# CITY OF ALBUQUERQUE



June 7, 2005

Mr. Michael Brewer, P.E. CH2M HILL, INC. 6001 Indian School Rd. NE Suite 350 Albuquerque, NM 87110

ARROYO DEL OSO NONPOTABLE WATER PUMP STATION Re:

5201 Wyoming Bd. NE

Approval of Permanent Certificate of Occupancy (C.O.)

Engineer's Stamp dated 05/19/2003 (F-19/D37)

Certification dated 06/06/2005

Dear Mike:

P.O. Box 1293

www.cabq.gov

Based upon the information provided in your submittal received 06/07/2005, the Albuquerque

above referenced certification is approved for release of Permanent Certificate of

Occupancy by Hydrology.

New Mexico 87103 If you have any questions, you can contact me at 924-3982.

Sincerely, (Internet Pottello Arlene V. Portillo

Plan Checker, Planning Dept. - Hydrology

Development and Building Services

Phyllis Villanueva

File

#### DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

	T TITLE: <u>Arroyo Del Oso Nonp</u> 2-DRB-01329	otable Water Pump Station EPC#:02EPC00441			P/DRG. FILE #: <u>F-19</u> / RDER#: <u>CIP No. 5267.0</u>	
	SCRIPTION: <u>Eastern End, Arro</u> RESS: <u>5201 Wyoming Blvd., N.E.</u>	yo Del Oso Park				
Α	RING FIRM: CH2M HILL, Inc. DDRESS: 6001 Indian School Rd. ITY, STATE: Albuquerque, NM	<u>., N.E. Suite 350</u>			T: <u>Michael Brewer</u> (505) 884-5600 E: <u>87110</u>	
	CITY OF ALBUQUERQ DDRESS: <u>P.O. Box 1293</u> CITY, STATE: <u>Albuquerque, NM</u>	<u>UE – PWD</u>			T: <u>James Chavez</u> (505) 768-2561 E: <u>87102</u>	
Α	CT: Molzen-Corbin & Associates DDRESS: 2701 Miles Rd., S.E. STY, STATE: Albuquerque, NM				T: <u>John Pate</u> (505) 242-5700 E: <u>87106</u>	
A	OR: Bradbury Stamm Construction  DDRESS: 3700 Paseo del Norte  SITY, STATE: Albuquerque, NM				T: <u>Jesse Vigil</u> (505) 765-1200 E: <u>87113</u>	
Α	CTOR: <u>Bradbury Stamm Construct</u> DDRESS: <u>3700 Paseo del Norte I</u> STY, STATE: <u>Albuquerque, NM</u>				T: <u>Bill McCarty</u> (505) 765-1200 E: <u>87113</u>	
CHECK TY	YPE OF SUBMITTAL:		CHEC	K TYPE OF A	PPROVAL SOUGHT:	
	PRAINAGE REPORT PRAINAGE PLAN 1 <sup>st</sup> SUBMITTAL, PRAINAGE PLAN RESUBMITTAL CONCEPTUAL GRADING & DRAIN PRADING PLAN PROSION CONTROL PLAN P	NAGE PLAN (DROLOGY) (TCL)		PRELIMINAL S. DEV. PLA S. DEV. PLA SECTOR PL FINAL PLAT FOUNDATIC BUILDING P CERTIFICAT GRADING P PAVING PEI	CIAL GUARANTEE REL RY PLAT APPROVAL AN FOR SUB'D. APPROVAL AN APPROVAL APPROVAL ON PERMIT APPROVAL PERMIT APPROVAL TE OF OCCUPANCY (PI PERMIT APPROVAL RMIT APPROVAL PERMIT APPROVAL DER APPROVAL DER APPROVAL DER APPROVAL DER APPROVAL DECIFY)	VAL APPROVAL ERM.)
□ Y N	RE-DESIGN CONFERENCE ATTE ES IO OPY PROVIDED	<u>NDED</u> :			D	05
DATE SUE	3MITTED: <u>6/6/2005</u>	В	<i>(:</i>	2/18	HYDROŁOGY S	ECTION
Paguasta	for approvals of Site Develope	nent Plane and/or Subdivici	on Diate	e chall be acc	companied by a drains	ac cubmitta

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.



# City of Albuquerque P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 25, 2003

Mike Brewer, PE CH2M Hill, Inc. 6001 Indian School NE, Ste 350 Albuquerque, NM 87110

Re: ADO NPSWRP Pump Station and Reservoirs Grading and Drainage Plan

Engineer's Stamp dated 5-19-03 (F19/D37)

Dear Mr. Brewer,

Based upon the information provided in your submittal dated 7-15-03, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

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

Sincerely,

Bradley L. Bingham, PE

Sr. Engineer, Planning Dept.

Development and Building Services

C: file

#### DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV. 1/28/2003rd) PROJECT TITLE: Arroyo Del Oso Nonpotable Water Pump Station ZONE MAP/DRG. FILE #:F-19 DRB #: 02-DRB-01329 EPC#:02EPC00441 WORK ORDER#:CIP No. 5267.07 LEGAL DESCRIPTION: : Eastern End, Arroyo Del Oso Park CITY ADDRESS:5201 Wyoming Blvd., N.E. ENGINEERING FIRM: CH2M HILL, Inc. CONTACT: Michael Brewer ADDRESS: 6001 Indian School Rd., N.E. Suite 350 PHONE: (505) 884-5600 CITY, STATE: Albuquerque, NM ZIP CODE: 87110 CITY OF ALBUQUERQUE - PWD OWNER: CONTACT: James Chavez ADDRESS: P.O. Box 1293 PHONE: (505) 768-2561 CITY, STATE: Albuquerque, NM ZIP CODE: <u>87102</u> ARCHITECT: Molzen-Corbin & Associates CONTACT: John Pate ADDRESS: 2701 Miles Rd., S.E. PHONE: (505) 242-5700 CITY, STATE: Albuquerque, NM **ZIP CODE: 87106** Pacific Western Technologies, Ltd. SURVEYOR: CONTACT: Philip Turner ADDRESS: 7007 Wyoming Blvd., N.C. Bldg. C PHONE: (505) 294-5051 CITY, STATE: Albuquerque, NM **ZIP CODE: 87109** CONTRACTOR: CONTACT: ADDRESS: PHONE: CITY, STATE: \_\_\_\_ ZIP CODE: CHECK TYPE OF SUBMITTAL: CHECK TYPE OF APPROVAL SOUGHT: DRAINAGE REPORT SIA / FINANCIAL GUARANTEE RELEASE DRAINAGE PLAN 1<sup>st</sup> SUBMITTAL, REQUIRES TCL or equal PRELIMINARY PLAT APPROVAL DRAINAGE PLAN RESUBMITTAL S. DEV. PLAN FOR SUB'D. APPROVAL CONCEPTUAL GRADING & DRAINAGE PLAN S. DEV. PLAN FOR BLDG. PERMIT APPROVAL GRADING PLAN SECTOR PLAN APPROVAL EROSION CONTROL PLAN FINAL PLAT APPROVAL **ENGINEER'S CERTIFICATION (HYDROLOGY)** FOUNDATION PERMIT APPROVAL CLOMR/LOMR BUILDING PERMIT APPROVAL TRAFFIC CIRCULATION LAYOUT (TCL) CERTIFICATE OF OCCUPANCY (PERM.) **ENGINEERS CERTIFICATION (TCL)** CERTIFICATE OF OCCUPANCY (TEMP.) ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN) GRADING PERMIT APPROVAL OTHER PAVING PERMIT APPROVAL WORK ORDER APPROVAL OTHER (SPECIFY)

#### WAS A PRE-DESIGN CONFERENCE ATTENDED:

YES

NO
COPY PROVIDED



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.

