



# *City of Albuquerque*

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 4, 1995

Jeff Mortensen  
Jeff Mortensen & Assoc.  
6010-B Midway Park Blvd. NE  
Albuquerque, NM 87109

RE: SUNRISE SUBDIVISION (K-9/D5) ENGINEER'S STAMP DATED  
12/16/94

Dear Mr. Mortensen:

Based upon the information provided in your 12/16/94 submittal,  
Engineer's Certification for the referenced site is acceptable.

If I can be of further assistance, feel free to contact me at 768-3622.

Sincerely,

Scott Davis  
PWD, Hydrology Division

c: Teresa Lucero  
Andrew Garcia  
File



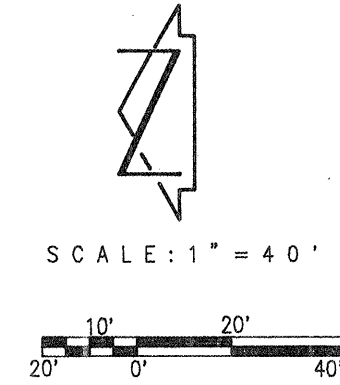
# DRAINAGE CERTIFICATION

As indicated by the as-built information shown hereon, the site has been graded in substantial conformance with the approved grading and drainage plan. All grades verified are within 18" of the approved grades. The grading was performed on each lot per the grades shown on the approved plan. Curb grades were modified to conform with the approved construction plans for the respective streets. The trickle channel along the west side of the site is in substantial compliance with the approved plan. The above information was obtained by me or under my direct supervision and is true and correct to the best of my knowledge and belief.

Jeffrey G. Mortensen, NMPE  
 Date 12-14-94  
 NEW MEXICO  
 8547  
 PROFESSIONAL ENGINEER

