

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 21, 2003

Shahab Biazar, P.E.
Advanced Engineering & Consulting
10205 Snowflake Ct NW
Albuquerque, New Mexico 87114

RE: COPPERWYND "II" SUBDIVISION (L-10/D021)
Engineers Certification – Submitted for Release of Financial Guaranty
Engineers Stamp dated 4/11/2002
Engineers Certification dated 5/14/2003

Dear Shahab:

Based upon the information provided in your Engineers Certification submittal dated 5/20/2003, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, please call me at 924-3981.

Sincerely,

Teresa A. Martin

CTM Hydrology Plan Checker
Development & Bldg. Ser. Division

c: Arlene Portillo, COA- Project # 688981

 File

DRAINAGE INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: COPPERWYND "H" SUBDIVISION ZONE ATLAS/DRG. FILE #: L-10 / D21
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOTS 423 & 424, TOWN OF ATRISCO GRANT, UNIT 3
CITY ADDRESS: _____

ENGINEERING FIRM: Advanced Engineering and Consulting, LLC
ADDRESS: 10205 Snowflake Ct. NW
CITY, STATE: Albuquerque, New Mexico

CONTACT: Shahab Biazar
PHONE: (505) 899-5570
ZIP CODE: 87114

OWNER: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

ARCHITECT: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CONTRACTOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1ST SUBMITTAL, REQUIRES TCL OR EQUAL
_____ CONCEPTUAL GRADING & DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION (HYDROLOGY)
_____ CLOMR / LOMR
_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ ENGINEER'S CERTIFICATION (TCL)
_____ ENGINEER'S 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
☒ PAD & GRADING CERTIFICATION

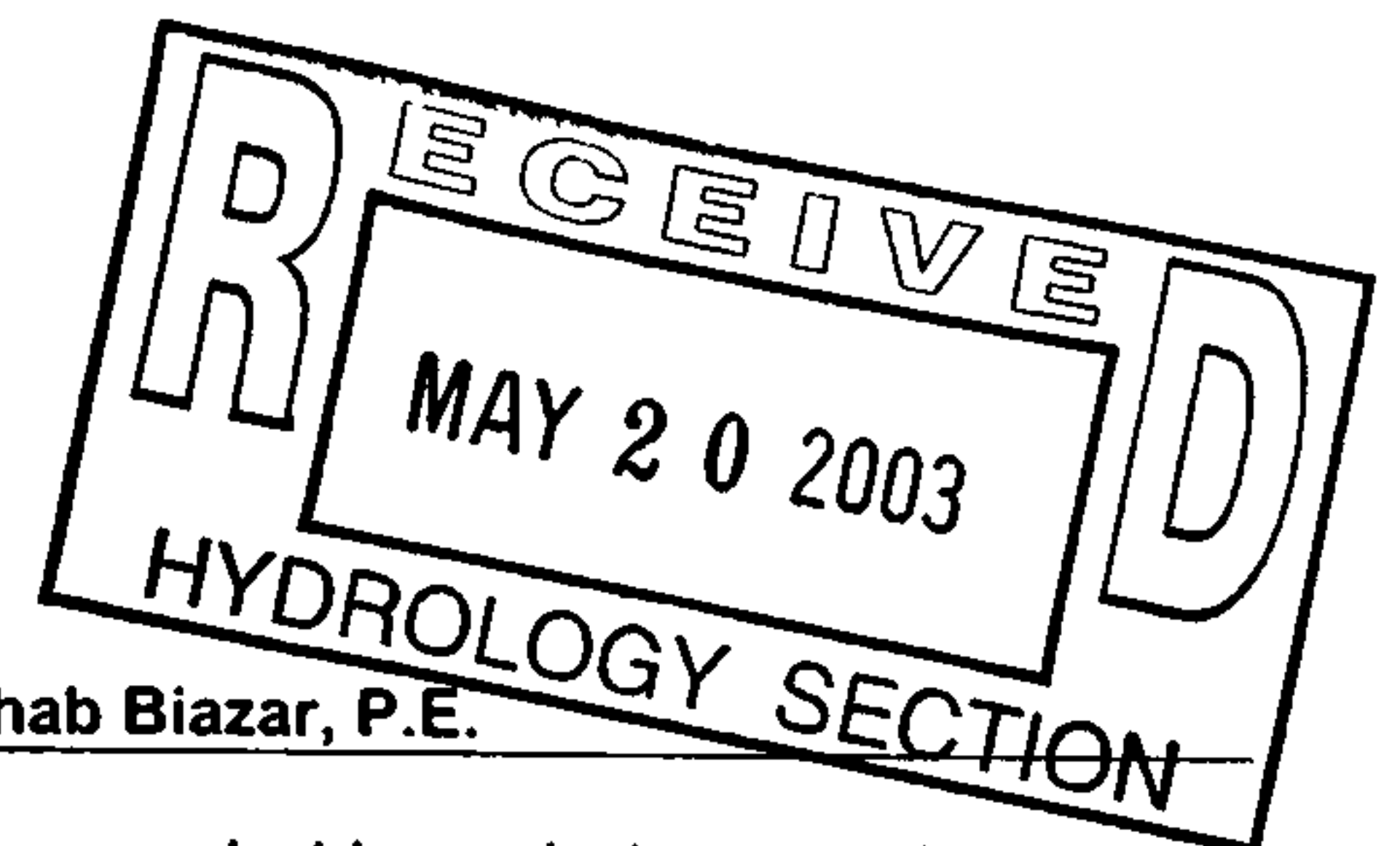
WAS A PRE-DESIGN CONFERENCE ATTENDED:

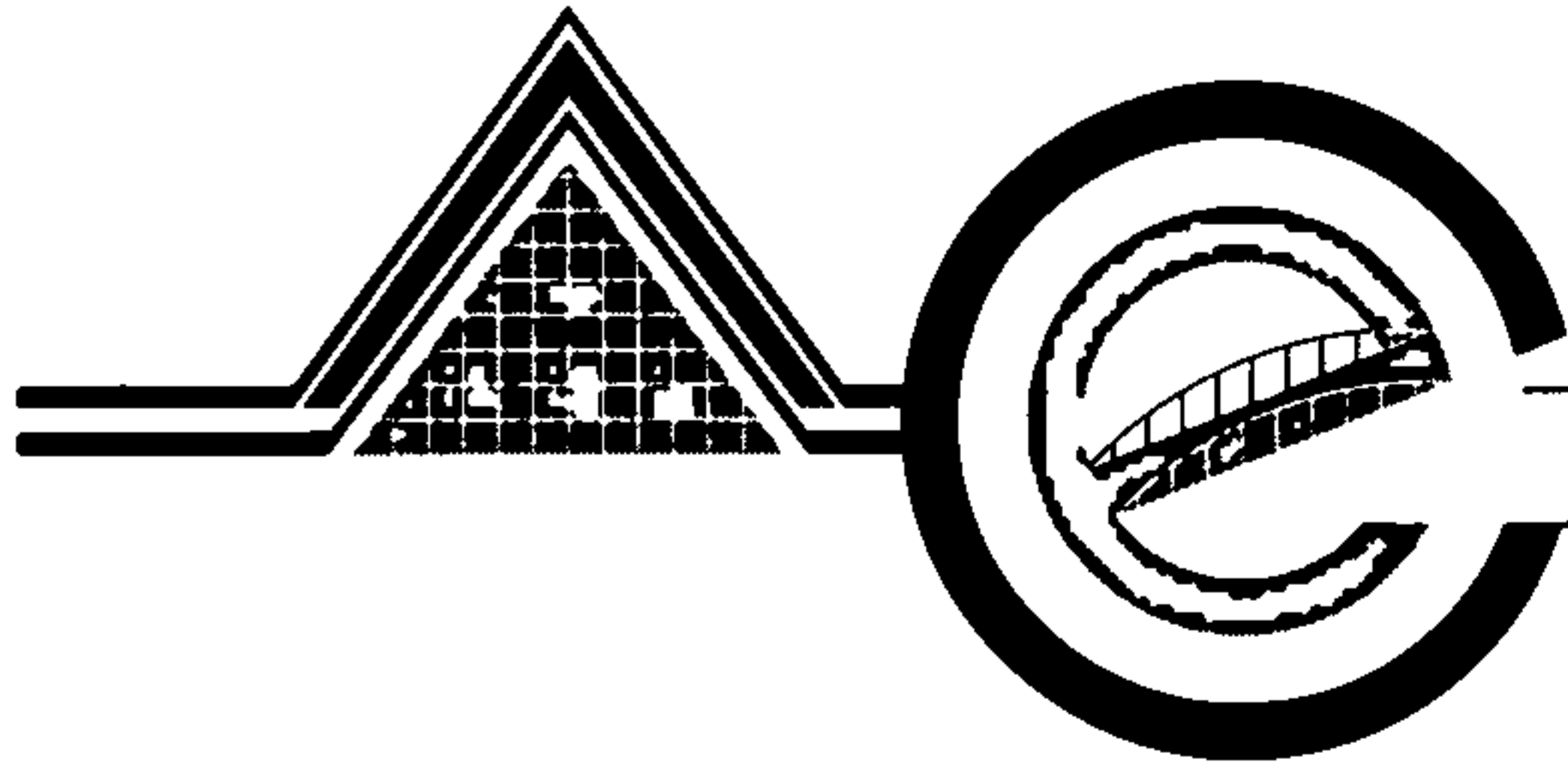
_____ YES
☒ NO
_____ COPY PROVIDED

DATE SUBMITTED: 05 / 14 / 2003 BY: Shahab Biazar, P.E.

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 submittals may be required based on the following:

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





ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

May 14, 2003

Mr. Carlos A. Montoya, P.E.
City Floodplain Administrator, PWD
Development and Building Services
Plaza Del Sol-2nd Floor West
600 2nd Street NW
Albuquerque, NM 87102

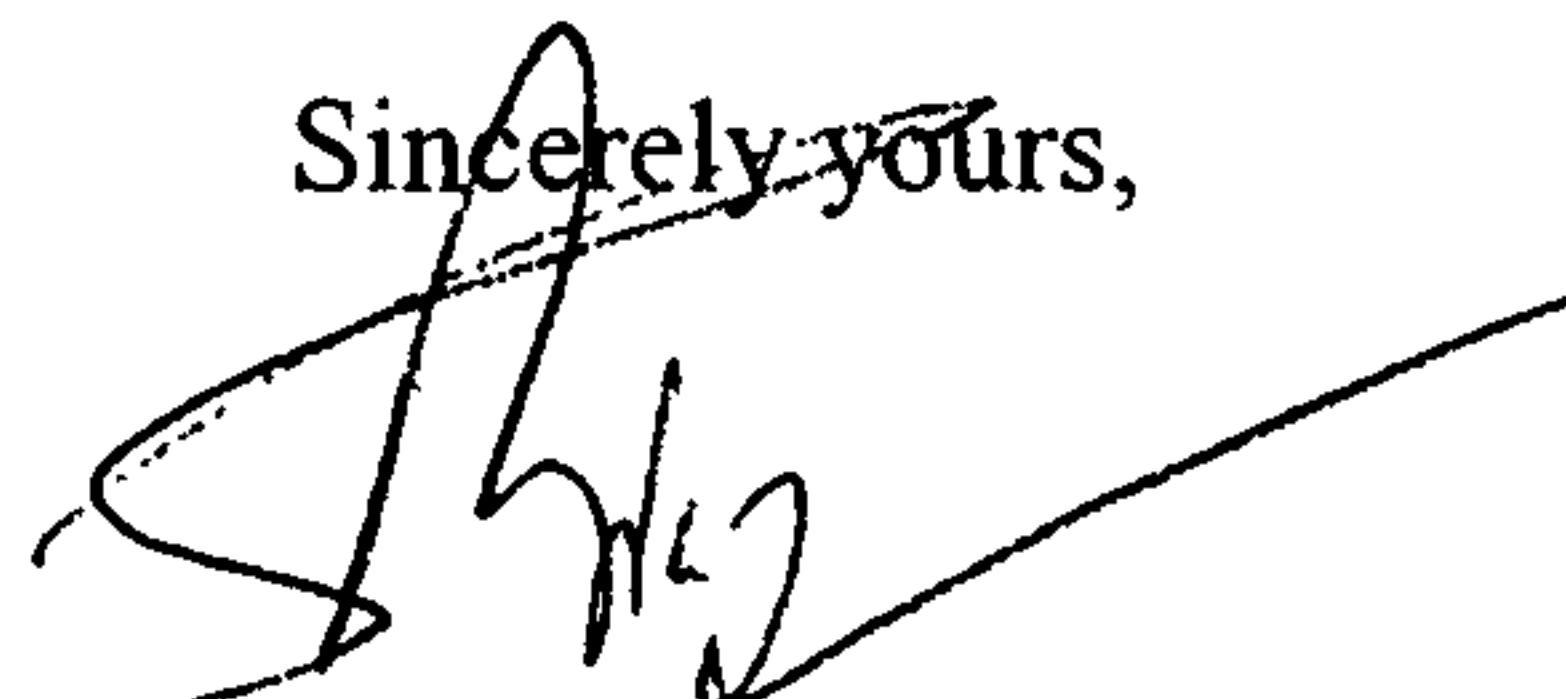
RE: Pad and Grading Certification for Copperwynd II Subdivision, L10 / D21

