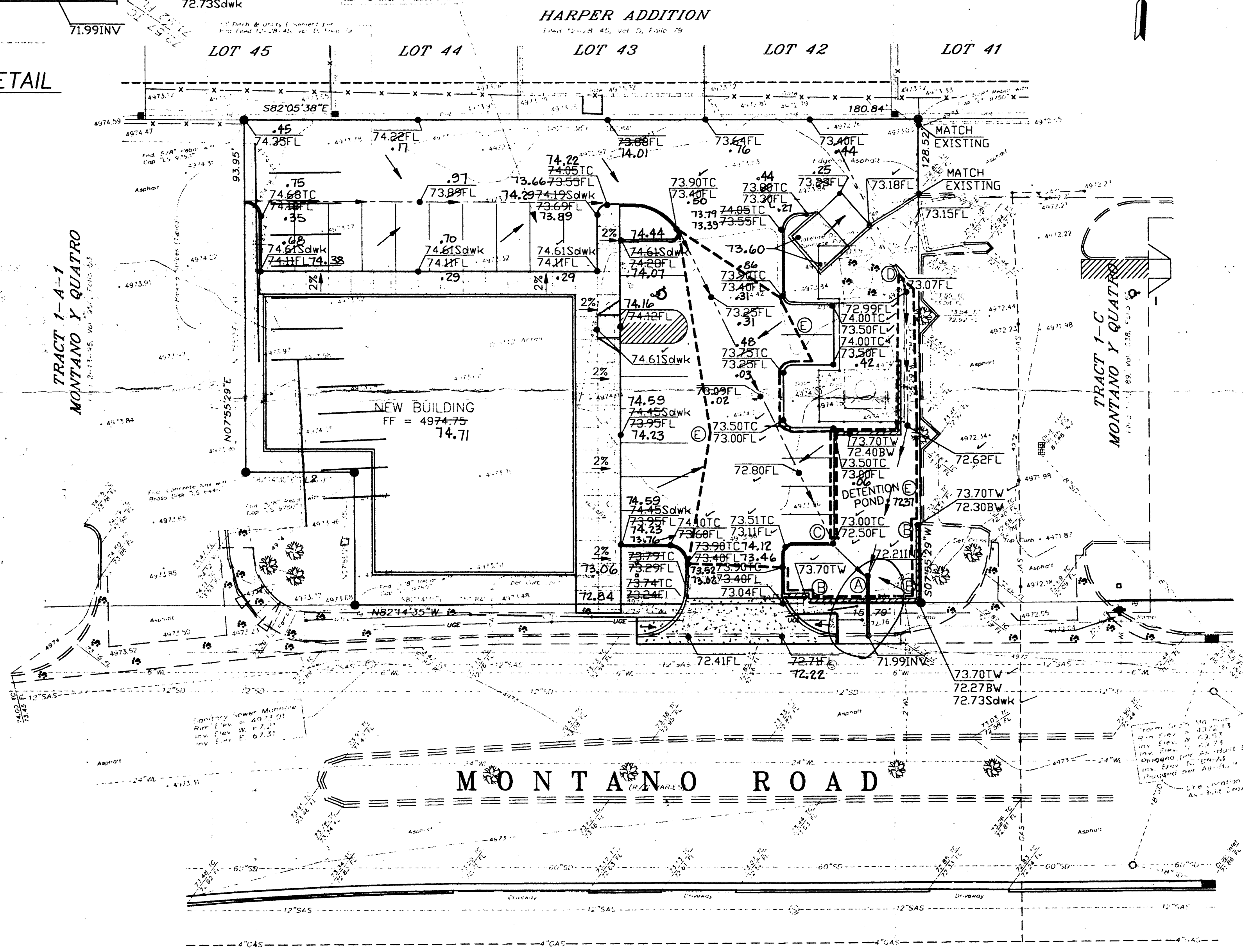
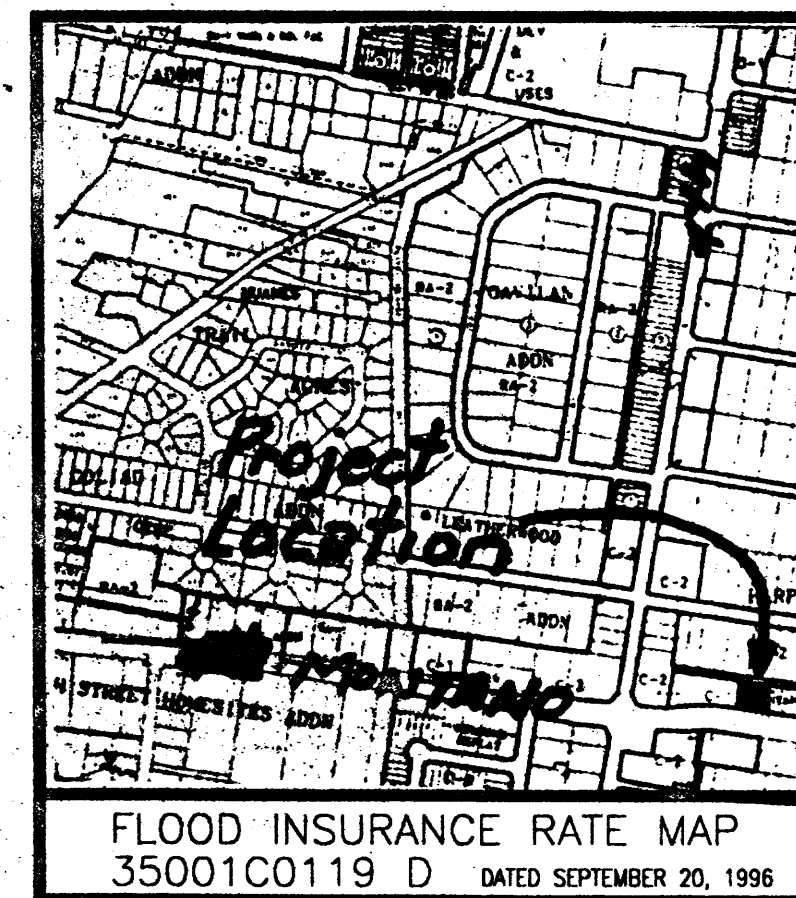
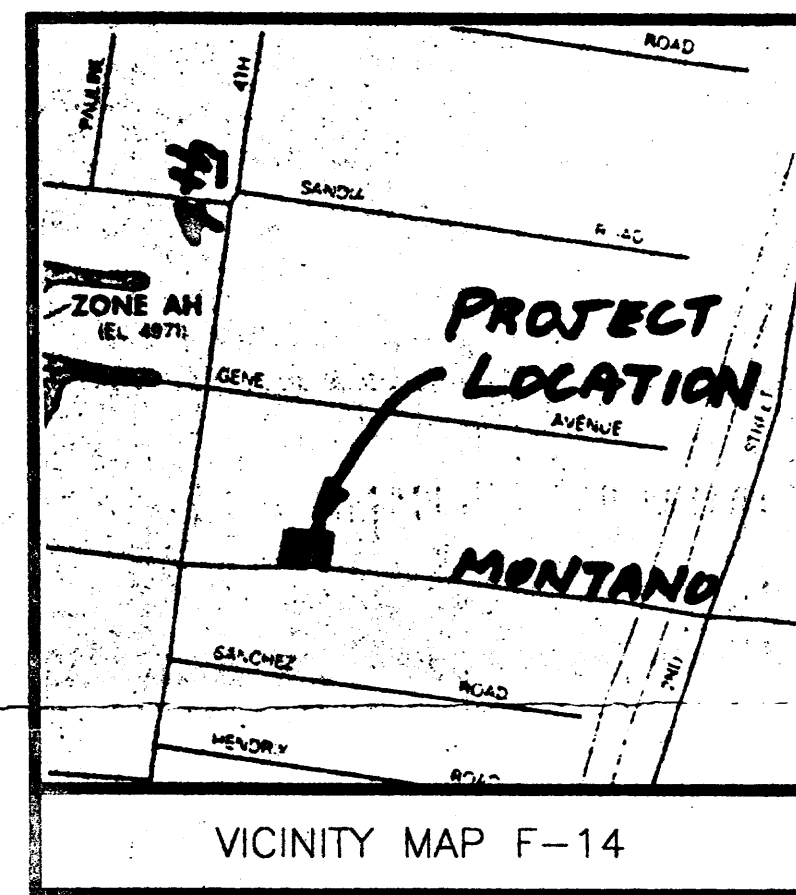
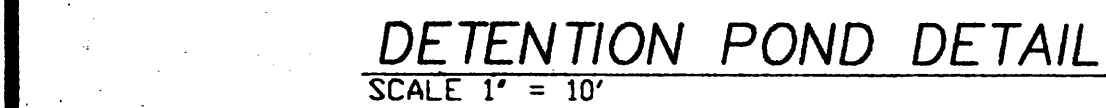
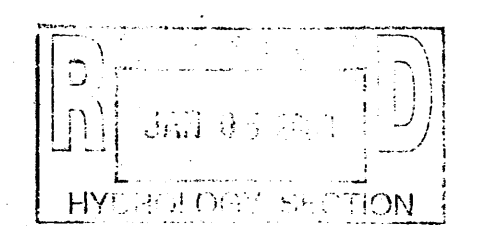