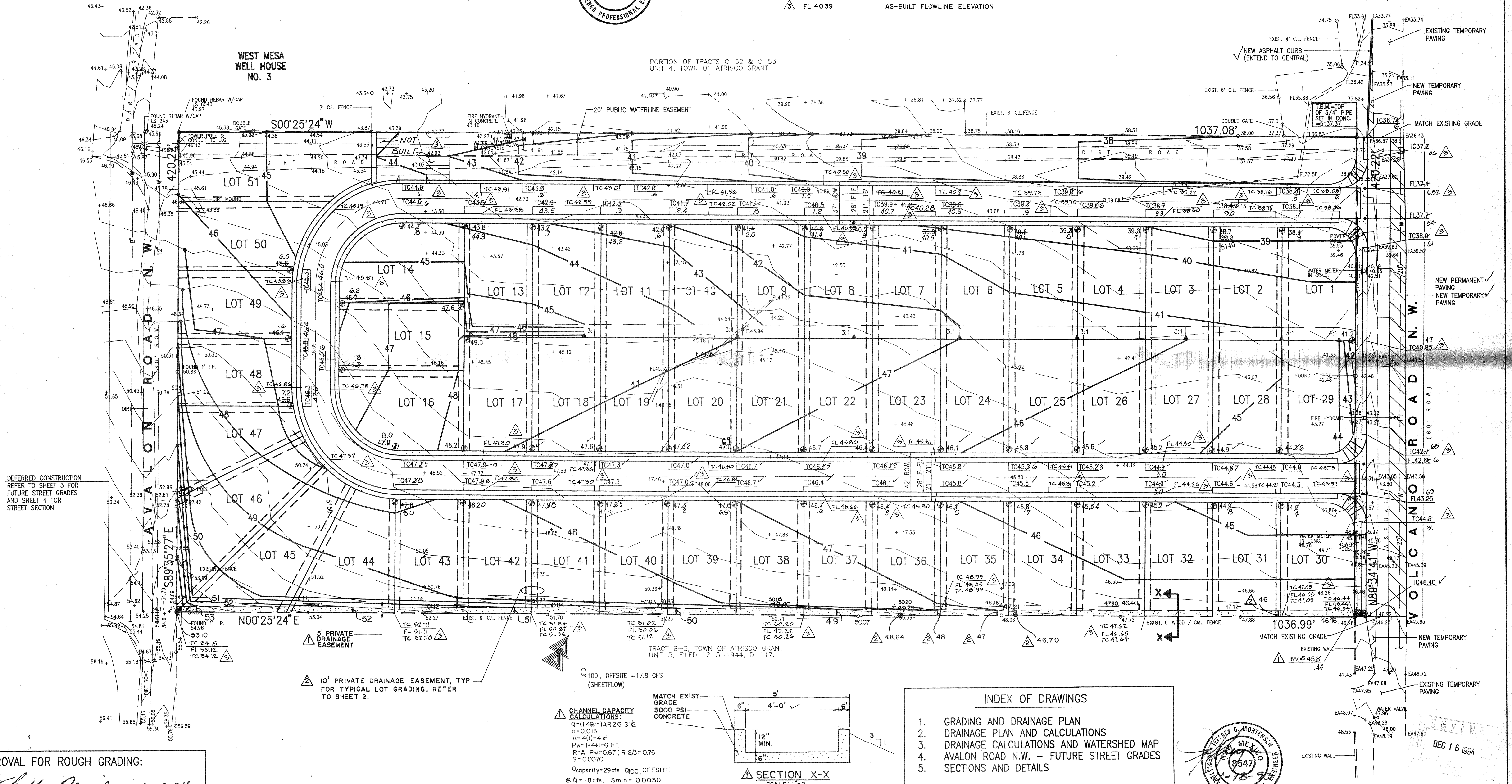
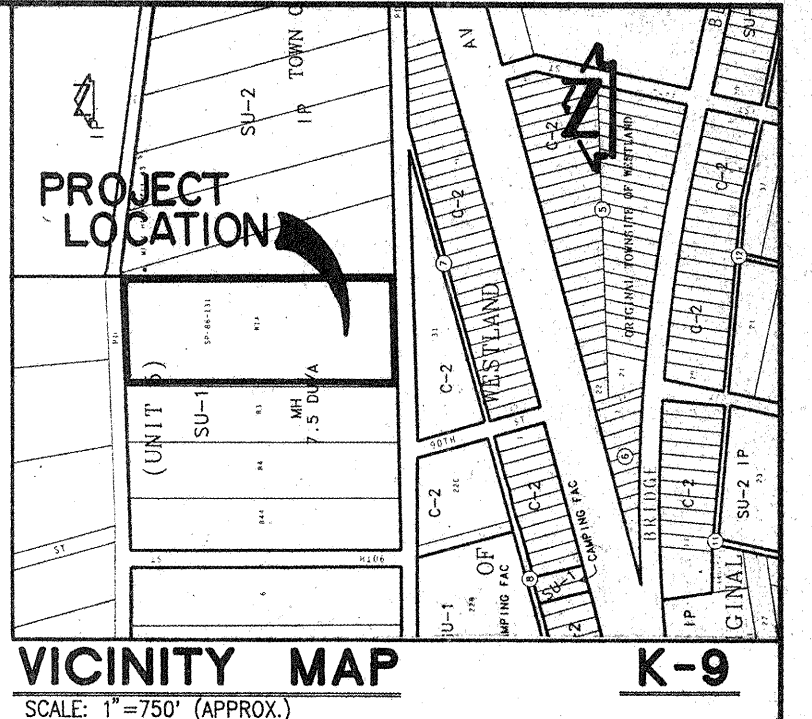
## LEGEND

- + 40.62 EXISTING SPOT ELEVATION
- 38.7 PROPOSED SPOT ELEVATION
- 5140 EXISTING CONTOUR
- 43 PROPOSED CONTOUR
- EA TC FL PROPOSED CONCRETE
- EA TC FL EDGE OF ASPHALT
- TC TOP OF CURB
- FL FLOWLINE
- TC 51.84 AS-BUILT EAST TOP OF CHANNEL
- FL 50.87 AS-BUILT INVERT OF TRICKLE CHANNEL
- TC 51.56 AS-BUILT WEST TOP OF CHANNEL
- TC 38.08 AS-BUILT TOP OF CURB ELEVATION
- FL 40.39 AS-BUILT FLOWLINE ELEVATION

