Final Draft Environmental Assessment

Loop 1604, San Antonio District

From FM 78 to I-10 E

CSJ 2452-03-111

Bexar County, Texas

April 2021

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 USC 327 and a Memorandum of Understanding, dated December 9, 2019, and executed by FHWA and TxDOT.

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LIST OF ACRONYMS

AAMPO	Alamo Area Metropolitan Planning Organization
AFB	Air Force Base
amsl	above mean sea level
AOI	Area of Influence
APE	Area of Potential Effects
BMP	Best Management Practice
CFR	Code of Federal Regulations
CGP	Construction General Permit
CMP	Congestion Management Process
CO	Carbon Monoxide
dB(A)	Decibel on the A-Weighted Scale
dBA Leq	Traffic Noise Levels
EA	Environmental Assessment
EAA	Edwards Aquifer Authority
EIS	Environmental Impact Statement
EMST	Ecological Mapping System of Texas
ENV	Environmental Affairs Division
EO	Executive Order
EPA	Environmental Protection Agency
EPIC	Environmental Permits, Issues, and Commitments
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FM	Farm-to-Market Road
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
FY	Fiscal Year
HOV	High-Occupancy Vehicle
HPALM	Hybrid Potential Archeological Liability Map
I-10 E	Interstate Highway 10 East
I-35	Interstate Highway 35
IBWC	International Boundary and Water Commission
IPaC	Information for Planning and Consultation
ISA	Initial Site Assessment
LEP	Limited English Proficiency
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act

MOU	Memorandum of Understanding
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NHL	National Historic Landmark
NRHP	National Register of Historic Places
NOI	Notice of Intent
NOT	Notice of Termination
NRCS	Natural Resources Conservation Service
NWP	Nationwide Permit
PA	Programmatic Agreement
PEL	Planning and Environmental Linkages (Study)
PL	Public Law
PM	Particulate Matter
PS&E	Plans, Specifications, and Estimates
PWC	Parks and Wildlife Code
ROE	Right-of-Entry
ROW	Right-of-Way
SAL	State Antiquities Landmark
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SLRTP	State-wide Long Range Transportation Plan
SOV	Single Occupancy Vehicle
SUE	Subsurface Utility Engineering
SWP3	Storm Water Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TERP	Texas Emissions Reduction Plan
THC	Texas Historical Commission
TIP	Transportation Improvement Plan
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TRTP	Texas Rural Transportation Plan
TTP	Texas Transportation Plan
TxDOT	Texas Department of Transportation
US	United States
USACE	US Army Corps of Engineers
USDOT	US Department of Transportation
USFWS	US Fish and Wildlife Service
vpd	Vehicles Per Day

1.0 INTRODUCTION

The Texas Department of Transportation (TxDOT) San Antonio District proposes to improve the Texas Loop 1604 corridor from Farm-to-Market (FM) 78 to Interstate Highway 10 East (I-10 E) in northeast Bexar County, Texas. Improvements would include the addition of main lanes, frontage roads, entrance and exit ramps and pedestrian facilities; the existing roadway would be converted from a four-lane divided highway to a four-lane expressway. The linear extent of the proposed project area is approximately 5.9 miles, which cross portions of the cities of San Antonio and Converse, plus a small portion of Universal City, as well as some of unincorporated Bexar County (see **Appendix A** for project location map).

The purpose of the Environmental Assessment (EA) is to study the potential environmental consequences of the proposed project and determine whether such consequences warrant preparation of an Environmental Impact Statement (EIS). This EA was prepared to comply with both the TxDOT environmental review rules and the National Environmental Policy Act (NEPA). The Draft EA will be made available for public review and TxDOT will consider any comments submitted during the comment period. After the comment period, TxDOT will evaluate all comments and results of the environmental analysis to determine if the proposed project would have any significant adverse effects on the "human environment" as NEPA directs (Title 40, Code of Federal Regulations, Section 1502.1 [40 CFR §1502.1]). If TxDOT determines that there would be no significant adverse effects, it will prepare and sign a Finding of No Significant Impact (FONSI), which will be made available to the public.

2.0 PROJECT DESCRIPTION

2.1 EXISTING FACILITY

Within the proposed project area, the existing Loop 1604 is a four-lane, divided highway with 12-foot travel lanes and variable shoulders. There are overpasses and at-grade connectors between Loop 1604 and FM 78. A rail line parallels FM 78. Driveways and city streets connect directly to the 1604 lanes. The center median varies from 35 to 60 feet wide. Bikes are accommodated by wide shoulders and there are no sidewalks. Drainage consists of roadside ditches. In addition, there are numerous underground utilities such as gas, water and sanitary sewer in the ROW in accordance with TxDOT's Utility Accommodation policy. These are typically located along the perimeter of the existing ROW, although some cross the ROW under the frontage roads and main lanes. The existing ROW width ranges between approximately 246 feet and 566 feet.

I-10 E is a controlled-access freeway with continuous frontage roads. It is currently under expansion from four to six main lanes each way. I-10 E intersects with Loop 1604 at a two-level diamond interchange with I-10 E main lanes passing over Loop 1604. See **Appendix B** for photographs and **Appendix D** for typical sections of the existing roadway.

2.2 PROPOSED FACILITY

The project would expand Loop 1604 from a four-lane divided highway to a four-lane expressway between FM 78 and I-10 E. The controlled access main lanes would consist of two 12-foot wide general purpose lanes with variable shoulders. The frontage roads would typically include two lanes each way except at the Martinez Dam detention pool where they would transition to one lane and at the approaches to major intersections where turn lanes would be included. The lanes would typically include a minimum 5-feet wide outside shoulder for bicycle use. Ramps would be constructed between the controlled access lanes and frontage roads. Auxiliary lanes would be constructed between entrance and exit ramps. In addition, a direct connect ramp would be constructed from Loop 1604 to FM 78 to alleviate congestion near Randolph AFB.

The project would construct several bridges, including an elevated U-turn bridge between FM 78 and Hanover Pass, and overpasses at the U-turn, Rocket Lane, Lower Seguin Road, Graytown Road, and Binz-Engelman Road. The bridges over Salitrillo Creek and the Martinez Creek Dam impoundment would be widened to carry one lane frontage roads across the floodplain. The corridor would provide 18.5 feet vertical clearance for freight traffic. The direct connector bridges to I-10 E would be realigned to match the proposed typical section and widened to accommodate two lanes.

Lower Seguin Road would be realigned to intersect at right angles with Loop 1604. Continuous sidewalks would be constructed along the east side of Loop 1604. Sidewalks would be constructed along the west side of Loop 1604 with a gap from Graytown Road to Benz Engleman Road. Storm drainage would be conveyed primarily by roadside ditches and underground storm sewer system where space is limited. Culverts would be added or modified to accommodate cross drainage. Illumination and traffic signals, signs, and pavement markings would be added, removed or modified as necessary.

The proposed project would require approximately 50.99 acres of new ROW to construct the proposed improvements. The proposed project schematics and typical sections can be found in **Appendices C** and **D**, respectively.

Logical Termini

Federal regulations (23 Code of Federal Regulations [CFR] § 771.111(f)(1)) require that federally-funded transportation projects have logical termini. Simply stated, this means that a project must have rational, rather than arbitrary, beginning and end points. Those end points may not be created simply to avoid proper analysis of environmental impacts.

The logical termini for this project are FM 78 to the north and I-10 E to the south. The project uses FM 78 and I-10 E as the logical termini because these are the two closest larger roads serving the immediate area and capture the major traffic generators, namely Randolph AFB and growing

residential and commercial land uses nearby. The proposed improvements would begin approximately 1.5 miles north of FM 78 and end approximately 0.1 mile south of I-10 E to allow for transition work (see **Appendices A** and **C**).

Independent Utility

Federal regulations require that a project have independent utility and be a reasonable expenditure even if no other transportation improvements are made in the area (23 CFR § 771.111(f)(2)). This means a project must be able to provide benefit by itself and not compel further expenditures to make the project useful. This means a project must be able to satisfy its purpose and need even with no other projects built.

This project would improve mobility on Loop 1604 from FM 78 to I-10 E and would not require additional transportation improvements to address the purpose and need of the project.

Future Transportation Improvement Alternatives

Federal law prohibits a project from restricting consideration of alternatives for other reasonably foreseeable transportation improvements (23 CFR § 771.111(f)(3)). This means that a project must not dictate or restrict any future roadway alternatives. The construction of the proposed project does not rule out future options for the development of other reasonably foreseeable transportation improvements along Loop 1604. Because the proposed project has independent utility and would not force a future expenditure of funds, no future alternatives would be dictated or restricted by the proposed project.

Project Funding

The estimated cost for construction of the proposed project is $300,000,000 in state and federal funds. See **Appendix E-1**.

Transportation Planning

The proposed project is located within the Alamo Area Metropolitan Planning Organization (AAMPO) region. The proposed project is included in, and consistent with, the AAMPO Mobility 2045 Metropolitan Transportation Plan (MTP). The project is listed in the Fiscal Year (FY) 2019-2022 TIP in **Appendix D** for environmental clearance projects. The project would be added to the fiscally constrained Transportation Improvement Plan (TIP) in the future. Once the proposed project is included in the TIP, funding may be allocated.

3.0 PURPOSE AND NEED

3.1 NEED

The project is needed because Loop 1604 from FM 78 to I-10 E is not able to accommodate current and projected traffic volumes at acceptable levels of service.

3.2 SUPPORTING FACTS AND/OR DATA

Growth in the Project Area

Transportation improvements for Loop 1604 are needed between FM 78 and I-10 E due to high traffic counts and congestion along Loop 1604. Over the last 20 years the population of Bexar County has grown over 23 percent. The city of San Antonio to the west has grown even faster. Loop 1604 is currently the outermost loop around the city of San Antonio and provides access for project area neighborhoods and commercial development, as well as to Randolph AFB. It is also a route for regional travellers passing through the greater Alamo area which is already home to over 2 million residents, with another 1.5 million new residents expected over the next 25 years. Without the improvements proposed by this project, Loop 1604 will be unable to accommodate existing and projected future traffic volumes at acceptable levels of service.

The mobility needs are substantiated by the growing traffic volumes on Loop 1604 within the project limits. The demand for travel on Loop 1604 within the project limits is also expected to increase in the future. The historical AADT for Loop 1604 between FM 78 to Hanover Cove for 2000, 2010 and 2015 and the projected maximum AADT for Loop 1604 between FM 78 to Hanover Cove for 2020, 2040 and 2050 is shown in **Table 3-1** below. The historical data shows that traffic has steadily increased from 21,000 ADT in 2000 to 32,400 ADT in 2015. The maximum traffic forecast for the southern segment of the loop from Hanover Cove to I-10 E similarly shows an increase from 37,200 ADT in 2020 to 58,500 ADT by 2050.

Table 3-1 AADT for Loop 1604 between FM 78 and Hanover Cove

Year	AADT
2000	21,000
2010	26,000
2015	32,400
2020	37,200
2040	52,000
2050	58,500

Notes: 2000-2015 data from TxDOT Traffic Count Database System at Station 15H123.
2020, 2040, 2050 data from TxDOT TP&P Traffic Projections.
1990 AADT is not available on the TxDOT online traffic count database.

As shown in **Table 3-2**, at present several intersections along Loop 1604 are already experiencing a level of service (LOS) of D or, in one case, E. LOS is an indicator of how well traffic moves (or is delayed) through a given intersection or segment of roadway. It is measured during peak hours on an “A” to “F” rating scale, where “A” is free flow and “F” is stopped traffic.

As shown in **Table 3-3**, without the proposed improvements, motorists by the year 2040 would experience LOS “E” or “F” at seven intersections within the project corridor. With the proposed improvements, the majority of the corridor would be at LOS “D” or better by 2040 and only one intersection would be below LOS “D” (see **Table 3-3**).

Table 3-2 Traffic - Existing (2015) Conditions

Segment ID	Intersection[1]	Type of Control	MOE[2]	AM Peak	PM Peak
114	FM 78 at Loop 1604 SBFR	Signalized	*LOS* *Delay (s)*	D 41.1	**E** **76.9**
115	FM 78 at Loop 1604 NBFR	Signalized	*LOS* *Delay (s)*	C 30.9	D 43.4
117	Hanover Cove at Tuttle Road	Unsignalized	*LOS* *Delay (s)*	B 10.8*	B 10.4*
118	Hanover Cove at Loop 1604	Signalized	*LOS* *Delay (s)*	C 21.8	B 16.6
119	Miramar Blvd at Loop 1604	Signalized	*LOS* *Delay (s)*	B 14.2	B 11.0
120	Rocket Lane at Loop 1604	Signalized	*LOS* *Delay (s)*	C 21.4	C 22.8
121	Lower Seguin at Loop 1604	Signalized	*LOS* *Delay (s)*	C 32.7	D 39.7
122	Ware Seguin at Loop 1604 Southbound	Unsignalized	*LOS* *Delay (s)*	C 18.2*	C 17.4*
123	Ware Seguin at Loop 1604 Northbound	Unsignalized	*LOS* *Delay (s)*	C 15.6*	C 16.1*
124	Coppergate at Loop 1604	Unsignalized	*LOS* *Delay (s)*	C 20.6*	B 14.7*
125	Autumn Run at Loop 1604	Signalized	*LOS* *Delay (s)*	A 9.3	A 6.5
126	Graytown Rd at Loop 1604	Unsignalized	*LOS* *Delay (s)*	B 14.6*	C 16.4*
127	Quiet Night Lane at Loop 1604	Unsignalized	*LOS* *Delay (s)*	B 13.8*	A 0.0*
128	I-10 EBFR at Loop 1604	Signalized	*LOS* *Delay (s)*	B 18.3	C 24.2
129	I-10 WBFR at Loop 1604	Signalized	*LOS* *Delay (s)*	C 22.7	C 22.2

Source: Loop 1604 Phase Two from FM 78 to I-10 Draft Traffic Operations Technical Report, 2018.

Notes:
1. SBFR = Southbound Frontage Road; NBFR = Northbound Frontage Road; EBFR = Eastbound Frontage Road; WBFR = Westbound Frontage Road
2. MOE = Measures of Effectiveness. LOS = Level of Service (operational conditions or ease of flow through a given intersection or segment, with A = best, F = worst); Delay (s) = length of delay (total wait time) at intersection, in seconds. See report for full details on these criteria.
3. Asterisk denotes two-way stop-controlled intersections for which the highest approach delay is reported in accordance with HCM 2010 guidance.

Table 3-3 Traffic – Projected Future (2040) Intersection Conditions

Segment ID	Intersection[1,5]	Type of Control	*Scenario:*	NO BUILD		BUILD (With Project)	
			MOE[2]	AM Peak	PM Peak	AM Peak	PM Peak
109	FM 78 at Loop 1604 SBFR	Signalized	*LOS* *Delay (s)*	D 54.3	D 49.8	C 23.3	C 27.1

Segment ID	Intersection[1,5]	Type of Control	*Scenario:* MOE[2]	NO BUILD AM Peak	NO BUILD PM Peak	BUILD (With Project) AM Peak	BUILD (With Project) PM Peak
110	FM 78 at Loop 1604 NBFR	Signalized	*LOS*	D	D	C	D
			Delay (s)	49.3	43.6	34.0	41.9
111	Hanover Cove at Tuttle Road (at Loop 1604)**	Signalized	*LOS*	**F**	**F**	A	A
			Delay (s)	**155.7***	**130.4***	0.0***	0.0***
112	Miramar Blvd at Loop 1604 (SBFR)**	Signalized	*LOS*	**E**	**F**	A	A
			Delay (s)	**77.1***	**92.0***	0.0***	0.0***
113	Rocket Lane at Loop 1604 (SBFR)**	Signalized	*LOS*	**F**	**F**	C	C
			Delay (s)	**130.1**	**103.8**	32.3	30.0
202	Rocket Lane at Loop 1604 NBFR**	Signalized	*LOS*	---	---	C	C
			Delay (s)	---	---	31.3	24.9
114	Lower Seguin at Loop 1604 (SBFR)**	Signalized	*LOS*	**F**	**F**	C	C
			Delay (s)	**381.9**	**198.7**	33.0	28.2
203	Lower Seguin at Loop 1604 NBFR**	Signalized	*LOS*	---	---	C	B
			Delay (s)	---	---	20.4	14.4
115	Ware Seguin at Loop 1604 Southbound (SBFR)**	Unsignalized	*LOS*	**F**	**F**	C	C
			Delay (s)	**71.5***	**328.1***	17.6*	16.8
116	Ware Seguin at Loop 1604 Northbound (NBFR)**	Unsignalized	*LOS*	**F**	**F**	C	B
			Delay (s)	**1060.6***	**340.8***	14.5*	12.6*
117	Coppergate at Loop 1604 (SBFR)**	Unsignalized	*LOS*	**F**	D	C	B
			Delay (s)	**93.8**	27.5*	18.8*	12.5*
118	Autumn Run at Loop 1604 (SBFR)**	Signalized	*LOS*	B	B	**F**	C
			Delay (s)	16.9	13.8	**86.5**	22.1*
119	Graytown Rd at Loop 1604 (SBFR)**	Signalized	*LOS*	C	**F**	C	B
			Delay (s)	34.9	**101.3**	28.0*	18.9
204	Graytown Rd at Loop 1604 (NBFR)**	Signalized	*LOS*	---	---	C	B
			Delay (s)	---	---	23.9	15.7
120	Quiet Night Lane at Loop 1604 (NBFR)**	Unsignalized	*LOS*	**E**	A	A	A
			Delay (s)	**39.0***	0.0***	9.4*	9.5*
121	Binz-Engelman Rd at Loop 1604 SBFR[4]	Signalized	*LOS*	B	C	C	B
			Delay (s)	19.9	28.0	23.0	19.8
122	Binz-Engelman Rd at Loop 1604 NBFR[4]	Signalized	*LOS*	B	B	C	B
			Delay (s)	15.0	14.0	22.4	19.4

Source: Loop 1604 Phase Two from FM 78 to I-10 Draft Traffic Operations Technical Report, 2018.

Notes:
1. SBFR = Southbound Frontage Road; NBFR = Northbound Frontage Road; EBFR = Eastbound Frontage Road; WBFR = Westbound Frontage Road
2. MOE = Measures of Effectiveness. LOS = Level of Service (operational conditions or ease of flow through a given intersection or segment, with A = best, F = worst); Delay (s) = length of delay (total wait time) at intersection, in seconds. See report for full details on these criteria.
3. * Denotes two-way stop-controlled intersections for which the highest approach delay is reported in accordance with HCM 2010 guidance.
4. This road was extended to Loop 1604 from its prior terminus at FM 1516 after 2015 and is thus included here.
5. This scenario includes the I-10 / Loop 1604 interchange redesign, as it is a separately approved project expected to be constructed before 2040.
6. ** Denotes build (with-project) configuration, if different from No Build (without- project) configuration. "---" Denotes no data because intersection would not exist in the No Build scenario.
7. *** Denotes values as a result of free movements.

Increased demand on Loop 1604 is in part due to the rapid population growth experienced in the region over the past 20 years. According to the United States (US) Census Bureau, in 2000 the

population of Bexar County was 1,392,931 and grew 23 percent to 1,714,773 in 2010. Statewide, there is a similar trend of population growth of 21 percent during this same period. According to Texas Demographic Center (see **Table 3-4**), the population of Bexar County is expected to grow another 55 percent (to 2,656,573) by 2050, compared to 53 percent in Texas statewide.

Table 3-4 Population Projections for Bexar County and Texas Statewide

Year	Bexar County Total Population	Texas Statewide Total Population
2010	1,714,773	25,145,561
2015	1,839,926	26,947,116
2020	1,967,590	28,813,282
2025	2,094,216	30,734,321
2030	2,216,912	32,680,217
2035	2,331,743	34,616,890
2040	2,442,098	36,550,595
2045	2,550,326	38,499,538
2050	2,656,573	40,502,749
Percent Growth 2010-2050	55 percent	53 percent

Source: Texas Populations Projections Program, 2014.

3.3 PURPOSE

The purpose of the project to accommodate existing and projected traffic volumes on Loop 1604 from FM 78 to I-10 E at acceptable levels of service.

4.0 ALTERNATIVES

4.1 BUILD ALTERNATIVE

The Build Alternative would satisfy the project purpose and need by providing acceptable levels of service on Loop 1604 from FM 78 to I-10 E through 2040. The data presented in **Table 3-3** indicates that the proposed improvements would bring all the intersections with unacceptable levels of service to an acceptable LOS except for Autumn Run Lane at Loop 1604 southbound frontage road for year 2040 conditions. The proposed Build Alternative configuration would convert the existing Loop 1604 signalized route to an expressway with continuous frontage roads and necessary improvements at intersections to generally achieve acceptable LOS throughout the corridor for the year 2040. This includes two additional main lanes in each direction, as well as access lanes and ramps, frontage roads, grade-separated crossings, and pedestrian facilities. The additional main lanes and access roads would add capacity to improve mobility and increase operational efficiency. The elimination of intersecting roadways' direct access to the Loop (via rerouting to the frontage roads and access ramps, and the construction of grade-separated crossings) would improve Loop access and improve both operational efficiency and travel speeds on the main lanes.

In total, the Build Alternative (including frontage roads and main lanes) would operate with higher speeds and lower delays than the No Build Alternative.

4.2 NO BUILD ALTERNATIVE

Under the No Build Alternative, Loop 1604 would remain a four-lane divided highway. In addition, pedestrian facilities would not be constructed. Analysis of existing and projected future traffic with and without the proposed project (**Tables 3-2 and 3-3**) indicate that without the proposed project (i.e., the "No Build" scenario), by 2040, seven intersections would operate at an unacceptable LOS. The No Build Alternative would not meet the purpose and need for the project; therefore, the Build Alternative is the preferred alternative. Nevertheless, the No Build Alternative is evaluated throughout the EA for comparison purposes.

4.3 PRELIMINARY ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATIONS

The proposed project would limit the proposed ROW required primarily taking ROW from Randolph AFB. This minimizes impacts to commercial land uses important to the city's tax base. Rejected alternatives are not further evaluated in the EA.

5.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

In support of this EA, the following technical documentation was prepared:

- Water Resources Technical Report
- Section 404 Jurisdictional Memo (Addendum to Water Resources Technical Report)
- Traffic Noise Analysis Technical Report
- Biological Evaluation Form (BEF)
- Tier I Site Assessment
- Biological Resources Technical Report
- Hazardous Materials Initial Site Assessment
- Community Impact Assessment Technical Report
- Archeological Background Study
- Project Coordination Request for Historical Studies Project
- Air Quality Analysis Technical Report
- Indirect Impacts Technical Report

5.1 ROW / DISPLACEMENTS

The proposed Build Alternative would require displacements and additional ROW. There are potentially six displacements as a result of the Build Alternative: one single-family residence, two commercial facilities, and three other non-residential and non-commercial displacements which include a carpool parking lot, one billboard, and one propane tank. ROW is being acquired in advance of the FONSI; however, this did not influence the environmental review or selection of alternatives.

The potential commercial displacements consist of a motorcycle dealer/automotive repair business and a private storage warehouse. Please refer to the *Community Impacts Assessment*

Technical Report Form listed in Section 5.0 for details regarding displacements and ROW acquisition (TxDOT, 2019a). **Appendix F, Figure 1,** provides a graphical depiction of potential displacements for the Build Alternative.

The TxDOT Right-of-Way Acquisition and Relocation Program would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in the Surface Transportation and Uniform Relocation Assistance Act of 1987 (the Uniform Act), and relocation resources are available to all residential and business relocatees without discrimination.

Under the No Build Alternative, the existing Loop 1604 would remain as-is and normal routine maintenance would be conducted. No ROW acquisition would be required, and no displacements or relocations would occur.

5.2 LAND USE

The project area is located within the cities of Universal City, Converse, and San Antonio, Texas. The surrounding land includes several large tracts of undeveloped land that are zoned primarily for commercial, residential, mixed-use, and light industrial use. Much of the surrounding area was historically used for farming, followed by development complementary to nearby Randolph AFB. Please refer to the *Community Impacts Assessment Technical Report* (TxDOT, 2019a) and *Indirect Impacts Technical Report* (TxDOT, 2019g) listed in Section 5.0 for additional information regarding existing land uses within the project area.

The Build Alternative would result in the change of approximately 50.99 acres of existing land uses to transportation use. The proposed project is not anticipated to substantially alter the existing land use in the vicinity of the project.

Under the No Build Alternative, no impacts to land use would occur. Land use in the area would remain as-is or change to other land uses as the community and economy warrants.

5.3 FARMLANDS

The proposed project must comply with the Farmland Protection Policy Act (FPPA). As mentioned above, approximately 50.99 acres would be converted to transportation use. The majority of the soils in the project area are recognized as prime farmland; however, approximately half of the project area is within the San Antonio urbanized area and additional areas have previously been converted from farmland and are not subject to the provisions of the FPPA.

The remaining areas of potential farmland conversion were assessed using the *Farmland Conversion Impact Rating Form (NRCS-CPA-106)*. Please refer to the *Biological Resources Technical Report* listed in Section 5.0 for the Farmland Conversion Impact Rating Form, a US Census Bureau map of the San Antonio urban area and a Natural Resources Conservation Service (NRCS) prime farmland report. A determination was made that the Build Alternative would

cause non-adverse effects and that no additional considerations or evaluations would be required before construction.

The No Build Alternative would not convert any farmland to transportation use and would cause no effects to farmland.

5.4 UTILITY RELOCATION

It is reasonably foreseeable that utilities will have to be relocated as a result of the Build Alternative. The impacts resulting from removal of any utilities from within existing highway ROW have been considered as part of the project impacts under each of the resource area subheadings within this environmental assessment. Additionally, if utilities will be re-located within highway ROW, then the impacts resulting from re-installation of the utilities within highway ROW have also been considered as part of the project impacts under each of the resource area subheadings within this environmental assessment. To the extent that the owner of any displaced utility determines to re-install the displaced utility at a location outside of highway ROW, such location will be determined by the owner of the utility subject to the rules and policies governing the utility relocation process. Significant impacts to utilities are not anticipated as a result of the Build Alternative.

The No-Build Alternative would not include utility relocations and adjustments as no improvements would be made to Loop 1604.

5.5 BICYCLE AND PEDESTRIAN FACILITIES

No bicycle and pedestrian facilities currently exist in the project area. Bicycle and pedestrian accommodations would be provided along the eastern side of Loop 1604 as well as the western side of Loop 1604 with a gap from Graytown Road to Benz Engleman Road. The proposed project includes the addition of facilities for bicycles and pedestrians throughout the project area. The design of the project complies with the US Department of Transportation's 2010 Policy Statement on Bicycle and Pedestrian Accommodations, Regulations and Recommendations; and TxDOT's 2011 Guidelines Emphasizing Bicycle and Pedestrian Accommodations. The Build Alternative is anticipated to positively impact bicycle and pedestrian facilities.

No bicycle or pedestrian facilities exist in the project area; therefore, no impacts would occur as a result of the No-Build Alternative.

5.6 COMMUNITY IMPACTS

As described in Section 5.1, the proposed project would require the displacement of one residence, two commercial properties, and three other structures. **Appendix F, Figure 1** provides a graphical depiction of community facilities and potential displacements for the Build Alternative. The existing Loop 1604 facility predates much of the development in the area. As existing land uses, particularly residential, are mostly newer to the area, the proposed project would not separate or divide neighborhoods. Further, the new facility would be an expansion of existing

roadways. It would not introduce a new barrier or affect neighborhood connectivity or cohesion. Crossings at major intersections would be maintained and the project would provide bicycle accommodations and new sidewalks in the project area, improving non-motorized mobility and safety.

Access and Travel Patterns

Overall, the proposed project is anticipated to result in both adverse and beneficial impacts to access and travel patterns for the immediate community in the cities of Universal City, Converse, and San Antonio. The proposed construction of the frontage roads throughout the project area would increase safety for turning traffic but would also result in changes to access and travel patterns throughout the corridor and five local cross streets. Some properties would only be able to be accessed by cars traveling in specific directions. Five local streets (Kneupper Lane, Lahm Avenue, Hanover Cove/Kneupper Road, Miramar Boulevard, and Autumn Run Lane) that currently have two-way access, would no longer be able to accommodate left-hand turns due to the proposed frontage roads. Thus, travel time for all motorists and emergency responders wanting to access properties on these streets would increase by one to three minutes. The potential changes in access and travel patterns could result in slightly longer travel times for other residents, employers, or business patrons along Loop 1604. However, other commuters could experience shorter travel times due to the increased capacity and operational efficiency of the roadway. Access to and from Randolph AFB, a major employer and institution that influences traffic patterns, would also be improved by the proposed project.

The Build Alternative would result in enhanced mobility and safety for all users of the Loop 1604 roadway, including emergency vehicles, bicycles, and pedestrians, due to the increased capacity and operational efficiency of the roadway, overpass bridges, frontages roads, intersection improvements, and continuous and connected sidewalks.

The No Build Alternative would not result in any improvements to mobility or safety within the project area.

Community Cohesion

Loop 1604 is an existing roadway and the improvements to ramp configurations and continuous frontage roads would not substantially change the degree of separation in the surrounding community. The construction of continuous frontage roads would allow the local community to access businesses, schools, and residential neighborhoods more efficiently. Furthermore, the proposed sidewalk facilities within the project area would allow for increased mobility of pedestrians within and between communities.

The purpose of the proposed project is to improve operational efficiency of the Loop 1604 roadway. The overall impact of the Loop 1604 improvements is anticipated to result in both negative and positive impacts to community cohesion. The proposed construction of frontage

roads throughout the project area would result in changes in access points to residences and businesses on both sides of the corridor and to and from five local streets (Kneupper Lane, Lahm Avenue, Hanover Cove/Kneupper Road, Miramar Boulevard, and Autumn Run Lane) and would affect travel patterns for the immediate community along Loop 1604. The proposed grade-separated overpass bridges and dedicated turnaround lanes would alleviate the danger associated with the high-speed Loop 1604 intersections and turns. The proposed Loop 1604 overpass bridges and grade-separated intersections would also make it safer and easier for traffic to move between communities on either side of the highway. Additionally, the proposed continuous and connected sidewalks would allow for increased pedestrian access throughout the project area.

Concerns documented during the October 2018 public meeting and other meetings with property owners included encroachment of the highway and left-turn access to homes and businesses along Loop 1604 and arterial streets. The proposed design reflects the results of the alternatives analysis that has been ongoing for some time. The proposed design has been carried forward because it resulted in the fewest displaced structures and had the least amount of overall environmental impact. The proposed project would not affect, separate, or isolate any distinct neighborhoods, ethnic groups, or other specific groups as Loop 1604 is an existing roadway.

Overall, the Build Alternative would improve the community cohesion by the proposed project as a result of improved mobility and safer intersections and connections between communities on either side of the highway.

The No Build Alternative would not result in any improvements to mobility, decreases in congestion or improvements to bicycle and pedestrian movements within the project area.

Environmental Justice

The Build Alternative is anticipated to increase mobility for existing and future residences, businesses, and public facilities (e.g. schools and Randolph AFB) within the project vicinity. Environmental justice populations occur in 26 of the 35 populated census blocks adjacent to the proposed project, with the largest minority population being Hispanic (see **Appendix F, Figure 2**). Three (two commercial and one other) of the six potential displacements are located within census blocks that contain predominantly minority populations. Review of the census data for low-income populations at the census block group level did not indicate a presence of predominantly low-income populations along the Build Alternative corridor (see **Appendix F, Figure 2**).

Additionally, areas anticipated to have permanent changes in travel patterns occur within census blocks containing most minority populations. Pedestrian transportation would be improved with the proposed connect and continuous sidewalk network in the project area. No existing neighborhoods would be divided; however, permanent disruptions to normal daily activities are

expected due to the proposed frontage roads, which would make some properties only accessible when traveling in a specific direction. In some cases, travelers would have to travel in the opposite direction then complete a legal U-turn, or turnaround, in order to reach their destination.

Ongoing community outreach has been conducted to keep the public apprised of roadway design changes considered and associated areas of additional ROW needs. The area of proposed ROW was carefully considered and communications with affected property owners are being conducted, as appropriate. This consideration of design changes and continued public outreach has minimized any concerns of impacts to environmental justice populations. Therefore, no disproportionally high and adverse impacts to minority or low-income populations are anticipated as a result of the Build Alternative. The requirements of Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, are satisfied. Please refer to the *Community Impacts Analysis Technical Report* for additional information regarding minority and low-income populations within the project area.

The No Build Alternative would not result in any impacts to low-income or minority populations. Beneficial impacts from improved mobility and enhanced safety resulting from intersection improvements would not be experienced by the entire community, including minorities and low-income individuals. Under the No Build Alternative, congestion will increase and mobility will be hindered as development and population growth occurs within the region over time.

Limited English Proficiency

The project area does contain the presence of persons who speak English “less than very well,” or Limited English Proficiency (LEP) populations. The LEP populations present within the project area range from 1.6 to 13.7 percent. Of the 15,863 people over five years of age, approximately 6.2 percent speak English “less than very well.” The largest LEP population speaks Spanish (83.8 percent). The next prevalent language spoken is Asian/Pacific Islander (11.3 percent). Please refer to the *Community Impacts Analysis Technical Report* for additional information regarding LEP populations within the project area.

LEP persons have been afforded the opportunity to participate in the decision-making process. A public meeting was held for the proposed project on October 24, 2018 (see **Section 7.0**) and no translation services were requested. Notices for the public meeting were published in English and Spanish in locally-circulated newspapers. Mailed notices were printed in English and Spanish. Notices for future events will be printed in English and Spanish. Reasonable steps will continue to be taken to ensure all persons have meaningful access to the programs, services, and information TxDOT provides. Any public involvement information and/or materials would continue to be made available in English and Spanish, and translation services would be provided upon request. Therefore, the requirements of EO 13166, pertaining to LEP, would be satisfied.

The No Build Alternative would have no impacts to LEP populations. Increased congestion and reduced mobility that is anticipated as a result of not implementing the Build Alternative may result in adverse effects to the communities of the project area, including LEP populations. Beneficial impacts from the Build Alternative, including improving mobility, reduced congestion, and enhanced pedestrian and bicyclist usage, would not be attained under the No Build Alternative, and would be unavailable to all communities, including LEP populations.

5.7 VISUAL/AESTHETIC IMPACTS

Aerial imagery and field visits were used to assess visual and aesthetics impacts within the project area. Section 136 of the Federal Aid Highway Act of 1970 (Public Law [PL] 91-605) requires consideration of aesthetic values in the highway planning process. The general terrain along the project corridor consists of rolling hills with the highest elevation at the northern terminus of the proposed corridor (about 770 feet above mean sea level [amsl]), and the lowest in the southern portion of the project at the Escondido Creek crossing (about 610 feet amsl).

A notable feature along the corridor is the Soil Conservation Service Site 6-A, a water feature in the southern portion of the project area. Aside from this water feature, Loop 1604 is the dominant visual element in the project area. Visual elements surrounding the project area consist of residential housing, commercial properties, pastureland, highway ROW, and woodland areas leaving the existing landscape generally fragmented. The primary viewers would include motorists and single-family residents.

The Build Alternative would result in the expansion and modification of the existing roadway in a mostly urban setting. There will be changes in the visual and aesthetic setting of the facility's location, however such changes are generally viewed as neutral given the already-disturbed nature of the region and lack of any particularly notable elevation changes or other vantage points from which to view scenic vistas or other unique aesthetic resources. Construction activities would be limited to daylight hours to eliminate the need to use high-wattage lighting sources to operate during night-time hours to the maximum extent practicable. Reseeding/revegetation would take place in areas disturbed during construction to ensure disturbed areas are not left to become weedy and unsightly.

Where reasonable and feasible, measures that would result in beneficial visual and aesthetic impacts may be programmed for this project. These measures may include aesthetic enhancements, such as lighting, and/or decorative details. Aesthetics treatments would be developed during final design and incorporated into the project design as appropriate.

The No Build Alternative would not result in any changes to the existing visual and aesthetic quality of the project area.

5.8 CULTURAL RESOURCES

Evaluation of impacts to cultural resources have been conducted under Section 106 of the National Historic Preservation Act in accordance with the Programmatic Agreement among FHWA, TxDOT, the Texas State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings.

5.8.1 Archeology

An archeological background study meeting TxDOT requirements was completed in 2019 to evaluate archeological resources within the area of potential effects (APE), consisting of approximately 280 acres of existing transportation ROW, approximately 50.99 acres of new ROW, and existing easements. No new temporary or permanent easements are anticipated. Based upon the results of the San Antonio District Hybrid Potential Archeological Liability Map (HPALM), approximately 60 percent of the proposed ROW exhibits a moderate or high shallow and/or deep potential for archeological resources (Abbott and Pletka 2017). The remaining APE exhibits a low potential for archeological resources. One previously recorded archaeological site is recorded within the APE (41BX1692). This site contains prehistoric-age lithic scatter containing lithic debitage and burned rock and is undetermined for eligibility to be listed on the National Register of Historic Places (NRHP)/State Antiquities Landmarks (SALs). No additional sites or cemeteries have been recorded within the APE.

The project would be treated per right-of-entry (ROE) denial provisions of the Programmatic Agreement (PA) between TxDOT and Federal Highway Administration (FHWA) as well as other entities. The archeological survey would be conducted when ROE to the remaining acreage is available or the ROW is acquired (**Appendix G**).

Tribal consultation with federally recognized Native American tribes with demonstrated historic interest in the area was concluded on June 14, 2019. No objections or expressions of concern were received within the comment period. See **Appendix G** for associated correspondence.

To ensure no previously unknown cultural resources are harmed, construction may not begin until the recommended survey of archeological resources is completed, and the corresponding report is accepted by the Texas Historical Commission (THC) and TxDOT ENV. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area would cease, and TxDOT archeological staff would be contacted to initiate post-review discovery procedures.

The No Build Alternative is not anticipated to result in impacts to archeological resources.

5.8.2 Historic Properties

The evaluation of potential impacts to historic-age cultural resources was initiated for the Build Alternative with submittal of the *Project Coordination Request for Historical Studies Project* (TxDOT 2019d) listed in Section 5.0 in January 2019. The APE for historical resources was 150

feet from the existing ROW and the study area was 1,300 feet from the existing ROW. The historic-age cut-off date for the historical survey was 1976.

TxDOT historians reviewed the NRHP, the list of SAL, the list of Recorded Texas Historic Landmarks, and TxDOT files. The project APE clips the whole Randolph AFB parcel, and the project does require ROW from the Department of Defense, but the designated Randolph Field Historic District, an NRHP District and National Historic Landmark (NHL), falls well outside of the APE and the 1,300-foot study area. Because the project clips the parcel, TxDOT did consider effects to the property and informally consulted with the THC.

TxDOT historians determined that the project would have no adverse effect on the NHL Randolph Field Historic District and through consultation with the THC determined that the project did not warrant individual coordination with their office. Therefore, pursuant to Stipulation IX, Appendix 6 of the Section 106 PA and the Memorandum of Understanding (MOU), TxDOT historians determined that there would be no adverse effects to historic, non-archeological properties in or on parcels clipped by the APE. In compliance with the Antiquities Code of Texas and the MOU, TxDOT historians determined project activities have no potential for adverse effects and individual coordination with SHPO is not required on July 29, 2019 (**Appendix G**). Please refer to the *Project Coordination Request for Historical Studies Project* for additional details regarding historic resources in the project area.

The Build and No Build Alternatives are not anticipated to affect historic properties eligible for the NRHP.

5.9 PROTECTED LANDS

Section 4(f)

There are no Section 4(f) properties present in the project area.

Section 6(f)

There are no Section 6(f) resources in the proposed project area.

Chapter 26

There are no Chapter 26 properties present in the project area

There are no Section 4(f), Section 6(f), or Chapter 26 properties present in the project area; therefore, no impacts as a result of the Build Alternative and No Build Alternative are anticipated.

5.10 WATER RESOURCES

5.10.1 Clean Water Act Section 404

As detailed in the *Water Resources Technical Report* (TxDOT, 2019c) listed in Section 5.0 and further clarified in the *Section 404 Jurisdictional Memo*, dated January 2020, listed in Section 5.0, potentially jurisdictional waters are located within the project area.

This project will involve regulated activity in jurisdictional waters; therefore, will require authorization under Section 404. The following table shows the waters that are anticipated to be jurisdictional waters in which regulated activity is anticipated to take place. It also indicates whether the impacts are anticipated to be authorized under Section 404 by a non-reporting nationwide permit (i.e., no pre-construction notification required). **Table 5-1** below identifies the potentially jurisdictional waters in the project area.

Table 5-1 Potentially Jurisdictional Waters of the US Within the Project Area

Name of Water Body	Type of Water Body	Location of Water Body	Covered by non-reporting Nationwide Permit under Section 404?
Salitrillo Creek	Perennial Stream	Refer to Resource-Specific Map in Appendix F	Y
Unnamed Tributary of Salitrillo Creek	Intermittent Stream	Refer to Resource-Specific Map in Appendix F	Y
Soil Conservation Service Site 6-A Reservoir	Open Water	Refer to Resource-Specific Map in Appendix F	Y

Source: Section 404 Jurisdictional Memo, January 2020.

Impacts to potentially jurisdictional waters shown above would result from construction of the bridge columns necessary to widening the existing Loop 1604 bridge. Temporary impacts resulting from construction staging adjacent to each feature are anticipated to be well below 0.10 acre each. Permanent impacts (three bridge columns) will occur within or adjacent to Salitrillo Creek (feature 08), Unnamed Tributary of Salitrillo Creek (feature 09), and Soil Conservation Service Site 6-A Reservoir (feature 09a). These bridge columns will be approximately 110 square feet each, approximately 0.009 acres in total. Although wetland vegetation types occur in the vicinity, it was determined that no wetlands subject to USACE jurisdiction were observed within the existing or proposed ROW.

Temporary fills, if necessary, would be removed in their entirety and temporarily affected areas returned to pre-construction elevations, and revegetated as appropriate. Construction impact avoidance measures and Best Management Practices (BMPs), as required by Nationwide Permit (NWP) general conditions would also be implemented around all water feature impact areas, as applicable.

The No Build Alternative would not require ROW acquisition nor bridge construction, thus would not impact any jurisdictional waters of the US, wetlands or special aquatic sites.

5.10.2 Clean Water Act Section 401

For a project requiring the use of a NWP under Section 404 or Section 10, regardless of whether the NWP is non-reporting (i.e., assumed) or reporting (i.e., requires submittal of a pre-construction notification), TxDOT complies with Section 401 of the Clean Water Act by implementing TCEQ's conditions for NWPs. For projects that require authorization under Section 404 or Section 10 beyond a NWP (i.e. individual permit, letter of permission, or regional general permit application), TxDOT complies with Section 401 of the Clean Water Act by including a Tier I or Tier II checklist in the application that is submitted to the USACE, and then complying with the conditions of the Tier I or Tier II checklist.

As the proposed project would be authorized under a USACE Section 404 NWP, construction activities would be required to comply with the Texas Commission on Environmental Quality (TCEQ) Water Quality Certification Program established under Section 401 of the Clean Water Act. Thus, compliance with Section 401 requires the use of TCEQ BMPs to manage water quality on sites affecting jurisdictional waters. These BMPs would specifically address erosion control, post-construction total suspended solids (TSS) control and sedimentation control. The specific nature, location, and type of measures for implementation of these BMPs would be developed during final design.

Compliance with USACE NWP 14, CWA Section 401 water quality requirements and TCEQ BMPs would ensure that the small amount of potentially jurisdictional waters affected by the Build Alternative would be minor and that no significant impacts to any water resources, wetlands or special aquatic sites would occur. Impacts to water quality would similarly be minimal.

Under the No Build Alternative, there would be no fill impacts to waters of the US, wetlands, special aquatic sites or other sensitive water resources. Thus, there would not be any activities that could have an adverse effect on water quality either.

5.10.3 Executive Order 11990 Wetlands

EO 11990 Protection of Wetlands (issued 1977) requires federal agencies to minimize the destruction or modification of wetlands. The Build Alternative would minimally affect jurisdictional waters, as described in Section 5.10.1, above. In addition, although wetland vegetation types occur in the vicinity, as described above per the *Section 404 Jurisdictional Memo*, listed in Section 5.0, it was determined that no wetlands subject to USACE jurisdiction were observed within the existing or proposed ROW. Thus, the Build Alternative would not impact wetlands within the project area. The No Build Alternative would not impact wetlands within the project area.

5.10.4 Rivers and Harbors Act

The proposed project does not involve the construction or modification, including changes to lighting, of a dam, dike, bridge or causeway, in or over a navigable water of the US; nor does it involve work in a navigable water of the US. Therefore, Sections 9 and 10 of the Rivers and Harbors Act do not apply to the Build or No Build Alternative.

5.10.5 Clean Water Action Section 303(d)

For the purposes of monitoring water quality, the TCEQ has divided the major water bodies within the San Antonio River Basin into discrete segments. **Table 5-2** identifies the impaired segment within five miles of the Build Alternative.

Table 5-2 Impaired Waters within 5 miles of the Build Alternative

Watershed	Segment Name	Segment Number	Assessment Unit Number
San Antonio	Martinez Creek	1902A	1902A_01

Source: TCEQ 2020

This segment is impaired due to bacteria in water. A Storm Water Pollution Prevention Plan (SWP3) would be implemented to avoid discharging pollutants into waterways that may degrade the water quality. Compliance with the SWP3, as well as NWP 14 conditions and BMPs, as discussed above, would ensure that the project does not adversely affect water quality, impair or impede any plans to improve the quality of polluted waters.

For the reasons listed above, it is not anticipated that the Build Alternative would impact any Section 303(d) stream segments.

Since no ROW acquisition or construction would occur, the No Build Alternative would not impact any Section 303(d) stream segments.

5.10.6 Clean Water Act Section 402

The Build Alternative would disturb five or more acres of earth; therefore, it is considered a “large construction activity.” Section 402 of the Clean Water Act sets forth the National Pollutant Discharge Elimination System program, which in Texas is administered by TCEQ under the Texas Pollutant Discharge Elimination System (TPDES) program. Since TPDES Construction General Permit (CGP) authorization and compliance (and the associated documentation) occur outside of the environmental clearance process, compliance is ensured by the policies and procedures that govern the design and construction phases of the project. The *Project Development Process Manual* (2019i) and TxDOT *Plans, Specifications, and Estimates (PS&E) Preparation Manual* (2017b) require a SWP3 be included in the plans of all projects that disturb one or more acres. The TxDOT *Construction Contract Administration Manual* (2019j) requires that the appropriate CGP authorization documents (Notice of Intent [NOI] or site notice) be completed, posted, and

submitted, when required by the CGP, to TCEQ and the municipal separate storm sewer system operator. It also requires that projects be inspected to ensure compliance with the CGP.

The *PS&E Preparation Manual* requires that all projects include Standard Specification Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls), and the "Required Specification Checklists" require Special Provision 506-003 on all projects that need authorization under the CGP. These documents require the project contractor to comply with the CGP and SWP3, and to complete the appropriate authorization documents.

The No Build Alternative would not result in any earth disturbance.

5.10.7 Floodplains

As detailed in the *Water Resources Technical Report* (2019c), listed in Section 5.0, according to the Federal Emergency Management Agency Flood Insurance Rate Map Panels (Community Panel Numbers: 48029C0295F and 48029C0435G [effective September 29, 2010]), the project area intersects three flood zone designations, Zone A, Zone AE, and Zone X. Zone A is defined as an area subject to inundation by the one-percent-annual-chance flood event and no base flood elevations have been determined. Zone AE is defined as an area subject to inundation by the one-percent-annual-chance flood event and base flood elevations have been determined. Zone X is defined as an area determined to be outside the one-percent-annual-chance floodplain.

This project is subject to, and will comply with, federal EO 11988 on Floodplain Management. The department implements this EO on a programmatic basis through its Hydraulic Design Manual. Design of this project will be conducted in accordance with the department's Hydraulic Design Manual. Adherence to the TxDOT Hydraulic Design Manual ensures that this project will not result in a "significant encroachment" as defined by FHWA's rules implementing EO 11988 at 23 CFR 650.105(q)."

The project would require coordination with the local floodplain administrator.

The Build Alternative and No Build Alternative would not result in adverse impacts to floodplains.

5.10.8 Wild and Scenic Rivers

No wild and scenic rivers are located within the project area. The Wild and Scenic Rivers Act would not be applicable. Therefore, neither the Build nor the No Build Alternative would impact wild or scenic rivers.

5.10.9 Coastal Barrier Resources

The proposed project corridor is not situated within a coastal county subject to the Coastal Barrier Resources Act (CBRA) of 1982. Therefore, the CBRA does not apply and neither the Build nor the No-Build Alternative would impact coastal barrier resources.

5.10.10 Coastal Zone Management

The project is not located within the Texas Coastal Management Plan (TCMP) boundary. Therefore, a consistency determination is not required. Neither the Build nor the No Build Alternative would impact coastal zone management areas.

5.10.11 Edwards Aquifer

The project area is not located within any contributing, recharge, or transition zones of the Edwards Aquifer (TCEQ 2019). Therefore, an Edwards Aquifer Protection Plan would not be required. The TCEQ Edwards Aquifer Rules do not apply.

There is, however, an Edwards Aquifer Authority (EAA) test well used for research located within the project area. It is located in the existing ROW. See **Appendix C**, schematics (sheet 1 of 2), for precise location. It is anticipated that this well would be avoided by the project. TxDOT will coordinate with the EAA regarding the disposition of the well.

Neither the Build Alternative nor the No Build Alternative would adversely affect the Edwards Aquifer.

5.10.12 International Boundary and Water Commission

This project does not cross or encroach upon the floodway of the International Boundary Water Commission (IBWC) ROW or an IBWC flood control project. Neither the Build Alternative nor the No Build Alternative would impact any international boundary or its floodplains.

5.10.13 Drinking Water Systems

In accordance with TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Item 103, Disposal of Wells), any drinking water wells would need to be properly removed and disposed of during construction of the project.

5.11 BIOLOGICAL RESOURCES

5.11.1 Texas Parks and Wildlife Department Coordination

Early coordination is required between TxDOT and the Texas Parks and Wildlife Department (TPWD) per the 2013 MOU between the two departments because of the need for a NWP from the USACE, as well as other criteria. Accordingly, early coordination between TxDOT and TWPD was performed to address the species issues identified in the *BEF* and *Tier I Site Assessment*, listed in Section 5.0, for the proposed project (TxDOT, 2019b). As a result of the TPWD coordination, a number of BMPs were identified and will be included in EPICs as necessary to ensure they are implemented. See Section 8.2, below, for the full list of BMPs / EPICs identified.

As part of the biological review and Tier I Site Assessment, unusual vegetation features or special habitat features occurring within the proposed project area were identified and described in accordance with the 2013 TxDOT-TPWD MOU. As documented in the *Biological Resources Technical Report*, unusual vegetation features identified include: unmaintained vegetation and

riparian vegetation. Approximately 35.30 acres of unmaintained vegetation and 9.61 acres of riparian vegetation were initially identified as potentially impacted by the proposed project in terms of triggering TPWD coordination. (It should be noted that, although wetland vegetation types occur in the vicinity, as described above in Section 5.10.1 and per the *Section 404 Jurisdictional Memo*, it was determined that no wetlands subject to USACE jurisdiction were observed within the existing or proposed ROW.) No remnant vegetation occurs in the project area. Special habitat features identified include: bottomland hardwoods (approximately 0.84 acres near the Soil Conservation Service reservoir on Salitrillo Creek) and bird nests observed on two bridges crossing the creek. These features are described in detail in the above-mentioned biological study.

5.11.2 Impacts to Vegetation

The Loop 1604 project area was assessed using the Ecological Mapping System of Texas (EMST) to determine potentially occurring vegetation types and was then investigated by qualified ecologists to document site conditions (Elliot *et al*. 2014). EMST vegetation and associated habitat types are defined in the *Tier 1 Site Assessment* and the *Biological Resources Technical Report* attached to the BEF.

The Build Alternative is anticipated to result in permanent or temporary impacts to vegetation. Site conditions were found to differ somewhat from EMST predictions, but both methods showed that the project area was dominated by the Urban (high and low intensity) habitat type. Approximately 34.2 acres of the Blackland Prairie: Disturbed or Tame Grassland vegetation type occurs in the project area, much of which is in areas of proposed ROW acquisitions. This vegetation type is common in the region. Within the project area, the relative abundance of woody vegetation was found to vary widely, which may result from past land use practices. The project area also contains approximately 8.7 acres of Central Texas: Floodplain Herbaceous vegetation type. Much of this occurs under an existing bridge over Salitrillo Creek and around an impoundment thereof. This area is regularly mowed and maintained, and existing vegetation would be preserved to the greatest extent practicable during required improvements.

The project area contains approximately 5.3 acres of row crops. Evidence of corn production was observed during field observations. Additional vegetation types were documented at less significant coverage amounts. The *Tier 1 Site Assessment* and *BEF* contain additional information on vegetation including EMST maps, observed vegetation maps, notes on species composition, and representative photographs for each type observe. For the purposes of agency coordination, a worst-case-scenario was assumed where all vegetation in the project area would be impacted. As previously described, above, impacts to vegetation were coordinated with TPWD in accordance with the TxDOT-TPWD MOU (2013).

The No Build Alternative would not impact vegetation beyond current impacts as a result of continued maintenance of the existing Loop 1604 ROW.

5.11.3 Executive Order 13112 on Invasive Species

The Build Alternative is subject to and will comply with federal EO 13112 on Invasive Species. The department implements this EO on a programmatic basis through its *Roadside Vegetation Management Manual* (2018) and *Landscape and Aesthetics Design Manual* (2017d).

The No Build Alternative would not require compliance with EO 13112.

5.11.4 Executive Memorandum on Environmentally and Economically Beneficial Landscaping

The Build Alternative is subject to and would comply with the federal Executive Memorandum on Environmentally and Economically Beneficial Landscaping, in effect since April 26, 1994. TxDOT implements this Executive Memorandum on a programmatic basis through its *Roadside Vegetation Management Manual* and *Landscape and Aesthetics Design Manual*.

The No Build Alternative would not require compliance with the federal Executive Memorandum on Environmentally and Economically Beneficial Landscaping.

5.11.5 Impacts to Wildlife

Required clearing or other construction-related activities as part of the Build Alternative may directly and/or indirectly affect animals that reside on or adjacent to the project area. Heavy machinery could kill small, low-mobility animals or could cause soil compaction impacting animals that live underground. Larger, more mobile species would typically avoid construction activities and move into adjacent areas. In order to minimize disturbance to inert microhabitats (e.g., snags, brush piles), clearing within the ROW would be minimized to the extent practicable.

BMPs have been incorporated into this project per the 2013 TxDOT-TPWD MOU. Potential impacts and programmatic BMPs are discussed in the *Tier 1 Site Assessment* and *Biological Resources Technical Report.* Considerations for state-listed and federally-listed threatened and endangered species, as well as species of additional conservation needs, are discussed in the sections below, particularly Section 5.11.11.

The No Build Alternative would not impact wildlife populations beyond current impacts as a result of continued operation and maintenance of the existing Loop 1604 ROW.

5.11.6 Migratory Bird Protections

This project would comply with applicable provisions of the Migratory Bird Treaty Act (MBTA) and Texas PWC Title 5, Subtitle B, Chapter 64, Birds. It is the department's policy to avoid removal and destruction of active bird nests except through federal or state approved options. In addition, it is the department's policy to, where appropriate and practicable:

- Use measures to prevent or discourage birds from building nests on man-made structures within portions of the project area planned for construction.

- Schedule vegetation disturbing activities outside the typical nesting season.

The Build Alternative would be in compliance with the MBTA.

Under the No Build Alternative, the proposed project would not be constructed; therefore, there would be no project-related impacts to wildlife.

5.11.7 Fish and Wildlife Coordination Act

The project is anticipated to require a nationwide permit issued by the USACE. Compliance with the Fish and Wildlife Coordination Act (FWCA) will be accomplished by complying with the terms and conditions of the nationwide permit.

