HYDROLOGY

F21/D34

F21 / D34

OSO GRANDE

TRACT "D"

DRAINAGE REPORT

4 PLANS

WOOD BROS.
HOMES

Oso Grande DR

F21-034

July 9, 1981

RECEIVED
JUL 13 1981
CITY ENGINEER

Charles M. Easterling
Principal Assistant City Engineer/Hydrology
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Mr. Easterling:

Thank you for your letter of July 6, 1981, about flows on Spain Road at Morris Street. Your statement about "no runoff continues down Spain west of Morris" is not consistant with policy or Mr. Heller's recent statement that 150 cfs was being taken off Spain Road by the proposed storm drain. Perhaps you meant no runoff in the 10 year storm continues down Spain west of Morris. The City Engineers interim criteria allows flows "confined within the right of way" and the City Development Regulations and Policies allow flows "0.2 feet above the top of curb". Please clarify the "no flow" statement for me.

Very truly yours,

Kleston H Laws

Kleston H. Laws
Southwest Region Land Development Manager

KHL:clb

cc: Community Sciences Corp.

P.O. Box 16019, Albuquerque, New Mexico 87191 505/881-1804

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N. E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

January 12, 1982

RECEIVED
JAN 13 1982
CITY ENGINEER

Mr. Charles M. Easterling
Principal Assistant City Engineer
Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Preliminary Drainage Report Oso Grande Tracts D-1 and D-2 – Supplemental Data

Dear Chuck:

Enclosed is a copy of the preliminary grading plan for Arroyo Chamisa, formerly known as El Oso Grande Tract D-2. This should be considered as supplemental data for the Preliminary Drainage Report previously submitted for Tracts D-1 and D-2. We are supplying this to you at this time so you will have a chance to review it prior to the Environmental Planning Commission meeting shceduled for the latter part of February, 1982.

The preliminary grading plan has taken into consideration the design elevations for the future Morris Street, Morris Street storm sewer, the sanitary sewer between Morris Street and Eubank Avenue, the Bear Canyon Arroyo, the grading plan for Mesa Del Oso (Oso Grande Tract D-1) and the existing elevations to the west of the site. Consequently, this grading plan should be quite similar to the final grading plan for Arroyo Chamisa (Oso Grande Tract D-2). We hope this information will be useful to you. If you should have any questions concerning this matter, please feel free to call. We look forward to receiving your comments.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

Enclosures

cc: Mr. Chuck Walek
Mr. Dave Kochert
Mr. H. Barker

DW/js
Job No. 1 194 0

PRINCIPALS
JERRY R. BOHANNAN, P. E. & L. S.
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DONALD T. CREMANS, P. E.
C. J. (SKIP) MEAD, P. E.
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6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

February 11, 1982

Mr. Charles M. Easterling
Principal Assistant City Engineer
Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RECEIVED
FEB 22 1982
ENGINEERING

Re: Oso Grande Tract "D" Drainage Report

Dear Chuck: F21-034

Enclosed are two (2) copies of the drainage report for Oso Grande Tract "D". As you are aware, the two projects in this tract are being heard before the Environmental Planning Commission on Thursday, February 18, 1982.

The comments concerning the conceptual drainage plan, listed in Bruno Conegliano's memorandum to you, are addressed in this report. Upon review of this report, please notify the Planning Department and us, prior to the EPC Hearing, of your position concerning the proposed drainage solutions for these developments.

If you have any questions, please call Dave Millikan or me. Thank you for your assistance in this matter.

Sincerely yours,

Michial M. Emery, P.E.
Vice President

Enclosures

cc: Mr. Randy Trainer
Mr. Dave Kochert
Mr. Chuck Walek
Mr. Andrew Bol

DMYM/js
Job No. 1 194 3

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DARRELL L. WADE, P. E.
PATRICK L. STIEHR, P. E.
DAVID M. Y. MILLIKAN, P. E.

MME
CC: Dave Kochert

File 11890

PEDIATRIC HEALTH SERVICES
W. WESTON SUMNER, D.O. DAVID K. RAGLAND, M.D.

RECEIVED B.H. MAR 01 1982

February 12, 1982

Mr. Dave Millikan
Bohannan-Huston, Inc.
4125 Carlisle Blvd., NE
Albuquerque, N.M. 87107

Re: Development of Oso Grande Tract D

Dear Dave:

As discussed in our meeting with you on February 9, 1982, we were willing to accept the developed runoff (approximately 0.7 cfs) from the areas of Oso Grande Tract D adjacent to our property on the following conditions:

1) All flows discharged onto our property during the 100-year storm are discharged in locations and in such a way that they do not cause damage to our property or improvements.

2) Any modifications to our detention facility (if required) are done at the expense of the developer of Oso Grande Tract D.

3) The connection of your improvements with our improvements at the property line is done in a manner that is aesthetically acceptible to us and can be easily maintained by the respective property owner.

If you have any questions concerning these items, please feel free to contact Dr. Ragland or me.

Sincerely,

W. W. Sumner, D.O.

WWS/dgs

10110 SPAIN, N.E. ALBUQUERQUE, NEW MEXICO 87111 TELEPHONE 294-5065

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N. E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7871

ENGINEERS PLANNERS PHOTOGRAMMETRISTS

22

March 25, 1982

Mr. Richard Heller
City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

RECEIVED
MAR 26 1982
CITY ENGINEER

Re: Grading Plan for Mesa del Oso

Dear Dick:

Enclosed are three (3) copies of the grading plan for the above-referenced project. This plan conforms to the guidelines specified in the drainage report. The drainage report was submitted to Mr. Chuck Easterling, of your office, on March 12, 1982.

The developers are anxious to begin grading on this project. Your prompt review and approval for rough grading will be appreciated.

If you have any questions, please call Dave Millikan or me. Thank you for your time.

Sincerely yours,

Michial M. Emery, P.E.
Vice President

cc: Mr. Dave Kochert
Mr. Chuck Walek

Enclosures

DMYM/dlh
Job No. 1 189 2

RSH	ADM
HRO	SUR
CDS	COUN
DES	SEC
INSP	FILE
HYDRO	RETURN

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DARRELL L. WADE, P. E.
PATRICK L. STIEHR, P. E.
DAVID M. Y. MILLIKAN, P. E.

cc: Jim Fink
Dave Kochert
File 11891

Faith Lutheran Church

10,000 SPAIN ROAD, NE
ALBUQUERQUE, NEW MEXICO 87111
(505) 296-0762

RUSSELL C. LEE
ORVAL K. MOREN
- PASTORS -

May 4, 1982

Mr. Mike Emery
Bohannan-Huston, Inc.
4125 Carlisle Blvd., N.E.
Albuquerque, New Mexico 87107

RE: Development of Oso Grande Tract D

Dear Mike:

As discussed with Dave Kochert on April 15, 1982, we are willing to accept the developed runoff (approximately 5.1 cfs) from the areas of Oso Grande Tract D adjacent to our property. This developed runoff is about 46.4% of the 11.0 cfs undeveloped runoff. We understand that all flows discharged onto our property during the 100-Year Storm are discharged in locations and in such a way that they do not cause damage to our property or improvements.

We would like a copy of the final Drainage Report for Oso Grande Tract D for our records.

