

CITY OF ALBUQUERQUE



December 21, 2007

Greg Krenik, PE
Mark Goodwin & Associates
P.O. Box 90606,
Albuquerque, NM 87199

**Re: Anderson Heights Subdivision Units 4 & 6 Amended Drainage Report
Engineer's Stamp dated 10-29-07, (N8/D3A)**

DOC 6 D 1

Dear Mr. Krenik,

Based upon the information provided in your submittal dated 10-30-07, the above referenced report is approved for Amended Preliminary Plat action by the DRB. This is now the plan that must be certified for release of SIA and Financial Guarantees.

If you have any questions, please contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Principal Engineer, Planning Dept
Development and Building Services

C: file

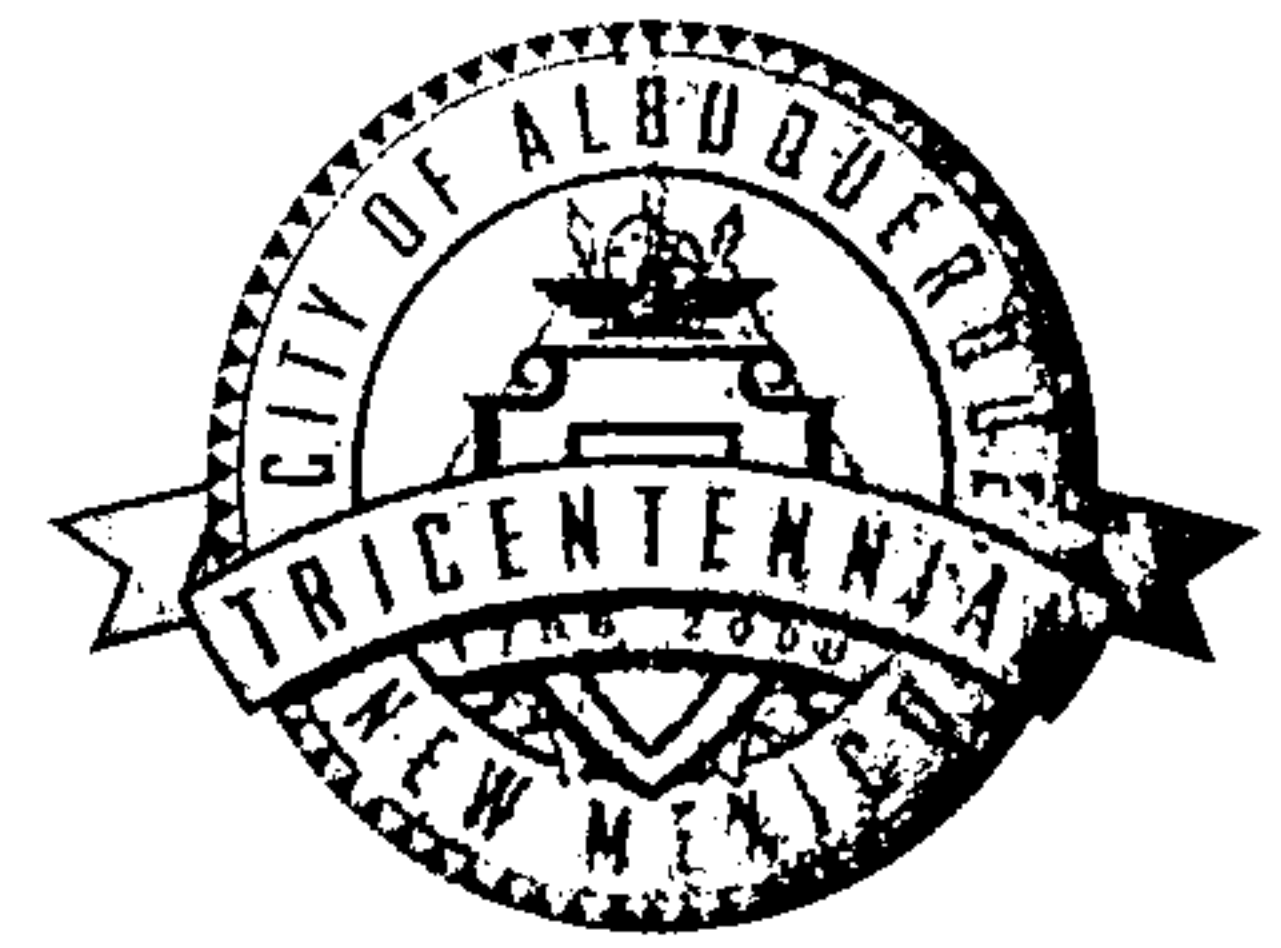
P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

CITY OF ALBUQUERQUE



August 13, 2007

Greg Krenik, PE
Mark Goodwin & Associates
P.O. Box 90606,
Albuquerque, NM 87199

Re: Anderson Heights Subdivision Units 4 & 6 Drainage Report
Engineer's Stamp dated 7-20-07, (N8/D3A)

0006 D1

Dear Mr. Krenik,

Based upon the information provided in your submittal dated 7-23-07, the above referenced report is approved for Preliminary Plat action by the DRB. However, before that board acts on the project and I sign the infrastructure list, I will need a cost analysis of the comparison of the parallel pipe system versus removing and upsizing the existing pipe layout.

If you have any questions, please contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Principal Engineer, Planning Dept
Development and Building Services

C: file

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New Mexico 87103

www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Anderson Heights, Units 4 & 6DRB #: 1002793

EPC#: _____

LEGAL DESCRIPTION: Parcels 4 & 6, Anderson Heights, Unit 1

CITY ADDRESS: _____

ENGINEERING FIRM: Mark Goodwin & Associates, PAADDRESS: PO Box 90806CITY, STATE: Albuquerque, NMOWNER: KB HOME, New Mexico, Inc.ADDRESS: 8330 Riverside Plaza Lane NW #200CITY, STATE: Albuquerque, NM

ARCHITECT: _____

ADDRESS: _____

CITY, STATE: _____

SURVEYOR: Aldrich Land SurveyingADDRESS: PO Box 30701CITY, STATE: Albuquerque, NM

CONTRACTOR: _____

ADDRESS: _____

CITY, STATE: _____

CHECK TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
☐ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
☒ DRAINAGE PLAN RESUBMITTAL
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEERS CERTIFICATION (TCL)
☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
☒ OTHER

*REVISED UNITS 4+6*WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
☒ NO
☐ COPY PROVIDED

DATE SUBMITTED: July 20, 2007ZONE MAP/DRG. FILE # N-8/P-8

WORK ORDER#: _____

CONTACT: Gregory J. KrenikPHONE: 828-2200ZIP CODE: 87199CONTACT: Gary JenkinsPHONE: 353-5300ZIP CODE: 87120

CONTACT: _____

PHONE: _____

ZIP CODE: _____

CONTACT: Tim AldrichPHONE: 884-1990ZIP CODE: 87190

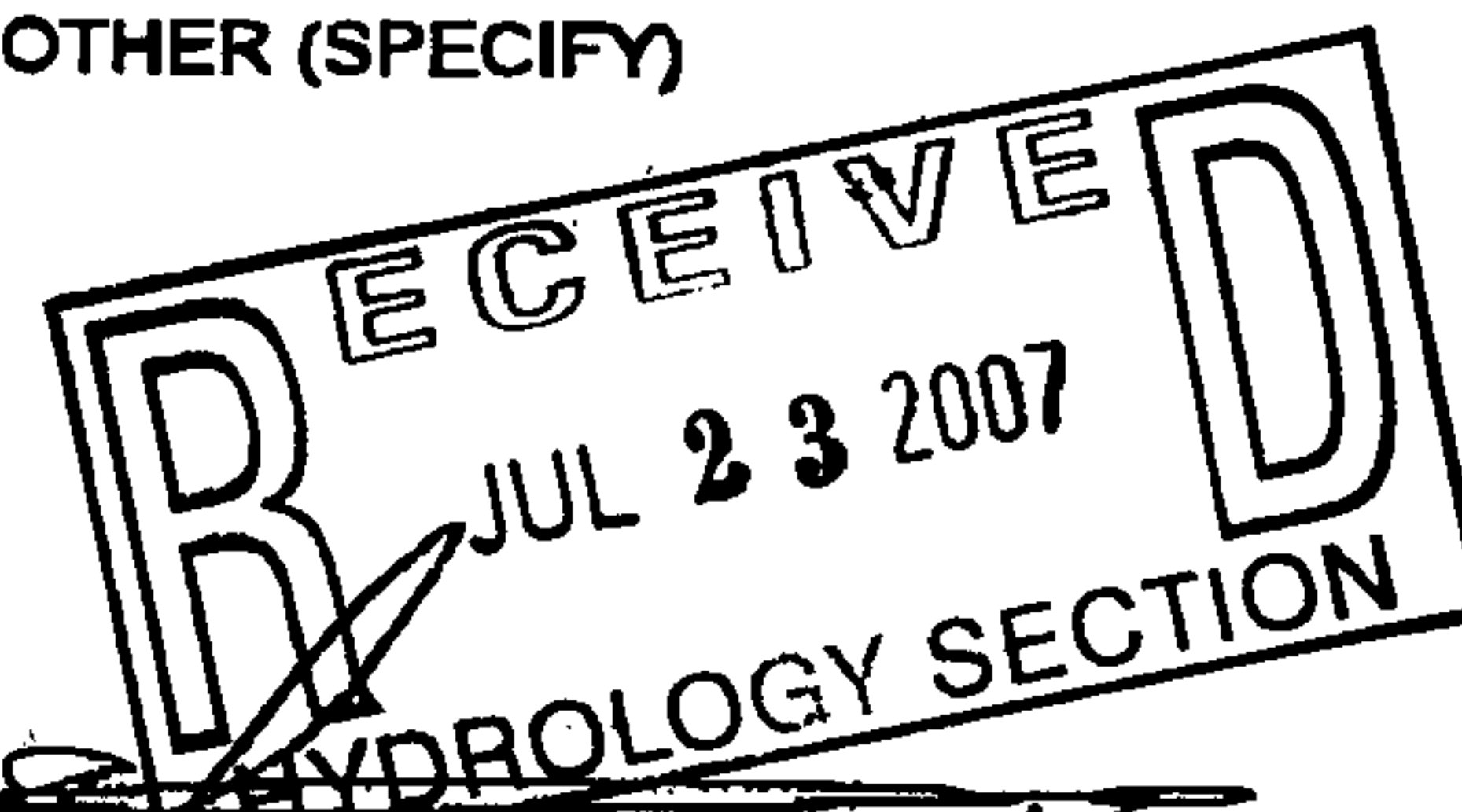
CONTACT: _____

PHONE: _____

ZIP CODE: _____

CHECK TYPE OF APPROVAL SOUGHT:

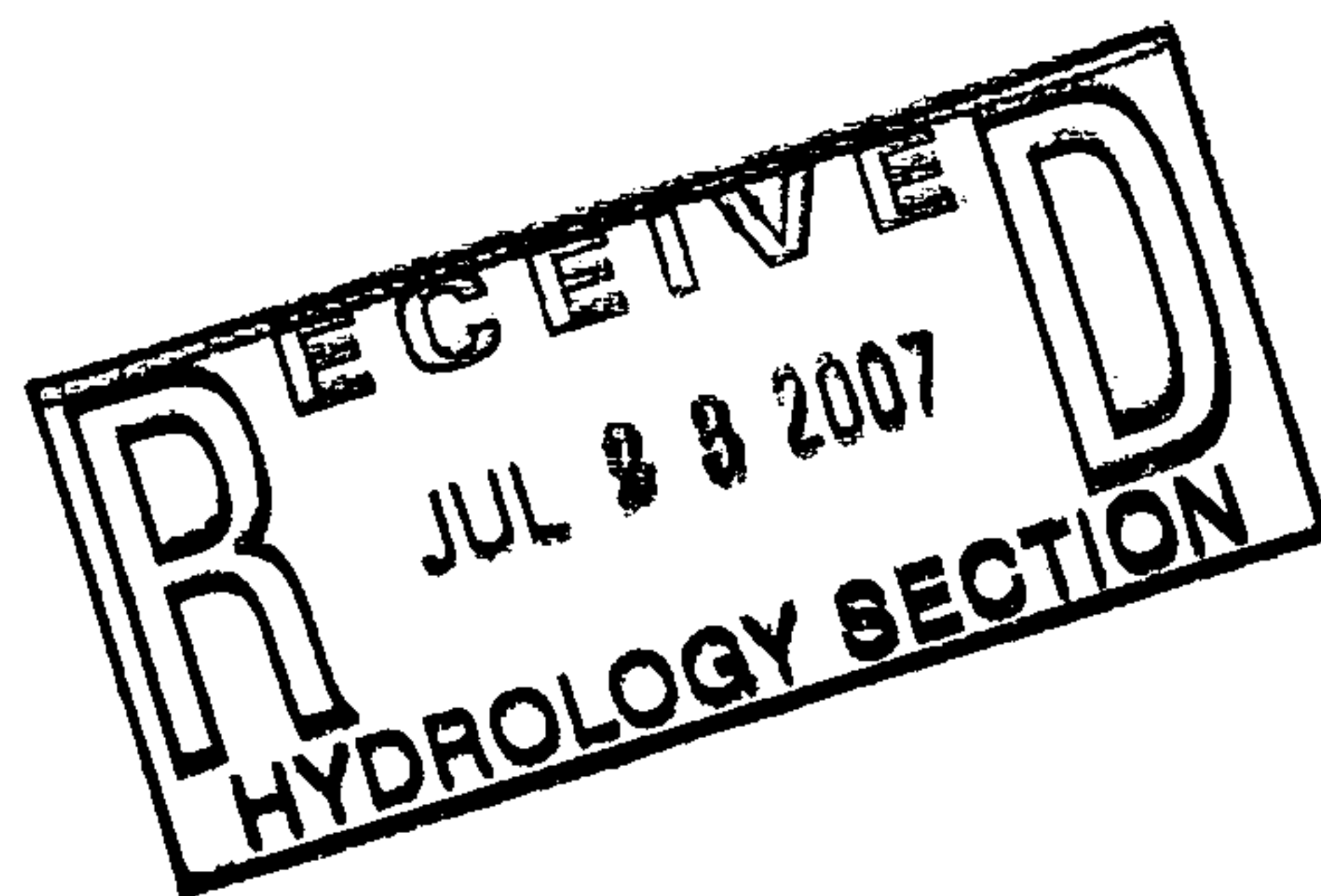
- ☐ SIA / FINANCIAL GUARANTEE RELEASE
☒ PRELIMINARY PLAT APPROVAL
☒ S. DEV. PLAN FOR SUB'D. APPROVAL
☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
☐ SECTOR PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☐ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY (PERM.)
☐ CERTIFICATE OF OCCUPANCY (TEMP.)
☒ GRADING PERMIT APPROVAL
☐ PAVING PERMIT APPROVAL
☐ WORK ORDER APPROVAL
☐ OTHER (SPECIFY)

BY: GREGORY J. KRENICK

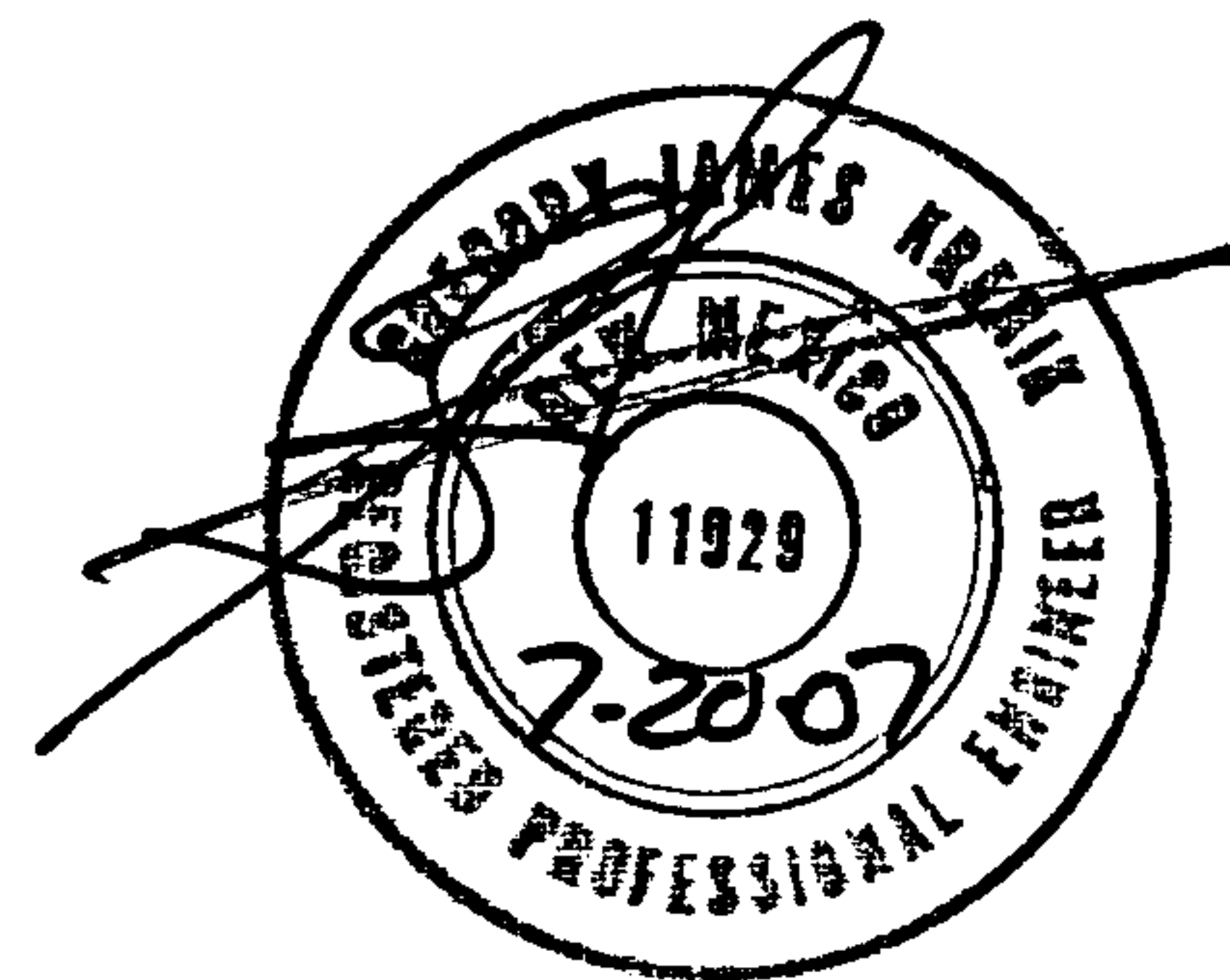
Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

DRAINAGE REPORT
for
ANDERSON HEIGHTS SUBDIVISION
REVISED FOR UNITS 4 & 6



July 2007





D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
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e-mail: goodwinengrs@comcast.net

PROJECT ANDERSON HEIGHTS 4+6
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 1 OF _____

- THIS PROJECT WILL CHANGE THE DENSITY OF UNITS 4+6 FROM THE PREVIOUS REPORT CALLED "ANDERSON HEIGHTS SUBDIVISION".
APPENDIX 1

- AN AREA OF 54,3702 AC WHICH WAS PREVIOUSLY CALCULATED WITH 299 LOTS WITH 35'x65' PADS WILL NOW HAVE 324 LOTS WITH 30'x75' PADS.

40' LOTS (NEW)
LOTS = 324
PAD = 30x75
PAD AREA = 729,000 SF
DRIVE PAD AREA = 129,600 SF
TYPE "D" = 19.7107 AC ←

$P_1 = 1.9011$
 $P_6 = 2.2511$
 $P_{24} = 2.7011$

AREA WITHOUT PARK
 $54,3702 - 2.1750 = 52.1952 \text{ AC}$

- DETERMINE RUNOFF PER LOT

TYPE D = $19.7107 + 9.9440$
 $= 29.6547 \text{ AC} = 56.815\%$

TYPE B = 43.185%

FROM A HYMO OUTPUT SHEETS 14-19
 $Q = 179.04 \text{ CFS}$

$Q_{\text{per Lot}} = 179.04 / 324$
 $= 0.552593 \text{ CFS}$

- FIND FLOW ON CACHE ROAD BETWEEN LOTS 26+27 BLK 12

$Q = 45 \times 0.552593$
 $= 24.866685 \text{ CFS}$

ADD TWO SGL "A" INLETS AT THIS LOCATION

PARK AREA = 2.1750 AC
50% C = 1.0875 AC
50% B = 1.0875 AC

ROW = 12.4300 AC
80% D = 9.9440 AC ←
20% B = 2.4860 AC

FROM A HYMO OUTPUT SHEET

$Q_{\text{park}} = 5.46 \text{ CFS}$
THIS IS MORE THAN 5.02 CFS FROM PREVIOUS REPORT

FROM PREVIOUS REPORT THE RUNOFF FROM THE 299 LOTS IS $299 \times 0.558635 = 167.02 \text{ CFS}$

THE REVISED LAYOUT GENERATES 12 CFS MORE THAN THE PREVIOUS.