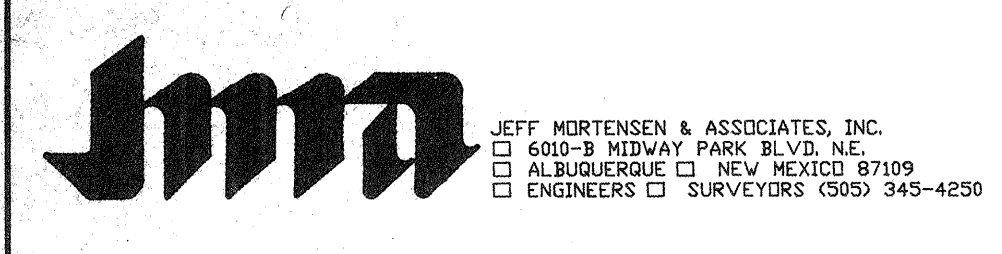


## LEGAL DESCRIPTION

TRACT B-1-A, UNIT 5, TOWN OF ATRISCO GRANT.  
**PROJECT BENCHMARK**  
 AN ACS BENCHMARK (2' X 3') THE STATION IS AN "X" CUT ON THE NORTH BOUNDARY OF FIRE HYDRANT LOCATED @ THE INTERSECTION OF WEST CENTRAL AVENUE & 90th STREET N.W. ELEVATION = 5144.90 FEET (M.S.L.D.)  
**T.B.M.**  
 TOP OF 3/4" PIPE SET IN CONCRETE LOCATED @ THE S.E. CORNER OF SAID SITE AS SHOWN BELOW. ELEVATION = 5137.37 FEET (M.S.L.D.)

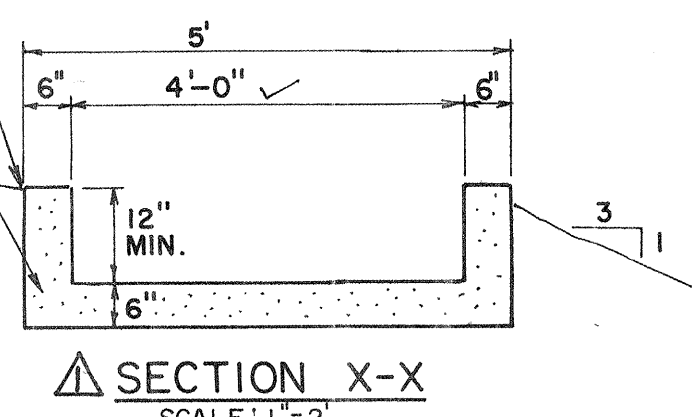


APPROVAL FOR ROUGH GRADING:  
 Hydrology Section  
 DATE 1-12-94



## GRADING AND DRAINAGE PLAN SUNRISE SUBDIVISION

- ### INDEX OF DRAWINGS
1. GRADING AND DRAINAGE PLAN
  2. DRAINAGE PLAN AND CALCULATIONS
  3. DRAINAGE CALCULATIONS AND WATERSHED MAP
  4. AVALON ROAD N.W. - FUTURE STREET GRADES
  5. SECTIONS AND DETAILS

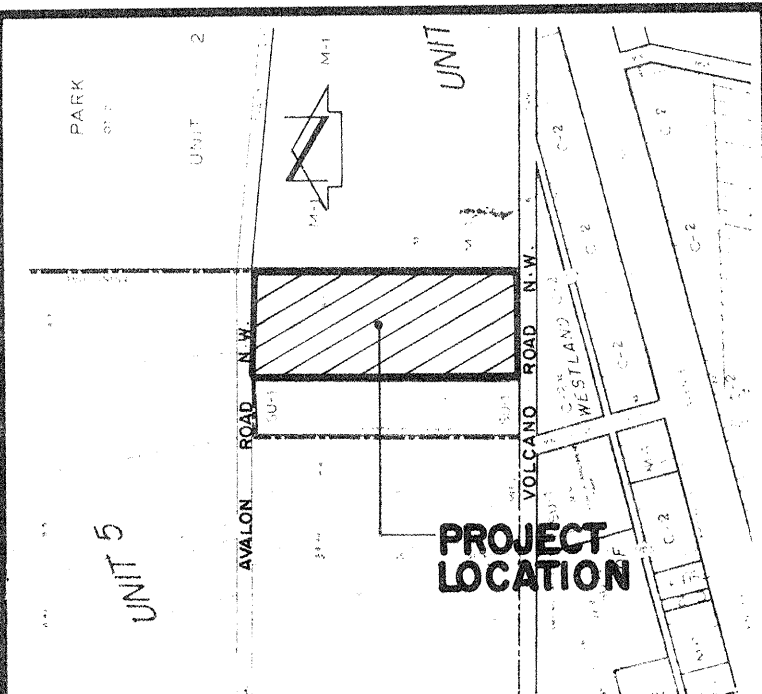


DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
J.G.M.	12/93	J.G.M.	ADD PRIVATE DRAINAGE EASEMENT & CHANNEL	930615
S.G.H.	02/94	G.R.B.	ADD PRIVATE DRAINAGE EASEMENTS AND REVISE GRADES	DATE 11-1993
J.G.M.	11/94	S.K.	AS-BUILT & CERTIFY	SHEET 1 OF 5

