Design Concept Report (Final Draft)

Drexel Road Bridge – Midvale Park Road to Calle Santa Cruz

Tucson, Pima County, Arizona

Project No. PRJ000398

Prepared for the City of Tucson by HDR

October 7, 2024

CITY OF TUCSON

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Executive Summary

The City of Tucson (COT) Department of Transportation and Mobility (DTM) proposes to extend Drexel Road over the Santa Cruz River by building a new bridge and completing associated roadway improvements between Midvale Park Road and Calle Santa Cruz. This report presents the design concept for the proposed Drexel Road Bridge Project. The proposed project is located in the southwestern part of Tucson in Pima County, Arizona. It is part of a larger corridor project that would improve Drexel Road between Mission and County Club Roads, with a focus on pedestrian and bicycle facilities, landscaping, lighting, and upgraded traffic signals, as discussed in the COT *Move Tucson: Delivering Mobility Choices* planning document.

This design concept report discusses existing conditions in the study area (Figure ES-1), traffic and crash data, the design concept alternatives considered by the study team, the major design features of the Preferred Alternative, a cost estimate for the proposed project, a project implementation plan, the design criteria and design exceptions, and the social, economic, and environmental concerns related to the proposed project.

Existing Conditions. Drexel Road is a two-lane roadway with a two-way center left-turn lane west of Midvale Park Road and dedicated left-turn lanes at Midvale Park Road and Calle Santa Cruz. Drexel Road currently ends at Mahan Drive west of the Santa Cruz River. East of the Santa Cruz River, it ends at Calle Santa Cruz. The lack of connectivity across the river means that travelers must use the bridges at Irvington and Valencia Roads—approximately 1 mile to the north and south—to cross the river. Study area land uses include suburban residential development, natural open space along the river (with The Loop path on the river's west bank), and commercial/institutional development east of Calle Santa Cruz.

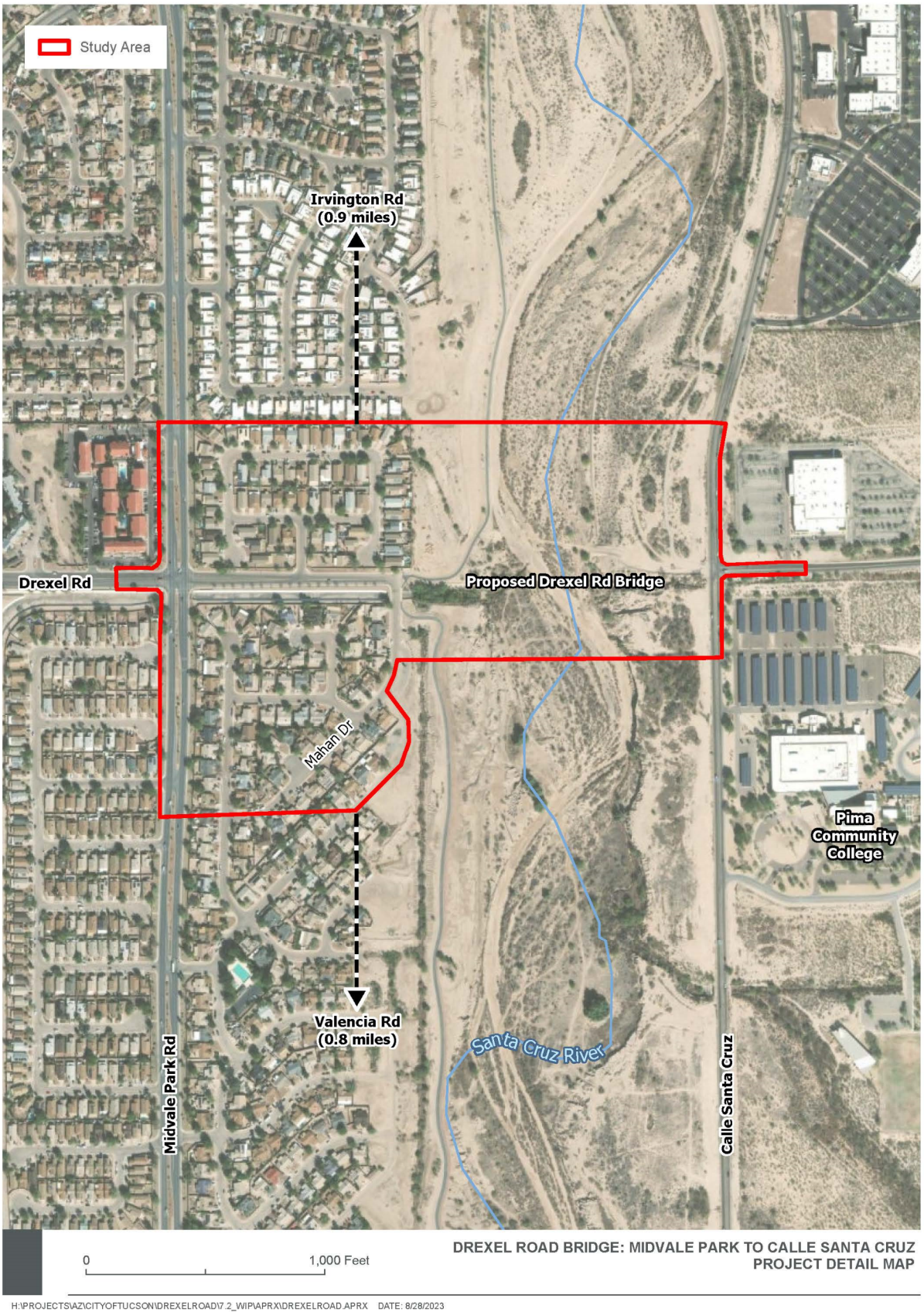
Traffic and Crash Data. Within the study area, 39 crashes have occurred over the past 5 years. Most of the crashes involved only vehicles, with 2 of the 39 crashes involving pedestrians. More crashes occurred at the Drexel Road and Midvale Park Road intersection than at the Drexel Road and Calle Santa Cruz intersection (23 of the 39 crashes).

Existing and future vehicular traffic volumes were determined for Drexel Road (Table ES-1). The future traffic volumes accounted for three scenarios: with no Drexel Road bridge, with the bridge, and with the bridge plus a traffic interchange (TI) on Drexel Road at Interstate 19. As shown in the table, Drexel Road currently has low traffic volumes that would notably increase under the bridge and bridge plus TI scenarios.

Table ES-1. Existing and projected traffic volumes (vehicles per day)

Drexel Road segment	Existing	2045 with No Bridge	2045 with Bridge	2045 with Bridge and TI
West of Midvale Park Road	5,269	6,364	9,472	11,441
Midvale Park Road to Mahan Drive	1,211	1,211	11,000	15,000
Mahan Drive to Calle Santa Cruz	Not applicable	Not applicable	11,000	15,000
East of Calle Santa Cruz	8,249	9,956	16,371	28,041

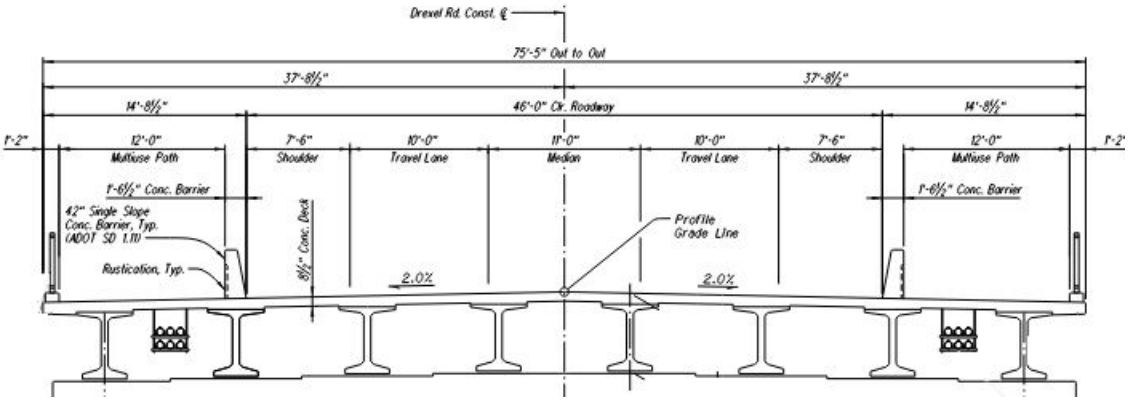
Figure ES-1. Drexel Road Bridge Project study area



Alternatives Considered. The study team considered the No-Build Alternative, which would consist of not building the proposed project, and two build alternatives. The build alternatives would both extend Drexel Road over the Santa Cruz River with construction of a new bridge with two travel lanes (one in each direction) and a center turning lane. They differed in terms of their provisions for pedestrians and bicyclists on the bridge. Alternative No. 1 would provide a multiuse path that would be shared by pedestrians and bicyclists. Alternative No. 2 would provide a separate bicycle lane for bicyclists and a sidewalk for pedestrians. Alternative No. 1 was identified as the Preferred Alternative because of superior safety attributes and the opportunity to provide enhanced aesthetic features on the bridge.

Preferred Alternative. The Preferred Alternative would extend Drexel Road across the Santa Cruz River and provide one 10-foot travel lane in each direction, with an 11-foot median. The roadway on the bridge would have a 7.5-foot shoulder in each direction and a concrete barrier would be placed between the shoulder and the 12-foot multiuse path, which would be provided in each direction (Figure ES-2).

Figure ES-2. Preferred Alternative bridge cross-section



The Preferred Alternative would also provide traffic signals and additional turn lanes at the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz. The Loop path would pass underneath the new bridge. The drainage channel along the south side of Drexel Road would be extended past Mahan Drive to empty into the Santa Cruz River. Landscaping and public art would be provided.

Future traffic volumes on parallel routes would be reduced with the Preferred Alternative. Projections show that upon opening of the new bridge, traffic on Irvington Road would be reduced by 8 percent, and traffic on Valencia Road would be reduced by 11 percent. Thus, the new Drexel Road Bridge would address a subregional traffic issue, given the more limited transportation network on Tucson's southwest side.

Cost Estimate. The Preferred Alternative's estimated construction bid items' cost would be $23.1 million. Additional costs—including final design, construction engineering, construction contingency, and inflation—would result in an estimated total project cost of $40.9 million. The proposed project currently has COT and State of Arizona funding, and federal grant funding is being pursued to expedite the project.

Project Implementation. The COT has received $15 million in funding from the State of Arizona, and $4 million from COT local funds, consisting of $2 million from local allocation of the Arizona Highway User Revenue Fund (HURF) and $2 million from COT Development Impact fees. With a total project cost of $40.9 million, this leaves a funding deficit of approximately $21.9 million. The COT applied for a Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant of $20 million in February 2024, but the application was not successful. The COT will explore other regional and federal funding opportunities and is considering re-applying for a RAISE Grant in the next cycle to keep the project moving forward.

Construction is expected to have little effect on the surrounding area. The bridge can be built without disrupting traffic. Traffic signals can be installed at the Midvale Park Road/ Drexel Road and the Calle Santa Cruz/Drexel Road intersections, and roadway improvements can be constructed between Midvale Park Road and the bridge using phased construction, which would allow traffic to be maintained during construction.

Design Criteria and Exceptions. The Drexel Road improvements would be designed in accordance with the American Association of State Highway and Transportation Officials' *A Policy on Geometric Design of Highways and Streets* (2018) and *Roadside Design Guide* (2011), as a low-speed urban roadway. Given the low speed and straight and flat nature of the roadway, no geometric design exceptions are expected.

Environmental Concerns. The environmental concerns associated with the proposed bridge project include impacts on animal and plant species along the Santa Cruz River, deteriorated air quality during construction, higher noise levels from construction and from additional traffic on the new bridge, the potential disturbance of hazardous materials sites, potential impacts on cultural resources sites, changes in views as a result of the new bridge, and potential impacts on nearby neighborhoods. The proposed project's design may be adjusted to avoid environmental impacts where possible, and for unavoidable impacts mitigation would be implemented to minimize the impacts to the extent possible.

1 Introduction

1.1 Foreword

This report describes the City of Tucson (COT) Department of Transportation and Mobility (DTM) design concept for the planned Drexel Road Bridge Project, which would construct a new bridge over the Santa Cruz River and make associated roadway improvements on Drexel Road between Midvale Park Road and Calle Santa Cruz. The proposed project is located in the southwestern part of Tucson in Pima County, Arizona (Figures 1 and 2). COT has assigned the following project number to the proposed project: PRJ000398. The bridge project is part of a an overall and future corridor improvement project that would modernize Drexel Road between Mission Road and County Club Road, with a focus on pedestrian and bicycle facilities, landscaping, lighting, and upgraded traffic signals (COT 2021a).

Design of the bridge is being funded by COT and the State of Arizona. At this time, most of the identified construction funding is from the State of Arizona. COT is pursuing additional funding through federal grant programs; therefore, the design and preconstruction process would follow National Environmental Policy Act (NEPA) guidelines. Alternatives for the bridge design are described in this design concept report (DCR), and an environmental assessment (EA) would be prepared to discuss the potential environmental impacts of the proposed bridge project.

This DCR discusses traffic and crash data (Section 2), the design concept alternatives (Section 3), the major design features of the Preferred Alternative (Section 4), an itemized cost estimate for the proposed project (Section 5), a project implementation plan (Section 6), the American Association of State Highway and Transportation Officials (AASHTO) design criteria and design exceptions (Section 7), and the social, economic, and environmental concerns related to the proposed project (Section 8).

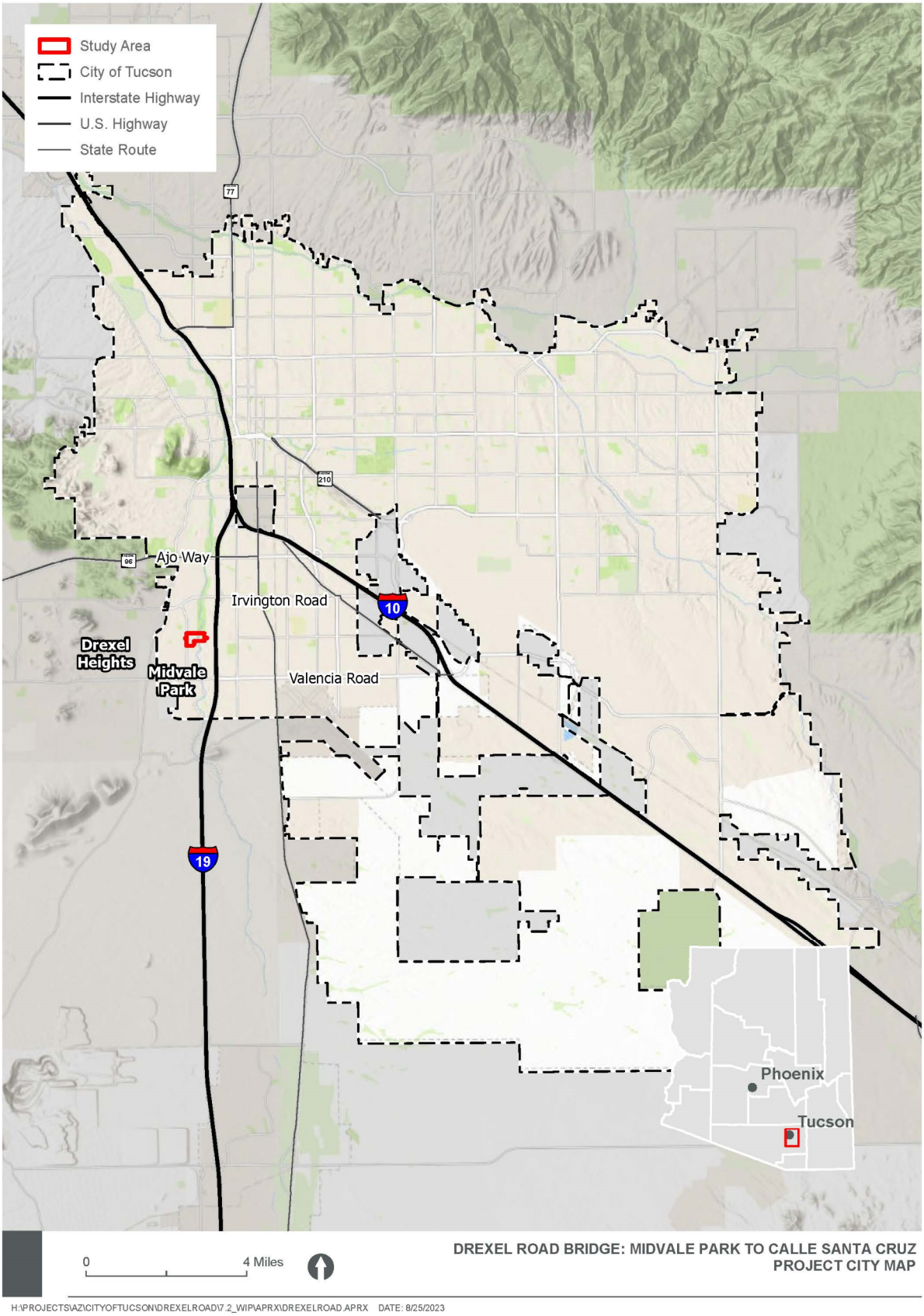
1.2 Need for the Project

Drexel Road does not currently cross the Santa Cruz River. It terminates east of Midvale Park Road on the west side of the river and terminates at Calle Santa Cruz on the east side of the river. The nearest Santa Cruz River crossing to the north is at Irvington Road and to the south is at Valencia Road (both approximately 1 mile away).

The purpose of the proposed project is to provide an additional access route for neighborhoods on both sides of the Santa Cruz River. The proposed project is needed because urban development and population growth are expected to continue in southwestern Tucson, but access across the Santa Cruz River is currently restricted to Irvington and Valencia Roads, which are 2 miles apart. A bridge at Drexel Road would provide better access for residents, commuters, and visitors as business and residential development expands in southwestern Tucson.

Figure 1. Project location in state

Figure 2. Project location in city



Future traffic volumes on parallel routes would be reduced with the Preferred Alternative. Projections show that upon opening of the new bridge, traffic on Irvington Road would be reduced by 8 percent, and traffic on Valencia Road would be reduced by 11 percent. Thus, the new Drexel Road Bridge would address a subregional traffic issue, given the more limited transportation network on Tucson's southwest side. Irvington and Valencia Roads are currently congested, so the opening of the new bridge would provide immediate relief. In the event of emergencies, the new bridge would offer more redundancy in the network. Additionally, it would provide a lower-stress route for pedestrians and bicyclists in the area.

The COT has identified the Drexel Road Bridge Project in its *Move Tucson: Delivering Mobility Choices* transportation plan. On a regional level, the proposed project is identified as the Drexel Road Extension in the 2045 *Regional Mobility and Accessibility Plan* (RMAP ID #6.03), published by the Pima Association of Governments (PAG), a metropolitan planning organization serving southern Arizona. The Drexel Road Bridge Project has been included in regional planning documents since 2003, demonstrating the proposed project's regional significance.

1.3 Description of the Project

1.3.1 Proposed Project

The scope of work for the Drexel Road Bridge Project includes:

- Construct a new two-lane bridge, with one travel lane in each direction and a median, to connect Drexel Road across the Santa Cruz River.
- Provide a multiuse path for pedestrians and bicyclists across the new bridge.
- Modernize Drexel Road between Midvale Park Road and Mahan Drive by providing a two-way left-turn lane (TWLTL), street lighting, and other safety improvements.
- Install a signalized intersection at Drexel Road and Calle Santa Cruz, including right-turn lanes on all approaches and new pedestrian ramps on all four corners.
- Install a signalized intersection at Drexel Road and Midvale Park Road, including a right-turn lane on the westbound approach and new pedestrian ramps on all four corners.
- Connect and realign the existing Pima County Chuck Huckelberry Loop (The Loop) path to a new path crossing under the new bridge on the west side of the Santa Cruz River.
- Extend an existing drainage channel south of Drexel Road from Mahan Drive to the Santa Cruz River.
- Replace the two-barrel pipe culvert under Calle Santa Cruz south of Drexel Road with a three-barrel 48-inch RCP culvert and extend it to outlet into the Santa Cruz River south of the new bridge.
- Install a two-barrell 30-inch RCP culvert under Drexel Road to carry water from the northeast corner of the Drexel Road/Calle Santa Cruz intersection to drain into the new 3-barrel RCP culvert described in the bullet above.

- Provide bank protection for the Santa Cruz River at the new bridge.

1.3.2 Existing Conditions

The following sections describe the study area's existing infrastructure.

Roadway

The three main roadways in the study area—Drexel Road, Midvale Park Road, and Calle Santa Cruz—are described below:

Drexel Road

Drexel Road immediately east of the intersection with Midvale Park Road includes two westbound travel lanes (10-foot outside and 11-foot inside), a 10-foot-wide left-turn lane, a 21-foot-wide eastbound travel lane and 5-foot shoulders on each side of the roadway, for a total width of 62 feet. Drexel Road between Ascott Drive and the Santa Cruz River has one 15-foot travel lane in each direction and a 5-foot shoulder in each direction, for a total out-to-out roadway width of 40 feet, with 5-foot pedestrian sidewalks and landscaping on both sides of the road. Heading east toward the river, Drexel Road turns right and transitions into Mahan Drive at the beginning of The Loop, a multiuse pedestrian and bicyclist pathway running along the west bank of the Santa Cruz River.

East of Calle Santa Cruz, Drexel Road has one 12-foot travel lane in each direction and an 8-foot shoulder in each direction, for a total out-to-out roadway width of 40 feet, with a 4-foot pedestrian sidewalk on the north side of the road. At Calle Santa Cruz, where Drexel Road terminates with a three-way stop sign, there is a 12-foot left-turn lane and a 12-foot right-turn lane in the westbound direction and a 24-foot travel lane in the eastbound direction. The total out-to-out roadway increases to 48 feet, with a 4-foot sidewalk on the north side of the road.

Calle Santa Cruz

Calle Santa Cruz runs north-to-south adjacent to the east bank of the Santa Cruz River. The road provides direct access to the Tucson Spectrum shopping center north of Drexel Road and to the Pima Community College Desert Vista Campus south of Drexel Road. Calle Santa Cruz intersects Irvington Road (north of Drexel Road) and Valencia Road (south of Drexel Road), both of which have bridge crossings over the Santa Cruz River and provide direct access to Interstate 19 (I-19).

The Calle Santa Cruz as-built plans (U-2005-012) show one 12-foot travel lane in each direction, one 14-foot center turning lane, and a 5-foot shoulder in each direction. Measurements show one 12-foot travel lane in each direction, one 13-foot center turning lane, and a 5-foot 6-inch shoulder in each direction, with a 5-foot pedestrian sidewalk on the east side of the road.

Midvale Park Road

Midvale Park Road runs north-to-south 900 feet west of the Santa Cruz River and intersects Irvington and Valencia Roads. Traffic west of the Santa Cruz River travelling on Drexel Road must use Midvale Park Road to access Irvington and Valencia Roads, where the Santa Cruz River can be crossed. Midvale Park Road has two 12-foot travel

lanes in each direction, a 6-foot shoulder in each direction, a variable-width center median, a 5-foot sidewalk in each direction, landscaping, and street lights.

As-built Documents

The following as-built documents were reviewed for the Drexel Road Bridge Project:

- ADOT Standard Drawings, Triple Barrel Box Culvert, Standard No. CB-3, Drawing No. B-2.04
- City of Tucson, Drexel Road Paving and Drainage Project Job Number 124, Plan No. I-79-04, dated March 3, 1980
- City of Tucson, Calle Santa Cruz – South of Drexel Road District Paving Improvement, Plan No. I-80-31, dated November 27, 1981
- City of Tucson, Midvale Road Valencia Rd. to Irvington Rd., Phase II – Drexel Road to Oaktree Drive, Plan No. I-84-07, dated September 10, 1986
- City of Tucson, Drexel Road W.B. Channel to Santa Cruz River, Plan No. I-84-29, dated February 2, 1987
- City of Tucson, Drexel Rd Paving Plans, Plan No. U-2005-017, dated April 26, 2012

Traffic Features and Lighting

- The intersection of Drexel Road with Midvale Park Road features a four-way stop with stop signs and flashing red lights controlling traffic.
- The intersection of Drexel Road and Calle Santa Cruz features a three-way stop with stop signs controlling traffic.
- No lighting is provided on Drexel Road between Midvale Park Road and Mahan Drive. On Midvale Park Road, street lights with cobra-style heads are provided on both sides of the road. No lighting is provided on Calle Santa Cruz in the study area.

Right-of-Way

The existing right-of-way (ROW) widths and other details for the roadways and drainage channel in the study area are provided below.

- Drexel Road ROW is 90 and 150 feet wide, as described below:
    - Between Midvale Park Road going east to the common section lines of Sections 2 and 3 (north half) and common section lines of Sections 10 and 11 (south half) of Township 15 South, Range 13 East: 90 feet wide total with 45-foot half width on each side of the common section line of Sections 3 and 10, acquired by Deed of Gift, according to Pima County Recorder's Docket 6316 page 29.
    - Between common section lines of Sections 2 and 3 (north half) and common section lines of Sections 10 and 11 (south half) of Township 15 South, Range 13 East to I-19: 150 feet wide total with 75-foot half width on each side of the common section line of Sections 2 and 11, acquired by City Resolution No. 4506, recorded at Pima County Recorder's Docket 1707 page 69.

- Midvale Park Road ROW is 150 feet wide, as described below:
    - South of Drexel Road: 150 feet wide total with 75-foot half width on each side of the road centerline, including intersection spandrels, dedicated by Amended Plat of Laurel Heights subdivision plat, according to Pima County Recorder's Map Book 40 page 19.
    - North of Drexel Road: 150 feet wide total, including intersection spandrels, acquired by Warranty Deed, according to Pima County Recorder's Docket 7257 page 1372.
- Ascott Drive ROW is 45 feet wide, as described below:
    - North of Drexel Road: 45 feet wide total with 22.5-foot half width on each side of the road centerline, including intersection spandrels. Dedicated by The Gates of Midvale Park Lot 1 through 67 and Block "A" subdivision plat, according to Pima County Recorder's Map Book 51 page 73.
- Mahan Drive ROW is 56 feet wide, as described below:
    - South of Drexel Road: 56 feet wide total with 26-foot half width on west side and 30-foot half width on east side of the road centerline, including intersection spandrels. Dedicated by Amended Plat of Laurel Heights subdivision plat, according to Pima County Recorder's Map Book 40 page 19.
- Calle Santa Cruz ROW is 80 feet wide, as described below:
    - South of Drexel Road: 80 feet wide total with 40-foot half width on each side of the road centerline, including intersection spandrels, dedicated by Santa Cruz Industrial Park Lots 1, 2, & 3 subdivision plat, according to Pima County Recorder's Map Book 24 page 15.
    - North of Drexel Road: 80 feet wide total with 40-foot half width on each side of the road centerline, including intersection spandrels, dedicated by Parque de Santa Cruz Blocks 1 and 2 subdivision plat, according to Pima County Recorder's Map Book 29 page 48.
- COT-owned public drainage parcel, south of Drexel Road between Midvale Park Road and Mahan Drive, is 60 feet wide. Dedicated by Amended Plat of Laurel Heights subdivision plat, according to Pima County Recorder's Map Book 40 page 19.
- Pima County Regional Flood Control District has ROW within the Santa Cruz River north and south of Drexel Road.

Drainage and Drainage Structures

The Santa Cruz River runs from south to north through the study area and features a 100-year floodplain (which coincides with the floodway) and some adjacent areas of a 500-year floodplain. The river has a watershed of 2,101 square miles. At Drexel Road, the river flows during a 10-year storm are 16,800 cubic feet per second (cfs) and during a 100-year storm are 60,000 cfs.

The Santa Cruz River was mapped by the Federal Emergency Management Agency (FEMA) and published on the Digital Flood Insurance Rate Map (DFIRM) number 04019C2288L, effective June 16, 2011. The river is mapped as Zone AE with floodway. The floodway is the most restrictive part of the floodplain and is reserved for passage of 100-year storm flows. In the project limits, the floodway and Zone AE floodplain limits are equivalent, meaning that no encroachment is allowed into the floodway unless it can be demonstrated that a no-rise condition can be reached. Increases to water surface elevations (WSELs) from the proposed bridge would trigger the Letter of Map Revision (LOMR) process, which starts with a Conditional LOMR application.

The FEMA Effective Hydraulic Model for the Santa Cruz River is a HEC-2 model from 1989 and, since HEC-2 is no longer supported by the U.S. Army Corp of Engineers (USACE), a corrected effective model was created that matches the effective model cross section locations but uses newer topography for the cross-section geometry. The corrected effective model was created in HEC-RAS Version 6.4.1, a hydraulic model accepted by FEMA and supported by USACE. Table 1 shows the 100-year existing condition WSELs for the effective model and the corrected effective model, which will be used to compare existing and proposed conditions.

Table 1. Existing 100-year water surface elevation in Santa Cruz River

DFIRM letter designation	HEC-RAS river station	Effective model WSEL (feet)	Corrected effective model WSEL (feet)
GU	1477	2420.1	2420.07
GV	2490	2424.4	2424.13
GW	3586	2426.3	2426.43
GX	4592	2431.0	2429.87
GY	5653	2432.9	2433.22
GZ	6828	2438.4	2438.65
HA	7862	2438.9	2442.48
HB	8926	2449.9	2446.01
HC	9899	2450.0	3449.38
HD	10917	2459.5	2455.24
HE	11919	2460.6	2460.96

In addition to the Santa Cruz River, a drainage channel runs along the south side of Drexel Road between Midvale Park Road and Mahan Drive. The channel through this stretch is concrete lined and trapezoidal in shape with a bottom width of 28 feet and a depth between 6.5 feet and 8 feet. It runs underneath Mahan Drive in a three-cell reinforced concrete box culvert and then daylights east of Mahan Drive as a concrete U-channel. The drainageway then transitions to have a riprap lined bottom with dense vegetation and trees before emptying into the Santa Cruz River. The portion of the channel east of Mahan Drive is identified as a 100-year floodplain.

Other minor drainage facilities include a three-barrel 48-inch-diameter corrugated metal pipe (CMP) culvert running north-to-south just east of Mahan Drive under The Loop path south of Drexel Road, a three-barrel 36-inch reinforced concrete pipe (RCP) culvert running northwest to southeast underneath The Loop path north of Drexel Road on the west side of the Santa Cruz River, and a two-barrel 45-inch × 29-inch elliptical concrete pipe culvert running east-to-west beneath Calle Santa Cruz immediately south of Drexel Road.

Utilities

Information on existing utilities in the study area was requested through Arizona 811 on December 18, 2023. Table 2 lists the utility owners and the types of facilities that could be affected in a defined work area on Drexel Road, from Pine Oak Drive to 500 feet east of Calle Santa Cruz.

Table 2. Existing utilities

Utility owner	Facility type
COT DTM Traffic Engineering	Street lights, traffic signals
COT Facilities Design and Maintenance	Electric, gas, sewer, water
COT Fiber	Fiber optics
Cogent Communications (formerly known as Sprint Comm. Co.)	Fiber optics
Cox Communications	Cable television, fiber optics
Crown Castle Solutions Corporation	Fiber optics
Lumen (formerly known as CenturyLink)	Coaxial cable, fiber optics
Pima County Regional Wastewater Reclamation Department	Fiber optics, sewer, traffic signals
Southwest Gas Corporation	Natural gas
Tucson Electric Power (TEP)	Electric
Tucson Water	Reclaimed water, water
Zayo Group, LLC	Fiber optics

COT DTM Traffic Engineering

COT facilities are located at the intersection of Drexel Road and Midvale Park Road, for a four-way flashing signal at the intersection. It is expected that a new signal structure would be installed at this location. Street lighting is located at the four corners of the intersection with Midvale Park Road. A COT-owned pole is also located near the northeast corner of the intersection with Calle Santa Cruz.

COT Facilities Design and Maintenance

The Bluestake for design response indicates that COT Facilities Design and Maintenance potentially operates electric, gas, sewer and water facilities within the project limits. As part of the Bluestake response process, a representative from COT determined that its facilities are not in conflict and no facility basemaps were provided.

COT Fiber

COT has underground fiber facilities along the north side of Drexel Road, from Midvale Park Road to Mahan Drive, which then transition to aerial facilities, supported on TEP poles, crossing the Santa Cruz River and continuing along Drexel Road past the eastern project limits. An underground fiber line serves the Pima Community College Desert Vista Campus at Drexel Road and Calle Santa Cruz.

Cogent Communications

Cogent Communications has facilities running east-to-west along the entire project limits, from Midvale Park Road to Calle Santa Cruz. Cogent also has aerial facilities, supported on TEP poles, running east-to-west over the Santa Cruz River.

Cox Communications

Cox Communications has facilities running east-to-west along the entire project limits, from Midvale Park Road to Calle Santa Cruz. It also has aerial facilities, supported on TEP poles, running east-to-west over the Santa Cruz River and along Drexel Road, east of Calle Santa Cruz. Cox Communications has underground facilities along the west side of Calle Santa Cruz heading north toward Irvington Road and on the east side of Mahan Drive running south.

Crown Castle Solutions Corporation

Crown Castle has facilities running east-to-west along the entire project limits, from Midvale Park Road to Calle Santa Cruz. It also has aerial facilities, supported on TEP poles, running east-to-west over the Santa Cruz River and along Drexel Road, east of Calle Santa Cruz. Crown Castle has additional underground facilities along the west side of Calle Santa Cruz and also at the Midvale Park Road intersection.

Lumen

Lumen has underground facilities running north-to-south along Calle Santa Cruz. Preliminary basemaps indicate that these facilities have multiple crossings of Drexel Road just east of Calle Santa Cruz. Additional facilities are located at the intersection of Drexel Road and Midvale Park Road.

Pima County Regional Wastewater Reclamation Department

The Pima County Regional Wastewater Reclamation Department has sewer facilities running north-to-south along Mahan Drive and facilities running east-to-west along Drexel Road from Mahan Drive to Midvale Park Road.

Southwest Gas Corporation

Southwest Gas has underground natural gas distribution facilities running north-to-south along Calle Santa Cruz, underneath the east edge of the sidewalk on the east side of the road. The facilities cross Drexel Road just east of the intersection with Calle Santa Cruz. Additional Southwest Gas facilities are located at the intersection of Drexel Road and Midvale Park Road.

Tucson Electric Power

TEP has overhead electric facilities within the project limits. TEP operates a 138 kilovolt (kV) electric transmission line, which runs north-to-south along the west bank of the Santa Cruz River. These lines require a minimum vertical separation of 25 feet, 6 inches from the top of the proposed bridge deck and a minimum approach distance of 15 feet for construction equipment and 25 feet for cranes.

TEP also has overhead electric distribution lines supported on wooden poles, running east-to-west across the Santa Cruz River. It is anticipated that these overhead lines would conflict with the proposed work and would have to be relocated. These poles also support several of the other utilities in the project limits. The aerial line transitions to underground buried facilities at Mahan Drive and the underground electric lines continue west to Midvale Park Road.

Tucson Water

Tucson Water facilities are located at the following intersections with Drexel Road: Midvale Park Road, Mahan Drive, and Calle Santa Cruz. This includes a 24” diameter water transmission main along Calle Santa Cruz and 8” diameter water mains along Drexel Road. Tucson Water performed a feasibility study evaluating the need for a 12” diameter water main crossing the Santa Cruz River along Drexel Road, to be supported on the proposed bridge. Tucson Water has indicated that this crossing is not necessary at this time, as there is additional redundancy with river crossings along Irvington Road and Valencia Road.

Zayo Group, LLC

Zayo has facilities running east-to-west along the entire project limits, including overhead facilities on TEP poles starting at the eastern project limit and continuing over the Santa Cruz River up until Mahan Drive, where facilities then transition underground and continue along Drexel Road past the western project limit.

Geology

A geotechnical study is being conducted for the proposed project, and information on geological conditions will be provided in a Geotechnical Foundation Report.

1.4 Characteristics of the Study Area

The study area, shown in Figure 3, is a mix of suburban residential development and natural open space.

West of the Santa Cruz River, the study area features suburban development, with single-story homes, residential streets with sidewalks, and ornamental landscaping. A multistory apartment complex is located at the northwestern corner of Drexel Road and Midvale Park Road.

The eastern portion of the study area is dominated by the Santa Cruz River, with the riverbed measuring over 400 feet wide and featuring natural vegetation. The banks of the river are steep in some locations, with gullies eroded into the banks. Along the top of the river banks, The Loop paved recreational pathway runs north-to-south along the west

bank, and the Santa Cruz River Bikeway runs to the north of Drexel Road along the east bank (the bikeway is currently closed and not maintained). Adjacent facilities include Pima Community College's Desert Vista Campus southeast of the Drexel Road and Calle Santa Cruz intersection and Casa Alitas Drexel Center for Migrants to the northeast of the intersection that is currently being used as a temporary respite center for legal asylum seekers.

Figure 3. Drexel Road Bridge Project study area

1.5 Agency and Public Scoping

1.5.1 Agency Scoping

An agency scoping meeting was held on October 26, 2023. The meeting, which was a virtual meeting, was attended by 23 people and included representatives from the following agencies:

- Arizona Department of Transportation Southcentral District
- COT DTM
- COT Planning and Development Services
- COT Ward 1 Council Office
- Pima Community College Desert Vista Campus
- Pima Community College Police Department
- Pima County Natural Resources, Parks, and Recreation
- Pima County Regional Flood Control District Engineering Department
- Sunnyside School District
- Sun Tran
- Tucson Police Department

The meeting began with introductions, followed by a presentation that provided a project overview and information regarding the proposed project's traffic analysis, bridge design, roadway design, public involvement efforts, environment efforts, and design and construction schedule. This was followed by an open discussion. Table 3 summarizes the comments received during the meeting.

Table 3. Agency scoping meeting comments

Agency	Comment	Response
Arizona Department of Transportation Southcentral District	Comment to take into account traffic loads from new traffic interchanges (TIs) and widening improvements on I-19. Recommend further coordination.	The study team is considering the impacts to traffic on the proposed project assuming a new TI is constructed on I-19 at Drexel Road.
Pima County Regional Flood Control District Engineering Department	Information on the Santa Cruz River's lateral migration has been provided to the study team. Question regarding whether this will be further considered when it comes to the bridge abutment design.	The study team will consider the river's lateral migration.
	Regarding the minimum elevation of The Loop underpass, a 10-year water surface elevation would be the lowest that Pima County Regional Flood Control District would accept.	The study team asked for confirmation of the overhead clearance for The Loop underpass, and Pima County will follow up. The study team also noted that Pima County Natural Resources, Parks, and Recreation favors the pathway going under the bridge on both sides of the river.
Pima Community College Police Department	Comment regarding traffic on Calle Santa Cruz, which becomes very congested when a significant traffic incident occurs on Valencia or Irvington Roads, making it difficult for students at the Pima Community College Desert Vista Campus to turn onto Calle Santa Cruz. Question regarding what can be done to facilitate the increased traffic on Calle Santa Cruz.	The reconstructed interchange at I-19 and Irvington Road may help by reducing traffic incidents. Adding a traffic signal and turn lanes at the Drexel Road/Calle Santa Cruz intersection will help.
Sunnyside School District	Question regarding the project's impact on widening or improving Drexel Road to the east to Country Club Road. The school district's Los Amigos School is on Drexel Road.	This is the first phase of a Drexel Road modernization project. Later phases will continue east to I-19, 12th Avenue, and Country Club Road. Vehicular capacity will not be added but improvements will include drainage, curbs, pedestrian amenities, and separated bicycle lanes.
Sun Tran	Comment on how Sun Tran buses entering the Pima Community College Desert Vista Campus parking lot have difficulty turning out of the parking lot onto Calle Santa Cruz. A HAWK signal is being evaluated for the campus south entrance but something else may be needed.	The campus south entrance is outside of the proposed project's study area but the issue will be considered. A HAWK signal or full traffic signal could be a potential solution.
Tucson Police Department	Question regarding whether Pima County Emergency Management has been involved. The building at the northeast corner of Drexel Road and Calle Santa Cruz is being used as an immigrant processing center with many people and buses passing through day and night. Construction could affect operations.	It is unknown if this processing center will be in operation at the time the bridge construction is completed. However, construction work at the Drexel Road/Calle Santa Cruz intersection will cause some delays to traffic, but both roads are anticipated to be kept open with lane restrictions during construction.

1.5.2 Public Scoping

Two public scoping meeting were held in December 2023 to gather input on the proposed project. An in-person meeting was held on December 5 at El Pueblo Activity Center, at 101 W. Irvington Road, with 132 attendees. A virtual meeting was held on December 6 and had 38 attendees. Table 4 summarizes the public scoping meeting comments.

Table 4. Public scoping meeting comments

Topic	Comment
Project overview	Comments supporting and opposing widening Drexel Road to four lanes
	Comment on need for a crosswalk light at Drexel Road and Santa Clara Avenue for students attending Mission Manor School
	Concern regarding impacts on neighborhood traffic, accidents, speeding, red light running, stop sign running, and pedestrian injuries and fatalities
	Concern regarding impacts on Grijalva Elementary School
	Concern regarding poor road conditions that will get worse with additional traffic
	Concerns regarding wildlife, including coyotes and javelina in Santa Cruz River bed
	Comments supporting and opposing a TI at Drexel Road and I-19
	Question regarding whether homeowner association fees will be affected
	Comments to use funding to improve existing Irvington Road and Valencia Road bridges rather than building a new bridge
	Concerns regarding homeless people living along new bridge
	Concern regarding additional noise in neighborhood
	Concern regarding additional thefts and crime
	Question regarding whether traffic signal will be installed at Drexel Road and Midvale Park Road
	Comment that an additional entrance to community at northwest corner of Drexel Road and Midvale Park Road will be needed
	Question regarding whether Calle Santa Cruz will be repaved
Roadway and bridge	Comments expressing support for Alternative No. 1 or Alternative No. 2
	Comments supporting or opposing widening Drexel Road to four lanes
	Comment to improve Irvington Road, Valencia Road, and Ajo Way while leaving Drexel Road alone
	Concern expressed about difficulty turning left onto new bridge from neighborhood
	Comments supporting Alternative No. 2 because of better bicycle and pedestrian safety
	Comments stating that no one rides bicycles

Topic	Comment
Traffic analysis	Comments expressing support for project
	Concerns about need for traffic signals at Drexel Road intersections with 6th Avenue, 12th Avenue, Santa Clara Avenue, Calle Santa Cruz, and Midvale Park Road
	Concern about age and condition of Drexel Road bridge over I-19
	Concern that traffic model is not valid and that traffic will far exceed the estimates
	Comments regarding need for access off I-19
	Comment to block off Mahan Drive to deter neighborhood crime
	Comment regarding the need to add speed tables or speed bumps
	Question regarding how long it will take to build the project, and how many phases are involved
	Comments regarding congestion on 12th Avenue and southwest side streets in general
	Concern about noise and vehicles
Environmental	Concern about increased litter and trash
	Concerns about air quality, noise, crime/safety, and car lights
	Comment regarding owl nest sites already being destroyed by construction in the area
	Comment to block off Mahan Drive
	Question about who will maintain the project
Multimodal access	Comment that bicycle lanes and sidewalks are beneficial for young people
	Comment that Drexel Road should be bicycle friendly to Santa Cruz bicycle path
	Comment that lighting should consider residents and wildlife
	Comment that Calle Santa Cruz needs repairs
	Comment that bicycle lanes are not needed

Source: Summarized from Drexel Road Bridge Comment Board, December 2023 (https://drexelroadbridge.com/assets/documents/DrexelRoadBridge_CommentBoard_Dec2023.pdf)

Additional public outreach will be held to present this DCR and the draft EA to the public and gather feedback.

2 Traffic and Crash Data Analysis

The study team analyzed existing (2023) and future (2045) traffic conditions for roadway, pedestrian, bicyclist, and transit infrastructure in the study area, along with crash data, to guide the proposed project's design and ensure consideration of traffic congestion and safety issues for multiple modes. The traffic analysis followed guidelines provided in COT's *Transportation Access Management Guidelines* (2017) and *Street Design Guide* (2021b) and ADOT's *Traffic Guidelines and Processes* (2020). Existing and future no-build and build traffic conditions during the morning (AM) and afternoon (PM) peak hours were evaluated following procedures established in the Transportation Research Board's *Highway Capacity Manual* (HCM), 6th Edition (2016).

2.1 Crash Data Analysis

A crash analysis was completed to identify the number and nature of crashes occurring at two intersections in the study area from 2018 to 2022. Table 5 summarizes the crash analysis results.

Table 5. Crash data analysis results

Crash mode	Drexel Road and Midvale Park Road	Drexel Road and Calle Santa Cruz	Total
Vehicle	22	15	**37**
Single vehicle	6	3	**9**
Two vehicles	16	11	**27**
Three vehicles	0	1	**1**
Pedestrian	1	1	**2**
Total	**23**	**16**	**39**

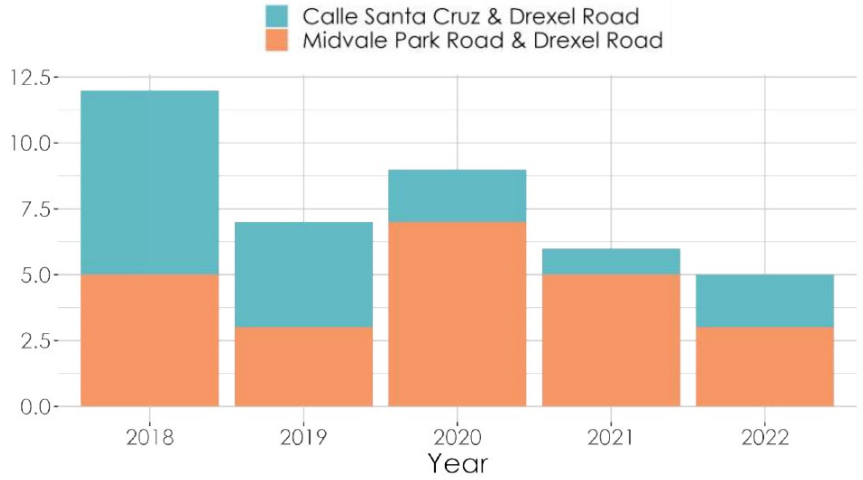
Source: Kittelson & Associates (2024)

As shown in Table 5, most of the crashes during the 5-year period involved only vehicles, with 2 of the 39 total crashes involving pedestrians. The data also show that more crashes occurred at the Drexel Road and Midvale Park Road intersection than at the Drexel Road and Calle Santa Cruz intersection (23 of the 39 total crashes). The following bullets provide more context for the crashes:

- **Crash type**: Rear-end crashes were the most common crash type at the Drexel Road and Calle Santa Cruz intersection. Rear-end, single-vehicle, and angle crashes were the most common crash types at the Midvale Park Road intersection.
- **Injury severity**: No fatal crashes occurred in the last 5 years at either intersection. Most of the crashes at the Drexel Road and Midvale Park Road intersection involved no injuries (about 70 percent of the crashes), and the remaining 30 percent of crashes involved only possible or minor injuries. The crashes at the intersection of Drexel Road and Calle Santa Cruz were more serious. About 45 percent of the crashes involved no injuries, while about 50 percent of the crashes had possible or minor injuries. The remaining crashes involved serious injuries.

- **Road user actions and violations**: In most cases, the primary road user (who caused the crash) was traveling straight ahead or making a left turn. The most common road user violation was failing to yield to right-of-way.
- **Time of day**: About 14 percent of crashes occurred during a peak hour. Most of the crashes at the Drexel Road and Calle Santa Cruz intersection happened during the day, and most of the crashes at the Drexel Road and Midvale Park Road intersection occurred at night.
- **Lighting**: Most of the crashes occurred in daylight lighting. However, a serious injury crash at Calle Santa Cruz occurred in dark (not lighted) conditions. Minor injury crashes occurred in both dark (lighted) and dark (not lighted) conditions, in addition to daylight, at Midvale Park Road.
- **Surface condition**: Most of the crashes occurred in dry roadway conditions.
- **Other factors**: Three of the 16 crashes (19 percent) at Calle Santa Cruz involved an intoxicated driver. Six of the 10 left-turn crashes at Midvale Park Road involved an eastbound left turn.
- **Crash trends**: The crash data show a general downward trend downward in the total number of crashes since 2018, except for an increase in crashes from 2019 to 2020 (Figure 4). When considering Calle Santa Cruz crashes independently, there is an increase in crashes from 2021 to 2022 after multiple years of decline. For Midvale Park Road, there is a peak in 2020 with a steady decreasing trend since that year.

Figure 4. Trends in number of crashes, 2018 to 2022



Source: From Kittelson & Associates (2024)

The crash data discussed above were considered when making recommendations for future traffic-related improvements, as discussed in Section 2.2.3.

2.2 Traffic Analysis

The traffic analysis involved gathering data on current (2023) traffic volumes in the study area and predicting future (2045) traffic volumes (with no bridge and with a bridge). It was a multimodal (vehicle, bicycle, pedestrian, and transit) evaluation that considered the weekday AM and PM peak hours.

The study analyzed four intersections along the Drexel Road corridor:

- Midvale Park Road and Drexel Road
- Ascott Drive and Drexel Road
- Mahan Drive and Drexel Road
- Calle Santa Cruz and Drexel Road

Additionally, The Loop shared-use path within the Santa Cruz River Park crosses Drexel Road in the study area. The Loop extends over 130 miles throughout unincorporated Pima County, Marana, Oro Valley, Tucson, and South Tucson.

The study involved the following analysis scenarios:

- **Scenario 1**: No-Build Conditions
- **Scenario 2**: Drexel Road Bridge Build Conditions
- **Scenario 3**: Drexel Road Bridge Build Conditions with I-19 and Drexel Road TI

The traffic analysis determined the current and future level of service (LOS) for facilities in the study area. LOS indicates the quality of transportation service using six letter grades: LOS A through F, with LOS A being the best (few or no delays) and LOS F being the worst (long queues and delays). According to the COT *Transportation Access Management Guidelines* and COT *Street Design Guide*, intersections and through movements must operate at LOS D or better, and all turning lane movements must operate at LOS E or better.

The intersection operational analysis was performed using the HCM 6th Edition analysis procedures. The peak 15-minute flow rate during the AM and PM peak hours was used to evaluate intersection LOS and volume-to-capacity (v/c) ratios. This analysis reflects conditions that are only likely to occur for 15 minutes of each average peak hour. The transportation system will likely operate better than the conditions described in this report during all other time periods. The intersection operations analyses were conducted using Synchro 11 software.

HCM 2000 was used in addition to the HCM 6th Edition to report v/c ratios for signalized intersections, since the HCM 6th Edition does not report overall intersection v/c ratio.

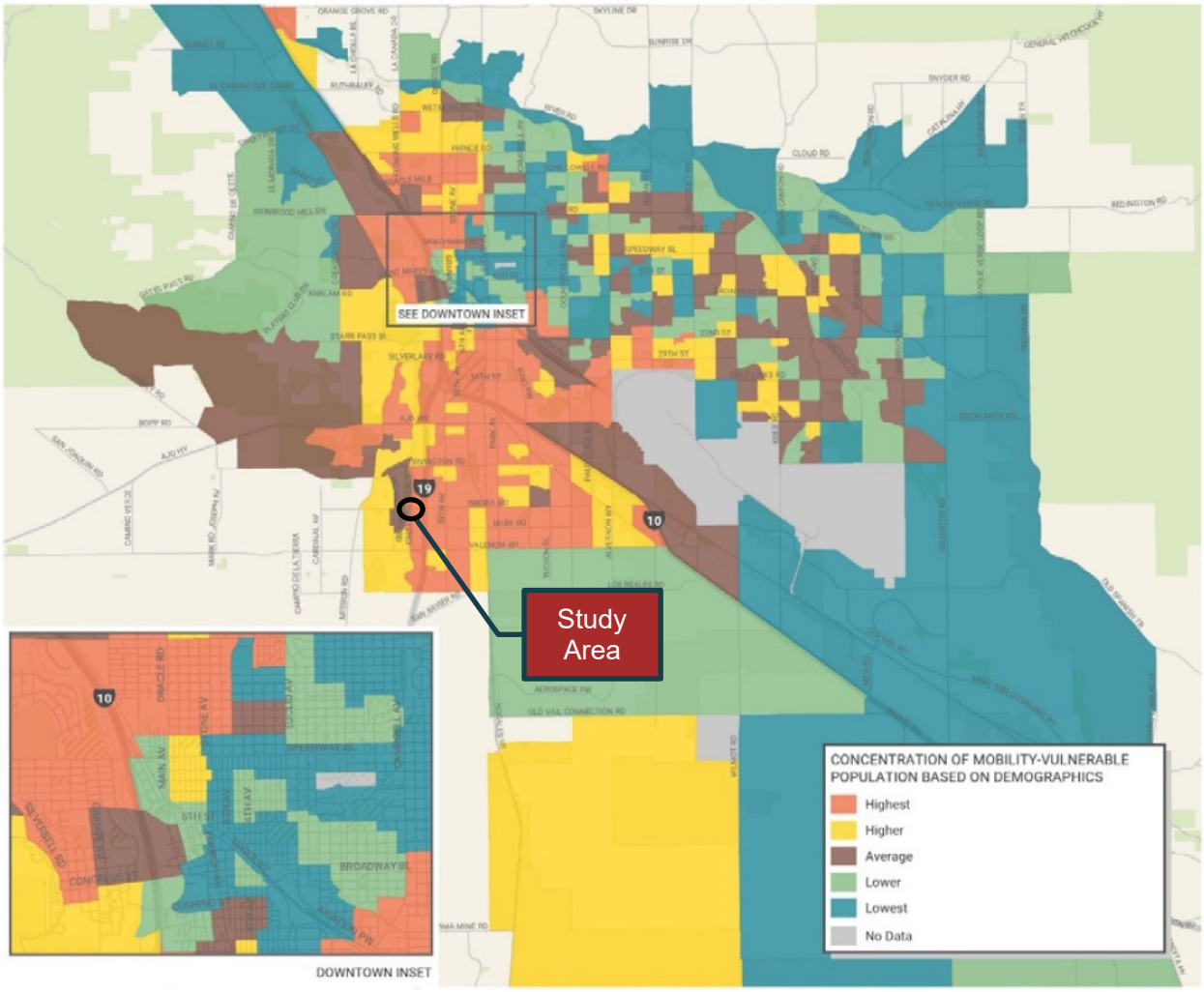
2.2.1 Existing Conditions (2023)

The existing conditions data were gathered in the fall of 2023 and considered the regional context, with Drexel Road located in the southwest portion of Tucson and classified as a "Suburban Connector Roadway." The zoning adjacent to the study corridor is primarily residential, commercial, or park industrial. The land uses surrounding the Midvale Park Road intersection are primarily single-family residential, with some multifamily residential, schools, and parks nearby. Land uses surrounding the Calle Santa Cruz intersection are commercial and institutional, with Tucson Spectrum Mall and Pima Community College's Desert Vista Campus nearby.

Population Characteristics

The traffic study considered population characteristics in and near the study area. Based on an equity analysis completed for the COT *Move Tucson: Delivering Mobility Choices* transportation plan (2021a), areas along the Drexel Road corridor have a high percentage of residents who might experience challenges accessing services, goods, employment, and/or education (Figure 5). The analysis considered attributes including communities of color, youth and seniors, low-income households, educational attainment, limited English proficiency, zero-vehicle households, and people with disabilities. The project corridor is adjacent to neighborhoods with a population that may be at a disadvantage from a socioeconomic and/or transportation mobility perspective.

Figure 5. Concentration of Mobility-vulnerable Populations, based on Demographics (from *Move Tucson*)



Source: From COT (2021a)

Existing Roadway Network

The following roadway segments were considered in the traffic study:

- **Drexel Road** is an east-to-west roadway that generally has one travel lane in each direction; however, between Oak Tree Drive and Midvale Park Road, it provides two lanes of travel in each direction. West of the Santa Cruz River, Drexel Road terminates as a two-lane roadway at Mahan Drive. East of the Santa Cruz River, Drexel Road terminates at Calle Santa Cruz. Bike lanes are provided on both sides of the road in the vicinity of the proposed project. The posted speed limit is 35 miles per hour (mph) on Drexel Road, except between Midvale Park Road and Mahan Drive, where the speed limit is 25 mph.
- **Midvale Park Road** is a north-to-south roadway that provides two travel lanes in each direction with a raised median. Bike lanes are provided on both sides of the road in the vicinity of the proposed project. The posted speed limit is 35 mph.

- **Calle Santa Cruz** is a north-to-south roadway that provides one travel lane in each direction with a TWLTL. Six-foot bike lanes are present on both sides of Calle Santa Cruz. A 5-foot sidewalk is provided on the east side of the road. The posted speed limit is 40 mph.

The following intersections were considered in the traffic study:

- **Midvale Park Road and Drexel Road** intersection is an all-way-stop-controlled (AWSC) intersection, and the intersection features span-wire flashing red warning lights. The intersection approaches include the following lane configurations:
    - Eastbound (Drexel Road)
        - left-turn lane
        - travel lane
        - bike lane
        - right-turn lane
    - Westbound (Drexel Road)
        - left-turn lane
        - travel lane
        - shared through-right-turn lane
    - Northbound (Midvale Park Road)
        - left-turn lane
        - travel lane
        - shared through-right-turn lane
    - Southbound (Midvale Park Road)
        - left-turn lane
        - travel lane
        - shared through-right-turn lane
- **Ascott Drive and Drexel Road** is a two-way-stop-controlled (TWSC) intersection with the stop control on the Ascott Drive approach. The intersection approaches include the following lane configurations:
    - Eastbound (Drexel Road)
        - shared through-left-turn lane
    - Westbound (Drexel Road)
        - shared through-right-turn lane
    - Southbound (Ascott Drive)
        - shared left-right-turn lane
- **Mahan Drive and Drexel Road** is the location where Drexel Road curves onto Mahan Drive without stop control. The intersection approaches include the following lane configurations:
    - Eastbound (Drexel Road)
        - right-turn lane
    - Northbound (Mahan Drive)
        - left-turn lane

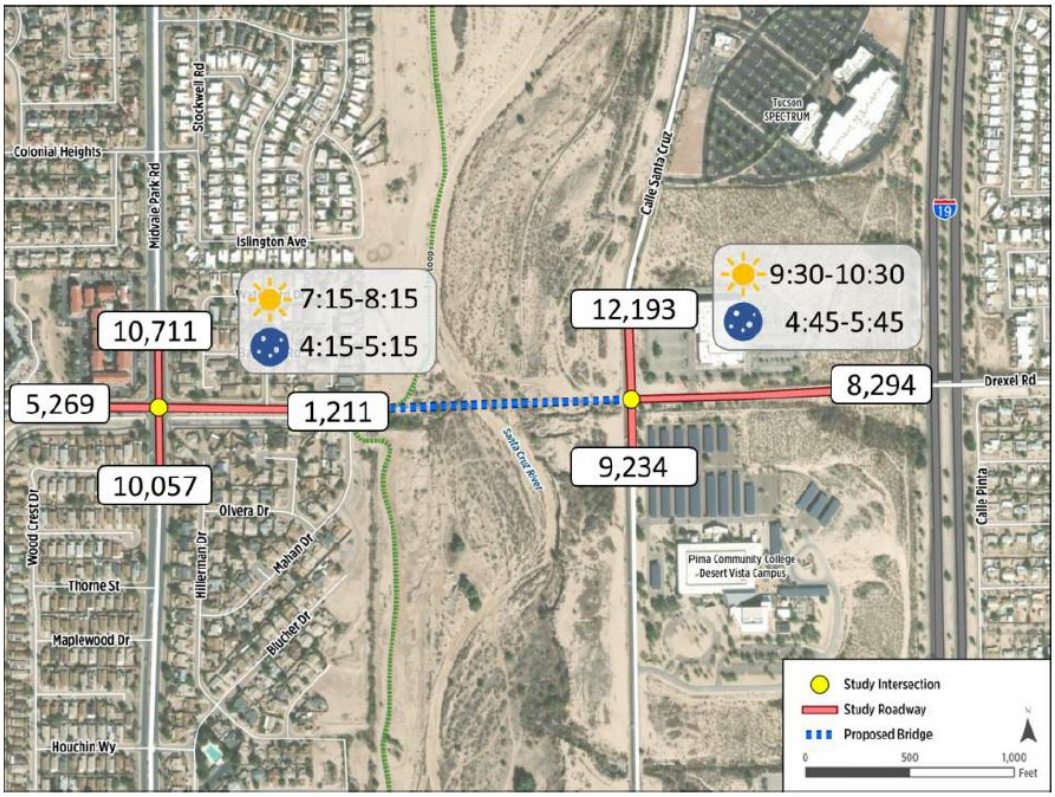
- **Calle Santa Cruz and Drexel Road** is an AWSC intersection. The intersection approaches include the following lane configurations:
  - Westbound (Drexel Road)
    - left-turn lane
    - right-turn lane
  - Northbound (Calle Santa Cruz)
    - shared through-right-turn lane
  - Southbound (Calle Santa Cruz)
    - left-turn lane
    - travel lane

Existing Vehicular Traffic Volumes

On Tuesday, August 29, 2023, turning movement counts were collected by All Traffic Data Services at the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz. The Midvale Park Road counts were conducted from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. The Calle Santa Cruz counts were conducted from 7:00 to 11:00 AM and from 3:00 to 7:00 PM. The peak hours at Midvale Park Road were 7:15 to 8:15 AM and 4:15 to 5:15 PM. The peak hours at Calle Santa Cruz were 9:30 to 10:30 AM and 4:45 to 5:45 PM.