32' F-F 5% SLOPE STD C+G

$d = 0.38$
 $WP = 15.13$
 $\Delta = 2.26$
 $V_{1/2} = 5.50 \text{ F/S}$
 $Q_{1/2} = 12.44 \text{ CFS} \times 2 = 24.88 \approx 24.866685 \text{ OK}$
 $d + V^2/2g = 0.85 \text{ OK}$



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PROJECT ANDERSON HEIGHTS 4+6
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 2 OF _____

FROM NOMO SHEET 11

$$Q_{GATE} = 6.9 \text{ CFS}$$

$$\begin{aligned} Q_{PAST \text{ INLETS}} &= 24.866685 - 2(6.9) \\ &= 11.066685 \text{ CFS} \end{aligned}$$

• FIND FLOW ON BASIN PEAK JUST SOUTH OF CACHE

$$\begin{aligned} Q &= 16 \times 0.552593 \\ &= 8.841488 \text{ CFS} \end{aligned}$$

• FIND FLOW ON CACHE TWO LOTS WEST OF BASIN PEAK (BETWEEN LOTS 24+25, BLK 6)

$$\begin{aligned} Q &= 18 \times 0.552593 + 11.066685 + 3.56 (\text{FLOW FROM AMOLE MESA}) \\ &= 24.573359 \text{ CFS} \end{aligned}$$

→ THIS FLOW PLUS THE FLOW FROM BASIN PEAK WILL BE MORE THAN THE STREET CAN HANDLE SO INSTALL TWO 36" 'A' INLET AT THIS POINT

$$\begin{aligned} d &= 0.38 & S &= 5\% & 32' \text{ F-F} & \text{STD C+G} \\ WP &= 15.13 \\ A &= 2.26 \\ V_{1/2} &= 5.50 \text{ F/S} \\ Q_{1/2} &= 12.44 \times 2 = 24.88 \text{ CFS} \approx 24.573359 \text{ OK} \\ d + V^2/2g &= 0.85 \text{ OK} \end{aligned}$$

FROM NOMO SHEET 11

$$Q_{GATE} = 6.9 \text{ CFS}$$

$$\begin{aligned} Q_{PAST \text{ INLETS}} &= 24.573359 - 2(6.9) \\ &= 10.773359 \text{ CFS} \end{aligned}$$

• FIND FLOW ON CACHE JUST EAST OF BASIN PEAK (BETWEEN LOTS

$$\begin{aligned} Q &= 10.773359 + 8.841488 + 9(0.552593) \\ &= 24.588184 \text{ CFS} \end{aligned}$$

ADD TWO 36" 'A' INLETS AT THIS LOCATION

$$\begin{aligned} d &= 0.38 & S &= 5\% & 32' \text{ F-F} & \text{STD C+G} \\ WP &= 15.13 \\ A &= 2.26 \\ V_{1/2} &= 5.50 \text{ F/S} \\ Q_{1/2} &= 12.44 \times 2 = 24.88 \text{ CFS} \approx 24.588184 \text{ CFS OK} \\ d + V^2/2g &= 0.85 \text{ OK} \end{aligned}$$

FROM NOMO SHEET 11

$$Q_{GATE} = 6.9 \text{ CFS}$$

$$\begin{aligned} Q_{PAST \text{ INLETS}} &= 24.588184 - 2(6.9) = 10.788184 \text{ CFS} \end{aligned}$$



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PROJECT ANDERSON HEIGHTS 4+6
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 3 OF _____

- FIND Q IN COSTILLA PEAK JUST EAST OF BASIN PEAK (BETWEEN LOTS 60+61, BCK 8)

$$Q = 42 \times 0.552593 + 5.46 (\text{PARK}) \\ = 28.668906 \text{ CFS}$$

INSTALL TWO 36" "A" INLET AT THIS LOCATION

$$d = 0.41 \quad S = 4.0\% \quad 32' \text{ F-F} \quad \text{STD C+G} \\ \text{WP} = 32.82$$

$$A = 5.45$$

$$V = 5.28 \text{ F/S}$$

$$Q = 28.79 \text{ CFS} \approx 28.668906 \text{ CFS} \quad \text{OK}$$

$$d + V^2/2g = 0.84 \quad \text{OK}$$

FROM NOMO SHEET 11

$$Q_{\text{GATE}} = 6.4 \text{ CFS}$$

$Q_{\text{PWT INLETS}}$

$$= 28.668906 - 2(6.4)$$

$$= 15.868906 \text{ CFS}$$

- FIND Q IN EMERALD PEAK AT CACHE TWO LOTS BACK (BETWEEN LOTS 26+27, BCK 5)

$$Q = 15.868906 + 25 \times 0.552593 \\ = 29.683731 \text{ CFS}$$

INSTALL TWO 36" "A" INLETS AT THIS LOCATION

$$d = 0.45 \quad S = 2.0\% \quad 32' \text{ F-F} \quad \text{STD C+G} \\ \text{WP} = 32.90$$

$$A = 6.73$$

$$V = 4.29 \text{ F/S}$$

$$Q = 28.88 \text{ CFS} \approx 29.683731 \text{ CFS} \quad \text{OK}$$

$$d + V^2/2g = 0.74 \quad \text{OK}$$

FROM NOMO SHEET 11

$$Q_{\text{GATE}} = 6.8 \text{ CFS}$$

$Q_{\text{PWT INLETS}}$

$$= 29.683731 - 2(6.8)$$

$$= 16.083731 \text{ CFS}$$

- FIND Q IN CACHE JUST WEST OF IRONSTONE PER PREVIOUS REPORT (SHEET 6)

$$Q = 10.788184 + 16.083731 + 11 \times 0.552593 + 2 \times 0.558635 \\ = 34.067708 \text{ CFS}$$

INSTALL TWO "B" INLETS AT THIS LOCATION

$$d = 0.47 \quad S = 2.2\% \quad 32' \text{ F-F} \quad \text{STD C+G} \\ \text{WP} = 32.94$$

$$A = 7.37$$

$$V = 4.78 \text{ F/S}$$

$$Q = 35.22 \text{ CFS} \approx 34.067708 \text{ CFS} \quad \text{OK}$$

$$d + V^2/2g = 0.82 \quad \text{OK}$$



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PROJECT ANDERSON HEIGHTS 416
SUBJECT DRAINAGE ~~CALLS~~
BY GSK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 4 OF _____

FROM NOMO SHEET 13

$$Q_{\text{GRATE}} = 12.25 \text{ CFS}$$

$$\begin{aligned} Q_{\text{PAST INLETS W/O INTO UNIT 9}} \\ &= 34.067708 - 2(12.25) \\ &= 9.567708 \text{ CFS} \end{aligned}$$

- FIND Q AT NEXT INLET LOCATION PER PREVIOUS REPORT (sheets 6+7)

$$\begin{aligned} Q &= 9.567708 + 4.46908 + 5.29 + 23(0.558635) \\ &= 32.175393 \text{ CFS} > 28.79 \text{ CFS WHICH IS CAPACITY AT 4\% SLOPE} \\ &\text{REMOVE 6 LOTS} \end{aligned}$$

$$Q = 28.823583 \text{ CFS OK}$$

$$Q_{\text{GRATE}} = 7.8$$

$$\begin{aligned} Q_{\text{PAST INLETS}} \\ &= 28.823583 - 2(7.8) = 13.223583 \text{ CFS} \rightarrow \text{GO TO SHEET 10} \end{aligned}$$

- FIND Q IN DEERHORN PEAK ONE LOT NORTH OF HAWKINS PEAK (BETWEEN LOTS 4+5, BLK 8)

$$\begin{aligned} Q &= 42 \times 0.552593 \\ &= 23.208906 \text{ CFS} \end{aligned}$$

- FIND Q IN HAWKINS PEAK ONE LOT WEST OF DEERHORN PEAK (BETWEEN LOTS 17+18, BLK 10)

$$\begin{aligned} Q &= 43 \times 0.552593 \\ &= 23.761499 \text{ CFS} \end{aligned}$$

INSTALL 2 SGL "A" INLETS AT THIS LOCATION

$$d = 0.39$$

$$S = 4.0\% \quad 32' \text{ F-F STD C+G}$$

$$NP = 15.64$$

$$A = 2.41$$

$$V_{1/2} = 5.02 \text{ F/S}$$

$$Q_{1/2} = 12.11 \text{ CFS} \times 2 = 24.22 \text{ CFS} \approx 23.761499 \text{ CFS OK}$$

$$d + V^2/2g = 0.78 \text{ OK}$$

FROM NOMO SHEET 11

$$Q_{\text{GRATE}} = 6.5 \text{ CFS}$$

$$\begin{aligned} Q_{\text{PAST INLETS}} \\ &= 23.761499 - 2(6.5) \\ &= 10.761499 \text{ CFS} \end{aligned}$$



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PROJECT ANDERSON HEIGHTS 4+6
SUBJECT DRAINAGE CALCS
BY GJK DATE 2-2-07
CHECKED _____ DATE _____
SHEET 5 OF _____

INSTALL 2 SGL "A" INLETS ON DEERHORN PEAK BETWEEN
LOTS 4+5, BLK 8

$$\begin{aligned}d &= 0.44 & S &= 1.57\% & 32' \text{ F-F} & \text{ STD C+G} \\wP &= 32.88 \\A &= 6.41 \\V &= 3.68 \text{ F/s} \\Q &= 23.604523 \text{ CFS} \approx 23.208906 \text{ CFS} \text{ OK} \\d + V^2/2g &= 0.65 \text{ OK}\end{aligned}$$

FROM NOMO SHEET 11

$$Q_{\text{GRATE}} = 5.4 \text{ CFS}$$

$$\begin{aligned}Q_{\text{PAST INLETS}} &= 23.208906 - 2(5.4) \\&= 12.408906 \text{ CFS}\end{aligned}$$

• INSTALL 2 TYPE "B" INLETS BETWEEN LOTS 4+2, BLK 5 ON
DEERHORN PEAK

$$\begin{aligned}Q &= 10.761499 + 12.408906 + 5 \times 0.552593 \\&= 25.933370 \text{ CFS}\end{aligned}$$

$$\begin{aligned}d &= 0.40 & S &= 4.0\% & 32' \text{ F-F} & \text{ STD C+G} \\wP &= 16.15 \\A &= 2.5656 \\V &= 5.13 \text{ F/s} \\Q_1 &= 13.16 \text{ CFS} \times 2 = 26.32 \approx 25.933370 \text{ CFS} \text{ OK} \\d + V^2/2g &= 0.81 \text{ OK}\end{aligned}$$

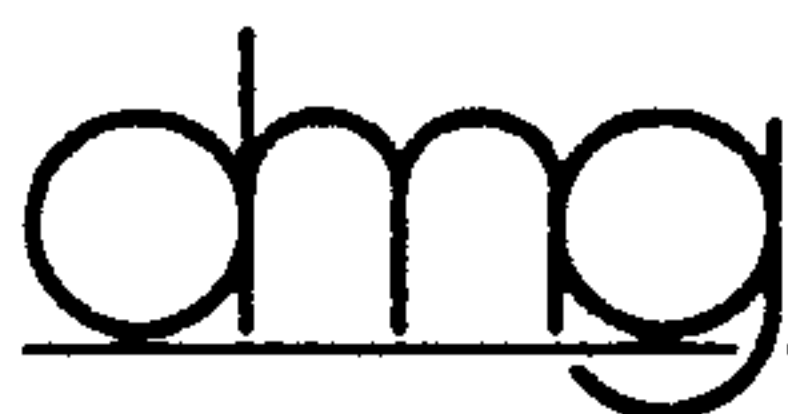
FROM NOMO SHEET 13

$$Q_{\text{GRATE}} = 9.8 \text{ CFS}$$

$$\begin{aligned}Q_{\text{PAST INLETS}} &= 25.933370 - 2(9.8) \\&= 6.333370 \text{ CFS}\end{aligned}$$

$$\begin{aligned}Q_{\text{INTO COLOBEL AT DEERHORN PEAK}} &= 6.333370 + 0.552593 \\&= 6.885963 \text{ CFS}\end{aligned}$$

THIS FLOW WILL BE ALONG THE NORTH SIDE
OF COLOBEL



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PROJECT ANDERSON HEIGHTS 416
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 6 OF _____

• FIND Q IN EMERALD PEAK BETWEEN LOTS 5+6, BLK 5

$$Q = 32 \times 0.552593 \\ = 17.682976 \text{ CFS}$$

INSTALL 2 SGL "A" INLETS AT THIS LOCATION

$$d = 0.36 \quad S = 3.62\% \quad 32' \text{ F-F STD C+G}$$

$$WP = 14.11$$

$$A = 1.9756$$

$$V_{1/2} = 4.48 \text{ F/S}$$

$$Q_{1/2} = 8.859 \text{ CFS} \times 2 = 17.7188 \text{ CFS} \approx 17.682976 \text{ OK}$$

FROM NOMO SHEET 11

$$Q_{\text{GATE}} = 4.8 \text{ CFS}$$

Q PAST INLETS

$$= 17.682976 - 2(4.8) \\ = 8.082976 \text{ CFS}$$

• FIND Q IN ADAMS PEAK BETWEEN LOTS 98+97, BLK 8

$$Q = 28 \times 0.552593 \\ = 15.472604 \text{ CFS}$$

$$d = 0.33 \quad S = 5\% \quad 32' \text{ F-F STD C+G}$$

$$WP = 12.58$$

$$A = 1.5856$$

$$V_{1/2} = 4.91 \text{ F/S}$$

$$Q_{1/2} = 7.79 \text{ CFS} \times 2 = 15.58 \text{ CFS} \approx 15.472604 \text{ OK}$$

FROM NOMO SHEET 11

INSTALL 2 SGL "A" INLETS HERE

$$Q_{\text{GATE}} = 6.4 \text{ CFS}$$

Q PAST INLETS

$$= 15.472604 - 2(6.4) \\ = 2.672604 \text{ CFS}$$

• INSTALL TWO TYPE "B" INLETS BETWEEN LOTS 1+2, BLK 5 ON EMERALD PEAK

$$Q = 8.082976 + 2.672604 + 6 \times 0.552593 \\ = 14.071138 \text{ CFS}$$

$$d = 0.34 \quad S = 3.62\% \quad 32' \text{ F-F STD C+G}$$

$$WP = 13.09$$

$$A = 1.71$$

$$V_{1/2} = 4.28 \text{ F/S}$$

$$Q_{1/2} = 7.32 \text{ CFS} \times 2 = 14.64 \approx 14.071138$$

FROM NOMO SHEET 13

$$Q_{\text{GATE}} = 6.3 \text{ CFS}$$

Q PAST INLETS INTO COLOREL - FLOW ON NORTH SIDE

$$= 14.071138 - 2(6.3) + 1(0.552593) = 2.023731 \text{ CFS}$$



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PROJECT ANDERSON HEIGHTS 4/16
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 7 OF _____

• DETERMINE COLOBEL CAPACITY

FROM PREVIOUS REPORT SHEETS 12+13

FLOW FROM DUERSON = 12.22 CFS THIS FLOW WILL BE ON SOUTH SIDE
COLOBEL FLOW WEST OF DUERSON = 6.87 CFS THIS IS SPLIT N TO S

- AT DUERSON THE FLOW IN COLOBEL ON NORTH SIDE IS

$$6.885963 + 6.87/2 = 10.320963 \text{ CFS}$$

- AT DUERSON THE FLOW IN COLOBEL ON THE SOUTH SIDE IS

$$12.218987 + 6.87/2 = 15.653987 \text{ CFS}$$

- AT EMERALD PEAK (AKA HAMMERSTONES) THE FLOW IN
COLOBEL WILL HAVE 36.3% OF $10.88/2$ ADDED
TO EACH SIDE

$$\text{NORTH SIDE} = 10.320963 + 2.023731 + 0.363(10.88/2) = 14.319414 \text{ CFS}$$

$$\text{SOUTH SIDE} = 15.653987 + 0.363(10.88/2) = 17.628707 \text{ CFS}$$

- THE CAPACITY OF ONE SIDE OF COLOBEL AT EMERALD PEAK
PER THE PREVIOUS REPORT SHEET 13 IS

$$d = 0.46$$

$$S = 3.25\% \quad 48' \text{ F-F STD C+G}$$

$$WP = 19.21$$

$$A = 3.60$$

$$V_{1/2} = 5.16 \text{ F/S}$$

$$Q_{1/2} = 18.58 \text{ CFS} > 17.628707 \text{ CFS} \quad \text{OK}$$

$$d + V^2/2g = 0.87 \quad \text{OK}$$

- THE CAPACITY OF COLOBEL JUST EAST OF EMERALD PEAK

$$d = 0.47$$

$$S = 3.0\% \quad 48' \text{ F-F STD C+G}$$

$$WP = 19.72$$

$$A = 3.79$$

$$V_{1/2} = 5.04 \text{ F/S}$$

$$Q_{1/2} = 19.11 \text{ CFS}$$

$$d + V^2/2g = 0.86 \quad \text{OK}$$



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PROJECT ANDERSON HEIGHTS 4/16
SUBJECT DRAINAGE CALCS
BY GSK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 8 OF _____

- INSTALL 2 DBL "A" INLETS AT THIS LOCATION

$$\begin{aligned} d &= 0.46 & S &= 3.0\% & 4/8' \text{ F-F} & \text{STD C+S} & \text{SOUTHSIDE} \\ \text{WP} &= 19.21 \\ A &= 3.60 \\ V_{1/2} &= 4.96 \text{ F/s} \\ Q_{1/2} &= 17.85 \text{ cfs} \approx 17.628707 \text{ OK} \end{aligned}$$

FROM NODD SHEET 12

$$Q_{\text{GATE}} = 9.6 \text{ cfs} + 8.6$$

$Q_{\text{PACT INLETS}}$

$$\begin{aligned} \text{NORTH SIDE} &= 14.319414 - 8.6 \\ &= 5.719414 \text{ cfs} \end{aligned}$$

$$\begin{aligned} \text{SOUTH SIDE} &= 17.628707 - 9.6 \\ &= 8.028707 \text{ cfs} \end{aligned}$$

NORTHSIDE

$$\begin{aligned} d &= 0.43 \\ \text{WP} &= 17.68 \\ A &= 3.06 \\ V_{1/2} &= 4.703 \text{ F/s} \\ Q_{1/2} &= 14.39 \text{ cfs} \approx 14.319414 \text{ OK} \end{aligned}$$

- FIND RUNOFF IN COLOBEL AT MORRISSEY

$$\begin{aligned} \text{NORTHSIDE} & \quad \text{REMAINDER OF COLOBEL} \quad \text{POTSHARD} \\ Q &= 5.719414 + 10.88 \left(\frac{1-0.363}{2} \right) + 2.793175 \\ &= 11.977869 \text{ cfs} \end{aligned}$$

SOUTHSIDE

$$\begin{aligned} Q &= 8.028707 + 10.88 \left(\frac{1-0.363}{2} \right) \\ &= 11.493987 \text{ cfs} \end{aligned}$$

THIS FLOW WILL TURN SOUTH ON MORRISSEY

- INSTALL ONE DBL "A" INLET ON THE NORTHSIDE OF COLOBEL

$$\begin{aligned} d &= 0.41 \\ \text{WP} &= 16.66 \\ A &= 2.726 \\ V_{1/2} &= 4.53 \text{ F/s} \\ Q_{1/2} &= 12.35 \text{ cfs} \approx 11.977869 \text{ OK} \end{aligned}$$

FROM NODD SHEET 12

$$Q_{\text{GATE}} = 7.8 \text{ cfs}$$

$Q_{\text{PACT INLET}}$

$$= 11.977869 - 7.8$$

$= 3.693987 \text{ cfs}$ CONTINUES EAST TO THE ADJACENT SUBDIVISION
THIS IS LESS THAN THE 5.670324 cfs PER THE PREVIOUS REPORT.



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e-mail: goodwinengrs@comcast.net

PROJECT ANDERSON HEIGHTS 4/16
SUBJECT DRAINAGE CALLS
BY CJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 9 OF _____

- DETERMINE SUMP IN MORRISSEY AT THE NORTH END OF THE PARK

$$Q = 14.959267$$

$$Q/p = 3.04'{}^5$$

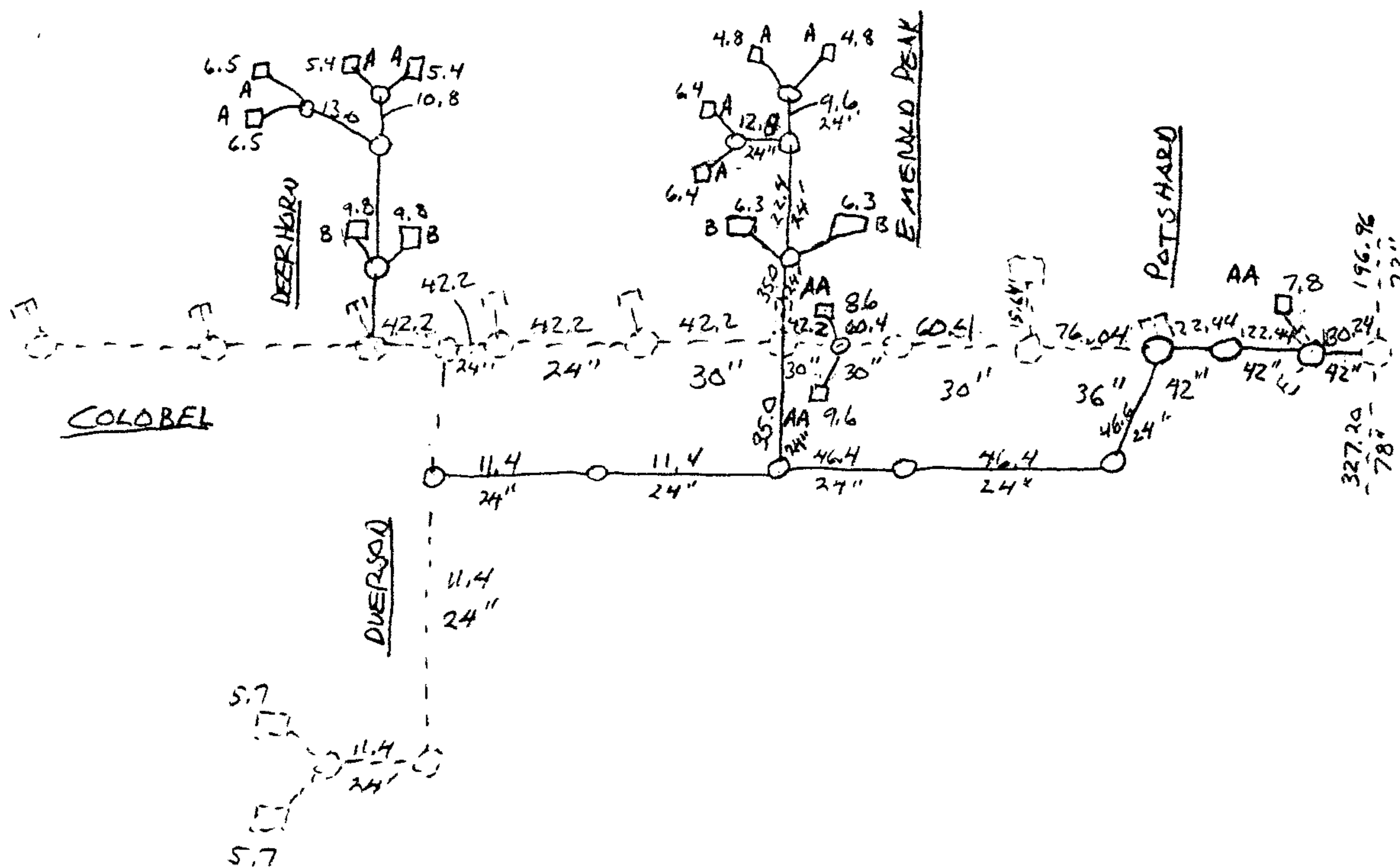
USE TWO 36" "A" INLETS $P = 11.0$

$$H = 0.37' < 0.67' \text{ OK}$$

ASSUME 50% CLOGGED

$$H = 0.59' < 0.85' \text{ OK}$$

- WE WILL USE AS MUCH OF THE EXISTING STORMDRAIN AS POSSIBLE. A PARALLEL STORMDRAIN WILL BE REQUIRED.