DRAINAGE AND GRADING PLAN FOR  
ROBERT'S MONTANO RETAIL  
223 MONTANO ROAD, N.W.  
TRACT 1-A-2, MONTANO Y QUATRO  
ALBUQUERQUE, NEW MEXICO

**SEPTEMBER 1999**



## DRAINAGE CALCULATIONS



THE FOLLOWING ITEMS CONCERNING ROBERT'S MONTANO RETAIL,  
TRACT 1-A-2, MONTANO Y QUATRO, GRADING AND DRAINAGE PLAN  
ARE CONTAINED HEREON:

1. VICINITY MAP
2. GRADING AND DRAINAGE PLAN
3. FLOODMAP
4. DRAINAGE CALCULATIONS

EXITING CONDITIONS

AS SHOWN BY THE VICINITY MAP, THE SITE CONTAINS APPROXIMATELY 0.51 ACRES AND IS LOCATED AT 223 MONTANO ROAD NW, JUST EAST OF 4TH STREET. THE SITE CURRENTLY IS ZONED C-1, NEIGHBORHOOD COMMERCIAL ZONE. THE SITE TOPOGRAPHY IS RELATIVELY FLAT. THE SITE IS SPARSELY COVERED WITH MINIMAL NATIVE VEGETATION.

ACCORDING TO THE FLOOD INSURANCE RATE MAP, PANEL 35001C0119 D, DATED SEPTEMBER 20, 1995, THIS SITE DOES NOT LIE IN A DESIGNATED FLOODPLAIN.

PROPOSED CONDITIONS

AS SHOWN BY THE PLAN, THE PROJECT CONSISTS OF A NEW OFFICE RETAIL BUILDING. THE PLAN SHOWS THE PROPOSED GRADES AND ELEVATIONS REQUIRED TO PROPERLY GRADE THE REQUIRED PAVING AND DRAINAGE IMPROVEMENTS. ALL DRAINAGE FLOWS WILL BE MANAGED ONSITE AND DISCHARGED TO THE SOUTHEAST CORNER WHERE DETENTION PONDING IS PROPOSED WITHIN THE LANDSCAPED AREA AND A PORTION OF THE ASPHALT PARKING LOT. A 3" DRAIN LINE THROUGH THE MONTANO CURB WILL BE CONSTRUCTED TO RELEASE THE FLOW IN THE POND

THE CALCULATIONS WHICH APPEAR HEREON, ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6 HOUR RAINFALL RUNOFF FOR PEAK FLOWS AND STORM DURATION FOR VOLUME REQUIREMENTS. THE PROCEDURE FOR 40 ACRE AND SMALLER BASINS AS SET FORTH IN THE REVISION OF SECTION 22.7 HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED JANUARY 1993. THIS D.P.M. PROCEDURE IS USED FOR ANALYZING ONSITE FLOWS.

OFFSITE FLOWS  
BASED ON A FIRE

BASED ON A FIELD VISIT AND THE EXISTING SURVEY GRADES  
OFFSITE FLOWS DO NOT APPEAR TO ENTER THE SITE

DOWNSTREAM CAPACITY  
THERE IS AN EXISTING DE

THERE IS AN EXISTING DRAINAGE STUDY FOR THE TRACT 1-C, MONTANO Y CUATRO, WHICH IS IMMEDIATELY EAST OF THE TRACT PREPARED BY EASTERLING AND ASSOCIATES. THE EXISTING DRAINAGE STUDY REFERS TO THIS TRACT HAS UNDEVELOPED DRAINAGE BASINS "OFF-2-U" AND "OFF-1-U". THIS UNDEVELOPED FLOW WAS ACCOUNTED FOR ON THIS DRAINAGE STUDY FOR DISCHARGE INTO THE EXISTING 12" STORM DRAIN AND EXISTING INLETS SHOWN APPROXIMATELY 75 FEET EAST OF THIS TRACT ON MONTANO ROAD

IT IS THE INTENT OF THIS DEVELOPMENT TO DETAIN THE POND VOLUME DIFFERENCE BETWEEN UNDEVELOPED AND DEVELOPED CONDITIONS. ALSO BASED ON THIS EXISTING DRAINAGE STUDY THE RELEASE RATE IS TO BE 0.25CFS/ACRE, THEREFORE THE ALLOWABLE RELEASE RATE IS 0.25CFS FOR THIS SITE.

