CITY OF
Albuquerque

October 14, 1996

Martin J. Chávez, Mayor

Diane Hoelzer
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, NM

RE: WHATABURGER (E17-D51). ENGINEER'S CERTIFICATION FOR CERTIFICATE OF OCCUPANCY. ENGINEER'S CERTIFICATION DATED OCTOBER 2, 1992.

Dear Ms. Hoelzer:

Based on the information provided on your October 3, 1996 submittal, the above referenced project is approved for a 30-day temporary Certificate of Occupancy. Prior to final Certificate of Occupancy, please submitt a copy of the inspector's "green tag" for the sidewalk culvert.

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

Sincerely,

Lisa Ann Manwill
Engineering Assoc./Hyd.

c: Arlene Portillo
Andrew Garcia
File

CITY OF
Albuquerque

May 8, 1996

Martin J. Chávez, Mayor

Diane Hoelzer
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, NM

RE: WHATABURGER (E17-D51) DRAINAGE REPORT FOR BUILDING AND SO #19 PERMIT APPROVALS. ENGINEER'S STAMP DATED 4-17-96.

Dear Ms. Hoelzer:

Based on the information provided on your April 23, 1996 submittal, the above referenced project is approved for Building Permit and SO #19 Permit.

Prior to Certificate of Occupancy, an Engineer's Certification will be required.

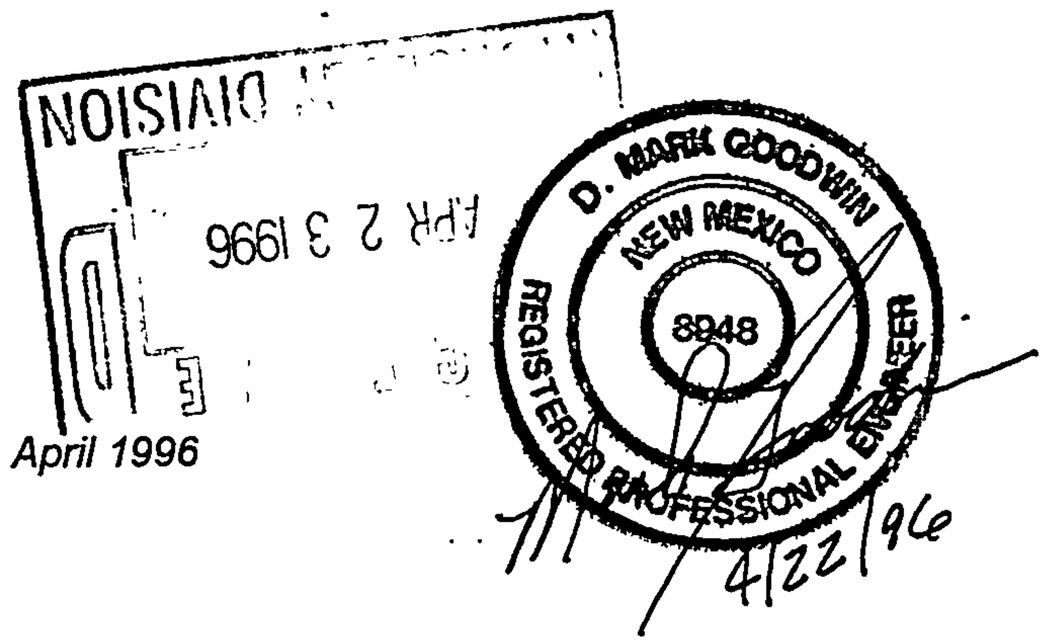
If I can be of further assistance, please feel free to contact me at 768-3622.

Sincerely,

Lisa Ann Manwill
Engineering Assoc./Hyd.

c: Arlene Portillo
Andrew Garcia
File

DRAINAGE REPORT
for
WHATABURGER
On Osuna @ Jefferson



April 1996

INTRODUCTION

The 1.145 acre undeveloped site is proposed for a Whataburger Restaurant. The site is presently bounded by a Diamond Shamrock on the east, Osuna Road on the south, the Calvary Chapel parking lot on the west and a developed light manufacturing zoned parcel on the north. According to the Flood Insurance Rate Map, Community Panel No. 350002 0016 C, dated October 14, 1983, the site lies in Zone C, an area of minimal flooding.