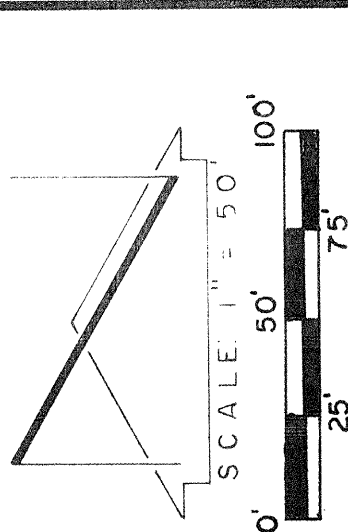






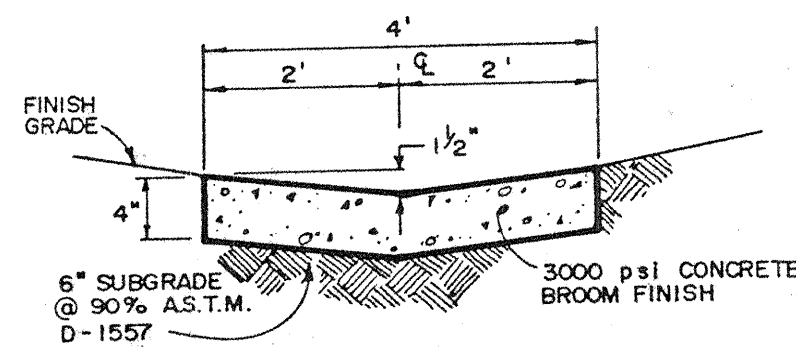


VICINITY MAP K-9  
SCALE: 1" = 400'

