	0.	*	1	0358	120	117.	*	1	0628	195	13.	*	1	0858	270	1.
1	0130	46	0.	*	1	0400	121	114.	*	1	0630	196	12.	*	1	0900	271	1.
1	0132	47	0.	*	1	0402	122	112.	*	1	0632	197	12.	*	1	0902	272	1.
1	0134	48	0.	*	1	0404	123	109.	*	1	0634	198	12.	*	1	0904	273	1.
1	0136	49	0.	*	1	0406	124	107.	*	1	0636	199	11.	*	1	0906	274	1.
1	0138	50	0.	*	1	0408	125	106.	*	1	0638	200	11.	*	1	0908	275	1.
1	0140	51	0.	*	1	0410	126	104.	*	1	0640	201	11.	*	1	0910	276	1.
1	0142	52	0.	*	1	0412	127	102.	*	1	0642	202	10.	*	1	0912	277	1.
1	0144	53	0.	*	1	0414	128	101.	*	1	0644	203	10.	*	1	0914	278	1.
1	0146	54	0.	*	1	0416	129	99.	*	1	0646	204	10.	*	1	0916	279	1.
1	0148	55	0.	*	1	0418	130	98.	*	1	0648	205	10.	*	1	0918	280	1.
1	0150	56	0.	*	1	0420	131	96.	*	1	0650	206	9.	*	1	0920	281	1.
1	0152	57	0.	*	1	0422	132	95.	*	1	0652	207	9.	*	1	0922	282	1.
1	0154	58	0.	*	1	0424	133	94.	*	1	0654	208	9.	*	1	0924	283	1.
1	0156	59	0.	*	1	0426	134	93.	*	1	0656	209	8.	*	1	0926	284	1.
1	0158	60	0.	*	1	0428	135	92.	*	1	0658	210	8.	*	1	0928	285	1.
1	0200	61	0.	*	1	0430	136	90.	*	1	0700	211	8.	*	1	0930	286	1.
1	0202	62	0.	*	1	0432	137	89.	*	1	0702	212	8.	*	1	0932	287	1.
1	0204	63	0.	*	1	0434	138	88.	*	1	0704	213	7.	*	1	0934	288	1.
1	0206	64	0.	*	1	0436	139	87.	*	1	0706	214	7.	*	1	0936	289	1.
1	0208	65	0.	*	1	0438	140	86.	*	1	0708	215	7.	*	1	0938	290	1.
1	0210	66	0.	*	1	0440	141	84.	*	1	0710	216	7.	*	1	0940	291	1.
1	0212	67	1.	*	1	0442	142	63.	*	1	0712	217	6.	*	1	0942	292	1.
1	0214	68	1.	*	1	0444	143	58.	*	1	0714	218	6.	*	1	0944	293	1.
1	0216	69	1.	*	1	0446	144	57.	*	1	0716	219	6.	*	1	0946	294	1.
1	0218	70	1.	*	1	0448	145	55.	*	1	0718	220	6.	*	1	0948	295	1.
1	0220	71	1.	*	1	0450	146	54.	*	1	0720	221	6.	*	1	0950	296	1.
1	0222	72	1.	*	1	0452	147	53.	*	1	0722	222	5.	*	1	0952	297	1.
1	0224	73	1.	*	1	0454	148	51.	*	1	0724	223	5.	*	1	0954	298	1.
1	0226	74	1.	*	1	0456	149	49.	*	1	0726	224	5.	*	1	0956	299	1.
1	0228	75	1.	*	1	0458	150	46.	*	1	0728	225	5.	*	1	0958	300	1.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)				

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

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                    (CFS)
+     256.     3.27                49.        30.        30.        30.
                (INCHES)         1.053      1.064      1.064      1.064
                 (AC-FT)          24.        25.        25.        25.

                CUMULATIVE AREA =    0.43 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 380 KK   *     05Det  *       Storage
          *            *
          **************

 381 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           2  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

 382 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        0.00  INITIAL CONDITION
                          X        0.00 WORKING R AND D COEFFICIENT

 383 SV            STORAGE         0.0       2.1       5.3       8.5      11.8      15.2      18.6      25.7

 384 SE          ELEVATION       48.65     50.00     51.00     52.00     53.00     54.00     55.00     57.00

 385 SQ          DISCHARGE          0.        0.        0.       10.       70.      115.      125.      140.
                                                             ***

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                                        HYDROGRAPH AT STATION    05Det

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	48.7	*	1		0320	101	4.	6.5	51.4	*	1		0640	201	23.	9.2	52.2
1		0002	2	0.	0.1	48.7	*	1		0322	102	6.	7.2	51.6	*	1		0642	202	22.	9.2	52.2
1		0004	3	0.	0.1	48.7	*	1		0324	103	8.	7.8	51.8	*	1		0644	203	22.	9.1	52.2
1		0006	4	0.	0.1	48.7	*	1		0326	104	10.	8.4	52.0	*	1		0646	204	21.	9.1	52.2
1		0008	5	0.	0.1	48.7	*	1		0328	105	18.	8.9	52.1	*	1		0648	205	21.	9.1	52.2
1		0010	6	0.	0.1	48.7	*	1		0330	106	27.	9.4	52.3	*	1		0650	206	20.	9.1	52.2
1		0012	7	0.	0.1	48.7	*	1		0332	107	35.	9.9	52.4	*	1		0652	207	20.	9.0	52.2
1		0014	8	0.	0.1	48.7	*	1		0334	108	42.	10.3	52.5	*	1		0654	208	19.	9.0	52.2
1		0016	9	0.	0.1	48.7	*	1		0336	109	49.	10.6	52.7	*	1		0656	209	19.	9.0	52.1
1		0018	10	0.	0.1	48.7	*	1		0338	110	55.	11.0	52.8	*	1		0658	210	18.	8.9	52.1
1		0020	11	0.	0.1	48.7	*	1		0340	111	60.	11.3	52.8	*	1		0700	211	18.	8.9	52.1
1		0022	12	0.	0.1	48.7	*	1		0342	112	65.	11.5	52.9	*	1		0702	212	17.	8.9	52.1
1		0024	13	0.	0.1	48.7	*	1		0344	113	70.	11.8	53.0	*	1		0704	213	17.	8.9	52.1
1		0026	14	0.	0.1	48.7	*	1		0346	114	73.	12.0	53.1	*	1		0706	214	16.	8.8	52.1
1		0028	15	0.	0.1	48.7	*	1		0348	115	75.	12.2	53.1	*	1		0708	215	16.	8.8	52.1
1		0030	16	0.	0.1	48.7	*	1		0350	116	78.	12.4	53.2	*	1		0710	216	16.	8.8	52.1
1		0032	17	0.	0.1	48.7	*	1		0352	117	80.	12.5	53.2	*	1		0712	217	15.	8.8	52.1
1		0034	18	0.	0.1	48.7	*	1		0354	118	82.	12.7	53.3	*	1		0714	218	15.	8.7	52.1
1		0036	19	0.	0.1	48.7	*	1		0356	119	83.	12.8	53.3	*	1		0716	219	14.	8.7	52.1
1		0038	20	0.	0.1	48.7	*	1		0358	120	85.	12.9	53.3	*	1		0718	220	14.	8.7	52.1
1		0040	21	0.	0.1	48.7	*	1		0400	121	86.	13.0	53.4	*	1		0720	221	14.	8.7	52.1
1		0042	22	0.	0.1	48.7	*	1		0402	122	87.	13.1	53.4	*	1		0722	222	13.	8.7	52.1
1		0044	23	0.	0.1	48.7	*	1		0404	123	88.	13.2	53.4	*	1		0724	223	13.	8.6	52.0
1		0046	24	0.	0.1	48.7	*	1		0406	124	89.	13.2	53.4	*	1		0726	224	12.	8.6	52.0
1		0048	25	0.	0.1	48.7	*	1		0408	125	90.	13.3	53.4	*	1		0728	225	12.	8.6	52.0
1		0050	26	0.	0.1	48.7	*	1		0410	126	91.	13.3	53.5	*	1		0730	226	12.	8.6	52.0
1		0052	27	0.	0.1	48.7	*	1		0412	127	91.	13.4	53.5	*	1		0732	227	11.	8.6	52.0
1		0054	28	0.	0.1	48.7	*	1		0414	128	92.	13.4	53.5	*	1		0734	228	11.	8.6	52.0
1		0056	29	0.	0.1	48.7	*	1		0416	129	92.	13.4	53.5	*	1		0736	229	11.	8.5	52.0
1		0058	30	0.	0.1	48.7	*	1		0418	130	92.	13.5	53.5	*	1		0738	230	10.	8.5	52.0
1		0100	31	0.	0.1	48.7	*	1		0420	131	93.	13.5	53.5	*	1		0740	231	10.	8.5	52.0
1		0102	32	0.	0.1	48.7	*	1		0422	132	93.	13.5	53.5	*	1		0742	232	10.	8.5	52.0
1		0104	33	0.	0.1	48.7	*	1		0424	133	93.	13.5	53.5	*	1		0744	233	10.	8.5	52.0
1		0106	34	0.	0.1	48.7	*	1		0426	134	93.	13.5	53.5	*	1		0746	234	10.	8.5	52.0
1		0108	35	0.	0.1	48.7	*	1		0428	135	93.	13.5	53.5	*	1		0748	235	10.	8.4	52.0
1		0110	36	0.	0.1	48.7	*	1		0430	136	93.	13.5	53.5	*	1		0750	236	10.	8.4	52.0
1		0112	37	0.	0.1	48.7	*	1		0432	137	93.	13.5	53.5	*	1		0752	237	10.	8.4	52.0
1		0114	38	0.	0.1	48.7	*	1		0434	138	93.	13.5	53.5	*	1		0754	238	10.	8.4	52.0
1		0116	39	0.	0.1	48.7	*	1		0436	139	93.	13.5	53.5	*	1		0756	239	10.	8.4	52.0
1		0118	40	0.	0.1	48.7	*	1		0438	140	93.	13.5	53.5	*	1		0758	240	10.	8.4	52.0
1		0120	41	0.	0.1	48.7	*	1		0440	141	93.	13.5	53.5	*	1		0800	241	10.	8.3	52.0
1		0122	42	0.	0.1	48.7	*	1		0442	142	92.	13.4	53.5	*	1		0802	242	9.	8.3	51.9

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1	0124	43	0.	0.1	48.7	*	1	0444	143	91.	13.4	53.5	*	1	0804	243	9.	8.3	51.9
1	0126	44	0.	0.1	48.7	*	1	0446	144	90.	13.3	53.4	*	1	0806	244	9.	8.3	51.9
1	0128	45	0.	0.1	48.7	*	1	0448	145	89.	13.2	53.4	*	1	0808	245	9.	8.3	51.9
1	0130	46	0.	0.1	48.7	*	1	0450	146	88.	13.1	53.4	*	1	0810	246	9.	8.2	51.9
1	0132	47	0.	0.1	48.7	*	1	0452	147	86.	13.0	53.4	*	1	0812	247	9.	8.2	51.9
1	0134	48	0.	0.1	48.7	*	1	0454	148	85.	12.9	53.3	*	1	0814	248	9.	8.2	51.9
1	0136	49	0.	0.1	48.7	*	1	0456	149	84.	12.8	53.3	*	1	0816	249	9.	8.2	51.9
1	0138	50	0.	0.1	48.7	*	1	0458	150	83.	12.7	53.3	*	1	0818	250	9.	8.2	51.9
1	0140	51	0.	0.1	48.7	*	1	0500	151	81.	12.6	53.3	*	1	0820	251	9.	8.2	51.9
1	0142	52	0.	0.1	48.7	*	1	0502	152	80.	12.5	53.2	*	1	0822	252	9.	8.1	51.9
1	0144	53	0.	0.1	48.7	*	1	0504	153	79.	12.4	53.2	*	1	0824	253	9.	8.1	51.9
1	0146	54	0.	0.1	48.7	*	1	0506	154	77.	12.3	53.2	*	1	0826	254	9.	8.1	51.9
1	0148	55	0.	0.1	48.7	*	1	0508	155	76.	12.2	53.1	*	1	0828	255	9.	8.1	51.9
1	0150	56	0.	0.1	48.7	*	1	0510	156	75.	12.1	53.1	*	1	0830	256	9.	8.1	51.9
1	0152	57	0.	0.1	48.7	*	1	0512	157	73.	12.0	53.1	*	1	0832	257	9.	8.1	51.9
1	0154	58	0.	0.1	48.7	*	1	0514	158	72.	11.9	53.0	*	1	0834	258	9.	8.0	51.9
1	0156	59	0.	0.1	48.7	*	1	0516	159	70.	11.8	53.0	*	1	0836	259	9.	8.0	51.9
1	0158	60	0.	0.1	48.7	*	1	0518	160	68.	11.7	53.0	*	1	0838	260	8.	8.0	51.8
1	0200	61	0.	0.1	48.7	*	1	0520	161	67.	11.6	52.9	*	1	0840	261	8.	8.0	51.8
1	0202	62	0.	0.1	48.7	*	1	0522	162	65.	11.5	52.9	*	1	0842	262	8.	8.0	51.8
1	0204	63	0.	0.1	48.7	*	1	0524	163	63.	11.4	52.9	*	1	0844	263	8.	7.9	51.8
1	0206	64	0.	0.1	48.7	*	1	0526	164	61.	11.3	52.9	*	1	0846	264	8.	7.9	51.8
1	0208	65	0.	0.1	48.7	*	1	0528	165	59.	11.2	52.8	*	1	0848	265	8.	7.9	51.8
1	0210	66	0.	0.1	48.7	*	1	0530	166	58.	11.1	52.8	*	1	0850	266	8.	7.9	51.8
1	0212	67	0.	0.1	48.7	*	1	0532	167	56.	11.0	52.8	*	1	0852	267	8.	7.9	51.8
1	0214	68	0.	0.1	48.7	*	1	0534	168	55.	10.9	52.7	*	1	0854	268	8.	7.9	51.8
1	0216	69	0.	0.1	48.7	*	1	0536	169	53.	10.9	52.7	*	1	0856	269	8.	7.8	51.8
1	0218	70	0.	0.1	48.7	*	1	0538	170	52.	10.8	52.7	*	1	0858	270	8.	7.8	51.8
1	0220	71	0.	0.1	48.7	*	1	0540	171	50.	10.7	52.7	*	1	0900	271	8.	7.8	51.8
1	0222	72	0.	0.1	48.7	*	1	0542	172	49.	10.6	52.6	*	1	0902	272	8.	7.8	51.8
1	0224	73	0.	0.1	48.7	*	1	0544	173	47.	10.5	52.6	*	1	0904	273	8.	7.8	51.8
1	0226	74	0.	0.1	48.7	*	1	0546	174	46.	10.5	52.6	*	1	0906	274	8.	7.8	51.8
1	0228	75	0.	0.1	48.7	*	1	0548	175	45.	10.4	52.6	*	1	0908	275	8.	7.7	51.8
1	0230	76	0.	0.1	48.7	*	1	0550	176	44.	10.3	52.6	*	1	0910	276	8.	7.7	51.8
1	0232	77	0.	0.1	48.7	*	1	0552	177	42.	10.3	52.5	*	1	0912	277	8.	7.7	51.8
1	0234	78	0.	0.1	48.7	*	1	0554	178	41.	10.2	52.5	*	1	0914	278	8.	7.7	51.8
1	0236	79	0.	0.1	48.7	*	1	0556	179	40.	10.2	52.5	*	1	0916	279	7.	7.7	51.7
1	0238	80	0.	0.1	48.7	*	1	0558	180	39.	10.1	52.5	*	1	0918	280	7.	7.6	51.7
1	0240	81	0.	0.1	48.7	*	1	0600	181	38.	10.0	52.5	*	1	0920	281	7.	7.6	51.7
1	0242	82	0.	0.2	48.7	*	1	0602	182	37.	10.0	52.5	*	1	0922	282	7.	7.6	51.7
1	0244	83	0.	0.2	48.8	*	1	0604	183	36.	9.9	52.4	*	1	0924	283	7.	7.6	51.7
1	0246	84	0.	0.2	48.8	*	1	0606	184	35.	9.9	52.4	*	1	0926	284	7.	7.6	51.7
1	0248	85	0.	0.2	48.8	*	1	0608	185	34.	9.8	52.4	*	1	0928	285	7.	7.6	51.7
1	0250	86	0.	0.3	48.8	*	1	0610	186	34.	9.8	52.4	*	1	0930	286	7.	7.5	51.7
1	0252	87	0.	0.3	48.8	*	1	0612	187	33.	9.7	52.4	*	1	0932	287	7.	7.5	51.7

Osborn Outfall 50% Submittal
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1	0254	88	0.	0.4	48.9	*	1	0614	188	32.	9.7	52.4	*	1	0934	288	7.	7.5	51.7
1	0256	89	0.	0.4	48.9	*	1	0616	189	31.	9.6	52.4	*	1	0936	289	7.	7.5	51.7
1	0258	90	0.	0.5	49.0	*	1	0618	190	30.	9.6	52.3	*	1	0938	290	7.	7.5	51.7
1	0300	91	0.	0.7	49.1	*	1	0620	191	30.	9.6	52.3	*	1	0940	291	7.	7.5	51.7
1	0302	92	0.	0.9	49.2	*	1	0622	192	29.	9.5	52.3	*	1	0942	292	7.	7.5	51.7
1	0304	93	0.	1.2	49.4	*	1	0624	193	28.	9.5	52.3	*	1	0944	293	7.	7.4	51.7
1	0306	94	0.	1.5	49.7	*	1	0626	194	27.	9.4	52.3	*	1	0946	294	7.	7.4	51.7
1	0308	95	0.	2.0	50.0	*	1	0628	195	27.	9.4	52.3	*	1	0948	295	7.	7.4	51.7
1	0310	96	0.	2.6	50.2	*	1	0630	196	26.	9.4	52.3	*	1	0950	296	7.	7.4	51.7
1	0312	97	0.	3.3	50.4	*	1	0632	197	25.	9.3	52.3	*	1	0952	297	7.	7.4	51.7
1	0314	98	0.	4.1	50.6	*	1	0634	198	25.	9.3	52.2	*	1	0954	298	6.	7.4	51.6
1	0316	99	0.	4.9	50.9	*	1	0636	199	24.	9.3	52.2	*	1	0956	299	6.	7.3	51.6
1	0318	100	1.	5.7	51.1	*	1	0638	200	24.	9.2	52.2	*	1	0958	300	6.	7.3	51.6
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 93.	4.50		39.	24.	24.	24.
		(INCHES)	0.784	0.799	0.799	0.799
		(AC-FT)	19.	20.	20.	20.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	9.97-HR
+ (AC-FT)	(HR)				
14.	4.47	10.	7.	7.	7.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	9.97-HR
+ (FEET)	(HR)				
53.52	4.50	52.47	51.21	51.21	51.21

CUMULATIVE AREA = 0.46 SQ MI

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              *            *
  397 KK      *    050610  *          COMBINE
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Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

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 399 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          2  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

 400 HC          HYDROGRAPH COMBINATION
                       ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 050610
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0230	76	1.	*	1		0500	151	86.	*	1		0730	226	12.
1		0002	2	0.	*	1		0232	77	1.	*	1		0502	152	84.	*	1		0732	227	12.
1		0004	3	0.	*	1		0234	78	1.	*	1		0504	153	83.	*	1		0734	228	12.
1		0006	4	0.	*	1		0236	79	1.	*	1		0506	154	81.	*	1		0736	229	11.
1		0008	5	0.	*	1		0238	80	1.	*	1		0508	155	80.	*	1		0738	230	11.
1		0010	6	0.	*	1		0240	81	2.	*	1		0510	156	78.	*	1		0740	231	11.
1		0012	7	0.	*	1		0242	82	2.	*	1		0512	157	77.	*	1		0742	232	11.
1		0014	8	0.	*	1		0244	83	2.	*	1		0514	158	75.	*	1		0744	233	10.
1		0016	9	0.	*	1		0246	84	3.	*	1		0516	159	74.	*	1		0746	234	10.
1		0018	10	0.	*	1		0248	85	4.	*	1		0518	160	72.	*	1		0748	235	10.
1		0020	11	0.	*	1		0250	86	5.	*	1		0520	161	70.	*	1		0750	236	10.
1		0022	12	0.	*	1		0252	87	7.	*	1		0522	162	68.	*	1		0752	237	10.
1		0024	13	0.	*	1		0254	88	9.	*	1		0524	163	66.	*	1		0754	238	10.
1		0026	14	0.	*	1		0256	89	11.	*	1		0526	164	64.	*	1		0756	239	10.
1		0028	15	0.	*	1		0258	90	16.	*	1		0528	165	63.	*	1		0758	240	10.
1		0030	16	0.	*	1		0300	91	22.	*	1		0530	166	61.	*	1		0800	241	10.
1		0032	17	0.	*	1		0302	92	34.	*	1		0532	167	59.	*	1		0802	242	10.
1		0034	18	0.	*	1		0304	93	54.	*	1		0534	168	58.	*	1		0804	243	10.
1		0036	19	0.	*	1		0306	94	80.	*	1		0536	169	56.	*	1		0806	244	10.
1		0038	20	0.	*	1		0308	95	99.	*	1		0538	170	55.	*	1		0808	245	10.
1		0040	21	0.	*	1		0310	96	99.	*	1		0540	171	53.	*	1		0810	246	10.
1		0042	22	0.	*	1		0312	97	89.	*	1		0542	172	52.	*	1		0812	247	10.
1		0044	23	0.	*	1		0314	98	77.	*	1		0544	173	50.	*	1		0814	248	9.

1	0046	24	0.	*	1	0316	99	66.	*	1	0546	174	49.	*	1	0816	249	9.
1	0048	25	0.	*	1	0318	100	59.	*	1	0548	175	48.	*	1	0818	250	9.
1	0050	26	0.	*	1	0320	101	55.	*	1	0550	176	46.	*	1	0820	251	9.
1	0052	27	0.	*	1	0322	102	52.	*	1	0552	177	45.	*	1	0822	252	9.
1	0054	28	0.	*	1	0324	103	51.	*	1	0554	178	44.	*	1	0824	253	9.
1	0056	29	0.	*	1	0326	104	49.	*	1	0556	179	43.	*	1	0826	254	9.
1	0058	30	0.	*	1	0328	105	56.	*	1	0558	180	42.	*	1	0828	255	9.
1	0100	31	0.	*	1	0330	106	63.	*	1	0600	181	41.	*	1	0830	256	9.
1	0102	32	0.	*	1	0332	107	69.	*	1	0602	182	40.	*	1	0832	257	9.
1	0104	33	0.	*	1	0334	108	75.	*	1	0604	183	39.	*	1	0834	258	9.
1	0106	34	0.	*	1	0336	109	80.	*	1	0606	184	38.	*	1	0836	259	9.
1	0108	35	0.	*	1	0338	110	85.	*	1	0608	185	37.	*	1	0838	260	9.
1	0110	36	0.	*	1	0340	111	88.	*	1	0610	186	36.	*	1	0840	261	9.
1	0112	37	0.	*	1	0342	112	91.	*	1	0612	187	35.	*	1	0842	262	9.
1	0114	38	0.	*	1	0344	113	93.	*	1	0614	188	34.	*	1	0844	263	9.
1	0116	39	0.	*	1	0346	114	94.	*	1	0616	189	33.	*	1	0846	264	9.
1	0118	40	0.	*	1	0348	115	95.	*	1	0618	190	33.	*	1	0848	265	8.
1	0120	41	0.	*	1	0350	116	96.	*	1	0620	191	32.	*	1	0850	266	8.
1	0122	42	0.	*	1	0352	117	97.	*	1	0622	192	31.	*	1	0852	267	8.
1	0124	43	0.	*	1	0354	118	97.	*	1	0624	193	30.	*	1	0854	268	8.
1	0126	44	0.	*	1	0356	119	98.	*	1	0626	194	29.	*	1	0856	269	8.
1	0128	45	0.	*	1	0358	120	98.	*	1	0628	195	29.	*	1	0858	270	8.
1	0130	46	0.	*	1	0400	121	99.	*	1	0630	196	28.	*	1	0900	271	8.
1	0132	47	0.	*	1	0402	122	99.	*	1	0632	197	27.	*	1	0902	272	8.
1	0134	48	0.	*	1	0404	123	99.	*	1	0634	198	27.	*	1	0904	273	8.
1	0136	49	0.	*	1	0406	124	100.	*	1	0636	199	26.	*	1	0906	274	8.
1	0138	50	0.	*	1	0408	125	100.	*	1	0638	200	25.	*	1	0908	275	8.
1	0140	51	0.	*	1	0410	126	100.	*	1	0640	201	25.	*	1	0910	276	8.
1	0142	52	0.	*	1	0412	127	100.	*	1	0642	202	24.	*	1	0912	277	8.
1	0144	53	0.	*	1	0414	128	100.	*	1	0644	203	23.	*	1	0914	278	8.
1	0146	54	0.	*	1	0416	129	100.	*	1	0646	204	23.	*	1	0916	279	8.
1	0148	55	0.	*	1	0418	130	100.	*	1	0648	205	22.	*	1	0918	280	8.
1	0150	56	0.	*	1	0420	131	100.	*	1	0650	206	22.	*	1	0920	281	8.
1	0152	57	0.	*	1	0422	132	100.	*	1	0652	207	21.	*	1	0922	282	7.
1	0154	58	0.	*	1	0424	133	100.	*	1	0654	208	20.	*	1	0924	283	7.
1	0156	59	0.	*	1	0426	134	100.	*	1	0656	209	20.	*	1	0926	284	7.
1	0158	60	0.	*	1	0428	135	100.	*	1	0658	210	19.	*	1	0928	285	7.
1	0200	61	0.	*	1	0430	136	100.	*	1	0700	211	19.	*	1	0930	286	7.
1	0202	62	0.	*	1	0432	137	99.	*	1	0702	212	18.	*	1	0932	287	7.
1	0204	63	0.	*	1	0434	138	99.	*	1	0704	213	18.	*	1	0934	288	7.
1	0206	64	0.	*	1	0436	139	99.	*	1	0706	214	17.	*	1	0936	289	7.
1	0208	65	0.	*	1	0438	140	98.	*	1	0708	215	17.	*	1	0938	290	7.
1	0210	66	0.	*	1	0440	141	98.	*	1	0710	216	16.	*	1	0940	291	7.
1	0212	67	0.	*	1	0442	142	97.	*	1	0712	217	16.	*	1	0942	292	7.
1	0214	68	0.	*	1	0444	143	96.	*	1	0714	218	16.	*	1	0944	293	7.

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    1     0216   69        0.   *    1     0446  144       95.   *    1     0716  219       15.   *    1     0946  294        7.
    1     0218   70        0.   *    1     0448  145       94.   *    1     0718  220       15.   *    1     0948  295        7.
    1     0220   71        0.   *    1     0450  146       92.   *    1     0720  221       14.   *    1     0950  296        7.
    1     0222   72        0.   *    1     0452  147       91.   *    1     0722  222       14.   *    1     0952  297        7.
    1     0224   73        0.   *    1     0454  148       90.   *    1     0724  223       13.   *    1     0954  298        7.
    1     0226   74        0.   *    1     0456  149       88.   *    1     0726  224       13.   *    1     0956  299        7.
    1     0228   75        1.   *    1     0458  150       87.   *    1     0728  225       13.   *    1     0958  300        7.
                                *                                  *                                 *
 ********************************************************************************************************************************

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR       9.97-HR
+   (CFS)       (HR)
                          (CFS)
+     100.      4.30                  48.         30.         30.          30.
                         (INCHES)   0.818       0.844       0.844        0.844
                          (AC-FT)     24.         24.         24.          24.

                         CUMULATIVE AREA =    0.54 SQ MI


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  410 KK    *    050620  *      COMBINE
            *            *
            **************

  412 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          1  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

  413 HC          HYDROGRAPH COMBINATION
                        ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
 ********************************************************************************************************************************

                                                HYDROGRAPH AT STATION   050620
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SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	1.	1		0500	151	92.	1		0730	226	14.
1		0002	2	0.	1		0232	77	1.	1		0502	152	90.	1		0732	227	13.
1		0004	3	0.	1		0234	78	2.	1		0504	153	89.	1		0734	228	13.
1		0006	4	0.	1		0236	79	2.	1		0506	154	87.	1		0736	229	12.
1		0008	5	0.	1		0238	80	2.	1		0508	155	86.	1		0738	230	12.
1		0010	6	0.	1		0240	81	3.	1		0510	156	84.	1		0740	231	12.
1		0012	7	0.	1		0242	82	4.	1		0512	157	82.	1		0742	232	11.
1		0014	8	0.	1		0244	83	5.	1		0514	158	81.	1		0744	233	11.
1		0016	9	0.	1		0246	84	6.	1		0516	159	79.	1		0746	234	11.
1		0018	10	0.	1		0248	85	7.	1		0518	160	77.	1		0748	235	11.
1		0020	11	0.	1		0250	86	9.	1		0520	161	75.	1		0750	236	11.
1		0022	12	0.	1		0252	87	12.	1		0522	162	73.	1		0752	237	11.
1		0024	13	0.	1		0254	88	16.	1		0524	163	71.	1		0754	238	11.
1		0026	14	0.	1		0256	89	21.	1		0526	164	70.	1		0756	239	11.
1		0028	15	0.	1		0258	90	28.	1		0528	165	68.	1		0758	240	11.
1		0030	16	0.	1		0300	91	42.	1		0530	166	66.	1		0800	241	11.
1		0032	17	0.	1		0302	92	64.	1		0532	167	64.	1		0802	242	11.
1		0034	18	0.	1		0304	93	101.	1		0534	168	62.	1		0804	243	10.
1		0036	19	0.	1		0306	94	148.	1		0536	169	61.	1		0806	244	10.
1		0038	20	0.	1		0308	95	191.	1		0538	170	59.	1		0808	245	10.
1		0040	21	0.	1		0310	96	209.	1		0540	171	58.	1		0810	246	10.
1		0042	22	0.	1		0312	97	201.	1		0542	172	56.	1		0812	247	10.
1		0044	23	0.	1		0314	98	180.	1		0544	173	55.	1		0814	248	10.
1		0046	24	0.	1		0316	99	156.	1		0546	174	53.	1		0816	249	10.
1		0048	25	0.	1		0318	100	137.	1		0548	175	52.	1		0818	250	10.
1		0050	26	0.	1		0320	101	123.	1		0550	176	51.	1		0820	251	10.
1		0052	27	0.	1		0322	102	113.	1		0552	177	49.	1		0822	252	10.
1		0054	28	0.	1		0324	103	105.	1		0554	178	48.	1		0824	253	10.
1		0056	29	0.	1		0326	104	100.	1		0556	179	47.	1		0826	254	10.
1		0058	30	0.	1		0328	105	99.	1		0558	180	46.	1		0828	255	10.
1		0100	31	0.	1		0330	106	103.	1		0600	181	45.	1		0830	256	9.
1		0102	32	0.	1		0332	107	108.	1		0602	182	44.	1		0832	257	9.
1		0104	33	0.	1		0334	108	112.	1		0604	183	43.	1		0834	258	9.
1		0106	34	0.	1		0336	109	116.	1		0606	184	42.	1		0836	259	9.
1		0108	35	0.	1		0338	110	119.	1		0608	185	41.	1		0838	260	9.
1		0110	36	0.	1		0340	111	121.	1		0610	186	40.	1		0840	261	9.
1		0112	37	0.	1		0342	112	122.	1		0612	187	39.	1		0842	262	9.
1		0114	38	0.	1		0344	113	122.	1		0614	188	38.	1		0844	263	9.
1		0116	39	0.	1		0346	114	122.	1		0616	189	37.	1		0846	264	9.

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

1	0118	40	0.	*	1	0348	115	121.	*	1	0618	190	36.	*	1	0848	265	9.
1	0120	41	0.	*	1	0350	116	120.	*	1	0620	191	35.	*	1	0850	266	9.
1	0122	42	0.	*	1	0352	117	119.	*	1	0622	192	34.	*	1	0852	267	9.
1	0124	43	0.	*	1	0354	118	118.	*	1	0624	193	33.	*	1	0854	268	9.
1	0126	44	0.	*	1	0356	119	117.	*	1	0626	194	32.	*	1	0856	269	9.
1	0128	45	0.	*	1	0358	120	116.	*	1	0628	195	32.	*	1	0858	270	9.
1	0130	46	0.	*	1	0400	121	116.	*	1	0630	196	31.	*	1	0900	271	8.
1	0132	47	0.	*	1	0402	122	115.	*	1	0632	197	30.	*	1	0902	272	8.
1	0134	48	0.	*	1	0404	123	114.	*	1	0634	198	29.	*	1	0904	273	8.
1	0136	49	0.	*	1	0406	124	114.	*	1	0636	199	28.	*	1	0906	274	8.
1	0138	50	0.	*	1	0408	125	113.	*	1	0638	200	28.	*	1	0908	275	8.
1	0140	51	0.	*	1	0410	126	113.	*	1	0640	201	27.	*	1	0910	276	8.
1	0142	52	0.	*	1	0412	127	112.	*	1	0642	202	26.	*	1	0912	277	8.
1	0144	53	0.	*	1	0414	128	112.	*	1	0644	203	26.	*	1	0914	278	8.
1	0146	54	0.	*	1	0416	129	112.	*	1	0646	204	25.	*	1	0916	279	8.
1	0148	55	0.	*	1	0418	130	111.	*	1	0648	205	24.	*	1	0918	280	8.
1	0150	56	0.	*	1	0420	131	111.	*	1	0650	206	24.	*	1	0920	281	8.
1	0152	57	0.	*	1	0422	132	110.	*	1	0652	207	23.	*	1	0922	282	8.
1	0154	58	0.	*	1	0424	133	110.	*	1	0654	208	22.	*	1	0924	283	8.
1	0156	59	0.	*	1	0426	134	109.	*	1	0656	209	22.	*	1	0926	284	8.
1	0158	60	0.	*	1	0428	135	109.	*	1	0658	210	21.	*	1	0928	285	8.
1	0200	61	0.	*	1	0430	136	108.	*	1	0700	211	21.	*	1	0930	286	8.
1	0202	62	0.	*	1	0432	137	108.	*	1	0702	212	20.	*	1	0932	287	7.
1	0204	63	0.	*	1	0434	138	107.	*	1	0704	213	19.	*	1	0934	288	7.
1	0206	64	0.	*	1	0436	139	107.	*	1	0706	214	19.	*	1	0936	289	7.
1	0208	65	0.	*	1	0438	140	106.	*	1	0708	215	18.	*	1	0938	290	7.
1	0210	66	0.	*	1	0440	141	105.	*	1	0710	216	18.	*	1	0940	291	7.
1	0212	67	0.	*	1	0442	142	105.	*	1	0712	217	17.	*	1	0942	292	7.
1	0214	68	0.	*	1	0444	143	103.	*	1	0714	218	17.	*	1	0944	293	7.
1	0216	69	0.	*	1	0446	144	102.	*	1	0716	219	16.	*	1	0946	294	7.
1	0218	70	0.	*	1	0448	145	100.	*	1	0718	220	16.	*	1	0948	295	7.
1	0220	71	1.	*	1	0450	146	99.	*	1	0720	221	16.	*	1	0950	296	7.
1	0222	72	1.	*	1	0452	147	98.	*	1	0722	222	15.	*	1	0952	297	7.
1	0224	73	1.	*	1	0454	148	96.	*	1	0724	223	15.	*	1	0954	298	7.
1	0226	74	1.	*	1	0456	149	95.	*	1	0726	224	14.	*	1	0956	299	7.
1	0228	75	1.	*	1	0458	150	93.	*	1	0728	225	14.	*	1	0958	300	7.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 209.	3.17		59.	37.	37.	37.
		(INCHES)	0.858	0.883	0.883	0.883

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

(AC-FT) 29. 30. 30. 30.

CUMULATIVE AREA = 0.64 SQ MI

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            **************
            *            *
 423 KK     *    050630  *      COMBINE
            *            *
            **************

 425 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

 426 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 050630
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	2.	1		0500	151	96.	1		0730	226	14.
1		0002	2	0.	1		0232	77	2.	1		0502	152	95.	1		0732	227	14.
1		0004	3	0.	1		0234	78	3.	1		0504	153	93.	1		0734	228	14.
1		0006	4	0.	1		0236	79	3.	1		0506	154	92.	1		0736	229	13.
1		0008	5	0.	1		0238	80	4.	1		0508	155	90.	1		0738	230	13.
1		0010	6	0.	1		0240	81	5.	1		0510	156	88.	1		0740	231	13.
1		0012	7	0.	1		0242	82	5.	1		0512	157	87.	1		0742	232	12.
1		0014	8	0.	1		0244	83	7.	1		0514	158	85.	1		0744	233	12.
1		0016	9	0.	1		0246	84	9.	1		0516	159	83.	1		0746	234	12.
1		0018	10	0.	1		0248	85	11.	1		0518	160	82.	1		0748	235	11.

1	0020	11	0.	*	1	0250	86	14.	*	1	0520	161	80.	*	1	0750	236	11.
1	0022	12	0.	*	1	0252	87	18.	*	1	0522	162	78.	*	1	0752	237	11.
1	0024	13	0.	*	1	0254	88	24.	*	1	0524	163	76.	*	1	0754	238	11.
1	0026	14	0.	*	1	0256	89	31.	*	1	0526	164	74.	*	1	0756	239	11.
1	0028	15	0.	*	1	0258	90	43.	*	1	0528	165	72.	*	1	0758	240	11.
1	0030	16	0.	*	1	0300	91	60.	*	1	0530	166	70.	*	1	0800	241	11.
1	0032	17	0.	*	1	0302	92	92.	*	1	0532	167	68.	*	1	0802	242	11.
1	0034	18	0.	*	1	0304	93	146.	*	1	0534	168	66.	*	1	0804	243	11.
1	0036	19	0.	*	1	0306	94	217.	*	1	0536	169	65.	*	1	0806	244	11.
1	0038	20	0.	*	1	0308	95	280.	*	1	0538	170	63.	*	1	0808	245	11.
1	0040	21	0.	*	1	0310	96	308.	*	1	0540	171	61.	*	1	0810	246	11.
1	0042	22	0.	*	1	0312	97	301.	*	1	0542	172	60.	*	1	0812	247	10.
1	0044	23	0.	*	1	0314	98	274.	*	1	0544	173	58.	*	1	0814	248	10.
1	0046	24	0.	*	1	0316	99	240.	*	1	0546	174	57.	*	1	0816	249	10.
1	0048	25	0.	*	1	0318	100	209.	*	1	0548	175	55.	*	1	0818	250	10.
1	0050	26	0.	*	1	0320	101	183.	*	1	0550	176	54.	*	1	0820	251	10.
1	0052	27	0.	*	1	0322	102	164.	*	1	0552	177	53.	*	1	0822	252	10.
1	0054	28	0.	*	1	0324	103	151.	*	1	0554	178	51.	*	1	0824	253	10.
1	0056	29	0.	*	1	0326	104	140.	*	1	0556	179	50.	*	1	0826	254	10.
1	0058	30	0.	*	1	0328	105	132.	*	1	0558	180	49.	*	1	0828	255	10.
1	0100	31	0.	*	1	0330	106	130.	*	1	0600	181	48.	*	1	0830	256	10.
1	0102	32	0.	*	1	0332	107	132.	*	1	0602	182	47.	*	1	0832	257	10.
1	0104	33	0.	*	1	0334	108	135.	*	1	0604	183	46.	*	1	0834	258	10.
1	0106	34	0.	*	1	0336	109	138.	*	1	0606	184	45.	*	1	0836	259	10.
1	0108	35	0.	*	1	0338	110	140.	*	1	0608	185	43.	*	1	0838	260	9.
1	0110	36	0.	*	1	0340	111	141.	*	1	0610	186	42.	*	1	0840	261	9.
1	0112	37	0.	*	1	0342	112	140.	*	1	0612	187	41.	*	1	0842	262	9.
1	0114	38	0.	*	1	0344	113	139.	*	1	0614	188	40.	*	1	0844	263	9.
1	0116	39	0.	*	1	0346	114	138.	*	1	0616	189	39.	*	1	0846	264	9.
1	0118	40	0.	*	1	0348	115	136.	*	1	0618	190	39.	*	1	0848	265	9.
1	0120	41	0.	*	1	0350	116	134.	*	1	0620	191	38.	*	1	0850	266	9.
1	0122	42	0.	*	1	0352	117	132.	*	1	0622	192	37.	*	1	0852	267	9.
1	0124	43	0.	*	1	0354	118	130.	*	1	0624	193	36.	*	1	0854	268	9.
1	0126	44	0.	*	1	0356	119	128.	*	1	0626	194	35.	*	1	0856	269	9.
1	0128	45	0.	*	1	0358	120	127.	*	1	0628	195	34.	*	1	0858	270	9.
1	0130	46	0.	*	1	0400	121	125.	*	1	0630	196	33.	*	1	0900	271	9.
1	0132	47	0.	*	1	0402	122	124.	*	1	0632	197	32.	*	1	0902	272	9.
1	0134	48	0.	*	1	0404	123	123.	*	1	0634	198	31.	*	1	0904	273	9.
1	0136	49	0.	*	1	0406	124	122.	*	1	0636	199	31.	*	1	0906	274	8.
1	0138	50	0.	*	1	0408	125	121.	*	1	0638	200	30.	*	1	0908	275	8.
1	0140	51	0.	*	1	0410	126	120.	*	1	0640	201	29.	*	1	0910	276	8.
1	0142	52	0.	*	1	0412	127	120.	*	1	0642	202	28.	*	1	0912	277	8.
1	0144	53	0.	*	1	0414	128	119.	*	1	0644	203	27.	*	1	0914	278	8.
1	0146	54	0.	*	1	0416	129	118.	*	1	0646	204	27.	*	1	0916	279	8.
1	0148	55	0.	*	1	0418	130	117.	*	1	0648	205	26.	*	1	0918	280	8.

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

1	0150	56	0.	*	1	0420	131	117.	*	1	0650	206	25.	*	1	0920	281	8.
1	0152	57	0.	*	1	0422	132	116.	*	1	0652	207	25.	*	1	0922	282	8.
1	0154	58	0.	*	1	0424	133	115.	*	1	0654	208	24.	*	1	0924	283	8.
1	0156	59	0.	*	1	0426	134	115.	*	1	0656	209	23.	*	1	0926	284	8.
1	0158	60	0.	*	1	0428	135	114.	*	1	0658	210	23.	*	1	0928	285	8.
1	0200	61	0.	*	1	0430	136	113.	*	1	0700	211	22.	*	1	0930	286	8.
1	0202	62	0.	*	1	0432	137	113.	*	1	0702	212	21.	*	1	0932	287	8.
1	0204	63	0.	*	1	0434	138	112.	*	1	0704	213	21.	*	1	0934	288	8.
1	0206	64	0.	*	1	0436	139	111.	*	1	0706	214	20.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	111.	*	1	0708	215	20.	*	1	0938	290	7.
1	0210	66	0.	*	1	0440	141	110.	*	1	0710	216	19.	*	1	0940	291	7.
1	0212	67	0.	*	1	0442	142	109.	*	1	0712	217	19.	*	1	0942	292	7.
1	0214	68	1.	*	1	0444	143	108.	*	1	0714	218	18.	*	1	0944	293	7.
1	0216	69	1.	*	1	0446	144	107.	*	1	0716	219	18.	*	1	0946	294	7.
1	0218	70	1.	*	1	0448	145	105.	*	1	0718	220	17.	*	1	0948	295	7.
1	0220	71	1.	*	1	0450	146	104.	*	1	0720	221	17.	*	1	0950	296	7.
1	0222	72	1.	*	1	0452	147	102.	*	1	0722	222	16.	*	1	0952	297	7.
1	0224	73	1.	*	1	0454	148	101.	*	1	0724	223	16.	*	1	0954	298	7.
1	0226	74	2.	*	1	0456	149	99.	*	1	0726	224	15.	*	1	0956	299	7.
1	0228	75	2.	*	1	0458	150	98.	*	1	0728	225	15.	*	1	0958	300	7.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 308.	3.17		68.	42.	42.	42.
		(INCHES)	0.903	0.927	0.927	0.927
		(AC-FT)	34.	35.	35.	35.

CUMULATIVE AREA = 0.70 SQ MI

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              **************
              *            *
 436 KK       *    050660  *      COMBINE
              *            *
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Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

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438 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

439 HC          HYDROGRAPH COMBINATION
                      ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 050660
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0230	76	2.	*	1		0500	151	100.	*	1		0730	226	15.
1		0002	2	0.	*	1		0232	77	2.	*	1		0502	152	99.	*	1		0732	227	15.
1		0004	3	0.	*	1		0234	78	3.	*	1		0504	153	97.	*	1		0734	228	15.
1		0006	4	0.	*	1		0236	79	3.	*	1		0506	154	95.	*	1		0736	229	14.
1		0008	5	0.	*	1		0238	80	4.	*	1		0508	155	94.	*	1		0738	230	14.
1		0010	6	0.	*	1		0240	81	4.	*	1		0510	156	92.	*	1		0740	231	13.
1		0012	7	0.	*	1		0242	82	5.	*	1		0512	157	91.	*	1		0742	232	13.
1		0014	8	0.	*	1		0244	83	6.	*	1		0514	158	89.	*	1		0744	233	13.
1		0016	9	0.	*	1		0246	84	8.	*	1		0516	159	87.	*	1		0746	234	12.
1		0018	10	0.	*	1		0248	85	10.	*	1		0518	160	86.	*	1		0748	235	12.
1		0020	11	0.	*	1		0250	86	13.	*	1		0520	161	84.	*	1		0750	236	12.
1		0022	12	0.	*	1		0252	87	17.	*	1		0522	162	82.	*	1		0752	237	12.
1		0024	13	0.	*	1		0254	88	22.	*	1		0524	163	80.	*	1		0754	238	12.
1		0026	14	0.	*	1		0256	89	29.	*	1		0526	164	78.	*	1		0756	239	11.
1		0028	15	0.	*	1		0258	90	40.	*	1		0528	165	76.	*	1		0758	240	11.
1		0030	16	0.	*	1		0300	91	57.	*	1		0530	166	74.	*	1		0800	241	11.
1		0032	17	0.	*	1		0302	92	83.	*	1		0532	167	72.	*	1		0802	242	11.
1		0034	18	0.	*	1		0304	93	129.	*	1		0534	168	70.	*	1		0804	243	11.
1		0036	19	0.	*	1		0306	94	201.	*	1		0536	169	69.	*	1		0806	244	11.
1		0038	20	0.	*	1		0308	95	290.	*	1		0538	170	67.	*	1		0808	245	11.
1		0040	21	0.	*	1		0310	96	354.	*	1		0540	171	65.	*	1		0810	246	11.
1		0042	22	0.	*	1		0312	97	377.	*	1		0542	172	63.	*	1		0812	247	11.
1		0044	23	0.	*	1		0314	98	363.	*	1		0544	173	62.	*	1		0814	248	11.
1		0046	24	0.	*	1		0316	99	329.	*	1		0546	174	60.	*	1		0816	249	11.
1		0048	25	0.	*	1		0318	100	289.	*	1		0548	175	59.	*	1		0818	250	10.
1		0050	26	0.	*	1		0320	101	252.	*	1		0550	176	57.	*	1		0820	251	10.

1	0052	27	0.	*	1	0322	102	222.	*	1	0552	177	56.	*	1	0822	252	10.
1	0054	28	0.	*	1	0324	103	198.	*	1	0554	178	55.	*	1	0824	253	10.
1	0056	29	0.	*	1	0326	104	180.	*	1	0556	179	53.	*	1	0826	254	10.
1	0058	30	0.	*	1	0328	105	166.	*	1	0558	180	52.	*	1	0828	255	10.
1	0100	31	0.	*	1	0330	106	156.	*	1	0600	181	51.	*	1	0830	256	10.
1	0102	32	0.	*	1	0332	107	151.	*	1	0602	182	50.	*	1	0832	257	10.
1	0104	33	0.	*	1	0334	108	150.	*	1	0604	183	48.	*	1	0834	258	10.
1	0106	34	0.	*	1	0336	109	152.	*	1	0606	184	47.	*	1	0836	259	10.
1	0108	35	0.	*	1	0338	110	153.	*	1	0608	185	46.	*	1	0838	260	10.
1	0110	36	0.	*	1	0340	111	153.	*	1	0610	186	45.	*	1	0840	261	10.
1	0112	37	0.	*	1	0342	112	153.	*	1	0612	187	44.	*	1	0842	262	10.
1	0114	38	0.	*	1	0344	113	152.	*	1	0614	188	43.	*	1	0844	263	9.
1	0116	39	0.	*	1	0346	114	150.	*	1	0616	189	42.	*	1	0846	264	9.
1	0118	40	0.	*	1	0348	115	148.	*	1	0618	190	41.	*	1	0848	265	9.
1	0120	41	0.	*	1	0350	116	145.	*	1	0620	191	40.	*	1	0850	266	9.
1	0122	42	0.	*	1	0352	117	142.	*	1	0622	192	39.	*	1	0852	267	9.
1	0124	43	0.	*	1	0354	118	139.	*	1	0624	193	38.	*	1	0854	268	9.
1	0126	44	0.	*	1	0356	119	137.	*	1	0626	194	37.	*	1	0856	269	9.
1	0128	45	0.	*	1	0358	120	135.	*	1	0628	195	36.	*	1	0858	270	9.
1	0130	46	0.	*	1	0400	121	133.	*	1	0630	196	35.	*	1	0900	271	9.
1	0132	47	0.	*	1	0402	122	131.	*	1	0632	197	34.	*	1	0902	272	9.
1	0134	48	0.	*	1	0404	123	129.	*	1	0634	198	33.	*	1	0904	273	9.
1	0136	49	0.	*	1	0406	124	128.	*	1	0636	199	33.	*	1	0906	274	9.
1	0138	50	0.	*	1	0408	125	127.	*	1	0638	200	32.	*	1	0908	275	9.
1	0140	51	0.	*	1	0410	126	125.	*	1	0640	201	31.	*	1	0910	276	9.
1	0142	52	0.	*	1	0412	127	124.	*	1	0642	202	30.	*	1	0912	277	8.
1	0144	53	0.	*	1	0414	128	123.	*	1	0644	203	29.	*	1	0914	278	8.
1	0146	54	0.	*	1	0416	129	122.	*	1	0646	204	28.	*	1	0916	279	8.
1	0148	55	0.	*	1	0418	130	122.	*	1	0648	205	28.	*	1	0918	280	8.
1	0150	56	0.	*	1	0420	131	121.	*	1	0650	206	27.	*	1	0920	281	8.
1	0152	57	0.	*	1	0422	132	120.	*	1	0652	207	26.	*	1	0922	282	8.
1	0154	58	0.	*	1	0424	133	119.	*	1	0654	208	26.	*	1	0924	283	8.
1	0156	59	0.	*	1	0426	134	118.	*	1	0656	209	25.	*	1	0926	284	8.
1	0158	60	0.	*	1	0428	135	118.	*	1	0658	210	24.	*	1	0928	285	8.
1	0200	61	0.	*	1	0430	136	117.	*	1	0700	211	23.	*	1	0930	286	8.
1	0202	62	0.	*	1	0432	137	116.	*	1	0702	212	23.	*	1	0932	287	8.
1	0204	63	0.	*	1	0434	138	115.	*	1	0704	213	22.	*	1	0934	288	8.
1	0206	64	0.	*	1	0436	139	115.	*	1	0706	214	22.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	114.	*	1	0708	215	21.	*	1	0938	290	8.
1	0210	66	0.	*	1	0440	141	113.	*	1	0710	216	20.	*	1	0940	291	8.
1	0212	67	0.	*	1	0442	142	113.	*	1	0712	217	20.	*	1	0942	292	8.
1	0214	68	0.	*	1	0444	143	112.	*	1	0714	218	19.	*	1	0944	293	7.
1	0216	69	0.	*	1	0446	144	111.	*	1	0716	219	19.	*	1	0946	294	7.
1	0218	70	1.	*	1	0448	145	109.	*	1	0718	220	18.	*	1	0948	295	7.
1	0220	71	1.	*	1	0450	146	108.	*	1	0720	221	18.	*	1	0950	296	7.

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

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  1     0222   72        1.   *    1     0452  147      106.   *    1     0722  222       17.   *    1     0952  297        7.
  1     0224   73        1.   *    1     0454  148      105.   *    1     0724  223       17.   *    1     0954  298        7.
  1     0226   74        1.   *    1     0456  149      103.   *    1     0726  224       16.   *    1     0956  299        7.
  1     0228   75        1.   *    1     0458  150      102.   *    1     0728  225       16.   *    1     0958  300        7.
                                *                                *                                *
*****************************************************************************************************************************

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR      9.97-HR
+   (CFS)       (HR)
                          (CFS)
+     377.      3.20                 75.         46.         46.         46.
                        (INCHES)    0.940       0.963       0.963       0.963
                         (AC-FT)     37.         38.         38.         38.

                       CUMULATIVE AREA =    0.74 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 448 KK     *    050131  *        COMBINE
            *            *
            **************

 450 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

 451 HC          HYDROGRAPH COMBINATION
                       ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                   ***

*****************************************************************************************************************************

                                          HYDROGRAPH AT STATION   050131
                                               SUM OF  2 HYDROGRAPHS

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

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	2.	1		0500	151	103.	1		0730	226	16.
1		0002	2	0.	1		0232	77	2.	1		0502	152	101.	1		0732	227	16.
1		0004	3	0.	1		0234	78	3.	1		0504	153	100.	1		0734	228	15.
1		0006	4	0.	1		0236	79	3.	1		0506	154	98.	1		0736	229	15.
1		0008	5	0.	1		0238	80	4.	1		0508	155	96.	1		0738	230	14.
1		0010	6	0.	1		0240	81	5.	1		0510	156	95.	1		0740	231	14.
1		0012	7	0.	1		0242	82	6.	1		0512	157	93.	1		0742	232	14.
1		0014	8	0.	1		0244	83	7.	1		0514	158	92.	1		0744	233	13.
1		0016	9	0.	1		0246	84	8.	1		0516	159	90.	1		0746	234	13.
1		0018	10	0.	1		0248	85	10.	1		0518	160	88.	1		0748	235	13.
1		0020	11	0.	1		0250	86	13.	1		0520	161	87.	1		0750	236	12.
1		0022	12	0.	1		0252	87	17.	1		0522	162	85.	1		0752	237	12.
1		0024	13	0.	1		0254	88	22.	1		0524	163	83.	1		0754	238	12.
1		0026	14	0.	1		0256	89	30.	1		0526	164	81.	1		0756	239	12.
1		0028	15	0.	1		0258	90	40.	1		0528	165	79.	1		0758	240	12.
1		0030	16	0.	1		0300	91	57.	1		0530	166	77.	1		0800	241	11.
1		0032	17	0.	1		0302	92	85.	1		0532	167	75.	1		0802	242	11.
1		0034	18	0.	1		0304	93	129.	1		0534	168	73.	1		0804	243	11.
1		0036	19	0.	1		0306	94	193.	1		0536	169	71.	1		0806	244	11.
1		0038	20	0.	1		0308	95	278.	1		0538	170	69.	1		0808	245	11.
1		0040	21	0.	1		0310	96	360.	1		0540	171	68.	1		0810	246	11.
1		0042	22	0.	1		0312	97	405.	1		0542	172	66.	1		0812	247	11.
1		0044	23	0.	1		0314	98	410.	1		0544	173	64.	1		0814	248	11.
1		0046	24	0.	1		0316	99	384.	1		0546	174	63.	1		0816	249	11.
1		0048	25	0.	1		0318	100	345.	1		0548	175	61.	1		0818	250	11.
1		0050	26	0.	1		0320	101	303.	1		0550	176	60.	1		0820	251	11.
1		0052	27	0.	1		0322	102	266.	1		0552	177	58.	1		0822	252	10.
1		0054	28	0.	1		0324	103	235.	1		0554	178	57.	1		0824	253	10.
1		0056	29	0.	1		0326	104	211.	1		0556	179	56.	1		0826	254	10.
1		0058	30	0.	1		0328	105	192.	1		0558	180	54.	1		0828	255	10.
1		0100	31	0.	1		0330	106	178.	1		0600	181	53.	1		0830	256	10.
1		0102	32	0.	1		0332	107	167.	1		0602	182	52.	1		0832	257	10.
1		0104	33	0.	1		0334	108	162.	1		0604	183	50.	1		0834	258	10.
1		0106	34	0.	1		0336	109	161.	1		0606	184	49.	1		0836	259	10.
1		0108	35	0.	1		0338	110	161.	1		0608	185	48.	1		0838	260	10.
1		0110	36	0.	1		0340	111	161.	1		0610	186	47.	1		0840	261	10.
1		0112	37	0.	1		0342	112	160.	1		0612	187	46.	1		0842	262	10.
1		0114	38	0.	1		0344	113	159.	1		0614	188	45.	1		0844	263	10.
1		0116	39	0.	1		0346	114	157.	1		0616	189	44.	1		0846	264	10.
1		0118	40	0.	1		0348	115	155.	1		0618	190	43.	1		0848	265	9.
1		0120	41	0.	1		0350	116	152.	1		0620	191	42.	1		0850	266	9.
1		0122	42	0.	1		0352	117	149.	1		0622	192	41.	1		0852	267	9.

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

1	0124	43	0.	*	1	0354	118	146.	*	1	0624	193	40.	*	1	0854	268	9.
1	0126	44	0.	*	1	0356	119	143.	*	1	0626	194	39.	*	1	0856	269	9.
1	0128	45	0.	*	1	0358	120	140.	*	1	0628	195	38.	*	1	0858	270	9.
1	0130	46	0.	*	1	0400	121	138.	*	1	0630	196	37.	*	1	0900	271	9.
1	0132	47	0.	*	1	0402	122	136.	*	1	0632	197	36.	*	1	0902	272	9.
1	0134	48	0.	*	1	0404	123	134.	*	1	0634	198	35.	*	1	0904	273	9.
1	0136	49	0.	*	1	0406	124	132.	*	1	0636	199	34.	*	1	0906	274	9.
1	0138	50	0.	*	1	0408	125	130.	*	1	0638	200	33.	*	1	0908	275	9.
1	0140	51	0.	*	1	0410	126	129.	*	1	0640	201	32.	*	1	0910	276	9.
1	0142	52	0.	*	1	0412	127	128.	*	1	0642	202	31.	*	1	0912	277	9.
1	0144	53	0.	*	1	0414	128	127.	*	1	0644	203	31.	*	1	0914	278	9.
1	0146	54	0.	*	1	0416	129	125.	*	1	0646	204	30.	*	1	0916	279	8.
1	0148	55	0.	*	1	0418	130	124.	*	1	0648	205	29.	*	1	0918	280	8.
1	0150	56	0.	*	1	0420	131	124.	*	1	0650	206	28.	*	1	0920	281	8.
1	0152	57	0.	*	1	0422	132	123.	*	1	0652	207	27.	*	1	0922	282	8.
1	0154	58	0.	*	1	0424	133	122.	*	1	0654	208	27.	*	1	0924	283	8.
1	0156	59	0.	*	1	0426	134	121.	*	1	0656	209	26.	*	1	0926	284	8.
1	0158	60	0.	*	1	0428	135	120.	*	1	0658	210	25.	*	1	0928	285	8.
1	0200	61	0.	*	1	0430	136	119.	*	1	0700	211	25.	*	1	0930	286	8.
1	0202	62	0.	*	1	0432	137	118.	*	1	0702	212	24.	*	1	0932	287	8.
1	0204	63	0.	*	1	0434	138	118.	*	1	0704	213	23.	*	1	0934	288	8.
1	0206	64	0.	*	1	0436	139	117.	*	1	0706	214	23.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	116.	*	1	0708	215	22.	*	1	0938	290	8.
1	0210	66	0.	*	1	0440	141	115.	*	1	0710	216	21.	*	1	0940	291	8.
1	0212	67	0.	*	1	0442	142	115.	*	1	0712	217	21.	*	1	0942	292	8.
1	0214	68	0.	*	1	0444	143	114.	*	1	0714	218	20.	*	1	0944	293	8.
1	0216	69	0.	*	1	0446	144	113.	*	1	0716	219	20.	*	1	0946	294	8.
1	0218	70	1.	*	1	0448	145	112.	*	1	0718	220	19.	*	1	0948	295	7.
1	0220	71	1.	*	1	0450	146	111.	*	1	0720	221	19.	*	1	0950	296	7.
1	0222	72	1.	*	1	0452	147	109.	*	1	0722	222	18.	*	1	0952	297	7.
1	0224	73	1.	*	1	0454	148	108.	*	1	0724	223	18.	*	1	0954	298	7.
1	0226	74	1.	*	1	0456	149	106.	*	1	0726	224	17.	*	1	0956	299	7.
1	0228	75	1.	*	1	0458	150	104.	*	1	0728	225	17.	*	1	0958	300	7.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 410.	3.23		79.	49.	49.	49.
		(INCHES)	0.960	0.983	0.983	0.983
		(AC-FT)	39.	40.	40.	40.

CUMULATIVE AREA = 0.76 SQ MI

Osborn Outfall 50% Submittal
File:Preald.dat
No Outflow Below Elev. 1252

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            **************
            *            *
 462 KK     *    051410  *          COMBINE
            *            *
            **************

 464 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

 465 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 051410
SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	3.	1		0500	151	108.	1		0730	226	17.
1		0002	2	0.	1		0232	77	3.	1		0502	152	107.	1		0732	227	17.
1		0004	3	0.	1		0234	78	4.	1		0504	153	105.	1		0734	228	16.
1		0006	4	0.	1		0236	79	5.	1		0506	154	103.	1		0736	229	16.
1		0008	5	0.	1		0238	80	6.	1		0508	155	102.	1		0738	230	15.
1		0010	6	0.	1		0240	81	7.	1		0510	156	100.	1		0740	231	15.
1		0012	7	0.	1		0242	82	8.	1		0512	157	98.	1		0742	232	14.
1		0014	8	0.	1		0244	83	10.	1		0514	158	96.	1		0744	233	14.
1		0016	9	0.	1		0246	84	13.	1		0516	159	95.	1		0746	234	14.
1		0018	10	0.	1		0248	85	16.	1		0518	160	93.	1		0748	235	13.
1		0020	11	0.	1		0250	86	20.	1		0520	161	91.	1		0750	236	13.
1		0022	12	0.	1		0252	87	26.	1		0522	162	90.	1		0752	237	13.
1		0024	13	0.	1		0254	88	34.	1		0524	163	88.	1		0754	238	12.

1	0026	14	0.	*	1	0256	89	45.	*	1	0526	164	86.	*	1	0756	239	12.
1	0028	15	0.	*	1	0258	90	61.	*	1	0528	165	84.	*	1	0758	240	12.
1	0030	16	0.	*	1	0300	91	86.	*	1	0530	166	82.	*	1	0800	241	12.
1	0032	17	0.	*	1	0302	92	130.	*	1	0532	167	80.	*	1	0802	242	12.
1	0034	18	0.	*	1	0304	93	205.	*	1	0534	168	78.	*	1	0804	243	12.
1	0036	19	0.	*	1	0306	94	303.	*	1	0536	169	76.	*	1	0806	244	12.
1	0038	20	0.	*	1	0308	95	401.	*	1	0538	170	74.	*	1	0808	245	11.
1	0040	21	0.	*	1	0310	96	481.	*	1	0540	171	72.	*	1	0810	246	11.
1	0042	22	0.	*	1	0312	97	528.	*	1	0542	172	70.	*	1	0812	247	11.
1	0044	23	0.	*	1	0314	98	533.	*	1	0544	173	69.	*	1	0814	248	11.
1	0046	24	0.	*	1	0316	99	505.	*	1	0546	174	67.	*	1	0816	249	11.
1	0048	25	0.	*	1	0318	100	459.	*	1	0548	175	65.	*	1	0818	250	11.
1	0050	26	0.	*	1	0320	101	407.	*	1	0550	176	64.	*	1	0820	251	11.
1	0052	27	0.	*	1	0322	102	358.	*	1	0552	177	62.	*	1	0822	252	11.
1	0054	28	0.	*	1	0324	103	315.	*	1	0554	178	61.	*	1	0824	253	11.
1	0056	29	0.	*	1	0326	104	280.	*	1	0556	179	59.	*	1	0826	254	11.
1	0058	30	0.	*	1	0328	105	253.	*	1	0558	180	58.	*	1	0828	255	11.
1	0100	31	0.	*	1	0330	106	231.	*	1	0600	181	57.	*	1	0830	256	10.
1	0102	32	0.	*	1	0332	107	214.	*	1	0602	182	55.	*	1	0832	257	10.
1	0104	33	0.	*	1	0334	108	202.	*	1	0604	183	54.	*	1	0834	258	10.
1	0106	34	0.	*	1	0336	109	194.	*	1	0606	184	53.	*	1	0836	259	10.
1	0108	35	0.	*	1	0338	110	190.	*	1	0608	185	52.	*	1	0838	260	10.
1	0110	36	0.	*	1	0340	111	188.	*	1	0610	186	51.	*	1	0840	261	10.
1	0112	37	0.	*	1	0342	112	185.	*	1	0612	187	49.	*	1	0842	262	10.
1	0114	38	0.	*	1	0344	113	182.	*	1	0614	188	48.	*	1	0844	263	10.
1	0116	39	0.	*	1	0346	114	179.	*	1	0616	189	47.	*	1	0846	264	10.
1	0118	40	0.	*	1	0348	115	175.	*	1	0618	190	46.	*	1	0848	265	10.
1	0120	41	0.	*	1	0350	116	171.	*	1	0620	191	45.	*	1	0850	266	10.
1	0122	42	0.	*	1	0352	117	166.	*	1	0622	192	44.	*	1	0852	267	10.
1	0124	43	0.	*	1	0354	118	162.	*	1	0624	193	43.	*	1	0854	268	9.
1	0126	44	0.	*	1	0356	119	158.	*	1	0626	194	42.	*	1	0856	269	9.
1	0128	45	0.	*	1	0358	120	154.	*	1	0628	195	41.	*	1	0858	270	9.
1	0130	46	0.	*	1	0400	121	151.	*	1	0630	196	40.	*	1	0900	271	9.
1	0132	47	0.	*	1	0402	122	147.	*	1	0632	197	39.	*	1	0902	272	9.
1	0134	48	0.	*	1	0404	123	145.	*	1	0634	198	37.	*	1	0904	273	9.
1	0136	49	0.	*	1	0406	124	142.	*	1	0636	199	36.	*	1	0906	274	9.
1	0138	50	0.	*	1	0408	125	140.	*	1	0638	200	36.	*	1	0908	275	9.
1	0140	51	0.	*	1	0410	126	138.	*	1	0640	201	35.	*	1	0910	276	9.
1	0142	52	0.	*	1	0412	127	136.	*	1	0642	202	34.	*	1	0912	277	9.
1	0144	53	0.	*	1	0414	128	135.	*	1	0644	203	33.	*	1	0914	278	9.
1	0146	54	0.	*	1	0416	129	133.	*	1	0646	204	32.	*	1	0916	279	9.
1	0148	55	0.	*	1	0418	130	132.	*	1	0648	205	31.	*	1	0918	280	9.
1	0150	56	0.	*	1	0420	131	131.	*	1	0650	206	30.	*	1	0920	281	8.
1	0152	57	0.	*	1	0422	132	130.	*	1	0652	207	29.	*	1	0922	282	8.
1	0154	58	0.	*	1	0424	133	128.	*	1	0654	208	28.	*	1	0924	283	8.