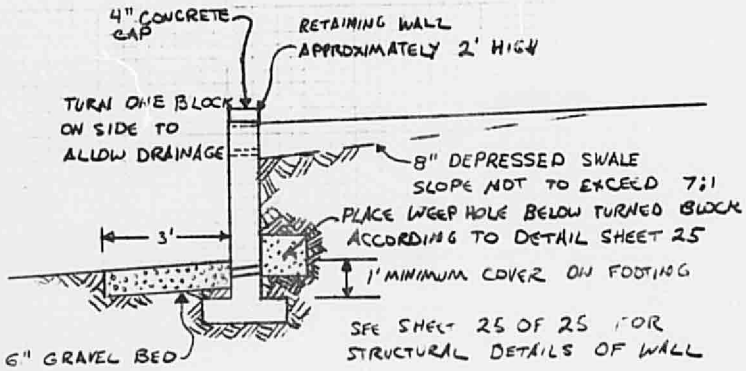
Sincerely,

Paul S Peercy

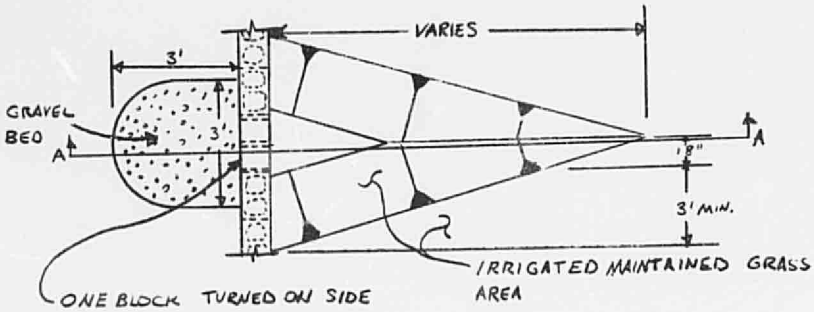
Paul Peercy
President
Faith Lutheran Church

PP/lks

RECEIVED B.H. JUN 9 1982



SECTION A-A



CAPACITY OF OPENING 1.5 CFS AT 7.3" DEPTH

DETAIL N

REFAINING WALL FLOW THROUGH

NO SCALE

TO BE INCLUDED ON GRADING PLAN OF CITY JOB 1442

PROJECT NAME	MESA DEL OSO	SHEET 1	OF 1
PROJECT NO.	11892	BY	DATE 6/9/82
SUBJECT	RETAINING WALL FLOW THROUGH	CH'D	DATE

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

F21 - D34 file

May 5, 1982

Mr. David M. Y. Millikan
Bohannan Huston, Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, N.M. 87103

RE: MESA DEL OSO, OSO GRANDE TRACT D-1 DRAINAGE REPORT

The referenced drainage report is approved with the contingencies that the following items are satisfied before the construction drawings can be signed off:

1. Letters from the church site and doctors offices to the west of the site are received allowing minor flows to enter the property.

2. A method is devised to collect flows and discharge through the proposed retaining walls on the west side of the site.

3. An approved Erosion Control Plan is submitted.

If I can be of any further help, please call.

Sincerely,

Jim Fink
Civil Engineer/Hydrology

JF/tsl

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N. E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

June 10, 1982

Mr. James Fink
Engineer
Hydrology Department
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Mesa del Oso (Oso Grande Tract D-1) Drainage Report

Dear Jim:

Enclosed are copies of letters from Pediatric Health Services and Faith Lutheran Church. These letters indicate these organizations will allow the minor flows specified in the drainage report for Oso Grande Tract D to be discharged onto their land.

Also enclosed is a copy of the detail which describes a method of collecting and discharging flows through the proposed retaining walls at the west boundary of Mesa del Oso. This detail will be included on the grading plan for Mesa del Oso.

A note stating "if construction does not occur on the site for a period of six (6) months or longer, the site and borrow area shall be revegetated by the owner with native grasses," has been added to the grading plan to provide for erosion control in the event of delayed development.

We hope this has provided the information you were seeking. If you have any questions, please contact Dave Woods or me at this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

Enclosures

DW/dlh
Job No. 1 189 1

PRINCIPALS
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DARRELL L. WADE, P. E.
PATRICK L. STIEHR, P. E.
DAVID M. Y. MILLIKAN, P. E.

DRAINAGE REPORT FOR
OSO GRANDE – TRACT D

PREPARED FOR

Grupe Construction West, Inc.
5023 Justin, NW
Albuquerque, New Mexico 87114

PREPARED BY

Bohannan–Huston, Inc.
4125 Carlisle Blvd., NE
Albuquerque, New Mexico 87107

DAVID M. Y. MILLIKAN
NEW MEXICO
7547
REGISTERED PROFESSIONAL ENGINEER

David M.Y. Millikan

David M.Y. Millikan
N.M.P.E. No. 7547

DRAINAGE REPORT FOR
OSO GRANDE, TRACT D
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APPENDIX

Appendix 1	Basin Runoff Calculations
Appendix 2	Flow Depths in Streets (Mesa Del Oso
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Plate 8	FLOOD PLAIN BOUNDARIES
Plate 9	KEY TO PLATE 8

DRAINAGE REPORT FOR
OSO GRANDE, TRACT D

PURPOSE AND LOCATION

Oso Grande, Tract D, is located on the southwest corner of the intersection of Spain Road and the proposed Morris Street (See Plate 1). The site is approximately 25.1 acres. It is intended to be developed in two stages. The first stage, Mesa Del Oso (11.2 acres), is the northern portion of the site. The second stage, Arroyo Chamisa (13.9 acres), is the southern portion. It is anticipated that Mesa Del Oso will be constructed first. The Drainage Plan for Mesa Del Oso provides for the possibility that Arroyo Chamisa, may not be constructed while making provisions for Arroyo Chamisa's possible development.

The soil on the site is classified by the Bernalillo County Soils Report as gravelly and fine sandy loam and gravelly sandy loam (See Plate 2). This soil type is listed as belonging to Hydrologic Soil Group B. There has been considerable dumping of degradable fill on the site. The site slopes from east to west at approximately 4–5%.

METHOD OF ANALYSIS

AMAFCA Resolution 1980–15 states "the storm water runoff from such lot, tract, or parcel will discharge from such property into, and in such a manner as does not exceed the capacity of, storm drainage facilities downstream. . . ."

Plans for the improvement of the Bear Canyon Arroyo from Morris Street to Eubank Blvd. have been submitted to the City for review.

The Bear Canyon Arroyo has sufficient capacity to convey the uncontrolled runoff from this parcel as well as the runoff from upland basins. The Arroyo Del Oso Dam is approximately two and one-half miles downstream. It has recently been upgraded to provide adequate capacity to handle uncontrolled discharge from all contributing basins.

The Rational Method was used in determining all on-site runoff. The Kirpich Formula was used in determining the times of concentration for the undeveloped site and Figure 2–3 of the Engineering Field Manual for Conservation Practices by the U.S. Department of Agriculture Soil Conservation Service was used in the determination of the time of concentration for the developed site (see Appendix 7).

UPLAND DRAINAGE

The construction of Morris Street and its related storm sewer will prevent any upland runoff from entering the site. The storm sewer will intercept 250 cfs of the flow in Spain Road east of Morris Street. The remaining flow in Spain Road will be confined within the street right-of-way. Waterblocks will be constructed in the entrance roads to Mesa Del Oso and Arroyo Chamisa to prevent flows within Spain Road or Morris Street from entering the projects. Since the site will not be developed until these improvements are in the construction phases, the upland flows will not be analyzed in this report. The proposed upland runoff and how it is to be handled may be found in the approved Conceptual Drainage Plan for El Oso Grande. That report indicated that the storm sewer will remove 150 cfs from Spain Road but this has since been changed to 250 cfs. The design of the Morris Street storm sewer has been prepared by Community Sciences Corporation.

EXISTING CONDITIONS

Since the site will be developed in two separate stages, each stage will be handled separately.

Mesa Del Oso

All upland flows will be contained within Spain Road, Morris Street, or the storm Sewer in Morris Street. The runoff generated on the undeveloped site amounts to 23.2 cfs. Of this, 1.0 cfs flows into Spain Road from Basin A (see Plate 3). Runoff from Basin B flows west onto the property of Faith Lutheran Church. Considerable dumping exists in this basin which may result in increased retention on the site. Assuming minimal retention, approximately 11.0 cfs is discharged from the site to the

church property. Runoff from Basins C and D (11.2 cfs) is conveyed to the southwest as sheet flow across Tract D-2 into the Bear Canyon Arroyo. Again, dumping in Basin C may reduce this runoff. A temporary berm has been constructed along the northwest property line which diverts runoff from Basin B to the south. Upon completion of the storm sewer in Morris Street, the need for this berm is eliminated.

