

# DRAINAGE INFORMATION SHEET

PROJECT TITLE: TANGLEWOOD SUBDIVISION ZONE ATLAS/DRNG. FILE #: J-101D26  
 DRB #: 96-S44 EPC #: \_\_\_\_\_ WORK ORDER #: 5760.81  
 LEGAL DESCRIPTION: TRACTS 231 & 232, AIRPORT UNIT, TOWN OF ATRISCO GRANT  
 CITY ADDRESS: N/A

ENGINEERING FIRM: PROTEC Consulting CONTACT: Ray Macy  
 ADDRESS: P.O. BOX 27007, 87125 PHONE: 833-0177

OWNER: ARGUS DEVELOPMENT CONTACT: Jeff Jesionowski  
 ADDRESS: 6400 UPTOWN, NE Suite 200-W PHONE: 889-3061

ARCHITECT: N/A CONTACT: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH  
 ADDRESS: P.O. BOX 30701, 87190 PHONE: 884-1990

CONTRACTOR: SUNDANCE MECHANICAL CONTACT: CARLOS  
 ADDRESS: 5920 Midway Park, NE PHONE: 345-2694

## TYPE OF SUBMITTAL:

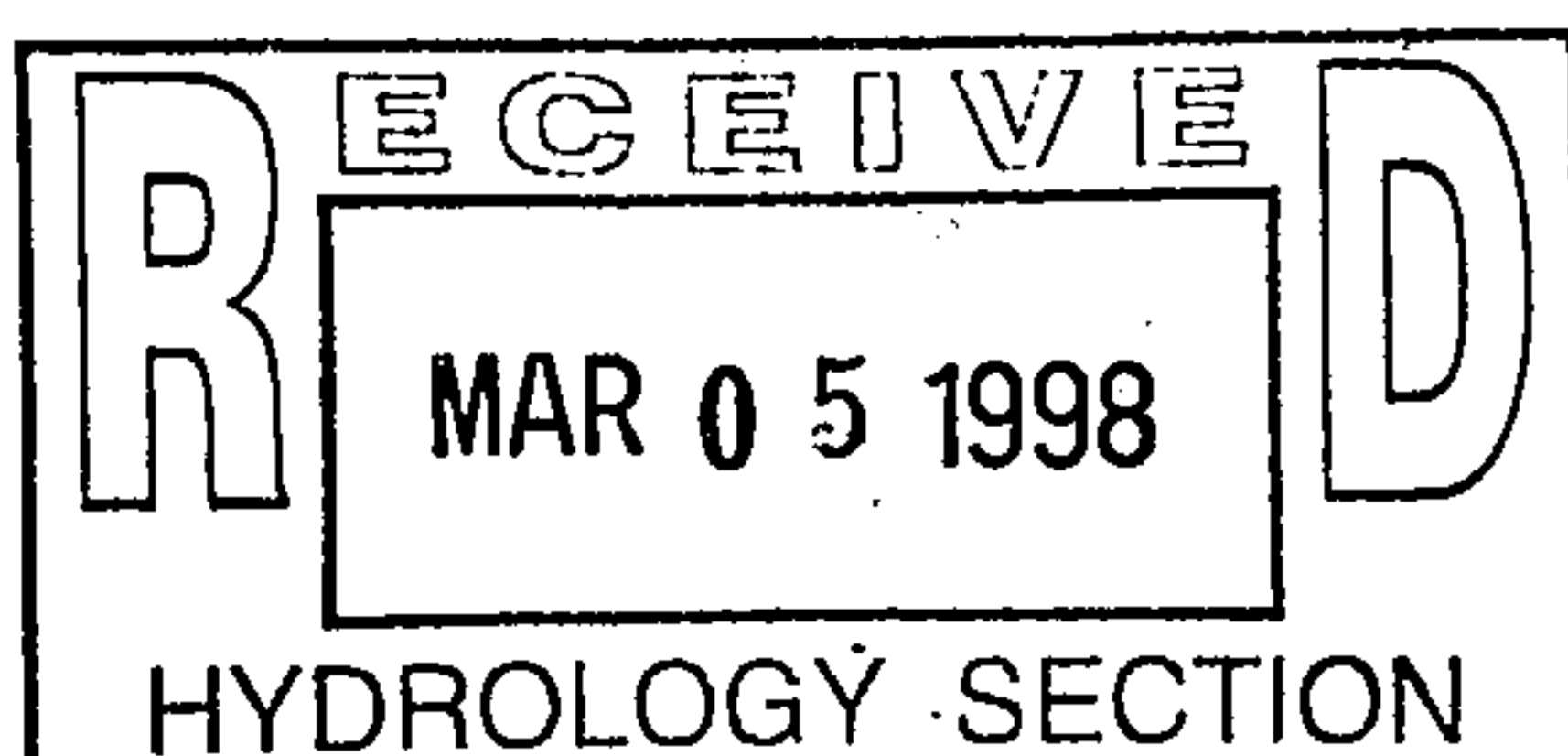
- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☒ ENGINEER'S CERTIFICATION
- ☐ OTHER \_\_\_\_\_

## PRE-DESIGN MEETING:

- ☐ YES
- ☐ NO
- ☐ COPY PROVIDED

## CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SKETCH PLAT APPROVAL
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
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- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY APPROVAL
- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ S.A.D. DRAINAGE REPORT
- ☐ DRAINAGE REQUIREMENTS
- ☐ SUBDIVISION CERTIFICATION
- ☒ OTHER GRADING & DRAINAGE PLAN CERTIFICATION (SPECIFY)



DATE SUBMITTED: March 5, 1998  
 BY: R.W. Macy



March 10, 1998

Ray Macy  
PROTEC CONSULTING  
P.O. Box 27007  
Albuquerque, New Mexico 87125

RE: ENGINEER CERTIFICATION FOR TANGLEWOOD SUBDIVISION (J10-D26)  
FINANCIAL GUARANTEE RELEASE CERTIFICATION STATEMENT DATED 3/4/98

Dear Mr. Macy:

Based on the information provided on your March 4, 1998 submittal, Engineer Certification for the above referenced site is acceptable.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia  
Terri Martin

File

Sincerely

*Bernie J. Montoya*  
Bernie J. Montoya CE  
Associate Engineer

Good for You, Albuquerque!



# PROTEC

Consulting

March 5, 1998

Professional Technologies and  
Design Development Services

Mr. Bernie J. Montoya  
Engineering Associate  
City of Albuquerque  
Public Works Department  
Hydrology Division  
P.O. Box 1293  
Albuquerque, NM 87103

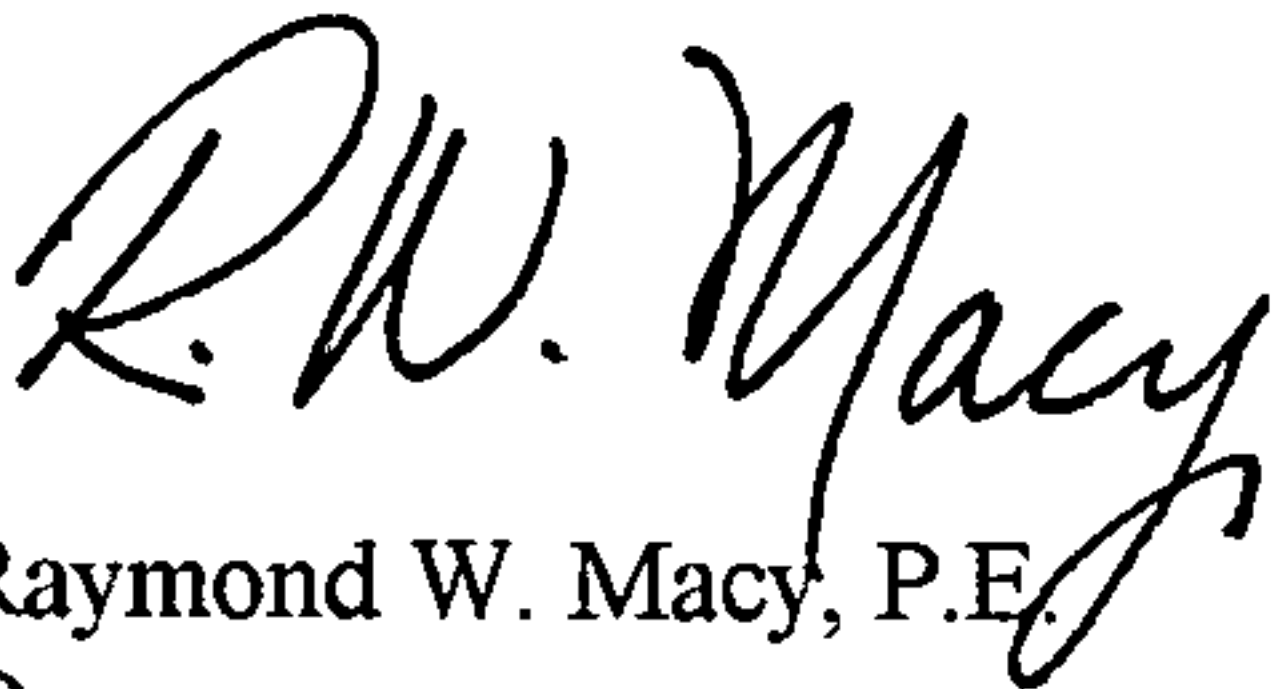
**Re: ENGINEER'S CERTIFICATION dated 3/4/98 - Tanglewood Subdivision Grading and Drainage Plan  
City Project No. 5760.81**

Dear Mr. Montoya:

Enclosed is a copy of the above referenced Grading and Drainage Plan with the Engineer's Certification dated March 4, 1998. Please let me know at your earliest convenience if the Certification is acceptable.

If you have any questions please contact me at (505) 833-0177.

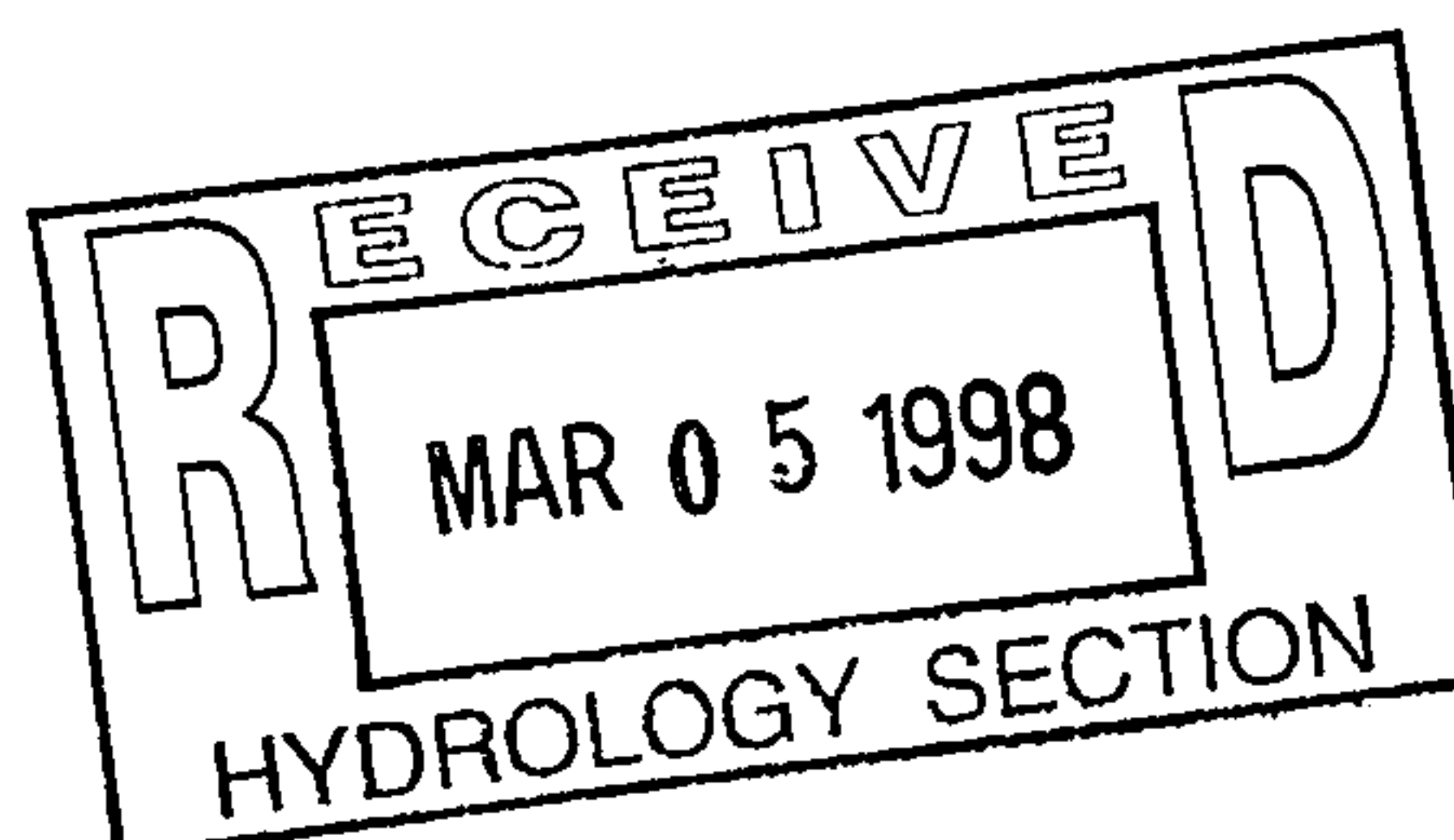
Sincerely,  
**PROTEC Consulting**

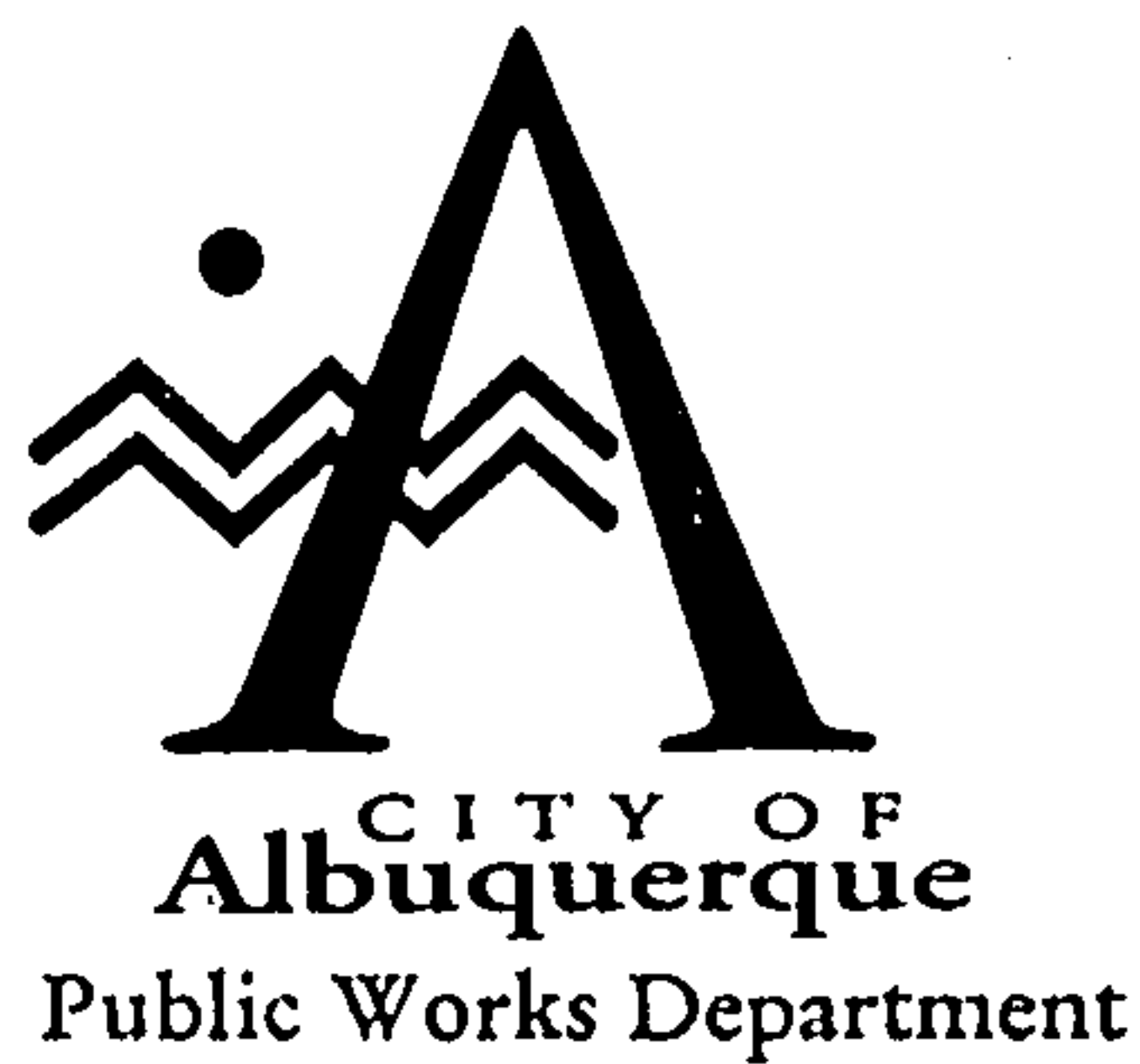


Raymond W. Macy, P.E.  
Owner

Enclosure

xc: Mr. Jeff Jesionowski, Argus Development Co.





Martin J. Chávez, Mayor  
August 26, 1997

Robert E. Gurulé, Director

Raymond W. Macy PE  
PROTEC Consulting  
P.O. Box 27007  
Albuquerque, New Mexico 87125

RE: REVISED DRAINAGE PLAN FOR TANGLEWOOD SUBDIVISION (J10-D26)  
REVISION DATED 8/10/97

Dear Mr. Macy:

Based on the information provided on your August 19, 1997 resubmittal, the above referenced site is approved for Preliminary Plat, Final Plat, and Rough Grading.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia  
File

Sincerely

*Bernie J. Montoya*  
Bernie J. Montoya CE  
Associate Engineer

Good for You, Albuquerque!

