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April 19, 2019

Mr. Blake Staton, PE
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14160 N Dallas Parkway Suite 850
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Re: North-East Expressway
Geotechnical Assessment and Construction Recommendations Memo
Owner: Texas Department of Transportation
HVJ Project No. AG 1710197.2.1

Dear Mr. Staton,

Submitted herein is the geotechnical assessment and construction recommendations for the North-East Expressway (NEX) Project. This study was performed in accordance with the sub-agreement 15-7ID5004, PS 7478 WA 01, Garver Project No. 17087621.

1. Objectives and Scope of Work

HVJ South Central Texas – M&J, Inc. (HVJ) was retained by Garver USA to provide geotechnical assessment and construction recommendations for geotechnical related structures along the NEX alignment and interchanges. Specifically, HVJ was tasked to provide recommendations for back-to-back MSE walls, soil nailing procedures, atypical drilled shafts installation conditions and roadway widening proposed along the alignment of the NEX Project. The expressway alignment has a total approximate length over 15 miles along Interstate Highway I-35, from 0.4 miles east AT&T Parkway to 0.6 miles north-east Roy Richard Dr. in Bexar, Guadalupe and Comal Counties, Texas. The project has been divided in four components which include the Base Project alignment and three deferred work components (DWC).

The Base Project is the main and longest component with more than 11 miles of length. It extends north from Nacodoches Rd with I-410 to FM 3009 with I-35, and includes works on Loop 1604 from Nacodoches Rd. to I-35. DWC #1 and DWC#2 are located at the north and south ends of the Base Project, respectively. DWC#1 extends north on I-35 for about 3 miles from the Base Project north-end to Country Club Blvd. DWC#2 extends north on I-35 for about 7 miles from AT&T Pkwy until intersecting the Base Project alignment. DWC#2 also includes works on I-410 from Deitrich Rd. to I-35. DWC#3 is the shortest component with about 1 mile and is located on Loop 1604 from I-35 to Palisades Dr. Plate 1 in the appendices illustrates the boundaries for each work component.

The scope of this report contains the following topics:

1. Maximum plausible height of back-to-back MSE walls to be constructed at the entrance/exit ramps (touch downs) of the elevated expressway.
2. Construction requirements for bridge and roadways widenings.
3. Assessment and construction recommendations of soil nailing retaining walls to be constructed at the approaches of existing bridges in order to clear way for U-turns directing traffic under the bridge deck.
4. Geotechnical assessment and construction requirements/methodology of drilled shafts to be installed within the reinforced zone of existing retaining walls.

The objectives of this study were accomplished by:

1. Utilizing information from available TxDOT provided data and previously submitted HVJ Reports to develop a subsurface soil profile with associated engineering properties.
2. Performing stability analyses of for the proposed retaining walls.
3. Consulting contractors and reviewing literature about current construction practices.

2. Maximum Height of Back-to-Back MSE walls

HVJ understands back-to-back MSE walls are expected to be employed in the construction of exit and entrance ramps (touch downs) to the elevated expressway. Therefore, it is of interest for Garver to determine the maximum allowable height these walls can achieve given the alignment geometry constraints and geotechnical properties of the foundation soil. Plans of the alignment's final design provided by Garver to HVJ were used to identify the location and dimensions of these walls. A total of 10 touch downs have being identified and present a range of widths from 30 to 88 ft. Table 1 displays the location and other characteristics of the proposed touch downs.

Table 1: Characteristics of Proposed Touch Downs

Wall	DWC	Baseline	Connecting	Station	Width (ft.)
1	2	I-35 SB	EX - I-35S ML	3180+00	42
2	2	I-35 NB	I-35N ML - EX	3164+00	42
3	2	I-35 SB FR	I-35S EX - I-35S FR	3305+00	30
4	2	410 SB	410S EX - I-35S ML	146+00	40
5	2	410 NB	410N ML - I-35N EX	146+00	40
6	Base	I-35 NB EL	I-35N EX - I-35NB ML	3845+00	38
7	1	I-35 EL	I-35 - EX	4005+00	87.5
8	Base	410 EB	410W ML - I-35N EX	81020+00	38
9	3	1604 WB	1604W ML - I-35N EX	1065+00	29
10	3	1604 EB	I-35S N,S EX - 1604E ML	1056+00	29

EX= Expressway N= North bound
ML= Main lane S= South bound

2.1 Soil Profile and Strength Parameters

Geotechnical investigation of the subsurface along the project alignment and/or touch down locations was not included in HVJ's scope for this project. Results of field and laboratory test of projects previously performed by HVJ in the vicinity of the NEX alignment and review of TxDOT provided as-builts were utilized in the characterization of the native soil materials and profile identification.

2.1.1 Native Soils

Based on the results of limited borings from previous investigation programs, HVJ has defined three generalized subsurface sections that characterize the mechanical properties of the soil materials expected along the alignment. Estimated soil profiles and shear strength parameters were defined for each section and are presented in Appendix A.

The unit weight and shear strength parameters for each of the identified strata were selected based on the material type, Texas cone penetrometer correlations, and laboratory test results of unconfined compressive strength.

Table 2 presents the shear strength parameters selected for the materials defined at the surface of each section's profile. These materials are assumed to perform as the foundation of the touch downs.

As shown in Table 2, the subsurface of section 1 is assumed to consist of a 35 ft. thick layer of very stiff to hard Lean Clay (CL) underlain by a Clayey Sand/Clayey Gravel (SC-GC) layer with a thickness of 10 ft., followed by 10 ft. of Fat Clay (CH) (See appendix A) which overlies shale bedrock at a depth of 55 ft. The profile for section 2 is defined as a 25 ft. thick layer of very stiff to hard Lean Clay (CL), underlain by 25 ft. of Fat Clay (CH). Marl rock is expected at depths around 50 ft in this section. For section 3, shallow marl bedrock is expected to be found at a depth of 5ft. Taking into consideration the projected size of the touch downs relative to the reduced thickness of the material at the surface of section 3, the touch downs were assumed to be supported directly on the rock.

2.1.2 Embankments

Soil samples from existing embankments along the NEX's alignment were recovered by HVJ as part of geotechnical investigation programs of previous projects conducted in the vicinity. Laboratory and field test results information was used to define a black to dark brown highly plastic cohesive material performing as backfill of embankments, which is indicative of the use of excavation excess material as backfill for embankments.

Based on available field and laboratory test results, this material was assigned the engineering properties presented in Table 2.

Table 2: Estimated Shear Strength Parameters

Section	Stations	Material	Depth	TCP N/12"	Su (psf)	ϕ (°)	C' (psf)	Wet Unit Weight, γ (pcf)	Bond Strength, τ (psi)
1	2210+00 - 2435+00	CL	0-35'	30	2000	26	50	125	7
2	2435+00 - 2915+00	CL	0-25'	36	2400	28	60	125	8.3
Embankment backfill	-	CL	-	30	2000	26	80	120	7

Section	Stations	Material	Depth	Hoek & Brown Parameters			ϕ (°)	UCS (ksf)	Wet Unit Weight, γ (pcf)	Bond Strength, τ (psi)
				s	m	a				
3	2915+00 - 5150+00	Marl	>5'	0.002	0.842	0.508	57	120	134	20

2.1.3 Fill

The retaining wall backfill was modeled with a friction angle of 30 degrees and zero cohesion for both long term and short term conditions.

2.2 Design Requirements

The walls were analyzed for external stability. An analysis for undrained and long term stability was performed for each touch down. The undrained case is representative of the short term construction period, while the long term case models the post construction, steady state condition. The rapid drawdown case consists of long term parameters and a drawdown from a piezometric water level at the highest conceivable level such that the retained soils are fully saturated. For this project, the rapid drawdown loading case was not performed since the touch down locations are above the 100-year flood plain.

MSE retaining walls should be designed and constructed as shown on TxDOT Standard Drawing for Mechanically Stabilized Earth (MSE) walls ¹ and must be designed in accordance with the TxDOT Geotechnical Manual². Following is a summary of geotechnical design requirements compiled from these sources:

Sliding: Factor of Safety > 1.5

Overtopping: Factor of Safety > 2.0

Bearing Capacity

Eccentricity < Stabilized Mass Width / 6

Bearing Pressure adjusted for eccentricity: Factor of Safety > 2.0

¹ Texas Department of Transportation, TxDOT. RW(MSE) - Mechanically Stabilized Earth Retaining Wall Standard Drawings. January, 2013.

² Texas Department of Transportation, TxDOT. Geotechnical Manual. March 2018.

Global Rotational Stability: Factor of Safety > 1.5

The interaction of MSE retaining walls placed back-to-back is dependent on the separation between the reinforced zones of the walls. According to FHWA guidelines³, for long enough separations individual wall designs should be conducted, whereas for overlapping reinforcement layers, reductions of the active thrust are applicable. The stability checks considered both reinforcement configurations, with and without overlap.

Lateral earth pressures were computed for walls in accordance to Sections 3.11.5.3 and applied based on Figure 3.11.5.3.1-1 of AASHTO LRFD Bridge Design Specifications⁴. A surcharge of 250 psf was applied to both long term and short term conditions to account for maintenance, construction, and traffic loading. It was assumed that the backfill is free draining and a drainage system will be placed behind the walls.

Additional design is required for MSE retaining walls, to determine the type and spacing of reinforcement. Due to the proprietary nature of MSE wall systems, the MSE retaining wall subcontractor typically carries out such design.

2.3 External Stability Results

Based on previous experience and guidelines of the FHWA⁵ for retaining walls design, the procedure to determine the maximum height of the touch downs targeted a maximum wall width (W) to height (H) ratio of $W/H=1.1$ and a minimum reinforcement length of 70% of the wall height. The final back-to-back MSE wall resulted in configurations of the reinforcement with considerable high overlapping exceeding 30% of the wall height. Back-to-back MSE walls behave as a single block of reinforced earth without external loads (active lateral pressure) inducing either wall's sliding or overturning. Therefore, bearing capacity of the foundation becomes the stability criteria governing design of this particular kind of retaining walls.

Results from the external stability analysis are presented below in Table 3. As it can be seen from the table, all the back-to-back walls proposed for the touch downs meet safety factor criteria. It should be noted that current practice for the TxDOT San Antonio District requires a minimum MSE reinforcement length of 100% wall height, and the top two reinforcements are extended a distance of 10 feet beyond the reinforced zone. If these requirements are imposed on this project, they will likely have impacts on construction and traffic phasing.

Table 3 External Stability Analysis Results

Wall	Station	Geotechnical Section	Touch down Width, W (ft.)	Wall Height, H (ft.)	Reinforcement Length, L (ft.)	Reinforcement Length, L (%H)	Bearing Cap. F.S.	
							Short Term	Long Term
1	3180+00	1	42	38.2	26.7	70	2.00	2.14

³ Federal Highway Administration, FHWA. Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I. November, 2009.

⁴ AASHTO. LRFD Bridge Design Specifications, 8th Edition, September 2017.

⁵ Federal Highway Administration, FHWA. Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I. November, 2009.

Wall	Station	Geotechnical Section	Touch down Width, W (ft.)	Wall Height, H (ft.)	Reinforcement Length, L (ft.)	Reinforcement Length, L (%H)	Bearing Cap. F.S.	
							Short Term	Long Term
2	3164+00	1	42	38.2	26.7	70	2.00	2.14
3	3305+00	1	30	27.3	19.1	70	2.80	2.06
4	146+00	1	40	36.4	25.5	70	2.10	2.13
5	146+00	1	40	36.4	25.5	70	2.10	2.13
6	3845+00	2	38	34.5	24.2	70	2.70	2.84
7	4005+00	3	87.5	79.5	55.7	70	2.20	N/A
8	81020+00	2	38	34.5	24.2	70	2.70	2.84
9	1065+00	2	29	26.4	18.5	70	3.50	2.75
10	1056+00	2	29	26.4	18.5	70	3.50	2.75

2.4 Fill

This project will possibly include both general and select fill. However it is important to note that the stability analysis were conducted assuming the use of select backfill within the active pressure wedge zone and the use of general fill for the areas outside of it.

3. Roadway Widening

HVJ understands roadway widening will be required for the NEX project. Based on the plans of the final alignment design provided by Garver, HVJ has identified the locations where widenings are projected to take place. Table 4 presents a summary of these locations and the existing structures.

Table 4 Proposed Widenings Sites

Widening Site ID	Bridge Approach ID	DWC	Baseline	Station	Vicinity	Geotechnical Section	Deck Width (ft.)		Existing Structure
							Existing	Approximate Widening	
1	A	2	I-35	3130+00	I-35 & RR Crossing 0.25 miles SW AT&T Pkwy.	1	115 ft. (1x3-lane each way)	50 ft. (NB) (4 ln) 15 ft. (SB) (4 ln)	Bridge approach: Embankment slope ~2:1, concrete riprap under bridge deck, earth faced when parallel to alignment
	B			3135+00					Bridge approach: Embankment slope ~2:1, concrete riprap under bridge deck, earth faced when parallel to alignment
	C			3143+00	I-35 & AT&T Pkwy.				Bridge approach: Soil nailing Wall under bridge deck, earth face embankment, slope ~2:1.
	D			3146+50					Bridge approach: Embankment slope ~2:1, concrete riprap under bridge deck, earth faced when parallel to alignment
2	A	Base	1604	4920+00	Loop 1604 & RR Crossing 0.22 miles NW	2	220 ft. (2x2-lane each way)	30 ft. (WB) (6 ln) 20 ft. (EB) (6 ln)	Bridge approach: MSE Wall, Vertical face, back sloped, 4 two-lane roadways on top
	B			4925+00				35 ft. (EB) (7 ln) 25 ft. (WB) (7 ln)	Bridge approach: MSE Wall, Vertical face, back sloped, 4 two-lane roadways on top

Widening Site ID	Bridge Approach ID	DWC	Baseline	Station	Vicinity	Geotechnical Section	Deck Width (ft.)		Existing Structure
							Existing	Approximate Widening	
					Lookout Rd.				
	C			4933+00	Loop 1604 & NW Lookout Rd.		120 ft. (1x2-lane each way)	50 ft. (WB) (5 ln) 50 ft. (EB) (5 ln)	Bridge approach: Embankment slope ~3:1, concrete rip rap and MSE wall <8 ft under bridge deck, earth face when parallel to the alignment
	D			4937+00				20 ft. (WB) (3 ln) 15 ft. (EB) (3 ln)	Bridge approach: Embankment slope ~3:1, concrete rip rap under bridge deck, earth face when parallel to the alignment.
3	A	Base	I-35	3860+00	I-35 & N Evans Rd.	2	120 ft. (1x4 ln each way)	40 ft. (NB) (5 ln)	Bridge approach: MSE wall on SB. Embankment on NB, slope ~2:1, concrete riprap under bridge deck, earth face when parallel to the alignment
	B			3875+00	I-35 & Corporate Dr.			25 ft. (NB) (5 ln)	Bridge approach: Embankment, concrete face, earth faced when parallel to the alignment, ~3:1 and 2:1
4	-	1	I-35	3929+00	I-35 & 0.2 miles NE Schertz Pkwy.	3	80 ft. (NB)	15 ft. (NB) (+1 ln)	Soil nail retaining Wall: north bound I-35

Widening activities generally rely on preexisting structures that support the road, and the partial or complete removal of these structures might be necessary depending on the specific conditions and requirements of each case. Most commonly, preexisting structures must be modified in order to correctly interact and couple with the new retaining wall, embankment, or any other structure providing the additional needed width. Therefore, this study will provide recommendations regarding activities required for widening at the identifications listed in Table 4. The following chapters present recommendations for widening activities per type of preexisting structure.

3.1.1 Embankments

According to the final design of the alignment, widening of embankments will be required at the approaches A thru D of Site 1, approaches C and D of Site 2 and approaches A and B of Site 3.

Global slope stability analysis were conducted for the embankments in order to determine the maximum temporary slope during construction. The stability analysis followed the factor of safety criteria previously describe in Chapter 2.2, using the embankment and foundation material parameters presented in Table 2.

SLOPE/W computational software by GeoStudio 2012 was employed to determine the factor of safety of the embankments by means of the Morgenstern-Price two-dimensional limit equilibrium methodology. A maximum temporary slope for construction of 1V:2H was determined stable with a factor of safety of 1.40 and is recommended for the widening activities of Site 1, 2 and 3.

The use of trapezoidal MSE walls with uneven reinforcement lengths (see Figure 1) is not recommended for widening activities within geotechnical section 1 and 2, due to the low competence foundation materials expected.

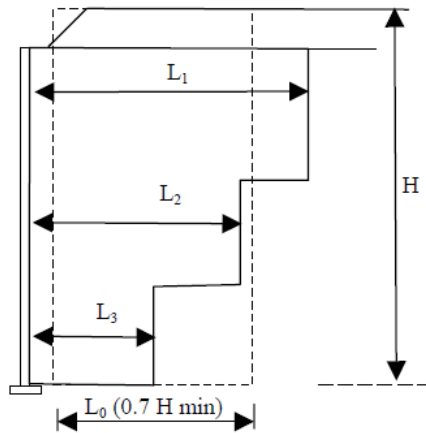


Figure 1 Trapezoidal MSE Wall. (FHWA, 2009)

Due to the expected shallow rock on section 3, the use of trapezoidal MSE walls may be considered within this section. The stability analysis of these walls must assume an average wall base greater or equal to $0.7H$ (wall height) for external stability calculations. As recommended by the FHWA⁶, the difference between the reinforcement lengths of consecutive zones must not exceed $0.3H$ and the length of the reinforcement at the base of the wall must be $0.4H$ or 8 ft. (2.5 m) whichever is greater.

External stability analysis at long and short term was conducted in order to determine the minimum length of reinforcement required for the MSE walls to be employed in the roadway widenings of embankments. Factor of safety criteria for sliding, overturning and bearing capacity was presented earlier in Chapter 2.2.

Considering that the projected height of the walls will vary significantly, stability analysis was conducted for multiple heights in order to determine the change in length of required reinforcement. The factors of safety for external stability and minimum reinforcement lengths are presented below in Table 5. The minimum required reinforcement length is presented as a percentage of the wall high (H).

Table 5 Minimum Reinforcement Length MSE Walls

Geotechnical Section	Wall Height, H (ft.)	Minimum Reinforcement Length, L (% H)	F.S.		
			Overturning	Sliding	Bearing Capacity
1	<10	80% or 8 ft. min.	3.05	1.56	2.31
	≥ 10	80%	3.07	1.57	2.16
2	<10	80% or 8 ft. min.	3.05	1.71	3.11
	≥ 10	80%	3.07	1.72	2.90
3	Any wall Height	70% or 8 ft. min.	4.98	3.34	14.38

⁶ Federal Highway Administration, FHWA. Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I. November, 2009.

3.1.2 MSE Walls.

According to the schematics, widenings are projected to take place at roadways constructed on top of existing MSE walls. Approaches A and B of Site 2 have existing MSE walls along the perimeter with embankment above that slopes up to the 4 two-lane roadways projected to be widen. The figure below illustrates the proposed widening configuration for approaches A and B at Site 2.

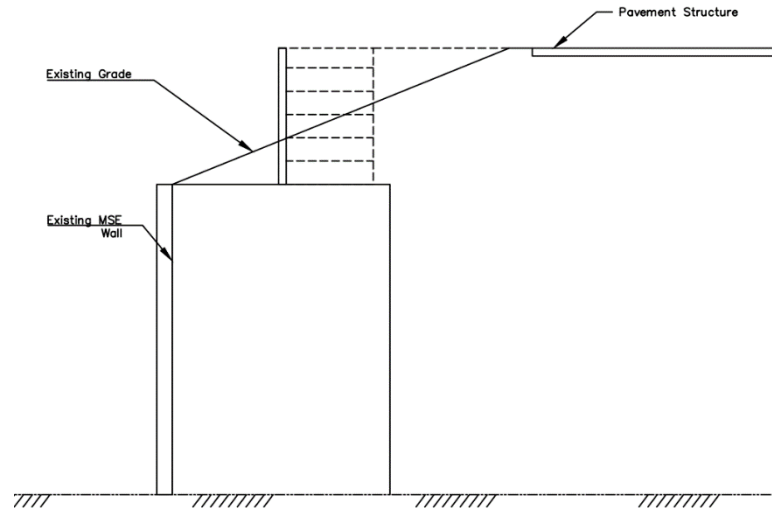


Figure 2 Roadway Widenings on Top of Preexisting MSE Walls

Based on the characteristics of these approaches and the structures in-place, an additional retaining wall on top of the existing walls would be needed to provide the required widenings. However, this situation results in additional loading that was likely not accounted for in the design of the existing MSE wall.

Considering that improving the reinforcement of in-service MSE walls is not viable, HVJ recommends the complete replacement of the MSE walls located at approaches A and B of Site 2. The maximum temporary slope during construction to be use for the replacement of the existing walls is 1V:2H as presented in Chapter 3.1.1 . Likewise, the minimum length of reinforcement required for the installation of the new MSE walls is presented in Table 5.

3.1.3 Rock Nail Walls

Based on the schematics, the north bound of I-35 is required to be widened at stations 3910+00 – 3918+00 and 3929+00 – 3934+50 (Widening Site 4, Table 4) in order to clear the way for the construction of new exit and entrance ramps.

Currently the main lanes at the specified stations are depressed with respect to the frontage roads due to the overpass at Schertz Parkway. According to the as-built plans provided by Garver, rock nail retaining walls with a maximum height of 20 ft. have being installed at both sides of the highway to support the north and south bound frontage roads. Schematics show the widening will result in a 15 foot cut into the existing wall.

For sections of the existing wall that are 15 feet or less in height, the excavation for the 15 foot widening should extend past the existing reinforcements, and another rock nail wall can be installed. For wall sections that are greater than 15 feet, the excavation to widen by 15 feet may not extend past the existing reinforcements, and additional excavation would be required to remove the existing wall. For this case, HVJ recommends to completely remove the existing rock nail wall and replace it with a new rock nail wall located right behind it. Depending on the length of current reinforcement (not shown in as-builts), a new wall would be required to replace soils that were over-excavated. A spread footing wall or a shored MSE (Figure 3) walls are both potential options. According to FHWA manual⁷ the minimum reinforcement length of the shored MSE walls is $0.3H$ as shown in Figure 3.

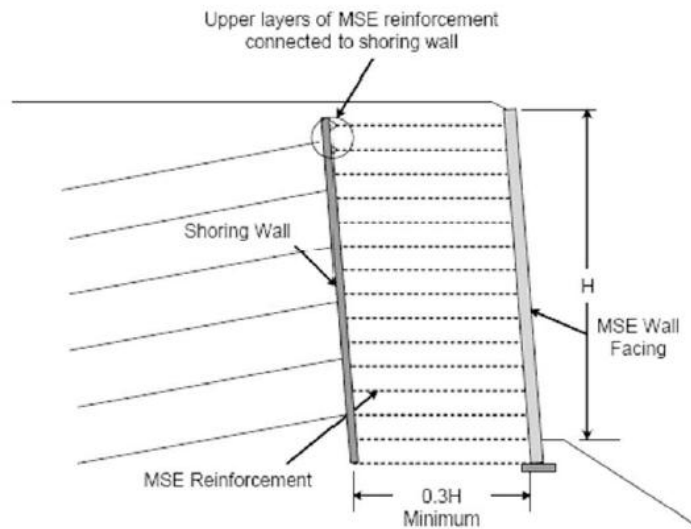


Figure 3 Shored MSE Wall. (FHWA, 2009)

Stability analysis was conducted for the maximum expected height of rock nail retaining wall in order to determine the minimum reinforcement length required to meet factors of safety criteria previously describe in Chapter 2.2. The material parameters used in the analysis are presented in Table 2.

The properties and characteristics of the steel bars (rock nails) employed in the analysis for the design of the retaining walls are presented in Table 7. According to TxDOT Geotechnical Manual 2018, Table 6 displays the minimum criteria for permanent soil/rock nailing walls.

Table 6 Rock Nail Walls Reinforcement Parameters

Bar Size:	#6 (0.75 in. diameter)
Steel Grade:	75 ksi.
Bar type:	Epoxy-coated, threaded
Hole Diameter:	6 in.

⁷ Ibid

Failure mechanisms in rocks differ from soil and are controlled by discontinuities within the rock mass and their orientations. Planar failure is a potential problem when the strike of the joint is within 20° of the strike of the slope, and the discontinuity dips at an angle that exceeds the frictional strength along this plane of weakness. A worst case scenario with an average dip of the slip plane of 60 deg. was assumed in order to determine the minimum reinforcement length required. The minimum reinforcement length for one potential configuration is presented below in Table 7.

Table 7 Rock Nail Walls Reinforcement Configuration for Widening Site 4

Wall Height (ft.)	Number of Bar Levels	Nail Length, L (ft.)	Vertical Spacing, Sv (ft.)	Horizontal Spacing, Sh (ft.)	L/H Ratio
20	3	19	5.0	5.0	0.95

4. Soil Nail Retaining Walls

HVJ understands soil nail retaining walls are required to be installed at embankments performing as bridge approaches in order to clear way for the construction of U-turns directing traffic under the bridge deck. To do so, the structures located under the bridge deck that are in conflict with the alignment of the proposed turns must be removed and the backfill of the approaches' embankment must be contained.

Based on the final design of the project alignment, HVJ has identified the four bridge approaches within Widening Site 1 in Table 4 where soil nail walls are required for the construction of the U-turns. Table 8 presents a summary of these locations, the existing structures and proposed activities.

Table 8: Proposed Soil Nail Retaining Walls Locations

Widening Site ID	Bridge Approach	DWC	Baseline	Station	Vicinity	Geotechnical Section	Recoil of Abutment (ft.)	Existing Structure under Bridge
1	A	2	I-35	3130+00	I-35 & RR Crossing 0.25 miles SW AT&T Pkwy.	1	70	Embankment slope ~2:1, concrete riprap, Max expected height: 20 ft.
	B			3135+00			100	Embankment slope ~2:1, concrete riprap Max expected height: 20 ft.
	C			3143+00	I-35 & AT&T Pkwy.		60	Soil nailing Wall Max expected height: 20 ft.
	D			3146+50			45	Embankment slope ~2:1, concrete riprap Max expected height: 20 ft.

Currently approaches A, B and C are equipped with an existing U-turn under the bridge deck. However, the final design has proposed new alignments for each of these and a complete new U-turn at approach D.

Global stability analysis was conducted for the maximum expected height of soil nail retaining wall in order to determine the minimum reinforcement length required to meet factors of safety criteria previously describe in Chapter 2.2. The embankment and foundation material parameters used in the analysis are presented in Table 2.

The properties and characteristics of the steel bars (soil nails) employed in the analysis for the design of the retaining walls are presented in Table 6. Stability analyses were performed using the computer program SNAILZ specifically developed for the design of soil nail walls. SNAILZ uses two-part planar wedges with general slope stability methods (e.g., search routines, closed form force/moment equilibrium equations, etc.). The program allows iterative and interactive design of the soil nail length and the consideration of other failure modes (e.g., soil nail tensile force and facing punching shear failure).

The factors of safety for the external stability of the soil nail walls and minimum reinforcement length are presented below in Table 9.

Table 9 Soil Nail Walls Reinforcement Configuration for U-Turns

Wall Height (ft.)	Number of Bar Levels	Nail Length, L (ft.)	Vertical Spacing, Sv (ft.)	Horizontal Spacing, Sh (ft.)	L/H Ratio	Global F.S.	Sliding F.S.
20	5	21	4.0	3.5	1.05	1.51	3.19

Typical construction procedures may not apply for the bridge approaches of Site 1 considering that roadway widenings activities and soil nail retaining walls are proposed for these locations. Conflict of the reinforcement zones of both retaining structures is expected at the transition from the soil nail wall to the MSE wall required for widenings. Presented below is a potential approach to address this issue. The final methodology of approach is left open to the contractor judgment.

1. Prepare the side slopes of the embankments employing the maximum temporary slope for construction as described in Chapter 3.1.1. (See Figure 4.1)
2. Within the area beneath the bridge deck, install the soil nails by removing the existing retaining structure in lifts not exceeding 5 ft. height. The lifts removal must be done from top to bottom and until achieving the total height of the abutment. Although soil nails are to be installed only beneath the deck, the removal of the existing retaining structure must include the complete cross section of the approach's embankment. Temporary shoring must be applied to the portion of the embankment's cross section outside the deck shade. (See Figure 4.2, Figure 4.3 and Figure 4.4)
3. In lifts not exceeding 5 ft. height, remove from the side slopes of the embankment the backfill mass laying within the area from the soil nail wall face to the length of reinforcement required by the MSE wall. Temporary shoring shall be applied to the exposed faces of the embankment after each lift. (See Figure 4.5)
4. Install MSE wall for roadway widening. (See Figure 4.6)

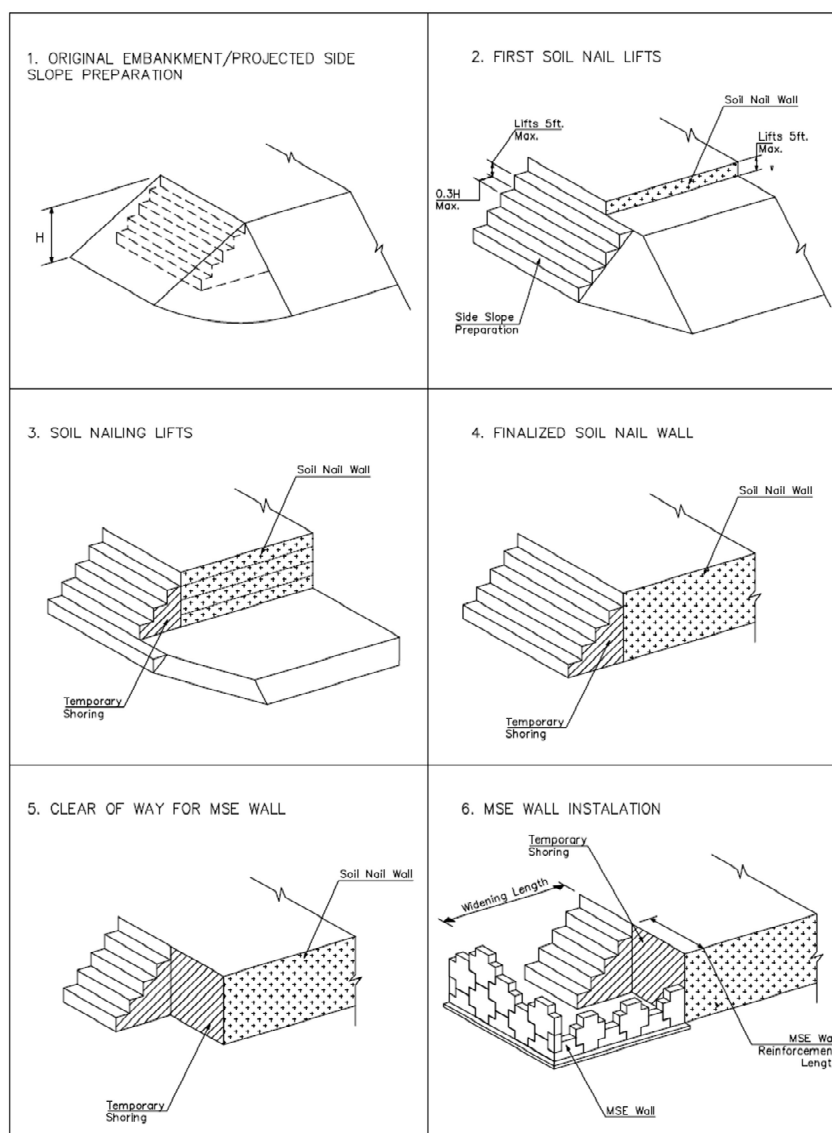


Figure 4 Soil Nail Walls and Widening - Methodology

5. Drilled Shafts in Retaining Walls Reinforcement Zone

HVJ understands up to 8 ft. diameter drilled shafts are estimated to perform as foundation for the columns supporting the elevated expressway. The likely locations of the shafts along the project alignment were assessed and potential conflicts with existing structures have been identified. The shafts in a few specific locations are required to go through the reinforcement zones of in-service retaining walls, and will require non-conventional practices in order to maintain integrity of adjacent structures and the system in general.

Based on the final design of the project alignment and as-built plans provided by Garver, HVJ has identified the locations and existing structures expected to be in conflict with the installation of the shafts. Table 10 presents a summary of these locations and the characteristics of the in-service structures.

Table 10 Retaining Walls in Potential Conflict with Drilled Shafts Installation

Retaining Wall ID	Location	DWC	Baseline	Bound	Station	Existing Type of Retaining Wall Per As-Built
1	I-35 with O'Connor Rd	Base	I-35	NB	3593+50 - 3601+00	RW 1-1: CIP Cantilever + 24" Drilled Shafts
					3601+00 - 3623+00	RW 1-2: CIP Cantilever RW 1-3: CIP Cantilever + 24" Drilled Shafts (3606+00 - 3607+00), @ 2' from back heel
				SB	3610+00 - 3616+50	RW 1-4: CIP Cantilever (Back heel in conflict) RW 1-5: CIP Cantilever (Back heel in conflict)
2	I-35 with Judson Rd.	Base	I-35	NB	3640+00 - 3655+00	RW 2-1: CIP Cantilever (Front heel in conflict)
					3655+00 - 3674+00	RW 2-2: CIP Cantilever + 24" Drilled shafts (3667+50 - 3671+50), @ 2' from back heel RW 2-3: CIP Cantilever
				SB	3633+00 - 3640+00 3648+500 - 3653+00	RW 2-4: CIP Cantilever + 24" Drilled shafts (3635+20 - 3637+20), @ 2' from back heel
					3657+00 - 3666+00	RW 2-5: CIP Cantilever + 24" Soldier Piles in the back (12.5') RW 2-6: CIP Cantilever + 24" Soldier Piles in the back (12.5') (3658+00 - 3664+00)
3	I-35 with Forum Pkwy.	Base	I-35	NB	3775+00 - 3781+20	RW 3-1: CIP Cantilever + 24" Soldier Piles in the back RW 3-2: CIP Cantilever + 24" Soldier Piles in the back (3777+00 - 3779+00) @ 2' from back heel
				SB	3775+00 - 3780+00	RW 3-3: CIP Cantilever + 24" Soldier Piles in the back RW 3-4: CIP Cantilever + 24" Soldier Piles in the back (3777+00 - 3779+00) @ 2' from back heel
4	I-35 with Schertz Pkwy.	Base	I-35	NB	3910+00 - 3935+00	RW 4-1: Cutwall, RW D: Soil Nail Wall Sh=5', Sv=3-5'
				SB	3910+50 - 3930+00	RW 4-2: Cutwall, RW E: Soil Nail Wall Sh=5', Sv=3-5'
5	I-35 with Rittman Rd.	Base	I-35	NB	3341+00 - 3352+00	RW 5-1, RW 5-2: MSE Wall, Back slope surface in concrete. Temporary shoring at the back of the wall, placed during construction.
				SB	3343+00 - 3354+50	
6	I-35 with Eisenhower Rd.	Base	I-35	NB	3387+00 - 3397+00	RW 6-1, 6-2: MSE Wall, Back slope surface in concrete. Temporary shoring at the back of the wall, placed during construction.
				SB	3389+00 - 3399+00	
7	Loop 1604 with Pat Booker Rd.	DWC3	1604	EB	1024+00 - 1032+00	RW 7-1: CIP Wall, Back slope surface in concrete + 24" Drilled shafts (3667+50 - 3671+50), @ 2' from back heel. (Currently under widening modifications, potential new MSE wall)
				WB	1026+00 - 1030+00	

The following case scenarios were identified for the potential conflict between the drilled shafts's proposed locations and the existing retaining wall structures:

1. Drilled shafts requiring to go through the toe and back heel of cantilever spread footing cast in place (CIP) retaining walls.
2. Drilled shafts requiring to go through the reinforced zone of in-service MSE retaining walls.
3. Drilled shafts in conflict with modules of in-service doublewalls.

4. Drilled shafts requiring to go through the reinforced zone of in-service soil nail walls.
5. Drilled shafts simultaneously in conflict with in-place drilled shaft walls, Cantilever CIP walls and Drainage structures.

The following sections present recommendations for the installation of drilled shafts considering the in-place restrictions imposed by each of the case scenario previously presented.

Vicinity plans for each of the walls shown in Table 10 are presented in Appendix B. Appendix C presents a list of references for the as-built plans and typical cross sections of the retaining walls in potential conflict with the drilled shafts. Appendix D presents facing specifics extracted from as-built plans. Finally, Appendix E presents current photos of facing elements of retaining walls presented in Table 10.

5.1 CIP Cantilever Walls

Potential conflict between the proposed locations of the drilled shafts and in-place CIP retaining walls was identified at the Retaining Walls 1, 2, 3 and 7 presented in Table 10. According to the project schematics, the drilled shafts are requiring to go through either the toe or the back heel of the CIP walls. Current boring equipment can allow for coring through the reinforced concrete in the heel or toe of the CIP walls. It should be noted that this will be much more time consuming than a typical construction. Boring through the existing wall will reduce the performance of the existing wall and may cause destabilization. Below are two construction alternatives to avoid destabilization of the existing walls during construction.

- The use of anchors spanning either side of the shaft could be used to maintain integrity of the CIP wall. These anchors could be installed directly into existing wall (pending structural analysis) or be constructed into a new face placed in front of the existing wall. The anchors would need to be designed to support the entire lateral earth pressure load for the span.
- A slurry wall installed behind the existing walls would drastically reduce lateral earth pressures. The slurry wall would need to be placed behind the wall over the section where the shaft will be installed. A grout slurry would replace excavated soils behind the wall for a distance to cover the active earth pressure wedge. No modifications to the CIP wall would be required using this method.

Although the as-built plans point out the use of spread footing CIP cantilever walls for the construction of Retaining Walls 1, 2 and 3, current in-place facing of these structures suggest the final use of a different type of retaining walls per the wall panel style typical in the as-built drawings. Doublewalls and MSE retaining walls are likely to be the type of wall employed based on the existing panel-facing characteristics. Current facing photos of all the retaining walls in potential conflict with the proposed drilled shafts are presented in Appendix E. Given the discrepancies between the as-built plans and the current mis-matched wall facing, it is likely that during construction wall type changes were made. If this is the case, different approaches are presented below and are recommended for each wall type.

5.2 MSE Walls

Potential conflict between the proposed locations of the drilled shafts and in-service MSE retaining walls was identified at the Retaining Walls 5-1, 5-2, 6-1 and 6-2 presented in Table 10. According to

the project schematics, the drilled shafts are positioned over the reinforced zone of the MSE walls where metallic straps are expected. Based on the available as-built plans, each of these walls were constructed using temporary vertical shoring (see Appendix C) that was employed during construction to retain the backfill of the existing embankment.

Additionally, although as-built plans point out the use of spread footing CIP cantilever walls for the construction of Retaining Walls 1 and 2, MSE walls are anticipated based on the in-place facing of these structures.

HVJ anticipates the installation of the drilled shafts will unavoidably affect the reinforcement of the MSE wall by disturbing the backfill surrounding the metallic straps and more significantly by shortening their length. Ultimately, this will compromise the integrity of the wall due to the important reduction in friction area available to counteract the active force. Moreover, the vibration and stresses induced during the installation of the shafts are expected to disturb the backfill and generate excessive deformation at the face of the wall.

Therefore, HVJ recommends installation of the drilled shafts to be performed by 'notching' the existing wall. Slurry walls could be utilized for this concept. The construction process for this method would involve placing the slurry grout behind the wall face, to either side of the shaft location and perpendicularly to the existing MSE wall face in order to contain the backfill surrounding the notch. Multiple injections points would be required to obtain the required coverage of the slurry grout wall. Then, the wall facing and backfill within the slurry walls should be removed and the shaft installed. Once the shaft is finished, the MSE wall face could be patched using a CIP cantilever wall, smaller shafts or piles, or connecting the wall face patch directly to the newly installed shaft. Backfill of the notch could be achieved using either flow fill or gravel.

In the case of Retaining Walls 5-1, 5-2, 6-1 and 6-2, the slurry walls should extend from the wall face to the temporary shoring located in the back of the MSE walls. In the case of the other MSE walls with no temporary shoring, a third slurry wall must be installed at the back of the notch, parallel to the existing MSE wall face, perpendicular and in contact with the other two slurry walls.

5.3 Doublewalls

Although the as-built plans point out the use of spread footing CIP cantilever walls for the construction of Retaining Walls 3-1 to 3-4 presented in Table 11, doublewalls are anticipated based on the in-place facing of these structures. Potential conflict between the proposed locations of the drilled shafts and the doublewalls's modules is expected. Furthermore, temporary shoring (shown as drilled shafts in the as-builts) was likely required during construction, and may also be in conflict with proposed drilled shaft locations.

HVJ anticipates the installation of the drilled shafts will affect the doublewalls modules, especially those exhibiting greater widths and located at mid height and base levels of the wall. By tearing apart the beams and back face of the modules (see Figure 5), the shafts will compromise the integrity of the wall due to important disturbance of the module's structure to retain backfill and work as a gravity wall. On the other hand, excavation of the drilled shaft through the doublewal structure would be problematic.

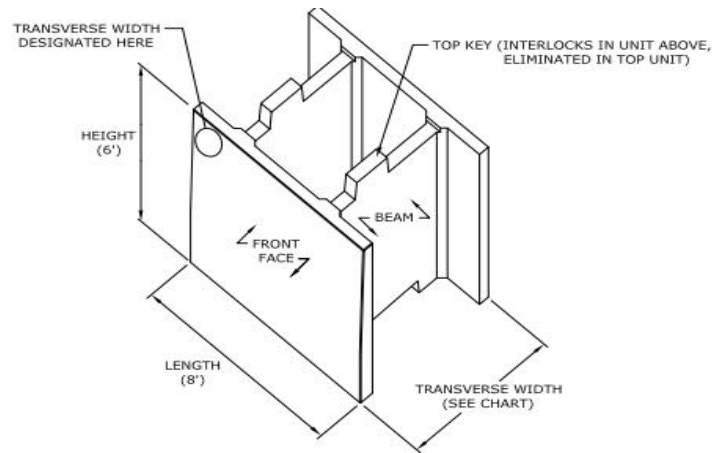


Figure 5 Typical Twal module. (Doublewal, 2014)⁸

HVJ recommends if possible to relocate the drilled shafts behind the existing temporary shoring and supporting bridge decks with a cantilever support. Otherwise, it is likely that these walls may need to be completely replaced and reconstructed.

5.4 Soil Nail Walls

Potential conflict between the proposed locations of the drilled shafts and in-place soil nail walls was identified at Retaining Walls 4-1 and 4-2 presented in Table 12. According to the project schematics, the drilled shafts are requiring to go through the reinforced zone of the soil nail walls where grouted metal bars are expected.

Similarly to the MSE walls case scenario, the installation of the drilled shafts will unavoidably affect the general stability of the soil nail walls by compromising the grouted steel bars acting as reinforcement. It is expected the shafts will completely or partially remove the length of the reinforcement bars extending beyond the failure wedge, debilitating the wall. Therefore, as recommended for the MSE walls case scenario, HVJ recommends an independent retaining structure be constructed in front of the existing wall. HVJ recommends a system of drilled shafts or soldier piles and lagging as described in Chapter 5.2. Alternatively, a series of tieback anchors could be installed on either side of the drilled shaft. For this option, the existing facing would possibly need additional reinforcement.

The use of high grade steel bars surrounded by grouting is anticipated in a dense arrangement of bars with vertical and horizontal spacing of 4 to 5 ft. based on the available as-built plans. These conditions make the installation of drilled shafts through the reinforcement of soil nail walls a challenging task. HVJ expects that drilled shaft boring equipment can bore through existing elements, however it is expected that construction will progress at very slow rates in the reinforced area. Damage to the face of the existing wall should be anticipated during construction and a significant construction cost increase should be expected.

⁸ Doublewal. Field Manual, Typical Doublewal Module Properties. www. Doublewal.com. 2014

5.5 In-place drilled shafts, Drainage structures and CIP Cantilever walls.

Based on available as-built plans, existing 2 ft. diameter drilled shaft walls and drainage structures of considerable size were identified to be located in the back of existing CIP cantilever walls, where drilled shafts are projected to be installed as part of the NEX project. Potential conflicts are identified in Table 10.

- 3593+50 - 3601+00 of Retaining Wall 1-1
- 3606+00 - 3607+00 of Retaining Wall 1-3
- 3667+50 - 3671+50 of Retaining Wall 2-2,
- 3635+20 - 3637+20 of Retaining Wall 2-4
- 3658+00 - 3664+00 of Retaining Wall 2-5 and 2-6
- 3777+00 - 3779+00 of Retaining Wall 3-1 and 3-2
- 3777+00 - 3779+00 of Retaining Wall 3-3 and 3-4
- 3667+50 - 3671+50 of Retaining Wall 7-1

According to the as-built plans, the existing drilled shaft walls are generally located 2 ft. apart from the back heel of the CIP cantilever wall and extend from the grade surface to 3-5 ft. below the CIP wall base level. In some cases storm drains are located behind the walls as well. One of the as-built sections is shown below in Figure 6.

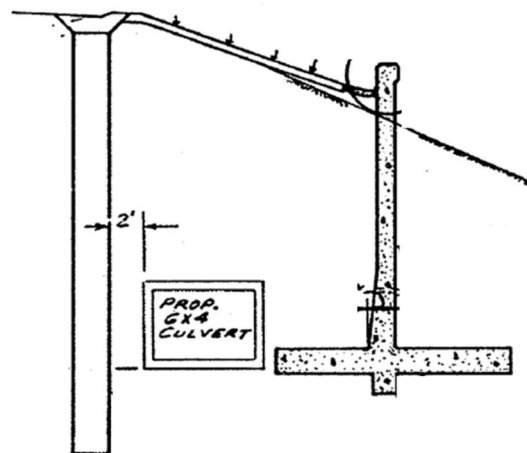


Figure 6 Configuration of Structures for Special Locations (CSJ: 0016-07-081 As-built Plans, 1981⁹)

Due to the presence of both of these structures, the installation of the NEX drilled shafts is considerably more restricted than the case scenario described in Chapter 5.1. HVJ recommends relocating drilled shafts behind the existing temporary drilled shaft walls and supporting bridge decks with a cantilever support when possible. Alternatively, the proposed shafts could be positioned between the existing wall face and temporary shoring, and a drilled shaft wall similar to Section 5.2 could be constructed in front of the existing wall. This option; however, comes with risks of conflicts with the temporary drilled shaft wall and the storm drains.