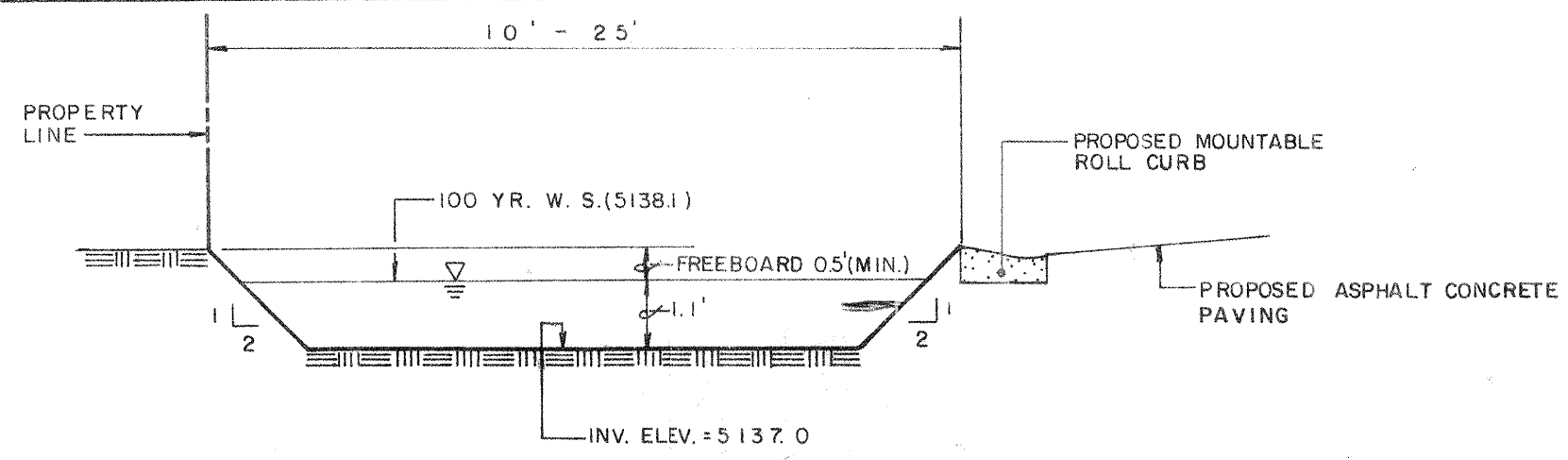


**PROJECT BENCHMARK:**  
AN ACS BENCHMARK (C-10) THE STATION IS ANY  
LOCATED @ THE INTERSECTION OF WEST CENTRAL AVE  
ELEVATION = 5144.80 FEET (M.S.L.D.)  
TOP OF REBAR @ S.W. PROPERTY CORNER,  
AS SHOWN BELOW.  
ELEVATION = 5137.80 FEET (M.S.L.D.)  
**LEGAL DESCRIPTION:**  
LOT 16-1A, UNIT 5, TOWN OF ATRISCO GRANT  
NOTE: BEARINGS SHOWN HEREON ARE BASED ON N.M.  
STATE PLANE COORDINATE SYSTEM.

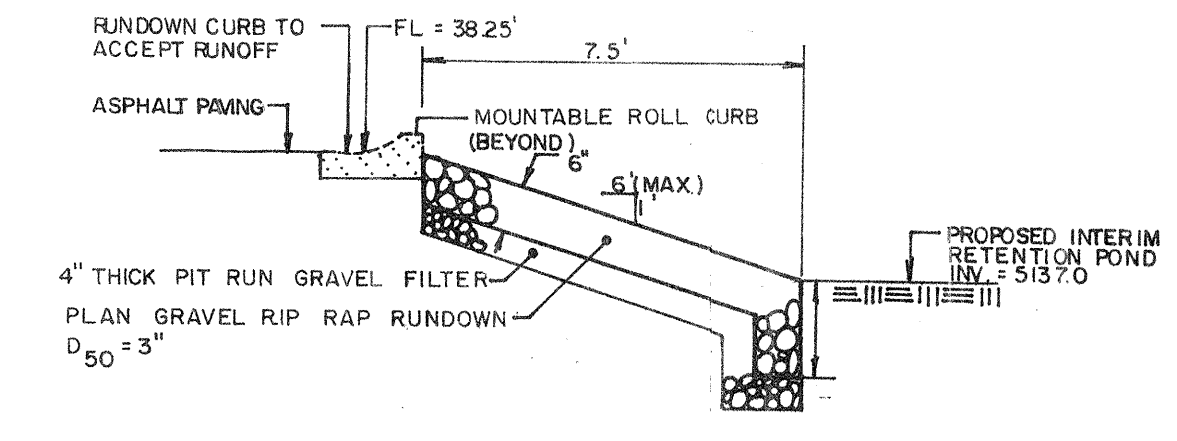
- LEGEND**
- 5156 EXIST. CONTOUR
  - 56 PROPOSED CONTOUR
  - EXIST. SPOT ELEVATION
  - PROPOSED SPOT ELEVATION
  - PROPERTY LINE
  - SWALE
  - BASIN BOUNDARY LINE
  - WATERLOCK



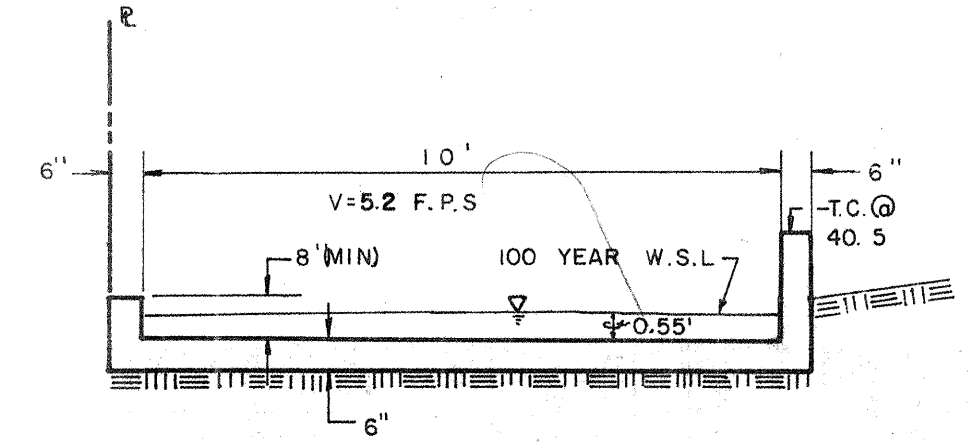
**SECTION D-D**  
HORIZONTAL SCALE: 1" = 2'  
VERTICAL SCALE: 1" = 1'