D 国 区 区 区 D JUL 1 5 2003 D HXDBOLOGY SECTION

£



# City of Albuquerque P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 23, 2002

Mike Brewer, PE CH2M Hill, Inc. 6001 Indian School NE, Ste 350 Albuquerque, NM 87110

Re: ADO NPSWRP Pump Station and Reservoirs Add'l Drainage Calculations Engineer's Stamp not provided (F19/D37)

Dear Mr. Brewer,

Based upon the information provided in your submittal dated 9-4-02, the above referenced calculations are adequate for Work Order requirements.

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

Sincerely,

Bradley L. Bingham, PE

Sr. Engineer, Planning Dept.

Development and Building Services

C: file

## DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV. 1/11/2002)

DRB #:EP	4p 374. C#:	ZONE ! Work	MAP/DRG. FILE #: <u>F/9/D37</u> ORDER#:
LEGAL DESCRIPTION:CITY ADDRESS:			ONDEN#.
ADDRESS: 6001 ALIG	LL LSchool 1	VE # 350	CONTACT: Mike Brewer PHONE:
			ZIP CODE:
WNER: ADDRESS: CITY, STATE:			CONTACT:PHONE:
RCHITECT:			ZIP CODE:
ADDRESS:CITY, STATE:			CONTACT:PHONE:
URVEYOR:			
ADDRESSCITY, STATE:		<del></del>	CONTACT:PHONE:ZIP CODE:
ONTRACTOR:ADDRESS:		<u> </u>	CONTACT:
CITY, STATE:			PHONE:ZIP CODE:
HECK TYPE OF SUBMITTAL:  DRAINAGE REPORT  DRAINAGE PLAN  CONCEPTUAL GRADING & DRAINAG  K GRADING PLAN  EROSION CONTROL PLAN  ENGINEER'S CERTIFICATION (HYDRO  CLOMR/LOMR  TRAFFIC CIRCULATION LAYOUT (TCL  ENGINEERS CERTIFICATION (TCL)  ENGINEERS CERTIFICATION (DRB AF  OTHER	DLOGY)  PPR. SITE PLAN)	SIA / FI PRELIN S. DEV S. DEV SECTO FINAL F FOUND BUILDIN CERTIF CERTIF GRADIN PAVING WORK	OF APPROVAL SOUGHT: INANCIAL GUARANTEE RELEASE MINARY PLAT APPROVAL  '. PLAN FOR SUB'D. APPROVAL  '. PLAN FOR BLDG. PERMIT APPROVAL  OR PLAN APPROVAL  PLAT APPROVAL  OATION PERMIT APPROVAL  FICATE OF OCCUPANCY (PERM.)  FICATE OF OCCUPANCY (TEMP.)  NG PERMIT APPROVAL  OR PERMIT APPROVAL  ORDER APPROVAL  (SPECIFY)
AS A PRE-DESIGN CONFERENCE ATTENDE YES NO COPY PROVIDED	<u>D</u> :		
TE SUBMITTED: 9-4-02	BY·		

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 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 constituting five (5) acres or



CH2M HILL

6001 Indian School Road NE

Suite 350

Albuquerque, NM

87110-4140

Tel 505.884.5600

Fax 505.883.7507

September 4, 2002

148973.NP.06.DP

Bradley L. Bingham, PE P.O. Box 1293 Albuquerque, NM 87103

#### Dear Mr. Bingham:

In response to your letter written May 30, 2002 Re: ADO NPSWRP Pump Station and Reservoirs Drainage Report Engineer's Stamp dated 5-13-02 (F19/D37), you approved the report for Site Plan for building Permit for action by the DRB. Approval for Work Order or Building Permit is contingent on addressing the following two items:

- The design of the gravel road will include some slope modifications near Wyoming.
   Please show all necessary regrading.
- 2. Since you are connecting to existing inlets and storm drain, verification of extra capacity will be needed to those systems. Provide all calculations, inverts and basin maps as needed to support this project. Will the existing inlet grate east of the reservoir be lowered due to your design?

This purpose of this letter is to addresses each of the two items above and provide the necessary documentation for approval of the drainage plan/report for Work Order or Building Permit through the DRC process.

#### Item 1

The final grading and drainage plans to be submitted to DRC will include the necessary slope modifications along Wyoming, associated with the new gravel roadway construction.

#### Item 2

An analysis of the existing storm drain system, in the vicinity of the proposed development, indicates that existing storm drain network has enough capacity to handle the additional flow from the proposed development. Each pipe segment associated with the storm drain system was analyzed to determine the impacts that the proposed development would have on the system. Attachment A shows the run-off calculations for the existing and developed basins. Attachment B shows the Basin information for the existing and developed conditions, pipe locations, and inlet locations. Attachment C and D are as-built drawings of the Arroyo Del Oso Park showing the existing drainage basins, storm drain pipe inverts, and inlet elevations used for the calculations.

Bradley L. Bingham, PE Page 2 September 4, 2002 148973.NP.06

Based on an analysis of the existing storm drain system with the pipes flowing full:

- Pipe 1 has an extra capacity of 18.14 cfs after developed conditions.
- Pipe 2 has an extra capacity of 17.67 cfs after developed conditions.
- Pipe 3 has an extra capacity of 0.57 cfs after developed conditions.
- Pipe 4 has an extra capacity of 18.21 cfs after developed conditions.

The flowing full capacity of Pipe 3 and Pipe 4 were calculated assuming the worst case scenario of a 100-Year 6-Hour storm event and the reservoir overflowing at the maximum pump capacity from the downstream pump station. This situation would be highly unlikely but in the event that it would occur the existing storm drain system would be able to convey the total flow.

The existing inlet grate, east of the reservoir, will not be lowered due to the new design.

If you have any questions, you can contact me at 884-5600

Sincerely,

CH2M HILL

Michael Brewer, P.E.

c: James Chavez, P.E. – City of Albuquerque/PWD File

#### **ATTACHMENT A**

The following calculations quantify the change in runoff flow and volumes due to the proposed site improvements.

#### **Ground Cover Information**

From SCS Bernalillo County Soil Survey

Sheet 21 Soil Type for This Site is: EmD – Embudo – gravelly fine sandy loam

Hydrologic Soil Group: B

From DPM Section 22.2 Table A-1: Precipitation Zone for this site is **Zone 3** (Between San

Mateo and Eubank, North of Interstate 40; and between San Mateo and the East boundary of Range 4 East, South

of Interstate 40)

#### Land Treatments Present:

**A** - Soil uncompacted by human activity with 0-10% slopes. Native grasses, weeds and shrubs in typical densities with minimal disturbance to grading, ground cover and infiltration capacity.

**B** - Irrigated lawns (slope < 10%), native grasses, weeds and shrubs, and soil uncompacted by human activity (slope 10%<20%)

C - Soil compacted by human activity. Minimal vegetation, vacant lots, unpaved parking/roads, gravel or rock on plastic.