⁹ State of Texas, State Department of Highways and Public Transportation. "Plans of Proposed State Highway Improvement: From Weidner Rd. to Toepperwein Rd, Bexar County.". CSJ: 0016-07-081.

6. Limitations

This report was performed for the exclusive use of the Garver USA for the North-East Expressway Project, Bexar, Guadalupe and Comal Counties, Texas. HVJ has endeavored to comply with generally accepted geotechnical engineering practice common in the local area. HVJ makes no warranty, express or implied. The analyses and recommendations contained in this report are based on data obtained from subsurface exploration, laboratory testing, the project information provided to us and our experience with similar soils and site conditions. Recommendations presented in this report are intended for informational and estimating purposes only. Recommendations were based on soil profiles estimated using very limited available information and should not be construed as conclusive. HVJ did not perform any field investigation to support soil parameters and designers will need more information to make final recommendations. Additional geotechnical and pavement investigation and design will be needed by in order to prepare release for construction plans and specifications for the project.

It has been a pleasure to work for you on this project and we appreciate the opportunity to be of service. Please notify us if there are questions or if we may be of further assistance.

Sincerely,

HVJ South Central Texas – M&J, Inc.

Texas Firm Registration No. F-18091



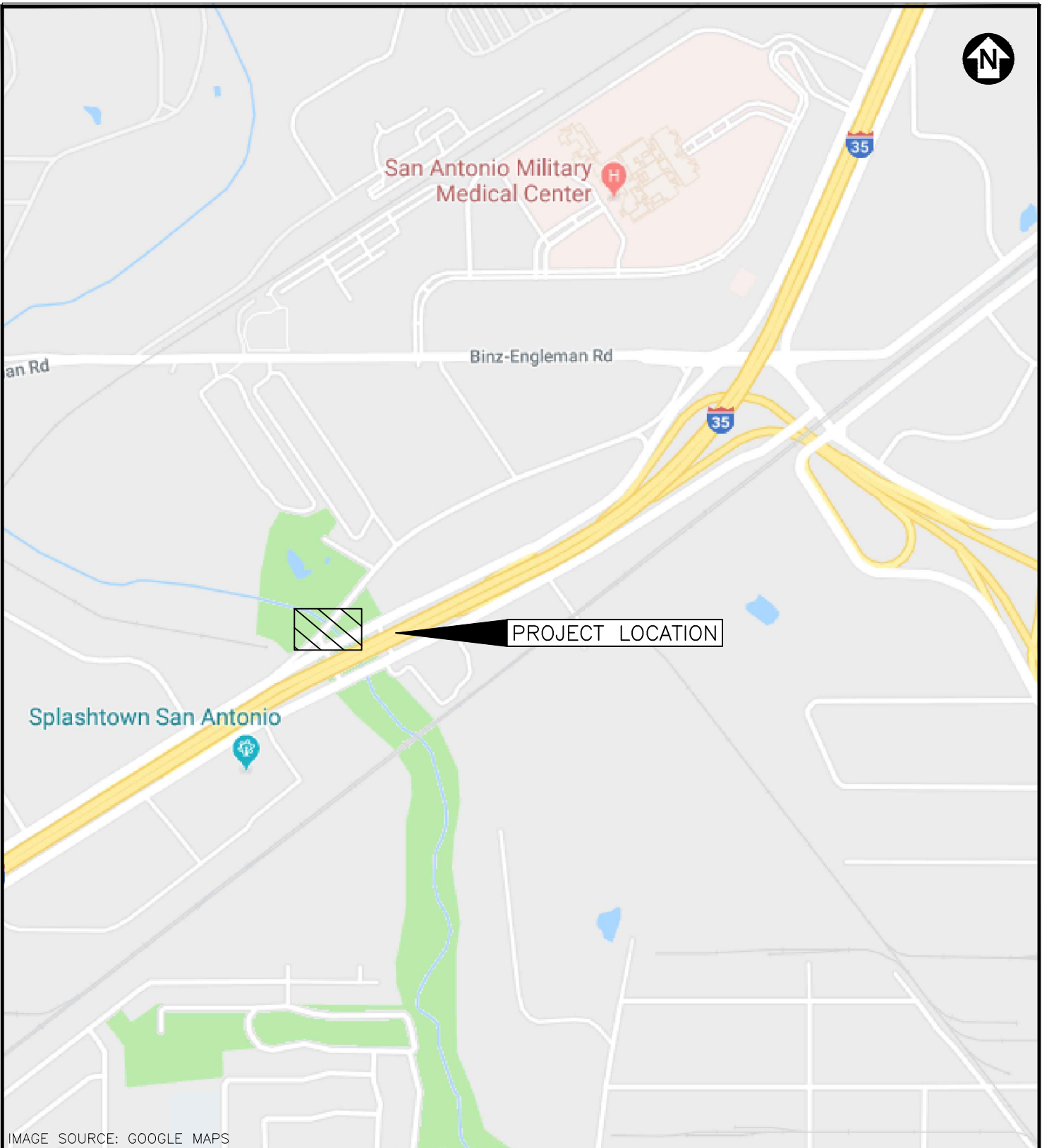
Zach Lootens, PE
Project Manager



Copies submitted: (1) Electronic

APPENDIX A
SOIL PROFILES OF GEOTECHNICAL SECTIONS AND
SUPPORTING BORE INFORMATION

CSJ: 0915-12-531

DATE: 7/30/2015 10:28:56 AM
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		DATE: 3/22/2018		
	DRAWN BY: MM	PROJ. CHK: ZL	APPRV. BY: JS	
	SITE VICINITY MAP OLD SEGUIN RD AT SALADO CREEK BEXAR COUNTY, TEXAS CSJ: 0915-12-531			
PROJECT NO.: AG 16 10081.11.3		FILENAME: VIC		PLATE 1

DATE: 6/27/2017 8:42 AM
FILE: P:\GEO\Projects\2016\AG 16 10081.11.5 TxDOT SL 368 at Salado Creek - WA\5\CAD\POB.dwg



● Boring Location



MAP LOCATION



SCALE: 1" = 100'

DATE: 8/20/2018

DRAWN BY:
MM

PROJ. CHK:
ZL

APPRV. BY:
JS

PLAN OF BORINGS
SL 368 AT SALADO CREEK AND IRA LEE RD
BEXAR COUNTY, TEXAS
CSJ: 0016-08-039

PROJECT NO.:
AG 16 10081.11.5

FILENAME:
POB

PLATE 3



WinCore
Version 3.1

DRILLING LOG

1 of 2

County Bexar County
Highway Old Seguin Road
CSJ 0915-12-531

Hole B-1
Structure Culvert
Station
Offset

District San Antonio
Date 02/19/18
Grnd. Elev. 616.00 ft
GW Elev. 611.50 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI Wet Den. (pcf)	
613.5			PAVEMENT, 6" asphaltic concrete, 4" tan flex base, 18" concrete						
			SAND, slightly compact, semi-moist, dark brown and red, with cherty gravel, clay, and ferrous staining. (SC) [Fluviatile Terrace Deposits]			8.8	44	27	SS: 8-8-13 Passing No. 200 Sieve: 14%
610.5	5	14 (6) 15 (6)							
			GRAVEL, loose to slightly compact, moist, dark brown and red, poorly graded with clay and sand, cherty. (GP-GC) [Fluviatile Terrace Deposits]			10.6	29	15	SS: 7-11-10 Passing No. 200 Sieve: 5%
									SS: 13-10-6
	10	15 (6) 12 (6)							
									SS: 7-11-21
						19.8	53	35	Passing No. 200 Sieve: 10%
599.5	15	12 (6) 6 (6)							
			MUDSTONE, soft, dark gray, slightly to moderately weathered, unfractured, with sand. [Wilcox Group]						PP = 4.5+ tsf
	20	50 (1) 50 (0.5)							

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 20 ft, and then wet coring methods were used to advance the boring to 40 ft. Groundwater was encountered at 4.5 ft. (N,E)=(13711819, 2151870).

Driller: Geotechnical Drilling Services

Logger: KC

Organization: HVJ SCTX

g:\geo\projects\2016\lag 16 10081.11.3 old seguin road at salado creek\wincore\seguin road borings.gpj



WinCore
Version 3.1

DRILLING LOG

2 of 2

County Bexar County
Highway Old Seguin Road
CSJ 0915-12-531

Hole B-1
Structure Culvert
Station
Offset

District San Antonio
Date 02/19/18
Grnd. Elev. 616.00 ft
GW Elev. 611.50 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			MUDSTONE, soft, dark gray, slightly to moderately weathered, unfractured, with sand. [Wilcox Group]							RUN:21-25;REC:75%;RQD:75%
		50 (2) 50 (1)			222	18.7			131	
25										RUN:25-30;REC:100%;RQD:100%
		50 (1) 50 (0.5)								
30					176	20.6			131	RUN:30-35;REC:98%;RQD:98%
		50 (1) 50 (0.5)								
35					228	19.8			131	RUN:35-40;REC:99%;RQD:99%
		50 (0.8) 50 (0.5)								
576.0										
40										

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 20 ft, and then wet coring methods were used to advance the boring to 40 ft. Groundwater was encountered at 4.5 ft. (N,E)=(13711819, 2151870).

Driller: Geotechnical Drilling Services

Logger: KC

Organization: HVJ SCTX



DRILLING LOG

1 of 2

WinCore
Version 3.1

County Bexar County
Highway Old Seguin Road
CSJ 0915-12-531

Hole B-2
Structure Culvert
Station
Offset

District San Antonio
Date 02/20/18
Grnd. Elev. 621.00 ft
GW Elev. 615.50 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
619.8			PAVEMENT, 4.5" asphaltic concrete, 10" tan flex base							
			SAND, compact, semi-moist, brown, clayey, with gravel, and trace ferrous staining. (SC) [Fluviatile Terrace Deposits]			7.6	50	34		SS: 9-14-9 Passing No. 200 Sieve: 23%
615.5	5	25 (6) 17 (6)								SS: 16-15-7
			GRAVEL, slightly compact, moist, dark brown, clayey, with sand, and chert. (GC) [Fluviatile Terrace Deposits]			11.5				SS: 15-10-7 SS: 17-24-22 Passing No. 200 Sieve: 14%
	10	17 (6) 14 (6)								SS: 10-21-26
607.0			MUDSTONE, soft, dark gray, slightly to moderately weathered, intact. [Wilcox Group]			19.1	56	37		Passing No. 200 Sieve: 93%
	15	50 (3) 50 (2)								SS: 7-8-19
	20	50 (3) 50 (1)								

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 20 ft, and then wet coring methods were used to advance the boring to 40 ft. Groundwater was encountered at 5.5 ft. (N,E)=(13711961, 2151985).

Driller: Geotechnical Drilling Services

Logger: KC

Organization: HVJ SCTX



WinCore
Version 3.1

DRILLING LOG

2 of 2

County Bexar County
Highway Old Seguin Road
CSJ 0915-12-531

Hole B-2
Structure Culvert
Station
Offset

District San Antonio
Date 02/20/18
Grnd. Elev. 621.00 ft
GW Elev. 615.50 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)
			MUDSTONE, soft, dark gray, slightly to moderately weathered, intact. [Wilcox Group]						
25		50 (3.5) 50 (1)							
					274	19.2			133
30		50 (1) 50 (0.5)							
35		50 (0.5) 50 (0.5)							
					269	21.2			129
581.0		50 (0.5) 50 (0.5)							
40									

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 20 ft, and then wet coring methods were used to advance the boring to 40 ft. Groundwater was encountered at 5.5 ft. (N,E)=(13711961, 2151985).

Driller: Geotechnical Drilling Services

Logger: KC

Organization: HVJ SCTX

CSJ: 0017-10-264

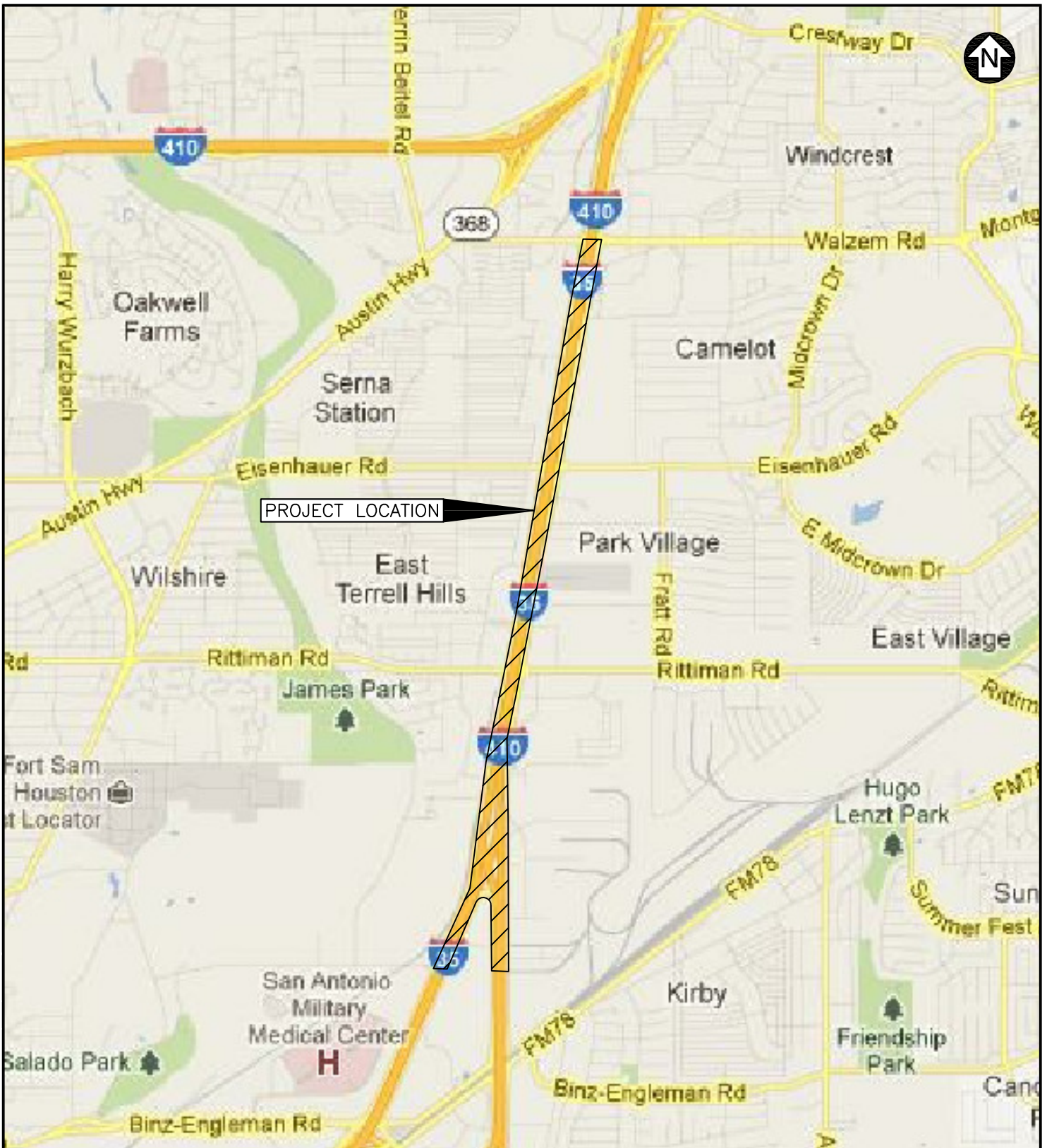


IMAGE SOURCE: GOOGLE EARTH



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY: JA	PROJ. CHK: ND	APPRV. BY: JS
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VICINITY MAP
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 1

DATE:
FILE:



IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION:



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3A

DATE:
FILE:

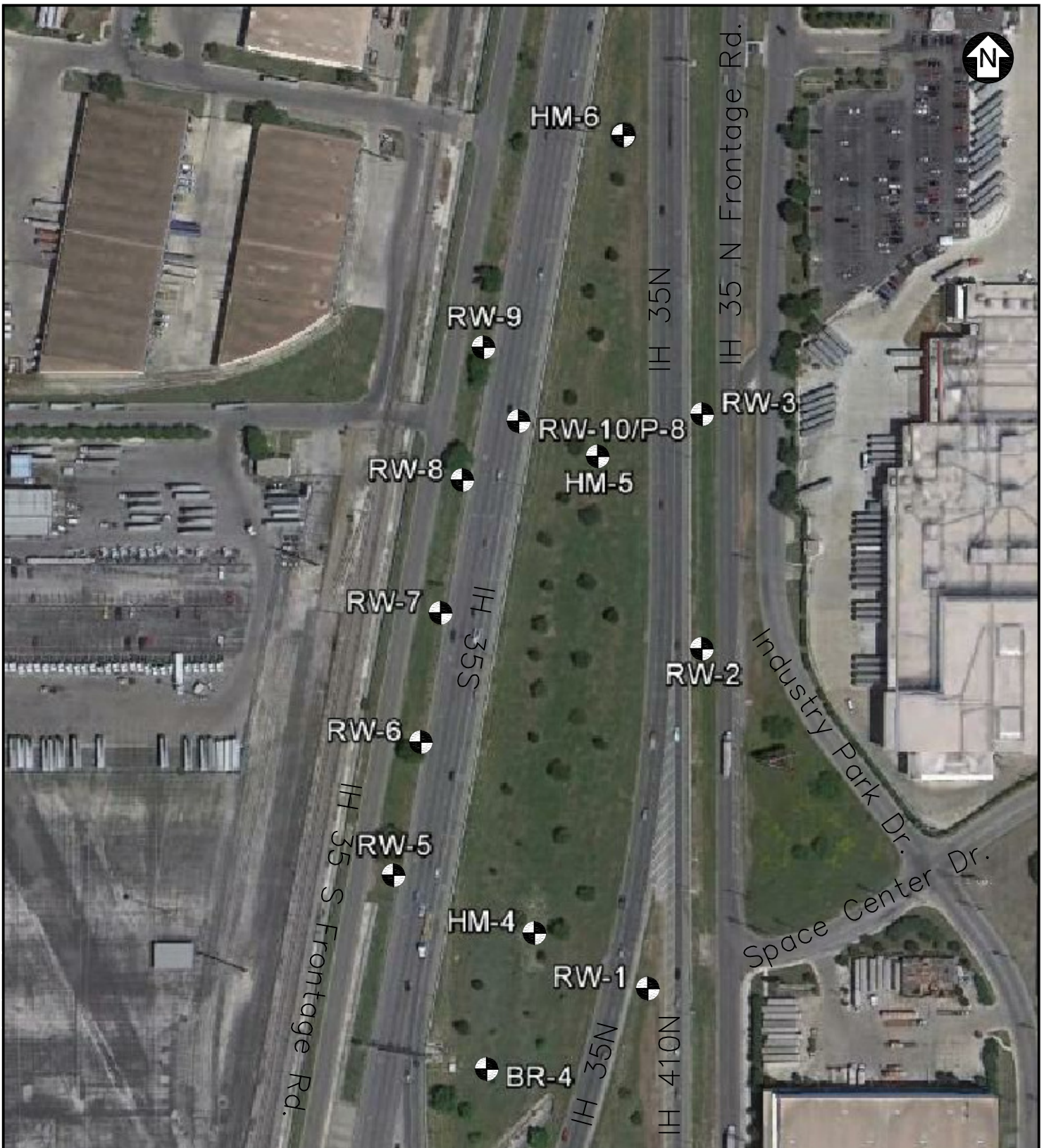


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MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3B

DATE:
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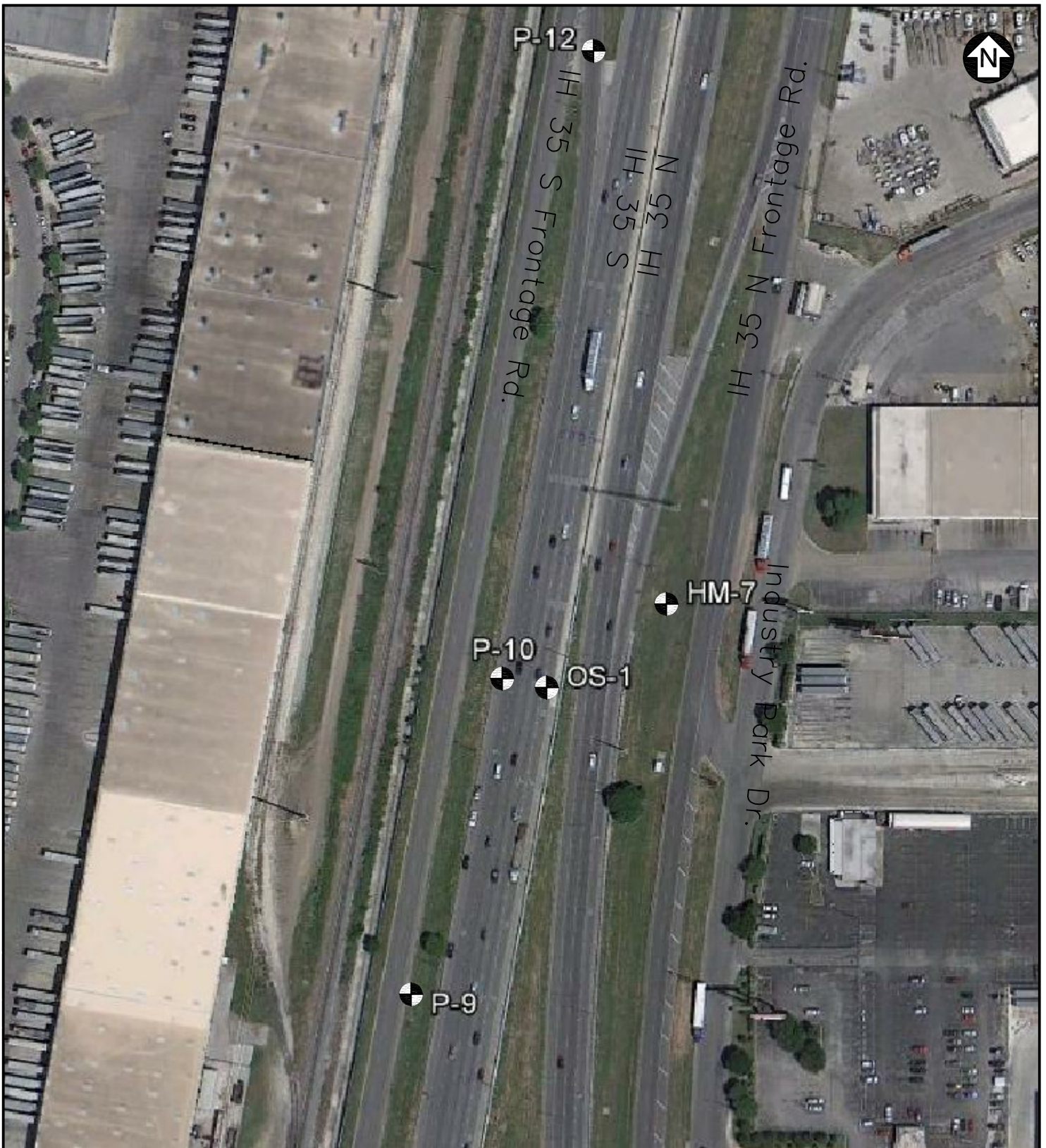


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MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3C

DATE:
FILE:

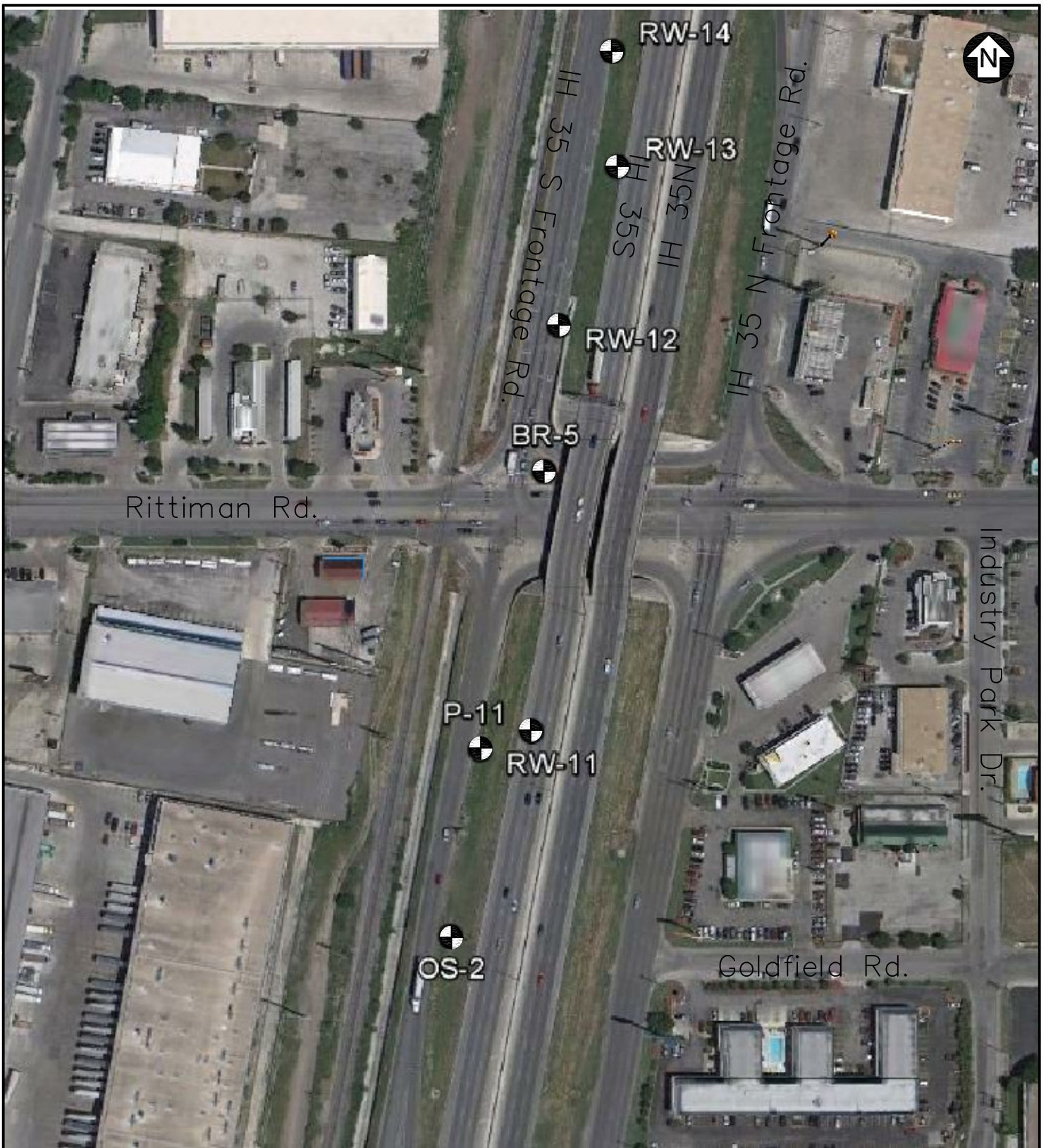


IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION: 



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3D

DATE:
FILE:

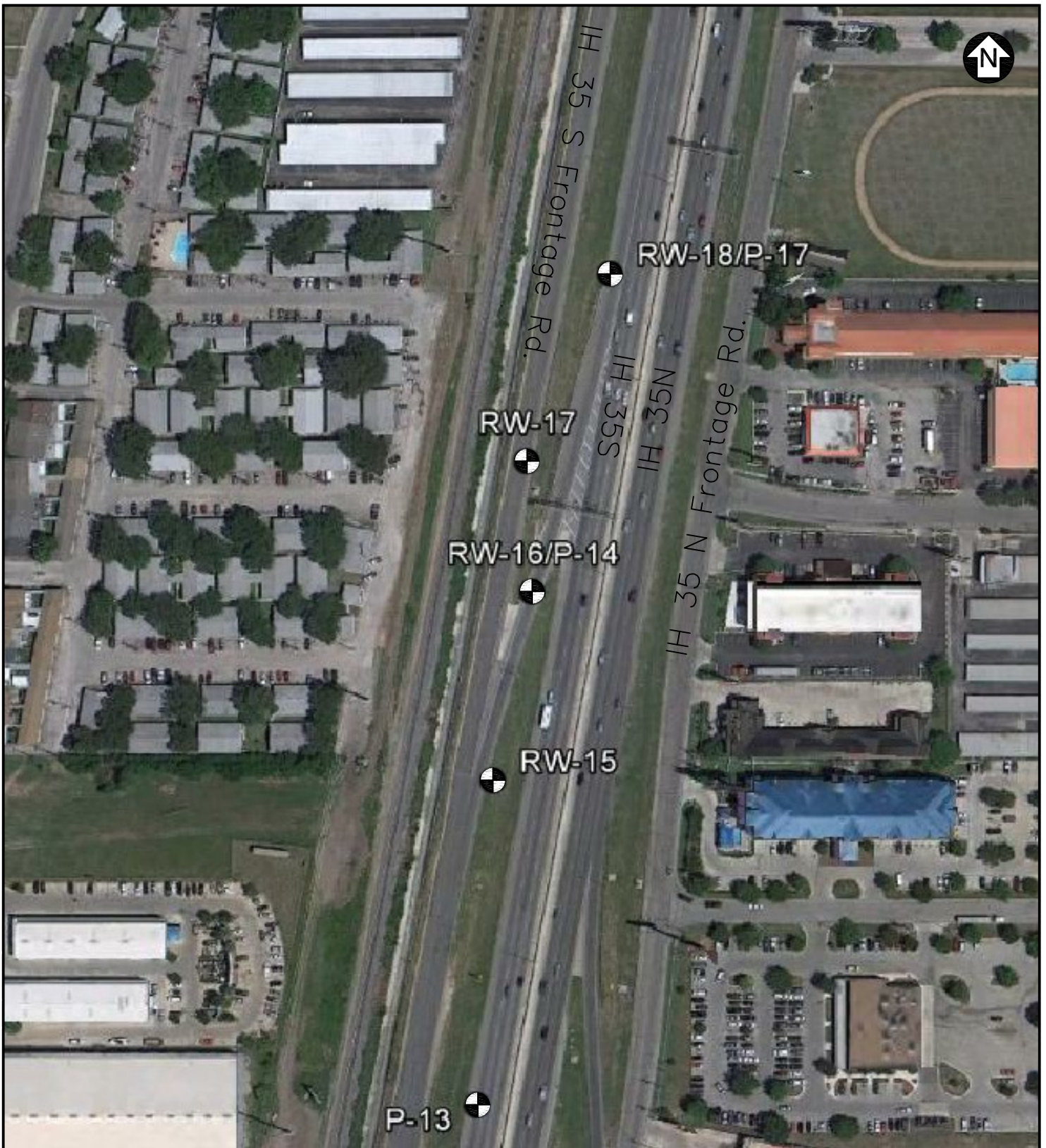


IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION: 



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3E

DATE:
FILE:



IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION:



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3F

DATE:
FILE:

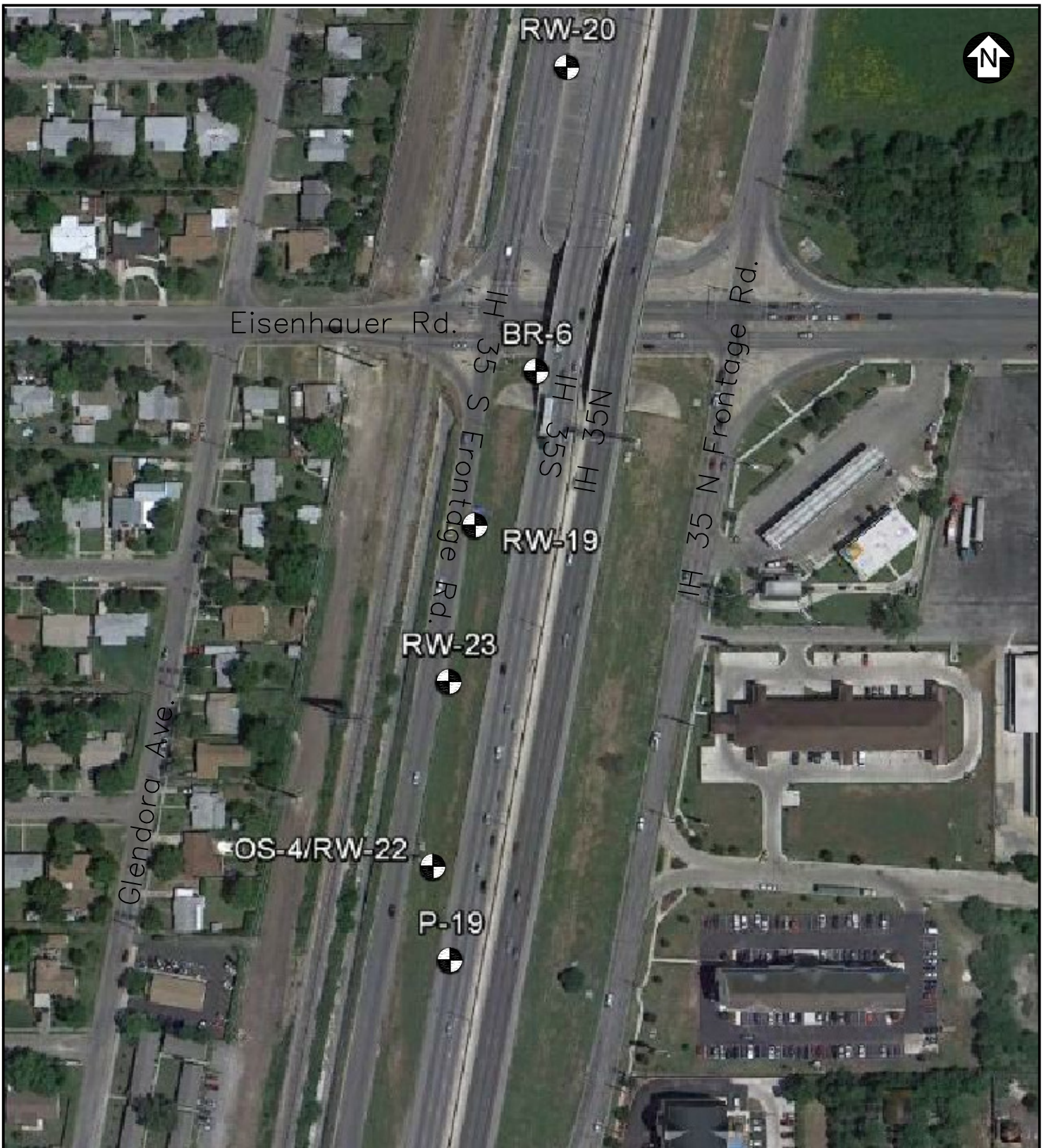


IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION: 



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3G

DATE:
FILE:



IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION: 



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3H

DATE:
FILE:

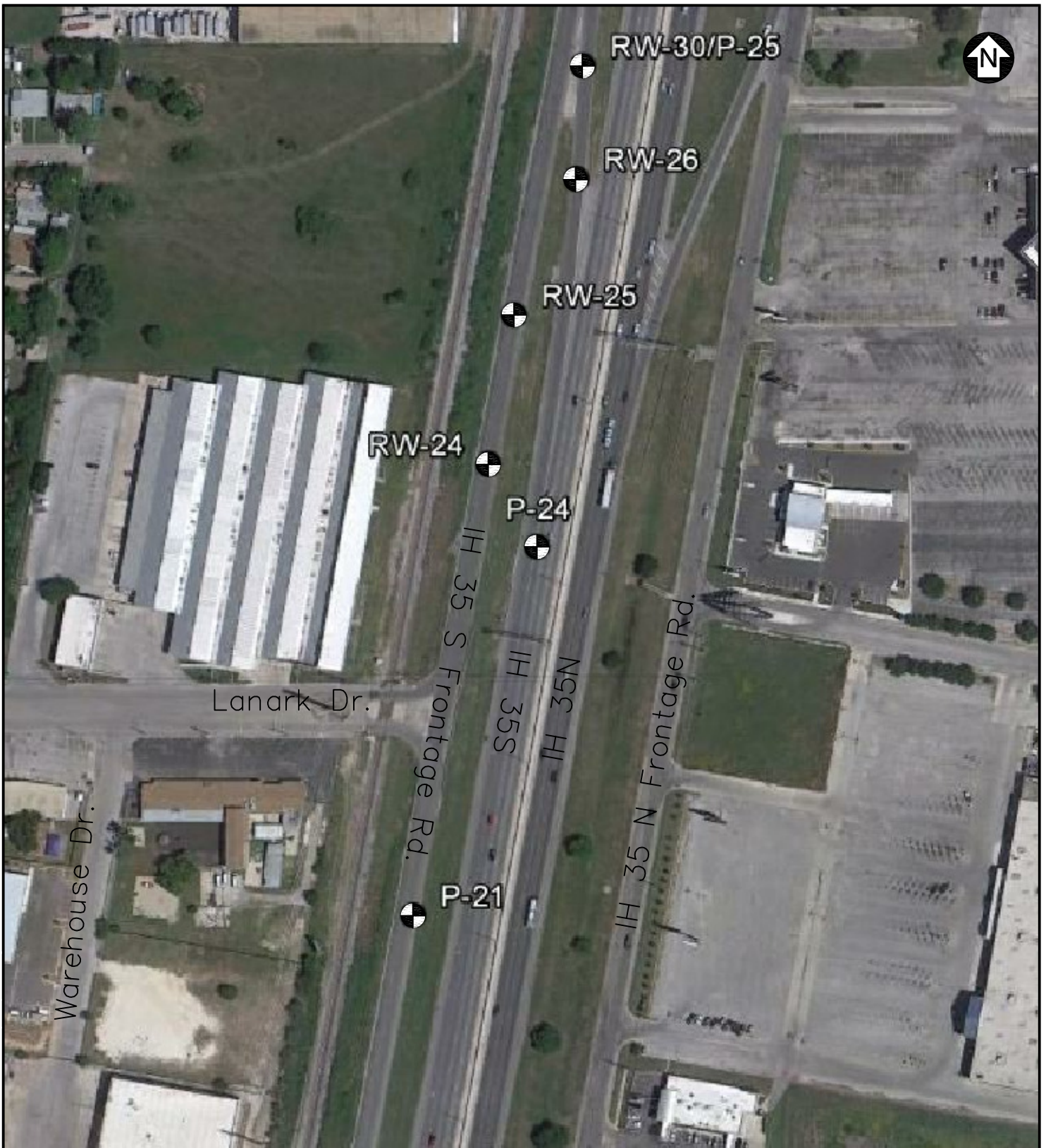


IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION: 



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:	PROJ. CHK:	APPRV. BY:
ZL	ND	JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 31

DATE:
FILE:



IMAGE SOURCE: GOOGLE EARTH

BORING LOCATION: 



MAP LOCATION



SCALE: N.T.S

DATE: 2/18/2013

DRAWN BY:
ZL

PROJ. CHK:
ND

APPRV. BY:
JS

PLAN OF BORINGS
IH 35
BEXAR COUNTY
SAN ANTONIO, TEXAS

PROJECT NO.:
AG 12 10400

FILENAME:
POB

PLATE 3J

DATE:
FILE:



DRILLING LOG

2 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-1
Structure Bridge
Station 764+75
Offset 85 (R)

District San Antonio
Date 11/29/2012
Grnd. Elev. 706.00 ft
GW Elev. 659.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
686.20	[Hatched Pattern]		CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							SPT: 11,14,11
		50 (1) 50 (0)	SAND, clayey, tan, very dense, with gravel and fat clay pockets (SC)							SPT: 50/0"
						5.1	15	4		% Passing No. 200 Sieve: 38.4
25	[Dotted Pattern]	32 (6) 33 (6)								SPT: 12,25,14
30	[Dotted Pattern]	50 (3) 50 (4)								

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.472512, -98.404709

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

3 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-1
Structure Bridge
Station 764+75
Offset 85 (R)

District San Antonio
Date 11/29/2012
Grnd. Elev. 706.00 ft
GW Elev. 659.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
35		27 (6) 33 (6)	SAND, clayey, tan, very dense, with gravel and fat clay pockets (SC)							SPT: 10,12,18
40		21 (6) 26 (6)								SPT: 10,14,18
664.						6.0	55	38		% Passing No. 200 Sieve: 23.0
45		22 (6) 24 (6)	CLAY, fat, tan and gray, hard (CH)							SPT: 13,15,17

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.472512, -98.404709

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

4 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-1
Structure Bridge
Station 764+75
Offset 85 (R)

District San Antonio
Date 11/29/2012
Grnd. Elev. 706.00 ft
GW Elev. 659.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, tan and gray, hard (CH)							
50		18 (6) 24 (6)								PP=2.5 tsf
55		26 (6) 31 (6)								PP=4.5+ tsf
646.60		30 (6) 37 (6)		0	61.9	20	58	41	132	PP=4.5+ tsf % Passing No. 200 Sieve: 99.2

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.472512, -98.404709

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-2/HM-1
Structure Bridge
Station 763+10
Offset 190 (R)

District San Antonio
Date 11/27/2012
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
701. 5 										

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471984, -98.404619

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

2 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-2/HM-1
Structure Bridge
Station 763+10
Offset 190 (R)

District San Antonio
Date 11/27/2012
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
20		14 (6) 26 (6)	CLAY, sandy, lean, tan, hard, with calcareous deposits (CL)							SPT: 8,7,20
25		50 (6) 50 (4.5)								
679.			GRAVEL, clayey, medium dense							SPT: 15,13,8
30						6.3	31	15		
										% Passing No. 200 Sieve: 28.2

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471984, -98.404619

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

3 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-2/HM-1
Structure Bridge
Station 763+10
Offset 190 (R)

District San Antonio
Date 11/27/2012
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
673.			GRAVEL, clayey, medium dense							
			CLAY, fat, tan-orange, hard, with calcite deposits (CH)							
		50 (4.5) 50 (2.5)								SPT: 14,16,22
35										
		50 (6) 50 (3)								SPT: 9,14,17
40										
45										PP=4.5+
<p>Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471984, -98.404619</p> <p>The ground water elevation was not determined during the course of this boring.</p>										

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

4 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-2/HM-1
Structure Bridge
Station 763+10
Offset 190 (R)

District San Antonio
Date 11/27/2012
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, tan-orange, hard, with calcite deposits (CH)	0	109.7	18.7	59	41	127	% Passing No. 200 Sieve: 99.1
		50 (4) 50 (3)								
50				0	112.8	19.2	59	41	126	PP=4.5+ % Passing No. 200 Sieve: 98.9
		50 (4) 50 (1)								
55										PP=4.5+
		50 (5) 50 (0)								
647.			SHALE, dark gray, soft, highly weathered							
		50 (1) 50 (0.5)								
645. 60										SPT: 21,31,41

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471984, -98.404619

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-3
Structure Bridge
Station 761+50
Offset 330 (R)

District San Antonio
Date 11/26 - 11/28/12
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
699.5 5 10 15			CLAY, fat, dark brown, stiff, trace of gravel (CH)							SPT: 1,1,2
				0	16.9	32.6	105	79	114	% Passing No. 200 Sieve: 92.6
		8 (6) 12 (6)								PP=2.0 tsf
			CLAY, lean, tan, hard, with trace of sand (CL)							PP=2.0 tsf
		44 (6) 44 (6)								PP=4.5+ tsf
										SPT: 30,28,38
						10.5	28	15		% Passing No. 200 Sieve: 90.2

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471416, -98.404419

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

2 of 4

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-3
Structure Bridge
Station 761+50
Offset 330 (R)

District San Antonio
Date 11/26 - 11/28/12
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
		50 (6) 45 (6)	CLAY, lean, tan, hard, with trace of sand (CL)							SPT: 13,20,23
20		50 (0.5) 50 (0)								
		50 (5.5) 35 (6)								
679. 25			SAND, clayey, tan, medium dense to dense (SC)							SPT: 10,14,11
		32 (6) 50 (4.5)								
30										PP=4.5+

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471416, -98.404419

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

3 of 4

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-3
Structure Bridge
Station 761+50
Offset 330 (R)

District San Antonio
Date 11/26 - 11/28/12
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
35			SAND, clayey, tan, medium dense to dense (SC)							SPT: 10,10,11
						14.7	41	27		% Passing No. 200 Sieve: 47.3
667.		50 (4) 50 (3)								
			CLAY, fat, tan-orange, very stiff to hard (CH)							SPT: 14,21,33
40		50 (4) 50 (3)								
45		50 (5) 50 (3)								

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471416, -98.404419

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

4 of 4

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-3
Structure Bridge
Station 761+50
Offset 330 (R)

District San Antonio
Date 11/26 - 11/28/12
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, tan-orange, very stiff to hard (CH)							SPT: 11,16,20
50						18.6	53	34		% Passing No. 200 Sieve: 99.4
		50 (3) 50 (2)								PP=4.5+ tsf
55										PP=4.5+
		50 (3) 50 (1.5)								
		50 (3) 50 (1.5)								PP=4.5+ tsf
644.60										

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471416, -98.404419

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

2 of 5

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-4
Structure Bridge
Station 768+20
Offset 130 (L)

District San Antonio
Date 12/4/2012
Grnd. Elev. 704.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
684.20			CLAY, sandy, lean, tan, very stiff to hard, with calcareous deposits (CL)							
		27 (6) 50 (4)								
				0	76.1	14.7			135	SPT: 27,30,28
			CLAY, lean, tan-orange, hard (gravel lense at 30') (CL)							
25		20 (6) 29 (6)								SPT: 7,14,22
						15.9	42	30		% Passing No. 200 Sieve: 72.8
30		28 (6) 28 (6)								PP=4.5+ tsf

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.473591, -98.404976

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates, Inc.



DRILLING LOG

3 of 5

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-4
Structure Bridge
Station 768+20
Offset 130 (L)

District San Antonio
Date 12/4/2012
Grnd. Elev. 704.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
35		50 (2) 50 (1)	CLAY, lean, tan-orange, hard (gravel lense at 30') (CL)							PP=4.5+ tsf
667.			GRAVEL, clayey, orange-tan, very dense, with sand and chert deposits							
40		50 (5) 50 (2)								SPT: 24,50/3"
45		50 (6) 50 (3)								

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.473591, -98.404976

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates, Inc.