Arroyo Chamisa

Oso Grande Tract D-2 will be protected from upland flows from the east by Morris Street and its related storm sewer. Currently 11.2 cfs enters Tract D-2 as sheet flow from Tract D-1 to the north. The total undeveloped runoff from Tract D-2 is 28.1 cfs. The runoff from Basin E is 23.5 cfs (see Plate 4). This is conveyed as sheet flow to the west and enters the Bear Canyon Arroyo approximately 400 feet west of the west property line of the site. The runoff from Basin F (4.8 cfs) is conveyed as sheet flow in a southwesterly direction. It enters the Bear Canyon Arroy near the middle of the site's south boundary.

DEVELOPED CONDITIONS

Mesa Del Oso

The total developed runoff from the site will be approximately 43.8 cfs (see Plate 5). The runoff from Basin 1 (0.4 cfs) and Basin 2 (0.5 cfs) will flow into Spain Road. This is approximately equal to the 1.0 cfs which presently flows into Spain Road under undeveloped conditions.

The runoff from Basin 3 (0.7 cfs) will flow west to the parking lot of Pediatric Health Services. The flow will be conveyed through the parking area and discharge through a concrete rundown on the west property line of Pediatric Health Services to the Faith Lutheran Church property. Basin 4 runoff (4.4 cfs) will flow west directly onto the Faith Lutheran Church property. The combined runoff (5.1 cfs) is less than the undeveloped runoff (11.0 cfs). These property owners have been informed of the proposed drainage plan. Letters accepting these flows will be obtained from the church and the doctor's office. Copies of these letters will be submitted prior to grading plan submittal.

The runoff from Basin 5 is 14.1 cfs. It will flow in the street to Basin 6 (see Plate 5). At this point the depth of flow will be .28 feet (see Appendix 2). The runoff from Basin 6 (10.6 cfs) will combine with the Basin 5 runoff and be conveyed

south in the street to combine with the runoff from Basin 7 (7.5 cfs). The depth of flow at this point will be .28 feet. These depths are coincidentally the same due to a greater slope at the later point causing a higher flow velocity (see Appendix 2). This flow will be conveyed west in the parking lot of Basin 8 to an appropriately-sized inlet.

The flow rate at the inlet will be 33.3 cfs. Flows entering the inlet will be conveyed to the southwest property line via an appropriately sized storm sewer where an additional inlet will intercept the over ground runoff from Basin 8 (3.3 cfs). The storm sewer will convey these flows (36.6 cfs) to the southwest corner of Mesa Del Oso. From this point, an earth lined channel in a 20 foot wide drainage easement will convey the flow to a desilting pond (see Plate 6), prior to entering the Bear Canyon Arroyo through a 48" RCP (see Appendix 5 and 6). This channel will intercept the undeveloped runoff from Tract D-2 (21.4 cfs) and the discharge from Basin 9 (1.2 cfs). This gives the channel a required capacity of 59.2 cfs. With the channel in place, the amount of runoff discharged onto the property west of Arroyo Chamisa will be decreased to approximately 2.1 cfs. The grading within the easement will be designed so that in the event the inlet in Basin 8 becomes blocked, the flows will be conveyed overland to the inlet at the south property line without inundating the adjacent residences. The inlet at the south property line will be sized to accept the peak flows from Basin 8.

Runoff from Basin 9 will be discharged as sheet flow onto Arroyo Chamisa. Along with development of Arroyo Chamisa, a grass-lined swale will be constructed to convey these flows to the parking area at the west end of Basin 10.

Arroyo Chamisa

Under developed conditions Arroyo Chamisa will have several drainage basins (see Plate 7). The total on-site generated dicharge will be 51.4 cfs (see Appendix 1). Flows generated on-site or received from Mesa Del Oso will be discharged into the Bear Canyon Arroyo except the runoff generated in Basin 22 (0.9 cfs). These flows will be discharged to the west as sheet flow. This runoff is less than the 23.5 cfs discharged at this point prior to development of Mesa Del Oso or Arroyo Chamisa. Basin 12 will discharge 2.5 cfs directly to the Bear Canyon Arroyo as sheet flow. The runoff from Basin 18 (2.0 cfs) will be collected at an inlet on the southwest side of the basin, conveyed by underground drainlines and discharged through the curb onto the road in Basin 16.

The runoff from Basins 11, 13, 15, 16, and 18 (25.8 cfs) is conveyed to the inlet on the west end of the southwest parking lot on site. The runoff from Basins 17 and 19 (2.2 cfs) is conveyed to the inlet at the west end of the parking lot within Basin 17. The runoff from Basins 9, 10, 20, 21, and 23 (19.3 cfs) is conveyed to the inlet at the west end of the parking lot in Basin 21. All of these inlets shall be appropriately sized and connected to the storm sewer which discharges into the Bear Canyon Arroyo. The required capacity of this storm sewer at its downstream end is (83.9 cfs). In the event an inlet becomes blocked, grading will be designed so that the flow will be conveyed overland to the next downstream inlet in a grass lined swale. The elevations of the residences will be set so that they are not impacted if an inlet becomes blocked. Each inlet will be designed to accept the design flow for itself or the immediate upstream inlet, whichever is larger.

FLOOD HAZARD BOUNDARIES

The flood boundaries, as shown on Plate 8 and explained on Plate 9 indicate the flood plains as they exist presently. The northern portion of Mesa Del Oso is partially covered by a 100-year flood plain. The entire Arroyo Chamisa site is within the 500-year flood plain; however, the 100-year flood plain only has small encroachments on the south property line.

The approved drainage improvements to Spain Road and Morris Street will cause the 100-year flood plain to be contained in Spain Road. The approved upgrading of the Bear Canyon Arroyo will confine the 100-year flood plain to the Bear Canyon Arroyo Channel. These improvements are to be in the construction phases prior to construction of these projects. With these improvements completed no portion of the site will be within a 100-year flood plain.

Plates 8 and 9, enclosed, are preliminary copies of a portion of Panel 18 of the National Flood Insurance Program. These flood insurance rate maps for the City of Albuquerque have been prepared by Bohannan–Huston, Inc. and are currently being reviewed by FEMA and other concerned agencies.

RECOMMENDATIONS FOR MESA DEL OSO

1. Construct a water block at both entrances to the site to prevent inflows from Spain Road and Morris Street.

2. Grade basin 1 to drain to the north.

3. Construct an adequately-sized inlet (designed to minimize the chance for clogging) at the west end of the parking area in Basin 8 to accept the street flows from Mesa Del Oso.

4. Construct an adequately sized grate inlet at the southwest corner of the site to intercept the potential overland flows from Basin 8.

5. Construct storm sewer from the inlet at the west end of the parking area in Basin 8 to 15' beyond the south property line of Mesa Del Oso. The required capacity of this storm sewer at its point of discharge is 36.6 cfs.

6. Construct a temporary open channel from the storm sewer outlet to the Bear Canyon Arroyo to handle the discharge from the storm sewer. This channel will be abandoned upon development of Arroyo Chamisa. The storm sewer will be connected directly to the storm sewer for Arroyo Chamisa.

7. Construct a desilting pond at the south end of the drainage channel with a concrete-lined weir and inlet structure which connects to a 48" RCP stubout from the Bear Canyon Arroyo.