D - Impervious areas, pavement and roofs.

#### Time of Concentration

T<sub>c</sub> (Inches/Hour) per

DPM Section 22.2 = 0.2 hours = 12 minutes

#### 100 Year 6-Hour Depth (R)

"R" Depth (Inches) per

DPM Section 22.2 Table A-2 = 2.60 inches

Rational Method Discharge (cfs): Q = CiA

Where: C = Runoff Coefficient (from DPM Section 22.2 Table A-11)

i = From DPM Section 22.2 Table A-10 = 5.38 in/hr

A = Area (acres)

SCS Method Volume (cf):  $V = 3630 \times \Sigma(E \times A)$ 

Where E = Excess Precipitation "E", from DPM Section 22.2, Table A-8.

A = Area (acres)

3630 = conversion factor (acre-feet to cubic feet)

## **Existing Basin B1**

## Site Data

Area = 0.32 ac.

Land Treatments	Area	Runoff	Excess		
Undeveloped, Uncompacted Area (Treatment A)	(acres) 0.00	Coefficient (C) 0.35	Precipitation (E) 0.66		
Landscaped Area (Treatment B)	0.00	0.48	0.92		
Undeveloped Area (Treatment C)	0.16	0.64	1.29		
Impervious Area (Treatment D)	0.16	0.93	2.36		
$Q_{100} = \Sigma(\text{CiA}) = (0.35)(5.38)(0.00) + (0.48)(5.38)(0.00) + (0.64)(5.38)(0.16) + (0.93)(5.38)(0.16)$					
$Q_{100} = 1.35 \text{ cfs}$					

## **Existing Basin B2**

## Site Data

Area = 0.51 ac.

Land Treatments	Area	Runoff	Excess Dracinitation (E)
Undeveloped, Uncompacted Area (Treatment A)	(acres) 0.00	Coefficient (C) 0.35	Precipitation (E) 0.66
Landscaped Area (Treatment B)	0.51	0.48	0.92
Undeveloped Area (Treatment C)	0.00	0.64	1.29
Impervious Area (Treatment D)	0.00	0.93	2.36
$Q_{100} = \Sigma(CiA) = (0.35)(5.38)(0.00)$	+(0.48)(5.3	8)(0.51) + (0.64)(5.38	3)(0.00) + (0.93)(5.38)(0.00)
$Q_{100} = 1.32 \text{ cfs}$			

# Fully Developed Conditions Basin B1

## Site Data

Area = 0.30 ac.

Land Treatments	Area	Runoff	Excess
	(acres)	Coefficient (C)	Precipitation (E)
Undeveloped, Uncompacted	0.00	0.35	0.66
Area (Treatment A)			

				ATTACHMENTA		
Landscaped Area (Treatment B)	0.00	0.48	0.92			
Undeveloped Area (Treatment C)	0.15	0.64	1.29			
Impervious Area (Treatment D)	0.15	0.93	2.36			
$Q_{100} = \Sigma(\text{CiA}) = (0.35)(5.38)(0.00) + (0.48)(5.38)(0.00) + (0.64)(5.38)(0.15) + (0.93)(5.38)(0.15)$						
$Q_{100} = 1.27 \text{ cfs}$						

## **Fully Developed Conditions Basin B2**

## Site Data

Area = 0.71 ac.

Land Treatments	Area	Runoff	Excess Draginitation (E)		
Undeveloped, Uncompacted Area (Treatment A)	(acres) 0.19	Coefficient (C) 0.35	Precipitation (E) 0.66		
Landscaped Area (Treatment B)	0.00	0.48	0.92		
Undeveloped Area (Treatment C)	0.33	0.64	1.29		
Impervious Area (Treatment D)	0.19	0.93	2.36		
$Q_{100} = \Sigma(\text{CiA}) = (0.35)(5.38)(0.19) + (0.48)(5.38)(0.00) + (0.64)(5.38)(0.33) + (0.93)(5.38)(0.19)$					
$Q_{100} = 2.44 \text{ cfs}$					

## **Capacity Comparison**

Total Q of existing basins = 1.35 cfs + 1.32 cfs = 2.67 cfs

Total Q of fully developed basins = 1.27 cfs + 2.44 cfs = 3.71 cfs

Flowing Full Capacity of Pipe 2 (Draining B2) = (Hazen-Williams) Q=1.318 x C x  $R^{0.63}$  x  $S^{0.54}$  x A C = Hazen-Williams Coefficient R = Hydraulic Radius = Area/WP S = Slope A = Cross Sectional Area WP = Wetted Perimeter  $Q = 1.318 \times 120 \times 0.375^{0.63} \times 0.024^{0.54} \times 1.7671 = 20.11 \text{ cfs}$ 

Flowing Full Capacity of Pipe 1 (Draining B1 and B2 = (Hazen-Williams) Q=1.318 x C x  $R^{0.63}$  x  $S^{0.54}$  x A Q = 1.318 x  $R^{0.63}$  x  $R^{0.63}$  x  $R^{0.63}$  x  $R^{0.63}$  x  $R^{0.63}$  x  $R^{0.64}$  x  $R^{0.64}$  x  $R^{0.65}$  x  $R^{0.6$ 

Flowing Full Capacity of Pipe 2 – Developed Basin B2 = 20.11 cfs – 2.44 cfs = 17.67 cfs extra capacity

Flowing Full Capacity of Pipe 1 – Total Q of fully developed basins (B1 + B2) =  $\cdot$ 21.85cfs – 3.71 cfs = 18.14 cfs extra capacity

## Capacity Comparison for Reservoir Overflow

Overflow of proposed reservoir = 5.54 MGD = 8.57 cfs

 $Q_{100}$  of Basin flowing into Pipe 3 = 9.08 cfs

Q total for Pipe 3 = 8.57 cfs + 9.08 cfs = 17.65 cfs

Flowing Full Capacity of Pipe 3 =

(Hazen-Williams) Q=1.318 x C x  $R^{0.63}$  x  $S^{0.54}$  x A

C = Hazen-Williams Coefficient

R = Hydraulic Radius = Area/WP

S = Slope

A = Cross Sectional Area

WP = Wetted Perimeter

Q = 1.318 x 120 x  $0.375^{0.63}$  x  $0.02^{0.54}$  x 1.7671 = 18.22 cfs

Flowing Full Capacity of Pipe 3 - Q total for Pipe 3 = 18.22 cfs - 17.65 cfs = 0.57 cfs extra capacity