5.11.8 Bald and Golden Eagle Protection Act of 2007

The Bald and Golden Eagle Protection Act of 2007 prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald or golden eagles, including their parts, nests or eggs. The Build Alternative is not within 660 feet of an active or inactive Bald or Golden Eagle nest. Therefore, no coordination with USFWS is required.

Neither the Build Alternative nor the No Build Alternative would impact bald or golden eagles.

5.11.9 Magnuson-Stevens Fishery Conservation Management Act

The proposed project is not located within a county with tidally-influenced waters. Neither the Build Alternative nor the No Build Alternative would require compliance with the Magnuson-Stevens Fishery Conservation Management Act.

5.11.10 Marine Mammal Protection Act

The proposed project is not located in a coastal county and, therefore, does not contain suitable habitat for marine mammals. Neither the Build Alternative nor the No Build Alternative would affect marine mammals.

5.11.11 Threatened, Endangered, and Candidate Species

The Endangered Species Act (ESA) affords protection for federally-listed threatened and endangered species and designated critical habitat for these species. The US Fish and Wildlife Service (USFWS) maintains a list of federally threatened and endangered species potentially present for each Texas County. The Information for Planning and Consultation (IPaC) web portal, administered by the USFWS, identified several federally-listed species within range of the proposed project (USFWS 2019). However, the project area does not provide suitable habitat for these species (e.g. vegetation communities, karst habitat, aquatic features, etc.), No consultation with the USFWS is required.

The project was also determined to be in the range of several state endangered species. For a number of these species, no suitable habitat was found to occur onsite. For the following state threatened species, however, suitable habitat was found to exist onsite:

State Threatened: Texas tortoise (*Gopherus berlandieri*), timber rattlesnake (*Crotalus horridus*), zone-tailed hawk (*Buteo albonotatus*), and white-nosed coati (*Nasua narica*).

During project review, several Species of Greatest Conservation Need (SGCN) were also identified as potentially being impacted by this project. These species are listed below. It should be noted, however, that in April 2019, TPWD subsequently revised the Bexar County list to include additional protected species. Pursuant to §2.206 (1) of the TxDOT- TPWD MOU, the analysis regarding species impacts was completed utilizing the County list available at the time the project scope was finalized; therefore, no additional coordination or documentation is provided for the newly added species. TxDOT will continue to implement the species-specific and taxa BMPs that were identified for use during TPWD coordination, which would also serve to benefit species added to the Bexar County list as a result of subsequent TPWD revisions.

Species of Greatest Conservation Need: Correll's false dragon-head (*Physostegia correllii*), low spurge (*Euphorbia peplidion*), net-leaf bundleflower (*Desmanthus reticulatus*), tree dodder (*Cuscuta exaltata*), spot-tailed earless lizard (*Holbrookia lacerata*), Texas garter snake (*Thamnophis sirtalis annectens*), western burrowing owl (*Athene cuicularia hypungaea*), cave myotis bat (*Myotix velifer*), and Plains spotted skunk (*Spilogale putorius interrupta*).

The project may impact the above species through conversion of suitable habitat. The following BMPs have been incorporated into this project to reduce the potential for impacts to protected species. As discussed in Section 8.2, below, EPICs will be created to ensure these project BMPs are implemented. As there are no BMPs for Correll's false dragon-head, low spurge, net-leaf bundleflower, tree dodder or the white-nosed coati, coordination with TPWD was required and completed for these species as stated in Section 5.11.1.

Zone-Tailed Hawk and Western Burrowing Owl:

- Comply with provisions of the MBTA.
- Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- Do not disturb, destroy or remove active nests, including ground-nesting birds, during nesting season.
- Avoid removal of unoccupied, inactive nests, as practicable.
- Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- Do not collect, capture, relocate or transport birds, eggs, young or active nests without a permit.

Texas Tortoise, Timber Rattlesnake, Texas Garter Snake, and Spot-Tailed Earless Lizard:

- Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas, where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, utilize erosion-control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred; plastic netting should be avoided to the extent practicable.
- For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1: 1) in areas left uncovered; visually inspect excavation areas for trapped wildlife prior to backfilling.
- Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
- Advise contractors of potential occurrence in the project area and inform contractors that if reptiles are found on project site, the species are to be allowed to safely leave the project area.
- Additionally, for Texas tortoise: Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species.

Plains Spotted Skunk:

- Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.

White-nosed Coati:

- Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.

Cave Myotis Bat:

- For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when night

time temperatures are above 50°F AND minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Section 2: Standard Recommendations for recommended methods of excluding bats from structures.

- If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
- Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.
- Large hollow trees, snags (dead standing trees) and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
- In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

With the implementation of these BMPs, the Build Alternative would not significantly impact threatened, endangered, or candidate species or their habitats. The No Build Alternative would not impact threatened, endangered, or candidate species or their habitats.

5.12 AIR QUALITY

An *Air Quality Technical Report*, listed in Section 5.0, was prepared for the project following TxDOT's current air quality compliance process and in accordance with TxDOT's May 2017 *Environmental Handbook for Air Quality* (2017a) and January 2017 *Standard Operating Procedures for Preparing Air Quality Statements* (2020b). The proposed project is located in Bexar County, which is designated as a marginal nonattainment area for the 2015 ozone and eight-hour ozone national ambient air quality standards (NAAQS). Therefore, transportation conformity rules apply. Both the MTP and the TIP, as amended, were initially found to confirm to the TCEQ State Implementation Plan (SIP) by FHWA and Federal Transit Authority (FTA) on September 24, 2019. TxDOT will not take final action on this environmental document until a project level conformity determination has been obtained from the FHWA, as applicable.

In addition, the proposed project was developed from the AAMPO's Congestion Management Process (CMP), which meets all requirements of 23 CFR 450.320 and 500.109, as applicable.

The CMP was adopted along with the Mobility 2040 MTP. in the Air Quality Technical Report (TxDOT 2019h) lists all of the CMP strategies relevant to the project.

Projects with an Annual Average Daily Traffic less than 140,000 vehicles per day (vpd) are not expected to cause an exceedance of the carbon monoxide (CO) NAAQS. Maximum traffic data for the Estimated Time to Completion year 2027 and design year 2040 is 79,200 vehicles per day and 118,750 vehicles per day, respectively. The average annual daily traffic projections for the proposed project do not exceed 140,000 vpd; therefore, a CO Traffic Air Quality Analysis is not required. The Estimated Time to Completion has been updated since the Air Quality Technical Report was finalized.

Results of a qualitative mobile source air toxics (MSAT) analysis acknowledged that the proposed Project Build Alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain and, because of this uncertainty, the health effects from these emissions cannot be estimated. Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Construction activities have the potential to produce short-term, localized air quality impacts. Potential temporary impacts due to implementing the Build Alternative include increased particulate matter (PM) and MSAT emissions from construction equipment and vehicles, as well as temporary impacts due to fugitive dust emissions. Dust suppression techniques, promotion of Texas Emissions Reduction Plan (TERP), and regulatory prescriptions for construction contractors are used to reduce these temporary construction emissions.

In total, the Build Alternative is not anticipated to cause or exacerbate a violation of any NAAQS or other air quality standard. It is not anticipated that there would be any significant adverse air quality impacts associated with the implementation of the proposed project; therefore, no mitigation measures are proposed with respect to operational activities.

Under the No Build Alternative, air quality would be expected to continue its' current regional trends and any differences in air quality, beneficial or not, would not be realized.

5.13 HAZARDOUS MATERIALS

The *Hazardous Material Initial Site Assessment Report*, listed in Section 5.0, prepared for the project included a review of topographic maps, historic aerial photographs, a regulatory database search, and a site visit (TxDOT, 2019e).

The GeoSearch regulatory database search identified the following at Randolph AFB, which is partially within the project area: one federal archived national priority list entry, one federal

Resource Conservation and Recovery Act (RCRA) corrective action entry, one RCRA waste generator entry, and four emergency response notification system entries. It also identified twelve leaking petroleum storage tank entries and eight petroleum storage tank entries located within and adjacent to the project area. Three industrial hazardous waste corrective action entries were also located: one within the project area, the other two approximately 0.69 and 0.85 miles way. Two closed and abandoned landfill entries were also noted, approximately 0.04 and 0.06 miles from the project area, respectively. Upon further review, all regulatory database entries were determined to either pose no environmental concern or present a low environmental concern to the project.

In 1993, a low-level radioactive waste disposal site roughly 0.33 acres in size was remediated (exhumed and backfilled) on Randolph AFB near Loop 1604 at Rocket Lane. Additional investigations were performed by TxDOT in 2009 and 2018 to determine if there was any potential for impacted soil or groundwater to be encountered during project construction activities, such as excavation for foundations for traffic signals, light poles and other project features. Borings and monitoring wells for any groundwater present were placed. Field investigations during placement did not indicate any readings above normal levels.

In regard to the presence of any radioactive contamination or other hazardous substances in either the soil or groundwater, contractors would be required to take all appropriate measures to prevent, minimize and control any contaminated materials disturbed (excavated, dewatered, etc.) during project construction. Any soil excavated from within the boundaries of the former low-level radioactive waste landfill at Randolph AFB will be managed according to the project-specific soil management plan. If present outside the Randolph AFB landfill, TxDOT would avoid and minimize the project's encroachment on these materials to the extent practicable and develop a plan for the management of any generated wastes. These materials, as well as any unanticipated hazardous materials or petroleum contamination encountered during construction would be handled according to applicable federal and state regulations per TxDOT standard specifications.

During the review of historical topographic and aerial photography maps, three gas pipelines were identified transecting the project area and one active gas station not previously identified was observed adjacent to the project area. All of these items were determined to pose a low environmental risk to the project.

Nevertheless, formal utilities location and advance planning would be required to facilitate pipeline adjustments and to otherwise ensure associated impacts are avoided. TxDOT District Subsurface Utility Engineering (SUE) Coordinator and ROW would be responsible for the adjustments and displacements. During construction of the Build Alternative, the contractor would take appropriate measures to prevent, minimize, and control the spill of fuels, lubricants, and hazardous materials that the contractor brings into the construction staging area.

Based on available historic data, existing land use, the nature of the proposed project, and anticipated actions to avoid impacts, all sites within and surrounding the Build Alternative were determined to pose no environmental risk or a low environmental risk to the project.

There are no hazardous materials concerns anticipated for the No Build Alternative.

5.14 TRAFFIC NOISE

A *Traffic Noise Analysis Technical Report*, listed in Section 5.0, was prepared to identify and assess traffic noise impacts associated with the proposed project (TxDOT, 2019f). Traffic noise impacts were evaluated in accordance with the most current FHWA policy and procedures, and the TxDOT (FHWA approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011b). A noise impact occurs when either the absolute or relative criterion (described below) is met:

Absolute Criterion: the predicted noise level at a receiver approaches, equals or exceeds the Noise Abatement Criteria (NAC). "Approach" is defined as one Decibel on the A-Weighted Scale, denoted as dB(A), below the FHWA NAC. For example: a noise impact would occur at a residence if the noise level is predicted to be 66 dB(A) or above.

Relative Criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. “Substantially exceeds” is defined as more than 10 dB(A). For example: a noise impact would occur at a residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The Build Alternative would result in traffic noise impacts to one representative receiver (see **Table 5-3**, below) and the noise abatement measures considered were construction of noise barriers. Before any noise abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. In order to be “feasible”, the abatement measure must be able to reduce the noise level at greater than 50 percent of impacted, first-row receivers by at least 5 dBA; and to be “reasonable”, it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least 5 dBA and the abatement measure must be able to reduce the noise level for at least one impacted, first-row receiver by at least 7 dBA. A noise barrier at this location would not be reasonable; therefore, no noise abatement measures are proposed for this project.

Table 5-3 Traffic Noise Levels (dBA Leq)

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2040	Change (+/-)	Noise Impact (Y/N)
R1 Residence	B	67	59	68	+9	Y
R2 Sports Field (outdoor seating)	C	67	59	61	+2	N
R3 School	D	52	37	41	+4	N
R4 Pavilion/Picnic Area	C	67	58	61	+3	N
R5 Church Playground	C	67	52	56	+4	N
R6 Residence	B	67	58	57	-1	N
R7 Residence	B	67	57	57	0	N
R8 School Playground	C	67	52	54	+2	N
R9 Residence	B	67	52	58	+6	N
R10 Residence	B	67	54	56	+2	N
R11 Residence	B	67	56	60	+4	N
R12 Residence	B	67	60	64	+4	N
R13 Residence	B	67	59	62	+3	N

Source: TxDOT, 2019f

To avoid noise impacts that may result from future development of properties adjacent to the Build Alternative, local officials responsible for land use control programs must ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the predicted (2040) noise impact contours identified in **Table 5-4**.

Table 5-4 Predicted Noise Impact Contours

Roadway Segment	71 dBA Impact Contour [1] Description	66 dBA Impact Contour [2] Description
Loop 1604 between Miramar Boulevard and Rocket Lane	Within ROW	50 feet from ROW
Loop 1604 between Coppergate and Autumn Run Lane	Within ROW	35 feet from ROW
Loop 1604 between Binz-Engleman Road and I-10 E	Within ROW	Within ROW

Source: TxDOT, 2019f
Notes: (1) NAC Category E
(2) NAC Category B and Category C

A copy of the traffic noise analysis will be available to local officials to ensure, to the maximum extent possible, future developments are planned, designed and programmed in a manner that would avoid traffic noise impacts. On the date of approval of the document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

The projected increase in traffic volumes on existing Loop 1604 would likely result in increases to traffic noise levels for adjacent receivers if the No Build was implemented.

5.15 INDUCED GROWTH

The Build Alternative is in an area that is experiencing growth; therefore, an *Indirect Impacts Technical Report,* listed in Section 5.0, was prepared for the proposed project in accordance with TxDOT's *Indirect Impacts Analysis Guidance* (TxDOT, 2019k).

The Build Alternative would add capacity and improve operational efficiency of the roadway network along the Loop 1604 corridor. The Build Alternative would accommodate future anticipated traffic demand and growth in the region and ease existing and projected (future) congestion by providing additional main lanes, as well as improved access control with new frontage roads, access ramps, controlled cross-street intersections and dedicated turnarounds along the proposed segment of Loop 1604. Because the project is not a new location roadway, it is not anticipated to substantially change traffic patterns through the region or establish new development potential for undeveloped areas.

Based on demographic and land use trends, there is a high potential for growth in the Area of Influence (AOI) between 2019 and 2040 (**Appendix F, Figure 3**). The AOI was identified as approximately 2,024 total acres in size. Based on interviews with local officials from the cities of San Antonio and Converse, as well as a cartographic assessment, approximately 1,272 acres of land have indirect induced growth potential within the AOI (62 percent of AOI). The 1,272-acre area of potential induced growth consists of many types of future land uses including residential, commercial, and industrial development in response to the area's future population and economic growth (TxDOT, 2019g). Furthermore, a mixed-use development of residential, office, and commercial/retail land use is being planned adjacent to the Loop 1604 roadway. Bexar County owns a 51-acre area next to Randolph AFB and a public-private partnership is already underway for the development called Santé 51 to include commercial pad sites, retail space, a hotel, restaurants, a new Bexar County Sheriff's substation and a new Precinct Four building that could house various county services. A representative from the City of Converse estimated that the development might be constructed before the Loop 1604 improvements are finished (TxDOT, 2019g).

Overall, local representatives interviewed for the *Indirect Impacts Technical Report* agreed that the area surrounding the proposed project as development potential and could see future residential, commercial and industrial development occurring in the area's future as population and economy growth. The proposed capacity increase and congestion reduction enabled by the proposed project may help make the area more desirable for developers and the general public looking to move into the area.

As described in the *Indirect Impacts Technical Report*, the resources that could be indirectly impacted by potential induced growth include historic-age properties and archeological resources. No formal surveys for historic properties, archeological resources, waters of the US, or threatened/endangered species have been conducted specifically for the areas of induced growth

at this time of the report preparation. Regarding historic-age properties, there are no properties that have been previously listed in or determined eligible for listing in the NRHP on parcels within the APE for the proposed project. However, there are at least five parcels in the APE with historic-age development that have not been previously evaluated. Resources that are 50 years of age are potentially historic; NRHP listed or eligible historic resources are protected by state and federal regulations for publicly funded projects. However, no state or federal regulations protect cultural resources for privately-funded projects.

Regarding archeological resources, preliminary consultation with TxDOT-developed HPALM data indicates there is predominately a moderate to high potential for archaeological impacts to the unknown deposits in either surficial or sub-surface contexts within the areas of induced growth. The Antiquities Code of Texas requires notification (to the THC) if public agencies sponsor ground-disturbing activity on public land. NRHP-listed or eligible archeological resources are protected by state and federal regulations for publicly-funded projects. However, these state and federal regulations do not apply to privately-funded projects.

Local and regional population and employment trends support the idea that new development would occur in the area, project-induced land use change is accounted for in the City of Converse's and the City of San Antonio's future planning documents and corresponding objectives, and that the project is expected to induce growth. Future land development activities would be generally private ventures regulated by the Cities of San Antonio and Converse.

Ultimately, because the Build Alternative is not anticipated to conflict with the development goals of the project area or cause substantial negative induced growth impacts, the requirement for mitigation of environmental impacts would be limited to mitigating only the direct impacts associated with the Build Alternative. See the *Indirect Impacts Technical Report* for additional information regarding induced growth impacts from the Build Alternative (TxDOT, 2019g).

Under the No Build Alternative, current development rates and patterns would remain constant and no induced growth would occur.

5.16 CUMULATIVE IMPACTS

Based on the TxDOT cumulative impacts risk assessment, supported by the information presented in the technical reports, the Build Alternative would not result in substantial direct or indirect impacts to any resource nor are any impacts anticipated on a resource that is in poor or declining health. Therefore, further Cumulative Impacts Analysis is not required.

Under the No Build Alternative, no cumulative impacts would be anticipated.

5.17 CONSTRUCTION PHASE IMPACTS

During the construction phase of the Build Alternative, clearing, grading, and contouring to accommodate the facilities modification would occur. No temporary lane closures or detours that require routing traffic off of Loop 1604 are anticipated.

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receptors are expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

During the construction phase of this project, temporary increases in particulate matter (PM) and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel particulate matter from diesel powered construction equipment and vehicles. The potential impacts of PM emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. Considering the temporary and transient nature of construction-related emissions, as well as the mitigation actions to be utilized including compliance with applicable regulatory requirements, it is not anticipated that emissions from construction of this project will have a significant impact on air quality in the area.

Construction activities would be limited to daylight hours to eliminate the need to use high-wattage lighting sources to operate during night-time hours to the maximum extent practicable.

The No Build Alternative would not include construction activities and therefore would not have any project-related construction impacts.

6.0 AGENCY COORDINATION

Tribal consultation with federally recognized Native American tribes with demonstrated historic interest in the area was concluded on June 14, 2019. Documentation related to the various agency consultations and coordination performed for this EA in relation to cultural and historical resources are presented in **Appendix G**.

Coordination between TxDOT and AAMPO was also performed to ensure that applicable Congestion Management Process measures are included or implemented as appropriate for the proposed project. The AAMPO CMP documentation for this project is included in **Appendix E-2**.

TPWD coordination regarding potential impacts to state listed species and vegetation was completed in February 2020 (**Appendix G**).

In terms of additional coordination actions still needed, as noted in section 5.8.1, an archeological survey is yet to be completed on at least one identified parcel. The survey would be conducted when right-of-entry to the remaining acreage is available or the ROW is acquired and before construction (**Appendix G**). As noted in Section 5.14, a copy of the traffic noise analysis will be made available to local officials to ensure, to the maximum extent possible, future developments are planned, designed and programmed in a manner that would avoid traffic noise impacts. And, as discussed under section 5.10.11, coordination with the Edwards Aquifer Authority will be necessary to determine the final disposition of the EAA test well located within the proposed project ROW.

7.0 PUBLIC INVOLVEMENT

On October 24, 2018, a public meeting was conducted at New Life Fellowship Church (11225 East Loop 1604 North Universal City, Texas 78148) from 5:00 to 7:00 p.m. The public meeting was held in an open house format. A formal presentation was not provided. However, a continuous looping video PowerPoint presentation explaining the proposed project was provided as well as two videos of the proposed project and printed schematic displays. A total of 77 attendees registered at this meeting, including one identified elected/public official and 32 TxDOT/consultant representatives. A total of eight written comments were received during the meeting and by mail. Concerns expressed during the meeting included drainage and traffic noise impacts. Overall public opinion at the meeting was positive towards the project.

Meetings with Affected Property Owners were held informally on January 31, 2018, February 1, 2018, and September 17, 2018 at the New Life Fellowship Church (address above). Additional informal meetings were held on October 5 and 22, 2018, at the TxDOT San Antonio District Office (4615 Northwest Loop 410, San Antonio, Texas 78229) and on May 1, 2019, at Bell Hydrogas, Inc., (1955 Southeast Military Drive San Antonio, Texas 78223). TxDOT and their consultant provided a project overview, details on the proposed project (impacts to their properties based on current design), information on environmental process, and overall project schedule.

The Build Alternative is added capacity; therefore, a notice of impending construction will be provided to owners of adjoining property and affected local governments and public officials. In addition, a notice will be provided to owners of adjoining property and affected local governments and public officials via posted signs in ROW, mailed notice, printed notice distributed by hand, or website notice after the environmental decision but prior to beginning construction activities.

8.0 POST-ENVIRONMENTAL CLEARANCE ACTIVITIES AND CONTRACTOR COMMUNICATIONS

8.1 POST-ENVIRONMENTAL CLEARANCE ACTIVITIES

As noted under section 6.0 above, post-environmental clearance activities would include:

1) An archeological survey on one parcel once right-of-entry is available or the ROW is acquired and before construction.
2) To ensure the Edwards Aquifer Authority well is not adversely affected by the project, TxDOT will coordinate with EAA regarding the disposition of the well.
3) Soil excavated from within the boundaries of the former low-level radioactive waste landfill at Randolph AFB will be managed according to a project-specific soil management plan.
4) Although no proposed noise abatement measures, such as noise barriers or walls are necessary for this project, a copy of the traffic noise analysis (TxDOT, 2019f) will be available to local officials to ensure, to the maximum extent possible, that future developments are planned, designed and programmed in a manner that avoids traffic noise impacts.

8.2 DESIGN/CONSTRUCTION COMMITMENTS

Several measures designed to either protect or enhance the environment are specifically included in the plans for the proposed project. These measures will be coordinated with the construction contractor through the use of Environmental Permits, Issues, and Commitments (EPIC) sheets. The permits, impacts and commitments relevant to the proposed project are as follows:

1) Clean Water Act Section 404: A NWP 14 without a pre-construction notification will be used to authorize placement of fill in waters of the US.

    - TxDOT will ensure compliance with Section 401 Water Quality Certification by acquiring necessary certification and applying required BMPs.

2) Texas Pollution Discharge Elimination System (TPDES), including:

    - Construction General Permit (CGP)
    - SW3P
    - Construction Site Notice
    - Notice of Intent (NOI) and Notice of Termination (NOT)

3) Implementation of erosion control, sedimentation control and post-construction TSS control BMPs for the TCEQ's Water Quality Certification Conditions for NWPs to prevent water quality impacts from occurring during and after construction.

4) In addition to BMPs required for a TCEQ SW3P and/or 401 water quality permit, implement the following (where/if applicable):

    - Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks or barges.

    - When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils surrounding the crossing.

    - Implementation of BMPs for state-listed species and SGCNs (see Section 5.11.11 for list of species and specific BMPs).

        - Per the BMP PA between TPWD and TxDOT, BMPs will be implemented for the following species: Texas tortoise, timber rattlesnake, zone-tailed hawk, spot-tailed earless lizard, Texas garter snake, western burrowing owl, cave myotis bat and Plains spotted skunk.

5) Since Correll's false dragon-head, low spurge, net-leaf bundleflower, tree dodder, and white-noted coati are not included in the BMP PA, TPWD coordination was performed for these species.

    - Species BMPs may also require pre-construction or other activities to verify absence of species prior to construction.

6) EO 13112 on Invasive Species: Applies because this project is a federally-funded undertaking. Thus, revegetation of disturbed areas will be performed in compliance with this EO and disturbed areas will be restored and reseeded in accordance with TxDOT's Vegetation Management Guidelines.

7) Compliance with Executive Memorandum on Beneficial Landscaping.

8) Compliance with MBTA.

9) In addition to complying with the MBTA, perform the following BMPs:

- Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- Do not disturb, destroy or remove active nests, including ground-nesting birds, during nesting season.
- Avoid removal of unoccupied, inactive nests, as practicable.
- Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- Do not collect, capture, relocate or transport birds, eggs, young or active nests without a permit.

10) In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures.

11) Any unanticipated hazardous materials and/or petroleum contamination encountered during construction would be handled according to applicable federal and state regulations per TxDOT Standard Specifications.

12) Implementation of fugitive dust control measures.

    - Provisions will be included that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

13) The traffic noise analysis and air quality analysis will be made available to local officials.

9.0 CONCLUSION

Implementation of the proposed project would not result in a significant impact on the human or natural environment. Therefore, a FONSI is recommended.

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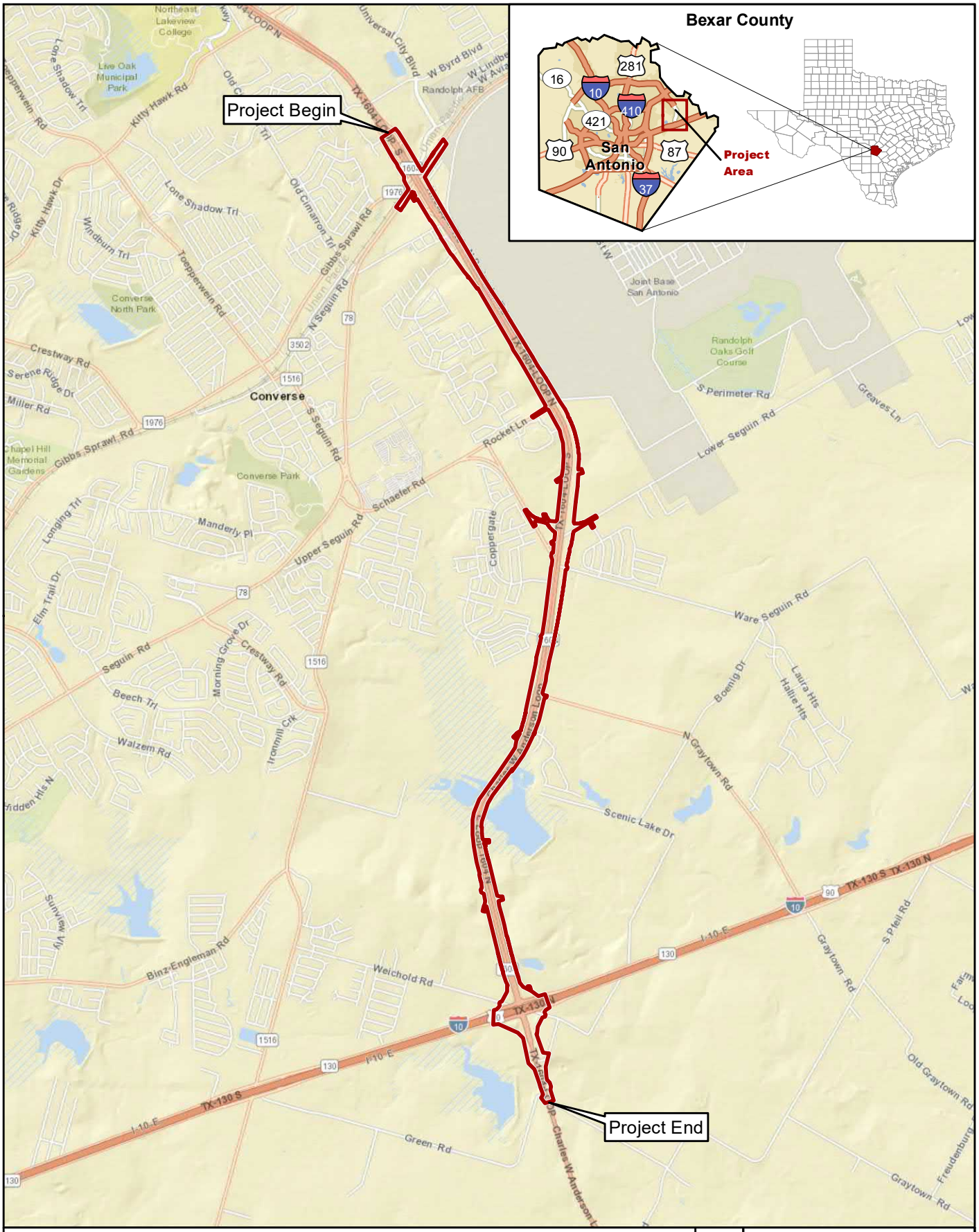
11.0 NAMES AND QUALIFICATIONS OF PERSONS PREPARING THE EA

Name	Title	Company	Years of Experience/Education Level and Subject
Jennifer Oakley	Project Manager	AECOM	11 years/Bachelors Environmental Science; Bachelors Biology; Masters Wildlife Ecology
Ryan Ingram	Senior Environmental Planner	AECOM	14 years/Bachelor of Science in Forestry/Wildlife Management
Kerry Winkler	Senior Environmental Planner / Program Manager	AECOM	23 years/Bachelor of Science Wildlife & Fisheries, Ecology
Courtney Filer, AICP	Project Manager	Cox|McLain Environmental Consulting, Inc.	15 years/Masters of Regional & City Planning
L. Ashley McLain, AICP	Principal, QA/QC	Cox|McLain Environmental Consulting, Inc.	23+ years/Master of Science in Community and Regional Planning
Kate Castles	Environmental Planner	Cox|McLain Environmental Consulting, Inc.	3 years/Master of Science in Community and Regional Planning and Master of Public Affairs
Walt Meitzen	Environmental Scientist	Cox|McLain Environmental Consulting, Inc.	20 years/Master of Earth and Environmental Resource Management
Claire Parra	Ecologist	Cox|McLain Environmental Consulting, Inc.	8 years/Master of Science in Wildlife Ecology
Emily Reed	Historic Preservation Program Manager	Cox|McLain Environmental Consulting, Inc.	12 years/Master of Science in Historic Preservation
David Sandrock	Staff Archeologist	Cox|McLain Environmental Consulting, Inc.	9+ years/Master of Arts in Anthropology
Sara Laurence	Senior GIS Analyst	Cox|McLain Environmental Consulting, Inc.	20 years/Master of Arts in Anthropology; Post Baccalaureate Certificate in GIS

APPENDIX A: PROJECT LOCATION MAP



Project Location

Project Location Map

Loop 1604 from FM 78 to I-10 E

Basemap Source: ESRI (2018)

0 0.75 Miles
0 1 Kilometers

Prepared for: TxDOT	1 in = 0.75 miles
	Scale: 1:47,520
CSJ: 2452-03-111	Date: 10/16/2019

G:\Projects\TXDOT\LP1604_FM78toI10\all_Figure 1_Project Location_Road_20181210.mxd

APPENDIX B: PROJECT PHOTOGRAPHS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	CSJ:
Loop 1604 from FM 78 to I-10 E	Bexar County, Texas	2452-03-111

Photo No.	Date:
1	3/7/2018

Direction Photo Taken:

North

Description:

View of the Loop 1604 and FM 78 intersection near the northern terminus.

Photo No.	Date:
2	3/7/2018

Direction Photo Taken:

West

Description:

View of typical existing ROW within the project area. Photo taken near the northern terminus.

Draft for Review

PHOTOGRAPHIC LOG

Client Name:	Site Location:	CSJ:
Loop 1604 from FM 78 to I-10 E	Bexar County, Texas	2452-03-111

Photo No.	Date:
3	3/7/2018

Direction Photo Taken:

West

Description:

View of typical existing ROW within the project area. Photo taken near Graytown Road.

Photo No.	Date:
4	3/7/2018

Direction Photo Taken:

West

Description:

View of typical existing and proposed ROW. Photo taken near the Salitrillo Creek bridge.

Draft for Comment

PHOTOGRAPHIC LOG

Client Name:	Site Location:	CSJ:
Loop 1604 from FM 78 to I-10 E	Bexar County, Texas	2452-03-111

Photo No.	Date:
5	3/7/2018

Direction Photo Taken:

Southeast

Description:

View of the Loop 1604 and IH 10 intersection.

Photo No.	Date:
6	3/7/2018

Direction Photo Taken:

Southwest

Description:

View of the Salitrillo Creek Bridge within the project area.

Draft for Comment

PHOTOGRAPHIC LOG

Client Name:	Site Location:	CSJ:
Loop 1604 from FM 78 to I-10 E	Bexar County, Texas	2452-03-111

Photo No.	Date:
7	3/7/2018

Direction Photo Taken:

Southeast

Description:

Typical view of existing ROW within the project area. Photo taken near Autumn Run Lane.

Draft for Coordination

APPENDIX C: SCHEMATICS

SCHEMATIC: 90%

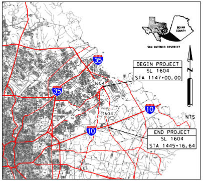
SHEET: 1 OF 2

TEXAS DEPARTMENT OF TRANSPORTATION

SCHEMATIC LAYOUT
LOOP 1604
BEXAR COUNTY

LIMITS: FROM FM 78 TO I-10 EAST
TxDOT C.S.J.: 2452-03-111
LENGTH: 29,816.64 FT = 5.65 MI

OFFICE OF THE DISTRICT ENGINEER
SAN ANTONIO DISTRICT



BEXAR COUNTY
SAN ANTONIO DISTRICT
BEGIN PROJECT
SL 1604
STA 1147+00.00
END PROJECT
SL 1604
STA 1445+16.64
NTS
35
10
1604

NOTE:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (2011 ADJUSTMENT) EPOCH 2010.00, AS OBSERVED IN DECEMBER, 2015.

2. COORDINATES AND DISTANCES ARE US SURVEY FEET, DISPLAYED IN SURFACE VALUES DERIVED FROM THE FOLLOWING FORMULA: GRID X 1.00017 = SURFACE. SURFACE ADJUSTMENT FACTOR = 1.00017.

*GPS OBSERVATIONS ARE BASED ON THE FOLLOWING CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS): TXAN, TXPL.

3. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988. (GEOID 12A). DIGITAL LEVELS WERE APPLIED TO THE NETWORK HOLDING CONTROL POINT NO. 100'S ELEVATION OF 619.34'.

VICINITY MAP: NTS
EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: UPRR
SURVEY DATA: TEXAS SOUTH CENTRAL ZONE #4204 (BEXAR COUNTY)

DESIGN SPEED:	MAINLANE	65 MPH (URBAN)(ROLLING)
	RAMP	50 MPH (URBAN)(ROLLING)
	LOOP	20 MPH (URBAN)(ROLLING)
	FRONTAGE ROAD	45 MPH (URBAN)(ROLLING)
	COLLECTOR DISTRIBUTOR	45 MPH (URBAN)(ROLLING)
	CROSS STREETS	35 MPH (URBAN)(ROLLING)

CURRENT ADT(2020):	50,700
PROJECTED ADT(2040):	70,900
PROJECTED ADT(2050):	79,750
FUNCTIONAL CLASSIFICATION:	URBAN PRINCIPAL ARTERIAL
PROPOSED DESIGN STANDARDS(STRUCTURES):	LRFD
PROPOSED DESIGN STANDARDS(ROADWAY):	TXDOT ROADWAY DESIGN MANUAL CHAPTER 3; 4R, SECTION 6; FREEWAYS
PROPOSED DESIGN STANDARDS(TRAFFIC):	TMUTCD & APPLICABLE TRAFFIC STANDARDS
PLOT SCALE:	1"=100' (HORIZ.) 0' 50' 100' 1"=10' (VERT.) 0' 5' 10'

SUBMITTED:

________________, 2021

PROJECT MANAGER

RECOMMENDED FOR APPROVAL:

________________, 2021

DIRECTOR OF TRANSPORTATION, PLANNING AND DEVELOPMENT

CORRECT:

________________, 2021

TRANSPORTATION PLANNING DIRECTOR

APPROVED:

________________, 2021

DISTRICT ENGINEER

APPROVED: DESIGN DIVISION LETTER DATED

APPROVED: F.H.W.A. LETTER DATED

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES
JMT
TBPE FIRM REG. NO. F-16341
ENGINEER MATTHEW J. WERNER
P.E. NO. 107847 DATE 1/11/2021

JMT
TBPE FIRM REG. NO. F-16341

Texas Department of Transportation

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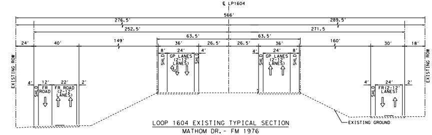
FILENAME: $FILE$

DRAWING DATE: 1/11/2021

EXISTING CHANNEL EASEMENT
LOOP 1604
HAZARDOUS MATERIAL PROHIBITED
LOCAL DELIVERY ONLY
35
San Antonio
Austin
EXIT ONLY
Kitty Hawk Rd
EXIT ONLY
FM 1976
EXIT 1 MILE
1035+00
1040+00
1045+00
1050+00
1055+00
1060+00
EXISTING ROW
TRIANGLE UNIT-2A
MADHUSUDAN LLC
BOBBY JOE KIRK & DAVID WIEDER
RANDOLPH-BROOKS FEDERAL CREDIT UNION

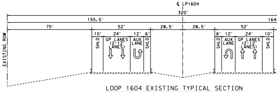
LEGEND

🟩	MAINLANES
🟩	MAINLANE BRIDGES
🟧	RAMPS
🟫	RAMP BRIDGES
🟦	FRONTAGE ROADS/DRIVEWAYS
🟦	FRONTAGE ROAD BRIDGES
⬛	DIRECT CONNECTORS
🟥	SIDEWALKS
🟥	SIDEWALK BRIDGES
🟨	CONCRETE MEDIANS
⬜	WORK DONE BY OTHERS
⇨	EXISTING TRAFFIC LANE
➡	PROPOSED TRAFFIC LANE
●	NUMBER OF LANES
▨	EXISTING PAVEMENT TO BE REMOVED
—	PROPOSED RETAINING WALL
—	CITY LIMITS
—	PARCEL LINES
—	EXISTING ROW
—	EXISTING DRAINAGE EASEMENT
—	PROPOSED ROW
—	ADJACENT PROJECT PROPOSED ROW
⬜	FLOOD PLAIN



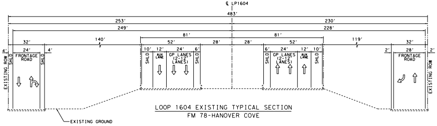
℄ LP1604
566'
276.5'
289.5'
252.5'
271.5
24'
40'
149'
63.5'
36'
26.5'
26.5'
63.5'
36'
160'
30'
18'
EXISTING ROW
FR ROAD
FR ROAD (2-12' LANES)
GP LANES (2-12' LANES)
SHLD
FR (2-12' LANES)
EXISTING GROUND
EXISTING ROW

LOOP 1604 EXISTING TYPICAL SECTION
MATHOM DR. - FM 1976



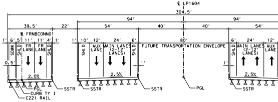
℄ LP1604
320'
155.5'
75'
52'
28.5'
28.5'
52'
EXISTING ROW
SHLD
GP LANES (2-12' LANES)
AUX LANE

LOOP 1604 EXISTING TYPICAL SECTION
HANOVER COVE-LOWER SEGUIN RD.



℄ LP1604
483'
253'
230'
249'
228'
140'
81'
81'
119'
32'
52'
28'
28'
52'
32'
FRONTAGE ROAD
SHLD
AUX LANE
GP LANES (2-12' LANES)
FRONTAGE ROAD
EXISTING ROW
EXISTING GROUND

LOOP 1604 EXISTING TYPICAL SECTION
FM 78-HANOVER COVE

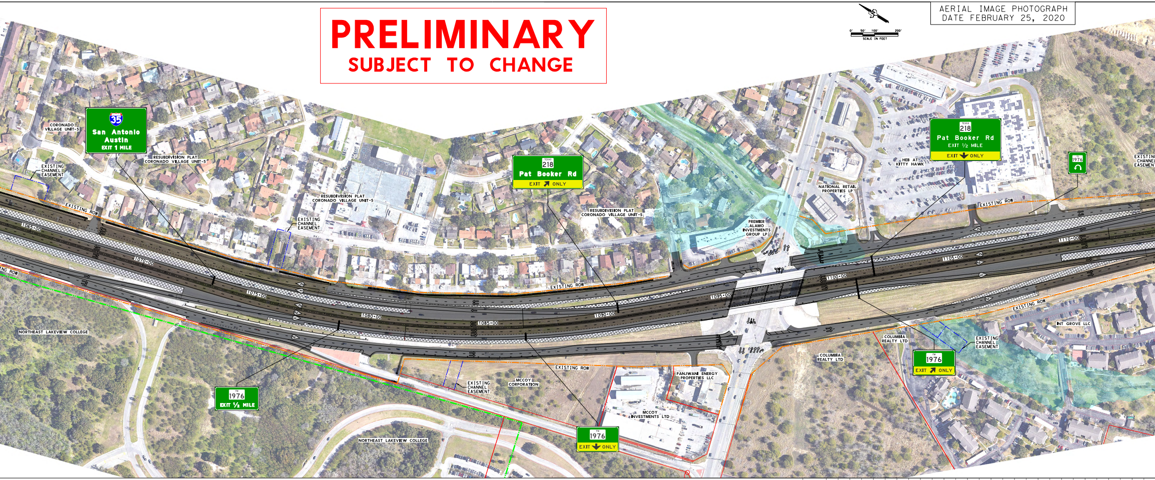


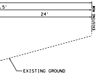
℄ LP1604
304.5'
94'
94'
39.5'
22'
54'
40'
40'
54'
℄ FRNBCONNO1
SDWK
FR LANE
SHLD
AUX LANE
MAIN LANES (2-12' LANES)
FUTURE TRANSPORTATION ENVELOPE
80'
2.0%
2.5%
2.5%
PGL
SSTR
CURB TY I
C221 RAIL

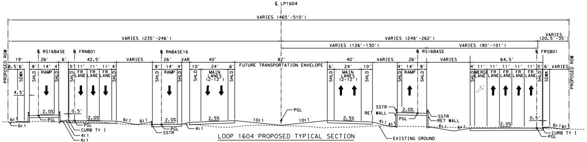
LOOP 1604 PROPOSED TYPICAL SECTION
FM 78 BRIDGE

PRELIMINARY
SUBJECT TO CHANGE

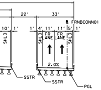
AERIAL IMAGE PHOTOGRAPH
DATE FEBRUARY 25, 2020

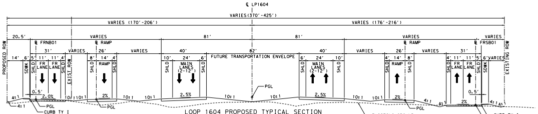

0' 50' 100' 200'
SCALE IN FEET
35
San Antonio
Austin
EXIT 1 MILE
CORONADO VILLAGE UNIT-5
EXISTING CHANNEL EASEMENT
RESUBDIVISION PLAT CORONADO VILLAGE UNIT-5
EXISTING ROW
1065+00
1070+00
1075+00
1080+00
1085+00
1090+00
1095+00
1100+00
1105+00
1110+00
TEXAS 218
Pat Booker Rd
EXIT ONLY
EXIT ½ MILE
PREMIER ALAMO INVESTMENTS GROUP LP
NATIONAL RETAIL PROPERTIES LP
HEB AT KITTY HAWK
1976
NORTHEAST LAKEVIEW COLLEGE
EXIT ½ MILE
MCCOY CORPORATION
MCCOY INVESTMENTS LTD
PANJWANI ENERGY PROPERTIES LLC
COLUMBIA REALTY LTD
INT GROVE LLC
EXISTING CHANNEL EASEMENT


1.5'
24'
EXISTING ROW
EXISTING GROUND

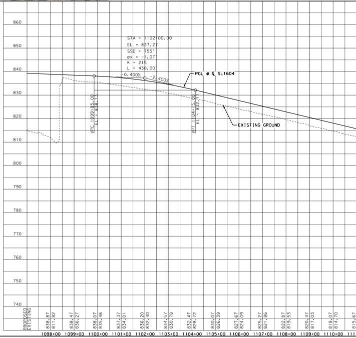

℄ LP1604
VARIES (465'-510')
VARIES (235'-246')
VARIES (248'-262')
VARIES (126'-130')
VARIES (90'-101')
VARIES (20.5'-35')
℄ RS16BASE
℄ FRNB01
℄ RNBASE16
℄ RS16BASE
℄ FRSB01
PROPOSED ROW
19' 26' 6' 42.5' VARIES 26' VAR 40' 82' 40' VARIES 26' VARIES 64.5'
8.5' 6' 8' 14' 4' 5' 11' 11' 11' 4' 8' 14' 4' 10' 24' 6'
FUTURE TRANSPORTATION ENVELOPE
6' 24' 10' 4' 14' 8' 4' 11' 11' 11' 11' 11' 5' 6' VARIES
SDWK
SHLD
RAMP
FR LANE
MAIN LANES (2-12')
MERGE LANE
4.5'
2.0%
0.5'
2.5%
PGL
CURB TY I
SSTR
RET WALL
6:1
4:1
10:1
EXISTING GROUND

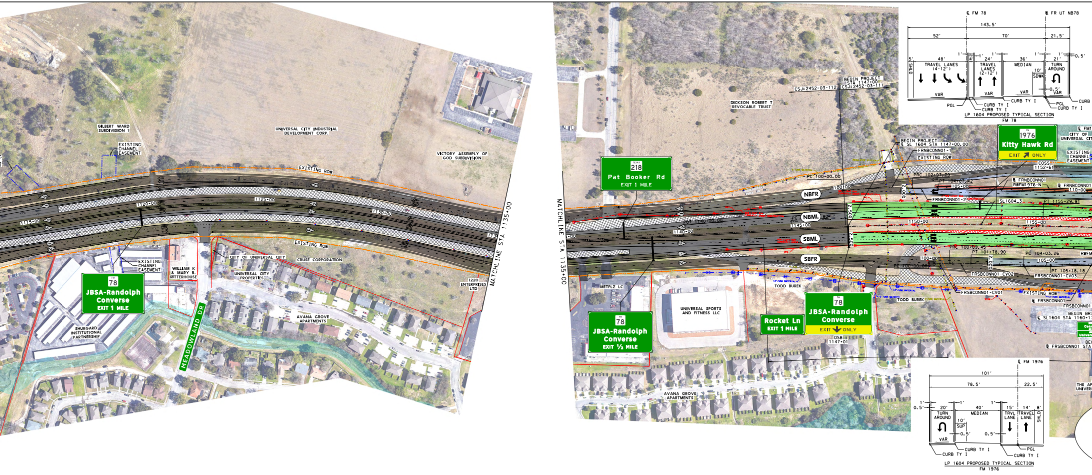
LOOP 1604 PROPOSED TYPICAL SECTION
FROM FM 78 TO HANOVER COVE

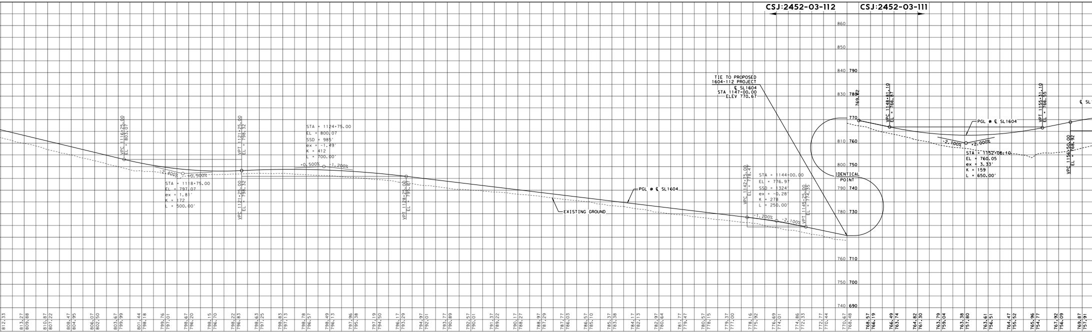

22'
33'
℄ FRNBCONN01
10' 1' 1' 4' 11' 11' 5' 1'
SHLD
FR LANE
2.0%
SSTR
PGL


℄ LP1604
VARIES(370'-425')
VARIES (170'-206')
VARIES (176'-216')
20.5' VARIES 81' 81' VARIES VARIES
℄ FRNB01
℄ RAMP
℄ RAMP
℄ FRSB01
PROPOSED ROW
EXIST ROW
EXISTING ROW
14' 6' 31' VARIES 26' VARIES 40' 82' 40' VARIES 26' VARIES 31'
5' 11' 11' 4' 8' 14' 4' 10' 24' 6'
FUTURE TRANSPORTATION ENVELOPE
6' 24' 10' 4' 14' 8' 4' 11' 11' 5' 6' VARIES
SDWK
SHLD
FR LANE
RAMP
MAIN LANES (2-12')
0.5'
2.0%
2%
2.5%
PGL
CURB TY I
EXISTING GROUND
4:1
10:1

LOOP 1604 PROPOSED TYPICAL SECTION
HANOVER COVE TO ROCKET LANE




GILBERT WARD SUBDIVISION 1
EXISTING CHANNEL EASEMENT
UNIVERSAL CITY INDUSTRIAL DEVELOPMENT CORP.
VICTORY ASSEMBLY OF GOD SUBDIVISION
EXISTING ROW
1115+00
1120+00
1125+00
1130+00
EXISTING ROW
EXISTING CHANNEL EASEMENT
WILLIAM K & MARY B. RITTERHOUSE
CITY OF UNIVERSAL CITY
UNIVERSAL CITY PROPERTIES
CRUSE CORPORATION
1220 ENTERPRISES LTD
78
JBSA-Randolph Converse
EXIT 1 MILE
SHURGARD INSTITUTIONAL PARTNERSHIP
MEADOWLAND DR
AVANA GROVE APARTMENTS
MATCHLINE STA 1135+00
MATCHLINE STA 1135+00
DICKSON ROBERT T REVOCABLE TRUST
CSJ:2452-03-112
BEGIN PROJECT STA 1147+00 CSJ:2452-03-111
218
Pat Booker Rd
EXIT 1 MILE
BEGIN PROJECT ℄ SL 1604 STA 1147+00.00
FRNBCONNO1-1
EXISTING ROW
PC 100+00.00
PRC 102+97.79
PT 104+07.42
105+00
NBFR
NBML
SBML
SBFR
1140+00
1145+00
1150+00
1155+00
SL1604_3
PT 1155+29.81
FRNBCONNO1-2
℄ FRNBCONNO1 RWFM1976-N
PRC 100+89.45
PT 101+78.90
PC 104+03.26
PT 105+18.18
FRSBCONNO1-CV02
FRSBCONNO1-CV03
FRSBCONNO1-CV01
EXISTING ROW
℄ FRSBCONNO1
FRSBCONNO1
BEGIN BRI
℄ SL1604 STA 1160+1
TODD BUREK
TODD BUREK
METPLZ LC
78
JBSA-Randolph Converse
EXIT ½ MILE
UNIVERSAL SPORTS AND FITNESS LLC
Rocket Ln
EXIT 1 MILE
78
JBSA-Randolph Converse
EXIT ONLY
OSB 1147+01
AVANA GROVE APARTMENTS
1976
Kitty Hawk Rd
EXIT ONLY
CITY OF UNIVERSAL CIT
EXISTING CHANNEL EASEMENT
COSS 1152+61
℄ FM 78
℄ FR UT NB78
143.5'
52'
70'
21.5'
5' SHLD
48' TRAVEL LANES (4-12')
24' TRAVEL LANES (2-12')
36' MEDIAN
21' TURN AROUND
10' SDWK
0.5'
VAR
PGL
CURB TY I
LP 1604 PROPOSED TYPICAL SECTION
FM 78
℄ FM 1976
101'
78.5'
22.5'
20' TURN AROUND
10' SUP
40' MEDIAN
15' TRVL LANE
14' TRAVEL LANE
8' SHLD
VAR
CURB TY I
PGL
LP 1604 PROPOSED TYPICAL SECTION
FM 1976


CSJ:2452-03-112
CSJ:2452-03-111
860
850
840 790
830 780
820 770
810 760
800 750
790 740
780 730
770 720
760 710
750 700
740 690
VPC 1116+25.00 EL = 803.07
VPT 1121+25.00 EL = 798.32
VPI 1121+25.00 EL = 798.32
STA = 1118+75.00
EL = 797.07
ex = 1.81'
K = 172
L = 500.00'
-2.400%
+0.500%
STA = 1124+75.00
EL = 800.07
SSD = 985'
ex = -1.49'
K = 412
L = 700.00'
+0.500%
-1.200%
VPT 1128+25.00 EL = 795.87
PGL @ ℄ SL1604
EXISTING GROUND
TIE TO PROPOSED 1604-112 PROJECT
℄ SL1604
STA 1147+00.00
ELEV 770.67
VPC 1142+75.00 EL = 778.47
STA = 1144+00.00
EL = 776.97
SSD = 1324'
ex = -0.28'
K = 278
L = 250.00'
-1.200%
-2.100%
VPT 1145+25.00 EL = 774.35
IDENTICAL POINT
769.82
VPC 1148+81.10 EL = 766.81
PGL @ ℄ SL1604
-2.100%
+2.000%
STA = 1152+06.10
EL = 760.05
ex = 3.33'
K = 159
L = 650.00'
VPT 1155+31.10 EL = 766.55
VPC 1156+50.00 EL = 768.92
℄ SL
812.33
809.88
813.27
810.87
807.22
808.47
804.95
806.07
802.50
803.67
799.99
801.44
798.18
799.76
797.01
798.67
796.20
798.15
796.70
798.22
796.83
798.63
797.25
798.83
797.13
798.78
796.57
798.49
796.13
797.96
795.38
797.19
794.50
796.17
793.29
794.97
792.01
793.77
790.89
792.57
790.01
791.37
789.22
790.17
788.27
788.97
787.29
787.77
786.03
786.57
785.10
785.37
783.38
784.17
782.13
782.97
780.64
781.77
779.47
780.57
778.15
779.37
777.00
778.16
775.92
776.69
774.01
774.86
772.33
772.77
770.44
770.67
768.48
768.57
766.19
766.49
763.74
764.82
761.30
763.79
759.04
763.38
757.80
763.61
756.51
764.47
755.52
765.96
754.77
767.92
756.09
769.87
751.91
1112+00
1113+00
1114+00
1115+00
1116+00
1117+00
1118+00
1119+00
1120+00
1121+00
1122+00
1123+00
1124+00
1125+00
1126+00
1127+00
1128+00
1129+00
1130+00
1131+00
1132+00
1133+00
1134+00
1135+00
1136+00
1137+00
1138+00
1139+00
1140+00
1141+00
1142+00
1143+00
1144+00
1145+00
1146+00
1147+00
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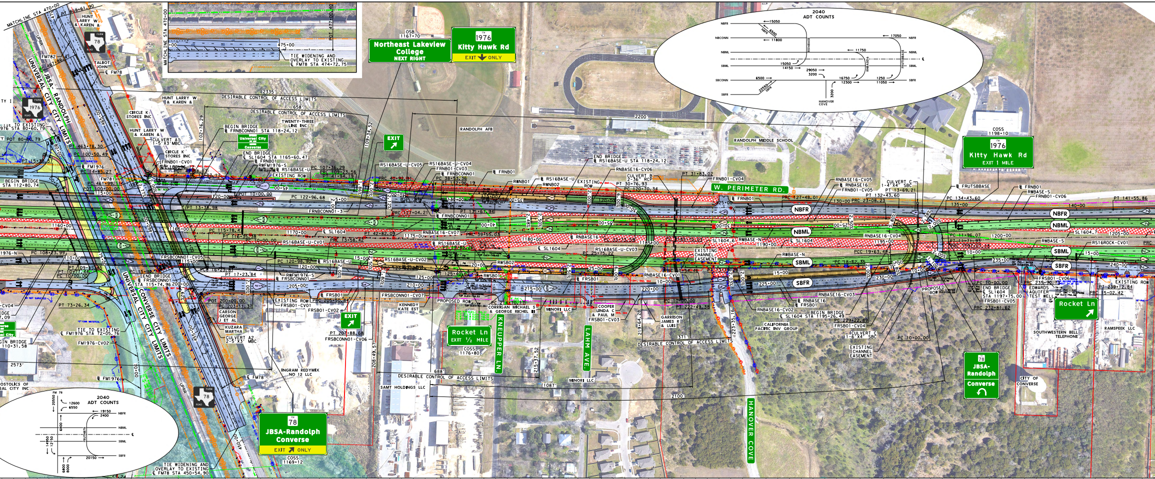
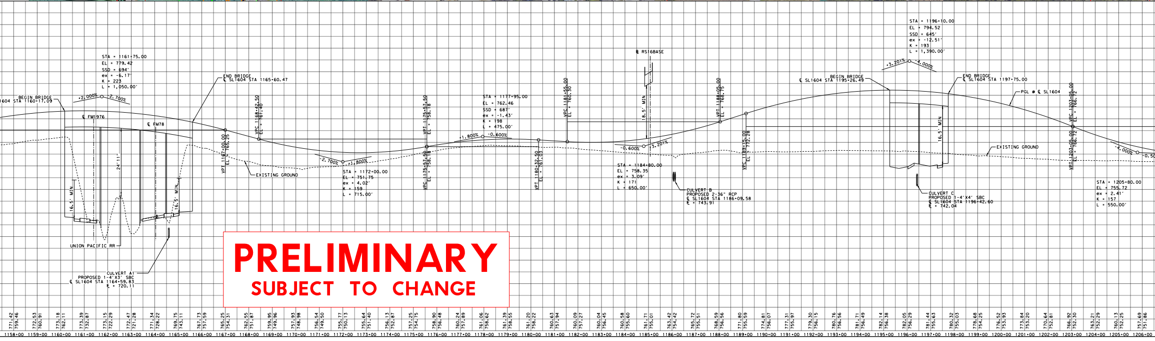
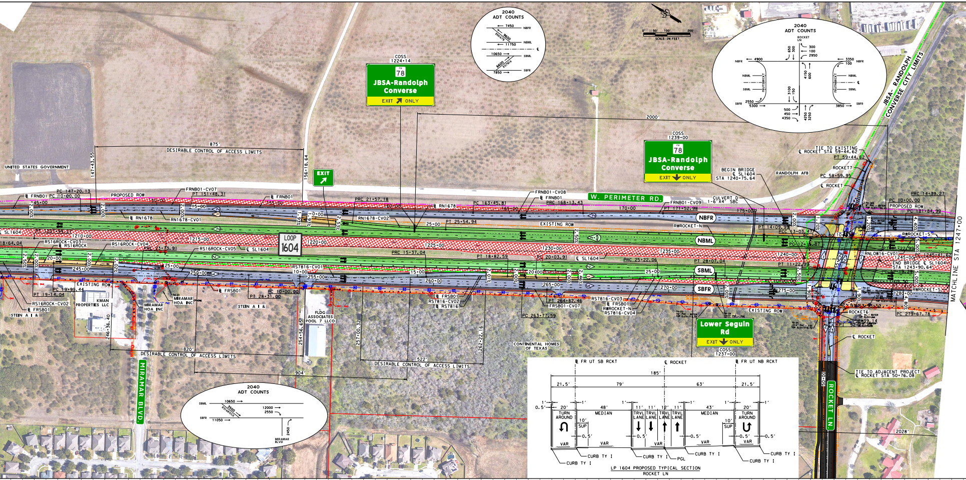
1155+00
1156+00
1157+00