P.O. Box 1293, Albuquerque, New Mexico 87103





# DRAINAGE INFORMATION SHEET

PROJECT TITLE: TANGLEWOOD SUBDIVISION ZONE ATLAS/DRNG. FILE #: J-10 <sup>26</sup>  
 DRB #: 96-544 EPC #: \_\_\_\_\_ WORK ORDER #: \_\_\_\_\_  
 LEGAL DESCRIPTION: TRACTS 231 & 232, AIRPORT UNIT, TOWN OF ATRISCO GRANT  
 CITY ADDRESS: N/A

ENGINEERING FIRM: PROTEC Consulting CONTACT: RAY MACY  
 ADDRESS: P.O. BOX 27007 PHONE: 833-0177

OWNER: ADIL RIZVI CONTACT: ADIL RIZVI  
 ADDRESS: 7049 LUELLA ANNE, NE PHONE: 857-0467

ARCHITECT: \_\_\_\_\_ CONTACT: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ PHONE: T

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH  
 ADDRESS: P.O. BOX 30701 PHONE: 884-1990

CONTRACTOR: \_\_\_\_\_ CONTACT: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_

## TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☒ DRAINAGE PLAN (RESUBMITTAL #1)
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☒ GRADING PLAN (RESUBMITTAL #1)
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION
- ☐ OTHER \_\_\_\_\_

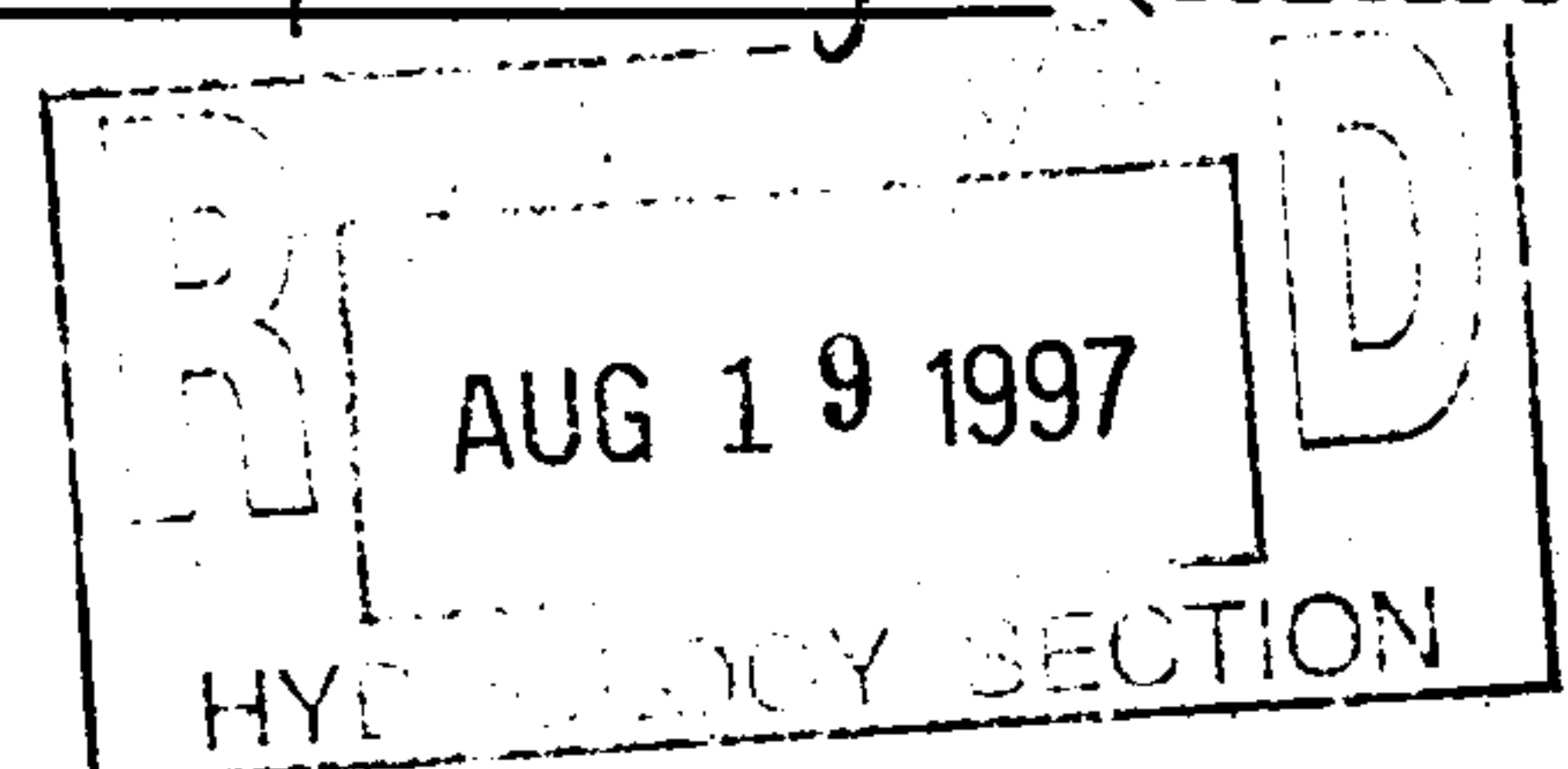
## PRE-DESIGN MEETING:

- ☒ YES
- ☐ NO
- ☐ COPY PROVIDED

## CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SKETCH PLAT APPROVAL
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- ☐ CERTIFICATE OF OCCUPANCY APPROVAL
- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ S.A.D. DRAINAGE REPORT
- ☐ DRAINAGE REQUIREMENTS
- ☐ SUBDIVISION CERTIFICATION
- ☐ OTHER Rough Grading (SPECIFY)

DATE SUBMITTED: AUGUST 19, 1997  
 BY: R.W. Macy



August 19, 1997

Mr. Bernie J. Montoya  
Engineering Associate  
City of Albuquerque  
Public Works Department  
Hydrology Division  
P.O. Box 1293  
Albuquerque, NM 87103

**Re: Revision No. 1 - Tanglewood Subdivision Grading and Drainage Plan**  
**Engineer's Stamp Dated August 10, 1997**  
**DRB 96-544**


Dear Mr. Montoya:

Please find enclosed Revision No. 1 to the above referenced Grading and Drainage Plan. The revision is to address comments in your letter of May 9, 1997 which required that pad elevations be shown to full-mean level designation and that more separation be provided between curb inlets on the west side of Tanglewood. Also, there is a revision to show a 6:1 exterior slope around the proposed retention pond, as requested by AMAFCA. In all other respects, the Grading and Drainage Plan is as previously submitted. Also, as you requested please find enclosed a copy of the approved Infrastructure List.

On August 6, 1997 a submittal was made for DRC review and comment of the construction plans for the Tanglewood Subdivision. The Grading and Drainage Plan included in the submitted drawings is the same as the one provided here. We expect the DRC meeting to take place on August 27, 1997.

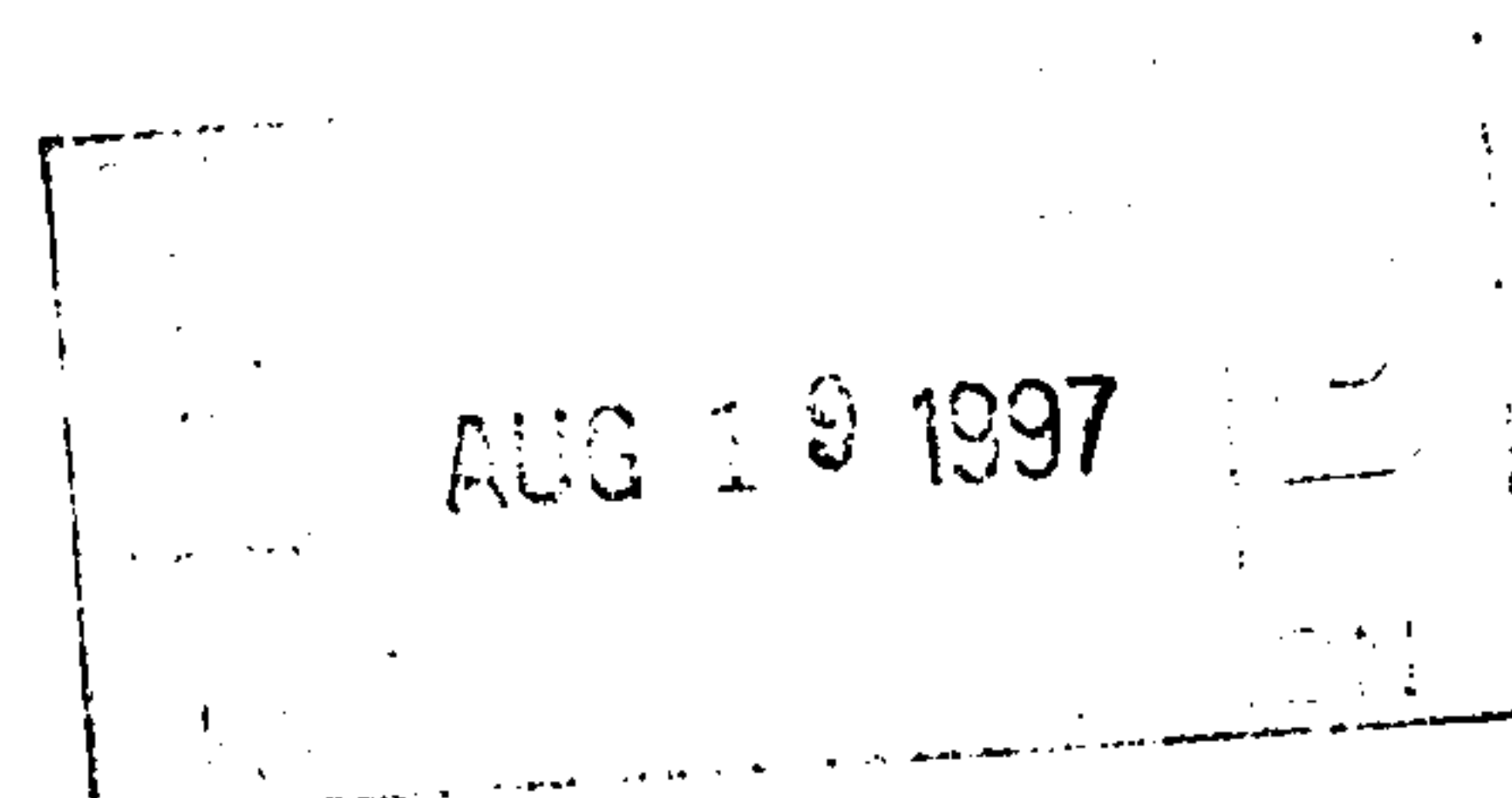
If you have any questions regarding the information provided here, please contact me at (505) 833-0177.

