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File

MEMORANDUM

Subject: Eagle's View Subdivision -- Drainage
Date: August 15, 2005

A meeting was held this date with City of Albuquerque Hydrology to discuss certain drainage conditions for the proposed Eagle's View Subdivision that is currently under design. The following people attended the meeting:

Adil Rizvi, Owner
Shakeel Rizvi, Owner
Brad Bingham, City of Albuquerque Hydrology
Ray Macy, THE Group

The project covers approximately 5.2 acres and is located along the west edge of Ventura Boulevard between Oakland Avenue and Eagle Rock Avenue. The project will include diversion of upland runoff with the construction of 54-inch storm drain in Ventura. The pipe will extend southward from approximately the midpoint between Eagle Rock and Oakland to Oakland Avenue. The storm drain will turn west at Oakland and reduce to a 48-inch diameter since more grade is available in the westward direction. The 48-inch storm drain will be connected to an existing 48-inch storm drain at the east edge of Oakland South Subdivision, which is currently under construction. Until channel improvements are completed in the receiving waters of the La Cueva Arroyo, discharge from the 48-inch storm drain constructed with the Eagle's View project will be diverted into a temporary retention pond. The pond will be built on the south side of Oakland adjacent to the west edge of the Eagle's View Subdivision. It will be located on a 0.88 acre parcel belonging to Esmail Haidari, Adil Rizvi and Shakeel Rizvi.

The temporary pond will have a capacity of approximately 4.4 ac-ft without freeboard. The bottom elevation will be approximately 5521.5. The pond will be shaped so that any volume exceeding 4.4 ac-ft will discharge over a hardened spillway onto Oakland Avenue at the northwest corner of the pond. The elevation of the street surface in Oakland and the elevation of the pond spillway will be essentially the same at approximately 5535. No embankment above the level of the street will be constructed as part of the pond containment.

THE Group will perform calculations to determine the approximate storm frequency for which runoff will be contained by the temporary pond. Previous calculations showed that approximately 6.2 ac-ft of excess runoff from contributing basins would be produced from the 100-year 72-hour storm. Because channel improvements in the La Cueva Arroyo are currently underway and expected to be completed soon, City Hydrology has agreed to accept a pond design for less than the 100-year storm. Pond volume to contain runoff from a 10-year storm is acceptable.

Design for the pond will be included with the Eagle's View Subdivision Plans. Engineer's Certification that grading of the pond is in accordance with the approved plans will be required. The pond shall remain in operation until improvements in the La Cueva Arroyo have been completed and accepted.

A total of two, single type A inlets will be constructed at the south end of the proposed interior subdivision street (Nazish Road) just before its connection with Oakland Avenue. Runoff collected from these inlets will be directed to the proposed 48-inch storm drain in Oakland Avenue. A third type A inlet will be constructed on the north side of Oakland Avenue at the west edge of the subdivision. Runoff from the proposed private drainage easement at the west edge of the subdivision will be directed by pipe into the back of this inlet. All runoff collected by the inlet from Oakland and the private drainage easement will be drained to the 48-inch storm drain.

Bradley L. Bingham — Brad Bingham, PE, COA — Date

R. W. Macy — 8/18/05
Ray Macy, PE, THE Group — Date

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 Prospect N.E., Albuquerque, NM 87107
Phone: (505) 884-2215 Fax: (505) 884-0214

File

July 22, 2005
Via Mail and Fax To: 924-3864

Sheran Matson, AICP, DRB Chair
City of Albuquerque Planning Department
600 Second Street NW
Albuquerque, New Mexico 87103

Re: Albuquerque Metropolitan Arroyo Flood Control Authority ("AMAFCA") Sale of Surplus Real Property To Llave Construction, Inc. ("LLAVE")

Dear Ms. Matson,

AMAFCA owns Lots 1 and 2, Block 2, Tract 3, Unit 3, North Albuquerque Acres and has entered into a sale agreement with LLAVE to sell a surplus portion of these two lots, containing 31,270.00 +/- square feet (the "SURPLUS PROPERTY"). AMAFCA and LLAVE have also entered into the "Agreement to Provide Maintenance for Channel Improvements on the La Cueva Arroyo from 1,300 feet west of Ventura to Barstow", dated April 13, 2005 ("La Cueva Channel Agreement"). In accordance with the La Cueva Channel Agreement, LLAVE is constructing an extension of the La Cueva Channel east of the Nor Este Estates Subdivision.

In order for AMAFCA to complete the sale of the SURPLUS PROPERTY to LLAVE, a subdivision plat of Lots 1 and 2 and the adjacent lots to the east needs to be prepared. LLAVE, and/or its successors or assigns, is beginning the subdivision process for a proposed subdivision to be named Eagle Rock Heights. Eagle Rock Heights is proposed as a nine lot subdivision plus an AMAFCA parcel or tract (now owned by AMAFCA that will be retained by AMAFCA for drainage purposes) together with additional drainage right-of-way to be dedicated to AMAFCA in fee simple with warranty covenants by the owner(s) of the adjacent property.

AMAFCA hereby authorizes LLAVE, and/or its successors or assigns, to act as Agent for AMAFCA in this subdivision process. At the appropriate time, AMAFCA will sign the proposed subdivision plat as Owner, and if appropriate, subsequently will sign it for approval.

If you have any questions, please contact me at (505) 884-2215. Thank you all very much for your consideration of this request.

Sincerely,
AMAFCA

John P. Kelly, Executive Engineer
Xc: Robert Keeran, President, Llave Construction, Inc.

CITY OF ALBUQUERQUE

August 24, 2006

Raymond W. Macy, P.E.
THE Group
2340 Menaul Blvd NE
Albuquerque, NM 87107

Re: Eagle's View Estates Subdivision Grading and Drainage Plan
Engineer's Stamp dated 8-22-06 (C20/D~~46~~ 56)

Dear Mr. Macy,

Based upon the information provided in your submittals received 7-19-06 and 8-22-06, the above referenced plan is approved for Preliminary Plat action by the DRB. Once that board approves the Grading Plan, please submit a mylar copy for my signature in order to obtain a Rough Grading Permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. If you have any questions about this permit, please feel free to call the Municipal Development Department, Hydrology section at 768-3654 (Charles Caruso).

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

Sincerely,

Curtis A. Cherne

Curtis A. Cherne, E.I.
Engineering Associate, Planning Dept.
Development and Building Services

BB

C: file
Brad Bingham
Charles Caruso, DMD

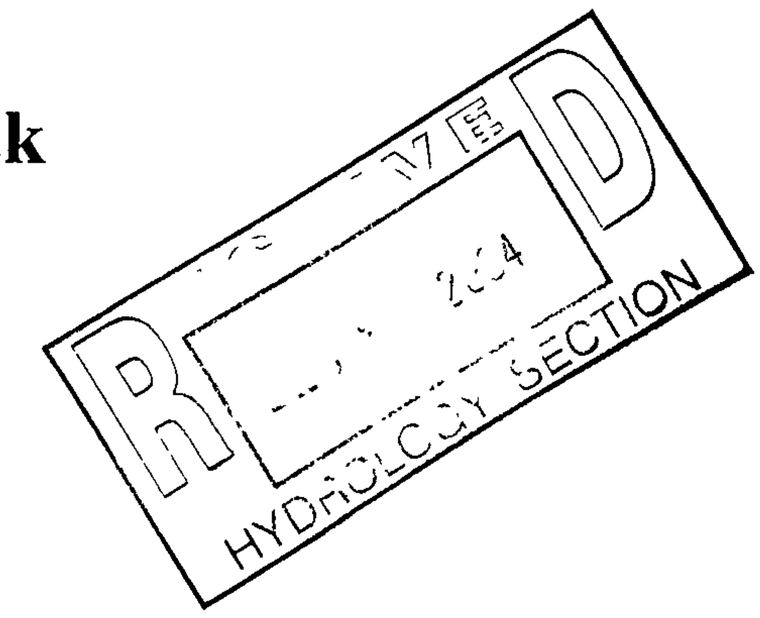
P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

Drainage Report

For

Proposed
Eagle Rock Estates Subdivision

Located at
Ventura and Eagle Rock



Prepared for
Sky Blue Investments

12-30-04

Prepared by
T.H.E. Group

December 2004

Eagle Rock Estates Subdivision

I. Purpose

The purpose of this report is to present a drainage management plan and a comprehensive analysis of the drainage control measures to be implemented with the construction of the Eagle Rock Estates subdivision located near the intersection of Ventura and Eagle Rock in North Albuquerque Acres. Both onsite and offsite drainage affected by this development will be addressed. The La Cueva Channel downstream of this project has been designed by Rio Grande Engineering, in compliance with the "Final North Albuquerque Acres Master Development Plan (FNAAMDP)," prepared by Resource Technology, Inc. dated October 1998. This channel extension is currently in review by AMAFCA at the time of this report. Interim ponding will be included in this report because the downstream outfall piping may not be constructed or approved prior to commencement of construction of this project.

II. Site Description and History

The purposed subdivision is located on lots 13, 14, 15, 16, 19, and 20 of Block 2, Tract 3, Unit 3 and lots 11 and 12 if Block 3, Tract 3, Unit 3 of North Albuquerque Acres. The site is located within Zone Atlas C20 near the intersection of Ventura Street and Eagle Rock Avenue. The site is bounded on the North by Eagle Rock Avenue, on the East by Ventura Street. The proposed subdivision is bounded on the South by Oakland Avenue but will utilize two acres on the South side of Oakland for temporary ponding until the La Cueva Channel downstream is completed.

There is a drainage channel that crosses Ventura and enters the site approximately 160 feet South of Eagle Rock. This water overtops Ventura before entering the site. The storm runoff then follows and existing arroyo and discharges near Eagle Rock and flows on the North side of the neighboring residence. This runoff eventually flows down Eagle Rock and into the La Cueva Channel.

The FNAAMDP indicates that a storm drain pipe (48" RCP) is to be constructed down Oakland from Ventura to the lined La Cueva Channel. There is two main tributaries that enter this storm drain system at Ventura. The first is the arroyo that enters the proposed subdivision near Eagle Rock and the other is South of Oakland. The peak flow rates from page 42 of FNAAMDP are 108.83cfs and 28.80cfs respectively. Copies from the Plan and Profile and the AHYMO run are included in Appendix A. The runoff volumes for these two basins are 3.739 and 0.989 acres feet respectively.