- THE 24" RCP WEST OF DEERHORN WILL BE ABANDONED IN PLACE. THE MH AT ANDERSON WILL BE PLUGGED TO THE SOUTH. THE FLOW FROM ANDERSON AND EMERALD PEAK WILL BE IN THE NEW PARALLEL STORMDRAIN UNTIL IT JOINS THE EXISTING AT POTSHARD. AT THIS POINT THE EXISTING 36" RCP WILL BE REPLACED BY 42" RCP EAST TO THE 78" RCP. THE FLOW FROM EMERALD PEAK WILL PASS UNDER THE EXISTING STORMDRAIN IN COLABEL.



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PROJECT ANDERSON HEIGHTS 426
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-2-07
CHECKED _____ DATE _____
SHEET 10 OF _____

• FIND Q WEST OF KNUCKLE ON QUERN

$$Q = 24 \times 0.558635 \\ = 13.407240 \text{ CFS}$$

$$d = 0.32 \quad S = 4.46\%$$

$$wP = 12.07$$

$$A = 1.4656$$

$$V_{1/2} = 4.53 \text{ F/S}$$

$$Q_{1/2} = 6.63 \text{ CFS} \times 2 = 13.26 \approx 13.407240 \text{ OK}$$

INSTALL 2 SGL "A" INLETS BETWEEN LOTS 14 + 15, BLK 2

FROM NOMO SHEET 11

$$Q_{\text{GATE}} = 4.6$$

$$Q_{\text{PAST INLETS}} \\ = 13.407240 - 2(4.6) \\ = 4.207240 \text{ CFS}$$

• FIND REVISED SUMP AT NORTH SIDE OF KNUCKLE

$$Q = 13.223583 + 2(0.558635) + 4.207240 \\ = 29.162158 \text{ CFS}$$

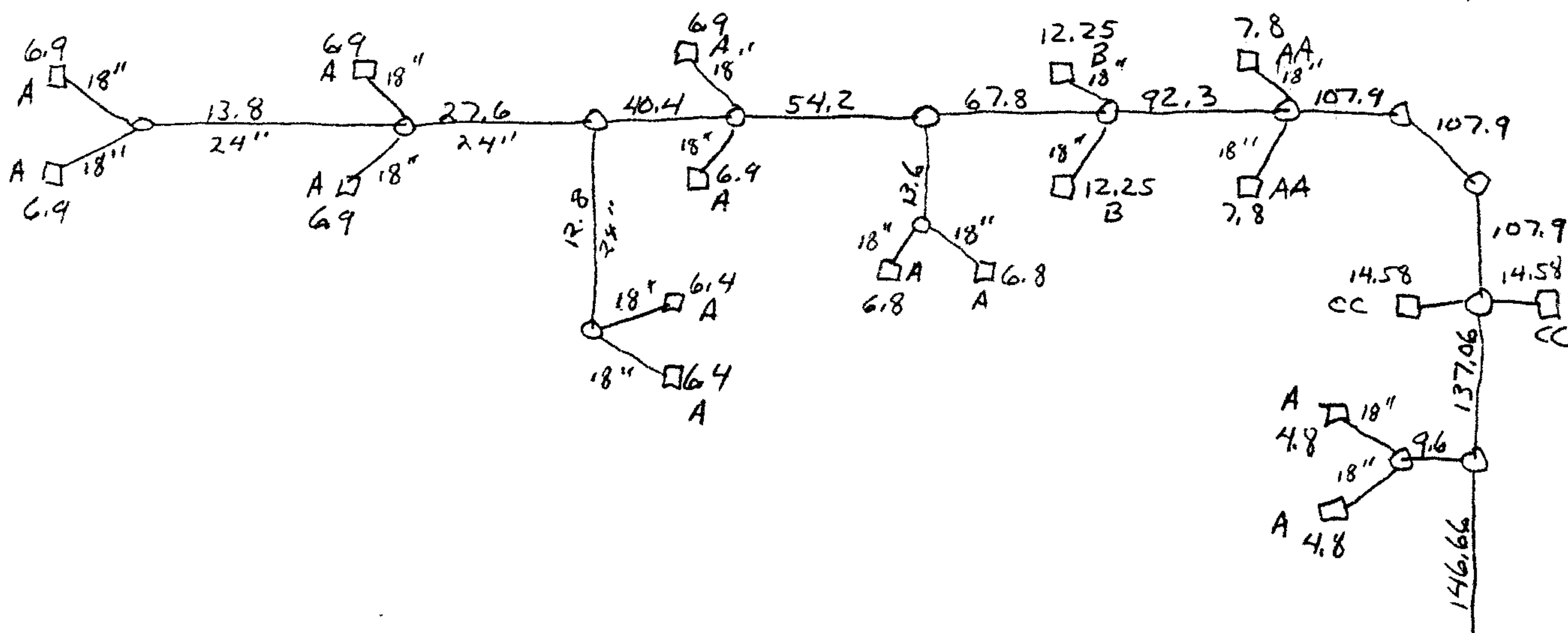
USE 2 DBL "C" INLETS $P = 17$

$$Q/P = 3.0 H^{1.5}$$

$$H = 0.43' < 0.67' \text{ OK}$$

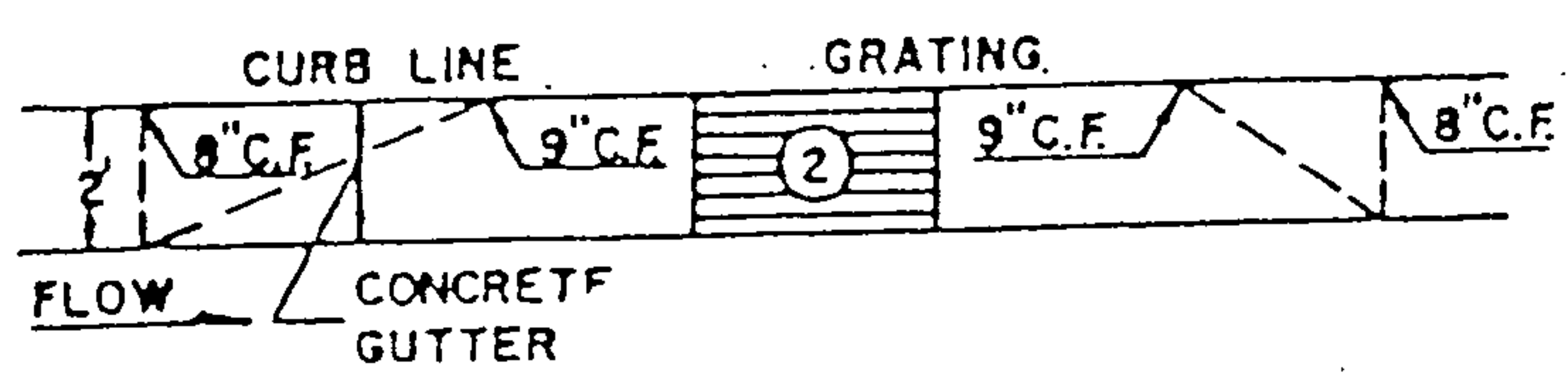
ASSUME 50% CLOGGED

$$H = 0.69' < 0.85' \text{ OK}$$

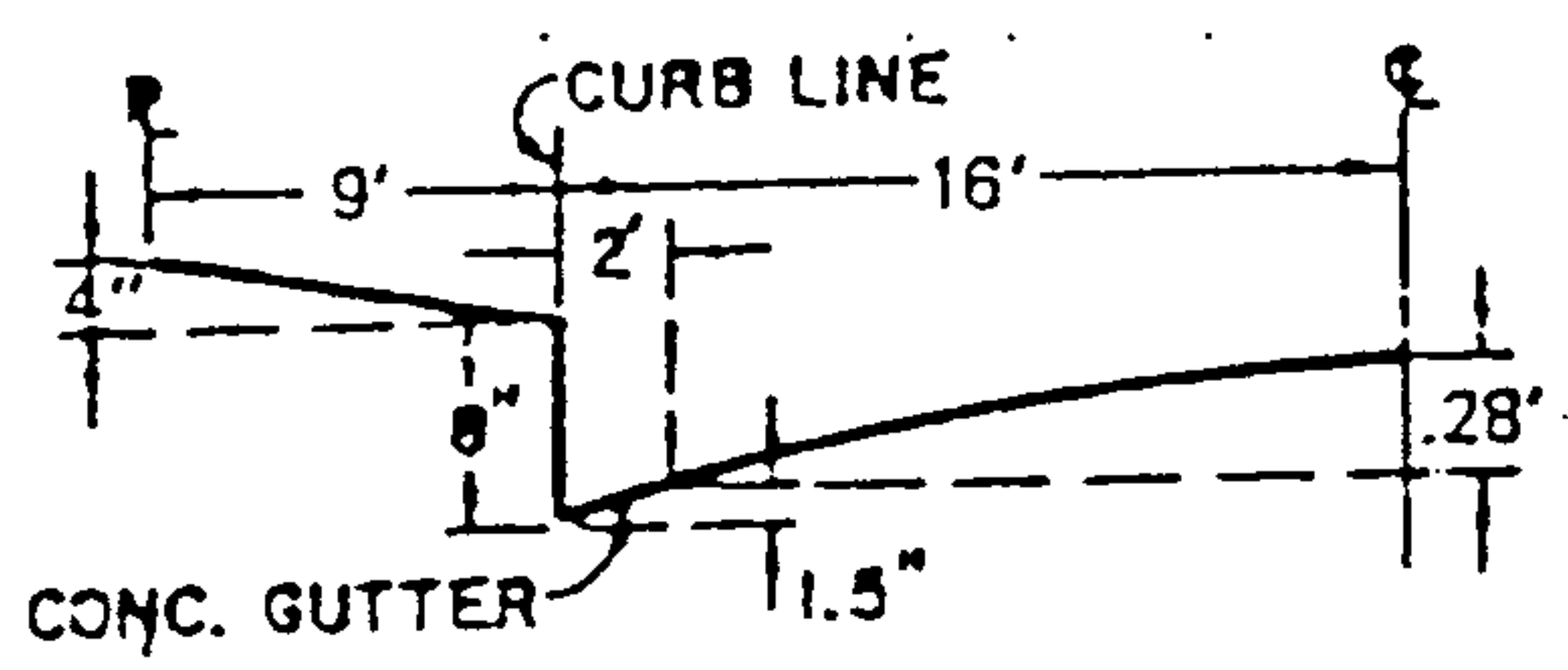


CONTINUES
SOUTH PER
ORIGINAL
REPORT

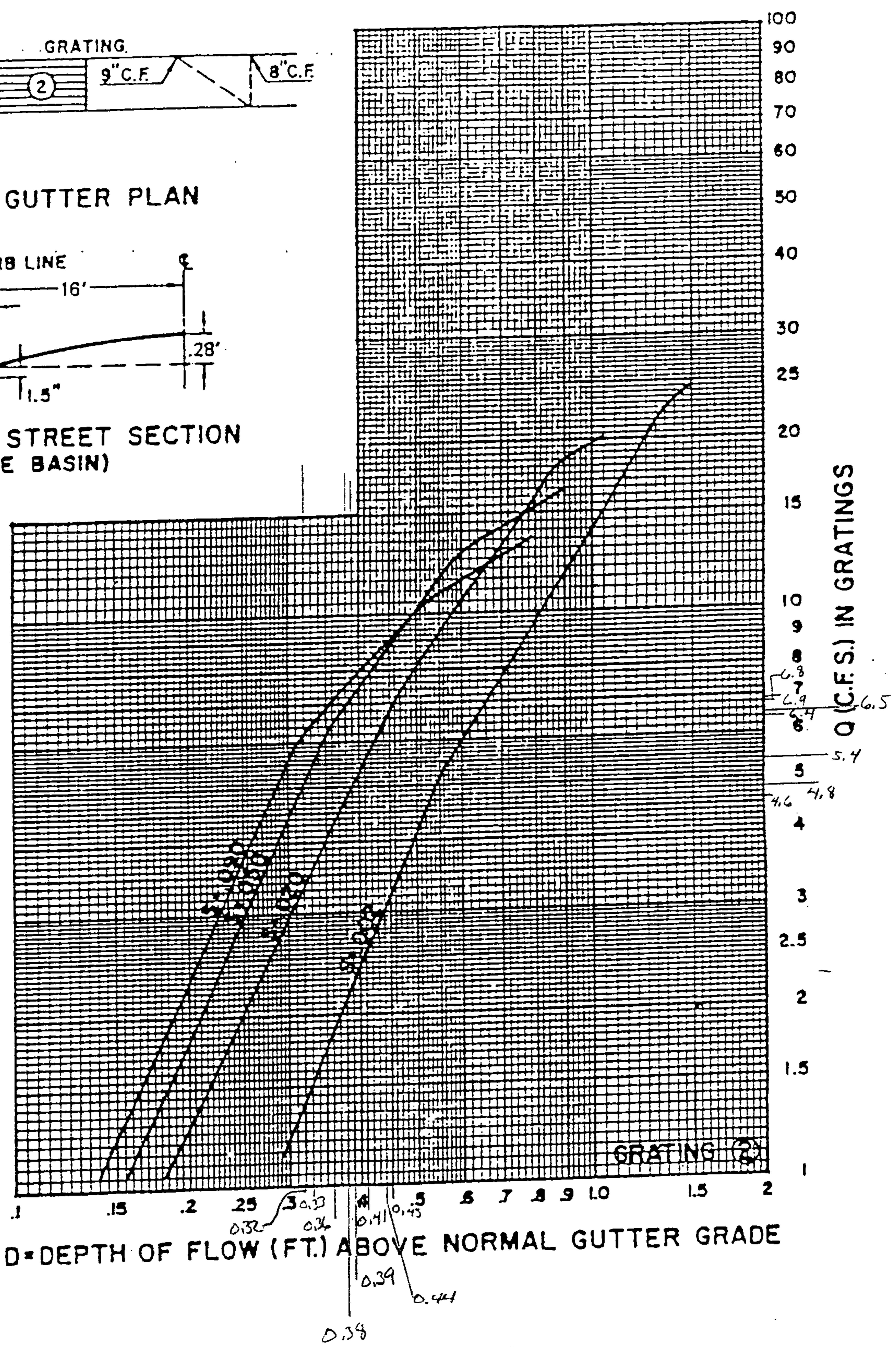
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



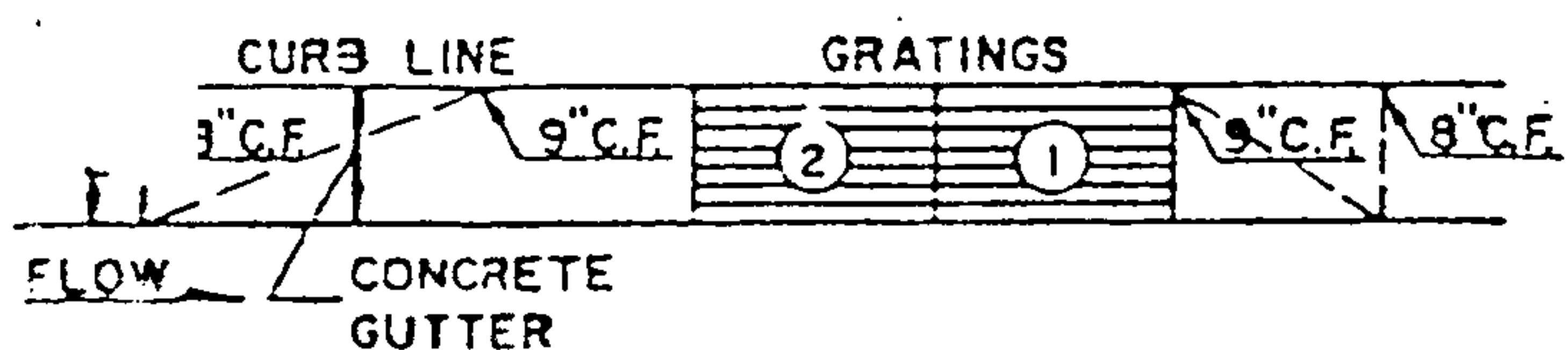
GRATING & GUTTER PLAN



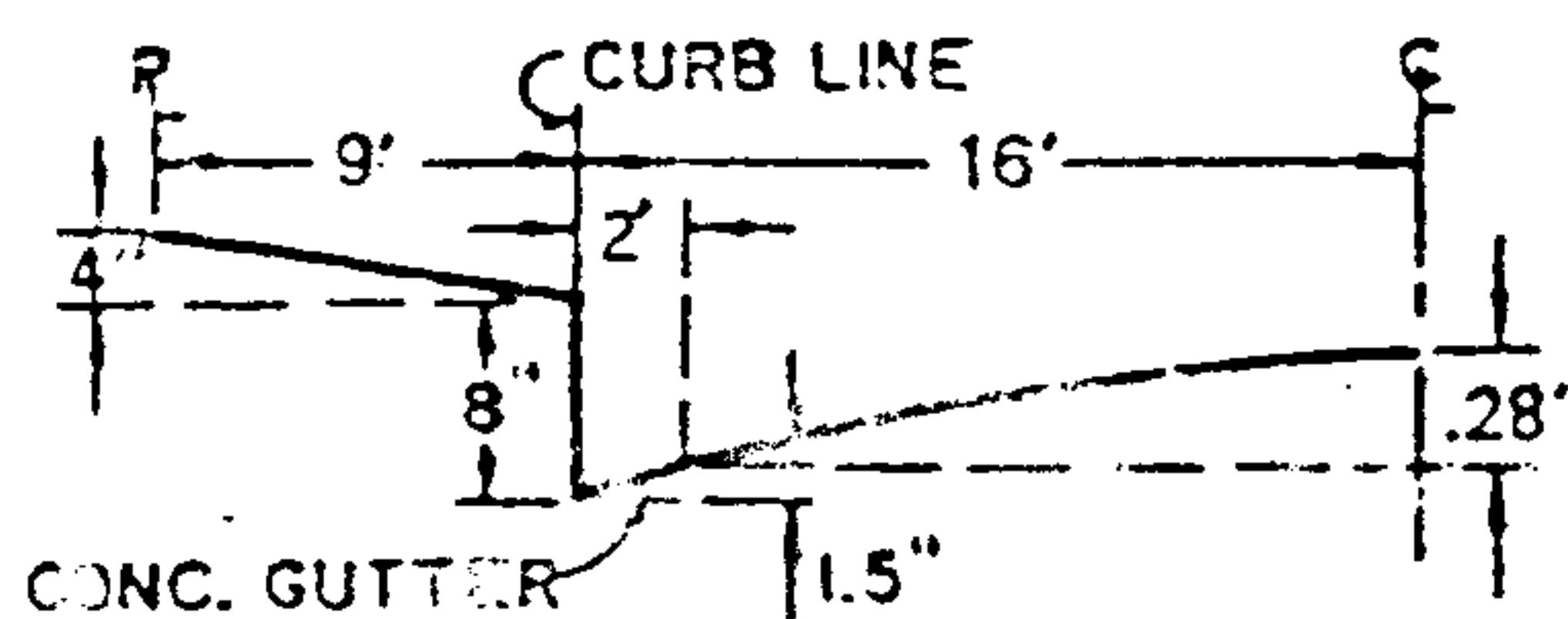
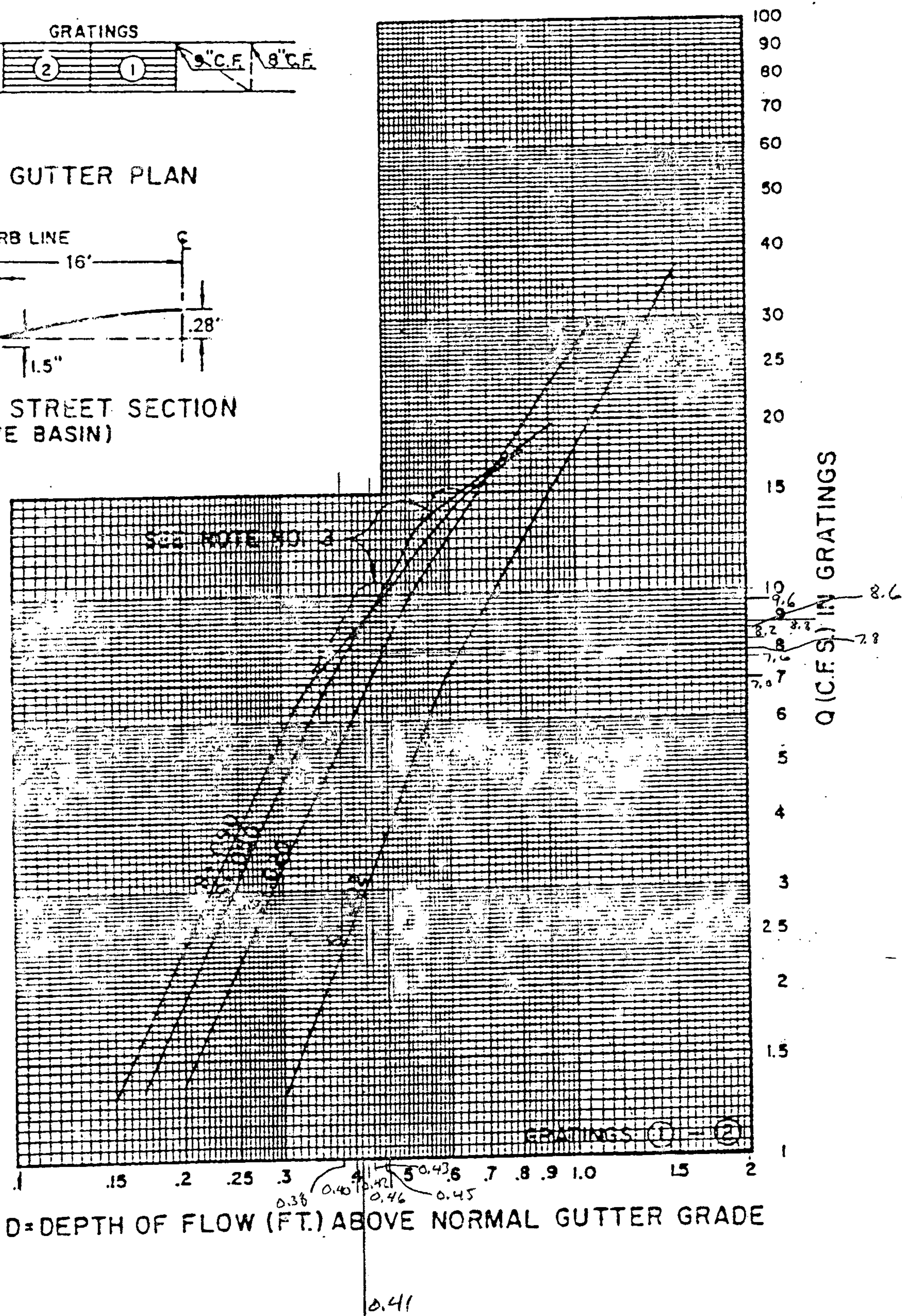
TYPICAL HALF STREET SECTION (ABOVE BASIN)