Sincerely,  
**PROTEC Consulting**

  
Raymond W. Macy, P.E.  
Owner

Enclosure

xc: Mr. Adil Rizvi



Tanglewood Subdivision  
 DRB Case No. 96-544  
 DRC Project No.  
 Date Submitted: 5/27/97  
 Prelim. Plat Approved: 5-27-97  
 Prelim Plat Expires:

FIGURE 12  
 EXHIBIT "A"  
TO SUBDIVISION IMPROVEMENT AGREEMENT  
 DEVELOPMENT REVIEW BOARD  
 REQUIRED INFRASTRUCTURE LISTING  
 DRB 96-544  
 TRACTS 231 AND 232, TOWN OF ATRISCO GRANT, AIRPORT UNIT  
 BEING REPLATED AS

**TANGLEWOOD SUBDIVISION**

Following is a summary of Public/Private Infrastructure required to be constructed or financially guaranteed to be constructed for the above development. This summary is not necessarily a complete listing. During the design process, if the City determines that appurtenant items have not been included in the summary, those items will be included in the listing and related financial guarantee, if the items normally are Subdivider responsibility. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility are the responsibility of the Subdivider and will be included in the financial guarantee provided by the City.

SIZE	IMPROVEMENT	LOCATION	FROM	TO
4'	PCC Sidewalk, So. Side	Hanover Road	East Property Line	West Property Line
32' F/F	Residential Paving	Tanglewood Rd.	Hanover Road	Tanbark Ct.
28' F/F	Residential Paving	"	Tanbark Ct.	Cul-de-Sac
Standard	C & G, Both Sides	"	Hanover Road	Lot #31 on Tanglewood
Mountable	C & G, Both Sides	"	Lot #31	Cul-de-Sac
4'	*PCC Sidewalk, Both Sides	"	Hanover Road	"
8"	Waterline	"	"	"
8"	Sanitary Sewer	"	"	"
18", 21", 24" and 36"	RCP Storm Drains, MH and Curb Inlets	Tanglewood Rd.	So. of Brendan Ct.	The Temp. Retention Pond
28' F/F	Residential Paving	Tanbark Ct.	Tanglewood Rd.	Cul-de-Sac
Mountable	C & G, Both Sides	"	"	"
4'	*PCC Sidewalk, Both Sides	"	"	"



SIZE	IMPROVEMENT	LOCATION	FROM	TO
6"	Waterline	Tanbark Ct	Tanglewood Rd	Cul-de-Sac
8"	Sanitary Sewer	"	"	"
28' F/F	Residential Paving	Brendan Ct.	Tanglewood Rd.	Cul-de-Sac
Mountable	C & G, Both Sides	"	"	"
4'	*PCC Sidewalk, Both Sides	"	"	"
6"	Waterline	"	"	"
8"	Sanitary Sewer	"	"	"

### MISCELLANEOUS

Street Lighting per DPM

Grading & Drainage: Certification per DPM (prior to release of financial guarantees). To include private perimeter and retaining walls as required on the approved Grading Plan.

23' wide concrete lined drainage and pedestrian access easement between Lots 31 & 32 per DPM Standards

Water improvements to include fire hydrants, valves and appurtenances per DPM.

A temporary storm water retention pond with chainlink fence and emergency spillway will be constructed within AMAFCA right-of-way adjacent to Lot 31. Other storm drain improvements include Type A and C inlets, and MH.

\* Sidewalks to be deferred, except along the south side of Hanover Road.

Prepared by:

*R.W. May*

Date:

*5/27/97*

\* \* \* \* \*

### Development Review Board Member Approval

Transportation Development

Date

*5-27-97*

Utility Development

Date

*5-27-97*

Parks & General Services

Date

*5-27-97*

City Engineer/AMAFCA

Date

*5-27-97*

DRB Chairman

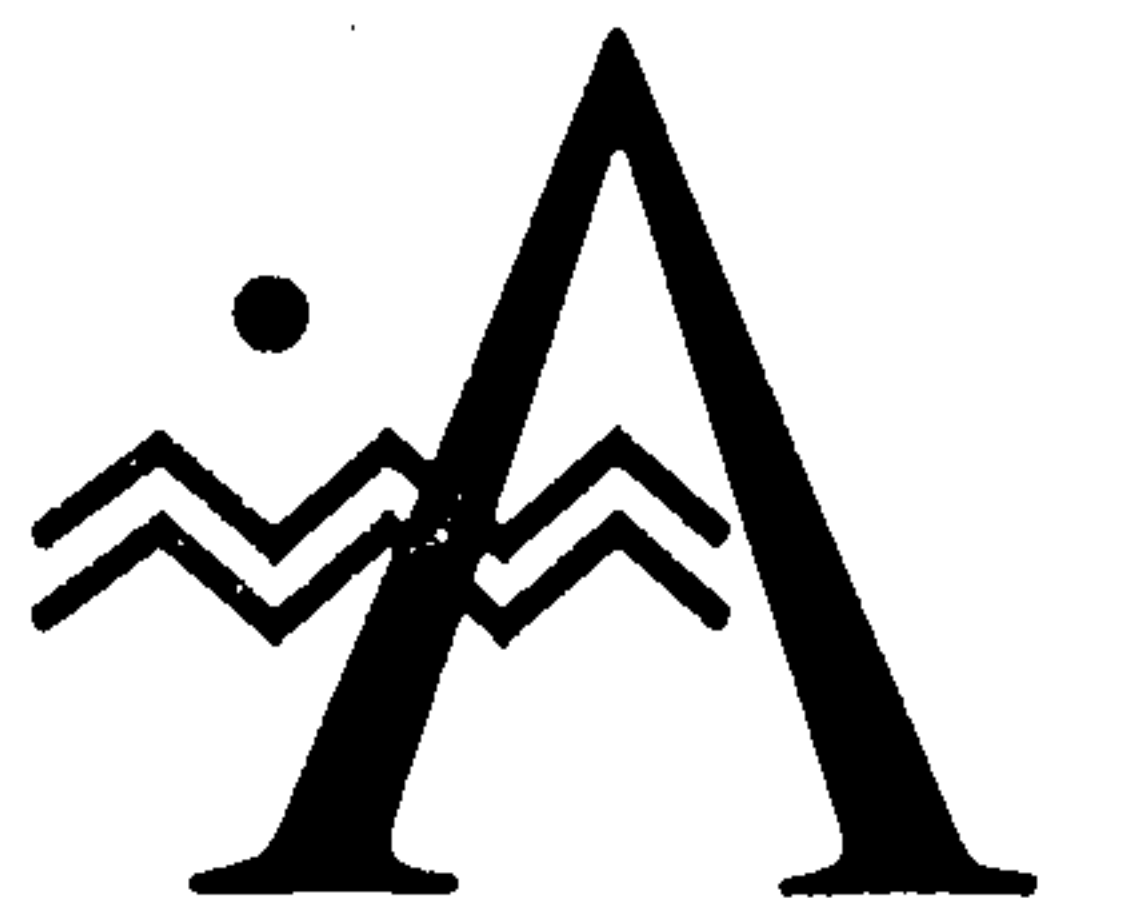
Date

*5/27/97*

AUG 19 1997

SECTION





CITY OF  
Albuquerque

Public Works Department

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

May 9, 1997

Raymond W. Macy PE  
PROTEC Consulting  
P.O. Box 27007  
Albuquerque, New Mexico 87125

RE: DRAINAGE PLAN FOR TANGLEWOOD SUBDIVISION (J10-D26) ENGINEER'S  
STAMP DATED 4/29/97

Dear Mr. Macy:

Based on the information provided on your April 29, 1997, listed are some concerns that will need to be addressed prior to final approval:

1. Pad elevations will need to be shown to full-mean-level designation.
2. More separation will be required on your proposed "A" inlets on the west side of Tangle-Wood.
3. Copy of the infrastructure list with your resubmittal.

Preliminary Plat approval is acceptable, the above referenced comments are prior to Final Plat, Building Permit and Work Order approval.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia

File

Sincerely

*Bernie J. Montoya*  
Bernie J. Montoya CE  
Associate Engineer

Good for You. Albuquerque!

P.O. Box 1293, Albuquerque, New Mexico 87103



# DRAINAGE INFORMATION SHEET

PROJECT TITLE: TANGLEWOOD SUB'N ZONE ATLAS/DRNG. FILE #: J-10/D26  
 DRB #: 96-544 EPC #: \_\_\_\_\_ WORK ORDER #: \_\_\_\_\_  
 LEGAL DESCRIPTION: TRACTS 231 & 232, AIRPORT UNIT, TOWN OF ATRISCO GRANT  
 CITY ADDRESS: N/A  
 ENGINEERING FIRM: PROTEC Consulting CONTACT: Ray Macy  
 ADDRESS: P.O. Box 27007 PHONE: 833-0177  
 OWNER: ADIL RIZVI CONTACT: ADIL RIZVI  
 ADDRESS: 7049 LUELLA ANNE, NE PHONE: 857-0467  
 ARCHITECT: \_\_\_\_\_ CONTACT: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 SURVEYOR: \_\_\_\_\_ CONTACT: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 CONTRACTOR: \_\_\_\_\_ CONTACT: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_

## TYPE OF SUBMITTAL:

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- ☒ GRADING PLAN
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- ☐ ENGINEER'S CERTIFICATION
- ☐ OTHER \_\_\_\_\_

