

VICINITY MAP M-15

SCALE: 1" = 800'

- LEGEND**
- EXISTING SPOT ELEVATION
  - PROPOSED SPOT ELEVATION
  - EXISTING CONTOUR
  - PROPOSED CONTOUR
  - EXISTING CONCRETE
  - PROPOSED CONCRETE
  - PROPOSED ASPHALT
  - FLOW LINE
  - TOP OF CURB
  - FUTURE TOP OF CURB ELEV. (PROJECT NO. 2834)
  - PROPERTY LINE
  - FUTURE CURB + GUTTER (PROJECT NO. 2834)
  - EXISTING SWALE
  - PROPOSED SWALE
  - PROPOSED CHAIN LINK FENCE
  - BASIN BOUNDARY

**PROJECT BENCHMARK**  
AC 9.1-116, BRASS CAP SET FLUSH  
IN PAVEMENT 16 FEET SOUTH OF  
THE INTERSECTION OF VALE BLVD  
& GIBSON BLVD  
ELEVATION: 5189.85 FEET (M.S.L.D.)

**T.B.M.**  
CHISELED "D" ON SW CORNER  
OF CONCRETE SLAB AS  
SHOWN HEREON  
ELEVATION: 5168.33 FEET (M.S.L.D.)

**LEGAL DESCRIPTION**  
TRACTS A-1, B-1, C-1  
LOVELACE HEIGHTS ADDITION

**DRAINAGE PLAN**  
The following items concerning the U.S.A. Park Parking Lot Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

As shown by the Vicinity Map, this site is located on the southwest corner of the intersection of Vale Boulevard S.E. and Gibson Boulevard S.E. As shown by Plate M-15 of the Albuquerque Master Drainage Study, (AMDS), this site does not lie within a designated Flood Hazard Zone, and downstream flooding is not apparent and does not appear to be a problem. At present, the majority of the site flows from east to west to an existing 24" RCP pipe extension which also connects to an existing storm inlet located in Gibson Boulevard S.E. The storm inlet drains directly onto private property located on the north side of Gibson Boulevard S.E. A portion of the site flows from east to west onto Gibson Boulevard S.E. No offsite flows enter the site along the north and east property lines since the adjacent streets route runoff away from the project site. No offsite flows enter the site along the south property line since the existing bar ditch along the north side of the Mile Road S.E. right-of-way routes runoff away from the project site. Also, when the future Mile Road S.E. is constructed (City Project No. 2834), the runoff generated will be routed away from the project site by the proposed street improvements.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' intervals, 2) continuity between existing and proposed grades, and 3) the limit and character of the proposed improvements. As shown by this Plan, the proposed improvements consist of the construction of a new parking lot along with adjacent landscaping. Flows generated by the proposed improvements will be routed from east to west and discharged onto Gibson Boulevard S.E. via a series of multiple sidewalk culverts. From that point, the runoff will flow west along the south edge of Gibson Boulevard S.E. to an existing concrete runoff located above the South Diversion Channel which is located roughly about 3500 feet to the west of the project site which is the outfall for this site. A previous submission by Fred C. Arfman has substantiated the capacity of this existing downstream facility. Based upon the fact that this site is an infill site, is located at the lower end of the watershed, and the proximity of downstream facilities, the free discharge of runoff from this site is appropriate. Furthermore, the proposed drainage pattern will eliminate the problem of discharging to the aforementioned storm inlet and hence will improve the existing drainage condition by decreasing the amount of runoff discharged onto the private property. Also, there would be no benefit in ponding and discharging at a controlled rate since this would only increase the amount of runoff discharged into an existing storm inlet located roughly about 140 feet to the west of the project site by extending the duration of low-flow runoff. This inlet also discharges onto private property. Some of the runoff generated by this site and discharged to the street may be captured by the existing downstream inlet. However, this is an existing inlet with an existing problem (i.e., the discharge of public runoff onto private property). The proposed parking lot will improve these conditions by bypassing the first inlet altogether.

Also, there is already sufficient flow within Gibson Boulevard S.E. such that the increase in runoff from this site will have no effect on the downstream inlet capacity (i.e., the inlet can only accept so much runoff). Based upon DPM Plate 22.20-6, the inlet capacity is only about 18 cfs. The upstream contribution is approximately 284 cfs as determined by the AMDS update (draft only). Consequently, the proposed paving will not affect the inlet capacity, nor will it increase the runoff presently being discharged onto private property.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used to quantify the peak rate of discharge and the SCS Method has been used to quantify the volume of runoff. Both methods have been used in accordance with the City of Albuquerque Development Process Manual, Volume II and the Mayor's Emergency Rule adopted January 14, 1986. As shown by these Calculations, the proposed improvements will increase the total discharge from this site by approximately 18.2 cfs.

**CALCULATIONS**

**Ground Cover Information**

From SCS Bernalillo County Soil Survey,  
Plate 91: Wab, Wink fine sandy loam  
Hydrologic Soil Group: B  
Existing Pervious CN = 70 (DPM Plate 22.2 C-2)  
Pasture or Range Land (fair condition)  
Developed Pervious CN = 61 (DPM Plate 22.2 C-2)

**Time of Concentration/Time to Peak**

$T_c = 0.0078 L^{0.778} S^{-0.385}$  (Kirpich Equation)

$T_p = T_c = 10$  min.

**Point Rainfall**

$P_g = 2.3$  in. (DPM Plate 22.2 D-1)

**Rational Method (100 YEAR RAINFALL)**

Discharge:  $Q = CIA$

where C varies

$C = P_g (6.84) T_c^{-0.51} = 4.86$  in/hr

$P_g = 2.3$  in (DPM Plate 22.2D-1)

$T_c = 10$  min (minimum)

A = area, acres

**SCS Method**

Volume:  $V = 3630(DRO) A$

Where DRO = Direct runoff in inches

A = area, acres

**Existing Condition**

Basin 1  
A total = 312,865 sf = 7.18 Ac  
 $C = 0.40$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.40)(4.86)(7.18) = 14.0$  cfs  
Aimp = 0 cfs; Impervious = 0  
Composite CN = 70 (DPM Plate 22.2 C-3)  
DRO = 0.4 in (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 10,425$  cf

**Developed Condition**

Basin 1  
A total = 214,600 sf = 4.92 Ac  
Roof area = 3200 sf (0.01)  
Paved area = 205,400 sf (0.46)  
Landscaped area = 6,000 sf (0.03)  
 $C = 0.88$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.88)(4.86)(4.92) = 21.0$  cfs  
Aimp = 208,600 sf; Impervious = 97  
Composite CN = 97 (DPM Plate 22.2 C-3)  
DRO = 2.2 in (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 33,930$  cf

**Developed Condition**

Basin 2  
A total = 46,075 sf = 1.06 Ac  
Paved area = 46,075 sf (1.0)  
Landscaped area = 0 sf (0.00)  
 $C = 0.95$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.95)(4.86)(1.06) = 4.9$  cfs  
Aimp = 46,075 sf; Impervious = 100  
Composite CN = 98 (DPM Plate 22.2 C-3)  
DRO = 2.2 in (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 8,465$  cf

**Developed Condition**

Basin 3  
A total = 59,040 sf = 1.36 Ac  
Paved area = 59,040 sf (1.0)  
Landscaped area = 0 sf (0.00)  
 $C = 0.95$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.95)(4.86)(1.36) = 6.3$  cfs  
Aimp = 59,040 sf; Impervious = 100  
Composite CN = 98 (DPM Plate 22.2 C-3)  
DRO = 2.2 in (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 10,840$  cf

**Channel Capacity (2'-0" curb opening) Weir Equation**

$Q = CWH^{3/2} = 3.4$  cfs

Where C = 3.0

$H = 0.67$  feet

**REVISED SIDEWALK CULVERT SIZING**

**Rational Method**

Discharge:  $Q = CIA$

where C varies

$C = P_g (6.84) T_c^{-0.51} = 3.15$  in/hr

$P_g = 1.51$  in (DPM Plate 22.2D-1 - 10 Year Rainfall)

$T_c = 10$  min (minimum)

A = area, acres

**Developed Condition (10 Year Rainfall)**

Basin 1  
 $C = 0.93$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.93)(3.15)(4.92) = 14.5$  cfs

Basin 2  
 $C = 0.95$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.95)(3.15)(1.06) = 3.2$  cfs

Basin 3  
 $C = 0.95$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = CIA = (0.95)(3.15)(1.36) = 4.1$  cfs

Therefore, use 4 - 2'-0" and 1 - 1'-0" sidewalk culverts (Basin 1)  
1 - 2'-0" sidewalk culvert (Basin 2)  
2 - 2'-0" sidewalk culverts (Basin 3)

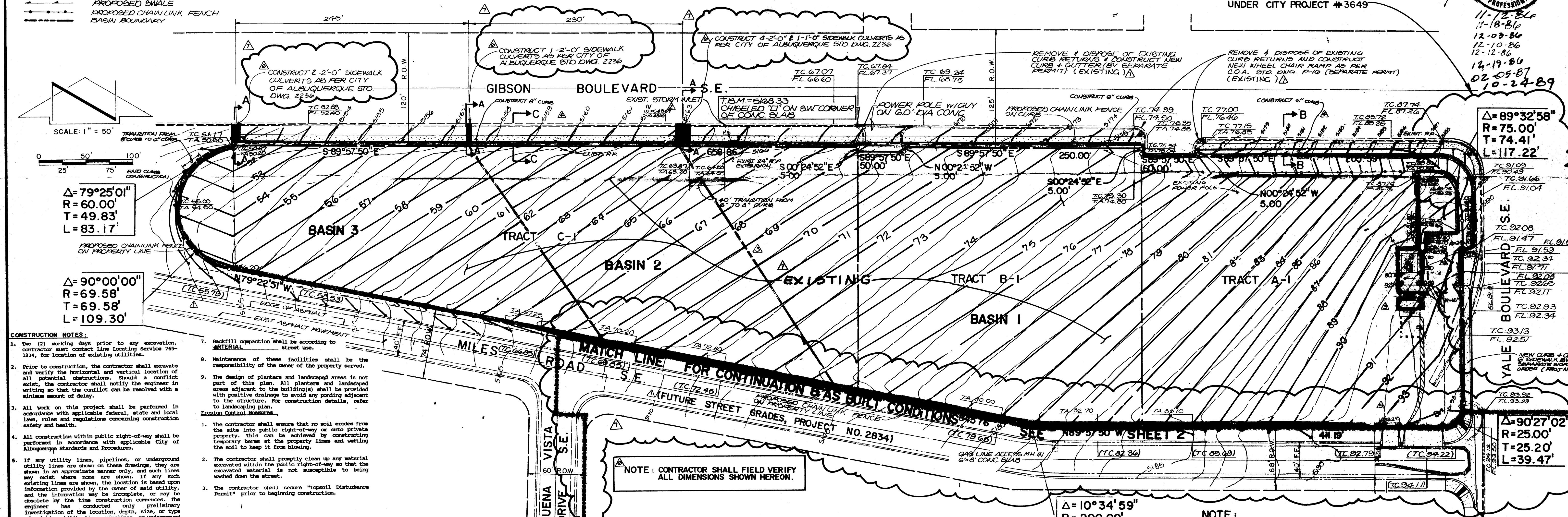
**Comparison**

$Q_{100} = (21.0 + 4.9 + 6.3) = 32.2$  cfs (increase)