8. The cross sections of the streets in the development shall have a 2" crown.

9. The cross sections of the parking areas in the development shall have a 3" inverted crown.

10. A six-inch high curb with a one-foot wide gutter shall be used throughout the project.

11. Street depth and velocity computations for the 10-year and 100-year storm are included in the Appendix.

12. Landscaping will be designed to provide ready access to manholes and inlets.

RECOMMENDATIONS FOR ARROYO CHAMISA

1. Construct a water block at both entrances to prevent inflows from Morris Street.

2. Construct a grass lined swale along the north property line to accept run-off from Basins 9, 10, and 23.

3. Construct a retaining wall up to 4' in height between the two southeast parking areas.

4. Construct a retaining wall up to 4' in height on the east end of the south property line to allow the grading to match both proposed Morris Street grades and proposed Bear Canyon Arroyo grades.

5. Grade Basin 12 to drain directly into the Bear Canyon Arroyo. Basin 12 will be irrigated, maintained grass.

6. Construct an inlet at the southwest end of the parking area in Basin 18 with adequately sized underground drain lines to convey the flows to the street in Basin 16.

7. Construct appropriately-sized inlets (designed to minimize the chance for clogging) at the west end of the three westerly parking lots. Each inlet shall be sized to accept the flows from its contributing basins or the immediate upstream inlet (in case of clogging) whichever is greater.

8. Replace the earth channel and desilting pond near the west property line with an appropriately sized storm sewer which will convey the flows from the storm sewer in Mesa Del Oso and the three inlets in Arroyo Chamisa to the Bear Canyon Arroyo.

9. The roads in the development shall have a 2" crown.

10. The parking areas shall have a 3" inverted crown.

11. Six-inch high curb with a one-foot wide gutter shall be used throughout the project.

12. Street depth and velocity computations for the 10-year and 100-year storm are included in the Appendix.

13. Landscaping will be designed to provide ready access to manholes and inlets.

UNDEVELOPED C = .35

BASIN	AREA	ΔH	L	S	T_c	I_{10}	I_{100}	Q_{10}	Q_{100}
A	.56	12	270	.044	19	3.8	5.85	.75	1.15
B	5.27	32	900	.035	53	3.8	5.85	7.0	10.77
C	5.32	42	1200	.035	67	3.8	5.85	7.07	10.89
D	.15	3	90	.033	36	3.8	5.85	.21	.32
E	11.51	35	1100	.032	65	3.8	5.85	15.3	23.5
F	2.36	30	1100	.028	69	3.8	5.85	3.1	4.8

DEVELOPED C DETERMINATIONS

BASIN	TOTAL AREA	PERVIOUS AREA	IMPERVIOUS AREA	% PERVIOUS	% IMPERVIOUS	C	Q_{10}	Q_{100}
1	.14	.02	.12	14	86	.44	.2	.4
2	.15	.06	.09	40	60	.39	.3	.5
3	.20	.09	.11	45	55	.42	.5	.7
4	1.21	.57	.64	47	53	.63	2.9	4.4
5	3.31	2.08	1.23	63	37	.73	7.9	14.1
6	2.62	1.49	1.13	57	43	.69	6.9	10.6
7	2.01	.98	1.03	49	51	.64	4.9	7.5
8	1.13	.59	.54	52	48	.66	2.9	4.4
9	.49	.05	.44	10	90	.91	.8	1.2
10	3.35	1.55	1.80	46	54	.63	8.0	12.3
11	4.79	2.48	2.31	52	48	.66	12.0	18.5
12	1.00	.12	.88	12	88	.42	1.6	2.5
13	.79	.51	.28	65	35	.74	2.2	3.4
14	.26	.13	.13	50	50	.65	.3	.7
15	.39	.12	.27	33	67	.53	.8	1.2
16	.40	.22	.18	55	45	.68	.4	.7
17	.20	.14	.06	70	30	.77	.6	.9
18	.50	.28	.22	56	44	.59	1.3	2.0
19	.35	.16	.19	46	54	.62	.8	1.3
20	.54	.35	.19	65	35	.74	1.5	2.3
21	.22	.16	.06	73	27	.79	.7	1.0
22	.44	0	.44	100	0	.35	.6	.9
23	.73	.24	.44	40	60	.59	1.6	2.5

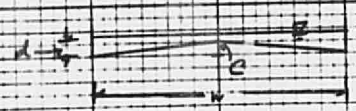
THE T_c FOR THE ALL BASINS ON THE SITE WAS FOUND TO BE LESS THAN 10 MIN. SO THE MAXIMUM INTENSITY WILL BE USED (5.85 IN/HR)

PROJECT NAME OSO GRANDE TRACT D SHEET 1 OF 10
PROJECT NO. 11891/11943 BY DAY DATE 1/12/82
SUBJECT BASIN RUNOFFS CH'D _____ DATE _____

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

FLOW DEPTH AT INTERSECTION IN BASIN 6

Q = 20.7 S = .0161 B = 24.7 n = .015 CROWN 2" d = .28' V = 4.51 FPS



FLOW DEPTH AT INTERSECTION OF BASINS 6, 7 + 8

Q = 32.2 S = .040 B = 24.7 n = .015 CROWN 2" d = .28 V = 7.0 FPS

dV = 1.96 ft²/sec

PIPE SIZE FOR PROPERTY DISCHARGE MESA DEL OSO

Q = 36.6 CFS L = 190 ΔH = 8' FROM ACPA CONCRETE PIPE DESIGN MANUAL FIG. 40

USE 24" DIAMETER.

GHASS

DEPTH & VELOCITY

LOCATION	Q_{10}	d_{10}	V_{10}	dV_{10}	Q_{100}	d_{100}	V_{100}	dV_{100}
BASIN 6	13.4	.24	4.1	.98	20.7	.28	4.51	1.26
INT. B-6,7+8	20.9	.24	6.3	1.51	32.2	.28	7.0	1.96
BASIN 8	21.6	.43	4.4	1.87	33.3	.47	5.5	2.58

PROJECT NAME MESA DEL OSO SHEET 2 OF 10

PROJECT NO. 11891 BY W DATE 1/14/81

SUBJECT FLOW DEPTHS IN STREETS CH'D DATE

FLOW DEPTH AT INTERSECTION OF BASINS 11, 13, & 16

Q = 21.2 CFS S = .01 n = .015 B = 24.7 C = 2" d = 3.9" V = 3.8 FPS

FLOW DEPTH AT INTERSECTION OF BASINS 10, 20, 21

Q = 15.6 S = .01 n = .015 B = 24.7 C = 2" d = 3.3" V = 3.5 FPS

FLOW DEPTH AT SW INLET

Q = 24.6 S = .01 n = .015 B = 25' C = -3" d = 3.0" V = 3.5 FPS

FLOW DEPTH AT NW INLET

Q = 16.6 S = .01 n = .015 B = 25 C = -3" d = 2.5 V = 2.9 FPS

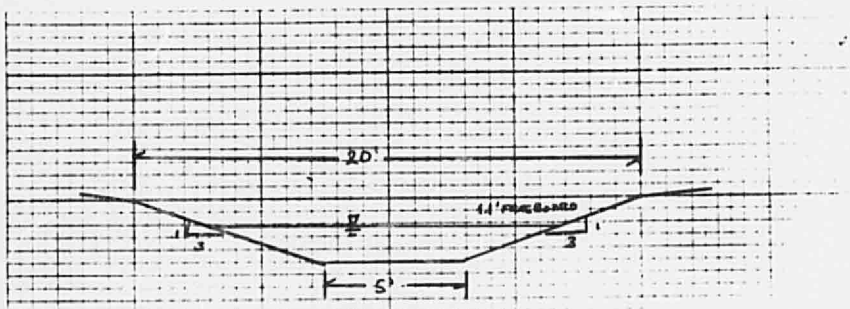
DEPTH & VELOCITY

LOCATION	Q_{10}	d_{10}	V_{10}	dV_{10}	Q_{100}	d_{100}	V_{100}	dV_{100}
INT B 11,13,16	13.7	.27	3.4	.92	21.2	.31	3.8	1.18
INT B 10,20,21	10.1	.24	3.1	.74	15.6	.28	3.5	.79
SW INLET	16.0	.45	2.8	1.26	24.6	.51	3.5	1.79
NW INLET	10.8	.41	2.5	.94	16.6	.46	2.9	1.33
W INLET	1.4	.3	.9	.27	2.2	.31	1.1	.34
MID-SITE INLET	1.3	.29	1.2	.34	2.0	.30	1.4	.42

