DRAINAGE REPORT FOR

SONATA TRAILS UNIT 4 APARTMENTS TRACTS 3A AND 4

PREPARED FOR

City of Albuquerque, Planning Department
Development Review Services, Hydrology Section

PREPARED BY

RESPEC, Inc.
7770 Jefferson St. NE, Suite 200
Albuquerque, NM 87109
505.253.9718

OCTOBER 2022

I, Jeremy Shell, do hereby certify that this report was duly prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

_____

Jeremy Shell, P.E.
NMPE No. 26341

10/25/2022

_____

Date

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this conceptual drainage report is to demonstrate that the proposed development of Sonata Tracts 3A and 4 safely conveys the peak 100-year storm runoff.

The development of Sonata Trails Unit 4, Tracts 3A & 4 site is within the "Upper Piedras Marcadas Watershed Drainage Management Plan" by Wilson & Company dated April 2017. The project site ultimately drains into an Albuquerque Metropolitan Arroyo and Flood Control Authority (AMAFCA) facility, Boca Negra Dam. The development impacts the existing surge Ponds L3 and K from the existing Addendum for Amendment to the Drainage Master Plan for the Trails Units 1,2 and 3 (2017). The existing Trails model in PCSWMM was revised due to the proposed change of footprint of Pond L3 and K. However, Ponds L3 and K were designed to capture some developed basins from the site and ultimately be at or below 62 cfs allowable discharge at the outfall of the Universe Blvd storm drain. All elevations mentioned in this report are based on the North American Vertical Datum of 1988 (NAVD 88). The PCSWMM elevations differ from the elevations by a factor of 2.7 ft mentioned in this report because they were based on the National Geodetic Vertical Datum of 1929 (NGVD 29) previously approved in Sonata Trails Unit 4 Apartments (Phase 1).

1.2 LOCATION AND DESCRIPTION

Tracts 3A and 4 within the Trails Unit 4 are located southwest of Paseo Del Norte NE and northeast of Universe Boulevard NW and contain approximately 13.6 acres. See Figure 1.2.1 below. The legal description of the property is "Tracts 3A (being a replat of tracts 1-3) and 4, the Trails Unit 4, within the Town of Alameda Grant in projected Section 15, Township 11 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico, December 28, 2007-Tract4 and June 24, 2021-Tract 3A." The existing site includes surge ponds L3 and K for the Trails Units 1, 2, and 3, but is otherwise undeveloped. The existing conditions are described in more detail in Section 3.1 and the developed conditions are described in Section 3.2.

FIGURE 1.2.1 – PROJECT LOCATION

2.0 METHODOLOGY

The hydrologic analysis was performed for the site in accordance with the Albuquerque Development Process Manual (DPM) Chapter 6. AHYMO-S4 (April 2018) was used to develop peak flow rates for the 100-year, 24-hour design storm to ensure all flow paths are sufficient to carry flows. The retention volume for the onsite ponds were required to store the 100-year, 10day volume. The required water quality volume was calculated by multiplying the onsite impervious area by the first flush runoff value of 0.42 inches. All hydrologic and hydraulic calculations are included in this report.

3.0 HYDROLOGY

3.1 EXISTING CONDITIONS

The site is primarily undisturbed with slopes ranging from 1% to 15%. There are 2 existing surge ponds part of the Universe storm drain system, Pond L3 and K. Flows in the Universe Blvd storm drain system surge into Pond L3 and Pond K and will release from the surge ponds into the Universe storm drain system as the capacity downstream becomes available. The area was divided into 8 subbasins and 4 offsite subbasins to better analyze peak flows at designated analysis points. These are shown on **Exhibit 1 in Appendix A – Hydrology**.

- Basins EX1 (Ex AP1) and EX2 (Ex AP2) pond along Tree Line Ave since the roadway is elevated above existing ground in Phase 1.
- Basin EX3 sheet flows to a low point in the existing Pond L3 (Ex AP3).
- Basin EX4 and EX7 flows to the southwest (Ex AP4) and northeast (Ex AP7) respectively to a low point in Basin OFF3 (Ex. Off AP3).
- Basin EX5 flows northeast away from the site to (Ex AP5).
- Basin EX6 sheet flows to a low point in the existing Pond K.
- Basin EX8 sheet flows towards the northeast out of the site boundary.

The Sonata Trails Unit 4 Tracts 3A and 4 receive offsite flows which are divided up in to 4 basins depicted on **Exhibit 1 in Appendix A – Hydrology**.

The existing offsite basin descriptions are as follows:

- Basin OFF1 flows to the south and is mostly captured by existing inlets at the southwest corner of Universe Blvd and Woodmont Ave NW. Bypass will flow to the east into the existing surge Pond L3 (Ex. Off AP1).
- Basin OFF2 sheet flows and ponds at a low point at the east side of the property (Ex. Off AP2).
- Basin OFF3 ponds between Tracts 3A and 4 at a low point (Ex. Off AP3).
- Basin OFF4 is captured by existing inlets at the southwest corner of Universe Blvd and Woodmont Ave NW (Ex. Off AP4).

TABLE 3.1 – HYDROLOGIC DATA – EXISTING CONDITIONS

HYDROLOGIC DATA - EXISTING							
SUB-BASIN	AREA (AC)	LAND USE PERCENTAGES				Q100YR-24HR (CFS)	V100YR-24HR (AC-FT)
		A	B	C	D		
EX1	0.6	100%	0%	0%	0%	0.9	0.02
EX2	1.2	96%	0%	4%	0%	1.6	0.04
EX3	7.6	0%	50%	50%	0%	18.7	0.5
EX4	0.3	81%	0%	19%	0%	0.6	0.02
EX5	0.1	93%	0%	7%	0%	0.2	0.01
EX6	0.8	0%	50%	50%	0%	1.9	0.05
EX7	2.2	0%	50%	50%	0%	5.4	0.15
EX8	0.7	100%	0%	0%	0%	0.9	0.03
OFF1	2.3	6%	0%	45%	49%	7.9	0.3
OFF2	6.4	96%	0%	4%	0%	8.7	0.24
OFF3	1.5	96%	0%	4%	0%	2.0	0.06
OFF4	1.0	0%	0%	33%	67%	3.9	0.2
TOTAL	**24.8**				**TOTAL**	**52.7**	**1.6**

3.2 DEVELOPED CONDITIONS

The development for the Trails Unit 4, Tracts 3A & 4 Apartments includes apartment buildings, parking lots, public streets, an onsite detention/retention pond and redesigning Ponds L3 and K. Under the developed condition, approximately 80% of the site will consist of impervious area and 20% will be split between fine grading and landscaped area. See **Appendix A** for the AHYMO input and output results for developed conditions. The property has been split into 6 proposed basins and 8 offsite basins and is depicted on **Exhibit 2 in Appendix A – Hydrology**.

The developed onsite and offsite basin descriptions are as follows:

- Basin DEV1 contains the Proposed Pond L3 and will capture local flows to the pond. Proposed Pond L3 will have an emergency spillway sized to carry the inflow of 90.3 cfs from the model in PCSWMM.
- Basin DEV2 will flow south into the site and be captured into proposed onsite retention pond.
- Basin DEV3 will drain to a low point in the basin that which a sump inlet will capture flows into a storm drain system. These flows will discharge into the proposed onsite retention pond.
- Basin DEV4 will drain to a low point in the basin that which a sump inlet will capture flows into a storm drain system which discharges into the proposed onsite retention pond.
- Basin DEV5 will drain to the east into a small water quality pond that will flow through a weir into the proposed Pond K. The water quality pond was sized to capture the first flush of pollutants and trash. Water quality calculations can be found **in Appendix A – Hydrology**.
- Basin DEV6 contains the Proposed Pond K and will capture local flows to the pond. Proposed Pond K will have an emergency spillway sized to carry the inflow of 157.5 cfs from the model in PCSWMM.
- DEV Basin OFF1 will slope towards the south and be captured by the existing inlets at Woodmont Ave and Universe Blvd into the Universe Blvd storm drain system.
- DEV Basin OFF2 will pond in a low point in the basin. When the ponded depth exceeds 2', runoff will discharge east away from the site. The site will be raised higher than existing grades to ensure that offsite flows don't affect the development.
- DEV Basin OFF3 will slope towards the north and will get captured by the existing inlets at Woodmont Ave and Universe Blvd into the Universe Blvd storm drain system.
- DEV Basin OFF4 will slope towards the west and be captured by inlets that will capture flows by the existing inlets at Woodmont Ave and Universe Blvd into the Universe Blvd storm drain system.
- DEV Basin OFF5 will pond towards the middle of the basin. When the ponded depth exceeds 2', runoff will discharge east away from the site. The site will be raised higher than existing grades to ensure that offsite flows don't affect the development.
- DEV Basin OFF6 is a portion of Ave De Jamito and will slope towards to east into a proposed Ave de Jamito Pond. The proposed pond was sized to store the volume from 26' wide road being designed in this report. However, the proposed pond will also be able to store the volume when the rest of the 32' road section with curb and gutter and sidewalk are built out by the owner to the south.
- DEV Basin OFF 7 will slope towards the north along Tree Line Ave. Eventually, it will flow towards the southeast into the site and will be managed accordingly.
- DEV Basin OFF 8 will slope towards the north and pond along Tree Line Ave. Eventually, it will flow into Tree Line Ave.

TABLE 3.2 – HYDROLOGIC DATA – DEVELOPED CONDITIONS

HYDROLOGIC DATA - DEVELOPED							
SUB-BASIN	AREA (AC)	LAND USE PERCENTAGES				Q100YR-24HR (CFS)	V100YR-24HR (AC-FT)
		A	B	C	D		
DEV1	1.2	0%	0%	42%	58%	4.5	0.2
DEV2	0.1	0%	0%	100%	0%	0.4	0.01
DEV3	3.6	0%	16%	16%	68%	13.4	0.6
DEV4	3.8	0%	11%	11%	78%	15.0	0.7
DEV5	1.9	0%	14%	14%	72%	7.3	0.3
DEV6	1.6	0%	0%	14%	86%	6.7	0.3
DEV OFF 1	3.1	0%	0%	0%	100%	13.2	0.6
DEV OFF 2	6.4	96%	0%	4%	0%	8.7	0.2
DEV OFF 3	1.0	0%	0%	0%	100%	4.2	0.2
DEV OFF 4	0.7	0%	0%	0%	100%	3.2	0.1
DEV OFF 5	1.3	100%	0%	0%	0%	1.7	0.05
DEV OFF 6	0.5	0%	0%	24%	76%	2.1	0.1
DEV OFF 7	0.5	0%	0%	100%	0%	1.4	0.04
DEV OFF 8	0.7	0%	0%	100%	0%	1.9	0.1
TOTAL	**26.5**				**TOTAL**	**83.7**	**3.5**

3.2.1 STORMWATER QUALITY

Water quality calculations were performed for the project site per requirements set out in the City of Albuquerque DPM Chapter 6, article 6-12 (Stormwater Quality and Low-Impact Development). The calculations performed in this report determine volume (cu. ft) of storm water runoff required to be treated by the capture of pollutants, trash, etc. from the site. The required water quality volume for the site was calculated based on the total proposed onsite impervious area multiplied by 0.42 inches with a total volume of 10,428 ft^3 of volume. The water quality calculations can be found in **Appendix A – Hydrology**.

3.2.2 PCSWMM REVISIONS

The model in PCSWMM prepared in Phase 1 of Sonata Trails Unit 4 was updated in this report to accommodate the proposed development Tracts 3A and 4, the redesigned Pond L3 and Pond K but be at or below the allowable discharge of 62 cfs at outfall of the Universe Blvd storm drain system.

Pond L3 inflow hydrograph was updated from 18.28 cfs to 4.5 cfs and Pond K inflow hydrograph was updated to 14 cfs. This caused flooding in the model and the following modifications to the model were as follows to eliminate flooding:

- Revised storage capacity of Pond L3 and Pond K to 4.8 ac-ft and 8.4 ac-ft respectively at the emergency spillway.
- Increasing the orifice opening for "OR1" from 3.5 ft to 3.78 ft. (Height = 3'-3½") per detail in **Appendix B – Hydraulics**.
- Increasing the orifice opening for "ORF_L3" from 2.5 ft to 3.78 ft. (Height = 3'-3½") per detail in **Appendix B – Hydraulics**.
- Decreasing the orifice opening for "ORF_K" from 2.61 ft to 2.58 ft. (Height = 2'-1") per detail in **Appendix B – Hydraulics**.

- Removing the existing 24" (Link64) and 30" (Link63) diameter pipe into Pond L3 with a proposed 36" diameter which will connect to the existing "SDMH-4A."
- Proposing a 48" diameter pipe connecting to Pond K and tie into the existing manhole "SDMH-F."

Since capacity to Pond L3 and Pond K were revised, maximum water surface elevations have changed. Pond J capacity and features have remained the same. However, the maximum water surface elevation is at 5421.92 (NAVD 88) which provides 1 foot of freeboard to the top of the pond. The total inflow volume of 0.65 ac-ft, maximum inflow of 51.2 cfs and maximum outflow of 25.6 cfs. Pond L3 water surface elevation is 5417.12 (NAVD 88) which provides 1 foot of freeboard to the top of the pond. The total inflow volume of 2.9 ac-ft, maximum inflow of 90.3 cfs and maximum outflow of 36.9 cfs. Pond K water surface elevation is 5412.89 (NAVD 88) which provides 1 foot of freeboard to the top of the pond. The total inflow volume of 8.5 ac-ft, maximum inflow of 157.5 cfs and maximum outflow of 25.8 cfs.

TABLE 3.2.2 – POND ROUTING SUMMARY

Pond Name	Pond Invert NAVD 88	Top of Pond NAVD 88	Pond Capacity (ac-ft)	Total Inflow Volume (ac-ft)	Total Pond Inflow (cfs)	Total Pond Outflow (cfs)	Max WSEL NGVD 29 (ft)	Datum Conversion (ft)	Max WSEL NAVD 88 (ft)
Pond J	5416.9	5423.9	0.8	0.65	51.2	25.6	5419.22	2.7	5421.92
Pond L3	5411	5420.2	4.8	2.9	90.3	36.9	5414.42	2.7	5417.12
Pond K	5405.7	5414	8.4	8.5	157.5	25.8	5410.19	2.7	5412.89

To summarize, the ultimate discharge in the Universe Blvd storm drain is 61.9 cfs, which is less than the allowable rate of 62 cfs. The results for all the ponds in the PCSWMM model, including Ponds L3 and K, an overview map of the PCSWMM model revisions, and an elevation comparison table are included in **Appendix B – Hydraulics**.

4.0 HYDRAULICS

4.1 STREETS

Runoff flow rates and volumes for the hydraulic design of the Sonata Trails Unit 4 Tracts 3A and 4 developments are those calculated by the AHYMO model. Internal street capacities were checked at certain locations throughout the roadways where flow runoff rates are critical.

The maximum street capacity was determined for a given street section using Hydraulic Toolbox Version 4.4 to ensure the design criteria mentioned in Section 2.0 of this report were met. Calculations for street capacities are shown in **Appendix B– Hydraulics**.

4.2 SIDEWALK CULVERTS, ONSITE INLETS AND STORM DRAIN

Flow intercepted by sidewalk culverts or onsite swales were determined using open channel equations. All proposed storm drain capacities were determined using Hydraulic Toolbox Version 4.4. The proposed inlets in Universe were designed using the COA DPM as guidance with inlet rating curves with a 15% clogging factor at 0.5% slope. The proposed sump inlets in Basins DEV 3 and DEV 4 were

designed using an orifice and weir equation and verify the inlets capture capacity. For further information on hydraulic drainage calculations see **Appendix B– Hydraulics**.

5.0 DRAINAGE MAINTENANCE COVENANTS

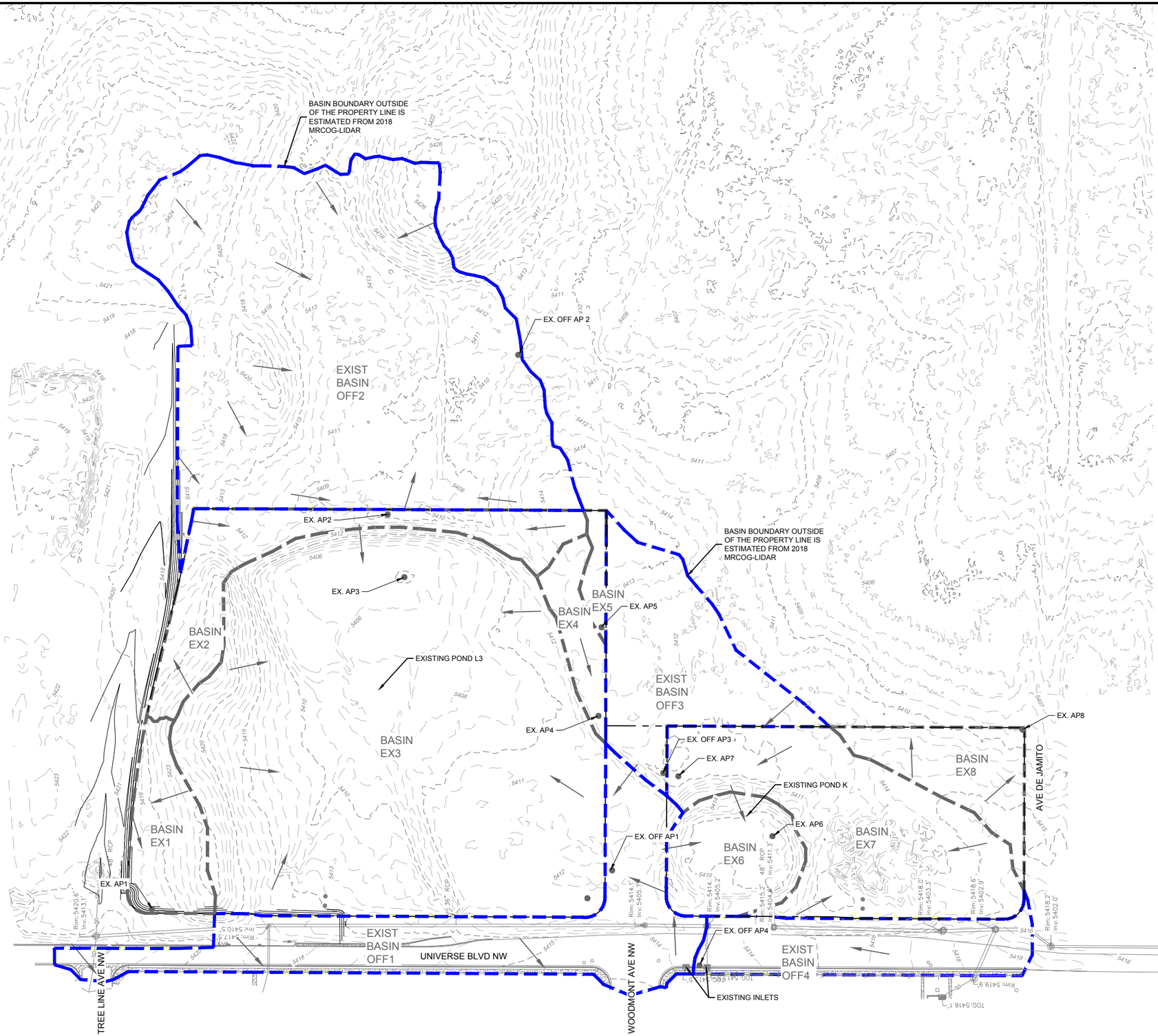
The existing Agreement and Covenants for Ponds L3, and K will be vacated. When this property is plated, the new Pond L3 and Pond K need to be shown in a drainage easement along with a City Drainage Easement note. On the Plat, this will show the maintenance responsibilities. There will be no need for new Agreements and Covenants. Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) will require that Pond L3 and K be encompassed by a public drainage easement along with the agreement and covenants.

6.0 CONCLUSION

This drainage report is prepared in support of the new development for Sonata Trails Unit 4, Tracts 3A and 4 Apartments. The existing site is undeveloped, and the new development will include apartments, parking, landscaping, public roadways, onsite retention/detention pond, pond at the east end of Ave De Jamito and revising existing surge Ponds L3 and K. The proposed pond at the east end of Ave De Jamito will store the 100yr-24hr volume when the full road section is built. The existing surge Ponds L3 and K will be redesigned to allow for the development of the site and consequently below the allowable discharge of 62 cfs at the outfall of the Universe Blvd storm drain system. The hydrologic calculations are included in **Appendix A – Hydrology**. The hydraulic calculations are included in **Appendix B– Hydraulics**.

APPENDIX A

HYDROLOGIC CALCULATIONS



LEGEND

- EXISTING BASIN
- EXISTING OFFSITE BASIN
- ANALYSIS POINT
- EXISTING FLOW ARROWS
- EXISTING STORM DRAIN MANHOLE
- EXISTING STORM DRAIN INLET
- EXISTING STORM DRAIN

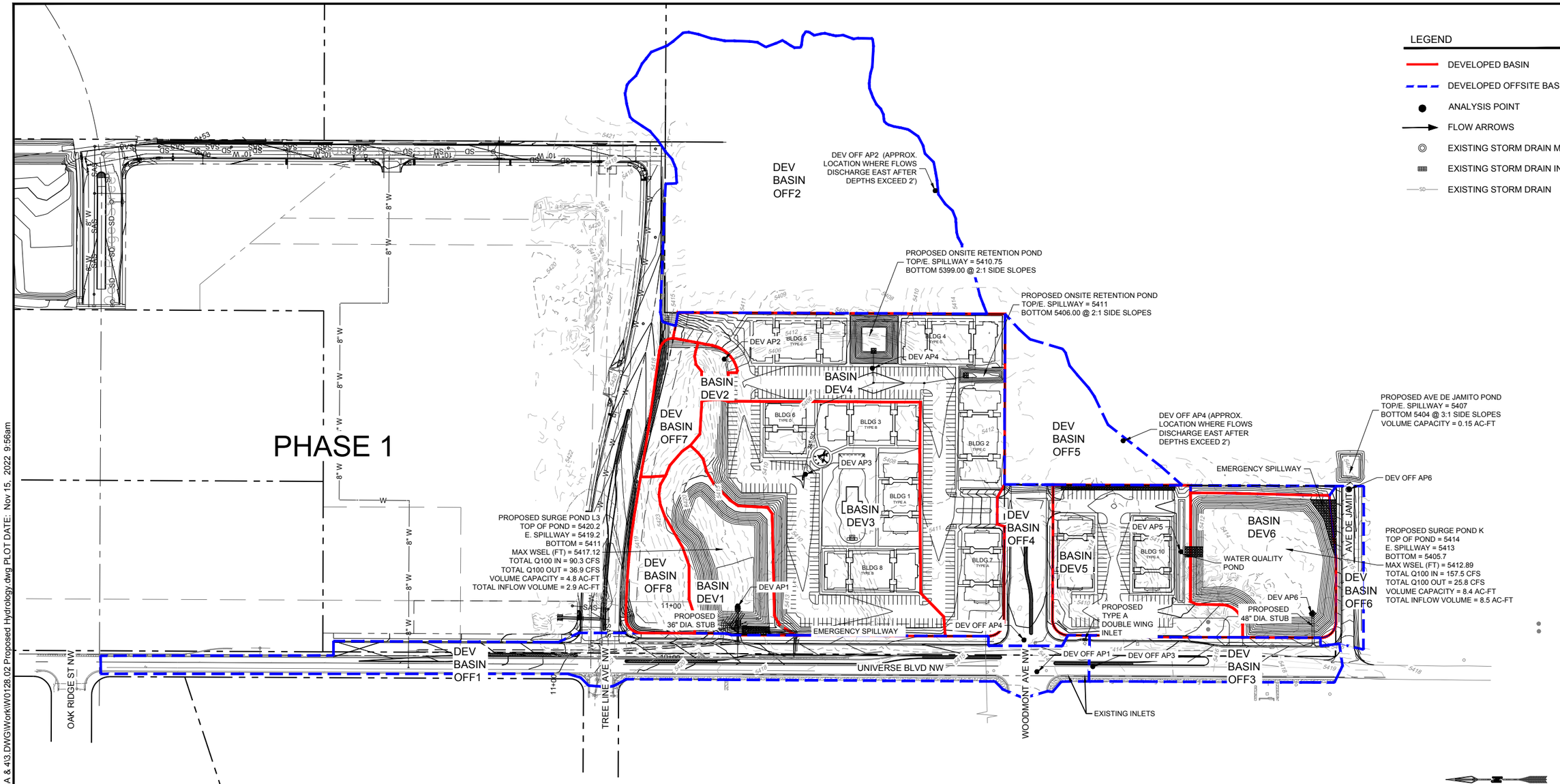
AHYMO OUTPUT: EXISTING CONDITIONS - 100YR 24HR

Subbasin	A (ac)	Q (cfs)	V (ac-ft)	Q/A (cfs/ac)
EX1	0.6	0.9	0.02	1.3
EX2	1.2	1.6	0.04	1.4
EX3	7.6	18.7	0.5	2.5
EX4	0.3	0.6	0.02	1.6
EX5	0.1	0.2	0.01	1.4
EX6	0.8	1.9	0.05	2.5
EX7	2.2	5.4	0.15	2.5
EX8	0.7	0.9	0.03	1.3
OFF1	2.3	7.9	0.3	3.5
OFF2	6.4	8.7	0.24	1.4
OFF3	1.5	2.0	0.06	1.4
OFF4	1.0	3.9	0.2	3.9
	Total:	52.7	1.6	

0 80 160
SCALE: 1" = 80'

EXHIBIT 1
EXISTING BASINS
OCTOBER 2022

RESPEC
COMMUNITY DESIGN SOLUTIONS
7770 JEFFERSON STREET SUITE 200
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718



AHYMO OUTPUT: DEVELOPED CONDITIONS - 100YR 24HR

Subbasin	A (ac)	Q (cfs)	V (acft)	Q/A (cfs/ac)
DEV1	1.2	4.5	0.2	3.7
DEV2	0.1	0.4	0.01	2.9
DEV3	3.6	13.4	0.6	3.7
DEV4	3.8	15.0	0.7	3.9
DEV5	1.9	7.3	0.3	3.8
DEV6	1.6	6.7	0.3	4.1
DEV OFF 1	3.1	13.2	0.6	4.3
DEV OFF 2	6.4	8.7	0.2	1.4
DEV OFF 3	1.0	4.2	0.2	4.3
DEV OFF 4	0.7	3.2	0.1	4.3
DEV OFF 5	1.3	1.7	0.05	1.3
DEV OFF 6	0.5	2.1	0.1	4.0
DEV OFF 7	0.5	1.4	0.04	2.9
DEV OFF 8	0.7	1.9	0.1	2.9
	Total:	83.7	3.5	

EXHIBIT 2
DEVELOPED BASINS
OCTOBER 2022

RESPEC
COMMUNITY DESIGN SOLUTIONS
7770 JEFFERSON STREET SUITE 200
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Hydrology Calculations
Creation Date: 10/24/2022
Comments:

HYDROLOGY CALCULATIONS

AHYMO INPUT: EXISTING CONDITIONS - 100YR 24HR

Subbasin	Area (ac)	Treatment Type Area (ac)				Treatment Type Area (%)			
		A	B	C	D	A	B	C	D
EX1	0.6	0.6	0.0	0.0	0.0	100%	0%	0%	0%
EX2	1.2	1.1	0.0	0.05	0.0	96%	0%	4%	0%
EX3	7.6	0.0	3.8	3.8	0.0	0%	50%	50%	0%
EX4	0.3	0.3	0.0	0.1	0.0	81%	0%	19%	0%
EX5	0.1	0.1	0.0	0.01	0.0	93%	0%	7%	0%
EX6	0.8	0.0	0.4	0.4	0.0	0%	50%	50%	0%
EX7	2.2	0.0	1.1	1.1	0.0	0%	50%	50%	0%
EX8	0.7	0.7	0.0	0.0	0.0	100%	0%	0%	0%
OFF1	2.3	0.1	0.0	1.0	1.1	6%	0%	45%	49%
OFF2	6.4	6.2	0.0	0.3	0.0	96%	0%	4%	0%
OFF3	1.5	1.4	0.0	0.1	0.0	96%	0%	4%	0%
OFF4	1.0	0.0	0.0	0.3	0.7	0%	0%	33%	67%

AHYMO INPUT: DEVELOPED CONDITIONS - 100YR 24HR

Subbasin	Area (ac)	Treatment Type Area (ac)				Treatment Type Area (%)			
		A	B	C	D	A	B	C	D
DEV1	1.2	0.0	0.0	0.5	0.7	0%	0%	42%	58%
DEV2	0.1	0.0	0.0	0.1	0.0	0%	0%	100%	0%
DEV3	3.6	0.0	0.6	0.6	2.5	0%	16%	16%	68%
DEV4	3.8	0.0	0.4	0.4	3.0	0%	11%	11%	78%
DEV5	1.9	0.0	0.3	0.3	1.4	0%	14%	14%	72%
DEV6	1.6	0.0	0.0	0.2	1.4	0%	0%	14%	86%
DEV OFF 1	3.1	0.0	0.0	0.0	3.1	0%	0%	0%	100%
DEV OFF 2	6.4	6.2	0.0	0.3	0.0	96%	0%	4%	0%
DEV OFF 3	1.0	0.0	0.0	0.0	1.0	0%	0%	0%	100%
DEV OFF 4	0.7	0.0	0.0	0.0	0.7	0%	0%	0%	100%
DEV OFF 5	1.3	1.3	0.0	0.0	0.0	100%	0%	0%	0%
DEV OFF 6	0.5	0.0	0.0	0.1	0.4	0%	0%	24%	76%
DEV OFF 7	0.5	0.0	0.0	0.5	0.0	0%	0%	100%	0%
DEV OFF 8	0.7	0.0	0.0	0.7	0.0	0%	0%	100%	0%

RESPEC

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Hydrology Calculations
Creation Date: 10/24/2022
Comments:

AHYMO OUTPUT: EXISTING CONDITIONS - 100YR 24HR

Subbasin	A (ac)	Q (cfs)	V (acft)	Q/A (cfs/ac)
EX1	0.6	0.9	0.02	1.3
EX2	1.2	1.6	0.04	1.4
EX3	7.6	18.7	0.5	2.5
EX4	0.3	0.6	0.02	1.6
EX5	0.1	0.2	0.01	1.4
EX6	0.8	1.9	0.05	2.5
EX7	2.2	5.4	0.15	2.5
EX8	0.7	0.9	0.03	1.3
OFF1	2.3	7.9	0.3	3.5
OFF2	6.4	8.7	0.24	1.4
OFF3	1.5	2.0	0.06	1.4
OFF4	1.0	3.9	0.2	3.9
	Total:	52.7	1.6	

AHYMO OUTPUT: DEVELOPED CONDITIONS - 100YR 24HR

Subbasin	A (ac)	Q (cfs)	V (acft)	Q/A (cfs/ac)
DEV1	1.2	4.5	0.2	3.7
DEV2	0.1	0.4	0.01	2.9
DEV3	3.6	13.4	0.6	3.7
DEV4	3.8	15.0	0.7	3.9
DEV5	1.9	7.3	0.3	3.8
DEV6	1.6	6.7	0.3	4.1
DEV OFF 1	3.1	13.2	0.6	4.3
DEV OFF 2	6.4	8.7	0.2	1.4
DEV OFF 3	1.0	4.2	0.2	4.3
DEV OFF 4	0.7	3.2	0.1	4.3
DEV OFF 5	1.3	1.7	0.05	1.3
DEV OFF 6	0.5	2.1	0.1	4.0
DEV OFF 7	0.5	1.4	0.04	2.9
DEV OFF 8	0.7	1.9	0.1	2.9
	Total:	83.7	3.5	

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Water Quality Calculations
Creation Date: 10/24/2022
Comments:

WATER QUALITY CALCULATIONS

Water Quality Calculations for Flush of 0.42"

Subbasin	Impervious Area (ac)	Runoff Required to Manage (in)	Runoff Required to Manage (ft)	Volume Required (ft^3)	Volume Provided (ft^3)
DEV3	2.5	0.42	0.04	3735	3735
DEV4	3.0	0.42	0.04	4574	4574
			Total:	8309	
DEV5	1.4	0.42	0.04	2119	2200

*City of Albuquerque DPM 2020

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Pond Routing Calculations
Creation Date: 10/24/2022
Comments:

Dev 2, 3 & 4 Onsite Pond #1						AHYMO Input Parameters				
Elev. (NGVD 29)	Elev. (NAVD 88)	Area (Sq. Ft.)	Vol (Cu. Ft.)	Incremental. (Ac. Ft.)	Cum. (Ac. Ft.)	Q (cfs) Through Pond Bottom	Storage (ac-ft)	Elev (ft)	Depth (ft)	Comment
5396.3	5399.00	2199.0	0	0.000	0	0.000	0.0	5399.0	0.00	Pond Bottom
5397.3	5400.00	2590.0	2395	0.055	0.055	0.001	0.1	5400.0	1.00	
5398.3	5401.00	3013.0	2802	0.064	0.119	0.005	0.1	5401.0	2.00	
5399.3	5402.00	3468.0	3241	0.074	0.194	0.010	0.2	5402.0	3.00	
5400.3	5403.00	3955.0	3712	0.085	0.279	0.015	0.3	5403.0	4.00	
5401.3	5404.00	4475.0	4215	0.097	0.376	0.020	0.4	5404.0	5.00	
5402.3	5405.00	5026.0	4751	0.109	0.485	0.025	0.5	5405.0	6.00	
5403.3	5406.00	5609.0	5318	0.122	0.607	0.030	0.6	5406.0	7.00	
5404.3	5407.00	6224.0	5917	0.136	0.743	0.035	0.7	5407.0	8.00	
5405.3	5408.00	6871.0	6548	0.150	0.893	0.040	0.9	5408.0	9.00	
5406.3	5409.00	7550.0	7211	0.166	1.058	0.045	1.1	5409.0	10.00	
5407.1	5409.75	8083.3	5862	0.135	1.193	0.050	1.2	5409.8	10.75	
5407.3	5410.00	8261.0	2043	0.047	1.240	0.055	1.2	5410.0	11.00	
5407.6	5410.25	8444.0	2088	0.048	1.288	0.060	1.3	5410.3	11.25	
5407.8	5410.50	8629.0	2134	0.049	1.337	0.065	1.3	5410.5	11.50	
5408.1	5410.75	8816.0	2181	0.050	1.387	0.070	1.4	5410.8	11.75	Top of Pond

Dev 2, 3 & 4 Onsite Pond #2						AHYMO Input Parameters				
Elev. (NGVD 29)	Elev. (NAVD 88)	Area (Sq. Ft.)	Vol (Cu. Ft.)	Incremental. (Ac. Ft.)	Cum. (Ac. Ft.)	Q (cfs) Through Pond Bottom	Storage (ac-ft)	Elev (ft)	Depth (ft)	Comment
5403.3	5406.0	757.0	0	0.000	0	0.000	0.0	5406.0	0.0	Pond Bottom
5404.3	5407.0	1098.0	928	0.021	0.021	0.000	0.0	5407.0	1.0	
5405.3	5408.0	1470.0	1284	0.029	0.051	0.015	0.1	5408.0	2.0	
5406.3	5409.0	1875.0	1673	0.038	0.089	0.020	0.1	5409.0	3.0	
5407.3	5410.0	2311.0	2093	0.048	0.137	0.025	0.1	5410.0	4.0	
5408.3	5411.0	2780.0	2546	0.058	0.196	0.030	0.2	5411.0	5.0	Top of Pond

Dev Basin Off 6 Pond						AHYMO Input Parameters				
5401.3	5404.0	1248.0	0	0.000	0	0.000	0.0	5404.0	0.0	Pond Bottom
5402.3	5405.0	1735.0	1492	0.034	0.03	0.005	0.03	5405.0	1.0	
5403.3	5406.0	2280.0	2008	0.046	0.08	0.010	0.08	5406.0	2.0	
5404.3	5407.0	3015.0	2648	0.061	0.14	0.015	0.14	5407.0	3.0	Top of Pond

Dev 2, 3 & 4 Road Ponding						AHYMO Input Parameters				
Elev. (NGVD 29)	Elev. (NAVD 88)	Area (Sq. Ft.)	Vol (Cu. Ft.)	Incremental. (Ac. Ft.)	Cum. (Ac. Ft.)	Q (cfs) Through Pond Bottom	Storage (ac-ft)	Elev (ft)	Depth (ft)	Comment
5407.1	5409.75	79.0	0	0.000	0.0	0.000	0.0	5409.8	0.0	Invert of inlet
5407.3	5410.00	2626.0	338	0.008	0.01	0.015	0.01	5410.0	0.3	Road ponding
5407.6	5410.25	10005.0	1579	0.036	0.04	0.020	0.04	5410.3	0.5	Road ponding
5407.8	5410.50	20674.0	3835	0.088	0.1	0.025	0.1	5410.5	0.8	Road ponding
5408.0	5410.70	31837.0	5251	0.121	0.3	1.025	0.3	5410.7	0.9	Road ponding

Diameter of Pipe (ft)	Area of Pipe (ft^2)	Length of Pipe (ft)	Volume of Pipe (ft^3)	Volume of Pipe (ac-ft)
4	12.57	491	6170.1	0.1

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.02a, Rel: 02a RUN DATE (MON/DAY/YR) =10/11/2022
INPUT FILE = N:\CDS Library\Engineering Tools\AHYMO-S4\Sonata Tracts 3A and 4.HMI USER NO.= AHYMO-S4TempUser05901704

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
RAINFALL TYPE=13										RAIN24= 2.660
*S EXISTING CONDITIONS										
*S COMPUTE HYD EX BASIN 1										
COMPUTE NM HYD	101.00	-	1	0.00101	0.85	0.023	0.43063	1.518	1.317	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 2										
COMPUTE NM HYD	102.00	-	2	0.00182	1.59	0.043	0.44549	1.518	1.363	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 3										
COMPUTE NM HYD	103.00	-	3	0.01192	18.73	0.509	0.80044	1.518	2.455	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 4										
COMPUTE NM HYD	104.00	-	4	0.00054	0.55	0.015	0.50657	1.518	1.578	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 5										
COMPUTE NM HYD	105.00	-	5	0.00020	0.18	0.005	0.45728	1.518	1.445	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 6										
COMPUTE NM HYD	106.00	-	6	0.00120	1.89	0.051	0.80044	1.518	2.464	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 7										
COMPUTE NM HYD	107.00	-	7	0.00344	5.41	0.147	0.80044	1.518	2.458	PER IMP= 0.00
*S COMPUTE HYD EX BASIN 8										
COMPUTE NM HYD	108.00	-	8	0.00108	0.91	0.025	0.43063	1.518	1.316	PER IMP= 0.00
*S COMPUTE HYD EX BASIN OFF1										
COMPUTE NM HYD	109.00	-	9	0.00357	7.90	0.313	1.64128	1.518	3.459	PER IMP= 49.00
*S COMPUTE HYD EX BASIN OFF2										
COMPUTE NM HYD	110.00	-	10	0.01001	8.71	0.238	0.44549	1.518	1.359	PER IMP= 0.00
*S COMPUTE HYD EX BASIN OFF3										
COMPUTE NM HYD	111.00	-	11	0.00230	2.01	0.055	0.44549	1.518	1.362	PER IMP= 0.00
*S COMPUTE HYD EX BASIN OFF4										
COMPUTE NM HYD	112.00	-	12	0.00160	3.94	0.166	1.94610	1.485	3.843	PER IMP= 67.00
*S PROPOSED CONDITIONS										
*S COMPUTE HYD DEV BASIN 1										
COMPUTE NM HYD	113.00	-	13	0.00191	4.53	0.185	1.81592	1.485	3.708	PER IMP= 58.00
*S COMPUTE HYD DEV BASIN 2										
COMPUTE NM HYD	114.00	-	14	0.00022	0.41	0.011	0.97702	1.518	2.930	PER IMP= 0.00
*S COMPUTE HYD DEV BASIN 3										
COMPUTE NM HYD	115.00	-	15	0.00564	13.37	0.573	1.90406	1.485	3.704	PER IMP= 68.00
*S COMPUTE HYD DEV BASIN 4										
COMPUTE NM HYD	116.00	-	16	0.00601	14.99	0.662	2.06636	1.485	3.896	PER IMP= 78.00
*S COMPUTE HYD DEV BASIN 5										
COMPUTE NM HYD	117.00	-	17	0.00300	7.27	0.315	1.96898	1.485	3.785	PER IMP= 72.00
*S COMPUTE HYD DEV BASIN 6										
COMPUTE NM HYD	118.00	-	18	0.00255	6.72	0.302	2.22091	1.485	4.118	PER IMP= 86.00
*S COMPUTE HYD DEV BASIN OFF1										
COMPUTE NM HYD	119.00	-	19	0.00479	13.24	0.619	2.42341	1.485	4.318	PER IMP= 100.00
*S COMPUTE HYD DEV BASIN OFF2										
COMPUTE NM HYD	120.00	-	20	0.01002	8.72	0.238	0.44549	1.518	1.359	PER IMP= 0.00
*S COMPUTE HYD DEV BASIN OFF3										
COMPUTE NM HYD	121.00	-	21	0.00150	4.15	0.194	2.42341	1.485	4.324	PER IMP= 100.00
*S COMPUTE HYD DEV BASIN OFF4										
COMPUTE NM HYD	122.00	-	22	0.00114	3.16	0.147	2.42341	1.485	4.327	PER IMP= 100.00
*S COMPUTE HYD DEV BASIN OFF5										
COMPUTE NM HYD	123.00	-	23	0.00206	1.73	0.047	0.43063	1.518	1.312	PER IMP= 0.00
*S COMPUTE HYD DEV BASIN OFF6										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	124.00	-	24	0.00081	2.07	0.090	2.07628	1.485	3.992	PER IMP= 76.00
*S COMPUTE HYD DEV BASIN OFF7										
COMPUTE NM HYD	124.00	-	25	0.00078	1.44	0.041	0.97702	1.518	2.890	PER IMP= 0.00
*S COMPUTE HYD DEV BASIN OFF8										
COMPUTE NM HYD	124.00	-	26	0.00102	1.88	0.053	0.97702	1.518	2.887	PER IMP= 0.00
ADD HYD	128.00	17&18	28	0.00555	13.99	0.617	2.08463	1.485	3.938	
FINISH										

```
*  100 YEAR RAINFALL TABLE
RAINFALL              TYPE=13  RAIN QUARTER=0.0 IN
                     RAIN ONE=1.84 IN  RAIN SIX=2.20 IN
                     RAIN DAY=2.66 IN  DT=0.033 HR
**********************************************************
*S EXISTING CONDITIONS

*S  COMPUTE HYD EX BASIN 1
COMPUTE NM HYD       ID=1  HYDNO=101  DA=0.00101SQ MI
                     PER A=100  PER B=0   PER C=0   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=1  CODE=10

*S  COMPUTE HYD EX BASIN 2
COMPUTE NM HYD       ID=2  HYDNO=102  DA=0.00182SQ MI
                     PER A=96  PER B=0   PER C=4   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=2  CODE=10

*S  COMPUTE HYD EX BASIN 3
COMPUTE NM HYD       ID=3  HYDNO=103  DA=0.01192SQ MI
                     PER A=0  PER B=50   PER C=50   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=3  CODE=10

*S  COMPUTE HYD EX BASIN 4
COMPUTE NM HYD       ID=4  HYDNO=104  DA=0.00054SQ MI
                     PER A=81  PER B=0   PER C=19   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=4  CODE=10

*S  COMPUTE HYD EX BASIN 5
COMPUTE NM HYD       ID=5  HYDNO=105  DA=0.00020SQ MI
                     PER A=93  PER B=0   PER C=7   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=5  CODE=10

*S  COMPUTE HYD EX BASIN 6
COMPUTE NM HYD       ID=6  HYDNO=106  DA=0.00120SQ MI
                     PER A=0  PER B=50   PER C=50   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=6  CODE=10

*S  COMPUTE HYD EX BASIN 7
COMPUTE NM HYD       ID=7  HYDNO=107  DA=0.00344SQ MI
                     PER A=0  PER B=50   PER C=50   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=7  CODE=10

*S  COMPUTE HYD EX BASIN 8
COMPUTE NM HYD       ID=8  HYDNO=108  DA=0.00108SQ MI
                     PER A=100  PER B=0   PER C=0   PER D=0
                     TP=-0.13   RAIN=-1
PRINT HYD            ID=8  CODE=10

*S  COMPUTE HYD EX BASIN OFF1
COMPUTE NM HYD       ID=9  HYDNO=109  DA=0.00357SQ MI
```

```
                    PER A=6  PER B=0   PER C=45   PER D=49
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=9  CODE=10

*S  COMPUTE HYD EX BASIN OFF2
COMPUTE NM HYD      ID=10  HYDNO=110  DA=0.01001SQ MI
                    PER A=96  PER B=0   PER C=4   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=10  CODE=10
*S  COMPUTE HYD EX BASIN OFF3
COMPUTE NM HYD      ID=11  HYDNO=111  DA=0.00230SQ MI
                    PER A=96  PER B=0   PER C=4   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=11  CODE=10

*S  COMPUTE HYD EX BASIN OFF4
COMPUTE NM HYD      ID=12  HYDNO=112  DA=0.00160SQ MI
                    PER A=0  PER B=0   PER C=33   PER D=67
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=12  CODE=10

**********************************************************
*S PROPOSED CONDITIONS

*S  COMPUTE HYD DEV BASIN 1
COMPUTE NM HYD      ID=13  HYDNO=113  DA=0.00191SQ MI
                    PER A=0  PER B=0   PER C=42   PER D=58
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=13  CODE=5

*S  COMPUTE HYD DEV BASIN 2
COMPUTE NM HYD      ID=14  HYDNO=114  DA=0.00022SQ MI
                    PER A=0  PER B=0   PER C=100   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=14  CODE=10

*S  COMPUTE HYD DEV BASIN 3
COMPUTE NM HYD      ID=15  HYDNO=115  DA=0.00564SQ MI
                    PER A=0  PER B=16   PER C=16   PER D=68
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=15  CODE=10

*S  COMPUTE HYD DEV BASIN 4
COMPUTE NM HYD      ID=16  HYDNO=116  DA=0.00601SQ MI
                    PER A=0  PER B=11   PER C=11   PER D=78
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=16  CODE=10

*S  COMPUTE HYD DEV BASIN 5
COMPUTE NM HYD      ID=17  HYDNO=117  DA=0.00300SQ MI
                    PER A=0  PER B=14   PER C=14   PER D=72
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=17  CODE=10

*S  COMPUTE HYD DEV BASIN 6
COMPUTE NM HYD      ID=18  HYDNO=118  DA=0.00255SQ MI
                    PER A=0  PER B=0   PER C=14   PER D=86
```

```
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=18  CODE=10

*S  COMPUTE HYD DEV BASIN OFF1
COMPUTE NM HYD      ID=19  HYDNO=119  DA=0.00479SQ MI
                    PER A=0  PER B=0   PER C=0   PER D=100
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=19  CODE=10

*S  COMPUTE HYD DEV BASIN OFF2
COMPUTE NM HYD      ID=20  HYDNO=120  DA=0.01002SQ MI
                    PER A=96  PER B=0   PER C=4   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=20  CODE=10

*S  COMPUTE HYD DEV BASIN OFF3
COMPUTE NM HYD      ID=21  HYDNO=121  DA=0.00150Q MI
                    PER A=0  PER B=0   PER C=0   PER D=100
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=21  CODE=10

*S  COMPUTE HYD DEV BASIN OFF4
COMPUTE NM HYD      ID=22  HYDNO=122  DA=0.00114SQ MI
                    PER A=0  PER B=0   PER C=0   PER D=100
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=22  CODE=10

*S  COMPUTE HYD DEV BASIN OFF5
COMPUTE NM HYD      ID=23  HYDNO=123  DA=0.00206SQ MI
                    PER A=100  PER B=0   PER C=0   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=23  CODE=10

*S  COMPUTE HYD DEV BASIN OFF6
COMPUTE NM HYD      ID=24  HYDNO=124  DA=0.00081SQ MI
                    PER A=0  PER B=0   PER C=24   PER D=76
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=24  CODE=10

*S  COMPUTE HYD DEV BASIN OFF7
COMPUTE NM HYD      ID=25  HYDNO=124  DA=0.00078SQ MI
                    PER A=0  PER B=0   PER C=100   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=25  CODE=10

*S  COMPUTE HYD DEV BASIN OFF8
COMPUTE NM HYD      ID=26  HYDNO=124  DA=0.00102SQ MI
                    PER A=0  PER B=0   PER C=100   PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=26  CODE=10


*ADD HYDROGRAPH FROM DEV 5 AND HYDROGRAPH FROM DEV 6
ADD HYD         ID=28   HYD=128         ID I=17  ID II=18

PRINT HYD           ID=28  CODE=5
```

FINISH

AHYMO PROGRAM (AHYMO-S4) - Version: S4.02a - Rel: 02a
RUN DATE (MON/DAY/YR) = 10/11/2022
START TIME (HR:MIN:SEC) = 15:48:48 USER NO.= AHYMO-S4TempUser05901704
INPUT FILE = N:\CDS Library\Engineering Tools\AHYMO-S4\Sonata Tracts 3A and 4.HMI