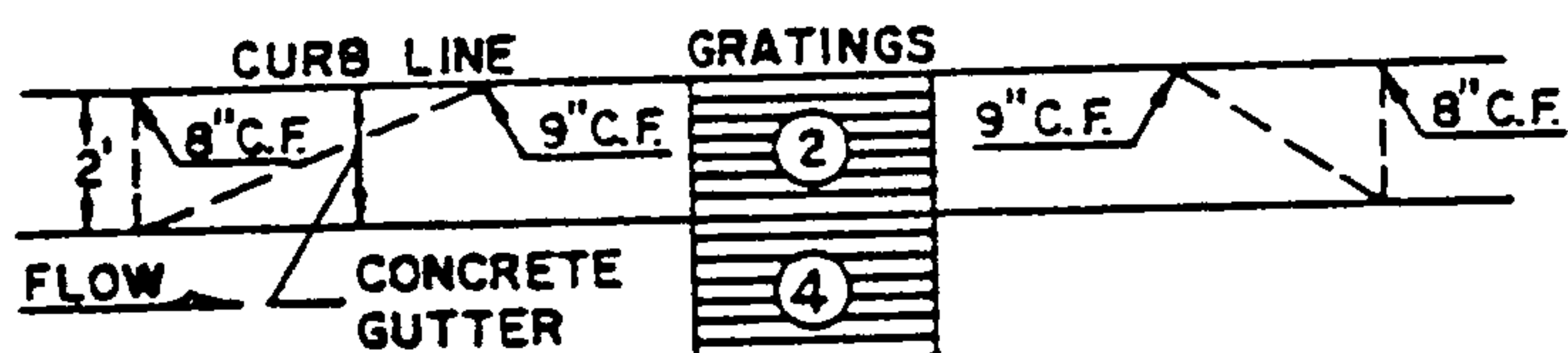
GRATING CAPACITIES FOR TYPE DOUBLE "A", "C," AND "D"



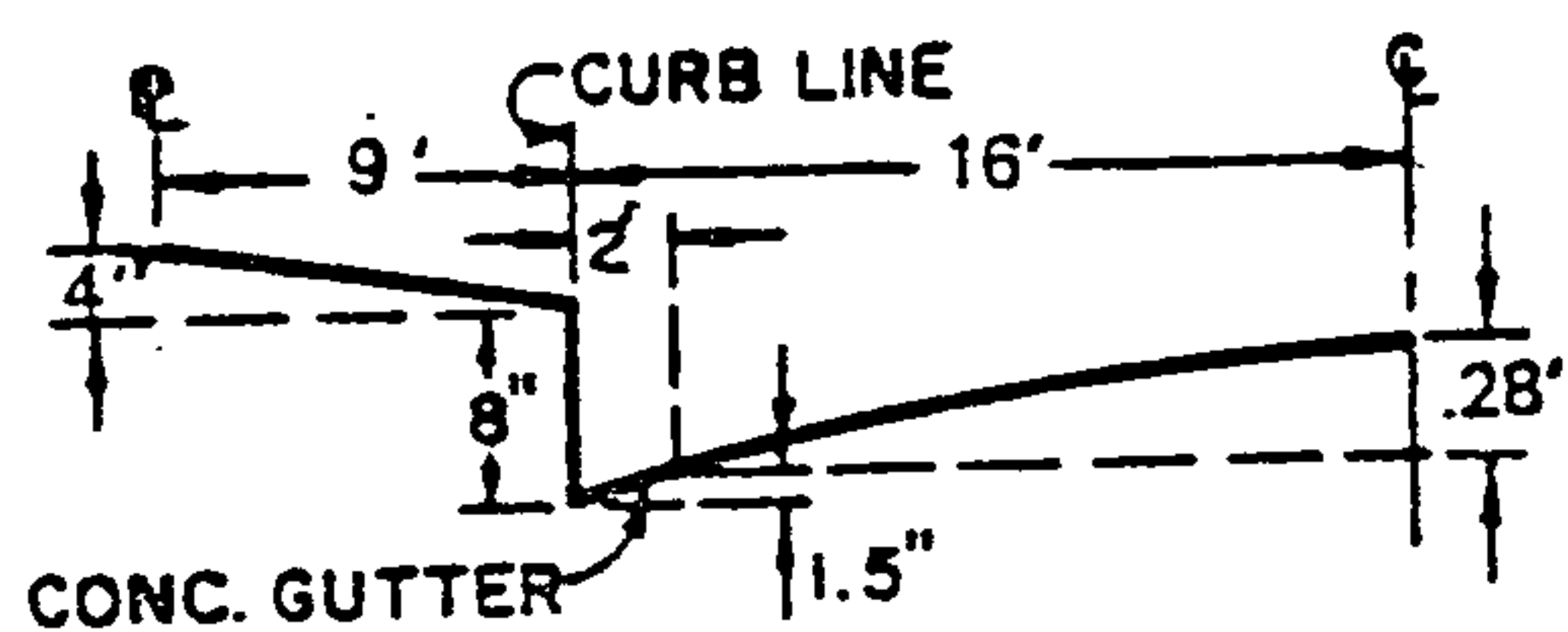
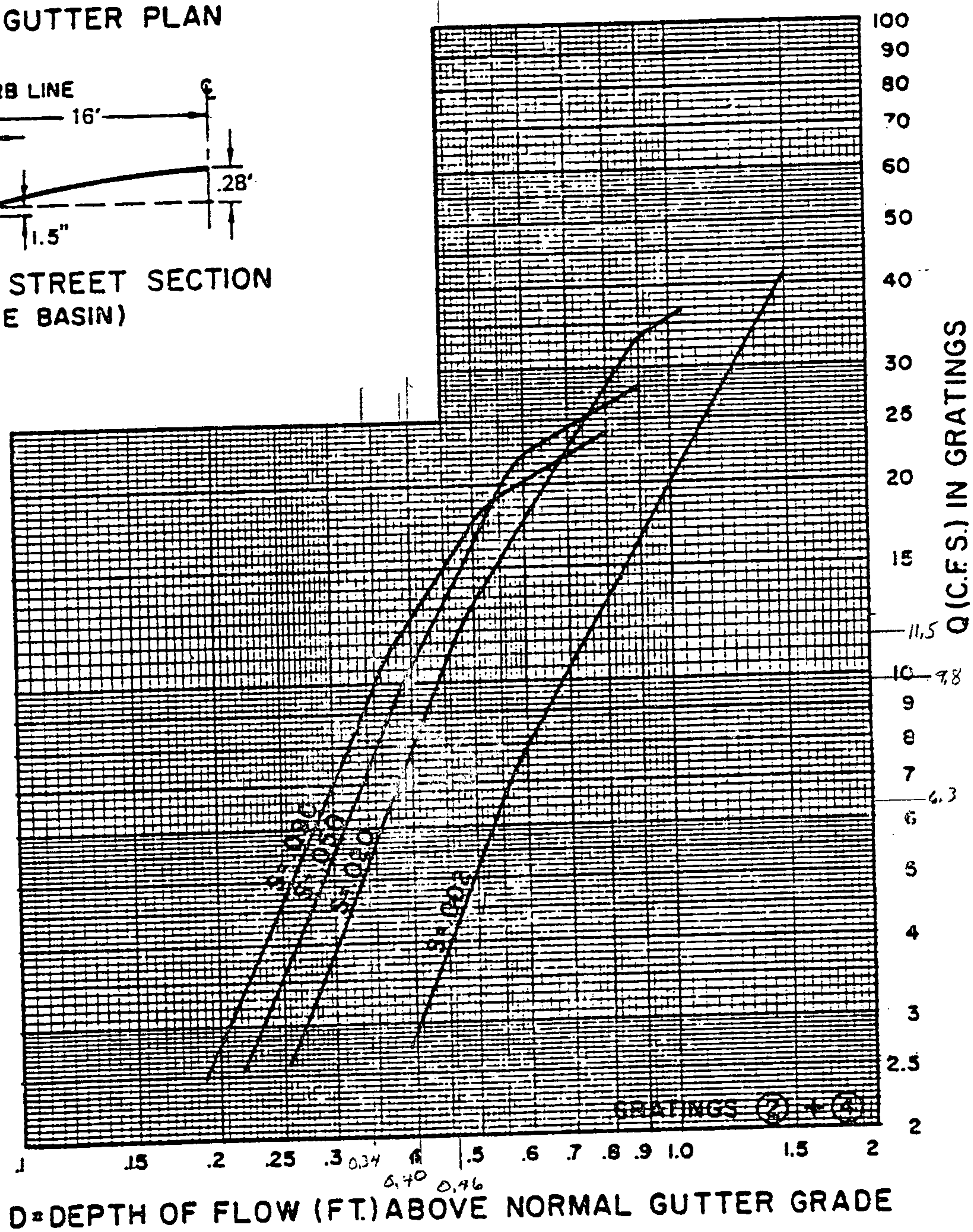
GRATING & GUTTER PLAN

TYPICAL HALF STREET SECTION
(ABOVE BASIN)

GRATING CAPACITIES FOR TYPE "B"



GRATING & GUTTER PLAN

TYPICAL HALF STREET SECTION
(ABOVE BASIN)

```

START                                TIME=0.0
***** HYDROGRAPH FOR ANDERSON HEIGHTS UNITS 4 & 6 WITHOUT PARK
RAINFALL                            TYPE=1 RAIN QUARTER=0.0 IN
                                    RAIN ONE=1.90 IN RAIN SIX=2.25 IN
                                    RAIN DAY=2.70 IN DT=0.03333 HR
COMPUTE NM HYD                      ID=1 HYD NO=101.1 AREA=0.081555 SQ MI
                                    PER A=0 B=43.185 C=0 D=56.815
                                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                          ID=1 CODE=1
***** HYDORGRAPH FOR ANDERSON HEIGHTS UNITS 4 & 6 PARK
COMPUTE NM HYD                      ID=2 HYD NO=102.1 AREA=0.003398 SQ MI
                                    PER A=0 B=50 C=50 D=0
                                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                          ID=2 CODE=1
***** HYDORGRAPH FOR ANDERSON HEIGHTS AMOLE MESA AT FIRST ENTRANCE
COMPUTE NM HYD                      ID=5 HYD NO=105.1 AREA=0.001453 SQ MI
                                    PER A=0 B=26.83 C=0 D=73.17
                                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                          ID=5 CODE=1
***** HYDORGRAPH FOR ANDERSON HEIGHTS AMOLE MESA AT SECOND ENTRANCE
COMPUTE NM HYD                      ID=6 HYD NO=106.1 AREA=0.002162 SQ MI
                                    PER A=0 B=26.83 C=0 D=73.17
                                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                          ID=6 CODE=1
***** HYDORGRAPH FOR ANDERSON HEIGHTS COLOBEL AT DUERSON
COMPUTE NM HYD                      ID=7 HYD NO=107.1 AREA=0.002573 SQ MI
                                    PER A=0 B=12 C=0 D=88
                                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                          ID=7 CODE=1
***** HYDORGRAPH FOR ANDERSON HEIGHTS COLOBEL AT MORRISSEY
COMPUTE NM HYD                      ID=8 HYD NO=108.1 AREA=0.004079 SQ MI
                                    PER A=0 B=12 C=0 D=88
                                    TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD                          ID=8 CODE=1
FINISH

```

AHYMO PROGRAM (AHYMO_97) - - Version:
 1997.02d
 RUN DATE (MON/DAY/YR) = 07/02/2007
 START TIME (HR:MIN:SEC) = 08:25:21 USER NO.= AHYMO-I-
 9702dGoodwinM-AH
 INPUT FILE = AH46.dat

START TIME=0.0
 ***** HYDROGRAPH FOR ANDERSON HEIGHTS UNITS 4 & 6 WITHOUT PARK
 RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
 RAIN ONE=1.90 IN RAIN SIX=2.25 IN
 RAIN DAY=2.70 IN DT=0.03333 HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA
 ATLAS 2 - PEAK AT 1.40 HR.

HOURS	DT = .033330 HOURS	END TIME = 5.999400
.0000	.0018	.0036
.0055	.0074	.0094
.0114	.0134	.0155
.0177	.0199	.0222
.0269	.0293	.0319
.0345	.0372	.0399
.0428	.0489	.0521
.0554	.0589	.0625
.0663	.0745	.0789
.0836	.0888	.0944
.1004	.1421	.1865
.2502	.3372	.4515
.5973	1.0003	1.2059
1.2918	1.3643	1.4288
1.4874	1.5916	1.6384
1.6823	1.7237	1.7627
1.7995	1.8674	1.8987
1.9284	1.9566	1.9834
1.9898	2.0014	2.0068
2.0120	2.0169	2.0216
2.0262	2.0349	2.0390
2.0430	2.0469	2.0507
2.0543	2.0614	2.0648
2.0681	2.0713	2.0745
2.0776	2.0836	2.0865
2.0894	2.0922	2.0949
2.0976	2.1029	2.1055
2.1080	2.1105	2.1129
2.1153	2.1201	2.1224
2.1247	2.1269	2.1291
2.1313	2.1356	2.1377
2.1398	2.1418	2.1439
2.1459	2.1498	2.1517
2.1537	2.1555	2.1574
2.1593	2.1629	2.1647
2.1665	2.1683	2.1700
2.1718	2.1752	2.1769
2.1785	2.1802	2.1818
2.1834	2.1866	2.1882
2.1898	2.1914	2.1929
2.1944	2.1975	2.1990
2.2004	2.2019	2.2034
2.2048	2.2077	2.2091
2.2105	2.2119	2.2133
2.2147		

2.2161
 2.2174 2.2188 2.2201 2.2215 2.2228 2.2241
 2.2254
 2.2267 2.2280 2.2293 2.2306 2.2318 2.2331
 2.2343
 2.2356 2.2368 2.2381 2.2393 2.2405 2.2417
 2.2429
 2.2441 2.2453 2.2465 2.2476 2.2488 2.2500

COMPUTE NM HYD ID=1 HYD NO=101.1 AREA=0.081555 SQ MI
 PER A=0 B=43.185 C=0 D=56.815
 TP=0.1333 HR MASS RAINFALL=-1

K = .072949HR TP = .133300HR K/TP RATIO = .547255
 SHAPE CONSTANT, N = 7.068951
 UNIT PEAK = 182.32 CFS UNIT VOLUME = .9992 B =
 524.51 P60 = 1.9000
 AREA = .046335 SQ MI IA = .10000 INCHES INF =
 .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
 METHOD - DT = .033330

K = .129816HR TP = .133300HR K/TP RATIO = .973861
 SHAPE CONSTANT, N = 3.626720
 UNIT PEAK = 87.048 CFS UNIT VOLUME = 1.000 B =
 329.46 P60 = 1.9000
 AREA = .035220 SQ MI IA = .50000 INCHES INF =
 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
 METHOD - DT = .033330

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = 1.44525 INCHES = .6.2862 ACRE-FEET
 PEAK DISCHARGE RATE = 179.04 CFS AT 1.500 HOURS BASIN
 AREA = .0816 SQ. MI.

***** HYDORGRAPH FOR ANDERSON HEIGHTS UNITS 4 & 6 PARK
 COMPUTE NM HYD ID=2 HYD NO=102.1 AREA=0.003398 SQ MI
 PER A=0 B=50 C=50 D=0
 TP=0.1333 HR MASS RAINFALL=-1

K = .118483HR TP = .133300HR K/TP RATIO = .888844
 SHAPE CONSTANT, N = 3.990548
 UNIT PEAK = 9.0377 CFS UNIT VOLUME = .9989 B =
 354.54 P60 = 1.9000
 AREA = .003398 SQ MI IA = .42500 INCHES INF =
 1.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
 METHOD - DT = .033330

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = .84675 INCHES = .1535 ACRE-FEET
 PEAK DISCHARGE RATE = 5.46 CFS AT 1.500 HOURS BASIN
 AREA = .0034 SQ. MI.

***** HYDROGRAPH FOR ANDERSON HEIGHTS AMOLE MESA AT FIRST ENTRANCE
 COMPUTE NM HYD ID=5 HYD NO=105.1 AREA=0.001453 SQ MI
 PER A=0 B=26.83 C=0 D=73.17
 TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 4.1974 CFS UNIT VOLUME = .9965 B =
 526.28 P60 = 1.9000
 AREA = .001063 SQ MI IA = .10000 INCHES INF =
 .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
 METHOD - DT = .033330

K = .130761HR TP = .133300HR K/TP RATIO = .980950
 SHAPE CONSTANT, N = 3.599930
 UNIT PEAK = .95793 CFS UNIT VOLUME = .9863 B =
 327.55 P60 = 1.9000
 AREA = .000390 SQ MI IA = .50000 INCHES INF =
 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
 METHOD - DT = .033330

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 105.10

RUNOFF VOLUME = 1.66087 INCHES = .1287 ACRE-FEET
 PEAK DISCHARGE RATE = 3.56 CFS AT 1.500 HOURS BASIN
 AREA = .0015 SQ. MI.

***** HYDROGRAPH FOR ANDERSON HEIGHTS AMOLE MESA AT SECOND ENTRANCE
 COMPUTE NM HYD ID=6 HYD NO=106.1 AREA=0.002162 SQ MI
 PER A=0 B=26.83 C=0 D=73.17
 TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 6.2456 CFS UNIT VOLUME = .9976 B =
 526.28 P60 = 1.9000
 AREA = .001582 SQ MI IA = .10000 INCHES INF =
 .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
 METHOD - DT = .033330

K = .130761HR TP = .133300HR K/TP RATIO = .980950
 SHAPE CONSTANT, N = 3.599930
 UNIT PEAK = 1.4254 CFS UNIT VOLUME = .9903 B =
 327.55 P60 = 1.9000

AREA = .000580 SQ MI IA = .50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .033330

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 106.10

RUNOFF VOLUME = 1.66087 INCHES = .1915 ACRE-FEET
PEAK DISCHARGE RATE = 5.29 CFS AT 1.500 HOURS BASIN
AREA = .0022 SQ. MI.

***** HYDORGRAPH FOR ANDERSON HEIGHTS COLOBEL AT DUERSON
COMPUTE NM HYD ID=7 HYD NO=107.1 AREA=0.002573 SQ MI
PER A=0 B=12 C=0 D=88
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.9393 CFS UNIT VOLUME = .9981 B =
526.28 P60 = 1.9000
AREA = .002264 SQ MI IA = .10000 INCHES INF =
.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .033330

K = .130761HR TP = .133300HR K/TP RATIO = .980950
SHAPE CONSTANT, N = 3.599930
UNIT PEAK = .75870 CFS UNIT VOLUME = .9822 B =
327.55 P60 = 1.9000
AREA = .000309 SQ MI IA = .50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .033330

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 107.10

RUNOFF VOLUME = 1.85638 INCHES = .2547 ACRE-FEET
PEAK DISCHARGE RATE = 6.87 CFS AT 1.500 HOURS BASIN
AREA = .0026 SQ. MI.

***** HYDORGRAPH FOR ANDERSON HEIGHTS COLOBEL AT MORRISSEY
COMPUTE NM HYD ID=8 HYD NO=108.1 AREA=0.004079 SQ MI
PER A=0 B=12 C=0 D=88
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.172 CFS UNIT VOLUME = .9985 B =
526.28 P60 = 1.9000
AREA = .003590 SQ MI IA = .10000 INCHES INF =

.04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .033330

K = .130761HR TP = .133300HR K/TP RATIO = .980950
SHAPE CONSTANT, N = 3.599930
UNIT PEAK = 1.2028 CFS UNIT VOLUME = .9885 B =
327.55 P60 = 1.9000
AREA = .000489 SQ MI IA = .50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .033330

PRINT HYD

ID=8 CODE=1

PARTIAL HYDROGRAPH 108.10

RUNOFF VOLUME = 1.85638 INCHES = .4038 ACRE-FEET
PEAK DISCHARGE RATE = 10.88 CFS AT 1.500 HOURS BASIN
AREA = .0041 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 08:25:22

APPENDIX 1

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

N-8/D50 3A

PROJECT TITLE: Anderson Heights, Units 4 & 6

DRB #: 1002793

EPC#: _____

ZONE MAP/DRG. FILE # N-8/D50 3A

WORK ORDER#: _____

LEGAL DESCRIPTION: Parcels 4 & 6, Anderson Heights, Unit 1

CITY ADDRESS: _____

ENGINEERING FIRM: Mark Goodwin & Associates, PA

ADDRESS: PO Box 90606

CITY, STATE: Albuquerque, NM

CONTACT: Gregory J. Krenik

PHONE: 828-2200

ZIP CODE: 87199

OWNER: KB HOME, New Mexico, Inc.