1	0156	59	0.	*	1	0426	134	127.	*	1	0656	209	28.	*	1	0926	284	8.
1	0158	60	0.	*	1	0428	135	126.	*	1	0658	210	27.	*	1	0928	285	8.
1	0200	61	0.	*	1	0430	136	125.	*	1	0700	211	26.	*	1	0930	286	8.
1	0202	62	0.	*	1	0432	137	124.	*	1	0702	212	25.	*	1	0932	287	8.
1	0204	63	0.	*	1	0434	138	124.	*	1	0704	213	25.	*	1	0934	288	8.
1	0206	64	0.	*	1	0436	139	123.	*	1	0706	214	24.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	122.	*	1	0708	215	23.	*	1	0938	290	8.
1	0210	66	0.	*	1	0440	141	121.	*	1	0710	216	23.	*	1	0940	291	8.
1	0212	67	0.	*	1	0442	142	120.	*	1	0712	217	22.	*	1	0942	292	8.
1	0214	68	0.	*	1	0444	143	119.	*	1	0714	218	21.	*	1	0944	293	8.
1	0216	69	1.	*	1	0446	144	118.	*	1	0716	219	21.	*	1	0946	294	8.
1	0218	70	1.	*	1	0448	145	117.	*	1	0718	220	20.	*	1	0948	295	8.
1	0220	71	1.	*	1	0450	146	116.	*	1	0720	221	20.	*	1	0950	296	8.
1	0222	72	1.	*	1	0452	147	115.	*	1	0722	222	19.	*	1	0952	297	7.
1	0224	73	1.	*	1	0454	148	113.	*	1	0724	223	19.	*	1	0954	298	7.
1	0226	74	2.	*	1	0456	149	111.	*	1	0726	224	18.	*	1	0956	299	7.
1	0228	75	2.	*	1	0458	150	110.	*	1	0728	225	18.	*	1	0958	300	7.
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 533.	3.23		92.	56.	56.	56.
		(INCHES)	1.022	1.045	1.045	1.045
		(AC-FT)	46.	47.	47.	47.

CUMULATIVE AREA = 0.83 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	070808	12.	3.43	2.	1.	1.	0.02		
+	DIVERSION TO	808OUT	0.	3.43	0.	0.	0.	0.02		

	HYDROGRAPH AT						
+	808PP	12.	3.43	2.	1.	1.	0.02
	ROUTED TO						
+	070610	12.	3.43	2.	1.	1.	0.02
	HYDROGRAPH AT						
+	070610	5.	3.43	1.	0.	0.	0.01
	DIVERSION TO						
+	610OUT	0.	3.40	0.	0.	0.	0.01
	HYDROGRAPH AT						
+	610PP	5.	3.40	1.	0.	0.	0.01
	2 COMBINED AT						
+	070610	17.	3.43	3.	2.	2.	0.02
	ROUTED TO						
+	070508	17.	3.43	3.	2.	2.	0.02
	HYDROGRAPH AT						
+	070508	4.	3.50	1.	0.	0.	0.01
	DIVERSION TO						
+	508OUT	0.	3.50	0.	0.	0.	0.01
	HYDROGRAPH AT						
+	508PP	4.	3.50	1.	0.	0.	0.01
	2 COMBINED AT						
+	070508	21.	3.47	3.	2.	2.	0.03
	ROUTED TO						
+	070010	21.	3.47	3.	2.	2.	0.03
	HYDROGRAPH AT						
+	070010	7.	3.43	1.	1.	1.	0.01
	DIVERSION TO						
+	010OUT	0.	3.43	0.	0.	0.	0.01
	HYDROGRAPH AT						
+	010PP	6.	3.43	1.	1.	1.	0.01

	2 COMBINED AT						
+		070010	27.	3.47	4.	3.	3.	0.04
	ROUTED TO						
+		070210	27.	3.47	4.	3.	3.	0.04
	HYDROGRAPH AT						
+		070209	12.	3.47	2.	1.	1.	0.02
	ROUTED TO						
+		070210	12.	3.47	2.	1.	1.	0.02
	HYDROGRAPH AT						
+		070210	5.	3.47	1.	0.	0.	0.01
	2 COMBINED AT						
+		070210	17.	3.47	3.	2.	2.	0.03
	DIVERSION TO						
+		210OUT	0.	3.43	0.	0.	0.	0.03
	HYDROGRAPH AT						
+		210PP	17.	3.43	3.	2.	2.	0.03
	2 COMBINED AT						
+		070210	44.	3.47	7.	4.	4.	0.07
	ROUTED TO						
+		050005	44.	3.47	7.	4.	4.	0.07
	HYDROGRAPH AT						
+		050005	21.	3.53	3.	2.	2.	0.04
	DIVERSION TO						
+		005OUT	0.	3.53	0.	0.	0.	0.04
	HYDROGRAPH AT						
+		005PP	21.	3.53	3.	2.	2.	0.04
	HYDROGRAPH AT						
+		070010	0.	3.37	0.	0.	0.	0.00
	ROUTED TO						
+		070020	0.	3.47	0.	0.	0.	0.00

+	ROUTED TO 070030	0.	3.67	0.	0.	0.	0.00
+	HYDROGRAPH AT 070030	5.	3.07	1.	0.	0.	0.00
+	2 COMBINED AT 070030	5.	3.07	1.	0.	0.	0.00
+	ROUTED TO 070040	5.	3.10	1.	0.	0.	0.00
+	HYDROGRAPH AT 070210	0.	3.47	0.	0.	0.	0.00
+	ROUTED TO 070220	0.	3.47	0.	0.	0.	0.00
+	ROUTED TO 070040	0.	3.77	0.	0.	0.	0.00
+	HYDROGRAPH AT 070040	5.	3.20	1.	0.	0.	0.01
+	3 COMBINED AT 070040	9.	3.13	1.	1.	1.	0.01
+	ROUTED TO 070050	9.	3.17	1.	1.	1.	0.01
+	HYDROGRAPH AT 070050	23.	3.07	2.	1.	1.	0.02
+	2 COMBINED AT 070050	30.	3.10	4.	2.	2.	0.03
+	ROUTED TO 070060	30.	3.13	4.	2.	2.	0.03
+	HYDROGRAPH AT 070310	30.	3.07	3.	2.	2.	0.02
+	ROUTED TO 070060	30.	3.10	3.	2.	2.	0.02

	HYDROGRAPH AT								
+		070060	26.	3.10	3.	2.	2.	0.02	
	3 COMBINED AT								
+		070060	83.	3.10	9.	6.	6.	0.07	
	ROUTED TO								
+		070070	82.	3.13	9.	6.	6.	0.07	
	HYDROGRAPH AT								
+		070070	43.	3.07	4.	3.	3.	0.03	
	HYDROGRAPH AT								
+		070080	52.	3.13	4.	2.	2.	0.02	
	3 COMBINED AT								
+		070080	168.	3.13	17.	10.	10.	0.12	
	ROUTED TO								
+		07Det	47.	3.63	17.	10.	10.	0.12	
+									70.41 3.63
	DIVERSION TO								
+		07Qspl	0.	3.63	0.	0.	0.	0.12	
	HYDROGRAPH AT								
+		07Qpip	47.	3.63	17.	10.	10.	0.12	
	ROUTED TO								
+		070420	47.	3.67	17.	10.	10.	0.12	
	HYDROGRAPH AT								
+		070410	17.	3.13	2.	1.	1.	0.01	
	ROUTED TO								
+		070420	17.	3.13	2.	1.	1.	0.01	
	HYDROGRAPH AT								
+		070420	5.	3.20	0.	0.	0.	0.00	
	3 COMBINED AT								
+		070420	62.	3.20	19.	12.	12.	0.14	
	ROUTED TO								
+		210005	62.	3.20	19.	12.	12.	0.14	

	HYDROGRAPH AT								
+		210005	13.	3.23	1.	1.	1.	0.01	
	2 COMBINED AT								
+		210005	75.	3.20	20.	12.	12.	0.15	
	ROUTED TO								
+		050030	75.	3.23	20.	12.	12.	0.15	
	HYDROGRAPH AT								
+		050005	0.	3.40	0.	0.	0.	0.00	
	ROUTED TO								
+		050010	0.	4.63	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		050010	96.	3.13	8.	5.	5.	0.07	
	2 COMBINED AT								
+		050010	96.	3.13	8.	5.	5.	0.07	
	ROUTED TO								
+		050020	93.	3.17	8.	5.	5.	0.07	
	HYDROGRAPH AT								
+		050210	100.	3.13	8.	5.	5.	0.05	
	ROUTED TO								
+		210ST	0.	5.53	0.	0.	0.	0.05	
+									0.55 9.97
	ROUTED TO								
+		050020	0.	4.73	0.	0.	0.	0.05	
	HYDROGRAPH AT								
+		050020	13.	3.17	1.	1.	1.	0.01	
	3 COMBINED AT								
+		050020	105.	3.17	10.	6.	6.	0.13	
	ROUTED TO								
+		050030	103.	3.20	10.	6.	6.	0.13	
	HYDROGRAPH AT								

+		050030	54.	3.10	3.	2.	2.	0.02	
	ROUTED TO								
+		030ST	20.	3.27	2.	1.	1.	0.02	
+									68.13 3.27
	2 COMBINED AT								
+		ALLEY	121.	3.20	12.	7.	7.	0.15	
	2 COMBINED AT								
+		050030	195.	3.20	32.	20.	20.	0.30	
	ROUTED TO								
+		050305	192.	3.23	32.	20.	20.	0.30	
	ROUTED TO								
+		050050	190.	3.27	32.	20.	20.	0.30	
	HYDROGRAPH AT								
+		050040	105.	3.20	12.	7.	7.	0.10	
	ROUTED TO								
+		40STOR	37.	3.67	12.	7.	7.	0.10	
+									61.58 3.67
	ROUTED TO								
+		050050	37.	3.67	12.	7.	7.	0.10	
	HYDROGRAPH AT								
+		050310	11.	3.13	1.	1.	1.	0.01	
	ROUTED TO								
+		SRPDet	5.	3.37	1.	1.	1.	0.01	
+									54.43 3.37
	HYDROGRAPH AT								
+		S 64th	7.	3.30	1.	0.	0.	0.01	
	HYDROGRAPH AT								
+		050065	37.	3.07	2.	1.	1.	0.01	
	HYDROGRAPH AT								
+		050062	16.	3.10	1.	1.	1.	0.01	
	ROUTED TO								

+		050050	15.	3.13	1.	1.	1.	0.01		
+	6 COMBINED AT	050050	256.	3.27	49.	30.	30.	0.43		
+	HYDROGRAPH AT	050060	53.	3.17	5.	3.	3.	0.03		
+	2 COMBINED AT	050050	301.	3.23	54.	33.	33.	0.46		
+	ROUTED TO	05Det	93.	4.50	39.	24.	24.	0.46		
+									53.52	4.50
+	DIVERSION TO	05Qspl	0.	4.50	0.	0.	0.	0.46		
+	HYDROGRAPH AT	05Qpip	93.	4.50	39.	24.	24.	0.46		
+	HYDROGRAPH AT	050610	99.	3.17	10.	6.	6.	0.08		
+	2 COMBINED AT	050610	100.	4.30	48.	30.	30.	0.54		
+	ROUTED TO	050620	100.	4.30	48.	30.	30.	0.54		
+	HYDROGRAPH AT	050620	110.	3.17	12.	7.	7.	0.10		
+	2 COMBINED AT	050620	209.	3.17	59.	37.	37.	0.64		
+	ROUTED TO	050630	207.	3.20	59.	37.	37.	0.64		
+	HYDROGRAPH AT	050630	120.	3.13	9.	6.	6.	0.06		
+	2 COMBINED AT	050630	308.	3.17	68.	42.	42.	0.70		

+	ROUTED TO	050660	303.	3.20	68.	42.	42.	0.70
+	HYDROGRAPH AT	050100	79.	3.17	6.	4.	4.	0.03
+	2 COMBINED AT	050660	377.	3.20	75.	46.	46.	0.74
+	ROUTED TO	050131	373.	3.23	75.	46.	46.	0.74
+	HYDROGRAPH AT	050131	55.	3.13	4.	3.	3.	0.02
+	2 COMBINED AT	050131	410.	3.23	79.	49.	49.	0.76
+	ROUTED TO	051410	407.	3.23	79.	49.	49.	0.76
+	HYDROGRAPH AT	051410	178.	3.13	13.	8.	8.	0.07
+	2 COMBINED AT	051410	533.	3.23	92.	56.	56.	0.83
+	ROUTED TO	051420	529.	3.23	92.	56.	56.	0.83

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

SUMMARIES REMOVED FOR PRINTOUT- SEE ELECTRONIC FILE

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION 210ST
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	0.00	1.00	1.00
STORAGE	0.	8.	8.
OUTFLOW	0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	0.55	0.00	4.	0.	0.00	9.97	0.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION 030ST
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	65.00	68.00	68.00
STORAGE	0.	1.	1.
OUTFLOW	0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	68.13	0.13	1.	20.	6.87	3.27	0.00

*** NORMAL END OF HEC-1 ***

preald2.dat

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              MAY   1991              *
 *           VERSION 4.0.1E             *
 *     Lahey F77L-EM/32 version 5.01    *
 *       Dodson & Associates, Inc.      *
 *  RUN DATE  08/11/99  TIME  14:16:52  *
 ****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              * ***********************************************************************
              * This is ALTERNATIVE D hydrology for Change Order #2
              *
              * - This model is based on the Recommended Plan - Part A for the Osborn Road
              *     Outfall with the following changes:
              *         Osborn Road Outfall has been modified to include a storm drain in
              *         Osborn Road running from the Paiute Basin to 71st Street, south on
```

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*         71st Street to Earll Drive and east on Earll Dr. to Indian Bend Wash.
*         Use of the existing storm drain in Osborn Road for excess runoff has
*         not been included in this model, since the benefit of this alternative
*         is the elimination of any construction activities in Osborn Road east
*         of Scottsdale Road.
*
*
ID    ************************************************************************
ID    STP-PAPAGO REGIONAL FLOOD CONTROL PROJECT
ID    SCOTTSDALE - TEMPE - PHOENIX
ID    ************************************************************************
ID
ID    Kimley-Horn and Associates, Inc.
ID    KVL Consultants, Inc.
ID
ID    10-Year, 6-Hour Storm Event
ID    10/97
ID
ID    PARSONS BRINCKERHOFF MODIFICATIONS TO ORIGINAL KIMLEY HORN MODEL
ID    PREMIER ENGINEERING FILE NAME: PREALD2.DAT
ID    FILE MODIFIED BY PARSONS BRINCKERHOFF TO BE USED IN DESIGN OF OSBORN OUTFALL
ID    MODIFICATIONS:
ID    1) SUBBASIN 050062 REROUTED DIRECTLY TO PAIUTE PARK- IMPROVEMENTS TO 64TH ST
ID       CONVEY FLOW TO DETENTION BASIN. AREA REDUCED TO 3.9 ACRES (0.0061 SM).
ID    2) PAIUTE PARK STAGE/DISCHARGE CURVE ADJUSTED TO REFLECT PRELIMINARY GRADING
ID       BY PREMIER ENGINEERING. ASSUME OUTFLOW FROM PAIUTE PARK IS SAME AS CULVER
ID       IN INLET CONTROL.  CITY OF SCOTTSDALE MAINTENANCE YARD NOT USED AS
ID       PART OF DETENTION BASIN.
ID    3) SUBBASINS CONTRIBUTING TO 66" ADOT PIPE AND SCOTTSDALE ROAD SOUTH OF
ID       OSBORN ROAD REMOVED FROM MODEL (SUBBASINS 050710, 050720,058810, 050640,
ID       050910, and 050650. FLOWS COLLECTED AND CONVEYED BY SCOTTSDALE ROAD
ID       STORM DRAIN.
ID    4) REVISE AREA OF SUBBASIN 050310 FROM 0.041 SM TO 0.0063 SM.AND ROUTE TO
ID       EXISTING DETENTION BASIN. REMAINING AREA IS SRP PROPERTY WHICH DRAINS
ID       WEST.
ID       AREA REDUCTION DUE TO:
ID       REMOVE APARTMENTS AT THOMAS AND 64TH ST DUE TO ON-SITE RETENTION.
ID       REMOVE PORTION OF SRP SUBSTATION WHICH DRAINS EAST.
ID       COLLECT PAVEMENT FLOWS FROM 64TH ST (THOMAS TO PAIUTE PARK) IN LARGE PIPE
ID       COLLECT FLOWS FROM PAVED AREA BETWEEN SUBSTATION AND APARTMENTS IN LARGE
ID       PIPE.
ID    5) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050130.  INSERT CONCENTRATION
ID       POINT AT EARLL AND CIVIC CENTER
ID    6) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050100.  EARLL ALIGNMENT DIVIDES
ID       SUBBASIN. ROUTE FLOWS TO CONCENTRATION POINT AT EARLL AND SCOTTSDALE.
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 39          ID    7) REVISE PIPE SIZES IN ROUTE CARDS TO REFLECT PB PRELIMINARY DESIGN
 40          ID
 41          ID    Parsons Brinckerhoff

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 42          ID    Alan Humphrey
 43          ID    5/5/99
 44          ID    Revised 8/11/99 FOR 50% SUBMITTAL
             *
             *DIAGRAM
 45          IT       2                     300
 46          IO       5

 47          KK  070808   BASIN
 48          BA   0.017
 49          PH       0       0    0.50    0.97    1.61    1.76    1.86    2.05
 50          LS       0      88       0       0      98       0
 51          UK     300  0.0100    0.20      99
 52          UK     100  0.0100    0.10       1
 53          RK    1600   0.214    0.03            TRAP       2     3.5
             *
             * The 10 year flows are diverted into a proposed storm drain along Oak Street.
             * In storm events greater than the 10 yr, the remaining flow will follow its
             * natural course across and sheet flow across Oak Street to the north.
             *

 54          KK   808PP  Divert 10-year flows into storm drain
 55          DT  808OUT
 56          DI       0      12      13      15      50     100
 57          DQ       0    0.01       1       3      38      88

 58          KK  070610 FROM  070808
 59          RK     240  0.0066   0.013            CIRC    3.00

 60          KK  070610   BASIN
 61          BA   0.007
 62          LS       0      88       0       0      98       0
 63          UK     300  0.0100    0.20      99
 64          UK     100  0.0100    0.10       1
 65          RK     500   0.054    0.03            TRAP       2     3.5

 66          KK   610PP  Divert 10-year flows into storm drain
 67          DT  610OUT
```

```
 68          DI       0       5       6      10      50     100
 69          DQ       0     .01       1       5      45      95

 70          KK  070610 COMBINE
 71          HC       2

 72          KK  070508    FROM  070610
 73          RK     420  0.0066   0.013            CIRC    3.00

 74          KK  070508   BASIN
 75          BA   0.008
 76          LS       0      85       0       0      98       0
 77          UK     300  0.0100    0.20      99
 78          UK     100  0.0100    0.10       1
 79          RK     600   0.048    0.03            TRAP       9     1.0
1                                          HEC-1 INPUT                                                    PAGE  3

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 80          KK   508PP  Divert 10-year flows into storm drain
 81          DT  508OUT
 82          DI       0       4       5      15      50     100
 83          DQ       0     .01       1      11      46      96

 84          KK  070508 COMBINE
 85          HC       2

 86          KK  070010    FROM  070508
 87          RK     270  0.0066   0.013            CIRC    3.00

 88          KK  070010   BASIN
 89          BA   0.009
 90          LS       0      88       0       0      98       0
 91          UK     300  0.0100    0.20      99
 92          UK     100  0.0100    0.10       1
 93          RK    1200   0.042    0.03            TRAP       2     3.5

 94          KK   010PP  Divert 10-year flows into storm drain
 95          DT  010OUT
 96          DI       0       7      10      15      50     100
 97          DQ       0     .01       3       8      43      93

 98          KK  070010 COMBINE
 99          HC       2
```

```
100          KK  070210    FROM  070010
101          RK     120  0.0033   0.013            CIRC    3.00

102          KK  070209   BASIN
103          BA   0.018
104          LS       0      87       0       0      98       0
105          UK     300  0.0100    0.20      99
106          UK     100  0.0100    0.10       1
107          RK    1200   0.252    0.03            TRAP       2     3.5

108          KK  070210    FROM  070209
109          RK     750   0.252   0.013            TRAP      10       1

110          KK  070210   BASIN
111          BA   0.008
112          LS       0      87       0       0      98       0
113          UK     300  0.0100    0.20      99
114          UK     100  0.0100    0.10       1
115          RK     600   0.043    0.03            TRAP       2     3.5

116          KK  070210 COMBINE
117          HC       2
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

118          KK   210PP  Divert 10-year flows into storm drain
119          DT  210OUT
120          DI       0      17      20      30      50     100
121          DQ       0     .01       3      13      33      83

122          KK  070210 COMBINE
123          HC       2

124          KK  050005   FROM 070210
125          RK     950   0.008   0.013            CIRC    3.00

126          KK  050005   BASIN
127          BA   0.038
128          LS       0      85       0       0      98       0
129          UK     300  0.0100    0.20      99
130          UK     100  0.0100    0.10       1
131          RK    1650    0.09    0.03            TRAP      30     1.0
```

```
132          KK   005PP  Divert 10-year flows into storm drain
133          DT  005OUT
134          DI       0      21      22     100     150     200
135          DQ       0     .01       1      79     129     179
             *
             * The start of the Osborn Road outfall hydrology
             *

136          KK  070010
137          KM    Retrieve overland flows at CP 070010
138          DR  010OUT

139          KK  070020    FROM  070010
140          RK     178  0.0131   0.013            CIRC     1.0

141          KK  070030    FROM  070020
142          RK     520  0.0146   0.025            TRAP     9.0       1

143          KK  070030   BASIN
144          BA   0.004
145          LS       0      85       0       0      98       0
146          UK     150  0.0100    0.30      65
147          UK      50  0.0100    0.10      35
148          RK     522  0.0146    0.03            TRAP       2     3.5

149          KK  070030 COMBINE
150          HC       2

151          KK  070040    FROM  070030
152          RK     177  0.0146   0.017            TRAP    54.8       1
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

153          KK  070210
154          KM    Retrieve overland flows at CP 070210
155          DR  210OUT

156          KK  070220    FROM  070210
157          RK     164  0.0131   0.013            CIRC     1.0

158          KK  070040    FROM  070220
159          RK     723  0.0146   0.017            TRAP    54.8       1
```

```
160          KK  070040   BASIN
161          BA   0.006
162          LS       0      86       0       0      98       0
163          UK     181  0.0100    0.28      72
164          UK      60  0.0100    0.10      28
165          RK    1946  0.0146    0.02            TRAP      30     1.0

166          KK  070040 COMBINE
167          HC       3

168          KK  070050    FROM  070040
169          RK     878  0.0146   0.025            TRAP    20.0     1.0

170          KK  070050   BASIN
171          BA   0.018
172          LS       0      86       0       0      98       0
173          UK     150  0.0100    0.30      65
174          UK      50  0.0100    0.10      35
175          RK     290  0.0058    0.02            TRAP      11     1.0
176          RK     981  0.0146    0.02            TRAP      11     1.0

177          KK  070050 COMBINE
178          HC       2

179          KK  070060    FROM  070050
180          RK     872  0.0058   0.025            TRAP     1.0     1.0

181          KK  070310   BASIN
182          BA   0.023
183          LS       0      86       0       0      98       0
184          UK     150  0.0100    0.30      65
185          UK      50  0.0100    0.10      35
186          RK     278  0.0058    0.02            TRAP      11     1.0
187          RK     986  0.0146    0.02            TRAP      11     1.0

188          KK  070060    FROM  070310
189          RK     745  0.0058   0.025            TRAP     1.0     1.0

190          KK  070060   BASIN
191          BA   0.020
192          LS       0      86       0       0      98       0
193          UK     150  0.0100    0.30      65
194          UK      50  0.0100    0.10      35
195          RK    1096  0.0058    0.03            TRAP       2     1.0
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 196          KK  070060 COMBINE
 197          HC       3

 198          KK  070070    FROM  070060
 199          RK     726  0.0146   0.025            TRAP    30.0     1.0

 200          KK  070070   BASIN
 201          BA   0.032
 202          LS       0      86       0       0      98       0
 203          UK     150  0.0100    0.30      65
 204          UK      50  0.0100    0.10      35
 205          RK    1209  0.0146    0.03            TRAP       2     1.0

 206          KK  070080   BASIN
 207          BA   0.021
 208          LS       0      83       0       0      98       0
 209          UK      29  0.0100    0.39       9
 210          UK     189  0.0100    0.10      91
 211          RK    1257  0.0058    0.02            TRAP      30     1.0

 212          KK  070080 COMBINE
 213          HC       3

 214          KK   07Det   Detention basin at Marriott's Brighton Gardens
 215          RS       1    STOR
              * SV CARD MODIFIED BY PREMIER ENGINEERING FOR 50% SUBMITTAL
 216          SV       0    0.53    1.22    2.03    3.07    4.37    5.92    6.77
 217          SE      66      67      68      69      70      71      72      73
 218          SQ       0      12      36      42      46      48      52     355
              *
              * Marriott's Brighton Gardens outfall - 07Qpip is the outflow in the storm drain
              * 07Qspl is the flow overtopping the basin
              *

 219          KK  07Qpip
 220          DT  07Qspl
 221          DI       0      71     112     172     245     329     420     518     623
 222          DQ       0     0.1      26      72     132     204     285     374     471

 223          KK  070420   FROM 07Qpip
```

```
                 * PB MODIFICATION FOR 50% SUBMITTAL
224              RK     369   0.005   0.012            CIRC     3.0
                 * RK  1000   0.005   0.013            CIRC     3.0

225              KK  070410   BASIN
226              BA   0.011
227              LS       0      84       0       0      98       0
228              UK     144  0.0100    0.32      44
229              UK     121  0.0100    0.10      56
230              RK    1816  0.0146    0.02            TRAP      23     1.0
1                                          HEC-1 INPUT                                                    PAGE  7

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

231              KK  070420    FROM  070410
232              RK     183  0.0058   0.017            TRAP    52.5       1

233              KK  070420   BASIN
234              BA   0.003
235              LS       0      79       0       0      98       0
236              UK     177  0.0100    0.31      25
237              UK     200  0.0100    0.10      75
238              RK    1046  0.0058    0.02            TRAP      49     1.0

239              KK  070420 COMBINE
240              HC       3

241              KK  210005  FROM 070420
                 * PB MODIFICATION FOR 50% SUBMITTAL
242              RK     487   0.005   0.012            CIRC     3.5
                 * RK   450   0.005   0.013            CIRC     3.5

243              KK  210005   BASIN
244              BA   0.008
245              LS       0      79       0       0      98       0
246              UK      94  0.0100    0.34      26
247              UK     116  0.0100    0.10      74
248              RK     523  0.0032    0.02            TRAP      38     1.0
249              RK    1250  0.0020    0.02            TRAP      45     1.0

250              KK  210005 COMBINE
251              KM    FLOW IN PIPE FROM MARRIOTT
252              HC       2
```

```
253          KK  050030   FROM 210005
             * PB MODIFICATION FOR 50% SUBMITTAL
254          RK    1232   0.005   0.012            CIRC       4
             * RK  1600   0.005   0.013            CIRC       4

255          KK  050005
256          KM    Retrieve overland flows at CP 050005
257          DR  005OUT

258          KK  050010   FROM 050005
259          RK    1300   0.015    0.02            TRAP      35       1

260          KK  050010   BASIN
261          BA   0.066
262          LS       0      81       0       0      98       0
263          UK     144  0.0100    0.30      52
264          UK      57  0.0100    0.10      48
265          RK    1189  0.0033    0.02            TRAP      30     1.0
266          RK    1197  0.0038    0.02            TRAP      60     1.0
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

267          KK  050010   COMBINE
268          HC       2

269          KK  050020    FROM  050010
270          RK    1370  0.0038   0.017            TRAP    37.5       1

271          KK  050210   BASIN
272          BA   0.054
273          LS       0      79       0       0      98       0
274          UK     200  0.0100    0.30      28
275          UK     200  0.0100    0.10      72
276          RK     564  0.0038    0.02            TRAP      23     1.0
277          RK    1199  0.0033    0.02            TRAP      23     1.0

278          KK   210ST STORAGE
279          RS       1    STOR
280          SV    0.00    7.72    7.72
281          SE    0.00    1.00    2.00
282          SQ    0.00    0.01    0.01
283          ST     1.0     500     3.0     1.5
```

```
284          KK  050020    FROM  050210
285          RK     278  0.0033   0.017            TRAP    60.0       1

286          KK  050020   BASIN
287          BA   0.009
288          LS       0      79       0       0      98       0
289          UK     166  0.0100    0.30      39
290          UK      98  0.0100    0.10      61
291          RK    1304  0.0038    0.02            TRAP      60     1.0

292          KK  050020 COMBINE
293          HC       3

294          KK  050030    FROM  050020
295          RK     347  0.0038   0.017            TRAP    37.5       1

296          KK  050030   BASIN
297          BA   0.020
298          LS       0      79       0       0      98       0
299          UK     150  0.0100    0.30      15
300          UK      50  0.0100    0.10      85
301          RK     278  0.0038    0.02            TRAP       9     1.0
302          RK    1468  0.0033    0.02            TRAP       9     1.0
             *
             * Scottsdale Executive Villas natural storage in parking lot
             *

303          KK   030ST STORAGE
304          RS       1    STOR
305          SV       0    0.01    0.06    0.62    2.72    2.72
306          SE      65      66      67      68      69      70
307          SQ    0.00    0.01    0.01    0.01    0.01    0.01
308          ST      68     150     3.0     1.5
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

309          KK   ALLEY COMBINE
310          KM    FLOW IN ALLEY AT CATALINA AND 64TH STREET
311          KM    PB MODIFICATION FOR 50% SUBMITTAL
312          HC       2

313          KK  050030 COMBINE
314          HC       2
```

```
315          KK  050305   FROM 050030
             * PB MODIFICATION FOR 50% SUBMITTAL
316          RK     943   0.002   0.012            CIRC     5.5
             * RK   150   0.002   0.013            CIRC     5.5

317          KK  050050   FROM 050305
318          RK    1500   0.001   0.013            TRAP       9     1.0

319          KK  050040   BASIN
320          BA   0.102
321          LS       0      79       0       0      98       0
322          UK     150  0.0100    0.30      57
323          UK      50  0.0100    0.10      43
324          RK    2230  0.0038    0.02            TRAP      38     1.0
325          RK    2654  0.0038    0.02            TRAP      38     1.0

326          KK  40STOR  Storage on west side of cross-cut canal
327          RS       1
328          SV       0       0       0       0     2.6    13.5    13.5
329          SE      58      59      60      61      62      63      64
330          SQ       0      10      22      32      40      50      55

331          KK  050050    FROM  050040
332          RK     491  0.0334   0.013            CIRC     2.5
             * ******************************************************************
             * PB Modification:
             * Reduce Area of Subbasin 050310 to 4.0 Acres (0.0063 SM)
             * Remaining area is west side of SRP substation
             * Remove one routing card for internal flows- this reduces route
             * length.
             * Add storage route through existing detention basin
             * Flows from other areas of original subbasin retained on-site or
             * collected by large pipe in 64th St.
             * ******************************************************************

333          KK  050310   BASIN
             * BA 0.041
334          BA   0.0063
335          LS       0      79       0       0      98       0
336          UK     200  0.0100    0.30      28
337          UK     200  0.0100    0.10      72
338          RK     816  0.0033    0.02            TRAP      30     1.0
             * RK   848  0.0038    0.02            TRAP      30     1.0
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 339          KK  SRPDet
 340          RS       1    STOR
 341          SA   0.152   0.207   0.207
 342          SE    53.4      56      57
 343          SQ       0       2       4       5       8      10      20      40
 344          SE    53.4    54.0    54.3    54.5    54.9    55.1   53.48      57
              * ******************************************************************
              * PB Modification:
              * Add subbasin to represent flows from pavement of 64th St south
              * of Paiute Park and paved area between SRP substation and new
              * apartments. Area to be collected by large pipe in 64th St.

 345          KK  S 64th   BASIN
 346          BA   0.011
 347          LS       0      79       0       0      83       0
 348          UK     100   0.004     0.1      53
 349          UK     100   0.008     0.1      47
 350          RK    1430   0.004   0.015            TRAP      35       1

 351          KK  050065   BASIN
 352          KO       2
 353          BA   0.014
 354          LS       0      79       0       0      98       0
 355          UK     100    0.01     0.3      15
 356          UK     100    0.01     0.1      85
 357          RK     500   0.005   0.012            TRAP      60       1
              * ******************************************************************
              * PB Modification
              * Relocate hydrograph and subsequent route for Basin 050060
              * Combine separately to get peak flow in main pipe
              * KK050060   BASIN
              * BA 0.029
              * LS     0      79       0       0      98       0
              * UK   105    0.01     0.3      20
              * UK   160    0.01     0.1      80
              * RK  1300  0.0038    0.03            TRAP     100     1.0
              *
              * ******************************************************************
              * PB Modification
              * Relocate hydrograph and subsequent route for Basin 050062
              * Modify pipe length to reflect storm drain route on 64th St
```

```
                 * Insert hydrographs at this location
                 * Revise basin area to 3.9 acres (0.0061 square miles)
                 * ****************************************************************

 358             KK  050062   BASIN
 359             BA   0.0061
                 * Original KH model had 2 BA cards. The 0.006 card was first, leaving
                 * the 0.014 card to be used in the model.
                 * BA 0.006
                 * BA 0.014
 360             LS       0      79       0       0      98       0
 361             UK     100    0.01     0.3      15
 362             UK      50    0.01     0.1      85
1                                          HEC-1 INPUT                                                    PAGE 11

LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 363             RK     900   0.005   0.012            TRAP      60       1

 364             KK  050050   FROM 050062
 365             KO       2
 366             RK    1000   0.002   0.013            CIRC     2.5       1
                 *
                 * Flows combined from 050040, 050305, revised 050310 and 050065
                 * into main pipe above Paiute Park. PB- Add 050062 and S 64th
                 *

 367             KK  050050 COMBINE
 368             KM   Peak flow in main pipe above Paiute Park
 369             KO       2
 370             HC       6
                 * Revise Hydrograph combine count from 5 to 6
                 * Move Subbasin 050060 (Paiute Park) to combine here.

 371             KK  050060   BASIN
 372             BA   0.029
 373             LS       0      79       0       0      98       0
 374             UK     105    0.01     0.3      20
 375             UK     160    0.01     0.1      80
 376             RK    1300  0.0038    0.03            TRAP     100     1.0

 377             KK  050050 COMBINE
 378             KM   Paiute Park inflow
 379             HC       2
                 * ****************************************************************
```

```
                 * PB Modification:
                 * Revise Kimley-Horn stage/storage/discharge curve
                 * Revisions based on iterative calculations which included effect of
                 * Paiute Park discharges on downstream pipe system.
                 * ******************************************************************

 380             KK   05Det  Storage
 381             KO       2
                 * Original KH Curve
                 * RS     1    STOR
                 * SV     0    0.64    2.37    5.14    8.40    11.7    15.1    18.5    22.1
                 *    22.1S
                 * SE    49      50      51      52      53      54      55      56      57
                 *       58
                 * SQ   4.5      22      37      47      56      65      73      81      88
                 *      156
                 * Revised Premier Curve 7/10/99 jjh
                 * SV Revised by Premier 7/22/99
                 * SV revised by Premier 8/6/99 to reflect no maintenance yard use in detention
                 * basin
 382             RS       1    STOR
                 * SV     0    4.92    9.18   13.51   17.92   22.39   26.92   36.48
                 * SV     0    2.40    6.57   10.83   15.17   19.58   24.06   33.52
 383             SV       0    2.09    5.26    8.49   11.79   15.16   18.60   25.68
 384             SE   48.65      50      51      52      53      54      55      57
                 * SQ     0      15      38      70     110     115     125     140
 385             SQ       0      20      40      60      80     100     120     140
```



```
LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 386             SE   48.65   50.10   50.92   51.60   52.19   52.71   53.19   53.66
                 *
                 * Revised PB Curve
                 * SA  1.20    1.84    3.17    3.21    3.31    3.35    3.42    3.49
                 * SE    50      51      52      53      54      55      56      57
                 * SQ     0      20      40      60      80     100     120     140
                 * SE    50    50.8   51.18   51.78   52.39   52.94   53.48   54.04
                 *
                 * Paiute Park outfall - 05Qpip is the outflow in the storm drain
                 * 05Qspl is the flow overtopping the basin
                 *
                 *
                 * Overflows to CP 050060
                 *
```

```
387          KK  05Qpip
388          DT  05Qspl
389          DI       0     160     382     780    1292    1897
390          DQ       0    0.01     212     600    1102    1697
             *
             * Begin storm drain system in Osborn Road
             *
             * ****************************************************************
             * PB Modification
             * Relocate hydrograph and subsequent route for Basin 050062
             * Remove hydrographs from this location
             * ****************************************************************
             * KK050062   BASIN
             * BA 0.006
             * BA 0.014
             * LS     0      79       0       0      98       0
             * UK   100    0.01     0.3      15
             * UK    50    0.01     0.1      85
             * RK   900   0.005   0.012            TRAP      60       1
             * KK050610   FROM 050062
             * RK  1500   0.003   0.013            TRAP      60       1

391          KK  050610   BASIN
392          BA   0.081
393          LS       0      79       0       0      98       0
394          UK     130  0.0100    0.32      56
395          UK      70  0.0100    0.10      44
396          RK    1450  0.0038    0.02            TRAP      45     1.0
397          RK    1240  0.0033    0.02            TRAP      60     1.0
             * ****************************************************************
             * PB Modification
             * Revise combine operation from 3 to 2 hydrographs due to hydrograph
             * relocation.
             * ****************************************************************
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

398          KK  050610    COMBINE
399          KM   OSBORN & PINTO
400          KO       1       0
401          HC       2
```

```
402          KK  050620    FROM  050610
             * ****************************************************************
             * PB Modification
             * FOR 50% SUBMITTAL
             * Revise pipe size in routing card to reflect PB preliminary design.
             * ****************************************************************
403          RK     980  0.0037   0.012            CIRC       5
             * RK  1050  0.0037   0.013            CIRC       6

404          KK  050620   BASIN
405          BA   0.099
406          LS       0      79       0       0      98       0
407          UK     147  0.0100    0.30      56
408          UK      53  0.0100    0.10      44
409          RK     940  0.0033    0.02            TRAP      41     1.0
410          RK    2545  0.0038    0.02            TRAP      60     1.0

411          KK  050620 COMBINE
412          KM   OSBORN AND 68TH STREET
413          KO       1       0
414          HC       2

415          KK  050630    FROM  050620
             * ****************************************************************
             * PB Modification
             * FOR 50% SUBMITTAL
             * Revise pipe size in routing card to reflect PB preliminary design.
             * ****************************************************************
416          RK    1630  0.0028   0.012            CIRC       7
             * RK  1440  0.0028   0.013            CIRC       7

417          KK  050630   BASIN
418          BA   0.062
419          LS       0      79       0       0      98       0
420          UK     138  0.0100    0.31      33
421          UK      64  0.0100    0.10      67
422          RK    1205  0.0038    0.02            TRAP      41     1.0
423          RK    1348  0.0033    0.02            TRAP      60     1.0

424          KK  050630 COMBINE
425          KM   OSBORN AND 70TH STREET
426          KO       1       0
427          HC       2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 428          KK  050660    FROM  050630
              * ******************************************************************
              * PB Modification
              * FOR 50% SUBMITTAL
              * Revise pipe size in routing card to reflect PB preliminary design.
              * ******************************************************************
 429          RK    1954  0.0015   0.012            CIRC     7.5
              * RK  2600  0.0015   0.013            CIRC       7
              * ******************************************************************
              * PB Modification:
              * Remove flows and subsequent routes from Subbasins 050710, 050720,
              * 050810, 050640, 050910, and 050650 from model. Flows drain to
              * Scottsdale Road. Allow flows to be collected by Scottsdale Road
              * system. Do not collect in Earll Road system.
              * ******************************************************************
              * KK050710   BASIN
              * BA 0.005
              * LS     0      79       0       0      98       0
              * UK    21  0.0100    0.40      15
              * UK   200  0.0100    0.10      85
              * RK   610  0.0038    0.02            TRAP      55     1.0
              * KK050720    FROM  050710
              * RK   316  0.0045   0.013            CIRC     5.5
              * KK050720   BASIN
              * BA 0.028
              * LS     0      79       0       0      98       0
              * UK    57  0.0100    0.38      17
              * UK   188  0.0100    0.10      83
              * RK   580  0.0038    0.02            TRAP      45     1.0
              * RK  1594  0.0033    0.02            TRAP      55     1.0
              * KK050720   COMBINE
              * HC     2
              * KK050640    FROM  050720
              * RK   422  0.0045   0.013            CIRC     5.5
              * KK050810   BASIN
              * BA 0.013
              * LS     0      79       0       0      98       0
              * UK    88  0.0100    0.36      20
              * UK   200  0.0100    0.10      80
              * RK   164  0.0033    0.02            TRAP      28     1.0
              * RK  1031  0.0038    0.02            TRAP      55     1.0
              * KK050640    FROM  050810
```

```
* RK   705  0.0025   0.013            CIRC     4.0
* KK050640   BASIN
* BA 0.032
* LS     0      79       0       0      98       0
* UK    64  0.0100    0.37      15
* UK   149  0.0100    0.10      85
* RK  1605  0.0038    0.02            TRAP      41     1.0
* RK  1168  0.0033    0.02            TRAP      60     1.0
* KK050640 COMBINE
* HC     3
* KK050650   FROM 050640
* RK   700  0.0029   0.013            CIRC       6
* KK050910   BASIN
* BA 0.012
* LS     0      79       0       0      98       0
* UK   170  0.0100    0.32      26
* UK   200  0.0100    0.10      74
* RK   837  0.0038    0.02            TRAP      38     1.0
* KK050650    FROM  050910
* RK   751  0.0045   0.013            DEEP     5.0
* KK050650   BASIN
* BA 0.019
* LS     0      79       0       0      98       0
* UK    29  0.0100    0.40      16
* UK   200  0.0100    0.10      84
* RK   598  0.0033    0.02            TRAP      23     1.0
* RK   566  0.0038    0.02            TRAP      90     1.0
* KK050650 COMBINE
* HC     3
* KK050660    FROM  050650
* RK   648  0.0027   0.013            CIRC     7.5
*
* This alternative includes a storm drain in 71st St.  This storm drain will
* intercept flows from the north part of the existing conditions subbasin
* 050100.  For this reason, subbasin 050100 has been split into two with 050100
* being north of Earll Drive and 050105 south of earll drive.  See drainage
* figure in the Appendix of the Final Report.
*
```

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```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 430          KK  050100   BASIN
 431          BA   0.034
```

```
432          LS       0      79       0       0      98       0
433          UK      20  0.0100    0.40       7
434          UK     200  0.0100    0.10      93
435          RK     505  0.0033    0.02            TRAP      30     1.0
436          RK    1727  0.0038    0.02            TRAP      23     1.0
             * ****************************************************************
             * PB Modification:
             * Remove flows from Subbasin 050660 from model. Drains to Scottsdale Road.
             * Allow flows to be collected by Scottsdale Road system.
             * Adjust combine card from 4 to 2
             * ****************************************************************
             * KK050660   BASIN
             * BA 0.018
             * LS     0      79       0       0      98       0
             * UK    20  0.0100    0.40      15
             * UK   200  0.0100    0.10      85
             * RK   578  0.0033    0.02            TRAP      49     1.0
             * RK   582  0.0038    0.02            TRAP      90     1.0

437          KK  050660 COMBINE
438          KM   SCOTTSDALE ROAD AND EARL DRIVE
439          KO       1       0
440          HC       2
             * ****************************************************************
             * PB Modification:
             * Collect local flows into large pipe. Earll Drive divides subbasin
             * 50130.  Runoff generated north of Earll Drive to be collected
             * at Earll Drive.  New subbasin north of Earll to be 050131. Add
             * required combine and route cards. Modify routing card from 050660.
             * Revise KH routes from TRAP to CIRC.
             * ****************************************************************
             *

441          KK  050131   FROM 050660
             * KK051410   FROM 050660
             * KH routing card
             * RK  2640  0.0015   0.013            TRAP      16
             * PB MODIFICATION FOR 50% SUBMITTAL
442          RK    1414  0.0015   0.012            CIRC     7.5

443          KK  050131
             * BA 0.096
444          BA   0.024
445          LS       0      79       0       0      98       0
446          UK      45  0.0100    0.38      15
```

```
447          UK     171  0.0100    0.10      85
             * RK  1905  0.0038    0.02            TRAP      71     1.0
             * RK  1212  0.0033    0.02            TRAP      71     1.0
448          RK    1000   0.004    0.02            TRAP      71     1.0
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

449          KK  050131   COMBINE
450          KM   EARL DRIVE AND 74TH STREET
451          KO       1       0
452          HC       2

453          KK  051410   FROM 050131
454          KM   ROUTE FROM CIVIC CENTER TO MILLER
             * PB MODIFICATION FOR 50% SUBMITTAL
455          RK    1241  0.0015   0.012            CIRC       8
             * RK  1300  0.0015   0.013            CIRC       8

456          KK  051410   BASIN
457          BA   0.072
458          LS       0      79       0       0      98       0
459          UK      64  0.0100    0.37       9
460          UK     150  0.0100    0.10      91
461          RK    1170  0.0033    0.02            TRAP      38     1.0
462          RK    1180  0.0038    0.02            TRAP      55     1.0

463          KK  051410    COMBINE
464          KM   EARL DRIVE AND MILLER ROAD
465          KO       1       0
466          HC       2
             *
             * EARLL DR OUTFALL TO INDIAN BEND WASH
             *
             * ****************************************************************
             * PB Modification:
             * Revise route to reflect storm drain from Miller to IBW
             * Use 105-inch pipe to represent 10' x 6' box culvert.
             * ****************************************************************

467          KK  051420    FROM  051410
             * RK  1460  0.0015   0.013            TRAP      14
             * PB MODIFICATION FOR 50% SUBMITTAL
468          RK    1471  0.0015   0.013            CIRC     8.7
```

```
*
* ******************************************************************
* PB Modification:
* End of area of interest. Remove subsequent hydrographs from model.
* ******************************************************************
*
* FLOW IN BASIN 05 EAST OF 71ST STREET FOLLOWS DRAINAGE PATHS OF EXISTING
* CONDITIONS MODEL IN THIS ALTERNATIVE - FLOWS IN THIS SECTION ARE NORTH OF
* OSBORN RD WITH THE EXCEPTION OF BASIN 051710 AND FLOW NATURALLY TO THE EAST
*
* KK051510   BASIN
* BA 0.010
* LS     0      79       0       0      98       0
* UK    59  0.0100    0.38      18
* UK   200  0.0100    0.10      82
* RK   139  0.0038    0.02            TRAP      41     1.0
* RK   521  0.0033    0.02            TRAP      71     1.0
* KK051520    FROM  051510
* RK   680  0.0028   0.013            CIRC     9.5
* KK051610   BASIN
* BA 0.021
* LS     0      79       0       0      98       0
* UK   165  0.0100    0.32      25
* UK   200  0.0100    0.10      75
* RK   624  0.0038    0.02            TRAP      41     1.0
* RK   792  0.0033    0.02            TRAP      60     1.0
* KK051520    FROM  051610
* RK   601  0.0047   0.013            CIRC     5.0
* KK051710   BASIN
* BA 0.004
* LS     0      79       0       0      98       0
* UK   146  0.0100    0.33      24
* UK   200  0.0100    0.10      76
* RK   515  0.0038    0.02            TRAP      30     1.0
* RK   287  0.0033    0.02            TRAP      30     1.0
* KK051520    FROM  051710
* RK   567  0.0032   0.013            CIRC     4.0
* KK051520   BASIN
* BA 0.023
* LS     0      79       0       0      98       0
* UK   179  0.0100    0.31      26
* UK   198  0.0100    0.10      74
* RK   473  0.0038    0.02            TRAP      60     1.0
* RK   704  0.0033    0.02            TRAP      71     1.0
* KK051520 COMBINE
```

```
* HC      4
* KK051530     FROM  051520
* RK    926   0.001   0.013            CIRC      6.0
* KK051530   BASIN
* BA 0.041
* LS      0       79       0       0       98       0
* UK     26  0.0100    0.40      15
* UK    193  0.0100    0.10      85
* RK    889  0.0038    0.02            TRAP      38      1.0
* RK    860  0.0033    0.02            TRAP      60      1.0
* KK051530 COMBINE
* HC      2
* KK051540     FROM  051530
* RK    360   0.001   0.013            CIRC      6.0
* KK051810   BASIN
* BA 0.005
* LS      0       79       0       0       98       0
* UK     23  0.0100    0.40      16
* UK    196  0.0100    0.10      84
* RK    272  0.0033    0.02            TRAP      19      1.0
* RK    272  0.0038    0.02            TRAP      30      1.0
* KK051540     FROM  051810
* RK    218  0.0045   0.013            CIRC      4.5
* KK051540   BASIN
* BA 0.004
* LS      0       79       0       0       98       0
* UK     44  0.0100    0.38      16
* UK    172  0.0100    0.10      84
* RK    233  0.0038    0.02            TRAP      12      1.0
* RK    265  0.0033    0.02            TRAP      60      1.0
* KK051540 COMBINE
* HC      3
* KK051550     FROM  051540
* RK    273   0.001   0.013            TRAP      8.0     1.0
* KK051560     FROM  051550
* RK    800  0.0038   0.013            CIRC      7.0
* KK051560   BASIN
* BA 0.008
* LS      0       79       0       0       98       0
* UK    116  0.0100    0.33      47
* UK     89  0.0100    0.10      53
* RK   1126  0.0033    0.02            TRAP      60      1.0
* KK051560 COMBINE
* HC      2
*
```

```
* Osborn Rd outfall to Indian Bend Wash
*
* KK051570    FROM  051560
* RK   228   0.003   0.013            CIRC     7.0
*
* Begin Thomas Rd outfall
*
* KK05Qspl  Retrieve spill from Paiute Park detention basin
* DR05Qspl
* KK050060    Qspl FROM  05Det
* RK   500   0.002   0.027            TRAP       5       1
* KK050070    FROM  050060
* RK  1429  0.0033   0.030            TRAP     5.0     1.0
* KK050410   BASIN
* BA 0.041
* LS     0      79       0       0      98       0
* UK    77  0.0100    0.36      25
* UK   137  0.0100    0.10      75
* RK   694  0.0038    0.02            TRAP      38     1.0
* RK  1177  0.0033    0.02            TRAP      38     1.0
* KK050070    FROM  050410
* RK   187  0.0038   0.017            TRAP    60.0       1
* KK050070   BASIN
* BA 0.084
* LS     0      79       0       0      98       0
* UK    22  0.0100    0.40       8
* UK   198  0.0100    0.10      92
* RK  3223  0.0038    0.02            TRAP      38     1.0
* KK050070 COMBINE
* HC     3
* KK050080    FROM  050070
* RK  1112  0.0027   0.013            CIRC     4.5
* KK050080   BASIN
* BA 0.021
* LS     0      79       0       0      98       0
* UK   132  0.0100    0.31      60
* UK    71  0.0100    0.10      40
* RK  1365  0.0033    0.02            TRAP      38     1.0
* KK050080 COMBINE
* HC     2
* KK050090    FROM  050080
* RK   416  0.0052   0.013            CIRC     4.0
* KK050510   BASIN
* BA 0.054
* LS     0      79       0       0      98       0
```

```
* UK   109  0.0100    0.33      48
* UK    97  0.0100    0.10      52
* RK  1096  0.0038    0.02            TRAP      41     1.0
* RK  1304  0.0033    0.02            TRAP      41     1.0
* KK050090    FROM  050510
* RK   626  0.0052   0.013            CIRC     4.0
* KK050090   BASIN
* BA 0.037
* LS     0      79       0       0      98       0
* UK    44  0.0100    0.38      23
* UK   172  0.0100    0.10      77
* RK   965  0.0038    0.02            TRAP      23     1.0
* RK  1064  0.0033    0.02            TRAP      45     1.0
* KK050090 COMBINE
* HC     3
* KK050105    FROM  050090
* RK   609  0.0028   0.013            CIRC     4.5
*
* This alternative includes a storm drain in 71st St.  This storm drain will
* intercept flows from the north part of the existing conditions subbasin
* 050100.  For this reason, subbasin 050100 has been split into two with 050100
* being north of Earll Drive and 050105 south of Earll Drive.  See drainage
* figure in the appendix of the Final Report.
*
* KK050105   BASIN
* BA 0.011
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40       7
* UK   200  0.0100    0.10      93
* RK   587  0.0033    0.02            TRAP      30     1.0
* RK   410  0.0038    0.02            TRAP      23     1.0
* KK050105 COMBINE
* HC     2
* KK050110    FROM  050105
* RK   692  0.0058   0.013            CIRC     4.0
* KK050110   BASIN
* BA 0.010
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40      15
* UK   200  0.0100    0.10      85
* RK   587  0.0033    0.02            TRAP      46     1.0
* RK   406  0.0038    0.02            TRAP      77     1.0
* KK050110 COMBINE
* HC     2
* KK050120    FROM  050110
```

```
* RK   888  0.0027   0.013          CIRC     7.5
* KK051010   BASIN
* BA 0.023
* LS     0      79       0       0      98       0
* UK   200  0.0100    0.30      28
* UK   200  0.0100    0.10      72
* RK   517  0.0033    0.02            TRAP      30     1.0
* RK   822  0.0038    0.02            TRAP      30     1.0
* KK1010ST STORAGE
* RS     1    STOR
* SV     0    0.20    0.70    1.49    1.49
* SE    58      59      60      61      62
* SQ     0    0.01    0.01    0.01    0.01
* ST    61     800     3.0     1.5
* KK051020    FROM  051010
* RK   948  0.0033   0.017            TRAP    60.0       1
* KK051110   BASIN
* BA 0.025
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40      10
* UK   200  0.0100    0.10      90
* RK   326  0.0038    0.02            TRAP       9     1.0
* RK  1382  0.0033    0.02            TRAP      19     1.0
* KK051020    FROM  051110
* RK   541  0.0038   0.017            TRAP    33.0       1
* KK051020   BASIN
* BA 0.027
* LS     0      79       0       0      98       0
* UK    64  0.0100    0.37      22
* UK   174  0.0100    0.10      78
* RK   409  0.0038    0.02            TRAP      26     1.0
* RK  1595  0.0033    0.02            TRAP      60     1.0
* KK051020 COMBINE
* HC     3
* KK051030    FROM  051020
* RK   694  0.0033   0.017            TRAP    60.0       1
* KK051210   BASIN
* BA 0.008
* LS     0      79       0       0      98       0
* UK    20  0.0100    0.40      15
* UK   200  0.0100    0.10      85
* RK   682  0.0038    0.02            TRAP       9     1.0
* KK051030    FROM  051210
* RK   241  0.0038   0.017            TRAP    60.0       1
* KK051310   BASIN
```

```
* BA 0.003
* LS      0       79        0        0       98        0
* UK     20   0.0100     0.40       6
* UK    200   0.0100     0.10      94
* RK    544   0.0033     0.02             TRAP       18      1.0
* KK051320     FROM   051310
* RK    333   0.0038    0.017             TRAP     60.0       1
* KK051320    BASIN
* BA 0.009
* LS      0       79        0        0       98        0
* UK     20   0.0100     0.40       7
* UK    200   0.0100     0.10      93
* RK    254   0.0038     0.02             TRAP        9      1.0
* RK    543   0.0033     0.02             TRAP       18      1.0
* KK051320 COMBINE
* HC      2
* KK051030     FROM   051320
* RK    960   0.0038    0.017             TRAP     60.0       1
* KK051030    BASIN
* BA 0.031
* LS      0       79        0        0       98        0
* UK     28   0.0100     0.39      13
* UK    190   0.0100     0.10      87
* RK   2532   0.0033     0.02             TRAP       49      1.0
* KK051030 COMBINE
* HC      4
* KK051040     FROM   051030
* RK   1501   0.0033    0.017             TRAP     60.0       1
* KK051040    BASIN
* BA 0.036
* LS      0       79        0        0       98        0
* UK    105   0.0100     0.34      39
* UK    102   0.0100     0.10      61
* RK   1159   0.0038     0.02             TRAP       45      1.0
* RK   1501   0.0033     0.02             TRAP       65      1.0
* KK051040 COMBINE
* HC      2
* KK050120     FROM   051040
* RK   1222    0.003    0.013             TRAP        8
* KK050120    BASIN
* BA 0.039
* LS      0       79        0        0       98        0
* UK     24   0.0100     0.40      14
* UK    195   0.0100     0.10      86
* RK    763   0.0038     0.02             TRAP       23      1.0
```

```
* RK  1114  0.0033    0.02            TRAP      90     1.0
* KK050120 COMBINE
* HC     3
* KK050130    FROM  050120
* RK  1265  0.0027   0.013            DEEP     7.0
* KK050130   BASIN
* BA 0.096
* LS     0      79       0       0      98       0
* UK    45  0.0100    0.38      15
* UK   171  0.0100    0.10      85
* RK  1905  0.0038    0.02            TRAP      71     1.0
* RK  1212  0.0033    0.02            TRAP      71     1.0
* KK050130 COMBINE
* HC     2
* KK050140    FROM  050130
* RK  1319  0.0027   0.013            DEEP     7.0
* KK050140   BASIN
* BA 0.086
* LS     0      79       0       0      98       0
* UK    94  0.0100    0.35      25
* UK   154  0.0100    0.10      75
* RK  1224  0.0038    0.02            TRAP       9     1.0
* RK  1267  0.0033    0.02            TRAP      79     1.0
* KK050140 COMBINE
* HC     2
* KK050150    FROM  050140
* RK  1252  0.0006   0.013            DEEP     5.0
* KK050150   BASIN
* BA 0.011
* LS     0      79       0       0      98       0
* UK   159  0.0100    0.30      57
* UK    57  0.0100    0.10      43
* RK  1202  0.0033    0.02            TRAP      60     1.0
* KK050150 COMBINE
* HC     2
*
* Thomas Rd Outfall to Indian Bend Wash
*
* KK050160    FROM  050150
* RK   332  0.0048   0.013            DEEP     6.0
*
* Notice:
* This document, together with the concepts and designs presented herein, as an
* instrument of service, is intended for the specific purpose and client for
* which it was prepared.  Reuse of and improper reliance on this document
```

* without written authorization and adaptation by Kimley-Horn and Associates,
* Inc. shall be without liability to Kimley-Horn and Associates, Inc.
*


```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 469          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   47      070808
                .
                .
   55           .-------->  808OUT
   54       808PP
                V
                V
   58      070610
                .
                .
   60           .      070610
                .           .
                .           .
   67           .           .-------->  610OUT
   66           .       610PP
                .           .
                .           .
   70      070610............
                V
                V
   72      070508
                .
                .
   74           .      070508
                .           .
                .           .
   81           .           .-------->  508OUT
   80           .       508PP
                .           .
                .           .
```

```
 84      070508............
              V
              V
 86      070010
              .
              .
 88           .      070010
              .           .
              .           .
 95           .           .-------> 010OUT
 94           .       010PP
              .           .
              .           .
 98      070010............
              V
              V
100      070210
              .
              .
102           .      070209
              .           V
              .           V
108           .      070210
              .           .
              .           .
110           .           .      070210
              .           .           .
              .           .           .
116           .      070210............
              .           .
              .           .
119           .           .-------> 210OUT
118           .       210PP
              .           .
              .           .
122      070210............
              V
              V
124      050005
              .
              .
126           .      050005
              .           .
              .           .
133           .           .-------> 005OUT
```

```
132          .       005PP
             .          .
             .          .
138          .          .          .<-------  010OUT
136          .          .     070010
             .          .          V
             .          .          V
139          .          .     070020
             .          .          V
             .          .          V
141          .          .     070030
             .          .          .
             .          .          .
143          .          .          .      070030
             .          .          .           .
             .          .          .           .
149          .          .     070030............
             .          .          V
             .          .          V
151          .          .     070040
             .          .          .
             .          .          .
155          .          .          .           .<-------  210OUT
153          .          .          .      070210
             .          .          .           V
             .          .          .           V
156          .          .          .      070220
             .          .          .           V
             .          .          .           V
158          .          .          .      070040
             .          .          .           .
             .          .          .           .
160          .          .          .           .      070040
             .          .          .           .           .
             .          .          .           .           .
166          .          .     070040........................
             .          .          V
             .          .          V
168          .          .     070050
             .          .          .
             .          .          .
170          .          .          .      070050
             .          .          .           .
             .          .          .           .
177          .          .     070050............
```

```
                 .          .          V
                 .          .          V
   179           .          .     070060
                 .          .          .
                 .          .          .
   181           .          .          .      070310
                 .          .          .           V
                 .          .          .           V
   188           .          .          .      070060
                 .          .          .           .
                 .          .          .           .
   190           .          .          .           .      070060
                 .          .          .           .           .
                 .          .          .           .           .
   196           .          .     070060.......................
                 .          .          V
                 .          .          V
   198           .          .     070070
                 .          .          .
                 .          .          .
   200           .          .          .      070070
                 .          .          .           .
                 .          .          .           .
   206           .          .          .           .      070080
                 .          .          .           .           .
                 .          .          .           .           .
   212           .          .     070080.......................
                 .          .          V
                 .          .          V
   214           .          .      07Det
                 .          .          .
                 .          .          .
   220           .          .          .-------> 07Qspl
   219           .          .     07Qpip
                 .          .          V
                 .          .          V
   223           .          .     070420
                 .          .          .
                 .          .          .
   225           .          .          .      070410
                 .          .          .           V
                 .          .          .           V
   231           .          .          .      070420
                 .          .          .           .
                 .          .          .           .
```

```
233          .          .          .          .      070420
             .          .          .          .           .
             .          .          .          .           .
239          .          .     070420.......................
             .          .          V
             .          .          V
241          .          .     210005
             .          .          .
             .          .          .
243          .          .          .     210005
             .          .          .          .
             .          .          .          .
250          .          .     210005............
             .          .          V
             .          .          V
253          .          .     050030
             .          .          .
             .          .          .
257          .          .          .          .<-------  005OUT
255          .          .          .     050005
             .          .          .          V
             .          .          .          V
258          .          .          .     050010
             .          .          .          .
             .          .          .          .
260          .          .          .          .      050010
             .          .          .          .           .
             .          .          .          .           .
267          .          .          .     050010............
             .          .          .          V
             .          .          .          V
269          .          .          .     050020
             .          .          .          .
             .          .          .          .
271          .          .          .          .      050210
             .          .          .          .           V
             .          .          .          .           V
278          .          .          .          .       210ST
             .          .          .          .           V
             .          .          .          .           V
284          .          .          .          .      050020
             .          .          .          .           .
             .          .          .          .           .
286          .          .          .          .           .      050020
             .          .          .          .           .           .
```

```
292                 050020.......................
                       V
                       V
294                 050030
                       .
                       .
296                       .        050030
                          .           V
                          .           V
303                       .         030ST
                          .           .
                          .           .
309                    ALLEY............
                          .
                          .
313              050030............
                    V
                    V
315              050305
                    V
                    V
317              050050
                    .
                    .
319                 050040
                       V
                       V
326                 40STOR
                       V
                       V
331                 050050
                       .
                       .
333                       .        050310
                          .           V
                          .           V
339                       .        SRPDet
                          .           .
                          .           .
345                       .           .        S 64th
                          .           .           .
                          .           .           .
351                       .           .           .        050065
                          .           .           .           .
```

```
358                                                                  050062
                                                                        V
                                                                        V
364                                                                  050050
                                                                        .
                                                                        .
367                 050050.......................................................
                        .
                        .
371                     .      050060
                        .           .
                        .           .
377                 050050............
                        V
                        V
380                  05Det
                        .
                        .
388                     .-------> 05Qspl
387                 05Qpip
                        .
                        .
391                     .      050610
                        .           .
                        .           .
398                 050610............
                        V
                        V
402                 050620
                        .
                        .
404                     .      050620
                        .           .
                        .           .
411                 050620............
                        V
                        V
415                 050630
                        .
                        .
417                     .      050630
                        .           .
                        .           .
424                 050630............
```

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

```
                 .          .          V
                 .          .          V
  428            .          .     050660
                 .          .          .
                 .          .          .
  430            .          .          .      050100
                 .          .          .           .
                 .          .          .           .
  437            .          .     050660............
                 .          .          V
                 .          .          V
  441            .          .     050131
                 .          .          .
                 .          .          .
  443            .          .          .      050131
                 .          .          .           .
                 .          .          .           .
  449            .          .     050131............
                 .          .          V
                 .          .          V
  453            .          .     051410
                 .          .          .
                 .          .          .
  456            .          .          .      051410
                 .          .          .           .
                 .          .          .           .
  463            .          .     051410............
                 .          .          V
                 .          .          V
  467            .          .     051420
```

```
 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *           VERSION 4.0.1E              *
 *     Lahey F77L-EM/32 version 5.01     *
 *       Dodson & Associates, Inc.       *
 *  RUN DATE  08/11/99  TIME  14:16:52   *
 *****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
*****************************************************************************
STP-PAPAGO REGIONAL FLOOD CONTROL PROJECT
SCOTTSDALE - TEMPE - PHOENIX
*****************************************************************************

Kimley-Horn and Associates, Inc.
KVL Consultants, Inc.