* 100 YEAR RAINFALL TABLE
RAINFALL TYPE=13 RAIN QUARTER=0.0 IN
RAIN ONE=1.84 IN RAIN SIX=2.20 IN
RAIN DAY=2.66 IN DT=0.033 HR

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = 0.033000 HOURS END TIME = 23.990999 HOURS

0.0000	0.0019	0.0039	0.0059	0.0080	0.0101	0.0123
0.0145	0.0167	0.0190	0.0214	0.0238	0.0263	0.0289
0.0315	0.0343	0.0370	0.0399	0.0429	0.0460	0.0492
0.0525	0.0559	0.0594	0.0631	0.0670	0.0710	0.0752
0.0797	0.0843	0.0892	0.0943	0.0995	0.1052	0.1129
0.1363	0.1732	0.2272	0.3018	0.4010	0.5285	0.6883
0.8844	1.1209	1.2268	1.3009	1.3659	1.4245	1.4782
1.5280	1.5744	1.6179	1.6588	1.6973	1.7337	1.7681
1.8008	1.8317	1.8610	1.8889	1.9154	1.9333	1.9393
1.9450	1.9505	1.9557	1.9607	1.9655	1.9701	1.9745
1.9789	1.9830	1.9871	1.9910	1.9948	1.9985	2.0021
2.0056	2.0091	2.0124	2.0157	2.0189	2.0221	2.0251
2.0281	2.0311	2.0340	2.0368	2.0396	2.0424	2.0451
2.0477	2.0503	2.0529	2.0554	2.0579	2.0603	2.0628
2.0651	2.0675	2.0698	2.0721	2.0743	2.0766	2.0787
2.0809	2.0831	2.0852	2.0873	2.0893	2.0914	2.0934
2.0954	2.0973	2.0993	2.1012	2.1031	2.1050	2.1069
2.1088	2.1106	2.1124	2.1142	2.1160	2.1178	2.1195
2.1212	2.1230	2.1247	2.1263	2.1280	2.1297	2.1313
2.1330	2.1346	2.1362	2.1378	2.1393	2.1409	2.1425
2.1440	2.1455	2.1471	2.1486	2.1501	2.1515	2.1530
2.1545	2.1559	2.1574	2.1588	2.1602	2.1616	2.1631
2.1644	2.1658	2.1672	2.1686	2.1699	2.1713	2.1726
2.1740	2.1753	2.1766	2.1779	2.1792	2.1805	2.1818
2.1831	2.1843	2.1856	2.1869	2.1881	2.1893	2.1906
2.1918	2.1930	2.1942	2.1954	2.1967	2.1978	2.1990
2.2002	2.2015	2.2028	2.2041	2.2054	2.2067	2.2080
2.2092	2.2105	2.2118	2.2130	2.2143	2.2156	2.2168
2.2181	2.2193	2.2206	2.2218	2.2231	2.2243	2.2255
2.2268	2.2280	2.2292	2.2305	2.2317	2.2329	2.2341
2.2354	2.2366	2.2378	2.2390	2.2402	2.2414	2.2426
2.2438	2.2450	2.2462	2.2474	2.2486	2.2497	2.2509
2.2521	2.2533	2.2545	2.2556	2.2568	2.2580	2.2591
2.2603	2.2615	2.2626	2.2638	2.2649	2.2661	2.2672
2.2684	2.2695	2.2706	2.2718	2.2729	2.2741	2.2752
2.2763	2.2774	2.2786	2.2797	2.2808	2.2819	2.2830
2.2842	2.2853	2.2864	2.2875	2.2886	2.2897	2.2908
2.2919	2.2930	2.2941	2.2952	2.2963	2.2974	2.2984
2.2995	2.3006	2.3017	2.3028	2.3038	2.3049	2.3060
2.3071	2.3081	2.3092	2.3103	2.3113	2.3124	2.3134
2.3145	2.3155	2.3166	2.3176	2.3187	2.3197	2.3208
2.3218	2.3229	2.3239	2.3249	2.3260	2.3270	2.3280

2.3291	2.3301	2.3311	2.3321	2.3331	2.3342	2.3352
2.3362	2.3372	2.3382	2.3392	2.3402	2.3413	2.3423
2.3433	2.3443	2.3453	2.3463	2.3473	2.3482	2.3492
2.3502	2.3512	2.3522	2.3532	2.3542	2.3552	2.3561
2.3571	2.3581	2.3591	2.3600	2.3610	2.3620	2.3630
2.3639	2.3649	2.3659	2.3668	2.3678	2.3687	2.3697
2.3706	2.3716	2.3726	2.3735	2.3745	2.3754	2.3763
2.3773	2.3782	2.3792	2.3801	2.3811	2.3820	2.3829
2.3839	2.3848	2.3857	2.3867	2.3876	2.3885	2.3894
2.3904	2.3913	2.3922	2.3931	2.3940	2.3950	2.3959
2.3968	2.3977	2.3986	2.3995	2.4004	2.4013	2.4022
2.4031	2.4040	2.4049	2.4058	2.4067	2.4076	2.4085
2.4094	2.4103	2.4112	2.4121	2.4130	2.4139	2.4148
2.4156	2.4165	2.4174	2.4183	2.4192	2.4200	2.4209
2.4218	2.4227	2.4235	2.4244	2.4253	2.4261	2.4270
2.4279	2.4287	2.4296	2.4305	2.4313	2.4322	2.4330
2.4339	2.4348	2.4356	2.4365	2.4373	2.4382	2.4390
2.4399	2.4407	2.4416	2.4424	2.4432	2.4441	2.4449
2.4458	2.4466	2.4474	2.4483	2.4491	2.4499	2.4508
2.4516	2.4524	2.4533	2.4541	2.4549	2.4557	2.4566
2.4574	2.4582	2.4590	2.4599	2.4607	2.4615	2.4623
2.4631	2.4639	2.4647	2.4656	2.4664	2.4672	2.4680
2.4688	2.4696	2.4704	2.4712	2.4720	2.4728	2.4736
2.4744	2.4752	2.4760	2.4768	2.4776	2.4784	2.4792
2.4800	2.4808	2.4816	2.4823	2.4831	2.4839	2.4847
2.4855	2.4863	2.4871	2.4878	2.4886	2.4894	2.4902
2.4910	2.4917	2.4925	2.4933	2.4941	2.4948	2.4956
2.4964	2.4971	2.4979	2.4987	2.4994	2.5002	2.5010
2.5017	2.5025	2.5033	2.5040	2.5048	2.5055	2.5063
2.5070	2.5078	2.5086	2.5093	2.5101	2.5108	2.5116
2.5123	2.5131	2.5138	2.5146	2.5153	2.5161	2.5168
2.5175	2.5183	2.5190	2.5198	2.5205	2.5212	2.5220
2.5227	2.5235	2.5242	2.5249	2.5257	2.5264	2.5271
2.5279	2.5286	2.5293	2.5300	2.5308	2.5315	2.5322
2.5329	2.5337	2.5344	2.5351	2.5358	2.5366	2.5373
2.5380	2.5387	2.5394	2.5401	2.5409	2.5416	2.5423
2.5430	2.5437	2.5444	2.5451	2.5458	2.5465	2.5472
2.5480	2.5487	2.5494	2.5501	2.5508	2.5515	2.5522
2.5529	2.5536	2.5543	2.5550	2.5557	2.5564	2.5571
2.5578	2.5585	2.5591	2.5598	2.5605	2.5612	2.5619
2.5626	2.5633	2.5640	2.5647	2.5654	2.5660	2.5667
2.5674	2.5681	2.5688	2.5695	2.5701	2.5708	2.5715
2.5722	2.5729	2.5735	2.5742	2.5749	2.5756	2.5762
2.5769	2.5776	2.5782	2.5789	2.5796	2.5803	2.5809
2.5816	2.5823	2.5829	2.5836	2.5843	2.5849	2.5856
2.5863	2.5869	2.5876	2.5882	2.5889	2.5896	2.5902
2.5909	2.5915	2.5922	2.5928	2.5935	2.5942	2.5948
2.5955	2.5961	2.5968	2.5974	2.5981	2.5987	2.5994
2.6000	2.6007	2.6013	2.6020	2.6026	2.6032	2.6039
2.6045	2.6052	2.6058	2.6065	2.6071	2.6077	2.6084
2.6090	2.6097	2.6103	2.6109	2.6116	2.6122	2.6128
2.6135	2.6141	2.6147	2.6154	2.6160	2.6166	2.6173
2.6179	2.6185	2.6191	2.6198	2.6204	2.6210	2.6217
2.6223	2.6229	2.6235	2.6241	2.6248	2.6254	2.6260
2.6266	2.6273	2.6279	2.6285	2.6291	2.6297	2.6303
2.6310	2.6316	2.6322	2.6328	2.6334	2.6340	2.6346
2.6353	2.6359	2.6365	2.6371	2.6377	2.6383	2.6389

```
                    2.6395  2.6401  2.6407  2.6413  2.6420  2.6426  2.6432
                    2.6438  2.6444  2.6450  2.6456  2.6462  2.6468  2.6474
                    2.6480  2.6486  2.6492  2.6498  2.6504  2.6510  2.6516
                    2.6522  2.6527  2.6533  2.6539  2.6545  2.6551  2.6557
                    2.6563  2.6569  2.6575  2.6581  2.6587  2.6593  2.6598

    ************************************************************
    *S EXISTING CONDITIONS

    *S  COMPUTE HYD EX BASIN 1
    COMPUTE NM HYD      ID=1  HYDNO=101  DA=0.00101SQ MI
                        PER A=100  PER B=0   PER C=0   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.160369HR    TP =  0.130000HR    K/TP RATIO =  1.233609     SHAPE CONSTANT, N =
2.887569
         UNIT PEAK =   2.1173    CFS   UNIT VOLUME =   0.9927       B =   272.53      P60 =
1.8400
         AREA =     0.001010 SQ MI    IA =   0.65000 INCHES    INF =   1.67000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=1  CODE=10

                                      PARTIAL HYDROGRAPH   101.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
         0.000       0.0          0.990       0.0          1.980       0.1          2.970
0.0
         0.330       0.0          1.320       0.0          2.310       0.0          3.300
0.0
         0.660       0.0          1.650       0.5          2.640       0.0

        RUNOFF VOLUME =     0.43063 INCHES     =       0.0232 ACRE-FEET
        PEAK DISCHARGE RATE =       0.85 CFS  AT   1.518 HOURS   BASIN AREA =  0.0010 SQ. MI.




    *S  COMPUTE HYD EX BASIN 2
    COMPUTE NM HYD      ID=2  HYDNO=102  DA=0.00182SQ MI
                        PER A=96  PER B=0   PER C=4   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.158071HR    TP =  0.130000HR    K/TP RATIO =  1.215931     SHAPE CONSTANT, N =
2.925598
         UNIT PEAK =   3.8599    CFS   UNIT VOLUME =   0.9960       B =   275.71      P60 =
1.8400
         AREA =     0.001820 SQ MI    IA =   0.63800 INCHES    INF =   1.63640 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=2  CODE=10

                                      PARTIAL HYDROGRAPH   102.00
```

```
         TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
         0.000       0.0          0.990       0.0          1.980       0.1          2.970
0.0
         0.330       0.0          1.320       0.0          2.310       0.1          3.300
0.0
         0.660       0.0          1.650       0.9          2.640       0.0          3.630
0.0

        RUNOFF VOLUME =     0.44549 INCHES     =       0.0432 ACRE-FEET
        PEAK DISCHARGE RATE =       1.59 CFS  AT   1.518 HOURS   BASIN AREA =  0.0018 SQ. MI.



    *S  COMPUTE HYD EX BASIN 3
    COMPUTE NM HYD      ID=3  HYDNO=103  DA=0.01192SQ MI
                        PER A=0  PER B=50   PER C=50   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.115590HR    TP =  0.130000HR    K/TP RATIO =  0.889153     SHAPE CONSTANT, N =
3.988933
         UNIT PEAK =   32.499    CFS   UNIT VOLUME =    1.000       B =   354.44      P60 =
1.8400
         AREA =     0.011920 SQ MI    IA =   0.42500 INCHES    INF =   1.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=3  CODE=10

                                      PARTIAL HYDROGRAPH   103.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
         0.000       0.0          0.990       0.0          1.980       1.8          2.970
0.1          3.960       0.0
         0.330       0.0          1.320       0.4          2.310       0.6          3.300
0.0
         0.660       0.0          1.650      10.7          2.640       0.2          3.630
0.0

        RUNOFF VOLUME =     0.80044 INCHES     =       0.5089 ACRE-FEET
        PEAK DISCHARGE RATE =      18.73 CFS  AT   1.518 HOURS   BASIN AREA =  0.0119 SQ. MI.



    *S  COMPUTE HYD EX BASIN 4
    COMPUTE NM HYD      ID=4  HYDNO=104  DA=0.00054SQ MI
                        PER A=81  PER B=0   PER C=19   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.149453HR    TP =  0.130000HR    K/TP RATIO =  1.149639     SHAPE CONSTANT, N =
3.081287
```

```
        UNIT PEAK =   1.1979    CFS   UNIT VOLUME =   0.9876       B =   288.39      P60 =
1.8400
        AREA =     0.000540 SQ MI    IA =   0.59300 INCHES    INF =   1.51040 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=4  CODE=10

                                      PARTIAL HYDROGRAPH   104.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW          TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS           HRS       CFS
        0.000       0.0          0.660       0.0          1.320       0.0          1.980
0.1         2.640       0.0
        0.330       0.0          0.990       0.0          1.650       0.3          2.310
0.0         2.970       0.0

       RUNOFF VOLUME =     0.50657 INCHES     =       0.0146 ACRE-FEET
       PEAK DISCHARGE RATE =       0.55 CFS  AT   1.518 HOURS   BASIN AREA =  0.0005 SQ. MI.



    *S  COMPUTE HYD EX BASIN 5
    COMPUTE NM HYD      ID=5  HYDNO=105  DA=0.00020SQ MI
                        PER A=93  PER B=0   PER C=7   PER D=0
                        TP=-0.13   RAIN=-1

        K =  0.156347HR    TP =  0.130000HR    K/TP RATIO =  1.202673     SHAPE CONSTANT, N =
2.955034
        UNIT PEAK =  0.42791    CFS   UNIT VOLUME =   0.9663       B =   278.14      P60 =
1.8400
        AREA =     0.000200 SQ MI    IA =   0.62900 INCHES    INF =   1.61120 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=5  CODE=10

                                      PARTIAL HYDROGRAPH   105.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW          TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS           HRS       CFS
        0.000       0.0          0.660       0.0          1.320       0.0          1.980
0.0
        0.330       0.0          0.990       0.0          1.650       0.1          2.310
0.0

       RUNOFF VOLUME =     0.45728 INCHES     =       0.0049 ACRE-FEET
       PEAK DISCHARGE RATE =       0.18 CFS  AT   1.518 HOURS   BASIN AREA =  0.0002 SQ. MI.



    *S  COMPUTE HYD EX BASIN 6
    COMPUTE NM HYD      ID=6  HYDNO=106  DA=0.00120SQ MI
```

```
                    PER A=0  PER B=50   PER C=50   PER D=0
                    TP=-0.13   RAIN=-1

      K =  0.115590HR    TP =  0.130000HR    K/TP RATIO =  0.889153     SHAPE CONSTANT, N =
3.988933
      UNIT PEAK =   3.2717    CFS   UNIT VOLUME =   0.9964       B =   354.44      P60 =
1.8400
      AREA =     0.001200 SQ MI    IA =   0.42500 INCHES    INF =   1.04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

  PRINT HYD           ID=6  CODE=10

                                     PARTIAL HYDROGRAPH   106.00

      TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
       HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
      0.000       0.0          0.660       0.0          1.320       0.0          1.980
0.2          2.640       0.0
      0.330       0.0          0.990       0.0          1.650       1.1          2.310
0.1          2.970       0.0

     RUNOFF VOLUME =     0.80044 INCHES     =       0.0512 ACRE-FEET
     PEAK DISCHARGE RATE =       1.89 CFS  AT   1.518 HOURS   BASIN AREA =  0.0012 SQ. MI.



  *S  COMPUTE HYD EX BASIN 7
  COMPUTE NM HYD      ID=7  HYDNO=107  DA=0.00344SQ MI
                      PER A=0  PER B=50   PER C=50   PER D=0
                      TP=-0.13   RAIN=-1

      K =  0.115590HR    TP =  0.130000HR    K/TP RATIO =  0.889153     SHAPE CONSTANT, N =
3.988933
      UNIT PEAK =   9.3789    CFS   UNIT VOLUME =   0.9990       B =   354.44      P60 =
1.8400
      AREA =     0.003440 SQ MI    IA =   0.42500 INCHES    INF =   1.04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

  PRINT HYD           ID=7  CODE=10

                                     PARTIAL HYDROGRAPH   107.00

      TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
       HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
      0.000       0.0          0.990       0.0          1.980       0.5          2.970
0.0
      0.330       0.0          1.320       0.1          2.310       0.2          3.300
0.0
      0.660       0.0          1.650       3.1          2.640       0.1

     RUNOFF VOLUME =     0.80044 INCHES     =       0.1469 ACRE-FEET
     PEAK DISCHARGE RATE =       5.41 CFS  AT   1.518 HOURS   BASIN AREA =  0.0034 SQ. MI.
```

```
    *S  COMPUTE HYD EX BASIN 8
    COMPUTE NM HYD      ID=8  HYDNO=108  DA=0.00108SQ MI
                        PER A=100  PER B=0   PER C=0   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.160369HR    TP =  0.130000HR    K/TP RATIO =  1.233609     SHAPE CONSTANT, N =
2.887569
         UNIT PEAK =   2.2641    CFS   UNIT VOLUME =   0.9932       B =   272.53      P60 =
1.8400
         AREA =     0.001080 SQ MI    IA =   0.65000 INCHES    INF =   1.67000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=8  CODE=10

                                      PARTIAL HYDROGRAPH   108.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
         0.000       0.0          0.990       0.0          1.980       0.1          2.970
0.0
         0.330       0.0          1.320       0.0          2.310       0.0          3.300
0.0
         0.660       0.0          1.650       0.5          2.640       0.0

        RUNOFF VOLUME =     0.43063 INCHES     =       0.0248 ACRE-FEET
        PEAK DISCHARGE RATE =       0.91 CFS  AT   1.518 HOURS   BASIN AREA =  0.0011 SQ. MI.



    *S  COMPUTE HYD EX BASIN OFF1
    COMPUTE NM HYD      ID=9  HYDNO=109  DA=0.00357SQ MI
                        PER A=6  PER B=0   PER C=45   PER D=49
                        TP=-0.13   RAIN=-1

         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
         UNIT PEAK =   7.0816    CFS   UNIT VOLUME =   0.9982       B =   526.28      P60 =
1.8400
         AREA =     0.001749 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000


         K =  0.109675HR    TP =  0.130000HR    K/TP RATIO =  0.843655     SHAPE CONSTANT, N =
4.222227
         UNIT PEAK =   5.1781    CFS   UNIT VOLUME =   0.9979       B =   369.72      P60 =
1.8400
         AREA =     0.001821 SQ MI    IA =   0.38529 INCHES    INF =   0.92882 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=9  CODE=10
```

PARTIAL HYDROGRAPH 109.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0	19.800	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0	20.130	0.0
0.660	0.0	5.610	0.0	10.560	0.0	15.510	0.0	20.460	0.0
0.990	0.0	5.940	0.0	10.890	0.0	15.840	0.0	20.790	0.0
1.320	1.5	6.270	0.0	11.220	0.0	16.170	0.0	21.120	0.0
1.650	4.3	6.600	0.0	11.550	0.0	16.500	0.0	21.450	0.0
1.980	1.6	6.930	0.0	11.880	0.0	16.830	0.0	21.780	0.0
2.310	0.4	7.260	0.0	12.210	0.0	17.160	0.0	22.110	0.0
2.640	0.1	7.590	0.0	12.540	0.0	17.490	0.0	22.440	0.0
2.970	0.1	7.920	0.0	12.870	0.0	17.820	0.0	22.770	0.0
3.300	0.0	8.250	0.0	13.200	0.0	18.150	0.0	23.100	0.0
3.630	0.0	8.580	0.0	13.530	0.0	18.480	0.0	23.430	0.0
3.960	0.0	8.910	0.0	13.860	0.0	18.810	0.0	23.760	0.0
4.290	0.0	9.240	0.0	14.190	0.0	19.140	0.0	24.090	0.0
4.620	0.0	9.570	0.0	14.520	0.0	19.470	0.0	24.420	0.0

RUNOFF VOLUME = 1.64128 INCHES = 0.3125 ACRE-FEET
PEAK DISCHARGE RATE = 7.90 CFS AT 1.518 HOURS BASIN AREA = 0.0036 SQ. MI.

```
    *S  COMPUTE HYD EX BASIN OFF2
    COMPUTE NM HYD      ID=10  HYDNO=110  DA=0.01001SQ MI
                        PER A=96  PER B=0   PER C=4   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.158071HR    TP =  0.130000HR    K/TP RATIO =  1.215931     SHAPE CONSTANT, N =
2.925598
         UNIT PEAK =   21.229    CFS   UNIT VOLUME =   0.9990       B =   275.71      P60 =
1.8400
         AREA =     0.010010 SQ MI    IA =   0.63800 INCHES    INF =   1.63640 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=10  CODE=10
```

PARTIAL HYDROGRAPH 110.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.990	0.0	1.980	0.8	2.970	0.1	3.960	0.0
0.330	0.0	1.320	0.0	2.310	0.4	3.300	0.0	4.290	0.0
0.660	0.0	1.650	5.2	2.640	0.2	3.630	0.0		

RUNOFF VOLUME = 0.44549 INCHES = 0.2378 ACRE-FEET
PEAK DISCHARGE RATE = 8.71 CFS AT 1.518 HOURS BASIN AREA = 0.0100 SQ. MI.

*S COMPUTE HYD EX BASIN OFF3
COMPUTE NM HYD ID=11 HYDNO=111 DA=0.00230SQ MI
PER A=96 PER B=0 PER C=4 PER D=0
TP=-0.13 RAIN=-1

K = 0.158071HR TP = 0.130000HR K/TP RATIO = 1.215931 SHAPE CONSTANT, N = 2.925598
UNIT PEAK = 4.8779 CFS UNIT VOLUME = 0.9967 B = 275.71 P60 = 1.8400
AREA = 0.002300 SQ MI IA = 0.63800 INCHES INF = 1.63640 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=11 CODE=10

PARTIAL HYDROGRAPH 111.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.990	0.0	1.980	0.2	2.970	0.0		
0.330	0.0	1.320	0.0	2.310	0.1	3.300	0.0		
0.660	0.0	1.650	1.2	2.640	0.0	3.630	0.0		

RUNOFF VOLUME = 0.44549 INCHES = 0.0546 ACRE-FEET
PEAK DISCHARGE RATE = 2.01 CFS AT 1.518 HOURS BASIN AREA = 0.0023 SQ. MI.

*S COMPUTE HYD EX BASIN OFF4
COMPUTE NM HYD ID=12 HYDNO=112 DA=0.00160SQ MI
PER A=0 PER B=0 PER C=33 PER D=67
TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 4.3397 CFS UNIT VOLUME = 0.9972 B = 526.28 P60 = 1.8400
AREA = 0.001072 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.102916HR TP = 0.130000HR K/TP RATIO = 0.791661 SHAPE CONSTANT, N = 4.530856
UNIT PEAK = 1.5805 CFS UNIT VOLUME = 0.9923 B = 389.14 P60 = 1.8400
AREA = 0.000528 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=12 CODE=10

PARTIAL HYDROGRAPH 112.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0	19.800	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0	20.130	0.0
0.660	0.0	5.610	0.0	10.560	0.0	15.510	0.0	20.460	0.0
0.990	0.0	5.940	0.0	10.890	0.0	15.840	0.0	20.790	0.0
1.320	0.9	6.270	0.0	11.220	0.0	16.170	0.0	21.120	0.0
1.650	2.1	6.600	0.0	11.550	0.0	16.500	0.0	21.450	0.0
1.980	0.9	6.930	0.0	11.880	0.0	16.830	0.0	21.780	0.0
2.310	0.2	7.260	0.0	12.210	0.0	17.160	0.0	22.110	0.0
2.640	0.1	7.590	0.0	12.540	0.0	17.490	0.0	22.440	0.0
2.970	0.0	7.920	0.0	12.870	0.0	17.820	0.0	22.770	0.0
3.300	0.0	8.250	0.0	13.200	0.0	18.150	0.0	23.100	0.0
3.630	0.0	8.580	0.0	13.530	0.0	18.480	0.0	23.430	0.0
3.960	0.0	8.910	0.0	13.860	0.0	18.810	0.0	23.760	0.0
4.290	0.0	9.240	0.0	14.190	0.0	19.140	0.0	24.090	0.0
4.620	0.0	9.570	0.0	14.520	0.0	19.470	0.0		

RUNOFF VOLUME = 1.94610 INCHES = 0.1661 ACRE-FEET
PEAK DISCHARGE RATE = 3.94 CFS AT 1.485 HOURS BASIN AREA = 0.0016 SQ. MI.

```
    ************************************************************
    *S PROPOSED CONDITIONS

    *S  COMPUTE HYD DEV BASIN 1
    COMPUTE NM HYD      ID=13  HYDNO=113  DA=0.00191SQ MI
                        PER A=0  PER B=0   PER C=42   PER D=58
                        TP=-0.13   RAIN=-1

         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
         UNIT PEAK =   4.4847    CFS   UNIT VOLUME =   0.9972       B =   526.28      P60 =
1.8400
         AREA =     0.001108 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000


         K =  0.102916HR    TP =  0.130000HR    K/TP RATIO =  0.791661     SHAPE CONSTANT, N =
4.530856
         UNIT PEAK =   2.4013    CFS   UNIT VOLUME =   0.9951       B =   389.14      P60 =
1.8400
         AREA =     0.000802 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=13  CODE=5

                                      PARTIAL HYDROGRAPH   113.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
         0.000       0.0          4.950       0.0          9.900       0.0         14.850
0.0         19.800       0.0
         0.165       0.0          5.115       0.0         10.065       0.0         15.015
0.0         19.965       0.0
         0.330       0.0          5.280       0.0         10.230       0.0         15.180
0.0         20.130       0.0
         0.495       0.0          5.445       0.0         10.395       0.0         15.345
0.0         20.295       0.0
         0.660       0.0          5.610       0.0         10.560       0.0         15.510
0.0         20.460       0.0
         0.825       0.0          5.775       0.0         10.725       0.0         15.675
0.0         20.625       0.0
         0.990       0.0          5.940       0.0         10.890       0.0         15.840
0.0         20.790       0.0
         1.155       0.0          6.105       0.0         11.055       0.0         16.005
0.0         20.955       0.0
         1.320       0.9          6.270       0.0         11.220       0.0         16.170
0.0         21.120       0.0
         1.485       4.5          6.435       0.0         11.385       0.0         16.335
0.0         21.285       0.0
         1.650       2.4          6.600       0.0         11.550       0.0         16.500
0.0         21.450       0.0
         1.815       1.4          6.765       0.0         11.715       0.0         16.665
```

```
0.0        21.615       0.0
        1.980       1.0          6.930       0.0         11.880       0.0         16.830
0.0        21.780       0.0
        2.145       0.5          7.095       0.0         12.045       0.0         16.995
0.0        21.945       0.0
        2.310       0.2          7.260       0.0         12.210       0.0         17.160
0.0        22.110       0.0
        2.475       0.1          7.425       0.0         12.375       0.0         17.325
0.0        22.275       0.0
        2.640       0.1          7.590       0.0         12.540       0.0         17.490
0.0        22.440       0.0
        2.805       0.1          7.755       0.0         12.705       0.0         17.655
0.0        22.605       0.0
        2.970       0.0          7.920       0.0         12.870       0.0         17.820
0.0        22.770       0.0
        3.135       0.0          8.085       0.0         13.035       0.0         17.985
0.0        22.935       0.0
        3.300       0.0          8.250       0.0         13.200       0.0         18.150
0.0        23.100       0.0
        3.465       0.0          8.415       0.0         13.365       0.0         18.315
0.0        23.265       0.0
        3.630       0.0          8.580       0.0         13.530       0.0         18.480
0.0        23.430       0.0
        3.795       0.0          8.745       0.0         13.695       0.0         18.645
0.0        23.595       0.0
        3.960       0.0          8.910       0.0         13.860       0.0         18.810
0.0        23.760       0.0
        4.125       0.0          9.075       0.0         14.025       0.0         18.975
0.0        23.925       0.0
        4.290       0.0          9.240       0.0         14.190       0.0         19.140
0.0        24.090       0.0
        4.455       0.0          9.405       0.0         14.355       0.0         19.305
0.0        24.255       0.0
        4.620       0.0          9.570       0.0         14.520       0.0         19.470
0.0
        4.785       0.0          9.735       0.0         14.685       0.0         19.635
0.0

       RUNOFF VOLUME =     1.81592 INCHES     =       0.1850 ACRE-FEET
       PEAK DISCHARGE RATE =       4.53 CFS  AT   1.485 HOURS   BASIN AREA =  0.0019 SQ. MI.



    *S  COMPUTE HYD DEV BASIN 2
    COMPUTE NM HYD      ID=14  HYDNO=114  DA=0.00022SQ MI
                        PER A=0  PER B=0   PER C=100   PER D=0
                        TP=-0.13   RAIN=-1

         K =  0.102916HR    TP =  0.130000HR    K/TP RATIO =  0.791661     SHAPE CONSTANT, N =
4.530856
         UNIT PEAK =  0.65854    CFS   UNIT VOLUME =   0.9813       B =   389.14      P60 =
1.8400
         AREA =     0.000220 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=14  CODE=10
```

PARTIAL HYDROGRAPH 114.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.660	0.0	1.320	0.0	1.980	0.1		
0.330	0.0	0.990	0.0	1.650	0.2	2.310	0.0		

RUNOFF VOLUME = 0.97702 INCHES = 0.0115 ACRE-FEET
PEAK DISCHARGE RATE = 0.41 CFS AT 1.518 HOURS BASIN AREA = 0.0002 SQ. MI.

*S COMPUTE HYD DEV BASIN 3
COMPUTE NM HYD ID=15 HYDNO=115 DA=0.00564SQ MI
PER A=0 PER B=16 PER C=16 PER D=68
TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 15.526 CFS UNIT VOLUME = 0.9991 B = 526.28 P60 = 1.8400
AREA = 0.003835 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.115590HR TP = 0.130000HR K/TP RATIO = 0.889153 SHAPE CONSTANT, N = 3.988933
UNIT PEAK = 4.9207 CFS UNIT VOLUME = 0.9977 B = 354.44 P60 = 1.8400
AREA = 0.001805 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=15 CODE=10

PARTIAL HYDROGRAPH 115.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1	14.850	0.1	19.800	0.1
0.330	0.0	5.280	0.1	10.230	0.1	15.180	0.1	20.130	0.1
0.660	0.0	5.610	0.1	10.560	0.1	15.510	0.1	20.460	0.0
0.990	0.0	5.940	0.1	10.890	0.1	15.840	0.1	20.790	0.0
1.320	3.0	6.270	0.1	11.220	0.1	16.170	0.1	21.120	0.0
1.650	7.2	6.600	0.1	11.550	0.1	16.500			

```
0.1        21.450       0.0
        1.980       3.0          6.930       0.1          11.880       0.1          16.830
0.1        21.780       0.0
        2.310       0.7          7.260       0.1          12.210       0.1          17.160
0.1        22.110       0.0
        2.640       0.3          7.590       0.1          12.540       0.1          17.490
0.1        22.440       0.0
        2.970       0.1          7.920       0.1          12.870       0.1          17.820
0.1        22.770       0.0
        3.300       0.1          8.250       0.1          13.200       0.1          18.150
0.1        23.100       0.0
        3.630       0.1          8.580       0.1          13.530       0.1          18.480
0.1        23.430       0.0
        3.960       0.1          8.910       0.1          13.860       0.1          18.810
0.1        23.760       0.0
        4.290       0.1          9.240       0.1          14.190       0.1          19.140
0.1        24.090       0.0
        4.620       0.1          9.570       0.1          14.520       0.1          19.470
0.1        24.420       0.0

        RUNOFF VOLUME =     1.90406 INCHES     =       0.5727 ACRE-FEET
        PEAK DISCHARGE RATE =      13.37 CFS  AT   1.485 HOURS   BASIN AREA =  0.0056 SQ. MI.



    *S  COMPUTE HYD DEV BASIN 4
    COMPUTE NM HYD      ID=16  HYDNO=116  DA=0.00601SQ MI
                        PER A=0  PER B=11   PER C=11   PER D=78
                        TP=-0.13   RAIN=-1

        K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
        UNIT PEAK =   18.977    CFS   UNIT VOLUME =   0.9993       B =   526.28      P60 =
1.8400
        AREA =     0.004688 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000


        K =  0.115590HR    TP =  0.130000HR    K/TP RATIO =  0.889153     SHAPE CONSTANT, N =
3.988933
        UNIT PEAK =   3.6049    CFS   UNIT VOLUME =   0.9968       B =   354.44      P60 =
1.8400
        AREA =     0.001322 SQ MI    IA =   0.42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=16  CODE=10

                                      PARTIAL HYDROGRAPH   116.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
        0.000       0.0          4.950       0.1          9.900       0.1          14.850
0.1        19.800       0.1
        0.330       0.0          5.280       0.1         10.230       0.1          15.180
```

```
0.1        20.130       0.1
        0.660       0.0          5.610       0.1         10.560       0.1         15.510
0.1        20.460       0.1
        0.990       0.0          5.940       0.1         10.890       0.1         15.840
0.1        20.790       0.1
        1.320       3.7          6.270       0.1         11.220       0.1         16.170
0.1        21.120       0.1
        1.650       8.0          6.600       0.1         11.550       0.1         16.500
0.1        21.450       0.1
        1.980       3.5          6.930       0.1         11.880       0.1         16.830
0.1        21.780       0.1
        2.310       0.8          7.260       0.1         12.210       0.1         17.160
0.1        22.110       0.1
        2.640       0.3          7.590       0.1         12.540       0.1         17.490
0.1        22.440       0.1
        2.970       0.2          7.920       0.1         12.870       0.1         17.820
0.1        22.770       0.1
        3.300       0.1          8.250       0.1         13.200       0.1         18.150
0.1        23.100       0.1
        3.630       0.1          8.580       0.1         13.530       0.1         18.480
0.1        23.430       0.1
        3.960       0.1          8.910       0.1         13.860       0.1         18.810
0.1        23.760       0.1
        4.290       0.1          9.240       0.1         14.190       0.1         19.140
0.1        24.090       0.0
        4.620       0.1          9.570       0.1         14.520       0.1         19.470
0.1        24.420       0.0

        RUNOFF VOLUME =     2.06636 INCHES     =       0.6623 ACRE-FEET
        PEAK DISCHARGE RATE =      14.99 CFS  AT   1.485 HOURS   BASIN AREA =  0.0060 SQ. MI.



    *S  COMPUTE HYD DEV BASIN 5
    COMPUTE NM HYD      ID=17  HYDNO=117  DA=0.00300SQ MI
                        PER A=0  PER B=14   PER C=14   PER D=72
                        TP=-0.13   RAIN=-1

        K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
        UNIT PEAK =   8.7443    CFS   UNIT VOLUME =   0.9986       B =   526.28      P60 =
1.8400
        AREA =     0.002160 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000


        K =  0.115590HR    TP =  0.130000HR    K/TP RATIO =  0.889153     SHAPE CONSTANT, N =
3.988933
        UNIT PEAK =   2.2902    CFS   UNIT VOLUME =   0.9946       B =   354.44      P60 =
1.8400
        AREA =     0.000840 SQ MI    IA =   0.42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=17  CODE=10

                                      PARTIAL HYDROGRAPH   117.00
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0	19.800	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0	20.130	0.0
0.660	0.0	5.610	0.0	10.560	0.0	15.510	0.0	20.460	0.0
0.990	0.0	5.940	0.0	10.890	0.0	15.840	0.0	20.790	0.0
1.320	1.7	6.270	0.1	11.220	0.0	16.170	0.0	21.120	0.0
1.650	3.9	6.600	0.1	11.550	0.0	16.500	0.0	21.450	0.0
1.980	1.6	6.930	0.1	11.880	0.0	16.830	0.0	21.780	0.0
2.310	0.4	7.260	0.1	12.210	0.0	17.160	0.0	22.110	0.0
2.640	0.2	7.590	0.0	12.540	0.0	17.490	0.0	22.440	0.0
2.970	0.1	7.920	0.0	12.870	0.0	17.820	0.0	22.770	0.0
3.300	0.1	8.250	0.0	13.200	0.0	18.150	0.0	23.100	0.0
3.630	0.0	8.580	0.0	13.530	0.0	18.480	0.0	23.430	0.0
3.960	0.0	8.910	0.0	13.860	0.0	18.810	0.0	23.760	0.0
4.290	0.0	9.240	0.0	14.190	0.0	19.140	0.0	24.090	0.0
4.620	0.0	9.570	0.0	14.520	0.0	19.470	0.0	24.420	0.0

RUNOFF VOLUME = 1.96898 INCHES = 0.3150 ACRE-FEET
PEAK DISCHARGE RATE = 7.27 CFS AT 1.485 HOURS BASIN AREA = 0.0030 SQ. MI.

*S COMPUTE HYD DEV BASIN 6
COMPUTE NM HYD ID=18 HYDNO=118 DA=0.00255SQ MI
PER A=0 PER B=0 PER C=14 PER D=86
TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 8.8779 CFS UNIT VOLUME = 0.9986 B = 526.28 P60 = 1.8400
AREA = 0.002193 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.102916HR TP = 0.130000HR K/TP RATIO = 0.791661 SHAPE CONSTANT, N = 4.530856

UNIT PEAK = 1.0686 CFS UNIT VOLUME = 0.9880 B = 389.14 P60 = 1.8400
AREA = 0.000357 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=18 CODE=10

PARTIAL HYDROGRAPH 118.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0	19.800	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0	20.130	0.0
0.660	0.0	5.610	0.0	10.560	0.0	15.510	0.0	20.460	0.0
0.990	0.0	5.940	0.0	10.890	0.0	15.840	0.0	20.790	0.0
1.320	1.7	6.270	0.1	11.220	0.0	16.170	0.0	21.120	0.0
1.650	3.6	6.600	0.1	11.550	0.0	16.500	0.0	21.450	0.0
1.980	1.6	6.930	0.1	11.880	0.0	16.830	0.0	21.780	0.0
2.310	0.4	7.260	0.1	12.210	0.0	17.160	0.0	22.110	0.0
2.640	0.1	7.590	0.1	12.540	0.0	17.490	0.0	22.440	0.0
2.970	0.1	7.920	0.0	12.870	0.0	17.820	0.0	22.770	0.0
3.300	0.1	8.250	0.0	13.200	0.0	18.150	0.0	23.100	0.0
3.630	0.0	8.580	0.0	13.530	0.0	18.480	0.0	23.430	0.0
3.960	0.0	8.910	0.0	13.860	0.0	18.810	0.0	23.760	0.0
4.290	0.0	9.240	0.0	14.190	0.0	19.140	0.0	24.090	0.0
4.620	0.0	9.570	0.0	14.520	0.0	19.470	0.0	24.420	0.0

RUNOFF VOLUME = 2.22091 INCHES = 0.3020 ACRE-FEET
PEAK DISCHARGE RATE = 6.72 CFS AT 1.485 HOURS BASIN AREA = 0.0026 SQ. MI.

*S COMPUTE HYD DEV BASIN OFF1
COMPUTE NM HYD ID=19 HYDNO=119 DA=0.00479SQ MI
PER A=0 PER B=0 PER C=0 PER D=100
TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428

UNIT PEAK = 19.391 CFS UNIT VOLUME = 0.9993 B = 526.28 P60 = 1.8400
AREA = 0.004790 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=19 CODE=10

PARTIAL HYDROGRAPH 119.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1	14.850	0.1	19.800	0.1
0.330	0.0	5.280	0.1	10.230	0.1	15.180	0.1	20.130	0.1
0.660	0.0	5.610	0.1	10.560	0.1	15.510	0.1	20.460	0.1
0.990	0.0	5.940	0.1	10.890	0.1	15.840	0.1	20.790	0.1
1.320	3.7	6.270	0.1	11.220	0.1	16.170	0.1	21.120	0.1
1.650	7.0	6.600	0.1	11.550	0.1	16.500	0.1	21.450	0.1
1.980	3.4	6.930	0.1	11.880	0.1	16.830	0.1	21.780	0.1
2.310	0.7	7.260	0.1	12.210	0.1	17.160	0.1	22.110	0.1
2.640	0.3	7.590	0.1	12.540	0.1	17.490	0.1	22.440	0.1
2.970	0.2	7.920	0.1	12.870	0.1	17.820	0.1	22.770	0.1
3.300	0.1	8.250	0.1	13.200	0.1	18.150	0.1	23.100	0.1
3.630	0.1	8.580	0.1	13.530	0.1	18.480	0.1	23.430	0.1
3.960	0.1	8.910	0.1	13.860	0.1	18.810	0.1	23.760	0.1
4.290	0.1	9.240	0.1	14.190	0.1	19.140	0.1	24.090	0.0
4.620	0.1	9.570	0.1	14.520	0.1	19.470	0.1	24.420	0.0

RUNOFF VOLUME = 2.42341 INCHES = 0.6191 ACRE-FEET
PEAK DISCHARGE RATE = 13.24 CFS AT 1.485 HOURS BASIN AREA = 0.0048 SQ. MI.

*S COMPUTE HYD DEV BASIN OFF2
COMPUTE NM HYD ID=20 HYDNO=120 DA=0.01002SQ MI
PER A=96 PER B=0 PER C=4 PER D=0
TP=-0.13 RAIN=-1

K = 0.158071HR TP = 0.130000HR K/TP RATIO = 1.215931 SHAPE CONSTANT, N = 2.925598

```
        UNIT PEAK =   21.251    CFS   UNIT VOLUME =   0.9990       B =   275.71      P60 =
1.8400
        AREA =     0.010020 SQ MI    IA =   0.63800 INCHES    INF =   1.63640 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=20  CODE=10

                                      PARTIAL HYDROGRAPH   120.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
        0.000       0.0          0.990       0.0          1.980       0.8          2.970
0.1          3.960       0.0
        0.330       0.0          1.320       0.0          2.310       0.4          3.300
0.0          4.290       0.0
        0.660       0.0          1.650       5.2          2.640       0.2          3.630
0.0

       RUNOFF VOLUME =     0.44549 INCHES     =       0.2381 ACRE-FEET
       PEAK DISCHARGE RATE =       8.72 CFS  AT   1.518 HOURS   BASIN AREA =  0.0100 SQ. MI.



    *S  COMPUTE HYD DEV BASIN OFF3
    COMPUTE NM HYD      ID=21  HYDNO=121  DA=0.00150Q MI
                        PER A=0  PER B=0   PER C=0   PER D=100
                        TP=-0.13   RAIN=-1

        K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
        UNIT PEAK =   6.0724    CFS   UNIT VOLUME =   0.9979       B =   526.28      P60 =
1.8400
        AREA =     0.001500 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=21  CODE=10

                                      PARTIAL HYDROGRAPH   121.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
        0.000       0.0          4.950       0.0          9.900       0.0         14.850
0.0         19.800       0.0
        0.330       0.0          5.280       0.0         10.230       0.0         15.180
0.0         20.130       0.0
        0.660       0.0          5.610       0.0         10.560       0.0         15.510
0.0         20.460       0.0
        0.990       0.0          5.940       0.0         10.890       0.0         15.840
0.0         20.790       0.0
        1.320       1.2          6.270       0.0         11.220       0.0         16.170
0.0         21.120       0.0
        1.650       2.2          6.600       0.0         11.550       0.0         16.500
```

```
0.0        21.450       0.0
        1.980       1.1          6.930       0.0          11.880       0.0          16.830
0.0        21.780       0.0
        2.310       0.2          7.260       0.0          12.210       0.0          17.160
0.0        22.110       0.0
        2.640       0.1          7.590       0.0          12.540       0.0          17.490
0.0        22.440       0.0
        2.970       0.1          7.920       0.0          12.870       0.0          17.820
0.0        22.770       0.0
        3.300       0.0          8.250       0.0          13.200       0.0          18.150
0.0        23.100       0.0
        3.630       0.0          8.580       0.0          13.530       0.0          18.480
0.0        23.430       0.0
        3.960       0.0          8.910       0.0          13.860       0.0          18.810
0.0        23.760       0.0
        4.290       0.0          9.240       0.0          14.190       0.0          19.140
0.0        24.090       0.0
        4.620       0.0          9.570       0.0          14.520       0.0          19.470
0.0        24.420       0.0

        RUNOFF VOLUME =     2.42341 INCHES     =       0.1939 ACRE-FEET
        PEAK DISCHARGE RATE =       4.15 CFS  AT   1.485 HOURS   BASIN AREA =  0.0015 SQ. MI.



    *S  COMPUTE HYD DEV BASIN OFF4
    COMPUTE NM HYD      ID=22  HYDNO=122  DA=0.00114SQ MI
                        PER A=0  PER B=0   PER C=0   PER D=100
                        TP=-0.13   RAIN=-1

        K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
        UNIT PEAK =   4.6150    CFS   UNIT VOLUME =   0.9972       B =   526.28      P60 =
1.8400
        AREA =     0.001140 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=22  CODE=10

                                        PARTIAL HYDROGRAPH   122.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
        0.000       0.0          4.950       0.0          9.900       0.0          14.850
0.0        19.800       0.0
        0.330       0.0          5.280       0.0         10.230       0.0          15.180
0.0        20.130       0.0
        0.660       0.0          5.610       0.0         10.560       0.0          15.510
0.0        20.460       0.0
        0.990       0.0          5.940       0.0         10.890       0.0          15.840
0.0        20.790       0.0
        1.320       0.9          6.270       0.0         11.220       0.0          16.170
0.0        21.120       0.0
        1.650       1.7          6.600       0.0         11.550       0.0          16.500
```

```
0.0        21.450       0.0
         1.980       0.8          6.930       0.0         11.880       0.0         16.830
0.0        21.780       0.0
         2.310       0.2          7.260       0.0         12.210       0.0         17.160
0.0        22.110       0.0
         2.640       0.1          7.590       0.0         12.540       0.0         17.490
0.0        22.440       0.0
         2.970       0.0          7.920       0.0         12.870       0.0         17.820
0.0        22.770       0.0
         3.300       0.0          8.250       0.0         13.200       0.0         18.150
0.0        23.100       0.0
         3.630       0.0          8.580       0.0         13.530       0.0         18.480
0.0        23.430       0.0
         3.960       0.0          8.910       0.0         13.860       0.0         18.810
0.0        23.760       0.0
         4.290       0.0          9.240       0.0         14.190       0.0         19.140
0.0        24.090       0.0
         4.620       0.0          9.570       0.0         14.520       0.0         19.470
0.0

        RUNOFF VOLUME =     2.42341 INCHES     =       0.1473 ACRE-FEET
        PEAK DISCHARGE RATE =       3.16 CFS  AT   1.485 HOURS   BASIN AREA =  0.0011 SQ. MI.



    *S  COMPUTE HYD DEV BASIN OFF5
    COMPUTE NM HYD      ID=23  HYDNO=123  DA=0.00206SQ MI
                        PER A=100  PER B=0   PER C=0   PER D=0
                        TP=-0.13   RAIN=-1

        K =  0.160369HR    TP =  0.130000HR    K/TP RATIO =  1.233609     SHAPE CONSTANT, N =
2.887569
        UNIT PEAK =   4.3186    CFS   UNIT VOLUME =   0.9962       B =   272.53      P60 =
1.8400
        AREA =     0.002060 SQ MI    IA =   0.65000 INCHES    INF =   1.67000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=23  CODE=10

                                      PARTIAL HYDROGRAPH   123.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
        0.000       0.0          0.990       0.0          1.980       0.2          2.970
0.0
        0.330       0.0          1.320       0.0          2.310       0.1          3.300
0.0
        0.660       0.0          1.650       1.0          2.640       0.0          3.630
0.0

        RUNOFF VOLUME =     0.43063 INCHES     =       0.0473 ACRE-FEET
        PEAK DISCHARGE RATE =       1.73 CFS  AT   1.518 HOURS   BASIN AREA =  0.0021 SQ. MI.
```

```
    *S  COMPUTE HYD DEV BASIN OFF6
    COMPUTE NM HYD      ID=24  HYDNO=124  DA=0.00081SQ MI
                        PER A=0  PER B=0   PER C=24   PER D=76
                        TP=-0.13   RAIN=-1

         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =
7.106428
         UNIT PEAK =   2.4921    CFS   UNIT VOLUME =   0.9949       B =   526.28      P60 =
1.8400
         AREA =     0.000616 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000


         K =  0.102916HR    TP =  0.130000HR    K/TP RATIO =  0.791661     SHAPE CONSTANT, N =
4.530856
         UNIT PEAK =  0.58191    CFS   UNIT VOLUME =   0.9792       B =   389.14      P60 =
1.8400
         AREA =     0.000194 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=24  CODE=10

                                      PARTIAL HYDROGRAPH   124.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW           TIME
FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS            HRS
CFS            HRS       CFS
         0.000       0.0          4.950       0.0          9.900       0.0         14.850
0.0         19.800       0.0
         0.330       0.0          5.280       0.0         10.230       0.0         15.180
0.0         20.130       0.0
         0.660       0.0          5.610       0.0         10.560       0.0         15.510
0.0         20.460       0.0
         0.990       0.0          5.940       0.0         10.890       0.0         15.840
0.0         20.790       0.0
         1.320       0.5          6.270       0.0         11.220       0.0         16.170
0.0         21.120       0.0
         1.650       1.1          6.600       0.0         11.550       0.0         16.500
0.0         21.450       0.0
         1.980       0.5          6.930       0.0         11.880       0.0         16.830
0.0         21.780       0.0
         2.310       0.1          7.260       0.0         12.210       0.0         17.160
0.0         22.110       0.0
         2.640       0.0          7.590       0.0         12.540       0.0         17.490
0.0         22.440       0.0
         2.970       0.0          7.920       0.0         12.870       0.0         17.820
0.0         22.770       0.0
         3.300       0.0          8.250       0.0         13.200       0.0         18.150
0.0         23.100       0.0
         3.630       0.0          8.580       0.0         13.530       0.0         18.480
0.0         23.430       0.0
         3.960       0.0          8.910       0.0         13.860       0.0         18.810
0.0         23.760       0.0
         4.290       0.0          9.240       0.0         14.190       0.0         19.140
```

```
0.0         24.090       0.0
        4.620       0.0          9.570       0.0         14.520       0.0         19.470
0.0

        RUNOFF VOLUME =     2.07628 INCHES     =       0.0897 ACRE-FEET
        PEAK DISCHARGE RATE =       2.07 CFS  AT   1.485 HOURS   BASIN AREA =  0.0008 SQ. MI.