Dear Mr. Montoya:

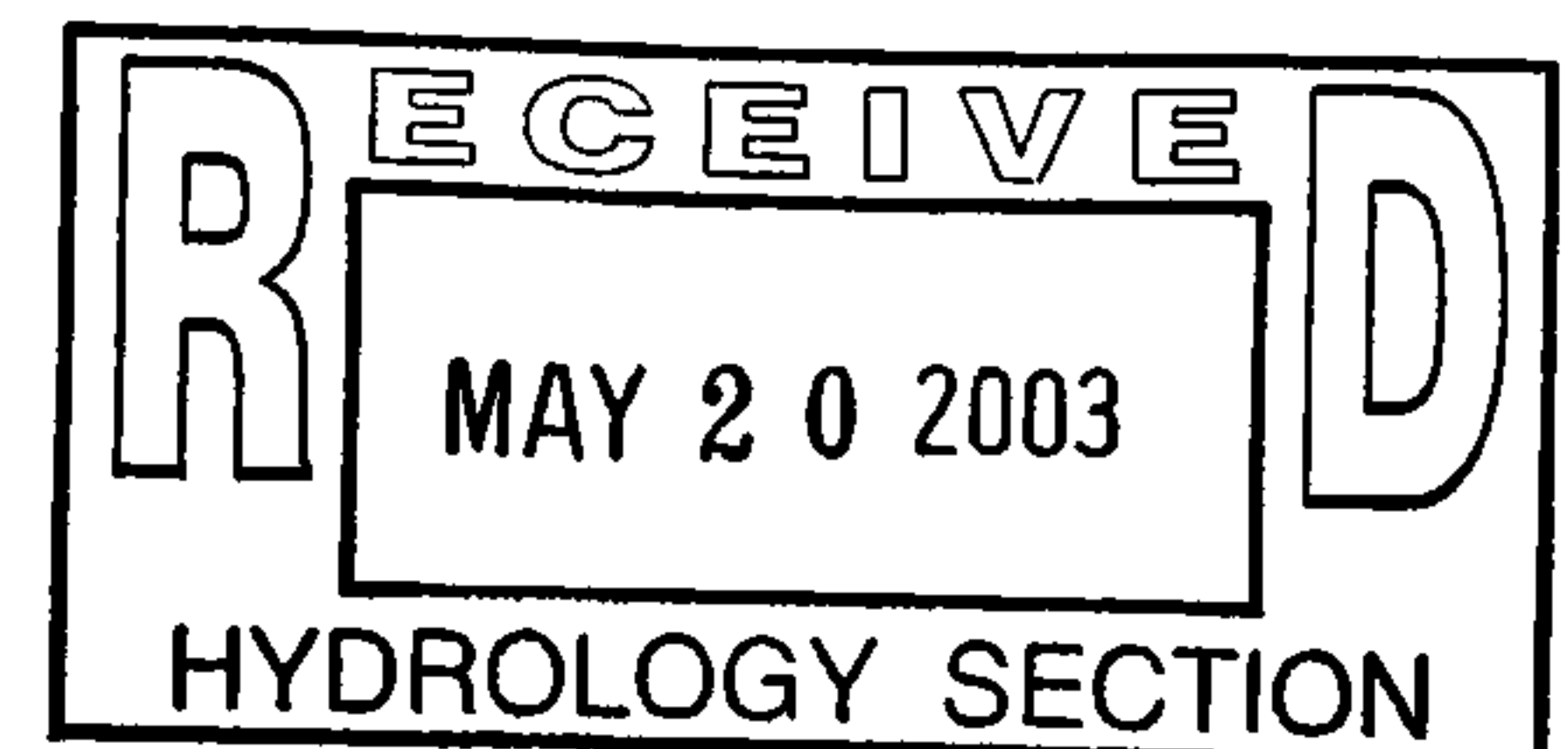
This letter is to inform you that we are submitting the as-built grades for Pad and Grading Certification for Copperwynd II subdivision. Enclosed please find one copy of the as-built Grading Plan for the above mentioned site. The grades are built according to the approved grading & drainage plan with engineering stamp date of 4/11/2002. Retaining wall were added at the south end of Seaborn Drive. See as-built grading plan for the location of the added retaining wall.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,



Shahab Biazar, P.E.





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 8, 2002

Shahab Biazar, P.E.
Advanced Engineering and Consultant, LLC
10205 Snowflake Ct. NW
Albuquerque, New Mexico 87114

RE: Drainage Report for Copperwynd II (L10-D21) Dated April 11, 2002

Dear Mr. Biazar:

Based on the information contained in your submittal dated April 11, 2002, the above referenced drainage and grading plan is approved for Preliminary Plat, Site Plan for Subdivision, and Site Plan for Building Permit action by the DRB. After you obtain Preliminary Plat approval from DRB and you want to grade the site please submit a mylar grading plan to Hydrology with a signature box for "Rough Grading ". This signature and a Top Soil Disturbance Permit will allow the grading of the site by the owner's contractor.

If you have any questions please call me at 924-3982.

Sincerely,

Carlos A. Montoya
City Floodplain Administrator

DRAINAGE INFORMATION SHEET

(REV. 11/01/2001)

PROJECT TITLE: COPPERWYND "II" SUBDIVISION ZONE ATLAS/DRG. FILE #: L-10 / D21
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOTS 423 & 424, TOWN OF ATRISCO GRANT, UNIT 3
CITY ADDRESS: _____

ENGINEERING FIRM: Advanced Engineering and Consulting, LLC
ADDRESS: 10205 Snowflake Ct. NW
CITY, STATE: Albuquerque, New Mexico

CONTACT: Shahab Biazar
PHONE: (505) 899-5570
ZIP CODE: 87114

OWNER: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

ARCHITECT: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CONTRACTOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

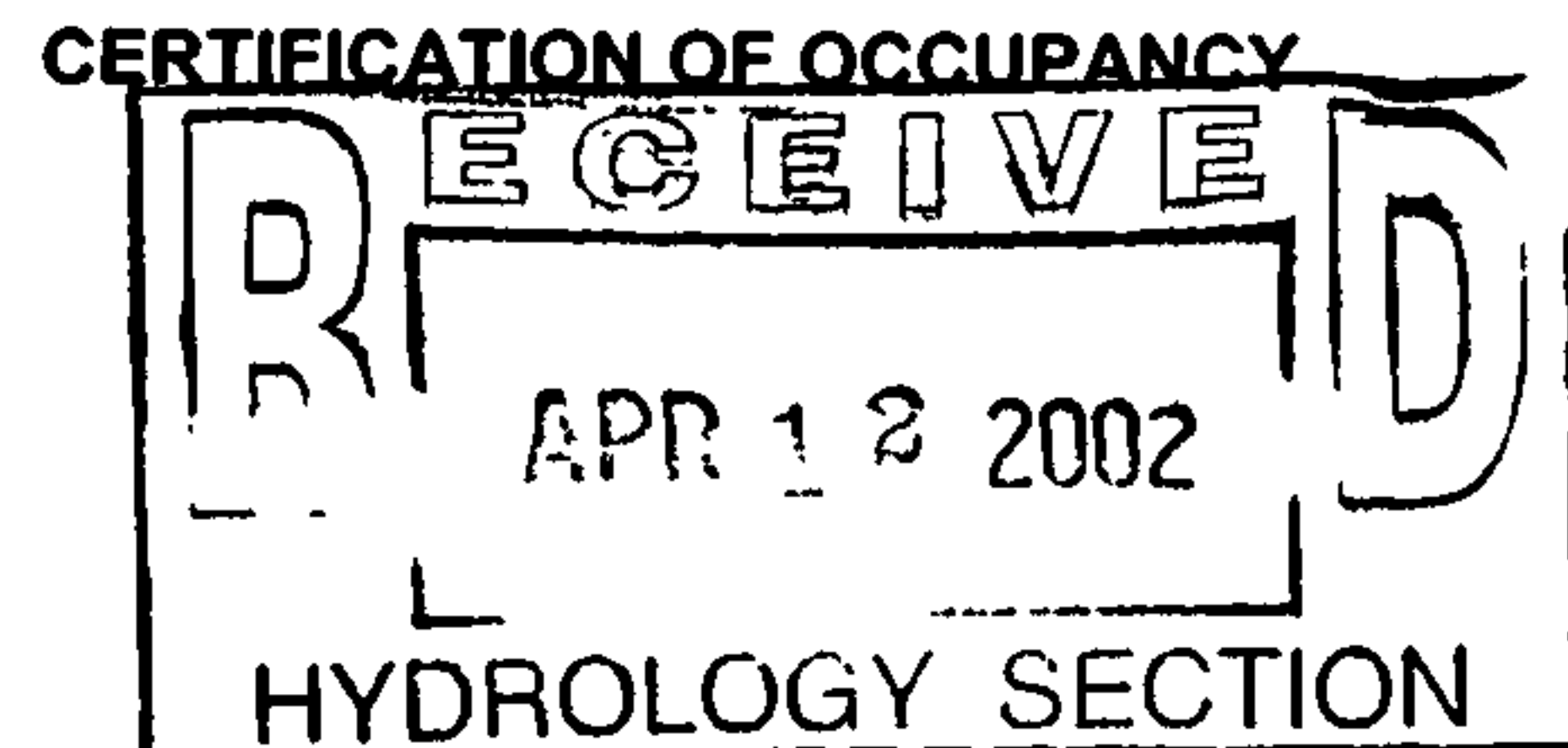
_____ DRAINAGE REPORT
_____ DRAINAGE PLAN
_____ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION (HYDROLOGY)
_____ CLOMR / LOMR
_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ ENGINEER'S CERTIFICATION (TCL)
_____ ENGINEER'S CERTIFICATION (DRB APPR. 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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

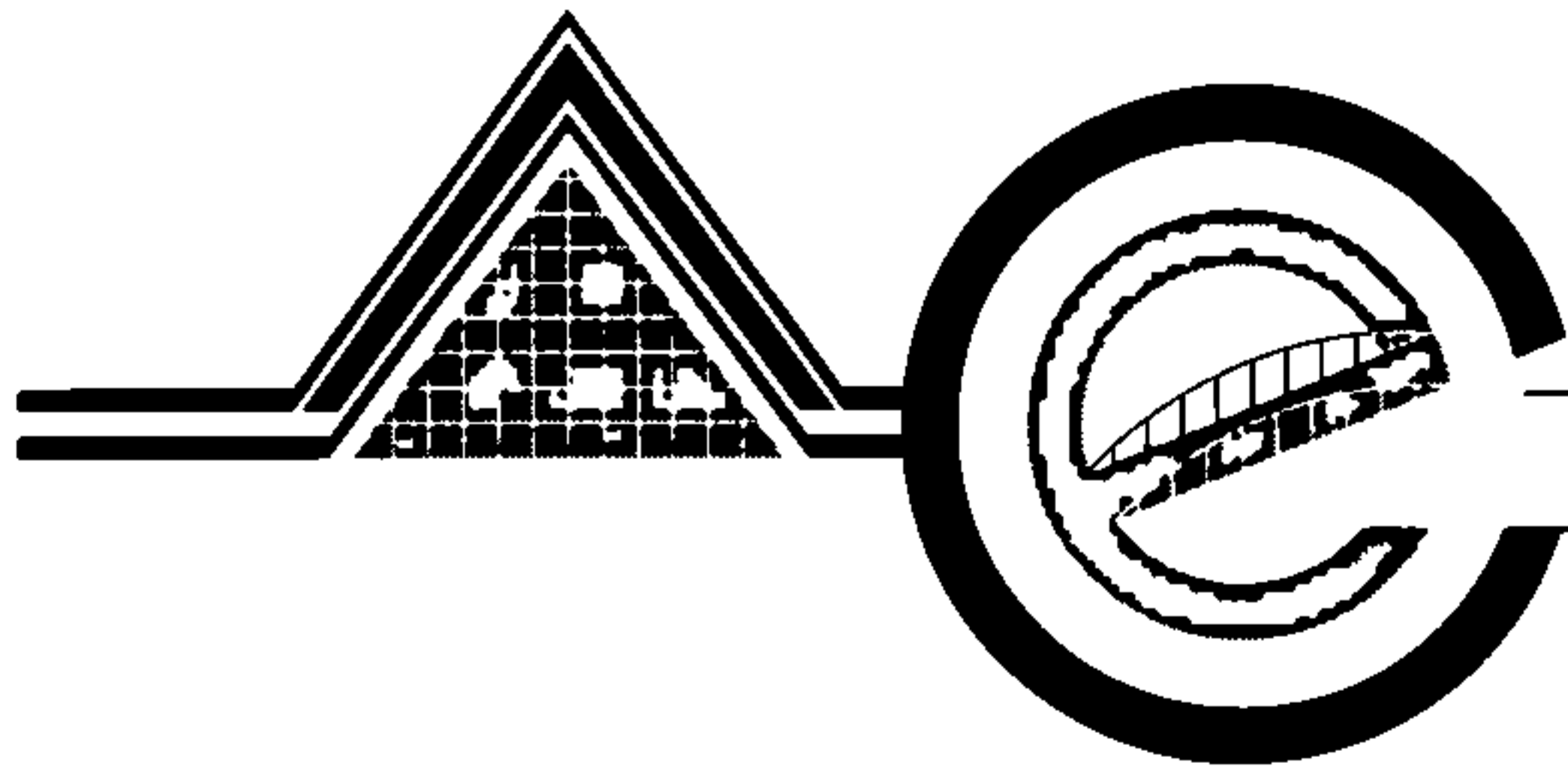
_____ YES
☒ NO
_____ COPY PROVIDED



DATE SUBMITTED: 04 / 12 / 2002 BY: Shahab Biazar, P.E.