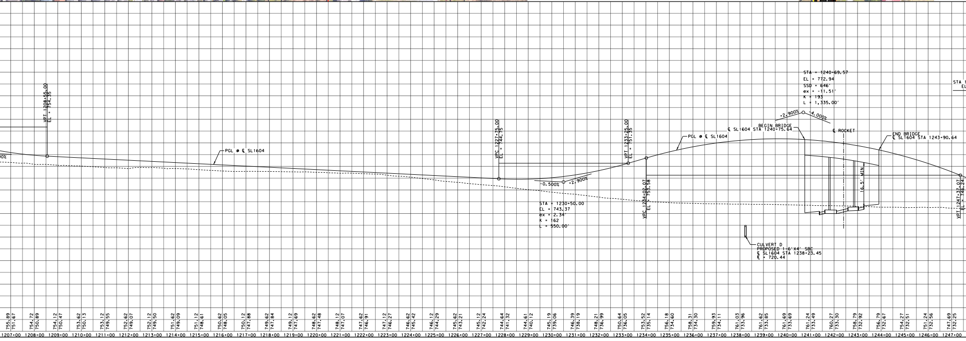

MATCHLINE STA 470+00
MATCHLINE STA 470+00
TIE WIDENING AND OVERLAY TO EXISTING FM78 STA 474+72.75
Northeast Lakeview College NEXT RIGHT
1976 Kitty Hawk Rd EXIT ONLY
OSB 1167+70
2040 ADT COUNTS
NBFR
NBCONN
NBML
SBML
SBCONN
SBFR
HANOVER COVE
UNIVERSAL CITY CITY LIMITS
JBSA-RANDOLPH
DESIRABLE CONTROL OF ACCESS LIMITS
RANDOLPH AFB
RANDOLPH MIDDLE SCHOOL
COSS 1198+10
1976 Kitty Hawk Rd EXIT 1 MILE
W. PERIMETER RD.
EXIT
Universal City Converse
NBFR
NBML
SBML
SBFR
EXISTING ROW
PROPOSED ROW
Rocket Ln EXIT 1/2 MILE
COSS 1176+80
KNEUPPER LN.
LAHM AVE.
HANOVER COVE
Rocket Ln
78 JBSA-Randolph Converse
CONVERSE CITY LIMITS
UNIVERSAL CITY CITY LIMITS
UPRR
78 JBSA-Randolph Converse EXIT ONLY
COSS 1169+12
2040 ADT COUNTS
TIE WIDENING AND OVERLAY TO EXISTING FM78 STA 450+54.90
INGRAM REDYMIX NO 12 LLC
SAMT HOLDINGS LLC
MINORI LLC
CALIFORNIA PACIFIC INV GROUP
SOUTHWESTERN BELL TELEPHONE
RAMSPEEK LLC
CITY OF CONVERSE
EXISTING CHANNEL EASEMENT
CULVERT B 2-36" RCP
CULVERT C 1-4'X4' SBC
CULVERT A1 1-5'X3' MBC
CULVERT A2 2-5'X3' MBC


STA = 1161+75.00
EL = 779.42
SSD = 694'
ex = -6.17'
K = 223
L = 1,050.00'
BEGIN BRIDGE SL1604 STA 1160+17.09
END BRIDGE SL1604 STA 1165+60.47
FM1976
FM78
-2.000%
-2.700%
UNION PACIFIC RR
16.5' MIN
24'11"
CULVERT A1 PROPOSED 1-4'X3' SBC SL1604 STA 1164+59.83 EL = 720.11
EXISTING GROUND
STA = 1172+00.00
EL = 751.75
ex = 4.02'
K = 159
L = 715.00'
STA = 1177+95.00
EL = 762.46
SSD = 687'
ex = -1.43'
K = 198
L = 475.00'
+1.800%
-0.600%
RS16BASE
18.5' MIN
STA = 1184+80.00
EL = 758.35
ex = 3.09'
K = 171
L = 650.00'
-0.600%
+3.201%
CULVERT B PROPOSED 2-36" RCP SL1604 STA 1186+09.58 EL = 743.91
STA = 1196+10.00
EL = 794.52
SSD = 645'
ex = -12.51'
K = 193
L = 1,390.00'
+3.201%
-4.000%
BEGIN BRIDGE SL1604 STA 1195+26.49
END BRIDGE SL1604 STA 1197+75.00
PGL SL1604
16.5' MIN
EXISTING GROUND
CULVERT C PROPOSED 1-4'X4' SBC SL1604 STA 1196+42.60 EL = 742.04
STA = 1205+80.00
EL = 755.72
ex = 2.41'
K = 157
L = 550.00'
-4.000%
1158+00
1159+00
1160+00
1161+00
1162+00
1163+00
1164+00
1165+00
1166+00
1167+00
1168+00
1169+00
1170+00
1171+00
1172+00
1173+00
1174+00
1175+00
1176+00
1177+00
1178+00
1179+00
1180+00
1181+00
1182+00
1183+00
1184+00
1185+00
1186+00
1187+00
1188+00
1189+00
1190+00
1191+00
1192+00
1193+00
1194+00
1195+00
1196+00
1197+00
1198+00
1199+00
1200+00
1201+00
1202+00
1203+00
1204+00
1205+00
1206+00

PRELIMINARY
SUBJECT TO CHANGE

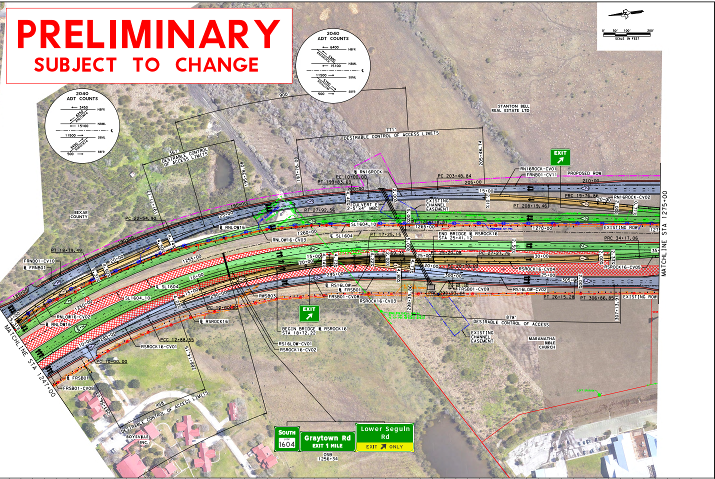


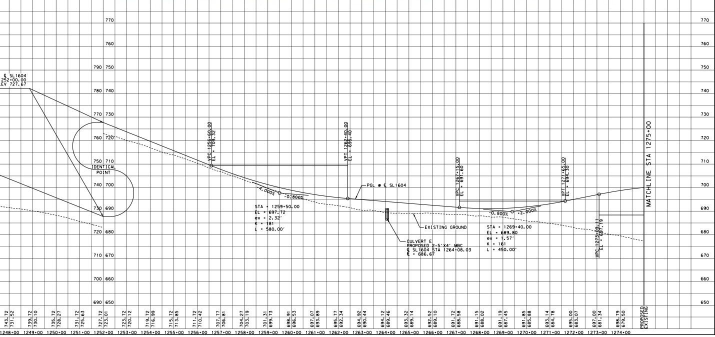
2040 ADT COUNTS
SCALE IN FEET
UNITED STATES GOVERNMENT
875' DESIRABLE CONTROL OF ACCESS LIMITS
COSS 1224+14
78
JBSA-Randolph Converse
EXIT ONLY
EXIT
COSS 1239+00
78
JBSA-Randolph Converse
EXIT ONLY
2000'
JBSA- RANDOLPH CONVERSE CITY LIMITS
TIE TO EXISTING ℄ ROCKET STA 59+44.62
BEGIN BRIDGE ℄ SL1604 STA 1240+75.64
RANDOLPH AFB
W. PERIMETER RD.
PROPOSED ROW
EXISTING ROW
NBFR
NBML
SBML
SBFR
LOOP 1604
CULVERT D 1-6'X4' SBC
END BRIDGE ℄ SL1604 STA 1243+90.64
MATCHLINE STA 1247+00
EXISTING ROW
KMAN PROPERTIES LLC
MIRAMAR HOA INC
STEIN A I &
FLDG ASSOCIATES POOL 7 LLC
CONTINENTAL HOMES OF TEXAS
820' DESIRABLE CONTROL OF ACCESS LIMITS
904'
522' DESIRABLE CONTROL OF ACCESS LIMITS
MIRAMAR BLVD.
Lower Seguin Rd
EXIT ONLY
COSS 1237+00
ROCKET LN
TIE TO ADJACENT PROJECT ℄ ROCKET STA 50+76.08
2028'
LP 1604 PROPOSED TYPICAL SECTION
ROCKET LN
℄ FR UT SB RCKT
℄ ROCKET
℄ FR UT NB RCKT
185'
21.5' 79' 63' 21.5'
TURN AROUND
MEDIAN
TRVL LANE
SUP
CURB TY I
PGL
VAR



VPT 1208+55.00 EL = 754.35
PGL @ ℄ SL1604
VPC 1227+75.00 EL = 744.75
-0.500%
+2.900%
STA = 1230+50.00
EL = 743.37
ex = 2.34'
K = 162
L = 550.00'
VPT 1233+25.00 EL = 751.35
VPC 1234+02.07 EL = 753.58
STA = 1240+69.57
EL = 772.94
SSD = 646'
ex = -11.51'
K = 193
L = 1,335.00'
+2.900%
-4.000%
BEGIN BRIDGE ℄ SL1604 STA 1240+75.64
℄ ROCKET
END BRIDGE ℄ SL1604 STA 1243+90.64
16.5' MIN
VPT 1247+37.07
CULVERT D
PROPOSED 1-6'X4' SBC
℄ SL1604 STA 1238+23.45
FL = 720.44
1207+00 1208+00 1209+00 1210+00 1211+00 1212+00 1213+00 1214+00 1215+00 1216+00 1217+00 1218+00 1219+00 1220+00 1221+00 1222+00 1223+00 1224+00 1225+00 1226+00 1227+00 1228+00 1229+00 1230+00 1231+00 1232+00 1233+00 1234+00 1235+00 1236+00 1237+00 1238+00 1239+00 1240+00 1241+00 1242+00 1243+00 1244+00 1245+00 1246+00 1247+00

PRELIMINARY
SUBJECT TO CHANGE


2040 ADT COUNTS
6400
3300
15100
11500
5750
500
NBFR
NBML
SBML
SBFR
2040 ADT COUNTS
3450
6250
15100
11500
3450
500
NBFR
NBML
SBML
SBFR
SCALE IN FEET
0'
50'
100'
200'
STANTON BELL REAL ESTATE LTD
BEXAR COUNTY
DESIRABLE CONTROL OF ACCESS LIMITS
367'
DESIRABLE CONTROL OF ACCESS LIMITS
771'
900'
EXIT
PROPOSED ROW
EXISTING ROW
EXISTING CHANNEL EASEMENT
CULVERT E 2-5'x4' MBC
END BRIDGE @ RSROCK16 STA 25+41.12
BEGIN BRIDGE @ RSROCK16 STA 18+72.22
RN16ROCK
RN16ROCK-CV01
FRNB01-CV11
RN16ROCK-CV02
RNLOW16
RNLOW16-CV03
RNLOW16-CV02
SL1604
SL1604_10
FRNB01-CV10
FRNB01
RS16LOW
FRSB01
FRSB01-CV08
FRSB01-CV09
RSROCK16
RSROCK16-CV01
RSROCK16-CV02
RSROCK16-CV03
RSROCK16-CV04
RSROCK16-CV05
RS16LOW-CV01
RS16LOW-CV02
RWSB03
PC 203+48.84
PT 208+19.46
PRC 19+76.86
PC 10+00.00
PT 199+83.63
PT 27+92.56
PC 22+54.90
PT 18+79.49
PT 17+25.15
PRC 34+17.06
PC 20+70.03
PC 27+27.76
PRC 298+93.44
PT 26+15.28
PT 306+86.85
PC 10+00.00
PCC 12+88.55
PC 10+00.00
DESIRABLE CONTROL OF ACCESS
878'
EXISTING CHANNEL EASEMENT
MARANATHA BIBLE CHURCH
DESIRABLE CONTROL OF ACCESS LIMITS
458'
BOYSVILLE INC.
OSB 1256+34
SOUTH LOOP 1604
Graytown Rd EXIT 1 MILE
Lower Seguin Rd EXIT ONLY
MATCHLINE STA 1247+00
MATCHLINE STA 1275+00


℄ SL1604 252+00.00 ELEV 727.67
IDENTICAL POINT
VPC 1256+00.00 EL = 709.32
VPI 1262+40.00 EL = 699.40
VPT 1267+15.00 EL = 691.60
VPI 1271+65.00 EL = 694.30
VPC 1273+09.11 EL = 697.19
-4.000%
-0.800%
-0.800%
+2.000%
PGL @ ℄ SL1604
STA = 1259+50.00
EL = 697.72
ex = 2.32'
K = 181
L = 580.00'
STA = 1269+40.00
EL = 689.80
ex = 1.57'
K = 161
L = 450.00'
EXISTING GROUND
CULVERT E PROPOSED 2-5'X4' MBC @ SL1604 STA 1264+08.03 EL = 686.67
MATCHLINE STA 1275+00
770
760
750
740
730
720
710
700
690
680
670
660
650
790
780
770
760
750
740
730
720
710
700
690
1248+00
1249+00
1250+00
1251+00
1252+00
1253+00
1254+00
1255+00
1256+00
1257+00
1258+00
1259+00
1260+00
1261+00
1262+00
1263+00
1264+00
1265+00
1266+00
1267+00
1268+00
1269+00
1270+00
1271+00
1272+00
1273+00
1274+00
PROPOSED
EXISTING

CURV

CURVE DATA

ALIGNMENT NO.	CURVE NO.	PC STATION	PI STATION	PT STATION	DELTA	D	L	T
SL1604			1140+00.00					
	SL1604_3	1144+60.80	1149+95.62	1155+29.81	4° 51′ 40.00″ RT	0° 27′ 17.02″	1,069.01′	534.83′
	SL1604_6	1185+70.03	1191+38.97	1197+07.13	5° 10′ 14.68″ LT	0° 27′ 17.02″	1,137.11′	568.94′
	SL1604_7	1197+07.13	1202+53.55	1207+99.27	4° 57′ 58.60″ RT	0° 27′ 17.02″	1,092.14′	546.41′
	SL1604_10	1245+41.62	1255+17.03	1264+18.81	38° 24′ 45.62″ RT	2° 02′ 46.60″	1,877.20′	975.41′
	SL1604_13	1295+63.53	1301+67.68	1307+71.47	3° 27′ 37.78″ RT	0° 17′ 11.32″	1,207.94′	604.15′
	SL1604_16	1336+44.92	1344+99.04	1353+25.52	25° 12′ 32.59″ RT	1° 30′ 00.00″	1,680.60′	854.13′
	SL1604_19	1363+34.09	1372+21.55	1379+95.62	49° 50′ 44.92″ LT	3° 00′ 00.00″	1,661.53′	887.46′
	SL1604_22	1408+09.19	1415+47.78	1422+85.86	3° 41′ 30.00″ LT	0° 15′ 00.00″	1,476.67′	738.59′
			1481+60.61					
FM1976			40+00.00					
	FM1976-CV01	58+99.21	62+19.71	65+24.24	31° 15′ 04.39″ RT	4° 59′ 59.93″	625.03′	320.50′
	FM1976-CV02	67+06.34	70+24.13	73+26.34	30° 59′ 59.57″ LT	4° 59′ 59.93″	620.00′	317.79′
			80+60.79					
FM78			444+00.00					
	FM781	461+99.11	462+88.74	463+78.30	3° 40′ 00.00″ LT	2° 02′ 46.60″	179.19′	89.62′
	FM782	467+86.47	468+74.22	469+61.90	3° 35′ 23.48″ RT	2° 02′ 46.60″	175.43′	87.75′
			477+00.40					
ROCKET			7+31.49					
	ROCKET1	10+40.84	10+47.54	10+54.24	1° 00′ 24.81″ RT	7° 31′ 08.87″	13.39′	6.70′
			12+27.37					
			13+41.94					
			15+00.00					
	ROCKET2	20+78.56	21+05.98	21+33.39	1° 34′ 14.70″ RT	2° 51′ 53.24″	54.83′	27.42′
	ROCKET3	23+70.34	24+07.56	24+44.78	2° 07′ 57.48″ LT	2° 51′ 53.24″	74.44′	37.23′
	ROCKET4	26+27.73	26+91.65	27+55.53	3° 39′ 39.93″ LT	2° 51′ 53.24″	127.80′	63.92′
	ROCKET5	28+68.12	29+26.47	29+84.78	3° 20′ 31.10″ RT	2° 51′ 53.24″	116.66′	58.34′
			38+28.77					
			40+57.96					
			52+22.84					
	ROCKET6	52+39.14	52+76.47	53+13.50	12° 47′ 35.54″ RT	17° 12′ 21.38″	74.35′	37.33′
	ROCKET7	58+59.95	59+02.51	59+44.62	14° 34′ 04.02″ RT	17° 12′ 21.38″	84.67′	42.56′
LSEGUIN	LSEGUIN1	10+00.00	13+12.28	15+87.47	48° 05′ 06.34″ LT	8° 11′ 06.40″	587.47′	312.28′
	LSEGUIN2	18+67.45	18+97.51	19+27.53	4° 55′ 02.73″ LT	8° 11′ 06.40″	60.08′	30.06′
	LSEGUIN3	25+58.76	27+52.25	29+31.83	37° 29′ 59.62″ LT	10° 03′ 06.81″	373.06′	193.49′
			30+89.11					
GRAYTOWN			10+00.00					
	GRAYTOWN1	13+08.74	13+48.82	13+88.85	4° 22′ 16.23″ RT	5° 27′ 24.27″	80.11′	40.07′
			27+30.76					
BINZ-ENGRD			10+00.00					
	BINZ-ENGRD_3	26+67.86	31+52.89	35+39.91	62° 27′ 19.63″ RT	7° 09′ 43.10″	872.04′	485.03′
	BINZ-ENGRD_6	40+43.26	43+01.36	45+40.42	37° 58′ 50.40″ LT	7° 38′ 21.97″	497.17′	258.10′
	BINZ-ENGRD_9	48+38.72	48+90.42	49+41.96	7° 53′ 12.18″ RT	7° 38′ 21.97″	103.24′	51.70′
	BINZ-ENGRD_12	51+51.78	52+03.50	52+55.06	7° 53′ 24.59″ LT	7° 38′ 21.97″	103.28′	51.72′
	BINZ-ENGRD_15	59+45.16	59+47.34	59+49.52	0° 05′ 59.44″ LT	2° 17′ 30.58″	4.36′	2.18′
	BINZ-ENGRD_18	66+57.05	68+96.74	71+21.04	35° 26′ 45.15″ RT	7° 38′ 21.97″	463.99′	239.69′
	BINZ-ENGRD_21	76+14.83	78+58.66	80+86.32	36° 01′ 07.20″ LT	7° 38′ 21.97″	471.48′	243.82′
			85+19.11					
FRNBCONN01	FRNBCONN01-1	100+00.00	101+49.18	102+97.79	8° 31′ 54.67″ RT	2° 51′ 54.31″	297.79′	149.18′
	FRNBCONN01-2	102+97.79	103+52.60	104+07.42	0° 39′ 40.32″ LT	0° 36′ 11.22″	109.63′	54.82′
	FRNBCONN01-3	122+96.68	125+00.48	127+04.21	2° 27′ 28.39″ LT	0° 36′ 11.22″	407.53′	203.80′
	FRNBCONN01-4	127+04.21	129+36.12	131+67.94	2° 47′ 48.56″ RT	0° 36′ 11.22″	463.73′	231.91′
FRSBCONN01	FRSBCONN01-CV01	100+00.00	100+44.73	100+89.45	2° 33′ 45.21″ LT	2° 51′ 53.24″	89.45′	44.73′
	FRSBCONN01-CV02	100+89.45	101+34.18	101+78.90	2° 33′ 45.21″ RT	2° 51′ 53.24″	89.45′	44.73′
	FRSBCONN01-CV03	104+03.26	104+60.74	105+18.18	3° 17′ 31.83″ LT	2° 51′ 53.24″	114.92′	57.48′
	FRSBCONN01-CV04	108+23.99	109+04.74	109+85.45	3° 17′ 31.83″ RT	2° 02′ 20.38″	161.46′	80.75′
	FRSBCONN01-CV05	115+78.47	116+06.93	116+35.38	1° 09′ 37.91″ RT	2° 02′ 20.38″	56.92′	28.46′
	FRSBCONN01-CV06	120+98.90	122+00.66	123+02.24	5° 49′ 31.30″ RT	2° 51′ 53.24″	203.34′	101.76′
	FRSBCONN01-CV07	123+02.24	124+21.57	125+40.62	6° 49′ 45.02″ LT	2° 51′ 53.24″	238.38′	119.33′
FRNB01			100+00.00					
	FRNB01-CV01	100+50.49	100+73.66	100+96.12	24° 25′ 51.52″ RT	53° 32′ 50.85″	45.62′	23.16′
	FRNB01-CV02	107+36.29	108+30.05	109+23.56	7° 09′ 10.65″ RT	3° 49′ 10.99″	187.26′	93.75′
	FRNB01-CV03	109+23.56	111+10.12	112+96.19	7° 07′ 00.41″ LT	1° 54′ 35.49″	372.63′	186.56′
	FRNB01-CV04	120+70.34	124+09.28	127+48.01	3° 29′ 52.68″ LT	0° 30′ 58.24″	677.67′	338.94′
	FRNB01-CV05	127+48.01	129+95.88	132+43.60	3° 31′ 22.64″ RT	0° 42′ 39.12″	495.59′	247.87′
	FRNB01-CV06	134+43.60	137+99.85	141+55.86	3° 40′ 35.53″ LT	0° 30′ 58.24″	712.26′	356.25′
	FRNB01-CV07	147+20.13	149+34.27	151+48.31	3° 02′ 37.56″ RT	0° 42′ 39.12″	428.18′	214.14′
	FRNB01-CV08	163+45.81	165+79.65	168+13.43	2° 24′ 49.54″ LT	0° 30′ 58.24″	467.62′	233.85′
	FRNB01-CV09	168+13.43	169+83.23	171+52.98	2° 24′ 49.54″ RT	0° 42′ 39.12″	339.55′	169.80′
	FRNB01-CV10	181+84.99	191+12.25	199+83.63	34° 21′ 05.69″ RT	1° 54′ 35.49″	1,798.64′	927.27′
	FRNB01-CV11	203+48.84	205+84.21	208+19.46	3° 20′ 43.65″ RT	0° 42′ 39.12″	470.62′	235.38′
	FRNB01-CV12	219+61.68	221+81.86	224+01.92	3° 07′ 46.25″ RT	0° 42′ 39.12″	440.24′	220.17′
	FRNB01-CV13	227+44.22	230+59.61	233+74.92	2° 24′ 32.77″ LT	0° 22′ 55.10″	630.70′	315.40′
	FRNB01-CV14	233+74.92	248+14.34	262+50.59	6° 35′ 25.98″ RT	0° 13′ 45.06″	2,875.67′	1,439.42′
	FRNB01-CV15	262+50.59	265+48.08	268+45.43	3° 04′ 13.62″ LT	0° 30′ 58.24″	594.84′	297.49′
	FRNB01-CV16	272+06.04	277+25.39	282+41.88	10° 24′ 43.84″ RT	1° 00′ 18.68″	1,035.84′	519.35′
FRNB02	FRNB02-CV01	100+00.00	102+10.32	104+20.60	1° 54′ 45.30″ RT	0° 27′ 17.02″	420.60′	210.32′
	FRNB02-CV02	118+17.59	119+76.06	121+34.49	2° 18′ 25.69″ LT	0° 43′ 40.90″	316.90′	158.47′
	FRNB02-CV03	121+34.49	123+40.87	125+47.07	4° 08′ 50.11″ RT	1° 00′ 18.68″	412.58′	206.38′
	FRNB02-CV04	125+47.07	127+67.72	129+88.26	3° 09′ 35.16″ LT	0° 42′ 58.31″	441.19′	220.65′
	FRNB02-CV05	134+33.22	138+49.06	142+64.78	2° 22′ 56.02″ LT	0° 17′ 11.32″	831.55′	415.84′
FRSB01			200+00.00					
	FRSB01-CV-01	203+11.37	204+31.25	205+50.84	6° 51′ 37.00″ LT	2° 51′ 53.24″	239.47′	119.88′
	FRSB01-CV-02	205+50.84	206+69.90	207+88.68	6° 48′ 49.25″ RT	2° 51′ 53.24″	237.84′	119.06′
	FRSB01-CV-03	214+70.17	218+60.01	222+49.38	4° 51′ 10.00″ LT	0° 37′ 22.01″	779.21′	389.84′
	FRSB01-CV-04	229+22.89	231+02.74	232+81.62	10° 16′ 36.35″ LT	2° 51′ 53.24″	358.73′	179.85′
	FRSB01-CV-05	232+81.62	234+37.30	235+90.73	16° 52′ 02.61″ RT	5° 27′ 24.27″	309.11′	155.68′
	FRSB01-CV-06	235+90.73	237+51.80	239+12.84	1° 39′ 45.48″ LT	0° 30′ 58.24″	322.10′	161.06′
	FRSB01-CV-07	263+77.59	264+30.02	264+82.46	0° 30′ 02.82″ LT	0° 28′ 39.09″	104.87′	52.44′
	FRSB01-CV-08	279+67.78	289+75.70	298+93.44	41° 47′ 32.81″ RT	2° 10′ 13.06″	1,925.66′	1,007.92′
	FRSB01-CV-09	298+93.44	302+90.31	306+86.85	4° 05′ 43.47″ LT	0° 30′ 58.24″	793.41′	396.87′
	FRSB01-CV-10	326+07.38	328+07.74	330+08.01	2° 50′ 52.76″ LT	0° 42′ 39.12″	400.64′	200.36′
	FRSB01-CV-11	330+08.01	340+17.23	350+20.90	10° 23′ 24.37″ RT	0° 30′ 58.24″	2,012.89′	1,009.21′
	FRSB01-CV-12	350+20.90	352+53.19	354+85.35	3° 18′ 05.77″ LT	0° 42′ 39.12″	464.45′	232.29′
			370+11.95					
FRSB02	FRSB02-CV01	200+00.00	201+84.73	203+69.41	2° 14′ 57.32″ RT	0° 36′ 31.97″	369.41′	184.73′
	FRSB02-CV02	203+69.41	205+66.18	207+62.85	3° 18′ 19.34″ LT	0° 50′ 24.41″	393.44′	196.78′
	FRSB02-CV03	229+56.92	232+84.54	236+11.81	4° 41′ 25.09″ LT	0° 42′ 58.31″	654.89′	327.63′
	FRSB02-CV04	236+11.81	236+80.81	237+49.81	0° 59′ 18.30″ RT	0° 42′ 58.31″	138.01′	69.01′
			245+13.85					
RS16BASE-U			10+00.00					
	RS16BASE-U-CV01	10+00.00	11+79.30	13+58.42	4° 33′ 48.75″ RT	1° 16′ 23.66″	358.42′	179.30′
	RS16BASE-U-CV02	13+58.42	16+72.00	19+85.26	4° 33′ 48.75″ LT	0° 43′ 40.90″	626.84′	313.58′
	RS16BASE-U-CV03	25+75.22	566+69.77	30+76.93	179° 39′ 39.83″ LT	35° 48′ 35.50″	501.71′	54,094.55′
	RS16BASE-U-CV04	38+53.36	39+73.22	40+92.91	5° 29′ 24.71″ RT	2° 17′ 30.59″	239.56′	119.87′
	RS16BASE-U-CV05	40+92.91	41+43.59	41+94.19	5° 31′ 34.95″ LT	5° 27′ 24.27″	101.28′	50.68′
			49+58.17					
RNBASE16	RNBASE16-CV01	10+00.00	10+77.30	11+54.46	5° 53′ 59.40″ LT	3° 49′ 10.99″	154.46′	77.30′
	RNBASE16-CV02	11+54.46	12+36.92	13+19.28	4° 43′ 19.03″ RT	2° 51′ 53.24″	164.83′	82.46′
	RNBASE16-CV03	18+62.35	19+12.93	19+63.49	2° 57′ 43.11″ LT	2° 55′ 42.54″	101.14′	50.58′
	RNBASE16-CV04	19+63.49	54+85.14	23+08.23	176° 21′ 24.61″ LT	51° 09′ 25.01″	344.74′	3,521.64′
	RNBASE16-CV05	23+08.23	27+45.80	31+83.02	4° 00′ 53.53″ RT	0° 27′ 32.23″	874.79′	437.57′
	RNBASE16-CV06	33+73.59	36+64.44	39+55.03	4° 09′ 51.24″ LT	0° 42′ 58.31″	581.44′	290.85′
	RNBASE16-CV07	39+55.03	41+18.63	42+82.09	4° 09′ 51.24″ RT	1° 16′ 23.66″	327.06′	163.60′
RN1678			10+00.00					
	RN1678-CV01	10+00.00	15+79.60	21+57.18	8° 17′ 15.71″ RT	0° 42′ 58.31″	1,157.18′	579.60′
	RN1678-CV02	21+57.18	23+56.20	25+54.94	5° 10′ 46.38″ LT	1° 18′ 07.84″	397.76′	199.02′
			25+54.94					
RNLOW16	RNLOW16-CV01	10+00.00	12+19.69	14+39.27	3° 08′ 45.84″ LT	0° 42′ 58.31″	439.27′	219.69′
	RNLOW16-CV02	14+39.27	16+60.98	18+79.49	16° 48′ 54.75″ RT	3° 49′ 10.99″	440.22′	221.70′
	RNLOW16-CV03	22+54.90	25+25.47	27+92.56	15° 52′ 44.92″ RT	2° 57′ 12.21″	537.66′	270.56′
RN16ROCK			10+00.00					
	RN16ROCK-CV01	10+00.00	14+89.63	19+76.86	9° 49′ 09.62″ RT	1° 00′ 18.68″	976.86′	489.63′
	RN16ROCK-CV02	19+76.86	23+74.70	27+71.88	5° 41′ 37.91″ LT	0° 42′ 58.31″	795.01′	397.83′
			27+71.88					
RNGRAY16			10+00.00					
	RNGRAY16-CV01	10+00.00	11+93.22	13+86.19	5° 01′ 43.85″ LT	1° 18′ 07.84″	386.19′	193.22′
	RNGRAY16-CV02	13+86.19	19+75.55	25+62.78	8° 25′ 36.21″ RT	0° 42′ 58.31″	1,176.59′	589.36′
			25+62.78					
RN16LOW			10+00.00					
	RN16LOW-CV01	10+00.00	14+03.89	18+07.09	5° 46′ 49.28″ RT	0° 42′ 58.31″	807.09′	403.89′
	RN16LOW-CV02	18+07.09	22+53.58	26+99.14	6° 23′ 19.86″ LT	0° 42′ 58.31″	892.05′	446.49′
			26+99.14					

E AND COORDINATE DATA

CURVE COORDINATE DATA

R	e(%)	PC COORDINATE		PI COORDINATE		PT COORDINATE		BEARING	
		"X"	"Y"	"X"	"Y"	"X"	"Y"	BACK	AHEAD
				2,189,713.3549	13,746,455.5527				S 35° 21′ 20.33" E
12,600.00′		2,189,979.9952	13,746,079.7377	2,190,289.4734	13,745,643.5449	2,190,560.8751	13,745,182.6957	S 35° 21′ 20.33" E	S 30° 29′ 40.33" E
12,600.00′		2,192,103.6516	13,742,563.0098	2,192,392.3633	13,742,072.7678	2,192,724.0827	13,741,610.5406	S 30° 29′ 40.33" E	S 35° 39′ 55.01" E
12,600.00′		2,192,724.0827	13,741,610.5406	2,193,042.6682	13,741,166.6145	2,193,321.6273	13,740,696.7752	S 35° 39′ 55.01" E	S 30° 41′ 56.41" E
2,800.00′		2,195,232.1970	13,737,478.8813	2,195,730.1713	13,736,640.1638	2,195,599.2491	13,735,673.5797	S 30° 41′ 56.41" E	S 7° 42′ 49.22" W
20,000.00′		2,195,177.1575	13,732,557.3229	2,195,096.0664	13,731,958.6359	2,194,978.9862	13,731,365.9353	S 7° 42′ 49.22" W	S 11° 10′ 27.00" W
3,819.72′		2,194,422.1338	13,728,546.9549	2,194,256.6112	13,727,709.0217	2,193,749.9586	13,727,021.3932	S 11° 10′ 27.00" W	S 36° 22′ 59.59" W
1,909.86′		2,193,151.6912	13,726,209.4253	2,192,625.2676	13,725,494.9638	2,192,831.8765	13,724,631.8937	S 36° 22′ 59.59" W	S 13° 27′ 45.33" E
22,918.31′		2,193,486.9059	13,721,895.6314	2,193,658.8571	13,721,177.3374	2,193,876.7004	13,720,471.6053	S 13° 27′ 45.33" E	S 17° 09′ 15.33" E
				2,195,609.4310	13,714,858.1973				
				2,188,470.5074	13,742,018.7855				N 35° 23′ 55.18" E
1,145.92′		2,189,570.6478	13,743,566.9100	2,189,756.3007	13,743,828.1618	2,190,050.5506	13,743,955.1911	N 35° 23′ 55.18" E	N 66° 38′ 59.57" E
1,145.92′		2,190,217.7396	13,744,027.3675	2,190,509.5030	13,744,153.3234	2,190,694.7216	13,744,411.5575	N 66° 38′ 59.57" E	N 35° 39′ 00.00" E
				2,191,122.7817	13,745,008.3645				
				2,190,101.9111	13,743,157.6282				N 35° 22′ 38.08" E
2,800.00′		2,191,143.5218	13,744,624.5503	2,191,195.4104	13,744,697.6261	2,191,242.5194	13,744,773.8706	N 35° 22′ 38.08" E	N 31° 42′ 38.08" E
2,800.00′		2,191,457.0650	13,745,121.1061	2,191,503.1865	13,745,195.7524	2,191,553.8915	13,745,267.3644	N 31° 42′ 38.08" E	N 35° 18′ 01.57" E
				2,191,980.6387	13,745,870.0715				
				2,190,934.4531	13,735,358.8643				N 60° 04′ 31.07" E
762.00′		2,191,202.5648	13,735,513.1891	2,191,208.3678	13,735,516.5294	2,191,214.2287	13,735,519.7671	N 60° 04′ 31.07" E	N 61° 04′ 55.88" E
				2,191,365.7792	13,735,603.4890				N 60° 36′ 55.60" E
				2,191,465.6079	13,735,659.7041				N 60° 36′ 07.05" E
				2,191,603.3111	13,735,737.2897				N 60° 11′ 30.19" E
2,000.00′		2,192,105.3299	13,736,024.8949	2,192,129.1190	13,736,038.5236	2,192,153.2727	13,736,051.4951	N 60° 11′ 30.19" E	N 61° 45′ 44.89" E
2,000.00′		2,192,362.0181	13,736,163.5995	2,192,394.8138	13,736,181.2121	2,192,426.9313	13,736,200.0328	N 61° 45′ 44.89" E	N 59° 37′ 47.41" E
2,000.00′		2,192,584.7802	13,736,292.5318	2,192,639.9288	13,736,324.8487	2,192,692.9013	13,736,360.6211	N 59° 37′ 47.41" E	N 55° 58′ 07.47" E
2,000.00′		2,192,786.2073	13,736,423.6309	2,192,834.5597	13,736,456.2834	2,192,884.7334	13,736,486.0617	N 55° 58′ 07.47" E	N 59° 18′ 38.58" E
				2,193,610.5271	13,736,916.8228				N 58° 48′ 38.58" E
				2,193,806.5868	13,737,035.5107				N 59° 00′ 28.06" E
				2,194,805.1688	13,737,635.3345				N 59° 00′ 28.05" E
333.00′		2,194,819.1405	13,737,643.7269	2,194,851.1429	13,737,662.9500	2,194,886.6074	13,737,674.6094	N 59° 00′ 28.05" E	N 71° 48′ 03.59" E
333.00′		2,195,405.7274	13,737,845.2774	2,195,446.1614	13,737,858.5706	2,195,488.6391	13,737,861.2663	N 71° 48′ 03.59" E	N 86° 22′ 07.61" E
700.00′		2,194,229.5251	13,734,635.1532	2,194,385.9678	13,734,364.8821	2,194,691.5946	13,734,300.7490	S 30° 03′ 49.77" E	S 78° 08′ 56.11" E
700.00′		2,194,965.6082	13,734,243.2495	2,194,995.0248	13,734,237.0767	2,195,024.8623	13,734,233.4482	S 78° 08′ 56.11" E	S 83° 03′ 58.84" E
570.00′		2,195,651.4784	13,734,157.2458	2,195,843.5517	13,734,133.8879	2,196,010.1532	13,734,232.2834	S 83° 03′ 58.84" E	N 59° 26′ 01.54" E
				2,196,145.5837	13,734,312.2691				
				2,194,381.2614	13,729,173.4120				S 78° 49′ 33.00" E
1,050.00′		2,194,684.1512	13,729,113.5802	2,194,723.4639	13,729,105.8145	2,194,762.0705	13,729,095.0750	S 78° 49′ 33.00" E	S 74° 27′ 16.77" E
				2,196,054.8948	13,728,735.4411				
				2,194,210.4869	13,723,497.2601				S 80° 34′ 24.95" W
800.00′		2,192,565.1436	13,723,224.0962	2,192,086.6665	13,723,144.6583	2,191,794.9667	13,723,532.1656	S 80° 34′ 24.95" W	N 36° 58′ 15.43" W
750.00′		2,191,492.2471	13,723,934.3121	2,191,337.0206	13,724,140.5220	2,191,087.7676	13,724,207.5348	N 36° 58′ 15.43" W	N 74° 57′ 05.83" W
750.00′		2,190,799.6974	13,724,284.9837	2,190,749.7702	13,724,298.4069	2,190,702.1572	13,724,318.5538	N 74° 57′ 05.83" W	N 67° 03′ 53.65" W
750.00′		2,190,508.9263	13,724,400.3172	2,190,461.2923	13,724,420.4730	2,190,411.3425	13,724,433.8990	N 67° 03′ 53.65" W	N 74° 57′ 18.24" W
2,500.00′		2,189,744.8964	13,724,613.0330	2,189,742.7928	13,724,613.5984	2,189,740.6882	13,724,614.1602	N 74° 57′ 18.24" W	N 75° 03′ 17.68" W
750.00′		2,189,057.0848	13,724,796.6292	2,188,825.5061	13,724,858.4426	2,188,672.6952	13,725,043.1001	N 75° 03′ 17.68" W	N 39° 36′ 32.53" W
750.00′		2,188,357.8793	13,725,423.5249	2,188,202.4299	13,725,611.3706	2,187,966.2359	13,725,671.8932	N 39° 36′ 32.53" W	N 75° 37′ 39.74" W
				2,187,546.9864	13,725,779.3221				
2,000.00′		2,190,233.9188	13,745,984.0577	2,190,326.5135	13,745,867.0864	2,190,400.7297	13,745,737.6723	S 38° 21′ 54.68" E	S 29° 50′ 00.01" E
9,500.00′		2,190,400.7297	13,745,737.6723	2,190,427.9995	13,745,690.1206	2,190,455.8163	13,745,642.8867	S 29° 50′ 00.01" E	S 30° 29′ 40.33" E
9,500.00′		2,191,414.5358	13,744,014.9492	2,191,517.9542	13,743,839.3413	2,191,628.8083	13,743,668.3301	S 30° 29′ 40.33" E	S 32° 57′ 08.72" E
9,500.00′		2,191,628.8083	13,743,668.3301	2,191,754.9547	13,743,473.7281	2,191,871.4554	13,743,273.2027	S 32° 57′ 08.72" E	S 30° 09′ 20.16" E
2,000.00′		2,190,168.7660	13,745,508.5792	2,190,191.4658	13,745,470.0342	2,190,215.8663	13,745,432.5426	S 30° 29′ 40.33" E	S 33° 03′ 25.54" E
2,000.00′		2,190,215.8663	13,745,432.5426	2,190,240.2667	13,745,395.0510	2,190,262.9666	13,745,356.5060	S 33° 03′ 25.54" E	S 30° 29′ 40.33" E
2,000.00′		2,190,376.8209	13,745,163.1776	2,190,405.9869	13,745,113.6526	2,190,437.9490	13,745,065.8843	S 30° 29′ 40.33" E	S 33° 47′ 12.16" E
2,810.00′		2,190,608.0104	13,744,811.7221	2,190,652.9171	13,744,744.6076	2,190,693.8955	13,744,675.0250	S 33° 47′ 12.16" E	S 30° 29′ 40.33" E
2,810.00′		2,190,994.8243	13,744,164.0378	2,191,009.2662	13,744,139.5150	2,191,023.2084	13,744,114.7047	S 30° 29′ 40.33" E	S 29° 20′ 02.43" E
2,000.00′		2,191,250.2838	13,743,710.6233	2,191,300.1358	13,743,621.9116	2,191,340.7263	13,743,528.5982	S 29° 20′ 02.43" E	S 23° 30′ 31.13" E
2,000.00′		2,191,340.7263	13,743,528.5982	2,191,388.3267	13,743,419.1700	2,191,448.6014	13,743,316.1783	S 23° 30′ 31.13" E	S 30° 20′ 16.15" E
				2,191,121.4573	13,744,593.4765				S 54° 37′ 21.92" E
107.00′		2,191,162.6279	13,744,564.2426	2,191,181.5153	13,744,550.8314	2,191,193.1646	13,744,530.8092	S 54° 37′ 21.92" E	S 30° 11′ 30.40" E
1,500.00′		2,191,515.1064	13,743,977.4753	2,191,562.2548	13,743,896.4395	2,191,598.9457	13,743,810.1635	S 30° 11′ 30.40" E	S 23° 02′ 19.75" E
3,000.00′		2,191,598.9457	13,743,810.1635	2,191,671.9556	13,743,638.4865	2,191,765.6724	13,743,477.1775	S 23° 02′ 19.75" E	S 30° 09′ 20.16" E
11,100.00′		2,192,154.5673	13,742,807.7966	2,192,324.8331	13,742,514.7285	2,192,512.6628	13,742,232.5948	S 30° 09′ 20.16" E	S 33° 39′ 12.85" E
8,060.00′		2,192,512.6628	13,742,232.5948	2,192,650.0256	13,742,026.2658	2,192,774.4503	13,741,811.8860	S 33° 39′ 12.85" E	S 30° 07′ 50.21" E
11,100.00′		2,192,874.8449	13,741,638.9094	2,193,053.6742	13,741,330.7922	2,193,251.8930	13,741,034.7764	S 30° 07′ 50.21" E	S 33° 48′ 25.74" E
8,060.00′		2,193,565.8545	13,740,565.9130	2,193,685.0013	13,740,387.9817	2,193,794.5321	13,740,203.9748	S 33° 48′ 25.74" E	S 30° 45′ 48.18" E
11,100.00′		2,194,407.0450	13,739,174.9803	2,194,526.6554	13,738,974.0401	2,194,654.6224	13,738,778.3156	S 30° 45′ 48.18" E	S 33° 10′ 37.72" E
8,060.00′		2,194,654.6224	13,738,778.3156	2,194,747.5426	13,738,636.1950	2,194,834.3949	13,738,490.2870	S 33° 10′ 37.72" E	S 30° 45′ 48.18" E
3,000.00′		2,195,362.2602	13,737,603.4967	2,195,836.5512	13,736,806.7089	2,195,778.5183	13,735,881.2604	S 30° 45′ 48.18" E	S 3° 35′ 17.51" W
8,060.00′		2,195,755.6619	13,735,516.7707	2,195,740.9310	13,735,281.8566	2,195,712.5165	13,735,048.2025	S 3° 35′ 17.51" W	S 6° 56′ 01.16" W
8,060.00′		2,195,574.6270	13,733,914.3297	2,195,548.0475	13,733,695.7653	2,195,509.5755	13,733,478.9778	S 6° 56′ 01.16" W	S 10° 03′ 47.41" W
15,000.00′		2,195,449.7650	13,733,141.9490	2,195,394.6545	13,732,831.4039	2,195,352.6462	13,732,518.8167	S 10° 03′ 47.41" W	S 7° 39′ 14.64" W
25,000.00′		2,195,352.6462	13,732,518.8167	2,195,160.9271	13,731,092.2194	2,194,806.7398	13,729,697.0537	S 7° 39′ 14.64" W	S 14° 14′ 40.61" W
11,100.00′		2,194,806.7398	13,729,697.0537	2,194,733.5381	13,729,408.7077	2,194,675.8864	13,729,116.8547	S 14° 14′ 40.61" W	S 11° 10′ 27.00" W
5,700.00′		2,194,606.0029	13,728,763.0801	2,194,505.3567	13,728,253.5742	2,194,314.2858	13,727,770.6479	S 11° 10′ 27.00" W	S 21° 35′ 10.84" W
12,600.00′		2,192,991.9002	13,724,609.7902	2,193,047.6639	13,724,406.9985	2,193,096.6283	13,724,202.4587	S 15° 22′ 30.63" E	S 13° 27′ 45.33" E
7,870.00′		2,193,421.8620	13,722,843.8558	2,193,458.7561	13,722,689.7377	2,193,501.8245	13,722,537.2297	S 13° 27′ 45.33" E	S 15° 46′ 11.03" E
5,700.00′		2,193,501.8245	13,722,537.2297	2,193,557.9134	13,722,338.6153	2,193,599.4916	13,722,136.4647	S 15° 46′ 11.03" E	S 11° 37′ 20.92" E
8,000.00′		2,193,599.4916	13,722,136.4647	2,193,643.9441	13,721,920.3395	2,193,700.2420	13,721,706.9931	S 11° 37′ 20.92" E	S 14° 46′ 56.08" E
20,000.00′		2,193,813.7719	13,721,276.7599	2,193,919.8711	13,720,874.6858	2,194,042.5912	13,720,477.3693	S 14° 46′ 56.08" E	S 17° 09′ 52.11" E
				2,190,852.2684	13,744,214.3720				S 30° 17′ 28.40" E
2,000.00′		2,191,009.3212	13,743,945.5138	2,191,069.7869	13,743,842.0027	2,191,142.1840	13,743,746.4552	S 30° 17′ 28.40" E	S 37° 09′ 05.40" E
2,000.00′		2,191,142.1840	13,743,746.4552	2,191,214.0882	13,743,651.5582	2,191,274.2259	13,743,548.8007	S 37° 09′ 05.40" E	S 30° 20′ 16.15" E
9,200.00′		2,191,618.4430	13,742,960.6352	2,191,815.3497	13,742,624.1798	2,192,040.0133	13,742,305.5880	S 30° 20′ 16.15" E	S 35° 11′ 26.15" E
2,000.00′		2,192,428.1592	13,741,755.1644	2,192,531.8040	13,741,608.1873	2,192,660.0072	13,741,482.0587	S 35° 11′ 26.15" E	S 45° 28′ 02.50" E
1,050.00′		2,192,660.0072	13,741,482.0587	2,192,770.9850	13,741,372.8768	2,192,845.5084	13,741,236.1910	S 45° 28′ 02.50" E	S 28° 35′ 59.89" E
11,100.00′		2,192,845.5084	13,741,236.1910	2,192,922.6081	13,741,094.7799	2,193,003.7783	13,740,955.6654	S 28° 35′ 59.89" E	S 30° 15′ 45.37" E
11,998.50′		2,194,245.9248	13,738,826.7977	2,194,272.3505	13,738,781.5078	2,194,299.1710	13,738,736.4505	S 30° 15′ 45.37" E	S 30° 45′ 48.18" E
2,640.00′		2,195,058.9031	13,737,460.1343	2,195,574.4472	13,736,594.0430	2,195,381.6255	13,735,604.7404	S 30° 45′ 48.18" E	S 11° 01′ 44.62" W
11,100.00′		2,195,381.6255	13,735,604.7404	2,195,305.7008	13,735,215.1968	2,195,257.7902	13,734,821.2255	S 11° 01′ 44.62" W	S 6° 56′ 01.16" W
8,060.00′		2,195,025.9441	13,732,914.7420	2,195,001.7567	13,732,715.8478	2,194,987.4815	13,732,515.9975	S 6° 56′ 01.16" W	S 4° 05′ 08.40" W
11,100.00′		2,194,987.4815	13,732,515.9975	2,194,915.5772	13,731,509.3498	2,194,663.3038	13,730,532.1763	S 4° 05′ 08.40" W	S 14° 28′ 32.77" W
8,060.00′		2,194,663.3038	13,730,532.1763	2,194,605.2385	13,730,307.2623	2,194,560.2229	13,730,079.3774	S 14° 28′ 32.77" W	S 11° 10′ 27.00" W
				2,194,264.3794	13,728,581.7149				
9,410.00′		2,192,780.5885	13,724,278.7318	2,192,820.2764	13,724,098.3181	2,192,852.8530	13,723,916.4858	S 12° 24′ 23.31" E	S 10° 09′ 25.99" E
6,820.00′		2,192,852.8530	13,723,916.4858	2,192,887.5545	13,723,722.7935	2,192,933.3661	13,723,531.4242	S 10° 09′ 25.99" E	S 13° 27′ 45.33" E
8,000.00′		2,193,444.1674	13,721,397.6475	2,193,520.4426	13,721,079.0222	2,193,622.5163	13,720,767.7009	S 13° 27′ 45.33" E	S 18° 09′ 10.42" E
8,000.00′		2,193,622.5163	13,720,767.7009	2,193,644.0154	13,720,702.1292	2,193,664.3803	13,720,636.1964	S 18° 09′ 10.42" E	S 17° 09′ 52.12" E
				2,193,889.8593	13,719,906.1895				
				2,191,122.7144	13,744,065.1130				
4,500.00′		2,191,122.7144	13,744,065.1130	2,191,213.7036	13,743,910.6102	2,191,292.1115	13,743,749.3577	S 30° 29′ 40.33" E	S 25° 55′ 51.59" E
7,870.00′		2,191,292.1115	13,743,749.3577	2,191,429.2381	13,743,467.3450	2,191,588.3681	13,743,197.1369	S 25° 55′ 51.59" E	S 30° 29′ 40.33" E
160.00′		2,191,887.7476	13,742,688.7805	2,219,338.3629	13,696,076.7212	2,192,163.9623	13,742,850.3495	S 30° 29′ 40.33" E	N 30° 09′ 20.16" W
2,500.00′		2,191,773.9228	13,743,521.7007	2,191,713.7064	13,743,625.3474	2,191,663.6828	13,743,734.2798	N 30° 09′ 20.16" W	N 24° 39′ 55.45" W
1,050.00′		2,191,663.6828	13,743,734.2798	2,191,642.5342	13,743,780.3334	2,191,617.0488	13,743,824.1362	N 24° 39′ 55.45" W	N 30° 11′ 30.40" W
				2,191,232.8445	13,744,484.4832				
1,500.00′		2,191,957.4801	13,742,478.0456	2,192,000.7182	13,742,413.9732	2,192,050.3133	13,742,354.6845	S 34° 00′ 45.77" E	S 39° 54′ 45.18" E
2,000.00′		2,192,050.3133	13,742,354.6845	2,192,103.2213	13,742,291.4354	2,192,150.7430	13,742,224.0456	S 39° 54′ 45.18" E	S 35° 11′ 26.15" E
1,956.50′		2,192,463.7091	13,741,780.2333	2,192,492.8600	13,741,738.8949	2,192,524.1081	13,741,699.1179	S 35° 11′ 26.15" E	S 38° 09′ 09.26" E
112.00′		2,192,524.1081	13,741,699.1179	2,194,699.6312	13,738,929.8072	2,192,704.4731	13,741,831.7594	S 38° 09′ 09.26" E	N 34° 30′ 33.87" W
12,484.00′		2,192,704.4731	13,741,831.7594	2,192,456.5699	13,742,192.3340	2,192,234.5208	13,742,569.3808	N 34° 30′ 33.87" W	N 30° 29′ 40.33" W
8,000.00′		2,192,137.8106	13,742,733.5979	2,191,990.2187	13,742,984.2138	2,191,824.8179	13,743,223.4505	N 30° 29′ 40.33" W	N 34° 39′ 31.58" W
4,500.00′		2,191,824.8179	13,743,223.4505	2,191,731.7799	13,743,358.0212	2,191,648.7595	13,743,498.9926	N 34° 39′ 31.58" W	N 30° 29′ 40.33" W
				2,193,525.8929	13,740,591.4426				
8,000.00′		2,193,525.8929	13,740,591.4426	2,193,848.3827	13,740,109.8431	2,194,098.0852	13,739,586.7881	S 33° 48′ 25.74" E	S 25° 31′ 10.03" E
4,400.00′		2,194,098.0852	13,739,586.7881	2,194,183.8248	13,739,407.1883	2,194,285.4280	13,739,236.0622	S 25° 31′ 10.03" E	S 30° 41′ 56.41" E
				2,194,285.4280	13,739,236.0622				
8,000.00′		2,195,147.2545	13,737,784.5233	2,195,259.4135	13,737,595.6186	2,195,381.7708	13,737,413.1541	S 30° 41′ 56.41" E	S 33° 50′ 42.25" E
1,500.00′		2,195,381.7708	13,737,413.1541	2,195,505.2487	13,737,229.0184	2,195,570.1792	13,737,017.0355	S 33° 50′ 42.25" E	S 17° 01′ 47.50" E
1,940.00′		2,195,680.1248	13,736,658.0890	2,195,759.3646	13,736,399.3895	2,195,764.7982	13,736,128.8810	S 17° 01′ 47.50" E	S 1° 09′ 02.58" E
				2,195,755.2032	13,735,813.0429				
5,700.00′		2,195,755.2032	13,735,813.0429	2,195,724.5597	13,735,324.3714	2,195,611.0260	13,734,848.0848	S 3° 35′ 17.51" W	S 13° 24′ 27.13" W
8,000.00′		2,195,611.0260	13,734,848.0848	2,195,518.7779	13,734,461.0935	2,195,465.3795	13,734,066.8593	S 13° 24′ 27.13" W	S 7° 42′ 49.22" W
				2,195,465.3795	13,734,066.8593				
				2,195,236.4227	13,732,381.6173				
4,400.00′		2,195,236.4227	13,732,381.6173	2,195,208.9052	13,732,190.3688	2,195,198.2580	13,731,997.4445	S 8° 11′ 15.81" W	S 3° 09′ 31.96" W
8,000.00′		2,195,198.2580	13,731,997.4445	2,195,165.7814	13,731,408.9808	2,195,047.4193	13,730,831.6293	S 3° 09′ 31.96" W	S 11° 35′ 08.18" W
				2,195,047.4193	13,730,831.6293				
				2,195,030.0200	13,730,747.4941				
8,000.00′		2,195,030.0200	13,730,747.4941	2,194,947.5463	13,730,352.1167	2,194,825.6714	13,729,967.0560	S 11° 46′ 57.57" W	S 17° 33′ 46.85" W
8,000.00′		2,194,825.6714	13,729,967.0560	2,194,690.9414	13,729,541.3803	2,194,604.4155	13,729,103.3560	S 17° 33′ 46.85" W	S 11° 10′ 27.00" W
				2,194,604.4155	13,729,103.3560				