DRILLING LOG

4 of 5

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-4
Structure Bridge
Station 768+20
Offset 130 (L)

District San Antonio
Date 12/4/2012
Grnd. Elev. 704.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
658.			GRAVEL, clayey, orange-tan, very dense, with sand and chert deposits							SPT: 10,13,16
			CLAY, lean, orange-tan and light gray, very stiff (CL)							
		21 (6) 50 (4)								
50										SPT: 9,15,17
651.			SHALE, dark gray, soft, highly weathered							
				0	173.9	18.0	52	18	134	% Passing No. 200 Sieve: 98.8
55		50 (3) 50 (1)								PP=4.5+ tsf
		50 (2) 50 (1)								
60										SPT: 15,18,19

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.473591, -98.404976

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates, Inc.



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-4
Structure Bridge
Station 768+20
Offset 130 (L)

District San Antonio
Date 12/4/2012
Grnd. Elev. 704.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
643.			SHALE, dark gray, soft, highly weathered							
65										
70										
75										

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.473591, -98.404976

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ Associates, Inc.



DRILLING LOG

1 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-5
Structure Bridge
Station 1807+45
Offset 90 (L)

District San Antonio
Date 01/10/2013
Grnd. Elev. 722.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
720.			CLAY, fat, dark brown and tan, stiff (CH)							SPT: 25,15,10
719.			GRAVEL, clayey, brown, medium dense							
			CLAY, gravelly, tan and brown, hard (CL)							
5		28 (6) 23 (6)								
716.			CLAY, fat, black and tan, stiff to hard (CH)							
				0	100.8	25.1	82	57	128	% Passing No. 200 Sieve: 91.4
										PP: 4.5 tsf
10		9 (6) 12 (6)								PP: 4.5 tsf
710.			CLAY, lean, tan and brown, hard, with calcareous deposits (CL)							
				0	93.9	12.1	37	22	123	% Passing No. 200 Sieve: 95.4
15		22 (6) 23 (6)								PP: 4.5 tsf

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.484229, -98.403413

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



DRILLING LOG

2 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-5
Structure Bridge
Station 1807+45
Offset 90 (L)

District San Antonio
Date 01/10/2013
Grnd. Elev. 722.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
20		16 (6) 18 (6)	CLAY, lean, tan and brown, hard, with calcareous deposits (CL)	0	83.1	13.4			134	PP: 4.5 tsf
699.			CLAY, lean, light tan, with sand and calcareous deposits (CL)							SPT: 50/5"
25		50 (0.5) 50 (0.25)								
										SPT: 41,27,50/2"
						7.3	24	11		% Passing No. 200 Sieve: 73.3
30		50 (5) 50 (1.5)								

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.484229, -98.403413

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



DRILLING LOG

3 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-5
Structure Bridge
Station 1807+45
Offset 90 (L)

District San Antonio
Date 01/10/2013
Grnd. Elev. 722.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, light tan, with sand and calcareous deposits (CL)							
35		50 (4) 50 (1)								SPT: 50/4"
684.			CLAY, lean, reddish brown, with sand and gravel (CL)							SPT: 20,21,36
						13.7	26	14		% Passing No. 200 Sieve: 83.1
40		47 (6) 50 (0.75)								
										SPT: 37,40,20
45		50 (5) 50 (3.5)								

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.484229, -98.403413

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

4 of 4

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-5
Structure Bridge
Station 1807+45
Offset 90 (L)

District San Antonio
Date 01/10/2013
Grnd. Elev. 722.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, reddish brown, with sand and gravel (CL)							
50		50 (5) 50 (2)								SPT: 24,50/5"
55		46 (6) 50 (3)								SPT: 7,16,36
662.60		50 (5) 50 (3)								SPT: 21,41,41

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.484229, -98.403413

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



DRILLING LOG

1 of 4

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-6
Structure Bridge
Station 1852+35
Offset 65 (L)

District San Antonio
Date 12/7/2012
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, brown and black, very stiff, with sand and gravel (CH)	0	74.7	22.5			146	
										PP=4.0 tsf
										PP=3.5 tsf
5		5 (6) 5 (6)								
										PP=2.5 tsf
						14.3	84	63		% Passing No. 200 Sieve: 82.5
727.5										
10		10 (6) 11 (6)	CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
				0	67.5	18.1			132	
15		15 (6) 16 (6)								PP=4.5+ tsf

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.496370, -98.400846

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates, Inc.



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-6
Structure Bridge
Station 1852+35
Offset 65 (L)

District San Antonio
Date 12/7/2012
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
718.			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							
20		13 (6) 17 (6)				19.7	33	22		% Passing No. 200 Sieve: 79.4 PP=4.5+ tsf
714.			SAND, clayey, tan, dense (SC)	0	15.8	21.9	29	15	126	% Passing No. 200 Sieve: 42.1 PP=3.75 tsf
25		15 (6) 20 (6)								
708.			CLAY, lean, orange-brown and light gray, hard, with calcareous and chert deposits (CL)							
30										

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.496370, -98.400846

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates, Inc.



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-6
Structure Bridge
Station 1852+35
Offset 65 (L)

District San Antonio
Date 12/7/2012
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
		50 (5) 50 (4)	CLAY, lean, orange-brown and light gray, hard, with calcareous and chert deposits (CL)	0	147.5	10.5			141	PP = 4.5+ tsf
35										
		50 (4) 50 (3)								SPT: 19,34,44
40		50 (6) 50 (3)								SPT: 50/5"
45		50 (4) 50 (1)								

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.496370, -98.400846

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates, Inc.



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Version 3.0

DRILLING LOG

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County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole BR-6
Structure Bridge
Station 1852+35
Offset 65 (L)

District San Antonio
Date 12/7/2012
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, orange-brown and light gray, hard, with calcareous and chert deposits (CL)							SPT: 50/2"
50		50 (1) 50 (0)								SPT: 50/1"
55		50 (2) 50 (1)								SPT: 50/2"
		50 (2) 50 (1)								SPT: 50/4"
677.60										

Remarks: Ground elevation is approximate. SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.496370, -98.400846

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates, Inc.



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-2
Structure High-Mast
Station 757+60
Offset 580 (R)

District San Antonio
Date 01/16/13
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with calcareous deposits (CL)							
20		33 (6) 44 (6)								SPT: 21,28,50
25		50 (2) 50 (0.75)								SPT: 49,50/5.75"
30		48 (6) 50 (2.5)								SPT: 29,50/5.5"

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470089, -98.404197

The ground water elevation was not determined during the course of this boring.

Driller: Core Tech

Logger: D. Dawson

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-2
Structure High-Mast
Station 757+60
Offset 580 (R)

District San Antonio
Date 01/16/13
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
672.			CLAY, lean, tan, hard, with calcareous deposits (CL)							
			GRAVEL, clayey, reddish brown, medium dense to very dense							SPT: 23,17,13
35		27 (6) 37 (6)								
										SPT: 29,43,28
40		47 (6) 50 (4)				4.3	21	7		% Passing No. 200 Sieve: 14.9
662.			CLAY, fat, brown, hard (CH)							SPT: 13,17,19
						17.8	62	45		% Passing No. 200 Sieve: 98.0
45		22 (6) 47 (6)								

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470089, -98.404197

The ground water elevation was not determined during the course of this boring.

Driller: Core Tech

Logger: D. Dawson

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-2
Structure High-Mast
Station 757+60
Offset 580 (R)

District San Antonio
Date 01/16/13
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, brown, hard (CH)							SPT: 13,15,19
50		26 (6) 47 (6)								
652.			CLAY, lean, brown, hard (CL)							PP=4.5+ tsf % Passing No. 200 Sieve: 98.6
				0	230.8	15.1	45	30	133	
55		50 (1) 50 (0.5)								PP=4.5+ tsf
644. 60		50 (0.5) 50 (0.5)								

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470089, -98.404197

The ground water elevation was not determined during the course of this boring.

Driller: Core Tech

Logger: D. Dawson

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-3
Structure High-Mast
Station 755+70
Offset 145 (L)

District San Antonio
Date 1/16/13&1/17/13
Grnd. Elev. 706.00 ft
GW Elev. 675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
704.			CLAY, fat, black, very stiff, with sand and gravel (CH)							PP=2.0 tsf
			CLAY, lean, tan, hard, with calcareous deposits (3" sand and gravel seam between 3-4') (CL)			10.8	30	18		PP=4.5+ tsf % Passing No. 200 Sieve: 81.5
702.			CLAY, fat, black, very stiff, with sand (CH)							
5		8 (6) 9 (6)								
699.5			CLAY, sandy, lean, tan, hard, with calcareous deposits (CL)							PP=4.5+ tsf PP=4.5+ tsf
10		27 (6) 22 (6)								
15		12 (6) 14 (6)								PP=4.5+ tsf

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470483, -98.406508

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-3
Structure High-Mast
Station 755+70
Offset 145 (L)

District San Antonio
Date 1/16/13&1/17/13
Grnd. Elev. 706.00 ft
GW Elev. 675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
689.			CLAY, sandy, lean, tan, hard, with calcareous deposits (CL)							
			CLAY, lean, tan and light gray, hard, with sand and clacareous deposits (CL)							PP=4.5+
						11.9	31	18		% Pasing No. 200 Sieve: 80.2
20		38 (6) 46 (6)								
684.			SAND, clayey, light tan, dense, with gravel and chert deposits (SC)							
25		38 (6) 50 (4)								SPT: 25,15,20
30		16 (6) 29 (6)								

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470483, -98.406508

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-3
Structure High-Mast
Station 755+70
Offset 145 (L)

District San Antonio
Date 1/16/13&1/17/13
Grnd. Elev. 706.00 ft
GW Elev. 675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
674.			SAND, clayey, light tan, dense, with gravel and chert deposits (SC)			17.6	26	8		SPT: 6,11,15 % Passing No. 200 Sieve: 50.0
			CLAY, fat, tan and light gray, hard (CH)							
35		37 (6) 40 (6)								SPT: 12,12,15
40		38 (6) 46 (6)		0	62.2	17.1	55	34	123	PP=4.5+ tsf % Passing No. 200 Sieve: 98.2
45		12 (6) 50 (4.5)								PP=4.5+ tsf

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470483, -98.406508

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-3
Structure High-Mast
Station 755+70
Offset 145 (L)

District San Antonio
Date 1/16/13&1/17/13
Grnd. Elev. 706.00 ft
GW Elev. 675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
50		15 (6) 50 (4)	CLAY, fat, tan and light gray, hard (CH)							PP=4.5+ tsf
55		50 (5) 50 (3)								SPT: 9,18,21
60		50 (1) 50 (1)								SPT: 10,18,24
646										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470483, -98.406508

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Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-4
Structure High-Mast
Station 770+45
Offset 110 (L)

District San Antonio
Date 1/17/13
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
703.			CLAY, fat, black, stiff (CH)							PP=1.5 tsf
			CLAY, lean, brown, very stiff to hard, with sand and calcareous deposits (CL)							PP=4.5+ tsf
5		20 (6) 20 (6)								PP=4.5+ tsf
										SPT: 13,16,28
10		13 (6) 16 (6)								SPT: 33,43,50/2"
										% Passing No. 200 Sieve: 77.7
15		50 (3) 50 (3)				7.1	30	18		

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.474158, -98.404747

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-4
Structure High-Mast
Station 770+45
Offset 110 (L)

District San Antonio
Date 1/17/13
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
20		27 (6) 29 (6)	CLAY, lean, brown, very stiff to hard, with sand and calcareous deposits (CL)							SPT: 14,21,30
25		50 (4.5) 50 (5)								SPT: 29,46,50/4.75"
										SPT: 36,48,50/5"
30		48 (6) 50 (3.5)				9.2	28	16		% Passing No. 200 Sieve: 85.4

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.474158, -98.404747

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-4
Structure High-Mast
Station 770+45
Offset 110 (L)

District San Antonio
Date 1/17/13
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
673.			CLAY, lean, brown, very stiff to hard, with sand and calcareous deposits (CL)							
			CLAY, lean, tan, hard, with calcareous deposits (CL)							
						13	29	17		SPT: 20,32,29 % Passing No. 200 Sieve: 93.5
35		42 (6) 50 (4.5)								
669.			CLAY, silty, tan, hard, with sand (CL-ML) (CL)							
										SPT: 20,24,42
40		40 (6) 50 (3.5)								
663.			CLAY, lean, tan, hard (CL)							
				0	149.2	19.7			129	PP=4.5+ tsf
45		50 (3) 50 (2.25)								

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.474158, -98.404747

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-4
Structure High-Mast
Station 770+45
Offset 110 (L)

District San Antonio
Date 1/17/13
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard (CL)							
				0	198.3	18.6			138	PP=4.5+ tsf
50		50 (1) 50 (1)								
				0	160.6	17.8			137	PP=4.5+ tsf
55		50 (1) 50 (2.25)								
649.			CLAY, fat, tan and light gray, hard (CH)							
				0	196.1	18.7			130	PP=4.5+ tsf
645. 60		50 (1.25) 50 (1)								

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.474158, -98.404747

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-5
Structure High-Mast
Station 777+90
Offset 70 (L)

District San Antonio
Date 01/15/13
Grnd. Elev. 711.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		11 (6) 11 (6)	CLAY, black, fat, firm to hard (CH)	0	173.3	18.7	67	45	128	PP=1.0 tsf
										PP=4.5+ tsf
703.										PP=4.5+ tsf
10		23 (6) 35 (6)	CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							% Passing No. 200 Sieve: 93.5
										PP=4.5+ tsf
15		25 (6) 25 (6)								SPT: 15,19,26

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.476134, -98.404442

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Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-5
Structure High-Mast
Station 777+90
Offset 70 (L)

District San Antonio
Date 01/15/13
Grnd. Elev. 711.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
20		50 (3) 50 (5)	CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							SPT: 31,22,27
25		27 (6) 43 (6)								SPT: 16,28,31
30		50 (2) 50 (1)								SPT: 50/3.75
						9.1	41	29		% Passing No. 200 Sieve: 82.2

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.476134, -98.404442

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Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-5
Structure High-Mast
Station 777+90
Offset 70 (L)

District San Antonio
Date 01/15/13
Grnd. Elev. 711.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							
35		21 (6) 27 (6)								SPT: 18,18,32
674.			GRAVEL, clayey, tan, dense, with sand							SPT: 12,42,50/3.5"
40		33 (6) 50 (4)								SPT: 14,22,32
666.		50 (4) 50 (4)				12.0	22	8		% Passing No. 200 Sieve: 10.8

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.476134, -98.404442

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Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-5
Structure High-Mast
Station 777+90
Offset 70 (L)

District San Antonio
Date 01/15/13
Grnd. Elev. 711.00 ft
GW Elev. 666.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
50		44 (6) 50 (4)	SAND, clayey, reddish brown, dense, with gravel (SC)							SPT: 18,35,41
55		26 (6) 50 (3.5)				15.9	50	35		SPT: 29,16,13 % Passing No. 200 Sieve: 43.8
651. 60		50 (1) 50 (0.25)								SPT: 19,26,40

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.476134, -98.404442

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Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

1 of 4

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-6
Structure High-Mast
Station 782+75
Offset 30 (L)

District San Antonio
Date 1/15/13
Grnd. Elev. 713.00 ft
GW Elev. 667.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
707.			CLAY, fat, black, very stiff to hard (CH)							PP=1.5 tsf
										PP=4.5+ tsf
		6 (6) 7 (6)								PP=4.5+ tsf
			CLAY, fat, tan, hard, (CH)							PP=4.5+ tsf
10										PP=4.5+ tsf
		16 (6) 21 (6)		0	36.4	22.3	72	52	115	% Passing No. 200 Sieve: 92.9
698.										SPT: 7,14,20
		15 (6) 29 (6)								

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.477468, -98.404320

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-6
Structure High-Mast
Station 782+75
Offset 30 (L)

District San Antonio
Date 1/15/13
Grnd. Elev. 713.00 ft
GW Elev. 667.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
35		50 (4) 50 (2)	CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							SPT: 34,50/5"
			CLAY, sandy, lean, orange-brown, hard, with calcareous deposits (CL)							
40		50 (2) 50 (1.25)				7.3	24	11		SPT: 50/4.5" % Passing No. 200 Sieve: 61.2
45		50 (5) 50 (2)	GRAVEL, clayey, orange-tan, dense, with sand and chert deposits							SPT: 50,26,26

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.477468, -98.404320

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Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-7
Structure High-Mast
Station 791+10
Offset 105 (R)

District San Antonio
Date 1/17/13
Grnd. Elev. 713.00 ft
GW Elev. 676.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
711.			CLAY, sandy, fat, black, soft (CH)							PP=0.5 tsf
			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							PP=0.5 tsf
5		8 (6) 13 (6)								PP=4.5+ tsf
						17.9	49	33		% Passing No. 200 Sieve: 89.8
10		27 (6) 26 (6)								PP=4.5+ tsf
15		18 (6) 19 (6)								PP=4.5+ tsf

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479707, -98.403720

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Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-7
Structure High-Mast
Station 791+10
Offset 105 (R)

District San Antonio
Date 1/17/13
Grnd. Elev. 713.00 ft
GW Elev. 676.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
696.			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
			CLAY, lean, tan-orange and gray, very stiff to hard (CL)							
20		23 (6) 26 (6)				19.1	49	33		PP=4.0 tsf % Passing No. 200 Sieve: 94.6
25		18 (6) 23 (6)								PP=4.5+ tsf
30		21 (6) 24 (6)								PP=4.5+ tsf

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479707, -98.403720

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-7
Structure High-Mast
Station 791+10
Offset 105 (R)

District San Antonio
Date 1/17/13
Grnd. Elev. 713.00 ft
GW Elev. 676.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
680.			CLAY, lean, tan-orange and gray, very stiff to hard (CL)							
35		27 (6) 36 (6)	SAND, clayey, orange-tan, dense, with gravel, fat clay pockets, and chert deposits (SC)							
						5.9	54	36		SPT: 9,16,21 % Passing No. 200 Sieve: 21.9
673.		26 (6) 36 (6)	CLAY, sandy, lean, tan and light gray, dense (3" sand and gravel seam between 44-45') (CL)							SPT: 12,11,30
669.			CLAY, lean, tan and light gray, hard, with sand (CL)							
45		27 (6) 50 (4)								

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479707, -98.403720

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 410 & IH35
CSJ 0017-240

Hole HM-7
Structure High-Mast
Station 791+10
Offset 105 (R)

District San Antonio
Date 1/17/13
Grnd. Elev. 713.00 ft
GW Elev. 676.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan and light gray, hard, with sand (CL)							SPT: 27,27,35
50		50 (4) 50 (3)				12.5	45	33		SPT: 19,19,32 % Passing No. 200 Sieve: 97.2
660.			CLAY, lean, tan and light gray, hard, trace of sand (CL)							SPT: 18,27,31
55		50 (4) 50 (3)								SPT: 21,27,29
653. 60		50 (3) 50 (2)								

Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479707, -98.403720

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-1
Structure Overhead Sign
Station 789+90
Offset 25 (L)

District San Antonio
Date 1-6-13
Grnd. Elev. 715.00 ft
GW Elev. 675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
714.			PAVEMENT, 2.5" asphaltic concrete, 10" concrete							
713.5			BASE, 6" clayey gravel							
			CLAY, gravelly, lean, tan, stiff (FILL) (CL)							
712.			CLAY, fat, black, stiff, with trace of sand (CH)							
5				0	27.2	30.8			114	PP=2.0 tsf
708.			CLAY, sandy, fat, tan, very stiff, with trace of gravel and calcareous deposits (CH)							PP=1.5 tsf
				0	31.1	29.3			115	PP=2.5 tsf
10										
		17 (6) 13 (6)								PP=4.0 tsf
702.			CLAY, lean, tan, hard, with calcareous and chert deposits (CL)							
						20.5	34	15		% Passing No. 200 Sieve: 96.0
15		9 (6) 9 (6)								PP=2.5 tsf

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479431, -98.404175

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole	OS-1
Structure	Overhead Sign
Station	789+90
Offset	25 (L)

District	San Antonio
Date	1-6-13
Grnd. Elev.	715.00 ft
GW Elev.	675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
<div style="text-align: center;">20</div>	<div style="background-image: linear-gradient(to top right, transparent 49%, black 49% 49% 51%, black 51%); background-size: 4px 8px;"></div>		CLAY, lean, tan, hard, with calcareous and chert deposits (CL)							
<div style="text-align: center;">25</div>	<div style="background-image: linear-gradient(to top right, transparent 49%, black 49% 49% 51%, black 51%); background-size: 4px 8px;"></div>					17.9	40	24	% Passing No. 200 Sieve: 89.0	PP=3.5 tsf
<div style="text-align: center;">30</div>	<div style="background-image: linear-gradient(to top right, transparent 49%, black 49% 49% 51%, black 51%); background-size: 4px 8px;"></div>									PP=4.5+ tsf

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479431, -98.404175

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Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-1
Structure Overhead Sign
Station 789+90
Offset 25 (L)

District San Antonio
Date 1-6-13
Grnd. Elev. 715.00 ft
GW Elev. 675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with calcareous and chert deposits (CL)							
		50 (2) 50 (1)								
35						10.6	33	18		% Passing No. 200 Sieve: 92.1 SPT: 45,50/4,50/4
		50 (5) 50 (4)								
40										
										SPT: 16,19,19
672.			SAND, clayey, tan, dense, with chert and limestone deposits (SC)							
		26 (6) 50 (4)								
45										

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.479431, -98.404175

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS


Logger: ZL

Organization: HVJ

**WinCore
Version 3.0**

Hole	OS-1
Structure	Overhead Sign
Station	789+90
Offset	25 (L)

District	San Antonio
Date	1-6-13
Grnd. Elev.	715.00 ft
GW Elev.	675.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
668.			SAND, clayey, tan, dense, with chert and limestone deposits (SC)			16.2	51	35	SPT: 9,45,50/4.5	
		50 (2.5) 50 (1.5)	CLAY, fat, tan, lean hard (CH)							
665.	50								% Passing No. 200 Sieve: 91.4	
									SPT: 15,21,27	

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-2
Structure Overhead Sign
Station 1801+10
Offset 100 (L)

District San Antonio
Date 12/10/2012
Grnd. Elev. 722.00 ft
GW Elev. 672.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
720.			CLAY, fat, dark brown, stiff (CH)							PP=4.5+ tsf
			CLAY, fat, tan, hard, with calcareous deposits (CH)							PP=4.5+ tsf
5		27 (6) 26 (6)								
716.			CLAY, fat, dark brown, stiff to hard (CH)							PP=3.5 tsf
										PP=4.5+ tsf
10		17 (6) 18 (6)		0	49.2	27.0	59	36	123	% Passing No. 200 Sieve: 92.2
711.			CLAY, fat, tan, hard, with calcareous deposits (CH)							PP=4.5+ tsf
15		35 (6) 34 (6)								

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.482508, -98.403814

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CORE TECH

Logger: DD

Organization: HVJ ASSOCIATES



DRILLING LOG

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WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-2
Structure Overhead Sign
Station 1801+10
Offset 100 (L)

District San Antonio
Date 12/10/2012
Grnd. Elev. 722.00 ft
GW Elev. 672.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
706.			CLAY, fat, tan, hard, with calcareous deposits (CH)							
			CLAY, fat, tan-brown and gray, hard, with calcareous deposits (CH)							
										PP=4.5+ tsf
				0	89.7	16.5	54	35	132	% Passing No. 200 Sieve: 99.1
20		22 (6) 24 (6)								
				0	49.2	20.0			129.2	PP=4.5+ tsf
25		24 (6) 26 (6)								
										PP=4.5+ tsf
				0	146.7	14.5	54	40	135	% Passing No. 200 Sieve: 98.9
30		50 (1.5) 50 (1)								

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.482508, -98.403814

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Driller: CORE TECH

Logger: DD

Organization: HVJ ASSOCIATES

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole	OS-2
Structure	Overhead Sign
Station	1801+10
Offset	100 (L)

District	San Antonio
Date	12/10/2012
Grnd. Elev.	722.00 ft
GW Elev.	672.00 ft

Elev. (ft.)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, tan-brown and gray, hard, with calcareous deposits (CH)							SPT: 50/2.25"
35		50 (0.5) 50 (0.25)								
686.			CLAY, gravelly, fat, tan, stiff, with calcareous depositions (CH)							SPT: 9,9,10
40		7 (6) 6 (6)				13.1	50	33		% Passing No. 200 Sieve: 98.2
										SPT: 7,15,10
677	45	8 (6) 9 (6)								

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.482508, -98.403814

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CORE TECH

Logger: DD

Organization: HVJ ASSOCIATES



DRILLING LOG

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WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-3
Structure Overhead Sign
Station 1831+75
Offset 70 (L)

District San Antonio
Date 12/11/2012
Grnd. Elev. 729.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
725. 5		10 (6) 10 (6)	CLAY, fat, dark brown, stiff (CH)							PP=1.5 tsf
				0	16.4	36.9	83	49	114	PP=1.5 tsf
										% Passing No. 200 Sieve: 91.3
			CLAY, lean, tan, stiff to hard, with sand and calcareous deposits (CL)							PP=4.0 tsf
10		30 (6) 28 (6)		0	64.2	14.4			124	PP=4.5+ tsf
										PP=4.5+ tsf
15		33 (6) 34 (6)		0	75.6	14.8	47	31	132	PP=4.5+ tsf
										% Passing No. 200 Sieve: 84.3

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.490794, -98.402011

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

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WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-3
Structure Overhead Sign
Station 1831+75
Offset 70 (L)

District San Antonio
Date 12/11/2012
Grnd. Elev. 729.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
709.20			CLAY, lean, tan, stiff to hard, with sand and calcareous deposits (CL)							PP=4.5+ tsf
		41 (6) 39 (6)								
			CLAY, lean, tan-brown and gray, hard, with calcareous deposits (CL)							
25										PP=4.5+ tsf
		50 (2) 50 (0.75)		0	153.3	14.2	46	29	137	
30										PP=4.5+ tsf
		20 (6) 25 (6)								

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.490794, -98.402011

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

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WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-3
Structure Overhead Sign
Station 1831+75
Offset 70 (L)

District San Antonio
Date 12/11/2012
Grnd. Elev. 729.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
35		50 (5.5) 47 (6)	CLAY, lean, tan-brown and gray, hard, with calcareous deposits (CL)							PP=4.5+ tsf
40		50 (2.75) 50 (2.25)		0	70.3	13.4			137	PP=4.5+ tsf
686.5			GRAVEL, clayey, light brown, very dense							
685.5			CLAY, fat, light brown, hard, with calcareous deposits (CH)							SPT: 28,50/5.75
45		50 (2.25) 50 (2)				13.1	50	33		% Passing No. 200 Sieve: 98.2

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.490794, -98.402011

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-3
Structure Overhead Sign
Station 1831+75
Offset 70 (L)

District San Antonio
Date 12/11/2012
Grnd. Elev. 729.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
679.50		50 (4) 50 (2)	CLAY, fat, light brown, hard, with calcareous deposits (CH)							SPT: 40,50/5.5
55										
60										
<p>Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.490794, -98.402011</p> <p>The ground water elevation was not determined during the course of this boring.</p>										

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

1 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-4/RW-22
Structure Overhead Sign
Station 1845+90
Offset 85 (L)

District San Antonio
Date 12/12/2012
Grnd. Elev. 735.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
730.5			CLAY, fat, dark brown, hard (CH)	0	64.4	15.4			125	PP=4.5+ tsf
										PP=4.5+ tsf
										% Passing No. 200 Sieve: 92.7
										PP=4.5+ tsf
10		6 (6) 7 (6)	CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							PP=4.5+ tsf
										PP=4.5+ tsf
										PP=4.5+ tsf
										% Passing No. 200 Sieve: 89.8
15		36 (6) 35 (6)		0	127.5	15.1				PP=4.5+ tsf
15		31 (6) 31 (6)								

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.494625, -98.401264

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

2 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-4/RW-22
Structure Overhead Sign
Station 1845+90
Offset 85 (L)

District San Antonio
Date 12/12/2012
Grnd. Elev. 735.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
715.20		16 (6) 16 (6)	CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							PP=3.0 tsf
			CLAY, lean, light brown and gray, hard (CL)							
709.25		22 (6) 24 (6)		0	116.7	16.7	48	29	137	PP=4.5+ tsf % Passing No. 200 Sieve: 95.1
			GRAVEL, clayey, light brown, very dense							
707.5			CLAY, lean, tan-brown and gray, hard (CL)	0	71.7	12.7			138	PP=4.5+ tsf
30		50 (3) 50 (2.25)								

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.494625, -98.401264

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

3 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-4/RW-22
Structure Overhead Sign
Station 1845+90
Offset 85 (L)

District San Antonio
Date 12/12/2012
Grnd. Elev. 735.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
700.35		50 (3) 50 (2.25)	CLAY, lean, tan-brown and gray, hard (CL)							SPT: 15,26,30
			CLAY, sandy, lean, tan-brown, hard, with calcareous deposits (CL)							
40		18 (6) 19 (6)				11.8	34	21		PP=4.5+ tsf % Passing No. 200 Sieve: 65.1
45		50 (1) 50 (0.5)								SPT: 50/2"

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.494625, -98.401264

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

4 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-4/RW-22
Structure Overhead Sign
Station 1845+90
Offset 85 (L)

District San Antonio
Date 12/12/2012
Grnd. Elev. 735.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
685.50		50 (1.25) 50 (0.75)	CLAY, sandy, lean, tan-brown, hard, with calcareous deposits (CL)							SPT: 50/2"
55										
60										

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.494625, -98.401264

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: ZL

Organization: HVJ ASSOCIATES



DRILLING LOG

1 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-5
Structure Overhead Sign
Station 1891+30
Offset 100 (L)

District San Antonio
Date 12/6/2012
Grnd. Elev. 736.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5			CLAY, fat, dark brown, hard, with sand (CH)							PP=4.5+ tsf % Passing No. 200 Sieve: 75.4 PP=4.5+
						15.2	68	42		
				0	171.7	16.7				
				0	204.7	16.7			130	
729.		11 (6) 11 (6)								PP=4.5+ tsf PP=4.5+ tsf % Passing No. 200 Sieve: 85.0
			CLAY, lean, tan, hard, with sand (CL)							
						12.0	46	30		
10		28 (6) 25 (6)								
				0	106.1	18.2				
15		24 (6) 27 (6)								PP=4.5+ tsf

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.507193, -98.398723

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: DD

Organization: HVJ ASSOCIATES



DRILLING LOG

3 of 4

WinCore
Version 3.0

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-5
Structure Overhead Sign
Station 1891+30
Offset 100 (L)

District San Antonio
Date 12/6/2012
Grnd. Elev. 736.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
35		50 (2.5) 50 (3.5)	CLAY, lean, tan and gray, hard, with calcareous deposits (CL)							PP=4.5+ tsf
40		50 (1) 50 (0.5)								SPT: 50/2.5"
693.			CLAY, fat, tan and gray, hard (CH)							SPT: 33,50/4.75"
45		50 (2.5) 50 (1.5)				14.1	50	31		% Passing No. 200 Sieve: 98.9

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.507193, -98.398723

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: DD

Organization: HVJ ASSOCIATES



WinCore
Version 3.0

DRILLING LOG

4 of 4

County BEXAR
Highway IH-35 S/ IH-410S
CSJ 0017-10-240

Hole OS-5
Structure Overhead Sign
Station 1891+30
Offset 100 (L)

District San Antonio
Date 12/6/2012
Grnd. Elev. 736.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
686.50		50 (3) 50 (2)	CLAY, fat, tan and gray, hard (CH)							SPT: 31,50/5"
55										
60										

Remarks: Remarks: Approx Ground El.; SPT= Standard Penetration Test *(Modified Using 170lb Hammer); PP=Pocket Penetrometer; GPS (Lat, Long)=29.507193, -98.398723

The ground water elevation was not determined during the course of this boring.

Driller: CORE TECH

Logger: DD

Organization: HVJ ASSOCIATES



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-1
Structure Pavement
Station 753+40
Offset 40 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 705.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
703.7			PAVEMENT, 15.5" asphaltic concrete							
			BASE, 18" clayey gravel possibly cement and/or lime treated							
702.2			GRAVEL, clayey, tan, medium dense (FILL)			10.7	28	11		% Passing No. 200 Sieve: 26.4
701.			CLAY, fat, black, soft to stiff (CH)							
5						29.7	86	53		% Passing No. 200 Sieve: 91.6
697.			CLAY, lean, tan, stiff to hard, with sand (CL)							
						12.5	37	22		% Passing No. 200 Sieve: 78.7
690.										
15										

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.469794, -98.406497, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/I 1410S
CSJ 0017-10-240

Hole P-2
Structure Pavement
Station 754+60
Offset 680 (R)

District San Antonio
Date 12/10/12
Grnd. Elev. 704.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
703.1			PAVEMENT, 2.5" asphaltic concrete, 8.5" concrete							
			BASE, 18" clayey gravel possibly cement and/or lime treated							
701.5			CLAY, gravelly, lean, tan, stiff (FILL) (CL)							
701.			CLAY, fat, black, soft to stiff (CH)							
5						30.4	80	52		% Passing No. 200 Sieve: 91.6
698.			CLAY, fat, black, soft to stiff, with sand (CH)							
696.			CLAY, lean, tan, stiff to hard, trace of sand and calcareous (CL)			13	41	27		% Passing No. 200 Sieve: 77.8
10										
						12.7	38	21		% Passing No. 200 Sieve: 94.4
689.										
15										

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.469294, -98.404272, (IH-410S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-3
Structure Pavement
Station 757+05
Offset 100 (L)

District San Antonio
Date 12/9/12
Grnd. Elev. 707.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
705.3			PAVEMENT, 20.5" asphaltic concrete							
704.3			BASE, 12" clayey gravel possibly treated with cement and/or lime							
5			CLAY, fat, black, soft to stiff (CH)			37.2	91	64		% Passing No. 200 Sieve: 91.4
						32.4	89	67		% Passing No. 200 Sieve: 89.7
10						28.8	92	70		% Passing No. 200 Sieve: 89.5
696.5			CLAY, lean, tan, stiff to hard (CL)							
692.15										

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.470771, -98.406221, (IH-35S Off Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: TSS

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-4
Structure Pavement
Station 761+00
Offset 135 (L)

District San Antonio
Date 12/9/12
Grnd. Elev. 714.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
712.2			PAVEMENT, 21.5" asphaltic concrete							
711.			BASE, 14" clayey gravel							
709.5			CLAY, fat, black, firm to hard (CH)							SPT: 2-2-3
5			CLAY, lean, tan, hard, trace of gravel (CL)							PP=4.5+tsf
										PP=4.5+tsf
10										PP=4.5+tsf
15										SPT: 3-4-7

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.471814, -98.405814, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-5
Structure Pavement
Station 765+50
Offset 265 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 710.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
708.3			PAVEMENT, 20.5" asphaltic concrete							
707.3			BASE, 12" clayey gravel							
706.8			, Approx 6" of treated soil			26.5	72	45		% Passing No. 200 Sieve: 69.9
5			CLAY, sandy, fat, black, soft to stiff (CH)							
704.5			CLAY, lean, tan, stiff to hard, with sand (CL)			14.5	49	34		% Passing No. 200 Sieve: 73.3
10										
15						13.8	43	28		% Passing No. 200 Sieve: 79.4
695.										

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.473067, -98.405636, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: TSS

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-6
Structure Pavement
Station 760+95
Offset 235 (R)

District San Antonio
Date 12/10/12
Grnd. Elev. 717.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
716.1			PAVEMENT, 3" asphaltic concrete, 8" concrete							
715.5			BASE, 6" clayey gravel							
			CLAY, gravelly, lean, tan, soft to very stiff (FILL) (CL)							
5						14.4	26	11		% Passing No. 200 Sieve: 51.7
						13.9	35	19		% Passing No. 200 Sieve: 64.2
708.5			CLAY, fat, black, soft to stiff (CH)			22.5	66	43		% Passing No. 200 Sieve: 93
10										
706.5			CLAY, lean, tan, stiff to hard (CL)							
15										
702.										

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.471383, -98.404757, (IH-410S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-9
Structure Pavement
Station 786+80
Offset 150 (L)

District San Antonio
Date 1/14/2013
Grnd. Elev. 713.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
711.3			PAVEMENT, 20.5" asphaltic concrete							
710.3			BASE, 12" clayey gravel							
5			CLAY, fat, black and light gray, very stiff, with sand seams and trace of gravel (CH)							PP: 2.5 tsf
704.										PP: 2.5 tsf
10			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							PP: 2.5 tsf
										PP: 4.0 tsf
698.										PP: 4.5+ tsf
15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.478613, -98.404665, (IH-35S Frontage Rd)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-10
Structure Pavement
Station 789+90
Offset 80 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 714.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
712.3			PAVEMENT, 20.5" asphaltic concrete							
711.			BASE, 15" clayey gravel possibly cement and/or lime treated							
						21.2	60	31		% Passing No. 200 Sieve: 59
			CLAY, fat, black, firm to very stiff, with lenses of sand and gravel (CH)							
5										
						25.4	80	58		% Passing No. 200 Sieve: 80.1
705.										
			CLAY, lean, tan, hard, with calcareous deposits (CL)							
10										
						20.5	41	24		% Passing No. 200 Sieve: 97
699.										
15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.479461, -98.404340, (IH-35S Exit Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-11
Structure Pavement
Station 1804+00
Offset 45 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 736.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
734.2			PAVEMENT, 21.5" asphaltic concrete							
733.			BASE, 12" clayey gravel possibly cement and/or lime treated			19	57	39		% Passing No. 200 Sieve: 88.7
5			CLAY, fat, tan, firm to very stiff, with traces of gravel and sand (FILL) (CH)			20.3	60	41		% Passing No. 200 Sieve: 89.4
730.			CLAY, sandy, lean, tan, hard (FILL) (CL)			18.8	44	28		% Passing No. 200 Sieve: 66.4
10										
721.										
15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.483275, -98.403469, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-12
Structure Pavement
Station 1797+45
Offset 100 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 719.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
717.1			PAVEMENT, 23.5" asphaltic concrete							
716.			BASE, 12" clayey gravel							
714. 5			CLAY, sandy, fat, black, stiff (CH)			26.8	68	46		% Passing No. 200 Sieve: 60.9
			CLAY, fat, black, firm to very stiff, trace of sand (CH)			27.2	91	67		% Passing No. 200 Sieve: 89.1
709. 10			CLAY, lean, tan, hard, with sand (CL)			22	83	62		% Passing No. 200 Sieve: 83
704. 15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.481519, -98.404000, (IH-35S On Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-13
Structure Pavement
Station 1814+20
Offset 45 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
725.1			PAVEMENT, 11.5" asphaltic concrete							
724.			BASE, 12" clayey gravel possibly cement and/or lime treated							
			CLAY, gravelly, lean, tan, stiff to hard (FILL) (CL)			12.2	32	16		% Passing No. 200 Sieve: 53.1
5										SPT:12-9-16
719.			CLAY, fat, black, soft to stiff, with sand (CH)			22.8	77	57		% Passing No. 200 Sieve: 81.5
10										
713.5			CLAY, fat, tan, stiff, with calcareous deposits (CH)			21.7	52	31		% Passing No. 200 Sieve: 90.5
15										
711.										