    *S  COMPUTE HYD DEV BASIN OFF7
    COMPUTE NM HYD      ID=25  HYDNO=124  DA=0.00078SQ MI
                        PER A=0  PER B=0   PER C=100   PER D=0
                        TP=-0.13   RAIN=-1

        K =  0.102916HR    TP =  0.130000HR    K/TP RATIO =  0.791661     SHAPE CONSTANT, N =
4.530856
        UNIT PEAK =   2.3348    CFS   UNIT VOLUME =   0.9951       B =   389.14      P60 =
1.8400
        AREA =     0.000780 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=25  CODE=10

                                      PARTIAL HYDROGRAPH   124.00

        TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME
FLOW          TIME      FLOW
         HRS       CFS           HRS       CFS           HRS       CFS           HRS
CFS           HRS       CFS
        0.000       0.0         0.660       0.0         1.320       0.1         1.980
0.2         2.640       0.0
        0.330       0.0         0.990       0.0         1.650       0.8         2.310
0.0         2.970       0.0

        RUNOFF VOLUME =     0.97702 INCHES     =       0.0406 ACRE-FEET
        PEAK DISCHARGE RATE =       1.44 CFS  AT   1.518 HOURS   BASIN AREA =  0.0008 SQ. MI.



    *S  COMPUTE HYD DEV BASIN OFF8
    COMPUTE NM HYD      ID=26  HYDNO=124  DA=0.00102SQ MI
                        PER A=0  PER B=0   PER C=100   PER D=0
                        TP=-0.13   RAIN=-1

        K =  0.102916HR    TP =  0.130000HR    K/TP RATIO =  0.791661     SHAPE CONSTANT, N =
4.530856
        UNIT PEAK =   3.0532    CFS   UNIT VOLUME =   0.9961       B =   389.14      P60 =
1.8400
        AREA =     0.001020 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033000

    PRINT HYD           ID=26  CODE=10

                                      PARTIAL HYDROGRAPH   124.00
```

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
0.000	0.0	0.660	0.0	1.320	0.1	1.980	0.2	2.640	0.0
0.330	0.0	0.990	0.0	1.650	1.0	2.310	0.1	2.970	0.0

RUNOFF VOLUME = 0.97702 INCHES = 0.0531 ACRE-FEET
PEAK DISCHARGE RATE = 1.88 CFS AT 1.518 HOURS BASIN AREA = 0.0010 SQ. MI.

*ADD HYDROGRAPH FROM DEV 5 AND HYDROGRAPH FROM DEV 6
ADD HYD ID=28 HYD=128 ID I=17 ID II=18

PRINT HYD ID=28 CODE=5

PARTIAL HYDROGRAPH 128.00

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
0.000	0.0	4.950	0.1	9.900	0.1	14.850	0.1	19.800	0.1
0.165	0.0	5.115	0.1	10.065	0.1	15.015	0.1	19.965	0.1
0.330	0.0	5.280	0.1	10.230	0.1	15.180	0.1	20.130	0.1
0.495	0.0	5.445	0.1	10.395	0.1	15.345	0.1	20.295	0.1
0.660	0.0	5.610	0.1	10.560	0.1	15.510	0.1	20.460	0.1
0.825	0.0	5.775	0.1	10.725	0.1	15.675	0.1	20.625	0.1
0.990	0.0	5.940	0.1	10.890	0.1	15.840	0.1	20.790	0.1
1.155	0.1	6.105	0.1	11.055	0.1	16.005	0.1	20.955	0.1
1.320	3.4	6.270	0.1	11.220	0.1	16.170	0.1	21.120	0.1
1.485	14.0	6.435	0.1	11.385	0.1	16.335	0.1	21.285	0.1
1.650	7.5	6.600	0.1	11.550	0.1	16.500	0.1	21.450	0.1
1.815	4.6	6.765	0.1	11.715	0.1	16.665	0.1	21.615	0.1
1.980	3.3	6.930	0.1	11.880	0.1	16.830	0.1	21.780	0.1
2.145	1.7	7.095	0.1	12.045	0.1	16.995	0.1	21.945	0.1
2.310	0.7	7.260	0.1	12.210	0.1	17.160			

```
0.1        22.110       0.1
         2.475       0.5          7.425       0.1         12.375       0.1         17.325
0.1        22.275       0.1
         2.640       0.3          7.590       0.1         12.540       0.1         17.490
0.1        22.440       0.1
         2.805       0.2          7.755       0.1         12.705       0.1         17.655
0.1        22.605       0.1
         2.970       0.2          7.920       0.1         12.870       0.1         17.820
0.1        22.770       0.1
         3.135       0.1          8.085       0.1         13.035       0.1         17.985
0.1        22.935       0.1
         3.300       0.1          8.250       0.1         13.200       0.1         18.150
0.1        23.100       0.1
         3.465       0.1          8.415       0.1         13.365       0.1         18.315
0.1        23.265       0.1
         3.630       0.1          8.580       0.1         13.530       0.1         18.480
0.1        23.430       0.1
         3.795       0.1          8.745       0.1         13.695       0.1         18.645
0.1        23.595       0.1
         3.960       0.1          8.910       0.1         13.860       0.1         18.810
0.1        23.760       0.1
         4.125       0.1          9.075       0.1         14.025       0.1         18.975
0.1        23.925       0.1
         4.290       0.1          9.240       0.1         14.190       0.1         19.140
0.1        24.090       0.0
         4.455       0.1          9.405       0.1         14.355       0.1         19.305
0.1        24.255       0.0
         4.620       0.1          9.570       0.1         14.520       0.1         19.470
0.1        24.420       0.0
         4.785       0.1          9.735       0.1         14.685       0.1         19.635
0.1

        RUNOFF VOLUME =     2.08463 INCHES     =       0.6170 ACRE-FEET
        PEAK DISCHARGE RATE =      13.99 CFS  AT   1.485 HOURS   BASIN AREA =  0.0056 SQ. MI.



    FINISH

        NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 15:48:49
```

REFERENCES

AMENDMENT TO
THE DRAINAGE MASTER PLAN
FOR THE TRAILS
UNITS 1, 2, AND 3

April 2014

AMENDMENT TO
THE DRAINAGE MASTER PLAN
FOR THE TRAILS
UNITS 1, 2, AND 3

Prepared for:
THE TRAILS, LLC

Prepared by:
Thompson Engineering Consultants, Inc.
P.O. Box 65760
Albuquerque, NM 87193

April 2014

APPENDIX A
DEVELOPED CONDITIONS HYDROLOGIC MODEL

— AHYMO Input File
— AHYMO Summary File
— AHYMO Output Showing Pond Detention Time
— Offsite Basin Map

I –Zoning

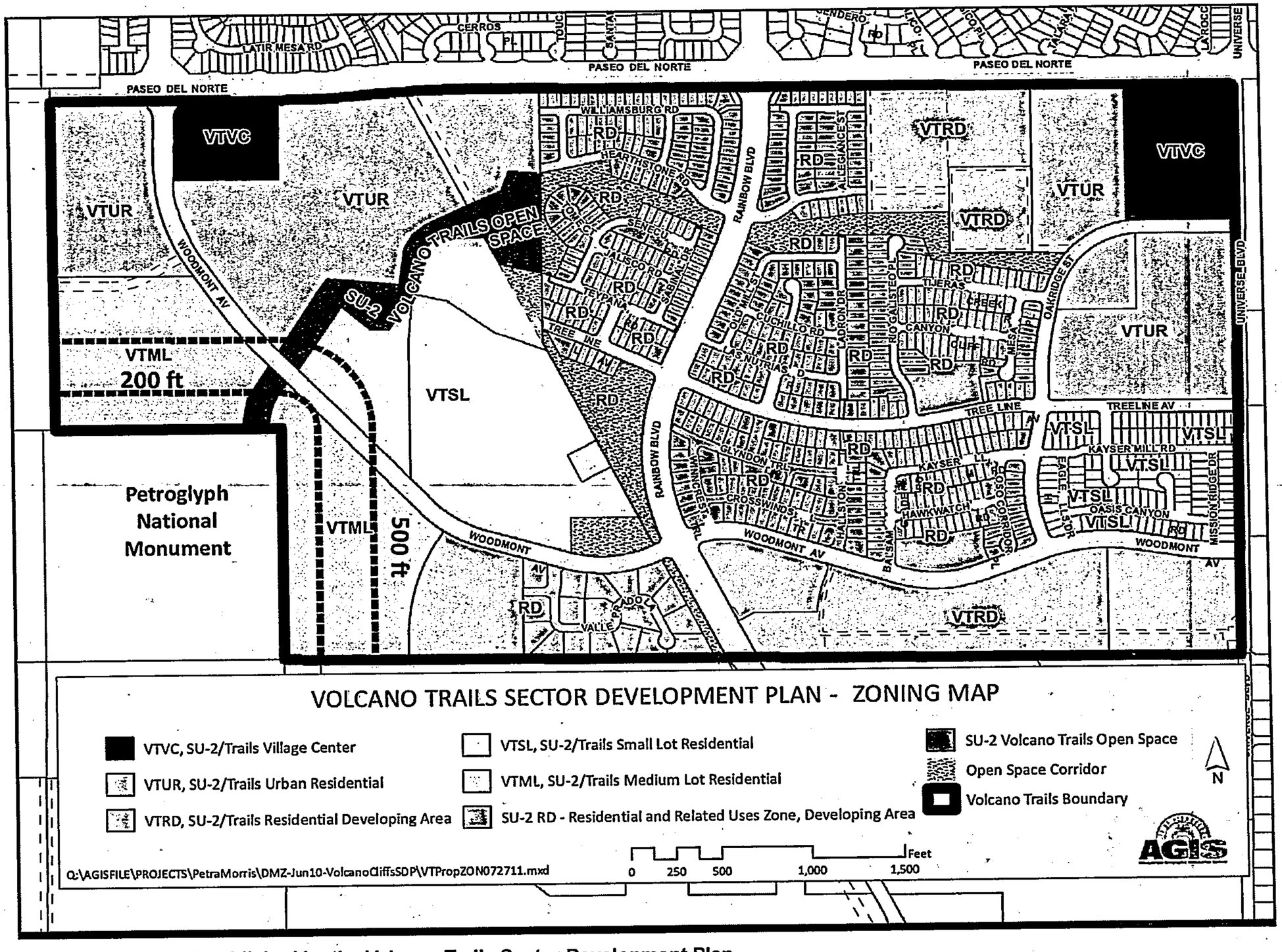


Exhibit 10, Zoning Established by the Volcano Trails Sector Development Plan

APPENDIX A
DEVELOPED CONDITIONS HYDROLOGIC MODEL

— AHYMO Input File
— AHYMO Summary File
— AHYMO Output Showing Pond Detention Time
— Offsite Basin Map

INPUT - AHSMO

AHYMO INPUT FILE

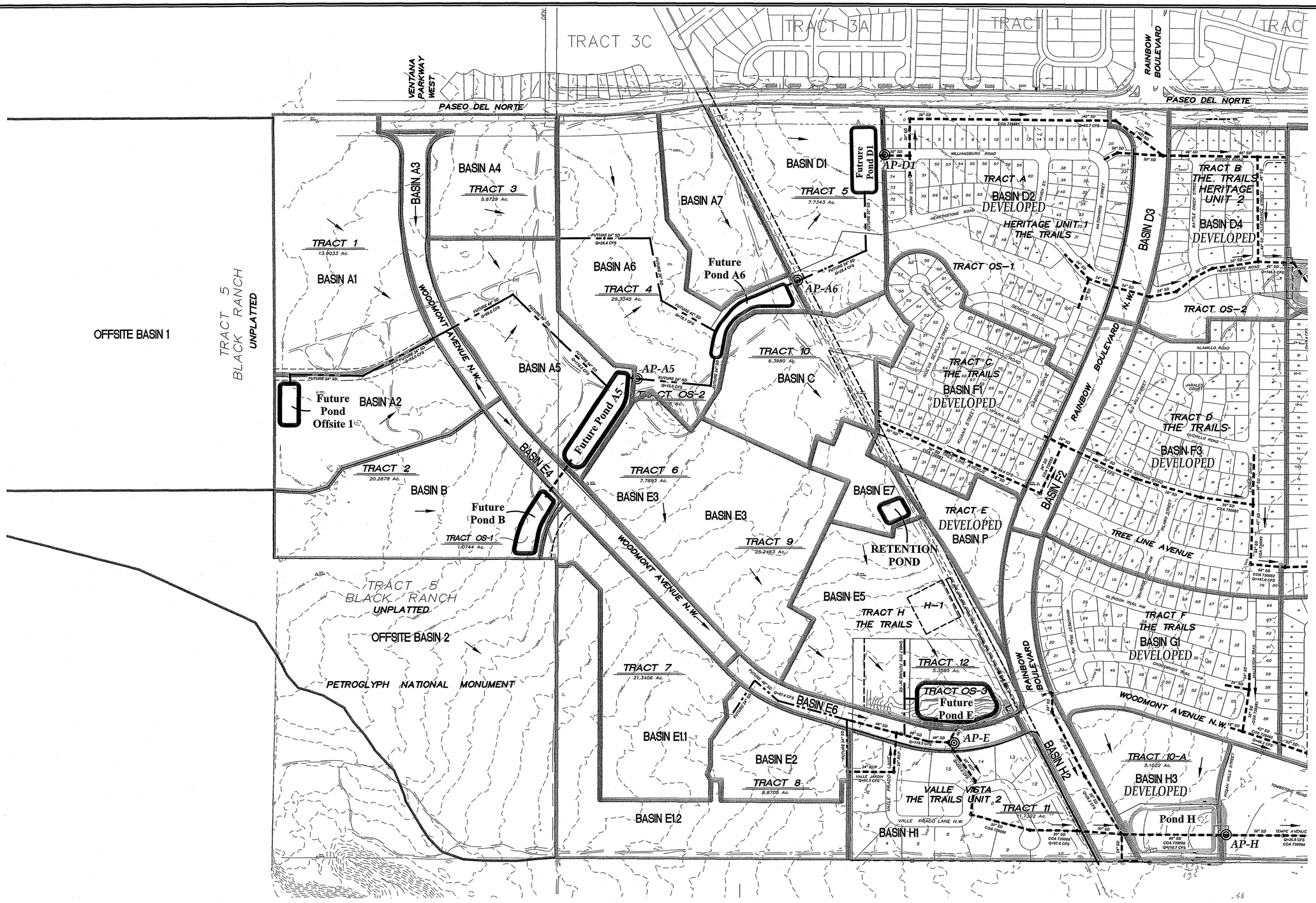
```
*
*                    TRAILS UNIT III DRAINAGE MASTER PLAN
*                 HYDROLOGIC MODEL--FULLY DEVELOPED CONDITIONS
*                              10 APRIL 2014
*
*
*****************************************************************************
*
*        HYDROLOGIC MODEL FOR OFFSITE AND ONSITE BASINS
*        100-YEAR, 24-HOUR STORM:
*
*
*              PRECIPITATION:
*                    P60 =   1.84"
*                    P360 =  2.20"
*                    P1440 = 2.66"
*
*
*
*****************************************************************************
*
START                   TIME=0.0 HR   PUNCH CODE=0
*
*
*
RAINFALL                TYPE=2    RAIN QUARTER=0.0 IN
                        RAIN ONE=1.84 IN   RAIN SIX=2.20 IN
                        RAIN DAY=2.66 IN   DT=0.10   HRS
SEDIMENT BULK           CODE=1   FACTOR=1.0
*
*S**************************************************************************
*S**********  COMPUTE ONSITE BASINS FROM THE TRAILS
*S**********
*
COMPUTE NM HYD          ID=50   HYD NO=OFFSITE1   DA=.1998 SQ MI
                        %A=100   %B=0   %C=0 %D=0
                        TP=-.66 HR   RAIN=-1
PRINT HYD               ID=50 CODE=10
*
ROUTE RESERVOIR         ID=53 HYD=OFF.POND.1   INFLOW ID=50 CODE=5
                        OUTFLOW    STORAGE      DEPTH
                        0          0            0
                        3.85       0.037        1
                        5.44       0.218        2
                        6.66       0.610        3
                        7.69       1.150        4
                        8.60       1.759        5
                        9.42       2.439        6

PRINT HYD               ID=53 CODE=10
*
*
COMPUTE RATING CURVE    CID=1   VS NO=1   CODE=-1    SLP=0.0176
                        DIA=2.0   N=0.013
ROUTE MCUNGE            ID=54 HYD=RTE.OFF.POND INFLOW ID=53
                        DT=0.0   L=740 NS=0   SLOPE=0.0176
                        MATCODE=0 REGCODE=0 CCODE=0 MM CODE=0
*
PRINT HYD               ID=54 CODE=0
*
COMPUTE NM HYD          ID=21   HYD NO=BASIN.A1   DA=.02422 SQ MI
```