$V_{100} = (33,930 + 8,465 + 10,860) = 53,255$  cf (increase)



THIS AREA RECONSTRUCTED  
UNDER CITY PROJECT #3649



**CONSTRUCTION NOTES:**

1. Two (2) working days prior to any excavation, contractor must erect line locating service 705-1234, for location of existing utilities.
2. Prior to construction, the contractor shall excavate and verify the horizontal and vertical location of all potential obstructions. Should a conflict exist, the contractor shall notify the engineer in writing so that the conflict can be resolved with a minimum amount of delay.
3. All work on this project shall be performed in accordance with applicable federal, state and local laws, rules and regulations concerning construction safety and health.
4. All construction within public right-of-way shall be performed in accordance with applicable City of Albuquerque Standards and Procedures.
5. If any utility lines, pipelines, or underground utility lines are shown on these drawings, they are shown in an approximate manner only, and such lines may exist where none are shown. If any such existing lines are shown, the location is based upon information provided by the owner of said utility, and the information may be incomplete, or may be obsolete by the time construction commences. The engineer has conducted only preliminary investigation of the location, depth, size, or type of existing utility lines, pipelines, or underground utility lines. This investigation is not conclusive, and may not be complete, therefore, makes no representation pertaining thereto, and assumes no responsibility or liability therefor. 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.
6. 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.

7. Backfill operation shall be according to ARTERIAL.
8. Maintenance of these facilities shall be the responsibility of the owner of the property served.
9. The design of planters and landscaped areas is not part of this plan. All planters and landscaped areas adjacent to the building(s) shall be provided with positive drainage to avoid any ponding adjacent to the structure. For construction details, refer to landscaping plan.

**Erosion Control Measures:**

1. The contractor shall ensure that no soil erodes from the site into public right-of-way or onto private property. This can be achieved by constructing temporary berms at the property lines and wetting the soil to keep it from blowing.
2. The contractor shall promptly clean up any material excavated within the public right-of-way so that the excavated material is not susceptible to being washed down the street.
3. The contractor shall secure "topsoil Disturbance Permit" prior to beginning construction.

APPROVALS	NAME	DATE
A.C.E. / DESIGN		
INSPECTOR		
A.C.E. / FIELD		

NO.	DATE	BY	REVISIONS
10/89	JGM		UPDATE FOR PARKING LOT EXPANSION;
9/18/91	LRI		REVISE NO. OF SIDEWALK CULVERTS NEEDED FOR ALL TRACTS BASED ON A 10-YEAR RAINFALL - SECTION B-B
12/86	LRI		REVISED ENTRANCES TO PARKING LOT
12/86	LRI		REVISE CURB, SIDEWALK & DRIVEPAD LOCATIONS
12/86	LRI		REVISED GRADES, TEXT, CALCULATIONS & ENTRANCES

NO.	DATE	BY	REVISIONS
11/86	LRI		SHOW FUTURE CURB ELEVATIONS ON MILES RD.
11/86	LRI		REMOVED PROPOSED STORM INLET + REVISED CALCS

DESIGNED BY: L.P.U.

DRAWN BY: R.A.R.

APPROVED: J.G.M.

JOB NO. 60157

DATE 10-89

**SECTION A-A**

SCALE: H. 1" = 4'-0"

V. 1" = 2'-0"

INVERT VARIES

2% SLOPE

GRATE

INV. ELEV. VARIES

NEW ASPHALT PAVEMENT

HEIGHT VARIES FROM 6" TO 8" AS SHOWN

**SECTION B-B**

SCALE: V. 1" = 3'-0"

H. 1" = 4'-0"

EXIST. STD. CURB & GUTTER

5% SLOPE

2% SLOPE

SLOPE VARIES

NEW ASPHALT PAVEMENT

NEW HEADER CURB

**SECTION C-C**

SCALE: V. 1" = 3'-0"

H. 1" = 4'-0"

EXIST. STD. CURB & GUTTER

2% SLOPE

4" THICK CONC. SIDEWALK

NEW ASPHALT PAVEMENT

NEW HEADER CURB

HEIGHT VARIES FROM 6" TO 8" AS SHOWN

GRADING AND DRAINAGE PLAN

EXPRESS AIRPORT PARKING

NOV 08 1989

FILE NO.

SHEET 1 OF 2



**LEGEND**

+ EXISTING SPOT ELEVATION  
 - PROPOSED SPOT ELEVATION  
 --- EXISTING CONTOUR  
 --- PROPOSED CONTOUR  
 --- EXISTING FLOWLINE  
 --- PROPOSED FLOWLINE  
 --- TOP OF CURB  
 --- FLOWLINE

**LEGAL DESCRIPTION**

TRACT X-1, LOVELACE HEIGHTS ADDITION,  
 TRACT 1-A-3, NEWPORT INDUSTRIAL PARK WEST,  
 UNIT 2, AND MILES ROAD S.E. RIGHT-OF-WAY  
 FROM BUENA VISTA DRIVE S.E. TO YALE BOVD. S.E.

**DRAINAGE PLAN**

The following items concerning the Express Airport Parking Phase II Drainage Plan are contained herein:

1. Grading Plan
2. Calculations

The Phase II expansion of Express Airport Parking lies to the south of the existing facility. The project will consist of the paving of Tract X-1, Lovelace Heights Addition, Tract 1-A-3, Newport Industrial Park West, Unit 2, and the Miles Road S.E. right-of-way from Buena Vista Drive S.E. to Yale Boulevard S.E. A lease agreement has been executed with the City of Albuquerque to allow the use of Miles Road S.E. within the limits mentioned above. The intent of this plan is to pave the lands described above in order to expand the existing parking facility. At present, runoff flows from east to west within Miles Road S.E. Street grades have been established under City Project No. 2834 for this section of Miles Road S.E. Review and comment has been received for the street grades, however, construction has not followed, hence final approval of those street grades has not been obtained. The paving of this portion of Miles Road S.E. will be consistent with the drainage pattern established by the street grades established by City Project No. 2834. Those street grades are also consistent with the drainage pattern established by the Drainage Report by Newport Industrial Park - West Unit 2 Site Improvements prepared for Craddock Development Company, Albuquerque, New Mexico by Andrews, Asbury & Robert, Inc., dated April 1979, revised September 12, 1979.

The grading plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1'0" intervals, 2) the limit and character of the existing improvements, 3) the limit and character of the proposed improvements, 4) continuity between existing and proposed grades, 5) future parking lot expansion. As shown by this plan, the proposed improvements consist of the paving of the site. The drainage pattern to be followed is outlined above. Areas for future expansion with the permission of the adjacent lot owner has been shown to verify the compatibility of grades. The free discharge of runoff to the Miles Road right-of-way is consistent with the aforementioned drainage report prepared by Andrews, Asbury and Robert, Inc. The Miles Road runoff flows onto Buena Vista Drive S.E. and flows south within the paved street to the "knuckle" where Buena Vista Drive S.E. and Renard Place S.E. intersect. At this point, there are existing public storm inlets to accept the runoff and convey said runoff via a 30" RCP storm drain to an existing concrete drainage channel which is situated to the south.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used to determine the peak discharge of runoff while the SCS Method has been used to quantify the volume of runoff generated. Both Methods have been used in accordance with the City of Albuquerque Development Process Manual, Volume II, coupled with the Mayor's Emergency Rule adopted January 14, 1986. As shown by these calculations, both the peak rate of discharge and the volume of runoff generated are expected to increase in conjunction with the paving of this site.

**CALCULATIONS****Ground Cover Information**

From SCS Bernalillo County Soil Survey,  
 Plate 31: WAB - Wink Fine Sandy Loam  
 Hydrologic Soil Group: B  
 Pervious CN = 70 (DPM Plate 22.2 C-2  
 Pasture or Range Land: fair condition)

**Time of Concentration/Time to Peak**

$T_c = 0.0078 L^{0.77} / S^{0.385}$  (Kirpich Equation)

$T_p = T_c = 10$  min.

**Point Rainfall**

$P_6 = 2.3$  in. (DPM Plate 22.2 D-1)

**Rational Method**

Discharge:  $Q = C i A$

where C varies

$i = P_6 (6.84) T_c^{-0.51} = 4.86$  in/hr

$P_6 = 2.3$  in (DPM Plate 22.2D-1)

$T_c = 10$  min (minimum)

A = area, acres

**SCS Method**

Volume:  $V = 3630(DRO) A$

Where DRO = Direct runoff in inches

A = area, acres

**Existing Condition**

$A_{total} = 122,700$  sf = 2.8 Ac  
 $Paved\ area = 11,000$  sf (0.09)  
 $Unpaved\ area = 111,700$  sf (0.91)  
 $C = 0.45$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = C i A = 0.45(4.86)(2.8) = 6.1$  cfs  
 $\% \text{ impervious} = 9 \%$   
 $Composite\ CN = 73$  (DPM Plate 22.2 C-2)  
 $DRO = 0.5$  in (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 5080$  cf

**Developed Condition**

$A_{total} = 122,700$  sf = 2.8 Ac  
 $Paved\ area = 121,400$  sf (0.99)  
 $Unpaved\ area = 1300$  sf (0.01)  
 $C = 0.94$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = C i A = 0.94(4.86)(2.8) = 12.8$  cfs  
 $\% \text{ impervious} = 99 \%$   
 $Composite\ CN = 97$  (DPM Plate 22.2 C-2)  
 $DRO = 2.0$  in (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 20,330$  cf