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.486028, -98.402899, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/I 1410S
CSJ 0017-10-240

Hole P-15
Structure Pavement
Station 1830+55
Offset 140 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 727.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
726.2			PAVEMENT, 10" asphaltic concrete							
725.3			BASE, 12" clayey gravel							
			CLAY, fat, black, soft to stiff (CH)			31.3	79	50		% Passing No. 200 Sieve: 90.4
5										
		3 (6) 5 (6)				26.4	70	42		% Passing No. 200 Sieve: 94.1
719.			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							PP=3.5 tsf
						20.2	49	28		% Passing No. 200 Sieve: 82.9
10										PP=4.5+ tsf
		14 (6) 18 (6)								
										PP=4.5+ tsf
712. 15		21 (6) 26 (6)								

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.490502, -98.402282, (IH-35S Frontage Rd)

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

1 of 1

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-18
Structure Pavement
Station 1840+15
Offset 100 (L)

District San Antonio
Date 01/07/13
Grnd. Elev. 731.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
729.6			PAVEMENT, 17" asphaltic concrete							
			BASE, 18" clayey gravel possibly cement and/or lime treated							
728.						23.1	58	22		% Passing No. 200 Sieve: 35.3
			SAND, clayey, black, medium dense (FILL)							
727.			CLAY, fat, black, stiff (CH)							PP= 2.0 tsf
5										PP= 2.0 tsf
723.5			CLAY, lean, tan, very stiff to hard (CL)			16.9	45	28		% Passing No. 200 Sieve: 90.3
										PP= 3.0 tsf
10										
						16	44	26		% Passing No. 200 Sieve: 91.2
										PP= 4.5+ tsf
716. 15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.493082, -98.401624, (IH-35S On Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

1 of 1

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-19
Structure Pavement
Station 1844+75
Offset 40 (L)

District San Antonio
Date 1/11/13
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
735.9			PAVEMENT, 3.75" asphaltic concrete, 9" concrete							
			BASE, 22" clayey gravel possibly cement and/or lime treated							PP= 3.5 tsf
734.						30.2	66	33		% Passing No. 200 Sieve: 78.7
			CLAY, fat, black, very stiff, with sand and gravel seams between 5' and 11' (CH)							PP= 3.5 tsf
5						14.7	55	31		% Passing No. 200 Sieve: 49.1
										PP= 4.0 tsf
										PP= 3.5 tsf
10										
725.			CLAY, lean, tan, hard, with calcareous deposits (CL)			16.4	38	22		% Passing No. 200 Sieve: 90.5
										PP=4.5+ tsf
722. 15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.494299, -98.401193, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-21
Structure Pavement
Station 1874+90
Offset 120 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
736.4			PAVEMENT, 7" asphaltic concrete							
			BASE, 12" clayey gravel							
735.5			CLAY, fat, black, very stiff, with trace of sand (CH)							
						33	83	58		% Passing No. 200 Sieve: 89.7
										PP=2.5 tsf
5		3 (6) 5 (6)								
731.			CLAY, sandy, lean, black, hard (CL)			9.9	42	20		% Passing No. 200 Sieve: 50.9
										PP=4.5+ tsf
729.			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							
										PP=4.5+ tsf
10		6 (6) 10 (6)								
						15.1	31	17		% Passing No. 200 Sieve: 83.5
										PP=4.5+ tsf
722. 15		33 (6) 36 (6)								

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.502494, -98.399762, (IH-35S Frontage Rd)

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-22
Structure Pavement
Station 1865+25
Offset 90 (L)

District San Antonio
Date 1/10/13
Grnd. Elev. 739.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
737.			PAVEMENT, 24.5" asphaltic cement							
			BASE, 18" clayey gravel possibly cement and/or lime treated							
735.5			SAND, clayey, black, medium dense with fat clay pockets (FILL) (SC)			22.3	51	33		% Passing No. 200 Sieve: 47.4
734. 5			CLAY, fat, black, stiff to very stiff, with sand lenses between 5' and 8' (CH)							PP= 2.0 tsf
						33.7	93	58		% Passing No. 200 Sieve: 92.7 PP= 2.0 tsf
										PP= 2.5 tsf
729. 10			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
						18.3	42	26		% Passing No. 200 Sieve: 92.8 PP= 4.5+ tsf
724. 15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.499868, -98.400208, (IH-35S Off Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway I 35 S/ I 1410S
CSJ 0017-10-240

Hole P-23
Structure Pavement
Station 1868+80
Offset 130 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 739.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
738.8			PAVEMENT, 2" asphaltic concrete							
			BASE, 9" clayey gravel							
738.			CLAY, fat, black, hard (CH)							SPT:20-7-9
						31.9	85	60		PP=4.5+ tsf % Passing No. 200 Sieve: 92.9
										PP=4.5+ tsf
734. 5			CLAY, fat, tan, hard, with calcareous deposits (CH)							PP=4.5+ tsf
		7 (6) 7 (6)								
						19	57	38		% Passing No. 200 Sieve: 95.1
										PP=4.5+ tsf
729. 10			CLAY, lean, tan, hard, with calcareous deposits (CL)							
		16 (6) 17 (6)								
						13.7	43	26		% Passing No. 200 Sieve: 99
										PP=4.5+ tsf
724. 15		26 (6) 28 (6)								

Remarks: Approx Ground El. ; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.500853, -98.400125, (IH-35S Frontage Rd)

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ



DRILLING LOG

1 of 1

WinCore
Version 3.0

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-24
Structure Pavement
Station 1880+25
Offset 45 (L)

District San Antonio
Date 1/10/13
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
735.8			PAVEMENT, 3.5" asphaltic concrete, 10.75" concrete							
			BASE, 15" clayey gravel possibly cement and/or lime treated			14	36	18		% Passing No. 200 Sieve: 52.7
734.5			CLAY, sandy, lean, tan, firm, with gravel (FILL) (CL)							
734.			CLAY, lean, tan, very stiff to hard, with calcareous deposits (CL)			20.2	43	26		% Passing No. 200 Sieve: 92.9
										PP= 1.5 tsf
5										PP= 2.5 tsf
										PP=4.5+ tsf
10										
						16.1	43	28		% Passing No. 200 Sieve: 99.5
										PP= 4.5+ tsf
722. 15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.503906, -98.399218, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

1 of 1

County Bexar
Highway IH 35S at IH 410S
CSJ 0017-10-240

Hole P-26
Structure Pavement
Station 1893+60
Offset 50 (L)

District San Antonio
Date 1/10/13
Grnd. Elev. 739.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
737.6			PAVEMENT, 3.5" asphaltic concrete, 13" concrete							
737.			BASE, 6" clayey gravel							
			CLAY, fat, black, very stiff, with sand and gravel (FILL) (CH)			28.6	81	52		% Passing No. 200 Sieve: 84.9 PP= 2.5 tsf
						20.3	52	36		% Passing No. 200 Sieve: 73.7 PP= 3.5 tsf
733.5			CLAY, lean, tan, very stiff, with sand (FILL) (CL)							
733.			CLAY, fat, black, very stiff, with traces of sand and gravel (CH)							PP= 2.5 tsf
										PP= 4.0 tsf
726.5			CLAY, lean, tan, very stiff, with sand and calcareous deposits (CL)							
						13.4	40	23		% Passing No. 200 Sieve: 81.3 PP= 2.5 tsf
724. 15										

Remarks: Approximate Ground Elevation; SPT = Standard Penetration Test, PP = Pocket Penetrometer GPS (Lat, Long) = 29.507512, -98.398500, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-1
Structure Retaining Wall
Station 770+00
Offset 80 (R)

District San Antonio
Date 1-15-13
Grnd. Elev. 708.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, brown, hard, calcareous, with sand (CL)							
20		35 (6) 50 (4)								SPT: 23,29,50/5"
										SPT: 38,50/4"
25		44 (6) 50 (2)				7.7				
										SPT: 50/2.5"
678.30		50 (3) 50 (1)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.4739286, -98.404208; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-2
Structure Retaining Wall
Station 775+05
Offset 90 (R)

District San Antonio
Date 12/3/2012
Grnd. Elev. 706.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
703.			CLAY, fat, black, stiff. (CH)							PP= 2.5 tsf
			CLAY, lean, tan, hard, with trace of sand and calcareous and chert deposits (CL)							PP= 3.0 tsf
5		13 (6) 13 (6)								
						14.1	36	23		% Passing No. 200 Sieve: 88.4
10		23 (6) 23 (6)								PP= 3.5 tsf
15		50 (3.5) 50 (1.5)								% Passing No. 200 Sieve: 94.5

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.475339, -98.403947; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-2
Structure Retaining Wall
Station 775+05
Offset 90 (R)

District San Antonio
Date 12/3/2012
Grnd. Elev. 706.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with trace of sand and calcareous and chert deposits (CL)			11.3	30	15		SPT: 41, 23, 19
20		14 (6) 12 (6)								PP= 4.5+ tsf
25		9 (6) 9 (6)								PP= 4.5+ tsf
678.			CLAY, sandy, lean, orange-tan, hard (CL)							PP= 4.5+ tsf
676. 30		50 (3) 50 (2.5)		0	33.1	10.4	30	20	133	% Passing No. 200 Sieve: 60.9

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.475339, -98.403947; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-3
Structure Retaining Wall
Station 778+55
Offset 90 (R)

District San Antonio
Date 12/3/2012
Grnd. Elev. 707.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
703.5			CLAY, fat, black, firm (CH)							PP= 1.5 tsf
				0	30	13.3	29	17		PP= 2.5 tsf
										% Passing No. 200 Sieve: 86.9
			CLAY, lean, tan, soft to hard, with trace of sand and calcareous deposits (CL)							
5		20 (6) 29 (6)								PP= 1.0 tsf
10		50 (4) 50 (2.5)								PP= 2.0 tsf
15		50 (4) 50 (2.5)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476311, -98.403947, PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-3
Structure Retaining Wall
Station 778+55
Offset 90 (R)

District San Antonio
Date 12/3/2012
Grnd. Elev. 707.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, soft to hard, with trace of sand and calcareous deposits (CL)			11.3	25	13		SPT: 40, 30, 28 % Passing No. 200 Sieve: 84.2
20		30 (6) 36 (6)								SPT:12, 12, 20
25		50 (6) 50 (5)								SPT:17, 14, 15
678.			SAND, clayey, orange-tan, very dense. (SC)			9.9	26	15		PP= 4.0 tsf
677. 30		35 (6) 50 (3)								% Passing No. 200 Sieve: 32.2

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476311, -98.403947, PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-4
Structure Retaining Wall
Station 779+10
Offset 5 (L)

District San Antonio
Date 1-14-13
Grnd. Elev. 100.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
95.5		12 (6) 15 (6)	CLAY, fat, black, firm to stiff (CH)	0	91.9	25.2	81	60	124	PP=0.5 tsf
										PP=1.5 tsf % Passing No. 200 Sieve: 92.9
90.10		15 (6) 22 (6)	CLAY, fat, tan, hard, with calcareous deposits (CH)			16.3	50	31		PP=4.5+ tsf
										PP=4.5+ tsf % Passing No. 200 Sieve: 97.6
15		50 (3.5) 50 (4)	CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471163, -98.405680; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-4
Structure Retaining Wall
Station 779+10
Offset 5 (L)

District San Antonio
Date 1-14-13
Grnd. Elev. 100.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
80.	20	50 (6) 50 (4)	CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							SPT: 42,50/4"
			CLAY, silty, light tan, hard, with sand and calcareous deposits (thin sand lense at 25') (CL-ML) (CL)							
	25	50 (4) 50 (2)								SPT: 19,19,17
						11	21	4		% Passing No. 200 Sieve: 43.1
73.			SAND, clayey, orange-brown, very dense (SC)							
70.	30	37 (6) 50 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.471163, -98.405680; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-5
Structure Retaining Wall
Station 770+95
Offset 335 (L)

District San Antonio
Date 12/5/12
Grnd. Elev. 708.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, very stiff to hard, trace of sand and calcareous pockets (CL)							
20		26 (6) 35 (6)		0	78.9	13.8	42	28	136.6	% Passing No. 200 Sieve: 96.3
										PP=3.0 tsf
25		25 (6) 27 (6)								PP=3.0 tsf
681.			CLAY, fat, tan, hard (CH)							
				0	92.5	15.7	57	39	134.2	% Passing No. 200 Sieve: 91.4
678.		35 (6) 50 (5)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.474398, -98.405416 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-6
Structure Retaining Wall
Station 773+25
Offset 325 (L)

District San Antonio
Date 12/6/12
Grnd. Elev. 707.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with calcareous deposits (CL)							
						11.5	26	12		% Passing No. 200 Sieve: 93.0
20		50 (4) 50 (3.25)								PP=4.5+ tsf
				0	90.3	9.0			136.2	PP=4.5+ tsf
25		50 (3) 50 (2)								
678.			CLAY, lean, tan and gray, hard (CL)							PP=4.5+ tsf
677. 30		50 (3.25) 50 (2)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammar). GPS (Lat, Long) = 29.474949, -98.405293 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

1 of 2

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-7
Structure Retaining Wall
Station 775+45
Offset 305 (L)

District San Antonio
Date 12/6/12
Grnd. Elev. 709.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, black, firm to very stiff, trace of gravel (CH)							
				0	14.2	35.8	84	62	112.6	PP=2.5 tsf
		4 (6) 8 (6)								% Passing No. 200 Sieve: 92.2
5										PP=1.0 tsf
702.5			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
		30 (6) 33 (6)								PP=4.5 +tsf
										PP=4.5 +tsf
10										
				0	181.9	12.5	45	33	138.6	% Passing No. 200 Sieve: 96.3
15										

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.475484, -98.405194 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-7
Structure Retaining Wall
Station 775+45
Offset 305 (L)

District San Antonio
Date 12/6/12
Grnd. Elev. 709.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
686.		28 (6) 34 (6)	CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
		23 (6) 49 (6)								
		50 (4) 50 (0.75)	CLAY, lean, light tan, hard, with trace of sand and calcareous deposits (CL)							SPT:50/4"
		25 (6) 50 (6)								
679. 30						9.1	34	20		% Passing No. 200 Sieve: 85

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.475484, -98.405194 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-8
Structure Retaining Wall
Station 777+55
Offset 275 (L)

District San Antonio
Date 12/5/12
Grnd. Elev. 709.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, black, stiff, with trace of sand (CH)							PP=2.0 tsf
				0	23.3	33.3	87	59	113.4	% Passing No. 200 Sieve: 91.9
										PP=2.0 tsf
5		7 (6) 11 (6)								PP=4.0 tsf
702.			CLAY, lean, tan to light tan, hard, with trace of sand and calcareous deposits (CL)							PP=4.5+ tsf
10		24 (6) 28 (6)								
15		47 (6) 50 (4)								SPT: 15, 25, 36

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476033, -98.405090 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-8
Structure Retaining Wall
Station 777+55
Offset 275 (L)

District San Antonio
Date 12/5/12
Grnd. Elev. 709.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan to light tan, hard, with trace of sand and calcareous deposits (CL)			10.1	43	32		% Passing No. 200 Sieve: 96.6
20		36 (6) 50 (4)								SPT: 23, 21, 20
						13.4	44	30		% Passing No. 200 Sieve: 92.8
25		50 (5) 50 (0.5)								SPT:50/3.75"
679.30		50 (5) 50 (5.75)								SPT:17, 20, 38

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476033, -98.405090 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-9
Structure Retaining Wall
Station 779+55
Offset 240 (L)

District San Antonio
Date 12/5/12
Grnd. Elev. 711.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
705.		5 (6) 5 (6)	CLAY, fat, black, soft to firm, with trace of sand (CH)	0	48.3	14.3	47	33	133.1	PP=0.5 tsf
										PP=1.0 tsf
			CLAY, lean, tan, very stiff to hard, with sand, trace of gravel and calcareous deposits (CL)							PP=2.0 tsf
700.		20 (6) 30 (6)		0	149.4	14.6			138.4	% Passing No. 200 Sieve: 92.0
										PP=4.5+ tsf
			CLAY, lean, tan, hard, with calcareous deposits (CL)							PP=4.5+ tsf
15		21 (6) 19 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476590, -98.404987 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-9
Structure Retaining Wall
Station 779+55
Offset 240 (L)

District San Antonio
Date 12/5/12
Grnd. Elev. 711.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
693.			CLAY, lean, tan, hard, with calcareous deposits (CL)							
			CLAY, fat, tan, very stiff. (CH)							SPT: 50/5.75"
20		7 (6) 50 (4)		0	50.3	19.7	55	42	126.4	% Passing No. 200 Sieve: 95.5
688.			CLAY, sandy, lean, light tan, hard, with gravel (CL)							
						12.9	25	12		% Passing No. 200 Sieve: 68.6
25		23 (6) 29 (6)								PP=4.5+ tsf
				0	76.9	17.2			132	
681.5			CLAY, lean, tan, hard, with calcareous deposits (CL)							PP=4.5+ tsf
681.		27 (6) 27 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476590, -98.404987 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-10/P-8
Structure Retaining Wall
Station 778+45
Offset 190 (L)

District San Antonio
Date 1-11-13
Grnd. Elev. 711.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
708.1			PAVEMENT, 34.75" asphaltic concrete							
707.5			BASE, 6" clayey gravel							
			CLAY, fat, black, stiff, with traces of sand and gravel (CH)	0	20.3	31.4	85	67	117	% Passing No. 200 Sieve: 90.7
5										PP=1.5 tsf
		5 (6) 5 (6)								PP=2.0 tsf
703.			CLAY, lean, tan, with sand and calcareous deposits (CL)							
						16	39	16		% Passing No. 200 Sieve: 75.4
10										PP=4.0 tsf
		16 (6) 17 (6)								PP=3.5 tsf
15										

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476279, -98.404820; PP=Pocket Penetrometer, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-10/P-8
Structure Retaining Wall
Station 778+45
Offset 190 (L)

District San Antonio
Date 1-11-13
Grnd. Elev. 711.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
		22 (6) 25 (6)	CLAY, lean, tan, with sand and calcareous deposits (CL)							SPT: 17,34,50/5"
20		29 (6) 32 (6)								
687.			CLAY, sandy, silty, hard (CL-ML) (CL)							% Passing No. 200 Sieve: 66.8 SPT: 12,19,25
25		36 (6) 34 (6)				13.1	22	6		
681.		45 (6) 38 (6)								
30										

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.476279, -98.404820; PP=Pocket Penetrometer, (IH-35S Main Lane)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ Associates



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-11
Structure Retaining Wall
Station 1803+65
Offset 105 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 724.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, brown, very stiff to hard (CH)							PP=4.5+ tsf
										PP=4.5+ tsf
				0	58.3	26.9	86	66	123.2	% Passing No. 200 Sieve: 91.0
5		6 (6) 6 (6)								PP=3.5 tsf
										PP=3.0 tsf
										PP=4.0 tsf
10		8 (6) 7 (6)								
713.			CLAY, fat, light brown and gray, hard, with calcareous deposits (CH)							
				0	83.9	22.8	59	36	129.4	% Passing No. 200 Sieve: 93.9
15		26 (6) 34 (6)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.483198, -98.403686 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-12
Structure Retaining Wall
Station 1809+45
Offset 105 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 728.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
723.5			CLAY, fat, gray & yellowish brown, hard, with calcareous deposits (CH)							PP=4.5+ tsf
		5 (6) 6 (6)								
			CLAY, fat, black, stiff to very stiff (CH)							
10										PP=2.5 tsf
		8 (6) 8 (6)								
716.				0	55.6	29.0	92	72	122.3	% Passing No. 200 Sieve: 93.7
			CLAY, fat, brown & gray, calcareous (CH)							
15										PP=4.0 tsf
										PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.484767, -98.403353 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-12
Structure Retaining Wall
Station 1809+45
Offset 105 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 728.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
711.			CLAY, fat, brown & gray, calcareous (CH)							
			CLAY, lean, yellowish-brown and gray, hard, with calcareous deposits (CL)							
				0	169.2	12.6	35	20	136.9	% Passing No. 200 Sieve: 91.0
20		18 (6) 19 (6)								PP=4.5+ tsf
				0	175.8	14.2	34	18	136.5	% Passing No. 200 Sieve: 56.7
25		33 (6) 43 (6)								PP=4.5+ tsf
										PP=4.5+ tsf
698. 30		50 (4) 50 (3)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.484767, -98.403353 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coreteck

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-13
Structure Retaining Wall
Station 1811+65
Offset 65 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 731.00 ft
GW Elev. 714.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, tan and brown, hard (CH)							PP=4.5+ tsf
5		6 (6) 7 (6)								SPT: 5,5,5
				0	47.2	25.2	93	66	123.8	% Passing No. 200 Sieve: 89.2
										PP=3.5 tsf
722.										PP=4.5+ tsf
10		15 (6) 16 (6)	CLAY, lean, tan, hard, with calcareous deposits (CL)							
				0	65.8	16.3	42	28	133	% Passing No. 200 Sieve: 91.5
15		34 (6) 36 (6)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.485350, -98.403105 PP=Pocket Penetrometer

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Coretech

Logger:

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-13
Structure Retaining Wall
Station 1811+65
Offset 65 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 731.00 ft
GW Elev. 714.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with calcareous deposits (CL)							
20		30 (6) 31 (6)								PP=4.5+ tsf
709.			CLAY, lean, tan and light gray, hard, with calcareous deposits (CL)							PP=4.5+ tsf
25		30 (6) 32 (6)								
				0	140.6	12.8	35	21	138.9	% Passing No. 200 Sieve: 92.1
701. 30		49 (6) 50 (5)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.485350, -98.403105 PP=Pocket Penetrometer

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Coretech

Logger:

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-14
Structure Retaining Wall
Station 1813+20
Offset 100 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, dark brown, stiff to hard, with trace of gravel (CH)							PP=4.5+ tsf
				0	21.4	32.5	78	50	117	% Passing No. 200 Sieve: 89.6
										PP=2.0 tsf PP=4.5+ tsf
5		6 (6) 9 (6)								
720.5			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							PP=4.5+ tsf
						14.8	49	28		% Passing No. 200 Sieve: 84.6
10		39 (6) 40 (6)								PP=4.5+ tsf
										PP=4.5+ tsf
15		47 (6) 45 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.485783, -98.403125 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-14
Structure Retaining Wall
Station 1813+20
Offset 100 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							
20		42 (6) 48 (6)								PP=4.5+ tsf
704.			CLAY, lean, tan and light gray, hard, with calcareous deposits (CL)							
				0	136.4	14.3	40	27	135.3	% Passing No. 200 Sieve: 96.2
25		35 (6) 37 (6)								PP=4.5+ tsf
696.		46 (6) 49 (6)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.485783, -98.403125 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-15
Structure Retaining Wall
Station 1818+35
Offset 100 (L)

District San Antonio
Date 1-14-13
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, black, firm (CH)							PP=1.0 tsf
										PP=4.5+ tsf
				0	61.9	25.4	90	72	124	% Passing No. 200 Sieve: 88.0
5		9 (6) 9 (6)								
720.			CLAY, fat, brown, hard, with calcareous deposits (CH)							PP=4.5+ tsf
										SPT: 8,14,16
						18.5	58	41		% Passing No. 200 Sieve: 92.0
716.	10	12 (6) 12 (6)	CLAY, lean, light brown, hard, with calcareous deposits (CL)							
										PP=4.5+ tsf
15		28 (6) 28 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.487173, -98.402834; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: core tech

Logger: D Dawson

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-15
Structure Retaining Wall
Station 1818+35
Offset 100 (L)

District San Antonio
Date 1-14-13
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, light brown, hard, with calcareous deposits (CL)							
20		19 (6) 19 (6)		0	125	15.5	39	24	136	PP=4.5+ tsf % Passing No. 200 Sieve: 90.0
25		12 (6) 12 (6)								PP=4.5+ tsf
700.			CLAY, lean, brown and white, hard, with chert deposits (CL)							SPT: 20,15,15
696.		26 (6) 26 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.487173, -98.402834; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: core tech

Logger: D Dawson

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-16/P-14
Structure Retaining Wall
Station 1820+80
Offset 90 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
724.8			PAVEMENT, 14.5" asphaltic concrete							
724.			BASE, 9" clayey gravel							
			CLAY, fat, black, soft to stiff, with sand and gravel (CH)			29.1	80	55		% Passing No. 200 Sieve: 84.3
5										
		3 (6) 3 (6)								
718.5			CLAY, lean, tan, hard, with gravel (CL)							PP=4.5+
10						17.8	44	26		% Passing No. 200 Sieve: 80.4
		16 (6) 21 (6)								PP=4.5+
711. 15										

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.487839, -98.402675, (IH-35S Off Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-16/P-14
Structure Retaining Wall
Station 1820+80
Offset 90 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
		19 (6) 19 (6)	CLAY, lean, tan, hard, with trace of gravel (CL)							
20		28 (6) 33 (6)				11.6	37	25		% Passing No. 200 Sieve: 88.6 PP=4.5+
25		50 (5) 50 (4)								PP=4.5+
696.30		40 (6) 42 (6)								PP=4.5+

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.487839, -98.402675, (IH-35S Off Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-17
Structure Retaining Wall
Station 1822+45
Offset 125 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 727.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
722.5			CLAY, fat, brown & black, stiff to very stiff (CH)							SPT:24, 6, 12 % Passing No. 200 Sieve: 91.3 PP=2.0 tsf
				0	34.4	34.5	79	54	118.1	
		5 (6) 6 (6)	CLAY, fat, brown and yellow, hard, with trace of sand and calcareous deposits (CH)							
							24	13		
10										PP=3.5 tsf % Passing No. 200 Sieve: 91.1 PP=4.5+ tsf
				0	78.9	23.8	63	43	128.4	
		14 (6) 17 (6)								
15				0	95	14.4			134.5	% Passing No. 200 Sieve: 78.0 PP=4.5+ tsf
		22 (6) 21 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.488300, -98.402697 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-17
Structure Retaining Wall
Station 1822+45
Offset 125 (L)

District San Antonio
Date 12/10/12
Grnd. Elev. 727.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
20		19 (6) 22 (6)	CLAY, fat, brown and yellow, hard, with trace of sand and calcareous deposits (CH)							PP=4.5+ tsf
704.			CLAY, lean, yellowish brown, hard, sandy (CL)	0	98.3	9.0	22	11	132.8	% Passing -200: 65.1
25		24 (6) 29 (6)								PP=4.5+ tsf
697. 30		50 (0.25) 50 (4)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.488300, -98.402697 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

1 of 2

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-18/P-17
Structure Retaining Wall
Station 1825
Offset 65 (L)

District San Antonio
Date 1/7/13
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
724.4			PAVEMENT, 19.25" asphaltic concrete							
723.5			BASE, 11" clayey gravel possibly cement and/or lime treated							
722.			CLAY, sandy, fat, black, firm to stiff, traces of gravel (CH)			24.3	66	33		% Passing No. 200 Sieve: 57.8
5			CLAY, fat, black, firm to stiff, trace of gravel (CH)							PP=1.0 tsf PP=1.5 tsf
719.			CLAY, lean, tan, hard, with traces of sand and gravel (2" gravel layer at 8') (CL)			25.1	79	51		% Passing No. 200 Sieve: 86.6 PP=2.5 tsf PP=4.0 tsf
10		10 (6) 10 (6)								
711. 15						18.1	41	23		% Passing No. 200 Sieve: 91.9 PP=4.5+

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.488961, -98.402359; PP=Pocket Penetrometer, (IH-35S Off Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-18/P-17
Structure Retaining Wall
Station 1825
Offset 65 (L)

District San Antonio
Date 1/7/13
Grnd. Elev. 726.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard (CL)							
		23 (6) 26 (6)								
20										PP=4.5+
		33 (6) 39 (6)								PP=4.5+
25										PP=4.5+
		36 (6) 42 (6)								
										PP=4.5+ tsf
696.30		44 (6) 50 (5)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.488961, -98.402359; PP=Pocket Penetrometer, (IH-35S Off Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-19
Structure Retaining Wall
Station 1850+30
Offset 110 (L)

District San Antonio
Date 12/6/12
Grnd. Elev. 736.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, very stiff to hard, with sand and calcareous deposits (CL)							PP=3.5 tsf
20		11 (6) 20 (6)								PP=2.0 tsf
25		50 (4) 50 (3)								PP=4.5+ tsf
706.30		50 (3) 50 (1.5)				7.9	40	28		% Passing No. 200 Sieve: 84.1
										SPT:44-50/4"

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.495826, -98.401094 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-20
Structure Retaining Wall
Station 1856+25
Offset 95 (L)

District San Antonio
Date 1-14-13
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
736.4			PAVEMENT, 7.5" asphaltic concrete							
			BASE, 15" clayey gravel							
735.1			CLAY, fat, black, stiff to very stiff (CH)							PP=1.5 tsf
5		4 (6) 5 (6)		0	26.9	34.2	71	49	116	PP=2.0 tsf % Passing No. 200 Sieve: 91.2
										PP=2.0 tsf
729.			CLAY, fat, brown, very stiff, with calcareous deposits (CH)							PP=3.0 tsf
10		9 (6) 11 (6)								
724.			CLAY, lean, tan and brown, hard, with trace of gravel (CL)							PP=4.0 tsf
				0	78.1	16.5	29	13	130	% Passing No. 200 Sieve: 98.9
15		8 (6) 12 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.497437, -98.400721; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: D Dawson

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-20
Structure Retaining Wall
Station 1856+25
Offset 95 (L)

District San Antonio
Date 1-14-13
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan and brown, hard, with trace of gravel (CL)							
20										PP=4.5 tsf
										SPT: 29,44,50/5"
						10.0	34	22		% Passing No. 200 Sieve: 88.6
25		48 (6) 50 (2.5)								
										SPT: 50/5.75"
707.30		50 (3) 50 (1)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.497437, -98.400721; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: D Dawson

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-21
Structure Retaining Wall
Station 1858+40
Offset 95 (L)

District San Antonio
Date 12/6/12
Grnd. Elev. 737.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan and gray, very stiff to hard, with calcareous deposits (CL)							
				0	151.4	12.3	40	25	137.9	% Passing No. 200 Sieve: 93.8
20		45 (6) 45 (6)								PP=3.5 tsf
				0	160.6	10.6	46	31	137.3	% Passing No. 200 Sieve: 86.7
25		40 (6) 39 (6)								PP=4.5+ tsf
										SPT:29,50/5"
707.30		50 (3.5) 50 (1.5)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.498012, -98.400609 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-23
Structure Retaining Wall
Station 1848+25
Offset 105 (L)

District San Antonio
Date 12/7/12
Grnd. Elev. 735.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, dark brown & black, stiff to hard, with traces of sand and gravel (CH)							PP=1.5 tsf
				0	66.1	24.0	74	56	124.7	% Passing No. 200 Sieve: 89.8
										PP=3.0 tsf
5		7 (6) 8 (6)								PP=4.5+ tsf
				0	91.4	25.0	83	63	124	% Passing No. 200 Sieve: 92.3
										PP=4.5+ tsf
725. 10		8 (6) 14 (6)	CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
										PP=4.0 tsf
15		13 (6) 15 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.495277, -98.401199 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-23
Structure Retaining Wall
Station 1848+25
Offset 105 (L)

District San Antonio
Date 12/7/12
Grnd. Elev. 735.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
717.			CLAY, lean, tan, hard, with trace of sand and calcareous deposits (CL)							
			CLAY, fat, tan, hard, with calcareous deposits (CH)							
20		17 (6) 21 (6)		0	59.7	20.7	52	40	126.5	% Passing No. 200 Sieve: 88.9
										PP=4.0 tsf
										PP=4.5+ tsf
710. 25		50 (3) 50 (2.75)	CLAY, lean, tan, hard, with sand, trace of gravel and calcareous deposits (CL)							
				0	58.3	13.7			132.3	PP=4.5+ tsf
705. 30		30 (6) 30 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.495277, -98.401199 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-24
Structure Retaining Wall
Station 1881+30
Offset 130 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 744.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
743.3			PAVEMENT, 9" asphaltic concrete							
742.4			BASE, 10" clayey gravel							
			CLAY, fat, dark brown and gray, very stiff, with sand and calcareous deposits (CH)							PP=2.0 tsf
5		3 (6) 5 (6)								PP=2.5 tsf
				0	47.8	24.4	64	41	126.8	% Passing No. 200 Sieve: 87.3
735.			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							PP=4.5+ tsf
10		4 (6) 10 (6)								PP=4.5+ tsf
15		9 (6) 12 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.504222, -98.399431 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-24
Structure Retaining Wall
Station 1881+30
Offset 130 (L)

District San Antonio
Date 12/11/12
Grnd. Elev. 744.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							
				0	67.5	19.2	40	24	132.8	% Passing No. 200 Sieve: 94.1
20		24 (6) 27 (6)								PP=4.5+ tsf
722.			CLAY, lean, tan and light gray, with sand and calcareous deposits (CL)							
				0	112.5	15.3			136.8	PP=4.5+ tsf
25		22 (6) 24 (6)								
				0	88.3	16.1	48	33	137.1	% Passing No. 200 Sieve: 98.5
714. 30		33 (6) 47 (6)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.504222, -98.399431 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-25
Structure Retaining Wall
Station 1883+40
Offset 130 (L)

District San Antonio
Date 1/7/2012
Grnd. Elev. 744.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
743.5			PAVEMENT, 6" asphaltic concrete							
			BASE, 13.5" clayey gravel							
742.4			CLAY, fat, dark brown, very stiff (CH)							
5		3 (6) 5 (6)		0	27.8	34.3	79	53	116	PP=3.0 tsf PP=2.5 tsf % Passing No. 200 Sieve: 93.1
738.			CLAY, lean, light brown and tan, hard (CL)							PP=4.5+ tsf PP=4.5+ tsf
10		10 (6) 13 (6)								PP=4.5+ tsf
15		10 (6) 14 (6)		0	128.9	16.2	49	33	136	PP=4.5+ tsf % Passing No. 200 Sieve: 98.5

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.504792, -98.399319; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



DRILLING LOG

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WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-25
Structure Retaining Wall
Station 1883+40
Offset 130 (L)

District San Antonio
Date 1/7/2012
Grnd. Elev. 744.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, light brown and tan, hard (CL)							
20		6 (6) 12 (6)								PP=4.5+ tsf
25		25 (6) 28 (6)		0	200.3	13.5	41	26	122	PP=4.5+ tsf % Passing No. 200 Sieve: 97.5
714.30		13 (6) 25 (6)		0	98.6	16.9			116	PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.504792, -98.399319; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-26
Structure Retaining Wall
Station 1885+40
Offset 80 (L)

District San Antonio
Date 1/7/2012
Grnd. Elev. 739.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
738.5			PAVEMENT, 6" asphaltic concrete							
			BASE, 14" clayey gravel							
737.3			CLAY, fat, dark brown, very stiff (CH)							
				0	36.7	29.1	64	23	120	PP=3.5 tsf % Passing No. 200 Sieve: 90.8
5		6 (6) 9 (6)								PP=3.0 tsf
										PP=4.5+ tsf
731.			CLAY, fat, tan, hard, with calcareous deposits (CH)							PP=4.5+ tsf
10		12 (6) 12 (6)								
										PP=4.5+ tsf
15		15 (6) 19 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.505317, -98.399044; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-26
Structure Retaining Wall
Station 1885+40
Offset 80 (L)

District San Antonio
Date 1/7/2012
Grnd. Elev. 739.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
20		23 (6) 26 (6)	CLAY, fat, tan, hard, with calcareous deposits (CH)	0	129.2	16	53	33	136	PP=4.5+ tsf % Passing No. 200 Sieve: 96.9
				0	143.1	13.4			138	PP=4.5+ tsf
				0	54.4	16	51	34	137	PP=4.5+ tsf % Pasing No. 200 Sieve: 98.3
709.30		50 (5.5) 50 (2)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.505317, -98.399044; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ Associates



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-27
Structure Retaining Wall
Station 1897+85
Offset 105 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 742.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
741.7			PAVEMENT, 4" asphaltic concrete							
			BASE, 12" clayey gravel							
740.7			CLAY, fat, black, hard (CH)							
				0	48.1	24.2	63	45	124.3	% Passing No. 200 Sieve: 84.1
										PP=4.5+ tsf
5		3 (6) 4 (6)								
				0	50.8	21.9	63	45	127.8	% Passing No. 200 Sieve: 83.3
										PP=4.5+ tsf
734.			CLAY, lean, tan, with sand and calcareous deposits (CL)							
						21.6				PP=4.5+ tsf
10		12 (6) 12 (6)								
										PP=4.5+ tsf
15		19 (6) 24 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.508698, -98.398434 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: D. Dawson

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

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County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-27
Structure Retaining Wall
Station 1897+85
Offset 105 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 742.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, with sand and calcareous deposits (CL)							
20		22 (6) 28 (6)								PP=4.5+ tsf
25		50 (2) 50 (1)								PP=4.5+ tsf
										SPT:45, 46, 50/1"
						7.8	35	24		SPT:50/2"
712.30		50 (2) 50 (1)								% Passing No. 200 Sieve: 86.2

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.508698, -98.398434 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: D. Dawson

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

1 of 2

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-28
Structure Retaining Wall
Station 1900+10
Offset 60 (L)

District San Antonio
Date 1-9-13
Grnd. Elev. 754.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
753.			PAVEMENT, 12.5" asphaltic concrete							
			BASE, 18" clayey gravel							
751.5			CLAY, fat, black, stiff, with gravel (CH)	0	44.2	26.3	75	57	120	PP=1.5 tsf % Passing No. 200 Sieve: 78.9
5		5 (6) 7 (6)								PP=1.5 tsf
										PP=1.5 tsf
10		6 (6) 6 (6)					83	62		PP=2.0 tsf
										PP=2.0 tsf
739. 15		9 (6) 10 (6)		0	36.7	30.3	80	59	114	% Passing No. 200 Sieve: 83.0

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.505284, -98.398160; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-28
Structure Retaining Wall
Station 1900+10
Offset 60 (L)

District San Antonio
Date 1-9-13
Grnd. Elev. 754.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, black, stiff to very stiff, traces of gravel and sand (CH)							
20		9 (6) 10 (6)								PP=2.5 tsf
25		10 (6) 9 (6)		0	26.1	26.7	65	46	109	PP=3.0 tsf % Passing No. 200 Sieve: 89.4
724.30		15 (6) 12 (6)		0	60.3	19.6			120	PP=4.0 tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.505284, -98.398160; PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-29
Structure Retaining Wall
Station 1902+15
Offset 110 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 743.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
742.3			PAVEMENT, 8" asphaltic concrete							
			BASE, 11" clayey gravel							
741.4			CLAY, fat, black, very stiff, trace of sand (CH)							PP=2.5 tsf
5		4 (6) 4 (6)								
				0	65	18.3	33	21	133.9	PP=4.0 tsf
										% Passing No. 200 Sieve: 88.4
735.			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							PP=4.5+ tsf
										% Passing No. 200 Sieve: 72.7
10		9 (6) 13 (6)								
				0	55.6	15.9	33	21	136.3	PP=4.5+ tsf
15		18 (6) 22 (6)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.509860, -98.398210 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S and IH 410 S
CSJ 0017-10-240

Hole RW-29
Structure Retaining Wall
Station 1902+15
Offset 110 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 743.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, lean, tan, hard, with sand and calcareous deposits (CL)							
20		40 (6) 50 (5)								PP=4.5+ tsf
				0	172.2	11.9	32	20	141.8	PP=4.5+ tsf
25		40 (6) 49 (6)								% Passing No. 200 Sieve: 82.6
										PP=4.5+ tsf
713.30		50 (4) 50 (3)								

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.509860, -98.398210 PP=Pocket Penetrometer

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-30/P-25
Structure Retaining Wall
Station 1886+95
Offset 100 (L)

District San Antonio
Date 1-10-13
Grnd. Elev. 741.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
740.			PAVEMENT, 12" asphaltic concrete							
			BASE, 18" clayey gravel possibly cement and/or lime treated							
738.5						25.7	50	26		% Passing No. 200 Sieve: 77.7
738.			CLAY, fat, tan, stiff, with sand and gravel (FILL) (CH)							PP=2.0 tsf
			CLAY, lean, black, very stiff (CL)							
						17.1	47	32		% Passing No. 200 Sieve: 95.9
5										PP=3.5 tsf
735.			CLAY, lean, tan, hard, with calcareous deposits (CL)							
		6 (6) 10 (6)								PP=4.5+ tsf
										PP=4.5+ tsf
10										
		17 (6) 22 (6)								
						15	45	29		% Passing No. 200 Sieve: 95.2
15										PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.505749, -98.399016; PP=Pocket Penetrometer, (IH-35S On Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



WinCore
Version 3.0

DRILLING LOG

2 of 2

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-30/P-25
Structure Retaining Wall
Station 1886+95
Offset 100 (L)

District San Antonio
Date 1-10-13
Grnd. Elev. 741.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
		16 (6) 20 (6)	CLAY, lean, tan, hard, with calcareous deposits (CL)							PP=4.5+ tsf
20										
		27 (6) 31 (6)								
25										
		29 (6) 37 (6)								PP=4.5+ tsf
711.30		48 (6) 50 (4)								PP=4.5+ tsf

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.505749, -98.399016; PP=Pocket Penetrometer, (IH-35S On Ramp)

The ground water elevation was not determined during the course of this boring.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-31
Structure Retaining Wall
Station 1889+50
Offset 95 (L)

District San Antonio
Date 12/12/12
Grnd. Elev. 739.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
719.20		50 (5) 50 (5)	CLAY, lean, light brown, hard, with sand and calcareous deposits (CL)	0	120.6	11	47	31	138	PP=4.5+ tsf % Passing No. 200 Sieve: 79.2
25		50 (4) 50 (3.75)	CLAY, lean, light brown and gray, hard (CL)	0	249.7	10.9	44	29		PP=4.5+ tsf % Passing No. 200 Sieve: 91.9
709.30		50 (1.25) 50 (1)								PP=4.5+ tsf

Remarks: Approx Ground El.; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long)=29.506434, -98.398871, PP=Pocket Penotrometer

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: DD

Organization: HVJ



DRILLING LOG

1 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-32/P-27
Structure Retaining Wall
Station 1895+85
Offset 45 (L)

District San Antonio
Date 1-9-13
Grnd. Elev. 746.00 ft
GW Elev. 737.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
744.7			PAVEMENT, 3.5" asphaltic concrete, 12" concrete							
743.5			BASE, 15" clayey gravel possibly cement and/or lime treated			13.7	24	8		% Passing No. 200 Sieve: 52.6 PP=3.0 tsf
			CLAY, fat, black, firm to stiff, with traces of sand and gravel (4" gravel layer at 9') (CH)							PP=1.5 tsf
5		5 (6) 6 (6)								
						32.9	79	50		% Passing No. 200 Sieve: 91.4 PP=1.5 tsf
10		7 (6) 10 (6)								PP=2.5 tsf
										PP=3.0 tsf
14		14 (6) 20 (6)								
15										
731										

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.508120, -98.398361; PP=Pocket Penetrometer, (IH-35S Main Lane)

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ



DRILLING LOG

2 of 2

WinCore
Version 3.0

County Bexar
Highway IH 35 S & IH 410 S
CSJ 0017-10-240

Hole RW-32/P-27
Structure Retaining Wall
Station 1895+85
Offset 45 (L)

District San Antonio
Date 1-9-13
Grnd. Elev. 746.00 ft
GW Elev. 737.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, fat, black, stiff to very stiff (CH)							PP=4.0 tsf
		14 (6) 20 (6)								
20										
724.			CLAY, lean, tan, with traces of sand and calcareous deposits (CL)							
						13.4	40	23		% Passing No. 200 Sieve: 92
25		30 (6) 33 (6)								PP=4.5+ tsf
		34 (6) 38 (6)								
716. 30										SPT: 18,24,32

Remarks: Approx Ground El. ; SPT-N Values are not standard (170-lb hammer). GPS (Lat, Long) = 29.508120, -98.398361; PP=Pocket Penetrometer, (IH-35S Main Lane)

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: TSS

Logger: ZL

Organization: HVJ

CSJ: 2452-03-112

DATE: 8/4/2017 3:49 PM
FILE: P:\geo\Projects\2015\AG 15 10341.2 loop 1604 san antonio\CAD\VIC.dwg

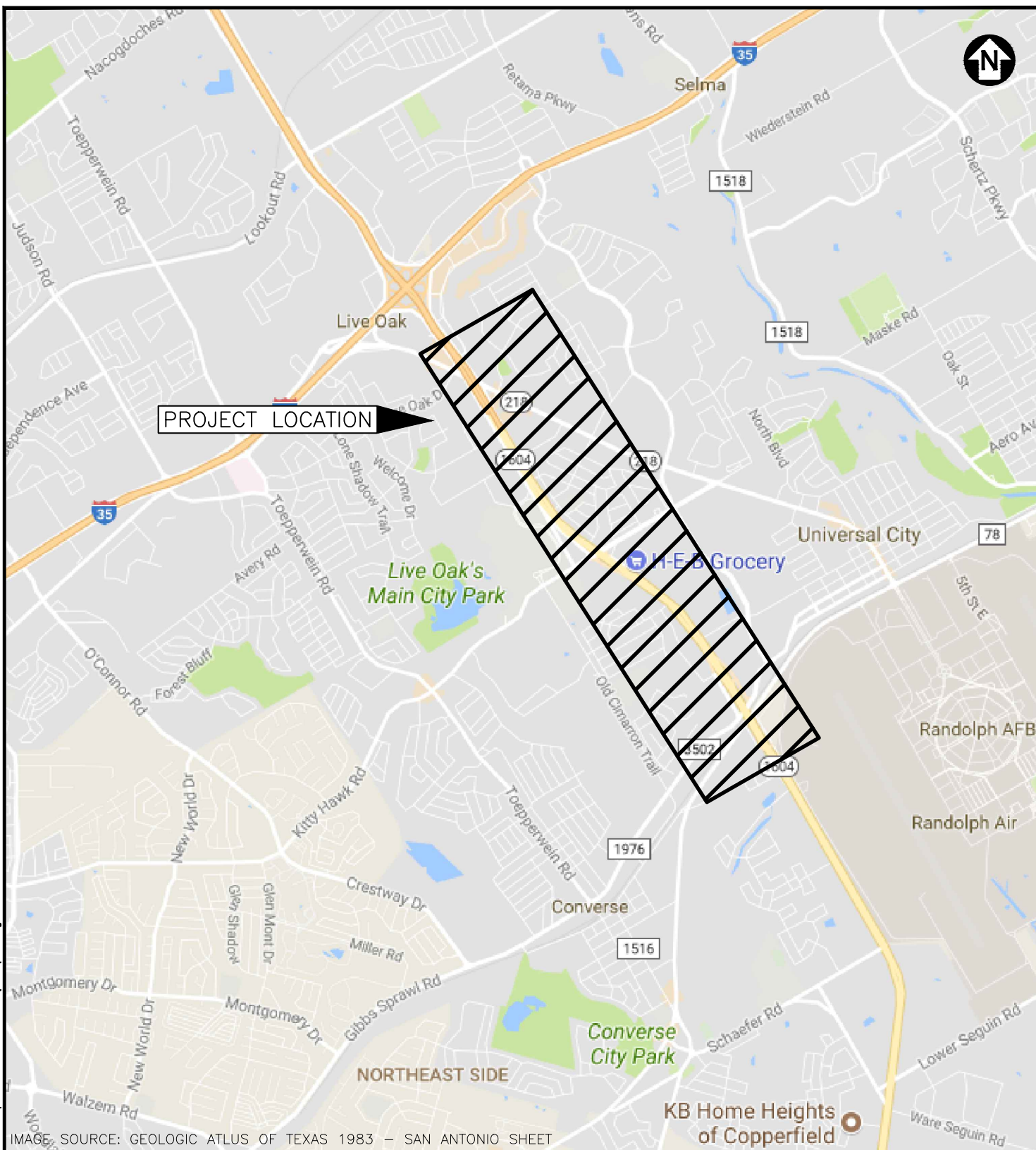


IMAGE SOURCE: GEOLOGIC ATLAS OF TEXAS 1983 - SAN ANTONIO SHEET



MAP LOCATION



SCALE: NTS

DATE: 8/3/2017

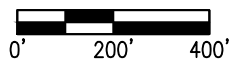
DRAWN BY:	PROJ. CHK:	APPRV. BY:
MM	ZL	JS

GEOLOGY MAP
LOOP 1604 FROM IH-35 TO FM 78
BEXAR COUNTY, TEXAS
CSJ: 2452-03-112

PROJECT NO.: AG 15 10341.2	FILENAME: GEO	PLATE 2
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- BORING LOCATION
- TEXAS TRIAXIAL LOCATION



SCALE: 1" = 400'

DATE: 8/1/2017

DRAWN BY: MM	PROJ. CHK: ZL	APPRV. BY: JS
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PLAN OF BORINGS
 LOOP 1604 FROM 1H-35 TO FM 78
 BEXAR COUNTY, TEXAS
 CSJ: 2452-03-112

PROJECT NO.: AG 15 10341.2	FILENAME: POB	PLATE 3A
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DRILLING LOG

1 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-1
Structure Bridge
Station 1028+91.40
Offset 63.17

District San Antonio
Date 7/16/2017
Grnd. Elev. 929.40 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
928.1			PAVEMENT, 8" asphaltic concrete, 8" flex base							PP = 4.5+ tsf
927.4			CLAY, soft, semi-moist, tan, lean, gravelly. [Fill] (CL)							PP = 2.75 tsf
			CLAY, soft, moist, light brown and gray, fat, with trace gravel. [Fill] (CH)			25.4	51	27		Passing No. 200 Sieve: 89%
924.9										PP = 4.5+ tsf
5		11 (6) 12 (6)	CLAY, stiff, moist, dark brown to black, fat, sandy, with trace gravel. [Fill] (CH)							PP = 3.0 tsf
						27.5	75	49		Passing No. 200 Sieve: 67%
921.9			CLAY, soft to stiff, moist, light tan to dark gray, fat, calcareous, with trace gravel and black fat clay seams. [Fill] (CH)							PP = 2.25 tsf
		8 (6) 9 (6)								PP = 3.75 tsf
				0	31	24.1			125	
15		11 (6) 21 (6)								PP = 2.25 tsf
				0	41	28.3	74	51	116	Passing No. 200 Sieve: 90%
20		12 (6) 22 (6)								-black fat clay seam 18-19'

Remarks: Boring advanced by dry drilling techniques to 60 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13754639, 2182493)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

2 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-1
Structure Bridge
Station 1028+91.40
Offset 63.17

District San Antonio
Date 7/16/2017
Grnd. Elev. 929.40 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
903.4			CLAY, soft to stiff, moist, light tan to dark gray, fat, calcareous, with trace gravel and black fat clay seams. [Fill] (CH)							PP = 3.0 tsf
		11 (6) 19 (6)								
			CLAY, very stiff to very hard, moist, tan and gray, lean, friable, with calcareous nodules and ferrous staining. [Residual] (CL)							PP = 4.5+ tsf
						15.6	46	31		Passing No. 200 Sieve: 95%
30		28 (6) 32 (6)								PP = 4.5+ tsf
35		50 (3) 50 (3)								PP = 4.5+ tsf
40		50 (2) 50 (2)								

Remarks: Boring advanced by dry drilling techniques to 60 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13754639, 2182493)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

3 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-1
Structure Bridge
Station 1028+91.40
Offset 63.17

District San Antonio
Date 7/16/2017
Grnd. Elev. 929.40 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, very stiff to very hard, moist, tan and gray, lean, friable, with calcareous nodules and ferrous staining. [Residual] (CL)							
45		27 (6) 50 (1.5)								PP = 4.5+ tsf
50		37 (6) 50 (3.5)								PP = 4.5+ tsf
55		50 (0) 50 (0.5)								PP = 4.5+ tsf
869.4 60		50 (0) 50 (1)		0	18	14			121	PP = 4.5+ tsf
										RUN:60-65';REC:84%;RQD:34%

Remarks: Boring advanced by dry drilling techniques to 60 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13754639, 2182493)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

4 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-1
Structure Bridge
Station 1028+91.40
Offset 63.17

District San Antonio
Date 7/16/2017
Grnd. Elev. 929.40 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
864.4 65		50 (0.5) 50 (0)	LIMESTONE, very hard, tan, moderately weathered, heavily fractured, marly. [Pecan Gap]	0	1275	12.1			140	
				0	846	11.7			136	
70										
75										
80										
<p>Remarks: Boring advanced by dry drilling techniques to 60 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13754639, 2182493)</p> <p>The ground water elevation was not determined during the course of this boring.</p>										

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

1 of 3

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-2
Structure Bridge
Station 1031+26.01
Offset -59.20