### EROSION CONTROL

TEMPORARY EROSION CONTROL WILL BE REQUIRED DURING THE CONSTRUCTION PHASE TO PROTECT DOWNSTREAM PROPERTY AND IMPROVEMENTS FROM SEDIMENT AND UNCONTROLLED RUNOFF. EARTH BERMS SHALL BE CONSTRUCTED AS TEMPORARY EROSION CONTROL MEASURES. THEY ARE TO BE PROVIDED ALONG THE WEST PROJECT BOUNDARIES TO HOLD RUNOFF DURING CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY MAINTAIN THESE FACILITIES DURING THE CONSTRUCTION PHASE OF THE PROJECT.

### DRAINAGE CALCULATIONS

1. PRECIPITATION ZONE = 2
2. DESIGN STORM = DEPTH (INCHES) AT 100-YEAR STORM  
6-HOUR = 2.35 INCHES  
10 DAY = 3.95 INCHES
3. PEAK DISCHARGE (CFS/ACRE) FIR 100-YEAR, ZONE 2, TABLE A-9:  
Q = 1.56 CFS/ACRE SOIL UNCOMPACTED "A"  
Q = 2.28 CFS/ACRE LANDSCAPED "B"  
Q = 3.14 CFS/ACRE COMPACTED SOL "C"  
Q = 4.70 CFS/ACRE IMPERVIOUS AREA "D"  
FOR WATERSHEDS LESS THAN OR EQUAL TO 40 ACRES
4. EXCESS PRECIPITATION, E (INCHES), 6 HOUR STORM, ZONE 2, TABLE A-8:  
E = 0.53 INCHES SOIL UNCOMPACTED "A"  
E = 0.78 INCHES LANDSCAPED "B"  
E = 1.13 INCHES COMPACTED SOIL "C"  
E = 2.12 INCHES IMPERVIOUS AREA "D"
5. EXISTING CONDITIONS ONSITE,  
TOTAL AREA = 0.51ACRES  
TABLE A-9:  

TREATMENT	AREA(ACRES)
A	0
B	0.25
C	0.26
D	0

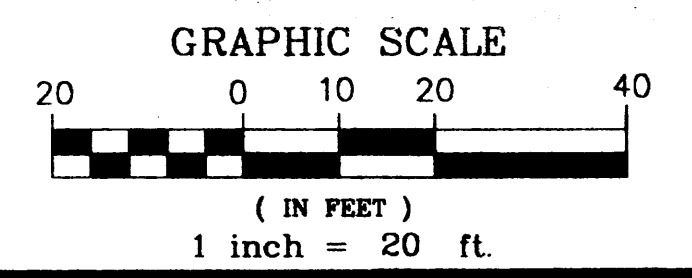
THESE TREATMENTS ARE BASED ON THE DRAINAGE REPORT  
PREPARED FOR TRACT 1-C, THIS IS IMMEDIATELY EAST OF  
THIS TRACT

$$Q(\text{EXISTING}) = (2.28 \times 0.25) + (3.14 \times 0.26) = 1.4 \text{ CFS}$$

EXISTING ONSITE FLOW

$$V(\text{EXISTING}-6\text{HR}) = ((0.78 \times 0.25) + (1.13 \times 0.26) / 12)$$
$$\times 43,560 = 1,774\text{CF}$$
$$= 0.041 \text{ AC}-\text{FT EXISTING ONSITE VOLUME}$$