CURVE AND COORDINATE DATA

CURVE DATA / CURVE COORDINATE DATA

ALIGNMENT NO.	CURVE NO.	PC STATION	PI STATION	PT STATION	DELTA	D	L	T	R	e(%)	PC COORDINATE		PI COORDINATE		PT COORDINATE		BEARING	
											"X"	"Y"	"X"	"Y"	"X"	"Y"	BACK	AHEAD
RN16GRAY	RN16GRAY-CV01	10+00.00	12+86.32	15+69.45	14° 47′ 48.75" RT	2° 35′ 54.41"	569.45′	286.32′	2,205.00′		2,194,314.2858	13,727,770.6479	2,194,208.9484	13,727,504.4107	2,194,039.1092	13,727,273.9051	S 21° 35′ 10.84" W	S 36° 22′ 59.59" W
			19+44.26										2,193,816.7792	13,726,972.1590				
RNBINZ16	RNBINZ161	10+00.00	11+52.26	13+02.42	16° 30′ 08.17" LT	5° 27′ 24.27"	302.42′	152.26′	1,050.00′		2,192,905.7391	13,725,472.1031	2,192,872.7690	13,725,323.4515	2,192,883.3820	13,725,171.5578	S 12° 30′ 19.59" W	S 3° 59′ 48.58" E
	RNBINZ162	14+87.44	16+02.72	17+17.07	12° 31′ 48.03" LT	5° 27′ 24.27"	229.62′	115.27′	1,050.00′		2,192,896.2784	13,724,986.9832	2,192,904.3130	13,724,871.9916	2,192,937.1038	13,724,761.4819	S 3° 59′ 48.58" E	S 16° 31′ 36.61" E
	RNBINZ163	17+17.07	17+97.47	18+77.87	1° 09′ 05.98" RT	0° 42′ 58.31"	160.80′	80.40′	8,000.00′		2,192,937.1038	13,724,761.4819	2,192,959.9758	13,724,684.3998	2,192,981.2939	13,724,606.8737	S 16° 31′ 36.61" E	S 15° 22′ 30.63" E
RN16BINZ	RN16BINZ-CV01	10+00.00	11+02.98	12+05.95	2° 04′ 12.55" RT	1° 00′ 18.68"	205.95′	102.98′	5,700.00′		2,193,605.4296	13,722,017.5685	2,193,627.6549	13,721,917.0109	2,193,646.2332	13,721,815.7160	S 12° 27′ 47.34" E	S 10° 23′ 34.79" E
	RN16BINZ-CV02	12+05.95	15+96.97	19+87.37	5° 35′ 47.62" LT	0° 42′ 58.31"	781.43′	391.02′	8,000.00′		2,193,646.2332	13,721,815.7160	2,193,716.7736	13,721,431.1066	2,193,824.4861	13,721,055.2100	S 10° 23′ 34.79" E	S 15° 59′ 22.42" E
	RN16BINZ-CV03	23+36.63	25+79.94	28+23.11	3° 29′ 02.80" RT	0° 42′ 58.31"	486.47′	243.31′	8,000.00′		2,193,920.6938	13,720,719.4631	2,193,987.7170	13,720,485.5645	2,194,040.4019	13,720,248.0251	S 15° 59′ 22.42" E	S 12° 30′ 19.61" E
	RN16BINZ-CV04	28+23.11	30+01.71	31+80.11	4° 38′ 55.72" LT	1° 18′ 07.84"	357.00′	178.60′	4,400.00′		2,194,040.4019	13,720,248.0251	2,194,079.0745	13,720,073.6628	2,194,131.7516	13,719,903.0084	S 12° 30′ 19.61" E	S 17° 09′ 15.33" E
RS16ROCK	RS16ROCK-CV01	10+00.00	12+51.48	15+02.42	6° 32′ 32.46" RT	1° 18′ 07.84"	502.42′	251.48′	4,400.00′		2,192,765.4758	13,741,429.0738	2,192,909.2903	13,741,222.7723	2,193,028.6629	13,741,001.4283	S 34° 52′ 50.45" E	S 28° 20′ 18.00" E
	RS16ROCK-CV02	15+02.42	16+83.26	18+64.04	2° 35′ 23.67" LT	0° 42′ 58.31"	361.62′	180.84′	8,000.00′		2,193,028.6629	13,741,001.4283	2,193,114.5037	13,740,842.2598	2,193,207.4492	13,740,687.1327	S 28° 20′ 18.00" E	S 30° 55′ 41.66" E
	RS16ROCK-CV03	18+64.04	18+89.04	19+14.04	0° 13′ 45.26" RT	0° 27′ 30.51"	50.00′	25.00′	12,497.00′		2,193,207.4492	13,740,687.1327	2,193,220.2984	13,740,665.6874	2,193,233.0616	13,740,644.1908	S 30° 55′ 41.66" E	S 30° 41′ 56.41" E
	RS16ROCK-CV04	19+99.44	21+86.74	23+73.91	3° 45′ 50.94" RT	1° 00′ 18.68"	374.47′	187.30′	5,700.00′		2,193,276.6611	13,740,570.7579	2,193,372.2847	13,740,409.7031	2,193,457.1287	13,740,242.7181	S 30° 41′ 56.41" E	S 26° 56′ 05.47" E
	RS16ROCK-CV05	23+73.91	26+02.52	28+31.00	3° 19′ 39.89" LT	0° 43′ 40.90"	457.09′	228.61′	7,870.00′		2,193,457.1287	13,740,242.7181	2,193,560.6837	13,740,038.9075	2,193,675.8948	13,739,841.4516	S 26° 56′ 05.47" E	S 30° 15′ 45.37" E
RS7816	RS7816-CV01	10+00.00	12+68.63	15+37.04	3° 54′ 35.39" LT	0° 43′ 40.90"	537.04′	268.63′	7,870.00′		2,193,785.3407	13,739,653.8765	2,193,920.7187	13,739,421.8572	2,194,071.6022	13,739,199.6089	S 30° 15′ 45.37" E	S 34° 10′ 20.76" E
	RS7816-CV02	15+37.04	17+09.87	18+82.59	3° 28′ 24.35" RT	1° 00′ 18.68"	345.55′	172.83′	5,700.00′		2,194,071.6022	13,739,199.6089	2,194,168.6771	13,739,056.6196	2,194,256.9106	13,738,908.0116	S 34° 10′ 20.76" E	S 30° 41′ 56.41" E
	RS7816-CV03	20+03.91	22+63.07	25+22.06	3° 42′ 39.55" LT	0° 42′ 58.31"	518.15′	259.17′	8,000.00′		2,194,318.8439	13,738,803.6999	2,194,451.1556	13,738,580.8528	2,194,597.6133	13,738,367.0367	S 30° 41′ 56.41" E	S 34° 24′ 35.96" E
	RS7816-CV04	25+22.06	26+64.60	28+07.04	3° 42′ 39.55" RT	1° 18′ 07.84"	284.98′	142.54′	4,400.00′		2,194,597.6133	13,738,367.0367	2,194,678.1650	13,738,249.4378	2,194,750.9364	13,738,126.8720	S 34° 24′ 35.96" E	S 30° 41′ 56.41" E
RSROCK16	RSROCK16-CV01	10+00.00	11+44.29	12+88.55	2° 06′ 02.67" RT	0° 43′ 40.90"	288.55′	144.29′	7,870.00′		2,195,267.0744	13,737,077.4131	2,195,319.5830	13,736,943.0140	2,195,367.1298	13,736,806.7804	S 21° 20′ 24.68" E	S 19° 14′ 22.02" E
	RSROCK16-CV02	12+88.55	17+86.52	22+69.35	24° 25′ 58.11" RT	2° 29′ 28.04"	980.80′	497.97′	2,300.00′		2,195,367.1298	13,736,806.7804	2,195,531.2182	13,736,336.6251	2,195,486.1437	13,735,840.7023	S 19° 14′ 22.02" E	S 5° 11′ 36.10" W
	RSROCK16-CV03	22+69.35	23+94.73	25+20.08	2° 31′ 13.12" RT	1° 00′ 18.68"	250.73′	125.39′	5,700.00′		2,195,486.1437	13,735,840.7023	2,195,474.7942	13,735,715.8318	2,195,457.9646	13,735,591.5812	S 5° 11′ 36.10" W	S 7° 42′ 49.22" W
	RSROCK16-CV04	27+27.76	30+72.62	34+17.06	4° 56′ 12.26" LT	0° 42′ 58.31"	689.30′	344.86′	8,000.00′		2,195,430.0887	13,735,385.7763	2,195,383.8003	13,735,044.0343	2,195,367.0926	13,734,699.5765	S 7° 42′ 49.22" W	S 2° 46′ 36.96" W
	RSROCK16-CV05	34+17.06	36+06.74	37+96.18	4° 56′ 12.26" RT	1° 18′ 07.84"	379.11′	189.67′	4,400.00′		2,195,367.0926	13,734,699.5765	2,195,357.9033	13,734,510.1248	2,195,332.4447	13,734,322.1666	S 2° 46′ 36.96" W	S 7° 42′ 49.22" W
RS16LOW	RS16LOW-CV01	10+00.00	13+68.17	17+25.15	24° 26′ 23.49" RT	3° 22′ 13.22"	725.15′	368.17′	1,700.00′		2,195,490.1814	13,736,575.4154	2,195,561.4597	13,736,214.2091	2,195,476.9064	13,735,855.8777	S 11° 09′ 46.71" E	S 13° 16′ 36.77" W
	RS16LOW-CV02	20+70.03	23+42.86	26+15.28	5° 28′ 50.61" LT	1° 00′ 18.68"	545.24′	272.83′	5,700.00′		2,195,397.7002	13,735,520.2072	2,195,335.0430	13,735,254.6699	2,195,298.0339	13,734,984.3620	S 13° 16′ 36.77" W	S 7° 47′ 46.16" W
RS16GRAY	RS16GRAY-CV-01	10+00.00	12+17.85	14+35.34	5° 40′ 07.94" RT	1° 18′ 07.84"	435.34′	217.85′	4,400.00′		2,195,118.9151	13,732,745.7012	2,195,089.6751	13,732,529.8256	2,195,039.2542	13,732,317.8941	S 7° 42′ 49.22" W	S 13° 22′ 57.16" W
	RS16GRAY-CV-02	14+35.34	17+70.09	21+04.43	4° 52′ 16.24" LT	0° 43′ 40.90"	669.09′	334.75′	7,870.00′		2,195,039.2542	13,732,317.8941	2,194,961.7763	13,731,992.2359	2,194,912.2317	13,731,661.1748	S 13° 22′ 57.16" W	S 8° 30′ 40.92" W
RSLOW16	RSLOW16-CV-01	10+00.00	11+35.16	12+70.26	2° 43′ 00.01" LT	1° 00′ 18.68"	270.26′	135.16′	5,700.00′		2,194,785.0031	13,730,963.7305	2,194,756.5212	13,730,831.6080	2,194,734.3336	13,730,698.2840	S 12° 09′ 54.71" W	S 9° 26′ 54.70" W
	RSLOW16-CV-02	12+70.26	14+31.55	15+92.78	2° 20′ 52.84" RT	0° 43′ 40.90"	322.52′	161.28′	7,870.00′		2,194,734.3336	13,730,698.2840	2,194,707.8574	13,730,539.1910	2,194,674.8856	13,730,381.3163	S 9° 26′ 54.70" W	S 11° 47′ 47.55" W
	RSLOW16-CV-03	15+92.78	18+90.39	21+87.73	4° 15′ 39.61" LT	0° 42′ 58.31"	594.95′	297.61′	8,000.00′		2,194,674.8856	13,730,381.3163	2,194,614.0428	13,730,089.9905	2,194,575.0138	13,729,794.9494	S 11° 47′ 47.55" W	S 7° 32′ 07.93" W
	RSLOW16-CV-04	21+87.73	23+27.49	24+67.16	3° 38′ 19.06" RT	1° 18′ 07.84"	279.43′	139.76′	4,400.00′		2,194,575.0138	13,729,794.9494	2,194,556.6854	13,729,656.3962	2,194,529.6010	13,729,519.2854	S 7° 32′ 07.93" W	S 11° 10′ 27.00" W
RSGRAY16			10+00.00										2,194,275.1709	13,728,579.5831				S 11° 10′ 27.00" W
	RSGRAY16-CV-01	14+53.22	17+84.20	21+10.27	17° 04′ 22.53" RT	2° 35′ 54.41"	657.04′	330.97′	2,205.00′		2,194,187.3396	13,728,134.9504	2,194,123.1994	13,727,810.2506	2,193,966.5576	13,727,518.6906	S 11° 10′ 27.00" W	S 28° 14′ 49.53" W
RS16BINZ			10+00.00										2,192,736.1104	13,725,472.3909				S 11° 27′ 26.82" W
	RS16BINZ1	12+00.29	13+00.14	13+99.34	11° 24′ 18.00" LT	5° 43′ 46.48"	199.05′	99.86′	1,000.00′		2,192,696.3256	13,725,276.0964	2,192,676.4899	13,725,178.2289	2,192,676.3985	13,725,078.3716	S 11° 27′ 26.82" W	S 0° 03′ 08.82" W
	RS16BINZ2	13+99.34	15+55.03	17+10.11	8° 50′ 45.38" LT	2° 50′ 47.35"	310.77′	155.69′	2,012.86′		2,192,676.3985	13,725,078.3716	2,192,676.2560	13,724,922.6789	2,192,700.0573	13,724,768.8161	S 0° 03′ 08.82" W	S 8° 47′ 36.56" E
	RS16BINZ3	17+10.11	19+58.32	22+06.38	3° 36′ 46.75" LT	0° 43′ 40.90"	496.27′	248.22′	7,870.00′		2,192,700.0573	13,724,768.8161	2,192,738.0032	13,724,523.5162	2,192,791.3316	13,724,281.0951	S 8° 47′ 36.56" E	S 12° 24′ 23.31" E
RSBINZ16	RSBINZ16-CV01	10+00.00	12+35.08	14+69.89	4° 43′ 23.79" LT	1° 00′ 18.68"	469.89′	235.08′	5,700.00′		2,193,334.9024	13,721,888.4443	2,193,389.6310	13,721,659.8259	2,193,462.9989	13,721,436.4905	S 13° 27′ 45.33" E	S 18° 11′ 09.13" E
	RSBINZ16-CV02	14+69.89	16+01.78	17+33.64	1° 53′ 20.31" RT	0° 42′ 58.31"	263.75′	131.89′	8,000.00′		2,193,462.9989	13,721,436.4905	2,193,504.1610	13,721,311.1910	2,193,541.1705	13,721,184.6029	S 18° 11′ 09.13" E	S 16° 17′ 48.82" E
	RSBINZ16-CV03	20+68.32	23+98.24	27+27.78	4° 43′ 22.94" LT	0° 42′ 58.31"	659.46′	329.92′	8,000.00′		2,193,635.0874	13,720,863.3677	2,193,727.6670	13,720,546.7063	2,193,846.0059	13,720,238.7432	S 16° 17′ 48.82" E	S 21° 01′ 11.76" E
	RSBINZ16-CV04	27+27.78	28+76.27	30+24.65	3° 51′ 56.43" RT	1° 18′ 07.84"	296.86′	148.49′	4,400.00′		2,193,846.0059	13,720,238.7432	2,193,899.2673	13,720,100.1367	2,193,943.0630	13,719,958.2547	S 21° 01′ 11.76" E	S 17° 09′ 15.33" E
DCSE	DCSE-CV01	50+00.00	51+65.41	53+30.67	4° 18′ 21.21" RT	1° 18′ 07.84"	330.67′	165.41′	4,400.00′		2,193,127.3127	13,723,144.3395	2,193,165.8224	13,722,983.4725	2,193,192.1453	13,722,820.1682	S 13° 27′ 45.33" E	S 9° 09′ 24.13" E
	DCSE-CV02	53+30.67	56+31.42	59+31.88	4° 18′ 21.21" LT	0° 42′ 58.31"	601.22′	300.75′	8,000.00′		2,193,192.1453	13,722,820.1682	2,193,240.0051	13,722,523.2512	2,193,310.0227	13,722,230.7657	S 9° 09′ 24.13" E	S 13° 27′ 45.33" E
	DCSE-CV03	62+98.99	71+18.62	79+37.55	4° 04′ 46.81" LT	0° 14′ 56.32"	1,638.56′	819.63′	23,012.32′		2,193,395.4887	13,721,873.7475	2,193,586.3065	13,721,076.6419	2,193,833.3497	13,720,295.1315	S 13° 27′ 45.33" E	S 17° 32′ 32.15" E
	DCSE-CV04	79+37.55	86+03.15	89+85.57	89° 37′ 19.97" LT	8° 33′ 05.79"	1,048.02′	665.60′	670.00′		2,193,833.3497	13,720,295.1318	2,194,033.9667	13,719,660.4886	2,194,669.9188	13,719,856.9167	S 17° 32′ 32.15" E	N 72° 50′ 07.88" E
	DCSE-CV05	90+47.69	94+77.50	99+07.06	3° 28′ 07.31" LT	0° 24′ 13.08"	859.37′	429.82′	14,195.00′		2,194,729.2732	13,719,875.2496	2,195,139.9451	13,720,002.0949	2,195,542.1902	13,720,153.5548	N 72° 50′ 07.88" E	N 69° 22′ 00.57" E
	DCSE-CV06	118+01.70	120+28.47	122+55.08	3° 42′ 39.54" LT	0° 49′ 06.64"	453.38′	226.77′	7,000.00′		2,197,315.2989	13,720,821.1945	2,197,527.5232	13,720,901.1046	2,197,734.1304	13,720,994.5831	N 69° 22′ 00.57" E	N 65° 39′ 21.03" E
	DCSE-CV07	124+82.32	127+39.02	129+95.55	3° 42′ 39.54" RT	0° 43′ 23.04"	513.23′	256.70′	7,924.00′		2,197,941.1659	13,721,088.2554	2,198,175.0453	13,721,194.0730	2,198,415.2831	13,721,284.5313	N 65° 39′ 21.03" E	N 69° 22′ 00.57" E
			132+08.26										2,198,614.3505	13,721,359.4874				
DCEN			36+89.00										2,190,179.2273	13,718,530.5695				N 72° 50′ 07.88" E
	DCEN-CV01	38+89.00	41+49.95	44+10.78	2° 52′ 04.80" RT	0° 32′ 58.75"	521.78′	260.95′	10,424.00′		2,190,370.3196	13,718,589.5926	2,190,619.6440	13,718,666.6021	2,190,872.5094	13,718,731.0401	N 72° 50′ 07.88" E	N 75° 42′ 12.68" E
	DCEN-CV02	51+85.95	53+85.70	55+85.36	2° 51′ 38.02" LT	0° 42′ 58.31"	399.41′	199.75′	8,000.00′		2,191,623.6721	13,718,922.4599	2,191,817.2324	13,718,971.7851	2,192,008.0900	13,719,030.7086	N 75° 42′ 12.68" E	N 72° 50′ 34.66" E
	DCEN-CV03	70+56.87	78+89.57	83+65.05	89° 58′ 45.37" LT	6° 52′ 41.68"	1,308.17′	832.70′	833.00′		2,193,414.1185	13,719,464.7921	2,194,209.7619	13,719,710.4313	2,193,964.4106	13,720,506.1635	N 72° 50′ 34.66" E	N 17° 08′ 10.71" W
	DCEN-CV04	83+65.05	90+97.03	98+28.50	3° 40′ 25.37" RT	0° 15′ 03.71"	1,463.46′	731.98′	22,824.31′		2,193,964.4106	13,720,506.1635	2,193,748.7356	13,721,205.6486	2,193,578.3230	13,721,917.5156	N 17° 08′ 10.71" W	N 13° 27′ 45.33" W
	DCEN-CV05	101+65.25	104+09.00	106+52.59	3° 29′ 24.94" LT	0° 42′ 58.31"	487.33′	243.74′	8,000.00′		2,193,499.9240	13,722,245.0125	2,193,443.1784	13,722,482.0565	2,193,372.1071	13,722,715.2062	N 13° 27′ 45.33" W	N 16° 57′ 10.27" W
	DCEN-CV06	106+52.59	107+86.64	109+20.62	3° 29′ 24.94" RT	1° 18′ 07.84"	268.03′	134.06′	4,400.00′		2,193,372.1071	13,722,715.2063	2,193,333.0179	13,722,843.4386	2,193,301.8078	13,722,973.8128	N 16° 57′ 10.27" W	N 13° 27′ 45.33" W
DCSW	DCSW-CV01	50+00.00	53+49.33	56+97.98	6° 10′ 17.49" RT	0° 53′ 03.10"	697.98′	349.33′	6,480.00′		2,193,570.7646	13,721,097.5224	2,193,663.7783	13,720,760.8038	2,193,720.0539	13,720,416.0373	S 15° 26′ 31.39" E	S 9° 16′ 13.90" E
	DCSW-CV02	56+97.98	61+99.74	65+50.14	75° 55′ 57.86" RT	8° 54′ 38.51"	852.15′	501.76′	643.00′		2,193,720.0539	13,720,416.0373	2,193,800.8854	13,719,920.8317	2,193,340.1775	13,719,722.0593	S 9° 16′ 13.90" E	S 66° 39′ 43.96" W
	DCSW-CV03	65+50.14	68+99.57	72+48.32	6° 10′ 23.92" RT	0° 53′ 03.10"	698.19′	349.43′	6,480.00′		2,193,340.1775	13,719,722.0593	2,193,019.3354	13,719,583.6319	2,192,685.4679	13,719,480.5094	S 66° 39′ 43.96" W	S 72° 50′ 07.88" W
DCWN	DCWN-CV01	50+00.00	54+82.62	59+63.45	8° 31′ 07.69" RT	0° 53′ 03.10"	963.45′	482.62′	6,480.00′		2,195,691.0357	13,720,427.5437	2,195,239.3764	13,720,257.4777	2,194,767.5076	13,720,156.1939	S 69° 22′ 00.57" W	S 77° 53′ 08.26" W
	DCWN-CV02	59+63.45	64+96.24	68+53.29	79° 17′ 25.17" RT	8° 54′ 38.51"	889.83′	532.79′	643.00′		2,194,767.5076	13,720,156.1939	2,194,246.5824	13,720,044.3806	2,194,039.9118	13,720,535.4534	S 77° 53′ 08.26" W	N 22° 49′ 26.57" W
	DCWN-CV03	68+53.29	73+04.41	77+54.08	7° 57′ 53.26" RT	0° 53′ 03.10"	900.80′	451.13′	6,480.00′		2,194,039.9118	13,720,535.4534	2,193,864.9193	13,720,951.2557	2,193,749.2302	13,721,387.2947	N 22° 49′ 26.57" W	N 14° 51′ 33.32" W
FRUTSB1976			10+00.00										2,190,663.0469	13,744,559.0823				
	FRUTSB1976-CV01	10+00.00	10+59.79	10+77.44	113° 46′ 19.17" LT	146° 54′ 44.12"	77.44′	59.79′	39.00′		2,190,663.0469	13,744,559.0823	2,190,693.4647	13,744,507.6035	2,190,728.3146	13,744,556.1916	S 30° 34′ 40.83" E	N 35° 39′ 00.00" E
	FRUTSB1976-CV02	14+85.27	15+10.72	15+30.37	66° 15′ 21.28" LT	146° 54′ 44.12"	45.10′	25.45′	39.00′		2,190,966.0122	13,744,887.5927	2,190,980.8458	13,744,908.2739	2,190,967.8880	13,744,930.1793	N 35° 39′ 00.00" E	N 30° 36′ 21.28" W
			15+30.37										2,190,967.8880	13,744,930.1793				
FRUTNB78			10+00.00										2,191,323.3664	13,744,235.4410				N 30° 11′ 30.40" W
	FRUTNB78-CV01	12+07.17	13+09.64	13+38.98	114° 25′ 51.52" LT	86° 48′ 42.43"	131.82′	102.47′	66.00′		2,191,219.1825	13,744,414.5058	2,191,167.6494	13,744,503.0778	2,191,108.3220	13,744,419.5259	N 30° 11′ 30.40" W	S 35° 22′ 38.08" W
	FRUTNB78-CV02	15+90.73	16+07.87	16+23.81	37° 09′ 12.01" LT	112° 20′ 40.80"	33.07′	17.14′	51.00′		2,190,962.5684	13,744,214.2580	2,190,952.6449	13,744,200.2825	2,190,953.1761	13,744,183.1505	S 35° 22′ 38.08" W	S 1° 46′ 33.92" E
	FRUTNB78-CV03	16+23.81	16+74.88	17+23.84	28° 30′ 54.47" LT	28° 30′ 19.31"	100.03′	51.08′	201.00′		2,190,953.1761	13,744,183.1505	2,190,954.7591	13,744,132.0992	2,190,980.5215	13,744,087.9967	S 1° 46′ 33.92" E	S 30° 17′ 28.40" E
			17+23.84										2,190,980.5215	13,744,087.9967				
FRUTSBBASE	FRUTSBBASE-1	10+00.00	11+08.81	11+71.93	83° 55′ 43.82" LT	48° 48′ 53.78"	171.93′	108.81′	121.00′		2,192,580.9223	13,741,588.3767	2,192,653.2842	13,741,507.1117	2,192,741.7467	13,741,570.4729	S 41° 40′ 59.72" E	N 54° 23′ 16.46" E
	FRUTSBBASE-2	11+96.07	13+06.01	13+69.21	84° 31′ 06.67" LT	48° 48′ 53.78"	173.14′	109.94′	121.00′		2,192,761.3691	13,741,584.5274	2,192,850.7515	13,741,648.5474	2,192,795.5624	13,741,743.6365	N 54° 23′ 16.46" E	N 30° 07′ 50.21" W
FRUTSBRCKT			10+00.00										2,194,880.4817	13,737,851.7620				
	FRUTSBRCKT-CV01	10+00.00	10+72.95	11+22.99	77° 26′ 08.22" LT	62° 57′ 44.62"	122.99′	72.95′	91.00′		2,194,880.4817	13,737,851.7620	2,194,917.7958	13,737,789.0760	2,194,987.0978	13,737,811.8600	S 30° 45′ 48.18" E	N 71° 48′ 03.59" E
	FRUTSBRCKT-CV02	12+15.87	12+69.16	13+03.47	82° 17′ 19.19" LT	93° 55′ 39.03"	87.61′	53.30′	61.00′		2,195,075.3305	13,737,840.8678	2,195,125.9613	13,737,857.5134	2,195,116.2600	13,737,909.9198	N 71° 48′ 03.59" E	N 10° 29′ 15.60" W
	FRUTSBRCKT-CV03	13+03.47	13+57.30	14+09.99	20° 16′ 32.59" LT	19° 02′ 06.51"	106.52′	53.82′	301.00′		2,195,116.2600	13,737,909.9198	2,195,106.4632	13,737,962.8422	2,195,078.9339	13,738,009.0903	N 10° 29′ 15.60" W	N 30° 45′ 48.18" W
			14+09.99										2,195,078.9339	13,738,009.0903				
FRUTNBRCKT			10+00.00										2,195,284.0741	13,737,642.9581				
	FRUTNBRCKT-CV01	10+00.00	10+72.95	11+22.99	77° 26′ 08.22" LT	62° 57′ 44.62"	122.99′	72.95′	91.00′		2,195,284.0741	13,737,642.9581	2,195,246.7600	13,737,705.6441	2,195,177.4580	13,737,682.8601	N 30° 45′ 48.18" W	S 71° 48′ 03.59" W
	FRUTNBRCKT-CV02	12+19.29	12+74.92	13+09.50	84° 43′ 53.90" LT	93° 55′ 39.03"	90.21′	55.63′	61.00′		2,195,085.9741	13,737,652.7835	2,195,033.1231	13,737,635.4080	2,195,045.5723	13,737,581.1848	S 71° 48′ 03.59" W	S 12° 55′ 50.31" E
	FRUTNBRCKT-CV03	13+09.50	13+56.72	14+03.18	17° 49′ 57.87" LT	19° 02′ 06.51"	93.68′	47.22′	301.00′		2,195,045.5723	13,737,581.1848	2,195,056.1396	13,737,535.1589	2,195,080.2941	13,737,494.5804	S 12° 55′ 50.31" E	S 30° 45′ 48.18" E
			14+03.18										2,195,080.2941	13,737,494.5804				
FRUTSBSEGUIN			10+00.00										2,195,257.1961	13,734,427.0092				
	FRUTSBSEGUIN-01	10+00.00	10+37.67	10+74.47	21° 13′ 43.14" LT	28° 30′ 19.31"	74.47′	37.67′	201.00′		2,195,257.1961	13,734,427.0092	2,195,252.6488	13,734,389.6165	2,195,261.9496	13,734,353.1147	S 6° 56′ 01.16" W	S 14° 17′ 41.99" E
	FRUTSBSEGUIN-02	10+74.47	11+02.81	11+27.52	49° 49′ 36.55" LT	93° 55′ 39.03"	53.05′	28.33′	61.00′		2,195,261.9496	13,734,353.1147	2,195,268.9453	13,734,325.6593	2,195,294.4369	13,734,313.2933	S 14° 17′ 41.99" E	S 64° 07′ 18.54" E
	FRUTSBSEGUIN-03	11+27.52	11+57.72	11+87.37	18° 56′ 40.31" LT	31° 39′ 18.46"	59.85′	30.20′	181.00′		2,195,294.4369	13,734,313.2933	2,195,321.6076	13,734,300.1127	2,195,351.5857	13,734,296.4670	S 64° 07′ 18.54" E	S 83° 03′ 58.85" E
	FRUTSBSEGUIN-04	13+32.55	13+48.30	13+63.88	14° 50′ 06.40" LT	47° 21′ 06.78"	31.33′	15.75′	121.00′		2,195,495.7033	13,734,278.9410	2,195,511.3410	13,734,277.0393	2,195,526.9443	13,734,279.2049	S 83° 03′ 58.85" E	N 82° 05′ 54.75" E
	FRUTSBSEGUIN-05	13+63.88	13+87.05	14+08.17	41° 36′ 27.28" LT	93° 55′ 39.03"	44.30′	23.18′	61.00′		2,195,526.9443	13,734,279.2049	2,195,549.9006	13,734,282.3909	2,195,564.9496	13,734,300.0167	N 82° 05′ 54.75" E	N 40° 29′ 27.47" E
	FRUTSBSEGUIN-06	14+08.17	14+44.66	14+79.04	33° 33′ 26.32" LT	47° 21′ 06.78"	70.87′	36.48′	121.00′		2,195,564.9496	13,734,300.0167	2,195,588.6390	13,734,327.7622	2,195,593.0432	13,734,363.9783	N 40° 29′ 27.47" E	N 6° 56′ 01.16" E
			14+79.04										2,195,593.0432	13,734,363.9783				
FRUTNBSEGUIN			10+00.00										2,195,533.0359	13,733,961.6555				
	FRUTNBSEGUIN-01	10+00.00	10+30.20	10+59.85	18° 56′ 40.30" LT	31° 39′ 18.46"	59.85′	30.20′	181.00′		2,195,533.0359	13,733,961.6555	2,195,536.6816	13,733,991.6336	2,195,530.3972	13,734,021.1714	N 6° 56′ 01.16" E	N 12° 00′ 39.15" W
	FRUTNBSEGUIN-02	10+59.85	10+89.67	11+15.33	52° 06′ 37.26" LT	93° 55′ 39.03"	55.48′	29.82′	61.00′		2,195,530.3972	13,734,021.1714	2,195,524.1909	13,734,050.3429	2,195,497.3572	13,734,063.3603	N 12° 00′ 39.15" W	N 64° 07′ 16.41" W
	FRUTNBSEGUIN-03	11+15.33	11+45.53	11+75.18	18° 56′ 42.44" LT	31° 39′ 18.46"	59.85′	30.20′	181.00′		2,195,497.3583	13,734,063.3598	2,195,470.1869	13,734,076.5411	2,195,440.2079	13,734,080.1868	N 64° 07′ 16.41" W	N 83° 03′ 58.84" W
	FRUTNBSEGUIN-04	13+23.36	13+39.11	13+54.68	14° 50′ 06.40" LT	47° 21′ 06.78"	31.33′	15.75′	121.00′		2,195,293.1121	13,734,098.0750	2,195,277.4745	13,734,099.9767	2,195,261.8712	13,734,097.8112	N 83° 03′ 58.84" W	S 82° 05′ 54.75" W
	FRUTNBSEGUIN-05	13+54.68	13+85.35	14+11.51	53° 22′ 41.16" LT	93° 55′ 39.03"	56.83′	30.67′	61.00′		2,195,261.8712	13,734,097.8112	2,195,231.4971	13,734,093.5957	2,195,216.7614	13,734,066.7031	S 82° 05′ 54.75" W	S 28° 43′ 13.60" W
	FRUTNBSEGUIN-06	14+11.51	14+50.20	14+87.94	21° 47′ 12.44" LT	28° 30′ 19.31"	76.43′	38.68′	201.00′		2,195,216.7614	13,734,066.7031	2,195,198.1731	13,734,032.7795	2,195,193.5033	13,733,994.3799	S 28° 43′ 13.60" W	S 6° 56′ 01.16" W
			14+87.94										2,195,193.5033	13,733,994.3799				
FRUTSBGRYTWN			10+00.00										2,194,456.2454	13,729,310.4792				
	FRUTSBGRYTWN-01	10+00.00	10+51.00	10+80.11	90° 00′ 00.00" LT	112° 20′ 40.80"	80.11′	51.00′	51.00′		2,194,456.2454	13,729,310.4792	2,194,446.3620	13,729,260.4460	2,194,496.3952	13,729,250.5626	S 11° 10′ 27.00" W	S 78° 49′ 33.00" E
	FRUTSBGRYTWN-02	11+91.60	12+35.16	12+63.70	80° 59′ 38.90" LT	112° 20′ 40.80"	72.09′	43.55′	51.00′		2,194,605.7731	13,729,228.9564	2,194,648.5010	13,729,220.5161	2,194,663.5258	13,729,261.3961	S 78° 49′ 33.00" E	N 20° 10′ 48.09" E
	FRUTSBGRYTWN-03	12+63.70	12+98.44	13+33.07	7° 55′ 59.85" LT	11° 26′ 10.62"	69.37′	34.74′	501.00′		2,194,663.5258	13,729,261.3961	2,194,675.5102	13,729,294.0038	2,194,682.8793	13,729,327.9535	N 20° 10′ 48.09" E	N 12° 14′ 48.24" E
			13+33.07										2,194,682.8793	13,729,327.9535				
FRUTNBGRYTWN			10+00.00										2,194,620.2352	13,728,964.1335				
	FRUTNBGRYTWN-01	10+00.00	10+61.00	10+95.82	90° 00′ 00.00" LT	93° 55′ 39.03"	95.82′	61.00′	61.00′		2,194,620.2352	13,728,964.1335	2,194,632.0565	13,729,023.9771	2,194,572.2129	13,729,035.7984	N 11° 10′ 26.99" E	N 78° 49′ 33.00" W
	FRUTNBGRYTWN-02	11+96.41	12+12.87	12+29.27	9° 22′ 00.44" LT	28° 30′ 19.31"	32.86′	16.47′	201.00′		2,194,473.5329	13,729,055.2913	2,194,457.3785	13,729,058.4824	2,194,440.9201	13,729,059.0017	N 78° 49′ 33.00" W	N 88° 11′ 33.44" W
	FRUTNBGRYTWN-03	12+29.27	12+63.76	12+89.93	68° 09′ 04.05" LT	112° 20′ 40.80"	60.66′	34.50′	51.00′		2,194,440.9201	13,729,059.0017	2,194,406.4394	13,729,060.0898	2,194,392.5972	13,729,028.4908	N 88° 11′ 33.44" W	S 23° 39′ 22.50" W
	FRUTNBGRYTWN-04	12+89.93	13+55.65	14+20.86	12° 28′ 55.51" LT	9° 32′ 00.27"	130.93′	65.73′	601.00′		2,194,392.5972	13,729,028.4908	2,194,366.2251	13,728,968.2886	2,194,353.4881	13,728,903.8095	S 23° 39′ 22.50" W	S 11° 10′ 27.00" W
			14+20.86										2,194,353.4881	13,728,903.8095				
FRUTSBBZEGD			10+00.00										2,192,994.4287	13,723,478.2273				
	FRUTSBBZEGD-01	10+00.00	10+94.12	11+51.54	85° 57′ 49.72" LT	56° 43′ 42.58"	151.54′	94.12′	101.00′		2,192,994.4287	13,723,478.2273	2,193,016.3419	13,723,386.6892	2,193,109.1953	13,723,402.1050	S 13° 27′ 45.33" E	N 80° 34′ 24.95" E
	FRUTSBBZEGD-02	12+16.90	12+25.17	12+33.41	9° 22′ 00.44" LT	56° 43′ 42.58"	16.51′	8.27′	101.00′		2,193,173.6728	13,723,412.8097	2,193,181.8354	13,723,414.1649	2,193,189.6685	13,723,416.8304	N 80° 34′ 24.95" E	N 71° 12′ 24.51" E
	FRUTSBBZEGD-03	12+41.60	12+78.78	13+05.85	72° 11′ 14.34" LT	112° 20′ 40.80"	64.26′	37.18′	51.00′		2,193,197.4241	13,723,419.4696	2,193,232.6230	13,723,431.4477	2,193,231.9868	13,723,468.6234	N 71° 12′ 24.51" E	N 0° 58′ 49.83" W
	FRUTSBBZEGD-04	13+05.85	13+71.58	14+36.78	12° 28′ 55.50" LT	9° 32′ 00.27"	130.93′	65.73′	601.00′		2,193,231.9868	13,723,468.6234	2,193,230.8621	13,723,534.3389	2,193,215.5606	13,723,598.2580	N 0° 58′ 49.83" W	N 13° 27′ 45.33" W
			14+36.78										2,193,215.5606	13,723,598.2580				
FRUTNBBZEGD			10+00.00										2,193,298.1228	13,723,158.8723				
	FRUTNBBZEGD-01	10+00.00	10+94.12	11+51.54	85° 57′ 49.72" LT	56° 43′ 42.58"	151.54′	94.12′	101.00′		2,193,298.1228	13,723,158.8723	2,193,276.2097	13,723,250.4103	2,193,183.3562	13,723,234.9946	N 13° 27′ 45.33" W	S 80° 34′ 24.95" W
	FRUTNBBZEGD-02	12+12.26	12+54.90	12+86.68	69° 54′ 03.83" LT	93° 55′ 39.03"	74.42′	42.63′	61.00′		2,193,123.4485	13,723,225.0485	2,193,081.3899	13,723,218.0659	2,193,073.4943	13,723,176.1692	S 80° 34′ 24.95" W	S 10° 40′ 21.12" W
	FRUTNBBZEGD-03	12+86.68	13+29.66	13+71.35	24° 08′ 06.45" LT	28° 30′ 19.31"	84.67′	42.97′	201.00′		2,193,073.4943	13,723,176.1692	2,193,065.5361	13,723,133.9408	2,193,075.5404	13,723,092.1500	S 10° 40′ 21.12" W	S 13° 27′ 45.33" E
			13+71.35										2,193,075.5404	13,723,092.1500				

PRELIMINARY
SUBJECT TO CHANGE

SUBMITTAL: 90%

SHEET: 2 OF 2

FILENAME: $FILE$

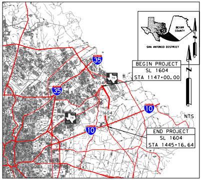
DRAWING DATE: 1/8/2021

TEXAS DEPARTMENT OF TRANSPORTATION

SCHEMATIC LAYOUT
LOOP 1604
BEXAR COUNTY

LIMITS: FROM FM 78 TO I-10 EAST
TxDOT C.S.J.: 2452-03-111
LENGTH: 29,816.64 FT = 5.65 MI

OFFICE OF THE DISTRICT ENGINEER
SAN ANTONIO DISTRICT


BEXAR COUNTY
SAN ANTONIO DISTRICT
BEGIN PROJECT
SL 1604
STA 1147+00.00
END PROJECT
SL 1604
STA 1445+16.64
35
10
1604
78
NTS

NOTE:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (2011 ADJUSTMENT) EPOCH 2010.00, AS OBSERVED IN DECEMBER, 2015.

2. COORDINATES AND DISTANCES ARE US SURVEY FEET, DISPLAYED IN SURFACE VALUES DERIVED FROM THE FOLLOWING FORMULA: GRID X 1.00017 = SURFACE. SURFACE ADJUSTMENT FACTOR = 1.00017.

*GPS OBSERVATIONS ARE BASED ON THE FOLLOWING CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS): TXAN, TXPL.

3. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988. (GEOID 12A). DIGITAL LEVELS WERE APPLIED TO THE NETWORK HOLDING CONTROL POINT NO. 100'S ELEVATION OF 619.34'.

VICINITY MAP: NTS
EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: UPRR
SURVEY DATA: TEXAS SOUTH CENTRAL ZONE #4204 (BEXAR COUNTY)

DESIGN SPEED:	MAINLANE	65 MPH (URBAN)(ROLLING)
	RAMP	50 MPH (URBAN)(ROLLING)
	LOOP	20 MPH (URBAN)(ROLLING)
	FRONTAGE ROAD	45 MPH (URBAN)(ROLLING)
	COLLECTOR DISTRIBUTOR	45 MPH (URBAN)(ROLLING)
	CROSS STREETS	35 MPH (URBAN)(ROLLING)

CURRENT ADT(2020):	50,700
PROJECTED ADT(2040):	70,900
PROJECTED ADT(2050):	79,750
FUNCTIONAL CLASSIFICATION:	URBAN PRINCIPAL ARTERIAL
PROPOSED DESIGN STANDARDS(STRUCTURES):	LRFD
PROPOSED DESIGN STANDARDS(ROADWAY):	TXDOT ROADWAY DESIGN MANUAL CHAPTER 3; 4R,SECTION 6; FREEWAYS
PROPOSED DESIGN STANDARDS(TRAFFIC):	TMUTCD & APPLICABLE TRAFFIC STANDARDS
PLOT SCALE:	1"=100' (HORIZ.) 0' 50' 100' 1"=10' (VERT.) 0' 5' 10'

SUBMITTED:
______________________, 2021
PROJECT MANAGER

RECOMMENDED FOR APPROVAL:
______________________, 2021
DIRECTOR OF TRANSPORTATION, PLANNING AND DEVELOPMENT

CORRECT:
______________________, 2021
TRANSPORTATION PLANNING DIRECTOR

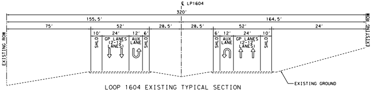
APPROVED:
______________________, 2021
DISTRICT ENGINEER

APPROVED: DESIGN DIVISION LETTER DATED

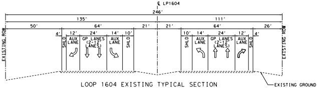
APPROVED: F.H.W.A. LETTER DATED

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES
JMT
TBPE FIRM REG. NO. F-16341
ENGINEER MATTHEW J. WERNER
P.E. NO. 107847 DATE 1/8/2021

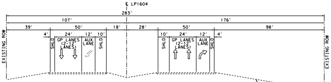
○


℄ LP1604
320'
155.5'
164.5'
75'
52'
28.5'
28.5'
52'
24'
EXISTING ROW
SHLD
GP LANES (2-12' LANES)
AUX LANE
EXISTING GROUND

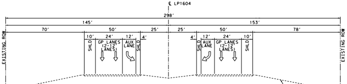
LOOP 1604 EXISTING TYPICAL SECTION
HANNOVER COVE.-LOWER SEGUIN RD.


℄ LP1604
246'
135'
111'
50'
64'
21'
21'
64'
26'
EXISTING ROW
SHLD
GP LANES (2-12' LANES)
AUX LANE
EXISTING GROUND

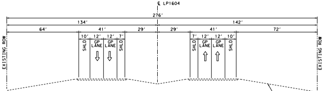
LOOP 1604 EXISTING TYPICAL SECTION
LOWER SEGUIN RD.-WARE SEGUIN RD.


℄ LP1604
283'
107'
176'
39'
50'
18'
28'
50'
98'
EXISTING ROW
SHLD
GP LANES (2-12' LANES)
AUX LANE
EXISTING GROUND

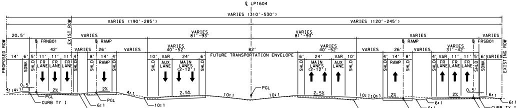
LOOP 1604 EXISTING TYPICAL SECTION
SECTION I-I
WARE SEGUIN RD.-AUTUMN RD.


℄ LP1604
298'
145'
153'
70'
50'
25'
25'
50'
78'
EXISTING ROW
SHLD
GP LANES (2-12' LANES)
AUX LANE
EXISTING GROUND

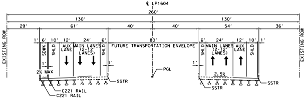
LOOP 1604 EXISTING TYPICAL SECTION
SECTION J-J
AUTUMN RD.- QUIET NIGHT LN.