District San Antonio
Date 7/17/2017
Grnd. Elev. 933.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
930.9			PAVEMENT, 9.75" asphaltic concrete, 15" flex base							PP = 2.0 tsf
			SAND, loose, moist, tan and light gray, clayey, with trace gravel. [Fill] (SC)							PP = 3.5 tsf
5		11 (6) 7 (6)				28.7	59	33		Passing No. 200 Sieve: 49%
										PP = 2.0 tsf
				0	18	17.8			132	PP = 4.0 tsf
10		5 (6) 7 (6)								PP = 4.0 tsf
										PP = 4.0 tsf
920.			CLAY, soft to stiff, moist, brown and gray, fat, sandy, with trace calcareous seams. [Fill] (CH)	0	10	25.4	50	28	116	Passing No. 200 Sieve: 69%
15		12 (6) 16 (6)								PP = 3.5 tsf
20		8 (6) 11 (6)								

Remarks: Boring advanced by dry drilling techniques to 45 ft and groundwater was not encountered. Wet coring methods were then used to advance the boring to 60 ft. (N,E)=(13754500, 2182718)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: LF

Organization: HVJ Associates



DRILLING LOG

2 of 3

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-2
Structure Bridge
Station 1031+26.01
Offset -59.20

District San Antonio
Date 7/17/2017
Grnd. Elev. 933.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, soft to stiff, moist, brown and gray, fat, sandy, with trace calcareous seams. [Fill] (CH)							
25		11 (6) 21 (6)								PP = 3.5 tsf
										PP = 2.5 tsf
904.										
30		18 (6) 12 (6)	CLAY, stiff, moist, brown, lean, with trace ferrous staining. [Residual] (CL)							
										PP = 2.5 tsf
						20.5	32	12		Passing No. 200 Sieve: 94%
35		12 (6) 15 (6)								
896.			CLAY, stiff to hard, moist, tan, lean, calcareous. [Residual] (CL)							PP = 3.5 tsf
40		50 (3) 50 (3)								

Remarks: Boring advanced by dry drilling techniques to 45 ft and groundwater was not encountered. Wet coring methods were then used to advance the boring to 60 ft. (N,E)=(13754500, 2182718)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: LF

Organization: HVJ Associates



DRILLING LOG

3 of 3

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-2
Structure Bridge
Station 1031+26.01
Offset -59.20

District San Antonio
Date 7/17/2017
Grnd. Elev. 933.00 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
888. 45	50	50 (0.25) 50 (0)	CLAY, stiff to hard, moist, tan, lean, calcareous. [Residual] (CL)							PP = 4.5+ tsf RUN:45-50';REC:50%;RQD:0%
		50 (1.5) 50 (1)	LIMESTONE, hard to very hard, tan, moderately weathered, heavily fractured. [Pecan Gap]							
		50 (1.5) 50 (0.5)								
		50 (1) 50 (0)								
873. 60				0	418	16.1			131	
				0	603	16.1			131	

Remarks: Boring advanced by dry drilling techniques to 45 ft and groundwater was not encountered. Wet coring methods were then used to advance the boring to 60 ft. (N,E)=(13754500, 2182718)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: LF

Organization: HVJ Associates



DRILLING LOG

1 of 3

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-3
Structure Bridge
Station 1035+12.75
Offset 60.16

District San Antonio
Date 7/16/2017
Grnd. Elev. 923.20 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
921.8			PAVEMENT, 8" asphaltic concrete, 9" flex base							
			CLAY, soft to stiff, moist, tan, fat, calcareous. [Fill] (CH)							PP = 1.5 tsf
										PP = 3.5 tsf
5		5 (6) 5 (6)		0	59	20.5	55	35	127	Passing No. 200 Sieve: 97%
										PP = 2.0 tsf
										PP = 2.25 tsf
10		7 (6) 11 (6)								
										PP = 3.5 tsf
				0	21	18.6			127	
15		9 (6) 15 (6)								
										PP = 4.0 tsf
904.7			CLAY, stiff, moist, dark brown to black, fat. [Fill] (CH)			29.9	78	52		Passing No. 200 Sieve: 94%
20		15 (6) 16 (6)								

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Wet coring methods were then used to advance the boring to 60 ft. (N,E)=(13754107, 2182812)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: LF

Organization: HVJ Associates



DRILLING LOG

2 of 3

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-3
Structure Bridge
Station 1035+12.75
Offset 60.16

District San Antonio
Date 7/16/2017
Grnd. Elev. 923.20 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
900.2			CLAY, stiff, moist, dark brown to black, fat. [Fill] (CH)							PP = 4.5 tsf
			CLAY, stiff to very hard, moist, tan, fat. [Residual] (CH)							
25		10 (6) 10 (6)								PP = 4.0 tsf
						14.9	52	34		Passing No. 200 Sieve: 96%
30		43 (6) 35 (6)								PP = 4.5+ tsf
35		50 (3) 50 (3)								PP = 4.5+ tsf
40		50 (1.15) 50 (0)								

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Wet coring methods were then used to advance the boring to 60 ft. (N,E)=(13754107, 2182812)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: LF

Organization: HVJ Associates



DRILLING LOG

3 of 3

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-3
Structure Bridge
Station 1035+12.75
Offset 60.16

District San Antonio
Date 7/16/2017
Grnd. Elev. 923.20 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, stiff to very hard, moist, tan, fat. [Residual] (CH)							
				0	57	13.5			131	PP = 4.5+ tsf
45		28 (6) 32 (6)								
										PP = 4.5+ tsf
50		50 (0.5) 50 (0.5)								
										SS: 17-38-32
868.2 55		50 (1) 50 (0)	LIMESTONE, very hard, tan, slightly weathered, slightly fractured, marly. [Pecan Gap]	0	2214	12.3			140	RUN:55-60';REC:100%;RQD:95%
				0	1540	11.7			140	
863.2 60		50 (0) 50 (0)								

Remarks: Split-spoon values are not standard (170-lb hammer). Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Wet coring methods were then used to advance the boring to 60 ft. (N,E)=(13754107, 2182812)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: LF

Organization: HVJ Associates



DRILLING LOG

1 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-4
Structure Bridge
Station 1037+11.66
Offset -39.24

District San Antonio
Date 7/18/2017
Grnd. Elev. 921.70 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
920.9			PAVEMENT, 4.5" asphaltic concrete, 5" flex base							PP = 3.75 tsf
			CLAY, soft, moist, tan, lean, calcareous, with sand and dark gray clay seams. [Fill] (CL)	0	30	19.6	34	12	130	
										PP = 4.5+ tsf
5		8 (6) 9 (6)								
915.7			CLAY, stiff, moist, gray, lean, with gravel. [Fill] (CL)			21.2	37	19		PP = 2.75 tsf
										Passing No. 200 Sieve: 79%
										PP = 2.5 tsf
10		15 (6) 17 (6)								
908.7			CLAY, stiff, moist, tan, lean, with sand and gravel. [Fill] (CL)							PP = 3.0 tsf
15		14 (6) 19 (6)								
903.7			CLAY, stiff to hard, moist, gray, lean, with gravel. [Fill] (CL)			24.6	45	26		PP = 2.75 tsf
										Passing No. 200 Sieve: 78%
20		48 (6) 50 (3.5)								

Remarks: Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13753983, 2183022)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

2 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-4
Structure Bridge
Station 1037+11.66
Offset -39.24

District San Antonio
Date 7/18/2017
Grnd. Elev. 921.70 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
895.7			CLAY, stiff to hard, moist, gray, lean, with gravel. [Fill] (CL)							PP = 4.5+ tsf
				0	25	20.0			118	
		25								
		12 (6) 19 (6)								
			CLAY, very stiff to very hard, moist, tan and gray, fat, with ferrous staining and trace calcareous nodules. [Residual] (CH)							PP = 2.75 tsf Passing No. 200 Sieve: 96%
				0	41	20.9	60	43	127	
		30								
		40 (6) 50 (3.5)								
										PP = 4.5+ tsf PP = 4.5+ tsf
		35								
		50 (4) 50 (2)								
40		50 (2) 50 (1)								

Remarks: Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13753983, 2183022)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

3 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-4
Structure Bridge
Station 1037+11.66
Offset -39.24

District San Antonio
Date 7/18/2017
Grnd. Elev. 921.70 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, very stiff to very hard, moist, tan and gray, fat, with ferrous staining and trace calcareous nodules. [Residual] (CH)							
45		31 (6) 47 (6)								PP = 4.5+ tsf
50		50 (0.5) 50 (1)								PP = 4.5+ tsf
866.7 55		50 (1) 50 (0)								PP = 4.5+ tsf
			LIMESTONE, very hard, tan, highly weathered, heavily fractured, marly. [Pecan Gap]							RUN:55-60';REC:100%;RQD:8%
60		50 (1) 50 (0.25)								RUN:60-65';REC:99%;RQD:21%

Remarks: Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13753983, 2183022)

The ground water elevation was not determined during the course of this boring.

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates



DRILLING LOG

4 of 4

WinCore
Version 3.1

County Bexar
Highway LP 1604
CSJ 2452-03-112

Hole BR-4
Structure Bridge
Station 1037+11.66
Offset -39.24

District San Antonio
Date 7/18/2017
Grnd. Elev. 921.70 ft
GW Elev. N/A

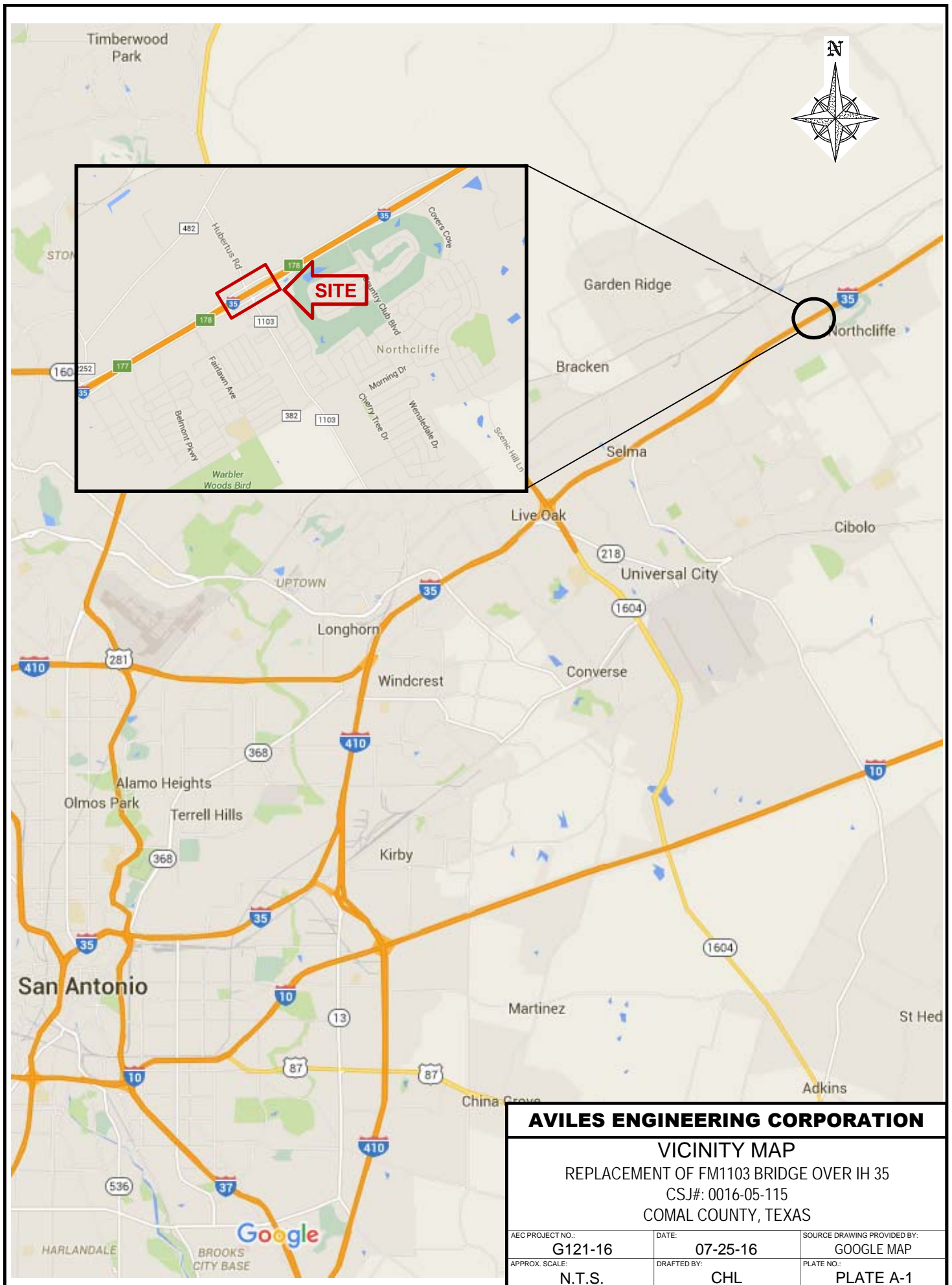
Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
856.7 65		50 (1) 50 (0)	LIMESTONE, very hard, tan, highly weathered, heavily fractured, marly. [Pecan Gap]	0	536	13.2			139	
				0	924	13.8			137	
70										
75										
80										
Remarks: Boring advanced by dry drilling techniques to 55 ft and groundwater was not encountered. Air coring methods were then used to advance the boring to 65 ft. (N,E)=(13753983, 2183022)										
The ground water elevation was not determined during the course of this boring.										

Driller: TX Geo Bore

Logger: KC

Organization: HVJ Associates

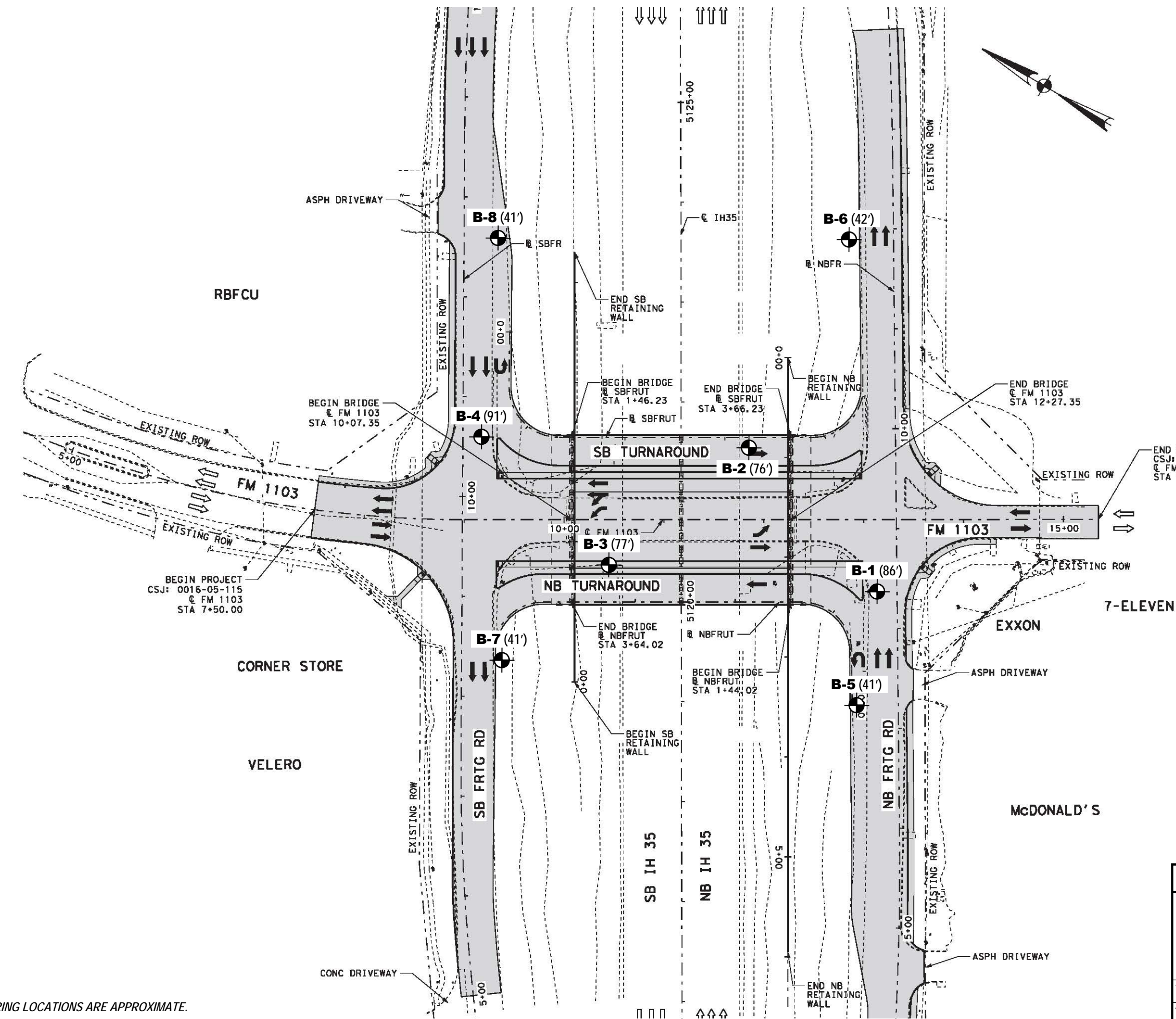
CSJ: 0016-05-115



AVILES ENGINEERING CORPORATION

VICINITY MAP
REPLACEMENT OF FM1103 BRIDGE OVER IH 35
CSJ#: 0016-05-115
COMAL COUNTY, TEXAS

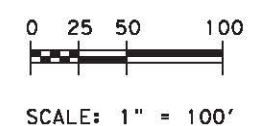
AEC PROJECT NO:	DATE:	SOURCE DRAWING PROVIDED BY:
G121-16	07-25-16	GOOGLE MAP
APPROX. SCALE:	DRAFTED BY:	PLATE NO.:
N.T.S.	CHL	PLATE A-1



- LEGEND**
- PROPOSED TRAFFIC
 - ⇌ EXIST TRAFFIC
 - PROPOSED CONSTRUCTION

- NOTES:**
1. REFER TO PLAN AND PROFILE SHEETS FOR INFORMATION NOT SHOWN HERE.
 2. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR DETAILED ALIGNMENTS INFORMATION.
 3. REFER TO PLAN AND PROFILE RETAINING WALL SHEETS FOR RETAINING WALLS INFORMATION.

PRELIMINARY - 60%
Not intended for construction, bidding or permit purposes.
Engineer: CRAIG L. HESTER, PE
P.E. Serial No.: 65414
Date: 8/8/2016



REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TSP/E Firm Registration No. 274
TSP/LS Firm Registration No. 100487
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax: 713.462.3252
www.cobb fendley.com

AVILES ENGINEERING CORPORATION

BORING LOCATION PLAN
REPLACEMENT OF FM1103 BRIDGE OVER IH 35
CSJ#: 0016-05-115
COMAL COUNTY, TEXAS

AEC REPORT NO.: G121-16	DATE: 08-22-16	SOURCE DRAWING PROVIDED BY: COBBFENDLEY
APPROX. SCALE: 1" = 100'	DRAFTED BY: CHL	PLATE NO.: PLATE A-2

NOTE: BORING LOCATIONS ARE APPROXIMATE.



WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

DRILLING LOG

1 of 2

Hole B-1
Structure BRIDGE
Station 5120+02.95
Offset 196.10' RT

District SAN ANTONIO
Date 5/9/16
Grnd. Elev. 798.77 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
796.8			PVMT, 15.75" AC + 8.25" clay and gravel base			14				P=4.5+
5		44 (6) 50 (4.75)	CLAY, LEAN, hard to very hard, tan, with silt partings and siltstone fragments -with siltstone seams 20'-22' and 34'-35' (CL)			14	32	14	121.8	N=19, P=4.0, S.C.=13ppm
						11				N=50/5.5", P=4.5+
				0	57.2	14			129.4	N=50/4", P=3.25
10		50 (1.5) 50 (1.5)				12	29	14		N=50/3.75", P=4.5+
15		50 (2.25) 50 (0.5)				12				
20		50 (3) 50 (0.75)								
						12	27	13		N=50/3", P=3.75
25		50 (3) 50 (0.5)				11				-#200=94%, P=2.75
30		50 (2) 50 (0.75)				15				
35		50 (2.75) 50 (0.5)				11	29	13		P=4.5+
760.8			SHALE, hard to very hard, gray							
40		50 (1) 50 (0.75)				9				N=50/1", P=4.5+
756.8			CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)							
45		50 (1) 50 (0.5)				15				
50		50 (0.75) 50 (1)				15				
55		50 (1) 50 (0.5)				15	25	11		
739.8										
60		50 (0.5) 50 (0)								

Remarks: Water was encountered at 70' during drilling. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

2 of 2

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-1
Structure BRIDGE
Station 5120+02.95
Offset 196.10' RT

District SAN ANTONIO
Date 5/9/16
Grnd. Elev. 798.77 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
736.8			SHALE, very hard, gray			10				N=50/4", P=4.5+
65		50 (1.25) 50 (1)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings -with limestone fragments 69'-75' (CL)			13				P=2.0
70		50 (0.5) 50 (0.25)				15	25	11		P=1.0
724.8		50 (0.25) 50 (0.25)	CHALK, hard to very hard, gray, with claystone fragments			13				
80		50 (0.75) 50 (0.25)					23	9		
85		50 (2.75) 50 (0.25)				8				N=50/3"
712.8						10				TD=86'
90										
95										
100										
105										
110										
115										
120										

Remarks: Water was encountered at 70' during drilling. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

1 of 2

WinCore	County	COMAL	Hole	B-2	District	SAN ANTONIO
Version 3.1	Highway	FM1103	Structure	BRIDGE	Date	5/3/16
	CSJ	0016-05-115	Station	5121+57.40	Grnd. Elev.	777.93 ft
			Offset	80.95' RT	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, SANDY LEAN, very hard, light tan, with silt partings and claystone fragments -with calcareous nodules 0'-2' (CL)			11				N=56/11.75", P=4.5+
5		50 (2) 50 (0.5)				11	25	10		N=50/4", S.C.=0ppm
						13				N=50/4", P=4.5+
10		50 (2) 50 (0.75)				12				N=50/3.75"
763.9			CLAY, SHALEY, LEAN, very hard, gray -with shale layer 15'-17' and 34'-35' (CL)							
15		50 (2.5) 50 (1)				11	26	11		
20		50 (2.25) 50 (0.5)				12				N=50/3", P=4.5+
						12				P=4.5+
25		50 (1.5) 50 (0.5)								
30		50 (2.25) 50 (0.5)				10	25	11		N=50/2.5", P=4.5+
						13				P=2.5
35		50 (3) 50 (0.75)								
738.9		50 (2.5) 50 (0.25)				12	26	12		N=50/2.25", P=3.5
734.9			CLAY, CHALKY, LEAN, very hard, light yellow and gray, with abundant siltstone fragments (CL)			13				P=4.25
45		50 (0.75) 50 (0.25)								
						16				N=50/1.5"
50		50 (0.75) 50 (0.25)								
						14	23	9		
55		50 (0.25) 50 (0)								
60		50 (0.5) 50 (0)				16				

Remarks: Water was encountered at 44' during drilling and measured at 30' after 24 hours. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

DRILLING LOG

2 of 2

Hole B-2
Structure BRIDGE
Station 5121+57.40
Offset 80.95' RT

District SAN ANTONIO
Date 5/3/16
Grnd. Elev. 777.93 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
65		50 (1.25) 50 (0.125)	CLAY, CHALKY, LEAN, very hard, light yellow and gray, with abundant siltstone fragments (CL)			19	29	16		N=50/0.25"
70		50 (0.5) 50 (0.25)								
75		50 (1) 50 (0.25)				18				
701.9										
80										TD=76'
85										
90										
95										
100										
105										
110										
115										
120										

Remarks: Water was encountered at 44' during drilling and measured at 30' after 24 hours. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

1 of 2

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-3
Structure BRIDGE
Station 5120+34.90
Offset 74.85' LT

District SAN ANTONIO
Date 5/6/16
Grnd. Elev. 777.85 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		50 (1.5) 50 (0.5)	CLAY, LEAN, very hard, tan, with silt partings and abundant siltstone fragments (CL)			12				N=50/4"
						11				
						11				
10		50 (1.25) 50 (0.75)	CLAY, LEAN, very hard, tan, with silt partings and abundant siltstone fragments (CL)			13	31	15		N=50/3", P=4.5+
										N=50/3.5", P=4.5+
764.8			CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)							
15		50 (1.75) 50 (0.25)				12				P=1.25, S.C.=367ppm
20		50 (1.5) 50 (0.25)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)							
						12				N=50/3.5", P=4.0
25		50 (1) 50 (0.5)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)			11	25	11		
30		50 (1.5) 50 (0.75)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)							
						12				N=50/3", P=4.0
35		50 (1.25) 50 (0.25)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)							
738.8			SHALE, hard to very hard, gray							
40		50 (1.5) 50 (0.5)				11				N=50/2.75", P=4.5+
735.8										
						14				
45		50 (0.75) 50 (0.75)	CLAY, SHALEY, LEAN, very hard, gray (CL)							
728.8			CHALK, hard, light yellow							
50		50 (1.75) 50 (0.5)				9	25	11		N=50/3", P=4.5+
724.8			CLAY, CHALKY, LEAN, very hard, gray, with silt partings and abundant claystone fragments -light yellow 60'-74' (CL)							
55		50 (0.5) 50 (0.25)				13				
60		50 (0.5) 50 (0)								

Remarks: Water was not encountered during drilling; groundwater was measured at 27' after 24 hours. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

2 of 2

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-3
Structure BRIDGE
Station 5120+34.90
Offset 74.85' LT

District SAN ANTONIO
Date 5/6/16
Grnd. Elev. 777.85 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
65		50 (0.75) 50 (0.25)	CLAY, CHALKY, LEAN, very hard, gray, with silt partings and abundant claystone fragments -light yellow 60'-74' (CL)			17				N=50/0.75"
70		50 (0.5) 50 (0.25)				17	24	8		
703.8										
75		50 (1.5) 50 (0.5)	CHALK, hard to very hard, light gray							P=3.0 N=50/2", P=0.5 TD=77'
700.8				0	66.4	14	23	10	138.4	
80										
85										
90										
95										
100										
105										
110										
115										
120										

Remarks: Water was not encountered during drilling; groundwater was measured at 27' after 24 hours. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

1 of 2

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-4
Structure BRIDGE
Station 5121+62.72
Offset 197.32' LT

District SAN ANTONIO
Date 5/4/16
Grnd. Elev. 796.83 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
794.9			PVMT, 26"AC + 1.5" AC base							
792.8			FILL, FAT CLAY, tan, with asphalt and chalk pockets (CH)			21	51	35		P=2.5, S.C.=13ppm
5		10 (6) 10 (6)	CLAY, FAT, soft to stiff, tan and gray -with silty clay seams 4'-6' (CH)			19	52	32		P=4.5+, -#200=97%
788.8						29	50	33	126.4	P=2.75, -#200=96%
10		50 (2.75) 50 (1.5)	CLAY, LEAN, (stiff to) very hard, tan, with silt partings and siltstone fragments (CL)	0	81.8	12			133.1	N=84/11.5", P=4.5+
15		50 (2.25) 50 (0.75)				10	26	12		
20		50 (2.5) 50 (0.75)								
25		50 (4.75) 50 (0.75)		0	24.6	12			121.2	N=50/4.75", P=3.5
30		50 (2.5) 50 (0.75)				12				
764.8						13	28	14		P=3.0
35		50 (1.5) 50 (0.5)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings -with limestone fragments 34'-35' (CL)			14				
757.8		50 (2.25) 50 (0.5)	SHALE, hard, gray							
754.8						11				N=50/4", P=4.5+
45		50 (1.25) 50 (0.25)	CLAY, SHALEY, LEAN, very hard, gray (CL)			13	27	13		P=3.25
50		50 (0.75) 50 (0.5)				13				P=1.75
55		50 (1) 50 (0.5)				15				P=3.0
737.8		50 (1.5) 50 (0.25)								

Remarks: Water was encountered at 73' during drilling and measured at 46' after completion of drilling. N=SPT blow count; S.C.=Sulphate Content. Soil consistency in bracket () is based on the value obtained from unconfined compression test.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

2 of 2

WinCore	County	COMAL	Hole	B-4	District	SAN ANTONIO
Version 3.1	Highway	FM1103	Structure	BRIDGE	Date	5/4/16
	CSJ	0016-05-115	Station	5121+62.72	Grnd. Elev.	796.83 ft
			Offset	197.32' LT	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
733.8			SHALE, hard to very hard, light gray			12	26	12		N=50/3"
65		50 (1.75) 50 (0.5)	CLAY, SHALEY, LEAN, very hard, gray, with silt partings (CL)			16				
70		50 (2.5) 50 (0.25)				13				P=1.25
75		50 (0.25) 50 (0)				11	25	11		
720.8			CHALK, very hard, gray -with claystone fragments and clay pockets 80'-90'							
80		50 (0.25) 50 (0)				14	23	8		N=50/0.75", P=0.5
85		50 (0) 50 (0)				14				
90		50 (0.25) 50 (0)				11				TD=91'
705.8										
95										
100										
105										
110										
115										
120										

Remarks: Water was encountered at 73' during drilling and measured at 46' after completion of drilling. N=SPT blow count; S.C.=Sulphate Content. Soil consistency in bracket () is based on the value obtained from unconfined compression test.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

1 of 1

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-5
Structure RETAINING WALL
Station 5118+93.82
Offset 179.61' RT

District SAN ANTONIO
Date 5/2/16
Grnd. Elev. 799.64 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
795.6			CLAY, SANDY LEAN, (very stiff), tan, with abundant silt partings and pockets (CL)			13	31	14		N=11, P=4.5+
				0	54.4	11			124.4	P=4.5+
5		50 (2.5) 50 (2)	CLAY, SANDY LEAN, very hard, tan -with claystone/siltstone fragments 6'-10' and shaley clay seams 15'-22' -with siltstone fragments 25'-27' (CL)			12				N=50/6", P=4.5+
						12				N=50/3", P=4.5+
10		50 (2) 50 (2.5)				11	27	13		N=50/4.5", P=4.25
15		50 (1.75) 50 (0.5)				10				N=50/3", P=4.5+
20		50 (1.5) 50 (1)				11				N=50/3"
25		50 (1) 50 (0.75)				12				N=50/2.5", P=4.5+
771.6		50 (1) 50 (0.25)	CLAY, SHALEY, LEAN, very hard, tan and gray (CL)			8	28	13		N=50/2.5"
35		50 (2) 50 (0.5)				8				N=50/2"
40		50 (2) 50 (0.75)								TD=41'
758.6										
45										
50										
55										
60										

Remarks: Water was not encountered during drilling. N=SPT blow count. Soil consistency in bracket () is based on the value obtained from unconfined compression test.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

1 of 1

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-6
Structure RETAINING WALL
Station 5123+66.60
Offset 175.78' RT

District SAN ANTONIO
Date 5/11/16
Grnd. Elev. 784.09 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
782.1			CLAY, FAT, dark gray, with siltstone fragments (CH)			15				N=15, P=3.0
5		50 (2.5) 50 (1.75)	CLAY, LEAN, very hard, light tan, with silt partings -with siltstone seams and flakes 20'-22' (CL)			12	27	11		N=73/9.5", P=4.5+, S.C.=7ppm P=2.0
						13				N=50/5.75", P=4.5+
10		50 (1.5) 50 (1.5)				11				N=50/2.75"
						12	27	12		
15		50 (1.75) 50 (1)				14				
20		50 (0.75) 50 (0.25)								
						12				N=50/2.5, P=4.5+
25		50 (1) 50 (1)				14	27	12		P=4.25
755.1		50 (1.25) 50 (0.5)	CLAY, SHALEY, LEAN, very hard, gray (CL)			9				N=50/1.5", P=4.5+
35		50 (1) 50 (0.5)				15	25	11		
40		50 (0.75) 50 (1)								N=50/1" TD=42'
742.1										
45										
50										
55										
60										

Remarks: Water was not encountered during drilling. N=SPT blow count; S.C.=Sulphate Content.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

DRILLING LOG

1 of 1

Hole B-7
Structure RETAINING WALL
Station 5119+41.39
Offset 180.74' LT

District SAN ANTONIO
Date 5/11/16
Grnd. Elev. 794.64 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
790.6			CLAY, LEAN, dark gray and tan -with limestone fragments and siltstone seams 0'-2' (CL)			14	42	24		N=12, P=4.5+
						12				N=26, P=4.5+ P=4.5+
5		50 (2.75) 50 (2)	CLAY, LEAN, (hard) to very hard, tan, with siltstone fragments -with silty sand seams 6'-10' and ferrous nodules 6'-8' (CL)			12				
				0	67.5	11			128.6	N=99/10.25", P=4.5+
10		50 (2) 50 (0.75)				12	30	15		N=28, P=4.5+ P=4.25
15		50 (1.75) 50 (0.75)				11				P=4.5+
20		50 (1) 50 (0.5)								
						10				N=50/3.5", P=4.5+
771.6			CLAY, SHALEY, LEAN, very hard, gray -with silt partings 34'-40' (CL)			11				P=4.5+
25		50 (1) 50 (0.75)								
30		50 (1) 50 (0.5)				11	28	14		N=50/2", P=4.5+
35		50 (1) 50 (0.5)				15				P=1.75
40		50 (1) 50 (0.25)				14	26	12		P=4.25 TD=41'
753.6										
45										
50										
55										
60										

Remarks: Water was not encountered during drilling. N=SPT blow count. Soil consistency in bracket () is based on the value obtained from unconfined compression test.

The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.



DRILLING LOG

1 of 1

WinCore
Version 3.1

County COMAL
Highway FM1103
CSJ 0016-05-115

Hole B-8
Structure RETAINING WALL
Station 5123+70.55
Offset 180.96' LT

District SAN ANTONIO
Date 5/2/16
Grnd. Elev. 792.35 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
790.4			CLAY, SANDY LEAN, gray, with limestone fragments (CL)			21	44	21		N=7, S.C.=0ppm
788.4			CLAY, FAT, tan and brown, with abundant gravel (CH)			16	54	32		P=4.0+, -#200=95%
5		40 (6) 50 (5)	CLAY, SANDY LEAN, hard to very hard, light tan, with abundant silt and sand partings -with siltstone fragments 8'-12' and 20'-22' -with limestone gravel 25'-27' (CL)			12				N=50/4", P=4.0
10		50 (0.25) 50 (0.75)				13				N=50/5.25", P=4.25
15		50 (1.25) 50 (0.5)				10				
20		50 (1.75) 50 (0.5)				11				N=50/5.75"
25		50 (1.75) 50 (1.75)				13	28	13		N=50/3"
30		50 (1.5) 50 (0.75)				10				N=50/3"
35		50 (1.25) 50 (0.5)	CLAY, SHALEY, LEAN, very hard, gray, with siltstone fragments/flakes (CL)			11	27	12		N=50/2.5"
40		50 (1) 50 (0.5)				10	27	13		N=50/4"
45										TD=41'
50										
55										
60										

Remarks: Water was not encountered during drilling. N=SPT blow count; S.C.=Sulphate Content.

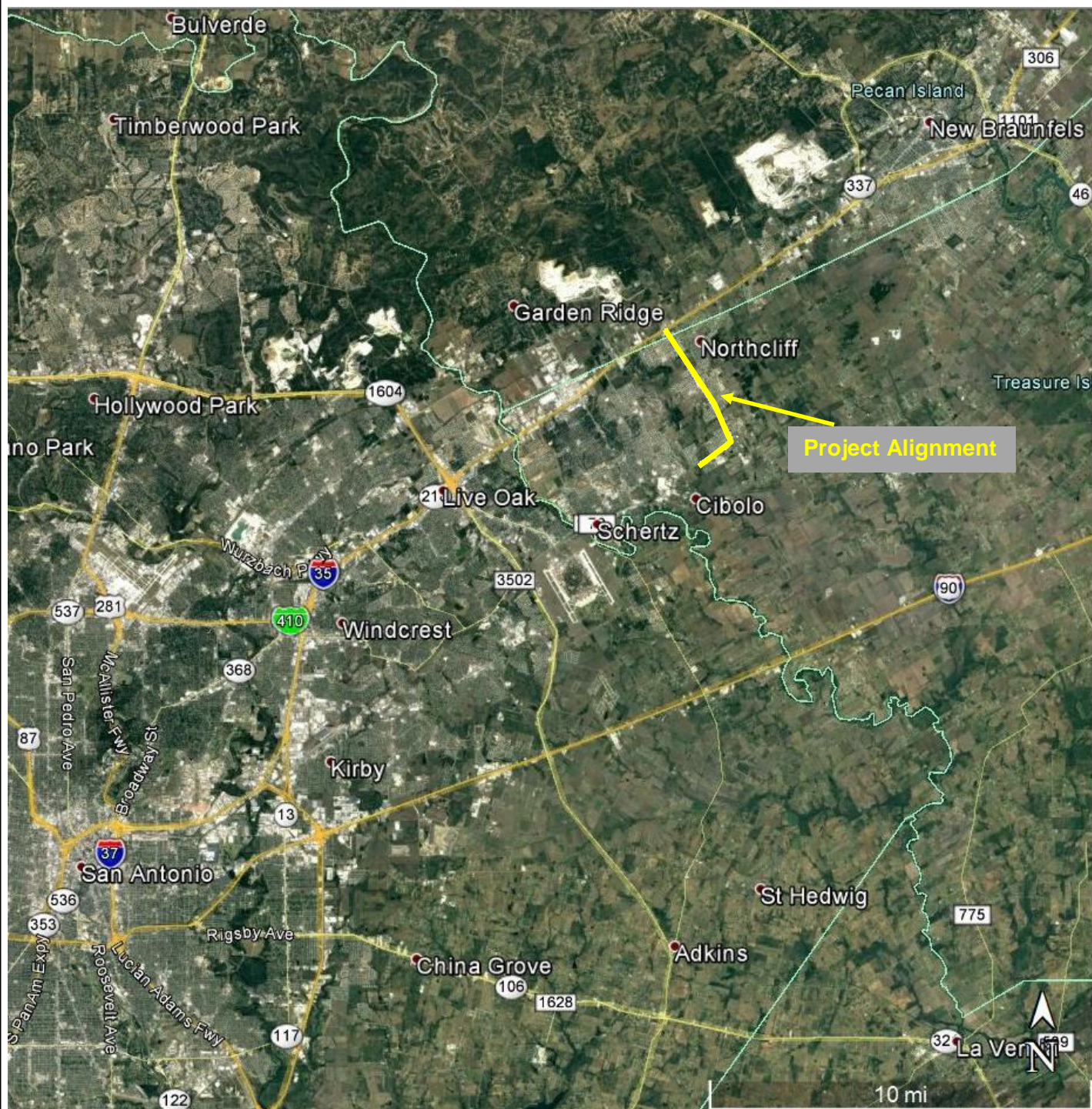
The ground water elevation was not determined during the course of this boring.

Driller: EAGLE

Logger: BpJ

Organization: AVILES ENGINEERING CORP.

CSJ: 1268-01-036



Source: Google Earth Professional

VICINITY MAP

FM 1103

From IH35 to Rodeo Way

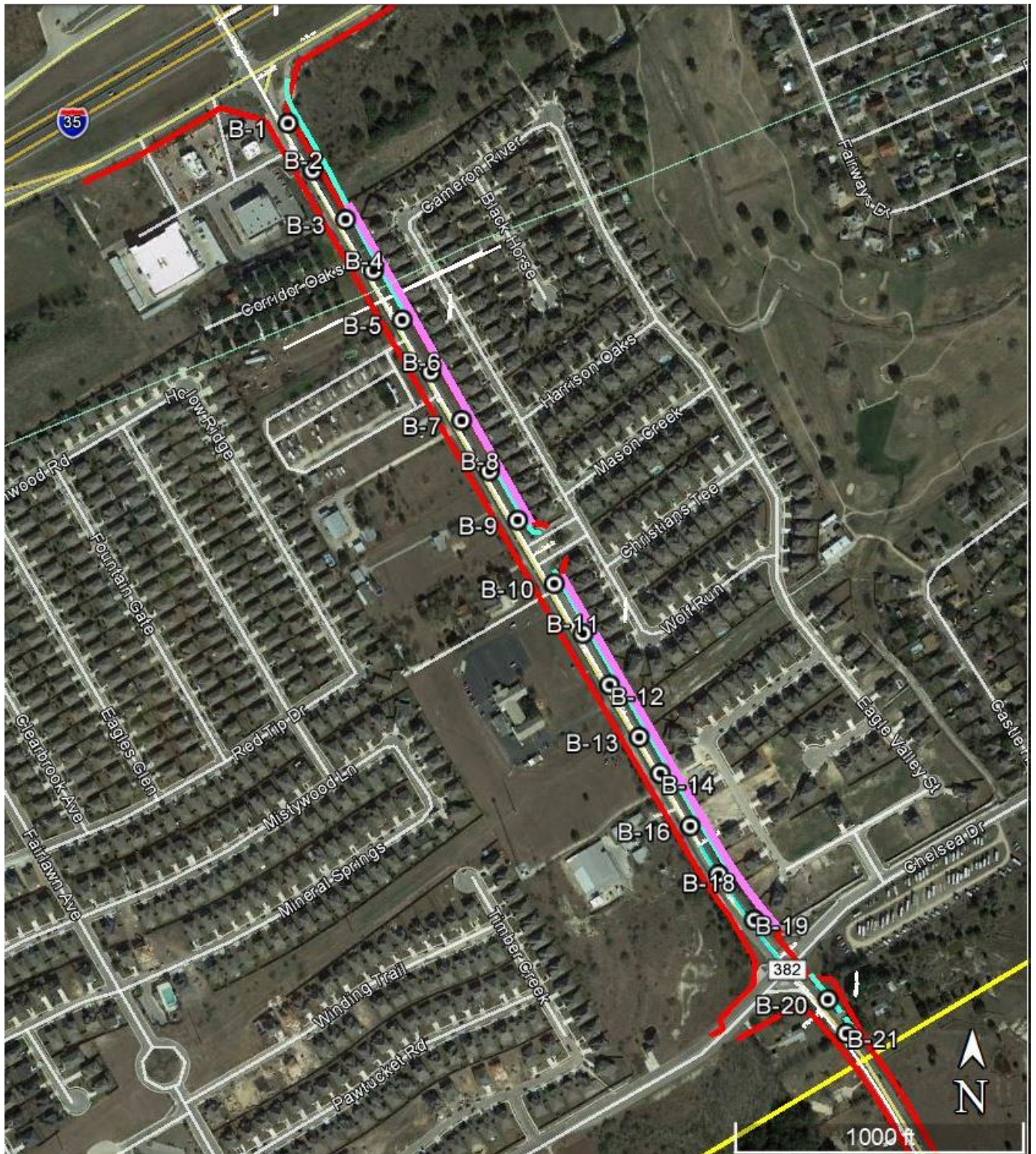
CSJs: 1268-01-013 and 1268-02-027

Guadalupe and Comal Counties, Texas

**Balcones
Geotechnical**

Austin, TX 78731
512.380.9969

Plate 1



Source: Google Earth Professional

PARTIAL BORING PLAN – REACH 1

FM 1103

From IH35 to Rodeo Way

CSJs: 1268-01-013 and 1268-02-027

Guadalupe and Comal Counties, Texas

**Balcones
Geotechnical**
Austin, TX 78731
512.380.9969

Plate 2b



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Comal
Highway FM 1103
CSJ 1268-01-013

Hole B-1
Structure Block Wall
Station
Offset

District San Antonio
Date 2/17/17
Grnd. Elev. 790.31 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
788.3			CLAY, Fat; soft, brown, w/sand (CH)							SS=9-8-10
			CLAY, Lean; hard, tan, w/sand (CL)							
785.3 5		50 (3) 50 (2)		0	101	16			132	UC=7.3 tsf
			LIMESTONE, Weathered; soft to hard, tan, calcareous							SS=50/4
10		50 (1) 50 (0.25)								SS=50/3
775.3 15		50 (1) 50 (0.25)								SS=50/4
20										
25										
30										
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13777773.19, E2210624.074

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Comal
Highway FM 1103
CSJ 1268-01-013

Hole B-2
Structure Block Wall
Station
Offset

District San Antonio
Date 2/17/17
Grnd. Elev. 790.21 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
787.2			CLAY, Fat; soft, brown and tan, w/sand (CH)							PP=2.5 tsf
5		9 (6) 11 (6)	CLAY, Lean; stiff to very stiff, tan, calcareous, w/sand (CL)			15	38	19		PP=4.5+; -200=85%
781.2		50 (1) 50 (0.5)	LIMESTONE, Weathered; soft to hard, tan							PP=4.5+ SS=31-50/5
10		50 (1.25) 50 (0.25)								SS=50/4
775.2										
15										
20										
25										
30										
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13777634.16, E2210702.383

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Comal
Highway FM 1103
CSJ 1268-01-013

Hole B-3
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/24/17
Grnd. Elev. 786.14 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
784.1			CLAY, Fat; brown, w/calcareous nodules (CH)							
			CLAY, Lean; soft, tan, calcareous, w/sand (CL)			20	32	12		SS=4-6-8; -200=83
781.1 5		50 (2) 50 (1.5)								
			LIMESTONE, hard, tan, w/weathered seams and layers							REC=80, RQD=16 (5-10 ft)
10		50 (1.75) 50 (1.25)								REC=100, RQD=57 (10-15 ft)
15		50 (1) 50 (0.75)		0	972	9			134	U=70 tsf REC=97, RQD=88 (15-20 ft)
20		50 (0.75) 50 (1.5)								
				0	389	9			138	REC=97, RQD=93 (20-25 ft) U=100 tsf
25		50 (1) 50 (0.5)								
				0	306	11			135	REC=97, RQD=80 (25-30 ft) U=94 tsf
756.1 30		50 (0.5) 50 (0.5)								
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13777472.65, E2210826.926

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Comal
Highway FM 1103
CSJ 1268-01-013

Hole B-4
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/23/17
Grnd. Elev. 789.45 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
787.5			CLAY, Fat; soft, dark brown, w/calcareous nodules and sand (CH)							PP=1.5 tsf
			CLAY, Lean; stiff, light brown to tan, calcareous, w/sand (CL)							SS=11-14-21
784.5	5	50 (3.5) 50 (3)	LIMESTONE, hard, tan, w/weathered seams and layers							REC=100,RQD=67 (5-10 ft)
				0	708	1			137	U=51 tsf
10		50 (2) 50 (1)								REC=96,RQD=70 (10-15 ft)
15		50 (0.75) 50 (1.25)								U=146 tsf
				0	2028	1			137	REC=97,RQD=97 (15-20 ft)
20		50 (0.75) 50 (0.5)								REC=97,RQD=97 (20-25 ft)
25		50 (1) 50 (0.25)								REC=98,RQD=97 (25-30 ft)
759.5	30	50 (0.5) 50 (0.25)								
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13777294.87, E2210937.408

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Guadalupe
Highway FM 1103
CSJ 1268-02-027

Hole B-5
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/23/17
Grnd. Elev. 794.41 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
790.4	5	7 (6) 9 (6)	CLAY, Fat; soft, dark brown, w/sand and calcareous nodules (CH)	0	46	30			120	PP=2.0 U=3.3 tsf
784.4	10	50 (1.25) 50 (0.75)	CLAY, Lean; soft to stiff, tan, calcareous, w/sand (CL)							SS=3-6-22 REC=96,RQD=0 (8-10 ft)
	15	50 (1) 50 (0.75)	LIMESTONE, hard, tan, w/weathered seams and layers							REC=88,RQD=23 (10-15 ft)
	20	50 (0.75) 50 (0.5)		0	1653	1			135	U=119 tsf REC=99,RQD=48 (15-20 ft)
	25	50 (0.75) 50 (0.25)								REC=100,RQD=60 (20-25 ft)
764.4	30	50 (0.5) 50 (0.25)		0	3500	1			136	U=252 tsf REC=100,RQD=87 (25-30 ft)
	35									
	40									

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13777087.92, E2211033.868

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Guadalupe
Highway FM 1103
CSJ 1268-02-027

Hole B-6
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/22/17
Grnd. Elev. 798.71 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
794.7	5	15 (6) 23 (6)	CLAY, Fat; soft, dark brown, w/sand and calcareous nodules (CH)							PP=1.5 tsf PP=2.0 tsf
790.7	10	50 (1.5) 50 (1)	CLAY, Lean; stiff to very stiff, tan, calcareous, w/sand (CL)							SS=19-32-50/5 REC=100,RQD=0 (8-10 ft)
	15	50 (1) 50 (0.75)	LIMESTONE, hard, tan, w/weathered seams and layers	0	2222	1			140	REC=100,RQD=42 (10-15 ft) U=160 tsf
	20	50 (0.75) 50 (0.75)								REC=100,RQD=53 (15-20 ft)
	25	50 (0.5) 50 (0.5)								REC=97,RQD=38 (20-25 ft)
768.7	30	50 (1) 50 (0.75)								REC=80,RQD=11 (25-30 ft)
	35									
	40									

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13776945.62, E2211120.422

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Guadalupe
Highway FM 1103
CSJ 1268-02-027

Hole B-7
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/22/17
Grnd. Elev. 805.60 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
803.6			CLAY, Fat; soft, dark brown, w/sand (CH)							PP=3.0 tsf
			CLAY, Lean; hard, tan, calcareous, w/sand (CL)							
5		34 (6) 50 (5)				15	39	22		PP=4.5 tsf; -200=91%
798.6			LIMESTONE, hard, tan, w/weathered seams and layers							SS=34-50/5
										SS=50/6
10		50 (1) 50 (0.75)								REC=100,RQD=68 (10-15 ft)
15		50 (1) 50 (0.75)								REC=97,RQD=75 (15-20 ft)
20		50 (1) 50 (1)		0	972	1			139	U=70 tsf
										REC=97,RQD=68 (20-25 ft)
25		50 (1) 50 (0.5)								
				0	2139	3			143	U=154 tsf
										REC=93,RQD=63 (25-30 ft)
775.6		50 (0.5) 50 (0.5)								
30										
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13776777.23, E2211222.832

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Wooley

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Guadalupe
Highway FM 1103
CSJ 1268-02-027

Hole B-8
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/17/17
Grnd. Elev. 815.17 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		6 (6) 7 (6)	CLAY, Fat; stiff, brown to tan and gray, w/fine sand and silt partings, mineral staining, and calcareous pockets (CH)	0	54.2	18			130	PP=2.5 tsf
										PP=2.5 tsf
										U=3.9 tsf
										PP=4.5+, -200=95
805.2 10		22 (6) 50 (3)	LIMESTONE, Weathered, soft, tan, calcareous, friable							
15		50 (0.5) 50 (0.25)								SS=50/4
20		50 (2) 50 (1.5)								SS=44-50/3
25		50 (2) 50 (1.25)								SS=50/4
785.2 30		50 (0.5) 50 (0.5)								SS=50/4
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13776591.75, E2211330.086

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Brewster

Organization: Balcones Geotechnical



DRILLING LOG

1 of 1

WinCore
Version 3.1

County Guadalupe
Highway FM 1103
CSJ 1268-02-027

Hole B-9
Structure Sound Wall
Station
Offset

District San Antonio
Date 2/17/17
Grnd. Elev. 822.21 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
			CLAY, Fat; soft to stiff, brown to tan and gray, w/sand and silt partings, calcareous nodules, and mineral staining (CH)			28	70	45		PP=4.0 tsf PP=2.5 tsf, -200=88%
5		6 (6) 9 (6)								PP=4.5+ tsf
10		22 (6) 24 (6)		0	90.3	16			135	U=6.5 tsf
15		44 (6) 30 (6)								PP=4.5+ tsf
806.2			LIMESTONE, Weathered; soft, tan, calcareous, friable							SS=50/5
20		50 (0.75) 50 (0.75)								
25		50 (1) 50 (0.5)								SS=50/6
792.2		50 (1.25) 50 (0.5)								SS=50/2.5
30										
35										
40										

Remarks: PP=Pocket Pen, SS=Split Spoon Sample with 170-lb hammer. Groundwater was not encountered at the time of drilling. State Coord: N13776422.97, E2211428.252

The ground water elevation was not determined during the course of this boring.

