

CITY OF ALBUQUERQUE

# WEST CENTRAL COMPLETE STREETS SARRACINO PLACE TO 98<sup>TH</sup> STREET

PRELIMINARY DRAINAGE REPORT

COA PROJECT NUMBER: A/E 6321.94

NMDOT CN A302335



# WEST CENTRAL COMPLETE STREETS SARRACINO PLACE TO 98TH STREET

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1	INTRODUCTION .....	1
1.1	SCOPE .....	1
1.2	EXISTING CONDITIONS .....	2
1.3	FLOODPLAIN MAPS .....	3
2	HYDROLOGY .....	3
2.1	DRAINAGE CRITERIA AND METHODOLOGY .....	3
2.2	PRECIPITATION DATA .....	4
2.3	BASIN DELINEATION .....	4
2.4	LAND TREATMENTS AND SCS CURVE NUMBER .....	4
2.4.1	FRONTAGE ROAD SYSTEM LOSS PARAMETERS .....	5
2.4.2	SOUTH CENTRAL AVENUE LOSS PARAMETERS .....	6
2.5	TIME OF CONCENTRATION AND LAG TIME .....	6
2.6	HYDROLOGIC ANALYSIS RESULTS .....	6
2.6.1	FRONTAGE ROAD SYSTEM RESULTS .....	6
2.6.2	SOUTH CENTRAL AVENUE RESULTS .....	7
3	HYDRAULICS AND RECOMMENDATIONS .....	8
3.1	FRONTAGE ROAD SYSTEM .....	8
3.2	SOUTH CENTRAL SYSTEM .....	9
3.2.1	ALTERNATIVE 1 – DRAINAGE SWALE OPTION .....	9
3.2.2	ALTERNATIVE 2 – STORM DRAIN OPTION .....	10
3.2.3	RECOMMENDED ALTERNATIVE .....	10
4	CONCLUSION .....	11
5	REFERENCES .....	12

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## ***TABLES***

TABLE 1: LAND TREATMENTS AND CORRESPONDING PARAMETERS FOR DRAINAGE BASINS .....	5
TABLE 2: COMPOSITE CN FOR EACH SUBBASIN .....	5
TABLE 3: PEAK DISCHARGE RESULTS – UNIT HYDROGRAPH METHOD .....	7
TABLE 4: PEAK DISCHARGE RESULTS – RATIONAL METHOD .....	8
TABLE 5: RUNOFF VOLUME RESULTS .....	8

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## ***APPENDICES***

<b>A</b>	EXISTING CONDITIONS MAP
<b>B</b>	FLOODPLAIN MAP
<b>C</b>	NOAA POINT PRECIPITATION FREQUENCY ESTIMATES
<b>D</b>	BASIN MAPS
<b>E</b>	HYDROLOGIC SUMMARY
	E.1 FRONTAGE ROAD HYDROLOGY
	E.2 SOUTH CENTRAL HYDROLOGY
<b>F</b>	HYDRAULIC SUMMARY
	F.1 FRONTAGE ROAD HYDRAULIC ANALYSIS
	F.2 SOUTH CENTRAL ALTERNATIVES

# 1 INTRODUCTION

WSP USA is working with the City of Albuquerque (COA) Department of Municipal Development (DMD) to design Complete Streets improvements for Central Avenue between 98<sup>th</sup> Street and Sarracino Place in Albuquerque, New Mexico. The design intent is to close multi-modal infrastructure gaps, improve safety in the corridor for bicyclists, pedestrians, buses, and motorists, and control stormwater. This project will continue the improvements on the north Frontage Road and implement improvements on the south side of Central Avenue.

The previous phase of this project was built in 2023 and was primarily frontage road and side path improvements between Sarracino Place and 90<sup>th</sup> Street, north of Central Avenue. A storm drain was built underneath the Frontage Road with curb and swale inlets to drain the offsite flows. This system captures the contributory basins east of 90<sup>th</sup> Street and drains from west to east.

The subject of this report is the current phase of this project, which will continue the Frontage Road improvements between 90<sup>th</sup> Street and 98<sup>th</sup> Street and include complete streets improvements on the south side of Central Avenue between Sarracino Place and 98<sup>th</sup> Street. Both the 98<sup>th</sup> Street and Bridge Boulevard intersections will be improved for multi-modal safety. Implementation of Green Stormwater Infrastructure (GSI) is another component of the project, particularly on the south side of Central Avenue.

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## 1.1 SCOPE

This preliminary drainage report focuses on the drainage recommendations for both the south and north sides of Central Avenue. The alternatives in this report are designed in conjunction with the alternatives in the Design Alternatives Report also written by WSP USA. The procedures in the current (September 2020) edition of the City of Albuquerque Development Process Manual (DPM) <sup>[1]</sup> were used for the drainage analysis. The Hydrologic Engineering Centers – Hydrologic Modeling System (HEC-HMS) model from the Amole-Hubbell Drainage Management Plan Update <sup>[2]</sup> was used and modified for the overall drainage conditions in the corridor, including the existing storm drain on 90<sup>th</sup> Street. Subbasins required for analysis were split from the basins in this model. The final discharge flow rates from the subbasins within public right-of-way (ROW) were incorporated in the updated HEC-HMS model. PCSWMM was used to create hydraulic models of the storm drain systems because it considers how the flow changes with respect to time. Drainage improvements at the Volcano Road and Frontage Road intersection are not a part of the preliminary drainage report but will be provided in the final drainage report. Alternatives for drainage management on the south side of Central Avenue were created based on ROW constraints, safety, utility avoidance, maintenance consideration, and cost.

## 1.2 EXISTING CONDITIONS

Central Avenue, between 98<sup>th</sup> Street and Unser Boulevard, is a four-lane arterial street with a large center median. There is a frontage road to the north of street with a buffer ranging between 10' to 30'. The eastbound lanes (south side of Central Avenue) have intermittent sidewalk and have no curb and gutter for most of the project area. There is existing curb, gutter, and sidewalk on the south side of Central Avenue between 86<sup>th</sup> Street and Unser Blvd that is new and in good condition. A map of existing conditions is provided in **Appendix A**.

Roadway flows from the eastbound lanes of Central Avenue typically sheet flow southeast onto the offsite properties between Central Avenue and Bridge Boulevard. Runoff originating from the eastbound lanes ultimately ends up in the Tierra Bayita Channel via storm drains. Runoff between 98<sup>th</sup> Street and 94<sup>th</sup> Street is intercepted by seven inlets located offsite. Runoff between 94<sup>th</sup> Street and 86<sup>th</sup> Street travels along swales on both sides of Bridge Boulevard and is intercepted by slab-top manholes and median drop inlets on each side of the street. These flows are carried in an existing 84" diameter reinforced concrete pipe (RCP) storm drain trunkline located underneath Bridge Boulevard to the Tierra Bayita Channel. Runoff along 86<sup>th</sup> Street is collected by inlets near the 86<sup>th</sup> Street and Bridge Boulevard intersection. These inlets feed into the 84" RCP system. Runoff east of 86<sup>th</sup> Street travels along the existing curb and gutter towards Unser Boulevard and is intercepted by two inlets that are just upstream of the intersection. This runoff is conveyed by a storm drain system under Unser Boulevard that ultimately outfalls in the Tierra Bayita Channel.

Runoff originating from the areas between 98<sup>th</sup> Street, Volcano Road, and Central Avenue is intercepted by existing slab-top manholes north of the Frontage Road. There is also an existing lateral system under 94<sup>th</sup> Street, north of Central Avenue, where street flows are captured by two curb inlets. This lateral system drains into the main system at the intersection of 94<sup>th</sup> Street and the Frontage Road. The offsite flows are conveyed in the existing Frontage Road system from these inlets and manholes into the 84" RCP that runs north to south under 90<sup>th</sup> Street. The trunkline of the storm drain system begins as a 36" RCP near the shopping center at the northeast corner of the 98<sup>th</sup> Street and Central Avenue intersection and travels west under the Frontage Road. There is an existing detention pond northwest of the 98<sup>th</sup> Street and Central Avenue intersection that outlets into this system. The trunkline gradually increases in size from 36" RCP at the start to 54" RCP downstream of the 94<sup>th</sup> Street intersection. This system is also considerably deep in many areas. There is an existing wye at the intersection of Central Avenue and 90<sup>th</sup> Street that is 20' deep where a 54" RCP and a 66" RCP join, and the 84" RCP is the outlet pipe. In general, the system under the Frontage Road is between 10'-15' deep.

Runoff originating from the area between 98<sup>th</sup> Street, Central Avenue, 94<sup>th</sup> Street, and Sunset Gardens Road is conveyed by an existing 36" RCP trunkline that travels from south of Central Avenue to the north Frontage Road system. This trunkline is located under 94<sup>th</sup> Street. Flows from this system are collected by three curb inlets in the Vista Manufactured Home Community, three curb inlets along both sides of 94<sup>th</sup> Street, and one median inlet in the drainage pond on the northeast corner of the Route 66 Self-Storage property. The 36" trunkline is also considerably deep, being more than 17' below Central Avenue as it crosses from south to north. The flow from this basin contributes significantly to the Frontage Road system.

There is an existing utility corridor that includes a large cable duct bank located south of Central Avenue. The duct bank runs parallel to the street and is approximately 20' from the edge of the existing driving lane. There is also an existing sanitary sewer line and an existing gas line in this corridor. The presence of these utilities restricts any underground infrastructure that would be proposed in the area.

There are two existing concrete box culvert (CBC) crossings at Central Avenue between 90<sup>th</sup> Street and 86<sup>th</sup> Street. One of the crossings is a two-barrel 8' x 3' CBC, and the other one is a one-barrel 8' x 3' CBC. These two CBC crossings are shown on the 1952 as-built plans, "FI-178(9)" [3]. They were made obsolete with the developments of storm drain systems north of Central and have recently been abandoned with the upstream ends plugged. There is an existing arroyo downstream of the CBC crossings that flows through private property located between Central Avenue and Bridge Boulevard. This arroyo drains to an inlet on the north side of Bridge Boulevard. There is another abandoned two-barrel 8' x 4' CBC crossing between Westland Road and 94<sup>th</sup> Street that is currently buried on both ends. This crossing is also present in the "FI-178(9)" as-built plans.

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## 1.3 FLOODPLAIN MAPS

Flood Insurance Rate Map (FIRM) 35001C0328J for Bernalillo County, NM dated November 4, 2016, shows the mapped flood hazard areas as designated by FEMA. The work limits for this project are outside of the areas of flood hazard and are in "Areas Determined to be Outside the 0.2% Annual Chance Floodplain". There is an existing area designated as Zone AO with a depth of 1'. This area is located downstream of the project limits on the westbound lanes of Central Avenue between Victory Lane and Unser Boulevard. Results from the drainage improvements during the previous phase of this project showed that the flood risk had been improved. However, a FEMA Conditional Letter of Map Revision or Letter of Map Revision was not completed in the previous phase of this project and is not in the scope of the current project. The other flood hazard areas near the project limits are contained in drainage ponds and channels. The floodplain map is shown in **Appendix B**.

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# 2 HYDROLOGY

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## 2.1 DRAINAGE CRITERIA AND METHODOLOGY

The analysis follows the current City of Albuquerque Development Process Manual Chapter 6, Drainage, Flood Control and Erosion Control. All models used in the analysis are based on the Amole-Hubbell Drainage Management Plan (DMP) Update. Hydrologic Engineering Centers – Hydrologic Modeling System created by the U.S. Army Corps of Engineers (HEC-HMS) computer program, version 4.11, was used to perform peak flow rate and runoff volume calculations using the SCS Unit Hydrograph method for drainage basins within the study area. The Amole-Hubbell DMP Update HEC-HMS model was obtained and revised to create the offsite subbasins. Unlike the drainage report for the previous phase, no Arid-lands Hydrologic Model (AHYMO) was created for this project, and HEC-HMS was used in lieu. The analysis used the 100-year, 24-hour duration for the runoff volume and the 100-yr, 6-hr duration for the peak flow rate. For smaller subbasins, the COA DPM method "Section 6-2(A)(7) Hydrograph for Small Watershed" was used to determine the peak flow rate and runoff volumes. Land treatment, excess precipitation, and the coefficient C were obtained using the tables in Part 6-2(A) of the COA DPM. The values selected for these parameters are discussed in later sections of this report.

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## 2.2 PRECIPITATION DATA

The COA DPM recommends the latest rainfall data be used in the hydrology calculations. Rainfall data was obtained from the “Precipitation-Frequency Atlas of the United States” of *NOAA Atlas 14, Volume 1, Version 5*<sup>[4]</sup>. Point Precipitation Frequency Estimate data sheets for the project area are provided in **Appendix C**.

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## 2.3 BASIN DELINEATION

The larger and offsite drainage basins were delineated using ESRI ArcGIS Pro, version 3.1.2. The smaller on-street drainage basins were delineated using Autodesk Civil 3D 2025. Aerial photos, ground survey data, private development plans, the Amole Hubbell DMP Update, as-built plans, and Bernalillo County’s 2010 Light Detection and Ranging (LiDAR) mapping data were used to refine these basins. A field investigation was conducted in July 2025 to verify drainage patterns and basin boundaries.

The contributory basins for the Frontage Road system on the north side of Central Avenue are generally bounded by 98<sup>th</sup> Street, Volcano Road, and Central Avenue, but also includes the area south of Central Avenue from the 36” RCP system at 94<sup>th</sup> Street. These basins include the shopping centers on both sides of 98<sup>th</sup> Street north of the intersection with Central Avenue. The basins are delineated based on the existing and proposed inlets that capture these offsite flows. They are also delineated based on changes in land treatment, routing between properties, walls, and development retention ponds.

The contributory basins for the south side of Central Avenue are confined to only the eastbound lanes and the proposed sidepath. No westbound flows enter these basins because the median is located at the crown of the street and is sufficiently higher than the curb and gutter lines of both sides of the street. No offsite flows from the basins to the south contribute to the street or the swales due to the elevation difference. A basin map is provided in **Appendix D**.

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## 2.4 LAND TREATMENTS AND SCS CURVE NUMBER

There are four land treatments designated in the COA DPM Section 6-2(A) that are used to calculate peak runoff flows and volume. The soils found in the study area of this project are entirely hydrological soil group A, which is good for infiltration and managing runoff. As a result, much of the undeveloped land in the project limits can be considered Land Treatment A due to the infiltration potential. Much of the variance between land treatments is due to the presence of impervious areas such as pavement, medians, and buildings. **Table 1** shows the corresponding parameters taken from COA DPM Section 6-2(A) used for each land treatment. A soils map is provided in **Appendix D**.

The SCS curve number (CN) is a parameter used in the SCS Unit Hydrograph method for calculating runoff. This number is used to calculate losses when calculating runoff and is based on land cover and soil type. The CN values for this project were taken from the tables in COA DPM Section 6-2(A).

**Table 1: Land Treatments and Corresponding Parameters for Drainage Basins**

Land Treatment	Description	C (100-yr)	CN
A	Uncompacted soil, native grasses, weeds, and shrubs	0.34	77
B	Irrigated lawns, parks, and golf courses	0.47	79
C	Compacted soil, unpaved parking lots, gravel or rock landscaping	0.63	86
D	Impervious areas, pavement, ponds, and channels	0.90	98

### 2.4.1 FRONTAGE ROAD SYSTEM LOSS PARAMETERS

The subbasins contributing to the Frontage Road system vary from land treatment A for the undeveloped properties to land treatment D for the fully developed properties and paved streets. Many subbasins are composed of more than one land treatment, due to presence of buildings and parking lots. Thus, a composite curve number (CN) was calculated for each subbasin based on percentage of land treatment, as shown in **Table 2**.

**Table 2: Composite CN for Each Subbasin**

Subbasin	Land Treatment				CN (composite)
	% A	% B	% C	% D	
TB207A	10			90	96
TB207B (EXIST)	100				77
TB207B (FUTURE)	66			33	84
TB207C	66			33	84
TB207D	66			33	84
TB207E	50			50	88
TB207F	66			33	84
TB207G			100		86
TB207H			25	75	95
TB207I				100	98
TB208A	66			33	84
TB208B	33			66	91
TB208C	10			90	96
TB208D	50			50	88
TB208E				100	98
TB209A			50	50	92
TB209B	50			50	88
TB209C	50			50	88
TB209D	50			50	88
TB209E	33			66	91
TB209F	50			50	88
TB209G (EXIST)	100				77
TB209G (FUTURE)	66			33	84
TB209H			100		86
TB209I			25	75	95

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### 2.4.2 SOUTH CENTRAL AVENUE LOSS PARAMETERS

The south Central Avenue subbasins primarily consist of impervious pavement with some percentage of road that will be a drainage swale. Therefore, land treatment “D” (CN value of 98) is assumed for all these subbasins, since it is used for impervious areas and ponds. The rational coefficient C and excess precipitation E were referenced from the tables in Section 6-2(A) based on land treatment “D” and for each recurrence interval. These values are provided in **Table 3**.

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## 2.5 TIME OF CONCENTRATION AND LAG TIME

Time of Concentration ( $T_C$ ) represents the time it takes for a water drop to travel from the uppermost point in the watershed to the outlet. Lag time ( $T_L$ ), which is proportional to  $T_C$ , represents the delay between the centroid of excess rainfall from the centroid of a peak rainfall event.  $T_L$  is used as an input in the SCS Unit Hydrograph method to develop a hydrograph for each drainage basin. The longest flow path length, an input in the  $T_C$  calculation, was determined for each drainage basin using Autodesk Civil 3D. The minimum  $T_L$  used was 7.2 minutes ( $T_C = 0.2$  hr), per the COA DPM. The minimum  $T_L$  was used for the south drainage swale basins, since the basin areas were relatively small (less than 2 acres), the flow paths were street flow only (impervious), and the average slopes for the flow paths were greater than 1%. The  $T_L$  values, as well as routing parameters, are provided in **Appendix E**.

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## 2.6 HYDROLOGIC ANALYSIS RESULTS

### 2.6.1 FRONTAGE ROAD SYSTEM RESULTS

The peak discharge flow rates (Q) were calculated for each subbasin in the Frontage Road system in HEC-HMS using the SCS Unit Hydrograph method. The areas, curve numbers, precipitation data, and lag times were used as inputs in the computation for each subbasin and recurrence interval. The results are shown in **Table 3**, and the calculations are also provided in **Appendix E**.

Subbasins TB207B and TB209G are both currently undeveloped and were analyzed for existing and future developed conditions. For the future development conditions, it is assumed that the strictest limitation on the undeveloped properties is a runoff flow rate of 1.5 CFS per acre. This allowable flow rate is greater than existing conditions, but less than the free discharge of flow on impervious areas. The curve number was increased to account for the recommended developed conditions.

**Table 3: Peak Discharge Results – Unit Hydrograph method**

Subbasin	Drainage Area (acre)	CN	T <sub>L</sub> (min)	Q <sub>10</sub> (cfs)	Q <sub>100</sub> (cfs)
TB207A	18.40	96	7.2	41.4	71.0
TB207B (FUTURE)	10.70	84	12.3	7.5	18.2
TB207B (EXIST)	10.70	77	15.4	3.1	10.0
TB207C	1.28	84	7.2	1.1	2.8
TB207D	3.42	84	9.3	2.8	6.7
TB207E	1.46	88	7.2	1.9	4.1
TB207F	3.03	84	7.2	2.7	6.6
TB207G	1.46	86	7.2	1.6	3.6
TB207H	3.60	95	7.2	8.0	14.2
TB207I	0.72	98	7.2	1.9	3.1
TB208A	2.16	84	7.2	1.9	4.7
TB208B	22.93	91	8.7	31.6	62.0
TB208C	1.85	96	7.2	4.4	7.6
TB208D	0.81	88	7.2	1.1	2.3
TB208E	1.05	98	8.7	2.6	4.2
TB209A	1.76	92	7.2	3.2	6.1
TB209B	1.94	88	12.6	1.9	4.2
TB209C	1.29	88	7.2	1.7	3.6
TB209D	1.23	88	7.2	1.6	3.4
TB209E	5.91	91	7.2	9.8	19.3
TB209F	1.24	88	7.2	1.6	3.4
TB209G (FUTURE)	2.63	84	7.2	2.3	5.7
TB209G (EXIST)	2.63	77	7.2	1.0	3.4
TB209H	1.35	86	7.2	1.5	3.3
TB209I	2.84	95	7.2	6.3	11.2

### 2.6.2 SOUTH CENTRAL AVENUE RESULTS

The peak discharge flow rates (Q) were calculated for each south Central Avenue subbasin using the Rational Method described in Part 6-2(A) of the COA DPM. The area, coefficient C, rainfall intensity at minimum T<sub>C</sub>, and bulking factor were used as inputs in the computation for each basin and recurrence interval. The results are shown in **Table 4**, and the calculations are also provided in **Appendix E**.

**Table 4: Peak Discharge Results – Rational method**

Basin	Drainage Area (acre)	Intensity (in/hr)		C		Q (cfs)	
		10-YR	100-YR	10-YR	100-YR	10-YR	100-YR
SC1	1.07	2.97	4.74	0.90	0.90	2.87	4.58
SC2	1.29	2.97	4.74	0.90	0.90	3.44	5.49
SC3	0.53	2.97	4.74	0.90	0.90	1.43	2.28
SC4	1.31	2.97	4.74	0.90	0.90	3.52	5.61
SC5	1.41	2.97	4.74	0.90	0.90	3.76	6.00
SC6	0.38	2.97	4.74	0.90	0.90	1.02	1.63

Runoff volumes were calculated using the volumetric runoff formulas in Section 6-2(A)4. This method is based on excess precipitation E, the basin area, and the precipitation depths for 6-hr and 24-hr storms. Both the 6-hour and 24-hour volumes were calculated for each basin. However, the 24-hour volume is the design volume for the project. The results are shown in **Table 5**, and the calculations are also provided in **Appendix E**.

**Table 5: Runoff Volume Results**

Basin	Drainage Area (acre)	E (in)		V - 6hr (acre-ft)		V - 24hr (acre-ft)	
		10-YR	100-YR	10-YR	100-YR	10-YR	100-YR
SC1	1.07	1.43	2.24	0.13	0.20	0.15	0.23
SC2	1.29	1.43	2.24	0.15	0.24	0.18	0.27
SC3	0.53	1.43	2.24	0.06	0.10	0.08	0.11
SC4	1.31	1.43	2.24	0.16	0.25	0.19	0.28
SC5	1.41	1.43	2.24	0.17	0.26	0.20	0.30
SC6	0.38	1.43	2.24	0.05	0.07	0.05	0.08

## 3 HYDRAULICS AND RECOMMENDATIONS

### 3.1 FRONTAGE ROAD SYSTEM

The hydrologic results from the Frontage Road system subbasins were used to develop three PCSWMM hydraulic models of the existing system. The trunkline of the system was modelled in PCSWMM. The model was simplified so that inlets were not modelled and flows were assigned directly to the manholes.

The first model assessed the existing conditions of the storm drain and used the existing curve numbers and lag times for the undeveloped lots. The results from this model showed that the existing system has capacity when the undeveloped lots remain undeveloped or limited to existing conditions. However, this condition is not acceptable for design because there needs to be some factor of safety to account for development, even if the City of Albuquerque restricts the free discharge on those properties. Additionally, the EGL is above the top of pavement, and it would be difficult to contain the EGL within the right-of-way.

A second iteration of the first model was created that used the future curve numbers and lag times as inputs for the undeveloped lots. This assumption would still require the City of Albuquerque to modify the discharge condition of these properties from “Free Discharge” to “Detention”. The reason for this change is that the existing system does not have the capacity for free discharge of full impervious area flow. It was discovered that the existing system was undersized for the future development conditions. The results from the two iterations of the existing storm drain model are provided in **Appendix F**.

A new 42” trunkline is proposed that diverts flows coming from the 36” RCP system at 94<sup>th</sup> Street to the 84” RCP system at 90<sup>th</sup> Street. This proposed trunkline would be under the eastbound lanes of Central Avenue. The proposed line would start east of the large duct bank crossing by the existing 36” RCP. This new system was modelled in PCSWMM, and the results are provided in **Appendix F**. This proposed diversion trunkline resolves the capacity issues of the trunkline in the Frontage Road for the future development conditions.

New curb and median inlets are proposed in the Frontage Road system to adequately drain the westbound lanes of Central Avenue and the proposed swales. The placement of these inlets was designed as part of the 60% design of the previous phase of this project per the criteria in COA DPM. “HEC-22 Urban Drainage Design Manual” [5] will also guide the design of the curb and median inlets. Future spread and street hydraulic analysis will be completed in the future as the roadway and drainage design progresses. These inlets will connect to the existing Frontage Road system with proposed laterals, and new manholes will be constructed on the existing trunkline. The PCSWMM model currently has all the basin flows routed directly to the trunkline manholes. In the future, the PCSWMM models will be updated to include these inlets and laterals.

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## 3.2 SOUTH CENTRAL SYSTEM

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### 3.2.1 ALTERNATIVE 1 – DRAINAGE SWALE OPTION

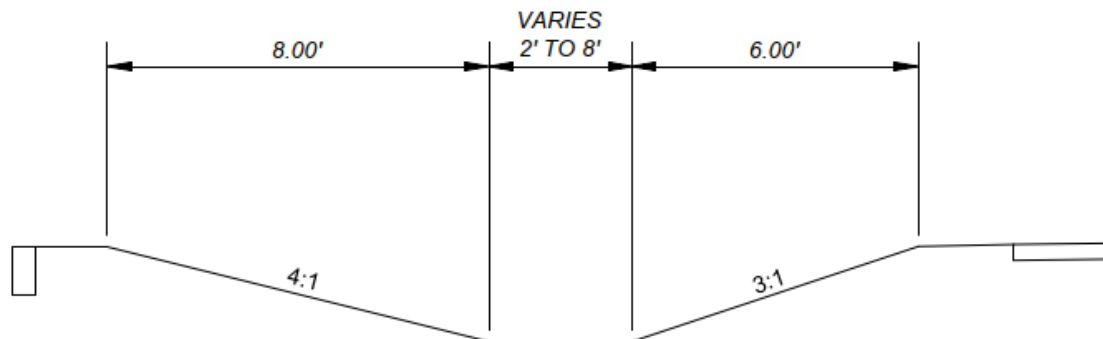
The first alternative is to use the buffer area between the eastbound lanes of Central Avenue and the proposed sidewalk as a drainage swale for retention. These swales are green stormwater infrastructure (GSI) measures that allow water to infiltrate the ground rather than flow to the Tierra Bayita Channel. The intention is for these swales to capture the 24-hour, 100-year storm event. Overflow from the swales will end up in the side streets and flow south towards Bridge Boulevard. Rock check dams will be utilized to slow down the flows in the swales and allow the runoff to infiltrate. Check dams are recommended to be placed at every 1’ drop in vertical elevation measured in flowline of the ditch. The swales would be located along Central Avenue from 86<sup>th</sup> Street to 98<sup>th</sup> Street.

The typical drainage swale is 2’ deep and varies from 16’ to 22’ in top width. It is a trapezoidal section with a 4:1 side slope on the street side and a 3:1 side slope on the side path side. A typical section of the proposed drainage swale is shown in **Figure 1**. Plan view sheets are provided in **Appendix F**.

Due to R.O.W. and space constraints, inlets and a 24” RCP trunkline are proposed under the eastbound lanes of Central Avenue between 98<sup>th</sup> Street and Westland Road. There would be two curb inlets draining flows from the eastbound lanes and the signalized intersection of 98<sup>th</sup> Street and Central Avenue. This storm drain would connect to the Frontage Road storm drain system and would cross the street at the Westland Road and Central Avenue intersection to avoid conflicts with the existing median landscaping.

Another drawback of the drainage swales is that there are several utilities present underneath the proposed buffer area between the street and the sidewalk. The swales will need to be designed so that there is adequate cover above the utilities. There would also need to be significant R.O.W. acquisitions to fully capture the 24-hour, 100-year storm volume that contributes to the south side Central Avenue. There is also high erosion potential due to the 1% to 3% longitudinal slopes of Central Avenue.

**Figure 1: Drainage Swale Section**



**SECTION - DRAINAGE BIOSWALE  
BETWEEN CURB AND TRAIL**

### 3.2.2 ALTERNATIVE 2 – STORM DRAIN OPTION

The second alternative utilizes inlets and storm drain for the entire south side of Central Avenue between 98<sup>th</sup> Street and 86<sup>th</sup> Street. The proposed storm drain would consist of a 24" trunkline underneath the eastbound side of Central Avenue. The storm drain would be designed around utility crossings and conflicts. This system would connect to the proposed 36" RCP diversion trunkline under the 94<sup>th</sup> Street intersection and would be sized to have capacity for the combined flows. The proposed pipe downstream of the existing 36" RCP system is 42" RCP. There would be an inlet draining eastbound Central Avenue between 90<sup>th</sup> Street and 86<sup>th</sup> Street, and a 24" storm drain pipe will carry that water west to 90<sup>th</sup> Street. Since there is no proposed water block on 86<sup>th</sup> Street, all excess water after this inlet will flow onto 86<sup>th</sup> Street as it currently does in existing conditions. Small drainage swales may be used between the last inlet and 86<sup>th</sup> Street to mitigate the bypass runoff. Plan and profile sheets of this alternative are provided in **Appendix F**.

The primary drawback of this alternative is the cost and difficulty of construction associated with installing a storm drain system under the eastbound lanes of Central Avenue. Traffic control, pavement reconstruction, and installation of storm drain will be much more expensive with this alternative.

### 3.2.3 RECOMMENDED ALTERNATIVE

WSP recommends that the storm drain option be used in conjunction with some GSI drainage swales. The storm drain system is required if R.O.W acquisition is to be mitigated. The storm drain system is straightforward, easier to maintain, and will ensure that the south Central Avenue flows are managed. Adding drainage swales reduces

the runoff entering the storm drain system. These swales will be designed so that there is no increase in proposed flows compared to existing conditions, which is required by the MS4 permit for the City of Albuquerque.

## 4 CONCLUSION

This preliminary drainage report documents the preliminary analysis and recommendations for the drainage management of Central Avenue between 98<sup>th</sup> Street and 86<sup>th</sup> Street corresponding to the Complete Streets improvements. It was determined that the existing Frontage Road system does not have capacity for the future development of the bare properties. As a resolution, a diversion trunkline is recommended under the eastbound lanes of Central Avenue between 94<sup>th</sup> Street and 90<sup>th</sup> Street. As a result of this proposed change, the existing Frontage Road system will not need to be upsized, which would be considerably expensive and difficult to construct due to its depth.

As the roadway and drainage design progresses, the drainage analysis will be refined and become more detailed to account for all the proposed inlets and laterals. Street hydraulic calculations will be completed to ensure that inlets are placed, so that street flows meet COA DPM criteria. The trunkline connection at the 84" RCP at 90<sup>th</sup> Street will be addressed during future design. In addition, major utility crossings will also be assessed once pothole data is obtained to ensure that the proposed design is still valid. The final drainage report for this project will expand on this preliminary report and document a more detailed analysis of the proposed streets and inlets.

## 5 REFERENCES

1. City of Albuquerque, "Development Process Manual" September 2020.
2. Wilson & Company, "AMAFCA Amole-Hubbell Drainage Master Plan Update", May 2013.
3. New Mexico State Highway Commission, "New Mexico Project FI-178(9)", As-builts, 1952.
4. National Oceanic and Atmospheric Administration, National Weather Service, "Precipitation-Frequency Atlas of the United States" of NOAA Atlas 14, Volume1, Version 5, November 2024.  
Retrieved from [https://hdsc.nws.noaa.gov/pfds/pfds\\_map\\_cont.html?bkmrk=nm](https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=nm)
5. U.S. Department of Transportation, Federal Highway Administration, "Urban Drainage Design Manual", Hydraulic Engineering Circular No. 22, Third Edition, August

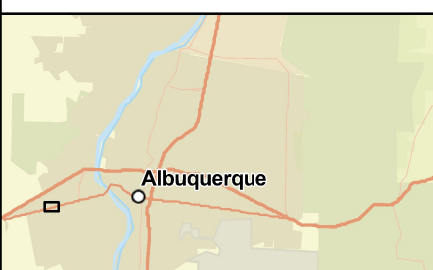
# APPENDIX

# A EXISTING CONDITIONS MAP



**Legend**

- Existing Manholes
- Existing Inlets
- Existing Storm Drain
- Existing CBCs



**Existing Conditions Map**

West Central Complete Streets  
Sarrancino Place to 98th Street

City of Albuquerque  
Project No. 6321.94

# APPENDIX

## B

## FLOODPLAIN MAP



**FLOOD HAZARD INFORMATION**

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT  
**THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)**

	Without Base Flood Elevation (BFE) Zone A, V, AE, AH
	With BFE or Depth Zone AE, AO, AH, VE, AE, AH
	Regulatory Floodway
	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
	Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
	Area of Undetermined Flood Hazard Zone D
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	Cross Sections with 1% Annual Chance Water Surface Elevation
	Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

**NOTES TO USERS**

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with the FIRM including historic versions of this FIRM, the current map date of each FIRM panel, how to order products or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information Hotline at 1-877-FEMA-5888 (1-877-362-5888) or visit the FEMA Flood Map Service Center website at <http://mfmc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

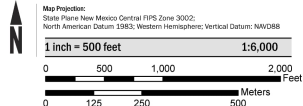
Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be located directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-658-4600.

This information was derived from digital orthophotography dated 2014. Additional information pertaining to road names and political boundaries were provided by the City of Albuquerque, 2014.

**SCALE**



**PANEL LOCATOR**



**NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP**

**BERNALILLO COUNTY, NEW MEXICO**  
and Incorporated Areas

PANEL 328 of 825

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF BERNALILLO COUNTY	350002	0328	J
	350001	0328	J

Panel Contains:



VERSION NUMBER  
2.3.3.2  
MAP NUMBER  
3500100328J  
MAP REVISED  
NOVEMBER 4, 2016

# APPENDIX

## C NOAA POINT PRECIPITATION FREQUENCY ESTIMATES



**NOAA Atlas 14, Volume 1, Version 5**  
**Location name: Albuquerque, New Mexico, USA\***  
**Latitude: 35.0753°, Longitude: -106.735°**  
**Elevation: 5149 ft\*\***



\* source: ESRI Maps  
 \*\* source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Tryppaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

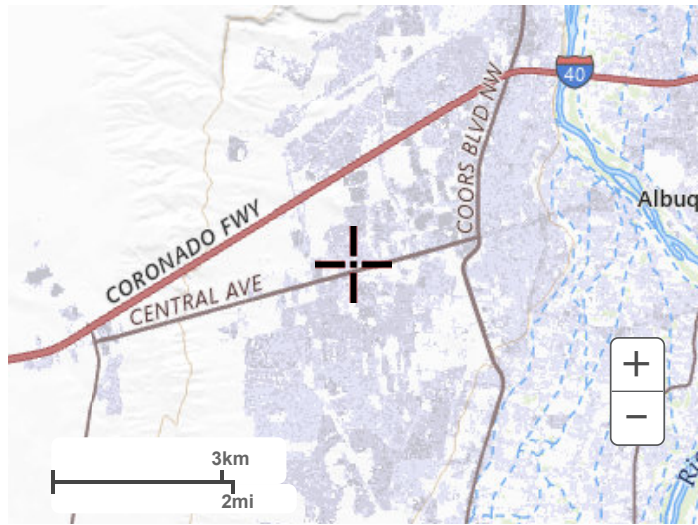
**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min</b>	<b>0.168</b> (0.144-0.196)	<b>0.218</b> (0.186-0.253)	<b>0.292</b> (0.249-0.341)	<b>0.351</b> (0.299-0.408)	<b>0.431</b> (0.364-0.500)	<b>0.494</b> (0.416-0.573)	<b>0.560</b> (0.468-0.649)	<b>0.630</b> (0.523-0.729)	<b>0.725</b> (0.596-0.841)	<b>0.801</b> (0.653-0.928)
<b>10-min</b>	<b>0.255</b> (0.219-0.298)	<b>0.331</b> (0.284-0.386)	<b>0.445</b> (0.379-0.519)	<b>0.534</b> (0.454-0.620)	<b>0.656</b> (0.555-0.761)	<b>0.751</b> (0.633-0.872)	<b>0.852</b> (0.712-0.987)	<b>0.958</b> (0.796-1.11)	<b>1.10</b> (0.907-1.28)	<b>1.22</b> (0.994-1.41)
<b>15-min</b>	<b>0.316</b> (0.272-0.369)	<b>0.410</b> (0.352-0.478)	<b>0.551</b> (0.470-0.643)	<b>0.662</b> (0.563-0.769)	<b>0.814</b> (0.688-0.944)	<b>0.931</b> (0.785-1.08)	<b>1.06</b> (0.883-1.22)	<b>1.19</b> (0.986-1.38)	<b>1.37</b> (1.12-1.59)	<b>1.51</b> (1.23-1.75)
<b>30-min</b>	<b>0.426</b> (0.366-0.497)	<b>0.553</b> (0.473-0.644)	<b>0.743</b> (0.633-0.866)	<b>0.892</b> (0.759-1.04)	<b>1.10</b> (0.926-1.27)	<b>1.25</b> (1.06-1.46)	<b>1.42</b> (1.19-1.65)	<b>1.60</b> (1.33-1.85)	<b>1.84</b> (1.51-2.14)	<b>2.03</b> (1.66-2.36)
<b>60-min</b>	<b>0.527</b> (0.453-0.615)	<b>0.684</b> (0.586-0.797)	<b>0.919</b> (0.783-1.07)	<b>1.10</b> (0.939-1.28)	<b>1.36</b> (1.15-1.57)	<b>1.55</b> (1.31-1.80)	<b>1.76</b> (1.47-2.04)	<b>1.98</b> (1.64-2.29)	<b>2.28</b> (1.87-2.64)	<b>2.52</b> (2.05-2.92)
<b>2-hr</b>	<b>0.604</b> (0.516-0.714)	<b>0.771</b> (0.660-0.915)	<b>1.02</b> (0.872-1.21)	<b>1.22</b> (1.04-1.44)	<b>1.51</b> (1.27-1.77)	<b>1.73</b> (1.45-2.03)	<b>1.98</b> (1.64-2.31)	<b>2.23</b> (1.84-2.60)	<b>2.59</b> (2.11-3.02)	<b>2.88</b> (2.32-3.36)
<b>3-hr</b>	<b>0.651</b> (0.564-0.768)	<b>0.829</b> (0.714-0.976)	<b>1.09</b> (0.939-1.28)	<b>1.29</b> (1.11-1.52)	<b>1.58</b> (1.34-1.85)	<b>1.81</b> (1.54-2.11)	<b>2.06</b> (1.73-2.40)	<b>2.32</b> (1.93-2.70)	<b>2.68</b> (2.21-3.13)	<b>2.98</b> (2.43-3.48)
<b>6-hr</b>	<b>0.752</b> (0.655-0.877)	<b>0.949</b> (0.829-1.11)	<b>1.22</b> (1.07-1.42)	<b>1.44</b> (1.26-1.67)	<b>1.74</b> (1.50-2.02)	<b>1.97</b> (1.70-2.28)	<b>2.22</b> (1.90-2.57)	<b>2.48</b> (2.10-2.86)	<b>2.84</b> (2.38-3.28)	<b>3.13</b> (2.60-3.63)
<b>12-hr</b>	<b>0.844</b> (0.742-0.964)	<b>1.07</b> (0.937-1.22)	<b>1.35</b> (1.18-1.54)	<b>1.58</b> (1.38-1.80)	<b>1.88</b> (1.64-2.14)	<b>2.12</b> (1.83-2.40)	<b>2.36</b> (2.04-2.68)	<b>2.62</b> (2.23-2.96)	<b>2.96</b> (2.50-3.36)	<b>3.24</b> (2.72-3.68)
<b>24-hr</b>	<b>0.943</b> (0.835-1.07)	<b>1.18</b> (1.05-1.34)	<b>1.48</b> (1.31-1.68)	<b>1.71</b> (1.52-1.94)	<b>2.03</b> (1.79-2.30)	<b>2.28</b> (2.00-2.57)	<b>2.53</b> (2.22-2.85)	<b>2.79</b> (2.43-3.14)	<b>3.14</b> (2.72-3.53)	<b>3.41</b> (2.93-3.83)
<b>2-day</b>	<b>1.00</b> (0.893-1.12)	<b>1.26</b> (1.12-1.41)	<b>1.57</b> (1.40-1.76)	<b>1.81</b> (1.61-2.03)	<b>2.14</b> (1.90-2.39)	<b>2.40</b> (2.11-2.67)	<b>2.66</b> (2.34-2.96)	<b>2.92</b> (2.56-3.26)	<b>3.27</b> (2.85-3.66)	<b>3.54</b> (3.07-3.96)
<b>3-day</b>	<b>1.12</b> (1.01-1.24)	<b>1.39</b> (1.26-1.54)	<b>1.72</b> (1.56-1.90)	<b>1.98</b> (1.79-2.18)	<b>2.33</b> (2.10-2.57)	<b>2.60</b> (2.33-2.86)	<b>2.86</b> (2.56-3.15)	<b>3.13</b> (2.79-3.45)	<b>3.49</b> (3.10-3.85)	<b>3.76</b> (3.33-4.16)
<b>4-day</b>	<b>1.24</b> (1.13-1.35)	<b>1.53</b> (1.40-1.68)	<b>1.88</b> (1.72-2.05)	<b>2.15</b> (1.97-2.34)	<b>2.52</b> (2.30-2.74)	<b>2.80</b> (2.54-3.04)	<b>3.07</b> (2.79-3.34)	<b>3.35</b> (3.03-3.65)	<b>3.71</b> (3.35-4.05)	<b>3.99</b> (3.58-4.36)
<b>7-day</b>	<b>1.42</b> (1.30-1.54)	<b>1.76</b> (1.61-1.91)	<b>2.14</b> (1.96-2.32)	<b>2.43</b> (2.23-2.64)	<b>2.82</b> (2.58-3.05)	<b>3.10</b> (2.84-3.36)	<b>3.39</b> (3.09-3.67)	<b>3.66</b> (3.34-3.96)	<b>4.01</b> (3.65-4.35)	<b>4.27</b> (3.88-4.63)
<b>10-day</b>	<b>1.57</b> (1.44-1.70)	<b>1.94</b> (1.78-2.11)	<b>2.38</b> (2.18-2.57)	<b>2.71</b> (2.49-2.94)	<b>3.16</b> (2.90-3.41)	<b>3.49</b> (3.20-3.77)	<b>3.83</b> (3.50-4.13)	<b>4.15</b> (3.78-4.49)	<b>4.57</b> (4.16-4.95)	<b>4.89</b> (4.42-5.29)
<b>20-day</b>	<b>1.96</b> (1.80-2.14)	<b>2.43</b> (2.24-2.65)	<b>2.95</b> (2.72-3.21)	<b>3.34</b> (3.07-3.63)	<b>3.84</b> (3.53-4.16)	<b>4.20</b> (3.85-4.55)	<b>4.54</b> (4.16-4.92)	<b>4.87</b> (4.45-5.26)	<b>5.27</b> (4.82-5.70)	<b>5.56</b> (5.07-6.02)
<b>30-day</b>	<b>2.35</b> (2.16-2.54)	<b>2.92</b> (2.68-3.15)	<b>3.50</b> (3.22-3.79)	<b>3.94</b> (3.62-4.25)	<b>4.48</b> (4.12-4.83)	<b>4.87</b> (4.46-5.24)	<b>5.23</b> (4.80-5.63)	<b>5.57</b> (5.10-5.99)	<b>5.98</b> (5.46-6.43)	<b>6.25</b> (5.72-6.73)
<b>45-day</b>	<b>2.87</b> (2.65-3.10)	<b>3.55</b> (3.28-3.83)	<b>4.22</b> (3.90-4.55)	<b>4.70</b> (4.34-5.07)	<b>5.28</b> (4.88-5.69)	<b>5.67</b> (5.25-6.11)	<b>6.03</b> (5.58-6.48)	<b>6.34</b> (5.86-6.81)	<b>6.68</b> (6.19-7.18)	<b>6.88</b> (6.39-7.38)
<b>60-day</b>	<b>3.31</b> (3.05-3.58)	<b>4.09</b> (3.78-4.42)	<b>4.87</b> (4.50-5.26)	<b>5.43</b> (5.02-5.85)	<b>6.10</b> (5.64-6.57)	<b>6.55</b> (6.06-7.05)	<b>6.97</b> (6.45-7.50)	<b>7.33</b> (6.79-7.90)	<b>7.74</b> (7.17-8.34)	<b>8.00</b> (7.42-8.61)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

**PF graphical**



Large scale terrain



Large scale map



Large scale aerial



**NOAA Atlas 14, Volume 1, Version 5**  
**Location name: Albuquerque, New Mexico, USA\***  
**Latitude: 35.0753°, Longitude: -106.735°**  
**Elevation: 5149 ft\*\***



\* source: ESRI Maps  
 \*\* source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Tryppaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

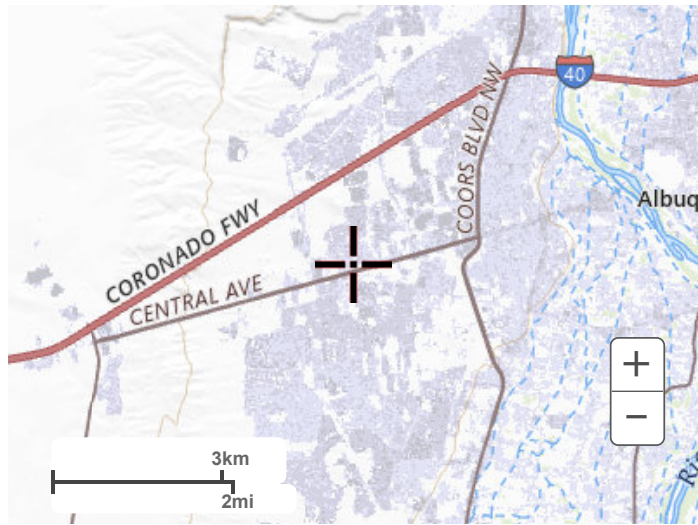
**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min</b>	<b>2.02</b> (1.73-2.35)	<b>2.62</b> (2.23-3.04)	<b>3.50</b> (2.99-4.09)	<b>4.21</b> (3.59-4.90)	<b>5.17</b> (4.37-6.00)	<b>5.93</b> (4.99-6.88)	<b>6.72</b> (5.62-7.79)	<b>7.56</b> (6.28-8.75)	<b>8.70</b> (7.15-10.1)	<b>9.61</b> (7.84-11.1)
<b>10-min</b>	<b>1.53</b> (1.31-1.79)	<b>1.99</b> (1.70-2.32)	<b>2.67</b> (2.27-3.11)	<b>3.20</b> (2.72-3.72)	<b>3.94</b> (3.33-4.57)	<b>4.51</b> (3.80-5.23)	<b>5.11</b> (4.27-5.92)	<b>5.75</b> (4.78-6.66)	<b>6.62</b> (5.44-7.67)	<b>7.31</b> (5.96-8.47)
<b>15-min</b>	<b>1.26</b> (1.09-1.48)	<b>1.64</b> (1.41-1.91)	<b>2.20</b> (1.88-2.57)	<b>2.65</b> (2.25-3.08)	<b>3.26</b> (2.75-3.78)	<b>3.72</b> (3.14-4.32)	<b>4.22</b> (3.53-4.90)	<b>4.75</b> (3.94-5.50)	<b>5.47</b> (4.50-6.34)	<b>6.04</b> (4.93-7.00)
<b>30-min</b>	<b>0.852</b> (0.732-0.994)	<b>1.11</b> (0.946-1.29)	<b>1.49</b> (1.27-1.73)	<b>1.78</b> (1.52-2.07)	<b>2.19</b> (1.85-2.54)	<b>2.51</b> (2.11-2.91)	<b>2.85</b> (2.38-3.30)	<b>3.20</b> (2.66-3.71)	<b>3.68</b> (3.03-4.27)	<b>4.07</b> (3.32-4.71)
<b>60-min</b>	<b>0.527</b> (0.453-0.615)	<b>0.684</b> (0.586-0.797)	<b>0.919</b> (0.783-1.07)	<b>1.10</b> (0.939-1.28)	<b>1.36</b> (1.15-1.57)	<b>1.55</b> (1.31-1.80)	<b>1.76</b> (1.47-2.04)	<b>1.98</b> (1.64-2.29)	<b>2.28</b> (1.87-2.64)	<b>2.52</b> (2.05-2.92)
<b>2-hr</b>	<b>0.302</b> (0.258-0.357)	<b>0.385</b> (0.330-0.457)	<b>0.511</b> (0.436-0.605)	<b>0.612</b> (0.520-0.719)	<b>0.753</b> (0.635-0.883)	<b>0.867</b> (0.725-1.02)	<b>0.987</b> (0.820-1.16)	<b>1.12</b> (0.918-1.30)	<b>1.30</b> (1.05-1.51)	<b>1.44</b> (1.16-1.68)
<b>3-hr</b>	<b>0.216</b> (0.187-0.255)	<b>0.276</b> (0.237-0.325)	<b>0.361</b> (0.312-0.425)	<b>0.430</b> (0.369-0.504)	<b>0.525</b> (0.447-0.615)	<b>0.603</b> (0.511-0.703)	<b>0.684</b> (0.576-0.798)	<b>0.772</b> (0.644-0.900)	<b>0.893</b> (0.736-1.04)	<b>0.993</b> (0.809-1.16)
<b>6-hr</b>	<b>0.125</b> (0.109-0.146)	<b>0.158</b> (0.138-0.185)	<b>0.204</b> (0.178-0.237)	<b>0.240</b> (0.209-0.279)	<b>0.290</b> (0.251-0.336)	<b>0.329</b> (0.283-0.381)	<b>0.371</b> (0.316-0.429)	<b>0.413</b> (0.350-0.478)	<b>0.473</b> (0.397-0.547)	<b>0.522</b> (0.434-0.605)
<b>12-hr</b>	<b>0.070</b> (0.061-0.080)	<b>0.088</b> (0.077-0.100)	<b>0.112</b> (0.098-0.127)	<b>0.131</b> (0.114-0.149)	<b>0.156</b> (0.135-0.177)	<b>0.175</b> (0.152-0.199)	<b>0.196</b> (0.168-0.222)	<b>0.217</b> (0.185-0.246)	<b>0.245</b> (0.207-0.278)	<b>0.268</b> (0.225-0.305)
<b>24-hr</b>	<b>0.039</b> (0.034-0.044)	<b>0.049</b> (0.043-0.055)	<b>0.061</b> (0.054-0.069)	<b>0.071</b> (0.063-0.080)	<b>0.084</b> (0.074-0.095)	<b>0.094</b> (0.083-0.106)	<b>0.105</b> (0.092-0.118)	<b>0.116</b> (0.101-0.130)	<b>0.130</b> (0.113-0.146)	<b>0.141</b> (0.122-0.159)
<b>2-day</b>	<b>0.020</b> (0.018-0.023)	<b>0.026</b> (0.023-0.029)	<b>0.032</b> (0.029-0.036)	<b>0.037</b> (0.033-0.042)	<b>0.044</b> (0.039-0.049)	<b>0.049</b> (0.044-0.055)	<b>0.055</b> (0.048-0.061)	<b>0.060</b> (0.053-0.067)	<b>0.068</b> (0.059-0.076)	<b>0.073</b> (0.063-0.082)
<b>3-day</b>	<b>0.015</b> (0.014-0.017)	<b>0.019</b> (0.017-0.021)	<b>0.023</b> (0.021-0.026)	<b>0.027</b> (0.024-0.030)	<b>0.032</b> (0.029-0.035)	<b>0.036</b> (0.032-0.039)	<b>0.039</b> (0.035-0.043)	<b>0.043</b> (0.038-0.047)	<b>0.048</b> (0.043-0.053)	<b>0.052</b> (0.046-0.057)
<b>4-day</b>	<b>0.012</b> (0.011-0.014)	<b>0.015</b> (0.014-0.017)	<b>0.019</b> (0.017-0.021)	<b>0.022</b> (0.020-0.024)	<b>0.026</b> (0.023-0.028)	<b>0.029</b> (0.026-0.031)	<b>0.032</b> (0.029-0.034)	<b>0.034</b> (0.031-0.037)	<b>0.038</b> (0.034-0.042)	<b>0.041</b> (0.037-0.045)
<b>7-day</b>	<b>0.008</b> (0.007-0.009)	<b>0.010</b> (0.009-0.011)	<b>0.012</b> (0.011-0.013)	<b>0.014</b> (0.013-0.015)	<b>0.016</b> (0.015-0.018)	<b>0.018</b> (0.016-0.019)	<b>0.020</b> (0.018-0.021)	<b>0.021</b> (0.019-0.023)	<b>0.023</b> (0.021-0.025)	<b>0.025</b> (0.023-0.027)
<b>10-day</b>	<b>0.006</b> (0.006-0.007)	<b>0.008</b> (0.007-0.008)	<b>0.009</b> (0.009-0.010)	<b>0.011</b> (0.010-0.012)	<b>0.013</b> (0.012-0.014)	<b>0.014</b> (0.013-0.015)	<b>0.015</b> (0.014-0.017)	<b>0.017</b> (0.015-0.018)	<b>0.019</b> (0.017-0.020)	<b>0.020</b> (0.018-0.022)
<b>20-day</b>	<b>0.004</b> (0.003-0.004)	<b>0.005</b> (0.004-0.005)	<b>0.006</b> (0.005-0.006)	<b>0.006</b> (0.006-0.007)	<b>0.008</b> (0.007-0.008)	<b>0.008</b> (0.008-0.009)	<b>0.009</b> (0.008-0.010)	<b>0.010</b> (0.009-0.010)	<b>0.010</b> (0.010-0.011)	<b>0.011</b> (0.010-0.012)
<b>30-day</b>	<b>0.003</b> (0.003-0.003)	<b>0.004</b> (0.003-0.004)	<b>0.004</b> (0.004-0.005)	<b>0.005</b> (0.005-0.005)	<b>0.006</b> (0.005-0.006)	<b>0.006</b> (0.006-0.007)	<b>0.007</b> (0.006-0.007)	<b>0.007</b> (0.007-0.008)	<b>0.008</b> (0.007-0.008)	<b>0.008</b> (0.007-0.009)
<b>45-day</b>	<b>0.002</b> (0.002-0.002)	<b>0.003</b> (0.003-0.003)	<b>0.003</b> (0.003-0.004)	<b>0.004</b> (0.004-0.004)	<b>0.004</b> (0.004-0.005)	<b>0.005</b> (0.004-0.005)	<b>0.005</b> (0.005-0.006)	<b>0.005</b> (0.005-0.006)	<b>0.006</b> (0.005-0.006)	<b>0.006</b> (0.005-0.006)
<b>60-day</b>	<b>0.002</b> (0.002-0.002)	<b>0.002</b> (0.002-0.003)	<b>0.003</b> (0.003-0.003)	<b>0.003</b> (0.003-0.004)	<b>0.004</b> (0.003-0.004)	<b>0.004</b> (0.004-0.004)	<b>0.004</b> (0.004-0.005)	<b>0.005</b> (0.004-0.005)	<b>0.005</b> (0.004-0.005)	<b>0.005</b> (0.005-0.005)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

**PF graphical**



Large scale terrain



Large scale map



Large scale aerial

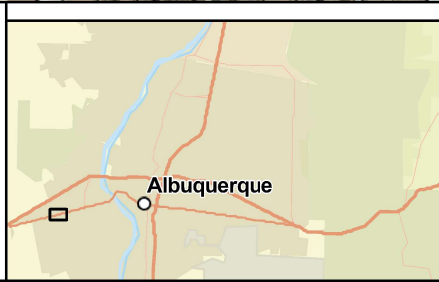
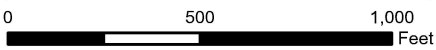
# APPENDIX

## D BASIN MAPS



**Legend**

- Frontage Road Basins
- South Central Basins



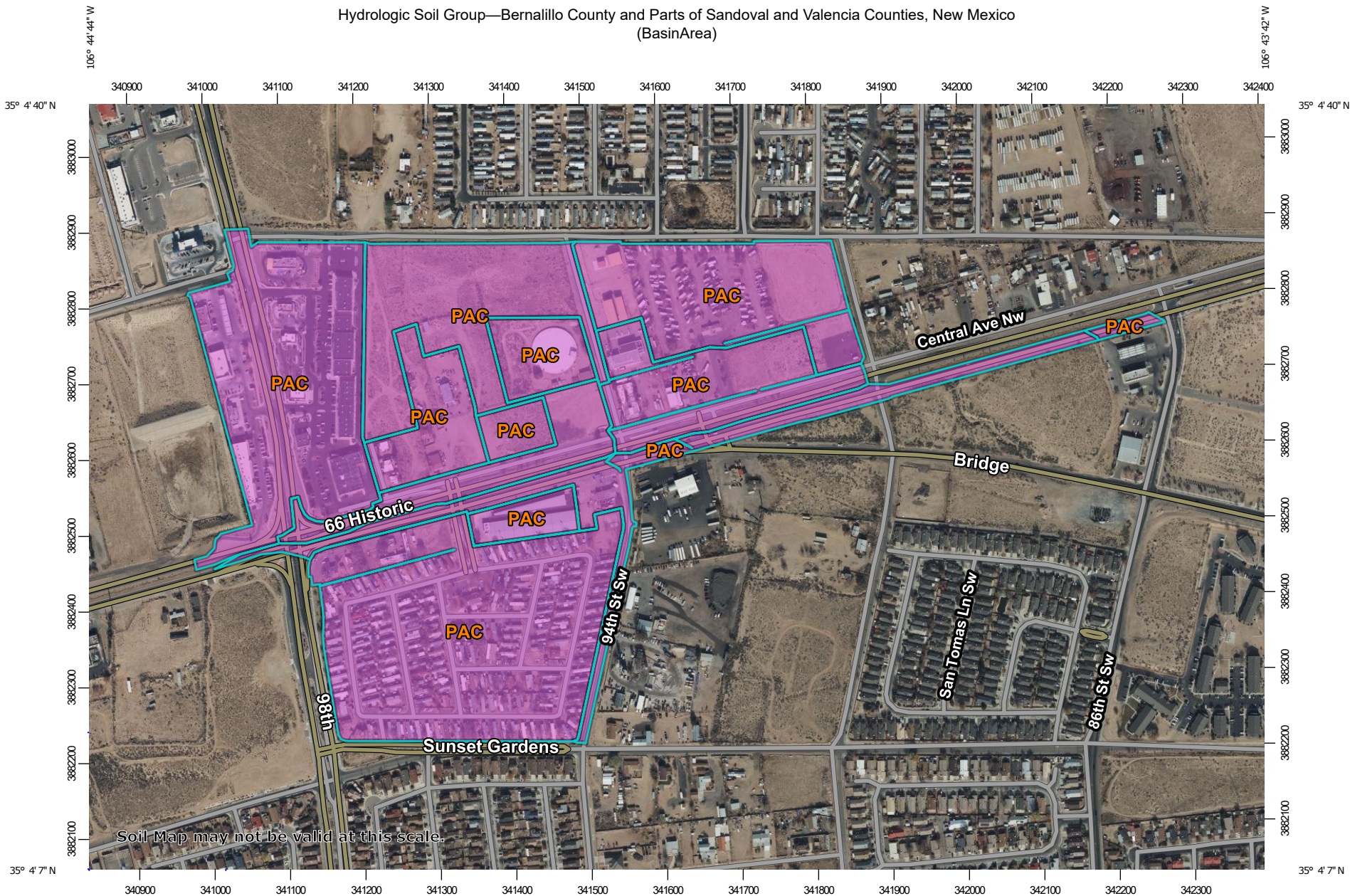
**Basin Map**

West Central Complete Streets  
Sarrancino Place to 98th Street

City of Albuquerque  
Project No. 6321.94

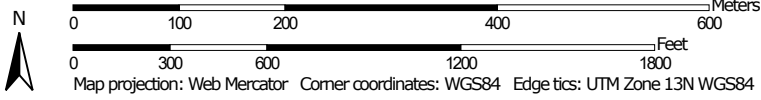


Hydrologic Soil Group—Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico  
(BasinArea)




Soil Map may not be valid at this scale.

Map Scale: 1:7,130 if printed on A landscape (11" x 8.5") sheet.



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines


 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico  
 Survey Area Data: Version 19, Sep 3, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 22, 2021—Dec 2, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PAC	Pajarito loamy fine sand, 1 to 9 percent slopes	A	99.0	99.9%
<b>Totals for Area of Interest</b>			<b>99.0</b>	<b>100.0%</b>

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Rating Options

*Aggregation Method: Dominant Condition*

*Component Percent Cutoff: None Specified*

# APPENDIX

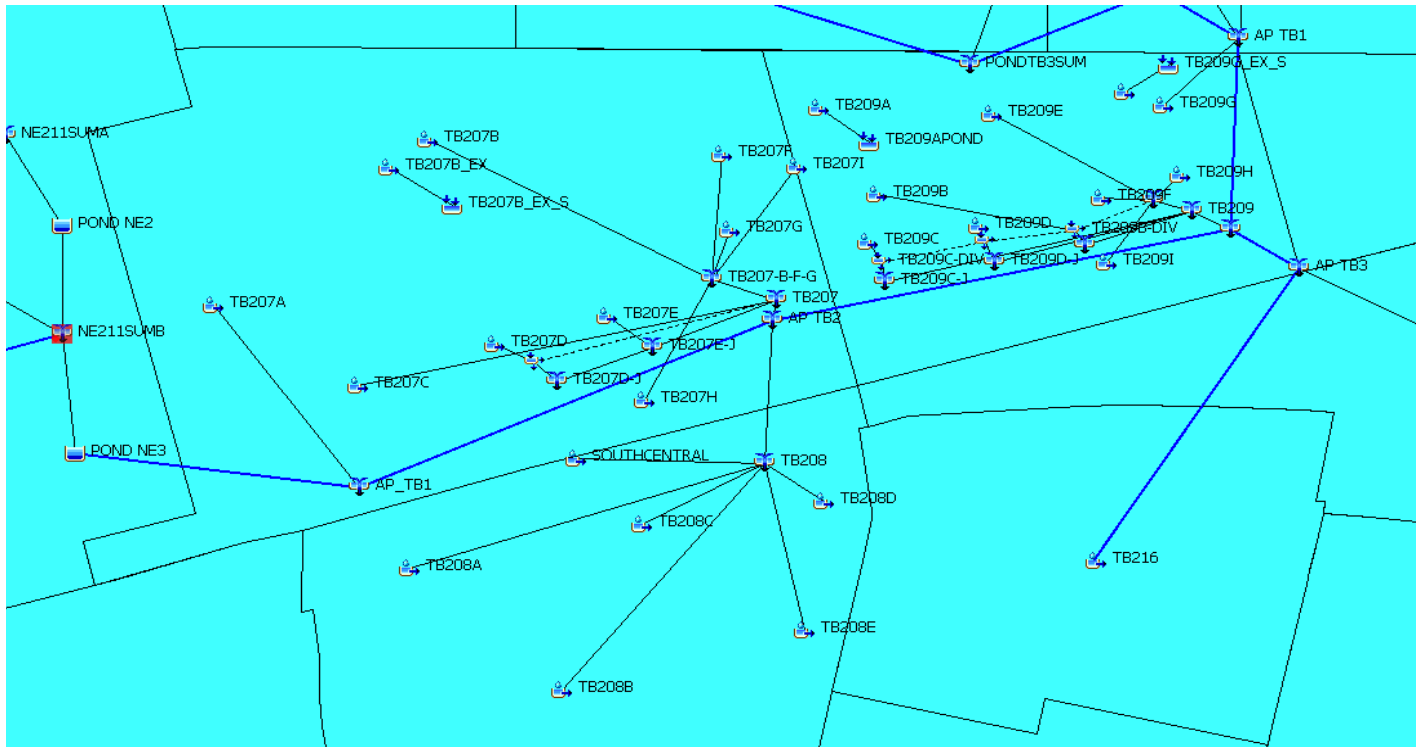
## **E** HYDROLOGIC SUMMARY

E.1 FRONTAGE ROAD  
E.2 SOUTH CENTRAL

# APPENDIX

## E.1 FRONTAGE ROAD HYDROLOGY

FRONTAGE ROAD SYSTEM - HEC-HMS ROUTING



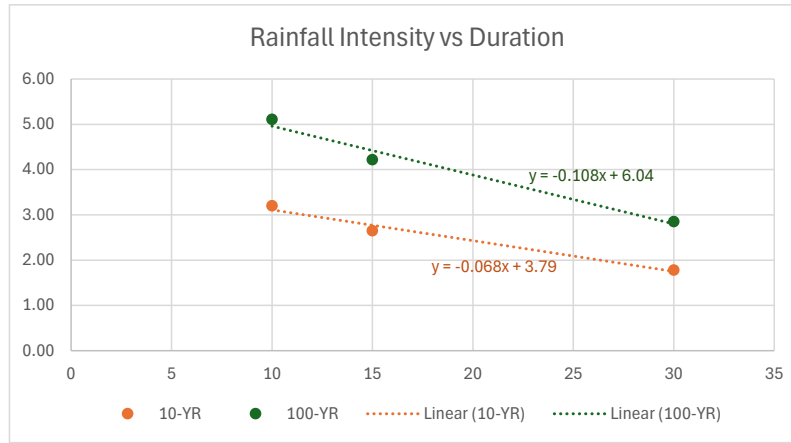
FRONTAGE ROAD SYSTEM - PARAMETERS					
SUBBASIN NAME	AREA (SQ MI)	% IMPERVIOUS AREA	CURVE NUMBER	GRAPH TYPE	LAG TIME (MIN)
TB207A	0.02875	0	96	Standard (PRF 484)	7.2
TB207B	0.01672	0	84	Standard (PRF 484)	12.3
TB207B_EX	0.01672	0	77	Standard (PRF 484)	15.4
TB207C	0.00200	0	84	Standard (PRF 484)	7.2
TB207D	0.00534	0	84	Standard (PRF 484)	9.3
TB207E	0.00229	0	88	Standard (PRF 484)	7.2
TB207F	0.00474	0	84	Standard (PRF 484)	7.2
TB207G	0.00228	0	86	Standard (PRF 484)	7.2
TB207H	0.00562	0	95	Standard (PRF 484)	7.2
TB207I	0.00113	0	98	Standard (PRF 484)	7.2
TB208A	0.00338	0	84	Standard (PRF 484)	7.2
TB208B	0.03583	0	91	Standard (PRF 484)	11.2
TB208C	0.00289	0	96	Standard (PRF 484)	7.2
TB208D	0.00127	0	88	Standard (PRF 484)	7.2
TB208E	0.00164	0	98	Standard (PRF 484)	8.7
TB209A	0.00276	0	92	Standard (PRF 484)	7.2
TB209B	0.00303	0	88	Standard (PRF 484)	12.6
TB209C	0.00202	0	88	Standard (PRF 484)	7.2
TB209D	0.00193	0	88	Standard (PRF 484)	7.2
TB209E	0.00924	0	91	Standard (PRF 484)	7.2
TB209F	0.00193	0	88	Standard (PRF 484)	7.2
TB209G	0.00410	0	84	Standard (PRF 484)	7.2
TB209G_EX	0.00410	0	77	Standard (PRF 484)	7.2
TB209H	0.00211	0	86	Standard (PRF 484)	7.2
TB209I	0.00443	0	95	Standard (PRF 484)	7.2
SOUTHCENTRAL	0.00798	0	98	Standard (PRF 484)	7.2

FRONTAGE ROAD SYSTEM - RESULTS				
SUBBASIN	10-YR PEAK DISCHARGE (CFS)	100-YR PEAK DISCHARGE (CFS)	10-YR VOLUME (IN)	100-YR VOLUME (IN)
AP_TB1	49.8	81.8	0.57	0.96
TB207A	41.4	71.0	1.29	2.09
TB207B	7.5	18.2	0.58	1.21
TB207B_EX	3.1	10.0	0.32	0.80
TB207B_EX_S	3.1	10.0	0.32	0.80
TB207C	1.1	2.8	0.58	1.21
TB207D	2.8	6.7	0.58	1.21
TB207D-J	2.6	6.1	0.56	1.15
TB207E	1.9	4.1	0.78	1.49
TB207E-J	4.3	9.7	0.63	1.25
TB207F	2.7	6.6	0.58	1.21
TB207G	1.6	3.6	0.67	1.34
TB207H	8.0	14.2	1.28	2.11
TB207I	1.9	3.1	1.58	2.44
TB207-B-F-G	19.4	41.4	0.75	1.43
TB208	50.6	94.9	1.06	1.83
TB208A	1.9	4.7	0.58	1.21
TB208B	31.6	62.0	0.97	1.74
TB208C	4.4	7.6	1.37	2.22
TB208D	1.1	2.3	0.78	1.49
TB208E	2.6	4.2	1.58	2.44
TB208SUMBRT	126.9	231.8	0.61	1.03
TB209	24.0	47.6	0.93	1.68
TB209A	3.2	6.1	1.04	1.82
TB209APOND	3.2	6.1	1.04	1.82
TB209B	1.9	4.2	0.78	1.49
TB209B-J	1.9	4.0	0.77	1.46
TB209C	1.7	3.6	0.78	1.49
TB209C-J	1.6	3.4	0.76	1.44
TB209D	1.6	3.4	0.78	1.49
TB209D-J	1.6	3.4	0.78	1.49
TB209E	9.8	19.3	0.97	1.74
TB209F	1.6	3.4	0.78	1.49
TB209G	2.3	5.7	0.58	1.21
TB209G_EX	1.0	3.4	0.32	0.80
TB209G_EX_S	1.0	3.4	0.32	0.80
TB209H	1.5	3.3	0.67	1.34
TB209I	6.3	11.2	1.28	2.11
SOUTHCENTRAL	12.8	21.0	1.49	2.30
AP_TB1	320.3	483.6	1.28	1.96

# APPENDIX

## E.2 SOUTH CENTRAL HYDROLOGY

INTENSITY IN/HR		
TIME (MIN)	10-YR	100-YR
10	3.20	5.11
15	2.65	4.22
30	1.78	2.85
Tc	12	<b>2.97</b>
		<b>4.74</b>



BASIN NAME	Drainage Area (acre)	Intensity (in/hr)		C		Q (CFS)	
		10-YR	100-YR	10-YR	100-YR	10-YR	100-YR
SC1	1.07	2.97	4.74	0.90	0.90	2.87	4.58
SC2	1.29	2.97	4.74	0.90	0.90	3.44	5.49
SC3	0.53	2.97	4.74	0.90	0.90	1.43	2.28
SC4	1.31	2.97	4.74	0.90	0.90	3.52	5.61
SC5	1.41	2.97	4.74	0.90	0.90	3.76	6.00
SC6	0.38	2.97	4.74	0.90	0.90	1.02	1.63

BASIN NAME	Area (acre)	Q (CFS)		E (IN)		6-HR P (IN)		24-HR P (IN)		V - 6 HR (ACRE-FT)		V - 24 HR (ACRE-FT)		V - 24 HR (IN)	
		10-YR	100-YR	10-YR	100-YR	10-YR	100-YR	10-YR	100-YR	10-YR	100-YR	10-YR	100-YR	10-YR	100-YR
SC1	1.07	2.87	4.58	1.43	2.24	1.44	2.22	1.71	2.53	0.13	0.20	0.15	0.23	1.70	2.55
SC2	1.29	3.44	5.49	1.43	2.24	1.44	2.22	1.71	2.53	0.15	0.24	0.18	0.27	1.70	2.55
SC3	0.53	1.43	2.28	1.43	2.24	1.44	2.22	1.71	2.53	0.06	0.10	0.08	0.11	1.70	2.55
SC4	1.31	3.52	5.61	1.43	2.24	1.44	2.22	1.71	2.53	0.16	0.25	0.19	0.28	1.70	2.55
SC5	1.41	3.76	6.00	1.43	2.24	1.44	2.22	1.71	2.53	0.17	0.26	0.20	0.30	1.70	2.55
SC6	0.38	1.02	1.63	1.43	2.24	1.44	2.22	1.71	2.53	0.05	0.07	0.05	0.08	1.70	2.55

# APPENDIX

## F HYDRAULIC SUMMARY



F.1 FRONTAGE ROAD  
F.2 SOUTH CENTRAL

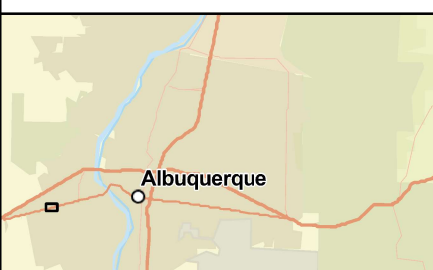
# APPENDIX

## F.1 FRONTAGE ROAD HYDRAULIC ANALYSIS



**Legend**

-  Outfall
-  Existing Storm Drain
-  Existing and Proposed Manholes



### Frontage Road System (No Diversion)

West Central Complete Streets  
Sarracino Place to 98th Street

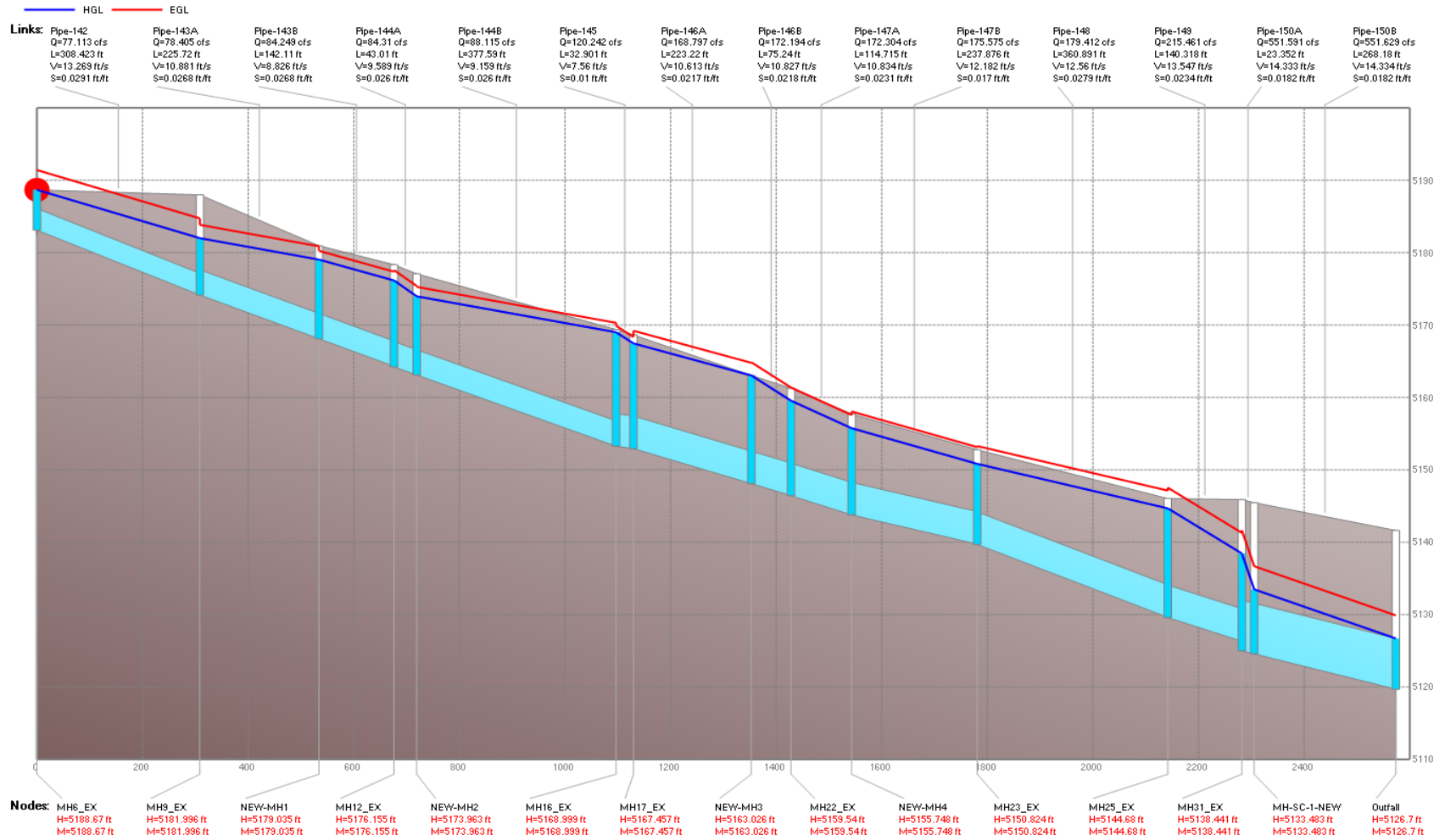
City of Albuquerque  
Project No. 6321.94



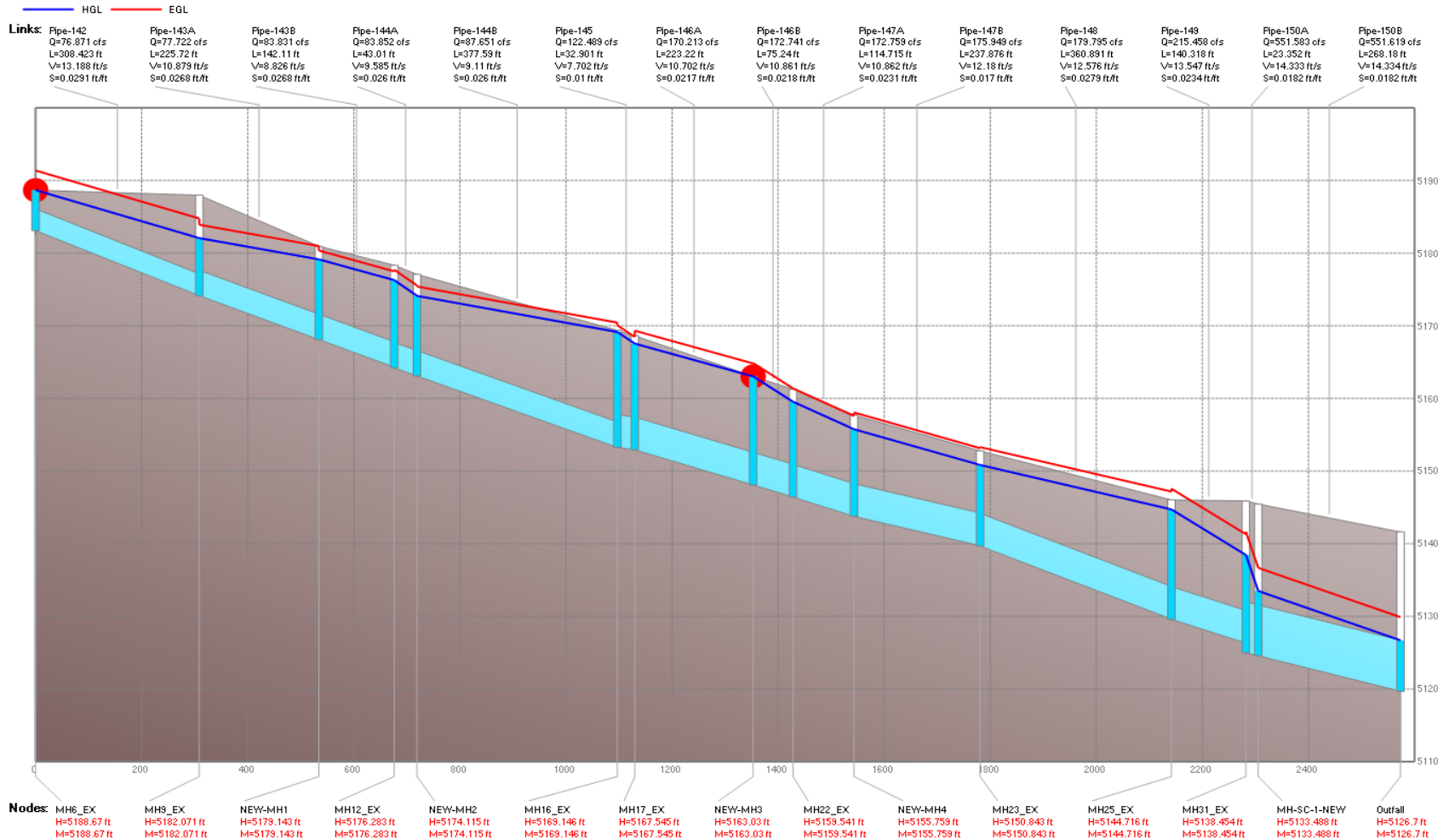
## **FRONTAGE ROAD SYSTEM - HYDRAULIC ANALYSIS**

**EXISTING AND FUTURE CONDITIONS WITH NO SOUTH CENTRAL DIVERSION**

**FRONTAGE ROAD SYSTEM (NO DIVERSION) - PROFILE**  
Existing Frontage Road Trunkline - Existing Conditions



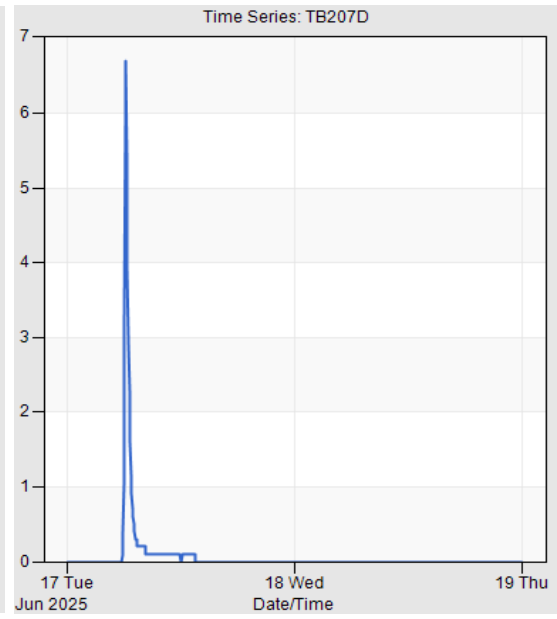
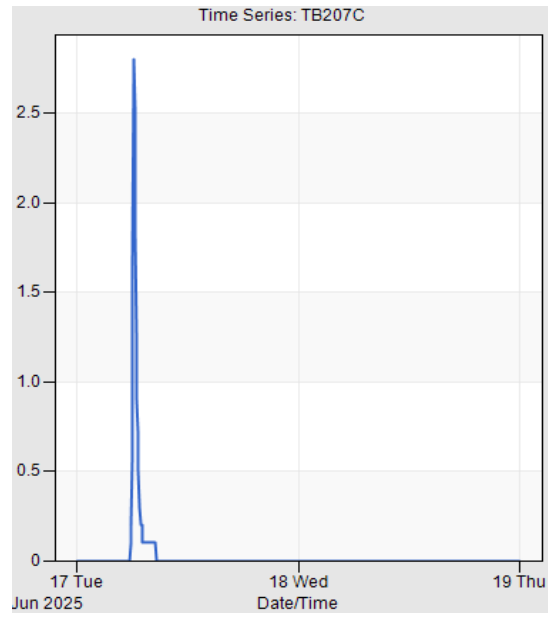
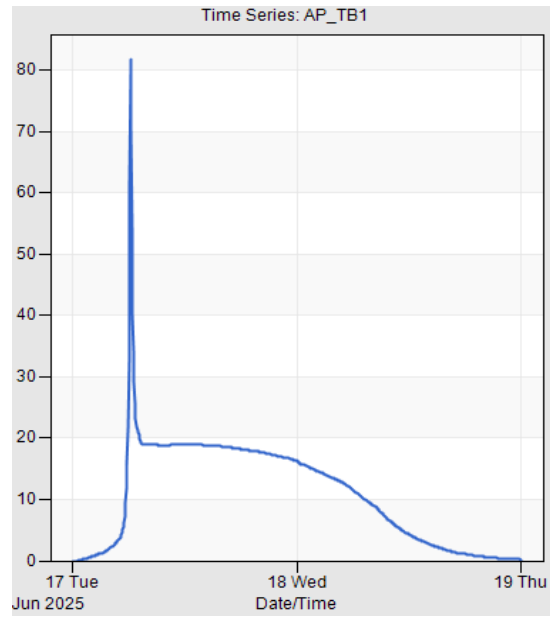
### FRONTAGE ROAD SYSTEM (NO DIVERSION) - PROFILE Existing Frontage Road Trunkline - Future Conditions



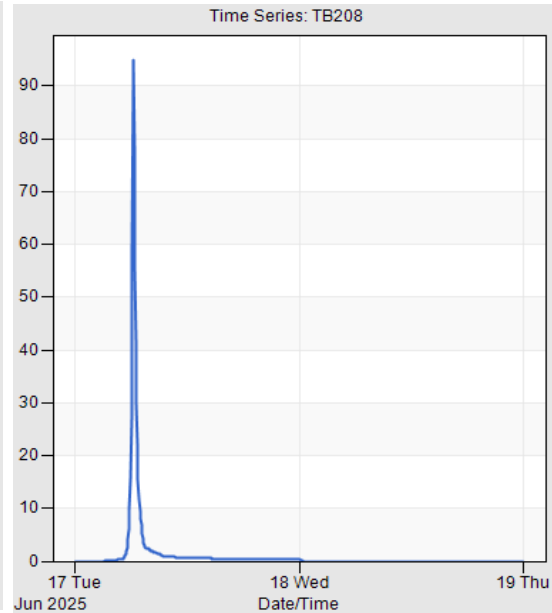
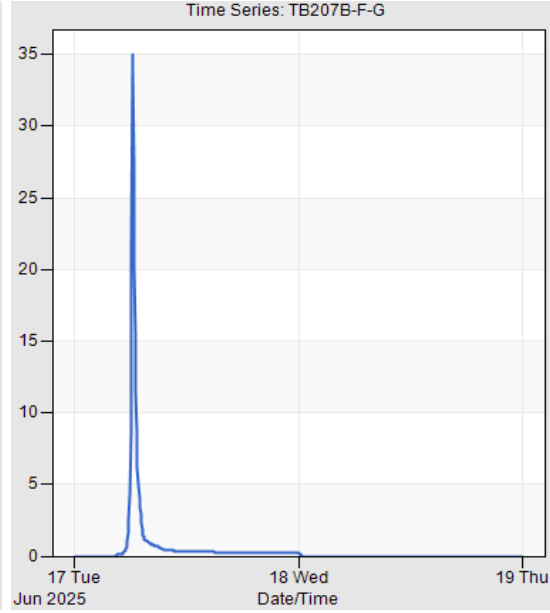
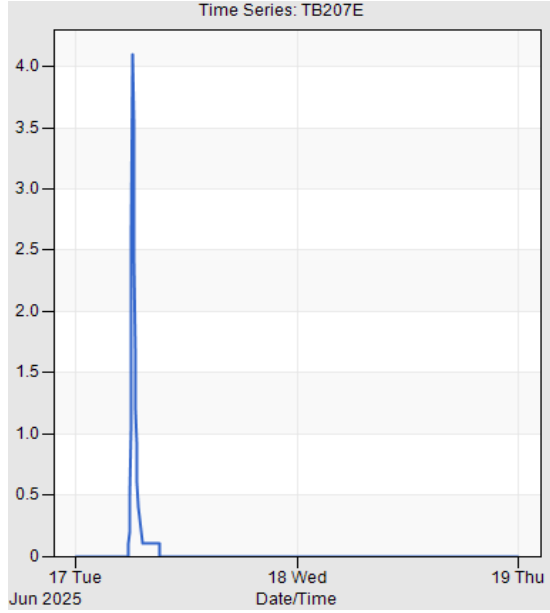
FRONTAGE ROAD SYSTEM (NO DIVERSION, FUTURE CONDITIONS) - MANHOLES									
Name	Inflows	Invert Elev. (ft)	Rim Elev. (ft)	Depth (ft)	Time Series	Avg. Depth (ft)	Max. Depth (ft)	Max. HGL (ft)	Max. Total Inflow (cfs)
MH12_EX	NO	5164.21	5178.34	14.13		0.94	12.13	5176.34	83.84
MH16_EX	YES	5153.26	5169.37	16.11	TB207B-F-G	1.10	15.95	5169.21	122.71
MH17_EX	NO	5152.93	5168.63	15.70		0.72	14.67	5167.60	170.54
MH22_EX	NO	5146.42	5161.26	14.84		0.79	13.14	5159.56	172.82
MH23_EX	YES	5139.69	5152.78	13.09	TB209B	0.65	11.21	5150.90	179.94
MH25_EX	YES	5129.59	5146.03	16.44	TB209E-F-H	0.88	15.17	5144.76	215.92
MH28_EX	YES	5129.41	5144.89	15.48	APT B1	0.60	15.48	5144.89	481.66
MH31_EX	NO	5125.00	5145.88	20.88		2.08	13.48	5138.48	551.86
MH6_EX	YES	5183.10	5188.67	5.57	AP_TB1	0.67	5.57	5188.67	81.73
MH9_EX	YES	5174.14	5187.97	13.83	TB207C	0.67	7.96	5182.10	79.45
MH-SC-1-EX	YES	5153.48	5170.75	17.27	TB208	0.54	17.27	5170.75	94.88
MH-SC-1-NEW	NO	5124.58	5145.46	20.89		2.26	8.93	5133.50	551.84
MH-SC-2-EX	YES	5153.45	5170.54	17.09	SouthCentral	0.44	16.89	5170.34	82.07
MH-SC-3-EX	NO	5153.05	5169.51	16.46		0.68	15.84	5168.89	82.07
NEW-MH1	YES	5168.10	5180.95	12.85	TB207D	0.69	11.08	5179.18	84.16
NEW-MH2	YES	5163.09	5177.07	13.98	TB207E	0.62	11.08	5174.17	87.68
NEW-MH3	YES	5148.08	5163.03	14.95	TB209C	0.89	14.95	5163.03	174.40
NEW-MH4	YES	5143.77	5157.71	13.94	TB209D	0.80	12.02	5155.79	176.02
OUTFALL	NO	5119.70	5141.62	21.92		7.00	7.00	5126.70	552.01

FRONTAGE ROAD SYSTEM FRONTAGE ROAD SYSTEM (NO DIVERSION, FUTURE CONDITIONS) - PIPES													
Name	Inlet Node	Outlet Node	Length (ft)	Roughness	Inlet Offset (ft)	Outlet Offset (ft)	Entry Loss Coeff.	Exit Loss Coeff.	Cross-Section	Geom1 (ft)	Slope (ft/ft)	Max.  Flow  (cfs)	Max.  Velocity  (ft/s)
Pipe-142	MH6_EX	MH9_EX	308.42	0.013	0.00	0.00	0.6	1	CIRCULAR	3	0.02906	76.88	13.27
Pipe-143A	MH9_EX	NEW-MH1	225.72	0.013	0.00	0.00	0.6	1	CIRCULAR	3.5	0.02677	78.09	10.88
Pipe-143B	NEW-MH1	MH12_EX	142.11	0.013	0.00	0.09	0.6	1	CIRCULAR	3.5	0.02675	83.84	8.83
Pipe-144A	MH12_EX	NEW-MH2	43.01	0.013	0.00	0.00	0.6	1	CIRCULAR	3.5	0.02605	83.87	9.6
Pipe-144B	NEW-MH2	MH16_EX	377.59	0.013	0.00	0.00	0.6	1	CIRCULAR	3.5	0.02604	87.79	9.12
Pipe-145	MH16_EX	MH17_EX	32.90	0.013	0.00	0.00	0.6	1	CIRCULAR	4.5	0.01003	122.89	7.73
Pipe-146A	MH17_EX	NEW-MH3	223.22	0.013	0.00	0.00	0.6	1	CIRCULAR	4.5	0.02173	170.83	10.74
Pipe-146B	NEW-MH3	MH22_EX	75.24	0.013	0.00	0.02	0.6	1	CIRCULAR	4.5	0.0218	172.82	10.87
Pipe-147A	MH22_EX	NEW-MH4	114.72	0.013	0.00	0.00	0.6	1	CIRCULAR	4.5	0.02311	172.87	10.87
Pipe-147B	NEW-MH4	MH23_EX	237.88	0.013	0.00	0.04	0.6	1	CIRCULAR	4.5	0.01699	176.04	12.22
Pipe-148	MH23_EX	MH25_EX	360.89	0.013	0.00	0.03	0.6	1	CIRCULAR	4.5	0.02791	179.94	12.58
Pipe-149	MH25_EX	MH31_EX	140.32	0.013	0.00	1.31	0.6	1	CIRCULAR	4.5	0.02338	215.98	13.58
Pipe-150A	MH31_EX	MH-SC-1-NEW	23.35	0.013	0.00	0.00	0.5	1	CIRCULAR	7	0.0182	551.84	14.34
Pipe-150B	MH-SC-1-NEW	Outfall	268.18	0.013	0.00	0.00	0.5	1	CIRCULAR	7	0.01818	552.01	14.34
Pipe-154	MH28_EX	MH31_EX	178.31	0.013	0.00	0.00	0.5	1	CIRCULAR	5.5	0.02474	382.07	16.08
PIPE-SC-1	MH-SC-1-EX	MH-SC-2-EX	51.51	0.013	0.00	0.10	0.6	1	CIRCULAR	3	-0.00136	65.1	9.21
PIPE-SC-2	MH-SC-2-EX	MH-SC-3-EX	65.66	0.013	0.00	0.10	0.6	1	CIRCULAR	3	0.00457	82.07	11.61
PIPE-SC-3	MH-SC-3-EX	MH17_EX	29.99	0.013	0.00	0.00	0.6	1	CIRCULAR	3	0.004	82.06	11.61

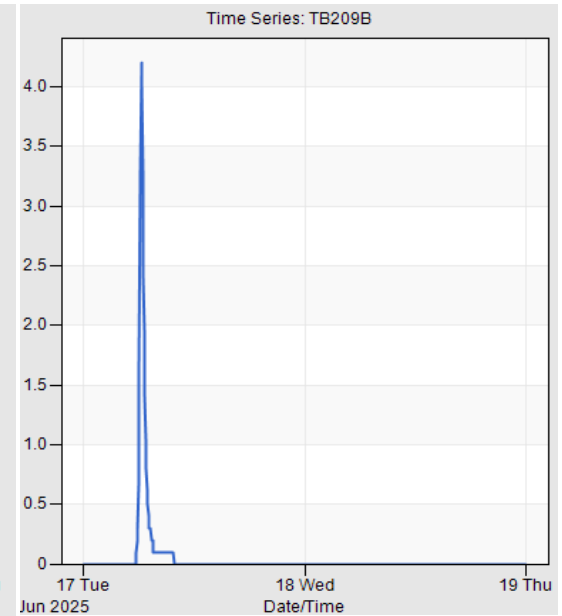
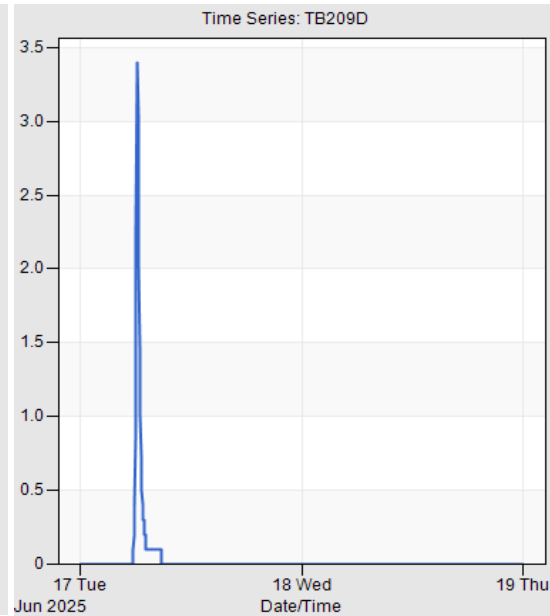
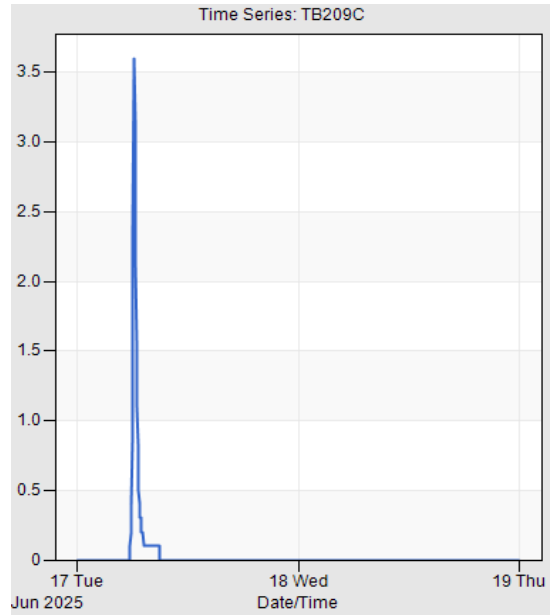
Frontage Road System (No Diversion, Future Conditions) - Time Series Charts



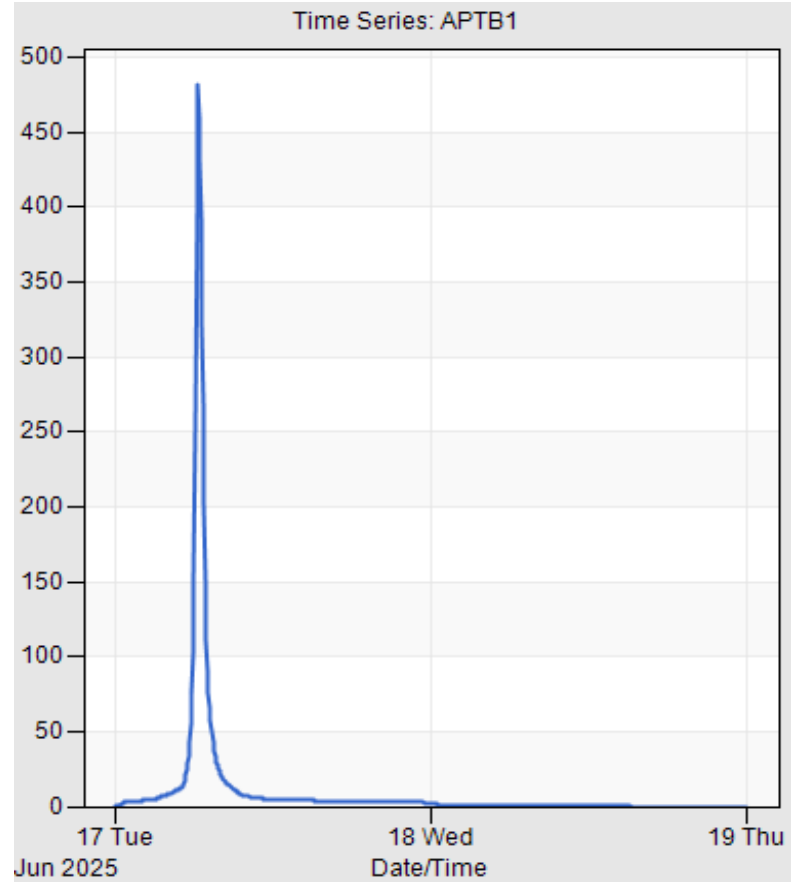
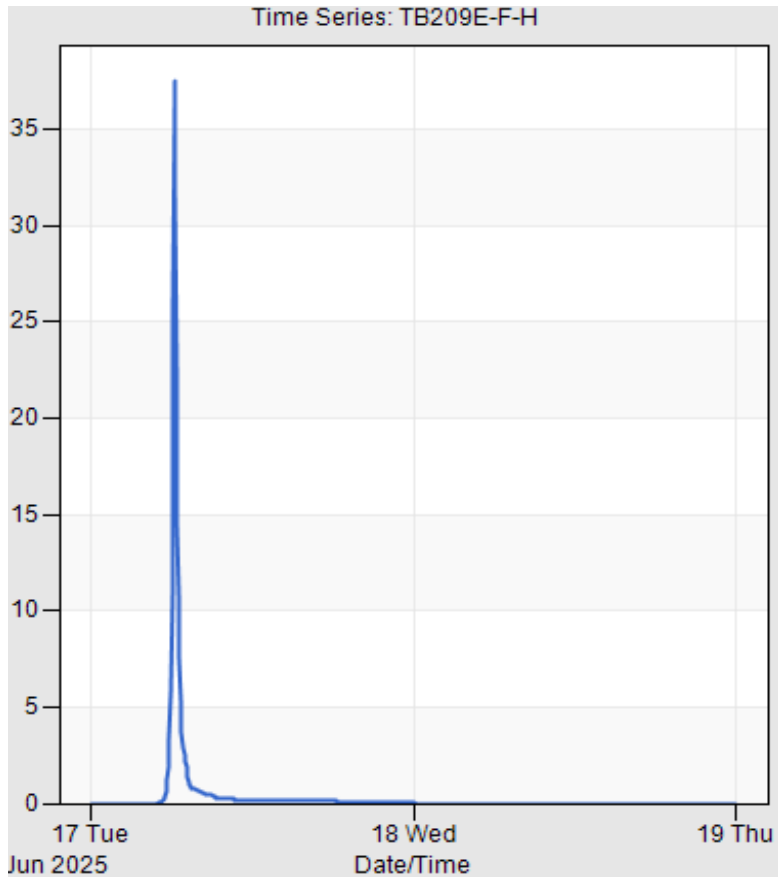
Frontage Road System (No Diversion, Future Conditions) - Time Series Charts



Frontage Road System (No Diversion, Future Conditions) - Time Series Charts



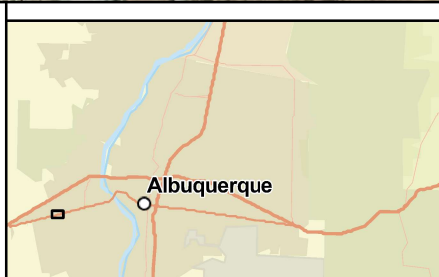
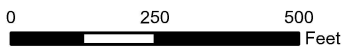
**Frontage Road System (No Diversion, Future Conditions) - Time Series Charts**





**Legend**

- ▲ Outfall
- Storm Drain
- Existing and Proposed Manholes



## Frontage Road System (South Central Diversion)

West Central Complete Streets  
Sarracino Place to 98th Street

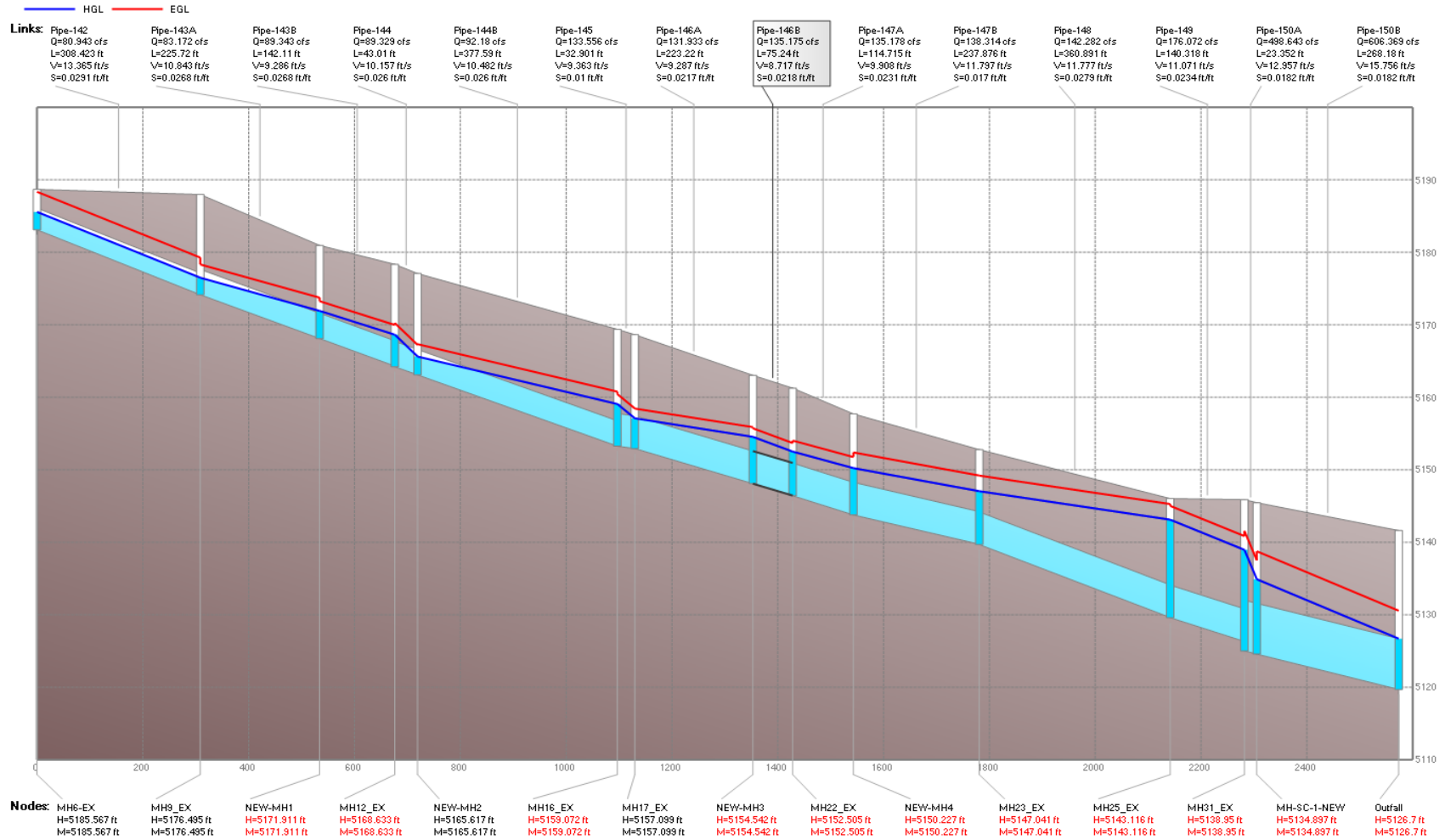
City of Albuquerque  
Project No. 6321.94

**FRONTAGE ROAD SYSTEM - HYDRAULIC ANALYSIS**

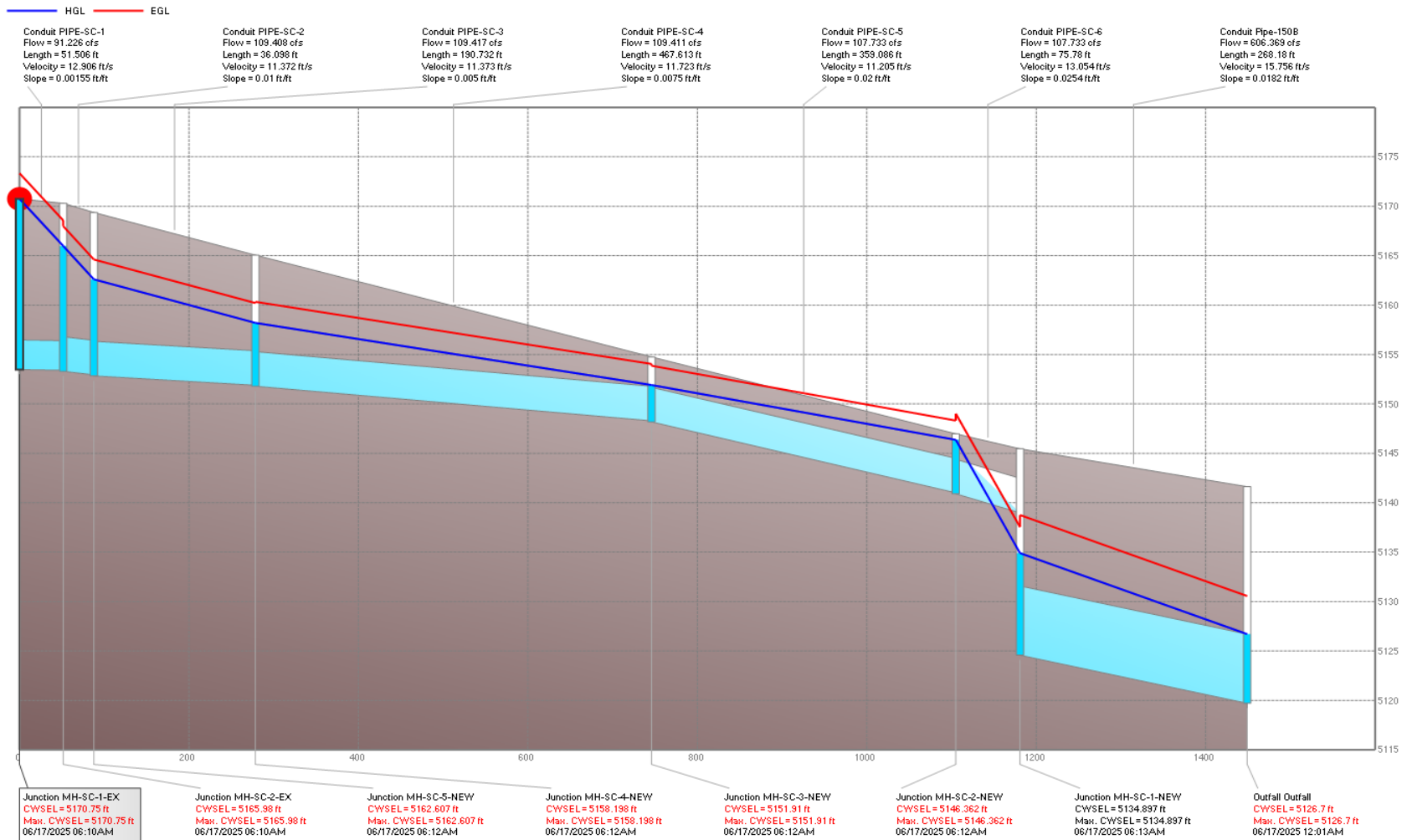
**FUTURE CONDITIONS WITH SOUTH CENTRAL DIVERSION**

### FRONTAGE ROAD SYSTEM (SOUTH CENTRAL DIVERSION) - PROFILE

Existing Frontage Road Trunkline



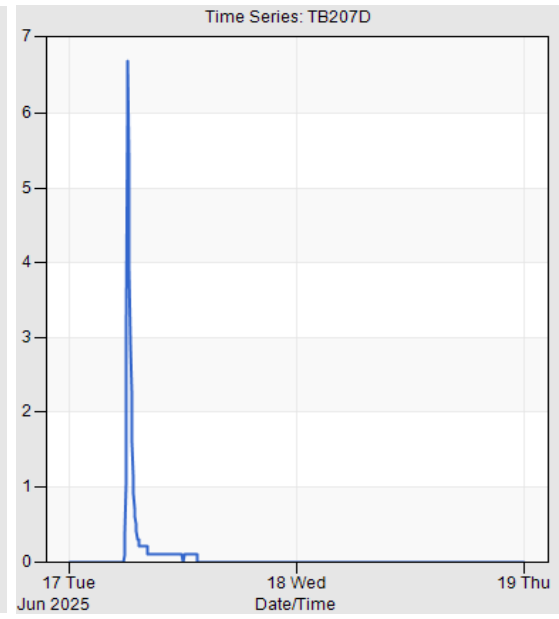
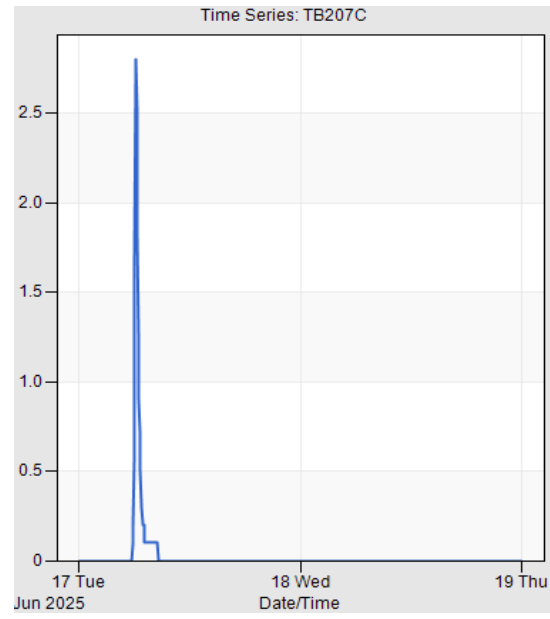
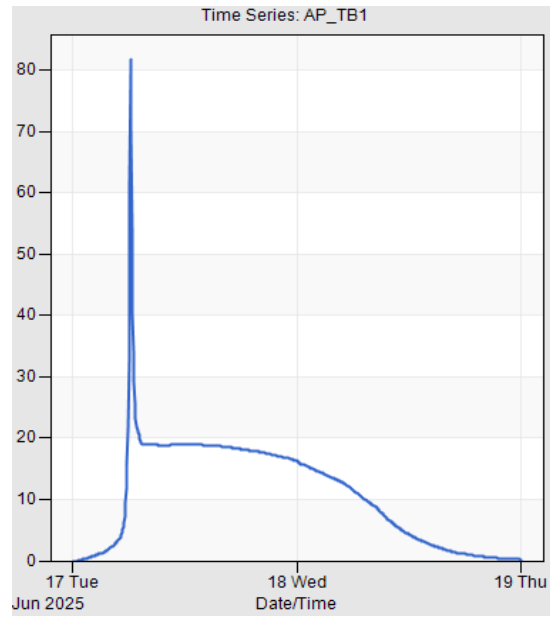
### FRONTAGE ROAD SYSTEM (SOUTH CENTRAL DIVERSION) - PROFILE Proposed Diversion Trunkline



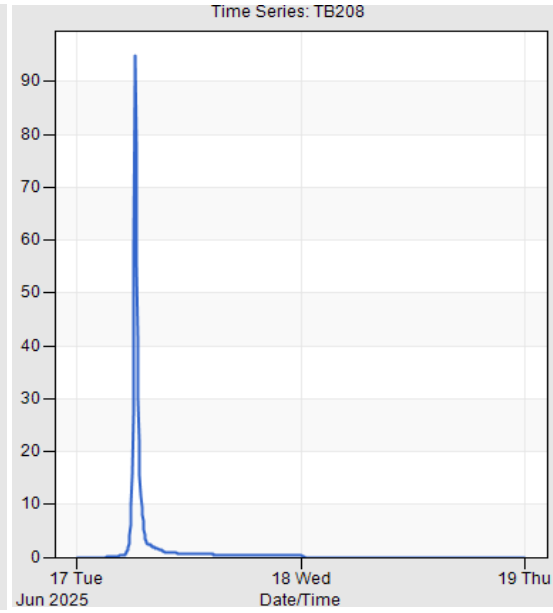
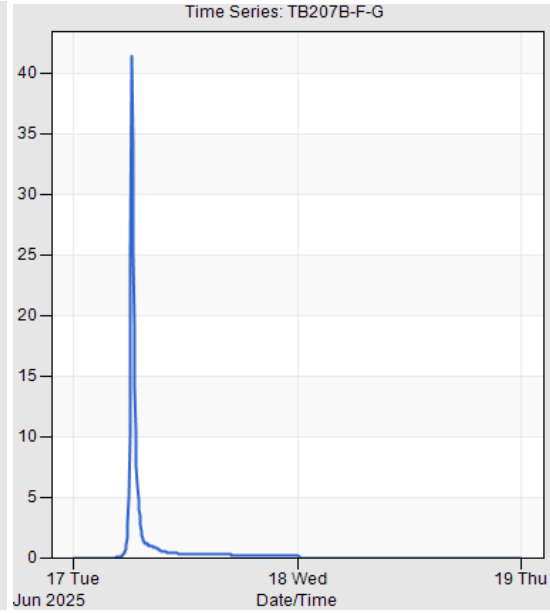
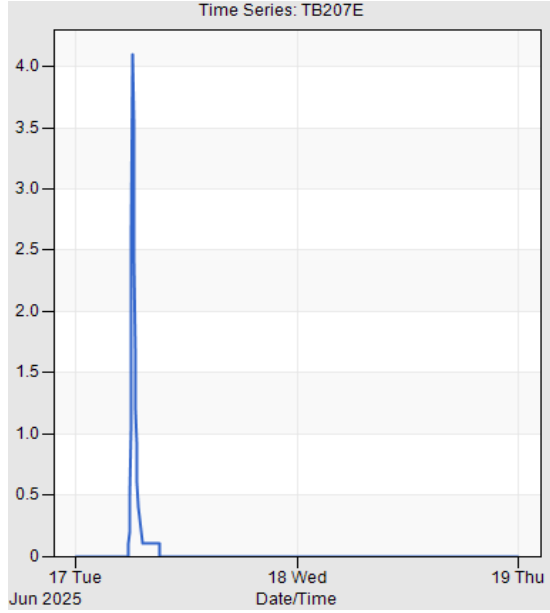
FRONTAGE ROAD SYSTEM (SOUTH CENTRAL DIVERSION) - MANHOLES									
Name	Inflows	Invert Elev. (ft)	Rim Elev. (ft)	Depth (ft)	Time Series	Avg. Depth (ft)	Max. Depth (ft)	Max. HGL (ft)	Max. Total Inflow (cfs)
MH12_EX	NO	5164.21	5178.34	14.13		0.94	4.51	5168.72	89.96
MH16_EX	YES	5153.26	5169.37	16.11	TB207B-F-G	1.09	5.81	5159.07	134.24
MH17_EX	NO	5152.93	5168.63	15.70		0.66	4.17	5157.10	134.26
MH22_EX	NO	5146.42	5161.26	14.84		0.74	6.57	5152.99	135.30
MH23_EX	YES	5139.69	5152.78	13.09	TB209B	0.62	10.64	5150.33	142.37
MH25_EX	YES	5129.59	5146.03	16.44	TB209E-F-H	0.88	14.35	5143.94	176.23
MH28_EX	YES	5129.41	5144.89	15.48	APTB1	0.70	15.48	5144.89	484.47
MH31_EX	NO	5125.00	5145.88	20.88		2.14	13.96	5138.96	498.74
MH6-EX	YES	5183.10	5188.67	5.57	AP_TB1	0.68	2.48	5185.58	81.78
MH9_EX	YES	5174.14	5187.97	13.83	TB207C	0.67	2.37	5176.51	84.44
MH-SC-1-EX	YES	5153.48	5170.75	17.27	TB208	0.47	17.27	5170.75	94.90
MH-SC-1-NEW	NO	5124.58	5145.46	20.89		2.32	10.33	5134.90	606.45
MH-SC-2-EX	YES	5153.30	5170.30	17.00	SouthCentral	0.34	12.90	5166.20	109.44
MH-SC-2-NEW	NO	5140.90	5146.98	6.08		0.22	5.50	5146.40	108.04
MH-SC-3-NEW	NO	5148.18	5154.75	6.57		0.16	3.84	5152.02	109.45
MH-SC-4-NEW	NO	5151.79	5165.06	13.27		0.23	9.29	5161.08	109.44
MH-SC-5-NEW	NO	5152.84	5169.38	16.54		0.30	10.56	5163.39	109.45
NEW-MH1	YES	5168.10	5180.95	12.85	TB207D	0.70	4.36	5172.46	91.03
NEW-MH2	YES	5163.09	5177.07	13.98	TB207E	0.61	2.53	5165.62	94.04
NEW-MH3	YES	5148.08	5163.03	14.95	TB209C	0.82	6.68	5154.76	135.28
NEW-MH4	YES	5143.77	5157.71	13.94	TB209D	0.75	6.92	5150.69	138.42
OUTFALL	NO	5119.70	5141.62	21.92		7.00	7.00	5126.70	606.43

FRONTAGE ROAD SYSTEM (SOUTH CENTRAL DIVERSION) - PIPES													
Name	Inlet Node	Outlet Node	Length (ft)	Roughness	Inlet Offset (ft)	Outlet Offset (ft)	Entry Loss Coeff.	Exit Loss Coeff.	Cross-Section	Geom1 (ft)	Slope (ft/ft)	Max.  Flow  (cfs)	Max.  Velocity  (ft/s)
Pipe-142	MH6-EX	MH9_EX	308.42	0.013	0.00	0.00	0.6	1	CIRCULAR	3	0.02906	81.66	13.39
Pipe-143A	MH9_EX	NEW-MH1	225.72	0.013	0.00	0.00	0.6	1	CIRCULAR	3.5	0.02677	84.76	10.85
Pipe-143B	NEW-MH1	MH12_EX	142.11	0.013	0.00	0.09	0.6	1	CIRCULAR	3.5	0.02675	89.96	9.35
Pipe-144	MH12_EX	NEW-MH2	43.01	0.013	0.00	0.00	0.6	1	CIRCULAR	3.5	0.02605	90.04	10.29
Pipe-144B	NEW-MH2	MH16_EX	377.59	0.013	0.00	0.00	0.6	1	CIRCULAR	3.5	0.02604	92.87	10.53
Pipe-145	MH16_EX	MH17_EX	32.90	0.013	0.00	0.00	0.6	1	CIRCULAR	4.5	0.01003	134.26	9.37
Pipe-146A	MH17_EX	NEW-MH3	223.22	0.013	0.00	0.00	0.6	1	CIRCULAR	4.5	0.02173	132.04	9.29
Pipe-146B	NEW-MH3	MH22_EX	75.24	0.013	0.00	0.02	0.6	1	CIRCULAR	4.5	0.0218	135.3	8.79
Pipe-147A	MH22_EX	NEW-MH4	114.72	0.013	0.00	0.00	0.6	1	CIRCULAR	4.5	0.02311	135.3	9.91
Pipe-147B	NEW-MH4	MH23_EX	237.88	0.013	0.00	0.04	0.6	1	CIRCULAR	4.5	0.01699	138.42	11.82
Pipe-148	MH23_EX	MH25_EX	360.89	0.013	0.00	0.03	0.6	1	CIRCULAR	4.5	0.02791	142.37	11.79
Pipe-149	MH25_EX	MH31_EX	140.32	0.013	0.00	1.31	0.6	1	CIRCULAR	4.5	0.02338	176.23	11.08
Pipe-150A	MH31_EX	MH-SC-1-NEW	23.35	0.013	0.00	0.00	0.5	1	CIRCULAR	7	0.0182	498.74	12.96
Pipe-150B	MH-SC-1-NEW	Outfall	268.18	0.013	0.00	0.00	0.5	1	CIRCULAR	7	0.01818	606.43	15.76
Pipe-154	MH28_EX	MH31_EX	178.31	0.013	0.00	0.00	0.5	1	CIRCULAR	5.5	0.02474	389.89	16.41
PIPE-SC-1	MH-SC-1-EX	MH-SC-2-EX	51.51	0.013	0.00	0.10	0.6	1	CIRCULAR	3	0.00155	91.23	12.91
PIPE-SC-2	MH-SC-2-EX	MH-SC-5-NEW	36.10	0.013	0.00	0.10	0.6	1	CIRCULAR	3.5	0.01	109.45	11.38
PIPE-SC-3	MH-SC-5-NEW	MH-SC-4-NEW	190.73	0.013	0.00	0.10	0.6	1	CIRCULAR	3.5	0.005	109.44	11.38
PIPE-SC-4	MH-SC-4-NEW	MH-SC-3-NEW	467.613	0.013	0.00	0.10	0.6	1	CIRCULAR	3.5	0.0075	109.45	11.79
PIPE-SC-5	MH-SC-3-NEW	MH-SC-2-NEW	359.086	0.013	0.00	0.10	0.6	1	CIRCULAR	3.5	0.02	108.04	11.26
PIPE-SC-6	MH-SC-2-NEW	MH-SC-1-NEW	75.78	0.013	0.00	14.40	0.6	1	CIRCULAR	3.5	0.02541	108.05	13.08

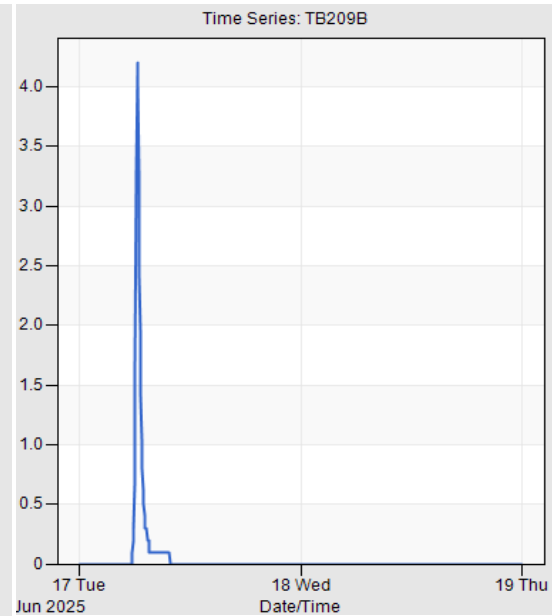
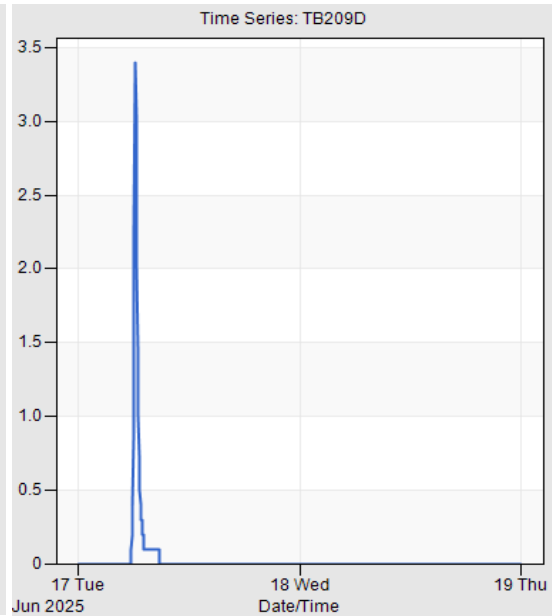
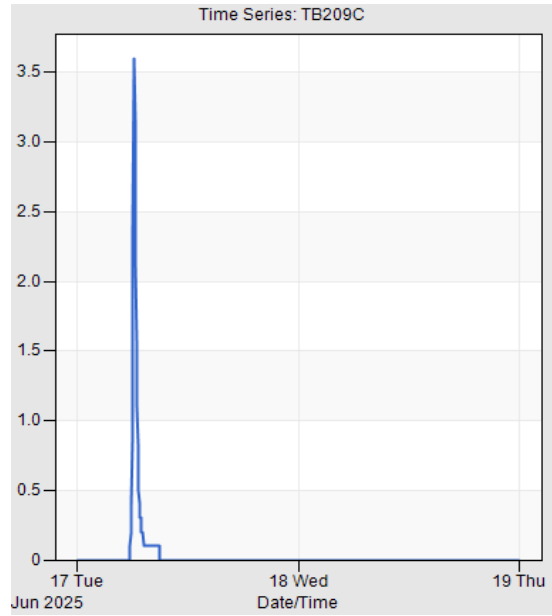
Frontage Road System (South Central Diversion) - Time Series Charts



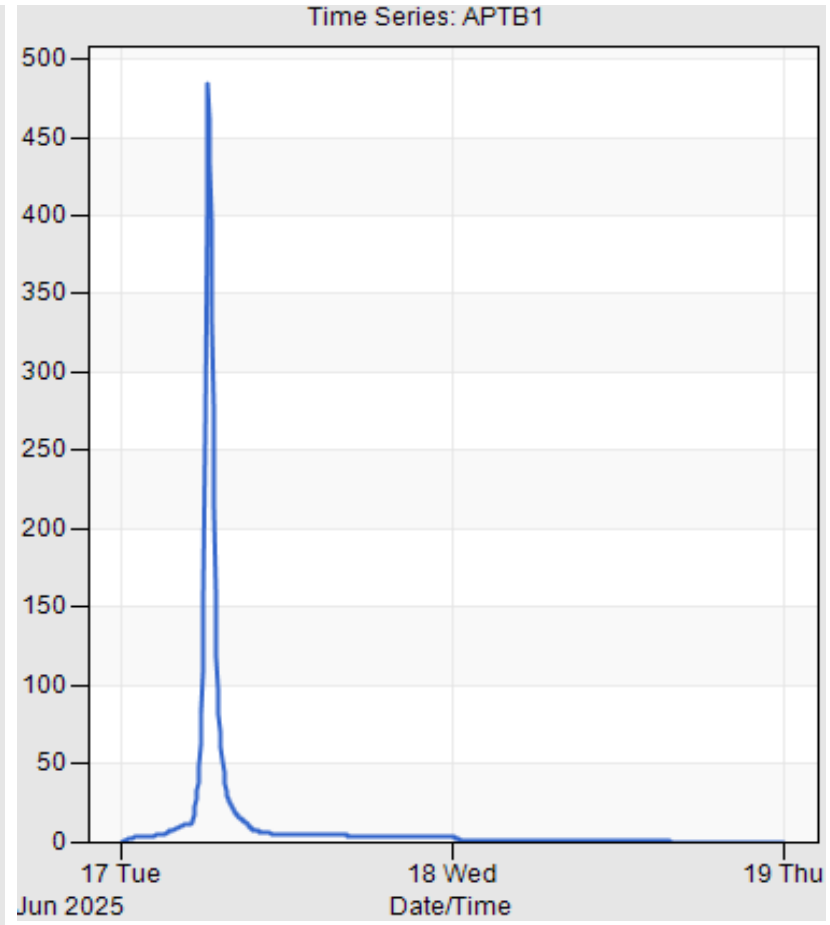
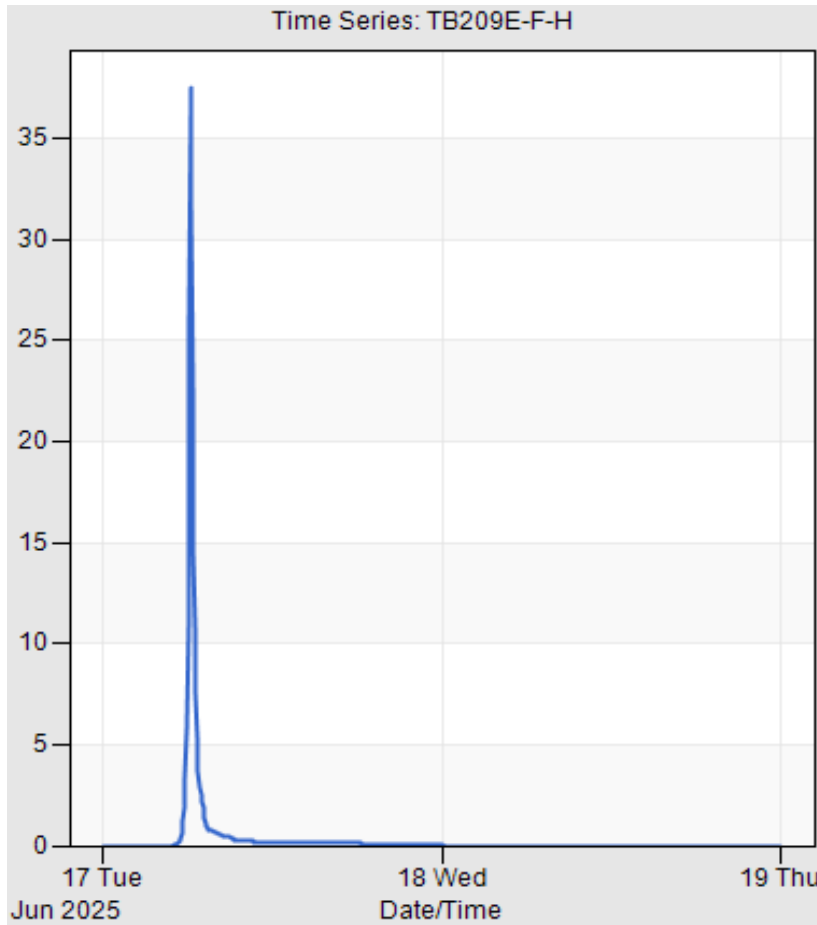
Frontage Road System (No Diversion) - Time Series Charts



Frontage Road System (No Diversion) - Time Series Charts



Frontage Road System (No Diversion) - Time Series Charts

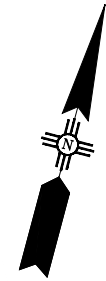
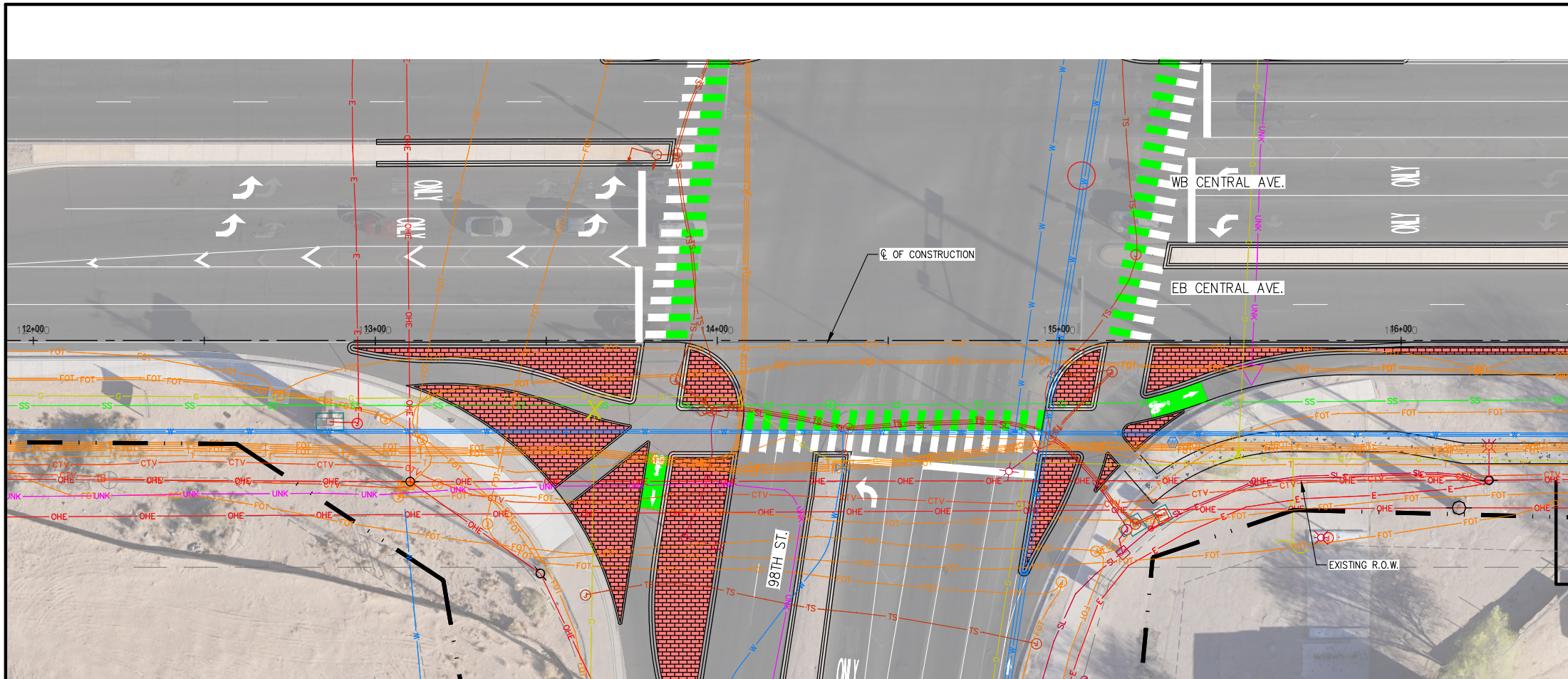


# APPENDIX

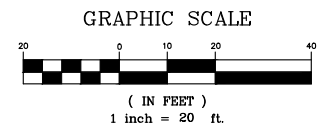
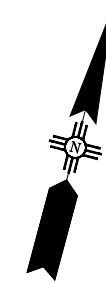
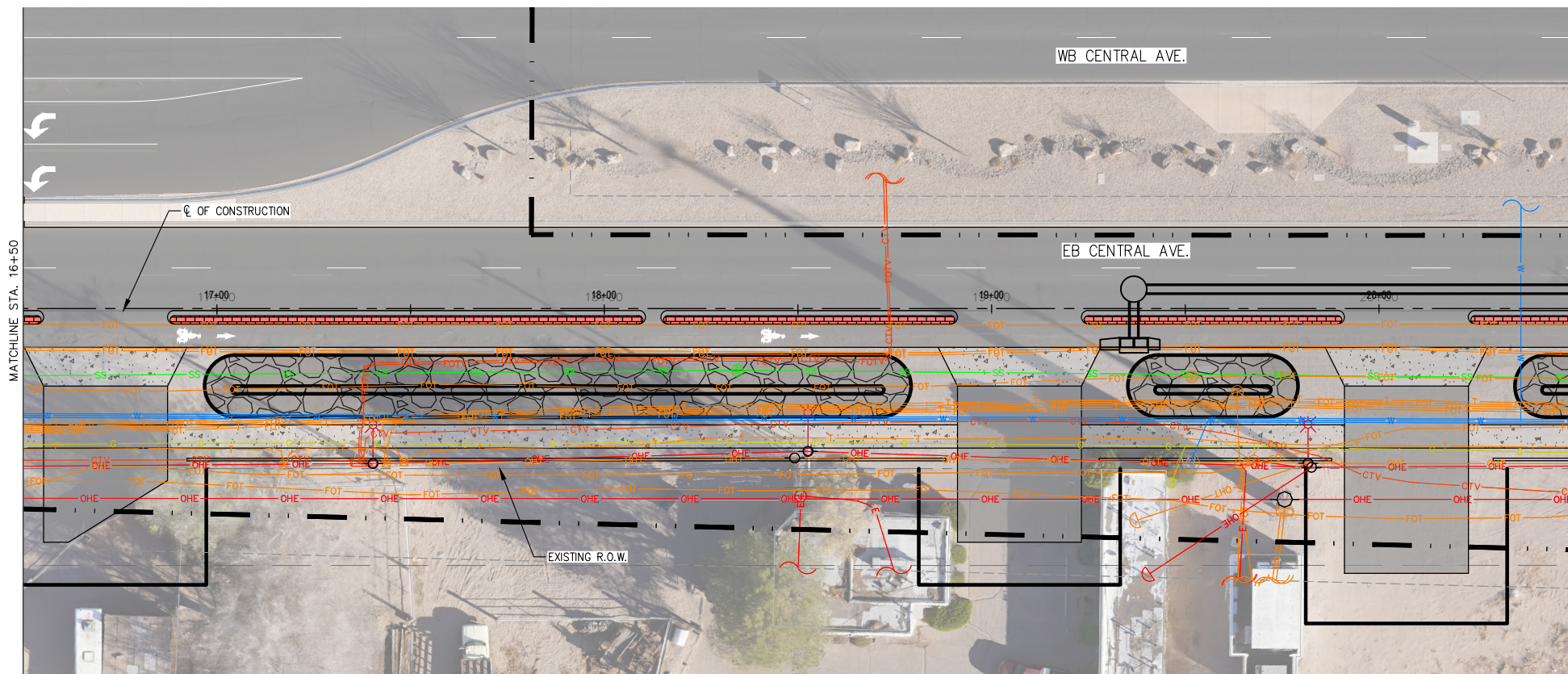
## F.2 SOUTH CENTRAL ALTERNATIVES

# APPENDIX

## ALTERNATIVE #1 – DRAINAGE SWALES



LEGEND	
	EXISTING RIGHT-OF-WAY
	PROPOSED RIGHT-OF-WAY
	PROPOSED TEMPORARY CONSTRUCTION PERMIT
	PROPOSED SLOPE LIMITS
	PROPOSED MEDIAN PAVEMENT
	PROPOSED BIO-SWALE
	PROPOSED ASPHALT
	PROPOSED CONCRETE
	BUS STOP
	NEW SIGNALIZED INTERSECTION



**90% SUBMITTAL  
NOT FOR CONSTRUCTION**

ENGINEER'S SEAL		SURVEY INFORMATION		AS BUILT INFORMATION	
NO.	DATE	NO.	BY	CONTRACTOR	DATE
				WORK PERFORMED BY	DATE
				INSPECTED BY	DATE
				ACCEPTANCE BY	DATE
				VERIFICATION BY	DATE
				DRAWINGS BY	DATE
				CORRECTED BY	DATE
				<b>MICRO-FILM INFORMATION</b>	DATE
				RECORDED BY	DATE
				NO.	NO.

STATION IS LOCATED 4.7 MILES SW OF DOWNTOWN ALBUQUERQUE, FROM THE INTERSECTION OF I-40 AND UNISER BLVD. NW TRAVEL SOUTH ON UNSER BLVD. 1.3 MILES TO CENTRAL AVE. 0.58 MILES TO THE STATION ON THE MEDIAN. THE STATION IS 0.1 MILE EAST OF 90TH ST. CL. THE STATION MARK IS A COA SURVEY CONTROL 3" ALUMINUM DISC RIVETED TO A PIPE 0.2" ABOVE GROUND. STAMPED "7-K9 1989".

**wsp** WSP USA INC. 2440 LOUISIANA BLVD. NE SUITE 400 ALBUQUERQUE, NM 87110 TEL: +1 505.881.5357 WWW.WSP.COM

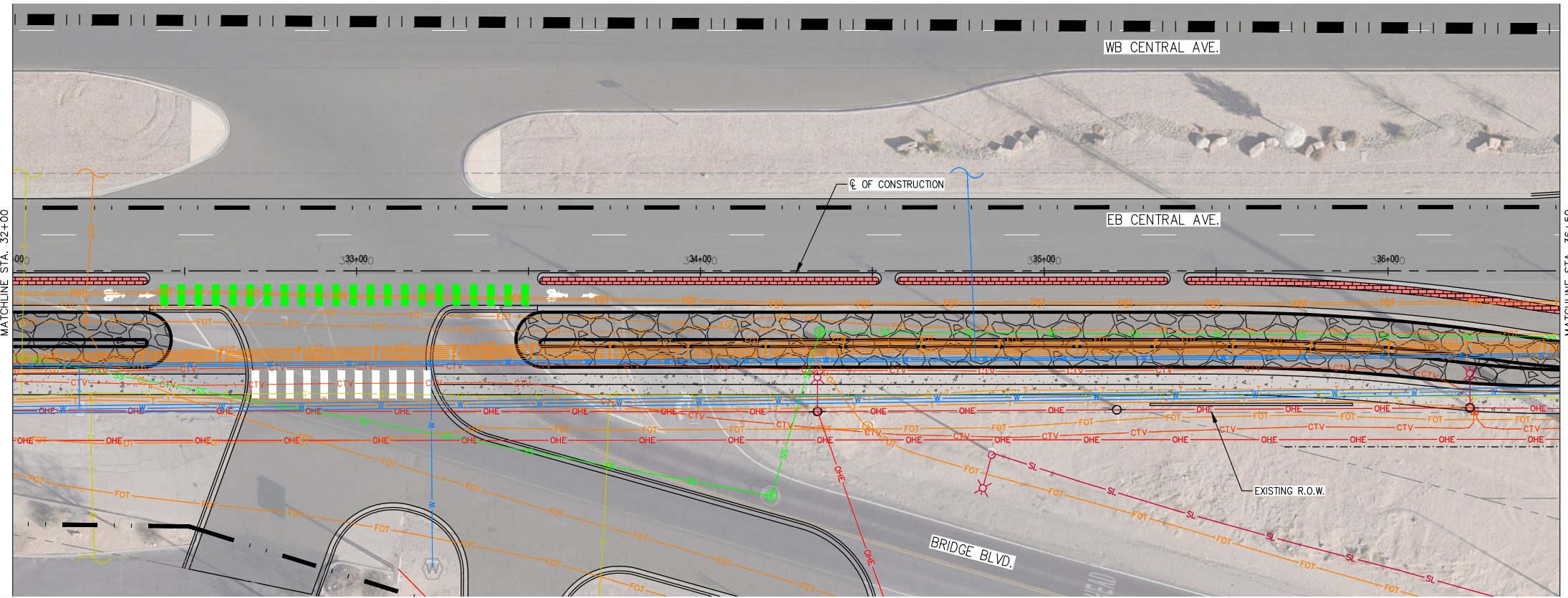
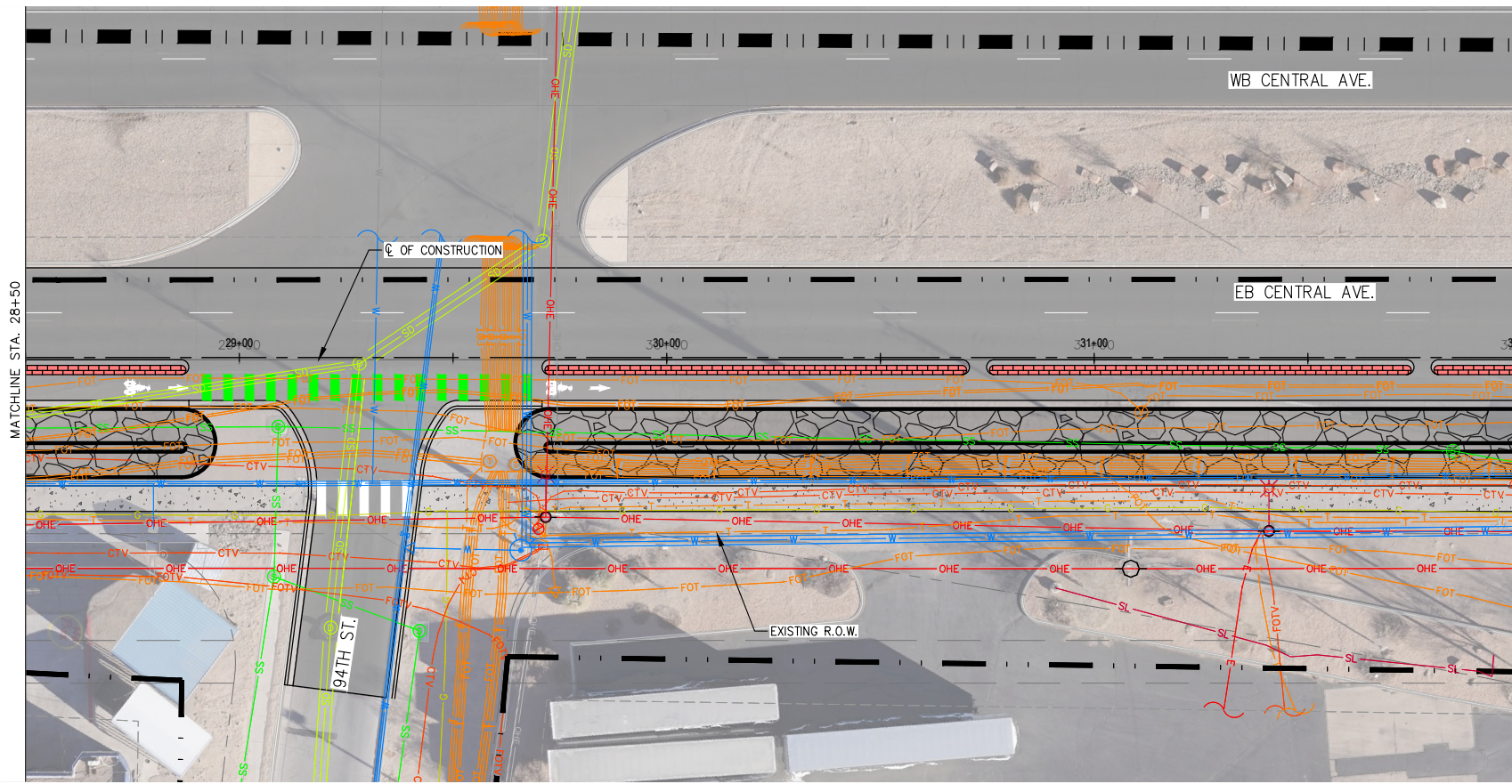
CITY OF ALBUQUERQUE  
DEPARTMENT OF MUNICIPAL DEVELOPMENT  
ENGINEERING DIVISION

WEST CENTRAL COMPLETE STREETS  
SARRACINO PLACE TO 98TH STREET  
ALTERNATIVE 1 - DRAINAGE SWALE (FULL CAPTURE)

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

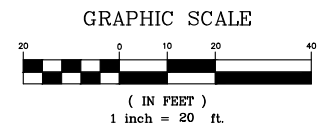
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**LEGEND**

- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION PERMIT
- PROPOSED SLOPE LIMITS
- PROPOSED MEDIAN PAVEMENT
- PROPOSED BIO-SWALE
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- BUS STOP
- NEW SIGNALIZED INTERSECTION



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DEPARTMENT OF MUNICIPAL DEVELOPMENT  
ENGINEERING DIVISION**

**WEST CENTRAL COMPLETE STREETS  
SARRACINO PLACE TO 98TH STREET  
ALTERNATIVE 1 - DRAINAGE SWALE (FULL CAPTURE)**

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

City Project No. COA: 6321.94 NMDOT CN: A302335      Zone Map No. K9, K10      Sheet 3-3

**AS BUILT INFORMATION**

CONTRACTOR	DATE
WORK PERFORMED BY	DATE
INSPECTED BY	DATE
ACCEPTANCE BY	DATE
VERIFICATION BY	DATE
DRAWINGS BY	DATE
CORRECTED BY	DATE
RECORDED BY	DATE
NO.	NO.

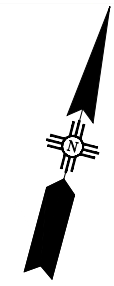
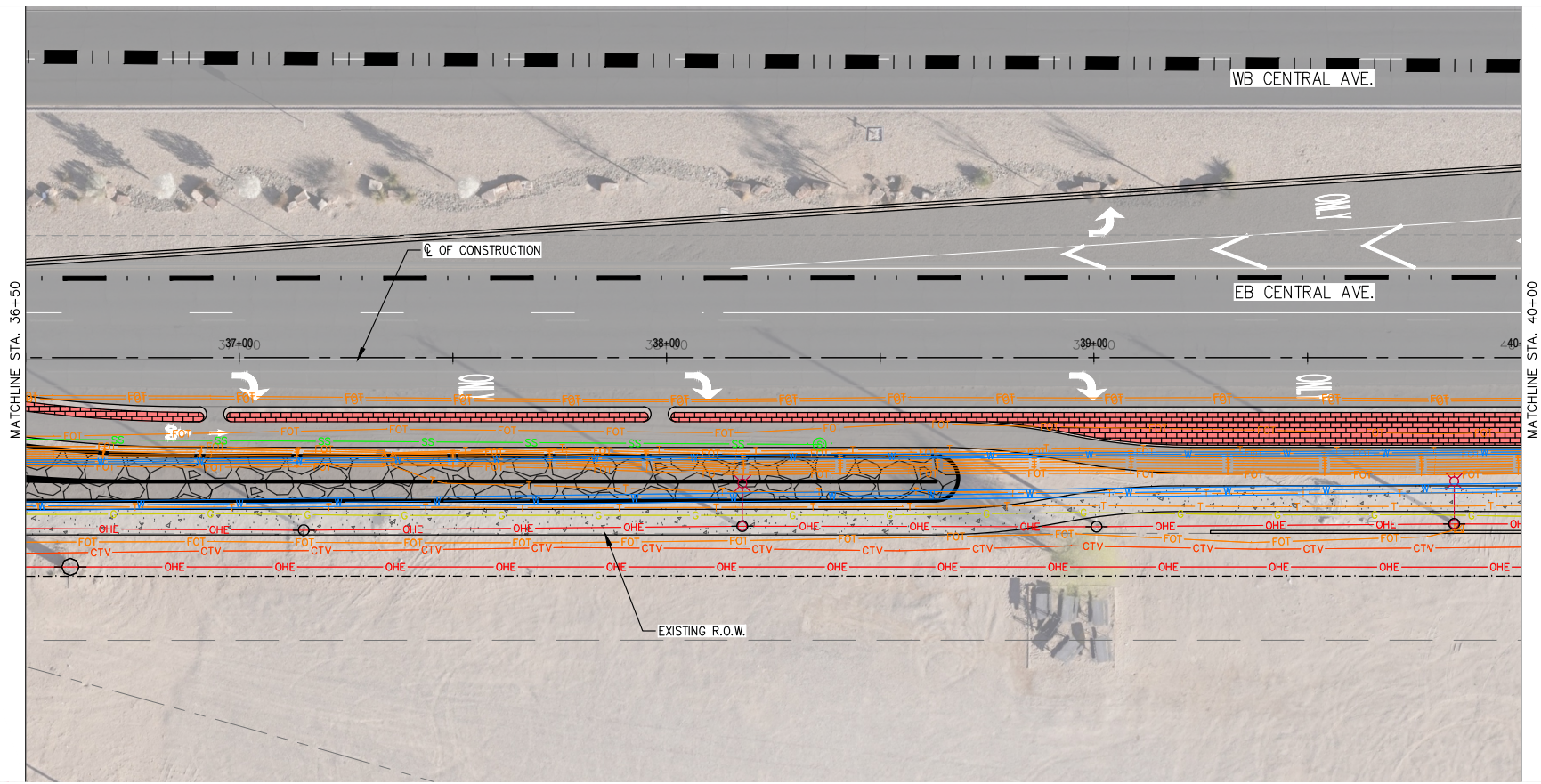
**SURVEY INFORMATION**

FIELD NOTES	DATE
BY	
NO.	

**ENGINEER'S SEAL**

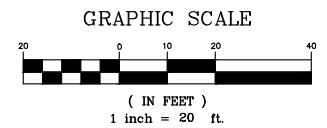
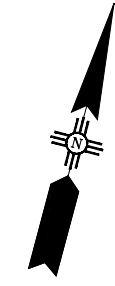
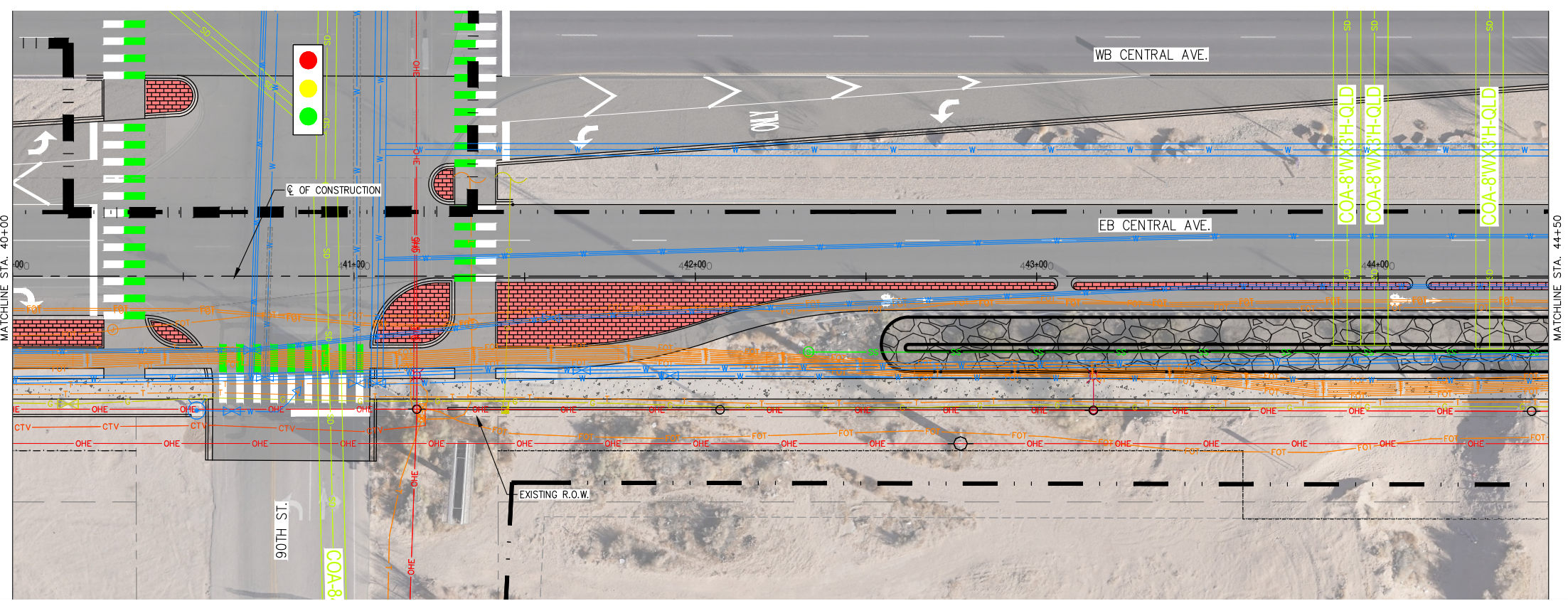
**30% SUBMITTAL  
NOT FOR CONSTRUCTION**

REMARKS	DATE
DESIGN	11/4/2025
	11/4/2025



**LEGEND**

- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION PERMIT
- PROPOSED SLOPE LIMITS
- PROPOSED MEDIAN PAVEMENT
- PROPOSED BIO-SWALE
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- BUS STOP
- NEW SIGNALIZED INTERSECTION



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ENGINEERING DIVISION  
WEST CENTRAL COMPLETE STREETS  
SARRACINO PLACE TO 98TH STREET  
ALTERNATIVE 1 - DRAINAGE SWALE (FULL CAPTURE)

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

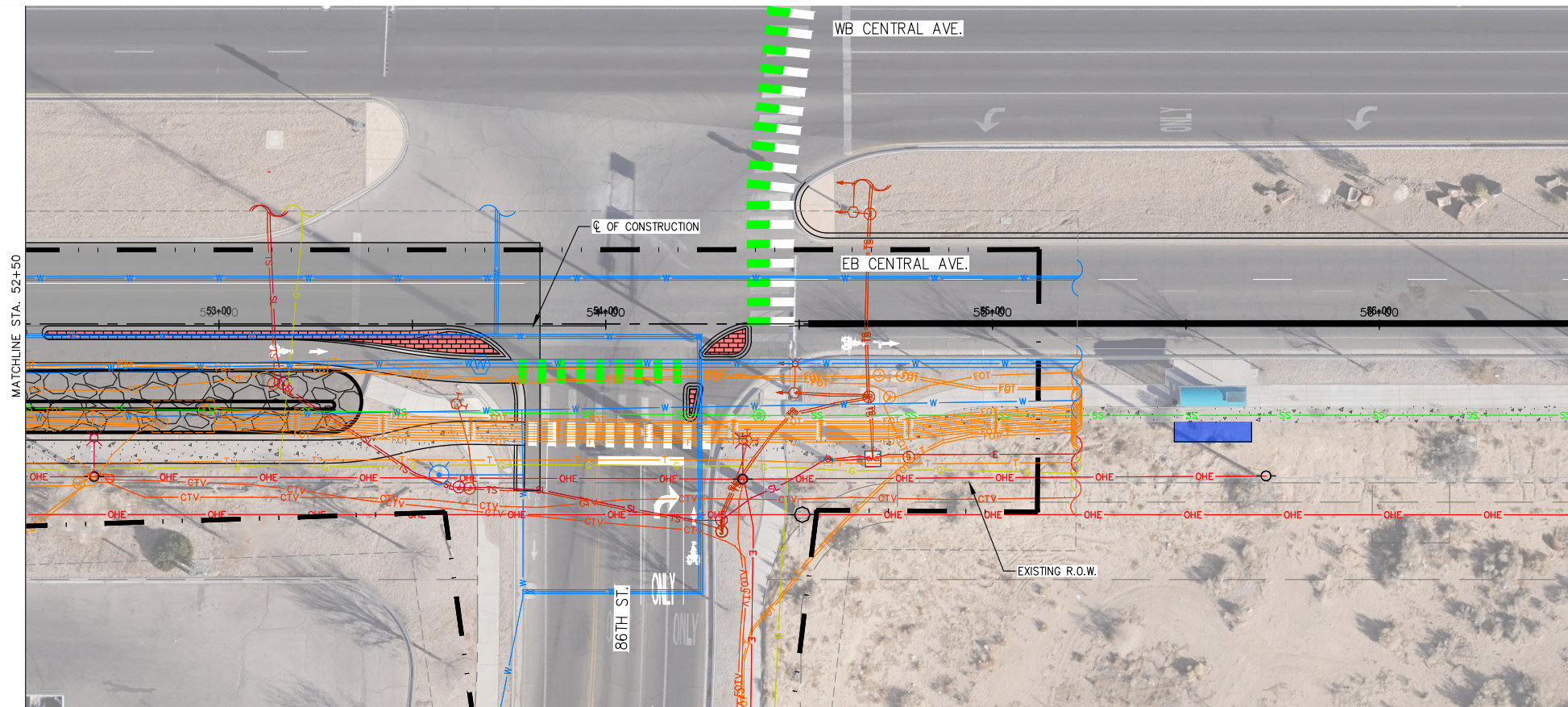
City Project No. COA: 6321.94 NMDOT CN: A302335      Zone Map No. K9, K10      Sheet 3-4

ENGINEER'S SEAL		SURVEY INFORMATION		AS BUILT INFORMATION	
NO.	DATE	NO.	BY	CONTRACTOR	DATE
				WORKED BY	DATE
				INSPECTED BY	DATE
				ACCEPTANCE BY	DATE
				VERIFICATION BY	DATE
				DRAWINGS	DATE
				CORRECTED BY	DATE
				MICRO-FILM INFORMATION	DATE
				RECORDED BY	DATE
				NO.	NO.

STATION IS LOCATED 4.7 MILES SW OF DOWNTOWN ALBUQUERQUE, FROM THE INTERSECTION OF I-40 AND UNSER BLVD. NW TRAVEL SOUTH ON UNSER BLVD. 1.3 MILES TO CENTRAL AVE. 0.58 MILES TO THE STATION ON THE MEDIAN. THE STATION IS 0.1 MILE EAST OF 90TH ST. CL. THE STATION MARK IS A COA SURVEY CONTROL 3" ALUMINUM DISC RIVETED TO A PIPE 0.2" ABOVE GROUND. STAMPED "7-K9 1989".

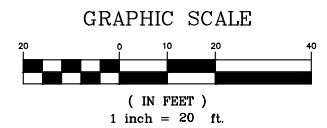
**90% SUBMITTAL NOT FOR CONSTRUCTION**





**LEGEND**

- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION PERMIT
- PROPOSED SLOPE LIMITS
- PROPOSED MEDIAN PAVEMENT
- PROPOSED BIO-SWALE
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- BUS STOP
- ●
●
 NEW SIGNALIZED INTERSECTION



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WEST CENTRAL COMPLETE STREETS  
SARRACINO PLACE TO 98TH STREET  
ALTERNATIVE 1 – DRAINAGE SWALE (FULL CAPTURE)

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

City Project No. COA: 6321.94 NMDOT CN: A302335      Zone Map No. K9, K10      Sheet 3-6

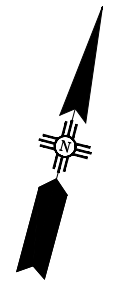
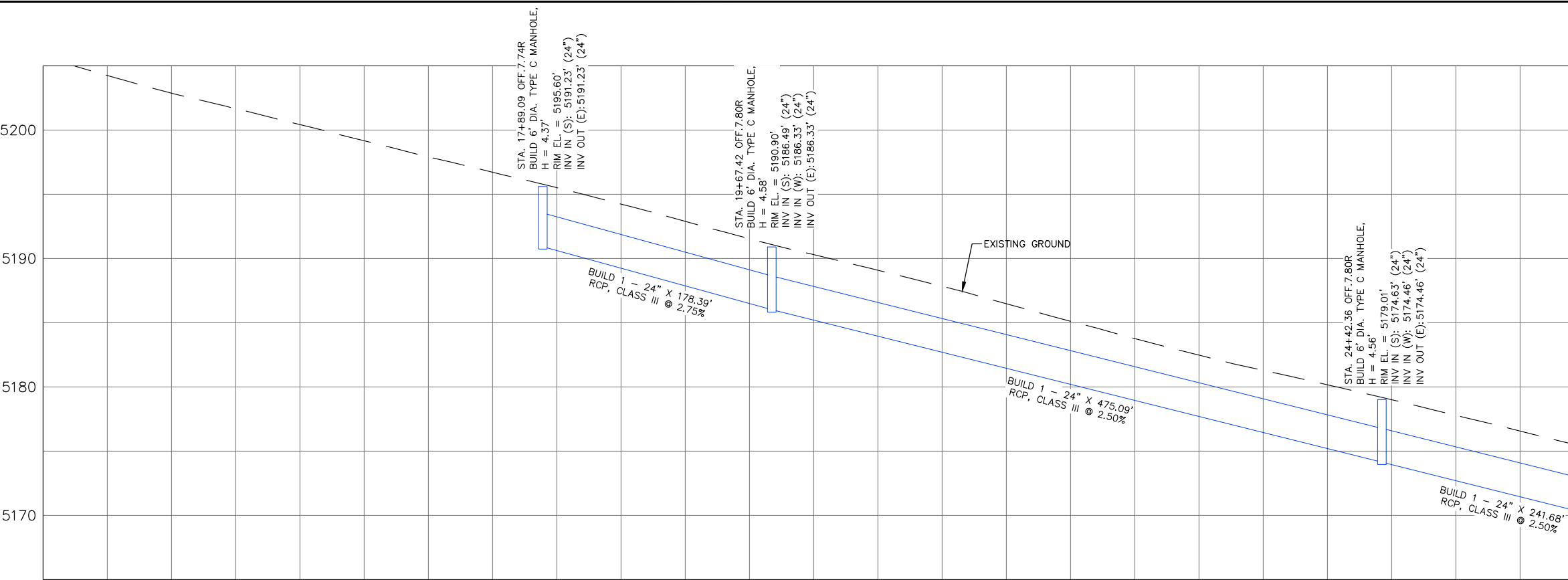
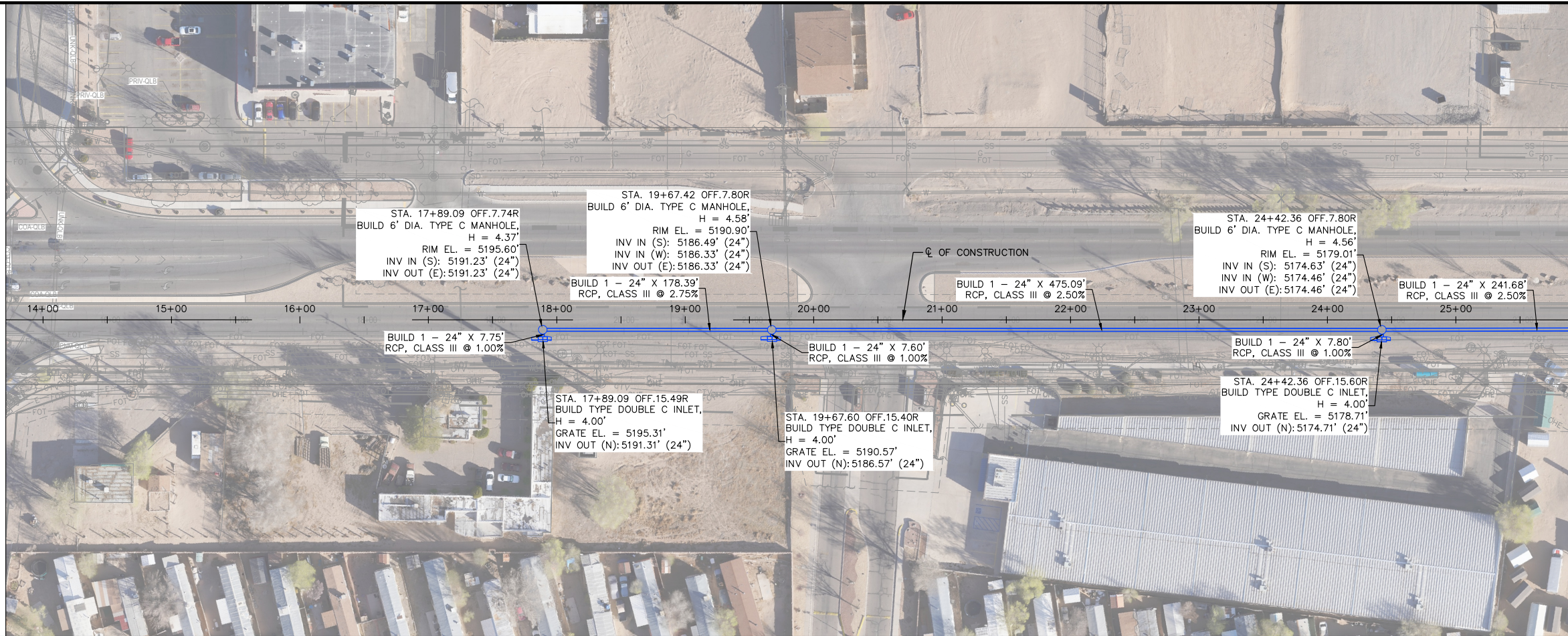
BENCH MARKS		AS BUILT INFORMATION	
STATION IS LOCATED 4.7 MILES SW OF DOWNTOWN ALBUQUERQUE, FROM THE INTERSECTION OF I-40 AND UNISER BLVD. NW TRAVEL SOUTH ON UNISER BLVD. 1.3 MILES TO CENTRAL AVE. 0.58 MILES TO THE STATION ON THE MEDIAN. THE STATION IS 0.1 MILE EAST OF 90TH ST. CL. THE STATION MARK IS A COA SURVEY CONTROL 3 # ALUMINUM DISC RIVETED TO A PIPE 0.2" ABOVE GROUND. STAMPED "7-K9-1989".	CONTRACTOR	WORK RECORDED BY	DATE
	INSPECTOR'S ACCEPTANCE BY		DATE
	VERIFICATION BY		DATE
	DRAWINGS CORRECTED BY		DATE
	MICRO-FILM INFORMATION		DATE
	RECORDED BY		NO.

ENGINEER'S SEAL		SURVEY INFORMATION	
<p style="text-align: center; font-weight: bold; font-size: 1.2em;">NOT FOR SUBMITTAL FOR CONSTRUCTION</p>	NO.	FIELD NOTES	DATE
	BY		

NO.	DATE	REMARKS
		DESIGN
	11/4/2025	DESIGNED BY: WSP
	11/4/2025	DRAWN BY: WSP
		CHECKED BY: WSP

# APPENDIX

## ALTERNATIVE #2 – STORM DRAIN



- LEGEND**
- EXISTING STORM DRAIN
  - PROPOSED STORM DRAIN
  - PROPOSED INLET
  - PROPOSED MANHOLE



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SARRACINO PLACE TO 98TH STREET  
ALTERNATIVE #2 - CONNECTION TO EXISTING TRUNKLINE

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

City Project No. COA: 6321.94 NMDOT CN: A302335  
Zone Map No. K9, K10  
Sheet 1 OF 3

SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
NO.	FIELD NOTES	CONTRACTOR	WORKED BY	DATE	DATE
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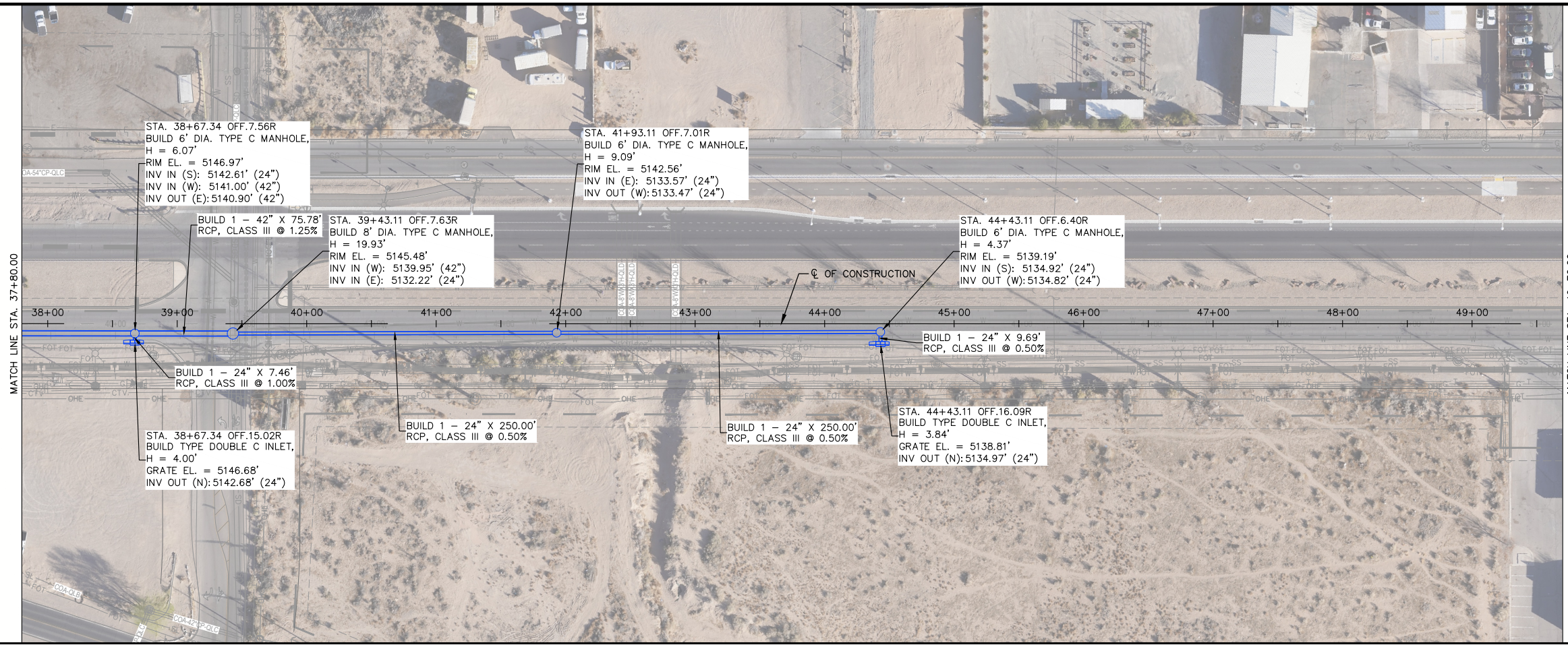
NO.	DATE	REMARKS

**ENGINEER'S SEAL**

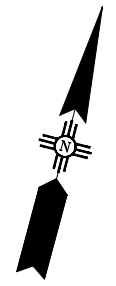
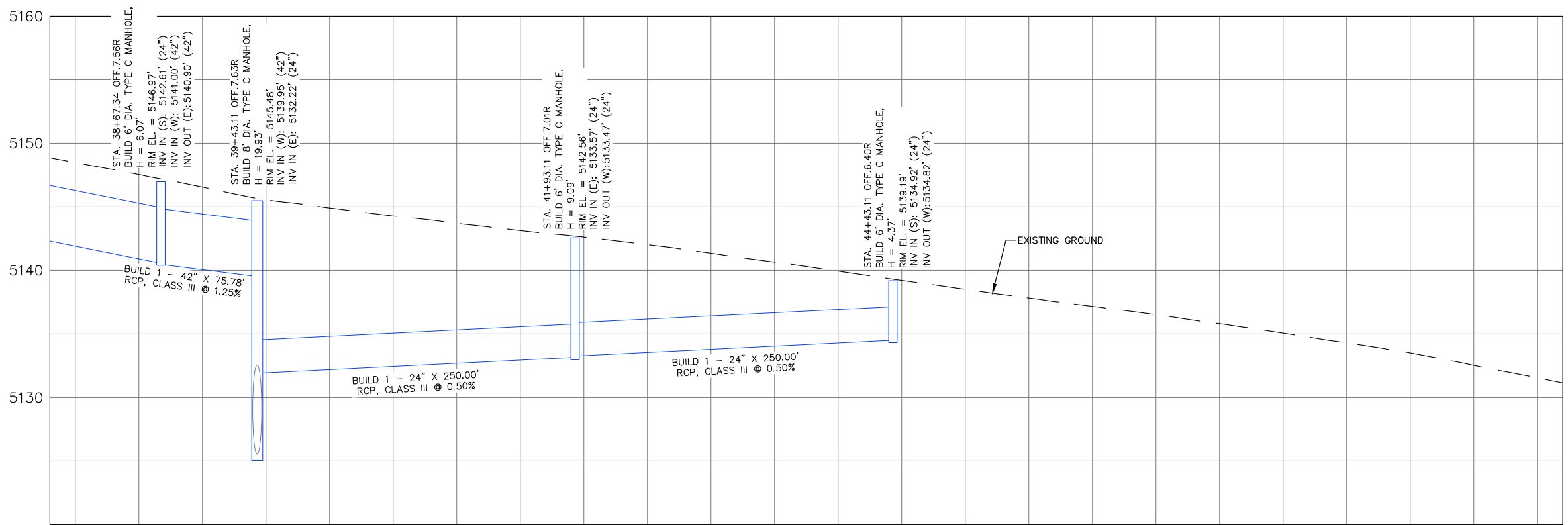
**30% SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED BY	WSP	DATE	11/4/2025
DRAWN BY	WSP	DATE	11/4/2025
CHECKED BY	WSP	DATE	





PLAN AND PROFILE SCALE: 1 inch = 50 ft. PROFILE VERTICAL SCALE: 1 inch = 4 ft. Elevations are in NAVD 1988



- LEGEND**
- EXISTING STORM DRAIN
  - PROPOSED STORM DRAIN
  - PROPOSED INLET
  - PROPOSED MANHOLE

SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
NO.	FIELD NOTES	STATION IS LOCATED 4.7 MILES SW OF DOWNTOWN ALBUQUERQUE, FROM THE INTERSECTION OF I-40 AND UNISER BLVD. NW TRAVEL SOUTH ON UNISER BLVD. 1.3 MILES TO CENTRAL AVE. 0.58 MILES TO THE STATION ON THE MEDIAN. THE STATION IS 0.1 MILE EAST OF 90TH ST. CL. THE STATION MARK IS A COA SURVEY CONTROL 3 # ALUMINUM DISC RIVETED TO A PIPE 0.2" ABOVE GROUND. STAMPED "7-K9 1989"	CONTRACTOR	WORKED BY	DATE

ENGINEER'S SEAL		REMARKS	
NO.	DATE	NO.	DATE

**NOT FOR CONSTRUCTION**



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ALTERNATIVE #2 - CONNECTION TO EXISTING TRUNKLINE

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

City Project No. COA: 6321.94 NMDOT CN: A302335  
Zone Map No. K9, K10  
Sheet 3 OF 3