℄ LP1604
276'
134'
142'
64'
41'
29'
29'
41'
72'
EXISTING ROW
SHLD
GP LANE
EXISTING GROUND

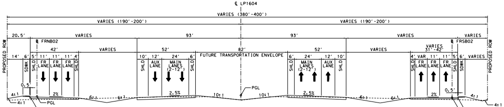
LOOP 1604 EXISTING TYPICAL SECTION
QUIET NIGHT LN.-APROX. 920FT
FROM QUIET NIGHT LN. TOWARDS ℄I10


℄ LP1604
VARIES (310'-530')
VARIES (190'-285')
VARIES (120'-245')
PROPOSED ROW
EXIST. ROW
℄ FRNB01
℄ RAMP
℄ FRSB01
FUTURE TRANSPORTATION ENVELOPE
SDWK
SHLD
FR LANE
RAMP
AUX LANE
MAIN LANES (2-12')
PGL
CURB TY I
EXISTING GROUND
10:1
6:1
4:1
2%
2.5%

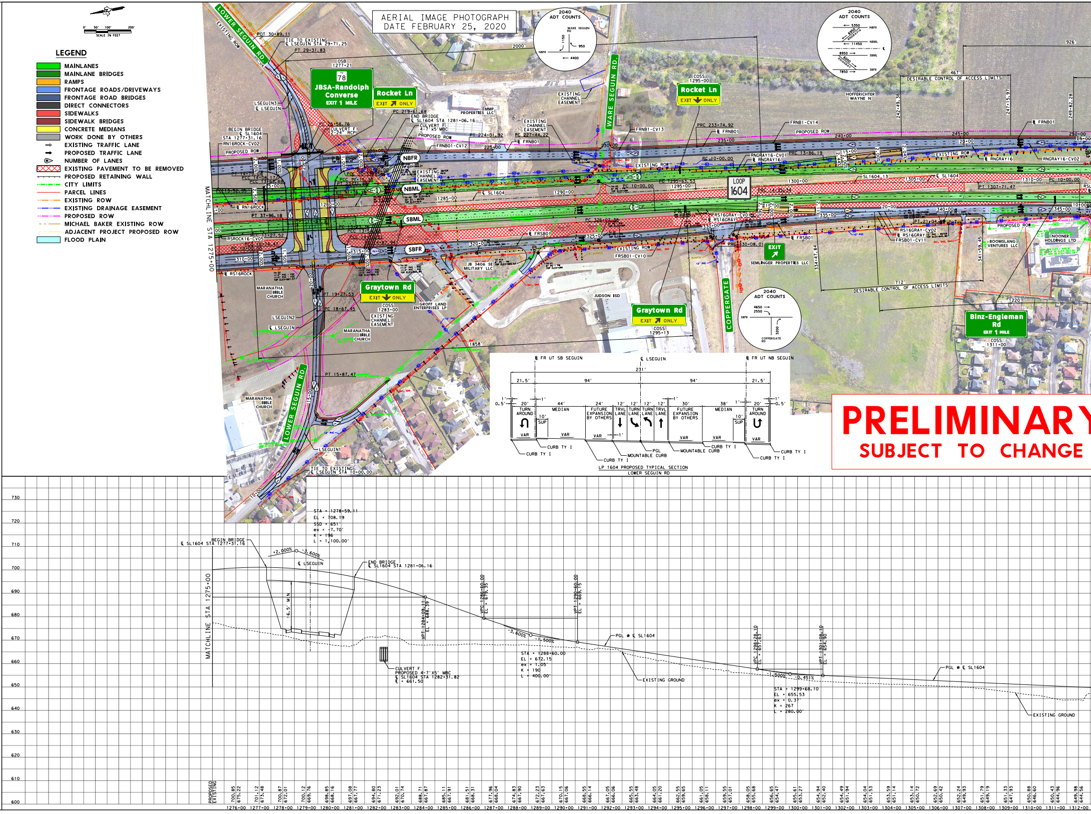
LOOP 1604 PROPOSED TYPICAL SECTION
ROCKET LANE TO SALITRILLO CREEK


℄ LP1604
260'
130'
130'
29'
61'
40'
40'
54'
36'
EXISTING ROW
FUTURE TRANSPORTATION ENVELOPE
SDWK
SHLD
AUX LANE
MAIN LANES (2-12' LANES)
2% MAX
2.5%
PGL
SSTR
C221 RAIL

LOOP 1604 PROPOSED TYPICAL SECTION
SALITRILLO BRIDGE


℄ LP1604
VARIES (380'-400')
VARIES (190'-200')
VARIES (190'-200')
PROPOSED ROW
℄ FRNB02
℄ FRSB02
FUTURE TRANSPORTATION ENVELOPE
SDWK
SHLD
FR LANE
AUX LANE
MAIN LANES (2-12')
PGL
CURB TY I
10:1
6:1
4:1
2%
2.5%

LOOP 1604 PROPOSED TYPICAL SECTION
SALITRILLO CREEK TO I-10 EAST

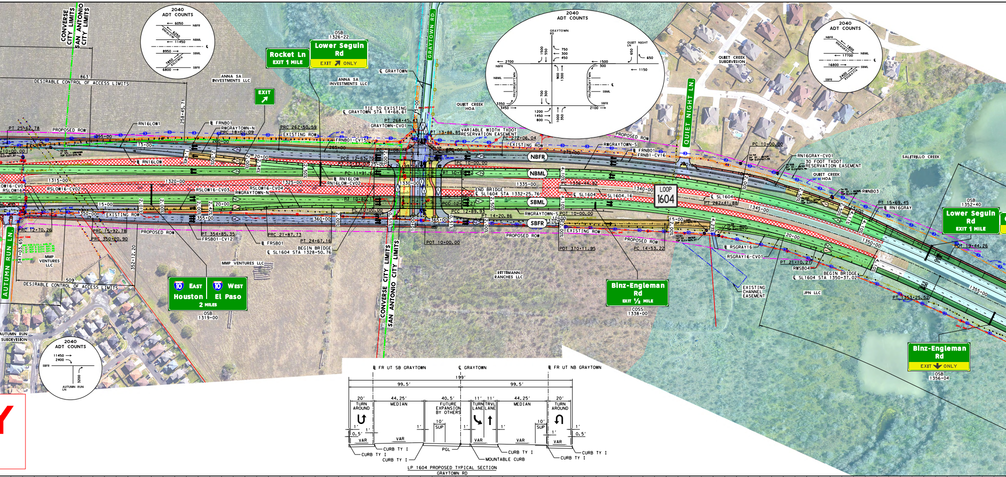

0' 50' 100' 200'
SCALE IN FEET
LOWER SEGUIN RD.
EXISTING ROW
POT 30+89.11
TIE TO EXISTING ℄ LSEGUIN STA 29+71.25
PT 29+31.83
OSB 1277+21
78
JBSA-Randolph Converse
EXIT 1 MILE
Rocket Ln
EXIT ↗ ONLY
LSEGUIN3
℄ LSEGUIN
PC 219+61.68
END BRIDGE ℄ SL1604 STA 1281+06.16
CULVERT F 4-7'x5' MBC
PC 25+58.76
CULVERT F1 2-24" RCP
BEGIN BRIDGE ℄ SL1604 STA 1277+31.16
RN16ROCK-CV02
PROPOSED ROW
MMP PROPERTIES LLC
PT 224+01.92
PC 227+44.22
℄ FRNB01
FRNB01-CV12
225+00
EXISTING CHANNEL EASEMENT
NBFR
NBML
SBML
SBFR
PT 14+79.04
PCC 14+08.17
PCC 13+63.88
PC 13+52.35
℄ RN16ROCK
PT 37+96.18
PCC 11+27.52
RSROCK16-CV05
PCC 10+74.47
PC 10+00.00
℄ RS16ROCK
310+00
315+00
320+00
1280+00
1285+00
1290+00
℄ SL1604
℄ FRSB01
JB 3406 SE MILITARY LLC
MARANATHA BIBLE CHURCH
Graytown Rd
EXIT ↓ ONLY
PT 19+27.53
PC 18+67.45
COSS 1283+00
EXISTING CHANNEL EASEMENT
GROFF LAND ENTERPRISES LP
LSEGUIN2
℄ LSEGUIN
PT 15+87.47
1858'
LOWER SEGUIN RD.
LSEGUIN1
TIE TO EXISTING ℄ LSEGUIN STA 10+00.00
10+00
MATCHLINE STA 1275+00
AERIAL IMAGE PHOTOGRAPH DATE FEBRUARY 25, 2020
2040 ADT COUNTS
WARE SEGUIN RD
1150
950
NBFR
4400
2000'
WARE SEGUIN RD.
COSS 1295+00
Rocket Ln
EXIT ↓ ONLY
EXISTING CHANNEL EASEMENT
FRNB1-CV13
PRC 233+74.92
℄ FRNB01
FRNB1-CV14
PROPOSED ROW
230+00
235+00
240+00
245+00
250+00
EXISTING ROW
PC 10+00.00
RNGRAY16-CV01
℄ RNGRAY16
PRC 13+86.19
15+00
20+00
RNGRAY16-CV02
PC 1295+63.53
PC 10+00.00
1295+00
1300+00
1305+00
1310+00
LOOP 1604
PRC 14+35.34
SL1604_13
PT 1307+71.47
PC 10+00.00
PC 326+07.38
℄ FRSB01
325+00
330+00
335+00
340+00
345+00
RS16GRAY-CV01
℄ RS16GRAY
PRC 330+08.01
EXISTING ROW
FRSB01-CV10
EXIT ↗
SEMLINGER PROPERTIES LLC
PT 21+04.40
RS16GRAY-CV02
℄ RS16GRAY
FRSB01-CV11
℄ FRSB01
PROPOSED ROW
BOOMSLANG VENTURES LLC
NOONER HOLDINGS LTD
2040 ADT COUNTS
5350 NBFR
6950 RNGRAY16
11450 NBML
8950 SBML
6000 RS16GRAY
7850 SBFR
HOFFERICHTER WAYNE N
467'
DESIRABLE CONTROL OF ACCESS LIMITS
926'
242+49.38
247+15.97
249+82.28
334+47.84
341+59.45
712'
DESIRABLE CONTROL OF ACCESS LIMITS
1220'
JUDSON ISD
Graytown Rd
EXIT ↗ ONLY
COSS 1295+13
COPPERGATE
2040 ADT COUNTS
4650
2550
SBFR
3200
COPPERGATE RD
Binz-Engleman Rd
EXIT 1 MILE
COSS 1311+00
℄ FR UT SB SEGUIN
℄ LSEGUIN
℄ FR UT NB SEGUIN
231'
21.5'
94'
94'
21.5'
1'
0.5'
20'
TURN AROUND
1'
44'
MEDIAN
10'
SUP
VAR
VAR
24'
FUTURE EXPANSION BY OTHERS
VAR
1'
12'
TRVL LANE
12'
TURN LANE
12'
TURN LANE
12'
TRVL LANE
1'
30'
FUTURE EXPANSION BY OTHERS
VAR
38'
MEDIAN
10'
SUP
VAR
1'
20'
TURN AROUND
VAR
1'
0.5'
CURB TY I
CURB TY I
CURB TY I
MOUNTABLE CURB
PGL
MOUNTABLE CURB
CURB TY I
CURB TY I
CURB TY I
730
720
710
700
690
680
670
660
650
640
630
620
610
600
MATCHLINE STA 1275+00
BEGIN BRIDGE ℄ SL1604 STA 1277+31.16
+2.000%
-3.600%
℄ LSEGUIN
STA = 1278+59.11
EL = 708.19
SSD = 651'
ex = -7.70'
K = 196
L = 1,100.00'
END BRIDGE ℄ SL1604 STA 1281+06.16
16.5' MIN
CULVERT F
PROPOSED 4-7'X5' MBC
℄ SL1604 STA 1282+31.82
FL = 661.50
VPT 1284+09.11
EL = 688.39
VPC 1286+60.00
EL = 679.35
VPT 1290+60.00
EL = 669.15
-3.600%
-1.500%
STA = 1288+60.00
EL = 672.15
ex = 1.05'
K = 190
L = 400.00'
PGL @ ℄ SL1604
EXISTING GROUND
VPC 1298+28.10
EL = 657.63
VPT 1301+08.10
EL = 654.90
-1.500%
-0.451%
STA = 1299+68.10
EL = 655.53
ex = 0.37'
K = 267
L = 280.00'
PGL @ ℄ SL1604
EXISTING GROUND
PROPOSED
EXISTING
700.85 675.22
701.12 673.48
700.87 672.01
700.12 669.76
698.85 668.16
697.08 667.77
694.80 671.23
692.01 670.74
688.71 667.87
685.11 667.91
681.51 668.31
677.96 668.04
674.83 667.90
672.23 667.63
670.15 667.06
668.55 666.14
667.05 666.06
665.55 663.48
664.05 661.20
662.55 659.65
661.05 658.11
659.55 657.01
658.05 655.68
656.65 654.47
655.61 653.27
654.94 652.40
654.49 651.94
654.04 651.53
653.59 651.14
653.14 650.72
652.69 650.42
652.24 649.93
651.79 649.19
651.33 647.93
650.88 646.60
650.43 644.96
649.98 644.56
1276+00
1277+00
1278+00
1279+00
1280+00
1281+00
1282+00
1283+00
1284+00
1285+00
1286+00
1287+00
1288+00
1289+00
1290+00
1291+00
1292+00
1293+00
1294+00
1295+00
1296+00
1297+00
1298+00
1299+00
1300+00
1301+00
1302+00
1303+00
1304+00
1305+00
1306+00
1307+00
1308+00
1309+00
1310+00
1311+00
1312+00

LEGEND

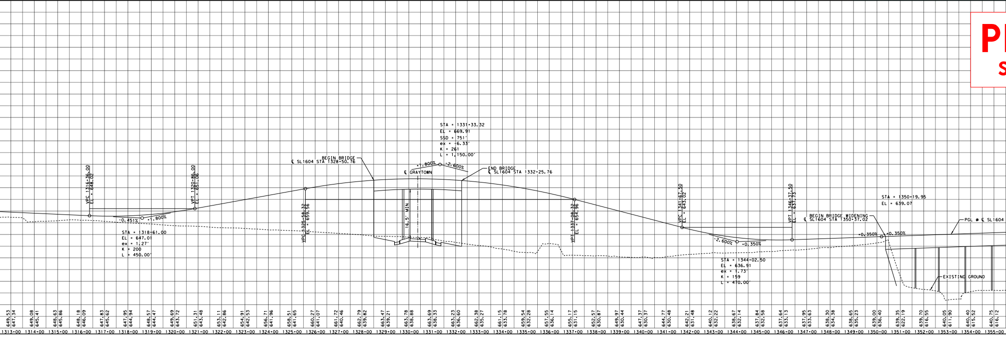
🟩	MAINLANES
🟩	MAINLANE BRIDGES
🟧	RAMPS
🟦	FRONTAGE ROADS/DRIVEWAYS
🟦	FRONTAGE ROAD BRIDGES
⬛	DIRECT CONNECTORS
🟥	SIDEWALKS
🟫	SIDEWALK BRIDGES
🟨	CONCRETE MEDIANS
⬜	WORK DONE BY OTHERS
⇨	EXISTING TRAFFIC LANE
➡	PROPOSED TRAFFIC LANE
◉	NUMBER OF LANES
▨	EXISTING PAVEMENT TO BE REMOVED
—	PROPOSED RETAINING WALL
—	CITY LIMITS
—	PARCEL LINES
—	EXISTING ROW
—	EXISTING DRAINAGE EASEMENT
—	PROPOSED ROW
—	MICHAEL BAKER EXISTING ROW
—	ADJACENT PROJECT PROPOSED ROW
🟦	FLOOD PLAIN

LP 1604 PROPOSED TYPICAL SECTION
LOWER SEGUIN RD

PRELIMINARY
SUBJECT TO CHANGE


2040 ADT COUNTS
6050 NBFR
11450 NBML
8950 SBML
6800 SBFR
CONVERSE CITY LIMITS
SAN ANTONIO CITY LIMITS
DESIRABLE CONTROL OF ACCESS LIMITS
863'
258+45.71
ANNA SA INVESTMENTS LLC
OSB 1326+22
Rocket Ln EXIT 1 MILE
Lower Seguin Rd EXIT ONLY
EXIT
GRAYTOWN RD
℄ GRAYTOWN
TIE TO EXISTING ℄ GRAYTOWN STA 14+68.61
PT 268+45.43
GRAYTOWN-CV01
QUIET CREEK HOA
VARIABLE WIDTH TXDOT RESERVATION EASEMENT
PC 272+06.04
EXISTING ROW
PROPOSED ROW
QUIET NIGHT LN.
QUIET CREEK SUBDIVISION
2040 ADT COUNTS
NBFR NBML SBML SBFR
1800 17700 16800 2400
RN16LOW1
RWGRAYTOWN-N
PRC 18+03.09
FRNB01
FRNB01-CV15
PRC 262+50.59
PT 25+62.78
NBFR
NBML
SBML
SBFR
LOOP 1604
RWGRAYTOWN-S
FRNB01-CV16
PC 10+00.00
RN16GRAY-CV01
30 FOOT TXDOT RESERVATION EASEMENT
QUIET CREEK HOA
SALITRILLO CREEK
RWNB03
PT 15+69.45
RN16GRAY
OSB 1352+40
Lower Seguin Rd EXIT 1 MILE
1315+00
1320+00
1325+00
1330+00
1335+00
1340+00
1345+00
1350+00
1355+00
RN16LOW
RSLOW16-CV02
RSLOW16-CV03
RSLOW16-CV04
RN16LOW-CV02
RWGRAYTOWN-N
END BRIDGE ℄ SL1604 STA 1332+25.76
℄ SL1604
SL1604_16
PT 282+41.88
PCC 12+63.70
PT 11+91.68
PT 10+80.14
PC 10+00.00
PCC 12+89.93
PT 14+20.86
POT 10+00.00
RWGRAYTOWN-S
EXISTING ROW
PROPOSED ROW
POT 370+11.95
PC 14+53.22
RSGRAY16
RSGRAY16-CV01
PT 21+10.27
RWSB04
BEGIN BRIDGE ℄ SL1604 STA 1350+37.02
POT 19+44.26
EXISTING CHANNEL EASEMENT
JPN LLC
PT 353+25.62
360+00
355+00
PT 354+85.35
FRSB01-CV12
PRC 21+87.73
FRSB01
PT 24+67.16
BEGIN BRIDGE ℄ SL1604 STA 1328+50.76
PRC 15+92.78
PRC 350+20.90
347+03.65
352+12.20
509'
MMP VENTURES LLC
AUTUMN RUN LN.
10 East Houston
10 West El Paso
2 MILES
OSB 1319+00
CONVERSE CITY LIMITS
SAN ANTONIO CITY LIMITS
RITTIMANN RANCHES LLC
Binz-Engleman Rd EXIT ½ MILE
COSS 1338+00
Binz-Engleman Rd EXIT ONLY
OSB 1356+04
AUTUMN RUN SUBDIVISION
2040 ADT COUNTS
11450
2400
SBFR
3200
AUTUMN RUN LN
℄ FR UT SB GRAYTOWN
℄ GRAYTOWN
℄ FR UT NB GRAYTOWN
199'
99.5'
99.5'
20' TURN AROUND
44.25' MEDIAN
40.5' FUTURE EXPANSION BY OTHERS
11' TURN LANE
11' TRVL LANE
44.25' MEDIAN
20' TURN AROUND
10' SUP
VAR
CURB TY I
PGL
MOUNTABLE CURB

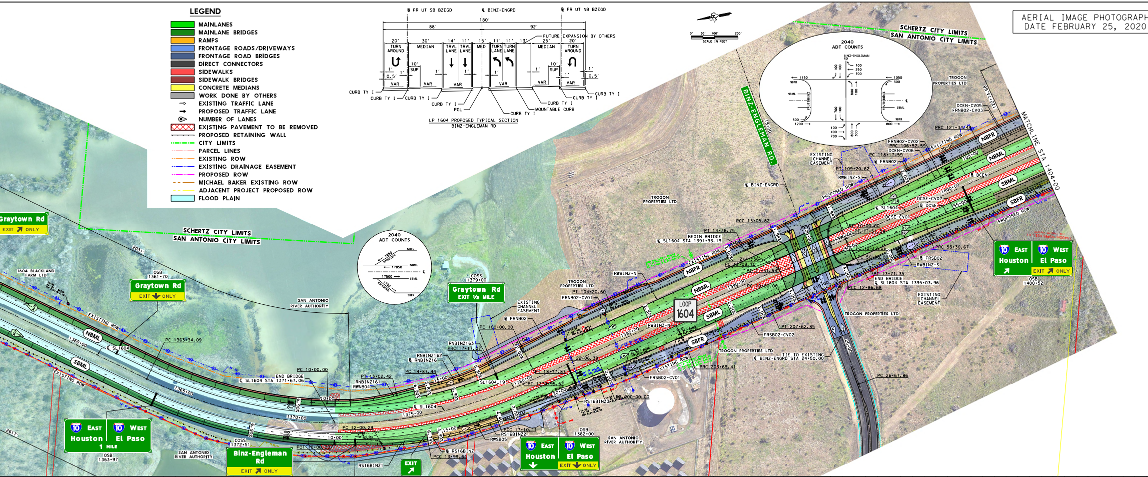
LP 1604 PROPOSED TYPICAL SECTION
GRAYTOWN RD


STA = 1331+33.32
EL = 669.91
SSD = 751'
ex = -6.33'
K = 261
L = 1,150.00'
+1.800%
-2.600%
BEGIN BRIDGE ℄ SL1604 STA 1328+50.76
℄ GRAYTOWN
END BRIDGE ℄ SL1604 STA 1332+25.76
VPC 1316+36.00 EL = 648.02
VPT 1320+86.00 EL = 651.06
-0.451%
+1.800%
STA = 1318+61.00
EL = 647.01
ex = 1.27'
K = 200
L = 450.00'
VPC 1325+58.32 EL = 659.56
16.5' MIN
VPT 1337+08.32 EL = 654.96
VPC 1341+67.50 EL = 643.02
VPT 1346+37.50 EL = 637.73
-2.600%
+0.350%
STA = 1344+02.50
EL = 636.91
ex = 1.73'
K = 159
L = 470.00'
STA = 1350+19.95
EL = 639.07
BEGIN BRIDGE WIDENING ℄ SL1604 STA 1350+37.02
+0.350%
PGL ● ℄ SL1604
EXISTING GROUND
1313+00 1314+00 1315+00 1316+00 1317+00 1318+00 1319+00 1320+00 1321+00 1322+00 1323+00 1324+00 1325+00 1326+00 1327+00 1328+00 1329+00 1330+00 1331+00 1332+00 1333+00 1334+00 1335+00 1336+00 1337+00 1338+00 1339+00 1340+00 1341+00 1342+00 1343+00 1344+00 1345+00 1346+00 1347+00 1348+00 1349+00 1350+00 1351+00 1352+00 1353+00 1354+00 1355+00

AERIAL IMAGE PHOTOGRAPH
DATE FEBRUARY 25, 2020

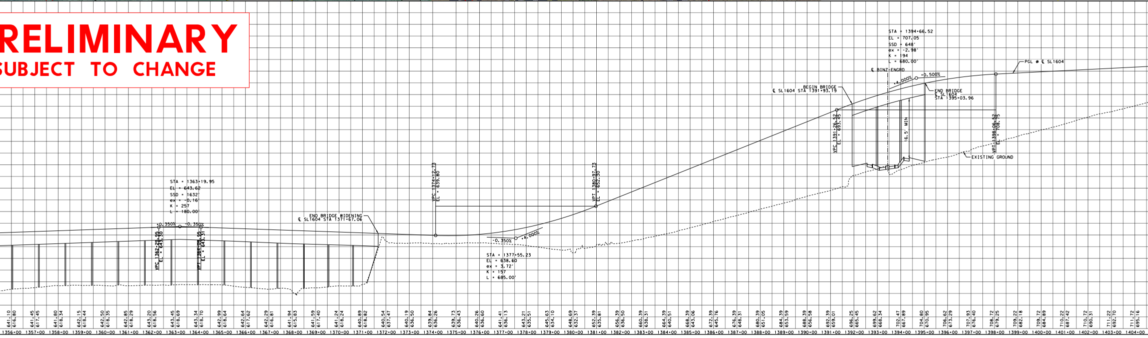
LEGEND

- 🟩 MAINLANES
- 🟩 MAINLANE BRIDGES
- 🟧 RAMPS
- 🟦 FRONTAGE ROADS/DRIVEWAYS
- 🟦 FRONTAGE ROAD BRIDGES
- ⬛ DIRECT CONNECTORS
- 🟥 SIDEWALKS
- 🟫 SIDEWALK BRIDGES
- 🟨 CONCRETE MEDIANS
- ⬜ WORK DONE BY OTHERS
- ⇨ EXISTING TRAFFIC LANE
- ➡ PROPOSED TRAFFIC LANE
- ◉ NUMBER OF LANES
- ▨ EXISTING PAVEMENT TO BE REMOVED
- PROPOSED RETAINING WALL
- CITY LIMITS
- PARCEL LINES
- EXISTING ROW
- EXISTING DRAINAGE EASEMENT
- PROPOSED ROW
- MICHAEL BAKER EXISTING ROW
- ADJACENT PROJECT PROPOSED ROW
- FLOOD PLAIN

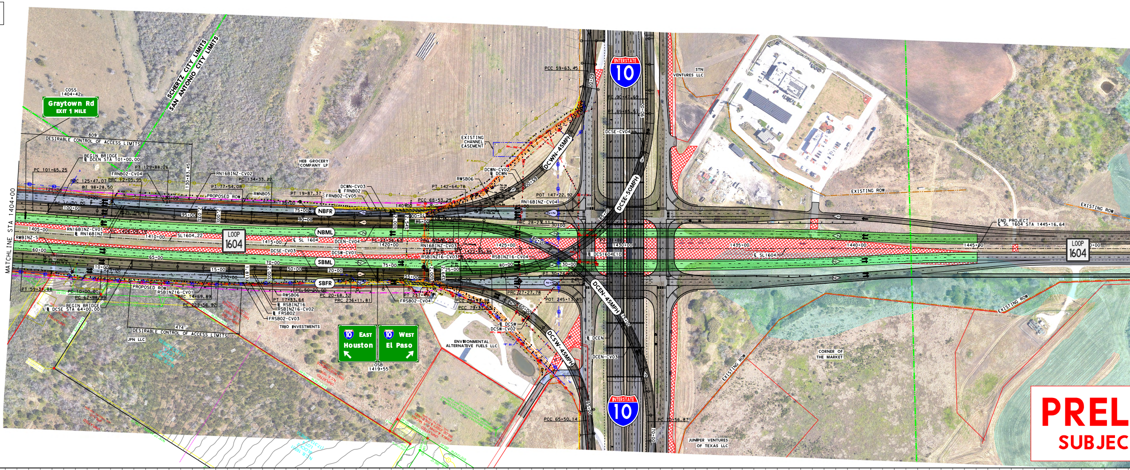


℄ FR UT SB BZEGD
℄ BINZ-ENGRD
℄ FR UT NB BZEGD
180'
88'
92'
20' TURN AROUND
30' MEDIAN
14' TRVL LANE
11' TRVL LANE
15' MED
11' TURN LANE
11' TURN LANE
13'
25' MEDIAN
20' TURN AROUND
FUTURE EXPANSION BY OTHERS
10' SUP
VAR
1'
0.5'
CURB TY I
PGL
MOUNTABLE CURB
LP 1604 PROPOSED TYPICAL SECTION
BINZ-ENGLEMAN RD
0' 50' 100' 200'
SCALE IN FEET
SCHERTZ CITY LIMITS
SAN ANTONIO CITY LIMITS
2040 ADT COUNTS
BINZ-ENGLEMAN RD
NBFR
NBML
SBML
SBFR
1150
1050
1200
500
800
17850
17500
1650
1700
BINZ-ENGLEMAN RD
MATCHLINE STA 1404+00
TROGON PROPERTIES LTD
EXISTING CHANNEL EASEMENT
SAN ANTONIO RIVER AUTHORITY
1604 BLACKLAND FARM LTD
Graytown Rd
EXIT ONLY
Graytown Rd
EXIT 1/2 MILE
Binz-Engleman Rd
EXIT ONLY
10 East Houston
10 West El Paso
1 MILE
EXIT
LOOP 1604
NBFR
NBML
SBML
SBFR
EXISTING ROW
PROPOSED ROW
℄ SL1604
℄ BINZ-ENGRD
BEGIN BRIDGE
℄ SL1604 STA 1391+93.19
END BRIDGE
℄ SL1604 STA 1395+03.96
END BRIDGE
℄ SL1604 STA 1371+67.06
OSB 1361+70
OSB 1363+97
COSS 1372+51
COSS 1379+00
OSB 1382+00
OSB 1400+52
PC 1363+34.09
PC 10+00.00
PC 14+87.44
PT 13+02.42
PC 12+00.29
PCC 13+99.34
PCC 17+10.11
PT 18+77.87
PT 14+36.75
PCC 13+05.82
PC 12+08.70
PT 12+41.56
PRC 121+34.97
PC 118+17.59
PRC 106+52.59
PT 109+20.62
PC 104+20.60
PRC 53+30.67
PT 13+71.35
PCC 12+86.68
PT 207+62.85
PRC 203+69.41
PC 26+67.86
TIE TO EXISTING
℄ BINZ-ENGRD STA 24+50.00
FRNB02
FRNB02-CV01
FRNB02-CV02
FRSB02
FRSB02-CV01
FRSB02-CV02
DCEN-CV03
DCEN-CV05
DCEN-CV06
DCSE-CV01
DCSE-CV02
RNBINZ16
RNBINZ161
RNBINZ162
RNBINZ163
RWNB04
RSBINZ1
RSBINZ2
RS16BINZ
RWSB05
RWBINZ-N
RWBINZ-S
SL1604_19

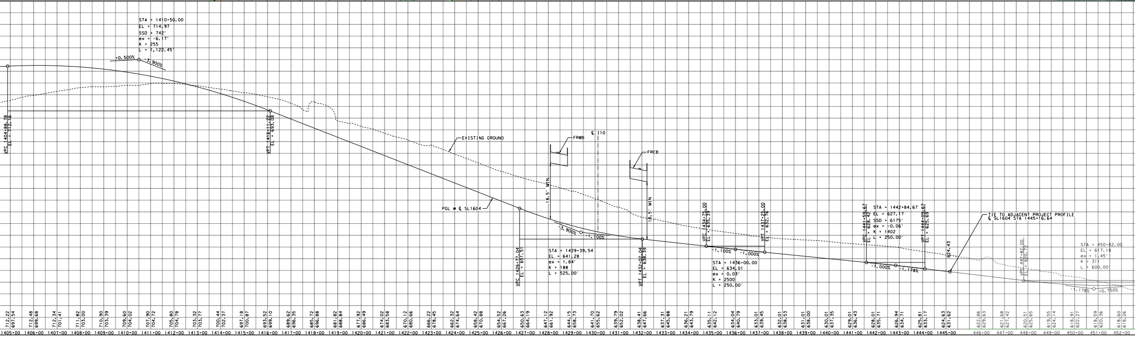
RELIMINARY
SUBJECT TO CHANGE

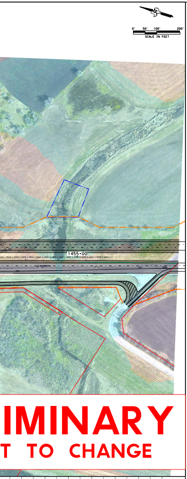


STA = 1394+66.52
EL = 707.05
SSD = 648'
ex = -2.98'
K = 194
L = 680.00'
PGL @ ℄ SL1604
℄ BINZ-ENGRD
+4.000%
+0.500%
BEGIN BRIDGE
℄ SL1604 STA 1391+93.19
END BRIDGE
℄ SL1604
STA 1395+03.96
VPC 1391+26.52
EL = 693.45
16.5' MIN
VPT 1398+06.52
EL = 708.75
EXISTING GROUND
STA = 1363+19.95
EL = 643.62
SSD = 1632'
ex = -0.16'
K = 257
L = 180.00'
+0.350%
-0.350%
VPC 1362+29.95
EL = 643.30
VPT 1364+09.95
EL = 643.31
END BRIDGE WIDENING
℄ SL1604 STA 1371+67.06
VPC 1374+12.73
EL = 639.80
VPT 1380+97.73
EL = 652.30
-0.350%
+4.000%
STA = 1377+55.23
EL = 638.60
ex = 3.72'
K = 157
L = 685.00'
641.10 616.80
641.45 617.45
641.80 618.34
642.15 618.44
642.50 618.35
642.85 618.29
643.20 618.56
643.45 618.69
643.34 618.70
642.99 618.64
642.64 617.62
642.29 616.81
641.94 615.83
641.59 617.40
641.24 618.24
640.89 618.82
640.54 637.47
640.19 636.50
639.84 636.26
639.73 636.43
640.26 636.60
641.41 636.13
643.21 635.51
645.63 634.10
648.69 632.37
652.39 635.81
656.39 636.50
660.39 638.31
664.39 640.51
668.39 643.06
672.39 645.76
676.39 648.31
680.39 651.05
684.39 653.59
688.39 656.58
692.39 659.01
696.25 665.45
699.62 668.34
702.47 667.89
704.80 670.95
706.62 673.29
707.93 676.40
708.72 679.25
709.22 682.18
709.72 684.89
710.22 687.42
710.72 690.31
711.22 692.70
711.72 695.16
1356+00 1357+00 1358+00 1359+00 1360+00 1361+00 1362+00 1363+00 1364+00 1365+00 1366+00 1367+00 1368+00 1369+00 1370+00 1371+00 1372+00 1373+00 1374+00 1375+00 1376+00 1377+00 1378+00 1379+00 1380+00 1381+00 1382+00 1383+00 1384+00 1385+00 1386+00 1387+00 1388+00 1389+00 1390+00 1391+00 1392+00 1393+00 1394+00 1395+00 1396+00 1397+00 1398+00 1399+00 1400+00 1401+00 1402+00 1403+00 1404+00

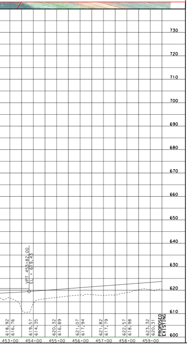

MATCHLINE STA 1404+00
Graytown Rd
EXIT 1 MILE
COSS 1404+42
SCHERTZ CITY LIMITS
SAN ANTONIO CITY LIMITS
809'
DESIRABLE CONTROL OF ACCESS LIMITS
BEGIN BRIDGE
℄ DCEN STA 101+00.00
PT 129+88.26
PC 101+65.25
PRC 125+47.07
PRC 12+05.95
PT 98+28.50
FRNB02-CV04
RN16BINZ-CV02
PC 134+33.22
PT 77+54.08
PROPOSED ROW
RWNB05
HEB GROCERY COMPANY LP
PT 19+87.37
DCWN-CV03
℄ FRNB02
FRNB02-CV05
PT 142+64.78
PCC 68+53.29
RWSB06
DCWN-CV02
℄ DCWN
EXISTING CHANNEL EASEMENT
DCWN-45MPH
DCSE-50MPH
PCC 59+63.45
PC 90+47.69
PT 89+65.81
DCSE-CV04
STN VENTURES LLC
POT 147+22.92
RN16BINZ-CV04
EXISTING ROW
END PROJECT
℄ SL 1604 STA 1445+16.64
EXISTING ROW
NBFR
NBML
SBML
SBFR
LOOP 1604
RN16BINZ-CV01
℄ RN16BINZ
SL1604_22
℄ SL 1604
DCEN-CV04
DCSE-CV03
DCSW-CV01
RN16BINZ-CV03
RSBINZ16-CV03
RSBINZ16-CV04
℄ DCS1604E10
℄ SL1604
RWBINZ-S
PT 59+36.88
PC 10+00.00
PC 62+98.99
BEGIN BRIDGE
℄ DCSE STA 64+00.00
PROPOSED ROW
RSBINZ16-CV01
PRC 14+69.89
PC 229+56.92
PT 17+33.64
RWSB06
℄ RSBINZ16
RSBINZ16-CV02
℄ FRSB02
FRSB02-CV03
PC 20+68.32
PRC 236+11.81
PT 237+49.61
FRSB02-CV04
PRC 27+27.78
POT 245+13.85
TRIO INVESTMENTS
474'
DESIRABLE CONTROL OF ACCESS LIMITS
JPN LLC
10 East Houston
10 West El Paso
OSB 1419+55
ENVIRONMENTAL ALTERNATIVE FUELS LLC
℄ DCSW
DCSW-CV02
DCSW-45MPH
DCEN-45MPH
℄ DCEN
DCEN-CV03
PCC 65+50.14
PCC 79+56.87
CORNER OF THE MARKET
EXISTING ROW
JUNIPER VENTURES OF TEXAS LLC
INTERSTATE 10

PREL
SUBJEC




0'
50'
100'
200'
SCALE IN FEET
1455+00

IMINARY
T TO CHANGE



CURVE AND COORDINATE DATA

CURVE DATA

CURVE COORDINATE DATA

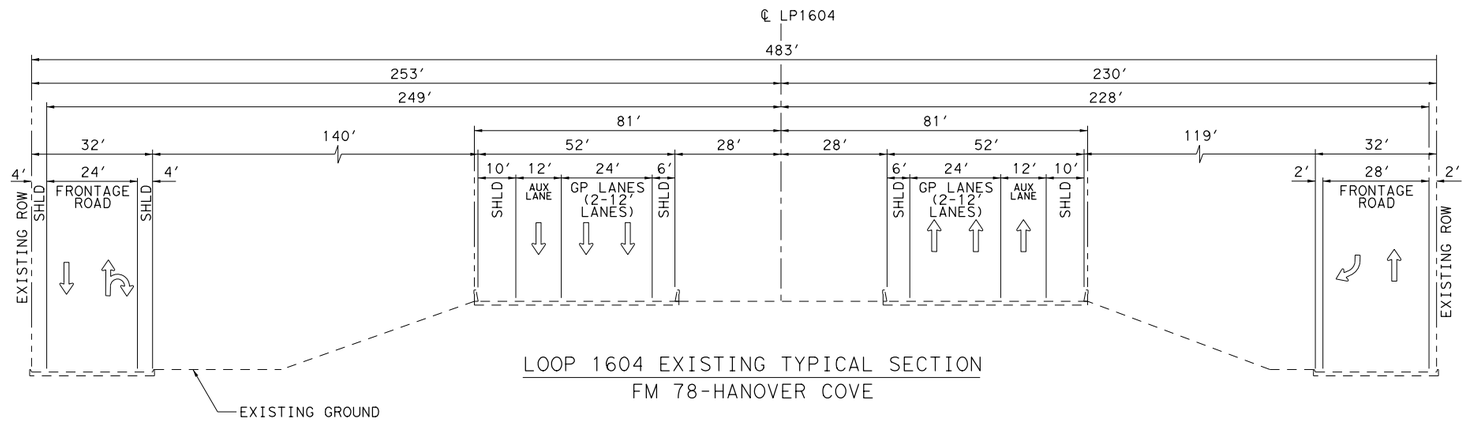
ALIGNMENT NO.	CURVE NO.	PC STATION	PI STATION	PT STATION	DELTA	D	L	T	R	e(%)	PC COORDINATE		PI COORDINATE		PT COORDINATE		BEARING	
											"X"	"Y"	"X"	"Y"	"X"	"Y"	BACK	AHEAD
SL1604			1140+00.00										2,189,713.3549	13,746,455.5527				S 35° 21′ 20.33" E
	SL1604_3	1144+60.80	1149+95.62	1155+29.81	4° 51′ 40.00" RT	0° 27′ 17.02"	1,069.01′	534.83′	12,600.00′		2,189,979.9952	13,746,079.7377	2,190,289.4734	13,745,643.5449	2,190,560.8751	13,745,182.6957	S 35° 21′ 20.33" E	S 30° 29′ 40.33" E
	SL1604_6	1185+70.03	1191+38.97	1197+07.13	5° 10′ 14.68" LT	0° 27′ 17.02"	1,137.11′	568.94′	12,600.00′		2,192,103.6516	13,742,563.0098	2,192,392.3633	13,742,072.7678	2,192,724.0827	13,741,610.5406	S 30° 29′ 40.33" E	S 35° 39′ 55.01" E
	SL1604_7	1197+07.13	1202+53.55	1207+99.27	4° 57′ 58.60" RT	0° 27′ 17.02"	1,092.14′	546.41′	12,600.00′		2,192,724.0827	13,741,610.5406	2,193,042.6682	13,741,166.6145	2,193,321.6273	13,740,696.7752	S 35° 39′ 55.01" E	S 30° 41′ 56.41" E
	SL1604_10	1245+41.62	1255+17.03	1264+18.81	38° 24′ 45.62" RT	2° 02′ 46.60"	1,877.20′	975.41′	2,800.00′		2,195,232.1970	13,737,478.8813	2,195,730.1713	13,736,640.1638	2,195,599.2491	13,735,673.5797	S 30° 41′ 56.41" E	S 7° 42′ 49.22" W
	SL1604_13	1295+63.53	1301+67.68	1307+71.47	3° 27′ 37.78" RT	0° 17′ 11.32"	1,207.94′	604.15′	20,000.00′		2,195,177.1575	13,732,557.3229	2,195,096.0664	13,731,958.6359	2,194,978.9862	13,731,365.9353	S 7° 42′ 49.22" W	S 11° 10′ 27.00" W
	SL1604_16	1336+44.92	1344+99.04	1353+25.52	25° 12′ 32.59" RT	1° 30′ 00.00"	1,680.60′	854.13′	3,819.72′		2,194,422.1338	13,728,546.9549	2,194,256.6112	13,727,709.0217	2,193,749.9586	13,727,021.3932	S 11° 10′ 27.00" W	S 36° 22′ 59.59" W
	SL1604_19	1363+34.09	1372+21.55	1379+95.62	49° 50′ 44.92" LT	3° 00′ 00.00"	1,661.53′	887.46′	1,909.86′		2,193,151.6912	13,726,209.4253	2,192,625.2676	13,725,494.9638	2,192,831.8765	13,724,631.8937	S 36° 22′ 59.59" W	S 13° 27′ 45.33" E
	SL1604_22	1408+09.19	1415+47.78	1422+85.86	3° 41′ 30.00" LT	0° 15′ 00.00"	1,476.67′	738.59′	22,918.31′		2,193,486.9059	13,721,895.6314	2,193,658.8571	13,721,177.3374	2,193,876.7004	13,720,471.6053	S 13° 27′ 45.33" E	S 17° 09′ 15.33" E
			1481+60.61										2,195,609.4310	13,714,858.1973				
FM1976			40+00.00										2,188,470.5074	13,742,018.7855				N 35° 23′ 55.18" E
	FM1976-CV01	58+99.21	62+19.71	65+24.24	31° 15′ 04.39" RT	4° 59′ 59.93"	625.03′	320.50′	1,145.92′		2,189,570.6478	13,743,566.9100	2,189,756.3007	13,743,828.1618	2,190,050.5506	13,743,955.1911	N 35° 23′ 55.18" E	N 66° 38′ 59.57" E
	FM1976-CV02	67+06.34	70+24.13	73+26.34	30° 59′ 59.57" LT	4° 59′ 59.93"	620.00′	317.79′	1,145.92′		2,190,217.7396	13,744,027.3675	2,190,509.5030	13,744,153.3234	2,190,694.7216	13,744,411.5575	N 66° 38′ 59.57" E	N 35° 39′ 00.00" E
			80+60.79										2,191,122.7817	13,745,008.3645				
FM78			444+00.00										2,190,101.9111	13,743,157.6282				N 35° 22′ 38.08" E
	FM781	461+99.11	462+88.74	463+78.30	3° 40′ 00.00" LT	2° 02′ 46.60"	179.19′	89.62′	2,800.00′		2,191,143.5218	13,744,624.5503	2,191,195.4104	13,744,697.6261	2,191,242.5194	13,744,773.8706	N 35° 22′ 38.08" E	N 31° 42′ 38.08" E
	FM782	467+86.47	468+74.22	469+61.90	3° 35′ 23.48" RT	2° 02′ 46.60"	175.43′	87.75′	2,800.00′		2,191,457.0650	13,745,121.1061	2,191,503.1865	13,745,195.7524	2,191,553.8915	13,745,267.3644	N 31° 42′ 38.08" E	N 35° 18′ 01.57" E
			477+00.40										2,191,980.6387	13,745,870.0715				
ROCKET			7+31.49										2,190,934.4531	13,735,358.8643				N 60° 04′ 31.07" E
	ROCKET1	10+40.84	10+47.54	10+54.24	1° 00′ 24.81" RT	7° 31′ 08.87"	13.39′	6.70′	762.00′		2,191,202.5648	13,735,513.1891	2,191,208.3678	13,735,516.5294	2,191,214.2287	13,735,519.7671	N 60° 04′ 31.07" E	N 61° 04′ 55.88" E
			12+27.37										2,191,365.7792	13,735,603.4890				N 60° 36′ 55.60" E
			13+41.94										2,191,465.6079	13,735,659.7041				N 60° 36′ 07.05" E
			15+00.00										2,191,603.3111	13,735,737.2897				N 60° 11′ 30.19" E
	ROCKET2	20+78.56	21+05.98	21+33.39	1° 34′ 14.70" RT	2° 51′ 53.24"	54.83′	27.42′	2,000.00′		2,192,105.3299	13,736,024.8949	2,192,129.1190	13,736,038.5236	2,192,153.2727	13,736,051.4951	N 60° 11′ 30.19" E	N 61° 45′ 44.89" E
	ROCKET3	23+70.34	24+07.56	24+44.78	2° 07′ 57.48" LT	2° 51′ 53.24"	74.44′	37.23′	2,000.00′		2,192,362.0181	13,736,163.5995	2,192,394.8138	13,736,181.2121	2,192,426.9313	13,736,200.0328	N 61° 45′ 44.89" E	N 59° 37′ 47.41" E
	ROCKET4	26+27.73	26+91.65	27+55.53	3° 39′ 39.93" LT	2° 51′ 53.24"	127.80′	63.92′	2,000.00′		2,192,584.7802	13,736,292.5318	2,192,639.9288	13,736,324.8487	2,192,692.9013	13,736,360.6211	N 59° 37′ 47.41" E	N 55° 58′ 07.47" E
	ROCKET5	28+68.12	29+26.47	29+84.78	3° 20′ 31.10" RT	2° 51′ 53.24"	116.66′	58.34′	2,000.00′		2,192,786.2073	13,736,423.6309	2,192,834.5597	13,736,456.2834	2,192,884.7334	13,736,486.0617	N 55° 58′ 07.47" E	N 59° 18′ 38.58" E
			38+28.77										2,193,610.5271	13,736,916.8228				N 58° 48′ 38.58" E
			40+57.96										2,193,806.5868	13,737,035.5107				N 59° 00′ 28.06" E
			52+22.84										2,194,805.1688	13,737,635.3345				N 59° 00′ 28.05" E
	ROCKET6	52+39.14	52+76.47	53+13.50	12° 47′ 35.54" RT	17° 12′ 21.38"	74.35′	37.33′	333.00′		2,194,819.1405	13,737,643.7269	2,194,851.1429	13,737,662.9500	2,194,886.6074	13,737,674.6094	N 59° 00′ 28.05" E	N 71° 48′ 03.59" E
	ROCKET7	58+59.95	59+02.51	59+44.62	14° 34′ 04.02" RT	17° 12′ 21.38"	84.67′	42.56′	333.00′		2,195,405.7274	13,737,845.2774	2,195,446.1614	13,737,858.5706	2,195,488.6391	13,737,861.2663	N 71° 48′ 03.59" E	N 86° 22′ 07.61" E
LSEGUIN	LSEGUIN1	10+00.00	13+12.28	15+87.47	48° 05′ 06.34" LT	8° 11′ 06.40"	587.47′	312.28′	700.00′		2,194,229.5251	13,734,635.1532	2,194,385.9678	13,734,364.8821	2,194,691.5946	13,734,300.7490	S 30° 03′ 49.77" E	S 78° 08′ 56.11" E
	LSEGUIN2	18+67.45	18+97.51	19+27.53	4° 55′ 02.73" LT	8° 11′ 06.40"	60.08′	30.06′	700.00′		2,194,965.6082	13,734,243.2495	2,194,995.0248	13,734,237.0767	2,195,024.8623	13,734,233.4482	S 78° 08′ 56.11" E	S 83° 03′ 58.84" E
	LSEGUIN3	25+58.76	27+52.25	29+31.83	37° 29′ 59.62" LT	10° 03′ 06.81"	373.06′	193.49′	570.00′		2,195,651.4784	13,734,157.2458	2,195,843.5517	13,734,133.8879	2,196,010.1532	13,734,232.2834	S 83° 03′ 58.84" E	N 59° 26′ 01.54" E
			30+89.11										2,196,145.5837	13,734,312.2691				
GRAYTOWN			10+00.00										2,194,381.2614	13,729,173.4120				S 78° 49′ 33.00" E
	GRAYTOWN1	13+08.74	13+48.82	13+88.85	4° 22′ 16.23" RT	5° 27′ 24.27"	80.11′	40.07′	1,050.00′		2,194,684.1512	13,729,113.5802	2,194,723.4639	13,729,105.8145	2,194,762.0705	13,729,095.0750	S 78° 49′ 33.00" E	S 74° 27′ 16.77" E
			27+30.76										2,196,054.8948	13,728,735.4411				
BINZ-ENGRD			10+00.00										2,194,210.4869	13,723,497.2601				S 80° 34′ 24.95" W
	BINZ-ENGRD_3	26+67.86	31+52.89	35+39.91	62° 27′ 19.63" RT	7° 09′ 43.10"	872.04′	485.03′	800.00′		2,192,565.1436	13,723,224.0962	2,192,086.6665	13,723,144.6583	2,191,794.9667	13,723,532.1656	S 80° 34′ 24.95" W	N 36° 58′ 15.43" W
	BINZ-ENGRD_6	40+43.26	43+01.36	45+40.42	37° 58′ 50.40" LT	7° 38′ 21.97"	497.17′	258.10′	750.00′		2,191,492.2471	13,723,934.3121	2,191,337.0206	13,724,140.5220	2,191,087.7676	13,724,207.5348	N 36° 58′ 15.43" W	N 74° 57′ 05.83" W
	BINZ-ENGRD_9	48+38.72	48+90.42	49+41.96	7° 53′ 12.18" RT	7° 38′ 21.97"	103.24′	51.70′	750.00′		2,190,799.6974	13,724,284.9837	2,190,749.7702	13,724,298.4069	2,190,702.1572	13,724,318.5538	N 74° 57′ 05.83" W	N 67° 03′ 53.65" W
	BINZ-ENGRD_12	51+51.78	52+03.50	52+55.06	7° 53′ 24.59" LT	7° 38′ 21.97"	103.28′	51.72′	750.00′		2,190,508.9263	13,724,400.3172	2,190,461.2923	13,724,420.4730	2,190,411.3425	13,724,433.8990	N 67° 03′ 53.65" W	N 74° 57′ 18.24" W
	BINZ-ENGRD_15	59+45.16	59+47.34	59+49.52	0° 05′ 59.44" LT	2° 17′ 30.58"	4.36′	2.18′	2,500.00′		2,189,744.8964	13,724,613.0330	2,189,742.7928	13,724,613.5984	2,189,740.6882	13,724,614.1602	N 74° 57′ 18.24" W	N 75° 03′ 17.68" W
	BINZ-ENGRD_18	66+57.05	68+96.74	71+21.04	35° 26′ 45.15" RT	7° 38′ 21.97"	463.99′	239.69′	750.00′		2,189,057.0848	13,724,796.6292	2,188,825.5061	13,724,858.4426	2,188,672.6952	13,725,043.1001	N 75° 03′ 17.68" W	N 39° 36′ 32.53" W
	BINZ-ENGRD_21	76+14.83	78+58.66	80+86.32	36° 01′ 07.20" LT	7° 38′ 21.97"	471.48′	243.82′	750.00′		2,188,357.8793	13,725,423.5249	2,188,202.4299	13,725,611.3706	2,187,966.2359	13,725,671.8932	N 39° 36′ 32.53" W	N 75° 37′ 39.74" W
			85+19.11										2,187,546.9864	13,725,779.3221				
FRNBCONN01	FRNBCONN01-1	100+00.00	101+49.18	102+97.79	8° 31′ 54.67" RT	2° 51′ 54.31"	297.79′	149.18′	2,000.00′		2,190,233.9188	13,745,984.0577	2,190,326.5135	13,745,867.0864	2,190,400.7297	13,745,737.6723	S 38° 21′ 54.68" E	S 29° 50′ 00.01" E
	FRNBCONN01-2	102+97.79	103+52.60	104+07.42	0° 39′ 40.32" LT	0° 36′ 11.22"	109.63′	54.82′	9,500.00′		2,190,400.7297	13,745,737.6723	2,190,427.9995	13,745,690.1206	2,190,455.8163	13,745,642.8867	S 29° 50′ 00.01" E	S 30° 29′ 40.33" E
	FRNBCONN01-3	122+96.68	125+00.48	127+04.21	2° 27′ 28.39" LT	0° 36′ 11.22"	407.53′	203.80′	9,500.00′		2,191,414.5358	13,744,014.9492	2,191,517.9542	13,743,839.3413	2,191,628.8083	13,743,668.3301	S 30° 29′ 40.33" E	S 32° 57′ 08.72" E
	FRNBCONN01-4	127+04.21	129+36.12	131+67.94	2° 47′ 48.56" RT	0° 36′ 11.22"	463.73′	231.91′	9,500.00′		2,191,628.8083	13,743,668.3301	2,191,754.9547	13,743,473.7281	2,191,871.4554	13,743,273.2027	S 32° 57′ 08.72" E	S 30° 09′ 20.16" E
FRSBCONN01	FRSBCONN01-CV01	100+00.00	100+44.73	100+89.45	2° 33′ 45.21" LT	2° 51′ 53.24"	89.45′	44.73′	2,000.00′		2,190,168.7660	13,745,508.5792	2,190,191.4658	13,745,470.0342	2,190,215.8663	13,745,432.5426	S 30° 29′ 40.33" E	S 33° 03′ 25.54" E
	FRSBCONN01-CV02	100+89.45	101+34.18	101+78.90	2° 33′ 45.21" RT	2° 51′ 53.24"	89.45′	44.73′	2,000.00′		2,190,215.8663	13,745,432.5426	2,190,240.2667	13,745,395.0510	2,190,262.9666	13,745,356.5060	S 33° 03′ 25.54" E	S 30° 29′ 40.33" E
	FRSBCONN01-CV03	104+03.26	104+60.74	105+18.18	3° 17′ 31.83" LT	2° 51′ 53.24"	114.92′	57.48′	2,000.00′		2,190,376.8209	13,745,163.1776	2,190,405.9869	13,745,113.6526	2,190,437.9490	13,745,065.8843	S 30° 29′ 40.33" E	S 33° 47′ 12.16" E
	FRSBCONN01-CV04	108+23.99	109+04.74	109+85.45	3° 17′ 31.83" RT	2° 02′ 20.38"	161.46′	80.75′	2,810.00′		2,190,608.0104	13,744,811.7221	2,190,652.9171	13,744,744.6076	2,190,693.8955	13,744,675.0250	S 33° 47′ 12.16" E	S 30° 29′ 40.33" E
	FRSBCONN01-CV05	115+78.47	116+06.93	116+35.38	1° 09′ 37.91" RT	2° 02′ 20.38"	56.92′	28.46′	2,810.00′		2,190,994.8243	13,744,164.0378	2,191,009.2662	13,744,139.5150	2,191,023.2084	13,744,114.7047	S 30° 29′ 40.33" E	S 29° 20′ 02.43" E
	FRSBCONN01-CV06	120+98.90	122+00.66	123+02.24	5° 49′ 31.30" RT	2° 51′ 53.24"	203.34′	101.76′	2,000.00′		2,191,250.2838	13,743,710.6233	2,191,300.1358	13,743,621.9116	2,191,340.7263	13,743,528.5982	S 29° 20′ 02.43" E	S 23° 30′ 31.13" E
	FRSBCONN01-CV07	123+02.24	124+21.57	125+40.62	6° 49′ 45.02" LT	2° 51′ 53.24"	238.38′	119.33′	2,000.00′		2,191,340.7263	13,743,528.5982	2,191,388.3267	13,743,419.1700	2,191,448.6014	13,743,316.1783	S 23° 30′ 31.13" E	S 30° 20′ 16.15" E
FRNB01			100+00.00										2,191,121.4573	13,744,593.4765				S 54° 37′ 21.92" E
	FRNB01-CV01	100+50.49	100+73.66	100+96.12	24° 25′ 51.52" RT	53° 32′ 50.85"	45.62′	23.16′	107.00′		2,191,162.6279	13,744,564.2426	2,191,181.5153	13,744,550.8314	2,191,193.1646	13,744,530.8092	S 54° 37′ 21.92" E	S 30° 11′ 30.40" E
	FRNB01-CV02	107+36.29	108+30.05	109+23.56	7° 09′ 10.65" RT	3° 49′ 10.99"	187.26′	93.75′	1,500.00′		2,191,515.1064	13,743,977.4753	2,191,562.2548	13,743,896.4395	2,191,598.9457	13,743,810.1635	S 30° 11′ 30.40" E	S 23° 02′ 19.75" E
	FRNB01-CV03	109+23.56	111+10.12	112+96.19	7° 07′ 00.41" LT	1° 54′ 35.49"	372.63′	186.56′	3,000.00′		2,191,598.9457	13,743,810.1635	2,191,671.9556	13,743,638.4865	2,191,765.6724	13,743,477.1775	S 23° 02′ 19.75" E	S 30° 09′ 20.16" E
	FRNB01-CV04	120+70.34	124+09.28	127+48.01	3° 29′ 52.68" LT	0° 30′ 58.24"	677.67′	338.94′	11,100.00′		2,192,154.5673	13,742,807.7966	2,192,324.8331	13,742,514.7285	2,192,512.6628	13,742,232.5948	S 30° 09′ 20.16" E	S 33° 39′ 12.85" E
	FRNB01-CV05	127+48.01	129+95.88	132+43.60	3° 31′ 22.64" RT	0° 42′ 39.12"	495.59′	247.87′	8,060.00′		2,192,512.6628	13,742,232.5948	2,192,650.0256	13,742,026.2658	2,192,774.4503	13,741,811.8860	S 33° 39′ 12.85" E	S 30° 07′ 50.21" E
	FRNB01-CV06	134+43.60	137+99.85	141+55.86	3° 40′ 35.53" LT	0° 30′ 58.24"	712.26′	356.25′	11,100.00′		2,192,874.8449	13,741,638.9094	2,193,053.6742	13,741,330.7922	2,193,251.8930	13,741,034.7764	S 30° 07′ 50.21" E	S 33° 48′ 25.74" E
	FRNB01-CV07	147+20.13	149+34.27	151+48.31	3° 02′ 37.56" RT	0° 42′ 39.12"	428.18′	214.14′	8,060.00′		2,193,565.8545	13,740,565.9130	2,193,685.0013	13,740,387.9817	2,193,794.5321	13,740,203.9748	S 33° 48′ 25.74" E	S 30° 45′ 48.18" E
	FRNB01-CV08	163+45.81	165+79.65	168+13.43	2° 24′ 49.54" LT	0° 30′ 58.24"	467.62′	233.85′	11,100.00′		2,194,407.0450	13,739,174.9803	2,194,526.6554	13,738,974.0401	2,194,654.6224	13,738,778.3156	S 30° 45′ 48.18" E	S 33° 10′ 37.72" E
	FRNB01-CV09	168+13.43	169+83.23	171+52.98	2° 24′ 49.54" RT	0° 42′ 39.12"	339.55′	169.80′	8,060.00′		2,194,654.6224	13,738,778.3156	2,194,747.5426	13,738,636.1950	2,194,834.3949	13,738,490.2870	S 33° 10′ 37.72" E	S 30° 45′ 48.18" E
	FRNB01-CV10	181+84.99	191+12.25	199+83.63	34° 21′ 05.69" RT	1° 54′ 35.49"	1,798.64′	927.27′	3,000.00′		2,195,362.2602	13,737,603.4967	2,195,836.5512	13,736,806.7089	2,195,778.5183	13,735,881.2604	S 30° 45′ 48.18" E	S 3° 35′ 17.51" W
	FRNB01-CV11	203+48.84	205+84.21	208+19.46	3° 20′ 43.65" RT	0° 42′ 39.12"	470.62′	235.38′	8,060.00′		2,195,755.6619	13,735,516.7707	2,195,740.9310	13,735,281.8566	2,195,712.5165	13,735,048.2025	S 3° 35′ 17.51" W	S 6° 56′ 01.16" W
	FRNB01-CV12	219+61.68	221+81.86	224+01.92	3° 07′ 46.25" RT	0° 42′ 39.12"	440.24′	220.17′	8,060.00′		2,195,574.6270	13,733,914.3297	2,195,548.0475	13,733,695.7653	2,195,509.5755	13,733,478.9778	S 6° 56′ 01.16" W	S 10° 03′ 47.41" W
	FRNB01-CV13	227+44.22	230+59.61	233+74.92	2° 24′ 32.77" LT	0° 22′ 55.10"	630.70′	315.40′	15,000.00′		2,195,449.7650	13,733,141.9490	2,195,394.6545	13,732,831.4039	2,195,352.6462	13,732,518.8167	S 10° 03′ 47.41" W	S 7° 39′ 14.64" W
	FRNB01-CV14	233+74.92	248+14.34	262+50.59	6° 35′ 25.98" RT	0° 13′ 45.06"	2,875.67′	1,439.42′	25,000.00′		2,195,352.6462	13,732,518.8167	2,195,160.9271	13,731,092.2194	2,194,806.7398	13,729,697.0537	S 7° 39′ 14.64" W	S 14° 14′ 40.61" W
	FRNB01-CV15	262+50.59	265+48.08	268+45.43	3° 04′ 13.62" LT	0° 30′ 58.24"	594.84′	297.49′	11,100.00′		2,194,806.7398	13,729,697.0537	2,194,733.5381	13,729,408.7077	2,194,675.8864	13,729,116.8547	S 14° 14′ 40.61" W	S 11° 10′ 27.00" W
	FRNB01-CV16	272+06.04	277+25.39	282+41.88	10° 24′ 43.84" RT	1° 00′ 18.68"	1,035.84′	519.35′	5,700.00′		2,194,606.0029	13,728,763.0801	2,194,505.3567	13,728,253.5742	2,194,314.2858	13,727,770.6479	S 11° 10′ 27.00" W	S 21° 35′ 10.84" W
FRNB02	FRNB02-CV01	100+00.00	102+10.32	104+20.60	1° 54′ 45.30" RT	0° 27′ 17.02"	420.60′	210.32′	12,600.00′		2,192,991.9002	13,724,609.7902	2,193,047.6639	13,724,406.9985	2,193,096.6283	13,724,202.4587	S 15° 22′ 30.63" E	S 13° 27′ 45.33" E
	FRNB02-CV02	118+17.59	119+76.06	121+34.49	2° 18′ 25.69" LT	0° 43′ 40.90"	316.90′	158.47′	7,870.00′		2,193,421.8620	13,722,843.8558	2,193,458.7561	13,722,689.7377	2,193,501.8245	13,722,537.2297	S 13° 27′ 45.33" E	S 15° 46′ 11.03" E
	FRNB02-CV03	121+34.49	123+40.87	125+47.07	4° 08′ 50.11" RT	1° 00′ 18.68"	412.58′	206.38′	5,700.00′		2,193,501.8245	13,722,537.2297	2,193,557.9134	13,722,338.6153	2,193,599.4916	13,722,136.4647	S 15° 46′ 11.03" E	S 11° 37′ 20.92" E
	FRNB02-CV04	125+47.07	127+67.72	129+88.26	3° 09′ 35.16" LT	0° 42′ 58.31"	441.19′	220.65′	8,000.00′		2,193,599.4916	13,722,136.4647	2,193,643.9441	13,721,920.3395	2,193,700.2420	13,721,706.9931	S 11° 37′ 20.92" E	S 14° 46′ 56.08" E
	FRNB02-CV05	134+33.22	138+49.06	142+64.78	2° 22′ 56.02" LT	0° 17′ 11.32"	831.55′	415.84′	20,000.00′		2,193,813.7719	13,721,276.7599	2,193,919.8711	13,720,874.6858	2,194,042.5912	13,720,477.3693	S 14° 46′ 56.08" E	S 17° 09′ 52.11" E
FRSB01			200+00.00										2,190,852.2684	13,744,214.3720				S 30° 17′ 28.40" E
	FRSB01-CV-01	203+11.37	204+31.25	205+50.84	6° 51′ 37.00" LT	2° 51′ 53.24"	239.47′	119.88′	2,000.00′		2,191,009.3212	13,743,945.5138	2,191,069.7869	13,743,842.0027	2,191,142.1840	13,743,746.4552	S 30° 17′ 28.40" E	S 37° 09′ 05.40" E
	FRSB01-CV-02	205+50.84	206+69.90	207+88.68	6° 48′ 49.25" RT	2° 51′ 53.24"	237.84′	119.06′	2,000.00′		2,191,142.1840	13,743,746.4552	2,191,214.0882	13,743,651.5582	2,191,274.2259	13,743,548.8007	S 37° 09′ 05.40" E	S 30° 20′ 16.15" E
	FRSB01-CV-03	214+70.17	218+60.01	222+49.38	4° 51′ 10.00" LT	0° 37′ 22.01"	779.21′	389.84′	9,200.00′		2,191,618.4430	13,742,960.6352	2,191,815.3497	13,742,624.1798	2,192,040.0133	13,742,305.5880	S 30° 20′ 16.15" E	S 35° 11′ 26.15" E
	FRSB01-CV-04	229+22.89	231+02.74	232+81.62	10° 16′ 36.35" LT	2° 51′ 53.24"	358.73′	179.85′	2,000.00′		2,192,428.1592	13,741,755.1644	2,192,531.8040	13,741,608.1873	2,192,660.0072	13,741,482.0587	S 35° 11′ 26.15" E	S 45° 28′ 02.50" E
	FRSB01-CV-05	232+81.62	234+37.30	235+90.73	16° 52′ 02.61" RT	5° 27′ 24.27"	309.11′	155.68′	1,050.00′		2,192,660.0072	13,741,482.0587	2,192,770.9850	13,741,372.8768	2,192,845.5084	13,741,236.1910	S 45° 28′ 02.50" E	S 28° 35′ 59.89" E
	FRSB01-CV-06	235+90.73	237+51.80	239+12.84	1° 39′ 45.48" LT	0° 30′ 58.24"	322.10′	161.06′	11,100.00′		2,192,845.5084	13,741,236.1910	2,192,922.6081	13,741,094.7799	2,193,003.7783	13,740,955.6654	S 28° 35′ 59.89" E	S 30° 15′ 45.37" E
	FRSB01-CV-07	263+77.59	264+30.02	264+82.46	0° 30′ 02.82" LT	0° 28′ 39.09"	104.87′	52.44′	11,998.50′		2,194,245.9248	13,738,826.7977	2,194,272.3505	13,738,781.5078	2,194,299.1710	13,738,736.4505	S 30° 15′ 45.37" E	S 30° 45′ 48.18" E
	FRSB01-CV-08	279+67.78	289+75.70	298+93.44	41° 47′ 32.81" RT	2° 10′ 13.06"	1,925.66′	1,007.92′	2,640.00′		2,195,058.9031	13,737,460.1343	2,195,574.4472	13,736,594.0430	2,195,381.6255	13,735,604.7404	S 30° 45′ 48.18" E	S 11° 01′ 44.62" W
	FRSB01-CV-09	298+93.44	302+90.31	306+86.85	4° 05′ 43.47" LT	0° 30′ 58.24"	793.41′	396.87′	11,100.00′		2,195,381.6255	13,735,604.7404	2,195,305.7008	13,735,215.1968	2,195,257.7902	13,734,821.2255	S 11° 01′ 44.62" W	S 6° 56′ 01.16" W
	FRSB01-CV-10	326+07.38	328+07.74	330+08.01	2° 50′ 52.76" LT	0° 42′ 39.12"	400.64′	200.36′	8,060.00′		2,195,025.9441	13,732,914.7420	2,195,001.7567	13,732,715.8478	2,194,987.4815	13,732,515.9975	S 6° 56′ 01.16" W	S 4° 05′ 08.40" W
	FRSB01-CV-11	330+08.01	340+17.23	350+20.90	10° 23′ 24.37" RT	0° 30′ 58.24"	2,012.89′	1,009.21′	11,100.00′		2,194,987.4815	13,732,515.9975	2,194,915.5772	13,731,509.3498	2,194,663.3038	13,730,532.1763	S 4° 05′ 08.40" W	S 14° 28′ 32.77" W
	FRSB01-CV-12	350+20.90	352+53.19	354+85.35	3° 18′ 05.77" LT	0° 42′ 39.12"	464.45′	232.29′	8,060.00′		2,194,663.3038	13,730,532.1763	2,194,605.2385	13,730,307.2623	2,194,560.2229	13,730,079.3774	S 14° 28′ 32.77" W	S 11° 10′ 27.00" W
			370+11.95										2,194,264.3794	13,728,581.7149				
FRSB02	FRSB02-CV01	200+00.00	201+84.73	203+69.41	2° 14′ 57.32" RT	0° 36′ 31.97"	369.41′	184.73′	9,410.00′		2,192,780.5885	13,724,278.7318	2,192,820.2764	13,724,098.3181	2,192,852.8530	13,723,916.4858	S 12° 24′ 23.31" E	S 10° 09′ 25.99" E
	FRSB02-CV02	203+69.41	205+66.18	207+62.85	3° 18′ 19.34" LT	0° 50′ 24.41"	393.44′	196.78′	6,820.00′		2,192,852.8530	13,723,916.4858	2,192,887.5545	13,723,722.7935	2,192,933.3661	13,723,531.4242	S 10° 09′ 25.99" E	S 13° 27′ 45.33" E
	FRSB02-CV03	229+56.92	232+84.54	236+11.81	4° 41′ 25.09" LT	0° 42′ 58.31"	654.89′	327.63′	8,000.00′		2,193,444.1674	13,721,397.6475	2,193,520.4426	13,721,079.0222	2,193,622.5163	13,720,767.7009	S 13° 27′ 45.33" E	S 18° 09′ 10.42" E
	FRSB02-CV04	236+11.81	236+80.81	237+49.81	0° 59′ 18.30" RT	0° 42′ 58.31"	138.01′	69.01′	8,000.00′		2,193,622.5163	13,720,767.7009	2,193,644.0154	13,720,702.1292	2,193,664.3803	13,720,636.1964	S 18° 09′ 10.42" E	S 17° 09′ 52.12" E
			245+13.85										2,193,889.8593	13,719,906.1895				
RS16BASE-U			10+00.00										2,191,122.7144	13,744,065.1130				
	RS16BASE-U-CV01	10+00.00	11+79.30	13+58.42	4° 33′ 48.75" RT	1° 16′ 23.66"	358.42′	179.30′	4,500.00′		2,191,122.7144	13,744,065.1130	2,191,213.7036	13,743,910.6102	2,191,292.1115	13,743,749.3577	S 30° 29′ 40.33" E	S 25° 55′ 51.59" E
	RS16BASE-U-CV02	13+58.42	16+72.00	19+85.26	4° 33′ 48.75" LT	0° 43′ 40.90"	626.84′	313.58′	7,870.00′		2,191,292.1115	13,743,749.3577	2,191,429.2381	13,743,467.3450	2,191,588.3681	13,743,197.1369	S 25° 55′ 51.59" E	S 30° 29′ 40.33" E
	RS16BASE-U-CV03	25+75.22	566+69.77	30+76.93	179° 39′ 39.83" LT	35° 48′ 35.50"	501.71′	54,094.55′	160.00′		2,191,887.7476	13,742,688.7805	2,219,338.3629	13,696,076.7212	2,192,163.9623	13,742,850.3495	S 30° 29′ 40.33" E	N 30° 09′ 20.16" W
	RS16BASE-U-CV04	38+53.36	39+73.22	40+92.91	5° 29′ 24.71" RT	2° 17′ 30.59"	239.56′	119.87′	2,500.00′		2,191,773.9228	13,743,521.7007	2,191,713.7064	13,743,625.3474	2,191,663.6828	13,743,734.2798	N 30° 09′ 20.16" W	N 24° 39′ 55.45" W
	RS16BASE-U-CV05	40+92.91	41+43.59	41+94.19	5° 31′ 34.95" LT	5° 27′ 24.27"	101.28′	50.68′	1,050.00′		2,191,663.6828	13,743,734.2798	2,191,642.5342	13,743,780.3334	2,191,617.0488	13,743,824.1362	N 24° 39′ 55.45" W	N 30° 11′ 30.40" W
			49+58.17										2,191,232.8445	13,744,484.4832				
RNBASE16	RNBASE16-CV01	10+00.00	10+77.30	11+54.46	5° 53′ 59.40" LT	3° 49′ 10.99"	154.46′	77.30′	1,500.00′		2,191,957.4801	13,742,478.0456	2,192,000.7182	13,742,413.9732	2,192,050.3133	13,742,354.6845	S 34° 00′ 45.77" E	S 39° 54′ 45.18" E
	RNBASE16-CV02	11+54.46	12+36.92	13+19.28	4° 43′ 19.03" RT	2° 51′ 53.24"	164.83′	82.46′	2,000.00′		2,192,050.3133	13,742,354.6845	2,192,103.2213	13,742,291.4354	2,192,150.7430	13,742,224.0456	S 39° 54′ 45.18" E	S 35° 11′ 26.15" E
	RNBASE16-CV03	18+62.35	19+12.93	19+63.49	2° 57′ 43.11" LT	2° 55′ 42.54"	101.14′	50.58′	1,956.50′		2,192,463.7091	13,741,780.2333	2,192,492.8600	13,741,738.8949	2,192,524.1081	13,741,699.1179	S 35° 11′ 26.15" E	S 38° 09′ 09.26" E
	RNBASE16-CV04	19+63.49	54+85.14	23+08.23	176° 21′ 24.61" LT	51° 09′ 25.01"	344.74′	3,521.64′	112.00′		2,192,524.1081	13,741,699.1179	2,194,699.6312	13,738,929.8072	2,192,704.4731	13,741,831.7594	S 38° 09′ 09.26" E	N 34° 30′ 33.87" W
	RNBASE16-CV05	23+08.23	27+45.80	31+83.02	4° 00′ 53.53" RT	0° 27′ 32.23"	874.79′	437.57′	12,484.00′		2,192,704.4731	13,741,831.7594	2,192,456.5699	13,742,192.3340	2,192,234.5208	13,742,569.3808	N 34° 30′ 33.87" W	N 30° 29′ 40.33" W
	RNBASE16-CV06	33+73.59	36+64.44	39+55.03	4° 09′ 51.24" LT	0° 42′ 58.31"	581.44′	290.85′	8,000.00′		2,192,137.8106	13,742,733.5979	2,191,990.2187	13,742,984.2138	2,191,824.8179	13,743,223.4505	N 30° 29′ 40.33" W	N 34° 39′ 31.58" W
	RNBASE16-CV07	39+55.03	41+18.63	42+82.09	4° 09′ 51.24" RT	1° 16′ 23.66"	327.06′	163.60′	4,500.00′		2,191,824.8179	13,743,223.4505	2,191,731.7799	13,743,358.0212	2,191,648.7595	13,743,498.9926	N 34° 39′ 31.58" W	N 30° 29′ 40.33" W
RN1678			10+00.00										2,193,525.8929	13,740,591.4426				
	RN1678-CV01	10+00.00	15+79.60	21+57.18	8° 17′ 15.71" RT	0° 42′ 58.31"	1,157.18′	579.60′	8,000.00′		2,193,525.8929	13,740,591.4426	2,193,848.3827	13,740,109.8431	2,194,098.0852	13,739,586.7881	S 33° 48′ 25.74" E	S 25° 31′ 10.03" E
	RN1678-CV02	21+57.18	23+56.20	25+54.94	5° 10′ 46.38" LT	1° 18′ 07.84"	397.76′	199.02′	4,400.00′		2,194,098.0852	13,739,586.7881	2,194,183.8248	13,739,407.1883	2,194,285.4280	13,739,236.0622	S 25° 31′ 10.03" E	S 30° 41′ 56.41" E
			25+54.94										2,194,285.4280	13,739,236.0622				
RNLOW16	RNLOW16-CV01	10+00.00	12+19.69	14+39.27	3° 08′ 45.84" LT	0° 42′ 58.31"	439.27′	219.69′	8,000.00′		2,195,147.2545	13,737,784.5233	2,195,259.4135	13,737,595.6186	2,195,381.7708	13,737,413.1541	S 30° 41′ 56.41" E	S 33° 50′ 42.25" E
	RNLOW16-CV02	14+39.27	16+60.98	18+79.49	16° 48′ 54.75" RT	3° 49′ 10.99"	440.22′	221.70′	1,500.00′		2,195,381.7708	13,737,413.1541	2,195,505.2487	13,737,229.0184	2,195,570.1792	13,737,017.0355	S 33° 50′ 42.25" E	S 17° 01′ 47.50" E
	RNLOW16-CV03	22+54.90	25+25.47	27+92.56	15° 52′ 44.92" RT	2° 57′ 12.21"	537.66′	270.56′	1,940.00′		2,195,680.1248	13,736,658.0890	2,195,759.3646	13,736,399.3895	2,195,764.7982	13,736,128.8810	S 17° 01′ 47.50" E	S 1° 09′ 02.58" E
RN16ROCK			10+00.00										2,195,755.2032	13,735,813.0429				
	RN16ROCK-CV01	10+00.00	14+89.63	19+76.86	9° 49′ 09.62" RT	1° 00′ 18.68"	976.86′	489.63′	5,700.00′		2,195,755.2032	13,735,813.0429	2,195,724.5597	13,735,324.3714	2,195,611.0260	13,734,848.0848	S 3° 35′ 17.51" W	S 13° 24′ 27.13" W
	RN16ROCK-CV02	19+76.86	23+74.70	27+71.88	5° 41′ 37.91" LT	0° 42′ 58.31"	795.01′	397.83′	8,000.00′		2,195,611.0260	13,734,848.0848	2,195,518.7779	13,734,461.0935	2,195,465.3795	13,734,066.8593	S 13° 24′ 27.13" W	S 7° 42′ 49.22" W
			27+71.88										2,195,465.3795	13,734,066.8593				
RNGRAY16			10+00.00										2,195,236.4227	13,732,381.6173				
	RNGRAY16-CV01	10+00.00	11+93.22	13+86.19	5° 01′ 43.85" LT	1° 18′ 07.84"	386.19′	193.22′	4,400.00′		2,195,236.4227	13,732,381.6173	2,195,208.9052	13,732,190.3688	2,195,198.2580	13,731,997.4445	S 8° 11′ 15.81" W	S 3° 09′ 31.96" W
	RNGRAY16-CV02	13+86.19	19+75.55	25+62.78	8° 25′ 36.21" RT	0° 42′ 58.31"	1,176.59′	589.36′	8,000.00′		2,195,198.2580	13,731,997.4445	2,195,165.7814	13,731,408.9808	2,195,047.4193	13,730,831.6293	S 3° 09′ 31.96" W	S 11° 35′ 08.18" W
			25+62.78										2,195,047.4193	13,730,831.6293				
RN16LOW			10+00.00										2,195,030.0200	13,730,747.4941				
	RN16LOW-CV01	10+00.00	14+03.89	18+07.09	5° 46′ 49.28" RT	0° 42′ 58.31"	807.09′	403.89′	8,000.00′		2,195,030.0200	13,730,747.4941	2,194,947.5463	13,730,352.1167	2,194,825.6714	13,729,967.0560	S 11° 46′ 57.57" W	S 17° 33′ 46.85" W
	RN16LOW-CV02	18+07.09	22+53.58	26+99.14	6° 23′ 19.86" LT	0° 42′ 58.31"	892.05′	446.49′	8,000.00′		2,194,825.6714	13,729,967.0560	2,194,690.9414	13,729,541.3803	2,194,604.4155	13,729,103.3560	S 17° 33′ 46.85" W	S 11° 10′ 27.00" W
			26+99.14										2,194,604.4155	13,729,103.3560				

