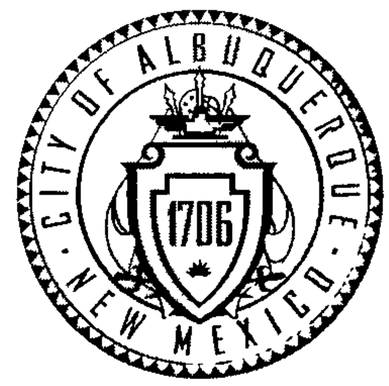
CITY OF ALBUQUERQUE



Planning Department
Transportation Development Services

November 7, 2014

Joel Hernandez
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: **Chili's, 1700 Miles Road SE**
Traffic Circulation Layout
Engineer's Stamp dated 11-06-14 (M15-D012B)

Dear Mr. Hernandez,

Based upon the information provided in your submittal received 11-06-14, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

1. Please identify <u>all</u> door entrances to the new building, and list the square footage for the new building.
2. Identify existing pavement, sidewalk, and right-of-way dimensions for Gibson Boulevard. Label and list the dimension for the easement across the site to the north of the new building.
3. Provide Plan Sheets C6 through C8 which show remaining details for signage, curb, and pedestrian ways. The ADA van accessible sign must have the required language per 66-7-352.4C NMSA 1978 "Violators Are Subject to a Fine and/or Towing." There must also be the required language indicating "Van Accessible" per ANSI 502.7.
4. The two 8-foot wide ADA access aisles shall have the words **"NO PARKING"** in capital letters, each of which shall be at least one foot high and at least two inches wide, placed at the rear of the parking space so as to be close to where an adjacent vehicle's rear tire would be placed. (66-1-4.1.B NMSA 1978)
5. Per the DPM, a 6-foot wide ADA accessible pedestrian pathway is required from the public sidewalk to the building entrances. Please extend the 6-foot pathway that you have shown on the plan all of the way to the existing sidewalk on Gibson Boulevard.
6. The design delivery vehicle route needs to be shown. Also, provide a separate sheet showing delivery truck turning movements.

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

7. Reference the DRB Case Number for the Miles Road vacation, and define limit of the vacation for Miles Road toward the east side of the site. Label the existing Miles Road public road right-of-way and pavement dimensions to the east of the site.

8. Please include two copies of the traffic circulation layout at the next submittal.

Resubmit acceptable package along with fully completed Drainage Transportation Information Sheet to front counter personnel for log in and evaluation by Transportation. If you have any questions, please contact me at (505) 924-3924.

Sincerely,

Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
Development Review Services

c: File
CO Clerk

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: **Chilis Gibson & University** City Drainage #: M15D012B

DRB#: EPC#: Work Order#:

Legal Description:

City Address:

Engineering Firm: **Tierra West, LLC** Contact: **Joel Hernandez**

Address: **5571 Midway Park Place NE Albuquerque NM 87109**

Phone#: **505-858-3100** Fax#: **505-858-1118** E-mail: **jdhernandez@tierrawestllc.com**

Owner: **Josh Skarsgard** Contact: —

Address: **8220 San Pedro Ne Suite 500**

Phone#: **505-262-2323** Fax#: E-mail: **josh@skarsgardfirm.com**

Architect: **GHA Architecture/ Development** Contact: **Keilah Brown**

Address: **14901 Quorum Drive, Suite 300 Dallas, Texas 75254**

Phone#: **972-238-8884** Fax#: **972-239-5054** E-mail: **kbrown@GHA-Architects.com**

Surveyor: **Precision Surveys** Contact: **Larry Medrano**

Address: **5571 Midway Park Place NE Albuquerque, NM 87109**

Phone#: **505-856-5700** Fax#: E-mail: **larry@presurv.com**

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
___ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
___ RADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
X TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
X BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION
___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED NOV - 6 2014 LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes ___ No ___ Copy Provided

DATE SUBMITTED: **10/24/2014** By: **Joel Hernandez**

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal The particular nature, location, and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the followin

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

RECEIVED NOV - 6 2014 LAND DEVELOPMENT SECTION

CITY OF ALBUQUERQUE

November 4, 2015

Ronald R. Bohannan, PE
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Chili's Gibson & University
1700 Miles Rd SE
Request Permanent C.O. - Accepted
Engineer's Stamp dated: 12-30-14 (M15D012B)
Certification dated: 11-3-15

Dear Mr. Bohannan,

Based on the Certification received 11/4/2015, the above referenced site is acceptable for release of Certificate of Occupancy by Hydrology.

If you have any questions, you can contact me at 924-3695 or Totten Elliott at 924-3982.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Hydrology
Planning Department

TE/RH

C: email
CO Clerk

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Chilis Gibson & University Building Permit #: _____ City Drainage #: M15D012B

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: _____

City Address: 1700 Miles Rd SE

Engineering Firm: Tierra West, LLC Contact: Ron Bohannan

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: _____ Contact: _____

Address: _____

Phone# _____ Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Check all that Apply:

DEPARTMENT:

x HYDROLOGY/ DRAINAGE

____ TRAFFIC/ TRANSPORTATION

____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

X ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN

____ GRADING PLAN

____ DRAINAGE MASTER PLAN

____ DRAINAGE REPORT

____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)

____ TRAFFIC IMPACT STUDY (TIS)

____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ BUILDING PERMIT APPROVAL

X CERTIFICATE OF OCCUPANCY (Perm)

____ PRELIMINARY PLAT APPROVAL

____ SITE PLAN FOR SUB'D APPROVAL

____ SITE PLAN FOR BLDG PERMIT APPROVAL

____ FINAL PLAT APPROVAL

____ SIA/ RELEASE OF FINANCIAL GUARANTEE

____ FOUNDATION PERMIT APPROVAL

____ GRADING PERMIT APPROVAL

____ SO-19 APPROVAL

____ PAVING PERMIT APPROVAL

____ GRADING/ PAD CERTIFICATION

____ WORK ORDER APPROVAL

____ CLOMR/LOMR

____ PRE-DESIGN MEETING

____ OTHER (SPECIFY) _____

RECEIVED NOV 04 2015 LAND DEVELOPMENT SECTION

IS THIS A RESUBMITTAL?: ____ Yes ____ No

DATE SUBMITTED: 11/02/2015 By: Brad Frosch

COA STAFF. ELECTRONIC SUBMITTAL RECEIVED: ___

CITY OF ALBUQUERQUE

May 20, 2015

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

RE: **Chili's at University/Gibson**
Grading and Drainage Plan
Engineers Stamp Date 12/30/14 (M15-D012B)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 5/20/15, the above referenced plan is approved for Grading Permit and Building Permit. Please attach a copy of this approved plan to the construction sets in the permitting process prior to sign-off by Hydrology.

Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, please contact me at 924-3986 or Rudy Rael at 924-3977.

Sincerely,

Shahab Biazar, P.E.
City Engineer,
COA, Development Review Services

RR/SB
C: File

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE REPORT
for

Chili's at University & Gibson
1700 Miles Road

Losing 2 inlets at end of cul-de-sac & Smith's one inlet from a A/C to a D

Two double "c" and a single "l"

Prepared by:

Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

Revised December, 2014

RECEIVED
DEC 2014
31
LAND DEVELOPMENT SECTION

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.

RONALD R. BOHANNAN
NEW MEXICO
7868
12/31/14
PROFESSIONAL ENGINEER

Ronald R. Bohannan, PE

Job No 2013086

TABLE OF CONTENTS

Purpose 3
Introduction 3
Exhibit A – Vicinity Map 4
Exhibit B – FIRM Map 5
Existing Drainage Conditions 6
Proposed Drainage Conditions 7-8
Stormwater Control Measures 9
Summary 10

Appendix (Calculations)

Appendix A – Hydrology Calculations and Basin Maps
Appendix B – Hydraulic Calculations
Appendix C – Master Drainage Plan by Plan Jeff Mortensen & Associates, Inc., dated 03/04/97 (JMA Report)

Plan Attachments

Site Plan Sheet C1
Demo Plan Sheet C2
Grading and Drainage Plan Sheet C3
Grading and Drainage Plan Detail Sheet C4
Detail Sheets C6-C9
Erosion Control Sheet EC-1
Erosion Control Detail Sheet EC-2

Purpose

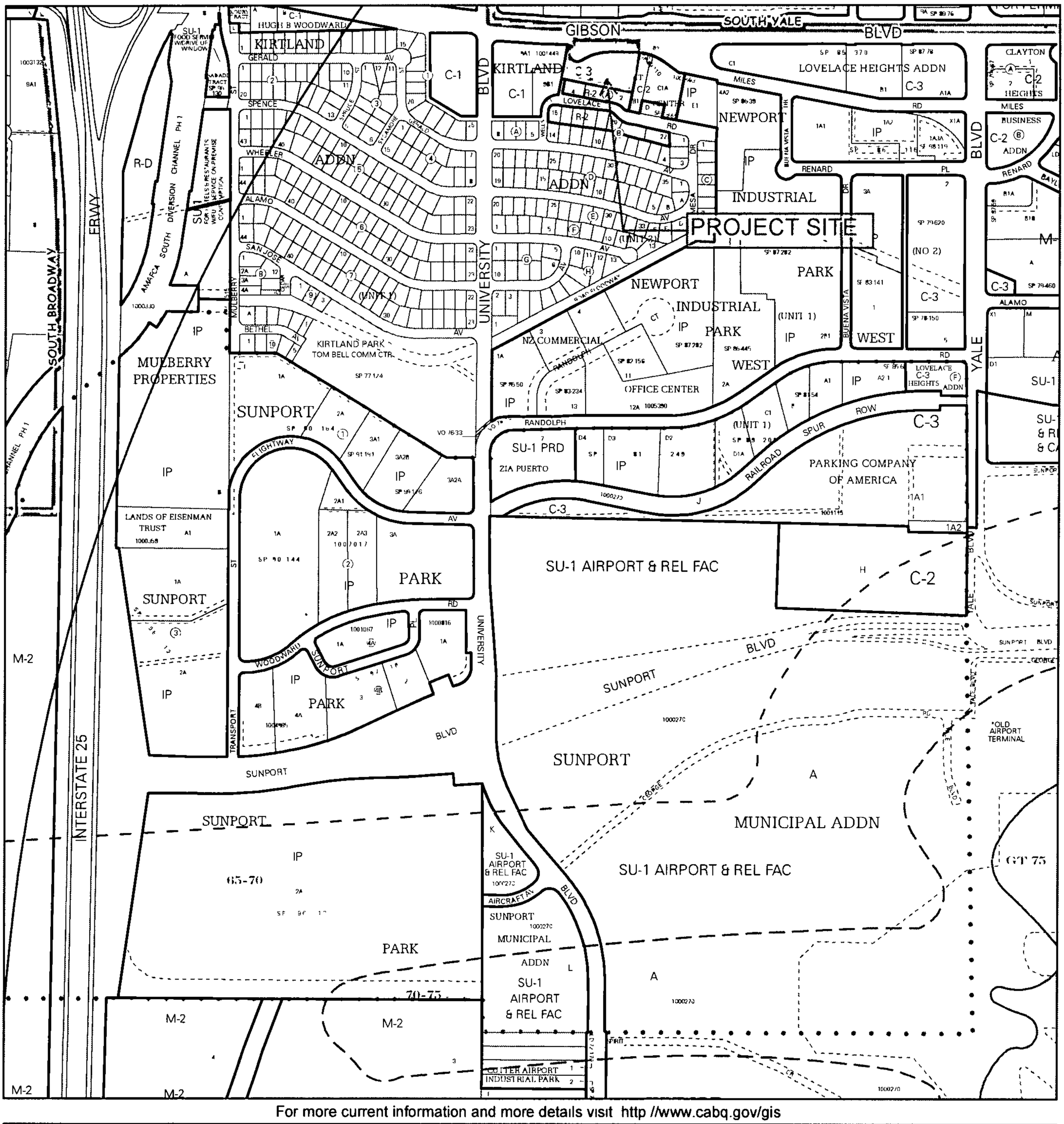
The purpose of this report is to provide the drainage management plan for redevelopment of a property for a Chili's sit-down restaurant to be located on the south side of Miles Road, near the southeast corner of Gibson and University Boulevard in Albuquerque, New Mexico. This plan is in accordance with the City of Albuquerque's Development Process Manual, Chapter 22, Hydrology Section.

Introduction

The subject of this report, as shown on the Exhibit A - Vicinity Map, is an approximately 1.9-acre property located near the westerly terminus of Miles Road. The property address is 1700 Miles Road SE, has a legal description of Tract A of Tracts A-E, Airport Center, and is zoned C-3. The site is vacant, but currently developed with a building and associated parking lot formerly used as a rental car building. A vacation action for the Miles Road public right of way along the property frontage has been approved and the parcel will be re-platted to incorporate the vacated property. A Master Drainage Plan was prepared for this area by Jeff Mortensen & Associates, Inc., updated on March 4, 1997 (JMA Report) and is included for reference in the Appendix.

Flood Plain

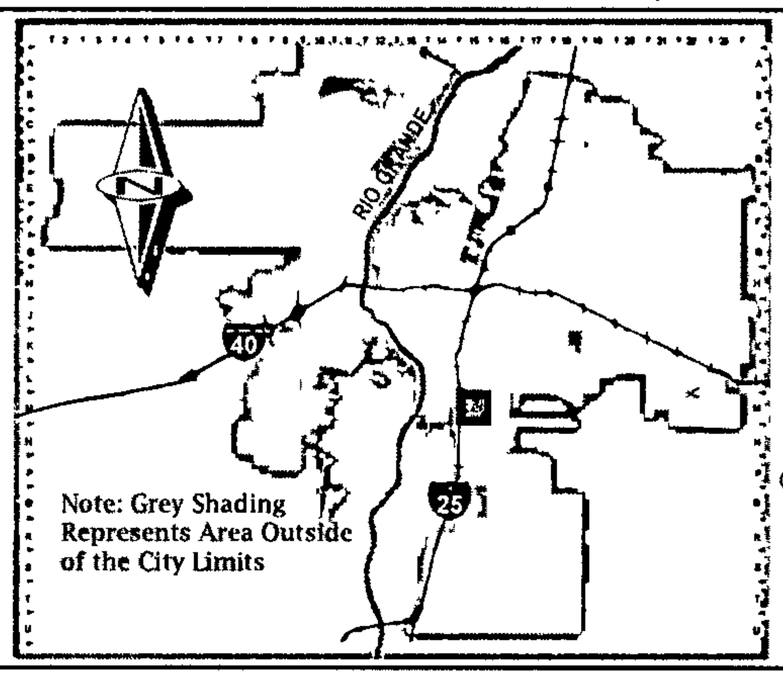
The site is not within a floodplain as shown on FIRM Map 35001C0342G. See Exhibit B for location of site.



For more current information and more details visit http //www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 1/24/2011



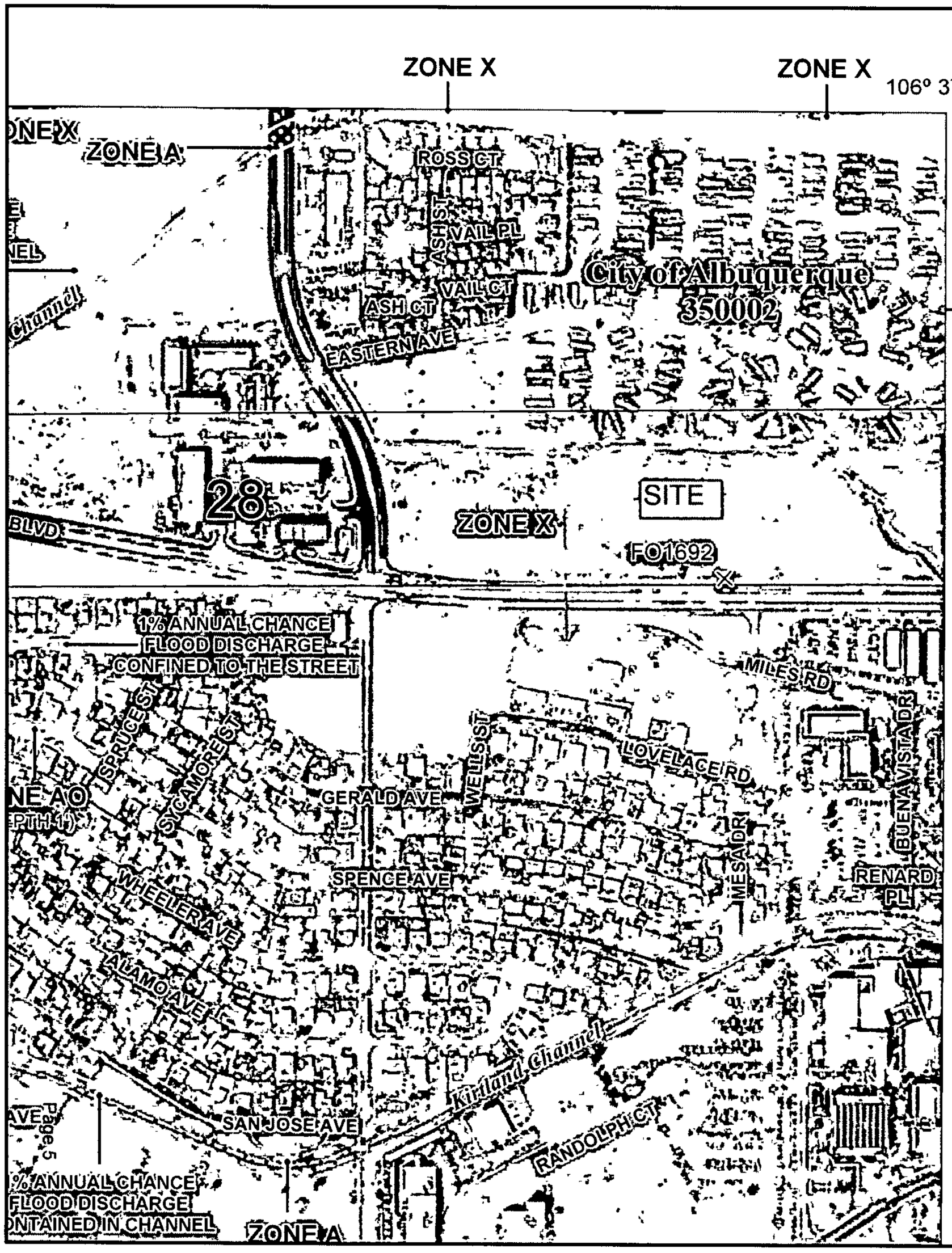
Zone Atlas Page:

M-15-Z

Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1 500 Feet



MAP SCALE 1" = 500'

50 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0342G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 342 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE CITY OF	350002	0342	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0342	G

Notice to User The **Map Number** shown below should be used when placing map orders the **Community Number** shown above should be used on insurance applications for the subject community

MAP NUMBER
35001C0342G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map It was extracted using F-MIT On-Line This map does not reflect changes or amendments which may have been made subsequent to the date on the title block For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www msc fema gov

Existing Drainage Conditions

Currently the site is developed with an office building and parking lot. The project site is bounded on the north by Gibson Boulevard, on the west by a partially developed property, on the south by a residential subdivision, and to the east by a parking lot. This site is included in the JMA Report (See Appendix), an d analyzed as Drainage Basin C.

The property is steeply sloped from east to west with drainage from the site being conveyed to Miles Road by sheet flow and a concrete rundown, which drains west to a series of drainage inlets at the end of the cul-de-sac. The street grade of Miles Road at the property frontage is approximately 5% and the parking lot grades within the site are approximately 8%. The JMA Report anticipated all developed flows from this site and upstream basins, calculated to be 20.4 cfs, to be conveyed to the end of the Miles Road cul-de-sac.

Storm runoff from the adjacent parking lot to the east (Basin DE-1 per the JMA Report) sheet flows into the subject property at a calculated rate of 5.0 cfs. An additional offsite basin, Basin F-1, is taken into account by the JMA Report and assumed to flow into Miles Road in the ultimate developed condition, although said basin remains undeveloped and flows south- away from Miles Road . The portion of Miles Road which drains to the end of the cul-de-sac is designated as Basin M and contributes 6.0 cfs.

Proposed Drainage Conditions

The proposed development will consist of a 6,000 square foot restaurant building with 117 parking spaces and associated landscape. Surface improvements of Miles Road are proposed to be demolished, as are all private improvements within the project property. A private driveway connection is anticipated to be constructed in the future in conjunction with the commercial development proposed on the adjacent property to the west as a separate project.

Six onsite drainage basins are delineated on the site corresponding to the proposed grading configuration and impervious land treatment for the developed condition. The "onsite" portion of Basin M previously delineated by the JMA Report is accounted for by the proposed onsite basins, while the offsite portion of Basin M and the entirety of the other two offsite basins are accounted for. Although the Drainage Plan in the JMA report suggests flow from that basin being conveyed to Miles Road, this analysis accounts for that flow to be accepted by this development at two points along the easterly boundary consistent with the topography and parking lot improvements. All basins are analyzed under fully developed conditions.

Onsite and offsite flows from Basin M are designed to be conveyed to an existing curb inlet on the north side of Miles Road via curb & gutter and concrete rundowns. This existing curb inlet is designed to be raised in grade and modified to a Type D inlet, identified as Analysis Point #2 (AP#2). Surface flows calculated at 1.11 cfs will still be conveyed to the drainage structures end of the cul-de-sac in the developed condition, whereas the pre-development condition handles 20.4 cfs.

A public storm drain easement will be dedicated by plat to contain flows from the public right of way. Surface flows from the parking lot area and landscaped areas are designed to be captured by private drainage facilities consisting of drainage inlets and storm drain pipe connecting to the existing storm drain system on the southerly portion of the ~~Miles Road~~ Mitchell cul-de-sac. A small slope area on the westerly portion of the site will sheet flow onto the adjacent property to the west at a calculated rate of 0.4 cfs during the 100-yr storm event. A similar, albeit smaller, tributary area from the existing slope has historically drained to the adjacent site, however, it is impractical to divert flow from this slope area into the existing storm drain system due to topography.

The grading design is configured to maintain historical drainage patterns and accept drainage from the adjacent property consistent with the existing conditions and in substantial conformance with the approved Master Drainage Plan as outlined in the JMA Report. Total peak flows from onsite and offsite basins in the proposed developed condition will not increase from the existing condition (20.37 vs. 20.58 cfs) 20.11 + 0.26 due to the proposed demolition of the expansive parking lot and road improvements to be replaced with landscape areas meeting current zoning code requirements.

Stormwater Control Measures

Stormwater Control Measures are incorporated in the design to the extent practicable and will provide management of the 90th Percentile Storm. Design measures include passive water harvesting in depressed parking lot islands, a

vegetated gravel-lined swale along the southerly and northerly property boundary, and three small retention ponds. The 90th Percentile Storm was quantified per the Drainage Ordinance requirement of 0.44 inches and reduced by 0.1 inch to account for the initial impervious abstraction as listed in Table A-6 of Section 22 of the DPM. Detailed pond volume design tabulations are included in Appendix A.

As noted above, the proposed use is less intense than the existing and there should be an improvement in stormwater quality due to the proposed design. An Erosion Control and Sediment Control Plan was designed in conjunction with the grading and drainage plan which will implement best management practices during construction activities and is included with this report.

Summary

Following a detailed analysis of existing and proposed drainage conditions guided by DPM Section 22 – Weighted E Method, storm water discharge resulting from the 100-year, 6-hr storm event indicates that the proposed redevelopment and corresponding grading and drainage design will accommodate the proposed development, and correspondingly not increase run-off volumes or alter historic discharge locations. It is therefore recommended that this development be approved for grading and Site Plan Development for Building Permit based upon these findings.