```
                        %A=0  %B=12.5  %C=12.5 %D=75.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=21 CODE=10
*
COMPUTE NM HYD          ID=22  HYD NO=BASIN.A2  DA=.01331 SQ MI
                        %A=0  %B=33.0  %C=33.0 %D=34.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=22 CODE=10
*
*
COMPUTE NM HYD          ID=23  HYD NO=BASIN.A3  DA=.00502 SQ MI
                        %A=0  %B=5.0  %C=5.0 %D=90.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=23 CODE=10
*
*
COMPUTE NM HYD          ID=24  HYD NO=BASIN.A4  DA=.01186 SQ MI
                        %A=0  %B=7.5  %C=7.5 %D=85.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=24 CODE=10
*
*
COMPUTE NM HYD          ID=25  HYD NO=BASIN.A5  DA=.01830 SQ MI
                        %A=0  %B=17.0  %C=17.0 %D=66.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=25 CODE=10
*
*
COMPUTE NM HYD          ID=26  HYD NO=BASIN.A6  DA=.02652 SQ MI
                        %A=0  %B=19.0  %C=19.0 %D=62.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=26 CODE=10
*
*
COMPUTE NM HYD          ID=27  HYD NO=BASIN.A7  DA=.01055 SQ MI
                        %A=0  %B=12.5  %C=12.5 %D=75.0
                        TP=-.133 HR  RAIN=-1
PRINT HYD               ID=26 CODE=10
*
ADD HYD                 ID=55 HYD=O1.A2 ID I=54 II=22
PRINT HYD               ID=55 CODE=10
*
ADD HYD                 ID=56 HYD=O1A2.A1 ID I=55 II=21
PRINT HYD               ID=56 CODE=10
*
*
ADD HYD                 ID=57 HYD=O1A2A1.A3 ID I=56 II=23
PRINT HYD               ID=57 CODE=10
*
*
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1   SLP=0.007
                        DIA=4.0  N=0.013
ROUTE MCUNGE            ID=58 HYD=RTE.O1A2A1.A3 INFLOW ID=57
                        DT=0.0  L=1000 NS=0  SLOPE=0.007
                        MATCODE=0 REGCODE=0 CCODE=0 MM CODE=0
*
PRINT HYD               ID=58 CODE=0
*
*
ADD HYD                 ID=59 HYD=A1TOA5 ID I=58 II=25
PRINT HYD               ID=59 CODE=10
*
*
**********************************************************************
```

Hydraulic Analysis Addendum for the Amendment to the Drainage Master Plan for the Trails Units 1, 2 and 3

Thompson Engineering Consultants, Inc.

January, 2017



NOTES:

1. *STORM DRAIN SIZES BASED ON 100-YR, 24-HR STORM FLOWS. FUTURE PROJECTS MAY BE REQUIRED TO INCREASE STORM DRAIN SIZE BASED ON 100-YR, 6-HR STORM FLOWS.*
2. *THE INTENDED FUTURE CONTRIBUTION FROM THE TRAILS UNIT 4 IS 20 CFS TO THE MAXIMUM DOWNSTREAM DISCHARGE OF 62 CFS IN UNIVERSE BLVD.*

LEGEND

- *ANALYSIS POINT*
- *EXISTING STORM DRAIN*
- *FLOW DIRECTION*
- *FUTURE DEVELOPED STORM DRAIN*

N

200' 100' 0 200' 400'

SCALE: 200'

DATUM NAVD 1929

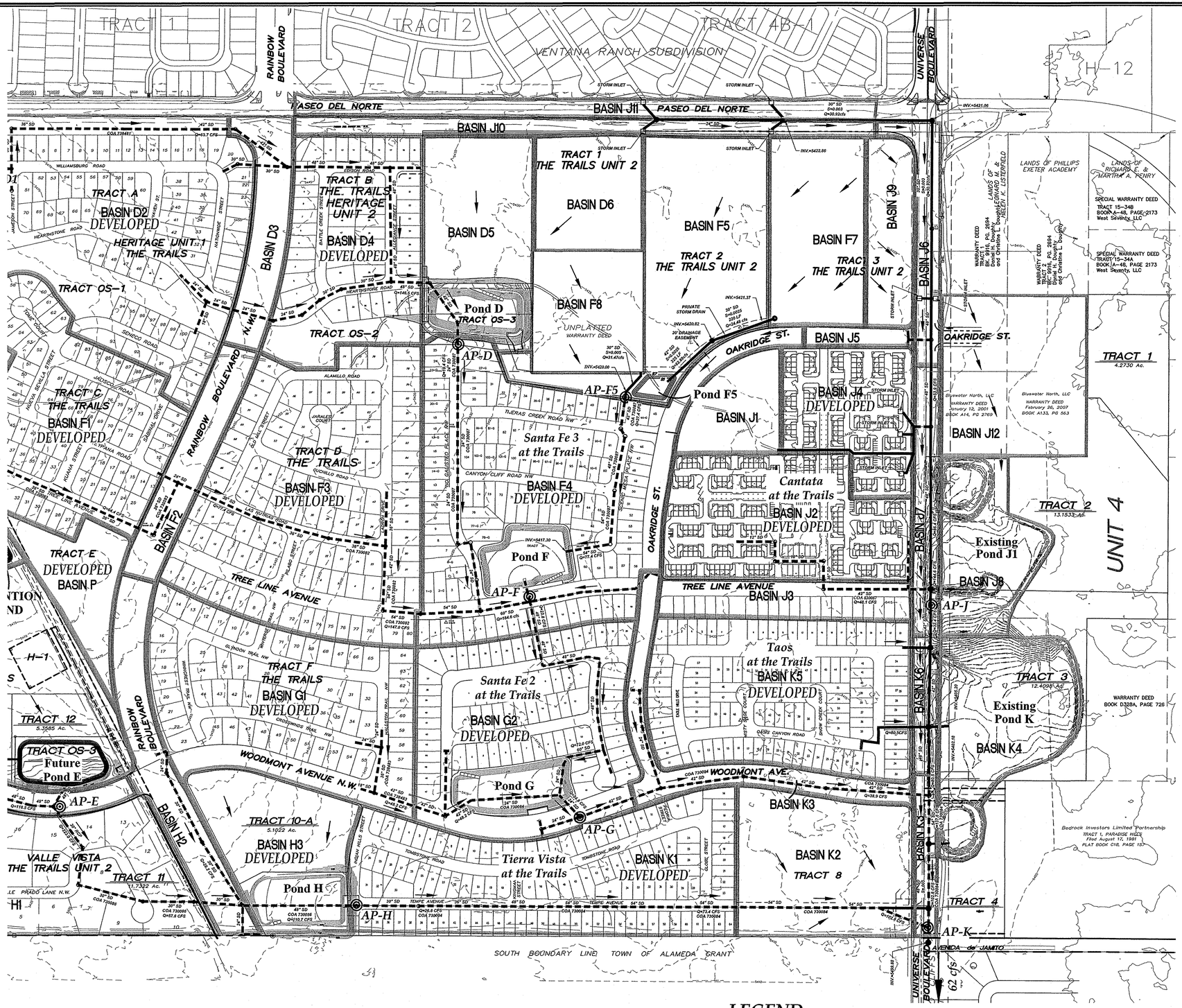
Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 65760
ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9248

UPDATE TO THE AMENDMENT TO DMP FOR THE TRAILS UNITS, 1, 2 AND 3

PLATE 1

9677 REGISTERED PROFESSIONAL ENGINEER

2-26-15



DETENTION POND CHARACTERISTICS

POND	DRAIN AREA (AC)	Q100 IN (CFS)	Q100 OUT (CFS)	BYPASS Q (CFS)	MAX VOL (ac-ft)	V100 (ac-ft)	TOP ELEV	BOTTOM ELEV	WSEL
OFF 1	127.9	37.00	9.25		2.44	2.302	6	0	5.80
A5	179.6	121.19	16.29		4.61	4.256	5516	5511	5515.76
A6	204.2	84.21	16.19		4.72	3.241	5506	5500	5504.73
B	12.8	94.80	3.36		0.99	0.930	5519	5515	5518.86
D1	222.5	65.02	14.46		6.06	5.360	5475	5471	5474.48
D	274.7	146.48	5.93	13.77	6.24	4.035	5436.9	5429.5	5435.03
E	118.2	194.46	20.22		7.17	6.412	5452	5440	5451.44
F5	18.9	62.89	19.84		1.40	1.386	5426	5421	5425.97
F	373.1	259.49	17.58	6.20	11.76	10.293	5424.3	5415.08	5423.51
G	405.5	111.28	7.00	17.61	7.21	2.948	5422.5	5415.67	5419.83
H	149.8	97.80	4.50	21.60	3.02	2.205	5422	5418.65	5421.42
J	57.9	141.18	6.05	26.34	7.94	3.771	5417	5414	5415.66
K	670.8	239.15	15.75	44.91	14.84	8.346	5409	5404.85	5407.77

ANALYSIS POINT PEAK FLOWS

ANALYSIS POINT	PEAK FLOW
AP-A5	16.29 CFS
AP-A6	16.19 CFS
AP-D1	14.46 CFS
AP-D	19.42 CFS
AP-E	20.22 CFS
AP-F5	27.40 CFS
AP-F	23.78 CFS
AP-G	24.61 CFS
AP-H	26.10 CFS
AP-J	32.39 CFS
AP-K	60.66 CFS

DEVELOPED DRAINAGE BASIN CHARACTERISTICS

BASIN	AREA	LAND TREATMENT				Q	VOL
	ACRES	A	B	C	D	CFS	AC-FT
OFFSITE 1	127.87	100	0	0	0	37.00	4.426
A1	13.50	0	12.5	12.5	75	51.68	2.610
A2	8.52	0	33	33	34	23.43	0.960
A3	3.21	0	5	5	90	11.41	0.606
A4	7.59	0	7.5	7.5	85	26.39	1.381
A5	11.71	0	17	17	66	37.55	1.829
A6	16.97	0	19	19	62	53.44	2.558
A7	6.75	0	12.5	12.5	75	22.52	1.137
C	9.08	12.8	28.4	28.4	30.4	23.20	0.935
D1	11.62	0	19	19	62	36.60	1.752
D2	22.12	0	28.5	28.5	43	63.65	2.763
D3	3.71	0	5	5	90	13.18	0.701
D4	12.55	0	28.5	28.5	43	36.12	1.568
D5	8.75	0	23	23	54	26.55	1.224
D6	5.00	0	18	18	64	15.89	0.764
F1	14.13	0	21.7	21.8	56.5	43.39	2.025
F2	3.67	0	5	5	90	13.02	0.692
F3	22.80	0	21.7	21.8	56.5	70.02	3.267
F4	24.91	0	25	25	50	74.16	3.349
F5	11.85	0	12.5	12.5	75	39.52	1.996
F7	7.02	0	7.5	7.5	85	24.42	1.278
F8	5.00	0	18	18	64	15.89	0.764
G1	16.20	0	25	25	50	48.23	2.178
G2	16.19	0	25	25	50	48.22	2.177
OFFSITE 2	51.52	100	0	0	0	13.87	1.783
B	12.79	0	34	34	32	34.80	1.407
E1.1	11.91	0	28.1	28.1	43.8	34.41	1.501
E1.2	12.76	0	28.1	28.1	43.8	36.78	1.608
E2	5.55	0	30.7	30.7	38.6	15.63	0.660
E3	15.50	0	22	22	56	47.48	2.210
E4	3.69	0	5	5	90	13.11	0.697
E5	17.28	18.8	23.8	26.4	31	43.19	1.762
E6	3.12	0	5	5	90	11.09	0.590
E7	2.90	16.5	24.8	20.6	38.1	7.55	0.324
P	4.51	43	25	25	7	8.41	0.273
H1	11.00	0	26.6	26.6	46.8	32.26	1.431
H2	5.35	0	5	5	90	19.16	1.018
H3	7.62	0	20	20	60	23.79	1.128
J1	3.31	0	12.5	12.5	75	11.04	0.557
J2	10.92	0	12.5	12.5	75	36.40	1.839
J3	3.71	0	19	19	62	11.70	0.560
J4	6.44	0	12.5	12.5	75	21.47	1.084
J5	0.86	0	5	5	90	3.05	0.162
J6	2.70	0	5	5	90	9.59	0.510
J7	2.84	0	5	5	90	10.09	0.536
J8	5.78	0	70	30	0	12.31	0.355
J9	3.51	0	7.5	7.5	85	12.20	0.638
J10	4.02	0	5	5	90	14.27	0.759
J11	4.79	0	5	5	90	16.65	0.886
J12	9.08	100	0	0	0	10.65	0.514
K1	17.11	0	19	19	62	50.54	2.579
K2	9.51	0	15	15	70	29.39	1.537
K3	5.85	0	5	5	90	20.76	1.104
K4	8.58	0	70	30	0	18.28	0.527
K5	15.13	0	19	19	62	47.63	2.281
K6	1.41	0	5	5	90	5.01	0.266

LEGEND

- ANALYSIS POINT
- EXISTING STORM DRAIN
- FLOW DIRECTION
- FUTURE DEVELOPED STORM DRAIN

NOTES:

1. STORM DRAIN SIZES BASED ON 100-YR, 24-HR STORM FLOWS. FUTURE PROJECTS MAY BE REQUIRED TO INCREASE STORM DRAIN SIZE BASED ON 100-YR, 6-HR STORM FLOWS.
2. THE INTENDED FUTURE CONTRIBUTION FROM THE TRAILS UNIT 4 IS 20 CFS TO THE MAXIMUM DOWNSTREAM DISCHARGE OF 62 CFS IN UNIVERSE BLVD.

N

200' 100' 0 200' 400'

SCALE: 200'

DATUM NAVD 1929

Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 65760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199 FAX: (505) 830-9248

UPDATE TO THE AMENDMENT TO DMP FOR THE TRAILS UNITS, 1, 2 AND 3

PLATE 2

NEW MEXICO 9677 REGISTERED PROFESSIONAL ENGINEER
2-26-15

CHAPTER 6
DRAINAGE, FLOOD CONTROL, AND EROSION CONTROL

This chapter presents the design standards established for drainage, flood control, and erosion control within the City of Albuquerque. Detailed requirements to facilitate the planning, design, construction, and operation of both public and private drainage control, flood control, stormwater quality, and erosion control facilities are covered.

CONTENTS

ARTICLE 6-2 HYDROLOGY

The primary method for hydrology calculations in the DPM since the update in 1993 has been the Arid-lands Hydrologic Model (AHYMO), and it continues to be the basis for hydrology calculations in this Article. Other methods described in this Article are calibrated to produce results close to the AHYMO method. *Part 6-2(A) Procedure for 40-Acre and Smaller Basins* is calibrated to exactly match AHYMO. In 1993, AHYMO replaced a Rational Method that had been derived from the Soil Conservation Service (SCS) Curve Number method. One version of the SCS Curve Number method is being allowed with the DPM update 2020 because its results closely match AHYMO's results.

The methods in the 1993 DPM were based on precipitation data from the National Oceanic and Atmospheric Agency (NOAA) Atlas 2, which has been superseded by NOAA Atlas 14. Atlas 14 Volume 1, Version 1 was published in 2001; Volume 4 was published in 2006; and Version 5, the most current version, was published in 2011. Atlas 14 precipitation data can be accessed via the NOAA website: https://hdsc.nws.noaa.gov/hdsc/pfds. More revisions are expected as new data are collected. AHYMO-93 and AHYMO-97 used the precipitation distributions from NOAA Atlas 2. AHYMO-S4, released in 2009, uses precipitation distribution based on NOAA Atlas 14. The methods, graphs, and tables that follow will be used by City staff to review and evaluate development plans and drainage management plans, including 2 basic methods of analysis.

1. *Part 6-2(A)* describes a simplified procedure for smaller watersheds based on the Rational Method and initial abstraction/uniform infiltration precipitation losses. The procedure is applicable to watersheds up to 40 acres in size, and the procedure may be used for certain larger watersheds, with some limitations.
2. *Part 6-2(C)* describes 2-unit hydro graph procedures that are accomplished using computer programs. One method is the AHYMO method, and the other method is the SCS Curve Number method. The AHYMO-S4 program is used for the AHYMO method, and TR-20 and HEC-HMS are two of the programs that can be used for the SCS Curve Number method and the Atlas 14 precipitation distribution. These procedures are applicable for small and large watersheds.

Part 6-2(B) describes the computation of time of concentration, lag time, and time to peak that are used in *Part 6-2(A)* and *Part 6-2(C)*.

Part 6-2(D) contains a list of definitions of symbols used in this chapter and a bibliography.

Part 6-2(A) Procedure for 40-Acre and Smaller Basins

A simplified procedure for projects with basins smaller than 40 acres has been developed based on initial abstraction/uniform infiltration precipitation losses and Rational Method procedures. For this procedure, the portion of Bernalillo County within City limits has been divided into 4 precipitation zones, as shown in *FIGURE 6.2.3*.

Section 6-2(A)(1) Precipitation Zones

Albuquerque's 4 precipitation zones are indicated in *TABLE 6.2.7* and on *FIGURE 6.2.3*, and the corresponding precipitation values are in *TABLE 6.2.8*. When modeling the storm, the standard practice is to set the peak intensity 1.5 hours into the storm when using AHYMO losses and 12 hours into the storm when using the SCS Curve Number losses, which must use NOAA Atlas 14 precipitation distributions, must not smooth the distribution, and must not use the SCS precipitation distribution. The storm duration must be 24 hours, and the calculation increment should be set to 5 minutes for the distribution used with the SCS Curvey Number method. The unit hydrograph time increment must be 0.01 hours or less. NOAA Atlas 14 can be used for several other frequency events, and it can be used to obtain a more precise precipitation depth for a particular location than the precipitation depths listed in *TABLE 6.2.8*.

TABLE 6.2.7 **Precipitation Zones**

Zone	Location
1	West of the Rio Grande
2	Between the Rio Grande and San Mateo
3	Between San Mateo and Eubank, North of Interstate 40 and between San Mateo and the East boundary of Range 4 East, South of Interstate 40
4	East of Eubank, North of Interstate 40 and East of the East boundary of Range 4 East, South of Interstate 40 Not including the Cibola National Forest

FIGURE 6.2.3 **Precipitation Zones**

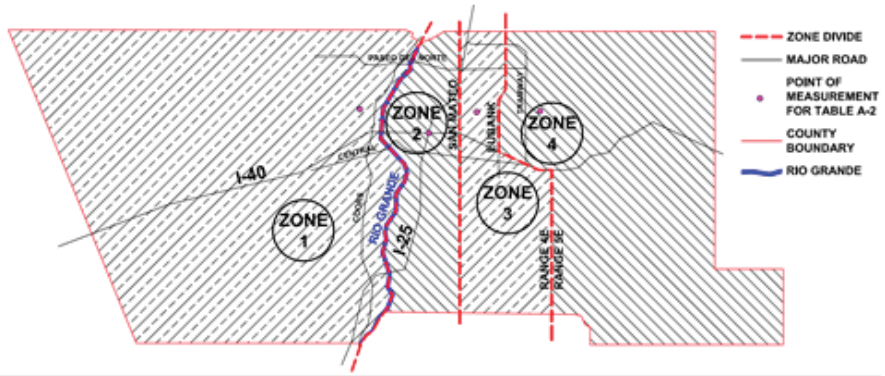


TABLE 6.2.8 **Precipitation for Zones 1-4**

Partial Duration		500 year		100 year		10 year		2 year	
		Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr
ZONE 1									
5	min.	0.701	8.41	0.538	6.46	0.335	4.02	0.207	2.48
10	min.	1.070	6.42	0.819	4.91	0.511	3.07	0.315	1.89
12	min.	-	5.96	-	4.58	-	2.85	-	1.76
15	min.	1.320	5.28	1.020	4.08	0.633	2.53	0.390	1.56
30	min.	1.780	3.56	1.370	2.74	0.852	1.70	0.525	1.05
60	min.	2.200	2.20	1.690	1.69	1.060	1.06	0.650	0.65
2	hr.	2.530	1.27	1.920	0.96	1.190	0.60	0.746	0.37
3	hr.	2.760	0.92	2.000	0.67	1.250	0.42	0.800	0.27
6	hr.	2.780	0.46	2.170	0.36	1.400	0.23	0.920	0.15
24	hr.	3.090	0.13	2.490	0.10	1.680	0.07	1.160	0.05
4	day	3.780	0.04	3.120	0.03	2.190	0.02	1.560	0.02
10	day	4.680	0.02	3.900	0.02	2.760	0.01	1.970	0.01
Zone 2									
5	min.	0.731	8.77	0.565	6.78	0.355	4.26	0.220	2.64
10	min.	1.110	6.66	0.860	5.16	0.540	3.24	0.335	2.01
12	min.	-	6.20	-	4.81	-	3.01	-	1.87
15	min.	1.380	5.52	1.070	4.28	0.669	2.68	0.415	1.66
30	min.	1.860	3.72	1.440	2.88	0.901	1.80	0.559	1.12
60	min.	2.300	2.30	1.780	1.78	1.120	1.12	0.692	0.69
2	hr.	2.660	1.33	2.030	1.02	1.260	0.63	0.797	0.40
3	hr.	2.730	0.91	2.100	0.70	1.320	0.44	0.844	0.28
6	hr.	2.980	0.50	2.290	0.38	1.480	0.25	0.977	0.16

TABLE 6.2.8 **Precipitation for Zones 1-4**

Partial Duration		500 year		100 year		10 year		2 year	
		Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr
24	hr.	3.210	0.13	2.590	0.11	1.760	0.07	1.220	0.05
4	day	3.590	0.04	2.960	0.03	2.070	0.02	1.470	0.02
10	day	4.330	0.02	3.620	0.02	2.560	0.01	1.830	0.01
Zone 3									
5	min.	0.753	9.04	0.584	7.01	0.368	4.42	0.228	2.74
10	min.	1.150	6.90	0.889	5.33	0.560	3.36	0.348	2.09
12	min.	-	6.41	-	4.96	-	3.12	-	1.94
15	min.	1.420	5.68	1.100	4.40	0.693	2.77	0.431	1.72
30	min.	1.910	3.82	1.480	2.96	0.934	1.87	0.580	1.16
60	min.	2.370	2.37	1.840	1.84	1.160	1.16	0.718	0.72
2	hr.	2.810	1.41	2.150	1.08	1.340	0.67	0.845	0.42
3	hr.	2.890	0.96	2.220	0.74	1.400	0.47	0.895	0.30
6	hr.	3.090	0.52	2.430	0.41	1.570	0.26	1.010	0.17
24	hr.	3.570	0.15	2.840	0.12	1.900	0.08	1.300	0.05
4	day	4.000	0.04	3.290	0.03	2.290	0.02	1.620	0.02
10	day	4.940	0.02	4.100	0.02	2.890	0.01	2.060	0.01
Zone 4									
5	min.	0.798	9.58	0.624	7.49	0.398	4.78	0.249	2.99
10	min.	1.210	7.26	0.950	5.70	0.606	3.64	0.380	2.28
12	min.	-	6.77	-	5.31	-	3.38	-	2.12
15	min.	1.510	6.04	1.180	4.72	0.751	3.00	0.471	1.88
30	min.	2.030	4.06	1.590	3.18	1.010	2.02	0.634	1.27
60	min.	2.510	2.51	1.960	1.96	1.250	1.25	0.784	0.78
2	hr.	3.010	1.51	2.330	1.17	1.470	0.74	0.933	0.47
3	hr.	3.120	1.04	2.420	0.81	1.530	0.51	0.991	0.33
6	hr.	3.340	0.56	2.640	0.44	1.730	0.29	1.150	0.19
24	hr.	4.490	0.19	3.600	0.15	2.400	0.10	1.640	0.07
4	day	5.910	0.06	4.750	0.05	3.200	0.03	2.200	0.02
10	day	7.760	0.03	6.270	0.03	4.260	0.02	2.950	0.01

The principal design storm is the 100-year event defined by the NOAA Atlas 14 Volume 1, Version 5, and its subsequent updates. *TABLE 6.2.8*, *TABLE 6.2.14*, and *TABLE 6.2.15* will be updated when NOAA Atlas 14 precipitation depths are updated. For certain applications (e.g. street drainage, low-flow channels, and sediment transport), storms of greater frequency than the

100-year storm must be considered, and the 500-year storm must be used for some floodplains.

Section 6-2(A)(2) Land Treatments

All land areas are described by one of four basic land treatments or by a combination of the four land treatments. Land treatments are provided in *TABLE 6.2.9*.

TABLE 6.2.9 Land Treatments

Treatment	Land Condition
A (CN=77)	Soil uncompacted by human activity with 0 to 10% slopes. Native grasses, weeds, and shrubs in typical densities with minimal disturbance to grading, ground cover, and infiltration capacity.
B (CN=79)	Irrigated lawns, parks and golf courses with 0 to 10% slopes. Native grasses, weeds and shrubs, and soil uncompacted by human activity with slopes greater than 10% and less than 20%.
C (CN=86)	Soil compacted by human activity. Minimal vegetation. Unpaved parking, roads, trails. Most vacant lots. Gravel or rock (desert landscaping). Irrigated lawns and parks with slopes greater than 10%. Native grasses, weeds and shrubs, and soil uncompacted by human activity with slopes at 20%or greater. Native grass, weed and shrub areas with clay or clay loam soils, and other soils of very low permeability as classified by SCS Hydrologic Soil Group D.
D (CN=98)	Impervious areas, pavement, and roofs. Ponds, channels, and wetlands, even if seasonally dry.

Most watersheds contain a mix of land treatments. To determine proportional treatments, measure respective subareas. For large developed basins, the areal percentages in TABLE 6.2.10 may be used instead of specific measurement for treatment D.

TABLE 6.2.10 Percent Treatment D (Impervious)

Land Use	Percent
Commercial*	90
Single Family Residential N=units/acre, N≤6	$7*[(N^2) + (5N)]^{0.5}$
Multiple Unit Residential Detached* Attached*	 60 70
Industrial Light* Heavy*	 70 80
Parks, Cemeteries	7
Playgrounds	13
Schools	50
Collector & Arterial Streets	90

**Includes local streets*

TABLE 6.2.10 does not provide areal percentages for land treatments A, B, and C. Use of *TABLE 6.2.10* will require additional analysis to determine the appropriate areal percentages of these land treatments.

Section 6-2(A)(3) Abstractions

Initial abstraction is the precipitation depth that must be exceeded before direct runoff begins. Initial abstraction may be intercepted by vegetation, retained in surface depressions, or absorbed on the watershed surface. Initial abstractions are shown in *TABLE 6.2.11*.

TABLE 6.2.11 **Initial Abstraction**

Treatment	Initial Abstraction (inches)
A	0.65
B	0.50
C	0.35
D	0.10

Infiltration is the only significant abstraction after the initial abstraction. After initial abstraction is satisfied, treat infiltration as a constant loss rate as specified in *TABLE 6.2.12*.

TABLE 6.2.12 **Infiltration (INF)**

Treatment	Loss Rate (inches/hour)
A	1.67
B	1.25
C	0.83
D	0.04*

**Treatment D infiltration rate is applicable from 0 to 3 hours; use uniform reduction from 3 to 6 hours, with no infiltration after 6 hours.*

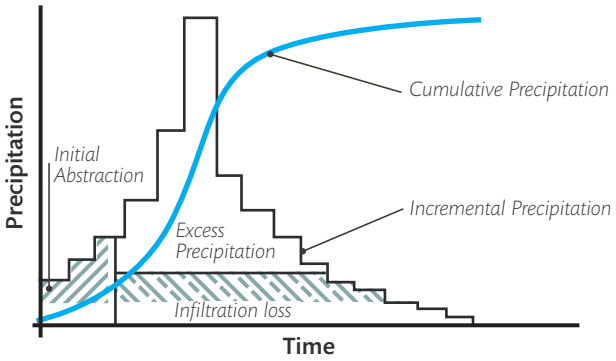
Runoff from a previous event can saturate a channel bed or pond bottom, rendering it minimally pervious for several days. Do not anticipate additional bed losses for design purposes.

Section 6-2(A)(4) Excess Precipitation & Volumetric Runoff

Excess precipitation, E, is the depth of precipitation remaining after abstractions are removed. Excess precipitation does not depend on watershed area.

Excess precipitation is determined by subtracting the initial abstraction and infiltration from the design storm hydro graph. *FIGURE 6.2.4* illustrates the development of excess precipitation.

FIGURE 6.2.4 **Precipitation and Time**



The 6-hour excess precipitation, E, by zone and treatment is summarized in TABLE 6.2.13.

TABLE 6.2.13 **6-hour Excess Precipitation, 'E'**

Zone	Land Treatment			
	A	B	C	D
100-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.55	0.73	0.95	2.24
2	0.62	0.80	1.03	2.33
3	0.67	0.86	1.09	2.58
4	0.76	0.95	1.20	3.34
2-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.00	0.01	0.13	0.92
2	0.00	0.02	0.16	0.98
3	0.00	0.05	0.19	1.05
4	0.00	0.28	0.87	1.39
10-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.11	0.26	0.43	1.43
2	0.15	0.30	0.48	1.51
3	0.18	0.34	0.52	1.64
4	0.25	0.41	0.59	2.15

To determine the volume of runoff:

1. Determine the area in each treatment, A_A, A_B, A_C, A_D
2. Compute the weighted excess precipitation, E

EQUATION 6.1 **Weighted E** = $E_A A_A + E_B A_B + E_C A_C + E_D A_D$ / $A_A + A_B + A_C + A_D$

3. Multiply the weighted E by the watershed area.

EQUATION 6.2 $\mathbf{V_{360}}$ **(as volume)** = weighted E* ($A_A + A_B + A_C + A_D$)

EXAMPLE 1

Find the 100-year V_{360} for 30 acres in zone 1. Eight acres are treatment A, 10 acres are treatment B, 5 acres are treatment C, and 7 acres are treatment D.

Weighted E = ((8 * 0.55) + (10 * 0.73) + (5 * 0.95) + (7 * 2.24)) / 30
= 1.071 inches

Volume = (1.071 * 30) / 12 = 2.68 acre-ft. = V_{360}

For ponds that hold water for longer than 6 hours, longer duration storms are required to establish runoff volumes. Since the additional precipitation is assumed to occur over a long period, the additional volume is based on the runoff from the impervious areas only.

For 24-hour storms:
EQUATION 6.3 $\mathbf{V_{1440}} = V_{360} + A_D * (P_{1440} - P_{360}) / 12$ in/ft

For 4-day storms:
EQUATION 6.4 $\mathbf{V_{4DAYS}} = V_{360} + A_D * (P_{4DAYS} - P_{360}) / 12$ in/ft

For 10-day storms:
EQUATION 6.5 $\mathbf{V_{10DAYS}} = V_{360} + A_D * (P_{10DAYS} - P_{360}) / 12$ in/ft

EXAMPLE 2

Find the 100-year 24-hour and 4-day runoff volume, V_{1440} and V_{4days}, for the area in *EXAMPLE 1*.

$\mathbf{V_{360}}$ = 2.68 acre-feet

$\mathbf{V_{1440}}$ = 2.68 + 7 ac * (2.49 - 2.17) / 12 = 2.87 acre-feet

$\mathbf{V_{4DAYS}}$ = 2.68 + 7 ac * (3.12 - 2.17) / 12 = 3.23 acre-feet

CHAPTER 6
DRAINAGE, FLOOD CONTROL, AND EROSION CONTROL

This chapter presents the design standards established for drainage, flood control, and erosion control within the City of Albuquerque. Detailed requirements to facilitate the planning, design, construction, and operation of both public and private drainage control, flood control, stormwater quality, and erosion control facilities are covered.

CONTENTS

ARTICLE 6-12 STORMWATER QUALITY AND LOW-IMPACT DEVELOPMENT

All new development and redevelopment projects shall apply best Management Practices (BMPs) to manage the stormwater quality volume (SWQV) by management on-site, or payment-in-lieu, or private off-site mitigation. BMPs remove pollutants from SWQV by first capturing the volume of the area draining to them, then either infiltrate the volume into the soil, or is reuse the volume for irrigation, or treat the volume by extended filtration, or some combination thereof. Where practical, stormwater volumes in excess of the SWQV should bypass the BMP rather than being allowed to pass thru the BMP to prevent pollutants from being washed downstream. The BMP bypass shall be designed for the peak 100-year flow rate.

The stormwater quality volume new development sites are required to manage is the runoff from a 0.62 inch storm. The stormwater quality volume redevelopment sites are required to manage is the runoff from a 0.48 inch storm. A site is defined as a redevelopment site if the land was occupied by an artificial surface or by any structure intended for human occupation, including structures intended for commercial enterprise.

The methodology used in the U.S. Environmental Protection Agency (EPA) Report, Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, New Mexico, TetraTech, April 2014, EPA Publication Number 832-R-14-007, yields runoff values of 0.42 inches for the 90th percentile storm and using the same methodology but generated from HEC-HMS, 0.26 inches for the 80th percentile storm.

To calculate the required SWQV, multiply the impervious area draining to the BMP by 0.42 inches for new development sites and 0.26 inches for redevelopment sites. The calculations of both the required and the provided volume of each BMP must be shown on the Grading and Drainage Plan. Each BMP should be labeled on the Grading and Drainage Plan with the required SWQV and associated water surface elevation and the 100-year water surface elevation. Landscaping of surface BMPs is also required to be noted on the Grading and Drainage Plan.

For single-family subdivisions, stormwater quality ponds will not be allowed on individual lots. Instead, a centralized stormwater quality pond for the entire subdivision must be constructed for all impervious areas to include the houses, patios, sidewalks, driveways, and public or private streets, or a payment-in-lieu can be paid. The following equation can be used to determine the amount of impervious area for single-family subdivisions:

EQUATION 6.62 **Impervious percentage** = $7*\sqrt{((N*N) = (5*N))}$

where:
N = units/acre

For all developments, a combination of on-site/off-site ponding and payment-in-lieu is allowed.

Part 6-12(A) Low Impact Development Strategies

This section outlines principles to apply Low Impact Development strategies to effectively design stormwater quality features to treat the stormwater quality volume as part of the development process.

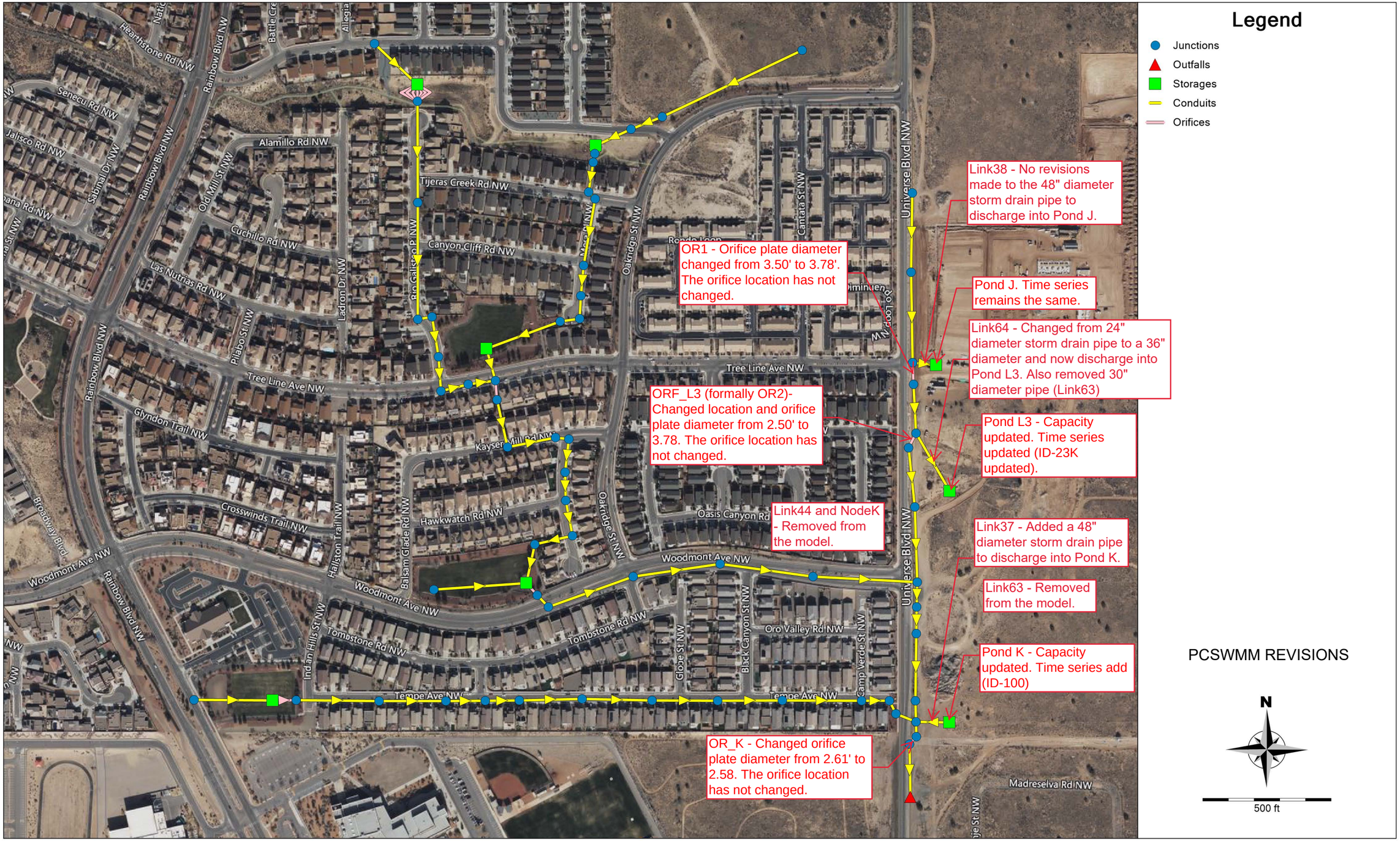
1. **Consider stormwater quality needs early in the design process.** This will provide for stormwater capture and treatment throughout the site rather than "shoe-horning" the facility, resulting in a forced, constrained approach.
2. **Take advantage of the entire site when planning for stormwater treatment.** Spreading the runoff over a larger portion of the site can help to avoid less desirable treatment strategies that rely on underground capture and deep basins that can be difficult to maintain.
3. **Reduce runoff.** Drain impervious areas to landscape areas and minimize directly connected impervious areas. Reduce the amount of impervious areas (e.g. use porous pavement or gravel for low-use or emergency access) and select treatment techniques that promote infiltration.
4. **Integrate stormwater quality management and flood control, when practical.** If the site is required to detain runoff for flood control purposes, the facility used for flood control can be modified for stormwater quality by establishing the overflow elevation above the design standard volume.