**SECTION A-A**  
HORIZONTAL SCALE: 1" = 6'  
VERTICAL SCALE: 1" = 3'



**SECTION B-B**  
HORIZONTAL SCALE: 1" = 5'  
VERTICAL SCALE: 1" = 2'



**SECTION C-C**  
**FUTURE OUTFALL CHANNEL**  
SCALE: 1" = 3'

**NOTE:**  
WHEN THE FUTURE IMPROVEMENTS DOWNSTREAM OF THE SITE ARE CONSTRUCTED, FREE DISCHARGE TO VOLCANO ROAD NW NEEDS TO BE ANALYZED. AT THIS TIME, WE ARE UNABLE TO DETERMINE THE AMOUNT OF RUNOFF THAT CAN BE DISCHARGED TO THE STREET.

**EMERGENCY SPILLWAY:**  
AS A RESULT OF THE SITE DEVELOPMENT PLAN REVIEW BY THE EPC, A SOLID WALL WILL BE BUILT ALONG THE NORTH, EAST, AND SOUTH PROPERTY LINES, EXCEPT WHERE DRIVEWAYS ARE INDICATED. BECAUSE OF THIS, THE EASTERLY DRIVEWAY WILL SERVE AS AN EMERGENCY SPILLWAY SHOULD PONDED RUNOFF REACH 5140, OR GREATER. THE OVERFLOW POINT IS SHOWN BELOW.

**DRAINAGE PLAN**

The following items concerning the Sunrise Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

Proposed improvements as shown by the Vicinity Map, are located at Volcano Road N.W. approximately 250' east of 90th Street N.W. The site is more particularly described as Tract B-1A, Unit 5, Town of Atrisco Grant. The surrounding sites are predominantly undeveloped.

A review of Plate K-9 of the Albuquerque Master Drainage Study indicates that whereas the subject site is not within any designated Flood Hazard Zone, it is directly upstream of one. There is presently no storm drainage improvements on either Avalon Road or Volcano Road with both streets draining presently from west to east and eventually to Central Avenue N.W.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1'0" intervals, 2) interface and continuity of proposed and existing elevations, 3) limit and character of proposed improvements. The site presently drains southeasterly. Due to considerations as mentioned above, it is proposed that the site be graded to retain 100% of both offsite and on-site runoff via the use of a retention pond. Said pond is designed, as shown in the Grading Plan, to facilitate future outfall onto Volcano Road when downstream facilities become available. This can be accomplished by the construction of a future spillway in conjunction with sidewalk culverts at the southeast corner of the subject site. Preliminary street grades for both Avalon Road and Volcano Road are included in this submittal.

The Calculations which appear below analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The SCS Method has been used for this analysis in accordance with the City of Albuquerque Development Process Manual, Volume II. The proposed grading concept is consistent with the predesign conference recap which is also included in this submittal.

**CALCULATIONS**

**OFFSITE FLOWS (BASIN A)**  
Ground Cover Information  
From SCS Bernillo County Soil Survey,  
Plate: 30  
Hydrologic Soil Group: B  
Developed Previous C<sub>u</sub> = 69 (DPM Plate 22.2 C-2)  
Time of Concentration/Time to Peak  
 $T_c = 0.0078 (10.77/50.385)$  (Kirpich Equation)  
 $T_p = T_c = 10$  min.  
**Point Rainfall**  
 $P_g = 2.2$  in. (DPM Plate 22.2 D-1)  
Atotal = 108,900 sf = 2.5 Ac  
Aimp = 0.200 sf; 1 impervious = 8 ft  
Composite C<sub>u</sub> = 72 (DPM Plate 22.2 C-3)  
Q<sub>100</sub> = 72 in (DPM Plate 22.2 C-4)  
Q<sub>p</sub> = 45.4 A/T<sub>p</sub> = 11.25 cfs/in runoff  
Q<sub>100</sub> = Q<sub>peak</sub> = Q<sub>p</sub> (DRO) = 5.1 cfs  
V<sub>100</sub> = 3530 (DRO) A = 4,084 cf