In addition, 24-hour roadway counts were collected on Drexel Road, Midvale Park Road, and Calle Santa Cruz on August 29, 2023. Figure 6 shows the 24-hour segment volumes in vehicles per day. As shown in the figure, Calle Santa Cruz has the highest traffic volumes (12,193 to 9,234 vehicles per day), with Midvale Park Road having the second highest volumes (10,711 to 10,057 vehicles per day). Drexel Road has the lowest volumes: 8,294 vehicles per day east of Calle Santa Cruz, 5,269 vehicles per day west of Midvale Park Road, and only 1,211 vehicles per day east of Midvale Park Road.

Figure 6. Existing traffic volumes



Source: From Kittelson & Associates (2024)

Existing Roadway Operations

The roadway segment LOS of the Drexel Road corridor was calculated based on the Florida Department of Transportation *Multimodal Quality/Level of Service Handbook* (2023). Based on the calculations, Drexel Road, Calle Santa Cruz, and Midvale Park Road all operate at LOS C or better under 2023 existing conditions.

For the intersection of Drexel Road at Calle Santa Cruz, the AM operation was at LOS B with delays of 13.1 seconds per vehicle and the PM operation was at LOS C with delays of 15.8 seconds per vehicle. At the intersection of Drexel Road and Midvale Park Road, the AM operation was at LOS C with delays of 15.7 seconds per vehicle and the PM operation was at LOS B with delays of 12.3 seconds per vehicle.

Origin-Destination Data for Vehicles

The Replica Platform was used to obtain origin-destination data on the segment of Drexel Road west of Midvale Park Road. The top 15 origin-destination pairs were obtained. These pairs represent the common trips completed that had similar origins and destinations. While these pairs indicate frequently made trips, the pairs are not indicative of overall traffic flow patterns in the area. Figures 7 and 8 show the top pairs for the Drexel Road segment in the eastbound and westbound directions, respectively. The blue dot indicates the origin, the red dot indicates the destination, and the arc width indicates the pair intensity of that trip. As shown in Figures 7 and 8, a significant number of trip pairs travel between the neighborhood to the southwest of the Midvale Park Road and

Drexel Road intersection and the shopping center located at Calle Santa Cruz and Irvington Road.

Figure 7. Drexel Road Eastbound Origin-destination Pairs

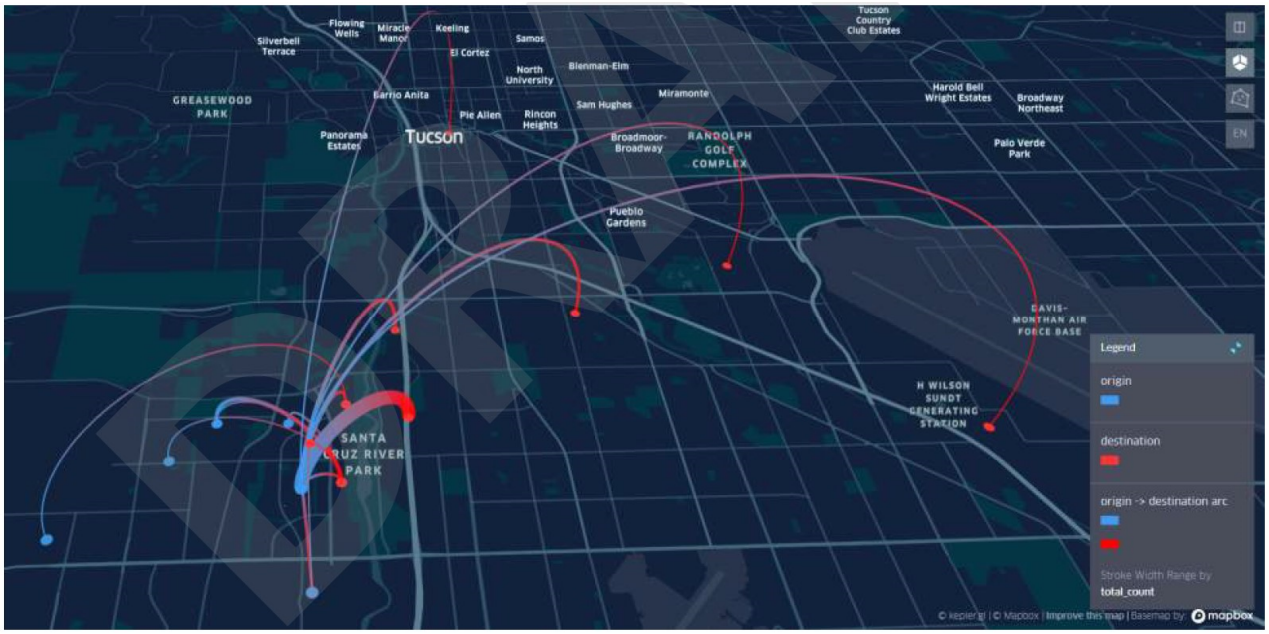
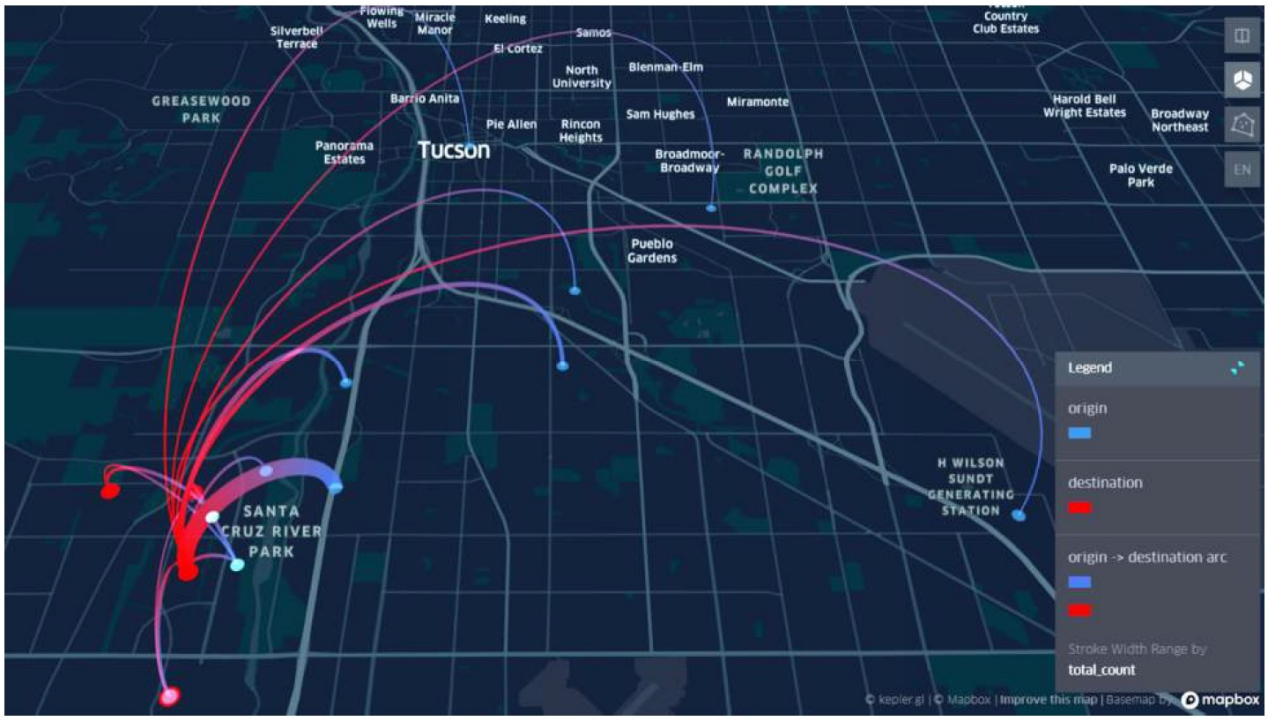


Figure 8. Drexel Road Westbound Origin-destination Pairs



Existing Pedestrian Network

The following pedestrian facilities were considered in the traffic study:

- **Drexel Road west of Midvale Park Road** has a 4-foot attached sidewalk on both the north and south sides of the roadway. This section of sidewalk also includes an unsignalized crossing of Drexel Road at the Raul M. Grijalva Elementary School. Curb ramps are present at all driveways and roadway crossings along this segment.
- **Drexel Road between Midvale Park Road and Mahan Drive** includes 5-foot detached sidewalks on the north side of the road and 5-foot attached sidewalks on the south side of the road. Curb ramps are present at all driveways and roadway crossings along this segment. To the east of this section of sidewalk is The Loop trail. This section of sidewalk does not directly connect to The Loop because the sidewalk on the north side terminates prior to The Loop and an unpaved connection provides users access to the trail. The south sidewalk terminates at a curb ramp on the west side of Mahan Drive; no curb ramp is present on the east side of the intersection to connect users with the trail.
- **Drexel Road west of Calle Santa Cruz** includes a detached 4-foot sidewalk on the north side of the roadway. Curb ramps are present at all driveways and roadway crossings along this segment.
- **Midvale Park Road** has 4-foot attached sidewalks on both the east and west sides of the roadway throughout the study area. Curb ramps are present at all driveways and roadway crossings along this segment.
- **Calle Santa Cruz** has a 5-foot detached sidewalk on the east side of the roadway throughout the study area. Curb ramps are present at all driveways and roadway crossings along this segment.

Existing Pedestrian Volumes and Operations

The pedestrian counts were collected on Tuesday, August 29, 2023. Local schools were in session at that time. Table 6 summarizes the existing (2023) counts. The table reports the counts for the vehicular peak hour and the pedestrian peak hour; the pedestrian peak hour occurs earlier in the AM and later in the PM compared to the vehicular peak hour.

Table 6. Existing pedestrian volumes

Intersection	AM pedestrian count	PM pedestrian count
Drexel Road and Midvale Park Road	Vehicular peak hour: 8 Pedestrian peak hour: 13	Vehicular peak hour: 1 Pedestrian peak hour: 2
Drexel Road and Calle Santa Cruz	Vehicular peak hour: 0 Pedestrian peak hour: 1	Vehicular peak hour: 0 Pedestrian peak hour: 1

The pedestrian level of comfort (PLOC) was also determined based on factors such as sidewalk width, posted speed limit, sidewalk buffer width, and presence of bike lanes or on-street parking. The PLOC scale, developed by the Montgomery County Planning Department, uses a four-point ranking system as follows: PLOC 1 – very comfortable, PLOC 2 – somewhat comfortable, PLOC 3 – uncomfortable, PLOC 4 – undesirable.

Users currently experience PLOC 3 (uncomfortable) on all roadway segments, except for the segment of Drexel Road between Midvale Park Road and Mahan Drive, which is PLOC 1 (very comfortable) and PLOC 2 (somewhat comfortable) on the north and south sides of the road, respectively. The increased comfort level on this segment is attributable to the lower roadway posted speed and the sidewalk on the north side of the roadway is detached.

The intersection crossing PLOC considers categories including number of lanes to cross, median type, crosswalk type, and posted speed.

For intersections in the study area, all of the crossings on Drexel Road at Midvale Park Road and Calle Santa Cruz had PLOC 3 (uncomfortable) while the crossings on Drexel Road at Ascott Drive and Mahan Drive were at PLOC 1 (very comfortable).

Existing Bicycle Network

Bicycle lanes exist on the following roadway segments in the study area:

- Drexel Road – Oak Tree Drive to Mahan Drive (4 feet wide, both sides)
- Drexel Road – Calle Santa Cruz Road to I-19 overpass (6 feet wide, both sides)
- Midvale Park Road – Valencia Road to Irvington Road (6 feet wide, both sides)
- Calle Santa Cruz – Valencia Road to Irvington Road (6 feet wide, both sides)

Drexel Road has an at-grade connection to The Loop (on the west side of the river) at the Drexel Road and Mahan Drive intersection. Pima County plans to reopen the path along the east side of the river along Calle Santa Cruz from Irvington Road to Drexel Road and to construct a new path between Drexel Road and Valencia Road along Calle Santa Cruz.

While bicycle lanes are provided along all roadway segments within the corridor, the existing bridge over I-19 along Drexel Road does not include bicycle facilities.,This connection has been identified as a future phase in the larger corridor project. The currently discontinuous bicycle lanes limit east-to-west bicycle connections along Drexel Road. Additionally, no bicycle infrastructure is present to cross the river within the study area.

Bicyclists traveling east-to-west along Drexel Road must cross the river 1 mile to the north or south of Drexel Road using the bridge at Irvington Road or Valencia Road.

Existing Bicycle Volumes and Operations

On average, 221 bicyclists and 132 pedestrians used The Loop path daily in 2023, according to a digital counter installed on The Loop on the west bank of the river at Irvington Road (Pima County 2023).

In terms of bicycle operations, conditions for bicyclists were measured in terms of level of traffic stress (LTS), a five-point ranking system ranging from LTS 1 (little traffic stress, typically physically separated from traffic, and suitable for most bicyclists including children) to LTS 5 (high traffic stress, no bicycle lane or shoulder with moderate- to high-speed traffic, and suitable for highly confident adult bicyclists).

The LTS for Drexel Road and Midvale Park Road in the study area was ranked as LTS 2, and the LTS for Calle Santa Cruz was ranked as LTS 3. With these rankings, the study area roadways are suitable for adults who are somewhat confident bicyclists.

Transit Infrastructure

Currently, the Sun Tran Route 27 (Midvale Park) runs along Drexel Road west of Midvale Park Road and east of Calle Santa Cruz. The bus uses Midvale Park Road, Valencia Road, and Calle Santa Cruz to get from one side of Drexel Road to the other. The route provides access to the Pima Community College Desert Vista Campus. The PAG *Long Range Regional Transit Plan Update* does not include any additional transit service on these roadways. The proposed new bridge would provide an opportunity for more direct and enhanced transit service on Drexel Road.

Lighting Infrastructure

Street lighting is present only on Midvale Park Road in the study area. The lighting on Midvale Park Road is on both the east and west sides of the road running from Irvington Road to Valencia Road. Drexel Road has no street lighting within the project limits.

2.2.2 Future Conditions (2045)

This section discusses future conditions in the study area, including planned projects; future vehicle, pedestrian, and bicycle volumes and operations; and future transit and lighting options.

ADOT and Pima County Projects

The following transportation improvements are planned in and around the study area by ADOT and Pima County:

- Reconstruct the I-19 and Irvington Road TI – in design (ADOT)
- Construct/reconstruct the three inside lanes on I-19, Valencia Road to Interstate 10 (I-10) – in 5-year plan (ADOT)
- Construct/reconstruct the three inside lanes in each direction on I-19, San Xavier Road to Valencia Road (ADOT) *Unfunded
- Construct the I-19 and Drexel Road TI and the southbound I-19 braided off ramp to Valencia Road (ADOT) *Unfunded
- Construct the I-19 fourth outer lane in each direction and auxiliary lanes from Valencia Road to I-10 (ADOT) *Unfunded
- Construct the I-19 and San Xavier Road TI and the I-19 and Los Reales Road TI, including collector-distributor roads between San Xavier Road and Los Reales Road, and construct the fourth outer lane in each direction of I-19 and any auxiliary lanes from San Xavier Road to Valencia Road (ADOT) *Unfunded
- Widen I-19 from Ajo Way to Valencia Road by adding an extra lane, with ultimate I-19 lane configuration to be eight lanes (four in each direction) (ADOT) *Unfunded

- Widen Valencia Road from four lanes to six lanes, Mission Road to Camino de la Tierra – in design (Pima County)

The COT has also identified roadway improvements in and near the study area in its *Move Tucson* plan (COT 2021a):

- Catalyst Corridors
  - Modernization
    - 12th Avenue: Irvington Road to Drexel Road (complete—enhanced with green infrastructure)
    - Drexel Road: Calle Santa Cruz to 12th Avenue *Unfunded
    - Drexel Road: 12th Avenue to Country Club Road (includes new bicycle and pedestrian facilities over I-19) *Unfunded
  - Expansion
    - Drexel Road: Midvale Park Road to Calle Santa Cruz (this proposed project)
  - Lane Reduction
    - Drexel Road: Mission Road to Midvale Park Road (includes corridor updates and modernization) *Programmed
- Local Connections
  - Multiuse Pathways
    - Airport Wash Greenway, including a new bicycle and pedestrian bridge over I-19 at Nebraska Road (funded by Reconnecting Communities federal grant) *Programmed (Design Efforts)
  - Sidewalk Infill
    - Calle Santa Cruz: Drexel Road to Valencia Road (repaving in 2025, plus adding buffered bicycle lanes and closing remaining sidewalk gaps north of Drexel Road) *Programmed
    - Nogales Highway: Drexel Road to Los Reales Road *Unfunded
    - Mission Road: Irvington Road to Drexel Road *Unfunded
- Transit Service Improvements
  - Medium Term Frequent Transit Network
    - Calle Santa Cruz: Irvington Road to Drexel Road (Pima Community College) *Unfunded
- Strategic Solutions
  - Bicycle and Pedestrian Improvements
    - 12th Avenue: Drexel Road to Los Reales Road (includes roadway repaving) *Unfunded
- Signal Upgrades

- Valencia Road from Midvale Park Road to Houghton Road *Programmed

Future Vehicular Traffic Volumes

PAG provided a 2045 travel demand model run for the study area. PAG uses a travel demand model to predict vehicular trips and the resulting travel demand for future time frames. To provide a comprehensive analysis, the 2045 traffic projection volumes were used to evaluate 2045 future conditions. PAG provided four travel demand model runs:

- 2019 Base Year Model
- 2045 No-Build Model
- 2045 Bridge Model (includes a new bridge over the Santa Cruz River connecting Drexel Road to Calle Santa Cruz)
- 2045 Bridge + TI Model (in addition to a new bridge over the Santa Cruz River, this model includes a new TI at I-19 and Drexel Road)

Year 2045 forecast turning movement volumes were developed by applying procedures outlined in the National Cooperative Highway Research Program *Report 255: Highway Traffic Data for Urbanized Area Project Planning and Design*. These procedures used 2023 traffic counts and traffic volume projections provided by the PAG regional travel demand model for 2019 and 2045.

Table 7 provides the projected vehicular traffic volumes on Drexel Road. As shown in the table, Drexel Road under future conditions with the bridge and TI would experience notably higher traffic volumes.

Table 7. Projected traffic volumes (vehicles per day)

Drexel Road segment	Existing	Opening year with Bridge	2045 with No Bridge	2045 with Bridge	2045 with Bridge and TI
West of Midvale Park Road	5,269	8,400	6,364	9,472	11,441
Midvale Park Road to Mahan Drive	1,211	9,300	1,211	11,000	15,000
Mahan Drive to Calle Santa Cruz	Not applicable	9,700	Not applicable	11,000	15,000
East of Calle Santa Cruz	8,249	14,400	9,956	16,371	28,041

Future Roadway Operations

The LOS for roadway segments and intersections was projected based on the future traffic volumes, as follows:

- **2045 No-Build Roadway Segments**: Drexel Road, Calle Santa Cruz, and Midvale Park Road would have LOS C.
- **2045 No-Build Intersections**:

  - Calle Santa Cruz and Drexel Road: LOS C in AM and PM
  - Midvale Park Road and Drexel Road: LOS C in AM and LOS B in PM
- **2045 with Bridge Roadway Segments**: Drexel Road, Calle Santa Cruz, and Midvale Park Road would have LOS C.
- **2045 with Bridge Intersections**:
  - Assuming Stop Controlled Intersection
    - Calle Santa Cruz and Drexel Road: LOS F in AM and PM
    - Midvale Park Road and Drexel Road: LOS F in AM and PM
  - Assuming Signalized Intersection
    - Calle Santa Cruz and Drexel Road: LOS B in AM and PM
    - Midvale Park Road and Drexel Road: LOS B in AM and PM
- **2045 with Bridge and TI Roadway Segments**: Calle Santa Cruz and Midvale Park Road would have LOS C. Drexel Road would have LOS C from west of Midvale Park Road to Calle Santa Cruz, and LOS F east of Calle Santa Cruz. Should ADOT proceed with the design and construction of the I-19 and Drexel Road TI, segment widening for Drexel Road east of Calle Santa Cruz should be considered.
- **2045 with Bridge and TI Intersections:**
  - Assuming Signalized Intersection
    - Calle Santa Cruz and Drexel Road: LOS C in AM and PM
    - Midvale Park Road and Drexel Road: LOS B in AM and PM

Parallel Routes

Future traffic volumes on parallel routes would be reduced with the proposed project. Projections show that upon opening of the new bridge, traffic on Irvington Road would be reduced by 8 percent, and traffic on Valencia Road would be reduced by 11 percent. Thus, the new Drexel Road Bridge would address a subregional traffic issue, given the more limited transportation network on Tucson's southwest side. Irvington and Valencia Roads are currently congested, so the opening of the new bridge would provide immediate relief.

Table 8. Traffic Volume and Travel Time Impacts to Adjacent Corridors

Roadway	2045 Daily Volume Projections (vehicles per day)			2045 Daily Travel Time (vehicle hours traveled per day)		
	No-Build	Build	% Difference	No-Build	Build	% Difference
Irvington Road	43,974	40,622	-8%	518	455	-12%
Valencia Road	61,869	55,324	-11%	597	499	-16%

Additional Analysis

The analyses (signal warrants, turn lane warrant analysis, and queuing analysis) also determined that traffic signals and additional turn lanes would be warranted in 2045 at the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz. Westbound right and left turn lanes would be added at Midvale Park Road. Left turn lanes in all directions would be added at Calle Santa Cruz.

Future Pedestrian Network

The proposed project includes the following pedestrian improvements along Drexel Road from Midvale Park Road to Calle Santa Cruz:

- Upgraded Curb Ramps
  - Drexel Road and Midvale Park Road: all corners
  - Drexel Road and Calle Santa Cruz: all corners
  - Drexel Road and Ascott Drive: northwest and northeast corners
  - Drexel Road and Mahan Drive: southwest and southeast corners
- New Sidewalk
  - Drexel Road from Midvale Park Road to Mahan Drive: 6-foot sidewalk with 3-foot roadway buffer where space is available.
  - Drexel Road from Mahan Drive to Calle Santa Cruz: 12-foot multiuse path or 6-foot sidewalk adjacent to protected bike lane

Future Pedestrian Operations

The Drexel Road Bridge will provide a lower-stress alternative route for people walking. With the proposed pedestrian improvements, Drexel Road between Midvale Park Road and Mahan Drive would have a PLOC of 2 (somewhat comfortable). Between Mahan Drive and Calle Santa Cruz, it would have a PLOC of 1 (very comfortable).

The segments of Drexel Road west of Midvale Park Road and east of Calle Santa Cruz (outside the project limits), would have a PLOC of 3 (uncomfortable). Calle Santa Cruz and Midvale Park Road would also have a PLOC of 3.

The PLOC at intersections would be as follows:

- **Midvale Park Road and Drexel Road intersection**: PLOC 3 (uncomfortable)
- **Calle Santa Cruz and Drexel Road intersection**: PLOC 3 (uncomfortable) for east and west crosswalk legs and PLOC 4 (undesirable) for north and south crosswalk legs
- **Ascott Drive and Drexel Road**: PLOC 1 (very comfortable)
- **Mahan Drive and Drexel Road**: PLOC 1 (very comfortable)

The proposed Drexel Road bridge would provide more direct and comfortable access to the Tucson Spectrum shopping center from the Midvale Park area, reducing the trip

distance by approximately 1 mile by allowing pedestrians and bicyclists to cross the river at Drexel Road rather than Irvington Road to the north.

COT is working to identify funding for Drexel Road west of Midvale Park Road to improve pedestrian and bicyclist comfort and safety.

Future Bicycle Network

The proposed project includes bicycle improvements along Drexel Road from Midvale Park Road to Calle Santa Cruz. These improvements include:

- Protected bike lanes on Drexel Road from Midvale Park Road to Mahan Drive
- Separated multiuse path on Drexel Road from Mahan Drive to Calle Santa Cruz

Additionally, the proposed bridge would substantially reduce the length of bicycle trips traveling along Drexel Road. Currently, bicyclists must travel to Irvington Road or Valencia Road to cross the river, adding significant mileage to these trips. With the bridge in place, bicycle trip lengths traveling along Drexel Road would be reduced by nearly 65 percent.

Future Bicycle Operations

The future LTS on roadway segments in the study area would be as follows:

- **Drexel Road**: LTS 1 between Midvale Park Road and Calle Santa Cruz (within project limits), LTS 2 west of Midvale Park Road and east of Calle Santa Cruz
- **Calle Santa Cruz**: LTS 3 north and south of Drexel Road
- **Midvale Park Road**: LTS 2 north of Drexel Road

Future Transit Opportunities

The existing Sun Tran bus route (Route 27) along Drexel Road currently uses Midvale Park Road, Valencia Road, and Calle Santa Cruz to continue along Drexel Road. With the proposed bridge in place, the bus route could potentially reroute along the new bridge and significantly reduce the distance required to travel along Drexel Road, resulting in travel time savings. The route with the bridge would reduce the travel distance from 2.5 miles to 0.5 mile.

Lighting Design

The proposed project includes lighting improvements along Drexel Road. It would provide lighting at the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz and along the segment of Drexel Road between Midvale Park Road and Calle Santa Cruz. The lighting for the proposed project would be designed to meet the PAG Standard Detail T-32418, which outlines the minimum criteria for lighting on a roadway corridor.

2.2.3 Conclusion and Recommendations

The proposed Drexel Road Bridge would provide an important connection for area drivers, pedestrians, bicyclists, and transit users, enhancing access to local destinations.

However, the new bridge would also introduce additional vehicular traffic to a road currently experiencing relatively little traffic. The following recommendations emphasize the need to maintain safe, efficient, and comfortable operations for all roadway users.

The recommended roadway and bridge cross-section design for Drexel Road would consist of one travel lane in each direction and a center turning lane or median, with a 30 mph design speed. Traffic signals and turn lanes are recommended for the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz to ensure acceptable traffic operations at those locations. A protected multiuse path or a protected separate bike lane and sidewalk should be added to the Drexel Road Bridge for pedestrians and bicyclists to provide superior PLOC and LTS rankings for pedestrians and bicyclists, respectively. Sidewalks and bicycle lanes are also recommended along Drexel Road from Midvale Park Road to Mahan Drive. Connections to The Loop pathway would be maintained. The study team should coordinate with Sun Tran regarding desirable bus stop locations, and signs and pavement markings should be provided in accordance with local standards. Street lighting on Drexel Road and at intersections would enhance safety. For more details regarding the recommended design for the Preferred Alternative to best accommodate the multiple modes of travel along Drexel Road, refer to Section 4.12, *Traffic Design*.

3 Design Concept Alternatives

3.1 Introduction

The alternatives development process built upon prior planning efforts completed by COT to establish a vision for Drexel Road from Mission Road to Country Club Road. The Drexel Road Bridge Project is part of this larger corridor project that would improve Drexel Road across the city, with a focus on modernizing the corridor, including improving safety for all modes and upgrading pedestrian and bicycle facilities, landscaping, lighting, and traffic signals (COT 2021a). The *Move Tucson: Delivering Mobility Choices* plan identifies the following improvements for Drexel Road between Midvale Park Road and Calle Santa Cruz: "Construct new two-lane bridge over the Santa Cruz River with safe and accessible bicycle and pedestrian facilities" (COT 2021a: 99).

In response to the agency and public scoping process, the proposed project's purpose and need, and the traffic and crash analysis discussed previously in Section 2, the study team developed a range of reasonable alternatives to address the study objectives. The study team developed two build alternatives for the proposed project and also considered the no-build alternative.

The alternatives development process is discussed in further detail in the following sections. Section 3.2 discusses the design concept alternatives that were considered and eliminated in the study's early phases. In Section 3.3, the two build alternatives and no-build alternative are discussed in detail. Section 3.4 presents the evaluation of alternatives using criteria related to engineering, environmental, public feedback, and cost considerations and Section 3.5 recommends the Preferred Alternative.

3.2 Design Concept Alternatives Considered and Discontinued

The following conceptual alternatives were considered early in the study process:

- **Bridge location**: COT and regional planning documents indicate that Drexel Road is the preferred location for another bridge over the Santa Cruz River (COT 2021a; PAG 2020) between the existing bridges at Irvington and Valencia Roads. Drexel Road is classified as a collector street approaching the study area, according to the COT's Major Streets and Routes map (2016), and the only other collector street between Irvington and Valencia Roads is Bilby Road. However, Bilby Road ends at 12th Avenue and does not exist west of the Santa Cruz River, and thus the Bilby Road alignment would not be a logical location for a bridge across the Santa Cruz River. Considering that Drexel Road is the main collector street located midway between Irvington and Valencia Roads and that it currently exists on both sides of the river, any concepts of placing the bridge in another location were discontinued.
- **Bridge type**: A precast prestressed concrete girder bridge supported on multi-column piers is planned for the Drexel Road crossing over the Santa Cruz River, in keeping with similar bridges in the area including at Irvington and Valencia Roads. This bridge type is economical, uses local materials and fabricators, and reduces construction risk. On the contrary, a steel girder bridge is costly, introduces supply

chain risk, and is more challenging to design and construct. As a result, steel girder bridges were discontinued from detailed evaluation.

- **Travel lanes**: Planning documents also indicate that Drexel Road would have one travel lane in each direction in the area of the proposed project (COT 2021a). Adjacent improvement projects for Drexel Road between Mission Road and Country Club Road would also provide one lane in each direction—in fact, a planned project on Drexel Road between Mission Road and Midvale Park Road would involve a "road diet," reducing the number of travel lanes on Drexel Road from two lanes in each direction to one lane to improve safety. Therefore, the concept of providing two or more travel lanes in each direction was discontinued.
- **Pathway configuration**: The study team considered carrying The Loop recreational pathway over the bridge on the west side of the Santa Cruz River to avoid issues related to the floodplain within the Santa Cruz River. However, it was decided to place the pathway underneath the bridge to be consistent with other nearby locations where the path passes under bridges and to avoid issues related to the cost and visual impacts of building a structure to carry the path over the bridge. The concept of carrying the pathway over the bridge was discontinued. However, The Loop path users wishing to enter or exit the path from Drexel Road west of the Santa Cruz River would be able to cross Drexel Road at grade using a striped crosswalk located at Mahan Drive. Similarly, path users wishing to enter or exit the path from Drexel Road east of the Santa Cruz River would be able to cross Drexel Road at grade using a striped crosswalk at the intersection of Calle Santa Cruz and Drexel Road.

3.3 Design Concept Alternatives Studied in Detail

This section describes the No-Build Alternative and the two build alternatives. Both build alternatives involve a bridge over the Santa Cruz River, but the roadway cross sections on the bridge and approaching/departing roadway would differ.

3.3.1 No-Build Alternative

The No-Build Alternative would involve maintenance of existing infrastructure in the study area. No new bridge over the Santa Cruz River would be provided on Drexel Road. The existing bridges on Irvington and Valencia Roads would continue to carry large volumes of traffic. Residents, commuters, and visitors near Drexel Road would continue to travel out of their way to be able to access jobs, services, health care, and educational opportunities on the other side of the river. The No-Build Alternative represents the baseline condition for the 2045 design year and was used to measure the incremental impacts and benefits of the build alternatives.

3.3.2 Build Alternative No. 1

Alternative No. 1 would add a new 550- to 600-foot-long bridge across the Santa Cruz River. The bridge would have one travel lane in each direction, a center TWLTL, a shoulder in each direction, and a separated multiuse path in each direction. The multiuse path would be shared by pedestrians and bicyclists. The bridge would be 75 feet and 5 inches wide. Drexel Road approaching and departing the bridge would be modified to ensure a smooth transition for all modes of travel. Table 9 provides more details on the

Drexel Road cross sections for Alternative No. 1, from Midvale Park Road to Calle Santa Cruz.

This alternative would include traffic signals at the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz. A marked pedestrian crosswalk would be provided at the Drexel Road and Mahan Drive intersection. Alternative No. 1 would provide new segments of The Loop recreational pathway to pass underneath the bridge, with the existing pathway that curves toward Mahan Drive remaining. The existing drainage channel east of Mahan Drive would be cleared of vegetation and lined with concrete, in keeping with the channel west of Mahan Drive, ensuring that flows in the channel would not affect the new bridge and roadway approach. Alternative No. 1 would also add right-turn lanes to all approaches to the intersection of Calle Santa Cruz and Drexel Road. It would add a westbound right-turn lane to the intersection of Midvale Park Road and Drexel Road. Sun Tran bus service would be extended across the bridge, although bus stop locations have yet not been identified. Figure 9 shows the overall roadway plan that was presented to the public at the public meetings held in December 2023.

3.3.3 Build Alternative No. 2

Alternative No. 2 would add a new 550- to 600-foot-long bridge across the Santa Cruz River with one travel lane in each direction, a center TWLTL, a buffered bicycle lane in each direction, and a sidewalk in each direction. The bridge would be 67 feet, 4 inches wide. This alternative differs from Alternative No. 1 by providing separate facilities for bicyclists and pedestrians, rather than a shared multiuse path. Additionally, it would lack shoulders alongside the travel lanes. Drexel Road approaching and departing the bridge would be modified to ensure a smooth transition for all modes of travel. Table 10 provides more details on the Drexel Road cross sections for Alternative No. 2, from Midvale Park Road to Calle Santa Cruz.

This alternative would include traffic signals at the Drexel Road intersections with Midvale Park Road and Calle Santa Cruz. A marked pedestrian crosswalk would be provided at the Drexel Road and Mahan Drive intersection. It would build new segments of The Loop recreational pathway to pass underneath the bridge, with the existing pathway that curves toward Mahan Drive remaining in place. The existing drainage channel east of Mahan Drive would be cleared of vegetation and lined with concrete, in keeping with the channel west of Mahan Drive, ensuring that flows in the channel would not affect the new bridge. Alternative No. 2 would also add right-turn lanes to all approaches to the intersection of Calle Santa Cruz and Drexel Road. It would add a westbound right-turn lane to the intersection of Midvale Park Road and Drexel Road. Sun Tran bus service would be extended across the bridge, although bus stop locations have yet not been identified. Figure 10 shows the overall roadway plan.

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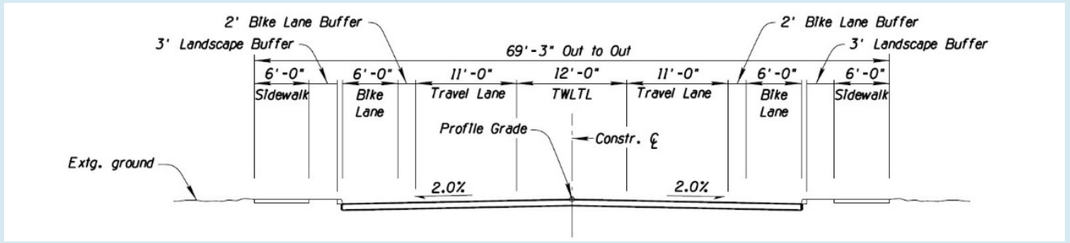
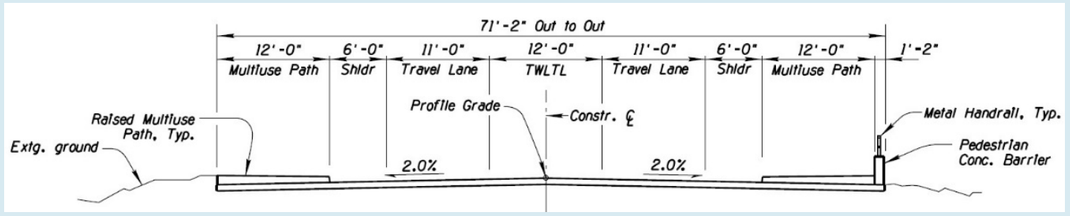
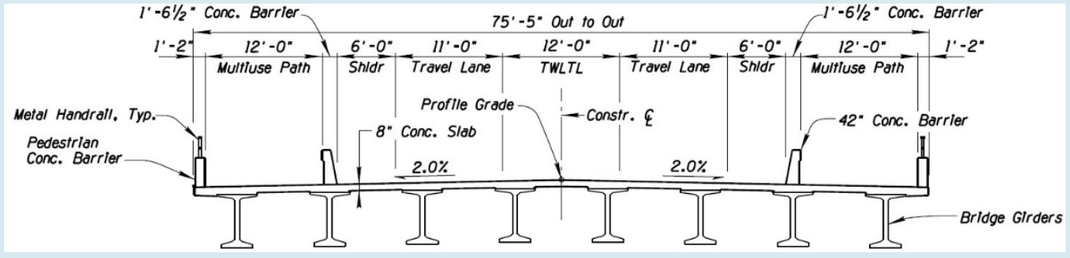
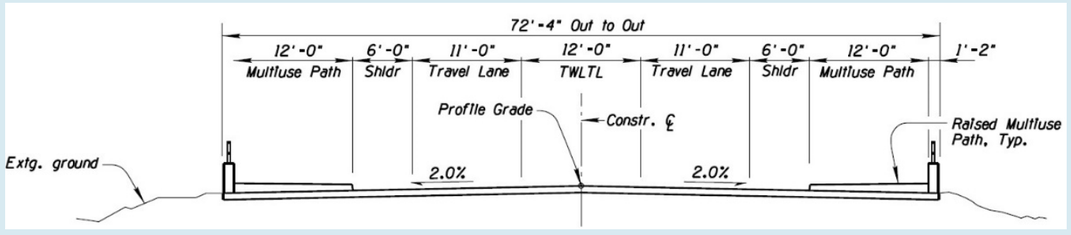
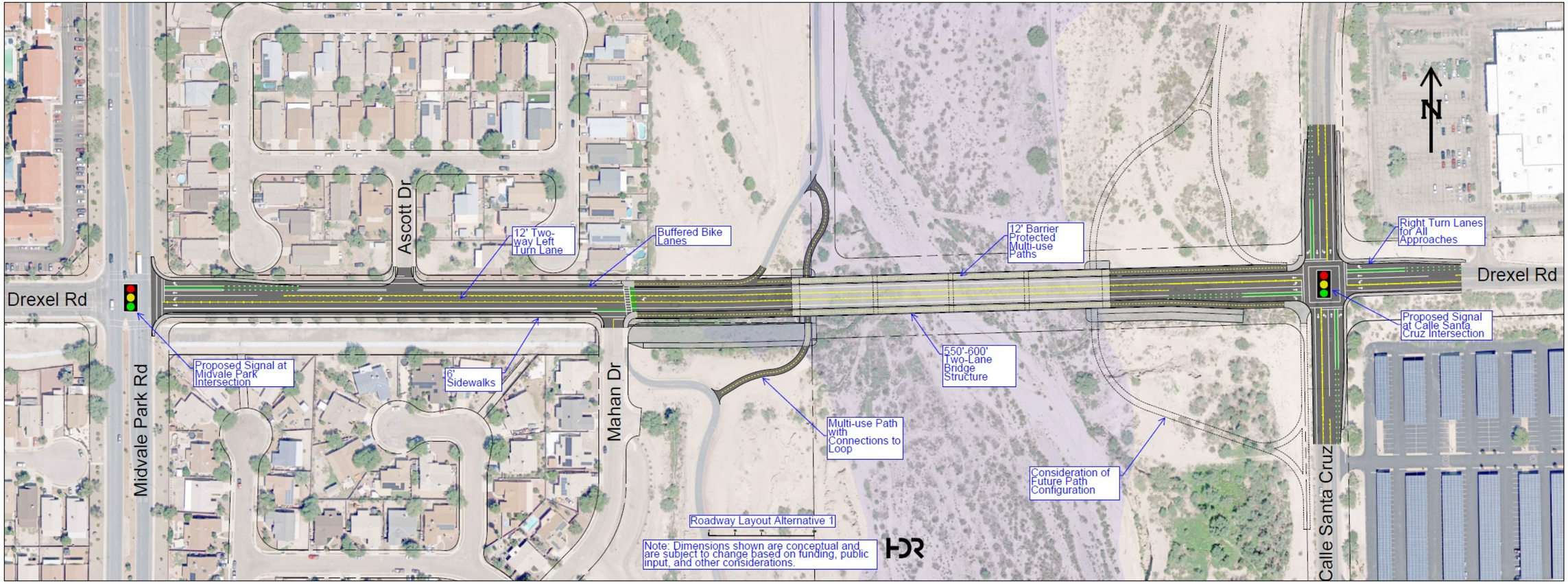
Table 9. Alternative No. 1 cross sections (December 2023)

Location	Cross section	Description
Drexel Road, Midvale Park Road to Mahan Drive		• One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 2-foot bike lane buffer in each direction • One 6-foot bike lane in each direction • One 6-foot sidewalk in each direction, separated from roadway by a 3-foot landscape buffer • Right-turn lane onto northbound Midvale Park Road • Green-colored pavement for bike lanes at Midvale Park Road intersection
Drexel Road, Mahan Drive to Bridge		• One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 6-foot shoulder in each direction • One 12-foot raised multiuse path in each direction • Concrete barrier with handrail along south side • Green-colored pavement for pedestrian crossings at Mahan Drive intersection
Drexel Road Bridge		• Bridge supported on eight girders • One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 6-foot shoulder in each direction • Concrete barrier between shoulder and multiuse path • One 12-foot multiuse path in each direction • Concrete barrier with handrail at edge of bridge in each direction
Drexel Road, Bridge to Calle Santa Cruz		• One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 6-foot shoulder in each direction • One 12-foot raised multiuse path in each direction • Concrete barrier with handrail in each direction • Right-turn lanes for all approaches to Calle Santa Cruz intersection • Green-colored pavement for bike lanes at Calle Santa Cruz intersection

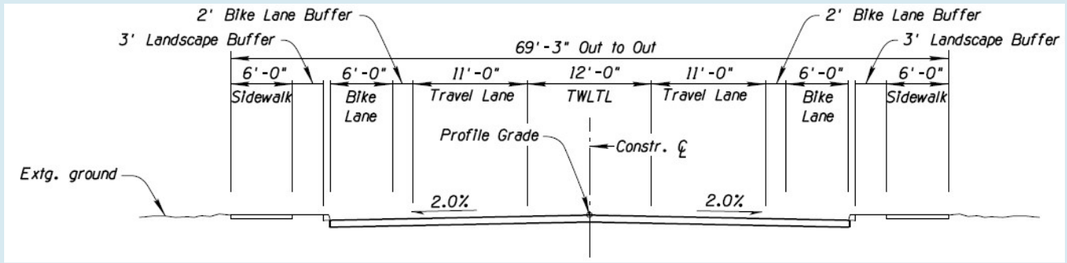
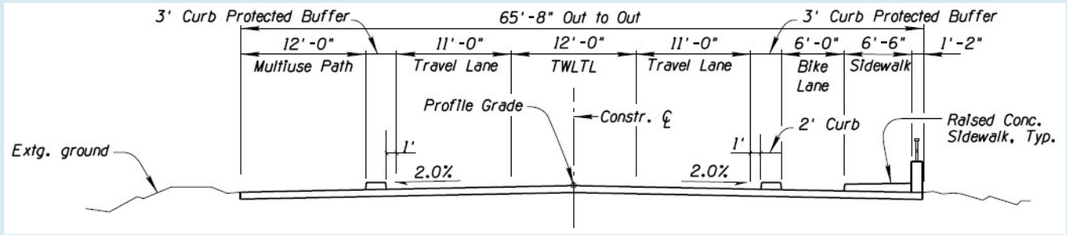
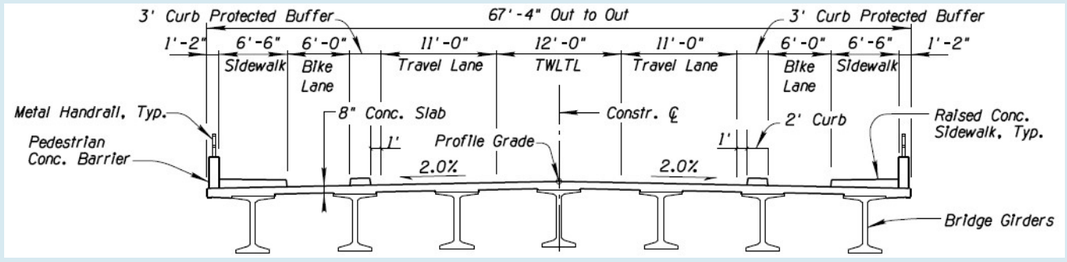
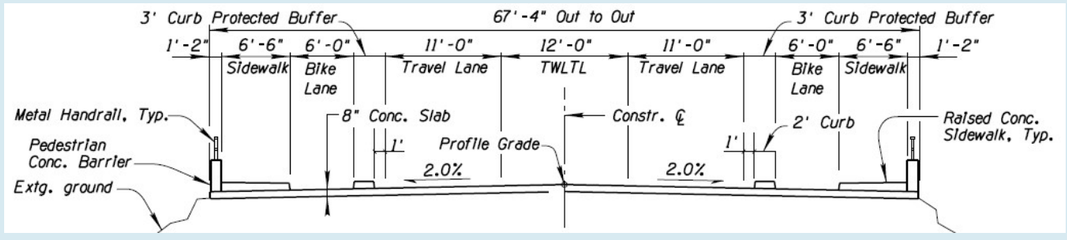
Note: Information in table presented to public in December 2023

Figure 9. Alternative No. 1 roadway plan (December 2023)



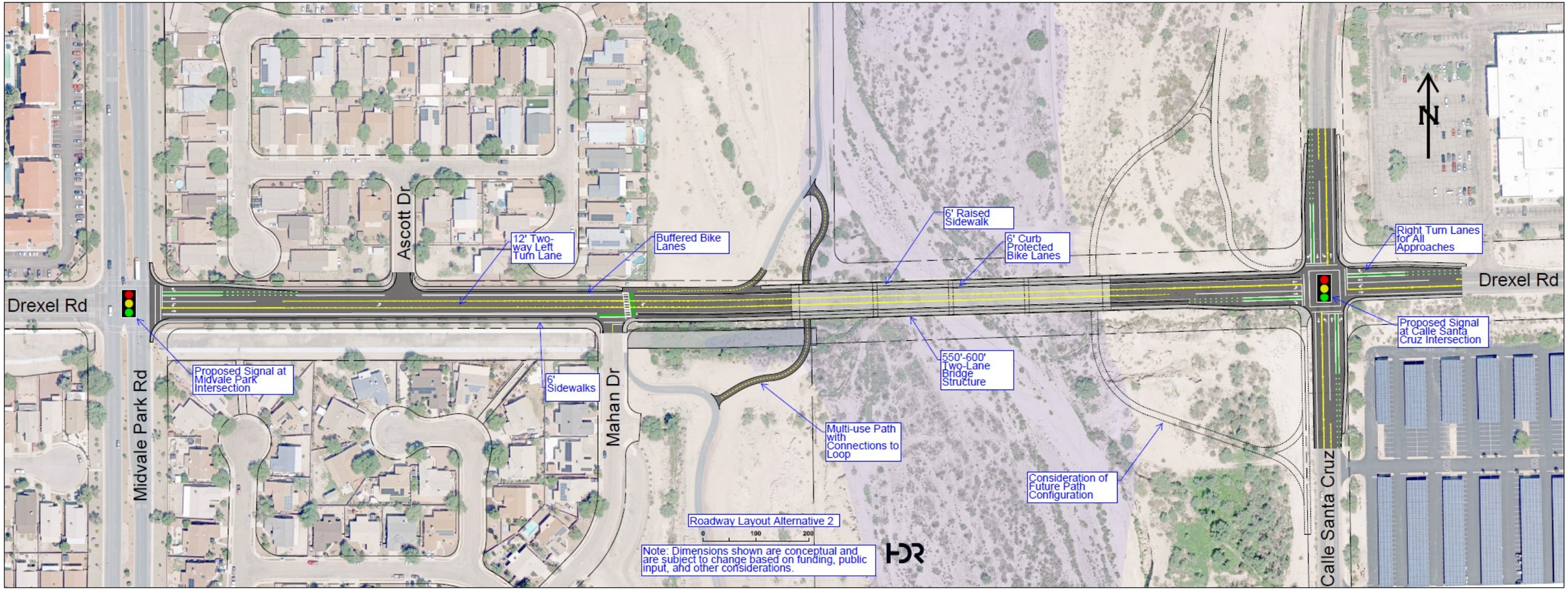
Note: Information in figure presented to public in December 2023

Table 10. Alternative No. 2 cross sections (December 2023)

Location	Cross section	Description
Drexel Road, Midvale Park Road to Mahan Drive		• One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 2-foot bike lane buffer in each direction • One 6-foot bike lane in each direction • One 6-foot sidewalk in each direction, separated from roadway by a 3-foot landscape buffer • Right-turn lane onto northbound Midvale Park Road • Green-colored pavement for bike lanes at Midvale Park Road intersection
Drexel Road, Mahan Drive to Bridge		• One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 3-foot curb buffer in each direction • One 12-foot multiuse path on north side of roadway • One 6-foot bike lane on south side • One 6-foot and 6-inch sidewalk on south side • Concrete barrier with handrail on south side • Green-colored pavement for pedestrian crossings at Mahan Drive intersection
Drexel Road Bridge		• Bridge supported on seven girders • One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 3-foot curb buffer in each direction • One 6-foot bike lane in each direction • One 6-foot and 6-inch sidewalk in each direction • Concrete barrier with handrail at edge of bridge in each direction
Drexel Road, Bridge to Calle Santa Cruz		• One center 12-foot TWLTL • One 11-foot travel lane in each direction • One 3-foot curb buffer in each direction • One 6-foot bike lane in each direction • One 6-foot and 6-inch sidewalk in each direction • Concrete barrier with handrail in each direction • Right-turn lanes for all approaches to Calle Santa Cruz intersection • Green-colored pavement for bike lanes at Calle Santa Cruz intersection

Note: Information in table presented to public in December 2023

Figure 10. Alternative No. 2 roadway plan (December 2023)



Note: Information in figure presented to public in December 2023

3.4 Evaluation of Alternatives

The alternatives previously described in Section 3.3 were evaluated using criteria related to engineering considerations, environmental impacts, public input, and cost:

- **Engineering considerations**: This criterion included considerations related to the roadway and bridge design, drainage, traffic operations, safety, constructability, utility impacts, and future maintenance.
- **Environmental impacts**: This criterion related to potential environmental impacts of the proposed project on the natural and human environment, which encompassed water resources (floodplains and jurisdictional waters), biological resources, visual resources, noise levels, air quality, hazardous materials, land use, social and economic conditions, Section 4(f) and Section 6(f) properties, and cultural resources.
- **Public input**: This criterion related to public input on the proposed project, gathered during the public outreach effort completed in December 2023.
- **Cost**: This criterion identified the comparative construction and maintenance costs of the proposed project.

Table 11 summarizes the alternatives evaluation for each criterion. It focuses on the factors that differentiated between the alternatives.

Table 11. Alternatives evaluation

Criterion	No-Build Alternative	Build Alternative No. 1	Build Alternative No. 2
Engineering considerations			
Roadway design	Not applicable; roadway improvements would not occur.	Similar design as other build alternative but would include multiuse paths for both pedestrians and bicyclists on bridge and approach to Calle Santa Cruz.	Similar design as other build alternative but would include separated bike lanes and sidewalks on bridge and approach to Calle Santa Cruz
Bridge design	Not applicable; new bridge would not be built.	Similar design as other build alternative but bridge would be wider.	Similar design as other build alternative but bridge would be narrower.
Drainage	Not applicable; drainage improvements would not occur.	Same drainage features for both build alternatives.	
Traffic operations	Traffic volumes on Drexel Road would remain low as travelers continue to use the bridges at Irvington and Valencia Roads to cross the Santa Cruz River.	Same traffic projections for both build alternatives, predicting higher traffic volumes on Drexel Road as travelers use the new bridge.	
Safety	Heavy traffic congestion on Irvington and Valencia Roads would continue to pose a safety concern. Drexel Road between Midvale Park Road and Mahan Drive would continue to have low traffic volumes (a safety benefit).	Superior safety features would include a concrete barrier between travel lanes and multiuse paths on bridge. Travel lanes would have 6-foot shoulders, a safety benefit in terms of accommodating vehicles that swerve or need to pull over.	Acceptable safety features would include curbs between travel lanes and bike lanes on bridge. Travel lanes would lack shoulders.
Constructability	Not applicable; no construction would occur.	Same level of constructability for both build alternatives.	
Utility impacts	No construction would affect existing utilities; no opportunity to extend fiber optic line across new bridge.	Same utility impacts for both build alternatives. Same opportunity to extend fiber optic line across new bridge for both build alternatives.	
Maintenance	Existing infrastructure would be maintained.	Both build alternatives would require future maintenance of the new roadway, bridge, and drainage features.	
Environmental impacts			
Floodplains	No construction would affect floodplain.	Both build alternatives would have similar, minimal effects on floodplain.	
Jurisdictional waters	No construction would affect jurisdictional waters.	Both build alternatives would have similar, minimal effects on jurisdictional waters.	
Biological resources	No construction would affect biological resources.	Both build alternatives would have similar, minimal effects on biological resources.	

Criterion	No-Build Alternative	Build Alternative No. 1	Build Alternative No. 2
Visual resources	Views would generally remain the same, although future development on vacant land east of the Santa Cruz River may change views across the river.	Similar to other build alternative in terms of introducing a bridge where none exists, affecting views of the Santa Cruz River. Alternative could incorporate decorative metal fencing along edge of bridge because of concrete barrier between travel lanes and multiuse paths.	Similar to other build alternative in terms of introducing a bridge where none exists, affecting views of the Santa Cruz River. Less attractive concrete barrier would be required along edge of bridge to prevent vehicles from driving off the bridge.
Noise levels	Noise levels would generally remain the same.	Noise levels would increase to the same extent with both build alternatives because new bridge would result in more traffic on Drexel Road.	
Air quality	Air quality may suffer from continued congestion on Irvington and Valencia Roads and out-of-way travel; however, more stringent emissions rules and expected transition to electric vehicles would improve air quality in the future.	Air quality would benefit from reduced congestion on Irvington and Drexel Roads and from reduced travel times resulting from new connection across river.	
Hazardous materials	No construction would disturb potential hazardous materials sites in the area.	Both build alternatives would involve ground disturbance that could disturb potential hazardous materials sites.	
Land use	Future development along Drexel Road corridor may be hampered by lack of connection across river.	Future development along Drexel Road corridor may increase with both build alternatives because of new connection across river, resulting in increased traffic volumes.	
Social and economic conditions	Separation between Sunnyside and Midvale Park neighborhoods would continue. Area residents, including low-income and minority populations, would continue to lack more direct access to jobs, schools, shopping, healthcare, and other services.	Both build alternatives would provide a new connection between Sunnyside and Midvale Park neighborhoods. Both build alternatives would provide area residents with more direct access to jobs, schools, shopping, healthcare, and other services.	
Section 4(f) and Section 6(f) properties	No construction would affect potential Section 4(f) and/or Section 6(f) resources.	Both build alternatives would have similar potential to affect potential Section 4(f) and Section 6(f) resources.	
Cultural resources	No construction would affect potential cultural resources sites or traditional cultural properties.	Both build alternatives would have similar potential to affect potential cultural resources sites and/or traditional cultural properties.	

Criterion	No-Build Alternative	Build Alternative No. 1	Build Alternative No. 2
Public input			
Input on alternatives	Few public comments were made in favor of the No-Build Alternative.	More public comments were made in favor of the build alternatives. Both build alternatives received supportive comments from the public, with no clear "winner" among the two alternatives.	
Cost			
Estimated construction cost	Not applicable; no construction would occur.	Construction cost would be higher than for other build alternative because of wider bridge ($38,951,000).	Construction cost would be lower than for other build alternative because of narrower bridge ($37,003,000).
Estimated maintenance cost	Maintenance expenditures for existing infrastructure would be less than for the additional infrastructure provided with the build alternatives.	Maintenance expenditures would be similar for both build alternatives and would be more than with the No-Build Alternative because of the new bridge, connecting roadway, and drainage features.	

3.5 Recommendations

The two build alternatives are largely similar in terms of their engineering aspects, potential environmental impacts, and level of public support. They differ in three areas: cost, safety, and the potential for aesthetic treatments. Alternative No. 2 would be a narrower bridge and thus would cost less to construct because it would require fewer materials, such as girders, reinforcing steel, and concrete.

However, Alternative No. 2 would lack a concrete barrier on the bridge between the travel lanes and the adjacent bike lanes, instead providing a curb. While the curb would be better than the painted line that typically separates a travel lane from a bike lane, it would not provide as much protection for bicyclists and pedestrians on the adjacent sidewalk as a concrete barrier. Alternative No. 2, being the narrower option, would also lack shoulders adjacent to the travel lanes. Shoulders provide a safety benefit by accommodating vehicles that need to swerve or pull over unexpectedly. Furthermore, Alternative No. 2 would provide bike travel only in the direction of vehicular traffic, while Alternative No. 1 would accommodate bi-directional bike travel on both sides of the bridge, which is more convenient for bicyclists accessing or crossing over to the opposite bank of The Loop trail. Additionally, since Alternative No. 2 would not have a concrete barrier on the bridge separating the travel lanes from the bike lanes, the outside edges of the bridge would be required to feature concrete barriers to protect vehicles from running off the bridge. This would preclude the use of decorative concrete or metal barriers at the outside edges of the bridge (see example in Figure 11 of a decorative bridge railing on the La Cholla Boulevard Bridge over the Rillito River). Such decorative barriers could offset the adverse visual impacts of building a new bridge over the natural setting of the Santa Cruz River.

Figure 11. Decorative metal barrier on La Cholla Boulevard Bridge

Source: Google Streetview, imagery date July 2023

A decorative metal barrier is located on the outside edge of the bridge. Pedestrians walk on a sidewalk between the metal barrier and the standard concrete barrier that prevents vehicles from driving off the bridge.

While Alternative No. 1 would cost more to construct, it would offer safety advantages for bicyclists, pedestrians, and motorists by providing a concrete barrier between the travel lanes and the multiuse path and by offering 6-foot shoulders on the bridge along the travel lanes to accommodate motorists who may need to swerve or pull over unexpectedly. Additionally, Alternative No. 1 would provide an opportunity for aesthetic enhancement of the new bridge through the use of decorative concrete or metal barriers along the outside edges of the bridge.[1]

The No-Build Alternative would not address the purpose and need for the proposed project and would not be in keeping with COT and regional planning documents that have identified the proposed project as a long-standing goal for improving connectivity between the southern and western portions of Tucson. It would not address traffic congestion at the nearby bridges on Irvington and Valencia Roads and would require area residents to continue making out-of-the-way trips to reach their destinations. A benefit-cost analysis completed for the proposed project in February 2024 found that the benefit-cost ratio was 1.5, meaning that the cost of construction would be a worthwhile expenditure, with benefits outweighing the costs. The benefits would include reduced traffic congestion, faster travel times, and additional economic activity. Most members of the public who participated in the December 2023 meeting preferred one of the build alternatives over the No-Build Alternative.

For these reasons, Alternative No. 1 was identified as the Preferred Alternative and was carried forward for more detailed study and design. Section 4 provides more details on the major design features of the Preferred Alternative and the changes made to the design since the public meetings held in December 2023.

[1] Note that should COT decide to incorporate decorative elements on the bridge, members of the public would have the opportunity to review and comment on such elements.

4 Major Design Features (Preferred Alternative)

4.1 Introduction

Subsequent to the public scoping meetings and the determination to move forward with Alternative No. 1 as the Preferred Alternative, additional evaluation and coordination with the COT occurred. This led to some minor modifications to the Preferred Alternative, primarily in changes to the widths of the lanes, bike buffers, and shoulders on Drexel Road.

The COT, in its *Move Tucson Plan* and *Street Design Guide*, provides a street typology that emphasizes the transportation and land use connection for each roadway. While this approach is different than the traditional Federal Highway Administration (FHWA) functional classification system, Tucson's typology does not replace the federal system but is intended to build upon it by also focusing on the existing context of adjacent land uses.

In the *Move Tucson Plan*, this section of Drexel Road is identified as a Suburban Connector. This typology is further defined in the *Street Design Guide* as a moderately sized roadway that serves a mix of vehicle, bike, pedestrian and transit travel at low-to-moderate speeds and volumes. The *Street Design Guide* provides the sample roadway section, shown in Figure 12. Table 2.4 of the *Street Design Guide* provides preferred widths with the travel lane widths being 1-foot less than shown in the figure. Based on conversations with the COT, given there are connections to existing neighborhoods and a multi-use path within the project limits, there is a desire to encourage slower speeds along Drexel Road. As a result, the 10-foot travel lane widths in Table 2.4 of the *Street Design Guide* are recommended. Median islands were added to serve as a gateway treatment at the transition into the neighborhood, to further reduce speeds and to prevent motorists from potentially using the TWLTL and median as a passing lane.

Figure 12. Sample roadway section, from Street Design Guide

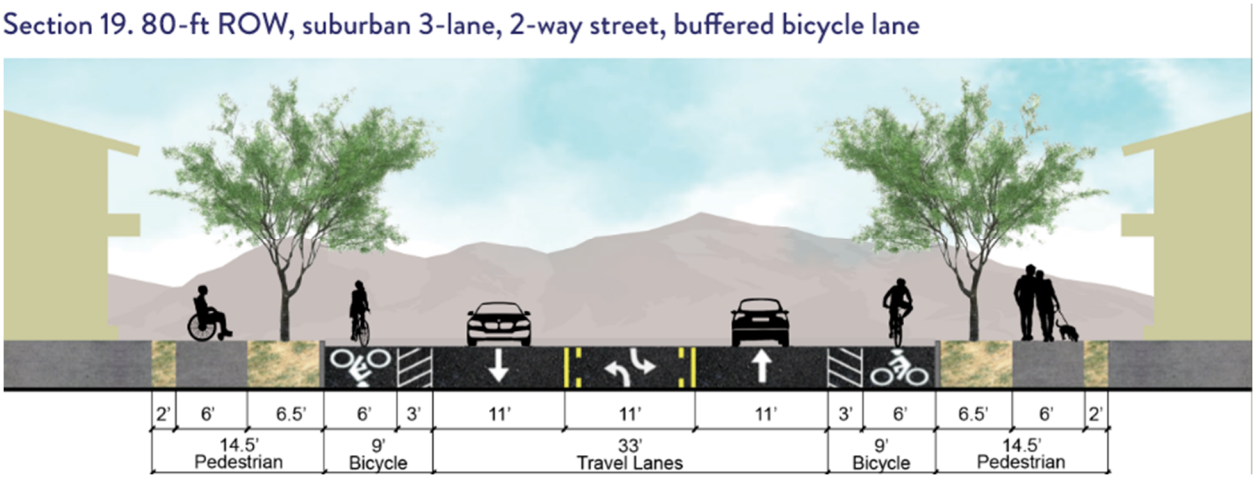
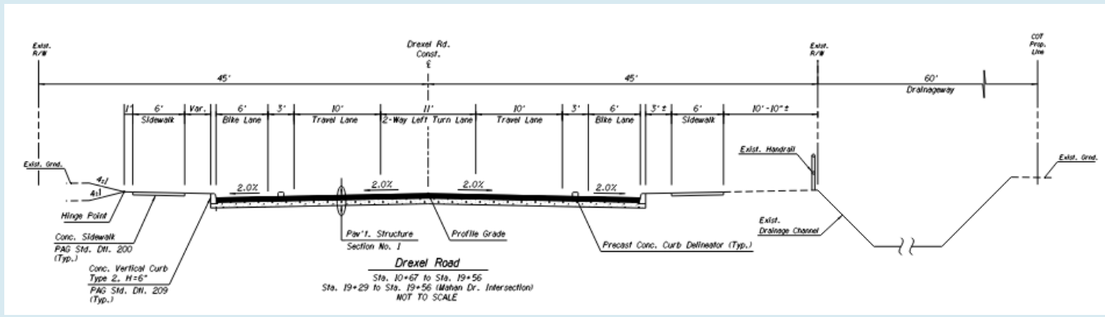
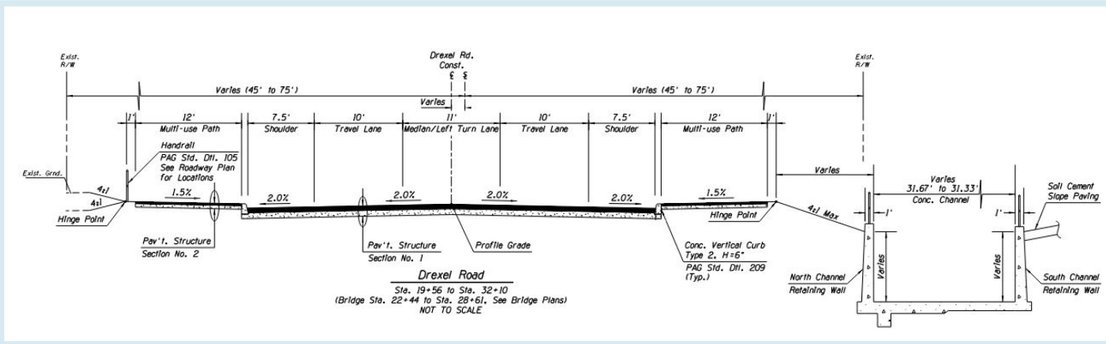


Table 12 reflects the final recommended widths, while Figure 13 shows the updated overall roadway plan.

Table 12. Preferred Alternative cross sections

Location	Cross section	Description
Drexel Road, Midvale Park Road to Mahan Drive		• One center 11-foot TWLTL • One 10-foot travel lane in each direction • One 3-foot bike lane buffer in each direction • One 6-foot bike lane in each direction • One 6-foot sidewalk in each direction, separated from roadway by a 3-foot minimum landscape buffer • One 10-foot right-turn lane onto northbound Midvale Park Road (not shown in typical section) • Green-colored pavement marking for westbound bike lane at Midvale Park Road intersection
Drexel Road, Mahan Drive to Bridge		• One center 11-foot Median • One 10-foot travel lane in each direction • One 7.5-foot shoulder in each direction • One 12-foot raised multiuse path in each direction • Handrail in westbound direction tying into end of bridge • Striped, high visibility crosswalk for east-to-west pedestrian crossing of Mahan Drive and striped, high visibility crosswalk for north-to-south pedestrian and bicycle crossing of Drexel Road at Mahan Drive

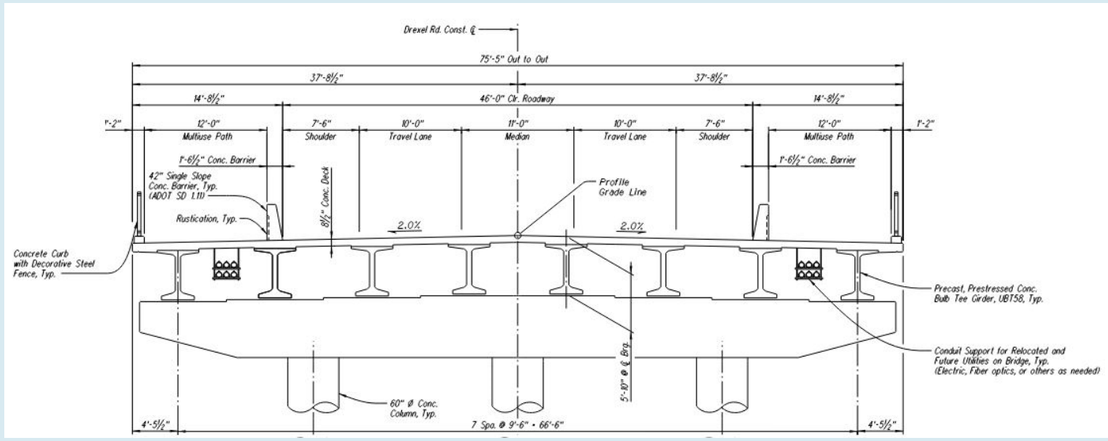
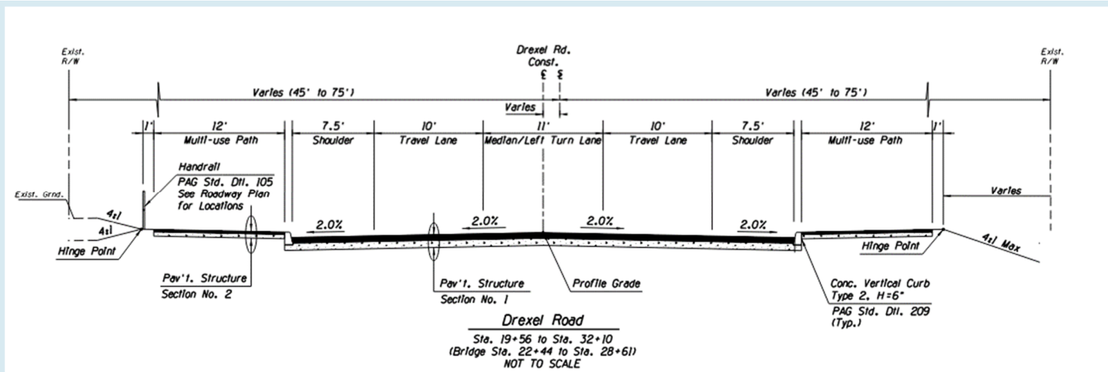
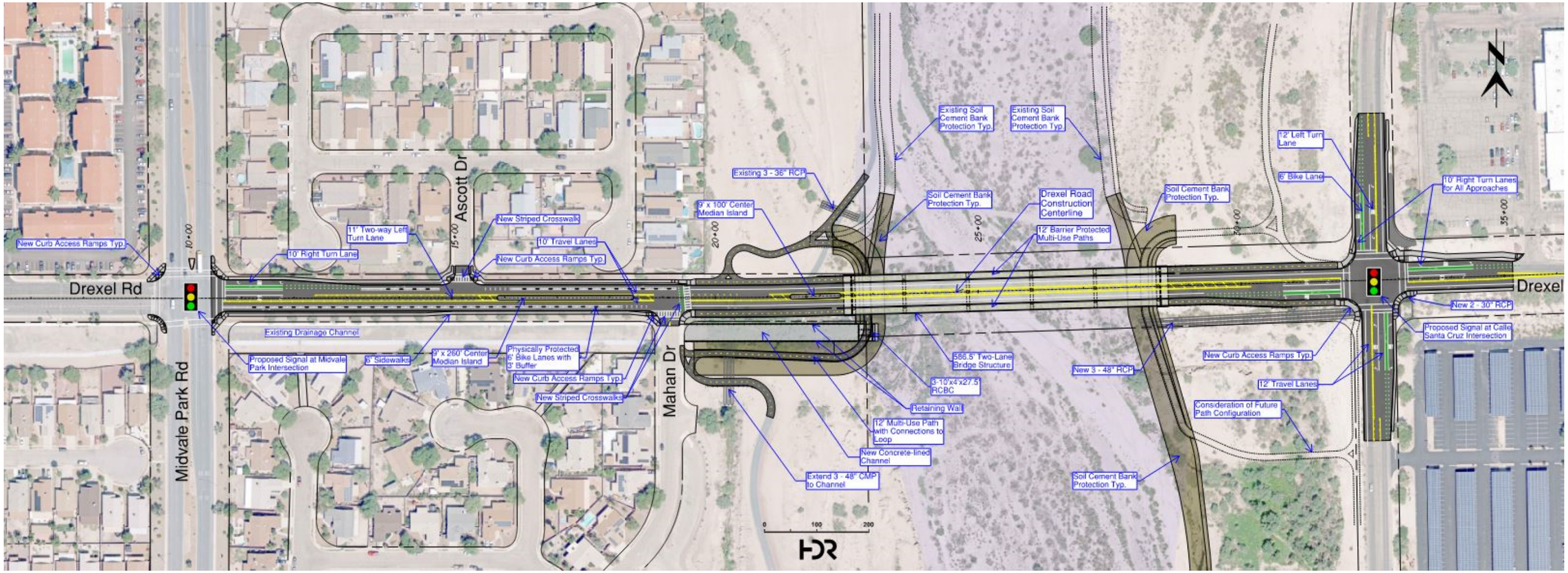
Location	Cross section	Description
Drexel Road Bridge		• Bridge supported on eight precast concrete girders • One center 11-foot median • One 10-foot travel lane in each direction • One 7.5-foot shoulder in each direction • Concrete barrier between shoulder and multiuse path • One 12-foot multiuse path in each direction • Concrete curb or parapet with steel railing at edge of bridge in each direction
Drexel Road, Bridge to Calle Santa Cruz		• One center 11-foot median and left turn lane • One 10-foot travel lane in each direction • One 7.5-foot shoulder in each direction that transitions to a bike lane near Calle Santa Cruz intersection • One 12-foot raised multiuse path in each direction • Handrail in each direction tying into end of bridge • Right-turn lanes for all approaches to Calle Santa Cruz intersection (not shown in typical section) • Green-colored pavement markings for bike lanes at Calle Santa Cruz intersection

Figure 13. Preferred Alternative roadway plan



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4.2 Design Controls

Design standards and controls for the proposed project include the COT *Street Design Guide* (COT 2021b), *Move Tucson Plan* (COT 2021a), *Pima County Roadway Design Manual* (Pima County 2013), PAG *Standard Specifications and Details for Public Improvements* (PAG 2015), Pima County/COT *Signing & Pavement Marking Manual* (Pima County and COT 2020), AASHTO's *A Policy on Geometric Design of Highways and Streets* (AASHTO 2018), AASHTO's *Guide for the Development of Bicycle Facilities* (AASHTO 2020), and FHWA's *Manual on Uniform Traffic Control Devices* (FHWA 2024).

The design controls and notable design criteria that were used in the development of the Preferred Alternative are presented in Table 13.

Table 13. Design controls for Drexel Road

Item	Description
Typical section including ROW	See Table 12, Figure 13, and Appendix A
Design year	2045
Design vehicle	WB-40 and COT bus
Design speed/Posted speed	35 mph/30 mph [COT]
Stopping sight distance	250' [AASHTO]
Cross slope	2% [PC Roadway Design Manual]
Maximum superelevation	4% [PC Roadway Design Manual]
Horizontal curve	510' Minimum radius [AASHTO, Low-Speed Streets]
Maximum horizontal angle break	1°08' [PC Roadway Design Manual]
Vertical gradient	3% Maximum [PC Roadway Design Manual] 0.5% Minimum [PC Roadway Design Manual
Maximum vertical gradient break	4% at side street intersection [PC Roadway Design Manual]
Minimum vertical curve length	105' [3X Design speed] [AASHTO]
Number of through/travel lanes	2 lanes (1 lane each direction)
Lane width	10 feet travel and right turn lanes [COT Street Design Guide] 11 feet two-way center left turn lane or median [COT Street Design Guide]
Outside shoulder width	7.5 feet [COT Street Design Guide]
Bike lane	6 feet plus 3-foot buffer [COT Street Design Guide]
Sidewalk	6 feet [COT Street Design Guide]
Multi-use path	12 feet
Barrier type	42" Single Slope Barrier [ADOT Bridge Group SD Drawings] next to outside travel lane. Concrete curb or Parapet with decorative steel railing along bridge edge (subject to artist input)
Curb and gutter	PAG Standard Detail 209

Item	Description
Roadside slopes	4:1 Typical, 2:1 Max where needed
Pavement design life	20 years
Drainage (pavement)	10 years

The new bridge would be designed in accordance with AASHTO LRFD Bridge Design Guidelines except as superseded by ADOT Bridge Design Guidelines where appropriate. ADOT Bridge Group SD Drawings would be followed for standard reinforced concrete retaining walls, box culverts and various bridge components including railings, joints and approach slabs.

4.3 Horizontal and Vertical Alignment

Existing Drexel Road west of the Santa Cruz River is centered on the section line. There is an angle point in the section line just east of Mahan Drive that changes the bearing of the section line to the east and across the Santa Cruz River to Calle Santa Cruz. This places the Drexel Road/Calle Santa Cruz intersection approximately 32 feet north of the Drexel Road/Midvale Park Road intersection. To connect Drexel Road across the Santa Cruz River, the proposed construction centerline requires one horizontal curve just east of Mahan Drive and a slight angle break of 00°17’36” at the Calle Santa Cruz intersection.

The plans in Appendix A include detailed horizontal and vertical alignment information for the Preferred Alternative.

4.4 Access

Within the limits of the proposed project, there is no access control on Drexel Road. The two existing access points west of the Santa Cruz River to Mahan Drive and Ascott Drive would be maintained. Connection to The Loop path would be modified near the west end of the proposed bridge. No new access points would be provided.

4.5 Right-of-Way

As shown on the typical sections in Appendix A, the existing right-of-way along Drexel Road varies from 90 feet to150 feet and would be maintained. The existing right-of-way along Calle Santa Cruz is 80 feet.

No new right-of-way would be needed along Calle Santa Cruz to accommodate new right turn lanes and sidewalks at the intersection with Drexel Road. A small drainage channel is being proposed along the east side of Calle Santa Cruz north of Drexel Road that would require new right-of-way from the adjacent parcel to the east. However, a 5-foot tall gravity wall is being proposed along the property line to avoid the need to obtain new right-of-way. No new right-of-way will be needed at the intersection of Drexel Road with Midvale Park Road to construct the new curb access ramps and the new westbound Drexel Road to northbound Midvale Park Road right turn lane.

Construction of the bank protection, drainage features and portions of the multi-use path connecting to the existing Loop path would occur on Pima County property. In addition, temporary access would be needed on Pima County property to construct the bridge and the improvements at the Drexel Road and Calle Santa Cruz intersection. Construction on and access to Pima County property would be included in future Intergovernmental Agreements (IGAs). Final requirements and execution of the IGAs would occur during the final design phase.

4.6 Drainage

4.6.1 Santa Cruz River

A Technical Memorandum dated June 14, 2024 was prepared by CMG Drainage Engineering (CMG) to document the preliminary hydraulic modeling and preliminary bridge hydraulics. In addition, CMG prepared a preliminary Drainage Report dated September 26, 2024 to further support and document the new roadway drainage system and bridge design. Three different bridge span configurations were modeled, each with the abutments and bank protection outside of the delineated floodway in order to help achieve a no-rise condition and avoid the Letter of Map Revision (LOMR) process. The preliminary bridge hydraulic modeling shows that a no-rise condition would be achieved by all three span configurations including the recommended 5-span configuration. Refinements would be made to the model during final design to account for the final recommended bridge layout, the final river bottom grading and the final configuration of the bank protection, and to confirm the initial findings of a no-rise condition.

Preliminary bridge scour calculations have been provided for the 100-year design flow and 200-year check flood events in the Preliminary Drainage Report. Pier scour depths of 32.2 feet and 33.4 feet deep for the 100-year and 200-year events, respectively, have been calculated. The scour depths for the 500-year extreme event (i.e., superflood) will be determined during final design and the bridge will be designed to remain stable even with the assumed loss of bank protection for this superflood event. Scour depths will be finalized once the geotechnical investigation is completed.

Bank protection consisting of soil cement, which is the type of bank protection that exists along the main Santa Cruz River channel downstream of Drexel Road, will be located in front of the abutments. In order to protect the bridge, soil cement is recommended by CMG to wrap around each abutment in a horseshoe shape and extend a distance of approximately 600 feet east or west of the center of the Santa Cruz River channel on the upstream side of each abutment. This 600-foot lateral distance is to protect the bridge from the tendency for the Santa Cruz River to meander and erode the upstream banks. On the downstream side, the bank protection is only recommended to wrap around to the end of the concrete approach slabs. This horseshoe shaped bank protection configuration is what is needed to protect the bridge. However, in discussions with the Pima County Flood Control District, they have requested that the bank protection along the east bank upstream of the bridge extend approximately 1000 feet to the south of the new bridge. This will further protect the east, upstream bank from erosion due to stream meandering and allow them to construct a future multi-use path on top of this bank protection. Because this additional bank protection is not needed to protect the bridge, the PCRFCD stated in a meeting on August 29, 2024 with the COT, HDR and CMG, that

they are willing to sharing the cost of this additional bank protection with the City of Tucson. On the west side of the upstream side, the bank protection will wrap around and run parallel to Drexel Road to protect the approach roadway, abutments, and the proposed concrete drainage channel with retaining walls between Mahan Road and the Santa Cruz River. On the downstream side, the bank protection will have two legs on each side of the river. One leg will run parallel to the river and tie into existing bank protection while one short leg will wrap around and run parallel to Drexel Road and end at the end of the concrete wingwalls, which coincide with the beginning/end of the approach slabs. The depth below the thalweg of the toe of the bank protection is recommended to be 14.3 feet in the Preliminary Drainage Report, but will be refined during final design based on additional information such as soil data that will be provided in the Geotechnical Investigation Report.

4.6.2 Channel Along South Side of Drexel Road

The concrete U-channel east of Mahan Drive would be removed and a new concrete U-channel would be constructed between Manan Drive and the new multi-use path connection to the Loop path. The channel would pass beneath the new multi-use path via a 27.5-foot long 3-cell 10'x4' reinforced concrete box culvert. The existing 3 – 48" CMP system running south from the existing concrete U-channel east of Mahan Drive would be removed, salvaged, extended, and replaced to accommodate the new concrete U-channel as well as the new multi-use path alignment and profile south of Drexel Road.

4.6.3 On-site Pavement Drainage

A preliminary on-site drainage analysis has been performed to assess impacts to existing on-site features and assess the on-site drainage system requirements for the proposed project. Initially, the preliminary on-site drainage scheme for each segment of the proposed project is discussed below.

The segment of Drexel Road from Midvale Park Road to the west end of the bridge would drain from west to east. North curb-line drainage would be collected as necessary in catch-basins to meet spread requirements and would be discharged into the Santa Cruz River. South curb-line drainage would be collected via sidewalk scuppers located as necessary to meet spread requirements and would discharge into the existing south side channel which flows east to the Santa Cruz River. Remaining flow along the south curb-line in Drexel Road would exit at Mahan Drive and drain into the roadside channel.

Bridge drains are being evaluated but are not anticipated to be needed as the profile would likely have its highpoint on the bridge and flows would drain away from that highpoint both east and west. Concentrated flows from the bridge would be directed off of the bridge to drainage inlets or spillways. The west half of the bridge would drain to a sag or to Mahan Drive where it would exit Drexel Road. The east half would drain towards Calle Santa Cruz and would be collected at curb-line prior to entering the intersection and in conformance with spread requirements. The collection mechanism could be scuppers or catch-basins. The soil is very erosive on the east bank of the Santa Cruz River and that may preclude the team from draining the pavement via surface flow.

The south and east legs of the Calle Santa Cruz intersection would drain towards the intersection and be collected at the curb line and discharged into the cross-drainage

system discussed below. The northeast leg of the Calle Santa Cruz intersection would drain to the south (against grade) in a fully lined grouted riprap channel along the east side of Calle Santa Cruz. The flow would cross under Drexel Road in a new two-barrel 30-inch RCP and drain into the new 3-barrell 48-inch RCP described below and outlet into the Santa Cruz River.

4.6.4 Off-site Cross Drainage

The existing 2 – 45”x29” CMP system at the southeast corner of the Calle Santa Cruz intersection flows west to the Santa Cruz River and would be replaced with 3-48” RCPs for an offsite design flow of 247 cfs.

Other off-site flow that impacts the proposed project includes existing scuppers on the north leg of the Calle Santa Cruz Intersection that currently drain offsite flow into Calle Santa Cruz. This flow would be collected and drained back to the south (via 2-30” RCPs under Drexel Road) to the new inlet for the 3-48” RCPs.

The Midvale development to the south of Drexel Road west of Mahan Drive, drains to an existing channel system that runs along the south side of Drexel Road and drains into the Santa Cruz River. This system would continue to function with improvements to the channel east of Mahan Drive.

The existing 3 – 36” RCP system north of Drexel Road along the west bank of the Santa Cruz River would be removed, salvaged, and reconstructed to accommodate construction of the bank protection.

Additional cross-drainage considerations are required for The Loop path improvements, which would be designed to pass a 10-year storm.

4.7 Sections 401 and 404 of the Clean Water Act

The U.S Army Corps of Engineers (Corps) administers Section 404 of the Clean Water Act (CWA), which regulates the discharge of dredged or fill material into Waters of the US (WUS), including wetlands. The Corps regulates activities within jurisdictional waters through permitting, using nationwide and individual permits, and letters of permission.

The bridge over the Santa Cruz River would require temporary work and permanent features in the river bed. A preliminary jurisdictional delineation would be prepared for the proposed project to determine whether the Santa Cruz River and adjacent drainages are considered jurisdictional by the Corps. If so, depending on the anticipated impacts from the proposed project, a Nationwide Permit 14 could likely be utilized for project activities.

In Arizona, the Arizona Department of Environmental Quality (ADEQ) regulates surface water quality standards and issues Section 401 Water Quality Certifications. The Santa Cruz River is not an Outstanding Arizona Water, Impaired Water, Not Attaining Water, or lake, therefore, a separate Section 401 Water Quality Certification application to the ADEQ is not required; the proposed project activities would be conditionally certified under the Nationwide Permit.

4.8 Floodplain Considerations

A discussion of the existing FEMA floodplain is contained in Section 1.3.2. The Technical Memorandum and the Preliminary Drainage Report prepared by CMG contains a more detailed discussing including the outdated Effective Hydraulic Model and the Corrective Effective Model (CEM) created by CMG for the proposed project. The CEM results and subsequent revisions would be coordinated with Pima County Regional Flood Control District to gain acceptance of the CEM and the final determined impacts to the floodway. As mentioned in Section 4.6, the goal is to achieve a no-rise condition and avoid the Letter of Map Revision (LOMR) process.

4.9 Earthwork

The roadway profile between Midvale Park Road and Mahan Drive would match existing grade closely. The east leg of the Drexel Road and Midvale Park Road intersection would be slightly widened to accommodate a westbound right-turn lane. Drexel Road between Midvale Park Road and Mahan Drive would be widened an average of 9 feet to accommodate the new roadway typical section. Between Midvale Park Road and Mahan Drive, only minor earthwork would be required.

The new roadway over the Santa Cruz River, between Mahan Drive and Calle Santa Cruz, is where most of the earthwork for the proposed project would occur. This roadway profile is controlled by three main constraints. The first constraint is the need to provide a bridge structure that accommodates three feet of freeboard over the 100-year flood event. The second and third constraints are to provide a minimum of 10 feet of clearance over the multi-use path (2nd constraint) that would pass under the bridge in front of the east and west abutments while maintaining a path profile that would be higher than a ten-year storm event (3rd constraint). Pima County Flood Control District requested that The Loop path be placed above a 10-year flow event to reduce the maintenance, such as the clearing of sand and other debris, that needs to be cleared from the path after storm events. Another consideration was to minimize the overall height of the bridge to make the effect of vehicle headlights on the bridge less noticeable to nearby residents. Since the bridge is not aligned directly with any of the nearby residences and a 42-inch tall concrete barrier is planned adjacent to the shoulder on the bridge, headlights would not be pointed directly at houses, however, headlights of vehicles crossing the bridge would still be noticeable at nearby residences due to the height of the bridge.

The need for soil improvement or the need for over-excavation and replacement has not been determined at this time. All excavation including pavement removal is assumed to be suitable for reuse for embankment demand. For purposes of estimating quantities, a shrink of 15% has been assumed in the earthwork quantities. See Table 14 for a summary of the earthwork quantities for the Preferred Alternative.

Table 14. Preferred Alternative estimated earthwork quantities

Location	Total excavation Including pavement removal (cubic yards)	Shrink (-15%) (cubic yards)	Embankments (cubic yards)	Net in-place borrow (+) or waste (-) (cubic yards)
Drexel Road	4,221	481	5,452	**+1,712**

4.10 Landscaping and Public Art

The existing landscaping along Drexel Road between Midvale Park Road and Mahan Drive would be impacted by the improvements, particularly along the new right turn lane at the Midvale Park Road intersection. This existing vegetation and landscaping would be preserved in place or relocated when possible. Where there is adequate space in the right-of-way between sidewalks and existing homes, new trees would be planted to act as a buffer and provide shade for pedestrians.

Landscape along the roadway between Mahan Drive and Calle Santa Cruz would consist of new trees and shrubs and new native seed mix to improve areas that have been degraded over time by erosion. Water harvesting features would support new and existing plant materials by keeping water on site. Landscape plans including irrigation plans would be developed by Wheat Design Group (WDG) during final design. One landscape concept plan sheet showing potential planting areas and hardscape materials has been provided by WDG and is included in the plan set in Appendix A.

As a result of coordination with the COT and the Arts Foundation for Tucson and Southern Arizona (Arts Foundation), it has been determined that artwork would be incorporated into the proposed project via participation of the Arts Foundation. The Arts Foundation would release a Call to Artists to select an artist to work with the design team to incorporate artwork into the proposed project. This would occur during the final design phase.

The proposed project areas initially identified as candidate areas for artwork include: (1) rustication on the bridge barrier, concrete parapet on bridge, wingwalls and even the bridge columns; (2) rustication on retaining walls including the U-channel along the south side of Drexel Road just east of Mahan Driver; (3) steel pedestrian railing on top of the concrete curb or parapet along the outside edges of the bridge; (4) bridge deck overlooks similar to La Cholla over the Rillito River could be added to the bridge; and (5) stand-alone artwork. For estimating purposes, 1 percent of the total estimated construction cost has been included for artwork.

4.11 Construction Phasing and Traffic Control

The new bridge would be built off-line from traffic. The primary considerations with constructing the bridge, which would be addressed as part of the final design package preparation, are the seasonal (winter and monsoon) river flows and construction of the bank protection in front of the bridge abutments and along the upstream approaches to the bridge.

Construction of the new bank protection would also have to consider river flows and construction of the new drainage channel RCB that would pass beneath the multi-use path south of Drexel Road and east of Mahan Drive.

Construction of the new section of The Loop path near the west end of the bridge would have to consider the timing of all new infrastructure as well as contractor access in order to minimize path detours and/or closures.

Construction of the drainage channel improvements would need to consider increased chance of flow during winter and monsoon seasons.

Construction of the Drexel Road improvements between Midvale Park Road and Mahan Drive including all landscape, drainage improvements, and utility work, would be phased and would require traffic control. Traffic shifts with multiple phases would be necessary. Similarly, phased construction and traffic control would be required for the work at the Midvale Park Road intersection and the Calle Santa Cruz intersection. Advance traffic control notification to the public would be needed prior to restrictions, closures or major traffic control changes. Phasing and traffic control plans would be the responsibility of the contractor and special requirements that the contractor needs to comply with would be included in the proposed project's special provisions. Depending on timing of construction, coordination may be required with the future I-19 Irvington Interchange improvements – particularly as related to improvements at the intersection of Drexel Road and Calle Santa Cruz.

The new Drexel Road alignment between Mahan Drive and Calle Santa Cruz could serve as a contractor staging and stockpiling area. In addition, the vacant land on the north or south side of Drexel Road between the Santa Cruz River and Calle Santa Cruz could also be used for staging and stockpiling if approved by the Pima County Flood Control District. It should be noted that a fairly large area may need to be used for the contractor to set up a batch plant for the construction of the soil cement.

4.12 Traffic Design

As discussed in Section 2, the study team analyzed existing (2023) and future (2045) traffic conditions for roadway, pedestrian, bicyclist, and transit infrastructure in the study area, along with crash data, to inform the proposed project's design and ensure consideration of traffic congestion and safety issues for multiple modes.

Based on the findings of the traffic analysis and the recommendations of the COT *Street Design Guide*, the following subsections discuss the "Complete Street" elements that are recommended to be included in the proposed project.

4.12.1 Roadway Cross-section Design

The recommended roadway cross-section design for Drexel Road is as follows:

- Three-lane vehicular cross-section
    - A cross-section with one lane in each direction of travel and a TWLTL where needed is expected to operate at LOS C or better in 2045. A three-lane roadway meets the guideline for Suburban Connectors, as presented in the COT *Street Design Guide* (typically two to five lanes).

- 10-foot travel lanes
    - The COT *Street Design Guide* states that the preferred travel lane width for a Suburban Connector is 10 feet.
- 11-foot TWLTL
    - The COT *Street Design Guide* states that the maximum left-turn lane width for a Suburban Connector is 11 feet. Where a TWLTL is not needed, an 11-foot wide striped median or a 9-foot wide raised median may be used to discourage passing and street racing.
- 30 mph speed limit
    - A speed limit of 30 mph meets the target speed outlined in the COT *Street Design Guide* for a Suburban Connector (30 to 35 mph).

4.12.2 Intersection Design

The recommended design for the Drexel Road intersections is as follows:

- Calle Santa Cruz and Drexel Road intersection
    - Install a traffic signal.
    - Maintain left-turn lanes on westbound and southbound approaches.
        - Turn lane storage lengths:
            - Westbound left: 110 feet
            - Southbound left: 125 feet
    - Install left-turn lane on eastbound and northbound approaches.
        - Turn lane storage lengths:
            - Eastbound left: 110 feet
            - Northbound left: 110 feet
    - Install right-turn lane on all approaches.
        - Turn lane storage lengths: 110 feet at EBR, NBR & SBR
        - Turn lane storage lengths: 125 feet at WBR
    - Install new pedestrian ramps on all corners.
- Midvale Park Road and Drexel Road intersection
    - Install a traffic signal.
    - Maintain left-turn lanes on all approaches.
    - Install right-turn lane on westbound approach.
        - Turn lane storage length: 125 feet
    - Install new pedestrian ramps on all corners.
    - Reduce curb radii to shorten crossing distances and slow speeds of turning vehicles

4.12.3 Pedestrian Design

The recommended pedestrian facility design for Drexel Road is as follows:

- Bridge segment design
  - Install protected multiuse path.
    - A protected multiuse path provides the highest level of comfort for a pedestrian facility (PLOC 1).
- Drexel Road design
  - Install 6-foot sidewalk.
    - The COT *Street Design Guide* states that the preferred sidewalk width for a Suburban Connector is 6 feet.
    - The 6-foot sidewalk, in combination with a buffer between the sidewalk and curb, maintains the existing PLOC on the Drexel Road segment from Midvale Park Road to Mahan Drive (PLOC 2).
  - Consider sidewalk buffer (planting/amenity zone).
    - The COT *Street Design Guide* states that the preferred buffer width for a Suburban Connector is 4 feet.
    - The 4-foot buffer maintains the existing PLOC on the Drexel Road segment from Midvale Park Road to Mahan Drive (PLOC 2).
    - The 4-foot buffer would be reduced as necessary to avoid the removal of some of the existing trees located between the existing trapezoidal channel and the existing sidewalk, along the south side of Drexel Road, between Midvale Park Road and Mahan Drive.
  - Consider high-visibility crosswalks for midblock crossings.
    - FHWA states that a high-visibility crosswalk should always occur for uncontrolled crossing locations with the characteristics of Drexel Road. These characteristics consist of speed, daily traffic, and roadway configuration.
  - Consider advance “Yield Here to Pedestrians” signs and yield lines (R1-5A).
    - FHWA states that R1-5A signs should always be considered for uncontrolled crossing locations with the characteristics of Drexel Road. These characteristics consist of speed, daily traffic, and roadway configuration.

4.12.4 Bicycle Design

The recommended bicycle facility design for Drexel Road is as follows:

- Bridge segment design
  - Install protected multiuse path.
    - A protected multiuse path provides an LTS of 1, which is the most comfortable type of bicycle facility.

- Install a 7.5-foot shoulder on bridge that bicycles can also use in addition to the protected multiuse path.

- Drexel Road design (not including bridge)
  - Install 6-foot bike lane with 3-foot protected buffer.
    - The COT *Street Design Guide* states that the preferred bike lane plus buffer width for a Suburban Connector is 8 to 11 feet.

4.12.5 Transit Design

The study team has begun coordination with Sun Tran. Sun Tran is in favor of the proposed project and noted that the construction of this project would save time and miles for Sun Tran users and would reduce operating costs. Because of time savings, they expect ridership to increase. Sun Tran is evaluating how best to use the new bridge. It could be that Route 29 (Valencia), rather than Route 27 (Midvale Park), would be rerouted to use the new bridge. Sun Tran would provide information regarding desirable bus stop locations along Drexel Road as the design progresses. Also, the COT should coordinate with Sun Tran to determine whether any stop removals are required on account of the potential reroute.

4.12.6 Curb Returns

Minimum curb return radii for the intersections within the project limits were evaluated using the AutoTURN computer program version 11.0. A typical City Bus and a WB-40 semi-trailer truck were used for the design vehicles at major intersections and passenger vehicles at local streets. A minimum design radius of 35 feet was required for both the WB-40 and City Bus in order to complete all right turn movements at the Drexel Road and Calle Santa Cruz intersection. A minimum design radius of 30 feet was required for both the WB-40 and City Bus in order to complete all right turn movements at the Drexel Road and Midvale Park Road intersection. In accordance with City of Tucson Development Standard No. 3-01.0, the minimum curb return radius for the Drexel Road and Midvale Park intersection is 25 feet to 30 feet, depending on roadway classification, the Drexel Road and Calle Santa Cruz intersection is 25 feet, and the Drexel Road and Ascott/Mahan Drive intersections are 25 feet. These are the minimum curb return radii based on the development standard, which does not account for the actual turning ability of the design vehicles. However, as shown from the AutoTURN program, roadway geometry and lane configuration make it necessary to increase the curb return radii at the Drexel Road and Calle Santa Cruz intersection to accommodate the design vehicles to allow them to turn without passing into oncoming travel lanes in the receiving direction. See Table 15 for required curb return radii based on design vehicle turning capabilities that accounts for the proposed roadway geometry. The larger curb radius between the "Minimum COT Development Standard Design Curb Radius" and the "Minimum Design Vehicle Turn Movement Curb Radius" should be used for the proposed curb return radii.

Table 15. Curb Return Radii

Turn Movement	Vehicle	Existing Curb Radius	Minimum COT Development Standard Design Curb Radius	Minimum Design Vehicle Turn Movement Curb Radius (AutoTURN)	Controlling Curb Return Radii used for Design
Drexel - Ascott	Passenger Vehicle	35'	25'	15'	25’
Drexel - Mahan	Passenger Vehicle	25’	25'	15'	25’
Drexel – Midvale Park	City Bus / WB-40	40’	30'	30’	30’
Drexel – Calle Santa Cruz	City Bus / WB-40	30’	25'	35’	35’

4.12.7 Signing and Pavement Markings

Signing and pavement markings should be designed in accordance with the Pima County/COT *Signing and Pavement Marking Manual*, 2020 Edition.

4.13 Utilities, Railroad and Irrigation Systems

Several existing utilities would be impacted by the proposed project. An initial disposition of the known existing utilities is included in Table 16. These dispositions include relocate, protect in place, and no conflict. Accurate horizontal and vertical locations of these facilities will be determined as needed during final design to determine final dispositions.

New utilities required for the proposed project such as irrigation, lighting and signals are discussed in other sections of Chapter 4. New utilities for utility companies, if any, will be determined during final design. Future accommodations for fiber infrastructure would be provided on the new bridge. Based on anticipated conflicts with the proposed improvements, the existing aerial electrical and communication lines that cross the Santa Cruz River along the south side of Drexel Road would be relocated to supports beneath the bridge deck between the outside girders (see bridge typical section in Appendix A).

Table 16. Existing utilities initial disposition

Utility owner	Facility type *(Utility Location)*	Initial Disposition	Remarks
COT DTM Traffic Engineering	Street lights, traffic signals *(Underground and Overhead)*	Protect in Place	Existing facilities to be protected in place.
COT Facilities Design and Maintenance	Electric, gas, sewer, water *(Underground)*	No Conflicts	Bluestake response indicates no conflicts.

Utility owner	Facility type *(Utility Location)*	Initial Disposition	Remarks
COT Fiber	Fiber optics *(Underground and Overhead)*	Relocate	Grade Cut Conflict at Drexel Road/Mahan Drive. Conflicts with overhead facilities, supported on TEP poles, crossing Santa Cruz River.
Cogent Communications (formerly known as Sprint Comm. Co.)	Fiber optics *(Underground and Overhead)*	Relocate	Grade Cut Conflict at Drexel Road/Mahan Drive. Conflicts with overhead facilities, supported on TEP poles, crossing Santa Cruz River.
Cox Communications	Cable television, fiber optics *(Underground and Overhead)*	Relocate	Grade Cut Conflict at Drexel Road/Mahan Drive. Conflicts with overhead facilities, supported on TEP poles, crossing Santa Cruz River.
Crown Castle Solutions Corporation	Fiber optics *(Underground and Overhead)*	Relocate	Grade Cut Conflict at Drexel Road/Mahan Drive. Conflicts with overhead facilities, supported on TEP poles, crossing Santa Cruz River.
Lumen (formerly known as CenturyLink)	Coaxial cable, fiber optics *(Underground)*	Relocate	Conflict with proposed drainage structure at Drexel Road/Calle Santa Cruz
Pima County Regional Wastewater Reclamation Department	Sewer *(Underground)*	Protect in Place, Manhole Adjustments	Adjust sewer manhole elevations due to roadway grade change on Drexel Road, from Midvale Park Road to Mahan Drive.
Southwest Gas Corporation	Natural gas *(Underground)*	Relocate	Conflict with proposed drainage structure at Drexel Road/Calle Santa Cruz
Tucson Electric Power	Electric Distribution *(Underground and Overhead)*	Relocate	Grade Cut Conflict at Drexel Road/Mahan Drive. Conflicts with TEP Poles and overhead facilities crossing the Santa Cruz River. Conflict with proposed drainage structure at Drexel Road/Calle Santa Cruz
	Electric Transmission *(Overhead)*	Protect in Place	138kV Transmission lines to be protected in place.
Tucson Water	Reclaimed water, water *(Underground)*	Relocate / Protect in Place	Conflict between 8” water main and proposed drainage structures at Drexel Road/Calle Santa Cruz. Drainage conflicts with 24” water line will be mitigated through design. Valve adjustments due to grade change would be required.
Zayo Group, LLC	Fiber optics *(Underground and Overhead)*	Relocate	Grade Cut Conflict at Drexel Road/Mahan Drive. Conflicts with Aerial facilities, supported on TEP poles, crossing Santa Cruz River.

There are no railroads within ½ mile of the project limits. The closest railroad is a Union Pacific at-grade crossing of Drexel Road just east of the intersection of Drexel Road and South Nogales Highway, which is approximately 1½ miles east of the project limits.

4.14 Structures

4.14.1 Bridge

As shown in the plans in Appendix A, the bridge typical section tying into the approach roadway on each end would consist of an 11-foot center median, one 10-foot travel lane in each direction, a 7.5-foot outside shoulder in each direction, a concrete bridge barrier on the outside of each shoulder, a 12-foot multiuse path in each direction, and a concrete curb or parapet with decorative steel railing along the outside edges of the bridge deck. This yields an out-to-out bridge width of 75’-5”.

The different bridge superstructure types evaluated included precast prestressed (PC/PS) concrete bulb tee girders, PC/PS concrete AASHTO I-girders, and PC/PS concrete box beams. Due to the regionally higher cost for steel superstructures and supply chain uncertainty, steel girders were not considered in detail in the Bridge Selection Report. Cast-in-place options were also not considered to avoid the use of falsework in the river bottom. PC/PS concrete bulb tee girders, which are now commonplace in the Arizona market, are efficient and are generally the preferred structure type unless site specific conditions warrant otherwise.

Four different bridge alternatives were evaluated including one four-span, one five-span and two six-span bridges. As discussed in Section 4.6, the abutments would be located outside of the delineated floodway in order to help achieve a no-rise condition. The resulting bridge length is nearly 600 feet with maximum span lengths ranging from 157 feet for the four-span alternative to 97 feet for the six-span alternatives. Regardless of superstructure type, the longer the span, the deeper the superstructure and the higher the roadway profile.

The driving factors in evaluating the bridge type and layout were constructability, cost, hydraulics, utility impacts, and impacts to the surrounding community. The primary utility consideration was the TEP overhead 138 kV electric transmission line, which runs north-to-south along the west bank of the Santa Cruz River. These lines require a minimum vertical separation of 25’-6” from the top of the proposed bridge deck and a separation of 15 feet minimum approach distance for construction equipment and 25 feet for cranes. Regarding impacts to the surrounding community, the goal was to avoid an overly high bridge that could create higher noise levels and cause impacts to nearby residences from vehicle headlights shining over backyard walls at night.

The preliminary recommended bridge type and layout is a five-span PC/PS concrete bulb tee girder bridge. The bridge would have a length of 586’-6” with a maximum span length of 121’-0”. For this span length and for the typical section previously discussed, eight lines of 58-inch deep bulb tee girders (UBT58) at 9’-6” spacing would be utilized. The deck, which would be cast-in-place, would have a depth of 8 inches. The resulting superstructure depth would be 5’-10” at centerline of bearing. The five-span arrangement utilizing UBT58 girders is a good solution relative to the driving factors. It is the most economical, has fewer substructure units to construct in the river compared to the six-

span alternative, and results in a no-rise hydraulic condition. It also results in a crest curve vertical profile that provides a clearance greater than 35 feet from the top of deck to the low point of the TEP overhead electric transmission line. Finally, it establishes a high point bridge deck elevation that is only about 2 inches higher than the back yard fence wall of the nearest house (the corner house located north of Drexel Road west of the bridge across from the intersection with Mahan Drive). The 4-span bridge option would yield a value greater than 15 inches higher than the fence wall due to longer spans and deeper girders.

Multi-column piers are required for this bridge width. A 3-column layout, with round columns for reduced hydraulic drag, would generate an efficient substructure system. Stub abutments behind the bank protection are recommended. With 100-year scour depths of up to 32 feet anticipated, the abutments and piers would be supported on drilled shaft foundations. Both the piers and abutments would be designed for the 100-year flood event with live load on the bridge and the abutment bank protection assumed to remain in place. In addition, the piers and abutments would be designed for the 500-year extreme flood event with the abutment bank protection and the bridge approaches assumed to be washed out, and therefore a reduced live load, in accordance with AASHTO LRFD, would be on the bridge for this extreme event condition.

The bridge would be constructed on a horizontal tangent. The bank protection and substructures would be oriented normal to Drexel Road, thus eliminating skew on the bridge. This simplifies design, detailing and construction.

4.14.2 Drainage Structures

The walls of the new concrete U-channel along the south side of Drexel Road between Mahan Drive and the new multi-use path connection to The Loop path would consist of cast-in-place retaining walls. These walls would be constructed similar to standard ADOT retaining walls (ADOT Bridge Group SD 7 series drawings) except that they would be supported by the bottom slab of the channel, thereby eliminating the need for the walls to be supported on separate spread footings. The channel bottom supporting the retaining walls would consist of a reinforced concrete slab. See plans in Appendix A.

A 3-cell 10’x4’ box culvert is planned to be constructed near the outlet of the same drainage channel to provide a crossing of the channel for The Loop path that passes beneath the bridge in front of the west abutment of the new bridge. This box culvert is planned to be an ADOT standard cast-in-place box culvert (ADOT Bridge Group SD 6 series drawings). The outlet of the culvert will be mitered to match the slope of the exposed face of the soil-cement bank protection.

4.15 Geotechnical Design Considerations

The geotechnical investigation for the proposed project will occur during the final design phase. The investigation will include borings at the location of the bridge abutments and piers and will be taken to a depth that accounts for scour. The investigation will also include borings for the bank protection, approach roadway and the U-channel along the south side of Drexel Road just east of Mahan Drive.

Based on review of the geotechnical borings performed for the Irvington Road bridge over the Santa Cruz River, located one mile north of Drexel Road, subsurface soils at the Drexel Road bridge site are expected to consist of interbedded layers of river-run alluvial deposits. These soils are predominately sandy soils including classifications of silty to clayey sand with variable amounts of gravel and cobbles, silty/clayey gravel, sandy gravel, and sand and gravel mixtures. These soils are loose to medium dense within the upper 10 feet from channel bottom, increasing with depth to dense to very dense. Sandy clay was encountered within the upper 10 feet of the profile at the bridge abutments, probably representing river overbank fine-grained soil deposits.

Both an upper, perched groundwater table which forms in response to seasonal, ephemeral river flows, and a deeper regional groundwater table, likely will be encountered in borings and drilled shaft excavations within the river. ADWR GWSI registered wells located within the Santa Cruz River floodplain about 0.6 mile from Drexel Road indicated measured depth to groundwater of 105 feet (0.6 mile north, in December 2019) and 93 feet (0.6 mile south, January 2020).

4.16 Pavement Design Considerations

No pavement designs were developed for this DCR. For the purposes of computing quantities, the pavement section for Drexel Road was assumed to consist of 6 inches of asphaltic concrete over 8 inches of aggregate base over 6 inches of recompacted subgrade. For the multi-use path, the pavement section was assumed to consist of 2.5 inches of asphaltic concrete over 4 inches of aggregate base over 6 inches of recompacted subgrade. Preliminary pavement sections are shown in the typical sections in Appendix A.

Pavement sections will be updated during final design after geotechnical information is available.

4.17 Multimodal Considerations

As discussed in Section 4.2 and shown in the typical sections in Appendix A, the Drexel Road typical sections include space dedicated to pedestrians and bicyclists in both directions. Depending on location along Drexel Road, for bicyclists, this includes a bike lane with a 3-foot curb delineated buffer, green pavement at intersections, and a 7.5-foot wide shoulder across the bridge. For pedestrians, this includes either a 6-foot sidewalk or a 12-foot multiuse path (for bicycles and pedestrians).

At grade pedestrian and bicyclist access to the existing Loop path that runs along the west side of the Santa Cruz River would be provided by paved “tie-ins” off of Drexel Road on the north side and Mahan Drive on the south side. The paved Loop path would be realigned between the tie-ins to pass beneath the bridge in front of the west abutment. This realignment would provide 10-foot minimum vertical clearance beneath the bridge and would be above the 10-year water surface elevation. The realignment would also pass over the outlet of the new drainage channel immediately south of the west bridge abutment. A reinforced concrete box culvert would be constructed at the outlet of the drainage channel to carry the path over the channel. The realigned path would be designed to have a grade less than or equal to 5% and would therefore meet ADA requirements.

The proposed project would allow direct and improved connectivity and access across the Santa Cruz River for Sun Tran bus service.

4.18 Design Exceptions

As noted in Chapter 7, no design exceptions or variances are anticipated.

4.19 Intergovernmental Agreements

See Section 4.5 for information on anticipated IGAs between the COT and Pima County.

5 Itemized Cost Estimate

5.1 Cost Estimate of the Preferred Alternative

Table 17 includes the preliminary construction cost estimate for the proposed project assuming the Preferred Alternative No. 1 is constructed. This cost estimate will be refined as more detailed plans are prepared. These estimated costs are based on unit prices obtained from recent COT, Pima County and ADOT projects and adjusted for recent upward trends in construction pricing. Additional project costs not part of the construction bid include inflation (assumed 3 years at 6% per year), public art at 1%, and construction contingency at 30%. Additionally, a line item in the cost estimate was included for unknown items at 8%. The COT would administer and construct the proposed project. Once construction activities are complete, maintenance and repair operations would be the responsibility of COT.

Table 17. Preferred Alternative cost estimate

Item	Estimated cost
Construction Bid Items' Cost	$23,097,000
Artwork	$231,000
Right-of-Way	$100,000
Design and Planning	$2,600,000
Environmental Mitigations	$50,000
Construction Engineering (30%)	$3,465,000
Construction Contingency	$6,929,000
Inflation (3 years @ 6% per year)	$4,412,000
Total	**$40,884,000**

A detailed cost estimate of the Preferred Alternative is included in Appendix C.

5.2 Estimate of Future Maintenance Costs

The bridge would have a design life of 75 years and the pavement would have a design life of 20 years. Items that would require maintenance include pavement, striping, sidewalks, cleaning of drainage channels and storm drains, landscaping, multiuse path, traffic signals and street lighting. Items on the bridge that would require maintenance include deck expansion joints, paint for metal railing, and deck surface maintenance. No unusually high-cost maintenance items are associated with the proposed project. Based on discussions with COT staff, the COT currently spends approximately $22,000 per lane mile per year for maintenance of roads. With maintenance of the bridge included, a total cost to maintain this section of road is estimated to be $26,000 per lane mile per year. The proposed project length is approximately ½ mile with three lanes. Therefore, the yearly maintenance cost is expected to be around $39,000 per year in current dollars.

5.3 Detailed Cost Estimates of Other Alternatives Considered

The cost estimate for Alternative No. 2 is summarized in Table 18.

Table 18. Alternative No. 2 cost estimate

Item	Estimated cost
Construction Cost	$21,786,000
Artwork	$218,000
Right-of-Way	$100,000
Design and Planning	$2,600,000
Environmental Mitigations	$50,000
Construction Engineering	$3,268,000
Construction Contingency	$6,536,000
Inflation (3 years @ 6% per year)	$4,161,000
Total	**$38,719,000**

A detailed cost estimate for Alternative 2 is included in Appendix C.

6 Implementation Plan

6.1 Preferred Alternative Recommended Construction Phases

The first phase of construction would include the relocation of utilities that conflict with new construction. Some utilities would be moved permanently, and some would be moved temporarily and then moved to their final locations once construction work is completed to the point necessary for permanent relocation. For example, aerial utilities that cross the Santa Cruz River would be temporarily relocated while the bridge is built, and then relocated to the new bridge once it is completed. Ideally, all utility work would be completed prior to construction.

The second phase of construction would be the new bridge, which would also include construction of the retaining walls and drainage channel along the south side of Drexel Road between Mahan Drive and the Santa Cruz River, as well as the 3-barrel RCP culvert along the south side of Drexel Road between Calle Santa Cruz and the Santa Cruz River. It would also include the construction of bank protection. As noted in Section 4.11, the new bridge can be built without impacting traffic, since there is currently no bridge on Drexel Road across the Santa Cruz River.

Once the bridge is built, the third phase of construction can begin which would include roadway reconstruction of the pavement, curbs, and sidewalks on the west side of the river between Midvale Park Road and the Santa Cruz River. This third phase would also include roadway construction on the east side of the river between the Santa Cruz River and Calle Santa Cruz. It would also include construction of new traffic signals at Midvale Park Road and Calle Santa Cruz, along with street lighting.

The fourth phase of construction would include construction of The Loop path connections, landscaping, and any other miscellaneous items needed for construction. It is anticipated that construction would last 14 to 16 months.

6.2 Funding

The COT has received $15 million in funding from the State of Arizona, and $4 million from COT local funds, consisting of $2 million from local allocation of the Arizona Highway User Revenue Fund (HURF) and $2 million from COT Development Impact fees. With a total project cost of $40.9 million, this leaves a funding deficit of approximately $21.9 million.

In February of 2024, the COT applied for a USDOT Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant in the amount of $20 million, which is approximately 49 percent of the total project costs, but the City was notified in June 2024 that the application was not successful. The COT will explore other regional and federal funding opportunities and is considering re-applying for a RAISE Grant in the next cycle to keep the project moving forward.

If the re-application of the RAISE Grant is not successful, then the additional funding would likely be obtained through the RTA Next program, but funding for RTA Next would not be available until May or June of 2026 at the earliest. Construction would therefore begin in the summer or fall of 2026. If the RTA Next program is not approved by voters, then the COT would have to obtain funding from other sources, which could delay the project.

7 AASHTO Controlling Design Criteria and Design Exceptions

The roadway would be designed in accordance with AASHTO's *A Policy on Geometric Design of Highways and Streets* (2018) and AASHTO's *Roadside Design Guide* (2011) as a low-speed urban roadway. Due to the low speed and straight and flat nature of the roadway, there would be no geometric design exceptions.

See Section 4.2 for the design controls and notable design criteria that were used in the development of the Preferred Alternative.

8 Social, Economic, and Environmental Concerns

8.1 Biological Resources

Biological resources in the project area include vegetation in the Santa Cruz River bed, landscaped plants, and animals that may inhabit the area. Vegetation in the Santa Cruz River includes native plant species which may be protected by the Arizona Native Plant Law and the Pima County Native Plant Preservation Ordinance. Migratory and nesting birds protected by the Migratory Bird Treaty Act may inhabit or nest in trees and burrowing owls have the potential to be found in the project area. Mitigation measures would be included in the Biological Evaluation to protect these species.

8.2 Air Quality

An Air Quality Assessment Report has been prepared for the proposed project (Newton 2024a). The project area is in an attainment area of the U.S. Environmental Protection Agency (EPA) National Ambient Air Quality Standards. However, for reasons noted in the Air Quality Assessment Report, air quality project-level transportation conformity does not apply to the proposed project.

The highest measured concentrations of criteria pollutants in the region per Pima County Department of Environmental Quality are well below EPA National Ambient Air Quality Standards. In addition, per FHWA, a 76% decrease in pollutants is expected between 2010 and 2060 due to new engine and fuel standards. As a result, long-term air quality is unlikely to be affected. Air quality within and adjacent to the project area may be temporarily affected due to equipment and vehicles working in the area during construction.

8.3 Noise

Sensitive noise receptors are found within the project area and adjacent to Drexel Road. A noise report has been prepared for the proposed project (Newton 2024b). Preliminary results indicate that the modeled noise levels in 2045 with the bridge built would not exceed 66 dBA (A-weighted decibels), which is the threshold for requiring noise mitigation. Additionally, future predicted noise levels would not increase more than 15 dBA over existing noise levels, therefore noise mitigation would not be needed.

8.4 Hazardous Materials

A Preliminary Initial Site Assessment (PISA) for hazardous materials is being prepared for the proposed project. Preliminary results indicate that there are two sites of concern within the project area that require more investigation. Additionally, if any concrete structures or paint stripes would be disturbed for the proposed project, samples should be collected and analyzed for lead-based paint and asbestos. Lastly, because of illegal dumping, trash, and debris found in the Santa Cruz River bed, additional site visits should be considered to monitor the presence of new hazardous materials on site.

8.5 Historical and Cultural Resources

The Class I Cultural Resources Overview prepared for the proposed project compiled an inventory of known cultural resources in the vicinity of the project study area. Consultation with Native American tribes is recommended to identify traditional cultural properties.

Approximately 60 percent of the cultural resources review area (and approximately 90 percent of the study area) has been previously surveyed for cultural resources; however, most of the surveys took place more than 10 years ago. According to SHPO's Guidance Point No. 5, these areas would likely require new archaeological survey if they are within the limits of the project footprint.

Two previously documented archaeological sites are identified within the study area. One site is listed on the National Register under Criterion D. The second site has been previously recommended not eligible for inclusion in the National Register.

8.6 Visual Resources

A visual resources report is being prepared for the proposed project. Preliminary results indicate that the proposed project would have a minor, long-term adverse impact on visual resources in the study area, due to the presence of sensitive viewers—the residential neighbors along the west bank of the Santa Cruz River. Proposed mitigation measures may include incorporating aesthetic treatments for the bridge, incorporating landscaping as a screen for residential viewers, and using carefully designed street lights. These mitigation measures would be in keeping with planning documents that emphasize attractive urban environments and roadways and that value urban forests and green infrastructure.

8.7 Neighborhood Impact

The proposed project would increase connectivity and provide an alternative access point for Midvale Park Road and Calle Santa Cruz. Additionally, access across I-19 would be improved, as travelers would be able to avoid heavily congested roadways like Valencia Road and Irvington Road. The Midvale Park Neighborhood would be more affected by the proposed project. Public involvement efforts have occurred throughout the study to inform the community, including the Midvale Park Neighborhood, about the proposed project and to collect input and feedback. There are no proposed right-of-way acquisitions from private residences. Mitigation measures for increased traffic on Drexel Road would be identified during final design in coordination with affected residents.

8.8 Community Resource Impact

Temporary effects during project construction would include a loss of access or detour along The Loop path at Drexel Road on the west side of the Santa Cruz River. Pedestrians and cyclists would be directed to an alternate route during certain construction activities. Requirements would be included in the construction documents for the contractor to follow to provide as much access to The Loop as possible during

construction. This could include requirements to always keep at least one connection open to allow for safe access to the path.

8.9 Environmental Documentation

The proposed project is not currently federally funded, but it is anticipated that federal funding will be acquired for construction, therefore, technical reports are being prepared in support of an EA, which would follow NEPA guidelines. Once federal funding is obtained, technical reports will be updated and incorporated into the EA prior to being published and provided for public comment.

8.10 Mitigation Measures

Mitigation measures would be developed as the proposed project progresses. Mitigation measures would depend on the results of the technical reports prepared for the proposed project. Mitigation measures may include items related to the protection of native plants, migratory birds and their nests, cultural and/or historic resources, noise impacts, and hazardous materials. Final mitigation measures will be included in the EA.

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Appendix A. Typical Sections and Plans of the Preferred Alternative

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

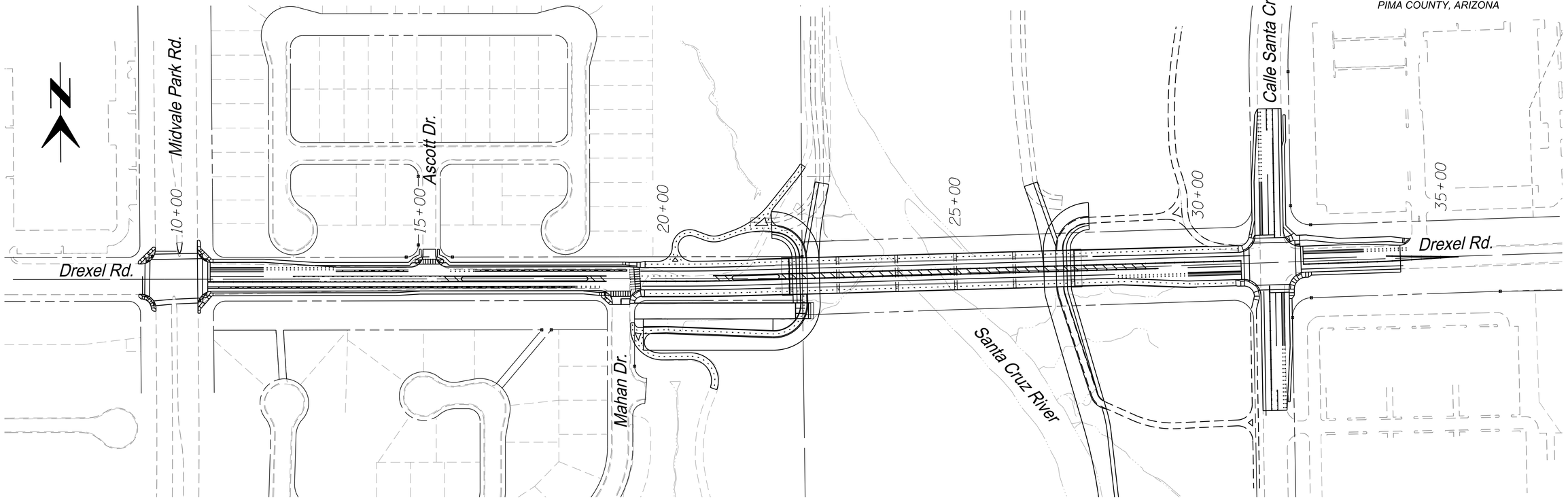
Location Map

N.T.S.
SECTIONS 2, 3, 10 & 11
T-15-S, R-13-E,
G & S R M
PIMA COUNTY, ARIZONA

GENERAL DESCRIPTION OF PROJECT

The proposed scope of work for this project includes the construction of a new 586.5' 5-span precast prestressed concrete bulb tee bridge with bank protection, asphalt concrete surface roadway, drainage channel extension, asphalt concrete surface shared-use path, and other incidental items.

CITY OF TUCSON PROJECT NUMBER PRJ000398



PRELIMINARY (30%) DESIGN PLANS
OCTOBER 2024

HDR

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
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CITY OF TUCSON

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

Approvals	Signatory	Date
DESIGN SECTION/PERMITS AND CODES		
TRAFFIC ENGINEERING		
STREETS AND TRAFFIC MAINTENANCE		
ENGINEERING LANDSCAPE ARCH		
ENGINEERING ADMINISTRATOR		

DRWN. BY JR 20 24 DSGN. BY JR/DL 20 24 CHKD. BY TWB/BK 20 24

Approved _____ 20 ___
TRANSPORTATION DIRECTOR

1 OF 45

REF. _____ SCALE: 1" = 100'
PLAN NO. _____

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GENERAL NOTES

1. HORIZONTAL CONTROL:
Horizontal Datum: The coordinates are derived from Arizona State Central Zone plane grid values by using the following formulas. A combined scale factor (CF), 0.9998800 (1/CF=1.0001200144), was used to convert grid coordinates to surface coordinates for this project. Surface Northing and Easting coordinates are derived by dividing the state plane grid coordinates by the combined scale factor (grid value/CF).

2. BASIS OF BEARING:
The Basis of Bearing for this project, North 88°03'48" East, was derived using the Arizona Coordinate System, North American Datum (NAD) 1983 (2011) with 2010 EPOCH, Central Zone 0202, in international feet, and observed between the southwest section corner of Section 2, Point 174, being a found 3" brass cap that is difficult to read stamped "S3 S2 S10 S11 1986 LS 12290" 3.5' below ground, and the south quarter corner of Section 2, Point 149, being a found magnetic nail with 3" aluminum washer in concrete stamped "T15S R13E 1/4 S 2 11 2012 RLS 21782", both of T.15S., R.13E., Gila And Salt River Meridian.

3. VERTICAL CONTROL:
The Basis of Elevation for this project is City of Tucson Benchmark point "148D", Point 215, which is a found chiseled "X" at the North end of a concrete box culvert headwall located in the southwest corner of Drexel Road and Mahan Drive and shown on City of Tucson Field Book 1989D1 Page 17-Right with an Orthometric Elevation = 2443.44 based upon North American Vertical Datum (NAVD) 1988, GEOID18 in international feet.

4. The primary horizontal control point number 100, being a set 1/2" rebar tagged "EPS CONTROL", is an OPUS resolved static solution and is located on the west bank of the Santa Cruz River approximately 150' north of Drexel Road and 50' east of The Gates of Midvale Park Subdivision east boundary. Project control points used have the following coordinate values:

Point & Name		Northing	Easting	Elevation
Primary Control Pt.				
100	2011 Grid	419,069.0584	985,065.8202	
Base	Surface	419,119.3527	985,184.0423	2448.96
Secondary Control Pts.				
145	2011 Grid	424,320.6500	985,318.6250	
HA17	Surface	424,371.5746	985,436.8774	2026.83
164	2011 Grid	413,614.9000	982,783.9940	
HJ15	Surface	413,664.5397	982,901.9422	2476.27
169	2011 Grid	424,396.6350	990,612.3890	
HA21	Surface	424,447.5687	990,731.2768	2461.93

5. All stationing shown on the plans and profiles is along the construction centerline unless otherwise noted.

6. All construction shall conform to 2015 Edition of the Pima Association of Governments (PAG) Standard Specifications and Details for Public Improvements except as modified in the contract specifications or plans. Pavement marking shall conform to the PC/COT Signing & Pavement Marking Design Manual, 2020 First Edition. Referenced ADOT Standards are per the latest edition ADOT Bridge Group Structure Detail Drawings, Construction Standard Drawings, & Signing and Marking Standard Drawings.

7. Existing overhead electric, telephone and cable T.V. utilities and underground electric, gas, T.V. and telephone utilities will be relocated by others.

8. Survey monuments will be furnished and placed by the Contractor per PAG Std. Dtl. 103 Sht. 1 of 3 or Sht. 2 of 3. See Geometric Layout and Paving Plan and Profile Sheets for locations.

9. All survey monuments shall be established by a land surveyor registered in the state of Arizona, and a record of survey will be provided.

10. Radii are measured to front face of curb per C.O.T. standards.

11. Construction zone traffic control shall conform to the requirements of the "Manual on Uniform Traffic Control Devices", U.S. Department of Transportation, Federal Highway Administration, Edition of 2009, and the Special Provisions.

12. Contractor shall comply with all applicable Occupational Safety and Health Administration regulations.

13. Southwest Gas has valves within the project area that may need to be protected and adjusted to final grade. the Contractor must contact Southwest Gas for adjusting valves at least two weeks prior to the start of construction by calling (520) 794-6208.

14. Southwest Gas requires a 1-foot minimum separation when crossing its distribution facilities and a 3-foot minimum separation when crossing high pressure mains.

15. SWPPP measures shall be installed so as to prevent all storm water, construction water, fuels, chemicals or liquids from being directed into or onto any sanitary sewer facilities. Protection of sanitary sewer facilities shall be a part of the Approved Construction SWPPP and Best Management Practices. Protection devices shall be installed and maintained around all potentially affected sanitary sewer facilities within the project limits. Additional measures shall include but not be limited to the use of rain stoppers and waterproof manhole covers as deemed necessary by the Pima County Regional Wastewater Reclamation Department.

16. The Contractor shall verify existence of all utilities by calling Blue Stake at 1-800-782-5348 48 hours prior to construction. All existing utility locations are approximate, and are shown using the best available data. The Contractor is responsible for verifying the depth and horizontal location of all underground utilities prior to construction. Any and all damage done by the Contractor to existing utilities during construction shall be the fault of the Contractor, with the Contractor bearing all financial responsibility.

17. The contractor shall install all permanent pavement markings, and all permanent Traffic Control Signs.

18. The contractor shall maintain access to all driveways, alleys, and mailboxes during construction. The Contractor will not restrict emergency vehicles, US Postal delivery, solid waste collections and/or access to the adjacent properties except as approved by the Engineer.

19. A copy of these plans shall be kept in an easily accessible location on the site at all times during construction.

20. Any excess excavated material shall become the property of the contractor, and shall be removed from the project site by the contractor.

21. Dimensions shall not be scaled from the drawings.

22. In the event that human remains, including human skeletal remains, cremations, and/or funerary objects are found during excavation or vicinity of the discovery. State laws ARS 41-865 and ARS 41-844 require that the Arizona State Museum be notified of the discovery at (520) 621-4795 so that cultural groups who claim cultural or religious affinity to them can make appropriate arrangements for the repatriation and reburial of the remains. The human remains will be removed from the site by a professional archaeologist pending consultation and review by the Arizona State Museum and the concerned cultural groups.

23. The contractor shall not damage natural growth within private property. All work shall be done within easements, roadways, and alleys.

24. When matching existing pavement or curb and gutter, the Contractor must verify existing elevations to ensure proper drainage and grades. Any discrepancies with the plans shall be immediately brought to the attention of the Engineer.

25. It shall be the contractor's responsibility to furnish, haul, and apply all water required for compaction, and for the control of dust from construction activity. The cost for this work is to be included in the construction price.

26. The contractor shall be responsible for the care, maintenance, repair or replacement of existing improvements in the work area which have been removed or damaged during the course of construction. All repair, replacement, or cleanup shall be done to the satisfaction of the owner.

27. Omissions or conflicts between various elements of the drawings, notes and details shall be brought to the attention of the Engineer and resolved before proceeding with the work.

INDEX OF SHEETS

DESIGN SHEET

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

2 OF 45

CITY OF TUCSON

NO.	DATE	REVISION	BY	CHKD.	APPR.

DRWN. BY	JR	09/2024	REF.	SCALE: NTS
DSGN. BY	JR	09/2024		
CHKD. BY	BK	09/2024	PLAN NO.	

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DREXEL ROAD DESIGN DATA

Design Speed = 40 mph
Posted Speed = 30 mph

Oak Tree Drive to Midvale Park Road
2026 ADT = 8,400
2045 ADT = 9,500

Midvale Park Road to Mahan Drive
2026 ADT = 9,300
2045 ADT = 10,600

Mahan Drive to Calle Santa Cruz
2026 ADT = 9,700
2045 ADT = 11,000

Calle Santa Cruz to Santa Clara Avenue
2026 ADT = 14,400
2045 ADT = 16,400

Design Vehicle

Collector and Local Intersections
Typical WB-40
Check CITY-BUS

Length of Project

Sta. 10+42.95 to Sta. 35+16.54 = 2473.59' = 0.47 miles

LEGEND

Legend Used is per PAG Standard Detail
for Public Improvements 2015 Edition
Detail 100 and 101 as follows:

New	Existing	Item
		Traffic Signal (Two Head)
		Guy Wire and/or Guy Pole
		Utility Pole
	T	Telephone Manhole
		Pavement Removal
		New Storm Drain
		New Right of Way
		Existing Right of Way
		Temporary Const. Esmt.

EARTHWORK SUMMARY	
Roadway Excavation	3,204 C.Y.
Drainage Excavation	1,165 C.Y.
Existing Pavement Removal	1,016 C.Y.
Pipe Excavation	C.Y.
Structural Excavation	460 C.Y.
Total Excavation	C.Y.
Roadway Embankment	5,452 C.Y.
Pipe & Trench Backfill	C.Y.
Structure Backfill	310 C.Y.
Waste	1,165 C.Y.
Borrow	1,712 C.Y.

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DESIGN SHEET

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

3 OF 45

CITY OF TUCSON

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CHKD. BY	BK	09/2024	PLAN NO.

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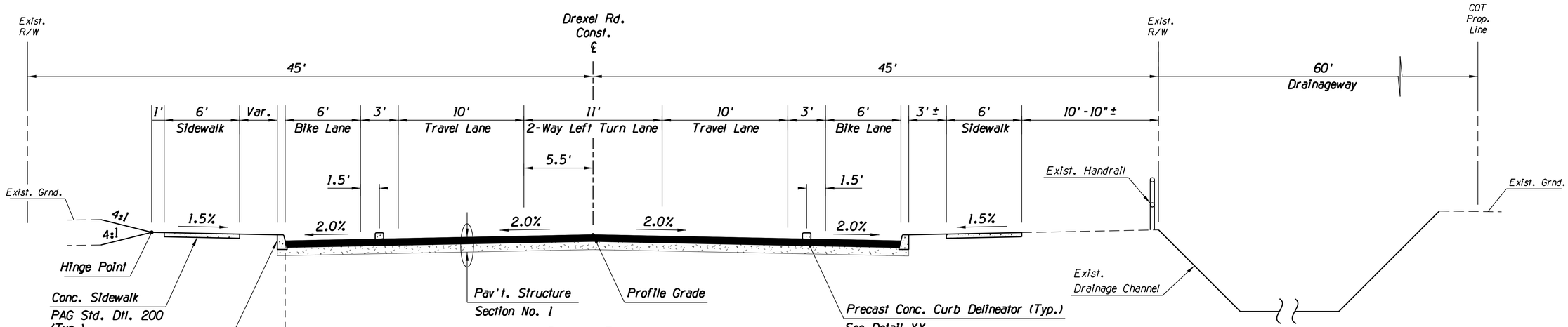
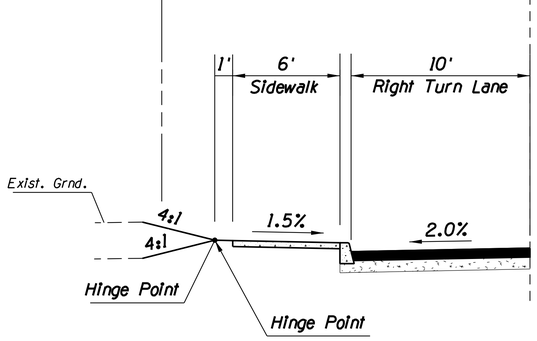
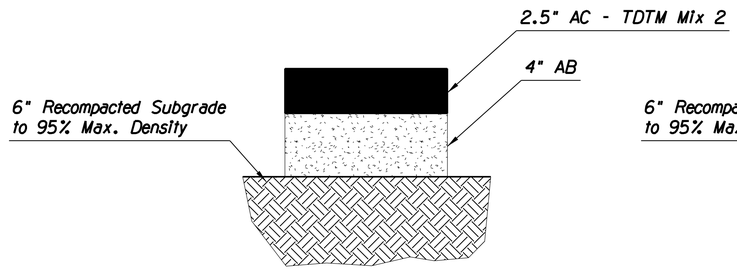


Drexel Road

Sta. 10+67 to Sta. 19+56
Sta. 19+29 to Sta. 19+56 (Mahan Dr. Intersection)
NOT TO SCALE



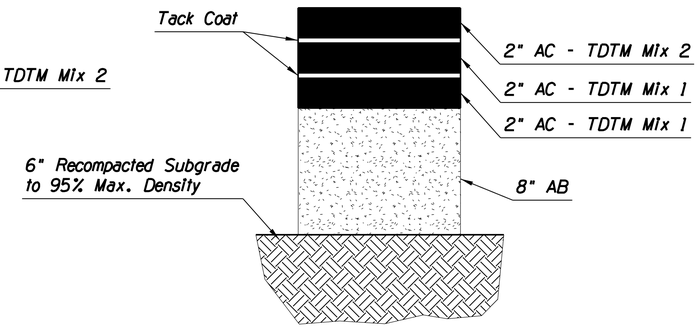
Sta. 10+67 to Sta. 11+77



Pavement Structure Section No. 2

Multi-Use Path

Note: Preliminary Design Subject to Change with Further Analysis



Pavement Structure Section No. 1

Drexel Road, Calle Santa Cruz

Note: Preliminary Design Subject to Change with Further Analysis

Note: All Lane Dimensions are Measured from the Center of Lane Line, Center of Double Lane Line, or Edge of Pavement, Unless Otherwise Noted.

TYPICAL SECTIONS

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

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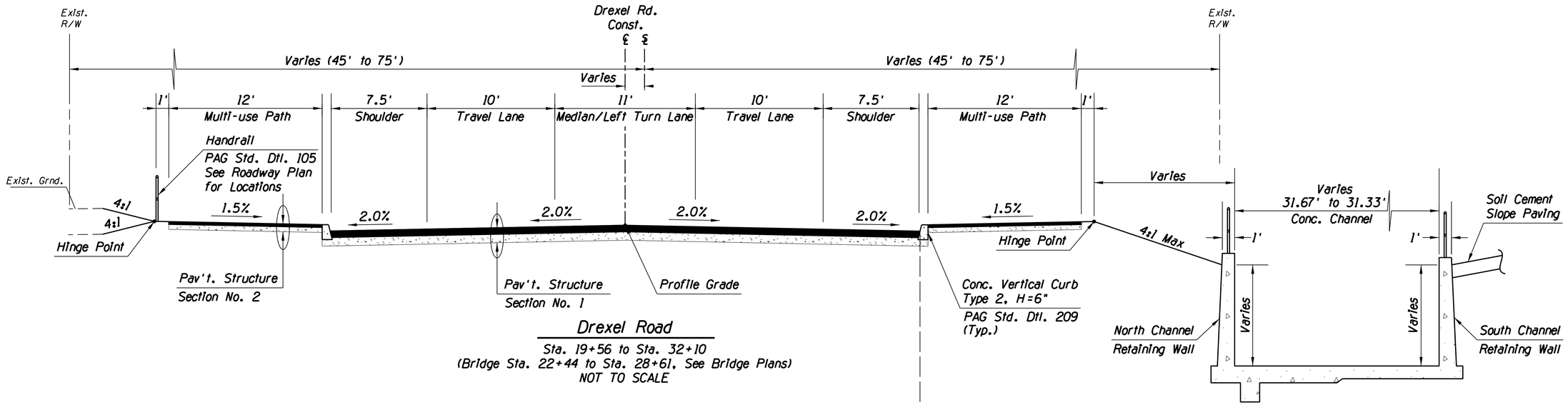
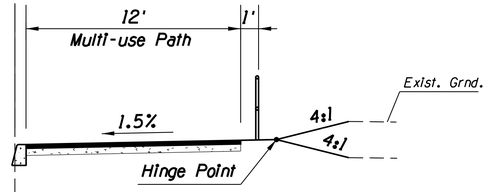


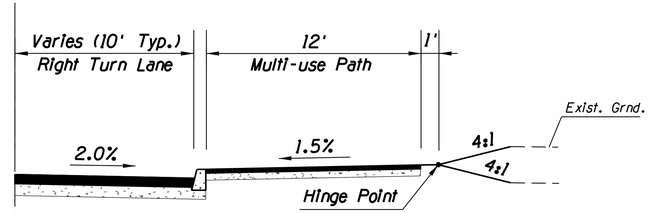
Drexel Road

Sta. 19+56 to Sta. 32+10
(Bridge Sta. 22+44 to Sta. 28+61, See Bridge Plans)
NOT TO SCALE

Note: See Retaining Wall Plans for Wall Elevations



Sta. 28+61 to Sta. 29+50
See Multi-Use Path Sections on Sheet 7.



Sta. 29+50 to Sta. 32+10

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TYPICAL SECTIONS

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION
DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

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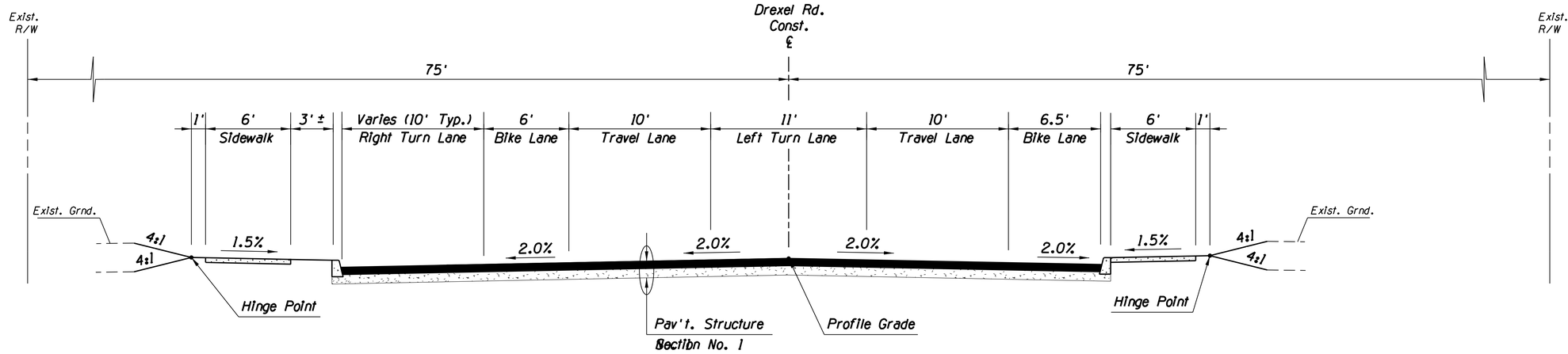
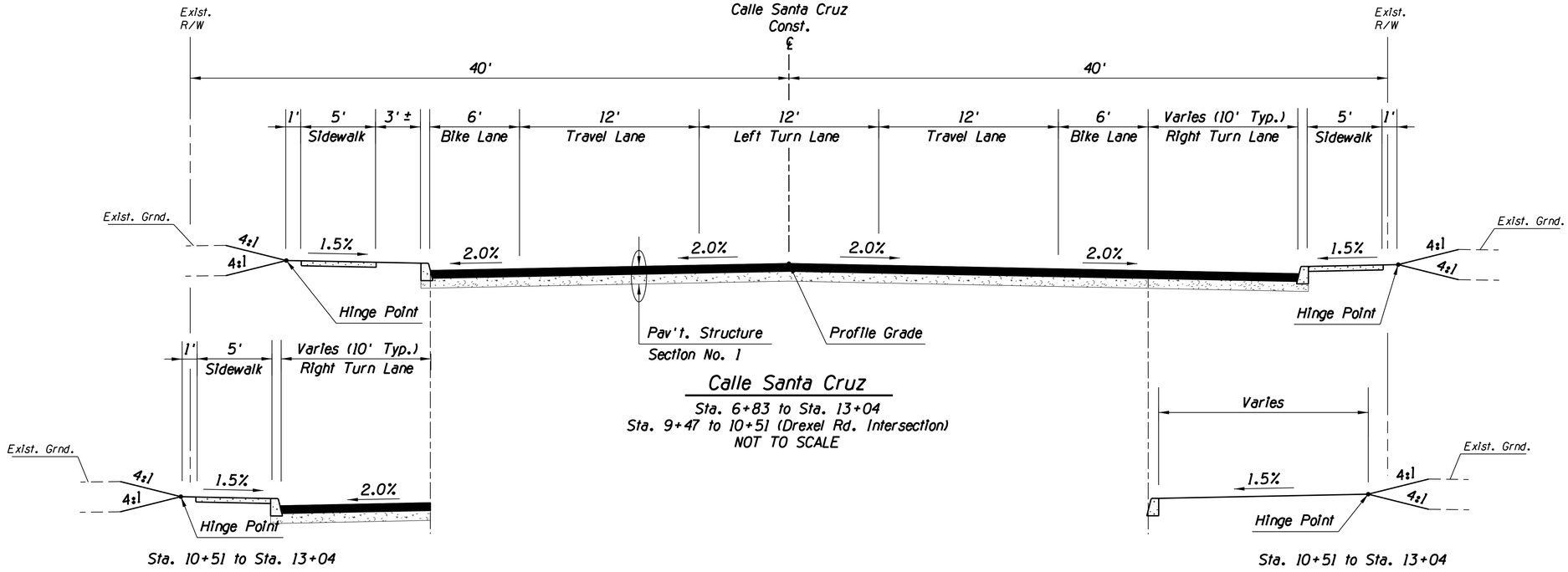


Drexel Road

Sta. 32+10 to Sta. 35+17
Sta. 32+10 to 32+96 (Calle Santa Cruz Intersection)
NOT TO SCALE



Calle Santa Cruz

Sta. 6+83 to Sta. 13+04
Sta. 9+47 to 10+51 (Drexel Rd. Intersection)
NOT TO SCALE

Sta. 10+51 to Sta. 13+04

Sta. 10+51 to Sta. 13+04

TYPICAL SECTIONS

Note: All Lane Dimensions are Measured from the Center of Lane Line, Center of Double Lane Line, or Edge of Pavement, Unless Otherwise Noted.

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

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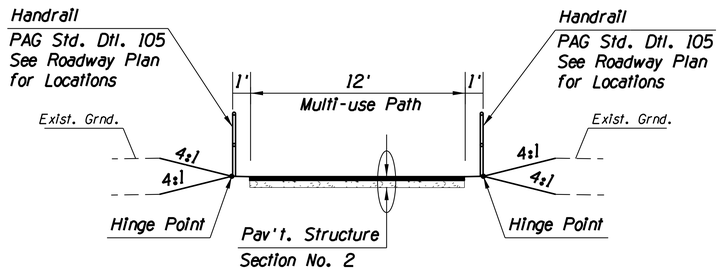
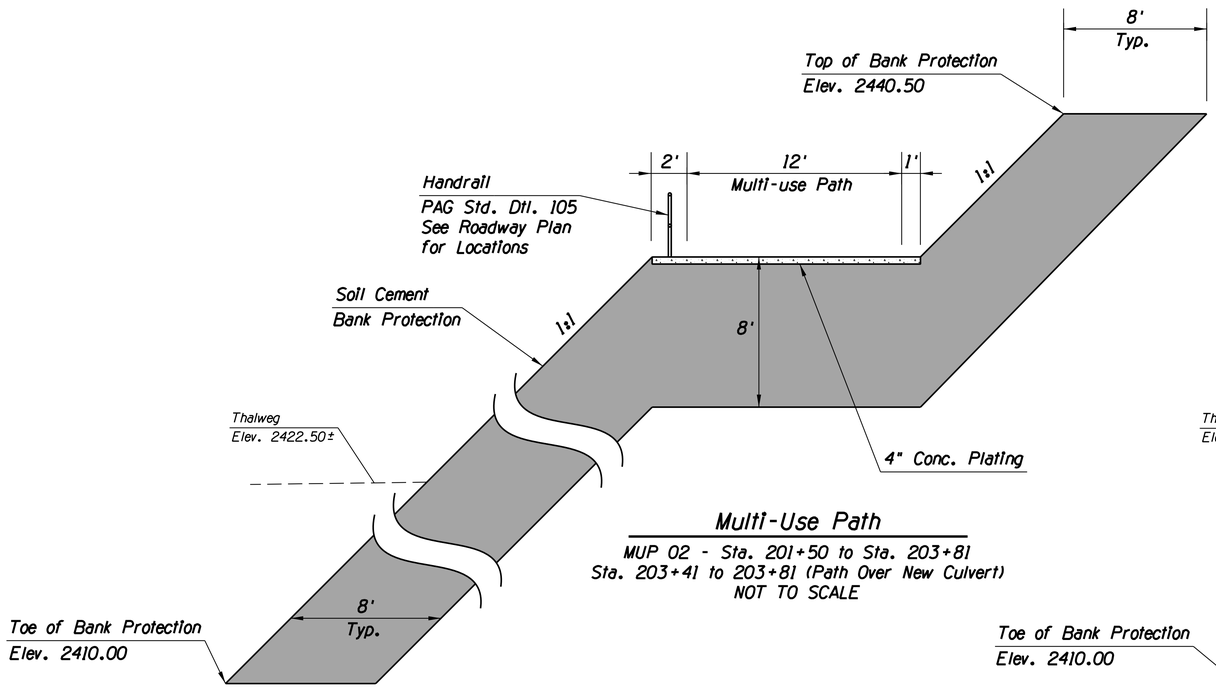


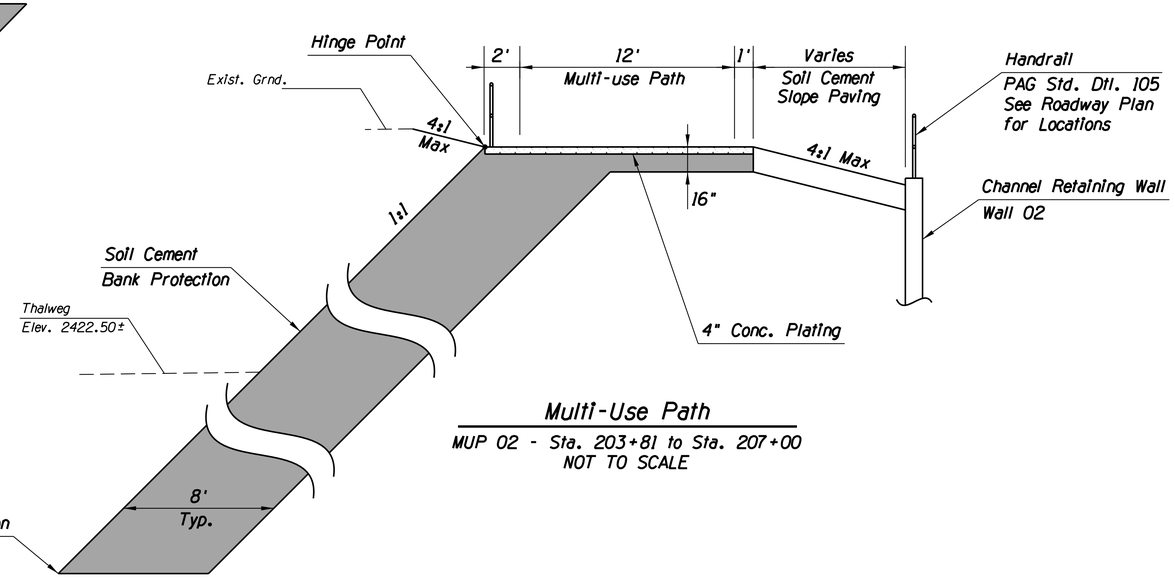
Multi-Use Path

MUP 01 - Sta. 100+00 to Sta. 102+53
MUP 02 - Sta. 200+00 to Sta. 201+50
MUP 02 - Sta. 207+00 to Sta. 209+39
NOT TO SCALE



Multi-Use Path

MUP 02 - Sta. 201+50 to Sta. 203+81
Sta. 203+41 to 203+81 (Path Over New Culvert)
NOT TO SCALE



Multi-Use Path

MUP 02 - Sta. 203+81 to Sta. 207+00
NOT TO SCALE

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TYPICAL SECTIONS - MULTI-USE PATH

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION
DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

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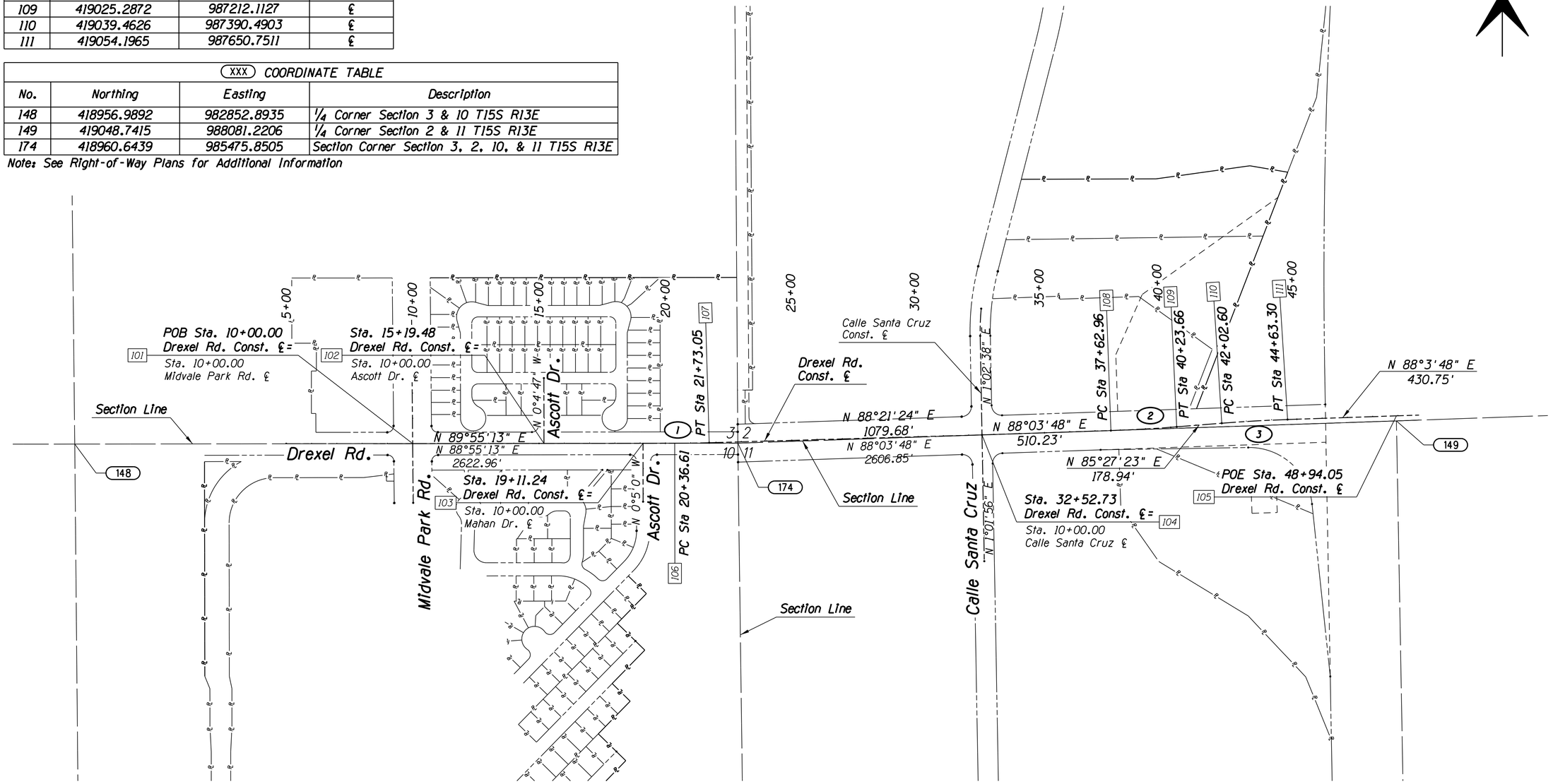
XXX CENTERLINE COORDINATE TABLE			
No.	Northing	Easting	Alignment
101	418958.8518	984189.6434	R/W and ℄
102	418959.5756	984709.1229	R/W and ℄
103	418960.1214	985100.8830	R/W and ℄
104	418993.3103	986441.9123	R/W and ℄
105	419068.7532	988081.2468	℄
106	418960.2961	985226.2499	℄
107	418962.3477	985362.6704	℄
108	419010.5534	986951.8519	℄
109	419025.2872	987212.1127	℄
110	419039.4626	987390.4903	℄
111	419054.1965	987650.7511	℄

XX ROADWAY CURVE DATA				
No.	Radius	Δ	Length	Tangent
1	5000.00'	1°33'49"	136.44'	68.22'
2	5729.58'	2°35'25"	260.70'	130.37'
3	5729.58'	2°35'25"	260.70'	130.37'

XXX COORDINATE TABLE			
No.	Northing	Easting	Description
148	418956.9892	982852.8935	1/4 Corner Section 3 & 10 T15S R13E
149	419048.7415	988081.2206	1/4 Corner Section 2 & 11 T15S R13E
174	418960.6439	985475.8505	Section Corner Section 3, 2, 10, & 11 T15S R13E

Note: See Right-of-Way Plans for Additional Information



GEOMETRIC LAYOUT

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CITY OF TUCSON

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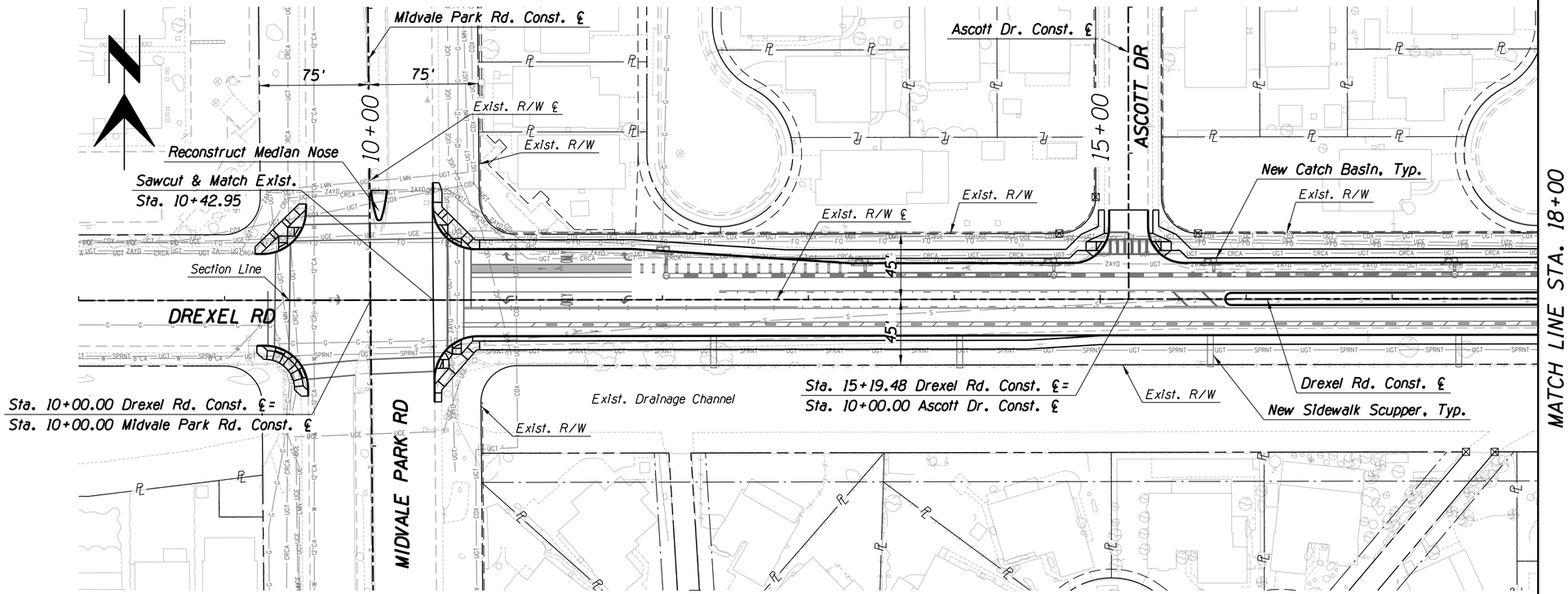

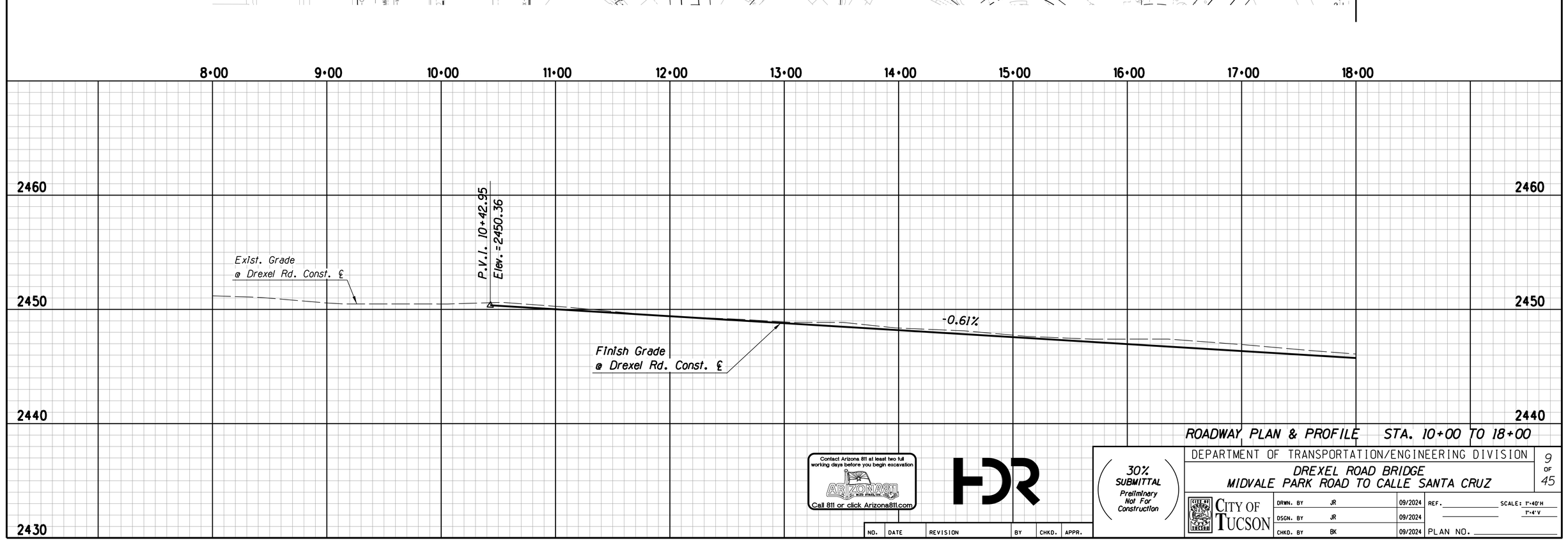

ROADWAY PLAN & PROFILE STA. 10+00 TO 18+00

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MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
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MATCH LINE STA. 18+00

MATCH LINE STA. 30+00

Exist. 3 - 36" RCP
Remove, Salvage, & Reconstruct

Exist. R/W

20+00

25+00

Handrail

12' Multi-Use Path

Bank Protection

Exist. R/W

Sta. 19+11.24 Drexel Rd. Const. ℄ =
Sta. 10+00.00 Mahan Dr. Const. ℄

New Catch Basin, Typ.

Handrail

Exist. R/W ℄

75'

75'

DREXEL RD

Section Line

Bank Protection

Drexel Rd. Const. ℄

Handrail

Handrail

Exist. R/W

Retaining Wall

Handrail

Exist. R/W

New 3 - 48" RCP

Exist. R/W

Bank Protection

MAHAN DR

Exist. R/W

Drexel Road Bridge
See Bridge Plan Sheets

26'

30'

Exist. R/W

Bank Protection

Section Line

Mahan Dr. Const. ℄

Exist. 3 - 48" CMP
Remove, Salvage, Reconstruct & Extend

18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00

2450

2440

2430

2420

150' VC
S.D. =812'

B.V.C. 18+63.00
Elev. =2445.36

E.V.C. 20+13.00
Elev. =2446.09

-0.61%

1.59%

P.V.I. 19+38.00
Elev. =2444.90

Exist. Grade
@ Drexel Rd. Const. ℄

B.V.C. 22+05.00
Elev. =2449.14

100-Year
WSE = 2439.68

650' VC
S.D. =735'

P.V.I. 25+30.00
Elev. =2454.31

Finish Grade
@ Drexel Rd. Const. ℄

-1.04%

E.V.C. 28+55.00
Elev. =2450.93

ROADWAY PLAN & PROFILE STA. 18+00 TO 30+00

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

10 OF 45

CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
DSGN. BY	JR	09/2024	SCALE: 1"=40'H, 1"=4'V
CHKD. BY	BK	09/2024	PLAN NO.

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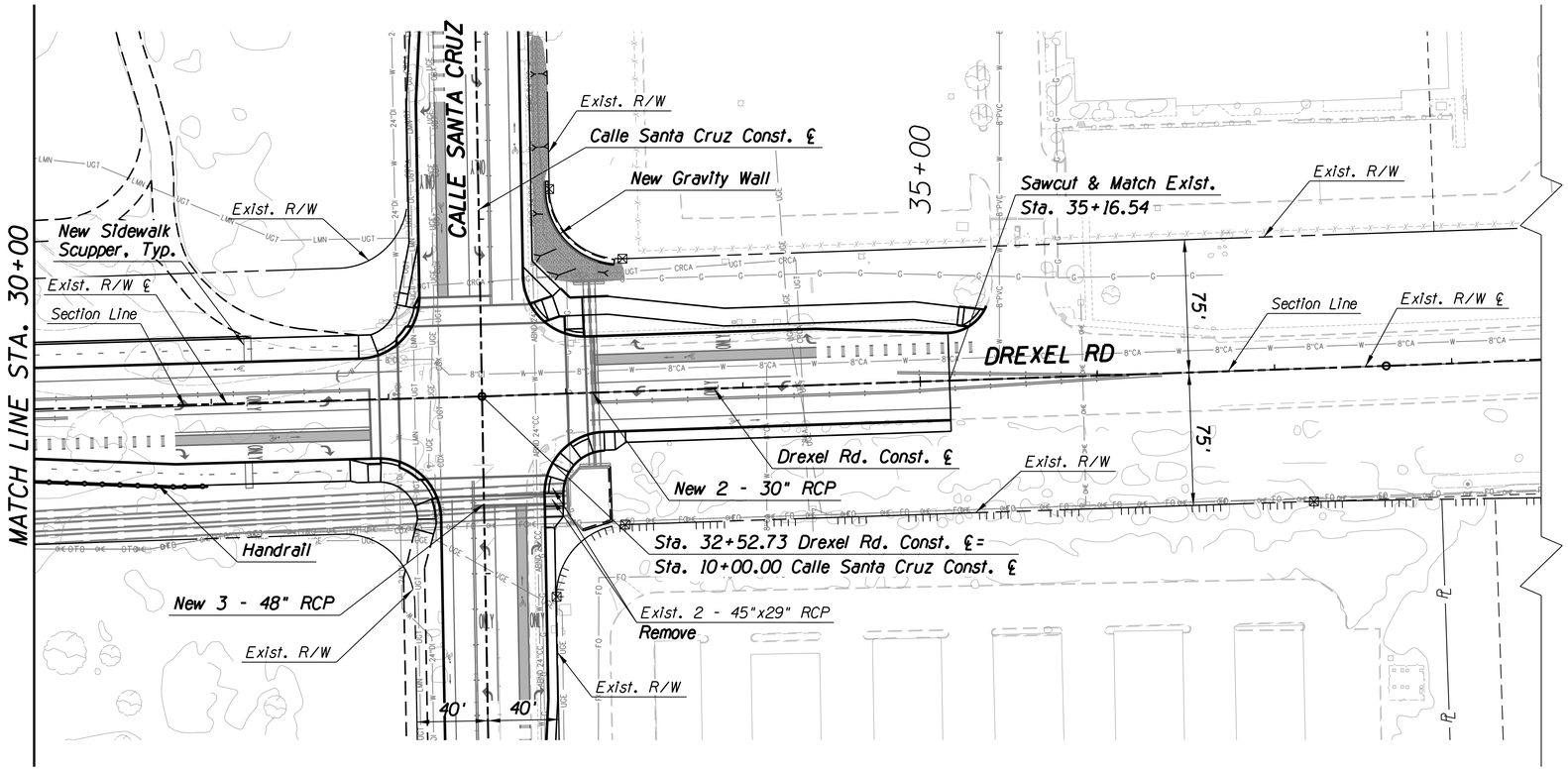

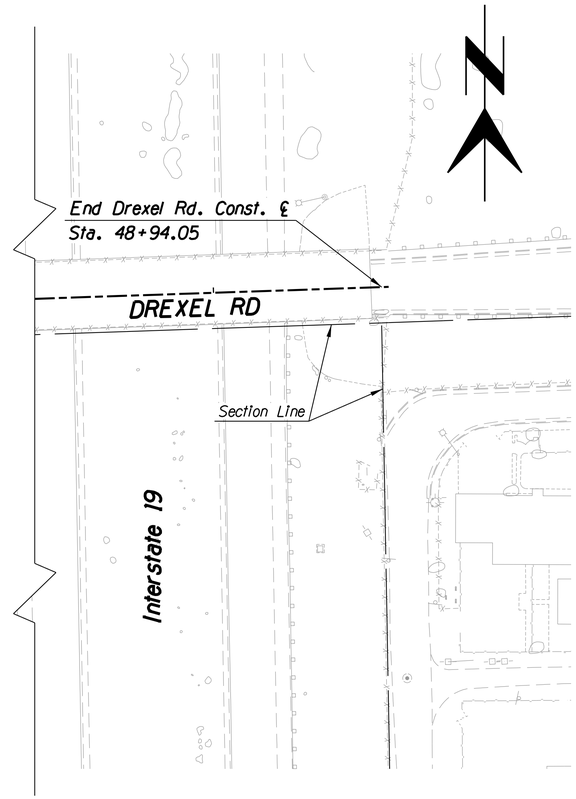

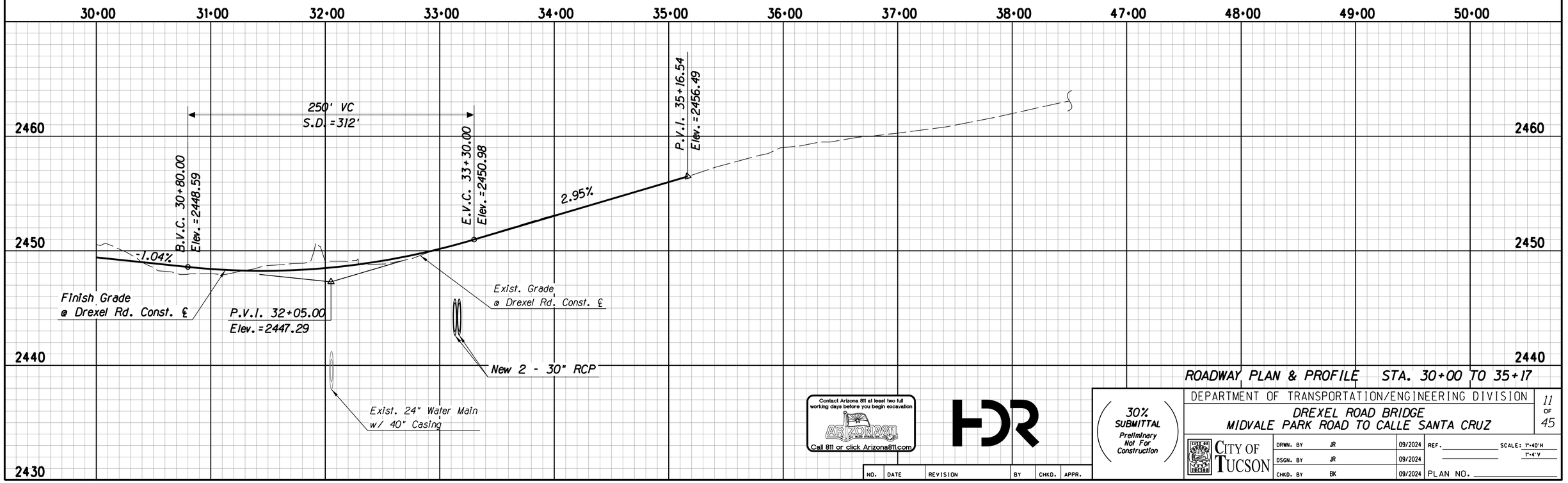

ROADWAY PLAN & PROFILE STA. 30+00 TO 35+17

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

11 OF 45

CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
DSGN. BY	JR	09/2024	SCALE: 1"=40'H, 1"=4'V
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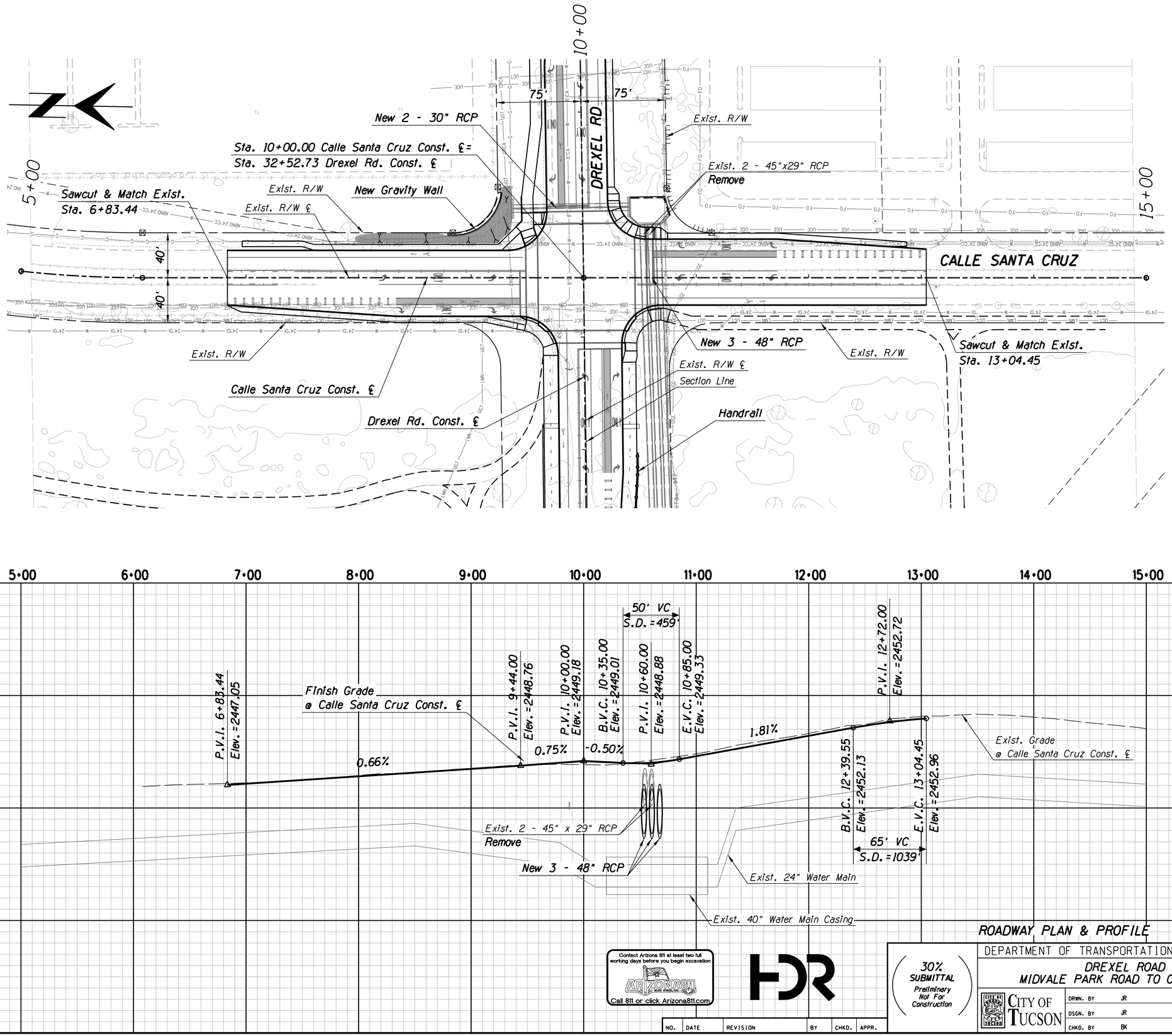

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ROADWAY PLAN & PROFILE CALLE SANTA CRUZ

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

12 OF 45

CITY OF TUCSON

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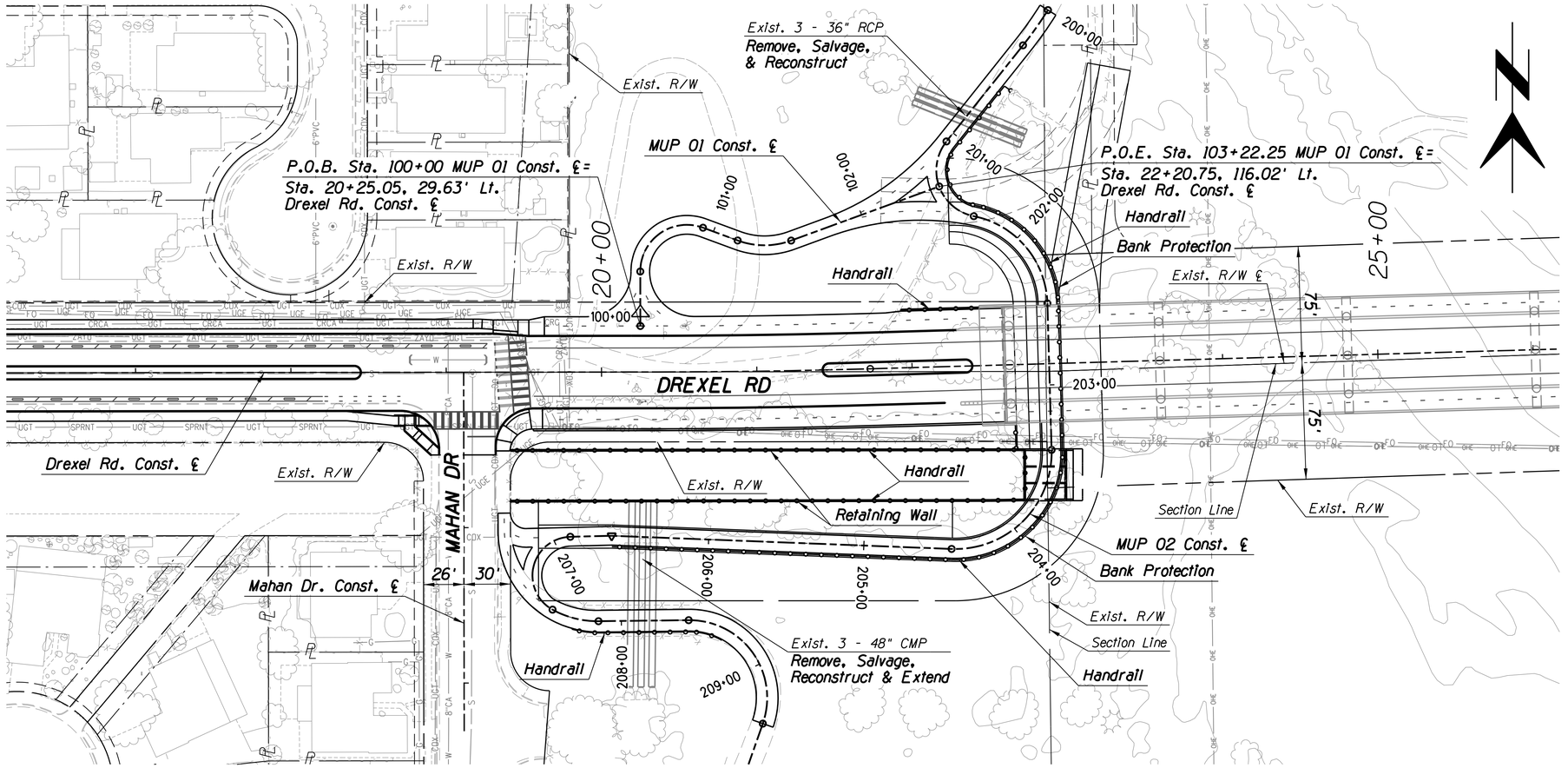

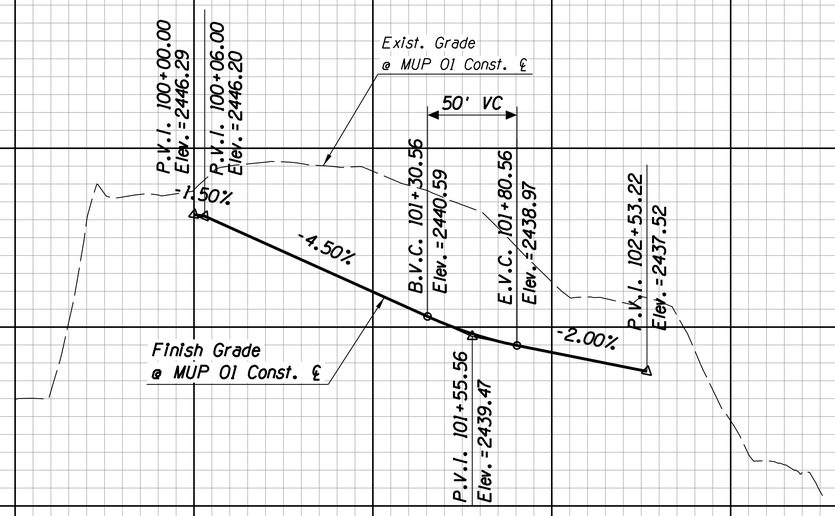

MULTI-USE PATH PLAN & PROFILE

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

13 OF 45

CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
DSGN. BY	JR	09/2024	SCALE: 1"=40'H, 1"=4'V
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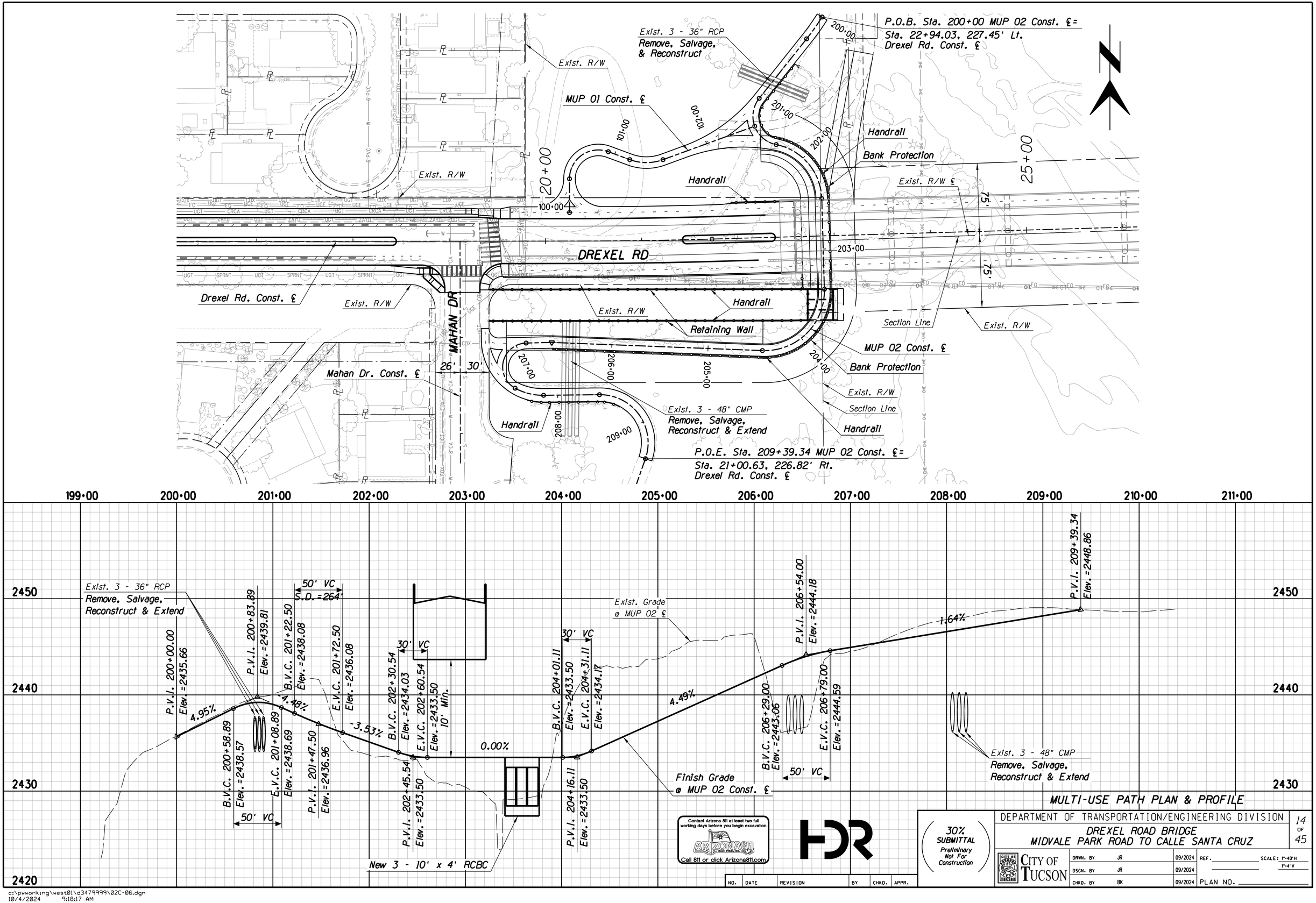

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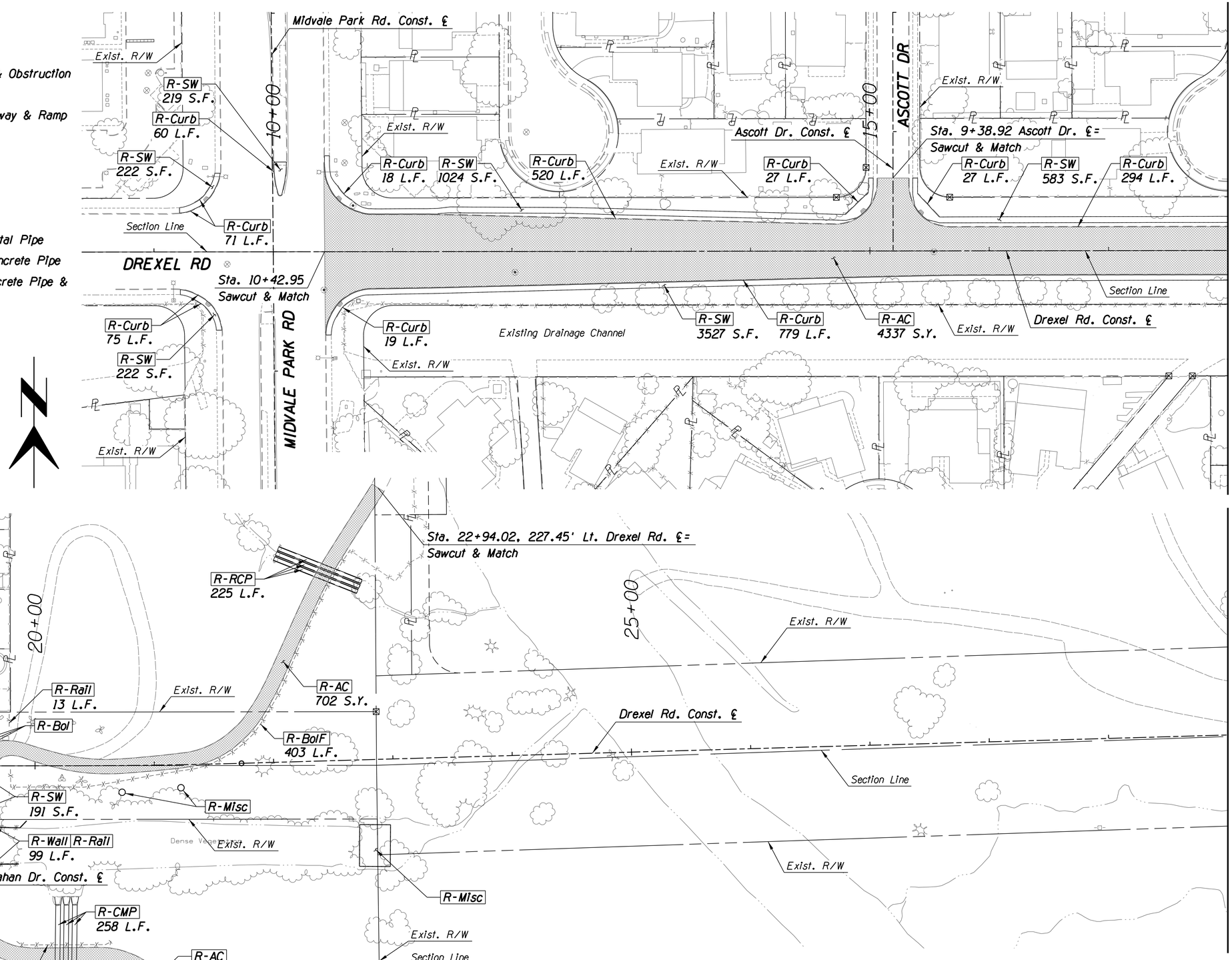
LEGEND

Symbol	Description
R-Misc	Remove Miscellaneous Structure & Obstruction
R-Curb	Remove Curb
R-SW	Remove Concrete Sidewalk, Driveway & Ramp
R-AC	Remove A.C. Pavement
R-Rail	Remove Handrail
R-Bol	Remove Bollard
R-BolF	Remove Bollard Fencing
R-Wall	Remove Concrete Wall
R-CMP	Remove & Salvage Corrugated Metal Pipe
R-RCP	Remove & Salvage Reinforced Concrete Pipe
R-ERCP	Remove Elliptical Reinforced Concrete Pipe & Inlet/Outlet Structures



DEMOLITION PLAN SHEET 1 OF 2

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

15 OF 45

CITY OF TUCSON

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DSGN. BY	JR	09/2024		
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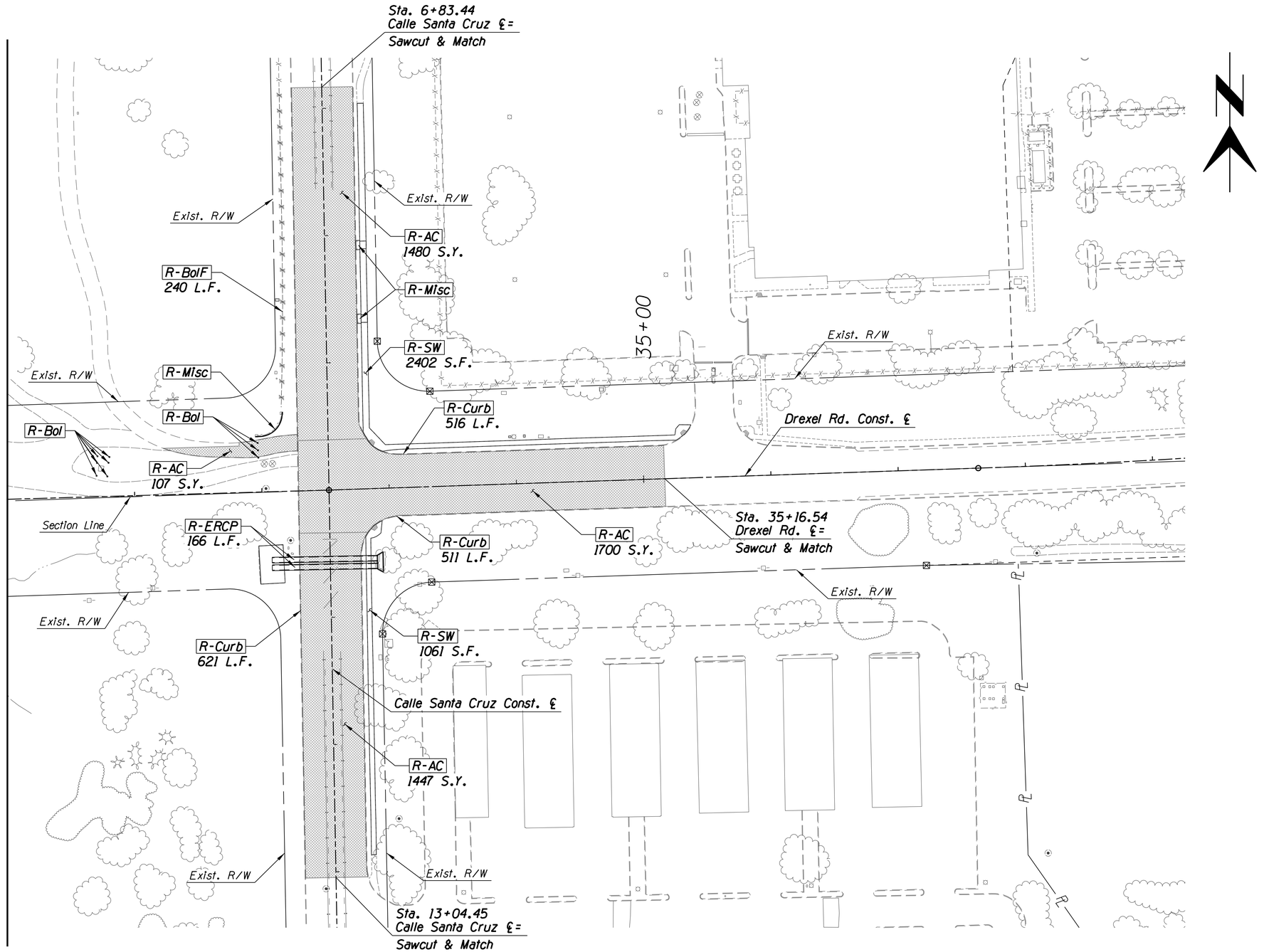

DEMOLITION PLAN SHEET 2 OF 2

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
DSGN. BY	JR	09/2024	SCALE: 1"=40'H, 1"=4'V
CHKD. BY	BK	09/2024	PLAN NO.

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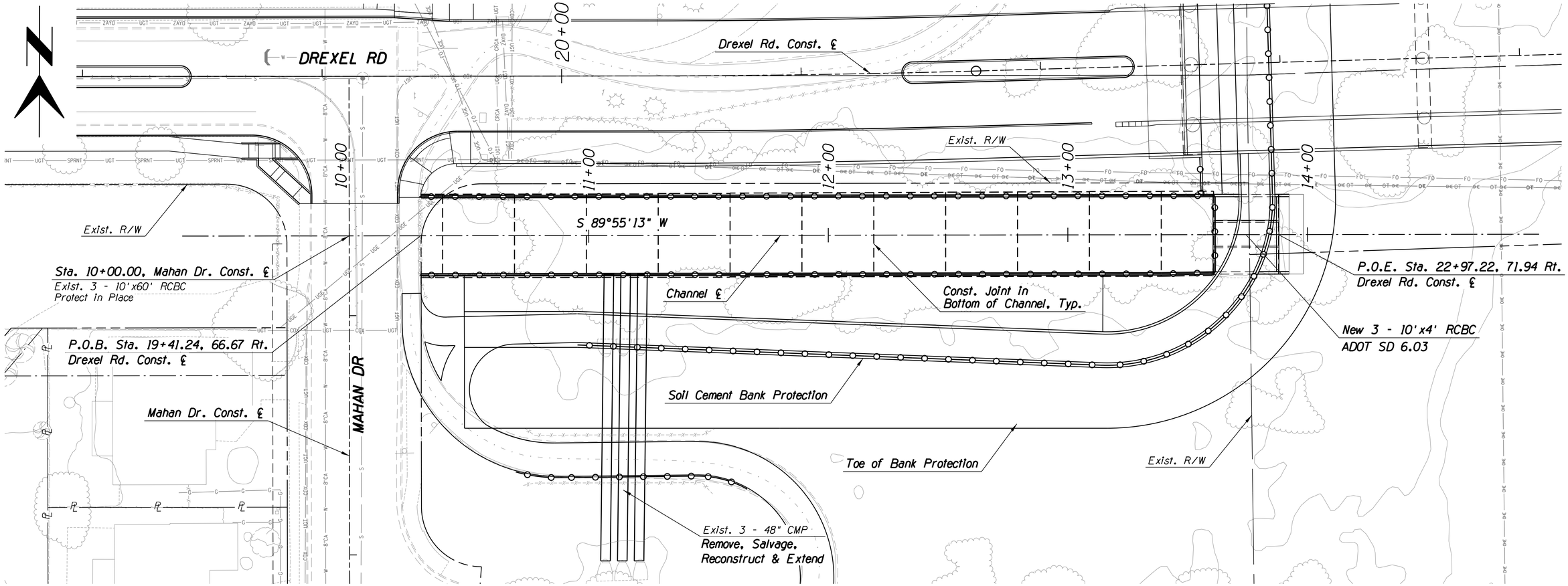

CHANNEL / CULVERT PLAN & PROFILE SHEET 1 OF 4

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

17 OF 45

CITY OF TUCSON

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DSGN. BY	JR	09/2024	SCALE: 1"=20'H, 1"=4'V
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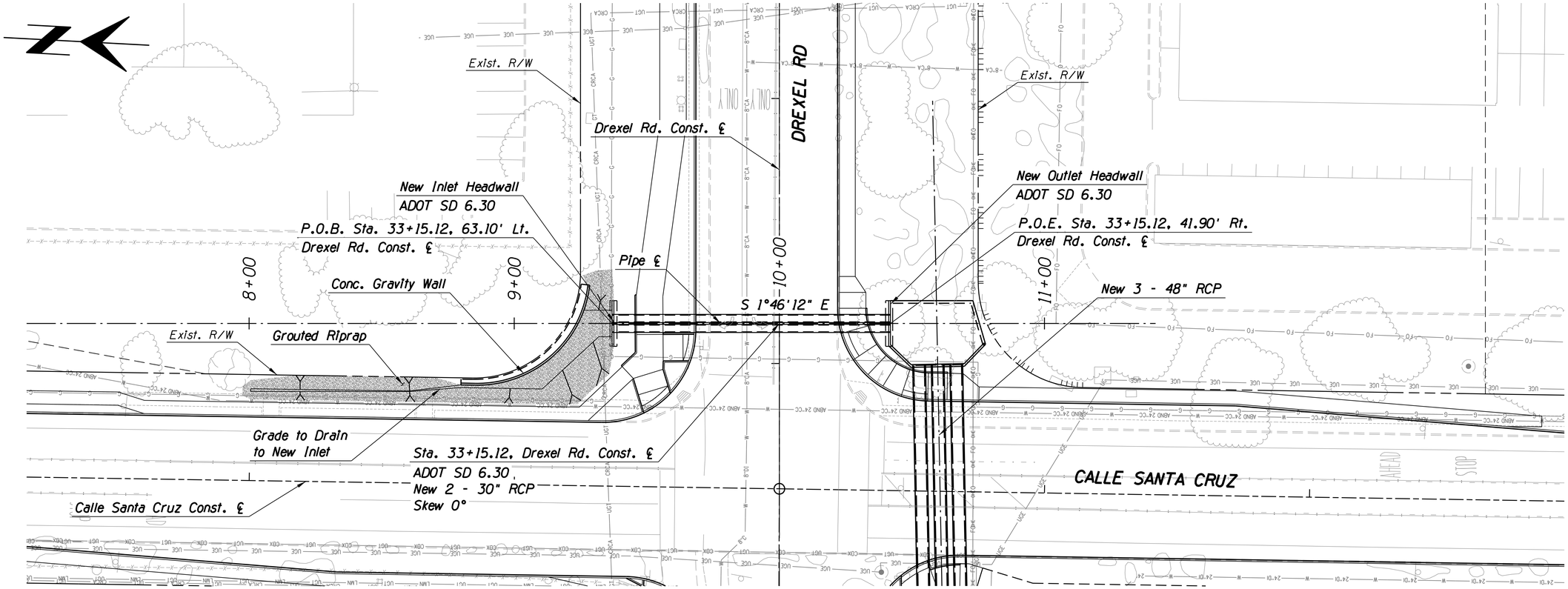

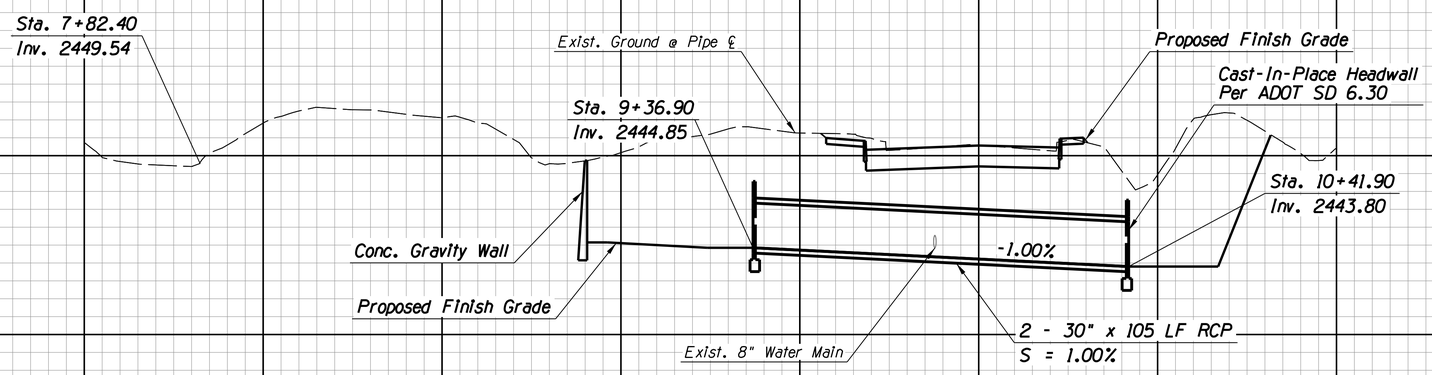

CULVERT PLAN & PROFILE

SHEET 2 OF 4

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

18 OF 45

CITY OF TUCSON

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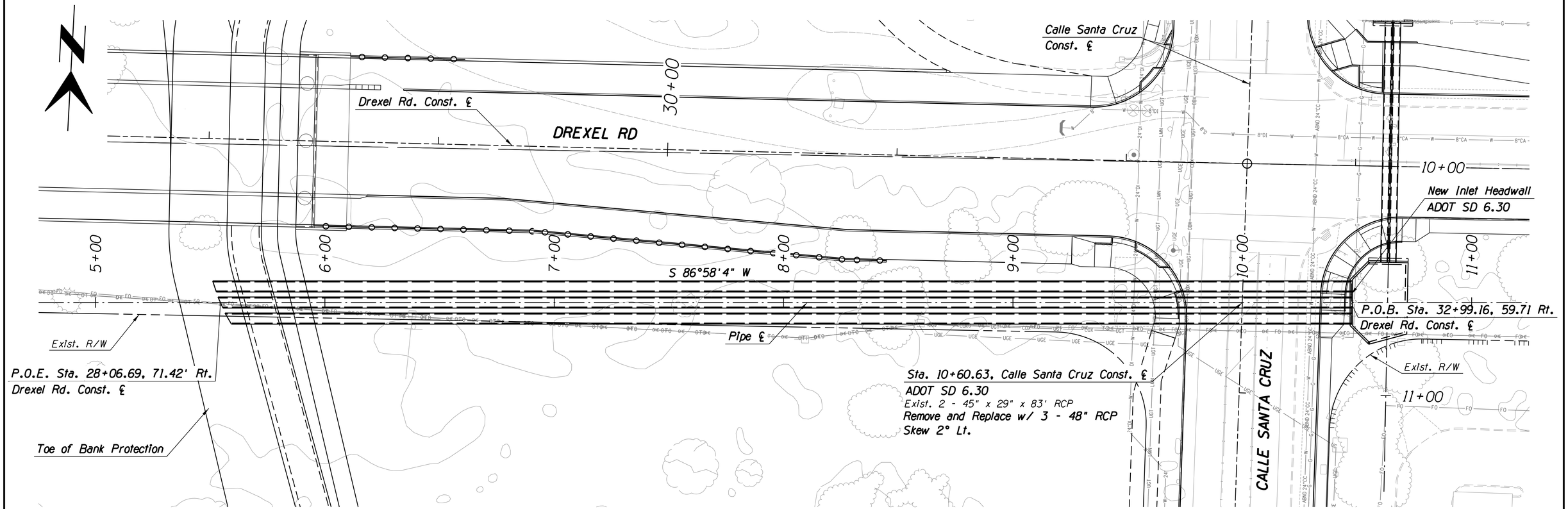

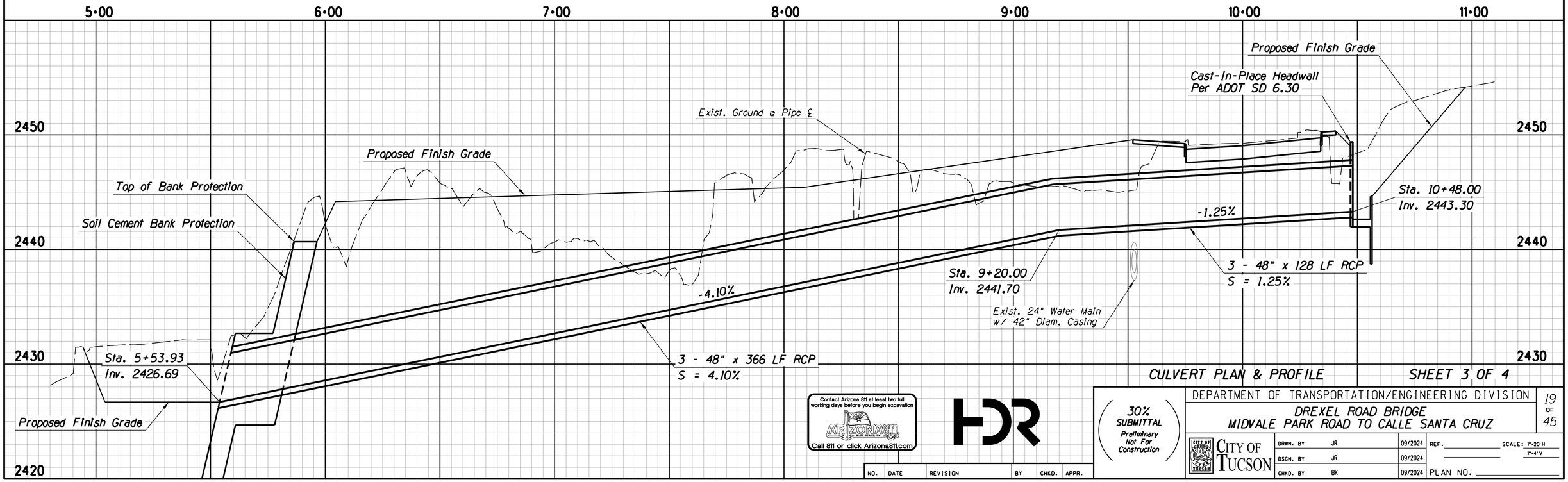

CULVERT PLAN & PROFILE SHEET 3 OF 4

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

19 OF 45

CITY OF TUCSON

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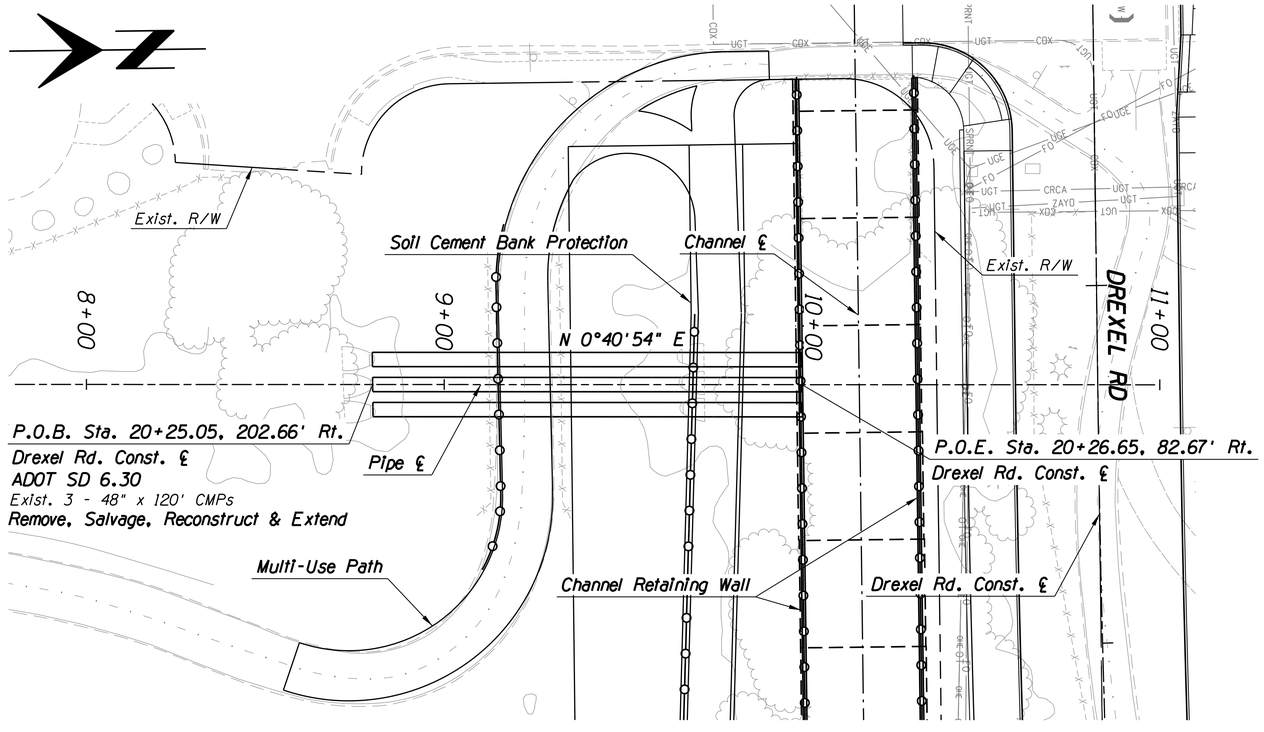

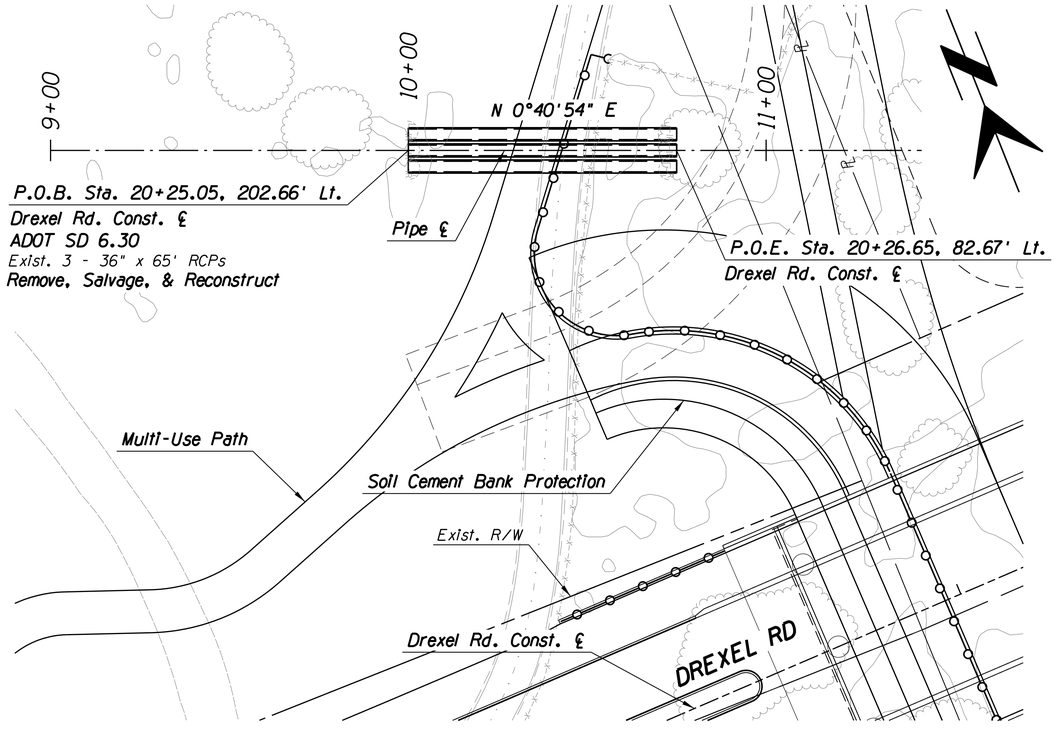

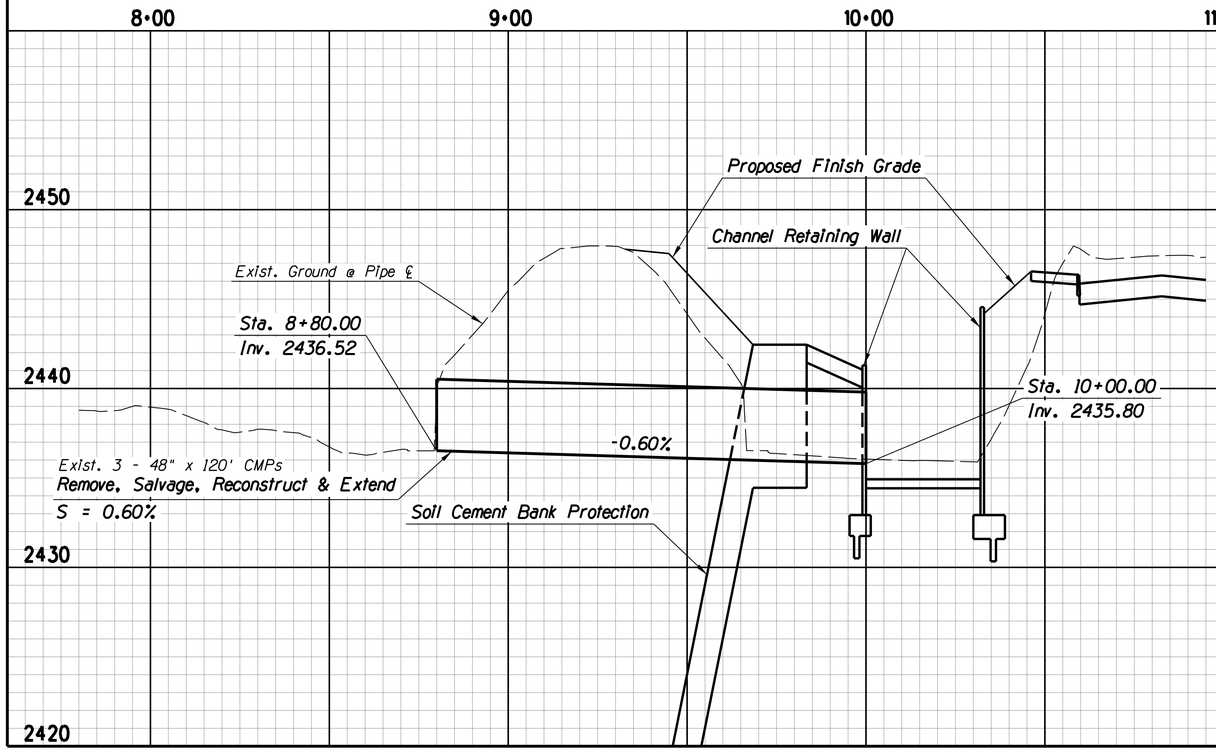

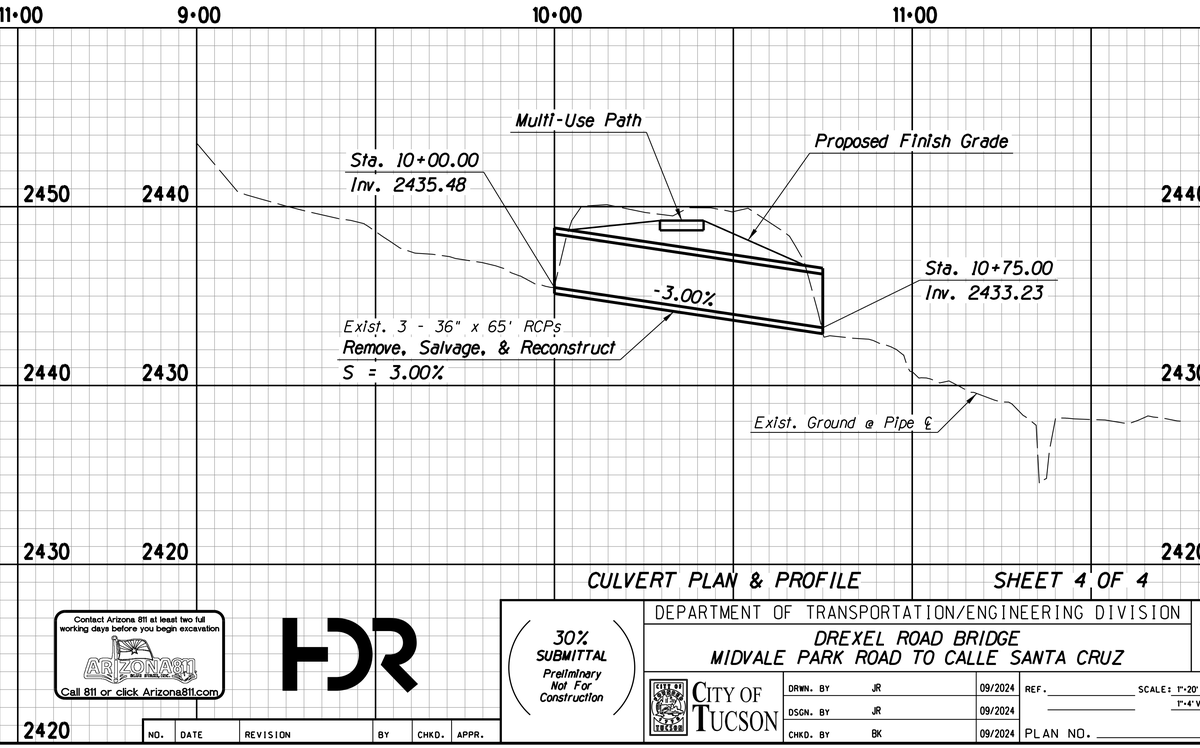

CULVERT PLAN & PROFILE SHEET 4 OF 4

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
DSGN. BY	JR	09/2024	SCALE: 1"=20'H, 1"=4'V
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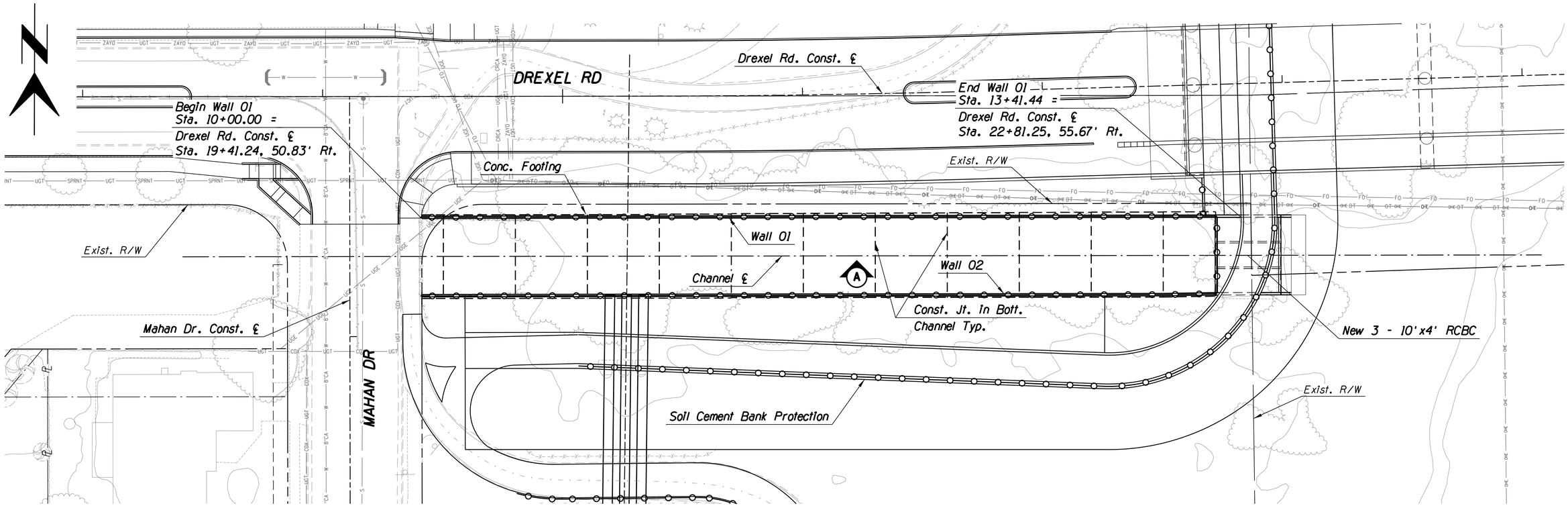

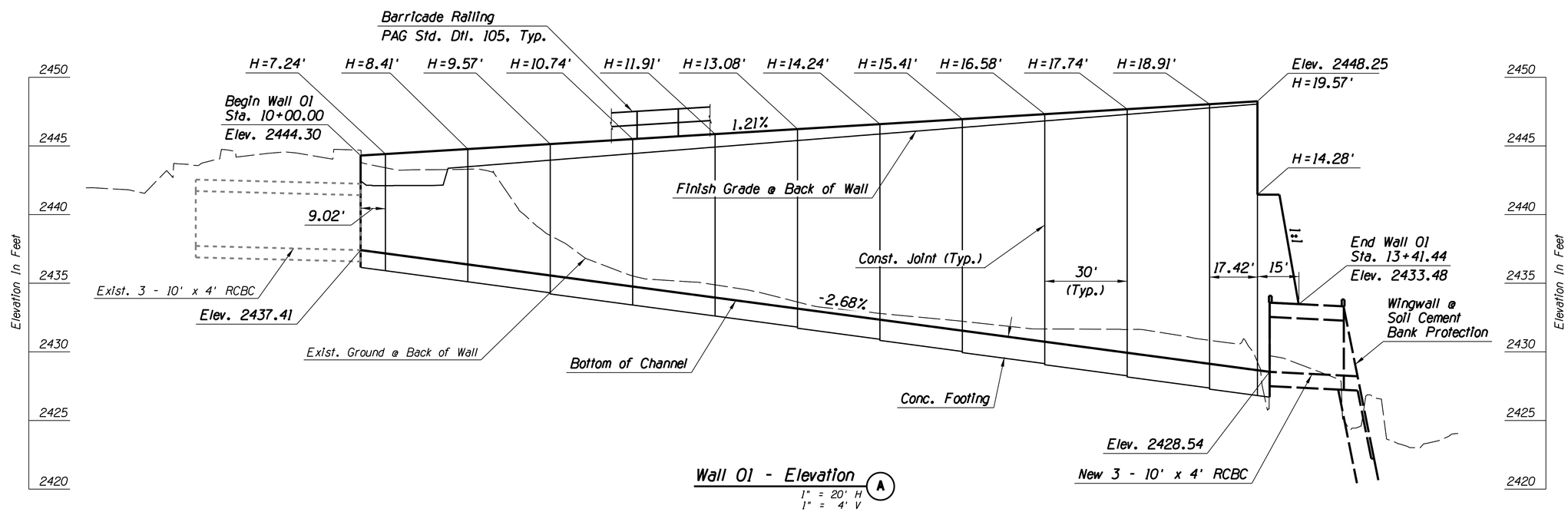

Wall 01 - Elevation (A)
1" = 20' H
1" = 4' V

RETAINING WALL / DRAINAGE CHANNEL

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

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CITY OF TUCSON

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DSGN. BY	JR	09/2024	SCALE: 1"=20'H, 1"=4'V
CHKD. BY	BK	09/2024	PLAN NO.

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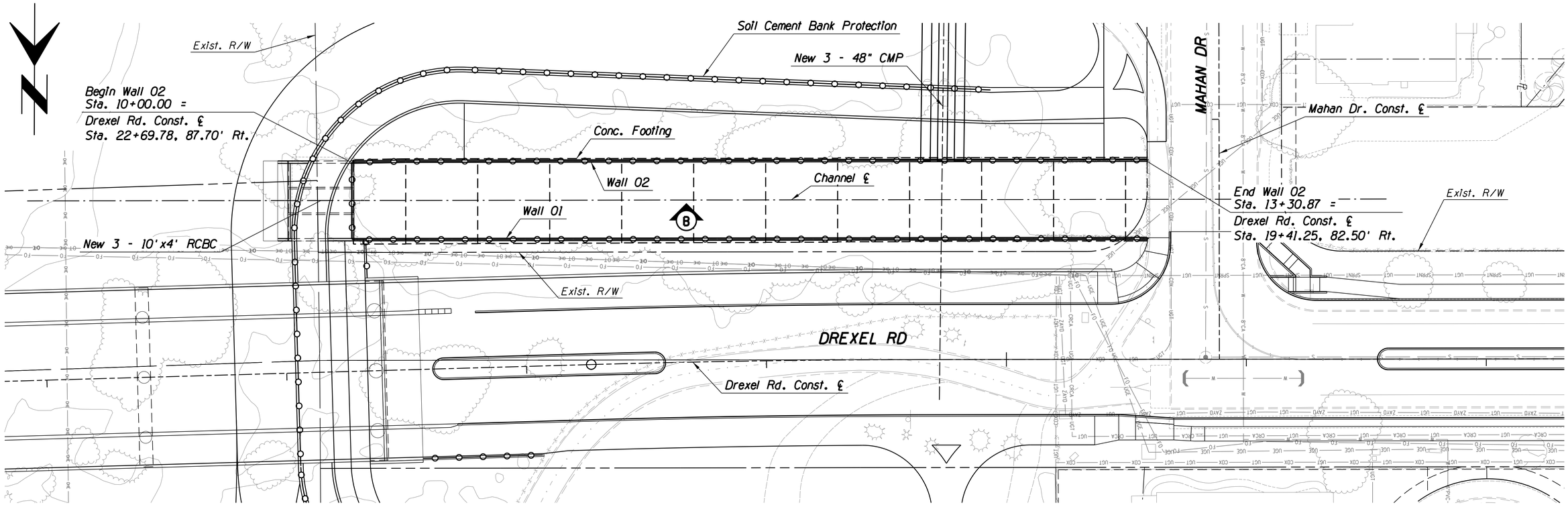

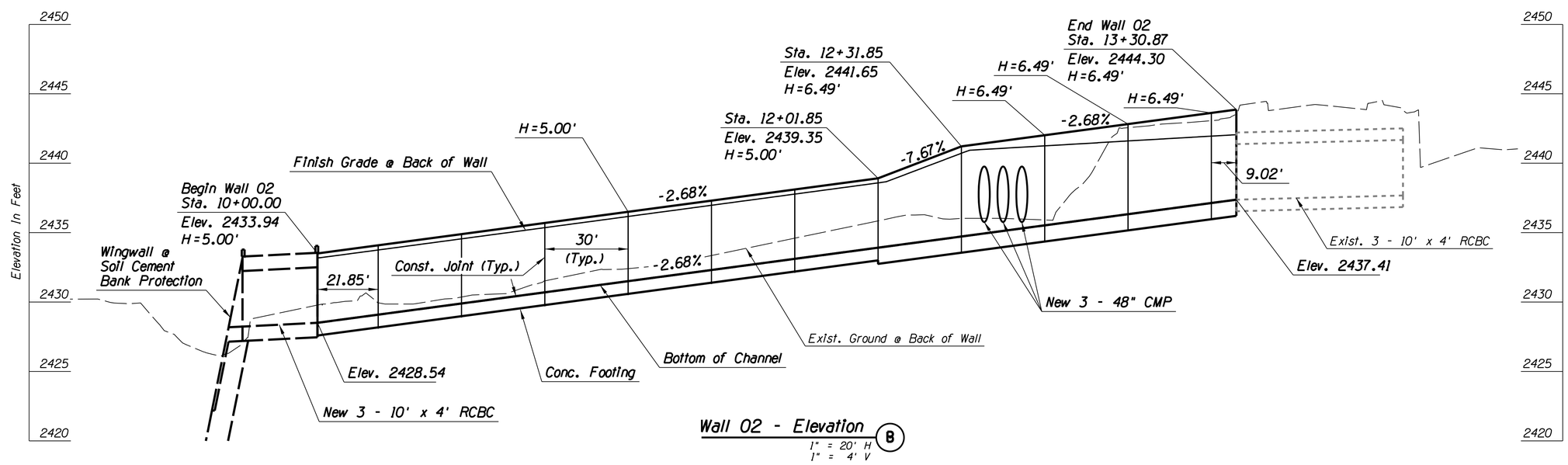

Wall 02 - Elevation (B)

1" = 20' H
1" = 4' V

RETAINING WALL / DRAINAGE CHANNEL

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

22 OF 45

CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
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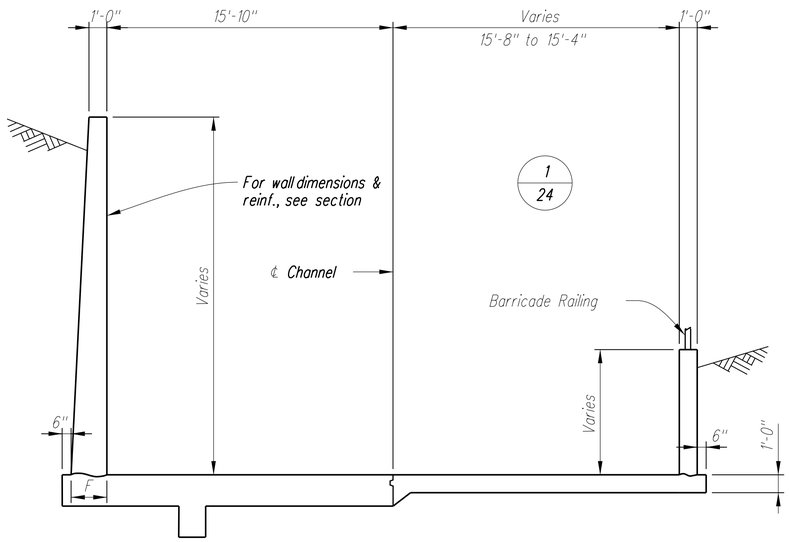
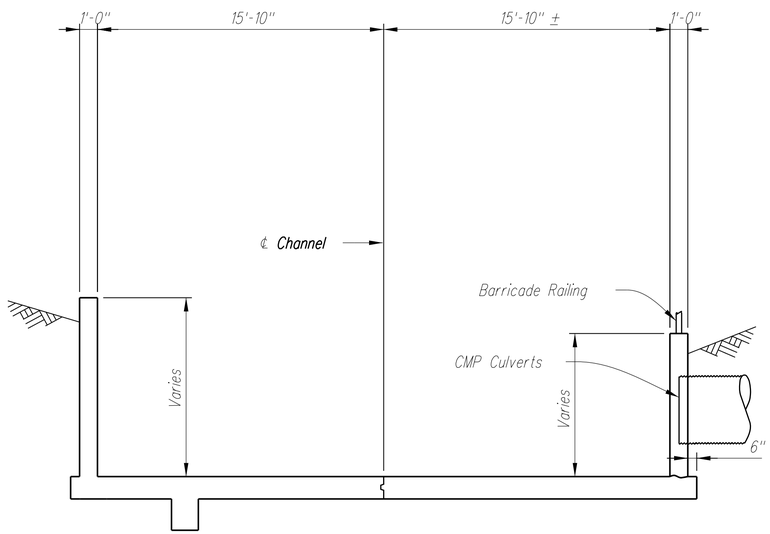
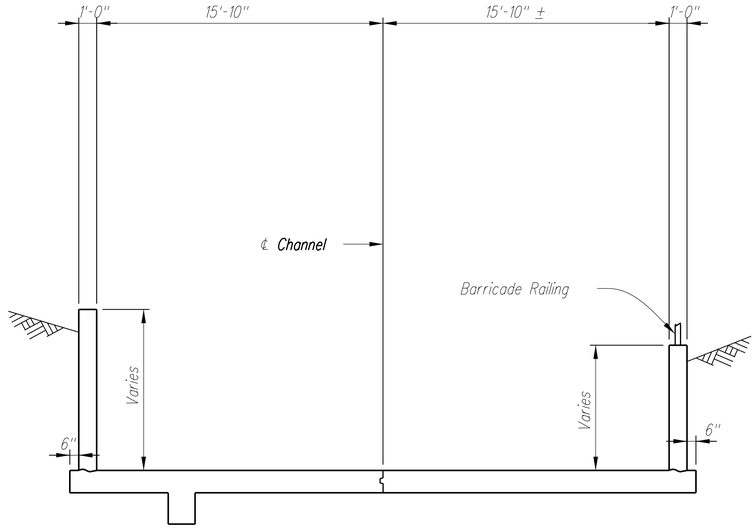


Section 1



Section 2



Section 3

Notes:

1. *See General Notes on Sheet RWX.XX.*
2. *See Sheet RWX.XX for Foundation Preparation Requirements.*
3. *Retaining Walls are designed for level fill with 2' surcharge.*

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DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

CITY OF TUCSON

DRWN. BY	RMK	09/2024	REF.
DSGN. BY	RMK	09/2024	SCALE:
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Drainage Channel Details

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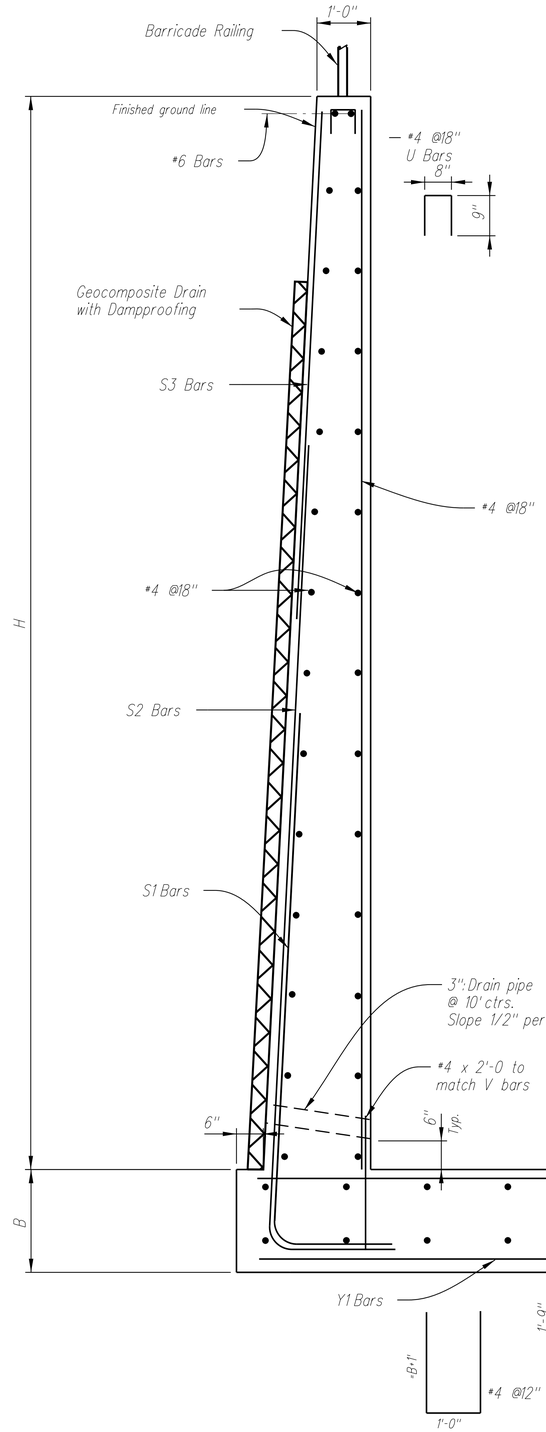

Section- Conc. Drainage Channel
3/4"=1'0

1

Schedule

Dimensions			Steel List																	
			S1			S2			S2			V	Y1		Y2		T	
H & H'	B & B'	F	Bar Size	Spacing	Length	Bar Size	Spacing	Length	Bar Size	Spacing	Length	Length	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing
5'	1'-0	1'-0	5	12"	6'-6							4'-9	9	6"	9	6"	5	12"
6'	1'-0	1'-0	5	12"	7'-6							5'-9	9	6"	9	6"	5	12"
7'	1'-2	1'-0	6	12"	8'-9							6'-9	9	6"	9	6"	5	12"
8'	1'-2	1'-0	6	9"	9'-9							7'-9	9	6"	9	6"	5	12"
9'	1'-2	1'-0	6	9"	10'-9							8'-9	9	6"	9	6"	5	12"
10'	1'-3	1'-0	7	12"	12'-0							9'-9	9	6"	9	6"	6	12"
11'	1'-3	1'-0	6	12"	4'-9	6	12"	12'-9				10'-9	9	6"	9	6"	7	12"
12'	1'-3	1'-2	6	12"	5'-0	6	12"	13'-9				11'-9	9	6"	9	6"	7	12"
13'	1'-3	1'-3	7	12"	7'-6	5	12"	14'-9				12'-9	9	6"	9	6"	8	12"
14'	1'-3	1'-4	7	12"	7'-3	6	12"	15'-9				13'-9	9	6"	9	6"	8	12"
15'	1'-4	1'-5	8	12"	8'-9	6	12"	17'-0				14'-9	9	6"	9	6"	8	12"
16'	1'-5	1'-6	7	12"	7'-0	7	12"	9'-0	6	12"	10'-9	15'-9	9	6"	9	6"	7	8"
17'	1'-6	1'-7	8	12"	8'-0	7	12"	9'-0	6	12"	10'-9	16'-9	9	6"	9	6"	7	8"
18'	1'-7	1'-8	7	10"	7'-6	7	10"	10'-0	6	10"	11'-0	17'-9	9	6"	9	6"	9	10"
19'	1'-8	1'-9	8	12"	8'-0	8	12"	12'-6	6	12"	10'-9	18'-9	9	6"	9	6"	8	8"
20'	1'-9	1'-10	9	12"	9'-6	8	12"	13'-3	6	12"	11'-0	19'-9	10	6"	9	6"	9	9"

Notes:

1. See General Notes on Sheet RWX.XX.
2. See ADOT STD SD7.01 for additional information.
3. Retaining Walls are designed for level fill with 2' surcharge (traffic).
4. Extend Geocomposite Drain Material 6" below Drain Pipe. Cut a 3" diameter hole in Geocomposite Drain Material at the Drain Pipe. Do not cut the Filter Fabric.
5. Spacing of reinforcing steel shall be measured along wall layout line.
6. Use Class B Tension Splices where two bars of different size are lapped. Splice length to be equal to the larger bar's tension lap splice. #5: 2'0 #6: 2'-5" #7: 2'-10" #8: 3'-2" #9: 3'-7"
7. Backfill placement behind walls shall not occur until the wall and channel bottom on the opposite side of the channel are constructed and backfill behind short stem wall is in place.
8. For design height, use high end of construction segment rounded up to the next foot.
9. Shear key maintains a constant depth and thickness for the entirety of the wall length.

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DRAINAGE CHANNEL DETAILS

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

CITY OF TUCSON

DRWN. BY	RMK	09/2024	REF.
DSGN. BY	RMK	09/2024	SCALE:
CHKD. BY	TWB	09/2024	PLAN NO.

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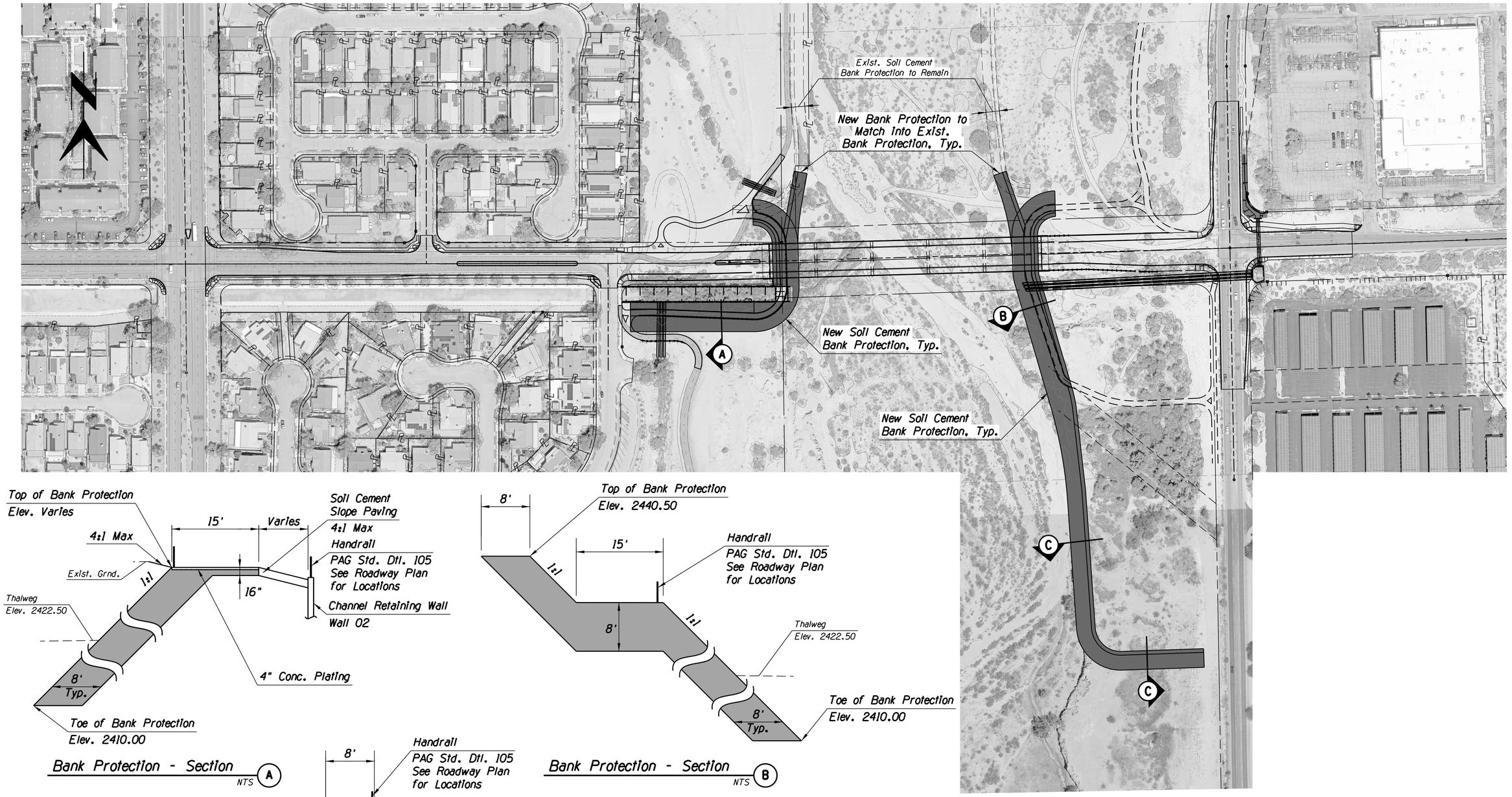
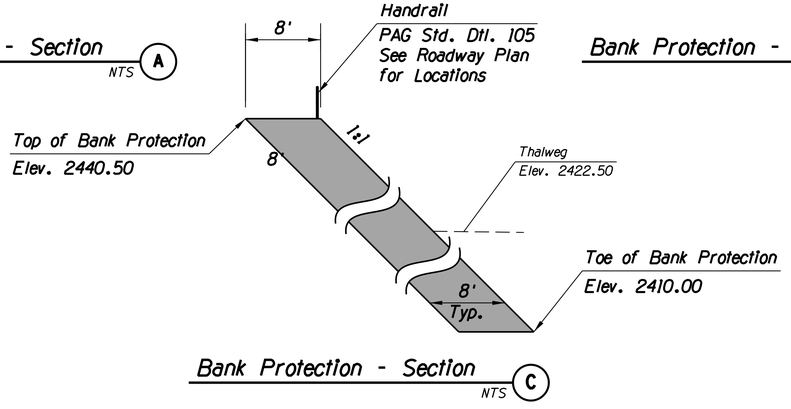


Bank Protection - Section A
NTS

Bank Protection - Section B
NTS



Bank Protection - Section C
NTS

BANK PROTECTION OVERVIEW

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NO.	DATE	REVISION	BY	CHKD.	APPR.

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Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

25 OF 45

CITY OF TUCSON

DRWN. BY	JR	09/2024	REF.
DSGN. BY	JR	09/2024	SCALE: 1"=100'H
CHKD. BY	BK	09/2024	PLAN NO.

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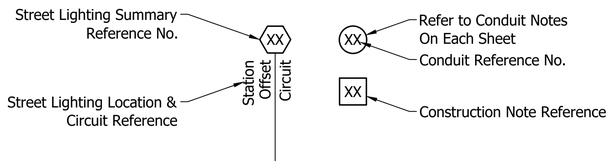
GENERAL STREET LIGHTING NOTES

1. The exact location of each street light pole, pull boxes, ground rods, and conduit runs shall be approved by the Engineer prior to excavation and installation.
2. Each pole shall be connected per the circuit designation indicated on the plans.
3. The Contractor is responsible for locating all utilities whether shown on the plans or not and shall protect them from damage.
4. All pull boxes shall be installed with a 6-inch concrete collar per PAG Std Dtl T 106.
5. Conduit locations shown on the plans are schematic. The Contractor should locate the conduit to avoid conflicts with other utilities.
6. Luminaire shall be American Electric Lighting LED, Autobahn Series ATB2 173W/480V, Type 3, 3000k CCT, or approved equal.
7. All poles shall be PAG Std Dtl T 445 Type 2B with a 35' mounting height and 20' equivalent mast arm length.
8. Street lighting load center cabinet shall be Myers MEUG461-M100-AZ, 240/480V, 1 phase, 3 wires, 100A. Refer to special provisions.

NOTATION LEGEND



LEGEND

New

- Metered Street Light Cabinet (Type I), See PAG Std Dtl 325; 240/480V, 1ϕ, 3W, 100A with appropriate circuit breakers.
- No. 7 Pull Box
- No. 7 Pull Box with Extension
- No. 3 1/2 Pull Box
- Conduit Run
- Street Lighting Pole
- XX — Street Lighting Pole Number
- XX — Street Lighting Circuit Number
- Ground Rod

UNDERGROUND FACILITIES

1. Utility locations shown on plans were compiled based on the best information available. Utility locations are not intended to be exact or complete. Two full working days before beginning any excavation, the Contractor shall contact Arizona Blue Stake, 1-800-782-5348, to request marking of underground facilities. Underground facilities shall be exposed and located in accordance with A.R.S. 40-360.21 thru 360.29. Field adjustments for the placement of conduit, pull boxes, street light pole foundations, and street light poles, as directed by the Engineer, shall be used to avoid conflicts with existing underground or overhead utilities.The Contractor shall pothole utilities as needed or as directed by the Engineer to verify locations. This work shall be considered incidental to the other related items of work.
2. The Contractor shall take precautions not to damage water facilities that are in the area of construction. The Contractor will be responsible for any damage.
3. At pole foundations close to existing water mains, maintain a minimum of five (5) feet horizontal distance from outside of foundation to the outside of pipe. Minimum horizontal separation between existing water mains and electrical conduit is five (5) feet from outside water line to outside of electric conduit. Minimum vertical separation is one (1) foot from outside water line to outside electrical conduit.
4. Contractor shall pothole existing water mains behind curb prior to street light pole foundation work. This work shall be considered incidental to the pole foundation work.
5. For ground rods and pole foundations close to existing sanitary sewer, maintain a minimum of two (2) feet horizontal and vertical distance from outside of foundation to the outside of sanitary sewer pipe.
6. House or business sewer connections (HCS or BCS) are not part of the public sanitary sewer conveyance system. Private sewer connections constructed prior to January 2006 are not required to be Blue Staked. Any HCS/BCS encountered during construction shall be protected, repaired, or rerouted, as the situation dictates (COT/PC SD WWM 404), at no expense to the property owner or the Pima County Regional Wastewater Reclamation Department (PCRWRD).
7. The City shall not be held liable or responsible for any errors and or omissions on these plans relative to PCRWRD facilities. Items not meeting PCRWRD standards shall be repaired or replaced at no cost to the City.
8. Minimum horizontal and vertical separation between existing gas distribution faclities such as gas lines and the new street lighting conduit, pull boxes, ground rods, and pole foundations shall be one (1) foot.
9. The Contractor shall exercise extreme caution when excavating near all Southwest Gas facilities. The Contractor shall support and/or protect in place all gas distribution and service facilities that are exposed during the installation of the lighting improvements associated with the project.
10. Minimum horizontal and vertical separation between existing communication distribution facilities and the new street lighting conduit, pull boxes, ground rods, and pole foundations shall be one (1) foot.
11. The Contractor shall exercise extreme caution when excavating near all Century Link and AT&T facilities. The Contractor shall support and/or protect in place all existing communication distribution facilities that are exposed during the installation of the lighting improvements associated with the project.
12. When encountering tree branches or tree roots, the Contractor will contact DTM Landscape Architect to arrange an on-site meeting, prior to proceeding with removal or trimming of any tree.

OVERHEAD POWER LINES

The Contractor's attention is directed to A.R.S. 40-360.41 thru 360.44 for restrictions on work in the vicinity of overhead power lines. The Contractor shall not operate power equipment placed so that any extension of the equipment and/or load carried by the equipment can reach to within 10 feet of active power lines rated at or under 50 kilovolts. Greater clearances apply for higher voltage power lines. Where work within the clearance limits is necessary, the Contractor shall contact TEP 10 working days in advance of the proposed work, to arrange for temporary deactivation, or other measures deemed necessary to permit safe operation near the overhead lines. Where excavation near existing power poles is planned, the Contractor shall contact TEP 10 working days in advance, to arrange for bracing and shoring. Before the end of the work shift each day, the Contractor shall provide drivable access to all TEP poles, equipment, and facilities.

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CITY OF TUCSON

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REVIEW
NOT FOR CONSTRUCTION OR RECORDING

APPROVALS	SIGNATORY	DATE

APPROVED _____ 20 __
TRANSPORTATION DIRECTOR

DRWN. BY BDH 20 24 | DSGN. BY BDH 20 24 | CHKD. BY FLG 20 24

REF. _____ SCALE: 1"=20'
PLAN NO. _____

SL01 OF SL03

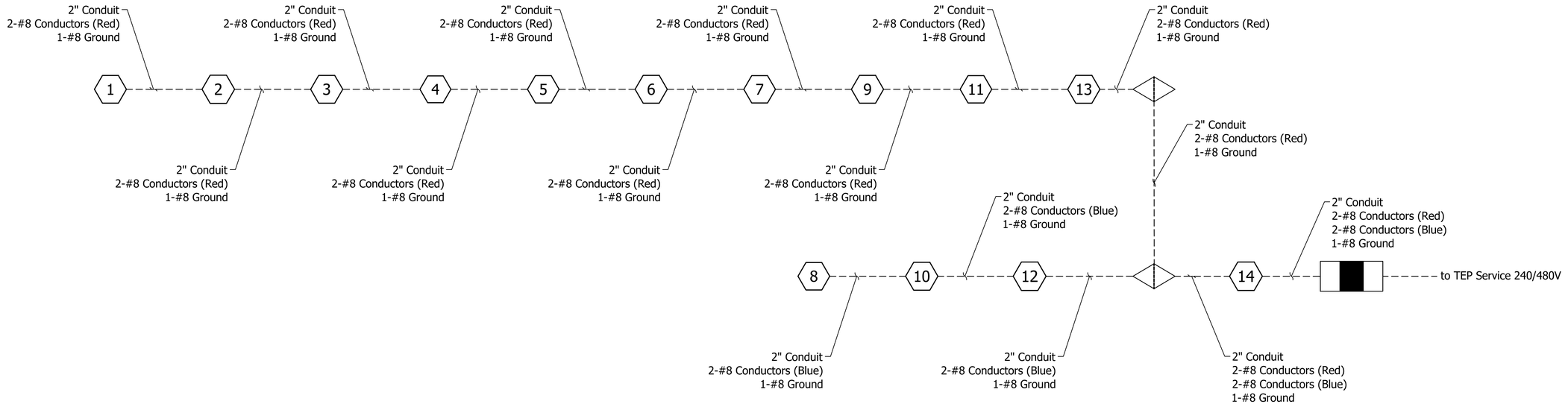
DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

STREET LIGHTING GENERAL NOTES

26 OF 45



AVERAGE MAINTAINED LUMINANCE DESIGN VALUES

Luminance	Average Luminance (fc)	Uniformity Ave/Min
Required	0.9	3
Midvale Park Road to Mahan Drive	1.6	3.1
Bridge Section	1.6	2.3
Bridge to Calle Santa Cruz	1.5	3.0

Per PAG Standard Detail T 324

METERED STREET LIGHTING CABINET LOAD SUMMARY

Circuit No.	Amp (% V Drop)
Ckt 1 (Red)	TO BE COMPLETED AT NEXT SUBMITTAL
Ckt 2 (Blue)	
Total Load	

STREET LIGHT SUMMARY TABLE

SL No.	Sta	Off	Circuit No.	Foundation	Pole Height
1	12+05	41.5' Lt	Ckt 1	T 444	30
2	13+85	38.0' Lt	Ckt 1	T 444	30
3	15+65	37.0' Lt	Ckt 1	T 444	30
4	17+45	41.0' Lt	Ckt 1	T 444	30
5	19+25	41.0' Lt	Ckt 1	T 444	30
6	21+05	38.0' Lt	Ckt 1	T 444	30
7	22+35	23.8' Lt	Ckt 1	Bridge Foundation	-
8	23+35	23.8' Rt	Ckt 2	Bridge Foundation	-
9	24+35	23.8' Lt	Ckt 1	Bridge Foundation	-
10	25+35	23.8' Rt	Ckt 2	Bridge Foundation	-
11	26+35	23.8' Lt	Ckt 1	Bridge Foundation	-
12	27+35	23.8' Rt	Ckt 2	Bridge Foundation	-
13	28+35	23.8' Lt	Ckt 1	Bridge Foundation	-
14	30+15	44.0' Rt	Ckt 2	T 444	30

* Refer to Foundation Notes

FOUNDATION NOTES

1. The following foundations are applicable for the project street light poles only. The foundations specified in the Street Light Summary Table should be used unless conditions require use of an alternate. Use of an alternate shall be approved by the City of Tucson Electrical Inspector.
   A. Standard foundation per PAG Std Dtl T 444.
   B. Barrier foundation.
2. The foundation depth shall be measured from the point of undisturbed earth. Grading around new foundations shall be provided to divert drainage.
3. The back fill and grading around the pole foundation shall be incidental to the foundation.
4. Foundations shall include a twenty-five (25) foot coil of #4 AWG bare copper conductor bonded to pole at the handhole with three-eighths (3/8) inch diameter bolt and ground clamp shall be installed prior to placement of concrete in foundation. For spread foundations, the coil shall be twenty (20) feet in length.

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

STREET LIGHTING AND CONDUIT DETAILS

APPROVALS	SIGNATORY	DATE

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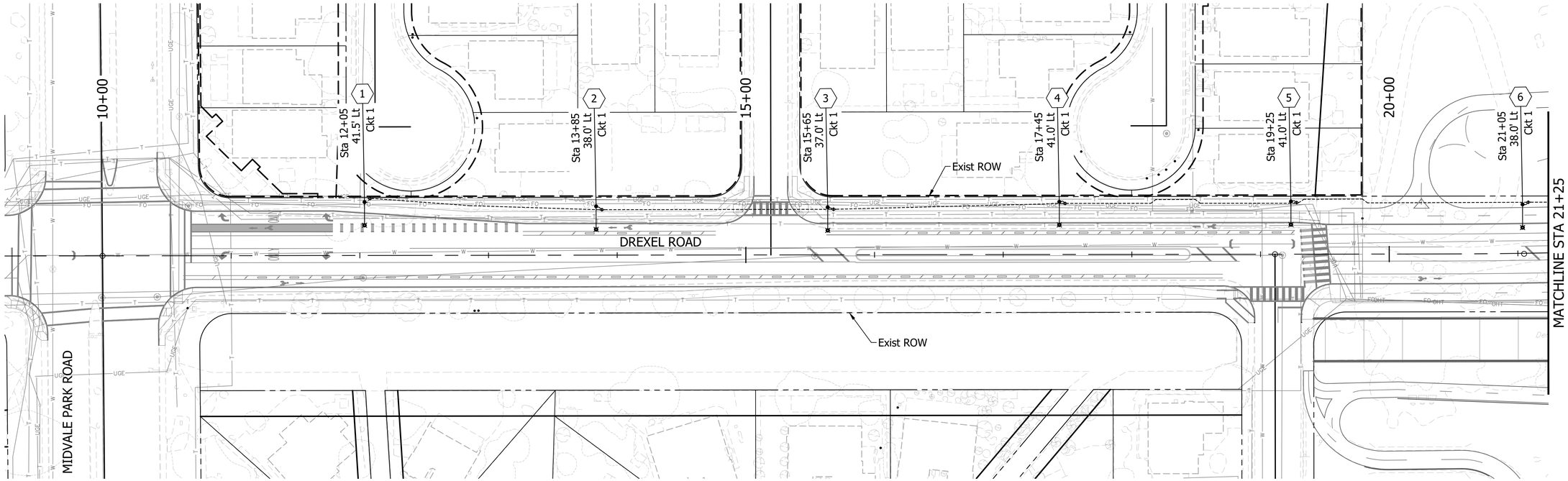
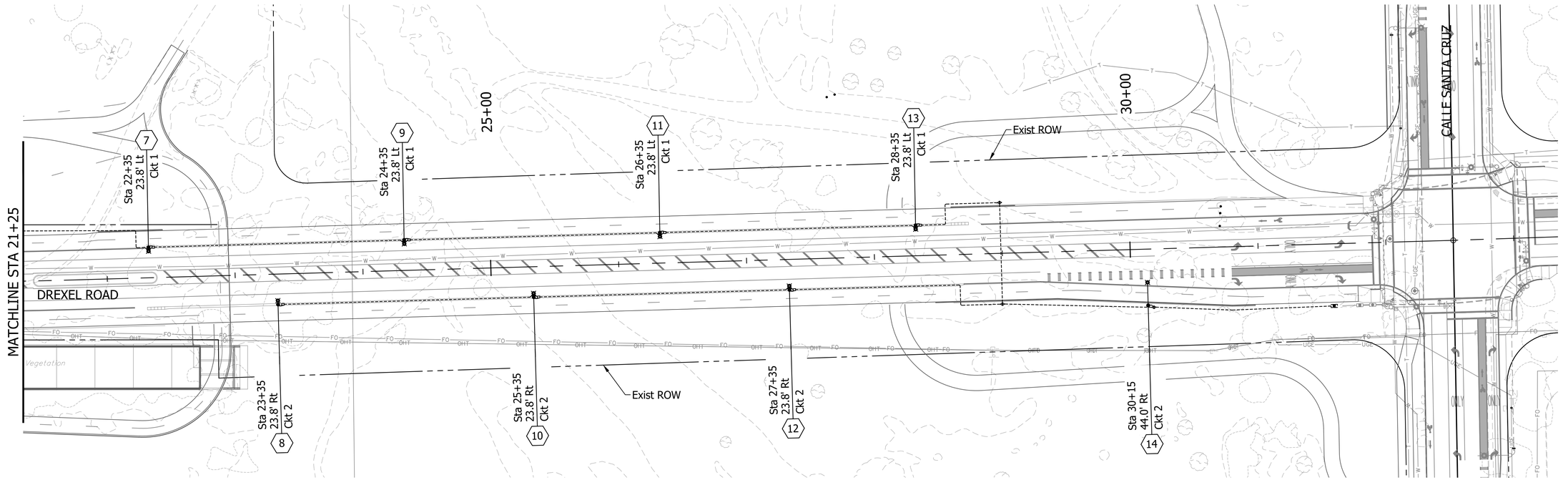
27 OF 45

REF. _____ SCALE: 1"=20'

DRWN. BY BDH 20 24 DSGN. BY BDH 20 24 CHKD. BY FLG 20 24

PLAN NO. _____





SL03 OF SL03

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CITY OF TUCSON

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

STREET LIGHTING PLAN SHEET

NO.	DATE	REVISION DESCRIPTION	BY	CHKD.	APPR.

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28 OF 45

DRWN. BY BDH 20 24 | DSGN. BY BDH 20 24 | CHKD. BY FLG 20 24

REF. _____ SCALE: 1"=20'

PLAN NO. _____

GENERAL TRAFFIC SIGNAL AND LIGHTING NOTES

1. All equipment/materials and construction shall meet or exceed the current Pima Association of Governments (PAG) "Standard Specifications for Public Improvements" and "Standard Details for Public Improvements", the current MUTCD with the Arizona Supplement, the Special Provisions, and the plans.
2. Station and offsets are to the Drexel Road construction centerline. The exact location of each new pole foundation, pull box, controller cabinet foundation, and electric service pedestal foundation shall be approved by the Engineer prior to excavation and installation.
3. All pole foundations shall be installed at finished grade. If the slope of shoulder drops off from the finished grade, the contractor shall grade around the pole foundation. Refer to the PAG Standard Details for Public Improvements.
4. Only new conduit and cable shall be installed, unless otherwise specified.
5. All conduit shall be installed a minimum of 30 inches below finished grade in protected areas (behind curb) and a minimum of 36 inches below finished grade in unprotected areas, under roadways or under driveways.
6. Any conduit installed shallower than the minimum below finished grade shall be encased in concrete per Standard Specification 732-3.01 (G).
7. All new and existing conduits shall be cleaned by compressed air and a properly sized conduit piston or mandrel prior to cable installation.
8. Pull boxes shall not be installed within concrete curb access ramps. In addition, any pull boxes installed behind curbs shall be installed between the curb and the proposed/future sidewalk or beyond the proposed/future sidewalk. Any pull boxes installed along an uncurbed roadway shall be installed adjacent to, but not within, the shoulder.
9. A 3/4-inch x 10-ft ground rod shall be installed in the No. 7 pull box (w/extension) adjacent to the controller cabinet. Two ground rod clamps shall be furnished for grounding the wire.
10. High voltage cables should be separated from low voltage cables as much as possible.
11. A (#14) AWG 16 conductor IMSA cable shall be installed from each traffic signal terminal strip (unspliced) to the traffic signal cabinet.
12. Conductors shall be installed from each new luminaire to the concrete pull box adjacent to the pole foundation, leaving three feet of slack for each conductor (measured from the top of the pull box) in the pull box. A 5-amp in-line fuse shall be installed for each luminaire in the associated pull box.
13. Poles with pedestrian signals and APS pushbutton stations shall use one 7-conductor IMSA cable for both the APS pushbutton station and the pedestrian signal, unless otherwise noted. The outer cable jacket shall not be removed at the hand hole height. Two conductors shall be routed to the push button station and the remaining conductors shall be routed to the pedestrian signal. The APS pushbutton station should be mounted on the same side of the pole as the pedestrian signal that it serves.
14. Coordinate the hookup of conductors and communication cables in the controller cabinet with the City of Tucson (COT) Electric Shop. Call the COT Electric Shop at (520) 791-3154 a minimum of five (5) days prior to work.
15. Contact the Tucson Electric Power (TEP) Public Improvement Coordinator Roman Felix at (520) 918-8359 for electric service hookup. The contractor shall be responsible for excavating and backfilling the trench, installing any necessary sleeves under sidewalk or driveways and supplying a galvanized sweep and riser for the electric service cable to be installed by TEP.
16. The contractor shall take precautions not to damage water facilities, sanitary sewer pipelines, and dry utility facilities that are in the area of construction. The contractor will be responsible for any damage.
17. At pole foundations close to existing water mains, sewer lines, and manholes, maintain a minimum of five (5) feet horizontal distance from outside of the foundation wall to the outside of pipe wall. PCRWRD requires the contractor to submit a Wastewater Flow Management Plan for new pole foundations that encroach the sewer impact zone. See PCRWRD SSDC 202, Section 2.2.1 for more information.
18. Minimum horizontal separation between existing water mains and electrical conduit is five (5) feet from outside water line to outside of electrical conduit. Minimum vertical separation is one (1) foot from outside water line to outside electrical conduit.
19. The location of all utilities shown on the plans is approximate. The contractor shall pothole existing utilities within the vicinity of pole and cabinet foundations prior to excavation. This work shall be considered incidental to the pole foundation work.
20. The contractor shall contact Arizona 811 at 1-800-782-5348 a minimum of 48 hours prior to any excavation.
21. The contractor shall support and protect in place all water facilities that are exposed during the installation of the traffic signal improvements associated with the project. Any damage to water facilities resulting from the installation of the project improvements shall be replaced in kind by the contractor and at the contractor's expense.
22. The traffic signal operation at existing signalized intersections shall be maintained throughout the duration of the project.
23. All signal housings shall be aluminum and yellow that are to be mounted on the mast arms, all other housings shall be poly carbonate and yellow that will be side mounted. All back plates shall be five inches (5”), black, louvered aluminum with reinforced 90-degree bent edges. All back plates shall have a two-inch (2”) yellow retro reflective border. All visors shall be yellow (tunnel style) and of the material that the signal housing is made of and approved by the City of Tucson Traffic Engineer or his/her designee prior to ordering and installation.
24. The emergency vehicle pre-emption sensor cable shall be Tomar Detector Cable Model M913, and shall run unspliced from the sensor to the cabinet.

EQUIPMENT NOTES

1. The contractor shall remove and salvage existing poles. mast arms, and other equipment that will not be reused in the project to the COT Electric Shop. Call the COT Electric shop at (520) 791-3154 for instructions at least 48 hours in advance.
2. All pedestrians pushbutton assemblies shall be an APS (audio vibrotactile type) pushbutton, Campbell Company Guardian 912 Yellow with Bluetooth and wave feature or approved equal and shall be mounted 42 inches above the finished grade to the center of the pushbutton. The pushbutton shall be wired to the SPI (unsplided) using a shielded (#18) AWG 4 conductor (preferably with colors the Black, White, Red and Green) stranded cable. Locations and accessibility of pushbuttons shall comply with the requirements of the Americans with Disabilities Act (ADA). The pedestrian pushbutton signs that shall be used are identified in the 11th Edition of the MUTCD in Section 2B.51 and are shown in PAG Std Dtl T 1104.
3. All signal indications shall be LED. Pedestrian signals shall be the international man/hand with a countdown timer.
4. All mast arm signal heads shall have the yellow metal housing with black aluminum louvered backplates.
5. Luminaires shall be American Electric Lighting LED Autobahn ATB2 Series, 173W, 120V, Type 3, 3000 KCCT with a 7-pin Road Node connector.

RESPONSIBILITIES

1. The contractor shall install the following City supplied equipment and materials: traffic signal controller cabinet(s) with controller(s). The contractor shall supply and install the following equipment and materials as specified in the plans: steel pole anchor bolts (with nuts and washers), concrete pole foundations with reinforcement (where specified), controller cabinet concrete foundation(s), concrete pull boxes, electrical conduit, ground rods and connectors, bare bond wire and all other conductors, poles, mast arms, traffic signals and mounting assemblies, pedestrian/bicycle signals and mounting assemblies, pedestrian push button stations with signs, emergency vehicle preemption with mounting assemblies, luminaires, photocells, pole and mast arm signs with mounting assemblies, service pedestal with concrete foundation(s), all auxiliary equipment, and all other appurtenances necessary for the operation of the traffic signal installation(s), except as modified in the plans.
2. The contractor shall pick up and transport the traffic controller cabinet(s) from the City of Tucson Streets and Traffic Maintenance Division Yard to the intersection(s). Call (520) 791-3191 at least 48 hours in advance of pickup.
3. The contractor shall install each traffic controller cabinet on its foundation and route all of the conductors into the controller cabinet. The City of Tucson Streets and Traffic Maintenance Division staff shall terminate the conductors in the controller cabinet.

UNDERGROUND FACILITIES

Two full working days before beginning any excavation, the contractor shall contact Arizona 811 at 1-800-782-5348 to request marking of underground facilities. Underground facilities shall be exposed and located in accordance with A.R.S. 40-360.21 through 360.29.

OVERHEAD POWER LINES

The contractor's attention is directed to A.R.S. 40-360.41 through 360.44 for restrictions on work in the vicinity of overhead power lines. The contractor shall not operate power equipment placed so that any extension of the equipment and/or load carried by the equipment can reach to within ten (10) feet of active power lines rated at or under 50 kilovolts. Greater clearances apply for higher voltage power lines. Where work within the clearance limits is necessary, the contractor shall contact TEP ten (10) working days in advance of the proposed work, to arrange for temporary deactivation, or other measures deemed necessary to permit safe operation near the overhead lines. Where excavation near existing power poles is planned, the contractor shall contact TEP ten (10) working days in advance, to arrange for bracing and shoring. Before the end of the work shift each day, the contractor shall provide drivable access to all TEP poles, equipment, and facilities.

LEGEND	PROPOSED	EXISTING
Traffic Control Cabinet with Foundation		
Metered Service Pedestal with Foundation		
Traffic Signal Pole		
Traffic Signal Face		
Pedestrian Signal		
Pushbutton		
Luminaire Pole		
Pull Box No. 3-1/2		
Pull Box No. 5		
Pull Box No. 7		
Pull Box No. 7 with Extension		
Street Name Sign		
Emergency Vehicle Preemption Sensor		
Emergency Vehicle Preemption Beacon		
Video Detection Camera		
Conduit Run		

TS01 OF TS04

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CITY OF TUCSON

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

TRAFFIC SIGNAL NOTES

NO.	DATE	REVISION DESCRIPTION	BY	CHKD.	APPR.

PRELIMINARY 30% REVIEW NOT FOR CONSTRUCTION OR RECORDING

APPROVALS	SIGNATORY	DATE

APPROVED _____ 20 __

TRANSPORTATION DIRECTOR

29 OF 45

DRWN. BY BDH 20 24 | DSGN. BY BDH 20 24 | CHKD. BY FLG 20 24

REF. _____ SCALE: 1"=20'

PLAN NO. _____

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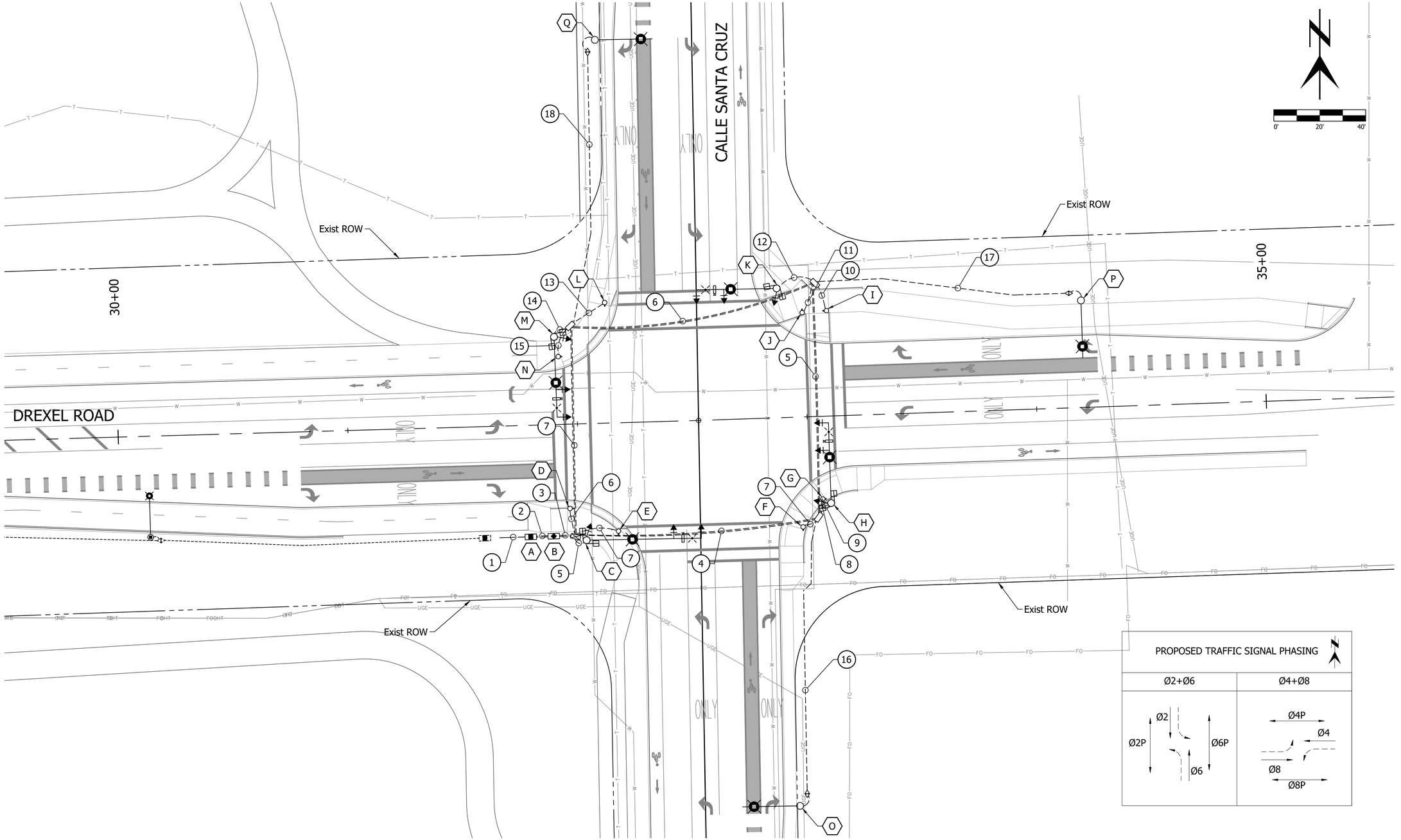

TS02 OF TS04

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

TRAFFIC SIGNAL PLAN SHEETS

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APPROVALS	SIGNATORY	DATE

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30 OF 45

REF. _____ SCALE: 1"=20'

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PLAN NO. _____

Contact Arizona 811 at least two full working days before you begin excavation

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CABINET SCHEDULE

CABINET	TYPE	CONTROLLER	AUX. CONTROLLER	FOUNDATION	LOCATION	REMARKS
A	METERED PEDESTAL	MYERS 125 AMP 120/240V MUEG16-125WTB		T 1801		
B	M-49	NEMA TS-2 TYPE 2 ECONOLITE COBALT CONTROLLER		T 203		

POLE SCHEDULE

POLE NUMBER	POLE TYPE	MAST ARM SIGNAL	MAST ARM LUMINAIRE	SIGNALS FACE	SIGNALS MOUNTING	PED PUSHBUTTON	LUMINAIRE	LOCATION	REMARKS
C	R T413	50'	20'	(2) F (1) F (2) PED	(2) II (1) V (1) VII	-	ATB2 SEE NOTE 9		
D	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(L) T1101	-		
E	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(R) T1101	-		
F	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(L) T1101	-		
G	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(R) T1101	-		
H	Q T412	35'	20'	(2) F (1) F (2) PED	(2) II (1) V (1) VII	-	ATB2 SEE NOTE 9		
I	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(R) T1101	-		
J	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(R) T1101	-		
K	Q T412	35'	20'	(2) F (1) F (2) PED	(2) II (1) V (1) VII	-	ATB2 SEE NOTE 9		
L	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(R) T1101	-		
M	Q T412	35'	20'	(2) F (1) F (2) PED	(2) II (1) V (1) VII	-	ATB2 SEE NOTE 9		
N	PPB TYPE 1 T419	-	-	-	-	SEE NOTE 1 P.B. SIGN R10-4b(L) T1101	-		
O P Q	Type 1 Street Light	-	20'	-	-	-	-		

TO BE COMPLETED AT NEXT SUBMITTAL

TO BE COMPLETED AT NEXT SUBMITTAL

CABINET AND POLE SCHEDULE NOTES

1. All new pedestrian pushbutton assemblies shall be an APS (audio vibrotactile type) pushbutton, Campbell Company Guardian 912 Yellow with bluetooth and wave feature or approved equal. Locations of pushbuttons shall comply with the requirments of the Americans with Disabilities Act (ADA).
2. Centers of pedestrian pushbuttons shall be at a height of 42 inches above finish grade of adjacent area that is accessible per ADA standards.
3. Pushbutton signs shall be type R10-4b, as shown in PAG Std. Dtl. TS 1104. Arrows shall point left (L), right (R), or both ways (B), as indicated in cabinet and pole schedule.
4. All pushbutton signs shall fit the pushbutton housing without overhangs or overlaps. All pushbutton signs shall be aluminum with Type XI (Diamond) Grade sheeting.
5. All pedestrian signal faces shall be LED countdown signals.
6. All vehicular indications shall be LED.
7. Station/offsets are to the Drexel Road centerline. The exact location and elevation of each pole and cabinet shall be approved by the City of Tucson Electrical Inspector prior to installation.
8. Fire pre-emption system (TOMAR M913) shall include 4-Strobecom II 4090-1-ST detectors with 4140 optical signal pressor card. Pre-emption sensor cable shall run from sensor to controller unspliced.
9. Luminaire shall be American Electric Lighting LED Autoban ATB2 Series, 173W, 120V, Type 3, 3000KCCT with 7-pin Road Node connector.
10. Street name signs shall be in compliance with the latest edition of the Manual on Uniform Traffic Control Devices, the latest editions of the Pima County and City of Tucson Traffic Signing Design Manual, the PAG Standard Specifications, and these plans.
11. Street name signs shall be flag mounted from signal pole at a minimum of 24 feet above the pavement using approved mounting hardware. Refer to Std Detail 4.6 of the Pima County and City of Tucson Traffic Signing Design Manual.
12. Street name sign sheeting shall be Type XI or equivalent.
13. The City of Tucson shall review and accept the cabinet, controller, UPS, and all auxiliary equipment located within cabinet.

KITTELSON & ASSOCIATES 2 E CONGRESS STREET, SUITE 705 TUCSON, AZ 85701 P 520.544.4067 F 520.544.9616

NO.	DATE	REVISION DESCRIPTION	BY	CHKD.	APPR.

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CITY OF TUCSON

PRELIMINARY

30%

REVIEW NOT FOR CONSTRUCTION OR RECORDING

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

TRAFFIC SIGNAL PLAN SHEETS

APPROVALS	SIGNATORY	DATE

APPROVED _____ 20 __

TRANSPORTATION DIRECTOR

31 OF 45

REF. _____ SCALE: 1"=20'

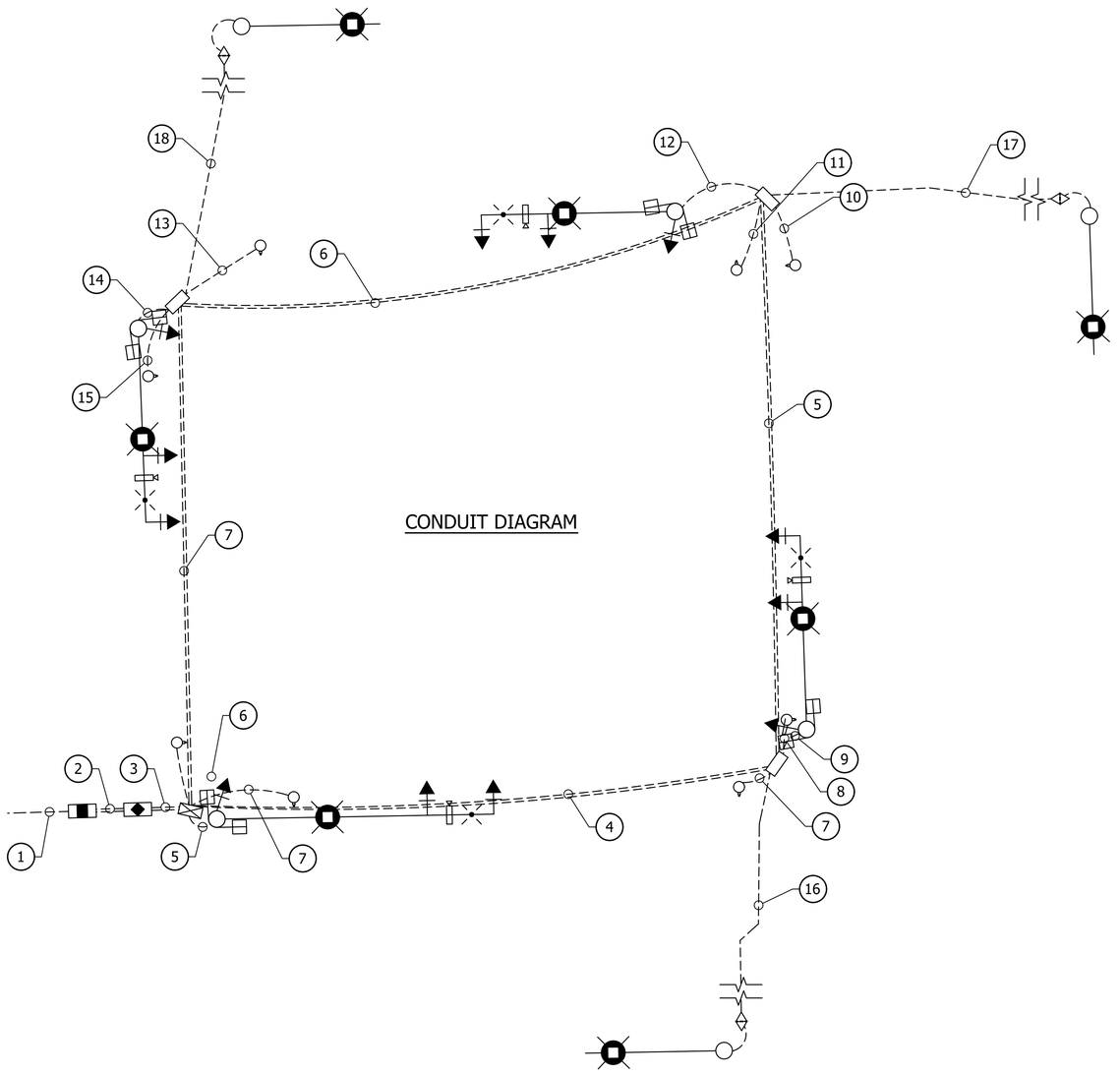
DRWN. BY BDH 20 24 DSGN. BY BDH 20 24 CHKD. BY FLG 20 24

PLAN NO. _____

CONDUIT AND CONDUCTOR SCHEDULE

CONDUIT RUN NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CONDUIT SIZE (INCHES)																			
CIRCUIT PHASE																			
(#14) 16 CONDUCTOR IMSA CABLE	BLACK-PED SIGNAL WALK																		
	WHITE-SIGNAL COMMON																		
	RED-AØ SIGNAL RED																		
	GREEN-AØ SIGNAL GREEN																		
	ORANGE-PED PUSHBUTTON																		
	BLUE-AØ SIGNAL YELLOW																		
	WHITE W/B-LOW VOLTAGE COMMON																		
	RED W/B-AØ AUX RED																		
	GREEN W/B-AØ AUX GREEN																		
	ORANGE W/B-SPARE PED PUSHBUTTON																		
	BLUE W/B-AØ AUX YELLOW																		
	BLACK W/W-PED SIGNAL DON'T WALK																		
	RED W/W-SPARE																		
	GREEN W/W-BØ LEFT TURN GREEN																		
	BLUE W/W-BØ LEFT TURN YELLOW																		
	BLACK W/R-SPARE																		
#14 7CC IMSA																			
#10 THW	STREET LIGHT/SIGN CIRCUIT #1 (BLK)																		
	STREET LIGHT/SIGN CIRCUIT #2 (RED)																		
	STREET LIGHT COMMON (WHT)																		
	PRE-EMPT BEACON																		
	PRE-EMPT BEACON																		
#8 BARE																			
	EQUIPMENT GROUND																		
#4 THW	POWER HOT (RED) (BLACK)																		
	POWER NEUTRAL (WHITE)																		
3 COND. IMSA CABLE	TO PHOTOCELL (BLACK)																		
	COMMON (WHITE)																		
	FROM PHOTOCELL (RED)																		
#18 4CC AWG																			

TO BE COMPLETED AT NEXT SUBMITTAL



CONDUIT DIAGRAM

TS04 OF TS04

KITTELSON & ASSOCIATES
2 E CONGRESS STREET, SUITE 705
TUCSON, AZ 85701
P 520.544.4067 F 520.544.9616

CITY OF TUCSON

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ

TRAFFIC SIGNAL PLAN SHEETS

NO.	DATE	REVISION DESCRIPTION	BY	CHKD.	APPR.

PRELIMINARY

30%

REVIEW NOT FOR CONSTRUCTION OR RECORDING

APPROVALS	SIGNATORY	DATE

APPROVED _____ 20 ___

TRANSPORTATION DIRECTOR

32 OF 45

REF. _____ SCALE: 1"=20'

DRWN. BY BDH 20 24 DSGN. BY BDH 20 24 CHKD. BY FLG 20 24 PLAN NO. _____

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Plant Materials Schedule

Trees

Symbol	Botanical Name Common Name
	Acacia greggii Catclaw Acacia
	Chilopsis linearis Desert Willow
	Parkinsonia microphylla Foothills Palo Verde
	Prosopis velutina Velvet Mesquite

Shrubs

Symbol	BOTANICAL NAME COMMON NAME
	Atriplex canescens Fourwing Saltbush
	Calliandra eriophylla Sonoran Fairy Duster
	Fouquieria splendens Ocotillo
	Larrea tridentata Creosote

Accents

Symbol	BOTANICAL NAME COMMON NAME
	Carnegiea gigantea Saguaro
	Dasylirion wheeleri Desert Spoon
	Ferocactus wislizenii Fishhook Barrel

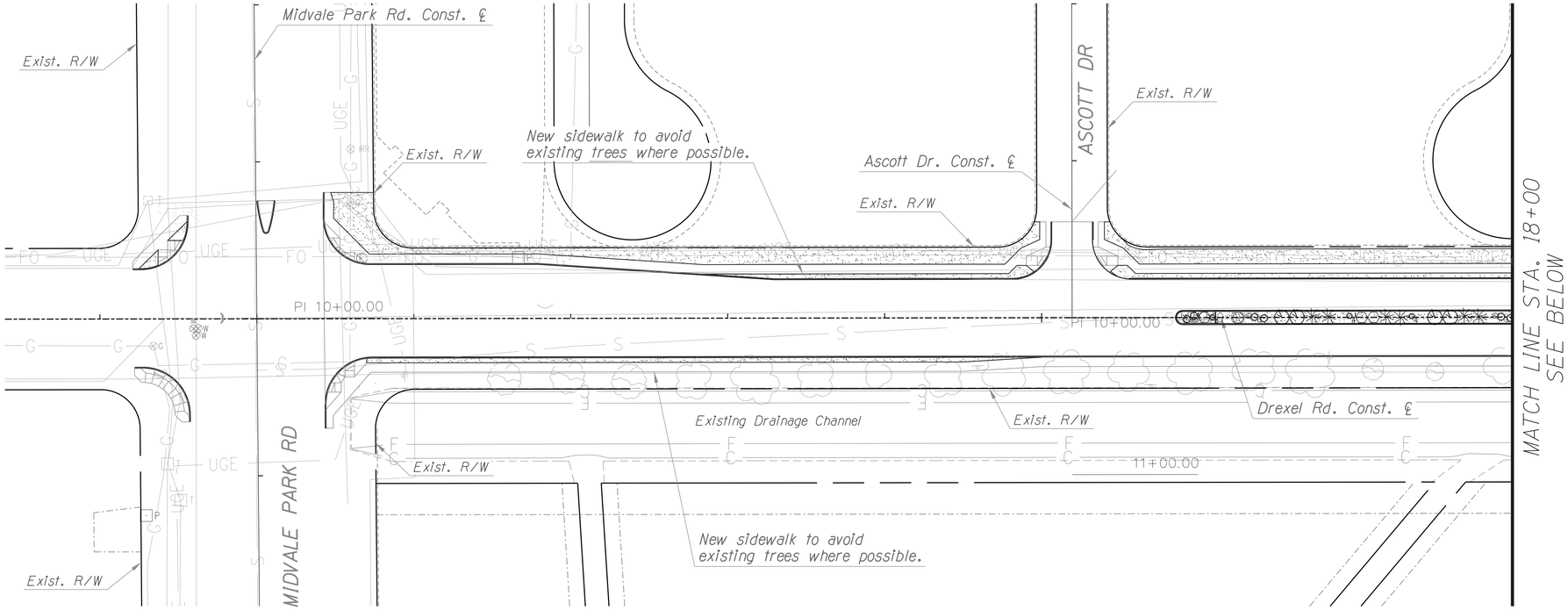
Seed Mix

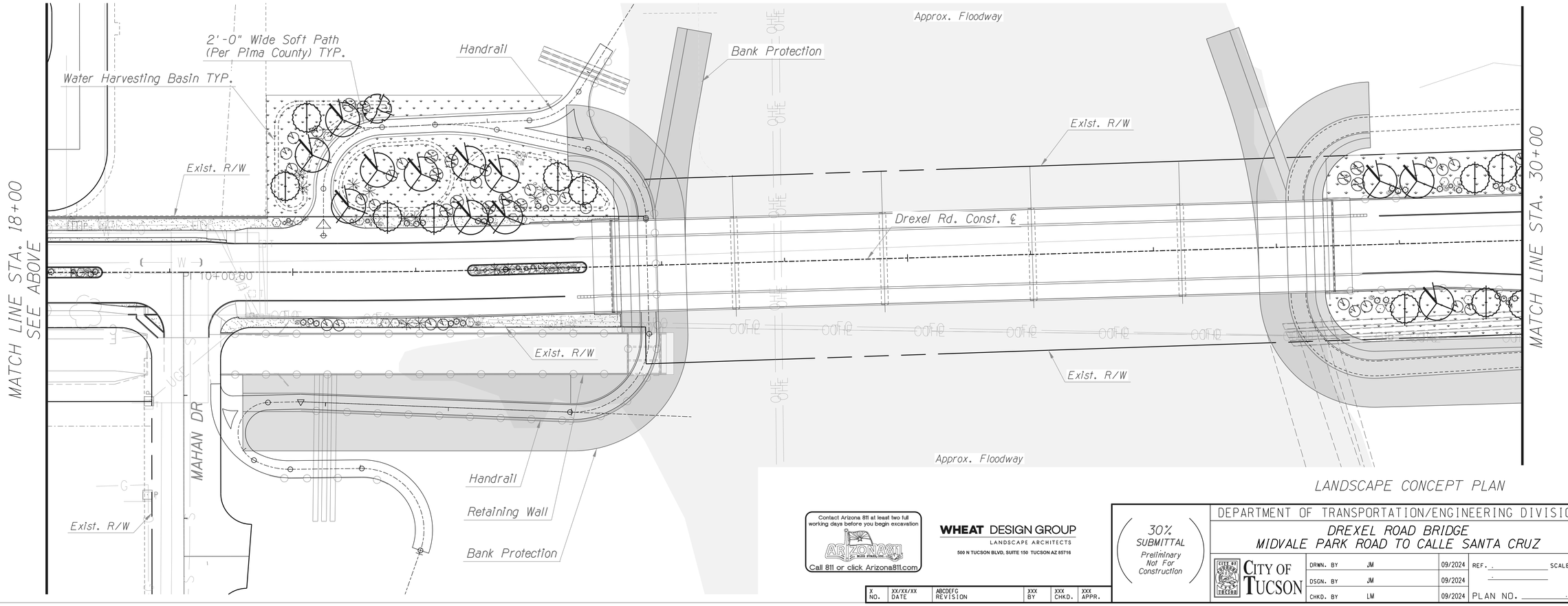
Hardscape Materials Schedule

Symbol	Item
	Granite Mulch 1/2"
	Rock Mulch 4"-8"
	Boulders

NOTE: Same landscape treatment for west and east side of new bridge. Pima County to maintain west side. City of Tucson to maintain east side.

40 0 40 80





LANDSCAPE CONCEPT PLAN

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WHEAT DESIGN GROUP
LANDSCAPE ARCHITECTS
500 N TUCSON BLVD, SUITE 150 TUCSON AZ 85716

X NO.	XX/XX/XX DATE	ABCDEFG REVISION	XXX BY	XXX CHKD.	XXX APPR.

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

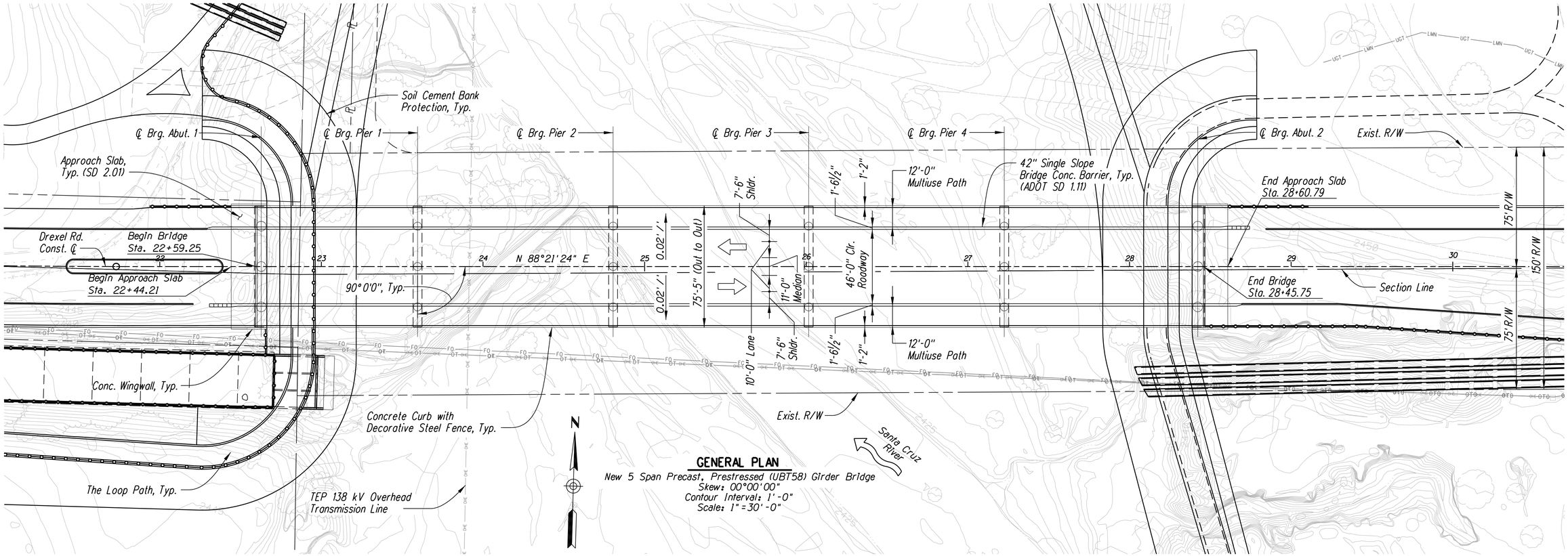
DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

33 OF 45

CITY OF TUCSON

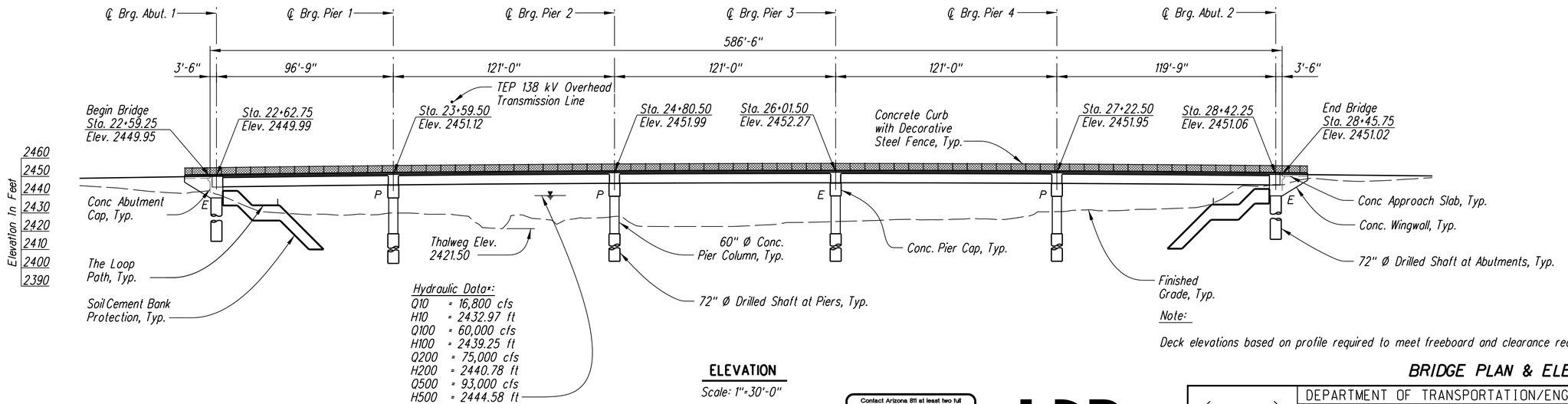
DRWN. BY	JM	09/2024	REF. _____ SCALE: 1" = 40'
DSGN. BY	JM	09/2024	_____ _____
CHKD. BY	LM	09/2024	PLAN NO. _____

$FILE$
$DATE$ $TIME$



GENERAL PLAN

New 5 Span Precast, Prestressed (UBT58) Girder Bridge
Skew: 00°00'00"
Contour Interval: 1'-0"
Scale: 1" = 30'-0"



Hydraulic Data*:

Q10	= 16,800 cfs
H10	= 2432.97 ft
Q100	= 60,000 cfs
H100	= 2439.25 ft
Q200	= 75,000 cfs
H200	= 2440.78 ft
Q500	= 93,000 cfs
H500	= 2444.58 ft

*from Preliminary Drainage Report, dated 9/26/2024

ELEVATION

Scale: 1"=30'-0"

Note:

Deck elevations based on profile required to meet freeboard and clearance requirements.

BRIDGE PLAN & ELEVATION

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

CITY OF TUCSON

DRWN. BY	TRK	09/2024	REF.
DSGN. BY	DL	09/2024	SCALE:
CHKD. BY	TWB	09/2024	PLAN NO.