 $Q_{100}$  of Basin flowing into Pipe  $4 = Q_{100}$  of Basin flowing into Pipe 3 + Overflow of proposed reservoir  $+ Q_{100}$  Basin flowing into Inlet 3 = 9.08 cfs + 8.57 cfs + 4.00 cfs = 21.65 cfs

```
Flowing Full Capacity of Pipe 4 =

(Hazen-Williams) Q=1.318 x C x R^{0.63} x S^{0.54} x A

C = Hazen-Williams Coefficient

R = Hydraulic Radius = Area/WP

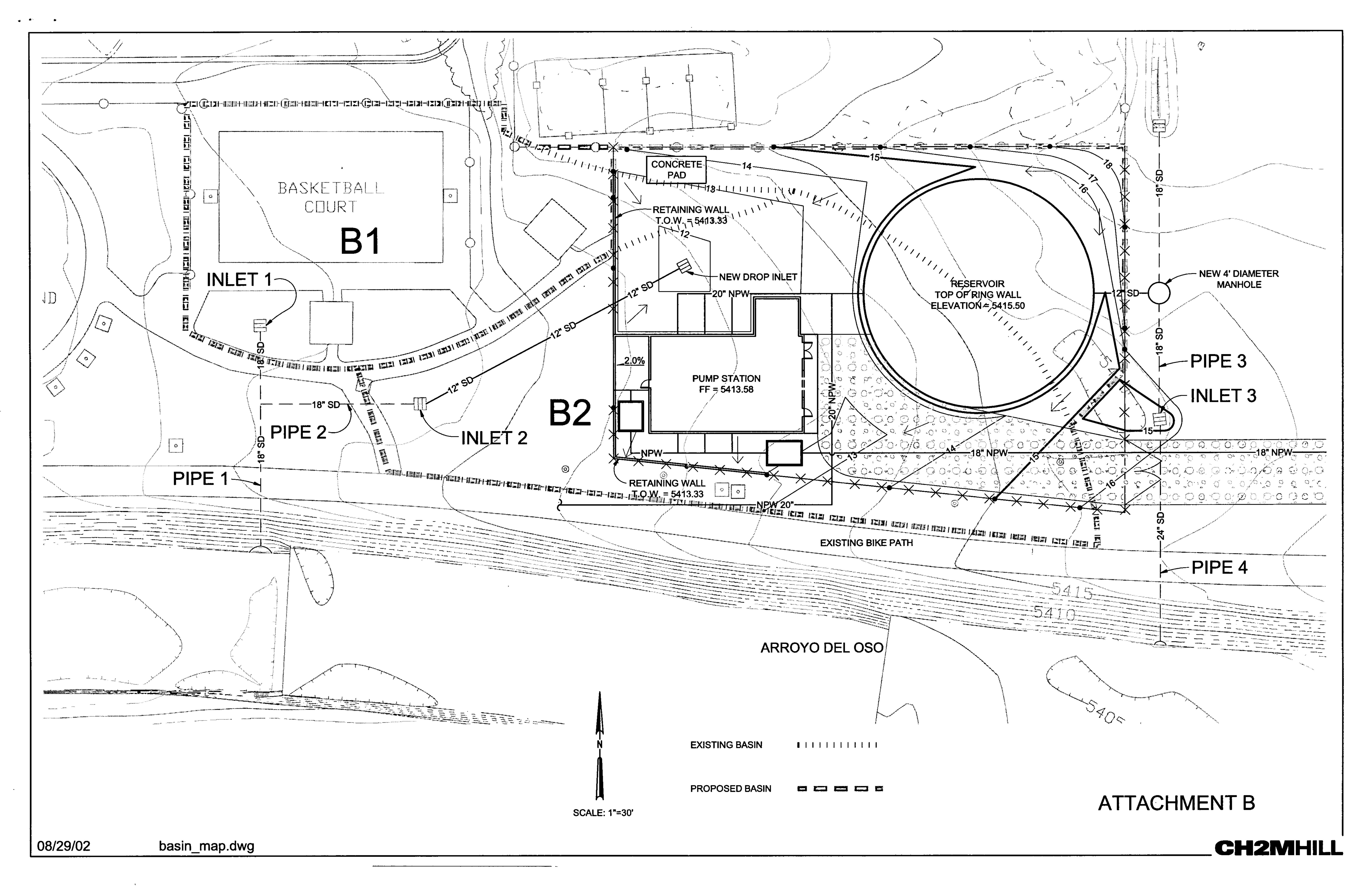
S = Slope

A = Cross Sectional Area

WP = Wetted Perimeter

Q = 1.318 x 120 x 0.50^{0.63} x 0.021^{0.54} x 3.1416 = 39.86 cfs
```

Flowing Full Capacity of Pipe 4 - Q total for Pipe 4 = 39.86 cfs - 21.65 cfs = 18.21 cfs extra capacity





# City of Albuquerque P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 30, 2002

Mike Brewer, PE CH2M Hill, Inc. 6001 Indian School NE, Ste 350 Albuquerque, NM 87110

ADO NPSWRP Pump Station and Reservoirs Drainage Report Re: Engineer's Stamp dated 5-13-02 (F19/D37)

Dear Mr. Brewer,

Based upon the information provided in your submittal dated 5-14-02, the above referenced report is approved for Site Plan for Building Permit action by the DRB. Prior to Work Order or Building Permit, please address the following:

- The design of the gravel road will include some slope modifications near Wyoming. Please show all necessary regrading.
- Since you are connecting to existing inlets and storm drain, verification of extra capacity will be needed in those systems. Provide all calculations, inverts and basin maps as needed to support this project. Will the existing inlet grate east of the reservoir be lowered due to your design?

