CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

August 19, 2014

David Soule, P.E.
Rio Grande Engineering
P.O. Box 93924
Albuquerque, NM 87199

RE: **Eagle Crest Subdivision**
Drainage Report and Grading and Drainage Plan
Engineer's Stamp Date 8-1914 (File: C18D064B)

Dear Mr. Soule:

Based upon the information provided in your submittal received 8-19-14, the above referenced submittal is approved for action by the DRB on the Site Plan for Building Permit and the Preliminary Plat. Approval for Grading Permit is pending the DRB action.

If you have any questions, you can contact me at 924-3695.

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file
c.pdf: via Email: Recipient, Tim Simms , Monica Ortiz

CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

August 20, 2014

David Soule, P.E.
Rio Grande Engineering
P.O. Box 93924
Albuquerque, NM 87199

RE: **Eagle Crest Subdivision**
Drainage Report and Grading and Drainage Plan
Engineer's Stamp Date 8-19-2014 (File: C18D064B)

Dear Mr. Soule:

Since the DRB approved the Preliminary Plat and Site Plan for Subdivision on 8-20-2014, and based upon the information provided in your submittal received 8-19-14, the above referenced submittal is approved for Grading Permit. Upon completion of the project, provide an Engineer Certification for our files.

Please note that ~~since~~ the lateral pipes in Alameda are shown as 30"dia. RCP in more recent plans (as opposed to 24" RCP from earlier plans). Forthcoming as-builts should confirm this. Also, the storm drain from Soaring Avenue to Alameda (back of inlet) is sized as a 30" RCP in the report, and the DRC plans should reflect this.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file
c.pdf: via Email: Recipient, Tim Simms , Monica Ortiz

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

UPDATED
DRAINAGE REPORT

For

EAGLE CREST ESTATE

Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

AUGUST 2014

8/19/12

David Soule P.E. No. 14522

TABLE OF CONTENTS

Appendix

Map

PURPOSE

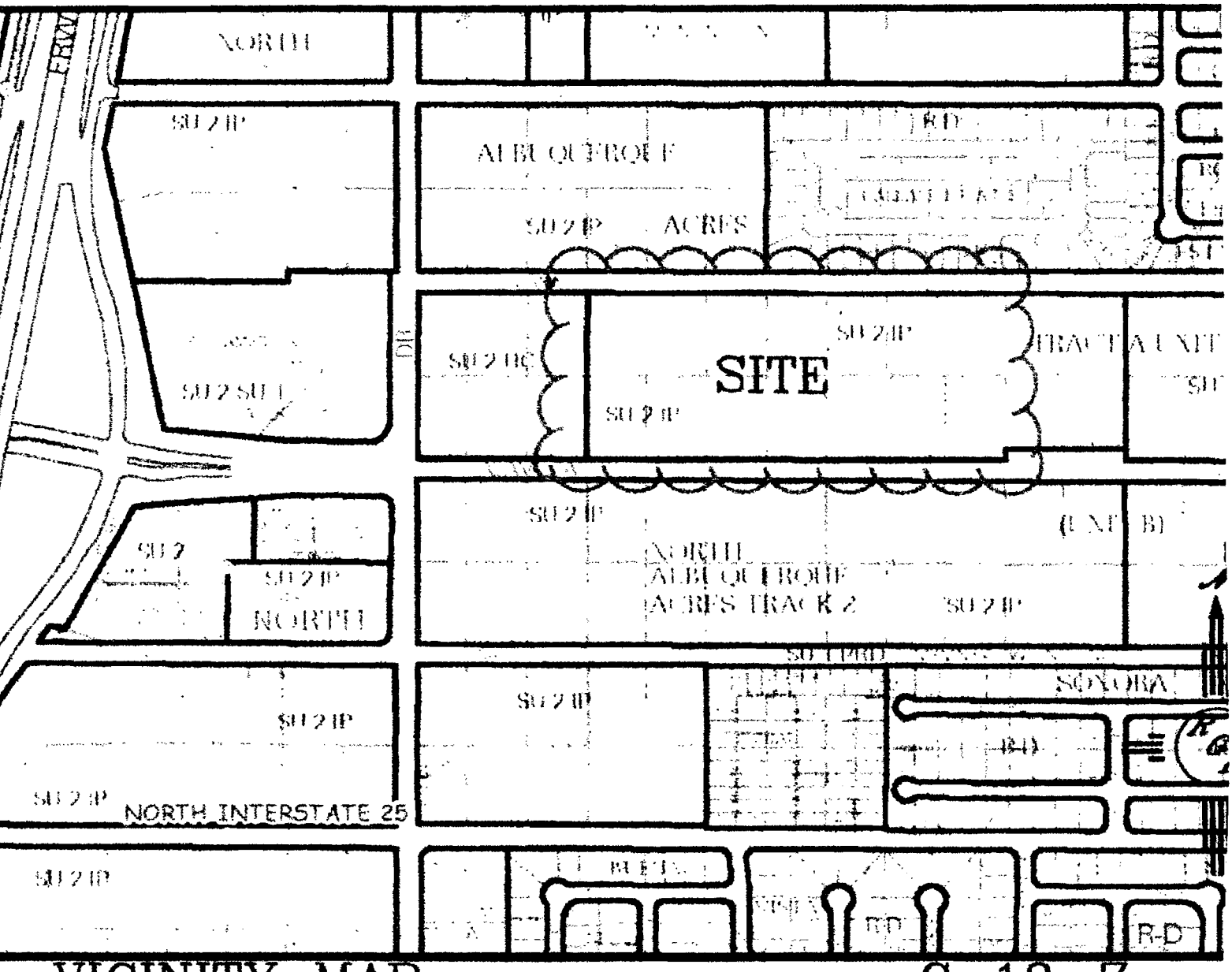
The purpose of this report is to provide the Drainage Management Plan for the development of a 60-lot subdivision located on Oakland Avenue between San Pedro and Louisiana NE. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines, and HYDROCAD. This report will demonstrate that the grading does not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

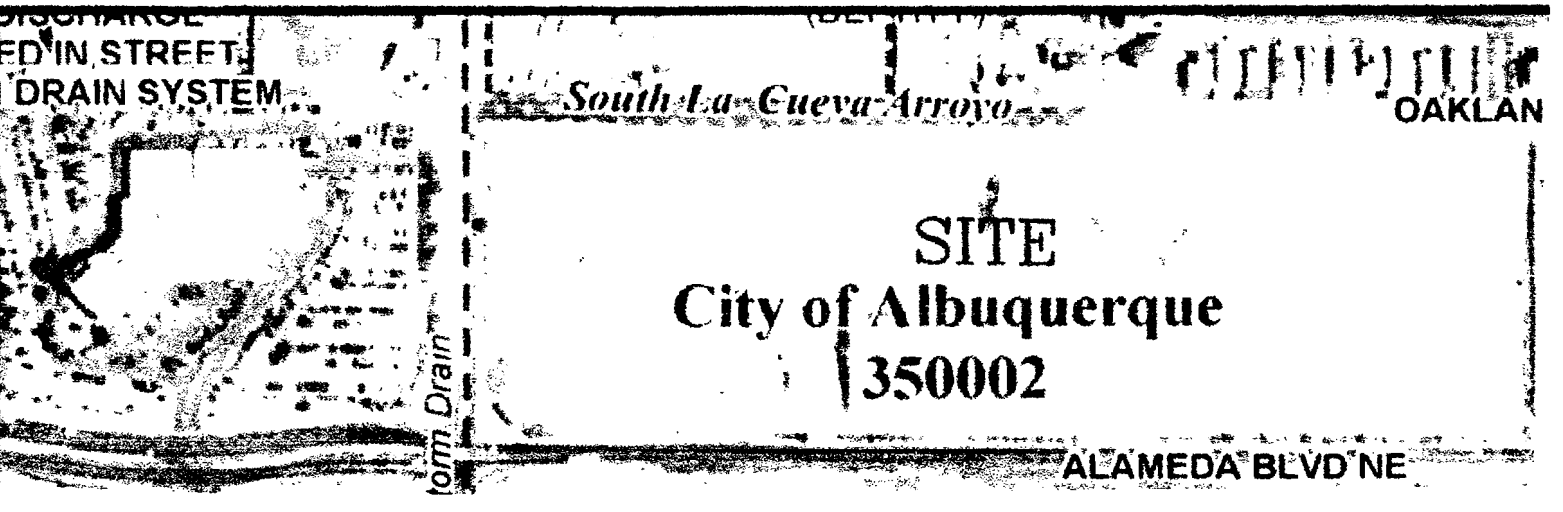
The subject of this report, as shown on the Exhibit A, is a 12.41-acre parcel of land located on the south side of Oakland Avenue and the north side of Alameda Boulevard between San Pedro and Louisiana. The legal description of this site is Lots 4-10 and 23-29, block 28, tract A, unit B, North Albuquerque Acres. As shown on FIRM map35013C0137H, the majority of the site is located within Flood Zone X; a portion of the site is impacted by flood zone AE-1 foot. The site has had significant grading activities upon it over the past 10 years. The site is not in native condition. Due to the upstream construction, the site is not affected by any upland flow. The site free discharges to the west. The development of the site will require the site to discharge at a rate equal to or less than the fully developed conditions assumed for this site in the governing North Albuquerque Acres Master Drainage Plan (NAAMDP), which relevant excerpts can be found in appendix A.

EXISTING CONDITIONS

The site currently does have structures on it and has been impacted by human development over the years. The site was most recently an auto salvage and parts yard. The site is not impacted by any upland flows. The site currently discharges all of its flow to the North West



VICINITY MAP: C-18-Z



corner of the site. The site is located within basins 117.2 and 117.3 of the NAAMDP. The NAAMDP design analysis has been modified by the Eagle Rock drainage plan. The diversion of the upper 57% of basin 117.2 was designed with the construction of Oakland estates Subdivision. The upland properties have been designed to drain to the storm drain provided within Oakland. The recently constructed San Pedro and Alameda storm drain were designed to convey the developed flow from this site.

PROPOSED CONDITIONS

The proposed improvements consist of a new 60-lot subdivision serviced by public paved roadway. The lots shall free discharge to the roadway and be conveyed within the roadway to the available downstream storm drain. Each lot will be required to retain the first .34" of rain or 165 cubic feet per lot. The plan specifies the minimum dimensions of a front yard pond or an alternative underground catchment basin- stormtech SC740. A copy of the product sheet is located in appendix B. All the flow leaving the site will be conveyed via surface drainage to Oakland or underground storm drain to Alameda. The proposed land treatment will conform to the residential density assumptions of the NAADMP. The site discharge is reduced to these master plan assumptions by the creation of water quality ponds in front yards. The impervious area is consistent with table A.5 of the DPM, utilizing 4.8 dwelling units per acre.

As shown in appendix B, the site will contain 6 onsite basins, with an additional five basins affecting Oakland and 6 basins affecting Alameda. Basin A1 and A2 contain the northern half of the subdivision which corresponds to NAAMDP basin 117.2. These basins will generate 19.96 cfs. or 9.98 cfs per basin. This flow will be conveyed within the roadways double grated type A inlets. As shown in appendix B, each inlet grate has the capacity for 12 cfs or 24cfs per inlet. Basin A1 drains to a new inlet to be constructed within Oakland. This storm drain reach will be connected to the existing eagle rock diversion to the existing 24" storm drain at the west end of

our site. This reach will convey the flow from upstream Basin A1 and the he cumulative upstream basin generation of 35.07 cfs to the eagle rock diversion. Basin A2 will drain to a new inlet and storm drain reach tied to the San Pedro storm drain. This reach will capture basin A2 as well as all the down stream basins which have a combined discharge 47.60 cfs, the 9.98 cfs from basin A and 13.94 cfs from the contributing basin to the south of Oakland will be captured, the 23.68 cfs to the northern portion is programmed to enter this reach but due to existing grades the flow will enter the storm drain within San Pedro. The contributing basins are shown on the drainage basin map located in appendix b. As shown in appendix A, the allowed discharge to this reach of the San Pedro storm drain is 45cfs, which due to grades on the northern lots will not be exceeded..

The southern half of the site contains eight onsite sub basins. The cumulative discharge from these basins is captured by inlets located at the west end of the project. Due to the phasing, phase 1-3 will temporarily retain the 100-year, 10-day volume generated. At complete build out the total flow collected by the inlets will be 7.84 cfs on the north flow line and 12.01 cfs on the south half. The cumulative flow rate of 19.85 cfs will be conveyed to the alameda storm drain via a 24" conduit. The existing inlets located within Alameda will be removed and additional inlets will be constructed at the new face of curb consistent with the ultimate condition design located in appendix C. As shown in appendix B, the maximum flow rate at each inlet will be 15.38 cfs, there for the inlets have excess capacity. As shown in the ultimate condition the storm drain is anticipated to collect 88cfs in the reach from Louisiana to the inlets we are discharging to. The northerly basin is anticipated to generate 44 cfs. Our anticipated discharge is for the northerly half is 50.06 cfs. The excess of 6.4 cfs will be attenuated with the development of the westerly commercial property owned by the same developer. As shown the remaining reach between our site and San Pedro is anticipated to collect and additional 32 cfs of which 16 cfs will be from the north, so the commercial site will be allowed to discharge 10 cfs. The attenuation of this peak can

be accomplished within commercial developments without difficulty

As shown in Appendix C, each grated inlet on a 3.3% slope has the capacity for 12 cfs. The inlets located within basin B are in a sump condition, there for each inlet has the capacity to capture the entire flow rate of the entire basin 19.92, two inlets have been added to allow for clogging. The hydraulic grade lines have not been computed with this submittal. The flow rates entering the downstream pipes have been accounted for and as shown in appendix C, the pipes have the capacity to convey the discharge without being full; therefore the hydraulic grade line of the reach will not exceed the ground level at any time. The street capacities are also shown in appendix C,

SUMMARY AND RECOMMENDATIONS

This project is a development of residential subdivision with the North Albuquerque Acres Master Drainage plan. The development is consistent with the land use assumptions of the plan. The surrounding development altered the upland and onsite basin by the creation of a diversion from Oakland to Eagle rock. Our plan conforms to this diversion. Our discharge will enter the downstream storm drain where it was anticipated. The inlets, pipes and roadways have been shown to provide the required capacity. The new storm drain within Alameda appears to have been designed such that it has less capacity than the North Albuquerque Acres plan calls for. The capacity is not a factor with this development and reduced discharge will need to be designed on the later commercial phases of this property. The site has been designed in accordance with City of Albuquerque Drainage ordinance. This drainage plan and report conforms to the governing drainage regulations of the City. Since the effected area site encompasses more than 1 acre, a NPDES permit will be required prior to any construction activity. A letter of Map revision (LOMA-F) will be required to be submitted and accepted prior to the release of building permits on annotated lots. In addition a LOMR will be required to be submitted prior to release of financial guarantee as well as prior to release of annotated lots

APPENDIX A

North Albuquerque Acres Master Drainage Plan

and

excerpts of Oakland diversion map

and

San Pedro Storm drain design excerpts

FINAL
NORTH ALBUQUERQUE ACRES
MASTER DRAINAGE PLAN

Prepared For:

City of Albuquerque

Prepared By:

Resource Technology, Inc.
ENGINEERS AND ENVIRONMENTAL SCIENTISTS
1720-B Randolph Road SE, Albuquerque, NM 87106
Telephone (505) 243-7300
Fax (505) 243-7400
rti@nmia.com

October 2003

- Commercial/Industrial (C/I): The area west of Louisiana Boulevard, north of Modesto Avenue and east of I-25 would develop as high density commercial and industrial. Also used for Paseo del Norte Corridor.
- Medium Density Industrial (MI): Campus type commercial/office facilities and APS schools sites.
- Sandia Tribal Lands (ST): Sandia tribal lands south of Tramway Road and north of the Sandia Pueblo Grant Boundary were allocated land treatments consistent with moderate levels of development even though there are no current plans to develop this area.

The relative weight of each type of Land Treatment is shown in Table 2.

TABLE 2

FUTURE FULL DEVELOPMENT HYDROLOGIC CONDITION ASSUMPTIONS

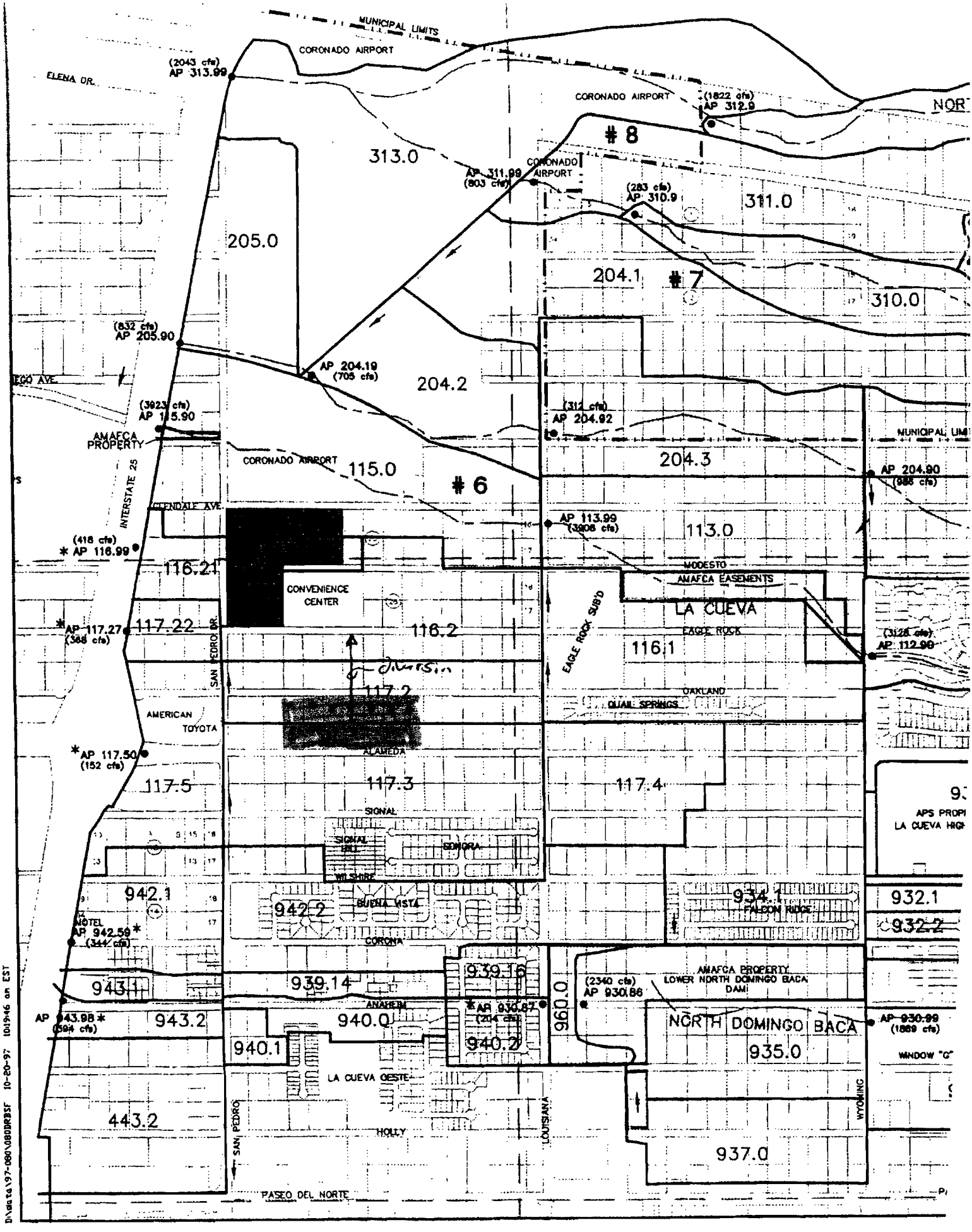
	Land Treatments (%)			
	A	**B**	**C**	**D**
Sandia Heights/Tramway (SH/TB)	20	40	5	35
North Albuquerque Acres (NAA)	22	23	38	17
Low Density Residential (LR)	20	20	34	26
Residential (R)	0	34	16	50
High Density Residential (HR)	0	25	15	60
Commercial/Industrial (C/I)	0	20	10	70
Medium Density Industrial (MI)	0	20	30	50
Sandia Tribal Lands (ST)	20	20	40	20
Primrose Pointe (PP)	0	40	20	40

TABLE A-2 (cont.)

LA CUEVA ARROYO SUB-BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
113*	Existing	.1136	80	0	15	5	.133
	Future	.1000	0	25	15	60	.133
115*	Existing	.1337	80	0	15	5	.133
	Future	.1202	0	26	12	62	.133
116*	Existing	.1309	80	0	5	15	.133
116.1	Future	.1000	0	25	15	50	.133
116.2	Future	.0719	0	25	15	50	.133
116.21	Future	.0344	0	40	20	40	.133
[illegible]	Existing	.1391	73	0	7	20	.22
	Future	.0500	0	34	16	50	.133
117.21*	Existing	.0234	0	34	16	50	.133
117.22*	Future	.0156	0	20	10	70	.133
117.3*	Existing	.0863	65	5	15	15	.133
	Future	.1172	0	34	16	50	.133
117.31*	Existing	.0250	0	34	16	50	.133
117.32*	Existing	.0090	0	34	16	50	.133
117.4*	Existing	.0750	85	0	5	10	.133
	Future	.0512	0	25	15	60	.133
117.5*	Existing	.0550	0	10	20	70	.133
	Future	.0550	0	10	20	70	.133
118	Existing	.0649	0	20	10	70	.133
	Future	.0649	0	20	10	70	.133
118.1	Existing	.0306	75	5	10	10	.133
	Future	.0306	0	20	30	50	.133
119	Existing	.0549	0	20	10	70	.133
	Future	.0549	0	20	10	70	.133
120	Existing	.0268	50	0	0	50	.133
	Future	.0268	0	20	10	70	.133
121	Existing	.0489	80	0	15	5	.133
	Future	.0489	0	20	10	70	.133

*Modified for COA NAA MDP 9/97



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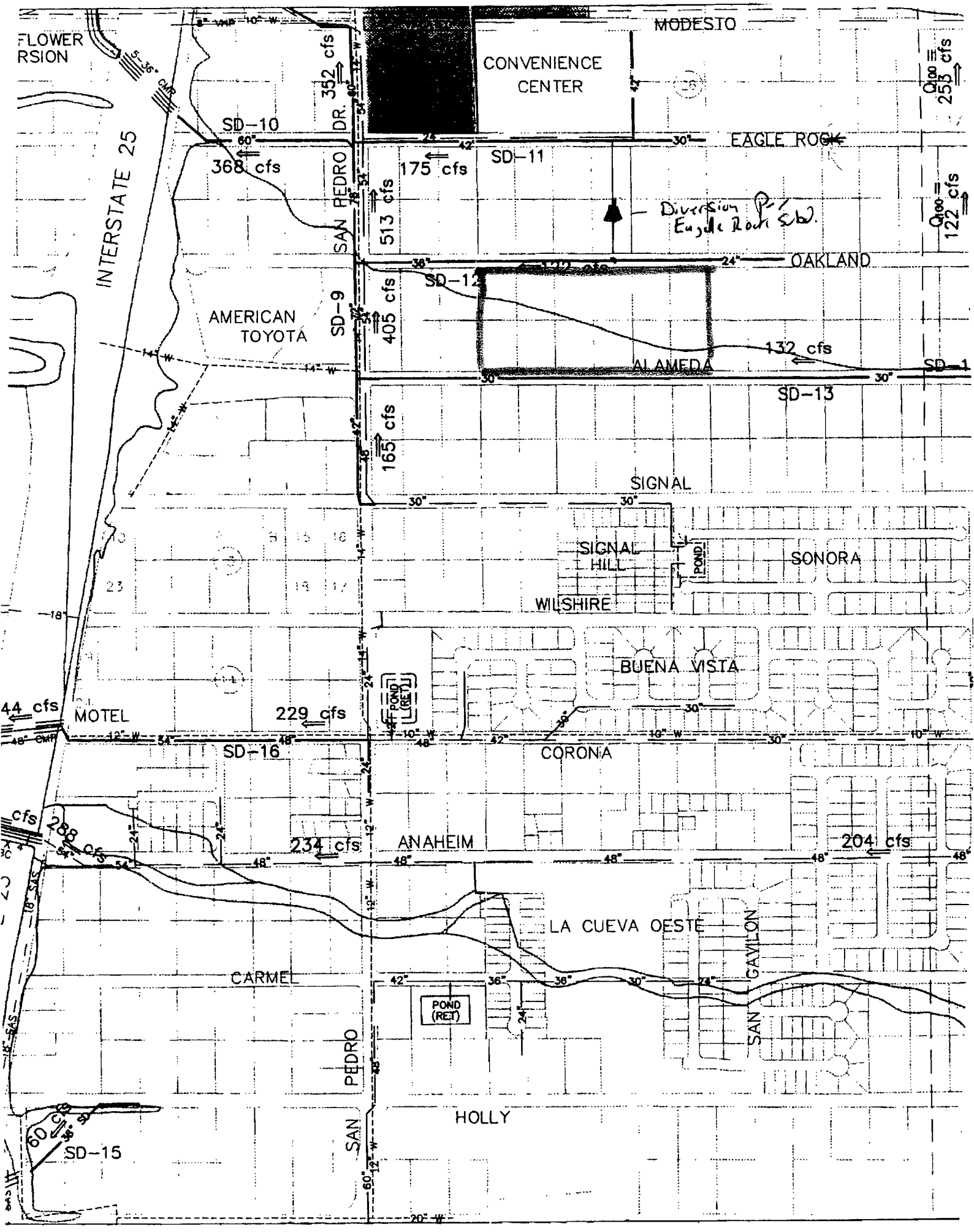

MODESTO
CONVENIENCE CENTER
EAGLE ROCK
SD-10
SD-11
SD-12
SD-13
SD-9
SD-16
SD-15
368 cfs
175 cfs
513 cfs
405 cfs
165 cfs
352 cfs
253 cfs
122 cfs
132 cfs
44 cfs
229 cfs
234 cfs
204 cfs
INTERSTATE 25
SAN PEDRO DR.
AMERICAN TOYOTA
OAKLAND
ALAMEDA
SIGNAL
SIGNAL HILL
POND
SONORA
WILSHIRE
BUENA VISTA
MOTEL
CORONA
ANAHEIM
LA CUEVA OESTE
CARMEL
GAVILON
SAN PEDRO
HOLLY
POND (RET)

DESIGN ANALYSIS REPORT
FOR
SAN PEDRO STORM DRAIN PROJECT
CITY PROJECT NO. 5304.91

Prepared by:
Thompson Engineering Consultants, Inc.
P.O. Box 65760
Albuquerque, NM 87193