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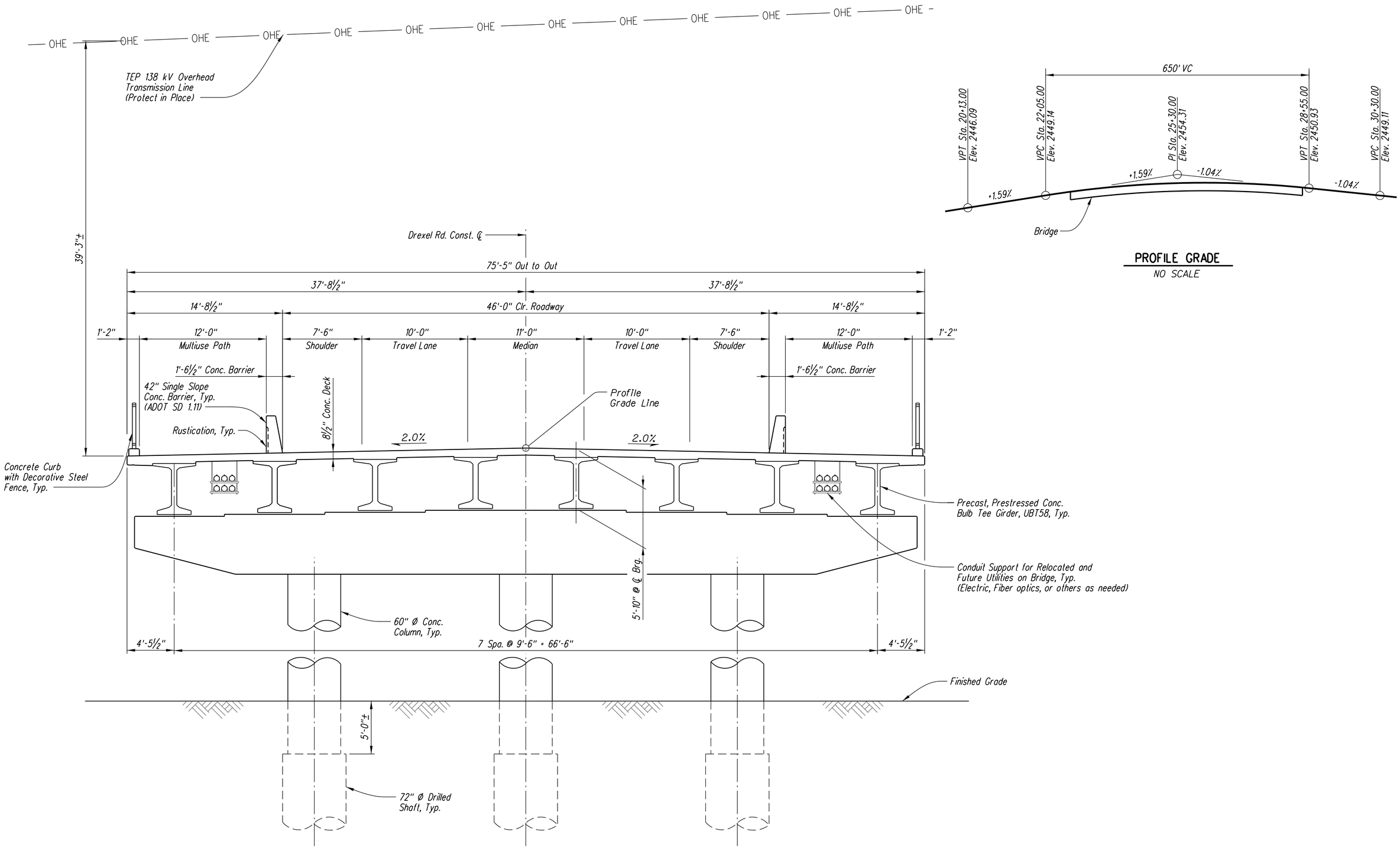

TYPICAL SECTION

Scale: 1/4" = 1'-0"

PROFILE GRADE

NO SCALE

TYPICAL SECTION

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DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

35 OF 45

CITY OF TUCSON

DRWN. BY	TRK	09/2024	REF. ____ SCALE: ____
DSGN. BY	DL	09/2024	
CHKD. BY	TWB	09/2024	PLAN NO. ____

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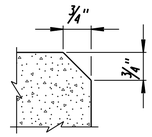
APPROXIMATE QUANTITIES

Item	Structural Excavation	Structure Backfill	Class 'S' Concrete		Reinforcing Steel	UBT58 Girders	Drilled Shaft
			3500 psi	4500 psi			72" Dia
	CY	CY	CY	CY	LB	LF	LF
Abutment 1	110	95	215	-	36,490	-	296
Pier 1	60	35	126	-	54,770	-	240
Pier 2	60	35	127	-	54,775	-	240
Pier 3	60	35	127	-	54,775	-	240
Pier 4	60	35	127	-	54,775	-	240
Abutment 2	110	95	215	-	36,490	-	299
Superstructure	-	-		1704	443,790	4,616	-
Total	460	330	937	1704	735,865	4,616	1,555
As Built Total							

Quantities for structural excavation and structure backfill are based on ADOT SD 5.01 & SD 5.02 and are provided for information only.
These are not direct pay items in this contract and shall be considered incidental to the bridge construction.

Deck Joint Assembly (Flangeless Strip Seal)(ADOT SD 3.03)	218	LF
42" Single Slope Bridge Concrete Barrier and Transition (ADOT SD 1.11)	1234	LF
Approach Slab (ADOT SD 2.01)	2272	SF
Restrainers, Vertical Earthquake (Expansion)	42	EA
Restrainers, Vertical Earthquake (Fixed)	42	EA



Chamfer all exposed corners thus unless otherwise noted. This note applicable to all sheets pertaining to the structure.

CHAMFER DETAIL
NO SCALE

GENERAL NOTES:

Construction Specification - Pima Association of Governments (PAG) Standard Specifications for Public Improvements, 2015 Edition and the Special Provisions.

Design Specification - AASHTO LRFD Bridge Design Specifications, 9th Edition 2020 except as superseded by ADOT Bridge Design Guidelines.

Dead Load - Dead Load includes allowance of 25 pounds per square foot (psf) for future wearing surface and 15 psf for stay-in-place deck forms. Stay-in-place deck forms are not allowed for this project, but their weight is included for future replacement or widenings.

Loading Class - AASHTO HL-93.

Girder Composite Design - Girders are designed as composite for live load and superimposed dead load only. Girders designed using transformed section properties.

The bridge site is Site Class X with peak ground acceleration (PGA) = 0.0XXg and horizontal response spectral acceleration coefficient at 0.2 sec return period (Ss) of 0.XXXg, and horizontal response spectral acceleration coefficient at 1.0 sec return period (S1) of 0.0XXg. The bridge site is classified as Seismic Zone 1.

Inventory and operating ratings for HL-93 are in accordance with AASHTO Manual for Bridge Evaluation, 3rd Edition 2018 with Interim Revisions through 2019 and with the Load and Resistance Factor Rating Method.
Inventory Load Rating Factor X.XX
Operating Load Rating Factor X.XX

All concrete shall be Class "S" unless noted otherwise.

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60.

All mechanical splices of reinforcing steel shall develop 125% of the yield strength of the reinforcing bar and shall conform to the requirements for mechanical connections in Section 605-3.02 of the Standard Specifications.

All bends/hooks shall meet the requirements of AASHTO LRFD, Article 5.10.2.
All bend dimensions for reinforcing steel shall be out to out of bars.
All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

All reinforcing steel shall have 2 inch clear cover unless noted otherwise.

Strengths:

Deck Slab & Pier Diaphragms	f'c =	4.5 ksi
Bridge Barriers and Approach Slabs	f'c =	4.0 ksi
Abutments, Piers, Drilled Shafts, Abutment and Intermediate Diaphragms & Wingwalls	f'c =	3.5 ksi
All Other Class "S" Concrete	f'c =	3.0 ksi
Grade 60 Reinforcing Steel	fy =	60.0 ksi
Grade 60 Transverse Deck Reinforcing	fs =	24.0 ksi
Prestressing Steel (0.6" Diameter 7-Wire Low Relaxation Strands)	fpu =	270.0 ksi

Barriers shall not be slip formed.

Chamfer all Exposed Corners ¾" unless noted otherwise. See Chamfer Detail this sheet.

All roughened construction joints to be roughened to 1/4" minimum amplitude.

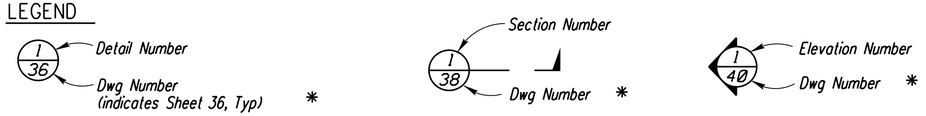
Dimensions shall not be scaled from drawings.

Contractor shall coordinate all existing conditions during construction of project. The Contractor shall coordinate the location of all existing, new, relocated and abandoned utilities with the project plans and notify respective owners before commencing the work of excavation. Conflicts shall be brought to the attention of the Engineer and resolved prior to proceeding with the work.

STANDARD DRAWING LIST

ADOT Bridge Group SD Drawings - SD 1.11, SD 2.01, SD 3.03, SD 5.01 and SD 5.02

LEGEND



*"-" indicates Section or Detail is located on same drawing.

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HDR

NO.	DATE	REVISION	BY	CHKD.	APPR.

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GENERAL NOTES AND QUANTITIES

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION
DREXEL ROAD BRIDGE
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

36 OF 45

CITY OF TUCSON

DRWN. BY	TRK	09/2024	REF.	SCALE:
DSGN. BY	DL	09/2024		
CHKD. BY	TWB	09/2024	PLAN NO.	

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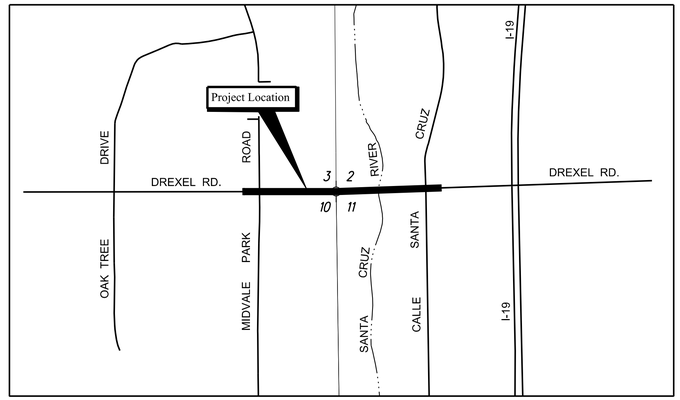
DREXEL ROAD BRIDGE

MIDVALE PARK ROAD TO CALLE SANTA CRUZ
RECORD OF SURVEY AND RIGHT OF WAY PLANS
CITY OF TUCSON JOB NO. GR001071

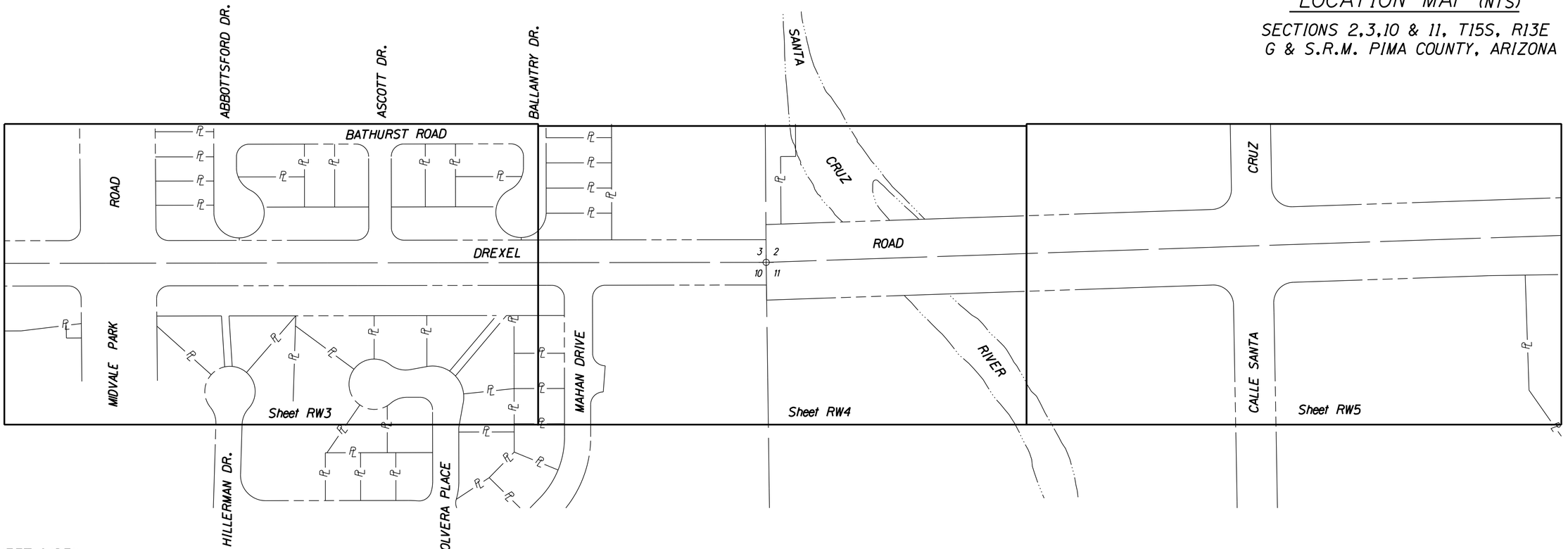
Project Surveyor:
HDR
1. S. Church Avenue,
Suite 1400
Tucson, AZ 85701
(520) 584-3600

Project Owner:
City of Tucson Department of
Transportation and Mobility
201 N. Stone Avenue,
6th Floor
Tucson, AZ 85701
(520) 791-4371



LOCATION MAP (NTS)

SECTIONS 2,3,10 & 11, T15S, R13E
G & S.R.M. PIMA COUNTY, ARIZONA



SHEET INDEX

100 0 100 200

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NO.	DATE	REVISION	BY	CHKD.	APPR.

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

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DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

37 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=100'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

RW1 of RW9

COVER SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

PRINTED BY: LBARELA
PRINT SCALE: 1:1.00
PENTABLE: COTPMA_PLOTORDR.TBL
PLOTDRIVER: 1037S275.PDF-XM.FULL.B&W.PLT
PROJECT ID: 10375275
CLIENT NUMBER: 01.2149

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The Basis of Bearing for this project, North 88°03'48" East, was derived using the Arizona Coordinate System, North American Datum (NAD) 1983 (2011) with 2010 EPOCH, Central Zone 0202, in International feet, and observed between the southwest section corner of Section 2, Point 174, being a found 3" brass cap that is difficult to read stamped "S3 S2 S10 S11 1986 LS 12290" 3.5' below ground, and the south quarter corner of Section 2, Point 149, being a found magnetic nail with 3" aluminum washer in concrete stamped "T15S R13E 1/4 S 2 11 2012 RLS 21782", both of T.15S., R.13E., Gila And Salt River Meridian.

The Basis of Elevation for this project is City of Tucson Benchmark point 148D, Point 215, which is a found chiseled "X" at the North end of a concrete box culvert headwall located in the southwest corner of Drexel Road and Mahan Drive and shown on City of Tucson Field Book 1989D1 at Page 17-Right with an Orthometric Elevation = 2443.44 based upon North American Vertical Datum (NAVD) 1988, GEOID 18 in International feet.

The coordinates are derived from Arizona State Central Zone plane grid values by using the following formulas using a combined scale factor (CF), 0.9998800 (1/CF=1.00012001440), was used to convert grid coordinates to surface coordinates for this project. Surface Northing and Easting coordinates are derived by dividing the state plane grid coordinates by the combined scale factor (grid value/CF).

The primary horizontal control point number 100, being a set 1/2" rebar tagged EPS CONTROL, is an OPUS resolved static solution and is located on the west bank of the Santa Cruz River approximately 150' north of Drexel Road and 50' east of The Gates of Midvale Park Subdivision east residential property line. Project control points used have the following coordinate values:

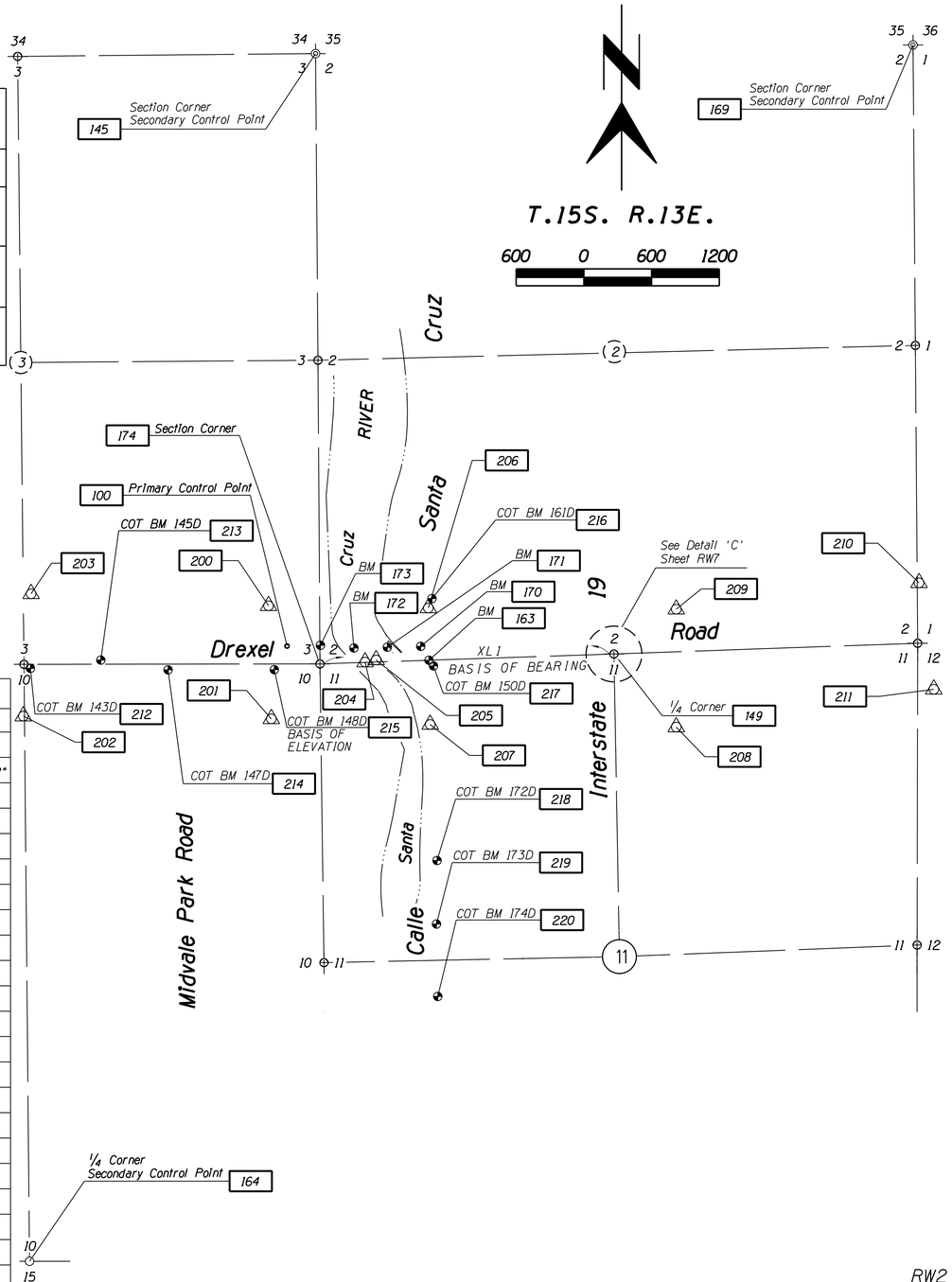
Point & Name		Northing International Feet	Easting International Feet	Orthometric Elevation International Feet
100 Base & Primary	2011 Grid	419,069.0584	985,065.8202	2,448.96
	Surface	419,119.3527	985,184.0423	
Secondary Control Points				
145 HA17	2011 Grid	424,320.6500	985,318.6250	2,426.83
	Surface	424,371.5746	985,436.8774	
164 HJ15	2011 Grid	413,614.9000	982,783.9940	2,476.27
	Surface	413,664.5397	982,901.9422	
169 HA21	2011 Grid	424,396.6350	990,612.3890	2,461.93
	Surface	424,447.5687	990,731.2768	

Sheet Existing Line (XL#) Bearing And Distance Table			
Line	Bearing	Distance	Record Distance
XL1	N88°03'48"E	2606.86' (M)	2606.81' (R10)
	BASIS OF BEARING		

Sheet Reference (R#) Table	
Record	Bk. Dkt. Seq. Reference
R10	SURVEY Seq. 20091010002

COORDINATE TABLE

POINT NO.	NORTHING	EASTING	ELEVATION	DREXEL RD. CONSTRUCTION ℄ STATION	OFFSET	DESCRIPTION
100	419,119.3527	985,184.0423	2,448.96	19+94.62	159.11' LT.	BASE SET 1/2" REBAR TAGGED "EPS CP"
145	424,371.5746	985,436.8774	2,426.83	- - - - - -	- - - - - - - -	COT GPS HA17 FD. 2" BC IN HAND HOLE STAMPED "CITY OF TUCSON 34 35 3 2 PLS 20373"
149	419,048.7415	988,081.2206	2,491.44	48+93.34	20.00' RT.	FD. MAG. NAIL 3" AL. WASHER IN CONC. STAMPED "T15S R13E 1/4 S 2 11 2012 RLS 21782"
163	418,993.3103	986,441.9123	2,449.03	32+52.73	0.00	FD. 2" BC IN 1' SQUARE CONC. WITH PUNCH ONLY
164	413,664.5397	982,901.9422	2,476.27	- - - - - -	- - - - - - - -	COT GPS HJ15 FD. 2" BC IN PAVEMENT STAMPED "PCDOT 1/4 10 15 T15S R13E"
169	424,447.5687	990,731.2768	2,461.93	- - - - - -	- - - - - - - -	COT GPS HA21 FD. 2" BC IN HAND HOLE WITH PUNCH ONLY
170	419,116.5562	986,368.6574	2,448.44	31+83.04	125.30' LT.	SET 1/2" REBAR TAGGED "EPS CP"
171	419,109.0800	986,072.4802	2,448.64	28+86.77	126.32' LT.	SET 1/2" REBAR TAGGED "EPS CP"
172	419,101.6055	985,776.6018	2,426.29	25+90.80	127.33' LT.	SET 1/2" REBAR TAGGED "EPS CP"
173	419,125.6233	985,479.9850	2,433.40	22+95.00	159.84' LT.	SET 1/2" REBAR TAGGED "EPS CP"
174	418,960.6439	985,475.8505	2,427.42	22+86.13	4.95' RT.	FD. 3" BC STAMPED "S3 S2 S10 S11 1986 LS 122909" DIFFICULT TO READ 3.5' DOWN
200	419,476.1865	985,019.8169	2,442.51	- - - - - -	- - - - - - - -	PANEL #6 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
201	418,473.8587	985,044.4097	2,446.33	- - - - - -	- - - - - - - -	PANEL #5 FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
202	418,497.9215	982,846.8941	2,450.59	- - - - - -	- - - - - - - -	PANEL #2 FD. BC STAMPED "RLS 16845"
203	419,582.1917	982,915.6922	2,445.07	- - - - - -	- - - - - - - -	PANEL #1 FD. BC STAMPED "PL9661"
204	418,976.8025	985,875.4254	2,426.68	26+86.01	0.26' RT.	PANEL #11 SET VINYL TARGET
205	418,995.4920	985,973.1783	2,432.71	27+84.25	15.62' LT.	PANEL #12 SET VINYL TARGET
206	419,456.1475	986,436.2185	2,446.66	- - - - - -	- - - - - - - -	PANEL #9 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
207	418,423.8899	986,451.9137	2,451.18	- - - - - -	- - - - - - - -	PANEL #10 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
208	418,400.7737	988,632.8376	2,476.83	- - - - - -	- - - - - - - -	PANEL #7 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
209	419,445.4705	988,633.0927	2,474.26	- - - - - -	- - - - - - - -	PANEL #8 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
210	419,679.4228	990,784.4393	2,479.55	- - - - - -	- - - - - - - -	PANEL #3 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
211	418,735.7478	990,915.4334	2,485.31	- - - - - -	- - - - - - - -	PANEL #4 SET MAGNETIC NAIL TAGGED "EPS CONTROL"
212	418,921.2606	982,909.8369	2,453.78	- - - - - -	- - - - - - - -	COT BM 143D FD. CHISELED "X"
213	418,994.2765	983,533.5230	2,451.97	- - - - - -	- - - - - - - -	COT BM 145D FD. CHISELED "X"
214	418,908.1565	984,129.6606	2,448.00	9+39.95	50.61' RT.	COT BM 147D FD. CHISELED "X"
215	418,909.5945	985,071.1468	2,443.44	18+81.43	50.49' RT.	COT BM 148D FD. CHISELED "X"
216	419,539.8797	986,468.4627	2,446.84	32+97.74	545.36' LT.	COT BM 161D FD. CHISELED "X"
217	418,942.7341	986,481.6084	2,450.32	32+90.70	51.89' RT.	COT BM 150D FD. CHISELED "X"
218	417,217.8671	986,513.1102	2,457.83	- - - - - -	- - - - - - - -	COT BM 172D FD. CHISELED "X"
219	416,654.6369	986,508.2406	2,462.61	- - - - - -	- - - - - - - -	COT BM 173D FD. CHISELED "X"
220	416,012.3390	986,519.8619	2,463.96	- - - - - -	- - - - - - - -	COT BM 174D FD. CHISELED "X"



RW2 of RW9

SURVEY CONTROL SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

Contact Arizona 811 at least two full working days before you begin excavation
Call 811 or click Arizona811.com

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL
Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

38 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=600'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

NO.	DATE	REVISION	BY	CHKD.	APPR.

PRINTED BY: LBARELA
PRINT SCALE: 1:600
PENTABLE: COTPMA PLOTORDR.TBL
PLOTDRIVER: 18375275_PDF_XM_FULL_B&W.PLT
PROJECT ID: 18375275
CLIENT NUMBER: 012149

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SN1 Monument #286 found 0.21' from calculated record location and monument #285.

SN2 Monument #284 found 0.64' from calculated record location and monument #283.

Section Corner 143 — 1/4 Corner 144 — Section Corner Secondary Control Point 145 — Section Corner 169

2640.02' (R14) 2640.18' (M) N88°49'13"E — Section Line — 2640.11' (R15) 2640.15' (M) N89°27'32"E

1356.92' (M) N00°30'59"W — North 1/16 Corner 142 — 5389.81' (R16) 5389.94' (M) — 2718.68' (R10) 2718.75' (M) — 296 — 2663.45' (R10) 2663.50' (M) N00°27'01"W

1323.42' (M) N00°32'26"W — 1/4 Corner 141 — Center 1/4 Corner Not Searched For Lands on Residence Calculated By Bearing-Bearing Intersection — 1/4 Corner 146 — 185 — 184 — 183 — 295 — 257 — 1/4 Corner 168 — Center 1/4 Corner Not Searched For Located Within Interstate 19 Travel Lane

N89°33'23"E — 5276.24' (R16) 5276.26' (M) Mid-Section Line — N00°26'43"W — N88°34'48"E — 5295.83' (M)

2659.16' (M) N01°02'08"W — Section Line — N00°35'47"W — N00°22'47"W — 2692.44' (R1) 2692.33' (M) — 2640.74' (R10) 2640.78' (M) N00°26'36"W

See Detail 'E' This Sheet — 182 — 181 — 320 — 321 — 322 — 326 — 323 — 231 — 369 — 513 — 230 — 232 — 372 — 373 — 374 — 289 — 290 — 288 — 375 — 377 — 376 — 277 — 274 — 273

Section Corner 140 — 174 Section Corner — Center-West 1/16 Corner 157 — 167 Section Corner

2622.96' (R17) 2622.94' (M) N89°55'12"E — Drexel — 1311.48' (M)&(R1) N89°55'13"E — XL1 — XL3 — XL2 — 2693.17' (R10) & (R13) 2693.09'(M) N87°59'05"E — Section Line — See Detail 'C' Sheet RW7

148 1/4 Corner — See Detail 'A' Sheet RW7 — Midvale Park Road — 2648.59' (R13) 2648.55' (M) — Santa Cruz — Interstate 19 — 2683.38' (R13) 2683.42' (M) N01°02'01"W Mid-Section Line — 1/4 Corner 149 — 371 — 2675.31' (R12) 2675.18' (M) N00°06'22"E

5292.68' (M) N00°31'52"W — Mid-Section Line — N00°45'57"W — 1/4 Corner 175 — 2618.93'(M) N88°49'52"E — XL4 — 1/4 Corner 166 — N87°46'29"E 2640.06'(M) Mid-Section Line — 2691.35' (R12) 2691.27'(M) N00°04'00"E — Section Line

See Detail 'D' RW7 — See Detail 'F' This Sheet — Calle — XL5 — N00°44'54"W 2649.46' (M) 2649.55' (R12) — Center 1/4 Corner 177 — See Detail 'B' Sheet RW7

1/4 Corner Secondary Control Point 164 — 273 — S89°58'07"E 2644.06' (R12) 2643.90' (M) Section Line — 151 Section Corner — 165 Section Corner

T.15S. R.13E.

600 0 600 1200

Contact Arizona 811 at least two full working days before you begin excavation. Call 811 or click Arizona811.com

DETAIL 'E'
(N.T.S.)

Calle Santa Cruz ℄ — Exist R/W (R7) — 181 — 325 — 304 — 180 — 511 — 512 — 319 — XC1 — XC2 — XC3 — 510 — 179 — XL6 — XL7 — XL8 — 227 — 40' — 509 — 228 — 163

DETAIL 'F'
(N.T.S.)

Calle Santa Cruz ℄ — 163 — 538 — 235 — XL9 — XL10 — XL11 — 539 — 287 — 162 — Not Accepted SN1 — 286 — 224 — 285 — Exist. R/W (R8) — Not Accepted SN2 — 284 — 283 — 225 — 226 — 282 — 305

Sheet Existing Line (XL#) Bearing And Distance Table

Line	Bearing	Distance	Record Distance
XL1	N89°55'13"E	2622.96'(M)	----------
XL2	N88°03'48"E	2606.86'(M)	2606.81'(R10)
	BASIS OF BEARING		
XL3	N89°55'13"E	1311.48'(M)	1311.52'(R1)
XL4	N00°44'54"E	796.35'(M)	----------
XL5	N00°44'54"E	1853.11'(M)	1853.07'(R11)
XL6	N01°02'38"W	278.28'	278.89'(R7)
XL7	N01°02'38"W	392.04'(M)	392.22'(R7)
XL8	N01°02'38"W	275.78'(M)	275.95'(R7)
XL9	N01°01'56"W	4141.02'	4140.93'(R8)
XL10	N01°01'56"W	4257.30'(M)	4257.21'(R8)
XL11	N01°01'56"W	4143.55'(M)	4143.44'(R8)

Sheet Existing & Record Curve (XC#) Data Table

Curve	Delta (Δ)	Radius	Length
XC1	15°22'06"	1040.00'	278.96'
(R7)	15°21'52"	1040.00'	278.89'
XC2	15°22'06"	1000.00'	268.23'(M)
(R7)	15°21'52"	1000.00'	268.16'
XC3	15°22'06"	960.00'	257.50'
(R7)	15°21'52"	960.00'	257.43'

Sheet Reference (R#) Table

Record	Bk. Dkt. Seq. Reference
R1	PLAT Bk. 51 Pg. 73 (1998)
R2	PLAT Bk. 40 Pg. 19 (1986)
R3	Dkt. 6316 Pg. 29 (1980)
R4	PLAT Bk. 32 Pg. 38 (1980)
R5	Incomplete Road Proceedings 1130 (1964)
R6	Dkt. 1707 Pg. 69 (1960) & COT Res. 4506
R7	PLAT Bk. 29 Pg. 48 (1978)
R8	PLAT Bk. 24 Pg. 15 (1972)
R9	PLAT Seq. 20143530542 (2014)
R10	SURVEY Seq. 20091010002
R11	PLAT Bk. 53 Pg. 67 (2000)
R12	SURVEY Bk. 18 Pg. 64 (1999)
R13	ADOT R/W 019 PM 057 H5105 01R (2014)
R14	PLAT Bk. 23 Pg. 97 (1972)
R15	SURVEY Bk. 20 Pg. 43 (2000)
R16	SURVEY Bk. 43 Pg. 7 (2005)
R17	SURVEY Bk. 6 Pg. 65 (1990)

LEGEND

ADOT	Arizona Department of Transportation
AHD	Arizona Highway Division
AL.	Aluminum
APN	Assessor's Parcel number
BC	Brass Cap
Bk.	Book
BM	Bench Mark
(C)	Calculated
Conc.	Concrete
Const.	Construction
COT	City of Tucson
Dr.	Drive
Esmt.	Easement
E	East or Easting
Exist.	Existing
Fd.	Found
(M)	Dimension From Field Measurement
Mag.	Magnetic
M & P	Maps & Plats
N	North or Northing
Pg.	Page
R/W	Right-of-Way
Rd.	Road
SFNF	Searched For Not Found
S	South
W	West
⊠	Found Existing R/W Monument (See Coordinate Table For Description)
■	Set New R/W Monument (See Coordinate Table For Description)
⊕	Found Survey Monument (See Coordinate Table For Description)
⊕	Set Survey Monument (See Coordinate Table For Description)
○	Survey Control Point (See Survey Control For Description)
○	Found Quarter Corner (See Coordinate Table For Description)
⊕	Found Section Corner (See Coordinate Table For Description)
◉	Bench Mark Symbol (See Survey Control For Description)
(11)	Unfound Center Section Corner (See Coordinate Table For Description)
△	Aerial Panel Location (See Survey Control For Description)
	Exist. R/W Line
	New R/W Line
℄	Property Line
℄	Subdivision Boundary
	Existing Block Wall
-x-x-x-x-x-	Existing Fence

RW3 of RW9

SECTION CONTROL SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

NO.	DATE	REVISION	BY	CHKD.	APPR.

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

39 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=600'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

PROJECT ID: 10375275
CLIENT NUMBER: 01249
PENTABLE: COTPMA_PLOTOROR.TBL
PLOTDRIVER: 10375275.PDF_XM_FULL_B&W.PLT
PRINTED BY: LBARELA
PRINT SCALE: 1:600

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THE GATES OF MIDVALE PARK
AMENDED
BK. 51 PG. 73 M&P

UNSUBDIVIDED

BATHURST RD.

ABBOTTSFORD DR.

ASCOTT DR.

BALLANTRY DR.

DREXEL ROAD

Drexel Road Construction ℄

MIDVALE PARK ROAD

MIDVALE PARK

HILLERMAN DR.

OLVERA PL.

Public Drainage Way

60' Public Drainage Way (R2)

20' Bldg. Setback (R2)

Section Line

P.O.T. 5+00.00

P.O.T. 10+00.00

10+00

15+00

N89°55'13"E 2622.96' (M) 2623.00' (R1) 2623.38' (R2)

N00°30'20"W 585.61'(R6) 585.58' (M)

N00°30'20"W 619.04' (M) 619.14' (R1)

N00°30'29"W 234.15'(M) 234.37'(R2)

N00°04'47"W 258.55' (M) & (R1)

APN 137-11-434C
CABO Owners LLC
5600 S. Midvale Park Rd.
Tucson, AZ 85746
Seq. 20203000721

Lot 6 APN 137-11-7600
Villa, Chris B. &
Lopez, Priscilla B. CP/RS
5692 S. Abbottsford Dr.
Tucson, AZ 85746
Seq. 20031041169

Lot 5
APN 137-11-7590
AMH 2014-1 Borrower LLC
American Homes 4 Rent
5691 S. Abbottsford Dr.
Tucson, AZ 85746
Seq. 20141430170

Lot 41
APN 137-11-7950
Jones, John E. &
Carmen B. CP/RS
5694 S. Ballantry Dr.
Tucson, AZ 85746
Seq. 19992040033

APN 137-33-5740
City of Tucson
No Situs Address
Dkt 7827 Pg 1645 (1986)

APN 137-33-5750
City of Tucson
No Situs Address,
(R2)

APN 137-27-631A
Midvale Park Review Board Inc.
No Situs Address
Seq. 20080540645

Lot 26
APN 137-27-4330
Corchado, Jesus
5730 S. Hillerman Dr.
Tucson, AZ 85746
Seq. 20190230623

Lot 25
APN 137-27-4320
Perez Danny R. &
Lisa Mona JT/RS
5729 S. Hillerman Dr.
Tucson, AZ 85746
Dkt. 9269
Pg. 1150
(1992)

Lot 24
APN 137-27-4310
Rhodes, Kenneth Lee &
Cynthia A. CP/RS
5739 S. Hillerman Dr.
Tucson, AZ 85746
Seq. 20131780205

Lot 12
APN 137-27-4190
Drummond, James C.
5755 S. Olvera Pl.
Tucson, AZ 85746
Seq. 20121500477

Lot 13
APN 137-27-4200
Siqueiros, Arthur P. &
Irma L. JT/RS
5751 S. Olvera Pl.
Tucson, AZ 85746
Dkt. 8526 Pg. 1495 (1989)

Lot 11
APN 137-27-4180
Brusoe, Kennard G. III &
Watts, Laura A. CP/RS
5759 S. Olvera Pl.
Tucson, AZ 85746
Seq. 20082130816

Lot 10
APN 137-27-4170
Weber, Mark A. &
Rachelle D. CP/RS
5763 S. Olvera Pl.
Tucson, AZ 85746
Seq. 20172850680

Lot 9
APN 137-27-4160
Tellez, Ernest &
Jo Ann D. JT/RS
5767 S. Olvera Pl.
Tucson, AZ 85746
Dkt. 9555 Pg. 262
(1993)

Lot 1
APN 137-27-4080
Cuellar, Luis C. &
McCullough, Jesse D.
CP/RS
5730 S. Mahan Dr.
Tucson, AZ 85746
Seq. 20182700155

CAMBRIE AT MIDVALE PARK
BK. 46 PG. 39
(R7)

LAUREL HEIGHTS
AMENDED
BK. 40 PG. 19 M&P
(R2)

MATCH LINE SEE SHEET RW5

Sheet Existing Line (XL#) Bearing And Distance Table			
Line	Bearing	Distance	Record Distance
XL1	N00°30'20"W	45.24'	45.24' (R1)
XL2	N00°04'47"W	41.05'	41.05' (R1)
XL3	N00°04'47"W	41.05'	41.05' (R1)
XL4	N00°30'20"W	34.81'	34.82' (R2)
XL5	N89°55'13"E	179.58'	179.58' (R1)

Sheet Existing & Record Curve (XC#) Data Table			
Curve	Delta (Δ)	Radius	Length
XC1	89°34'27"	25.00'	39.08'
(R1)	89°34'31"	25.00'	39.08'
XC2	90°25'33"	25.00'	39.46'
(R2)	90°25'29"	25.00'	39.46'
XC3 & (R1)	90°00'00"	25.00'	39.27'
XC4	89°34'27"	25.00'	39.08'
XC5	90°25'33"	25.00'	39.46'

Sheet Easement Note (EN#) Table	
Note	Description
EN1	1' No Access Esmt. (R1)
EN2	2.5' Private Wall Esmt. (R1)
EN3	Private Wall Esmt. (R1)
EN4	6' Public Access & Public Utility Esmt. (R1)
EN5	58.84' Public Utility & Sewer Esmt. (R1)
EN6	10' Building Setback (R2)
EN7	15' Public Drainageway (R2)
EN8	24.61' Public Water Esmt. (R1)
EN9	1' No Access Esmt. (R2)

Sheet Reference (R#) Table	
Record	Bk. Dkt. Seq. Reference
R1	PLAT Bk. 51 Pg. 73 (1998)
R2	PLAT Bk. 40 Pg. 19 (1986)
R3	Dkt. 6316 Pg. 29 (1980)
R4	Dkt. 7257 Pg. 1372 (1984)
R5	Incomplete Road Proceedings 1130 (1964)
R6	Seq. 20203000721
R7	PLAT Bk. 49 Pg. 39 (1994)

40 0 40 80

RW4 of RW9

PLAN SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

NO.	DATE	REVISION	BY	CHKD.	APPR.

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL
Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=40'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

40 OF 45

PRINTED BY: LBARELA
PRINT SCALE: 1:1

PENTABLE: COTPMA_PLOTORDR.TBL
PLOTDRIVER: 1037527S.PDF.XM.FULL.B&W.PLT

PROJECT ID: 1037527S
CLIENT NUMBER: 0121149

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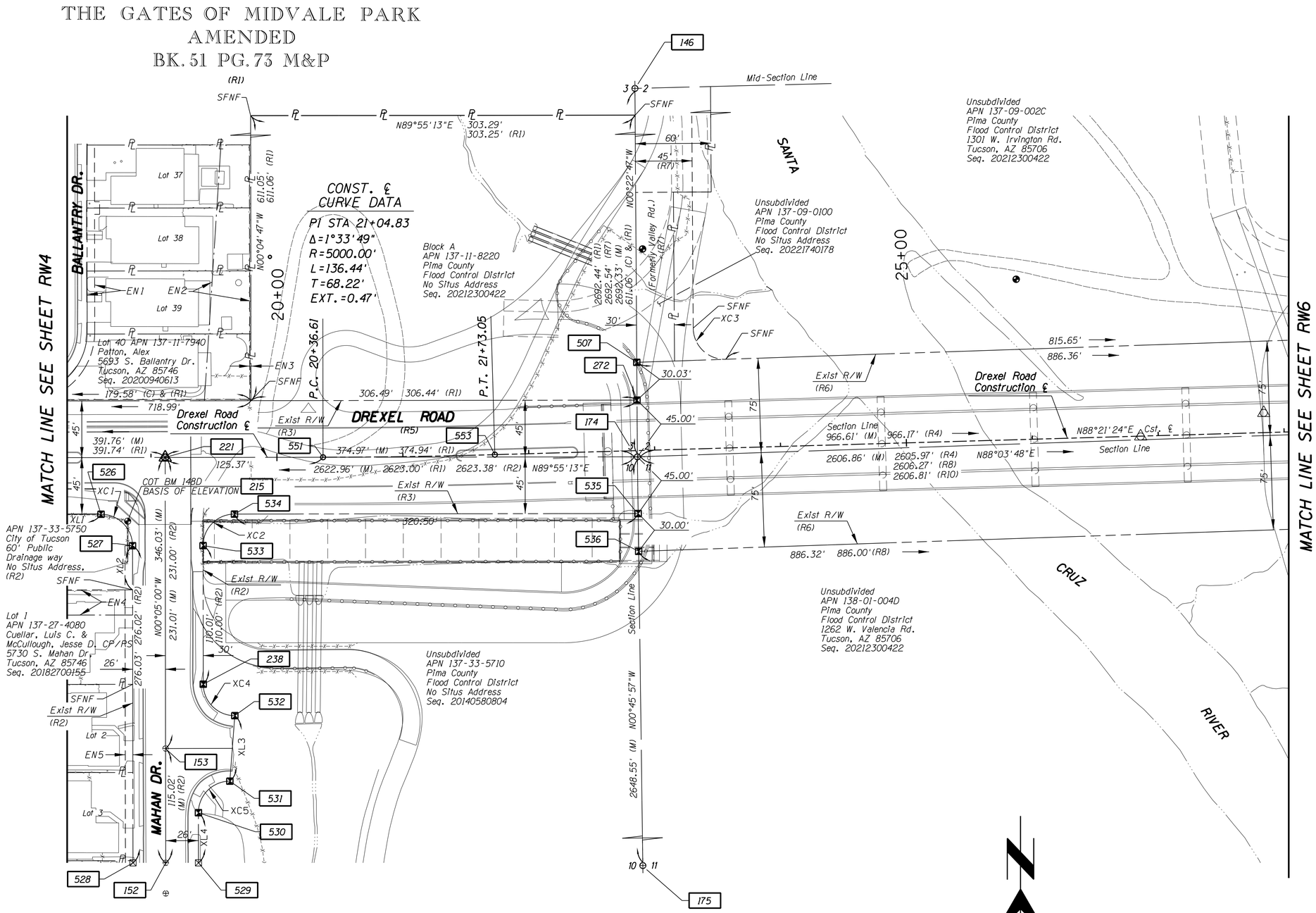

LAUREL HEIGHTS AMENDED
BK. 40 PG. 19
M&P
(R2)

Sheet Reference (R#) Table	
Record	Bk. Dkt. Seq. Reference
R1	PLAT Bk. 51 Pg. 73 (1998)
R2	PLAT Bk. 40 Pg. 19 (1986)
R3	Dkt. 6316 Pg. 29 (1980)
R4	PLAT Bk. 32 Pg. 38 (1980)
R5	Incomplete Road Proceedings 1130 (1964)
R6	Dkt. 1707 Pg. 69 (1960) & COT Res. 4506
R7	PLAT Bk. 29 Pg. 48 (1978)
R8	PLAT Bk. 24 Pg. 15 (1972)
R10	SURVEY Seq. 20091010002

Sheet Existing Line (XL#) Bearing And Distance Table			
Line	Bearing	Distance	Record Distance
XL1	N89°55'13"E	759.72'	759.72' (R2)
XL2	N00°05'00"W	35.00'	35.00' (R2)
XL3	N04°18'55"E	52.15'	52.15' (R2)
XL4	N00°05'00"W	64.02'	64.02' (R2)

Sheet Existing & Record Curve (XC#) Data Table			
Curve	Delta (Δ)	Radius	Length
XC1	89°59'48"	25.00'	39.27'
(R2)	90°00'00"	25.00'	39.27'
XC2	90°00'12"	25.00'	39.27'
(R2)	90°00'00"	25.00'	39.27'
XC3	91°33'25"	25.00'	39.95'
(R7)	91°32'17"	25.00'	39.94'
XC4 & (R2)	90°00'00"	25.00'	39.27'
XC5 & (R2)	90°00'00"	25.00'	39.27'

Sheet Easement Note (EN#) Table	
Note	Description
EN1	6' Public Access & Public Utility Esmt. (R1)
EN2	Erosion Hazard Setback (R1)
EN3	1' No Access Esmt. (R1)
EN4	20' Bldg. Setback (R2)
EN5	6' Utility Esmt. (R2)

RW5 of RW9

PLAN SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

Contact Arizona 811 at least two full working days before you begin excavation
Call 811 or click Arizona811.com

NO.	DATE	REVISION	BY	CHKD.	APPR.

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL
Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

41 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=40'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

PROJECT ID: 10375275
CLIENT NUMBER: 0121149
PENTABLE: COTPMA_PLOTORDR.TBL
PLOTDRIVER: 10375275_PDF_XML_FULL_B&W.PLT
PRINTED BY: LBARELA
PRINT SCALE: 1:40

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CALLE SANTA CRUZ
BLOCKS 1-3
SEQ. NO. 20143530542 M&P
(R9)

BLOCK 1

MATCH LINE SEE SHEET RW5

Unsubdivided
APN 137-09-002C
Pima County
Flood Control District
1301 W. Irvington Rd.
Tucson, AZ 85706
Seq. 20212300422

Proposed R/W
1116.75 Sq. Ft.

CALLE SANTA CRUZ

30+00

35+00

Block 1
APN 137-05-5430
Pima County
1150 W. Drexel Rd.
Tucson, AZ 85706
Seq. 20233450472

Drexel Road
Construction ℄

P.I. 32+52.73

P.C. 37+62.96

DREXEL ROAD

Exist R/W
(R6)

Exist R/W
(R7)

Exist R/W
(R8)

Section Line

N88°21'24"E Cst. ℄
N88°03'48"E

815.65'
886.36'
966.61' (M) 966.17' (R4)
2606.86' (M) 2605.97' (R4)
2606.27' (R8)
886.32' 886.00'(R8)
1640.25' (M) 1639.99' (R8)
1639.80' (R4) & (R7)
510.23'
1279.58'
1279.36' (R4)
388.74' (M) 388.79' (R4) & (R8)
72.14' (M)
72.01' (R4)
N89°04'56"E

278.89'(R7)
278.28'
275.95'(R7)
275.78'
392.04'(M) 392.22'(R7)
4257.30'(M) 4257.21'(R8)
4141.02' 4140.93'(R8)
4143.55'(M) 4143.44'(R8)
NO1°02'38"W
NO1°01'56"W
40'
75'
Varies

CDT BM 150D

XC1
XC2
XC3
XC4

EN1
EN2
EN3
EN4

Unsubdivided
APN 138-01-004D
Pima County
Flood Control District
1262 W. Valencia Rd.
Tucson Az. 85706
Seq. 20212300422

60' Drainage Esmt. (R8)

Lot 15
APN 137-05-5150
Pima County
Community College District
5901 S. Calle Santa Cruz
Tucson, AZ 85709
Seq. 20171810476

Lot 15

See Detail 'C'
Sheet RW8

510 179 227 228 229 513 554 149 163 217 368 232 233 234 235 537 538 539 509 508 162 287

PARQUE DE SANTA CRUZ
RESUBDIVISION LOTS 1 THRU 16
BK. 32 PG. 38 M&P
(R4)

40 0 40 80

Sheet Existing Line (XL#) Bearing And Distance Table			
Line	Bearing	Distance	Record Distance
XL1	N89°04'56"E	583.78'	583.55' (R4)

Sheet Existing & Record Curve (XC#) Data Table			
Curve	Delta (Δ)	Radius	Length
XC1	89°06'26"	40.00'	62.21'
(R7)	89°05'55"	40.00'	62.20'
XC2	90°53'34"	40.00'	63.46'
(R7)	90°54'05"	40.00'	63.46'
XC3	89°05'44"	40.00'	62.20'
(R8)	89°05'55"	40.00'	62.20'
XC4	90°54'16"	40.00'	63.46'
(R8)	90°54'05"	40.00'	63.46'

Sheet Easement Note (EN#) Table	
Note	Description
EN1	30' Sewer Esmt. (R4)
EN2	No Access (R4) & (R8)
EN3	70' Access & Utility Esmt. (R4)
EN4	Underground Water Line Esmt. (R4)

Sheet Reference (R#) Table	
Record	Bk. Dkt. Seq. Reference
R4	PLAT Bk. 32 Pg. 38 (1980)
R5	Incomplete Road Proceedings 1130 (1964)
R6	Dkt. 1707 Pg. 69 (1960) & C.O.T. Res. 4506
R7	PLAT Bk. 29 Pg. 48 (1978)
R8	PLAT Bk. 24 Pg. 15 (1972)
R9	PLAT Seq. 20143530542 (2014)

RW6 of RW9

PLAN SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

HDR

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL
Preliminary
Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

42 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=40'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

NO.	DATE	REVISION	BY	CHKD.	APPR.

PRINTED BY: LBARELA
PRINT SCALE: 1:40
PENTABLE: COTPMA_PLOTOPOR.TBL
PLOTDRIVER: 1037S275_PDF_XML_FULL_B&W.PLT
PROJECT ID: 1037S275
CLIENT NUMBER: 01.2149

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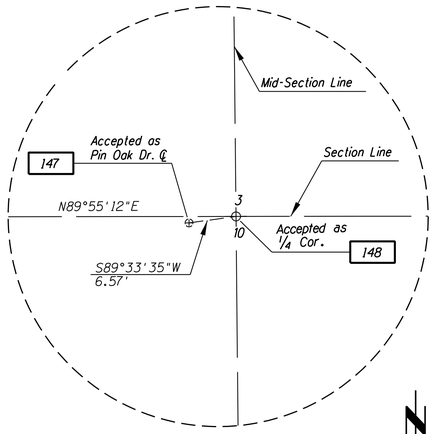
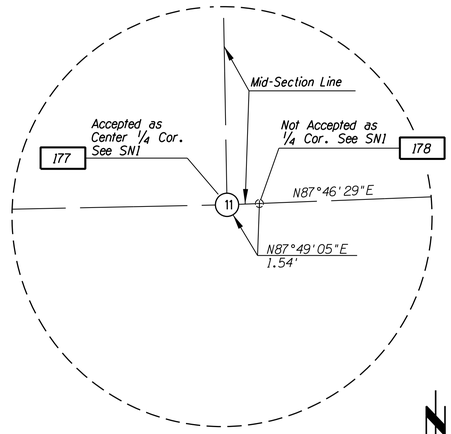
Sheet Reference (R#) Table	
Record	Bk. Dkt. Seq. Reference
R2	PLAT Bk. 40 Pg. 19 (1986)
R4	PLAT Bk. 32 Pg. 38 (1980)
R7	PLAT Bk. 29 Pg. 48 (1978)
R8	PLAT Bk. 24 Pg. 15 (1972)
R9	PLAT Seq. 20143530542 (2014)



DETAIL 'A'
From Sheet RW3
(N.T.S.)

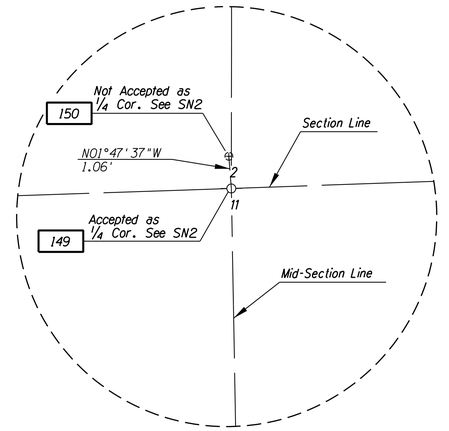
T.15S. R.13E.



DETAIL 'B'
From Sheet RW3
(N.T.S.)

T.15S. R.13E.

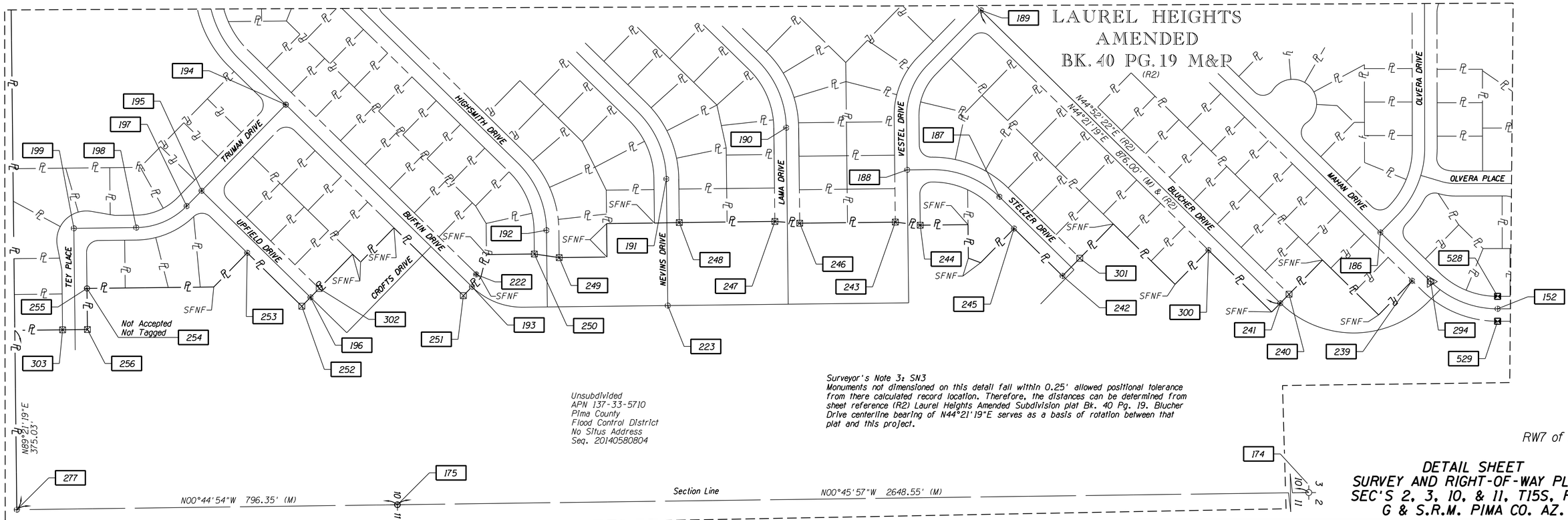
Surveyor's Note 1: SN1
Monument #177 is accepted as the Center Quarter of Section 11 since it agrees best with Santa Cruz Industrial Park Subdivision Plat, Bk. 24 Pg. 15 which is controlling this projects parcel boundaries in this section.



DETAIL 'C'
From Sheet RW3 & RW6
(N.T.S.)

T.15S. R.13E.

Surveyor's Note 2: SN2
Monument #149 is accepted as the 1/4 corner of Section 2 and Section 11 since it agrees best with R4, R7, R8, and R9 which are controling this projects parcel boundaries in these two sections.



Unsubdivided
APN 137-33-5710
Pima County
Flood Control District
No Situs Address
Seq. 20140580804

Surveyor's Note 3: SN3
Monuments not dimensioned on this detail fall within 0.25' allowed positional tolerance from there calculated record location. Therefore, the distances can be determined from sheet reference (R2) Laurel Heights Amended Subdivision plat Bk. 40 Pg. 19. Blucher Drive centerline bearing of N44°21'19"E serves as a basis of rotation between that plat and this project.

DETAIL 'D'
From Sheet RW3

100 0 100 200

Contact Arizona 811 at least two full working days before you begin excavation
Call 811 or click Arizona811.com

NO.	DATE	REVISION	BY	CHKD.	APPR.

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL
Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

43 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE:
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

RW7 of RW9

DETAIL SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

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PRINT SCALE: 1:100
PENTABLE: COTPMA_PLOTORDR.TBL
PLOTDRIVER: 1037527S_PDF_XM_FULL_B&W_PLT
PROJECT ID: 10375275
CLIENT NUMBER: 0121149

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COORDINATE TABLE

POINT NO.	NORTHING	EASTING	DREXEL RD. CONSTRUCTION ℄ STATION	DREXEL RD. CONSTRUCTION ℄ OFFSET	DESCRIPTION
140	418,953.3326	980,229.9546	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 17479"
141	421,612.0590	980,181.8977	- - - - -	- - - - - -	FD. 2" BC IN 1' CIRCLED CONC. STAMPED "RLS 46278"
142	422,935.4160	980,169.4088	- - - - -	- - - - - -	FD. BRASS PIN IN CONC. BELOW PAVEMENT CAP MISSING LOCATED CENTER
143	424,292.2818	980,157.1775	- - - - -	- - - - - -	FD. 2" AL. CAP IN HAND HOLE STAMPED "33 34 S33 RLS 14145"
144	424,346.6381	982,796.7955	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "PLS 22245 T-15-S R-13-E N1/4 SEC 3"
145	424,371.5746	985,436.8774	- - - - -	- - - - - -	COT GPS HA17 FD. 2" BC IN HAND HOLE STAMPED "CITY OF TUCSON 34 35 3 2 PLS 20373"
146	421,652.9112	985,458.0041	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 21782"
147	418,956.9387	982,846.3207	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 17479"
148	418,956.9892	982,852.8935	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 17479"
149	419,048.7415	988,081.2206	- - - - -	- - - - - -	FD. MAG. NAIL 3" AL. WASHER IN CONC. STAMPED "T15S R13E 1/4 S 2 11 2012 RLS 21782"
150	419,049.8003	988,081.1876	- - - - -	- - - - - -	FD. 3" BC IN BROKEN CONC. LOOSE STAMPED "T15S R13E 1/4 COR S2 S11 1998 LS 12213"
151	413,663.0918	985,545.8458	- - - - -	- - - - - -	FD. 2" BC IN HAND HOLE STAMPED "RLS 21782"
152	418,614.0931	985,101.3858	19+11.26	346.03' RT.	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
153	418,729.1130	985,101.2187	19+11.25	231.01' RT.	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
154	418,959.5756	984,709.1229	15+19.48	0.00'	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 17479"
155	419,218.1253	984,708.7626	15+19.48	258.55' LT.	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 14172"
156	418,958.8518	984,189.6896	10+00.05	0.00'	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 13019"
157	418,958.8166	984,164.3720	9+74.73	0.00'	FD. 2" BC IN 1' SQUARE CONC. STAMPED "COT RLS 13019"
161	419,577.8679	984,184.2262	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "COT RLS 13019"
162	414,736.7004	986,518.5988	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. WITH PUNCH ONLY; ADDED STAMPINGS "RLS 58427"
163	418,993.3103	986,441.9123	32+52.73	0.00'	FD. 2" BC IN 1' SQUARE CONC. WITH PUNCH ONLY; ADDED STAMPINGS "RLS 58427"
164	413,664.5397	982,901.9422	- - - - -	- - - - - -	COT GPS HJ15 FD. 2" BC IN PAVEMENT STAMPED "PCDOT 1/4 10 15 T15S R13E"
165	413,777.0059	990,764.5633	- - - - -	- - - - - -	FD. 2" BC IN HAND HOLE WITH PUNCH ONLY
166	416,468.2702	990,767.6960	- - - - -	- - - - - -	COT GPS HG21 FD. 2" BC IN HAND HOLE STAMPED "RLS 23956 1/4 S11 S12 T15S R13E"
167	419,143.4494	990,772.6449	- - - - -	- - - - - -	FD. 2" BC IN PAVEMENT STAMPED "RLS 12537"
168	421,784.1462	990,752.2055	- - - - -	- - - - - -	COT GPS HC21 1/2" REBAR IN HAND HOLE NO TAG
169	424,447.5687	990,731.2768	- - - - -	- - - - - -	COT GPS HA21 FD. 2" BC IN HAND HOLE WITH PUNCH ONLY
174	418,960.6439	985,475.8505	22+86.13	4.95' RT.	FD. 3" BC STAMPED "S3 S2 S10 S11 1986 LS 12290" ILLEGIBLE 3.5' DOWN
175	416,312.3286	985,511.2478	- - - - -	- - - - - -	FD. 2" AL. CAP STAMPED "1/4 10 11 T.15S. R.13E." 3.5' DOWN
176	424,388.9219	988,078.7542	- - - - -	- - - - - -	FD. CHISELED "X"
177	416,365.7576	988,129.6320	- - - - -	- - - - - -	FD. 3" AL. CAP STAMPED "T15S R13E C1/4 11 2010 PLS 78" REMAINING ILLEGIBLE
178	416,365.8162	988,131.1700	- - - - -	- - - - - -	FD. 1-1/2" OPEN IRON PIPE
179	419,385.2890	986,434.7706	- - - - -	- - - - - -	FD. 2" BC IN CONC. WITH PUNCH ONLY; ADDED STAMPINGS "RLS 58427"
180	419,650.9196	986,465.6948	- - - - -	- - - - - -	FD. 2" BC IN CONC. WITH PUNCH ONLY; ADDED STAMPINGS "RLS 58427"
181	420,540.7740	986,692.9218	- - - - -	- - - - - -	FD. 2" BC IN CONC. STAMPED "RLS 16597"
182	421,337.1418	986,732.2399	- - - - -	- - - - - -	FD. 2" BC IN CONC. STAMPED "RLS 16597"
183	421,866.0262	986,651.5780	- - - - -	- - - - - -	FD. 2" BC IN CONC. STAMPED "RLS 16597"
184	422,096.6201	986,643.3379	- - - - -	- - - - - -	FD. 2" BC IN CONC. STAMPED "RLS 16597"
185	422,575.0884	986,681.6535	- - - - -	- - - - - -	FD. 2" BC IN PAVEMENT STAMPED "RLS 16597"
186	418,368.9737	984,941.7188	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
187	417,571.8762	984,867.2369	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 1684"
188	417,378.8097	984,810.8269	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
189	417,533.2594	984,477.0406	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
190	417,125.8019	984,722.6755	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
191	416,874.9922	984,829.8860	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
192	416,624.1826	984,937.0934	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
193	416,468.4359	985,055.3332	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
194	416,078.8442	984,674.4111	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
195	415,902.6694	984,854.5956	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
196	416,130.5384	985,077.3938	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
197	415,871.4774	984,886.4976	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
198	415,765.9124	984,931.6221	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
199	415,635.4278	984,933.0903	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "L.S. 16845"
221	418,960.1214	985,100.8830	19+11.24	0.00'	COT GPS HE18 FD. 2' BC IN CONC. STAMPED "LS 16845"
222	416,477.0700	985,029.4484	- - - - -	- - - - - -	COT GPS HG18 FD. MAGNETIC NAIL WITH 2" AL. WASHER STAMPED "COT GPS HG18 RLS 23596"
223	416,877.9714	985,094.6620	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
224	414,508.4608	986,568.1776	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. NO PUNCH
225	414,142.3854	986,727.1919	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. NO PUNCH

COORDINATE TABLE

POINT NO.	NORTHING	EASTING	DREXEL RD. CONSTRUCTION ℄ STATION	DREXEL RD. CONSTRUCTION ℄ OFFSET	DESCRIPTION
226	413,917.6869	986,776.6964	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. WITH PUNCH ONLY
227	419,386.0177	986,474.7640	- - - - -	- - - - - -	FD. 5/8" REBAR BENT TAGGED "RLS 12122"
228	419,110.2804	986,479.7878	32+94.54	115.62' LT.	FD. 1" AL. CAPPED PIN STAMPED "RLS 12122"
229	419,071.0319	986,521.1330	33+34.54	75.00' LT.	FD. 1" AL. CAPPED PIN DETERIORATING
230	419,095.7902	987,261.1709	40+78.15	66.40' LT.	FD. 1" AL. CAPPED PIN STAMPED "RLS 12122"
231	419,097.5460	987,290.5033	41+07.53	65.82' LT.	FD. 1" AL. CAPPED PIN STAMPED "RLS 36786"
232	418,943.4837	987,494.8164	43+00.77	103.12' RT.	FD. 1" AL. CAPPED PIN STAMPED "UCSON"
233	418,934.1331	986,911.1154	37+19.67	75.00' RT.	FD. 1" LEAD CAPPED PIN STAMPED "CITY OF TUCSON" BENT
234	418,920.9957	986,522.5965	33+30.93	75.00' RT.	FD. 5/8" REBAR BENT NO TAG
235	418,880.2980	986,483.9548	32+90.93	114.37' RT.	FD. 1/2" REBAR BENT TAGGED "RLS 4080"
238	418,780.1565	985,131.1445	19+41.25	180.01' RT.	FD. 1/2" REBAR BENT NO TAG; REMOVED AND SET 1/2" REBAR TAGGED "RLS 58427"
239	418,435.1261	985,042.7619	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
240	418,177.7917	985,070.8673	- - - - -	- - - - - -	FD. 1/2" REBAR NO TAG
241	418,159.3897	985,089.6367	- - - - -	- - - - - -	FD. MAGNETIC NAIL IN PAVEMENT NO TAG
242	417,703.8529	985,032.6394	- - - - -	- - - - - -	FD. MAGNETIC NAIL IN PAVEMENT TAGGED "RLS 18547"
243	417,354.0374	984,920.0866	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
244	417,406.1132	984,926.5279	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
245	417,602.4634	984,933.5061	- - - - -	- - - - - -	FD. 1/2" REBAR BENT NO TAG
246	417,154.0501	984,922.3368	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
247	417,102.0066	984,918.7685	- - - - -	- - - - - -	FD. 1/2" REBAR BENT NO TAG
248	416,902.0193	984,921.0187	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
249	416,650.8282	984,994.3275	- - - - -	- - - - - -	FD. 1/2" REBAR BENT TAGGED "RLS 18547"
250	416,598.7401	984,986.7928	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
251	416,450.2592	985,073.9237	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
252	416,112.3617	985,095.9843	- - - - -	- - - - - -	FD. 1/2" REBAR BENT TAGGED "RLS 18547"
253	415,998.1376	984,984.3020	- - - - -	- - - - - -	FD. 1/2" REBAR BENT NO TAG
254	415,662.9558	985,058.8520	- - - - -	- - - - - -	FD. 1/2" REBAR NO TAG
255	415,662.8438	985,058.7898	- - - - -	- - - - - -	FD. 1/2" REBAR BENT TAGGED "RLS 18547"
256	415,663.8115	985,144.7944	- - - - -	- - - - - -	FD. 1/2" REBAR BENT TAGGED "RLS 18547"
257	421,859.9954	986,612.0353	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP BENT ILLEGIBLE
261	418,854.9460	984,975.0357	17+85.25	105.00' RT.	FD. 1/2" REBAR NO TAG
262	418,854.9249	984,959.8702	17+70.08	105.00' RT.	FD. CHISELED "X" IN CURB
263	418,854.8975	984,940.2265	17+50.44	105.00' RT.	FD. 1/2" REBAR NO TAG; ATTACHED TAG "RLS 58427"
264	419,004.9663	984,989.4845	17+99.90	45.00' LT.	FD. 1/2" REBAR NO TAG
265	419,004.6417	984,756.5601	15+66.98	45.00' LT.	FD. 1/2" REBAR NO TAG; ATTACHED TAG "RLS 58427"
266	419,070.6568	984,731.4681	15+41.98	111.05' LT.	FD. 1/2" REBAR NO TAG
267	419,170.5940	984,686.3288	14+96.98	211.05' LT.	FD. 1/2" REBAR BENT NO TAG; REMOVED AND SET 1/2" REBAR TAGGED "RLS 58427"
268	419,070.5941	984,686.4682	14+96.98	111.05' LT.	FD. 1/2" REBAR TAGGED "RLS 14172"
269	419,029.5442	984,686.5254	14+96.98	70.00' LT.	FD. 1/2" REBAR NO TAG; ATTACHED TAG "RLS 58427"
270	419,004.5094	984,661.5602	14+71.98	45.00' LT.	FD. 1/2" REBAR BENT TAGGED "RLS 14172"
271	419,004.1860	984,429.4851	12+39.90	45.00' LT.	FD. 1/2" REBAR TAGGED "RLS 14172"
272	419,005.6435	985,475.5522	22+87.12	40.04' LT.	FD. 60D NAIL NO TAG; REMOVED AND SET 1/2" REBAR TAGGED "RLS 58427"
273	414,286.7018	985,537.7017	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "PE 11294"
274	414,633.3228	985,533.1750	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 18547"
277	415,516.0421	985,521.6470	- - - - -	- - - - - -	FD. 1/2" REBAR NO TAG; ATTACHED TAG "RLS 58427"
282	413,918.9455	986,816.4317	- - - - -	- - - - - -	FD. 5/8" REBAR NO TAG

Surveyor's Note:
In accordance with Arizona Boundary Survey Minimum Standards tolerance policy on found R/W and property corner monuments, the found coordinate values within 0.25' of the calculated record position have been adjusted to the values of the calculated position.

At the time of printing of this submittal, the monuments shown as being set, added stampings, and attached tags on this sheet have not yet been established in the field.

RW8 of RW9

COORDINATE SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

HDR

THIS SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

30% SUBMITTAL
Preliminary Not For Construction

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

44 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024
DSGN. BY	JTS	09/2024
CHKD. BY	LJB	09/2024

REF. _____ SCALE: 1"=40'

PLAN NO. R-2024-XXX

NO.	DATE	REVISION	BY	CHKD.	APPR.

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PRINT SCALE: 1:40
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PLOTDRIVER: 10375275.PDF_XM.FULL_B&W.PLT
PROJECT ID: 10375275
CLIENT NUMBER: 012149

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COORDINATE TABLE

POINT NO.	NORTHING	EASTING	DREXEL RD. CONSTRUCTION ℄ STATION	DREXEL RD. CONSTRUCTION ℄ OFFSET	DESCRIPTION
283	414,158.3219	986,763.8801	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 14145"
284	414,158.9571	986,763.7763	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "CITY OF TUCSON" BENT
285	414,524.3973	986,604.8658	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 14145"
286	414,524.5009	986,605.0516	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "CITY OF TUCSON" BENT
287	414,737.4209	986,558.5923	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 14145"
288	417,263.3363	986,513.0858	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 4080"
289	417,260.5503	986,535.0850	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 4080"
290	417,166.9809	986,726.4978	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "RLS 14145"
291	418,724.7106	984,191.7561	10+01.79	234.14' RT.	FD. CHISELED "X" ON CURB
292	418,854.3420	984,541.5774	13+51.79	105.00' RT.	FD. 1/2" REBAR BENT NO TAG
293	418,854.5589	984,697.1960	15+07.41	105.00' RT.	FD. 1/2" REBAR TAGGED "LS 16845"
294	418,473.9812	985,044.3896	- - - - -	- - - - - -	FD. 2" BC IN 1' SQUARE CONC. STAMPED "RLS 16845"
295	421,653.6217	985,502.4367	- - - - -	- - - - - -	FD. 3/8" REBAR BENT NO TAG
296	423,789.4834	985,570.3476	- - - - -	- - - - - -	FD. 1/2" REBAR NO TAG
300	418,009.1599	984,978.7135	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
301	417,739.9865	984,995.6642	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
302	416,148.7152	985,058.8033	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
303	415,611.8147	985,145.3794	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
304	419,660.4675	986,436.7605	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
305	413,808.4085	986,819.2808	- - - - -	- - - - - -	FD. 60D NAIL NO TAG
319	419,532.5268	986,483.3142	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS ___22" REMAINING ILLEGIBLE
320	419,542.3250	986,748.9490	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
321	419,530.6294	986,749.2697	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
322	419,541.2050	987,061.5680	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
323	419,332.2660	987,352.6770	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
325	419,765.7361	986,536.2971	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
326	419,780.3810	987,553.6950	- - - - -	- - - - - -	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
364	419,614.4843	984,108.9001	- - - - -	- - - - - -	FD. 1/2" REBAR TAGGED "REC LS 17479" 0.4' DOWN
368	418,935.2886	986,983.2491	37+91.42	76.35' RT.	FD. 5/8" REBAR NO TAG 1' DOWN
369	419,123.8810	987,799.8270	46+14.65	64.61' LT.	FD. 3" AHD BC WITH PUNCH ONLY 0.4' DOWN
370	419,113.9430	987,800.0280	46+14.52	54.67' LT.	FD. 1-1/2" AL. CAP STAMPED "RLS 12122"
371	418,963.9220	987,802.5940	46+12.01	95.35' RT.	FD. 3" AHD BC
372	418,719.7548	987,747.4399	45+48.64	337.52' RT.	FD. 1-1/2" COT LEAD CAP WITH PUNCH ONLY
373	418,037.3217	987,819.4633	- - - - -	- - - - - -	FD. 1-1/2" COT LEAD CAP WITH PUNCH ONLY
374	417,785.6128	987,823.9919	- - - - -	- - - - - -	FD. 1-1/2" COT LEAD CAP
375	416,795.5722	987,841.8038	- - - - -	- - - - - -	FD. 1-1/2" COT LEAD CAP
376	415,795.6668	987,859.7932	- - - - -	- - - - - -	FD. 1-1/2" COT LEAD CAP
377	416,348.7905	987,299.6298	- - - - -	- - - - - -	FD. 1-1/2" COT LEAD CAP WITH PUNCH ONLY
500	419,003.7117	984,089.1040	8+99.52	45.00' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
501	419,028.9323	984,114.0681	9+24.52	70.19' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
502	419,614.9983	984,258.9014	- - - - -	- - - - - -	CALCULATED EXISTING R/W
503	419,028.7697	984,264.0754	10+74.53	69.81' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
504	419,003.9904	984,289.1093	10+99.53	45.00' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
505	419,170.6567	984,731.3288	15+41.98	211.05' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
506	419,029.6069	984,731.5253	15+41.98	70.00' LT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
507	419,035.6699	985,475.3532	22+87.79	70.06' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
508	419,065.6241	986,361.2049	31+74.13	74.60' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
509	419,106.3299	986,399.8465	32+13.93	114.18' LT.	SET 1/2" REBAR TAGGED "RLS 58427"
510	419,384.5603	986,394.7772	- - - - -	- - - - - -	SET 1/2" REBAR TAGGED "RLS 58427"
511	419,660.8162	986,426.9384	- - - - -	- - - - - -	SET 1/2" REBAR TAGGED "RLS 58427"
512	419,641.0231	986,504.4512	- - - - -	- - - - - -	SET 1/2" REBAR TAGGED "RLS 58427"
513	419,114.2748	987,799.9797	46+14.48	55.00' LT.	CALCULATED EXISTING R/W
520	418,913.7133	984,090.2699	9+00.56	45.00' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
521	418,888.9339	984,115.3038	9+25.56	69.81' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
522	418,724.0486	984,116.7590	9+26.79	234.70' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
523	418,725.3725	984,266.7532	10+76.78	233.59' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
524	418,888.7713	984,265.3110	10+75.57	70.19' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"

COORDINATE TABLE

POINT NO.	NORTHING	EASTING	DREXEL RD. CONSTRUCTION ℄ STATION	DREXEL RD. CONSTRUCTION ℄ OFFSET	DESCRIPTION
525	418,913.9919	984,290.2752	11+00.57	45.00' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
526	418,915.0504	985,049.9499	18+60.24	45.00' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
527	418,890.0868	985,074.9847	18+85.24	70.00' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
528	418,614.0553	985,075.3859	18+85.26	346.03' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
529	418,614.1309	985,127.3858	19+37.26	346.03' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
530	418,678.1508	985,127.2928	19+37.26	282.01' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
531	418,703.1871	985,152.2564	19+62.26	257.01' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
532	418,755.1929	985,156.1808	19+66.25	205.01' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
533	418,890.1618	985,130.9847	19+41.24	70.00' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
534	418,915.1981	985,155.9498	19+66.24	45.00' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
535	418,915.6447	985,476.4520	22+85.44	49.95' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
536	418,885.6349	985,476.8531	22+84.98	79.96' RT.	SET MAG SPIKE WITH 2" WASHER STAMPED "RLS 58427"
537	418,915.5879	986,362.6680	31+71.29	75.42' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
538	418,876.3312	986,404.0133	32+11.50	115.84' RT.	SET 1/2" REBAR TAGGED "RLS 58427"
539	414,735.9799	986,478.6053	- - - - -	- - - - - -	SET 1/2" REBAR TAGGED "RLS 58427"
550	418,958.1551	983,689.6439	5+00.00	0.00'	CALCULATED DREXEL ROAD CONSTRUCTION CENTERLINE
551	418,960.2961	985,226.2499	20+36.61	0.00'	CALCULATED DREXEL ROAD CONSTRUCTION CENTERLINE
552	423,960.2913	985,219.2832	20+36.61	5000.00' LT.	CALCULATED DREXEL ROAD CONSTRUCTION RADIUS POINT
553	418,962.3477	985,362.6704	21+73.05	0.00'	CALCULATED DREXEL ROAD CONSTRUCTION CENTERLINE
554	419,010.5534	986,951.8519	37+62.96	0.00'	CALCULATED DREXEL ROAD CONSTRUCTION CENTERLINE

Surveyor's Note:
In accordance with Arizona Boundary Survey Minimum Standards tolerance policy on found R/W and property corner monuments, the found coordinate values within 0.25' of the calculated record position have been adjusted to the values of the calculated position.

At the time of printing of this submittal, the monuments shown as being set, added stampings, and attached tags on this sheet have not yet been established in the field.

RW9 of RW9

COORDINATE SHEET
SURVEY AND RIGHT-OF-WAY PLANS
SEC'S 2, 3, 10, & 11, T15S, R13E
G & S.R.M. PIMA CO. AZ.

Contact Arizona 811 at least two full working days before you begin excavation
Call 811 or click Arizona811.com

HDR

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30% SUBMITTAL
Preliminary Not For Construction

NO.	DATE	REVISION	BY	CHKD.	APPR.

DEPARTMENT OF TRANSPORTATION AND MOBILITY

- DREXEL ROAD BRIDGE -
MIDVALE PARK ROAD TO CALLE SANTA CRUZ

45 OF 45

CITY OF TUCSON

DRWN. BY	JTS	09/2024	REF.
DSGN. BY	JTS	09/2024	SCALE: 1"=40'
CHKD. BY	LJB	09/2024	PLAN NO. R-2024-XXX

PROJECT I.D: 103752275
CLIENT NUMBER: 012149
PENTABLE: COTPMA_PLOTOROR.TBL
PLOTDRIVER: 103752275_PDF_XM_FULL_B&W.PLT
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PRINT SCALE: 1:40

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Appendix B. Alternatives Considered

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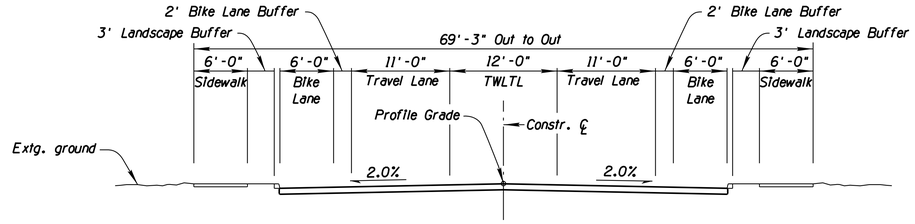
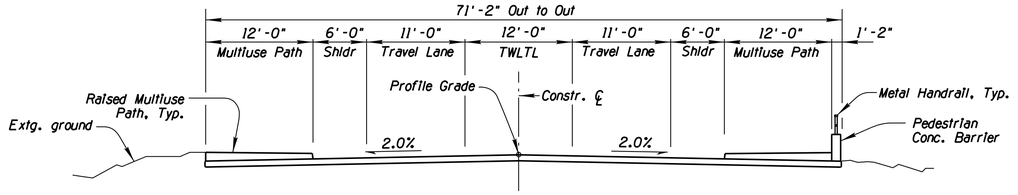


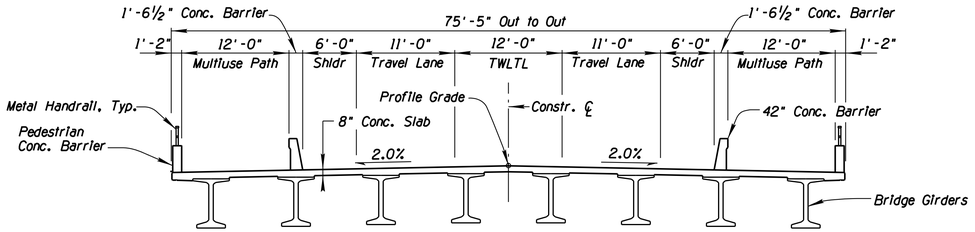
TYPICAL ROADWAY SECTION - MIDVALE TO MAHAN (1)

(Looking Ahead Station)
1/8"=1'-0"



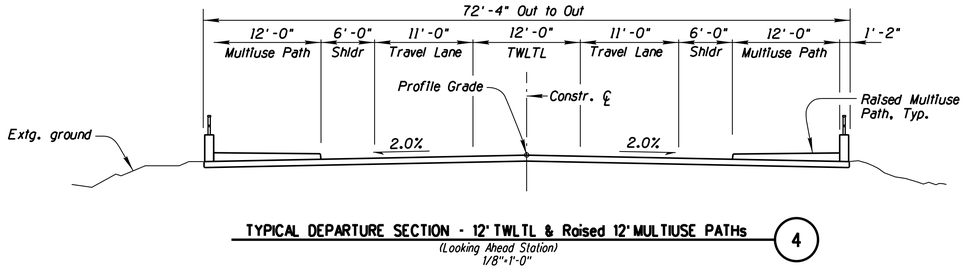
TYPICAL APPROACH SECTION - 12' TWLTL & Raised 12' MULTIUSE PATHs (2)

(Looking Ahead Station)
1/8"=1'-0"



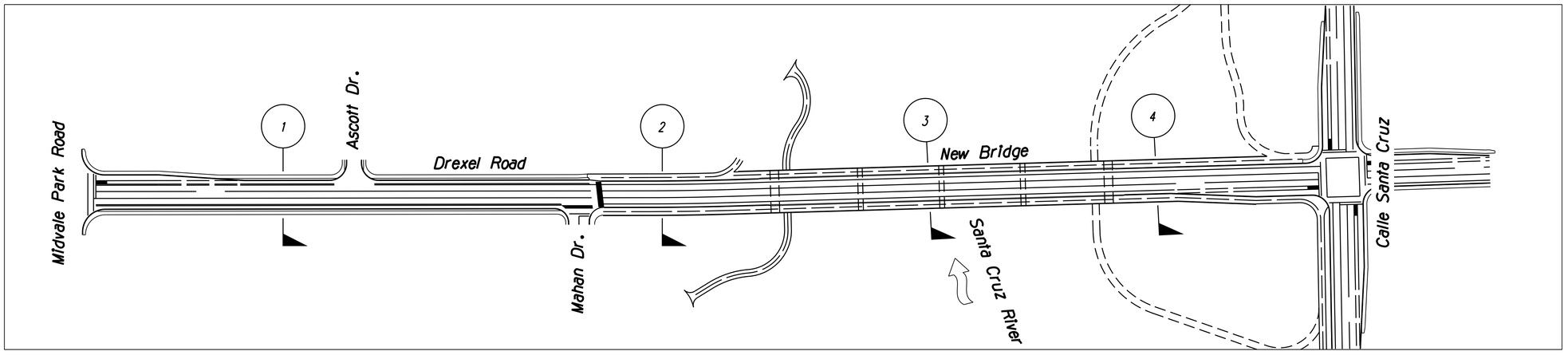
TYPICAL BRIDGE SECTION - 12' TWLTL & 12' MULTIUSE PATHs W/ BARRIER (3)

(Looking Ahead Station)
1/8"=1'-0"



TYPICAL DEPARTURE SECTION - 12' TWLTL & Raised 12' MULTIUSE PATHs (4)

(Looking Ahead Station)
1/8"=1'-0"



ALTERNATIVE 1 - PLAN VIEW
1"=100'

Note: Dimensions shown are conceptual and are subject to change based on funding, public input, and other considerations.

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

NO.	DATE	REVISION	BY	CHKD.	APPR.

PRELIMINARY NOT FOR CONSTRUCTION

TYPICAL SECTION ALTERNATIVES

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE - MIDVALE PARK TO CALLE SANTA CRUZ

OF 70

CITY OF TUCSON

DRWN. BY	TRK	2022	REF.
DSGN. BY	DL	2022	SCALE:
CHKD. BY	TWB	2022	PLAN NO.

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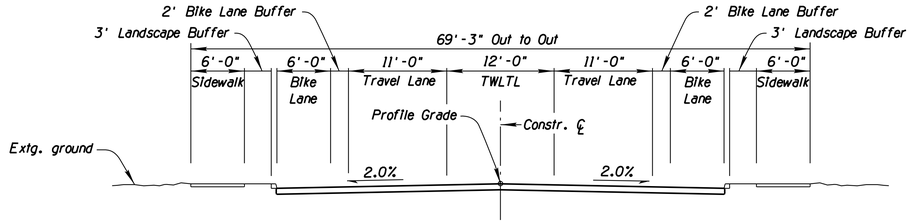
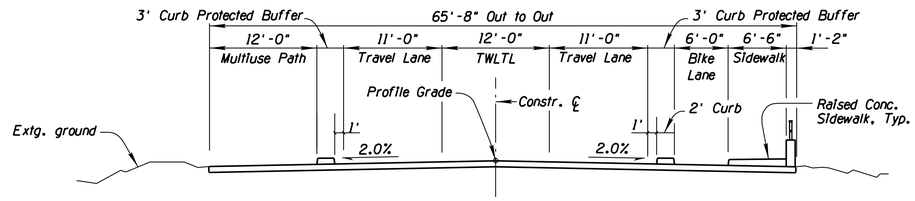


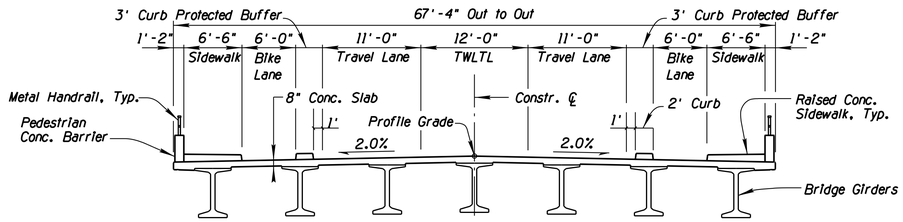
TYPICAL ROADWAY SECTION - MIDVALE TO MAHAN (1)

(Looking Ahead Station)
1/8"=1'-0"



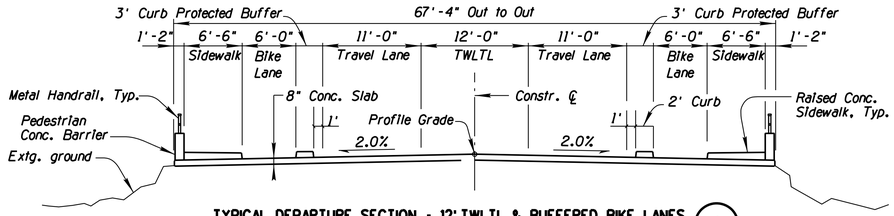
TYPICAL APPROACH SECTION - 12' TWLTL, MULTIUSE PATH, & SIDEWALK (2)

(Looking Ahead Station)
1/8"=1'-0"



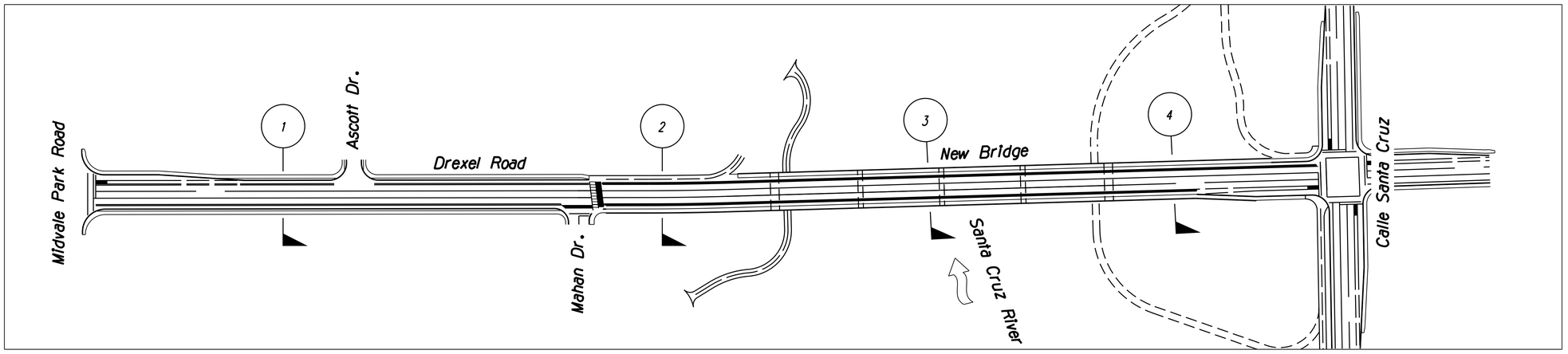
TYPICAL SECTION - 12' TWLTL & BUFFERED BIKE LANES (3)

(Looking Ahead Station)
1/8"=1'-0"



TYPICAL DEPARTURE SECTION - 12' TWLTL & BUFFERED BIKE LANES (4)

(Looking Ahead Station)
1/8"=1'-0"



ALTERNATIVE 2 - PLAN VIEW
1"=100'

Note: Dimensions shown are conceptual and are subject to change based on funding, public input, and other considerations.

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ARIZONA 811 Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

HDR

NO.	DATE	REVISION	BY	CHKD.	APPR.

PRELIMINARY NOT FOR CONSTRUCTION

TYPICAL SECTION ALTERNATIVES

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

DREXEL ROAD BRIDGE - MIDVALE PARK TO CALLE SANTA CRUZ

OF 70

CITY OF TUCSON

DRWN. BY TRK	2022	REF. SCALE:
DSGN. BY DL	2022	
CHKD. BY TWB	2022	PLAN NO.

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Appendix C. Detailed Cost Estimates for Alternative Nos. 1 and 2

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PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 1

Item No.	Item Description	Units	Quantity	Unit Price	Amount
1090010	Fuel Adjustment Allowance	USD	50,000	$ 1.00	$ 50,000.00
2010010	Clearing and Grubbing (Noxious and Invasive Species Control Allowance)	USD	2,000	$ 1.00	$ 2,000.00
2010011	Clearing and Grubbing	ACRE	8.5	$ 5,000.00	$ 42,500.00
2020001	Removal of Structures & Obstructions	L.S.	1	$ 15,000.00	$ 15,000.00
2020029	Removal of Bituminous Pavement	S.Y.	10,907	$ 8.00	$ 87,256.00
2020034	Removal of Signs and Delineators	L.S.	1	$ 2,000.00	$ 2,000.00
2030300	Roadway Excavation	C.Y.	3,204	$ 35.00	$ 112,140.00
2030401	Drainage Excavation	C.Y.	1,165	$ 35.00	$ 40,775.00
2030901	Borrow	C.Y.	1,712	$ 50.00	$ 85,600.00
3030003	Aggregate Base (Roadway)	C.Y.	3,131	$ 140.00	$ 438,340.00
3030003	Aggregate Base (MUP)	C.Y.	309	$ 140.00	$ 43,260.00
4010004	Portland Cement Concrete Pavement (4")	S.Y.	694	$ 30.00	$ 20,820.00
4040111	Tack Coat	TON	6	$ 2,000.00	$ 12,000.00
4060001	Asphaltic Concrete (No. 1: Roadway)	TON	3,050	$ 185.00	$ 564,250.00
4060002	Asphaltic Concrete (No. 2: Roadway)	TON	1,530	$ 200.00	$ 306,000.00
4060002	Asphaltic Concrete (No. 2: MUP)	TON	380	$ 200.00	$ 76,000.00
5010035	Pipe, Corrugated Metal, 48"	L.F.	360	$ 300.00	$ 108,000.00
5011012	Pipe, Reinforced Concrete, Class III, 18"	L.F.	62	$ 200.00	$ 12,400.00
5011023	Pipe, Reinforced Concrete, Class III, 24"	L.F.	308	$ 250.00	$ 77,000.00
5011033	Pipe, Reinforced Concrete, Class III, 30"	L.F.	210	$ 300.00	$ 63,000.00
5011043	Pipe, Reinforced Concrete, Class III, 36"	L.F.	463	$ 400.00	$ 185,200.00
5011053	Pipe, Reinforced Concrete, Class III, 48"	L.F.	1,482	$ 500.00	$ 741,000.00
5018041	Relocate 36" Reinforced Concrete Pipe	EACH	3	$ 8,600.00	$ 25,800.00
5030712	Catch Basin, Type 3, One 4' Wing, D=8' or Less	EACH	7	$ 10,000.00	$ 70,000.00
5030728	Catch Basin, Type 3, Two 12' Wings, D=8' or Less	EACH	1	$ 500.00	$ 500.00
5030803	Catch Basin Scupper (Type 3)	EACH	7	$ 3,500.00	$ 24,500.00
5150101	Utility Impact Allowance	USD	250,000	$ 1.00	$ 250,000.00
6010101	Box Culvert 1	L.F.	27	$ 3,623.00	$ 97,821.00
6010200	Concrete Retaining Wall	S.F.	6,260	$ 140.00	$ 876,400.00
6016087	Pipe Culvert Headwall	EACH	3	$ 17,870.00	$ 53,610.00
6070010	Permanent Signing	L.S.	1	$ 25,000.00	$ 25,000.00
6090006	Drilled Shaft (6' Diameter)	L.F.	1,555	$ 1,400.00	$ 2,177,000.00
7010005	Traffic Control	L.S.	1	$ 150,000.00	$ 150,000.00
7040005	Pavement Marking (White Extruded Thermoplastic) (0.090")	L.F.	16,817	$ 0.80	$ 13,453.60
7040006	Pavement Marking (Yellow Extruded Thermoplastic) (0.090")	L.F.	21,325	$ 0.80	$ 17,060.00
7040030	Pavement Marking (White Hot-Sprayed Thermoplastic) Sgl. Arrow (0.090")	EACH	20	$ 300.00	$ 6,000.00
7040060	Pavement Legend (White Hot-Sprayed Thermoplastic) (ONLY) (0.090")	EACH	5	$ 400.00	$ 2,000.00
7050025	Pavement Marking,Preformed, Type 1, Green Stripe (0.090")	S.F.	4,059	$ 25.00	$ 101,475.00
7050080	Pavement Legend, Preformed, Type I, Bike Lane Legend and Symbol	EACH	12	$ 500.00	$ 6,000.00
7060025	Pavement Marker, Reflective, (Type D, Yellow, Two-Way)	EACH	173	$ 4.50	$ 778.50
7310045	Pole (Type Q)	EACH	3	$ 8,500.00	$ 25,500.00
7310050	Pole (Type R)	EACH	5	$ 9,900.00	$ 49,500.00
7310078	Pole (Type 1 Street Light) Single Mast Arm)	EACH	11	$ 4,750.00	$ 52,250.00
7310085	Post (Type I) (Pedestrian Push Button)	EACH	16	$ 1,000.00	$ 16,000.00
7310090	Pole (Decorative Bridge Light)	EACH	7	$ 5,000.00	$ 35,000.00
7310230	Pole Foundation (Type Q)	EACH	3	$ 2,500.00	$ 7,500.00
7310235	Pole Foundation (Type R)	EACH	5	$ 2,500.00	$ 12,500.00
7310247	Pole Foundation (Type 1 Street Light)	EACH	11	$ 1,200.00	$ 13,200.00
7310255	Post Foundation (Type 1) (Pedestrian Push Button)	EACH	16	$ 675.00	$ 10,800.00
7310260	Pole Foundation (Decorative Bridge Light)	EACH	7	$ 2,500.00	$ 17,500.00
7310350	Control Cabinet Foundation	EACH	2	$ 1,400.00	$ 2,800.00
7310375	Service Pedestal Cabinet Foundation	EACH	2	$ 800.00	$ 1,600.00
7310415	Mast Arm (35 ft.) (Tapered)	EACH	3	$ 4,750.00	$ 14,250.00
7310430	Mast Arm (50 ft.) (Tapered)	EACH	5	$ 6,000.00	$ 30,000.00
7310535	Mast Arm (20 ft.) (Tapered) (Luminaire)	EACH	8	$ 1,500.00	$ 12,000.00
7320005	Utility Allowance (TEP Overhead Protection)	USD	1	$ 20,000.00	$ 20,000.00

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 1

Item No.	Item Description	Units	Quantity	Unit Price	Amount
7320020	Electrical Conduit (2") (PVC)	L.F.	2,775	$ 20.00	$ 55,500.00
7320030	Electrical Conduit (3") (PVC)	L.F.	80	$ 25.00	$ 2,000.00
7320040	Electrical Conduit (4") (PVC)	L.F.	800	$ 100.00	$ 80,000.00
7320041	Electrical Conduit (4") (PVC) (Second in Trench)	L.F.	800	$ 25.00	$ 20,000.00
7320042	Electrical Conduit (PVC) (4") (Fiber Optic Between Signals)	L.F.	2,250	$ 100.00	$ 225,000.00
7320400	Pull Box (No. 3 1/2)	EACH	9	$ 550.00	$ 4,950.00
7320420	Pull Box (No. 7)	EACH	6	$ 750.00	$ 4,500.00
7320421	Pull Box (No. 7) (with Extension)	EACH	2	$ 950.00	$ 1,900.00
7320470	Bridge Junction Box	EACH	7	$ 750.00	$ 5,250.00
7320601	Conductors, Signal/Lighting (Intersection A)	L.S.	1	$ 10,000.00	$ 10,000.00
7320620	Conductor (No. 10) (Insulated)	L.F.	2,615	$ 2.00	$ 5,230.00
7320630	Conductor (No. 10) (Bare)	L.F.	2,615	$ 2.00	$ 5,230.00
7320690	Ground Rod (3/4" Dia. X 10')	EACH	7	$ 200.00	$ 1,400.00
7320800	Service Pedestal Cabinet	EACH	3	$ 3,400.00	$ 10,200.00
7320888	Electrical Service Installation Fees Allowance	USD	1	$ 120,000.00	$ 120,000.00
7320891	Electrical Service Installation (Intersection A)	L.S.	1	$ 7,000.00	$ 7,000.00
7330045	Traffic Signal Face (Type F)	EACH	24	$ 850.00	$ 20,400.00
7330200	Traffic Signal Face (Pedestrian) (Man/Hand)	EACH	16	$ 500.00	$ 8,000.00
7330305	Traffic Signal Mounting Assembly (Type II)	EACH	16	$ 190.00	$ 3,040.00
7330320	Traffic Signal Mounting Assembly (Type V)	EACH	8	$ 650.00	$ 5,200.00
7330330	Traffic Signal Mounting Assembly (Type VII)	EACH	8	$ 650.00	$ 5,200.00
7330500	Pre-Empt Beacon	EACH	8	$ 1,000.00	$ 8,000.00
7330510	Pre-Empt Sensor	EACH	8	$ 1,000.00	$ 8,000.00
7340100	Control Cabinet (Agency Supplied/Contractor Installed)	EACH	2	$ 1,000.00	$ 2,000.00
7350001	Video Detection System (Agency Supplied/Contractor Installed)	L.S.	1	$ 20,000.00	$ 20,000.00
7350405	Pedestrian Push Button (Vibrotactile)	EACH	16	$ 1,600.00	$ 25,600.00
7360050	Luminaire (Horizontal Mount) (LED 105 Watt)	EACH	19	$ 1,200.00	$ 22,800.00
7360060	Luminaire (Horizontal Mount) (LED 175 Watt)	EACH	7	$ 2,000.00	$ 14,000.00
7360310	Load Center Cabinet (Type I)	L.S.	1	$ 10,000.00	$ 10,000.00
8020000	Landscape (Grading, Ground Cover, Planting)	ACRE	2	$ 45,000.00	$ 90,000.00
8070001	Landscaping Establishment	L.S.	1	$ 25,000.00	$ 25,000.00
8080001	Landscape Irrigation System	L.S.	1	$ 90,000.00	$ 90,000.00
8100001	AZPDES/NPDES (Original)	L.S.	1	$ 27,500.00	$ 27,500.00
8100004	Erosion Control	L.S.	1	$ 97,000.00	$ 97,000.00
9010001	Mobilization (8%)	L.S.	1	$ 1,541,000.00	$ 1,541,000.00
9050030	Guard Rail Crash Attenuator (Smart Cushion)	EACH	2	$ 5,000.00	$ 10,000.00
9080040	Concrete Curb (Precast segment w/ delineators)	EACH	44	$ 920.00	$ 40,480.00
9080100	Concrete Curb	L.F.	5,925	$ 35.00	$ 207,375.00
9080113	Concrete Curb to Concrete Barrier Transition	EACH	2	$ 10,000.00	$ 20,000.00
9080201	Concrete Sidewalk	S.F.	22,767	$ 10.00	$ 227,670.00
9080288	Curb Access Ramp	EACH	21	$ 3,750.00	$ 78,750.00
9120100	Concrete Channel Lining	S.Y.	1,213	$ 150.00	$ 181,950.00
9130009	Rip Rap (Hand Placed) (Grouted)	S.Y.	201	$ 350.00	$ 70,350.00
9140148	Concrete Gravity Wall (H≥1.5')	L.F.	68	$ 320.00	$ 21,760.00
9200401	Soil Cement Bank Protection	C.Y.	20,600	$ 70.00	$ 1,442,000.00
9250001	Construction Survey and Layout (5%)	L.S.	1	$ 963,000.00	$ 963,000.00
9260001	Engineer's Field Office	L.S.	1	$ 100,000.00	$ 100,000.00
9330009	Handrail (Std. Dtl. 105) (Alternate Lower Rail Location)	L.F.	2,054	$ 45.00	$ 92,430.00
9999901	Lump Sum Structure No. 1 (From Item Summary Below)	L.S.	1	$ 8,512,458.00	$ 8,512,458.00
	Additional Unknown Items (~8%)	L.S.	1	$ 1,184,000.00	$ 1,184,000.00
				SUBTOTAL A (TOTAL BID):	**$ 23,035,462.10**

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 1

Item No.	Item Description	Units	Quantity	Unit Price	Amount

Drexel Road Bridge at Santa Cruz River Item Summary

Item No.	Item Description	Units	Quantity	Unit Price	Amount
6010003	Structural Concrete (f'c = 3,500)	C.Y.	937	$ 1,400.00	$ 1,311,800.00
6010005	Structural Concrete (f'c = 4,500)	C.Y.	1,704	$ 1,400.00	$ 2,385,600.00
6011151	Single Slope Bridge Concrete Barrier and Transition (42")	L.F.	1,234	$ 200.00	$ 246,800.00
6011345	Bridge Deck Joint Assembly (Strip Seal Joint)	L.F.	218	$ 400.00	$ 87,200.00
6011371	Approach Slab (SD-2.01)	S.F.	2,272	$ 60.00	$ 136,320.00
6014974	Precast , P/S Member (UBT58 Girder)	L.F.	4,616	$ 650.00	$ 3,000,400.00
6015101	Restrainers, Vertical Earthquake (Fixed)	EACH	42	$ 300.00	$ 12,600.00
6015102	Restrainers, Vertical Earthquake (Expansion)	EACH	42	$ 400.00	$ 16,800.00
6050001	Reinforcing Steel	LB.	735,865	$ 1.20	$ 883,038.00
9300153	Miscellaneous Work (Concrete Parapet with Decorative Steel Railing)	L.F.	1,234	$ 350.00	$ 431,900.00
9999901	Lump Sum Structure No. 1	L.S.			$ 8,512,458.00

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 1

OTHER PROJECT COSTS NOT PART OF BID

	Item Description				Amount
	Inflation (3 years, 6% per year compounded = 19.10% of Subtotal A)				$ 4,400,142.00
	Design				$ 2,600,000.00
	Public Art (1% of Subtotal A)				$ 230,355.00
	Right-of-Way				$ 100,000.00
	Riparian Habitat In-Lieu Fee or Other Enviroment Mitigations				$ 50,000.00
	Post Design/ As-Builts (1% of Subtotal A)				$ 230,355.00
	Construction Engineering (14% of Subtotal A)				$ 3,224,965.00
	Construction Contingency (~30% of Subtotal A)				$ 6,910,639.00
	SUBTOTAL B (OTHER PROJECT COSTS NOT PART OF BID):				**$ 17,746,456.00**
	TOTAL ESTIMATED PROJECT COST (A+B):				**$ 40,781,918.10**
	TOTAL ESTIMATED PROJECT COST (ROUNDED)				**$ 40,782,000.00**

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 2

Item No.	Item Description	Units	Quantity	Unit Price	Amount
1090010	Fuel Adjustment Allowance	USD	50,000	$ 1.00	$ 50,000.00
2010010	Clearing and Grubbing (Noxious and Invasive Species Control Allowance)	USD	2,000	$ 1.00	$ 2,000.00
2010011	Clearing and Grubbing	ACRE	8.5	$ 5,000.00	$ 42,500.00
2020001	Removal of Structures & Obstructions	L.S.	1	$ 15,000.00	$ 15,000.00
2020029	Removal of Bituminous Pavement	S.Y.	10,907	$ 8.00	$ 87,256.00
2020034	Removal of Signs and Delineators	L.S.	1	$ 2,000.00	$ 2,000.00
2030300	Roadway Excavation	C.Y.	3,204	$ 35.00	$ 112,140.00
2030401	Drainage Excavation	C.Y.	1,165	$ 35.00	$ 40,775.00
2030901	Borrow	C.Y.	1,712	$ 50.00	$ 85,600.00
3030003	Aggregate Base (Roadway)	C.Y.	3,241	$ 140.00	$ 453,740.00
3030003	Aggregate Base (MUP)	C.Y.	309	$ 140.00	$ 43,260.00
4010004	Portland Cement Concrete Pavement (4")	S.Y.	694	$ 30.00	$ 20,820.00
4040111	Tack Coat	TON	6	$ 2,000.00	$ 12,000.00
4060001	Asphaltic Concrete (No. 1: Roadway)	TON	3,160	$ 185.00	$ 584,600.00
4060002	Asphaltic Concrete (No. 2: Roadway)	TON	1,580	$ 200.00	$ 316,000.00
4060002	Asphaltic Concrete (No. 2: MUP)	TON	380	$ 200.00	$ 76,000.00
5010035	Pipe, Corrugated Metal, 48"	L.F.	360	$ 300.00	$ 108,000.00
5011012	Pipe, Reinforced Concrete, Class III, 18"	L.F.	62	$ 200.00	$ 12,400.00
5011023	Pipe, Reinforced Concrete, Class III, 24"	L.F.	308	$ 250.00	$ 77,000.00
5011033	Pipe, Reinforced Concrete, Class III, 30"	L.F.	210	$ 300.00	$ 63,000.00
5011043	Pipe, Reinforced Concrete, Class III, 36"	L.F.	463	$ 400.00	$ 185,200.00
5011053	Pipe, Reinforced Concrete, Class III, 48"	L.F.	1,482	$ 500.00	$ 741,000.00
5018041	Relocate 36" Reinforced Concrete Pipe	EACH	3	$ 8,600.00	$ 25,800.00
5030712	Catch Basin, Type 3, One 4' Wing, D=8' or Less	EACH	7	$ 10,000.00	$ 70,000.00
5030728	Catch Basin, Type 3, Two 12' Wings, D=8' or Less	EACH	1	$ 500.00	$ 500.00
5030803	Catch Basin Scupper (Type 3)	EACH	7	$ 3,500.00	$ 24,500.00
5150101	Utility Impact Allowance	USD	250,000	$ 1.00	$ 250,000.00
6010101	Box Culvert 1	L.F.	27	$ 3,623.00	$ 97,821.00
6010200	Concrete Retaining Wall	S.F.	6,260	$ 140.00	$ 876,400.00
6016087	Pipe Culvert Headwall	EACH	3	$ 17,870.00	$ 53,610.00
6070010	Permanent Signing	L.S.	1	$ 25,000.00	$ 25,000.00
6090006	Drilled Shaft (6' Diameter)	L.F.	1,555	$ 1,400.00	$ 2,177,000.00
7010005	Traffic Control	L.S.	1	$ 150,000.00	$ 150,000.00
7040005	Pavement Marking (White Extruded Thermoplastic) (0.090")	L.F.	16,817	$ 0.80	$ 13,453.60
7040006	Pavement Marking (Yellow Extruded Thermoplastic) (0.090")	L.F.	21,325	$ 0.80	$ 17,060.00
7040030	Pavement Marking (White Hot-Sprayed Thermoplastic) Sgl. Arrow (0.090")	EACH	20	$ 300.00	$ 6,000.00
7040060	Pavement Legend (White Hot-Sprayed Thermoplastic) (ONLY) (0.090")	EACH	5	$ 400.00	$ 2,000.00
7050025	Pavement Marking,Preformed, Type 1, Green Stripe (0.090")	S.F.	4,059	$ 25.00	$ 101,475.00
7050080	Pavement Legend, Preformed, Type I, Bike Lane Legend and Symbol	EACH	12	$ 500.00	$ 6,000.00
7060025	Pavement Marker, Reflective, (Type D, Yellow, Two-Way)	EACH	173	$ 4.50	$ 778.50
7310045	Pole (Type Q)	EACH	3	$ 8,500.00	$ 25,500.00
7310050	Pole (Type R)	EACH	5	$ 9,900.00	$ 49,500.00
7310078	Pole (Type 1 Street Light) Single Mast Arm)	EACH	11	$ 4,750.00	$ 52,250.00
7310085	Post (Type I) (Pedestrian Push Button)	EACH	16	$ 1,000.00	$ 16,000.00
7310090	Pole (Decorative Bridge Light)	EACH	7	$ 5,000.00	$ 35,000.00
7310230	Pole Foundation (Type Q)	EACH	3	$ 2,500.00	$ 7,500.00
7310235	Pole Foundation (Type R)	EACH	5	$ 2,500.00	$ 12,500.00
7310247	Pole Foundation (Type 1 Street Light)	EACH	11	$ 1,200.00	$ 13,200.00
7310255	Post Foundation (Type 1) (Pedestrian Push Button)	EACH	16	$ 675.00	$ 10,800.00
7310260	Pole Foundation (Decorative Bridge Light)	EACH	7	$ 2,500.00	$ 17,500.00
7310350	Control Cabinet Foundation	EACH	2	$ 1,400.00	$ 2,800.00
7310375	Service Pedestal Cabinet Foundation	EACH	2	$ 800.00	$ 1,600.00
7310415	Mast Arm (35 ft.) (Tapered)	EACH	3	$ 4,750.00	$ 14,250.00
7310430	Mast Arm (50 ft.) (Tapered)	EACH	5	$ 6,000.00	$ 30,000.00
7310535	Mast Arm (20 ft.) (Tapered) (Luminaire)	EACH	8	$ 1,500.00	$ 12,000.00
7320005	Utility Allowance (TEP Overhead Protection)	USD	1	$ 20,000.00	$ 20,000.00

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 2

Item No.	Item Description	Units	Quantity	Unit Price	Amount
7320020	Electrical Conduit (2") (PVC)	L.F.	2,775	$ 20.00	$ 55,500.00
7320030	Electrical Conduit (3") (PVC)	L.F.	80	$ 25.00	$ 2,000.00
7320040	Electrical Conduit (4") (PVC)	L.F.	800	$ 100.00	$ 80,000.00
7320041	Electrical Conduit (4") (PVC) (Second in Trench)	L.F.	800	$ 25.00	$ 20,000.00
7320042	Electrical Conduit (PVC) (4") (Fiber Optic Between Signals)	L.F.	2,250	$ 100.00	$ 225,000.00
7320400	Pull Box (No. 3 1/2)	EACH	9	$ 550.00	$ 4,950.00
7320420	Pull Box (No. 7)	EACH	6	$ 750.00	$ 4,500.00
7320421	Pull Box (No. 7) (with Extension)	EACH	2	$ 950.00	$ 1,900.00
7320470	Bridge Junction Box	EACH	7	$ 750.00	$ 5,250.00
7320601	Conductors, Signal/Lighting (Intersection A)	L.S.	1	$ 10,000.00	$ 10,000.00
7320620	Conductor (No. 10) (Insulated)	L.F.	2,615	$ 2.00	$ 5,230.00
7320630	Conductor (No. 10) (Bare)	L.F.	2,615	$ 2.00	$ 5,230.00
7320690	Ground Rod (3/4" Dia. X 10')	EACH	7	$ 200.00	$ 1,400.00
7320800	Service Pedestal Cabinet	EACH	3	$ 3,400.00	$ 10,200.00
7320888	Electrical Service Installation Fees Allowance	USD	1	$ 120,000.00	$ 120,000.00
7320891	Electrical Service Installation (Intersection A)	L.S.	1	$ 7,000.00	$ 7,000.00
7330045	Traffic Signal Face (Type F)	EACH	24	$ 850.00	$ 20,400.00
7330200	Traffic Signal Face (Pedestrian) (Man/Hand)	EACH	16	$ 500.00	$ 8,000.00
7330305	Traffic Signal Mounting Assembly (Type II)	EACH	16	$ 190.00	$ 3,040.00
7330320	Traffic Signal Mounting Assembly (Type V)	EACH	8	$ 650.00	$ 5,200.00
7330330	Traffic Signal Mounting Assembly (Type VII)	EACH	8	$ 650.00	$ 5,200.00
7330500	Pre-Empt Beacon	EACH	8	$ 1,000.00	$ 8,000.00
7330510	Pre-Empt Sensor	EACH	8	$ 1,000.00	$ 8,000.00
7340100	Control Cabinet (Agency Supplied/Contractor Installed)	EACH	2	$ 1,000.00	$ 2,000.00
7350001	Video Detection System (Agency Supplied/Contractor Installed)	L.S.	1	$ 20,000.00	$ 20,000.00
7350405	Pedestrian Push Button (Vibrotactile)	EACH	16	$ 1,600.00	$ 25,600.00
7360050	Luminaire (Horizontal Mount) (LED 105 Watt)	EACH	19	$ 1,200.00	$ 22,800.00
7360060	Luminaire (Horizontal Mount) (LED 175 Watt)	EACH	7	$ 2,000.00	$ 14,000.00
7360310	Load Center Cabinet (Type I)	L.S.	1	$ 10,000.00	$ 10,000.00
8020000	Landscape (Grading, Ground Cover, Planting)	ACRE	2	$ 45,000.00	$ 90,000.00
8070001	Landscaping Establishment	L.S.	1	$ 27,500.00	$ 25,000.00
8080001	Landscape Irrigation System	L.S.	1	$ 90,000.00	$ 90,000.00
8100001	AZPDES/NPDES (Original)	L.S.	1	$ 27,500.00	$ 27,500.00
8100004	Erosion Control	L.S.	1	$ 97,000.00	$ 97,000.00
9010001	Mobilization (8%)	L.S.	1	$ 1,456,000.00	$ 1,456,000.00
9080040	Concrete Curb (Precast segment w/ delineators)	EACH	118	$ 920.00	$ 108,560.00
9080100	Concrete Curb	L.F.	6,584	$ 35.00	$ 230,440.00
9080201	Concrete Sidewalk	S.F.	27,828	$ 10.00	$ 278,280.00
9080288	Curb Access Ramp	EACH	21	$ 3,750.00	$ 78,750.00
9120100	Concrete Channel Lining	S.Y.	1,213	$ 150.00	$ 181,950.00
9200401	Soil Cement Bank Protection	C.Y.	20,600	$ 70.00	$ 1,442,000.00
9250001	Construction Survey and Layout (5%)	L.S.	1	$ 910,000.00	$ 910,000.00
9260001	Engineer's Field Office	L.S.	1	$ 100,000.00	$ 100,000.00
9330009	Handrail (Std. Dtl. 105) (Alternate Lower Rail Location)	L.F.	2,054	$ 45.00	$ 92,430.00
9999901	Lump Sum Structure No. 1 (From Item Summary Below)	L.S.	1	$ 7,399,142.00	$ 7,399,142.00
	Additional Unknown Items (~8%)	L.S.	1	$ 1,120,000.00	$ 1,120,000.00
				SUBTOTAL A (TOTAL BID):	**$ 21,785,541.10**

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 2

Item No.	Item Description	Units	Quantity	Unit Price	Amount

Drexel Road Bridge at Santa Cruz River Item Summary

Item No.	Item Description	Units	Quantity	Unit Price	Amount
6010003	Structural Concrete (f'c = 3,500)	C.Y.	869	$ 1,400.00	$ 1,216,600.00
6010005	Structural Concrete (f'c = 4,500)	C.Y.	1,518	$ 1,400.00	$ 2,125,200.00
6011345	Bridge Deck Joint Assembly (Strip Seal Joint)	L.F.	194	$ 400.00	$ 77,600.00
6011371	Approach Slab (SD-2.01)	S.F.	2,029	$ 60.00	$ 121,740.00
6014974	Precast , P/S Member (UBT58 Girder)	L.F.	3,987	$ 650.00	$ 2,591,550.00
6015101	Restrainers, Vertical Earthquake (Fixed)	EACH	36	$ 300.00	$ 10,800.00
6015102	Restrainers, Vertical Earthquake (Expansion)	EACH	36	$ 400.00	$ 14,400.00
6050001	Reinforcing Steel	LB.	674,460	$ 1.20	$ 809,352.00
6011132	Combination Pedestrian-Traffic Bridge Railing (SD-1.12)	L.F.	1,234	$ 350.00	$ 431,900.00
9999901	Lump Sum Structure No. 1	L.S.			$ 7,399,142.00

PROJECT NO. PRJ000398

Drexel Road Bridge - Midvale Park Road to Calle Santa Cruz
Project Cost Estimate (30% Submittal)
Alternative 2

OTHER PROJECT COSTS NOT PART OF BID

	Item Description				Amount
	Inflation (3 years, 6% per year compounded = 19.10% of Subtotal A)				$ 4,161,387.00
	Design				$ 2,600,000.00
	Public Art (1% of Subtotal A)				$ 217,855.00
	Right-of-Way				$ 100,000.00
	Riparian Habitat In-Lieu Fee or Other Enviroment Mitigations				$ 50,000.00
	Post Design/ As-Builts (1% of Subtotal A)				$ 217,855.00
	Construction Engineering (14% of Subtotal A)				$ 3,049,976.00
	Construction Contingency (~30% of Subtotal A)				$ 6,535,662.00
	SUBTOTAL B (OTHER PROJECT COSTS NOT PART OF BID):				**$ 16,932,735.00**
	TOTAL ESTIMATED PROJECT COST (A+B):				**$ 38,718,276.10**
	TOTAL ESTIMATED PROJECT COST (ROUNDED)				**$ 38,719,000.00**