**Comparison**

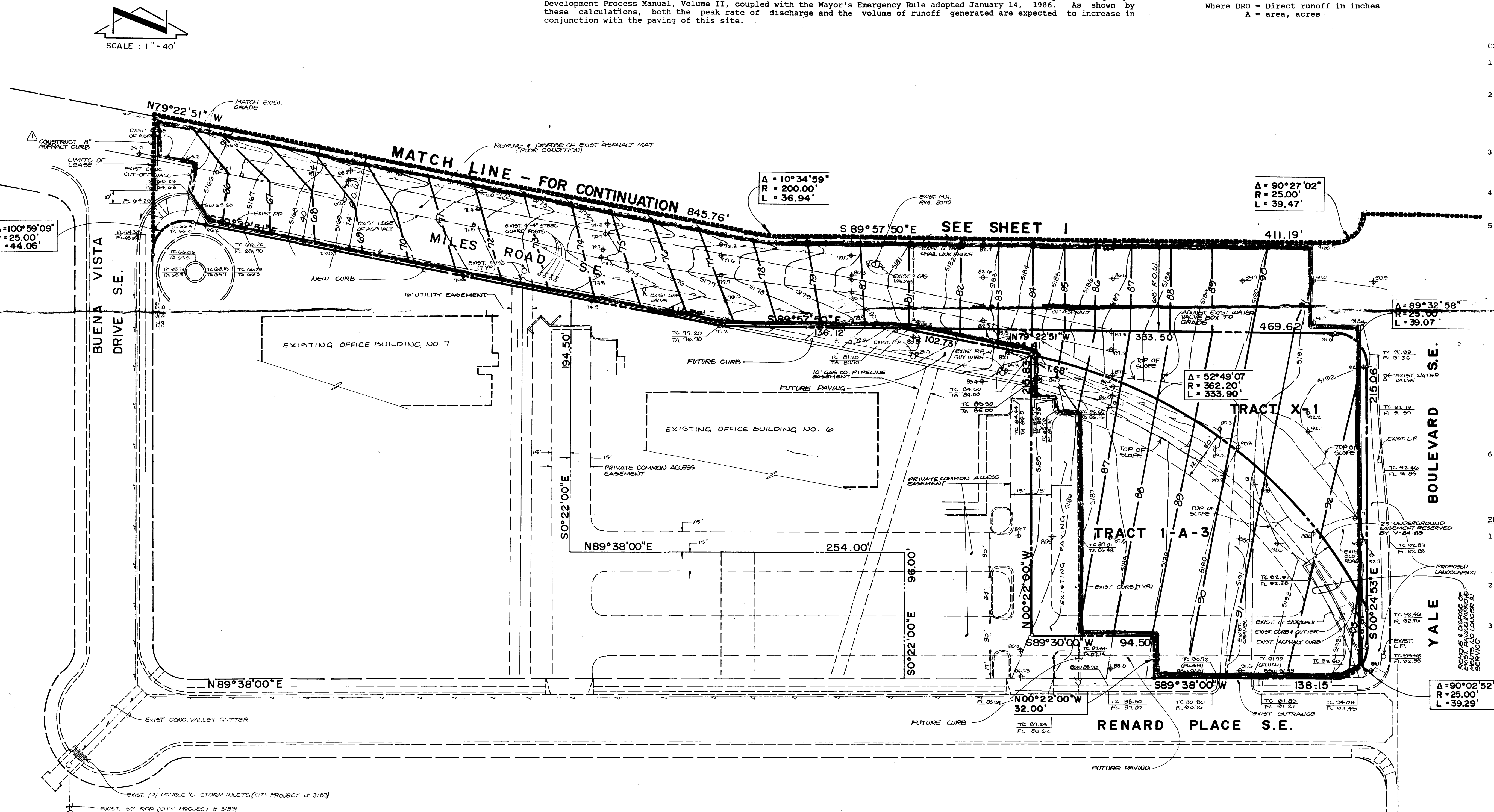
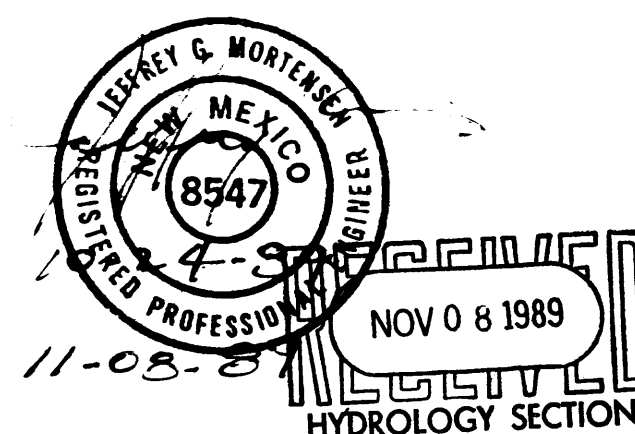
$\Delta Q_{100} = 12.8 - 6.1 = 6.7$  cfs (increase)  
 $\Delta V_{100} = 20,330 - 5080 = 15,250$  cf (increase)

**CONSTRUCTION NOTES:**

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE 765-1234, FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.
5. IF ANY UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES ARE SHOWN ON THESE DRAWINGS, THEY ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. IF ANY SUCH EXISTING LINES ARE SHOWN, THE LOCATION IS BASED UPON INFORMATION PROVIDED BY THE OWNER OF SAID UTILITY, AND THE INFORMATION MAY BE INCOMPLETE, OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. THE ENGINEER HAS CONDUCTED ONLY PRELIMINARY INVESTIGATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES. THIS INVESTIGATION IS NOT CONCLUSIVE, AND MAY NOT BE COMPLETE, THEREFORE, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. 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.
6. THE DESIGN OF PLANTERS AND LANDSCAPED AREAS IS NOT PART OF THIS PLAN. ALL PLANTERS AND LANDSCAPED AREAS ADJACENT TO THE BUILDING(S) SHALL BE PROVIDED WITH POSITIVE DRAINAGE TO AVOID ANY PONDING ADJACENT TO THE STRUCTURE. FOR CONSTRUCTION DETAILS, REFER TO LANDSCAPING PLAN.

**EROSION CONTROL MEASURES**

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.
3. THE CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" PRIOR TO BEGINNING CONSTRUCTION.



JEFF MORTENSEN & ASSOCIATES, INC.  
 811 DALLAS N.E. ALBUQUERQUE, NM 87110  
 ENGINEERS © TELEPHONE (505) 265-5611

**GRADING & DRAINAGE PLAN**  
**EXPRESS AIRPORT PARKING**  
**PHASE II**

DESIGNED BY	NO.	DATE	BY	REVISIONS	JOB NO.
J.G.M.	1	11/89	J.G.M.	ADD CURB @ WEST END OF PAVING	60157
DRAWN BY					DATE
S.G.H.					10-89
APPROVED BY					SHEET
J.G.M.					2 OF 2

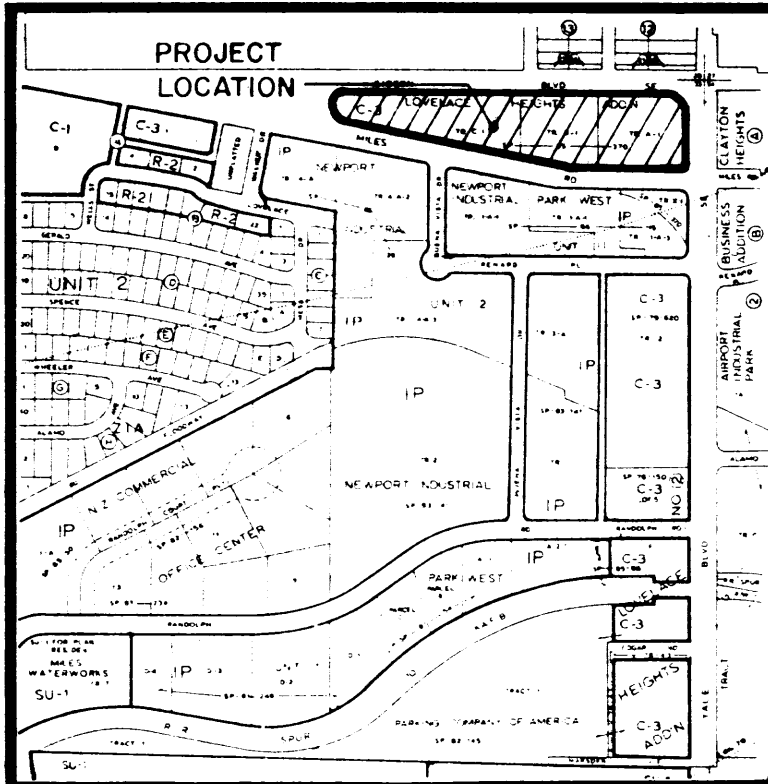






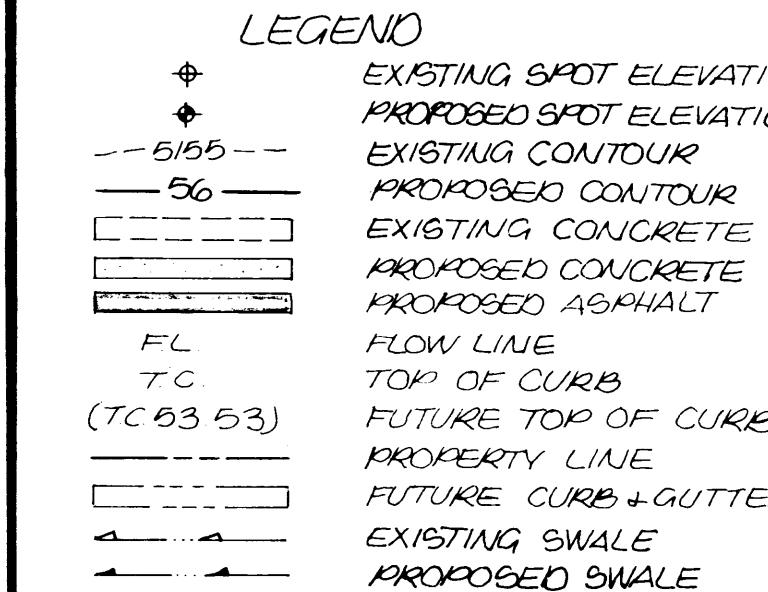






VICINITY MAP M-15

SCALE: 1" = 800'



**PROJECT BENCHMARK**  
AC 9 1-MIG. BRASS CAP SET FLUSH  
IN PAVEMENT 16 FEET SOUTH OF  
THE INTERSECTION OF YALE BLVD  
& GIBSON BLVD  
ELEVATION: 5189.85 FEET (M.S.L.D.)

**TBM**  
CHISELED "I" ON SW CORNER  
OF CONCRETE SLAB AS  
SHOWN HEREON  
ELEVATION: 5168.33 FEET (M.S.L.D.)

**LEGAL DESCRIPTION**  
TRACTS A-1, B-1, C-1  
LOVELACE HEIGHTS ADDITION

# CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST LOCATE AND MARK ALL EXISTING UTILITIES. CITY RIGHT-OF-WAY. AN APPROVED COPY OF THESE PLANS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.
5. IF ANY UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES ARE SHOWN ON THESE DRAWINGS, THEY ARE SHOWN IN AN APPROXIMATE MANNER ONLY. AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. IF ANY SUCH EXISTING LINES ARE SHOWN, THE LOCATION IS BASED UPON INFORMATION PROVIDED BY THE OWNER OF SAID UTILITY, AND THE INFORMATION MAY BE INCOMPLETE, OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. THE ENGINEER HAS UNDERTAKEN NO FIELD VERIFICATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. 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.
6. 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.
7. BACKFILL COMPACTION SHALL BE ACCORDING TO ARTERIAL STREET USE.
8. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.

## EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERM AT THE PROPERTY LINES AND HITTING THE SOIL TO KEEP IT FROM BLOWING.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.
3. THE CONTRACTOR SHALL SECURE "TOPSOIL" DISTURBANCE PERMIT PRIOR TO BEGINNING CONSTRUCTION.

APPROVALS	NAME	DATE
A.C.E./DESIGN		
INSPECTOR		
A.C.E./FIELD		

## DRAINAGE PLAN

The following items concerning the U.S.A. Park Parking Lot Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

As shown by the Vicinity Map, this site is located on the southwest corner of the intersection of Yale Boulevard S.E. and Gibson Boulevard S.E. As shown by Plate M-15 of the Albuquerque Master Drainage Study, this site does not lie within a designated Flood Hazard Zone, and the site is not in a designated Flood Hazard Zone. The site is located in a manner which will route runoff away from the project site. No offsite flows enter the site along the north and east property lines since the adjacent streets route runoff away from the project site. No offsite flows enter the site along the south property line since the existing basins along the north side of the Miles Road S.E. right-of-way route runoff away from the project site. Also, when the future Miles Road S.E. is constructed (City Project No. 2834), the runoff generated will be routed away from the project site by the proposed street improvements.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1'0" intervals, 2) continuity between existing and proposed grades, and 3) the limit and character of the proposed improvements. As shown by this Plan, the proposed improvements consist of the construction of a new parking lot along with adjacent landscaping. Flows generated by the proposed improvements will be routed from east to west and discharged onto Gibson Boulevard S.E. via a series of multiple sidewalk culverts. From that point, the runoff will flow west along the south edge of Gibson Boulevard S.E. to an existing concrete runoff located above the South Diversion Channel which is located roughly about 3500 feet to the west of the project site. The outfall for this site. A previous submission by Fred C. Arfman has substantiated the capacity of this existing downstream facility. Based upon the fact that this site is located at the lower end of the watershed, and the proximity of downstream facilities, the free discharge of runoff from this site is appropriate. Furthermore, the steep grades on Gibson Boulevard S.E. should enable the containment of high quantities of runoff.

The calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used to quantify the peak rate of discharge of the project site. Both methods have been used in accordance with the City of Albuquerque Development Process Manual, Volume II and the Mayor's Emergency Rule adopted January 14, 1986. As shown by these calculations, the proposed improvements will increase the total discharge from this site by approximately 12.8 cfs.

## Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 311: Wab, Wink fine sandy loam  
Hydrologic Soil Group: B  
Existing Permeable CN = 70 (DPM Plate 22.2 C-2)  
Developed Permeable CN = 61 (DPM Plate 22.2 C-2)

**Time of Concentration/Time to Peak**  
 $T_c = 0.0078 L^{0.775} / S^{0.385}$  (Kirpich Equation)  
 $T_p = T_c + 10$  min.

**Point Rainfall**  
 $P_g = 2.3$  in. (DPM Plate 22.2 D-1)

## Rational Method

Discharge:  $Q = C i A$   
where C varies  
 $i = P_g (6.84) T_c^{-0.51} = 4.86$  in/hr  
 $P_g = 2.3$  in. (DPM Plate 22.2D-1)  
 $T_c = 10$  min (minimum)  
 $A =$  area, acres

## SCS Method

Volume:  $V = 3630 (DRO) A$   
where DRO = Direct runoff in inches  
 $A =$  area, acres

## Existing Condition

Atotal = 312,865 sf = 7.18 Ac  
 $C = 0.40$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = C i A = (0.40)(4.86)(7.18) = 14.0$  cfs  
Aimp = -0.42 sf; % impervious = -0.42  
Composite CN = 70 (DPM Plate 22.2 C-3)  
 $Q_{100} = 0.4$  in. (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 10,425$  cf

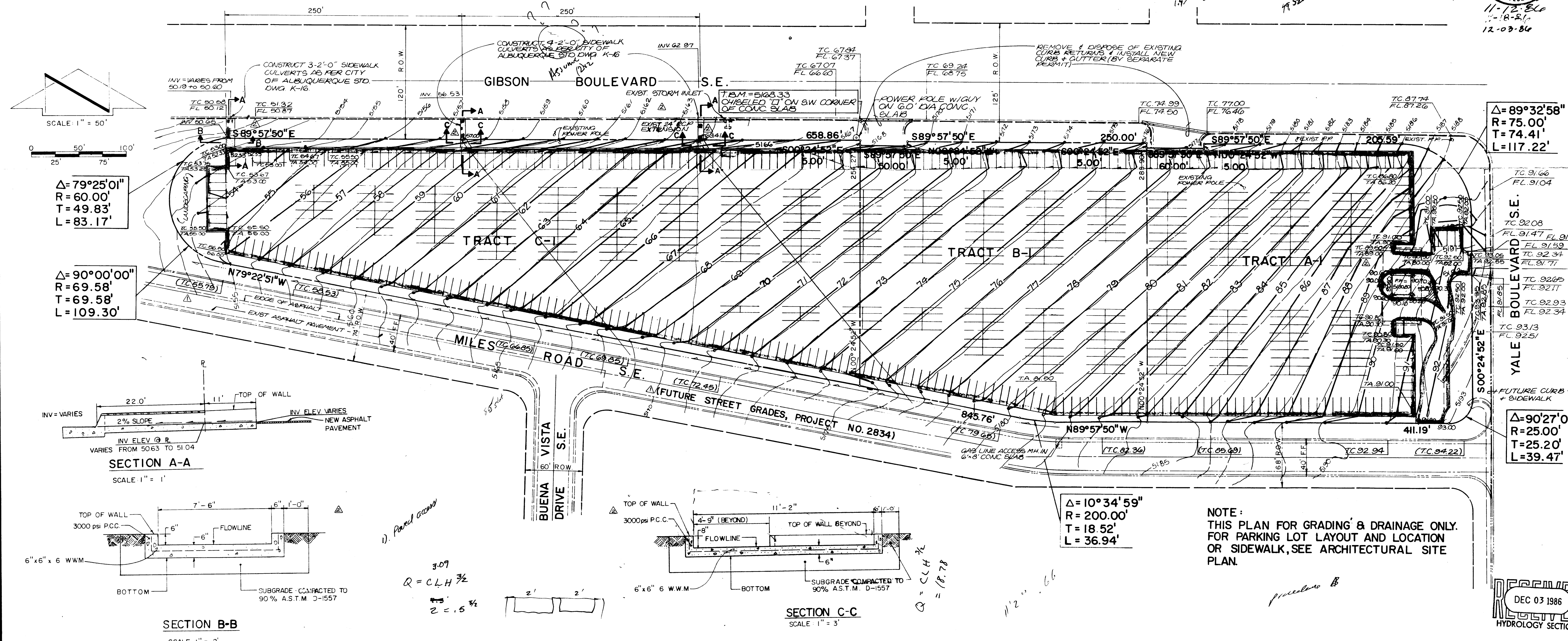
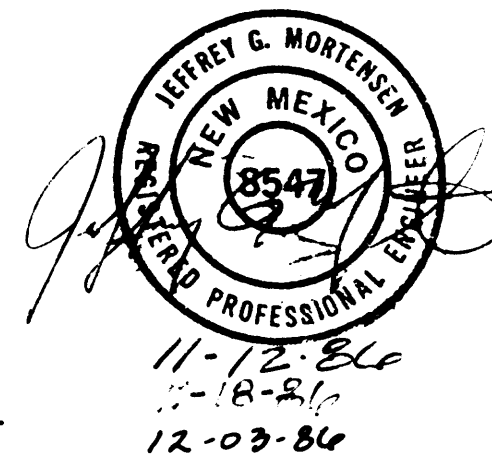
## Developed Condition

Atotal = 312,865 sf = 7.18 Ac  
Roof area = 3200 sf (0.01)  
Paved area = 297,000 sf (4.15)  
Landscaped area = 12,865 sf (0.26)  
 $C = 0.77$  (Weighted average per Emergency Rule, 1/14/86)  
 $Q_{100} = C i A = (0.77)(4.86)(7.18) = 26.5$  cfs  
Aimp = 230,800 sf; % impervious = 73.44  
Composite CN = 69 (DPM Plate 22.2 C-3)  
 $Q_{100} = 0.4$  in. (DPM Plate 22.2 C-4)  
 $V_{100} = 3630 (DRO) A = 22,850$  cf

## Channel Capacity (2'-0" curb opening)

$Q = CA \sqrt{2gh} = 4.3$  cfs  
Where  $C = 0.7$   
 $A = 1.34$  sf  
 $g = 32.2$  ft/sec<sup>2</sup>  
 $h = 0.33$  ft  
Therefore, use 7 - 2'-0" sidewalk culverts  
Comparison  
 $Q_{100} = 26.5 - 14.0 = 12.5$  cfs (increase)  
 $V_{100} = 31,800 - 10,425 = 21,375$  cf (increase)

use weir eqn for design Q  
 $Q = CLH^{3/2}$

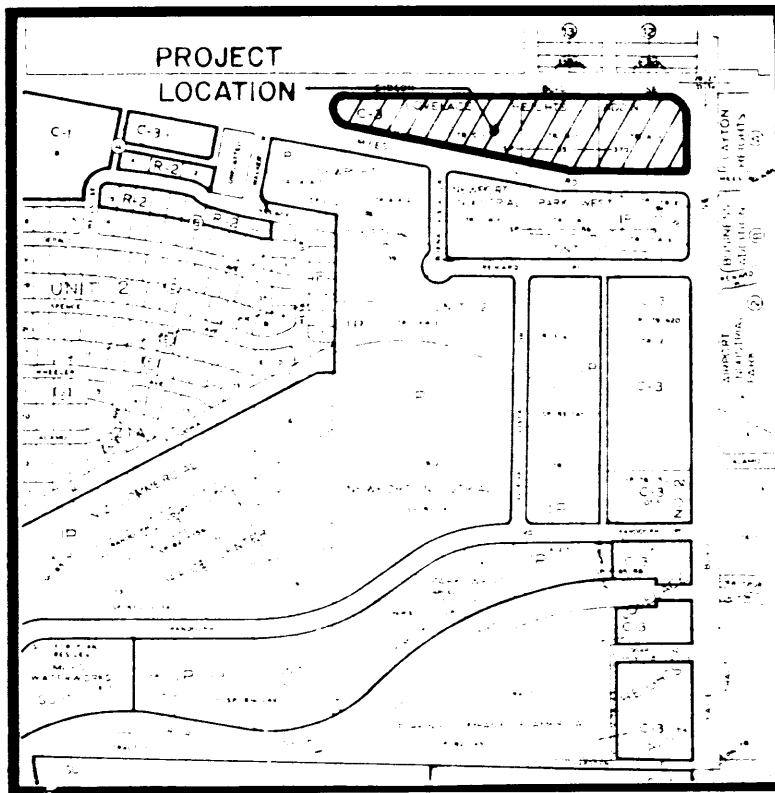


**NOTE:**  
THIS PLAN FOR GRADING & DRAINAGE ONLY.  
FOR PARKING LOT LAYOUT AND LOCATION  
OR SIDEWALK, SEE ARCHITECTURAL SITE  
PLAN.