APPENDIX A

HYDROLOGY

EXISTING DRAINAGE BASINS

LEGAL DESCRIPTION

LOT 9, BLOCK A, KIRTLAND ADDITION
LOT 1, BLOCK A, KIRTLAND ADDITION
UNPLATTED PARCELS
TRACT 4-A-1, NEWPORT INDUSTRIAL PARK-WEST, UNIT 2
MILES RD S.E., WALKER DRIVE S.E., AND PUBLIC ALLEYS

SCALE 1 = 40

PROJECT BENCHMARK = T.B.M.

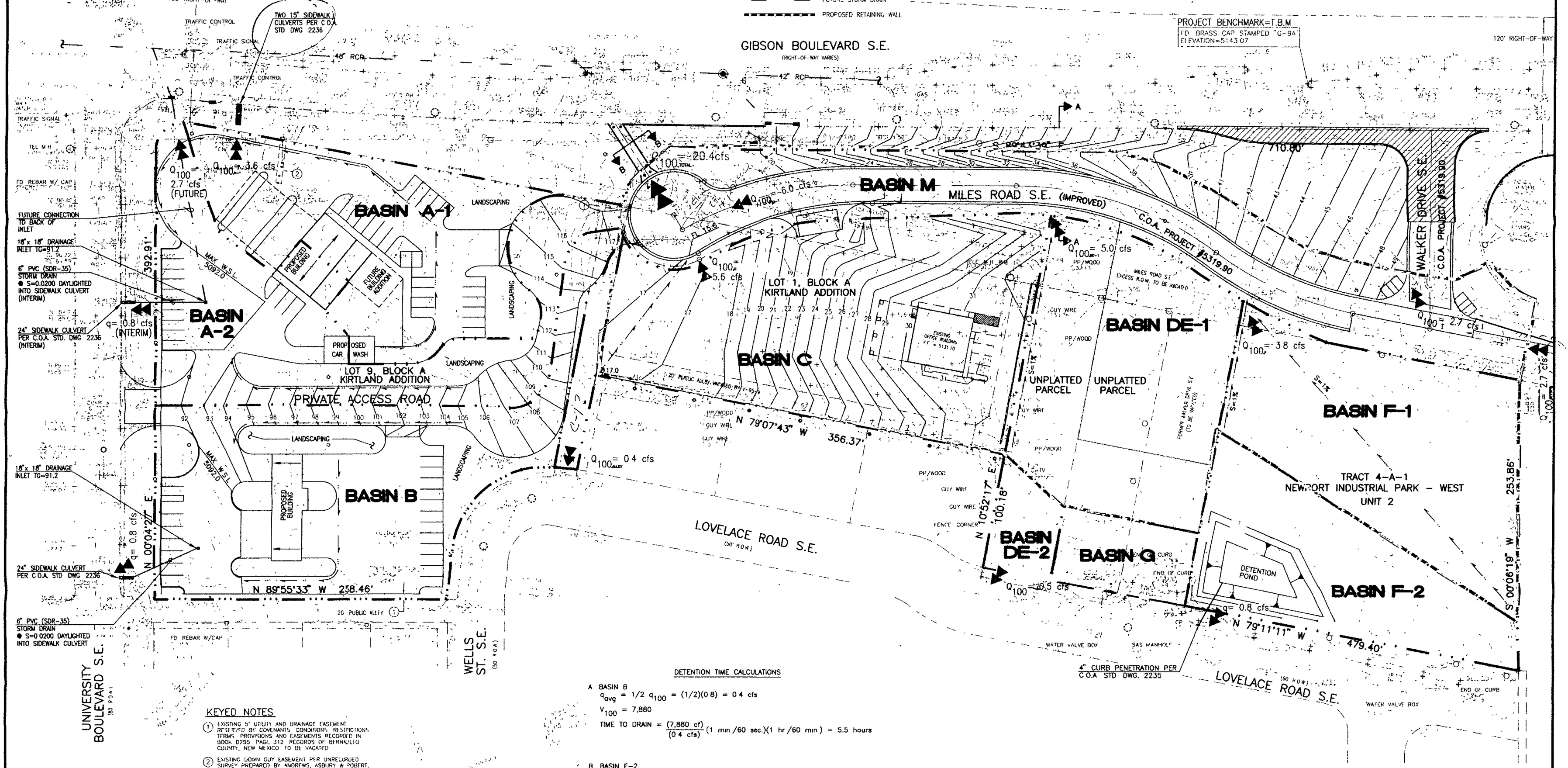
CITY OF ALBUQUERQUE BENCHMARK "G 9A"
STATION IS STAMPED "ACS,G-9A, "984" A
3 1/4" ALUMINUM TABLET SET FLUSH IN THE
CONCRETE GUTTER TO REACH THE STATION
FROM I-25, TRAVEL EAST ON GIBSON BLVD 0 7
MILES AS SHOWN BELOW
ELEVATION = 5143.07' (M.S.L.D.)

LEGAL

TC	TOP OF CURB
FL	FLOW LINE
NG	NATURAL GROUND
91.93	SPOT ELEVATION
	GUY WIRE/ANCHOR
	POWER POLE
	LIGHT POLE
	MANHOLE
	CONTROL POINT

	EXISTING CONTOUR
	PROPOSED CONTOUR
91.93	PROPOSED SPOT ELEVATION
	PROPOSED FLOWLINE
q=	ATTENUATED FLOW RATE
	BASIN BOUNDARY
	FUTURE STORM DRAIN
	PROPOSED RETAINING WALL

NOTE THIS IS NOT A BOUNDARY SURVEY
APPARENT PROPERTY CORNERS ARE SHOWN
FOR ORIENTATION ONLY



KEYED NOTES

1. EXISTING 5' UTILITY AND DRAINAGE EASEMENT RESERVED BY COVENANTS, CONDITIONS, RESTRICTIONS, TERMS, PROVISIONS AND EASEMENTS RECORDED IN BOOK D250, PAGE 312, RECORDS OF BERNALILLO COUNTY, NEW MEXICO TO BE VACATED
2. EXISTING DOWN GUY EASEMENT PER UNRECORDED SURVEY PREPARED BY ANDREWS, ASBURY & ROBERT, INC. DATED JANUARY 02, 1979

DETENTION TIME CALCULATIONS

A. BASIN B

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 7{,}880$

TIME TO DRAIN $= \frac{(7{,}880\ cf)}{(0.4\ cfs)}(1\ min/60\ sec.)(1\ hr/60\ min) = 5.5$ hours

B. BASIN F-2

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 4{,}440$ cf

TIME TO DRAIN $= \frac{(4{,}440\ cf)}{(0.4\ cfs)}(1\ min/60\ sec)(1\ hr/60\ min) = 3.1$ hours

THIS PLAN REPLACES THE PREVIOUS PLAN DATED 02-15-1996.

JEFFREY G. MORTENSEN NEW MEXICO 8547 REGISTERED PROFESSIONAL ENGINEER

03-0497

JMA — JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD N.E.
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS (505) SURVEYORS (505) 345-4250

MASTER DRAINAGE PLAN
MILES ROAD S.E. / KIRTLAND ADDITION

DESIGNED BY GM/GRB
DRAWN BY TNT
APPROVED BY JGM

NO	DATE	BY	REVISIONS

JOB NO 950925
DATE 03-1997
SHEET 1 OF 2

Weighted E Method

Albuquerque Chili's University & Gibson (Miles Road). - Zone #2

Pre-Development Basins

Basin Description												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
C	59,100	1.357	0.00212	0%	0	13%	0.176	16%	0.21708	71%	0.963	1.787	0.202	5.61	1.071	0.121	3.56	0.588	0.066	1.94
M	58,550	1.344	0.00210	0%	0	0%	0.000	12%	0.161295	88%	1.183	2.001	0.224	6.07	1.242	0.139	3.99	0.713	0.080	2.30
DE-1	52,950	1.216	0.00190	0%	0	14%	0.170	18%	0.218802	68%	0.827	1.754	0.178	4.96	1.044	0.106	3.13	0.567	0.057	1.68
F-1	39,550	0.908	0.00142	0%	0	0%	0.000	23%	0.208827	77%	0.699	1.892	0.143	3.94	1.151	0.087	2.55	0.643	0.049	1.43
Total	**210,150**	**4.824**	**0.00754**										**0.747**	**20.58**		**0.453**	**13.24**		**0.252**	**7.34**

Post-Development Basins

Basin Description												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	39,283	0.902	0.00141	0%	0	0%	0.000	19%	0.171345	81%	0.730	1.932	0.145	3.97	1.184	0.089	2.59	0.668	0.050	1.46
2	9,360	0.215	0.00034	0%	0	0%	0.000	4%	0.008595	96%	0.206	2.080	0.037	1.00	1.307	0.023	0.66	0.764	0.014	0.39
3	18,908	0.434	0.00068	0%	0	0%	0.000	7%	0.030385	93%	0.404	2.051	0.074	1.99	1.283	0.046	1.32	0.745	0.027	0.77
4	3,508	0.081	0.00013	0%	0	0%	0.000	100%	0.080533	0%	0.000	1.130	0.008	0.25	0.520	0.003	0.14	0.150	0.001	0.05
5	3,647	0.084	0.00013	0%	0	0%	0.000	100%	0.083724	0%	0.000	1.130	0.008	0.26	0.520	0.004	0.14	0.150	0.001	0.05
6	15,094	0.347	0.00054	0%	0	0%	0.000	96%	0.33265	4%	0.014	1.170	0.034	1.11	0.553	0.016	0.61	0.176	0.005	0.23
M1 (offsite)	31,190	0.716	0.00112	0%	0	0%	0.000	43%	0.30789	57%	0.408	1.694	0.101	2.89	0.987	0.059	1.81	0.515	0.031	0.94
DE-1	52,950	1.216	0.00190	0%	0	14%	0.170	18%	0.218802	68%	0.827	1.754	0.178	4.96	1.044	0.106	3.13	0.567	0.057	1.68
F-1	39,550	0.908	0.00142	0%	0	0%	0.000	23%	0.208827	77%	0.699	1.892	0.143	3.94	1.151	0.087	2.55	0.643	0.049	1.43
Total	**213,490**	**4.901**	**0.00766**										**0.728**	**20.37**		**0.434**	**12.95**		**0.235**	**7.00**

Equations:

Weighted E = $E_a*A_a + E_b*A_b + E_c*A_c + E_d*A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a * A_a + Q_b * A_b + Q_c * A_c + Q_d * A_d$

First Flush and Pond Volume Calculations

North Swale Pond

ELEVATION	AREA SF	INCREMENT VOL, CF	CUM VOL CF	CUM VOL AC-FT
26	8			
27	100	54	54	0.0012
27.5	191	73	**127**	0.0029

Landscape Island
west

ELEVATION	AREA SF	INCREMENT VOL, CF	CUM VOL CF	CUM VOL AC-FT
25.7	50			
26.7	224	137	**137**	0.0031

Landscape Island
east

ELEVATION	AREA SF	INCREMENT VOL, CF	CUM VOL CF	CUM VOL AC-FT
29.1	50			
30.1	224	137	**137**	0.0031

West POND

ELEVATION	AREA SF	INCREMENT VOL, CF	CUM VOL CF	CUM VOL AC-FT
25	26			
26	288	157	157	0.0036
27	654	471	**628**	0.0144

Southeast POND

ELEVATION	AREA SF	INCREMENT VOL, CF	CUM VOL CF	CUM VOL AC-FT
34	217			
35	313	265	265	0.0061
36	424	369	**634**	0.0145

Total Vol Provided= **1662** cubic feet

Volume Required = A_d * (0.44in-0.1in)

A_d=1.317 acres = 57368 ~~cubic~~ sq feet

Vol Req'd= 1625 cubic feet< Vol Provided, Therefore **OK** 1662

APPENDIX B

HYDRAULIC CALCULATIONS

Worksheet for Triangular Channel - South Rock Swale AP#1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0 033	
Channel Slope	0.01500	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H V)
Discharge	8.93	ft^3/s

Results

Normal Depth	0.96	ft	<1', therefore OK. ✓
Flow Area	2 74	ft^2	
Wetted Perimeter	6.05	ft	
Hydraulic Radius	0.45	ft	
Top Width	5 74	ft	
Critical Depth	0 89	ft	
Critical Slope	0.02232	ft/ft	
Velocity	3.26	ft/s	
Velocity Head	0 16	ft	
Specific Energy	1.12	ft	
Froude Number	0 83		
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0 00	ft
Length	0 00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0 00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0 96	ft
Critical Depth	0.89	ft
Channel Slope	0.01500	ft/ft
Critical Slope	0 02232	ft/ft

Worksheet for Rectangular Channel - 2' wide AP#2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.04000	ft/ft
Bottom Width	2.00	ft
Discharge	8.82	ft³/s

? should be 14.4 cfs

Results

Normal Depth	0.43	ft
Flow Area	0.86	ft²
Wetted Perimeter	2.86	ft
Hydraulic Radius	0 30	ft
Top Width	2 00	ft
Critical Depth	0.85	ft
Critical Slope	0.00590	ft/ft
Velocity	10.25	ft/s
Velocity Head	1.63	ft
Specific Energy	2 06	ft
Froude Number	2 76	
Flow Type	Supercritical	

<0.5', therefore OK.

you need to show D inlet

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0 00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.43	ft
Critical Depth	0 85	ft
Channel Slope	0.04000	ft/ft
Critical Slope	0.00590	ft/ft

CAPACITY OF SINGLE 'C' STORM DI @ BASIN 2

Capacity of the grate:

L = 47.375" - 2(6" $_{ends}$) - 14(½" $_{middle\ bars}$)
= 28.375"
= 2.365'

W = 30" - 13(½" $_{middle\ bars}$)
= 23.5"
= 1.958'

Area = 2.365' x 1.958'
= 4.63 ft^2

Effective Area = 4.63 – 4.63 (0.5 $_{clogging\ factor}$)
= 2.3 ft^2 at the grate

Orifice Equation

Q = CA sqrt(2gH)
Q = 0.6*2.3*sqrt(2*32.2*0.67)
Q = 9.06 cfs

Capacity of the throat:

L = 47-⅜"
= 3.948'

Weir Equation

Q = CLH^(3/2)
Q = 2.95 * 3.948 * 0.67^(3/2)
Q = 6.39 cfs

Total Capacity:

Q = 9.06_{grate} + 6.39_{throat}
Q = 15.45 cfs

Q (CAPACITY)=15.45 CFS > Q (REQUIRED)=1.0 CFS, THEREFORE OK. ✓

SINGLE 'D' TYPE STORM DRAIN INLET @ AP#1

SINGLE 'D':

Area at the grate:

L = 38.375" - 7 (1/2" $_{\text{middle bars}}$)
= 34.875"
= 2.906'

W = 25.5" - 13 (1/2 $_{\text{middle bars}}$)
= 19"
= 1.583'

Area = 1.583' x 2.906'
= 4.601 ft^2

Effective Area = 4.601 - 0.5 (4.601)
= 2.30 ft^2

Effective Area = 2.30 ft^2

Orifice Equation

Q = CA sqrt(2gH)
Q = 0.6*2.3*sqrt(2*32.2*1.0)
Q = 11.07 cfs

11.07 8.93 ✓

Q (CAPACITY)=8.93 CFS > Q (REQUIRED)=2.83 CFS, THEREFORE OK.

SINGLE 'D' TYPE STORM DRAIN INLET @ AP#2

SINGLE 'D':

Area at the grate:

L = 38.375" - 7 (1/2" $_{\text{middle bars}}$)
= 34.875"
= 2.906'

W = 25.5" - 13 (1/2 $_{\text{middle bars}}$)
= 19"
= 1.583'

Area = 1.583' x 2.906'
= 4.601 ft^2

Effective Area = 4.601 - 0.5 (4.601)
= 2.30 ft^2

Effective Area = 2.30 ft^2

Orifice Equation

Q = CA sqrt(2gH)
Q = 0.6*2.3*sqrt(2*32.2*1.0)
Q = 11.07 cfs

how nothing 1 foot of head or less

Q (CAPACITY)=11.07 CFS > Q (REQUIRED)=8.82 CFS, THEREFORE OK. ✓

Worksheet for Circular Pipe - 18in, Capacity @1% slope

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0 013		
Channel Slope	0 01000	ft/ft	
Diameter	18	in	
Discharge	10 18	ft³/s	=Q required

Results

Normal Depth	1 19	ft	
Flow Area	1.50	ft²	
Wetted Perimeter	3 30	ft	
Hydraulic Radius	0 46	ft	
Top Width	1.22	ft	
Critical Depth	1.23	ft	
Percent Full	79.3	%	
Critical Slope	0.00940	ft/ft	
Velocity	6.77	ft/s	
Velocity Head	0.71	ft	
Specific Energy	1.90	ft	
Froude Number	1 07		
Maximum Discharge	11.30	ft³/s	
Discharge Full	10.50	ft³/s	> Q required, therefore OK. ✓
Slope Full	0.00939	ft/ft	
Flow Type	SuperCritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0 00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	79.31	%
Downstream Velocity	Infinity	ft/s

Worksheet for Circular Pipe - 6in PVC capacity

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0 010		
Channel Slope	0.01000	ft/ft	
Diameter	6	in	
Discharge	0.25	ft³/s	= Q required

Results

Normal Depth	0 20	ft	
Flow Area	0.07	ft²	
Wetted Perimeter	0.69	ft	
Hydraulic Radius	0.11	ft	
Top Width	0.49	ft	
Critical Depth	0 25	ft	
Percent Full	40.3	%	
Critical Slope	0 00459	ft/ft	
Velocity	3.37	ft/s	
Velocity Head	0 18	ft	
Specific Energy	0 38	ft	
Froude Number	1.53		
Maximum Discharge	0.78	ft³/s	
Discharge Full	0 73	ft³/s	> Q required, therefore OK. ✓
Slope Full	0.00117	ft/ft	
Flow Type	SuperCritical		

GVF Input Data

Downstream Depth	0 00	ft
Length	0 00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	40 34	%
Downstream Velocity	Infinity	ft/s

APPENDIX C

Master Drainage Plan by Plan Jeff Mortensen & Associates, Inc., dated 03/04/97 (JMA Report)

SUPPLEMENTARY INFORMATION

FOR

MILES ROAD S.E./KIRTLAND ADDITION

MASTER DRAINAGE PLAN

(REVISED MARCH, 1997)

Revised to Account for New Alignment of Miles Road & Cul-de-Sac

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JEFFREY G. MORTENSEN
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

03-04-97

JMA No. 950525

BASIN A-1 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 39,835/0.91
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	39,835/0.91	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	11,555/0.26	29
D	28,280/0.65	71

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(39,835) = 3,750$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.91) = 2.9$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.26)+(2.12)(0.65)]/(0.91) = 1.74$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.74/12)(39,835) = 5,780$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.26)+(4.70)(0.65) = 3.6$ cfs

Comparison

1. $\Delta V_{100} = 5,780 - 3,750 = 2,030$ cf (increase)
2. $\Delta Q_{100} = 3.6 - 2.9 = 0.7$ cfs (increase)

BASIN A-2 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 37,500/0.86
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	37,500/0.86	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	10,875/0.25	29
D	26,625/0.61	71

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(37,500) = 3,530$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.86) = 2.7$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.25)+(2.12)(0.61)]/(0.86) = 1.73$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.73/12)(37,500) = 5,410$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.25)+(4.70)(0.61) = 3.4$ cfs

Comparison

1. $\Delta V_{100} = 5,410 - 3,530 = 1,880$ cf (increase)
2. $\Delta Q_{100} = 3.4 - 2.7 = 0.7$ cfs (increase)

BASIN B CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 59,410/1.42
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	59,410/1.42	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	16,040/0.38	27
D	43,370/1.04	73

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(59,410) = 5,590$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.42) = 4.5$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.38)+(2.12)(1.04)]/(1.42) = 1.76$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.76/12)(59,410) = 8,710$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.38)+(4.70)(1.04) = 5.8$ cfs

Comparison

1. $\Delta V_{100} = 8,710 - 5,590 = 3,120$ cf (increase)
2. $\Delta Q_{100} = 5.8 - 4.5 = 1.3$ cfs (increase)

BASIN C CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 59,100/1.36
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	57,330/1.32	97
D	1,770/0.04	03

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	7,680/0.18	13
C	9,460/0.22	16
D	41,960/0.96	71

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(1.13)(1.32)+(2.12)(0.04)]/(1.36) = 1.16$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.16/12)(59,100) = 5,710$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.32)+(4.70)(0.04) = 4.3$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.18)+(1.13)(0.22)+(2.12)(0.96)]/(1.36) = 1.78$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.78/12)(59,100) = 8,770$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.18)+(3.14)(0.22)+(4.70)(0.96) = 5.6$ cfs

Comparison

1. $\Delta V_{100} = 8,770 - 5,710 = 3,060$ cf (increase)
2. $\Delta Q_{100} = 5.6 - 4.3 = 1.3$ cfs (increase)

BASIN DE-1 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 52,950/1.21
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	52,950/1.21	100

5. Developed Land Treatment (Assume will develop like Tract C)

Treatment	Area (sf/ac)	%
B	7,420/0.16	14
C	9,530/0.22	18
D	36,000/0.83	68

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(52,950) = 4,990$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.21) = 3.8$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.16)+(1.13)(0.22)+(2.12)(0.83)]/(1.21) = 1.76$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.76/12)(52,950) = 7,770$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.16)+(3.14)(0.22)+(4.70)(0.83) = 5.0$ cfs

Comparison

1. $\Delta V_{100} = 7,770 - 4,990 = 2,780$ cf (increase)
2. $\Delta Q_{100} = 5.0 - 3.8 = 1.2$ cfs (increase)

BASIN DE-2 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 5,000/0.11
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	5,000/0.11	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
D	5,000/0.11	100

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(5{,}000) = 470$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.11) = 0.3$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 2.12$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (2.12/12)(5{,}000) = 880$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (4.70)(0.11) = 0.5$ cfs

Comparison

1. $\Delta V_{100} = 880 - 470 = 410$ cf (increase)
2. $\Delta Q_{100} = 0.5 - 0.3 = 0.2$ cfs (increase)

BASIN F-1 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 39,550/0.91
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	39,550/0.91	100

5. Developed Land Treatment (Same land treatments as M15/D22, IP Use)

Treatment	Area (sf/ac)	%
B	9,100/0.21	23
D	30,450/0.70	77

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(39,550) = 3,720$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.91) = 2.9$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.21)+(2.12)(0.70)]/(0.91) = 1.81$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.81/12)(39,550) = 5,970$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.21)+(4.70)(0.70) = 3.8$ cfs

Comparison

1. $\Delta V_{100} = 5,97 - 3,720 = 2,250$ cf (increase)
2. $\Delta Q_{100} = 3.8 - 2.9 = 0.9$ cfs (increase)

BASIN F-2 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 29,250/0.67
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	29,250/0.67	100

5. Developed Land Treatment (Same land treatments as M15/D22, IP Use)

Treatment	Area (sf/ac)	%
B	6,730/0.15	23
D	22,520/0.52	77

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(29,250) = 2,750$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.67) = 2.1$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.15)+(2.12)(0.52)]/(0.67) = 1.82$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.82/12)(29,250) = 4,440$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.15)+(4.70)(0.52) = 2.8$ cfs

Comparison

1. $\Delta V_{100} = 4,440 - 2,750 = 1,690$ cf (increase)
2. $\Delta Q_{100} = 2.8 - 2.1 = 0.7$ cfs (increase)

BASIN M CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 58,550/1.34
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	58,550/1.34	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	7,025/0.16	12
D	51,525/1.18	88

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(58,550) = 5,510$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.34) = 4.2$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(1.13)(0.16)+(2.12)(1.18)]/(1.34) = 2.00$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (2.00/12)(58,550) = 9,760$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.16)+(4.70)(1.18) = 6.0$ cfs

Comparison

1. $\Delta V_{100} = 9,760 - 5,510 = 4,250$ cf (increase)
2. $\Delta Q_{100} = 6.0 - 4.2 = 1.8$ cfs (increase)

ALLEY CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 3,850/0.09
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	3,850/0.09	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
D	3,850/0.09	100

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(3,850) = 360$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.09) = 0.3$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 2.12$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (2.12/12)(3,850) = 680$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (4.70)(0.09) = 0.4$ cfs

Comparison

1. $\Delta V_{100} = 680 - 360 = 320$ cf (increase)
2. $\Delta Q_{100} = 0.4 - 0.3 = 0.1$ cfs (increase)

OFFSITE BASIN CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 27,300/0.63
4. Developed Land Treatment

Treatment	Area (sf/ac)	%
C	6,800/0.16	25
D	20,500/0.47	75

Developed Condition

1. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$$
$$E_W = [(1.13)(0.16)+(2.12)(0.47)]/(0.63) = 1.87 \text{ in.}$$
$$V_{100} = (E_W/12)A_T$$
$$V_{100} = (1.87/12)(27,300) = 4,250 \text{ cf}$$

2. Peak Discharge

$$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$$
$$Q_p = Q_{100} = (3.14)(0.16)+(4.70)(0.47) = 2.7 \text{ cfs}$$

HYDRAULIC CALCULATIONS
TEMPORARY RUN-DOWN

1. Curb Opening Width

$Q = CLH^{3/2}$

Let:
C = 2.7
Q = 20.4 cfs
H = 0.67 ft (8" curb height)

Therefore: L = 13.77 ft.
Use 16.0 foot design width for future inlet construction

2. Minimum Channel Width
Using Manning's Equation

Let:
n = 0.013
Q = 20.4 cfs
s = 0.0850 ft/ft
d = 0.67 ft (8" curb height)

Therefore: W = 1.74 ft.
Use 10' design width to satisfy C.O.A. requirements

3. Velocity Multiplied by Depth Calculation
Use Manning's Equation

A. 10-Year Storm Event

Let: $Q_{10} = 0.67\ Q_{100} = 0.67(20.4) = 13.7$ cfs

W = 10.0 ft.
S = 0.0850 ft/ft
n = 0.013

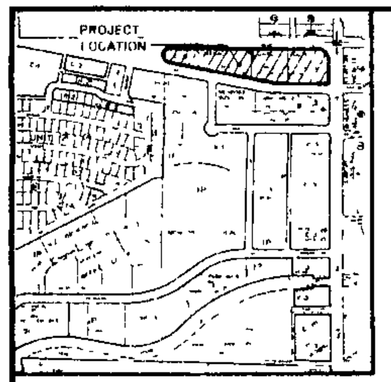
Therefore:
d = 0.15 ft
V = 9.1 ft/s
Vd = 1.36 < 6.5 (per D.P.M.)