5. **Landscape stormwater management facilities.** A stormwater management facility can be an attractive addition to the site, rather than just an unimproved dirt area. In addition, landscaping will minimize the potential for erosion and therefore minimize the amount of required maintenance.
6. **Consider surface conveyance as an alternative to pipes.**
7. **Design facilities for easier maintenance.** Fine soils may clog void spaces with time. The designer should consider a capture area for fine soils where stormwater enters the facility that can be easily replaced or maintained.
8. **Amend the soil** to allow for improved infiltration.

Part 6-12(B) Effective Strategies for Stormwater Treatment

There are a variety of methods to improve stormwater quality. Not all methods are appropriate for all development types. See *TABLE 6.12.23* for development types.

APPENDIX B

HYDRAULIC CALCULATIONS


Legend
Junctions
Outfalls
Storages
Conduits
Orifices
Link38 - No revisions made to the 48" diameter storm drain pipe to discharge into Pond J.
OR1 - Orifice plate diameter changed from 3.50' to 3.78'. The orifice location has not changed.
Pond J. Time series remains the same.
Link64 - Changed from 24" diameter storm drain pipe to a 36" diameter and now discharge into Pond L3. Also removed 30" diameter pipe (Link63)
ORF_L3 (formally OR2)- Changed location and orifice plate diameter from 2.50' to 3.78. The orifice location has not changed.
Pond L3 - Capacity updated. Time series updated (ID-23K updated).
Link44 and NodeK - Removed from the model.
Link37 - Added a 48" diameter storm drain pipe to discharge into Pond K.
Link63 - Removed from the model.
Pond K - Capacity updated. Time series add (ID-100)
OR_K - Changed orifice plate diameter from 2.61' to 2.58. The orifice location has not changed.
PCSWMM REVISIONS
N
500 ft
Hearthstone Rd NW
Senecu Rd NW
Jalisco Rd NW
Sabinal Dr NW
Rainbow Blvd NW
Old Mill St NW
Alamillo Rd NW
Tijeras Creek Rd NW
Cuchillo Rd NW
Canyon Cliff Rd NW
Las Nutrias Rd NW
Ladron Dr NW
Rio Galisteo Pl NW
Pilabo St NW
Tree Line Ave NW
Glyndon Trail NW
Kayser Mill Rd NW
Oakridge St NW
Cantata St NW
Universe Blvd NW
Broadway Blvd
Woodmont Ave NW
Crosswinds Trail NW
Hawkwatch Rd NW
Hallston Trail NW
Balsam Glade Rd NW
Oasis Canyon Rd
Tombstone Rd NW
Indian Hills St NW
Globe St NW
Black Canyon St NW
Oro Valley Rd NW
Camp Verde St NW
Tempe Ave NW
Madreselva Rd NW

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Output Hydrographs for PCSWMM
Creation Date: 10/24/2022
Comments:

AHYMO - OUTPUT HYDROGRAPHS FOR PCSWMM

Basin DEV 1		Basin DEV 5 & 6	
Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
0.00	0.0	0.00	0.0
0.33	0.0	0.33	0.0
0.66	0.0	0.66	0.0
0.99	0.0	0.99	0.0
1.32	0.9	1.32	3.4
1.49	4.5	1.49	14.0
1.52	4.5	1.52	14.0
1.65	2.4	1.65	7.5
1.98	1.0	1.98	3.3
2.31	0.2	2.31	0.7
2.64	0.1	2.64	0.3
2.97	0.0	2.97	0.2
3.30	0.0	3.30	0.1
3.63	0.0	3.63	0.1
3.96	0.0	3.96	0.1
4.29	0.0	4.29	0.1
4.62	0.0	4.62	0.1
4.95	0.0	4.95	0.1
5.28	0.0	5.28	0.1
5.61	0.0	5.61	0.1
5.94	0.0	5.94	0.1
6.27	0.0	6.27	0.1
6.60	0.0	6.60	0.1
6.93	0.0	6.93	0.1
7.26	0.0	7.26	0.1
7.59	0.0	7.59	0.1
7.92	0.0	7.92	0.1
8.25	0.0	8.25	0.1
8.58	0.0	8.58	0.1
8.91	0.0	8.91	0.1
9.24	0.0	9.24	0.1
9.57	0.0	9.57	0.1
9.90	0.0	9.90	0.1
10.23	0.0	10.23	0.1
10.56	0.0	10.56	0.1
10.89	0.0	10.89	0.1
11.22	0.0	11.22	0.1

11.55	0.0	11.55	0.1
11.88	0.0	11.88	0.1
12.21	0.0	12.21	0.1
12.54	0.0	12.54	0.1
12.87	0.0	12.87	0.1
13.20	0.0	13.20	0.1
13.53	0.0	13.53	0.1
13.86	0.0	13.86	0.1
14.19	0.0	14.19	0.1
14.52	0.0	14.52	0.1
14.85	0.0	14.85	0.1
15.18	0.0	15.18	0.1
15.51	0.0	15.51	0.1
15.84	0.0	15.84	0.1
16.17	0.0	16.17	0.1
16.50	0.0	16.50	0.1
16.83	0.0	16.83	0.1
17.16	0.0	17.16	0.1
17.49	0.0	17.49	0.1
17.82	0.0	17.82	0.1
18.15	0.0	18.15	0.1
18.48	0.0	18.48	0.1
18.81	0.0	18.81	0.1
19.14	0.0	19.14	0.1
19.47	0.0	19.47	0.1
19.80	0.0	19.80	0.1
20.13	0.0	20.13	0.1
20.46	0.0	20.46	0.1
20.79	0.0	20.79	0.1
21.12	0.0	21.12	0.1
21.45	0.0	21.45	0.1
21.78	0.0	21.78	0.1
22.11	0.0	22.11	0.1
22.44	0.0	22.44	0.1
22.77	0.0	22.77	0.1
23.10	0.0	23.10	0.1
23.43	0.0	23.43	0.1
23.76	0.0	23.76	0.1
24.09	0.0	24.09	0.0
24.42	0.0	24.42	0.0
24.75	0.0	24.75	0.0
25.08	0.0	25.08	0.0

Hydraulic Analysis Report

Project Data

Project Title: Project - Sonata Tracts 3A & 4

Designer:

Project Date: Wednesday, May 4, 2022

Project Units: U.S. Customary Units

Notes:

Channel Analysis: 62ft Typical Road @ 0.5% Onsite Basin DEV3-13.4cfs

Notes:

Input Parameters

Channel Type: Custom Cross Section

Cross Section Data

Elevation (ft)	Elevation (ft)	Manning's n
0.00	5410.12	0.0130
6.00	5410.00	0.0130
6.17	5409.33	0.0170
37.17	5408.71	0.0170
68.17	5409.33	0.0170
68.34	5410.00	0.0130
74.34	5410.12	-----

Longitudinal Slope: 0.0050 ft/ft

Flow: 13.4000 cfs

Result Parameters

Depth: 0.3666 ft

Area of Flow: 6.7195 ft^2

Wetted Perimeter: 36.6666 ft

Hydraulic Radius: 0.1833 ft

Average Velocity: 1.9942 ft/s

Top Width: 36.6593 ft

Froude Number: 0.8208

Critical Depth: 0.3388 ft

Critical Velocity: 2.3355 ft/s

Critical Slope: 0.0076 ft/ft

Critical Top Width: 33.88 ft

Calculated Max Shear Stress: 0.1144 lb/ft^2

Calculated Avg Shear Stress: 0.0572 lb/ft^2

Composite Manning's n Equation: Lotter method

Manning's n: 0.0170

Channel Analysis: 62ft Typical Road @ 0.5% Onsite Basin DEV2, 3 &4-28.8cfs

Notes:

Input Parameters

Channel Type: Custom Cross Section

Cross Section Data

Elevation (ft)	Elevation (ft)	Manning's n
0.00	5410.12	0.0130
6.00	5410.00	0.0130
6.17	5409.33	0.0170
37.17	5408.71	0.0170
68.17	5409.33	0.0170
68.34	5410.00	0.0130
74.34	5410.12	-----

Longitudinal Slope: 0.0050 ft/ft

Flow: 28.8000 cfs

Result Parameters

Depth: 0.4884 ft

Area of Flow: 11.9276 ft^2

Wetted Perimeter: 48.8516 ft

Hydraulic Radius: 0.2442 ft

Average Velocity: 2.4146 ft/s

Top Width: 48.8418 ft

Froude Number: 0.8611

Critical Depth: 0.4600 ft

Critical Velocity: 2.7216 ft/s

Critical Slope: 0.0069 ft/ft

Critical Top Width: 46.00 ft

Calculated Max Shear Stress: 0.1524 lb/ft^2

Calculated Avg Shear Stress: 0.0762 lb/ft^2

Composite Manning's n Equation: Lotter method

Manning's n: 0.0170

Channel Analysis: Proposed Sidewalk Culverts- Basin Dev2 @ 1% - 6" Curb

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width: 1.0000 ft

Longitudinal Slope: 0.0100 ft/ft

Manning's n: 0.0130

Depth: 0.4200 ft

Result Parameters

Flow: 1.7931 cfs

Area of Flow: 0.4200 ft^2

Wetted Perimeter: 1.8400 ft

Hydraulic Radius: 0.2283 ft

Average Velocity: 4.2694 ft/s

Top Width: 1.0000 ft

Froude Number: 1.1609

Critical Depth: 0.4639 ft

Critical Velocity: 3.8651 ft/s

Critical Slope: 0.0076 ft/ft

Critical Top Width: 1.00 ft

Calculated Max Shear Stress: 0.2621 lb/ft^2

Calculated Avg Shear Stress: 0.1424 lb/ft^2

Channel Analysis: Proposed SD Dev 2, 3 & 4 @ 1%

Notes:

Input Parameters

Channel Type: Circular

Pipe Diameter: 2.0000 ft

Longitudinal Slope: 0.0100 ft/ft

Manning's n: 0.0130

Depth: 2.0000 ft

Result Parameters

Flow: 22.6224 cfs

Area of Flow: 3.1416 ft^2

Wetted Perimeter: 6.2832 ft

Hydraulic Radius: 0.5000 ft

Average Velocity: 7.2009 ft/s

Top Width: 0.0000 ft

Froude Number: 0.0000

Critical Depth: 1.6953 ft

Critical Velocity: 7.9674 ft/s

Critical Slope: 0.0095 ft/ft

Critical Top Width: 1.44 ft

Calculated Max Shear Stress: 1.2480 lb/ft^2

Calculated Avg Shear Stress: 0.3120 lb/ft^2

Weir Analysis: Pond K Emergency Spillway

Notes:

Input Parameters

Weir Type: Cipolletti

Coefficient: 3.3670

Length: 50.0000 ft

Flow: 168.3500 cfs

Result Parameters

Head: 1.0000 ft

Weir Analysis: Pond L3 Emergency Spillway

Notes:

Input Parameters

Weir Type: Cipolletti

Coefficient: 3.3670

Length: 32.0000 ft

Flow: 107.7440 cfs

Result Parameters

Head: 1.0000 ft

Channel Analysis: Typical Road @ Offsite 0.68% Basin DEV OFF1-1/2 of 13.2cfs

Notes:

Input Parameters

Channel Type: Custom Cross Section

Cross Section Data

Elevation (ft)	Elevation (ft)	Manning's n
0.00	5415.00	0.0130
6.00	5415.00	0.0130
6.17	5414.50	0.0130
28.17	5414.06	0.0170
28.33	5414.73	0.0170
33.33	5414.73	-----

Longitudinal Slope: 0.0068 ft/ft

Flow: 6.6000 cfs

Result Parameters

Depth: 0.3110 ft

Area of Flow: 2.4299 ft^2

Wetted Perimeter: 15.8724 ft

Hydraulic Radius: 0.1531 ft

Average Velocity: 2.7162 ft/s

Top Width: 15.6249 ft

Froude Number: 1.2138

Critical Depth: 0.3361 ft

Critical Velocity: 2.3262 ft/s

Critical Slope: 0.0045 ft/ft

Critical Top Width: 16.88 ft

Calculated Max Shear Stress: 0.1320 lb/ft^2

Calculated Avg Shear Stress: 0.0650 lb/ft^2

Composite Manning's n Equation: Lotter method

Manning's n: 0.0129

Channel Analysis: Typical Road @ Offsite 1.45% Basin DEV OFF3-1/2 of 4.2cfs

Notes:

Input Parameters

Channel Type: Custom Cross Section

Cross Section Data

Elevation (ft)	Elevation (ft)	Manning's n
0.00	5415.00	0.0130
6.00	5415.00	0.0130
6.17	5414.50	0.0130
28.17	5414.06	0.0170
28.33	5414.73	0.0170
33.33	5414.73	-----

Longitudinal Slope: 0.0145 ft/ft

Flow: 2.1000 cfs

Result Parameters

Depth: 0.1756 ft

Area of Flow: 0.7749 ft^2

Wetted Perimeter: 8.9637 ft

Hydraulic Radius: 0.0865 ft

Average Velocity: 2.7099 ft/s

Top Width: 8.8239 ft

Froude Number: 1.6115

Critical Depth: 0.2126 ft

Critical Velocity: 1.8501 ft/s

Critical Slope: 0.0052 ft/ft

Critical Top Width: 10.68 ft

Calculated Max Shear Stress: 0.1589 lb/ft^2

Calculated Avg Shear Stress: 0.0782 lb/ft^2

Composite Manning's n Equation: Lotter method

Manning's n: 0.0129

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Sump Inlet Calculations for Basin DEV2 & 4
Creation Date: 10/24/2022
Comments:

Curb Opening (Treated As Orfice)

Orifice Calcs
Qo = .6A√2gh

A = Open area of weir (sq. ft)	0.0
g = 32.2 (ft/s2)	32.20
H = Head (ft)	0.50
clogging factor =	15%
Qw = Capacity (cfs)	0.0

Notes:
-Boxed cells are user inputs.
-H is the height of water above the centroid of the curb opening.
-Clogging factor determined at Engineer's discretion.
Orifice Equation taken from COA DPM

Grate (Treated As Weir)

Weir Flow Calcs
Qw = 2.7L(H)1.5

P = Perimeter (ft)	10.0
H = Head (ft)	0.67
coefficient of discharge =	2.70
clogging factor =	20%
Qw = Capacity (cfs)	11.8

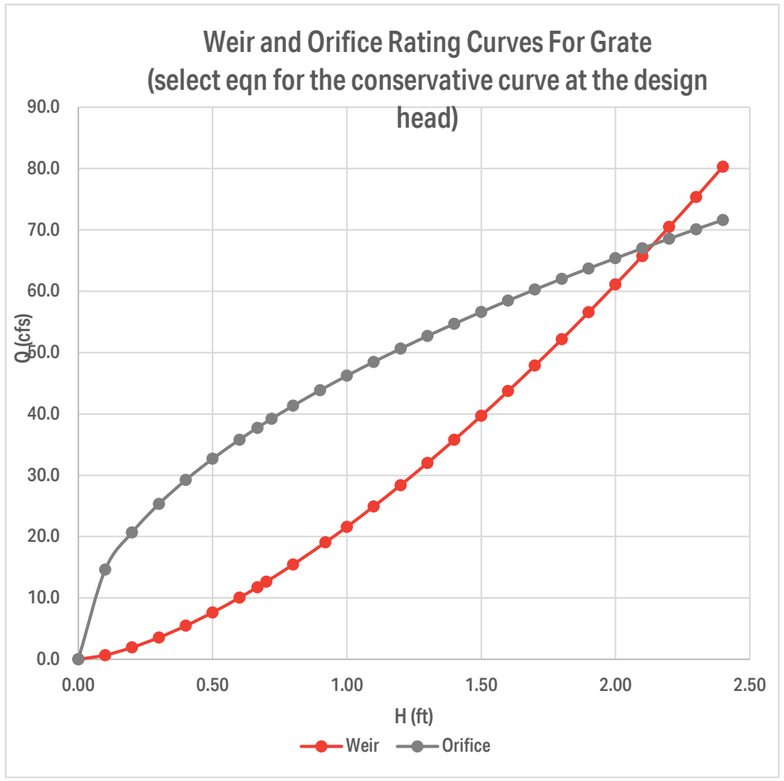
Notes:
-Boxed cells are user inputs.
-For a combination inlet P=2(width of grate - width of bars)+length of grate.
-For a double combination inlet P=2W+2L (i.e. the abutting grate widths do not contribute to the perimeter and the length of the grate along the curb also does not contribute to the perimeter.
-H is the hieght of water above the grate. 0.72' (8.63") is the average of the elevations at the front and back of the grate per COA type A inlet standard detail).
-Water is permitted to rise to the edge of ROW in the sump which results in a maximum head for the grate of .92'.
-2.7 for the coefficient of discharge is taken from the Albuquerque DPM.
-Clogging factor determined at Engineer's discretion.
-For COA standard grate, W=18.5" and L=35.5
Weir Equation taken from COA DPM

Grate (Treated As Orifice)

Orifice Calcs
Qo = .6A√2gh

A = Open area of grate (sq. ft)	12.0
g = 32.2 (ft/s2)	32.20
H = Head (ft)	0.67
clogging factor =	20%
Qo = Capacity (cfs)	37.8

Notes:
-Boxed cells are user inputs.
-H is the height of water above the grate.
-When calculating A subtract out the area of the bars.
-Multiply A by 2 for a double inlet. (In this case, 9.1=18.5*35.5/(12^2)*2
-H is the hieght of water above the grate. (8.63" is the average of the elevations at the front and back of the grate per COA type A inlet standard detail).
-Clogging factor determined at Engineer's discretion.
Orifice Equation taken from COA DPM



Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Sump Inlet Calculations for Basin DEV3
Creation Date: 10/24/2022
Comments:

Curb Opening (Treated As Orfice)

Orifice Calcs
Qo = .6A√2gh

A = Open area of weir (sq. ft)	0.0
g = 32.2 (ft/s2)	32.20
H = Head (ft)	0.50
clogging factor =	15%
Qw = Capacity (cfs)	0.0

Notes:
-Boxed cells are user inputs.
-H is the height of water above the centroid of the curb opening.
-Clogging factor determined at Engineer's discretion.
Orifice Equation taken from COA DPM

Grate (Treated As Weir)

Weir Flow Calcs
Qw = 2.7L(H)1.5

P = Perimeter (ft)	10.0
H = Head (ft)	0.67
coefficient of discharge =	2.70
clogging factor =	20%
Qw = Capacity (cfs)	11.8

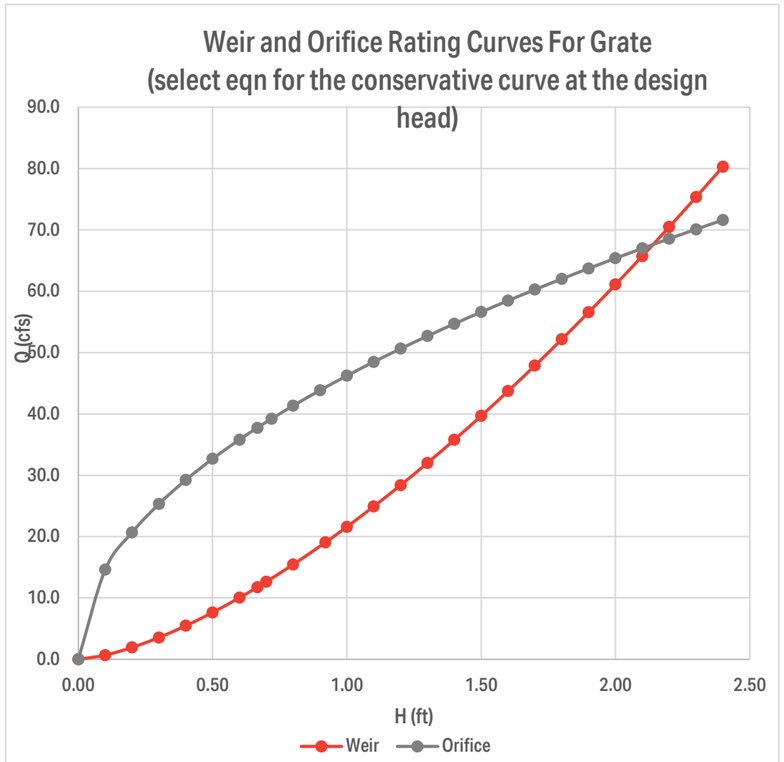
Notes:
-Boxed cells are user inputs.
-For a combination inlet P=2(width of grate - width of bars)+length of grate.
-For a double combination inlet P=2W+2L (i.e. the abutting grate widths do not contribute to the perimeter and the length of the grate along the curb also does not contribute to the perimeter.
-H is the hieght of water above the grate. 0.72' (8.63") is the average of the elevations at the front and back of the grate per COA type A inlet standard detail).
-Water is permitted to rise to the edge of ROW in the sump which results in a maximum head for the grate of .92'.
-2.7 for the coefficient of discharge is taken from the Albuquerque DPM.
-Clogging factor determined at Engineer's discretion.
-For COA standard grate, W=18.5" and L=35.5
Weir Equation taken from COA DPM

Grate (Treated As Orifice)

Orifice Calcs
Qo = .6A√2gh

A = Open area of grate (sq. ft)	12.0
g = 32.2 (ft/s2)	32.20
H = Head (ft)	0.67
clogging factor =	20%
Qo = Capacity (cfs)	37.8

Notes:
-Boxed cells are user inputs.
-H is the height of water above the grate.
-When calculating A subtract out the area of the bars.
-Multiply A by 2 for a double inlet. (In this case, 9.1=18.5*35.5/(12^2)*2
-H is the hieght of water above the grate. (8.63" is the average of the elevations at the front and back of the grate per COA type A inlet standard detail).
-Clogging factor determined at Engineer's discretion.
Orifice Equation taken from COA DPM



Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Sump Inlet Calculations for Basin DEV OFF1 & DEV OFF3
Creation Date: 10/24/2022
Comments:

Curb Opening (Treated As Orfice)

Orifice Calcs
Qo = .6A√2gh

A = Open area of weir (sq. ft)	1.8
g = 32.2 (ft/s2)	32.20
H = Head (ft)	0.50
clogging factor =	15%
Qw = Capacity (cfs)	5.1

Notes:
-Boxed cells are user inputs.
-H is the height of water above the centroid of the curb opening.
-Clogging factor determined at Engineer's discretion.
Orifice Equation taken from COA DPM

Grate (Treated As Weir)

Weir Flow Calcs
Qw = 2.7L(H)1.5

P = Perimeter (ft)	10.0
H = Head (ft)	0.67
coefficient of discharge =	2.70
clogging factor =	20%
Qw = Capacity (cfs)	11.8

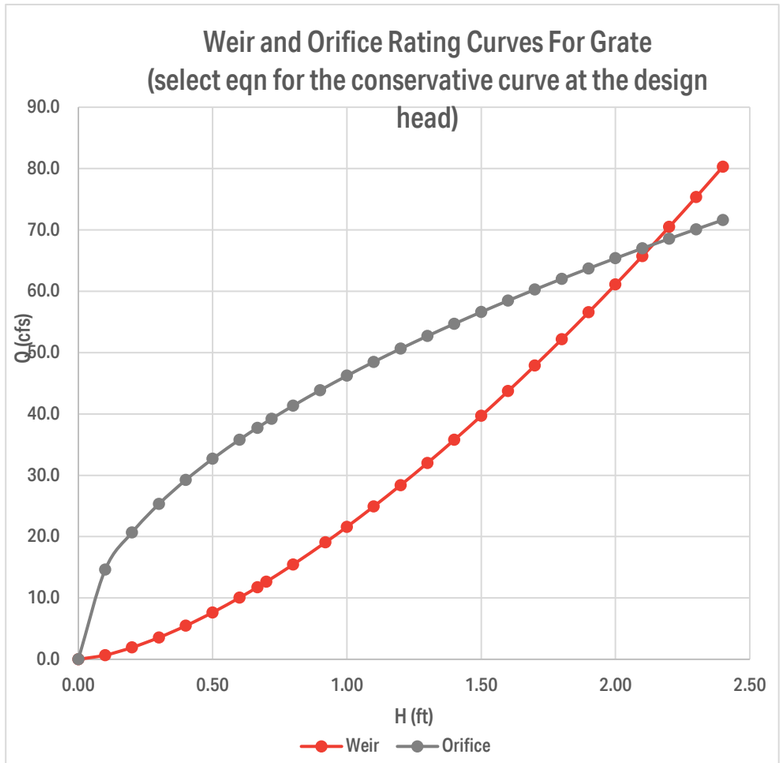
Notes:
-Boxed cells are user inputs.
-For a combination inlet P=2(width of grate - width of bars)+length of grate.
-For a double combination inlet P=2W+2L (i.e. the abutting grate widths do not contribute to the perimeter and the length of the grate along the curb also does not contribute to the perimeter.
-H is the hieght of water above the grate. 0.72' (8.63") is the average of the elevations at the front and back of the grate per COA type A inlet standard detail).
-Water is permitted to rise to the edge of ROW in the sump which results in a maximum head for the grate of .92'.
-2.7 for the coefficient of discharge is taken from the Albuquerque DPM.
-Clogging factor determined at Engineer's discretion.
-For COA standard grate, W=18.5" and L=35.5
Weir Equation taken from COA DPM

Grate (Treated As Orifice)

Orifice Calcs
Qo = .6A√2gh

A = Open area of grate (sq. ft)	12.0
g = 32.2 (ft/s2)	32.20
H = Head (ft)	0.67
clogging factor =	20%
Qo = Capacity (cfs)	37.8

Notes:
-Boxed cells are user inputs.
-H is the height of water above the grate.
-When calculating A subtract out the area of the bars.
-Multiply A by 2 for a double inlet. (In this case, 9.1=18.5*35.5/(12^2)*2
-H is the hieght of water above the grate. (8.63" is the average of the elevations at the front and back of the grate per COA type A inlet standard detail).
-Clogging factor determined at Engineer's discretion.
Orifice Equation taken from COA DPM



Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Orifice Equal Area (OR1)
Creation Date: 10/24/2022
Comments:

https://www.cedengineering.com/userfiles/Partially%20Full%20Pipe%20Flow%20Calculations.pdf

$$a = \frac{1}{2} r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin\left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$$

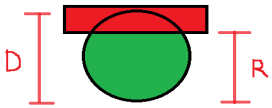
(partial area formula)

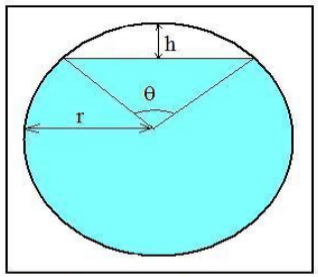
	Input		Input
Diameter of Storm Drain in PCSWMM (D)	4	Depth from invert to bottom of Orifice plate	3.372

Overall Radius (r)	Depth Below Crown of Pipe (R)	Partial Area of Conduit (a)
ft	ft	ft^2
2	3.372	11.304

Equal Area for PCSWMM	
Diameter to input in PCSWMM	3.78

Area of Circle
3.78





$r = D/2$ $\quad h = 2r - y$

$\theta = 2 \arccos\left(\frac{r-h}{r}\right)$

$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$

$P = 2\pi r - r\theta$

$R_h = A/P$

Figure 2. Partially Full Pipe Flow Parameters (more than half full)

Example #3: Calculate the hydraulic radius for water flowing 3.4 ft deep in a 48-inch diameter storm sewer.

Solution: r = 48/2 = 24 inches = 2 ft; h = 2*2 – 3.4 = 0.6 ft

$\theta = 2 \arccos [(2 - 0.6)/2)] = 1.59$ radians

$A = \pi (2^2) - [2^2 (1.59 - \sin (1.59))] / 2 = 11.38 \text{ ft}^2$

$P = 2 \pi (2) - (2)(1.59) = 9.4$ f5

$\mathbf{R_h} = 11.38/9.4 =$ **1.21 ft**

This example can also be solved with the course spreadsheet as illustrated in the screenshot below, which is from the "Q_more than half full" tab in the course spreadsheet. As you can see, the values for A, P, and R_h are the same as in the calculations above.

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Orifice Equal Area (ORF_L3)
Creation Date: 10/24/2022
Comments:

https://www.cedengineering.com/userfiles/Partially%20Full%20Pipe%20Flow%20Calculations.pdf

$$a = \frac{1}{2} r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin\left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$$

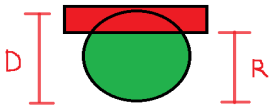
(partial area formula)

	Input		Input
Diameter of Storm Drain in PCSWMM (D)	4	Depth from invert to bottom of Orifice plate	3.372

Overall Radius (r)	Depth Below Crown of Pipe (R)	Partial Area of Conduit (a)
ft	ft	ft^2
2	3.372	11.304

Equal Area for PCSWMM	
Diameter to input in PCSWMM	3.78

Area of Circle
3.78



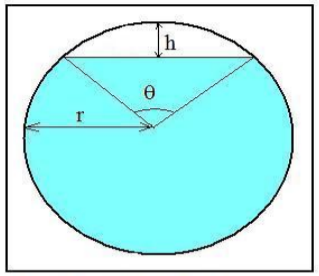


Figure 2. Partially Full Pipe Flow Parameters (more than half full)

$r = D/2$ $\quad h = 2r - y$

$\theta = 2 \arccos\left(\frac{r-h}{r}\right)$

$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$

$P = 2\pi r - r\theta$

$R_h = A/P$

Example #3: Calculate the hydraulic radius for water flowing 3.4 ft deep in a 48-inch diameter storm sewer.

Solution: r = 48/2 = 24 inches = 2 ft; h = 2*2 – 3.4 = 0.6 ft

$\theta = 2 \arccos [(2 - 0.6)/2)] = 1.59$ radians

$A = \pi (2^2) - [2^2 (1.59 - \sin (1.59))] / 2 = 11.38 \text{ ft}^2$

$P = 2 \pi (2) - (2)(1.59) = 9.4$ f5

$\mathbf{R_h} = 11.38/9.4 = \underline{\mathbf{1.21 \text{ ft}}}$

This example can also be solved with the course spreadsheet as illustrated in the screenshot below, which is from the "Q_more than half full" tab in the course spreadsheet. As you can see, the values for A, P, and R_h are the same as in the calculations above.

Project Name: Sonata Tracts 3A & 4
Project No: W0128.02
Sheet Title: Orifice Equal Area (ORF_K)
Creation Date: 10/24/2022
Comments:

https://www.cedengineering.com/userfiles/Partially%20Full%20Pipe%20Flow%20Calculations.pdf

$$a = \frac{1}{2} r^2 \left\{ \left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} - \sin\left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right) \right] \frac{\pi}{180} \right] \right\}$$

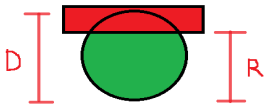
(partial area formula)

	Input		Input
Diameter of Storm Drain in PCSWMM (D)	3	Depth from invert to bottom of Orifice plate	2.0833

Overall Radius (r)	Depth Below Crown of Pipe (R)	Partial Area of Conduit (a)
ft	ft	ft^2
1.5	2.0833	5.239

Equal Area for PCSWMM	
Diameter to input in PCSWMM	2.58

Area of Circle
2.58



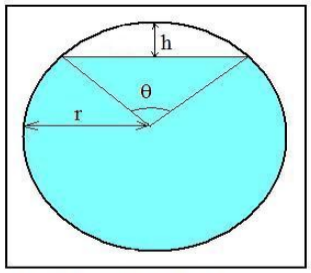


Figure 2. Partially Full Pipe Flow Parameters (more than half full)

$r = D/2 \qquad h = 2r - y$

$\theta = 2 \arccos\left(\frac{r-h}{r}\right)$

$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$

$P = 2\pi r - r\theta$

$R_h = A/P$

Example #3: Calculate the hydraulic radius for water flowing 3.4 ft deep in a 48-inch diameter storm sewer.

Solution: r = 48/2 = 24 inches = 2 ft; h = 2*2 – 3.4 = 0.6 ft

$\theta = 2 \arccos [(2 - 0.6)/2)] = 1.59$ radians

$A = \pi (2^2) - [2^2 (1.59 - \sin (1.59))] / 2 = 11.38 \text{ ft}^2$

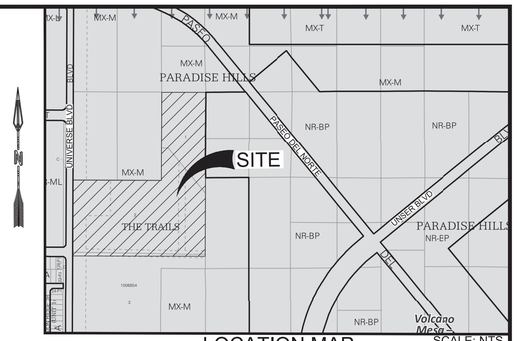
$P = 2 \pi (2) - (2)(1.59) = 9.4$ f5

$\mathbf{R_h} = 11.38/9.4 = \underline{\mathbf{1.21 \text{ ft}}}$

This example can also be solved with the course spreadsheet as illustrated in the screenshot below, which is from the "Q_more than half full" tab in the course spreadsheet. As you can see, the values for A, P, and R_h are the same as in the calculations above.

REFERENCES

CONSTRUCTION PLANS
FOR
SONATA TRAILS UNIT 4 APARTMENTS



LOCATION MAP
ZONE ATLAS MAP C-10-Z

SCALE: NTS

CITY OF ALBUQUERQUE
NEW MEXICO
COA PROJECT NO. 761284
ABCWUA AVAILABILITY STATEMENT NO. 200426
DRB PROJECT NO. PR-2020-003707
AUGUST 2021

APPLICANT:
RESPEC, Jeremy Shell, P.E.
5971 JEFFERSON ST NE, SUITE 101
ALBUQUERQUE, NM 87109
(505) 264-0472

DEVELOPER:
Sonata Green Owner, LLC

NOTE:
THE WORK FOR POND J AND THE ORIFICE PLATES IN THE UNIVERSE STORM DRAIN ARE TO BE BUILT FIRST.

Sheet List Table

Sheet Number	Sheet Title
	GENERAL SHEETS
1	COVER
2	INFORMATION SHEETS - PLAT 1
3	INFORMATION SHEETS - PLAT 2
4	INFORMATION SHEETS - PLAT 3
5	INFORMATION SHEETS - TOPO 1
6	INFORMATION SHEETS - TOPO 2
7	INFORMATION SHEETS - TOPO 3
8	INFORMATION SHEETS - TOPO 4
9	INFORMATION SHEETS - OVERALL GRADING PLAN
10	INFORMATION SHEETS - NORTH POND GRADING PLAN
11	GENERAL NOTES, LEGEND, & ABBREVIATIONS
	CIVIL SHEETS
12	OVERALL ROADWAY PLAN
13	DEMOLITION PLAN
14	UNIVERSE BLVD. PAVING PLAN & PROFILE
15	UNIVERSE AND PASEO PAVING PLAN
16	TREELINE PAVING PLAN & PROFILE
17	CHATSWORTH PAVING PLAN & PROFILE
18	CHATSWORTH PAVING PLAN & PROFILE
19	OAK RIDGE PAVING PLAN & PROFILE
20	CURB RETURN DETAILS
21	CURB RETURN DETAILS
22	TYPICAL ROADWAY SECTIONS
23	SIGNING & STRIPING PLAN

Sheet List Table

Sheet Number	Sheet Title
24	SIGNING & STRIPING PLAN
25	SIGNING & STRIPING PLAN
26	STRIPING AND MARKINGS DETAILS
27	SIGN FACE DETAILS
28	OVERALL UTILITY PLAN
29	WATER SHUT OFF & RESTRAINT JOINT TABLE
30	TREE LINE WATERLINE PLAN & PROFILE
31	CHATSWORTH WATER & SANITARY PLAN & PROFILE
32	CHATSWORTH WATER & SANITARY PLAN & PROFILE
33	CHATSWORTH STORM DRAIN PLAN & PROFILE
34	CHATSWORTH STORM DRAIN PLAN & PROFILE
35	CHATSWORTH STORM DRAIN STUB PROFILES
36	OAK RIDGE SANITARY SEWER PLAN & PROFILE
37	OAK RIDGE WATER PLAN & PROFILE
38	OAK RIDGE STORM DRAIN P&P
39	UNIVERSE STORM DRAIN
40	UNIVERSE STORM DRAIN RESTRICTOR PLATE DETAILS
41	MISCELLANEOUS DETAILS
42	NORTH DRAINAGE POND PLAN
43	SOUTHWEST DRAINAGE POND PLAN
44	OFFSITE 8" WATER LINE PLAN & PROFILE
45	OFFSITE 8" WATER LINE PLAN & PROFILE
46	ROADWAY LIGHTING GENERAL NOTES
47	LIGHTING PLAN
48	ELECTRICAL DETAILS

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

REV.	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE

ENGINEERS STAMP & SIGNATURE

JEREMY W SHELL NEW MEXICO 26341 PROFESSIONAL ENGINEER
08/05/2021

APPROVALS	ENGINEER	DATE
DRC Chairman		9/21/2021
Transportation		8/9/2021
Water/Wastewater		9/21/2021
Hydrology		09/09/21
Parks		
Constr. Mngmt.		
Constr. Coord.		

Approved by Albuquerque City Engineer and Design Review Committee Nov. 17, 2021

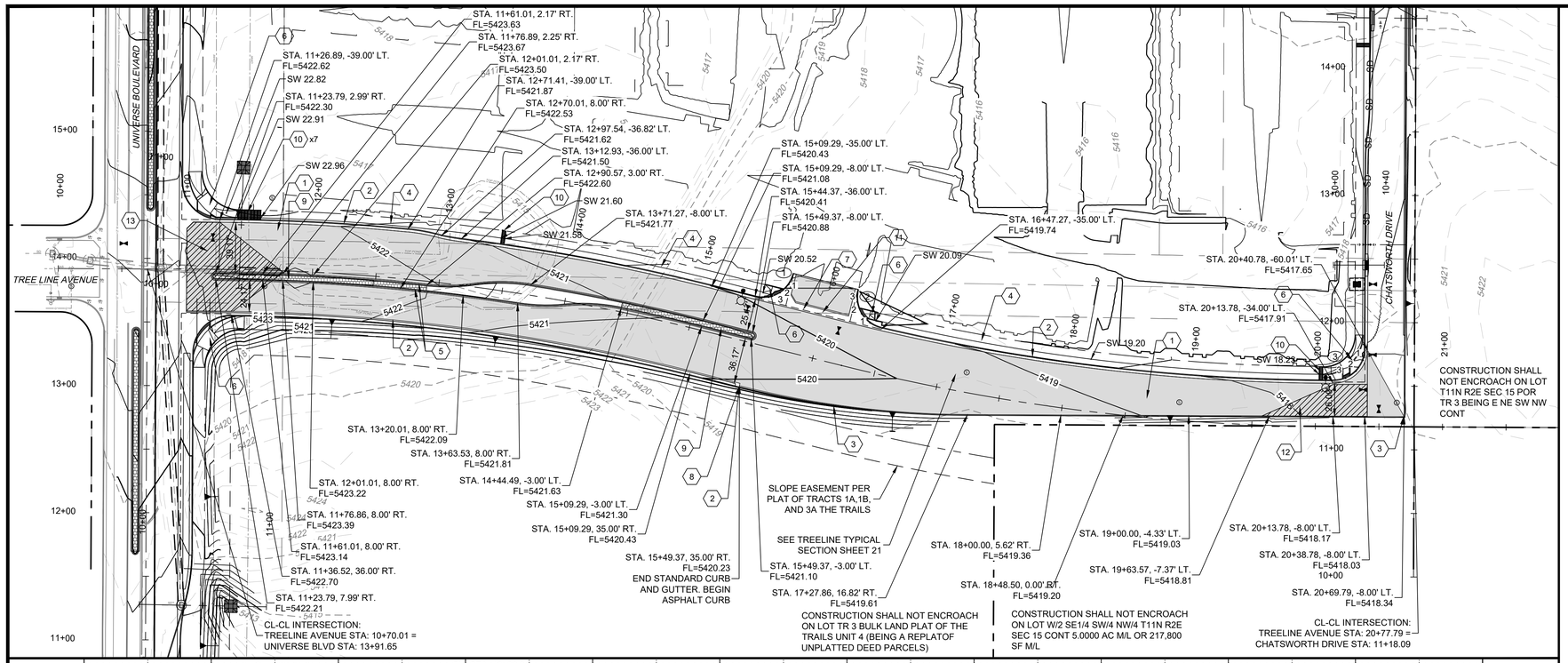
****
APPROVED FOR CONSTRUCTION

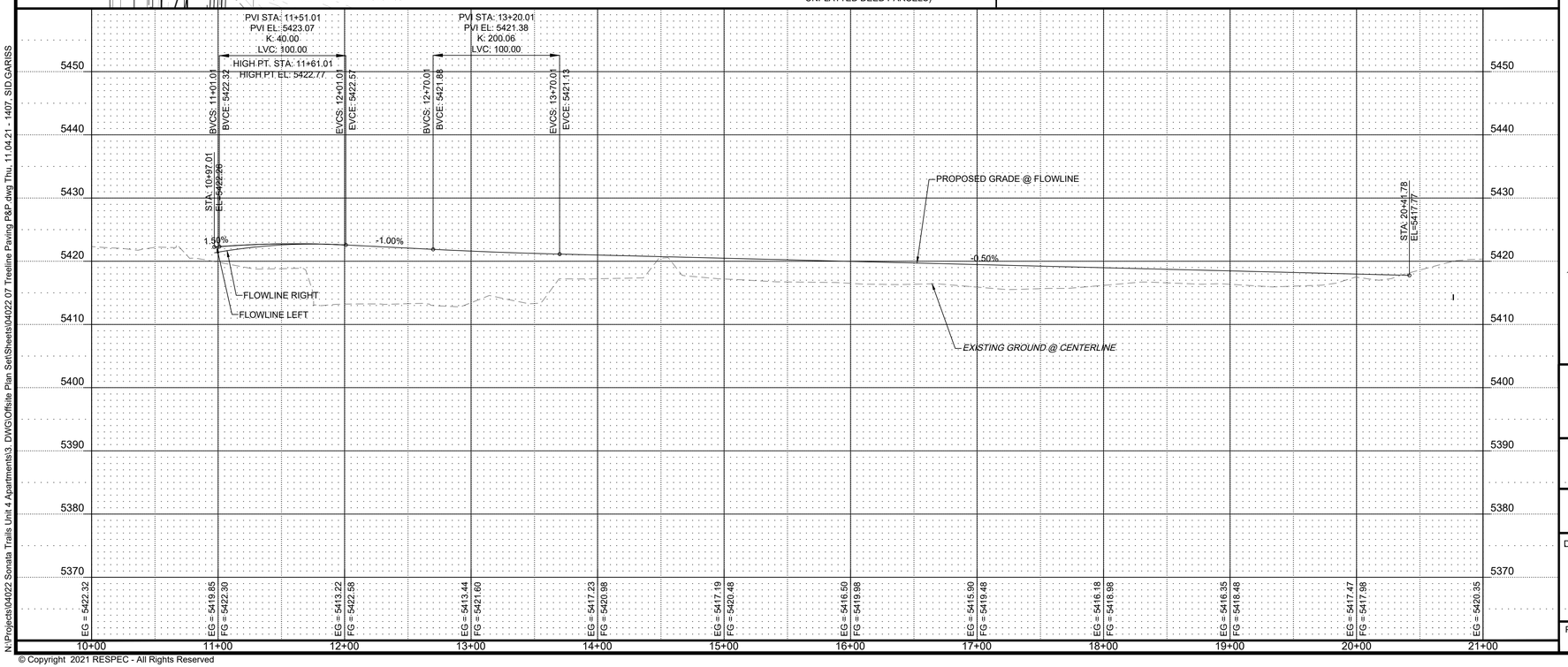
11/17/2021
City Engineer Date

City Project No.
761284

Sheet 1 Of 48

N:\Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Offsite Plan Set\Sheets\04022 01 COVER.dwg Thu, 8.05.21 - 1724, LSB jamie.vigil





PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
1	BUILD ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 21) OR MATCH EXISTING PAVEMENT SECTION WHICH EVER IS GREATER
2	BUILD PCC STD. CURB AND GUTTER, PER COA STD. DTL. DWG 2415A
3	BUILD ASPHALT CURB PER COA STD. DTL. DWG 2415A
4	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. DWG 2430, WITH LANDSCAPE BUFFER PER COA DWG 2414.
5	BUILD PCC MEDIAN CURB AND GUTTER, PER COA STD. DTL. DWG 2415A
6	BUILD ADA RAMP, PER NMDOT STD. DWG 608-01-5. SEE SHEET 19 FOR DETAILS.
7	BUILD PRIVATE ENTRANCE PER COA STD. DTL. DWG 2426. SEE SHEET 19 FOR DETAILS.
8	BUILD ASPHALT TRANSITION TO PCC CURB & GUTTER.
9	INSTALL 4" PATTERNED MEDIAN CONCRETE PAVEMENT PER COA STD DTL 2502 NOTE 3.
10	INSTALL 24" SIDEWALK CULVERT PER COA STD DTL 2236.
11	BUILD VALLEY GUTTER PER COA STD DWG 2420.
12	TRANSITION FROM FULL CROWN TO HALF CROWN ROADWAY PER COA STD. DTL. DWG 2401.
13	TRANSITION FROM FULL CROWN TO NO CROWN ROADWAY PER COA STD. DTL. DWG 2401.

1	FL
1	5420.57