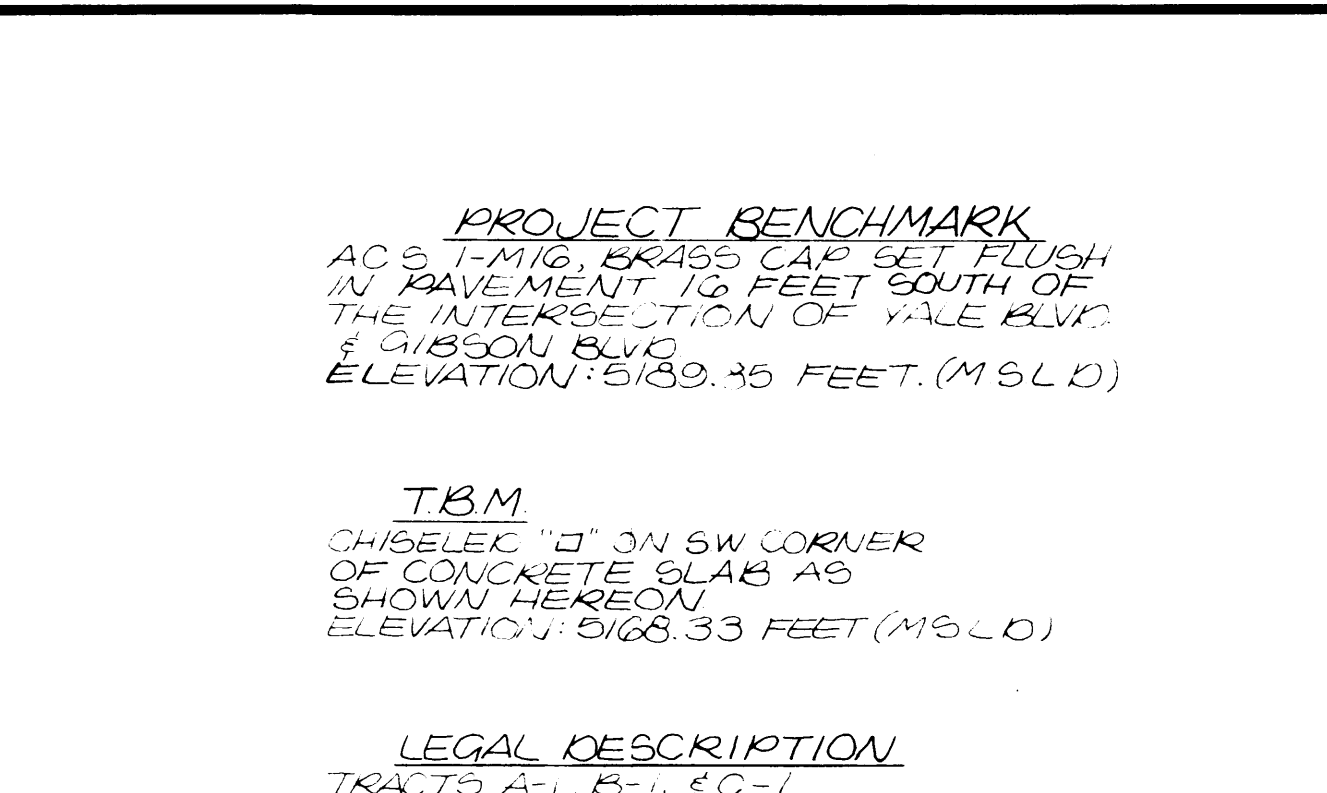




VICINITY MAP M-15

SCALE: 1" = 300'

- LEGEND
- EXISTING SPOT ELEVATION
  - PROPOSED SPOT ELEVATION
  - EXISTING CONTOUR
  - PROPOSED CONTOUR
  - EXISTING CONCRETE
  - PROPOSED CONCRETE
  - PROPOSED ASPHALT
  - FL
  - TC
  - TC 63.53
  - TC 61.17
  - TC 60.80
  - TC 60.50
  - TC 60.20
  - TC 59.90
  - TC 59.60
  - TC 59.30
  - TC 59.00
  - TC 58.70
  - TC 58.40
  - TC 58.10
  - TC 57.80
  - TC 57.50
  - TC 57.20
  - TC 56.90
  - TC 56.60
  - TC 56.30
  - TC 56.00
  - TC 55.70
  - TC 55.40
  - TC 55.10
  - TC 54.80
  - TC 54.50
  - TC 54.20
  - TC 53.90
  - TC 53.60
  - TC 53.30
  - TC 53.00
  - TC 52.70
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  - TC 52.10
  - TC 51.80
  - TC 51.50
  - TC 51.20
  - TC 50.90
  - TC 50.60
  - TC 50.30
  - TC 50.00
  - TC 49.70
  - TC 49.40
  - TC 49.10
  - TC 48.80
  - TC 48.50
  - TC 48.20
  - TC 47.90
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  - TC 47.30
  - TC 47.00
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  - TC 45.80
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  - TC 44.90
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  - TC 3.20
  - TC 2.90
  - TC 2.60
  - TC 2.30
  - TC 2.00
  - TC 1.70
  - TC 1.40
  - TC 1.10
  - TC 0.80
  - TC 0.50
  - TC 0.20
  - TC 0.00