ADDRESS: 6330 Riverside Plaza Lane NW #200

CITY, STATE: Albuquerque, NM

CONTACT: Gary Jenkins

PHONE: 353-5300

ZIP CODE: 87120

ARCHITECT: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying

ADDRESS: PO Box 30701

CITY, STATE: Albuquerque, NM

CONTACT: Tim Aldrich

PHONE: 884-1990

ZIP CODE: 87190

CONTRACTOR: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

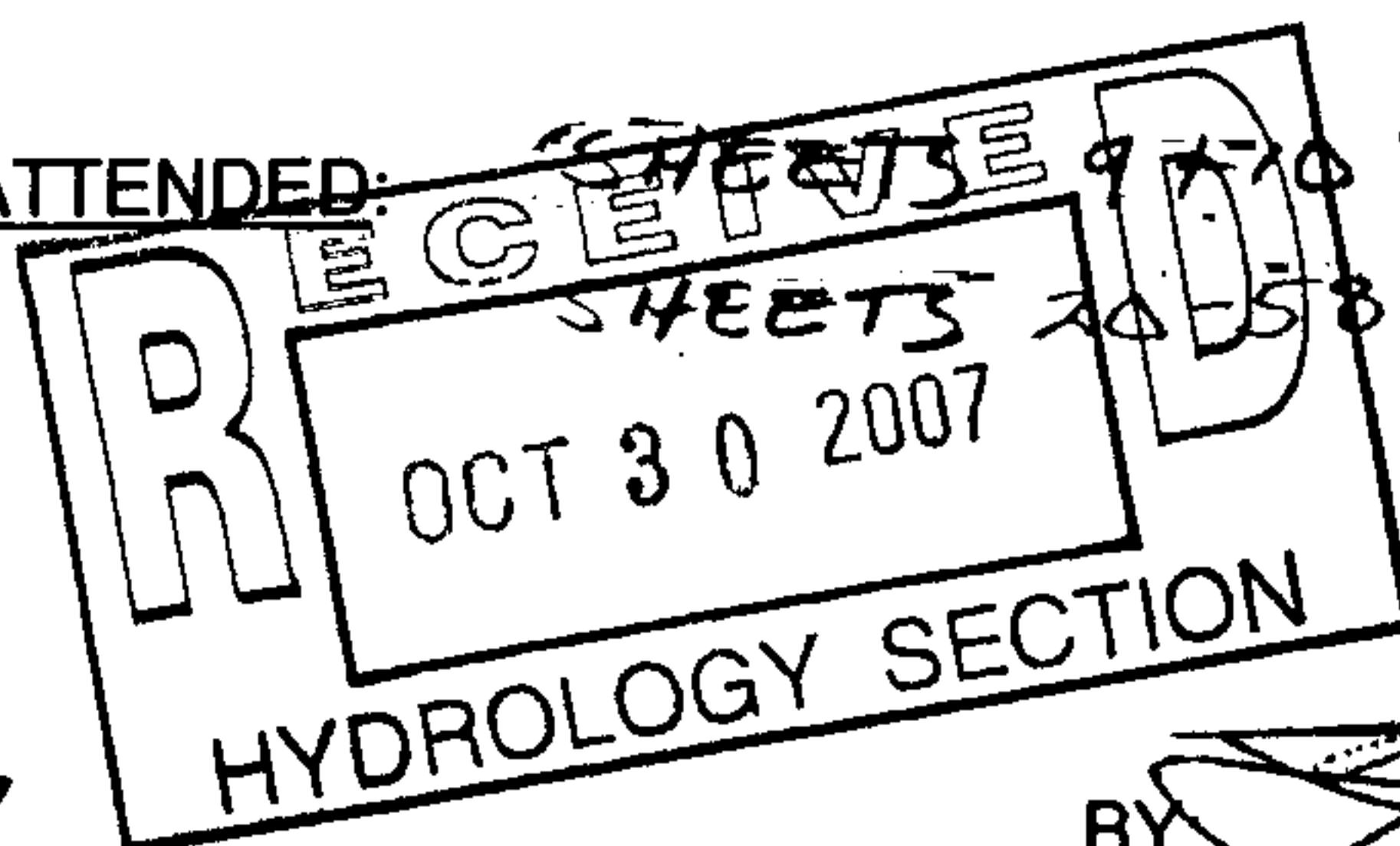
- ☒ DRAINAGE REPORT - *PARTIAL (SEE BELOW)*
- ☐ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☒ GRADING PLAN?
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER -

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☒ PRELIMINARY PLAT APPROVAL
- ☒ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY (PERM.)
- ☐ CERTIFICATE OF OCCUPANCY (TEMP.)
- ☒ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED



DATE SUBMITTED: 10-29-07

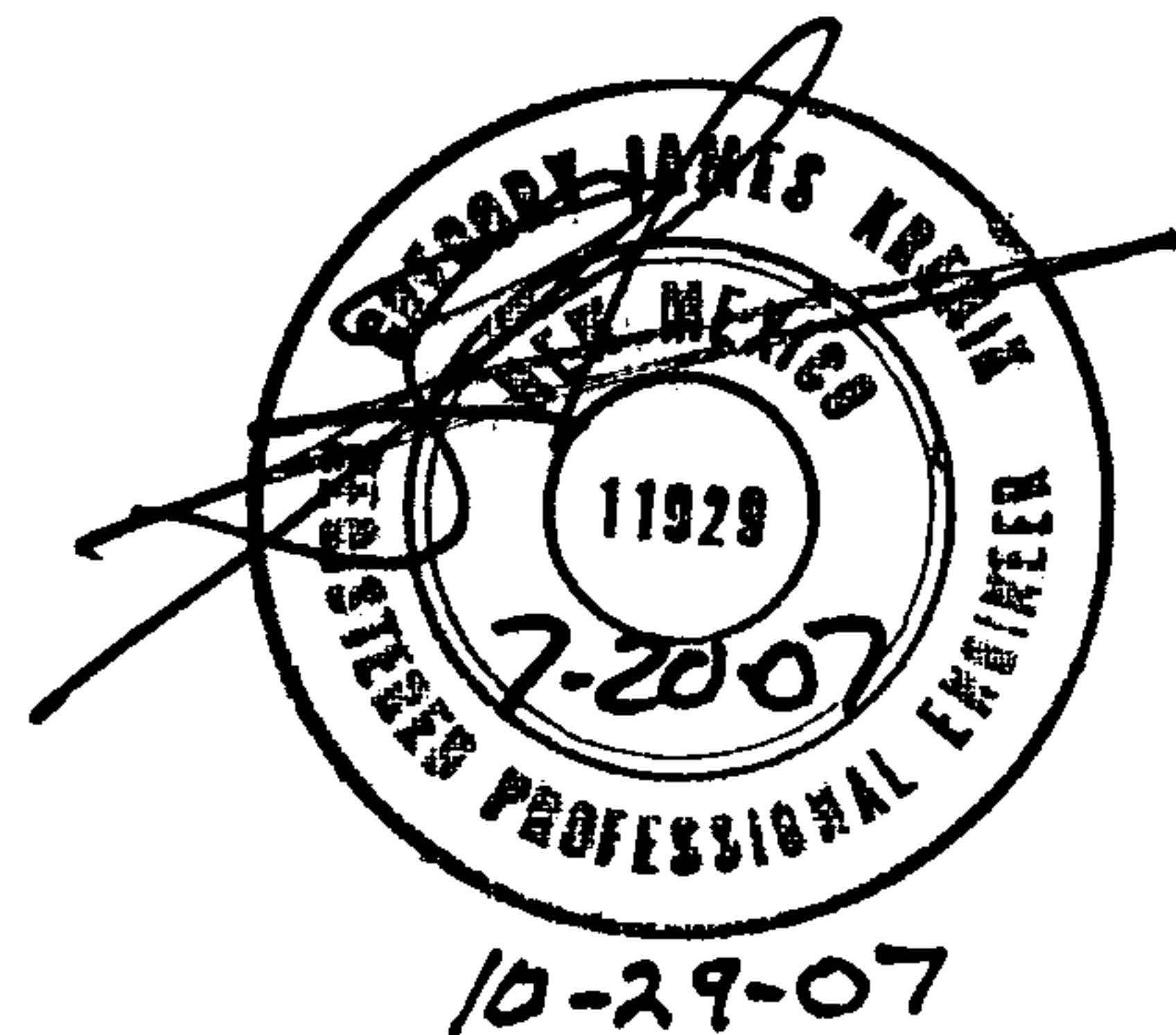
BY: GREGORY J. KRENIK

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

DRAINAGE REPORT
for
ANDERSON HEIGHTS SUBDIVISION
REVISED FOR UNITS 4 & 6

July 2007





D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: goodwinengrs@comcast.net

PROJECT ANDERSON HEIGHTS 4/6
SUBJECT DRAINAGE CALLS
BY CSK DATE 7-2-07
CHECKED _____ DATE _____

SHEET 9 OF _____

REVISED 10-29-07

- DETERMINE SUMP IN MORRISSEY AT THE NORTH END OF THE PARK

$$Q = 14.959267$$

$$Q/p = 3.0 \text{ H}^{1.5}$$

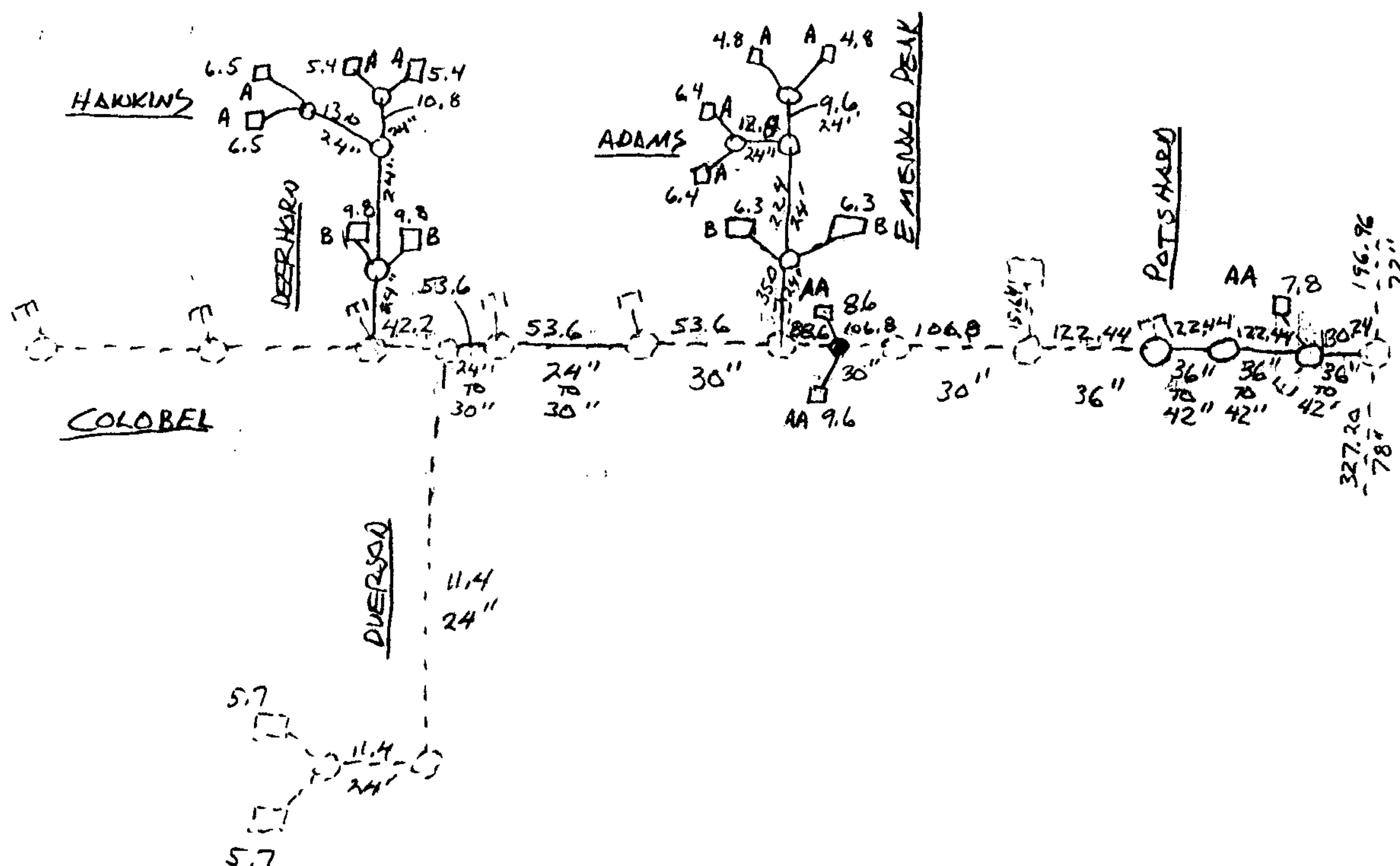
USE TWO SGL "A" INLETS $P = 11.0$

$$H = 0.37' < 0.67' \text{ OK}$$

ASSUME 50% CLOGGED

$$H = 0.59' < 0.85' \text{ OK}$$

- WE WILL USE AS MUCH OF THE EXISTING STORM DRAIN AS POSSIBLE.



- THE 24" RCP WEST OF DEERHORN WILL BE ABANDONED IN PLACE.
- THE 24" RCP EAST OF ANDERSON WILL BE REPLACED WITH 30" RCP.
- THE 36" RCP EAST OF POTSHARD WILL BE REPLACED WITH 42" RCP.
- SEE SHEETS 20-26 FOR COLOBEL & DEERHORN SD DESIGN
- SEE SHEETS 27-28 FOR HAWKINS SD DESIGN
- SEE SHEETS 29-36 FOR EMERALD/COLOBEL SD DESIGN
- SEE SHEETS 37-41 FOR ADAMS SD DESIGN



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FAX 797-9539

e-mail: goodwinengrs@comcast.net

PROJECT ADP PERSON HEIGHTS 426
SUBJECT DAMAGE CALCS

BY GJK DATE 7-2-07

CHECKED _____ DATE _____

SHEET 10 OF _____

REVISED 10-29-07

• FIND Q WEST OF KNUCKLE ON QUERN

$$Q = 24 \times 0.558635 \\ = 13.407240 \text{ CFS}$$

$$d = 0.32 \quad S = 4.46\%$$

$$WP = 12.07$$

$$A = 1.4656$$

$$V_{1/2} = 4.53 \text{ F/S}$$

$$Q_{1/2} = 6.63 \text{ CFS} \times 2 = 13.26 \approx 13.407240 \text{ OK}$$

INSTALL 2 SGL "A" INLETS BETWEEN LOTS 14 + 15, BLK 2

FROM NOMO SHEET 11

$$Q_{\text{GATE}} = 4.6$$

$$Q_{\text{PACT INLETS}} \\ = 13.407240 - 2(4.6) \\ = 4.207240 \text{ CFS}$$

• FIND REVISED SUMP AT NORTH SIDE OF KNUCKLE

$$Q = 13.223583 + 2(0.558635) + 4.207240 \\ = 29.162158 \text{ CFS}$$

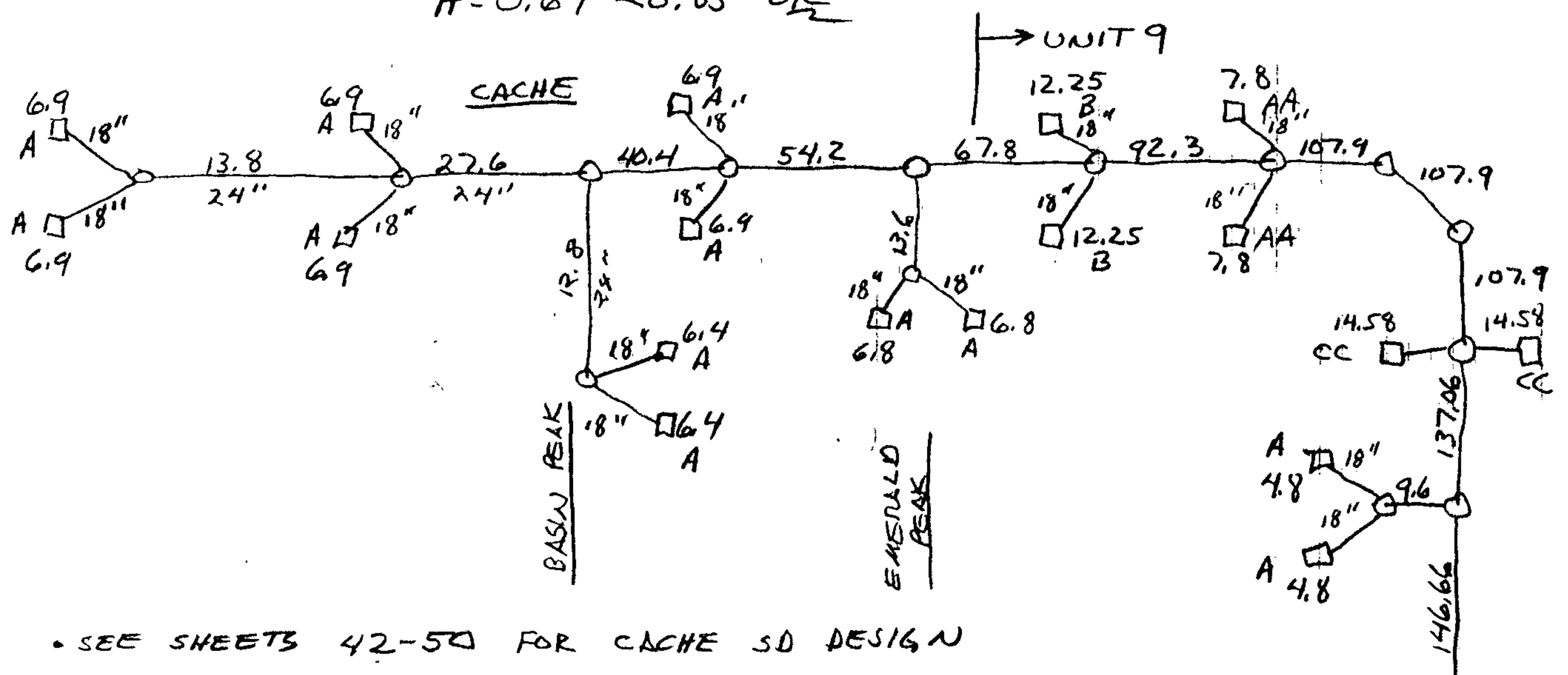
USE 2 DBL "C" INLETS $P = 17$

$$Q/P = 3.044'5$$

$$H = 0.43' < 0.67' \text{ OK}$$

ASSUME 50% CLOGGED

$$H = 0.69' < 0.85' \text{ OK}$$



• SEE SHEETS 42-50 FOR CACHE SD DESIGN

• SEE SHEETS 51-52 FOR EMERALD / CACHE SD DESIGN

• SEE SHEETS 53-58 FOR BASIN PEAK / CACHE SD DESIGN

CONTINUES
SOUTH PER
ORIGINAL
REPORT

T1 ANDERSON HEITGHTS UNITS 4 & 6

0

T2 COLOBEL STORMDRAIN DESIGN REVISION

T3 Existing conditions with revised flow & 30" + 42" added 10-9-07

[illegible]

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10: 3:20

ANDERSON HEITGHTS UNITS 4 & 6

COLOBEL STORMDRAIN DESIGN REVISION

Existing conditions with revised flow & 30" + 42" added 10-9-07

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1594.400	37.440	10.198	47.638	327.20	9.86	1.51	49.15	.00	4.86	.00	6.500	.000	.00	1 .0
184.500	.0035					.0039	.72	10.20	.00	5.78	.013	.00	.00	PIPE
1778.900	38.080	10.352	48.432	327.20	9.86	1.51	49.94	.00	4.86	.00	6.500	.000	.00	1 .0
JUNCT STR	.1825					.0103	.08	.00	.00		.013	.00	.00	PIPE
1786.900	39.540	9.107	48.647	130.24	13.54	2.85	51.49	.00	3.31	.00	3.500	.000	.00	1 .0
22.000	.0186					.0168	.37	9.11	.00	2.72	.013	.00	.00	PIPE
1808.900	39.950	9.066	49.016	130.24	13.54	2.85	51.86	.00	3.31	.00	3.500	.000	.00	1 .0
JUNCT STR	.0000					.0158	.09	9.07	.00		.013	.00	.00	PIPE
1814.900	39.950	9.822	49.772	122.44	12.73	2.51	52.29	.00	3.26	.00	3.500	.000	.00	1 .0
95.790	.0308					.0148	1.42	9.82	.00	2.14	.013	.00	.00	PIPE
1910.690	42.900	8.416	51.316	122.44	12.73	2.51	53.83	.00	3.26	.00	3.500	.000	.00	1 .0
JUNCT STR	.0333					.0148	.09	8.42	.00		.013	.00	.00	PIPE
1916.690	43.100	8.305	51.405	122.44	12.73	2.51	53.92	.00	3.26	.00	3.500	.000	.00	1 .0
143.750	.0334					.0148	2.13	8.31	.00	2.09	.013	.00	.00	PIPE
2060.440	47.900	5.760	53.660	122.44	12.73	2.51	56.17	.00	3.26	.00	3.500	.000	.00	1 .0
JUNCT STR	.0333					.0243	.15	5.76	.00		.013	.00	.00	PIPE
2066.450	48.100	3.612	51.712	122.44	17.32	4.66	56.37	.00	2.95	.00	3.000	.000	.00	1 .0
146.010	.0276					.0337	4.92	3.61	.00	3.00	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10: 3:20

ANDERSON HEITGHTS UNITS 4 & 6

COLOBEL STORMDRAIN DESIGN REVISION

Existing conditions with revised flow & 30" + 42" added 10-9-07

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
2212.460	52.130	4.735	56.865	122.44	17.32	4.66	61.52	.00	2.95	.00	3.000	.000	.00	1 .0
JUNCT STR	.0333					.0253	.15	4.73	.00		.013	.00	.00	PIPE
2218.460	52.330	7.928	60.258	106.80	10.88	1.84	62.10	.00	2.34	.00	2.500	.000	.00	2 .0
106.040	.0393					.0169	1.80	7.93	.00	1.48	.013	.00	.00	PIPE
2324.500	56.500	5.647	62.147	106.80	10.88	1.84	63.98	.00	2.34	.00	2.500	.000	.00	2 .0
49.687	.0299					.0169	.84	5.65	.00	1.62	.013	.00	.00	PIPE
2374.187	57.988	5.018	63.006	106.80	10.88	1.84	64.84	.00	2.34	.00	2.500	.000	.00	2 .0
HYDRAULIC JUMP														
2374.187	57.988	1.632	59.620	106.80	15.73	3.84	63.46	.00	2.34	2.38	2.500	.000	.00	2 .0
103.409	.0299					.0286	2.96	1.63	1.64	1.62	.013	.00	.00	PIPE
2477.595	61.084	1.657	62.741	106.80	15.46	3.71	66.45	.00	2.34	2.36	2.500	.000	.00	2 .0
76.394	.0299					.0265	2.02	1.66	1.59	1.62	.013	.00	.00	PIPE
2553.990	63.372	1.729	65.101	106.80	14.74	3.37	68.47	.00	2.34	2.31	2.500	.000	.00	2 .0
36.010	.0299					.0236	.85	1.73	1.47	1.62	.013	.00	.00	PIPE
2590.000	64.450	1.807	66.257	106.80	14.05	3.07	69.32	.00	2.34	2.24	2.500	.000	.00	2 .0
JUNCT STR	.0450					.0245	.10	1.81	1.34		.013	.00	.00	PIPE
2594.000	64.630	1.484	66.114	88.60	14.60	3.31	69.42	.00	2.21	2.46	2.500	.000	.00	2 .0
37.371	.0302					.0256	.96	1.48	1.64	1.43	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10: 3:20