10-Year, 6-Hour Storm Event
10/97

PARSONS BRINCKERHOFF MODIFICATIONS TO ORIGINAL KIMLEY HORN MODEL
PREMIER ENGINEERING FILE NAME: PREALD2.DAT
FILE MODIFIED BY PARSONS BRINCKERHOFF TO BE USED IN DESIGN OF OSBORN OUTFALL
MODIFICATIONS:
1) SUBBASIN 050062 REROUTED DIRECTLY TO PAIUTE PARK- IMPROVEMENTS TO 64TH ST
   CONVEY FLOW TO DETENTION BASIN. AREA REDUCED TO 3.9 ACRES (0.0061 SM).
2) PAIUTE PARK STAGE/DISCHARGE CURVE ADJUSTED TO REFLECT PRELIMINARY GRADING
   BY PREMIER ENGINEERING. ASSUME OUTFLOW FROM PAIUTE PARK IS SAME AS CULVER
   IN INLET CONTROL.  CITY OF SCOTTSDALE MAINTENANCE YARD NOT USED AS
   PART OF DETENTION BASIN.
3) SUBBASINS CONTRIBUTING TO 66" ADOT PIPE AND SCOTTSDALE ROAD SOUTH OF
   OSBORN ROAD REMOVED FROM MODEL (SUBBASINS 050710, 050720,058810, 050640,
   050910, and 050650. FLOWS COLLECTED AND CONVEYED BY SCOTTSDALE ROAD
   STORM DRAIN.
4) REVISE AREA OF SUBBASIN 050310 FROM 0.041 SM TO 0.0063 SM.AND ROUTE TO
   EXISTING DETENTION BASIN. REMAINING AREA IS SRP PROPERTY WHICH DRAINS
   WEST.
   AREA REDUCTION DUE TO:
   REMOVE APARTMENTS AT THOMAS AND 64TH ST DUE TO ON-SITE RETENTION.
   REMOVE PORTION OF SRP SUBSTATION WHICH DRAINS EAST.
   COLLECT PAVEMENT FLOWS FROM 64TH ST (THOMAS TO PAIUTE PARK) IN LARGE PIPE
   COLLECT FLOWS FROM PAVED AREA BETWEEN SUBSTATION AND APARTMENTS IN LARGE
   PIPE.
5) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050130.  INSERT CONCENTRATION
   POINT AT EARLL AND CIVIC CENTER
6) REVISE HYDROGRAPH CARDS FOR SUBBASIN 050100.  EARLL ALIGNMENT DIVIDES
   SUBBASIN. ROUTE FLOWS TO CONCENTRATION POINT AT EARLL AND SCOTTSDALE.
7) REVISE PIPE SIZES IN ROUTE CARDS TO REFLECT PB PRELIMINARY DESIGN

Parsons Brinckerhoff
Alan Humphrey
5/5/99
Revised 8/11/99 FOR 50% SUBMITTAL
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 46 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN           2  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME        0958  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL    0.03 HOURS
                      TOTAL TIME BASE    9.97 HOURS

         ENGLISH UNITS
              DRAINAGE AREA          SQUARE MILES
              PRECIPITATION DEPTH    INCHES
              LENGTH, ELEVATION      FEET
              FLOW                   CUBIC FEET PER SECOND
              STORAGE VOLUME         ACRE-FEET
              SURFACE AREA           ACRES
              TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 351 KK     *    050065  *        BASIN
            *            *
            **************

 352 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           2  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              SUBBASIN RUNOFF DATA
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353 BA          SUBBASIN CHARACTERISTICS
                      TAREA        0.01  SUBBASIN AREA

                PRECIPITATION DATA

 49 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 0.50    0.97    1.61    1.76    1.86    2.05    0.00    0.00    0.00    0.00    0.00    0.00

                                                STORM AREA =    0.01

354 LS          SCS LOSS RATE
                      STRTL        0.53  INITIAL ABSTRACTION
                     CRVNBR       79.00  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

                  LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT
                      STRTL        0.04  INITIAL ABSTRACTION
                     CRVNBR       98.00  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
355 UK            OVERLAND-FLOW ELEMENT NO. 1
                          L        100.  OVERLAND FLOW LENGTH
                          S      0.0100  SLOPE
                          N       0.300  ROUGHNESS COEFFICIENT
                         PA        15.0  PERCENT OF SUBBASIN
                      DXMIN           5  MINIMUM NUMBER OF DX INTERVALS
356 UK            OVERLAND-FLOW ELEMENT NO. 2
                          L        100.  OVERLAND FLOW LENGTH
                          S      0.0100  SLOPE
                          N       0.100  ROUGHNESS COEFFICIENT
                         PA        85.0  PERCENT OF SUBBASIN
                      DXMIN           5  MINIMUM NUMBER OF DX INTERVALS

                KINEMATIC WAVE
357 RK            MAIN CHANNEL
                          L        500.  CHANNEL LENGTH
                          S      0.0050  SLOPE
                          N       0.012  CHANNEL ROUGHNESS COEFFICIENT
                         CA        0.01  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       60.00  BOTTOM WIDTH OR DIAMETER
                          Z        1.00  SIDE SLOPE
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NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS
RUPSTQ NO ROUTE UPSTREAM HYDROGRAPH

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
PLANE1	0.50	1.67	1.88	9.09	0.95	204.23	0.55	0.09
PLANE2	1.49	1.67	0.99	20.00	39.29	183.80	1.82	0.38
MAIN	0.68	1.61	0.57	166.67	37.43	184.88	1.63	5.64

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.0000E+00 EXCESS=0.1219E+01 OUTFLOW=0.1218E+01 BASIN STORAGE=0.1294E-02 PERCENT ERROR= 0.0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	0.68	1.61	2.00	36.96	184.00	1.63

****

HYDROGRAPH AT STATION 050065

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	0.00	0.00	0.00	0.	1		0500	151	0.00	0.00	0.00	1.
1		0002	2	0.00	0.00	0.00	0.	1		0502	152	0.00	0.00	0.00	1.
1		0004	3	0.00	0.00	0.00	0.	1		0504	153	0.00	0.00	0.00	1.
1		0006	4	0.00	0.00	0.00	0.	1		0506	154	0.00	0.00	0.00	1.
1		0008	5	0.00	0.00	0.00	0.	1		0508	155	0.00	0.00	0.00	1.
1		0010	6	0.00	0.00	0.00	0.	1		0510	156	0.00	0.00	0.00	1.
1		0012	7	0.00	0.00	0.00	0.	1		0512	157	0.00	0.00	0.00	1.
1		0014	8	0.00	0.00	0.00	0.	1		0514	158	0.00	0.00	0.00	1.
1		0016	9	0.00	0.00	0.00	0.	1		0516	159	0.00	0.00	0.00	1.
1		0018	10	0.00	0.00	0.00	0.	1		0518	160	0.00	0.00	0.00	1.
1		0020	11	0.00	0.00	0.00	0.	1		0520	161	0.00	0.00	0.00	1.
1		0022	12	0.00	0.00	0.00	0.	1		0522	162	0.00	0.00	0.00	1.

1	0024	13	0.00	0.00	0.00	0.	*	1	0524	163	0.00	0.00	0.00	1.
1	0026	14	0.00	0.00	0.00	0.	*	1	0526	164	0.00	0.00	0.00	1.
1	0028	15	0.00	0.00	0.00	0.	*	1	0528	165	0.00	0.00	0.00	1.
1	0030	16	0.00	0.00	0.00	0.	*	1	0530	166	0.00	0.00	0.00	1.
1	0032	17	0.00	0.00	0.00	0.	*	1	0532	167	0.00	0.00	0.00	1.
1	0034	18	0.00	0.00	0.00	0.	*	1	0534	168	0.00	0.00	0.00	1.
1	0036	19	0.00	0.00	0.00	0.	*	1	0536	169	0.00	0.00	0.00	1.
1	0038	20	0.00	0.00	0.00	0.	*	1	0538	170	0.00	0.00	0.00	1.
1	0040	21	0.00	0.00	0.00	0.	*	1	0540	171	0.00	0.00	0.00	1.
1	0042	22	0.00	0.00	0.00	0.	*	1	0542	172	0.00	0.00	0.00	1.
1	0044	23	0.00	0.00	0.00	0.	*	1	0544	173	0.00	0.00	0.00	1.
1	0046	24	0.00	0.00	0.00	0.	*	1	0546	174	0.00	0.00	0.00	1.
1	0048	25	0.00	0.00	0.00	0.	*	1	0548	175	0.00	0.00	0.00	0.
1	0050	26	0.00	0.00	0.00	0.	*	1	0550	176	0.00	0.00	0.00	0.
1	0052	27	0.00	0.00	0.00	0.	*	1	0552	177	0.00	0.00	0.00	0.
1	0054	28	0.00	0.00	0.00	0.	*	1	0554	178	0.00	0.00	0.00	0.
1	0056	29	0.00	0.00	0.00	0.	*	1	0556	179	0.00	0.00	0.00	0.
1	0058	30	0.00	0.00	0.00	0.	*	1	0558	180	0.00	0.00	0.00	0.
1	0100	31	0.00	0.00	0.00	0.	*	1	0600	181	0.00	0.00	0.00	0.
1	0102	32	0.00	0.00	0.00	0.	*	1	0602	182	0.00	0.00	0.00	0.
1	0104	33	0.00	0.00	0.00	0.	*	1	0604	183	0.00	0.00	0.00	0.
1	0106	34	0.00	0.00	0.00	0.	*	1	0606	184	0.00	0.00	0.00	0.
1	0108	35	0.00	0.00	0.00	0.	*	1	0608	185	0.00	0.00	0.00	0.
1	0110	36	0.00	0.00	0.00	0.	*	1	0610	186	0.00	0.00	0.00	0.
1	0112	37	0.00	0.00	0.00	0.	*	1	0612	187	0.00	0.00	0.00	0.
1	0114	38	0.00	0.00	0.00	0.	*	1	0614	188	0.00	0.00	0.00	0.
1	0116	39	0.00	0.00	0.00	0.	*	1	0616	189	0.00	0.00	0.00	0.
1	0118	40	0.00	0.00	0.00	0.	*	1	0618	190	0.00	0.00	0.00	0.
1	0120	41	0.00	0.00	0.00	0.	*	1	0620	191	0.00	0.00	0.00	0.
1	0122	42	0.00	0.00	0.00	0.	*	1	0622	192	0.00	0.00	0.00	0.
1	0124	43	0.00	0.00	0.00	0.	*	1	0624	193	0.00	0.00	0.00	0.
1	0126	44	0.00	0.00	0.00	0.	*	1	0626	194	0.00	0.00	0.00	0.
1	0128	45	0.00	0.00	0.00	0.	*	1	0628	195	0.00	0.00	0.00	0.
1	0130	46	0.00	0.00	0.00	0.	*	1	0630	196	0.00	0.00	0.00	0.
1	0132	47	0.00	0.00	0.00	0.	*	1	0632	197	0.00	0.00	0.00	0.
1	0134	48	0.00	0.00	0.00	0.	*	1	0634	198	0.00	0.00	0.00	0.
1	0136	49	0.00	0.00	0.00	0.	*	1	0636	199	0.00	0.00	0.00	0.
1	0138	50	0.00	0.00	0.00	0.	*	1	0638	200	0.00	0.00	0.00	0.
1	0140	51	0.00	0.00	0.00	0.	*	1	0640	201	0.00	0.00	0.00	0.
1	0142	52	0.00	0.00	0.00	0.	*	1	0642	202	0.00	0.00	0.00	0.
1	0144	53	0.00	0.00	0.00	0.	*	1	0644	203	0.00	0.00	0.00	0.
1	0146	54	0.00	0.00	0.00	0.	*	1	0646	204	0.00	0.00	0.00	0.
1	0148	55	0.00	0.00	0.00	0.	*	1	0648	205	0.00	0.00	0.00	0.
1	0150	56	0.00	0.00	0.00	0.	*	1	0650	206	0.00	0.00	0.00	0.
1	0152	57	0.00	0.00	0.00	0.	*	1	0652	207	0.00	0.00	0.00	0.

1	0154	58	0.00	0.00	0.00	0.	*	1	0654	208	0.00	0.00	0.00	0.
1	0156	59	0.00	0.00	0.00	0.	*	1	0656	209	0.00	0.00	0.00	0.
1	0158	60	0.00	0.00	0.00	0.	*	1	0658	210	0.00	0.00	0.00	0.
1	0200	61	0.00	0.00	0.00	0.	*	1	0700	211	0.00	0.00	0.00	0.
1	0202	62	0.00	0.00	0.00	0.	*	1	0702	212	0.00	0.00	0.00	0.
1	0204	63	0.00	0.00	0.00	0.	*	1	0704	213	0.00	0.00	0.00	0.
1	0206	64	0.00	0.00	0.00	0.	*	1	0706	214	0.00	0.00	0.00	0.
1	0208	65	0.00	0.00	0.00	0.	*	1	0708	215	0.00	0.00	0.00	0.
1	0210	66	0.00	0.00	0.00	0.	*	1	0710	216	0.00	0.00	0.00	0.
1	0212	67	0.00	0.00	0.00	0.	*	1	0712	217	0.00	0.00	0.00	0.
1	0214	68	0.00	0.00	0.00	0.	*	1	0714	218	0.00	0.00	0.00	0.
1	0216	69	0.00	0.00	0.00	0.	*	1	0716	219	0.00	0.00	0.00	0.
1	0218	70	0.00	0.00	0.00	0.	*	1	0718	220	0.00	0.00	0.00	0.
1	0220	71	0.01	0.00	0.00	0.	*	1	0720	221	0.00	0.00	0.00	0.
1	0222	72	0.01	0.00	0.00	1.	*	1	0722	222	0.00	0.00	0.00	0.
1	0224	73	0.01	0.00	0.00	1.	*	1	0724	223	0.00	0.00	0.00	0.
1	0226	74	0.01	0.00	0.00	1.	*	1	0726	224	0.00	0.00	0.00	0.
1	0228	75	0.01	0.00	0.00	1.	*	1	0728	225	0.00	0.00	0.00	0.
1	0230	76	0.01	0.00	0.00	1.	*	1	0730	226	0.00	0.00	0.00	0.
1	0232	77	0.02	0.01	0.01	1.	*	1	0732	227	0.00	0.00	0.00	0.
1	0234	78	0.02	0.01	0.01	1.	*	1	0734	228	0.00	0.00	0.00	0.
1	0236	79	0.02	0.01	0.01	1.	*	1	0736	229	0.00	0.00	0.00	0.
1	0238	80	0.02	0.01	0.01	1.	*	1	0738	230	0.00	0.00	0.00	0.
1	0240	81	0.02	0.01	0.02	2.	*	1	0740	231	0.00	0.00	0.00	0.
1	0242	82	0.02	0.01	0.02	2.	*	1	0742	232	0.00	0.00	0.00	0.
1	0244	83	0.03	0.01	0.02	3.	*	1	0744	233	0.00	0.00	0.00	0.
1	0246	84	0.03	0.01	0.02	3.	*	1	0746	234	0.00	0.00	0.00	0.
1	0248	85	0.04	0.01	0.03	4.	*	1	0748	235	0.00	0.00	0.00	0.
1	0250	86	0.04	0.01	0.03	5.	*	1	0750	236	0.00	0.00	0.00	0.
1	0252	87	0.05	0.01	0.03	6.	*	1	0752	237	0.00	0.00	0.00	0.
1	0254	88	0.06	0.01	0.05	7.	*	1	0754	238	0.00	0.00	0.00	0.
1	0256	89	0.08	0.02	0.07	9.	*	1	0756	239	0.00	0.00	0.00	0.
1	0258	90	0.11	0.02	0.09	13.	*	1	0758	240	0.00	0.00	0.00	0.
1	0300	91	0.20	0.03	0.17	20.	*	1	0800	241	0.00	0.00	0.00	0.
1	0302	92	0.20	0.03	0.17	30.	*	1	0802	242	0.00	0.00	0.00	0.
1	0304	93	0.16	0.02	0.14	37.	*	1	0804	243	0.00	0.00	0.00	0.
1	0306	94	0.10	0.01	0.09	35.	*	1	0806	244	0.00	0.00	0.00	0.
1	0308	95	0.08	0.01	0.07	30.	*	1	0808	245	0.00	0.00	0.00	0.
1	0310	96	0.05	0.00	0.04	24.	*	1	0810	246	0.00	0.00	0.00	0.
1	0312	97	0.04	0.00	0.04	19.	*	1	0812	247	0.00	0.00	0.00	0.
1	0314	98	0.04	0.00	0.04	15.	*	1	0814	248	0.00	0.00	0.00	0.
1	0316	99	0.04	0.00	0.03	13.	*	1	0816	249	0.00	0.00	0.00	0.
1	0318	100	0.03	0.00	0.02	11.	*	1	0818	250	0.00	0.00	0.00	0.
1	0320	101	0.02	0.00	0.02	10.	*	1	0820	251	0.00	0.00	0.00	0.
1	0322	102	0.02	0.00	0.02	9.	*	1	0822	252	0.00	0.00	0.00	0.

1	0324	103	0.02	0.00	0.02	8.	*	1	0824	253	0.00	0.00	0.00	0.
1	0326	104	0.02	0.00	0.02	7.	*	1	0826	254	0.00	0.00	0.00	0.
1	0328	105	0.02	0.00	0.02	7.	*	1	0828	255	0.00	0.00	0.00	0.
1	0330	106	0.02	0.00	0.02	6.	*	1	0830	256	0.00	0.00	0.00	0.
1	0332	107	0.01	0.00	0.01	6.	*	1	0832	257	0.00	0.00	0.00	0.
1	0334	108	0.01	0.00	0.01	5.	*	1	0834	258	0.00	0.00	0.00	0.
1	0336	109	0.01	0.00	0.01	4.	*	1	0836	259	0.00	0.00	0.00	0.
1	0338	110	0.01	0.00	0.01	4.	*	1	0838	260	0.00	0.00	0.00	0.
1	0340	111	0.01	0.00	0.01	3.	*	1	0840	261	0.00	0.00	0.00	0.
1	0342	112	0.01	0.00	0.00	3.	*	1	0842	262	0.00	0.00	0.00	0.
1	0344	113	0.01	0.00	0.00	3.	*	1	0844	263	0.00	0.00	0.00	0.
1	0346	114	0.00	0.00	0.00	2.	*	1	0846	264	0.00	0.00	0.00	0.
1	0348	115	0.00	0.00	0.00	2.	*	1	0848	265	0.00	0.00	0.00	0.
1	0350	116	0.00	0.00	0.00	2.	*	1	0850	266	0.00	0.00	0.00	0.
1	0352	117	0.00	0.00	0.00	2.	*	1	0852	267	0.00	0.00	0.00	0.
1	0354	118	0.00	0.00	0.00	2.	*	1	0854	268	0.00	0.00	0.00	0.
1	0356	119	0.00	0.00	0.00	2.	*	1	0856	269	0.00	0.00	0.00	0.
1	0358	120	0.00	0.00	0.00	2.	*	1	0858	270	0.00	0.00	0.00	0.
1	0400	121	0.00	0.00	0.00	1.	*	1	0900	271	0.00	0.00	0.00	0.
1	0402	122	0.00	0.00	0.00	1.	*	1	0902	272	0.00	0.00	0.00	0.
1	0404	123	0.00	0.00	0.00	1.	*	1	0904	273	0.00	0.00	0.00	0.
1	0406	124	0.00	0.00	0.00	1.	*	1	0906	274	0.00	0.00	0.00	0.
1	0408	125	0.00	0.00	0.00	1.	*	1	0908	275	0.00	0.00	0.00	0.
1	0410	126	0.00	0.00	0.00	1.	*	1	0910	276	0.00	0.00	0.00	0.
1	0412	127	0.00	0.00	0.00	1.	*	1	0912	277	0.00	0.00	0.00	0.
1	0414	128	0.00	0.00	0.00	1.	*	1	0914	278	0.00	0.00	0.00	0.
1	0416	129	0.00	0.00	0.00	1.	*	1	0916	279	0.00	0.00	0.00	0.
1	0418	130	0.00	0.00	0.00	1.	*	1	0918	280	0.00	0.00	0.00	0.
1	0420	131	0.00	0.00	0.00	1.	*	1	0920	281	0.00	0.00	0.00	0.
1	0422	132	0.00	0.00	0.00	1.	*	1	0922	282	0.00	0.00	0.00	0.
1	0424	133	0.00	0.00	0.00	1.	*	1	0924	283	0.00	0.00	0.00	0.
1	0426	134	0.00	0.00	0.00	1.	*	1	0926	284	0.00	0.00	0.00	0.
1	0428	135	0.00	0.00	0.00	1.	*	1	0928	285	0.00	0.00	0.00	0.
1	0430	136	0.00	0.00	0.00	1.	*	1	0930	286	0.00	0.00	0.00	0.
1	0432	137	0.00	0.00	0.00	1.	*	1	0932	287	0.00	0.00	0.00	0.
1	0434	138	0.00	0.00	0.00	1.	*	1	0934	288	0.00	0.00	0.00	0.
1	0436	139	0.00	0.00	0.00	1.	*	1	0936	289	0.00	0.00	0.00	0.
1	0438	140	0.00	0.00	0.00	1.	*	1	0938	290	0.00	0.00	0.00	0.
1	0440	141	0.00	0.00	0.00	1.	*	1	0940	291	0.00	0.00	0.00	0.
1	0442	142	0.00	0.00	0.00	1.	*	1	0942	292	0.00	0.00	0.00	0.
1	0444	143	0.00	0.00	0.00	1.	*	1	0944	293	0.00	0.00	0.00	0.
1	0446	144	0.00	0.00	0.00	1.	*	1	0946	294	0.00	0.00	0.00	0.
1	0448	145	0.00	0.00	0.00	1.	*	1	0948	295	0.00	0.00	0.00	0.
1	0450	146	0.00	0.00	0.00	1.	*	1	0950	296	0.00	0.00	0.00	0.
1	0452	147	0.00	0.00	0.00	1.	*	1	0952	297	0.00	0.00	0.00	0.

```
      1     0454  148    0.00    0.00    0.00        1.      *       1     0954  298    0.00    0.00    0.00        0.
      1     0456  149    0.00    0.00    0.00        1.      *       1     0956  299    0.00    0.00    0.00        0.
      1     0458  150    0.00    0.00    0.00        1.      *       1     0958  300    0.00    0.00    0.00        0.
                                                              *
*****************************************************************************************************************************

   TOTAL RAINFALL =    2.05, TOTAL LOSS =    0.42, TOTAL EXCESS =    1.63

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR      9.97-HR
+   (CFS)       (HR)
                          (CFS)
+     37.       3.07                   2.          1.          1.          1.
                         (INCHES)    1.626       1.631       1.631       1.631
                          (AC-FT)      1.          1.          1.          1.

                         CUMULATIVE AREA =    0.01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 364 KK     *    050050  *        FROM 050062
            *            *
            **************

 365 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           2  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

 366 RK          KINEMATIC WAVE STREAM ROUTING
                           L       1000.  CHANNEL LENGTH
                           S      0.0020  SLOPE
                           N       0.013  CHANNEL ROUGHNESS COEFFICIENT
                          CA        0.00  CONTRIBUTING AREA
                       SHAPE        CIRC  CHANNEL SHAPE
                          WD        2.50  BOTTOM WIDTH OR DIAMETER
                           Z        1.00  SIDE SLOPE
```

NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	3.22	1.25	1.07	333.33	15.56	187.40	1.64	5.53

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5227E+00 EXCESS=0.0000E+00 OUTFLOW=0.5236E+00 BASIN STORAGE=0.4824E-04 PERCENT ERROR= -0.2

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	3.22	1.25	2.00	15.38	188.00	1.64

****

HYDROGRAPH AT STATION 050050

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0230	76	0.	*	1		0500	151	0.	*	1		0730	226	0.
1		0002	2	0.	*	1		0232	77	0.	*	1		0502	152	0.	*	1		0732	227	0.
1		0004	3	0.	*	1		0234	78	0.	*	1		0504	153	0.	*	1		0734	228	0.
1		0006	4	0.	*	1		0236	79	0.	*	1		0506	154	0.	*	1		0736	229	0.
1		0008	5	0.	*	1		0238	80	0.	*	1		0508	155	0.	*	1		0738	230	0.
1		0010	6	0.	*	1		0240	81	0.	*	1		0510	156	0.	*	1		0740	231	0.
1		0012	7	0.	*	1		0242	82	1.	*	1		0512	157	0.	*	1		0742	232	0.
1		0014	8	0.	*	1		0244	83	1.	*	1		0514	158	0.	*	1		0744	233	0.
1		0016	9	0.	*	1		0246	84	1.	*	1		0516	159	0.	*	1		0746	234	0.
1		0018	10	0.	*	1		0248	85	1.	*	1		0518	160	0.	*	1		0748	235	0.
1		0020	11	0.	*	1		0250	86	1.	*	1		0520	161	0.	*	1		0750	236	0.
1		0022	12	0.	*	1		0252	87	2.	*	1		0522	162	0.	*	1		0752	237	0.
1		0024	13	0.	*	1		0254	88	2.	*	1		0524	163	0.	*	1		0754	238	0.
1		0026	14	0.	*	1		0256	89	2.	*	1		0526	164	0.	*	1		0756	239	0.
1		0028	15	0.	*	1		0258	90	3.	*	1		0528	165	0.	*	1		0758	240	0.

1	0030	16	0.	*	1	0300	91	4.	*	1	0530	166	0.	*	1	0800	241	0.
1	0032	17	0.	*	1	0302	92	7.	*	1	0532	167	0.	*	1	0802	242	0.
1	0034	18	0.	*	1	0304	93	11.	*	1	0534	168	0.	*	1	0804	243	0.
1	0036	19	0.	*	1	0306	94	15.	*	1	0536	169	0.	*	1	0806	244	0.
1	0038	20	0.	*	1	0308	95	15.	*	1	0538	170	0.	*	1	0808	245	0.
1	0040	21	0.	*	1	0310	96	14.	*	1	0540	171	0.	*	1	0810	246	0.
1	0042	22	0.	*	1	0312	97	11.	*	1	0542	172	0.	*	1	0812	247	0.
1	0044	23	0.	*	1	0314	98	9.	*	1	0544	173	0.	*	1	0814	248	0.
1	0046	24	0.	*	1	0316	99	7.	*	1	0546	174	0.	*	1	0816	249	0.
1	0048	25	0.	*	1	0318	100	6.	*	1	0548	175	0.	*	1	0818	250	0.
1	0050	26	0.	*	1	0320	101	5.	*	1	0550	176	0.	*	1	0820	251	0.
1	0052	27	0.	*	1	0322	102	5.	*	1	0552	177	0.	*	1	0822	252	0.
1	0054	28	0.	*	1	0324	103	4.	*	1	0554	178	0.	*	1	0824	253	0.
1	0056	29	0.	*	1	0326	104	4.	*	1	0556	179	0.	*	1	0826	254	0.
1	0058	30	0.	*	1	0328	105	3.	*	1	0558	180	0.	*	1	0828	255	0.
1	0100	31	0.	*	1	0330	106	3.	*	1	0600	181	0.	*	1	0830	256	0.
1	0102	32	0.	*	1	0332	107	3.	*	1	0602	182	0.	*	1	0832	257	0.
1	0104	33	0.	*	1	0334	108	3.	*	1	0604	183	0.	*	1	0834	258	0.
1	0106	34	0.	*	1	0336	109	2.	*	1	0606	184	0.	*	1	0836	259	0.
1	0108	35	0.	*	1	0338	110	2.	*	1	0608	185	0.	*	1	0838	260	0.
1	0110	36	0.	*	1	0340	111	2.	*	1	0610	186	0.	*	1	0840	261	0.
1	0112	37	0.	*	1	0342	112	2.	*	1	0612	187	0.	*	1	0842	262	0.
1	0114	38	0.	*	1	0344	113	2.	*	1	0614	188	0.	*	1	0844	263	0.
1	0116	39	0.	*	1	0346	114	1.	*	1	0616	189	0.	*	1	0846	264	0.
1	0118	40	0.	*	1	0348	115	1.	*	1	0618	190	0.	*	1	0848	265	0.
1	0120	41	0.	*	1	0350	116	1.	*	1	0620	191	0.	*	1	0850	266	0.
1	0122	42	0.	*	1	0352	117	1.	*	1	0622	192	0.	*	1	0852	267	0.
1	0124	43	0.	*	1	0354	118	1.	*	1	0624	193	0.	*	1	0854	268	0.
1	0126	44	0.	*	1	0356	119	1.	*	1	0626	194	0.	*	1	0856	269	0.
1	0128	45	0.	*	1	0358	120	1.	*	1	0628	195	0.	*	1	0858	270	0.
1	0130	46	0.	*	1	0400	121	1.	*	1	0630	196	0.	*	1	0900	271	0.
1	0132	47	0.	*	1	0402	122	1.	*	1	0632	197	0.	*	1	0902	272	0.
1	0134	48	0.	*	1	0404	123	1.	*	1	0634	198	0.	*	1	0904	273	0.
1	0136	49	0.	*	1	0406	124	1.	*	1	0636	199	0.	*	1	0906	274	0.
1	0138	50	0.	*	1	0408	125	1.	*	1	0638	200	0.	*	1	0908	275	0.
1	0140	51	0.	*	1	0410	126	1.	*	1	0640	201	0.	*	1	0910	276	0.
1	0142	52	0.	*	1	0412	127	1.	*	1	0642	202	0.	*	1	0912	277	0.
1	0144	53	0.	*	1	0414	128	1.	*	1	0644	203	0.	*	1	0914	278	0.
1	0146	54	0.	*	1	0416	129	1.	*	1	0646	204	0.	*	1	0916	279	0.
1	0148	55	0.	*	1	0418	130	0.	*	1	0648	205	0.	*	1	0918	280	0.
1	0150	56	0.	*	1	0420	131	0.	*	1	0650	206	0.	*	1	0920	281	0.
1	0152	57	0.	*	1	0422	132	0.	*	1	0652	207	0.	*	1	0922	282	0.
1	0154	58	0.	*	1	0424	133	0.	*	1	0654	208	0.	*	1	0924	283	0.
1	0156	59	0.	*	1	0426	134	0.	*	1	0656	209	0.	*	1	0926	284	0.
1	0158	60	0.	*	1	0428	135	0.	*	1	0658	210	0.	*	1	0928	285	0.

```
  1    0200   61        0.   *    1    0430  136        0.   *    1    0700  211        0.   *    1    0930  286        0.
  1    0202   62        0.   *    1    0432  137        0.   *    1    0702  212        0.   *    1    0932  287        0.
  1    0204   63        0.   *    1    0434  138        0.   *    1    0704  213        0.   *    1    0934  288        0.
  1    0206   64        0.   *    1    0436  139        0.   *    1    0706  214        0.   *    1    0936  289        0.
  1    0208   65        0.   *    1    0438  140        0.   *    1    0708  215        0.   *    1    0938  290        0.
  1    0210   66        0.   *    1    0440  141        0.   *    1    0710  216        0.   *    1    0940  291        0.
  1    0212   67        0.   *    1    0442  142        0.   *    1    0712  217        0.   *    1    0942  292        0.
  1    0214   68        0.   *    1    0444  143        0.   *    1    0714  218        0.   *    1    0944  293        0.
  1    0216   69        0.   *    1    0446  144        0.   *    1    0716  219        0.   *    1    0946  294        0.
  1    0218   70        0.   *    1    0448  145        0.   *    1    0718  220        0.   *    1    0948  295        0.
  1    0220   71        0.   *    1    0450  146        0.   *    1    0720  221        0.   *    1    0950  296        0.
  1    0222   72        0.   *    1    0452  147        0.   *    1    0722  222        0.   *    1    0952  297        0.
  1    0224   73        0.   *    1    0454  148        0.   *    1    0724  223        0.   *    1    0954  298        0.
  1    0226   74        0.   *    1    0456  149        0.   *    1    0726  224        0.   *    1    0956  299        0.
  1    0228   75        0.   *    1    0458  150        0.   *    1    0728  225        0.   *    1    0958  300        0.
                         *                                   *                                   *
*****************************************************************************************************************************

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR       9.97-HR
+   (CFS)       (HR)
                              (CFS)
+      15.      3.13                     1.          1.          1.          1.
                           (INCHES)    1.631       1.636       1.636       1.636
                            (AC-FT)      1.          1.          1.          1.

                           CUMULATIVE AREA =    0.01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 367 KK     *    050050  *      COMBINE
            *            *
            **************

 369 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          2  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
```

370 HC HYDROGRAPH COMBINATION
ICOMP 6 NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 050050
SUM OF 6 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	32.	1		0230	76	1.	1		0500	151	44.	1		0730	226	5.
1		0002	2	6.	1		0232	77	2.	1		0502	152	42.	1		0732	227	5.
1		0004	3	0.	1		0234	78	2.	1		0504	153	40.	1		0734	228	5.
1		0006	4	0.	1		0236	79	3.	1		0506	154	38.	1		0736	229	4.
1		0008	5	0.	1		0238	80	3.	1		0508	155	36.	1		0738	230	4.
1		0010	6	0.	1		0240	81	4.	1		0510	156	34.	1		0740	231	4.
1		0012	7	0.	1		0242	82	5.	1		0512	157	33.	1		0742	232	4.
1		0014	8	0.	1		0244	83	6.	1		0514	158	32.	1		0744	233	4.
1		0016	9	0.	1		0246	84	7.	1		0516	159	30.	1		0746	234	4.
1		0018	10	0.	1		0248	85	9.	1		0518	160	29.	1		0748	235	4.
1		0020	11	0.	1		0250	86	11.	1		0520	161	28.	1		0750	236	4.
1		0022	12	0.	1		0252	87	14.	1		0522	162	27.	1		0752	237	3.
1		0024	13	0.	1		0254	88	18.	1		0524	163	26.	1		0754	238	3.
1		0026	14	0.	1		0256	89	23.	1		0526	164	25.	1		0756	239	3.
1		0028	15	0.	1		0258	90	32.	1		0528	165	24.	1		0758	240	3.
1		0030	16	0.	1		0300	91	49.	1		0530	166	23.	1		0800	241	3.
1		0032	17	0.	1		0302	92	73.	1		0532	167	23.	1		0802	242	3.
1		0034	18	0.	1		0304	93	99.	1		0534	168	22.	1		0804	243	3.
1		0036	19	0.	1		0306	94	116.	1		0536	169	22.	1		0806	244	3.
1		0038	20	0.	1		0308	95	137.	1		0538	170	21.	1		0808	245	3.
1		0040	21	0.	1		0310	96	177.	1		0540	171	21.	1		0810	246	3.
1		0042	22	0.	1		0312	97	228.	1		0542	172	20.	1		0812	247	3.
1		0044	23	0.	1		0314	98	253.	1		0544	173	20.	1		0814	248	3.
1		0046	24	0.	1		0316	99	256.	1		0546	174	20.	1		0816	249	3.
1		0048	25	0.	1		0318	100	247.	1		0548	175	19.	1		0818	250	2.
1		0050	26	0.	1		0320	101	232.	1		0550	176	19.	1		0820	251	2.
1		0052	27	0.	1		0322	102	218.	1		0552	177	18.	1		0822	252	2.
1		0054	28	0.	1		0324	103	205.	1		0554	178	18.	1		0824	253	2.
1		0056	29	0.	1		0326	104	194.	1		0556	179	18.	1		0826	254	2.
1		0058	30	0.	1		0328	105	185.	1		0558	180	17.	1		0828	255	2.
1		0100	31	0.	1		0330	106	177.	1		0600	181	17.	1		0830	256	2.

1	0102	32	0.	*	1	0332	107	171.	*	1	0602	182	17.	*	1	0832	257	2.
1	0104	33	0.	*	1	0334	108	165.	*	1	0604	183	16.	*	1	0834	258	2.
1	0106	34	0.	*	1	0336	109	160.	*	1	0606	184	16.	*	1	0836	259	2.
1	0108	35	0.	*	1	0338	110	155.	*	1	0608	185	16.	*	1	0838	260	2.
1	0110	36	0.	*	1	0340	111	151.	*	1	0610	186	15.	*	1	0840	261	2.
1	0112	37	0.	*	1	0342	112	146.	*	1	0612	187	15.	*	1	0842	262	2.
1	0114	38	0.	*	1	0344	113	142.	*	1	0614	188	15.	*	1	0844	263	2.
1	0116	39	0.	*	1	0346	114	138.	*	1	0616	189	15.	*	1	0846	264	2.
1	0118	40	0.	*	1	0348	115	134.	*	1	0618	190	14.	*	1	0848	265	2.
1	0120	41	0.	*	1	0350	116	130.	*	1	0620	191	14.	*	1	0850	266	2.
1	0122	42	0.	*	1	0352	117	126.	*	1	0622	192	14.	*	1	0852	267	2.
1	0124	43	0.	*	1	0354	118	123.	*	1	0624	193	13.	*	1	0854	268	2.
1	0126	44	0.	*	1	0356	119	119.	*	1	0626	194	13.	*	1	0856	269	2.
1	0128	45	0.	*	1	0358	120	117.	*	1	0628	195	13.	*	1	0858	270	1.
1	0130	46	0.	*	1	0400	121	114.	*	1	0630	196	12.	*	1	0900	271	1.
1	0132	47	0.	*	1	0402	122	112.	*	1	0632	197	12.	*	1	0902	272	1.
1	0134	48	0.	*	1	0404	123	109.	*	1	0634	198	12.	*	1	0904	273	1.
1	0136	49	0.	*	1	0406	124	107.	*	1	0636	199	11.	*	1	0906	274	1.
1	0138	50	0.	*	1	0408	125	106.	*	1	0638	200	11.	*	1	0908	275	1.
1	0140	51	0.	*	1	0410	126	104.	*	1	0640	201	11.	*	1	0910	276	1.
1	0142	52	0.	*	1	0412	127	102.	*	1	0642	202	10.	*	1	0912	277	1.
1	0144	53	0.	*	1	0414	128	101.	*	1	0644	203	10.	*	1	0914	278	1.
1	0146	54	0.	*	1	0416	129	99.	*	1	0646	204	10.	*	1	0916	279	1.
1	0148	55	0.	*	1	0418	130	98.	*	1	0648	205	10.	*	1	0918	280	1.
1	0150	56	0.	*	1	0420	131	96.	*	1	0650	206	9.	*	1	0920	281	1.
1	0152	57	0.	*	1	0422	132	95.	*	1	0652	207	9.	*	1	0922	282	1.
1	0154	58	0.	*	1	0424	133	94.	*	1	0654	208	9.	*	1	0924	283	1.
1	0156	59	0.	*	1	0426	134	93.	*	1	0656	209	8.	*	1	0926	284	1.
1	0158	60	0.	*	1	0428	135	92.	*	1	0658	210	8.	*	1	0928	285	1.
1	0200	61	0.	*	1	0430	136	90.	*	1	0700	211	8.	*	1	0930	286	1.
1	0202	62	0.	*	1	0432	137	89.	*	1	0702	212	8.	*	1	0932	287	1.
1	0204	63	0.	*	1	0434	138	88.	*	1	0704	213	7.	*	1	0934	288	1.
1	0206	64	0.	*	1	0436	139	87.	*	1	0706	214	7.	*	1	0936	289	1.
1	0208	65	0.	*	1	0438	140	86.	*	1	0708	215	7.	*	1	0938	290	1.
1	0210	66	0.	*	1	0440	141	84.	*	1	0710	216	7.	*	1	0940	291	1.
1	0212	67	1.	*	1	0442	142	63.	*	1	0712	217	6.	*	1	0942	292	1.
1	0214	68	1.	*	1	0444	143	58.	*	1	0714	218	6.	*	1	0944	293	1.
1	0216	69	1.	*	1	0446	144	57.	*	1	0716	219	6.	*	1	0946	294	1.
1	0218	70	1.	*	1	0448	145	55.	*	1	0718	220	6.	*	1	0948	295	1.
1	0220	71	1.	*	1	0450	146	54.	*	1	0720	221	6.	*	1	0950	296	1.
1	0222	72	1.	*	1	0452	147	53.	*	1	0722	222	5.	*	1	0952	297	1.
1	0224	73	1.	*	1	0454	148	51.	*	1	0724	223	5.	*	1	0954	298	1.
1	0226	74	1.	*	1	0456	149	49.	*	1	0726	224	5.	*	1	0956	299	1.
1	0228	75	1.	*	1	0458	150	46.	*	1	0728	225	5.	*	1	0958	300	1.
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 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR       9.97-HR
+   (CFS)       (HR)
                              (CFS)
+     256.      3.27                 49.         30.         30.          30.
                          (INCHES)  1.053       1.064       1.064        1.064
                           (AC-FT)   24.         25.         25.          25.

                          CUMULATIVE AREA =    0.43 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 380 KK     *     05Det  *       Storage
            *            *
            **************

 381 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           2  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

 382 RS          STORAGE ROUTING
                       NSTPS           1  NUMBER OF SUBREACHES
                        ITYP        STOR  TYPE OF INITIAL CONDITION
                      RSVRIC        0.00  INITIAL CONDITION
                           X        0.00 WORKING R AND D COEFFICIENT

 383 SV            STORAGE         0.0       2.1       5.3       8.5      11.8      15.2      18.6      25.7

 384 SE          ELEVATION       48.65     50.00     51.00     52.00     53.00     54.00     55.00     57.00

 385 SQ          DISCHARGE         0.       20.       40.       60.       80.      100.      120.      140.

 386 SE          ELEVATION       48.65     50.10     50.92     51.60     52.19     52.71     53.19     53.66
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	2.09	2.41	5.01	5.26	7.20	8.49	9.12	10.83	11.79
OUTFLOW	0.00	18.62	20.00	40.00	42.35	60.00	73.56	80.00	100.00	112.08
ELEVATION	48.65	50.00	50.10	50.92	51.00	51.60	52.00	52.19	52.71	53.00

STORAGE	12.43	14.01	15.16	18.60	25.68
OUTFLOW	120.00	140.00	154.47	197.02	282.13
ELEVATION	53.19	53.66	54.00	55.00	57.00

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HYDROGRAPH AT STATION 05Det

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	48.7	*	1		0320	101	47.	5.8	51.2	*	1		0640	201	38.	4.7	50.8
1		0002	2	0.	0.1	48.7	*	1		0322	102	52.	6.3	51.3	*	1		0642	202	37.	4.6	50.8
1		0004	3	1.	0.1	48.7	*	1		0324	103	57.	6.8	51.5	*	1		0644	203	37.	4.6	50.8
1		0006	4	1.	0.1	48.7	*	1		0326	104	61.	7.3	51.6	*	1		0646	204	36.	4.5	50.8
1		0008	5	1.	0.1	48.7	*	1		0328	105	65.	7.7	51.8	*	1		0648	205	36.	4.4	50.7
1		0010	6	0.	0.1	48.7	*	1		0330	106	69.	8.1	51.9	*	1		0650	206	35.	4.4	50.7
1		0012	7	0.	0.1	48.7	*	1		0332	107	73.	8.4	52.0	*	1		0652	207	34.	4.3	50.7
1		0014	8	0.	0.1	48.7	*	1		0334	108	76.	8.7	52.1	*	1		0654	208	34.	4.2	50.7
1		0016	9	0.	0.1	48.7	*	1		0336	109	79.	9.0	52.1	*	1		0656	209	33.	4.1	50.6
1		0018	10	0.	0.1	48.7	*	1		0338	110	81.	9.2	52.2	*	1		0658	210	33.	4.1	50.6
1		0020	11	0.	0.0	48.7	*	1		0340	111	84.	9.5	52.3	*	1		0700	211	32.	4.0	50.6
1		0022	12	0.	0.0	48.7	*	1		0342	112	86.	9.7	52.4	*	1		0702	212	32.	3.9	50.6
1		0024	13	0.	0.0	48.7	*	1		0344	113	89.	9.9	52.4	*	1		0704	213	31.	3.9	50.6
1		0026	14	0.	0.0	48.7	*	1		0346	114	91.	10.0	52.5	*	1		0706	214	31.	3.8	50.5
1		0028	15	0.	0.0	48.7	*	1		0348	115	92.	10.2	52.5	*	1		0708	215	30.	3.8	50.5
1		0030	16	0.	0.0	48.7	*	1		0350	116	94.	10.3	52.5	*	1		0710	216	30.	3.7	50.5
1		0032	17	0.	0.0	48.7	*	1		0352	117	95.	10.4	52.6	*	1		0712	217	29.	3.6	50.5
1		0034	18	0.	0.0	48.7	*	1		0354	118	96.	10.5	52.6	*	1		0714	218	29.	3.6	50.5
1		0036	19	0.	0.0	48.7	*	1		0356	119	97.	10.6	52.6	*	1		0716	219	28.	3.5	50.4
1		0038	20	0.	0.0	48.7	*	1		0358	120	98.	10.7	52.7	*	1		0718	220	28.	3.4	50.4
1		0040	21	0.	0.0	48.7	*	1		0400	121	99.	10.7	52.7	*	1		0720	221	28.	3.4	50.4
1		0042	22	0.	0.0	48.7	*	1		0402	122	99.	10.8	52.7	*	1		0722	222	27.	3.3	50.4
1		0044	23	0.	0.0	48.7	*	1		0404	123	100.	10.8	52.7	*	1		0724	223	27.	3.3	50.4
1		0046	24	0.	0.0	48.7	*	1		0406	124	100.	10.9	52.7	*	1		0726	224	26.	3.2	50.4
1		0048	25	0.	0.0	48.7	*	1		0408	125	101.	10.9	52.7	*	1		0728	225	26.	3.2	50.3

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

1	0050	26	0.	0.0	48.7	*	1	0410	126	101.	10.9	52.7	*	1	0730	226	25.	3.1	50.3
1	0052	27	0.	0.0	48.7	*	1	0412	127	101.	10.9	52.7	*	1	0732	227	25.	3.0	50.3
1	0054	28	0.	0.0	48.7	*	1	0414	128	101.	10.9	52.7	*	1	0734	228	24.	3.0	50.3
1	0056	29	0.	0.0	48.7	*	1	0416	129	101.	10.9	52.7	*	1	0736	229	24.	2.9	50.3
1	0058	30	0.	0.0	48.7	*	1	0418	130	101.	10.9	52.7	*	1	0738	230	24.	2.9	50.2
1	0100	31	0.	0.0	48.7	*	1	0420	131	101.	10.9	52.7	*	1	0740	231	23.	2.8	50.2
1	0102	32	0.	0.0	48.7	*	1	0422	132	101.	10.9	52.7	*	1	0742	232	23.	2.8	50.2
1	0104	33	0.	0.0	48.7	*	1	0424	133	101.	10.9	52.7	*	1	0744	233	22.	2.7	50.2
1	0106	34	0.	0.0	48.7	*	1	0426	134	101.	10.9	52.7	*	1	0746	234	22.	2.7	50.2
1	0108	35	0.	0.0	48.7	*	1	0428	135	101.	10.9	52.7	*	1	0748	235	22.	2.6	50.2
1	0110	36	0.	0.0	48.7	*	1	0430	136	100.	10.9	52.7	*	1	0750	236	21.	2.6	50.2
1	0112	37	0.	0.0	48.7	*	1	0432	137	100.	10.8	52.7	*	1	0752	237	21.	2.5	50.1
1	0114	38	0.	0.0	48.7	*	1	0434	138	100.	10.8	52.7	*	1	0754	238	21.	2.5	50.1
1	0116	39	0.	0.0	48.7	*	1	0436	139	100.	10.8	52.7	*	1	0756	239	20.	2.4	50.1
1	0118	40	0.	0.0	48.7	*	1	0438	140	99.	10.8	52.7	*	1	0758	240	20.	2.4	50.1
1	0120	41	0.	0.0	48.7	*	1	0440	141	99.	10.7	52.7	*	1	0800	241	20.	2.3	50.1
1	0122	42	0.	0.0	48.7	*	1	0442	142	98.	10.7	52.7	*	1	0802	242	20.	2.3	50.1
1	0124	43	0.	0.0	48.7	*	1	0444	143	97.	10.6	52.6	*	1	0804	243	19.	2.3	50.1
1	0126	44	0.	0.0	48.7	*	1	0446	144	96.	10.5	52.6	*	1	0806	244	19.	2.2	50.0
1	0128	45	0.	0.0	48.7	*	1	0448	145	95.	10.4	52.6	*	1	0808	245	19.	2.2	50.0
1	0130	46	0.	0.0	48.7	*	1	0450	146	93.	10.3	52.5	*	1	0810	246	19.	2.1	50.0
1	0132	47	0.	0.0	48.7	*	1	0452	147	92.	10.2	52.5	*	1	0812	247	19.	2.1	50.0
1	0134	48	0.	0.0	48.7	*	1	0454	148	91.	10.1	52.5	*	1	0814	248	18.	2.0	50.0
1	0136	49	0.	0.0	48.7	*	1	0456	149	90.	10.0	52.4	*	1	0816	249	18.	2.0	49.9
1	0138	50	0.	0.0	48.7	*	1	0458	150	88.	9.8	52.4	*	1	0818	250	17.	2.0	49.9
1	0140	51	0.	0.0	48.7	*	1	0500	151	87.	9.7	52.4	*	1	0820	251	17.	1.9	49.9
1	0142	52	0.	0.0	48.7	*	1	0502	152	86.	9.6	52.3	*	1	0822	252	17.	1.9	49.9
1	0144	53	0.	0.0	48.7	*	1	0504	153	84.	9.5	52.3	*	1	0824	253	16.	1.8	49.8
1	0146	54	0.	0.0	48.7	*	1	0506	154	83.	9.4	52.3	*	1	0826	254	16.	1.8	49.8
1	0148	55	0.	0.0	48.7	*	1	0508	155	82.	9.3	52.2	*	1	0828	255	16.	1.8	49.8
1	0150	56	0.	0.0	48.7	*	1	0510	156	80.	9.1	52.2	*	1	0830	256	15.	1.7	49.8
1	0152	57	0.	0.0	48.7	*	1	0512	157	79.	9.0	52.2	*	1	0832	257	15.	1.7	49.7
1	0154	58	0.	0.0	48.7	*	1	0514	158	78.	8.9	52.1	*	1	0834	258	15.	1.7	49.7
1	0156	59	0.	0.0	48.7	*	1	0516	159	76.	8.8	52.1	*	1	0836	259	14.	1.6	49.7
1	0158	60	0.	0.0	48.7	*	1	0518	160	75.	8.6	52.0	*	1	0838	260	14.	1.6	49.7
1	0200	61	0.	0.0	48.7	*	1	0520	161	74.	8.5	52.0	*	1	0840	261	14.	1.5	49.7
1	0202	62	0.	0.0	48.7	*	1	0522	162	73.	8.4	52.0	*	1	0842	262	14.	1.5	49.6
1	0204	63	0.	0.0	48.7	*	1	0524	163	71.	8.3	51.9	*	1	0844	263	13.	1.5	49.6
1	0206	64	0.	0.0	48.7	*	1	0526	164	70.	8.2	51.9	*	1	0846	264	13.	1.5	49.6
1	0208	65	0.	0.0	48.7	*	1	0528	165	69.	8.0	51.9	*	1	0848	265	13.	1.4	49.6
1	0210	66	0.	0.0	48.7	*	1	0530	166	68.	7.9	51.8	*	1	0850	266	12.	1.4	49.6
1	0212	67	0.	0.0	48.7	*	1	0532	167	66.	7.8	51.8	*	1	0852	267	12.	1.4	49.5
1	0214	68	0.	0.0	48.7	*	1	0534	168	65.	7.7	51.8	*	1	0854	268	12.	1.3	49.5
1	0216	69	0.	0.0	48.7	*	1	0536	169	64.	7.6	51.7	*	1	0856	269	12.	1.3	49.5
1	0218	70	0.	0.0	48.7	*	1	0538	170	63.	7.5	51.7	*	1	0858	270	11.	1.3	49.5

1	0220	71	0.	0.0	48.7	*	1	0540	171	62.	7.4	51.6	*	1	0900	271	11.	1.3	49.5
1	0222	72	0.	0.0	48.7	*	1	0542	172	60.	7.2	51.6	*	1	0902	272	11.	1.2	49.4
1	0224	73	0.	0.0	48.7	*	1	0544	173	59.	7.1	51.6	*	1	0904	273	11.	1.2	49.4
1	0226	74	0.	0.0	48.7	*	1	0546	174	58.	7.0	51.5	*	1	0906	274	10.	1.2	49.4
1	0228	75	0.	0.0	48.7	*	1	0548	175	58.	6.9	51.5	*	1	0908	275	10.	1.2	49.4
1	0230	76	0.	0.0	48.7	*	1	0550	176	57.	6.8	51.5	*	1	0910	276	10.	1.1	49.4
1	0232	77	0.	0.0	48.7	*	1	0552	177	56.	6.7	51.5	*	1	0912	277	10.	1.1	49.4
1	0234	78	0.	0.1	48.7	*	1	0554	178	55.	6.6	51.4	*	1	0914	278	10.	1.1	49.3
1	0236	79	1.	0.1	48.7	*	1	0556	179	54.	6.5	51.4	*	1	0916	279	9.	1.1	49.3
1	0238	80	1.	0.1	48.7	*	1	0558	180	53.	6.4	51.4	*	1	0918	280	9.	1.0	49.3
1	0240	81	1.	0.1	48.7	*	1	0600	181	52.	6.3	51.3	*	1	0920	281	9.	1.0	49.3
1	0242	82	1.	0.1	48.7	*	1	0602	182	51.	6.2	51.3	*	1	0922	282	9.	1.0	49.3
1	0244	83	1.	0.1	48.7	*	1	0604	183	50.	6.2	51.3	*	1	0924	283	9.	1.0	49.3
1	0246	84	1.	0.1	48.7	*	1	0606	184	50.	6.1	51.2	*	1	0926	284	8.	1.0	49.3
1	0248	85	1.	0.1	48.7	*	1	0608	185	49.	6.0	51.2	*	1	0928	285	8.	0.9	49.3
1	0250	86	2.	0.2	48.8	*	1	0610	186	48.	5.9	51.2	*	1	0930	286	8.	0.9	49.2
1	0252	87	2.	0.2	48.8	*	1	0612	187	47.	5.8	51.2	*	1	0932	287	8.	0.9	49.2
1	0254	88	2.	0.3	48.8	*	1	0614	188	47.	5.7	51.1	*	1	0934	288	8.	0.9	49.2
1	0256	89	3.	0.3	48.9	*	1	0616	189	46.	5.6	51.1	*	1	0936	289	8.	0.9	49.2
1	0258	90	4.	0.4	48.9	*	1	0618	190	45.	5.5	51.1	*	1	0938	290	7.	0.8	49.2
1	0300	91	5.	0.5	49.0	*	1	0620	191	44.	5.5	51.1	*	1	0940	291	7.	0.8	49.2
1	0302	92	7.	0.7	49.1	*	1	0622	192	44.	5.4	51.0	*	1	0942	292	7.	0.8	49.2
1	0304	93	9.	1.0	49.3	*	1	0624	193	43.	5.3	51.0	*	1	0944	293	7.	0.8	49.2
1	0306	94	12.	1.4	49.5	*	1	0626	194	42.	5.2	51.0	*	1	0946	294	7.	0.8	49.1
1	0308	95	16.	1.8	49.8	*	1	0628	195	41.	5.2	51.0	*	1	0948	295	7.	0.8	49.1
1	0310	96	20.	2.3	50.1	*	1	0630	196	41.	5.1	50.9	*	1	0950	296	7.	0.7	49.1
1	0312	97	24.	3.0	50.3	*	1	0632	197	40.	5.0	50.9	*	1	0952	297	6.	0.7	49.1
1	0314	98	30.	3.7	50.5	*	1	0634	198	39.	4.9	50.9	*	1	0954	298	6.	0.7	49.1
1	0316	99	35.	4.4	50.7	*	1	0636	199	39.	4.9	50.9	*	1	0956	299	6.	0.7	49.1
1	0318	100	41.	5.1	51.0	*	1	0638	200	38.	4.8	50.8	*	1	0958	300	6.	0.7	49.1
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 101.	4.30		52.	32.	32.	32.
		(INCHES)	1.037	1.068	1.068	1.068
		(AC-FT)	26.	26.	26.	26.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	9.97-HR
+ (AC-FT)	(HR)				
11.	4.27	6.	4.	4.	4.

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	9.97-HR
+ (FEET)	(HR)				
52.74	4.30	51.17	50.23	50.23	50.23

CUMULATIVE AREA = 0.46 SQ MI

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            **************
            *            *
398 KK      *    050610  *          COMBINE
            *            *
            **************

400 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

401 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 050610
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	1.	1		0500	151	91.	1		0730	226	26.
1		0002	2	0.	1		0232	77	1.	1		0502	152	90.	1		0732	227	26.
1		0004	3	1.	1		0234	78	1.	1		0504	153	88.	1		0734	228	25.
1		0006	4	1.	1		0236	79	2.	1		0506	154	87.	1		0736	229	25.
1		0008	5	1.	1		0238	80	2.	1		0508	155	86.	1		0738	230	24.
1		0010	6	0.	1		0240	81	2.	1		0510	156	84.	1		0740	231	24.

1	0012	7	0.	*	1	0242	82	3.	*	1	0512	157	83.	*	1	0742	232	23.
1	0014	8	0.	*	1	0244	83	3.	*	1	0514	158	81.	*	1	0744	233	23.
1	0016	9	0.	*	1	0246	84	4.	*	1	0516	159	80.	*	1	0746	234	23.
1	0018	10	0.	*	1	0248	85	5.	*	1	0518	160	79.	*	1	0748	235	22.
1	0020	11	0.	*	1	0250	86	6.	*	1	0520	161	77.	*	1	0750	236	22.
1	0022	12	0.	*	1	0252	87	8.	*	1	0522	162	76.	*	1	0752	237	21.
1	0024	13	0.	*	1	0254	88	11.	*	1	0524	163	75.	*	1	0754	238	21.
1	0026	14	0.	*	1	0256	89	14.	*	1	0526	164	73.	*	1	0756	239	21.
1	0028	15	0.	*	1	0258	90	19.	*	1	0528	165	72.	*	1	0758	240	20.
1	0030	16	0.	*	1	0300	91	27.	*	1	0530	166	71.	*	1	0800	241	20.
1	0032	17	0.	*	1	0302	92	41.	*	1	0532	167	69.	*	1	0802	242	20.
1	0034	18	0.	*	1	0304	93	63.	*	1	0534	168	68.	*	1	0804	243	20.
1	0036	19	0.	*	1	0306	94	92.	*	1	0536	169	67.	*	1	0806	244	20.
1	0038	20	0.	*	1	0308	95	115.	*	1	0538	170	66.	*	1	0808	245	19.
1	0040	21	0.	*	1	0310	96	119.	*	1	0540	171	65.	*	1	0810	246	19.
1	0042	22	0.	*	1	0312	97	113.	*	1	0542	172	63.	*	1	0812	247	19.
1	0044	23	0.	*	1	0314	98	107.	*	1	0544	173	62.	*	1	0814	248	18.
1	0046	24	0.	*	1	0316	99	102.	*	1	0546	174	61.	*	1	0816	249	18.
1	0048	25	0.	*	1	0318	100	99.	*	1	0548	175	60.	*	1	0818	250	18.
1	0050	26	0.	*	1	0320	101	98.	*	1	0550	176	59.	*	1	0820	251	17.
1	0052	27	0.	*	1	0322	102	98.	*	1	0552	177	58.	*	1	0822	252	17.
1	0054	28	0.	*	1	0324	103	99.	*	1	0554	178	58.	*	1	0824	253	17.
1	0056	29	0.	*	1	0326	104	101.	*	1	0556	179	57.	*	1	0826	254	16.
1	0058	30	0.	*	1	0328	105	103.	*	1	0558	180	56.	*	1	0828	255	16.
1	0100	31	0.	*	1	0330	106	105.	*	1	0600	181	55.	*	1	0830	256	16.
1	0102	32	0.	*	1	0332	107	107.	*	1	0602	182	54.	*	1	0832	257	15.
1	0104	33	0.	*	1	0334	108	109.	*	1	0604	183	53.	*	1	0834	258	15.
1	0106	34	0.	*	1	0336	109	110.	*	1	0606	184	52.	*	1	0836	259	15.
1	0108	35	0.	*	1	0338	110	111.	*	1	0608	185	51.	*	1	0838	260	14.
1	0110	36	0.	*	1	0340	111	112.	*	1	0610	186	50.	*	1	0840	261	14.
1	0112	37	0.	*	1	0342	112	112.	*	1	0612	187	50.	*	1	0842	262	14.
1	0114	38	0.	*	1	0344	113	112.	*	1	0614	188	49.	*	1	0844	263	13.
1	0116	39	0.	*	1	0346	114	112.	*	1	0616	189	48.	*	1	0846	264	13.
1	0118	40	0.	*	1	0348	115	112.	*	1	0618	190	47.	*	1	0848	265	13.
1	0120	41	0.	*	1	0350	116	112.	*	1	0620	191	46.	*	1	0850	266	13.
1	0122	42	0.	*	1	0352	117	112.	*	1	0622	192	46.	*	1	0852	267	12.
1	0124	43	0.	*	1	0354	118	112.	*	1	0624	193	45.	*	1	0854	268	12.
1	0126	44	0.	*	1	0356	119	112.	*	1	0626	194	44.	*	1	0856	269	12.
1	0128	45	0.	*	1	0358	120	112.	*	1	0628	195	43.	*	1	0858	270	12.
1	0130	46	0.	*	1	0400	121	112.	*	1	0630	196	43.	*	1	0900	271	11.
1	0132	47	0.	*	1	0402	122	111.	*	1	0632	197	42.	*	1	0902	272	11.
1	0134	48	0.	*	1	0404	123	111.	*	1	0634	198	41.	*	1	0904	273	11.
1	0136	49	0.	*	1	0406	124	111.	*	1	0636	199	40.	*	1	0906	274	11.
1	0138	50	0.	*	1	0408	125	111.	*	1	0638	200	40.	*	1	0908	275	10.
1	0140	51	0.	*	1	0410	126	111.	*	1	0640	201	39.	*	1	0910	276	10.

1	0142	52	0.	*	1	0412	127	110.	*	1	0642	202	39.	*	1	0912	277	10.
1	0144	53	0.	*	1	0414	128	110.	*	1	0644	203	38.	*	1	0914	278	10.
1	0146	54	0.	*	1	0416	129	110.	*	1	0646	204	37.	*	1	0916	279	10.
1	0148	55	0.	*	1	0418	130	109.	*	1	0648	205	37.	*	1	0918	280	9.
1	0150	56	0.	*	1	0420	131	109.	*	1	0650	206	36.	*	1	0920	281	9.
1	0152	57	0.	*	1	0422	132	109.	*	1	0652	207	36.	*	1	0922	282	9.
1	0154	58	0.	*	1	0424	133	108.	*	1	0654	208	35.	*	1	0924	283	9.
1	0156	59	0.	*	1	0426	134	108.	*	1	0656	209	35.	*	1	0926	284	9.
1	0158	60	0.	*	1	0428	135	107.	*	1	0658	210	34.	*	1	0928	285	8.
1	0200	61	0.	*	1	0430	136	107.	*	1	0700	211	33.	*	1	0930	286	8.
1	0202	62	0.	*	1	0432	137	106.	*	1	0702	212	33.	*	1	0932	287	8.
1	0204	63	0.	*	1	0434	138	106.	*	1	0704	213	32.	*	1	0934	288	8.
1	0206	64	0.	*	1	0436	139	105.	*	1	0706	214	32.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	105.	*	1	0708	215	31.	*	1	0938	290	8.
1	0210	66	0.	*	1	0440	141	104.	*	1	0710	216	31.	*	1	0940	291	7.
1	0212	67	0.	*	1	0442	142	103.	*	1	0712	217	30.	*	1	0942	292	7.
1	0214	68	0.	*	1	0444	143	102.	*	1	0714	218	30.	*	1	0944	293	7.
1	0216	69	0.	*	1	0446	144	101.	*	1	0716	219	29.	*	1	0946	294	7.
1	0218	70	0.	*	1	0448	145	99.	*	1	0718	220	29.	*	1	0948	295	7.
1	0220	71	1.	*	1	0450	146	98.	*	1	0720	221	28.	*	1	0950	296	7.
1	0222	72	1.	*	1	0452	147	97.	*	1	0722	222	28.	*	1	0952	297	7.
1	0224	73	1.	*	1	0454	148	96.	*	1	0724	223	27.	*	1	0954	298	6.
1	0226	74	1.	*	1	0456	149	94.	*	1	0726	224	27.	*	1	0956	299	6.
1	0228	75	1.	*	1	0458	150	93.	*	1	0728	225	26.	*	1	0958	300	6.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 119.	3.17		61.	38.	38.	38.
		(INCHES)	1.039	1.073	1.073	1.073
		(AC-FT)	30.	31.	31.	31.