Driller: Coretech

Logger: A. Brewster

Organization: Balcones Geotechnical



DRILLING LOG





1 of 1

WinCore
Version 3.1

County Guadalupe
Highway FM 1103
CSJ 1268-02-027

Hole B-10
Structure Sound Wall
Station
Offset

District San Antonio
Date 6-15-2017
Grnd. Elev. 824.76 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		5 (6) 6 (6)	CLAY, Fat; soft to very stiff, brown to tan and gray, blocky below 10 ft, w/sand and silt partings, calcareous nodules and mineral staining (CH)							P=4.5+ tsf
										P=3.25 tsf
										P=4.0 tsf
										P=4.5+ tsf; -200=96
10		25 (6) 27 (6)								
15		5 (6) 34 (6)								P=4.5+ tsf
804.8 20		50 (1) 50 (0.5)	LIMESTONE, soft to hard, tan, calcareous, w/weathered seams and layers							SS=31-50/4
										REC=93,RQD=83 (20-25 ft)
										U=76 tsf
25		50 (1.25) 50 (0.5)								REC=94,RQD=74 (25-30 ft)
794.8 30		50 (0.25) 50 (0.5)								
35										
40										

APPENDIX B
VICINITY MAPS

DATE: 5/6/2016 2:26 PM
FILE: \\10.176.2.232\p\GEO\Projects\2017\AG 17 10197.2.1 IH-35 NEX CAD\VIC.dwg

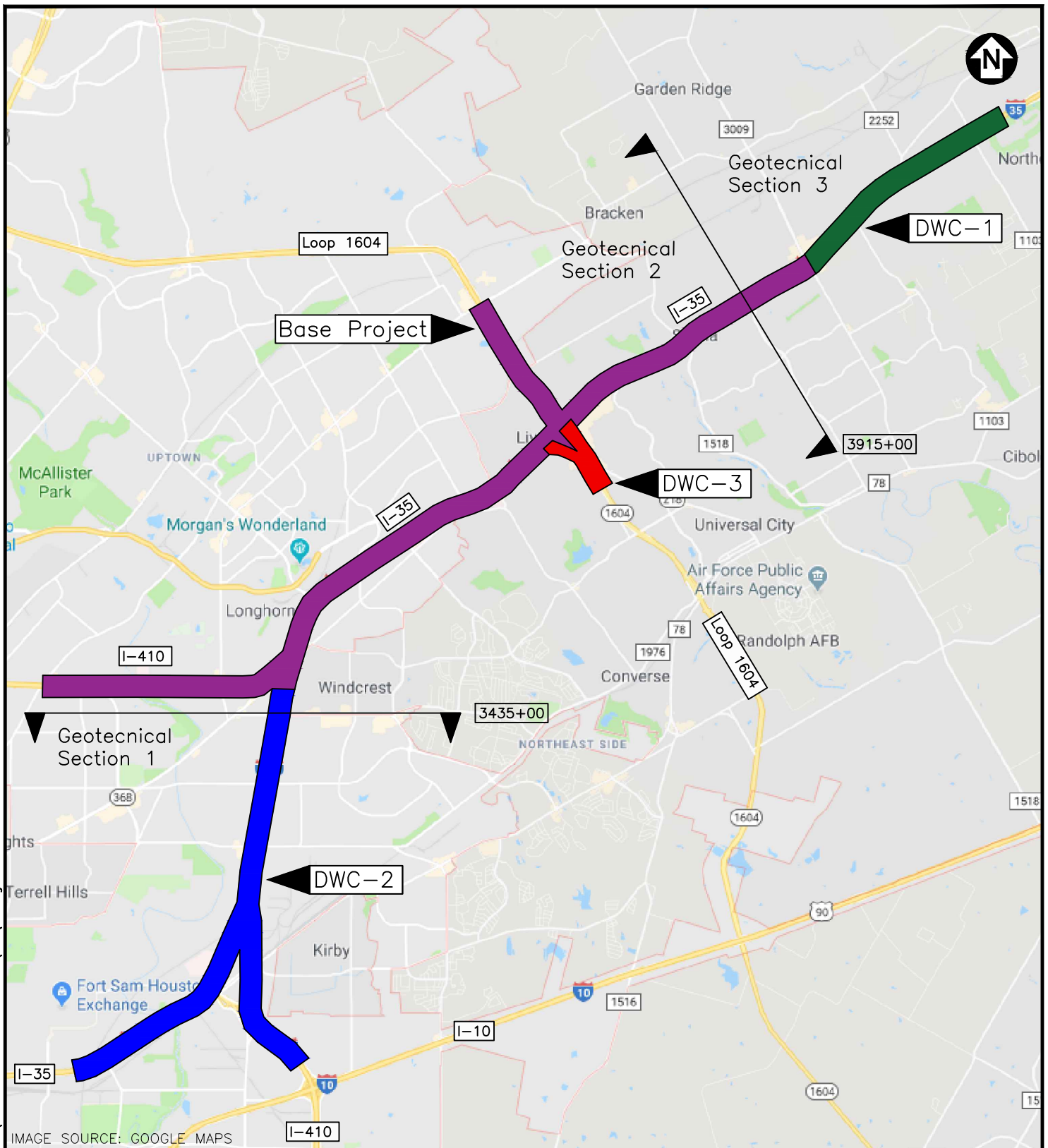


IMAGE SOURCE: GOOGLE MAPS



MAP LOCATION



SCALE: NTS

DATE: 4/9/2019

DRAWN BY:	PROJ. CHK:	APPRV. BY:
SCH	ZL	JS

SITE VICINITY MAP
North-East Expressway
Bexar, Guadalupe and Comal County

PROJECT NO.:
AG 1710197.2.1

FILENAME:
VIC

PLATE 1

WIDENING SITES

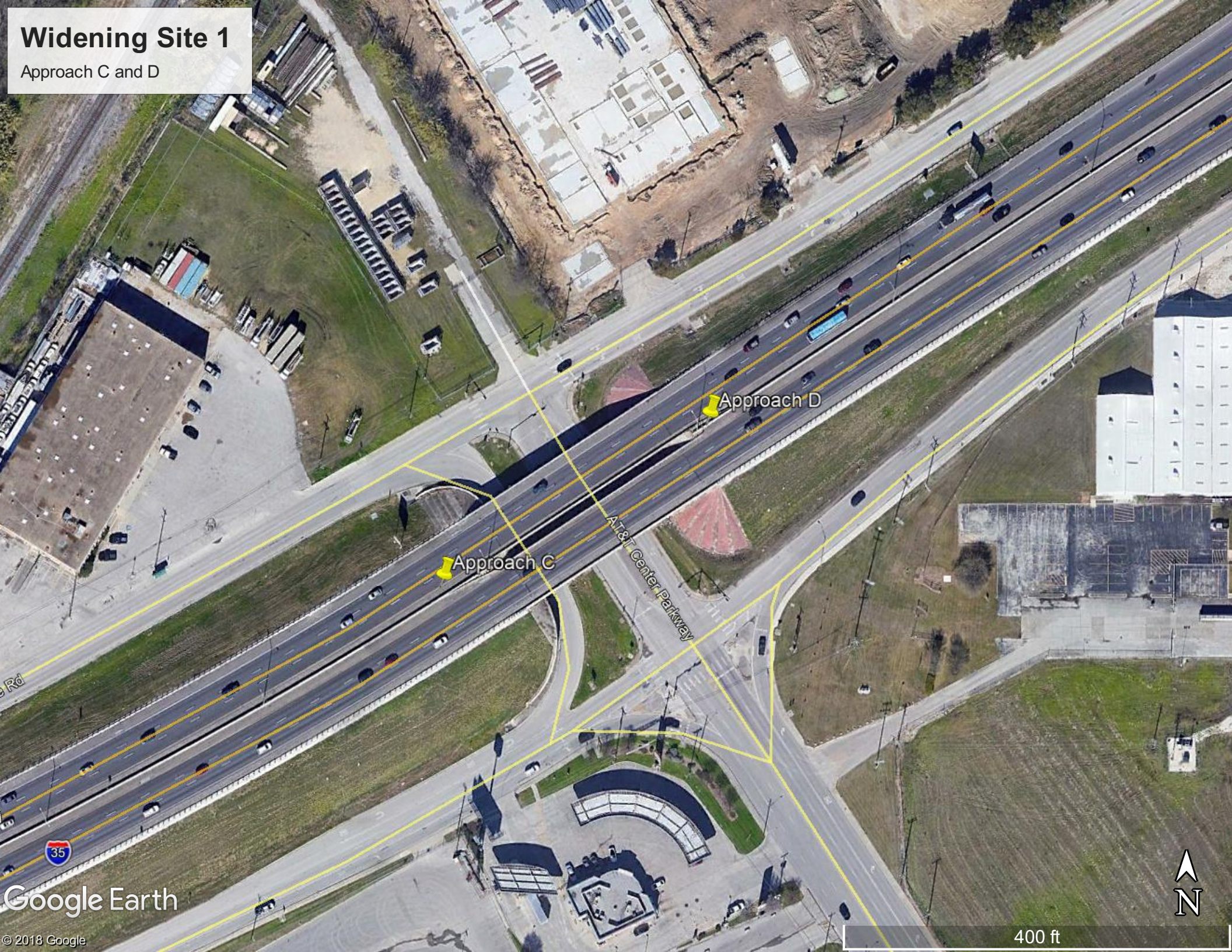
Widening Site 1

Approach A and B



Widening Site 1

Approach C and D



Google Earth

© 2018 Google

400 ft

Widening Site 2

Approach A and B



Approach A

Approach B

1604

North Loop 1604 E

Charles William Anderson Loop

Lookout Rd

Widening Site 2

Approach C and D



Lookout Rd

Approach C

Approach D

Charles William Anderson Loop

1604

1604 E

Google Earth

© 2018 Google

600 ft

Widening Site 3

Approach A



Google Earth

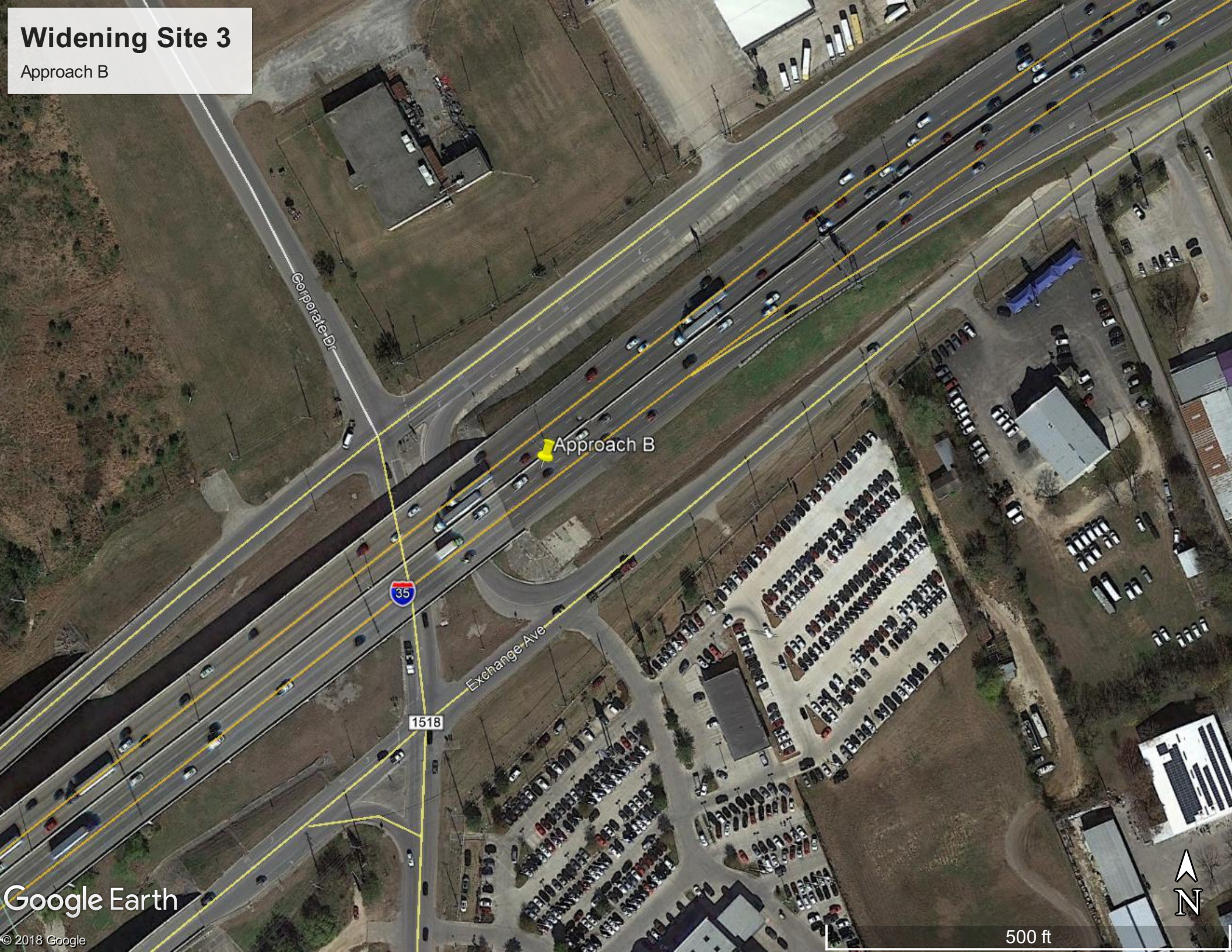
© 2018 Google

500 ft



Widening Site 3

Approach B



Google Earth

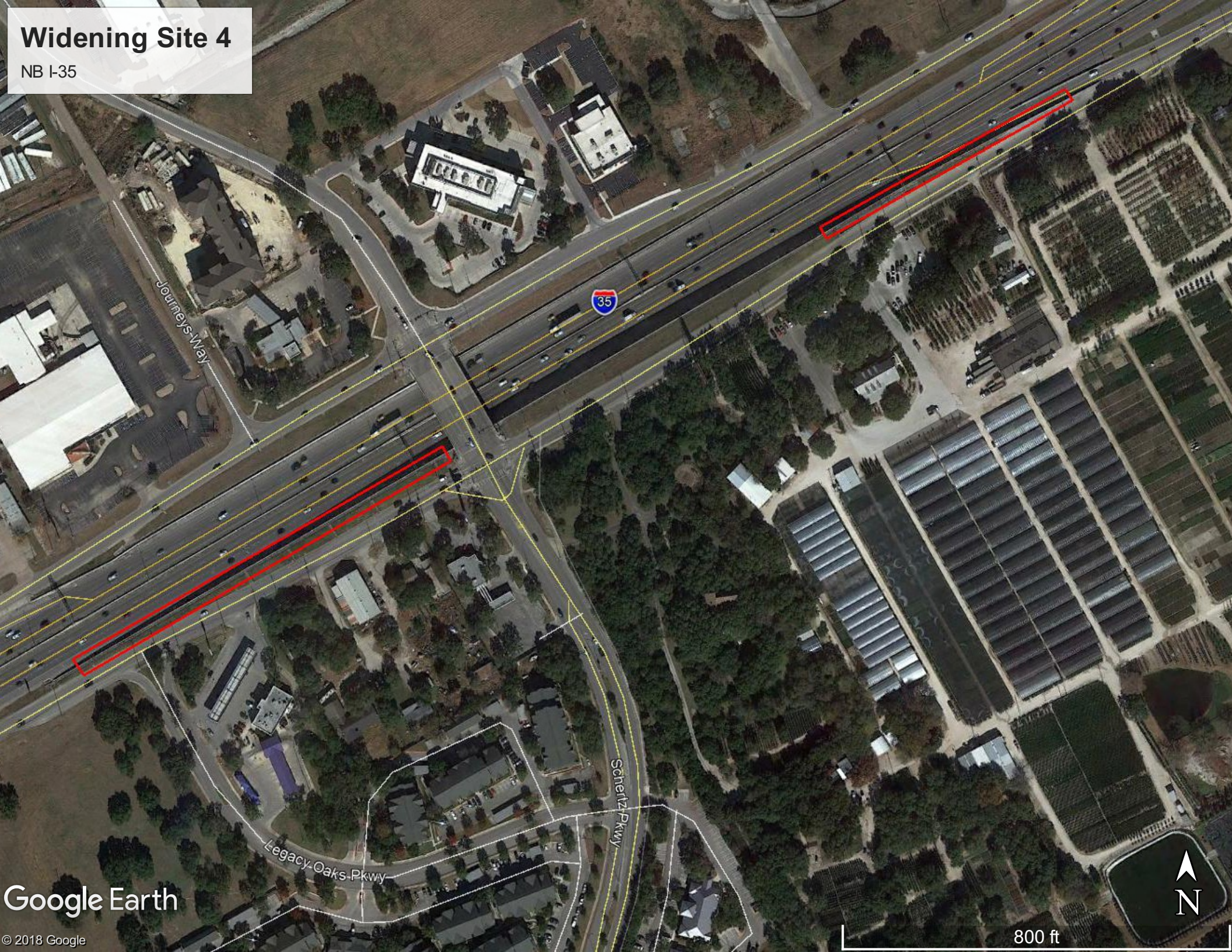
© 2018 Google

500 ft



Widening Site 4

NB I-35




**RETAINING WALLS IN POTENTIAL CONFLICT
WITH DRILLED SHAFTS INSTALLATION**

Retaining Wall 1

I-35 with O'Connor Rd

Legend


 RW ID (As-Built Plan ID)

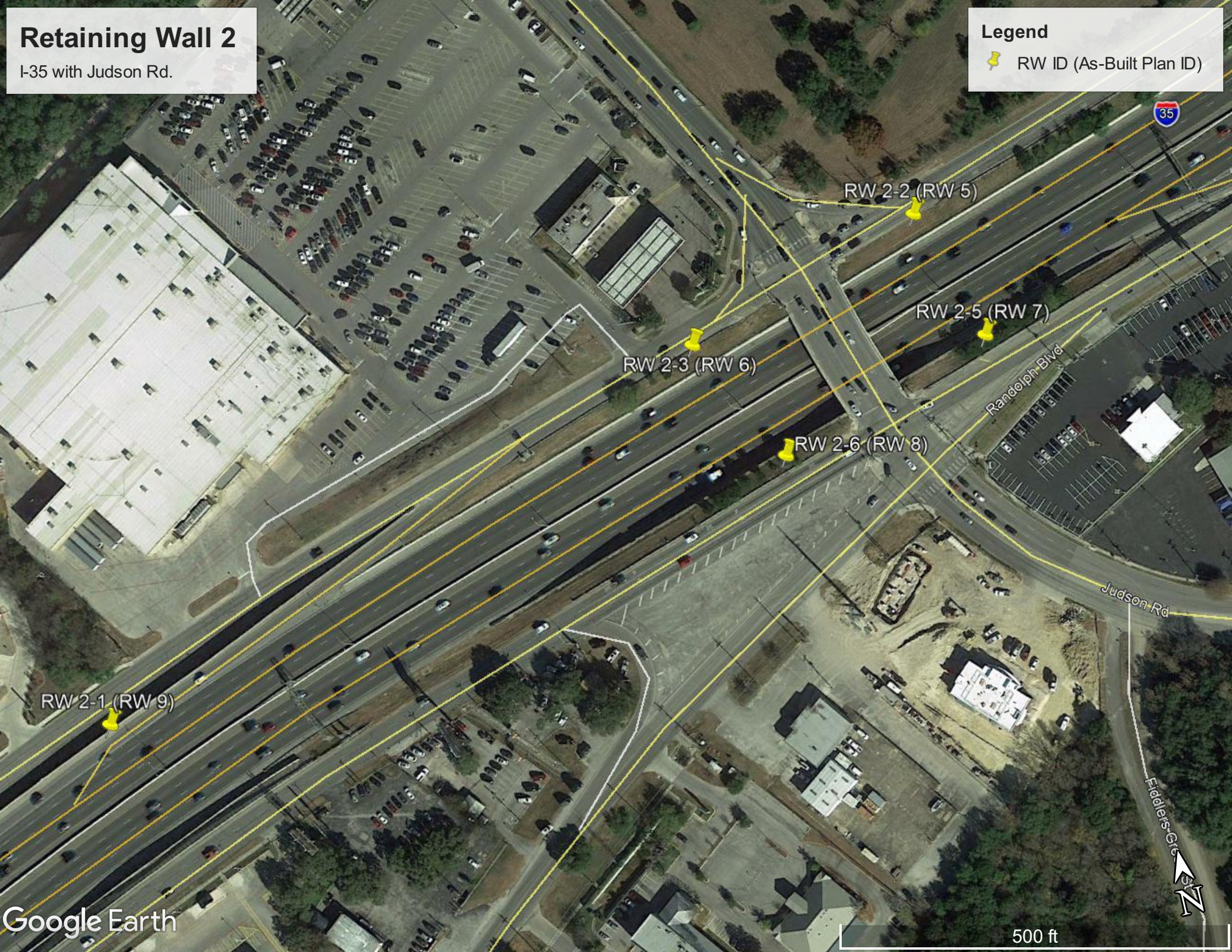


Retaining Wall 2

I-35 with Judson Rd.

Legend


 RW ID (As-Built Plan ID)



Retaining Wall 2

I-35 with Judson Rd.

Legend


 RW ID (As-Built Plan ID)

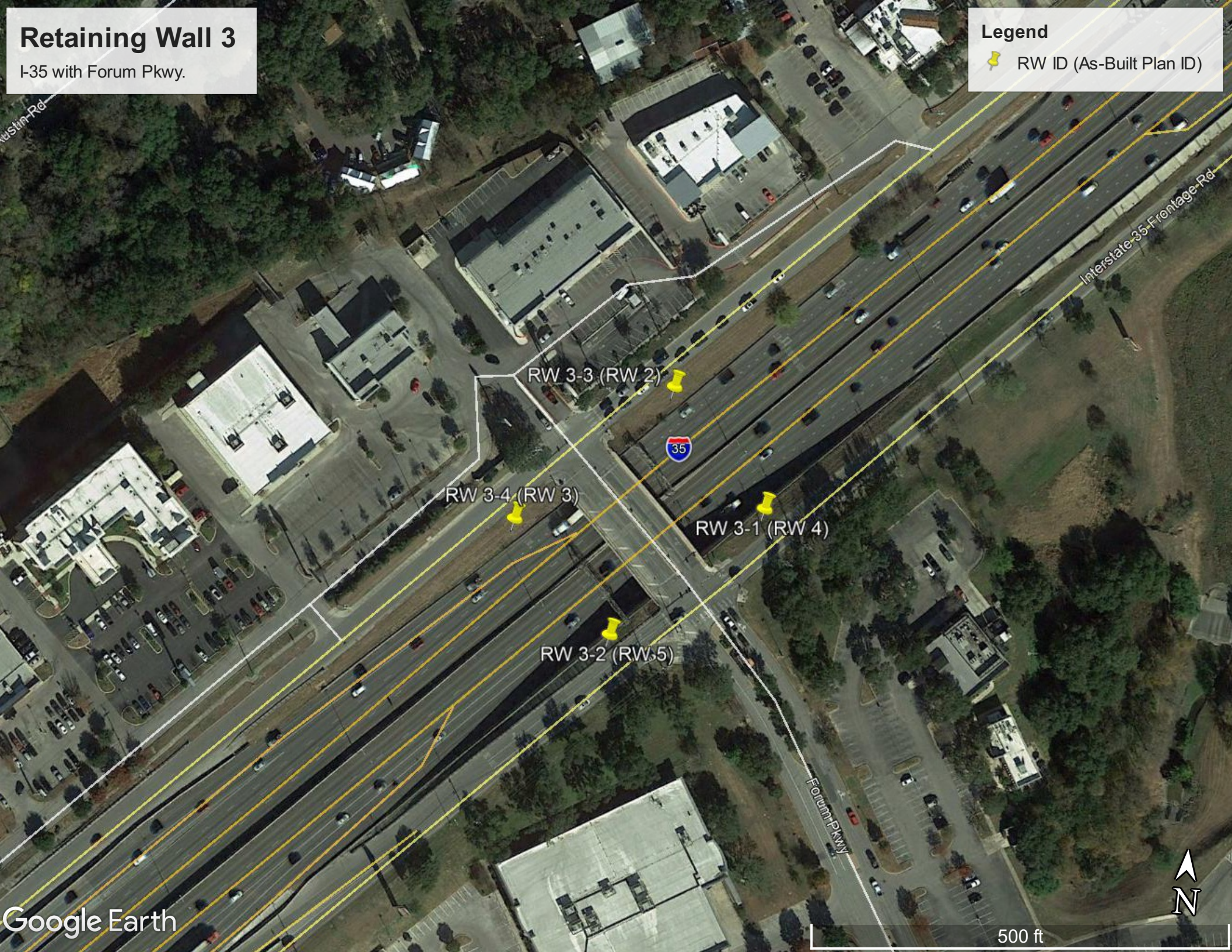


Retaining Wall 3

I-35 with Forum Pkwy.

Legend


 RW ID (As-Built Plan ID)



Retaining Wall 4

I-35 with Schertz Pkwy.

Legend


 RW ID (As-Built Plan ID)

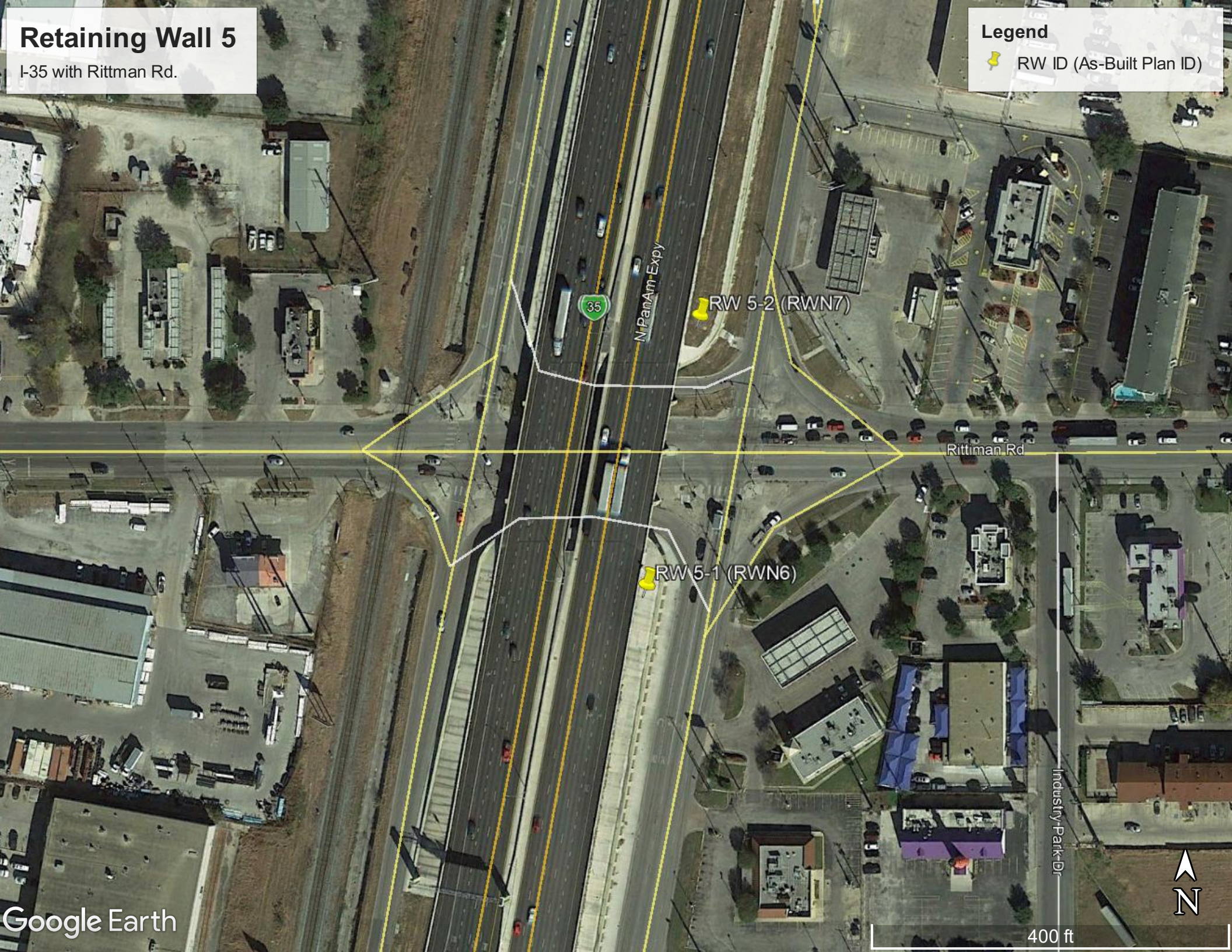


Retaining Wall 5

I-35 with Rittman Rd.

Legend


 RW ID (As-Built Plan ID)

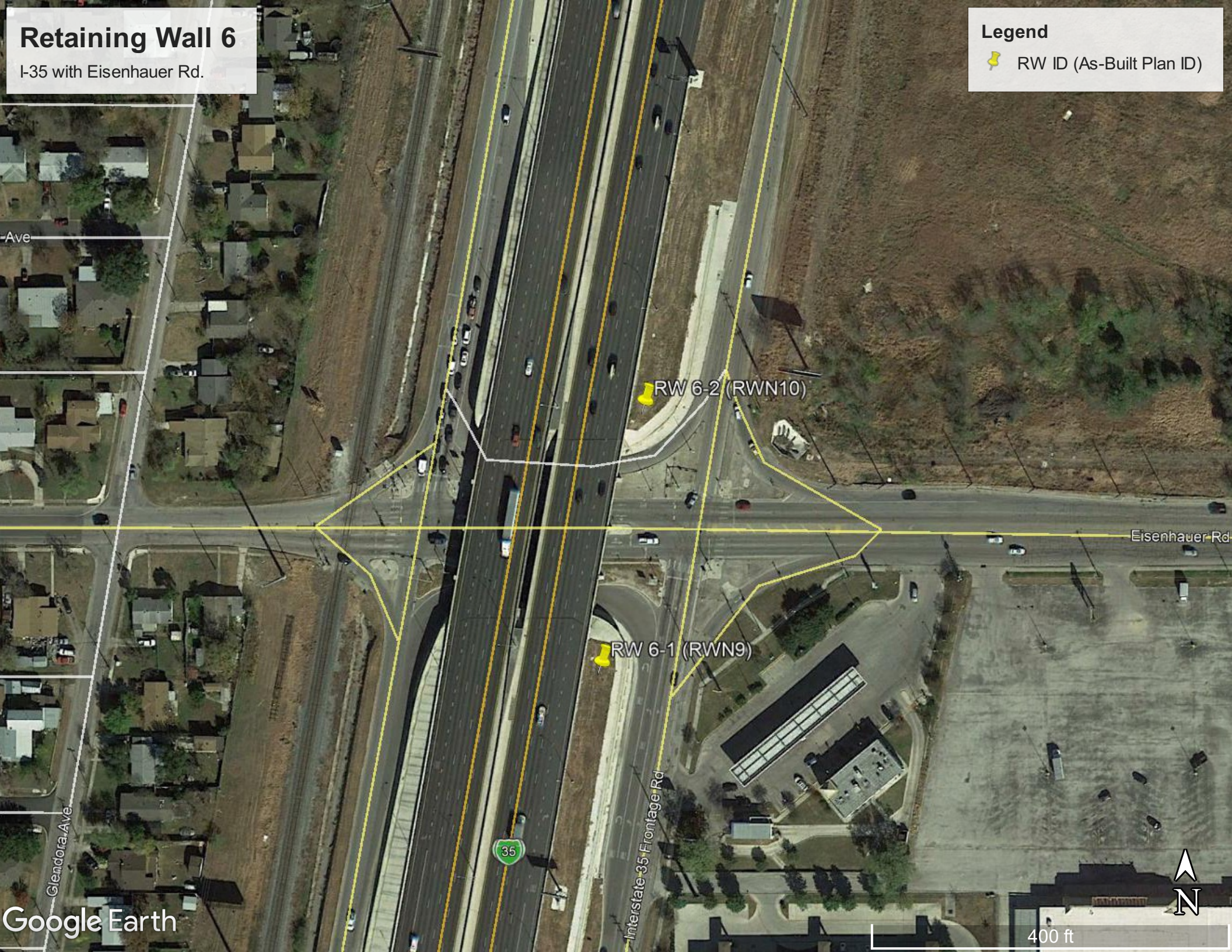


Retaining Wall 6

I-35 with Eisenhower Rd.

Legend


 RW ID (As-Built Plan ID)



Retaining Wall 7

Loop 1604 with Pat Booker Rd.

Legend

 RW ID (As-Built Plan ID)



APPENDIX C
AS-BUILT PLANS INFORMATION

LIST OF REFERENCES OF AS-BUILT PLANS

Widening Sites

Widening Site ID	Approach	DWC	Baseline	Vicinity	Station	CSJ Code	As-Built Document Page Numbers
1	A	2	I-35	I-35 & RR Crossing 0.25 miles SW AT&T Pkwy.	3130+00	0017-10-021	61, 199 - 202
	B				3135+00		
	C			I-35 & AT&T Pkwy.	3143+00	0017-10-021 0017-10-231	64, 215 336, 409 - 410
	D				3146+50	0017-10-021	64, 215
2	A	Base	1604	Loop 1604 & RR Crossing 0.22 miles NW Lookout Rd.	4920+00	2452-03-046	3, 45, 163
	B				4925+00		45, 164
	C			Loop 1604 & NW Lookout Rd.	4933+00		47, 165
	D				4937+00		-
3	A	Base	I-35	I-35 & N Evans Rd.	3860+00	0016-06-029	285 - 286
	B			I-35 & Corporate Dr.	3875+00		-
4	-	1	I-35	I-35 & 0.2 miles NE Schertz Pkwy.	3929+00	0016-06-029	5, 292 - 294., 295

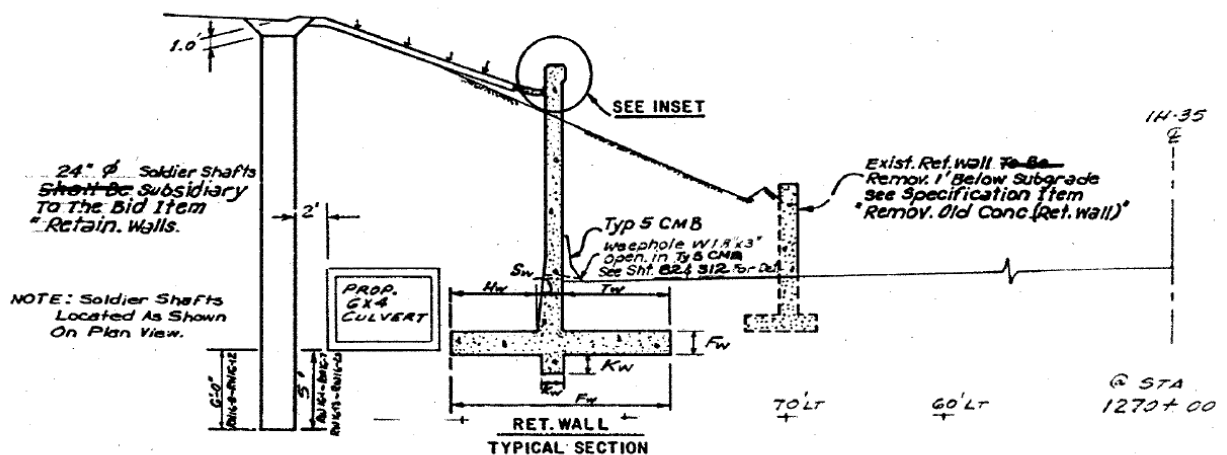
Drilled Shafts in Retaining Walls Reinforcement Zone

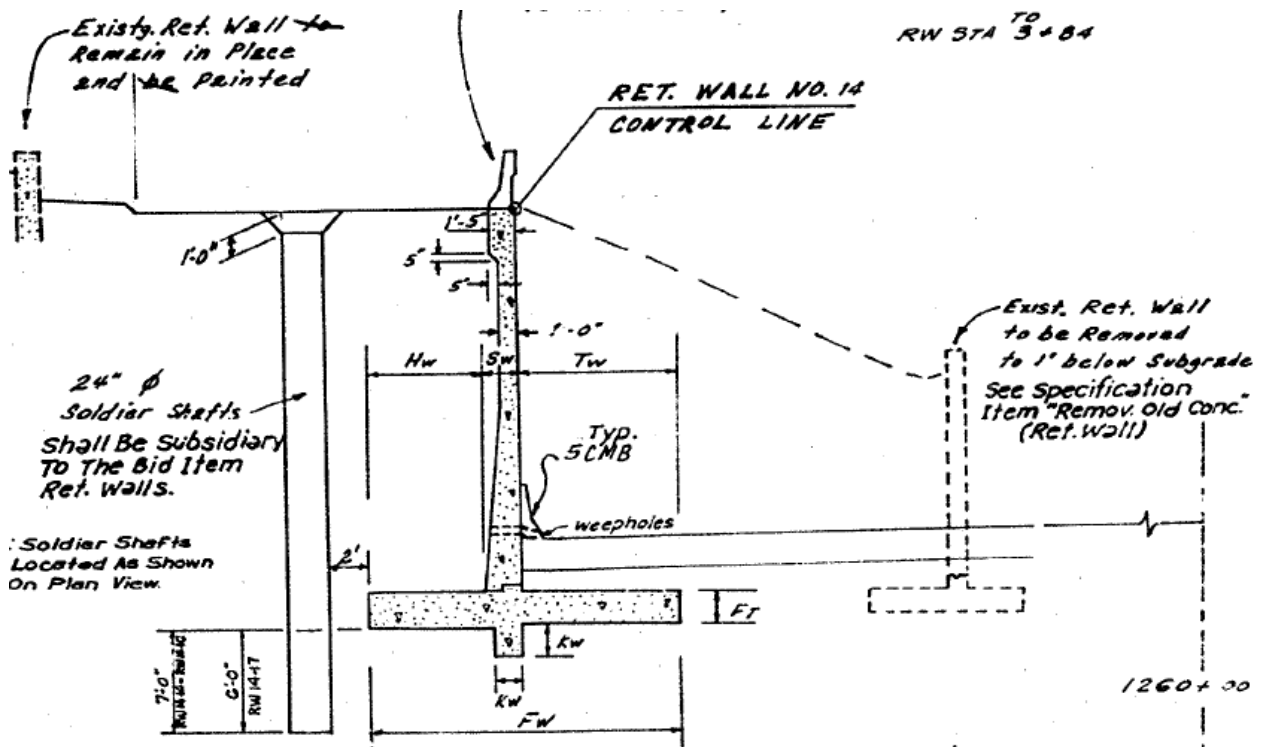
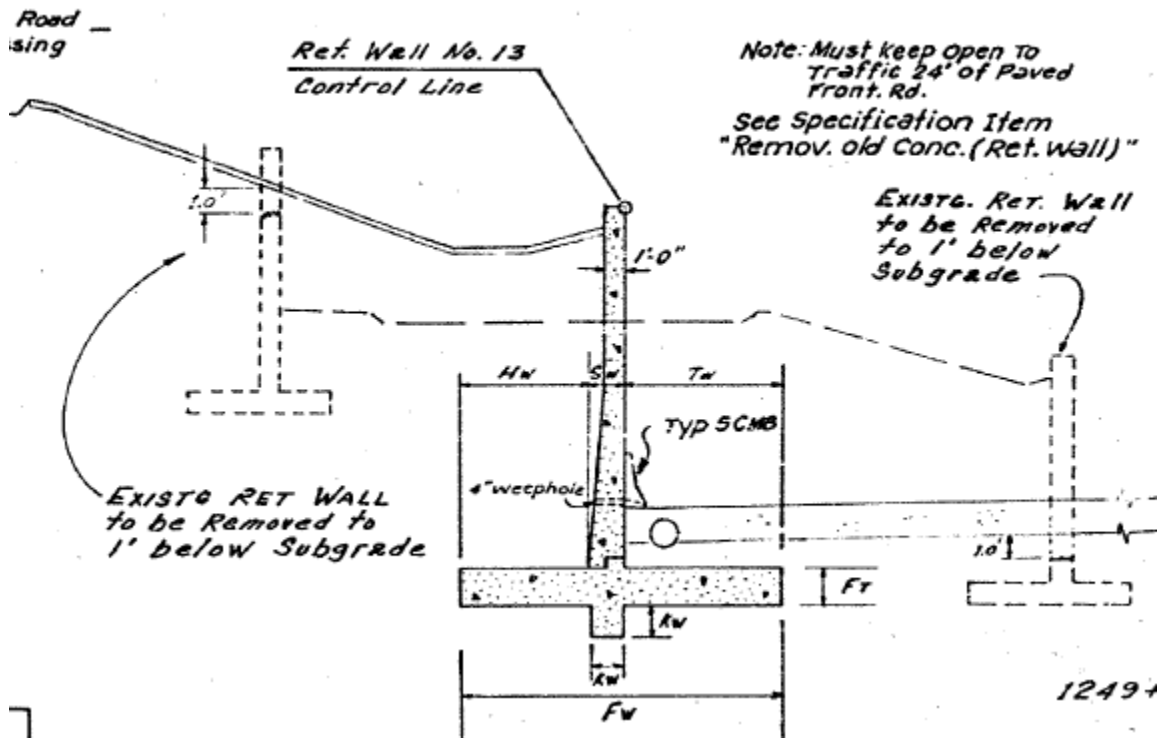
Retaining Wall ID	Location	DWC	Station	Wall ID	As-Built ID	CSJ Code	As-Built Document Page Numbers
1	I-35 with O'Connor Rd	Base	3593+50 - 3601+00	1-1	RW 16	0016-07-081	90, 341 - 344
			3601+00 - 3623+00	1-2	RW 13		RW 13: 85, 325 - 329
				1-3	RW 14		RW 14: 85, 330 - 337
2	I-35 with Judson Rd.	Base	3610+00 - 3616+50	1-4	RW 11		RW 11: 85, 317 - 319
				1-5	RW 12		RW 12: 85, 320 - 324
			3640+00 - 3655+00	2-1	RW 9		81, 306 - 313
			3655+00 - 3674+00	2-2	RW 5		RW 5: 75, 294 - 298
				2-3	RW 6		RW 6: 75, 299 - 301