Onsite soils consist of Embudo and Tijeras Complexes. Embudo soils are typically found in drainage ways and depressions and the Tijeras soils are found

on the low riders and narrow undulations. On both soils the runoff is medium and the hazard of water erosion is moderate. Vegetation is sparse and is limited to low annual growth. There is no evidence of any previous construction nor is there any formal landscaping on the site. Existing grade is from East to West and varies form 1.5 to 10 percent. Surface treatment breakdown is 73% B and 27% C (where slope exceeds 10%). The site is not in a 100year flood plain. A copy of the flood plain map from Albuquerque GIS is included in with the SCS Soil Survey in Appendix B.

III. Computation Procedures

Hydrologic analysis was performed utilizing the design criteria found in the City of Albuquerque DPM Section 22.2 released in June 1997.

IV. Precipitation

The 100year 6-hour duration storm was used as the design storm for this analysis. This site is within Zone 3 as identified in the DPM Section 22.2. Tables within the section were used to establish the 6-hour precipitation, excess precipitation volume and peak discharge.

In Accordance with ~~AMAFCA~~ DPM's design criteria for determination of percent land treatment D, the following equation was used for "single family residential" classification based on the maximum possible density of 3 dwelling unites per acre

$7x((NxN) + (5xN))^{1/2}$, where N is the number of du/acre. This results in a Land Treatment D = 35%. It is assumed that the other 65% would be equally split between land treatment B and C.

Street Capacities down Oakland were defined in the FNAAMDP on Table 5g to be 47cfs for the 100 year event.

The 48" storm drain capacity in Oakland is 197cfs with the total incoming flow of 137cfs.

V. Existing Drainage Conditions

The existing offsite drainage basins are a large concern to the proposed development. From the FNAAMDP there is 110cfs that over tops Ventura Street and enters the proposed subdivision approximately 160' south of Eagle Rock Avenue. This storm water currently flows through the site and discharges on the West edge of the proposed development near Eagle Rock. Run off from onsite basins add to this flow through to give a peak discharge at the West property line of 122.08cfs.

The other offsite drainage basin overtops Ventura near Alameda, flow Westerly and is fully contained in the arroyo that flows through lots 11 and 12 on

the South side of Oakland. The flow rate at Ventura for this offsite basin is 28.8 and the peak input at the proposed temporary pond (lots 11 and 12) will be 42.12cfs.

VI. Proposed Drainage Conditions

The proposed subdivision will be constructed utilizing an offsite ponding area located on the South side of Oakland. This was selected because until the La Cueva Channel is completed then the offsite drainage from the East side of Ventura can be retained and will reduce the risk of flooding damage on Eagle Rock and Oakland. Oakland was defined in the FNAAMDP as the preferred corridor for the construction of a 48" RCP storm drainage collection/conveyance system. This system will be constructed along the subdivision frontage as well as to the limits of the Oakland South Subdivision to the West. The underground storm collection system will also be constructed along Oakland to Ventura, along Ventura to the North to collect the storm runoff that formerly over topped Ventura (near Eagle Rock) and a line stubbed out toward the South for the Alameda storm drain lateral on Ventura. See the plans in appendix E.

The pond that is proposed on lots 11 and 12 on the South side of Oakland will be sized to hold the 100year 72 hour storm because the pond (until La Cueva Channel is constructed) will be full retention. The FNAAMDP indicated that 3.739 and 0.989 acre feet of water will overtop Ventura.

10-107

The proposed 5.16 acre site and the two one acre single family residences at the corner of Oakland and Ventura will generate 24.2cfs. This water can be conveyed either by street flows within Oakland or by underground storm drain piping.

The proposed development will generate an excess runoff from basins Offsite 1, 3, 8 and Proposed basin 1 of 1.0325 acre feet. After completing the Hydrograph the storage volume for these basins equals 0.86 acre feet.

There are 4.20 acres of developed land on the South side of Oakland that drains into the existing arroyo that will flow directly into the pond. This basin creates a peak discharge of 13.32cfs and an excess runoff of 0.43 acre feet.

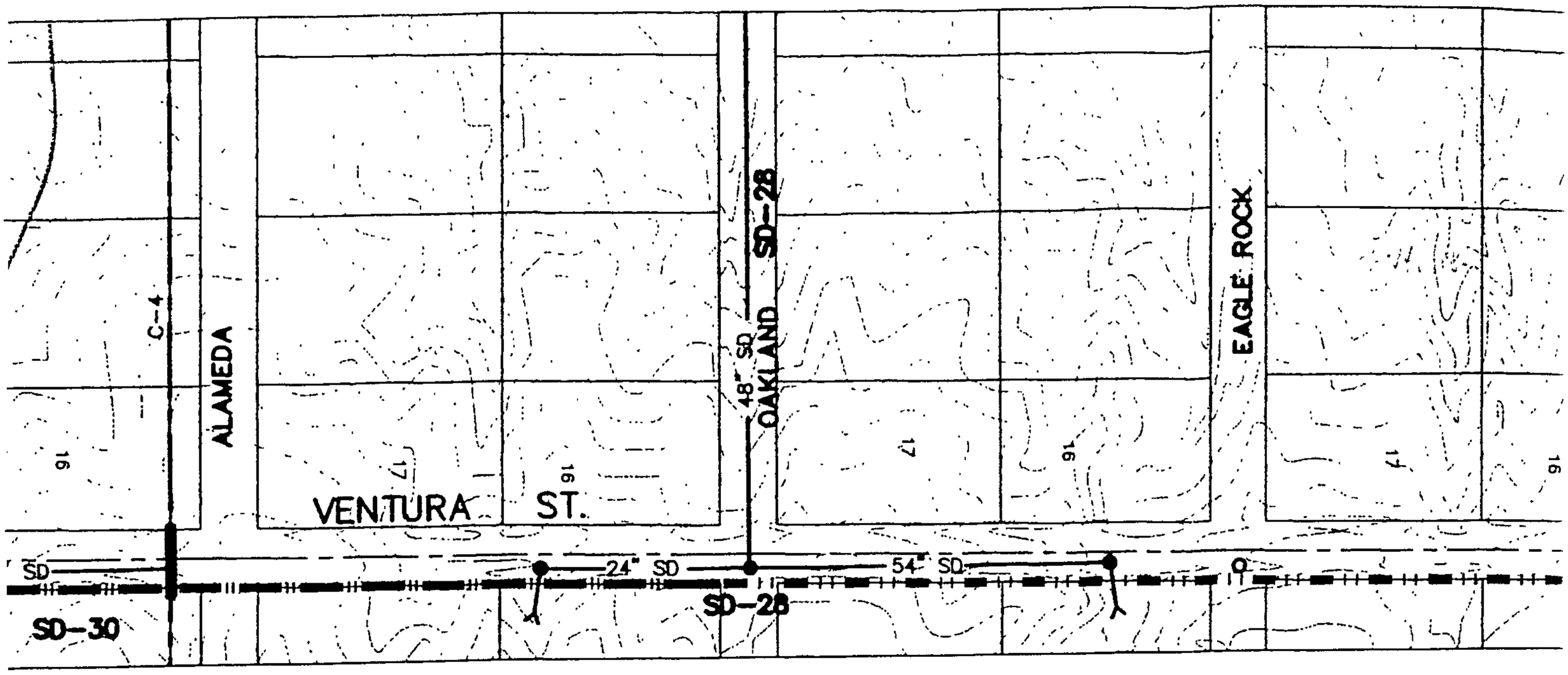
The pond has been designed to hold 6.45 acre feet of water while maintaining 2' of freeboard. After the La Cueva Channel is extended the pond will be filled and the 48" stub out into the pond plugged. The 48" RCP storm drain line will convey a total of 154.63cfs toward the pond. After the pond is removed the offsite flow from offsite basin 1 will be added into the underground conveyance system and the total flow at the connection to Oakland South subdivision will be 168cfs. The capacity of the 48" RCP drain is 197cfs.

VII. Conclusion

The final storm drainage system is being constructed with this project. The peak flow in the storm drainage system in Oakland is 168cfs with a capacity of

197cfs. The peak flow rate within the street on Oakland is 17.62cfs with a capacity of 47cfs.

The interim pond will only be required if the La Cueva Channel is not constructed prior to completion of the proposed subdivision. The pond will later be filled and a phase II project completed for a future subdivision.



PARTIAL
FIGURE 6E

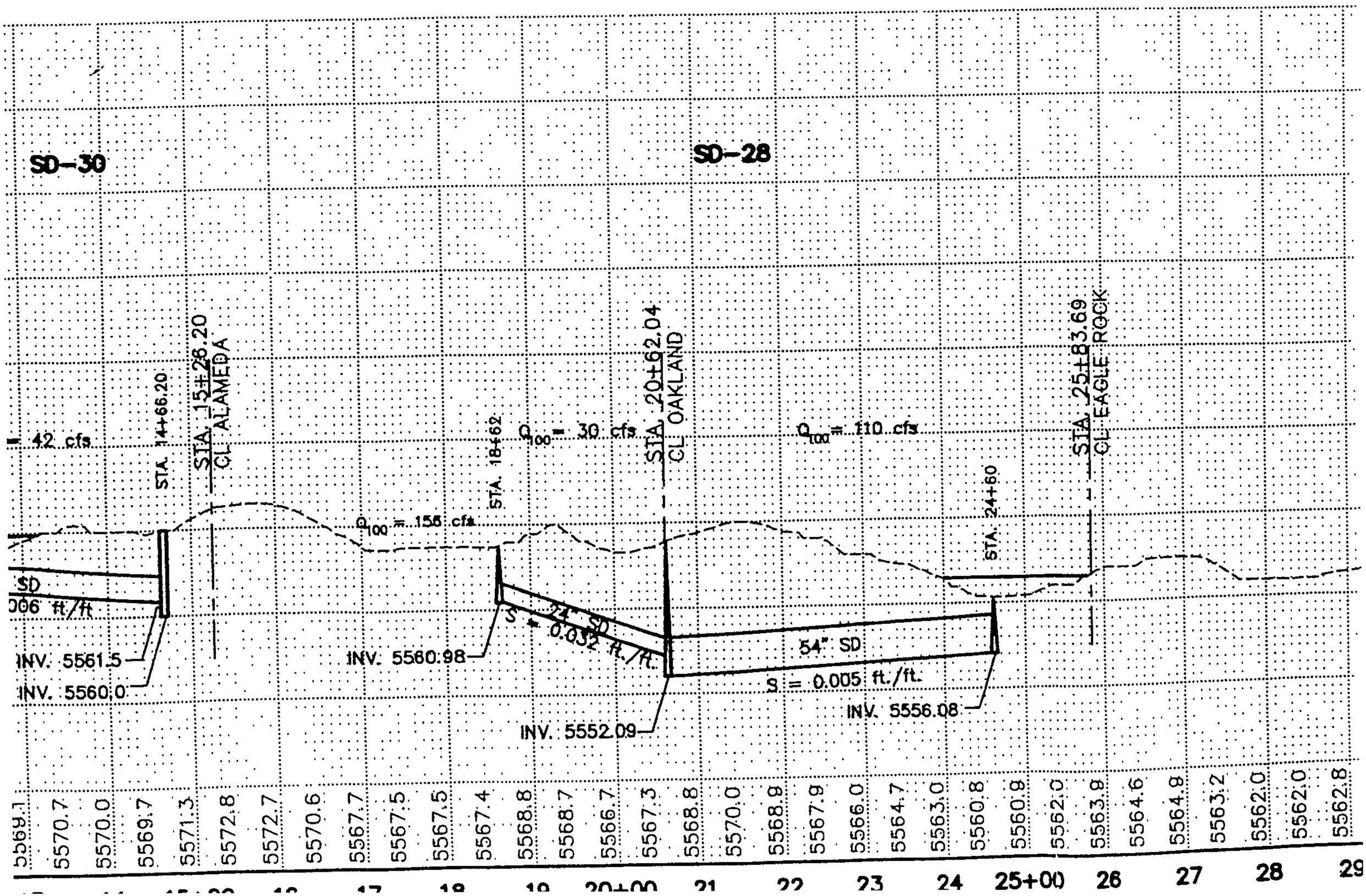
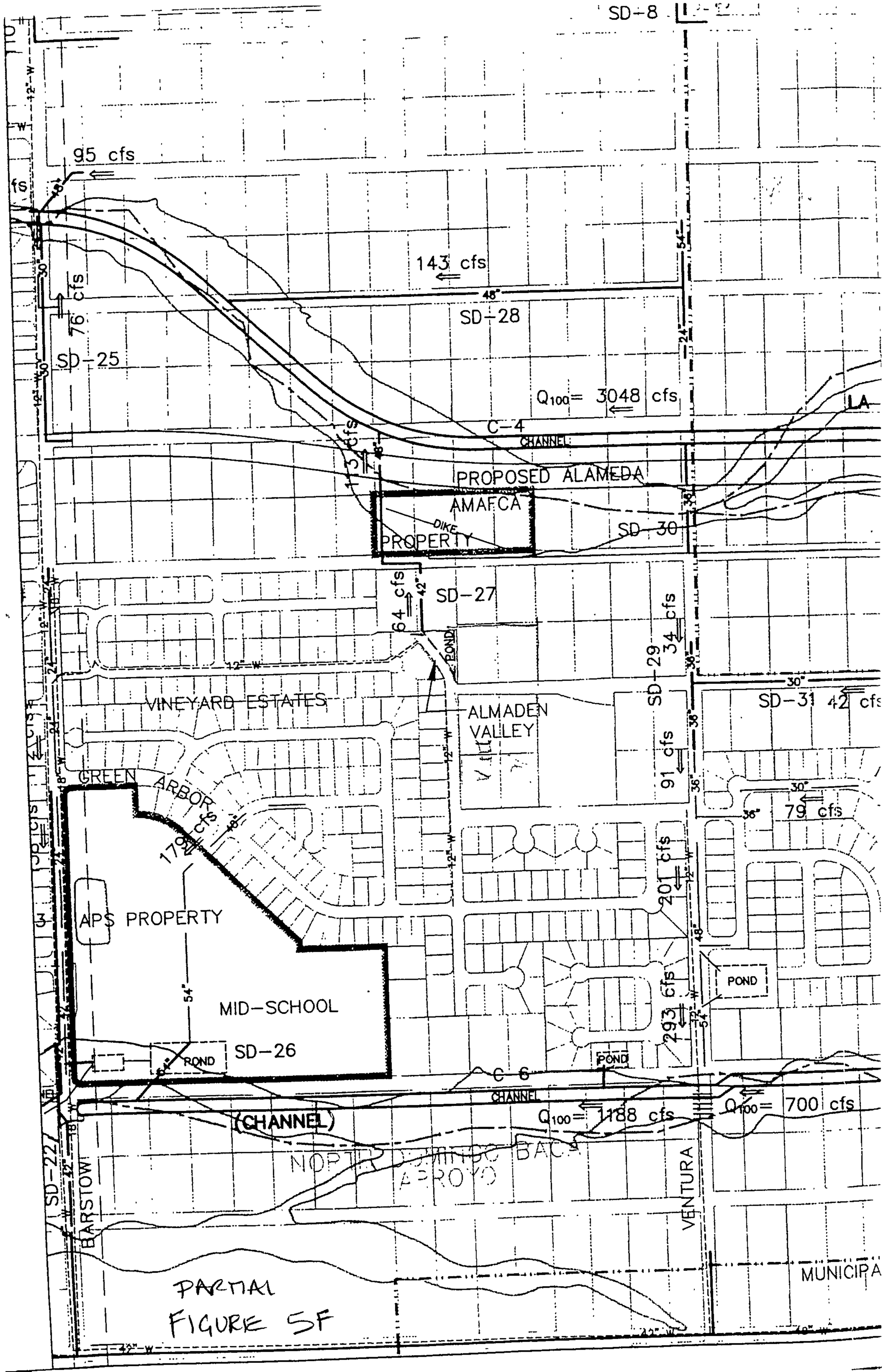


TABLE 5g

FUTURE STORM DRAIN CAPACITY

	10-YR STREET CAP (CFS)	100-YR STREET CAP (CFS)	SD SIZE "	SD S %	SD CAP (CFS)	TOTAL 10-YR CAP	TOTAL 100-YR CAP	Q-10 YR (CFS)	Q-100 YR (CFS)	10-YR OK?	100-YR OK?
SD-28 (OAKLAND)											**ZONE MAP C-20**
ALAMEDA TO OAKLAND	18	85	24"	3.2	35	43	120	15	29	YES	YES
EAGLE ROCK TO OAKLAND	0	0	54"	.5	121	121	121	57	110	YES	YES
VENTURA TO LA CUEVA CHANNEL	22	47	48"	2.5	197	219	244	75	143	YES	YES
SD-29 (VENTURA)											**ZONE MAP C-20**
SIGNAL TO WILSHIRE	0	0	36"	.5	41	41	41	17	34	YES	YES
WILSHIRE TO CORONA	19	71	36"	.5	41	60	112	49	91	YES	YES
SD-30 (VENTURA)											**ZONE MAP C-20**
SIGNAL TO LA CUEVA	0	0	36"	.6	45	45	45	21	42	YES	YES
SD-31 (WILSHIRE)											**ZONE MAP C-20**
EXIST POND TO VENTURA	0	0	30"	1.0	36	36	36	36	42	YES	YES*
SD-32 (VINYARD IV POND)											**ZONE MAP C-20**
EXIST POND TO NDB	0	0	54"	1.0	171	171	171	56	105	YES	YES

YES*: HGL IS ABOVE TOP OF PIPE BUT DOES NOT RISE ABOVE GROUND



D:\data\97-080\BASPRP 10-22-97 8:35:36 am ES1

BERNALILLO COUNTY, AND PARTS OF SANDOVAL A

12

N

2 Miles

10000 Feet

(Joins sheet 3)

SANDOVAL

BERNALILLO

SANDIA

PUEBLO

ELENA

ROF

SAF

TRAMWAY RD

Baca

Domingo

Cañon

de

TgB

EtC

EmB

Te

556

656

T. 11 N

(Joins sheet 11)

1 520 000 FEET

415 000 FEET

(Joins sheet 22)

Scale 1:24000

1 0 1 0

5000 4000 3000 2000 1000 0

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soi
unit is broadly defined, otherwise, it is a lower case letter. A
shows the slope Most symbols without slope letters are those
land types, soil associations, or soil complexes with a conside
shows that the soil has been severely eroded

SYMBOL	NAME
Af	Agua loam
Ag	Agua silty clay loam
Ah	Agua loam, wet variant
AkC	Akela-Rock outcrop complex, 1 to 9 percent slopes
AmB	Alemeda sandy loam, 0 to 5 percent slopes
An	Anapra silt loam
Ao	Anapra silty clay loam
Ar	Armijo clay loam
Ba	Badland
Bb	Bluepoint fine sand, hummocky
BcA	Bluepoint loamy fine sand, 1 to 3 percent slopes
BCC	Bluepoint loamy fine sand, 1 to 9 percent slopes
Bd3	Bluepoint-Wink, severely eroded complex
BKD	Bluepoint-Kokan association, hilly
BOF	Borolls-Rock outcrop association, very steep
Br	Brazito fine sandy loam
Bs	Brazito silty clay loam
Bt	Brazito complex
BUE	Burnac gravelly loam, 20 to 60 percent slopes
CAF	Carlito complex, 15 to 80 percent slopes
Cu	Cut and fill land
EmB	Embudo gravelly fine sandy loam, 0 to 5 percent slopes
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes
GA	Gila fine sandy loam
Gb	Gila loam
Gc	Gila loam, slightly saline
Gd	Gila loam, moderately alkali
Ge	Gila clay loam
GF	Gila complex, moderately alkali
GH	Gila-Hantz complex
Gk	Glendale loam
Gm	Glendale clay loam
Gs	Glendale clay loam, slightly saline

SYMBOL	NAME
Ha	Hantz silty clay loam
ILC	Ildefonso gravelly sandy loam, 1
KaB	Kim fine sandy loam, 1 to 8 perc
KbB	Kim silty clay loam, 3 to 5 perce
KD	Kim-Badland association
KOE	Kokan gravelly sand, 10 to 40 pe
KR	Kokan-Rock outcrop association
KS	Kolob stony loam
KT	Kolob-Rock outcrop association
KU	Kolob-Sandia association
KVE	Kolob stony loam, cold variant, 1
La	La Fonda loam
LBE	Laporte-Rock outcrop complex, 2
LRD	Laporte-Rock outcrop-Escabosa c slopes
LtB	Latene sandy loam, 1 to 5 percen
MaB	Madurez loamy fine sand, 1 to 5 p
MbC	Madurez-Bluepoint complex, 1 to
MWA	Madurez-Wink association, gently
MWB	Madurez-Wink association, undul.
Mz	Manzano loam
NL	Nickel-Latene association
OT	Otero fine sandy loam
PAC	Pajarito loamy fine sand, 1 to 9 p
PbB	Pajarito fine sandy loam, 1 to 5 p
PEB	Penistaja loamy fine sand, 1 to 5
PFB	Penistaja fine sandy loam, 1 to 5
PG	Penistaja-Bond association
PR	Pino-Rock outcrop association

Embudo soils are used for community development, watershed, range, and wildlife habitat.