B. 100-Year Storm Event

Let: $Q = Q_{100} = 20.4$ cfs

W = 10.0 ft.
S = 0.0850 ft/ft
n = 0.013

Therefore:
d = 0.19 ft
V = 10.7 ft/s
Vd = 2.03 < 6.5 (per D.P.M.)



PROJECT BENCHMARK
ACS 1 MAG BRASS CAP SET FLUSH IN RAVENWALL 14 FEET SOUTH OF THE INTERSECTION OF YALE BLVD & GIBSON BLVD
ELEVATION 5289.85 FEET (MSL 83)

TBM
(WELDED 3" ON SW CORNER OF CONCRETE SLAB AS SHOWN HEREON)
ELEVATION 5268.53 FEET (MSL 83)

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

VICINITY MAP M-15
SCALE 1" = 800

LEGEND
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING CONCRETE
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- FL HIGH LINE
- TC TOP OF CURB
- (TC 5863) FUTURE TOP OF CURB ELEV (PROJECT NO 2834)
- RAVENWALL LINE
- FUTURE CURB & GUTTER (PROJECT NO 2834)
- EXISTING SWALE
- PROPOSED SWALE
- EXPOSED RAVENWALL FENCE
- BASIN BOUNDARY

DRAINAGE PLAN

The following items concerning the Express Airport Parking Lot Drainage Plan are contained herein

1. Vicinity Map
2. Grading Plan
3. Calculations

As shown in 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 A-16 of the Albuquerque Master Drainage Study (MDS) 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 south side of the Miles Road S.E. right-of-way routes runoff away from the project site. 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) compatibility 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 west to east 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 curbed located above the South Diversion Channel which is located roughly about 1050 feet to the west of the project site which is the outfall for this site. A previous submittal by Jenkins Gilchrist has substantiated the capacity of this existing channel (outfall) based upon the fact that this site is on an infill site located at the lower end of the watershed and the provision of adequate facilities for the discharge of runoff from this site is appropriate. Furthermore the proposed drainage pattern will eliminate the problem of directly 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 pending and discharging at a controlled rate since there would only increase the amount of runoff discharged to an existing street inlet located roughly about 750 feet to the west of the project site by extending the duration of low flow runoff. This 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 problem (i.e. the discharge of public runoff onto private property). The proposed parking lot will improve these conditions by by(passing 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 22.3D-4 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 parking lot 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 2, 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 Map Mine (fine sandy loam
Hydrologic Soil Group B
Existing Pervious CN = 70 (DPM Plate 22.3 C-2)
Factors or Range Land (fair condition)
Developed Pervious CN = 8. (DPM Plate 22.2 C-2)

Time of Concentration/Time to Peak

$T_p = 0.6678\ L^{0.77}/S^{0.385}$ (Ripple Equation)

$T_p = T_c = 10$ min

Point Rainfall

$P_6 = 2.3$ in (DPM Plate 22.3 D-1)

Rational Method (100 YEAR RAINFALL)

Discharge: Q = CIA

where C varies
$i = P_6 (6/T_c)^{0.53} = 4.96$ 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(RO) A

Where RO = Direct runoff in inches
A = area, acres

Existing Condition

Basin 1
$A_{total} = 112,845$ sf = 2.59 Ac
$C = 0.40$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (C\ 40)(4.96)(2.59) = 14.0$ cfs
Basin 2
$A_{imp} = 0$ sf (0 impervious)
Composite CN = 70 (DPM Plate 22.2 C-3)
RO = 0.4 in (DPM Plate 22.2 C-4)
$V_{100} = 3630$ (RO) A = 10,49 cf

Developed Conditions

Basin 1
$A_{total} = 112,700$ sf = 2.59 Ac
Roof area = 2300 sf (0.05)
Paved area = 70,400 sf (0.75)
Landscaped area = 4,000 sf (0.03)
$C = 0.88$ (Weighted average per Emergency Rule, 1/14/86)
$Q_{100} = CIA = (0.88)(4.96)(2.59) = 11.0$ cfs
$A_{imp} = 2.58$ ac; All impervious = 87 %
Composite CN = 97 (DPM Plate 22.2 C-3)
RO = 1.9 in (DPM Plate 22.2 C-4)
$V_{100} = 3630$ (RO) A = 17,830 cf

Developed Condition
Basin 2
$A_{total} = 46,375$ sf = 1.06 Ac
Paved area = 46,375 sf (1.0)
Landscaped area = 0 sf (0.0)
$C = 0.95$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.95)(4.96)(1.06) = 4.9$ cfs
$A_{imp} = 46.0$ ac; All impervious = 100 %
Composite CN = 98 (DPM Plate 22.2 C-3)
RO = 2.2 in (DPM Plate 22.2 C-4)
$V_{100} = 3630$ (RO) A = 8,455 cf

Developed Condition
Basin 3
$A_{total} = 59,040$ sf = .36 Ac
Paved area = 29,240 sf (.67)
Landscaped area = 0 sf (0.0)
$C = 0.75$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.75)(4.96)(.36) = 1.3$ cfs
$A_{imp} = 29,240$ sf; approximate = 100 %
Composite CN = 98 (DPM Plate 22.2 C-3)
RO = 2.2 in (DPM Plate 22.2 C-4)
$V_{100} = 3630$ (RO) A = 4,650 cf

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

$Q = C(H)^{3/2} = 3.4$ cfs
Where C = 3.09
L = 2'-0"
H = 0.45 feet

REVISED SIDEWALK CULVERT SIZING

Rational Method

Discharge: Q = CIA

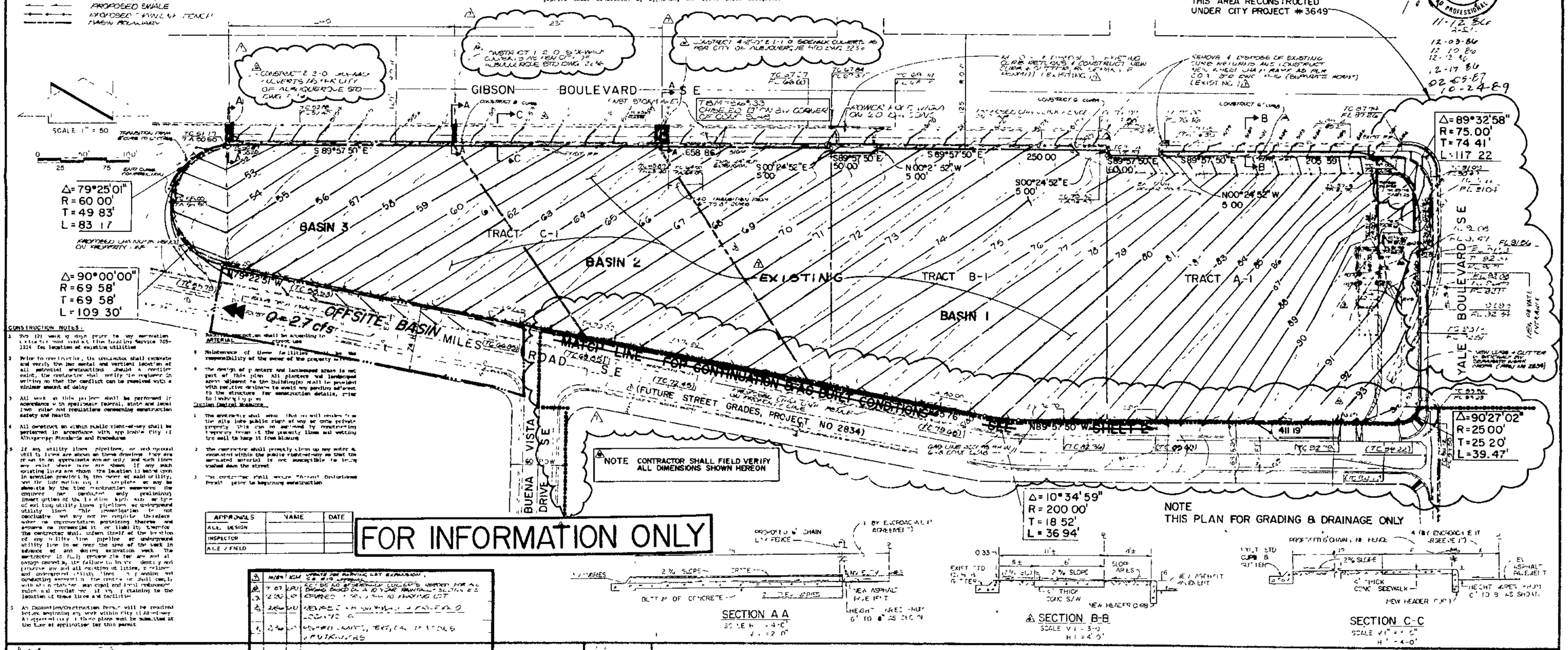
Where C varies
$i = P_6 (6/T_c)^{0.53} = 3.19$ in/hr
$P_6 = 1.51$ in (DPM Plate 22 2D-1 - 10 Year Rainfall)
$T_c = 10$ min (minimum)
A = area, acres

Developed Condition (10 Year Rainfall)
Basin 1
$C = 0.93$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.93)(3.19)(4.52) = 14.5$ cfs
Basin 2
$C = 0.94$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.94)(3.19)(1.06) = 3.2$ cfs
Basin 3
$C = 0.95$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.95)(3.19)(.36) = 1.1$ 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

$\Delta Q_{100} = (21.0 + 4.9 + 1.3) - 14.0 = 18.2$ cfs (increase)
$\Delta V_{100} = (33,930 + 8455 + 10,860) - 18,830 = 33,930$ cf (increase)



NOTE
THIS PLAN FOR GRADING & DRAINAGE ONLY

FOR INFORMATION ONLY

CONSTRUCTION NOTES:

1. Two (2) work days prior to any excavation within the area shall the Utility 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 interferences. 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 utilities have been shown on these drawings they are drawn 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 existing type, size or type of existing utility lines, pipelines or underground utilities. This investigation is not conclusive and may not be complete. Therefore, neither no representation pertaining thereto and assumes no responsibility is or shall be. Therefore, 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, the failure to locate, identify and preserve any and all existing utilities, pipelines and underground utility lines. If problems are encountered in the course of such work, consulting engineer in the contractor shall comply with all state, federal, 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 this plan must be submitted at the time of application for this permit
7. All construction shall be according to ARTERIAL STREET STANDARDS
8. Maintenance of these facilities shall be the responsibility of the owner of the property serviced
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 protective curbing to avoid any possible damage to the structure. For construction details, refer to landscaping plans

Dust Control Measures

1. The contractor shall assure that no soil leaves 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 watering the soil to keep it from blowing
2. The contractor shall promptly clean up any water or excavated material 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 "Street Obstruction Permit" prior to beginning construction

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

NO	DATE	BY	REVISIONS
3	1/89	KCM	UPDATE FOR PARKING LOT EXPANSION
2	7/87	LPU	REVISED CULVERTS, VARIOUS MINOR CHANGES
1	12/86	LPU	REVISED PARKING LOT

DESIGNED LPU
DRAWN FAR
APPROVED

60157
10 - 89

GRADING AND DRAINAGE PLAN
EXPRESS AIRPORT PARKING

SHEET 1 OF

JRS WORTHSEN & ASSOCIATES, INC.
ENGINEERS

LEGAL DESCRIPTION

LOT 9, BLOCK A, KIRTLAND ADDITION
LOT 1, BLOCK A, KIRTLAND ADDITION
UNPLATTED PARCELS
TRACT 4-A-1 NEWPORT INDUSTRIAL PARK-WEST UNIT 2
MILES RD S.E., WALKER DRIVE S.E., AND PUBLIC ALLEYS

SCALE 1 = 40

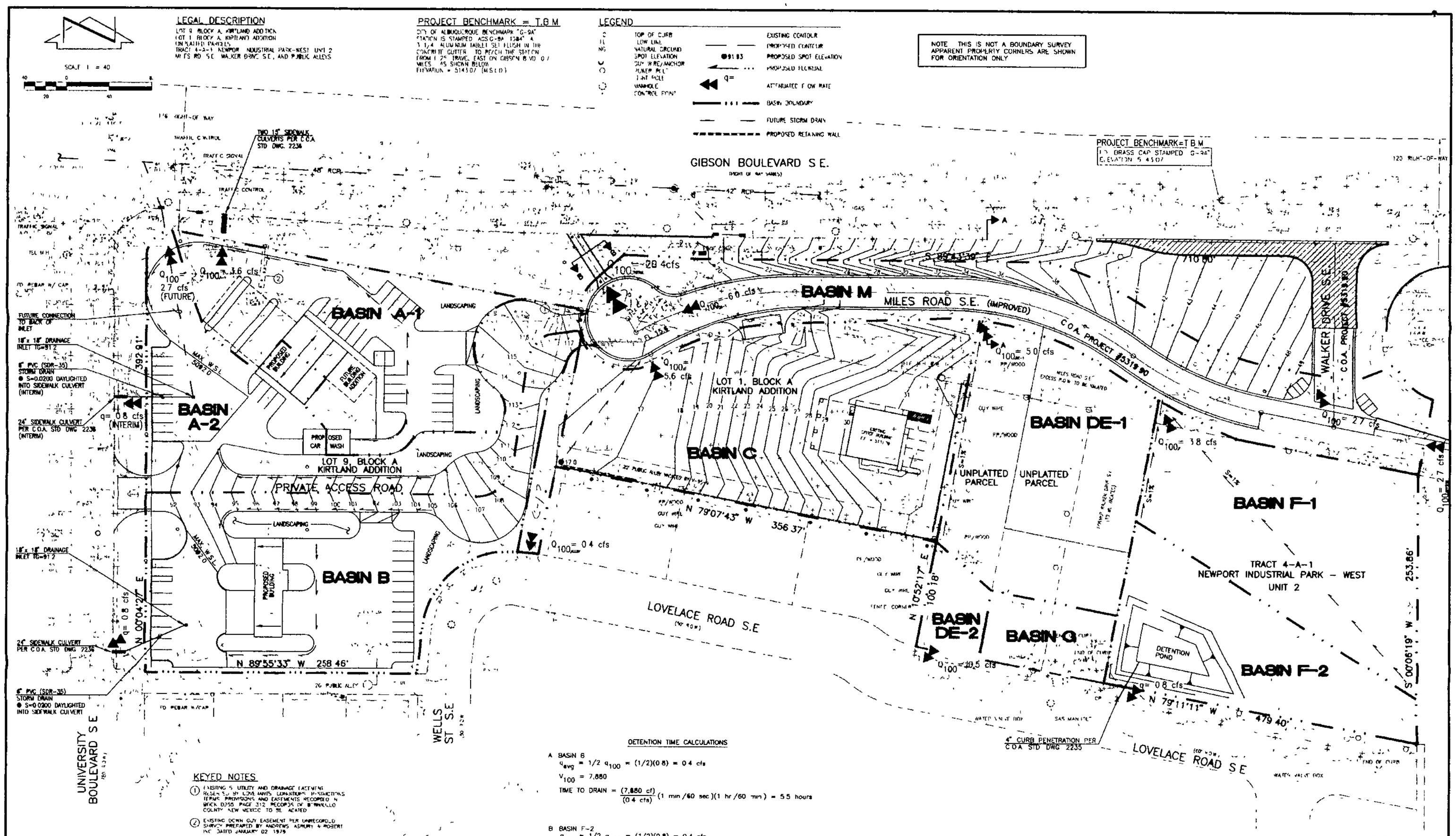
PROJECT BENCHMARK = T.B.M

CITY OF ALBUQUERQUE BENCHMARK "G-9A"
STATION IS STAMPED "ACSG-9A" 1984" A
1 1/4" ALUMINUM TABLET SET FLUSH IN THE CONCRETE GUTTER TO REACH THE STATION FROM I-25 TRAVEL EAST ON GIBSON BLVD 0.7 MILES AS SHOWN BELOW
ELEVATION = 5143.07 (M.S.L.D.)

LEGEND

- TOP OF CURB
- LOW LINE
- NATURAL GROUND
- SPOT ELEVATION
- GUY WIRE/ANCHOR
- POWER POLE
- LIGHT POLE
- MANHOLE
- CONTROL POINT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- 91.83 PROPOSED SPOT ELEVATION
- PROPOSED FLOWLINE
- q= ATTENUATED FLOW RATE
- BASIN BOUNDARY
- FUTURE STORM DRAIN
- PROPOSED RETAINING WALL

NOTE: THIS IS NOT A BOUNDARY SURVEY. APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY.



KEYED NOTES

1. EXISTING 5' UTILITY AND DRAINAGE EASEMENT RESERVED SUBJECT TO LOCAL LIMITS, LIMITATIONS, RESTRICTIONS, TERMS, PROVISIONS AND EASEMENTS RECORDED IN BOOK D255, PAGE 312, RECORDS OF BERNALILLO COUNTY, NEW MEXICO TO BE VACATED.
2. EXISTING DOWN GUY EASEMENT PER UNRECORDED SURVEY PREPARED BY ANDREWS, ASBURY & ROBERT INC. DATED JANUARY 02, 1979.

DETENTION TIME CALCULATIONS

A. BASIN B

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 7,880$

TIME TO DRAIN = $\frac{(7,880\ cf)}{(0.4\ cfs)}(1\ min/60\ sec)(1\ hr/60\ min) = 5.5$ hours

B. BASIN F-2

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 4,440$ cf

TIME TO DRAIN = $\frac{(4,440\ cf)}{(0.4\ cfs)}(1\ min/60\ sec)(1\ hr/60\ min) = 3.1$ hours

THIS PLAN REPLACES THE PREVIOUS PLAN DATED 02-15-1996

JEFFREY G. MORTENSEN NEW MEXICO 8547 PROFESSIONAL ENGINEER
03-04-97

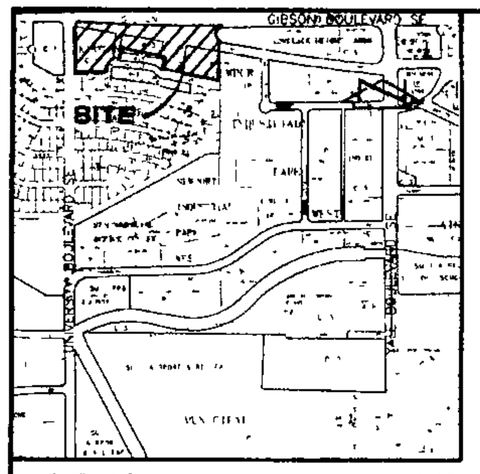
JMA — JEFF MORTENSEN & ASSOCIATES, INC.
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS & SURVEYORS (505) 345-4250

MASTER DRAINAGE PLAN
MILES ROAD S.E. / KIRTLAND ADDITION

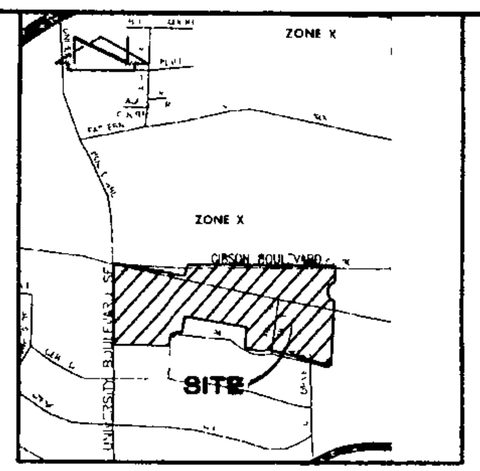
DESIGNED BY: JM/GRW
DRAWN BY: JNT
APPROVED BY: JGM

NO.	DATE	BY	REVISIONS

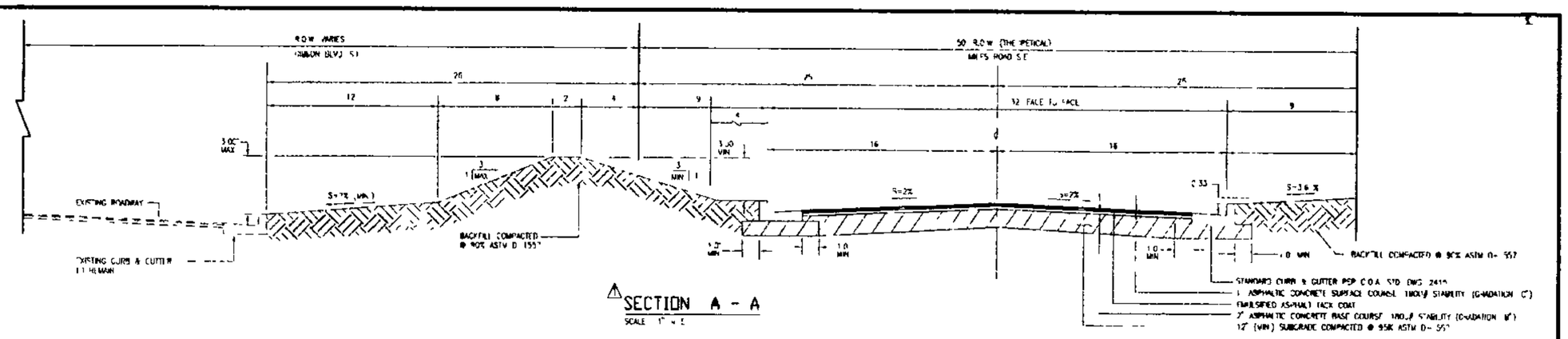
JOB NO. 950925
DATE 03-1997
SHEET 1 OF 2



VICINITY MAP M-15
SCALE 1" = 750



FIRM PANEL 342 OF 825
SCALE 500



SECTION A - A
SCALE 1" = 2'

STREET CAPACITY CALCULATIONS

USING DPM PLATE 22.3 D-2
40' F
60' ROW
S=0.049 ft/f
y=0.67

$Q_{(not\ 5\ feet)} \geq 75$ cfs

$Q_{FULL\ STREET} = 2(75) = 150$ cfs $>> Q_{100}$

RUNDOWN CALCULATIONS

1 Curb Opening

$Q = CLH^{3/2}$

C = 2.7
Q = 25 cfs (Per MDP)
H = 0.67 ft (18" curb height)

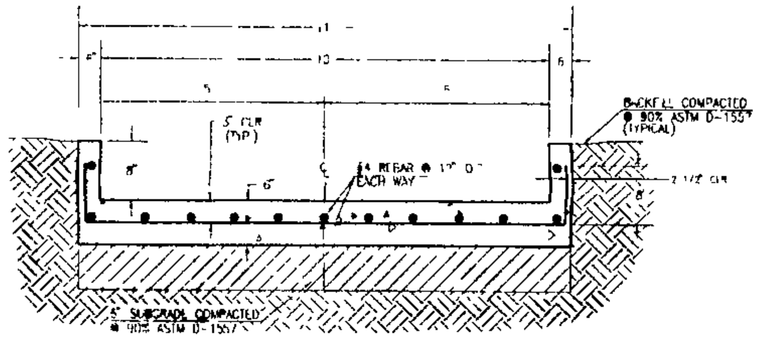
Therefore L = 5.87 ft
Use 6.0 ft design width

2 Channel Width
Using Manning's Equation

n = 0.013
S = 0.050 ft/ft
Q = 25 cfs (Per MDP)
y = 0.67 ft (18" curb height)
Therefore W = 1.34 ft

The store

3 Velocity times Depth per DPM
$vd < 6.5$ @ Q_{10}
using Manning's Equation
n = 0.013
S = 0.0050 ft/ft
$Q_{10} = 0.67\ Q_{100} = 0.67(25) = 16.75$ cfs
W = 10.0 ft
Therefore v = 4.7 fps
d = 0.16 ft
vd = 1.6 << 6.5



SECTION B - B
SCALE 1" = 2'-0"

DRAINAGE BASIN SUMMARY TABLES (EXISTING AND DEVELOPED CONDITIONS)

BASIN SUMMARY (OBSERVED AT UNIVERSITY AND GIPALO)

	BASIN	AREA (ac)	V_{100} (Exist) (cf)	V_{100} (Developed) (cf)	ΔV_{100} (cf)	Q_{100} (Exist) (cfs)	Q_{100} (developed) (cfs)	ΔQ_{100} (cfs)
⚠	A-1	0.91	3,760	0	(3,760)[C]	3.6	0.0	(3.6)[C]
⚠	A-2	0.86	3,530	[illegible]10[A]	1,880	3.4	0.8[A,B]	(2.6)[C]
⚠	B	1.42	5,590	4,710	3,120	4.5	0.8[B]	(3.7)[C]
⚠	C	1.36	5,710	0	(5,710)[C]	1.3	0.0	(1.3)[C]
	DE-1	1.21	4,990	0	(4,990)[C]	3.9	0.0	(3.8)[C]
	DE-2	0.11	470	890	420	0.3	0.5	0.2
⚠	F-1	1.21	3,720	0	(3,720)[C]	2.9	0.0	(2.9)[C]
	F-2	0.67	2,760	4,440	1,690	2.1	0.8[B]	(1.3)[C]
⚠	M	1.34	5,510	0	(5,510)[C]	4.2	0.0	(4.2)[C]
⚠	Alley	0.09	360	480	120	0.3	0.4	0.1
	Offsite	0.63	4,250	0	(4,250)[C]	2.7	0.0	(2.7)[C]
⚠	TOTAL	9.51	40,690	20,120	(20,510)[C]	32.1	3.3	(28.8)[C]

BASIN SUMMARY (OBSERVED AT GIBSON)

	BASIN	AREA (ac)	V_{100} (Exist) (cf)	V_{100} (Developed) (cf)	ΔV_{100} (cf)	Q_{100} (Exist) (cfs)	Q_{100} (developed) (cfs)	ΔQ_{100} (cfs)
⚠	A-1	0.91	0	5,780	5,780	0	3.6	3.6
⚠	A-2	0.86	0	5,410[A]	5,410[A]	0	3.4	3.4
⚠	B	1.42	0	0	0	0	0	0
⚠	C	1.36	0	8,770	8,770	0	5.6	5.6
	DE-1	1.21	0	7,700	7,700	0	5.0	5.0
	DE-2	0.11	0	0	0	0	0	0
⚠	F-1	0.91	0	5,970	5,970	0	3.8	3.8
	F-2	0.67	0	0	0	0	0	0
⚠	M	1.34	0	9,760	9,760	0	6.0	6.0
⚠	Alley	0.09	0	0	0	0	0	0
	Offsite	0.63	0	4,250	4,250	0	2.7	2.7
⚠	TOTAL	9.51	0	47,640	47,640	0	30.1	30.1

TOTAL DEVELOPED AREA DRAINING TO GIBSON (PRELIMINARY C.O.A. PROJ. NO. 4850.90) 6.85 ac (72%)
TOTAL DEVELOPED AREA DRAINING TO GIBSON (AFTER C.O.A. PROJ. NO. 4850.90) 7.19 ac (75%)

A FLOW TO BE DIVERTED TO GIBSON STORM DRAIN UPON COMPLETION OF CIP
B FLOW RATE OF 0.8 CFS ACHIEVED THROUGH DETENTION
C NUMBERS IN PARENTHESES ARE NEGATIVE THEREBY REPRESENTING A DECREASE

MASTER DRAINAGE PLAN

MASTER DRAINAGE PLAN

The following items concerning the Tracts A-G Airport Center Master Drainage Plan are contained hereon

1 Vicinity Map
2 F.I.R.M.
3 Basin Summary Tables
4 Conceptual Grading Plan
5 Future Gibson Blvd. S.E. Storm Drain

As shown by the Vicinity Map, the site is center of the southeast corner of Gibson Boulevard S.E. and University Boulevard S.E. More particularly the site is bounded by University Boulevard S.E. on the west, Gibson Boulevard S.E. on the north, existing developments on the east (M15/D22 and M15/D21) and Lovelace Road S.E. on unpaved public alley, and a small apartment complex on the south. Miles Road S.E. crosses through the site. At present Miles Road S.E. is unimproved.

As shown by Panel 342 of 825 of the National Flood Insurance Program Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico dated September 20, 1996, the site does not lie within a designated flood hazard area. The site does, however, contribute runoff to a flood hazard area which has downstream of the site along Mulberry Street S.E. Currently the site is undeveloped with the exception of Tract C which contains an office building and paved parking lot.

The Conceptual Grading Plan shows: 1) existing and proposed grades indicated by spot elevations and contours of 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, and 5) proposed pond locations.

It is the intent of the Master Drainage Plan to outline the probable development scenario of the properties and obtain approval of the drainage characteristics to serve the properties. This plan will also facilitate approval of the drainage improvements for Section of Miles Road S.E., Walker Drive S.E. and public alleys in anticipation of Lot 1, Block A, Kirtland Addition replatting action.

As indicated by the existing topography, the site slopes from east to west toward University Blvd. S.E. Consequently, offsite flows do not enter from the west. Offsite flows do not enter from the north or south because those areas are topographically lower. The two developed parcels to the east discharge to Gibson (M15/D21 A) and to the Kirtland Park Channel (M15/D22) respectively. Minor offsite flows are generated by that portion of Miles Road between Buena Vista Drive S.E. and the east end of the site. That area to the east contributes flows calculated to be 2.7 cfs. These flows will be accepted by the proposed Miles Road and carried by the street section to Gibson Blvd. S.E. In the existing condition the majority of the site drains to University Blvd. S.E. where runoff will flow south to be intercepted by the Kirtland Addition Unit 1 street system. These streets drain west to Mulberry Street S.E. where a flood zone is designated between Gerald St. and Wheeler St.

The Developed Drainage Basins shown hereon have been assumed to have the following future uses per information from the current property owners: Basin A1 - gas station, convenience store, fast food restaurant, police substation; Basin B - commercial/retail development; Basin C - currently utilized as a car rental facility; Basins DE - commercial/retail development; Basin F - industrial park use; Basin G contains a FNM electric unit well on site.

In recognition of downstream flooding conditions on Mulberry Street S.E. and considering the proposed Gibson Boulevard S.E. Reconstruction/Rehabilitation, University Boulevard to Jackson Street (C.O.A. Project #4850.90), the Plan will divert as much developed runoff to Gibson as is physically possible. As determined from the Basin Summary Table, 75% of the developed area will ultimately drain to Gibson. Of the private areas which will continue to drain to University Blvd. only Basin DE-2 will have free discharge. This is because Basin DE-2 is physically incapable of draining to Gibson Blvd. is very small and is odd shaped and will most likely be developed as landscaping. Although it was conservatively analyzed as Land Treatment D in the Calculations. For Basins B and F-2 it is proposed to limit the discharge from each tract to the flow rate which is delivered by a 6" drain pipe. This is the smallest discharge possible without utilizing onsite retention which is prohibited by Ordinance. These two Basins will utilize the concept of onsite detention ponding via a 6" storm drain discharging to historic points on public right-of-way. Individual grading and drainage plans will be required for the development of each tract as a condition for permit approvals.

The detained discharge rate (q) from Basins A-2, B and F-2 have been conservatively calculated using the Orifice Equation with an average head of 4 feet which was the head calculated in the Grading and Drainage Plan previously submitted for the current Lot 1, Kirtland Addition Grading and Drainage Plan (City of Albuquerque Hydrology File No. M15/D32, Engineer's Stamp 1/26/96). This yields a peak flow rate of 0.8 cfs from each Basin. The public alley and Basin DE-2 will discharge freely to Lovelace Road S.E. A total peak flow rate of 3.3 cfs will discharge to University Blvd. S.E. which is significantly less than the current rate of 32.6 cfs. There will also be a significant reduction in volume of 100-year runoff from 40,630 cf to 20,120 cf. It is proposed that the detention ponding be accommodated in the paved parking areas similar to the previously mentioned site specific plan (M15/D32 1/26/96). In the interim Basin A-2 should discharge its developed runoff at a controlled rate to University Boulevard S.E. This is proposed as an interim solution. The ultimate solution, as shown by the Master Drainage Plan, is to construct a private storm drain connection into the back of a public storm drain inlet proposed as part of the Gibson Boulevard project. It is further proposed that this line should be installed as a "dry" line at the time that Tract A is developed and that a temporary plug be placed in the line to render it "dry". At such time as the Gibson Boulevard storm drain and associated inlets are constructed, the plug can be removed and inserted into the temporary discharge line thereby diverting flows to Gibson. When the Basin A-2 diversion is completed there will be a further reduction in the flow rate to University by 0.8 cfs and a reduction in the volume of runoff by 5,410 cubic feet. The future discharge rate for Basin A-2 should be sized for the free discharge of 3.4 cfs and should be installed as shallow as possible to prevent be a problems in case the storm drain system depth changes during reconstruction.

In the preparation of this plan, the Preliminary Drainage Report for the "Gibson Boulevard Reconstruction/Rehabilitation, University Boulevard to Jackson Street" (COA Project No. 4850.90) prepared by Anil Engineering, Inc. dated August 1996, has been reviewed. It is noted that the majority of the sites within Basin 70 as identified on the Basin Map, appearing thereon "The Gibson Boulevard Report", conservatively calculates that all of Basin 70 will drain into Gibson Boulevard S.E. Closer review of the topographic data presented reveals that most of the area comprising roofs A-C, Airport Center drain to Lovelace Road S.E. or University Boulevard S.E. The AHYMO Model created by Anil Engineering for the developed conditions shows a discharge rate of 143 cfs per acre to Basin 70. It can be determined from the Basin Summary Table for Gibson Blvd. Basins A-1, A-2, C, DE-1, M-1, F-1 and the Offsite Basin, will discharge 30.1 cfs/7.37 acres = 4.08 cfs per acre. These Basins will all surface drain to Gibson Blvd. either directly or via the temporary run down to be constructed from Miles Rd. S.E. to Gibson Blvd.

This site lies within Reach 1 as designated in the Avid report when it ends from Yale Boulevard to University Boulevard and the South Diversion Channel. The storm drain improvements in this reach are intended to a) collect runoff from areas east and south of the Yale intersection, b) to eliminate runoff to the unimproved alleys/private property along the north side of Gibson Boulevard S.E. and to c) reduce surface flows through the University Boulevard intersection in accordance with City design criteria. Discussions with Mr. Rick Bellerome of Avid Engineering indicate that the system is being constructed in order to allow for free discharge from Basin 70. The diversion of the runoff from a University Boulevard discharge to a Gibson Boulevard discharge will be advantageous so as to lessen downstream impacts. The future alignment for the Gibson Boulevard storm drain is shown on this plan along with preliminary inlet locations. The final design and analysis of the future storm drain and inlet locations is being coordinated between this office and Avid Engineering, Inc.

It appears likely that Miles Road will develop before the Proposed Gibson Blvd. Storm Drain will be constructed. In the interim there will be free discharge of additional developed runoff to Gibson Boulevard. This is appropriate because this development is programmed toward the ultimate drainage scenario: the proposed construction lies in close proximity to the bottom of the Gibson Watershed and the existing facilities which convey flows into the South Diversion Channel. Carlos Montoya C.O.A. Hydrology Section indicated via phone conversation that the existing facilities located at the bottom of Gibson Blvd. have sufficient capacity to convey Gibson flows into the South Diversion Channel.

The Miles Road S.E. Street Section will convey all runoff from Basins C, DE-1, M-1 and the offsite flows directly to Gibson Blvd. S.E. via a temporary rundown. The temporary rundown is provided in lieu of permanent storm sewer improvements to provide maximum flexibility in the design of the Gibson Blvd. S.E. improvements. The rundown is 10' wide and constructed with concrete. Bollards will be installed at the inlet and outlet of the rundown to discourage traffic use. Per the DPM, the maximum value for the runoff depth multiplied by runoff velocity crossing driving lanes is 6.5 for the 10-year storm event. As shown by the Calculations, the depth multiplied by the velocity is equal to 1.57 which is much less than 6.5 for the 10-year event. The 100 year event increases the value to 2.45, which is still less than 6.5, the DPM requirement.

Runoff from Basin A-1 will cross directly to Gibson Blvd. S.E. either via developed and/or private drainage improvements with the end result being addressed by separate submittal for Building Permit. Basin A-2 will ultimately drain to University Blvd. S.E. via private storm drainage improvements within public right-of-way. Paving (street) improvements alone are sufficient to install and convey the developed runoff analyzed hereon to public drainage infrastructure is required.

The calculations which appear hereon analyze both the existing and developed conditions for the 100-year 6-hour rainfall event. The Procedure for 40-acre and Smaller Basins, as set forth in the Revised Section 22.2 Hydrology of the Development Process Manual Volume 2 Design Criteria dated January 1993, has been used to quickly the peak rate of discharge and volume of runoff generated. As shown by these calculations, there is a net increase in volume and peak flow when generated for each tract, but by redirecting much of the runoff to Gibson Blvd. N.E. and through the use of retention ponding, the peak flow rate and volume of runoff discharging to University will decrease significantly when compared to the existing flow rates. This reduction in flow rate and volume will lessen the impact on downstream flooding observed during significant rainfall events.

THIS PLAN REPLACES THE PREVIOUS PLAN DATED 02-15-1996

JEFFREY G. HORTENSEN NEW MEXICO 8547 REGISTERED PROFESSIONAL ENGINEER
03-04-97

VICINITY MAP, DRAINAGE PLAN, CALCULATIONS, SECTIONS AND F.I.R.M.
MASTER DRAINAGE PLAN
MILES ROAD S.E. / KIRTLAND ADDITION

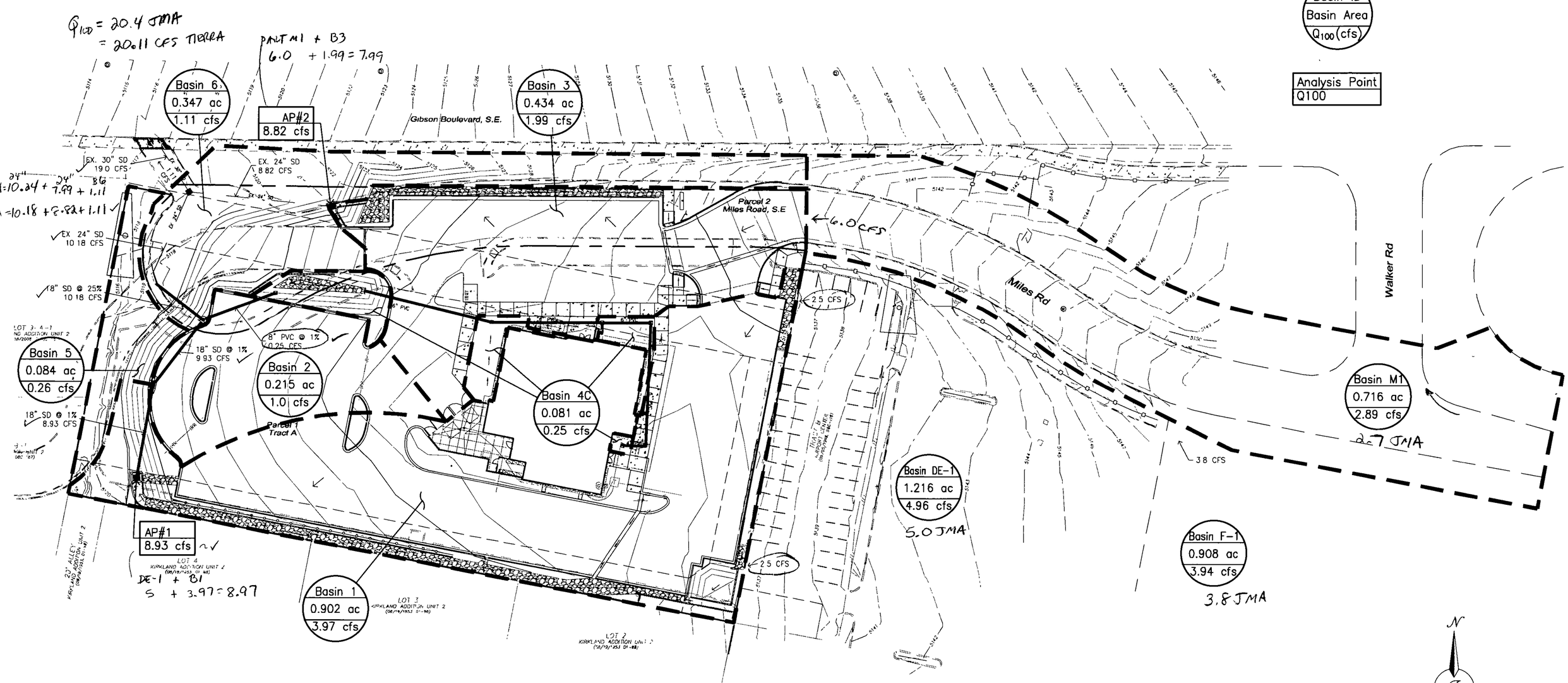
JEFF HORTENSEN & ASSOCIATES, INC.
CIVIL & STRUCTURAL ENGINEERS
ALBUQUERQUE, NEW MEXICO 87109
LAND DEVELOPMENT SURVEYING (505) 345-4558

DESIGNED BY GM/GRA
DRAWN BY SG-4
APPROVED BY JGH

NO	DATE	BY	REVISIONS
1	7/97	GRB	REVISE TO ACCOUNT FOR NEW ALIGNMENT OF MILES ROAD S.E.