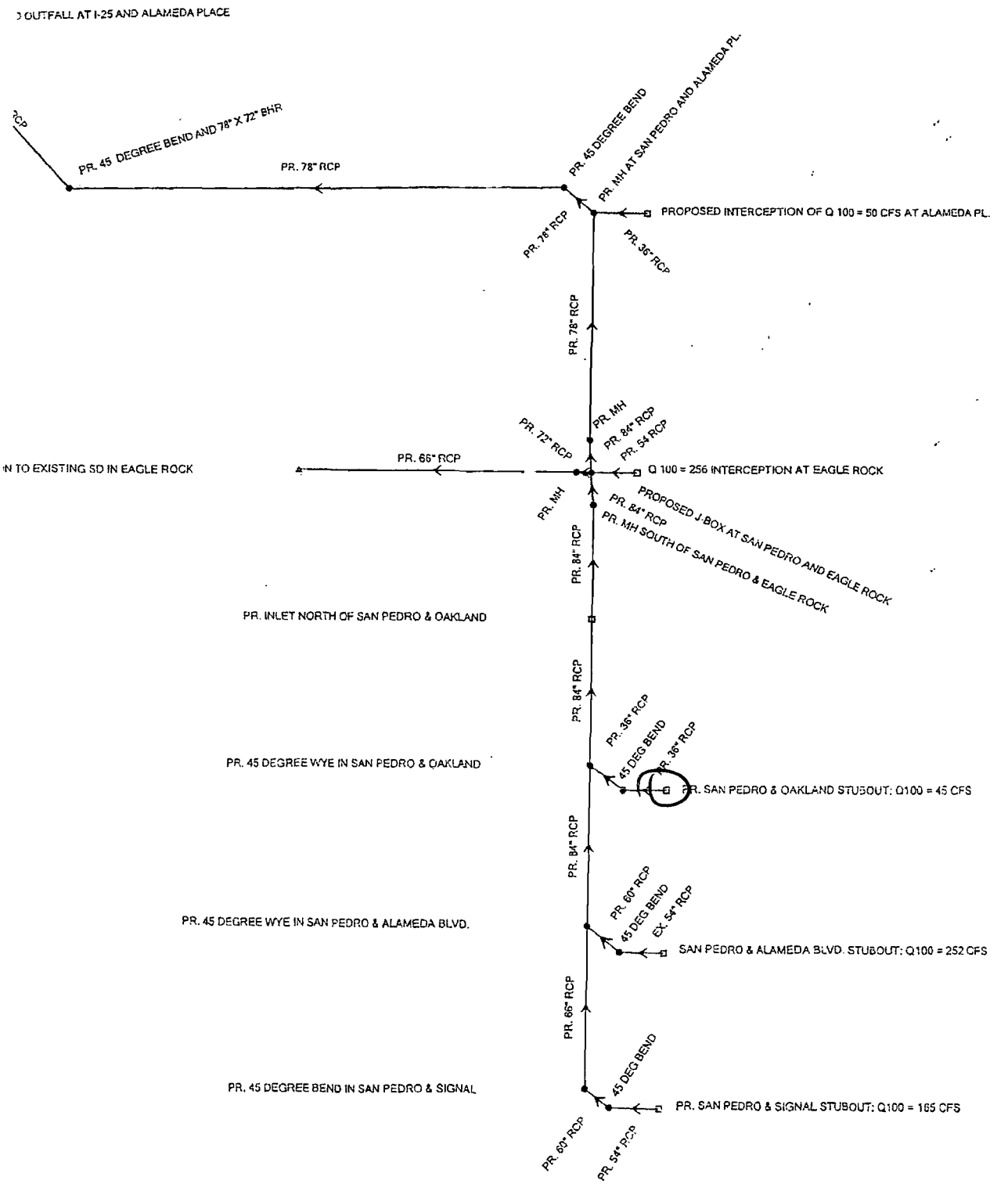
January 2010

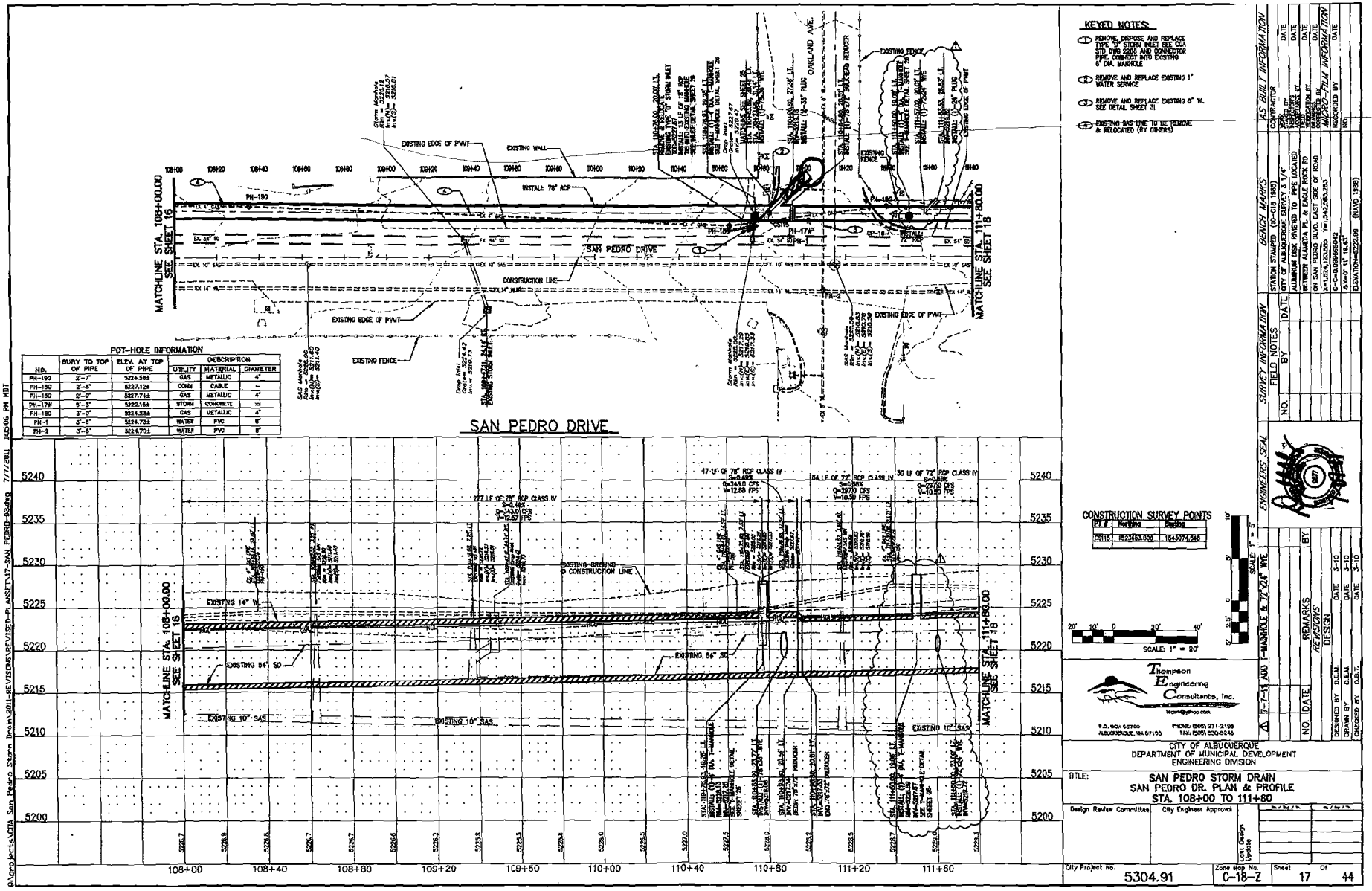
DOT Report (San Pedro SD - Final Single Pipe System with changes from coa.stc)

Label	Node Upstream Downstream	Conduit Description	Slope (Calculated) (ft/ft)	Length (ft)	Manning's n	Flow (ft³/s)	Velocity (Average) (ft/s)	Ground Upstream Downstream (ft)	Invert Upstream Downstream (ft)	HGL Upstream Downstream (ft)
PR. 66" RCP	PR. 45 DEGREE BEND IN SAN PEDRO & SIGNAL	Circular Pipe - 66.0 in	0.006	532	0.013	165	6.94	5230.42	5222.97	5229.42
	PR. 45 DEGREE WYE IN SAN PEDRO & ALAMEDA BLVD.							5229.65	5219.8	5228.13
PR. 84" RCP	PR. 45 DEGREE WYE IN SAN PEDRO & ALAMEDA BLVD.	Circular Pipe - 84.0 in	0.005	525	0.013	417	12.96	5229.65	5219.8	5225.46
	PR. 45 DEGREE WYE IN SAN PEDRO & OAKLAND							5228	5217.29	5223.93
PR. 84" RCP	PR. 45 DEGREE WYE IN SAN PEDRO & OAKLAND	Circular Pipe - 84.0 in	0.005	139	0.013	462	13.62	5228	5217.29	5223.55
	PR. INLET NORTH OF SAN PEDRO & OAKLAND							5226.12	5216.57	5223.01
PR. 84" RCP	PR. INLET NORTH OF SAN PEDRO & OAKLAND	Circular Pipe - 84.0 in	0.005	335	0.013	462	13.38	5226.12	5216.57	5222.46
	PR. MH SOUTH OF SAN PEDRO & EAGLE ROCK							5224.23	5214.89	5220.83
PR. 84" RCP	PR. MH SOUTH OF SAN PEDRO & EAGLE ROCK	Circular Pipe - 84.0 in	0.006	31	0.013	462	15.09	5224.23	5214.89	5220.53
	PROPOSED J-BOX AT SAN PEDRO AND EAGLE ROCK							5224.03	5210.5	5220.1
PR. 84" RCP	PROPOSED J-BOX AT SAN PEDRO AND EAGLE ROCK	Circular Pipe - 84.0 in	0.009	32	0.013	393	16.57	5224.03	5210.5	5215.72
	PR. MH							5223.95	5210.22	5215.94
PR. 78" RCP	PR. MH	Circular Pipe - 78.0 in	0.01	505	0.013	393	17.57	5223.95	5210.22	5215.52
	PR. MH AT SAN PEDRO AND ALAMEDA PL.							5221.4	5205	5212.69
PR.72" RCP	PR. 45 DEGREE BEND AND 78" X 72" BHR	Circular Pipe - 72.0 in	0.012	257	0.013	443	15.67	5208.9	5199.5	5205.55
	SAN PEDRO SD OUTFALL AT I-25 AND ALAMEDA PLACE							5203.5	5196.43	5202.74
PR. 54" RCP	PR. SAN PEDRO & SIGNAL STUBOUT: Q100 = 165 CFS	Circular Pipe - 54.0 in	0.026	50	0.013	165	10.37	5233.2	5225.75	5230.6
	45 DEG BEND							5231.8	5224.36	5230.25
PR. 60" RCP	45 DEG BEND	Circular Pipe - 60.0 in	0.026	50	0.013	165	8.4	5231.8	5224.36	5229.88
	PR. 45 DEGREE BEND IN SAN PEDRO & SIGNAL							5230.42	5222.97	5229.67
EX. 54" RCP	SAN PEDRO & ALAMEDA BLVD. STUBOUT: Q100 = 252 CFS	Circular Pipe - 54.0 in	0.034	50	0.013	252	15.84	5232.3	5223.36	5230.29
	45 DEG BEND							5230.1	5221.58	5229.47
PR. 60" RCP	45 DEG BEND	Circular Pipe - 60.0 in	0.034	50	0.013	252	12.83	5230.1	5221.58	5228.6
	PR. 45 DEGREE WYE IN SAN PEDRO & ALAMEDA BLVD.							5229.65	5219.8	5228.13
PR. 36" RCP	PR. SAN PEDRO & OAKLAND STUBOUT: Q100 = 45 CFS	Circular Pipe - 36.0 in	0.026	50	0.013	45	6.37	5230.6	5220.05	5224.6
	45 DEG BEND							5229.3	5218.67	5224.37
PR. 36" RCP	45 DEG BEND	Circular Pipe - 36.0 in	0.026	50	0.013	45	6.37	5229.3	5218.67	5224.15
	PR. 45 DEGREE WYE IN SAN PEDRO & OAKLAND							5228	5217.29	5223.93
PR. 72" RCP	PROPOSED J-BOX AT SAN PEDRO AND EAGLE ROCK	Circular Pipe - 72.0 in	0.02	5	0.013	325	(N/A)	5224.03	5210.5	(N/A)
	PR. MH							5224	5210.4	(N/A)
PR. 66" RCP	PR. MH	Circular Pipe - 66.0 in	0.019	334	0.013	325	20.9	5224	5210.4	5215.31
	CONNECTION TO EXISTING SD IN EAGLE ROCK							5212.65	5204.2	5207.75
PR. 78" RCP	PR. MH AT SAN PEDRO AND ALAMEDA PL.	Circular Pipe - 78.0 in	0.017	30	0.013	443	13.35	5221.4	5205	5211.75
	PR. 45 DEGREE BEND							5220	5204.5	5211.54
PR. 78" RCP	PR. 45 DEGREE BEND	Circular Pipe - 78.0 in	0.01	496.7	0.013	443	17.77	5220	5204.5	5210.07
	PR. 45 DEGREE BEND AND 78" X 72" BHR							5208.9	5199.5	5206.85
PR. 36" RCP	PROPOSED INTERCEPTION OF Q 100 = 50 CFS AT ALAMEDA	Circular Pipe - 42.0 in	0.01	50	0.013	50	10.44	5222	5211.5	5213.71
	PR. MH AT SAN PEDRO AND ALAMEDA PL.							5221.4	5205	5212.85
PR. 54 RCP	Q 100 = 256 INTERCEPTION AT EAGLE ROCK	Circular Pipe - 54.0 in	0.02	50	0.013	256	16.1	5226	5216	5220.62
	PROPOSED J-BOX AT SAN PEDRO AND EAGLE ROCK							5224.03	5210.5	5219.77

San Pedro Storm Drain

Proposed Single Pipe System





POT-HOLE INFORMATION

NO.	BURY TO TOP OF PIPE	ELEV. AT TOP OF PIPE	DESCRIPTION		
			UTILITY	MATERIAL	DIAMETER
PH-19D	2'-7"	5224.58±	GAS	METALLIC	4"
PH-18D	2'-8"	5227.12±	COAX	CABLE	"
PH-15D	2'-0"	5227.74±	GAS	METALLIC	4"
PH-17W	8'-3"	5222.15±	STORM	CONCRETE	30
PH-18D	3'-0"	5224.28±	GAS	METALLIC	4"
PH-1	3'-8"	5224.73±	WATER	PVC	8"
PH-2	3'-8"	5224.70±	WATER	PVC	8"

KEYED NOTES:

1. REMOVE, DISPOSE AND REPLACE TYPE "S" STORM INLET SEE COA STD DWG 2209 AND CONNECTOR PIPE. CONNECT INTO EXISTING 6' DIA. MANHOLE
2. REMOVE AND REPLACE EXISTING 1" WATER SERVICE
3. REMOVE AND REPLACE EXISTING 8" W.L. SEE DETAIL SHEET 31
4. EXISTING GAS LINE TO BE REMOVE & RELOCATED (BY OTHERS)

CONSTRUCTION SURVEY POINTS

PT #	Northing	Easting
CS16	1523483.800	1545074.648

SCALE: 1" = 20'

SCALE: 1" = 5'

Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 67760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199 FAX: (505) 830-8246

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: SAN PEDRO STORM DRAIN
SAN PEDRO DR. PLAN & PROFILE
STA. 108+00 TO 111+80

Design Review Committee | City Engineer Approval

City Project No. 5304.91 | Zone Map No. C-18-Z | Sheet 17 Of 44

AS BUILT INFORMATION
CONTRACTOR
APPROVED BY DATE
INSPECTED BY DATE
TESTED BY DATE
CORRECTED BY DATE

MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

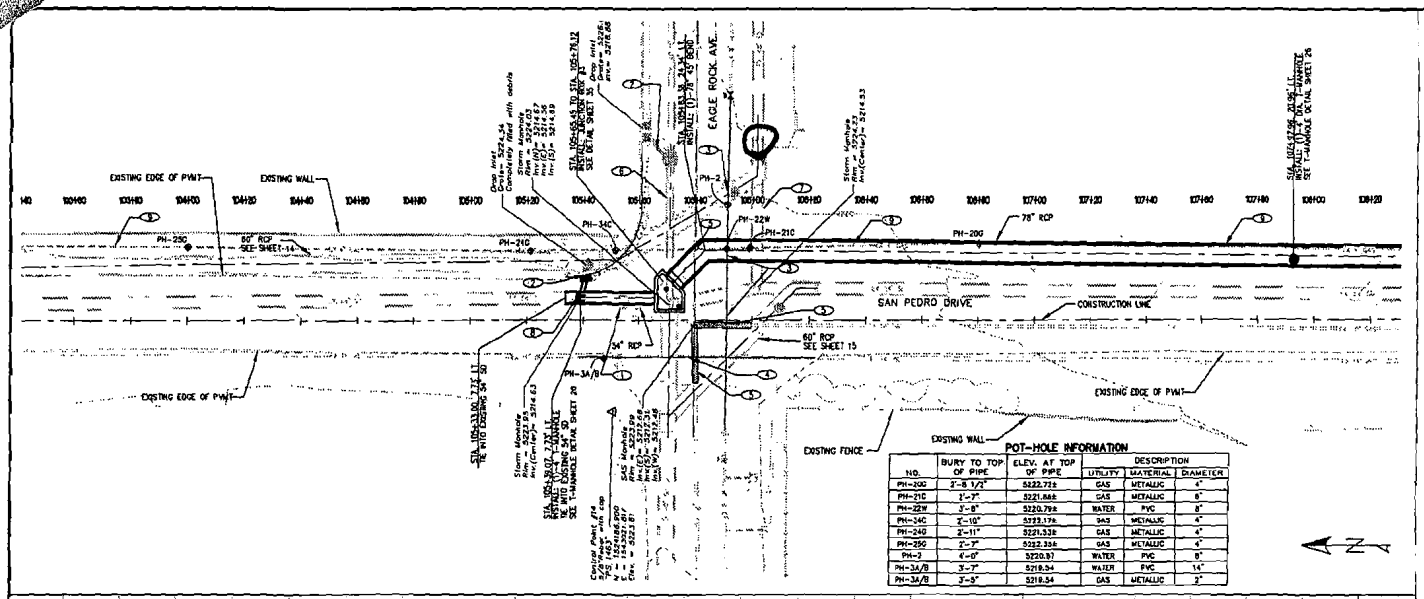
BENCH MARKS
STATION STAMPED (16-018 1989)
CITY OF ALBUQUERQUE SURVEY 3 1/4"
ALUMINUM DISK RIVETED TO PIPE LOCATED
BETWEEN ALAMEDA PL. & EAGLE ROCK RD
ON SAN PEDRO BLVD. EAST SIDE OF ROAD
X=1,524,123.000 Y=1,542,960.263
C-C=0.999955042
ELEVATION=5222.09 (NAVD 1988)