CUMULATIVE AREA = 0.54 SQ MI

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* *

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

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411 KK      *    050620  *      COMBINE
            *            *
            **************

413 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

414 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 050620
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0230	76	2.	*	1		0500	151	97.	*	1		0730	226	27.
1		0002	2	0.	*	1		0232	77	2.	*	1		0502	152	96.	*	1		0732	227	27.
1		0004	3	0.	*	1		0234	78	2.	*	1		0504	153	94.	*	1		0734	228	26.
1		0006	4	1.	*	1		0236	79	3.	*	1		0506	154	93.	*	1		0736	229	26.
1		0008	5	1.	*	1		0238	80	3.	*	1		0508	155	91.	*	1		0738	230	25.
1		0010	6	1.	*	1		0240	81	3.	*	1		0510	156	90.	*	1		0740	231	25.
1		0012	7	0.	*	1		0242	82	4.	*	1		0512	157	88.	*	1		0742	232	24.
1		0014	8	0.	*	1		0244	83	5.	*	1		0514	158	87.	*	1		0744	233	24.
1		0016	9	0.	*	1		0246	84	7.	*	1		0516	159	85.	*	1		0746	234	24.
1		0018	10	0.	*	1		0248	85	8.	*	1		0518	160	84.	*	1		0748	235	23.
1		0020	11	0.	*	1		0250	86	11.	*	1		0520	161	82.	*	1		0750	236	23.
1		0022	12	0.	*	1		0252	87	14.	*	1		0522	162	81.	*	1		0752	237	22.
1		0024	13	0.	*	1		0254	88	18.	*	1		0524	163	80.	*	1		0754	238	22.
1		0026	14	0.	*	1		0256	89	24.	*	1		0526	164	78.	*	1		0756	239	22.
1		0028	15	0.	*	1		0258	90	32.	*	1		0528	165	77.	*	1		0758	240	21.
1		0030	16	0.	*	1		0300	91	47.	*	1		0530	166	75.	*	1		0800	241	21.
1		0032	17	0.	*	1		0302	92	70.	*	1		0532	167	74.	*	1		0802	242	21.
1		0034	18	0.	*	1		0304	93	109.	*	1		0534	168	73.	*	1		0804	243	20.
1		0036	19	0.	*	1		0306	94	159.	*	1		0536	169	71.	*	1		0806	244	20.
1		0038	20	0.	*	1		0308	95	206.	*	1		0538	170	70.	*	1		0808	245	20.
1		0040	21	0.	*	1		0310	96	227.	*	1		0540	171	69.	*	1		0810	246	20.
1		0042	22	0.	*	1		0312	97	223.	*	1		0542	172	68.	*	1		0812	247	20.

1	0044	23	0.	*	1	0314	98	207.	*	1	0544	173	67.	*	1	0814	248	19.
1	0046	24	0.	*	1	0316	99	189.	*	1	0546	174	65.	*	1	0816	249	19.
1	0048	25	0.	*	1	0318	100	174.	*	1	0548	175	64.	*	1	0818	250	18.
1	0050	26	0.	*	1	0320	101	164.	*	1	0550	176	63.	*	1	0820	251	18.
1	0052	27	0.	*	1	0322	102	157.	*	1	0552	177	62.	*	1	0822	252	18.
1	0054	28	0.	*	1	0324	103	153.	*	1	0554	178	61.	*	1	0824	253	17.
1	0056	29	0.	*	1	0326	104	150.	*	1	0556	179	60.	*	1	0826	254	17.
1	0058	30	0.	*	1	0328	105	148.	*	1	0558	180	59.	*	1	0828	255	17.
1	0100	31	0.	*	1	0330	106	148.	*	1	0600	181	59.	*	1	0830	256	16.
1	0102	32	0.	*	1	0332	107	148.	*	1	0602	182	58.	*	1	0832	257	16.
1	0104	33	0.	*	1	0334	108	148.	*	1	0604	183	57.	*	1	0834	258	16.
1	0106	34	0.	*	1	0336	109	148.	*	1	0606	184	56.	*	1	0836	259	15.
1	0108	35	0.	*	1	0338	110	147.	*	1	0608	185	55.	*	1	0838	260	15.
1	0110	36	0.	*	1	0340	111	146.	*	1	0610	186	54.	*	1	0840	261	15.
1	0112	37	0.	*	1	0342	112	144.	*	1	0612	187	53.	*	1	0842	262	14.
1	0114	38	0.	*	1	0344	113	142.	*	1	0614	188	52.	*	1	0844	263	14.
1	0116	39	0.	*	1	0346	114	140.	*	1	0616	189	51.	*	1	0846	264	14.
1	0118	40	0.	*	1	0348	115	138.	*	1	0618	190	50.	*	1	0848	265	13.
1	0120	41	0.	*	1	0350	116	136.	*	1	0620	191	50.	*	1	0850	266	13.
1	0122	42	0.	*	1	0352	117	134.	*	1	0622	192	49.	*	1	0852	267	13.
1	0124	43	0.	*	1	0354	118	133.	*	1	0624	193	48.	*	1	0854	268	13.
1	0126	44	0.	*	1	0356	119	131.	*	1	0626	194	47.	*	1	0856	269	12.
1	0128	45	0.	*	1	0358	120	130.	*	1	0628	195	46.	*	1	0858	270	12.
1	0130	46	0.	*	1	0400	121	129.	*	1	0630	196	45.	*	1	0900	271	12.
1	0132	47	0.	*	1	0402	122	128.	*	1	0632	197	44.	*	1	0902	272	12.
1	0134	48	0.	*	1	0404	123	126.	*	1	0634	198	44.	*	1	0904	273	11.
1	0136	49	0.	*	1	0406	124	125.	*	1	0636	199	43.	*	1	0906	274	11.
1	0138	50	0.	*	1	0408	125	124.	*	1	0638	200	42.	*	1	0908	275	11.
1	0140	51	0.	*	1	0410	126	124.	*	1	0640	201	42.	*	1	0910	276	11.
1	0142	52	0.	*	1	0412	127	123.	*	1	0642	202	41.	*	1	0912	277	10.
1	0144	53	0.	*	1	0414	128	122.	*	1	0644	203	40.	*	1	0914	278	10.
1	0146	54	0.	*	1	0416	129	121.	*	1	0646	204	40.	*	1	0916	279	10.
1	0148	55	0.	*	1	0418	130	120.	*	1	0648	205	39.	*	1	0918	280	10.
1	0150	56	0.	*	1	0420	131	119.	*	1	0650	206	38.	*	1	0920	281	10.
1	0152	57	0.	*	1	0422	132	119.	*	1	0652	207	38.	*	1	0922	282	9.
1	0154	58	0.	*	1	0424	133	118.	*	1	0654	208	37.	*	1	0924	283	9.
1	0156	59	0.	*	1	0426	134	117.	*	1	0656	209	36.	*	1	0926	284	9.
1	0158	60	0.	*	1	0428	135	116.	*	1	0658	210	36.	*	1	0928	285	9.
1	0200	61	0.	*	1	0430	136	115.	*	1	0700	211	35.	*	1	0930	286	9.
1	0202	62	0.	*	1	0432	137	115.	*	1	0702	212	35.	*	1	0932	287	8.
1	0204	63	0.	*	1	0434	138	114.	*	1	0704	213	34.	*	1	0934	288	8.
1	0206	64	0.	*	1	0436	139	113.	*	1	0706	214	33.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	112.	*	1	0708	215	33.	*	1	0938	290	8.
1	0210	66	0.	*	1	0440	141	112.	*	1	0710	216	32.	*	1	0940	291	8.
1	0212	67	0.	*	1	0442	142	111.	*	1	0712	217	32.	*	1	0942	292	8.

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    1     0214   68        0.   *    1     0444  143      109.   *    1     0714  218       31.   *    1     0944  293        7.
    1     0216   69        1.   *    1     0446  144      108.   *    1     0716  219       31.   *    1     0946  294        7.
    1     0218   70        1.   *    1     0448  145      106.   *    1     0718  220       30.   *    1     0948  295        7.
    1     0220   71        1.   *    1     0450  146      105.   *    1     0720  221       30.   *    1     0950  296        7.
    1     0222   72        1.   *    1     0452  147      103.   *    1     0722  222       29.   *    1     0952  297        7.
    1     0224   73        1.   *    1     0454  148      102.   *    1     0724  223       29.   *    1     0954  298        7.
    1     0226   74        1.   *    1     0456  149      101.   *    1     0726  224       28.   *    1     0956  299        7.
    1     0228   75        1.   *    1     0458  150       99.   *    1     0728  225       28.   *    1     0958  300        6.
                                  *                                *                                *
 ************************************************************************************************************************************

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR       9.97-HR
+   (CFS)        (HR)
                            (CFS)
+     227.       3.17                 72.          45.          45.          45.
                          (INCHES)  1.045        1.076        1.076        1.076
                           (AC-FT)    36.          37.          37.          37.

                          CUMULATIVE AREA =    0.64 SQ MI


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  424 KK    *    050630  *      COMBINE
            *            *
            **************

  426 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           1  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

  427 HC          HYDROGRAPH COMBINATION
                        ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

 ************************************************************************************************************************************
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HYDROGRAPH AT STATION 050630
SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	2.	1		0500	151	102.	1		0730	226	28.
1		0002	2	0.	1		0232	77	3.	1		0502	152	100.	1		0732	227	28.
1		0004	3	0.	1		0234	78	3.	1		0504	153	99.	1		0734	228	27.
1		0006	4	0.	1		0236	79	4.	1		0506	154	97.	1		0736	229	27.
1		0008	5	0.	1		0238	80	4.	1		0508	155	96.	1		0738	230	26.
1		0010	6	0.	1		0240	81	5.	1		0510	156	94.	1		0740	231	26.
1		0012	7	1.	1		0242	82	6.	1		0512	157	92.	1		0742	232	25.
1		0014	8	1.	1		0244	83	7.	1		0514	158	91.	1		0744	233	25.
1		0016	9	1.	1		0246	84	9.	1		0516	159	89.	1		0746	234	24.
1		0018	10	0.	1		0248	85	12.	1		0518	160	88.	1		0748	235	24.
1		0020	11	0.	1		0250	86	15.	1		0520	161	86.	1		0750	236	23.
1		0022	12	0.	1		0252	87	20.	1		0522	162	85.	1		0752	237	23.
1		0024	13	0.	1		0254	88	25.	1		0524	163	84.	1		0754	238	23.
1		0026	14	0.	1		0256	89	34.	1		0526	164	82.	1		0756	239	22.
1		0028	15	0.	1		0258	90	45.	1		0528	165	81.	1		0758	240	22.
1		0030	16	0.	1		0300	91	63.	1		0530	166	79.	1		0800	241	21.
1		0032	17	0.	1		0302	92	96.	1		0532	167	78.	1		0802	242	21.
1		0034	18	0.	1		0304	93	152.	1		0534	168	76.	1		0804	243	21.
1		0036	19	0.	1		0306	94	226.	1		0536	169	75.	1		0806	244	21.
1		0038	20	0.	1		0308	95	292.	1		0538	170	74.	1		0808	245	20.
1		0040	21	0.	1		0310	96	323.	1		0540	171	72.	1		0810	246	20.
1		0042	22	0.	1		0312	97	321.	1		0542	172	71.	1		0812	247	20.
1		0044	23	0.	1		0314	98	297.	1		0544	173	70.	1		0814	248	20.
1		0046	24	0.	1		0316	99	268.	1		0546	174	69.	1		0816	249	19.
1		0048	25	0.	1		0318	100	242.	1		0548	175	68.	1		0818	250	19.
1		0050	26	0.	1		0320	101	221.	1		0550	176	67.	1		0820	251	19.
1		0052	27	0.	1		0322	102	206.	1		0552	177	66.	1		0822	252	18.
1		0054	28	0.	1		0324	103	195.	1		0554	178	65.	1		0824	253	18.
1		0056	29	0.	1		0326	104	188.	1		0556	179	64.	1		0826	254	18.
1		0058	30	0.	1		0328	105	182.	1		0558	180	63.	1		0828	255	17.
1		0100	31	0.	1		0330	106	178.	1		0600	181	62.	1		0830	256	17.
1		0102	32	0.	1		0332	107	176.	1		0602	182	61.	1		0832	257	17.
1		0104	33	0.	1		0334	108	174.	1		0604	183	60.	1		0834	258	16.
1		0106	34	0.	1		0336	109	173.	1		0606	184	59.	1		0836	259	16.
1		0108	35	0.	1		0338	110	170.	1		0608	185	58.	1		0838	260	15.
1		0110	36	0.	1		0340	111	168.	1		0610	186	57.	1		0840	261	15.
1		0112	37	0.	1		0342	112	165.	1		0612	187	56.	1		0842	262	15.
1		0114	38	0.	1		0344	113	161.	1		0614	188	55.	1		0844	263	15.

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

1	0116	39	0.	*	1	0346	114	158.	*	1	0616	189	54.	*	1	0846	264	14.
1	0118	40	0.	*	1	0348	115	154.	*	1	0618	190	53.	*	1	0848	265	14.
1	0120	41	0.	*	1	0350	116	151.	*	1	0620	191	52.	*	1	0850	266	14.
1	0122	42	0.	*	1	0352	117	148.	*	1	0622	192	51.	*	1	0852	267	13.
1	0124	43	0.	*	1	0354	118	145.	*	1	0624	193	50.	*	1	0854	268	13.
1	0126	44	0.	*	1	0356	119	143.	*	1	0626	194	49.	*	1	0856	269	13.
1	0128	45	0.	*	1	0358	120	141.	*	1	0628	195	48.	*	1	0858	270	13.
1	0130	46	0.	*	1	0400	121	139.	*	1	0630	196	48.	*	1	0900	271	12.
1	0132	47	0.	*	1	0402	122	137.	*	1	0632	197	47.	*	1	0902	272	12.
1	0134	48	0.	*	1	0404	123	135.	*	1	0634	198	46.	*	1	0904	273	12.
1	0136	49	0.	*	1	0406	124	134.	*	1	0636	199	45.	*	1	0906	274	12.
1	0138	50	0.	*	1	0408	125	133.	*	1	0638	200	44.	*	1	0908	275	11.
1	0140	51	0.	*	1	0410	126	131.	*	1	0640	201	43.	*	1	0910	276	11.
1	0142	52	0.	*	1	0412	127	130.	*	1	0642	202	43.	*	1	0912	277	11.
1	0144	53	0.	*	1	0414	128	129.	*	1	0644	203	42.	*	1	0914	278	11.
1	0146	54	0.	*	1	0416	129	128.	*	1	0646	204	41.	*	1	0916	279	10.
1	0148	55	0.	*	1	0418	130	127.	*	1	0648	205	41.	*	1	0918	280	10.
1	0150	56	0.	*	1	0420	131	126.	*	1	0650	206	40.	*	1	0920	281	10.
1	0152	57	0.	*	1	0422	132	125.	*	1	0652	207	39.	*	1	0922	282	10.
1	0154	58	0.	*	1	0424	133	124.	*	1	0654	208	38.	*	1	0924	283	10.
1	0156	59	0.	*	1	0426	134	123.	*	1	0656	209	38.	*	1	0926	284	9.
1	0158	60	0.	*	1	0428	135	122.	*	1	0658	210	37.	*	1	0928	285	9.
1	0200	61	0.	*	1	0430	136	121.	*	1	0700	211	36.	*	1	0930	286	9.
1	0202	62	0.	*	1	0432	137	120.	*	1	0702	212	36.	*	1	0932	287	9.
1	0204	63	0.	*	1	0434	138	119.	*	1	0704	213	35.	*	1	0934	288	9.
1	0206	64	0.	*	1	0436	139	118.	*	1	0706	214	35.	*	1	0936	289	8.
1	0208	65	0.	*	1	0438	140	117.	*	1	0708	215	34.	*	1	0938	290	8.
1	0210	66	1.	*	1	0440	141	116.	*	1	0710	216	33.	*	1	0940	291	8.
1	0212	67	1.	*	1	0442	142	116.	*	1	0712	217	33.	*	1	0942	292	8.
1	0214	68	1.	*	1	0444	143	114.	*	1	0714	218	32.	*	1	0944	293	8.
1	0216	69	1.	*	1	0446	144	113.	*	1	0716	219	32.	*	1	0946	294	8.
1	0218	70	1.	*	1	0448	145	111.	*	1	0718	220	31.	*	1	0948	295	7.
1	0220	71	1.	*	1	0450	146	110.	*	1	0720	221	31.	*	1	0950	296	7.
1	0222	72	1.	*	1	0452	147	108.	*	1	0722	222	30.	*	1	0952	297	7.
1	0224	73	2.	*	1	0454	148	107.	*	1	0724	223	30.	*	1	0954	298	7.
1	0226	74	2.	*	1	0456	149	105.	*	1	0726	224	29.	*	1	0956	299	7.
1	0228	75	2.	*	1	0458	150	104.	*	1	0728	225	29.	*	1	0958	300	7.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)	(CFS)			
+ 323.	3.17	81.	50.	50.	50.

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

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                    (INCHES)      1.073       1.104       1.104       1.104
                     (AC-FT)       40.         42.         42.         42.

                    CUMULATIVE AREA =    0.70 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
437 KK    *    050660  *      COMBINE
          *            *
          **************

439 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

440 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

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*****************************************************************************************************************************

                                    HYDROGRAPH AT STATION   050660
                                         SUM OF  2 HYDROGRAPHS

*****************************************************************************************************************************
                                 *                                 *                                 *
   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW
                                 *                                 *                                 *
    1     0000   1        0.     *    1     0230   76        2.     *    1     0500  151      106.     *    1     0730  226       29.
    1     0002   2        0.     *    1     0232   77        3.     *    1     0502  152      104.     *    1     0732  227       29.
    1     0004   3        0.     *    1     0234   78        3.     *    1     0504  153      103.     *    1     0734  228       28.
    1     0006   4        0.     *    1     0236   79        3.     *    1     0506  154      101.     *    1     0736  229       28.
    1     0008   5        0.     *    1     0238   80        4.     *    1     0508  155       99.     *    1     0738  230       27.
    1     0010   6        0.     *    1     0240   81        5.     *    1     0510  156       98.     *    1     0740  231       27.
    1     0012   7        0.     *    1     0242   82        6.     *    1     0512  157       96.     *    1     0742  232       26.
    1     0014   8        0.     *    1     0244   83        7.     *    1     0514  158       95.     *    1     0744  233       26.
    1     0016   9        0.     *    1     0246   84        9.     *    1     0516  159       93.     *    1     0746  234       25.
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1	0018	10	0.	*	1	0248	85	11.	*	1	0518	160	91.	*	1	0748	235	25.
1	0020	11	0.	*	1	0250	86	14.	*	1	0520	161	90.	*	1	0750	236	24.
1	0022	12	1.	*	1	0252	87	18.	*	1	0522	162	88.	*	1	0752	237	24.
1	0024	13	0.	*	1	0254	88	23.	*	1	0524	163	87.	*	1	0754	238	23.
1	0026	14	0.	*	1	0256	89	31.	*	1	0526	164	86.	*	1	0756	239	23.
1	0028	15	0.	*	1	0258	90	42.	*	1	0528	165	84.	*	1	0758	240	23.
1	0030	16	0.	*	1	0300	91	58.	*	1	0530	166	83.	*	1	0800	241	22.
1	0032	17	0.	*	1	0302	92	86.	*	1	0532	167	81.	*	1	0802	242	22.
1	0034	18	0.	*	1	0304	93	133.	*	1	0534	168	80.	*	1	0804	243	22.
1	0036	19	0.	*	1	0306	94	210.	*	1	0536	169	78.	*	1	0806	244	21.
1	0038	20	0.	*	1	0308	95	298.	*	1	0538	170	77.	*	1	0808	245	21.
1	0040	21	0.	*	1	0310	96	369.	*	1	0540	171	76.	*	1	0810	246	21.
1	0042	22	0.	*	1	0312	97	394.	*	1	0542	172	74.	*	1	0812	247	21.
1	0044	23	0.	*	1	0314	98	382.	*	1	0544	173	73.	*	1	0814	248	20.
1	0046	24	0.	*	1	0316	99	352.	*	1	0546	174	72.	*	1	0816	249	20.
1	0048	25	0.	*	1	0318	100	316.	*	1	0548	175	71.	*	1	0818	250	20.
1	0050	26	0.	*	1	0320	101	284.	*	1	0550	176	69.	*	1	0820	251	19.
1	0052	27	0.	*	1	0322	102	259.	*	1	0552	177	68.	*	1	0822	252	19.
1	0054	28	0.	*	1	0324	103	239.	*	1	0554	178	67.	*	1	0824	253	19.
1	0056	29	0.	*	1	0326	104	224.	*	1	0556	179	66.	*	1	0826	254	18.
1	0058	30	0.	*	1	0328	105	213.	*	1	0558	180	65.	*	1	0828	255	18.
1	0100	31	0.	*	1	0330	106	205.	*	1	0600	181	64.	*	1	0830	256	18.
1	0102	32	0.	*	1	0332	107	199.	*	1	0602	182	63.	*	1	0832	257	17.
1	0104	33	0.	*	1	0334	108	195.	*	1	0604	183	62.	*	1	0834	258	17.
1	0106	34	0.	*	1	0336	109	191.	*	1	0606	184	61.	*	1	0836	259	17.
1	0108	35	0.	*	1	0338	110	188.	*	1	0608	185	60.	*	1	0838	260	16.
1	0110	36	0.	*	1	0340	111	184.	*	1	0610	186	59.	*	1	0840	261	16.
1	0112	37	0.	*	1	0342	112	180.	*	1	0612	187	58.	*	1	0842	262	16.
1	0114	38	0.	*	1	0344	113	176.	*	1	0614	188	57.	*	1	0844	263	15.
1	0116	39	0.	*	1	0346	114	172.	*	1	0616	189	56.	*	1	0846	264	15.
1	0118	40	0.	*	1	0348	115	167.	*	1	0618	190	55.	*	1	0848	265	15.
1	0120	41	0.	*	1	0350	116	163.	*	1	0620	191	54.	*	1	0850	266	14.
1	0122	42	0.	*	1	0352	117	159.	*	1	0622	192	54.	*	1	0852	267	14.
1	0124	43	0.	*	1	0354	118	156.	*	1	0624	193	53.	*	1	0854	268	14.
1	0126	44	0.	*	1	0356	119	152.	*	1	0626	194	52.	*	1	0856	269	13.
1	0128	45	0.	*	1	0358	120	150.	*	1	0628	195	51.	*	1	0858	270	13.
1	0130	46	0.	*	1	0400	121	147.	*	1	0630	196	50.	*	1	0900	271	13.
1	0132	47	0.	*	1	0402	122	145.	*	1	0632	197	49.	*	1	0902	272	13.
1	0134	48	0.	*	1	0404	123	142.	*	1	0634	198	48.	*	1	0904	273	12.
1	0136	49	0.	*	1	0406	124	140.	*	1	0636	199	47.	*	1	0906	274	12.
1	0138	50	0.	*	1	0408	125	139.	*	1	0638	200	46.	*	1	0908	275	12.
1	0140	51	0.	*	1	0410	126	137.	*	1	0640	201	45.	*	1	0910	276	12.
1	0142	52	0.	*	1	0412	127	135.	*	1	0642	202	44.	*	1	0912	277	11.
1	0144	53	0.	*	1	0414	128	134.	*	1	0644	203	44.	*	1	0914	278	11.
1	0146	54	0.	*	1	0416	129	133.	*	1	0646	204	43.	*	1	0916	279	11.

1	0148	55	0.	*	1	0418	130	131.	*	1	0648	205	42.	*	1	0918	280	11.
1	0150	56	0.	*	1	0420	131	130.	*	1	0650	206	41.	*	1	0920	281	10.
1	0152	57	0.	*	1	0422	132	129.	*	1	0652	207	41.	*	1	0922	282	10.
1	0154	58	0.	*	1	0424	133	128.	*	1	0654	208	40.	*	1	0924	283	10.
1	0156	59	0.	*	1	0426	134	127.	*	1	0656	209	39.	*	1	0926	284	10.
1	0158	60	0.	*	1	0428	135	126.	*	1	0658	210	39.	*	1	0928	285	10.
1	0200	61	0.	*	1	0430	136	125.	*	1	0700	211	38.	*	1	0930	286	9.
1	0202	62	0.	*	1	0432	137	124.	*	1	0702	212	37.	*	1	0932	287	9.
1	0204	63	0.	*	1	0434	138	123.	*	1	0704	213	37.	*	1	0934	288	9.
1	0206	64	0.	*	1	0436	139	122.	*	1	0706	214	36.	*	1	0936	289	9.
1	0208	65	0.	*	1	0438	140	121.	*	1	0708	215	35.	*	1	0938	290	9.
1	0210	66	0.	*	1	0440	141	120.	*	1	0710	216	35.	*	1	0940	291	9.
1	0212	67	0.	*	1	0442	142	119.	*	1	0712	217	34.	*	1	0942	292	8.
1	0214	68	1.	*	1	0444	143	118.	*	1	0714	218	34.	*	1	0944	293	8.
1	0216	69	1.	*	1	0446	144	117.	*	1	0716	219	33.	*	1	0946	294	8.
1	0218	70	1.	*	1	0448	145	115.	*	1	0718	220	32.	*	1	0948	295	8.
1	0220	71	1.	*	1	0450	146	114.	*	1	0720	221	32.	*	1	0950	296	8.
1	0222	72	1.	*	1	0452	147	112.	*	1	0722	222	31.	*	1	0952	297	8.
1	0224	73	1.	*	1	0454	148	111.	*	1	0724	223	31.	*	1	0954	298	7.
1	0226	74	1.	*	1	0456	149	109.	*	1	0726	224	30.	*	1	0956	299	7.
1	0228	75	2.	*	1	0458	150	108.	*	1	0728	225	30.	*	1	0958	300	7.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 394.	3.20		88.	54.	54.	54.
		(INCHES)	1.101	1.132	1.132	1.132
		(AC-FT)	43.	45.	45.	45.