JOB NO. 950925
DATE 03-1997
SHEET 2 OF 2

POST-DEVELOPMENT DRAINAGE BASINS



Q_{100} = 20.4 JMA
= 20.11 CFS TIERRA

PART M1 + B3
6.0 + 1.99 = 7.99

24" 24" B6
19.34 = 10.24 + 7.99 + 1.11
20.11 = 10.18 + 8.82 + 1.11

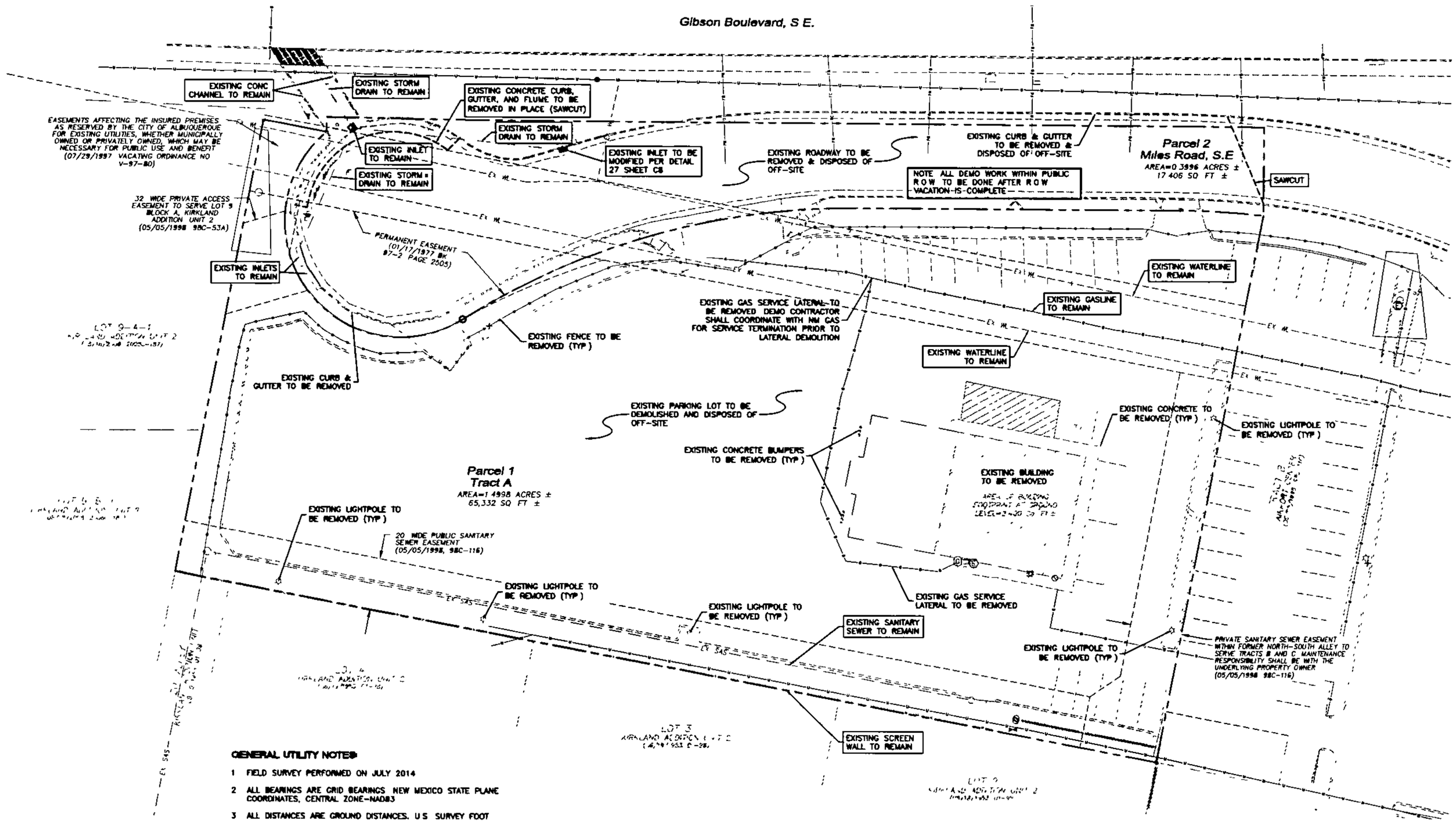
DE-1 + B1
5 + 3.97 = 8.97

2.7 JMA

5.0 JMA

3.8 JMA

AP#1=[Basin 1]+[Basin DE−1]=8.93 cfs
AP#2=[Basin 3]+[Basin M1 (Offsite)]+[Basin F−1]=8.82 cfs



GENERAL UTILITY NOTES

1. FIELD SURVEY PERFORMED ON JULY 2014
2. ALL BEARINGS ARE GRID BEARINGS NEW MEXICO STATE PLANE COORDINATES, CENTRAL ZONE-NAD83
3. ALL DISTANCES ARE GROUND DISTANCES. U S SURVEY FOOT
4. ALL EXISTING ONSITE IMPROVEMENTS (INCLUDING LANDSCAPING & PLANTINGS) WITHIN THE LIMITS OF ONSITE DEMOLITION SHALL BE REMOVED AND PROPERLY DISPOSED OF BY THE LANDLORD'S DEMOLITION CONTRACTOR UNLESS OTHERWISE NOTED
5. REFERENCE OFF-SITE IMPROVEMENT PLAN SHEETS FOR ADDITIONAL REMOVALS NOT COVERED BY THIS ON-SITE DEMOLITION PLAN
6. ALL WEATHER ACCESS TO EXISTING BUSINESSES WITHIN THE CENTER SHALL BE MAINTAINED AT ALL TIMES THE CONTRACTOR SHALL COORDINATE WITH THE EXISTING BUSINESS OWNERS PRIOR TO REMOVALS THAT DIRECTLY AFFECT THEIR PROPERTY OR ACCESS TO THEIR BUSINESS.
7. UNDER GROUND UTILITIES MAY EXIST WHERE NONE ARE SHOWN. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON AS-BUILT INFORMATION EXACT LOCATIONS SHALL BE VERIFIED BY THE CONTRACTOR.
8. IT IS RECOMMENDED THAT THE CONTRACTOR VISIT THE SITE PRIOR TO SUBMITTING A BID TO FAMILIARIZE THEMSELVES WITH ALL EXISTING CONDITIONS.
9. EXISTING ON-SITE POWER POLES & GUY WIRES TO REMAIN UNLESS OTHERWISE NOTED
10. DEMOLITION CONTRACTOR SHALL OBTAIN ALL NECESSARY DEMOLITION PERMITS, INCLUDING A FUGITIVE DUST PERMIT AN NOI FILING AND EROSION CONTROL MEASURES WILL BE REQUIRED IF MORE THAN 1 ACRE IS DISTURBED

NOTE:
DEMOLITION OF ALL STRUCTURES, SURFACE IMPROVEMENTS, AND SERVICE LATERALS, AS INDICATED, TO BE COMPLETED BY LANDLORD'S DEMOLITION CONTRACTOR PRIOR TO CONSTRUCTION START FOR CHILI'S DEVELOPMENT

N

GRAPHIC SCALE
20 10 0 10 20
SCALE 1"=20'

ISSUE FOR PERMIT 9/7/14

ENGINEER'S SEAL	CHILI'S UNIVERSITY BLVD & GIBSON BLVD	DRAWN BY DY
		DATE 11/05/14
	DEMO PLAN	2013086-DEMO
	TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE NM 87109 (505) 858-3100 www tierrawestllc com	SHEET # C2
RONALD R BOHANNAN P.E #7868		JOB # 2013086

CITY OF ALBUQUERQUE

October 14, 2015

Ronald R. Bohannan, PE
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Chili's Gibson and University
1700 Miles Rd SE
Request 30 day Temporary C.O. - Accepted
Engineer's Stamp dated: 12-30-14 (M15D012B)
Certification dated: 10-9-15

Dear Mr. Bohannan,

Based on the Certification received 10/9/2015, the above mentioned building is acceptable for a 30 day temporary Certificate of Occupancy by Hydrology.

- On the SW corner of the property in the swale the bottom of grade is 1'-0" below the top of concrete
- Grade in this swale coming from the east side should be 3" – 4" below the lip of concrete rundown.
- Both islands are not landscaped
- The landscaped area in the middle of the north property caved in.

If you have any questions, you can contact me at 924-3695 or Totten Elliott at 924-3982.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Hydrology
Planning Department

TE/RH
C: email

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Chilis Gibson & University Building Permit #. _____ City Drainage #: M15D012B

DRB#. _____ EPC#: _____ Work Order#: _____

Legal Description: _____

City Address: 1700 Miles Rd SE

Engineering Firm: Tierra West, LLC Contact: Ron Bohannan

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#. _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Check all that Apply.

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

____ TRAFFIC/ TRANSPORTATION

____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

X ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN

____ GRADING PLAN

____ DRAINAGE MASTER PLAN

____ DRAINAGE REPORT

____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)

____ TRAFFIC IMPACT STUDY (TIS)

____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ BUILDING PERMIT APPROVAL

X CERTIFICATE OF OCCUPANCY (Temp)

____ PRELIMINARY PLAT APPROVAL

____ SITE PLAN FOR SUB'D APPROVAL

____ SITE PLAN FOR BLDG. PERMIT APPROVAL

____ FINAL PLAT APPROVAL

____ SIA/ RELEASE OF FINANCIAL GUARANTEE

____ FOUNDATION PERMIT APPROVAL

____ GRADING PERMIT APPROVAL

____ SO-19 APPROVAL

____ PAVING PERMIT APPROVAL

____ GRADING/ PAD CERTIFICATION

____ WORK ORDER APPROVAL

____ CLOMR/LOMR

____ PRE-DESIGN MEETING

____ OTHER (SPECIFY) _____

Rec'd 10/9/2015

IS THIS A RESUBMITTAL?: _____ Yes _____ No

DATE SUBMITTED: 10/09/2015 By: Ron Bohannan

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED. ___

CITY OF ALBUQUERQUE

January 8, 2015

Ron Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Pl NE
Albuquerque, NM 87109

Re: Chili's at Gibson and University
Drainage Report and Grading and Drainage Plan
Engineer's Stamp Date 12-30-14 (M15D012B)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 12-31-14, the above referenced report and plans are approved for Final Plat action by DRB. However, the Grading and Drainage Plan cannot be approved for Grading or Building Permit approval until the following comments are addressed:

1. The vacation of Miles Road has been approved by City Council. This grading and drainage report and plan cannot be approved until the vacation is shown on the Final Plat for this site and is approved by DRB.
2. A turnaround for Miles Road will be required on the infrastructure list for Final Plat.
3. Revise the proposed drainage easement where the public drainage from Miles Road will flow in the parking lot and drainage system. Please see the enclosed exhibit for the minimum area that should be included. Include the drainage easement on the Final Plat.
4. The current grading and drainage plan cannot receive Grading Permit approval until the Final Plat is approved because the grading and drainage plan includes grading and drainage changes in Miles Road. Request Grading/Building Permit approval once the Final Plat has been approved.

Please contact me at 924-3994 if you have any questions.

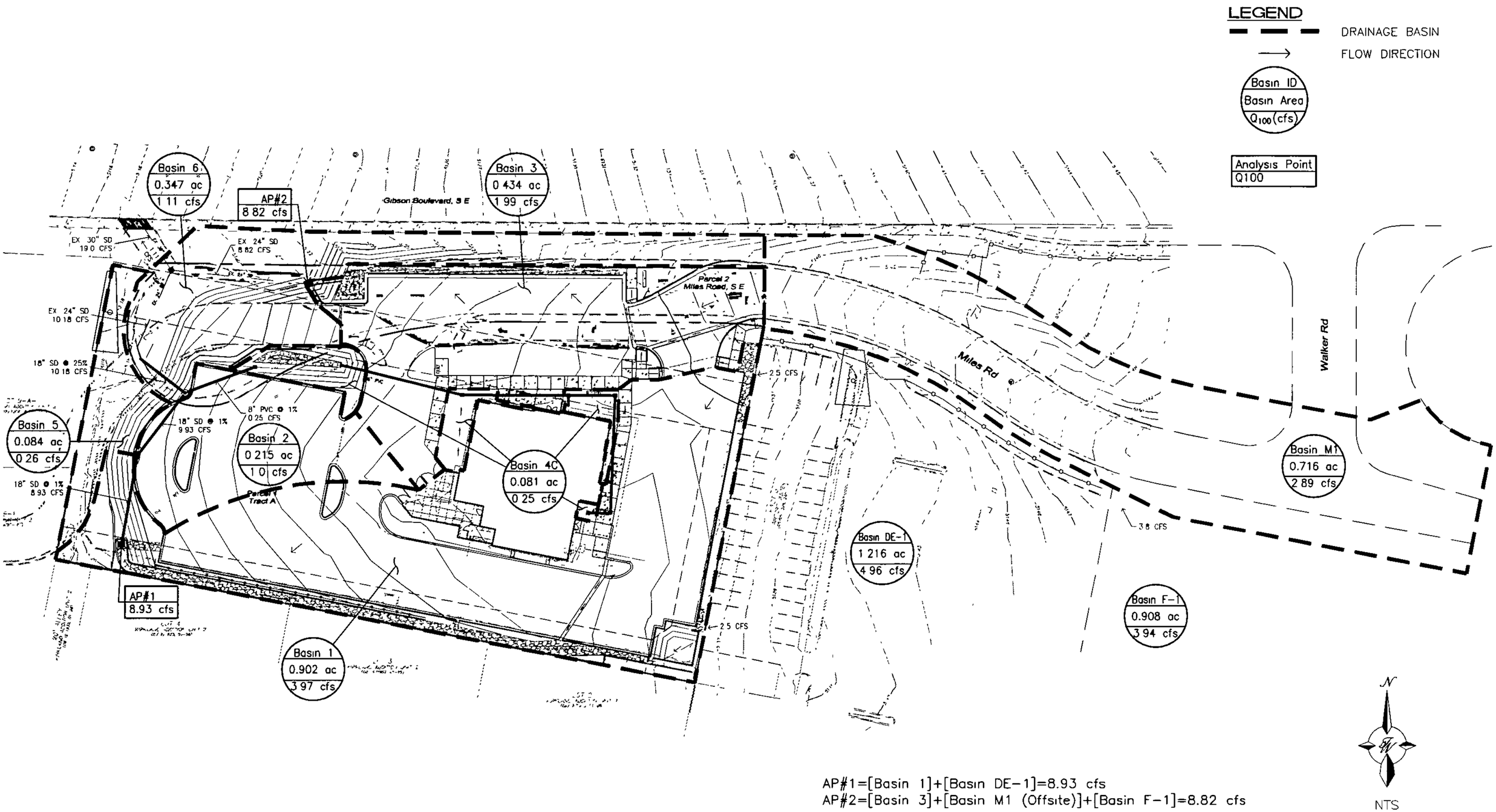
Sincerely,

Amy L. D. Niese, P.E.
Senior Engineer, Hydrology
Planning Department

C: e-mail

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

POST-DEVELOPMENT DRAINAGE BASINS



AP#1=[Basin 1]+[Basin DE-1]=8.93 cfs
AP#2=[Basin 3]+[Basin M1 (Offsite)]+[Basin F-1]=8.82 cfs

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Chilis Gibson & University City Drainage #: M15D012B

DRB#: EPC#: Work Order#:

Legal Description:

City Address:

Engineering Firm: Tierra West, LLC Contact: Joel Hernandez

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: jdhernandez@tierrawestllc.com

Owner: Josh Skarsgard Contact:

Address: 8220 San Pedro NE Suite 500

Phone#: 505-262-2323 Fax#: E-mail: josh@skarsgardfirm.com

Architect: GHA Architecture/Development Contact: Keilah Brown

Address: 14901 Quorum Drive, Suite 300 Dallas, Texas 75254

Phone#: 972-238-8884 Fax#: 972-239-5054 E-mail: kbrown@GHA-Architects.com

Surveyor: Precision Surveys Contact: Larry Medrano

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-856-5700 Fax#: E-mail: larry@presurv.com

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

✓ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
✓ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
✓ GRADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
✓ BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION
___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED
DEC 31 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes ___ No ___ Copy Provided

DATE SUBMITTED: 12/31/14 By: JOEL HERNANDEZ

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, an scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the followin

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

$A_D = 1.35$ $Q_{out} = 20.11$ FREE

12/31/14

Curtis

Chili at Sheant University
FP app before app G+D
→ Submit for FP app
BP come in

Var to Council

for 100
Skaneateles do plat

Pass Tuymey to do private
improvements in public ROW

"approval G+D plan + report
for FP"
Not approved for BP
Tell Monica to check "no"
for approval

Run by Transportation
Crystal they were told for DRB that must do
On DRS check FP app only turnaround
(They can do hammerhead)

DO WSE FOR PUBLIC WATER

show DPS improvement
He needs to submit + ~~new~~ diff G+D
for grading permit w/ PW WSE
(w/ sed pond / sys storm)

Joe Hernandez 12/31/14

Var app by City Council

Plat being submitted soon
by Josh Skaugard

no grading in ROW until
FP approval

Issue conditional letter

No BP issued until plat done

Fit in-de-sac back in
Miles Rd ROW on east prop

SUPPLEMENTARY INFORMATION

FOR

MILES ROAD S.E./KIRTLAND ADDITION

MASTER DRAINAGE PLAN

(REVISED MARCH, 1997)

Revised to Account for New Alignment of M. Lost Road w/ Cul-de-Sac #0

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NEW MEXICO
REGISTERED
PROFESSIONAL ENGINEER

03-04-97

JMA No. 950925

BASIN A-1 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 39,835/0.91
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	39,835/0.91	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	11,555/0.26	29
D	28,280/0.65	71

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(39,835) = 3,750$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.91) = 2.9$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.26)+(2.12)(0.65)]/(0.91) = 1.74$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.74/12)(39,835) = 5,780$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.26)+(4.70)(0.65) = 3.6$ cfs

Comparison

1. $\Delta V_{100} = 5,780 - 3,750 = 2,030$ cf (increase)
2. $\Delta Q_{100} = 3.6 - 2.9 = 0.7$ cfs (increase)

BASIN A-2 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 37,500/0.86
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	37,500/0.86	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	10,875/0.25	29
D	26,625/0.61	71

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(37{,}500) = 3{,}530$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.86) = 2.7$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.25)+(2.12)(0.61)]/(0.86) = 1.73$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.73/12)(37{,}500) = 5{,}410$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.25)+(4.70)(0.61) = 3.4$ cfs

Comparison

1. $\Delta V_{100} = 5{,}410 - 3{,}530 = 1{,}880$ cf (increase)
2. $\Delta Q_{100} = 3.4 - 2.7 = 0.7$ cfs (increase)

BASIN B CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 59,410/1.42
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	59,410/1.42	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	16,040/0.38	27
D	43,370/1.04	73

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(59,410) = 5,590$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.42) = 4.5$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.38)+(2.12)(1.04)]/(1.42) = 1.76$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.76/12)(59,410) = 8,710$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.38)+(4.70)(1.04) = 5.8$ cfs

Comparison

1. $\Delta V_{100} = 8,710 - 5,590 = 3,120$ cf (increase)
2. $\Delta Q_{100} = 5.8 - 4.5 = 1.3$ cfs (increase)

BASIN C CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 59,100/1.36
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	57,330/1.32	97
D	1,770/0.04	03

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	7,680/0.18	13
C	9,460/0.22	16
D	41,960/0.96	71

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(1.13)(1.32)+(2.12)(0.04)]/(1.36) = 1.16$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.16/12)(59,100) = 5,710$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.32)+(4.70)(0.04) = \boxed{4.3 \text{ cfs}}$

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.18)+(1.13)(0.22)+(2.12)(0.96)]/(1.36) = 1.78$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.78/12)(59,100) = 8,770$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.18)+(3.14)(0.22)+(4.70)(0.96) = \boxed{5.6 \text{ cfs}}$

Comparison

1. $\Delta V_{100} = 8,770 - 5,710 = 3,060$ cf (increase)
2. $\Delta Q_{100} = 5.6 - 4.3 = 1.3$ cfs (increase)

BASIN DE-1 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 52,950/1.21
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	52,950/1.21	100

5. Developed Land Treatment (Assume will develop like Tract C)

Treatment	Area (sf/ac)	%
B	7,420/0.16	14
C	9,530/0.22	18
D	36,000/0.83	68

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(52,950) = 4,990$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.21) = 3.8$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.16)+(1.13)(0.22)+(2.12)(0.83)]/(1.21) = 1.76$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.76/12)(52,950) = 7,770$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.16)+(3.14)(0.22)+(4.70)(0.83) = 5.0$ cfs

Comparison

1. $\Delta V_{100} = 7,770 - 4,990 = 2,780$ cf (increase)
2. $\Delta Q_{100} = 5.0 - 3.8 = 1.2$ cfs (increase)

BASIN DE-2 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 5,000/0.11
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	5,000/0.11	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
D	5,000/0.11	100

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(5{,}000) = 470$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.11) = 0.3$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 2.12$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (2.12/12)(5{,}000) = 880$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (4.70)(0.11) = 0.5$ cfs

Comparison

1. $\Delta V_{100} = 880 - 470 = 410$ cf (increase)
2. $\Delta Q_{100} = 0.5 - 0.3 = 0.2$ cfs (increase)

BASIN F-1 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 39,550/0.91
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	39,550/0.91	100

5. Developed Land Treatment (Same land treatments as M15/D22, IP Use)

Treatment	Area (sf/ac)	%
B	9,100/0.21	23
D	30,450/0.70	77

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(39,550) = 3,720$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.91) = 2.9$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.21)+(2.12)(0.70)]/(0.91) = 1.81$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.81/12)(39,550) = 5,970$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.21)+(4.70)(0.70) = 3.8$ cfs

Comparison

1. $\Delta V_{100} = 5,97 - 3,720 = 2,250$ cf (increase)
2. $\Delta Q_{100} = 3.8 - 2.9 = 0.9$ cfs (increase)

BASIN F-2 CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 29,250/0.67
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	29,250/0.67	100

5. Developed Land Treatment (Same land treatments as M15/D22, IP Use)

Treatment	Area (sf/ac)	%
B	6,730/0.15	23
D	22,520/0.52	77

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(29{,}250) = 2{,}750$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.67) = 2.1$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(0.78)(0.15)+(2.12)(0.52)]/(0.67) = 1.82$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.82/12)(29{,}250) = 4{,}440$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (2.28)(0.15)+(4.70)(0.52) = 2.8$ cfs

Comparison

1. $\Delta V_{100} = 4{,}440 - 2{,}750 = 1{,}690$ cf (increase)
2. $\Delta Q_{100} = 2.8 - 2.1 = 0.7$ cfs (increase)

BASIN M CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 58,550/1.34
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	58,550/1.34	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
B	7,025/0.16	12
D	51,525/1.18	88

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(58,550) = 5,510$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(1.34) = 4.2$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = [(1.13)(0.16)+(2.12)(1.18)]/(1.34) = 2.00$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (2.00/12)(58,550) = 9,760$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.16)+(4.70)(1.18) = 6.0$ cfs

Comparison

1. $\Delta V_{100} = 9,760 - 5,510 = 4,250$ cf (increase)
2. $\Delta Q_{100} = 6.0 - 4.2 = 1.8$ cfs (increase)

ALLEY CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 3,850/0.09
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
C	3,850/0.09	100

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
D	3,850/0.09	100

Existing Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 1.13$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (1.13/12)(3,850) = 360$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (3.14)(0.09) = 0.3$ cfs

Developed Condition

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$
$E_W = 2.12$ in.
$V_{100} = (E_W/12)A_T$
$V_{100} = (2.12/12)(3,850) = 680$ cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_p = Q_{100} = (4.70)(0.09) = 0.4$ cfs

Comparison

1. $\Delta V_{100} = 680 - 360 = 320$ cf (increase)
2. $\Delta Q_{100} = 0.4 - 0.3 = 0.1$ cfs (increase)

OFFSITE BASIN CALCULATIONS

Site Characteristics

1. Precipitation Zone = 2
2. $P_{6,100} = P_{360} =$ 2.35 in.
3. Total Area (A_T) 27,300/0.63
4. Developed Land Treatment

Treatment	Area (sf/ac)	%
C	6,800/0.16	25
D	20,500/0.47	75

Developed Condition

1. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$$
$$E_W = [(1.13)(0.16)+(2.12)(0.47)]/(0.63) = 1.87 \text{ in.}$$
$$V_{100} = (E_W/12)A_T$$
$$V_{100} = (1.87/12)(27,300) = 4,250 \text{ cf}$$

2. Peak Discharge

$$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$$
$$Q_p = Q_{100} = (3.14)(0.16)+(4.70)(0.47) = 2.7 \text{ cfs}$$

HYDRAULIC CALCULATIONS
TEMPORARY RUN-DOWN

1. Curb Opening Width

$Q = CLH^{3/2}$

Let:
C = 2.7
Q = 20.4 cfs
H = 0.67 ft (8" curb height)

Therefore: L = 13.77 ft.
Use 16.0 foot design width for future inlet construction

2. Minimum Channel Width
Using Manning's Equation

Let:
n = 0.013
Q = 20.4 cfs
s = 0.0850 ft/ft
d = 0.67 ft (8" curb height)

Therefore: W = 1.74 ft.
Use 10' design width to satisfy C.O.A. requirements

3. Velocity Multiplied by Depth Calculation
Use Manning's Equation

A. 10-Year Storm Event

Let: $Q_{10} = 0.67\ Q_{100} = 0.67(20.4) = 13.7$ cfs

W = 10.0 ft.
S = 0.0850 ft/ft
n = 0.013

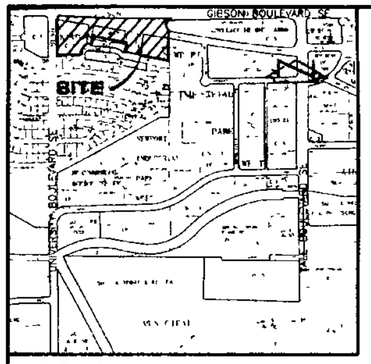
Therefore:
d = 0.15 ft
V = 9.1 ft/s
Vd = 1.36 < 6.5 (per D.P.M.)