Representative profile of Embudo gravelly fine sandy loam, 0 to 5 percent slopes, 50 feet north and 100 feet east of the junction of Moon and Signal Streets, Elena Gallegos Grant, in N½ sec. 17, T. 11 N., R. 4 E.

A1—0 to 4 inches, brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak, fine, granular structure in the upper 2 inches and moderate, fine, granular structure in the lower 2 inches; soft, very friable; many fine roots and tubular pores; 15 percent fine gravel; moderately alkaline; abrupt, smooth boundary.

AC—4 to 12 inches, brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 4/3) moist; weak, medium, subangular blocky structure; soft, friable; many fine roots; few fine tubular pores; 35 percent fine gravel; moderately alkaline; abrupt, wavy boundary.

C1ca—12 to 20 inches, light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; many fine roots; few fine tubular pores; 20 percent fine gravel; strongly calcareous with carbonates on undersides of pebbles; moderately alkaline; clear, wavy boundary.

C2—20 to 60 inches, pale brown (10YR 6/3) stratified gravelly loamy coarse sand, brown (10YR 5/3) moist; single grained; loose; few very fine roots in upper part; 35 percent fine gravel; strongly calcareous with few thin carbonates on pebbles; moderately alkaline.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5 dry and 3 or 4 moist, and chroma of 2 to 4. It is gravelly fine sandy loam or fine sandy loam. The AC horizon has value of 4 or 5 dry and 2 to 4 moist and chroma of 2 or 3. Depth to carbonates is 12 to 20 inches. The content of coarse fragments in the C2 horizon is 30 to 50 percent.

EmB—Embudo gravelly fine sandy loam, 0 to 5 percent slopes. This level to gently sloping soil is on the East Mesa. It has the profile described as representative of the series. Included in mapping are areas around Central Avenue and Tramway Road in Albuquerque where the surface layer is thick and slightly darker than is typical and the substratum is limy and cobbly. Also included are areas of Tijeras, Millett, and Tesajo soils.

Runoff is medium, and the hazard of water erosion is moderate.

This soil is used for watershed, wildlife habitat, community development, and range. It is subject to periodic flooding. Control of moisture is needed for proper compaction. Dryland capability subclass VIIe; native plant community 4.

EtC—Embudo-Tijeras complex, 0 to 9 percent slopes. This mapping unit is about 50 percent an Embudo gravelly fine sandy loam, 0 to 5 percent slopes, and about 35 percent a Tijeras gravelly fine sandy loam that has 1 to 9 percent slopes.

The Embudo soil is in drainageways and depressions, and the Tijeras soil is on low ridges in narrow undulations. The Tijeras soil has the profile described as representative of the Tijeras series. On both soils, runoff is medium and the hazard of water erosion is moderate.

Included in this unit in mapping are areas of Tesajo, Millett, and Wink soils, which make up about 15 percent of the unit.

This mapping unit is used for community development, watershed, wildlife habitat, and range. The Embudo part of this unit is subject to flooding. Control of moisture is required for proper compaction. Dryland capability subclass VIIe; native plant community 4.

Escabosa Series

The Escabosa series consists of moderately deep, well drained soils that formed in residuum weathered from limestone bedrock on mountain foothills. Slopes are 5 to 25 percent. The native vegetation is principally blue grama, pinyon pine, oneseed juniper, and agave species. Elevations range from 6,500 to 8,000 feet. The mean annual precipitation is 10 to 14 inches, the mean annual air temperature is about 52° to 55° F, and the frost-free season is 110 to 160 days. Escabosa soils are associated with Manzano, Witt, and Laporte soils.

In a representative profile, the surface layer is dark grayish brown loam about 6 inches thick. The subsoil is dark grayish brown loam about 9 inches thick. The substratum is white gravelly loam about 8 inches thick. Limestone bedrock is at a depth of 23 inches. The soil is calcareous and moderately alkaline.

Permeability is moderate. Available water capacity is 3.5 to 4 inches. Effective rooting depth is 20 to 40 inches.

Escabosa soils are used for range, wildlife habitat, watershed, and community development.

In this survey area, Escabosa soils are mapped only with Laporte soils and Rock outcrop.

Representative profile of Escabosa loam, from an area of Laporte-Rock outcrop-Escabosa complex, 5 to 20 percent slopes, in the northwest corner of sec. 22, T. 9 N., R. 7 E.

A1—0 to 6 inches, dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak, fine, granular structure; slightly hard, friable, sticky; many very fine roots and tubular pores; slightly calcareous; moderately alkaline; clear, smooth boundary.

B2—6 to 15 inches, dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate, fine, subangular blocky structure; slightly hard, firm; many very fine roots and tubular pores; slightly calcareous; moderately alkaline; clear, smooth boundary.

Cca—15 to 23 inches, white (10YR 8/2) gravelly loam, very pale brown (10YR 8/3) moist; very hard, very firm; strongly calcareous; moderately alkaline; abrupt, smooth boundary.

R—23 inches, limestone bedrock.

The A and B horizons have hue of 7.5YR or 10YR, value of 3 to 5 dry and 2 or 3 moist, and chroma of 2 or 3. They are loam that in places is gravelly, cobbly, or stony. The Cca horizon has hue of 7.5YR or 10YR, value of 7 to 9 dry and moist, and chroma of 2 or 3. It is gravelly loam, clay loam, or silty clay loam that is 20 to 35 percent clay. Depth to bedrock ranges from 20 to 40 inches.

Gila Series

The Gila series consists of deep, well drained soils that formed in recent alluvium on the flood plains along the Rio Grande and Rio Puerco. Slopes are 0 to 2 percent. The native vegetation is principally alkali sacaton, inland saltgrass, vine-mesquite, and fourwing saltbush. Elevations range from 4,850 to 6,000 feet. The mean annual precipitation is 7 to 10 inches, the mean annual air temperature is 58° to 60° F, and the frost-free season is 165 to 185 days. Gila soils are associated with Agua, Anapra, Hantz, Vinton, and Brazito soils.

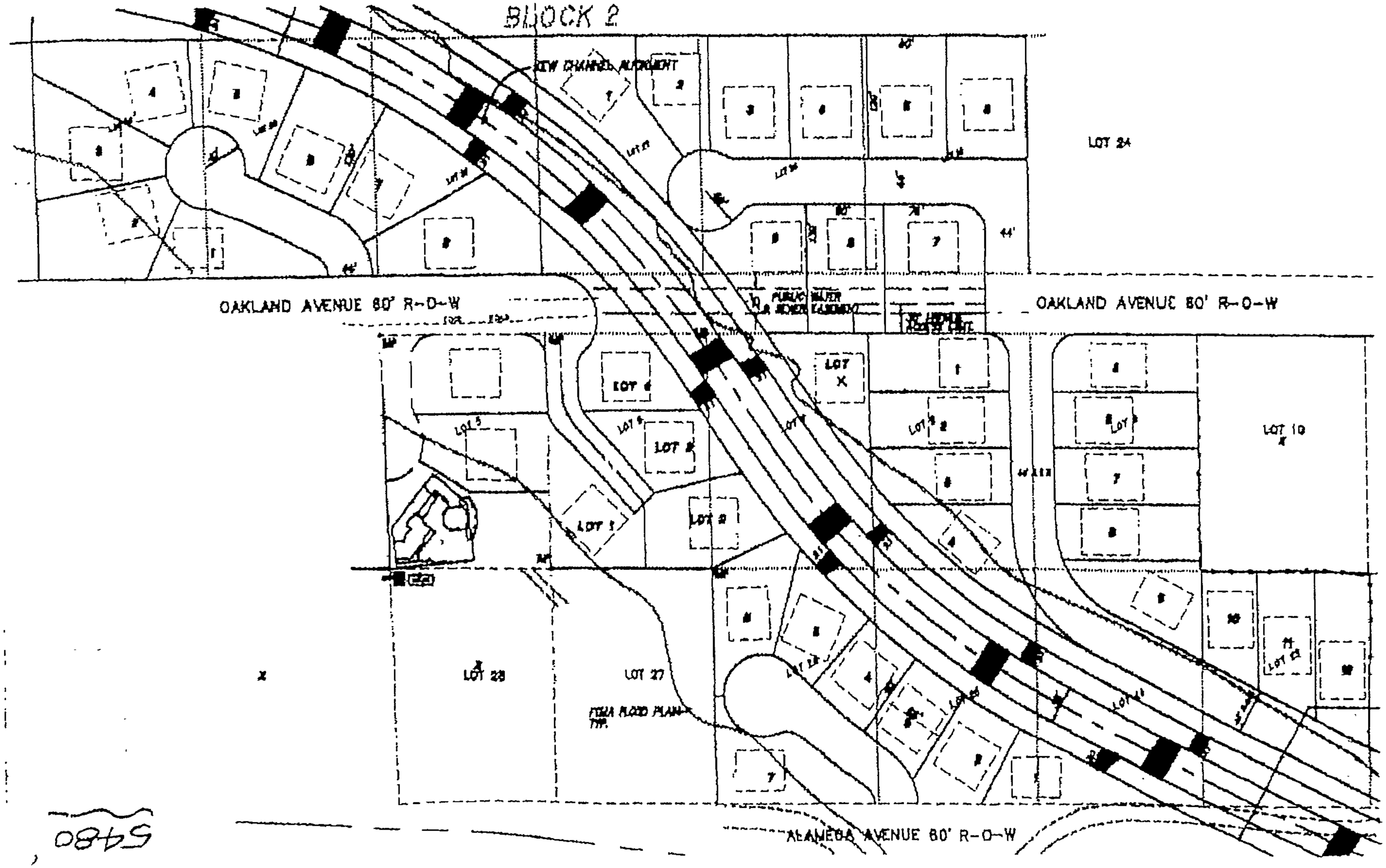
In a representative profile the surface layer is brown loam about 7 inches thick. Next is about 37 inches of stratified brown and light yellowish brown very fine sandy loam and sandy loam. Below this to a depth of 60

Scale: 1" = 135'

3-11-04 BJR

Summary - R-D/3 d.u./AC
w/Kellered;

Block 2 : 17 lots (6 exist.)
Block 3 : 27 Lots (9 exist.)
Note: As shown.... Blk. 3
is @ 3 d.u./Ac.