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

Sincerely,

Bradley L. Bingham, PE

Sr. Engineer, PWD

Development and Building Services

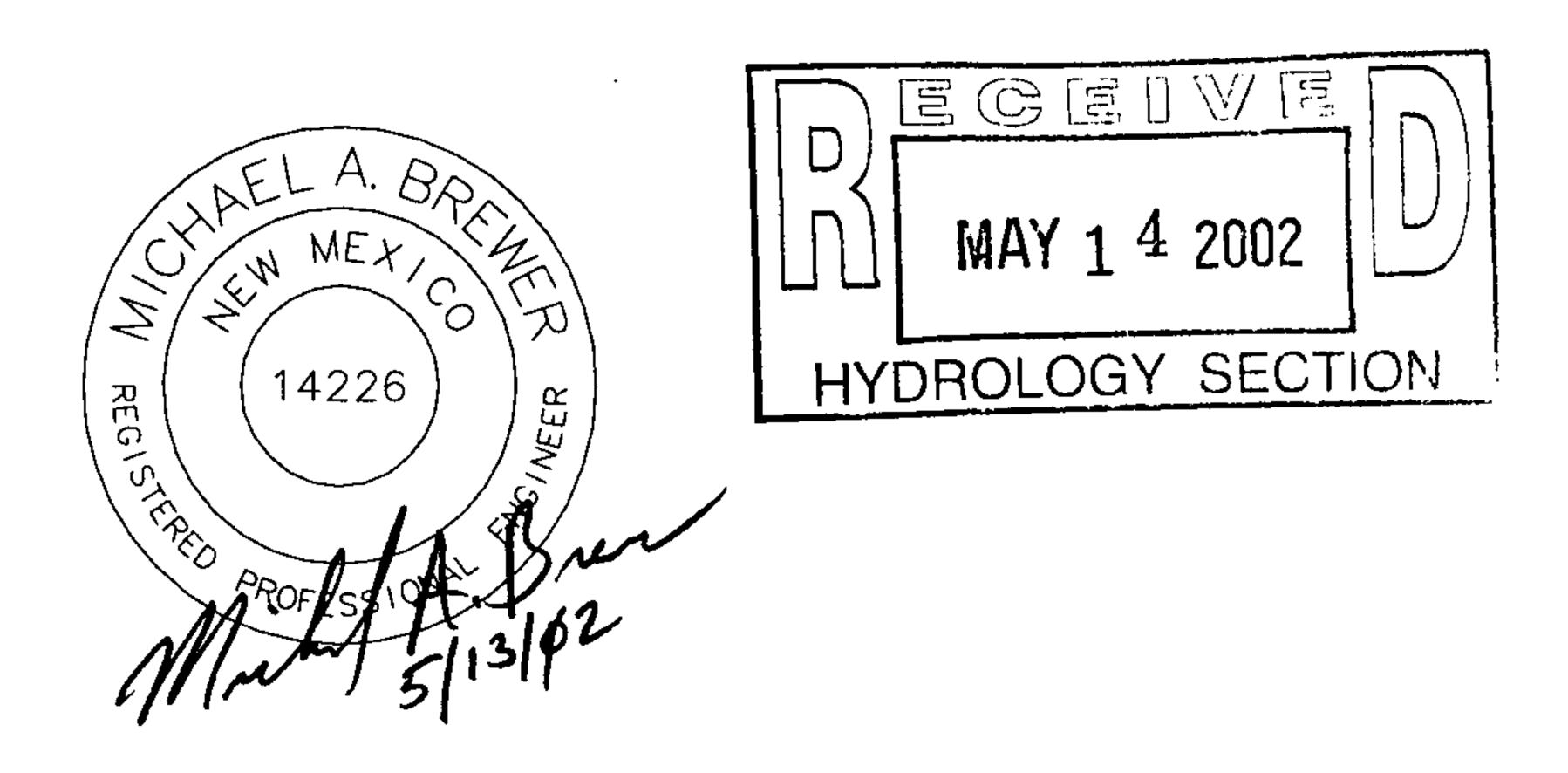
#### DRAINAGE INFORMATION SHEET

APPLICANTE NAME CITY OF ALPHOLIEDOLIE PLUD	CC DIMID CTATION
APPLICANTS NAME: <u>CITY OF ALBUQUERQUE PUBL</u>	IC WORKS DEPT. ZONE ATLAS/GRNG. FILE #: F-19-Z
	02EPC 00441 WORK ORDER #:
LEGAL DESCRIPTION: PORTION OF ARROYO DEL O	
CITY ADDRESS:SEE ABOVE	
ENGINERRING FIRM: CH2M HILL INC.	CONTACT: MIKE BREWER
ADDRESS: 6001 INDIAN SCHOOL RD. N.E., SUITE 350	
OWNER: CITY OF ALBUQUERQUE – PWD	CONTACT: JAMES CHAVEZ
ADDRESS: P.O. BOX 1293, ALBUQUERQUE, NM 87102	PHONE: 505 768-2562
ARCHITECT: MOLZEN CORBIN & ASSOCIATES	CONTACT: JOHN PATE
ADDRESS: 2701 MILES ROAD SE.	PHONE: 242-5700
SURVEYOR: PACIFIC WESTERN TECHNOLOGIES	CONTACT: PHILIP W. TUNER
ADDRESS: 8338A COMANCHE N.E. ABQ, NM 87110	
CONTRACTOR:	CONTACT:
ADDRESS:	
TYPE OF SUBMITTAL:	CHECK TYPE OF APPROVAL SOUGHT
DRAINAGE REPORT	SKETCH PLAT APPROVAL
DRAINAGE PLAN	☐ PRELIMINARY PLAT APPROVAL
CONCEPTUAL GRADING & DRAINAGE PLAN	S. DEV. PLAN FOR SUB'D APPROVAL
GRADING PLAN	S. DEV PLAN FOR BLDG. PERMIT APPROVAL
BROSION CONTROL PLAN	SECTOR PLAN APPROVAL
] ENGINEER'S CERTIFICATION	☐ FINAL PLAT APPROVAL
OTHER	☐ FOUNDATION PERMIT APPROVAL
	BUILDING PERMIT APPROVAL
RE-DESIGN MEETING:	CERTIFICATE OF OCCUPANCY APPROVAL
] YES	GRADING PERMIT APPROVAL
NO _	☐ PAVING PERMIT APPROVAL
COPY PROVIDED	S.A.D. DRAINAGE REPORT
	DRAINAGE REQUIREMENTS
	SUBDIVISION CERTIFICATION
	OTHERWORK ORDER(SPECIFY)
ATE SUBMITTED: 5/13/02	
BY: Mit A. Brew	
	MAY 1 4 2002
EVISED 02/98	HYDROLOGY SECTION

# CITY OF ALBUQUERQUE BERNALILLO COUNTY

# NORTH I-25 RECLAMATION/REUSE SYSTEM NONPOTABLE SURFACE WATER RECLAMATION PROJECT

# DRAINAGE REPORT FOR ARROYO DEL OSO RESERVOIR AND PUMP STATION SITE



The following items concerning the Arroyo Del Oso Reservoir site grading and drainage improvements are contained herein:

- Vicinity Map
- Site Grading and Drainage Plan for Proposed Improvements at the Arroyo Del Oso Reservoir and Pump Station Site
- Calculations

The site of the proposed improvements, as shown on the Site Vicinity Map (Attachment A), lies to the north of the Police Substation on the north side of the Bear Canyon Arroyo drainage easement and approximately 320 feet west of the centerline of Wyoming Blvd.

Access to the proposed site will be provided via a gravel surfaced road connecting to an existing access road located between existing tennis courts and Wyoming Blvd.

Improvements to the site include construction of a 0.55-million-gallon, above-grade nonpotable water storage reservoir, pump station, associated piping and appurtenances, site grading, gravel road, storm sewer modifications, water and sewer connections, and landscaping.

The runoff calculation (see Attachment C) analyze the existing and fully developed conditions for the 100-year, 6-hour rainfall event for the proposed site development. The Rational Method was used to quantify the peak rate of discharge and the Soil Conservation Service (SCS) method was used to quantify the volume of runoff. Both methods were used in accordance with the City of Albuquerque *Development Process Manual* (DPM), section 22.2.

As shown on the FEMA Flood Boundary and Floodway Map, Panel 17, dated 9/15/1983 (Attachment B), the southern most part of the site lies within a designated flood hazard area. The flood hazard area shown however does not correspond with the current Bear Canyon Arroyo alignment. The Arroyo alignment west of Wyoming has been straightened and the channel has been stabilized with concrete drop-offs, gabion baskets, and wire enclosed riprap. These recent improvements are not reflected by the flood hazard area. The proposed site should not be considered a part of the flood hazard area when the improvements are taken into consideration. In addition the proposed site grading and building elevations are above the maximum expected water surface elevations shown on the FEMA Maps.

# **Existing Conditions**

The Existing site comprises an area of 0.742 acres and is currently developed as a park/recreation area. Site runoff flows generally from East to West across the site.

Surface runoff from the existing site is currently collected and conveyed offsite by a system of drop inlets and an underground storm sewer system. The flow from the storm sewer is conveyed to the Bear Canyon Arroyo via a system of 18-inch and 24-inch diameter drain piping.

## Proposed Improvements

Proposed improvements will consist of demolition of a portion of existing concrete sidewalk, the construction of an 85-foot diameter, 0.55-million-gallon, above-grade, nonpotable water storage reservoir, pump station, associated underground utilities, site grading, gravel access road, and landscaping, as shown on Attachment D. Underground utilities and appurtenances will include a 20-inch and 18-inch reuse water pipeline, emergency reservoir overflow piping, drop inlet (Attachment F), and site drainage piping.