B. 100-Year Storm Event

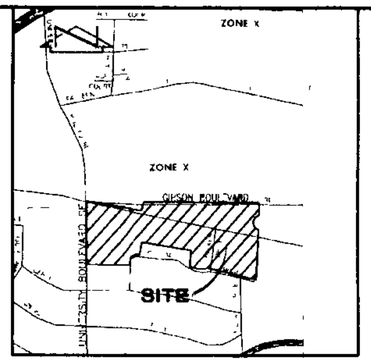
Let: $Q = Q_{100} = 20.4$ cfs

W = 10.0 ft.
S = 0.0850 ft/ft
n = 0.013

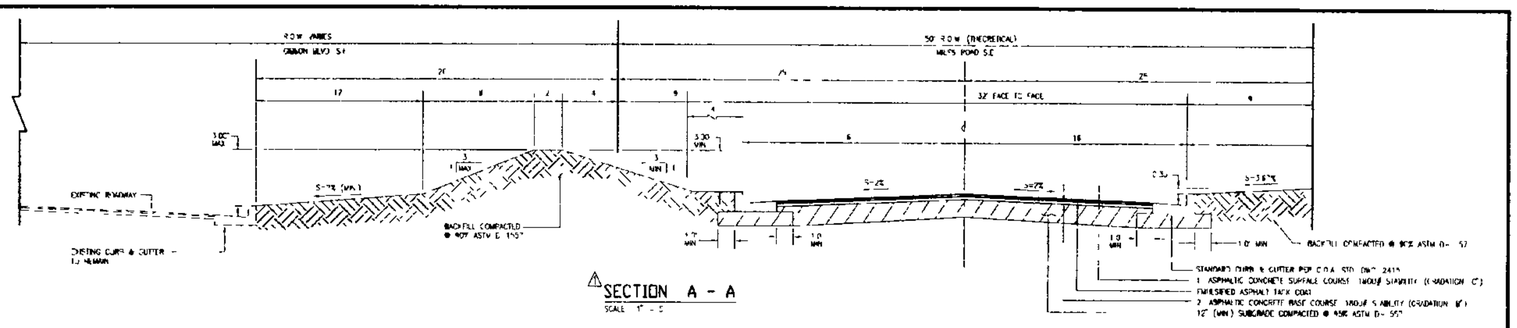
Therefore:
d = 0.19 ft
V = 10.7 ft/s
Vd = 2.03 < 6.5 (per D.P.M.)



VICINITY MAP — M-15
SCALE 1" = 750



FIRM — PANEL 342 OF 825
SCALE 1" = 500



SECTION A - A
SCALE 1" = 5'

STREET CAPACITY CALCULATIONS

USING D.P.M. PLATE 22.3 D-2
40' F.F.
60' R.O.W.
S=0.045 ft/ft
n=0.017

$Q_{(not\ spread)} \approx 75$ cfs

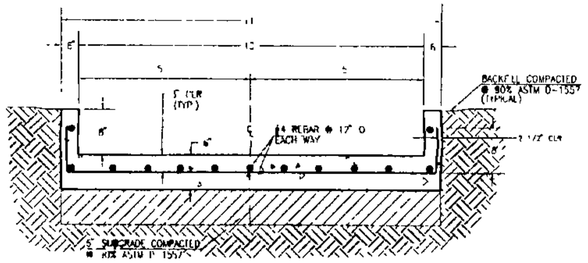
$Q_{FULL\ STREET} = 2(75) = 150$ cfs $>> Q_{100}$

HUNDOWN CALCULATIONS

1. Curb Opening
   $Q = CLH^{3/2}$
   C = 2.7
   Q = 3.35 cfs (Per M.D.P.)
   H = 0.67 ft (6" curb height)
   Therefore L = 4.9 ft
   Use 15.0 ft design width
2. Channel Width
   Using Manning's Equation
   Let n = 0.013
   s = 0.0050 ft/ft
   Q = 23.3 cfs (Per M.D.P.)
   y = 0.67 ft (6" curb height)
   Therefore W = 1.34 ft

The flow

3. Velocity times Depth per D.P.M.
   $vd = 6.5$ @ Q_0
   Using Manning's Equation
   Let n = 0.013
   s = 0.0050 ft/ft
   $Q_{100} = 2.5 \cdot Q_{100} = 2.5(2.53) = 6.3$ cfs
   W = 1.00 ft
   Therefore v = 6.3 fps
   d = 0.16 ft
   vd = 1.0 << 6.5



SECTION B - B
SCALE 1" = 2'-0"

DRAINAGE BASIN SUMMARY TABLES (EXISTING AND DEVELOPED CONDITIONS)

BASIN SUMMARY (OBSERVED AT UNIVERSITY AND GIBSON)

	BASIN	AREA (ac)	V_{100} (Exist) (cf)	V_{100} (Developed) (cf)	ΔV_{100} (cf)	Q_{100} (Exist) (cfs)	Q_{100} (developed) (cfs)	ΔQ_{100} (cfs)
⚠	A-1	0.91	3,760	0	(3,760)[C]	3.6	0.0	(3.6)[C]
⚠	A-2	0.86	3,590	2,710[A]	1,880	3.4	0.8[A,B]	(2.6)[C]
⚠	B	1.42	5,590	8,710	3,120	4.5	0.8[B]	(3.7)[C]
⚠	C	1.36	5,710	0	(5,710)[C]	4.3	0.0	(4.3)[C]
	DE-1	1.21	4,990	0	(4,990)[C]	3.8	0.0	(3.8)[C]
	DE-2	0.11	470	880	410	0.3	0.5	0.2
⚠	F-1	0.91	3,720	0	(3,720)[C]	2.9	0.0	(2.9)[C]
	F-2	0.67	2,750	4,440	1,690	2.1	0.8[B]	(1.3)[C]
⚠	M	1.34	5,510	0	(5,510)[C]	4.2	0.0	(4.2)[C]
⚠	Alley	0.09	370	660	320	0.3	0.4	0.1
	Offsite	0.63	4,250	0	(4,250)[C]	2.7	0.0	(2.7)[C]
⚠	TOTAL	9.51	40,630	20,120	(20,510)[C]	32.1	3.5	(28.6)[C]

BASIN SUMMARY (OBSERVED AT GIBSON)

	BASIN	AREA (ac)	V_{100} (Exist) (cf)	V_{100} (Developed) (cf)	ΔV_{100} (cf)	Q_{100} (Exist) (cfs)	Q_{100} (developed) (cfs)	ΔQ_{100} (cfs)
⚠	A-1	0.91	0	5,780	5,780	0	3.6	3.6
⚠	A-2	0.86	0	5,410[A]	5,410[A]	0	3.4	3.4
⚠	B	1.42	0	0	0	0	0	0
⚠	C	1.36	0	8,770	8,770	0	5.6	5.6
	DE-1	1.21	0	7,700	7,700	0	5.0	5.0
	DE-2	0.11	0	0	0	0	0	0
⚠	F-1	0.91	0	5,970	5,970	0	3.8	3.8
	F-2	0.67	0	0	0	0	0	0
⚠	M	1.34	0	9,760	9,760	0	6.0	6.0
⚠	Alley	0.09	0	0	0	0	0	0
	Offsite	0.63	0	4,250	4,250	0	2.7	2.7
⚠	TOTAL	9.51	0	47,640	47,640	0	30.1	30.1

TOTAL DEVELOPED AREA DRAINING TO GIBSON (BEFORE C.O.A. PROJ. NO. 4850.90) 6.85 ac (72%)
TOTAL DEVELOPED AREA DRAINING TO GIBSON (AFTER C.O.A. PROJ. NO. 4850.90) 7.13 ac (75%)

A — FLOW TO BE DIVERTED TO GIBSON STORM DRAIN UPON COMPLETION OF SIP
B — FLOW RATE OF 0.8 CFS ACHIEVED THROUGH DETENTION
C — NUMBERS IN PARENTHESES ARE NEGATIVE, THEREBY REPRESENTING A DECREASE

MASTER DRAINAGE PLAN

MASTER DRAINAGE PLAN

The following items concerning the Tracts A-G Airport Center Master Drainage Plan are contained herein:

1. Vicinity Map
2. F.I.R.M.
3. Basin Summary Tables
4. Conceptual Grading Plan
5. Future Gibson Blvd. S.E. Storm Drain

As shown by the Vicinity Map, the site is located at the southeast corner of Gibson Boulevard S.E. and University Boulevard S.E. More particularly, the site is bounded by University Boulevard S.E. on the west, Gibson Boulevard S.E. on the north, existing developments on the east (M15/022 and M15/021A) and Lovelace Road S.E. on improved public alley and a small apartment complex on the south. Miles Road S.E. crosses through the site. A present Miles Road S.E. is unimproved.

As shown by Panel 342 of 825 of the National Flood Insurance Program Flood Insurance Rate Maps published by F.E.M.A. for Bernalillo County, New Mexico dated September 20, 1996, the site does not lie within a designated flood hazard area. The site does, however, contribute runoff to a flood hazard area which lies downstream of the site along Mulberry Street S.E. Currently, the site is undeveloped with the exception of Tract C which contains an office building and paved parking lot.

The Conceptual Grading Plan shows: 1) existing and proposed grades indicated by spot elevations and contours at 1.0' intervals, 2) the final grid character of the existing improvements, 3) the final character of the proposed improvements, 4) continuity between existing and proposed grades, and 5) proposed pond locations.

It is the intent of the Master Drainage Plan to outline the probable development scenario of the properties and obtain approval of the drainage characteristics to serve the properties. This plan will also facilitate approval of the drainage requirements for Kirtland Miles Road S.E., Walker Drive S.E., and public alleys through adoption of Lot 1, Block 4, Kirtland Addition replatting action.

As indicated by the existing topography, the site slopes from east to west towards University Blvd. S.E. Consequently, offsite flows do not enter from the west. Offsite flows do not enter from the north or south because those areas are topographically lower. The two developed parcels to the east discharge to Gibson (M15/021A) and to the Kirtland Park Channel (M15/022) respectively. Minor offsite flows are generated by that portion of Miles Road between Buena Vista Drive S.E. and the east end of the site. That area to the east contributes flows calculated to be 2.7 cfs. These flows will be intercepted by the proposed Miles Road and carried by the street sections to Gibson Blvd. S.E. In the existing condition, the majority of the site drains to University Blvd. S.E. where runoff will flow south to be intercepted by the Kirtland Addition Unit 1 street system. These streets drain west to Mulberry Street S.E. where a flood zone is designated between Gerald S.E. and Wheeler S.E.

The Developed Drainage Basins shown hereon have been assumed to have the following future uses per information from the current property owners: Basin A1 – gas station, convenience store, fast food restaurant, police substation, farm & commercial/retail development; Basin B – currently utilized as a car rental facility; Basins DE – commercial/retail; Basin F – industrial park use; Basin G – portions of DPM, public, that will remain.

In recognition of downstream flooding conditions on Mulberry Street S.E. and considering the proposed Gibson Boulevard S.E. Reconstruction/Rehabilitation, University Boulevard to Jackson Street (C.O.A. Project #4850.90), this Plan will divert as much developed runoff to Gibson as is physically possible. As determined from the Basin Summary Table, 75% of the developed area will ultimately drain to Gibson. Of the private areas which will continue to drain to University Blvd., only Basin DE-2 will have free discharge. This is because Basin DE-2 is physically impossible of draining to Gibson Blvd. It is very small and is odd shaped and will most likely be developed as landscaping. Although I was conservatively analyzed as Land Treatment D in the Calculations, for Basins B and F-2 it is proposed to limit the discharge from each tract to the flow rate which is delivered by a 6" drain pipe. This is the smallest discharge possible without utilizing orifice plates, which Tract is prohibited by Ordinance. These two Basins will utilize the concept of onsite detention ponding via a 6" storm drain discharging to historic points on public right-of-way. Individual grading and drainage plans will be required for the development of each tract as a condition for permit approvals.

The determined discharge rate (Q) from Basins A-2, B and F-2 have been conservatively calculated using the Orifice Equation with an average head of 4 feet, which was the head calculated in the Grading and Drainage Plan previously submitted for the current Lot 1, Kirtland Addition Grading and Drainage Plan (City of Albuquerque Hydrology File No. M15/D32, Engineer's Stamp 1/26/96). This yields a peak flow rate of 0.8 cfs from each Basin. The public alley and Basin DE-2 will discharge freely to Lovelace Road S.E. A total peak flow rate of 3.3 cfs will discharge to University Blvd. S.E. which is significantly less than the current rate of 30.1 cfs. There will also be a significant reduction in volume of 100-year runoff, from 40,630 cf to 20,120 cf. It is proposed that the detention ponding be accommodated in the paved parking areas similar to the previously mentioned site specific plan (M15/D32, 1/26/96). In the interim, Basin A-2 should discharge its developed runoff at a controlled rate to University Boulevard S.E. This is proposed as an interim solution. The ultimate solution, as shown by this Master Drainage Plan, is to construct a private storm drain connecting into the back of a public storm drain inlet proposed as part of the Gibson Boulevard project. It is further proposed that this line should be installed as a "dry" line at the time that Tract A is developed and that a temporary plug be placed in the line to render it "dry". At such time as the Gibson Boulevard storm drain and associated inlets are constructed, the plug can be removed and inserted into the temporary discharge line thereby diverting flows to Gibson. When the Basin A-2 diversion is completed there will be a further reduction in the flow rate to University by 0.8 cfs and a reduction in the volume of runoff by 5,410 cubic feet. The future discharge rate for Basin A-2 should be sized for the free discharge of 3.4 cfs and should be installed as shallow as possible to prevent liens problems in case the storm drain system depth changes during construction.

In the preparation of this plan, the Preliminary Drainage Report for the Gibson Boulevard (Reconstruction/Rehabilitation, University Boulevard to Jackson Street) (C.O.A. Project No. 4850.90), prepared by And Engineering, Inc., dated August 1996, has been reviewed. It is noted that the majority of this site lies within Basin 70 as identified on the Basin Map appearing thereon. The Gibson Boulevard Report conservatively calculates that all of Basin 70 will drain into Gibson Boulevard S.E. Closer review of the topographic data presented reveals that most of the area comprising tracts A-G, Airport Center, drains to Lovelace Road S.E. or University Boulevard S.E. The ARMMS Model created by And Engineering for the developed conditions shows a discharge rate of 4.43 cfs per acre for Basin 70. This can be determined from the Basin Summary Table for Gibson Blvd.: Basins A-1, A-2, C, DE-1, M-1, F-1 and F-2. The Offsite Basin will discharge 30.1 cfs/7.37 acres = 4.08 cfs per acre. These Basins will all surface drain to Gibson Blvd. either directly or via the temporary run down to be constructed from Miles Rd. S.E. to Gibson Blvd.

This site lies within Reach 1 as designated in the And report which extends from Yale Boulevard to University Boulevard and the South Diversion Channel. The storm drain improvements in this reach are intended to: a) collect runoff from areas east and south of the Yale intersection, b) eliminate runoff to the unimproved arroyos/private property along the north side of Gibson Boulevard S.E. and to c) reduce surface flows through the University Boulevard intersection in accordance with City design criteria. Discussions with Mr. Rick Bellomo of And Engineering indicate that the system is being constructed in order to allow for free discharge from Basin 70. The diversion of the runoff from a University Boulevard discharge to a Gibson Boulevard discharge will be advantageous as it will lessen downstream impacts. The future alignment for the Gibson Boulevard storm drain is shown on this plan along with preliminary inlet locations. The final design and analysis of the future storm drain and inlet locations is being coordinated between this office and And Engineering, Inc.

It appears likely that Miles Road will develop before the Proposed Gibson Blvd. Storm Drain will be constructed. In the interim, there will be free discharge of additional developed runoff to Gibson Boulevard. This is appropriate because the development is programmed toward the ultimate drainage scenario. The planned construction are in close proximity to the bottom of the Gibson Watershed and the existing facilities which convey flows into the South Diversion Channel. Carlos Montoya, C.O.A. Hydrology Section, indicated via phone conversation that the existing facilities located at the bottom of Gibson Blvd. have sufficient capacity to convey Gibson flows into the South Diversion Channel.

The Miles Road S.E. Street Section will convey all runoff from Basins C, DE-1, M-1 and the offsite flows directly to Gibson Blvd. S.E. via a temporary rundown. The temporary rundown is provided in lieu of permanent storm drain improvements to provide maximum flexibility in the design of the Gibson Blvd. S.E. improvements. The rundown is 10' wide and constructed with concrete. Bollards will be installed at the inlet and outlet of the rundown to discourage traffic use. Per the D.P.M., the maximum value for the runoff depth multiplied by runoff velocity, using driving lanes is 6.5 for the 10-year storm event. As shown by the Calculations, the depth multiplied by the velocity is equal to 1.57, which is much less than 6.5 for the 10-year event. The 100-year event increases the value to 2.15, which is still less than 6.5 the D.P.M. requirement.

Runoff from Basin F-1 will drain directly to Gibson Blvd. S.E. either via developed and/or private drainage improvements with the final method to be addressed in a separate submittal for Building Permit. Basin A-2 will ultimately drain to University Blvd. S.E. via private storm drainage improvements within public right-of-way. Paving (street) improvements alone are sufficient to control and convey the developed runoff analyzed hereon for public drainage infrastructure is required.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Procedure for Arroyo and Small-Area Flows, as set forth in the Revised Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. As shown by these calculations, there is a net increase in volume and peak flow rate generated for each tract, but by exercising much of the runoff to Gibson Blvd. N.E. and through the use of detention ponding, the peak flow rate and volume of runoff discharging to University will decrease significantly when compared to the existing flow rates. This reduction in flow rate and volume will lessen the impact on downstream flooding observed during significant rainfall events.

THIS PLAN REPLACES THE PREVIOUS PLAN DATED 02-15-1996

JEFFREY G. MORTENSEN NEW MEXICO 8547 REGISTERED PROFESSIONAL ENGINEER
03-0497

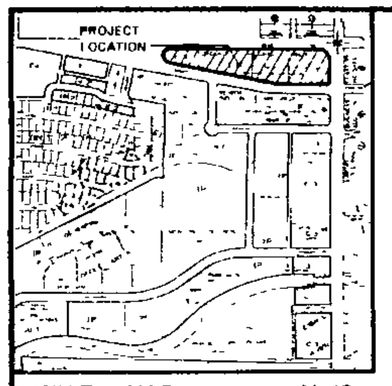
jma — JEFF MORTENSEN & ASSOCIATES, INC.
CIVIL & TRANSPORTATION ENGINEERS
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS • SURVEYORS (505) 345-4558

VICINITY MAP, DRAINAGE PLAN, CALCULATIONS, SECTIONS AND F.I.R.M.
MASTER DRAINAGE PLAN
MILES ROAD S.E. / KIRTLAND ADDITION

DESIGNED BY: GM/LMB
DRAWN BY: SGH
APPROVED BY: JGM

NO	DATE	BY	REVISIONS
1	2/97	GRB	REVISE TO ACCOUNT FOR NEW ALIGNMENT OF MILES ROAD S.E.

JOB NO: 950925
DATE: 03-1997
SHEET 2 OF 2



PROJECT BENCHMARK
AC 9 1 MAG BRASS CAP SET FLUSH IN PAVEMENT 16 FEET SOUTH OF THE INTERSECTION OF YALE BLVD & GIBSON BLVD
ELEVATION 5168.93 FEET (NAVD 88)

TBM
CHISELED 'X' ON SW CORNER OF CONCRETE SLAB AS SHOWN HEREON
ELEVATION 5168.53 (NAVD 88)

LEGAL DESCRIPTION
TRACTS A-1 B-1 & C-1
COLLALE HEIGHTS ADDITION

VICINITY MAP M-15

SCALE 1" = 800'

LEGEND

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- 5168 EXISTING CONTOUR
- 56 PROPOSED CONTOUR
- EXISTING CONCRETE
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- FL FLOW LINE
- TC TOP OF CURB
- (TC 63.63) 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

DRAINAGE PLAN

The following items concerning the E A Park Parking Lot Drainage Plan are contained herein

1 Vicinity Map
2 Grading Plan
3 Calculations

As shown in the Vicinity Map this site is located in 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 (AMDS) this site is down hill within a designated Flood Hazard Zone and downstream flooding is not apparent and can 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 into private property located on the north side of Gibson Boulevard S E A portion of the site flows from east to west into Gibson Boulevard S E as offsite flows enter the site along the north and east property lines since the adjacent streets route runoff away from the project site We offer no flows enter the site along the west property line since the adjacent lot is graded in a manner which will route runoff away from the project site We offsite flows enter the site along the south property line along the existing earth ditch along the north side of the Miles Road S E right-of-way reroute 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 into Gibson Boulevard S E via a series of multiple sidewalk culverts from this point the runoff will flow west along the south edge of Gibson Boulevard S E to an existing concrete culvert located above the South Diversion Channel which is located roughly about 1900 feet to the west of the project site which is the outfall for this site A previous hydrology study has substantiated the capacity of this existing downstream facility based upon the fact that this site is an infill site it is located at the lower end of the watershed and the proximity of downstream facilities the flow discharge of runoff from this site is appropriate Furthermore the proposed drainage pattern will eliminate the problem of directly 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 pending and discharging at a controlled rate since this would only increase the amount of runoff the hinged lid on an existing storm inlet located roughly about 350 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 21-F the inlet capacity is only about 18 cfs The upstream contribution is approximately 74 cfs as determined by the AMDS update (draft only) Consequently the proposed parking will not affect the inlet capacity nor will it increase the runoff presently being discharged onto private property

The Calculations which appear herein analyze both the existing and developed conditions for the 100-year 6-hour rainfall event The Rational 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 2 and the Hydrology Emergency Policy 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 Metropolitan County Soil Survey
Plate 31 Map Unit (fine sand) loam
Hydrologic Soil Group A
Existing Impervious CN = 98 (DPM Plate 22 2 C-2)
Pasture or Grass 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)

$T_l = T_c = 10$ min

Point Rainfall

$P_{6c} = 2.3$ in (DPM Plate 22 2 D-1)

Rational Method (100 YEAR RAINFALL)

Discharge Q = CIA

where C varies
$i = P_6 (6/T_c)^{0.51} = 2.3 (6/.16)^{0.51} = 4.98$ 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(RO) A

Where RO = Direct runoff in inches
A = area acres

Existing Condition

Basin 1
$A_{total} = 332,465$ sf = 7.63 Ac
$C_{avg} = 0.98$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.98)(4.98)(7.63) = 36.9$ cfs
Basin 2
$A_{lim} = 48$ sf (impervious)
Composite CN = 98 (DPM Plate 22 2 C-3)
RO = 0.4 in (DPM Plate 22 2 C-4)
$V_{100} = 3630$ (RO) A = 10,428 cf

Developed Condition

Basin 1
$A_{total} = 214,480$ sf = 4.92 Ac
Roof area = 1,200 sf (0.03)
Paved area = 207,409 sf (0.75)
Landscaped area = 6,000 sf (0.20)
$C_{avg} = 0.88$ (Weighted average per Emergency Rule, 1/14/86)
$Q_{100} = CIA = (0.88)(4.98)(4.92) = 21.7$ cfs
Basin 2
$A_{imp} = 208$ sf (impervious) = .57 Ac
Composite CN = 97 (DPM Plate 22 2 C-3)
RO = 1.2 in (DPM Plate 22 2 C-4)
$V_{100} = 3630$ (RO) A = 33,930 cf

Developed Condition

Basin 1
$A_{total} = 16,077$ sf = .36 Ac
Paved area = 14,075 sf (.91)
Landscaped area = 400 sf (0.03)
$C_{avg} = 0.95$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.95)(4.98)(.36) = 1.7$ cfs
Basin 2 = 49,040 sf = 1.01 Ac
Landscaped area = 400 sf (0.03)
$C_{avg} = 0.95$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.95)(4.98)(1.36) = 6.3$ cfs
Basin 3 = 44,000 sf = 1 (impervious) = 100 %
Composite CN = 98 (DPM Plate 22 2 C-3)
RO = 2.3 in (DPM Plate 22 2 C-4)
$V_{100} = 3630$ (RO) A = 8455 cf

Developed Condition

Basin 1
$A_{total} = 59,040$ sf = .36 Ac
Total area = 49,040 sf (1.0)
Landscaped area = 400 sf (0.03)
$C_{avg} = 0.95$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.95)(4.98)(1.36) = 6.3$ cfs
Basin 2 = 54,040 sf (1 impervious) = 100 %
Composite CN = 98 (DPM Plate 22 2 C-3)
RO = 2.3 in (DPM Plate 22 2 C-4)
$V_{100} = 3630$ (RO) A = 10,860 cf