**ON-SITE FLOWS (BASIN B)**  
Ground Cover Information  
From SCS Bernillo County Soil Survey,  
Plate: 30  
Hydrologic Soil Group: B  
Existing Previous C<sub>u</sub> = 70 (DPM Plate 22.2 C-3)  
Existing or Range Land:  
Developed Previous C<sub>u</sub> = 65 (DPM Plate 22.2 C-3)  
Time of Concentration/Time to Peak  
 $T_c = 0.0078 (10.77/50.385)$  (Kirpich Equation)  
 $T_p = T_c = 10$  min.  
**Point Rainfall**  
 $P_g = 2.2$  in. (DPM Plate 22.2 D-1)  
**Existing Condition**  
Atotal = 435,612 sf = 10.0 Ac  
Aimp = 0 sf; 1 impervious = 8 ft  
Composite C<sub>u</sub> = 70 (DPM Plate 22.2 C-3)  
Q<sub>100</sub> = 72 in (DPM Plate 22.2 C-4)  
Q<sub>p</sub> = 45.4 A/T<sub>p</sub> = 45.4 cfs/in runoff  
Q<sub>100</sub> = Q<sub>peak</sub> = Q<sub>p</sub> (DRO) = 17.3 cfs  
V<sub>100</sub> = 3530 (DRO) A = 13,800 cf  
**Developed Condition**  
Atotal = 435,612 sf = 10.0 Ac  
Aimp = 110,250 sf; 1 impervious = 23 ft  
Composite C<sub>u</sub> = 76 (DPM Plate 22.2 C-3)  
Q<sub>100</sub> = 0.52 in (DPM Plate 22.2 C-4)  
Q<sub>p</sub> = 45.4 A/T<sub>p</sub> = 45.4 cfs/in runoff  
Q<sub>100</sub> = Q<sub>peak</sub> = Q<sub>p</sub> (DRO) = 23.6 cfs  
V<sub>100</sub> = 3530 (DRO) A = 18,880 cf  
**Comparison**  
 $\Delta Q_{100} = (23.6 - 17.3) = 6.3$  CFS (Increase)  
 $\Delta V_{100} = (18,880 - 13,800) = 5,080$  cf (Increase)

**WATER LEVEL CALCULATION FOR RETENTION POND**  
100-Year Retention Volume:  
 $V_{100} (\text{Offsite}) + V_{100} (\text{Onsite}) = 4,100 + 18,880 = 22,980$  cf  
Use 23,000 cf  
Available Pond Surface Area =  $8.75 \times 50^2 = 21,875$  sf  
To calculate pond water depths for a 100-year storm, use an equivalent square pond with a width of 21,875 ft = 147.9 ft and 2:1 side slopes with a trapezoidal cross section.  
Using  $d$  = depth of water in retention pond in ft. for 100-year storm  
Freeboard = 0.5 ft.  
Top width of water surface =  $147.9 + (0.5)(2)(2) = 145.9$  ft.  
Bottom width =  $(145.9 - 4)(2) = 137.9$  ft.  
Equating volumes and solve for  $d$ :  
 $145.9 + (145.9 - 4d)(d) = 23,000$   
 $291.8d^2 - 21,286.8d + 23,000 = 0$   
 $d = 1.1'$

**FUTURE CONC. OUTFALL CHANNEL ANALYSIS:**  
 $b = 10$ ;  $S = .005$ ;  $n = .013$  &  $Q_{100} = 28.7$  cfs  
Rearranging Manning's Equation:  
 $AR^{2/3} = \frac{n Q}{1.486 S^{1/2}}$   
 $\frac{R^{2/3}}{1.486 S^{1/2}} = \frac{Q}{A}$   
 $\frac{R^{2/3}}{1.486 S^{1/2}} = \frac{28.7}{11.1}$   
 $\frac{R^{2/3}}{1.486 S^{1/2}} = 2.58$   
Since both  $A$  &  $R$  are functions of depth of flow  $d$ , solve by trial and error:  

d	A	P	R <sup>2/3</sup>	AR <sup>2/3</sup>
0.5	5.0	11.0	0.591	2.95
0.6	6.0	11.2	0.600	3.60
0.55	5.5	11.1	0.626	3.44

  
 $d = 0.55'$   
 $V = 28.7/5.5 = 5.2$  fps