2	5420.37
3	5420.26

2	FL
1	5419.84
2	5420.03
3	5420.31

3	FL
1	5417.71
2	5417.78
3	5417.85

GENERAL NOTES:

1. ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION. ANY DAMAGE AND REPAIRS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
2. ALL ADA CURB RAMPS SHALL HAVE A 8.33% MAXIMUM SLOPE. LANDING AREAS SHALL HAVE A 2.0% MAXIMUM SLOPE IN ALL DIRECTIONS.
3. CONTRACTOR SHALL FIELD VERIFY THE EXISTING PUBLIC STREET PAVEMENT SECTIONS PRIOR TO CONSTRUCTION.
4. ADJUST MANHOLE AND VALVE COLLARS TO GRADE AS NECESSARY.
5. BUILD SIDEWALK CULVERTS PER COA STD. DWG. 2236. CONTACT STORM DRAIN MAINTENANCE, 505-235-8106, TO SCHEDULE A MEETING PRIOR TO FORMING.

SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'

AS BUILT INFORMATION

CONTRACTOR
WORK STARTED BY: DATE
INSPECTORS
ACCEPTANCE BY: DATE
AGENT
VERIFICATION BY: DATE
DRAWINGS
PREPARED BY: DATE

MICRO-FILM INFORMATION
RECORDED BY: DATE
No.

BENCH MARKS
ALBUQUERQUE CONTROL SURVEY
MONUMENT "UNION" NEW MEXICO
STATE PLANE COORDINATES (CENTRAL ZONE - NAD 83)
NORTH= 1,523,503.475 FEET
EAST= 1,493,655.03 FEET
MAPPING ANGLE= -00°16'58.96"
GROUND TO GRID FACTOR= 0.99966436
ELEVATION= 5524.95 FEET

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL
JEREMY W SHIELD
NEW MEXICO
26341
PROFESSIONAL ENGINEER
08/05/2021

NO.	DATE	REVISIONS	BY
		REMARKS	

RESPEC DESIGN
DESIGNED BY: JWS — DATE: 11.04.2021
DRAWN BY: RESPEC — DATE: 11.04.2021
CHECKED BY: SEG — DATE: 11.04.2021

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

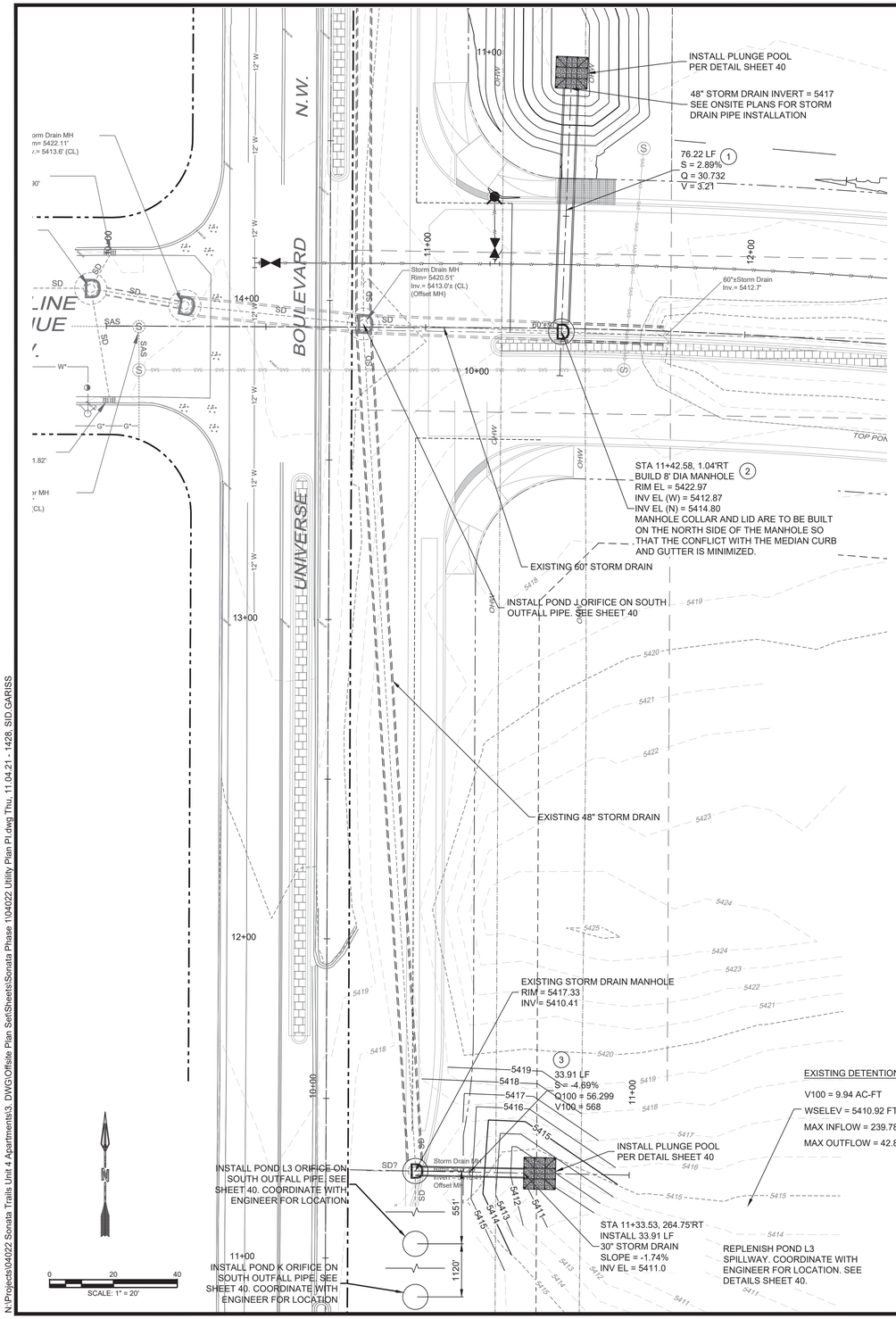
SONATA TRAILS UNIT 4 APARTMENTS

TREELINE PAVING PLAN & PROFILE

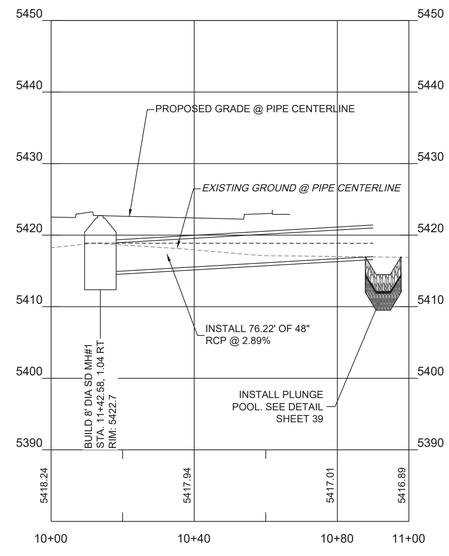
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.
	Approved by Albuquerque City Engineer and Design Review Committee Nov. 17, 2021			

Project No.	Zone Map No.	Sheet	of
761284	C-10-Z	15	47

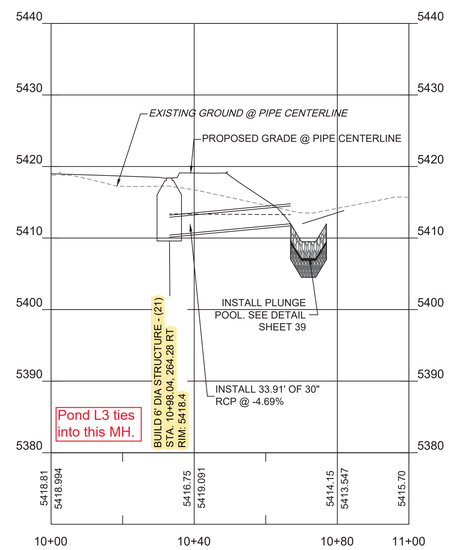
N:\Projects\04022 Sonata Trails Unit 4 Apartments\3_DWG\Offsite Plan Set\Sheets\04022 07 Treeline Paving P&P.dwg Thu, 11.04.21 - 1407 SID.GARISS



ONSITE STORM OUTFALL PROFILE



SOUTH OFFSITE OUTFALL PROFILE



STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
1	INSTALL 48" STORM DRAIN PIPE
2	INSTALL 8' DIA. MANHOLE PER NM APWA STD. DTL. 2101
3	INSTALL 30" STORM DRAIN PIPE

NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITY LOCATIONS,DEPTHS,AND INVERTS INCLUDING STORM DRAIN, SANITARY SEWER, AND WATER PRIOR TO ANY CONSTRUCTION.
2. ALL OTHER UTILITIES SHOWN WILL BE BUILT DURING PHASE II CONSTRUCTION.

AS BUILT INFORMATION

CONTRACTOR — DATE
WORK — DATE
INSPECTOR'S — DATE
ACCEPTANCE BY — DATE
AS BUILT — DATE
VERIFICATION BY — DATE
DRAWINGS — DATE
CONSTRUCTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
No.

BENCH MARKS

ALBUQUERQUE CONTROL SURVEY
MONUMENT "UNION" NEW MEXICO
STATE PLANE COORDINATES (CENTRAL ZONE - NAD 83)
NORTH= 1,523,503.475 FEET
EAST= 1,493,655.03 FEET
MAPPING ANGLE= -00°16'58.96"
GROUND TO GRID FACTOR= 0.99966436
ELEVATION= 5524.95 FEET

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

JEREMY W SHEIL
NEW MEXICO
26341
PROFESSIONAL ENGINEER
08/05/2021

NO.	DATE	REMARKS	BY

REVISIONS

RESPEC DESIGN
DESIGNED BY: JWS — DATE: 11.04.2021
DRAWN BY: JMT — DATE: 11.04.2021
CHECKED BY: SEG — DATE: 11.04.2021

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

SONATA TRAILS UNIT 4 APARTMENTS

UNIVERSE STORM DRAIN

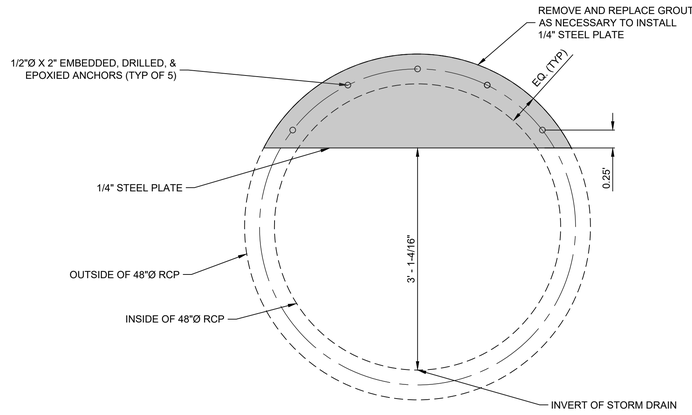
Design Review Committee — City Engineer Approval

Approved by Albuquerque
City Engineer and Design
Review Committee Nov. 17, 2021

Last Design Update — Mo./Day/Yr.

Project No. 761284
Zone Map No. C-10-Z
Sheet 38 of 47

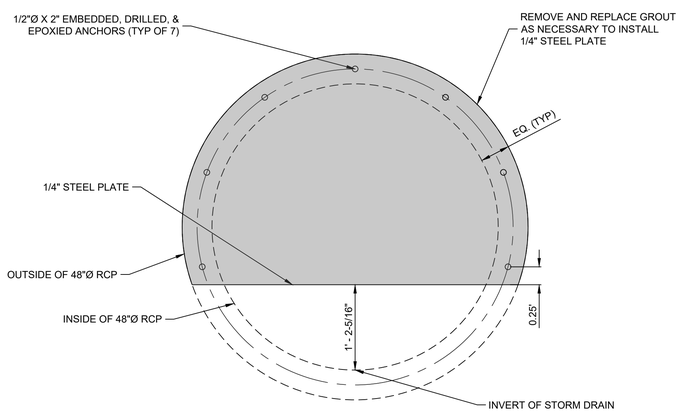
N:\Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Offsite Plan Set\Sheets\Sonata Phase 1\04022 Utility Plan P1.dwg Thu, 11.04.21 - 1428, SID.GARISS



POND J ORIFICE PLATE DETAIL
NOT TO SCALE

NOTE

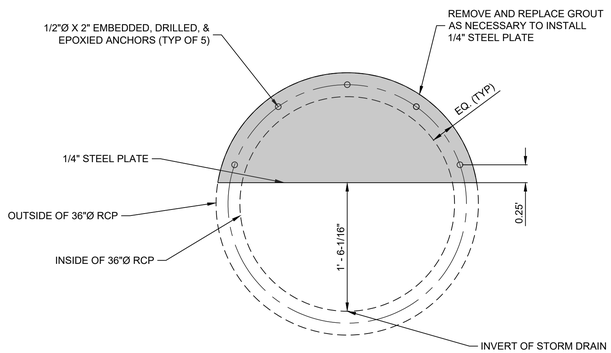
1. CONTRACTOR TO INSTALL ORIFICE PLATE IN EXISTING MANHOLE ON 48" PIPE OUTFALL, DOWNSTREAM OF TRAILS POND "J". COORDINATE WITH ENGINEER ON LOCATION.
2. SEAL AROUND OUTSIDE EDGES OF INSTALLED PLATE WITH URETHANE PRIMER & SEALANT.



POND L3 ORIFICE PLATE DETAIL
NOT TO SCALE

NOTE

1. CONTRACTOR TO INSTALL ORIFICE PLATE IN EXISTING MANHOLE ON 48" PIPE OUTFALL, DOWNSTREAM OF TRAILS POND "L3". COORDINATE WITH ENGINEER ON LOCATION.
2. SEAL AROUND OUTSIDE EDGES OF INSTALLED PLATE WITH URETHANE PRIMER & SEALANT.



POND K ORIFICE PLATE DETAIL
NOT TO SCALE

NOTE

1. CONTRACTOR TO INSTALL ORIFICE PLATE IN EXISTING MANHOLE ON 48" PIPE OUTFALL, DOWNSTREAM OF TRAILS POND "K". COORDINATE WITH ENGINEER ON LOCATION.
2. SEAL AROUND OUTSIDE EDGES OF INSTALLED PLATE WITH URETHANE PRIMER & SEALANT.

AS BUILT INFORMATION

CONTRACTOR	
WORK PERFORMED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
AS-BUILT VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

BENCH MARKS

ALBUQUERQUE CONTROL SURVEY
MONUMENT "UNION" NEW MEXICO
STATE PLANE COORDINATES (CENTRAL ZONE - NAD 83)
NORTH= 1,523,503.475 FEET
EAST= 1,493,655.03 FEET
MAPPING ANGLE= -00°16'58.96"
GROUND TO GRID FACTOR= 0.99966436
ELEVATION= 5524.95 FEET

MICRO-FILM INFORMATION

RECORDED BY DATE
No.

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

JEREMY W SHELL
NEW MEXICO
26341
PROFESSIONAL ENGINEER
08/05/2021

NO.	DATE	REVISIONS	BY
		REMARKS	

RESPEC DESIGN
DESIGNED BY: DATE: 11.04.2021
DRAWN BY: DATE: 11.04.2021
CHECKED BY: DATE: 11.04.2021

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

SONATA TRAILS UNIT 4 APARTMENTS

UNIVERSE STORM DRAIN RESTRICTOR PLATE DETAILS

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

Project No. 761284
Zone Map No. C-10-Z
Sheet 39 of 47

N:\Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Offsite Plan Set\Sheets\Sonata Phase 1\04022 Details P1.dwg Thu, 11.04.21 - 1429, SID.GARISS

GENERAL NOTES:

1. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 1988 EDITION WITH UPDATE NO. 8.
2. 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.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE & VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH MINIMUM DELAY.
4. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, INC. @ 260-1990 FOR LOCATION OF EXISTING UTILITIES.
5. CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN A MANNER WHICH WILL MINIMIZE INTERFERENCE WITH LOCAL TRAFFIC. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF ANY PUBLIC BODY HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY, AND TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS. CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR SAFETY CONTINUOUSLY AND NOT LIMITED TO NORMAL WORKING HOURS, THROUGHOUT THE DURATION OF THE PROJECT. CONTRACTOR SHALL ADHERE TO SECTION 19 OF THE GENERAL CONDITIONS OF THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986, AS AMENDED WITH UPDATE NO. 8.
6. THE CONTRACTOR AGREES THAT HE SHALL ASSUME THE SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD HARMLESS THE OWNER & ENGINEER FROM ANY AND ALL LIABILITY REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.
7. TRAFFIC CONTROL: SEVEN (7) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT TO THE CONSTRUCTION COORDINATION DIVISION A DETAILED CONSTRUCTION SCHEDULE. TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT FROM THE CONSTRUCTION COORDINATION DIVISION. CONTRACTOR SHALL NOTIFY BARRICADE ENGINEER (924-3400) PRIOR TO OCCUPYING AN INTERSECTION. SEE SECTION 19 OF THE SPECIFICATIONS.
8. ALL STREET STRIPING ALTERED OR DESTROYED SHALL BE REPLACED WITH PLASTIC REFLECTORIZED PAVEMENT MARKINGS BY CONTRACTOR TO LOCATION AS EXISTING OR AS SHOWN IN THIS PLAN SET.
9. WHEN ABUTTING EXISTING PAVEMENT TO NEW, SAWCUT EXISTING PAVEMENT TO A STRAIGHT EDGE AND AT A RIGHT ANGLE, OR AS APPROVED BY THE FIELD ENGINEER. REMOVAL OF BROKEN OR CRACKED PAVEMENT WILL ALSO BE REQUIRED. CUTS SHALL BE ORTHOGONAL TO TRAFFIC DIRECTION.
10. EXISTING CURB AND GUTTER NOT TO BE REMOVED UNDER THE CONTRACT WHICH IS DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
11. ALL BACKFILL FOR TRENCHES SHALL BE COMPACTED TO A MINIMUM 95% MAXIMUM DENSITY PER ASTM D-1557 AND AS DIRECTED BY SECTION 701.14.2 AND STANDARD DRAWING NUMBER 2465.
12. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY OR PRIVATE ROADWAY EASEMENTS SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET OR INTO ANY PUBLIC DRAINAGE FACILITY.
13. ALL SANITARY SEWER LINE STATIONING REFERS TO SANITARY SEWER CENTERLINE STATIONING.
14. ALL FITTINGS ON WATERLINES SHALL HAVE RESTRAINED JOINTS AS NOTED ON THE PLANS.
15. CONTRACTOR SHALL SUPPORT ALL EXISTING, UNDERGROUND UTILITY LINES WHICH BECOME EXPOSED DURING CONSTRUCTION. PAYMENT FOR SUPPORTING WORK SHALL BE INCIDENTAL TO WATERLINE AND/OR SEWERLINE COSTS.
16. CONTRACTOR SHALL ASSIST THE ENGINEER\INSPECTOR IN THE RECORDING OF DATA ON ALL UTILITY LINES AND ACCESSORIES AS REQUIRED BY THE CITY OF ALBUQUERQUE FOR THE PREPARATION OF RECORD DRAWINGS. CONTRACTOR SHALL NOT COVER UTILITY LINES AND ACCESSORIES UNTIL ALL DATA HAS BEEN RECORDED.
17. THE CONTRACTOR SHALL NOTIFY THE CITY SURVEYOR NOT LESS THAN SEVEN (7) DAYS PRIOR TO STARTING WORK IN ORDER THAT THE CITY SURVEYOR MAY TAKE NECESSARY MEASURES TO INSURE THE PRESERVATION OF SURVEY MONUMENTS. CONTRACTOR SHALL NOT DISTURB PERMANENT SURVEY MONUMENTS WITHOUT THE CONSENT OF THE CITY SURVEYOR AND SHALL NOTIFY THE CITY SURVEYOR AND BEAR THE EXPENSE OF REPLACING ANY THAT MAY BE DISTURBED WITHOUT PERMISSION. REPLACEMENT SHALL BE DONE ONLY BY THE CITY SURVEYOR. WHEN A CHANGE IS MADE IN THE FINISHED ELEVATIONS OF THE PAVEMENT OF ANY ROADWAY IN WHICH A PERMANENT SURVEY MONUMENT IS LOCATED, CONTRACTOR SHALL, AT HIS OWN EXPENSE, ADJUST THE MONUMENT COVER TO THE NEW GRADE UNLESS OTHERWISE SPECIFIED. REFER TO SECTION 4.4 OF THE GENERAL CONDITIONS OF THE STANDARD SPECIFICATIONS.
18. PNM WILL PROVIDE AT NO COST TO THE CITY OR THE CONTRACTOR THE REQUIRED PERSONNEL FOR INSPECTION OR OBSERVATION DEEMED NECESSARY BY PNM WHILE THE CONTRACTOR IS EXPOSING PNM'S CABLES. HOWEVER, THE CONTRACTOR SHALL BE CHARGED THE TOTAL COST ASSOCIATED WITH REPAIRS TO ANY DAMAGED CABLES OR FOR ANY COST ASSOCIATED WITH SUPPORTING OR RELOCATING THE POLES AND CABLES DURING CONSTRUCTION.
19. WARNING--EXISTING UTILITY LINE LOCATIONS ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. THE LOCATION OF ANY SUCH EXISTING LINES IS BASED UPON INFORMATION PROVIDED BY THE UTILITY COMPANY, THE OWNER, OR BY OTHERS, AND THE INFORMATION MAY BE INCOMPLETE OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. THE ENGINEER HAS UNDERTAKEN NO FIELD VERIFICATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UNDERGROUND UTILITY LINES, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY, AND PRESERVE ANY AND ALL EXISTING UTILITIES. THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES, IN PLANNING AND CONDUCTING EXCAVATION, WHETHER BY CALLING OR NOTIFYING THE UTILITIES, COMPLYING WITH "BLUE STAKES" PROCEDURES, OR OTHERWISE.
20. ANY WORK OCCURRING WITHIN AN ARTERIAL ROADWAY REQUIRES 24 HR. CONSTRUCTION.
21. ALL EXCAVATION, TRENCHING AND SHORING ACTIVITIES MUST BE ACCOMPLISHED IN ACCORDANCE WITH OSHA 29CFR 1926.650 SUBPART P.
22. CONTRACTOR SHALL MAINTAIN A GRAFFITI-FREE WORK SITE. CONTRACTOR SHALL PROMPTLY REMOVE ANY AND ALL GRAFFITI FROM EQUIPMENT, WHETHER PERMANENT OR TEMPORARY.
23. RCP SHALL BE INSTALLED SO THAT THE JOINT GAP AT THE HOME POSITION SHALL CONFORM TO THE APPROVED MANUFACTURER'S RECOMMENDATIONS. MANUFACTURER'S RECOMMENDED JOINT GAP TOLERANCES FOR EACH PIPE SIZE AND TYPE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PLACEMENT OF PIPE. RCP JOINTS SHALL NOT BE GROUTED UNLESS DIRECTED BY THE ENGINEER AFTER CITY APPROVAL.
24. AN SO 19 PERMIT IS REQUIRED TO PLACE ANY MATERIAL ON OR AROUND A STORM DRAIN INLET IN THE CITY RIGHT-OF-WAY THAT WOULD INTERFERE WITH THE INLET RECEIVING STORM WATER PER THE ENGINEER'S DESIGN. CITY PERSONNEL MAY REMOVE THIS MATERIAL AT ANY TIME WITHOUT NOTICE. THE PREFERRED BMP IS TO REMOVE SEDIMENT/POLLUTANTS ON THE PROPERTY WHERE CONSTRUCTION ACTIVITY IS OCCURRING.
25. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING & MAINTAINING ALL CONSTRUCTION SIGNING UNTIL PROJECT HAS BEEN ACCEPTED BY THE COA.

Y:\PROJECTS\LONGFORD-UNIVERSE_BASE-REVISED-10-12.dwg 11/8/2012

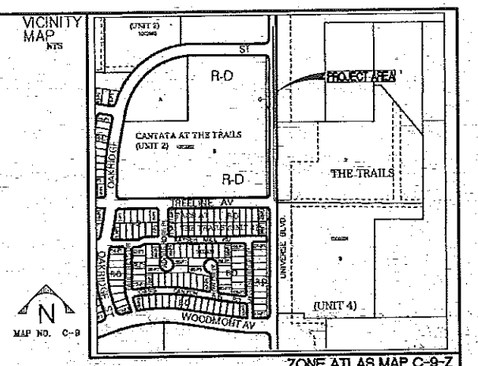
CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, Matthew A. Santistevan of the firm of Bohannan Huston, Inc., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as shown on these drawings (Universe Boulevard Storm Drain) has been inspected by me or by a qualified person under my direct supervision and has been constructed in accordance with the plans and specifications and that the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by the contractor, Python Construction Company and their surveyor, Russ P. Hugg, NMPS #9750.

Engineer's Seal & Signature

MATTHEW A. SANTISTEVAN — NEW MEXICO — 14729 — REGISTERED PROFESSIONAL ENGINEER

VICINITY MAP
NTS



ZONE ATLAS MAP C-9-Z

ALBUQUERQUE SEAL NEW MEXICO 1706

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PLANS FOR CONSTRUCTION

THE TRAILS
UNIVERSE BOULEVARD STORM DRAIN

PROJECT #693382

RECORD DRAWINGS

INDEX OF SHEETS

CALL BEFORE YOU DIG!
STATEWIDE 1-800-321-ALERT
ALBUQUERQUE 260-1990

SURVEYORS CERTIFICATION

I, Russ P. Hugg, New Mexico Professional Surveyor Number 9750, hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugg
NMPS No. 9750
CA-/03, 2013

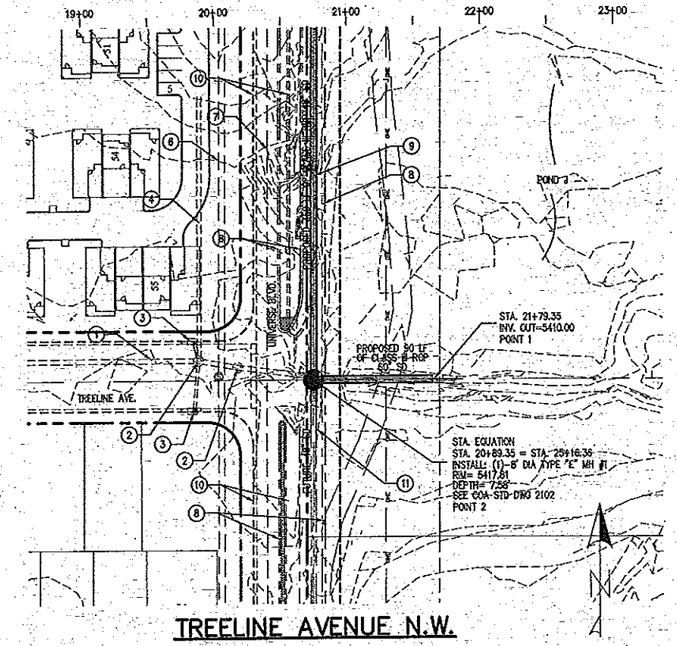
PROFESSIONAL SURVEYOR — STATE OF NEW MEXICO — No. 9750 — RUSS P. HUGG

Thompson Engineering Consultants, Inc.
tecnr@yahoo.com
P.O. Box 65760
Albuquerque, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9240

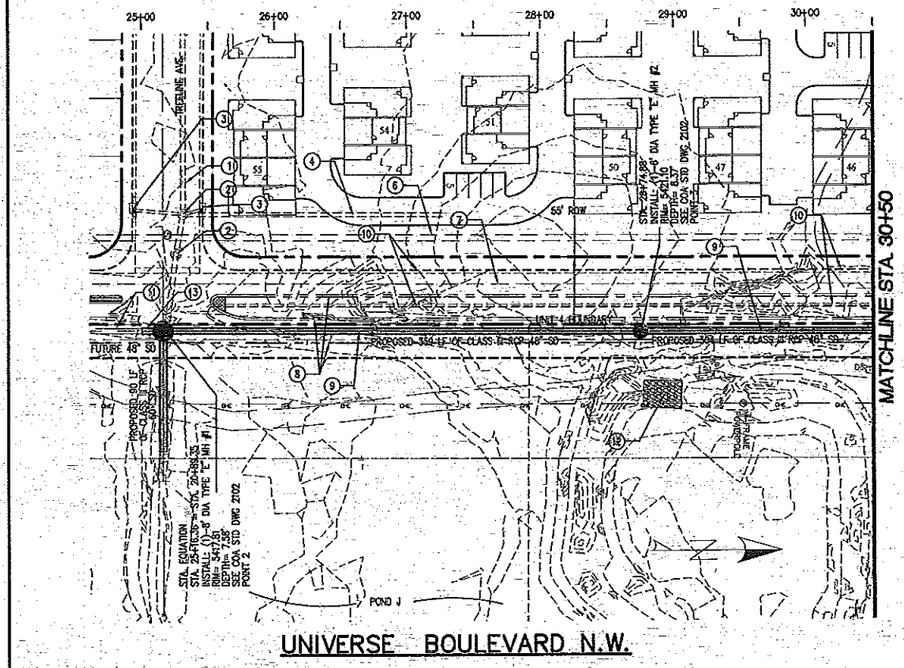
REV.	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE
ENGINEERS STAMP & SIGNATURE		APPROVED	ENGINEER	DATE		APPROVED FOR CONSTRUCTION	
		DRC Chairman		2/6/13			
		Transportation		11-14-12			
		Water/Wastewater		11-14-12			
		Hydrology		11/14/12			
		C I P					
		AMAFCA					
		County Coord.				CITY ENGINEER	DATE

PROJECT NUMBER 693382

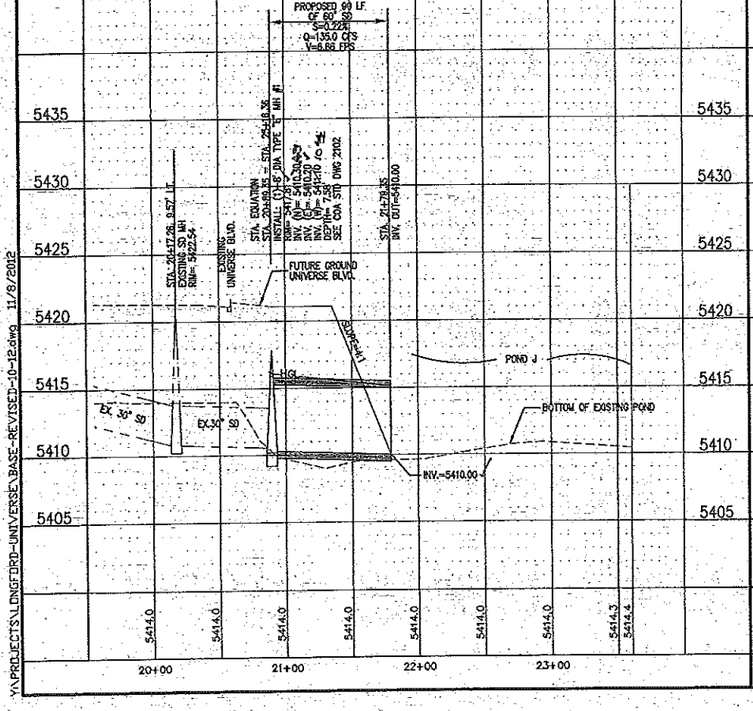
DRAWING NO. 1 OF 4

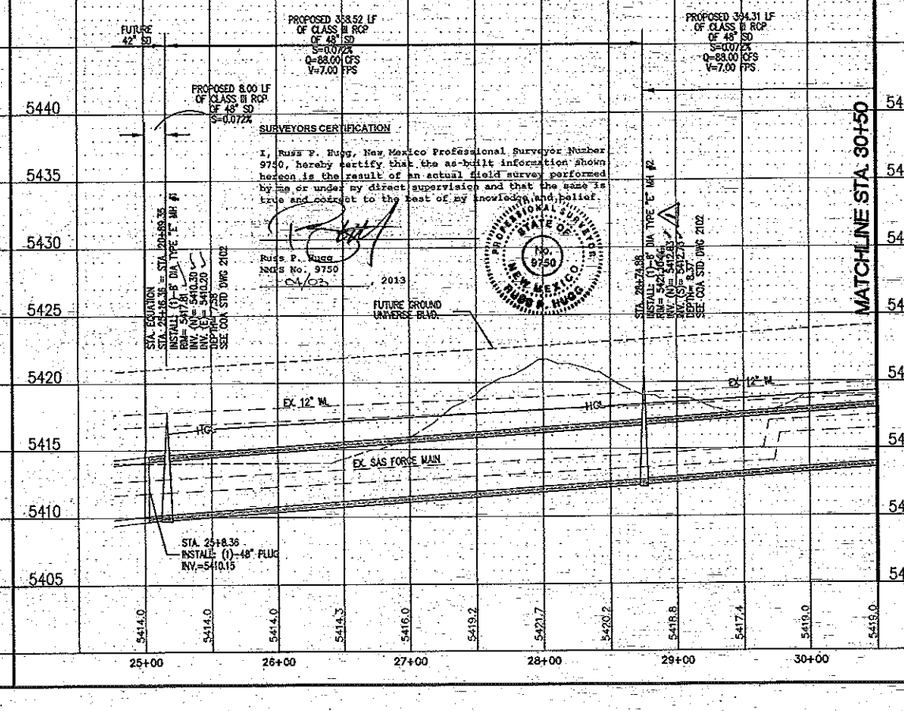


TREELINE AVENUE N.W.



UNIVERSE BOULEVARD N.W.





NOTE:
CONTRACTOR TO FIELD VERIFY INVERTS AT OF EXISTING STORM DRAIN PRIOR TO STARTING CONSTRUCTION OF STORM DRAIN.

KEYED NOTES:

1. EXISTING 42" STORM DRAIN
2. EXISTING STORM DRAIN MANHOLE
3. EXISTING TYPE A STORM DRAIN INLET
4. EXISTING 30" STORM DRAIN
5. 25' PUBLIC STORM DRAIN EASEMENT
6. APPROX LOCATION EXISTING SAS FORCE MAIN
7. EXISTING 12" WATER LINE
8. FUTURE CURB AND GUTTER
9. CONSTRUCTION CENTERLINE
10. EXISTING CURB AND GUTTER
11. FUTURE STORM DRAIN
12. EXISTING EMERGENCY SPILLWAY
13. PROPOSED 1 SECTION OF 48" SD WITH PLUG

CENTERLINE DATA

ALIGNMENT	BEARING	DISTANCE
UNIVERSE BLVD.	N 00° 16' 10" E	3677.38'
TREELINE AVE.	N 90° 00' 00" E	610.93'

NORTHING & EASTING POINT TABLE

POINT #	NORTHING	EASTING
1	1522945.67	357670.61
2	1522945.68	357579.84
3	1523304.20	357581.53
4	1523608.51	357582.96
5	1523618.58	357583.01

Tracts 2, 3 & 4 - The Trails - Unit 4
Public Drainage Easement
Doc: 2011102117
Date: 11/08/2011
Agreement & Covenant
Doc: 2011102118
Date 11/8/2011

RECORD DRAWINGS

SCALE: 1" = 50'

SCALE: 1" = 5'

Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 65760
ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9245

AS BUILT INFORMATION
CONTRACTOR
BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980" DATE 4/13
Geographic Position (NAD 1927) DATE 4/13
N.M. State Plane Coordinates (Central Zone DATE 4/13
X= 357,543.73 Y= 1,527,973.48
Ground-to-Grid Factor = 0.999866354 DATE 4/13
ΔDC = -00°16'30"
SLD 1929 ELEVATION = 5429.35
RECORDED BY
NO. DATE

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE
1 Sain Tek 4/13

ENGINEERS SEAL
NEW MEXICO 9977 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DEM	DATE	11-8-12
DRAWN BY	DEM	DATE	11-8-12
CHECKED BY	DST	DATE	11-8-12

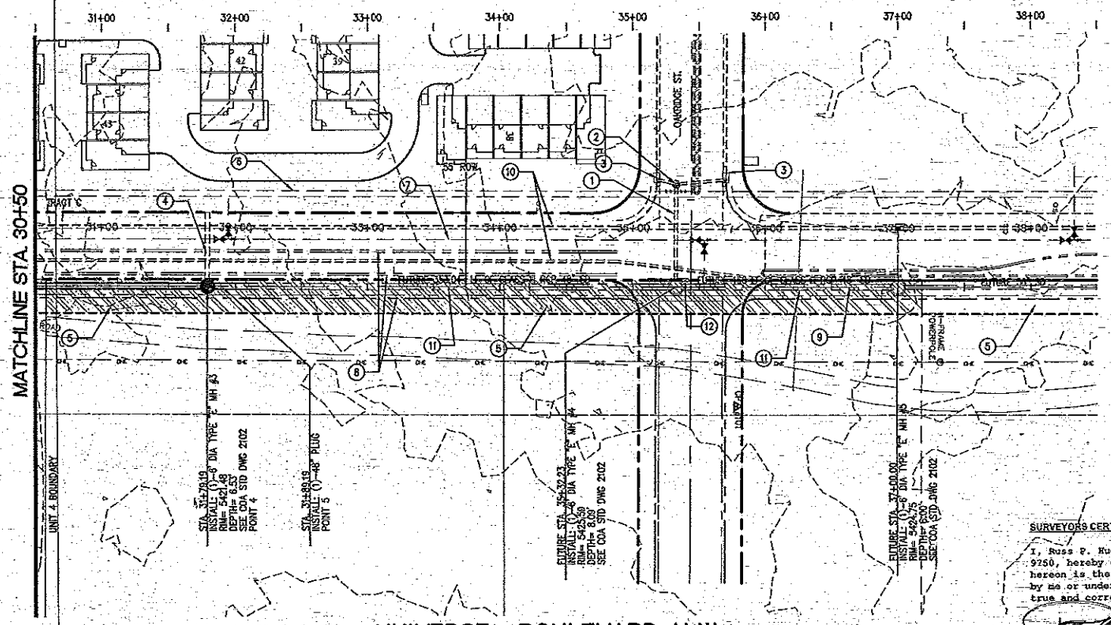
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

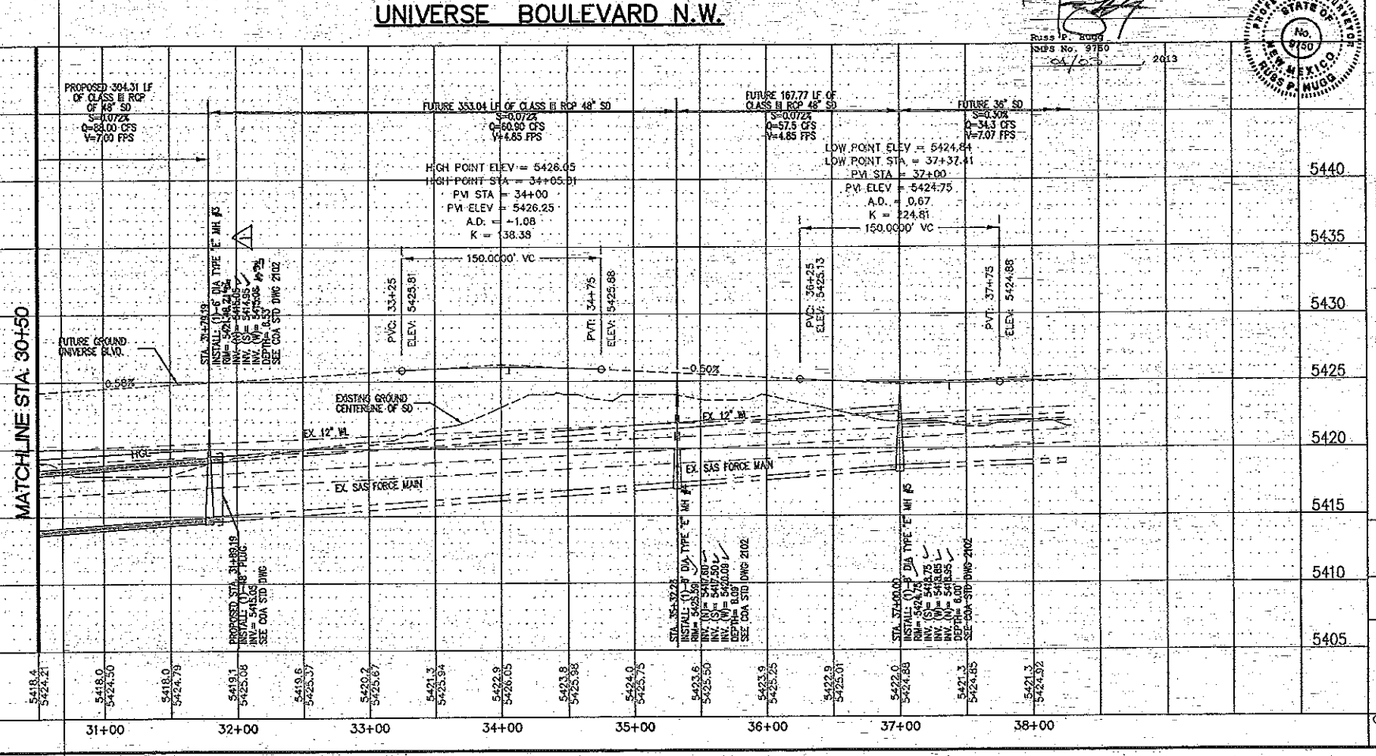
UNIVERSE BLVD. STORM DRAIN
TREELINE AVE & UNIVERSE BLVD. STORM DRAIN PLAN AND PROFILE

Design Review Committee: APPROVED FEB 06 2013
City Engineer Approval: APPROVED FEB 06 2013 CITY ENGINEER
Last Design Update

City Project No.	Zone Map No.	Sheet	Of
693382	C-9-Z	2	4

Y:\PROJECTS\LINGFORD-UNIVERSE\BASE-REVISED-10-12.dwg 11/8/2012





NOTE:
CONTRACTOR TO FIELD VERIFY INVERTS AT OF EXISTING STORM DRAIN PRIOR TO STARTING CONSTRUCTION OF STORM DRAIN.

KEYED NOTES:

1. EXISTING 18" STORM DRAIN
2. EXISTING STORM DRAIN MANHOLE
3. EXISTING TYPE A STORM DRAIN INLET
4. EXISTING 30" STORM DRAIN
5. 25' PUBLIC STORM DRAIN EASEMENT Doc.: 2013014060 Date: 01/06/2013
6. APPROX LOCATION EXISTING SAS FORCE MAIN
7. EXISTING 12" WATER LINE
8. FUTURE CURB AND GUTTER
9. CONSTRUCTION CENTERLINE
10. EXISTING CURB AND GUTTER
11. FUTURE STORM DRAIN
12. EXISTING BARRICADE SIGNS

SURVEYORS CERTIFICATION

I, Russ P. Rugg, New Mexico Professional Surveyor Number 9750, hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Rugg
NMPS No. 9750
2013

NORTHING & EASTING POINT TABLE

POINT #	NORTHING	EASTING
4	1523608.51	357582.96
5	1523618.58	357583.01

CENTERLINE DATA

ALIGNMENT	BEARING	DISTANCE
UNIVERSE BLVD.	N 00° 16' 10" E	3677.38'

RECORD DRAWINGS

SCALE: 1" = 50'

SCALE: 1" = 5'

Thompson Engineering Consultants, Inc.
P.O. BOX 65760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2189 FAX: (505) 830-9246

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

UNIVERSE BLVD. STORM DRAIN
UNIVERSE BLVD. STORM DRAIN STA. 30+50 TO STA. 38+00 PLAN AND PROFILE

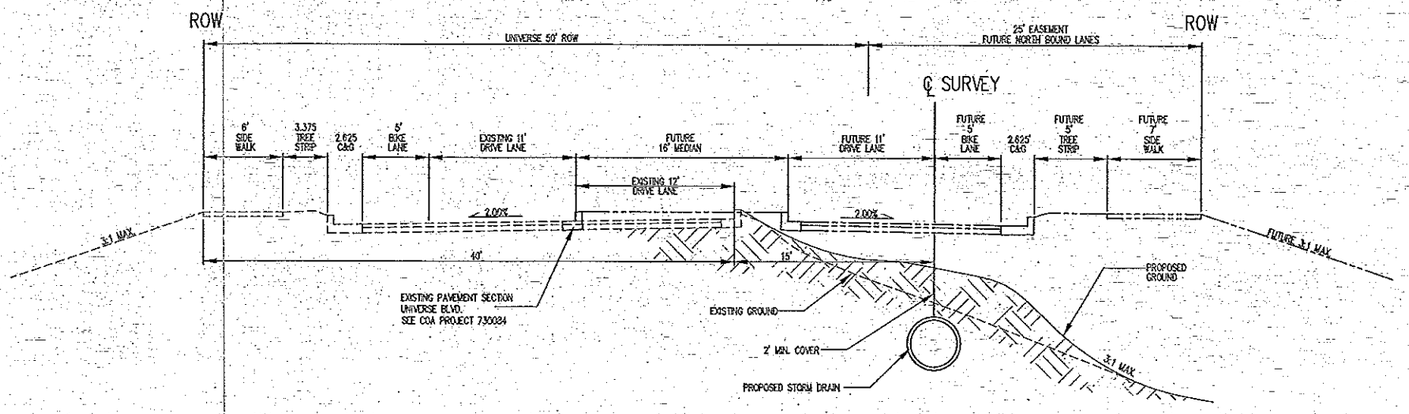
Design Review Committee: APPROVED FEB 06 2013
City Engineer Approval: APPROVED FEB 08 2013 CITY ENGINEER
Last Design Update:

City Project No. 693382 | Zone Map No. C-9-Z | Sheet 3 Of 4

AS BUILT INFORMATION
CONTRACTOR
BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
Y= 357,543.73 Y= 1,527,973.48
Ground-to-Grid Factor = 0.999968354
ΔG= -00°16'30"
SLD 1929 ELEVATION = 5429.35
SURVEY INFORMATION
FIELD NOTES BY Sun-Tek DATE 4/13
MARKED BY Sun-Tek DATE 5/13
REFERENCE BY BHE DATE 5/13
VERIFICATION BY Sun-Tek DATE 5/13
CORRECTED BY Sun-Tek DATE 5/13
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.
ENGINEERS SEAL

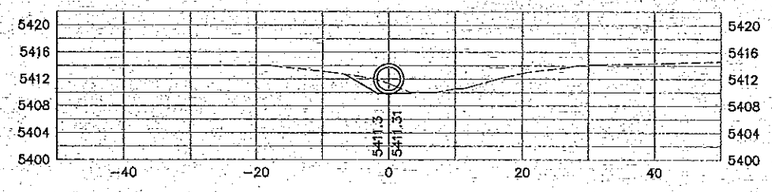
NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		DESIGNED BY DEM	DATE 11-8-12
		DRAWN BY DEM	DATE 11-8-12
		CHECKED BY DBT	DATE 11-8-12

Y:\PROJECTS\LINGFORD-UNIVERSE\BASE-REVISED-10-12.dwg 10/24/2012 9:51:26 AM MDT



UNIVERSE BLVD. TYPICAL SECTION

SCALE: 1"=5'



TYPICAL SECTION AT STATION 21+79.35

SCALE: 1"=10'

NOTE:
CONTRACTOR TO FIELD VERIFY INVERTS AT OF EXISTING STORM DRAIN PRIOR TO STARTING CONSTRUCTION OF STORM DRAIN.

RECORD DRAWINGS

Thompson Engineering Consultants, Inc.
P.O. BOX 65700
ALBUQUERQUE, NM 87193
tecinc@yahoo.com
PHONE: (505) 821-2193
FAX: (505) 830-9348

AS BUILT INFORMATION
CONTRACTOR
STAKED BY: SWL-TEC DATE: 9/13
INSPECTED BY: BHH DATE: 9/13
FIELD VERIFICATION BY: SWL-TEC DATE: 9/13
DRAWING CORRECTED BY: SWL-TEC DATE: 9/13
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73' Y= 1,327,973.48
Ground-to-Grid Factor = 0.99996354
ΔG= -0016'50"
SLD 1929 ELEVATION = 5429.35

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEERS SEAL

REVISIONS
NO. DATE BY REMARKS
DESIGN
DESIGNED BY DEM DATE 11-8-12
DRAWN BY DEM DATE 11-8-12
CHECKED BY DBT DATE 11-8-12

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

UNIVERSE BLVD. STORM DRAIN
TYPICAL SECTION

Design Review Committee: APPROVED FEB 06 2013
City Engineer Approval: APPROVED FEB 06 2013 CITY ENGINEER
Last Design Update
No. / By / In. | No. / By / In.

City Project No. 693382 | Zone Map No. C-9-Z | Sheet 4 Of 4

\\A\PROJECTS\LONGFORD-UNIVERSE\BASE-REVISED-10-12.dwg 11/8/2012

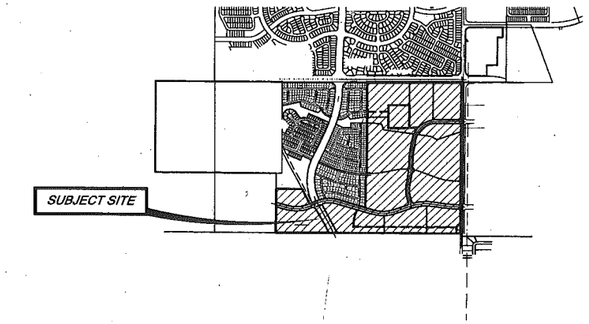
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

CONSTRUCTION PLANS FOR

THE TRAILS UNIT II

GRADING, PAVING, UTILITIES, & STORM DRAIN

Isaacson & Arfman, P.A. is responsible for the design of Sheets 52-55 which were added on 04/20/07 change ordered in on 04/20/07



VICINITY MAP
C-9-Z

INDEX TO DRAWINGS
RECORD DRAWINGS

NOT TO BE BUILT W/ THIS PROJECT

NOT TO BE BUILT W/ THIS PROJECT

DRAINAGE CERTIFICATION

I, Steve J. Salazar , NMPE 16241 , OF THE FIRM Wilson & Company, Inc., HEREBY CERTIFY THAT THIS PROJECT HAS BEEN CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED AMENDEMENT TO THE TRAILS UNIT II & III SUBDIVISION MASTER DRAINAGE STUDY DATED 12-23-05 . THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY Russ P. Hugg , NMPS 9750, OF THE FIRM Surveis.

I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE ON MAY 4TH, 2007 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A REQUEST FOR PERMANENT CERTIFICATE OF OCCUPANCY.

THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT IN RELATION TO APPROVED SUBDIVISION DRAINGE STUDY. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

Steve J. Salazar NMPE 16241

5/10/07
DATE

STEVE J. SALAZAR NEW MEXICO 16241 LICENSED PROFESSIONAL ENGINEER

RECORD DRAWINGS

I, Patrick Conley of the firm of Smith Engineering Company, a Registered Professional Engineer in the State of New Mexico, do hereby state that to the best of my knowledge and belief, the infrastructure for this project as shown on the plans has been constructed in general accordance with the project plans and in general accordance with the City of Albuquerque Standard Specifications for Public Works Construction (including all updates), and that the general intent of the plans has been met except as noted on the as-built construction drawings. The infrastructure construction has been observed by a qualified person from Smith Engineering Company and this statement covers infrastructure installation that was observed while a representative from Smith Engineering was on site. This statement is based on site observations by Smith Engineering Company personnel and on as-built information provided to Smith Engineering Company by Russ Hugg (Surveyor's name), NMPS number 9750 (PS#).

SURVEYORS CERTIFICATION

I, Russ P. Hugg, New Mexico Professional Surveyor Number 9750, Hereby Certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugg
NMPS No. 9750
4-9 20 07

PROFESSIONAL SURVEYOR STATE OF NEW MEXICO No. 9750 RUSS P. HUGG

NOTE

APPROVAL SIGNATURES REQUIRED FOR ENTITIES OTHER THAN CITY OF ALBUQUERQUE ARE PROVIDED ON INDIVIDUAL SHEETS.

NOTE

THE ENGINEER HAS UNDERTAKEN LIMITED FIELD VERIFICATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UNDERGROUND UTILITY LINES, MAKES NO REPRESENTATION PERTAINING THERETO AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFORE. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY, AND PRESERVE ANY AND ALL EXISTING UTILITIES. THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES IN PLANNING AND CONDUCTING EXCAVATION, WHETHER BY CALLING OR NOTIFYING THE UTILITIES, COMPLYING WITH "BLUE STAKES" PROCEDURES, OR OTHERWISE.

TRAFFIC CONTROL

TRAFFIC CONTROL FOR CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 2800 TEMPORARY TRAFFIC CONTROL OF THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2003 EDITION AS AMENDED THRU UPDATE NO. 7. CONTRACTOR SHALL SUBMIT CONSTRUCTION PHASING SCHEDULE FOR APPROVAL FROM DESIGN ENGINEER PRIOR TO CONSTRUCTION.

FIVE (5) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT TO THE CONSTRUCTION COORDINATION DIVISION A DETAILED CONSTRUCTION SCHEDULE. TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT FROM THE CONSTRUCTION COORDINATION DIVISION. CONTRACTOR SHALL NOTIFY BARRICADE ENGINEER (924–3400) PRIOR TO OCCUPYING AN INTERSECTION. SEE SECTION 19 OF THE SPECIFICATIONS. ALL STREET STRIPING ALTERED OR DESTROYED SHALL BE REPLACED WITH PLASTIC REFLECTORIZED PAVEMENT MARKINGS BY CONTRACTOR TO LOCATION AS EXISTING OR AS SHOWN IN THIS PLAN SET.

NOTE

THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL REMAIN THE RESPONSIBILITY OF THE CONTRACTOR.

NOTE

THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, ARE INTENDED FOR USE ON THIS PROJECT AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF WILSON & COMPANY. IN THE EVENT OF UNAUTHORIZED USE, THE USER ASSUMES ALL RESPONSIBILITY AND LIABILITY WHICH RESULTS.

GENERAL NOTES

1. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER THIS CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREIN, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2003 EDITION AS AMENDED THRU UPDATE NO. 7.
2. CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER NOT LESS THAN SEVEN (7) DAYS PRIOR TO STARTING WORK IN ORDER THAT THE ENGINEER MAY TAKE NECESSARY MEASURES TO INSURE THE PRESERVATION OF SURVEY MONUMENTS. CONTRACTOR SHALL NOT DISTURB PERMANENT SURVEY MONUMENTS WITHOUT THE CONSENT OF THE ENGINEER, AND SHALL BEAR THE EXPENSE OF REPLACING ANY THAT MAY BE DISTURBED WITHOUT PERMISSION. REPLACEMENT SHALL BE DONE ONLY BY THE CITY SURVEY SECTION. WHEN A CHANGE IS MADE IN ANY ROADWAY IN WHICH A PERMANENT SURVEY MONUMENT IS LOCATED, CONTRACTOR SHALL, AT HIS OWN EXPENSE, ADJUST THE MONUMENT COVER TO THE NEW GRADE UNLESS OTHERWISE SPECIFIED. REFER TO SECTION 4.4 OF GENERAL CONDITIONS OF THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