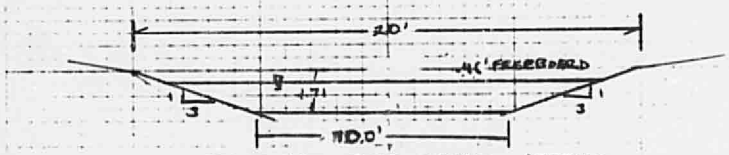
PROJECT NAME ARROYO CHAMISA SHEET 3 OF 10

PROJECT NO. 11743 BY DW DATE 11/18/92

SUBJECT FLOW DEPTHS CH'D _____ DATE _____



EARTHEN CHANNEL THROUGH TRACT D-2



WIER AT BEAR CANYON ARROYO
(LINNED WITH GUNNITE)

$$h = \left[\frac{59.2}{3.2\,(13.5)}\right]^{\frac{1}{3}} = 1.25'$$

S = .01
n = .03
B = 5
Z = 3
Q = 59.2
h = 1.4'
V = 4.8 FPS

FREEBOARD = 2.5 − 1.4 = 1.1'

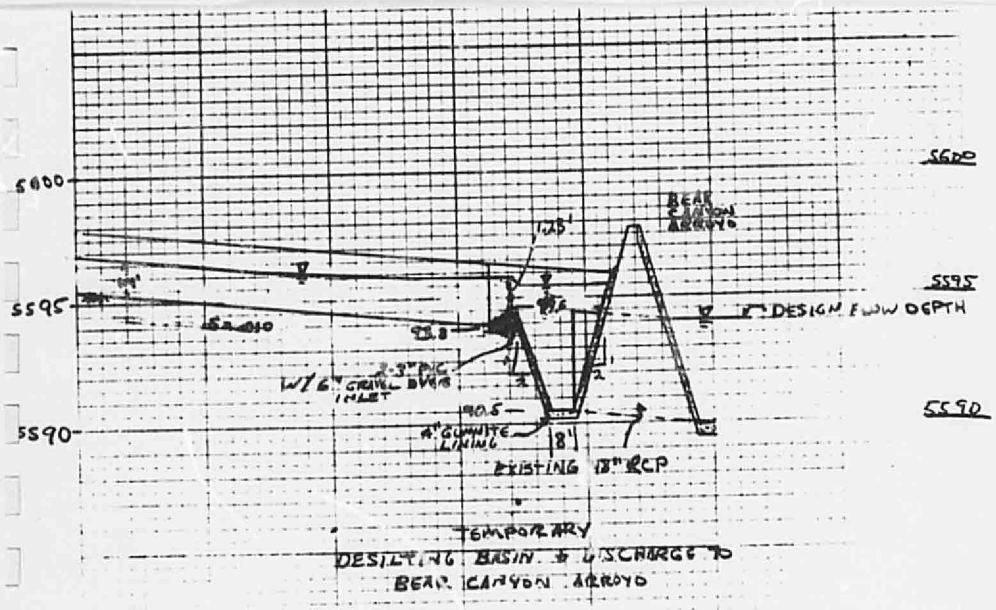
INLET CONTROL

$Q = CA\sqrt{2gh}$

$.6 \cdot 4\pi\sqrt{(4.4 \cdot 1)} = 60.5$ CFS

USE 1 FOOT HEAD ON INLET

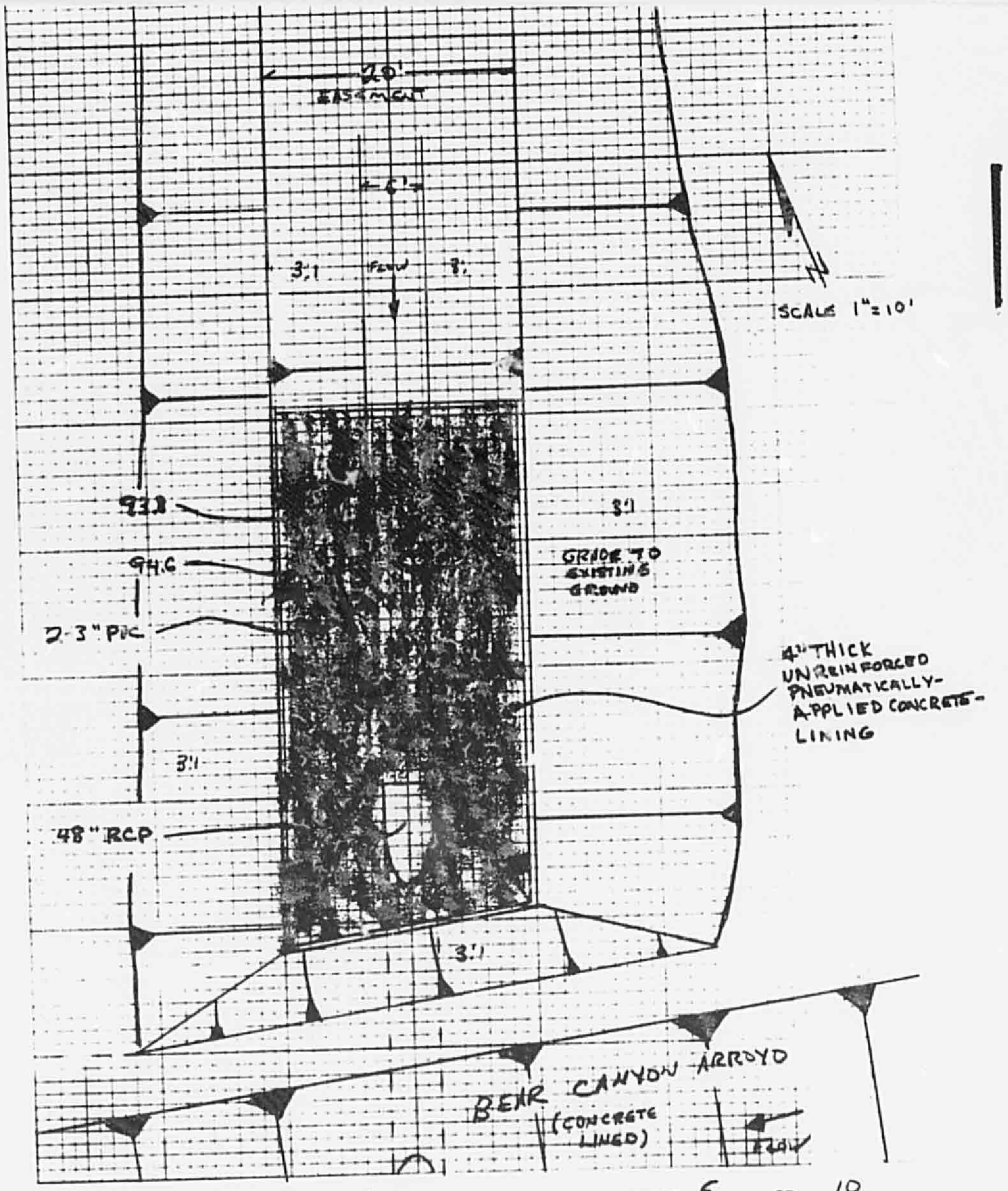
PROJECT NAME ARROYO CHAMISA SHEET 4 OF 10
PROJECT NO. 1189 BY W DATE 1/13/82
SUBJECT EARTH CHANNEL CH'D DATE