5480

Drainage Summary

Project	Ventura Subdivision
Project Number.	04-103
Date	09/10/04
By	Dave A
Site Location	Ventura and Eagle Rock
Precipitaion Zone	3 Per Table A-1 COA DPM Section 22 2

Existing summary

Area SF	165842 7	72444.6	71127.2	27738.2	11867.4	6293.6	16023.6	10352.2	84954 3	183088.4	16227.2	sf
Area Acres	3.807	1.663	1.633	0.637	0 272	0 144	0.368	0 238	1 950	4.203	0.373	acres
Percent A	0	0	0	0	0	0	0	0	0	0	0	%
Percent B	73	73	73	59	59	59	59	59	59	59	59	%
Percent C	27	27	27	27	27	27	27	27	27	27	27	%
Percent D	0	0	0	14	14	14	14	14	14	14	14	%

Basin Name	Ex 1	Ex2	Ex3	Off #1	Off #2	Off #3	Off #4	Off #5	Off #6	Off #7	Off #8	
Soil Treatment (acres)												
Area "A"	0 00	0.00	0.00	0 00	0 00	0.00	0 00	0 00	0.00	0.00	0 00	acres
Area "B"	2 78	1 21	1 19	0 38	0 16	0.09	0 22	0 14	1 15	2 48	0 22	acres
Area "C"	1.03	0 45	0 44	0 17	0 07	0 04	0 10	0 06	0 53	1 13	0 10	acres
Area "D"	0.00	0 00	0 00	0.09	0 04	0 02	0.05	0.03	0.27	0 59	0 05	acres
Excess Runoff (acre-feet)												
100yr 6hr	0.3236	0 1413	0.1388	0.06	0 03	0 01	0.04	0.02	0.20	0 43	0.04	acre-ft.
10yr 6hr.	0 1365	0.0596	0.0585	0 03	0.0134	0.0071	0.02	0.01	0 10	0.21	0.02	acre-ft
2yr 6hr	0 0310	0 0136	0.0133	0 01	0.0049	0 0026	0.01	0.00	0.03	0.07	0 01	acre-ft.
100yr 24hr.	0 3236	0 1413	0.1388	0 07	0.03	0 02	0.04	0.03	0.21	0.45	0 04	acre-ft.
Peak Discharge (cfs)												
100 yr.	10 77	4.71	4.62	2.02	0 86	0 46	1.17	0.75	6 18	13 32	1 18	cfs
10yr.	5.36	2 34	2.30	1 09	0 47	0 25	0.63	0.41	3.35	7.22	0.64	cfs
2yr.	1.39	0 61	0.59	0 39	0 17	0.09	0.23	0 15	1.21	2.61	0 23	cfs

Proposed summary

Area SF	238287.3	0	71127.2	27738 2	11867.4	6293.6	16023.6	10352 2	84954 3	183088.4	16227.2	sf
Area Acres	5 470	0.000	1 633	0 637	0 272	0.144	0 368	0.238	1 950	4 203	0.373	acres
Percent A	0	0	0	0	0	0	0	0	0	0	0	%
Percent B	33	33	33	59	59	59	59	59	59	59	59	%
Percent C	32	32	32	27	27	27	27	27	27	27	27	%
Percent D	35	35	35	14	14	14	14	14	14	14	14	%

Basin Name	Pro 1	Pro 2	Pro 3	Off #1	Off #2	Off #3	Off #4	Off #5	Off #6	Off #7	Off #8	
Soil Treatment (acres)												
Area "A"	0.00	0.00	0.00	0.00	0 00	0 00	0.00	0.00	0 00	0.00	0 00	acres
Area "B"	1.81	0.00	0 54	0 38	0 16	0 09	0 22	0.14	1.15	2 48	0 22	acres
Area "C"	1.75	0 00	0.52	0 17	0 07	0 04	0.10	0.06	0 53	1 13	0 10	acres
Area "D"	1.91	0 00	0.57	0 09	0 04	0.02	0.05	0 03	0 27	0.59	0 05	acres
Excess Runoff (acre-feet)												
100yr 6hr	0 7031	#DIV/0!	0 2099	0.0648	0.0277	0 0147	0.04	0 02	0.20	0.43	0.04	acre-ft.
10yr. 6hr	0.3839	#DIV/0!	0 1146	0.0313	0.0134	0.0071	0.02	0.01	0.10	0 21	0.02	acre-ft.
2yr 6hr.	0 1802	#DIV/0!	0.0538	0.0114	0 0049	0.0026	0.01	0.00	0 03	0 07	0.01	acre-ft.
100yr. 24hr.	0.7829	#DIV/0!	0 2337	0.0685	0.0293	0 0155	0.04	0.03	0.21	0 45	0.04	acre-ft
Peak Discharge (cfs)												
100 yr.	20.34	0.00	6.07	2.02	0 86	0.46	1 17	0 75	6 18	13.32	1.18	cfs
10yr.	12.14	0.00	3.62	1 09	0.47	0.25	0 63	0 41	3.35	7.22	0 64	cfs
2yr.	5.65	0.00	1.69	0.39	0.17	0 09	0 23	0 15	1.21	2.61	0.23	cfs

THE Group

Telck Hensley Engineering Group

PROJECT **Ventura Subdivision**
PROJECT NO. **04-103**
DATE **09/10/04**
BY **Dave A**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**Ex 1**	
Precipitation Zone	**3**	
Land Area	**3.81**	acres
Excess Precipitation Volume		
>>> 100-year 6-hour (design)	**0.32**	**acre-ft.**
10-year 6-hour	**0.14**	acre-ft.
2-year 6-hour	**0.03**	acre-ft.
100-year 24-hour	**0.32**	acre-ft.
Peak Discharge Rates (DPM)		
>>> Q100 (design)	**10.77**	**cfs**
Q10	**5.36**	cfs
Q2	**1.39**	cfs
Peak Discharge Rates (DPM-Rational Method)		
>>> Q100 (design)	**10.72**	**cfs**
Q10	**5.41**	cfs
Q2	**1.41**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	Ex 1	
>A.1	PRECIPITATION ZONE (from Table A-1)	3	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	2.14	inches
	100-YEAR STORM (P360)	2.60	inches
	100-YEAR STORM (P1440)	3.10	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	1.73	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	1.13	inches
>A.3	**LAND TREATMENTS (Ai)**		
	Treatment A	0.00	acres
	Treatment B	2.78	acres
	Treatment C	1.03	acres
	Treatment D	0.00	acres
	Total Area	3.81	acres
>A.4	**ABSTRACTIONS**	See A.5	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei)

from Table A-8

100-year 6-hour		
Treatment A	**0.66**	inches
Treatment B	**0.92**	inches
Treatment C	**1.29**	inches
Treatment D	**2.36**	inches
WEIGHTED E (Sum Ei*Ai/A)	**1.02**	inches
VOLUME V100:6h (E*A)	**0.32**	acre-ft.
	14,095.25	ft^3
10-year 6-hour		
Treatment A	**0.19**	inches
Treatment B	**0.36**	inches
Treatment C	**0.62**	inches
Treatment D	**1.50**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.43**	inches
VOLUME V10:6h (E*A)	**0.14**	acre-ft.
	5,945.46	ft^3
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.06**	inches
Treatment C	**0.20**	inches
Treatment D	**0.89**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.10**	inches
VOLUME V2:6h (E*A)	**0.03**	acre-ft.
	1,351.62	ft^3
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	**0.32**	acre-ft.
	14,095.25	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)

from Table A-9

100-year			
Treatment A		**1.87**	cfs/acre
Treatment B		**2.60**	cfs/acre
Treatment C		**3.45**	cfs/acre
Treatment D		**5.02**	cfs/acre

	Q100 (Sum Qi*Ai)	**10.77**	cfs
		==========	
10-year			
Treatment A		**0.58**	cfs/acre
Treatment B		**1.19**	cfs/acre
Treatment C		**2.00**	cfs/acre
Treatment D		**3.39**	cfs/acre

	Q10 (Sum Qi*Ai)	**5.36**	cfs
		==========	
2-year			
Treatment A		**0.00**	cfs/acre
Treatment B		**0.21**	cfs/acre
Treatment C		**0.78**	cfs/acre
Treatment D		**2.04**	cfs/acre

	Q2 (Sum Qi*Ai)	**1.39**	cfs
		==========	

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

Peak Intensity (I) 100-year	**5.38**
Peak Intensity (I) 10-year	**3.65**
Peak Intensity (I) 2-year	**2.21**

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year

Treatment A	**0.35**	cfs/acre
Treatment B	**0.48**	cfs/acre
Treatment C	**0.64**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q100 (Sum Qi*I*Ai)	**10.72**	cfs

10-year

Treatment A	**0.16**	cfs/acre
Treatment B	**0.33**	cfs/acre
Treatment C	**0.55**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q10 (Sum Qi*I*Ai)	**5.41**	cfs

2-year

Treatment A	**0.00**	cfs/acre
Treatment B	**0.10**	cfs/acre
Treatment C	**0.35**	cfs/acre
Treatment D	**0.92**	cfs/acre
Q2 (Sum Qi*I*Ai)	**1.41**	cfs

Drainage Summary

Project	Ventura Subdivision
Project Number	04-103
Date	09/10/04
By:	Dave A
Site Location	Ventura and Eagle Rock
Precipitaion Zone	3 Per Table A-1 COA DPM Section 22 2

Existing summary

Area SF	165842 7	72444 6	71127 2	27738 2	11867.4	6293 6	16023 6	10352 2	84954 3	183088 4	16227 2	sf
Area Acres	3 807	1.663	1.633	0 637	0 272	0 144	0 368	0 238	1 950	4 203	0.373	acres
Percent A	0	0	0	0	0	0	0	0	0	0	0	%
Percent B	73	73	73	59	59	59	59	59	59	59	59	%
Percent C	27	27	27	27	27	27	27	27	27	27	27	%
Percent D	0	0	0	14	14	14	14	14	14	14	14	%

Basin Name	Ex 1	Ex2	Ex3	Off #1	Off #2	Off #3	Off #4	Off #5	Off #6	Off #7	Off #8	
Soil Treatment (acres)												
Area "A"	0 00	0 00	0 00	0.00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	acres
Area "B"	2 78	1 21	1 19	0 38	0 16	0 09	0 22	0 14	1 15	2 48	0 22	acres
Area "C"	1 03	0 45	0 44	0 17	0 07	0 04	0 10	0 06	0 53	1 13	0 10	acres
Area "D"	0 00	0 00	0 00	0 09	0 04	0 02	0.05	0.03	0.27	0 59	0 05	acres
Excess Runoff (acre-feet)												
100yr 6hr	0.3236	0 1413	0 1388	0 06	0 03	0 01	0.04	0.02	0 20	0 43	0 04	acre-ft
10yr 6hr.	0 1365	0 0596	0 0585	0 03	0 0134	0.0071	0 02	0.01	0 10	0.21	0 02	acre-ft
2yr 6hr.	0 0310	0 0136	0.0133	0 01	0 0049	0 0026	0 01	0.00	0 03	0.07	0.01	acre-ft
100yr 24hr.	0.3236	0 1413	0.1388	0 07	0 03	0 02	0.04	0 03	0.21	0 45	0 04	acre-ft
Peak Discharge (cfs)												
100 yr	10 77	4 71	4.62	2.02	0 86	0 46	1.17	0.75	6.18	13.32	1.18	cfs
10yr	5 36	2 34	2 30	1 09	0 47	0 25	0.63	0 41	3 35	7 22	0 64	cfs
2yr	1 39	0 61	0 59	0 39	0 17	0 09	0 23	0 15	1.21	2 61	0.23	cfs

Proposed summary

Area SF	238287 3	0	71127 2	27738 2	11867 4	6293 6	16023 6	10352 2	84954 3	183088 4	16227 2	sf
Area Acres	5 470	0.000	1.633	0 637	0 272	0 144	0 368	0 238	1 950	4 203	0 373	acres
Percent A	0	0	0	0	0	0	0	0	0	0	0	%
Percent B	33	33	33	59	59	59	59	59	59	59	59	%
Percent C	32	32	32	27	27	27	27	27	27	27	27	%
Percent D	35	35	35	14	14	14	14	14	14	14	14	%

Basin Name	Pro 1	Pro 2	Pro 3	Off #1	Off #2	Off #3	Off #4	Off #5	Off #6	Off #7	Off #8	
Soil Treatment (acres)												
Area "A"	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	acres
Area "B"	1.81	0 00	0 54	0 38	0 16	0 09	0 22	0.14	1 15	2 48	0 22	acres
Area "C"	1 75	0.00	0 52	0 17	0 07	0 04	0 10	0 06	0 53	1 13	0 10	acres
Area "D"	1 91	0 00	0 57	0 09	0 04	0 02	0 05	0.03	0 27	0 59	0 05	acres
Excess Runoff (acre-feet)												
100yr 6hr.	0 7031	#DIV/0!	0.2099	0.0648	0 0277	0 0147	0.04	0.02	0 20	0.43	0 04	acre-ft.
10yr 6hr	0.3839	#DIV/0!	0 1146	0 0313	0 0134	0.0071	0 02	0.01	0 10	0 21	0 02	acre-ft.
2yr. 6hr.	0 1802	#DIV/0!	0 0538	0.0114	0 0049	0 0026	0.01	0 00	0 03	0 07	0 01	acre-ft
100yr. 24hr	0 7829	#DIV/0!	0.2337	0 0685	0 0293	0 0155	0.04	0 03	0 21	0 45	0 04	acre-ft
Peak Discharge (cfs)												
100 yr.	20 34	0 00	6 07	2 02	0 86	0 46	1 17	0 75	6 18	13 32	1.18	cfs
10yr	12.14	0 00	3 62	1 09	0 47	0 25	0 63	0.41	3 35	7 22	0.64	cfs
2yr	5.65	0 00	1 69	0 39	0 17	0 09	0 23	0 15	1 21	2.61	0.23	cfs

THE Group

Telck Hensley Engineering Group

PROJECT **Ventura Subdivision**
PROJECT NO. **04-103**
DATE **09/10/04**
BY **Dave A**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**Pro 1**	
Precipitation Zone	**3**	
Land Area	**5.47**	acres
Excess Precipitation Volume		
>>> 100-year 6-hour (design)	**0.70**	**acre-ft.**
10-year 6-hour	**0.38**	acre-ft.
2-year 6-hour	**0.18**	acre-ft.
100-year 24-hour	**0.78**	acre-ft.
Peak Discharge Rates (DPM)		
>>> Q100 (design)	**20.34**	**cfs**
Q10	**12.14**	cfs
Q2	**5.65**	cfs
Peak Discharge Rates (DPM-Rational Method)		
>>> Q100 (design)	**20.27**	**cfs**
Q10	**12.19**	cfs
Q2	**5.65**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	Pro 1	
>A.1	PRECIPITATION ZONE (from Table A-1)	3	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	**2.14**	inches
	100-YEAR STORM (P360)	**2.60**	inches
	100-YEAR STORM (P1440)	**3.10**	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	**1.73**	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	**1.13**	inches
>A.3	**LAND TREATMENTS (Ai)**		
	Treatment A	**0.00**	acres
	Treatment B	**1.81**	acres
	Treatment C	**1.75**	acres
	Treatment D	**1.91**	acres
	Total Area	**5.47**	acres
>A.4	**ABSTRACTIONS**	**See A.5**	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei) from Table A-8		
100-year 6-hour		
Treatment A	**0.66**	inches
Treatment B	**0.92**	inches
Treatment C	**1.29**	inches
Treatment D	**2.36**	inches

WEIGHTED E (Sum Ei*Ai/A)	**1.54**	inches

VOLUME V100:6h (E*A)	**0.70**	acre-ft.
	30,627.86	ft^3
	==========	
10-year 6-hour		
Treatment A	**0.19**	inches
Treatment B	**0.36**	inches
Treatment C	**0.62**	inches
Treatment D	**1.50**	inches

WEIGHTED E (Sum Ei*Ai/A)	**0.84**	inches

VOLUME V10:6h (E*A)	**0.38**	acre-ft.
	16,723.80	ft^3
	==========	
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.06**	inches
Treatment C	**0.20**	inches
Treatment D	**0.89**	inches

WEIGHTED E (Sum Ei*Ai/A)	**0.40**	inches

VOLUME V2:6h (E*A)	**0.18**	acre-ft.
	7,849.58	ft^3
	==========	
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	**0.78**	acre-ft.
	34,102.88	ft^3
	==========	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)
from Table A-9

100-year		
Treatment A	**1.87**	cfs/acre
Treatment B	**2.60**	cfs/acre
Treatment C	**3.45**	cfs/acre
Treatment D	**5.02**	cfs/acre
Q100 (Sum Qi*Ai)	**20.34**	cfs
10-year		
Treatment A	**0.58**	cfs/acre
Treatment B	**1.19**	cfs/acre
Treatment C	**2.00**	cfs/acre
Treatment D	**3.39**	cfs/acre
Q10 (Sum Qi*Ai)	**12.14**	cfs
2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.21**	cfs/acre
Treatment C	**0.78**	cfs/acre
Treatment D	**2.04**	cfs/acre
Q2 (Sum Qi*Ai)	**5.65**	cfs

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour) from Table A-10			
	Peak Intensity (I) 100-year	**5.38**	
	Peak Intensity (I) 10-year	**3.65**	
	Peak Intensity (I) 2-year	**2.21**	
RATIONAL METHOD COEFFICIENT, C from Table A-11			
	100-year		
	Treatment A	**0.35**	cfs/acre
	Treatment B	**0.48**	cfs/acre
	Treatment C	**0.64**	cfs/acre
	Treatment D	**0.93**	cfs/acre
	Q100 (Sum Qi*I*Ai)	**20.27**	cfs
	10-year		
	Treatment A	**0.16**	cfs/acre
	Treatment B	**0.33**	cfs/acre
	Treatment C	**0.55**	cfs/acre
	Treatment D	**0.93**	cfs/acre
	Q10 (Sum Qi*I*Ai)	**12.19**	cfs
	2-year		
	Treatment A	**0.00**	cfs/acre
	Treatment B	**0.10**	cfs/acre
	Treatment C	**0.35**	cfs/acre
	Treatment D	**0.92**	cfs/acre
	Q2 (Sum Qi*I*Ai)	**5.65**	cfs

STREET CAPACITY

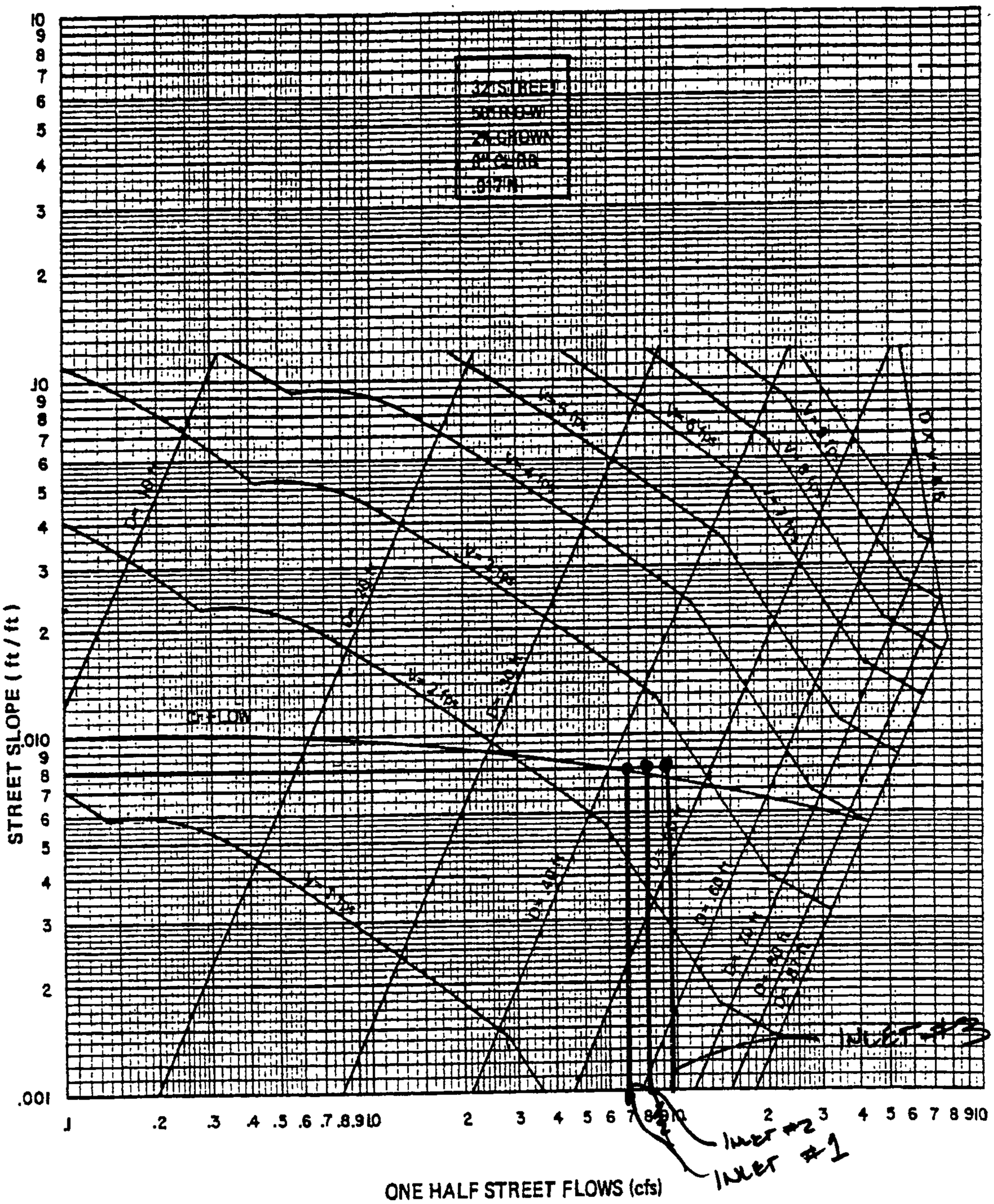
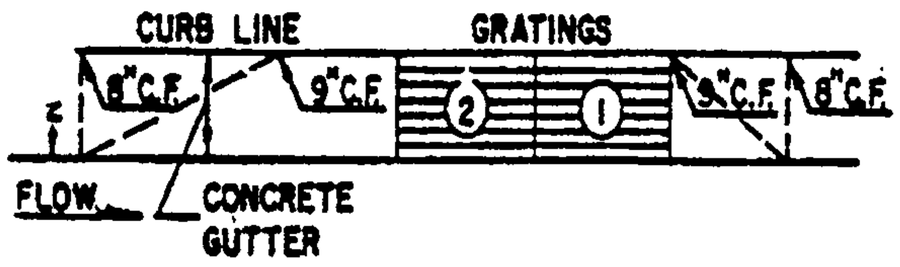
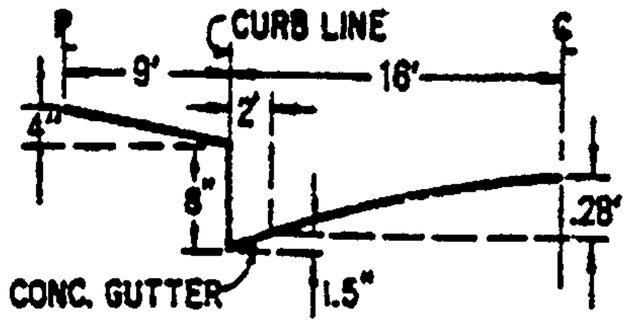


PLATE 22.3 D-1

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



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

PLATE 22.3 D-6

Run: SD2 (OAKLAND AVENUE)

********** Sheet View **********

Pipe Label	Node Label	North [ft]	East [ft]	Station [ft]	Offset [ft]	Elev. [ft]	Rim Type	Struct Dim. [in]	Struct Drop [ft]	Node Drop [ft]	Sump
	HW	1523294.3144	412903.2580	9544.5800	-303.7622	5568.1948	END	0.0000	0.0000	0.0000	
	PMH	1523294.5683	412843.2574	9484.5790	-303.6490	5564.4081	PMH	60.0000	0.1000	0.0000	
	PMH	1522980.9215	412841.9306	9485.1706	10.0000	5565.6210	PMH	60.0000	0.1000	0.0000	
	PMH	1522983.9502	412346.7729	8990.0036	10.0000	5544.5007	PMH	60.0000	0.1000	0.0000	
	PMH	1522985.5667	412067.6506	8710.8767	10.0907	5535.2027	PMH	60.0000	0.1000	0.0000	
	PMH	1522985.9021	412027.6520	8670.8768	10.0000	5534.2449	PMH	60.0000	0.1000	0.0000	
	PMH	1522987.9203	411697.7027	8340.9213	10.0000	5521.7037	PMH	60.0000	0.1000	0.0000	

Sump Elev [ft]	Pipe Size [in]	Start Inv. [ft]	Finish Inv. [ft]	Cen-Cen 2DLength [ft]	Pipe Slope [ft/ft]	Pipe Drop [ft]	Pipe Descr.	Rough Coeff [MANNG]	Pipe Flow [cfs]
5554.9600	48.0000	5554.9600	5553.7600	60.0011	0.0200	1.2000	RCP	0.0130	108.8300
5553.6600	48.0000	5553.6600	5552.0917	313.6496	0.0050	1.5682	RCP	0.0130	0.0000
5551.9917	48.0000	5551.9917	5535.1561	495.1670	0.0340	16.8357	RCP	0.0130	0.0000
5535.0561	48.0000	5535.0561	5525.5657	279.1269	0.0340	9.4903	RCP	0.0130	0.0000
5525.4657	48.0000	5525.4657	5524.1057	40.0000	0.0340	1.3600	RCP	0.0130	0.0000
5524.0057	48.0000	5524.0057	5512.9100	329.9555	0.0336	11.0957	RCP	0.0130	0.0000
5512.9100									

Lateral Name #1	Lateral Inv. #1 [ft]	Lateral Flow #1 [cfs]	Lateral Name #2	Lateral Inv. #2 [ft]	Infilt. Flow #2 [cfs]	Design Inflow [cfs]	Design Flow [cfs]	% Vel. [fps]	d/D
	0.0000	0.0000		0.0000	0.0000	0.0000	108.8300	16.4440	52.0945
	0.0000	0.0000		0.0000	0.0000	0.0000	108.8300	9.0382	91.3851
	0.0000	28.8000		0.0000	0.0000	0.0000	137.6300	21.2800	51.1526
	0.0000	17.0000		0.0000	0.0000	0.0000	154.6300	21.8890	54.8896
	0.0000	0.0000		0.0000	0.0000	0.0000	154.6300	21.8890	54.8896
	0.0000	0.0000		0.0000	0.0000	0.0000	154.6300	21.7973	55.0763

Design Depth [in]	Wet Area [ft2]	Wet Perim. [in]	D.Point Flow [cfs]	Full Vel [fps]	Full Area [ft2]	Full Perim [in]	Full Flow [cfs]	HGL Elev In [ft]	HGL Elev Out [ft]
25.0053	6.6182	77.4095	203.1423	16.1655	12.5664	150.7964	203.1423	5559.9600	5558.9600
43.8649	12.0411	122.1983	101.5711	8.0828	12.5664	150.7964	101.5711	5556.5500	5556.2100
24.5532	6.4676	76.5048	264.8651	21.0773	12.5664	150.7964	264.8651	5555.2700	5554.0400
26.3470	7.0643	80.0997	264.8651	21.0773	12.5664	150.7964	264.8651	5538.0100	5537.2600
26.3470	7.0643	80.0997	264.8651	21.0773	12.5664	150.7964	264.8651	5527.8000	5527.6700
26.4366	7.0940	80.2799	263.4121	20.9617	12.5664	150.7964	263.4121	5526.3300	5526.2100
									5515.0600

HY

LINE: OAKLAND MAIN STORM DRAIN LINE FINIAL CONDITI

1	2	3	4	5	6	
STATION	STRUCT	D	Q	A	V	
83+40.92	MH Ex#1					
		48	154.63	12.566	12.305	indside pipe @ outfall
86+70.88	MH P1					@us pipe end
		48	154.63	12.566	12.305	@us end of manhole
87+10.88	MH P2					
		48	154.63	12.566	12.305	
89+90.00	MH P3					
		48	137.63	12.566	10.952	
94+85.17	MH P4					
		54	108.83	15.904	6.8428	
94+85.17	MH P5					
		48	108.83	12.566	8.6604	
95+44.58	HEADWALL 2					

Run: entranceroad

********** Sheet View **********

Pipe Label	Node Label	North [ft]	East [ft]	Station [ft]	Offset [ft]	Elev. [ft]	Rim Type	Struct Dim.	Struct Drop [in]	Node Drop [ft]	Sump Drop [ft]
		1523326.0251	412344.0782	5226.0048	14.6300	5547.1200	cb		48.0000	0.0000	2.0000
		1523300.0255	412343.9294	5252.0048	14.6318	5546.9100	cb		48.0000	0.0000	2.0000
		1523286.9968	412348.4875	5265.0076	10.0000	5546.8100	pmh		60.0000	0.0000	0.0000
		1523032.2384	412347.0461	5519.7700	10.0000	5544.8700	pmh		60.0000	0.0000	0.0000
		1522983.9502	412346.7729	5568.0591	10.0000	5544.5007	pmh		60.0000	0.0000	0.0000

Sump Elev [ft]	Pipe Size [in]	Start Inv. [ft]	Finish Inv. [ft]	Cen-Cen 2DLength [ft]	Pipe Slope [ft/ft]	Pipe Drop [ft]	Pipe Descr.	Rough Coeff [MANNG]	Pipe Flow [cfs]
5541.2900	18.0000	5543.2900	5542.7700	26.0000	0.0200	0.5200	RCP	0.0130	5.5000
5540.7700	24.0000	5542.7700	5542.4939	13.8030	0.0200	0.2761	RCP	0.0130	5.5000
5542.4939	24.0000	5542.4939	5537.3987	254.7625	0.0200	5.0952	RCP	0.0130	6.0000
5537.3987	24.0000	5537.3987	5536.6502	48.2890	0.0155	0.7485	RCP	0.0130	0.0000
5536.6502									

Lateral Name #1	Lateral Inv. #1 [ft]	Lateral Flow #1 [cfs]	Lateral Name #2	Lateral Inv. #2 [ft]	Lateral Flow #2 [cfs]	Infilt. Design Inflow [cfs]	Design Flow [cfs]	% Vel. [fps]	d/D
	0.0000	0.0000		0.0000	0.0000	0.0000	5.5000	7.7776	42.1267
	0.0000	0.0000		0.0000	0.0000	0.0000	11.0000	9.2372	40.4424
	0.0000	0.0000		0.0000	0.0000	0.0000	17.0000	10.3383	51.8396
	0.0000	0.0000		0.0000	0.0000	0.0000	17.0000	9.3836	56.0365