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 submittals may be required based on the following:

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ADVANCED ENGINEERING and CONSULTING, LLC

*Consulting
Design
Development
Management
Inspection*

April 11, 2002

Mr. Carlos A. Montoya, P.E.
City Floodplain Administrator, PWD
Development and Building Services
Plaza Del Sol-2nd Floor West
600 2nd Street NW
Albuquerque, NM 87102

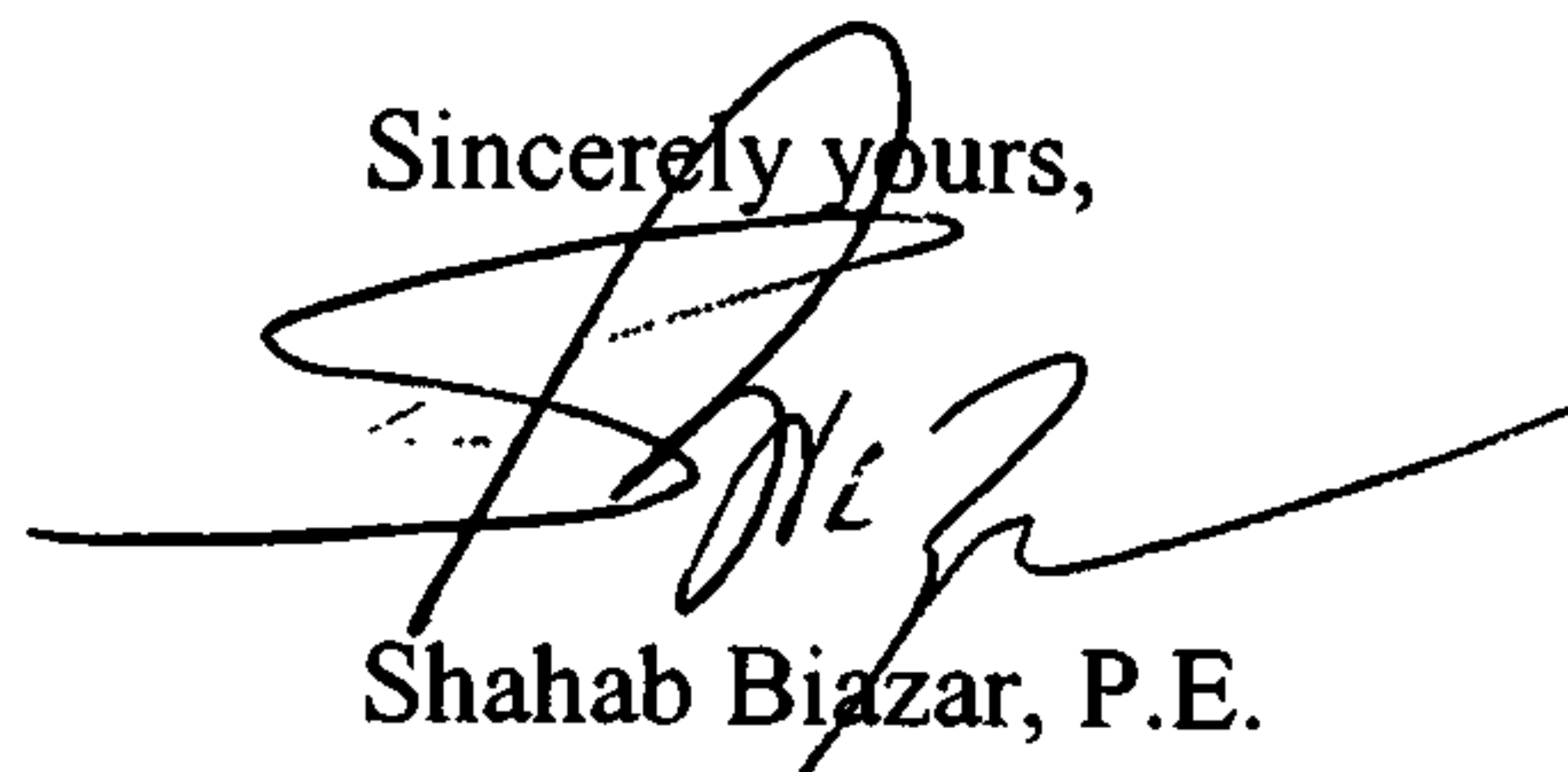
RE: Revised Grading Plan For Tracts 243 & 244, Unit 3, Town of Atrisco Grant
(Copperwynd "II" Subdivision), L10 / D21

Dear Mr. Montoya:

This letter is to inform you that we are resubmitting the grading and drainage plan to update the plan at the City Hydrology with the latest changes. New street names as well as new subdivision name was added to the plan. The name of the subdivision will be Copperwynd "II" Subdivision. Since some of the previous street names have been used other part of town, we have revised the street names for this subdivision. See enclosed grading plan for modification. No other changes have been done to the grading and drainage plan since last submittal with engineering stamp date of 3-08-02.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,



Shahab Biazar, P.E.



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 29, 2002

Shahab Biazar, PE
Advanced Engineering and Consulting, LLC
10205 Snowflake Ct. NW
Albuquerque, NM 87114

**Re: Town of Atrisco Lots 423 & 424 Grading and Drainage Plan
Engineer's Stamp Dated 3-06-02, (L10/D21)**

Dear Mr. Biazar,

Based on the information contained in your submittal dated 3-08-02, the above referenced plan is approved for Preliminary Plat, Site Plan for Subdivision, and Site Plan for Building Permit Action by the DRB.

For your information, the attached FIRM Map shows the future LOMR that will be processed with SAD 222 eliminating the flood zone on Tower Road.

If you have any questions, you can contact me at 924-3982.

Sincerely,

Carlos A. Montoya, PE
City Floodplain Administrator, PWD
Development and Building Services

C: Terri Martin, Hydrology
File (2)

423+424

DRAINAGE INFORMATION SHEET

(REV. 11/01/2001)

L-10/D21

PROJECT TITLE: LOTS 423 & 425, TOWN OF ATRISCO GRANT, UNIT 3ZONE ATLAS/DRG. FILE #: L-10

DRB #: _____ EPC #: _____

WORK ORDER #: _____

LEGAL DESCRIPTION: LOTS 423 & 425, TOWN OF ATRISCO GRANT, UNIT 3

CITY ADDRESS: _____

ENGINEERING FIRM: Advanced Engineering and Consulting, LLCADDRESS: 10205 Snowflake Ct. NWCITY, STATE: Albuquerque, New MexicoCONTACT: Shahab BiazarPHONE: (505) 899-5570ZIP CODE: 87114

OWNER: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

ARCHITECT: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

SURVEYOR: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

CONTRACTOR: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

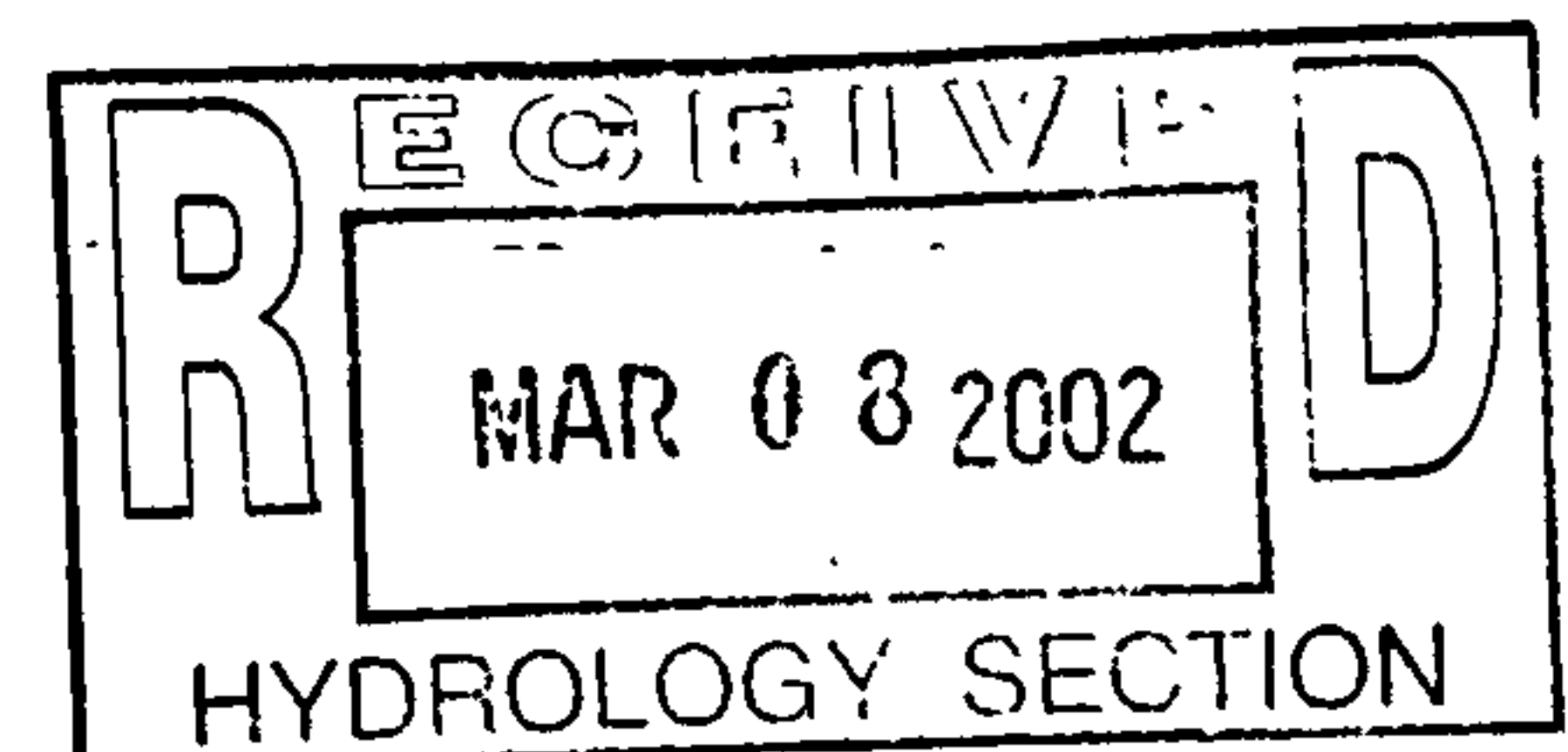
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

CHECK TYPE OF APPROVAL SOUGHT:

☒ DRAINAGE REPORT☐ DRAINAGE PLAN☐ CONCEPTUAL GRADING & DRAINAGE PLAN☒ GRADING PLAN☐ EROSION CONTROL PLAN☐ ENGINEER'S CERTIFICATION (HYDROLOGY)☐ CLOMR / LOMR☐ TRAFFIC CIRCULATION LAYOUT (TCL)☐ ENGINEER'S CERTIFICATION (TCL)☐ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)☐ OTHER☐ 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☐ CERTIFICATION OF OCCUPANCY

WAS A PRE-DESIGN CONFERENCE ATTENDED:

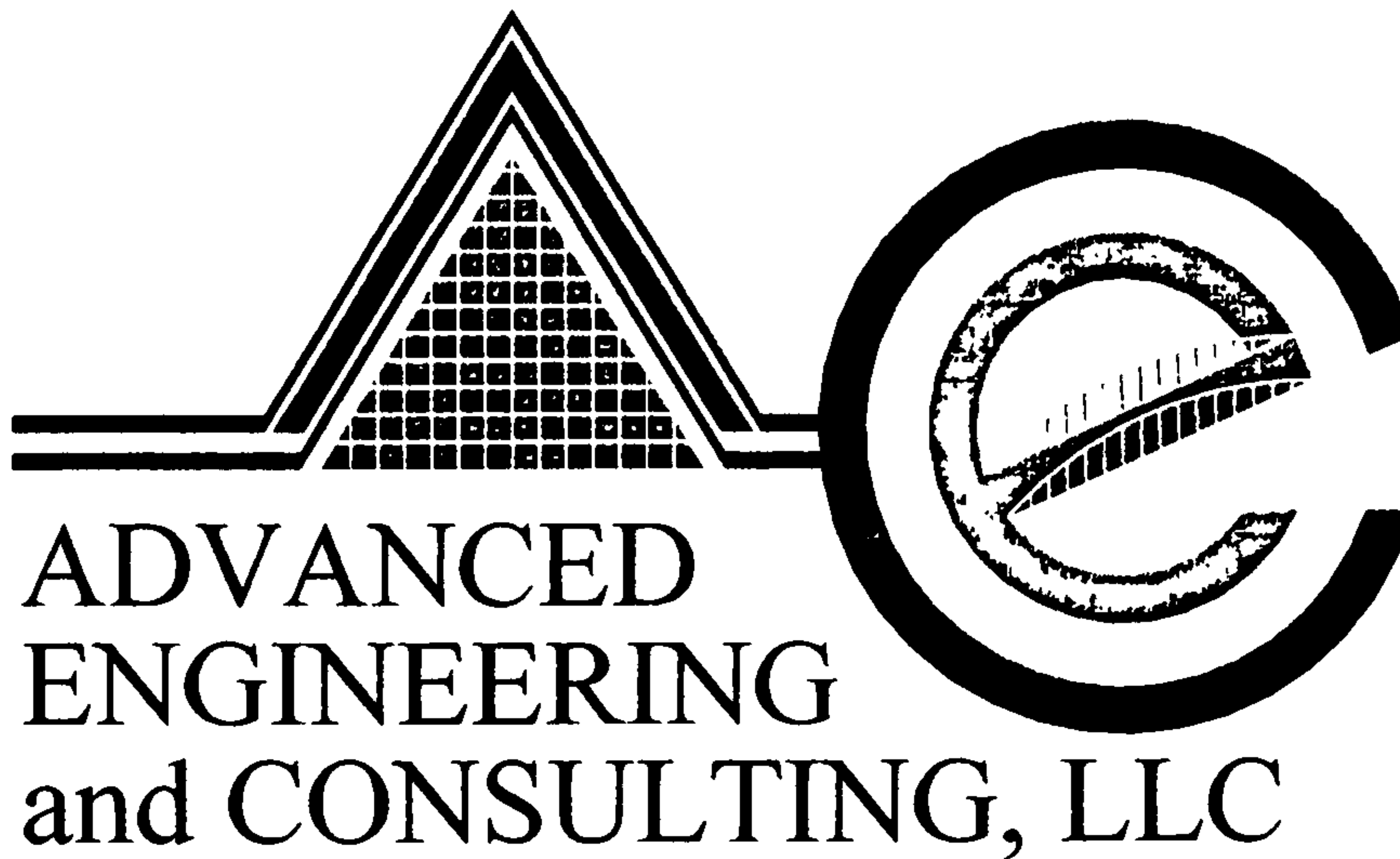
☐ YES☒ NO☐ COPY PROVIDEDDATE SUBMITTED: 03/06/2002BY: Shahab Biazar, P.E.

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 submittals may be required based on the following:

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2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5)
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or containing five (5) acres or

DRAINAGE REPORT
FOR
**423 & 424, TOWN OF ATRISCO
GRANT UNIT 3**
(67 Lots Subdivision)

Prepared by:

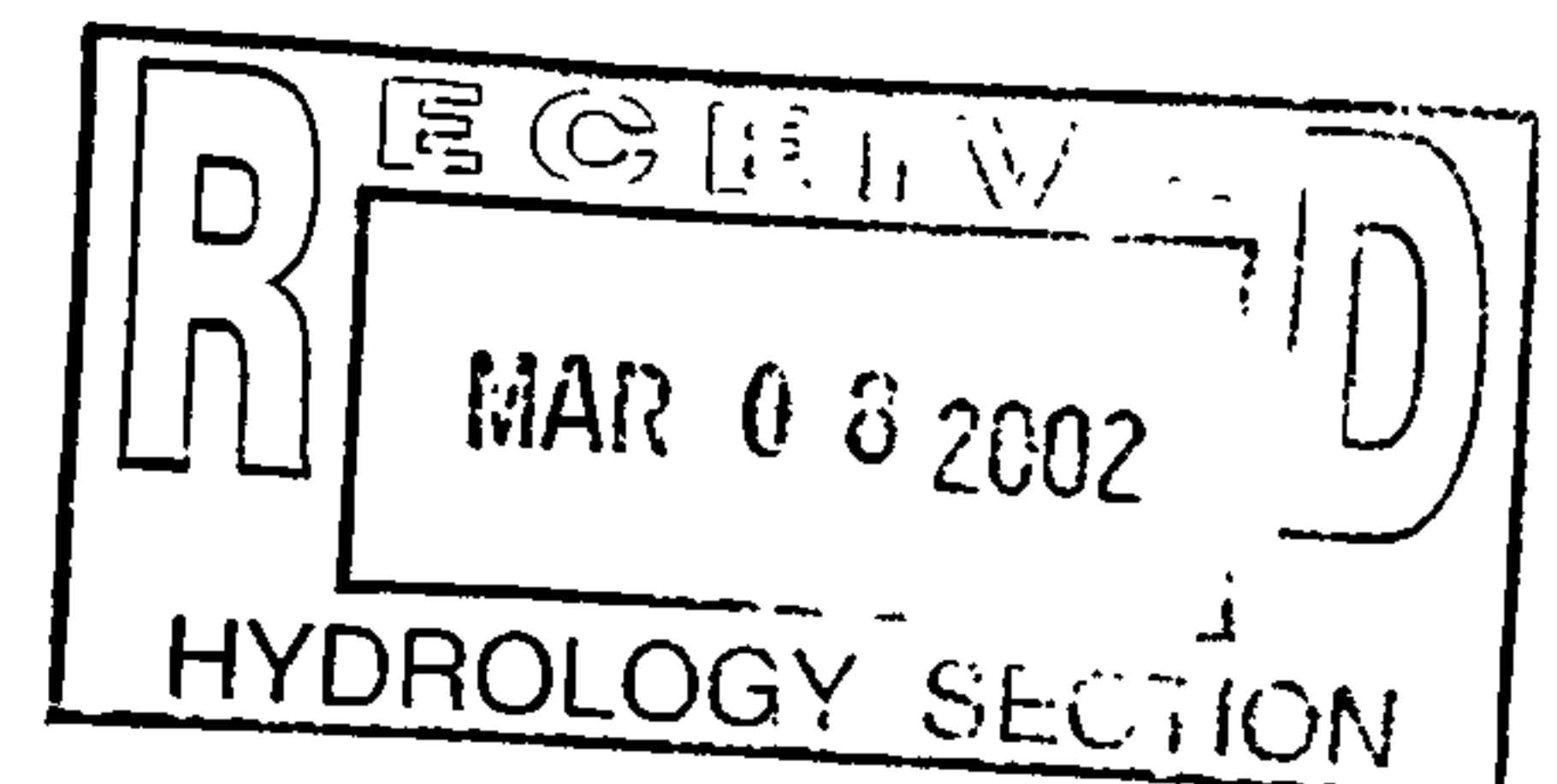


10205 Snowflake Ct. NW
Albuquerque, New Mexico 87114

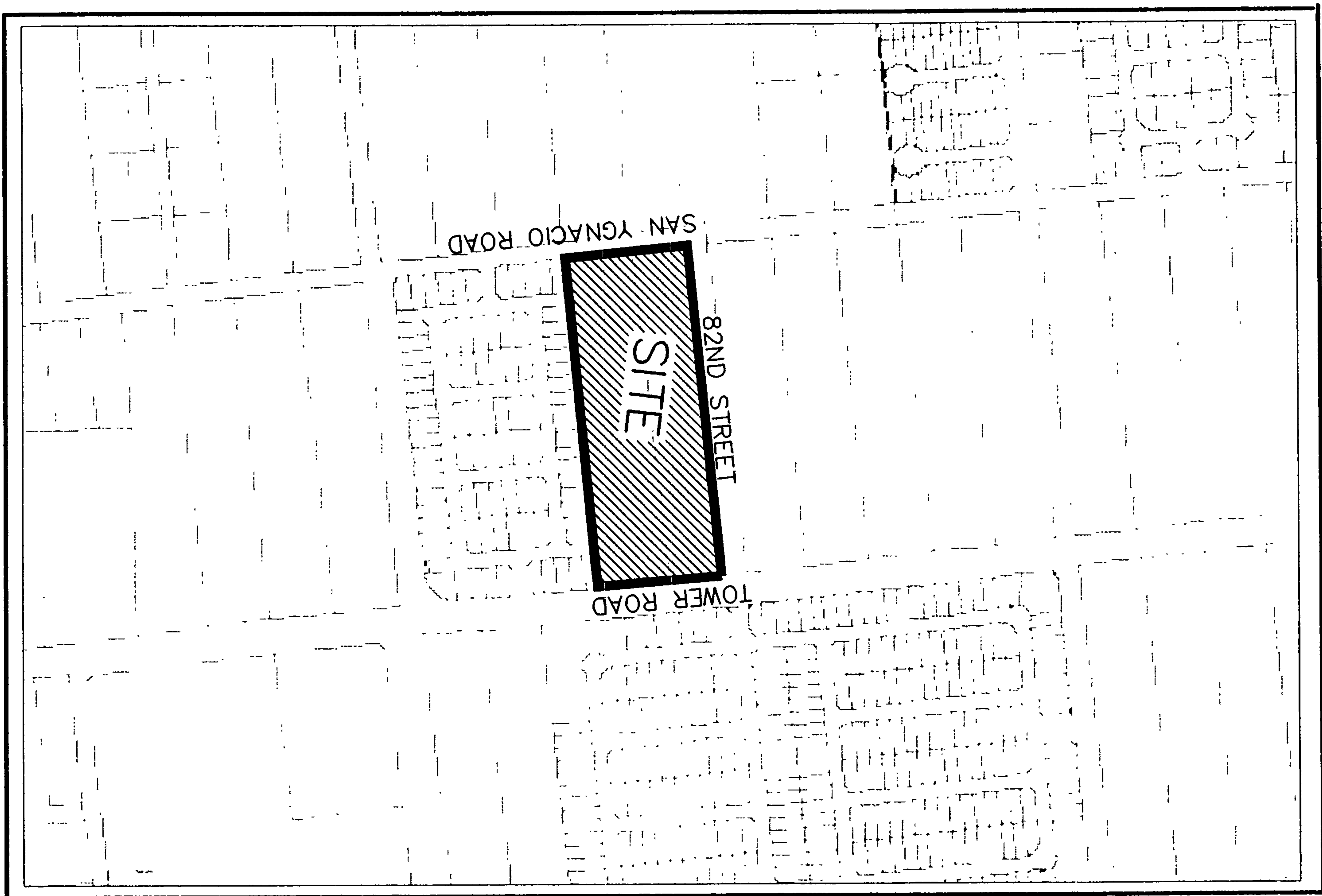
March, 2002



Shahab Biazar
PE NO. 13479



Z-01-7



Location

Tract 243 and 244 of Unit 2 of Atrisco Grant are two-five-acre lots that are located between Tower Road and San Ygnacio Road on the East side of 82nd Street. See attached Zone Atlas Page L-10-Z for exact location of the property.

Purpose

The purpose of this drainage report is to present a grading and drainage solution for the proposed sites. We are requesting rough grading approval, site development plan for subdivision purposes, site development plan for building permit, preliminary and final plat approval. The owners of the property are proposing to subdivide this ten acre lot into 67 lots single family residential subdivision. The lots have been both annexed into the City of Albuquerque, and are zoned residential for 9DU/acre.

Existing Drainage Conditions

Offsite Conditions

The runoff to the north (Tower Road) drains east. The runoff on Tower road will be intercepted by a series of inlets recently built under the Valencia Estates Subdivision, Unit I. There is a combination of existing V-ditch and berm along the northerly boundary line that detains any runoff from entering the site. Therefore, the runoff is diverted east and then to Unser Boulevard to the some existing inlets. The runoff to the west (82nd Street) drains south to

San Ygnacio Road. The runoff to the south (San Ygnacio Road) drains east to a series of inlets built under the Valencia Estates Subdivision, Unit I. There are no offsite runoff that enters the site. Storm sewer pipe has recently been built on San Ygnacio Road.

On-Site Conditions

The site is fairly flat and the runoff drains south to San Ygnacio Road. These lots do not fall within a 100-year flood plain.