CUMULATIVE AREA = 0.74 SQ MI

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            **************
            *            *
  449 KK    *    050131  *        COMBINE
            *            *
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Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

```
451 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

452 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 050131
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0230	76	2.	*	1		0500	151	109.	*	1		0730	226	30.
1		0002	2	0.	*	1		0232	77	2.	*	1		0502	152	107.	*	1		0732	227	29.
1		0004	3	0.	*	1		0234	78	3.	*	1		0504	153	105.	*	1		0734	228	29.
1		0006	4	0.	*	1		0236	79	4.	*	1		0506	154	104.	*	1		0736	229	28.
1		0008	5	0.	*	1		0238	80	4.	*	1		0508	155	102.	*	1		0738	230	28.
1		0010	6	0.	*	1		0240	81	5.	*	1		0510	156	100.	*	1		0740	231	27.
1		0012	7	0.	*	1		0242	82	6.	*	1		0512	157	99.	*	1		0742	232	27.
1		0014	8	0.	*	1		0244	83	7.	*	1		0514	158	97.	*	1		0744	233	26.
1		0016	9	0.	*	1		0246	84	9.	*	1		0516	159	96.	*	1		0746	234	26.
1		0018	10	0.	*	1		0248	85	11.	*	1		0518	160	94.	*	1		0748	235	25.
1		0020	11	0.	*	1		0250	86	14.	*	1		0520	161	92.	*	1		0750	236	25.
1		0022	12	0.	*	1		0252	87	18.	*	1		0522	162	91.	*	1		0752	237	25.
1		0024	13	0.	*	1		0254	88	24.	*	1		0524	163	89.	*	1		0754	238	24.
1		0026	14	0.	*	1		0256	89	31.	*	1		0526	164	88.	*	1		0756	239	24.
1		0028	15	0.	*	1		0258	90	42.	*	1		0528	165	86.	*	1		0758	240	23.
1		0030	16	0.	*	1		0300	91	59.	*	1		0530	166	85.	*	1		0800	241	23.
1		0032	17	0.	*	1		0302	92	87.	*	1		0532	167	84.	*	1		0802	242	22.
1		0034	18	0.	*	1		0304	93	132.	*	1		0534	168	82.	*	1		0804	243	22.
1		0036	19	0.	*	1		0306	94	198.	*	1		0536	169	81.	*	1		0806	244	22.
1		0038	20	0.	*	1		0308	95	287.	*	1		0538	170	79.	*	1		0808	245	21.
1		0040	21	0.	*	1		0310	96	369.	*	1		0540	171	78.	*	1		0810	246	21.
1		0042	22	0.	*	1		0312	97	421.	*	1		0542	172	77.	*	1		0812	247	21.
1		0044	23	0.	*	1		0314	98	426.	*	1		0544	173	75.	*	1		0814	248	21.
1		0046	24	0.	*	1		0316	99	405.	*	1		0546	174	74.	*	1		0816	249	20.
1		0048	25	0.	*	1		0318	100	368.	*	1		0548	175	73.	*	1		0818	250	20.

1	0050	26	0.	*	1	0320	101	331.	*	1	0550	176	71.	*	1	0820	251	20.
1	0052	27	0.	*	1	0322	102	298.	*	1	0552	177	70.	*	1	0822	252	20.
1	0054	28	0.	*	1	0324	103	272.	*	1	0554	178	69.	*	1	0824	253	19.
1	0056	29	0.	*	1	0326	104	252.	*	1	0556	179	68.	*	1	0826	254	19.
1	0058	30	0.	*	1	0328	105	237.	*	1	0558	180	67.	*	1	0828	255	18.
1	0100	31	0.	*	1	0330	106	225.	*	1	0600	181	66.	*	1	0830	256	18.
1	0102	32	0.	*	1	0332	107	216.	*	1	0602	182	65.	*	1	0832	257	18.
1	0104	33	0.	*	1	0334	108	209.	*	1	0604	183	64.	*	1	0834	258	17.
1	0106	34	0.	*	1	0336	109	204.	*	1	0606	184	63.	*	1	0836	259	17.
1	0108	35	0.	*	1	0338	110	200.	*	1	0608	185	62.	*	1	0838	260	17.
1	0110	36	0.	*	1	0340	111	195.	*	1	0610	186	61.	*	1	0840	261	16.
1	0112	37	0.	*	1	0342	112	191.	*	1	0612	187	60.	*	1	0842	262	16.
1	0114	38	0.	*	1	0344	113	186.	*	1	0614	188	59.	*	1	0844	263	16.
1	0116	39	0.	*	1	0346	114	181.	*	1	0616	189	58.	*	1	0846	264	15.
1	0118	40	0.	*	1	0348	115	176.	*	1	0618	190	57.	*	1	0848	265	15.
1	0120	41	0.	*	1	0350	116	172.	*	1	0620	191	56.	*	1	0850	266	15.
1	0122	42	0.	*	1	0352	117	167.	*	1	0622	192	55.	*	1	0852	267	14.
1	0124	43	0.	*	1	0354	118	163.	*	1	0624	193	54.	*	1	0854	268	14.
1	0126	44	0.	*	1	0356	119	159.	*	1	0626	194	53.	*	1	0856	269	14.
1	0128	45	0.	*	1	0358	120	156.	*	1	0628	195	52.	*	1	0858	270	14.
1	0130	46	0.	*	1	0400	121	152.	*	1	0630	196	51.	*	1	0900	271	13.
1	0132	47	0.	*	1	0402	122	150.	*	1	0632	197	50.	*	1	0902	272	13.
1	0134	48	0.	*	1	0404	123	147.	*	1	0634	198	49.	*	1	0904	273	13.
1	0136	49	0.	*	1	0406	124	145.	*	1	0636	199	48.	*	1	0906	274	12.
1	0138	50	0.	*	1	0408	125	143.	*	1	0638	200	47.	*	1	0908	275	12.
1	0140	51	0.	*	1	0410	126	141.	*	1	0640	201	47.	*	1	0910	276	12.
1	0142	52	0.	*	1	0412	127	139.	*	1	0642	202	46.	*	1	0912	277	12.
1	0144	53	0.	*	1	0414	128	137.	*	1	0644	203	45.	*	1	0914	278	11.
1	0146	54	0.	*	1	0416	129	136.	*	1	0646	204	44.	*	1	0916	279	11.
1	0148	55	0.	*	1	0418	130	135.	*	1	0648	205	43.	*	1	0918	280	11.
1	0150	56	0.	*	1	0420	131	133.	*	1	0650	206	43.	*	1	0920	281	11.
1	0152	57	0.	*	1	0422	132	132.	*	1	0652	207	42.	*	1	0922	282	11.
1	0154	58	0.	*	1	0424	133	131.	*	1	0654	208	41.	*	1	0924	283	10.
1	0156	59	0.	*	1	0426	134	130.	*	1	0656	209	40.	*	1	0926	284	10.
1	0158	60	0.	*	1	0428	135	128.	*	1	0658	210	40.	*	1	0928	285	10.
1	0200	61	0.	*	1	0430	136	127.	*	1	0700	211	39.	*	1	0930	286	10.
1	0202	62	0.	*	1	0432	137	126.	*	1	0702	212	38.	*	1	0932	287	10.
1	0204	63	0.	*	1	0434	138	125.	*	1	0704	213	38.	*	1	0934	288	9.
1	0206	64	0.	*	1	0436	139	124.	*	1	0706	214	37.	*	1	0936	289	9.
1	0208	65	0.	*	1	0438	140	123.	*	1	0708	215	36.	*	1	0938	290	9.
1	0210	66	0.	*	1	0440	141	122.	*	1	0710	216	36.	*	1	0940	291	9.
1	0212	67	0.	*	1	0442	142	121.	*	1	0712	217	35.	*	1	0942	292	9.
1	0214	68	1.	*	1	0444	143	120.	*	1	0714	218	34.	*	1	0944	293	8.
1	0216	69	1.	*	1	0446	144	119.	*	1	0716	219	34.	*	1	0946	294	8.
1	0218	70	1.	*	1	0448	145	118.	*	1	0718	220	33.	*	1	0948	295	8.

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   1     0220   71        1.   *    1     0450  146      117.   *    1     0720  221       33.   *    1     0950  296        8.
   1     0222   72        1.   *    1     0452  147      115.   *    1     0722  222       32.   *    1     0952  297        8.
   1     0224   73        1.   *    1     0454  148      113.   *    1     0724  223       31.   *    1     0954  298        8.
   1     0226   74        1.   *    1     0456  149      112.   *    1     0726  224       31.   *    1     0956  299        7.
   1     0228   75        2.   *    1     0458  150      110.   *    1     0728  225       30.   *    1     0958  300        7.
                                *                                  *                                 *
*****************************************************************************************************************************

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR      9.97-HR
+   (CFS)       (HR)
                            (CFS)
+     426.      3.23                 92.         57.         57.         57.
                          (INCHES)  1.116       1.146       1.146       1.146
                           (AC-FT)   45.         47.         47.         47.

                          CUMULATIVE AREA =    0.76 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 463 KK     *    051410  *         COMBINE
            *            *
            **************

 465 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

 466 HC          HYDROGRAPH COMBINATION
                       ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

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                                    HYDROGRAPH AT STATION   051410
                                         SUM OF  2 HYDROGRAPHS
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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0230	76	3.	1		0500	151	114.	1		0730	226	31.
1		0002	2	0.	1		0232	77	4.	1		0502	152	112.	1		0732	227	30.
1		0004	3	0.	1		0234	78	4.	1		0504	153	111.	1		0734	228	30.
1		0006	4	0.	1		0236	79	5.	1		0506	154	109.	1		0736	229	29.
1		0008	5	0.	1		0238	80	6.	1		0508	155	107.	1		0738	230	29.
1		0010	6	0.	1		0240	81	7.	1		0510	156	106.	1		0740	231	28.
1		0012	7	0.	1		0242	82	9.	1		0512	157	104.	1		0742	232	28.
1		0014	8	0.	1		0244	83	11.	1		0514	158	102.	1		0744	233	27.
1		0016	9	0.	1		0246	84	13.	1		0516	159	100.	1		0746	234	27.
1		0018	10	0.	1		0248	85	16.	1		0518	160	99.	1		0748	235	26.
1		0020	11	0.	1		0250	86	21.	1		0520	161	97.	1		0750	236	26.
1		0022	12	0.	1		0252	87	27.	1		0522	162	95.	1		0752	237	25.
1		0024	13	0.	1		0254	88	35.	1		0524	163	94.	1		0754	238	25.
1		0026	14	0.	1		0256	89	47.	1		0526	164	92.	1		0756	239	24.
1		0028	15	0.	1		0258	90	63.	1		0528	165	91.	1		0758	240	24.
1		0030	16	0.	1		0300	91	88.	1		0530	166	89.	1		0800	241	24.
1		0032	17	0.	1		0302	92	132.	1		0532	167	88.	1		0802	242	23.
1		0034	18	0.	1		0304	93	208.	1		0534	168	86.	1		0804	243	23.
1		0036	19	0.	1		0306	94	306.	1		0536	169	85.	1		0806	244	22.
1		0038	20	0.	1		0308	95	408.	1		0538	170	83.	1		0808	245	22.
1		0040	21	0.	1		0310	96	490.	1		0540	171	82.	1		0810	246	22.
1		0042	22	0.	1		0312	97	540.	1		0542	172	81.	1		0812	247	21.
1		0044	23	0.	1		0314	98	549.	1		0544	173	79.	1		0814	248	21.
1		0046	24	0.	1		0316	99	523.	1		0546	174	78.	1		0816	249	21.
1		0048	25	0.	1		0318	100	480.	1		0548	175	77.	1		0818	250	21.
1		0050	26	0.	1		0320	101	432.	1		0550	176	75.	1		0820	251	20.
1		0052	27	0.	1		0322	102	387.	1		0552	177	74.	1		0822	252	20.
1		0054	28	0.	1		0324	103	349.	1		0554	178	73.	1		0824	253	20.
1		0056	29	0.	1		0326	104	318.	1		0556	179	72.	1		0826	254	19.
1		0058	30	0.	1		0328	105	294.	1		0558	180	71.	1		0828	255	19.
1		0100	31	0.	1		0330	106	276.	1		0600	181	70.	1		0830	256	19.
1		0102	32	0.	1		0332	107	261.	1		0602	182	68.	1		0832	257	18.
1		0104	33	0.	1		0334	108	250.	1		0604	183	67.	1		0834	258	18.
1		0106	34	0.	1		0336	109	240.	1		0606	184	66.	1		0836	259	18.
1		0108	35	0.	1		0338	110	232.	1		0608	185	65.	1		0838	260	17.
1		0110	36	0.	1		0340	111	225.	1		0610	186	64.	1		0840	261	17.
1		0112	37	0.	1		0342	112	218.	1		0612	187	63.	1		0842	262	17.
1		0114	38	0.	1		0344	113	211.	1		0614	188	62.	1		0844	263	16.
1		0116	39	0.	1		0346	114	205.	1		0616	189	61.	1		0846	264	16.
1		0118	40	0.	1		0348	115	198.	1		0618	190	60.	1		0848	265	16.
1		0120	41	0.	1		0350	116	191.	1		0620	191	59.	1		0850	266	15.

Osborn Outfall 50% Submittal
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1	0122	42	0.	*	1	0352	117	185.	*	1	0622	192	58.	*	1	0852	267	15.
1	0124	43	0.	*	1	0354	118	180.	*	1	0624	193	57.	*	1	0854	268	15.
1	0126	44	0.	*	1	0356	119	174.	*	1	0626	194	56.	*	1	0856	269	14.
1	0128	45	0.	*	1	0358	120	170.	*	1	0628	195	55.	*	1	0858	270	14.
1	0130	46	0.	*	1	0400	121	166.	*	1	0630	196	54.	*	1	0900	271	14.
1	0132	47	0.	*	1	0402	122	162.	*	1	0632	197	53.	*	1	0902	272	13.
1	0134	48	0.	*	1	0404	123	159.	*	1	0634	198	52.	*	1	0904	273	13.
1	0136	49	0.	*	1	0406	124	156.	*	1	0636	199	51.	*	1	0906	274	13.
1	0138	50	0.	*	1	0408	125	153.	*	1	0638	200	50.	*	1	0908	275	13.
1	0140	51	0.	*	1	0410	126	150.	*	1	0640	201	49.	*	1	0910	276	12.
1	0142	52	0.	*	1	0412	127	148.	*	1	0642	202	48.	*	1	0912	277	12.
1	0144	53	0.	*	1	0414	128	146.	*	1	0644	203	47.	*	1	0914	278	12.
1	0146	54	0.	*	1	0416	129	144.	*	1	0646	204	46.	*	1	0916	279	12.
1	0148	55	0.	*	1	0418	130	142.	*	1	0648	205	45.	*	1	0918	280	11.
1	0150	56	0.	*	1	0420	131	141.	*	1	0650	206	44.	*	1	0920	281	11.
1	0152	57	0.	*	1	0422	132	139.	*	1	0652	207	44.	*	1	0922	282	11.
1	0154	58	0.	*	1	0424	133	138.	*	1	0654	208	43.	*	1	0924	283	11.
1	0156	59	0.	*	1	0426	134	136.	*	1	0656	209	42.	*	1	0926	284	10.
1	0158	60	0.	*	1	0428	135	135.	*	1	0658	210	41.	*	1	0928	285	10.
1	0200	61	0.	*	1	0430	136	134.	*	1	0700	211	40.	*	1	0930	286	10.
1	0202	62	0.	*	1	0432	137	133.	*	1	0702	212	40.	*	1	0932	287	10.
1	0204	63	0.	*	1	0434	138	131.	*	1	0704	213	39.	*	1	0934	288	10.
1	0206	64	0.	*	1	0436	139	130.	*	1	0706	214	38.	*	1	0936	289	9.
1	0208	65	0.	*	1	0438	140	129.	*	1	0708	215	38.	*	1	0938	290	9.
1	0210	66	1.	*	1	0440	141	128.	*	1	0710	216	37.	*	1	0940	291	9.
1	0212	67	1.	*	1	0442	142	127.	*	1	0712	217	36.	*	1	0942	292	9.
1	0214	68	1.	*	1	0444	143	126.	*	1	0714	218	36.	*	1	0944	293	9.
1	0216	69	1.	*	1	0446	144	125.	*	1	0716	219	35.	*	1	0946	294	9.
1	0218	70	1.	*	1	0448	145	124.	*	1	0718	220	34.	*	1	0948	295	8.
1	0220	71	1.	*	1	0450	146	122.	*	1	0720	221	34.	*	1	0950	296	8.
1	0222	72	1.	*	1	0452	147	121.	*	1	0722	222	33.	*	1	0952	297	8.
1	0224	73	2.	*	1	0454	148	119.	*	1	0724	223	33.	*	1	0954	298	8.
1	0226	74	2.	*	1	0456	149	117.	*	1	0726	224	32.	*	1	0956	299	8.
1	0228	75	3.	*	1	0458	150	116.	*	1	0728	225	31.	*	1	0958	300	8.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
+ (CFS)	(HR)					
		(CFS)				
+ 549.	3.23		105.	65.	65.	65.
		(INCHES)	1.164	1.194	1.194	1.194
		(AC-FT)	52.	53.	53.	53.

Osborn Outfall 50% Submittal
File: Preadl2.dat
Outflow Under Inlet Control

CUMULATIVE AREA = 0.83 SQ MI

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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	070808	12.	3.43	2.	1.	1.	0.02		
+	DIVERSION TO	808OUT	0.	3.43	0.	0.	0.	0.02		
+	HYDROGRAPH AT	808PP	12.	3.43	2.	1.	1.	0.02		
+	ROUTED TO	070610	12.	3.43	2.	1.	1.	0.02		
+	HYDROGRAPH AT	070610	5.	3.43	1.	0.	0.	0.01		
+	DIVERSION TO	610OUT	0.	3.40	0.	0.	0.	0.01		
+	HYDROGRAPH AT	610PP	5.	3.40	1.	0.	0.	0.01		
+	2 COMBINED AT	070610	17.	3.43	3.	2.	2.	0.02		
+	ROUTED TO	070508	17.	3.43	3.	2.	2.	0.02		
+	HYDROGRAPH AT	070508	4.	3.50	1.	0.	0.	0.01		
+	DIVERSION TO	508OUT	0.	3.50	0.	0.	0.	0.01		
	HYDROGRAPH AT									

+	508PP	4.	3.50	1.	0.	0.	0.01
2 COMBINED AT							
+	070508	21.	3.47	3.	2.	2.	0.03
ROUTED TO							
+	070010	21.	3.47	3.	2.	2.	0.03
HYDROGRAPH AT							
+	070010	7.	3.43	1.	1.	1.	0.01
DIVERSION TO							
+	010OUT	0.	3.43	0.	0.	0.	0.01
HYDROGRAPH AT							
+	010PP	6.	3.43	1.	1.	1.	0.01
2 COMBINED AT							
+	070010	27.	3.47	4.	3.	3.	0.04
ROUTED TO							
+	070210	27.	3.47	4.	3.	3.	0.04
HYDROGRAPH AT							
+	070209	12.	3.47	2.	1.	1.	0.02
ROUTED TO							
+	070210	12.	3.47	2.	1.	1.	0.02
HYDROGRAPH AT							
+	070210	5.	3.47	1.	0.	0.	0.01
2 COMBINED AT							
+	070210	17.	3.47	3.	2.	2.	0.03
DIVERSION TO							
+	210OUT	0.	3.43	0.	0.	0.	0.03
HYDROGRAPH AT							
+	210PP	17.	3.43	3.	2.	2.	0.03
2 COMBINED AT							
+	070210	44.	3.47	7.	4.	4.	0.07
ROUTED TO							

+		050005	44.	3.47	7.	4.	4.	0.07
	HYDROGRAPH AT							
+		050005	21.	3.53	3.	2.	2.	0.04
	DIVERSION TO							
+		005OUT	0.	3.53	0.	0.	0.	0.04
	HYDROGRAPH AT							
+		005PP	21.	3.53	3.	2.	2.	0.04
	HYDROGRAPH AT							
+		070010	0.	3.37	0.	0.	0.	0.00
	ROUTED TO							
+		070020	0.	3.47	0.	0.	0.	0.00
	ROUTED TO							
+		070030	0.	3.67	0.	0.	0.	0.00
	HYDROGRAPH AT							
+		070030	5.	3.07	1.	0.	0.	0.00
	2 COMBINED AT							
+		070030	5.	3.07	1.	0.	0.	0.00
	ROUTED TO							
+		070040	5.	3.10	1.	0.	0.	0.00
	HYDROGRAPH AT							
+		070210	0.	3.47	0.	0.	0.	0.00
	ROUTED TO							
+		070220	0.	3.47	0.	0.	0.	0.00
	ROUTED TO							
+		070040	0.	3.77	0.	0.	0.	0.00
	HYDROGRAPH AT							
+		070040	5.	3.20	1.	0.	0.	0.01
	3 COMBINED AT							
+		070040	9.	3.13	1.	1.	1.	0.01
	ROUTED TO							

+		070050	9.	3.17	1.	1.	1.	0.01	
	HYDROGRAPH AT								
+		070050	23.	3.07	2.	1.	1.	0.02	
	2 COMBINED AT								
+		070050	30.	3.10	4.	2.	2.	0.03	
	ROUTED TO								
+		070060	30.	3.13	4.	2.	2.	0.03	
	HYDROGRAPH AT								
+		070310	30.	3.07	3.	2.	2.	0.02	
	ROUTED TO								
+		070060	30.	3.10	3.	2.	2.	0.02	
	HYDROGRAPH AT								
+		070060	26.	3.10	3.	2.	2.	0.02	
	3 COMBINED AT								
+		070060	83.	3.10	9.	6.	6.	0.07	
	ROUTED TO								
+		070070	82.	3.13	9.	6.	6.	0.07	
	HYDROGRAPH AT								
+		070070	43.	3.07	4.	3.	3.	0.03	
	HYDROGRAPH AT								
+		070080	52.	3.13	4.	2.	2.	0.02	
	3 COMBINED AT								
+		070080	168.	3.13	17.	10.	10.	0.12	
	ROUTED TO								
+		07Det	47.	3.63	17.	10.	10.	0.12	
+									70.41 3.63
	DIVERSION TO								
+		07Qspl	0.	3.63	0.	0.	0.	0.12	
	HYDROGRAPH AT								
+		07Qpip	47.	3.63	17.	10.	10.	0.12	

	ROUTED TO						
+		070420	47.	3.67	17.	10.	10.	0.12
	HYDROGRAPH AT						
+		070410	17.	3.13	2.	1.	1.	0.01
	ROUTED TO						
+		070420	17.	3.13	2.	1.	1.	0.01
	HYDROGRAPH AT						
+		070420	5.	3.20	0.	0.	0.	0.00
	3 COMBINED AT						
+		070420	62.	3.20	19.	12.	12.	0.14
	ROUTED TO						
+		210005	62.	3.20	19.	12.	12.	0.14
	HYDROGRAPH AT						
+		210005	13.	3.23	1.	1.	1.	0.01
	2 COMBINED AT						
+		210005	75.	3.20	20.	12.	12.	0.15
	ROUTED TO						
+		050030	75.	3.23	20.	12.	12.	0.15
	HYDROGRAPH AT						
+		050005	0.	3.40	0.	0.	0.	0.00
	ROUTED TO						
+		050010	0.	4.63	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		050010	96.	3.13	8.	5.	5.	0.07
	2 COMBINED AT						
+		050010	96.	3.13	8.	5.	5.	0.07
	ROUTED TO						
+		050020	93.	3.17	8.	5.	5.	0.07
	HYDROGRAPH AT						
+		050210	100.	3.13	8.	5.	5.	0.05

	ROUTED TO								
+		210ST	0.	5.53	0.	0.	0.	0.05	
+									0.55	9.97
	ROUTED TO								
+		050020	0.	4.73	0.	0.	0.	0.05	
	HYDROGRAPH AT								
+		050020	13.	3.17	1.	1.	1.	0.01	
	3 COMBINED AT								
+		050020	105.	3.17	10.	6.	6.	0.13	
	ROUTED TO								
+		050030	103.	3.20	10.	6.	6.	0.13	
	HYDROGRAPH AT								
+		050030	54.	3.10	3.	2.	2.	0.02	
	ROUTED TO								
+		030ST	20.	3.27	2.	1.	1.	0.02	
+									68.13	3.27
	2 COMBINED AT								
+		ALLEY	121.	3.20	12.	7.	7.	0.15	
	2 COMBINED AT								
+		050030	195.	3.20	32.	20.	20.	0.30	
	ROUTED TO								
+		050305	192.	3.23	32.	20.	20.	0.30	
	ROUTED TO								
+		050050	190.	3.27	32.	20.	20.	0.30	
	HYDROGRAPH AT								
+		050040	105.	3.20	12.	7.	7.	0.10	
	ROUTED TO								
+		40STOR	37.	3.67	12.	7.	7.	0.10	
+									61.58	3.67
	ROUTED TO								
+		050050	37.	3.67	12.	7.	7.	0.10	

	HYDROGRAPH AT								
+		050310	11.	3.13	1.	1.	1.	0.01	
	ROUTED TO								
+		SRPDet	5.	3.37	1.	1.	1.	0.01	
+									54.43 3.37
	HYDROGRAPH AT								
+		S 64th	7.	3.30	1.	0.	0.	0.01	
	HYDROGRAPH AT								
+		050065	37.	3.07	2.	1.	1.	0.01	
	HYDROGRAPH AT								
+		050062	16.	3.10	1.	1.	1.	0.01	
	ROUTED TO								
+		050050	15.	3.13	1.	1.	1.	0.01	
	6 COMBINED AT								
+		050050	256.	3.27	49.	30.	30.	0.43	
	HYDROGRAPH AT								
+		050060	53.	3.17	5.	3.	3.	0.03	
	2 COMBINED AT								
+		050050	301.	3.23	54.	33.	33.	0.46	
	ROUTED TO								
+		05Det	101.	4.30	52.	32.	32.	0.46	
+									52.74 4.30
	DIVERSION TO								
+		05Qspl	0.	4.30	0.	0.	0.	0.46	
	HYDROGRAPH AT								
+		05Qpip	101.	4.30	52.	32.	32.	0.46	
	HYDROGRAPH AT								
+		050610	99.	3.17	10.	6.	6.	0.08	
	2 COMBINED AT								
+		050610	119.	3.17	61.	38.	38.	0.54	
	ROUTED TO								

+		050620	117.	3.17	61.	38.	38.	0.54
	HYDROGRAPH AT							
+		050620	110.	3.17	12.	7.	7.	0.10
	2 COMBINED AT							
+		050620	227.	3.17	72.	45.	45.	0.64
	ROUTED TO							
+		050630	226.	3.20	72.	45.	45.	0.64
	HYDROGRAPH AT							
+		050630	120.	3.13	9.	6.	6.	0.06
	2 COMBINED AT							
+		050630	323.	3.17	81.	50.	50.	0.70
	ROUTED TO							
+		050660	320.	3.20	81.	50.	50.	0.70
	HYDROGRAPH AT							
+		050100	79.	3.17	6.	4.	4.	0.03
	2 COMBINED AT							
+		050660	394.	3.20	88.	54.	54.	0.74
	ROUTED TO							
+		050131	389.	3.23	88.	54.	54.	0.74
	HYDROGRAPH AT							
+		050131	55.	3.13	4.	3.	3.	0.02
	2 COMBINED AT							
+		050131	426.	3.23	92.	57.	57.	0.76
	ROUTED TO							
+		051410	423.	3.23	92.	57.	57.	0.76
	HYDROGRAPH AT							
+		051410	178.	3.13	13.	8.	8.	0.07
	2 COMBINED AT							
+		051410	549.	3.23	105.	65.	65.	0.83
	ROUTED TO							

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+                    051420       543.    3.23        105.        64.        64.       0.83
1
                                   SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                       (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

                                 SUMMARIES REMOVED FOR PRINTOUT- SEE ELECTRONIC FILE

1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    210ST
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


      PLAN  1 ...............                    INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                                     ELEVATION          0.00              1.00             1.00
                                     STORAGE              0.                8.               8.
                                     OUTFLOW              0.                0.               0.

                     RATIO     MAXIMUM      MAXIMUM    MAXIMUM    MAXIMUM    DURATION     TIME OF     TIME OF
                      OF      RESERVOIR      DEPTH     STORAGE    OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
                      PMF     W.S.ELEV     OVER DAM     AC-FT       CFS       HOURS        HOURS       HOURS

                     1.00        0.55        0.00         4.         0.      0.00         9.97        0.00
1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    030ST
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


      PLAN  1 ...............                    INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                                     ELEVATION         65.00             68.00            68.00
                                     STORAGE              0.                1.               1.
                                     OUTFLOW              0.                0.               0.

                     RATIO     MAXIMUM      MAXIMUM    MAXIMUM    MAXIMUM    DURATION     TIME OF     TIME OF
                      OF      RESERVOIR      DEPTH     STORAGE    OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
                      PMF     W.S.ELEV     OVER DAM     AC-FT       CFS       HOURS        HOURS       HOURS

                     1.00       68.13        0.13         1.        20.      6.87         3.27        0.00


 *** NORMAL END OF HEC-1 ***
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Paiute Park

Osborn Outfall
Paiute Park Stage/Discharge Relationship
50% Submittal

		Paiute Park									
	Time*	Outflow	HEC-1 Stage	StormCad HGL	Park v. Pipe	MH 63+40 Flow	68th St- Flow	70th St- Flow	Scottsdale- Flow	Civic Center- Flow	Miller- Flow
Peak -20	250	2	48.8	49.0	Pipe	2	11	15	14	14	21
Peak -10	300	5	49.0	49.3	Pipe	5	47	63	58	59	88
Peak -8	302	7	49.1	49.4	Pipe	7	70	96	86	87	132
Peak -4	306	12	49.5	49.6	Pipe	12	159	226	210	198	306
Peak*	310	20	50.1	53.0	Pipe	20	227	323	369	369	490
Peak+4	314	30	50.5	53.2	Pipe	30	207	297	382	426	549
Peak +8	318	41	51.0	50.5	Park	41	174	242	316	368	480
Peak +10	320	47	51.2	50.6	Park	47	164	221	284	331	432
Peak +20	330	69	51.9	51.1	Park	69	148	178	205	225	276
Peak +30	340	84	52.3	51.3	Park	84	146	168	184	195	225
Peak +40	350	94	52.5	51.5	Park	94	136	151	163	172	191
Peak +58	408	101	52.7	51.6	Park	408	124	133	139	143	153

*Match times to peak at Pinto inlet

1) Record peak flows at times shown for the intersections listed in the table. Peak flows are calculated by HEC-1 model Preald2.dat. The stage/discharge relationship in this model is a culvert in inlet control. The relationship was calculated using HY8.
2) Input flows into StormCad model of storm drain downstream from Paiute Park.
3) Run StormCad models for all times shown.
4) From StormCad models, record calculated HGL at Paiute Park inlet.
5) Compare calculated HGL to stage shown in detention basin as calculated by HEC-1.
6) If the stage in the park is below the HGL calculated by StormCad, the flow outlet flow must be lower than the flow calculated by HEC-1. In other words, the outlet is not operating under inlet control- it is backed up by the storm drain.
7) The storm drain is backed up until approximately time 318. The stage in the park at this time is approximately 1251.

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	2.00	1,258.00	1,249.04	1,248.65	1,258.00	1,248.06	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	2.00	1,258.00	1,248.05	1,247.66	1,259.00	1,246.11	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	2.00	1,259.00	1,242.92	1,242.53	1,258.90	1,241.95	1,240.50
P-14	Pinto Ln	68th St.	60 inch	6.00	1,258.90	1,240.67	1,240.00	1,255.80	1,237.44	1,236.43
P-12	68th St.	70th St	78 inch	11.00	1,255.80	1,235.78	1,234.93	1,249.40	1,231.46	1,228.65
P-11	70th St	71st St	90 inch	15.00	1,249.40	1,229.85	1,227.64	1,247.50	1,229.83	1,226.62
P-10	71st St	Earll and 71st	90 inch	15.00	1,247.50	1,229.82	1,226.62	1,242.40	1,229.81	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	15.00	1,242.40	1,229.81	1,224.59	1,241.40	1,229.81	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	15.00	1,241.40	1,227.44	1,223.66	1,240.20	1,227.43	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	15.00	1,240.20	1,227.43	1,223.46	1,235.20	1,227.43	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	15.00	1,235.20	1,226.51	1,221.58	1,230.80	1,226.50	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	21.00	1,230.80	1,223.50	1,219.72	1,230.00	1,223.50	1,217.50

Peak -20min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	5.00	1,258.00	1,249.28	1,248.65	1,258.00	1,248.30	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	5.00	1,258.00	1,248.29	1,247.66	1,259.00	1,246.31	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	5.00	1,259.00	1,243.16	1,242.53	1,258.90	1,242.72	1,240.50
P-14	Pinto Ln	68th St.	60 inch	27.00	1,258.90	1,241.44	1,240.00	1,255.80	1,238.37	1,236.43
P-12	68th St.	70th St	78 inch	47.00	1,255.80	1,236.71	1,234.93	1,249.40	1,232.17	1,228.65
P-11	70th St	71st St	90 inch	63.00	1,249.40	1,230.56	1,227.64	1,247.50	1,230.44	1,226.62
P-10	71st St	Earll and 71st	90 inch	63.00	1,247.50	1,230.25	1,226.62	1,242.40	1,230.15	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	63.00	1,242.40	1,230.07	1,224.59	1,241.40	1,230.05	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	63.00	1,241.40	1,227.68	1,223.66	1,240.20	1,227.66	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	63.00	1,240.20	1,227.61	1,223.46	1,235.20	1,227.54	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	63.00	1,235.20	1,226.62	1,221.58	1,230.80	1,226.58	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	88.00	1,230.80	1,223.58	1,219.72	1,230.00	1,223.50	1,217.50

Peak -10min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	7.00	1,258.00	1,249.39	1,248.65	1,258.00	1,248.42	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	7.00	1,258.00	1,248.40	1,247.66	1,259.00	1,246.40	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	7.00	1,259.00	1,243.27	1,242.53	1,258.90	1,243.07	1,240.50
P-14	Pinto Ln	68th St.	60 inch	41.00	1,258.90	1,241.79	1,240.00	1,255.80	1,238.77	1,236.43
P-12	68th St.	70th St	78 inch	70.00	1,255.80	1,237.11	1,234.93	1,249.40	1,232.84	1,228.65
P-11	70th St	71st St	90 inch	96.00	1,249.40	1,231.23	1,227.64	1,247.50	1,231.07	1,226.62
P-10	71st St	Earll and 71st	90 inch	96.00	1,247.50	1,230.75	1,226.62	1,242.40	1,230.56	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	96.00	1,242.40	1,230.41	1,224.59	1,241.40	1,230.36	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	96.00	1,241.40	1,227.99	1,223.66	1,240.20	1,227.94	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	96.00	1,240.20	1,227.84	1,223.46	1,235.20	1,227.69	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	96.00	1,235.20	1,226.77	1,221.58	1,230.80	1,226.68	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	132.00	1,230.80	1,223.68	1,219.72	1,230.00	1,223.50	1,217.50

Peak - 8 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	12.00	1,258.00	1,249.63	1,248.65	1,258.00	1,248.66	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	12.00	1,258.00	1,248.64	1,247.66	1,259.00	1,246.60	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	12.00	1,259.00	1,244.01	1,242.53	1,258.90	1,244.03	1,240.50
P-14	Pinto Ln	159	60 inch	92.00	1,258.90	1,242.75	1,240.00	1,255.80	1,239.94	1,236.43
P-12	159	226	78 inch	159.00	1,255.80	1,238.28	1,234.93	1,249.40	1,237.11	1,228.65
P-11	226	71st St	90 inch	226.00	1,249.40	1,235.50	1,227.64	1,247.50	1,234.99	1,226.62
P-10	71st St	Earll and 71st	90 inch	226.00	1,247.50	1,234.43	1,226.62	1,242.40	1,233.43	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	226.00	1,242.40	1,232.86	1,224.59	1,241.40	1,232.42	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	226.00	1,241.40	1,230.05	1,223.66	1,240.20	1,229.81	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	226.00	1,240.20	1,229.54	1,223.46	1,235.20	1,228.81	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	226.00	1,235.20	1,227.89	1,221.58	1,230.80	1,227.40	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	306.00	1,230.80	1,224.40	1,219.72	1,230.00	1,223.50	1,217.50

Peak -4 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	20.00	1,258.00	1,252.95	1,248.65	1,258.00	1,252.92	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	20.00	1,258.00	1,252.92	1,247.66	1,259.00	1,252.89	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	20.00	1,259.00	1,252.86	1,242.53	1,258.90	1,252.82	1,240.50
P-14	Pinto Ln	159	60 inch	119.00	1,258.90	1,251.54	1,240.00	1,255.80	1,249.49	1,236.43
P-12	159	70th Street	78 inch	227.00	1,255.80	1,247.83	1,234.93	1,249.40	1,246.31	1,228.65
P-11	70th Street	71st St	90 inch	323.00	1,249.40	1,244.70	1,227.64	1,247.50	1,243.68	1,226.62
P-10	71st St	Earll and 71st	90 inch	323.00	1,247.50	1,242.53	1,226.62	1,242.40	1,240.49	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	323.00	1,242.40	1,239.33	1,224.59	1,241.40	1,238.42	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	369.00	1,241.40	1,236.05	1,223.66	1,240.20	1,235.41	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	369.00	1,240.20	1,234.87	1,223.46	1,235.20	1,232.40	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	369.00	1,235.20	1,231.48	1,221.58	1,230.80	1,229.75	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	490.00	1,230.80	1,226.75	1,219.72	1,230.00	1,223.50	1,217.50

Peak

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	30.00	1,258.00	1,253.17	1,248.65	1,258.00	1,253.11	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	30.00	1,258.00	1,253.10	1,247.66	1,259.00	1,253.04	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	30.00	1,259.00	1,252.97	1,242.53	1,258.90	1,252.87	1,240.50
P-14	Pinto Ln	159	60 inch	107.00	1,258.90	1,251.59	1,240.00	1,255.80	1,249.93	1,236.43
P-12	159	70th Street	78 inch	207.00	1,255.80	1,248.27	1,234.93	1,249.40	1,247.01	1,228.65
P-11	70th Street	71st St	90 inch	297.00	1,249.40	1,245.40	1,227.64	1,247.50	1,244.53	1,226.62
P-10	71st St	Earll and 71st	90 inch	297.00	1,247.50	1,243.56	1,226.62	1,242.40	1,241.84	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	297.00	1,242.40	1,240.85	1,224.59	1,241.40	1,240.09	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	382.00	1,241.40	1,237.72	1,223.66	1,240.20	1,237.03	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	382.00	1,240.20	1,236.45	1,223.46	1,235.20	1,233.80	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	426.00	1,235.20	1,232.88	1,221.58	1,230.80	1,230.58	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	549.00	1,230.80	1,227.58	1,219.72	1,230.00	1,223.50	1,217.50

Peak + 4 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Palute Park Inlet	MH 63+40	54 inch	41.00	1,258.00	1,250.49	1,248.65	1,258.00	1,249.54	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	41.00	1,258.00	1,249.50	1,247.66	1,259.00	1,248.01	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	41.00	1,259.00	1,247.88	1,242.53	1,258.90	1,247.69	1,240.50
P-14	Pinto Ln	159	60 inch	99.00	1,258.90	1,246.41	1,240.00	1,255.80	1,244.99	1,236.43
P-12	159	70th Street	78 inch	174.00	1,255.80	1,243.33	1,234.93	1,249.40	1,242.44	1,228.65
P-11	70th Street	71st St	90 inch	242.00	1,249.40	1,240.83	1,227.64	1,247.50	1,240.26	1,226.62
P-10	71st St	Earll and 71st	90 inch	242.00	1,247.50	1,239.61	1,226.62	1,242.40	1,238.47	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	242.00	1,242.40	1,237.81	1,224.59	1,241.40	1,237.31	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	316.00	1,241.40	1,234.94	1,223.66	1,240.20	1,234.47	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	316.00	1,240.20	1,234.07	1,223.46	1,235.20	1,232.26	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	368.00	1,235.20	1,231.34	1,221.58	1,230.80	1,229.62	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	480.00	1,230.80	1,226.62	1,219.72	1,230.00	1,223.50	1,217.50

Peak +8 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	47.00	1,258.00	1,250.63	1,248.65	1,258.00	1,249.68	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	47.00	1,258.00	1,249.64	1,247.66	1,259.00	1,247.44	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	47.00	1,259.00	1,245.51	1,242.53	1,258.90	1,245.38	1,240.50
P-14	Pinto Ln	159	60 inch	98.00	1,258.90	1,244.10	1,240.00	1,255.80	1,242.86	1,236.43
P-12	159	70th Street	78 inch	164.00	1,255.80	1,241.20	1,234.93	1,249.40	1,240.42	1,228.65
P-11	70th Street	71st St	90 inch	221.00	1,249.40	1,238.81	1,227.64	1,247.50	1,238.33	1,226.62