DESIGN CRITERIA

The 1994 version of AHYMO was utilized for the hydrologic analysis along with the January 1993 version of Section 22.2 Hydrology from the COA-DPM Volume 2, Design Criteria. The 100-year 6-hour storm event with a rainfall distribution based on NOAA Atlas 2 with peak intensity at 1.4 hours was used in the hydrologic analysis and used as the basis for drainage design criteria on the site.

EXISTING CONDITIONS

Presently most of the site is comprised of disturbed barren soil with a scattering of tumbleweeds. Under existing drainage conditions most of the site currently drains in a westerly direction to a depression area located at the west property boundary adjacent to an existing block wall. A mild east-west ridge located approximately 40 feet north of the south property line creates a drainage divide which diverts a portion of the onsite runoff south onto Osuna Road. A small amount of runoff from the southeast corner of the site flows onto the Diamond Shamrock site to the east. Offsite flows at the north property boundary do not appear to flow onto the site under present drainage conditions. No offsite flows from the parking lot to the west, the Diamond Shamrock to the east or Osuna Road to the south enter the site.

The 100-year peak discharge under existing conditions is 1.8 cfs, assuming a land treatment value of A for the entire site and a minimum 12.0 minute time of concentration.

DEVELOPED CONDITIONS

Under developed conditions, the entire runoff from the site will be directed south into Osuna Road. Runoff from approximately 29 percent (0.00051 sq.mi.) of the western portion of the site will flow south and directly into Osuna Road through the west exit/entrance road. The 100-year peak discharge from this area is 1.4 cfs. Runoff from the remaining 71 percent (0.001279 sq.mi.) of the Whataburger site will drain south and exit into Osuna Road through a 2.0 foot wide sidewalk culvert. The 100-year peak discharge exiting through the sidewalk culvert is 3.6 cfs. Runoff in Osuna Road will flow westward approximately 3600 feet before discharging into the AMAFCA diversion channel at design point AP2.

Justification for allowing free discharge into Osuna Road is based on two previously approved grading and drainage plans: the ABQ Venture II Office Building File No.E-17/D16A dated December 1993 and the Diamond Shamrock File No. E-17/D49 dated March 1996. In the "Drainage Report for ABQ Venture II Office & Warehouse Facility" by MCDowell Engineering, Inc.(Nov.1993), the existing roadway capacity for Osuna Road was calculated to be 174.7 cfs and the future ultimate roadway capacity was calculated to be 188 cfs. The 100-year flow was calculated to be 203 cfs at the AP2 design discharge point. However, as subsequently noted in the approved Diamond Shamrock Drainage Report (July 1995), this value was inaccurately based upon a 12-minute time of concentration. The 100-year peak discharge was recalculated in the Diamond Shamrock report to be 152.2 cfs. The addition of the 100-year peak discharge of 3.68 cfs from the Diamond Shamrock site increases the 100-year peak discharge in Osuna to 155.88 cfs. The addition of 5.0 cfs from the proposed Whataburger site will increase the flows in Osuna to 160.88 cfs which is still 13.8 shy of the calculated existing capacity for Osuna Road. Appendix A contains all the supporting calculations and information from the two previously approved drainage reports. Appendix B contains the AHYMO printouts and supporting hydraulic calculations.

McDowell Engineering, Inc.