The existing site will be regraded such that drainage on-site will be collected, conveyed, and discharged to the existing storm sewer servicing the existing site. Access to the proposed site will be provided by a 24-foot wide gravel drive connected to an existing service road

located between the tennis courts and Wyoming Blvd. No asphalt or concrete paving is proposed.

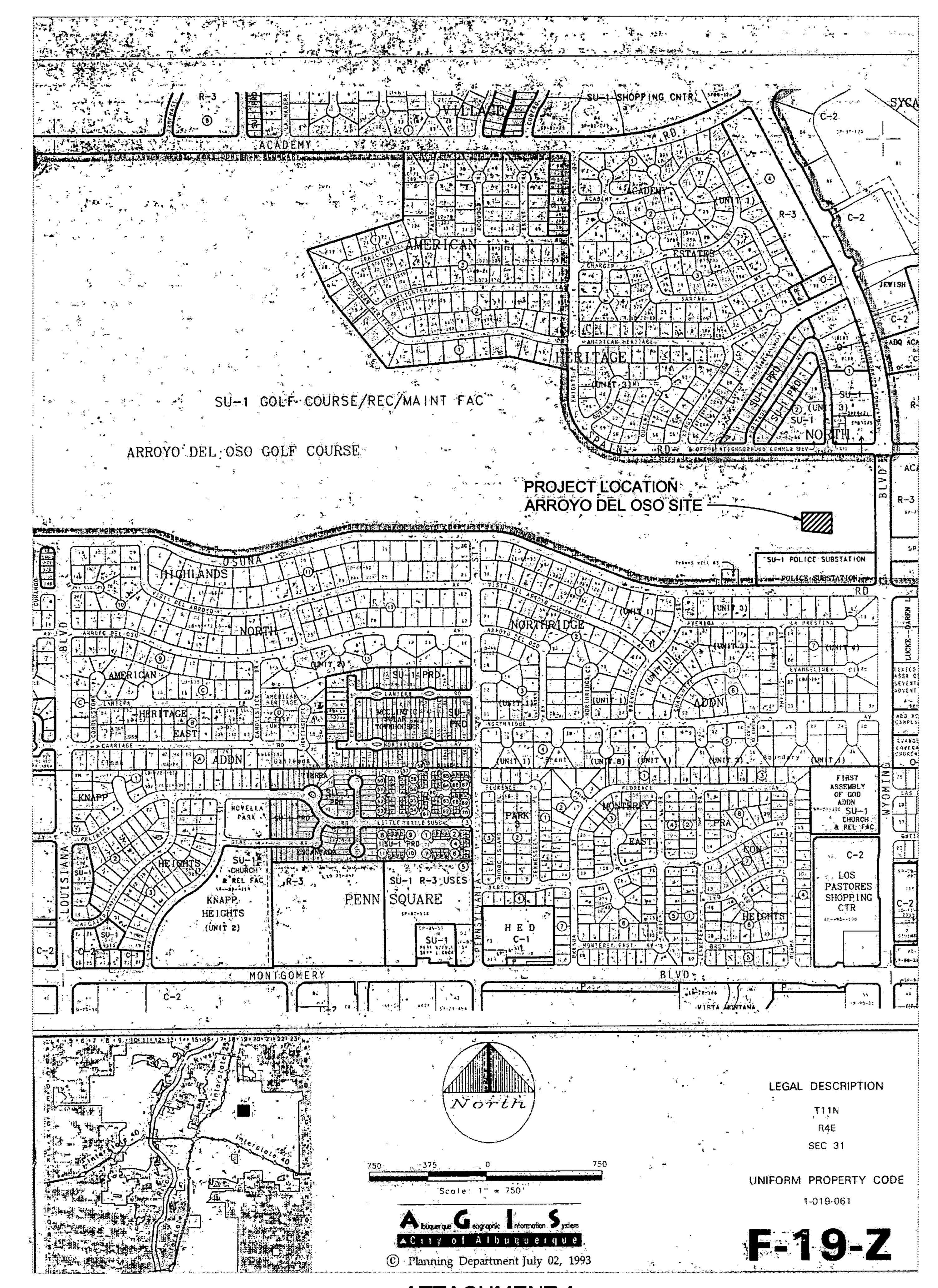
### **Storm Sewer Construction**

New storm sewer piping will be constructed to convey the nonpotable storage reservoir emergency overflow (Q = 5.54 mgd = 8.57 cfs) and surface runoff flow (Q $_{100}$  = 2.86 cfs) to the existing drainage system. The proposed storm sewer addition will consist of 12-inch diameter reinforced concrete pipe (RCP). A 12-inch RCP will be connected from the proposed drop inlet to an existing drop inlet which is tied to an existing 18-inch RCP that daylights into Arroyo Del Oso. The 12-inch RCP overflow / drain line for the proposed nonpotable reservoir will be connected to a new manhole which will be connected to an existing 18-inch RCP that daylights into Arroyo Del Oso.

Also attached for informational purposes are Attachment E – Proposed Landscaping Plan for the Nonpotable Reservoir and Pump Station Site.