6. PROPOSED CONDITIONS ONSITE  
TOTAL IMPERVIOUS AREA PROPOSED  
ROOFS = 5320SF = 0.12AC  
SIDEWALKS, DRIVEWAYS AND PAVING = 13,167SF = 0.30AC  
TOTAL IMP. "D" = 0.42AC (PROPOSED)  
LANDSCAPED AREA "B" = 3,729SF = 0.09AC  
TREATMENT AREA (ACRES)
- |   |      |
|---|------|
| A | 0    |
| B | 0.09 |
| C | 0    |
| D | 0.42 |
- Q (PROPOSED) =  $(2.28 \times 0.09) + (4.70 \times 0.42)$   
= 2.2CFS PROPOSED ONSITE FLOW  
V (PROPOSED) =  $((0.78 \times 0.09) + (2.12 \times 0.42)) / 12 =$   
= 0.08AC-FT PROPOSED ONSITE VOLUME = 3,480F  
Q (INCREASE DUE TO THIS DEVELOPMENT) =  $2.2 - 1.4\text{CFS} = 0.8\text{CFS}$   
V (INCREASE DUE TO THIS DEVELOPMENT) =  $3,487\text{CF} - 1,774\text{CF}$   
= 1,713CF (6 HOUR VOLUME REQUIRED)
7. PONDING VOLUME PROVIDED:  
GRADE ELEVATION = 73.40 MAX ELEVATION, SPILLWAY LOCATED  
AT DRIVEWAY INTO MONTANO ROAD.  
INVERT ELEVATION OF POND = 72.21  
AVERAGE VOLUME AREAS:  
PONDING AREA IN ASPHALT PARKING LOT = 72.50 GRADE  
(CORNER OF ASPHALT BEFORE POND) TO 73.40 GRADE,  
AREA = 2,178SF  
PONDING AREA IN ISLAND = 72.21 (INVERT) TO 73.40  
GRADE, AREA = 1272SF  
VOLUME =  $((73.40 - 72.50) / 2) \times 2,178\text{SF} + ((73.40 -$   
 $72.21) / 2) \times 1,272\text{SF} = 1,736\text{CF}$   
1,736CF (VOLUME PROVIDED) > 1,713CF (VOLUME REQD) OK
8. CHECK OUTFLOW RATE:  
J" DRAIN LINE SUBMERGED Q =  $C \times A \times X (2\text{gh})^{.5} \cdot 1/2$   
C = 0.60  
A =  $((3.14 \times (3/12)^2) / 4) = 0.0495\text{F}$   
h = 73.40 (MAX GRADE) 72.21 (INVERT) -  $3/12(\text{CL PIPE}) = 0.94\text{FT}$   
Q =  $0.60 \times 0.0495\text{F} \times (2 \times 32.2 \times 0.94)^{.5} \cdot 1/2 = 0.23\text{CFS}$   
0.23CFS < 0.25CFS (REQUIRED) OK



S.O. #19 FOR NEW 3" DRAIN LINE  
THRU CONCRETE CURB  
NOTICE TO CONTRACTOR

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY. AN APPROVED COPY OF THESE PLANS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED , EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON , SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE INTERIM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985.
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACKFILL COMPACTION SHALL BE ACCORDING TO ARTERIAL STREET USE.
6. MAINTENANCE OF THE NEW TYPE "D" INLET AND NEW STORM DRAIN SHOWN IN DETAIL "B" SHALL BE THE RESPONSIBILITY OF THE OWNER OF THIS PROPERTY.

APPROVALS	NAME	DATE
A.C.E. DESIGN	<i>Bruce L. Binger</i>	2-10-00
INSPECTOR		
A.C.E. FIELD		

## LEGEND

- 
- 97.73TC
- PROPOSED TOP OF CURB
- 97.73FL
- PROPOSED FLOWLINE
- 50.98
- EXISTING CONTOUR ELEVATION
- DIRECTION OF FLOW
- 6972.76
- EXISTING GRADE
- 25.24 TC  
20.98 FL
- EXISTING TOP OF CURB  
AND FLOWLINE

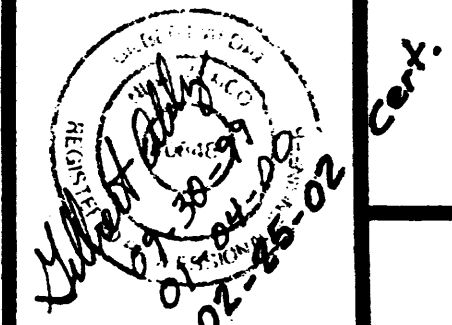
### CONSTRUCTION NOTES

- (A) CONSTRUCT 3" PVC DRAIN LINE THRU CURB, PER CITY DWG. 2235  
CONSTRUCT 18" X 18" CONCRETE APRON AROUND PIPE TO MINIMIZE VEGETATION  
AROUND PIPE OUTLET
- (B) CONSTRUCT 8" WIDE WALL, TOP OF WALL ELEVATION = 73.70
- (C) MAINTAIN 2 FOOT WIDE CURB OPENING FOR SURFACE DRAINAGE
- (D) MAINTAIN 2 FOOT WIDE BY 8" HIGH WALL OPENING FOR SURFACE DRAINAGE
- (E) 100 YEAR WATER SURFACE ELEVATION = 73.40

### UTILITY PRECAUTIONS

THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE, PIPELINE, OR UNDERGROUND UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES, AND UNDERGROUND UTILITY LINES. IN PLANNING AND CONDUCTING EXCAVATION, THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES.

FILE 990401



DRAINAGE & GRADING PLAN  
FOR  
ROBERT'S MONTANO RETAIL  
BUQUERQUE, NEW MEXICO

**APPLIED Engineering & Suveying, Inc.**  
1605 BLAIR DRIVE NE  
ALBUQUERQUE, NEW MEXICO 87112 PH: (505)237-1456

DATE/REVISIONS:

SHEET NUMBER: