

CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Interim Director



Mayor Timothy M. Keller

July 23, 2019

Scott Eddings, P.E.
Huitt-Zollars
333 Rio Rancho Blvd., Suite 101
Rio Rancho, NM 87124

RE: **Winrock Road B Extension**
2100 Louisiana Blvd NE
Grading Plan Stamp Date: 7/15/19
Drainage Report Stamp Date: 7/15/19
Hydrology File: J19D058G

Dear Mr. Eddings:

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

Based on submittal received on 7/11/19, the Grading Plan and Drainage Report are approved for Grading Permit and Building Permit. This action resolves the violation of the Drainage Ordinance, as stated in the letter sent to property owner, dated 6/20/19.

As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Curtis Cherne, PE, ccherne@cabq.gov, 924-3420) 14 days prior to any earth disturbance.

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services

C (email): Fred Gorenz (gorenz@goodmanrealty.com)



City of Albuquerque

Planning Department
Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Winrock Town Center - Road B Extension

Project Title: Grading and Drainage Building Permit #: _____ Hydrology File #: J19D058G

DRB#: 2018-001579 EPC#: _____ Work Order#: 4553.90

Legal Description: A-1-A-1-A-1 Winrock Town Center

City Address: 2100 Louisiana Blvd NE

Applicant: Winrock Partners LLC Contact: Darin Sand

Address: 100 Sun Avenue

Phone#: 505-881-0100 Fax#: _____ E-mail: seddings@huitt-zollars.com

Other Contact: Huitt-Zollars, Inc. Contact: Scott Eddings

Address: 333 Rio Rancho Blvd, Rio Rancho, NM 87124

Phone#: 505-235-7211 Fax#: _____ E-mail: seddings@huitt-zollars.com

TYPE OF DEVELOPMENT: _____ PLAT (# of lots) _____ RESIDENCE ☒ DRB SITE _____ ADMIN SITE

IS THIS A RESUBMITTAL? ☒ Yes _____ No

DEPARTMENT _____ TRANSPORTATION ☒ HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

- ☐ ENGINEER/ARCHITECT CERTIFICATION
- ☐ PAD CERTIFICATION
- ☐ CONCEPTUAL G & D PLAN
- ☒ GRADING PLAN
- ☒ DRAINAGE REPORT
- ☐ DRAINAGE MASTER PLAN
- ☐ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
- ☐ ELEVATION CERTIFICATE
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ TRAFFIC IMPACT STUDY (TIS)
- ☐ STREET LIGHT LAYOUT
- ☐ OTHER (SPECIFY) _____
- ☐ PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☐ BUILDING PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY
- ☒ PRELIMINARY PLAT APPROVAL
- ☐ SITE PLAN FOR SUB'D APPROVAL
- ☒ SITE PLAN FOR BLDG. PERMIT APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ SIA/ RELEASE OF FINANCIAL GUARANTEE
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ GRADING PERMIT APPROVAL
- ☐ SO-19 APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ GRADING/ PAD CERTIFICATION
- ☐ WORK ORDER APPROVAL
- ☐ CLOMR/LOMR
- ☐ FLOODPLAIN DEVELOPMENT PERMIT
- ☐ OTHER (SPECIFY) _____

DATE SUBMITTED: July 17, 2019 By: Scott Eddings

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

WINROCK TOWN CENTER ROAD B EXTENSION DRAINAGE STUDY

Prepared For



Project Location:

Albuquerque, New Mexico

JULY 2019



Prepared By

HUITT-ZOLLARS

ENGINEERING ARCHITECTURE CONSTRUCTION MANAGEMENT SURVEY

6501 Americas Parkway, NE, Suite 830
Albuquerque, NM 87110
(505) 883-8114, Fax (505) 883-5022
www.huitt-zollars.com



**WINROCK TOWN CENTER ROAD B EXTENSION
DRAINAGE STUDY**

**CITY OF ALBUQUERQUE
PROJECT NO. 4553.90**

PREPARED FOR:



PREPARED BY:

HUITT-ZOLIARS
333 RIO RANCHO BLVD., SUITE 101
RIO RANCHO, NEW MEXICO 87124

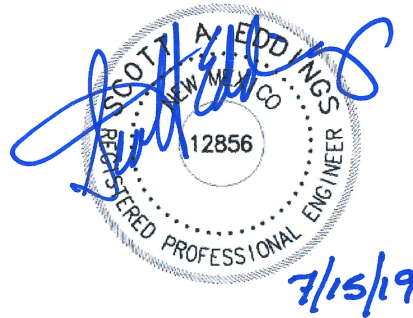
JULY 2019

HZI Project No. R303699.04



Winrock Town Center Road B Extension Drainage Study

I, Scott A. Eddings, being first duly sworn upon my oath, state that I am a registered professional engineer, qualified in civil engineering and that the accompanying report was prepared by me or under my supervision and is true and correct to the best of my knowledge and belief.





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INTRODUCTION

This drainage report addresses the proposed infrastructure required to convey the storm water runoff from Road B Extension and surrounding developments. Existing and proposed conditions have been analyzed to determine infrastructure requirements to improve drainage conditions along Road B Extension.

FLOOD HAZARD ZONE

Winrock Town Center does not lie within a flood zone as shown on Flood Insurance Rate Map Number 35001C0352H, dated August 16, 2012. See Appendix A for the FEMA Flood Insurance Rate Map.

RELATED REPORTS

This report references the Drainage Master Plan for Winrock Town Center (DMP) by Isaacson & Arfman, PA, dated June 26, 2015. The DMP provided analysis for Winrock Town Center. All hydrology calculations were completed for the 100-year, 6-hour storm. The DMP defines allowable peak flowrates at major analysis points. This drainage study for Road B Extension will utilize hydrology calculations from the DMP.

This report also references the Winrock Town Center Drainage Implementation Plan (DIP) by Huitt-Zollars, Inc., dated May 23, 2019. The DIP provides a basis for storm drain system recommendations for this report.

JURISDICTIONS OF PUBLIC AGENCIES

This project is located entirely within the City of Albuquerque (CoA) Municipal Limits and is therefore within their jurisdiction and must comply with the City's development requirements. The storm drain system will remain private as it currently is.

METHODOLOGY

This drainage report follows procedures outlined in the Development Process Manual, Chapter 22, by City of Albuquerque (DPM). This report will utilize hydrology calculations from the DMP. This report will utilize Bentley StormCAD V8i for the hydraulic modeling of the storm drain pipe system. For headloss calculations at junctions, the HEC-22 Energy Method (Third Edition) was chosen to comply with City of Albuquerque DPM requirements. See Appendix E for the StormCAD output files.



EXISTING CONDITIONS

Winrock site is a complex of buildings that includes the main mall, a number of outlying restaurants, Chuze, and movie theater. The existing mall building is composed of a number of individual buildings that were closed by an overall structure. The site is approximately 80 acres which is approximately 88% impervious. As previously studied in recent drainage reports, the site has multiple drainage outfalls which are summarized below and shown on Exhibit 1 of the Winrock Town Center Drainage Implementation Plan:

- AP-A – Discharge flowrate = 81.9 CFS
- AP-B – Discharge flowrate = 123.4 CFS
- AP-C – Discharge flowrate = 15.5 CFS
- AP-D – Discharge flowrate = 120.1 CFS
- AP-E – Discharge flowrate = 5.5 CFS
- AP-F – Discharge flowrate = 12.9 CFS
- AP-G – Discharge flowrate = 81.1 CFS

Winrock Partners, LLC completed Phase A infrastructure improvements in 2017. Phase A infrastructure included the following roadway segments as summarized below:

- Road B from Louisiana Blvd to the western face of the existing Winrock Mall
 - public roadway
 - public storm drain
 - public water line
 - public sanitary sewer line
 - public reuse water line
- Road C from Uptown Loop to current Men's Warehouse,
 - public roadway
 - public storm drain
 - public water line
 - public sanitary sewer line
- Road D from Road B to Road C
 - public roadway
 - public storm drain
 - public water line

Road B Extension project occurs within the demolished portion of Winrock Mall and will connect the existing Road B to the Regal Cinemas parking lot.



PROPOSED CONDITIONS

Construction limits of this project are the Regal Cinemas at the east end and Road D at the west end along the Road B Extension corridor. This project proposes to build the roadway, associated underground utilities, and the necessary storm drain improvements affecting the Road B Extension project area.

See Appendix B for a Basin Map. Existing basins delineated from the DMP are used for this report. Proposed basins affecting the drainage within the Road B Extension project are delineated from the proposed grading plan to be completed in conjunction with this drainage report. The proposed basins are slightly modified from the DMP existing basins, however, the minor changes do not affect the overall drainage system of Winrock Town Center. This project discharges into the storm drain systems of Analysis Point B (AP-B) and Analysis Point D (AP-D). Proposed basin peak flowrates were prorated from the DMP existing basins. Refer to the table below for a flowrate comparison at the ultimate outfalls of AP-B and AP-D.

Analysis Point	Allowable Q per DMP (CFS)	Actual Q (CFS)
AP-B	123.4	121.9
AP-D	120.1	118.6

All drainage inlets to be installed with this project are designed in a sump condition. Refer to Appendix C for inlet calculations.

Storm Drain System AP-D begins with three contributing basins: SW Culverts, SW Culverts 1, and First Flush. These three basins drain into a stormwater quality pond and directly into the AP-D storm drain. Basin MH7A will collect flow from the west end of the Road B Extension project and drain into AP-D before it connects into the existing storm drain.

Storm Drain System AP-B begins with Basin MH9A1, Basin Inlet 8C, and Basin MH7 which collects developed runoff from the northeast corner of the site. Basin MH6 will then drain into AP-B from a future detention pond. Basin Inlet 4B is the final contributing basin into AP-B from the Road B Extension project before it connects into the existing storm drain of AP-B.

The hydraulic capacity of the existing storm drain systems have been modeled and determined that it can adequately convey storm water from the project area during the design storm event. Hydraulic analysis of the storm drain system was completed with the use of StormCAD, a sewer modeling program. Please refer to Appendix E for StormCAD Output Files. Construction plans for this project include hydraulic grade lines computed by StormCAD.



STORMWATER QUALITY

As part of compliance with the stormwater quality program implemented by the City of Albuquerque in cooperation with the EPA, a number of Low Impact Development (LID) strategies are included in the Road B Extension project. First, a swale between the sidewalk and curb will be installed on the north side of the roadway to collect roadway runoff. This swale connects to a detention facility that will manage the first flush volume of a storm and then convey stormwater into the storm drain system. Finally, a larger detention pond will be built at the east end of Road B Extension with a future construction phase. This pond will serve as a dual use stormwater quality management and flood control device. With the installation of these LID strategies, the stormwater released within the Road B Extension project limits will be effectively treated.

CONCLUSION

This report provides a conceptual design and analysis of proposed improvements to safely manage stormwater generated along the Road B Extension project. In addition to stormwater management, this project will integrate techniques to improve stormwater quality. For a detailed design, please refer to the construction plans that were completed in conjunction with this drainage report.

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

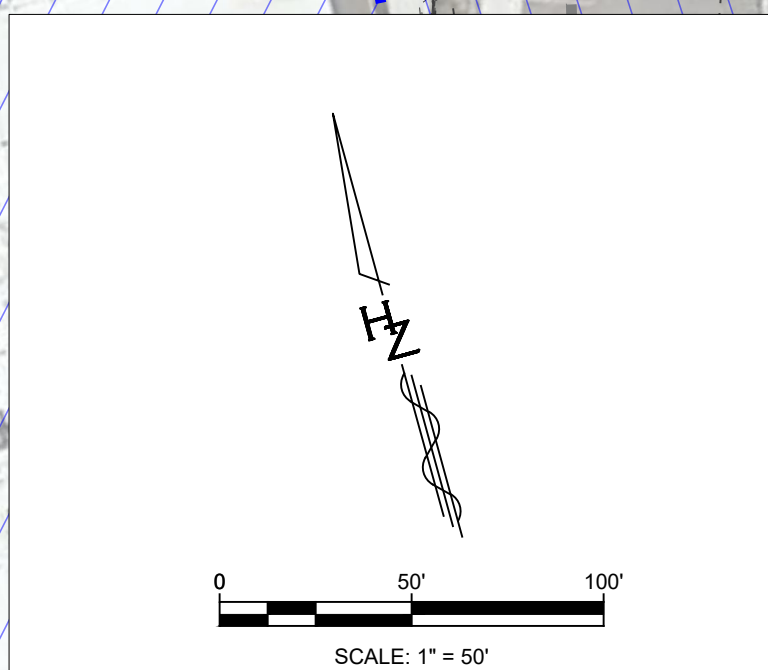
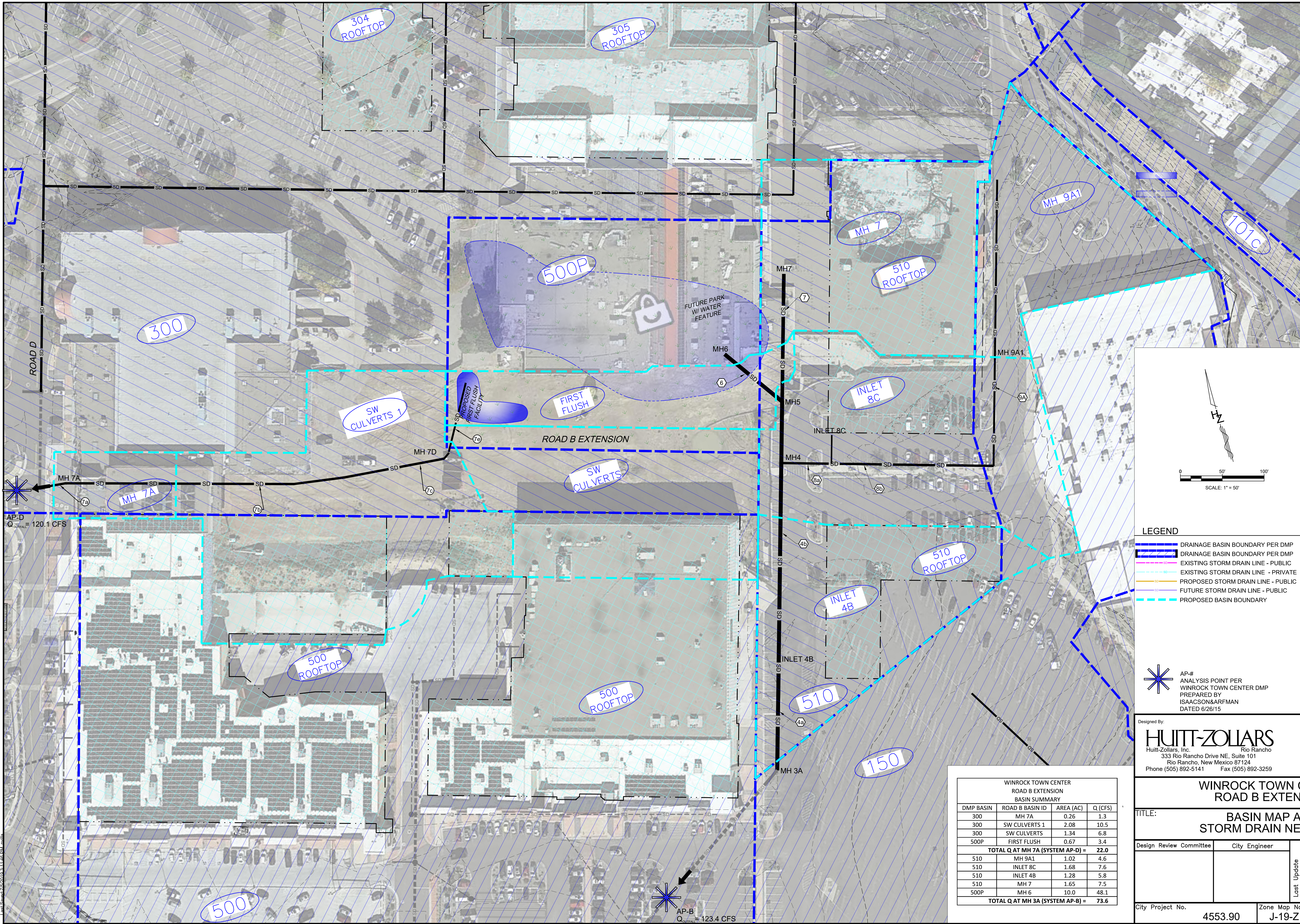
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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

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- LEGEND**
- DRAINAGE BASIN BOUNDARY PER DMP
 - DRAINAGE BASIN BOUNDARY PER DMP
 - EXISTING STORM DRAIN LINE - PUBLIC
 - EXISTING STORM DRAIN LINE - PRIVATE
 - PROPOSED STORM DRAIN LINE - PUBLIC
 - FUTURE STORM DRAIN LINE - PUBLIC
 - PROPOSED BASIN BOUNDARY

AP-#
ANALYSIS POINT PER
WINROCK TOWN CENTER DMP
PREPARED BY
ISAACSON&BARFMAN
DATED 6/26/15

Designed By:
HUITT-ZOLIARS
Huitt-Zoliars, Inc. Rio Rancho
333 Rio Rancho Drive NE, Suite 101
Rio Rancho, New Mexico 87124
Phone (505) 892-5141 Fax (505) 892-3259

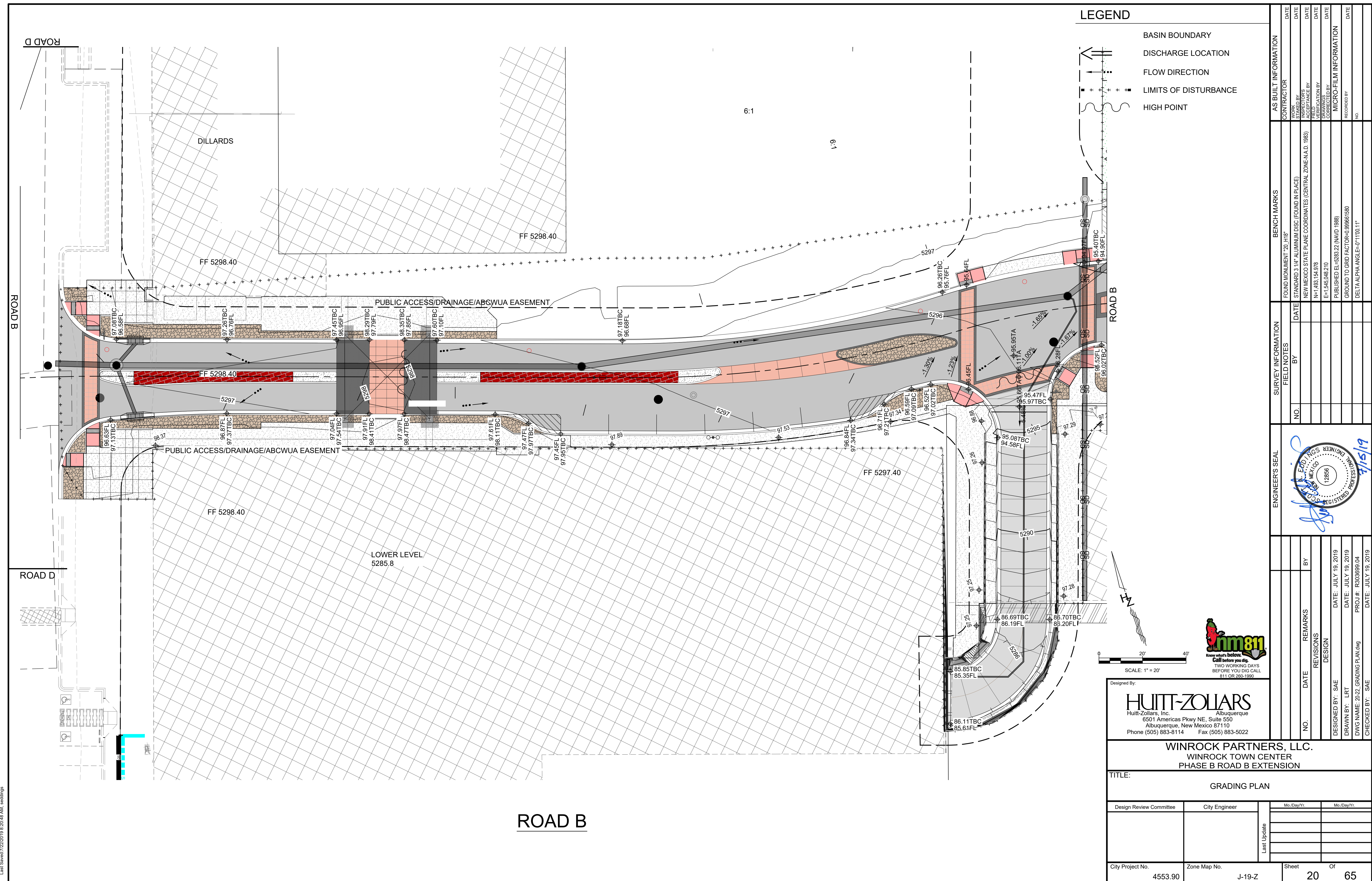
WINROCK TOWN CENTER ROAD B EXTENSION BASIN SUMMARY			
DMP BASIN	ROAD B BASIN ID	AREA (AC)	Q (CFS)
300	MH 7A	0.26	1.3
300	SW CULVERTS 1	2.08	10.5
300	SW CULVERTS	1.34	6.8
500P	FIRST FLUSH	0.67	3.4
TOTAL Q AT MH 7A (SYSTEM AP-D) =			22.0
510	MH 9A1	1.02	4.6
510	INLET 8C	1.68	7.6
510	INLET 4B	1.28	5.8
510	MH 7	1.65	7.5
500P	MH 6	10.0	48.1
TOTAL Q AT MH 3A (SYSTEM AP-B) =			73.6

WINROCK TOWN CENTER ROAD B EXTENSION

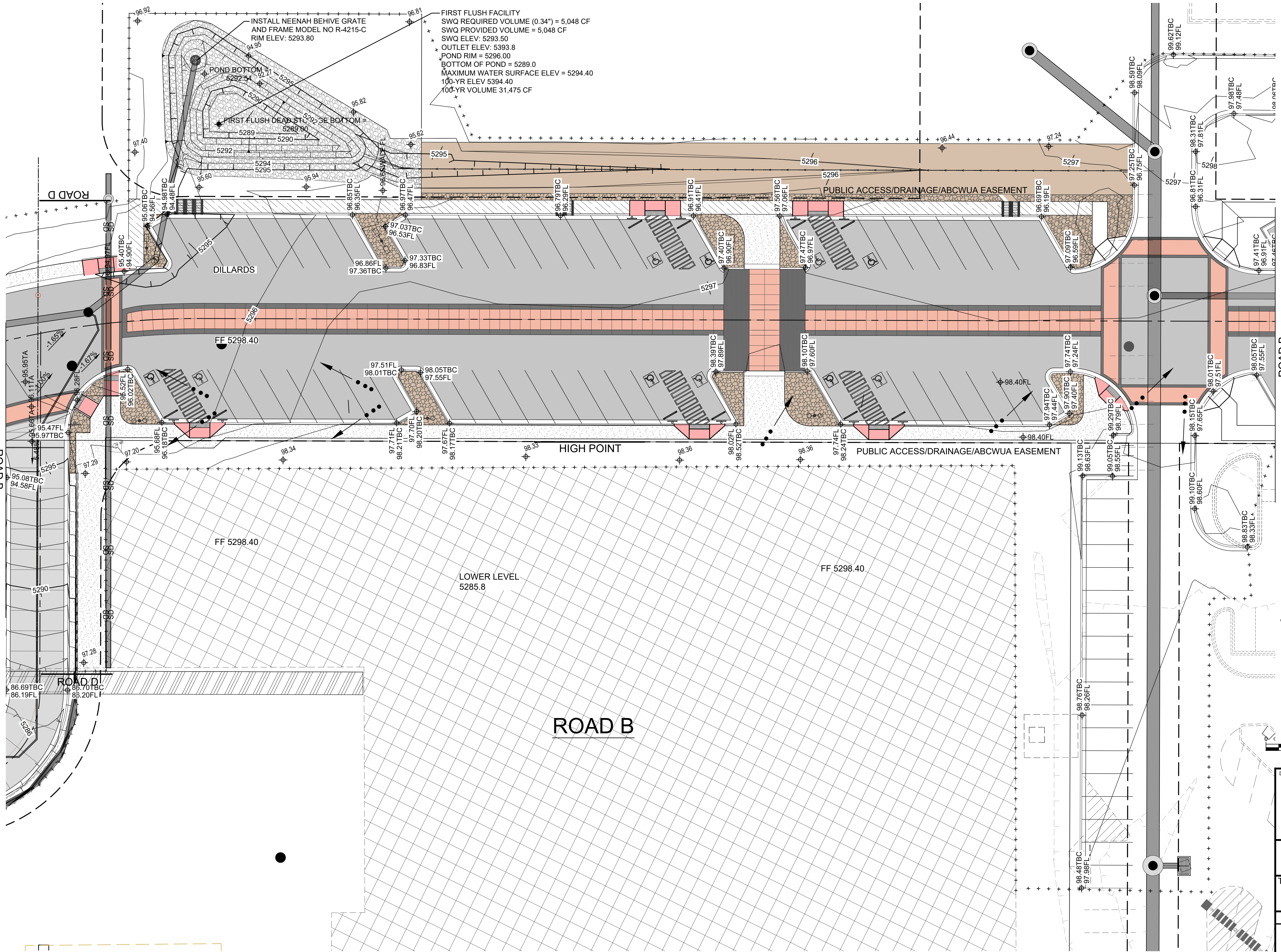
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Last Update					
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Sheet		Of		EXHIBIT 1	

SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
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				INSPECTOR'S	DATE
				ACCEPTANCE BY	DATE
				VERIFICATION BY	DATE
				COMPARISON BY	DATE
				COMPARISON BY	DATE
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				NO.	



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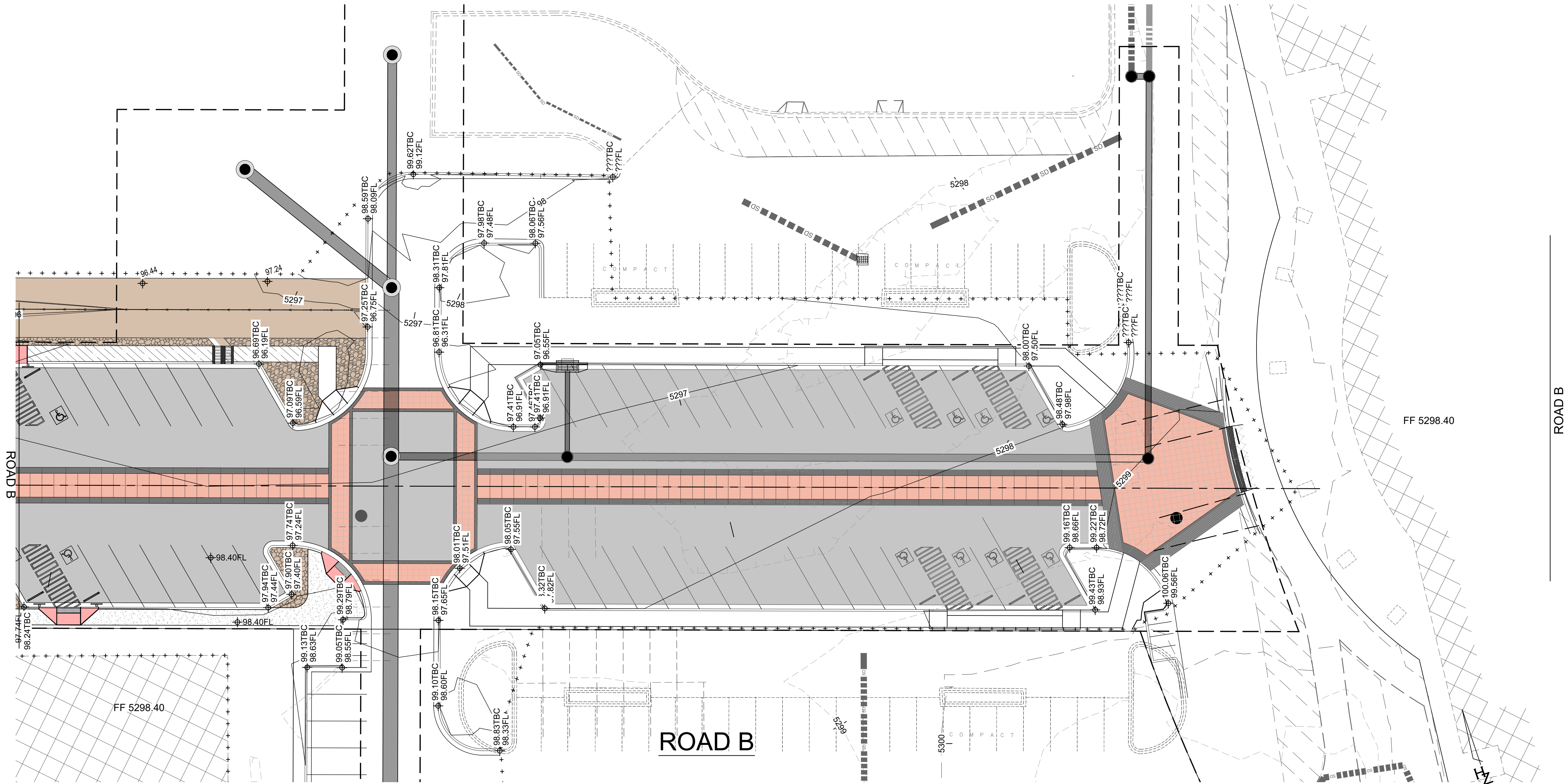


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				DELTA ALPHA ANGLE=0°11'00.11"	DATE

ENGINEER'S SEAL		REVISIONS		DESIGN	
NO.	DATE	REMARKS	BY	DESIGNED BY	DATE
				LRT	JULY 19, 2019
				SAE	JULY 19, 2019
				SAE	JULY 19, 2019

HUITT-ZOLLARS		WINROCK PARTNERS, LLC.	
Huitt-Zollars, Inc. 6501 Americas Pkwy NE, Suite 550 Albuquerque, New Mexico 87110 Phone (505) 883-8114 Fax (505) 883-5022		WINROCK TOWN CENTER PHASE B ROAD B EXTENSION	
TITLE: GRADING PLAN			
Design Review Committee	City Engineer	Mo./Day/Yr.	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of
4553.90	J-19-Z	21	65

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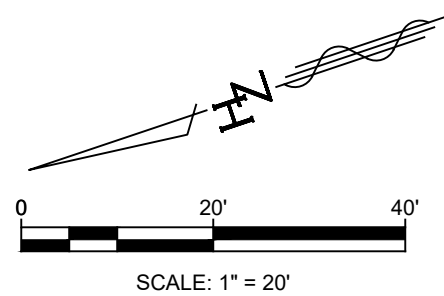


Designed By:
HUITT-ZOLLARS
Huitt-Zollars, Inc. Albuquerque
6501 Americas Pkwy NE, Suite 550
Albuquerque, New Mexico 87110
Phone (505) 883-8114 Fax (505) 883-5022

WINROCK PARTNERS, LLC.
WINROCK TOWN CENTER
PHASE B ROAD B EXTENSION

TITLE:			
GRADING PLAN			
Design Review Committee		City Engineer	
Last Update		Mo./Day/Yr.	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of
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CHECKED BY: SAE		DATE: JULY 19, 2019					



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HUITT-ZOLIARS Huitt-Zollars, Inc. Albuquerque 6501 Americas Pkwy NE, Suite 550 Albuquerque, New Mexico 87110 Phone (505) 883-8114 Fax (505) 883-5022													
WINROCK PARTNERS, LLC.													
WINROCK TOWN CENTER													
PHASE B ROAD B EXTENSION													
TITLE:													
SWQ POND SECTION													
Design Review Committee				City Engineer				Mo./Day/Yr.		Mo./Day/Yr.			
				Last Update									
City Project No.				Zone Map No.				Sheet		Of			
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WINROCK PARTNERS, LLC.
WINROCK TOWN CENTER
PHASE B ROAD B EXTENSION

TITLE: SWQ POND SECTION

Design Review Committee		City Engineer		Last Update	Mo./Day/Yr.		Mo./Day/Yr.	
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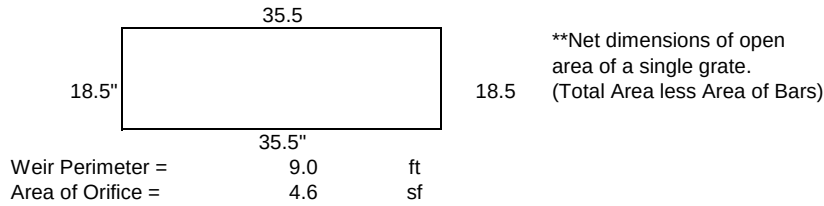
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REVISIONS			
DESIGN			
DESIGNED BY: SAE		DATE: JULY 19, 2019	
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DWG NAME: 2022 GRADING PLAN.dwg		PROJ.#: R303699.04	
CHECKED BY: SAE		DATE: JULY 19, 2019	

Winrock Town Center Road B Extension Inlet Calculation Summary									
Storm Drain System	Basin	Basin Q (cfs)	Actual Q (at Analysis Point)	Inlet Type	Q Inflow (cfs)	Q 2x100-yr (cfs)	Inlet Capacity (cfs)	Q Bypass (cfs)	Notes
AP-D	SW Culverts	6.8	6.8	Two-4' SW Culverts	6.8	N/A	8.7	0.0	Broad-crested Weir Calculation assumes Depth of Flow at Top of Curb
AP-D	SW Culverts 1	10.5	10.5	Two-4' SW Culverts	10.5	N/A	11.4	0.0	Broad-crested Weir Calculation assumes Depth of Flow at Top of Curb + 0.1'
AP-D	First Flush	3.4	20.7	Pond Inlet	20.7	41.4	44.4	0.0	Assumes H=2.2' at Top of Pond Elevation, Refer to Pond Rating Curve
AP-D	MH 7A	1.3	1.3	Two-Double C Inlets	1.3	2.6	46.0	0.0	Sump inlets capture all contributing flow. No bypass flow. Refer to Inlet Worksheet.
AP-B	MH 9A1	4.6	4.6	Existing Pipe Flow	4.6	N/A	N/A	0.0	Existing Pipe Flow. No Inlets Required.
AP-B	Inlet 8C	7.6	7.6	Double C	7.6	15.2	23.0	0.0	Sump inlets capture all contributing flow. No bypass flow. Refer to Inlet Worksheet.
AP-B	Inlet 4B	5.8	5.8	Double D	5.8	11.6	23.0	0.0	Sump inlets capture all contributing flow. No bypass flow. Refer to Inlet Worksheet.
AP-B	MH 7	7.5	7.5	Future Inlets	7.5	15.0	N/A	0.0	Assumes future inlets to be designed in sump condition. No bypass flow.
AP-B	MH 6	48.1	48.1	Future Pond Inlet	48.1	N/A	N/A	0.0	Pond and inlet to be designed with future construction phase.

Inlet Worksheet (Sump Condition) for Road B Extension

Objective: Design a Type C or Type D Inlet in Sump Condition for a 100-year flow

- 1 Inlet to collect peak flow amount before overtopping headwall.
- 2 Grate Dimensions



- 3 Calculate Orifice and Weir Flow into Grate at Design Depth

Orifice Equation	Weir Equation
$Q = 0.6 \times A \times (2 \times g \times h)^{1/2}$ Where $A = 4.6 \text{ sq. ft.}$ $g = 32.2 \text{ ft}^2/\text{sec}$ $h = 0.5 \text{ ft}$ Therefore $Q = 15.5 \text{ cfs}$	$Q = 2.65 \times P \times H^{1/2}$ Where $P = 9.0 \text{ ft}$ $H = 0.5 \text{ ft}$ Therefore $Q = 16.9 \text{ cfs}$

Orifice Equation controls
 Grate Capacity = 15.5 cfs

- 4 Apply 25% Clogging Factor to determine allowable design flow into inlet

$$15.5 \times 0.75 = 12 \text{ cfs}$$

Therefore Capacity of Single C/D Inlet in Sump Condition = 12 cfs

Capacity of Double C/D Inlet in Sump Condition = 23 cfs

*Grate Capacities do not account for curb opening inflow. Therefore, inlet capacities are the same for Type C and Type D inlets.

Worksheet for Broad Crested Weir - Sidewalk Culverts

Project Description

Solve For Discharge

Input Data

Headwater Elevation		0.50	ft
Crest Elevation		0.00	ft
Tailwater Elevation		0.00	ft
Crest Surface Type	Paved		
Crest Breadth		1.00	ft
Crest Length		4.00	ft

Results

Discharge	4.37	ft ³ /s
Headwater Height Above Crest	0.50	ft
Tailwater Height Above Crest	0.00	ft
Weir Coefficient	3.09	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	3.09	US
Flow Area	2.00	ft ²
Velocity	2.18	ft/s
Wetted Perimeter	5.00	ft
Top Width	4.00	ft

Rating Curve for Broad Crested Weir - Sidewalk Culverts

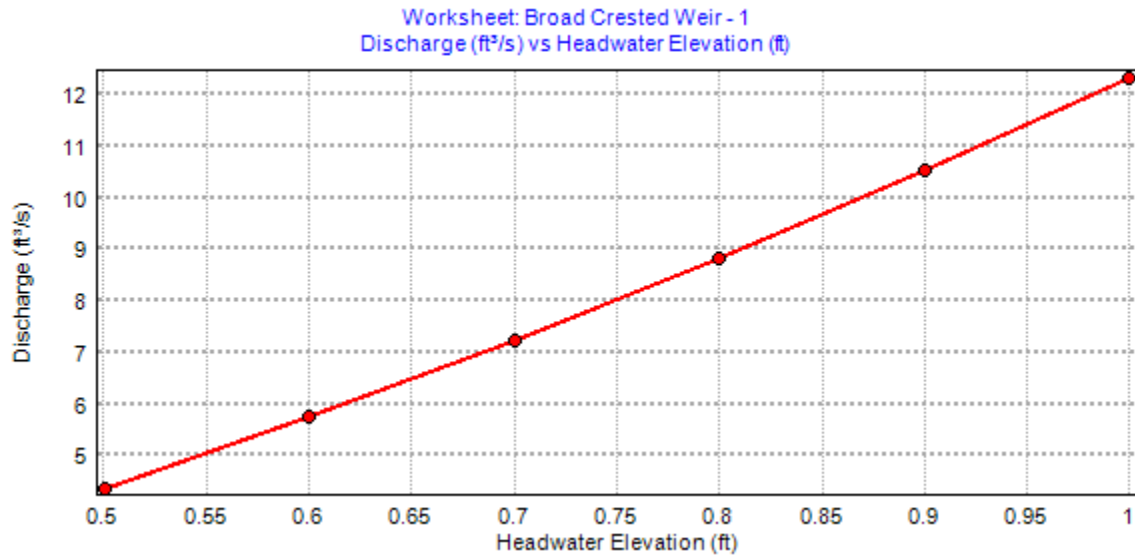
Project Description

Solve For Discharge

Input Data

Headwater Elevation	0.50	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Crest Surface Type	Paved	
Crest Breadth	1.00	ft
Crest Length	4.00	ft

Rating Curve Plot



Winrock Town Center Road B Extension
Proposed Pond Rating Curve: First Flush Facility
July 2019

Depth (ft)	Area		Volume (ac-ft)	Cum. Volume (ac-ft)	Cum. Volume (CF)	Outlet Pipe (CFS)	Pond Inlet (CFS)
	(sq ft)	(ac)					
5289.0	353	0.008	0	0	0	0.0	0
5290	605	0.014	0.011	0.011	479	0.0	0
5291	922	0.021	0.018	0.029	1243	0.0	0
5292	1296	0.030	0.025	0.054	2352	0.0	0
5293	1879	0.043	0.036	0.090	3939	0.0	0
5294	2470	0.057	0.050	0.140	6114	45.1	13.4
5295	3617	0.083	0.070	0.210	9157	51.0	32.8
5296	6209	0.143	0.113	0.323	14070	56.2	44.4

Pond Inlet = Neenah Grate R-4215-C
 Grate Elev. = 5293.8
 30" Outlet Pipe Invert = 5289.10

Inflow Q = 20.7 CFS
 Contributing Area = 4.1 AC = 178160 SF
 SWQ Volume (0.34") = 5048 CF
 SWQ Elevation = 5293.5
 100-YR Volume (2.12") = 31475 CF
 100-YR Elevation = 5294.4

Top of Pond = 5296
 Bottom of Pond = 5289.0
 Maximum Water Surface Elevation = 5294.4



File name

Display curve

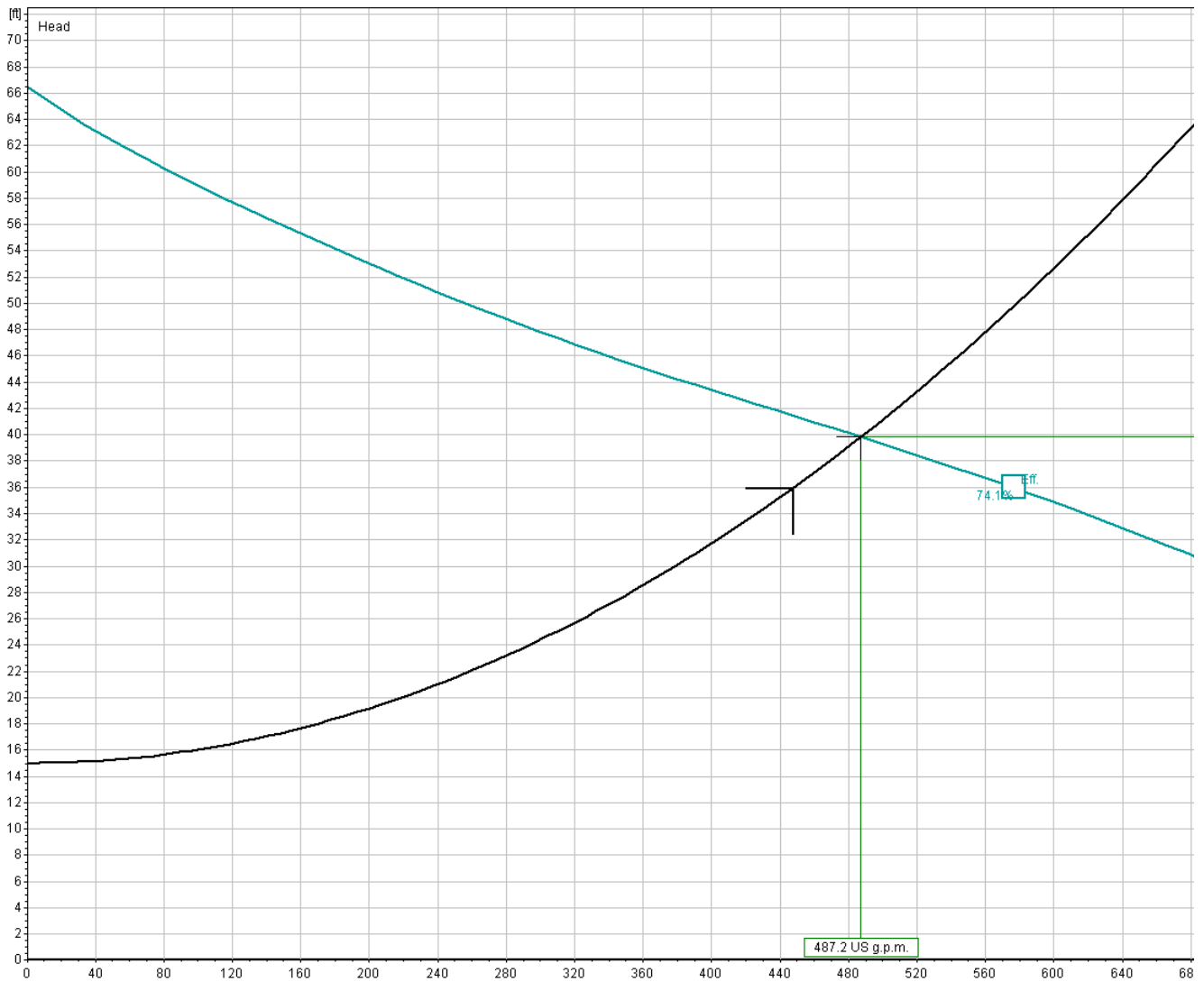
3 results
Flow: 448 US g.p.m.
Static head: 15 ft
Pipe system: NoEdit

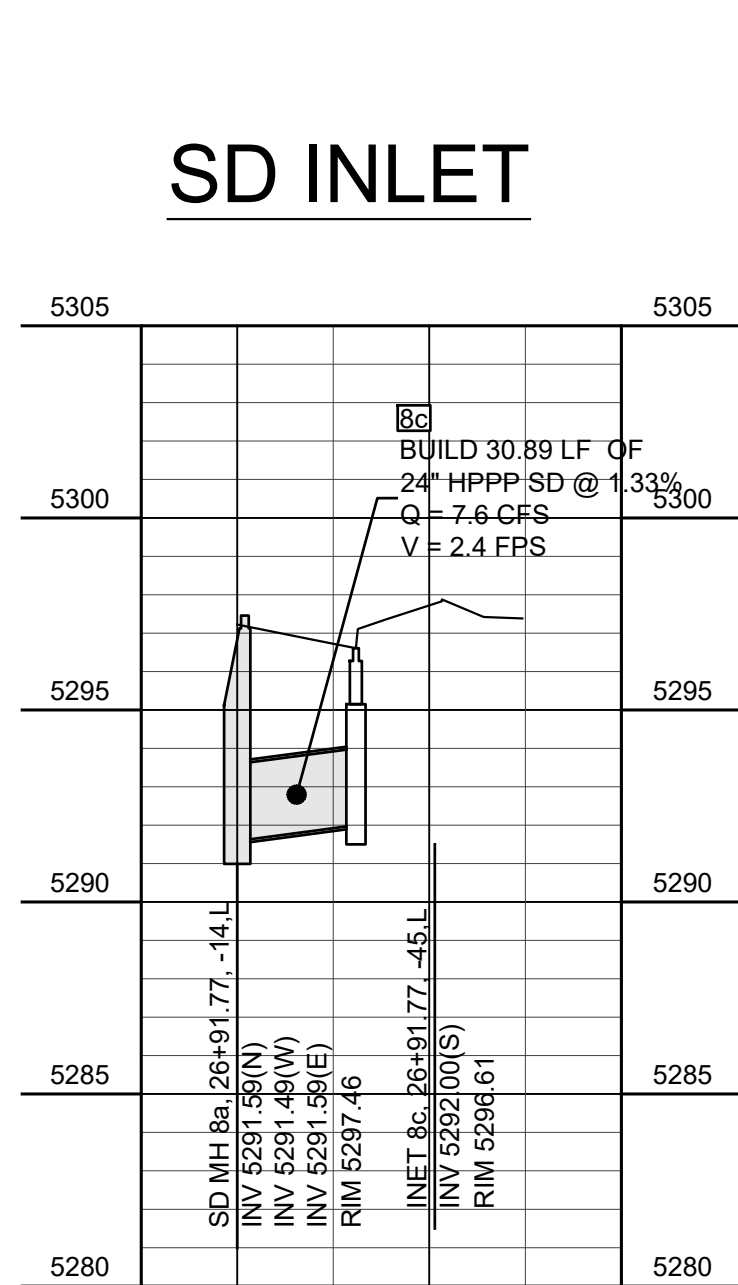
Xylet
Program version
47.0 - 4/10/2019 (Build 391)
Last update (Data)
5/15/2019 14:41 A5P5

Spaix® is a registered trademark of VSX - VOGEL SOFTWARE GmbH. 

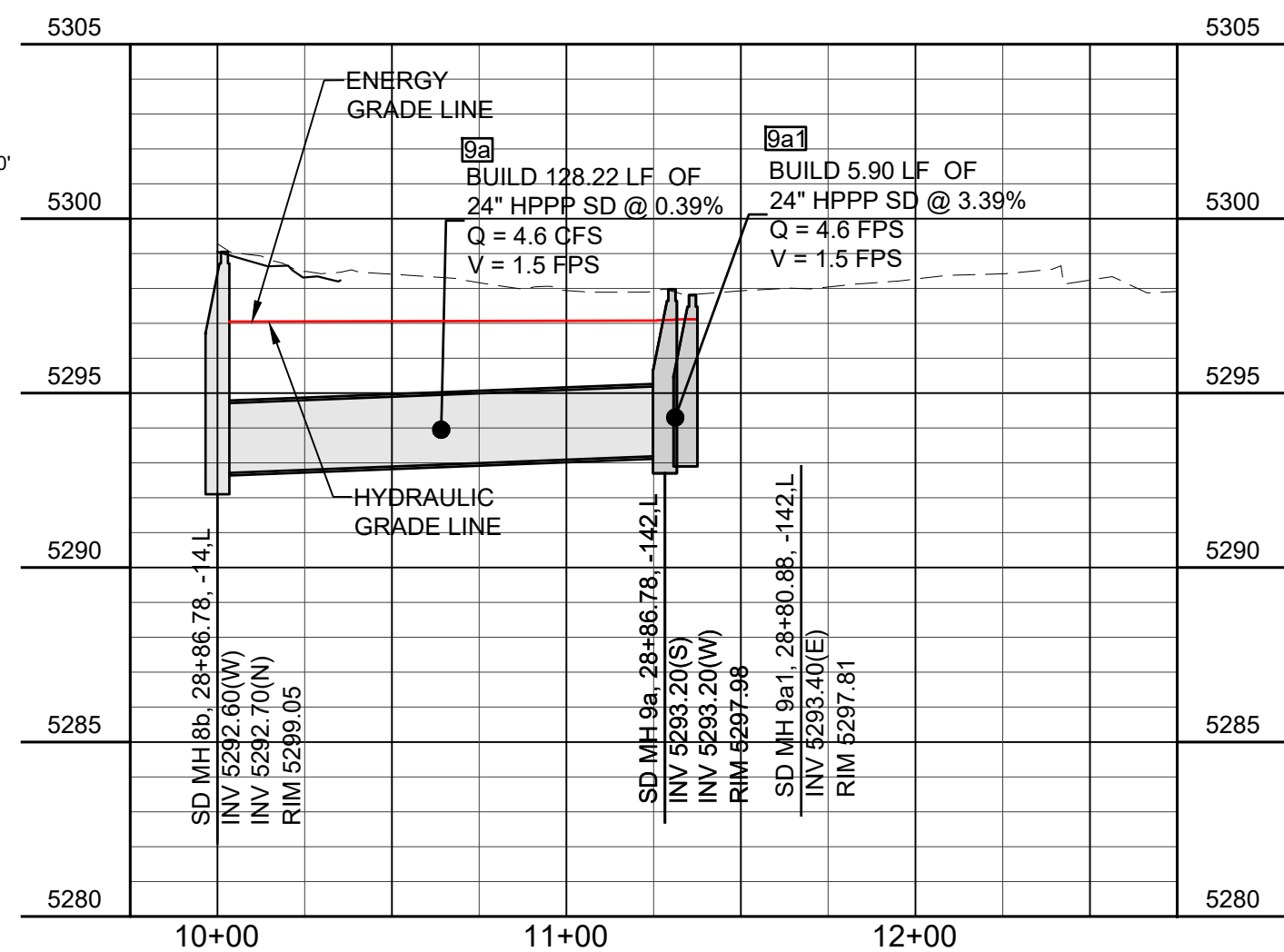
Product	Diff. [%]	Q [US g.p.m.]	Spec. Energy [kWh/US MG]	η [%]	n [rpm]	Rate [
 1320H Non-clog 3~	8.8	487.2	204	72.9	1440	7.9 3 15/16 2
 1320M Non-clog 3~	1.3	453.9	210	64.8	1440	7.9 3 15/16 2
 1320S Non-clog 3~	2.8	460.4	281	47.2	2900	10.1 3 1/8 2 25.1

1320H-4X.453.S41.230





STORM DRAIN DATA				
PIPE	PIPE SIZE	BEARING	LENGTH	SLOPE
7c	30"	S79° 40' 45"E	225.42'	0.62%
7d	30"	N20° 41' 57"E	33.69'	1.78%
7e	30"	N79° 46' 27"E	79.86'	2.25%
8A	36"	S71° 16' 29"E	59.13'	-1.00%
8b	30"	S71° 16' 29"E	195.01'	0.52%
8c	24"	N18° 43' 31"E	30.89'	1.33%
9a	24"	N18° 43' 31"E	128.22'	0.39%
9a1	24"	S71° 37' 35"E	5.90'	3.39%



Designed By:

HUITT-ZOLLARS

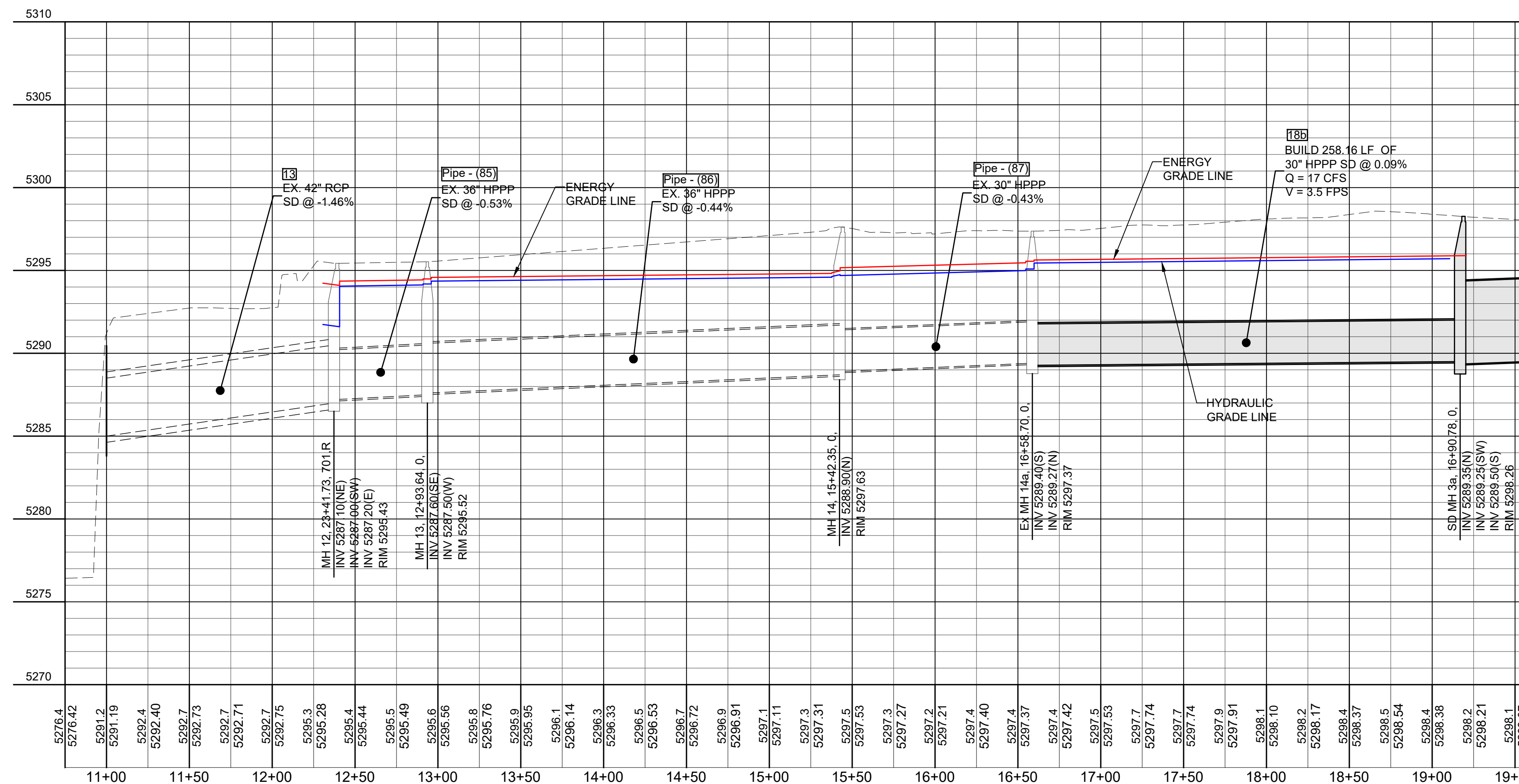
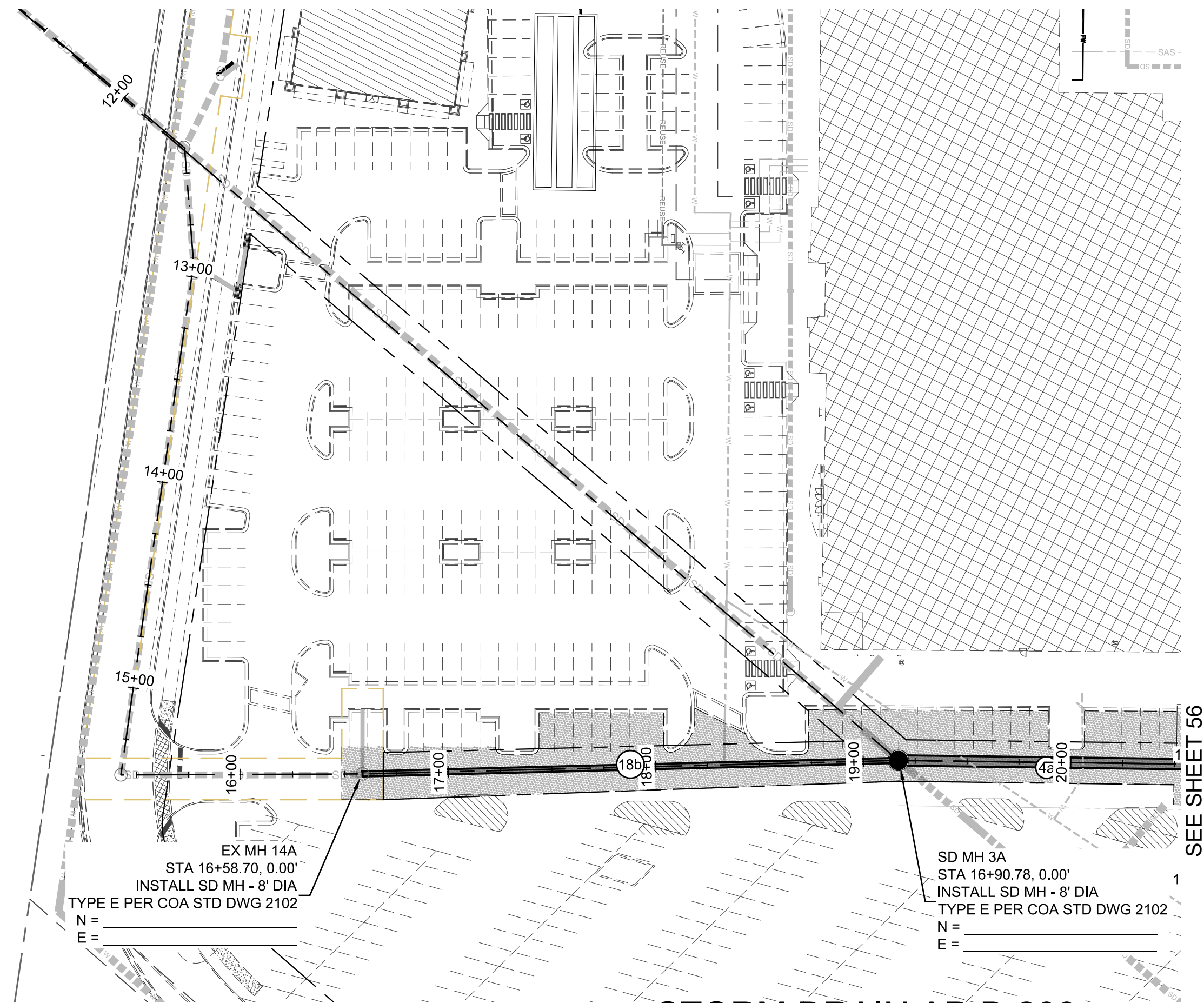
Huitt-Zollars, Inc. Albuquerque
6501 Americas Pkwy NE, Suite 550
Albuquerque, New Mexico 87110
Phone (505) 883-8114 Fax (505) 883-5022

WINROCK PARTNERS, LLC.
WINROCK TOWN CENTER
PHASE B ROAD B EXTENSION

TITLE:	ROAD B ROAD B STORM DRAIN PLAN & PROFILE STA. 21+50.00 TO STA. 29+16.00
--------	---

Design Review Committee	City Engineer	Last Update	Mo./Day/Yr.	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of	
4553.90	J-19-Z	55	65	

Plotted: 7/22/2019 3:20:36 PM By:Eddings, Scott
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Last Saved: 7/22/2019 3:18:48 PM, seedings



STORM DRAIN DATA				
PIPE	PIPE SIZE	BEARING	LENGTH	SLOPE
Pipe - (87)	30"	N17° 46' 54"E	116.36'	-0.43%
Pipe - (86)	36"	S63° 54' 18"E	248.70'	-0.44%
Pipe - (85)	36"	S76° 54' 50"E	56.22'	-0.53%
13	42"	S58° 08' 25"W	137.25'	-1.46%
18b	30"	N16° 33' 24"E	258.16'	0.09%

STORM DRAIN AP-B-200

ENGINEER'S SEAL		SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
		FIELD NOTES		FOUND MONUMENT "20_H18"		CONTRACTOR	
		NO.	DATE	STANDARD 3/14" ALUMINUM DISC (FOUND IN PLACE)		WORK BY	
		BY		DATE		INSPECTORS	
		REVISIONS		NEW MEXICO STATE PLANE COORDINATES (CENTRAL ZONE N.A.D. 1983)		ACCEPTANCE BY	
		DESIGN		N=1,493,134.978		DATE	
DESIGNED BY: SAE	DATE: JULY 19, 2019			E=1,545,048.210		DRAWINGS	
DRAWN BY: LRT	DATE: JULY 19, 2019			PUBLISHED EL=5283.22 (N.A.D. 1988)		CORRECTED BY	
DWG NAME: 54-57 SD PP.dwg	PROJ #: R3038696.04			GROUND TO GRID FACTOR=0.999661580		MICRO-FILM INFORMATION	
CHECKED BY: SAE	DATE: JULY 19, 2019			DELTA ALPHA ANGLE=0°11'00.11"		RECORDED BY	
						NO.	

Storm Drain System: AP-B
Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Diameter (in)	Length (ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)
LINE 15	INLET	MH 17	36.0	44.2	22.0	3.11	5,289.13	5,288.93	5,295.50	5,295.17	5,295.18	5,295.15	5,295.33	5,295.30
LINE 14	MH 17	MH 16	36.0	215.3	22.0	3.11	5,288.93	5,288.29	5,295.17	5,297.58	5,295.00	5,294.86	5,295.15	5,295.01
LINE 13	MH 16	MH 22	36.0	162.0	22.0	3.11	5,288.29	5,287.90	5,297.58	5,294.70	5,294.77	5,294.67	5,294.92	5,294.82
LINE 12	MH 22	MH 10	24.0	40.0	22.0	3.50	5,287.90	5,287.68	5,294.70	5,294.68	5,294.53	5,294.47	5,294.72	5,294.66
LINE 11	MH 10	MH 11	36.0	106.0	22.0	3.11	5,287.68	5,287.40	5,294.68	5,295.02	5,294.35	5,294.28	5,294.50	5,294.43
LINE 10	MH 11	MH 12	36.0	39.3	24.0	3.40	5,287.40	5,287.22	5,295.02	5,295.73	5,294.15	5,294.12	5,294.33	5,294.30
CO-42	CB-41	MH 2	24.0	156.1	5.0	1.59	5,290.00	5,288.18	5,297.66	5,296.20	5,295.49	5,295.45	5,295.53	5,295.49
CO-41	CB-40	MH 2	24.0	153.8	5.0	1.59	5,290.00	5,288.18	5,297.30	5,296.20	5,295.49	5,295.45	5,295.53	5,295.49
CO-61	INLET 4B	MH 3B	24.0	12.5	5.8	1.85	5,290.00	5,289.90	5,297.41	5,297.90	5,296.62	5,296.61	5,296.67	5,296.66
LINE 8C	INLET 8C	MH 8A	24.0	31.0	7.6	2.42	5,292.00	5,291.49	5,296.60	5,297.46	5,296.86	5,296.84	5,296.95	5,296.93
LINE 9B	MH 9A1	MH 9A	24.0	5.9	4.6	1.46	5,293.40	5,293.20	5,297.81	5,297.80	5,296.97	5,296.97	5,297.00	5,297.00
LINE 9A	MH 9A	MH 8B	24.0	128.2	4.6	1.46	5,293.20	5,292.60	5,297.80	5,299.05	5,296.93	5,296.90	5,296.97	5,296.94
LINE 8B	MH 8B	MH 8A	30.0	196.0	4.6	0.94	5,292.60	5,291.49	5,299.05	5,297.46	5,296.90	5,296.89	5,296.91	5,296.90
LINE 8A	MH 8A	MH 4	36.0	59.1	12.2	1.73	5,291.49	5,290.80	5,297.46	5,296.87	5,296.83	5,296.82	5,296.87	5,296.86
LINE 7	MH 7	MH 5	48.0	78.1	7.5	0.60	5,291.50	5,291.00	5,298.40	5,297.40	5,296.95	5,296.95	5,296.96	5,296.95
LINE 6	MH 6	MH 5	60.0	63.2	48.1	2.45	5,291.50	5,291.00	5,298.40	5,297.40	5,296.91	5,296.90	5,297.00	5,296.99
LINE 5	MH 5	MH 4	60.0	56.6	55.6	2.83	5,291.00	5,290.80	5,297.40	5,296.87	5,296.78	5,296.77	5,296.91	5,296.89
LINE 4B	MH 4	MH 3B	60.0	224.0	67.8	3.45	5,290.80	5,289.90	5,296.87	5,297.90	5,296.62	5,296.53	5,296.81	5,296.72
LINE 4A	MH 3B	MH-3A	60.0	143.0	73.6	3.75	5,289.90	5,289.50	5,297.90	5,298.26	5,296.38	5,296.31	5,296.60	5,296.53
LINE 17	MH 14	MH 13	36.0	246.7	27.0	3.82	5,288.80	5,287.50	5,297.81	5,295.78	5,294.59	5,294.35	5,294.82	5,294.58
LINE 18	MH 19	MH 14	30.0	117.0	27.0	5.50	5,289.26	5,288.80	5,297.92	5,297.81	5,294.99	5,294.69	5,295.46	5,295.16
LINE 18B	MH-3A	MH 19	30.0	258.2	17.0	0.00	5,289.50	5,289.26	5,298.26	5,297.92	5,295.71	5,295.44	5,295.89	5,295.63
LINE 3	MH-3A	MH 2	42.0	241.4	56.6	5.88	5,289.50	5,288.18	5,298.26	5,296.20	5,295.80	5,295.15	5,296.34	5,295.69
LINE 2	MH 2	MH 12	42.0	212.3	66.6	6.92	5,288.18	5,287.22	5,296.20	5,295.73	5,294.58	5,293.78	5,295.32	5,294.53
LINE 1	MH 12	AP-B	42.0	138.0	121.9	12.67	5,287.22	5,286.00	5,295.73	5,286.00	5,291.10	5,289.26	5,293.60	5,291.91
LINE 16	MH 13	MH 12	36.0	57.8	31.3	4.43	5,287.50	5,287.22	5,295.78	5,295.73	5,294.12	5,294.05	5,294.43	5,294.35

Storm Drain System: AP-D

Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Diameter (in)	Length (ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)
CO-56	INLET 7A RIGHT	MH 7A	24.0	25.6	0.6	3.50	5,289.20	5,289.00	5,296.70	5,296.91	5,289.48	5,289.22	5,289.57	5,289.41
LINE 7E	INLET	MH 7D	30.0	85.0	20.7	13.64	5,289.10	5,287.20	5,294.52	5,294.87	5,290.65	5,289.47	5,291.30	5,289.75
LINE 7D	MH 7D	MH 7C	30.0	28.2	20.7	14.17	5,287.20	5,286.50	5,294.87	5,295.30	5,288.75	5,288.87	5,289.40	5,289.15
LINE 7C	MH 7C	MH 7B	30.0	225.4	20.7	8.75	5,286.50	5,285.00	5,295.30	5,297.26	5,288.05	5,287.24	5,288.70	5,287.53
LINE 7B	MH 7B	MH 7A	30.0	213.5	20.7	8.93	5,285.00	5,283.50	5,297.26	5,296.91	5,286.55	5,286.37	5,287.20	5,286.65
CO-55	INLET 7A LEFT	MH 7A	24.0	14.8	0.6	4.24	5,289.20	5,289.00	5,296.61	5,296.91	5,289.48	5,289.20	5,289.57	5,289.45
LINE 7A	MH 7A	EX MH 12	30.0	31.4	22.0	4.48	5,283.40	5,283.18	5,296.91	5,296.69	5,286.16	5,286.11	5,286.48	5,286.42
LINE 11	MH 11	MH 6	24.0	425.2	14.0	9.38	5,296.92	5,292.50	5,303.80	5,298.40	5,298.27	5,294.39	5,298.87	5,294.70
LINE 6	MH 6	MH 5	30.0	417.5	14.0	9.25	5,292.50	5,288.20	5,298.40	5,298.00	5,293.76	5,292.15	5,294.26	5,292.28
LINE 9	MH 9	MH 5	24.0	361.4	14.0	11.02	5,294.00	5,288.20	5,303.00	5,298.00	5,295.35	5,292.04	5,295.95	5,292.35
LINE 5	MH 5	MH 4	30.0	447.6	28.0	5.70	5,288.20	5,283.00	5,298.00	5,294.74	5,291.54	5,290.31	5,292.05	5,290.82
LINE 10	MH 10	MH 8	24.0	121.8	18.0	5.73	5,287.82	5,286.00	5,297.00	5,296.00	5,292.89	5,292.43	5,293.40	5,292.94
LINE 8	MH 8	MH 4	30.0	227.2	42.3	8.62	5,286.00	5,283.00	5,296.00	5,294.74	5,291.35	5,289.92	5,292.50	5,291.07
LINE 4B	MH 4	MH 4A	36.0	242.0	70.3	9.95	5,283.00	5,278.25	5,294.74	5,296.06	5,288.64	5,287.05	5,290.18	5,288.59
LINE 4A	MH 4A	EX MH 12	36.0	115.0	70.3	9.95	5,278.25	5,276.00	5,296.06	5,296.69	5,286.13	5,285.37	5,287.67	5,286.91
LINE 3	EX MH 12	MH 2	42.0	228.2	92.3	9.59	5,276.00	5,274.00	5,296.69	5,290.53	5,284.17	5,282.25	5,285.60	5,283.68
LINE 2B	MH 2	MH 2A	42.0	204.4	111.9	11.63	5,274.00	5,272.30	5,290.53	5,284.59	5,280.59	5,278.06	5,282.69	5,280.16
LINE 2A	MH 2A	MH 1	42.0	55.4	111.9	11.63	5,272.30	5,271.10	5,284.59	5,284.10	5,276.80	5,276.11	5,278.90	5,278.22
CO-52	MH 18	MH 1	24.0	153.0	6.7	2.13	5,272.70	5,271.10	5,284.15	5,284.10	5,277.41	5,277.33	5,277.48	5,277.40
LINE 1	MH 1	AP-D	42.0	43.0	118.6	25.79	5,271.10	5,268.40	5,284.10	5,282.94	5,274.34	5,270.60	5,276.87	5,276.00



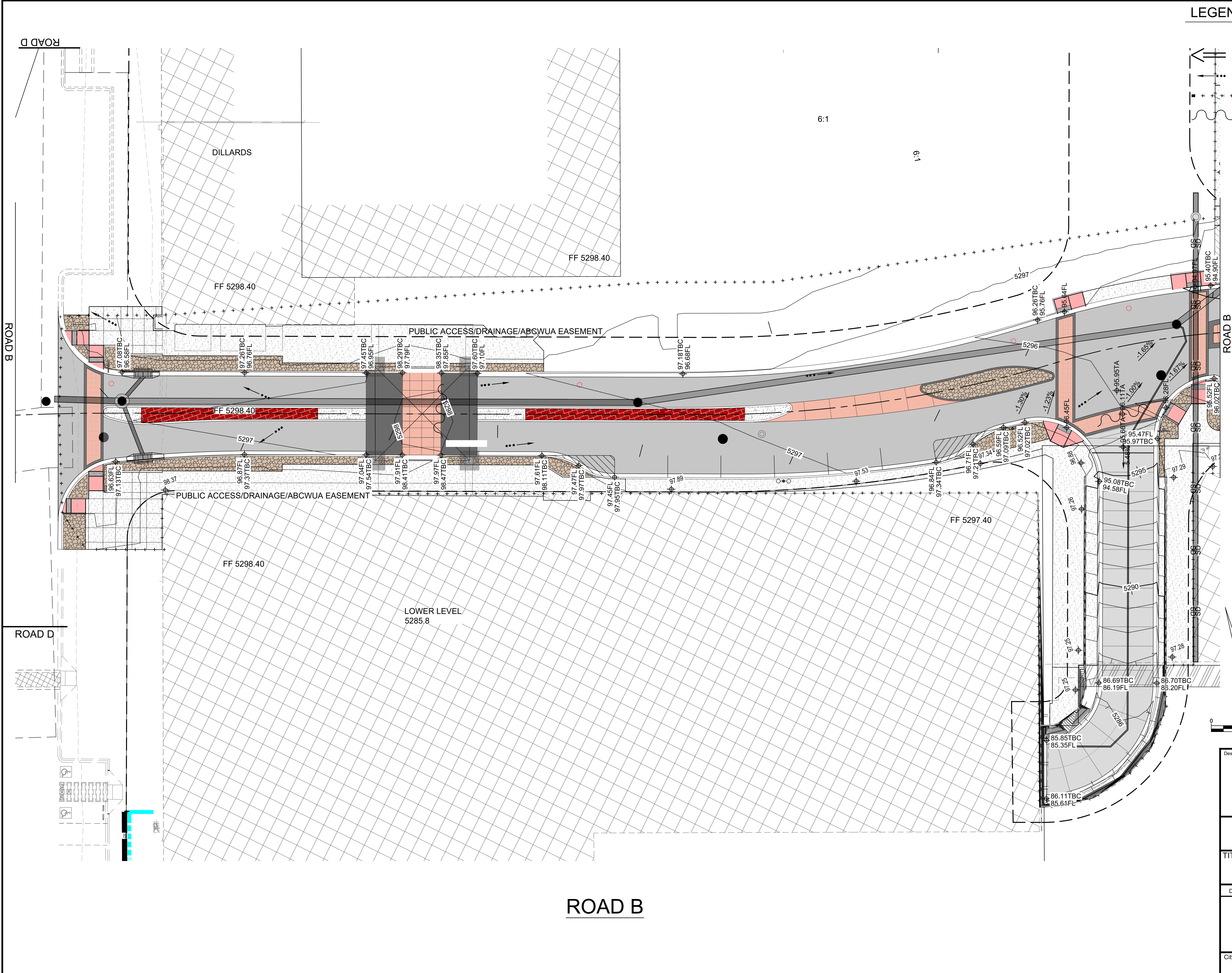
Office Locations

Albuquerque, New Mexico (505) 883-8114
Austin, Texas (512) 237-1129
Dallas, Texas (214) 871-3311
Denver, Colorado (303) 740-7325
El Paso, Texas (915) 587-4339
Fort Worth, Texas (817) 335-3000
Glendale, California (818-456-1833
Houston (Downtown), Texas (713) 622-1180
Houston (West), Texas (281) 496-0066
Irvine, California (949) 988-5815
Los Angeles, California (310) 820-4600
Oklahoma City, Oklahoma (405) 842-0363
Ontario, California (909) 941-7799
Orlando , Florida (407) 839-0414
Phoenix, Arizona (602) 952-9123
Rio Rancho, New Mexico (505) 892-5141
Seattle, Washington (206) 324-5500
Tacoma, Washington (253) 627-9131
Thousand Oaks, California (805) 418-1802



HUITT-ZOLIARS

Plotted: 7/22/2019 8:23:35 AM By: Eddings, Scott
H:\proj\R303699.M - Phase C Road B Extension Set\2022 GRADING PLAN.dwg
Last Saved: 7/22/2019 8:23:47 AM, Settings



LEGEND

BASIN BOUNDARY

DISCHARGE LOCATION

FLOW DIRECTION

LIMITS OF DISTURBANCE

HIGH POINT

0 20' 40'

SCALE: 1" = 20'

Designed By:

HUITT-ZOLIARS

Huitt-Zollars, Inc. Albuquerque
6501 Americas Pkwy NE, Suite 550
Albuquerque, New Mexico 87110
Phone (505) 883-8114 Fax (505) 883-5022

TITLE:

GRADING PLAN

Design Review Committee

City Engineer

Last Update

City Project No. 4553.90

Zone Map No. J-19-Z

Sheet 20 Of 65

AS BUILT INFORMATION

CONTRACTOR

STAKED BY

INSPECTOR'S

VERIFICATION BY

CONNECTIONS BY

MICRO-FILM INFORMATION

RECORDED BY

NO.

BENCH MARKS

FOUND MONUMENT "20" HIB"

STANDARD 3 1/4" ALUMINUM DISC (FOUND IN PLACE)

NEW MEXICO STATE PLANE COORDINATES (CENTRAL ZONE-N.A.D. 1983)

N=1483.54278

E=1545.048210

PUBLISHED E=+283.22 (NAVD 1983)

GROUND TO GRID FACTOR=0.99961580

DELTA ALPHA ANGLE=0°11'00.11"

SURVEY INFORMATION

FIELD NOTES

NO.

BY

DATE

ENGINEER'S SEAL

NO.

DATE

REMARKS

BY

DESIGNED BY: SAE

DRAWN BY: LRT

DWG NAME: 2022 GRADING PLAN.dwg

CHECKED BY: SAE

DATE: JULY 19, 2019

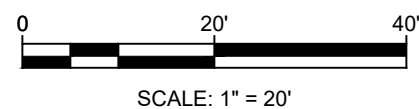
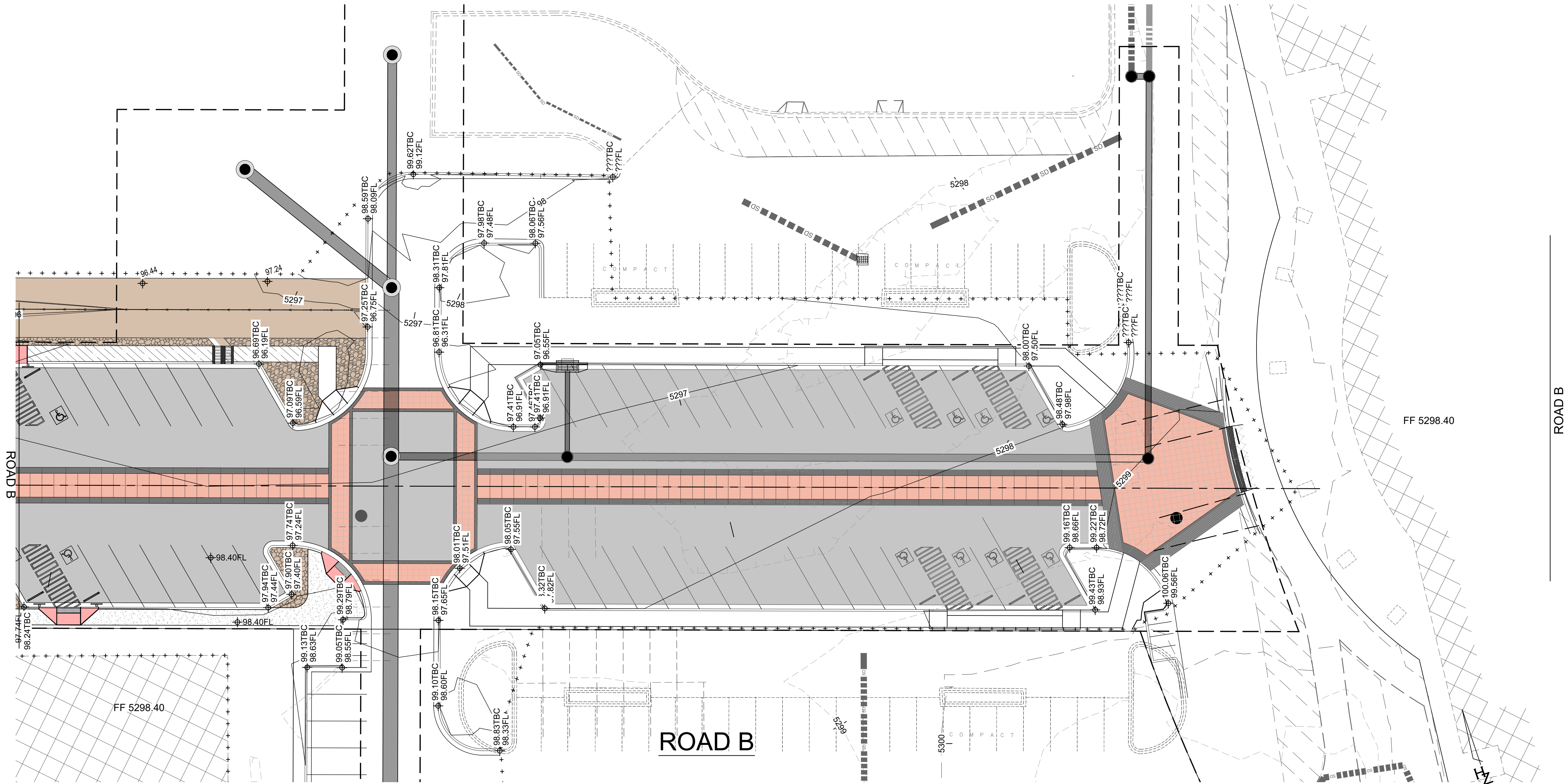
DATE: JULY 19, 2019

PROJ #: R303699.04

DATE: JULY 19, 2019

[illegible]

Plotted: 7/22/2018 8:23:56 AM By: Edgings, Scott
Last Saved: 7/22/2018 8:20:48 AM
Title: T1D110 CAD & B1M10.1 AutoCAD Sheet Set(20-22 GRADING PLAN.dwg)



Designed By:
HUITT-ZOLLARS
Huitt-Zollars, Inc. Albuquerque
6501 Americas Pkwy NE, Suite 550
Albuquerque, New Mexico 87110
Phone (505) 883-8114 Fax (505) 883-5022

WINROCK PARTNERS, LLC. WINROCK TOWN CENTER PHASE B ROAD B EXTENSION			
TITLE: GRADING PLAN			
Design Review Committee	City Engineer	Mo./Day/Yr.	Mo./Day/Yr.
Last Update			
City Project No.	Zone Map No.	Sheet	Of
4553.90	J-19-Z	22	65

ENGINEER'S SEAL		SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
		FIELD NOTES		FOUND MONUMENT "20 H"		CONTRACTOR	
		NO.	BY	DATE	DATE	WORK	DATE
						STANDARD 3 1/4" ALUMINUM DISC (FOUND IN PLACE)	STANDARD
						NEW MEXICO STATE PLANE COORDINATES (CENTRAL ZONE N.A.D. 1983)	INSPECTOR'S
						N+1,483,184.878	FIELD
DESIGNED BY: SAE DRAWN BY: LRT DWG NAME: 20-22 GRADING PLAN.dwg CHECKED BY: SAE		REVISIONS		DESIGN		VERIFICATION BY	
		NO.	DATE	REMARKS	BY	CORRECTED BY	
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						PUBLISHED EL=+3283.22 (NAVD 1988)	
						GROUND TO GRID FACTOR=0.99861380	
DATE: JULY 19, 2019 DATE: JULY 19, 2019 DATE: JULY 19, 2019		MICRO-FILM INFORMATION		RECORDED BY		NO.	



WINROCK PARTNERS, LLC.
WINROCK TOWN CENTER
PHASE B ROAD B EXTENSION

TITLE: SWQ POND SECTION

Design Review Committee		City Engineer		Last Update	Mo./Day/Yr.	Mo./Day/Yr.
City Project No.		Zone Map No.		Sheet	Of	
4553.90		J-19-Z		24	65	

SURVEY INFORMATION			BENCH MARKS		AS BUILT INFORMATION	
NO.	FIELD NOTES		DATE	FOUND MONUMENT "20. HIB"	CONTRACTOR	DATE
	BY					
				STANDARD 3 1/4" ALUMINUM DISC (FOUND IN PLACE)	WORK STOPPED BY	DATE
				NEW MEXICO STATE PLANE COORDINATES (CENTRAL ZONE N.A.D. 1983)	INSPECTORS ACCEPTANCE BY	DATE
				N=1 493,154.978	VERIFICATION BY	DATE
				E=1 545,048.210	DRAWINGS CORRECTED BY	DATE
				PUBLISHED EL=5283.22 (NAVD 1988)	MICRO-FILM INFORMATION	
				GROUND TO GRID FACTOR=0.99986180	RECORDED BY	DATE
				DELTA ALPHA ANGLE=0°11'00.11"	NO.	

Professional Engineer Seal for Mexico, No. 12856. The seal is circular with the text "INGENIEROS PROFESIONALES DE MEXICO" around the perimeter and "12856" in the center. A handwritten signature in blue ink is written across the seal, and the date "7/15/19" is written in blue ink to the right of the seal.

NO.	DATE	REMARKS	BY
REVISIONS			
DESIGN			
DESIGNED BY:	SAE	DATE:	JULY 19, 2019
DRAWN BY:	LRT	DATE:	JULY 19, 2019
DWG NAME:	23-22 GRADING PLAN.dwg	PROJ.#:	R303899.04
CHECKED BY:	SAE	DATE:	JULY 19, 2019