CURVE AND COORDINATE DATA

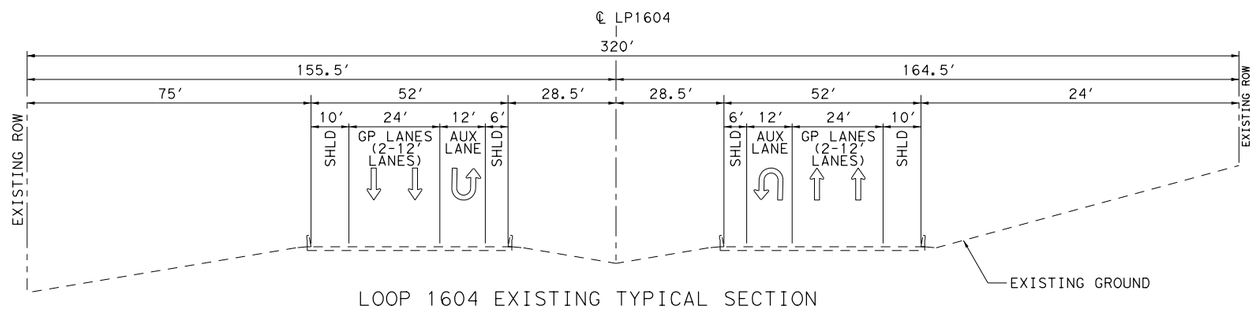
CURVE DATA										CURVE COORDINATE DATA								
ALIGNMENT NO.	CURVE NO.	PC STATION	PI STATION	PT STATION	DELTA	D	L	T	R	e(%)	PC COORDINATE		PI COORDINATE		PT COORDINATE		BEARING	
											"X"	"Y"	"X"	"Y"	"X"	"Y"	BACK	AHEAD
RN16GRAY	RN16GRAY-CV01	10+00.00	12+86.32	15+69.45	14° 47' 48.75" RT	2° 35' 54.41"	569.45'	286.32'	2,205.00'		2,194,314.2858	13,727,770.6479	2,194,208.9484	13,727,504.4107	2,194,039.1092	13,727,273.9051	S 21° 35' 10.84" W	S 36° 22' 59.59" W
			19+44.26										2,193,816.7792	13,726,972.1590				
RNBINZ16	RNBINZ161	10+00.00	11+52.26	13+02.42	16° 30' 08.17" LT	5° 27' 24.27"	302.42'	152.26'	1,050.00'		2,192,905.7391	13,725,472.1031	2,192,872.7690	13,725,323.4515	2,192,883.3820	13,725,171.5578	S 12° 30' 19.59" W	S 3° 59' 48.58" E
	RNBINZ162	14+87.44	16+02.72	17+17.07	12° 31' 48.03" LT	5° 27' 24.27"	229.62'	115.27'	1,050.00'		2,192,896.2784	13,724,986.9832	2,192,904.3130	13,724,871.9916	2,192,937.1038	13,724,761.4819	S 3° 59' 48.58" E	S 16° 31' 36.61" E
	RNBINZ163	17+17.07	17+97.47	18+77.87	1° 09' 05.98" RT	0° 42' 58.31"	160.80'	80.40'	8,000.00'		2,192,937.1038	13,724,761.4819	2,192,959.9758	13,724,684.3998	2,192,981.2939	13,724,606.8737	S 16° 31' 36.61" E	S 15° 22' 30.63" E
RN16BINZ	RN16BINZ-CV01	10+00.00	11+02.98	12+05.95	2° 04' 12.55" RT	1° 00' 18.68"	205.95'	102.98'	5,700.00'		2,193,605.4296	13,722,017.5685	2,193,627.6549	13,721,917.0109	2,193,646.2332	13,721,815.7160	S 12° 27' 47.34" E	S 10° 23' 34.79" E
	RN16BINZ-CV02	12+05.95	15+96.97	19+87.37	5° 35' 47.62" LT	0° 42' 58.31"	781.43'	391.02'	8,000.00'		2,193,646.2332	13,721,815.7160	2,193,716.7736	13,721,431.1066	2,193,824.4861	13,721,055.2100	S 10° 23' 34.79" E	S 15° 59' 22.42" E
	RN16BINZ-CV03	23+36.63	25+79.94	28+23.11	3° 29' 02.80" RT	0° 42' 58.31"	486.47'	243.31'	8,000.00'		2,193,920.6938	13,720,719.4631	2,193,987.7170	13,720,485.5645	2,194,040.4019	13,720,248.0251	S 15° 59' 22.42" E	S 12° 30' 19.61" E
	RN16BINZ-CV04	28+23.11	30+01.71	31+80.11	4° 38' 55.72" LT	1° 18' 07.84"	357.00'	178.60'	4,400.00'		2,194,040.4019	13,720,248.0251	2,194,079.0745	13,720,073.6628	2,194,131.7516	13,719,903.0084	S 12° 30' 19.61" E	S 17° 09' 15.33" E
RS16ROCK	RS16ROCK-CV01	10+00.00	12+51.48	15+02.42	6° 32' 32.46" RT	1° 18' 07.84"	502.42'	251.48'	4,400.00'		2,192,765.4758	13,741,429.0738	2,192,909.2903	13,741,222.7723	2,193,028.6629	13,741,001.4283	S 34° 52' 50.45" E	S 28° 20' 18.00" E
	RS16ROCK-CV02	15+02.42	16+83.26	18+64.04	2° 35' 23.67" LT	0° 42' 58.31"	361.62'	180.84'	8,000.00'		2,193,028.6629	13,741,001.4283	2,193,114.5037	13,740,842.2598	2,193,207.4492	13,740,687.1327	S 28° 20' 18.00" E	S 30° 55' 41.66" E
	RS16ROCK-CV03	18+64.04	18+89.04	19+14.04	0° 13' 45.26" RT	0° 27' 30.51"	50.00'	25.00'	12,497.00'		2,193,207.4492	13,740,687.1327	2,193,220.2984	13,740,665.6874	2,193,233.0616	13,740,644.1908	S 30° 55' 41.66" E	S 30° 41' 56.41" E
	RS16ROCK-CV04	19+99.44	21+86.74	23+73.91	3° 45' 50.94" RT	1° 00' 18.68"	374.47'	187.30'	5,700.00'		2,193,276.6611	13,740,570.7579	2,193,372.2847	13,740,409.7031	2,193,457.1287	13,740,242.7181	S 30° 41' 56.41" E	S 26° 56' 05.47" E
	RS16ROCK-CV05	23+73.91	26+02.52	28+31.00	3° 19' 39.89" LT	0° 43' 40.90"	457.09'	228.61'	7,870.00'		2,193,457.1287	13,740,242.7181	2,193,560.6837	13,740,038.9075	2,193,675.8948	13,739,841.4516	S 26° 56' 05.47" E	S 30° 15' 45.37" E
RS7816	RS7816-CV01	10+00.00	12+68.63	15+37.04	3° 54' 35.39" LT	0° 43' 40.90"	537.04'	268.63'	7,870.00'		2,193,785.3407	13,739,653.8765	2,193,920.7187	13,739,421.8572	2,194,071.6022	13,739,199.6089	S 30° 15' 45.37" E	S 34° 10' 20.76" E
	RS7816-CV02	15+37.04	17+09.87	18+82.59	3° 28' 24.35" RT	1° 00' 18.68"	345.55'	172.83'	5,700.00'		2,194,071.6022	13,739,199.6089	2,194,168.6771	13,739,056.6196	2,194,256.9106	13,738,908.0116	S 34° 10' 20.76" E	S 30° 41' 56.41" E
	RS7816-CV03	20+03.91	22+63.07	25+22.06	3° 42' 39.55" LT	0° 42' 58.31"	518.15'	259.17'	8,000.00'		2,194,318.8439	13,738,803.6999	2,194,451.1556	13,738,580.8528	2,194,597.6133	13,738,367.0367	S 30° 41' 56.41" E	S 34° 24' 35.96" E
	RS7816-CV04	25+22.06	26+64.60	28+07.04	3° 42' 39.55" RT	1° 18' 07.84"	284.98'	142.54'	4,400.00'		2,194,597.6133	13,738,367.0367	2,194,678.1650	13,738,249.4378	2,194,750.9364	13,738,126.8720	S 34° 24' 35.96" E	S 30° 41' 56.41" E
RSROCK16	RSROCK16-CV01	10+00.00	11+44.29	12+88.55	2° 06' 02.67" RT	0° 43' 40.90"	288.55'	144.29'	7,870.00'		2,195,267.0744	13,737,077.4131	2,195,319.5830	13,736,943.0140	2,195,367.1298	13,736,806.7804	S 21° 20' 24.68" E	S 19° 14' 22.02" E
	RSROCK16-CV02	12+88.55	17+86.52	22+69.35	24° 25' 58.11" RT	2° 29' 28.04"	980.80'	497.97'	2,300.00'		2,195,367.1298	13,736,806.7804	2,195,531.2182	13,736,336.6251	2,195,486.1437	13,735,840.7023	S 19° 14' 22.02" E	S 5° 11' 36.10" W
	RSROCK16-CV03	22+69.35	23+94.73	25+20.08	2° 31' 13.12" RT	1° 00' 18.68"	250.73'	125.39'	5,700.00'		2,195,486.1437	13,735,840.7023	2,195,474.7942	13,735,715.8318	2,195,457.9646	13,735,591.5812	S 5° 11' 36.10" W	S 7° 42' 49.22" W
	RSROCK16-CV04	27+27.76	30+72.62	34+17.06	4° 56' 12.26" LT	0° 42' 58.31"	689.30'	344.86'	8,000.00'		2,195,430.0887	13,735,385.7763	2,195,383.8003	13,735,044.0343	2,195,367.0926	13,734,699.5765	S 7° 42' 49.22" W	S 2° 46' 36.96" W
	RSROCK16-CV05	34+17.06	36+06.74	37+96.18	4° 56' 12.26" RT	1° 18' 07.84"	379.11'	189.67'	4,400.00'		2,195,367.0926	13,734,699.5765	2,195,357.9033	13,734,510.1248	2,195,332.4447	13,734,322.1666	S 2° 46' 36.96" W	S 7° 42' 49.22" W
RS16LOW	RS16LOW-CV01	10+00.00	13+68.17	17+25.15	24° 26' 23.49" RT	3° 22' 13.22"	725.15'	368.17'	1,700.00'		2,195,490.1814	13,736,575.4154	2,195,561.4597	13,736,214.2091	2,195,476.9064	13,735,855.8777	S 11° 09' 46.71" E	S 13° 16' 36.77" W
	RS16LOW-CV02	20+70.03	23+42.86	26+15.28	5° 28' 50.61" LT	1° 00' 18.68"	545.24'	272.83'	5,700.00'		2,195,397.7002	13,735,520.2072	2,195,335.0430	13,735,254.6699	2,195,298.0339	13,734,984.3620	S 13° 16' 36.77" W	S 7° 47' 46.16" W
RS16GRAY	RS16GRAY-CV-01	10+00.00	12+17.85	14+35.34	5° 40' 07.94" RT	1° 18' 07.84"	435.34'	217.85'	4,400.00'		2,195,118.9151	13,732,745.7012	2,195,089.6751	13,732,529.8256	2,195,039.2542	13,732,317.8941	S 7° 42' 49.22" W	S 13° 22' 57.16" W
	RS16GRAY-CV-02	14+35.34	17+70.09	21+04.43	4° 52' 16.24" LT	0° 43' 40.90"	669.09'	334.75'	7,870.00'		2,195,039.2542	13,732,317.8941	2,194,961.7763	13,731,992.2359	2,194,912.2317	13,731,661.1748	S 13° 22' 57.16" W	S 8° 30' 40.92" W
RSLOW16	RSLOW16-CV-01	10+00.00	11+35.16	12+70.26	2° 43' 00.01" LT	1° 00' 18.68"	270.26'	135.16'	5,700.00'		2,194,785.0031	13,730,963.7305	2,194,756.5212	13,730,831.6080	2,194,734.3336	13,730,698.2840	S 12° 09' 54.71" W	S 9° 26' 54.70" W
	RSLOW16-CV-02	12+70.26	14+31.55	15+92.78	2° 20' 52.84" RT	0° 43' 40.90"	322.52'	161.28'	7,870.00'		2,194,734.3336	13,730,698.2840	2,194,707.8574	13,730,539.1910	2,194,674.8856	13,730,381.3163	S 9° 26' 54.70" W	S 11° 47' 47.55" W
	RSLOW16-CV-03	15+92.78	18+90.39	21+87.73	4° 15' 39.61" LT	0° 42' 58.31"	594.95'	297.61'	8,000.00'		2,194,674.8856	13,730,381.3163	2,194,614.0428	13,730,089.9905	2,194,575.0138	13,729,794.9494	S 11° 47' 47.55" W	S 7° 32' 07.93" W
	RSLOW16-CV-04	21+87.73	23+27.49	24+67.16	3° 38' 19.06" RT	1° 18' 07.84"	279.43'	139.76'	4,400.00'		2,194,575.0138	13,729,794.9494	2,194,556.6854	13,729,656.3962	2,194,529.6010	13,729,519.2854	S 7° 32' 07.93" W	S 11° 10' 27.00" W
RSGRAY16			10+00.00										2,194,275.1709	13,728,579.5831				S 11° 10' 27.00" W
	RSGRAY16-CV-01	14+53.22	17+84.20	21+10.27	17° 04' 22.53" RT	2° 35' 54.41"	657.04'	330.97'	2,205.00'		2,194,187.3396	13,728,134.9504	2,194,123.1994	13,727,810.2506	2,193,966.5576	13,727,518.6906	S 11° 10' 27.00" W	S 28° 14' 49.53" W
RS16BINZ			10+00.00										2,192,736.1104	13,725,472.3909				S 11° 27' 26.82" W
	RS16BINZ1	12+00.29	13+00.14	13+99.34	11° 24' 18.00" LT	5° 43' 46.48"	199.05'	99.86'	1,000.00'		2,192,696.3256	13,725,276.0964	2,192,676.4899	13,725,178.2289	2,192,676.3985	13,725,078.3716	S 11° 27' 26.82" W	S 0° 03' 08.82" W
	RS16BINZ2	13+99.34	15+55.03	17+10.11	8° 50' 45.38" LT	2° 50' 47.35"	310.77'	155.69'	2,012.86'		2,192,676.3985	13,725,078.3716	2,192,676.2560	13,724,922.6789	2,192,700.0573	13,724,768.8161	S 0° 03' 08.82" W	S 8° 47' 36.56" E
	RS16BINZ3	17+10.11	19+58.32	22+06.38	3° 36' 46.75" LT	0° 43' 40.90"	496.27'	248.22'	7,870.00'		2,192,700.0573	13,724,768.8161	2,192,738.0032	13,724,523.5162	2,192,791.3316	13,724,281.0951	S 8° 47' 36.56" E	S 12° 24' 23.31" E
RSBINZ16	RSBINZ16-CV01	10+00.00	12+35.08	14+69.89	4° 43' 23.79" LT	1° 00' 18.68"	469.89'	235.08'	5,700.00'		2,193,334.9024	13,721,888.4443	2,193,389.6310	13,721,659.8259	2,193,462.9989	13,721,436.4905	S 13° 27' 45.33" E	S 18° 11' 09.13" E
	RSBINZ16-CV02	14+69.89	16+01.78	17+33.64	1° 53' 20.31" RT	0° 42' 58.31"	263.75'	131.89'	8,000.00'		2,193,462.9989	13,721,436.4905	2,193,504.1610	13,721,311.1910	2,193,541.1705	13,721,184.6029	S 18° 11' 09.13" E	S 16° 17' 48.82" E
	RSBINZ16-CV03	20+68.32	23+98.24	27+27.78	4° 43' 22.94" LT	0° 42' 58.31"	659.46'	329.92'	8,000.00'		2,193,635.0874	13,720,863.3677	2,193,727.6670	13,720,546.7063	2,193,846.0059	13,720,238.7432	S 16° 17' 48.82" E	S 21° 01' 11.76" E
	RSBINZ16-CV04	27+27.78	28+76.27	30+24.65	3° 51' 56.43" RT	1° 18' 07.84"	296.86'	148.49'	4,400.00'		2,193,846.0059	13,720,238.7432	2,193,899.2673	13,720,100.1367	2,193,943.0630	13,719,958.2547	S 21° 01' 11.76" E	S 17° 09' 15.33" E
DCSE	DCSE-CV01	50+00.00	51+65.41	53+30.67	4° 18' 21.21" RT	1° 18' 07.84"	330.67'	165.41'	4,400.00'		2,193,127.3127	13,723,144.3395	2,193,165.8224	13,722,983.4725	2,193,192.1453	13,722,820.1682	S 13° 27' 45.33" E	S 9° 09' 24.13" E
	DCSE-CV02	53+30.67	56+31.42	59+31.88	4° 18' 21.21" LT	0° 42' 58.31"	601.22'	300.75'	8,000.00'		2,193,192.1453	13,722,820.1682	2,193,240.0051	13,722,523.2512	2,193,310.0227	13,722,230.7657	S 9° 09' 24.13" E	S 13° 27' 45.33" E
	DCSE-CV03	62+98.99	71+18.62	79+37.55	4° 04' 46.81" LT	0° 14' 56.32"	1,638.56'	819.63'	23,012.32'		2,193,395.4887	13,721,873.7475	2,193,586.3065	13,721,076.6419	2,193,833.3497	13,720,295.1315	S 13° 27' 45.33" E	S 17° 32' 32.15" E
	DCSE-CV04	79+37.55	86+03.15	89+85.57	89° 37' 19.97" LT	8° 33' 05.79"	1,048.02'	665.60'	670.00'		2,193,833.3497	13,720,295.1318	2,194,033.9667	13,719,660.4886	2,194,669.9188	13,719,856.9167	S 17° 32' 32.15" E	N 72° 50' 07.88" E
	DCSE-CV05	90+47.69	94+77.50	99+07.06	3° 28' 07.31" LT	0° 24' 13.08"	859.37'	429.82'	14,195.00'		2,194,729.2732	13,719,875.2496	2,195,139.9451	13,720,002.0949	2,195,542.1902	13,720,153.5548	N 72° 50' 07.88" E	N 69° 22' 00.57" E
	DCSE-CV06	118+01.70	120+28.47	122+55.08	3° 42' 39.54" LT	0° 49' 06.64"	453.38'	226.77'	7,000.00'		2,197,315.2989	13,720,821.1945	2,197,527.5232	13,720,901.1046	2,197,734.1304	13,720,994.5831	N 69° 22' 00.57" E	N 65° 39' 21.03" E
	DCSE-CV07	124+82.32	127+39.02	129+95.55	3° 42' 39.54" RT	0° 43' 23.04"	513.23'	256.70'	7,924.00'		2,197,941.1659	13,721,088.2554	2,198,175.0453	13,721,194.0730	2,198,415.2831	13,721,284.5313	N 65° 39' 21.03" E	N 69° 22' 00.57" E
			132+08.26										2,198,614.3505	13,721,359.4874				
DCEN			36+89.00										2,190,179.2273	13,718,530.5695				N 72° 50' 07.88" E
	DCEN-CV01	38+89.00	41+49.95	44+10.78	2° 52' 04.80" RT	0° 32' 58.75"	521.78'	260.95'	10,424.00'		2,190,370.3196	13,718,589.5926	2,190,619.6440	13,718,666.6021	2,190,872.5094	13,718,731.0401	N 72° 50' 07.88" E	N 75° 42' 12.68" E
	DCEN-CV02	51+85.95	53+85.70	55+85.36	2° 51' 38.02" LT	0° 42' 58.31"	399.41'	199.75'	8,000.00'		2,191,623.6721	13,718,922.4599	2,191,817.2324	13,718,971.7851	2,192,008.0900	13,719,030.7086	N 75° 42' 12.68" E	N 72° 50' 34.66" E
	DCEN-CV03	70+56.87	78+89.57	83+65.05	89° 58' 45.37" LT	6° 52' 41.68"	1,308.17'	832.70'	833.00'		2,193,414.1185	13,719,464.7921	2,194,209.7619	13,719,710.4313	2,193,964.4106	13,720,506.1635	N 72° 50' 34.66" E	N 17° 08' 10.71" W
	DCEN-CV04	83+65.05	90+97.03	98+28.50	3° 40' 25.37" RT	0° 15' 03.71"	1,463.46'	731.98'	22,824.31'		2,193,964.4106	13,720,506.1635	2,193,748.7356	13,721,205.6486	2,193,578.3230	13,721,917.5156	N 17° 08' 10.71" W	N 13° 27' 45.33" W
	DCEN-CV05	101+65.25	104+09.00	106+52.59	3° 29' 24.94" LT	0° 42' 58.31"	487.33'	243.74'	8,000.00'		2,193,499.9240	13,722,245.0125	2,193,443.1784	13,722,482.0565	2,193,372.1071	13,722,715.2062	N 13° 27' 45.33" W	N 16° 57' 10.27" W
	DCEN-CV06	106+52.59	107+86.64	109+20.62	3° 29' 24.94" RT	1° 18' 07.84"	268.03'	134.06'	4,400.00'		2,193,372.1071	13,722,715.2063	2,193,333.0179	13,722,843.4386	2,193,301.8078	13,722,973.8128	N 16° 57' 10.27" W	N 13° 27' 45.33" W
DCSW	DCSW-CV01	50+00.00	53+49.33	56+97.98	6° 10' 17.49" RT	0° 53' 03.10"	697.98'	349.33'	6,480.00'		2,193,570.7646	13,721,097.5224	2,193,663.7783	13,720,760.8038	2,193,720.0539	13,720,416.0373	S 15° 26' 31.39" E	S 9° 16' 13.90" E
	DCSW-CV02	56+97.98	61+99.74	65+50.14	75° 55' 57.86" RT	8° 54' 38.51"	852.15'	501.76'	643.00'		2,193,720.0539	13,720,416.0373	2,193,800.8854	13,719,920.8317	2,193,340.1775	13,719,722.0593	S 9° 16' 13.90" E	S 66° 39' 43.96" W
	DCSW-CV03	65+50.14	68+99.57	72+48.32	6° 10' 23.92" RT	0° 53' 03.10"	698.19'	349.43'	6,480.00'		2,193,340.1775	13,719,722.0593	2,193,019.3354	13,719,583.6319	2,192,685.4679	13,719,480.5094	S 66° 39' 43.96" W	S 72° 50' 07.88" W
DCWN	DCWN-CV01	50+00.00	54+82.62	59+63.45	8° 31' 07.69" RT	0° 53' 03.10"	963.45'	482.62'	6,480.00'		2,195,691.0357	13,720,427.5437	2,195,239.3764	13,720,257.4777	2,194,767.5076	13,720,156.1939	S 69° 22' 00.57" W	S 77° 53' 08.26" W
	DCWN-CV02	59+63.45	64+96.24	68+53.29	79° 17' 25.17" RT	8° 54' 38.51"	889.83'	532.79'	643.00'		2,194,767.5076	13,720,156.1939	2,194,246.5824	13,720,044.3806	2,194,039.9118	13,720,535.4534	S 77° 53' 08.26" W	N 22° 49' 26.57" W
	DCWN-CV03	68+53.29	73+04.41	77+54.08	7° 57' 53.26" RT	0° 53' 03.10"	900.80'	451.13'	6,480.00'		2,194,039.9118	13,720,535.4534	2,193,864.9193	13,720,951.2557	2,193,749.2302	13,721,387.2947	N 22° 49' 26.57" W	N 14° 51' 33.32" W
FRUTSB1976			10+00.00										2,190,663.0469	13,744,559.0823				
	FRUTSB1976-CV01	10+00.00	10+59.79	10+77.44	113° 46' 19.17" LT	146° 54' 44.12"	77.44'	59.79'	39.00'		2,190,663.0469	13,744,559.0823	2,190,693.4647	13,744,507.6035	2,190,728.3146	13,744,556.1916	S 30° 34' 40.83" E	N 35° 39' 00.00" E
	FRUTSB1976-CV02	14+85.27	15+10.72	15+30.37	66° 15' 21.28" LT	146° 54' 44.12"	45.10'	25.45'	39.00'		2,190,966.0122	13,744,887.5927	2,190,980.8458	13,744,908.2739	2,190,967.8880	13,744,930.1793	N 35° 39' 00.00" E	N 30° 36' 21.28" W
			15+30.37										2,190,967.8880	13,744,930.1793				
FRUTNB78			10+00.00										2,191,323.3664	13,744,235.4410				N 30° 11' 30.40" W
	FRUTNB78-CV01	12+07.17	13+09.64	13+38.98	114° 25' 51.52" LT	86° 48' 42.43"	131.82'	102.47'	66.00'		2,191,219.1825	13,744,414.5058	2,191,167.6494	13,744,503.0778	2,191,108.3220	13,744,419.5259	N 30° 11' 30.40" W	S 35° 22' 38.08" W
	FRUTNB78-CV02	15+90.73	16+07.87	16+23.81	37° 09' 12.01" LT	112° 20' 40.80"	33.07'	17.14'	51.00'		2,190,962.5684	13,744,214.2580	2,190,952.6449	13,744,200.2825	2,190,953.1761	13,744,183.1505	S 35° 22' 38.08" W	S 1° 46' 33.92" E
	FRUTNB78-CV03	16+23.81	16+74.88	17+23.84	28° 30' 54.47" LT	28° 30' 19.31"	100.03'	51.08'	201.00'		2,190,953.1761	13,744,183.1505	2,190,954.7591	13,744,132.0992	2,190,980.5215	13,744,087.9967	S 1° 46' 33.92" E	S 30° 17' 28.40" E
			17+23.84										2,190,980.5215	13,744,087.9967				
FRUTSBBASE	FRUTSBBASE-1	10+00.00	11+08.81	11+71.93	83° 55' 43.82" LT	48° 48' 53.78"	171.93'	108.81'	121.00'		2,192,580.9223	13,741,588.3767	2,192,653.2842	13,741,507.1117	2,192,741.7467	13,741,570.4729	S 41° 40' 59.72" E	N 54° 23' 16.46" E
	FRUTSBBASE-2	11+96.07	13+06.01	13+69.21	84° 31' 06.67" LT	48° 48' 53.78"	173.14'	109.94'	121.00'		2,192,761.3691	13,741,584.5274	2,192,850.7515	13,741,648.5474	2,192,795.5624	13,741,743.6365	N 54° 23' 16.46" E	N 30° 07' 50.21" W
FRUTSBRCKT			10+00.00										2,194,880.4817	13,737,851.7620				
	FRUTSBRCKT-CV01	10+00.00	10+72.95	11+22.99	77° 26' 08.22" LT	62° 57' 44.62"	122.99'	72.95'	91.00'		2,194,880.4817	13,737,851.7620	2,194,917.7958	13,737,789.0760	2,194,987.0978	13,737,811.8600	S 30° 45' 48.18" E	N 71° 48' 03.59" E
	FRUTSBRCKT-CV02	12+15.87	12+69.16	13+03.47	82° 17' 19.19" LT	93° 55' 39.03"	87.61'	53.30'	61.00'		2,195,075.3305	13,737,840.8678	2,195,125.9613	13,737,857.5134	2,195,116.2600	13,737,909.9198	N 71° 48' 03.59" E	N 10° 29' 15.60" W
	FRUTSBRCKT-CV03	13+03.47	13+57.30	14+09.99	20° 16' 32.59" LT	19° 02' 06.51"	106.52'	53.82'	301.00'		2,195,116.2600	13,737,909.9198	2,195,106.4632	13,737,962.8422	2,195,078.9339	13,738,009.0903	N 10° 29' 15.60" W	N 30° 45' 48.18" W
			14+09.99										2,195,078.9339	13,738,009.0903				
FRUTNBRCKT			10+00.00										2,195,284.0741	13,737,642.9581				
	FRUTNBRCKT-CV01	10+00.00	10+72.95	11+22.99	77° 26' 08.22" LT	62° 57' 44.62"	122.99'	72.95'	91.00'		2,195,284.0741	13,737,642.9581	2,195,246.7600	13,737,705.6441	2,195,177.4580	13,737,682.8601	N 30° 45' 48.18" W	S 71° 48' 03.59" W
	FRUTNBRCKT-CV02	12+19.29	12+74.92	13+09.50	84° 43' 53.90" LT	93° 55' 39.03"	90.21'	55.63'	61.00'		2,195,085.9741	13,737,652.7835	2,195,033.1231	13,737,635.4080	2,195,045.5723	13,737,581.1848	S 71° 48' 03.59" W	S 12° 55' 50.31" E
	FRUTNBRCKT-CV03	13+09.50	13+56.72	14+03.18	17° 49' 57.87" LT	19° 02' 06.51"	93.68'	47.22'	301.00'		2,195,045.5723	13,737,581.1848	2,195,056.1396	13,737,535.1589	2,195,080.2941	13,737,494.5804	S 12° 55' 50.31" E	S 30° 45' 48.18" E
			14+03.18										2,195,080.2941	13,737,494.5804				
FRUTSBSEGUIN			10+00.00										2,195,257.1961	13,734,427.0092				
	FRUTSBSEGUIN-01	10+00.00	10+37.67	10+74.47	21° 13' 43.14" LT	28° 30' 19.31"	74.47'	37.67'	201.00'		2,195,257.1961	13,734,427.0092	2,195,252.6488	13,734,389.6165	2,195,261.9496	13,734,353.1147	S 6° 56' 01.16" W	S 14° 17' 41.99" E
	FRUTSBSEGUIN-02	10+74.47	11+02.81	11+27.52	49° 49' 36.55" LT	93° 55' 39.03"	53.05'	28.33'	61.00'		2,195,261.9496	13,734,353.1147	2,195,268.9453	13,734,325.6593	2,195,294.4369	13,734,313.2933	S 14° 17' 41.99" E	S 64° 07' 18.54" E
	FRUTSBSEGUIN-03	11+27.52	11+57.72	11+87.37	18° 56' 40.31" LT	31° 39' 18.46"	59.85'	30.20'	181.00'		2,195,294.4369	13,734,313.2933	2,195,321.6076	13,734,300.1127	2,195,351.5857	13,734,296.4670	S 64° 07' 18.54" E	S 83° 03' 58.85" E
	FRUTSBSEGUIN-04	13+32.55	13+48.30	13+63.88	14° 50' 06.40" LT	47° 21' 06.78"	31.33'	15.75'	121.00'		2,195,495.7033	13,734,278.9410	2,195,511.3410	13,734,277.0393	2,195,526.9443	13,734,279.2049	S 83° 03' 58.85" E	N 82° 05' 54.75" E
	FRUTSBSEGUIN-05	13+63.88	13+87.05	14+08.17	41° 36' 27.28" LT	93° 55' 39.03"	44.30'	23.18'	61.00'		2,195,526.9443	13,734,279.2049	2,195,549.9006	13,734,282.3909	2,195,564.9496	13,734,300.0167	N 82° 05' 54.75" E	N 40° 29' 27.47" E
	FRUTSBSEGUIN-06	14+08.17	14+44.66	14+79.04	33° 33' 26.32" LT	47° 21' 06.78"	70.87'	36.48'	121.00'		2,195,564.9496	13,734,300.0167	2,195,588.6390	13,734,327.7622	2,195,593.0432	13,734,363.9783	N 40° 29' 27.47" E	N 6° 56' 01.16" E
			14+79.04										2,195,593.0432	13,734,363.9783				
FRUTNBSEGUIN			10+00.00										2,195,533.0359	13,733,961.6555				
	FRUTNBSEGUIN-01	10+00.00	10+30.20	10+59.85	18° 56' 40.30" LT	31° 39' 18.46"	59.85'	30.20'	181.00'		2,195,533.0359	13,733,961.6555	2,195,536.6816	13,733,991.6336	2,195,530.3972	13,734,021.1714	N 6° 56' 01.16" E	N 12° 00' 39.15" W
	FRUTNBSEGUIN-02	10+59.85	10+89.67	11+15.33	52° 06' 37.26" LT	93° 55' 39.03"	55.48'	29.82'	61.00'		2,195,530.3972	13,734,021.1714	2,195,524.1909	13,734,050.3429	2,195,497.3572	13,734,063.3603	N 12° 00' 39.15" W	N 64° 07' 16.41" W
	FRUTNBSEGUIN-03	11+15.33	11+45.53	11+75.18	18° 56' 42.44" LT	31° 39' 18.46"	59.85'	30.20'	181.00'		2,195,497.3583	13,734,063.3598	2,195,470.1869	13,734,076.5411	2,195,440.2079	13,734,080.1868	N 64° 07' 16.41" W	N 83° 03' 58.84" W
	FRUTNBSEGUIN-04	13+23.36	13+39.11	13+54.68	14° 50' 06.40" LT	47° 21' 06.78"	31.33'	15.75'	121.00'		2,195,293.1121	13,734,098.0750	2,195,277.4745	13,734,099.9767	2,195,261.8712	13,734,097.8112	N 83° 03' 58.84" W	S 82° 05' 54.75" W
	FRUTNBSEGUIN-05	13+54.68	13+85.35	14+11.51	53° 22' 41.16" LT	93° 55' 39.03"	56.83'	30.67'	61.00'		2,195,261.8712	13,734,097.8112	2,195,231.4971	13,734,093.5957	2,195,216.7614	13,734,066.7031	S 82° 05' 54.75" W	S 28° 43' 13.60" W
	FRUTNBSEGUIN-06	14+11.51	14+50.20	14+87.94	21° 47' 12.44" LT	28° 30' 19.31"	76.43'	38.68'	201.00'		2,195,216.7614	13,734,066.7031	2,195,198.1731	13,734,032.7795	2,195,193.5033	13,733,994.3799	S 28° 43' 13.60" W	S 6° 56' 01.16" W
			14+87.94										2,195,193.5033	13,733,994.3799				
FRUTSBGRYTWN			10+00.00										2,194,456.2454	13,729,310.4792				
	FRUTSBGRYTWN-01	10+00.00	10+51.00	10+80.11	90° 00' 00.00" LT	112° 20' 40.80"	80.11'	51.00'	51.00'		2,194,456.2454	13,729,310.4792	2,194,446.3620	13,729,260.4460	2,194,496.3952	13,729,250.5626	S 11° 10' 27.00" W	S 78° 49' 33.00" E
	FRUTSBGRYTWN-02	11+91.60	12+35.16	12+63.70	80° 59' 38.90" LT	112° 20' 40.80"	72.09'	43.55'	51.00'		2,194,605.7731	13,729,228.9564	2,194,648.5010	13,729,220.5161	2,194,663.5258	13,729,261.3961	S 78° 49' 33.00" E	N 20° 10' 48.09" E
	FRUTSBGRYTWN-03	12+63.70	12+98.44	13+33.07	7° 55' 59.85" LT	11° 26' 10.62"	69.37'	34.74'	501.00'		2,194,663.5258	13,729,261.3961	2,194,675.5102	13,729,294.0038	2,194,682.8793	13,729,327.9535	N 20° 10' 48.09" E	N 12° 14' 48.24" E
			13+33.07										2,194,682.8793	13,729,327.9535				
FRUTNBGRYTWN			10+00.00										2,194,620.2352	13,728,964.1335				
	FRUTNBGRYTWN-01	10+00.00	10+61.00	10+95.82	90° 00' 00.00" LT	93° 55' 39.03"	95.82'	61.00'	61.00'		2,194,620.2352	13,728,964.1335	2,194,632.0565	13,729,023.9771	2,194,572.2129	13,729,035.7984	N 11° 10' 26.99" E	N 78° 49' 33.00" W
	FRUTNBGRYTWN-02	11+96.41	12+12.87	12+29.27	9° 22' 00.44" LT	28° 30' 19.31"	32.86'	16.47'	201.00'		2,194,473.5329	13,729,055.2913	2,194,457.3785	13,729,058.4824	2,194,440.9201	13,729,059.0017	N 78° 49' 33.00" W	N 88° 11' 33.44" W
	FRUTNBGRYTWN-03	12+29.27	12+63.76	12+89.93	68° 09' 04.05" LT	112° 20' 40.80"	60.66'	34.50'	51.00'		2,194,440.9201	13,729,059.0017	2,194,406.4394	13,729,060.0898	2,194,392.5972	13,729,028.4908	N 88° 11' 33.44" W	S 23° 39' 22.50" W
	FRUTNBGRYTWN-04	12+89.93	13+55.65	14+20.86	12° 28' 55.51" LT	9° 32' 00.27"	130.93'	65.73'	601.00'		2,194,392.5972	13,729,028.4908	2,194,366.2251	13,728,968.2886	2,194,353.4881	13,728,903.8095	S 23° 39' 22.50" W	S 11° 10' 27.00" W
			14+20.86										2,194,353.4881	13,728,903.8095				
FRUTSBBZEGD			10+00.00										2,192,994.4287	13,723,478.2273				
	FRUTSBBZEGD-01	10+00.00	10+94.12	11+51.54	85° 57' 49.72" LT	56° 43' 42.58"	151.54'	94.12'	101.00'		2,192,994.4287	13,723,478.2273	2,193,016.3419	13,723,386.6892	2,193,109.1953	13,723,402.1050	S 13° 27' 45.33" E	N 80° 34' 24.95" E
	FRUTSBBZEGD-02	12+16.90	12+25.17	12+33.41	9° 22' 00.44" LT	56° 43' 42.58"	16.51'	8.27'	101.00'		2,193,173.6728	13,723,412.8097	2,193,181.8354	13,723,414.1649	2,193,189.6685	13,723,416.8304	N 80° 34' 24.95" E	N 71° 12' 24.51" E
	FRUTSBBZEGD-03	12+41.60	12+78.78	13+05.85	72° 11' 14.34" LT	112° 20' 40.80"	64.26'	37.18'	51.00'		2,193,197.4241	13,723,419.4696	2,193,232.6230	13,723,431.4477	2,193,231.9868	13,723,468.6234	N 71° 12' 24.51" E	N 0° 58' 49.83" W
	FRUTSBBZEGD-04	13+05.85	13+71.58	14+36.78	12° 28' 55.50" LT	9° 32' 00.27"	130.93'	65.73'	601.00'		2,193,231.9868	13,723,468.6234	2,193,230.8621	13,723,534.3389	2,193,215.5606	13,723,598.2580	N 0° 58' 49.83" W	N 13° 27' 45.33" W
			14+36.78										2,193,215.5606	13,723,598.2580				
FRUTNBBZEGD			10+00.00										2,193,298.1228	13,723,158.8723				
	FRUTNBBZEGD-01	10+00.00	10+94.12	11+51.54	85° 57' 49.72" LT	56° 43' 42.58"	151.54'	94.12'	101.00'		2,193,298.1228	13,723,158.8723	2,193,276.2097	13,723,250.4103	2,193,183.3562	13,723,234.9946	N 13° 27' 45.33" W	S 80° 34' 24.95" W
	FRUTNBBZEGD-02	12+12.26	12+54.90	12+86.68	69° 54' 03.83" LT	93° 55' 39.03"	74.42'	42.63'	61.00'		2,193,123.4485	13,723,225.0485	2,193,081.3899	13,723,218.0659	2,193,073.4943	13,723,176.1692	S 80° 34' 24.95" W	S 10° 40' 21.12" W
	FRUTNBBZEGD-03	12+86.68	13+29.66	13+71.35	24° 08' 06.45" LT	28° 30' 19.31"	84.67'	42.97'	201.00'		2,193,073.4943	13,723,176.1692	2,193,065.5361	13,723,133.9408	2,193,075.5404	13,723,092.1500	S 10° 40' 21.12" W	S 13° 27' 45.33" E
			13+71.35										2,193,075.5404	13,723,092.1500				

PRELIMINARY
SUBJECT TO CHANGE

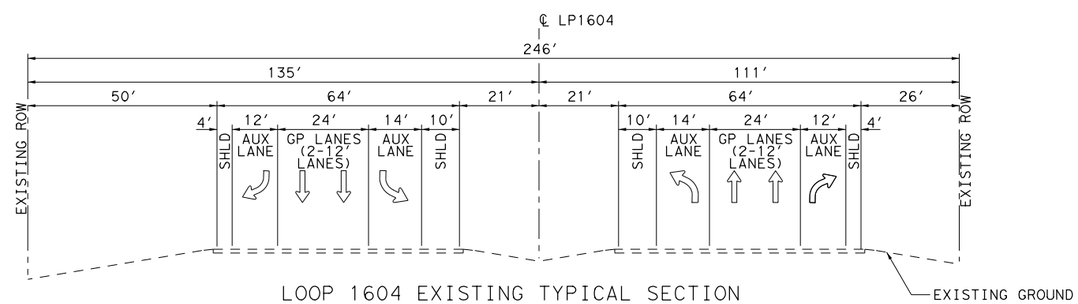
APPENDIX D: TYPICAL SECTIONS



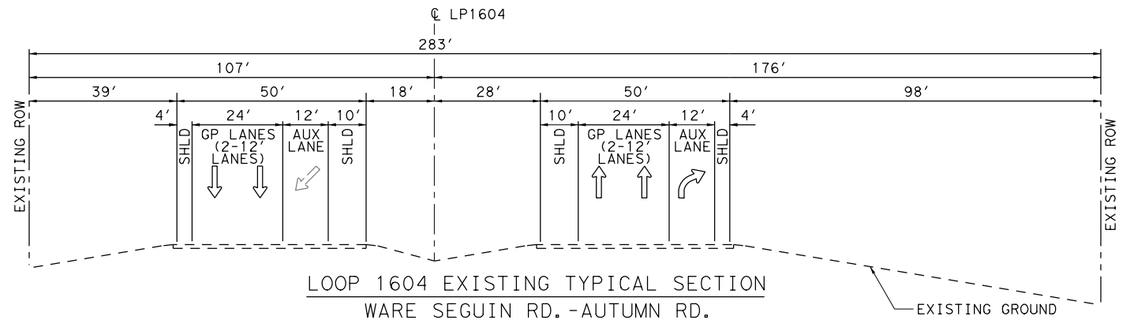
LOOP 1604 EXISTING TYPICAL SECTION
FM 78-HANOVER COVE



LOOP 1604 EXISTING TYPICAL SECTION
HANOVER COVE-LOWER SEGUIN RD.