LEGAL DESCRIPTION

TRACTS A-1, B-1, C-1, D-1, E-1, F-1, G-1, H-1, I-1, J-1, K-1, L-1, M-1, N-1, O-1, P-1, Q-1, R-1, S-1, T-1, U-1, V-1, W-1, X-1, Y-1, Z-1, AA-1, AB-1, AC-1, AD-1, AE-1, AF-1, AG-1, AH-1, AI-1, AJ-1, AK-1, AL-1, AM-1, AN-1, AO-1, AP-1, AQ-1, AR-1, AS-1, AT-1, AU-1, AV-1, AW-1, AX-1, AY-1, AZ-1, BA-1, BB-1, BC-1, BD-1, BE-1, BF-1, BG-1, BH-1, BI-1, BJ-1, BK-1, BL-1, BM-1, BN-1, BO-1, BP-1, BQ-1, BR-1, BS-1, BT-1, BU-1, BV-1, BW-1, BX-1, BY-1, BZ-1, CA-1, CB-1, CC-1, CD-1, CE-1, CF-1, CG-1, CH-1, CI-1, CJ-1, CK-1, CL-1, CM-1, CN-1, CO-1, CP-1, CQ-1, CR-1, CS-1, CT-1, CU-1, CV-1, CW-1, CX-1, CY-1, CZ-1, DA-1, DB-1, DC-1, DD-1, DE-1, DF-1, DG-1, DH-1, DI-1, DJ-1, DK-1, DL-1, DM-1, DN-1, DO-1, DP-1, DQ-1, DR-1, DS-1, DT-1, DU-1, DV-1, DW-1, DX-1, DY-1, DZ-1, EA-1, EB-1, EC-1, ED-1, EE-1, EF-1, EG-1, EH-1, EI-1, EJ-1, EK-1, EL-1, EM-1, EN-1, EO-1, EP-1, EQ-1, ER-1, ES-1, ET-1, EU-1, EV-1, EW-1, EX-1, EY-1, EZ-1, FA-1, FB-1, FC-1, FD-1, FE-1, FF-1, FG-1, FH-1, FI-1, FJ-1, FK-1, FL-1, FM-1, FN-1, 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SJ-1, SK-1, SL-1, SM-1, SN-1, SO-1, SP-1, SQ-1, SR-1, SS-1, ST-1, SU-1, SV-1, SW-1, SX-1, SY-1, SZ-1, TA-1, TB-1, TC-1, TD-1, TE-1, TF-1, TG-1, TH-1, TI-1, TJ-1, TK-1, TL-1, TM-1, TN-1, TO-1, TP-1, TQ-1, TR-1, TS-1, TT-1, TU-1, TV-1, TW-1, TX-1, TY-1, TZ-1, UA-1, UB-1, UC-1, UD-1, UE-1, UF-1, UG-1, UH-1, UI-1, UJ-1, UK-1, UL-1, UM-1, UN-1, UO-1, UP-1, UQ-1, UR-1, US-1, UT-1, UU-1, UV-1, UW-1, UX-1, UY-1, UZ-1, VA-1, VB-1, VC-1, VD-1, VE-1, VF-1, VG-1, VH-1, VI-1, VJ-1, VK-1, VL-1, VM-1, VN-1, VO-1, VP-1, VQ-1, VR-1, VS-1, VT-1, VU-1, VV-1, VW-1, VX-1, VY-1, VZ-1, WA-1, WB-1, WC-1, WD-1, WE-1, WF-1, WG-1, WH-1, WI-1, WJ-1, WK-1, WL-1, WM-1, WN-1, WO-1, WP-1, WQ-1, WR-1, WS-1, WT-1, WU-1, WV-1, WW-1, WX-1, WY-1, WZ-1, XA-1, XB-1, XC-1, XD-1, XE-1, XF-1, XG-1, XH-1, XI-1, XJ-1, XK-1, XL-1, XM-1, XN-1, XO-1, XP-1, XQ-1, XR-1, XS-1, XT-1, XU-1, XV-1, XW-1, XX-1, XY-1, XZ-1, YA-1, YB-1, YC-1, YD-1, YE-1, YF-1, YG-1, YH-1, YI-1, YJ-1, YK-1, YL-1, YM-1, YN-1, YO-1, YP-1, YQ-1, YR-1, YS-1, YT-1, YU-1, YV-1, YW-1, YX-1, YY-1, YZ-1, ZA-1, ZB-1, ZC-1, ZD-1, ZE-1, ZF-1, ZG-1, ZH-1, ZI-1, ZJ-1, ZK-1, ZL-1, ZM-1, ZN-1, ZO-1, ZP-1, ZQ-1, ZR-1, ZS-1, ZT-1, ZU-1, ZV-1, ZW-1, ZX-1, ZY-1, ZZ-1, AA-1, AB-1, AC-1, AD-1, AE-1, AF-1, AG-1, AH-1, AI-1, AJ-1, AK-1, AL-1, AM-1, AN-1, AO-1, AP-1, AQ-1, AR-1, AS-1, AT-1, AU-1, AV-1, AW-1, AX-1, AY-1, AZ-1, BA-1, BB-1, BC-1, BD-1, BE-1, BF-1, BG-1, BH-1, BI-1, BJ-1, BK-1, BL-1, BM-1, BN-1, BO-1, BP-1, BQ-1, BR-1, BS-1, BT-1, BU-1, BV-1, BW-1, BX-1, BY-1, BZ-1, CA-1, CB-1, CC-1, CD-1, CE-1, CF-1, CG-1, CH-1, CI-1, CJ-1, CK-1, CL-1, CM-1, CN-1, CO-1, CP-1, CQ-1, CR-1, CS-1, CT-1, CU-1, CV-1, CW-1, CX-1, CY-1, CZ-1, DA-1, DB-1, DC-1, DD-1, DE-1, DF-1, DG-1, DH-1, DI-1, DJ-1, DK-1, DL-1, DM-1, DN-1, DO-1, DP-1, DQ-1, DR-1, DS-1, DT-1, DU-1, DV-1, DW-1, DX-1, DY-1, DZ-1, EA-1, EB-1, EC-1, ED-1, EE-1, EF-1, EG-1, EH-1, EI-1, EJ-1, EK-1, EL-1, EM-1, EN-1, EO-1, EP-1, EQ-1, ER-1, ES-1, ET-1, EU-1, EV-1, EW-1, EX-1, EY-1, EZ-1, FA-1, FB-1, FC-1, 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LO-1, LP-1, LQ-1, LR-1, LS-1, LT-1, LU-1, LV-1, LW-1, LX-1, LY-1, LZ-1, MA-1, MB-1, MC-1, MD-1, ME-1, MF-1, MG-1, MH-1, MI-1, MJ-1, MK-1, ML-1, MM-1, MN-1, MO-1, MP-1, MQ-1, MR-1, MS-1, MT-1, MU-1, MV-1, MW-1, MX-1, MY-1, MZ-1, NA-1, NB-1, NC-1, ND-1, NE-1, NF-1, NG-1, NH-1, NI-1, NJ-1, NK-1, NL-1, NM-1, NN-1, NO-1, NP-1, NQ-1, NR-1, NS-1, NT-1, NU-1, NV-1, NW-1, NX-1, NY-1, NZ-1, OA-1, OB-1, OC-1, OD-1, OE-1, OF-1, OG-1, OH-1, OI-1, OJ-1, OK-1, OL-1, OM-1, ON-1, OO-1, OP-1, OQ-1, OR-1, OS-1, OT-1, OU-1, OV-1, OW-1, OX-1, OY-1, OZ-1, PA-1, PB-1, PC-1, PD-1, PE-1, PF-1, PG-1, PH-1, PI-1, PJ-1, PK-1, PL-1, PM-1, PN-1, PO-1, PP-1, PQ-1, PR-1, PS-1, PT-1, PU-1, PV-1, PW-1, PX-1, PY-1, PZ-1, QA-1, QB-1, QC-1, QD-1, QE-1, QF-1, QG-1, QH-1, QI-1, QJ-1, QK-1, QL-1, QM-1, QN-1, QO-1, QP-1, QQ-1, QR-1, QS-1, QT-1, QU-1, QV-1, QW-1, QX-1, QY-1, QZ-1, RA-1, RB-1, RC-1, RD-1, RE-1, RF-1, RG-1, RH-1, RI-1, RJ-1, RK-1, RL-1, RM-1, RN-1, RO-1, RP-1, RQ-1, RR-1, RS-1, RT-1, RU-1, RV-1, RW-1, RX-1, RY-1, RZ-1, SA-1, SB-1, SC-1, SD-1, SE-1, SF-1, SG-1, SH-1, SI-1, SJ-1, SK-1, SL-1, SM-1, SN-1, SO-1, SP-1, SQ-1, SR-1, SS-1, ST-1, SU-1, SV-1, SW-1, SX-1, SY-1, SZ-1, TA-1, TB-1, TC-1, TD-1, TE-1, TF-1, TG-1, TH-1, TI-1, TJ-1, TK-1, TL-1, TM-1, TN-1, TO-1, TP-1, TQ-1, TR-1, TS-1, TU-1, TV-1, TW-1, TX-1, TY-1, TZ-1, UA-1, UB-1, UC-1, UD-1, UE-1, UF-1, UG-1, UH-1, UI-1, UJ-1, UK-1, UL-1, UM-1, UN-1, UO-1, UP-1, UQ-1, UR-1, US-1, UT-1, UU-1, UV-1, UW-1, UX-1, UY-1, UZ-1, VA-1, VB-1, VC-1, VD-1, VE-1, VF-1, VG-1, VH-1, VI-1, VJ-1, VK-1, VL-1, VM-1, VN-1, VO-1, VP-1, VQ-1, VR-1, VS-1, VT-1, VU-1, VW-1, VX-1, VY-1, VZ-1, WA-1, WB-1, WC-1, WD-1, WE-1, WF-1, WG-1, WH-1, WI-1, WJ-1, WK-1, WL-1, WM-1, WN-1, WO-1, WP-1, WQ-1, WR-1, WS-1, WT-1, WU-1, WV-1, WW-1, WX-1, WY-1, WZ-1, XA-1, XB-1, XC-1, XD-1, XE-1, XF-1, XG-1, XH-1, XI-1, XJ-1, XK-1, XL-1, XM-1, XN-1, XO-1, XP-1, XQ-1, XR-1, XS-1, XT-1, XU-1, XV-1, XW-1, XX-1, XY-1, XZ-1, YA-1, YB-1, YC-1, YD-1, YE-1, YF-1, YG-1, YH-1, YI-1, YJ-1, YK-1, YL-1, YM-1, YN-1, YO-1, YP-1, YQ-1, YR-1, YS-1, YT-1, YU-1, YV-1, YW-1, YX-1, YY-1, YZ-1, ZA-1, ZB-1, ZC-1, ZD-1, ZE-1, ZF-1, ZG-1, ZH-1, ZI-1, ZJ-1, ZK-1, ZL-1, ZM-1, ZN-1, ZO-1, ZP-1, ZQ-1, ZR-1, ZS-1, ZT-1, ZU-1, ZV-1, ZW-1, ZX-1, ZY-1, ZZ-1

DRAINAGE PLAN

The following items concerning the U.S.A. Park Parking Lot Drainage Plan are contained herein:

1. Vicinity Map
2. Grading Plan
3. Calculations

As shown by the Vicinity Map, this site is located on the southwest corner of the intersection of Vale Boulevard S.E. and Gibson Boulevard S.E. As shown by Plate M-15 of the Albuquerque Master Drainage Study, (AMDS), this site does not lie within a designated Flood Hazard Zone, and downstream flooding is not apparent and does not appear to be a problem. At present, the majority of the site flows from east to west to an existing 24" RCP pipe extension which also connects to an existing storm inlet located in Gibson Boulevard S.E. The storm inlet drains directly onto private property located on the north side of Gibson Boulevard S.E. A portion of the site flows from east to west onto Gibson Boulevard S.E. No offsite flows enter the site along the north and east property lines since the adjacent streets route runoff away from the project site. No offsite flows enter the site along the south property line since the existing bar ditch along the north side of the Miles Road S.E. right-of-way routes runoff away from the project site. Also, when the future Miles Road S.E. is constructed (City Project No. 2834), the runoff generated will be routed away from the project site by the proposed street improvements.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' intervals, 2) continuity between existing and proposed grades, and 3) the limit and character of the proposed improvements. As shown by this Plan, the proposed improvements consist of the construction of a new parking lot along with adjacent landscaping. Flows generated by the proposed improvements will be routed from east to west and discharged onto Gibson Boulevard S.E. via a series of multiple sidewalk culverts. From that point, the runoff will flow west along the south edge of Gibson Boulevard S.E. to an existing concrete runoff located above the South Diversion Channel which is located roughly about 3500 feet to the west of the project site which is the outfall for this site. A previous submission by Fred C. Arfman has substantiated the capacity of this existing downstream facility. Based upon the fact that this site is an infill site, is located at the lower end of the watershed, and the proximity of downstream facilities, the free discharge of runoff from this site is appropriate. Furthermore, the proposed drainage pattern will eliminate the problem of directly discharging the aforementioned storm inlet and hence will improve the existing drainage condition by decreasing the amount of runoff discharged onto the private property. Also, there would be no benefit in ponding and discharging at a controlled rate since this would only increase the amount of runoff discharged into an existing storm inlet located roughly about 340 feet to the west of the project site by extending the duration of low-flow runoff. This inlet also discharges onto private property. Some of the runoff generated by this site and discharged to the street may be captured by the existing downstream inlet. However, this is an existing inlet with an existing problem (i.e., the discharge of public runoff onto private property). The proposed parking lot will improve these conditions by bypassing the first inlet altogether.

Also, there is already sufficient flows within Gibson Boulevard S.E. such that the increase in runoff from this site will have no effect on the downstream inlet capacity (i.e., the inlet can only accept so much runoff). Based upon DPM Plate 22.2D-5, the inlet capacity is only about 18 cfs. The upstream contribution is approximately 284 cfs as determined by the AMDS update (draft only). Consequently, the proposed paving will not affect the inlet capacity, nor will it increase the runoff presently being discharged onto private property.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used to quantify the peak rate of discharge and the SCS Method has been used to quantify the volume of runoff. Both methods have been used in accordance with the City of Albuquerque Development Process Manual, Volume II and the Mayor's Emergency Rule adopted January 14, 1986. As shown by these Calculations, the proposed improvements will increase the total discharge from this site by approximately 18.2 cfs.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 31: WAB, Wink fine sandy loam Hydrologic Soil Group: B Existing Pervious CN = 70 (DPM Plate 22.2 C-2) Pasture or Range Land: fair condition Developed Pervious CN = 61 (DPM Plate 22.2 C-2)

Time of Concentration/Time to Peak

$T_c = 0.0078 L^{0.77} S^{0.385}$  (Kirpich Equation)

$T_p = T_c = 10$  min.