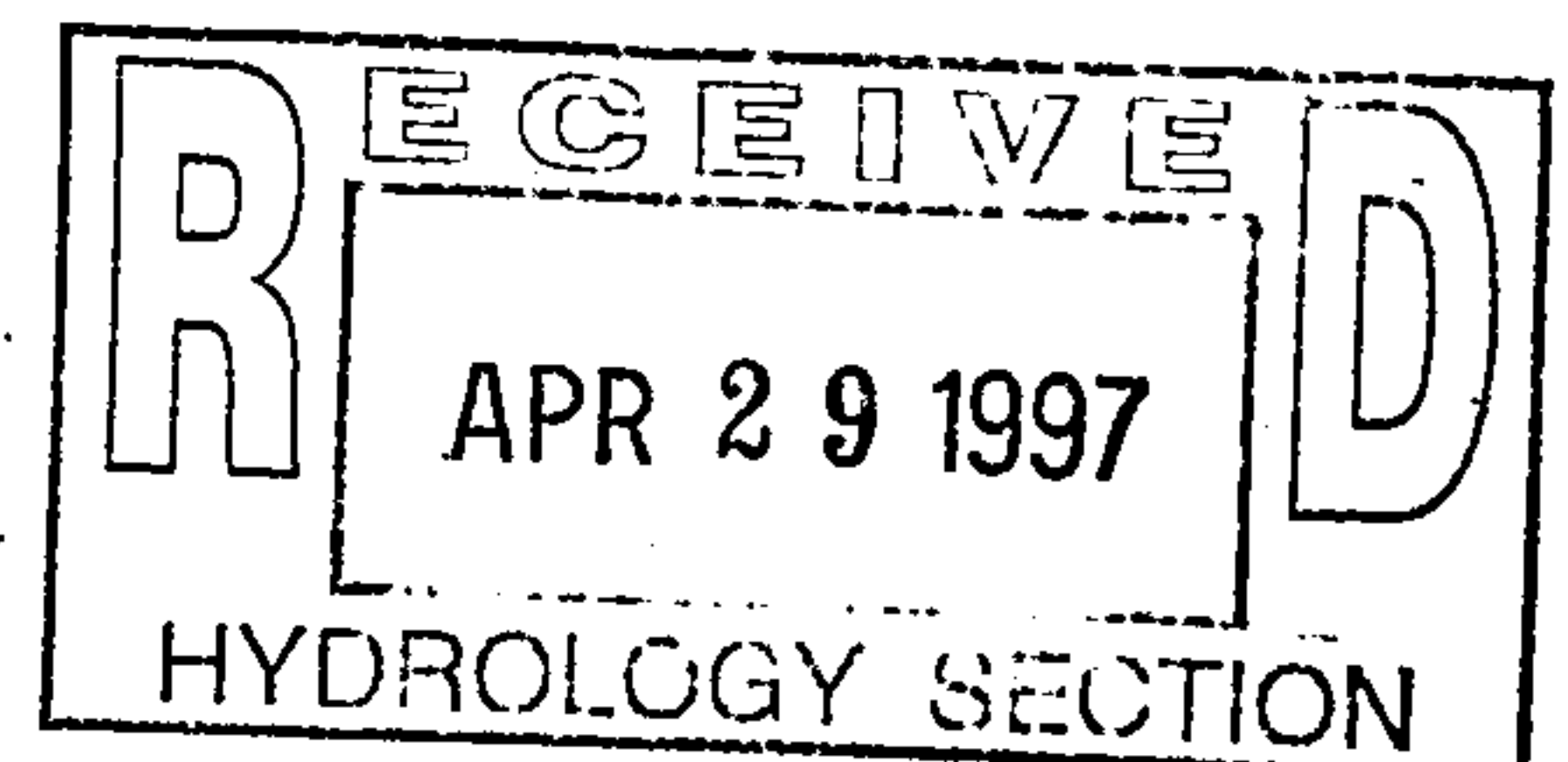
## PRE-DESIGN MEETING:

- ☒ YES
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- ☐ S.A.D. DRAINAGE REPORT
- ☐ DRAINAGE REQUIREMENTS
- ☐ SUBDIVISION CERTIFICATION
- ☐ OTHER \_\_\_\_\_ (SPECIFY)

DATE SUBMITTED: APRIL 29, 1997  
 BY: R.W. Macy



April 29, 1997

Mr. Bernie J. Montoya  
Engineering Associate  
City of Albuquerque  
Public Works Department  
Hydrology Division  
P.O. Box 1293  
Albuquerque, NM 87103

**Re: Tanglewood Subdivision Drainage Report & Grading and Drainage Plan  
Tracts 231 and 232 Airport Unit, Town of Atrisco Grant, Albuquerque, NM  
DRB 96-544**

Dear Mr. Montoya:

Please find enclosed for your review and comment, the above referenced drainage report and grading and drainage plan. We respectfully request your expedient review and approval of these documents.

Since a temporary drainage retention pond is to be constructed on AMAFCA right-of-way in conjunction with this project, we are also sending a copy of the above referenced drainage report and grading plan to AMAFCA for their review and comment.

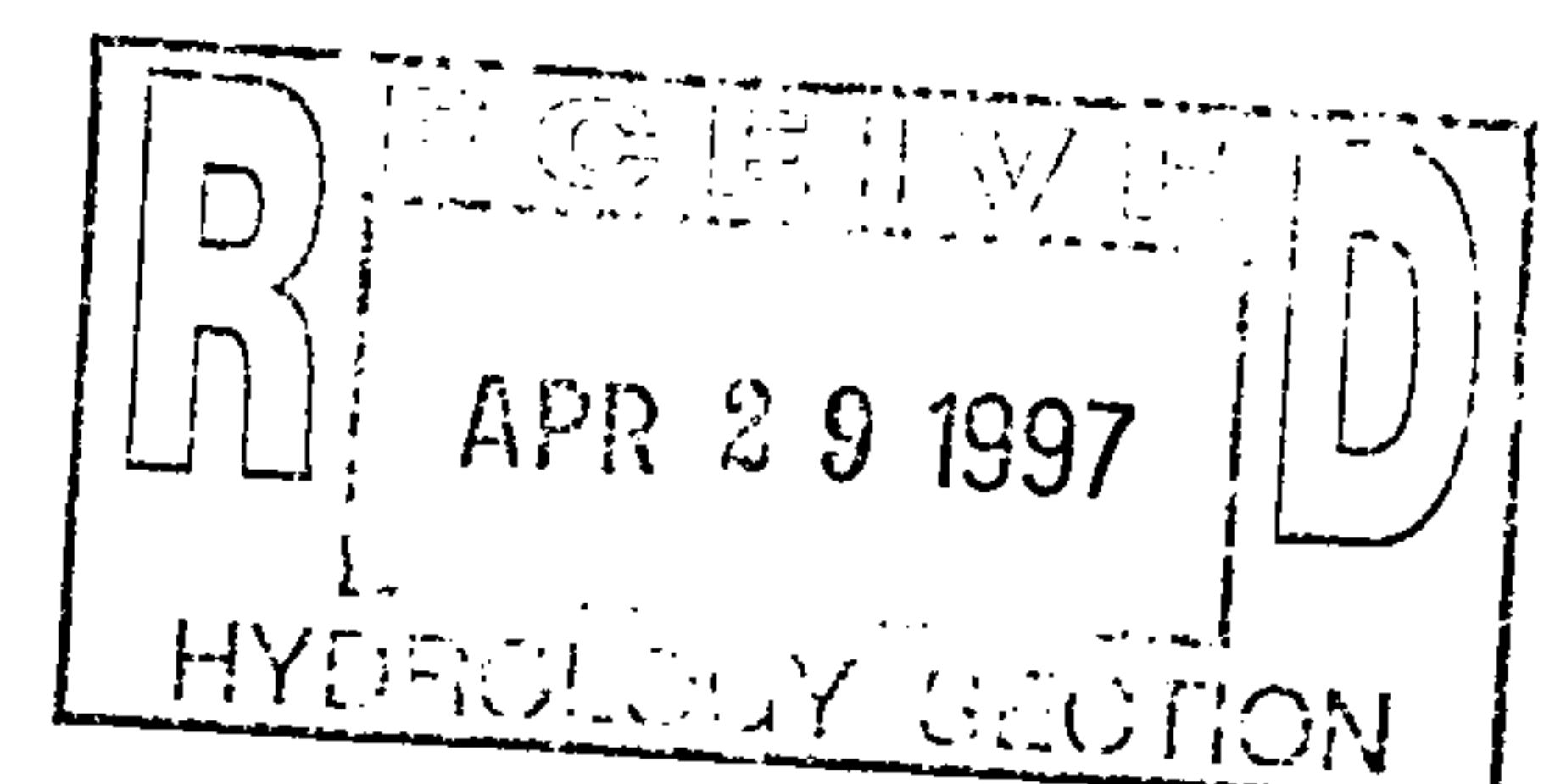
If you have any questions regarding the information provided here, please contact me at (505) 833-0177.