PROJECT NAME ARROYO CHAMISA SHEET 5 OF 10

PROJECT NO. 11891 BY W DATE 1/13/82

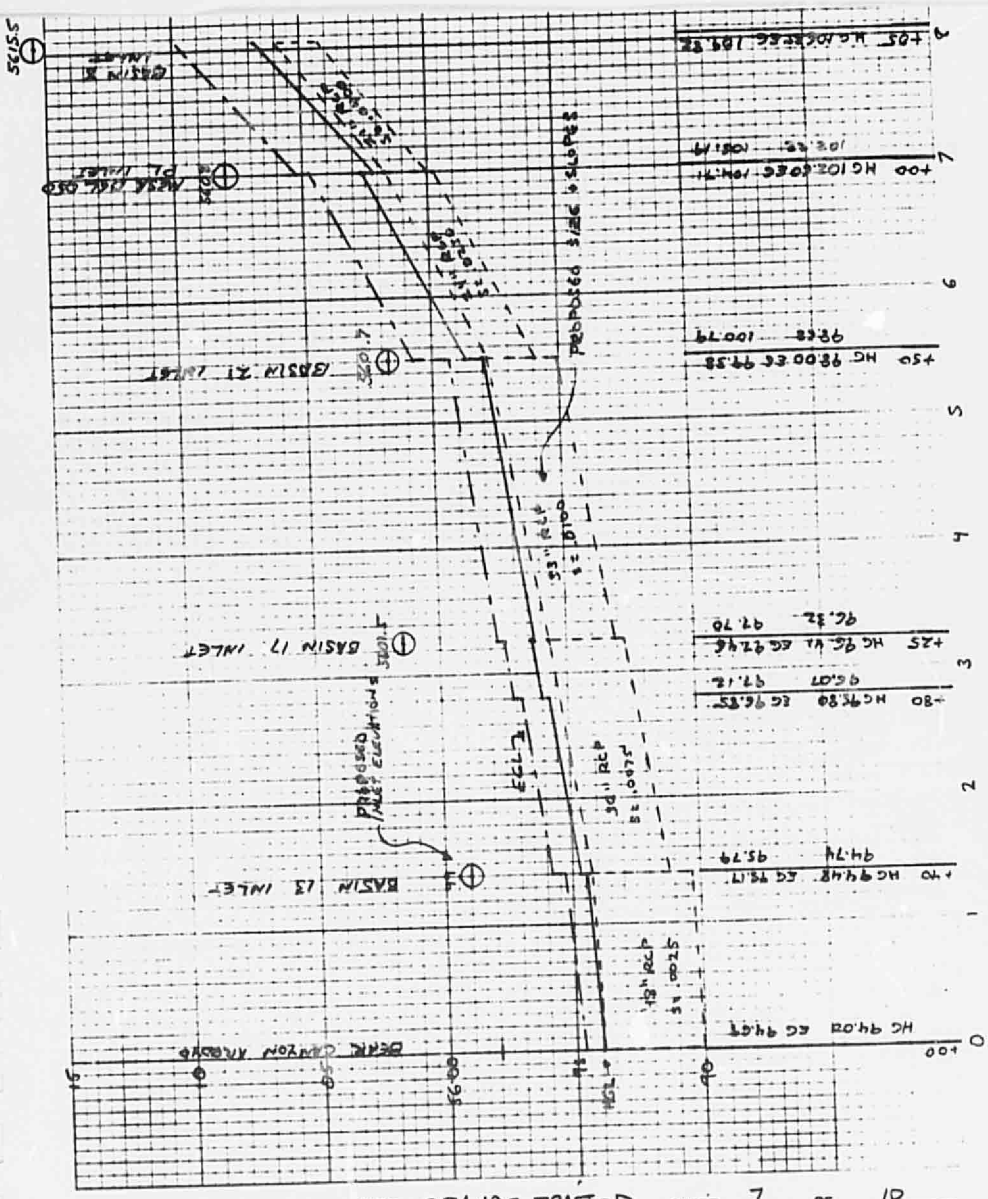
SUBJECT PROFILE OF DESILTING BASIN CH'D DATE



PROJECT NAME MESA DEL DSO SHEET 6 OF 10

PROJECT NO. 11891 BY DATE 1/18/82

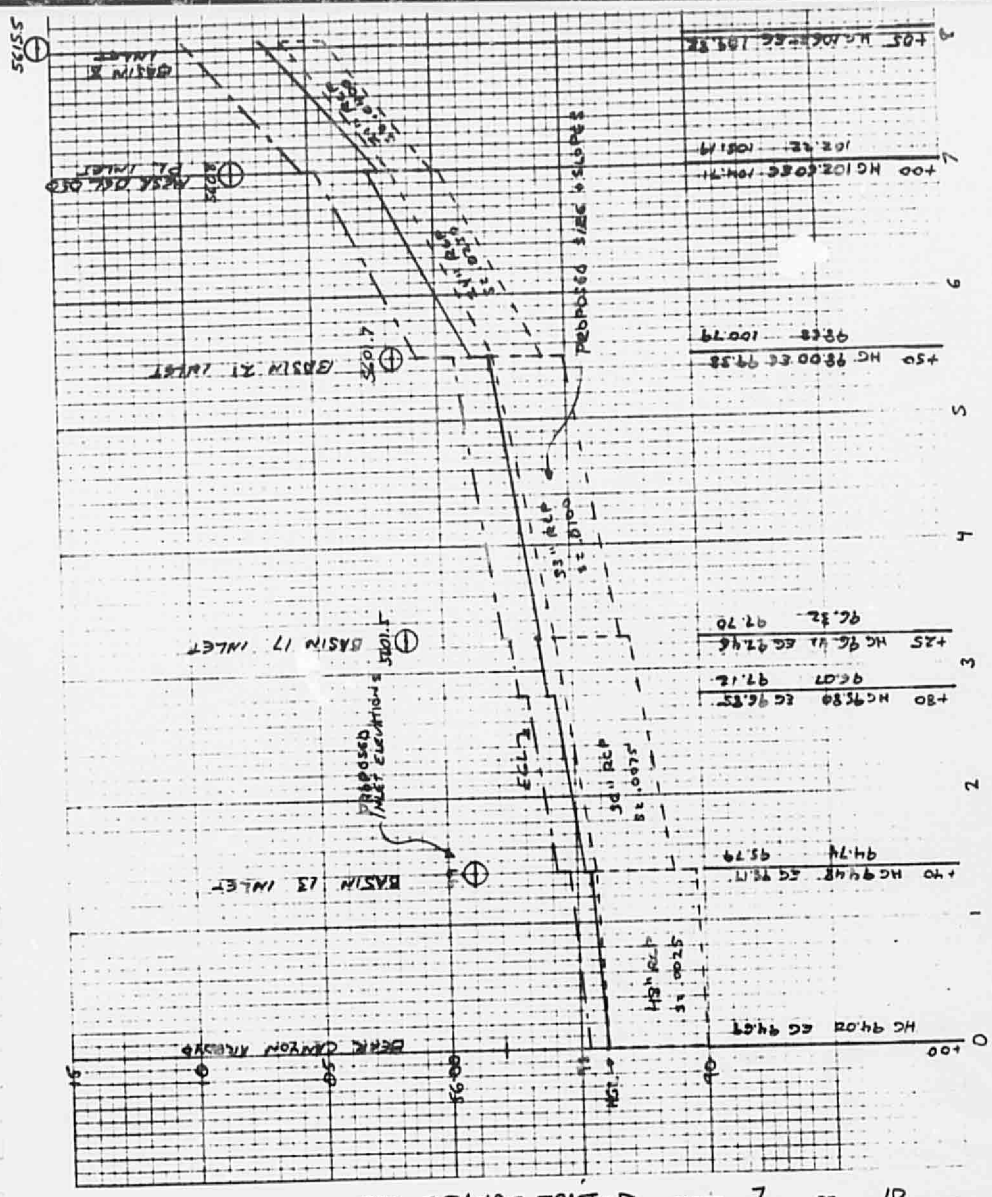
SUBJECT TEMPORARY DESILTING & DISCHARGE STRUCTURE PLAN VIEW CH'D DATE



PROJECT NAME OSO GRANDE TRACT-D SHEET 7 OF 10

PROJECT NO. 11981 BY W DATE 2/4/82

SUBJECT STORM SEWER HYDROLIC GRADE LINE CH'D DATE



PROJECT NAME OSO GRANDE TRACT-D SHEET 7 OF 10

PROJECT NO. 11981 BY W DATE 2/4/82

SUBJECT STORM SEWER HYDROLIC GRADE LINE CH'D DATE

SUMMARY OF HYDRAULIC CALCULATIONS

FULL CLOSED CONDUIT DESIGN

Calc. by: [illegible]
Chk. by:
Project: OSO GRANDE TRACT D DRAINAGE
Lines: Freq.: Yr.