ANDERSON HEITGHTS UNITS 4 & 6

COLOBEL STORMDRAIN DESIGN REVISION

Existing conditions with revised flow & 30" + 42" added 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
2631.371 | 65.760 | 1.525 | 67.285 | 88.60 | 14.12 | 3.09 | 70.38 | .00 | 2.21 | 2.44 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
30.728 | .0302 | | | | | .0231 | .71 | 1.53 | 1.55 | 1.43 | .013 | .00 | .00 | | PIPE
2662.099 | 66.689 | 1.588 | 68.277 | 88.60 | 13.46 | 2.81 | 71.09 | .00 | 2.21 | 2.41 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
19.330 | .0302 | | | | | .0205 | .40 | 1.59 | 1.43 | 1.43 | .013 | .00 | .00 | | PIPE
2681.429 | 67.274 | 1.656 | 68.930 | 88.60 | 12.83 | 2.56 | 71.49 | .00 | 2.21 | 2.36 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
13.390 | .0302 | | | | | .0183 | .24 | 1.66 | 1.32 | 1.43 | .013 | .00 | .00 | | PIPE
2694.820 | 67.679 | 1.728 | 69.407 | 88.60 | 12.24 | 2.32 | 71.73 | .00 | 2.21 | 2.31 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
9.549 | .0302 | | | | | .0163 | .16 | 1.73 | 1.22 | 1.43 | .013 | .00 | .00 | | PIPE
2704.369 | 67.967 | 1.806 | 69.773 | 88.60 | 11.67 | 2.11 | 71.89 | .00 | 2.21 | 2.24 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
6.896 | .0302 | | | | | .0146 | .10 | 1.81 | 1.12 | 1.43 | .013 | .00 | .00 | | PIPE
2711.265 | 68.176 | 1.890 | 70.066 | 88.60 | 11.12 | 1.92 | 71.99 | .00 | 2.21 | 2.15 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
4.761 | .0302 | | | | | .0131 | .06 | 1.89 | 1.02 | 1.43 | .013 | .00 | .00 | | PIPE
2716.026 | 68.320 | 1.983 | 70.303 | 88.60 | 10.61 | 1.75 | 72.05 | .00 | 2.21 | 2.02 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
2.925 | .0302 | | | | | .0118 | .03 | 1.98 | .92 | 1.43 | .013 | .00 | .00 | | PIPE
2718.950 | 68.408 | 2.088 | 70.496 | 88.60 | 10.11 | 1.59 | 72.08 | .00 | 2.21 | 1.85 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
1.050 | .0302 | | | | | .0109 | .01 | 2.09 | .82 | 1.43 | .013 | .00 | .00 | | PIPE
2720.000 | 68.440 | 2.213 | 70.653 | 88.60 | 9.64 | 1.44 | 72.10 | .00 | 2.21 | 1.59 | 2.500 | .000 | .00 | 2 | .0
| | | | | | | | | | | | | | | | |
JUNCT STR | .0300 | | | | | | | | | | | | | | | | |
2.21 | .71 | .013 | .00 | .00 | PIPE

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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10: 3:20

ANDERSON HEITGHTS UNITS 4 & 6

COLOBEL STORMDRAIN DESIGN REVISION

Existing conditions with revised flow & 30" + 42" added 10-9-07

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2724.000	68.560	.985	69.545	53.60	14.91	3.45	73.00	.00	1.76	2.44	2.500	.000	.00	2 .0
97.824	.0397					.0397	3.89	.99	2.17	.99	.013	.00	.00	PIPE
2821.824	72.446	.985	73.431	53.60	14.91	3.45	76.88	.00	1.76	2.44	2.500	.000	.00	2 .0
114.646	.0397					.0389	4.46	.99	2.17	.99	.013	.00	.00	PIPE
2936.470	77.000	.997	77.997	53.60	14.68	3.34	81.34	.00	1.76	2.45	2.500	.000	.00	2 .0
JUNCT STR	.0200					.0387	.15	1.00	2.12		.013	.00	.00	PIPE
2940.470	77.080	.988	78.068	53.60	14.86	3.43	81.50	.00	1.76	2.44	2.500	.000	.00	2 .0
178.536	.0393					.0393	7.02	.99	2.16	.99	.013	.00	.00	PIPE
3119.006	84.100	.988	85.087	53.60	14.86	3.43	88.52	.00	1.76	2.44	2.500	.000	.00	2 .0
114.464	.0393					.0375	4.29	.99	2.16	.99	.013	.00	.00	PIPE
3233.470	88.600	1.015	89.615	53.60	14.34	3.19	92.81	.00	1.76	2.46	2.500	.000	.00	2 .0
49.630	.0379					.0340	1.69	1.01	2.05	1.00	.013	.00	.00	PIPE
3283.100	90.480	1.042	91.522	53.60	13.84	2.98	94.50	.00	1.76	2.47	2.500	.000	.00	2 .0
JUNCT STR	.0400					.0361	.14	1.04	1.95		.013	.00	.00	PIPE
3287.100	90.640	1.533	92.173	42.20	16.33	4.14	96.32	.00	1.96	1.69	2.000	.000	.00	1 .0
10.822	.0400					.0398	.43	1.53	2.33	1.53	.013	.00	.00	PIPE
3297.921	91.073	1.533	92.606	42.20	16.33	4.14	96.75	.00	1.96	1.69	2.000	.000	.00	1 .0
144.300	.0400					.0379	5.47	1.53	2.33	1.53	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10: 3:20

ANDERSON HEITGHTS UNITS 4 & 6

COLOBEL STORMDRAIN DESIGN REVISION

Existing conditions with revised flow & 30" + 42" added 10-9-07

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3442.221	96.842	1.609	98.451	42.20	15.57	3.77	102.22	.00	1.96	1.59	2.000	.000	.00	1 .0
45.583	.0400					.0344	1.57	1.61	2.10	1.53	.013	.00	.00	PIPE
3487.803	98.664	1.697	100.361	42.20	14.85	3.42	103.78	.00	1.96	1.43	2.000	.000	.00	1 .0
24.940	.0400					.0317	.79	1.70	1.86	1.53	.013	.00	.00	PIPE
3512.744	99.661	1.802	101.463	42.20	14.16	3.11	104.57	.00	1.96	1.19	2.000	.000	.00	1 .0
13.726	.0400					.0309	.42	1.80	1.58	1.53	.013	.00	.00	PIPE
3526.470	100.210	1.961	102.171	42.20	13.49	2.83	105.00	.00	1.96	.55	2.000	.000	.00	1 .0
JUNCT STR	.0200					.0330	.13	1.96	1.00		.013	.00	.00	PIPE
3530.470	100.290	2.039	102.329	42.20	13.43	2.80	105.13	.00	1.96	.00	2.000	.000	.00	1 .0
86.000	.0170					.0348	2.99	2.04	.00	2.00	.013	.00	.00	PIPE
3616.470	101.750	3.712	105.462	42.20	13.43	2.80	108.26	.00	1.96	.00	2.000	.000	.00	1 .0
JUNCT STR	.0000					.0229	.14	3.71	.00		.013	.00	.00	PIPE
3622.470	101.750	7.001	108.751	23.80	7.58	.89	109.64	.00	1.73	.00	2.000	.000	.00	1 .0
81.450	.0359					.0111	.90	7.00	.00	1.07	.013	.00	.00	PIPE
3703.920	104.670	5.027	109.697	23.80	7.58	.89	110.59	.00	1.73	.00	2.000	.000	.00	1 .0
JUNCT STR	.0000					.0067	.04	5.03	.00		.013	.00	.00	PIPE
3709.920	104.670	6.482	111.152	10.80	3.44	.18	111.34	.00	1.18	.00	2.000	.000	.00	1 .0
36.190	.0392					.0023	.08	6.48	.00	.67	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10: 3:20

ANDERSON HEITGHTS UNITS 4 & 6

COLOBEL STORMDRAIN DESIGN REVISION

Existing conditions with revised flow & 30" + 42" added 10-9-07

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
3746.110 | 106.090 | 5.154 | 111.244 | 10.80 | 3.44 | .18 | 111.43 | .00 | 1.18 | .00 | 2.000 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
JUNCT STR | .0000 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3750.110 | 106.090 | 5.277 | 111.367 | 5.40 | 3.06 | .14 | 111.51 | .00 | .90 | .00 | 1.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
27.000 | .0337 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3777.110 | 107.000 | 4.446 | 111.446 | 5.40 | 3.06 | .14 | 111.59 | .00 | .90 | .00 | 1.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

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T1 Anderson Heights Units 4 & 6
 T2 Hawkins to Deerhorn Stormdrain
 T3 Run 1 10-9-07
 SO 3622.470 101.750 1 108.751
 R 3703.920 104.670 1 .013 .000 .000 1
 JX 3709.920 104.670 3 2 .013 10.800 104.670 .0 -90.000
 R 3766.790 106.750 3 .013 .000 .000 1
 JX 3770.790 107.250 5 4 .013 6.500 107.250 -45.0 45.000
 R 3815.790 108.250 5 .013 .000 .000 1
 SH 3815.790 108.250 5 110.250
 CD 1 4 1 .000 2.000 .000 .000 .000 .00
 CD 2 4 1 .000 2.000 .000 .000 .000 .00
 CD 3 4 1 .000 2.000 .000 .000 .000 .00
 CD 4 4 1 .000 1.500 .000 .000 .000 .00
 CD 5 4 1 .000 1.500 .000 .000 .000 .00
 Q 6.500 .0

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time:10:45:25

Anderson Heights Units 4 & 6

Hawkins to Deerhorn Stormdrain

Run 1 10-9-07

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope |
*****
3622.470 | 101.750 | 7.001 | 108.751 | 23.80 | 7.58 | .89 | 109.64 | .00 | 1.73 | .00 | 2.000 | .000 | .00 | 1 .0
      | 81.450 | .0359 |          |          |          | .0111 | .90 | 7.00 | .00 | 1.07 | .013 | .00 | .00 | PIPE
3703.920 | 104.670 | 5.027 | 109.697 | 23.80 | 7.58 | .89 | 110.59 | .00 | 1.73 | .00 | 2.000 | .000 | .00 | 1 .0
JUNCT STR | .0000 |          |          |          |          | .0072 | .04 | .00 | .00 | .013 | .00 | .00 | PIPE
3709.920 | 104.670 | 5.954 | 110.624 | 13.00 | 4.14 | .27 | 110.89 | .00 | 1.30 | .00 | 2.000 | .000 | .00 | 1 .0
      | 56.870 | .0366 |          |          |          | .0033 | .19 | 5.95 | .00 | .75 | .013 | .00 | .00 | PIPE
3766.790 | 106.750 | 4.075 | 110.825 | 13.00 | 4.14 | .27 | 111.09 | .00 | 1.30 | .00 | 2.000 | .000 | .00 | 1 .0
JUNCT STR | .1250 |          |          |          |          | .0036 | .01 | .00 | .00 | .013 | .00 | .00 | PIPE
3770.790 | 107.250 | 3.753 | 111.003 | 6.50 | 3.68 | .21 | 111.21 | .00 | .99 | .00 | 1.500 | .000 | .00 | 1 .0
      | 45.000 | .0222 |          |          |          | .0038 | .17 | 3.75 | .00 | .67 | .013 | .00 | .00 | PIPE
3815.790 | 108.250 | 2.936 | 111.186 | 6.50 | 3.68 | .21 | 111.40 | .00 | .99 | .00 | 1.500 | .000 | .00 | 1 .0
      |          |          |          |          |          |          |          |          |          |          |          |          |          |

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T1 Anderson Heights Units 4 & 6
T2 Emerald at Colobel Stormdrain
T3 Run 2 10-9-07

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[illegible]

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
1594.400 | 37.440 | 10.198 | 47.638 | 327.20 | 9.86 | 1.51 | 49.15 | .00 | 4.86 | .00 | 6.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
184.500 | .0035 | | | | | .0039 | .72 | 10.20 | .00 | 5.78 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
1778.900 | 38.080 | 10.352 | 48.432 | 327.20 | 9.86 | 1.51 | 49.94 | .00 | 4.86 | .00 | 6.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .1825 | | | | | .0103 | .08 | .00 | .00 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
1786.900 | 39.540 | 9.107 | 48.647 | 130.24 | 13.54 | 2.85 | 51.49 | .00 | 3.31 | .00 | 3.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
22.000 | .0186 | | | | | .0168 | .37 | 9.11 | .00 | 2.72 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
1808.900 | 39.950 | 9.066 | 49.016 | 130.24 | 13.54 | 2.85 | 51.86 | .00 | 3.31 | .00 | 3.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .0000 | | | | | .0158 | .09 | 9.07 | .00 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
1814.900 | 39.950 | 9.822 | 49.772 | 122.44 | 12.73 | 2.51 | 52.29 | .00 | 3.26 | .00 | 3.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
95.790 | .0308 | | | | | .0148 | 1.42 | 9.82 | .00 | 2.14 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
1910.690 | 42.900 | 8.416 | 51.316 | 122.44 | 12.73 | 2.51 | 53.83 | .00 | 3.26 | .00 | 3.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .0333 | | | | | .0148 | .09 | 8.42 | .00 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
1916.690 | 43.100 | 8.305 | 51.405 | 122.44 | 12.73 | 2.51 | 53.92 | .00 | 3.26 | .00 | 3.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
143.750 | .0334 | | | | | .0148 | 2.13 | 8.31 | .00 | 2.09 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
2060.440 | 47.900 | 5.760 | 53.660 | 122.44 | 12.73 | 2.51 | 56.17 | .00 | 3.26 | .00 | 3.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .0333 | | | | | .0243 | .15 | 5.76 | .00 | .013 | .00 | .00 | | PIPE
| | | | | | | | | | | | | | | |
2066.450 | 48.100 | 3.612 | 51.712 | 122.44 | 17.32 | 4.66 | 56.37 | .00 | 2.95 | .00 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
146.010 | .0276 | | | | | .0337 | 4.92 | 3.61 | .00 | 3.00 | .013 | .00 | .00 | | PIPE

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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip	*****	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	*****	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
2212.460	52.130	4.735	56.865	122.44	17.32	4.66	61.52	.00	2.95	.00	3.000	.000	.00	1	.0	
JUNCT STR	.0333					.0253	.15	4.73	.00		.013	.00	.00	PIPE		
2218.460	52.330	7.928	60.258	106.80	10.88	1.84	62.10	.00	2.34	.00	2.500	.000	.00	2	.0	
106.040	.0393					.0169	1.80	7.93	.00	1.48	.013	.00	.00	PIPE		
2324.500	56.500	5.647	62.147	106.80	10.88	1.84	63.98	.00	2.34	.00	2.500	.000	.00	2	.0	
49.687	.0299					.0169	.84	5.65	.00	1.62	.013	.00	.00	PIPE		
2374.187	57.988	5.018	63.006	106.80	10.88	1.84	64.84	.00	2.34	.00	2.500	.000	.00	2	.0	
HYDRAULIC JUMP																
2374.187	57.988	1.632	59.620	106.80	15.73	3.84	63.46	.00	2.34	2.38	2.500	.000	.00	2	.0	
103.409	.0299					.0286	2.96	1.63	1.64	1.62	.013	.00	.00	PIPE		
2477.595	61.084	1.657	62.741	106.80	15.46	3.71	66.45	.00	2.34	2.36	2.500	.000	.00	2	.0	
76.394	.0299					.0265	2.02	1.66	1.59	1.62	.013	.00	.00	PIPE		
2553.990	63.372	1.729	65.101	106.80	14.74	3.37	68.47	.00	2.34	2.31	2.500	.000	.00	2	.0	
36.010	.0299					.0236	.85	1.73	1.47	1.62	.013	.00	.00	PIPE		
2590.000	64.450	1.807	66.257	106.80	14.05	3.07	69.32	.00	2.34	2.24	2.500	.000	.00	2	.0	
JUNCT STR	.0450					.0245	.10	1.81	1.34		.013	.00	.00	PIPE		
2594.000	64.630	1.484	66.114	88.60	14.60	3.31	69.42	.00	2.21	2.46	2.500	.000	.00	2	.0	
37.371	.0302					.0256	.96	1.48	1.64	1.43	.013	.00	.00	PIPE		

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****
2631.371 | 65.760 | 1.525 | 67.285 | 88.60 | 14.12 | 3.09 | 70.38 | .00 | 2.21 | 2.44 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
30.728 | .0302 | | | | | | | | | | | | | | |
2662.099 | 66.689 | 1.588 | 68.277 | 88.60 | 13.46 | 2.81 | 71.09 | .00 | 2.21 | 2.41 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
19.330 | .0302 | | | | | | | | | | | | | | |
2681.429 | 67.274 | 1.656 | 68.930 | 88.60 | 12.83 | 2.56 | 71.49 | .00 | 2.21 | 2.36 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
13.390 | .0302 | | | | | | | | | | | | | | |
2694.820 | 67.679 | 1.728 | 69.407 | 88.60 | 12.24 | 2.32 | 71.73 | .00 | 2.21 | 2.31 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
9.549 | .0302 | | | | | | | | | | | | | | |
2704.369 | 67.967 | 1.806 | 69.773 | 88.60 | 11.67 | 2.11 | 71.89 | .00 | 2.21 | 2.24 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
6.896 | .0302 | | | | | | | | | | | | | | |
2711.265 | 68.176 | 1.890 | 70.066 | 88.60 | 11.12 | 1.92 | 71.99 | .00 | 2.21 | 2.15 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
4.761 | .0302 | | | | | | | | | | | | | | |
2716.026 | 68.320 | 1.983 | 70.303 | 88.60 | 10.61 | 1.75 | 72.05 | .00 | 2.21 | 2.02 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
2.925 | .0302 | | | | | | | | | | | | | | |
2718.950 | 68.408 | 2.088 | 70.496 | 88.60 | 10.11 | 1.59 | 72.08 | .00 | 2.21 | 1.85 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
1.050 | .0302 | | | | | | | | | | | | | | |
2720.000 | 68.440 | 2.213 | 70.653 | 88.60 | 9.64 | 1.44 | 72.10 | 2.50 | 2.21 | 1.59 | 2.500 | .000 | .00 | 2 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .0300 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

*****															*****	
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch		
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****		
2724.000	68.560	3.025	71.585	35.00	11.14	1.93	73.51	.00	1.92	.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
87.000	.0324					.0239	2.08	3.02	.00	1.43	.013	.00	.00	PIPE		
2811.000	71.380	2.384	73.764	35.00	11.14	1.93	75.69	.00	1.92	.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
JUNCT STR	.0000					.0169	.10	2.38	.00		.013	.00	.00	PIPE		
2817.000	71.380	4.447	75.827	22.40	7.13	.79	76.62	.00	1.69	.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
81.460	.0328					.0098	.80	4.45	.00	1.05	.013	.00	.00	PIPE		
2898.460	74.050	2.615	76.665	22.40	7.13	.79	77.45	.00	1.69	.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
JUNCT STR	.0000					.0058	.03	2.61	.00		.013	.00	.00	PIPE		
2904.460	74.050	3.939	77.989	9.60	3.06	.14	78.13	.00	1.11	.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
33.178	.0602					.0018	.06	3.94	.00	.56	.013	.00	.00	PIPE		
2937.638	76.048	2.000	78.048	9.60	3.06	.14	78.19	.00	1.11	.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
2.910	.0602					.0017	.00	2.00	.00	.56	.013	.00	.00	PIPE		
2940.548	76.224	1.814	78.038	9.60	3.20	.16	78.20	.00	1.11	1.16	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
.868	.0602					.0016	.00	1.81	.35	.56	.013	.00	.00	PIPE		
2941.417	76.276	1.756	78.032	9.60	3.28	.17	78.20	.00	1.11	1.31	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
HYDRAULIC JUMP																
2941.417	76.276	.665	76.941	9.60	10.51	1.71	78.66	.00	1.11	1.88	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
3.981	.0602					.0296	.12	.67	2.66	.56	.013	.00	.00	PIPE		

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev   | (FT)  | Elev   | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope |      |      |      |      | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
2945.398 | 76.516 | .689 | 77.205 | 9.60 | 10.00 | 1.55 | 78.76 | .00 | 1.11 | 1.90 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
3.381 | .0602 |      |      |      |      | .0259 | .09 | .69 | 2.48 | .56 | .013 | .00 | .00 | PIPE
2948.779 | 76.719 | .714 | 77.433 | 9.60 | 9.54 | 1.41 | 78.85 | .00 | 1.11 | 1.92 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
2.752 | .0602 |      |      |      |      | .0227 | .06 | .71 | 2.32 | .56 | .013 | .00 | .00 | PIPE
2951.531 | 76.885 | .739 | 77.624 | 9.60 | 9.09 | 1.28 | 78.91 | .00 | 1.11 | 1.93 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
2.223 | .0602 |      |      |      |      | .0199 | .04 | .74 | 2.17 | .56 | .013 | .00 | .00 | PIPE
2953.754 | 77.019 | .766 | 77.785 | 9.60 | 8.67 | 1.17 | 78.95 | .00 | 1.11 | 1.94 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
1.848 | .0602 |      |      |      |      | .0174 | .03 | .77 | 2.02 | .56 | .013 | .00 | .00 | PIPE
2955.602 | 77.130 | .793 | 77.923 | 9.60 | 8.26 | 1.06 | 78.98 | .00 | 1.11 | 1.96 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
1.501 | .0602 |      |      |      |      | .0153 | .02 | .79 | 1.89 | .56 | .013 | .00 | .00 | PIPE
2957.102 | 77.221 | .822 | 78.043 | 9.60 | 7.88 | .96 | 79.01 | .00 | 1.11 | 1.97 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
1.232 | .0602 |      |      |      |      | .0134 | .02 | .82 | 1.77 | .56 | .013 | .00 | .00 | PIPE
2958.334 | 77.295 | .852 | 78.147 | 9.60 | 7.51 | .88 | 79.02 | .00 | 1.11 | 1.98 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
.985 | .0602 |      |      |      |      | .0118 | .01 | .85 | 1.65 | .56 | .013 | .00 | .00 | PIPE
2959.319 | 77.354 | .884 | 78.238 | 9.60 | 7.16 | .80 | 79.04 | .00 | 1.11 | 1.99 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
.791 | .0602 |      |      |      |      | .0104 | .01 | .88 | 1.54 | .56 | .013 | .00 | .00 | PIPE
2960.111 | 77.402 | .917 | 78.319 | 9.60 | 6.83 | .72 | 79.04 | .00 | 1.11 | 1.99 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
.624 | .0602 |      |      |      |      | .0091 | .01 | .92 | 1.43 | .56 | .013 | .00 | .00 | PIPE