Sincerely,  
**PROTEC Consulting**

*R.W. Macy*  
Raymond W. Macy, P.E.  
Owner

Enclosure

xc: Mr. Adil Rizvi  
AMAFCA





# **DRAINAGE REPORT**

**FOR**

## **TANGLEWOOD SUBDIVISION**

**A 43 LOT SINGLE FAMILY  
RESIDENTIAL SUBDIVISION**

**PREPARED FOR:**

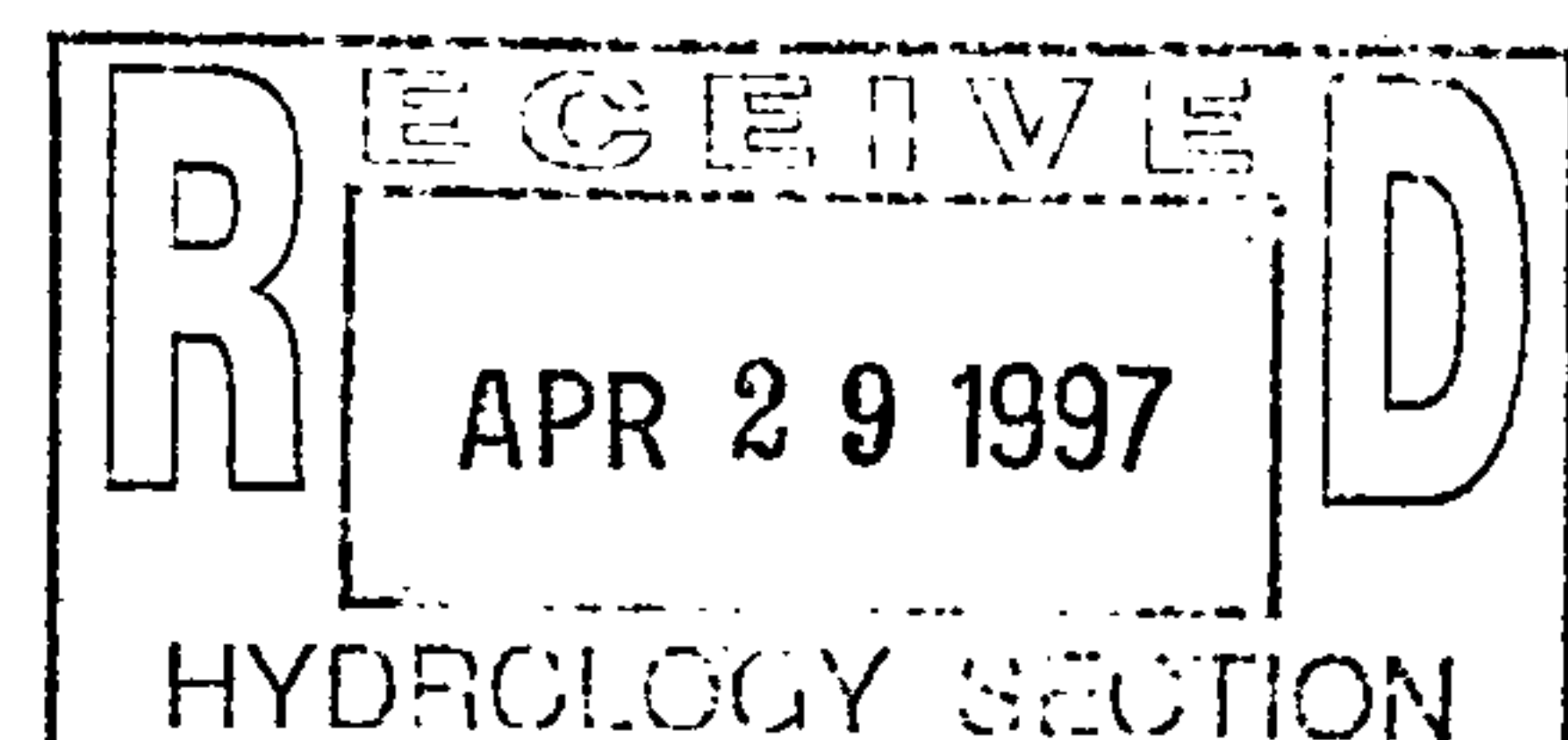
**ADIL RIZVI  
7049 LUELLA ANNE DRIVE, NE  
ALBUQUERQUE, NM 87112**

**PREPARED BY:**

**PROTEC CONSULTING  
PO BOX 27007  
ALBUQUERQUE, NM 87125  
(505) 833-0177**



**APRIL 7, 1997**



## **I. GENERAL**

### **I.1 Legal Description**

A certain tract of land, being and comprising a portion of Tract 231, Airport Unit, Town of Atrisco Grant, together with a portion of Tract 232, Airport Unit, Town of Atrisco Grant, as shown and designated on the plat thereof, filed in the Office of the County Clerk of Bernalillo County, New Mexico on December 5, 1944 in Map Book D, Folio 117, less and excepting that portion of said Tracts taken for the right-of-way of I-40 as the same is shown on the New Mexico State Highway Commission Right-of-way Map I-040-03(28) and as set forth in that certain Decree entered in District Court cause no A-38229 and recorded March 26, 1973 in Book Misc., Page 346, records of Bernalillo County, New Mexico and less and excepting that portion conveyed to the Albuquerque Metropolitan Flood Control Authority by that certain document recorded in Book BCR96-28, Page 6129 as document number 96-116539, records of Bernalillo County, New Mexico.

### **I.2 Engineer**

PROTEC Consulting  
PO Box 27007  
Albuquerque, NM 87125  
(505) 833-0177

### **I.3 Surveyor**

Aldrich Land Surveying, Inc.  
P.O. Box 30701  
Albuquerque, NM 87190  
(505) 884-1990

### **I.4 Benchmark**

8-J10 an N.M.S.H.C. brass cap stamped "HWY. R.W. STA. 1206+46.93, 8-J10" set in concrete post flush with the ground. Elevation 5130.013.

### **I.5 TBM**

South side of power pole at the southeast corner of Hanover Road and 76th Street, NW. Elevation 5135.31.

### **I.6 Zoning**

R-D (15 Du/Acre max.)

**I.7 Proposed**

43 Single Family Residential Lots

**I.8 Area**

7.2749 Acres more or less (316,894.64 square feet, more or less)

**I.9 Flood Hazard**

The proposed site (Tracts 231 and 232, Airport Unit, Town of Atrisco Grant) is located within Flood Hazard Zone C (areas of minimal flooding) as designated on the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Map (FIRM) Community-Panel No. 350002 0027 C (October 14, 1983).

**I.10 Location and Description**

The proposed 7.2749 acre site is undeveloped and mostly undisturbed at the writing of this Drainage Report. The extreme west edge of the site has been disturbed along the length of the west boundary line as a result of grading work for the adjacent Rosewood Subdivision, which is currently under construction. Existing ground cover across the site is comprised of sage brush and various native grasses. The proposed site is bounded on the north by Hanover Road, NW, on the south by Interstate 40, on the west by the Rosewood Subdivision, and on the east by 76th Street right-of-way, which is presently undeveloped. Hanover Road is developed and is characterized by a 40' wide paved roadway with standard curb and gutters on either side, a 21-inch sanitary sewer line, 12-inch water line, overhead power and buried cable TV and telephone lines. There are presently no sidewalks on Hanover Road adjacent to the proposed site. The proposed West Bluff Outfall Channel (West Bluff Storm Interceptor, Phase II) is planned to be located at the south edge of the proposed site inside of right-of-way recently acquired by AMAFCA. Plans for the outfall channel improvements are currently in the preliminary design phase, and construction is expected to begin sometime in 1997 or 1998.

**II HYDROLOGIC ANALYSIS****II.1 Existing Conditions**

In general, off-site flows are prevented from entering the proposed Tanglewood Subdivision by drainage improvements associated with Hanover Road, NW, the Rosewood Subdivision and the Unser/ I-40 off ramp.

Hanover Road, NW intercepts offsite flows originating from north of the proposed Tanglewood Subdivision and diverts them eastward to the Laurelwood Park Drainage Management Area at the northwest corner of Hanover Road, NW and 72nd Street, NW.



The Rosewood Subdivision is immediately west of the proposed site, and upon its completion will intercept all overland runoff that previously drained onto the proposed Tanglewood Subdivision. The Rosewood Subdivision has been designed to carry all storm runoff originating from within it to the south for containment in a temporary earthen drainage basin. This basin will eventually be removed and replaced with the development of residential lots when the West Bluff Outfall Channel is constructed along the north edge of the northbound Unser/I-40 off ramp. At that time, runoff from the Rosewood Subdivision will drain directly into the West Bluff Outfall Channel.

Runoff originating along the north edge of Interstate 40 west of the site is collected within the I-40 right-of-way at the north edge of the roadway. It is conveyed in a roadside ditch to the east until it reaches the southeast corner of Tract 233 where it is drained into a 30-inch diameter CMP culvert and directed southward to the south side of I-40.

Presently, runoff originating on the proposed Tanglewood Subdivision drains eastward primarily as overland flow with a gradient of approximately 2%. The 7.2749 acre site drains east to southeast where the runoff enters the north edge of the I-40 right of way. Some of the runoff originating on Tracts 231 and 232 drains southeast as overland flow to a 24-inch diameter CMP located near the south end of Tract 227. This runoff is conveyed southeast through the culvert under I-40. Runoff from Tracts 231 and 232 that is not intercepted by the 24-inch culvert continues eastward approximately 1500' farther in a swale along the north edge of I-40 where it drains into a double 5' x 3' concrete box culvert under the Interstate.

## II.2 Site Hydrology (Existing Conditions)

The site hydrology as determined herein is based on the methods and criteria presented in the City of Albuquerque Development Process Manual (DPM) - Volume 2, Section 22.2 Hydrology, dated January 1993. The proposed site is in Precipitation Zone 1 (west of the Rio Grande). The P360 (100-year, 6-hour storm event) has a depth of 2.20 inches as shown in Table A-2 of the DPM. Since the proposed site is primarily undeveloped and undisturbed land, then Land Treatment A is applicable. See Table A-4. Excess Precipitation E for this storm is 0.44 inches as shown in Table A-8. The Peak Discharge,  $Q_p$ , from the same storm is 1.29 cfs/acre. See Table A-9. The runoff volumes and peak discharge rates from the undeveloped site are determined as follows:

### 7.2749 Acres - Undeveloped Conditions on Tracts 231 and 232

$$\text{Volume(360)} = 0.44 \text{ in} \times 7.2749 \text{ ac} \times 1 \text{ ft}/12 \text{ in}$$

$$\text{Volume(360)} = .26675 \text{ ac-ft}$$

$$\text{Volume(360)} = 11,619.5 \text{ cf}$$

$$\text{Peak Discharge (100-yr, 6-hr)} = 1.29 \text{ cfs/acre} \times 7.2749 \text{ ac}$$

$$\text{Peak Discharge (100-yr, 6-hr)} = 9.38 \text{ cfs}$$



### **II.3 Proposed Improvements (Interim)**

Except for a small area at the entrance to the site at Hanover Road, the developed runoff will be collected from each lot and drained to the interior streets. The interior runoff will drain via the proposed streets to a low point in Tanglewood Road near where it curves to the southwest. From here the runoff will be collected in a storm drain pipe and directed into a temporary retention basin at the south end of the subdivision within the adjacent AMAFCA right-of-way.