LOOP 1604 EXISTING TYPICAL SECTION
LOWER SEGUIN RD.-WARE SEGUIN RD.



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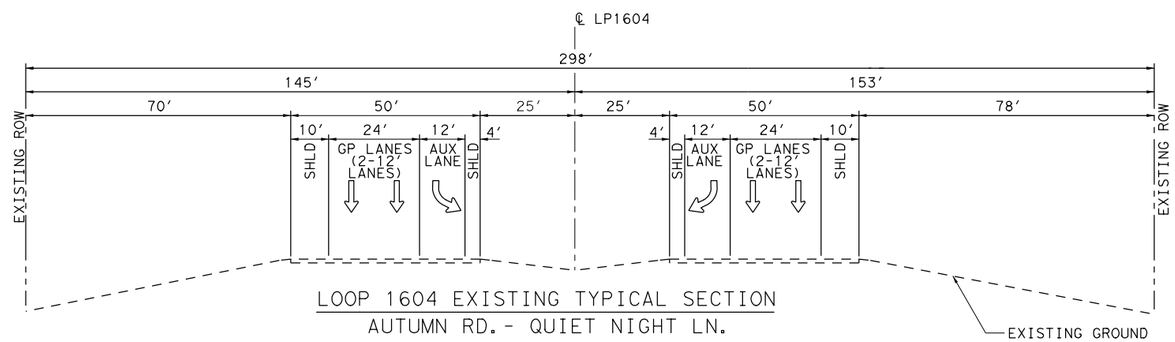
WARE SEGUIN RD.-AUTUMN RD.



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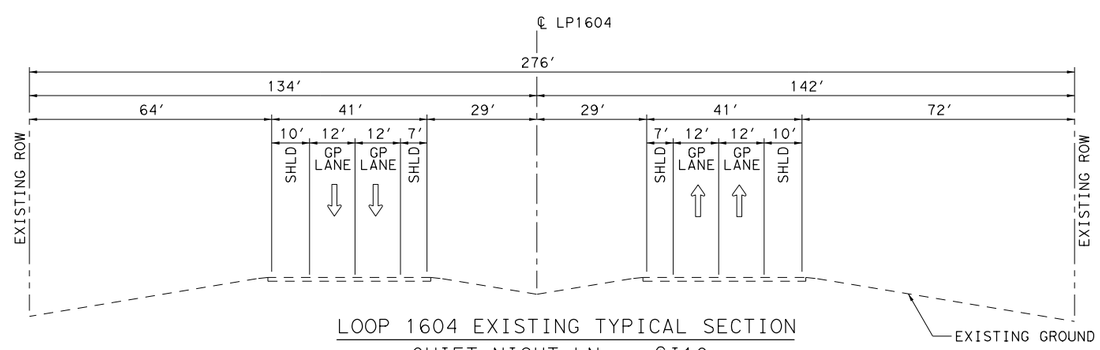
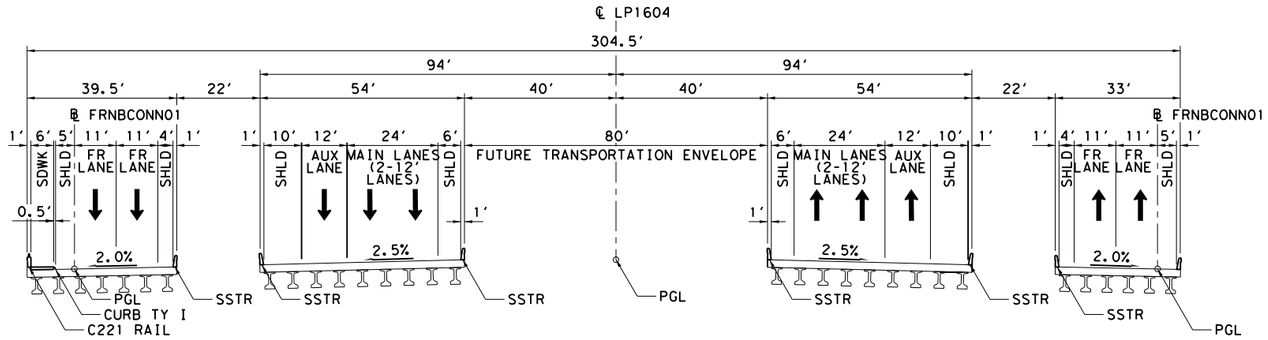
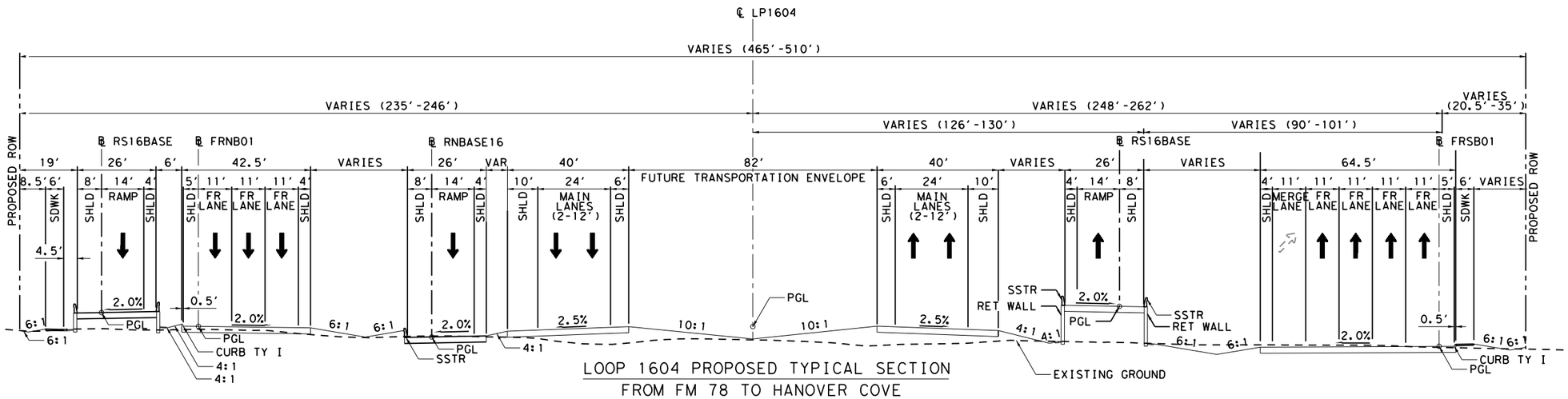
AUTUMN RD.- QUIET NIGHT LN.



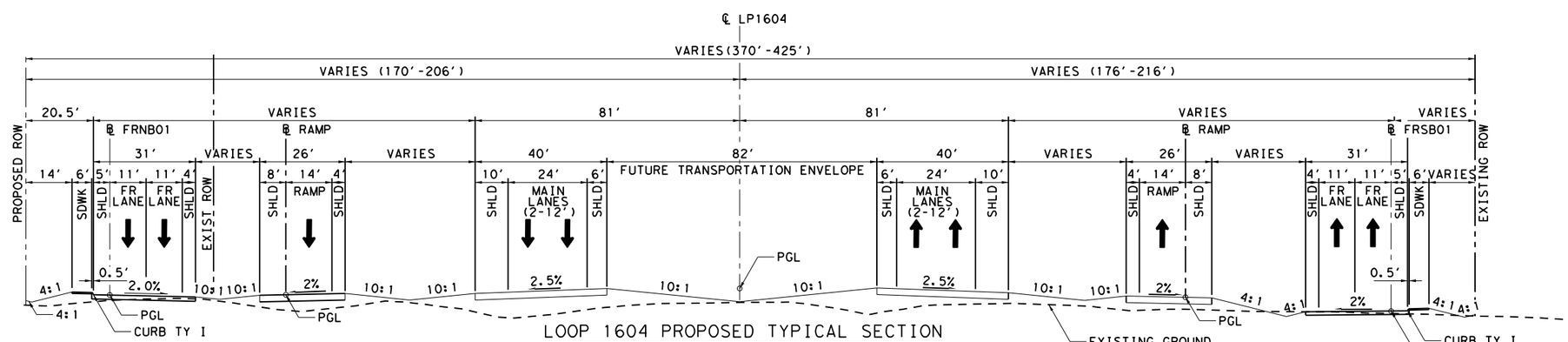
LOOP 1604 EXISTING TYPICAL SECTION
QUIET NIGHT LN. - ℄I10



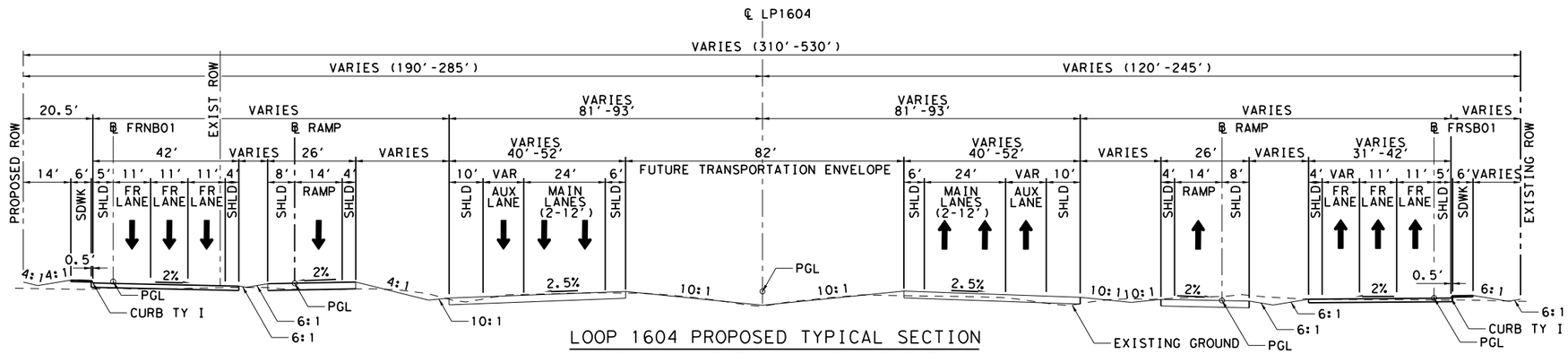
LOOP 1604 PROPOSED TYPICAL SECTION
FM 78 BRIDGE



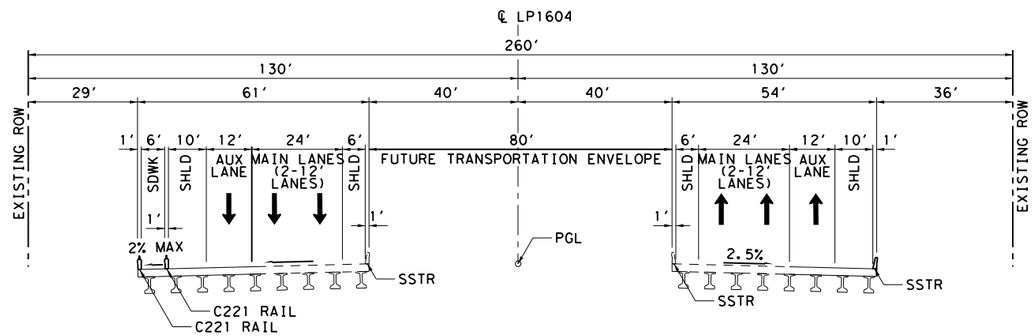
LOOP 1604 PROPOSED TYPICAL SECTION
FROM FM 78 TO HANOVER COVE



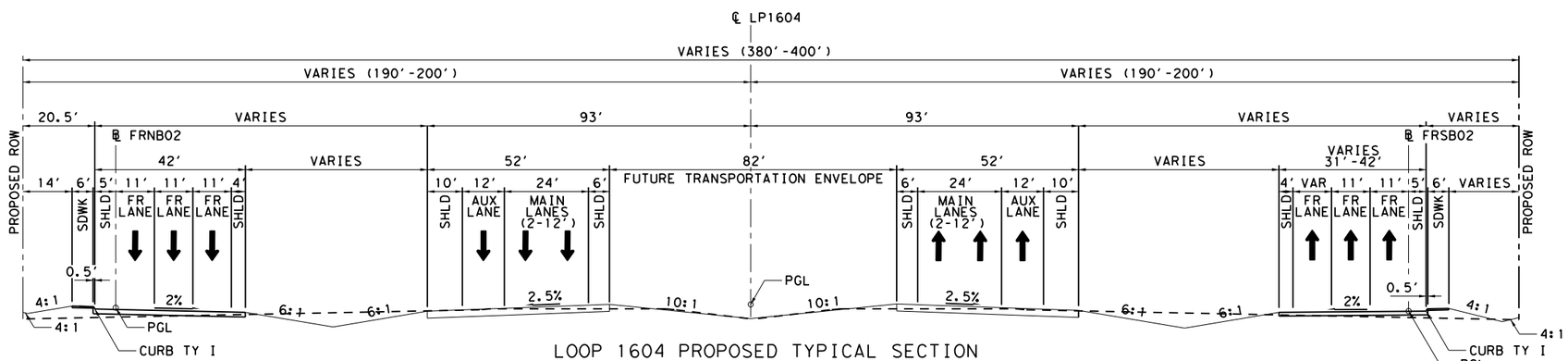
LOOP 1604 PROPOSED TYPICAL SECTION
HANOVER COVE TO ROCKET LANE



LOOP 1604 PROPOSED TYPICAL SECTION
ROCKET LANE TO SALITRILLO CREEK



LOOP 1604 PROPOSED TYPICAL SECTION
SALITRILLO BRIDGE



LOOP 1604 PROPOSED TYPICAL SECTION
SALITRILLO CREEK TO I-10 EAST

APPENDIX E-1: AAMPO METROPOLITAN TRANSORTATION PLAN AND TRANSPORTATION IMPROVEMENT PROGRAM EXCERPT

METROPOLITAN TRANSPORTATION PLAN "Mobility 2045"

ALAMO AREA METROPOLITAN PLANNING ORGANIZATION

FY 2023

TxDOT District	County	CSJ	Hwy	Phase	City	Project Sponsor	MPO Proj ID No.	Year of Expenditure Cost
15 - San Antonio	Bexar	0072-07-075	IH 10	E	Other	TxDOT	5401.2	$12,900,000

Limits From: Kendall/Bexar County Line
Limits To: FM 3351
Description: Expand from 4 to 8 lane expressway - 2 new general purpose, 2 new HOV lanes & from 4 to 4 FR lanes
Remarks: None

Last Revision Date: 7/2020 TDM Network Years: 2035,2045

Proj Hist: 5/20 - revise cost and move FY 28 to FY 25 & add E phase to TIP ; 1/19 - rev descr to incl FR lanes; 10/18 - move FY 29 to FY 28; 6/18 - correct funding distrib; 4/17 - add project to MTP with P1/P7; portion of project

Total Project Cost Information (TxDOT %):

Preliminary Engineering:	$12,900,000
ROW Purchase:	$0
Construction Cost:	$129,020,000
Construction Engineering:	$5,700,000
Contingencies:	$10,000,000
Indirect Costs:	$2,900,000
Other Field:	$5,700,000
Total Project Cost:	$166,220,000

Cost of Approved Phases: $12,900,000
NOX lbs/day N/A
VOC lbs/day N/A
CMP Score N/A

Type of Work: Added Capacity: Non Toll | Status: RSR | Non-Exempt

Authorized Funding by Category/Share

Funding Categories	Federal	State	Local	Local Contrib	Total
SWPE	$10,320,000	$2,580,000	$0	$0	$12,900,000
Other	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0
Totals	$10,320,000	$2,580,000	$0	$0	$12,900,000

15 - San Antonio	Bexar	2452-03-111	SL 1604	E,R	Other	TxDOT	9107.2	$47,500,000

Limits From: FM 78
Limits To: IH 10 East
Description: Expand from 4 lane divided to 4 lane expressway and from 0 to 4 FR lanes
Remarks: None

Last Revision Date: 7/2020 TDM Network Years: 2035,2045

Proj Hist: 5/20 - add E,R phases to TIP; 1/19 - update funding; 4/18 - correct funding distribution; 4/17 - add project; removed from 10/15 Prop 1 list due to financial constraint issues

Total Project Cost Information (TxDOT %):

Preliminary Engineering:	$30,000,000
ROW Purchase:	$4,200,000
Construction Cost:	$300,000,000
Construction Engineering:	$13,300,000
Contingencies:	$23,300,000
Indirect Costs:	$6,700,000
Other Field:	$13,300,000
Total Project Cost:	$390,800,000

Cost of Approved Phases: $47,500,000
NOX lbs/day N/A
VOC lbs/day N/A
CMP Score N/A

Type of Work: Added Capacity: Non Toll | Status: RSR | Non-Exempt

Authorized Funding by Category/Share

Funding Categories	Federal	State	Local	Local Contrib	Total
SBPE	$0	$43,300,000	$0	$0	$43,300,000
SWROW	$3,360,000	$840,000	$0	$0	$4,200,000
Other	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0
Totals	$3,360,000	$44,140,000	$0	$0	$47,500,000

15 - San Antonio	Bexar	2452-03-087	SL 1604	E	Other	TxDOT	3530.2	$23,000,000

Limits From: Redland Road
Limits To: IH 35 North
Description: Expand from 4 to 10 lane expressway - including 2 HOV - special use lanes & from 4 to 4 FR lanes
Remarks: None

Last Revision Date: 7/2020 TDM Network Years: 2035,2045

Proj Hist: 5/20 - add E phase to TIP; 9/19 - ADM clarify description; 1/19 - incl FR lanes & update cost; 10/18 - move 27 to 25 & rev descr; 4/17 - move 30 to 27 and rev funding; 4/14- move18 to 30, rev limits and descr; 8/12 -

Total Project Cost Information (TxDOT %):

Preliminary Engineering:	$23,000,000
ROW Purchase:	$0
Construction Cost:	$230,000,000
Construction Engineering:	$10,000,000
Contingencies:	$17,900,000
Indirect Costs:	$5,100,000
Other Field:	$10,200,000
Total Project Cost:	$296,400,000

Cost of Approved Phases: $23,000,000
NOX lbs/day N/A
VOC lbs/day N/A
CMP Score N/A

Type of Work: Added Capacity: Non Toll | Status: RSR | Non-Exempt

Authorized Funding by Category/Share

Funding Categories	Federal	State	Local	Local Contrib	Total
SWPE	$18,400,000	$4,600,000	$0	$0	$23,000,000
Other	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0
Totals	$18,400,000	$4,600,000	$0	$0	$23,000,000

APPENDIX D

Environmental Clearance Projects

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FY 2019-2022 Transportation Improvement Program
Appendix D: Environmental Clearance Project Listing

Hwy	CSJ	MPO Proj ID No.	Project Sponsor	Year
CR	0915-12-618	5532.0	BC	2025
Limits From:	In Bexar County, on Blanco Road			
Limits To:	Borgfeld to Bexar/Comal County Line			
Description:	Expand from 2 to 4 lane divided roadway with a raised median, bike lanes, sidewalk, curbs and drainage			
Note:	Project included in Appendix D in April 2018			
CS		5326.0	Converse	2030
Limits From:	On Toepperwein from Crossbow Peak			
Limits To:	FM 1976			
Description:	Expand from 2 to 4 lane roadway with continuous center turn lane sidewalks and bike lanes) to align with South Seguin Road (FM 1516)			
Note:	Project included in Appendix D in April 2016			
CS	0915-12-593	5534.0	CoSA	2025
Limits From:	In San Antonio on South New Braunfels			
Limits To:	From Lyster Road to IH 410			
Description:	Construct roadway extension on new alignment with multiuse path and sidewalks			
Note:	Project included in Appendix D in April 2018			
CS	0915-12-617	5538.0	CoSA	2024
Limits From:	In San Antonio, on Zarzamora			
Limits To:	From US 90 to Walton Avenue			
Description:	Construct grade separation at UPRR/Frio City Rd			
Note:	Project included in Appendix D in April 2018			
CS	0915-46-049	5533.0	Seguin	2025
Limits From:	In Seguin, on Rudeloff Road			
Limits To:	From Huber Road to SH 123 (at FM 20)			
Description:	Construct new alignment 4 lane roadway with center left turn lane, bicycle and pedestrian facilities			
Note:	Project included in Appendix D in April 2018			
FM 1518	0465-02-027	5309.0	TxDOT	2023
Limits From:	FM 78			
Limits To:	IH 10			
Description:	Expand from 2 to 4 lanes with raised median or center turn lane, bike lanes and sidewalks			
Note:	Project included in Appendix D in April 2018			
FM 1560	2230-01-021	5391.0	TxDOT	2023
Limits From:	SH 16			
Limits To:	Galm/Shaenfield			
Description:	Expand from 2 lanes to 4 lanes with turn lanes, bike accommodation and sidewalks			
Note:	Project included in Appendix D in April 2018			
FM 3351	3212-05-011	5330.1	TxDOT	2023
Limits From:	Kenneland			
Limits To:	Bexar/Comal County Line			
Description:	Expand 2 to 4 lanes with turn lanes, bike lanes & sidewalks			
Note:	Project included in Appendix D in April 2018			
FM 3351	3212-05-013	5541.0	TxDOT	2024
Limits From:	at Cibolo Creek			
Limits To:	.			
Description:	Reconstruct existing bridge and expand from 2 to 6 lanes			
Note:	Project included in Appendix D in April 2018			

FY 2019-2022 Transportation Improvement Program
Appendix D: Environmental Clearance Project Listing

Hwy	CSJ	MPO Proj ID No.	Project Sponsor	Year
FM 3351	3212-06-017	5330.2	TxDOT	2023
Limits From:	Comal/Bexar County Line			
Limits To:	IH 10			
Description:	Expand 2 to 4 lanes with turn lanes, bike lanes & sidewalks			
Note:	Project included in Appendix D in April 2018			
FM 725	0215-09-901	5390.0	TxDOT	2037
Limits From:	Zipp Rd			
Limits To:	FM 78			
Description:	Expand from 2 lanes to 4 lane divided and intersection improvements			
Note:				
IH 10	0025-03-097	5395.0	TxDOT	2029
Limits From:	Bexar/Guadalupe County Line			
Limits To:	US 90A			
Description:	Expand from 4 lane to 6 lane expressway			
Note:				
IH 10	0072-06-082	5400.0	TxDOT	2029
Limits From:	SH 46			
Limits To:	Bexar/Kendall County Line			
Description:	Expand from 4 to 8 lanes expressway - 2 new general purpose and 2 new HOV lanes			
Note:				
IH 10	0072-07-075	5401.0	TxDOT	2029
Limits From:	Kendall/Bexar County Line			
Limits To:	FM 3351			
Description:	Expand from 4 to 8 lanes expressway - 2 new general purpose and 2 new HOV lanes			
Note:				
IH 10	0535-01-074	5385.0	TxDOT	2025
Limits From:	US 90A			
Limits To:	SH 130			
Description:	Expand from 4 lanes to 6 lane expressway			
Note:	Project included in Appendix D in April 2018			
IH 10	0535-02-047	5397.0	TxDOT	2029
Limits From:	SH 130			
Limits To:	SH 80			
Description:	Expand from 4 lane to 6 lane expressway			
Note:				
IH 35	0016-05-111	4014.0	TxDOT	2025
Limits From:	Guadalupe/Comal County Line			
Limits To:	FM 1103			
Description:	Expand from 6 ln to 10 ln expy - add 4 new managed lanes			
Note:	Project included in Appendix D in April 2018			
IH 35	0016-05-114	5383.0	TxDOT	2025
Limits From:	Guadalupe River			
Limits To:	FM 1103			
Description:	Operational improvements including ramp revisions & intersection improvement			
Note:	Project included in Appendix D in April 2018			

FY 2019-2022 Transportation Improvement Program
Appendix D: Environmental Clearance Project Listing

Hwy	CSJ	MPO Proj ID No.	Project Sponsor	Year
IH 35	0016-06-047	4013.0	TxDOT	2025
Limits From:	Bexar/Guadalupe County Line			
Limits To:	Guadalupe/Comal County Line			
Description:	Expand from 8 ln to 12 ln expy thru FM 3009 and 6 ln to 10 ln expy from FM 3009 to Comal CL - add 4 new managed lanes			
Note:	Project included in Appendix D in April 2018			
IH 35 North	0016-07-113	3477.0	ARMA	2025
Limits From:	IH 410 N			
Limits To:	Guadalupe/Bexar County Line			
Description:	Expand from 8 ln to 12 ln expy - add 4 new managed lanes - including managed lane conns at Loop 1604			
Note:	Project included in Appendix D in April 2018			
IH 35 North	0017-10-168	61.2	ARMA	2025
Limits From:	IH 410 S			
Limits To:	IH 410 N			
Description:	Expand from ln 8 to 12 ln expy - add 4 new managed lanes incl managed lane conns at IH 410 N & IH 410 S			
Note:	Project included in Appendix D in April 2018			
IH 410	0521-05-144	5402.0	TxDOT	2037
Limits From:	US 90			
Limits To:	IH 35 S			
Description:	Expand from 6 to 8 lane between US 90 & Valley Hi; & from 4 to 6 lane between Valley Hi & IH 35 S; reconstruct IH 35 Inc			
Note:				
SH 123	0366-02-088	5398.0	TxDOT	2029
Limits From:	Guadalupe/Hays County Line			
Limits To:	Cordova Ln			
Description:	Widen roadway to provide operational improvements			
Note:				
SH 123	0366-02-089	5337.0	TxDOT	2026
Limits From:	Cordova Ln			
Limits To:	IH 10			
Description:	Expand from 2 to 4 lanes with center left turn lane			
Note:	Project included in Appendix D in April 2018			
SH 123	0366-03-066	5399.0	TxDOT	2029
Limits From:	SH 123B in Seguin			
Limits To:	Wilson/Guadalupe County Line			
Description:	Expand to 4 lane divided roadway			
Note:				
SH 151	3508-01-029	5382.0	TxDOT	2024
Limits From:	LP 1604			
Limits To:	IH 410			
Description:	Expand from 4 lane to 6 lane expressway			
Note:	Project included in Appendix D in April 2018			
SH 46	0215-01-051	5392.0	TxDOT	2037
Limits From:	Bentwood Dr			
Limits To:	FM 3159			
Description:	Expand from 2 lanes to 6 lanes with raised median or CLTL			
Note:				

FY 2019-2022 Transportation Improvement Program
Appendix D: Environmental Clearance Project Listing

Hwy	CSJ	MPO Proj ID No.	Project Sponsor	Year
SH 46	0215-07-049	5393.0	TxDOT	2037
Limits From:	Bulverde Rd			
Limits To:	Farhills Dr			
Description:	Expand from 2 lanes to 6 lanes with raised median or CLTL			
Note:				
SL 1604	2255-01-084	5386.0	TxDOT	2026
Limits From:	0.38 Mi North of FM 1303			
Limits To:	FM 1303			
Description:	Expand from 2 lanes to 4 lanes divided			
Note:	Project included in Appendix D in April 2018			
SL 1604	2255-02-027	5387.0	TxDOT	2026
Limits From:	US 87			
Limits To:	US 181			
Description:	Expand from 2 lanes to 4 lanes divided			
Note:	Project included in Appendix D in April 2018			
SL 1604	2255-02-028	5388.0	TxDOT	2026
Limits From:	US 181			
Limits To:	0.8 Mi North of FM 1303			
Description:	Expand from 2 lanes to 4 lanes divided			
Note:	Project included in Appendix D in April 2018			
SL 1604	2452-03-111	9107.0	TxDOT	2024
Limits From:	FM 78			
Limits To:	IH 10 East			
Description:	Expand from 4 lane divided to 4 lane expressway			
Note:	Project included in Appendix D in April 2018			
SL 1604	2452-04-014	9108.0	TxDOT	2025
Limits From:	IH 10 East			
Limits To:	FM 1346 - Houston Street			
Description:	Expand from 2 lanes to 4 lane divided			
Note:	Project included in Appendix D in April 2018			
SL 1604	2452-04-015	5389.0	TxDOT	2026
Limits From:	FM 1346 - Houston Street			
Limits To:	US 87			
Description:	Expand from 2 lanes to 4 lanes divided			
Note:	Project included in Appendix D in April 2018			
SL 368	0016-08-041	5535.0	TxDOT	2024
Limits From:	New Braunfels St.			
Limits To:	Burr Road			
Description:	Roadway rehabilitation and Complete Streets improvements			
Note:	Project included in Appendix D in April 2018			
US 90	0024-07-059	5380.0	TxDOT	2024
Limits From:	SH 211			
Limits To:	0.8 Miles W of IH 410			
Description:	Expand from 4 lane divided to 6 lane expressway			
Note:	Project included in Appendix D in April 2018			

APPENDIX E

Transit Project Detail

APPENDIX E-2: CONGESTIONS MANAGEMENT PROCESS ASSESSMENT

APPENDIX E-2: CONGESTIONS MANAGEMENT PROCESS ASSESSMENT

ROAD NAME: SL 1604 **LIMIT FROM:** FM 78 **TO:** IH 10 East

MPO PROJECT ID(S): 9107.0

STRATEGIES FOR MANAGING CONGESTION

N/A	Considered NOT IMPL	Considered IMPL	Strategies (Alternative Infrastructure / Modal Options / System Demand / System Reliability)	Description of how the strategy is being incorporated into the project *(when applicable)*
			Intelligent Transportation Systems (ITS)	
○	○	●	Advanced traffic management	Expanding ITS architecture
●	○	○	Advanced public transit systems	VIA Metropolitan Transit does not yet operate a route in this area.
○	○	●	Emergency management	ITS cameras are used to remotely inspect incident and to marshal resources. This portion of Loop 1604 is not a hurricane evacuation route; however the project would provide options for emergency management.
			Policy Management	
●	○	○	Land use	N/A - not identified for mixed-use in the adopted City of Converse 2019 Zoning Map or the 2019 City of San Antonio Zoning Map
○	○	●	Preservation of green space	Project is not located in any Edwards Aquifer zone. It is not acquiring any green space.
●	○	○	Parking management	N/A - parking demand does not warrant strategy
○	○	●	Preserve neighborhood aesthetic	The project preserves neighborhood aesthetic by avoiding impacts to cultural and historical sites.
●	○	○	Transit-oriented development (TOD)	N/A - The project area is not identified for TOD in local plans
			Corridor Improvements (≥1 mile in length)	
○	○	●	Capacity improvements	Expanding from 4 lane divided to a 4 lane controlled access facility with 2 lane frontage roads in each direction.
○	○	●	Congestion relief corridors	Loop 1604 provides congestion relief for IH 410
○	○	●	Bottleneck removal	Incorporating auxiliary lanes onto the new controlled access facility to improve merging and diverging on mainlanes; incorporating dedicated turn lanes on frontage roads.
○	○	●	Roadway rehabilitation	Reconstructing all of the lanes and construction of new frontage roads will include new riding surfaces and enhanced pavement structure.
○	○	●	Bicycle facilities	A shared use lane will be constructed along the frontage roads and shared use paths crossing the facility at the major intersections.
○	○	●	Pedestrian facilities	Six foot sidewalks will be added along the corridor.
			Advanced Transportation Systems	
●	○	○	Premium transit	N/A - VIA does not have plans to add Primo, Bus Rapid Transit or Light Rail Transit to this segment of Loop 1604 corridor
●	○	○	Managed lanes	Managed lanes will not be included on this project but will be accounted for when future expansion is warranted.

N/A	Considered NOT IMPL	Considered IMPL	Strategies (Alternative Infrastructure / Modal Options / System Demand / System Reliability)	Description of how the strategy is being incorporated into the project *(when applicable)*
●	○	○	Passenger rail service (between regional hubs)	N/A - Commuter rail was considered by the Lone Star District but abandoned after Union Pacific said they could not use their rail lines or ROW for that purpose.
●	○	○	High speed transportation	High-Speed Transportation (HST) study for HST between Fort Worth and Laredo is ongoing (AECOM). Any recommendations resulting from this study will be considered at the time they are available.
●	○	○	Active parking management	N/A - Strategy is appropriate for surface streets with on- and off-street parking demand
			Operational Management	
○	●	○	Connected and automated vehicle (CAV) technology	TxDOT is open to the use of HOV lanes for CAV when such technology can be deployed
○	○	●	Incident management	Expanded ITS architecture and additional lanes will expand incident management capabilities.
○	○	●	Access management	The project would add controlled access lanes only; thereby enhancing the mobility function of the corridor. No new access points would be created.
○	○	●	Signalization and traffic flow improvements	Major intersections will be improved to include grade separations, signals, and turnarounds. Signals will be equipped with radar detection to optimize traffic flow.
○	○	●	Railroad crossing improvement	Mainlane bridges over an existing UPRR track will be reconstructed to span the entire ROW. New frontage road bridges will be constructed over UPRR.
○	○	●	Construction coordination	The project would include outreach to inform public of any substantial traffic impacting events. Closures would be minimized particularly during peak travel.
○	○	●	Freight management	Transport of oversized loads will be planned to avoid traffic impacts during and after construction. Loop 1604 is part of the Texas Highway Freight Network.
			Travel Demand Management Campaigns	
○	○	●	Rideshare program	The MPO's Alamo Commutes program is actively advancing travel demand management strategies in the region to include carpool/vanpool (i.e. ridesharing), alternative scheduling and telecommuting as well as Guaranteed Ride Home benefits
○	○	●	Flexible work hours	The MPO's Alamo Commutes program is actively advancing travel demand management strategies in the region to include carpool/vanpool (i.e. ridesharing), alternative scheduling and telecommuting as well as Guaranteed Ride Home benefits
○	○	●	Guaranteed Ride Home program	The MPO's Alamo Commutes program is actively advancing travel demand management strategies in the region to include carpool/vanpool (i.e. ridesharing), alternative scheduling and telecommuting as well as Guaranteed Ride Home benefits
○	○	●	Telecommuting	The MPO's Alamo Commutes program is actively advancing travel demand management strategies in the region to include carpool/vanpool (i.e. ridesharing), alternative scheduling and telecommuting as well as Guaranteed Ride Home benefits
○	○	●	Walkable Community Program	The MPO's Active Transportation program hosts Walkable Community Workshops for interested community organizations in the region to make walking a safer, more attractive option
			Public Transportation Improvements	
●	○	○	Transit service enhancements	N/A - Service enhancements would be at the discretion of VIA Metropolitan Transit
●	○	○	Transit facilities	N/A, no transit facilities are present; however improved mobility would benefit future transit services.
●	○	○	Ridership incentives	N/A – Service enhancements would be in coordination with VIA Metropolitan Transit, which TxDOT is open to should opportunity arise.

PARTNER AGENCY REPRESENTATIVE: John Bryant

AAMPO REPRESENTATIVE: Allison Blazosky

DATE OF COORDINATION (mm/dd/yy): 01/15/20

APPENDIX F: RESOURCE-SPECIFIC MAPS

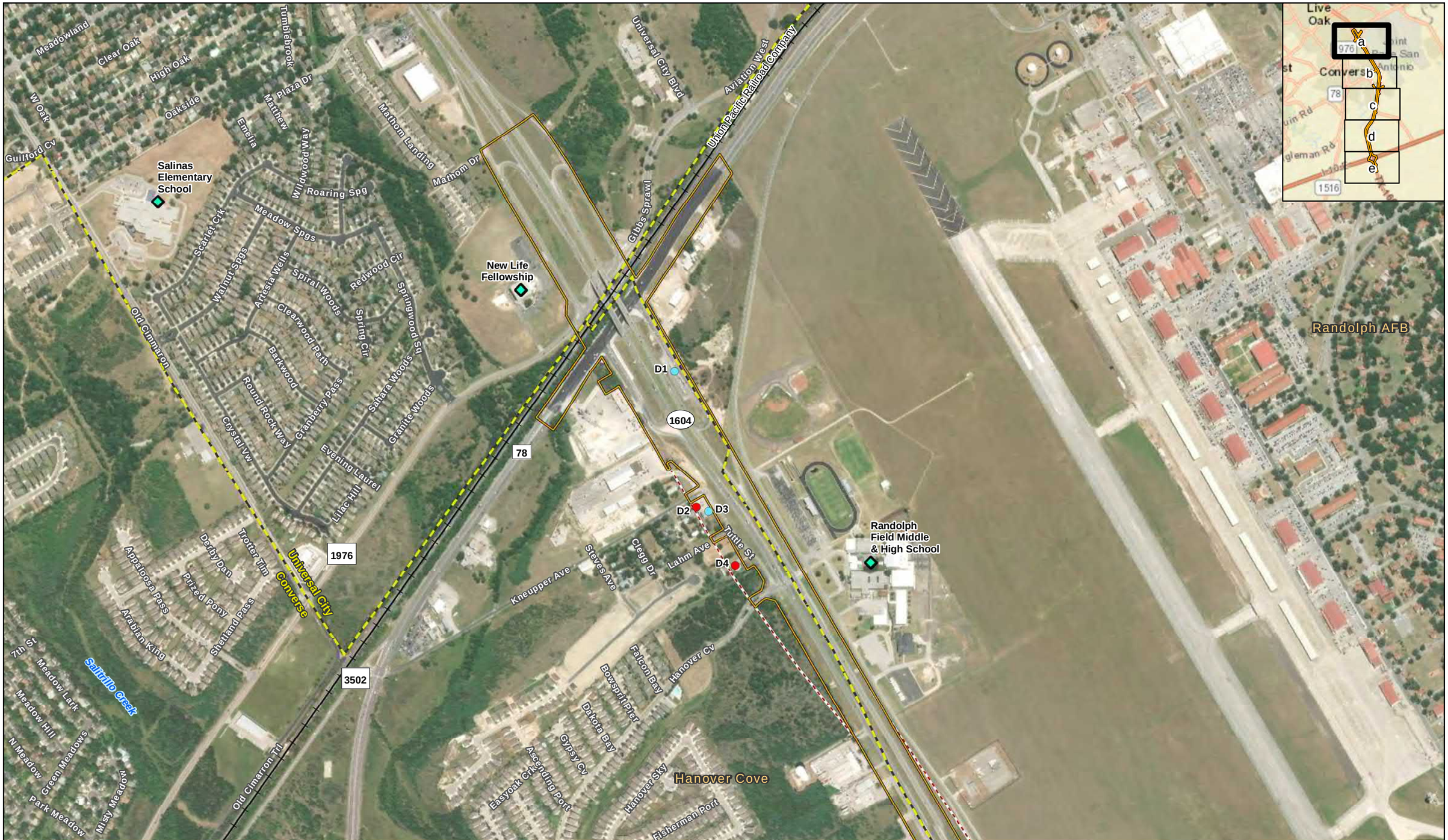

Figure 1a

Potential Displacements and Community Facilities

Loop 1604 from FM 78 to I-10 E

Existing Right-of-Way
Proposed Right-of-Way
City Boundary
Railroad
Potential Displacement
Commercial
Other
Community Facility

Data Source: CMEC (2018)
Aerial Source: ESRI (2017)

0 700 Feet
0 200 Meters

Prepared for: TxDOT	1 in = 700 feet
	Scale: 1:8,400
CSJ: 2452-03-111	Date: 10/16/2019

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Figure 1b

Potential Displacements and Community Facilities

Loop 1604 from FM 78 to I-10 E

Existing Right-of-Way
Proposed Right-of-Way
City Boundary
Railroad
Potential Displacement
Other
Community Facility

Data Source: CMEC (2018)
Aerial Source: ESRI (2017)

0 700 Feet
0 200 Meters

Prepared for: TxDOT	1 in = 700 feet
	Scale: 1:8,400
CSJ: 2452-03-111	Date: 10/16/2019

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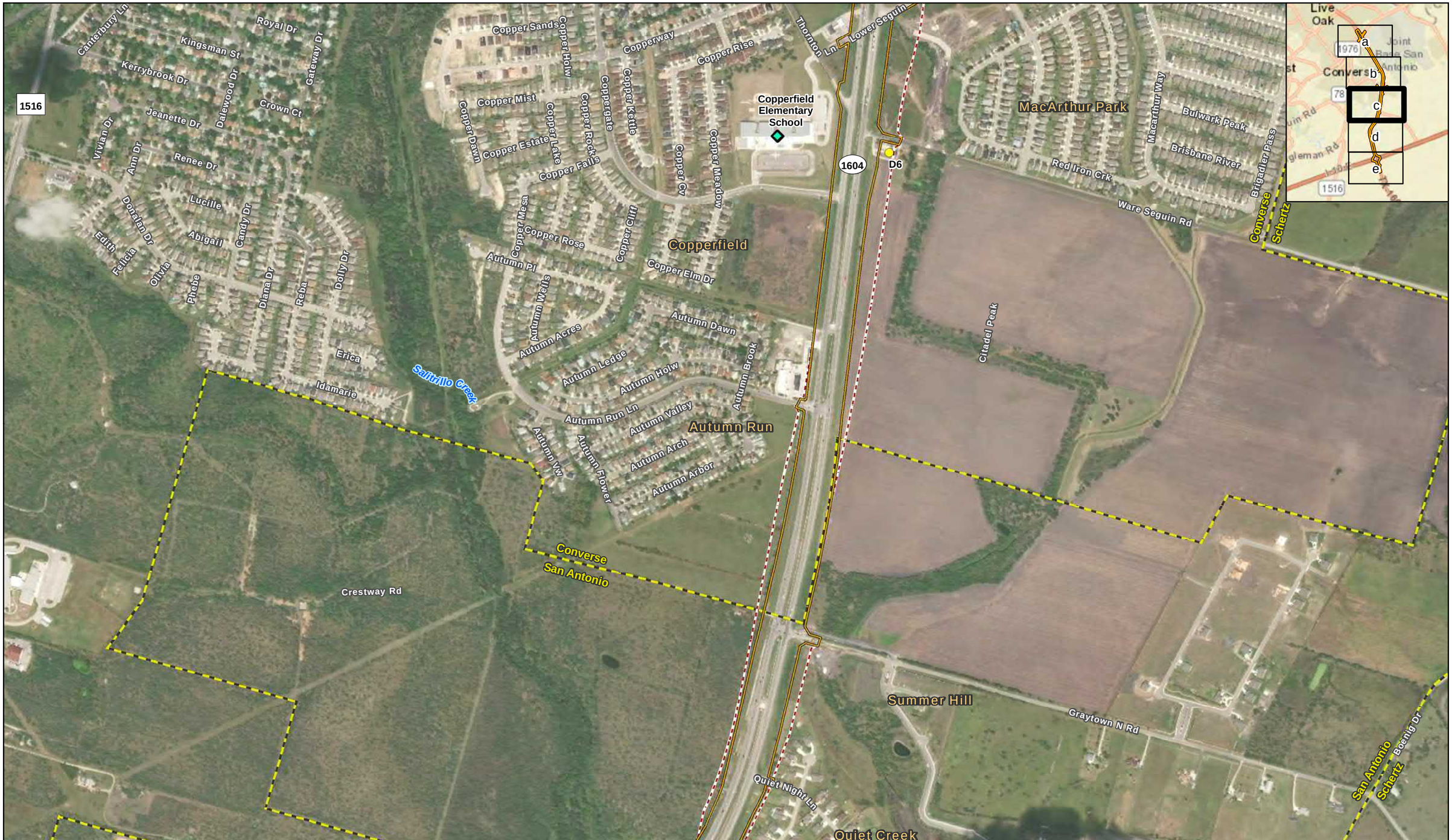

Figure 1c

Potential Displacements and Community Facilities

Loop 1604 from FM 78 to I-10 E

Existing Right-of-Way
Proposed Right-of-Way
City Boundary
Potential Displacement
Residential
Community Facility

Data Source: CMEC (2018)
Aerial Source: ESRI (2017)

0 700 Feet
0 200 Meters

Prepared for: TxDOT	1 in = 700 feet
	Scale: 1:8,400
CSJ: 2452-03-111	Date: 10/16/2019

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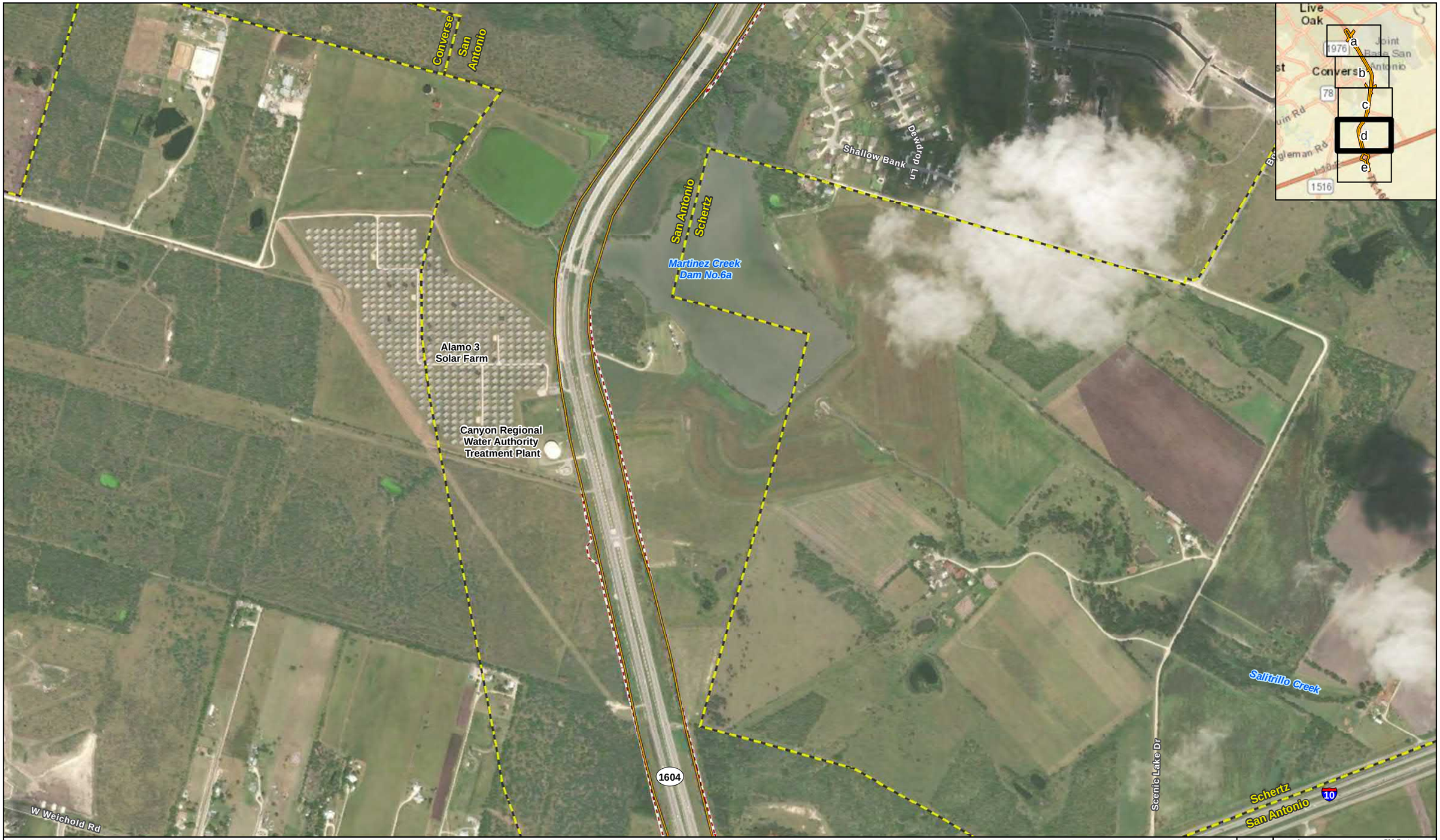

Figure 1d

Potential Displacements and Community Facilities

Loop 1604 from FM 78 to I-10 E

Existing Right-of-Way

Proposed Right-of-Way

City Boundary

Data Source: CMEC (2018)

Aerial Source: ESRI (2017)

0 700 Feet

0 200 Meters

Prepared for: TxDOT	1 in = 700 feet
	Scale: 1:8,400
CSJ: 2452-03-111	Date: 10/16/2019

G:\Projects\TXDOT\LP1604_FM78toI10\CIA_Figure 3_LandUse_CommunityFacilities_20181204.mxd

Figure 1e

Potential Displacements and Community Facilities

Loop 1604 from FM 78 to I-10 E

Existing Right-of-Way
Proposed Right-of-Way
City Boundary

Data Source: CMEC (2018)
Aerial Source: ESRI (2017)

0 700 Feet
0 200 Meters

Prepared for: TxDOT	1 in = 700 feet
	Scale: 1:8,400
CSJ: 2452-03-111	Date: 10/16/2019

G:\Projects\TXDOT\LP1604_FM78toI10\CIA_Figure 3_LandUse_CommunityFacilities_20181204.mxd

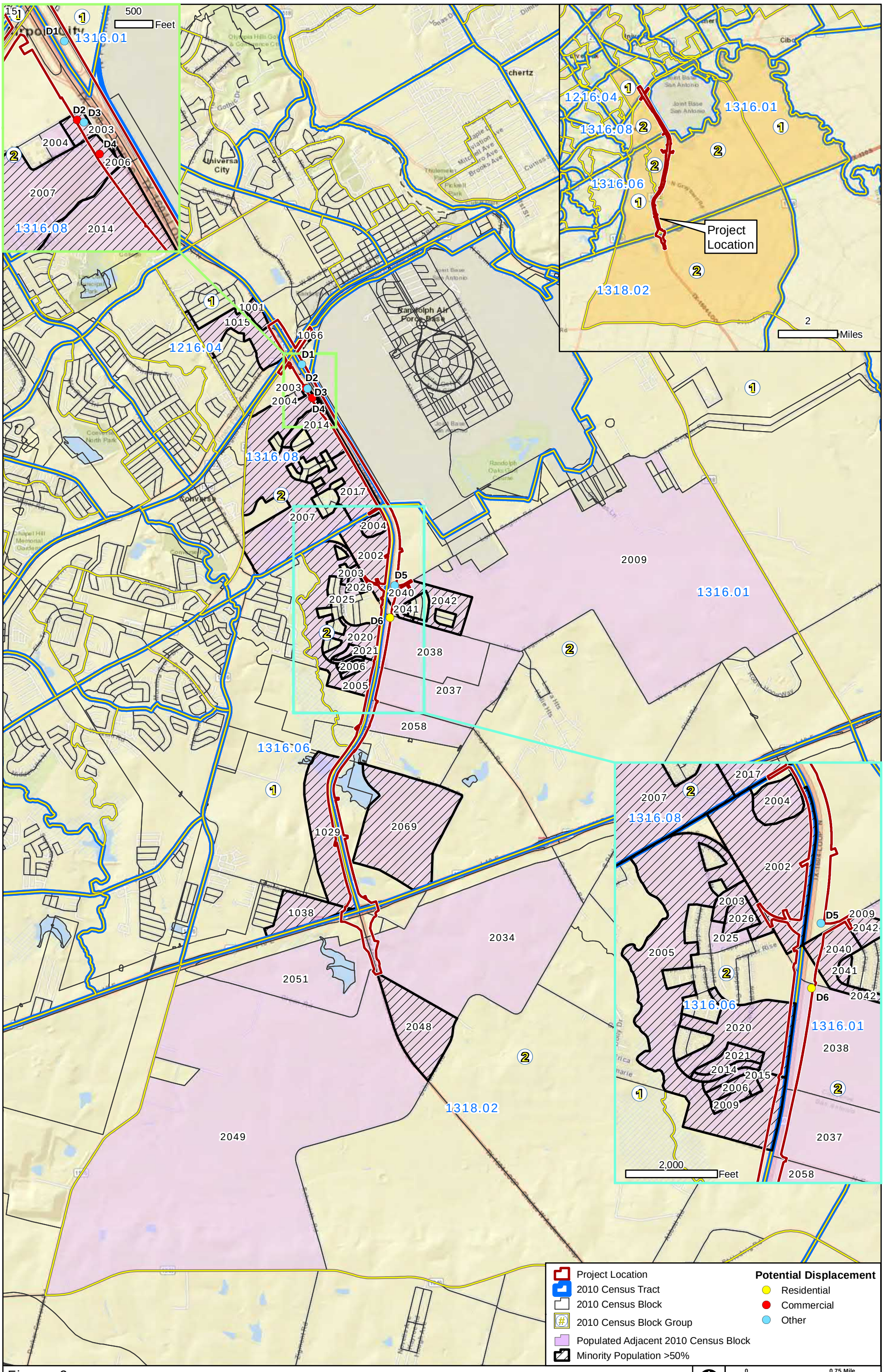

Figure 2

Census Geographies

Loop 1604 from FM 78 to I-10 E

Data Source: US Census Bureau (2010); CMEC (2018)
Basemap Source: ESRI (2018)

0 0.75 Mile
0 1 Kilometer

Prepared for: TxDOT	1 in = 0.75 mile
	Scale: 1:47,750
CSJ: 2452-03-111	Date: 10/16/2019

G:\Projects\TXDOT\LP1604_FM78toI10\CIA_Figure 4_Census Geographies_20181203.mxd

Figure 3a

Area of Induced Growth

Loop 1604 from FM 78 to I-10 E

Data Sources: BCAD (2018), FEMA NFHL (2018), NHD (2013), TxDOT (2018)
Aerial Source: Google (2018)

Prepared for: TxDOT	1 in = 1,200 feet
	Scale: 1:14,400
CSJ: 2452-03-111	Date: 4/15/2019

G:\Projects\TXDOT\LP1604_FM78toI10\Indirect_Figure 3_Area of Induced Growth_20190410.mxd

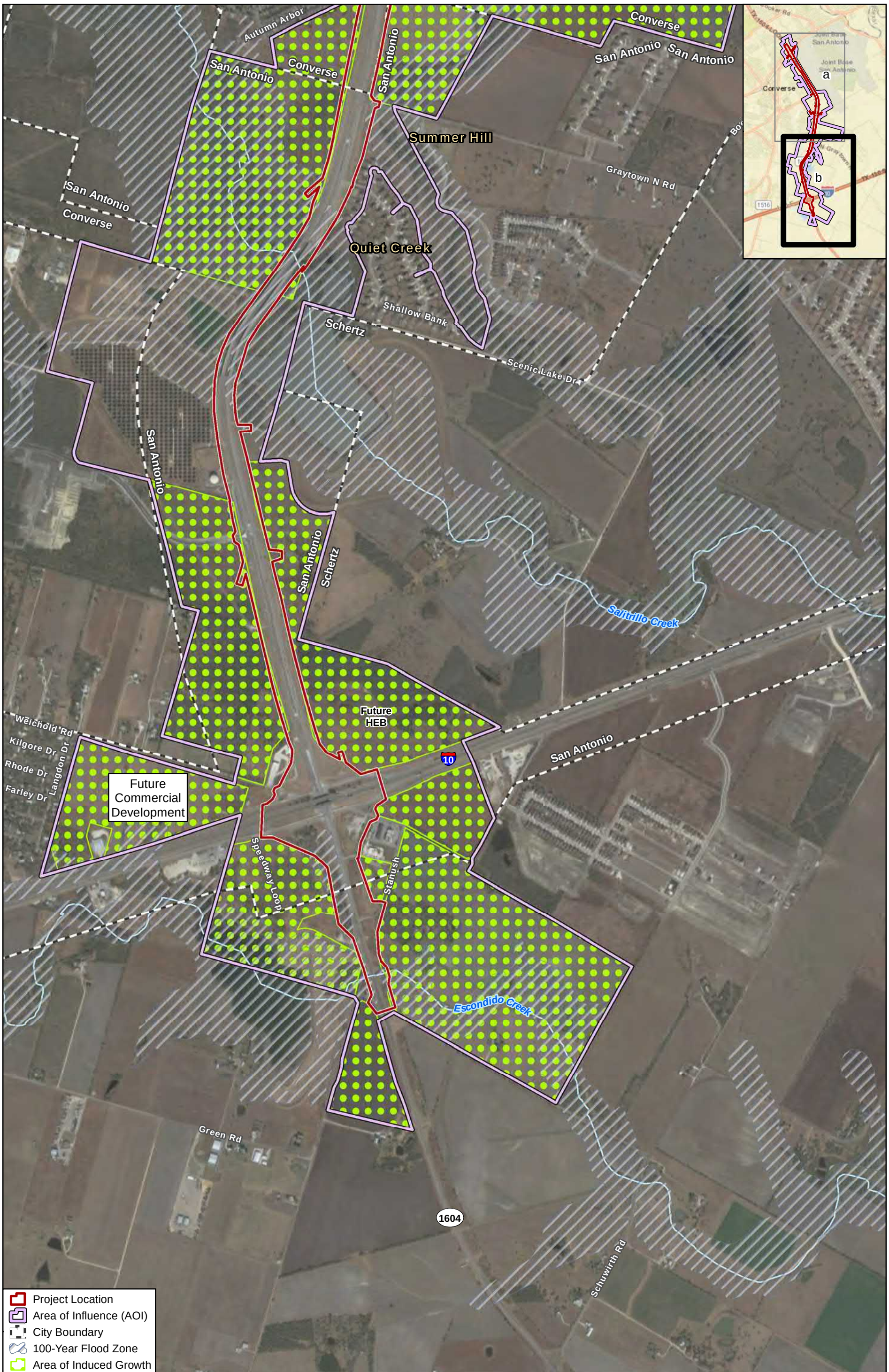

Figure 3b

Area of Induced Growth

Loop 1604 from FM 78 to I-10 E

Data Sources: BCAD (2018), FEMA NFHL (2018), NHD (2013), TxDOT (2018)
Aerial Source: Google (2018)

0 1,200 Feet
0 300 Meters

Prepared for: TxDOT	1 in = 1,200 feet
	Scale: 1:14,400
CSJ: 2452-03-111	Date: 4/15/2019

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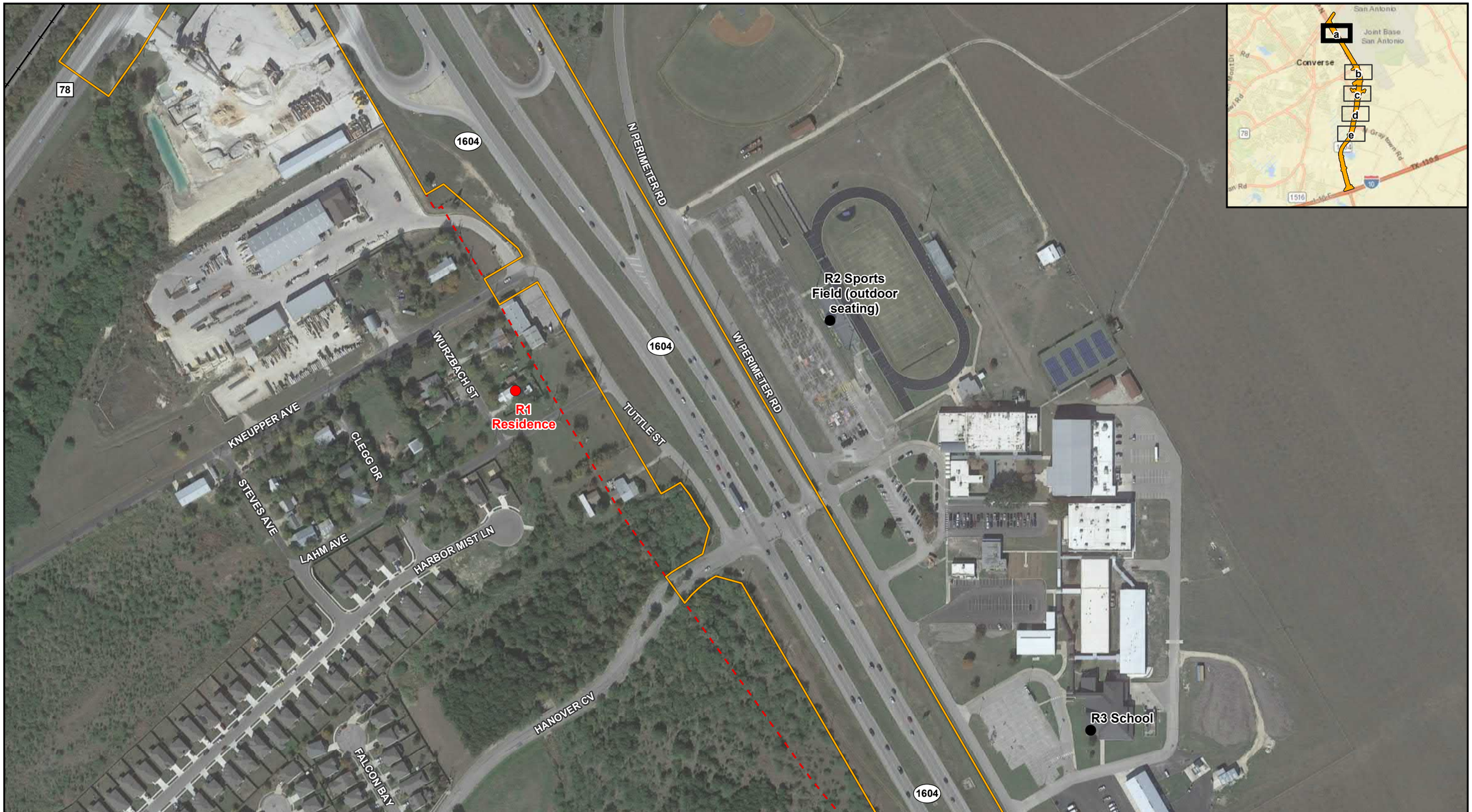


Figure 4a

Noise Receiver Locations

Loop 1604 from FM 78 to I-10 E

Existing ROW
Proposed ROW
Railroad
Impacted Receiver
No Impact

Data Sources: Roads/Railroads - TxDOT 2018
Basemap: Google Imagery 2019

0 200 400 Feet
0 50 100 Meters

Prepared for: TxDOT	1 inch = 249 feet
	Scale: 1:2,990
CSJ: 2452-03-111	Date: 03/02/2021

Author: helen.potter; Document Path: L:\DCS\GIS\Temp\TxDOT\Kennedy_LP_1604\Map_Docs\Figures\CSJ111_NoiseReceiverLocations_FM78 to I-10E.mxd

Figure 4b

Noise Receiver Locations

Loop 1604 from FM 78 to I-10 E

Existing ROW
Proposed ROW
Impacted Receiver
No Impact

Data Sources: Roads/Railroads - TxDOT 2018
Basemap: Google Imagery 2019

0 200 400 Feet
0 50 100 Meters

Prepared for: TxDOT	1 inch = 249 feet
	Scale: 1:2,990
CSJ: 2452-03-111	Date: 03/02/2021

Author: helen.potter; Document Path: L:\DCS\GIS\Temp\TxDOT\Kennedy_LP_1604\Map_Docs\Figures\CSJ111_NoiseReceiverLocations_FM78 to I-10E.mxd

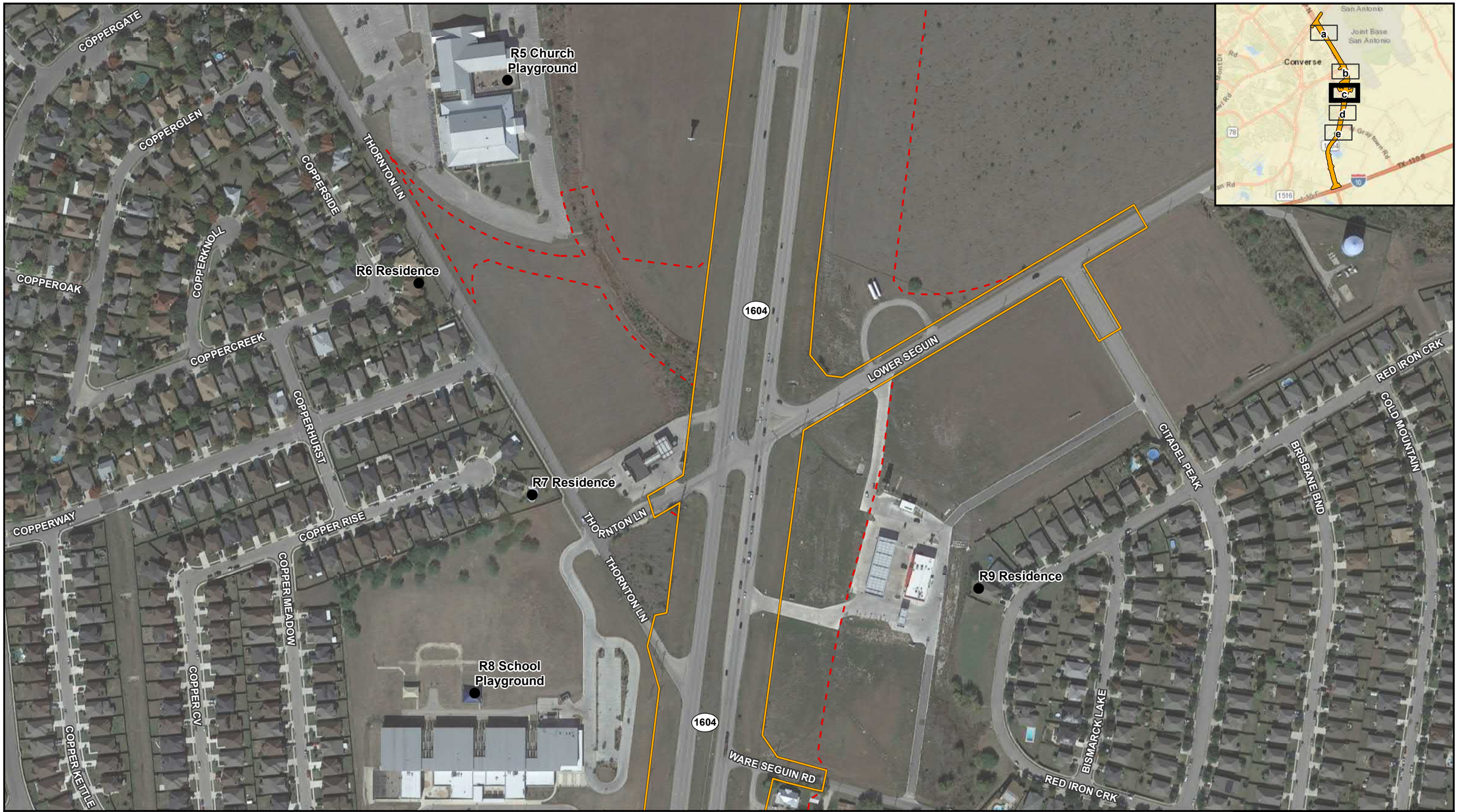


Figure 4c

Noise Receiver Locations

Loop 1604 from FM 78 to I-10 E

Existing ROW
Proposed ROW
Impacted Receiver
No Impact

Data Sources: Roads/Railroads - TxDOT 2018
Basemap: Google Imagery 2019

0 200 400 Feet
0 50 100 Meters

Prepared for: TxDOT	1 inch = 249 feet
	Scale: 1:2,990
CSJ: 2452-03-111	Date: 03/02/2021

Author: helen.potter; Document Path: L:\DCS\GIS\Temp\TxDOT\Kennedy_LP_1604\Map_Docs\Figures\CSJ111_NoiseReceiverLocations_FM78 to I-10E.mxd

Figure 4d

Noise Receiver Locations

Loop 1604 from FM 78 to I-10 E

Existing ROW
Proposed ROW
Impacted Receiver
No Impact

Data Sources: Roads/Railroads - TxDOT 2018
Basemap: Google Imagery 2019

0 200 400 Feet
0 50 100 Meters

Prepared for: TxDOT	1 inch = 249 feet
	Scale: 1:2,990
CSJ: 2452-03-111	Date: 03/02/2021

Author: helen.potter; Document Path: L:\DCS\GIS\Temp\TxDOT\Kennedy_LP_1604\Map_Docs\Figures\CSJ111_NoiseReceiverLocations_FM78 to I-10E.mxd

Figure 4e

Noise Receiver Locations

Loop 1604 from FM 78 to I-10 E

Existing ROW
Proposed ROW
Impacted Receiver
No Impact

Data Sources: Roads/Railroads - TxDOT 2018
Basemap: Google Imagery 2019

0 200 400 Feet
0 50 100 Meters

Prepared for: TxDOT	1 inch = 249 feet
	Scale: 1:2,990
CSJ: 2452-03-111	Date: 03/02/2021

Author: helen.potter; Document Path: L:\DCS\GIS\Temp\TxDOT\Kennedy_LP_1604\Map_Docs\Figures\CSJ111_NoiseReceiverLocations_FM78 to I-10E.mxd

APPENDIX G: RESOURCE AGENCY COORDINATION

Texas Department of Transportation

125 EAST 11TH STREET, AUSTIN, TEXAS 78701-2483 | 512.463.8588 | WWW.TXDOT.GOV

May 14, 2019

RE: CSJ: 2452-03-11; State Loop 1604 from FM 78 to IH-10 E, Highway Improvements, Section 106 Consultation; Bexar County, San Antonio District

To: Representatives of Federally-recognized Tribes with Interest in this Project Area

The above referenced transportation project is being considered for construction by the Federal Highway Administration (FHWA) and the Texas Department of Transportation (TxDOT). Environmental studies are in the process of being conducted for this project. The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

The purpose of this letter is to contact you in order to consult with your Tribe pursuant to stipulations of the Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU). The project is located in an area that is of interest to your Tribe.

Undertaking Description

TxDOT's San Antonio District is proposing improvements to State Loop (SL) 1604 between FM 78 and IH-10 E in eastern Bexar County, Texas (Exhibit A).

The proposed project would add frontage roads and sidewalks and make intersection improvements along SL 1604, adding grade separated interchanges (overpasses) at several locations between FM 78 and IH-10 East. The project would require approximately 51 acres of new right-of-way. This would be in narrow strips adjacent to existing right-of-way (Exhibit B).

Area of Potential Effects

The project's area of potential effects (APE) comprises the following area.

- The project limits extend from Farm-to-Market (FM) 78 to IH-10 East along SL 1604. The total project length is thus 31,152 feet.
- The existing right of way is 370-420 feet in width.
- The latitude and longitude for the end points of the project are:
    - Begin latitude: +29.53165416 Begin longitude: -98.300389

- End latitude: +29. 45979662 End longitude: -98. 29035189

- The existing right of way comprises an area estimated at 280 acres.
- The 51 acres of proposed new right-of-way parallels the existing SL 1604, typically between 10-50 feet in width (Exhibit B).
- There are approximately 3 acres of easement, 1.3 acres will be used as right-of-way and the remainder will be easement.
- The estimated depths of impact would be typically 3 to 5 feet with a maximum depth of impacts of 40 feet for support piers for overpasses and bridges.
- For the purposes of this cultural resources review, the APE also includes an additional 50-foot area around the previously-described horizontal dimensions to account for potential alterations to the proposed APE included in the final project design. Consultation would be continued if potential impacts extend beyond this additional area, based on the final design

Identification Efforts

For this project, TxDOT has conducted a desktop-based study of available background information that indicates further field investigation is warranted.

The majority of the APE was surveyed in 2007. Full access to the APE was not available until recently. Although there is little potential for intact deposits in the proposed APE, site 41BX1692, a prehistoric site was documented in the APE but was never evaluated fully as access was not available. TxDOT is proposing to revisit the location of site 41BX1692 within the APE and determine if the site is present and its potential for designation as an archeological historic property and State Antiquities Landmark.

- TxDOT will attempt to locate site 41BX1692 within the APE.
- TxDOT will assess site 41BX1692 to determine if further investigations are necessary.
- No other segments of the APE warrants additional investigation as previous surveys assessed the majority of the APE.

Findings and Recommendations

Based on the above, TxDOT proposes the following findings and recommendations:

- while archeological sites occur rarely even under favorable circumstances for their presence and preservation, field investigation of the APE to identify potential archeological historic properties (36 CFR 800.16(l)) is warranted to verify that archeological historic properties do not occur within the APE;
- that a zone of 50 feet beyond the horizontal project limits be considered as part of the cultural resources evaluation; and

- if any future changes to the project APE extend beyond the additional 50-foot zone or if archeological deposits are discovered, your Tribe would then be contacted for further consultation.

According to our procedures and agreements currently in place regarding consultation under Section 106 of the National Historic Preservation Act, we are writing to request your comments on historic properties of cultural or religious significance to your Tribe that may be affected by the proposed project APE and the area within the above defined buffer. Any comments you may have on the TxDOT findings and recommendations should also be provided. Please provide your comments within 30 days of receipt of this letter. Any comments provided after that time will be addressed to the fullest extent possible. If you do not object that the proposed findings and recommendations are appropriate, please sign below to indicate your concurrence. In the event that further work discloses the presence of archeological deposits, we will contact your Tribe to continue consultation.

Thank you for your attention to this matter. If you have questions, please contact Laura Cruzada at 512/416-2638 (email: Laura.Cruzada@txdot.gov). When replying to this correspondence by US Mail, please ensure that the envelope address includes reference to the Archeological Studies Branch, Environmental Affairs Division.

Sincerely,

Scott Pletka, Deputy Section Director
Environmental Affairs Division

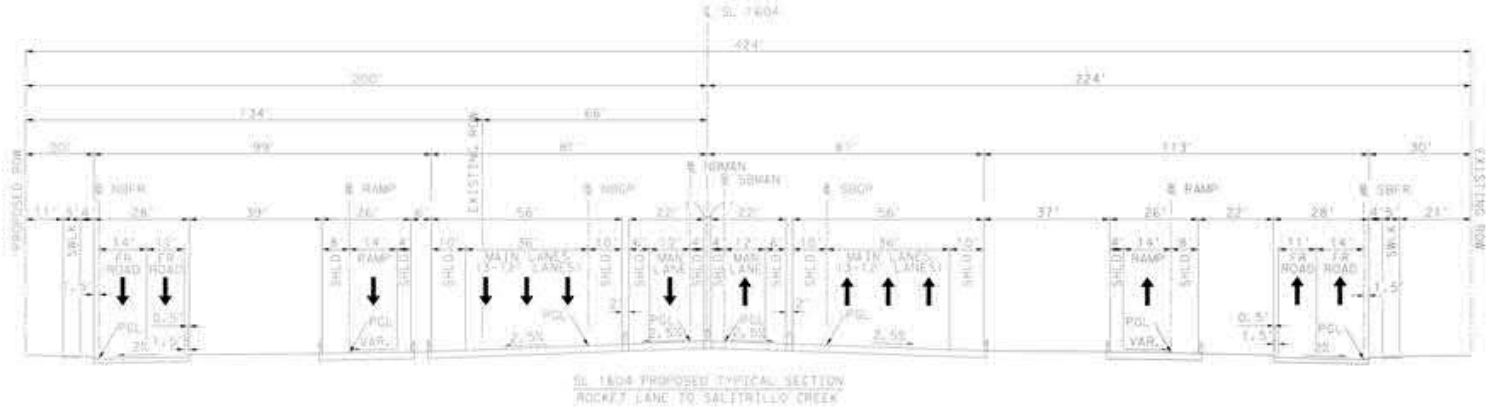
_____ _____

Concurrence by: Date:

Enclosure

cc w/ enclosure: ENV-ARCH ECOS

Byrd Blvd
FM 1518
Randolph Air Force Base
Randolph Air Force Base
Old Cimarron
Topperwein
FM 3502
FM 1976
Converse
FM 78
Rocket Ln
Schaefer Rd
Lower Seguin
Womans Hollow Creek
Salitrillo Creek
1604
Ware Seguin Rd
N Graytown Rd
FM 1518
10
Bexar County
16
281
410
San Antonio
37
Project Area
Exhibit A
Project Location
Loop 1604 from FM 78 to I-10 E
Project Location/APE
Basemap Source: ESRI (2018)
0
0.75 Mile
0
1 Kilometer
Prepared for: TxDOT
1 in = 0.75 miles
Scale: 1:47,520
CSJ: 2452-03-111
Date: 12/10/2018
G:\Projects\TXDOT\LP1604_FM78to110\Arch_Figure 1_Project Location_20181210.mxd



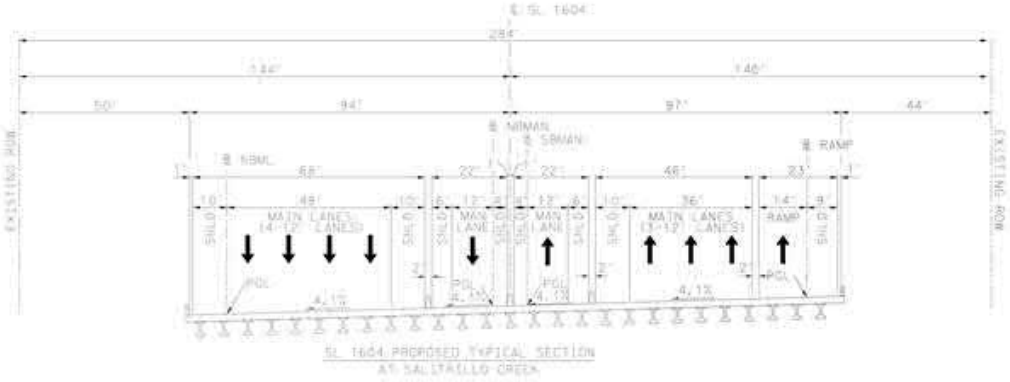


Exhibit B. Section

From:	Jason C. Nelson
To:	Laura Cruzada
Cc:	Cristina Collett
Subject:	RE: TxDOT Sec. 106 Consultation Request: CSJ: 2452-03-11; State Loop 1604 from FM 78 to IH-10 E, Highway Improvements; Bexar County, San Antonio District
Date:	Wednesday, May 15, 2019 11:15:24 AM
Attachments:	image001.png

This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning Ms. Cruzada,

The Kickapoo Traditional Tribe of Texas will not attend this survey. Thank you.

Best regards,
Jason C. Nelson

Jason C. Nelson | General Counsel
W: (830) 421-5386 | M: (830) 325-4729 | F: (830) 758-8008
2212 Rosita Valley Road | Eagle Pass, Texas 78852
www.kickapootexas.org

From: Laura Cruzada <Laura.Cruzada@txdot.gov>
Sent: Tuesday, May 14, 2019 11:01 AM
To: Jason C. Nelson <jason.nelson@ktttribe.org>; kentcollier2000@yahoo.com; dpacheco@okkt.net; kellie@tribaladminservices.org; Ivy Smith <Ivy@tribaladminservices.org>; Holly Houghten <holly@mathpo.org>; Gary.McAdams@wichitatribe.com; Terri.Parton@wichitatribe.com; 106NAGPRA@astribe.com; jlowe@alabama-quassarte.org; dhill@caddo.xyz; Tamara Francis <caddochair.cn@gmail.com>; Theodore Isham <isham.t@sno-nsn.gov>; lbrown@tonkawatribe.com; mallen@tonkawatribe.com; celestine.bryant@actribe.org; mooseanico@gmail.com; epa4apachetribeok@gmail.com; martinac@comanchenation.com; theodorev@comanchenation.com
Cc: Eric Oksanen <Eric.Oksanen@txdot.gov>
Subject: TxDOT Sec. 106 Consultation Request: CSJ: 2452-03-11; State Loop 1604 from FM 78 to IH-10 E, Highway Improvements; Bexar County, San Antonio District

Good morning,
Please let me know if you would like to attend this survey. We currently don't have right of entry, but when we obtain the land, we will continue to survey.

Sec. 106 Consultation

MAY 14, 2019

We kindly request your comments regarding a proposed undertaking. Please see the attached info for project details and information. A summary is provided below.

Summary:

Project ID (CSJ), County and TxDOT District	*CSJ: 2452-03-11; Bexar County, San Antonio District*
Project Sponsor:	*TxDOT San Antonio District*
Short Description:	*State Loop 1604 from FM 78 to IH-10 E, Highway Improvements*
New Right of Way:	*51 acres*
Depth of Impacts:	*3 to 5 ft.*
Known Archeological Sites or Properties in project area:	*Yes*
Identification Efforts:	*Desktop Review; 2007 survey of majority of APE.*
Recommendations:	*Further survey – trenching.*

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT

Contacts:

Laura Cruzada
512-416-2368

Laura Cruzada
512-416-2638
laura.cruzada@txdot.gov
Public Involvement Specialist & Tribal Liaison
Environmental Affairs Division
Cultural Resources Management

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DocuSign Envelope ID: CB9F48D5-5767-42FB-93C7-50D9F8036771

MEMO

24 July 2019

TO: Administrative File
From: Linda Henderson

District: San Antonio
County: Bexar
CSJ#: 2452-03-111
Highway: Loop 1604
Let Date: September 2023

Project Limits: south from FM 78 to IH-10 East
Project Description: Stipulation IX, Appendix 6. Widen and convert to limited access freeway. 45 acres of new ROW. No adverse effect to historic properties.

SUBJECT: Internal review under the Section 106 Programmatic Agreement (Section 106 PA) among the Texas Department of Transportation, Texas State Historic Preservation Officer, Advisory Council on Historic Preservation, and Federal Highway Administration; and the Memorandum of Understanding (MOU) between the Texas Historical Commission and the Texas Department of Transportation

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

Existing Conditions:
From just north of FM 78 to just south of I-10 E, existing Loop 1604 is a four-lane divided highway classified as an urban principal arterial. The existing Right of Way (ROW) varies from approximately 259 feet to 508 feed. The roadway features a center median ranging from 35 to 60 feet wide and driveways and city streets tied directly into the roadway, which is surrounded by residential neighborhoods, agricultural land, educational and light industrial facilities, and Randolph Air Force Base (AFB). See Figure 1 for locations map.

Proposed Project:
TxDOT proposes to convert Loop 1604 to a controlled-access design with the construction of continuous two-lane frontage roads in each direction, the reconstruction of the two-lane main lanes, and sidewalks along the frontage roads. TxDOT proposes five grade-separated interchanges, which will be constructed at the intersections of Loop 1604 and FM 78, Rocket Lane, Lower Seguin Road, Graytown Road, and Binz-Engleman Road. The design includes U-turns at several locations and ramps providing access to and from Randolph AFB. The design also includes new frontage road bridges over FM 78 to connect to existing frontage roads north of that road as well as the widening of existing non-historic bridges over Salitrillo Creek near the project's southern terminus.

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Determination of Eligibility:
TxDOT historians reviewed the National Register of Historic Places (NRHP), the list of State Antiquities Landmarks (SAL), the list of Recorded Texas Historic Landmarks (RTHL), and TxDOT files. The project APE clips the whole of the Randolph AFB parcel, and the project does require ROW from the Department of Defense, but the designated Randolph Field Historic District, an NRHP district and National Historic Landmark (NHL), falls well outside the APE and the 1,300-foot Study Area. Because the project APE clips the parcel, though, and because of the ROW take and the NHL-level significance of the historic district on the AFB, TxDOT did consider effects to the property and informally consult with the Texas Historical Commission (THC). See Figure 2, as well as exhibits in "PCR Attachments" documents attached.

Near the project's southern terminus, at the intersection of Loop 1604 and I-10, a cluster of buildings appear on current and historic aerial imagery on the edge of Parcel 61903 (see Figures 2d and 3h attached). These buildings lie outside the APE and Study Area, and the APE only barely clips the parcel. In addition, most of the buildings in the cluster lie on a parcel not clipped by the APE. Based on that and the completely limited visibility from the road to the buildings and vice versa, through informal consultation with the THC, TxDOT historians determined no additional research into the history of the property.

The Gates of Heaven Cemetery lies within the project study area near the southern terminus, but it is not a property eligible for NRHP designation.

See Table 1 in "PCR Attachments" for construction dates of buildings found on parcel from which the project requires ROW. See Table 2 for previous NRHP determinations for those parcels. TxDOT determined that the project did not warrant additional survey or research of these parcels.

Determination of Effects:
TxDOT historians determined that the project would have **no adverse effect** on the NHL Randolph Field Historic District and through consultation with THC determined that the project did not warrant individual consultation with their office. See "PCR in ECOS" email attached.

Therefore, pursuant to Stipulation IX, Appendix 6 "Undertakings with the Potential to Cause Effects per 36 CFR 800.16(i)" of the Section 106 PA and the MOU, TxDOT historians determined that there is not adverse effect no historic, non-archeological properties in or on parcels clipped by the APE. In compliance with the Antiquities Code of Texas and the MOU, TxDOT historians determined project activities have no potential for adverse effects. Individual project coordination with SHPO is not required.

Lead Reviewer DS RD for TxDOT 7/28/2019

Rebekah Dobrasko Date

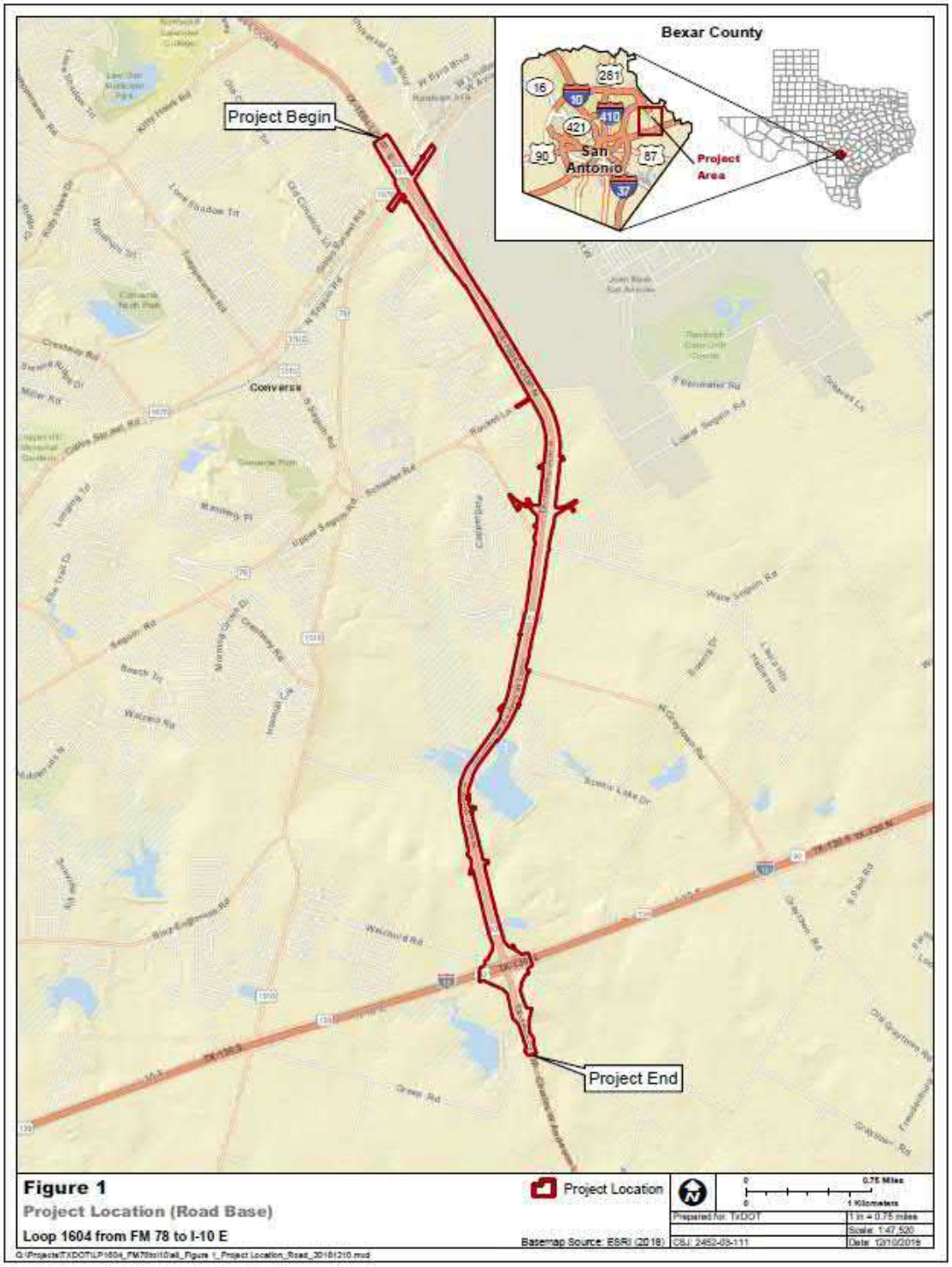
Approved by DS for TxDOT 7/29/2019

Bruce Jensen Date

DocuSign Envelope ID: CB9F48D5-5767-42FB-93C7-50D9F8036771

Exhibits

Figure 1: Project Map



DocuSign Envelope ID: CB9F48D5-5767-42FB-93C7-50D9F8036771

Figure 2:

Existing view from just south of intersection of Loop 1604 and Miramar Blvd showing residential and commercial development on left, Randolph AFB Schools and on-base construction right of center, and buildings at Randolph AFB far right

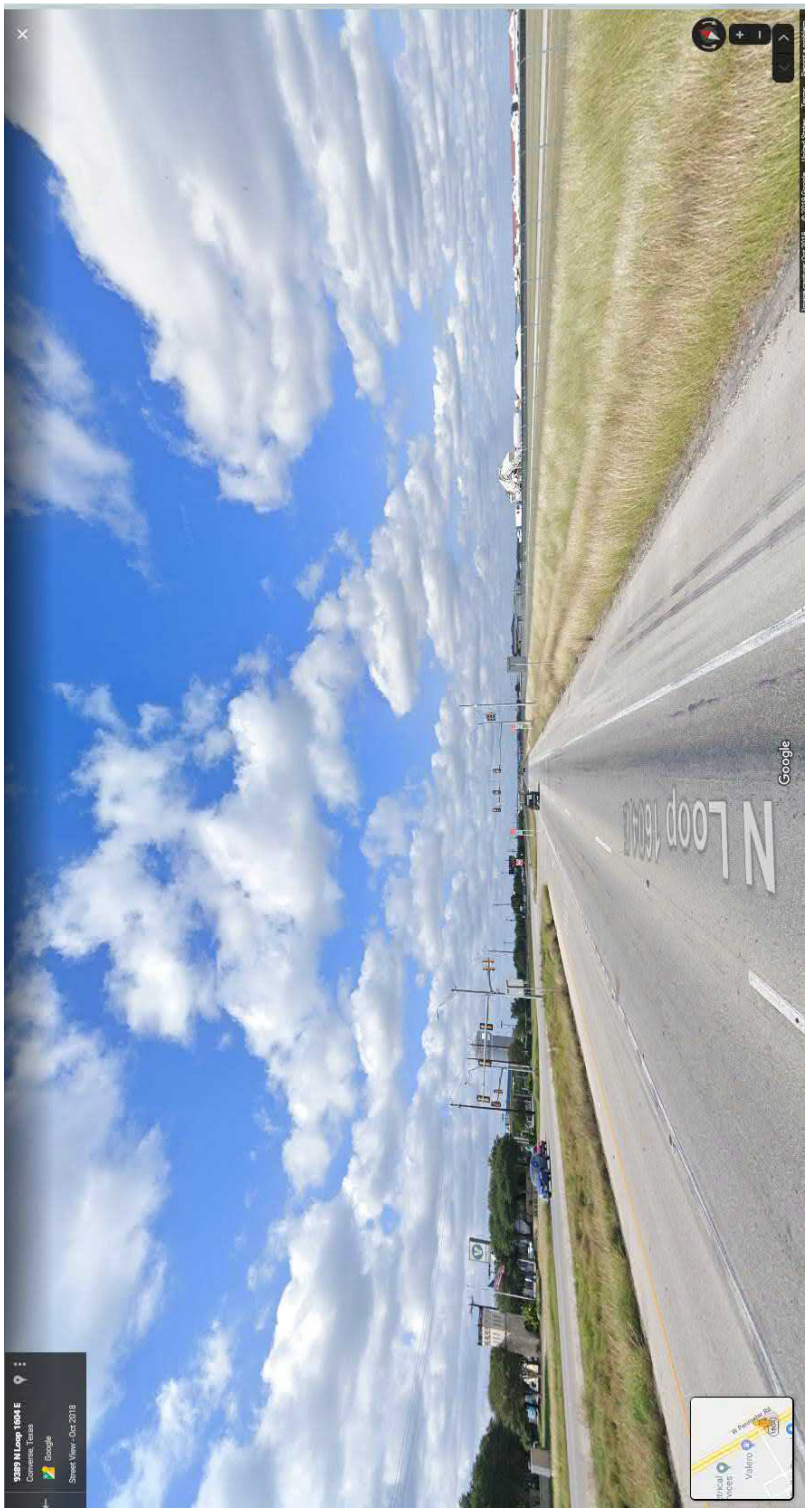


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Figure 3:

Cluster of buildings, accessed through road off I-10. See Figures 3g and 3h of PCR Attachments for parcel boundaries.

Texas Department of Transportation

MEMO

July 31, 2019

To: ECOS
Project file, CSJ 2452-03-111. SL 1604, Bexar County, San Antonio District

From: Eric Oksanen
Archeologist III

Subject: Internal review under the Programmatic Agreement (PA) Among the Federal Highway Administration, Texas State Historic Preservation Office, Advisory Council on Historic Preservation, and the Texas Department of Transportation; and the Memorandum of Understanding (MOU) Between the Texas Historical Commission and the Texas Department of Transportation

---

Project Description: Highway widening and improvements

APE Definition: Existing and proposed ROW between 1,500 feet north of FM 78 and 3,000 feet south of I-10E along SL 1604 in Bexar County, Texas. The total area is 331.19 acres. The typical depth of impacts is 2 feet, with a maximum depth of 80 feet for support piers (**Exhibit A**).

Records Search Results: Previous survey and Background Study identified archeological site 41BX1692 within the proposed APE. Further investigation is needed to evaluate 41BX1692 for listing on the National Register of Historic Places and designation as a State Antiquities Landmark. The investigations are required in proposed ROW between stations 365+00 and 373+00 on the South Bound Frontage Road (SBFR) (**Exhibit B**).

Justification for Further Work: Previous archeological investigations were denied the ability to evaluate site 41BX1692 for designation as an archeological historic property.

Permission to conduct archeological investigations was denied by at least one landowner. Thus, as provided under Stipulation XI.E.1 of the PA, this undertaking may proceed with further project development, including completion of the environmental process and right of way acquisition without the concurrence of the SHPO. After obtaining access to the proposed right of way, TxDOT will complete the inventory on unsurveyed properties and conclude any additional work that may be required under the terms of the PA and MOU.

Approved by _____ for TxDOT August 2, 2019
Scott Pletka, Ph.D. Date

Attachments

CC: John Bryant
Environmental Specialist, San Antonio District

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

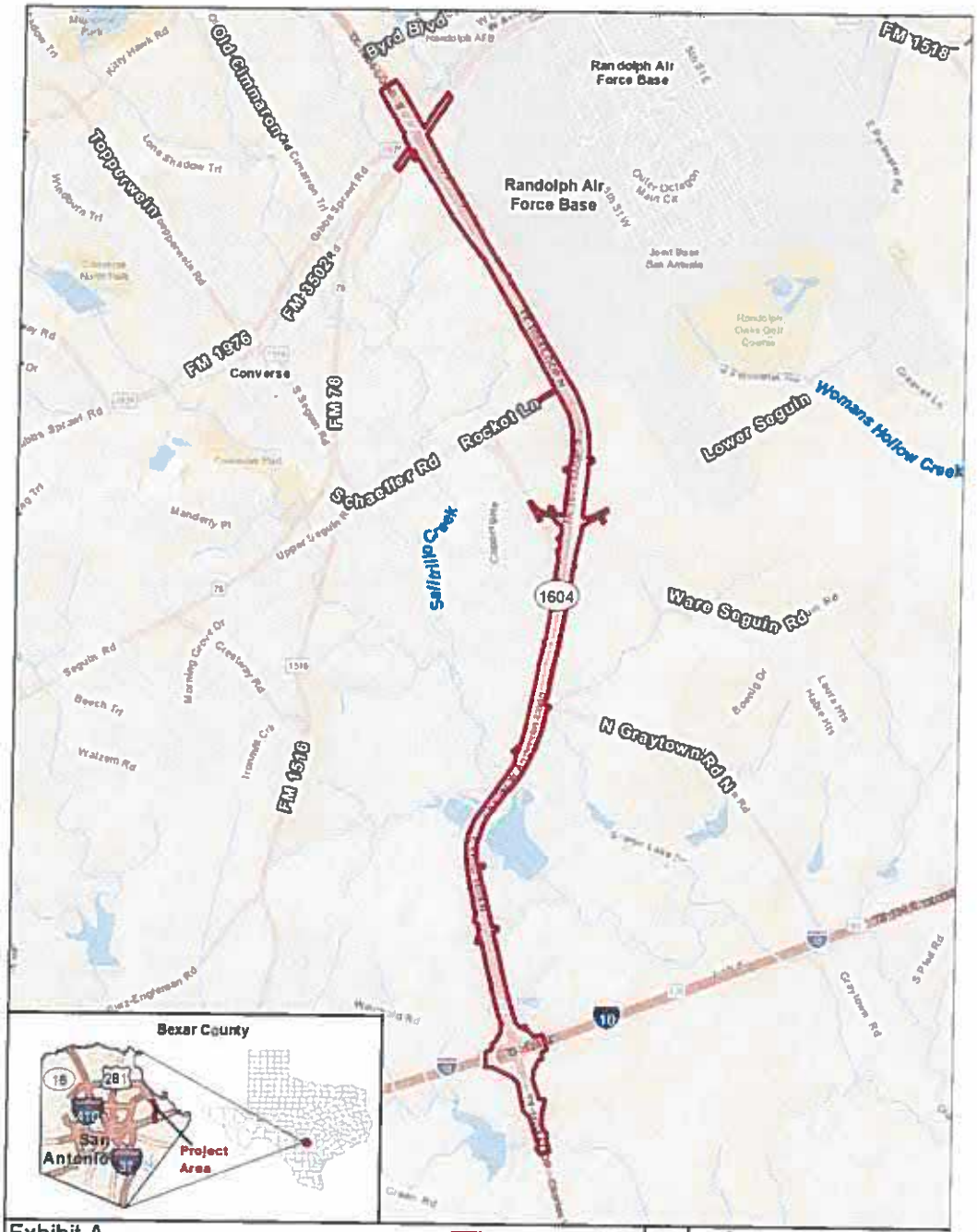

Exhibit A

Project Location

Loop 1604 from FM 78 to I-10 E

Basemap Source: ESRI (2018)

Prepared for: TxDOT

1 in = 0.75 miles

Scale 1:47,520

CSJ: 2452-03-111

Date: 12/10/2018

G:\Projects\TXDOT\LP1604_FM78to10\Arch_Figure 1_Project Location_20181210.mxd

Loop 1604 from FM 78 to I-10 E
CSJ: 2452-03-111

9

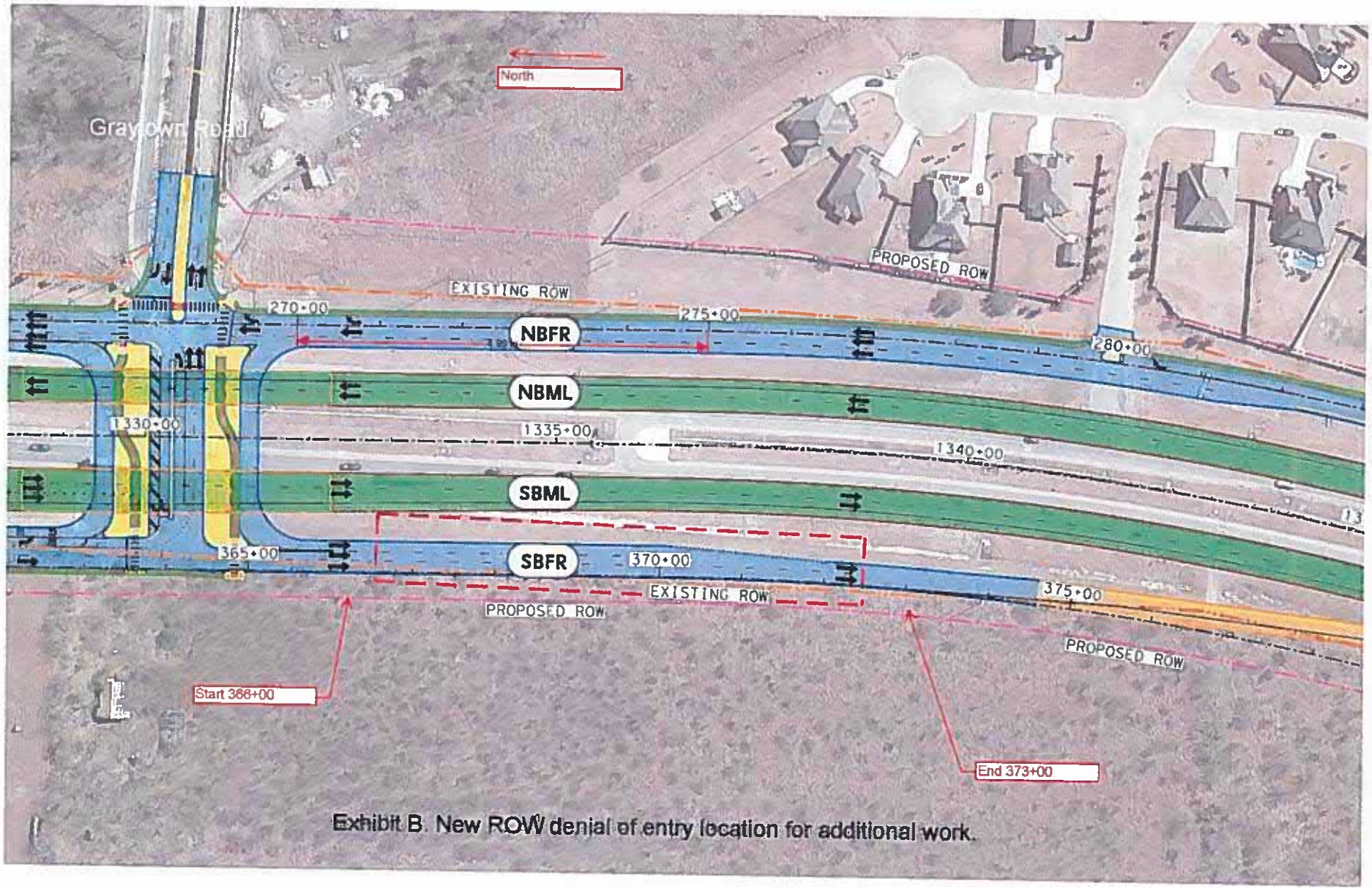

Exhibit B. New ROW denial of entry location for additional work.

From: Suzanne Walsh
To: John Bryant
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination
Date: Wednesday, February 19, 2020 1:42:31 PM

Hi John,

I appreciate that the district will implement the additional BMPs to the project.

Thank you for submitting the following project for early coordination: Loop 1604 from FM 78 to I-10 (CSJ: 2452-03-111). TPWD appreciates TxDOT's commitment to implement the practices listed in the Tier I Site Assessment form submitted on October 9, 2019 and those listed in the emails below. Based on a review of the documentation, the avoidance and mitigation efforts described, and provided that project plans do not change, TPWD considers coordination to be complete. However, please note it is the responsibility of the project proponent to comply with all federal, state, and local laws that protect plants, fish, and wildlife.

According to §2.204(g) of the 2013 TxDOT-TPWD MOU, TxDOT agreed to provide TXNDD reporting forms for observations of tracked SGCN (which includes federal- and state-listed species) occurrences within TxDOT project areas. Please keep this mind when completing project due diligence tasks. For TXNDD submission guidelines, please visit the following link: http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/txndd/submit.phtml

Sincerely,

Suzanne Walsh
Transportation Conservation Coordinator
(512) 389-4579

From: John Bryant <John.Bryant@txdot.gov>
Sent: Wednesday, February 19, 2020 12:44 PM
To: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

ALERT: This email came from an external source. Do not open attachments or click on links in unknown or unexpected emails.

Suzanne
Thanks for the reminder !
I have attached an update report that summarizes the temporary and permanent impacts to streams. The impacts are very minor, but definitely not zero as original report indicated. Also, all your suggestions from your Jan 30 email are reasonable and we can incorporate them into the project (stream impact and vegetation impact measures).

Sincerely,
JB

From: Suzanne Walsh [mailto:Suzanne.Walsh@tpwd.texas.gov]
Sent: Friday, February 14, 2020 3:42 PM
To: John Bryant <John.Bryant@txdot.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

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Hi John,

I'm checking on the status of this project.

Thanks,
Suzanne

From: John Bryant <John.Bryant@txdot.gov>
Sent: Thursday, January 30, 2020 3:16 PM
To: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

Yes, I got some updated information in the last week. It ended up changing our stream impact assessment, not a lot but a little. There are impacts, but very minor and mostly temporary. I gave it a once thru but need to give it a thorough review. I plan on sending you a response next week, and Ill take a look at those BMPs you mentioned and address that as well.

Thanks for keeping this on your radar !

JB

From: Suzanne Walsh [mailto:Suzanne.Walsh@tpwd.texas.gov]
Sent: Thursday, January 30, 2020 3:11 PM
To: John Bryant <John.Bryant@txdot.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

Hi John,

I'm checking to see if you have found out more information about stream impacts. If the project requires temporary crossings, I recommend including the Water Quality BMPs in the 2017 BMP PA to minimize equipment use in streams and removal of temporary stream crossings. Further, contractors should be advised to place staging areas, stock piles, and other project related sites in previously disturbed areas outside of the riparian corridor, at least 100 feet, whenever possible.

Could the district include the Vegetation BMPs from Section 2 of the 2017 BMP PA to further minimize impacts?

Thanks,
Suzanne

From: Suzanne Walsh
Sent: Friday, December 20, 2019 1:59 PM
To: John Bryant <John.Bryant@txdot.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

Ok – Thanks for letting me know about the ROW footprint and that you are still checking on stream impacts. After today, I will be out of the office until January 6. I hope that you have a great holiday!

Suzanne

From: John Bryant <John.Bryant@txdot.gov>
Sent: Friday, December 20, 2019 9:38 AM
To: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

Yes, I have some information. Our consultants (JMT) have informed me that the ROW footprint for the schematic referenced by our water report, bio report and what we showed to the public in Oct 2018 never changed.

The design is also the same, with the exception of the IH 10-1604 interchange area, where the project will transition with another, previously approved IH 10 NEPA project (first schematic below). The design changes mostly pertain to the alignment of direct connector (DC) bridges that are proposed between the two highways. So, we have a new revised schematic for my 1604 project that now shows these DCs (second schematic). The changes to DC alignments (more specifically, the locations of bridge support columns relative to underlying lanes, were a concern to the engineers, but they worked it out. These changes have no effect on the environmental analyses (no change in ROW or any impacts).

However, as far as impacts to streams go……..Im not sure. The water report they prepared says no impacts at all. I don't think there will be any at Salitrillo creek itself, but I'm not so sure about the area to the south, where the widened bridge gets very close to the lake. I just sent them an email to check their work. Sorry this is dragging out so long.
JB

From: Suzanne Walsh [mailto:Suzanne.Walsh@tpwd.texas.gov]
Sent: Wednesday, December 18, 2019 4:08 PM
To: John Bryant <John.Bryant@txdot.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

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Hi John,

Have you heard whether proposed ROW and impacts have changed? Will temporary crossings be needed? Can you tell me more about impacts to Salitrillo Creek?

Thanks,
Suzanne

From: Suzanne Walsh
Sent: Wednesday, November 13, 2019 9:06 AM

To: 'John Bryant' <John.Bryant@txdot.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

Hi John,

I'm checking if you were able to find out information about the schematic and plant surveys.

Thanks,
Suzanne

From: John Bryant <John.Bryant@txdot.gov>
Sent: Wednesday, November 6, 2019 9:50 AM
To: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

Suzanne,
Im waiting on some feedback from our engineer on the schematic version. The 1604-10 interchange area is still a work in progress even today. I need to find out if the project ROW and impacts have changed any from 2017.

I will get confirmation, but I am pretty sure we did not survey for any SGCN plants on this project, especially if they were ones that only showed up on a list around april 2019 ish.

Thanks
JB

From: Suzanne Walsh [mailto:Suzanne.Walsh@tpwd.texas.gov]
Sent: Wednesday, October 30, 2019 10:26 AM
To: John Bryant
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi John,

ECOS has a schematic file dated 5/15/2017 but the water report references a July 2018 schematic. I'm just checking if there is a newer schematic for review.

Did the district survey for any SGCN plants?

Thanks,
Suzanne

Suzanne Walsh

Transportation Conservation Coordinator
(512) 389-4579

From: WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>
Sent: Wednesday, October 9, 2019 2:52 PM
To: John Bryant <John.Bryant@txdot.gov>
Cc: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Subject: RE: Loop 1604 from FM 78 to IH 10 Early Coordination

The TPWD Wildlife Habitat Assessment Program has received your request and has assigned it project ID # 42618. The Habitat Assessment Biologist who will complete your project review is copied on this email.

Thank you,

John Ney
Administrative Assistant
Texas Parks & Wildlife Department
Wildlife Diversity Program – Habitat Assessment Program
4200 Smith School Road
Austin, TX 78744
Office: (512) 389-4571

From: John Bryant <John.Bryant@txdot.gov>
Sent: Wednesday, October 9, 2019 11:39 AM
To: WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>
Subject: Loop 1604 from FM 78 to IH 10 Early Coordination

This is for CSJ 2452-03-111, project in eastern Bexar County. The project is an EA, it requires ROW. There is no potential habitat for any federally listed species on this project; it is not in any karst zones or on any Edwards aquifer zones. It does cross one flowing creek that we surveyed for mussels many years ago and did not find anything notable.

This file is not currently in our ECOS system due to technical difficulties no one can upload anything to ECOS at this time.

Sincerely
John Bryant