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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
2960.734 | 77.439 | .951 | 78.391 | 9.60 | 6.51 | .66 | 79.05 | .00 | 1.11 | 2.00 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | .457 | .0602 | | | | | | | | | | | | | | |
2961.191 | 77.467 | .987 | 78.454 | 9.60 | 6.21 | .60 | 79.05 | .00 | 1.11 | 2.00 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | .309 | .0602 | | | | | | | | | | | | | | |
2961.500 | 77.486 | 1.025 | 78.511 | 9.60 | 5.92 | .54 | 79.05 | .00 | 1.11 | 2.00 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | .194 | .0602 | | | | | | | | | | | | | | |
2961.695 | 77.497 | 1.064 | 78.561 | 9.60 | 5.65 | .49 | 79.06 | .00 | 1.11 | 2.00 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | .045 | .0602 | | | | | | | | | | | | | | |
2961.740 | 77.500 | 1.108 | 78.608 | 9.60 | 5.38 | .45 | 79.06 | .35 | 1.11 | 1.99 | 2.000 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .1250 | | | | | | | | | | | | | | |
2965.740 | 78.000 | 1.095 | 79.095 | 4.80 | 3.47 | .19 | 79.28 | .00 | .84 | 1.33 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 3.759 | .0107 | | | | | | | | | | | | | | |
2969.499 | 78.040 | 1.047 | 79.087 | 4.80 | 3.64 | .21 | 79.29 | .00 | .84 | 1.38 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 3.117 | .0107 | | | | | | | | | | | | | | |
2972.615 | 78.073 | 1.003 | 79.077 | 4.80 | 3.82 | .23 | 79.30 | .00 | .84 | 1.41 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 1.821 | .0107 | | | | | | | | | | | | | | |
2974.436 | 78.093 | .962 | 79.055 | 4.80 | 4.01 | .25 | 79.30 | .00 | .84 | 1.44 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
HYDRAULIC JUMP

```

35

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2: 0:56

Anderson Heights Units 4 & 6

Emerald at Colobel Stormdrain

Run 2 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
2974.436 | 78.093 | .722 | 78.815 | 4.80 | 5.70 | .50 | 79.32 | .00 | .84 | 1.50 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
9.418 | .0107 | | | | | | | | | | | | | | |
2983.854 | 78.194 | .750 | 78.944 | 4.80 | 5.43 | .46 | 79.40 | .00 | .84 | 1.50 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
4.790 | .0107 | | | | | | | | | | | | | | |
2988.644 | 78.245 | .778 | 79.023 | 4.80 | 5.18 | .42 | 79.44 | .00 | .84 | 1.50 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
1.813 | .0107 | | | | | | | | | | | | | | |
2990.456 | 78.264 | .809 | 79.073 | 4.80 | 4.94 | .38 | 79.45 | .00 | .84 | 1.50 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
.544 | .0107 | | | | | | | | | | | | | | |
2991.000 | 78.270 | .842 | 79.112 | 4.80 | 4.70 | .34 | 79.46 | .00 | .84 | 1.49 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -

```

T1 Anderson Heights Units 4 & 6

0

T2 Adams Stormdrain

T3 Run 1 10-9-07

SO	2817.000	71.380	1						75.827		
R	2898.460	74.050	1		.013					.000	.000 1
JX	2904.460	74.050	3	2	.013	9.600			74.050	.0	-90.000
R	2963.740	76.500	3		.013					.000	.000 1
JX	2969.720	77.000	5	4	.013	6.400			77.000	-45.0	45.000
R	2996.000	78.000	5		.013					.000	.000 1
SH	2996.000	78.000	5						80.000		
CD	1	4	1		.000	2.000	.000	.000	.000	.00	
CD	2	4	1		.000	2.000	.000	.000	.000	.00	
CD	3	4	1		.000	2.000	.000	.000	.000	.00	
CD	4	4	1		.000	1.500	.000	.000	.000	.00	
CD	5	4	1		.000	1.500	.000	.000	.000	.00	
Q					6.400	.0					

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2:38:49

Anderson Heights Units 4 & 6

Adams Stormdrain

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
2817.000 | 71.380 | 4.447 | 75.827 | 22.40 | 7.13 | .79 | 76.62 | .00 | 1.69 | .00 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
81.460 | .0328 | | | | | .0098 | .80 | 4.45 | .00 | 1.05 | .013 | .00 | .00 | PIPE
2898.460 | 74.050 | 2.615 | 76.665 | 22.40 | 7.13 | .79 | 77.45 | .00 | 1.69 | .00 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
JUNCT STR | .0000 | | | | | .0065 | .04 | .00 | .00 | .013 | .00 | .00 | PIPE
2904.460 | 74.050 | 3.427 | 77.477 | 12.80 | 4.07 | .26 | 77.74 | .00 | 1.29 | .00 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
37.654 | .0413 | | | | | .0032 | .12 | 3.43 | .00 | .72 | .013 | .00 | .00 | PIPE
2942.114 | 75.606 | 2.000 | 77.606 | 12.80 | 4.07 | .26 | 77.86 | .00 | 1.29 | .00 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3.581 | .0413 | | | | | .0030 | .01 | 2.00 | .00 | .72 | .013 | .00 | .00 | PIPE
2945.694 | 75.754 | 1.842 | 77.596 | 12.80 | 4.23 | .28 | 77.87 | .00 | 1.29 | 1.08 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
HYDRAULIC JUMP
2945.694 | 75.754 | .876 | 76.630 | 12.80 | 9.67 | 1.45 | 78.08 | .00 | 1.29 | 1.98 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
.144 | .0413 | | | | | .0203 | .00 | .88 | 2.09 | .72 | .013 | .00 | .00 | PIPE
2945.838 | 75.760 | .876 | 76.636 | 12.80 | 9.66 | 1.45 | 78.08 | .00 | 1.29 | 1.98 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
4.417 | .0413 | | | | | .0190 | .08 | .88 | 2.08 | .72 | .013 | .00 | .00 | PIPE
2950.256 | 75.943 | .909 | 76.852 | 12.80 | 9.21 | 1.32 | 78.17 | .00 | 1.29 | 1.99 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3.480 | .0413 | | | | | .0167 | .06 | .91 | 1.94 | .72 | .013 | .00 | .00 | PIPE
2953.735 | 76.087 | .943 | 77.030 | 12.80 | 8.78 | 1.20 | 78.23 | .00 | 1.29 | 2.00 | 2.000 | .000 | .00 | 1 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.734 | .0413 | | | | | .0147 | .04 | .94 | 1.81 | .72 | .013 | .00 | .00 | PIPE

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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2:38:49

Anderson Heights Units 4 & 6

Adams Stormdrain

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
2956.469 | 76.200 | .979 | 77.179 | 12.80 | 8.37 | 1.09 | 78.27 | .00 | 1.29 | 2.00 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
2.181 | .0413 | | | | | .0129 | .03 | .98 | 1.69 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2958.650 | 76.290 | 1.016 | 77.306 | 12.80 | 7.98 | .99 | 78.29 | .00 | 1.29 | 2.00 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
1.701 | .0413 | | | | | .0114 | .02 | 1.02 | 1.57 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2960.351 | 76.360 | 1.055 | 77.415 | 12.80 | 7.61 | .90 | 78.31 | .00 | 1.29 | 2.00 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
1.303 | .0413 | | | | | .0100 | .01 | 1.06 | 1.46 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2961.654 | 76.414 | 1.096 | 77.510 | 12.80 | 7.26 | .82 | 78.33 | .00 | 1.29 | 1.99 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
.934 | .0413 | | | | | .0089 | .01 | 1.10 | 1.36 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2962.588 | 76.452 | 1.140 | 77.592 | 12.80 | 6.92 | .74 | 78.34 | .00 | 1.29 | 1.98 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
.674 | .0413 | | | | | .0078 | .01 | 1.14 | 1.26 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2963.262 | 76.480 | 1.185 | 77.665 | 12.80 | 6.60 | .68 | 78.34 | .00 | 1.29 | 1.97 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
.361 | .0413 | | | | | .0069 | .00 | 1.19 | 1.17 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2963.623 | 76.495 | 1.234 | 77.729 | 12.80 | 6.29 | .61 | 78.34 | .00 | 1.29 | 1.94 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
.117 | .0413 | | | | | .0061 | .00 | 1.23 | 1.08 | .72 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2963.740 | 76.500 | 1.287 | 77.787 | 12.80 | 5.99 | .56 | 78.34 | .28 | 1.29 | 1.92 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .0836 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
2969.720 | 77.000 | .633 | 77.633 | 6.40 | 9.04 | 1.27 | 78.90 | .00 | .98 | 1.48 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
3.030 | .0381 | | | | | .0263 | .08 | .63 | 2.30 | .58 | .013 | .00 | .00 | PIPE

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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2:38:49

Anderson Heights Units 4 & 6

Adams Stormdrain

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
L/Elem | Ch Slope | | | | | | | | | | | | | | Type Ch
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
2972.750 | 77.115 | .641 | 77.756 | 6.40 | 8.87 | 1.22 | 78.98 | .00 | .98 | 1.48 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
6.211 | .0381 | | | | | | | | | | | | | | | |
2978.961 | 77.352 | .665 | 78.017 | 6.40 | 8.45 | 1.11 | 79.13 | .00 | .98 | 1.49 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
4.488 | .0381 | | | | | | | | | | | | | | | |
2983.449 | 77.522 | .690 | 78.213 | 6.40 | 8.06 | 1.01 | 79.22 | .00 | .98 | 1.50 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
3.378 | .0381 | | | | | | | | | | | | | | | |
2986.827 | 77.651 | .716 | 78.367 | 6.40 | 7.69 | .92 | 79.28 | .00 | .98 | 1.50 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
2.600 | .0381 | | | | | | | | | | | | | | | |
2989.426 | 77.750 | .743 | 78.493 | 6.40 | 7.33 | .83 | 79.33 | .00 | .98 | 1.50 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
2.021 | .0381 | | | | | | | | | | | | | | | |
2991.448 | 77.827 | .771 | 78.598 | 6.40 | 6.99 | .76 | 79.36 | .00 | .98 | 1.50 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
1.534 | .0381 | | | | | | | | | | | | | | | |
2992.982 | 77.885 | .801 | 78.686 | 6.40 | 6.66 | .69 | 79.38 | .00 | .98 | 1.50 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
1.178 | .0381 | | | | | | | | | | | | | | | |
2994.160 | 77.930 | .832 | 78.762 | 6.40 | 6.35 | .63 | 79.39 | .00 | .98 | 1.49 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
.850 | .0381 | | | | | | | | | | | | | | | |
2995.011 | 77.962 | .865 | 78.827 | 6.40 | 6.06 | .57 | 79.40 | .00 | .98 | 1.48 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
.572 | .0381 | | | | | | | | | | | | | | | |