Channel Capacity (21'-0" curb opening) Weir Equation

$Q = CLH^{3/2} = 3.4$ cfs
Where C = 3.33
L = 21'-0"
H = 0.67 feet

REVISED SIDEWALK CULVERT SIZING

Rational Method

Discharge Q = CIA

Where C varies
$i = P_6 (6/T_c)^{0.51} = 3.3$ in/hr
$P_6 = 1.51$ in (DPM Plate 22 2D-1 = 100 Year Rainfall)
$T_c = 10$ min (minimum)
A = area acres

Developed Condition (10 Year Rainfall)

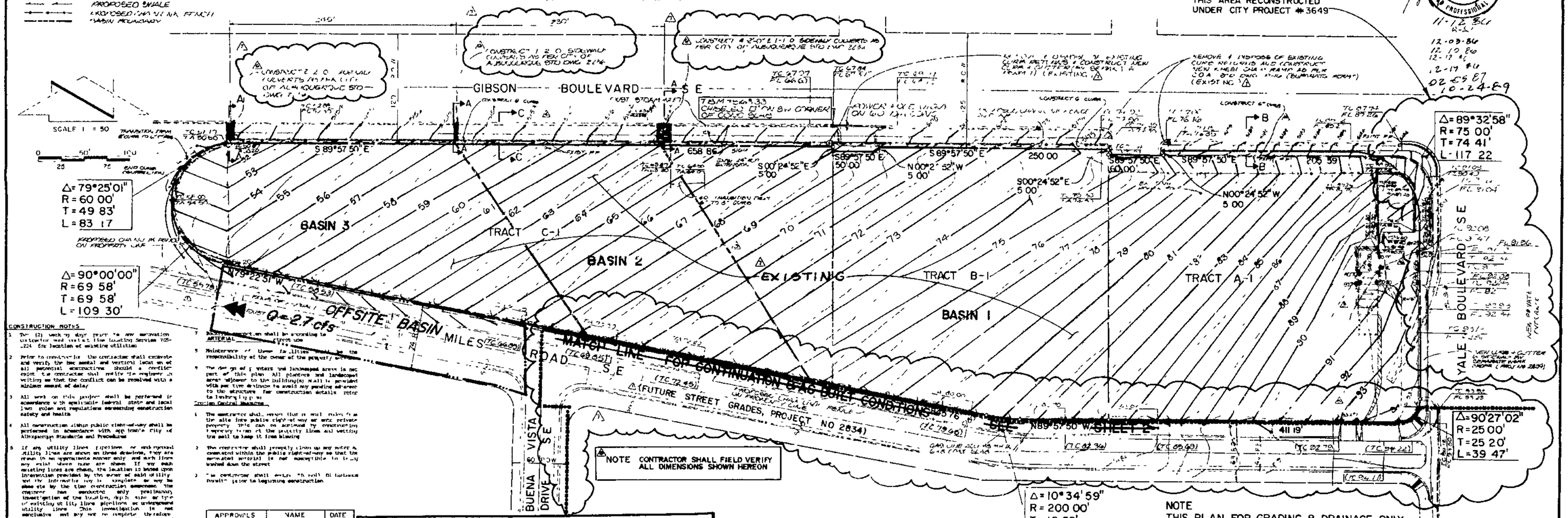
Basin 1
$C_{avg} = 0.93$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.93)(3.19)(4.92) = 14.3$ cfs
Basin 2
$C_{avg} = 0.95$ (Weighted average per Emergency Rule 1/14/86)
$Q_{100} = CIA = (0.95)(3.19)(1.06) = 3.2$ cfs
Basin 3
$C_{avg} = 0.95$ (Weighted average per Emergency Rule, 1/14/86)
$Q_{100} = CIA = (0.95)(3.19)(1.36) = 4.3$ cfs

Therefore use 4 - 21'0" and - 1 0" sidewalk culverts (Basin 1)
1 - 21'0" sidwalk culvert (Basin 2)
2 - 21'0" sidewalk culverts (Basin 3)

Comparison

$Q_{100} = (21.8 + 4.3 + 6.3 + 1.7) - (14.0 + 18.2)$ cfs (increase)
$Q_{100} = (33,930 + 8455 + 10,860) - 10,625 = 42,830$ cf (increase)

THIS AREA RECONSTRUCTED UNDER CITY PROJECT #3649



CONSTRUCTION NOTES

1 Two (2) working days prior to any excavation contractor must contact line locating Services 765-2211 for location of existing utilities
2 Prior to construction the contractor shall excavate and verify the horizontal and vertical location of all potential interferences 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 Albuquerque City of Albuquerque Standards and Procedures
5 If any utility lines pipelines or underground utility lines are shown on these drawings they are drawn 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 not by independent way to complete or may be done so by the time construction commences The engineer has conducted only preliminary investigation of the location depth size or type of existing utility lines This investigation is not conclusive and may not reveal the entire extent where no representation pertaining thereto and assumes no responsibility or liability for the same 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 construction 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 as a prerequisite and connecting excavation the road area shall comply with state and 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 A separate copy of these plans must be submitted at the time of application for this permit
7 Backfill material shall be according to ARTERIAL street use
8 Maintenance of these facilities shall be the responsibility of the owner of the property/ [illegible]
9 The design of private and landscaped areas is not part of this plan All planting and landscape areas adjacent to the building(s) shall be provided with per time distance to avoid any growing adjacent to the structure For construction details refer to landscaping plans

Erosion Control Measures

1 The contractor shall ensure that it will make it so the site from 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 mud or debris within the public right-of-way so that the accumulated material is not susceptible to being washed down the street
3 The contractor shall water the soil to control dust [illegible] prior to beginning construction

APPROVALS	NAME	DATE
ACE / DESIGN		
INSPECTOR		
ACE / FIELD		

NO	DATE	BY	REVISIONS
1	11/86	[illegible]	[illegible]
2	11/87	[illegible]	[illegible]
3	1/88	[illegible]	[illegible]

DESIGNED BY [illegible]
DRAWN BY [illegible]
APPROVED [illegible]

60157

10 - 89

GRADING AND DRAINAGE PLAN
EXPRESS AIRPORT PARKING

SHEET 1 OF [illegible]

LEGAL DESCRIPTION

LOT 9, BLOCK A, KIRTLAND ADDITION
LOT 1, BLOCK A, KIRTLAND ADDITION
UNPLATTED PARCELS
TRACT 4-A-1, NEWPORT INDUSTRIAL PARK-WEST UNIT 2
MILES RD S.E., WALKER DRIVE S.E. AND PUBLIC ALLEYS

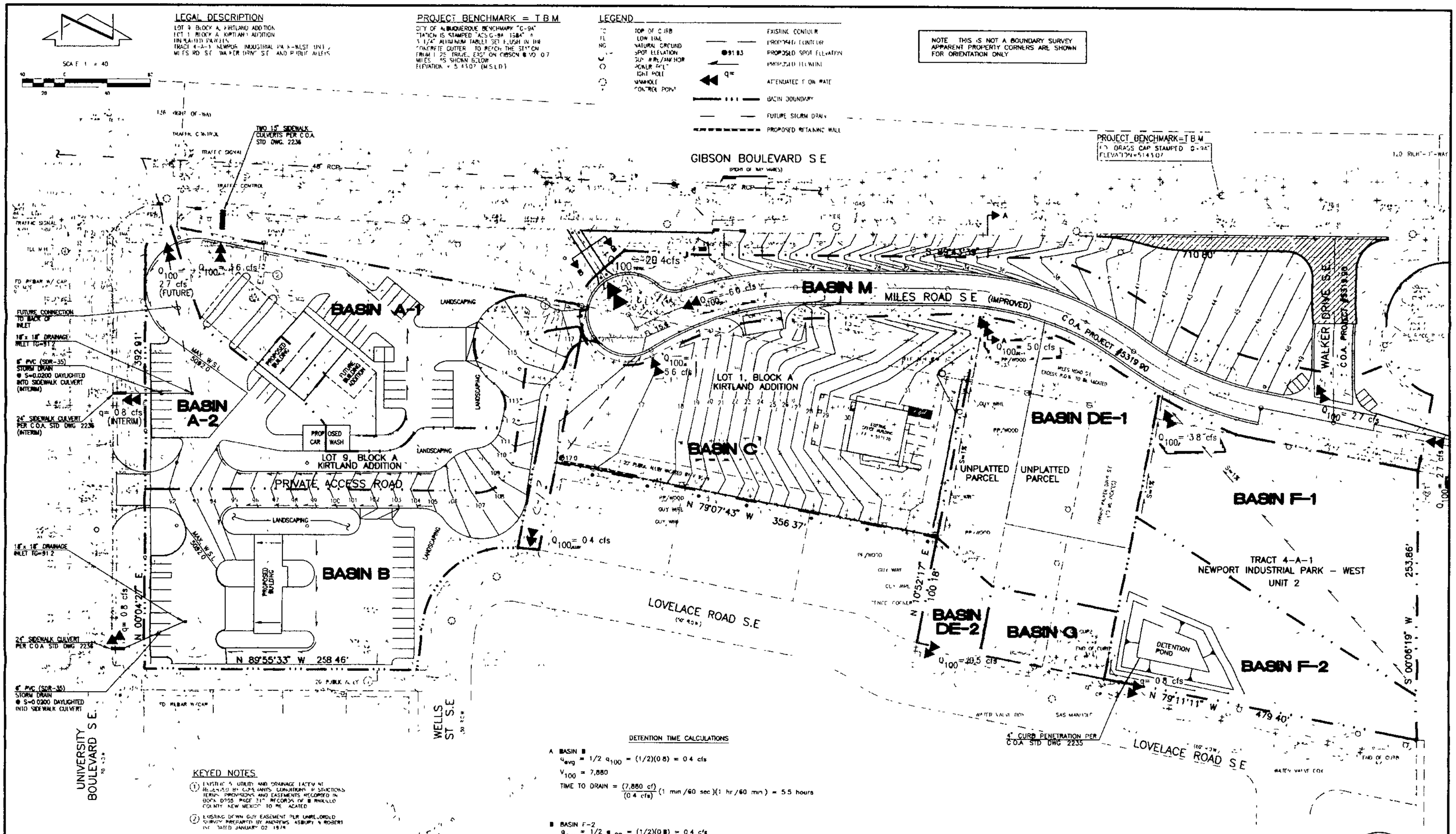
PROJECT BENCHMARK = T.B.M.

CITY OF ALBUQUERQUE BENCHMARK "G-9A"
STATION IS STAMPED "ACS G-9A 1984"
3 1/4" ALUMINUM TABLET SET FLUSH IN THE CONCRETE GUTTER TO REACH THE STATION FROM I-25 TRAVEL EAST ON GIBSON TO VO 0.7 MILES AS SHOWN BELOW
ELEVATION = 5.4507 (M.S.L.D.)

LEGEND

- TC — TOP OF CURB
- FL — LOW LINE
- NG — NATURAL GROUND
- SPOT ELEVATION
- GUY WIRE/ANCHOR
- POWER POLE
- LIGHT POLE
- MANHOLE
- CONTROL POINT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- 91.83 — PROPOSED SPOT ELEVATION
- PROPOSED FLOWLINE
- q= — ATTENUATED FLOW RATE
- BASIN BOUNDARY
- FUTURE STORM DRAIN
- PROPOSED RETAINING WALL

NOTE: THIS IS NOT A BOUNDARY SURVEY. APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY.



KEYED NOTES

1. EXISTING 5' UTILITY AND DRAINAGE EASEMENT RELEASED BY COVENANTS, CONDITIONS & RESTRICTIONS TERMS, PROVISIONS AND EASEMENTS RECORDED IN BOOK D755, PAGE 317, RECORDS OF BERNALILLO COUNTY, NEW MEXICO, TO BE VACATED.
2. EXISTING DOWN GUY EASEMENT PER UNRECORDED SURVEY PREPARED BY ANDREWS, ASBURY & ROBERTS INC. DATED JANUARY 02, 1974.

DETENTION TIME CALCULATIONS

A. BASIN B

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 7{,}880$

TIME TO DRAIN $= \frac{(7{,}880\ cf)}{(0.4\ cfs)}(1\ min/60\ sec)(1\ hr/60\ min) = 5.5$ hours

B. BASIN F-2

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 4{,}440$ cf

TIME TO DRAIN $= \frac{(4{,}440\ cf)}{(0.4\ cfs)}(1\ min/60\ sec)(1\ hr/60\ min) = 3.1$ hours

THIS PLAN REPLACES THE PREVIOUS PLAN DATED 02-15-1996

JEFFREY G. MONTGOMERY — NEW MEXICO — 8547 — REGISTERED PROFESSIONAL ENGINEER

03-04-97

jma — JEFF MONTGOMERY & ASSOCIATES, INC.
6400-B HIGHWAY PARK BLVD. NE
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS / SURVEYORS (505) 345 4558

MASTER DRAINAGE PLAN
MILES ROAD S.E. / KIRTLAND ADDITION

DESIGNED BY	GM/GW
DRAWN BY	TNT
APPROVED BY	JGM

NO.	DATE	BY	REVISIONS

JOB NO.	950925
DATE	03-1997
SHEET	1 OF 2

EXISTING DRAINAGE BASINS

LEGAL DESCRIPTION

LOT 9, BLOCK A, KIRTLAND ADDITION
LOT 1, BLOCK A, KIRTLAND ADDITION
UNPLATTED PARCELS
TRACT 4-A-1, NEWPORT INDUSTRIAL PARK-WEST, UNIT 2
MILES RD S.E., WALKER DRIVE S.E. AND PUBLIC ALLEYS

SCALE 1" = 40'

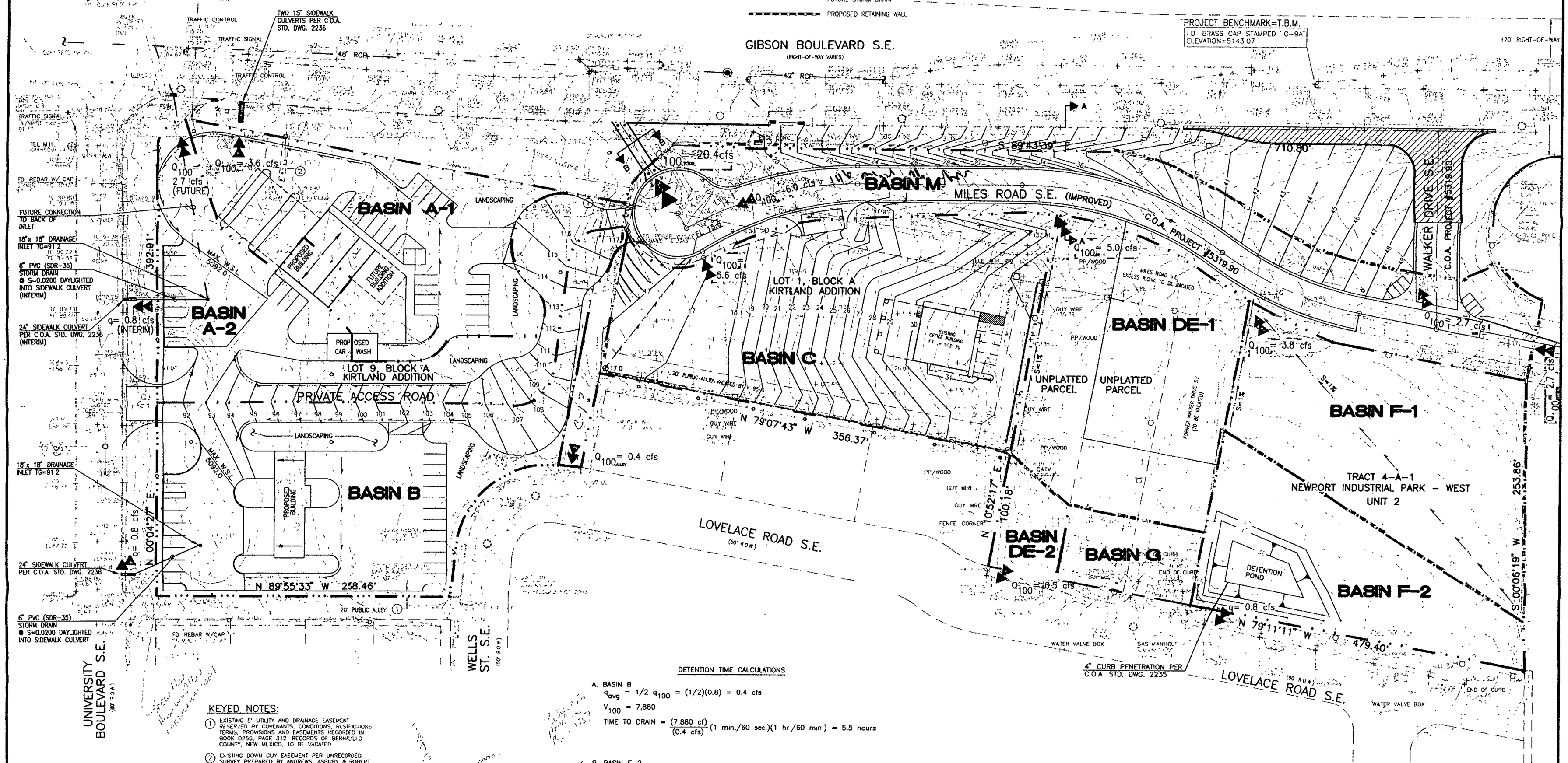
PROJECT BENCHMARK = T.B.M.

CITY OF ALBUQUERQUE BENCHMARK "G-9A"
STATION IS STAMPED "ACS,G-9A, 1984" A 3 1/4" ALUMINUM TABLET SET FLUSH IN THE CONCRETE GUTTER TO REACH THE STATION FROM I-25, TRAVEL EAST ON GIBSON BLVD 0.7 MILES AS SHOWN BELOW
ELEVATION = 5141.07' (MSLD)

LEGEND

TC	TOP OF CURB
FL	FLOW LINE
NG	NATURAL GROUND
91.93	SPOT ELEVATION
	GUY WIRE/ANCHOR
	POWER POLE
	LIGHT POLE
	MANHOLE
	CONTROL POINT
	EXISTING CONTOUR
	PROPOSED CONTOUR
91.93	PROPOSED SPOT ELEVATION
	PROPOSED FLOWLINE
q=	ATTENUATED FLOW RATE
	BASIN BOUNDARY
	FUTURE STORM DRAIN
	PROPOSED RETAINING WALL

NOTE: THIS IS NOT A BOUNDARY SURVEY APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY.



KEYED NOTES:

1. EXISTING 5' UTILITY AND DRAINAGE EASEMENT RESERVED BY COVENANTS, CONDITIONS, RESTRICTIONS TERMS, PROVISIONS AND EASEMENTS RECORDED IN BOOK 0295, PAGE 312 RECORDS OF BERNALILLO COUNTY, NEW MEXICO, TO BE VACATED
2. EXISTING DOWN GUY EASEMENT PER UNRECORDED SURVEY PREPARED BY ANDREWS, ASBURY & ROBERT, INC DATED JANUARY 02, 1979

DETENTION TIME CALCULATIONS

A. BASIN B

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 7{,}880$

TIME TO DRAIN $= \frac{(7{,}880\ cf)}{(0.4\ cfs)}(1\ min./60\ sec.)(1\ hr/60\ min) = 5.5$ hours

B. BASIN F-2

$q_{avg} = 1/2\ q_{100} = (1/2)(0.8) = 0.4$ cfs

$V_{100} = 4{,}440$ cf

TIME TO DRAIN $= \frac{(4{,}440\ cf)}{(0.4\ cfs)}(1\ min/60\ sec)(1\ hr/60\ min.) = 3.1$ hours

THIS PLAN REPLACES THE PREVIOUS PLAN DATED 02-15-1996.

JEFFREY G. MORTENSEN NEW MEXICO 8547 REGISTERED PROFESSIONAL ENGINEER

JN 03-0497

JEFF MORTENSEN & ASSOCIATES, INC.
6010 B MIDLAND PARK BLVD NE
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250

MASTER DRAINAGE PLAN
MILES ROAD S.E. / KIRTLAND ADDITION

DESIGNED BY	GH/GRB
DRAWN BY	TNT
APPROVED BY	JGM

NO.	DATE	BY	REVISIONS

JOB NO	950925
DATE	03-1997
SHEET	1 OF 2

C:\DATA\ACAD96\950925\950925H4 Wed Mar 5 15:06:22 1997

Weighted E Method

Albuquerque Chili's University & Gibson (Miles Road). - Zone #2

Pre-Development Basins

Basin Description												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
C	59,100	1.357	0.00212	0%	0	13%	0.176	16%	0.21708	71%	0.963	1.787	0.202	5.61	1.071	0.121	3.56	0.588	0.066	1.94
M	58,550	1.344	0.00210	0%	0	0%	0.000	12%	0.161295	88%	1.183	2.001	0.224	6.07	1.242	0.139	3.99	0.713	0.080	2.30
DE-1	52,950	1.216	0.00190	0%	0	14%	0.170	18%	0.218802	68%	0.827	1.754	0.178	4.96	1.044	0.106	3.13	0.567	0.057	1.68
F-1	39,550	0.908	0.00142	0%	0	0%	0.000	23%	0.208827	77%	0.699	1.892	0.143	3.94	1.151	0.087	2.55	0.643	0.049	1.43
Total	**210,150**	**4.824**	**0.00754**										**0.747**	**20.58**		**0.453**	**13.24**		**0.252**	**7.34**

Post-Development Basins

Basin Description												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	4,588	0.105	0.00016	0%	0	0%	0.000	100%	0.105326	0%	0.000	1.130	0.010	0.33	0.520	0.005	0.18	0.150	0.001	0.06
2	42,120	0.967	0.00151	0%	0	0%	0.000	7%	0.067686	93%	0.899	2.051	0.165	4.44	1.283	0.103	2.94	0.745	0.060	1.71
3	18,908	0.434	0.00068	0%	0	0%	0.000	7%	0.030385	93%	0.404	2.051	0.074	1.99	1.283	0.046	1.32	0.745	0.027	0.77
4	3,508	0.081	0.00013	0%	0	0%	0.000	100%	0.080533	0%	0.000	1.130	0.008	0.25	0.520	0.003	0.14	0.150	0.001	0.05
5	5,582	0.128	0.00020	0%	0	0%	0.000	100%	0.128145	0%	0.000	1.130	0.012	0.40	0.520	0.006	0.22	0.150	0.002	0.08
6	15,094	0.347	0.00054	0%	0	0%	0.000	96%	0.33265	4%	0.014	1.170	0.034	1.11	0.553	0.016	0.61	0.176	0.005	0.23
M1 (offsite)	31,190	0.716	0.00112	0%	0	0%	0.000	43%	0.30789	57%	0.408	1.694	0.101	2.89	0.987	0.059	1.81	0.515	0.031	0.94
DE-1	52,950	1.216	0.00190	0%	0	14%	0.170	18%	0.218802	68%	0.827	1.754	0.178	4.96	1.044	0.106	3.13	0.567	0.057	1.68
F-1	39,550	0.908	0.00142	0%	0	0%	0.000	23%	0.208827	77%	0.699	1.892	0.143	3.94	1.151	0.087	2.55	0.643	0.049	1.43
Total	**213,490**	**4.901**	**0.00766**										**0.725**	**20.31**		**0.431**	**12.90**		**0.233**	**6.95**

3.2

Equations:

Weighted E = $E_a*A_a + E_b*A_b + E_c*A_c + E_d*A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a * A_a + Q_b * A_b + Q_c * A_c + Q_d * A_d$

CITY OF ALBUQUERQUE

November 21, 2014

Ron Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Pl NE
Albuquerque, NM 87109

Re: Chili's at Gibson and University
Drainage Report and Grading Plan and Drainage Plan
Engineer's Stamp Date 11-6-14 (M15D012B)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 11-6-14, the above referenced report and plan cannot be approved for Building Permit approval until the following comments are addressed:

OK 1. The storm water in Miles Road to the east of the site is public water. Public water should not be allowed to drain onto a private site. Capture the storm water from Miles Road before the storm water enters the site. PROVIDING PUBLIC EASEMENT

2. The flows stated for the analysis points 2 and 3 and flows identified in the 18 inch storm drains do not seem to correspond to the basins draining to them. How were those determined? Provide an analysis point for the flow going to Gibson.