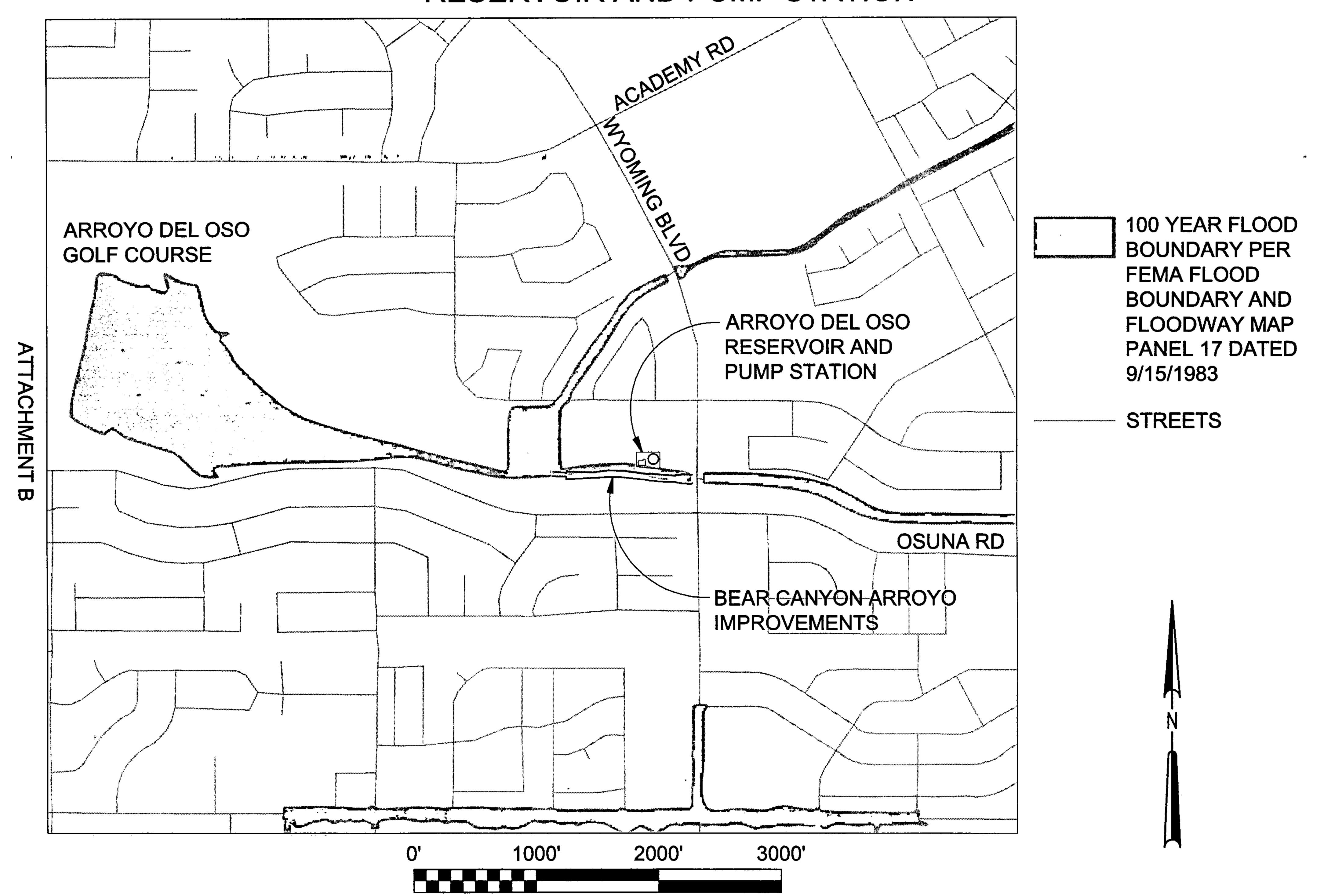
### Attachments

- A. Site Vicinity Map
- B. 100 Year Flood Plane in the Vicinity of Proposed Arroyo Del Oso Reservoir and Pump Station showing location of proposed development site
- C. Calculations on existing and proposed runoff flow and volume
- D. Site Grading and Drainage Plan for the Proposed Nonpotable Reservoir and Pump Station Site
- E. Proposed Landscaping Plan for the Nonpotable Site
- F. Proposed Drop Inlet



ATTACHMENT A

100 . LA. COOD . LA. IN ... IE VIC... Τ΄ OF ... OF USLU A. ... OF



## ATTACHMENT C

The following calculations quantify the change in runoff flow and volumes due to the proposed site improvements.

### **Ground Cover Information**

From SCS Bernalillo County Soil Survey

Sheet 21 Soil Type for This Site is: EmD – Embudo – gravelly fine sandy loam

Hydrologic Soil Group:

B

From DPM Section 22.2 Table A-1:

Precipitation Zone for this site is **Zone 3** (Between San Mateo and Eubank, North of Interstate 40; and between San Mateo and the East boundary of Range 4 East, South of Interstate 40)

#### Land Treatments Present:

- A Soil uncompacted by human activity with 0-10% slopes. Native grasses, weeds and shrubs in typical densities with minimal disturbance to grading, ground cover and infiltration capacity.
- **B** Irrigated lawns (slope < 10%), native grasses, weeds and shrubs, and soil uncompacted by human activity (slope 10%<20%)
- C Soil compacted by human activity. Minimal vegetation, vacant lots, unpaved parking/roads, gravel or rock on plastic.
- **D** Impervious areas, pavement and roofs.

### Time of Concentration

T<sub>c</sub> (Inches/Hour) per

DPM Section 22.2

= 0.2 hours = 12 minutes

### 100 Year 6-Hour Depth (R)

"R" Depth (Inches) per

DPM Section 22.2 Table A-2

= 2.60 inches .

Rational Method

Discharge (cfs):

Q = CiA

Where:

C = Runoff Coefficient (from DPM Section 22.2 Table A-11)

i = From DPM Section 22.2 Table A-10 = 5.38 in/hr

A = Area (acres)

SCS Method

Volume (cf):

 $V = 3630 \times \Sigma(E \times A)$ 

Where

E = Excess Precipitation "E", from DPM Section 22.2, Table A-8.

A = Area (acres)

3630 = conversion factor (acre-feet to cubic feet)

## **Existing Conditions**

### Site Data

Area = 0.74 ac.

Land Treatments	Area	Runoff	Excess
Undeveloped, Uncompacted Area (Treatment A)	(acres) 0.17	Coefficient (C) 0.35	Precipitation (E) 0.66
Landscaped Area (Treatment B)	0.52	0.48	0.92
Undeveloped Area (Treatment C)	0.00	0.64	1.29
Roof Area (Treatment D)	0.00	0.93	2.36
Paved Area (Treatment D)	0.05	0.93	2.36

 $Q_{100} = \Sigma(\text{CiA}) = (0.35)(5.38)(0.17) + (0.48)(5.38)(0.52) + (0.64)(5.38)(0.00) + (0.93)(5.38)(0.05) + (0.93)(5.38)(0.05)$ 

 $Q_{100} = 1.91 \text{ cfs}$ 

Area impervious = 0.05 ac.: % impervious = 6.75%

 $V_{100} = 3630 \times \Sigma(E \times A) = 3630 [(0.66)(0.17) + (0.92)(0.52) + (1.29)(0.00) + (2.36)(0.05)] = 2,572 \text{ cf}$ 

## **Fully Developed Conditions**

#### Site Data

Area = 0.74 ac.

Land Treatments	Area	Runoff	Excess Drocinitation (E)	,
Undeveloped, Uncompacted Area (Treatment A)	(acres) 0.20	Coefficient (C) 0.35	Precipitation (E) 0.66	
Landscaped Area (Treatment B)	0.00	0.48	0.92	
Undeveloped Area (Treatment C)	0.34	0.64	1.29	•
Roof Area (Treatment D)	0.18	0.93	2.36	Ĩ
Paved Area (Treatment D)	0.02	0.93	2.36	٠ ٢

 $Q_{100} = \Sigma(\text{CiA}) = (0.35)(5.38)(0.20) + (0.48)(5.38)(0.00) + (0.64)(5.38)(0.34) + (0.93)(5.38)(0.18) + (0.93)(5.38)(0.02)$ 