Retaining Wall ID	Location	DWC	Station	Wall ID	As-Built ID	CSJ Code	As-Built Document Page Numbers
			3633+00 - 3640+00	2-4	RW 10		81, 314 - 316
			3657+00 - 3666+00	2-5 2-6	RW 7 RW 8		RW 7: 75, 302 - 303 RW 8: 75, 304 - 305
3	I-35 with Forum Pkwy.	Base	3775+00 - 3781+20	3-1 3-2	RW 4 RW 5	0016-07-089	RW 4: 100, 509 - 510 RW 5: 100, 511 - 512
			3775+00 - 3780+00	3-3 3-4	RW 2 RW 3		RW 2: 100, 505 - 506 RW 3: 100, 507 - 508
4	I-35 with Schertz Pkwy.	Base	3910+00 - 3935+00	4-1	RW D	0016-06-029	5, 289 - 291, 295, 302
			3910+50 - 3930+00	4-2	RW E		5, 292 - 294., 295, 302
5	I-35 with Rittman Rd.	Base	3341+00 - 3352+00	5-1	RWN6	0017-10-261	RWN6: 325-326, 589-591, 866
			3343+00 - 3354+50	5-2	RWN7		RWN7::327, 594 - 595, 866
6	I-35 with Eisenhower Rd.	Base	3387+00 - 3397+00	6-1	RWN9		RWN9: 328, 603-604, 889
			3389+00 - 3399+00	6-2	RWN10		RWN10: 329, 607-608, 889
7	Loop 1604 with Pat Booker Rd.	DWC3	1024+00 - 1032+00	7-1	RW 26	0016-07-089	574 - 581
			1026+00 - 1030+00				

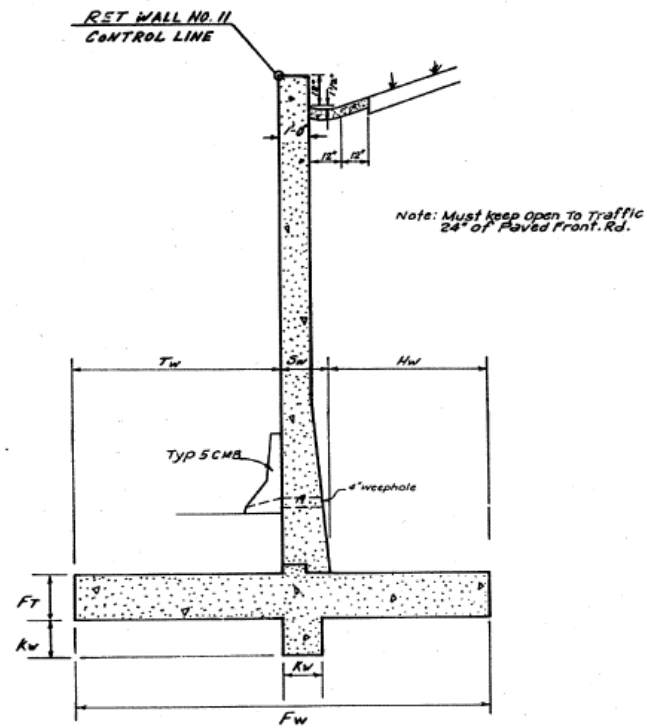
AS-BUILT PLANS TYPICAL SECTIONS FOR POTENTIAL DRILLED SHAFT CONFLICTS

- RW 1-1

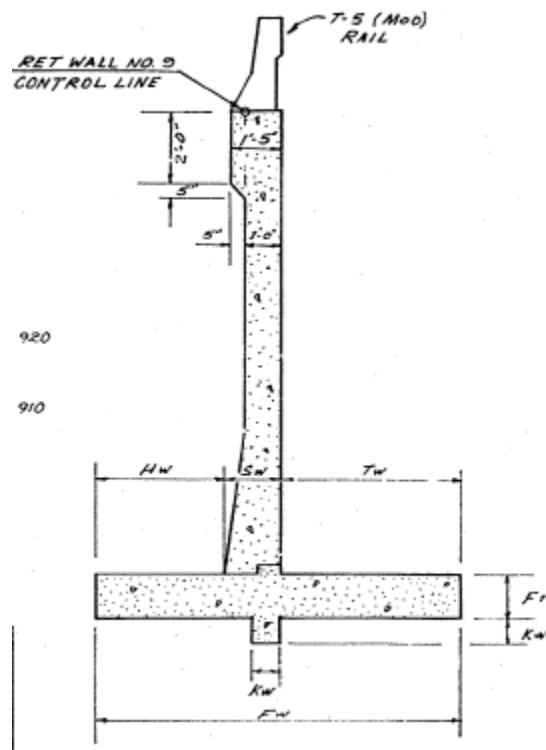




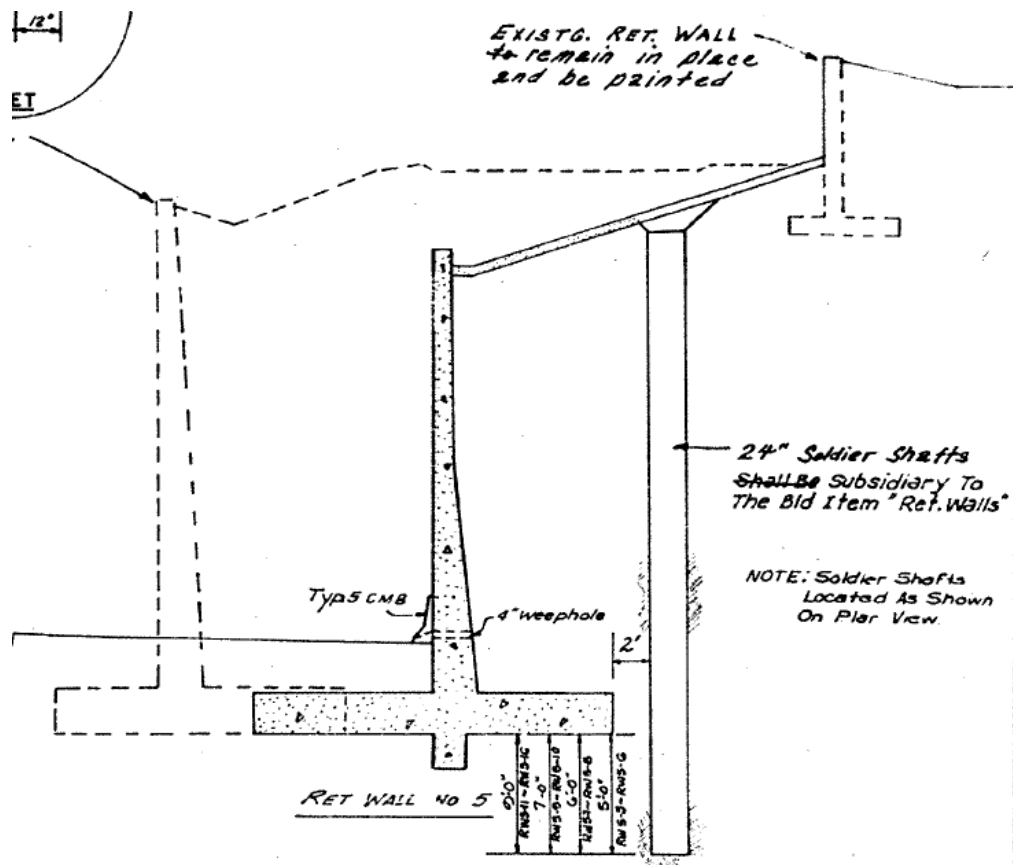
- RW 1-4, 1-5



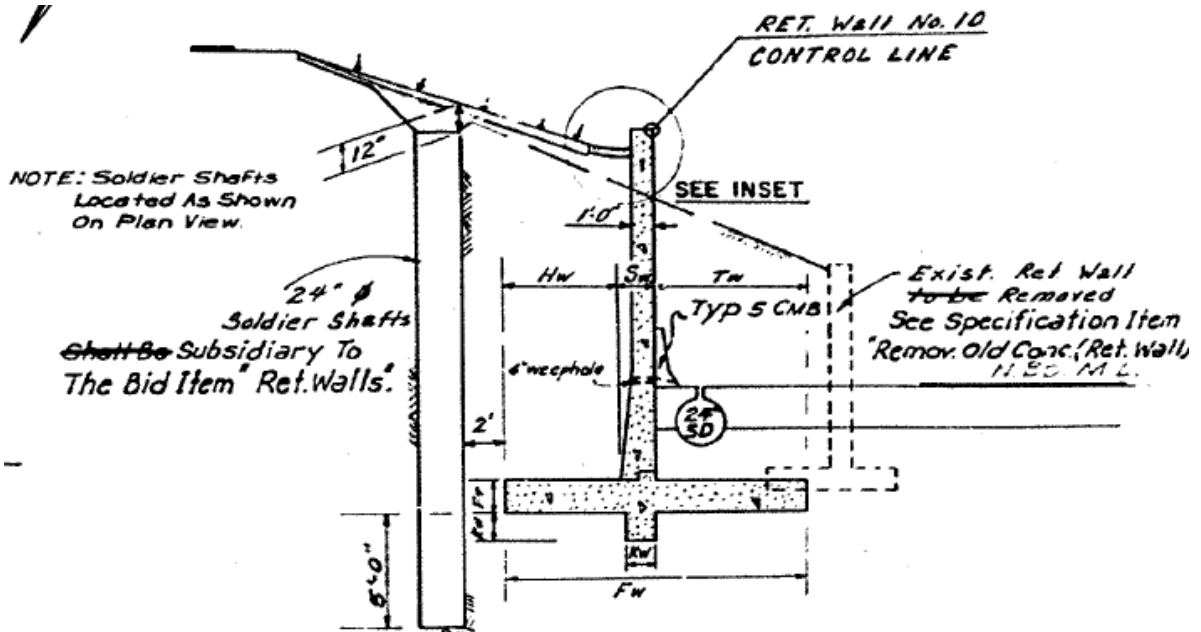
- RW 2-1, 2-3



- RW 2-2



- RW 2-4



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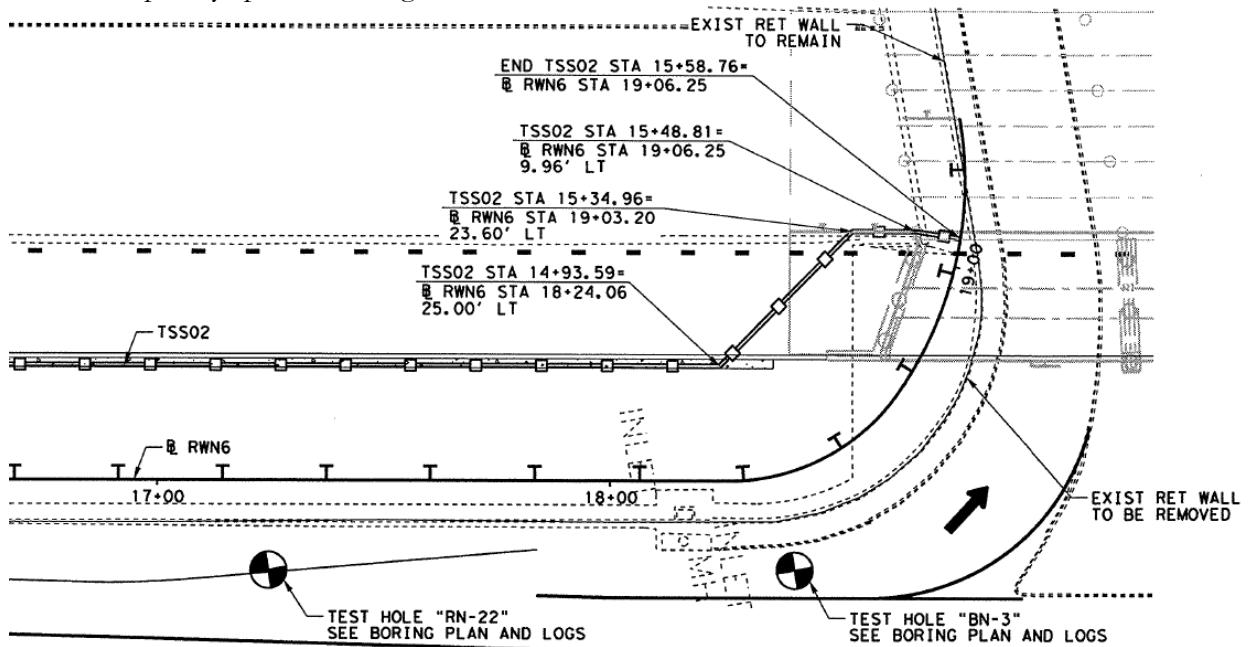
-
- TYPICAL SECTION**
- (LOOKING STATIONWISE)

-

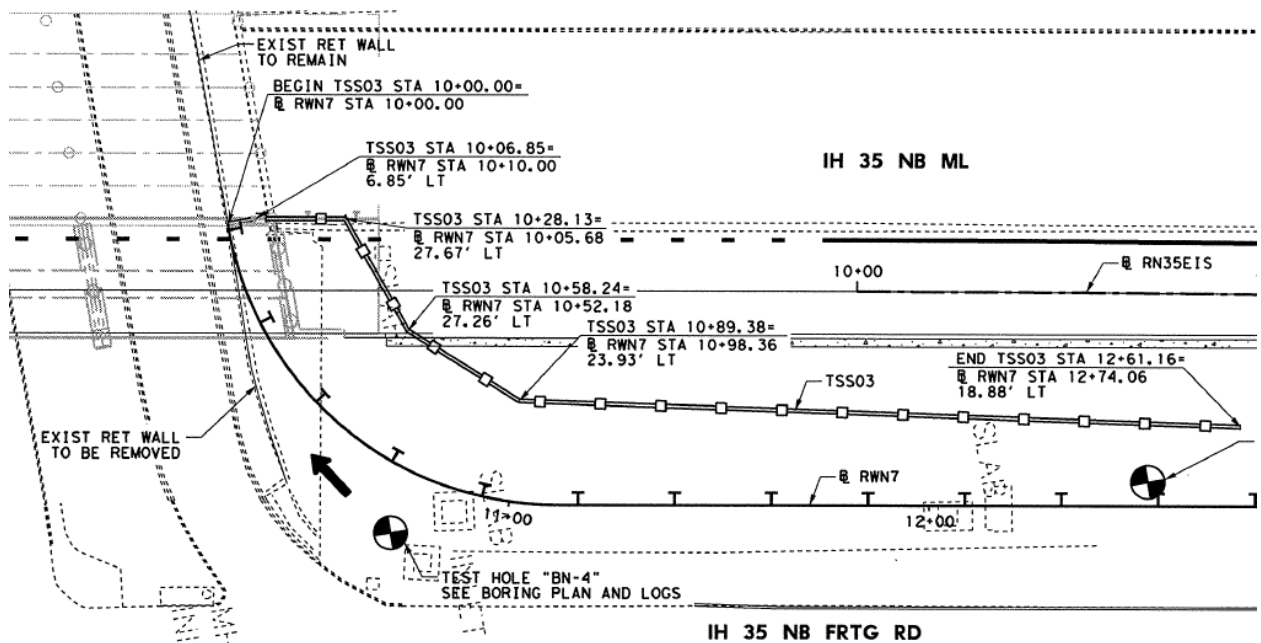
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- **RW 5-1**

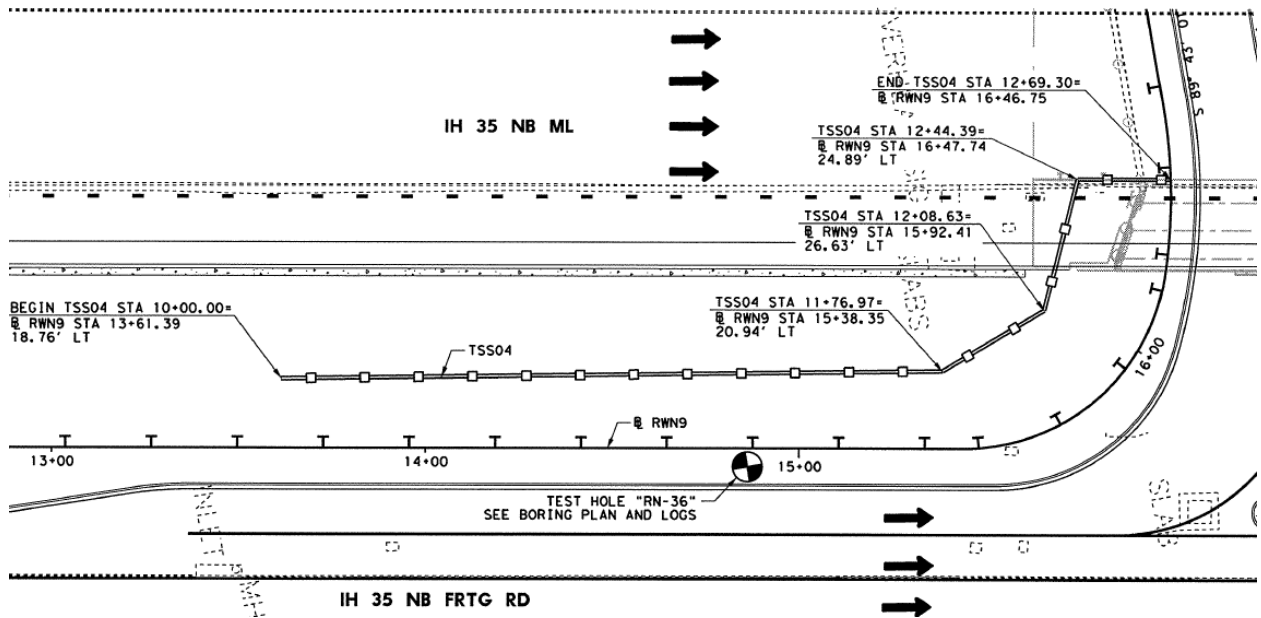
TSS = temporary special shoring



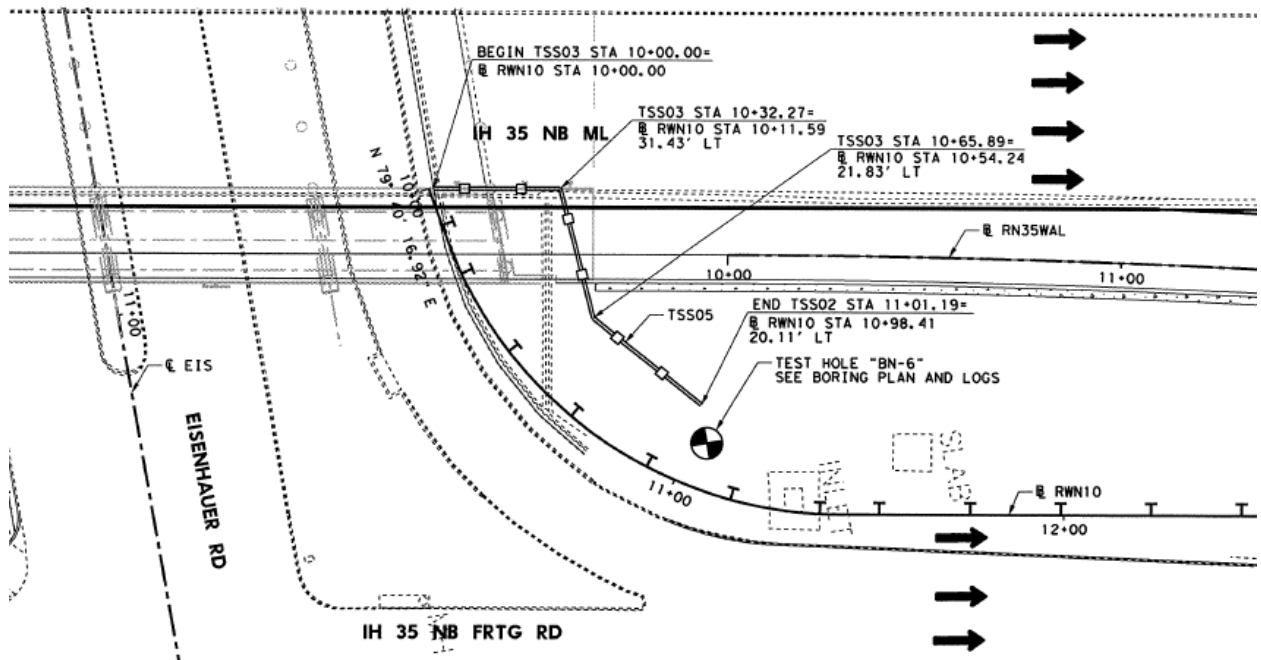
- **RW 5-2**



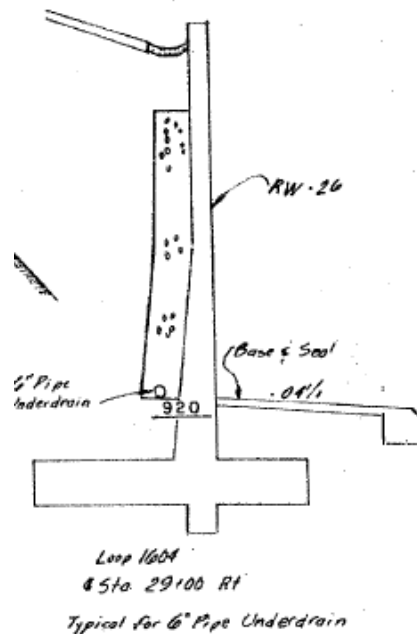
- RW 6-1



- RW 6-2

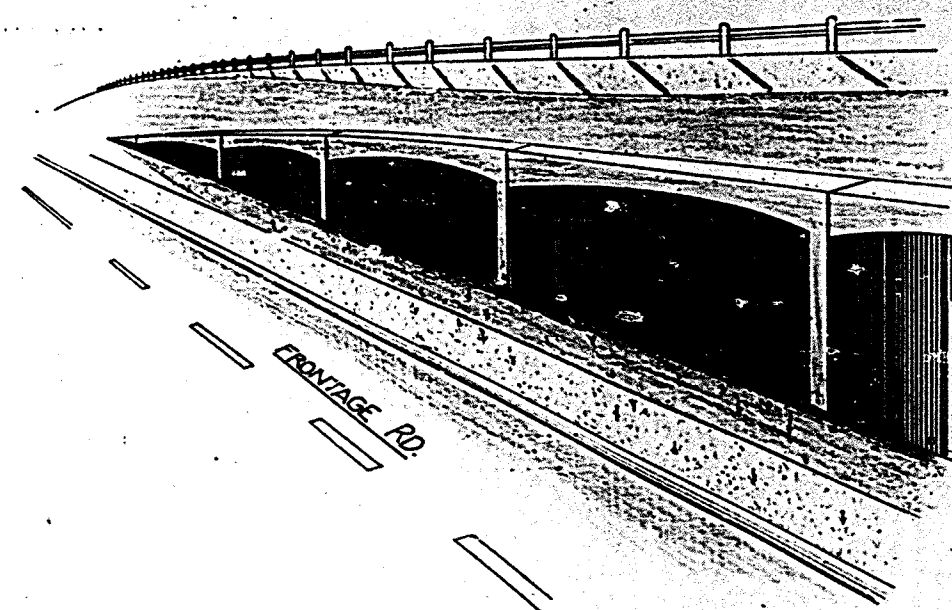


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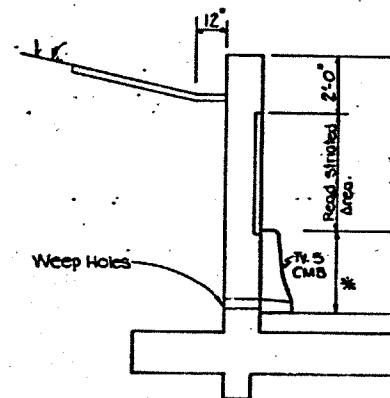
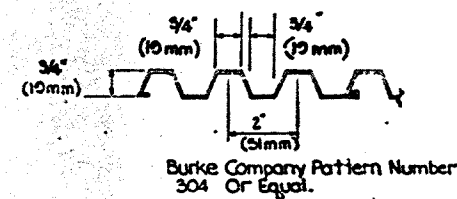


APPENDIX D
AS-BUILT FACING SPECIFICS OF RETAINING WALLS IN POTENTIAL CONFLICT
WITH PROPOSED DRILLED SHAFTS

CSJ: 0016-07-081
RETAINING WALLS 1 AND 2

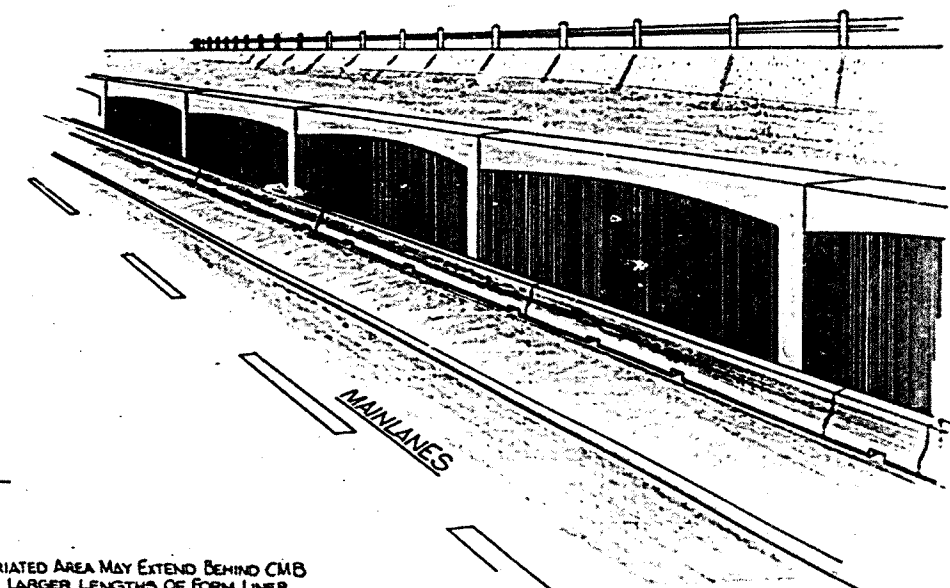


PERSPECTIVE OF STRIATED WALL
IN MAINLANE FILL AREAS

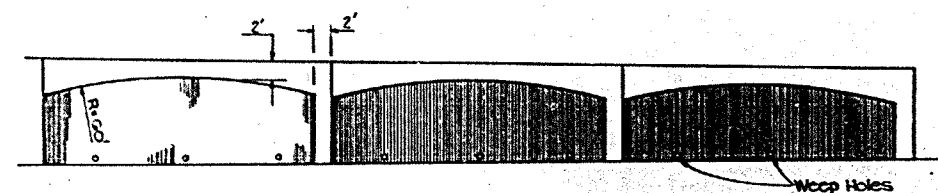


CUT SECTION

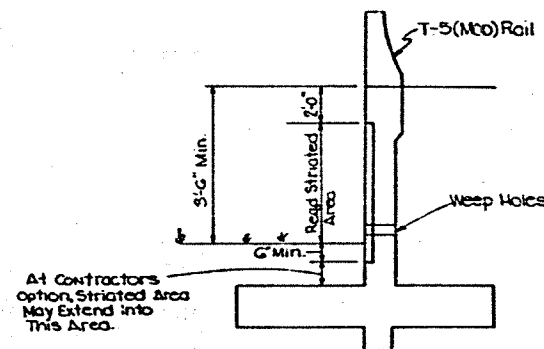
* AT CONTRACTORS OPTION, STRIATED AREA MAY EXTEND BEHIND CMB
IN ORDER TO ACCOMMODATE LARGER LENGTHS OF FORM LINER.
HOWEVER, THE RESULTING GROOVES BEHIND THE WALL SHALL
BE SEALED WITH GROUT AS APPROVED BY THE ENGINEER.



PERSPECTIVE OF STRIATED WALL IN
MAINLANE CUT AREAS

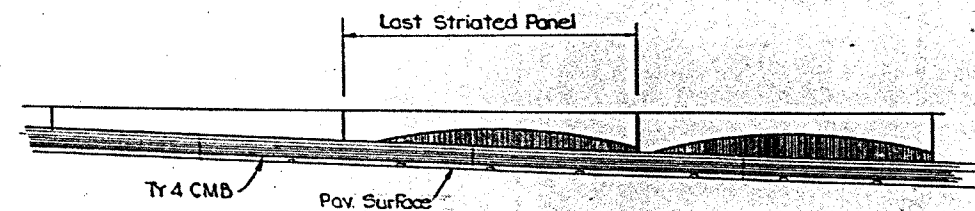


ELEVATION (IN MAINLANE FILL SECTION)

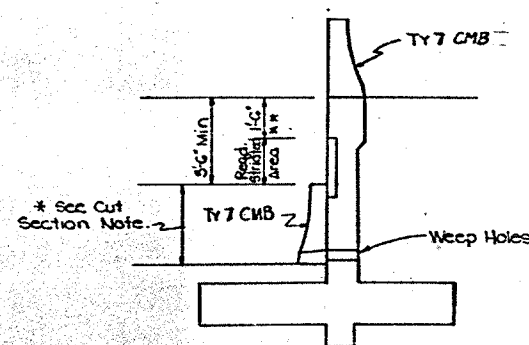


FILL SECTION

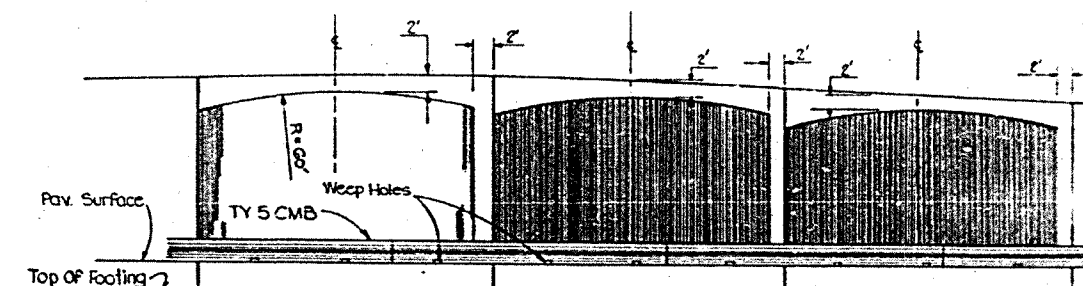
At Contractors
option, Striated Area
May Extend into
This Area.



ELEVATION @ END STRIATED AREA
(BOTH CUT AND FILL AREAS OF MAINLANES)

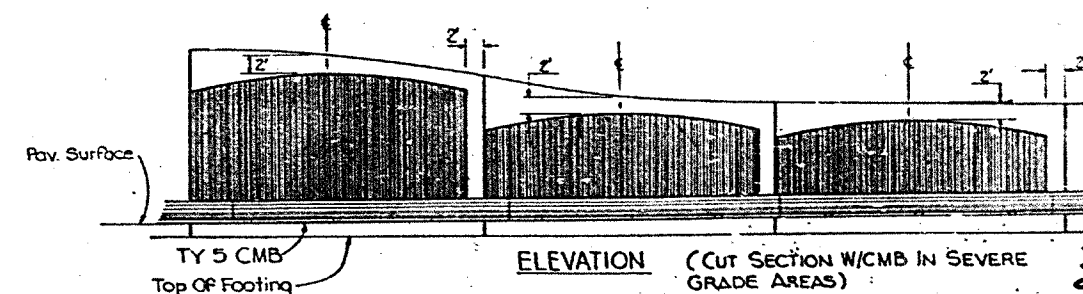


MEDIAN SECTION



ELEVATION (MAINLANE CUT SECTION W/CMB)

** 1'-6\"/>



ELEVATION (CUT SECTION W/CMB IN SEVERE
GRADE AREAS)

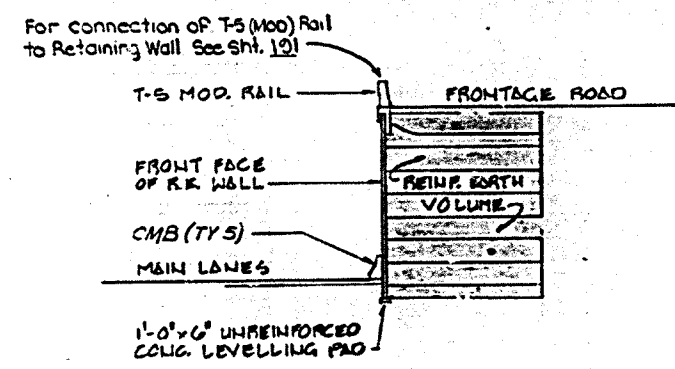
STRIATED FINISH
RETAINING WALL FACING
CAST-IN-PLACE RET. WALL

RW-3 (MOD. X2)									
NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.						
8	TEXAS	EACT 35-2(144)160	314						
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.	JOB NO.	HIGHWAY NO.				
15	BEAR	16	7	81	155				

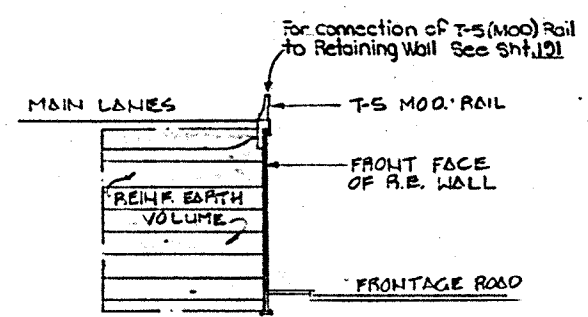
NOTES: 1. Required Striation Designs Are Listed for Each Wall On Retaining Wall Summary Sheet.
2. Striation Areas Shall Receive A C.B. Finish (Except For RW-3, Which Shall Be Left Unpainted).
Color Striation Areas Shall Be Stan-Lux Brand Maple Sugar As Manufactured By Standard T-Chemical Co.

Or Equal. The Engineer Shall Select The Exact Shade Of Maple Sugar, Similar To Local Exposed Aggregate Color, After The Contractor Has Furnished Sample Panels Of Several Shades.
The Non-Striated Surfaces Shall Be Painted With A Winter White Color Of The Same Brand Or Equal.

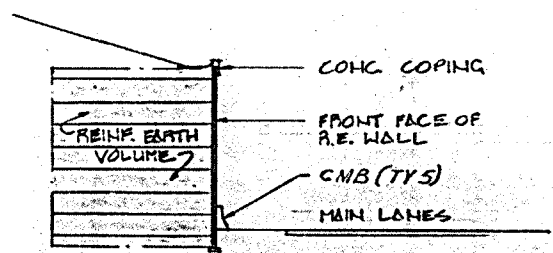
214



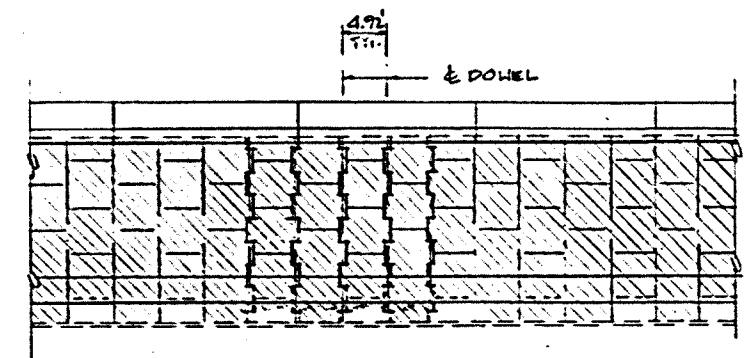
CUT SECTION - ELEVATED FRONTAGE ROAD



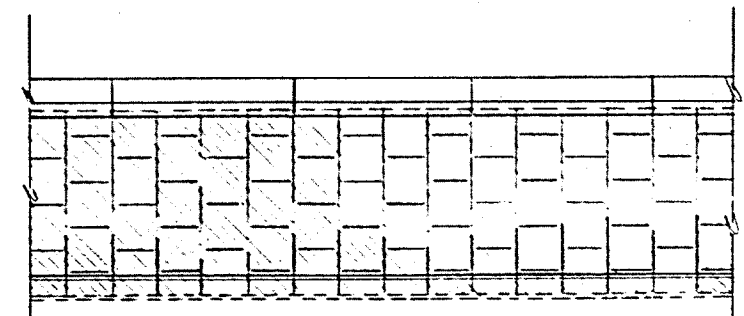
FILL SECTION - AT GRADE FRONTAGE ROAD



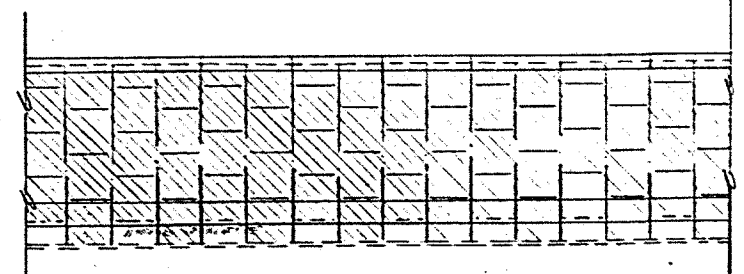
CUT SECTION - NO FRONTAGE ROAD




PARTIAL ELEVATION



PARTIAL ELEVATION



PARTIAL ELEVATION


 LIMIT OF ARCHITECTURAL TREATMENT. See next sheet for details.

SURFACE FINISH
 RETAINING WALL FACING
 REINFORCED EARTH RETAINING WALL
 RW-3(MOD)(3)

315

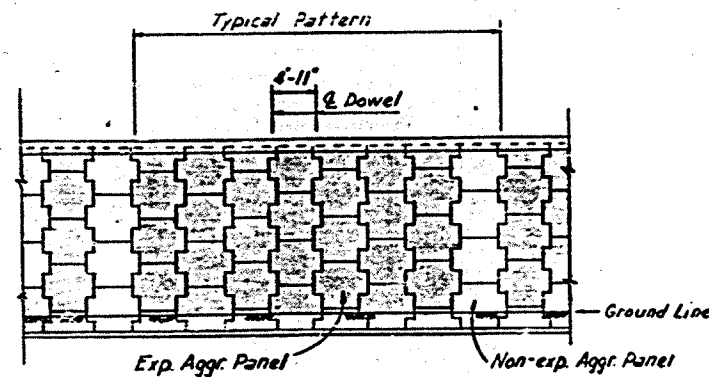
Sheet 1 of 2

This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of TEXAS STATE DEPT. OF HIGHWAYS & PUBLIC UTILITIES only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company.
 The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an express or implied license under the Vidal patents.