7200 Valley Forge Pl. NE
Albuquerque, New Mexico 87109
Tele: (505)828-2430

Project: NEW VENTURE EAST SUB

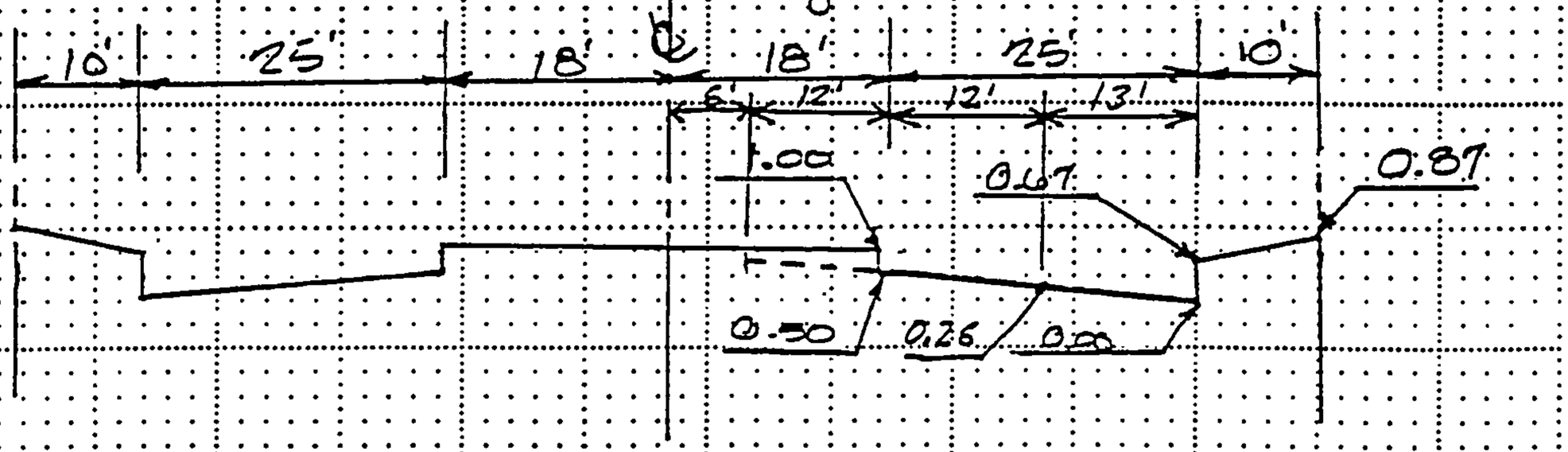
Project No.: ~~ATR~~ 01931 Date: 10-5-93

Subject: Downstream Conditions

By: DRM Sheet 1 of 2

- Jefferson Street is identified as a Minor Arterial on the Long Range Major Street Plan.
- Osuna Road is identified as a Principal Arterial on the Long Range Major Street Plan
- Jefferson Street currently has a right-of-way width of 106'.
- Osuna Road currently has a right-of-way width of 150'

Jefferson Street Section (existing & ultimate): 106' R/W



Minimum Slope along Jefferson is 0.003 ft/ft, south of Osuna.

½ Capacity $Q = \frac{1.486 A^{5/3} S^{1/2}}{n P^{2/3}}$ (½ street to R/W elev. 0.87')

$A = (1/2)(25)(0.5) + (0.17)(25) + (1/2)(10)(0.20) + (0.20)(25)$

$= 16.50$ sf

$A = 25'(.37 + .87)/2 + 10'(.2)/2 = 16.50$ sf

$S = 0.003$

$n = 0.017$

$A_{10} = 13(.26)/2 = 1.69$ sf

$P_{10} = 13.26$

$Q_{10} = 2$ cfs

~~$A_{5'} = 13(.5)/2 = 3.25$ sf~~

~~$P_{5'} = 15.5'$~~

~~$Q_{5'} = 6$ cfs~~

$P = 35' 36.04$

$Q = 47.85$ cfs 46.9

Full Street Capacity = 95.70 cfs — Jefferson & Osuna.

A.1

McDowell Engineering, Inc.

7200 Valley Forge Pl. NE
Albuquerque, New Mexico 87109
Tele: (505)828-2430

Project: [illegible] 506

Project No.: ~~A90~~ 9321 Date: 1-5-93

Subject: Downstream Conditions.

By: DSM Sheet 2 of 2

Existing Capacity of Osuna:

2 lanes each direction, minimum slope 0.01 ft/ft

½ Street: A = 1650 sf.