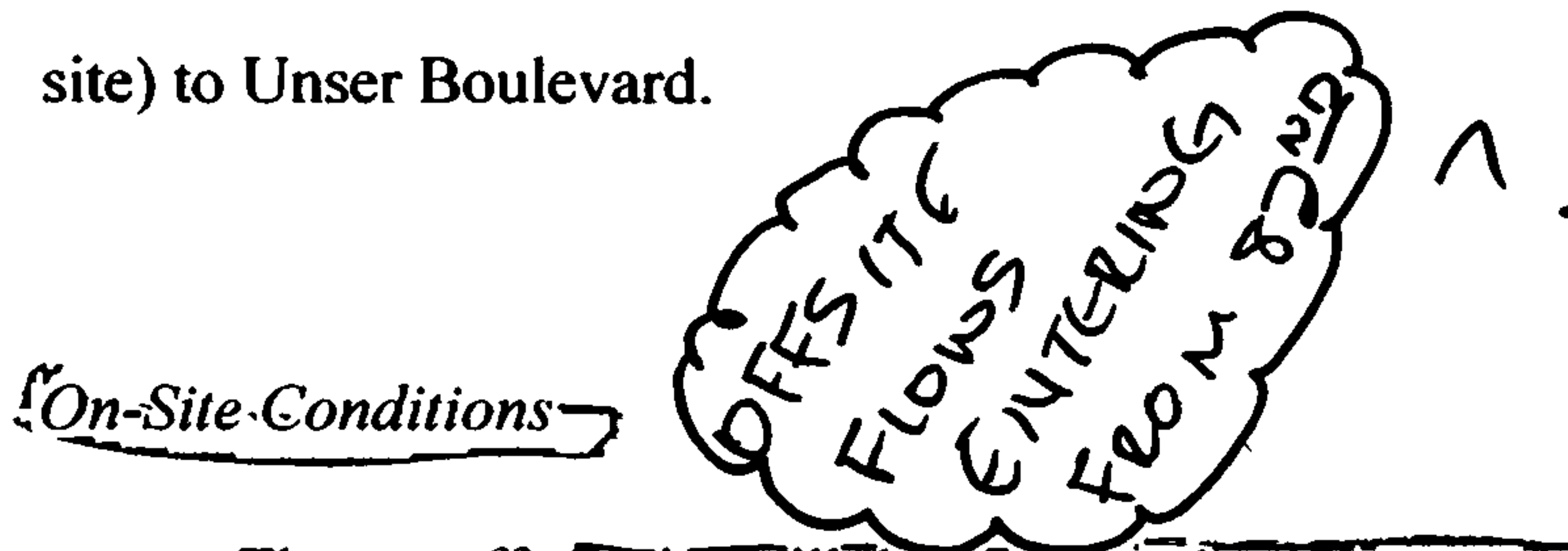
Proposed Conditions and On-Site Drainage Management Plan

The offsite and on-site runoff patterns for the most part will remain the same.

Offsite Conditions

The runoff to the north (Tower Road) will continue to drain to the east. Under the Valencia Estates Subdivision drainage report (prepared by Mark Goodwin and Associates) the street flow capacity calculations indicated that the street has more than adequate capacity to handle the runoff in this street. The runoff was calculated from the pond (just located west of our site) to Unser Boulevard. No additional inlets was required in front of our site. The runoff to the west (82nd Street) will drain to San Ygnacio Road in two different routing patterns. The northern portion of 82nd Street will drain through the site and then south to a proposed inlet located at the southeast corner of the project. Southern portion of 82nd Street will drain south to San Ygnacio Road at a flow rate of 2.51 cfs. This additional runoff will not have any significant impact to San Ygnacio Road flow capacity. We have calculated street flow capacity,

and the runoff will remain well within the curb height. Under the Valencia Estates Subdivision drainage report (prepared by Mark Goodwin and Associates) the runoff was calculated for San Ygnacio Road as well. The runoff was calculated from the pond (just located west of our site) to Unser Boulevard.



The runoff on-site will drain to southeast corner of the project to a proposed inlet and then to the existing storm sewer pipe in San Ygnacio. The street flow capacity calculations have been prepared and we also have determined the locations of the standard and mountable curb and gutters. The site was analyzed under two drainage basins A and B to determine the runoff within the streets at two different locations. Offsite Basin C will drain to Basin A at a flow rate of 3.3 cfs. Basin A along with Basin C will then drain to the southeast corner of the project to an inlet. Basin B will drain south at flow rate of 15.04 cfs to the proposed inlet located at the southeast corner of the property. The total runoff from basins A, B, and C is 39.49 cfs which drains to the proposed inlet (in swamp condition) on site. See this report for runoff, street flow capacity, inlet (types), and pipe flow capacity calculations.

Calculations

City of Albuquerque, Development Process Manuel, Section 22.2, Hydrology Section, revised January, 1993, was used for runoff calculations. See this report for all the calculations.

RUNOFF CALCULATIONS

The site is @ Zone 1

DEPTH (INCHES) @ 100-YEAR STORM

$$P_{60} = 1.87 \text{ inches}$$

$$P_{360} = 2.20 \text{ inches}$$

$$P_{1440} = 2.66 \text{ inches}$$

DEPTH (INCHES) @ 10-YEAR STORM

$$\begin{aligned} P_{60} &= 1.87 \times 0.667 \\ &= 1.25 \text{ inches} \end{aligned}$$

$$P_{360} = 1.47$$

$$P_{1440} = 1.77$$

LAND TREATMENT

Based on the historical conditions:

$$A=100.00\%$$

Based on the developed conditions:

$$D = 7 \sqrt{(N^2+5N)}, \quad \text{Where } N=\text{units/acre, } N \leq 6 \quad (\text{From DPM Section 22.2-Hydrology, Page A5, Table A-5})$$

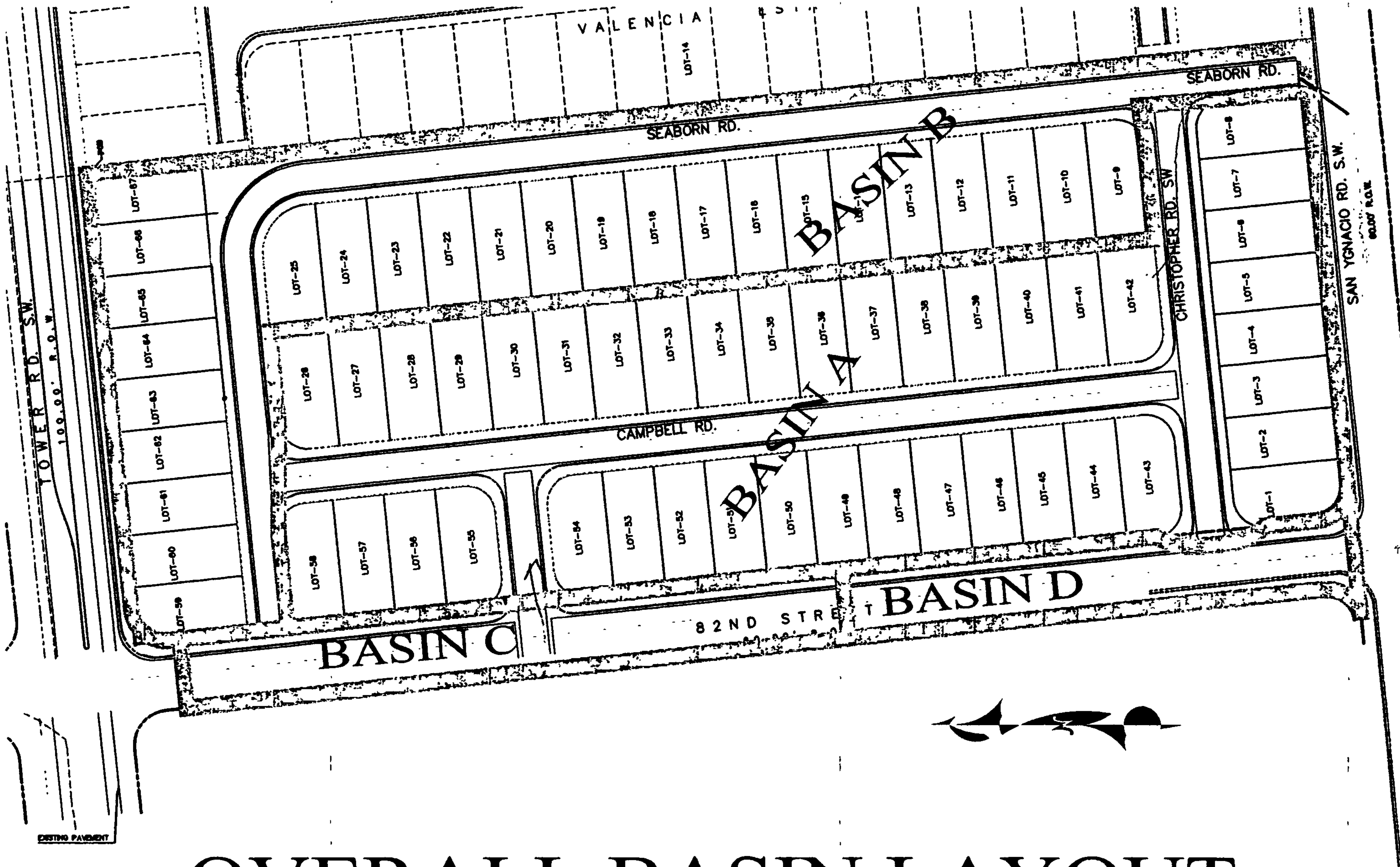
$$N = 67/10.0 = 6.70$$

Since $N > 6$ \therefore Use the following treatment

$$D = 60\%, C = 20\%, \text{ and } B = 20\%$$

See the summary output from AHYMO calculations.

Also see the following runoff tables for a summary of the results.



OVERALL BASIN LAYOUT

RUNOFF CALCULATION RESULTS

OVERALL BASINS

BASIN AREA			
ON-SITE	AREA (SF)	AREA (AC)	AREA (MI ²)
BASIN A / ON-SITE	255,646.49	5.8688	0.009170
BASIN B / ON-SITE	181,897.99	4.1758	0.006525
BASIN C / OFFSITE	34,948.67	0.8023	0.001254
BASIN D / OFFSITE	26,290.99	0.6036	0.000943

HISTORICAL		
ON-SITE	Q-100 CFS	Q-10 CFS
BASIN A	7.62	1.45
BASIN B	5.42	1.03
BASIN C	1.05	0.20
BASIN D	0.79	0.15

PROPOSED		
ON-SITE	Q-100 CFS	Q-10 CFS
BASIN A	<u>21.12</u>	12.73
BASIN B	<u>15.04</u>	9.06
BASIN C	<u>3.33</u>	2.16
BASIN D	<u>2.51</u>	1.62

ON SITE ?

* 10-YEAR, 6-HR STORM (UNDER EXISTING CONDITIONS) *

START TIME=0.0
RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
RAIN ONE=1.25 IN RAIN SIX=1.47 IN
RAIN DAY=1.77 IN DT=0.03333 HR

* BASIN A
COMPUTE NM HYD ID=1 HYD NO=111.0 AREA=0.009170 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD ID=1 HYD NO=112.0 AREA=0.006525 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN C
COMPUTE NM HYD ID=1 HYD NO=113.0 AREA=0.001254 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN D
COMPUTE NM HYD ID=1 HYD NO=114.0 AREA=0.000943 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* 10-YEAR, 6-HR STORM (UNDER PROPOSED CONDITIONS) *

START TIME=0.0
RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
RAIN ONE=1.25 IN RAIN SIX=1.47 IN
RAIN DAY=1.77 IN DT=0.03333 HR

* BASIN A
COMPUTE NM HYD ID=1 HYD NO=111.1 AREA=0.009170 SQ MI
PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD ID=1 HYD NO=112.1 AREA=0.006525 SQ MI
PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN C
COMPUTE NM HYD ID=1 HYD NO=113.1 AREA=0.001254 SQ MI
PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN D
COMPUTE NM HYD ID=1 HYD NO=114.1 AREA=0.000943 SQ MI
PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
TP=0.1333 HR MASS RAINFALL=-1

*
FINISH

AHYMO INPUT FILE

* ZONE 1

* 100-YEAR, 6-HR STORM (UNDER EXISTING CONDITIONS) *

START TIME=0.0
RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
RAIN ONE=1.87 IN RAIN SIX=2.20 IN
RAIN DAY=2.66 IN DT=0.03333 HR

* BASIN A

COMPUTE NM HYD ID=1 HYD NO=101.0 AREA=0.009170 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN B

COMPUTE NM HYD ID=1 HYD NO=102.0 AREA=0.006525 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN C

COMPUTE NM HYD ID=1 HYD NO=103.0 AREA=0.001254 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN D

COMPUTE NM HYD ID=1 HYD NO=104.0 AREA=0.000943 SQ MI
PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
TP=0.1333 HR MASS RAINFALL=-1

* 100-YEAR, 6-HR STORM (UNDER PROPOSED CONDITIONS) *

START TIME=0.0
RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
RAIN ONE=1.87 IN RAIN SIX=2.20 IN
RAIN DAY=2.66 IN DT=0.03333 HR