 $Q_{100} = 2.55 \text{ cfs}$ 

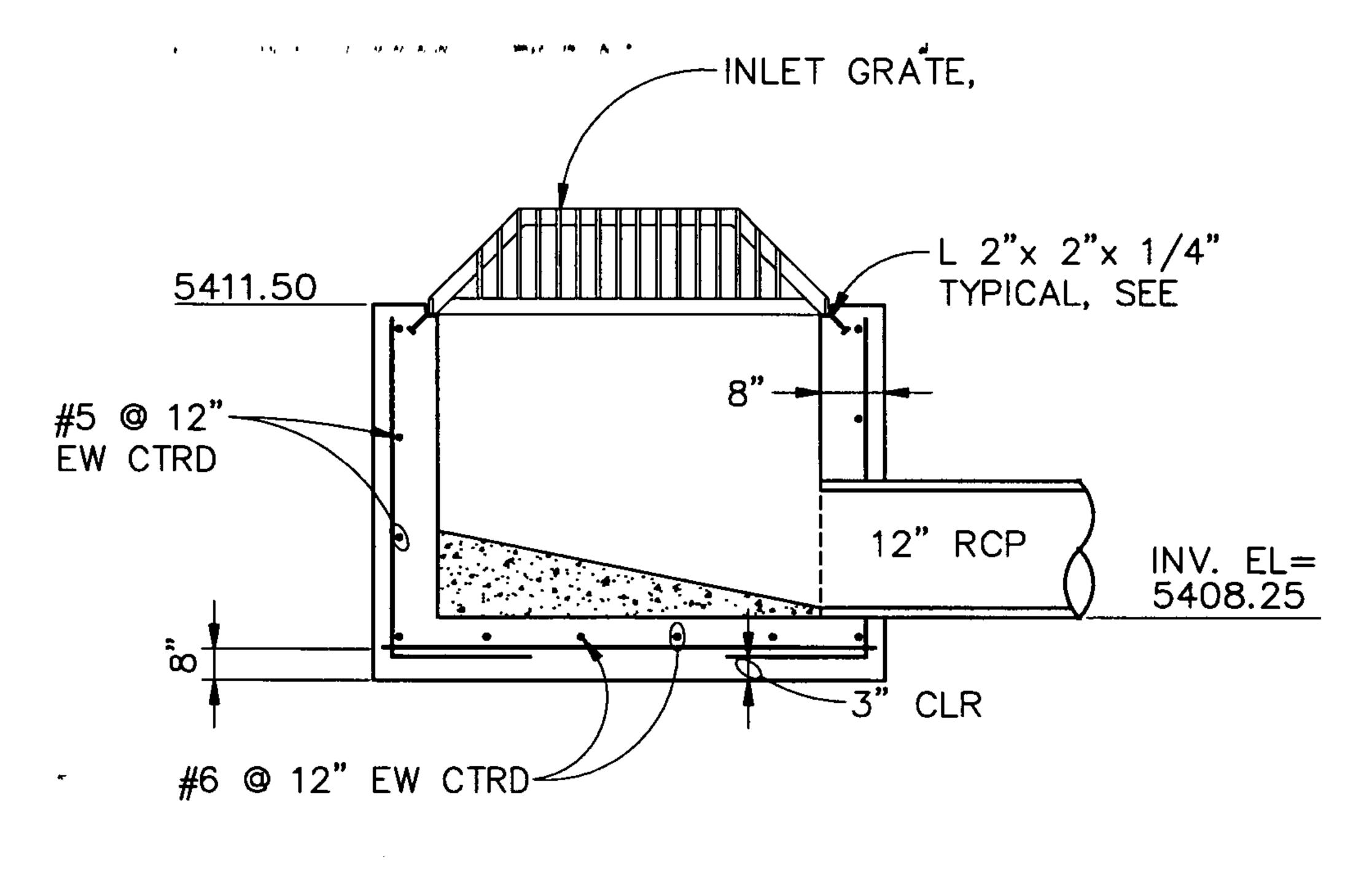
Area impervious = 0.20 ac.: % impervious = 27.0%

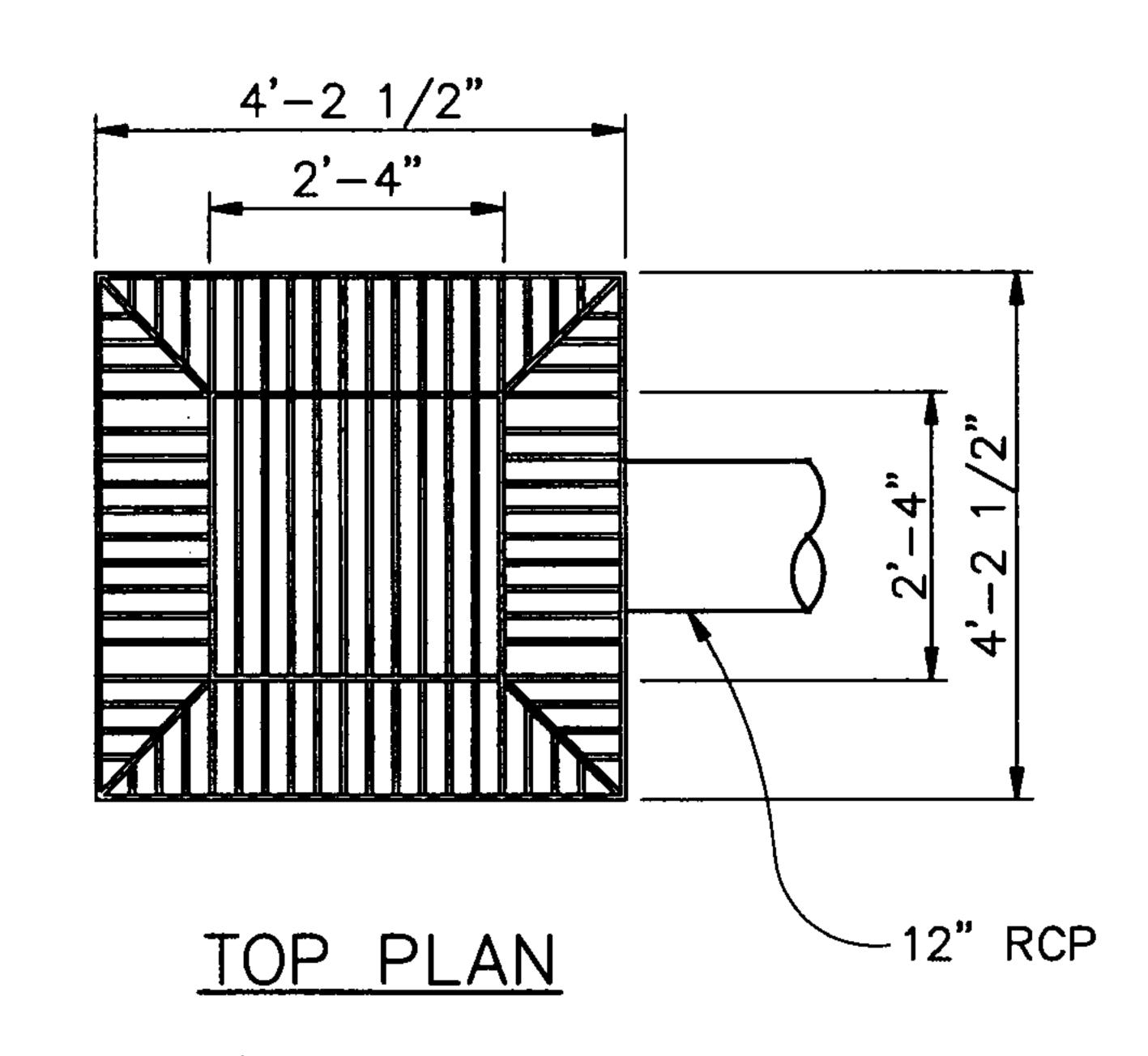
 $V_{100} = 3630 \times \Sigma(E \times A) = 3630 [(0.66)(0.20) + (0.92)(0.00) + (1.29)(0.34) + (2.36)(0.18) + (2.36)(0.02)] = 3785 \text{ cf}$ 

## Comparison

Change in  $Q_{100} = 2.55 \text{ cfs} - 1.91 \text{ cfs} = 0.64 \text{ cfs}$  (increase)

Change in  $V_{100} = 3,785 \text{ cf} - 2,572 \text{ cf} = 1213 \text{ cf}$  (increase)





<u>SECTION</u>

# DROP INLET STRUCTURE N.T.S

ATTACHMENT F

CH2MHILL