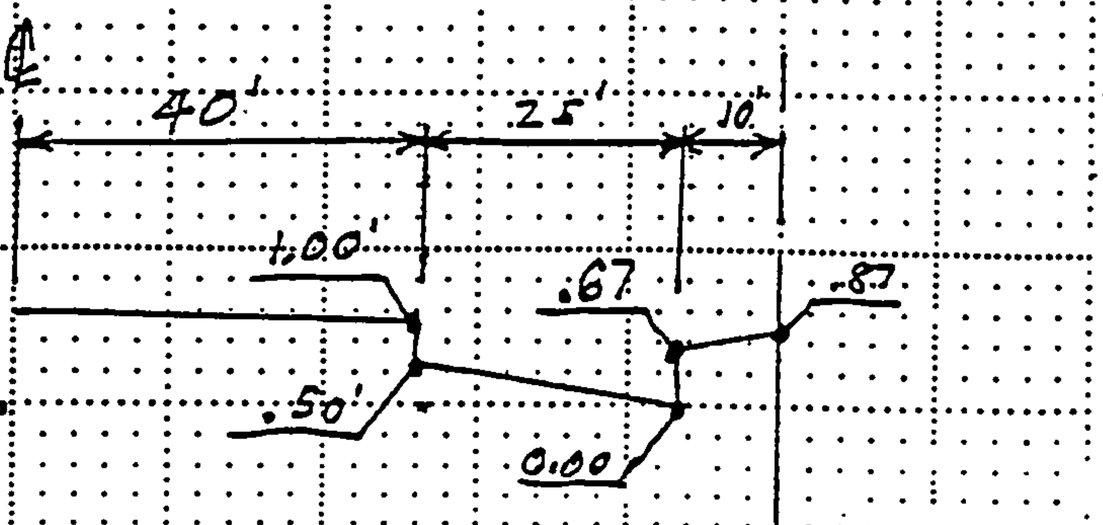
S = 0.01

n = 0.017

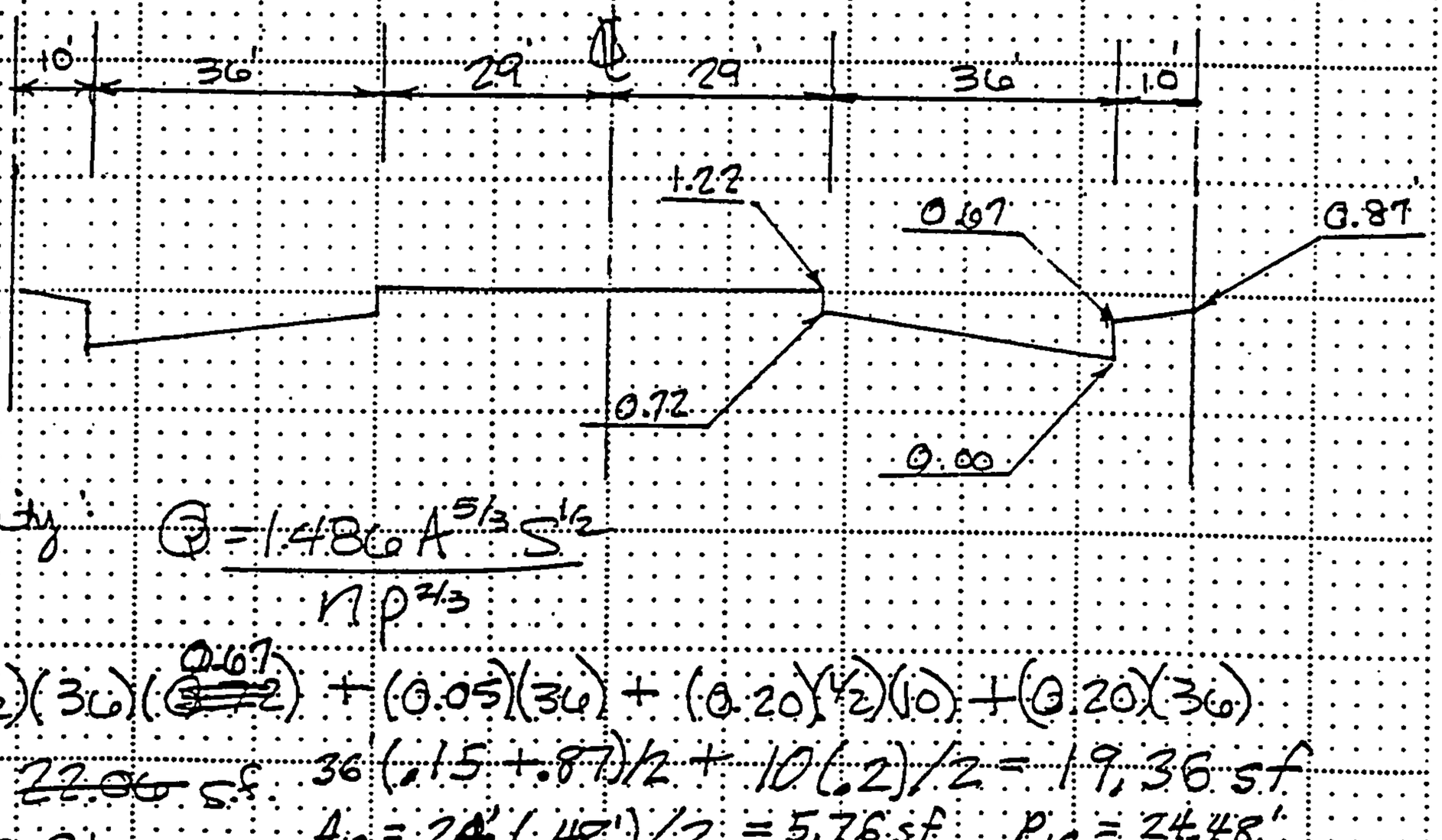
P = 35.87

½ Q = 87.36 85.9

full street Capacity = 174.73 cfs (existing)



Future Street Section for Osuna (Principal Arterial)



½ Capacity: $Q = \frac{1.486 A^{5/3} S^{1/2}}{n P^{2/3}}$

$A = (1/2)(36)(0.67) + (0.05)(36) + (0.20)(1/2)(10) + (0.20)(36)$

$= 22.06$ sf $\quad 36(.15 + .87)/2 + 10(.2)/2 = 19.36$ sf

$A_{10} = 24'(.48')/2 = 5.76$ sf $\quad P_{10} = 24.48'$

$Q_{10} = 19.2$ cfs Future

S = 0.01

n = 0.017

P = 46.82 $\quad R = .413$

½ Q = 118.14 cfs $\quad 94$ cfs

Full street Capacity (Future) = 236.29 cfs 188 cfs

A.2

Project: ABQ VENTURE EAST BLDG. Project No.: ~~AAL~~ 9301C

05-Oct-93

DRAINAGE BASIN TO OSUNA / JEFFERSON @ AP 2

Calculations: Total Basin

Calculations are based on "Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 - basins < 40 acres".

Precipitation Zone = 2

Depth at 100-year, 6-hour storm: (Table A-2) P = 2.35 inches

Land Treatments:

From Table 5 - Percent Treatment D

Single Family Residential =

7*SQR((N*N) +(5*N))

where N = units/acre

N = ———— = ——, ok < 6 N = 0.00

Therefore Percent Treatment D = 0.00%

(includes local streets)

DRAINAGE BASIN TO OSUNA / JEFFERSON.

Areas: (acres)	Existing	Proposed	
Treatment A	50.00	0.00	
Treatment B	0.00	10.00	20%
Treatment C	0.00	5.00	10%
Treatment D	0.00	35.00	70%
Total (acres) =	50.00	50.00	

Volume	100 year Existing	100 year Proposed	10 year Existing	10 year Proposed	2 year Existing	2 year Proposed
Volume (acre-feet) =	2.21	7.30	0.54	4.36	0.00	2.38
Volume (cubic feet) =	96,195	318,170	23,595	189,849	0	103,818

Total Q(p), cfs:	100 year Existing Q(p)*A	100 year Proposed Q(p)*A	10 year Existing Q(p)*A	10 year Proposed Q(p)*A	2 year Existing Q(p)*A	2 year Proposed Q(p)*A
Treatment A	78.00	0.00	19.00	0.00	0.00	0.00
Treatment B	0.00	22.80	0.00	9.50	0.00	0.80
Treatment C	0.00	15.70	0.00	8.55	0.00	3.00
Treatment D	0.00	164.50	0.00	109.90	0.00	65.10
Total Q (cfs) =	78.00	203.00	19.00	127.95	0.00	68.90

A.4

Project: ABQ VENTURE EAST BLDG. Project No.: AAR 0193L

05-Oct-93

INTERSTATE INDUSTRIAL TRACT, LOT 1 & LOT 2, BLOCK D, UNIT II (DRAINAGE BASIN TO JEFFERSON)

Lot 1 & Lot 2, Interstate Industrial Tract, Block D, Unit II

Calculations: Total Basin

Calculations are based on 'Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 - basins < 40 acres'.

Precipitation Zone = 2

Depth at 100-year, 6-hour storm: (Table A-2)

P = 2.35 inches @ AP 1

Land Treatments:

From Table 5 - Percent Treatment D

Single Family Residential =

7*SQR((N*N) +(5*N))

where N = units/acre

N = ———— = ——, ok < 6 N = 0.00

Therefore Percent Treatment D = 0.00%

(Includes local streets)

Areas: (acres)	Existing	Proposed	
Treatment A	18.93	0.00	
Treatment B	0.00	3.79	20 %
Treatment C	0.00	1.89	10 %
Treatment D	0.00	13.25	70 %
Total (acres) =	18.93	18.93	

Volume	100 year Existing	100 year Proposed	10 year Existing	10 year Proposed	2 year Existing	2 year Proposed
Volume (acre-feet) =	0.84	2.77	0.21	1.65	0.00	0.90
Volume (cubic feet) =	36,419	120,450	8,933	71,870	0	39,301

Total Q(p), cfs:	100 year Existing Q(p)*A	100 year Proposed Q(p)*A	10 year Existing Q(p)*A	10 year Proposed Q(p)*A	2 year Existing Q(p)*A	2 year Proposed Q(p)*A
Treatment A	29.53	0.00	7.19	0.00	0.00	0.00
Treatment B	0.00	8.64	0.00	3.60	0.00	0.30
Treatment C	0.00	5.93	0.00	3.23	0.00	1.13
Treatment D	0.00	62.28	0.00	41.61	0.00	24.65
Total Q (cfs) =	29.53	76.85	7.19	48.44	0.00	26.08

A.5

OSUNA ROAD CAPACITY ANALYSIS

BASIN REACHES

ABQ VENTURE II. SITE

$L_1 = 605'$ $\quad S_1 = \frac{62-48}{605} = 0.0231$ FT/FT

JEFFERSON STREET

$L_2 = 1100$ $\quad S_2 = \frac{48-39}{1100} = 0.0082$ FT/FT

OSUNA ROAD

$L_3 = 3600$ $\quad S_3 = \frac{5139-5090}{3600} = 0.0136$ FT/FT

$L = 605 + 1100 + 3600 = 5305$

$S = [(0.0231 * 605) + (0.0082 * 1100) + (0.0136 * 3600)] / 5305$

$S = 72/5305 = 0.0136$ FT/FT

$L_1/(K_1 * S_1^{1/2}) = 605/(2\ (0.0231)^{1/2} = 1,990.3$

$L_2/(K_2 * S_2^{1/2}) = 1100/(3\ (0.0082)^{1/2}) = 4,049.1$

$L_3/(K_3 * S_3^{1/2}) = 3600/(3\ (0.0136)^{1/2} = 10,289.9$

$\Sigma \qquad 16329.3$

$L/S^{1/2} = 5305/0.0136^{1/2} = 45490.0$

$K = 45490/16329.3 = 2.79$

$$T_c = \left(\frac{(12000-5305)}{(72000\ (2.79)\ (0.0136)^{1/2})}\right) + \frac{((5305-4000) * 0.021 * \left(\frac{2900}{5305}\right)^{0.33}}{(552.2 * (0.0136)^{0.165}}$$

$T_c = (6695/23426) + (22.45/271.7) = 0.3684$ HRS

$T_c = 22.1$ MIN.

Diamond Shamrock Calcs.

INTENSITY @ T_c = 0.3684 HRS ✓

P_{60} ZONE 2 = 2.01 INCHES ✓

$$I = 0.726\left(\text{LOG}_{10}(24.6\,(0.3684))\right)\left(\frac{1}{0.3684}\right)2.01$$ ✓

I = 3.79 INCHES

FROM THE APPROVED REPORT $A_{TREATMENT\ B}$ = 10.00 ACRES
$A_{TREATMENT\ C}$ = 5.00 ACRES, $A_{TREATMENT\ D}$ = 35.00 ACRES

$$Q_{100} = 3.79\left((10.00 \cdot 0.45) + (5.00 \cdot 0.62) + (35.00 \cdot 0.93)\right)$$ ✓

$Q_{100} = 3.79\,(40.15) = 152.2$ CFS ←

PER REPORT.. Q_{100} ON EXISTING STREET SECTION = 174.73 CFS

Q_{100} AT FUTURE WIDENING = 188 CFS

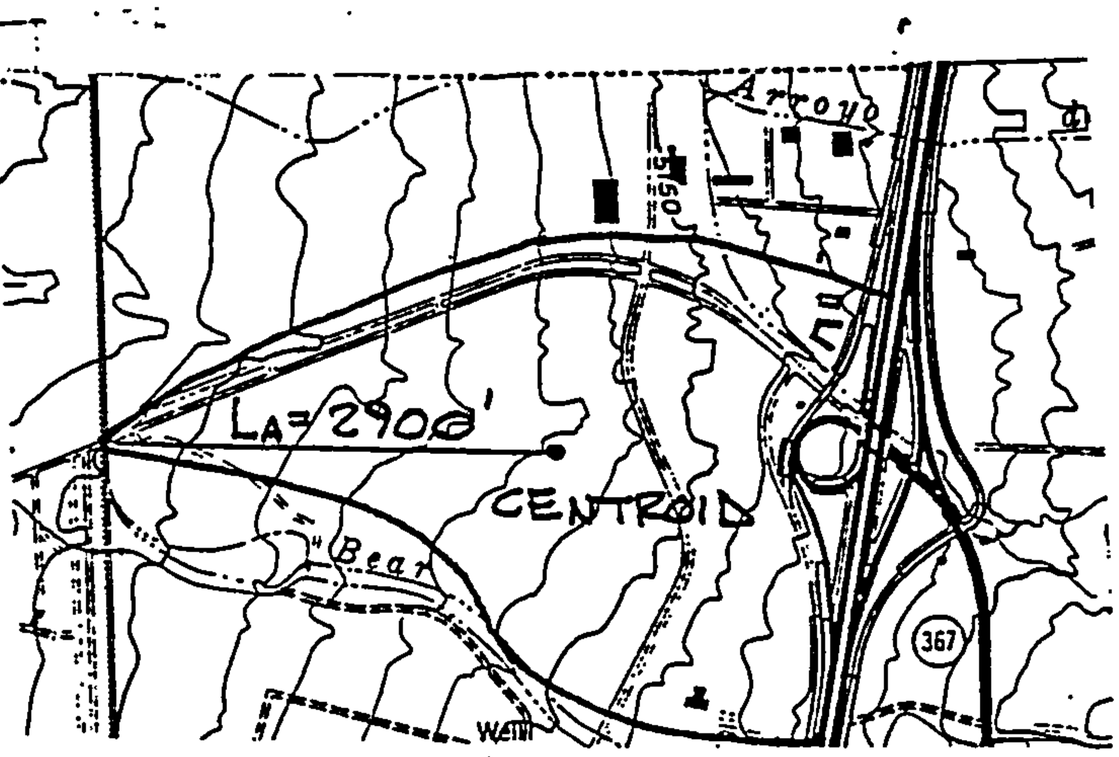
OSUNA HAS CAPACITY FOR THE ADDITIONAL 3.68 CFS

10 YEAR RUNOFF

$$Q = 3.79\left((10.00 \cdot 0.28) + (5.00 \cdot 0.50) + (35.00 \cdot 0.92)\right)$$

$Q = 3.79\,(37.5) = 142.1$ CFS

BASIN CENTROID DERIVED FROM THIS DRAWING



A.8

Diamond Shamrock Calcs.

DIAMOND SHAMROCK

HISTORIC PEAK DISCHARGE

BASIN NAME	AREA ACRES	TREATMENT A ACRES	Q10 CFS	Q100 CFS
A	0.196	0.196	0.07	0.31
B	0.658	0.658	0.25	1.03

DELELOPED PEAK DISCHARGE

BASIN NAME	AREA ACRES	TREATMENT B ACRES	TREATMENT D ACRES	Q10 CFS	Q100 CFS
A	0.484	0.070	0.414	1.37	2.11
B	0.371	0.070	0.301	1.01	1.57
					3.68

ADDITIONAL FLOW FROM DEVELOPMENT ⇒ 2.34 cfs

am 3.37 cfs increase to Drainage

3.68 is the total proposed runoff from the site.

Diamond Shamrock Calcs.

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = .53109 INCHES = .0507 ACRE-FEET
PEAK DISCHARGE RATE = 1.79 CFS AT 1.532 HOURS BASIN AREA = .0018 SQ. MI.

Existing Conditions

*****

***** DEVELOPED CONDITIONS

*****

***** WEST SUB-BASIN

*****

COMPUTE NM HYD ID=2 HYD NO=101.2 AREA=0.000510 SQ MI

PER A=0 PER B=15 PER C=0 PER D=85

TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.7115 CFS UNIT VOLUME = .9922 B = 526.28 P60 = 2.0100
AREA = .000434 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .132088HR TP = .133300HR K/TP RATIO = .990905 SHA

B.4

PE CONSTANT, N = 3.563124
UNIT PEAK = .18646 CFS UNIT VOLUME = .9284 B = 324.
91 P60 = 2.0100
AREA = .000077 SQ MI IA = .50000 INCHES INF = 1.25000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 1.91475 INCHES = .0521 ACRE-FEET
PEAK DISCHARGE RATE = 1.43 CFS AT 1.499 HOURS BASIN AREA =
.0005 SQ. MI.

Developed Conditions - West Subbasin

*****

***** EAST SUB-BASIN

*****

COMPUTE NM HYD ID=3 HYD NO=101.3 AREA=0.001279 SQ MI

PER A=0 PER B=15 PER C=0 PER D=85

TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHA
PE CONSTANT, N = 7.106420
UNIT PEAK = 4.2921 CFS UNIT VOLUME = .9965 B = 526.
28 P60 = 2.0100
AREA = .001087 SQ MI IA = .10000 INCHES INF = .04000

B.5

INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033300

K = .132088HR TP = .133300HR K/TP RATIO = .990905 SHA
PE CONSTANT, N = 3.563124
UNIT PEAK = .46762 CFS UNIT VOLUME = .9718 B = 324.
91 P60 = 2.0100
AREA = .000192 SQ MI IA = .50000 INCHES INF = 1.25000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033300

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.91475 INCHES = .1306 ACRE-FEET
PEAK DISCHARGE RATE = 3.57 CFS AT 1.499 HOURS BASIN AREA =
.0013 SQ. MI.

Developed Conditions-East Subbasin

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 10:23:35

D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT Whataburger ****
SUBJECT
BY Diane Hoelzer DATE 4-18-96
CHECKED DATE
SHEET 1 OF 1

SIDEWALK CULVERT CAPACITY

$$Q = \frac{1.486}{n}(A)(A/P)^{2/3}(S)^{1/2}$$

$n = .017$

$A = 2.0 \times 0.5' = 1.0\ sf$

$P = 3.0'$

$S = \frac{0.2}{24.0} = .0083\%$

$$Q = \frac{1.486}{.017}(1)(1/3)^{2/3}\sqrt{.0083} = 3.89\ cfs > 3.6\ cfs$$

design > actual