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QA

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 2:38:49

Anderson Heights Units 4 & 6

Adams Stormdrain

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2995.583 | 77.984 | .900 | 78.884 | 6.40 | 5.77 | .52 | 79.40 | .00 | .98 | 1.47 | 1.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .332 | .0381 | | | | | .0077 | .00 | .90 | 1.17 | .58 | .013 | .00 | .00 | PIPE
2995.915 | 77.997 | .937 | 78.934 | 6.40 | 5.51 | .47 | 79.40 | .00 | .98 | 1.45 | 1.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .085 | .0381 | | | | | .0068 | .00 | .94 | 1.08 | .58 | .013 | .00 | .00 | PIPE
2996.000 | 78.000 | .978 | 78.978 | 6.40 | 5.24 | .43 | 79.41 | .00 | .98 | 1.43 | 1.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

```

T1 Anderson Heights Units 4 & 6

0

T2 Cache Stormdrain ~~from~~ Unit 9

T3 Run 1 10-9-07 Added to

SO	3821.260	71.050	1						76.491				
R	4038.260	75.190	1		.013					.000	.000	1	
JX	4044.260	75.190	3	2	.013	13.600			76.190	-90.0			.000
R	4260.640	86.560	3		.013					.000	.000	1	
JX	4266.640	86.560	6	4	5.013	6.900		6.900	88.060	88.060	45.0-45.0		.000
R	4318.160	89.500	6		.013					.000	.000	1	
JX	4324.160	90.500	8	7	.013	12.800			90.500	-90.0			.000
R	4540.640	101.620	8		.013					.000	.000	1	
JX	4546.640	101.620	11	9	10.013	6.900		6.900	102.120	102.120	45.0-45.0		.000
R	4976.450	120.500	11		.013					.000	.000	1	
JX	4982.450	121.000	13	12	.013	6.900			121.000	-45.0		45.000	
R	5009.450	121.500	13		.013					.000	.000	1	
SH	5009.450	121.500	13						123.500				
CD	1	4	1		.000	3.000	.000	.000	.000	.00			
CD	2	4	1		.000	2.000	.000	.000	.000	.00			
CD	3	4	1		.000	3.000	.000	.000	.000	.00			
CD	4	4	1		.000	1.500	.000	.000	.000	.00			
CD	5	4	1		.000	1.500	.000	.000	.000	.00			
CD	6	4	1		.000	3.000	.000	.000	.000	.00			
CD	7	4	1		.000	2.000	.000	.000	.000	.00			
CD	8	4	1		.000	2.000	.000	.000	.000	.00			
CD	9	4	1		.000	1.500	.000	.000	.000	.00			
CD	10	4	1		.000	1.500	.000	.000	.000	.00			
CD	11	4	1		.000	2.000	.000	.000	.000	.00			
CD	12	4	1		.000	1.500	.000	.000	.000	.00			
CD	13	4	1		.000	1.500	.000	.000	.000	.00			
Q					6.900	.0							

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain ~~from~~ Unit 9Run 1 10-9-07 ~~ADDED TO~~

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****
3821.260 | 71.050 | 5.441 | 76.491 | 67.80 | 9.59 | 1.43 | 77.92 | .00 | 2.63 | .00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
217.000 | .0191 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4038.260 | 75.190 | 3.615 | 78.805 | 67.80 | 9.59 | 1.43 | 80.23 | .00 | 2.63 | .00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .0000 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4044.260 | 75.190 | 4.697 | 79.887 | 54.20 | 7.67 | .91 | 80.80 | .00 | 2.39 | .00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
4.342 | .0525 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4048.602 | 75.418 | 4.497 | 79.915 | 54.20 | 7.67 | .91 | 80.83 | .00 | 2.39 | .00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
HYDRAULIC JUMP
4048.602 | 75.418 | 1.251 | 76.669 | 54.20 | 19.41 | 5.85 | 82.52 | .00 | 2.39 | 2.96 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
39.561 | .0525 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4088.162 | 77.497 | 1.265 | 78.762 | 54.20 | 19.12 | 5.68 | 84.44 | .00 | 2.39 | 2.96 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
61.678 | .0525 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4149.841 | 80.738 | 1.312 | 82.050 | 54.20 | 18.23 | 5.16 | 87.21 | .00 | 2.39 | 2.98 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
32.194 | .0525 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4182.035 | 82.430 | 1.361 | 83.791 | 54.20 | 17.38 | 4.69 | 88.48 | .00 | 2.39 | 2.99 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
21.070 | .0525 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4203.105 | 83.537 | 1.412 | 84.949 | 54.20 | 16.57 | 4.26 | 89.21 | .00 | 2.39 | 2.99 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
15.212 | .0525 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |

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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain ~~from~~ Unit 9Run 1 10-9-07 ~~Added~~ ⁷⁰

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****
4218.317 | 84.336 | 1.465 | 85.801 | 54.20 | 15.80 | 3.88 | 89.68 | .00 | 2.39 | 3.00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 11.552 | .0525 | | | | | | | | | | | | | | |
4229.870 | 84.943 | 1.521 | 86.464 | 54.20 | 15.06 | 3.52 | 89.99 | .00 | 2.39 | 3.00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 9.090 | .0525 | | | | | | | | | | | | | | |
4238.960 | 85.421 | 1.579 | 87.000 | 54.20 | 14.36 | 3.20 | 90.20 | .00 | 2.39 | 3.00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 7.239 | .0525 | | | | | | | | | | | | | | |
4246.199 | 85.801 | 1.641 | 87.442 | 54.20 | 13.69 | 2.91 | 90.35 | .00 | 2.39 | 2.99 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 5.855 | .0525 | | | | | | | | | | | | | | |
4252.054 | 86.109 | 1.706 | 87.815 | 54.20 | 13.06 | 2.65 | 90.46 | .00 | 2.39 | 2.97 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 4.762 | .0525 | | | | | | | | | | | | | | |
4256.816 | 86.359 | 1.774 | 88.133 | 54.20 | 12.45 | 2.41 | 90.54 | .00 | 2.39 | 2.95 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 3.824 | .0525 | | | | | | | | | | | | | | |
4260.640 | 86.560 | 1.847 | 88.407 | 54.20 | 11.87 | 2.19 | 90.59 | .00 | 2.39 | 2.92 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .0000 | | | | | | | | | | | | | | |
4266.640 | 86.560 | 1.153 | 87.713 | 40.40 | 16.15 | 4.05 | 91.76 | .00 | 2.07 | 2.92 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | .120 | .0571 | | | | | | | | | | | | | | |
4266.760 | 86.567 | 1.153 | 87.720 | 40.40 | 16.13 | 4.04 | 91.76 | .00 | 2.07 | 2.92 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
      | 14.788 | .0571 | | | | | | | | | | | | | | |

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44

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain ~~from~~ Unit 9

Run 1 10-9-07 Added 70

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****
4281.547 | 87.411 | 1.195 | 88.606 | 40.40 | 15.38 | 3.67 | 92.28 | .00 | 2.07 | 2.94 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
11.066 | .0571 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4292.613 | 88.042 | 1.238 | 89.280 | 40.40 | 14.67 | 3.34 | 92.62 | .00 | 2.07 | 2.95 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
8.573 | .0571 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4301.187 | 88.531 | 1.284 | 89.815 | 40.40 | 13.98 | 3.04 | 92.85 | .00 | 2.07 | 2.97 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
6.871 | .0571 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4308.058 | 88.923 | 1.331 | 90.255 | 40.40 | 13.33 | 2.76 | 93.01 | .00 | 2.07 | 2.98 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
5.549 | .0571 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4313.607 | 89.240 | 1.381 | 90.621 | 40.40 | 12.71 | 2.51 | 93.13 | .00 | 2.07 | 2.99 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
4.553 | .0571 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4318.160 | 89.500 | 1.433 | 90.933 | 40.40 | 12.12 | 2.28 | 93.21 | .00 | 2.07 | 3.00 | 3.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .1667 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4324.160 | 90.500 | 1.049 | 91.549 | 27.60 | 16.54 | 4.25 | 95.80 | .00 | 1.82 | 2.00 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
68.120 | .0514 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4392.280 | 93.999 | 1.061 | 95.060 | 27.60 | 16.29 | 4.12 | 99.18 | .00 | 1.82 | 2.00 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
60.240 | .0514 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4452.520 | 97.094 | 1.103 | 98.197 | 27.60 | 15.53 | 3.75 | 101.94 | .00 | 1.82 | 1.99 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
27.300 | .0514 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
*****

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45

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain from Unit 9

Run 1 10-9-07 added to

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
          | Elev   | (FT)  | Elev   | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope |          |          |          |          | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
4479.820 | 98.496 | 1.146 | 99.642 | 27.60 | 14.81 | 3.41 | 103.05 | .00 | 1.82 | 1.98 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
16.829 | .0514 |          |          |          |          | .0358 | .60 | 1.15 | 2.69 | 1.04 | .013 | .00 | .00 | PIPE
4496.649 | 99.360 | 1.193 | 100.553 | 27.60 | 14.12 | 3.10 | 103.65 | .00 | 1.82 | 1.96 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
11.840 | .0514 |          |          |          |          | .0316 | .37 | 1.19 | 2.49 | 1.04 | .013 | .00 | .00 | PIPE
4508.489 | 99.969 | 1.241 | 101.210 | 27.60 | 13.46 | 2.82 | 104.02 | .00 | 1.82 | 1.94 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
8.740 | .0514 |          |          |          |          | .0280 | .25 | 1.24 | 2.31 | 1.04 | .013 | .00 | .00 | PIPE
4517.229 | 100.417 | 1.293 | 101.711 | 27.60 | 12.84 | 2.56 | 104.27 | .00 | 1.82 | 1.91 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
6.675 | .0514 |          |          |          |          | .0249 | .17 | 1.29 | 2.13 | 1.04 | .013 | .00 | .00 | PIPE
4523.904 | 100.760 | 1.349 | 102.109 | 27.60 | 12.24 | 2.33 | 104.44 | .00 | 1.82 | 1.87 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
5.222 | .0514 |          |          |          |          | .0222 | .12 | 1.35 | 1.97 | 1.04 | .013 | .00 | .00 | PIPE
4529.126 | 101.029 | 1.408 | 102.437 | 27.60 | 11.67 | 2.12 | 104.55 | .00 | 1.82 | 1.83 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
4.030 | .0514 |          |          |          |          | .0198 | .08 | 1.41 | 1.81 | 1.04 | .013 | .00 | .00 | PIPE
4533.157 | 101.236 | 1.473 | 102.709 | 27.60 | 11.13 | 1.92 | 104.63 | .00 | 1.82 | 1.76 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
3.116 | .0514 |          |          |          |          | .0177 | .06 | 1.47 | 1.65 | 1.04 | .013 | .00 | .00 | PIPE
4536.273 | 101.396 | 1.543 | 102.939 | 27.60 | 10.61 | 1.75 | 104.69 | .00 | 1.82 | 1.68 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
2.287 | .0514 |          |          |          |          | .0160 | .04 | 1.54 | 1.50 | 1.04 | .013 | .00 | .00 | PIPE
4538.560 | 101.513 | 1.621 | 103.134 | 27.60 | 10.12 | 1.59 | 104.72 | .00 | 1.82 | 1.57 | 2.000 | .000 | .00 | 1 .0
          | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
1.506 | .0514 |          |          |          |          | .0145 | .02 | 1.62 | 1.35 | 1.04 | .013 | .00 | .00 | PIPE

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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain ~~from~~ Unit 9Run 1 10-9-07 ~~Added to~~

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
4540.065	101.590	1.710	103.301	27.60	9.65	1.44	104.75	.00	1.82	1.41	2.000	.000	.00	1 .0
.575	.0514					.0134	.01	1.71	1.19	1.04	.013	.00	.00	PIPE
4540.640	101.620	1.821	103.441	27.60	9.19	1.31	104.75	.00	1.82	1.14	2.000	.000	.00	1 .0
JUNCT STR	.0000					.0084	.05	1.82	1.00		.013	.00	.00	PIPE
4546.640	101.620	3.438	105.058	13.80	4.39	.30	105.36	.00	1.34	.00	2.000	.000	.00	1 .0
28.599	.0439					.0037	.11	3.44	.00	.74	.013	.00	.00	PIPE
4575.239	102.876	2.289	105.165	13.80	4.39	.30	105.47	.00	1.34	.00	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
4575.239	102.876	.739	103.615	13.80	13.08	2.66	106.27	.00	1.34	1.93	2.000	.000	.00	1 .0
232.994	.0439					.0439	10.24	.74	3.12	.74	.013	.00	.00	PIPE
4808.232	113.111	.739	113.850	13.80	13.08	2.66	116.51	.00	1.34	1.93	2.000	.000	.00	1 .0
79.920	.0439					.0420	3.35	.74	3.12	.74	.013	.00	.00	PIPE
4888.153	116.621	.758	117.380	13.80	12.64	2.48	119.86	.00	1.34	1.94	2.000	.000	.00	1 .0
30.938	.0439					.0375	1.16	.76	2.97	.74	.013	.00	.00	PIPE
4919.090	117.980	.785	118.765	13.80	12.05	2.26	121.02	.00	1.34	1.95	2.000	.000	.00	1 .0
16.057	.0439					.0329	.53	.79	2.77	.74	.013	.00	.00	PIPE
4935.147	118.686	.813	119.499	13.80	11.49	2.05	121.55	.00	1.34	1.96	2.000	.000	.00	1 .0
10.394	.0439					.0289	.30	.81	2.59	.74	.013	.00	.00	PIPE

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain ~~from~~ Unit 9Run 1 10-9-07 *Added to*

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
         | Elev   | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope |          |          |          |          | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
4945.541 | 119.142 | .843 | 119.985 | 13.80 | 10.96 | 1.86 | 121.85 | .00 | 1.34 | 1.98 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
7.460 | .0439 |         |         |         |         | .0254 | .19 | .84 | 2.42 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4953.000 | 119.470 | .874 | 120.344 | 13.80 | 10.45 | 1.69 | 122.04 | .00 | 1.34 | 1.98 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
5.596 | .0439 |         |         |         |         | .0223 | .12 | .87 | 2.26 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4958.597 | 119.716 | .907 | 120.623 | 13.80 | 9.96 | 1.54 | 122.16 | .00 | 1.34 | 1.99 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4.361 | .0439 |         |         |         |         | .0196 | .09 | .91 | 2.10 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4962.958 | 119.907 | .941 | 120.848 | 13.80 | 9.50 | 1.40 | 122.25 | .00 | 1.34 | 2.00 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
3.460 | .0439 |         |         |         |         | .0172 | .06 | .94 | 1.96 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4966.418 | 120.059 | .976 | 121.035 | 13.80 | 9.06 | 1.27 | 122.31 | .00 | 1.34 | 2.00 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
2.739 | .0439 |         |         |         |         | .0152 | .04 | .98 | 1.83 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4969.157 | 120.180 | 1.013 | 121.193 | 13.80 | 8.63 | 1.16 | 122.35 | .00 | 1.34 | 2.00 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
2.167 | .0439 |         |         |         |         | .0134 | .03 | 1.01 | 1.70 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4971.325 | 120.275 | 1.052 | 121.327 | 13.80 | 8.23 | 1.05 | 122.38 | .00 | 1.34 | 2.00 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
1.701 | .0439 |         |         |         |         | .0118 | .02 | 1.05 | 1.58 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4973.026 | 120.350 | 1.093 | 121.443 | 13.80 | 7.85 | .96 | 122.40 | .00 | 1.34 | 1.99 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
1.312 | .0439 |         |         |         |         | .0104 | .01 | 1.09 | 1.47 | .74 | .013 | .00 | .00 | PIPE
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
4974.337 | 120.407 | 1.136 | 121.543 | 13.80 | 7.48 | .87 | 122.41 | .00 | 1.34 | 1.98 | 2.000 | .000 | .00 | 1 .0
         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
.952 | .0439 |         |         |         |         | .0092 | .01 | 1.14 | 1.37 | .74 | .013 | .00 | .00 | PIPE

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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date: 10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain ~~from~~ Unit 9Run 1 10-9-07 ~~10/6/07~~ 70

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | |
*****
4975.290 | 120.449 | 1.182 | 121.631 | 13.80 | 7.14 | .79 | 122.42 | .00 | 1.34 | 1.97 | 2.000 | .000 | .00 | 1 | .0
      | .667 | .0439 | | | | | | | | | | | | | |
      | .0081 | .01 | 1.18 | 1.27 | .74 | .013 | .00 | .00 | PIPE
4975.957 | 120.478 | 1.230 | 121.708 | 13.80 | 6.80 | .72 | 122.43 | .00 | 1.34 | 1.95 | 2.000 | .000 | .00 | 1 | .0
      | .363 | .0439 | | | | | | | | | | | | | |
      | .0072 | .00 | 1.23 | 1.17 | .74 | .013 | .00 | .00 | PIPE
4976.320 | 120.494 | 1.282 | 121.776 | 13.80 | 6.49 | .65 | 122.43 | .00 | 1.34 | 1.92 | 2.000 | .000 | .00 | 1 | .0
      | .130 | .0439 | | | | | | | | | | | | | |
      | .0064 | .00 | 1.28 | 1.09 | .74 | .013 | .00 | .00 | PIPE
4976.450 | 120.500 | 1.338 | 121.838 | 13.80 | 6.18 | .59 | 122.43 | .29 | 1.34 | 1.88 | 2.000 | .000 | .00 | 1 | .0
      | .0833 | | | | | | | | | | | | | |
      | 1.63 | 1.00 | .013 | .00 | .00 | PIPE
4982.450 | 121.000 | .780 | 121.780 | 6.90 | 7.43 | .86 | 122.64 | .00 | 1.02 | 1.50 | 1.500 | .000 | .00 | 1 | .0
      | 7.960 | .0185 | | | | | | | | | | | | | |
      | .0146 | .12 | .78 | 1.66 | .73 | .013 | .00 | .00 | PIPE
4990.410 | 121.147 | .798 | 121.946 | 6.90 | 7.21 | .81 | 122.75 | .00 | 1.02 | 1.50 | 1.500 | .000 | .00 | 1 | .0
      | 7.696 | .0185 | | | | | | | | | | | | | |
      | .0131 | .10 | .80 | 1.59 | .73 | .013 | .00 | .00 | PIPE
4998.106 | 121.290 | .830 | 122.120 | 6.90 | 6.88 | .73 | 122.85 | .00 | 1.02 | 1.49 | 1.500 | .000 | .00 | 1 | .0
      | 4.878 | .0185 | | | | | | | | | | | | | |
      | .0116 | .06 | .83 | 1.48 | .73 | .013 | .00 | .00 | PIPE
5002.984 | 121.380 | .863 | 122.243 | 6.90 | 6.56 | .67 | 122.91 | .00 | 1.02 | 1.48 | 1.500 | .000 | .00 | 1 | .0
      | 3.225 | .0185 | | | | | | | | | | | | | |
      | .0103 | .03 | .86 | 1.37 | .73 | .013 | .00 | .00 | PIPE
5006.209 | 121.440 | .897 | 122.337 | 6.90 | 6.25 | .61 | 122.94 | .00 | 1.02 | 1.47 | 1.500 | .000 | .00 | 1 | .0
      | 1.920 | .0185 | | | | | | | | | | | | | |
      | .0091 | .02 | .90 | 1.27 | .73 | .013 | .00 | .00 | PIPE

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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date: 10- 9-2007 Time: 8: 1:39

Anderson Heights Units 4 & 6

Cache Stormdrain from Unit 9

Run 1 10-9-07 ~~6/6d 7~~

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
          | Elev   | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem  | Ch Slope |          |          |          |          | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
5008.129 | 121.476 | .934 | 122.410 | 6.90 | 5.96 | .55 | 122.96 | .00 | 1.02 | 1.45 | 1.500 | .000 | .00 | 1 | .0
          | 1.062 | .0185 |          |          |          | .0080 | .01 | .93 | 1.18 | .73 | .013 | .00 | .00 | PIPE
5009.191 | 121.495 | .973 | 122.468 | 6.90 | 5.68 | .50 | 122.97 | .00 | 1.02 | 1.43 | 1.500 | .000 | .00 | 1 | .0
          | .259 | .0185 |          |          |          | .0071 | .00 | .97 | 1.09 | .73 | .013 | .00 | .00 | PIPE
5009.450 | 121.500 | 1.017 | 122.517 | 6.90 | 5.41 | .45 | 122.97 | .00 | 1.02 | 1.40 | 1.500 | .000 | .00 | 1 | .0
          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |

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T1 Anderson Heights Units 4 & 6

0

T2 Cache and Emerald Stormdrain

T3 run 1 10-9-07

IS	1	2	3	4	5	6	7	8	9	10	11	12
SO	3821.260	71.050	1							76.491		
R	4038.260	75.190	1		.013					.000	.000	1
JX	4044.260	76.190	3	2	.013	54.200			75.190	.0		-90.000
R	4085.440	77.500	3		.013					.000	.000	1
JX	4091.440	78.000	5	4	.013	6.800			78.000	-45.0		45.000
R	4125.440	78.500	5		.013					.000	.000	1
SH	4125.440	78.500	5						80.500			
CD	1	4	1		.000	3.000	.000	.000	.000	.00		
CD	2	4	1		.000	3.000	.000	.000	.000	.00		
CD	3	4	1		.000	2.000	.000	.000	.000	.00		
CD	4	4	1		.000	1.500	.000	.000	.000	.00		
CD	5	4	1		.000	1.500	.000	.000	.000	.00		
Q				6.800	.0							

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 8:31:56

Anderson Heights Units 4 & 6
Cache and Emerald Stormdrain
run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
3821.260 | 71.050 | 5.441 | 76.491 | 67.80 | 9.59 | 1.43 | 77.92 | .00 | 2.63 | .00 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
217.000 | .0191 | | | | | .0103 | 2.24 | 5.44 | .00 | 1.91 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
4038.260 | 75.190 | 3.615 | 78.805 | 67.80 | 9.59 | 1.43 | 80.23 | .00 | 2.63 | .00 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .1667 | | | | | .0070 | .04 | .00 | .00 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
4044.260 | 76.190 | 3.794 | 79.984 | 13.60 | 4.33 | .29 | 80.28 | .00 | 1.33 | .00 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
41.180 | .0318 | | | | | .0036 | .15 | 3.79 | .00 | .80 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
4085.440 | 77.500 | 2.648 | 80.148 | 13.60 | 4.33 | .29 | 80.44 | .00 | 1.33 | .00 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
JUNCT STR | .0833 | | | | | .0039 | .02 | .00 | .00 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
4091.440 | 78.000 | 2.351 | 80.351 | 6.80 | 3.85 | .23 | 80.58 | .00 | 1.01 | .00 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |
34.000 | .0147 | | | | | .0042 | .14 | 2.35 | .00 | .78 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
4125.440 | 78.500 | 2.005 | 80.505 | 6.80 | 3.85 | .23 | 80.73 | .00 | 1.01 | .00 | 1.500 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | |

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52

T1 Anderson Heights Units 4 & 6
 T2 Stormdrain from Basin Peak to Cache
 T3 Run 1 10-9-07

SO	4266.640	86.560	1				87.713			
R	4318.160	89.500	1		.013			.000	.000	1
JX	4324.160	90.500	3	2	.013	27.600	90.500	.0		-90.000
R	4762.170	93.300	3		.013			.000	.000	0
JX	4766.170	93.800	4		.013					
R	4803.170	94.200	4		.013			.000	.000	1
JX	4805.170	94.200	6	5	.013	6.400	94.200	90.0		-90.000
R	4831.170	94.500	6		.013			.000	.000	1
SH	4831.170	94.500	6				96.500			
CD	1	4	1		.000	3.000	.000	.000	.000	.00
CD	2	4	1		.000	2.000	.000	.000	.000	.00
CD	3	4	1		.000	2.000	.000	.000	.000	.00
CD	4	4	1		.000	1.500	.000	.000	.000	.00
CD	5	4	1		.000	2.000	.000	.000	.000	.00
CD	6	4	1		.000	1.500	.000	.000	.000	.00
Q		6.400	.0							

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 9:32:23

Anderson Heights Units 4 & 6

Stormdrain from Basin Peak to Cache

Run 1 10-9-07

*****															*****	
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch		
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****		
4266.640	86.560	1.199	87.759	40.40	15.33	3.65	91.41	.00	2.07	2.94	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
2.994	.0571					.0319	.10	1.20	2.85	1.03	.013	.00	.00	PIPE		
4269.634	86.731	1.209	87.940	40.40	15.15	3.56	91.50	.00	2.07	2.94	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
10.150	.0571					.0295	.30	1.21	2.80	1.03	.013	.00	.00	PIPE		
4279.784	87.310	1.253	88.563	40.40	14.44	3.24	91.80	.00	2.07	2.96	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
7.970	.0571					.0259	.21	1.25	2.62	1.03	.013	.00	.00	PIPE		
4287.753	87.765	1.299	89.064	40.40	13.77	2.94	92.01	.00	2.07	2.97	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
6.401	.0571					.0228	.15	1.30	2.44	1.03	.013	.00	.00	PIPE		
4294.154	88.130	1.347	89.477	40.40	13.13	2.68	92.15	.00	2.07	2.98	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
5.215	.0571					.0200	.10	1.35	2.28	1.03	.013	.00	.00	PIPE		
4299.369	88.428	1.397	89.825	40.40	12.52	2.43	92.26	.00	2.07	2.99	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
4.260	.0571					.0176	.07	1.40	2.12	1.03	.013	.00	.00	PIPE		
4303.629	88.671	1.450	90.121	40.40	11.93	2.21	92.33	.00	2.07	3.00	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
3.513	.0571					.0155	.05	1.45	1.98	1.03	.013	.00	.00	PIPE		
4307.142	88.871	1.505	90.376	40.40	11.38	2.01	92.39	.00	2.07	3.00	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
2.874	.0571					.0136	.04	1.51	1.84	1.03	.013	.00	.00	PIPE		
4310.016	89.035	1.563	90.598	40.40	10.85	1.83	92.43	.00	2.07	3.00	3.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
2.357	.0571					.0120	.03	1.56	1.72	1.03	.013	.00	.00	PIPE		

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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 9:32:23

Anderson Heights Units 4 & 6

Stormdrain from Basin Peak to Cache

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
*****
4312.373 | 89.170 | 1.623 | 90.793 | 40.40 | 10.34 | 1.66 | 92.45 | .00 | 2.07 | 2.99 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
1.874 | .0571 | | | | | .0106 | .02 | 1.62 | 1.60 | 1.03 | .013 | .00 | .00 | | PIPE
4314.246 | 89.277 | 1.687 | 90.964 | 40.40 | 9.86 | 1.51 | 92.47 | .00 | 2.07 | 2.98 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
1.454 | .0571 | | | | | .0094 | .01 | 1.69 | 1.48 | 1.03 | .013 | .00 | .00 | | PIPE
4315.700 | 89.360 | 1.755 | 91.115 | 40.40 | 9.40 | 1.37 | 92.49 | .00 | 2.07 | 2.96 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
1.104 | .0571 | | | | | .0083 | .01 | 1.76 | 1.37 | 1.03 | .013 | .00 | .00 | | PIPE
4316.804 | 89.423 | 1.826 | 91.249 | 40.40 | 8.97 | 1.25 | 92.50 | .00 | 2.07 | 2.93 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
.774 | .0571 | | | | | .0073 | .01 | 1.83 | 1.27 | 1.03 | .013 | .00 | .00 | | PIPE
4317.578 | 89.467 | 1.901 | 91.368 | 40.40 | 8.55 | 1.13 | 92.50 | .00 | 2.07 | 2.89 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
.438 | .0571 | | | | | .0065 | .00 | 1.90 | 1.18 | 1.03 | .013 | .00 | .00 | | PIPE
4318.016 | 89.492 | 1.982 | 91.474 | 40.40 | 8.15 | 1.03 | 92.51 | .00 | 2.07 | 2.84 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
.144 | .0571 | | | | | .0058 | .00 | 1.98 | 1.09 | 1.03 | .013 | .00 | .00 | | PIPE
4318.160 | 89.500 | 2.070 | 91.570 | 40.40 | 7.77 | .94 | 92.51 | 3.00 | 2.07 | 2.78 | 3.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
JUNCT STR | .1667 | | | | | | | 3.00 | 1.00 | | .013 | .00 | .00 | | PIPE
4324.160 | 90.500 | 1.242 | 91.742 | 12.80 | 6.24 | .61 | 92.35 | .00 | 1.29 | 1.94 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
301.669 | .0064 | | | | | .0064 | 1.93 | 1.24 | 1.07 | 1.24 | .013 | .00 | .00 | | PIPE
4625.829 | 92.428 | 1.242 | 93.670 | 12.80 | 6.24 | .61 | 94.28 | .00 | 1.29 | 1.94 | 2.000 | .000 | .00 | 1 | .0
| | | | | | | | | | | | | | | | |
5.572 | .0064 | | | | | .0064 | .04 | 1.24 | 1.07 | 1.24 | .013 | .00 | .00 | | PIPE

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WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 9:32:23

Anderson Heights Units 4 & 6
Stormdrain from Basin Peak to Cache
Run 1 10-9-07

*****															*****	
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch		
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****		
4631.400	92.464	1.237	93.701	12.80	6.27	.61	94.31	.00	1.29	1.94	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
24.948	.0064					.0069	.17	1.24	1.08	1.24	.013	.00	.00	PIPE		
4656.349	92.624	1.188	93.812	12.80	6.58	.67	94.48	.00	1.29	1.96	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
16.048	.0064					.0078	.12	1.19	1.16	1.24	.013	.00	.00	PIPE		
4672.397	92.726	1.143	93.869	12.80	6.90	.74	94.61	.00	1.29	1.98	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
12.417	.0064					.0088	.11	1.14	1.26	1.24	.013	.00	.00	PIPE		
4684.814	92.806	1.099	93.905	12.80	7.23	.81	94.72	.00	1.29	1.99	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
11.260	.0064					.0100	.11	1.10	1.35	1.24	.013	.00	.00	PIPE		
4696.074	92.877	1.058	93.936	12.80	7.59	.89	94.83	.00	1.29	2.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
10.058	.0064					.0113	.11	1.06	1.45	1.24	.013	.00	.00	PIPE		
4706.132	92.942	1.018	93.960	12.80	7.96	.98	94.94	.00	1.29	2.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
9.529	.0064					.0128	.12	1.02	1.56	1.24	.013	.00	.00	PIPE		
4715.661	93.003	.981	93.984	12.80	8.35	1.08	95.07	.00	1.29	2.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
8.821	.0064					.0146	.13	.98	1.68	1.24	.013	.00	.00	PIPE		
4724.482	93.059	.945	94.004	12.80	8.75	1.19	95.19	.00	1.29	2.00	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
8.354	.0064					.0166	.14	.95	1.80	1.24	.013	.00	.00	PIPE		
4732.836	93.112	.911	94.024	12.80	9.18	1.31	95.33	.00	1.29	1.99	2.000	.000	.00	1 .0		
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
7.939	.0064					.0188	.15	.91	1.93	1.24	.013	.00	.00	PIPE		

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 9:32:23

Anderson Heights Units 4 & 6

Stormdrain from Basin Peak to Cache

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | *****
4740.776 | 93.163 | .879 | 94.042 | 12.80 | 9.63 | 1.44 | 95.48 | .00 | 1.29 | 1.99 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
7.438 | .0064 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4748.214 | 93.211 | .847 | 94.058 | 12.80 | 10.10 | 1.58 | 95.64 | .00 | 1.29 | 1.98 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
7.125 | .0064 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4755.340 | 93.256 | .817 | 94.073 | 12.80 | 10.59 | 1.74 | 95.82 | .00 | 1.29 | 1.97 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
6.830 | .0064 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4762.170 | 93.300 | .789 | 94.089 | 12.80 | 11.11 | 1.92 | 96.01 | .00 | 1.29 | 1.96 | 2.000 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .1250 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4766.170 | 93.800 | 1.344 | 95.144 | 12.80 | 7.66 | .91 | 96.06 | .00 | 1.34 | .92 | 1.500 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
11.822 | .0108 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4777.992 | 93.928 | 1.454 | 95.382 | 12.80 | 7.31 | .83 | 96.21 | .00 | 1.34 | .52 | 1.500 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
11.871 | .0108 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4789.863 | 94.056 | 1.500 | 95.556 | 12.80 | 7.24 | .81 | 96.37 | .00 | 1.34 | .00 | 1.500 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
13.307 | .0108 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4803.170 | 94.200 | 1.568 | 95.768 | 12.80 | 7.24 | .81 | 96.58 | .00 | 1.34 | .00 | 1.500 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
JUNCT STR | .0000 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
4805.170 | 94.200 | 2.809 | 97.009 | 6.40 | 3.62 | .20 | 97.21 | .00 | .98 | .00 | 1.500 | .000 | .00 | 1 .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
26.000 | .0115 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
*****

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57

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING

Date:10- 9-2007 Time: 9:32:23

Anderson Heights Units 4 & 6

Stormdrain from Basin Peak to Cache

Run 1 10-9-07

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev  | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | *****
4831.170 | 94.500 | 2.616 | 97.116 | 6.40 | 3.62 | .20 | 97.32 | .00 | .98 | .00 | 1.500 | .000 | .00 | 1 | .0
      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -

```