Point Rainfall

$P_g = 2.3$  in. (DPM Plate 22.2 D-1)

Rational Method

Discharge:  $Q = CIA$

where C varies

$1 = P_g (6.84) T_c^{-0.51} = 4.86$  in/hr

$P_g = 2.3$  in (DPM Plate 22.2D-1)

$T_c = 10$  min (minutes)

$A =$  area, acres

SCS Method

Volume:  $V = 3630(DRO) A$

Where DRO = Direct runoff in inches

$A =$  area, acres

Existing Condition

Basin 1

Atotal = 312,865 sf = 7.18 Ac

$C = 0.40$  (Weighted average per Emergency Rule, 1/14/86)

$Q_{100} = CIA = (0.40)(4.86)(7.18) = 14.0$  cfs

$A_{imp} = 0$  sf;  $I$  impervious = 0%

Composite CN = 70 (DPM Plate 22.2 C-3)

DRO = 0.4 in (DPM Plate 22.2 C-4)

$V_{100} = 3630 (DRO) A = 10,425$  cf

Developed Condition

Basin 1

Atotal = 214,600 sf = 4.92 Ac

Road area = 3200 sf (0.01)

Paved area = 205,400 sf (0.96)

Landscaped area = 6,000 sf (0.03)

$C = 0.88$  (Weighted average per Emergency Rule, 1/14/86)

$Q_{100} = CIA = (0.88)(4.86)(4.12) = 21.0$  cfs

$A_{imp} = 208,600$  sf;  $I$  impervious = 97%

Composite CN = 97 (DPM Plate 22.2 C-3)

DRO = 1.9 in (DPM Plate 22.2 C-4)

$V_{100} = 3630 (DRO) A = 33,930$  cf

Developed Condition

Basin 2

Atotal = 46,075 sf = 1.06 Ac

Paved area = 46,075 sf (1.0)

Landscaped area = 0 sf (0.00)

$C = 0.95$  (Weighted average per Emergency Rule, 1/14/86)

$Q_{100} = CIA = (0.95)(4.86)(1.06) = 4.9$  cfs

$A_{imp} = 46,075$  sf;  $I$  impervious = 100%

Composite CN = 98 (DPM Plate 22.2 C-4)

DRO = 2.2 in (DPM Plate 22.2 C-4)

$V_{100} = 3630 (DRO) A = 8465$  cf

Developed Condition

Basin 3

Atotal = 59,040 sf = 1.36 Ac

Paved area = 59,040 sf (1.0)

Landscaped area = 0 sf (0.00)

$C = 0.95$  (Weighted average per Emergency Rule, 1/14/86)

$Q_{100} = CIA = (0.95)(4.86)(1.36) = 6.3$  cfs

$A_{imp} = 59,040$  sf;  $I$  impervious = 100%

Composite CN = 98 (DPM Plate 22.2 C-4)

DRO = 2.2 in (DPM Plate 22.2 C-4)

$V_{100} = 3630 (DRO) A = 10,860$  cf

Channel Capacity (2'-0" curb opening) Weir Equation

$Q = C_{18}^{3/2} L^{3/2} H^{3/2}$

where  $C = 3.09$

$L = 2'-0"$

$H = 0.67$  feet

Therefore, use 7 - 2'-0" sidewalk culverts (Basin 1)

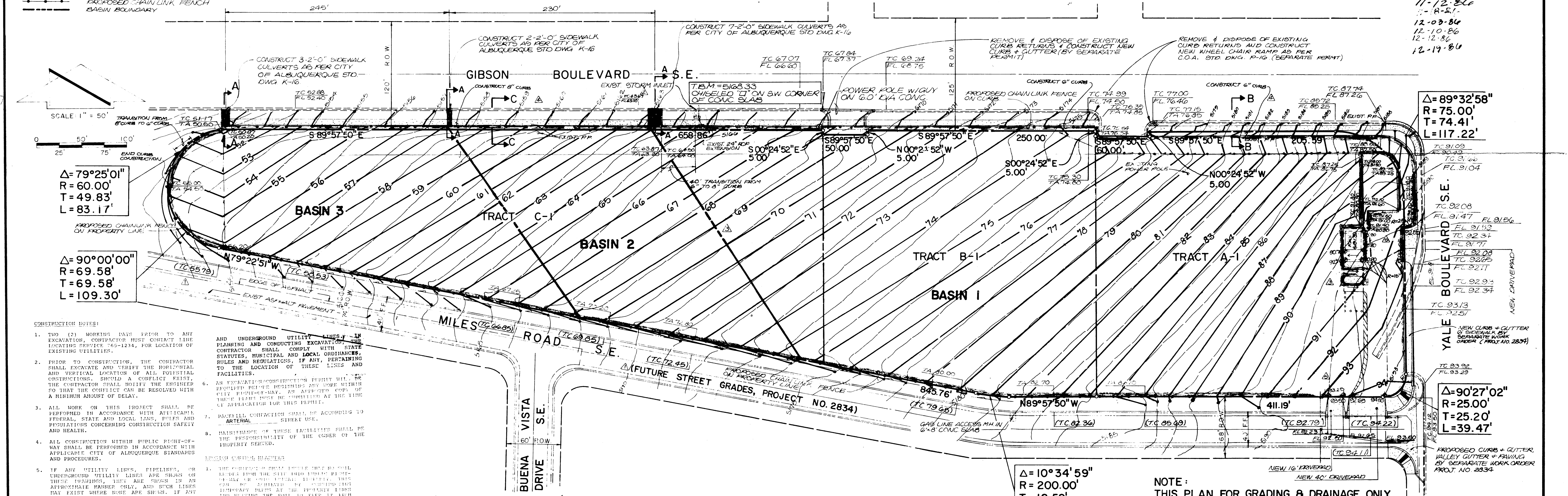
2 - 2'-0" sidewalk culverts (Basin 2)

3 - 2'-0" sidewalk culverts (Basin 3)

Comparison

$Q_{100} = (21.0 + 4.9 + 6.3) - 14.0 = 18.2$  cfs (increase)

$V_{100} = (33,930 + 8465 + 10,860) - 10,425 = 42,830$  cf (increase)



CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST NOTIFY THE LOCATING SERVICE (765-1234), FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXAMINE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE LOCATING SERVICE IMMEDIATELY. THE CONTRACTOR SHALL BE RESPONSIBLE TO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES.
4. AN EXCAVATION CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO THE START OF ANY EXCAVATION WORK. THESE PERMITS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
5. BACKFILL CONTACT SHALL BE ACCORDING TO ARTERIAL STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.

DESIGNER'S CERTIFICATE:

1. THE CONTRACTOR SHALL NOTIFY THE CITY OF ALBUQUERQUE IMMEDIATELY PRIOR TO ANY EXCAVATION WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO THE START OF ANY EXCAVATION WORK. THESE PERMITS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO THE START OF ANY EXCAVATION WORK. THESE PERMITS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO THE START OF ANY EXCAVATION WORK. THESE PERMITS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.

APPROVALS

NAME	DATE
ACE/DESIGN	
INSPECTOR	
ACE/FIELD	

REVISIONS

NO.	DATE	BY	REVISIONS
1	12/86	LRU	REVISED PARALLEL TO PARKING LOT
2	12/86	LRU	REVISED CURB, SIDEWALK & DRIVEWAY
3	12/86	LRU	REVISED GRADES, TEXT, CALCULATIONS & ENTRANCES
4	11/86	LRU	SHOW FUTURE CURB ELEVATIONS ON MILES RD.
5	11/		



LEGAL DESCRIPTION: Tracts A-1, B-1, & C-1, Lovelace Heights Addition.

SURVEYOR: Topographic survey by Albuquerque Surveying Company dated October, 1986.

BENCHMARK: ACS 1-M16, brass cap set flush in pavement 16 feet south of the intersection of Yale Blvd. & Gibson Blvd.

SOILS: From the SCS soil survey of Bernalillo County, these Wink fine sandy loam and gravelly sand soils are in hydrologic soil group 'B'.

FLOOD HAZARD STATEMENT: From Panel 35 of 50 of the FEMA flood maps, this site is not within an established flood hazard area, nor does it discharge to a flood zone.

OFFSITE FLOWS: No offsite flows will be accepted by this site.

EROSION CONTROL PLAN: The existing 24" storm water inlet shall remain functional throughout the period of grading & paving operations. Contractor shall build & maintain two earth berms running north-south. One will be located along the western property line and the other shall be on the downstream side of the existing 24" diameter storm drain stub.

CONCEPTUAL DRAINAGE PLAN: The developed drainage concept will utilize the existing 24" stub from the storm drain, with appropriate inlets, along with sidewalk culverts as required to release all flows to the paved surface of Gibson Blvd. Once this flow enters the public right-of-way, it will beat the peak flows to the South Diversion Channel, 3500 feet to the west.

EXISTING CONDITIONS: Presently, storm waters falling on this site sheet flow westward. This runoff is intercepted on the two easterly tracts, and routed north via dirt roads which carry the flows through existing curb cuts onto Gibson Blvd. The westerly tract sheds its runoff north & west, also to Gibson. Flows are transported west on Gibson two-thirds of a mile to the South Diversion Channel.

One existing drop inlet, in the south curb face of Gibson Blvd. has a 24" pipe with a headwall extending ten feet behind the curb to the south, where it is intercepted by a natural drainage course.

$Q = CIA$   
 $I = (2.3'')(2.16) = 5.0 \text{ in/hr}$   
 $A = 7.30 \text{ acres}$

$Q_{100} = (0.4)(5.0)(7.3) = 14.6 \text{ cfs}$

$Q_{10} = (14.6)(0.657) = 9.6 \text{ cfs}$

$V_{100} = (0.4)(2.3/12)(7.3)(43560) = 24,380 \text{ cu.ft.}$

$V_{10} = (24,380)(0.657) = 16,018 \text{ cu.ft.}$

PROPOSED CONDITIONS: The site will consist of an asphalt paved parking area with a landscaped perimeter.

Composite 'C':  $90\% @ 0.95 = 0.86$   
 $10\% @ 0.25 = 0.03$   
 $0.89$

$Q = CIA$   $C = 0.89$   
 $I = (2.3'')(2.16) = 5.0 \text{ in/hr}$   
 $A = 7.30 \text{ acres}$

$Q_{100} = (0.89)(5.0)(7.3) = 32.5 \text{ cfs}$

$Q_{10} = (32.5)(0.657) = 21.6 \text{ cfs}$

$V_{100} = (0.89)(2.3/12)(7.3)(43560) = 54,243 \text{ cu.ft.}$

$V_{10} = (54,243)(0.657) = 35,638 \text{ cu.ft.}$

24" PIPE CAPACITY (Assume inlet control)  
(from U.S. Bureau of Reclamation Hydraulic Engineering Circular No. 5)