All of Lot 43 and a portion of Lot 42 will drain northward onto Hanover Road, NW. This is a result of developing a water block in Tanglewood Road, NW at Hanover Road, NW to prevent runoff in Hanover from entering the site. The area draining onto Hanover Road (DB-1) is approximately 0.4224 acres.

Tanglewood Road serves as the primary collector of runoff from within the project. It will have standard curb and gutter from its northern end at Hanover Road past the low point where the road curves to the southwest. All of the remaining curbs in the project will be mountable.

All of the streets will have capacity to carry runoff from the 100-year, 6-hour storm event. Single "A," Single "C" and Double "C" inlets will be placed along Tanglewood Road as shown on the Grading and Drainage Plan to accommodate runoff that is two times the runoff from this storm event. This is done at the request of AMAFCA in order to provide an all weather pedestrian access from the subdivision to the proposed bicycle and pedestrian trail system along the north edge of the proposed West Bluff Outfall Channel. The 23' wide drainage easement between Tanglewood Road and the AMAFCA right-of-way will serve to contain the outfall storm pipe from the subdivision, and also provide an easement for pedestrians to access the trail system adjacent to the channel. Further, the easement will serve as a surface drainage overflow in the event the runoff exceeds that expected from twice the 100-year storm, or in case the subdivision's storm drain piping system is clogged and runoff is forced to leave the subdivision along the surface.

The temporary retention pond at the south end of the site will be sized to contain runoff from the 100-year, 6-hour storm event originating from within the Tanglewood Subdivision. The only interior drainage area that will not contribute runoff into the pond is DB-1. The retention pond will be of earthen construction with 3:1 interior slopes and a 4:1 exterior slope where necessary. It will have dumped riprap for erosion protection where the 36-inch storm drain line discharges into the pond from the subdivision. The pond will be enclosed with a five foot high chain link fence. Total pond depth will be 8 feet with a capacity of not less than 0.84 acre-feet. It will be equipped with an emergency spillway capable of discharging a flow rate equal to the 100-year, 6-hour runoff from the Tanglewood Subdivision. Discharge from the spillway will be into the I-40 right-of-way.

### **II.4 Proposed Improvements (Final Condition)**

In the final condition, when the West Bluff Outfall Channel is constructed, the temporary retention pond located inside the AMAFCA right-of-way will be removed. The 36-inch storm

pipe will be extended and connected to the north side of the West Bluff Outfall Channel, and so will the 23' wide concrete lined surface drainage easement. As discussed above, the drainage easement will serve three functions. First, it will provide for placement of the 36-inch RCP storm drain that will connect Tanglewood Road with the future West Bluff Outfall Channel. Second, it will serve as an emergency storm water (surface) outlet from the subdivision in the event the storm drain becomes clogged. Finally, it will serve as a pedestrian access easement to the future trail system planned for construction along the north edge of the future West Bluff Outfall Channel.

All other aspects of the drainage improvements will remain as described in II.3 above.

## II.5 General Site Hydrology for Developed Conditions

The total runoff volume and peak discharge rates from the developed site are based on the following information as presented in Chapter 22 of the Development Process Manual:

LAND TREATMENT CLASSIFICATION	EXCESS PRECIP (Inches)	PEAK DISCHARGE (cfs)
A	0.44	1.29
B	0.67	2.03
C	0.99	2.87
D	1.97	4.37

The table at the end of this report titled "DRAINAGE BASIN ANALYSIS - PEAK FLOW RATES and VOLUMES" provides the 100-year, 6-hour peak flow rates and 100-year runoff volumes from each of the developed interior basins (DB-1 through DB-8). The total area evaluated is 7.3867 acres, which is slightly greater than the original area of Tracts 231 and 232 (7.2749 acres) because of the inclusion of the area along the south edge of Hanover Road that is immediately south of the existing curb line. All of this additional area is within DB-1, which will drain onto Hanover Road and be carried to the Laurelwood Parkway Drainage Management Area. The effect of the runoff from DB-1 is to raise the anticipated ponded water surface level at the Laurelwood Parkway Drainage Management Area by less than 0.01 feet.

The temporary retention pond at the south end of the site will have sufficient capacity to contain the total runoff volume from basins DB-2 through DB-8, which amounts to 36,547 cubic feet (0.84 acre-feet).

## III SITE HYDRAULICS

### III.1 Site Hydraulics - Street Capacity

Except for the short one block segment of Tanglewood Road, NW between Tanbark Court and Hanover Road, all of the roads within the Tanglewood Subdivision are 28 feet from face-of-curb to face-of-curb. This one block segment has a street width of 32 feet face-to-face.



The City of Albuquerque DPM Plate 22.3 D-1 provides a determination of street flow capacity for a 32 foot wide street of varying street slopes and flow depths. It is understood that the capacity within a 28 foot wide street will be less than for a 32 foot wide street for depths which exceed the crown height (approximately 0.28 feet). Of particular interest here is the street capacity when the flow is just below the top of curb. It is desirable to place inlets and storm drains into the street system so that the street flow does not exceed the curb tops. This will minimize damage to the planter areas between the back of curb and sidewalk. Since the difference in flow capacity between the 28 foot wide street and 32 foot wide street is primarily due to the difference in flow areas, the results obtained from Plate 22.3 D-1 are scaled down by a factor equal to the ratio of the area of a 28 foot wide street divided by the area of a 32 foot wide street. At a flow depth of 0.67 feet, corresponding to a curb height of 8 inches for standard curb, this factor is approximately equal to 0.91. At a flow depth of 0.33 feet, corresponding to a curb height of 4 inches (mountable curb), the factor is equal to 0.978. The table at the end of this report titled "STREET DRAINAGE ANALYSIS" summarizes the anticipated half street flows resulting from the 100-year, 6-hour storm, and also lists the capacities of the corresponding streets.

### **III.2 Site Hydraulics - Curb Inlets and Storm Drain Pipe**

As discussed above, the storm drain system in the Tanglewood Subdivision will have capacity to carry runoff equal to twice that expected from the 100-year, 6-hour storm. This is to satisfy requirements established by AMAFCA.

A combination A-type and C-type inlet will be placed side-by-side on the west curb line of Tanglewood Road just south of Brandon Court. The 2x100-year runoff at this point is approximately 22.3 cfs, which is produced from DB-2 and DB-4. Each inlet will remove approximately 9 cfs (for a total of 18 cfs) according to the graph in Plate 22.3 D-5 of the DPM. Runoff collected by the inlet will be carried in a 21-inch RCP across the street to a single A-type inlet. The remaining 4.3 cfs will continue southward in the gutter to the sag point in the west curb line, then cross Tanglewood Road in a valley gutter and drain to a double "C" inlet located in front of the 23' wide drainage easement between lots 31 and 32.

As mentioned above, a single A-type inlet will be constructed on the east side of Tanglewood just south of Brandon Court. This inlet will collect the anticipated 7.6 cfs from DB-3. Together, this flow and the 18 cfs from the inlets across the street will be carried southward in a 24-inch pipe to a manhole at the east side of Tanglewood Road. From the manhole, the combined 25.6 cfs will flow in an 18-inch RCP at a grade of approximately 6 percent to the previously described double "C" inlet located in front of the 23' wide drainage easement. It is necessary for the 18-inch RCP to be constructed with the 6 percent grade so that it will be below the adjacent sanitary sewer, thereby allowing sanitary services to connect to the 8-inch sewer main.

The double "C" inlet adjacent to the 23' wide drainage easement will be located in a sag and collect runoff from DB-5, DB-6, DB-7 and the 4.3 cfs that was carried over from DB-2 and DB-4. The flow entering this inlet from the surface is 22.1 cfs. The inlet was analyzed for both orifice flow and weir flow. Weir flow was the most limiting at 24 cfs with a head above the inlet of 0.67'. The calculation is summarized as follows:

$$Q = 3.367 \times L \times H^{3/2}$$

where: Q = weir flow rate, cfs  
 L = length of the weir crest, ft  
 H = head on the weir, 0.67 ft (assumed)

solving :

$$Q = 3.367 \times 13 \times 0.67^{3/2}$$

$$Q = 24 \text{ cfs} > 22.1 \text{ (OK)}$$

A table at the end of this report titled "STORM DRAIN PIPE EVALUATION" summarizes the storm drain system providing information on pipe diameters, length of pipe, pipe slopes, pipe inverts, velocities, flow rates and capacities.

### III.3 Site Hydraulics - Emergency Spillway

The retention pond emergency spillway will be capable of passing the 100-year, 6-hour peak discharge flow rate arriving in the pond from the Tanglewood Subdivision. Discharge will be into the roadside ditch at the north edge of the I-40 right-of-way. The determination of the peak flow rate is made by adding the individual peak flow rates from DB-2 through DB-8. See the table at the end of this report which describes peak flow rates for each drainage basin. The spillway geometry is determined in the following:

#### Trapezoidal (Broad Crested) Weir

$$Q = 3.367 L H^{3/2}$$

where: Q = weir flow rate, 24.09 cfs  
 L = length of the weir crest, ft  
 H = head on the weir, 0.5 ft (assumed)

solving L:

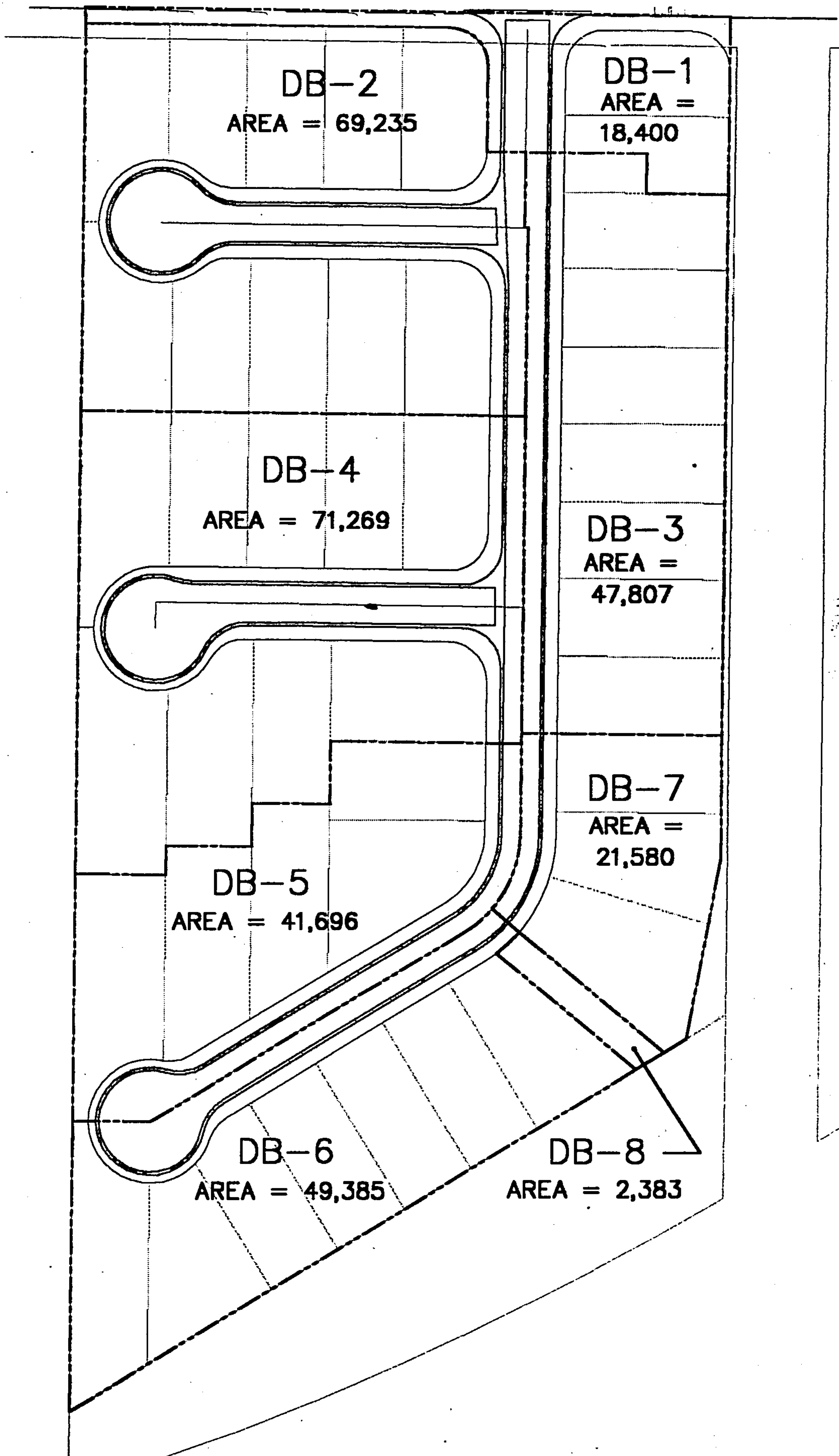
$$L = Q / (3.367 H^{3/2})$$

$$L = 20.24 \text{ ft} \quad \text{use 22 ft (minimum)}$$

### III.4 Site Hydraulics - Temporary Retention Pond

The temporary retention pond located within the AMAFCA right-of-way at the south end of the site will have a holding capacity of 36,750 cf. The dimensions at the top of the pond will be 70' x 115'. The top of pond will be set at elevation 5132.5 and the bottom of pond at elevation 5124.5. The weir crest will be at elevation 5132.0. The pond will have 3:1 interior slopes and 4:1 exterior slopes where required. The top width of the pond will be 5'. A 5' high chainlink fence will be constructed around the perimeter of the pond. The pipe outfall and area below where the concrete lined drainage easement enter the pond will be protected from erosion with an 18-inch thick layer of dumped, plain rip rap.





# DRAINAGE BASIN ANALYSIS - PEAK FLOW RATES and VOLUMES - PAGE 1 OF 2

BASIN ID	* CLASS	EXCESS (inches)	PEAK (cfs/acre)	AREA (acres)	TOT AREA (acres)	WT E (inches)	VOLUME 6 hour (cubic ft)	RUNOFF 100yr, 6hr (cfs)
DB-1	A	0.44	1.29	0				
DB-1	B	0.67	2.03	0.1322				
DB-1	C	0.99	2.87	0.0524				
DB-1	D	1.97	4.37	0.2378				
DB-1					0.4224	1.442	2210.365	1.458
DB-2	A	0.44	1.29	0				
DB-2	B	0.67	2.03	0.4975				
DB-2	C	0.99	2.87	0.1971				
DB-2	D	1.97	4.37	0.8948				
DB-2					1.5894	1.442	48317.092	5.486
DB-3	A	0.44	1.29	0				
DB-3	B	0.67	2.03	0.3435				
DB-3	C	0.99	2.87	0.1361				
DB-3	D	1.97	4.37	0.6179				
DB-3					1.0975	1.442	5743.194	3.788
DB-4	A	0.44	1.29	0				
DB-4	B	0.67	2.03	0.5121				
DB-4	C	0.99	2.87	0.2029				
DB-4	D	1.97	4.37	0.9211				
DB-4					1.6361	1.442	8561.518	5.647
DB-5	A	0.44	1.29	0				
DB-5	B	0.67	2.03	0.2996				
DB-5	C	0.99	2.87	0.1187				
DB-5	D	1.97	4.37	0.5389				
DB-5					0.9572	1.442	5008.957	3.304

# **DRAINAGE BASIN ANALYSIS - PEAK FLOW RATES and VOLUMES - PAGE 2 OF 2**

BASIN ID	* CLASS	EXCESS (inches)	PEAK (cfs/acre)	AREA (acres)	TOT AREA (acres)	WT E (inches)	VOLUME 6 hour (cubic ft)	RUNOFF 100yr, 6hr (cfs)
DB-6	A	0.44	1.29	0				
DB-6	B	0.67	2.03	0.3548				
DB-6	C	0.99	2.87	0.1406				
DB-6	D	1.97	4.37	0.6383				
DB-6					1.1337	1.442	5932.730	3.913
DB-7	A	0.44	1.29	0				
DB-7	B	0.67	2.03	0.1551				
DB-7	C	0.99	2.87	0.0614				
DB-7	D	1.97	4.37	0.2789				
DB-7					0.4954	1.442	2592.314	1.710
DB-8	A	0.44	1.29	0				
DB-8	B	0.67	2.03	0				
DB-8	C	0.99	2.87	0				
DB-8	D	1.97	4.37	0.0547				
DB-8					0.0547	1.970	391.165	0.239

\* Refers to Land Treatment Classification per DPM Chapter 22



## STREET DRAINAGE ANALYSIS

Street	F to F (ft)	Max SI (percent)	Min SI (percent)	Max Crn (percent)	Curb Ht. (ft)	Half St. Capacity (cfs)	St. Width Correct F.	Modif. Half St. Cap (cfs)	Max Half St. Flow (cfs)
TANGLEWOOD (N)	28	0.92	0.58	2	0.67	22	0.91	20.02	5.65
TANGLEWOOD (S)	28	1.6	1.42	2	0.33	4.2	0.978	4.1	3.91
TANBARK COURT	28	3.72	1	2	0.33	3.6	0.978	3.52	2.75
BRANDON COURT	28	3.57	1.39	2	0.33	4.1	0.978	4.01	2.83

### NOTES:

1. The half street capacity is based on the minimum street grade and Plate 22.3 D-1 in the DPM
2. The street width correction factor is applied to the street capacity when the street width is less than that shown in Plate 22.3 D-1. The modified half street capacity is for a 28' wide street
3. The maximum half street flow is based on the 100-year, 6-hour storm runoff

## STORM DRAIN PIPE EVALUATION

PIPE (seg)	DIA (in)	n	SL (ft/ft)	AREA (sf)	WT PER (ft)	HYD. R (ft)	R**2/3	S**1/2	VEL (fps)	Q CAP (cfs)	Q REQ'D (cfs)	LENGTH (ft)	INV IN (elev)	INV OUT (elev)
A	21	0.013	0.014	2.4053	5.49779	0.4375	0.5763	0.1183	7.7946	18.748	18	35	30.8	30.3
B	24	0.013	0.014	3.1416	6.28319	0.5	0.63	0.1183	8.5203	26.767	25.6	60	30.24	29.4
C	18	0.013	0.06	1.7671	4.71239	0.375	0.52	0.2449	14.56	25.73	25.6	55	29.3	26
D	36	0.013	0.0052	7.0686	9.42478	0.75	0.8255	0.0721	6.8043	48.097	47.7	132	26	25.32
E	36	0.013	0.0052	7.0686	9.42478	0.75	0.8255	0.0721	6.8043	48.097	47.7	35	25.2	25

**NOTE:** The Q REQ'D is twice the 100 year flow rate per conditions established by AMAFCA for this project