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL

REVISIONS
NO. DATE REMARKS BY
1 7-7-11 ADD T-MANHOLE & 72"x24" WYE

DESIGNED BY D.E.M. DATE 3-10
DRAWN BY D.E.M. DATE 3-10
CHECKED BY D.B.T. DATE 3-10

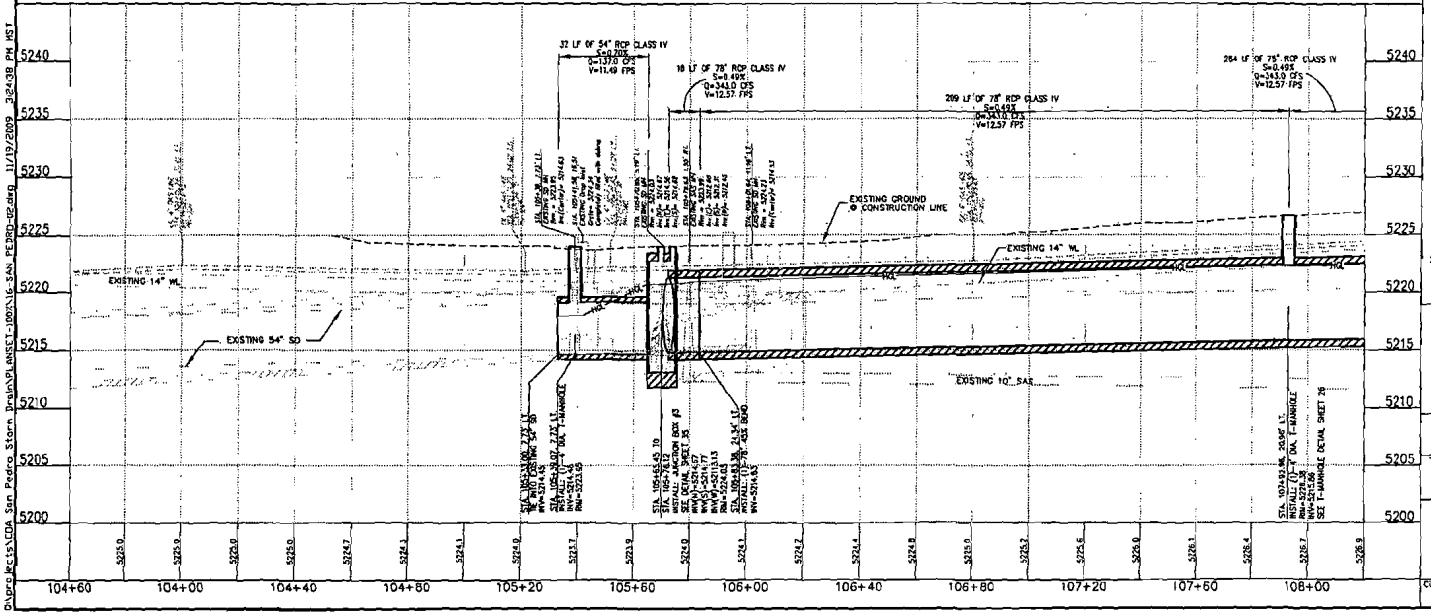


KEYED NOTES:

1. REMOVE AND DISPOSE OF 54" RCP STORM DRAIN
2. REMOVE, DISPOSE AND REPLACE TYPE "C" STORM INLET SEE COA STD DWG 2205 AND CONNECTOR PIPE SEE INLET DETAIL SHEET 28
3. RELOCATE 8" DIA WATERLINE VERTICALLY SEE DETAIL SHEET 30
4. RELOCATE 14" DIA WATERLINE VERTICALLY SEE DETAIL SHEET 29
5. PROTECT EXISTING 8", 10" AND 12" SAS LINES
6. REMOVE AND DISPOSE 56 LF OF 30" RCP STORM DRAIN
7. REMOVE AND DISPOSE 51 LF OF 48" RCP STORM DRAIN
8. REMOVE & REPLACE 6' DIA MANHOLE INSTALL (1)-T-MANHOLE SEE T-MANHOLE DETAIL SHEET 26
9. EXISTING GAS LINE TO BE REMOVED & RELOCTED (BY OTHERS)

POT-HOLE INFORMATION

NO.	BURY TO TOP OF PIPE	ELEV. AT TOP OF PIPE	DESCRIPTION		
			UTILITY	MATERIAL	DIAMETER
PH-20C	2'-8 1/2"	5222.72±	GAS	METALLIC	4"
PH-21C	1'-7"	5221.88±	GAS	METALLIC	8"
PH-22W	3'-8"	5220.79±	WATER	PVC	8"
PH-34C	2'-10"	5223.17±	GAS	METALLIC	4"
PH-24D	2'-11"	5221.33±	GAS	METALLIC	4"
PH-25D	2'-7"	5222.33±	GAS	METALLIC	4"
PH-2	4'-0"	5220.87	WATER	PVC	8"
PH-3A/B	3'-7"	5219.54	WATER	PVC	14"
PH-3A/B	3'-5"	5219.54	GAS	METALLIC	3"



SCALE: 1" = 20'

SCALE: 1" = 5'

AS BUILT INFORMATION	
CONTRACTOR	
START DATE	
COMPLETION DATE	
INSPECTED BY	
TRADE	
FIELD VERIFICATION BY	
DATE	
CHECKED BY	
DATE	

BENCH MARKS
STATION STAMPED (10-C18 1985)
CITY OF ALBUQUERQUE SURVEY 3 1/4"
ALUMINUM DISK RIVETED TO PIPE LOCATED
BETWEEN ALAMEDA PL. & EAGLE ROCK RD
ON SAN PEDRO BLVD. EAST SIDE OF ROAD
X=1,524,123.885 Y=1,542,566.263
C-C=0.999655042
∠3'=0° 11' 19.3"
ELEVATION=5222.09 (NAVD 1988)

MICRO-FILM INFORMATION	
DATE	
RECORDED BY	
NO.	

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

ENGINEERS SEAL

REMARKS		
NO.	BY	DATE
AS-BUILTS		
DESIGN		
DESIGNED BY	D.E.M.	DATE 11-09
DRAWN BY	D.E.M.	DATE 11-09
CHECKED BY	D.B.T.	DATE 11-09

Thompson Engineering Consultants, Inc.
tecm@yahoo.com
P.O. BOX 65760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9240

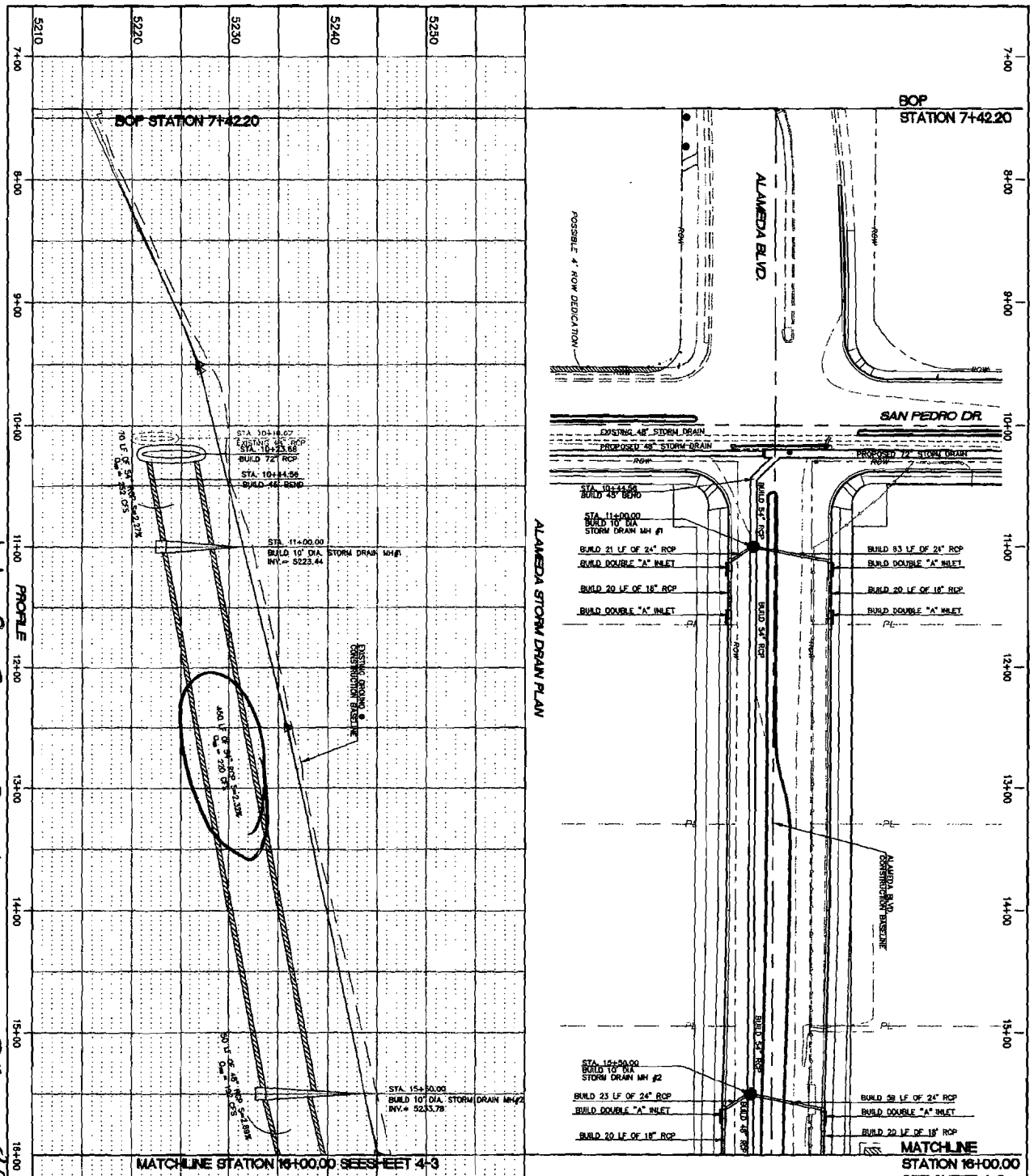
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: SAN PEDRO DR. PLAN & PROFILE
STA. 105+33.00 TO STA. 108+00.00

Design Review Committee	City Engineer Approval	Date Design Update

City Project No.	Zone Map No.	Sheet	of
5304.91	C-18-Z	16	44

D:\pro\acis\COA San Pedro Storn Drain\PLANSET-1009\1c-SAN_PEDRO-02.dwg 11/19/2009 3:24:38 PM MST



Total Q In our Reach is 220-132 = 88cfs
our Inlf = 44

City Project No. 7663.91	Design Review Committee	TITLE: ALAMEDA BLVD. WIDENING ALAMEDA STORM DRAIN PLAN AND PROFILE STA. 7+42.20 TO STA. 16+00	CITY OF ALBUQUERQUE DEPARTMENT OF MUNICIPAL DEVELOPMENT ENGINEERING DIVISION
Zone Map No. C-18/C-19	City Engineer Approval		
Sequence No. 42	Last Design Update		
Sheet 10 of 13			

Thompson Engineering Consultants, Inc.

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DBT	DATE 01-2011	
DRAWN BY	DEM	DATE 01-2011	
CHECKED BY	DBT	DATE 01-2011	

ENGINEERS SEAL

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

BENCH MARKS

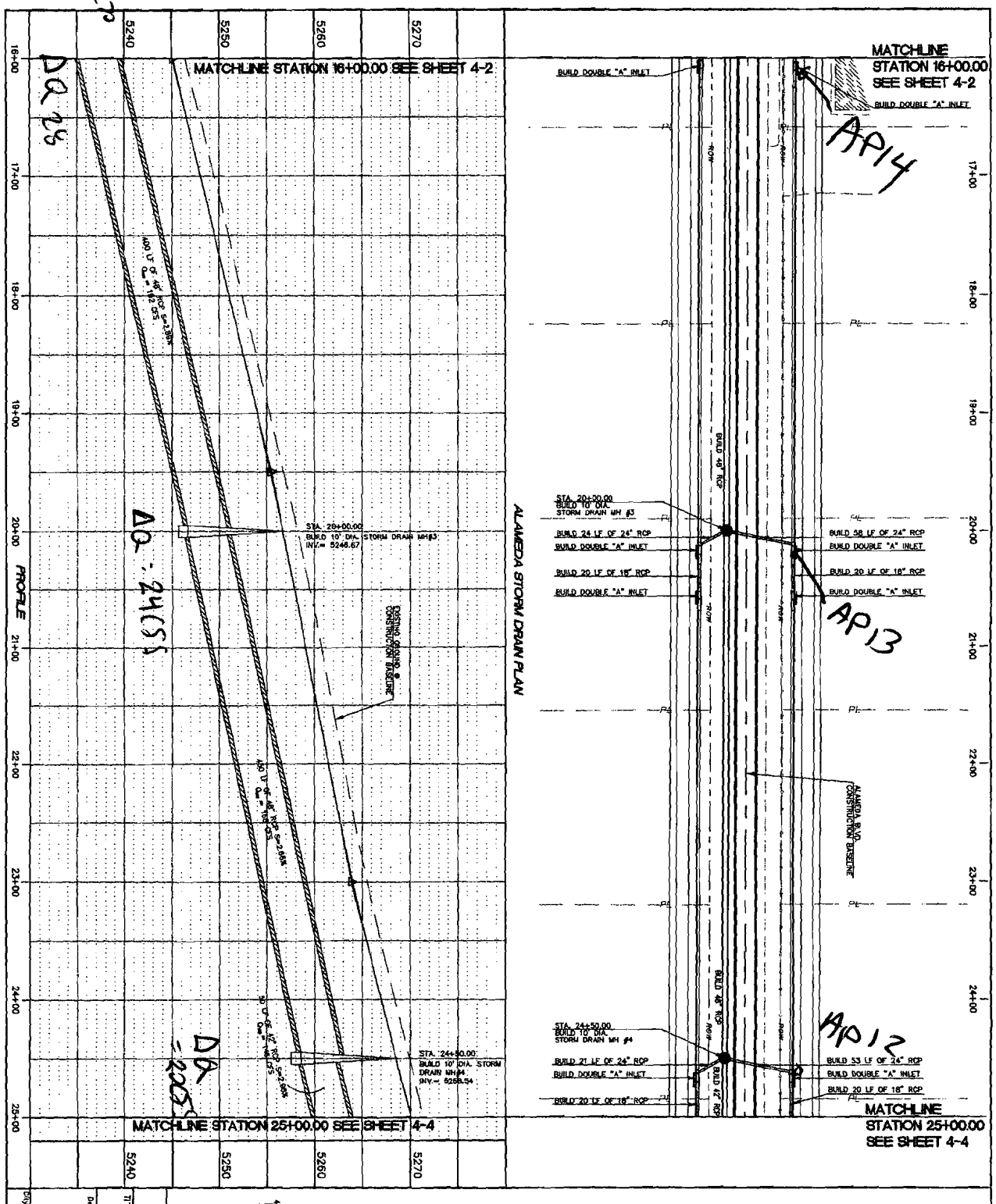
Coordinates shown hereon are modified (surface).
N.M. State Plane Coordinates — Central Zone.
NAD 83 and were derived by scaling State
Plane grid coordinates by the project average
combined factor of CF = 1.000334981 around
an origin of 0,0. Elevations are NAVD 88, and
are adjusted to the NGS Control Station "10-C16,
1985" (published elevation = 5222.080').
The coordinates and elevations are US Survey Feet.

AS BUILT INFORMATION

CONTRACTOR
WORK STAKED BY — DATE
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWING CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.



City Project No. 7663.91	Design Review Committee		
Zone Map No. C-18/C-19	City Engineer Approval		
Sequence No. 4-3	Last Design Update		
Sheet 11 of 83			

TITLE: ALAMEDA STORM DRAIN PLAN AND PROFILE
ALAMEDA BLVD. WIDENING
STA. 16+00 TO STA. 25+00

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

Thompson Engineering Consultants, Inc.