CHART 7 Nomograph with  $HW/D = 1.5$

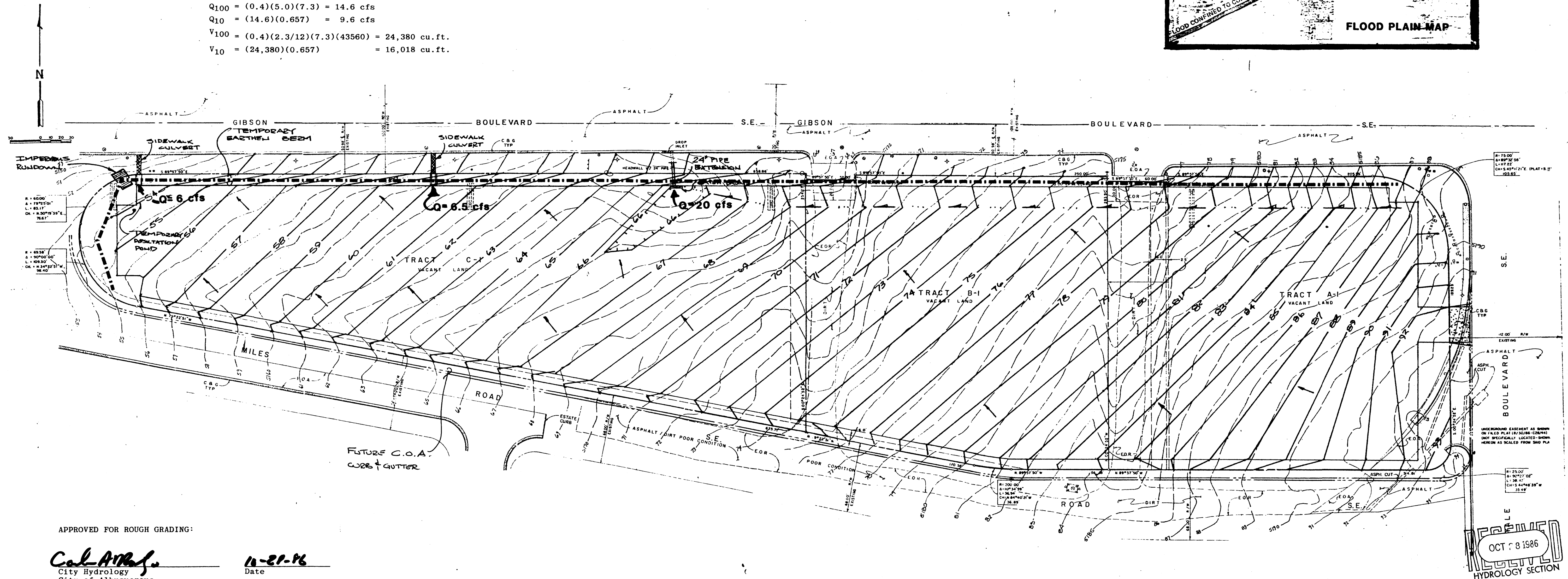
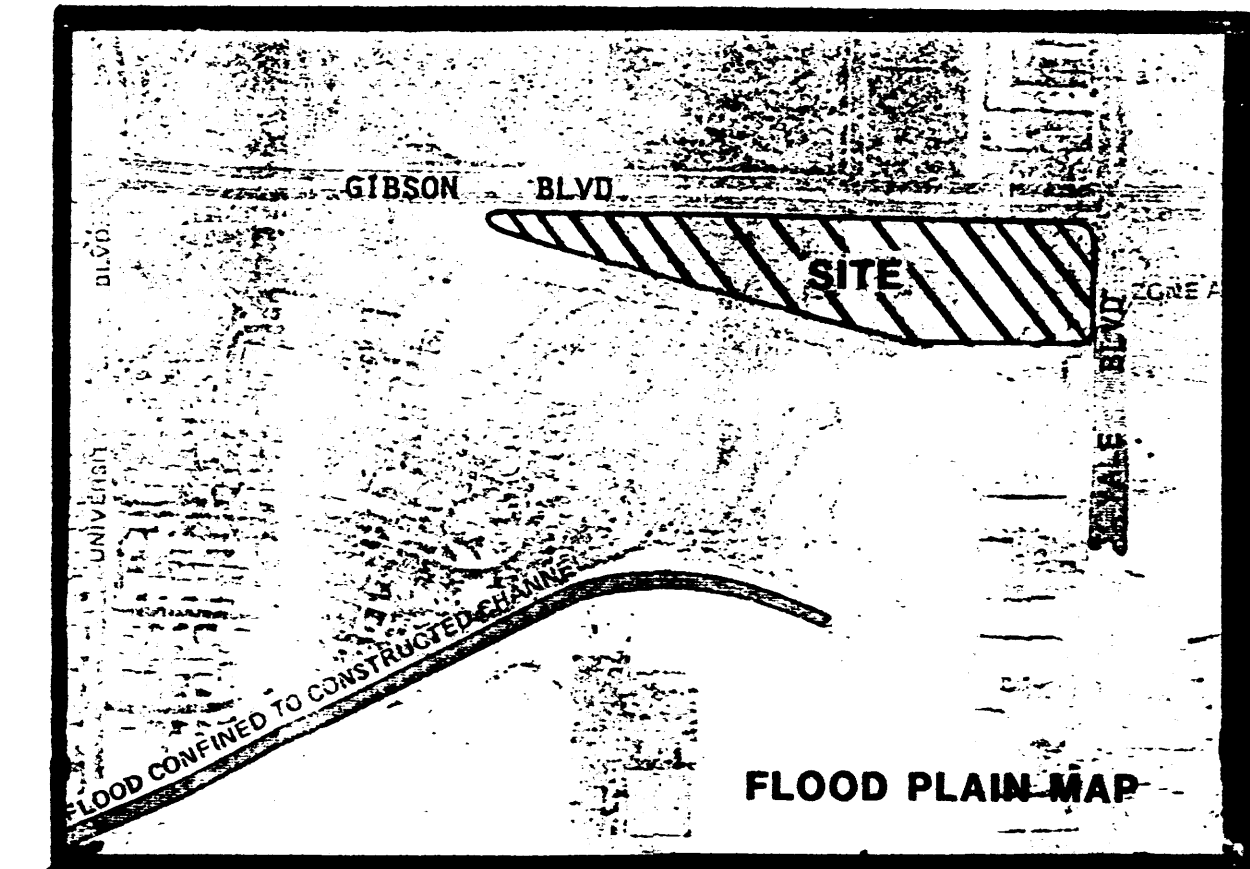
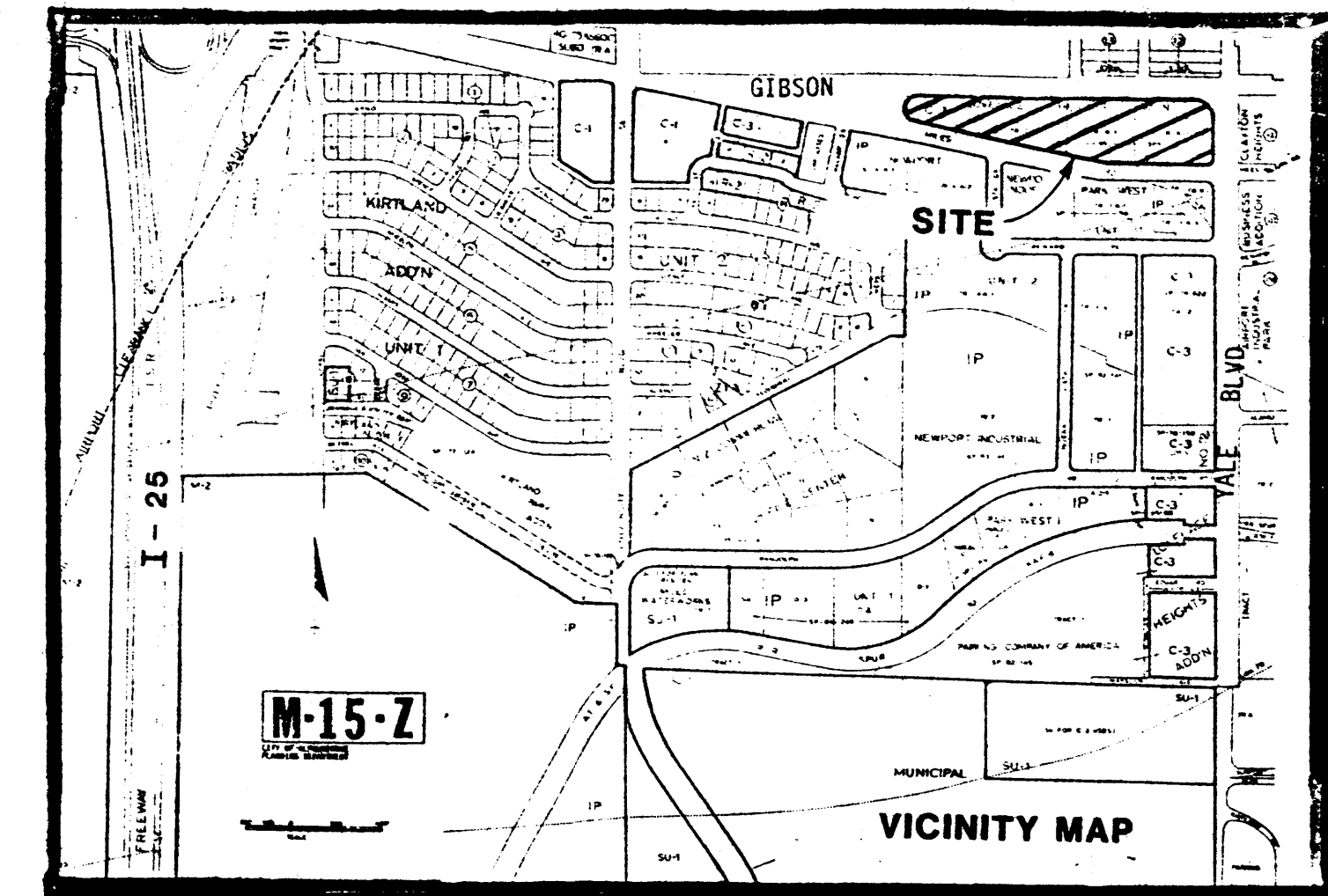
Headwater depth = pipe diameter

$Q = 20 \text{ cfs}$

DOWNSTREAM CAPACITY (GIBSON BLVD.): From DPM Plate 22.3 D-4 & using a street slope of 2.6%, a flow depth of 0.65 ft. in Gibson yields a one half street capacity of 50 cfs. All storm waters are accepted by the South Diversion Channel.

TIME OF CONCENTRATION

From DPM Plate 22.2 B-2 & using a street slope of 2.6%, velocity is equal to 4.3 ft/sec. Time of concentration then is 3500 feet divided by 4.3 ft/sec. or 13.5 minutes.



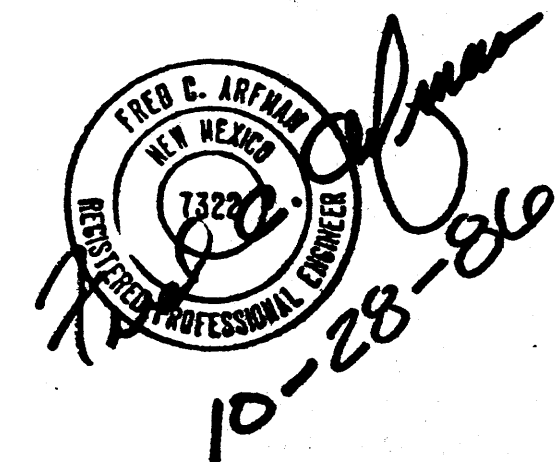
APPROVED FOR ROUGH GRADING:

Cal. Arfman  
City Hydrology  
City of Albuquerque

10-28-86  
Date

## CONCEPTUAL DRAINAGE EXHIBIT

Scale: 1"=50'



CONCEPTUAL  
GRADING & DRAINAGE PLAN

U S A PARK  
YALE BLVD at GIBSON BLVD

Sheet  
1  
of  
1

Isaacson & Arfman, P.A.

CONSULTING ENGINEERING ASSOCIATES  
Albuquerque, New Mexico