3. FIVE (5) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO THE CONSTRUCTION COORDINATION DIVISION A DETAILED CONSTRUCTION SCHEDULE. TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT FROM THE CONSTRUCTION COORDINATION DIVISION. CONTRACTOR SHALL NOTIFY BARRICADE ENGINEER (924–3400) PRIOR TO OCCUPYING AN INTERSECTION. SEE SECTION 19 OF THE SPECIFICATIONS.
4. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, INC. (260–1990) FOR LOCATION OF EXISTING UTILITIES.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS AND EXISTING PAVEMENT. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR SURVEYOR SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM OF DELAY.
6. ALL UTILITY WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH NEW MEXICO UTILITIES, INC. SPECIFICATIONS FOR WATER AND WASTE WATER FACILITIES (MOST RECENT REVISIONS). (NMUI 898–2661)
7. THE CONTRACTOR SHALL NOTIFY NEW MEXICO UTILITIES (898–2661) THREE WORKING DAYS PRIOR TO BEGINNING THE CONSTRUCTION OF THE UTILITIES.
8. THE PUBLIC WATER LINE MUST BE A MINIMUM OF 18" ABOVE THE SEWER LINE AT ALL CROSSINGS.
9. THE CONTRACTOR SHALL FURNISH EMD'S ON ALL WATER AND SEWER SERVICE STUBS, CAPS AND PLUGS.
10. ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED PRIOR TO PAVING.
11. BACKFILL COMPACTION SHALL BE ACCORDING TO SPECIFIED STREET USE.
12. TACK COAT REQUIREMENTS SHALL BE DETERMINED BY THE ENGINEER.
13. SIDEWALKS AND WHEELCHAIR RAMPS WITHIN THE CURB RETURNS SHALL BE CONSTRUCTED WHEREVER A NEW CURB RETURN IS CONSTRUCTED.
14. IF CURB IS DEPRESSED FOR A DRIVEPAD OR A HANDICAP RAMP, THE DRIVEPAD OR RAMP SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF THE CURB AND GUTTER.
15. ALL STREET STRIPING ALTERED OR DESTROYED SHALL BE REPLACED BY CONTRACTOR WITH PLASTIC REFLECTORIZED PAVEMENT MARKINGS IN EXISTING STRIPING LOCATIONS UNLESS OTHERWISE INDICATED BY THIS PLAN SET.
16. ANY WORK AFFECTING AN ARTERIAL ROADWAY REQUIRES 24 HOUR CONSTRUCTION.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR, OR REMOVAL AND REPLACEMENT, OF ANY PAVEMENT, PAVEMENT MARKINGS, CURB AND GUTTER, DRIVEPADS, SIDEWALK, WHEELCHAIR RAMP OR ANY OTHER EXISTING IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS.
18. FOR STORM DRAIN CONSTRUCTION, RCP PIPE SHALL NOT BE GROUTED PRIOR TO FINAL INSPECTION. FINAL INSPECTION WILL DETERMINE JOINTS TO BE GROUTED FOR FINAL ACCEPTANCE OF THE CONSTRUCTION.
19. EXCAVATION, TRENCHING AND SHORING ACTIVITIES MUST BE CARRIED OUT IN ACCORDANCE WITH OSHA 29 CFR 1926.650 SUBPART P. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS EMPLOYEES SAFETY.
20. WARNING--EXISTING UTILITY LINE LOCATIONS ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. THE LOCATION OF ANY SUCH EXISTING LINES IS BASED UPON INFORMATION PROVIDED BY THE UTILITY COMPANY, THE OWNER, OR BY OTHERS, AND THE INFORMATION MAY BE INCOMPLETE OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES.

   THE ENGINEER HAS UNDERTAKEN NO FIELD VERIFICATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UNDERGROUND UTILITY LINES, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY, AND PRESERVE ANY AND ALL EXISTING UTILITIES. THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES, IN PLANNING AND CONDUCTING EXCAVATION, WHETHER BY CALLING OR NOTIFYING THE UTILITIES, COMPLYING WITH "BLUE STAKES" PROCEDURES, OR OTHERWISE.

UTILITY COMPANY CONTACTS

NEW MEXICO UTILITIES
(Water & Sanitary Sewer)
Bob Goy
4700 Irving Blvd., NW
Suite 201
Albuquerque, New Mexico 87114
(505) 898–2661

AMAFCA
Executive Engineer
John Kelly
2800 Prospect Ave., NE
Albuquerque, New Mexico 87107
(505) 884–2215

PNM ELECTRIC
4201 Edith Blvd. NE
Albuquerque, New Mexico 87107
Rocky Ferran
(505) 241–0525

PNM GAS
4625 Edith Blvd., NE
Albuquerque, New Mexico 87107
Elisabeth Goble
(505) 241–7745

QWEST
201 3rd Street, NW Suite 700
Albuquerque, New Mexico 87102
David Muller
(505) 245–8706

AT&T
Dave Crowel
111 3rd ST., NW
Albuquerque, New Mexico 87103
(505) 842–2911

Comcast Digital Cable
Rita Erickson
4611 Montbel Pl., NE
Albuquerque, NM 87107
(505) 761–8235

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898–8021

DRB CASE No. 1002962

REV	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE
5	52–55				4/20/07		
4	24–26, 49		4-11-07		4/11/07	Bradley J. Bingham	4/11/07
3	27A–29A (1-7B1 (1-49)		4-11-07	Bradley J. Bingham	4/11/07		
1, 2	27-29, 41-49			Bradley J. Bingham	9/18/06		

ENGINEERS STAMP & SIGNATURE	APPROVALS	ENGINEER	DATE	**********
STEVE J. SALAZAR NEW MEXICO 16241 LICENSED PROFESSIONAL ENGINEER	DRC Chairman		4-16-07	APPROVED FOR CONSTRUCTION
	Transportation		5/20/05	
	Water/Wastewater		5/20/05	
	Hydrology		3/31/05	
	N.M.U.I.		5-9-05	
	A.M.A.F.C.A.			
	Constr. Coord.		4-16-05	

4-30-06
City Engineer Date

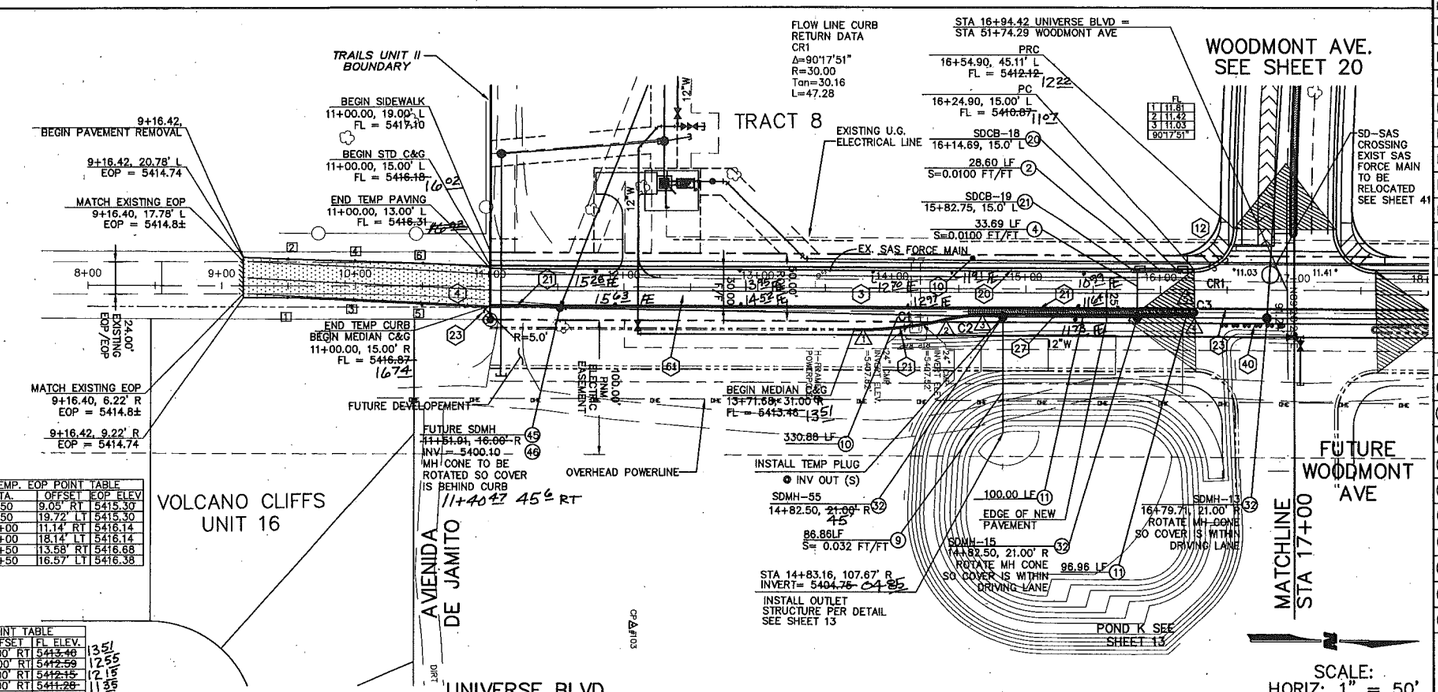
City Project No. 730084

Sheet 1 Of 55

T:\Projects\X42\5008\M\sheets\A-GENERAL\01COVER.dwg 3/31/2005 8:31:24 AM MST

LEGEND

TC	TOP OF STANDARD TYPE CURB
FL	FLOW LINE
TRC	TOP OF ROLL TYPE CURB
39.85*	TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
39.85	FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
	MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
	TRANSITION CROWN PER COA STD DWG 2401
	TEMPORARY ASPHALT SEE PAVING NOTE 4



TEMP. EOP POINT TABLE			
□	STA.	OFFSET	EOP ELEV
1	9+50	9.05' RT	5415.30
2	9+50	19.72' LT	5415.30
3	10+00	11.14' RT	5416.14
4	10+00	18.14' LT	5416.14
5	10+50	13.58' RT	5416.68
6	10+50	16.57' LT	5416.38

MEDIAN CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	69.44	300.00	13°15'41"	34.87
C2	34.72	150.00	13°15'41"	17.44
C3	6.28	2.00	180°00'00"	INFINITE

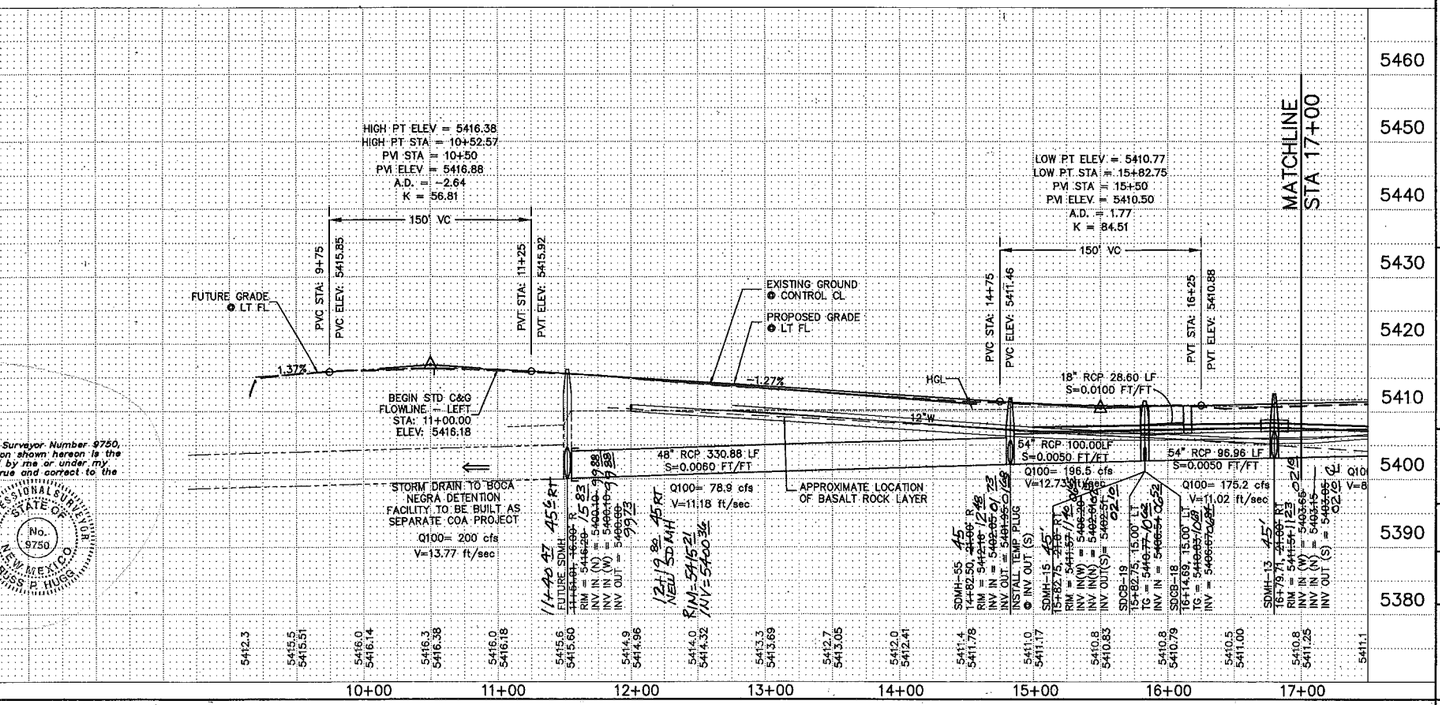
MEDIAN POINT TABLE			
△	STA.	OFFSET	FL ELEV.
1	13+71.68	31.00' RT	5413.46
2	14+40.50	23.00' RT	5412.59
3	14+74.91	19.00' RT	5412.15
4	16+24.91	19.00' RT	5411.26
5	16+24.91	15.00' RT	5411.28

PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
4	BUILD TEMPORARY ARTERIAL ASPHALT PAVING PER DETAIL (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
40	INSTALL TYPE III BARRICADES
61	REMOVE AND DISPOSE EXISTING ASPHALT PAVEMENT

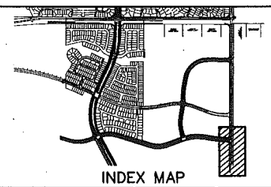
STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
2	INSTALL 18" STORM DRAIN PIPE
4	INSTALL 24" STORM DRAIN PIPE
9	INSTALL 42" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
11	INSTALL 54" STORM DRAIN PIPE
20	INSTALL TYPE A CATCH BASIN SINGLE GRATE SINGLE THROAT PER COA STD. DTL. 2201
21	INSTALL TYPE A CATCH BASIN SINGLE GRATE AND DOUBLE WNG PER COA STD. DTL. 2201
32	INSTALL 8' DIA. MANHOLE PER COA STD. DTL. 2101
45	INSTALL 48" STORM DRAIN PLUG
46	INSTALL 54" STORM DRAIN PLUG



GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460


INDEX MAP

SURVEYORS CERTIFICATION

I, Russ P. Hugg, New Mexico Professional Surveyor Number 9750, Hereby Certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugg NMPS No. 9750 4-9 2007

STATE OF NEW MEXICO No. 9750 PROFESSIONAL SURVEYOR RUSS P. HUGG

WILSON &COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVED SEP 16 2007 DESIGN REVIEW COMMITTEE

City Engineer Approval: APPROVED JAN 8 0 2008 CITY ENGINEER

Last Design Update: Mo./Day/Yr.

City Project No. 730084 | Zone Map No. C-9-Z | Sheet 27 Of 51

SURVEY INFORMATION
FIELD NOTES BY DATE NO.

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
ΔC = -00°16'30"
SLD 1929 Elevation = 5429.35

AS-BUILT INFORMATION
CONTRACTOR
WORK STAKED BY: SURV TEK DATE 12/06
AS-BUILT SURVEY ACCEPTANCE BY DATE
VERIFICATION BY SURV TEK DATE 02.07
DRAWINGS APPROVED BY SURV TEK DATE 02.07
MICRO-FILM INFORMATION
RECORDED BY DATE NO.

ENGINEER'S SEAL
SALAZAR NEW MEXICO (16241) REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		WILSON & COMPANY, ENGINEERS & ARCHITECTS	
		DESIGNED BY DMD	DATE JAN 05
		DRAWN BY DMD	DATE JAN 05
		CHECKED BY SJS	DATE JAN 05

LEGEND

TC	TOP OF STANDARD TYPE CURB
FL	FLOW LINE
TRC	TOP OF ROLL TYPE CURB
39.65*	TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
39.85	FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
	MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
	TRANSITION CROWN PER COA STD DWG 2401
	TEMPORARY ASPHALT SEE PAVING NOTE 4

TRAILS UNIT II BOUNDARY

TRACT 8

VOLCANO CLIFFS UNIT 16

AVENIDA DE JAMITO

UNIVERSE BLVD.

WOODMONT AVE. SEE SHEET 20

FUTURE WOODMONT AVE

MATCHLINE STA 17+00

POND K SEE SHEET 13

9+16.42, BEGIN PAVEMENT REMOVAL

9+16.42, 20.78' L EOP = 5414.74

MATCH EXISTING EOP 9+16.40, 17.78' L EOP = 5414.8±

MATCH EXISTING EOP 9+16.40, 6.22' R EOP = 5414.8±

9+16.42, 9.22' R EOP = 5414.74

BEGIN SIDEWALK 11+00.00, 19.00' L FL = 5417.10

BEGIN STD C&G 11+00.00, 15.00' L FL = 5416.18

END TEMP PAVING 11+00.00, 13.00' L FL = 5416.31

END TEMP CURB BEGIN MEDIAN C&G 11+00.00, 15.00' R FL = 5416.87

FUTURE DEVELOPMENT

FUTURE SDMH 11+51.91, 16.00' R INV.= 5400.10 MH CONE TO BE ROTATED SO COVER IS BEHIND CURB

75.39 LF

SDMH-55A 12+19.66, 45.00' R

STA. 12+30.11 INSTALL 90 LF OF 15" SAS W/CAPS S= 0.004 FT/FT INV (W) 5401.29 INV. (E) 5400.90

FLOW LINE CURB RETURN DATA CR1 Δ=90°17'51" R=30.00 Tan=30.16 L=47.28

STA 16+94.42 UNIVERSE BLVD = STA 51+74.29 WOODMONT AVE

PRC 16+54.90, 45.11' L

SD-WATERLINE CROSSING WL TOP OF PIPE = 5401.78

PC 16+24.90, 15.00' L FL = 5410.87

SDCB-18 16+14.69, 15.0' L

EXISTING U.G. ELECTRICAL LINE

28.60 LF S=0.0100 FT/FT

SDCB-19 15+82.75, 15.0' L

57.89 LF S=0.0060 FT/FT

SD-WATERLINE CROSSING WL TOP OF PIPE = 5406.77

EX. SAS FORCE MAIN

SD AT R.O.W. INV. = 5402.09

70.00 LF

SD-SAS CROSSING EXIST SAS FORCE MAIN TO BE RELOCATED SEE SHEET 41

263.21 LF

INSTALL TEMP PLUG @ INV OUT (S)

SDMH-55 14+82.50, 45.00' R

62.67LF S= 0.023 FT/FT

100.00 LF

EDGE OF NEW PAVEMENT

SDMH-15 14+82.50, 45.00' R ROTATE MH CONE SO COVER IS WITHIN DRIVING LANE

96.96 LF

SDMH-13 16+79.71, 45.00' R ROTATE MH CONE SO COVER IS WITHIN DRIVING LANE

STA 14+83.16, 107.67' R INVERT= 5404.75

INSTALL OUTLET STRUCTURE PER DETAIL SEE SHEET 13

BEGIN MEDIAN C&G 13+71.68, 31.00' R FL = 5413.46

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'

TEMP. EOP POINT TABLE

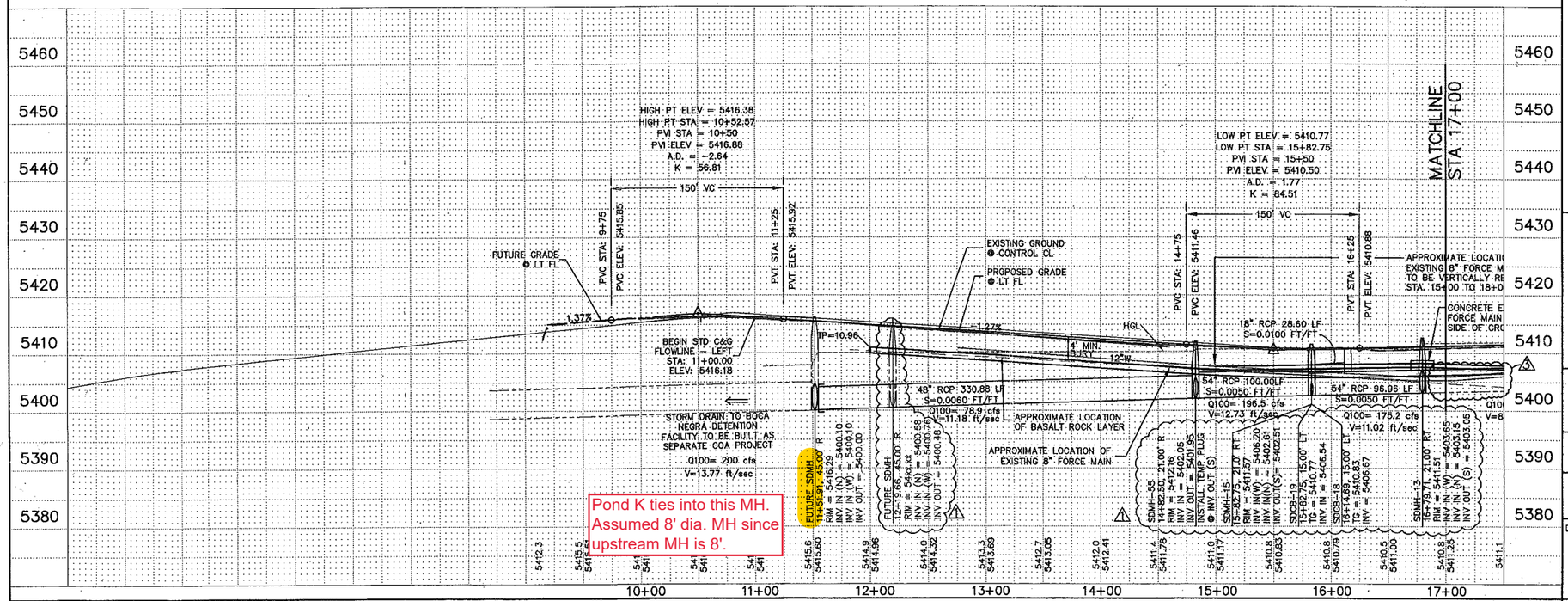
	STA.	OFFSET	EOP ELEV
1	9+50	9.05' RT	5415.30
2	9+50	19.72' LT	5415.30
3	10+00	11.14' RT	5416.14
4	10+00	18.14' LT	5416.14
5	10+50	13.58' RT	5416.68
6	10+50	16.57' LT	5416.38

MEDIAN CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	69.44	300.00	13°15'41"	34.87
C2	34.72	150.00	13°15'41"	17.44
C3	6.28	2.00	180°00'00"	INFINITE

MEDIAN POINT TABLE

	STA.	OFFSET	FL ELEV.
1	13+71.68	31.00' RT	5413.46
2	14+40.50	23.00' RT	5412.59
3	14+74.91	19.00' RT	5412.15
4	16+24.91	19.00' RT	5411.28
5	16+24.91	116.00' RT	5411.28



PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
4	BUILD TEMPORARY ARTERIAL ASPHALT PAVING PER DETAIL (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
20	INSTALL 6" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
40	INSTALL TYPE III BARRICADES
61	REMOVE AND DISPOSE EXISTING ASPHALT PAVEMENT

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
2	INSTALL 18" STORM DRAIN PIPE
4	INSTALL 24" STORM DRAIN PIPE
9	INSTALL 42" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
11	INSTALL 54" STORM DRAIN PIPE
20	INSTALL TYPE A CATCH BASIN SINGLE GRATE SINGLE THROAT PER COA STD. DTL. 2201
21	INSTALL TYPE A CATCH BASIN SINGLE GRATE AND DOUBLE WING PER COA STD. DTL. 2201
32	INSTALL 8' DIA. MANHOLE PER COA STD. DTL. 2101
45	INSTALL 48" STORM DRAIN PLUG
46	INSTALL 54" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460

INDEX MAP

AS-BUILT INFORMATION
CONTRACTOR
WORK STARTED BY
WORK ACCEPTANCE BY
VERIFICATION BY
DOMINATED BY
DATE

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
ΔG = -00°16'30"
SLD 1929 Elevation = 5429.35

MICRO-FILM INFORMATION
RECORDED BY
DATE
NO.

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
STEVEN M. SALAZAR NEW MEXICO 16241 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	PROJECT REMARKS	BY
		REVISIONS	
1	8/11/06	SD CHANGE ORDER	SJS
2	8/11/06	SAS ADDITION	SJS
3	4/02/07	DELETE MAINLINE SD FROM	SJS

WILSON & COMPANY, ENGINEERS & ARCHITECTS
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

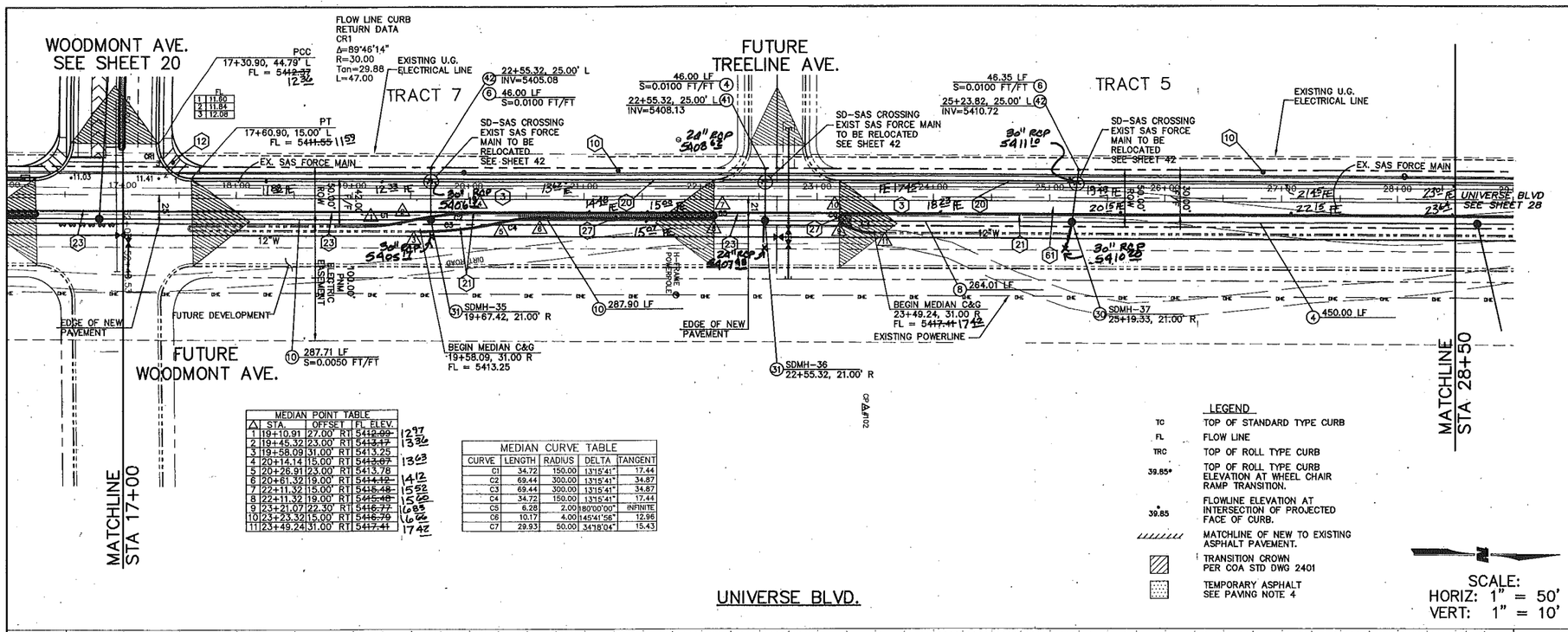
DESIGNED BY	DMD	JAN 05
DRAWN BY	DMD	JAN 05
CHECKED BY	SJS	JAN 05

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVED APR 18 2007 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED APR 11 2007 CITY ENGINEER
Last Design Update: Mo./Day/Yr.
Date Drawn: Mo./Day/Yr.

City Project No. 730084
Zone Map No. C-9-Z
Sheet 27A Of 51



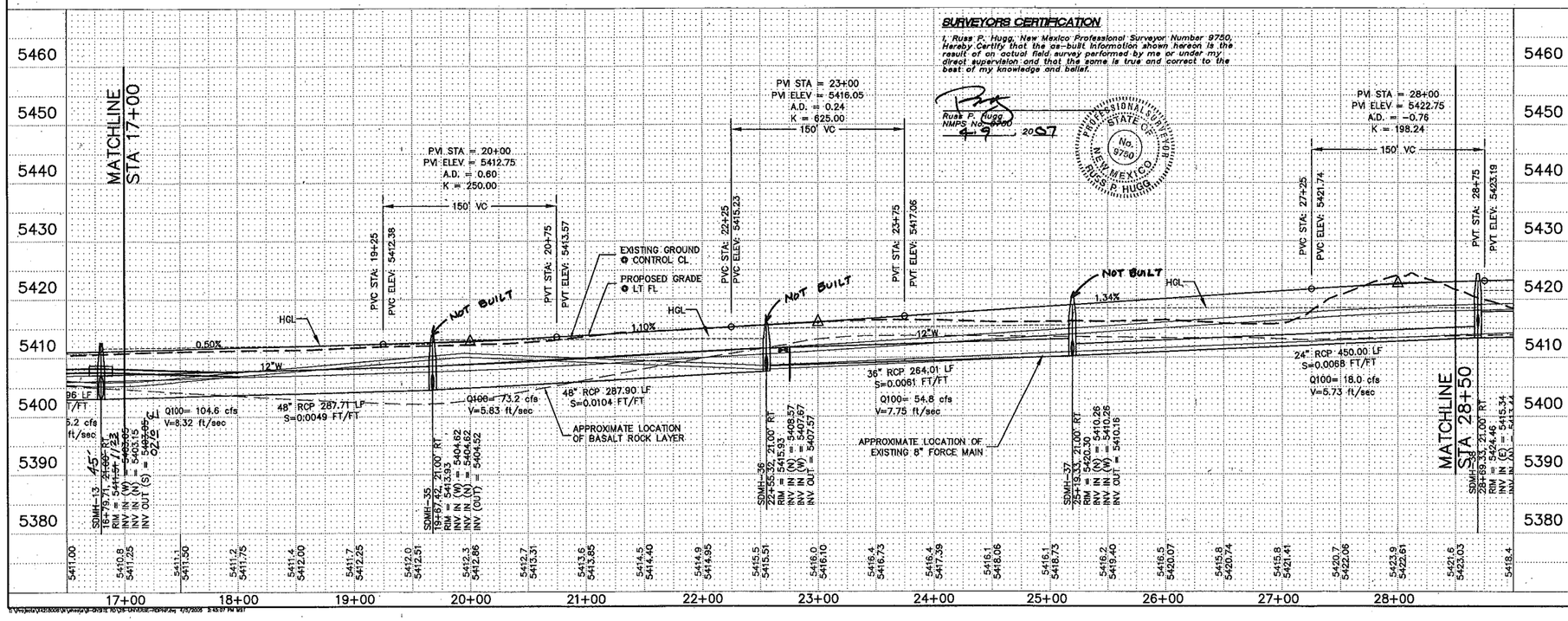
MEDIAN POINT TABLE				
	STA.	OFFSET	FL ELEV.	
1	19+10.91	27.00' RT	5412.09	12.97
2	19+45.32	23.00' RT	5413.17	13.36
3	19+58.09	31.00' RT	5413.25	
4	20+14.14	15.00' RT	5413.07	13.63
5	20+26.91	23.00' RT	5413.78	
6	20+61.32	19.00' RT	5414.12	14.12
7	22+11.32	15.00' RT	5415.48	15.52
8	22+11.32	19.00' RT	5415.48	15.52
9	23+21.07	22.30' RT	5416.77	16.85
10	23+23.32	15.00' RT	5416.79	16.66
11	23+49.24	31.00' RT	5417.41	17.42

MEDIAN CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	34.72	150.00	13°15'41"	17.44
C2	69.44	300.00	13°15'41"	34.87
C3	69.44	300.00	13°15'41"	34.87
C4	34.72	150.00	13°15'41"	17.44
C5	6.28	2.00	180°00'00"	INFINITE
C6	10.17	4.00	145°41'56"	12.96
C7	29.93	50.00	34°18'04"	15.43

LEGEND

TC	TOP OF STANDARD TYPE CURB
FL	FLOW LINE
TRC	TOP OF ROLL TYPE CURB
39.85*	TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
39.85	FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
	MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
	TRANSITION CROWN PER COA STD DWG 2401
	TEMPORARY ASPHALT SEE PAVING NOTE 4

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'



PAVING CONSTRUCTION NOTES

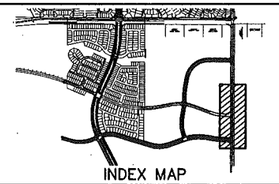
I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
14	INSTALL 6' PCC VALLEY GUTTER, PER COA STD. DETAIL 2420
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
50	BUILD 8' ASPHALT PEDESTRIAN TRAIL PER DETAIL SEE SHEET 7
61	REMOVE AND DISPOSE EXISTING ASPHALT PAVEMENT

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
4	INSTALL 24" STORM DRAIN PIPE
5	INSTALL 30" STORM DRAIN PIPE
8	INSTALL 36" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
30	INSTALL 4' DIA. MANHOLE PER COA STD. DTL. 2101
51	INSTALL 6' DIA. MANHOLE PER COA STD. DTL. 2101
41	INSTALL 24" STORM DRAIN PLUG
42	INSTALL 30" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460



INDEX MAP

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 998-8021

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVED SEP 14 2005 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 30 2006 CITY ENGINEER
Last Design Update: Mo./Day/Yr.
Mo./Day/Yr.

City Project No. 730084 | Zone Map No. C-9-Z | Sheet 28 Of 51

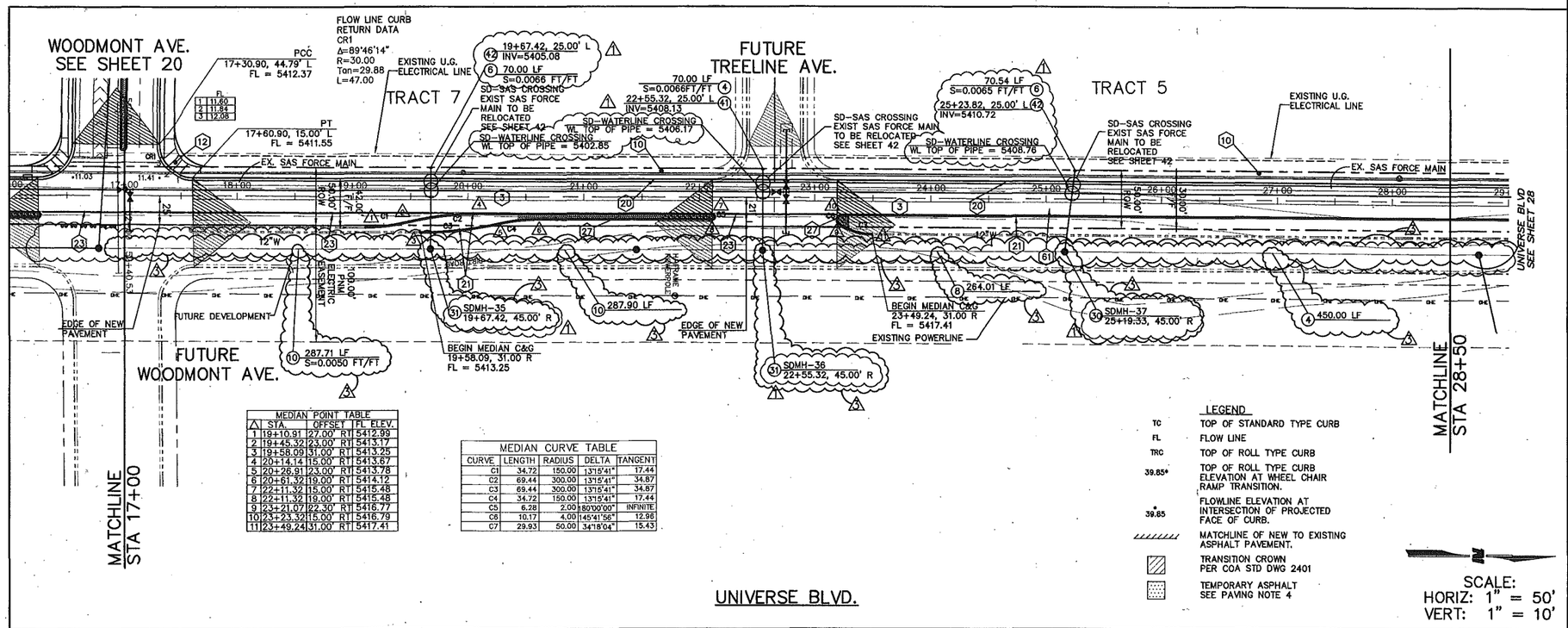
SURVEY INFORMATION
FIELD NOTES NO. BY DATE

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
ΔCC = -00°16'30"
SLD 1929 Elevation = 5429.35

AS-BUILT INFORMATION
CONTRACTOR
SURVEYED BY SURV TEK DATE 12/06
STAKED BY DATE
ACCEPTANCE BY
FIELD VERIFICATION BY SURV TEK DATE 02/07
DRAWINGS BY SURV TEK DATE 02/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

ENGINEER'S SEAL
SALAZAR NEW MEXICO 16241 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		WILSON & COMPANY, ENGINEERS & ARCHITECTS	
		DESIGNED BY DMD	DATE JAN 05
		DRAWN BY DMD	DATE JAN 05
		CHECKED BY SJS	DATE JAN 05



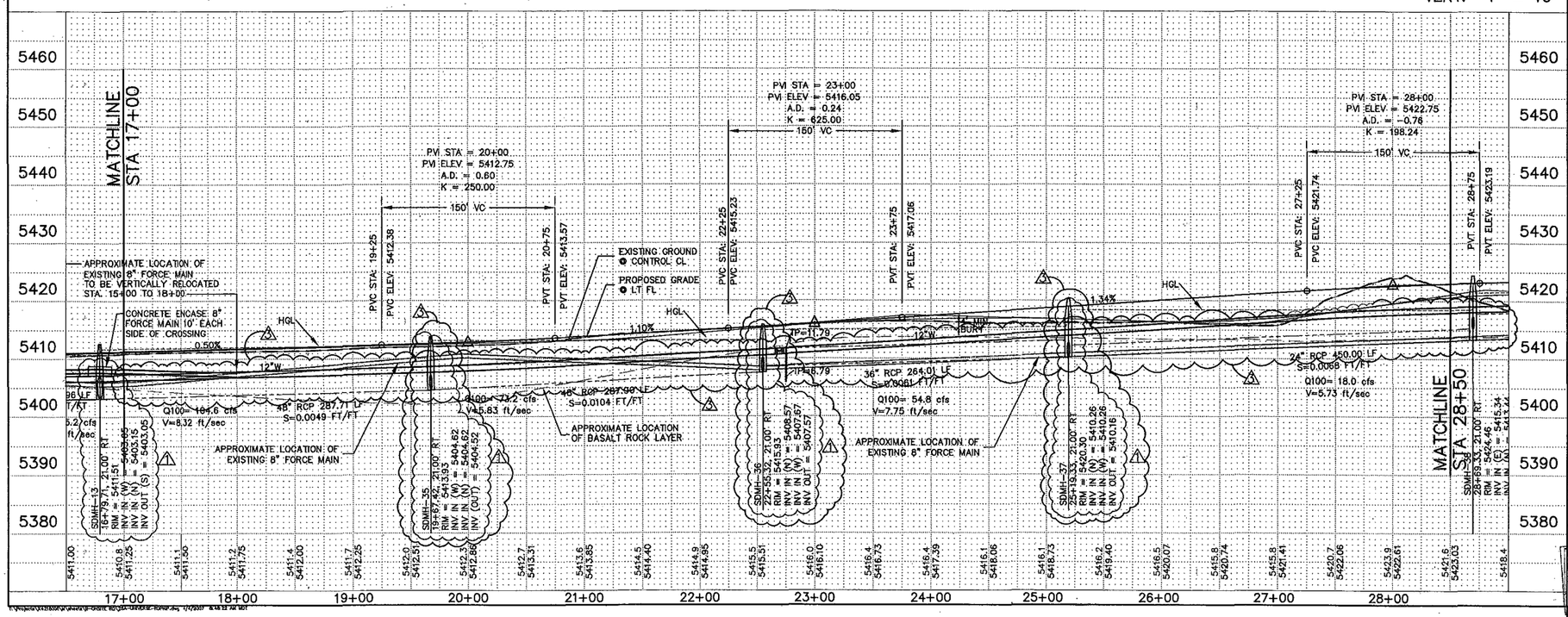
MEDIAN POINT TABLE			
STA.	OFFSET		FL ELEV.
1 19+10.91	27.00'	RT	5412.99
2 19+45.52	23.00'	RT	5413.17
3 19+58.09	31.00'	RT	5413.25
4 20+14.14	15.00'	RT	5413.67
5 20+26.91	23.00'	RT	5413.78
6 20+81.32	19.00'	RT	5414.12
7 22+11.32	15.00'	RT	5415.48
8 22+11.32	19.00'	RT	5415.48
9 23+21.07	22.30'	RT	5416.77
10 23+23.32	15.00'	RT	5416.79
11 23+49.24	31.00'	RT	5417.41

MEDIAN CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	34.72	150.00	13°15'41"	17.44
C2	69.44	300.00	13°15'41"	34.87
C3	69.44	300.00	13°15'41"	34.87
C4	34.72	150.00	13°15'41"	17.44
C5	6.28	2.00	180°00'00"	INFINITE
C6	10.17	4.00	145°41'56"	12.96
C7	29.93	50.00	34°18'04"	15.43

LEGEND

TC	TOP OF STANDARD TYPE CURB
FL	FLOW LINE
TRC	TOP OF ROLL TYPE CURB
39.85*	TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
39.85	FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
	MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
	TRANSITION CROWN PER COA STD DWG 2401
	TEMPORARY ASPHALT SEE PAVING NOTE 4

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'



PAVING CONSTRUCTION NOTES

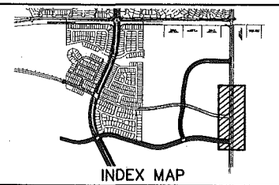
I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
14	INSTALL 6' PCC VALLEY GUTTER, PER COA STD. DETAIL 2420
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2405 & 2501
50	BUILD 8' ASPHALT PEDESTRIAN TRAIL PER DETAIL SEE SHEET 7
61	REMOVE AND DISPOSE EXISTING ASPHALT PAVEMENT

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
4	INSTALL 24" STORM DRAIN PIPE
6	INSTALL 30" STORM DRAIN PIPE
8	INSTALL 36" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
30	INSTALL 4' DIA. MANHOLE PER COA STD. DTL. 2101
31	INSTALL 6' DIA. MANHOLE PER COA STD. DTL. 2101
41	INSTALL 24" STORM DRAIN PLUG
42	INSTALL 30" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-- WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-- WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-- WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460



AS-BUILT INFORMATION
CONTRACTOR
MARK — DATE
ENGINEER BY — DATE
ACCEPTANCE BY — DATE
VERIFICATION BY
COMMENTS BY — DATE

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
$\Delta\alpha$ = -00°16'30"
SLD 1929 Elevation = 5429.35

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

SURVEY INFORMATION
FIELD NOTES
NO. — BY — DATE

ENGINEER'S SEAL
STEVEN M. SALAZAR NEW MEXICO 16249 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	PROJECT REMARKS
1	8/11/06	SD CHANGE ORDER
2	1/02/07	DELETE MAINLINE SD FROM

REVISIONS

WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY — DMD — DATE — JAN 05
DRAWN BY — DMD — DATE — JAN 05
CHECKED BY — SJS — DATE — JAN 05

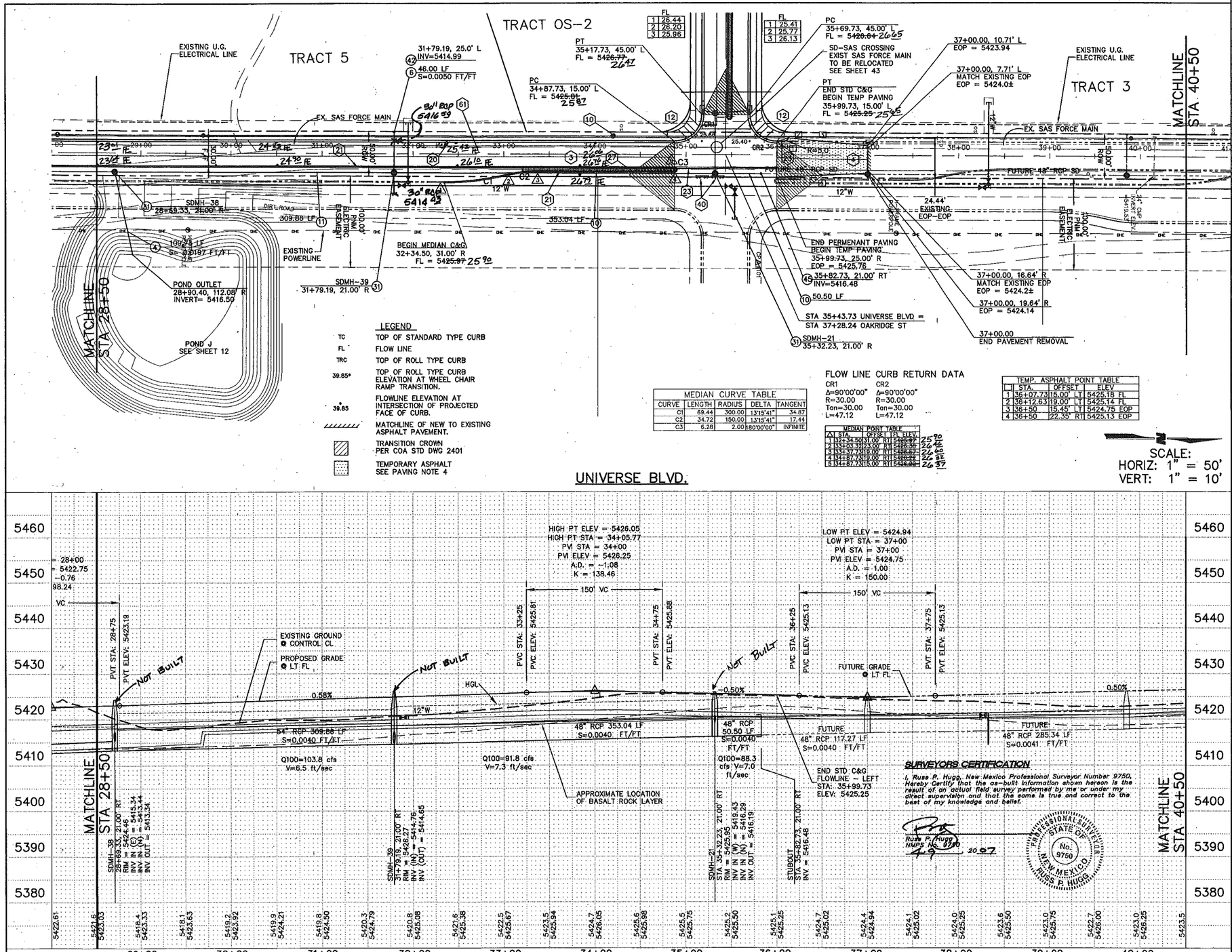
WILSON &COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVE APR 18 2007 DESIGN COMMITTEE
City Engineer Approval: APPROVED APR 18 2007 CITY ENGINEER
Last Design Update — Mo./Day/Yr.
Mo./Day/Yr.

City Project No. 730084 | Zone Map No. C-9-Z | Sheet 28A Of 51



T:\Projects\X4218008\M\sheets\B-ONSITE RD\29-UNIVERSE-RDPNP.dwg 4/5/2005 2:55:09 PM MST

PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
4	BUILD TEMPORARY ARTERIAL ASPHALT PAVING PER DETAIL (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
40	INSTALL TYPE III BARRICADES

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
2	INSTALL 18" STORM DRAIN PIPE
4	INSTALL 24" STORM DRAIN PIPE
6	INSTALL 30" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
11	INSTALL 54" STORM DRAIN PIPE
30	INSTALL 4' DIA. MANHOLE PER COA STD. DTL. 2101
31	INSTALL 6' DIA. MANHOLE PER COA STD. DTL. 2101
42	INSTALL 30" STORM DRAIN PLUG
45	INSTALL 48" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460

INDEX MAP

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

AS-BUILT INFORMATION
CONTRACTOR
WORK STAKED BY: SURV-TEK DATE: 12/06
WORK VERIFICATION BY: DATE:
ACCEPTANCE BY: DATE:
VERIFICATION BY: SURV-TEK DATE: 02/07
CORRECTED BY: SURV-TEK DATE: 3/07
MICRO-FILM INFORMATION
RECORDED BY: DATE:
NO.:

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.999966354
Δ'C = -00°16'30"
SLD 1929 Elevation = 5429.35

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
RUSS P. HUGG NEW MEXICO 15241 REGISTERED PROFESSIONAL ENGINEER

REVISIONS
NO. | DATE | BY | REMARKS
1 | JAN 05 | SJS | WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY DMD DATE JAN 05
DRAWN BY DMD DATE JAN 05
CHECKED BY SJS DATE JAN 05

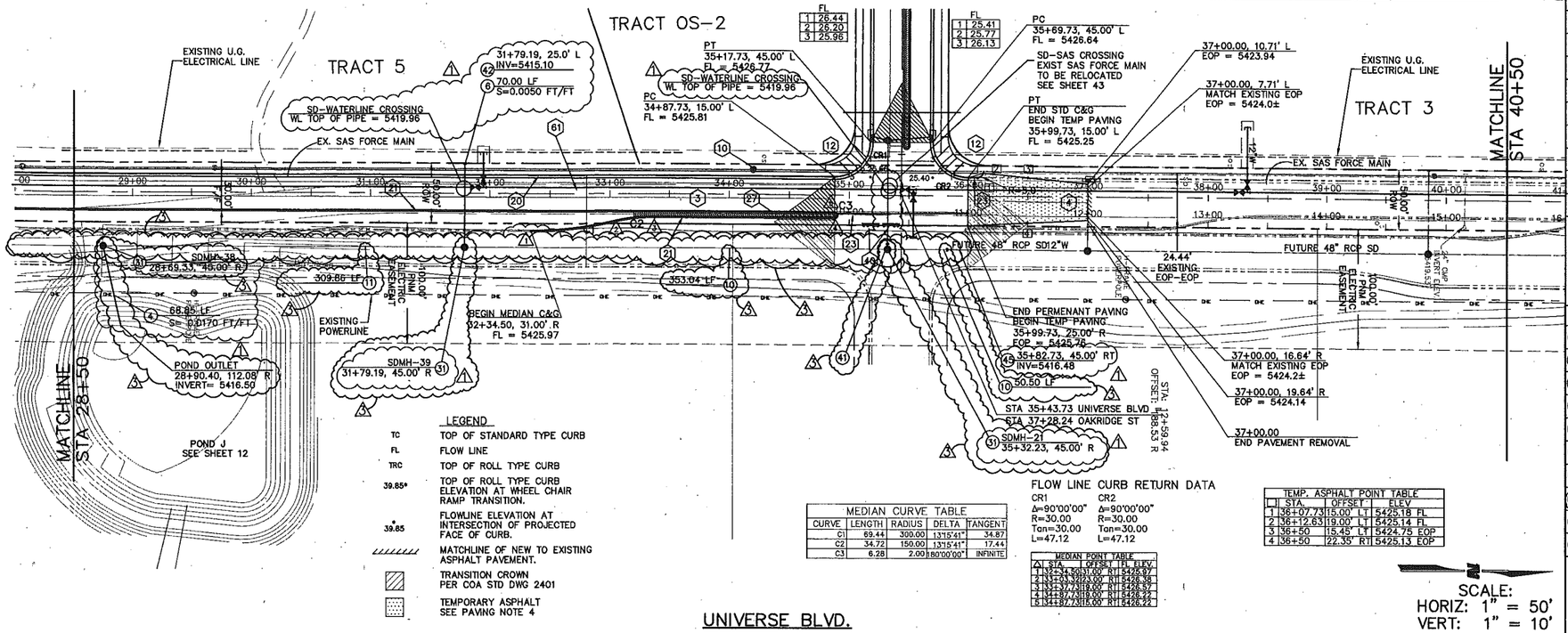
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVED SEP 16 2005 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 30 2006 CITY ENGINEER
Last Design Update: Mo./Day/Yr. | Mo./Day/Yr.

City Project No. 730084 | Zone Map No. C-9-Z | Sheet 29 Of 51

OAKRIDGE ST. SEE SHEET 23



FL	
1	26.44
2	26.20
3	25.96

FL	
1	25.41
2	25.77
3	26.13

LEGEND

TC	TOP OF STANDARD TYPE CURB
FL	FLOW LINE
TRC	TOP OF ROLL TYPE CURB
39.85*	TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
39.85	FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
	MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
	TRANSITION CROWN PER COA STD DWG 2401
	TEMPORARY ASPHALT SEE PAVING NOTE 4

MEDIAN CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	69.44	300.00	13°15'41"	34.87
C2	34.72	150.00	13°15'41"	17.44
C3	6.28	2.00	180°00'00"	INFINITE

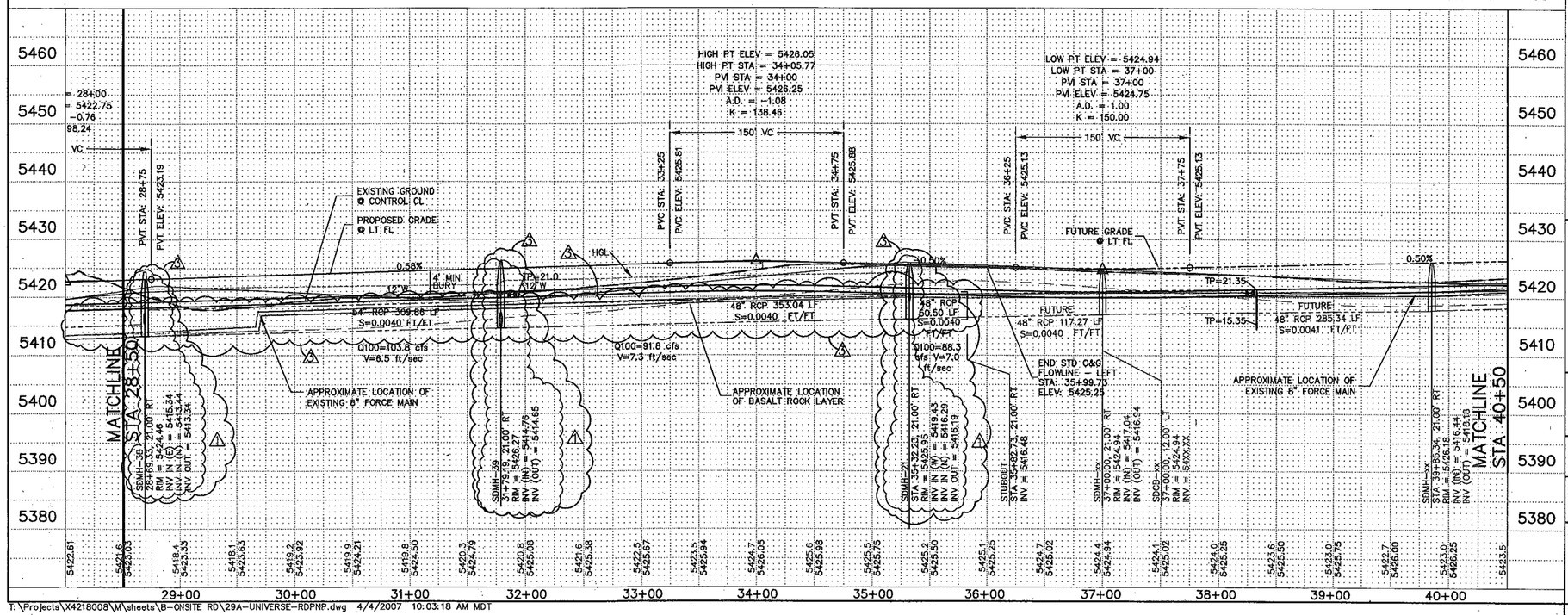
FLOW LINE CURB RETURN DATA

CR1	CR2
Δ=90°00'00"	Δ=90°00'00"
R=30.00	R=30.00
Tan=30.00	Tan=30.00
L=47.12	L=47.12

MEDIAN POINT TABLE			
△	STA	OFFSET	FL ELEV
1	32+34.50	31.00' RT	5425.97
2	33+03.00	31.00' RT	5426.38
3	33+47.78	19.00' RT	5426.93
4	34+34.50	19.00' RT	5426.42
5	34+87.73	15.00' RT	5426.22

TEMP. ASPHALT POINT TABLE				
△	STA	OFFSET		ELEV
1	36+07.73	15.00'	LT	5425.18 FL
2	36+12.63	19.00'	LT	5425.14 FL
3	36+50	15.45'	LT	5424.75 EOP
4	36+50	22.35'	RT	5425.13 EOP

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'



PAVING CONSTRUCTION NOTES

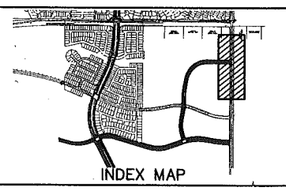
I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
4	BUILD TEMPORARY ARTERIAL ASPHALT PAVING PER DETAIL (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
40	INSTALL TYPE III BARRICADES

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
2	INSTALL 18" STORM DRAIN PIPE
4	INSTALL 24" STORM DRAIN PIPE
6	INSTALL 30" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
11	INSTALL 54" STORM DRAIN PIPE
30	INSTALL 4' DIA. MANHOLE PER COA STD. DTL. 2101
31	INSTALL 6' DIA. MANHOLE PER COA STD. DTL. 2101
41	INSTALL 24" STORM DRAIN PLUG
42	INSTALL 30" STORM DRAIN PLUG
45	INSTALL 48" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460



AS-BUILT INFORMATION
CONTRACTOR
WORK NOTED BY
INSPECTOR'S
RECEIPTANCE BY
FIELD VERIFICATION BY
DRAWING
CORRECTION BY
MICRO-FILM INFORMATION
RECORDED BY

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.999966354
ΔC = -00°16'30"
SLD 1929 Elevation = 5429.35

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL
SALAZAR NEW MEXICO 16240 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	PROJECT. REMARKS
1	8/11/06	SD CHANGE ORDER
2	4/02/07	DELETE MAINLINE SD FROM

REVISIONS

WILSON & COMPANY, ENGINEERS & ARCHITECTS

DESIGNED BY	DMD	DATE JAN 05
DRAWN BY	DMD	DATE JAN 05
CHECKED BY	SJS	DATE JAN 05

WILSON &COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVED APR 9 2007 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED APR 11 2007 CITY ENGINEER
Last Design Update: Mo./Day/Yr.
Last Mylar Update: Mo./Day/Yr.

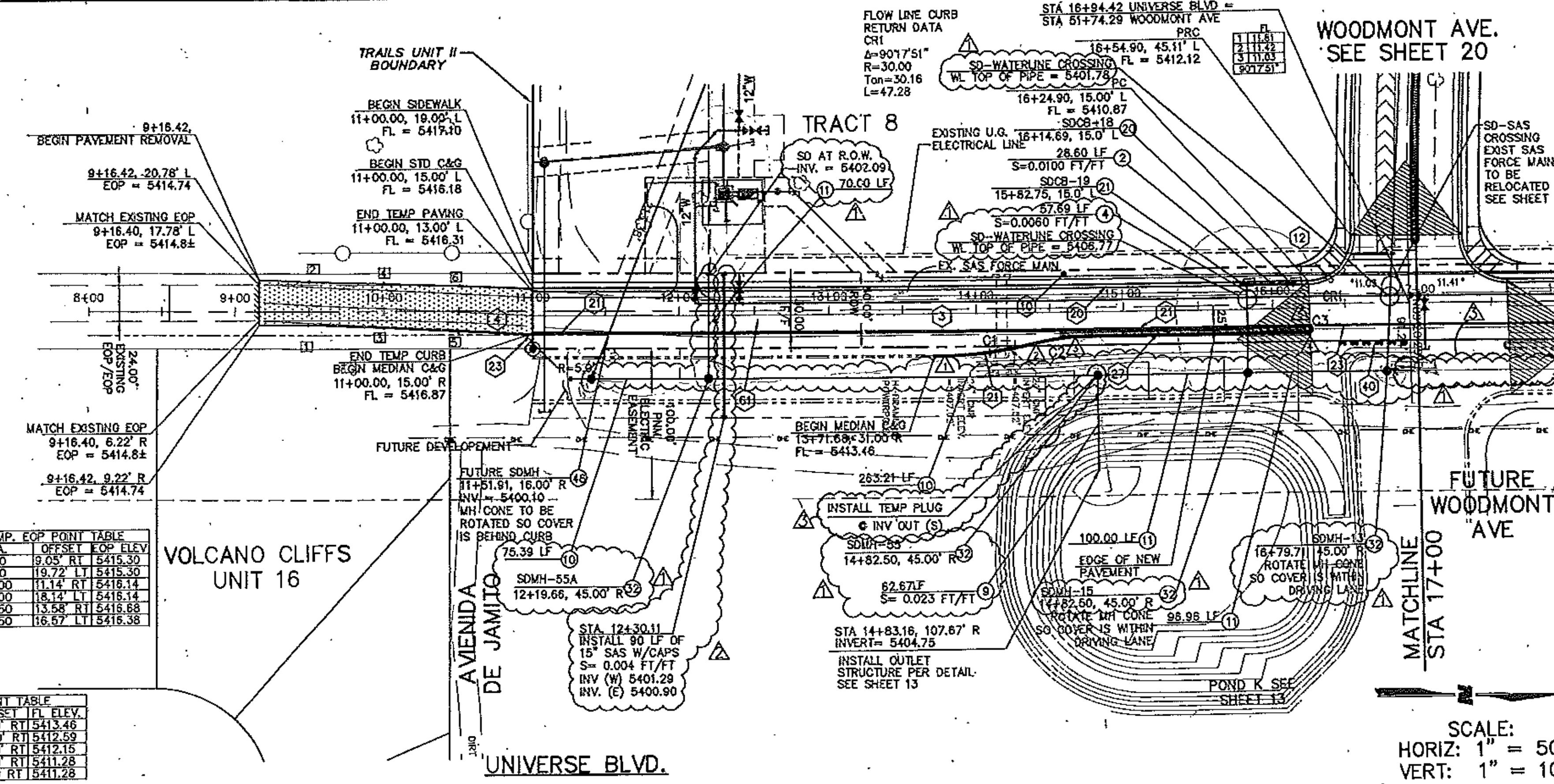
COA DRC No.	Zone Map No.	Sheet	Of
730084	C-9-Z	29A	51

T:\Projects\X4218008\M\sheets\B-ONSITE RD\29A-UNIVERSE-RDPNP.dwg 4/4/2007 10:03:18 AM MDT

Use This Sheet

LEGEND

Symbol	Description
TC	TOP OF STANDARD TYPE CURB
FL	FLOW LINE
TRC	TOP OF ROLL TYPE CURB
39.65*	TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
39.65	FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
(hatched line)	MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
(hatched box)	TRANSITION CROWN PER COA STD DWG 2401
(dotted box)	TEMPORARY ASPHALT SEE PAVING NOTE 4



	STA.	OFFSET	EOP ELEV
1	9+50	9.05' RT	5415.30
2	9+50	19.72' LT	5415.30
3	10+00	11.14' RT	5416.14
4	10+00	18.14' LT	5416.14
5	10+50	13.58' RT	5416.68
6	10+50	16.57' LT	5416.38

TEMP. EOP POINT TABLE

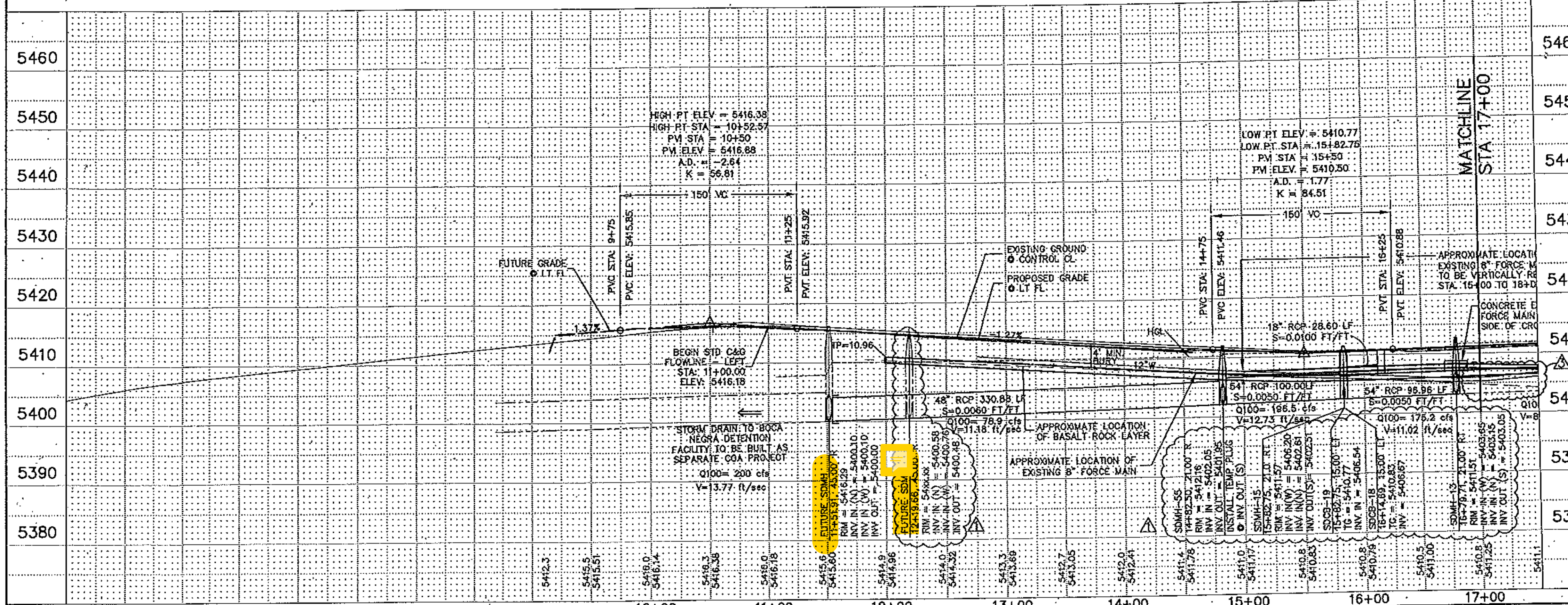
MEDIAN CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	69.44	300.00	13°15'41"	34.87
C2	34.72	150.00	13°15'41"	17.44
C3	6.28	2.00	180°00'00"	INFINITE

MEDIAN POINT TABLE

Δ	STA.	OFFSET	FL ELEV.
1	13+71.68	31.00' RT	5413.46
2	14+40.50	23.00' RT	5412.59
3	14+74.91	19.00' RT	5412.15
4	16+24.91	19.00' RT	5411.28
5	16+24.91	15.00 RT	5411.28

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'



PAVING CONSTRUCTION NOTES

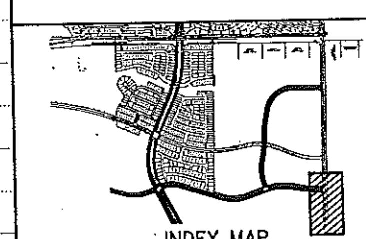
I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 6)
4	BUILD TEMPORARY ARTERIAL ASPHALT PAVING PER DETAIL (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
40	INSTALL TYPE III BARRICADES
61	REMOVE AND DISPOSE EXISTING ASPHALT PAVEMENT

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
2	INSTALL 18" STORM DRAIN PIPE
4	INSTALL 24" STORM DRAIN PIPE
9	INSTALL 42" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
11	INSTALL 54" STORM DRAIN PIPE
20	INSTALL TYPE A CATCH BASIN SINGLE GRATE SINGLE THROAT PER COA STD. DTL. 2201
21	INSTALL TYPE A CATCH BASIN SINGLE GRATE AND DOUBLE WING PER COA STD. DTL. 2201
32	INSTALL 8' DIA. MANHOLE PER COA STD. DTL. 2101
45	INSTALL 48" STORM DRAIN PLUG