P-10	71st St	Earll and 71st	90 inch	221.00	1,247.50	1,237.80	1,226.62	1,242.40	1,236.84	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	221.00	1,242.40	1,236.29	1,224.59	1,241.40	1,235.87	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	284.00	1,241.40	1,233.50	1,223.66	1,240.20	1,233.12	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	284.00	1,240.20	1,232.80	1,223.46	1,235.20	1,231.34	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	331.00	1,235.20	1,230.42	1,221.58	1,230.80	1,229.02	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	432.00	1,230.80	1,226.02	1,219.72	1,230.00	1,223.50	1,217.50

Peak +10 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	69.00	1,258.00	1,251.07	1,248.65	1,258.00	1,250.13	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	69.00	1,258.00	1,250.08	1,247.66	1,259.00	1,247.83	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	69.00	1,259.00	1,244.95	1,242.53	1,258.90	1,244.27	1,240.50
P-14	Pinto Ln	159	60 inch	105.00	1,258.90	1,242.99	1,240.00	1,255.80	1,239.81	1,236.43
P-12	159	70th Street	78 inch	148.00	1,255.80	1,238.15	1,234.93	1,249.40	1,235.48	1,228.65
P-11	70th Street	71st St	90 inch	178.00	1,249.40	1,233.87	1,227.64	1,247.50	1,233.64	1,226.62
P-10	71st St	Earll and 71st	90 inch	178.00	1,247.50	1,233.24	1,226.62	1,242.40	1,232.68	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	178.00	1,242.40	1,232.33	1,224.59	1,241.40	1,232.06	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	205.00	1,241.40	1,229.69	1,223.66	1,240.20	1,229.49	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	205.00	1,240.20	1,229.25	1,223.46	1,235.20	1,228.65	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	225.00	1,235.20	1,227.73	1,221.58	1,230.80	1,227.24	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	276.00	1,230.80	1,224.24	1,219.72	1,230.00	1,223.50	1,217.50

Peak +20 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	84.00	1,258.00	1,251.33	1,248.65	1,258.00	1,250.40	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	84.00	1,258.00	1,250.34	1,247.66	1,259.00	1,248.08	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	84.00	1,259.00	1,245.21	1,242.53	1,258.90	1,244.40	1,240.50
P-14	Pinto Ln	159	60 inch	112.00	1,258.90	1,243.12	1,240.00	1,255.80	1,239.79	1,236.43
P-12	159	70th Street	78 inch	146.00	1,255.80	1,238.13	1,234.93	1,249.40	1,234.81	1,228.65
P-11	70th Street	71st St	90 inch	168.00	1,249.40	1,233.20	1,227.64	1,247.50	1,232.98	1,226.62
P-10	71st St	Earll and 71st	90 inch	168.00	1,247.50	1,232.55	1,226.62	1,242.40	1,232.11	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	168.00	1,242.40	1,231.78	1,224.59	1,241.40	1,231.55	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	184.00	1,241.40	1,229.18	1,223.66	1,240.20	1,229.02	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	184.00	1,240.20	1,228.79	1,223.46	1,235.20	1,228.29	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	195.00	1,235.20	1,227.37	1,221.58	1,230.80	1,227.00	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	225.00	1,230.80	1,224.00	1,219.72	1,230.00	1,223.50	1,217.50

Peak + 30 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	94.00	1,258.00	1,251.50	1,248.65	1,258.00	1,250.57	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	94.00	1,258.00	1,250.51	1,247.66	1,259.00	1,248.25	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	94.00	1,259.00	1,245.38	1,242.53	1,258.90	1,244.40	1,240.50
P-14	Pinto Ln	159	60 inch	112.00	1,258.90	1,243.12	1,240.00	1,255.80	1,239.67	1,236.43
P-12	159	70th Street	78 inch	136.00	1,255.80	1,238.01	1,234.93	1,249.40	1,234.22	1,228.65
P-11	70th Street	71st St	90 inch	151.00	1,249.40	1,232.61	1,227.64	1,247.50	1,232.40	1,226.62
P-10	71st St	Earll and 71st	90 inch	151.00	1,247.50	1,231.97	1,226.62	1,242.40	1,231.63	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	151.00	1,242.40	1,231.35	1,224.59	1,241.40	1,231.19	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	163.00	1,241.40	1,228.82	1,223.66	1,240.20	1,228.69	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	163.00	1,240.20	1,228.49	1,223.46	1,235.20	1,228.08	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	172.00	1,235.20	1,227.16	1,221.58	1,230.80	1,226.86	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	191.00	1,230.80	1,223.86	1,219.72	1,230.00	1,223.50	1,217.50

Peak +40 min

Paiute Park Outflow Calculations

Pipe	Upstream Node	Downstream Node	Section Size	Discharge (cfs)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	101.00	1,258.00	1,251.60	1,248.65	1,258.00	1,250.68	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	101.00	1,258.00	1,250.61	1,247.66	1,259.00	1,248.36	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	101.00	1,259.00	1,245.48	1,242.53	1,258.90	1,244.38	1,240.50
P-14	Pinto Ln	159	60 inch	111.00	1,258.90	1,243.10	1,240.00	1,255.80	1,239.53	1,236.43
P-12	159	70th Street	78 inch	124.00	1,255.80	1,237.87	1,234.93	1,249.40	1,233.68	1,228.65
P-11	70th Street	71st St	90 inch	133.00	1,249.40	1,232.07	1,227.64	1,247.50	1,231.87	1,226.62
P-10	71st St	Earll and 71st	90 inch	133.00	1,247.50	1,231.46	1,226.62	1,242.40	1,231.17	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	133.00	1,242.40	1,230.92	1,224.59	1,241.40	1,230.81	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	139.00	1,241.40	1,228.44	1,223.66	1,240.20	1,228.35	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	139.00	1,240.20	1,228.17	1,223.46	1,235.20	1,227.86	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	143.00	1,235.20	1,226.94	1,221.58	1,230.80	1,226.74	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	153.00	1,230.80	1,223.74	1,219.72	1,230.00	1,223.50	1,217.50

Peak +58 min
(Peak Stage in Paiute)

Check of Premier Stage Discharge Curve

CURRENT DATE: 07-14-1999 FILE DATE: 07-14-1999
CURRENT TIME: 14:04:22 FILE NAME: PAIUTECK

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 6.0 **********
****

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	1248.65	1247.66	250.00	1 RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (cfs) FILE: PAIUTECK DATE: 07-14-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1248.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1250.69	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1250.96	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1251.22	42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1251.44	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1252.09	70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1252.50	84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1252.88	98.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1253.26	112.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1253.64	126.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1254.04	140.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: PAIUTECK DATE: 07-14-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
1248.65	0.000	0.00	0.00	0.00
1250.69	0.000	14.00	0.00	0.00
1250.96	0.000	28.00	0.00	0.00
1251.22	0.000	42.00	0.00	0.00
1251.44	0.000	50.00	0.00	0.00
1252.09	0.000	70.00	0.00	0.00
1252.50	0.000	84.00	0.00	0.00
1252.88	0.000	98.00	0.00	0.00
1253.26	0.000	112.00	0.00	0.00
1253.64	0.000	126.00	0.00	0.00
1254.04	0.000	140.00	0.00	0.00

****

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

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Check of Premier Stage Discharge Curve

CURRENT DATE: 07-14-1999 FILE DATE: 07-14-1999
CURRENT TIME: 14:04:22 FILE NAME: PAIUTECK

PERFORMANCE CURVE FOR CULVERT 1 - 1(5.00 (ft) BY 5.00 (ft)) RCP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	1248.65	0.00	0.00	0-NF	0.00	0.00	0.00	0.99	0.00	0.00
14.00	1250.69	1.24	2.04	1-S2n	0.93	1.02	0.93	0.99	5.49	0.00
28.00	1250.96	1.92	2.31	1-S2n	1.32	1.46	1.32	0.99	6.71	0.00
42.00	1251.22	2.50	2.57	1-S2n	1.64	1.79	1.64	0.99	7.48	0.00
50.00	1251.44	2.79	2.73	1-S2n	1.80	1.98	1.68	0.99	8.61	0.00
70.00	1252.09	3.44	3.13	1-S2n	2.17	2.35	2.05	0.99	9.22	0.00
84.00	1252.50	3.85	3.45	1-S2n	2.41	2.59	2.29	0.99	9.57	0.00
98.00	1252.88	4.23	3.79	1-S2n	2.64	2.81	2.65	0.99	9.29	0.00
112.00	1253.26	4.61	4.17	1-S2n	2.87	3.02	2.82	0.99	9.83	0.00
126.00	1253.64	4.99	4.56	1-S2n	3.10	3.20	3.00	0.99	10.24	0.00
140.00	1254.04	5.39	5.00	1-S2n	3.34	3.38	3.28	0.99	10.26	0.00

El. inlet face invert 1248.65 ft El. outlet invert 1247.66 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	1248.65 ft
OUTLET STATION	250.00 ft
OUTLET ELEVATION	1247.66 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0040
CULVERT LENGTH ALONG SLOPE	250.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	5.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

CURRENT DATE: 07-14-1999 FILE DATE: 07-14-1999
CURRENT TIME: 14:04:22 FILE NAME: PAIUTECK

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
1248.65

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	50.00 ft
CREST LENGTH	50.00 ft
OVERTOPPING CREST ELEVATION	1260.00 ft

****

Paiute Park Volume Calculations

Alan Humphrey

PB

tinvol.rpt
Thursday, July 22, 1999 05:43:41 Page: 1
Triangle Volume Report

Original Surface: alt2
Design Surface: 1543

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
344.8412	42139.9560	-41795.1148

Original Surface: alt2
Design Surface: 1248

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
16370.4288	0.0000	16370.4288

Original Surface: alt2
Design Surface: 1249

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
10111.1447	99.7018	10011.4429

Original Surface: alt2
Design Surface: 1250

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
7034.9696	3382.5126	3652.4570

Original Surface: alt2
Design Surface: 1251

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
5782.8247	8489.3536	-2706.5290

Original Surface: alt2
Design Surface: 1252

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
4637.7575	13703.2724	-9065.5149

Original Surface: alt2
Design Surface: 1253

Cut (cu yd)	Fill (cu yd)	Net (cu yd)
3602.1235	19026.6243	-15424.5008

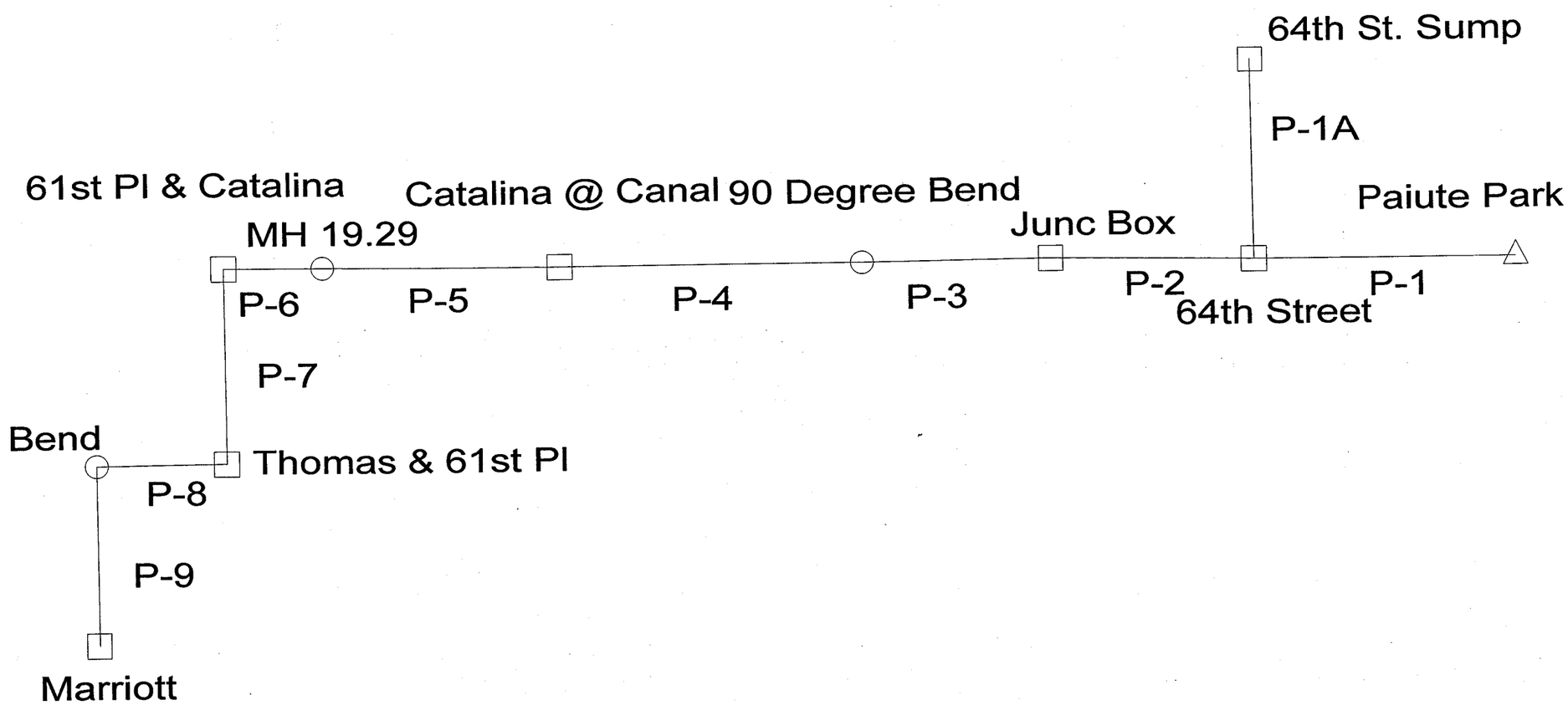
Re-PT
No mountain yard

Elev	
49	- 0
50	- 2.09
51	- 5.26
52	- 8.49
53	- 11.79
54	- 15.16
55	- 18.60
56	- 22.11
57	- 25.68

RECEIVED
JUL 23 1999
PREMIER ENGINEERING

StormCad Models

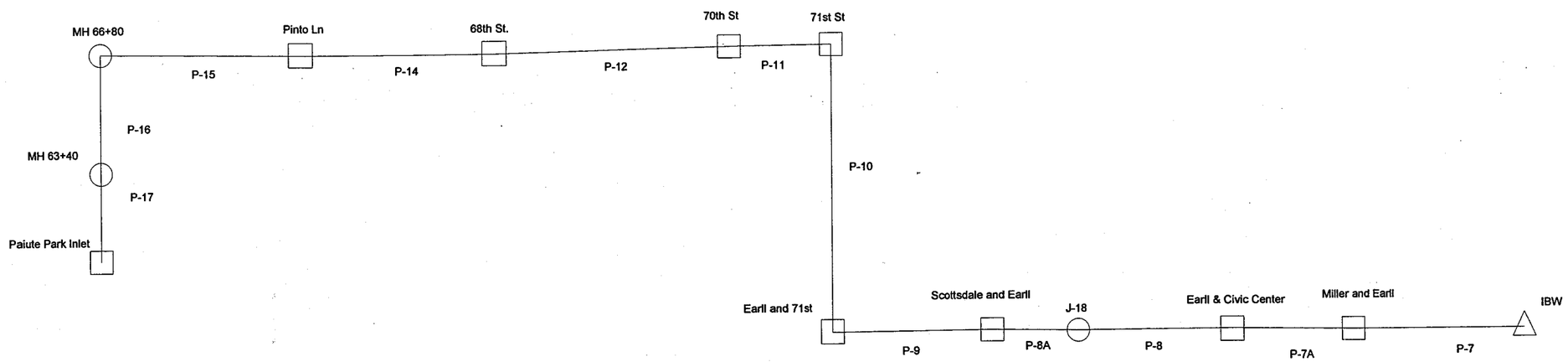
Osborn Outfall- Marriott to Paiute Park



Osborn Outfall, Marriott to Paiute Park

Pipe	Upstream Node	Downstream Node	Section Size	Length (ft)	Roughness	Discharge (cfs)	Velocity (ft/s)	System Flow Time (min)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-9	Marriott	Bend	36 inch	102.00	0.012	47.00	6.65	0.00	1,272.00	1,269.68	1,265.75	1,272.00	1,269.25	1,265.64
P-8	Bend	Thomas & 61st Pl	36 inch	267.00	0.012	47.00	8.33	0.26	1,272.00	1,267.87	1,265.64	1,272.00	1,266.99	1,264.17
P-7	Thomas & 61st Pl	61st Pl & Catalina	42 inch	487.00	0.012	62.00	8.55	0.84	1,272.00	1,266.64	1,264.17	1,268.00	1,264.96	1,260.30
P-6	61st Pl & Catalina	MH 19.29	48 inch	73.00	0.012	75.00	5.98	1.93	1,268.00	1,264.25	1,260.30	1,266.50	1,264.08	1,259.11
P-5	MH 19.29	Catalina @ Canal	48 inch	1,159.00	0.012	75.00	5.97	2.13	1,266.50	1,264.03	1,253.52	1,267.00	1,261.33	1,252.36
P-4	Catalina @ Canal	90 Degree Bend	66 inch	343.00	0.012	195.00	8.21	5.37	1,267.00	1,259.33	1,252.36	1,266.75	1,258.35	1,251.87
P-3	90 Degree Bend	Junc Box	66 inch	600.00	0.012	195.00	8.54	6.06	1,266.75	1,256.90	1,251.85	1,259.40	1,254.70	1,250.66
P-2	Junc Box	64th Street	10 x 4 ft	647.00	0.013	195.00	4.88	7.12	1,259.40	1,254.70	1,250.64	1,256.77	1,253.97	1,249.33
P-1A	64th St. Sump	64th Street	42 inch	171.00	0.012	54.00	5.61	0.00	1,256.26	1,254.39	1,249.95	1,256.77	1,253.97	1,249.50
P-1	64th Street	Paiute Park	10 x 4 ft	342.00	0.012	256.00	7.83	9.33	1,256.77	1,252.60	1,249.33	1,256.00	1,251.55	1,248.82

Osborn Outfall- Paiute Park to Indian Bend Wash



Project Title: Osborn Road Base Model
I:\...\11119\drng\stormcad models\finaldwn.stm
08/11/99 01:30:14 PM

Parsons Brinckerhoff
© Haestad Methods, Inc. 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Parsons Brinckerhoff
StormCAD v1.5 [158]
Page 1 of 1

Osborn Outfall, Paiute Park to IBW

Pipe	Upstream Node	Downstream Node	Section Size	Length (ft)	Roughness	Discharge (cfs)	Velocity (ft/s)	System Flow Time (min)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Invert Elevation (ft)
P-17	Paiute Park Inlet	MH 63+40	54 inch	340.00	0.012	101.00	6.35	0.00	1,258.00	1,256.09	1,248.65	1,258.00	1,255.33	1,245.59
P-16	MH 63+40	MH 66+80	54 inch	340.00	0.012	101.00	6.35	0.89	1,258.00	1,255.30	1,247.66	1,259.00	1,254.53	1,245.76
P-15	MH 66+80	Pinto Ln	54 inch	500.00	0.012	101.00	6.35	1.78	1,259.00	1,253.73	1,242.53	1,258.90	1,252.61	1,240.50
P-14	Pinto Ln	68th St	60 inch	980.00	0.013	101.00	5.14	3.10	1,258.90	1,251.33	1,240.00	1,255.80	1,249.85	1,236.43
P-12	68th St	70th Street	78 inch	950.00	0.012	209.00	6.30	6.27	1,255.80	1,248.19	1,234.93	1,249.40	1,246.90	1,228.65
P-11	70th Street	71st St	90 inch	680.00	0.012	308.00	6.97	8.79	1,249.40	1,245.29	1,227.64	1,247.50	1,244.36	1,226.62
P-10	71st St	Earll and 71st	90 inch	1,355.00	0.012	308.00	6.97	10.41	1,247.50	1,243.32	1,226.62	1,242.40	1,241.46	1,224.59
P-9	Earll and 71st	Scottsdale and Earll	90 inch	599.00	0.012	308.00	6.97	13.65	1,242.40	1,240.40	1,224.59	1,241.40	1,239.58	1,223.68
P-8A	Scottsdale and Earll	J-18	10 x 4 ft	158.00	0.013	377.00	9.43	15.08	1,241.40	1,237.21	1,223.66	1,240.20	1,236.55	1,223.45
P-8	J-18	Earll & Civic Center	90 inch	1,256.00	0.012	377.00	8.53	15.36	1,240.20	1,235.98	1,223.46	1,235.20	1,233.40	1,221.58
P-7A	Earll & Civic Center	Miller and Earll	96 inch	1,241.00	0.012	410.00	8.16	17.82	1,235.20	1,232.48	1,221.58	1,230.80	1,230.34	1,219.72
P-7	Miller and Earll	IBW	10 x 6 ft	1,471.00	0.013	533.00	8.88	20.35	1,230.80	1,227.34	1,219.72	1,230.00	1,223.50	1,217.50

Inlet Calculations

Supplementary Hydrology

*** O U T P U T D A T A ***

REVISED JUNE 1988 TO UPDATE COMPUTATION OF SHORT-DURATION VALUES

PRECIPITATION FREQUENCY VALUES FOR Osborn Outfall,
PRIMARY ZONE NUMBER= 7
SHORT-DURATION ZONE NUMBER= 8

POINT VALUES

RETURN PERIOD

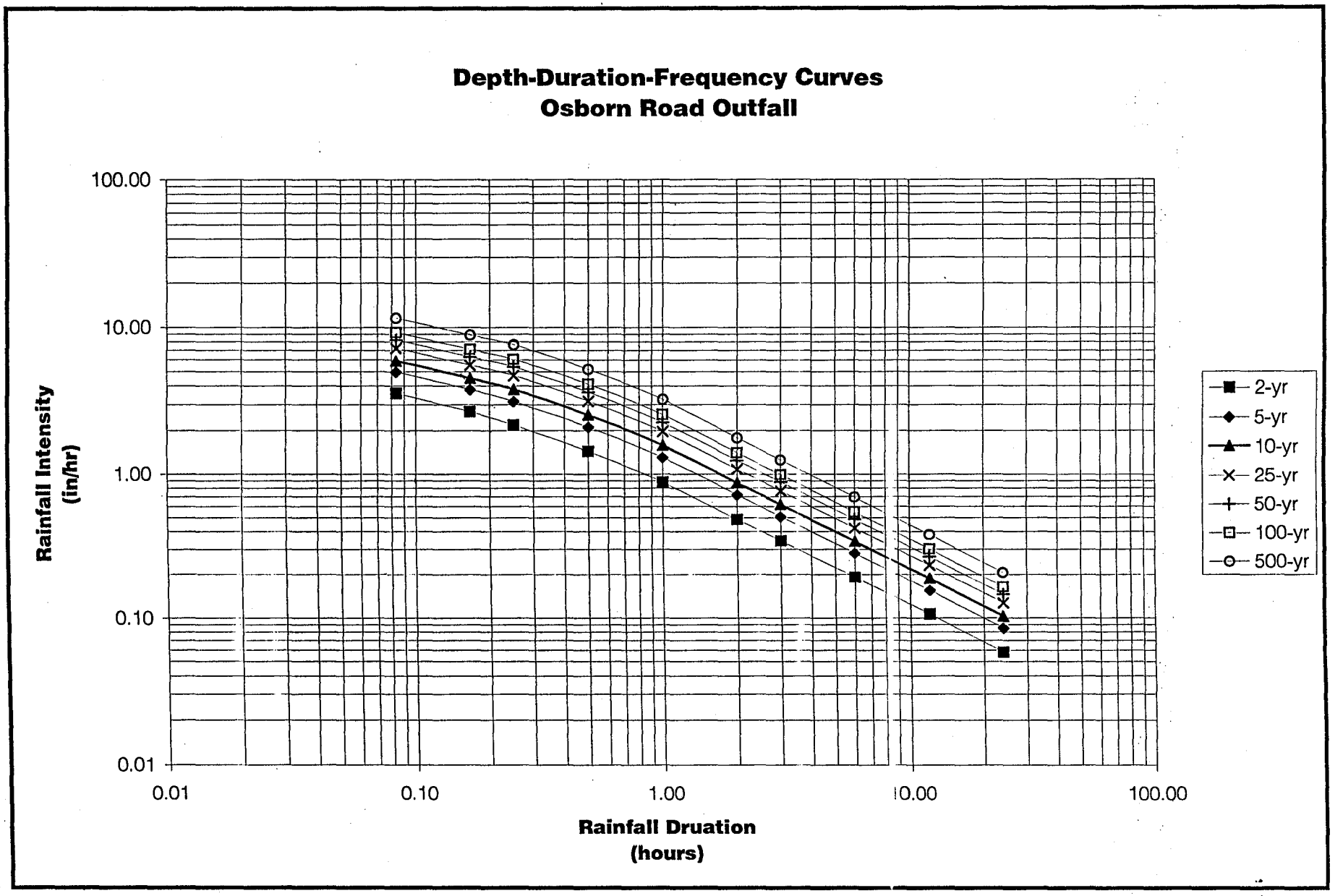
DURATION	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR	500-YR	
5-MIN	.30	.42	.50	.60	.69	.77	.97	5-MIN
10-MIN	.45	.63	.75	.92	1.05	1.18	1.49	10-MIN
15-MIN	.54	.79	.95	1.18	1.35	1.52	1.91	15-MIN
30-MIN	.72	1.06	1.28	1.59	1.83	2.06	2.60	30-MIN
1-HR	.88	1.31	1.59	1.98	2.28	2.58	3.26	1-HR
2-HR	.97	1.44	1.75	2.17	2.50	2.82	3.57	2-HR
3-HR	1.03	1.53	1.86	2.30	2.65	2.99	3.78	3-HR
6-HR	1.15	1.69	2.05	2.54	2.92	3.30	4.17	6-HR
12-HR	1.27	1.87	2.26	2.80	3.21	3.63	4.58	12-HR
24-HR	1.40	2.04	2.47	3.05	3.50	3.95	4.98	24-HR

* IF YOUR SITE IS IN ARIZONA OR NEW MEXICO, PLEASE CONSULT THE FOLLOWING PAPER FOR REVISED DEPTH-AREA VALUES:
  DEPTH-AREA RATIOS IN THE SEMI-ARID SOUTHWEST UNITED STATES
  NOAA TECHNICAL MEMORANDUM NWS HYDRO-40
  ZEHR AND MYERS
  AUGUST 1984

INPUT DATA

PROJECT NAME=Osborn Outfall,
ZONE= 7 SHORT-DURATION ZONE= 8
LATITUDE= .00 LONGITUDE= 100.00 ELEVATION= 0
2-YR, 6-HR PCPN= 1.15 100-YR, 6-HR PCPN= 3.30
2-YR, 24-HR PCPN= 1.40 100-YR, 24-HR PCPN= 3.95

* * * * E N D O F R U N * * * *


Depth-Duration-Frequency Curves
Osborn Road Outfall
Rainfall Intensity
(in/hr)
100.00
10.00
1.00
0.10
0.01
0.01
0.10
1.00
10.00
100.00
Rainfall Druation
(hours)
2-yr
5-yr
10-yr
25-yr
50-yr
100-yr
500-yr

Osborn Outfall
Intersection Data

Intersection	Gutter	Curb Height & Type[1]	Obstruction[2]	Distance Calculated From CR [ft]			HEC-1 Flows: Subbasin	Subbasin Peak (cfs)	Total Area (ac)	Subarea (ac)	Proportional Flows (cfs)
Thomas @ 61st Pl	NW	6" V	FRY'S DW	105.3	to	185.0					
		6" V	FRY'S DW	279.5	to	343.8					
	NE	6" V	DW		262.8						
	WN	---	---		---						
	WS	---	---		---						
	EN	---	---		---						
	ES	---	---		---						
Catalina @ 61st Pl	61st Pl [east side][4]	4" R	---		---						
Catalina @ 61st Pl	61st Pl [west side][4]	6" V	DW[3]		---						
Catalina @ 62nd St	NW	4" R	DW	24.6	to	44.6					
	NE	4" R	DW	10.8	to	31.2					
	EN	4" R	---		---						
	ES	4" R	---		---						
Catalina @ 62nd Pl	NW	4" R	DW	10.8	to	29.5					
	NE	4" R	DW	12.5	to	28.9					
	WN	4" R	---		---						
	WS	4" R	---		---						
	EN	4" R	---		---						
	ES	4" R	---		---						
Catalina @ 63rd St	NW	4" R	DW	11.2	to	27.2					
	NE	---	none		---						
	WN	4" R	---		---						
	WS	4" R	---		---						
	EN	4" R	---		---						
	ES	4" R	---		---						
Catalina @ 64th St/Alley	NW	4" R	DW		6.6		ALLEY	121			121
	NE	4" R	---		---						
	WN	4" R	none		---						
	WS	4" R	DW	14.8	to	31.2					
		4" R	DW	48.9	to	65.3					

Osborn Outfall
Intersection Data

Intersection	Gutter	Curb Height & Type[1]	Obstruction[2]	Distance Calculated From CR [ft]	HEC-1 Flows: Subbasin	Subbasin Peak (cfs)	Total Area (ac)	Subarea (ac)	Proportional Flows (cfs)
	SW	---	none	---					
	SE	---	none	---					
Osborn @ Navajo	NW	---	---	---					
	NE	---	---	---					
	WN	6" V	DW	43.0 to 61.7					
		6" V	DW	114.8 to 134.8					
	WS	---	---	---					
	EN	---	---	---	50610	99	51.8	25.43	49
	ES	---	---	---					
Osborn @ Paiute Park Alley	Osborn [south side][5]	Varies	DW	49.5					
Osborn @ Pinto	NW	6" V	A	87.3	50610	99	51.8	25.43	49
	NE	6" V	A	86.3					0
	WN	---	---	---				0.99	1.9
	WS	---	---	---					0
	EN[6]	4" R	none	---					0
	ES	---	---	---					0
Osborn @ 68th St	Revise hydrology model. Measured areas do not agree with model input. Total area of 50620 is 54.10 acres. Reduce peak flow proportionally.								
	NW	4" R	A	88.9	50620	110	63.4	50.87	88
	NE	4" R	A	76.8					0
	WN[6]	4" R	none	---				3.23	5.6
	WS	---	---	---					
	EN	---	---	---					
	ES	---	---	---					
	SW	---	---	---					
	SE	---	---	---					
Osborn @ Supai	Revise hydrology model. Measured areas do not agree with model input. Total area of 50630 is 41.97 acres. Increase peak flow proportionally.								
	NW	4" R	DW	18.0 to 38.4	50630	120	39.68	14.08	43
		4" R	A	84.0 to 103.7					0
	NE	4" R	DW	92.2					0
	WN	6" V	---	---				3.54	11

Osborn Outfall
Intersection Data

Intersection	Gutter	Curb Height & Type[1]	Obstruction[2]	Distance Calculated From CR [ft]	HEC-1 Flows: Subbasin	Subbasin Peak (cfs)	Total Area (ac)	Subarea (ac)	Proportional Flows (cfs)
	WS	---	---	---					
	EN	6" V	---	---					
	ES	---	---	---					
Osborn @ 70th St	Revise hydrology model. Measured areas do not agree with model input. Total area of 50630 is 41.97 acres. Increase peak flow proportionally.								
	NW	6" V	DW	120.4	50630	120	39.68	23.43	71
	NE	6" V	DW	21.3 to 43.6					
		6" V	DW	111.2 to 135.2					
	WN	---	---	---	50630	120	39.68	0.92	2.8
	WS	---	---	---					
	EN	---	---	---					
	ES	---	---	---					
	SW	---	---	---					
	SE	---	---	---					
Osborn @ 71st St	WN	---	---	---	50640	65	20.48	3.75	12
	WS	---	---	---					
	EN	---	---	---					
	ES	---	---	---					
	SW[7]	---	---	---					
	SE	---	---	---					
West side of 71st St.	Church				50100	79	20.5	5.75	22
	Apts.							1.49	5.7
Earll @ 71st St	NW[7]	6" V	none	---	50100	79	20.5	11.86	~~46~~
	NE	6" V	DW	82.4					Use 23 @ NW
	WN	6" V	none	---	Split flows 50/50 between NW and WN				23
	WS[8]	6" V	none	---					
	EN	6" V	---	---					
	ES[8]	6" V	DW @ Intersection to next DW to east	119.8					

Osborn Outfall
Intersection Data

Intersection	Gutter	Curb Height & Type[1]	Obstruction[2]	Distance Calculated From CR [ft]	HEC-1 Flows: Subbasin	Subbasin Peak (cfs)	Total Area (ac)	Subarea (ac)	Proportional Flows (cfs)
Earll @ Scottsdale	NW	---	---	---					
	NE	---	---	---					
	WN	6" V	DW	85.0	50100	79	20.5	1.36	5.2
	WS	6" V	DW	79.7					
	EN	---	---	---					
	ES	---	---	---					
	SW	---	---	---					
	SE	---	---	---					
Earll @ Civic Center	NW	6" V	DW	75.1	50131	55	15.4	8.7	34
	NE	6" V	none to ~200ft	107.3					0
	WN	6" V	DW	55.4 to 90.6				7.5	29
	WS	nverted crown at parking lot	none	---					0 0
	EN	---	---	---					0
	ES	---	---	---					0
	SW	---	---	---					0
	SE	---	---	---					0
Earll @ 75th St	NW	6" V	none	---	51410	178	46.1	14.6	56
	NE	6" V	none to ~300ft	---					0
	WN	---	---	---				4.75	18
	WS	---	---	---					0
	EN	---	---	---					0
	ES	---	---	---					0
Earll @ Miller	NW	4" R	DW	111.2	51410	178	46.1	13.9	53
	NE	6" V	none to ~300ft	---				7.8	30
	WN	---	---	---				5.3	20
	WS	---	---	---					0
	EN	---	---	---					0
	ES	4" R	DW	0.0 to 13.5					0

Osborn Outfall
Intersection Data

Intersection	Gutter	Curb Height & Type[1]	Obstruction[2]	Distance Calculated From CR [ft]	HEC-1 Flows: Subbasin	Subbasin Peak (cfs)	Total Area (ac)	Subarea (ac)	Proportional Flows (cfs)
	ES	4" R	DW	101.7 to ---					0
	SW	---	---	---					0
	SE	---	---	---					0

1). R = Rolled, V = Vertical
2). DW = Driveway, A = Alley
3). Driveway is opposite of Catalina.
4). Catalina ends in a cul-de-sac just east of 61st Place, therefore, it does not intersect 61st Place.
5). Distance measured is east of telephone manhole at alley to farside of driveway.
6). Locate inlets on north side of Osborn & east of Pinto to 68th Street. Do not locate any inlets about 250' west of 68th Street, there is a ~40' DW on the north side of Osborn.
7). Put catch basin on west side of 71st Street at Angus to pick up flow from church on SW corner of Osborn/71st Street and one catch basin ~100' south of Angus to pick up Desert Cove Apts.
8). Sanitary sewer manhole, not interceptor, at intersection.

HEC-12 Spreadsheets

PARSONS BRINCKERHOFF COMPUTATION SHEET

Subject Gutter Designations

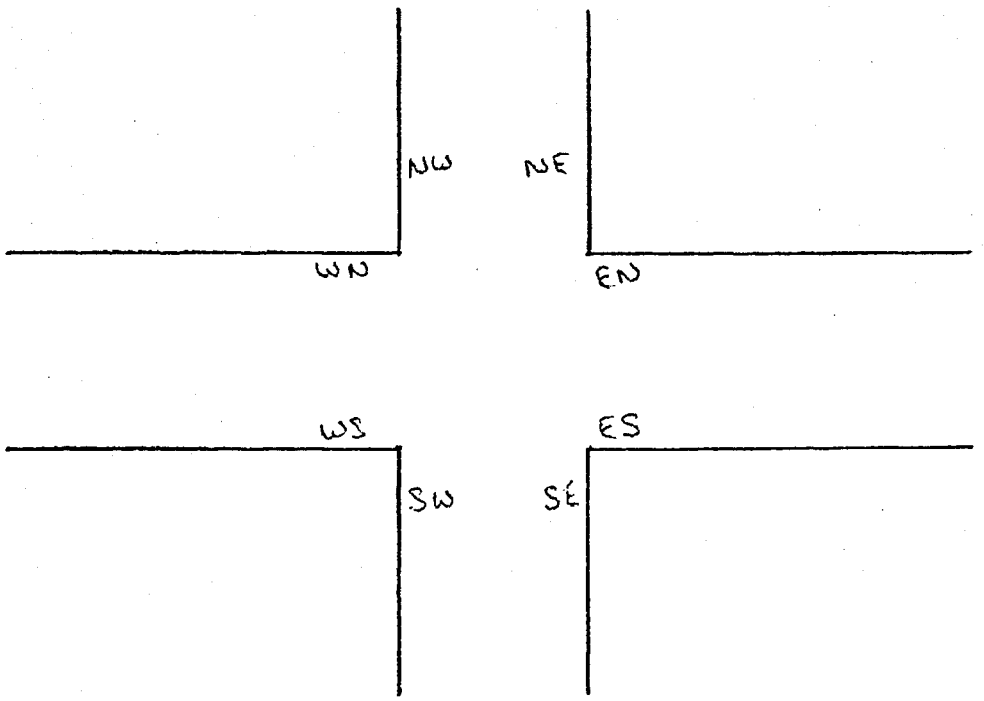
Page ____ of ____

Made by ____

Date ____

Checked by ____

Date ____



FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

		Clogging factors:	80%	50%	67%
Street or Intersection: 61st Pl and Catalina					
Return Period	10	10	10	10	
HYDROLOGY COMPUTATION:					
Structure location or station (ft):	61st Pl @ Catalina	Catalina @ 64th St.	Catalina @ 64th St. near 62nd Pl	Catalina @ 64th St. and Alley	
Average watershed width (ft):					
Watershed length (ft):					
Contributing watershed area (acres):	0.75	2.54			
Composite Runoff Coefficient "C":	0.95	0.90			
Precipitation intensity (in/hr):	4.20	3.00	Assume	See hand	
Time of Concentration Calculations:			half	calculations	
Length of longest flow path (miles)	0.23	0.25	of		
Slope of flow path (ft/mile)	34.0	5.0	contributing		
Roughness Coefficient- See Table 3.1, FCDMC Manual	0.0408	0.0374	area		
Kb Parameter	-0.0065	-0.0065	produces		
Kb Parameter	0.04	0.04	half		
Time of Concentration (hrs)	0.20	0.41	peak		
Subarea discharge Q (cfs):	3.0	6.9			
Previous by-pass flow (cfs):	0.0	0.0			
Discharge added by operator:	—	—			
Total discharge Q (cfs):	3.0	6.9	3.4		
SHOULDER AND GUTTER CONFIGURATION:					
Manning's n:	0.016	0.016	0.016		
Longitudinal slope S (ft/ft):	0.0057	0.0015	0.0015		
Inlet type (1=grate, 2=side opening or slotted):	2	2	2		
Longitudinal profile (1=on-grade, 2=sag):	1	1	1		
Gutter Configuration (1=roll, 2=vertical):	1	1	1		
Inlet description:	P-1570	None	P-1569		
Grate width:	0	0	0		
Grate length:	0.0	0.0	0.0		
Pavement cross-slope (Sx):	0.037	0.027	0.027		
Width of gutter from flowline (ft):	0.42	0.42	0.42		
Gutter depression from horizontal (ft):	0.042	0.042	0.042		
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.100	0.100	0.100		
Half Street Width at Inlet (ft):	20.0	15.0	15.0		
Flooded Width from flowline (ft): before inlet	7.7	16.7	12.9		
Depth at flowline (ft): before inlet	0.31	0.48	0.37		
Water cross-area (sq.ft): before inlet	1.22	4.09	2.43		
Velocity V for total discharge (fps): before inlet	2.45	1.68	1.41		
Ratio of gutter depression flow to total Q (Eod):	30.2%	19.1%	21.5%		
Equivalent cross-slope (Se):	0.056	0.041	0.042		
GRATE INLETS ON-GRADE:					
Ratio of grate frontal flow to total flow:	—	—	—		
Inlet frontal flow in cfs (Qw):	—	—	—		
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—		
Fraction of frontal flow intercepted (Rf):	—	—	—		
Side flow in cfs (Qs):	—	—	—		
Effective grate length w/clogging:	—	—	—		
Fraction of side flow interception (Rs):	—	—	—		
Grate Efficiency (E):	—	—	—		
Total flow intercepted (cfs):	—	—	—		
Grate flow-by (cfs):	—	—	—		
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:					
Length required for total interception (ft): w/clogging	13.6	—	11.4		
Length of inlet provided L (ft):	20		13		
Interception for length L (cfs):	2.99	—	3.43		
Efficiency for length L:	1.0	—	1.0		
Slotted drain or side opening flow-by (cfs):	0.00	—	0.00		

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

	Clogging factors:		80%	50%	67%	
Street or Intersection: Osborn and Navajo						
Return Period	10	10	10	10	10	10
HYDROLOGY COMPUTATION:						
Structure location or station (ft):	EN	EN	EN	SE	SE	SE
Average watershed width (ft):	1/2 Street Capacity	Curb Full Capacity	Inlet No. 1 Design	1/2 Street Capacity	Curb Full Capacity	Inlet No. 1 Design
Watershed length (ft):						
Contributing watershed area (acres):						
Composite Runoff Coefficient "C":	Max Depth =0.77	Design for curb full condition	HEC-1 proportional flow=49 cfs	Max Depth =0.65	Design for curb full condition	Runoff in north gutter exceeds half street capacity.
Precipitation intensity (in/hr):						
Time of Concentration Calculations:						
Length of longest flow path (miles)						
Slope of flow path (ft/mile)						
Roughness Coefficient- See Table 3.1, FCDMC Manual						
Kb Parameter						Expected flow =49-14.5=34.5 cfs which is greater than curb full capacity
Kb Parameter						
Time of Concentration (hrs)						
Subarea discharge Q (cfs):						
Previous by-pass flow (cfs):						
Discharge added by operator:						
Total discharge Q (cfs):	14.5	4.5	4.5	16.0	7.5	7.5
SHOULDER AND GUTTER CONFIGURATION:						
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0013	0.0013	0.0013	0.0026	0.0026	0.0026
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2
Inlet description:	None	None	P-1569	None	None	P-1569
Grate width:	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.039	0.039	0.039	0.030	0.030	0.030
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	22.0	22.0	22.0
Flooded Width from flowline (ft): before inlet	18.9	12.2	12.2	20.5	15.4	15.4
Depth at flowline (ft): before inlet	0.77	0.50	0.50	0.65	0.50	0.50
Water cross-area (sq.ft): before inlet	7.01	2.91	2.91	6.23	3.52	3.52
Velocity V for total discharge (fps): before inlet	2.07	1.55	1.55	2.57	2.13	2.13
Ratio of gutter depression flow to total Q (Eod):	19.3%	29.2%	29.2%	18.3%	24.2%	24.2%
Equivalent cross-slope (Se):	0.043	0.045	0.045	0.035	0.036	0.036
GRATE INLETS ON-GRADE:						
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:						
Length required for total interception (ft): w/clogging	—	—	11.9	—	—	20.4
Length of inlet provided L (ft):			20			20
Interception for length L (cfs):	—	—	4.5	—	—	6.4
Efficiency for length L:	—	—	100.0%	—	—	85.3%
Slotted drain or side opening flow-by (cfs):	—	—	0.0	—	—	1.1

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

	Clogging factors:		80%	50%	67%				
Street or Intersection: Osborn and Pinto									
Return Period	10	10	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:									
Structure location or station (ft):	WN	WN	WN	NW	NW	NW	NE	NE	NE
	1/2 Street	Max	Inlet No. 1	Curb Full	1/2 Street	Inlet No. 1	Curb Full	1/2 Street	Inlet No. 1
Average watershed width (ft):	Capacity	Spread	Design	Capacity	Capacity	Design	Capacity	Capacity	Design
Watershed length (ft):									
Contributing watershed area (acres):									
Composite Runoff Coefficient "C":	Max Depth	Maintain	HEC-1		Max Depth	Design for		Max Depth	Design for
Precipitation intensity (in/hr):	=0.65	6 feet dry	Proportional		=0.56	curb full		=0.56	curb full
Time of Concentration Calculations:		pavement	Flow			condition.			condition.
Length of longest flow path (miles)		each side.	Q=1.9 cfs						
Slope of flow path (ft/mile)						HEC-1			10-yr flow to
Roughness Coefficient- See Table 3.1, FCDMC Manual						Proportional			overtop
Kb Parameter						Flow			crown on
Kb Parameter						Q=49 cfs			Pinto from
Time of Concentration (hrs)									west.
Subarea discharge Q (cfs):									
Previous by-pass flow (cfs):									
Discharge added by operator:			1.9						
Total discharge Q (cfs):	**11.5**	**6.0**	**1.9**	**3.5**	**15.0**	**3.5**	**3.5**	**15.0**	**3.5**
SHOULDER AND GUTTER CONFIGURATION:									
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0010	0.0010	0.0010	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	1	1	1	1	1	1	1	1	1
Inlet description:	None	None	P-1569	None	None	P-1569	None	None	P-1569
Grate width:	0	0	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Width of gutter from flowline (ft):	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Gutter depression from horizontal (ft):	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Half Street Width at Inlet (ft):	21.0	21.0	21.0	17.0	17.0	17.0	17.0	17.0	
Flooded Width from flowline (ft): before inlet	**19.3**	**15.1**	**9.7**	**9.3**	**16.2**	**9.3**	**9.3**	**16.2**	**9.3**
Depth at flowline (ft): before inlet	0.65	0.52	0.34	0.33	0.56	0.33	0.33	0.56	0.33
Water cross-area (sq.ft): before inlet	6.68	4.10	1.72	1.60	4.79	1.60	1.60	4.79	1.60
Velocity V for total discharge (fps): before inlet	1.72	1.46	1.10	2.19	3.13	2.19	2.19	3.13	2.19
Ratio of gutter depression flow to total Q (Eod):	19.8%	21.6%	26.1%	26.8%	21.2%	26.8%	26.8%	21.2%	26.8%
Equivalent cross-slope (Se):	0.046	0.047	0.050	0.051	0.047	0.051	0.051	0.047	0.051
GRATE INLETS ON-GRADE:									
Ratio of grate frontal flow to total flow:	----	----	----	----	----	----	----	----	----
Inlet frontal flow in cfs (Qw):	----	----	----	----	----	----	----	----	----
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	----	----	----	----	----	----	----	----	----
Fraction of frontal flow intercepted (Rf):	----	----	----	----	----	----	----	----	----
Side flow in cfs (Qs):	----	----	----	----	----	----	----	----	----
Effective grate length w/clogging:	----	----	----	----	----	----	----	----	----
Fraction of side flow interception (Rs):	----	----	----	----	----	----	----	----	----
Grate Efficiency (E):	----	----	----	----	----	----	----	----	----
Total flow Intercepted (cfs):	----	----	----	----	----	----	----	----	----
Grate flow-by (cfs):	----	----	----	----	----	----	----	----	----
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:									
Length required for total interception (ft): w/clogging	----	----	7.1	----	----	13.9	----	----	13.9
Length of inlet provided L (ft):			20			20			20
Interception for length L (cfs):	----	----	1.9	----	----	3.5	----	----	3.5
Efficiency for length L:	----	----	100.0%	----	----	100.0%	----	----	100.0%
Slotted drain or side opening flow-by (cfs):	----	----	**0.0**	----	----	**0.0**	----	----	**0.0**

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

Clogging factors: 80% 50% 67%

Street or Intersection: Osborn and 68th

Return Period	10	10	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:									
Structure location or station (ft):	WN Max Spread	WN 1/2 Street Capacity	WN Inlet No. 1 Design	NW Curb Full Capacity	NW 1/2 Street Capacity	NW Inlet No. 1 Design	NE Curb Full Capacity	NE 1/2 Street Capacity	NE Inlet No. 1 Design
Average watershed width (ft):									
Watershed length (ft):									
Contributing watershed area (acres):									
Composite Runoff Coefficient "C":	Maintain 6 feet dry pavement each side.	Max Depth d=0.64	HEC-1 Proportional Flow Q=5.6 cfs		4-inch median curb. Estimate capacity to toe of median curb. Max Depth d=.75	Design for curb full condition. HEC-1 Proportional Flow Q=88 cfs		4-inch median curb. Estimate capacity to toe of median curb. Max Depth d=.74	Design for curb full condition. 10-yr flow to overtop crown on 68th from west.
Precipitation intensity (in/hr):									
Time of Concentration Calculations:									
Length of longest flow path (miles)									
Slope of flow path (ft/mile)									
Roughness Coefficient- See Table 3.1, FCDMC Manual									
Kb Parameter									
Kb Parameter									
Time of Concentration (hrs)									
Subarea discharge Q (cfs):									
Previous by-pass flow (cfs):									
Discharge added by operator:			5.6						
Total discharge Q (cfs):	10.0	23.0	5.6	4.0	42.0	4.0	3.5	33.0	3.5
SHOULDER AND GUTTER CONFIGURATION:									
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0039	0.0039	0.0039	0.0031	0.0031	0.0031	0.0035	0.0035	0.0035
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	1	1	1	1	1	1	1	1	1
Inlet description:	None	None	P-1569	None	None	P-1569	None	None	P-1569
Grate width:	0	0	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.029	0.029	0.029	0.021	0.021	0.021	0.029	0.029	0.029
Width of gutter from flowline (ft):	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Gutter depression from horizontal (ft):	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Half Street Width at Inlet (ft):	22.0	22.0	22.0	35.0	35.0	35.0	26.0	26.0	26.0