Proj. No. 11981
Date 2/4/82
Sheet 8 of 10

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
										LOSSES										
STRUCTURE	STATION	S.D. TYPE SIZE	Q	A	V	K	S_f	L	Δ	H_f	H_B	H_J	H_T	H_{MM}	H_{MISC}	ΣH_L	E.G.	h_v	H.G.	
																				A
1 EXIT	0+00	48"	83.9	12.56	6.67												94.69	.69	94.00	1A
2 PIPE		48"	83.9	12.56	6.67	1436	.0034	140		.48						.48	95.17	.69	94.48	2A
3 JS	1+40		25.8									.62				.62	95.79	1.05	94.74	3A
4 PIPE		36"	58.1	7.07	8.22	667	.0076	140		1.06						1.06	96.85	1.05	95.80	4A
5 BEND	2+80								10		.27					.27	97.12	1.05	96.07	5A
6 PIPE		36"	58.1	7.07	8.22	667	.0076	45		.34						.34	97.46	1.05	96.41	6A
7 JS	3+25		2.2									.24				.24	97.70	1.39	96.32	7A
8 PIPE		53"	55.9	5.94	9.41	529	.0112	225		1.68						1.68	99.38	1.38	98.00	8A
9 JS	5+50		19.3									1.41				1.41	100.79	2.11	98.68	9A
10 PIPE		24"	36.6	3.14	11.65	226	.026	150		3.92						3.92	104.71	2.11	102.60	10A
11 JS	7+00		3.3									.48				.48	105.19	2.97	102.22	11A
12 PIPE		21"	33.3	2.41	13.84	159	.0441	105		4.63						4.63	109.82	2.97	106.85	12A
13 INLET	8+05		33.3																	13A
14																				14A
15																				15A
16																				16A
17																				17A
18																				18A
19																				19A
20																				20A

NOTES:

APPENDIX 8

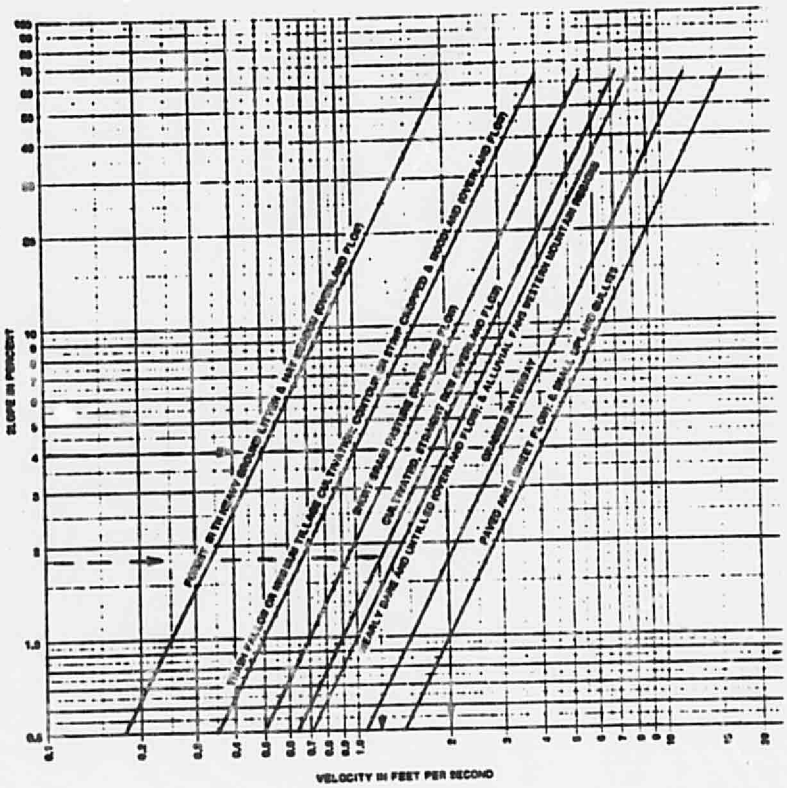


Figure 2-3 Velocities for upland method of estimating T_c

FROM: ENGINEERING FIELD MANUAL FOR CONSERVATION PRACTICES
US DEPT OF AGRICULTURE SOIL CONSERVATION SERVICE

APPENDIX 9

→ Dave McCown, F.E. 11421 Dwg

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
PLANNING DIVISION
P.O. Box 1293, Albuquerque, New Mexico 87103

RECEIVED B.H. OCT 27 1981

DATE: October 23, 1981

NOTIFICATION OF DECISION

Mr. Kleston Laws
Hood Brothers
Post Office Box 16019
Albuquerque, New Mexico 87191

File: Z-81-74
Location: between Eubank & Juan Tabo Boulevard, N.E.

On October 22, 1981, the Environmental Planning Commission took the following action on your above-referenced case.

FINDINGS:

1. The drainage plan for the Oso Grande area has been reviewed by the City. Mr. Easterling has stated that comparatively speaking, costs and benefits are achieved by this plan, and therefore it is accepted by this Commission.

2. The right of way of the Bear Canyon Arroyo east of Morris to Juan Tabo shall remain 150 feet until some determination or recommendation can be made by the City and the Parks and Recreation Department for an encroachment on that right of way.

3. The treatment of the Bear Canyon Arroyo west of Morris to Eubank for approximately 65 feet of right of way for concrete lining is approved, provided it can carry the storm drainage and also sufficient space for a maintainance road or related facilities within that right of way.

4. An arroyo study is expected to present possible alternatives which might differ from the request in five months to a year. Deferral of this request to await that determination would be extremely punitive on the part of the City toward the applicant.

THEREFORE, BE IT RESOLVED THAT Z-81-74 (AC-81-14) be recommended for approval by the City Council, based on and subject to the above Findings

If you wish to appeal this decision, you must do so by November 6, 1981 in the manner described below. A non-refundable filing fee of $40 is required at the time the appeal is filed.

Appeal to the City Council. Any person aggrieved with any determination of the Environmental Planning Commission which may under this ordinance may file an appeal to the City Council by submitting an application on the Planning Division form to the Planning Division within 15 days of the Planning Commission's decision. The date the determination in question is issued is not included in the 15-day period for filing an appeal, and if the fifteenth day falls on a Saturday, Sunday or holiday as listed in the Merit System Ordinance, the next working day is considered as the deadline for filing the appeal. The City Council may decline to hear the appeal if it finds that all City plans, policies and ordinances have been properly followed. If it decides that all City plans, policies and ordinances have not been properly followed, it shall hear the appeal. Such appeal, if heard, shall be heard within 60 days of its filing.

You will receive notice if any other person files an appeal. If there is no appeal you can receive building permits any time after the appeal deadline quoted above provided all conditions imposed at the time of approval have been met. Successful applicants are reminded that other regulations of the City must be complied with, even after approval of the referenced application(s).