* BASIN A

COMPUTE NM HYD ID=1 HYD NO=101.1 AREA=0.009170 SQ MI
PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN B

COMPUTE NM HYD ID=1 HYD NO=102.1 AREA=0.006525 SQ MI
PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN C

COMPUTE NM HYD ID=1 HYD NO=103.1 AREA=0.001254 SQ MI
PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
TP=0.1333 HR MASS RAINFALL=-1

* BASIN D

COMPUTE NM HYD ID=1 HYD NO=104.1 AREA=0.000943 SQ MI
PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
TP=0.1333 HR MASS RAINFALL=-1

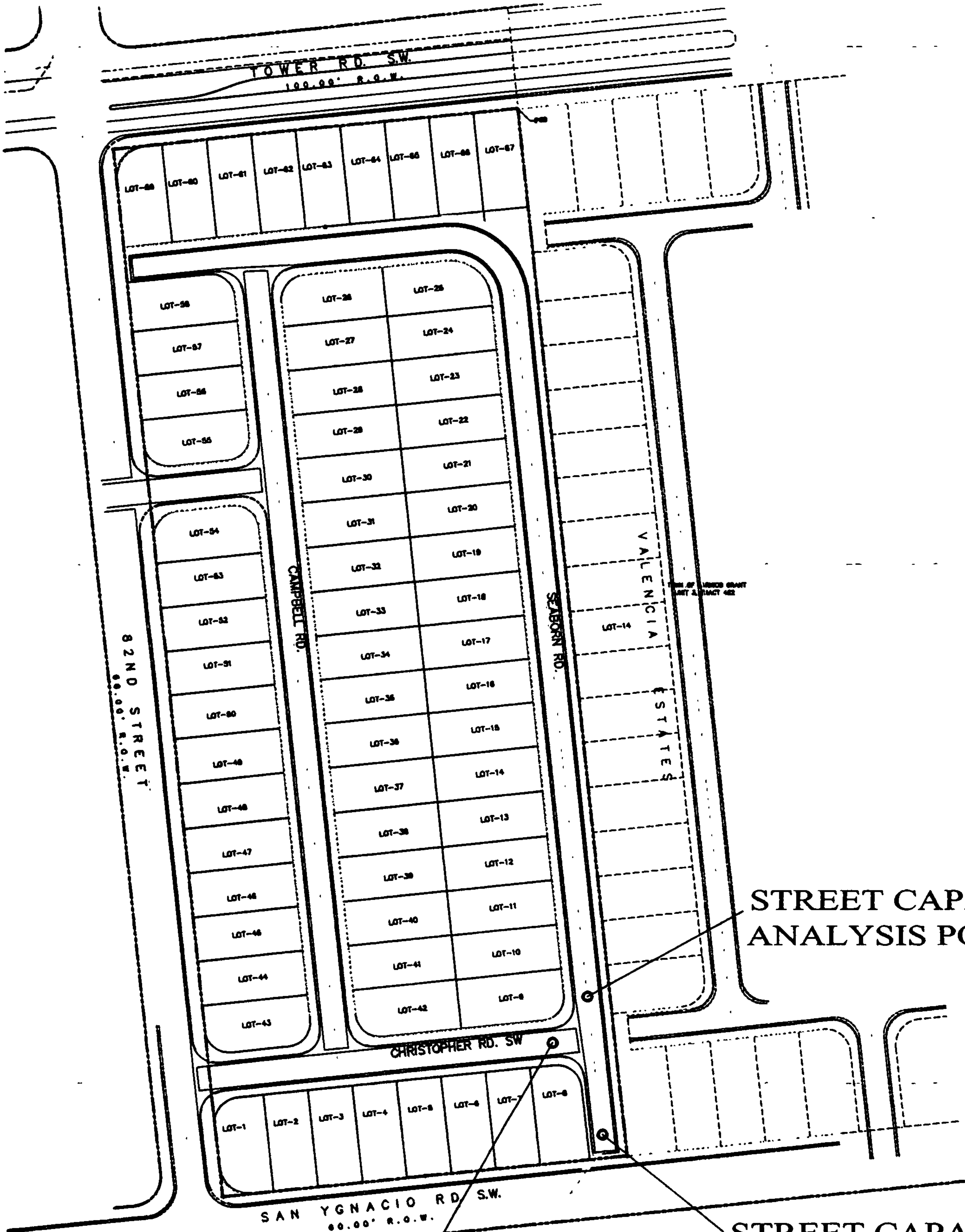
SUMMARY OUTPUT FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -
INPUT FILE = 200125

- VERSION: 1997.02d

RUN DATE (MON/DAY/YR) =03/04/2002
USER NO.= AHYMO-I-9702c01000R31-AH

[illegible]



STREET CAPACITY
ANALYSIS POINT B

STREET CAPACITY
ANALYSIS POINT A

STREET CAPACITY
ANALYSIS POINT C

STREET CAPACITY ANALYSIS POINTS

FINDING STREET CAPACITY - 28 F-F CROSS-SECTION FOR 4" CURB

Sections A & B

$$Q = 1.49/n A R^{(2/3)} S^{1/2}$$

$$n = 0.017$$

SLOPE = STREET SLOPE

$$R^{2/3} = (A/P)^{2/3}$$

$$D2 = \text{HYDRAULIC DEPTH AFTER HYDRAULIC JUMP} = D1/2 [\text{SQRT}(1 + 8Fr^2) - 1]$$

$$E = V^2 / 2g$$

HALF STREET CALCULATIONS

$$@ Y < 0.0625$$

$$A1 = \frac{1}{2} Y (Y/0.03125) = 16Y^2$$

$$P1 = \text{SQRT}[Y^2 + (Y/0.03125)^2] + Y = \text{SQRT}(1025 Y^2) + Y$$

$$@ 0.0625 < Y \leq 0.3025 \quad \& \quad Y1 = Y - 0.0625$$

$$A2 = A1 + \frac{1}{2} Y1 (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$$

$$P2 = P1 + \text{SQRT}[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + \text{SQRT}(2501 Y^2) + Y1$$

$$@ 0.3025 < Y \leq 0.333 \quad \& \quad Y2 = Y - 0.3025$$

$$A3 = A2 + 14Y2$$

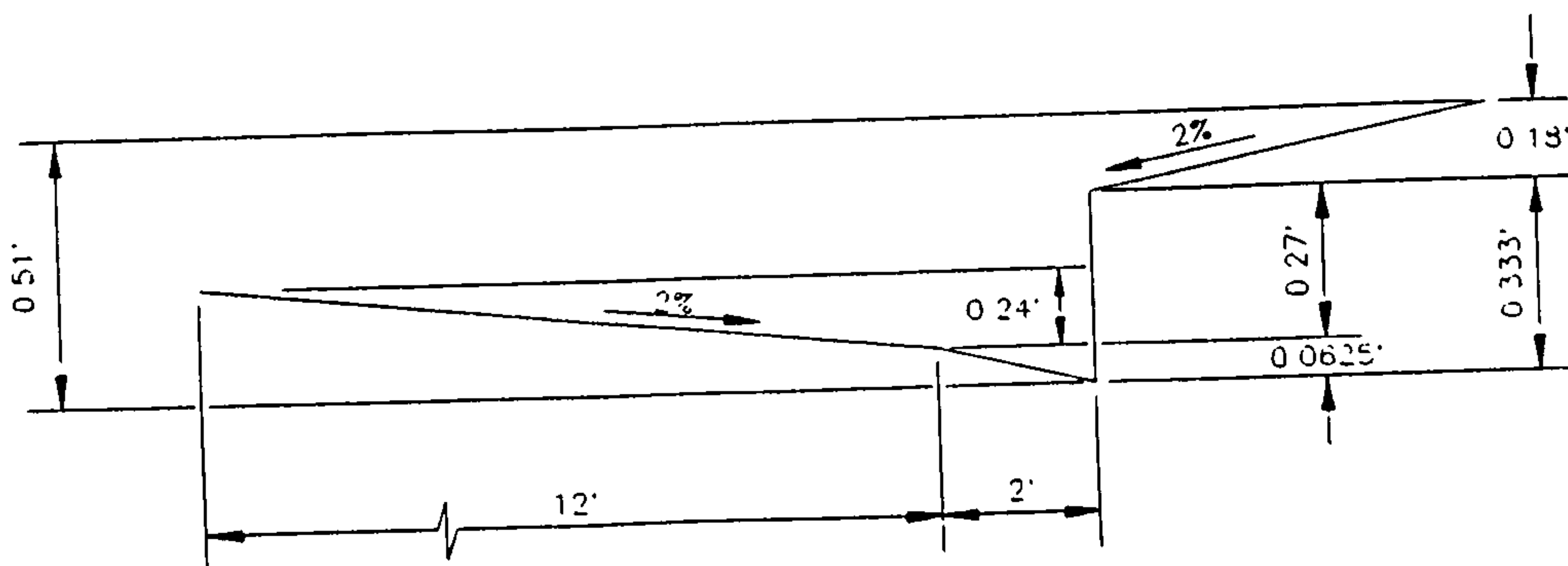
$$P3 = P2 + Y2$$

$$@ 0.333 < Y \leq 0.513 \quad \& \quad Y3 = Y - 0.333$$

$$A4 = A3 + 14Y3 + \frac{1}{2} Y3 [Y3/(0.02)] = A3 + 14 Y3 + 25 Y3^2$$

$$P4 = P3 + \text{SQRT}(Y3^2 + [Y3/(0.02)]^2) = P3 + \text{SQRT}(2501 Y3^2)$$

SEE THE FOLLOWING SHEET FOR INPUT AND OUTPUT FILE FOR CALCULATION RESULTS FROM COMPUTER PROGRAM USING THE EQUATION SHOWN ABOVE



28' F-F
4" CURB

NOT TO SCALE

INPUT FILE

```
*Analysis point A
100 24.45 0.00730
10 14.89 0.00730
*Analysis point B
100 15.04 0.00600
10 9.06 0.00600
*End of program
999 0.00 0.00
```

OUTPUT FILE

```
----- 28-FT F-F, 4" CURB STREET SECTION -----
----- STREET CAPACITY BASED ON 100-YR STORM -----
|  FLOW  |  SLOPE  |  Dn  |  Vn  |  D*V  |  Fr  |  E  |  D2  |
|  CFS   |  FT/FT  |  FT  |  FT/S |  FT²/S |      |  FT  |  FT  |
-----
|  24.45 | .00730  | .455 | 2.726 | 1.240  | .712 | .570 | ---- |
|  15.04 | .00600  | .392 | 2.262 | .887   | .637 | .472 | ---- |
-----
END OF THE OUTPUT FILE -----
```

```
----- 28-FT F-F, 4" CURB STREET SECTION -----
----- STREET CAPACITY BASED ON 10-YR STORM -----
|  FLOW  |  SLOPE  |  Dn  |  Vn  |  D*V  |  Fr  |  E  |  D2  |
|  CFS   |  FT/FT  |  FT  |  FT/S |  FT²/S |      |  FT  |  FT  |
-----
|  14.89 | .00730  | .376 | 2.436 | .916   | .700 | .468 | ---- |
|   9.06 | .00600  | .323 | 1.991 | .644   | .617 | .385 | ---- |
-----
END OF THE OUTPUT FILE -----
```