Flooded Width from flowline (ft): before inlet	15.2	20.9	12.2	13.8	33.5	13.8	10.6	24.7	10.6
Depth at flowline (ft): before inlet	0.47	0.64	0.39	0.33	0.75	0.33	0.33	0.74	0.33
Water cross-area (sq.ft): before inlet	3.71	6.95	2.40	2.20	12.90	2.20	1.76	9.54	1.76
Velocity V for total discharge (fps): before inlet	2.70	3.31	2.34	1.82	3.26	1.82	1.99	3.46	1.99
Ratio of gutter depression flow to total Q (Eod):	20.6%	18.3%	22.7%	19.4%	13.3%	19.4%	24.2%	17.1%	24.2%
Equivalent cross-slope (Se):	0.044	0.042	0.045	0.037	0.032	0.037	0.046	0.041	0.046
GRATE INLETS ON-GRADE:									
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:									
Length required for total interception (ft): w/clogging	—	—	18.0	—	—	16.5	—	—	14.2
Length of inlet provided L (ft):			20			20			20
Interception for length L (cfs):	—	—	5.6	—	—	4.0	—	—	3.5
Efficiency for length L:	—	—	100.0%	—	—	100.0%	—	—	100.0%
Slotted drain or side opening flow-by (cfs):	—	—	0.0	—	—	0.0	—	—	0.0
INTERCEPTION CAPACITY OF INLETS IN SAG LOCATION:									

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

	Clogging factors:		80%	50%	67%				
Street or Intersection: Osborn and Supal									
Return Period	10	10	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:									
Structure location or station (ft):	WN	WN	WN	WN	NW	NW	NW	NE	NE
	Max	1/2 Street	Inlet No. 1	Inlet No. 2	Curb Full	1/2 Street	Inlet No. 1	Curb Full	1/2 Street
Average watershed width (ft):	Spread	Capacity	Design	Design	Capacity	Capacity	Design	Capacity	Capacity
Watershed length (ft):									
Contributing watershed area (acres):									
Composite Runoff Coefficient "C":	Maintain	Max Depth	HEC-1	Inlet		Max Depth	Design for		Max Depth
Precipitation intensity (in/hr):	6 feet dry	d=0.53	Proportional	No. 1		d=0.52	curb full		d=0.61
Time of Concentration Calculations:	pavement		Flow	bypass			condition.		
Length of longest flow path (miles)	each side		Q=11 cfs						
Slope of flow path (ft/mile)			plus bypass				HEC-1		
Roughness Coefficient- See Table 3.1, FCDMC Manual			from 68th				Proportional		
Kb Parameter							Flow		
Kb Parameter							Q=43 cfs		
Time of Concentration (hrs)									
Subarea discharge Q (cfs):									
Previous by-pass flow (cfs):			0.0	4.5					
Discharge added by operator:			11.0						
Total discharge Q (cfs):	**14.0**	**17.0**	**11.0**	**4.5**	**2.6**	**9.5**	**2.6**	**2.3**	**12.5**
SHOULDER AND GUTTER CONFIGURATION:									
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0036	0.0036	0.0036	0.0036	0.0028	0.0028	0.0028	0.0025	0.0025
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	1	1	1	1	1
Inlet description:	None	None	P-1569	P-1569	None	None	P-1569	None	None
Grate width:	0	0	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.017	0.017	0.017	0.017	0.035	0.035	0.035	0.041	0.041
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	0.42	0.42	0.42	0.42	0.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.042	0.042	0.042	0.042	0.042
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.100	0.100	0.100	0.100	0.100
Half Street Width at Inlet (ft):	32.0	32.0	32.0	32.0	15.0	15.0	15.0	15.0	15.0
Flooded Width from flowline (ft): before inlet	**25.8**	**27.8**	**23.6**	**16.7**	**8.6**	**14.1**	**8.6**	**7.5**	**14.4**
Depth at flowline (ft): before inlet	0.50	0.53	0.46	0.34	0.33	0.52	0.33	0.33	0.61
Water cross-area (sq.ft): before inlet	5.72	6.62	4.77	2.41	1.45	3.86	1.45	1.33	4.75
Velocity V for total discharge (fps): before inlet	2.45	2.57	2.31	1.85	1.79	2.46	1.79	1.73	2.63
Ratio of gutter depression flow to total Q (Eod):	15.4%	14.3%	16.9%	24.2%	28.2%	22.8%	28.2%	31.3%	24.2%
Equivalent cross-slope (Se):	0.023	0.023	0.024	0.027	0.053	0.050	0.053	0.059	0.055
GRATE INLETS ON-GRADE:									
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:									
Length required for total interception (ft): w/clogging	—	—	34.0	21.7	—	—	10.7	—	—
Length of inlet provided L (ft):			20	20			20		
Interception for length L (cfs):	—	—	6.5	3.7	—	—	2.6	—	—
Efficiency for length L:	—	—	59.4%	82.3%	—	—	100.0%	—	—
Slotted drain or side opening flow-by (cfs):	—	—	**4.5**	**0.8**	—	—	**0.0**	—	—

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: Osborn and Supal

Return Period	10	10
HYDROLOGY COMPUTATION:		
Structure location or station (ft):	NE Inlet No. 1	ES 1/2 Street
Average watershed width (ft):	Design	Flow
Watershed length (ft):		
Contributing watershed area (acres):		0.37
Composite Runoff Coefficient "C":	Design for	0.95
Precipitation intensity (in/hr):	curb full	3.80
Time of Concentration Calculations:	condition.	
Length of longest flow path (miles)		0.10
Slope of flow path (ft/mile)	10-yr flow to	20.7
Roughness Coefficient- See Table 3.1, FCDMC Manual	overtop	0.0428
Kb Parameter	crown on	-0.0065
Kb Parameter	Supai from	0.04
Time of Concentration (hrs)	west.	0.16
Subarea discharge Q (cfs):		1.4
Previous by-pass flow (cfs):		0.0
Discharge added by operator:		---
Total discharge Q (cfs):	2.3	1.4
SHOULDER AND GUTTER CONFIGURATION:		**No Inlet Needed**
Manning's n:	0.016	0.016
Longitudinal slope S (ft/ft):	0.0025	0.0041
Inlet type (1=grate, 2=side opening or slotted):	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1
Gutter Configuration (1=roll, 2=vertical):	1	2
Inlet description:	P-1569	None
Grate width:	0	0
Grate length:	0.0	0.0
Pavement cross-slope (Sx):	0.041	0.007
Width of gutter from flowline (ft):	0.42	1.42
Gutter depression from horizontal (ft):	0.042	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.100	0.058
Half Street Width at Inlet (ft):	15.0	32.0
Flooded Width from flowline (ft): before inlet	7.5	18.3
Depth at flowline (ft): before inlet	0.33	0.19
Water cross-area (sq.ft): before inlet	1.33	1.16
Velocity V for total discharge (fps): before inlet	1.73	1.17
Ratio of gutter depression flow to total Q (Eod):	31.3%	27.9%
Equivalent cross-slope (Se):	0.059	0.021
GRATE INLETS ON-GRADE:		
Ratio of grate frontal flow to total flow:	-----	-----
Inlet frontal flow in cfs (Qw):	-----	-----
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	-----	-----
Fraction of frontal flow intercepted (Rf):	-----	-----
Side flow in cfs (Qs):	-----	-----
Effective grate length w/clogging:	-----	-----
Fraction of side flow interception (Rs):	-----	-----
Grate Efficiency (E):	-----	-----
Total flow intercepted (cfs):	-----	-----
Grate flow-by (cfs):	-----	-----
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:		
Length required for total interception (ft): w/clogging	9.2	----
Length of inlet provided L (ft):	20	
Interception for length L (cfs):	2.3	-----
Efficiency for length L:	100.0%	-----
Slotted drain or side opening flow-by (cfs):	0.0	-----

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

Street or Intersection: Osborn and 70th

		Clogging factors:	80%	50%	67%				
Return Period	10	10	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:									
Structure location or station (ft):	WN	WN	WN	WN	WS	NW	NW	NW	NE
	Max	1/2 Street	Check Exst.	Inlet No. 1	1/2 Street	Curb Full	1/2 Street	Inlet No. 1	Curb Full
Average watershed width (ft):	Spread	Capacity	Inlet	Design	Flow	Capacity	Capacity	Design	Capacity
Watershed length (ft):									
Contributing watershed area (acres):					0.92				
Composite Runoff Coefficient "C":	Maintain	Max Depth		Design for	0.95		Max Depth	Design for	
Precipitation intensity (in/hr):	6 feet dry	d=0.46		max spread	3.80		d=0.64	curb full	
Time of Concentration Calculations:	pavement			condition.				condition.	
Length of longest flow path (miles)	each side.				0.24				
Slope of flow path (ft/mile)					23.7			HEC-1	
Roughness Coefficient- See Table 3.1, FCDMC Manual			HEC-1	HEC-1	0.0402			Proportional	
Kb Parameter			proportional	proportional	-0.0065			Flow	
Kb Parameter			flow=2.8 cfs	flow=2.8 cfs	0.04			Q=71 cfs	
Time of Concentration (hrs)			plus bypass	plus bypass	0.24				
Subarea discharge Q (cfs):			from Supai	from Supai	3.3				
Previous by-pass flow (cfs):			0.8	—	0.0				
Discharge added by operator:			2.8	2.8	—				
Total discharge Q (cfs):	11.5	13.0	3.6	2.8	3.3	8.0	16.0	8.0	8.4
			Inadequate		**No inlet**				
SHOULDER AND GUTTER CONFIGURATION:			**Collection**		**Needed**				
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0040	0.0040	0.0040	0.0040	0.0042	0.0032	0.0032	0.0032	0.0032
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2	2	2
Inlet description:	None	None	P-1569	P-1569	None	None	None	P-1569	None
Grate width:	0	0	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.014	0.014	0.014	0.014	0.038	0.032	0.032	0.032	0.031
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	32.0	32.0	32.0	32.0	32.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	26.1	27.3	16.7	15.1	8.8	14.4	18.7	14.4	15.0
Depth at flowline (ft): before inlet	0.44	0.46	0.30	0.28	0.36	0.50	0.64	0.50	0.50
Water cross-area (sq.ft): before inlet	4.94	5.41	2.04	1.69	1.49	3.35	5.65	3.35	3.50
Velocity V for total discharge (fps): before inlet	2.33	2.40	1.76	1.66	2.22	2.39	2.83	2.39	2.40
Ratio of gutter depression flow to total Q (Eod):	15.6%	14.9%	25.0%	27.7%	39.3%	25.5%	19.8%	25.5%	24.7%
Equivalent cross-slope (Se):	0.021	0.021	0.025	0.027	0.046	0.039	0.037	0.039	0.038
GRATE INLETS ON-GRADE:									
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:									
Length required for total interception (ft): w/clogging	—	—	21.2	18.6	—	—	—	21.6	—
Length of inlet provided L (ft):			8	20				20	
Interception for length L (cfs):	—	—	1.5	2.8	—	—	—	6.6	—
Efficiency for length L:	—	—	40.8%	100.0%	—	—	—	82.6%	—
Slotted drain or side opening flow-by (cfs):	—	—	2.1	0.0	—	—	—	1.4	—

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: Osborn and 70th

Return Period	10	10
HYDROLOGY COMPUTATION:		
Structure location or station (ft):	NE	NE
	1/2 Street	Inlet No. 1
Average watershed width (ft):	Capacity	Design
Watershed length (ft):		
Contributing watershed area (acres):		
Composite Runoff Coefficient "C":	Max Depth	Design for
Precipitation intensity (in/hr):	d=0.62	curb full
Time of Concentration Calculations:		condition.
Length of longest flow path (miles)		
Slope of flow path (ft/mile)		10-yr flow to
Roughness Coefficient- See Table 3.1, FCDMC Manual		overtop
Kb Parameter		crown on
Kb Parameter		70th from
Time of Concentration (hrs)		west.
Subarea discharge Q (cfs):		
Previous by-pass flow (cfs):		
Discharge added by operator:		
Total discharge Q (cfs):	**15.0**	**8.4**
SHOULDER AND GUTTER CONFIGURATION:		
Manning's n:	0.016	0.016
Longitudinal slope S (ft/ft):	0.0032	0.0032
Inlet type (1=grate, 2=side opening or slotted):	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2
Inlet description:	None	P-1569
Grate width:	0	0
Grate length:	0.0	0.0
Pavement cross-slope (Sx):	0.031	0.031
Width of gutter from flowline (ft):	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0
Flooded Width from flowline (ft): before inlet	**18.7**	**15.0**
Depth at flowline (ft): before inlet	0.62	0.50
Water cross-area (sq.ft): before inlet	5.42	3.50
Velocity V for total discharge (fps): before inlet	2.77	2.40
Ratio of gutter depression flow to total Q (Eod):	19.9%	24.7%
Equivalent cross-slope (Se):	0.036	0.038
GRATE INLETS ON-GRADE:		
Ratio of grate frontal flow to total flow:	—	—
Inlet frontal flow in cfs (Qw):	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—
Fraction of frontal flow intercepted (Rf):	—	—
Side flow in cfs (Qs):	—	—
Effective grate length w/clogging:	—	—
Fraction of side flow interception (Rs):	—	—
Grate Efficiency (E):	—	—
Total flow Intercepted (cfs):	—	—
Grate flow-by (cfs):	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:		
Length required for total interception (ft): w/clogging	—	22.3
Length of inlet provided L (ft):		20
Interception for length L (cfs):	—	6.8
Efficiency for length L:	—	80.8%
Slotted drain or side opening flow-by (cfs):	—	**1.6**

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

	Clogging factors:		80%	50%	67%		
Street or Intersection: Osborn and 71st							
Return Period	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:							
Structure location or station (ft):	WN	WN	WN	WN	WN	WS	WS
	Max	1/2 Street	Inlet No. 1	Inlet No. 1	Inlet No. 2	1/2 Street	Inlet No. 1
Average watershed width (ft):	Spread	Capacity	Design	Design	Design	Flow	Design
Watershed length (ft):				(300' west)	(at 71st St)		
Contributing watershed area (acres):						0.48	
Composite Runoff Coefficient "C":	Maintain	Max Depth	Design for	Design for	Design for	0.95	Check
Precipitation intensity (in/hr):	12 feet dry	d=0.70	max spread	max spread	max spread	4.80	existing
Time of Concentration Calculations:	pavement		condition.	condition.	condition.		inlet:
Length of longest flow path (miles)	each side.					0.13	
Slope of flow path (ft/mile)			HEC-1	Half HEC-1	Half HEC-1	25.9	
Roughness Coefficient- See Table 3.1, FCDMC Manual			Proportional	Proportional	Proportional	0.0421	
Kb Parameter			Flow	Flow	Flow	-0.0065	
Kb Parameter			Q=12 cfs	Q=6 cfs	Q=6 cfs	0.04	
Time of Concentration (hrs)			plus bypass	plus bypass	plus bypass	0.16	
Subarea discharge Q (cfs):			from 70th	from 70th	from Inlet 1	2.2	
Previous by-pass flow (cfs):			0.6	0.6	1.7	0.0	
Discharge added by operator:			12.0	6.0	12.0	---	
Total discharge Q (cfs):	9.5	26.0	12.6	6.6	13.7	2.2	2.2
			Spread			**No Inlet**	
SHOULDER AND GUTTER CONFIGURATION:			**Exceeded**			**Needed**	
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0026	0.0026	0.0026	0.0034	0.0026	0.0047	0.0047
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2
Inlet description:	None	None	None	P-1569	P-1569	None	P-1568
Grate width:	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.022	0.022	0.022	0.018	0.022	0.021	0.021
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Flooded Width from flowline (ft): before inlet	20.3	29.7	22.5	19.0	23.3	10.6	10.7
Depth at flowline (ft): before inlet	0.50	0.70	0.55	0.40	0.56	0.27	0.27
Water cross-area (sq.ft): before inlet	4.53	9.67	5.60	3.27	5.98	1.20	1.21
Velocity V for total discharge (fps): before inlet	2.10	2.69	2.25	2.02	2.30	1.81	1.82
Ratio of gutter depression flow to total Q (Eod):	19.1%	13.0%	17.2%	20.9%	16.6%	36.6%	36.4%
Equivalent cross-slope (Se):	0.029	0.027	0.028	0.026	0.028	0.034	0.034
GRATE INLETS ON-GRADE:							
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:							
Length required for total interception (ft): w/clogging	—	—	—	25.5	30.9	—	15.1
Length of inlet provided L (ft):				20	20		8
Interception for length L (cfs):	—	—	—	4.9	8.8	—	1.2
Efficiency for length L:	—	—	—	73.8%	64.1%	—	54.5%
Slotted drain or side opening flow-by (cfs):	—	—	—	1.7	4.9	—	1.0
							OK

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

		Clogging factors:	80%	50%	67%	
Street or Intersection: 71st- Osborn to Earll						
Return Period	10	10	10	10	10	10
HYDROLOGY COMPUTATION:						
Structure location or station (ft):	Church (W) 1/2 Street	Church (W) Max	Church (W) Inlet No. 1	Church (W) Inlet No. 2	Church (E) 1/2 Street	Church (E) Max
Average watershed width (ft):	Capacity	Spread	Design	Design	Capacity	Spread
Watershed length (ft):						
Contributing watershed area (acres):						
Composite Runoff Coefficient "C":	Top	Maintain	HEC-1	Flow intercepted	Top	Maintain
Precipitation intensity (in/hr):	of	6 feet dry	proportional	by Inlet No. 1 is	of	6 feet dry
Time of Concentration Calculations:	curb	pavement	flow=22 cfs.	average of	curb	pavement
Length of longest flow path (miles)	above	each side	Bypass from WS	interceptions	above	each side
Slope of flow path (ft/mile)	crown.		on Osborn.	calculated for	crown.	
Roughness Coefficient- See Table 3.1, FCDMC Manual	Spreadsheet		Divide flow in	Inlet No. 1 and	Spreadsheet	
Kb Parameter	invalid		gutters by sub-	1/2 Street capacity.	invalid	
Kb Parameter	above		tracting gutter	Qin=(5.5+7.6)/2=6.6	above	
Time of Concentration (hrs)	depth=0.43		capacities and	Bypass	depth=0.39	
Subarea discharge Q (cfs):			splitting excess 50/50	=12.5-6.6=5.9 cfs		
Previous by-pass flow (cfs):			1.0			
Discharge added by operator:			22.0			
Total discharge Q (cfs):	7.5	4.2	12.5	5.9	5.5	3.4
SHOULDER AND GUTTER CONFIGURATION:						
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0037	0.0037	0.0037	0.0037	0.0032	0.0032
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2
Inlet description:	None	None	P-1569	P-1569	None	None
Grate width:	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.022	0.022	0.022	0.022	0.020	0.020
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	17.5	14.0	21.3	16.0	17.0	14.1
Depth at flowline (ft): before inlet	0.43	0.35	0.51	0.40	0.39	0.33
Water cross-area (sq.ft): before inlet	3.33	2.15	4.90	2.78	2.85	1.98
Velocity V for total discharge (fps): before inlet	2.25	1.96	2.55	2.12	1.93	1.72
Ratio of gutter depression flow to total Q (Eod):	22.2%	27.7%	18.2%	24.3%	23.2%	28.0%
Equivalent cross-slope (Se):	0.030	0.032	0.028	0.030	0.029	0.030
GRATE INLETS ON-GRADE:						
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:						
Length required for total interception (ft): w/clogging	25.7	—	32.8	22.9	22.1	—
Length of inlet provided L (ft):	20		20	20	20	
Interception for length L (cfs):	5.5	—	7.6	4.7	4.5	—
Efficiency for length L:	73.4%	—	61.1%	79.5%	81.3%	—
Slotted drain or side opening flow-by (cfs):	2.0	—	4.9	1.2	1.0	—

Spreadsheet configured to calculate flow depths associated with a given flow in a street with a triangular cross section. Depth of flow calculated for actual flow in 1/2 street cross section is slightly deeper than would be expected from the true full street cross section. Assume intercepted flow is average of 1/2 street capacity and amount intercepted in full design flow calculation.

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: 71st- Osborn to Earll

Return Period	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:							
Structure location or station (ft):	Church (E) Inlet No. 1	Church (E) Inlet No. 2	Sml Apts. (W) 1/2 Street	Sml Apts. (W) Max	Sml Apts. (W) Inlet No. 1	Lrg Apts. (NW) 1/2 Street	Lrg Apts. (NW) Max
Average watershed width (ft):	Design	Design	Capacity	Spread	Design	Capacity	Spread
Watershed length (ft):							
Contributing watershed area (acres):							
Composite Runoff Coefficient "C":	Street	Flow intercepted	Top	Maintain	HEC-1	Top	Maintain
Precipitation intensity (in/hr):	capacity	by Inlet No. 1 is	of	6 feet dry	proportional	of	6 feet dry
Time of Concentration Calculations:	13 cfs	average of	curb	pavement	flow=5.7 cfs	curb	pavement
Length of longest flow path (miles)	to crown	4.5 and 6.8	above	each side	and bypass	above	each side
Slope of flow path (ft/mile)	use inlets	or 5.7 cfs.	crown.		2nd Church	crown.	
Roughness Coefficient- See Table 3.1, FCDMC Manual	both sides	Bypass is	Spreadsheet		inlet (west).	Spreadsheet	
Kb Parameter	of street.	10.5-5.7=4.8	invalid		Flow close	invalid	
Kb Parameter	12.5 cfs west,		above		to 1/2 street	above	
Time of Concentration (hrs)	10.5 cfs east		depth=0.36		capacity.	depth=0.33	
Subarea discharge Q (cfs):							
Previous by-pass flow (cfs):					1.2		
Discharge added by operator:					5.7		
Total discharge Q (cfs):	**10.5**	**4.8**	**6.2**	**4.0**	**6.9**	**3.5**	**2.3**
SHOULDER AND GUTTER CONFIGURATION:							
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0032	0.0032	0.0059	0.0059	0.0059	0.0026	0.0026
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2
Inlet description:	P-1569	P-1569	None	None	P-1569	None	None
Grate width:	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.020	0.020	0.018	0.018	0.018	0.017	0.017
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	**21.7**	**16.1**	**16.6**	**14.0**	**17.3**	**16.5**	**14.0**
Depth at flowline (ft): before inlet	0.48	0.37	0.36	0.31	0.37	0.33	0.29
Water cross-area (sq.ft): before inlet	4.65	2.57	2.53	1.81	2.74	2.28	1.66
Velocity V for total discharge (fps): before inlet	2.26	1.87	2.45	2.21	2.52	1.53	1.39
Ratio of gutter depression flow to total Q (Eod):	18.1%	24.5%	24.0%	28.6%	23.0%	24.6%	29.1%
Equivalent cross-slope (Se):	0.027	0.029	0.028	0.030	0.027	0.027	0.029
GRATE INLETS ON-GRADE:							
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:							
Length required for total interception (ft): w/clogging	30.3	20.7	28.4	—	30.0	17.8	—
Length of inlet provided L (ft):	20	20	20		20	20	
Interception for length L (cfs):	6.8	4.1	4.2	—	4.5	3.5	—
Efficiency for length L:	65.0%	84.7%	68.2%	—	65.5%	100.0%	—
Slotted drain or side opening flow-by (cfs):	**3.7**	**0.7**	**2.0**	—	**2.4**	**0.0**	—
					Bypass OK for spread.		

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: 71st- Osborn to Earll

Return Period	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:							
Structure location or station (ft):	Lrg Apts. (NW) Inlet No. 1	Lrg Apts. (NW) Inlet No. 2	Lrg Apts. (NE) 1/2 Street	Lrg Apts. (NE) Max	Lrg Apts. (NE) Inlet No. 1	Lrg Apts. (NE) Inlet No. 2	Lrg Apts. (WN) 1/2 Street
Average watershed width (ft):	Design	Design	Capacity	Spread	Design	Design	Capacity
Watershed length (ft):							
Contributing watershed area (acres):							
Composite Runoff Coefficient "C":	HEC-1	Flow intercepted	Top	Maintain	Flow from	Flow intercepted	Max Depth
Precipitation intensity (in/hr):	Proportional	by Inlet No. 1 is	of	6 feet dry	west gutter=	by Inlet No. 1 is	d=0.56
Time of Concentration Calculations:	flow=23 cfs	average of	curb	pavement	(25.4-7.5-3.5)/2	average of	
Length of longest flow path (miles)	and bypass	3.5 and 6.8	above	each side	plus 7.5=14.7 cfs	6.2 and 9.8	
Slope of flow path (ft/mile)	from Sml Apt.	or 5.2 cfs.	crown.			or 8.0 cfs.	
Roughness Coefficient- See Table 3.1, FCDMC Manual	Divide flow in	Bypass is	Spreadsheet			Bypass is	
Kb Parameter	gutters by sub-	10.7-5.2=4.5	invalid			14.7-8.0=6.7	
Kb Parameter	tracting both gutter		above				
Time of Concentration (hrs)	capacities and		depth=0.48				
Subarea discharge Q (cfs):	splitting excess 50/50						
Previous by-pass flow (cfs):	2.4						
Discharge added by operator:	23.0				14.7		
Total discharge Q (cfs):	**10.7**	**4.5**	**7.5**	**3.3**	**14.7**	**6.7**	**13.0**
SHOULDER AND GUTTER CONFIGURATION:							
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0026	0.0026	0.0020	0.0020	0.0020	0.0020	0.0036
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2
Inlet description:	P-1569	P-1569	None	None	P-1569	P-1569	None
Grate width:	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.017	0.017	0.023	0.023	0.023	0.023	0.028
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	**25.3**	**18.2**	**19.1**	**14.0**	**24.7**	**18.3**	**18.4**
Depth at flowline (ft): before inlet	0.48	0.36	0.48	0.37	0.61	0.46	0.56
Water cross-area (sq.ft): before inlet	5.32	2.76	4.16	2.23	6.90	3.82	4.78
Velocity V for total discharge (fps): before inlet	2.01	1.63	1.80	1.48	2.13	1.76	2.72
Ratio of gutter depression flow to total Q (Eod):	15.8%	22.3%	20.2%	27.6%	15.6%	21.1%	20.4%
Equivalent cross-slope (Se):	0.023	0.026	0.030	0.032	0.028	0.030	0.034
GRATE INLETS ON-GRADE:							
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:							
Length required for total interception (ft): w/clogging	31.2	20.3	21.4	—	29.3	20.2	29.5
Length of inlet provided L (ft):	20	20	20		20	20	20
Interception for length L (cfs):	6.8	3.9	6.2	—	9.8	5.8	8.6
Efficiency for length L:	63.6%	85.7%	83.1%	—	66.7%	85.8%	66.4%
Slotted drain or side opening flow-by (cfs):	**3.9**	**0.6**	**1.3**	—	**4.9**	**0.9**	**4.4**

Spreadsheet configured to calculate flow depths associated with a given flow in a street with a triangular cross section. Depth of flow calculated for actual flow in 1/2 street cross section is slightly deeper than would be expected from the true full street cross section. Assume intercepted flow is average of 1/2 street capacity and amount intercepted in full design flow calculation.

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: 71st- Osborn to Earll

Return Period	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:							
Structure location or station (ft):	Lrg Apts. (WN) Max Spread	Lrg Apts. (WN) Inlet No. 1 Design	Lrg Apts. (S) 1/2 Street Capacity	Lrg Apts. (S) 1/2 Street Flow	Lrg Apts. (S) Max Spread	Lrg Apts. (S) Inlet No. 1 Design	71st & Earll (EN) Inlet No. 1 Design
Average watershed width (ft):							
Watershed length (ft):							
Contributing watershed area (acres):				0.30			
Composite Runoff Coefficient "C":	Maintain 6 feet dry pavement each side	HEC-1 proportional flow=23 cfs	Max Depth d=0.52	0.95	Maintain 6 feet dry pavement each side	10 cfs from WN gutter plus street flow 10+1.4=11.4 cfs	Flow is bypass from WN, NW and NE
Precipitation intensity (in/hr):				4.80			
Time of Concentration Calculations:							
Length of longest flow path (miles)				0.13			
Slope of flow path (ft/mile)		10 cfs to cross crown to south.		26.8			
Roughness Coefficient- See Table 3.1, FCDMC Manual				0.0434			
Kb Parameter				-0.0065			
Kb Parameter				0.04			
Time of Concentration (hrs)				0.16			
Subarea discharge Q (cfs):				1.4			
Previous by-pass flow (cfs):				0.0			6.0
Discharge added by operator:		23.0		---			
Total discharge Q (cfs):	**6.5**	**13.0**	**11.5**	**1.4**	**6.5**	**11.4**	**6.0**
SHOULDER AND GUTTER CONFIGURATION:							
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0037
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2
Inlet description:	None	P-1569	None	None	None	P-1569	P-1569
Grate width:	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.028	0.028	0.026	0.026	0.026	0.026	0.031
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	**14.1**	**18.4**	**18.6**	**8.2**	**15.0**	**18.6**	**12.8**
Depth at flowline (ft): before inlet	0.44	0.56	0.52	0.25	0.43	0.52	0.44
Water cross-area (sq.ft): before inlet	2.83	4.78	4.46	0.88	2.90	4.43	2.56
Velocity V for total discharge (fps): before inlet	2.30	2.72	2.58	1.54	2.24	2.57	2.33
Ratio of gutter depression flow to total Q (Eod):	26.4%	20.4%	20.4%	44.8%	25.3%	20.5%	28.7%
Equivalent cross-slope (Se):	0.036	0.034	0.032	0.040	0.034	0.032	0.039
GRATE INLETS ON-GRADE:							
Ratio of grate frontal flow to total flow:	---	---	---	---	---	---	---
Inlet frontal flow in cfs (Qw):	---	---	---	---	---	---	---
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	---	---	---	---	---	---	---
Fraction of frontal flow intercepted (Rf):	---	---	---	---	---	---	---
Side flow in cfs (Qs):	---	---	---	---	---	---	---
Effective grate length w/clogging:	---	---	---	---	---	---	---
Fraction of side flow interception (Rs):	---	---	---	---	---	---	---
Grate Efficiency (E):	---	---	---	---	---	---	---
Total flow intercepted (cfs):	---	---	---	---	---	---	---
Grate flow-by (cfs):	---	---	---	---	---	---	---
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:							
Length required for total interception (ft): w/clogging	---	29.5	29.1	10.4	---	28.9	19.9
Length of inlet provided L (ft):		20	20	20		20	20
Interception for length L (cfs):	---	8.6	7.7	1.4	---	7.7	6.0
Efficiency for length L:	---	66.4%	67.2%	100.0%	---	67.4%	100.0%
Slotted drain or side opening flow-by (cfs):	---	**4.4**	**3.8**	**0.0**	---	**3.7**	**0.0**
		Bypass OK for spread.				Bypass OK for spread.	Bypass OK for spread.

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: 71st- Osborn to Earll

Return Period	10	10	10	10	10
HYDROLOGY COMPUTATION:					
Structure location or station (ft):	Earll & Scottsdale(WN) Spread Check	Earll & Scottsdale(WN) Inlet No. 1 Design (300' west)	Earll & Scottsdale(WN) Inlet No. 2 Design (at Scottsdale)	Earll & Scottsdale(WS) Spread Check @ Scottsdale Rd.	Earll & Scottsdale(WS)! Inlet No. 1 Design
Average watershed width (ft):					
Watershed length (ft):					
Contributing watershed area (acres):				**0.29**	
Composite Runoff Coefficient "C":	Flow is	Flow is	Flow is	0.95	Flow is
Precipitation intensity (in/hr):	bypass	bypass	bypass	4.20	bypass
Time of Concentration Calculations:	from	from	from		from
Length of longest flow path (miles)	71st and Earll (EN)	71st and Earll (EN)	Inlet No. 1	0.12	south inlet at 71st St
Slope of flow path (ft/mile)	and HEC-1	and 1/2 HEC-1	and 1/2 HEC-1	18.0	and 1/2 Rational
Roughness Coefficient- See Table 3.1, FCDMC Manual	proportional	proportional	proportional	0.0435	flow
Kb Parameter	flow = 5.2 cfs	flow = 2.6 cfs		-0.0065	
Kb Parameter		Locate catch basin		0.04	Locate catch basin
Time of Concentration (hrs)		300' west of		0.19	300' west of
Subarea discharge Q (cfs):		Scottsdale Rd.		1.2	Scottsdale Rd.
Previous by-pass flow (cfs):	0.0	----	0.0	3.7	3.7
Discharge added by operator:	5.2	2.6	2.6	---	0.6
Total discharge Q (cfs):	**5.2**	**2.6**	**2.6**	**4.9**	**4.3**
SHOULDER AND GUTTER CONFIGURATION:	**Spread Exceeded**			**Spread Exceeded**	
Manning's n:	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0022	0.0023	0.0022	0.0033	0.0029
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2
Inlet description:	None	P-1569	P-1569	None	P-1569
Grate width:	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.017	0.027	0.017	0.020	0.023
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	**19.5**	**11.2**	**14.9**	**15.9**	**14.4**
Depth at flowline (ft): before inlet	0.39	0.34	0.31	0.37	0.38
Water cross-area (sq.ft): before inlet	3.26	1.70	1.92	2.56	2.37
Velocity V for total discharge (fps): before inlet	1.60	1.53	1.35	1.91	1.81
Ratio of gutter depression flow to total Q (Eod):	20.7%	33.2%	27.2%	24.8%	26.7%
Equivalent cross-slope (Se):	0.026	0.037	0.028	0.030	0.032
GRATE INLETS ON-GRADE:					
Ratio of grate frontal flow to total flow:	---	---	---	---	---
Inlet frontal flow in cfs (Qw):	---	---	---	---	---
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	---	---	---	---	---
Fraction of frontal flow intercepted (Rf):	---	---	---	---	---
Side flow in cfs (Qs):	---	---	---	---	---
Effective grate length w/clogging:	---	---	---	---	---
Fraction of side flow interception (Rs):	---	---	---	---	---
Grate Efficiency (E):	---	---	---	---	---
Total flow intercepted (cfs):	---	---	---	---	---
Grate flow-by (cfs):	---	---	---	---	---
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:					
Length required for total interception (ft): w/clogging	---	12.5	14.5	---	18.0
Length of inlet provided L (ft):		13	13		13
Interception for length L (cfs):	---	2.6	2.1	---	3.0
Efficiency for length L:	---	100.0%	80.8%	---	69.5%
Slotted drain or side opening flow-by (cfs):	---	**0.0**	**0.5**	---	**1.3**

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: 71st- Osborn to Earll

Return Period	10
HYDROLOGY COMPUTATION:	
Structure location or station (ft):	Earll & Scottsdale(WS) Inlet No. 2
Average watershed width (ft):	Design
Watershed length (ft):	
Contributing watershed area (acres):	
Composite Runoff Coefficient "C":	
Precipitation intensity (in/hr):	
Time of Concentration Calculations:	
Length of longest flow path (miles)	
Slope of flow path (ft/mile)	
Roughness Coefficient- See Table 3.1, FCDMC Manual	
Kb Parameter	
Kb Parameter	Locate catch basin
Time of Concentration (hrs)	at
Subarea discharge Q (cfs):	Scottsdale Rd.
Previous by-pass flow (cfs):	1.3
Discharge added by operator:	---
Total discharge Q (cfs):	**1.3**
SHOULDER AND GUTTER CONFIGURATION:	
Manning's n:	0.016
Longitudinal slope S (ft/ft):	0.0033
Inlet type (1=grate, 2=side opening or slotted):	2
Longitudinal profile (1=on-grade, 2=sag):	1
Gutter Configuration (1=roll, 2=vertical):	2
Inlet description:	P-1569
Grate width:	0
Grate length:	0.0
Pavement cross-slope (Sx):	0.020
Width of gutter from flowline (ft):	1.42
Gutter depression from horizontal (ft):	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058
Half Street Width at Inlet (ft):	20.0
Flooded Width from flowline (ft): before inlet	**9.5**
Depth at flowline (ft): before inlet	0.24
Water cross-area (sq.ft): before inlet	0.94
Velocity V for total discharge (fps): before inlet	1.40
Ratio of gutter depression flow to total Q (Eod):	41.0%
Equivalent cross-slope (Se):	0.036
GRATE INLETS ON-GRADE:	
Ratio of grate frontal flow to total flow:	—
Inlet frontal flow in cfs (Qw):	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—
Fraction of frontal flow intercepted (Rf):	—
Side flow in cfs (Qs):	—
Effective grate length w/clogging:	—
Fraction of side flow interception (Rs):	—
Grate Efficiency (E):	—
Total flow intercepted (cfs):	—
Grate flow-by (cfs):	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:	
Length required for total interception (ft): w/clogging	10.7
Length of inlet provided L (ft):	6