46	INSTALL 54" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER- WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460



AS-BUILT INFORMATION: CONTRACTOR / WORK STARTED BY / INSPECTOR'S ACCEPTANCE BY / FIELD VERIFICATION BY / DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION: RECORDED BY — DATE; NO.

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
Δα = -00°16'30"
SLD 1929 Elevation = 5429.35

SURVEY INFORMATION — FIELD NOTES: NO. / BY / DATE

ENGINEER'S SEAL: SALAZAR, NEW MEXICO, 16241, LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
1	8/11/06	SD CHANGE ORDER	
2	8/11/06	SAS ADDITION	
3	4/02/07	DELETE MAINLINE SD FROM PROJECT.	SS

REVISIONS

WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY DMD DATE JAN 05
DRAWN BY DMD DATE JAN 05
CHECKED BY SJS DATE JAN 05

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E. SUITE 100
RIO RANCHO, NEW MEXICO 87124
(505) 898-8021

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee: APPROVED APR 18 2007 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED APR 11 2007 CITY ENGINEER
Last Design Update — Mo./Day/Yr. — Mo./Day/Yr.

City Project No. 730084 | Zone Map No. C-9-Z | Sheet 27A Of 51

LEGEND

- TC — TOP OF STANDARD TYPE CURB
- FL — FLOW LINE
- TRC — TOP OF ROLL TYPE CURB
- 39.85* — TOP OF ROLL TYPE CURB ELEVATION AT WHEEL CHAIR RAMP TRANSITION.
- 39.85 — FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
- MATCHLINE OF NEW TO EXISTING ASPHALT PAVEMENT.
- TRANSITION CROWN PER COA STD DWG 2401
- TEMPORARY ASPHALT SEE PAVING NOTE 4

TRAILS UNIT II BOUNDARY

9+16.42, BEGIN PAVEMENT REMOVAL

9+16.42, 20.78' L, EOP = 5414.74

MATCH EXISTING EOP, 9+16.40, 17.78' L, EOP = 5414.8±

MATCH EXISTING EOP, 9+16.40, 6.22' R, EOP = 5414.8±

9+16.42, 9.22' R, EOP = 5414.74

BEGIN SIDEWALK, 11+00.00, 19.00' L, FL = 5419.10

BEGIN STD C&G, 11+00.00, 15.00' L, FL = 5416.18

END TEMP PAVING, 11+00.00, 13.00' L, FL = 5416.31

END TEMP CURB, BEGIN MEDIAN C&G, 11+00.00, 15.00' R, FL = 5416.82

TRACT 8

EXISTING U.G. ELECTRICAL LINE

FLOW LINE CURB RETURN DATA CR1: Δ=90°17'51", R=30.00, Tan=30.16, L=47.28

STA 16+94.42 UNIVERSE BLVD = STA 51+74.29 WOODMONT AVE

PRC 16+54.90, 45.11' L, FL = 5412.12

PC 16+24.90, 15.00' L, FL = 5410.87

SDCB-18 16+14.69, 16.0' L — 28.60 LF, S=0.0100 FT/FT

SDCB-19 15+82.75, 15.0' L — 33.69 LF, S=0.0100 FT/FT

WOODMONT AVE. SEE SHEET 20

SD-SAS CROSSING EXIST SAS FORCE MAIN TO BE RELOCATED SEE SHEET 41

EX. SAS FORCE MAIN

FUTURE DEVELOPMENT

FUTURE SDMH 11+51.91, 46.00' R, INV.= 5400.10 — MH CONE TO BE ROTATED SO COVER IS BEHIND CURB

OVERHEAD POWERLINE

VOLCANO CLIFFS UNIT 16

AVENIDA DE JAMITO

UNIVERSE BLVD.

11+40.17, 45° RT

BEGIN MEDIAN C&G 13+71.68, 31.00' R, FL = 5413.16

330.88 LF

INSTALL TEMP PLUG ● INV OUT (S)

SDMH-55 14+82.50, 21.00' R

86.86LF S= 0.032 FT/FT

STA 14+83.16, 107.67' R, INVERT= 5404.76

INSTALL OUTLET STRUCTURE PER DETAIL SEE SHEET 13

100.00 LF

EDGE OF NEW PAVEMENT

SDMH-15 14+82.50, 21.00' R, ROTATE MH CONE SO COVER IS WITH DRIVING LANE

98.98 LF

SDMH-13 16+79.71, 21.00' R, ROTATE MH CONE SO COVER IS WITH DRIVING LANE

POND K SEE SHEET 19

FUTURE WOODMONT AVE

MATCHLINE STA 17+00

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'

TEMP. EOP POINT TABLE

	STA.	OFFSET	EOP ELEV
1	9+50	9.05' RT	5415.30
2	9+50	19.72' LT	5415.30
3	10+00	11.14' RT	5416.14
4	10+00	18.14' LT	5416.14
5	10+50	13.58' RT	5416.68
6	10+50	16.57' LT	5416.38

MEDIAN CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	69.44	300.00	13°15'41"	34.87
C2	34.72	150.00	13°15'41"	17.44
C3	6.28	2.00	180°00'00"	INFINITE

MEDIAN POINT TABLE

	STA.	OFFSET	PT. ELEV.
1	13+71.68	31.00' RT	5413.16
2	14+40.50	23.00' RT	5412.59
3	14+74.91	19.00' RT	5412.15
4	15+24.91	19.00' RT	5411.88
5	16+24.91	15.00' RT	5411.26

PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
3	BUILD ARTERIAL ASPHALT PAVING, PER TYPICAL SECTION (SEE SHEET 5)
4	BUILD TEMPORARY ARTERIAL ASPHALT PAVING PER DETAIL (SEE SHEET 5)
10	BUILD 6' PCC SIDEWALK, PER COA STD. DTL. 2430
12	BUILD PCC WHEELCHAIR RAMP, PER COA STD. DETAIL 2441, CASE #2
20	INSTALL 8" PCC STD. CURB AND GUTTER, PER COA DETAIL 2415A
21	BUILD PCC MEDIAN CURB AND GUTTER, PER COA DETAIL 2415B
23	BUILD TEMP ASPHALT CURB TYPE C PER COA STD DWG 2415B
27	BUILD TEXTURED CONCRETE MEDIAN PAVEMENT, PER COA STD. DWG. 2408 & 2501
40	INSTALL TYPE III BARRICADES
61	REMOVE AND DISPOSE EXISTING ASPHALT PAVEMENT

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
2	INSTALL 18" STORM DRAIN PIPE
4	INSTALL 24" STORM DRAIN PIPE
9	INSTALL 42" STORM DRAIN PIPE
10	INSTALL 48" STORM DRAIN PIPE
11	INSTALL 54" STORM DRAIN PIPE
20	INSTALL TYPE A CATCH-BASIN SINGLE GRATE SINGLE THROAT PER COA STD. DTL. 2201
21	INSTALL TYPE A CATCH BASIN SINGLE GRATE AND DOUBLE WING PER COA STD. DTL. 2201
32	INSTALL 8' DIA. MANHOLE PER COA STD. DTL. 2101
45	INSTALL 48" STORM DRAIN PLUG
46	INSTALL 54" STORM DRAIN PLUG

GENERAL NOTES

1. ALL CURB RETURNS HAVE 30' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-WISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-WISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHER-WISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460

INDEX MAP

5460 / 5450 / 5440 / 5430 / 5420 / 5410 / 5400 / 5390 / 5380

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00

MATCHLINE STA 17+00

HIGH PT ELEV = 5416.38, HIGH PT STA = 10+52.57, PVI STA = 10+50, PVI ELEV = 5416.88, A.D. = -2.64, K = 56.81, 150' VC

FUTURE GRADE ○ LT. FL.

EXISTING GROUND ○ CONTROL CL

PROPOSED GRADE ○ LT. FL.

1.37%

BEGIN STD C&G FLOWLINE — LEFT STA: 11+00.00 ELEV: 5416.18

STORM DRAIN TO BOCA NEGRA DETENTION FACILITY TO BE BUILT AS SEPARATE COA PROJECT Q100= 200 cfs V=13.77 ft/sec

48" RCP 330.88 LF S=0.0060 FT/FT Q100= 78.9 cf/s V=11.16 ft/sec

APPROXIMATE LOCATION OF BASALT ROCK LAYER

LOW PT ELEV = 5410.77, LOW PT STA = 15+82.75, PVI STA = 15+50, PVI ELEV = 5410.50, A.D. = 1.77, K = 84.51, 150' VC

18" RCP 28.60 LF S=0.0100 FT/FT

54" RCP 100.00LF S=0.0050 FT/FT Q100= 196.5 cfs V=12.73 ft/sec

54" RCP 86.86 LF S=0.0050 FT/FT Q100= 175.2 cf/s V=11.02 ft/sec

HGL

SURVEYORS CERTIFICATION

I, Russ P. Hugo, New Mexico Professional Surveyor Number 9750, Hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugo, NMPS No. 9750, 4-5-07, 20__

REGISTERED PROFESSIONAL SURVEYOR, STATE OF NEW MEXICO, No. 9750, RUSS P. HUGO

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO 87124
(505) 898-8021

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE TRAILS UNIT II
PAVING AND STORM DRAIN PLAN & PROFILE
UNIVERSE BLVD.

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.
APPROVED SEP 10 DESIGN REVIEW COMMITTEE	APPROVED JAN. 8 0 2008 CITY ENGINEER		

City Project No. 730084 | Zone Map No. C-9-Z | Sheet 27 of 51

AS-BUILT INFORMATION
CONTRACTOR
WORK DONE BY: Surv Tek, DATE: 12/06
SURVEYED BY: DATE:
INSPECTED BY: Surv Tek, DATE: 3/07
ACCEPTANCE BY: DATE:
CORRECTED BY: Surv Tek, DATE: 4/07
MICRO-FILM INFORMATION
RECORDED BY: DATE:

BENCH MARKS
AGS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,976.48
Ground-to-Grid Factor = 0.99966354
Δ/C = -00°16'30"
SLD 1929 Elevation = 5429.35

SURVEY INFORMATION
FIELD NOTES
NO. | DATE | BY

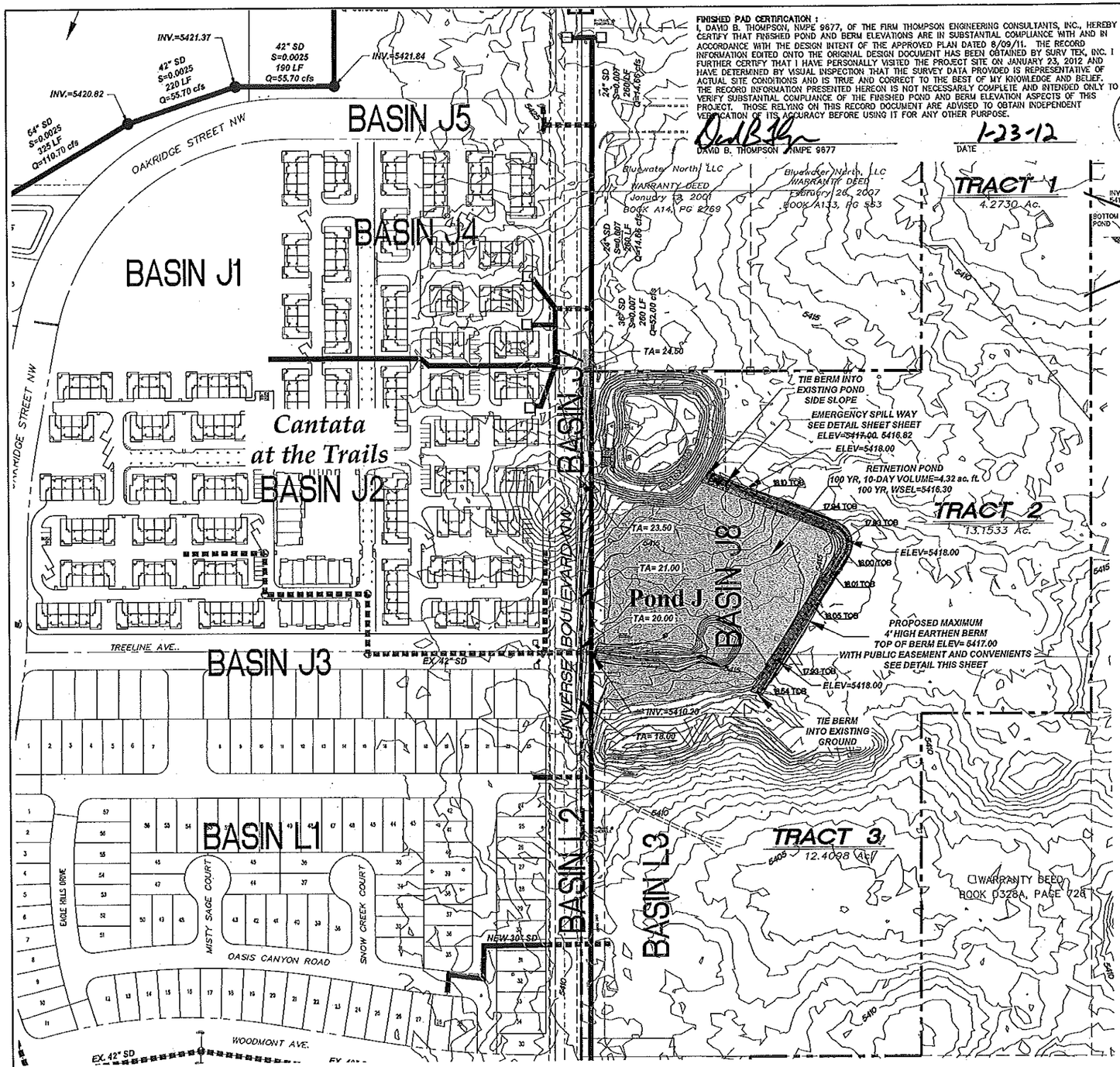
ENGINEER'S SEAL
SALVADOR KONING, 16214, REGISTERED PROFESSIONAL ENGINEER

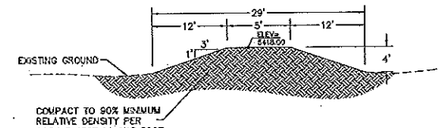
REMARKS
REVISIONS
WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY DMD DATE JAN 05
DRAWN BY DMD DATE JAN 05
CHECKED BY SJS DATE JAN 05
NO. | DATE | BY

FINISHED PAD CERTIFICATION :
I, DAVID B. THOMPSON, NMPE 9677, OF THE FIRM THOMPSON ENGINEERING CONSULTANTS, INC., HEREBY CERTIFY THAT FINISHED POND AND BERM ELEVATIONS ARE IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 8/09/11. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY SURV TEK, INC. I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE ON JANUARY 23, 2012 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE FINISHED POND AND BERM ELEVATION ASPECTS OF THIS PROJECT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

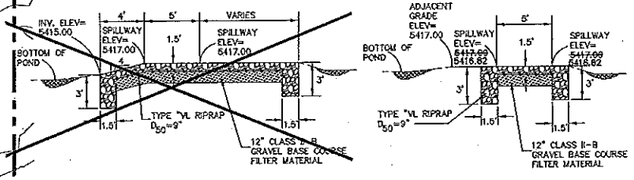
DAVID B. THOMPSON NMPE 9677 — DATE 1-23-12

DAVID B. THOMPSON NEW MEXICO 9677 LICENSED PROFESSIONAL ENGINEER

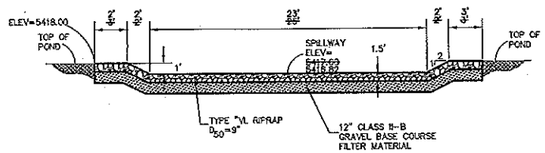




EARTHEN BERM DETAIL
NTS



EMERGENCY SPILLWAY SECTION
NTS



PERCENT LAND TREATMENT

BASIN	A	B	C	D
J2	0	12.5	10.5	75
J3	0	19	19	62
J7	0	5	5	90
J8	0	70	30	0

CANTATA 10 DAY VOLUME CALCS

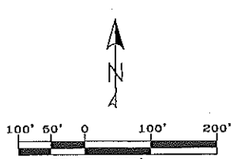
BASIN	AREA	%D	AREA D	V_{100}	$V_{10\,day}$	Q_{allv}
J2	10.92 ac.	75	8.19 ac.	1.522 ac-ft	2.53	41.81 cfs
J3	3.71 ac.	62	2.30 ac.	0.471 ac-ft	0.75	13.31 cfs
J7	2.64 ac.	90	2.55 ac.	0.437 ac-ft	0.75	11.70 cfs
J8	5.70 ac.	0	0 ac.	0.291 ac-ft	0.351	12.77 cfs
				TOTAL $V_{10\,day}$ =	4.38	ac-ft

VOLUME REQUIRED = 4.38 ac.-ft.
VOLUME PROVIDED = ~~5.38~~ 8.90 ac.-ft.

GRADING AND DRAINAGE CERTIFICATION WILL INCLUDE POND VOLUME CERTIFICATION BY A P.E. TO THE REQUIRED POND VOLUME.

LEGEND

- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- PROPOSED BASIN BOUNDARY
- PROPOSED DRAINAGE BOUNDARY
- TA — TOP OF ASPHALT
- TOB — TOP OF BERM ELEVATION



Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 65700 ALBUQUERQUE, NM 87193
PHONE (505) 271-2159 FAX (505) 830-9240

SURVEY INFORMATION
FIELD NOTES

NO.	DATE	BY

BENCH MARKS
ACS BRASS TABLET STAMPED "2-B10 1980"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,973.48
Ground-to-Grid Factor = 0.99966354
ΔX = -00°16'56"
SUD 1929 ELEVATION = 5429.35

AS-BUILT INFORMATION
CONTRACTOR — DATE
FIELD SURVEY BY — DATE
AS-BUILTS BY — DATE
CONSTRUCTION BY — DATE
CERTIFIED BY — DATE

MICROFILM INFORMATION
RECORDED BY — DATE
WO.

ENGINEER'S SEAL
DAVID B. THOMPSON NEW MEXICO 9677 REGISTERED PROFESSIONAL ENGINEER

No.	Date	By

REMARKS
REVISIONS
DESIGN — DATE:
Designed By: — DATE:
Drawn By: — DATE:
Checked By:

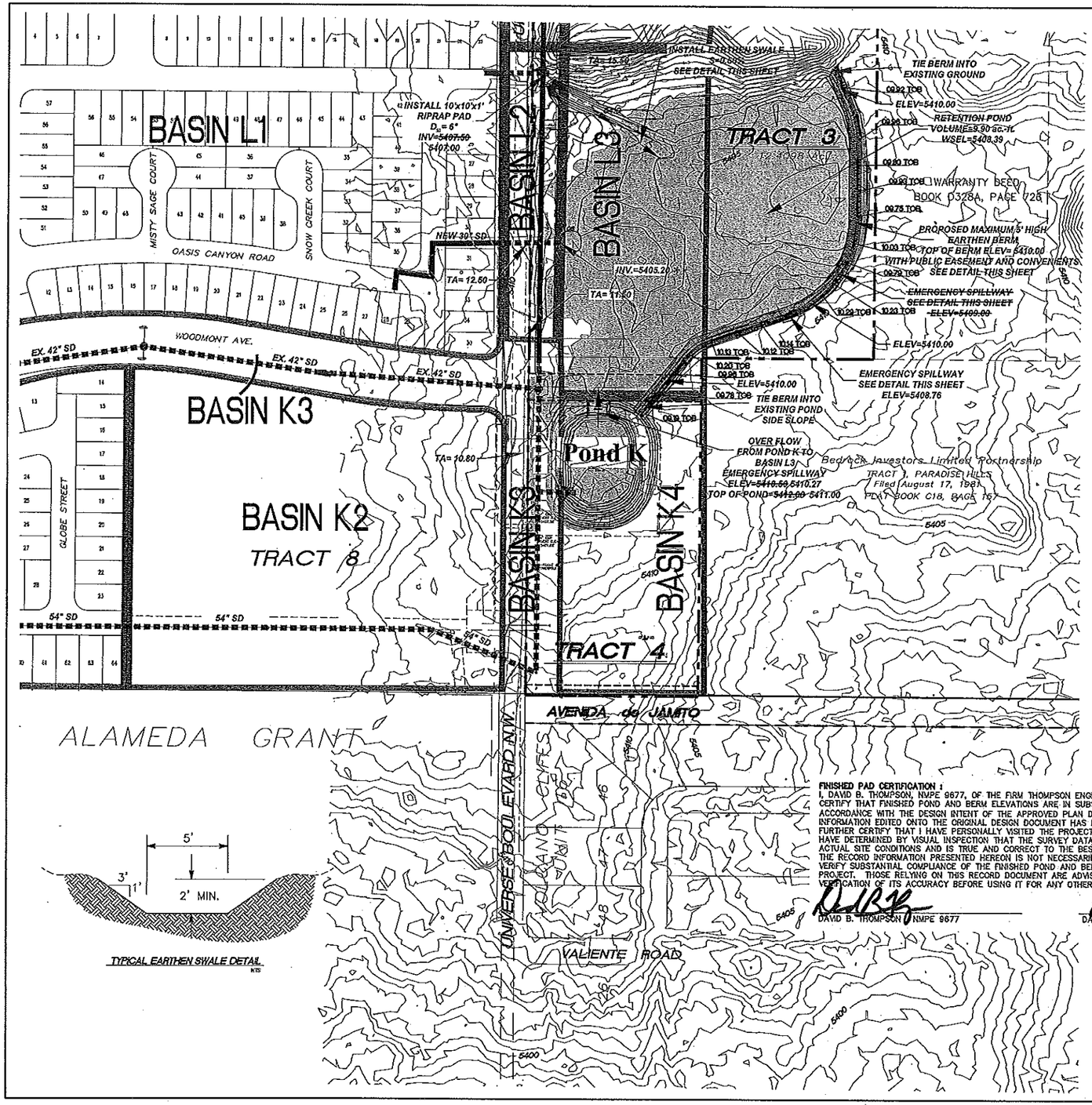
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

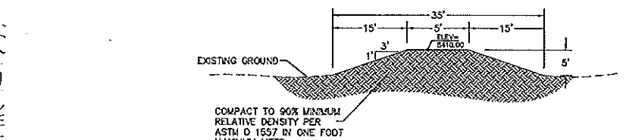
CANTATA AT THE TRAILS
POND J GRADING PLAN

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

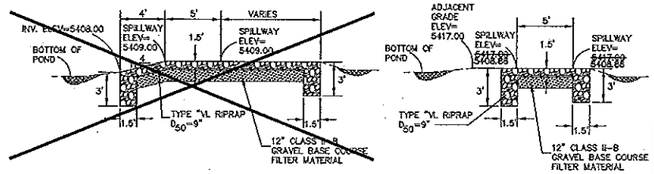
City Project No.	Zone Map No.	Sheet	Of
730078	C-9	13	14

G:\projects\Cloudpoint Trails DWG\C-CANTATA-POND-CERT.dwg, 1/23/2012 1:10:05 PM

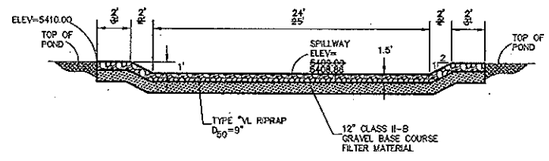




EARTHEN BERM DETAIL
NTS



EMERGENCY SPILLWAY SECTION
NTS



EMERGENCY SPILLWAY SECTION
NTS

*NEW 30" SD TO BE EXTENDED TO POND WITH THE CONSTRUCTION OF TAOS INFRASTRUCTURE.

VOLUME REQUIRED = 9.90 ac.-ft.
VOLUME PRVIDED = ~~14.83~~ ac.-ft.
14.94

GRADING AND DRAINAGE CERTIFICATION WILL INCLUDE POND VOLUME CERTIFACTION BY A P.E. TO THE REQUIRED POND VOLUME.

LEGEND

- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- PROPOSED BASIN BOUNDARY
- PROPOSED DRAINAGE BOUNDARY
- TA TOP OF ASPHALT

FINISHED PAD CERTIFICATION :
I, DAVID B. THOMPSON, NMPE 9677, OF THE FIRM THOMPSON ENGINEERING CONSULTANTS, INC., HEREBY CERTIFY THAT FINISHED POND AND BERM ELEVATIONS ARE IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 8/12/11. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY SURV TEK, INC. I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE ON JANUARY 23, 2012 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE FINISHED POND AND BERM ELEVATION ASPECTS OF THIS PROJECT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

DAVID B. THOMPSON NMPE 9677 — DATE 1-23-12

DAVID B. THOMPSON NEW MEXICO 9677 LICENSED PROFESSIONAL ENGINEER

N

100' 50' 0 100' 200'
SCALE: 100'

Thompson Engineering Consultants, Inc.
P.O. BOX 65760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199 FAX: (505) 830-9240
tecnm@yahoo.com

AS-BUILT INFORMATION
CONTRACTOR DATE
STAKED BY DATE
INSPECTED BY DATE
AS-BUILTED BY DATE
ENGINEERING BY DATE
MICROFILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
AGS BRASS TABLET STAMPED "2-B10 1985"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 357,543.73 Y= 1,527,973.48
Ground-to-Grid Factor = 0.99966354
$\Delta\alpha$ = -00°16'30"
SLD 1929 ELEVATION = 5429.35

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL
DAVID B. THOMPSON NEW MEXICO 9677 REGISTERED PROFESSIONAL ENGINEER

No.	Date	By	REMARKS
			REVISIONS
			DESIGN

Designed By: DATE:
Drawn By: DATE:
Checked By: DATE:

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

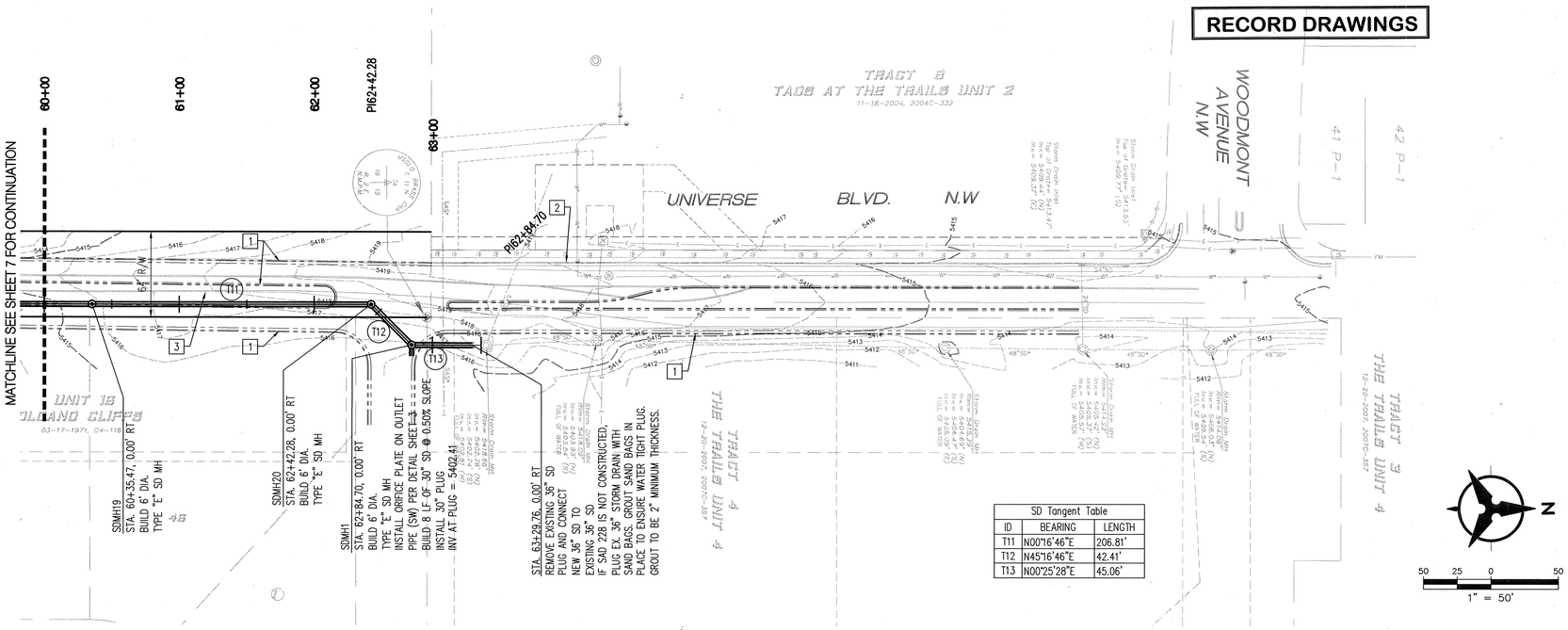
TAOS UNIT 1 at the TRAILS
POND K GRADING PLAN

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No. 730077 | Zone Map No. C-09-Z | Sheet 14 Of 16

O:\projects\Longford Trails DMP\CANTATA-POND-CERT.dwg, 1/23/2012 11:11:07 PM

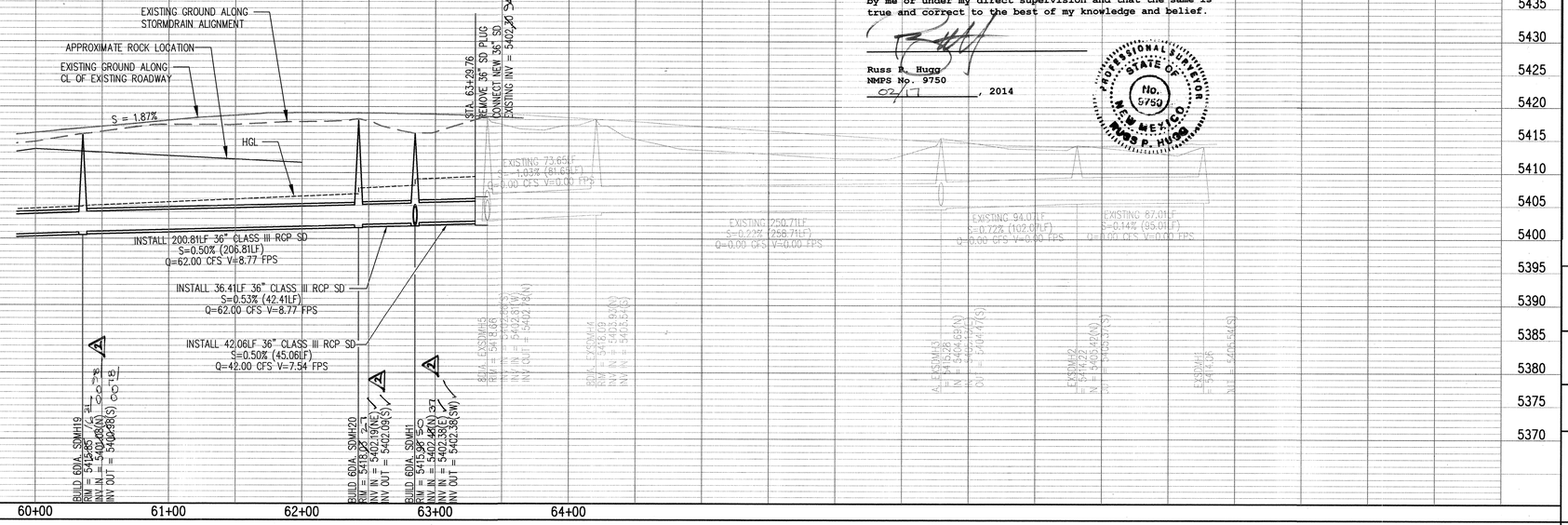
RECORD DRAWINGS



SD Tangent Table		
ID	BEARING	LENGTH
T11	N00°16'46"E	206.81'
T12	N45°16'46"E	42.41'
T13	N00°25'28"E	45.06'

STA. 60+00.00 - 63+36.00

ELEVATIONS ARE IN NAVD 88



SURVEYORS CERTIFICATION

I, Russ P. Hugg, New Mexico Professional Surveyor Number 9750, hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugg
NMPS No. 9750
02/17, 2014

PROFESSIONAL SURVEYOR STATE OF NEW MEXICO No. 9750 RUSS P. HUGG

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. CONTRACTOR SHALL COORDINATE RELOCATION OF UTILITY LINES WITH UTILITY COMPANIES AS REQUIRED.
2. ALL CURVE DATA AND DIMENSIONS ARE CALCULATED FROM CENTERLINE OF PIPE OR MANHOLE. ALL SAS & SD SLOPES ARE CALCULATED TO TRUE PIPE DIMENSIONS FROM INVERT TO INVERT. (PAY ITEMS ARE SHOWN IN PARENTHESES)
3. GRADE ELEVATIONS, WHERE NOTED, ARE FOR FLOWLINE OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ALL DAMAGED EXISTING UTILITY CONDUITS AND EXISTING LINES.
5. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.
6. ANY DAMAGE TO THE EXISTING FACILITIES (CURB & GUTTER, PAVEMENT, LANDSCAPING, ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.
7. MH RIMS & CATCH BASIN INLET ELEVATIONS, FIRE HYDRANT & FLANGE ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY AND ADJUST TO FINAL PAVEMENT OR SURFACE GRADES.
8. STORM DRAIN STATIONING FOLLOWS CL OF STORM DRAIN UNLESS OTHERWISE NOTED
9. STATIONING OF DROP INLET IS TO MIDDLE OF DOWN HILL GRATE AT FACE OF CURB.
10. FLOWLINE ELEVATIONS FOR DROP INLETS ARE PROJECTED FROM FLOWLINE OF STANDARD CURB TO MIDDLE OF DOWNHILL GRATE.
11. ALL WATERLINE FITTINGS, VALVES, BENDS, TEES, CROSSES AND APPURTENANCES SHALL USE RESTRAINED JOINTS UNLESS OTHERWISE NOTED ON THE PLANS.
12. AT UTILITY CROSSING WHERE LESS THAN 1 FOOT OF COVER OVER STORM DRAIN PIPE IS PRESENT LEAN FILL IS TO BE USED FOR A DISTANCE OF 5 FEET ON EACH SIDE OF THE SD ℄ FROM TOP OF STORM DRAIN TO BOTTOM OF SANITARY SEWER OR WATER LINE.
13. RCP SHALL BE INSTALLED SO THAT THE JOINT GAP AT THE HOME POSITION SHALL CONFORM TO THE APPROVED MANUFACTURER'S RECOMMENDATIONS. MANUFACTURER'S RECOMMENDED JOINT GAP TOLERANCES FOR EACH PIPE SIZE AND TYPE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PLACEMENT OF PIPE. RCP JOINTS SHALL NOT BE GROUTED UNLESS DIRECTED BY THE ENGINEER AFTER CITY APPROVAL.
14. ALL EXCAVATION, TRENCHING AND SHORING ACTIVITIES MUST BE CARRIED-OUT IN ACCORDANCE WITH OSHA 29 CFR 1926.650 SUBPART P.

KEYED NOTES

[1] FUTURE CURB & GUTTER
[2] EXISTING CURB & GUTTER
[3] EXISTING EDGE OF ASPHALT
[4] EXISTING 48" STORM DRAIN

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE
A	Sarv-Tek	3/14

BENCH MARKS

ACS MONUMENT STAMPED "CC_TA_16_15_11N_2E"
GEOGRAPHIC POSITION (NAD 83)
N.M. STATE PLANE COORDINATES (CENTRAL ZONE)
X = 1,497,693.917 Y = 1,521,076.443
GROUND-TO-GRID FACTOR = 0.999667560
Δα = -00°16'30.67"
NAVD 1988 ELEVATION = 5417.800

AS-BUILT INFORMATION

CONTRACTOR	DYTHAN	DATE 3/14
STAKED BY	Sarv-Tek	DATE 6/12
INSPECTION'S PERFORMED BY	RHF	DATE 3/14
FIELD VERIFICATION BY	Sarv-Tek	DATE 7/14
DRAWINGS CORRECTED BY	Sarv-Tek	DATE 7/14
MICRO-FILM INFORMATION		
RECORDED BY		DATE
NO.		

ENGINEER'S SEAL
RUSS P. HUGG 14664 NEW MEXICO PROFESSIONAL ENGINEER 2/13/15

No.	Date	By	REMARKS
			REVISIONS
			DESIGN
			Designed By: SJS DATE: 10/2012
			Drawn By: DH DATE: 10/2012
			Checked By: SJS DATE: 10/2012

Bohannan Huston

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

THE TRAILS UNIVERSE STORM DRAIN
UTILITY PLAN AND PROFILE
STA. 60+00.00 - 63+36.00

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.
APPROVED MAR 12 2013 DESIGN REVIEW COMMITTEE	APPROVED JUL 2013 CITY ENGINEER			

City Project No.	Zone Map No.	Sheet	Of
761283	C-9 / D-9	8	19

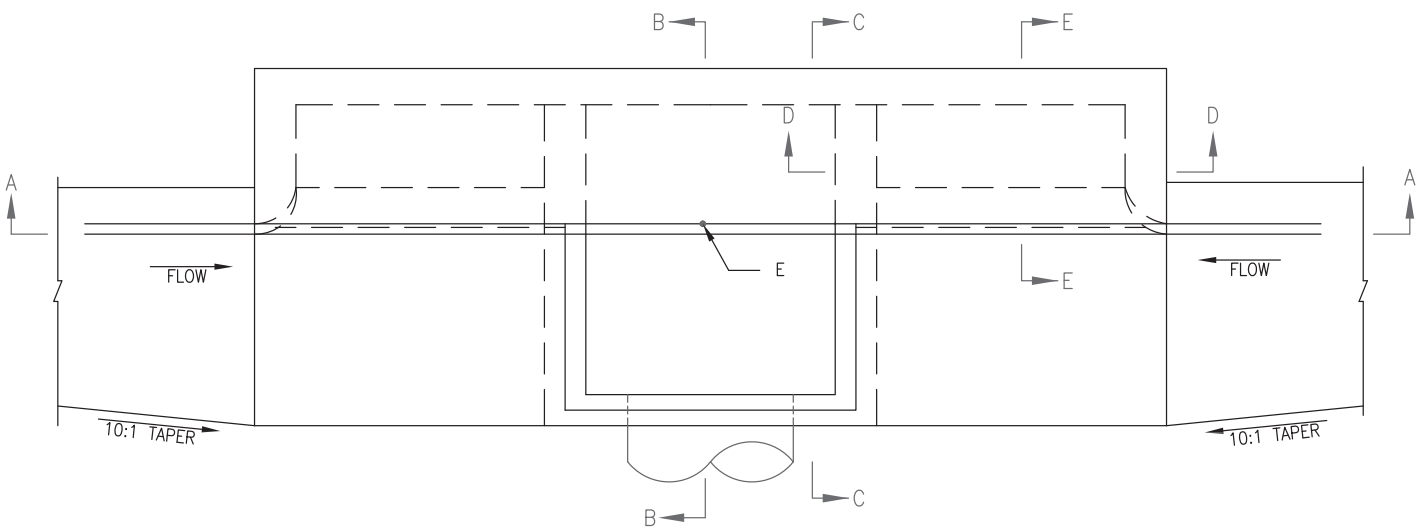
SCALE: 1" = 50' (HORIZ.)
1" = 10' (VERT.)

P:\20130203\CDP\Plans\PNP\Universe SD_Upnp06.dwg
February 13, 2013 - 9:20am

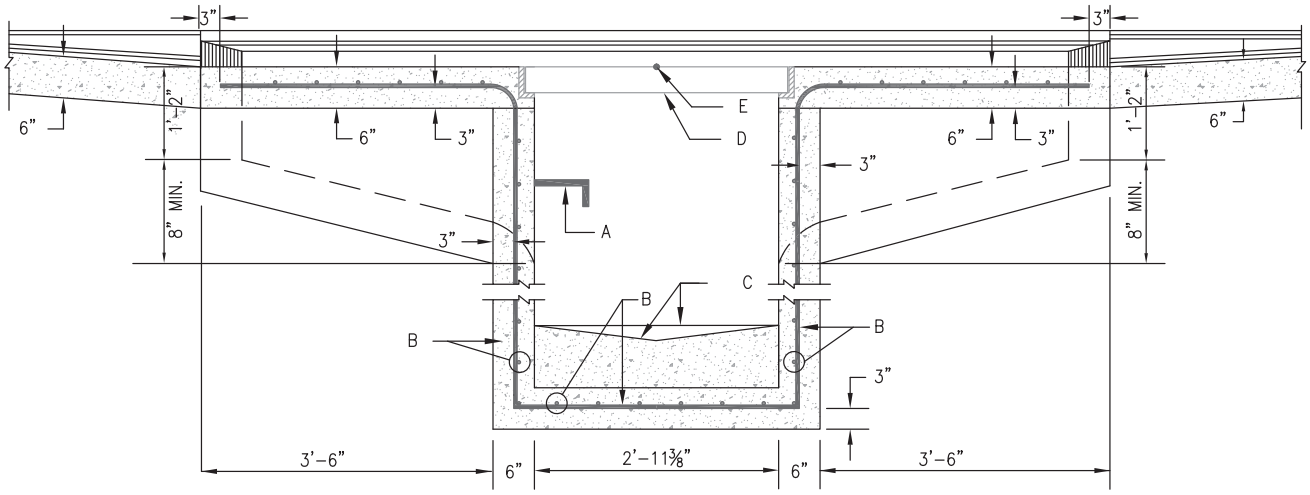
SECTION 2200

STANDARD DETAILS FOR DRAINAGE

DWG. NO.	TITLE
2201	DRAINAGE STORM INLET TYPE “A” PLAN AND SECTION A-A
2201A	DRAINAGE STORM INLET TYPE “SGL A-DBL WING” PLAN AND SECTION A-A
2201B	DRAINAGE STORM INLET TYPE “DBL A-SGL WING” PLAN AND SECTION A-A
2201C	DRAINAGE STORM INLET TYPE “DBL A-DBL WING” PLAN AND SECTION A-A
2202	DRAINAGE STORM INLET TYPE “A” SECTIONS B-B, C-C, D-D, AND E-E
2205	DRAINAGE STORM INLET TYPE “C”
2206	DRAINAGE STORM INLET TYPE “D”
2207	DRAINAGE STORM INLET GUTTER TRANSITION
2208	DRAINAGE STORM SEWER MANHOLE TYPE “C”
2209	DRAINAGE STORM SEWER MANHOLE TYPE “E”
2210	DRAINAGE STORM SEWER MANHOLE FRAME AND COVER
2212	DRAINAGE STORM SEWER CONCRETE MANHOLE TOP SLAB TYPE “C”
2215	DRAINAGE STORM INLET CENTER SUPPORT ASSEMBLY
2216	DRAINAGE STORM INLET FRAME
2220	DRAINAGE STORM INLET ALBUQUERQUE GRATE
2222	DRAINAGE INLET SHAPING
2229	DRAINAGE STEP DETAILS
2235	DRAINAGE DRAIN LINE THROUGH CURB
2236	DRAINAGE SIDEWALK CULVERT
2237	DRAINAGE DRAIN LINE CONNECTION TO EXISTING STORM INLET
2240	HP PP STORM TRENCH INSTALLATION
2250	DRAINAGE STATIONARY AND REMOVABLE POST DETAILS
2251	DRAINAGE PIPE GATE DETAIL
2252	DRAINAGE STANDARD CHAIN LINK GATE AND FENCE DETAIL
2253	DRAINAGE SQUARE TUBE GATE DETAIL
2260	DRAINAGE TYPICAL LINING FOR DRAINAGE EASEMENTS
2261	DRAINAGE CHANNEL DETAILS
2265	DRAINAGE CHANNEL EXPANSION JOINT WITH SLEEPER
2266	DRAINAGE EXPANSION JOINT CONNECTION TO CONCRETE WALL
2267	DRAINAGE CHANNEL EXPANSION JOINT REPAIR
2268	DRAINAGE SLEEP JOINT PROTECTION PLATE
2270	DRAINAGE WIRE ENCLOSED RIPRAP
2271	DRAINAGE CATTLE GUARD INLET
2272	DRAINAGE CATTLE GUARD INLET
2273	DRAINAGE MEDIAN STORM INLET
2274	DRAINAGE STATIONING AND WATER DEPTH MARKS IN CONC. LINED CHANNEL SECTION



PLAN



SECTION A-A

GENERAL NOTES

1. SEE DWG. 2202 FOR TYPE "A" INLET SECTIONS B-B, C-C, D-D, AND E-E.
2. FOR STORM INLET GUTTER TRANSITION, SEE DWG. 2207.
3. OUTLET PIPE SIZE, PER DESIGN REQUIREMENT. (MAXIMUM SIZE = 24")
4. MAXIMUM INLET DEPTH = 10'. FOR DEPTHS EXCEEDING 10', A SEPARATE STRUCTURAL DESIGN WILL BE REQUIRED.
5. FOR FRAME & GRATING, SEE DWG. 2216, 2220 OR 2221.
6. "DRAINS TO RIVER" ALUMINUM MEDALLION SHALL BE INSTALLED ON EACH NEW STORM INLET. THE MEDALLION IS TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS IN THE CENTER OF THE INLET, WITH THE BOLT HOLE 6 INCHES FROM THE FRONT OF THE INLET.

CONSTRUCTION NOTES

A. FOR STORM INLET DEPTHS GREATER THAN 4', INSTALL STD. STEPS, SEE DWG. 2229.

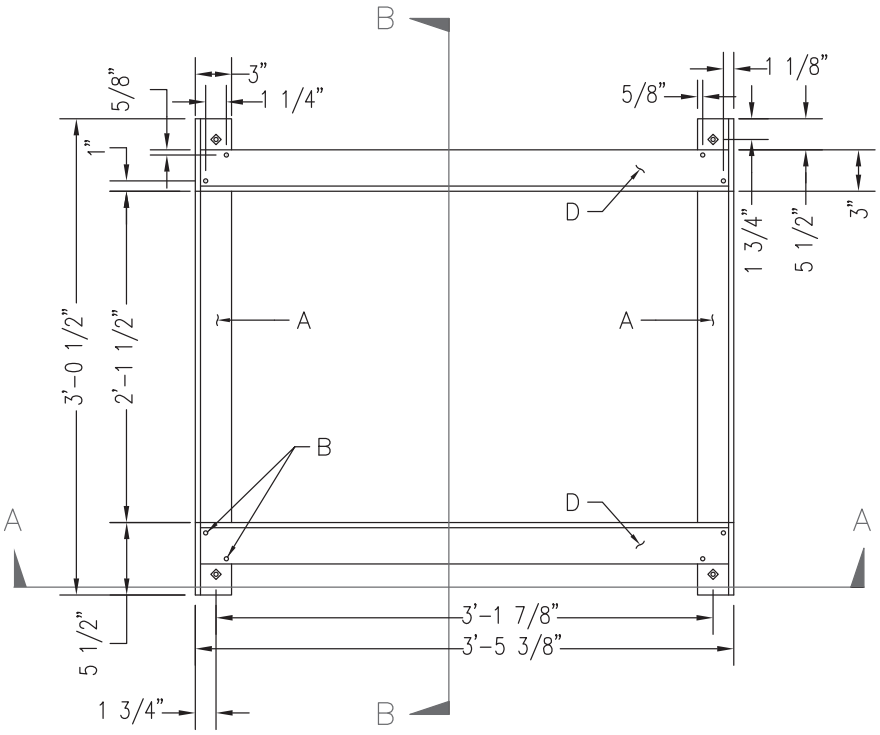
B. NO. 4 BARS AT 6" O.C. EACH WAY.

C. CONCRETE FILL, SHAPE PER DWG 2222.

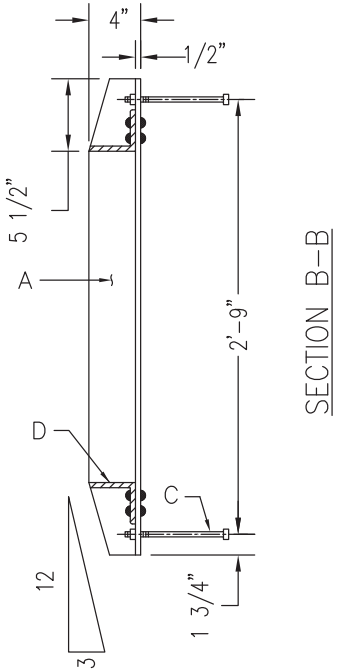
D. GRATE AND FRAME.

E. CONTROL POINT FOR TOP OF GRATE ELEVATION AND HORIZONTAL CONTROL.

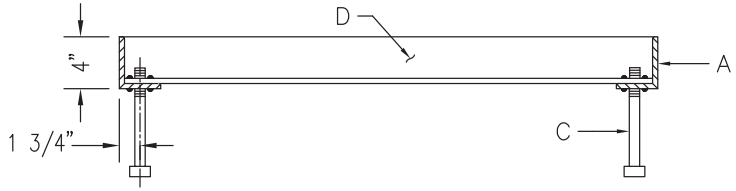
REVISIONS	CITY OF ALBUQUERQUE
	DRAINAGE STORM INLET TYPE "SGL A-DBL WING" PLAN AND SECTION A-A DWG. 2201A JUNE 2019



PLAN



SECTION B–B



SECTION A–A

GENERAL NOTES

1. ALL EXPOSED METAL PARTS SHALL BE PAINTED PRIOR TO ASSEMBLY. WELDING, MACHINING AND DRILLING SHALL BE DONE PRIOR TO PAINTING. ALL DIMENSIONS ARE FINISH DIMENSIONS.
2. ALL PARTS SHALL BE OF STRUCTURAL STEEL, GRADE 36.
3. AFTER CLEANING SURFACE OF SCALE, RUST, ETC, GRATING FRAME AND CENTER SUPPORT SHALL BE PAINTED WITH ONE SHOP COAT RED OXIDE, TWO FINISH COATS ALUMINUM PAINT (AASHTO M 69)
4. FRAME MAY BE WELDED OR RIVETED.

CONSTRUCTION NOTES

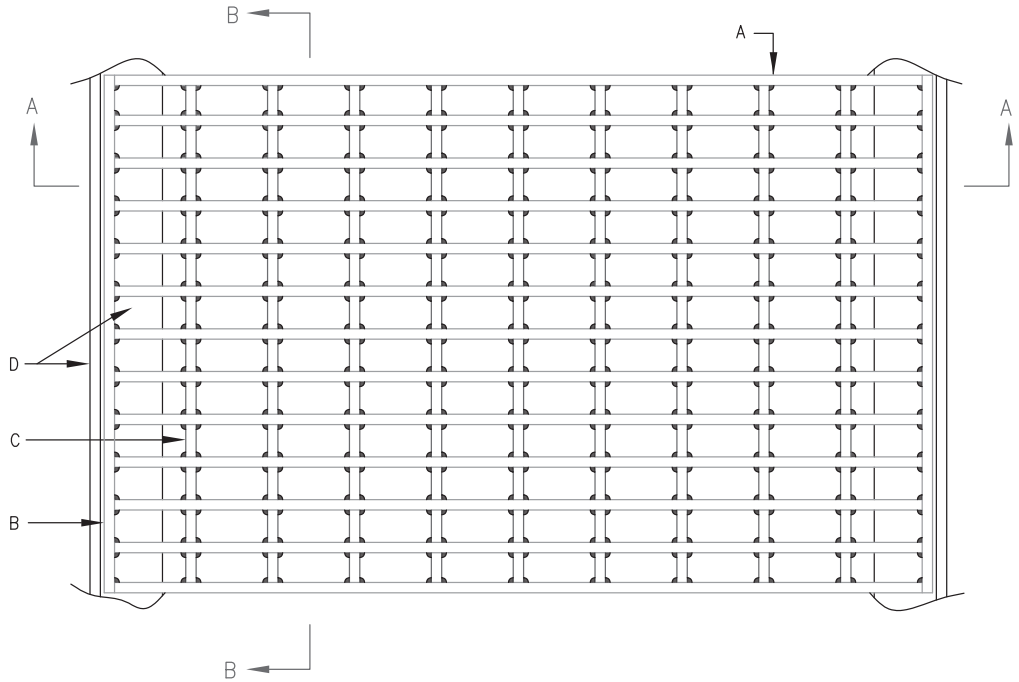
A. 4" X 3" X 1/2" X 3'-1/2" ∠ .

B. (2) 3/8" RIVETS AT EACH CORNER.

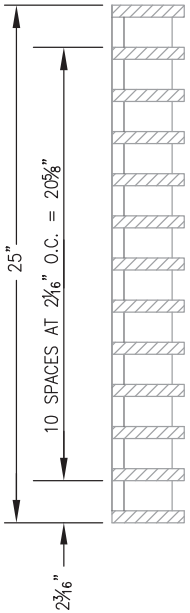
C. (4) 1/2" X 8" BOLTS WITH SQUARE HEAD AND NUT AT EACH CORNER. FOR ANCHORING FRAME INTO CONCRETE WALL.

D. 3 1/2" X 3" X 3/8" X 3'-4 3/8" ∠ .

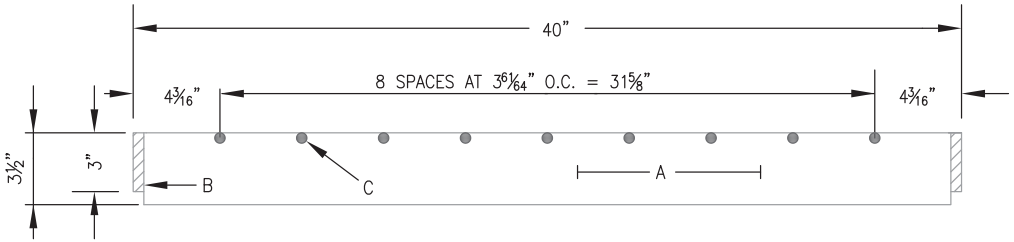
REVISIONS	CITY OF ALBUQUERQUE
	DRAINAGE
	STORM INLET FRAME
	DWG. 2216 JUNE 2019



PLAN



SECTION B–B



SECTION A–A

GENERAL NOTES

1. ALL BARS SHALL BE GRADE A36 STRUCTURAL STEEL.
2. THE GRATE SHALL BE WELDED WITH ⅛" FILLET WELD AROUND BOTH SIDES OF CROSS BARS, ¼". FILLET WELD BOTH SIDES OF BEARING BARS TO END BARS.
3. AFTER CLEANING SURFACE OF SCALE, RUST, OILS, ETC., PAINT GRATE WITH ONE SHOP COAT RED OXIDE, TWO FINISH COATS ALUMINUM PAINT (AASHTO M 69).
4. TOP OF CROSS BARS SHALL BE FLUSH WITH TOP OF GRATE.
5. GRIND WELDS FLUSH WITH BEARING BARS.
6. WHEN INSTALLED IN FRAME, PUSH TIGHT TO THE FRAME ON THE ROAD SIDE SO THAT IT IS FLUSH WITH THE FRAME. THE SIDE ALONG THE CURB LINE SIDE SHALL HAVE ½" MAX. OPENING. SPACERS WELDED TO FRAME MAY BE USED IF REQUIRED TO KEEP ½" SPACE OR LESS.
7. WHEN INSPECTING OR DOING ROAD REHAB PROJECTS, IF THE GRATE IS NOT FLUSH WITH THE FRAME ON THE ROAD SIDE EDGE, COVER PLATES WELDED TO THE FRAME MAY BE USED TO COVER ANY GAPS.
8. INSTALLED VOID SPACE AREA: 3.72 SQUARE FEET OR 536 SQUARE INCHES. VOID SPACE CALCULATED AS TOTAL AREA EXCLUSIVE OF: BEARING BARS, CROSS BARS, END BARS, FRAME, AND WELDS.

CONSTRUCTION NOTES

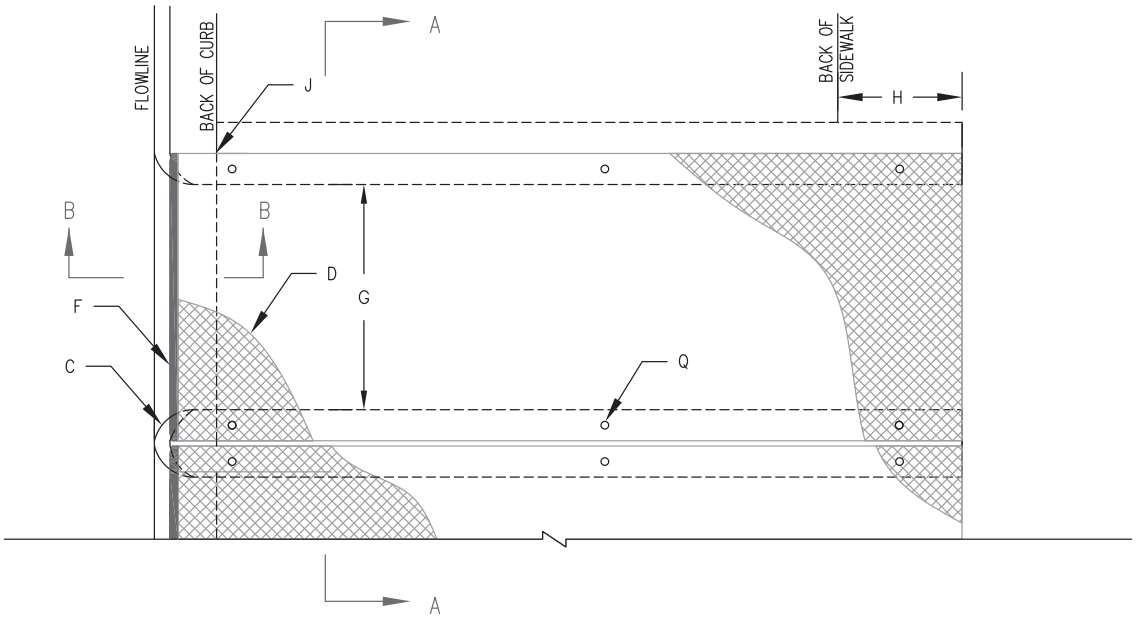
A. BEARING BARS, (13) PL ½ x 3½ x 39".

B. END BARS, (2) PL ½ x 3 X 25".

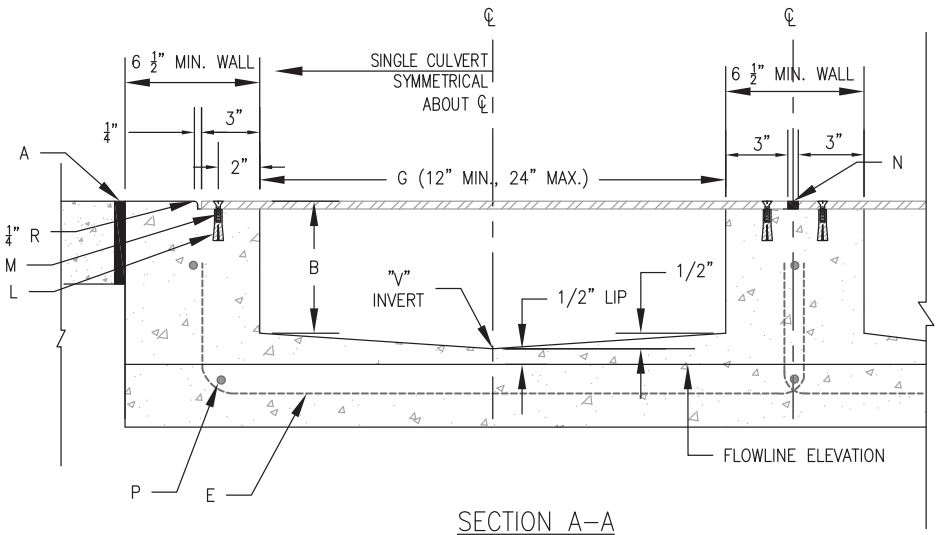
C. CROSS BARS, (9) ½ø X 24" ROD.

D. FRAME, SEE DWG. 2216.

REVISIONS	CITY OF ALBUQUERQUE
	DRAINAGE STORM INLET ALBUQUERQUE GRATE DWG. 2220 JUNE 2019



PLAN
SINGLE OR MULTIPLE CULVERT



SECTION A–A
SINGLE OR MULTIPLE CULVERT

GENERAL NOTES

1. PLACING OF DRAIN THRU EXISTING SIDEWALK AND CURB & GUTTER REQUIRES THAT THE ENTIRE SIDEWALK AND CURB AND GUTTER STONES BE REMOVED AND REPLACED AS DETAILED HEREIN.
2. THE CULVERT SHALL BE POURED MONOLITHICALLY WITH NEW GUTTER.
3. THE INVERT SHALL BE TROWELED TO PRODUCE A HARD POLISHED SURFACE OF MAXIMUM DENSITY AND SMOOTHNESS. INVERT SHALL BE V–SHAPED TO WITHIN 3" OF OUTLET, THEN WARPED PARALLEL TO FLOWLINE AT THE OUTLET, UNLESS OTHERWISE SHOWN.
4. LENGTH OF EACH PLATE SHALL BE SUCH THAT THE WEIGHT WILL NOT EXCEED 300 LBS. CLEAN SURFACE OF PLATE AND PAINT WITH ONE SHOP COAT RED OXIDE AND TWO FINISH COATS ALUMINUM PAINT (AASHTO M 69).
5. THE CITY WILL NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF ANY SIDEWALK CULVERT INSTALLED BY OR FOR PRIVATE PROPERTY OWNERS.
6. CULVERT MUST BE PERPENDICULAR TO THE CURB.

CONSTRUCTION NOTES

A. INSTALL ½" EXPANSION JOINT.

B. 7" DEPTH WHEN USED IN CONJUNCTION WITH 8" CURB; 5" DEPTH WHEN USED WITH 6" CURB.

C. 3" RADIUS (TYPICAL).

D. ⅜" CHECKERED STEEL PLATE (PAINT PER NOTE 4, ABOVE).

E. NO. 3 REBAR ⌙, SPACE AT 18" O.C. MAXIMUM, 1½" MINIMUM FROM FACE OF CONCRETE. STAGGER FOR MULTIPLE CULVERTS.

F. WELD ¾" STEEL ROD TO PLATE, FULL LENGTH OF PLATE; GRIND ENDS FLUSH TO THE FACE OF CURB.

G. DRAIN WIDTH PER PLAN (12" MINIMUM, 24" MAXIMUM).

H. EXTEND CULVERT AND STEEL PLATE 1–FOOT BEYOND BACK OF SIDEWALK, UNLESS RESTRICTED BY PROPERTY LINE.

J. IF SIDEWALK IS NOT AT BACK OF CURB, EXTEND CULVERT AND STEEL PLATE TO FACE OF CURB.

K. SLOPE ¼" PER FOOT (MINIMUM).

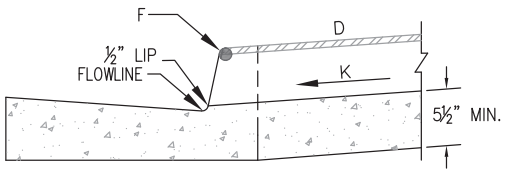
L. FOR SECURING PLATE USE POWERS® 3/8–16 CARBON STEEL FLANGED DROPIN ANCHOR OR APPROVED EQUAL. INSTALL USING SETTING TOOL AND MANUFACTURER'S INSTRUCTIONS AT MAX 24" O.C. A MINIMUM OF 2 PER SIDE AND WITHIN 6'" OF EACH END.

M. 3/8–16X1" COUNTERSUNK, STAINLESS STEEL, MACHINE SCREW. COVER HEAD WITH 2–PART EPOXY.

N. FILL VOID BETWEEN PLATES WITH NP–1 SEALANT OR CITY APPROVED EQUIVALENT.

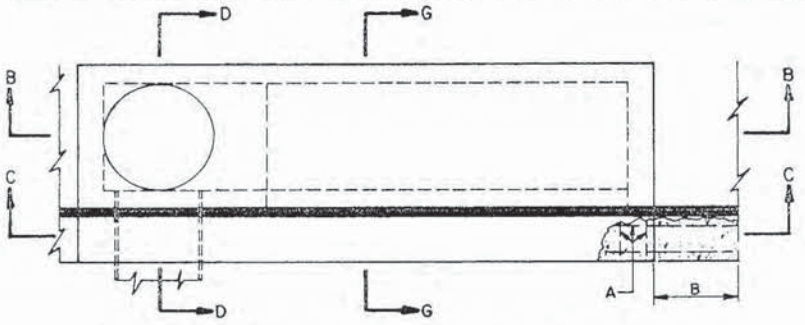
P. NO. 3 REBAR, CONTINUOUS.

Q. HOLE DIAMETER AT BOTTOM OF COUNTERSUNK HOLE OF STEEL PLATE TO BE ½" DIAMETER.

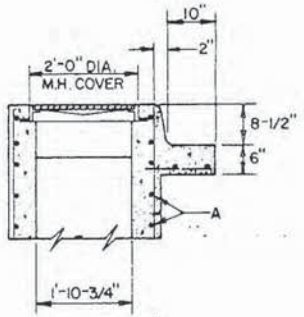


SECTION B–B
SINGLE OR MULTIPLE CULVERT

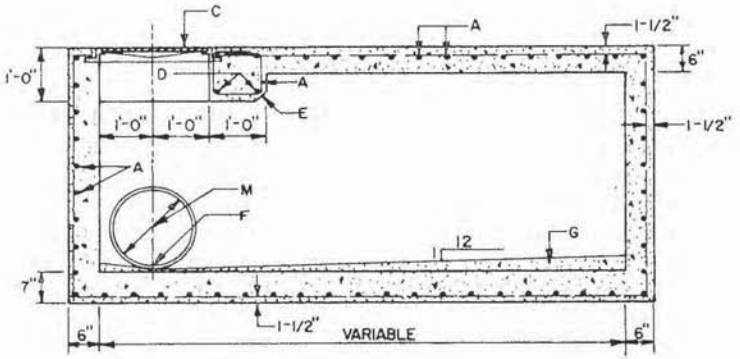
REVISIONS	CITY OF ALBUQUERQUE
	DRAINAGE SIDEWALK CULVERT PLAN, AND SECTIONS A–A AND B–B DWG. 2236 JUNE 2019



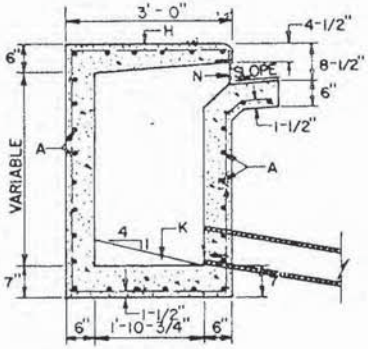
PLAN OF SPECIAL DROP INLET AT MEDIAN



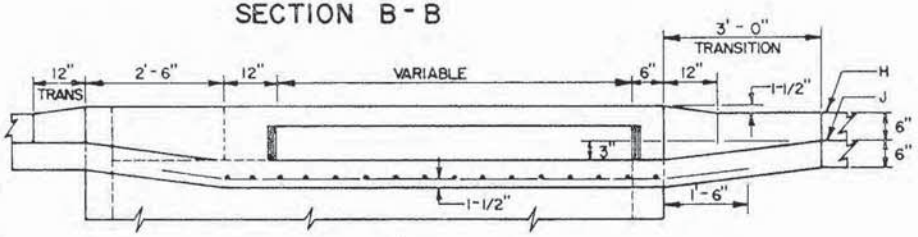
SECTION D-D



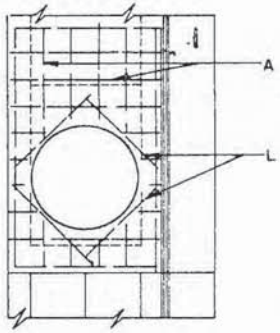
SECTION B-B



SECTION G-G



SECTION C-C



TOP MAT OF
REINFORCEMENT

GENERAL NOTES

1. FOR STORM INLET GUTTER TRANSITION, SEE STD. DETAIL DWG. 2207.
2. OUTLET PIPE SIZE, PER DESIGN REQUIREMENT.

CONSTRUCTION NOTES

A. NO. 4 REBAR @ 6" O.C. EACH WAY.
B. EXTEND REBARS 1'-6" (TYP.)
C. MANHOLE FRAME AND COVER PER. CITY OF ALBUQUERQUE STD. DETAIL DWG. 2110.
D. 2 EACH, NO. 5 REBAR @ 6" O.C.
E. 2" CHAMFER.
F. INVERT PER PLAN.
G. CONCRETE FILL.
H. TOP OF MEDIAN CURB.
J. FLOWLINE.
K. CONCRETE FILL 4:1 MINIMUM SLOPE TOWARDS OUTLET AND 12:1 TRANSVERSE.
L. NO. 4 REBARS, 8 EACH.
M. OUTLET STORM DRAIN.
N. 6" MINIMUM OPENING

CITY OF ALBUQUERQUE

DRAINAGE

MEDIAN STORM INLET

DWG. 2273

JUNE 1992