IF YOU RECEIVE APPROVAL FOR ANY REQUEST WHICH REQUIRES A SITE DEVELOPMENT PLAN, SEE ATTACHED SHEET FOR FURTHER INFORMATION.

Sincerely,

Felipe F. Quintana
Secretary

Letter of Advice

cc: Sheilah Sweenhart, AMDEC, 6400 Uptown Boulevard, N.E.; 87110
Community Sciences Corp., Post Office Box 1328, Corrales, NM; 87048
Dr. Sylvan D. Schwartzman, 5409 Rawlings Road, N.E.; 87111
Michael Danoff, 604 Chama, N.E.; 87108
Pat Stiehr, Bohannan-Huston, 4125 Carlisle Boulevard, N.E.; 87107
Judson A. & Jean A. Stewart, 5305 Veronica Drive, N.E.; 87111
Faith Lutheran Church, 10000 Spain Road, N.E.; 87111

APPENDIX 10

MUNICIPAL DEVELOPMENT DEPARTMENT
PLANNING DIVISION

Z-81-74-1, V-81-35

Z-81-74-1
V-81-35

Herbert H. Denish & Associates, agent for The Grupe Company of New Mexico, requests approval of a site development plan~~, and approval of waiver of all existing lot lines~~ street rights-of-way, utility, drainage and access easements for Tracts Z-2-B, Z-3, Z-4 and portions of Tract B-1-B of Academy Place Unit 4; zoned SU-1 for a Planned Residential Development, located on the southwest corner of the intersection of Spain Road, N.E., and Morris Road, N.E., containing approximately 11.45 acres. (F-21)

COMMENTS FROM OTHER DEPARTMENTS TO THE ENVIRONMENTAL PLANNING COMMISSION 11/19/81:

Traffic

"A master plan is needed for the entire area between Eubank and Morris. Specific comments are:
"1. Consideration should be given to an east-west connection between Morris and Eubank.
"2. There should be a vehicular and pedestrian connection between this project and the similar development planned to the south.
"3. Parking on the main drive is undesirable - it interferes with traffic flow and adjacent vehicles, particulary trucks, vans, campers, result in backing of to be blind. If parking is to be done this way, depth of bay should be increased to 21' to improve visibility.
"4. Main loop drive should be flared to 36' at Morris and Spain to provide right and left turn lanes plus one entry lane.
"5. Parking bay of S.E. corner intersects main loop drive too close to Morris.
"6. Visibility is very poor for vehicles entering loop road from street due to curve in loop road."

Transportation
Transit
COG

"See the Traffic Engineer's comments."
"Transit available on Eubank."
"Spain is a Minor Arterial and Morris is a Collector street on the Long Range Major Street Plan. As such, a minimum of 86 feet right-of-way on Spain and 60 feet right-of-way on Morris should be assured."

CIP

"Garbage pick up and fire protection to some internal buildings such as group 1-4 may cause a problem.
"Need some play areas to divert children away from parking lots.
"Can the city in the future support the water needs of all this tuilage?"

City Engineer

City Engineer: "a. Applicant must submit a drainage report for review and approval prior to approval of plat, development plan, and building plans.
"b. Included in the drainage report shall be the method of conveying the run-off from the site to the Bear Arroyo. Also, before approval of plat and plans, drainage easements must be recorded.
"c. Trees will not be planted in water line easements.
"d. Some of the buildings are located adjacent to the water line easement. This will place a structure within 10 feet of a 16" master water line.
"e. The application is not clear as what the vacation will encompass."

AMAFCA

"Defer to City Engineers comments."

Water Resources

"Our records indicate the existence of a master plan water line which crosses this tract in a north-south direction. Where this water line will lie in other than a paved street, a 30 foot easement is required.
"It is requested that Water Resources be a signatory on the site plan. Certain easements will be required for the extension of water and sewer lines. Sewer service will require the extension of off-site sewer lines in easements as yet undedicated. Certain terms of water and sewer service have as yet not been resolved, but are under discussions between WRD and the developer's engineer."

Parks & Recreation

"We concur with the choice of Arizona Ash street trees."

Refuse Removal

"The Albuquerque Refuse Service can provide service to any new residences or businesses within the City limits at virtually no additional cost to the City.
"Limitation - The only limitation placed on servicing areas is that development proceeds gradually outward from the existing City limits with no leapfrogging permitted. Service to any development would require moderate to major expenditures for equipment and manpower.
"Sector Development Plans: Request standard city street widths on private residential streets, also deadend streets are not acceptable. The Albuquerque Refuse Service trucks require 40 feet radius cul-de-sacs or hammerheads; request no planter in cul-de-sacs, or in any standard street, or in enter sections.
"Request no concrete stops in any of the above."

Police

"No adverse comment."

Fire Department

"No precise site plan concerning this proposal has been submitted to the Fire Department."

Mountain Bell

"No comment."

Public NM

"PNM has no adverse comments. PNM would like to request the reservation of rights of way within parcels to be vacated."

Gas Company

"The Gas Company of New Mexico approved."

Environmental Health

"No adverse comments."

Human Services

"No adverse social impact."

Zoning Enforcement

"No comment."

Real Estate Office

"No adverse comments."

APPENDIX 10 A

Other Concerns

The site plan indicates a 20 foot utility easement running along the vacated Morris alignment. This easement contains a 16-inch water line and cannot be properly serviced. The applicant should either provide a 30-foot easement and separate the structures accordingly, or relocate the line, at the developer's expense, to the new alignment of Morris.

Located at the southwest corner of this site and not indicated on the site plan is a 20-foot drainage and utility easement. Staff has basically the same concern as with the water line easement. It is yet to be determined to staff's satisfaction the nature of this easement. The location, size and nature of this easement is questionable.

Water Resources should be contacted concerning the two issues above. Water Resources has serious questions regarding this easement and other required off-site easements and has also requested site development plan sign-off authority.

3. Improvements to Morris and phasing of construction should be determined prior to approval. Since Morris is to be one of only two entrances for this development, then assurances should be made regarding construction. If the option to relocate the above mentioned water line within Morris is choosen, then a determination is most assuredly required.

4. Traffic Engineering has raised the issue of an east-west connection from Morris to Eubank. While it may not be needed for this development, it should be noted and determined a serious consideration for the development immediately south.

5. The issue of drainage and treatment of the Bear Canyon is under appeal to the City Council. Since this site is located within the Oro Grande area and given the City Council mandate to not approve any site plans, it would not be appropriate at this time to act on this case.

It should be noted that a detailed grading and drainage plan has been submitted to the City Engineer for review, and must be approved prior to final site plan approval.

FINDINGS: 1. The proposed density is not in keeping with that approved with the Oro Grande Master Plan.

2. Comments from the Traffic Engineer indicate several problems with internal access and the need for connections to adjacent properties. Also, no sidewalks have been provided along Spain and Morris.

3. As noted, the landscape plan lacks certain detail.

4. Water Resources has serious concerns regarding easements, especially the size, location and nature of easements.

5. The status of Morris is unclear and should be determined prior to approval.

6. The issue of drainage, because of a pending appeal, is not yet settled. Given the mandate from the City Council, it is inappropriate to hear this case.

7. As noted, the area east of Morris has been master planned as a portion of the Oro Grande Master Plan. All of the concerns listed above could be addressed in entirety with the submittal of a Master Plan for the area west of Morris, similar to that already provided east of Morris.

RECOMMENDATION: Indefinite deferral of Z-81-74-1 is recommended based on Findings 1-7.

Randy Traynor, Planner

cc: Chris Grubbs, P.O. 14752; 87191

IT IS REQUESTED THAT THE APPLICANT/AGENT BE PRESENT AT THE MEETING

RT:adj

APPENDIX 10 B