Interception for length L (cfs):	0.8
Efficiency for length L:	57.2%
Slotted drain or side opening flow-by (cfs):	**0.6**

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

Clogging factors: 80% 50% 67%

Street or Intersection: Earll and Civic Center

Return Period	10	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:								
Structure location or station (ft):	WN	WN	WN	WN	WN	WN	WN	WS
	Curb Full	Max	Inlet No. 1	Inlet No. 1	Inlet No. 2	Inlet No. 3	Inlet No. 4	1/2 Street
Average watershed width (ft):	Capacity	Spread	Design	Design	Design	Design	Design	Flow
Watershed length (ft):			(@ Civic Cen.)	(@ 73rd)		(@ Civic Cen.)	(@ Civic Cen.)	
Contributing watershed area (acres):			No Good					0.91
Composite Runoff Coefficient "C":		Maintain	HEC-1	Half HEC-1	Use 2nd inlet	Bypass from	Too much	0.95
Precipitation intensity (in/hr):		6 feet dry	proportional	proportional	between	Inlet 2	bypass into	3.80
Time of Concentration Calculations:		pavement	flow=29 cfs	flow=14.5 cfs	73rd and	and 1/4	intersection.	
Length of longest flow path (miles)		each side.			Civic Center	HEC-1	Add second	0.24
Slope of flow path (ft/mile)						Flow	inlet at Civic	17.3
Roughness Coefficient- See Table 3.1, FCDMC Manual			Too much		Bypass from		Center	0.0403
Kb Parameter			runoff. Use		Inlet 1			-0.0065
Kb Parameter			multiple		and 1/4			0.04
Time of Concentration (hrs)			inlets		HEC-1			0.26
Subarea discharge Q (cfs):					Flow			3.3
Previous by-pass flow (cfs):					6.1	6.4	6.3	0.0
Discharge added by operator:					7.3	7.3		---
Total discharge Q (cfs):	14.5	27.0	29.0	14.5	13.4	13.7	6.3	3.3
SHOULDER AND GUTTER CONFIGURATION:								**No Inlet Needed**
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0056	0.0056	0.0056	0.0034	0.0046	0.0056	0.0056	0.0056
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2	2
Inlet description:	None	None	None	P-1569	P-1569	P-1569	P-1569	None
Grate width:	0	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.022	0.022	0.022	0.021	0.018	0.022	0.022	0.022
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Flooded Width from flowline (ft): before inlet	20.7	26.2	27.0	23.5	23.8	20.3	15.1	11.7
Depth at flowline (ft): before inlet	0.50	0.62	0.63	0.54	0.48	0.49	0.38	0.31
Water cross-area (sq.ft): before inlet	4.68	7.48	7.89	5.72	5.01	4.47	2.49	1.52
Velocity V for total discharge (fps): before inlet	3.10	3.61	3.67	2.54	2.68	3.05	2.52	2.16
Ratio of gutter depression flow to total Q (Eod):	18.7%	14.7%	14.3%	16.6%	16.7%	19.1%	25.7%	33.0%
Equivalent cross-slope (Se):	0.028	0.027	0.027	0.027	0.024	0.029	0.031	0.034
GRATE INLETS ON-GRADE:								
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:								
Length required for total interception (ft): w/clogging	—	—	54.5	35.1	39.5	38.2	26.3	—
Length of inlet provided L (ft):			20	20	20	20	20	
Interception for length L (cfs):	—	—	11.5	8.4	7.1	7.4	4.5	—
Efficiency for length L:	—	—	39.8%	57.9%	52.6%	54.0%	72.3%	—
Slotted drain or side opening flow-by (cfs):	—	—	17.5	6.1	6.4	6.3	1.7	—

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: Earll and Civic Center

Return Period	10	10	10	10
HYDROLOGY COMPUTATION:				
Structure location or station (ft):	NW	NW	NW	NE
	1/2 Street	Curb Full	Inlet No. 1	Inlet No. 1
Average watershed width (ft):	Capacity	Capacity	Design	Design
Watershed length (ft):				
Contributing watershed area (acres):				
Composite Runoff Coefficient "C":	Max Depth	Design for	HEC-1 flows	
Precipitation intensity (in/hr):	d=0.72	curb full	exceed 1/2	9 cfs expected
Time of Concentration Calculations:		condition.	street capacity.	in NE gutter
Length of longest flow path (miles)				from west
Slope of flow path (ft/mile)			HEC-1	side of
Roughness Coefficient- See Table 3.1, FCDMC Manual			Proportional	Civic Center
Kb Parameter			Flow	
Kb Parameter			=34 cfs	
Time of Concentration (hrs)				
Subarea discharge Q (cfs):			9 cfs expected	
Previous by-pass flow (cfs):			in NE gutter	
Discharge added by operator:				
Total discharge Q (cfs):	**25.0**	**8.5**	**8.5**	**9.0**
SHOULDER AND GUTTER CONFIGURATION:				
Manning's n:	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0021	0.0021	0.0021	0.0039
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2
Inlet description:	None	None	P-1569	P-1569
Grate width:	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.023	0.023	0.023	0.014
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (Sw=Sw-Sx)	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	32.0	32.0	32.0	32.0
Flooded Width from flowline (ft): before inlet	**29.9**	**19.9**	**19.9**	**24.2**
Depth at flowline (ft): before inlet	0.72	0.50	0.50	0.40
Water cross-area (sq.ft): before inlet	10.10	4.48	4.48	4.16
Velocity V for total discharge (fps): before inlet	2.47	1.90	1.90	2.16
Ratio of gutter depression flow to total Q (Eod):	12.9%	19.4%	19.4%	17.0%
Equivalent cross-slope (Se):	0.027	0.029	0.029	0.022
GRATE INLETS ON-GRADE:				
Ratio of grate frontal flow to total flow:	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—
Effective grate length w/clogging:	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—
Grate Efficiency (E):	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—
Grate flow-by (cfs):	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:				
Length required for total interception (ft): w/clogging	—	—	23.0	34.1
Length of inlet provided L (ft):			20	20
Interception for length L (cfs):	—	—	6.7	5.3
Efficiency for length L:	—	—	79.3%	59.3%
Slotted drain or side opening flow-by (cfs):	—	—	**1.8**	**3.7**

Design by: Alan Humphrey

FCDMC / HEC-12 Pavement Drainage

JOB: MAG Roll Curb- 6" in macro HEC-12

	Clogging factors:		80%	50%	67%		
Street or Intersection: Earll and 75th							
Return Period	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:							
Structure location or station (ft):	WN	WN	WN	WN	NW	NE	75th @ Earll
	Max	1/2 Street	Inlet No. 1	Inlet No. 2	1/2 Street	1/2 Street	Curb Full
Average watershed width (ft):	Spread	Capacity	Design	Design	Capacity	Capacity	Capacity
Watershed length (ft):							
Contributing watershed area (acres):							
Composite Runoff Coefficient "C":	Maintain	Max. Depth	HEC-1	Too much	Top of curb	Top of curb	Spreadsheet
Precipitation intensity (in/hr):	6 feet dry	d=0.76	proportional	bypass going	above crown.	above crown.	inaccurate
Time of Concentration Calculations:	pavement		flow=18cfs	to east side	Depth to crown	Depth to crown	above crown.
Length of longest flow path (miles)	each side.			of intersection	=0.40	=0.30	Add flow from
Slope of flow path (ft/mile)			Design for				NW and NE gutters
Roughness Coefficient- See Table 3.1, FCDMC Manual			spread.				plus prisim above
Kb Parameter							crown =
Kb Parameter							40'x0.15'x2.7fps=
Time of Concentration (hrs)							16.2 cfs
Subarea discharge Q (cfs):							
Previous by-pass flow (cfs):				7.2			NW=8 cfs
Discharge added by operator:							NE=5 cfs
Total discharge Q (cfs):	21.0	30.0	18.0	7.2	8.0	5.0	29.2
SHOULDER AND GUTTER CONFIGURATION:							
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	
Longitudinal slope S (ft/ft):	0.0026	0.0026	0.0026	0.0026	0.0058	0.0087	
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	
Inlet description:	None	None	P-1569	P-1569	None	None	
Grate width:	0	0	0	0	0	0	
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	
Pavement cross-slope (Sx):	0.024	0.024	0.024	0.024	0.020	0.016	
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	
Half Street Width at Inlet (ft):	32.0	32.0	32.0	32.0	20.0	20.0	
Flooded Width from flowline (ft): before inlet	26.0	29.7	24.5	17.3	17.2	15.6	
Depth at flowline (ft): before inlet	0.67	0.76	0.63	0.46	0.40	0.30	
Water cross-area (sq.ft): before inlet	8.06	10.54	7.18	3.61	3.00	1.92	
Velocity V for total discharge (fps): before inlet	2.60	2.85	2.51	2.00	2.66	2.60	
Ratio of gutter depression flow to total Q (Eod):	14.7%	12.9%	15.6%	22.1%	22.8%	26.4%	
Equivalent cross-slope (Se):	0.029	0.028	0.029	0.031	0.029	0.027	
GRATE INLETS ON-GRADE:							
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	
Side flow in cfs (Qs):	—	—	—	—	—	—	
Effective grate length w/clogging:	—	—	—	—	—	—	
Fraction of side flow interception (Rs):	—	—	—	—	—	—	
Grate Efficiency (E):	—	—	—	—	—	—	
Total flow intercepted (cfs):	—	—	—	—	—	—	
Grate flow-by (cfs):	—	—	—	—	—	—	
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:							
Length required for total interception (ft): w/clogging	—	—	33.7	22.0	30.8	29.8	
Length of inlet provided L (ft):			20	20	20	20	
Interception for length L (cfs):	—	—	10.8	5.9	5.1	3.3	
Efficiency for length L:	—	—	59.8%	81.5%	64.2%	65.9%	
Slotted drain or side opening flow-by (cfs):	—	—	7.2	1.3	2.9	1.7	

Spreadsheet configured to calculate flow depths associated with a given flow in a street with a triangular cross section. Depth of flow calculated for actual flow in 1/2 street cross section is slightly deep than would be expected from the true full street cross section. Assume intercepted flow is average of 1/2 street capacity and amount intercepted in full design flow calculation.

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: Earll and 75th

Return Period	10	10	10	10	10	10
HYDROLOGY COMPUTATION:						
Structure location or station (ft):	NW Inlet No. 1	NW Inlet No. 2	NW Inlet No. 3	NE Inlet No. 1	NE Inlet No. 2	NE Inlet No. 3
Average watershed width (ft):	Design	Design	Design	Design	Design	Design
Watershed length (ft):						
Contributing watershed area (acres):						
Composite Runoff Coefficient "C":	Design inlets for	Flow intercepted	Bypass still	Design inlets for	Flow intercepted	Bypass still
Precipitation intensity (in/hr):	flow in west half of	by Inlet No. 1 is	significant.	flow in east half of	by Inlet No. 1 is	significant.
Time of Concentration Calculations:	street=	average of	Add 3rd inlet	street=	average of	Add 3rd inlet
Length of longest flow path (miles)	8+16.2/2=16.1 cfs	5.1 and 7.8		5+16.2/2=13.1 cfs	3.3 and 5.8	
Slope of flow path (ft/mile)		or 6.5 cfs.			or 4.6 cfs.	
Roughness Coefficient- See Table 3.1, FCDMC Manual		Bypass is			Bypass is	
Kb Parameter	HEC-1	16.1-6.5=9.6 cfs		HEC-1	16.1-4.6=8.5 cfs	
Kb Parameter	proportional			proportional		
Time of Concentration (hrs)	flow=56 cfs			flow=56 cfs		
Subarea discharge Q (cfs):	at intersection			at intersection		
Previous by-pass flow (cfs):			3.9			3.9
Discharge added by operator:						
Total discharge Q (cfs):	**16.1**	**9.6**	**3.9**	**13.1**	**8.5**	**3.9**
SHOULDER AND GUTTER CONFIGURATION:						
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0058	0.0058	0.0058	0.0087	0.0087	0.0087
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2
Inlet description:	P-1569	P-1569	P-1569	P-1569	P-1569	P-1569
Grate width:	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.020	0.020	0.020	0.016	0.016	0.016
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	**22.5**	**18.5**	**13.0**	**22.1**	**18.7**	**13.9**
Depth at flowline (ft): before inlet	0.50	0.42	0.31	0.41	0.36	0.28
Water cross-area (sq.ft): before inlet	5.10	3.45	1.73	3.96	2.85	1.59
Velocity V for total discharge (fps): before inlet	3.16	2.78	2.23	3.31	2.98	2.48
Ratio of gutter depression flow to total Q (Eod):	17.4%	21.2%	30.2%	18.3%	21.7%	29.5%
Equivalent cross-slope (Se):	0.027	0.028	0.032	0.024	0.025	0.029
GRATE INLETS ON-GRADE:						
Ratio of grate frontal flow to total flow:	---	---	---	---	---	---
Inlet frontal flow in cfs (Qw):	---	---	---	---	---	---
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	---	---	---	---	---	---
Fraction of frontal flow intercepted (Rf):	---	---	---	---	---	---
Side flow in cfs (Qs):	---	---	---	---	---	---
Effective grate length w/clogging:	---	---	---	---	---	---
Fraction of side flow interception (Rs):	---	---	---	---	---	---
Grate Efficiency (E):	---	---	---	---	---	---
Total flow intercepted (cfs):	---	---	---	---	---	---
Grate flow-by (cfs):	---	---	---	---	---	---
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:						
Length required for total interception (ft): w/clogging	43.2	33.7	21.4	48.0	38.6	26.0
Length of inlet provided L (ft):	20	20	20	20	20	20
Interception for length L (cfs):	7.8	5.7	3.2	5.8	4.6	2.9
Efficiency for length L:	48.7%	59.9%	82.9%	44.5%	53.5%	72.8%
Slotted drain or side opening flow-by (cfs):	**8.3**	**3.9**	**0.7**	**7.3**	**3.9**	**1.1**

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Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: Earll and 75th

Return Period	10
HYDROLOGY COMPUTATION:	
Structure location or station (ft):	WS 1/2 Street
Average watershed width (ft):	Flow
Watershed length (ft):	
Contributing watershed area (acres):	**0.30**
Composite Runoff Coefficient "C":	0.95
Precipitation intensity (in/hr):	4.20
Time of Concentration Calculations:	
Length of longest flow path (miles)	0.13
Slope of flow path (ft/mile)	21.7
Roughness Coefficient- See Table 3.1, FCDMC Manual	0.0434
Kb Parameter	-0.0065
Kb Parameter	0.04
Time of Concentration (hrs)	0.18
Subarea discharge Q (cfs):	1.2
Previous by-pass flow (cfs):	0.0
Discharge added by operator:	—
Total discharge Q (cfs):	**1.2**
SHOULDER AND GUTTER CONFIGURATION:	**No Inlet Needed**
Manning's n:	0.016
Longitudinal slope S (ft/ft):	0.0056
Inlet type (1=grate, 2=side opening or slotted):	2
Longitudinal profile (1=on-grade, 2=sag):	1
Gutter Configuration (1=roll, 2=vertical):	2
Inlet description:	None
Grate width:	0
Grate length:	0.0
Pavement cross-slope (Sx):	0.030
Width of gutter from flowline (ft):	1.42
Gutter depression from horizontal (ft):	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058
Half Street Width at Inlet (ft):	20.0
Flooded Width from flowline (ft): before inlet	**6.5**
Depth at flowline (ft): before inlet	0.23
Water cross-area (sq.ft): before inlet	0.65
Velocity V for total discharge (fps): before inlet	1.84
Ratio of gutter depression flow to total Q (Eod):	53.2%
Equivalent cross-slope (Se):	0.045
GRATE INLETS ON-GRADE:	
Ratio of grate frontal flow to total flow:	—
Inlet frontal flow in cfs (Qw):	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—
Fraction of frontal flow intercepted (Rf):	—
Side flow in cfs (Qs):	—
Effective grate length w/clogging:	—
Fraction of side flow interception (Rs):	—
Grate Efficiency (E):	—
Total flow intercepted (cfs):	—
Grate flow-by (cfs):	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:	
Length required for total interception (ft): w/clogging	—
Length of inlet provided L (ft):	
Interception for length L (cfs):	—
Efficiency for length L:	—
Slotted drain or side opening flow-by (cfs):	—

Design by: Alan Humphrey

FCDMC / HEC-12 ent Drainage

JOB: MAG Roll Curb- 6" in macro

	ogging factors:	80%	50%	67%				
Street or Intersection: Earll and Miller								
Return Period	10	10	10	10	10	10	10	10
HYDROLOGY COMPUTATION:								
Structure location or station (ft):	WN Max Spread	WN 1/2 Street Capacity	WN Inlet No. 1 Design (@ 75th)	WN Inlet No. 2 Design west of DW	WN Inlet No. 3 Design east of DW	WN Inlet No. 4 Design (@ Miller)	NW 1/2 Street Capacity	NW Curb Full Capacity
Average watershed width (ft):								
Watershed length (ft):								
Contributing watershed area (acres):								
Composite Runoff Coefficient "C":	Maintain 12 feet dry pavement in roadway. Not enough capacity in north gutter. Consider total road-way width in meeting criteria.	Max depth =0.56 Design for spread.	HEC-1 proportional flow=20 cfs Divide HEC-1 flows equally between inlets. Bypass from 75th St.	Bypass from Inlet 1 and 1/4 HEC-1 Flow	Bypass from Inlet 2 and 1/4 HEC-1 Flow	Bypass from Inlet 3 and 1/4 HEC-1 Flow		Design for curb full condition.
Precipitation intensity (in/hr):								
Time of Concentration Calculations:								
Length of longest flow path (miles)								
Slope of flow path (ft/mile)								
Roughness Coefficient- See Table 3.1, FCDMC Manual								
Kb Parameter								
Kb Parameter								
Time of Concentration (hrs)								
Subarea discharge Q (cfs):								
Previous by-pass flow (cfs):			1.3	1.4	1.7	0.0		
Discharge added by operator:			5.0	5.0	5.0	5.0		
Total discharge Q (cfs):	5.0	12.0	6.3	6.4	6.7	5.0	13.0	11.0
SHOULDER AND GUTTER CONFIGURATION:								
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0027	0.0027	0.0029	0.0036	0.0018	0.0027	0.0036	0.0036
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2	2	2
Inlet description:	None	None	P-1569	P-1569	P-1569	P-1569	None	None
Grate width:	0	0	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.027	0.027	0.019	0.017	0.027	0.027	0.026	0.026
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Flooded Width from flowline (ft): before inlet	13.9	19.4	18.6	19.1	16.8	13.9	19.2	18.0
Depth at flowline (ft): before inlet	0.42	0.56	0.41	0.38	0.49	0.42	0.55	0.52
Water cross-area (sq.ft): before inlet	2.62	5.07	3.32	3.15	3.81	2.62	4.86	4.28
Velocity V for total discharge (fps): before inlet	1.91	2.37	1.91	2.02	1.76	1.91	2.68	2.57
Ratio of gutter depression flow to total Q (Eod):	27.0%	19.5%	21.3%	21.1%	22.4%	27.0%	19.7%	21.0%
Equivalent cross-slope (Se):	0.035	0.033	0.027	0.026	0.034	0.035	0.033	0.033
GRATE INLETS ON-GRADE:								
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:								
Length required for total interception (ft): w/clogging	—	—	23.4	25.9	18.3	17.8	—	—
Length of inlet provided L (ft):			20	20	20	20		
Interception for length L (cfs):	—	—	5.0	4.7	6.7	5.0	—	—
Efficiency for length L:	—	—	78.4%	73.1%	100.0%	100.0%	—	—
Slotted drain or side opening flow-by (cfs):	—	—	1.4	1.7	0.0	0.0	—	—

Design by: Alan Humphrey

FCDMC / HEC-12

JOB: MAG Roll Curb- 6" in macro

Street or Intersection: Earll and Miller

Return Period	10	10	10	10	10	10
HYDROLOGY COMPUTATION:						
Structure location or station (ft):	NW Inlet No. 1	NW Inlet No. 2	NE 1/2 Street	NE Curb Full	NE Inlet No. 1	NE Inlet No. 2
Average watershed width (ft):	Design	Design	Capacity	Capacity	Design	Design
Watershed length (ft):	(@ Miller)	(@ Miller)			(@ Miller)	(@ Miller)
Contributing watershed area (acres):						
Composite Runoff Coefficient "C":	HEC-1	Bypass still		Design for	HEC-1	Bypass still
Precipitation intensity (in/hr):	proportional	significant.		curb full	proportional	significant.
Time of Concentration Calculations:	flow=53 cfs	Add 2nd inlet		condition.	flow=30 cfs	Add 2nd inlet
Length of longest flow path (miles)						
Slope of flow path (ft/mile)						
Roughness Coefficient- See Table 3.1, FCDMC Manual						
Kb Parameter						
Kb Parameter						
Time of Concentration (hrs)						
Subarea discharge Q (cfs):						
Previous by-pass flow (cfs):		3.4				2.0
Discharge added by operator:						
Total discharge Q (cfs):	**11.0**	**3.4**	**20.0**	**9.0**	**9.0**	**2.0**
SHOULDER AND GUTTER CONFIGURATION:						
Manning's n:	0.016	0.016	0.016	0.016	0.016	0.016
Longitudinal slope S (ft/ft):	0.0036	0.0036	0.0022	0.0022	0.0022	0.0022
Inlet type (1=grate, 2=side opening or slotted):	2	2	2	2	2	2
Longitudinal profile (1=on-grade, 2=sag):	1	1	1	1	1	1
Gutter Configuration (1=roll, 2=vertical):	2	2	2	2	2	2
Inlet description:	P-1569	P-1569	None	None	P-1569	P-1569
Grate width:	0	0	0	0	0	0
Grate length:	0.0	0.0	0.0	0.0	0.0	0.0
Pavement cross-slope (Sx):	0.026	0.026	0.023	0.023	0.023	0.023
Width of gutter from flowline (ft):	1.42	1.42	1.42	1.42	1.42	1.42
Gutter depression from horizontal (ft):	0.083	0.083	0.083	0.083	0.083	0.083
Gutter cross-slope Sw: (S'w=Sw-Sx)	0.058	0.058	0.058	0.058	0.058	0.058
Half Street Width at Inlet (ft):	20.0	20.0	22.0	22.0	22.0	22.0
Flooded Width from flowline (ft): before inlet	**18.0**	**11.5**	**27.3**	**20.1**	**20.1**	**11.4**
Depth at flowline (ft): before inlet	0.52	0.35	0.66	0.50	0.50	0.31
Water cross-area (sq.ft): before inlet	4.28	1.77	8.39	4.60	4.60	1.50
Velocity V for total discharge (fps): before inlet	2.57	1.93	2.38	1.96	1.96	1.37
Ratio of gutter depression flow to total Q (Eod):	21.0%	32.4%	14.1%	19.2%	19.2%	33.6%
Equivalent cross-slope (Se):	0.033	0.037	0.028	0.029	0.029	0.035
GRATE INLETS ON-GRADE:						
Ratio of grate frontal flow to total flow:	—	—	—	—	—	—
Inlet frontal flow in cfs (Qw):	—	—	—	—	—	—
Vo for effective length (P-1-7/8, Chart 7 HEC 12):	—	—	—	—	—	—
Fraction of frontal flow intercepted (Rf):	—	—	—	—	—	—
Side flow in cfs (Qs):	—	—	—	—	—	—
Effective grate length w/clogging:	—	—	—	—	—	—
Fraction of side flow interception (Rs):	—	—	—	—	—	—
Grate Efficiency (E):	—	—	—	—	—	—
Total flow intercepted (cfs):	—	—	—	—	—	—
Grate flow-by (cfs):	—	—	—	—	—	—
SLOTTED DRAINS AND SIDE-OPENING INLETS ON-GRADE:						
Length required for total interception (ft): w/clogging	28.1	16.2	—	—	23.9	11.6
Length of inlet provided L (ft):	20	20			20	20
Interception for length L (cfs):	7.6	3.4	—	—	7.0	2.0
Efficiency for length L:	68.8%	100.0%	—	—	77.3%	100.0%
Slotted drain or side opening flow-by (cfs):	**3.4**	**0.0**	—	—	**2.0**	**0.0**

Design by: Alan Humphrey

PARSONS BRINCKERHOFF COMPUTATION SHEET

Page 1 of

Made by AJH

Date 8/9/99

Checked by

Date

Subject Osborn Outfall
64th St + Alley Inlet

Inlet calculations -

1) Use COP P-1569 inlet with concrete apron
2) Configure opening for orifice flow conditions.

Use Equn. 3.10: $Q_i = C_o h L (2 g d_o)^{0.5}$

$$L = \frac{Q_i}{C_o h (2 g d_o)^{0.5}}$$

Where:

$C_o = 0.67$

$h = \frac{2(d_i - d_o)}{\sin\theta} = \frac{2(8'' - 6'')/12}{\sin(56.3°)} = 0.4'$ (d_i = 8" depression)

$Q_i = 121$ cfs

$$L = \frac{121}{0.67(0.4)(2(32.2)(0.5)^{0.5}} = 79'$$

Try deeper ponded depth = 1' = d_i

h = 0.4 (physical characteristic calculated based on typ. configuration)

$d_o = d_i - (h/2)\sin\theta = 1 - \frac{0.4}{2}\sin 56.3 = 0.83$ (0.17)

PARSONS BRINCKERHOFF COMPUTATION SHEET

Subject: Osborn Out Fall
Alley inlet

Page 2 of
Made by AJH
Date 8/10/99
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Date

$$L_1 = \frac{Q_1}{C_o h (2 g d_o)^{.5}} = \frac{121}{0.67(0.4)(64.4 \times 0.83)^{0.5}}$$

$$= 62'$$

Use 20% clogging factor -

$L = 62' \times 120\% = 74'$

long, but feasible. Performance improves with depth.

Need about 10:1 aprons on each end to drop 1' → add 20' to Length → 74+20 = 94'
still feasible

Try ponding to 1.25' -

$d_o = 1.25 - 0.17 = 1.08$

$$L = \frac{121}{0.67(0.4)(64.4 \times 1.08)^{0.5}} = 54'$$

w/ clogging: $54 \times 1.2 = 65'$

Check ADOT throat configuration -

Assum 6" Curb w/ 2" depression -

PARSONS BRINCKERHOFF COMPUTATION SHEET

Page 3 of

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Date

Subject Osborn Outfall
64th and Alley Inlet

ADOT throat configuration is different - (attached) - $\theta = 45°$

$h = \frac{2(8'' - 6'')/12}{\sin\theta} = 0.47$ ∴ increase 17%

Recheck 1' ponded depth -

$d_o = d_i - \frac{h}{2}\sin\theta = 1' - \frac{0.47}{2}\sin 45° = 0.83$

$L = \frac{121}{(0.67)(0.47)(64.4 \times 0.83)^{0.5}} = 52'$ saves 10'

w/ clogging: $52 \times 1.2 = 63'$

Try about 3 standard ADOT basins (C-15.40)
Wing lengths are 11.5' or 19.5', basin is 3'
19.5 LF wing + 3' @ grate = 22.5 LF curb opening
∴ too big

Try 3 @ w = 11.5 + give credit for grates —

$L = 3 \times (11.5 + 3) = 43.5'$

$Q_i = 0.67(0.47)\,43.5\,(64.4 \times 0.83)^{0.5} = 100$ cfs

PARSONS BRINCKERHOFF COMPUTATION SHEET

Subject: Oshkosh Outfall
64st + Alley Inlet

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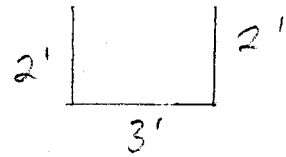
Date 8/10/99
Checked by
Date

Check grate inflow –

Assum 3 sided grates



$P = 7'$
$d = 1'$

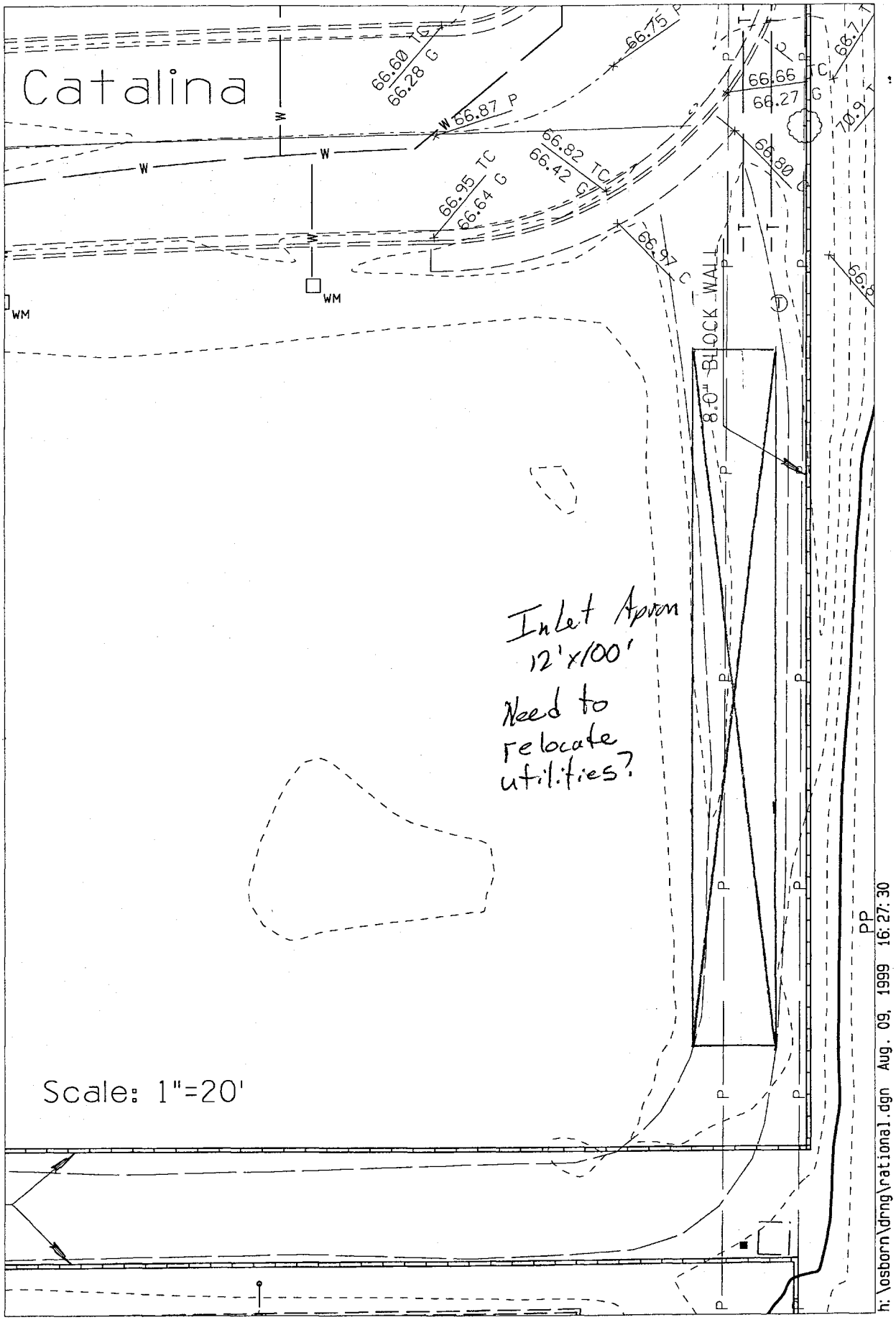
Use Figure 3.29 –

$Q_i = > 15$ cfs per grate (in transition zone)

Q_i grates $= 15 \times 3 \times 0.5 = 22.5$ cfs ✓ OK

Total inflow $= 100 + 22.5 = 122.5 > 121$ ✓ OK

$\boxed{\therefore \text{ Use 3, ADOT C-15.40, } w = 11.5'}$


Catalina
66.60 TC
66.28 G
66.75 P
66.87 P
66.66
66.27
66.71
70.9
66.80
66.82 TC
66.42 G
66.95 TC
66.64 G
66.97 C
66.8
WM
WM
8.0" BLOCK WALL
Inlet Apron
12'x100'
Need to
relocate
utilities?
Scale: 1"=20'
PP
h:\osborn\dnng\rational.dgn Aug. 09, 1999 16:27:30

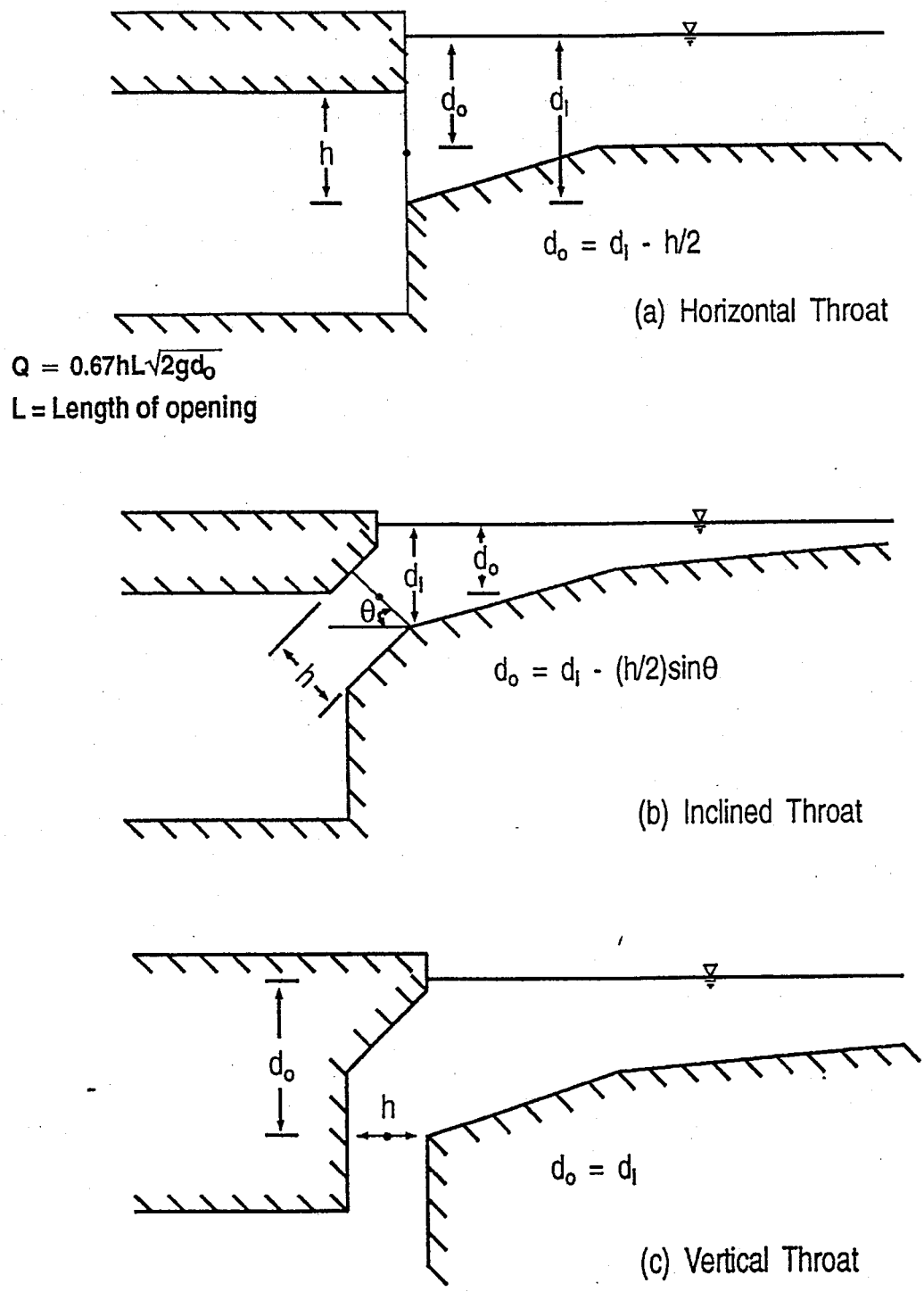
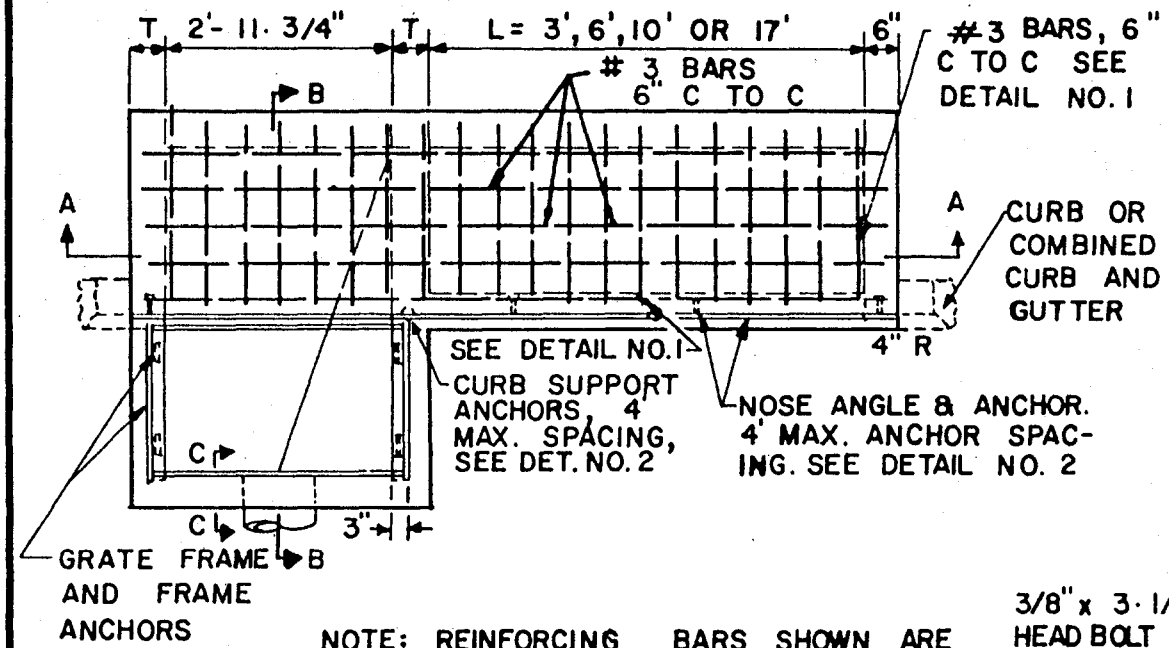
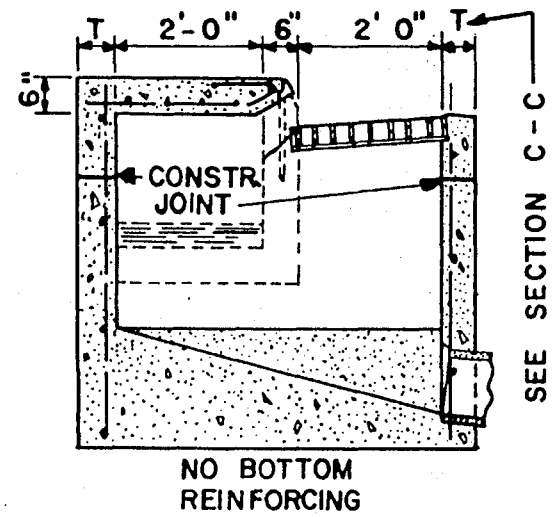


Figure 3.8
Curb Opening Catch Basin Inlets
(modified from: USDOT, FHWA, 1984, HEC-12, Figure 21)

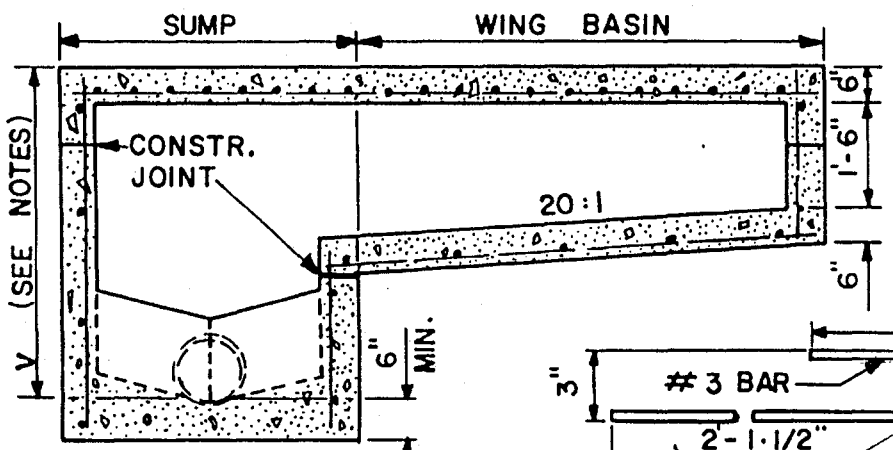


NOTE: REINFORCING BARS SHOWN ARE FOR ROOF SLAB ONLY. SEE SECTIONS FOR OTHER REINFORCING.

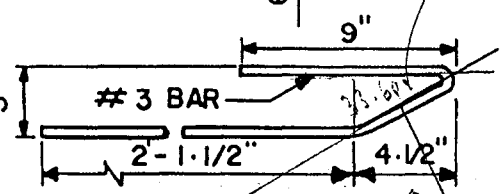
PLAN



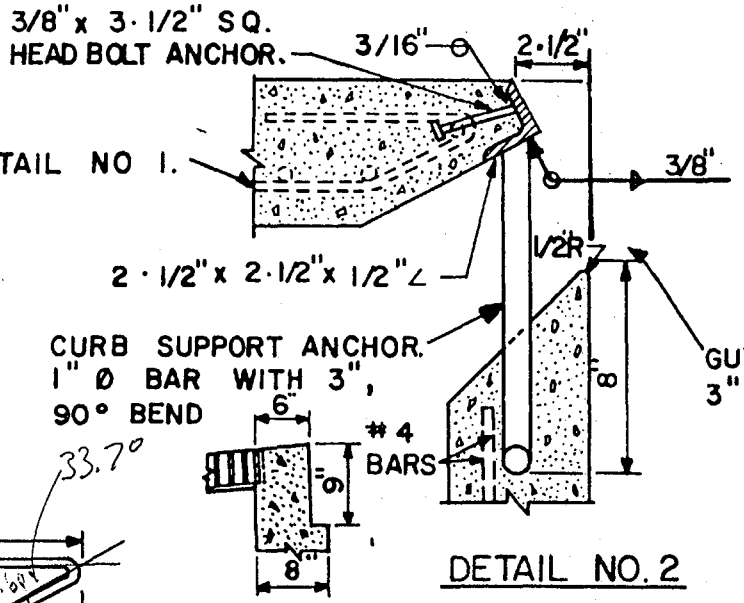
SECTION B-B



SECTION A-A



DETAIL NO. 1



DETAIL NO. 2

USE THIS SECTION WHEN T = 8"

SECTION C-C

NOTES:

1. SINGLE C. WITH WING
2. DOUBLE METRICAL
3. PIPES CAN WALL EXC A WING B.
4. SUMP FLO TROWEL FI OF 4:1 I OUTLET P
5. ALL REINFOR 18" C TO C CLEAR TO SIDE OF W AS SHOWN
6. ALL CONCRE PER SECT.
7. CONSTR. JO TO MEET
8. T = 6" WH 8'; 8" W SEE SECT

V = 3'-3"
V = 3'-5"
V = 3'-7"
V = 4'-0"
V DOUBLES FOR SYM

DETAIL NO. 533-1	STANDARD DETAIL	CATCH BASIN, TYPE D

θ = 56.3°

REVISED 1983

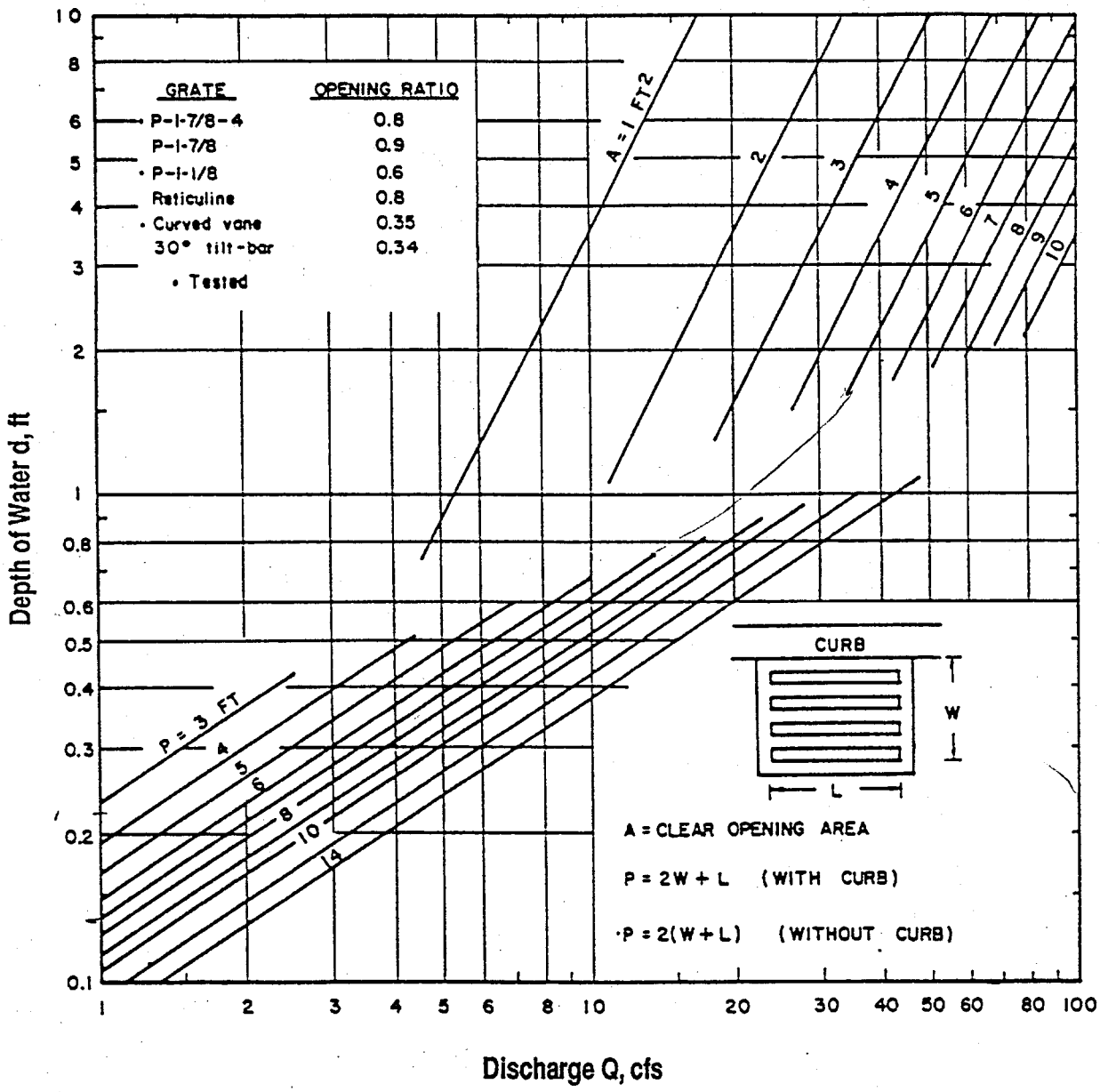
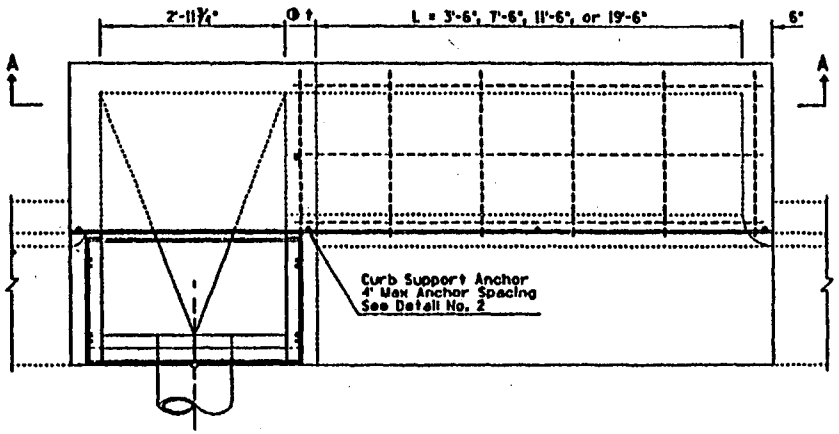


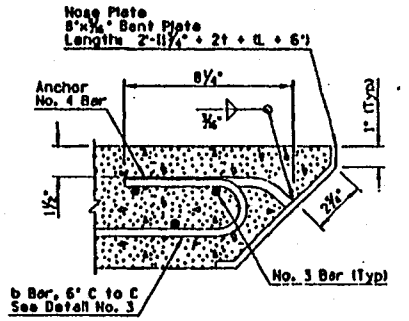
Figure 3.29
Grate Inlet Capacity in Sump Conditions
(USDOT, FHWA, 1984, HEC-12, Chart 11)

GENERAL NOTES

1. See sheet 1 of 2 for other dimensions, notes and reinforcing steel.
2. Ⓓt = 6" when H is 8' or less.
   8" when H is greater than 8'.



PLAN



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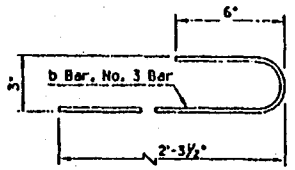

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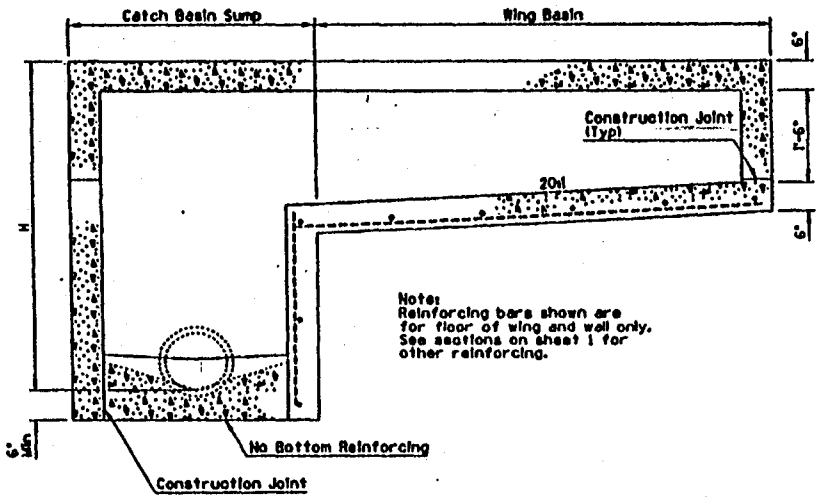
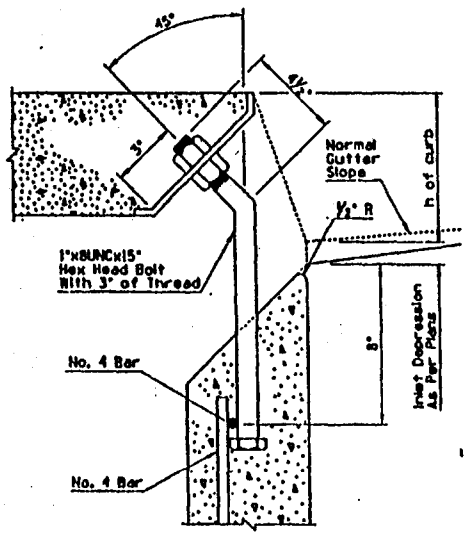
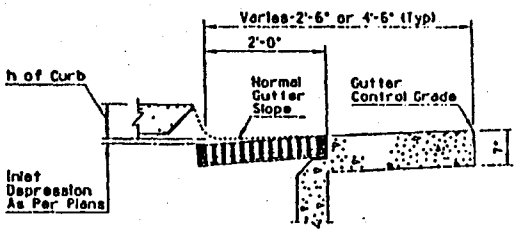


SECTION A-A
USE THIS SECTION WHEN H IS GREATER THAN 5'



DETAIL NO. 2
CURB SUPPORT ANCHOR



DETAIL NO. 4

DESIGN APPROVED: Terry H. Otterson APPROVED FOR DISTRIBUTION: Bruce W. Chen	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	DATE 5/97
	CATCH BASIN, TYPE 5	DRAWING NO. C-15.40 Sheet 2 of 2

Area Mapping

Subbasin 50610
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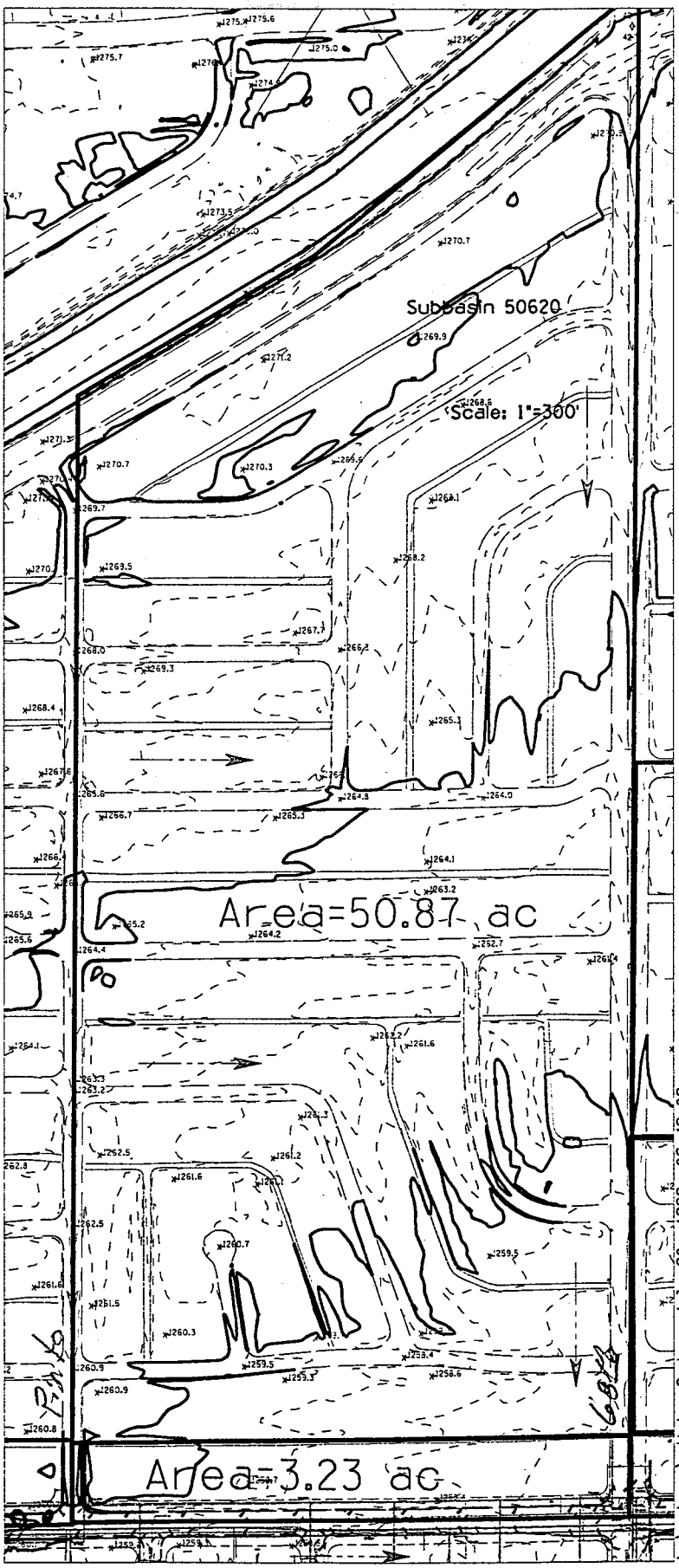

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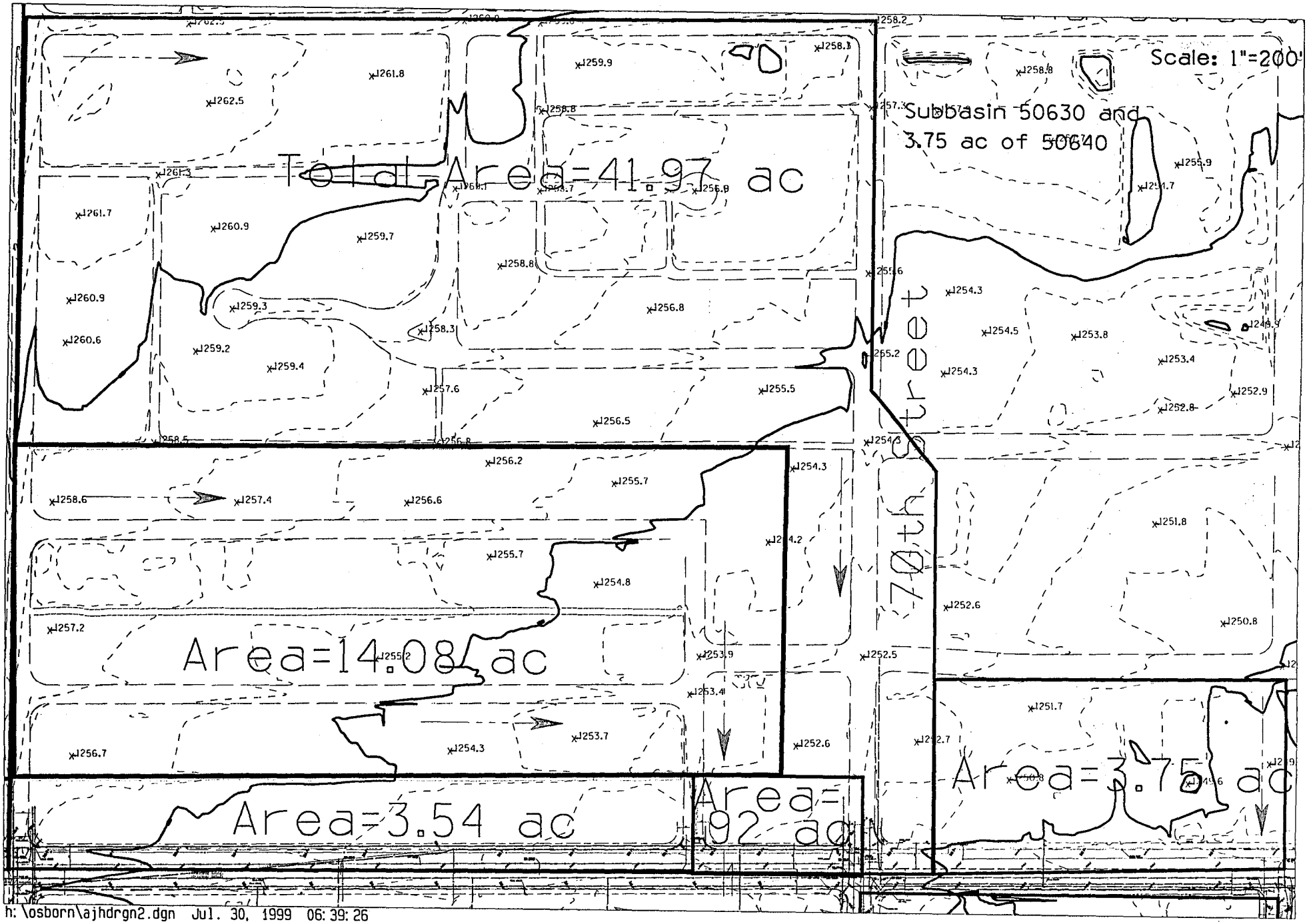

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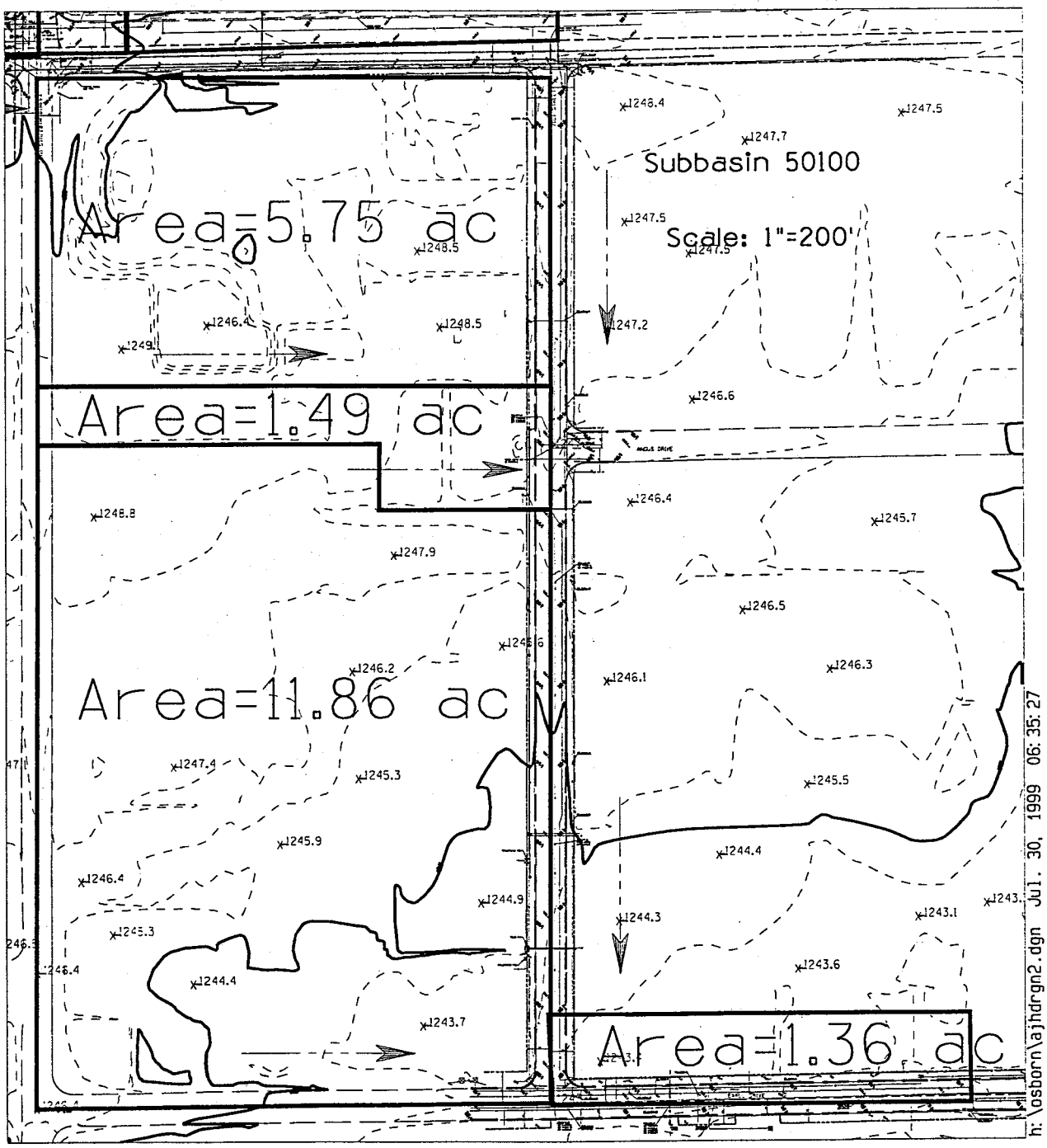
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Area=11.86 ac
Area=1.36 ac
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1247.7
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1246.4
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1244.3
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1243.6
1243.7
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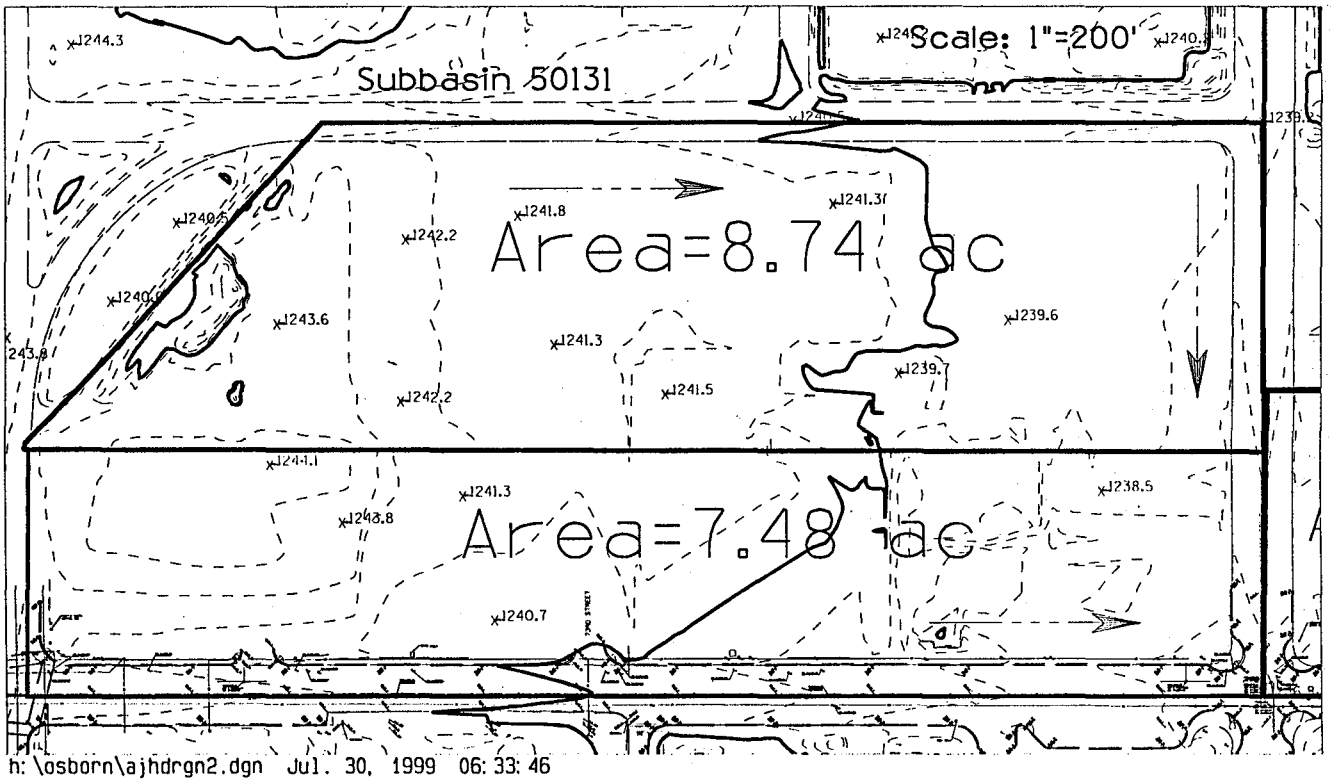

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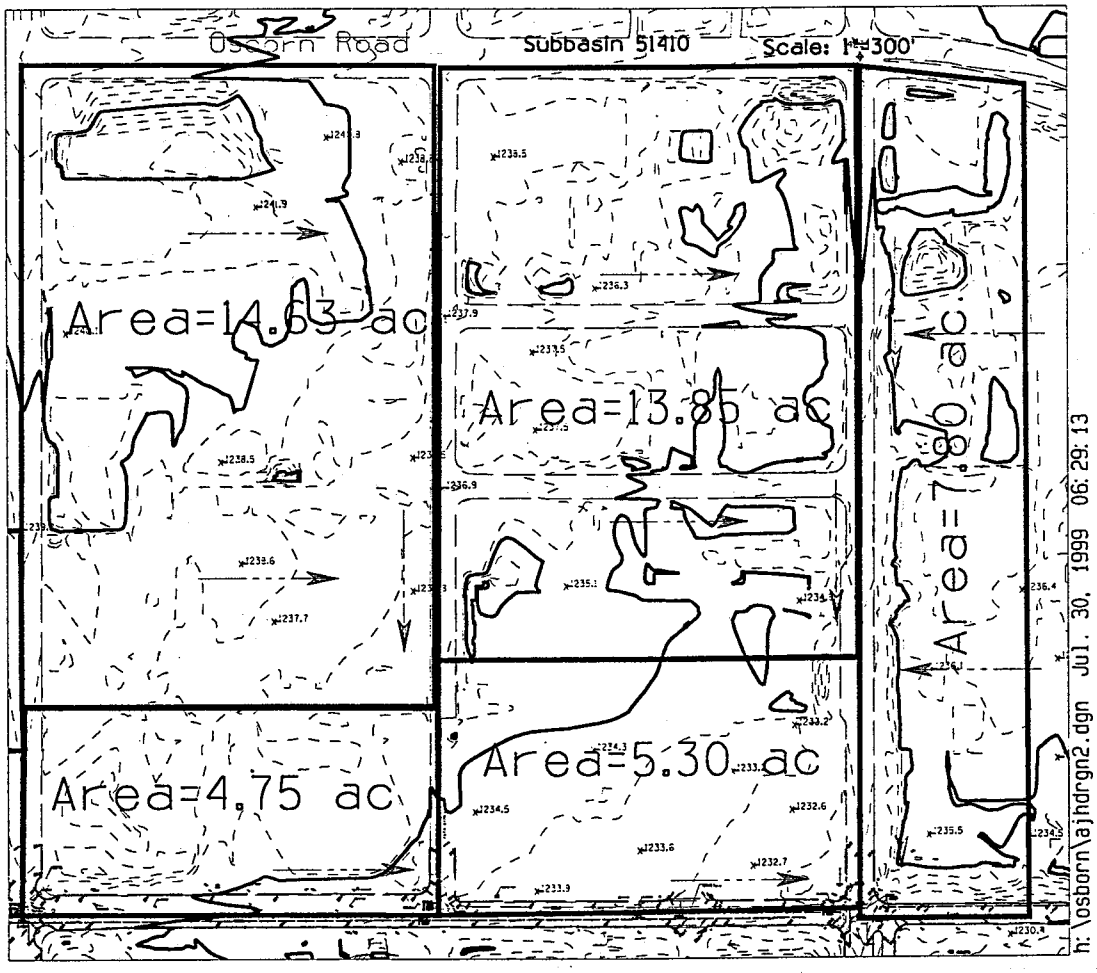
Osborn Road
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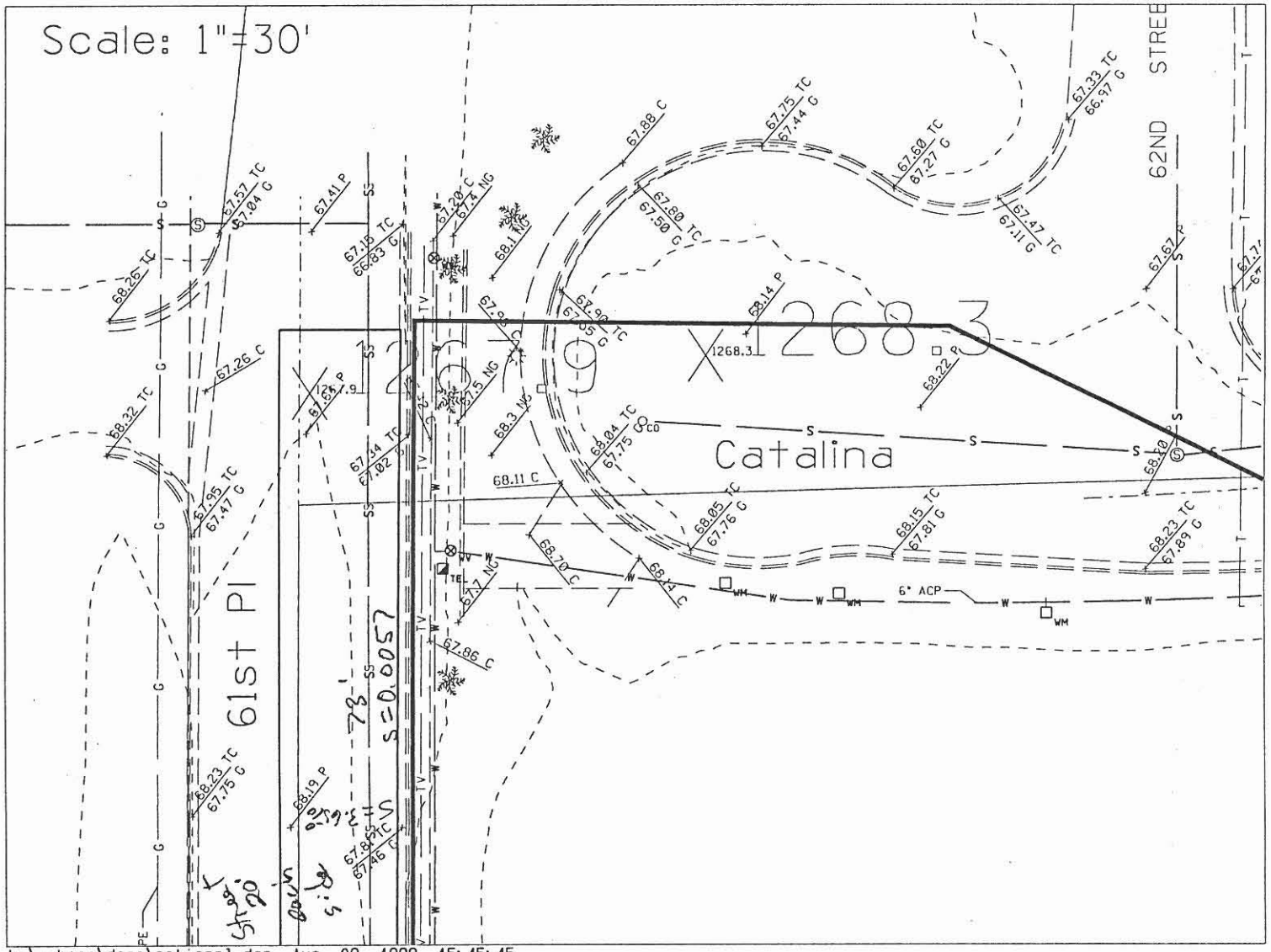
Intersection Mapping



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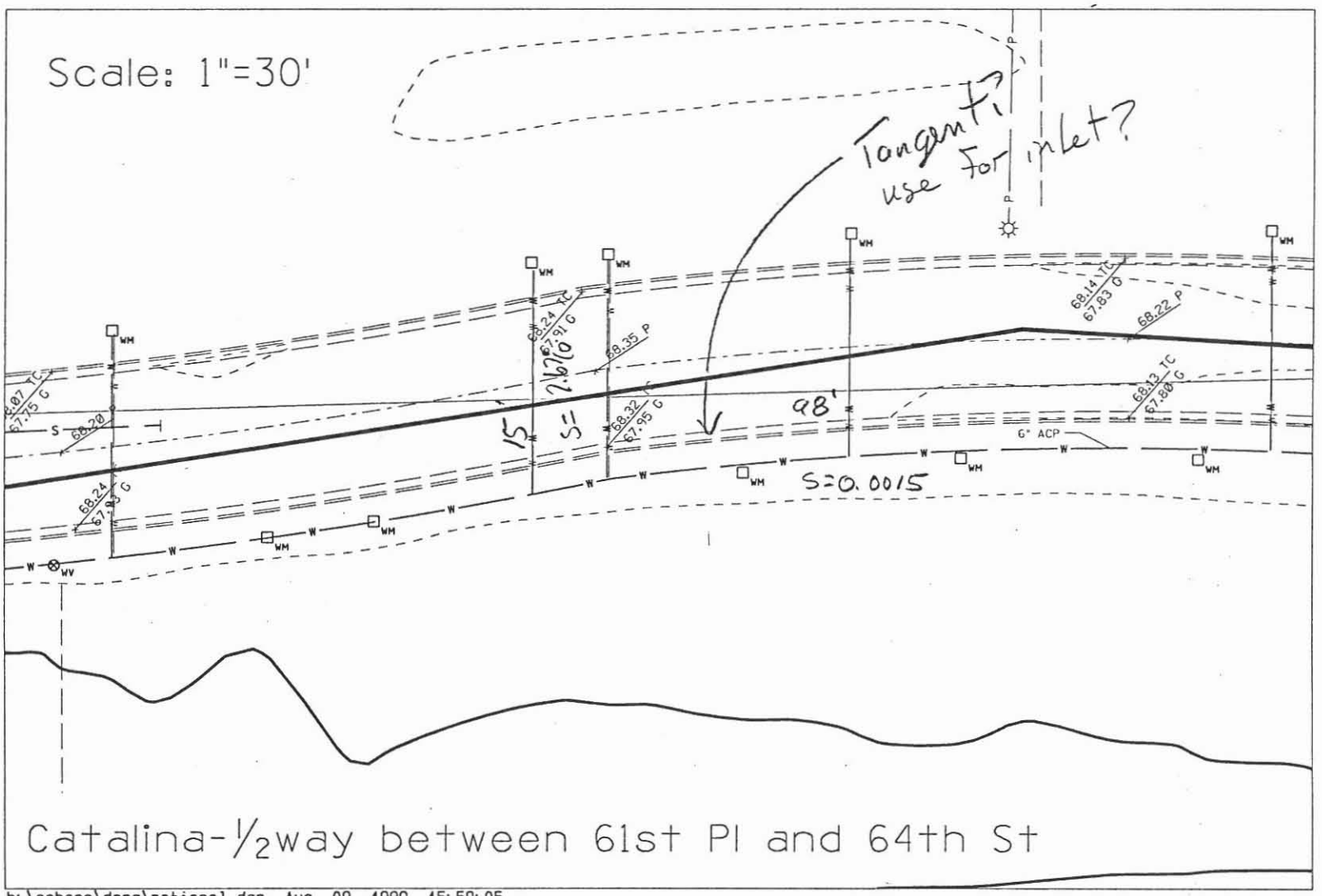

Catalina-½way between 61st Pl and 64th St

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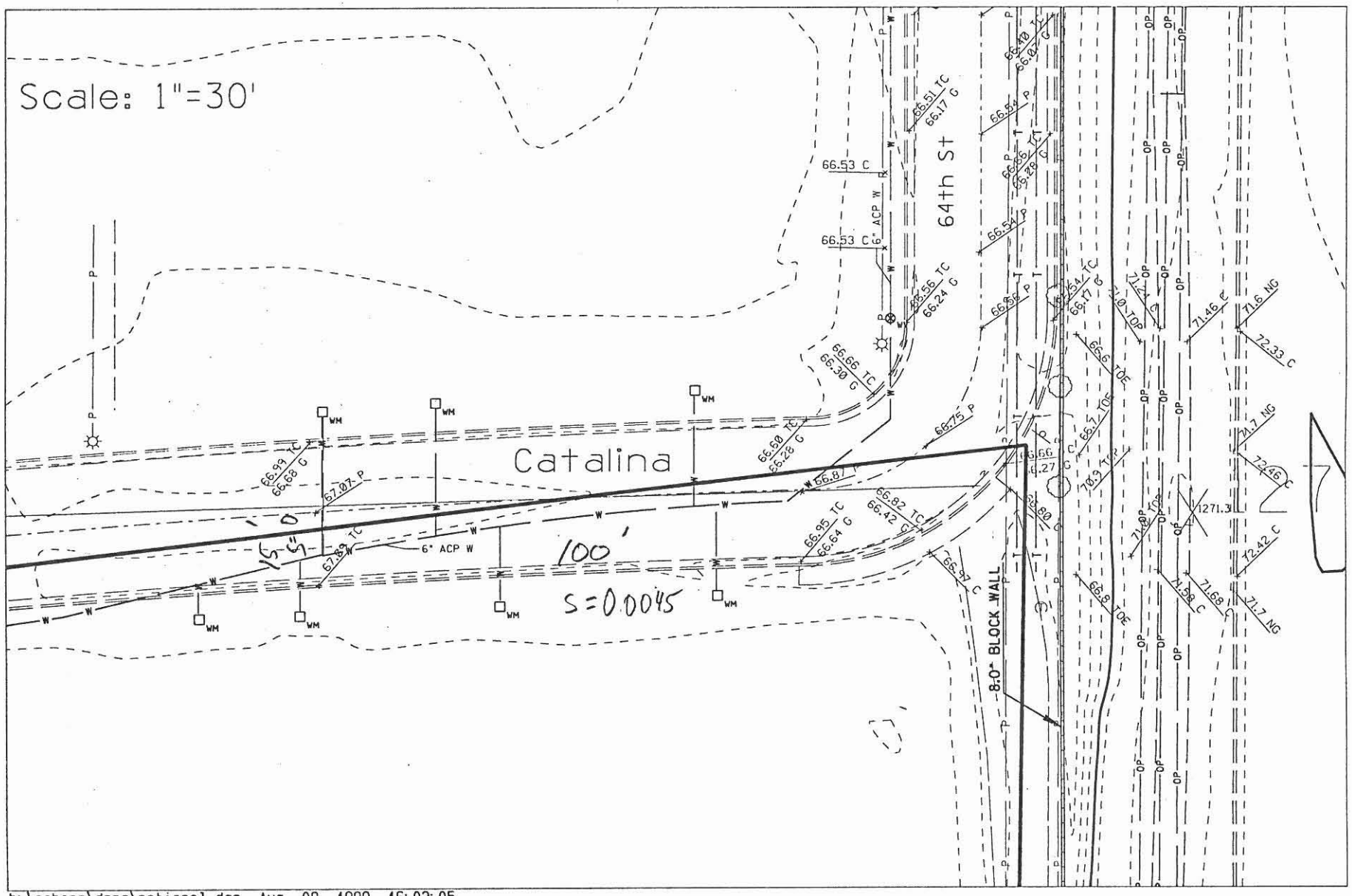

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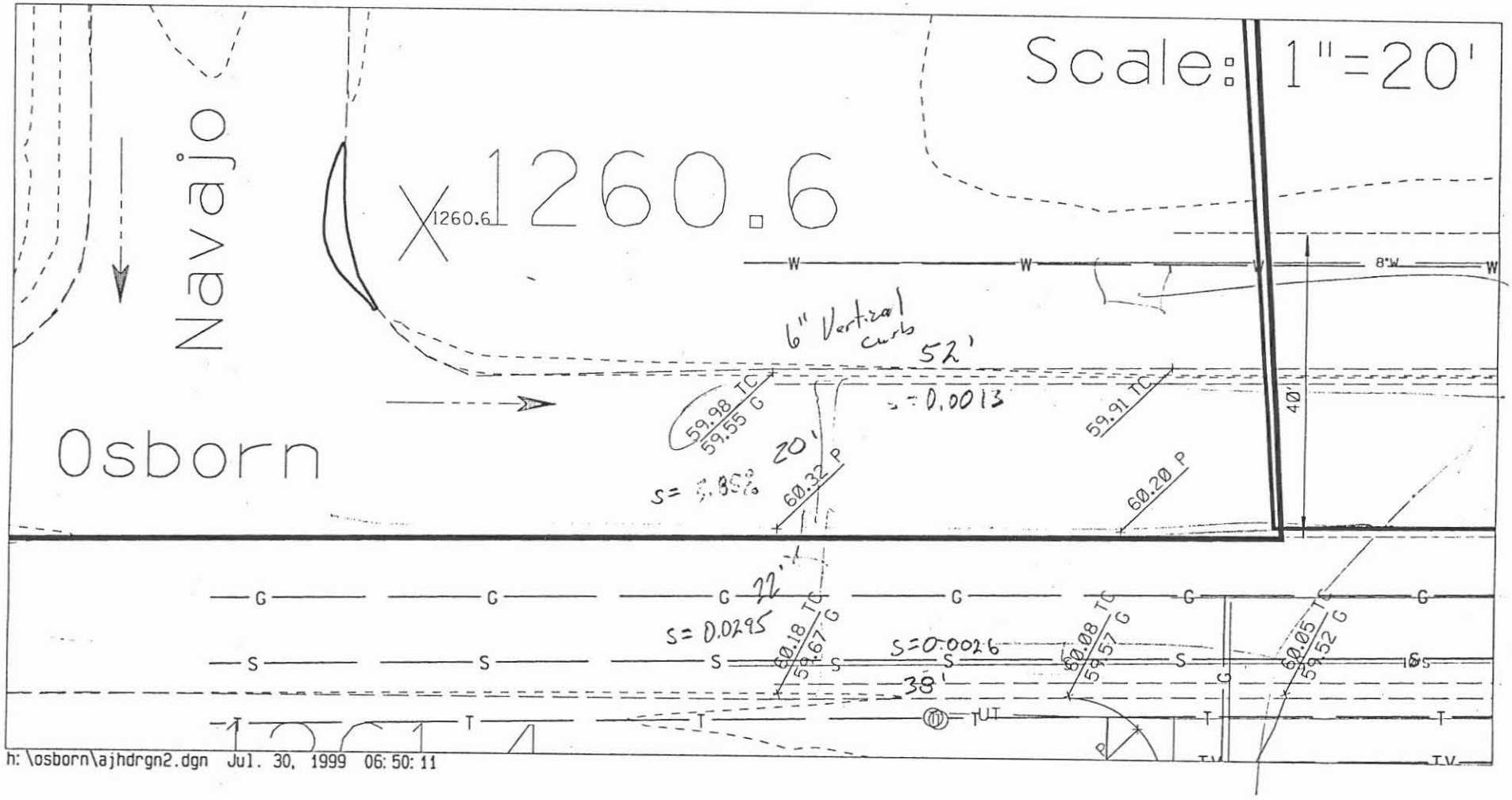

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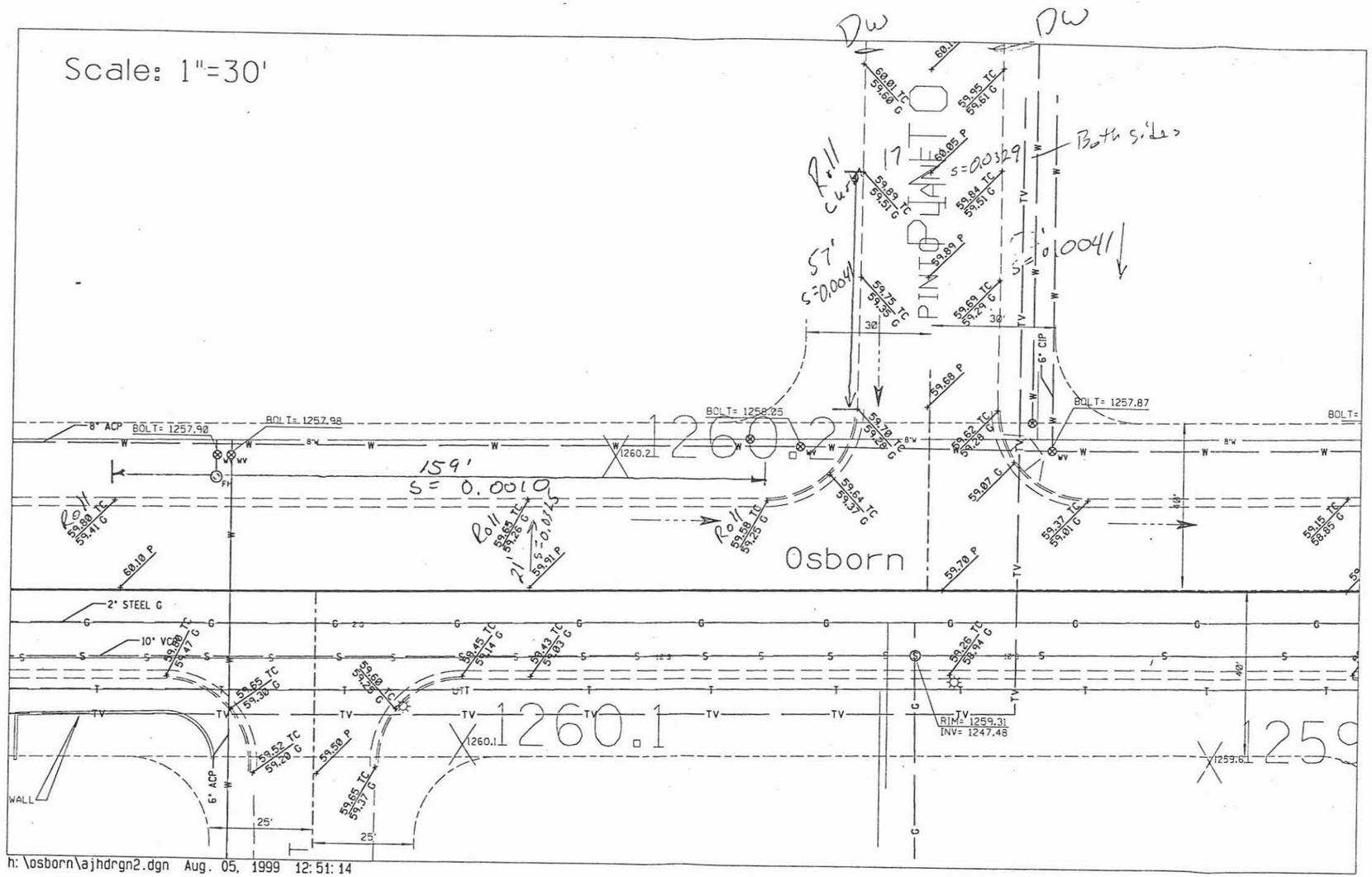

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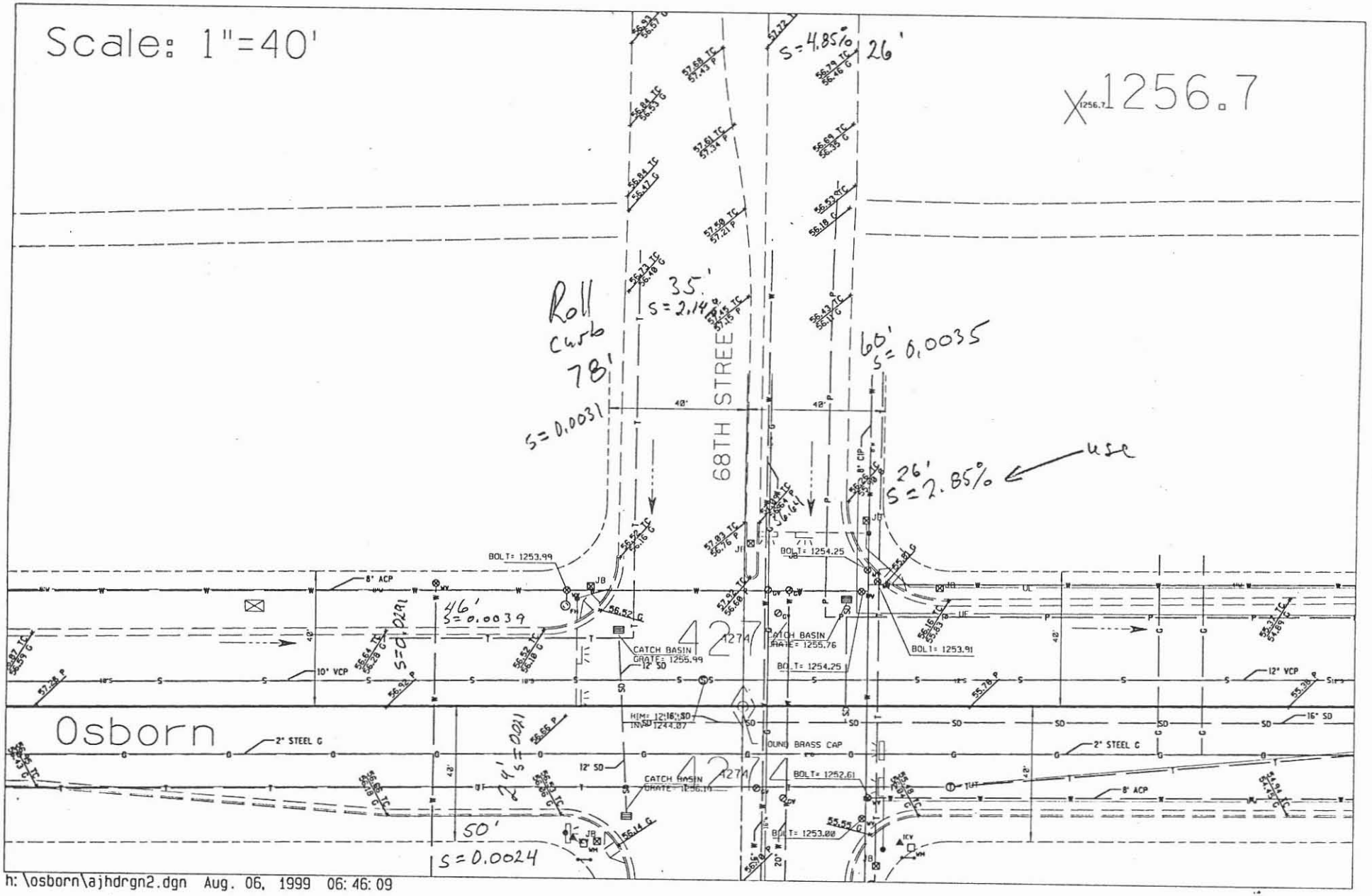
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68TH STREET
Osborn
Roll curb
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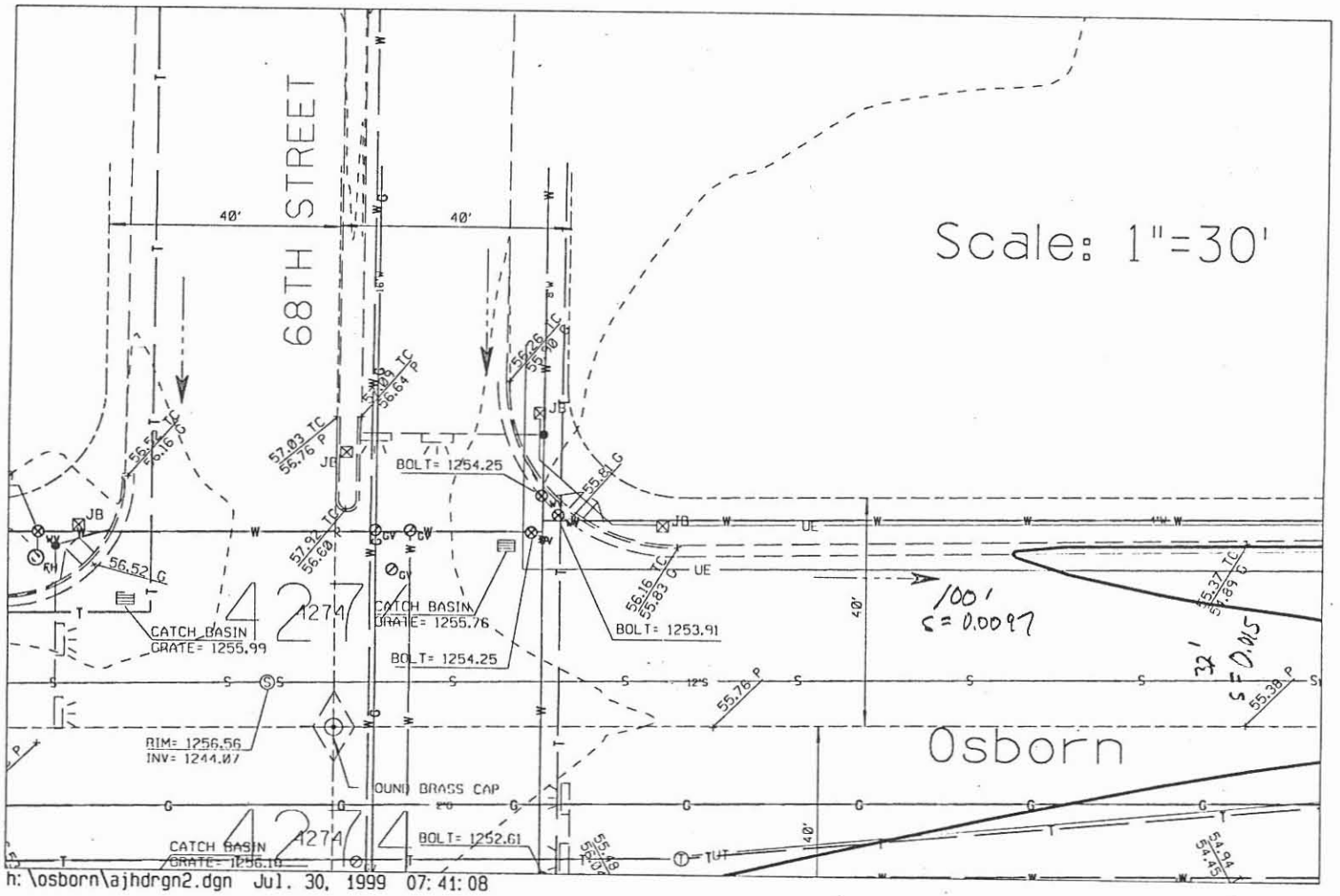
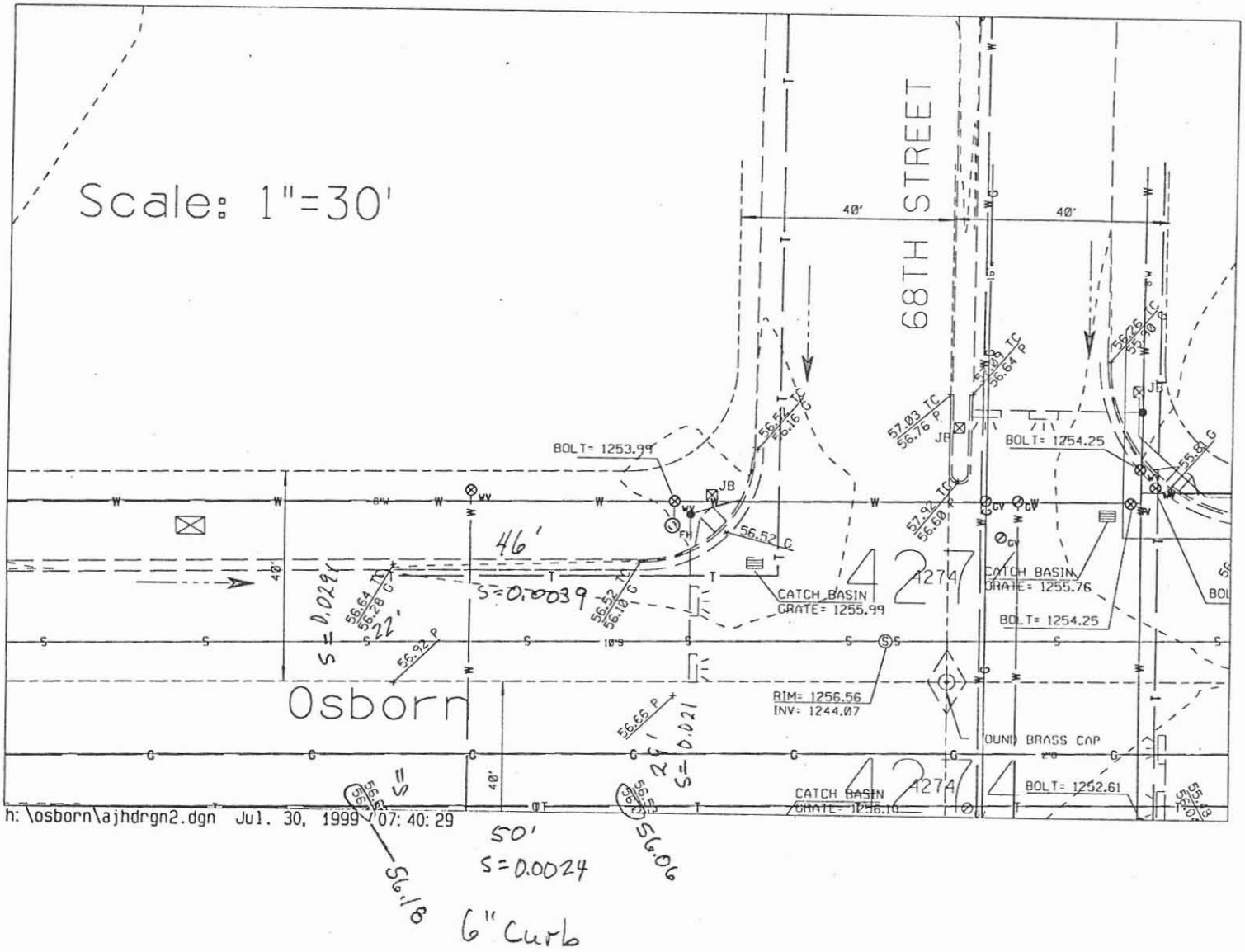
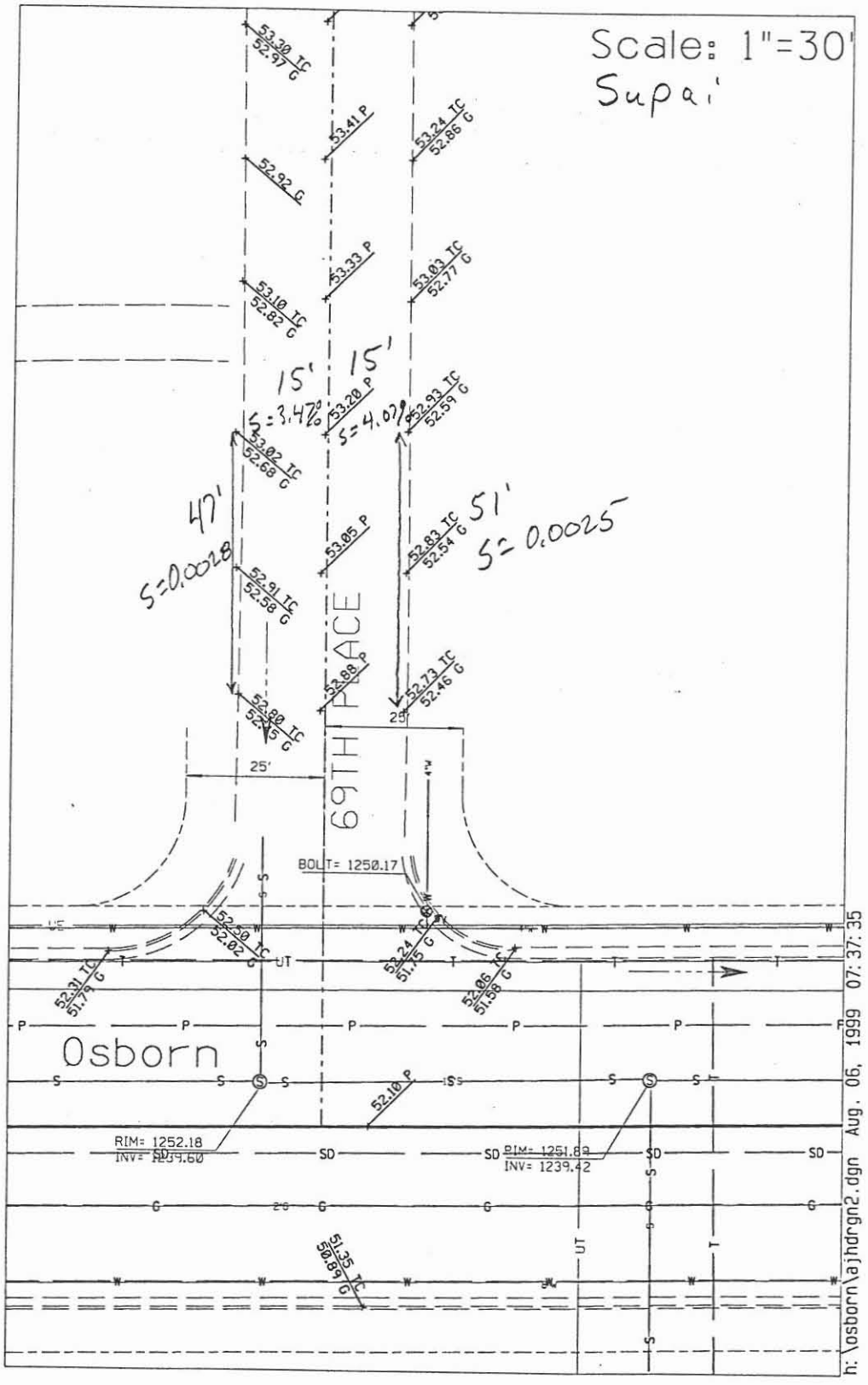
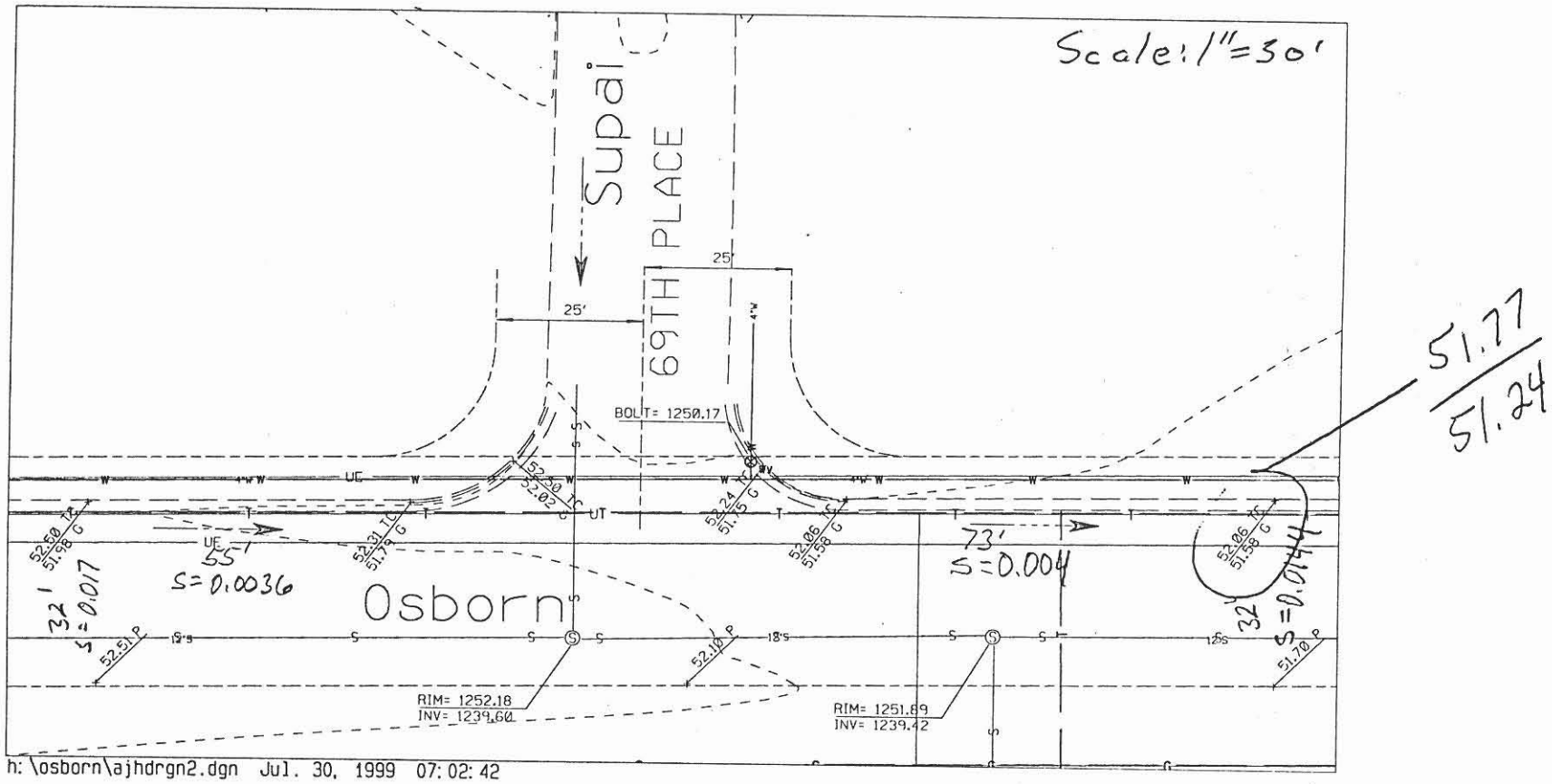
35'
S=2.14%
S=4.85%
26'
60'
S=0.0035
use
26'
S=2.85%
46'
S=0.0039
S=0.0021
24'
S=0.0021
50'
S=0.0024
BOLT= 1253.99
BOLT= 1254.25
BOLT= 1253.91
BOLT= 1252.61
BOLT= 1253.00
CATCH BASIN
GRATE= 1255.99
CATCH BASIN
GRATE= 1255.76
CATCH BASIN
GRATE= 1256.10
FOUND BRASS CAP
8" ACP
10" VCP
12" VCP
2" STEEL G
12" SD
16" SD
8" CIP
4274
4274
4274
h:\osborn\ajhdrgn2.dgn Aug. 06, 1999 06:46:09


Scale: 1"=30'
68TH STREET
Osborn
40'
40'
BOLT= 1254.25
CATCH BASIN
GRATE= 1255.76
BOLT= 1254.25
CATCH BASIN
GRATE= 1255.99
BOLT= 1253.91
RIM= 1256.56
INV= 1244.07
FOUND BRASS CAP
CATCH BASIN
GRATE= 1256.10
BOLT= 1252.61
100'
S = 0.0097
37'
S = 0.015
140'
4274
4274
4274
h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 07:41:08


Scale: 1"=30'
68TH STREET
40'
40'
Osborn
BOLT= 1253.99
BOLT= 1254.25
BOLT= 1254.25
BOLT= 1252.61
CATCH BASIN
GRATE= 1255.99
CATCH BASIN
GRATE= 1255.76
CATCH BASIN
GRATE= 1256.10
RIM= 1256.56
INV= 1244.07
FOUND BRASS CAP
4274
4274
4274
56.52 TC
56.16 C
56.52 C
57.03 TC
56.76 P
56.64 P
57.92 TC
56.60 P
56.26 TC
55.90 P
55.81 C
56.64 TC
56.28 C
56.52 TC
56.10 C
56.92 P
56.65 P
56.18
56.06
46'
S=0.0039
22'
S=0.029
22'
S=0.021
50'
S=0.0024
6" Curb
h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 07:40:29

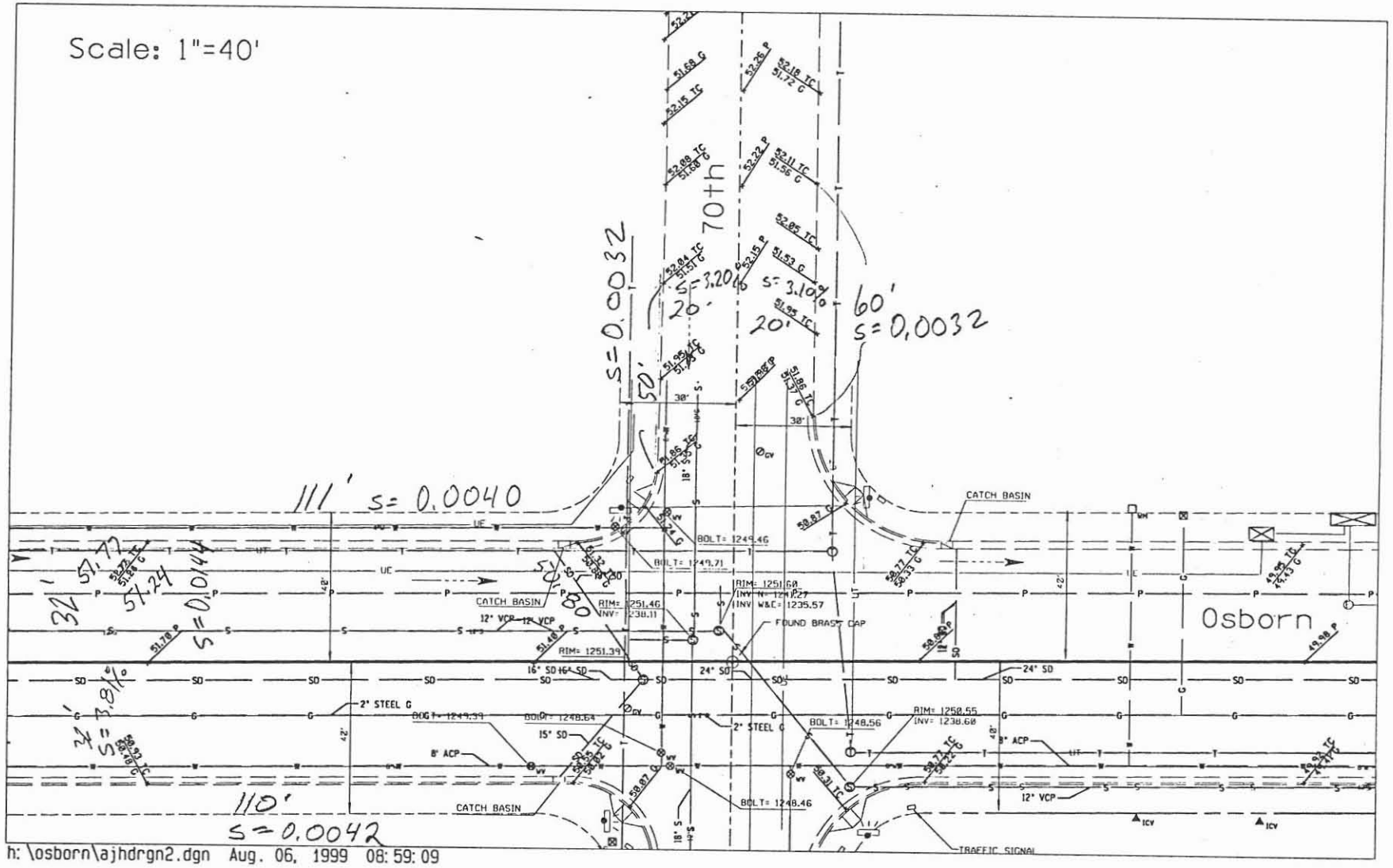

Scale: 1"=30'
Supai
69TH PLACE
Osborn
15'
15'
47'
51'
S=3.47%
S=4.07%
S=0.0028
S=0.0025
25'
25'
BOLT= 1250.17
RIM= 1252.18
INV= 1239.60
RIM= 1251.89
INV= 1239.42
53.30 TC
52.97 G
53.41 P
53.24 TC
52.86 G
52.92 G
53.33 P
53.03 TC
52.77 G
53.10 TC
52.82 G
53.20 P
52.93 TC
52.59 G
53.02 TC
52.68 G
53.05 P
52.83 TC
52.54 G
52.91 TC
52.58 G
53.08 P
52.73 TC
52.46 G
52.80 TC
52.45 G
52.30 TC
52.02 G
52.24 TC
51.75 G
52.31 TC
51.79 G
52.06 TC
51.58 G
52.10 P
51.35 TC
50.89 G
h:\osborn\ajhdrgn2.dgn Aug. 06, 1999 07:37:35



South gutter:

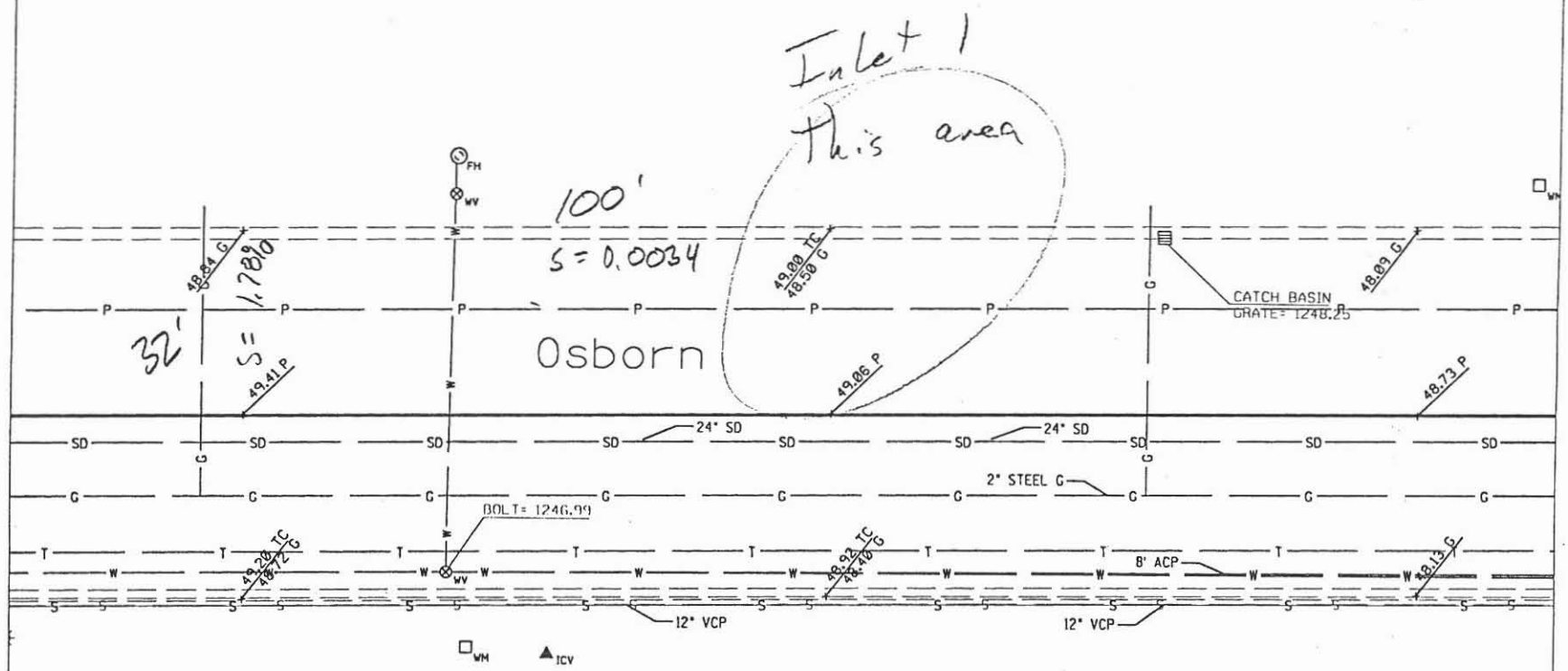
$$S_L = \frac{51.25 - 50.89}{99} = 0.0041$$

$$S_x = \frac{52.10 - 50.89}{32} = 0.0066$$

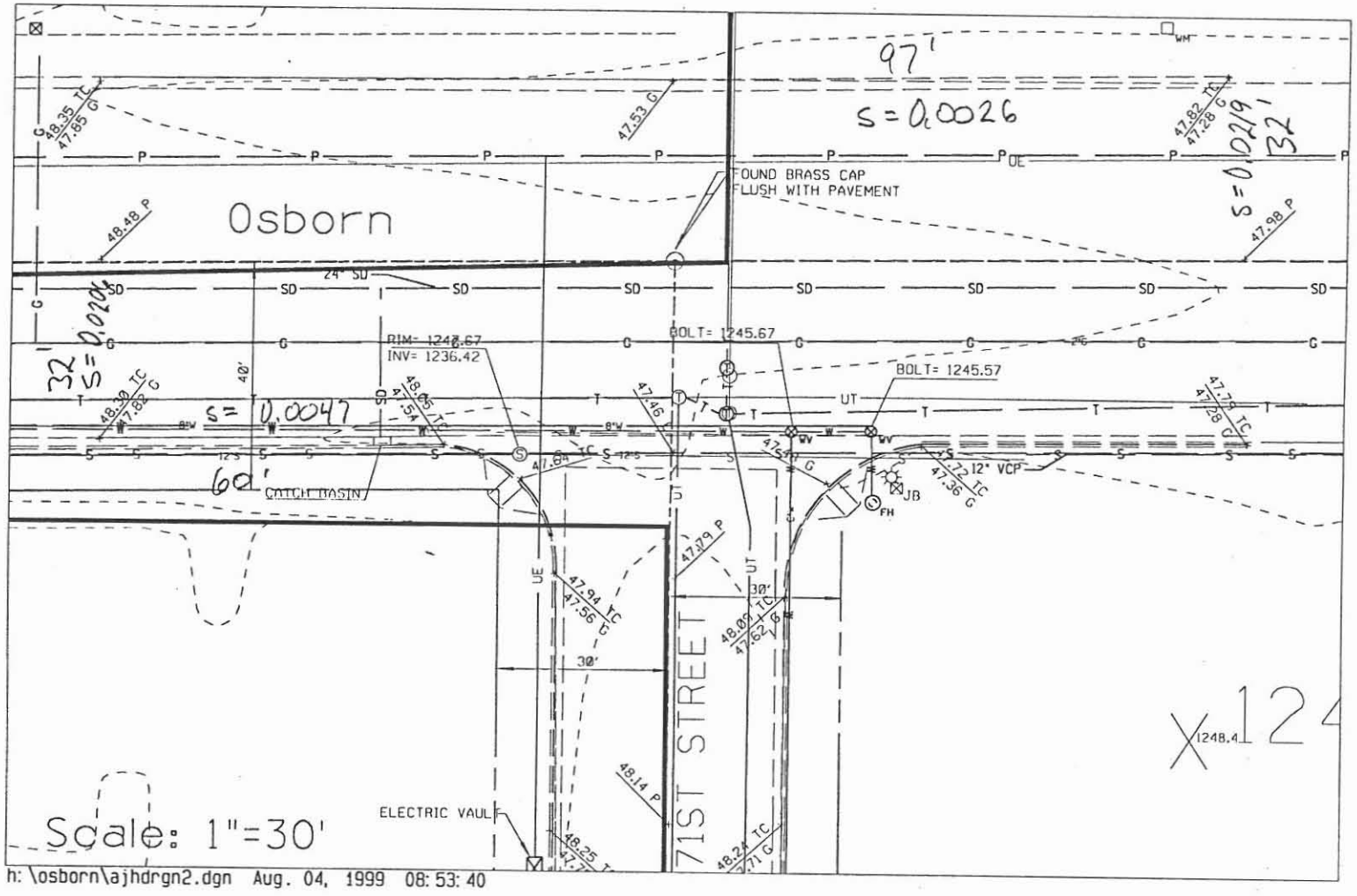

Scale: 1"=40'
70th
Osborn
4 lanes
111' s= 0.0040
110'
s= 0.0042
s= 0.0032
s= 3.20%
s= 3.10%
60'
s= 0.0032
20'
20'
50'
30'
30'
CATCH BASIN
CATCH BASIN
CATCH BASIN
FOUND BRASS CAP
TRAFFIC SIGNAL
2" STEEL G
8" ACP
12" VCP
24" SD
16" SD
15" SD
18" SD
BOLT= 1249.46
BOLT= 1249.71
BOLT= 1248.56
BOLT= 1248.46
RIM= 1251.39
RIM= 1250.55
INV= 1238.60
INV W&E= 1235.57
h: \osborn\ajhdrgn2.dgn Aug. 06, 1999 08:59:09

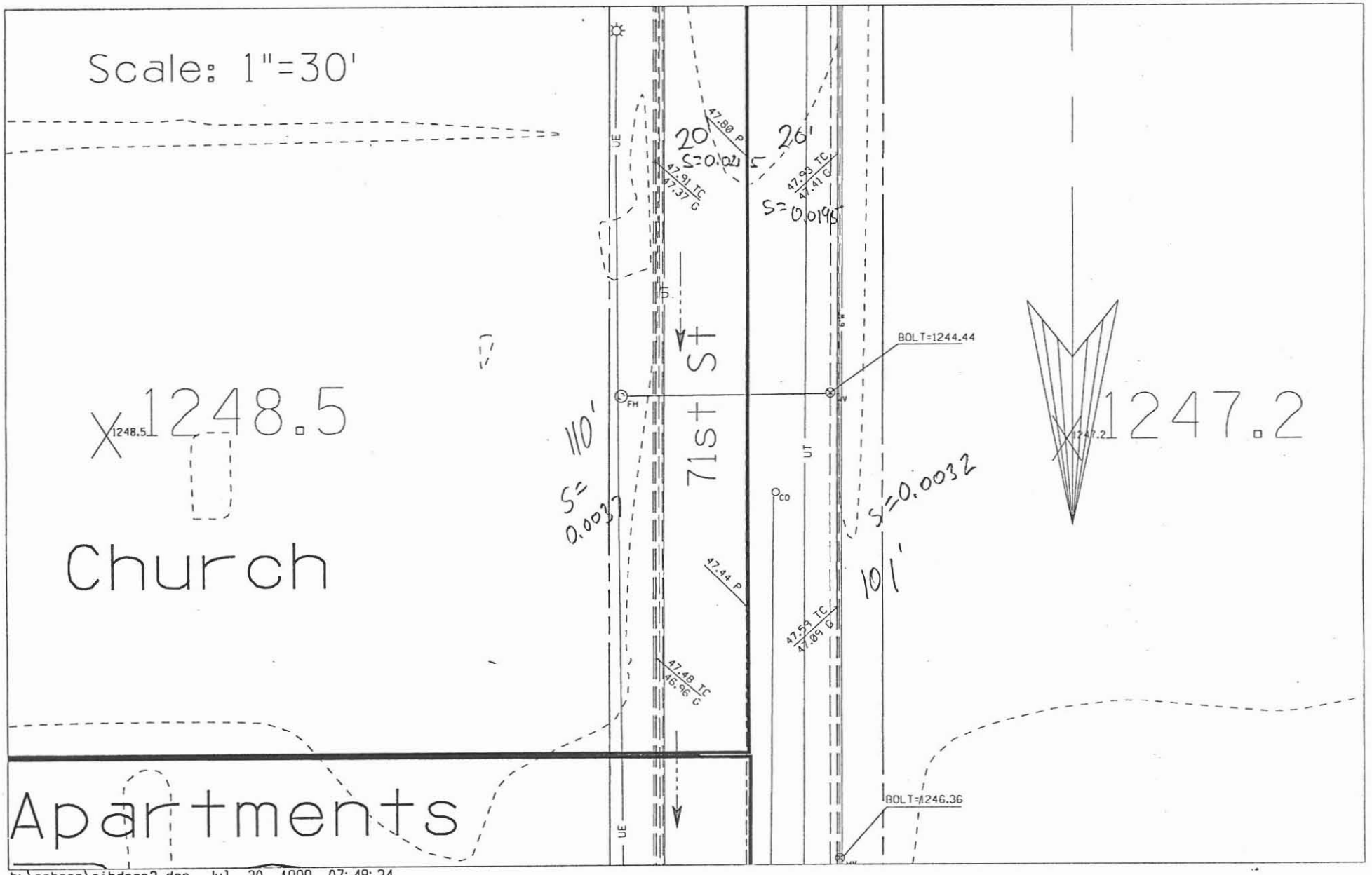
Osborn, ½way between 70th and 71st

Scale: 1"=30'

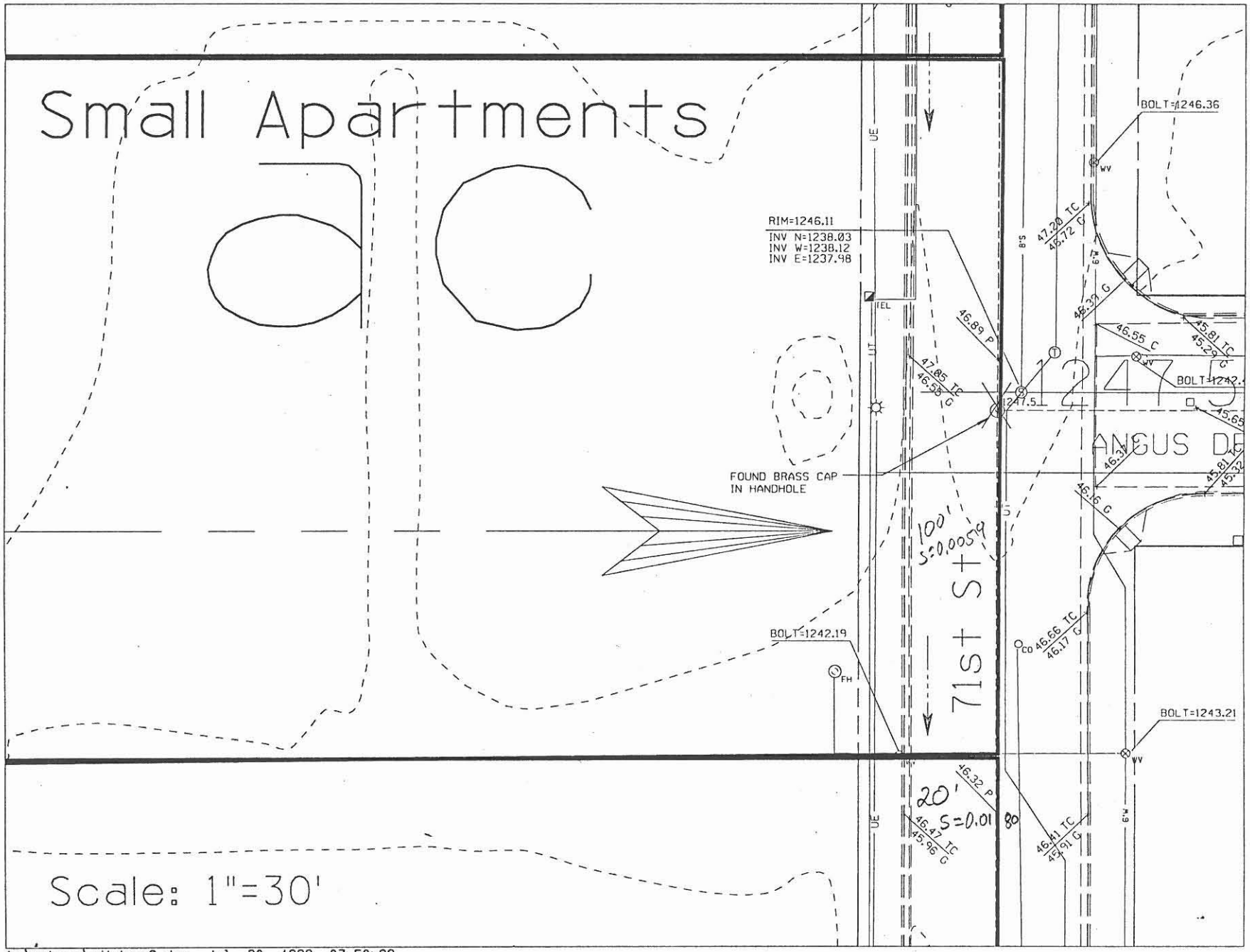


h:\osborn\ajhdrgn2.dgn Aug. 06, 1999 12:09:05

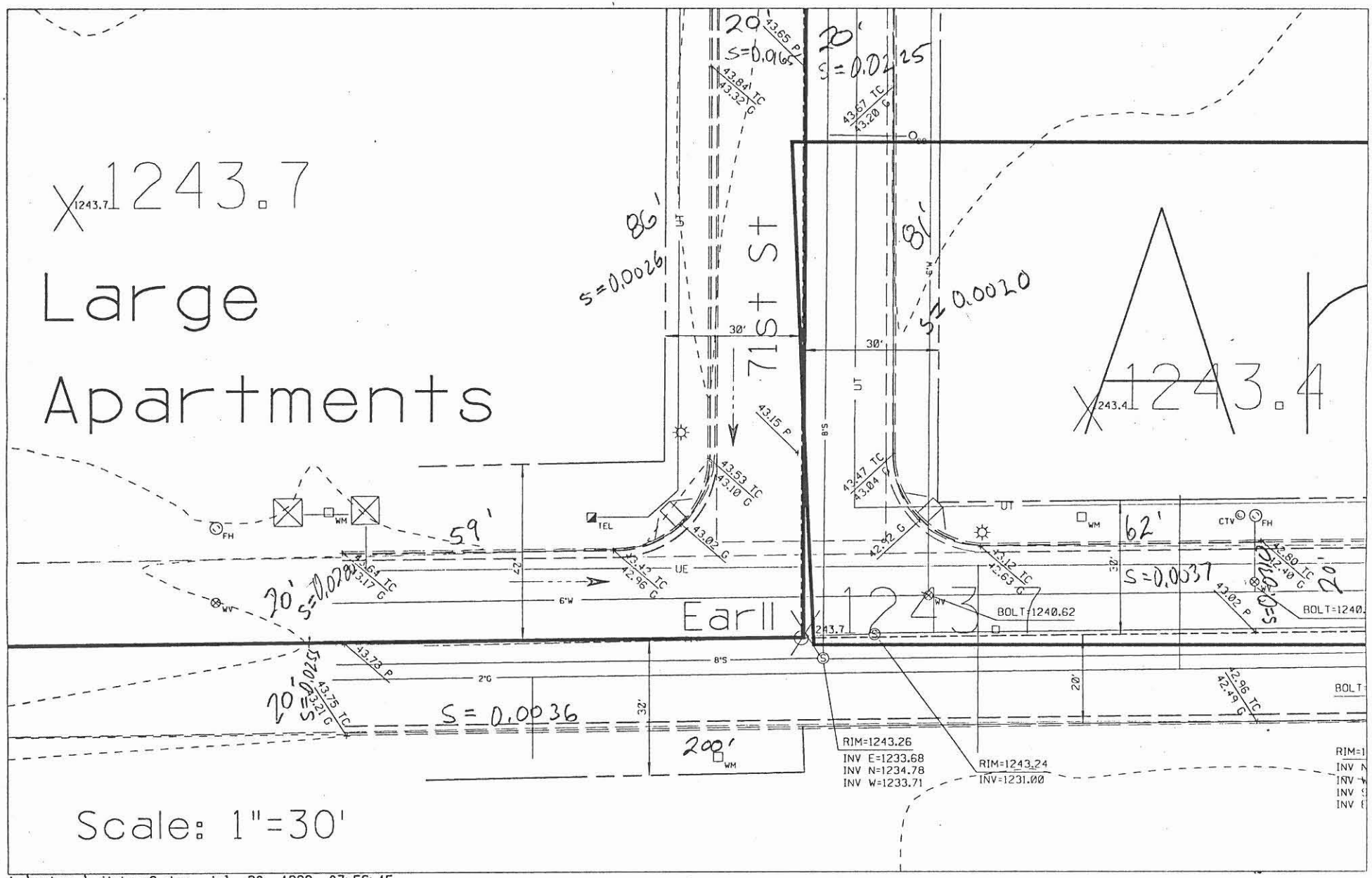

Osborn
71ST STREET
FOUND BRASS CAP
FLUSH WITH PAVEMENT
RIM= 1247.67
INV= 1236.42
BOLT= 1245.67
BOLT= 1245.57
CATCH BASIN
ELECTRIC VAULT
24" SD
12" VCP
97'
S= 0.0026
S= 0.0219
32
S= 0.0204
32
S= 0.0047
60'
30'
30'
Scale: 1"=30'
h:\osborn\ajhdrgn2.dgn Aug. 04, 1999 08:53:40



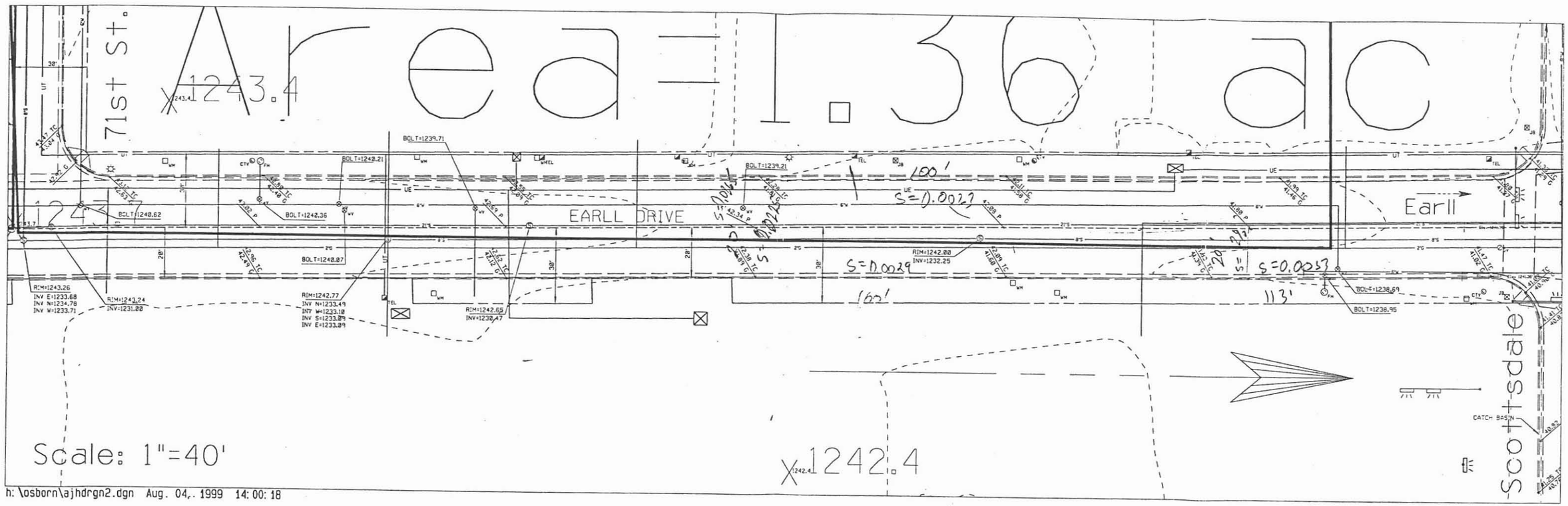
h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 07:48:24

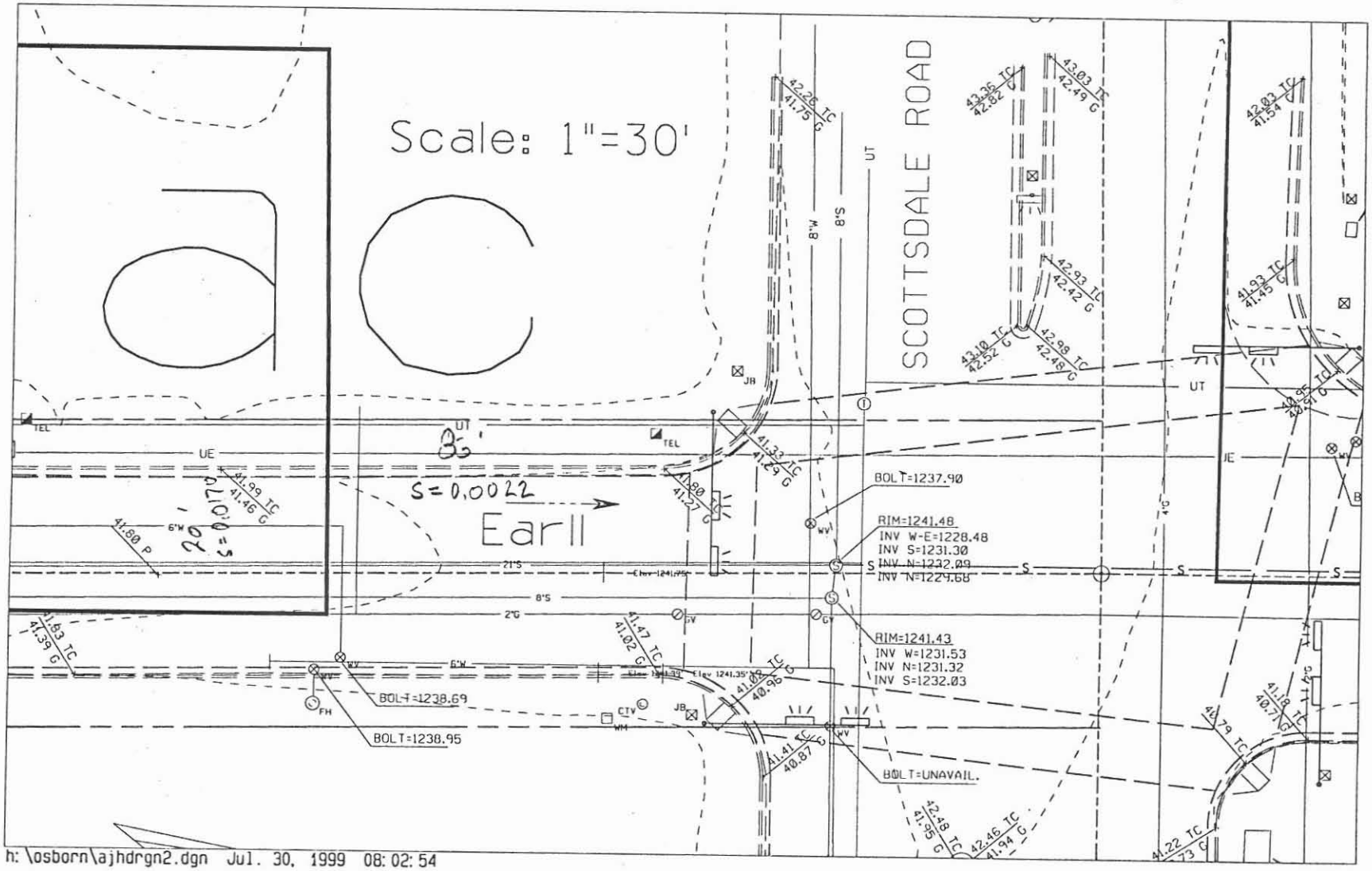


h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 07:50:29

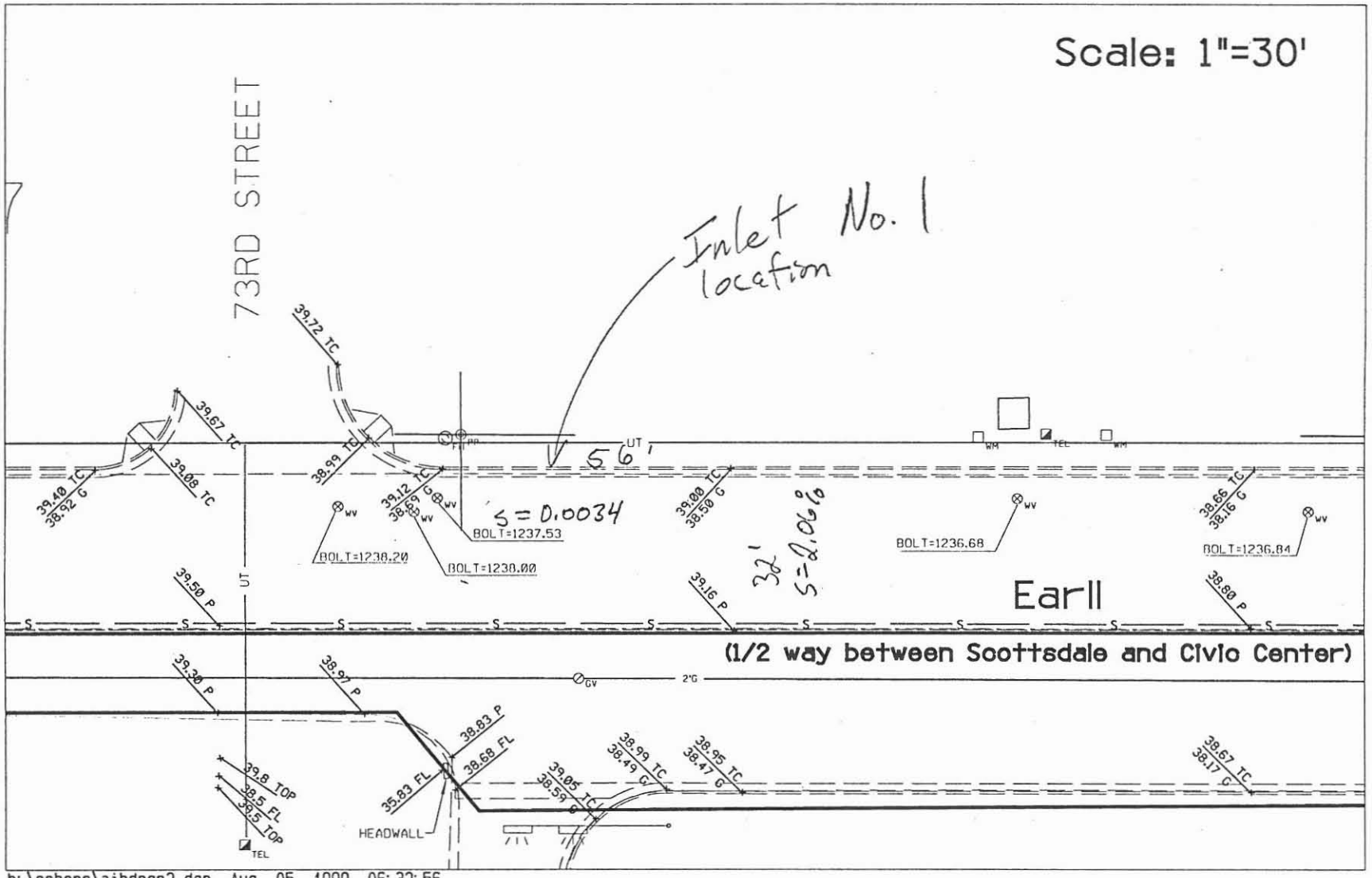


h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 07:56:15

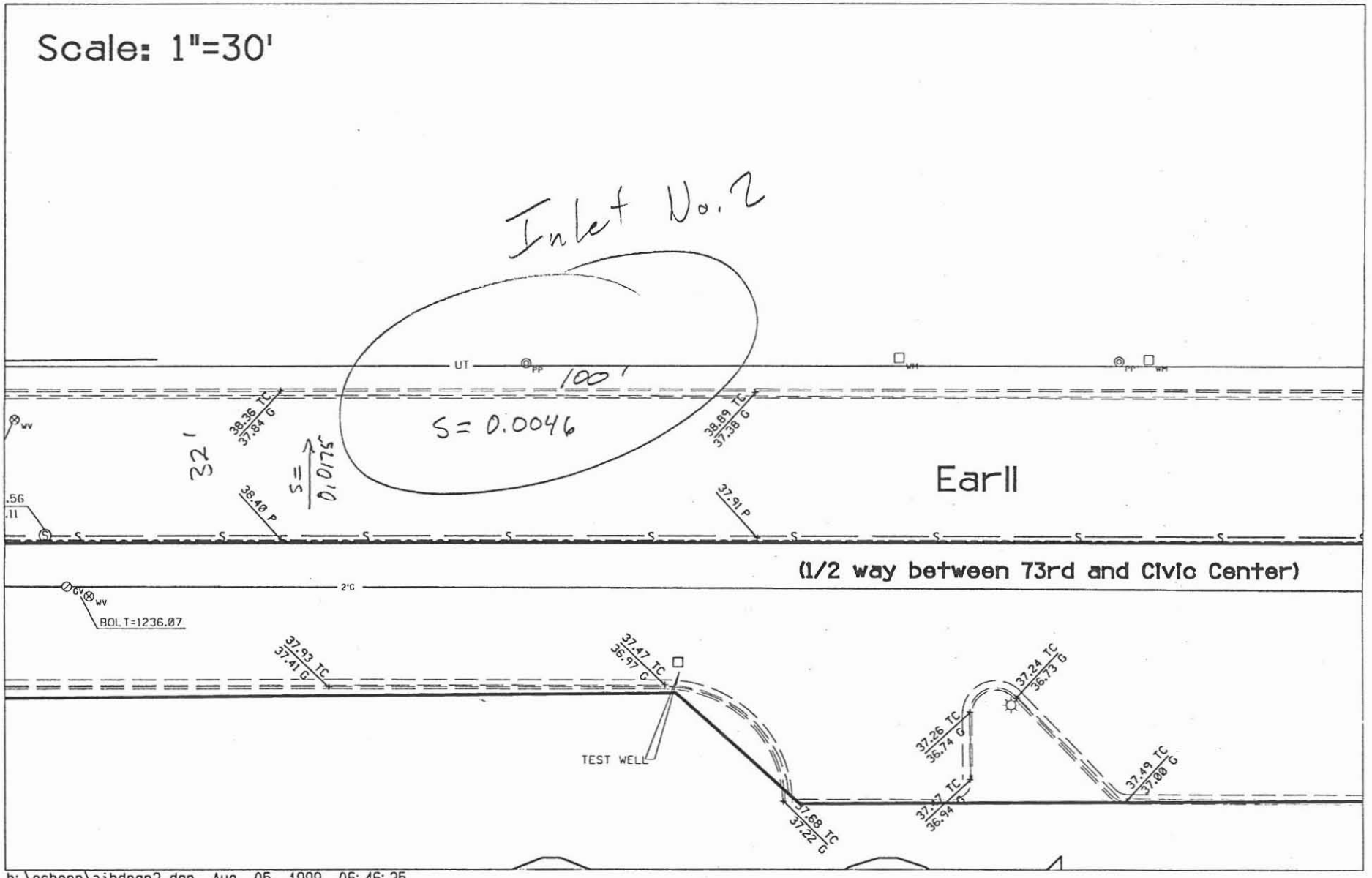

Area=1.36 ac
71st St.
X 1243.4
EARLL DRIVE
Earll
Scottsdale
CATCH BASIN
X 1242.4
S=0.0029
S=0.0053
100'
160'
113'
BOLT=1239.71
BOLT=1242.21
BOLT=1239.21
BOLT=1240.62
BOLT=1242.36
BOLT=1240.07
RIM=1242.00
INV=1232.25
BOLT=1238.69
BOLT=1238.95
RIM=1243.26
INV E=1233.68
INV N=1234.78
INV W=1233.71
RIM=1243.24
INV=1231.02
RIM=1242.77
INV N=1233.49
INV W=1233.10
INV S=1233.09
INV E=1233.09
RIM=1242.65
INV=1238.47
Scale: 1"=40'
h:\osborn\ajhdrgn2.dgn Aug. 04,. 1999 14:00:18



h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 08:02:54

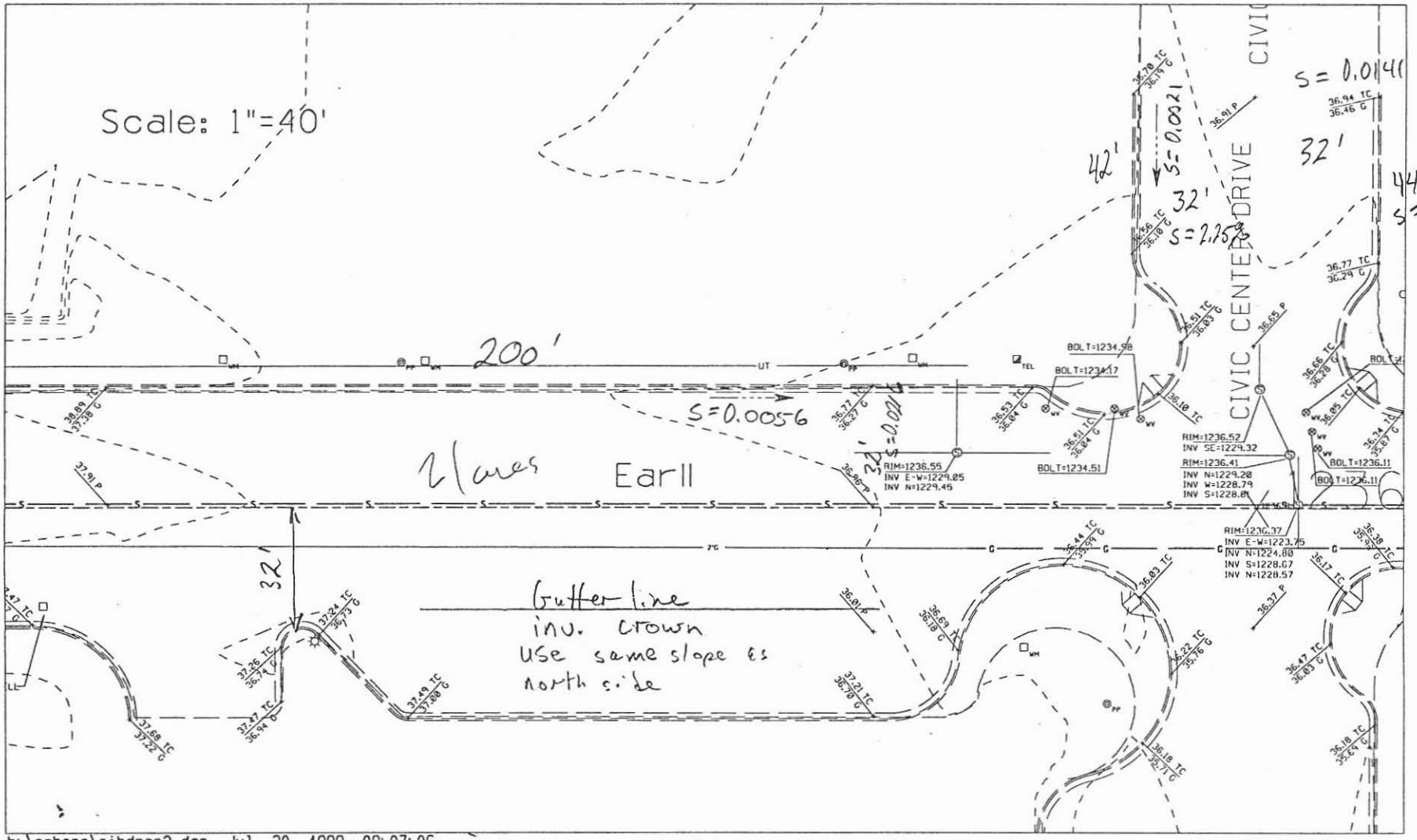


h:\osborn\ajhdrgn2.dgn Aug. 05, 1999 06:32:56



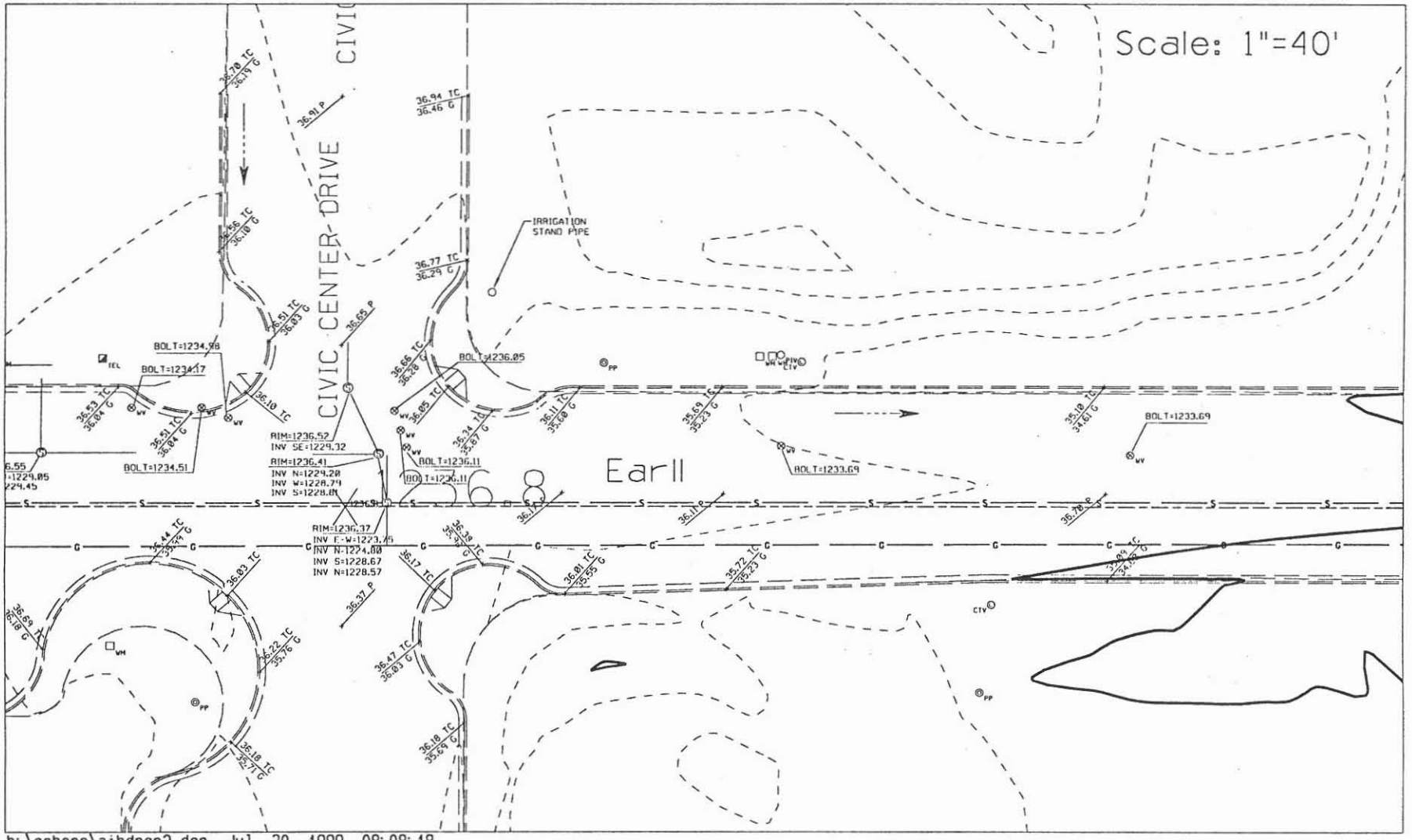
h:\osborn\ajhdrgn2.dgn Aug. 05, 1999 06:46:25

2 lanes w/ Turn bay

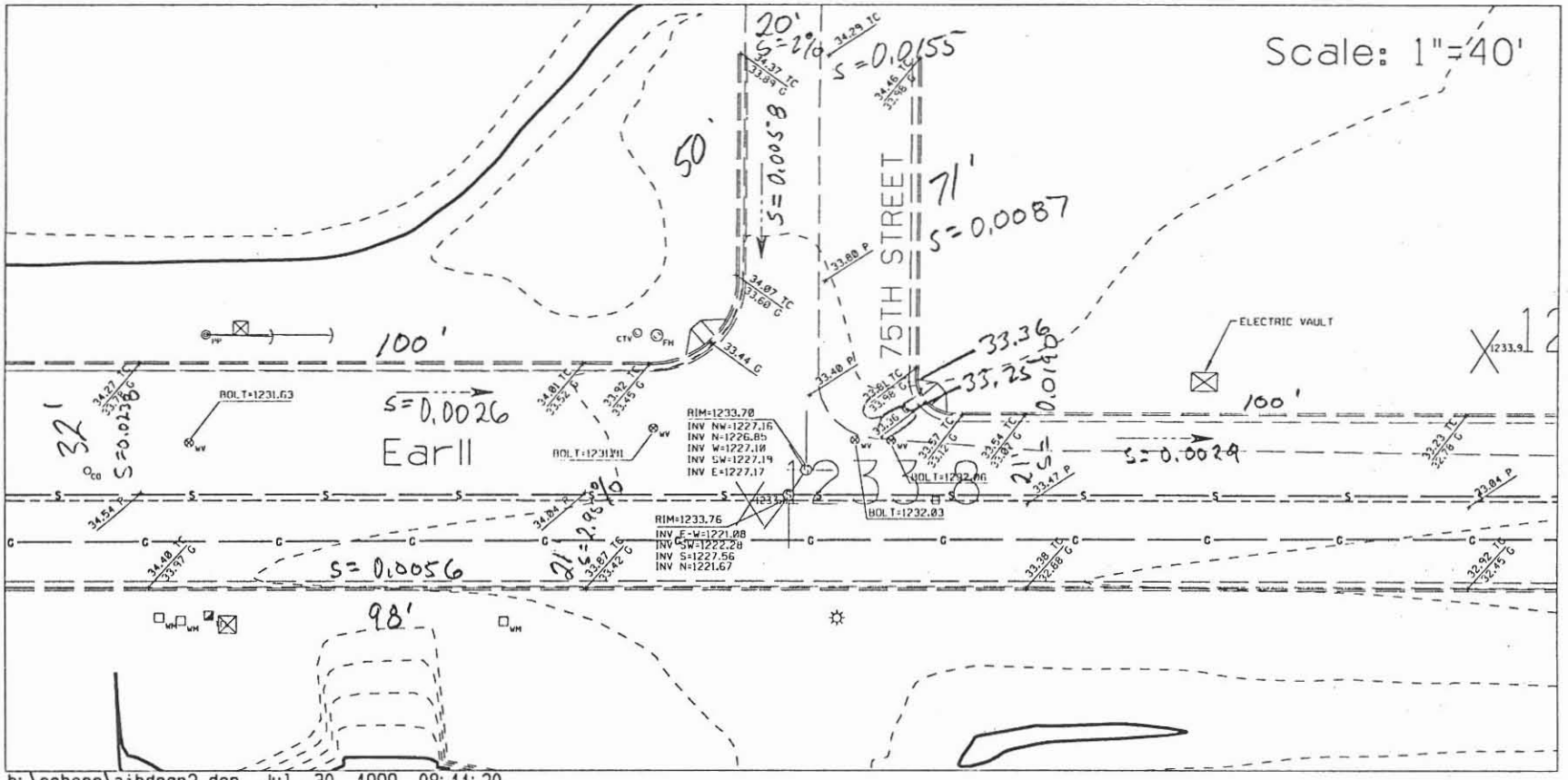


h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 08:07:06

2 lanes w/ median

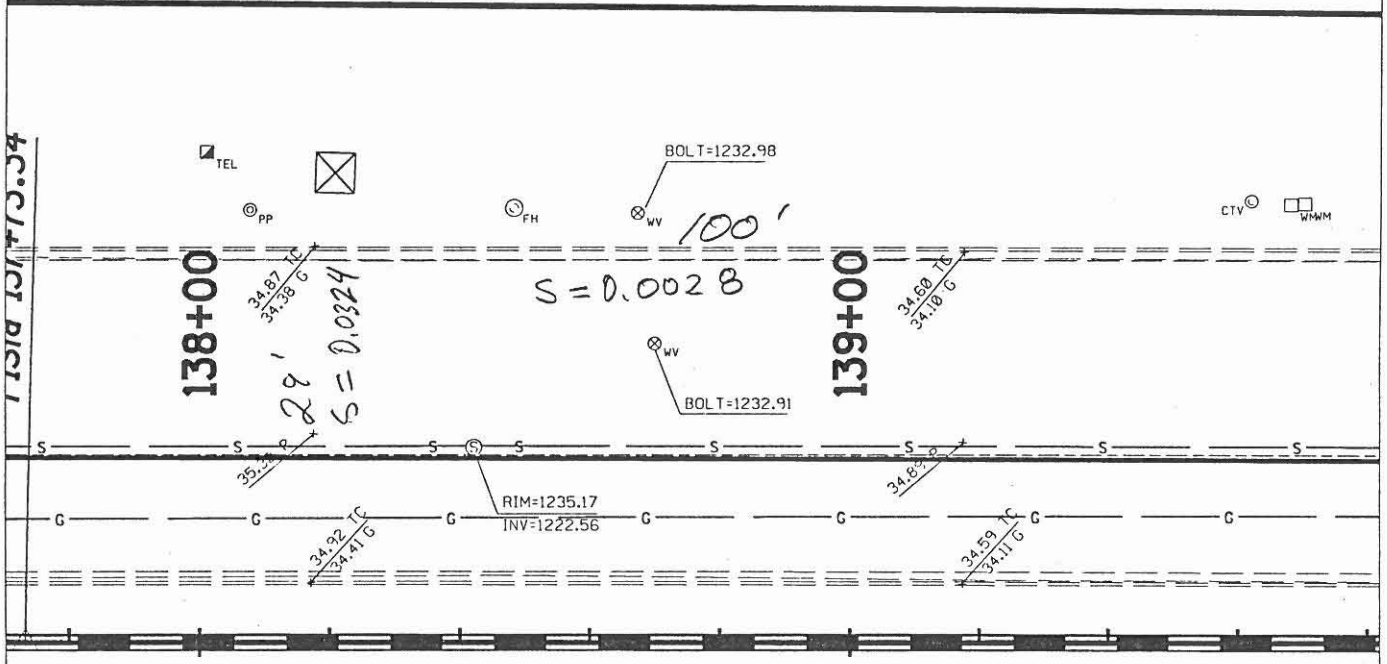


h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 08:08:18



h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 08:11:20

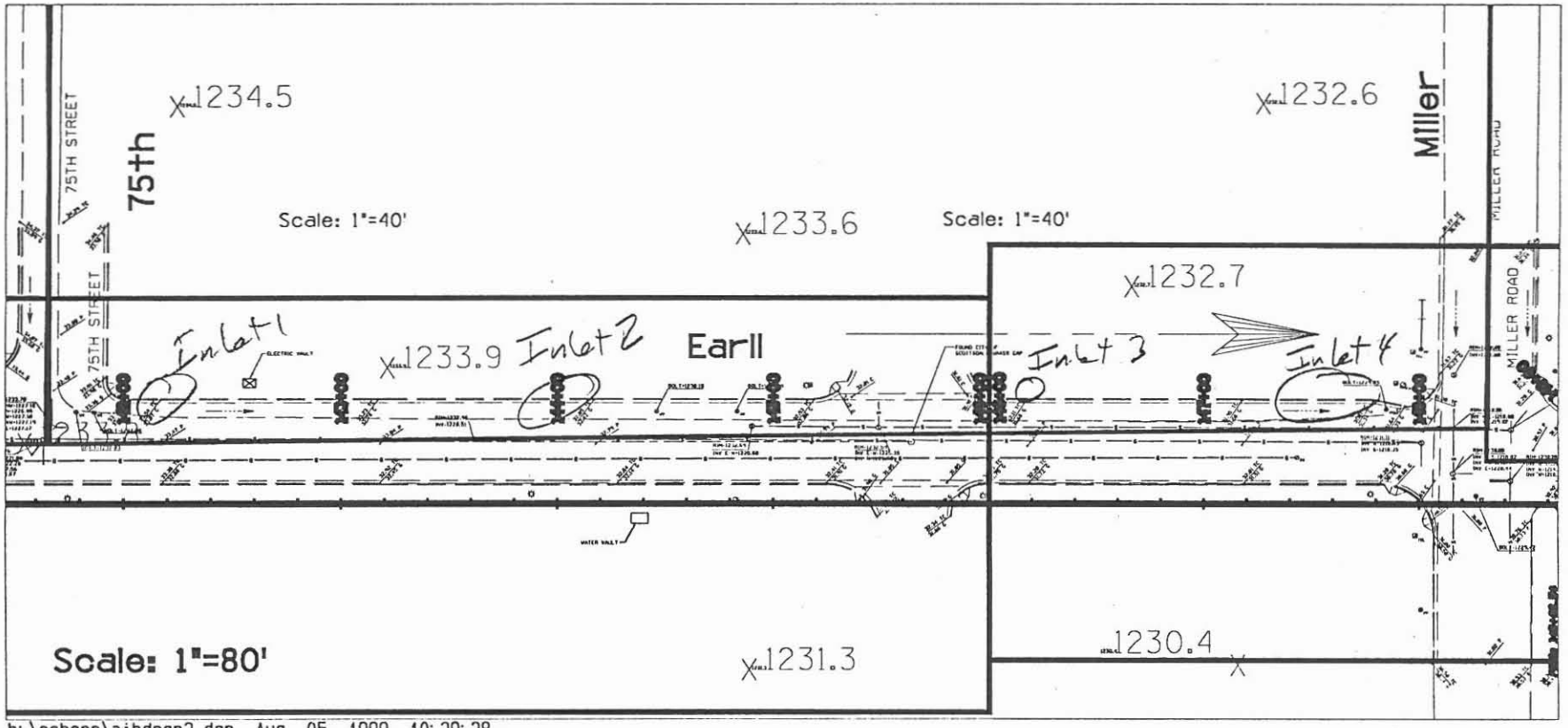
Scale: 1"=30'



Earll

(1/2 way between Civic Center and 75th)

h:\osborn\ajhdrgn2.dgn Aug. 05, 1999 07:59:41

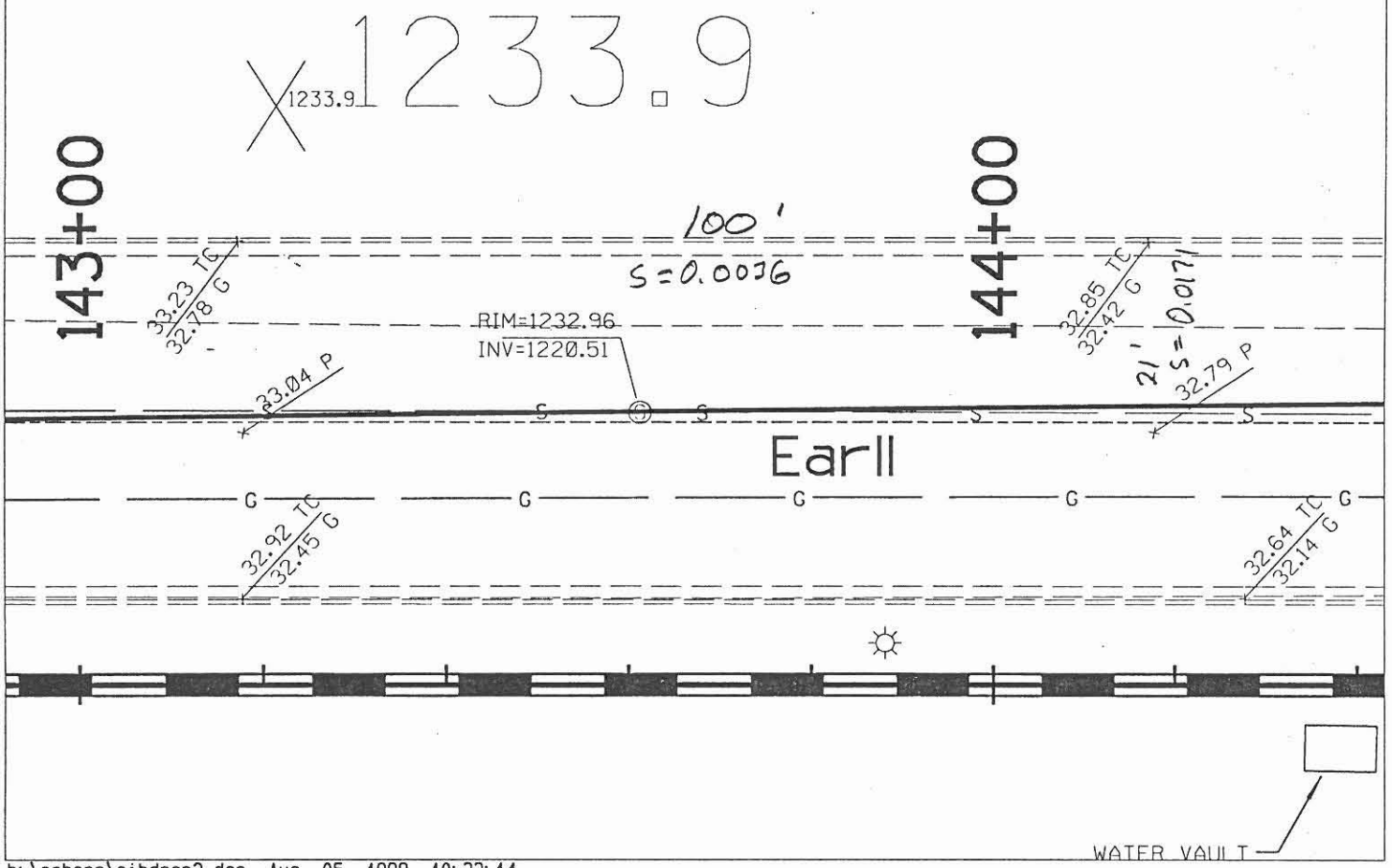


h: \osborn\ajhdrgn2.dgn Aug. 05, 1999 10: 29: 28

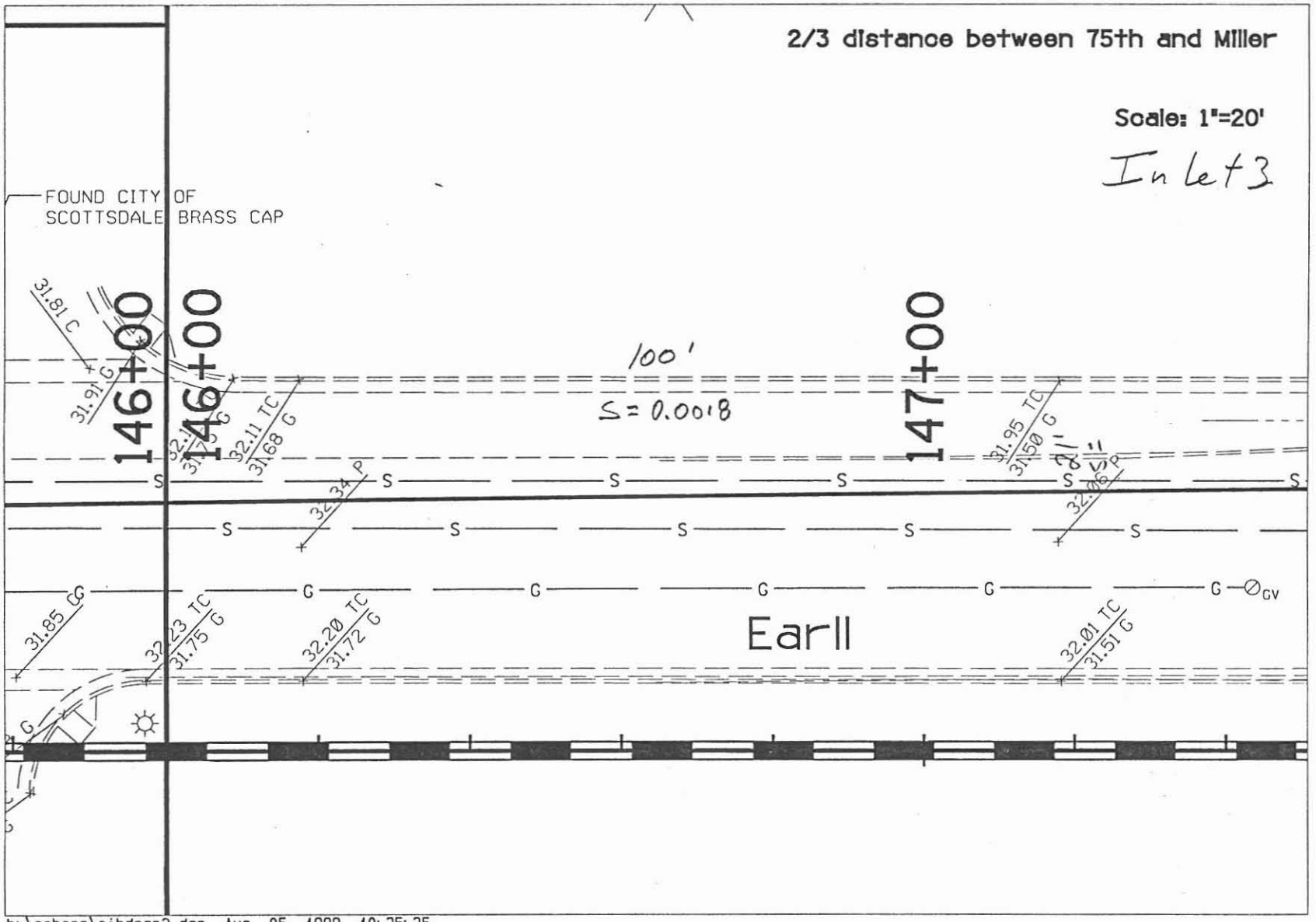
1/3 distance between 75th and Miller

Scale: 1"=20'

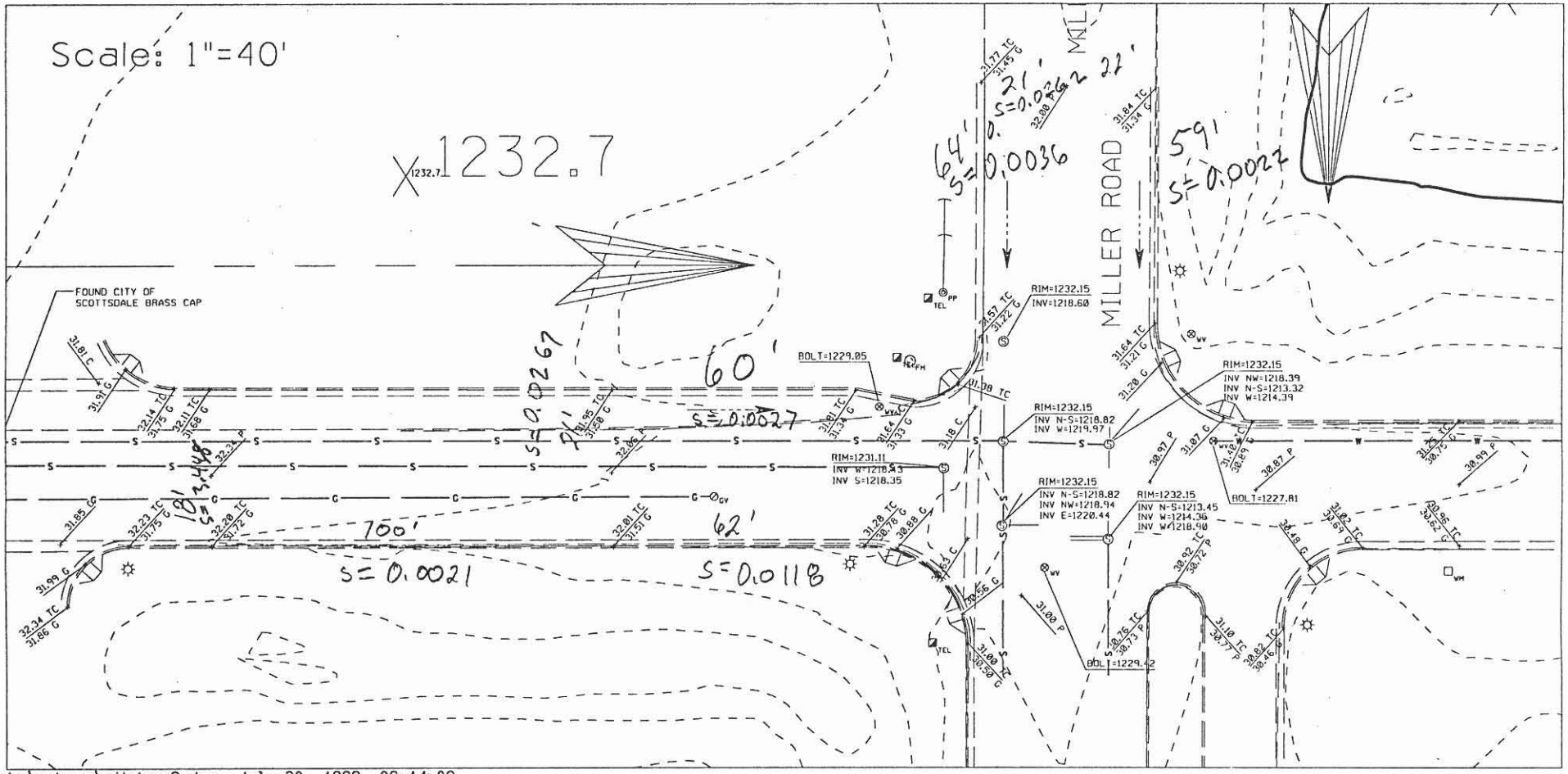
Inlet 2



h:\osborn\ajhdrgn2.dgn Aug. 05, 1999 10:33:14



h:\osborn\ajhdrgn2.dgn Aug. 05, 1999 10:35:35



h:\osborn\ajhdrgn2.dgn Jul. 30, 1999 08:14:02