Design Depth [in]	Wet Area [ft2]	Wet Perim. [in]	D.Point Flow [cfs]	Full Vel [fps]	Full Area [ft2]	Full Perim [in]	Full Flow [cfs]	HGL Elev In [ft]	HGL Elev Out [ft]
7.5828	0.7072	25.4281	14.8554	8.4064	1.7671	56.5487	14.8554	5543.6459	5543.6459
9.7062	1.1908	33.0831	31.9929	10.1837	3.1416	75.3982	31.9929	5543.5747	5543.3354
12.4415	1.6444	38.5823	31.9929	10.1837	3.1416	75.3982	31.9929	5543.3028	5542.4939
13.4487	1.8117	40.6037	28.1647	8.9651	3.1416	75.3982	28.1647	5538.4355	5538.0436
									5537.7709

FACTORS FOR CLOSED CONDUITS FLOWING FULL

Manning's Formula: $Q = \frac{1.486}{n} AR^{2/3}s^{1/2}$

Where:

Q	=	discharge in cfs
s	=	friction slope
A	=	area of conduit
R	=	hydraulic radius of conduit
n	=	0.013
d	=	diameter of pipe
"	=	height of equivalent box
w	=	width of equivalent box
p	=	wetted perimeter

$K = \frac{Q}{S^{1/2}} = \frac{1.486\ AR^{2/3}}{0.013}$, for pipe $K = 35.6259\ d^{8/3}$

for box $K = 114.3077\ \frac{A^{5/3}}{p^{2/3}}$

$Q = K\ s^{1/2}$

$s = \left(\frac{Q}{K}\right)^2$

PLATE 22.3 B-5

PIPE & BOX		PIPE		EQUIVALENT BOX			
d		A	K	w		A	K
ft.	in.	sq.ft.		ft.-in.	ft.	sq. ft.	
1.25	15	1.227	64.6				
.50	18	1.767	105.0				
.75	21	2.405	158.4				
2.00	24	3.142	226.2				
.25	27	3.976	309.7				
.50	30	4.909	410.1				
.75	33	5.939	528.7				
3.00	36	7.068	666.9				
.25	39	8.295	825.8				
.50	42	9.621	1,006				
.75	45	11.044	1,209				
4.00	48	12.566	1,436				
.25	51	14.186	1,688				
.50	54	15.904	1,967				
.75	57	17.721	2,272				
5.00	60	19.635	2,604				
.25	63	21.648	2,966				
.50	66	23.758	3,358				
.75	69	25.967	3,780				
6.00	72	28.274	4,236				
.25	75	30.680	4,720				
.50	78	33.183	5,244				
.75	81	35.785	5,796				
7.00	84	38.485	6,388	5'-10"	5.83	40.3	6.357
.25	87	41.283	7,015				
.50	90	44.179	7,677	6'-4"	6.33	47.0	7,780
.75	93	47.173	8,379				
8.00	96	50.266	9,120	6'-9"	6.75	53.5	9,256
.50	102	56.745	10,720	7'-1"	7.08	59.7	10,685
9.00	108	63.617	12,487	7'-6"	7.50	67.0	12,452
.50	114	70.882	14,421	8'-0"	8.00	75.4	14,598
10.00	120	78.540	16,538	8'-5"	8.42	83.6	16,726
.50	126	86.590	18,835	8'-10"	8.83	92.1	19,026
11.00	132	95.033	21,322	9'-2"	9.17	100.3	21,303
.50	138	103.879	24,005	9'-7"	9.58	109.5	23,954
12.00	144	113.098	26,890	10'-0"	10.00	119.4	26,849

Basins Offsite 1, 3, 8
Proposed 1.

	% D	%		Area.		Weighted Average.
Offsite		14%	×	0.637 + 0.194 + 0.373	=	$\frac{.16156 + 1.9145}{1.154 + 5.47}$ = 31% D.
Proposed		35%	×	5.47		

t_c = 0.2

$t_p = 0.7 \times t_c + (1.6 - A_D/A_T)/12$

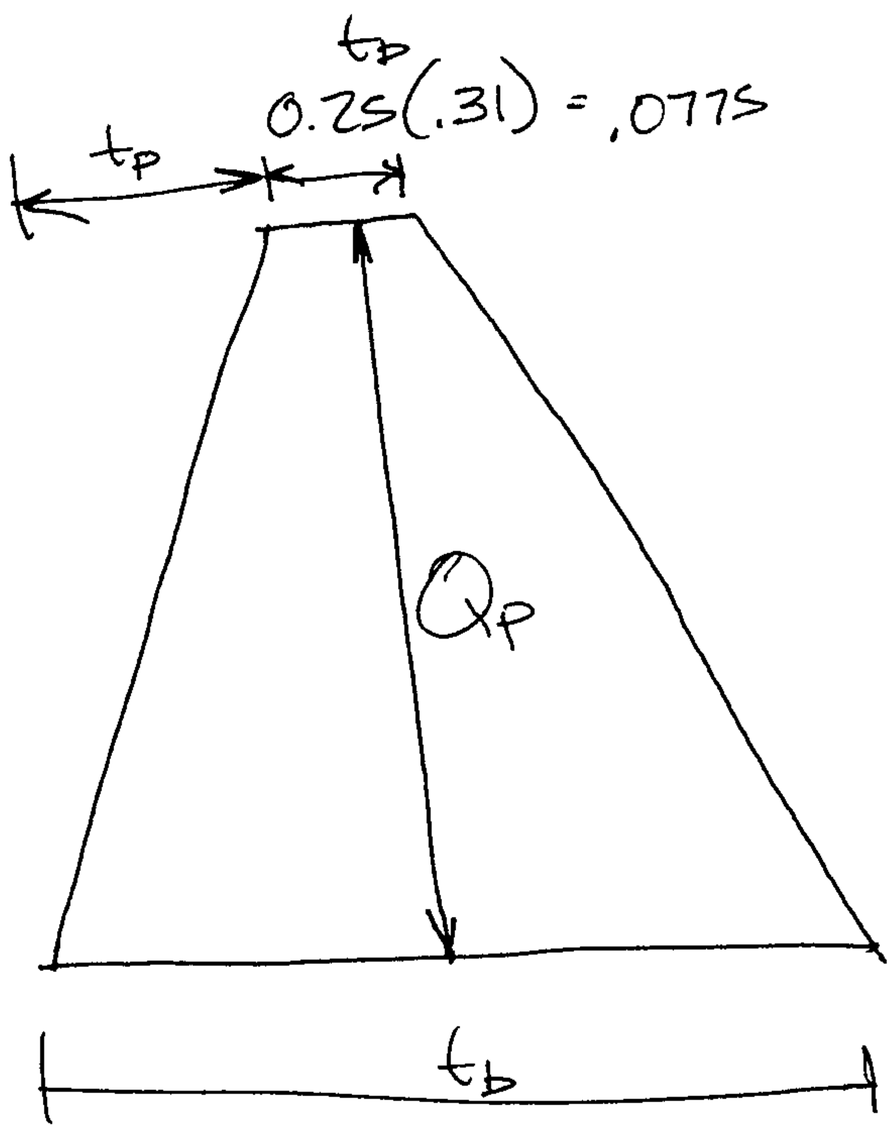
$= 0.7 * 0.2 + (1.6 - .31)/12 = .14 + .1075 = .25$

$t_B = 2.107 * E * A_T/Q_P - .25 * A_D/A_T = .789$ hrs

$$E = \frac{0.66 \times \text{Area A} + 0.92 \times \text{Area B} + 1.29 \text{ Area C} + 2.36 \times \text{Area D}}{\text{Total Area}}$$

$$= \frac{0.92(.33(5.47) + .54(1.154)) + 1.29(.32(5.47) + .27(1.154)) + 2.36(.35(5.47 + .14(1.1}{1.154 + 5.47}$$

$$= \frac{2.287 + 2.660 + 4.900}{6.624} = \frac{9.847}{6.624} = 1.49 \text{ inches}$$



$Q_P = 20.34 + 2.02 + 0.46 + 0.98$

$= 24$ cfs.

$V = Q_P/2 * t_b + t_D$

$= 24/2 * (0.789 + 0.0775) \times 60 \times 60$ (minutes, second)

$=$ ~~34,264~~ cf. 37433 cf

$=$ ~~.788~~ 0.86 acre feet.

the pond has been designed to hold 6.45 acre feet of water while maintaining 2' of freeboard. After the La Cueva channel is extended the pond will be filled and the 48" stub out into the pond plugged. The 48" RCP storm drain line will convey a total of 154.63 cfs toward the pond. After the pond is removed the offsite flow from ~~the~~ offsite basin 1 will be added into the underground conveyance system and the total flow at the connection to Oakland South subdivision will be 168 cfs. The capacity of the 48" RCP drain is 197 cfs.

~~Final~~.

VII

~~Final~~ Conclusion.

The final storm drainage system is being constructed with this project. The peak flow in the storm drainage system in Oakland is 168 cfs with a capacity of 197 cfs. The peak flowrate within the street on Oakland is 17.62 cfs with a capacity of 47 cfs.

The interim pond will only be required if the La Cueva Channel is not constructed prior to completion of the proposed subdivision. The pond will later be filled and a phase II project completed for ~~subdivision~~ a future subdivision.

RECEIVED
JUL 19 2006
HA

GRADE DITCH TO DAYLIGHT @ 1%

10'

36.5 INV

37.0 INV

V-SWALE W/RIPRAP LINING

38.3 TP

38.6 TP

39.2 TP

37.3 TP

37.8 TP

45' 12" CMP @ 1.1%

5538

5539

5540

5541

5542

5535

5340

STA. 16+20.07, 6.5' RT
END

STA. 16+52.20, 10.8' RT

STA. 16+96.65, 17.98' RT

STA. 17+25.95, 20.78' RT

ROW

V-SWALE W/RIPRAP LINING

TOP OF BERM @ 39.0, 3' WIDE

37.5 INV

39.4 TP

39.1 TP

5'

5538

5539

5' WIDE, 6" THK. V-SHAPED CONCRETE RUNDOWN

40.9 TP

43' 12" CMP @ 3.48%

41.4 TP

41.9 TP

38.0 INV

40.8 TP

41.7 TP

C&G

Q_{100} = 2.91 cfs

42.2 TP

42.7 TP

2' S/W CULVERT

39.5 INV

41.5 TP

STA. 17+68.60, 21.62' RT

OWNER PROPOSED FUTURE DRIVEWAY

EXISTING GRAVEL DRIVEWAY

FF = 41.5±

(NORTH 234.00)

N 00°13'14" E 233.83'

37 38 39 40 41 42 44 45 46 47

12

5' (MIN.)

3H:1V (MAX)

3H:1V (MAX.)

12"

FILTER FABRIC

3"-6" COBBLES

(95%) COMPACTION (MIN.)

V-SWALE DETAIL