SCALE: 1" = 40'

SCALE: 1" = 5'

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DBT	DATE	01-2011
DRAWN BY	DEM	DATE	01-2011
CHECKED BY	DBT	DATE	01-2011

ENGINEER'S SEAL

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

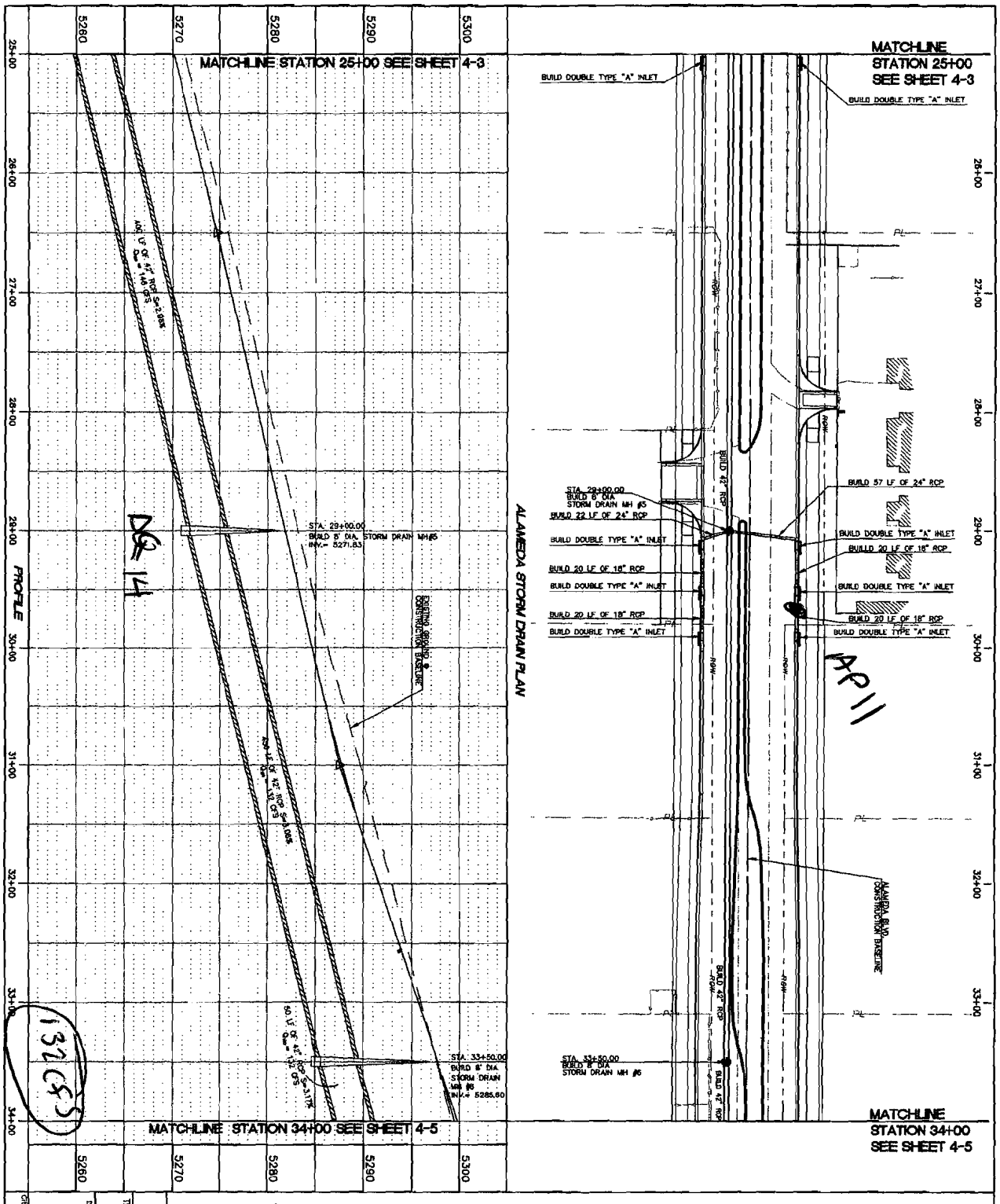
BENCH MARKS

Coordinates shown hereon are modified (surface) N.M. State Plane Coordinates – Central Zone, NAD 83 and were derived by scaling State Plane grid coordinates by the project average combined factor of CF = 1.00033-6861 around an origin of 0,0. Elevations are NAVD 88, and are adjusted to the NGS Control Station "10-C18, 1988" (published elevation = 5232.080'). The coordinates and elevations are US Survey Feet.

AS BUILT INFORMATION

CONTRACTOR
STAKED BY DATE
INSPECTOR DATE
CONSTRUCTION STAKED BY DATE
VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE

MICRO-FILM INFORMATION
RECORDED BY DATE
NO.



DG 14

AP 11

132 C5

TITLE:
ALAMEDA BLVD. WIDENING
ALAMEDA STORM DRAIN PLAN AND PROFILE
STA. 25+00 TO STA. 34+00

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

Thompson Engineering Consultants, Inc.

SCALE: 1" = 40'
SCALE: 1" = 5'

City Project No.	7663.91
Zone Map No.	C-18/C-19
Sequence No.	4-4
Sheet	12
of	13

Design Review Committee

City Engineer Approval

Last Design Update

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY	DBT	DATE 01-2011
DRAWN BY	DEM	DATE 01-2011
CHECKED BY	DBT	DATE 01-2011

ENGINEERS SEAL

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

BENCH MARKS

Coordinates shown hereon are modified (surface) N.M. State Plane Coordinates - Central Zone, NAD 83 and were derived by scaling State Plane grid coordinates by the project average combined factor of CF = 1.000334981 around an origin of 0,0. Elevations are NAVD 88, and are adjusted to the NGS Control Station "10-015, 1988" (published elevation = 5922.080'). The coordinates and elevations are US Survey Feet.

AS BUILT INFORMATION

CONTRACTOR
WORK STAKED BY — DATE
INSPECTION & CORRECTIONS BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

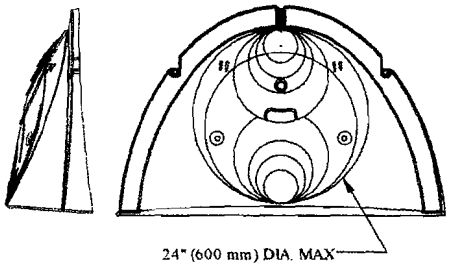
APPENDIX B

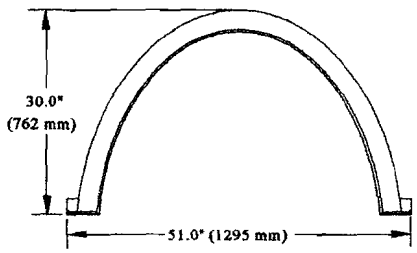
SITE HYDROLOGY

Figure 1 – StormTech SC-740 Chamber (not to scale)

Nominal Chamber Specifications

Size (W x H x Installed L)	51.0" (1295 mm) x 30.0" (762 mm) x 85.4" (2169 mm)
Chamber Storage	45.9 ft³ (1.30 m³)
Min. Installed Storage*	74.9 ft³ (2.12 m³)
Nominal Weight	75 lbs (34 kg)
Color	Yellow





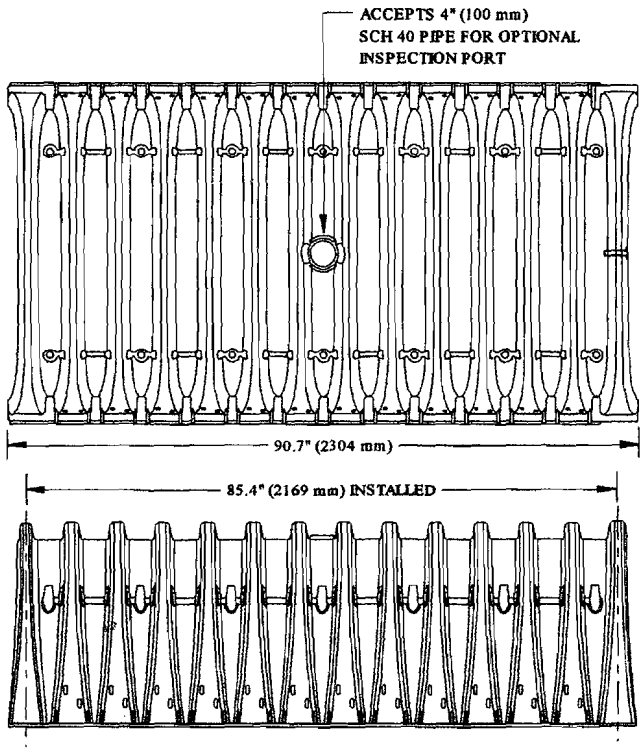
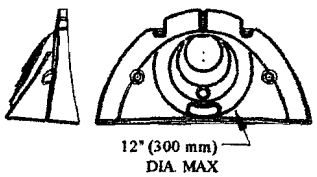
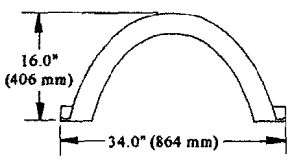


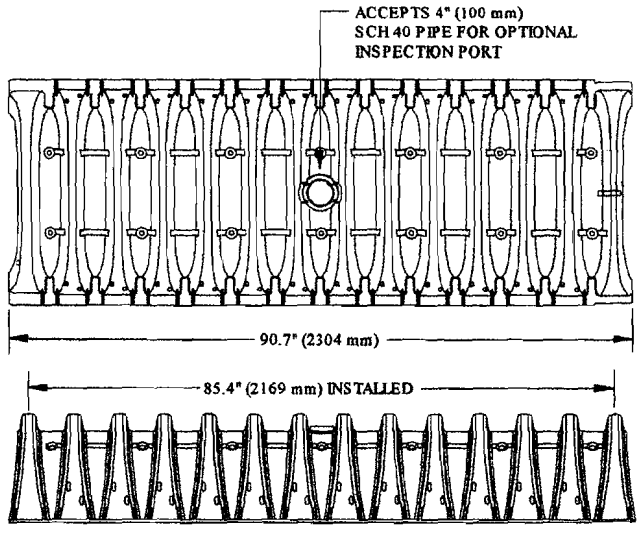
Figure 2 – StormTech SC-310 Chamber (not to scale)

Nominal Chamber Specifications

Size (W x H x Installed L)	34.0" (864 mm) x 16.0" (406 mm) x 85.4" (2169 mm)
Chamber Storage	14.7 ft³ (0.42 m³)
Min. Installed Storage*	31.0 ft³ (0.88 m³)
Nominal Weight	37 lbs (16.8 kg)
Color	Yellow







*This assumes a minimum of 6" (152 mm) of stone below, above and between chamber rows and 40% stone porosity.

Weighted E Method

EAGLE CREST

Existing Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN A1	110125	2.528	0%	0	34.0%	0.860	16.0%	0.4045	50%	1.264	1.699	0.358	9.98	0.527
BASIN A2	110125	2.528	0%	0	34.0%	0.860	16.0%	0.4045	50%	1.264	1.699	0.358	9.98	0.527
BASIN B1N	21627	0.496	0%	0	34.0%	0.169	16.0%	0.07944	50%	0.248	1.699	0.070	1.96	0.103
BASIN B1S	33260	0.764	0%	0	34.0%	0.260	16.0%	0.12217	50%	0.382	1.699	0.108	3.01	0.159
BASIN B2N	21627	0.496	0%	0	34.0%	0.169	16.0%	0.07944	50%	0.248	1.699	0.070	1.96	0.103
BASIN B2S	33260	0.764	0%	0	34.0%	0.260	16.0%	0.12217	50%	0.382	1.699	0.108	3.01	0.159
BASIN B3N	21627	0.496	0%	0	34.0%	0.169	16.0%	0.07944	50%	0.248	1.699	0.070	1.96	0.103
BASIN B3S	33260	0.764	0%	0	34.0%	0.260	16.0%	0.12217	50%	0.382	1.699	0.108	3.01	0.159
BASIN B4N	21627	0.496	0%	0	34.0%	0.169	16.0%	0.07944	50%	0.248	1.699	0.070	1.96	0.103
BASIN B4S	33260	0.764	0%	0	34.0%	0.260	16.0%	0.12217	50%	0.382	1.699	0.108	3.01	0.159
UPOAK(S-SURF)	183170	4.205	0%	0	5.0%	0.210	16.0%	0.6728	50%	2.103	1.432	0.502	13.42	0.782
UPOAK(N-SURF)	44290	1.017	0%	0	5.0%	0.051	10.0%	0.10168	85%	0.864	2.181	0.185	4.82	0.300
UPOAK PIPE	75660	1.737	0%	0	34.0%	0.591	16.0%	0.27791	50%	0.868	1.699	0.246	6.85	0.362
REMAINING OAK (N)	261401	6.001	0%	0	34.0%	2.040	16.0%	0.96015	50%	3.000	1.699	0.850	23.68	1.250
REMAINING OAK (3)	153847	3.532	0%	0	34.0%	1.201	16.0%	0.56509	50%	1.766	1.699	0.500	13.94	0.736
UP ALA SURF	158860	3.647	0%	0	5.0%	0.182	16.0%	0.58351	50%	1.823	1.432	0.435	11.64	0.678
UP ALA 1	34307	0.788	0%	0	5.0%	0.039	10.0%	0.07876	85%	0.669	2.181	0.143	3.73	0.232
UP ALA PIPE	75660	1.737	0%	0	34.0%	0.591	16.0%	0.27791	50%	0.868	1.699	0.246	6.85	0.362
ALA1	22165	0.509	0%	0	0.0%	0.000	15.0%	0.07633	85%	0.433	2.200	0.093	2.43	0.151
ALA2	28528	0.655	0%	0	0.0%	0.000	15.0%	0.09824	85%	0.557	2.200	0.120	3.13	0.194
ALA3	22165	0.509	0%	0	0.0%	0.000	15.0%	0.07633	85%	0.433	2.200	0.093	2.43	0.151