3. Existing contours on the west side of the property are not completely visible. JUST FLAT Show those. Provide the grate and inlet elevations of the existing inlet connected to the 30 inch storm drain.

4. How deep is the swale shown in Section A-A on sheet C9? On sheet C3, reference the Concrete Swale detail on C7. Is the Valley Gutter detail needed also? Where does the cut-off wall on sheet C7 go on sheet C3?

5. Retain the First Flush as much as possible. Per the City Drainage ordinance, the 90th Percentile Storm Event, which is 44 inches, is to be managed. Reduce 0.44 inch by the 0.1 inch for the initial impervious abstraction in Table A-6 of Section 22 of the DPM. Multiply the remaining 0.34 inch by your impervious area. This is the portion to retain. Provide the amount that is necessary to be retained and how much is actually being retained. There are many opportunities to retain the First Flush such as the following:
   A. Depress islands as much as possible. Provide curb cuts with elevations and bottom elevations.
   B. Make the southern swale a detention/retention pond with the restricted outlet or raise the outlet above the bottom elevation to create some retention. Where an inlet is being proposed with a grate elevation 5126.90, shorten the rundowns, create a ponding area, and raise the inlet above the bottom of the pond.
   C. Where an inlet is being proposed with a grate elevation 5123.00, create a ponding area and raise the inlet above the bottom of the pond.

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Albuquerque
New Mexico 87103
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CITY OF ALBUQUERQUE

There are many locations to allow water to percolate. Utilize as many as possible.

6. Move the southwestern inlet west without going into the future driveway to capture more flows from the steep slope and to keep as much flow as possible from going to the site to the west. OS contour? DONG RET WALL

Please contact me at 924-3994 if you have any questions.

Sincerely,

Amy L. D. Niese, P.E.
Senior Engineer, Hydrology
Planning Department

C: e-mail

✓ Rundowns big enough? He will check
x Show driveway + design with this GTD
We will get separate submittal from another eng for that
✓ Can do conc rundown + public drain easement
Just don't go to McDonald's site w/ storm water
Same owner for Chiles McDonald's + Chic FilA

PO Box 1293

Albuquerque

New Mexico 87103

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City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: **Chilis Gibson & University** City Drainage #: M15D012B

DRB#: EPC#: Work Order#:

Legal Description:

City Address:

Engineering Firm: **Tierra West, LLC** Contact: **Joel Hernandez**

Address: **5571 Midway Park Place NE Albuquerque NM 87109**

Phone#: **505-858-3100** Fax#: **505-858-1118** E-mail: **jdhernandez@tierrawestllc.co**

Owner: **Josh Skarsgard** Contact:

Address: **8220 San Pedro Ne Suite 500**

Phone#: **505-262-2323** Fax#: E-mail: **josh@skarsgardfirm.com**

Architect: **GHA Architecture/ Development** Contact: **Keilah Brown**

Address: **14901 Quorum Drive, Suite 300 Dallas, Texas 75254**

Phone#: **972-238-8884** Fax#: **972-239-5054** E-mail: **kbrown@GHA-Architects.com**

Surveyor: **Precision Surveys** Contact: **Larry Medrano**

Address: **5571 Midway Park Place NE Albuquerque, NM 87109**

Phone#: **505-856-5700** Fax#: E-mail: **larry@presurv.com**

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

X DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
___ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
X GRADING PLAN
X EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
X TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
X BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION

___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED
NOV - 6 2014
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes ___ No ___ Copy Provided

DATE SUBMITTED: **10/24/2014** By: **Joel Hernandez**

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, an scope to the proposed development defines the degree of drainage detail One or more of the following levels of submittal may be required based on the followin

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

$A_D = 3.2$? FRUSE

Cherne, Curtis

From: Heather Macomber <Heather.Macomber@Adams-Engineering.com>
Sent: Thursday, November 06, 2014 1:47 PM
To: Cherne, Curtis
Subject: RE: 2014.061 McDonald's Albuquerque, NM (SEC Gibson/University)

What kind of review time does it take for Grading and Drainage and Erosion Control?

Thanks,

Heather Macomber

Adams | Engineering & Development Consultants
O: 817.328.3200 D: 817.328.3243
heather.macomber@adams-engineering.com

From: Cherne, Curtis [mailto:CCherne@cabq.gov]
Sent: Friday, October 24, 2014 11:05 AM
To: Heather Macomber
Subject: RE: 2014.061 McDonald's Albuquerque, NM (SEC Gibson/University)

Heather,

a. It is not clear that the storm drain was constructed as the site is left ½ built.
1. Most of the site is to drain to the 24" stub in Gibson. Verify existing onsite storm drain inverts and whether manhole was constructed that ties to 24" stub in Gibson Blvd.
2. Yes
3. The site is to retain the first flush volume. Volume= 0.34 inches times the impervious area.
4. No
5. Yes, 0.8 cfs is allowed to surface drain to University Blvd.
6. You may have to build a manhole that connects to the City system. A manhole will be required at the end of the 24" stub on Gibson. This can be constructed via SO-19 Permit if barricading is not required in Gibson Blvd. Please contact Construction Services for fees.
7. Storm drain material in ROW to be RCP, ductile iron or PVC. Private is private and can be generally accepted materials.
8. Yes, for the realignment of Miles Rd. For onsite, you are to review previous studies to ensure your drainage plan is in compliance. Drainage file M15D012A and another study is referenced.
9. Hard to tell on the easements. Both properties will share a storm drain connection to Gibson Blvd. Depending on where it is located will dictate the appropriate private drainage easement required.
10. Yes. First flush, mentioned earlier.
11. No
12. Perform site visit and review previous drainage plans/studies.

It looks like a platting action is required and the realigned Miles Road cuts through Tract A. It is difficult to commit to the realignment of Miles Rd without more information.
You should contact Kristal Metro of Transportation Development.

Curtis Cherne, P.E.
City Hydrologist

From: Heather Macomber [mailto:Heather.Macomber@Adams-Engineering.com]
Sent: Thursday, October 16, 2014 5:18 PM
To: Cherne, Curtis
Subject: 2014.061 McDonald's Albuquerque, NM (SEC Gibson/University)

Curtis,
We are working on a new McDonald's at the southeast corner of Gibson and University. Attached is a concept plan for reference. There's a few questions that we have for you:

Storm Sewer

It is our understanding that there is a 21" HDPE storm pipe running thru the site in between the proposed McDonald's and Chick-fil-A, and then connects to a storm manhole in Gibson ROW.

1) Will we be able to utilize the existing storm system for our drainage? Or will we need to do a new tap?

2) Is the city's system adequate for McDonald's use?

3) Will we need to detain any stormwater? Detention or Retention Required? Above Ground or Below Ground?

4) Is infiltration testing required?

5) Can any portion of the site surface drain to the street?

6) Who is responsible for taps (city or local companies) and what fees are associated?

7) What type of pipe material is required for tap? What type for private?

8) Will a drainage study be required?

9) Are any easements required for utilities on McDonald's property?

10) Any water quality measures required?

11) Any storm sewer moratorium in effect?

12) Any additional requirements / work required for storm water?

Thanks,

Heather Macomber
Designer

Adams | **Engineering & Development Consultants**
Tyler | Dallas/Fort Worth | Austin | Tampa

O: 817.328.3200 | D: 817.328.3243
910 S. Kimball Avenue
Southlake, Texas 76092
heather.macomber@adams-engineering.com
www.adams-engineering.com

CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services

October 16, 2015

Ronald R. Bohannan, PE
Tierra West, LLC
5571 Midway Park Place, NE
Albuquerque, NM 87109

Re: Chili's, 1700 Miles Rd, SE
Request for Certificate of Occupancy- Transportation Development
M15D012B
Engineer's Stamp dated 12-31-14
Certification dated 10-8-15

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 10-9-15, Transportation Development has no objection to the issuance of a Permanent Certificate of Occupancy. This letter serves as a "green tag" from Transportation Development for a Permanent Certificate of Occupancy to be issued by the Building and Safety Division.

If you have any questions, please contact Gary Sandoval at (505) 924-3675 or me at (505)924-3991.

Sincerely,

John B. Gurulé, P.E.
Traffic Engineer, Planning Dept.
Development Review Services

\gs via: email
C: CO Clerk, File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services

Date 14, 2015

Ronald R. Bohannan
Tierra West, LLC
5571 Midway Park Place, NE
Albuquerque, NM 87109

Re: Chili's, 1700 Miles Rd, SE
30-Day Temporary Certificate of Occupancy- Transportation Development
Engineer's Stamp dated 12-31-14
Certification dated 10-08-15

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 10-09-15, Transportation Development has no objection to the issuance of a 30-day Temporary Certificate of Occupancy. This letter serves as a "green tag" from Transportation Development for a 30-day Temporary Certificate of Occupancy to be issued by the Building and Safety Division.

Prior to the issuance of a permanent Certificate of Occupancy, the following items must be addressed:

- Sidewalk slope on the northeast corner of the site shall be reduced so as not to exceed 5%, with a maximum cross slope of 2%.
- All construction debris and dumpster removed.

Once corrections are complete resubmit acceptable package along with fully completed Drainage Transportation Information Sheet to front counter personnel for log in and evaluation by Transportation. For digital submittal and minor comments and/or repairs, please submit photos to PLNDRS@cabq.gov prior to submittal. If you have any questions, please contact me at (505) 924-3991.

Sincerely,

John B. Gurule, P.E.
Traffic Engineer, Planning Dept.
Development Review Services

\gs via: email
C: CO Clerk, File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Chilis Gibson & University Building Permit #: _____ City Drainage #: M15D012B

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: _____

City Address: 1700 Miles Rd SE

Engineering Firm: Tierra West, LLC Contact: Ron Bohannan

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: rrb@tierrawestllc.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Check all that Apply.

DEPARTMENT:

____ HYDROLOGY/ DRAINAGE
X TRAFFIC/ TRANSPORTATION
____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

X ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN
____ GRADING PLAN
____ DRAINAGE MASTER PLAN
____ DRAINAGE REPORT
____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ BUILDING PERMIT APPROVAL
X CERTIFICATE OF OCCUPANCY (Temp)

____ PRELIMINARY PLAT APPROVAL
____ SITE PLAN FOR SUB'D APPROVAL
____ SITE PLAN FOR BLDG. PERMIT APPROVAL
____ FINAL PLAT APPROVAL
____ SIA/ RELEASE OF FINANCIAL GUARANTEE
____ FOUNDATION PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
____ SO-19 APPROVAL
____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR

____ PRE-DESIGN MEETING
____ OTHER (SPECIFY) _____

10/9/2015

IS THIS A RESUBMITTAL?: _____ Yes _____ No

DATE SUBMITTED: 10/09/2015 By: Ron Bohannan

COA STAFF. ELECTRONIC SUBMITTAL RECEIVED: ___

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

October 8, 2015

Ms. Racquel Michel, P.E.
Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: TRAFFIC CONTROL LAYOUT CERTIFICATION
CERTIFICATION FOR TEMPORARY CERTIFICATE OF OCCUPANCY
CHILI'S, 1700 MILES RD SE

Dear Ms. Michel:

I, Ronald R. Bohannan, NMPE #7868, of the firm Tierra West LLC, hereby request approval of the Approved Traffic Circulation Layout for issuance of the Temporary Certificate of Occupancy for the project referenced above. This project is in substantial compliance as inspected on October 8, 2015 and is in accordance with the design intent of the Approved Traffic Circulation Layout dated 12/31/14. This certification is submitted in support of the request for Temporary Certificate of Occupancy to allow training staff to occupy the completed building. This request is to allow the contractor to make corrections to the handicap ramps to meet current ADA standards.

The record information presented hereon is not necessarily complete and intended only to verify substantial compliance of the traffic aspects of this project. Those relying on the record document are advised to obtain independent verification of its accuracy before using it for any other purpose.

Enclosed, please find the information sheet and the as-built Traffic Control Layout. Therefore, we request approval of the as-built Traffic Control Layout for a Temporary Certificate of Occupancy for the referenced buildings.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

RONALD R. BOHANNAN
NEW MEXICO
7868
PROFESSIONAL ENGINEER

Ronald R. Bohannan, P.E.

Enclosures

JN: 2013086
RRB/JH/bf

Z:\2013\2013086 - Chili's University and Gibson\Correspondence\2013086 Racquel Michel Temp CO Letter 10-08-15 doc

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Chilis Gibson & University City Drainage #: M15-D012B

DRB#: 15DRB-70091 EPC#: Work Order#:

Legal Description: Tract A-1 Airport Center

City Address: 1700 Miles RD Albuquerque, NM

Engineering Firm: Tierra West, LLC Contact: Joel Hernandez

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: jdhernandez@tierrawestll.com

Owner: Josh Skarsgard Contact:

Address: 8220 San Pedro NE Suite 500

Phone#: 505-262-2323 Fax#: E-mail: josh@skarsgardfirm.com

Architect: GHA Architecture/Development Contact: Keilah Brown

Address: 14901 Quorum Drive, Suite 300 Dallas Texas 75254

Phone#: 972-238-8884 Fax#: 972-239-5054 E-mail: kbrown@ GHA-Architects.com

Surveyor: Precision Surveys Contact: Larry Medrano

Address: 5571 Midway Park Place NE Albuquerque, NM 87109

Phone#: 505-856-5700 Fax#: E-mail: larry@presurv.com

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
___ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
___ GRADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
X OTHER (SPECIFY) Information Only

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL, TEMP)
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION
___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED
MAY 12 2015
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes ___ No ___ Copy Provided

DATE SUBMITTED: 05/12/2015 By: Joel Hernandez

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, an scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the followin

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, includin project less than 1-acre than are part of a larger common plan of development

CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services

May 13, 2014

Joel Hernandez
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: **Chili's, 1700 Miles Road SE**
Traffic Circulation Layout
Engineer's Stamp dated 12-31-14 (M15-D012B)

Dear Mr. Hernandez,

The TCL submittal received 05-13-15 is approved for Building Permit. A copy of the stamped and signed plan will be needed for each of the building permit plans. Please keep the original to be used for certification of the site for final C.O. for Transportation.

When the site construction is completed and a Certificate of Occupancy (C.O.) is requested, use the original City stamped approved TCL for certification. Redline any minor changes and adjustments that were made in the field. A NM registered architect or engineer must stamp, sign, and date the certification TCL along with indicating that the development was built in "substantial compliance" with the TCL. Submit this certification TCL with a completed Drainage and Transportation Information Sheet to front counter personnel for log in and evaluation by Transportation.

Once verification of certification is completed and approved, notification will be made to Building Safety to issue Final C.O. To confirm that a final C.O. has been issued, call Building Safety at 924-3690.

Sincerely,

Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
Development Review Services

c: File
CO Clerk

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Chilis Gibson & University City Drainage #: M15-D012B

DRB#: 15DRB-70091 EPC#: Work Order#:

Legal Description: Tract A-1 Airport Center

City Address: 1700 Miles RD Albuquerque, NM

Engineering Firm: Tierra West, LLC Contact: Joel Hernandez

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: jdhernandez@tierrawestll.com

Owner: Josh Skarsgard Contact:

Address: 8220 San Pedro NE Suite 500

Phone#: 505-262-2323 Fax#: E-mail: josh@skarsgardfirm.com

Architect: GHA Architecture/Development Contact: Keilah Brown

Address: 14901 Quorum Drive, Suite 300 Dallas Texas 75254

Phone#: 972-238-8884 Fax#: 972-239-5054 E-mail: kbrown@ GHA-Architects.com

Surveyor: Precision Surveys Contact: Larry Medrano

Address: 5571 Midway Park Place NE Albuquerque, NM 87109

Phone#: 505-856-5700 Fax#: E-mail: larry@presurv.com

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
___ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
___ GRADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
X TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
X OTHER (SPECIFY) Information Only

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___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION
___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED MAY 12 2015 LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes ___ No ___ Copy Provided

DATE SUBMITTED: 05/12/2015 By: Joel Hernandez

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Wolfenbarger, Jeanne

From: Wolfenbarger, Jeanne
Sent: Wednesday, January 07, 2015 1:46 PM
To: 'Joel Hernandez'
Subject: Chili's (M15-D012B)

Joel,

Based on your resubmittal, I cannot approve Chili's for the Traffic Circulation Layout at this time until the platting actions as part of DRB 101060/14DRB-70118 are finalized and signed off by DRB members.
I just spoke with Kristal about it this morning.
Considering that the access to Chili's is heavily dependent upon the platting actions, this needs to be resolved first.

All of my previous comments have been addressed.

Jeanne

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title Chilis Gibson & University City Drainage #: M15-D012B

DRB#: EPC# Work Order#:

Legal Description:

City Address:

Engineering Firm: Tierra West, LLC Contact: Joel Hernandez

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone# 505-858-3100 Fax# 505-858-1118 E-mail jdhernandez@tierrawestllc.com

Owner: Josh Skarsgard Contact:

Address: 8220 San Pedro NE Suite 500

Phone#: 505-262-2323 Fax#: E-mail: josh@skarsgardfirm.com

Architect: GHA Architecture/Development Contact: Keilah Brown

Address: 14901 Quorum Drive, Suite 300 Dallas, Texas 75254

Phone# 972-238-8884 Fax# 972-239-5054 E-mail kbrown@GHA-Architects.com

Surveyor: Precision Surveys Contact: Larry Medrano

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-856-5700 Fax#: E-mail: larry@presurv.com

Contractor: Contact:

Address:

Phone#: Fax#: E-mail:

TYPE OF SUBMITTAL:

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____ ENGINEER'S CERT (HYDROLOGY)
____ CLOMR/LOMR
_X_ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERT (TCL)
____ ENGINEER'S CERT (DRB SITE PLAN)
____ ENGINEER'S CERT (ESC)
____ SO-19
____ OTHER (SPECIFY)

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____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ WORK ORDER APPROVAL
____ GRADING CERTIFICATION

____ SO-19 APPROVAL
____ ESC PERMIT APPROVAL
____ ESC CERT ACCEPTANCE
____ OTHER (SPECIFY)

RECEIVED
JAN 02 2015
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED _____ Yes _____ No _____ Copy Provided

DATE SUBMITTED: 01/02/15 By: Joel Hernandez

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(2007) Oxpo - Town Ctr

RECEIVED
JAN 02 2015
LAND DEVELOPMENT SECTION

Gibson Boulevard, S.E.
Right-Of-Way-Varies

78' WIDE RIGHT OF WAY FROM SURVEY CENTERLINE TO VACATED AREA TO REMAIN

43' FC-FC

6' CONCRETE SIDEWALK

6' SIDEWALK

LIMITS OF VACATION

EASEMENTS RESERVED BY THE CITY OF ALBUQUERQUE FOR EXISTING UTILITIES, WHETHER MUNICIPALLY OWNED OR PRIVATELY OWNED, WHICH MAY BE NECESSARY FOR PUBLIC USE AND BENEFIT (07/29/1997, VACATING ORDINANCE NO V-97-80)

32' WIDE PRIVATE ACCESS EASEMENT TO SERVE LOT 9 BLOCK A, KIRKLAND ADDITION, UNIT 2 (05/05/1998, 98C-53A) TO BE VACATED BY PLAT

30' EASEMENT

PERMANENT EASEMENT (01/17/1977 BK 97-2, PAGE 2505)

FUTURE IMPROVEMENTS BY OTHERS

S 89°38'37" E

S 89°45'35" E

269.74'

126.22'

Parcel 2
Miles Road, S.E.
Miles Road Vacation of Public Right-Of-Way (Project #101060/14DRB-70118)

ROW VARIES

32' F-F

S 10°51'45" W

PUBLIC R.O.W. VACATED BY PLAT

Parcel 1
Tract A

chili's

LOT 9-A-1
KIRKLAND ADDITION UNIT 2
(05/18/2008, 2008C-187)

LOT 9-B-1
KIRKLAND ADDITION UNIT 2
(08/18/2008, 2008C-187)

N 10°52'33" E

FUTURE IMPROVEMENTS BY OTHERS

20' WIDE PUBLIC SANITARY SEWER EASEMENT (05/05/1998, 98C-116)

386.29'

20' ALLEY
KIRKLAND ADDITION UNIT 2
(08/19/1953, D1-98)

LOT 4
KIRKLAND ADDITION UNIT 2
(08/19/1953, D1-98)

LOT 3
KIRKLAND ADDITION UNIT 2
(08/19/1953, D1-98)

N 79°08'15" W

215.60'

TRACT B
AIRPORT CENTER
(05/15/1998, 98C-116)

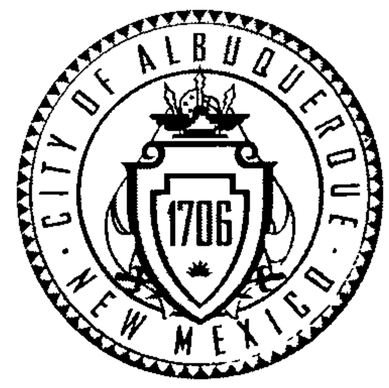
EXISTING PARKING TO REMAIN

PRIVATE SANITARY SEWER EASEMENT WITHIN FORMER NORTH-SOUTH ALLEY TO SERVE TRACTS B AND C, MAINTENANCE RESPONSIBILITY SHALL BE WITH THE UNDERLYING PROPERTY OWNER (05/05/1998, 98C-116)

DOCUMENT SECTION

F-FND Remit

CITY OF ALBUQUERQUE



Planning Department
Transportation Development Services

November 7, 2014

Joel Hernandez
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Chili's, 1700 Miles Road SE
Traffic Circulation Layout
Engineer's Stamp dated 11-06-14 (M15-D012B)

Dear Mr. Hernandez,

Based upon the information provided in your submittal received 11-06-14, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

1. Please identify <u>all</u> door entrances to the new building, and list the square footage for the new building.
2. Identify existing pavement, sidewalk, and right-of-way dimensions for Gibson Boulevard. Label and list the dimension for the easement across the site to the north of the new building.
3. Provide Plan Sheets C6 through C8 which show remaining details for signage, curb, and pedestrian ways. The ADA van accessible sign must have the required language per 66-7-352.4C NMSA 1978 "Violators Are Subject to a Fine and/or Towing." There must also be the required language indicating "Van Accessible" per ANSI 502.7.
4. The two 8-foot wide ADA access aisles shall have the words **"NO PARKING"** in capital letters, each of which shall be at least one foot high and at least two inches wide, placed at the rear of the parking space so as to be close to where an adjacent vehicle's rear tire would be placed. (66-1-4.1.B NMSA 1978)
5. Per the DPM, a 6-foot wide ADA accessible pedestrian pathway is required from the public sidewalk to the building entrances. Please extend the 6-foot pathway that you have shown on the plan all of the way to the existing sidewalk on Gibson Boulevard.
6. The design delivery vehicle route needs to be shown. Also, provide a separate sheet showing delivery truck turning movements.

7. Reference the DRB Case Number for the Miles Road vacation, and define limit of the vacation for Miles Road toward the east side of the site. Label the existing Miles Road public road right-of-way and pavement dimensions to the east of the site.

8. Please include two copies of the traffic circulation layout at the next submittal.

Resubmit acceptable package along with fully completed Drainage Transportation Information Sheet to front counter personnel for log in and evaluation by Transportation. If you have any questions, please contact me at (505) 924-3924.

Sincerely,

Jeanne Wolfenbarger, P.E.
Senior Engineer, Planning Dept.
Development Review Services

c: File
CO Clerk