$Q_{100} = 24.45$ cfs at street capacity analysis point A

$Q_{100} = 15.04$ cfs at street capacity analysis point B

FINDING STREET CAPACITY - 24 F-F CROSS-SECTION FOR 8" CURB

Section C

$$Q = 1.49/n A R^{2/3} S^{1/2}$$

$$n = 0.017$$

SLOPE = STREET SLOPE

$$R^{2/3} = (A/P)^{2/3}$$

$$D2 = \text{WATER DEPTH AFTER HYDRAULIC JUMP} = D1/2 [\text{SQRT}(1 + 8Fr^2) - 1]$$

$$E = V^2 / 2g$$

HALF STREET CALCULATIONS

$$@ Y \leq 0.125$$

$$A1 = \frac{1}{2} Y (Y/0.0625) = 8Y^2$$

$$P1 = \text{SQRT}[Y^2 + (Y/0.0625)^2] + Y = \text{SQRT}(257 Y^2) + Y$$

$$@ 0.125 < Y \leq 0.325 \quad \& \quad Y1 = Y - 0.125$$

$$A2 = A1 + \frac{1}{2} Y1 (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$$

$$P2 = P1 + \text{SQRT}[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + \text{SQRT}(2501 Y1^2) + Y1$$

$$@ 0.325 < Y \leq 0.667 \quad \& \quad Y2 = Y - 0.365$$

$$A3 = A2 + 14Y2 + \frac{1}{2} Y2 [Y2/(0.02)] = A2 + 14 Y2$$

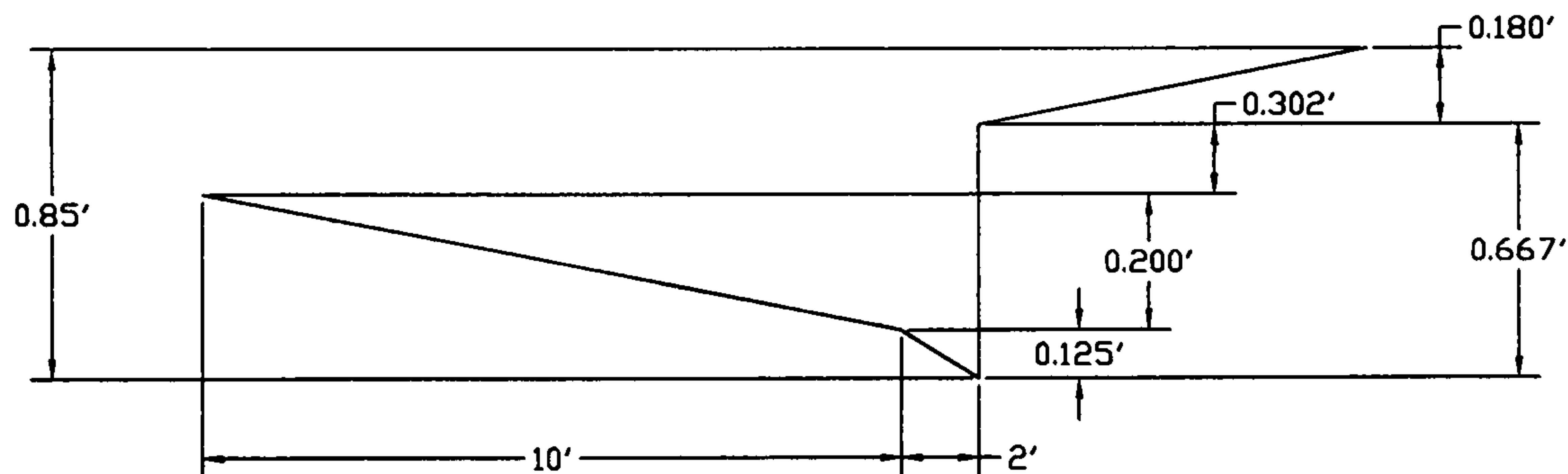
$$P3 = P2 + \text{SQRT}(Y2^2 + [Y2/(0.02)]^2) = P2 + Y2$$

$$@ 0.667 < Y \leq 0.847 \quad \& \quad Y3 = Y - 0.667$$

$$A4 = A3 + 14Y3 + \frac{1}{2} Y3 [Y3/(0.02)] = A3 + 14 Y3 + 25 Y3^2$$

$$P4 = P3 + \text{SQRT}(Y3^2 + [Y3/(0.02)]^2) = P3 + \text{SQRT}(2501 Y3^2)$$

SEE THE FOLLOWING SHEET FOR INPUT AND OUTPUT FILE FOR CALCULAITON RESULTS FROM COMPUTER PROGRAM USING THE EQUATION SHWON ABOVE



24' F-F
8" CURB

INPUT FILE

```
*Analysis point C
100 39.49 0.0060
10 23.95 0.0060
*End of program
999 0.00 0.00
```

OUTPUT FILE

```
----- 24-FT F-F, 8" CURB STREET SECTION -----
----- STREET CAPACITY BASED ON 100-YR STORM -----
| FLOW | SLOPE | Dn | Vn | D*V | Fr | E | D2 |
| CFS | FT/FT | FT | FT/S | FT2/S | | FT | FT |
-----
| 39.49 | .00600 | .634 | 3.772 | 2.392 | .835 | .855 | ---- |
----- END OF THE OUTPUT FILE -----
```

```
----- 24-FT F-F, 8" CURB STREET SECTION -----
----- STREET CAPACITY BASED ON 10-YR STORM -----
| FLOW | SLOPE | Dn | Vn | D*V | Fr | E | D2 |
| CFS | FT/FT | FT | FT/S | FT2/S | | FT | FT |
-----
| 23.95 | .00600 | .520 | 3.099 | 1.611 | .758 | .669 | ---- |
----- END OF THE OUTPUT FILE -----
```

$Q_{100} = 39.49$ cfs at street capacity analysis point C

INPUT FILE

```
*Runoff fronting our site
100 11.79 0.0061
*Runoff near Unser Boulevard
100 21.42 0.0050
999 0.00 0.00
```

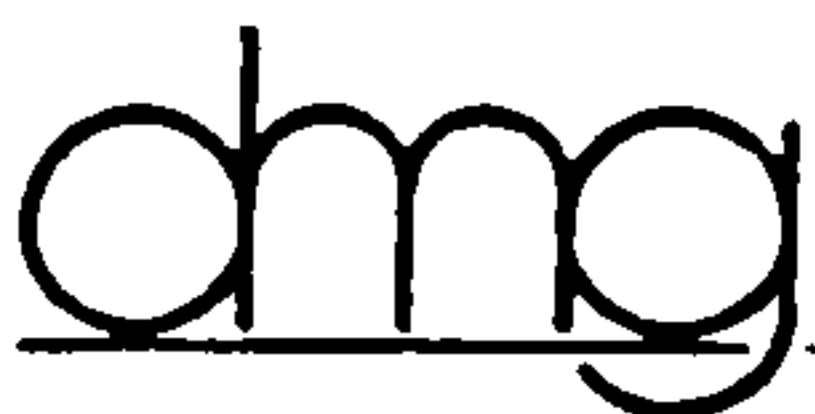
OUTPUT FILE

```
----- 40-FT F-F, 8" CURB STREET SECTION -----
----- STREET CAPACITY BASED ON 100-YR STORM -----
| FLOW | SLOPE | Dn | Vn | D*V | Fr | E | D2 |
| CFS | FT/FT | FT | FT/S | FT²/S | | FT | FT |
-----
| 11.79 | .00610 | .417 | 2.075 | .865 | .566 | .484 | ---- |
| 21.42 | .00500 | .513 | 2.303 | 1.182 | .567 | .596 | ---- |
----- END OF THE OUTPUT FILE -----
```

From the drainage report for Valencia Estates Subdivision prepared by Mark Goodwin and Associates (the subdivision located to the east side of our project) the flow in San Ygancio Road is 9.28 cfs (not including the back yard runoff) and we are contributing an extra 2.51 cfs from Basin C (from 82nd Street) which is a total runoff of 11.79.

The runoff near Unser according to Mark Goodwin and Associates including the runoff from the back yards is 18.91 cfs and we are contributing an extra 2.51 cfs from Basin C (from 82nd Street) which is a total runoff of 21.42.

In both cases the runoff in the street is well within the curb height (specially the portion fronting our site) and no additional inlets are required. Two inlets, Type A, has been built on San Ygnacio near Unser under the construction of the Valencia Estates Subdivision.



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

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(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT VALENCIA ESTATES
SUBJECT DRAINAGE CALCS