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

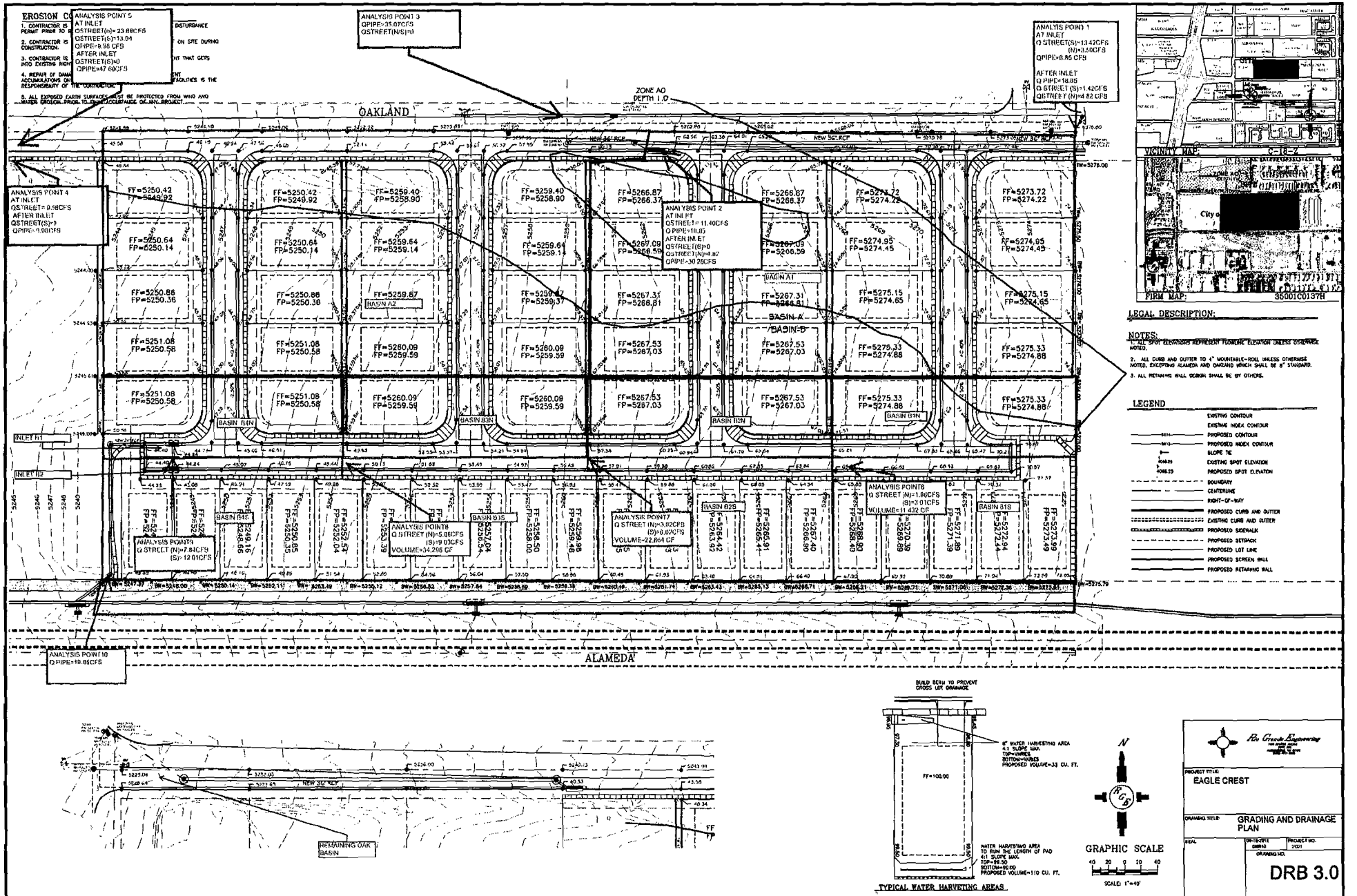
Ea= 0.66 Qa= 1.87

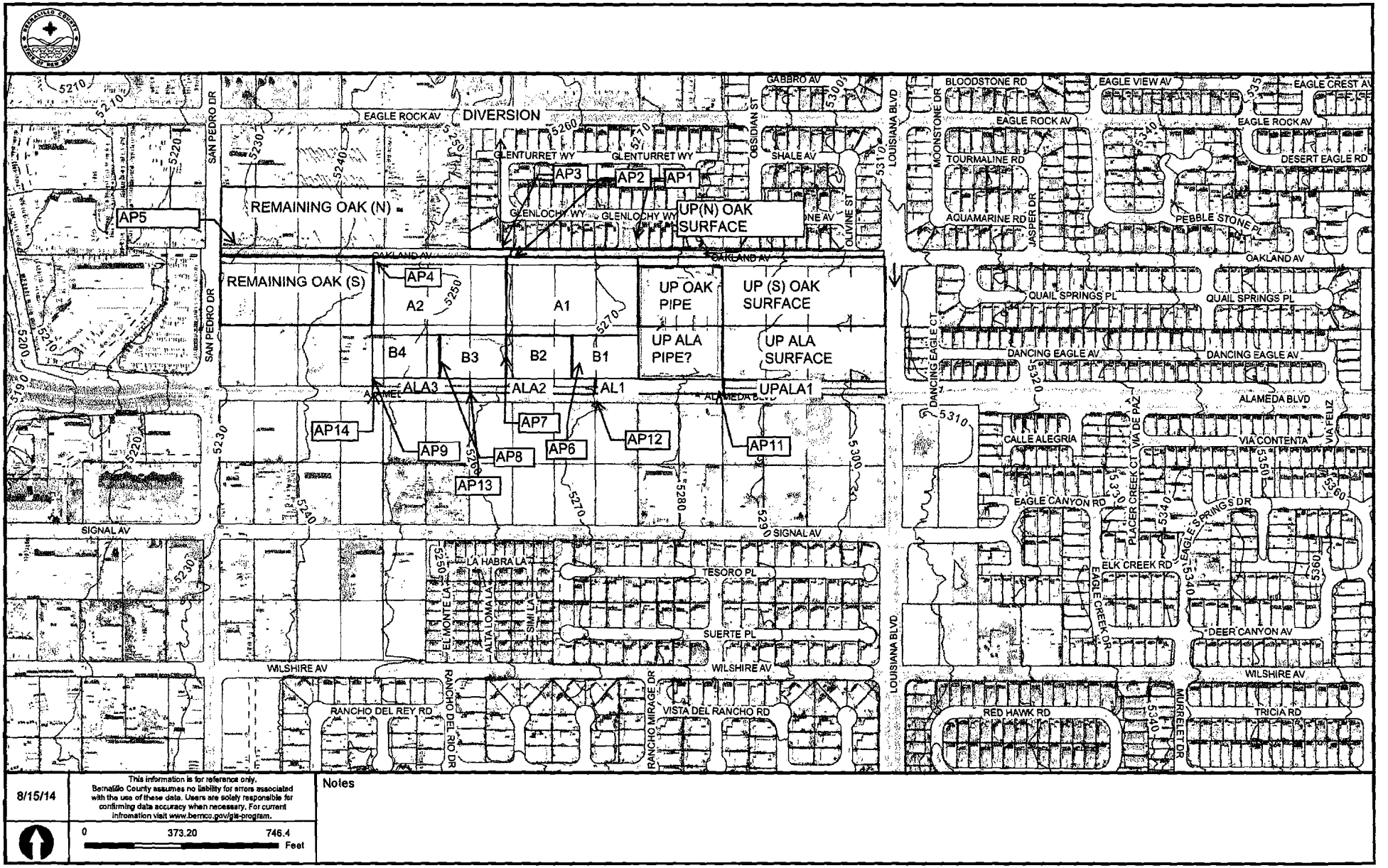
Eb= 0.92 Qb= 2.6

Ec= 1.29 Qc= 3.45

Ed= 2.36 Qd= 5.02

FLOW SUMMARY	AT INLET			AFTER INLET			10-DAY VOLUME
	STREET FLOW(CFS)		PIPE FLOW(CFS)	STREET FLOW(CFS)		PIPE FLOW(CFS)	(CF)
	N	S		N	S		
ANALYSIS POINT 1	3.5	13.42	6.85	3.5	1.42	18.85	
ANALYSIS POINT 2	4.82	11.4	6.85	0	4.82	30.28	
ANALYSIS POINT 3	4.82	0	30.28	0	0	35.07	
ANALYSIS POINT 4	n/a	9.98	0.00	n/a	0	9.98	
ANALYSIS POINT 5	23.68(ult)	13.94(ult)	9.98	0	0	47.6	
ANALYSIS POINT 6	1.96	3.01					11,432
ANALYSIS POINT 7	3.92	6.02					22,664
ANALYSIS POINT 8	5.88	9.03					34,096
ANALYSIS POINT 9	7.84	12.04					N/A
ANALYSIS POINT 10						19.88	
ANALYSIS POINT 11(SURF)	15.38						
ANALYSIS POINT 12(SURF)	9.29						
ANALYSIS POINT 13(SURF)	3.13						
ANALYSIS POINT 14(SURF)	2.43						


EROSION CO
1. CONTRACTOR IS PERMIT PRIOR TO
2. CONTRACTOR IS CONSTRUCTION.
3. CONTRACTOR IS INTO EXISTING
4. REPAIR OF DAMA ACCUMULATIONS OF RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.
DISTURBANCE
ON SITE DURING
NT THAT GETS
ENT
FACILITIES IS THE
ANALYSIS POINT 5
AT INLET
QSTREET(N)= 23.88CFS
QSTREET(S)=13.04
QPIPE=9.98 CFS
AFTER INLET
QSTREET(S)=0
QPIPE=47.88CFS
ANALYSIS POINT 3
QPIPE=35.07CFS
QSTREET(N/S)=0
ANALYSIS POINT 1
AT INLET
Q STREET(S)=13.42CFS
(N)=3.60CFS
QPIPE=8.85 CFS
AFTER INLET
Q PIPE=18.85
Q STREET (S)=1.42CFS
QSTREET (N)=4.82 CFS
ZONE AO
DEPTH 1.0
OAKLAND
ANALYSIS POINT 4
AT INLET
QSTREET= 8.98CFS
AFTER INLET
QSTREET(S)=0
QPIPE= 9.00CFS
ANALYSIS POINT 2
AT INLET
QSTREET= 11.40CFS
Q PIPE=18.85
AFTER INLET
QSTREET(S)=0
QSTREET(N)=4.82
QPIPE=30.28CFS
BASIN A1
BASIN A2
BASIN A
BASIN B
BASIN B4N
BASIN B3N
BASIN B2N
BASIN B1N
INLET H1
INLET H2
BASIN B4S
BASIN B3S
BASIN B2S
BASIN B1S
ANALYSIS POINT9
Q STREET (N)=7.84CFS
(S)= 12.01CFS
ANALYSIS POINT8
Q STREET (N)=5.86CFS
(S)=9.03CFS
VOLUME=34.296 CF
ANALYSIS POINT7
Q STREET (N)=3.02CFS
(S)=8.07CFS
VOLUME=22.864 CF
ANALYSIS POINT6
Q STREET (N)=1.90CFS
(S)=3.01CFS
VOLUME=11.432 CF
ANALYSIS POINT 10
Q PIPE=19.85CFS
ALAMEDA
NEW 36" RCP
REMAINING OAK BASIN
BUILD BERM TO PREVENT CROSS LOT DRAINAGE
6" WATER HARVESTING AREA
4:1 SLOPE MAX.
TOP=VARIES
BOTTOM=VARIES
PROPOSED VOLUME=33 CU. FT.
FF=100.00
WATER HARVESTING AREA TO RUN THE LENGTH OF PAD
4:1 SLOPE MAX.
TOP=99.50
BOTTOM=99.00
PROPOSED VOLUME=110 CU. FT.
TYPICAL WATER HARVESTING AREAS
N
GRAPHIC SCALE
40 20 0 20 40
SCALE 1"=40'
VICINITY MAP:
C-18-2
FIRM MAP:
360010C0137H
LEGAL DESCRIPTION:
NOTES:
1. SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER TO 4" MOUNTABLE-ROLL UNLESS OTHERWISE NOTED, EXCEPTING ALAMEDA AND OAKLAND WHICH SHALL BE 8" STANDARD.
3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.
LEGEND
EXISTING CONTOUR
EXISTING INDEX CONTOUR
PROPOSED CONTOUR
PROPOSED INDEX CONTOUR
SLOPE TIE
EXISTING SPOT ELEVATION
PROPOSED SPOT ELEVATION
BOUNDARY
CENTERLINE
RIGHT-OF-WAY
PROPOSED CURB AND GUTTER
EXISTING CURB AND GUTTER
PROPOSED SIDEWALK
PROPOSED SETBACK
PROPOSED LOT LINE
PROPOSED SCREEN WALL
PROPOSED RETAINING WALL
Rio Grande Engineering
PROJECT TITLE:
EAGLE CREST
DRAWING TITLE:
GRADING AND DRAINAGE PLAN
DRB 3.0



8/15/14

This information is for reference only. Bernalillo County assumes no liability for errors associated with the use of these data. Users are solely responsible for confirming data accuracy when necessary. For current information visit www.bernco.gov/gis-program.

0 373.20 746.4 Feet

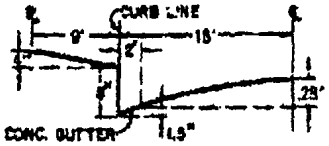
Notes

APPENDIX C

HYDRAULIC CALCULATIONS

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

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

12 CFS PER GRATE @ 3.3%

Inlets in Oakland & Alameda.

DROP INLET CALCULATIONS

POND	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
	Single 'A'	5.92	19.92	0.4884	0.67

ORIFICE EQUATION

Q = CA sqrt(2gH)

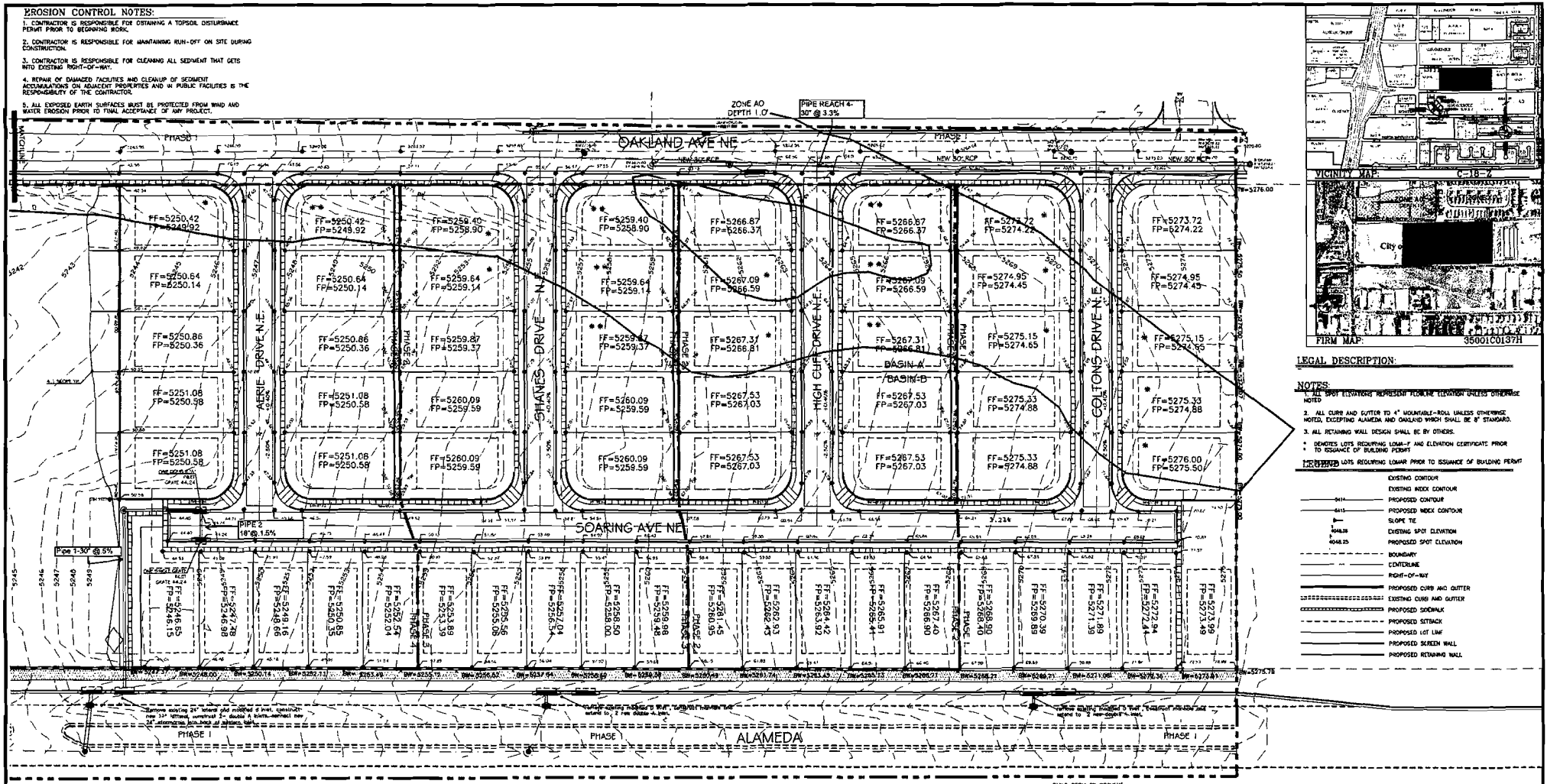
C = 0.6

g = 32.2

INLETS IN SUMP CONDITION. ONE INLET CAN HANDLE THE FLOW , DOUBLED TO ALLOW FOR CLOGGING.

EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.



LEGAL DESCRIPTION:

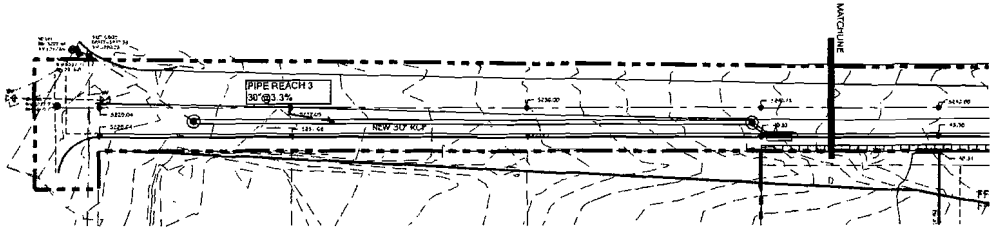
NOTES:

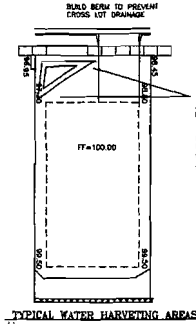
1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED
2. ALL CURB AND GUTTER TO 4" MOUNTABLE-ROLL UNLESS OTHERWISE NOTED, EXCEPTING ALAMEDA AND OAKLAND WHICH SHALL BE 8" STANDARD.
3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.

* DENOTES LOTS REQUIRING LOMA-F AND ELEVATION CERTIFICATE PRIOR TO ISSUANCE OF BUILDING PERMIT

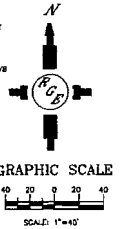
LEGEND: LOTS REQUIRING LOMAR PRIOR TO ISSUANCE OF BUILDING PERMIT

EXISTING CONTOUR
EXISTING INDEX CONTOUR
PROPOSED CONTOUR
PROPOSED INDEX CONTOUR
SLOPE TIE
EXISTING SPOT ELEVATION
PROPOSED SPOT ELEVATION
BOUNDARY
CENTERLINE
RIGHT-OF-WAY
PROPOSED CURB AND GUTTER
EXISTING CURB AND GUTTER
PROPOSED SIDEWALK
PROPOSED SETBACK
PROPOSED LOT LINE
PROPOSED SCREEN WALL
PROPOSED RETAINING WALL





TYPICAL WATER HARVESTING AREAS



Rio Grande Engineering

PROJECT TITLE: EAGLE CREST

DRAWING TITLE: GRADING AND DRAINAGE PLAN-PHASED PONDING

SEAL

08-16-2016 | PROJECT NO. 21231

DRAWING NO.

DRB 3.0

Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
1	30	0.5	4.91	0.625	29.08	20.00	4.07
2	18	1.5	1.77	0.375	12.90	12.01	6.80
3	30	3.3	4.91	0.625	74.71	47.60	9.70
4	30	3.3	4.91	0.625	74.71	25.17	5.13

Manning's Equation:

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

A = Area
R = D/4
S = Slope
n = 0.013

Street Capacity Calculations

AERIE/SHANE/HIGHLIF/COLTON IN BASIN A

28' F-F Street Section with 4" curb

Slope= 0.004 Q=4.99

For water depths less than 0.0625 feet

Y= Water depth
Area = 16*Y^2
P= SQRT(1025*Y^2) + Y
n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.33	0.00	0.00	0.00	0.16	0.00	0.28	0.00137
0.02	0.0064	0.66	0.01	0.00	0.00	0.25	0.01	0.31	0.00336
0.025	0.01	0.83	0.01	0.00	0.01	0.29	0.01	0.33	0.00448
0.035	0.0196	1.16	0.02	0.01	0.01	0.36	0.01	0.34	0.00691
0.045	0.0324	1.49	0.02	0.01	0.03	0.43	0.02	0.36	0.00954
0.052	0.043264	1.72	0.03	0.02	0.04	0.48	0.02	0.37	0.01149
0.06	0.0576	1.98	0.03	0.03	0.06	0.52	0.03	0.38	0.0138
0.0625	0.0625	2.06	0.03	0.03	0.07	0.54	0.03	0.38	0.01454

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625
A2= A1 + 2*Y1 + 25*Y1^2
P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.09	0.03	0.03	0.07	0.54	0.03	0.38	0.01462
0.1	0.172656	3.98	0.04	0.12	0.24	0.68	0.07	0.38	0.02347
0.13	0.311406	5.51	0.06	0.25	0.51	0.81	0.11	0.40	0.03289
0.16	0.495156	7.04	0.07	0.47	0.93	0.94	0.15	0.42	0.04338
0.2	0.810156	9.08	0.09	0.89	1.79	1.10	0.22	0.44	0.05857
0.207	0.873506	9.43	0.09	0.99	1.98	1.13	0.23	0.44	0.06134
0.2612	1.446942	12.20	0.12	1.93	3.86	1.33	0.35	0.46	0.08377
0.3025	**1.9825**	**14.31**	**0.14**	**2.94**	**5.87**	**1.48**	**0.45**	**0.47**	**0.10185**

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025
A3= A2 + Y2*14
P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.31	0.14	2.95	5.90	1.48	0.45	0.48	0.10226
0.3039	2.0021	14.31	0.14	2.98	5.97	1.49	0.45	0.48	0.103
0.3062	2.0343	14.31	0.14	3.06	6.13	1.51	0.46	0.48	0.10491
0.31	2.0875	14.31	0.15	3.20	6.40	1.53	0.47	0.48	0.10806
0.3125	2.1225	14.32	0.15	3.29	6.57	1.55	0.48	0.49	0.11014
0.32	2.2275	14.32	0.16	3.56	7.12	1.60	0.51	0.50	0.11641
0.3317	2.3913	14.34	0.17	4.01	8.01	1.68	0.56	0.51	0.12626
0.333	2.4095	14.34	0.17	4.06	8.11	1.68	0.56	0.51	0.12736

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333
A4= A3 + 14 * Y3 + 25 * Y3^2
P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.44	0.17	4.12	8.23	1.69	0.57	0.51	0.12815
0.3601	2.80726	15.69	0.18	4.93	9.85	1.76	0.63	0.52	0.13827
0.38	3.122725	16.69	0.19	5.65	11.30	1.81	0.69	0.52	0.14662
0.4196	3.809389	18.67	0.20	7.30	14.60	1.92	0.80	0.52	0.16399
0.4603	4.596832	20.70	0.22	9.32	18.64	2.03	0.93	0.53	0.18271
0.504	5.534525	22.89	0.24	11.88	23.75	2.15	1.08	0.53	0.20367
0.513	5.7395	23.34	0.25	12.46	24.91	2.17	1.11	0.53	0.20809

Street Capacity Calculations

SOARING UPPER 2/3

28' F-F Street Section with 4" curb

Slope= 0.03 13.25

For water depths less than 0.0625 feet

Y= Water depth
Area = 16*Y^2
P= SQRT(1025*Y^2) + Y
n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.33	0.00	0.00	0.00	0.43	0.00	0.76	0.00691
0.02	0.0064	0.66	0.01	0.00	0.01	0.69	0.01	0.86	0.01624
0.025	0.01	0.83	0.01	0.01	0.02	0.80	0.02	0.89	0.02136
0.035	0.0196	1.16	0.02	0.02	0.04	1.00	0.03	0.94	0.03228
0.045	0.0324	1.49	0.02	0.04	0.08	1.18	0.05	0.98	0.04391
0.052	0.043264	1.72	0.03	0.06	0.11	1.30	0.07	1.01	0.0524
0.06	0.0576	1.98	0.03	0.08	0.16	1.43	0.09	1.03	0.0624
0.0625	0.0625	2.06	0.03	0.09	0.18	1.47	0.09	1.04	0.06559

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625
A2= A1 + 2*Y1 + 25*Y1^2
P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.09	0.03	0.09	0.19	1.47	0.09	1.04	0.06598
0.1	0.172656	3.98	0.04	0.32	0.65	1.87	0.19	1.04	0.10566
0.13	0.311406	5.51	0.06	0.69	1.39	2.23	0.29	1.09	0.14572
0.16	0.495156	7.04	0.07	1.28	2.56	2.58	0.41	1.14	0.1894
0.2	0.810156	9.08	0.09	2.45	4.90	3.02	0.60	1.19	0.25153
0.207	0.873506	9.43	0.09	2.71	5.41	3.10	0.64	1.20	0.26277
0.2612	1.446942	12.20	0.12	5.29	10.58	3.65	0.95	1.26	0.35291
0.3025	**1.9825**	**14.31**	**0.14**	**8.04**	**16.08**	**4.05**	**1.23**	**1.30**	**0.42471**

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025
A3= A2 + Y2*14
P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.31	0.14	8.09	16.17	4.06	1.23	1.30	0.42622
0.3039	2.0021	14.31	0.14	8.17	16.34	4.08	1.24	1.30	0.42894
0.3062	2.0343	14.31	0.14	8.39	16.78	4.12	1.26	1.31	0.43588
0.31	2.0875	14.31	0.15	8.76	17.51	4.19	1.30	1.33	0.44737
0.3125	2.1225	14.32	0.15	9.00	18.00	4.24	1.33	1.34	0.45494
0.32	2.2275	14.32	0.16	9.75	19.51	4.38	1.40	1.36	0.47767
0.3317	2.3913	14.34	0.17	10.97	21.94	4.59	1.52	1.40	0.51325
0.333	2.4095	14.34	0.17	11.11	22.22	4.61	1.54	1.41	0.51721

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333
A4= A3 + 14 * Y3 + 25 * Y3^2
P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.44	0.17	11.27	22.55	4.63	1.55	1.41	0.52038
0.3601	2.80726	15.69	0.18	13.49	26.99	4.81	1.73	1.41	0.56106
0.38	3.122725	16.69	0.19	15.47	30.94	4.95	1.88	1.42	0.59436
0.4196	3.809389	18.67	0.20	19.99	39.98	5.25	2.20	1.43	0.66299
0.4603	4.596832	20.70	0.22	25.52	51.04	5.55	2.56	1.44	0.73635
0.504	5.534525	22.89	0.24	32.52	65.05	5.88	2.96	1.46	0.81782
0.513	5.7395	23.34	0.25	34.11	68.22	5.94	3.05	1.46	0.8349

Street Capacity Calculations

SOARING(LOWER 1/3)

28' F-F Street Section with 8" curb

Slope= 0.03 Q=20CFS

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

P= SQRT(257*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.00	0.17	0.00	0.00	0.00	0.42	0.00	0.75	0.0067048
0.02	0.00	0.34	0.01	0.00	0.00	0.67	0.01	0.84	0.0157771
0.04	0.01	0.68	0.02	0.01	0.03	1.07	0.04	0.94	0.0369621
0.06	0.03	1.02	0.03	0.04	0.08	1.40	0.08	1.01	0.0607017
0.08	0.05	1.36	0.04	0.09	0.17	1.70	0.14	1.06	0.0862391
0.1	0.08	1.70	0.05	0.16	0.32	1.97	0.20	1.10	0.1131876
0.12	0.12	2.04	0.06	0.26	0.51	2.23	0.27	1.13	0.1413075
0.125	0.13	2.13	0.06	0.29	0.57	2.29	0.29	1.14	0.1485001

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.30	0.61	2.24	0.29	1.09	0.1464784
0.16	0.23	3.91	0.06	0.51	1.02	2.26	0.36	1.00	0.1590045
0.2	0.42	5.95	0.07	1.07	2.13	2.57	0.51	1.01	0.2030387
0.24	0.69	8.00	0.09	2.02	4.04	2.94	0.71	1.06	0.2589738
0.2846	1.08	10.27	0.11	3.65	7.30	3.38	0.96	1.11	0.3284706
0.32	1.47	12.08	0.12	5.44	10.88	3.71	1.19	1.16	0.3871506
0.3551	1.91	13.87	0.14	7.71	15.41	4.04	1.43	1.19	0.44766
0.365	2.05	14.37	0.14	8.44	16.88	4.13	1.51	1.20	0.4650869

For water depths greater than 0.365 ft but less than 0.667 ft

Y2= Y - 0.365

A3= A2 + Y2*14

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	8.92	17.85	4.22	1.56	1.22	0.4808442
0.4556	**3.31**	**14.46**	**0.23**	**18.78**	**37.57**	**5.67**	**2.58**	**1.48**	**0.7526503**
0.4848	3.72	14.49	0.26	22.77	45.54	6.12	2.97	1.55	0.8465309
0.5	3.94	14.51	0.27	24.97	49.93	6.34	3.17	1.58	0.8956596
0.54	4.50	14.55	0.31	31.11	62.21	6.92	3.74	1.66	1.0257991
0.5584	4.75	14.56	0.33	34.10	68.21	7.18	4.01	1.69	1.0860745
0.63	5.76	14.64	0.39	46.76	93.53	8.13	5.12	1.80	1.322998
0.667	6.27	14.67	0.43	53.90	107.80	8.59	5.73	1.85	1.4468366

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 14 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	56.89	113.79	8.41	5.89	1.77	1.4389182
0.72	7.09	17.32	0.41	59.10	118.21	8.34	6.01	1.73	1.4404596
0.74	7.43	18.32	0.41	61.60	123.20	8.29	6.14	1 70	1.4460009
0.76	7.79	19.32	0.40	64.38	128.76	8.26	6.28	1.67	1.4550338
0.78	8.17	20 32	0.40	67.43	134.86	8.25	6.43	1 65	1.4671379
0.8	8.58	21.32	0.40	70.76	141.52	8.25	6.60	1.63	1.481962
0.847	9.60	23.68	0.41	79.67	159.33	8.30	7.03	1.59	1.5258996

EROSION CONTROL NOTES:

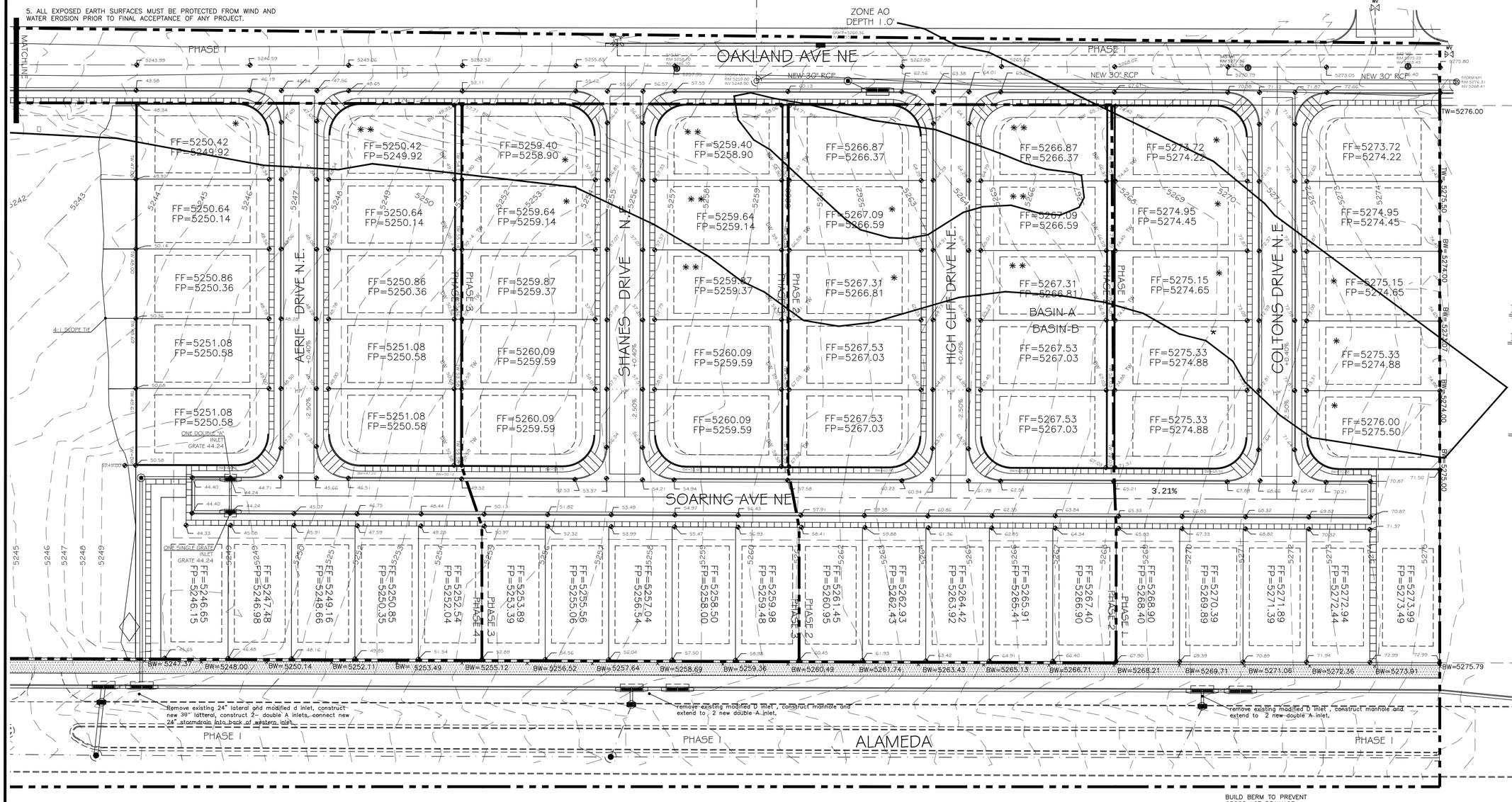
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.

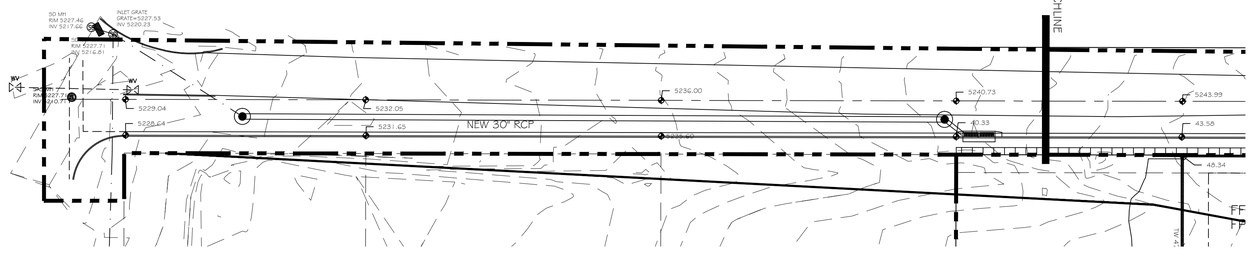
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.

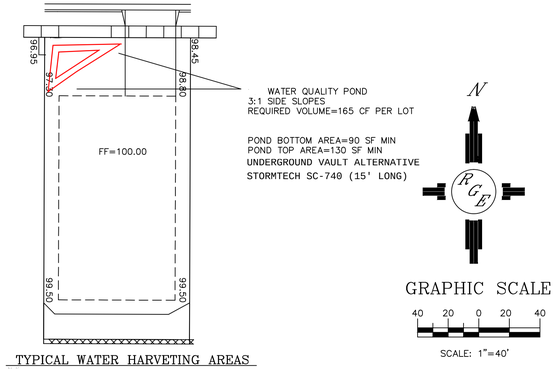
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.

4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

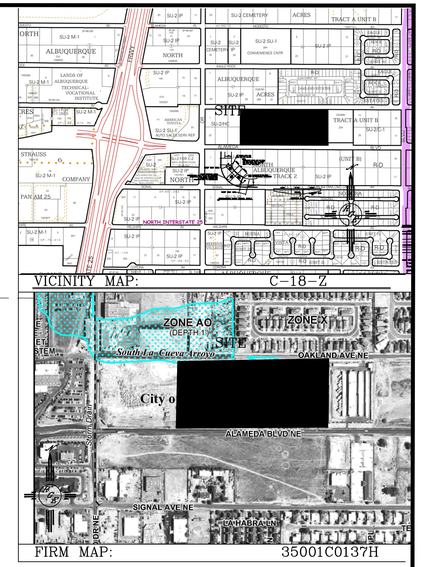
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.







TYPICAL WATER HARVETING AREAS



VICINITY MAP: C-18-Z

FIRM MAP: 35001C0137H

LEGAL DESCRIPTION:

-

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED

2. ALL CURB AND GUTTER TO 4" MOUNTABLE-ROLL UNLESS OTHERWISE NOTED, EXCEPTING ALAMEDA AND OAKLAND WHICH SHALL BE 8" STANDARD.

3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.

* DENOTES LOTS REQUIRING LOMA-F AND ELEVATION CERTIFICATE PRIOR TO ISSUANCE OF BUILDING PERMIT

* DENOTES LOTS REQUIRING LOMAR PRIOR TO ISSUANCE OF BUILDING PERMIT

LEGEND

- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- 5414 PROPOSED CONTOUR
- 5415 PROPOSED INDEX CONTOUR
- SLOPE TIE
- 4048.25 EXISTING SPOT ELEVATION
- 4048.25 PROPOSED SPOT ELEVATION
- BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY
- PROPOSED CURB AND GUTTER
- EXISTING CURB AND GUTTER
- PROPOSED SIDEWALK
- PROPOSED SETBACK
- PROPOSED LOT LINE
- PROPOSED SCREEN WALL
- PROPOSED RETAINING WALL

N

GRAPHIC SCALE

40 20 0 20 40

SCALE: 1"=40'

Rio Grande Engineering
1606 CENTRAL AVENUE
SUITE 201
ALBUQUERQUE, NM 87106
(505) 872-0999

PROJECT TITLE: EAGLE CREST

DRAWING TITLE: GRADING AND DRAINAGE PLAN-PHASED PONDING

SEAL: DAVID SOULE, NEW MEXICO, 14522, REGISTERED PROFESSIONAL ENGINEER

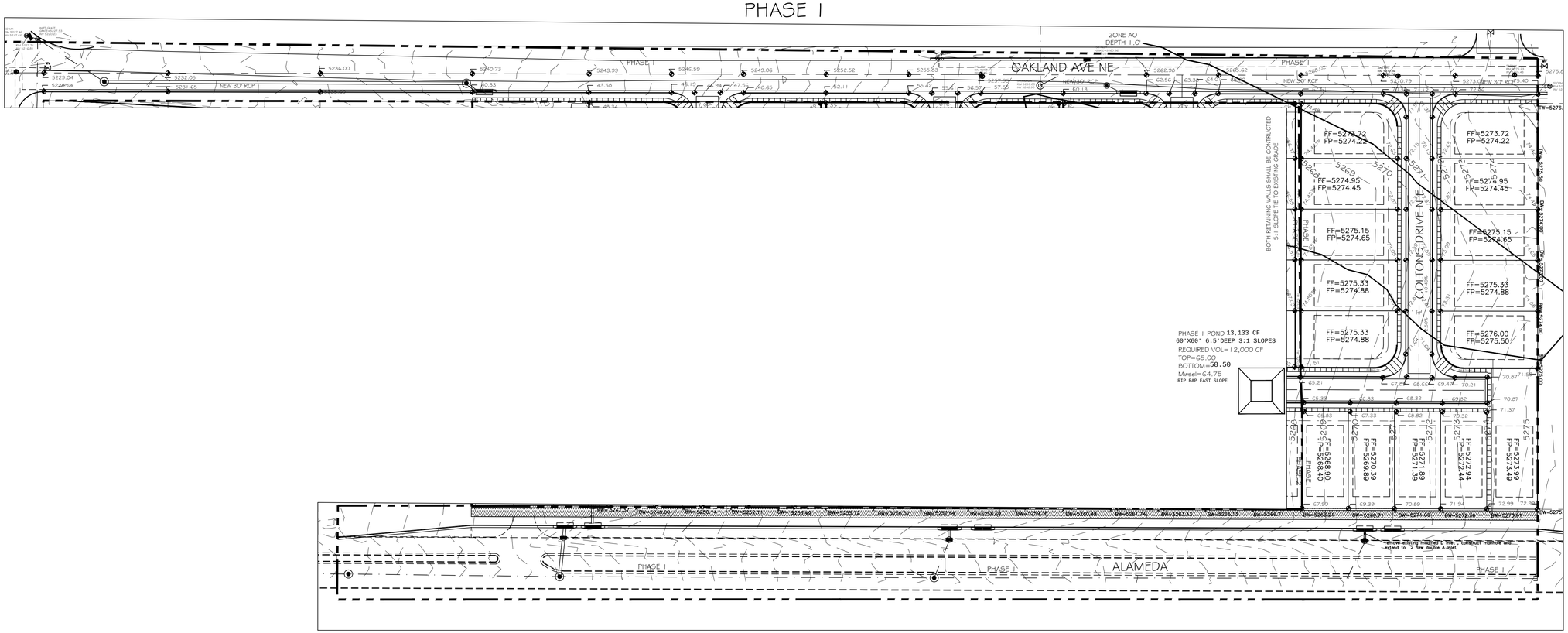
8/19/14

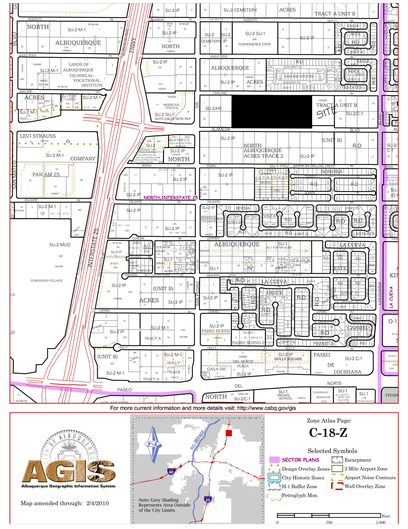
06-18-2014 | PROJECT NO. 90613 | 21331

DRAWING NO.

DRB 3.0

PHASE 1

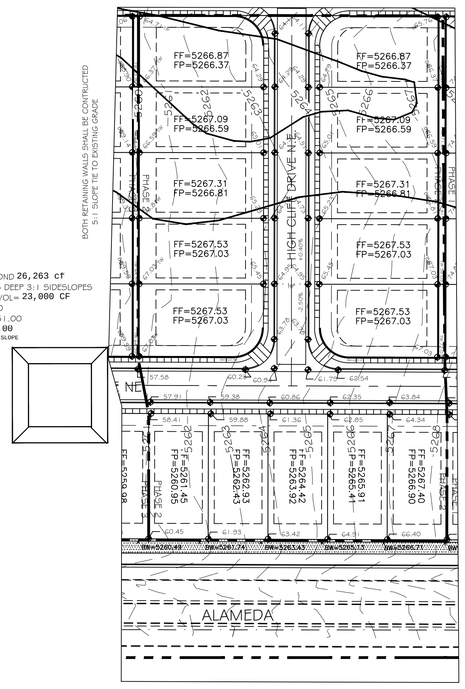




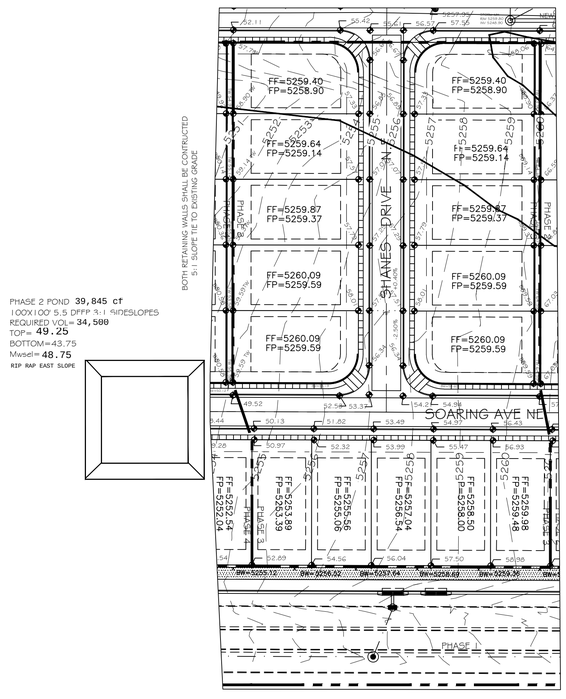
WATER SHUTOFF NOTES:

The contractor shall coordinate with the Water Authority seven (7) days in advance of performing work that will affect the public water or sanitary sewer infrastructure. Work requiring shutoff of facilities designated as Master Plan facilities must be coordinated with the Water Authority 14 days in advance of perming such work. Only Water Authority crews are authorized to operate public valves. Shutoff requests must be made online at <http://abcwua.org/content/view/463/729/>

PHASE 2



PHASE 3



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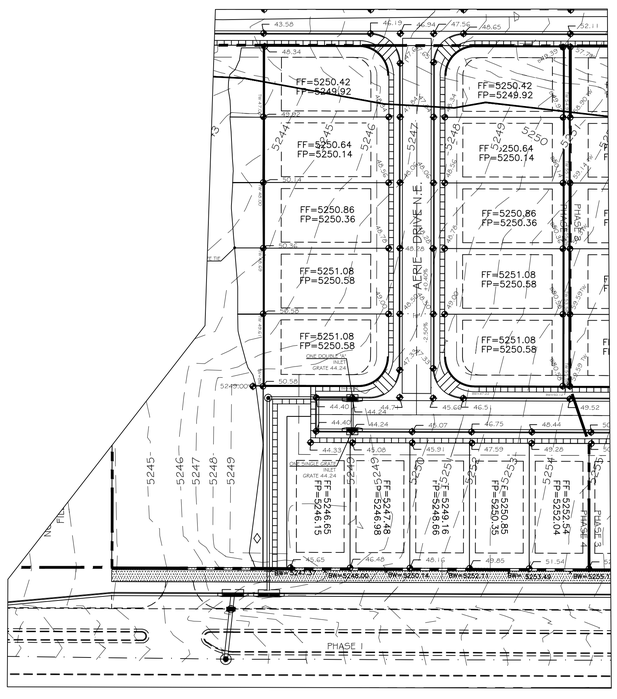

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PROJECT TITLE:
EAGLE CREST SUBDIVISION

DRAWING TITLE:
Grading Plan
PHASE 1-4

DAVID SOULE NEW MEXICO 14522 REGISTERED PROFESSIONAL ENGINEER
8/19/14

DATE: 08-15-2014
PROJECT NO.: 21331
DRAWING NO.: DRB.3.1