BY GJK DATE 7-13-00
CHECKED _____ DATE _____

REVISED 9-17-00 SHEET 4 OF _____

• FIND Q IN SAN YGNACIO

60' R/W 80% D 20% B AREA = 2.3416 AC

DISTANCE FROM TOWER/SAGE POND = 1700 LF
FROM AHYMO OUTPUT SHEETS 24-26

$$Q = 9.28 \text{ CFS}$$

ADD BACKYARDS + BASIN 1

$$Q = 9.28 + 0.27 + 9.36 = 18.91 \text{ CFS}$$

INSTALL 2 OBL "A" INLETS BEFORE UNSER

$$d = 0.50$$

$$w_p = 41.00$$

$$A = 8.77$$

$$V = 2.21 \text{ F/S}$$

$$Q = 19.39 \text{ CFS} \approx 18.91 \text{ CFS OK}$$

FROM SHEET 13

$$Q_{\text{gate}} = 5.6 \text{ CFS}$$

$$Q_{\text{INTO UNSER}} = 18.91 - 2(5.6) = 7.71 \text{ CFS}$$

SOUTH OF SAN YGNACIO

• FIND Q IN TOWER

100' R/W 70% D 30% B

DISTANCE FROM TOWER/SAGE POND = 1270 LF

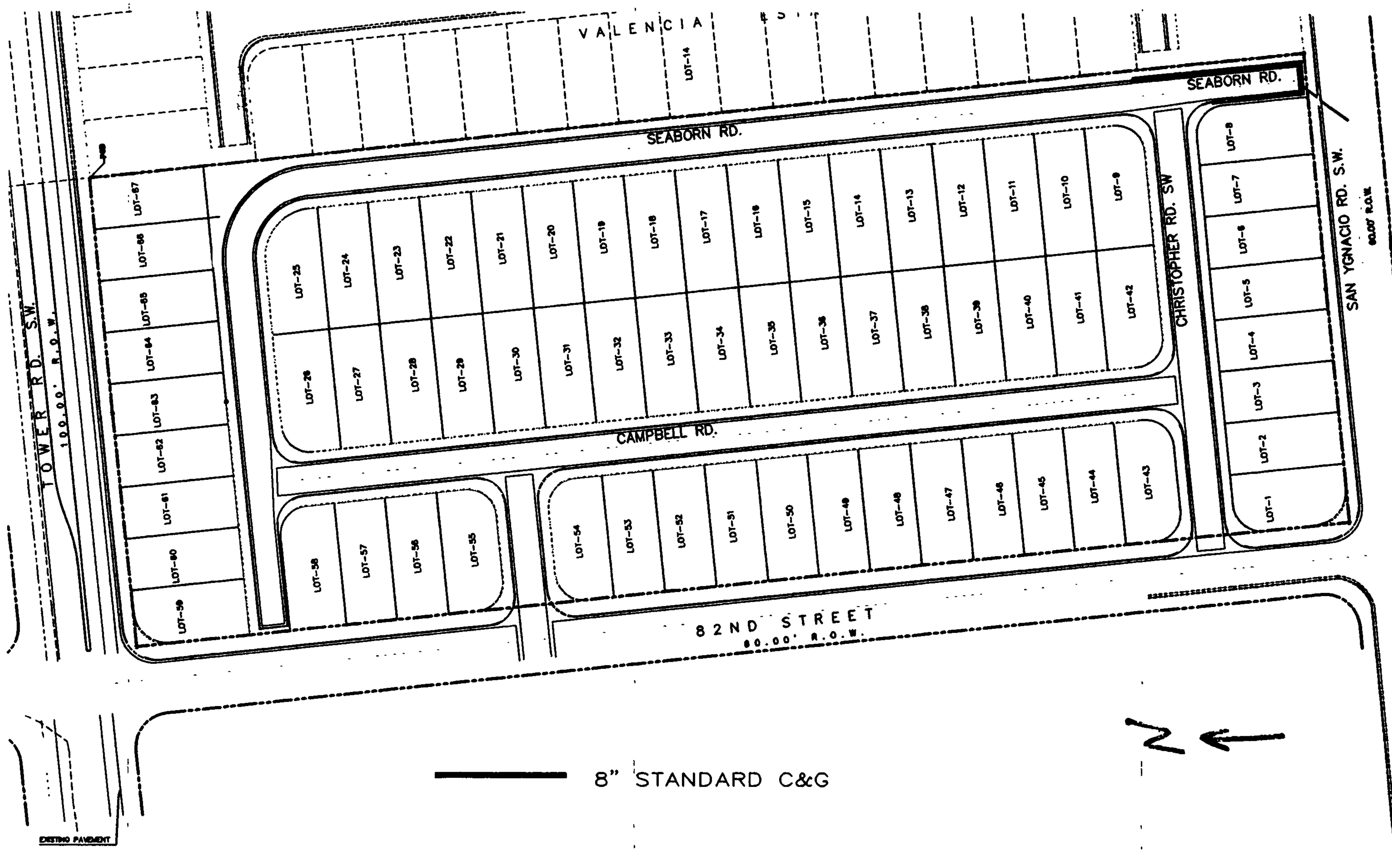
$$AREA = 2.9155 \text{ AC}$$

FROM AHYMO OUTPUT SHEETS 27-29

$$Q = 10.86 \text{ CFS} \quad Q_{1/2} = 5.43 \text{ CFS}$$

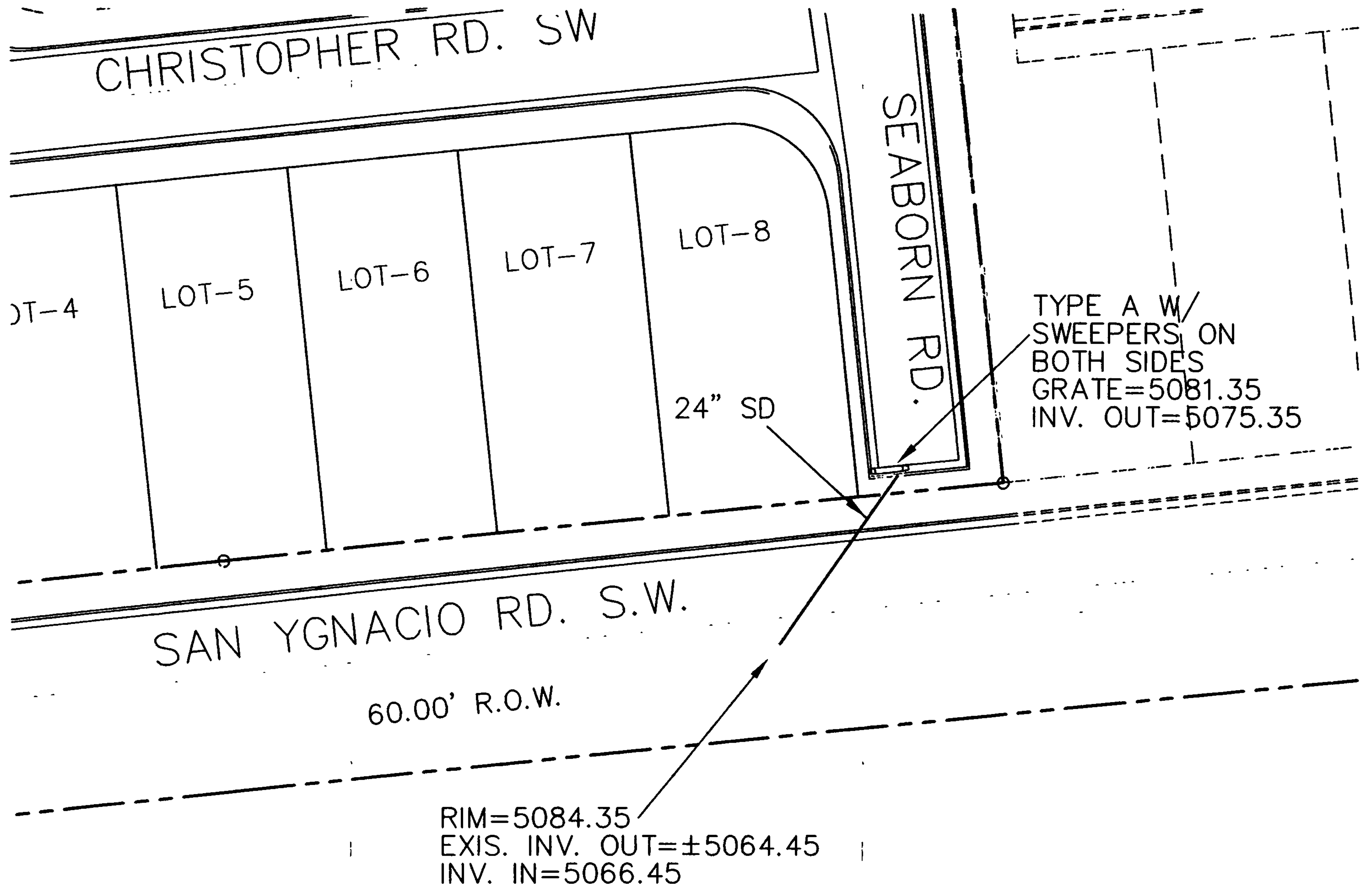
• HALF THE FLOW WILL ENTER THE
SUMP INLET AT THE NW QUAD OF
TOWER AND UNSER (SEE SHEET 7)

• HALF THE FLOW WILL TURN SOUTH AT
UNSER AND ENTER THE SUMP INLET
(SEE SHEET 7)



STREET CURB HEIGHT

ALL THE INTERNAL CURBS ARE 4" MOUNTABLE CURB & GUTTER OTHERWISE NOTED
ALL OF THE OFFSITE CURBS ARE 8" STANDARD CURB & GUTTER



INLET/SD LOCATIONS

STORM DROP INLET DRAINAGE CAPACITY

Type 'A' with sweepers on both sides in swamp conditions

Area at the grate:

$$\begin{aligned} L &= 88 \frac{3}{4}'' - 2(6''_{\text{ends}}) - 6''_{\text{center piece}} - 14(\frac{1}{2}''_{\text{middle bars}}) \\ &= 63 \frac{3}{4}'' \\ &= 5.3125' \end{aligned}$$

$$\begin{aligned} W &= 25 \frac{1}{2}'' - 13(\frac{1}{2}''_{\text{middle bars}}) \\ &= 19'' \\ &= 1.5833' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 5.3125' \times 1.5833' \\ &= 8.41 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Effective Area} &= 8.41 - 8.41 (0.5_{\text{clogging factor}}) \\ &= 4.21 \text{ ft}^2 \text{ at the grate} \end{aligned}$$

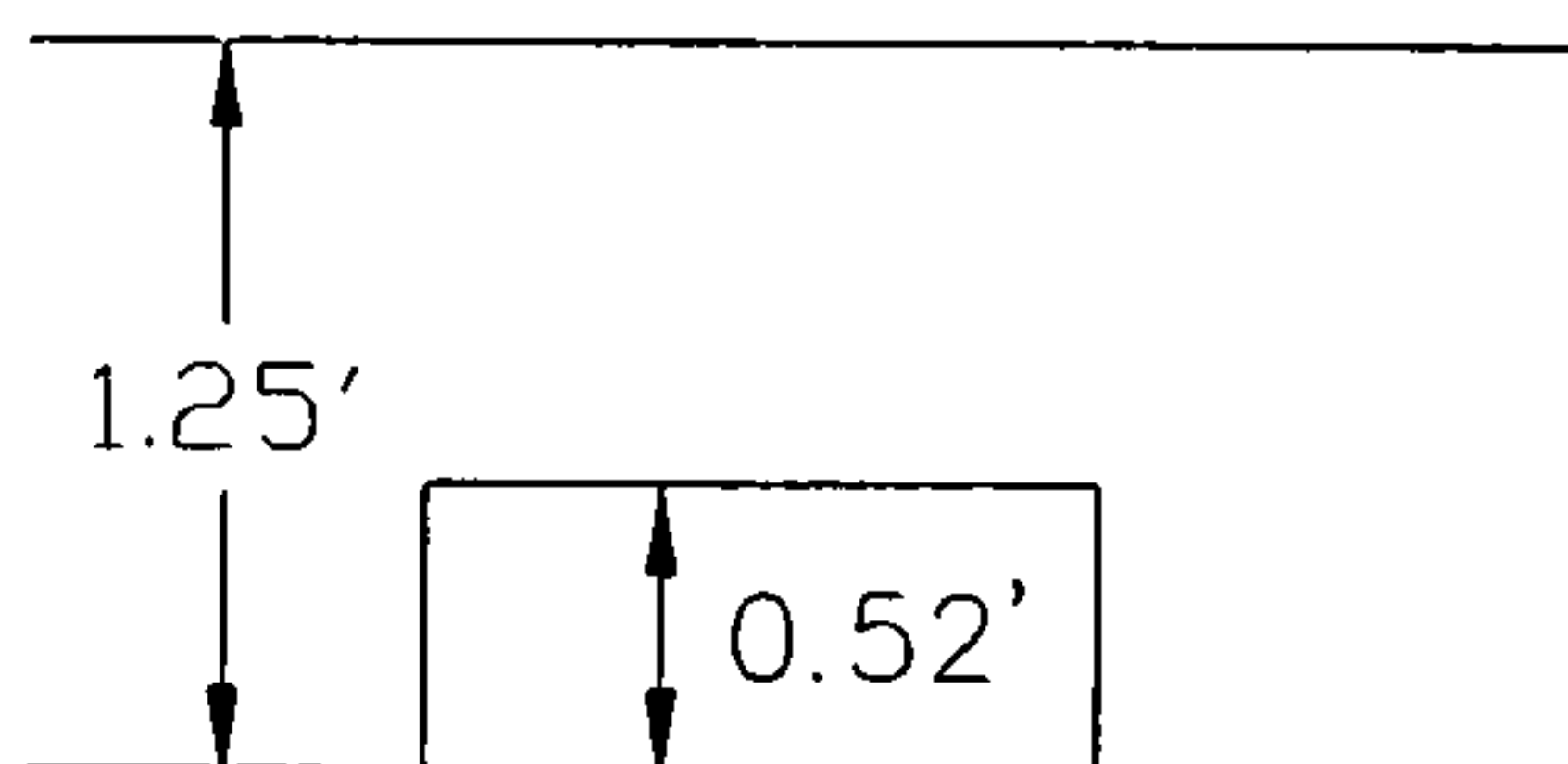
Area at the throat:

$$L = 10.95'$$

$$\begin{aligned} H &= 10 \frac{3}{4}'' - 4 \frac{1}{2}'' \\ &= 6 \frac{1}{4}'' \\ &= 0.5208' \end{aligned}$$

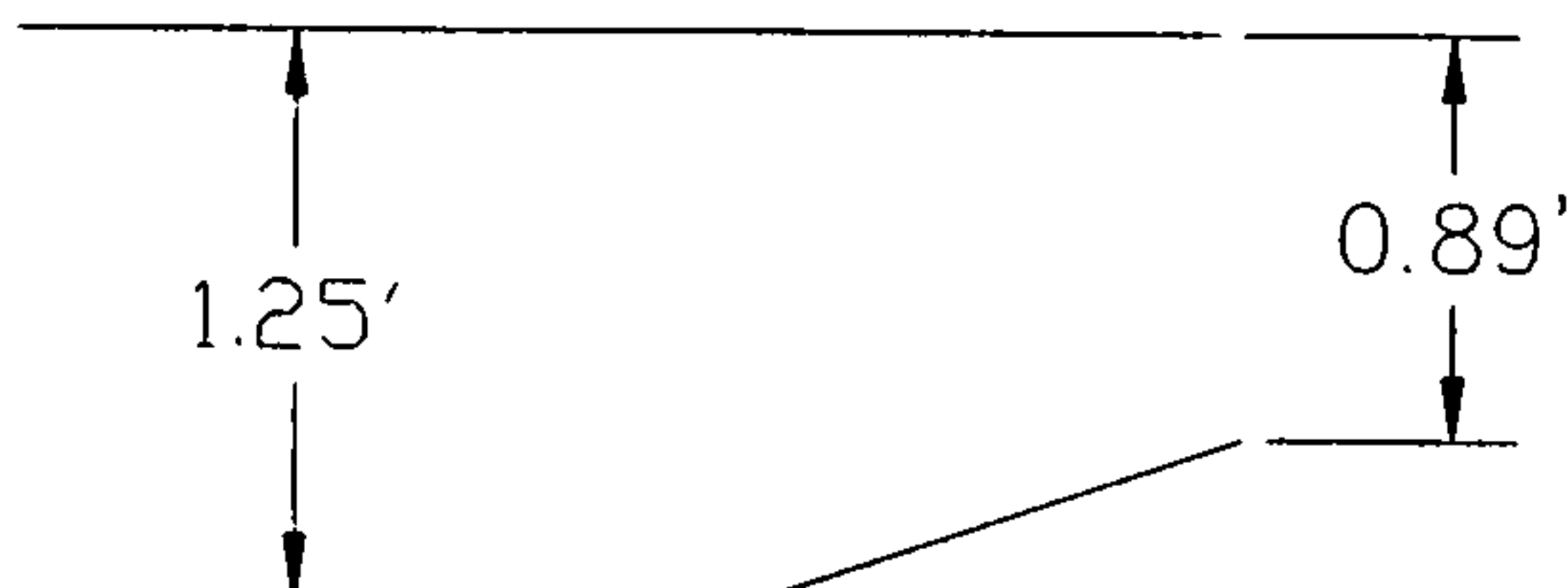
$$\begin{aligned} \text{Area} &= 10.95' \times 0.5208' \\ &= 5.70 \text{ ft}^2 \text{ at the throat} \end{aligned}$$

THROAT



$$\begin{aligned} H &= 1.25 \\ Q &= CA\sqrt{2gH} \\ Q &= 0.60(5.70)\sqrt{2(32.2)(1.25)} \\ Q &= 30.68 \text{ CFS} \end{aligned}$$

GRATE



$$\begin{aligned} H &= (1.25 + 0.89)/2 = 1.08 \\ Q &= CA\sqrt{2gH} \\ Q &= 0.60(4.21)\sqrt{2(32.2)(1.08)} \\ Q &= 21.07 \text{ CFS} \end{aligned}$$

TOTAL

$$Q = 21.07 + 30.68 = 51.75 \text{ CFS}$$

TOTAL FLOW TO THE INLET IS ONLY 39.49 CFS

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: 24" PIPE FLOW CAPACITY CALCULATIONS

Solve For Full Flow Capacity

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0350 ft/ft
Manning's n.....	0.012
Discharge.....	45.85 cfs

Computed Results:

Full Flow Capacity.....	45.85 cfs
Full Flow Depth.....	2.00 ft
Velocity.....	14.59 fps
Flow Area.....	3.14 sf
Critical Depth....	1.97 ft
Critical Slope....	0.0318 ft/ft
Percent Full.....	100.00 %
Full Capacity.....	45.85 cfs
QMAX @.94D.....	49.32 cfs
Froude Number.....	FULL