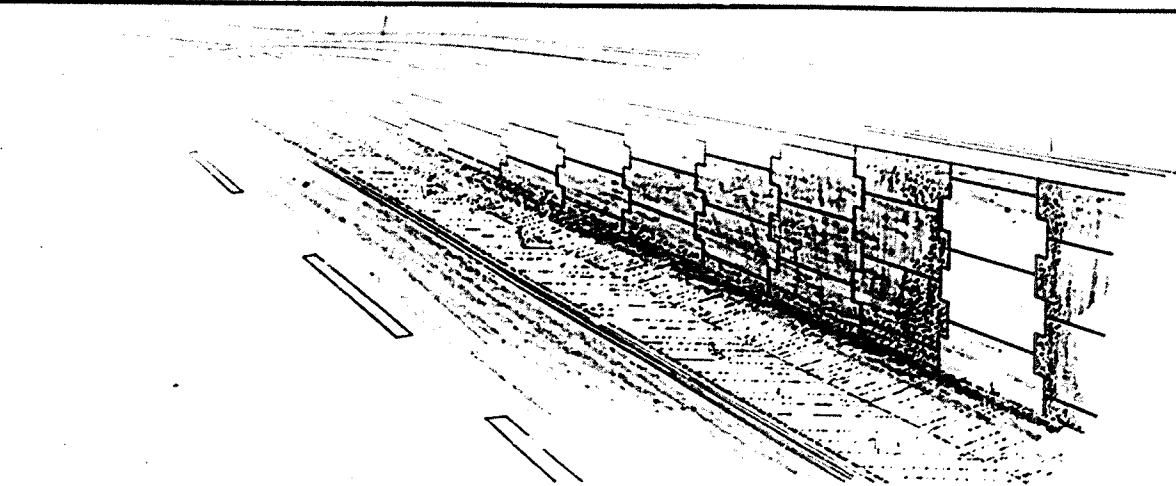
FILE NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
0	TEXAS	EACI 35-2(144)168	3/3
STATE	COUNTY	CONTR. SECT.	NO.
15	BEXAR	16	7 181

12 MAY 81

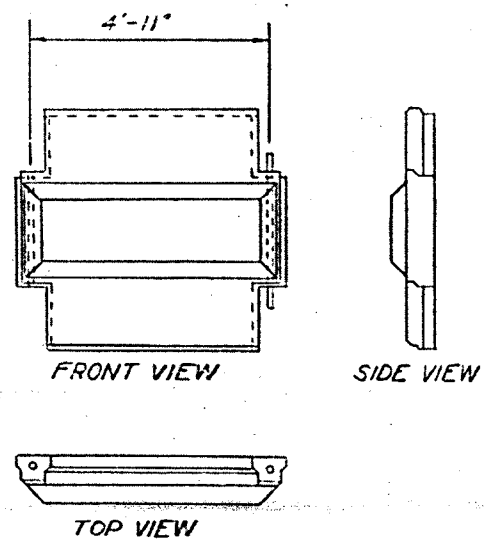
RE 963



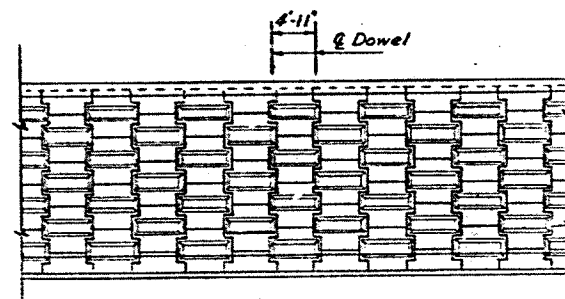
EXPOSED AGGREGATE PATTERN



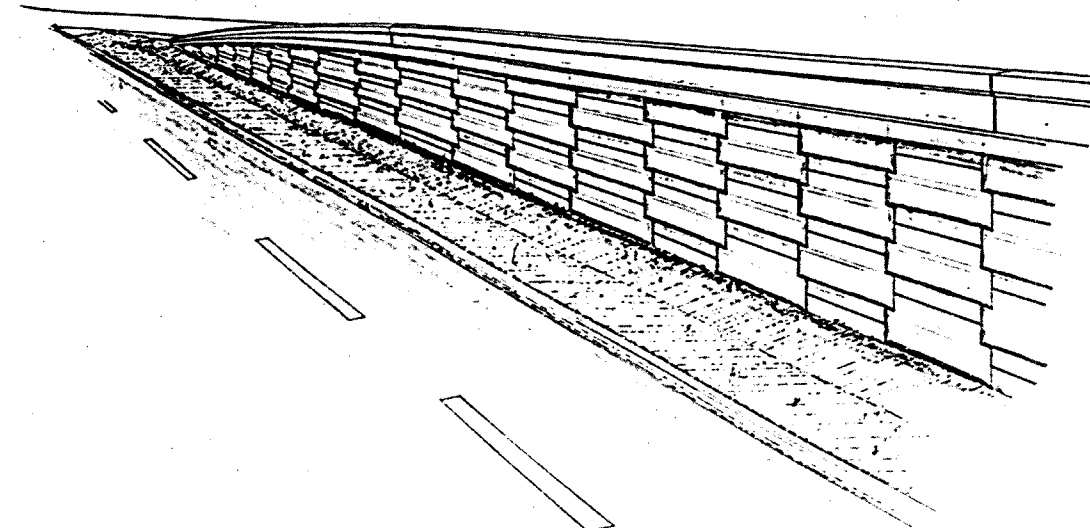
PERSPECTIVE OF EXPOSED AGGREGATE PATTERN



RAISED PANEL UNIT
(Drawing Not To Scale)



RAISED PANEL PATTERN



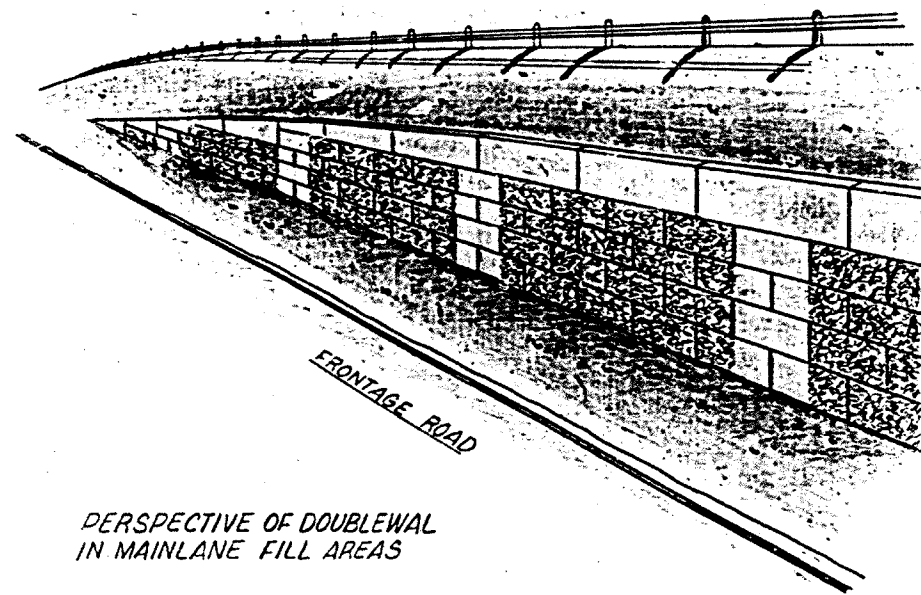
PERSPECTIVE OF RAISED PANEL PATTERN

SURFACE FINISH
RETAINING WALL FACING
REINFORCED EARTH RETAINING WALL
RW-3(MOD) 3

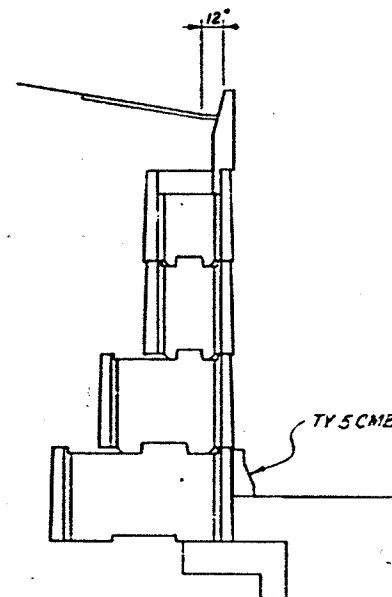
316

Sheet 2 of 2

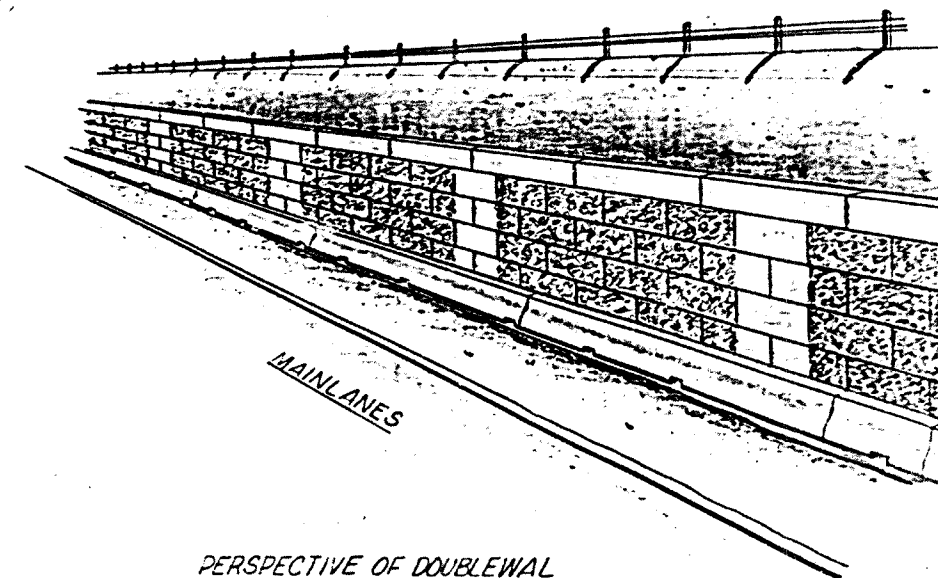
FED. AID DIST. NO.	STATE	FEDERAL AID PROJECT NO.	
6	TEXAS	EACI 35-2(144)168	316
COUNTY	CONTRACT NO.	SECTION NO.	JOB NO.
15	BEXAR	16	7 81 135



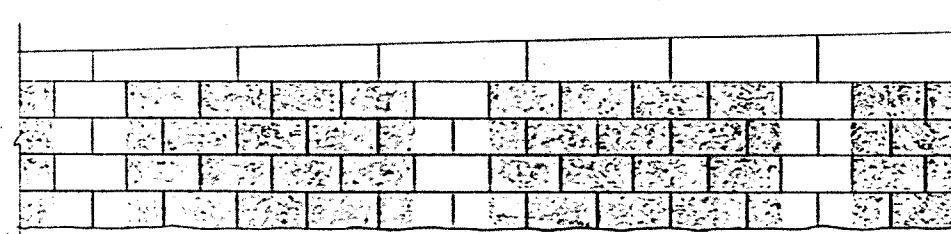
PERSPECTIVE OF DOUBLEWAL
IN MAINLANE FILL AREAS



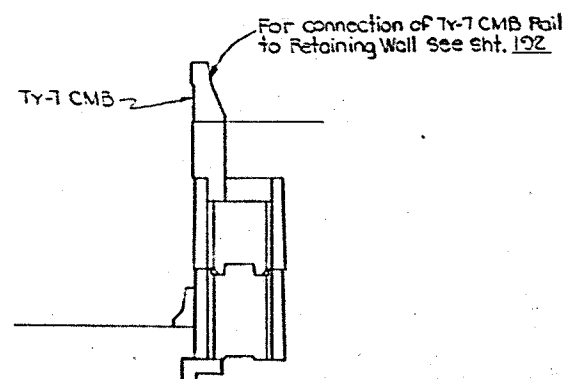
CUT SECTION



PERSPECTIVE OF DOUBLEWAL
IN MAINLANE CUT AREAS

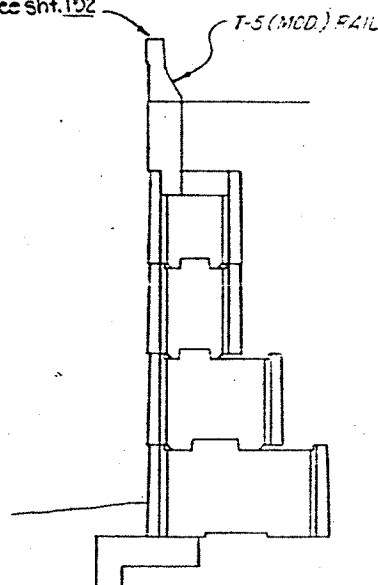


ELEVATION
(IN MAINLANE FILL SECTION)

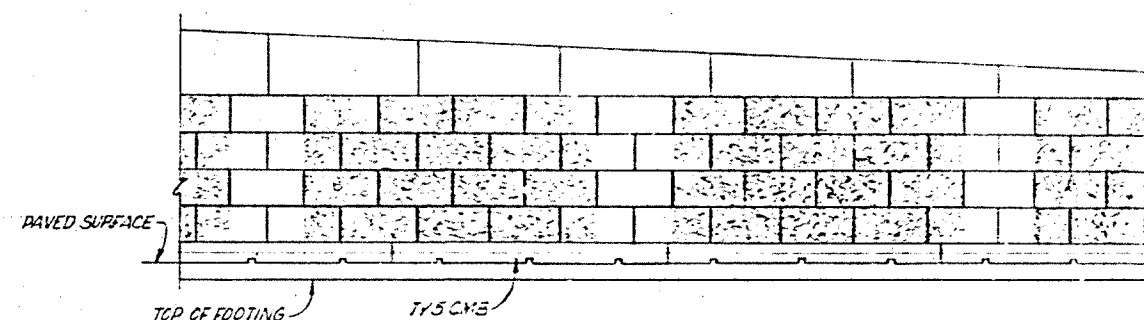


MEDIAN SECTION

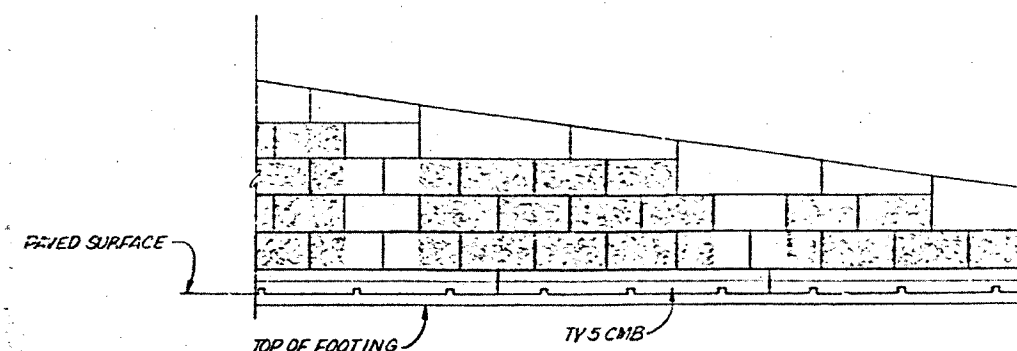
For connection of T-5 (MOD) Rail
to Retaining Wall See Sht. 122



FILL SECTION



ELEVATION
(MAINLANE CUT SECTION W/CMB)



ELEVATION
(CUT SECTION W/CMB) IN SEVERE GRADE AREAS)

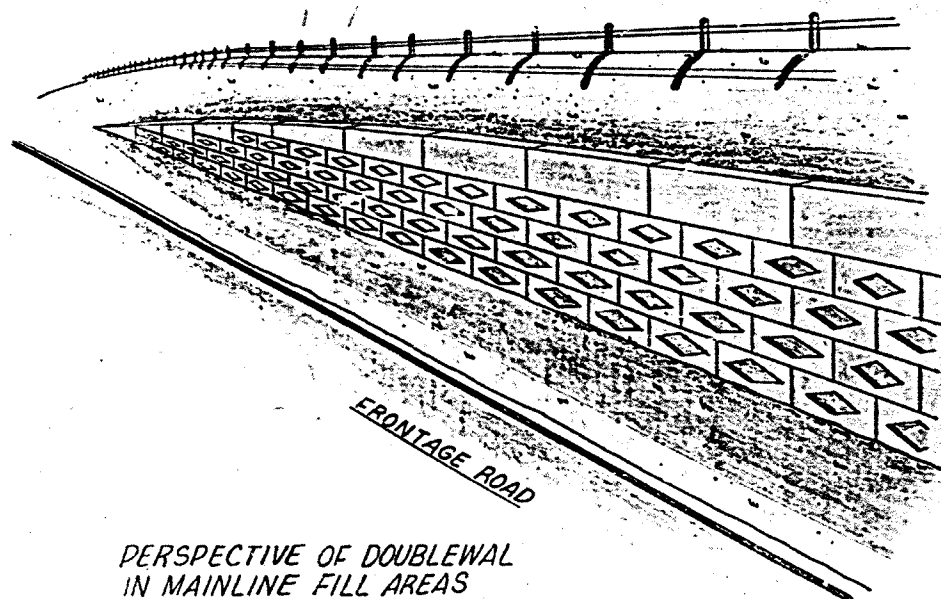
RW-3(MOD.)X(4)

Sheet 1 of 2

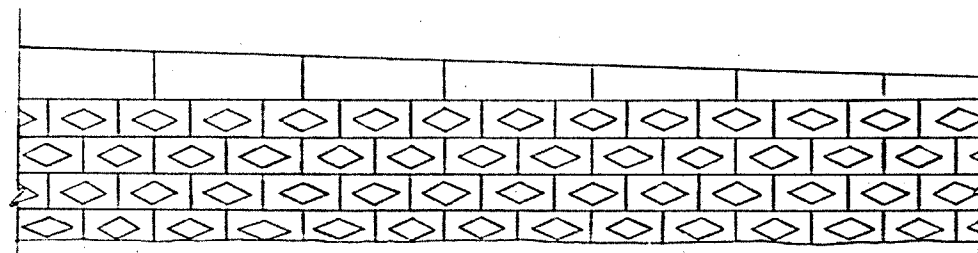
317

EXPOSED AGGREGATE FINISH
RETAINING WALL FACING
DOUBLEWAL OPTION

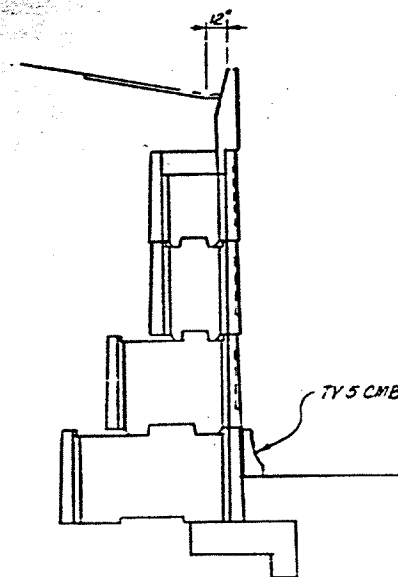
FIG. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
8	TEXAS	EACI 35-2(144)169	317
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
15	BEXAR	16	7 61



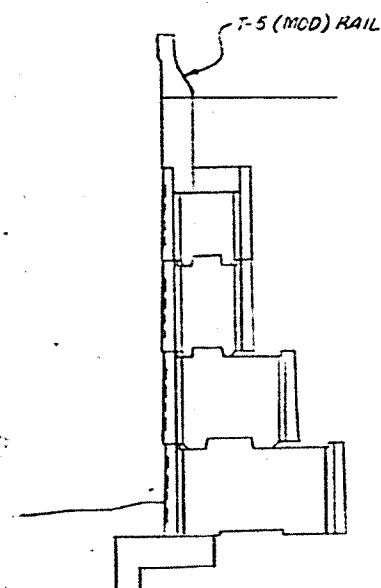
PERSPECTIVE OF DOUBLEWAL
IN MAINLINE FILL AREAS



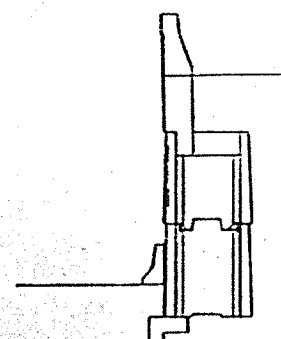
ELEVATION
(IN MAINLINE FILL AREA)



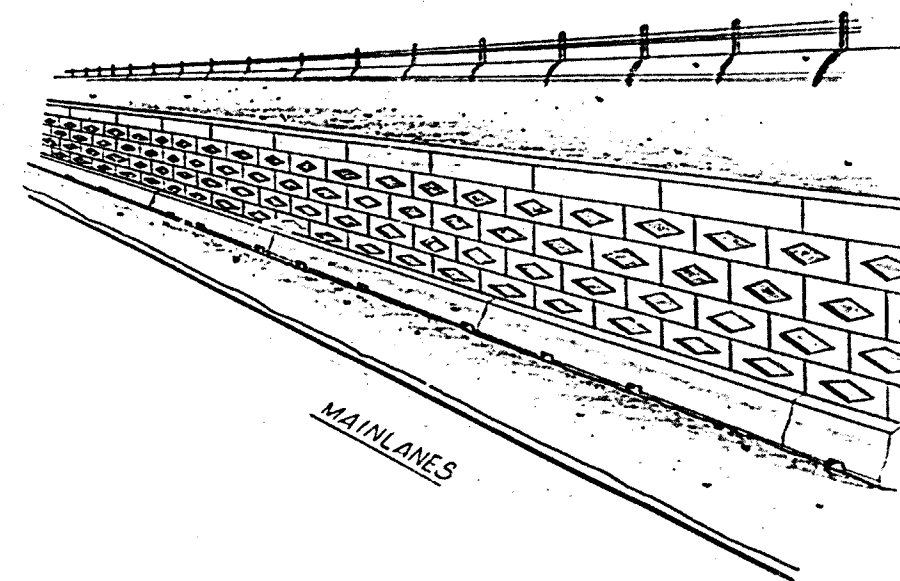
CUT SECTION



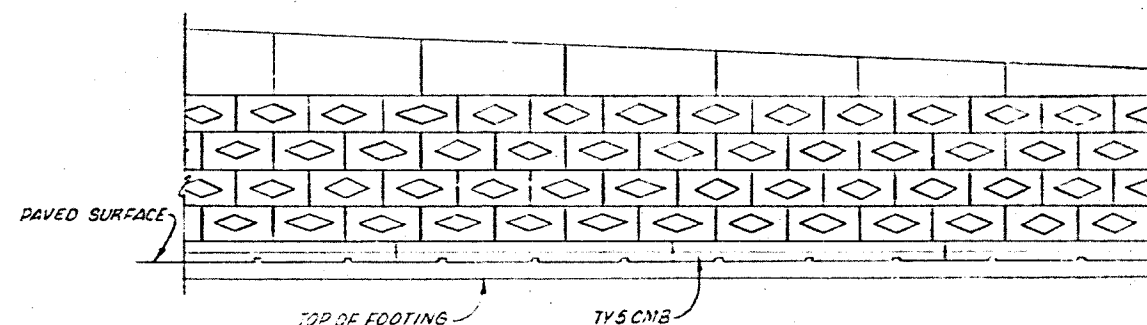
FILL SECTION



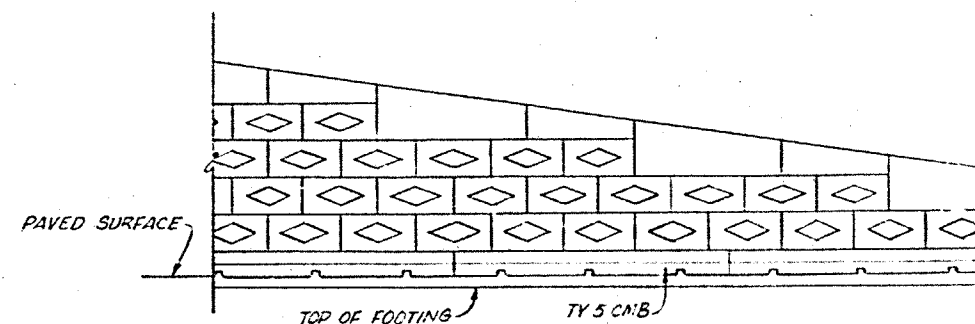
MEDIAN SECTION



PERSPECTIVE OF DOUBLEWAL
IN MAINLANE CUT AREAS



ELEVATION
(MAINLANE CUT SECTION W/CMB)



ELEVATION
(CUT SECTIONS W/CMB IN SEVERE GRADE AREAS)

RW-3(MOD)(4)

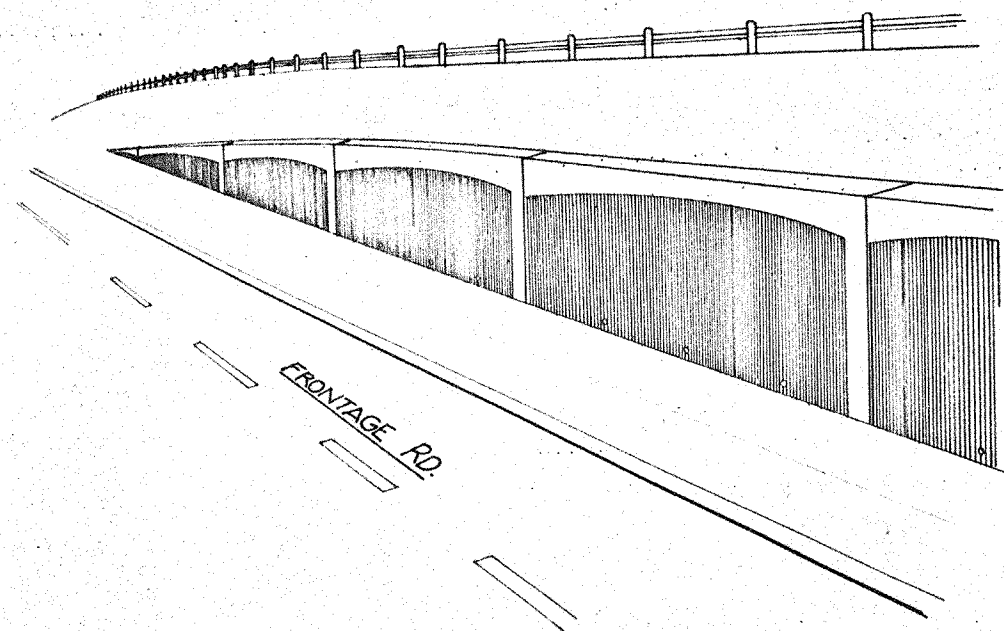
Sheet 2 of 2

RELIEF PATTERN
RETAINING WALL FACING
DOUBLEWAL OPTION

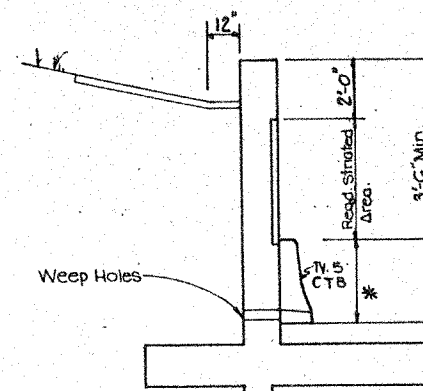
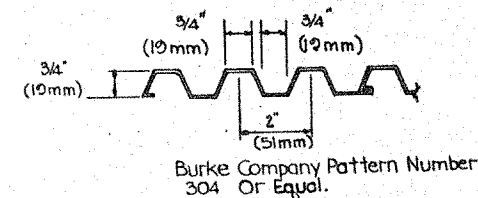
318

FILE NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
15	TEXAS	EACE 35-2(144)168	318
15	BEXAR	16 7 81 X 35	

CSJ: 0016-07-089
RETAINING WALLS 3 AND 7

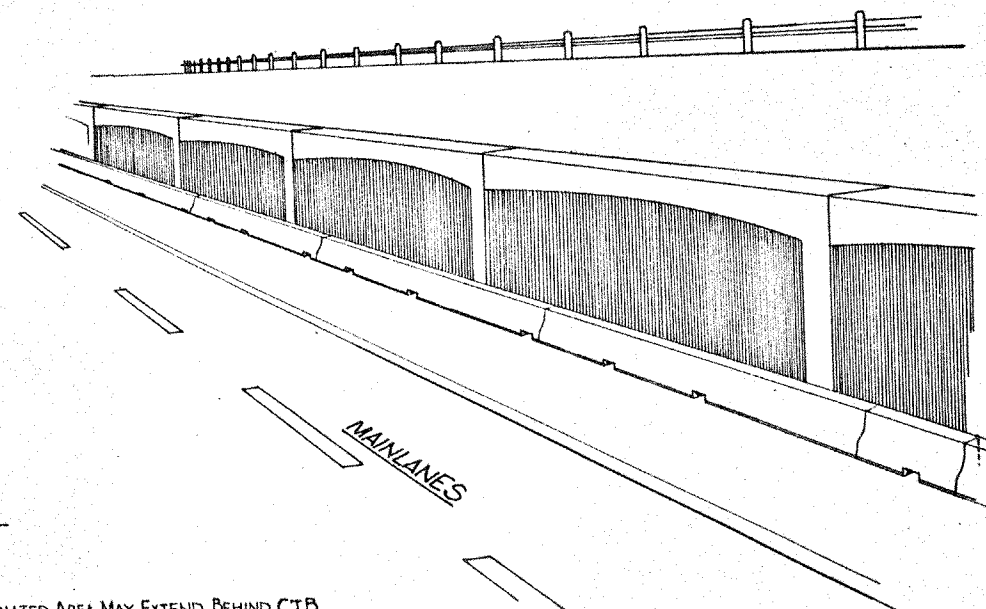


PERSPECTIVE OF STRIATED WALL
IN MAINLANE FILL AREAS

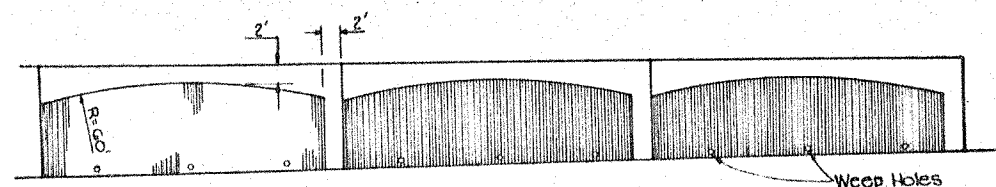


CUT SECTION

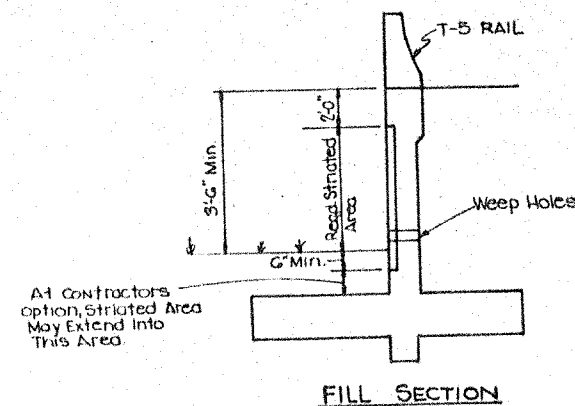
* AT CONTRACTORS OPTION, STRIATED AREA MAY EXTEND BEHIND CTB
IN ORDER TO ACCOMMODATE LARGER LENGTHS OF FORM LINER.
HOWEVER, THE RESULTING GROOVES BEHIND THE WALL SHALL
BE SEALED WITH GROUT AS APPROVED BY THE ENGINEER.



PERSPECTIVE OF STRIATED WALL IN
MAINLANE CUT AREAS

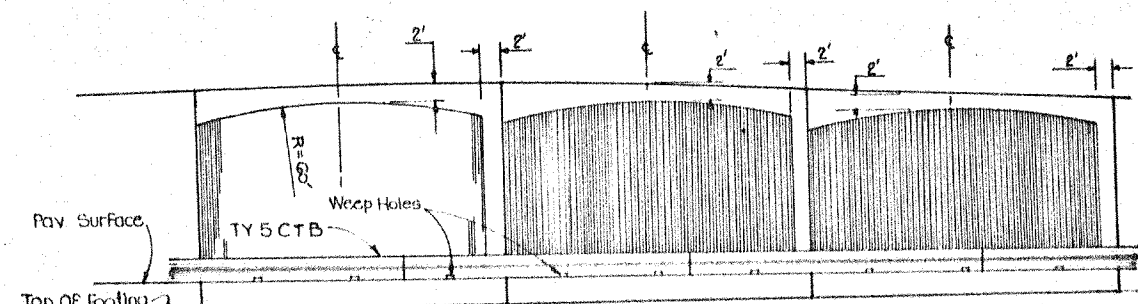


ELEVATION (IN MAINLANE FILL SECTION)



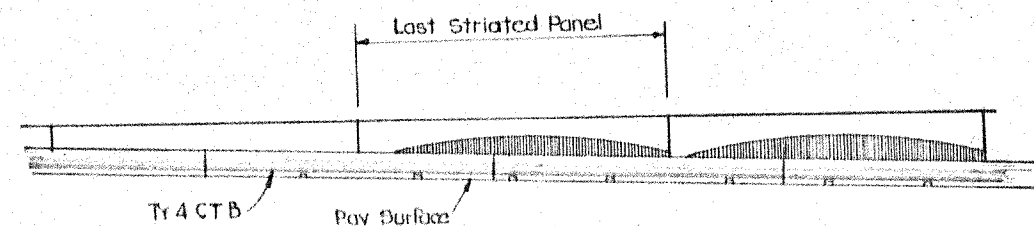
FILL SECTION

At Contractors
Option, Striated Area
May Extend into
This Area.

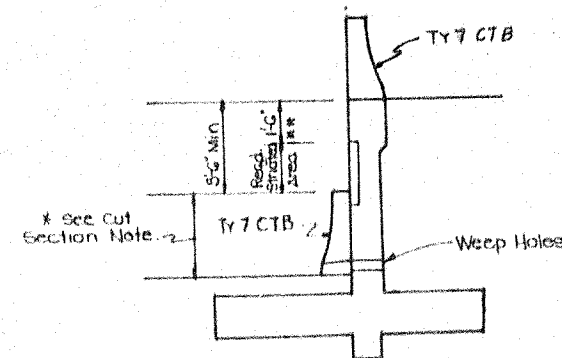


ELEVATION (MAINLANE CUT SECTION W/CTB)

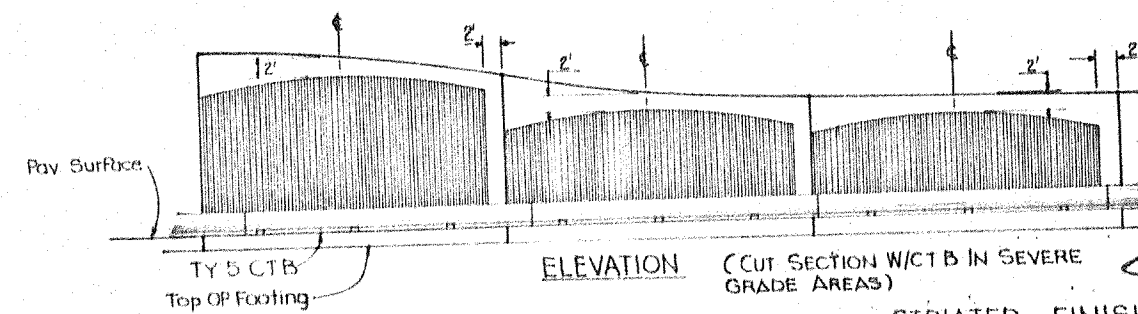
* * 1'-6\"/>



ELEVATION @ END STRIATED AREA
(BOTH CUT AND FILL AREAS OF MAINLANES)



MEDIAN SECTION



ELEVATION (CUT SECTION W/CTB IN SEVERE
GRADE AREAS)

STRIATED FINISH
RETAINING WALL FACING
CAST-IN-PLACE RET. WALL
RW-3 (MOD. X2)

NOTES: 1 Required Striation Designs Are Listed for Each Wall On
"Retaining Wall Summary Sheet".
2 Striation Areas Shall Receive A CTB Finish.
Color Striation Areas Shall Be Stain-Lux Brand "Maple
Sugar" As Manufactured By Standard T-Chemical Co.

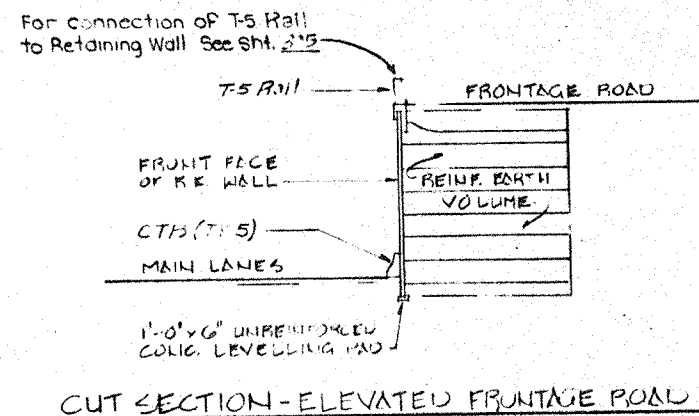
Or Equal. The Engineer Shall Select The Exact Shade Of
"Maple Sugar" Similar To Local Exposed Aggregate Color.
After The Contractor Has Furnished Sample Panels Of
Several Shades.
The Non-Striated Surfaces Shall Be Painted With
A Winter White Color Of The Same Brand Or Equal.

Sheet 1 OF 1

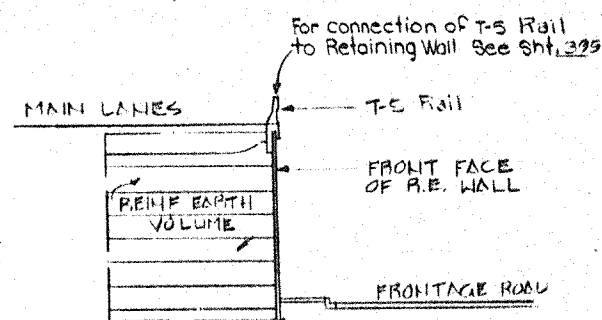
1-IR35-2(98)170 497

15 BEXAR 16 7 89, I 35
etc.

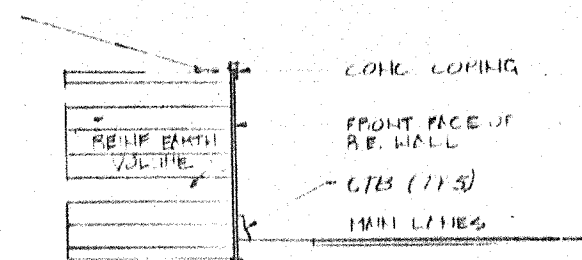
497



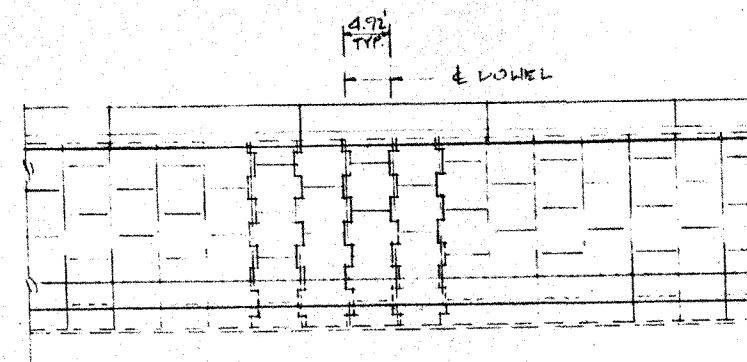
CUT SECTION - ELEVATED FRONTAGE ROAD



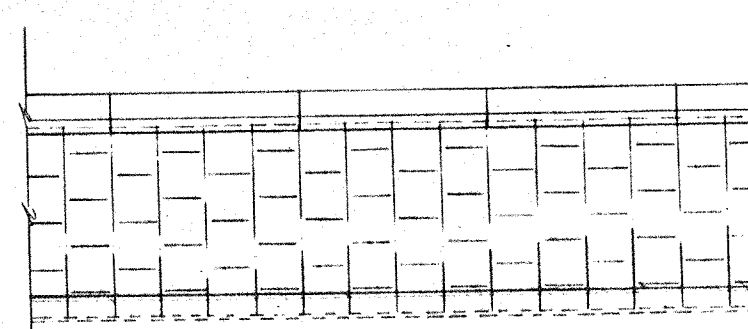
FILL SECTION - AT GRADE FRONTAGE ROAD



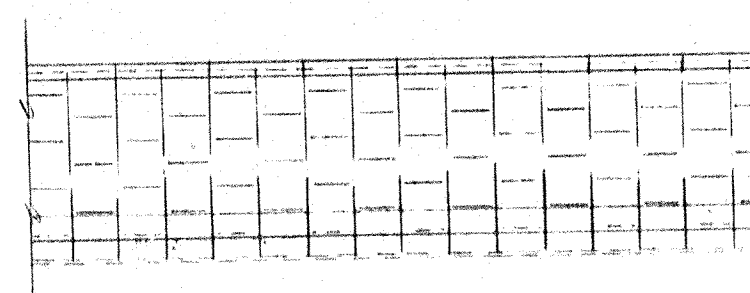
CUT SECTION - NO FRONTAGE ROAD



PARTIAL ELEVATION



PARTIAL ELEVATION



PARTIAL ELEVATION

LIMIT OF ARCHITECTURAL TREATMENT. See next sheet for details

DESIGN PARAMETERS

Structure shall be based on the following design parameters:

Random Backfill: unit weight = 125 PCF

$\phi = 30^\circ$ $C = 0$ KSF

$K_a = .333$

Select Backfill: unit weight = 125 PCF

$\phi = 34^\circ$ $C = 0$ KSF

$K_a = .28$ $K_o = .44$

Allowable Stresses for Steel Reinforcement:

$F_a = 0.55 F_y$ (tension)

Allowable Concrete Stresses:

$f_c = 0.40 f'_c$ (compression)

The minimum ratio of length of Reinforcement to height shall be 0.7. The minimum length of Reinforcement shall be 8.5 ft.

EXTERNAL STABILITY CRITERIA

Factor of Safety in sliding along the base of the structure shall be greater than or equal to 1.5.

Factor of Safety in Overturning shall be greater than or equal to 2.0.

The maximum allowable bearing pressure shall not exceed one half the gross ultimate bearing capacity of the foundation.

INTERNAL STABILITY CRITERIA

The coefficient of earth pressure, K , shall vary linearly from 0.44 at the top of the structure to 0.28 at a depth of 20 feet.

Below 20 feet, K shall equal 0.28.

The Factor of Safety against pullout of the Reinforcement shall be greater than or equal to 1.5 at all levels of soil reinforcement.

The embedded length used in calculations shall be the length beyond the appropriate failure surface. Pullout resistance shall be determined from actual test data evaluated at $\frac{1}{2}$ inch strain, utilizing the proposed backfill material.

The Rankine Failure Surface will be used as the Failure plane, unless another Failure plane can be properly justified.

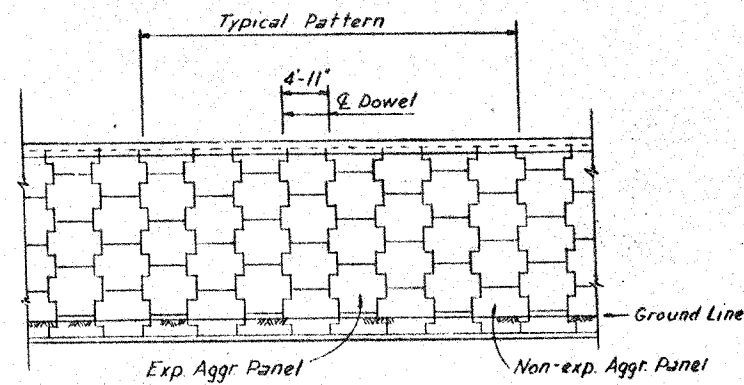
The Failure Load of the strips or the coil inserts will be determined by pullout tests on full panels during simultaneous loading of all the strips or coil inserts. The design of the strips or coil inserts shall provide a Factor of Safety greater than or equal to 2.0 against the Failure Load.

498
SURFACE FINISH
RETAINING WALL FACING
REINFORCED EARTH RETAINING WALL
RW-3(MOD)(3)

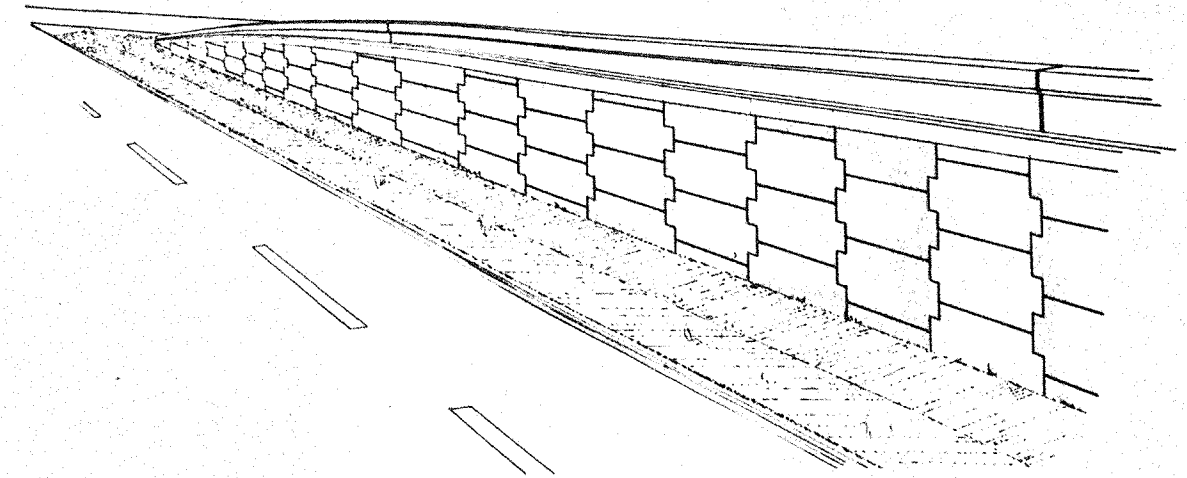
This drawing contains information proprietary to The Reinforced Earth Company, and is being furnished for the use of the client only in connection with this project, and the information contained herein is not to be transmitted to any other organization unless specifically authorized in writing by The Reinforced Earth Company. The Reinforced Earth Company is exclusive licensee in the United States under patents issued to Henri Vidal, and the furnishing of this drawing does not constitute an express or implied license under the Vidal patents.

Sheet 1 of 2

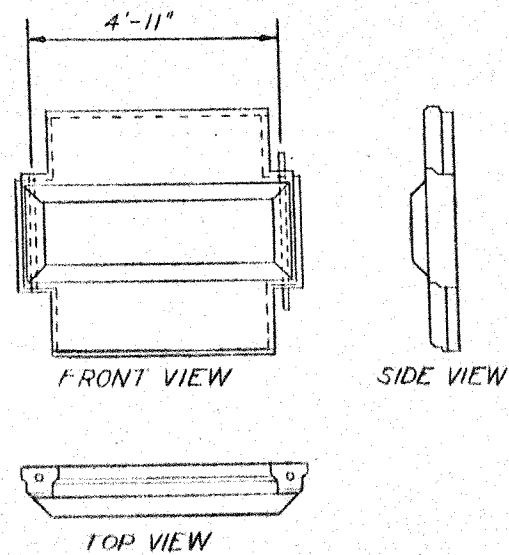
STATE	FEDERAL PROJECT NO.	NO.
TEXAS	1-1895 (15A)170	498
COUNTY	SECTION	NO.
BEXAR	16 7 89	135



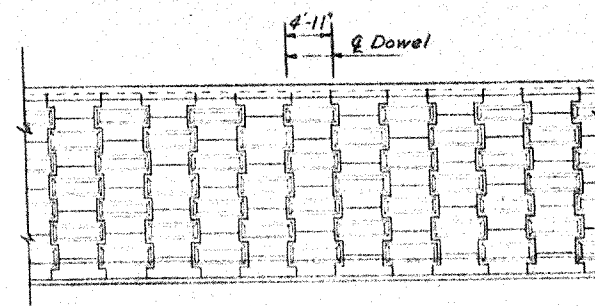
EXPOSED AGGREGATE PATTERN



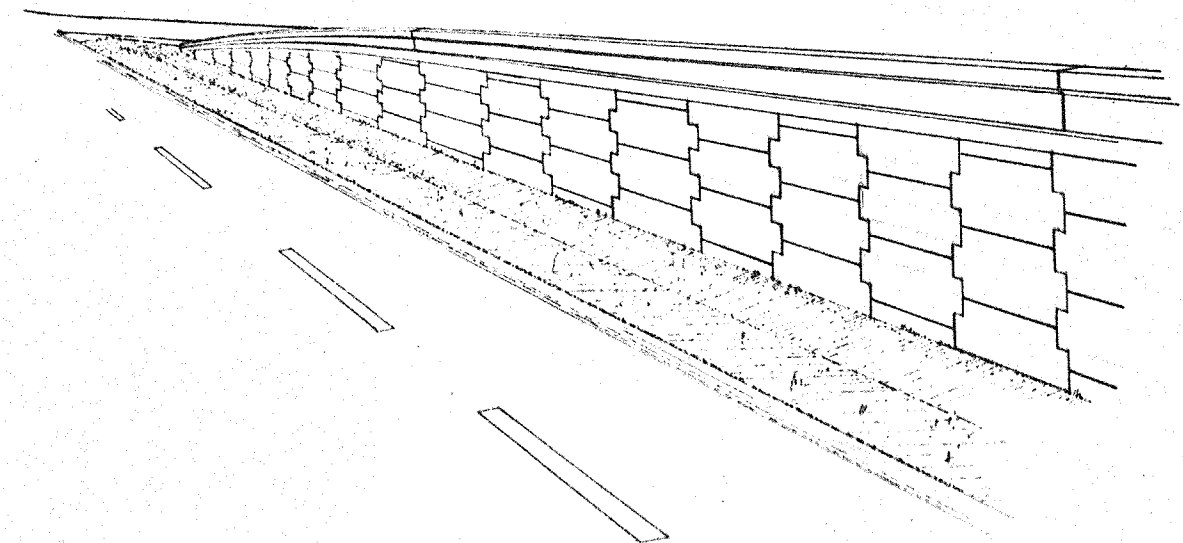
PERSPECTIVE OF EXPOSED AGGREGATE PATTERN



RAISED PANEL UNIT
(Drawing Not To Scale)



RAISED PANEL PATTERN



PERSPECTIVE OF RAISED PANEL PATTERN

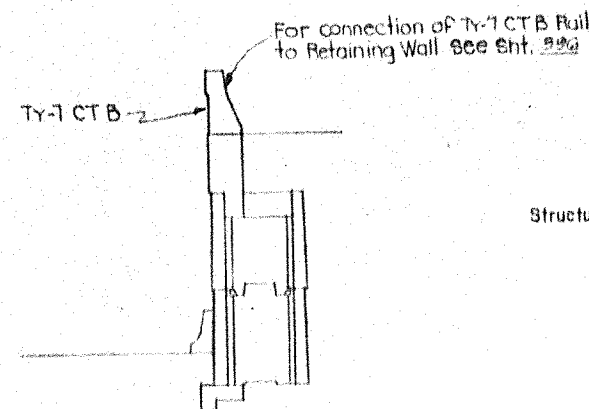
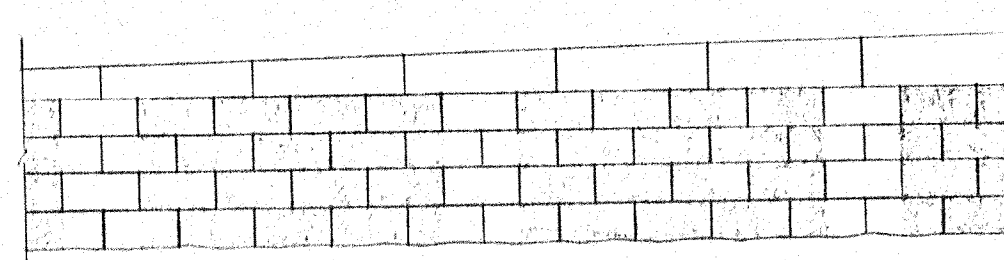
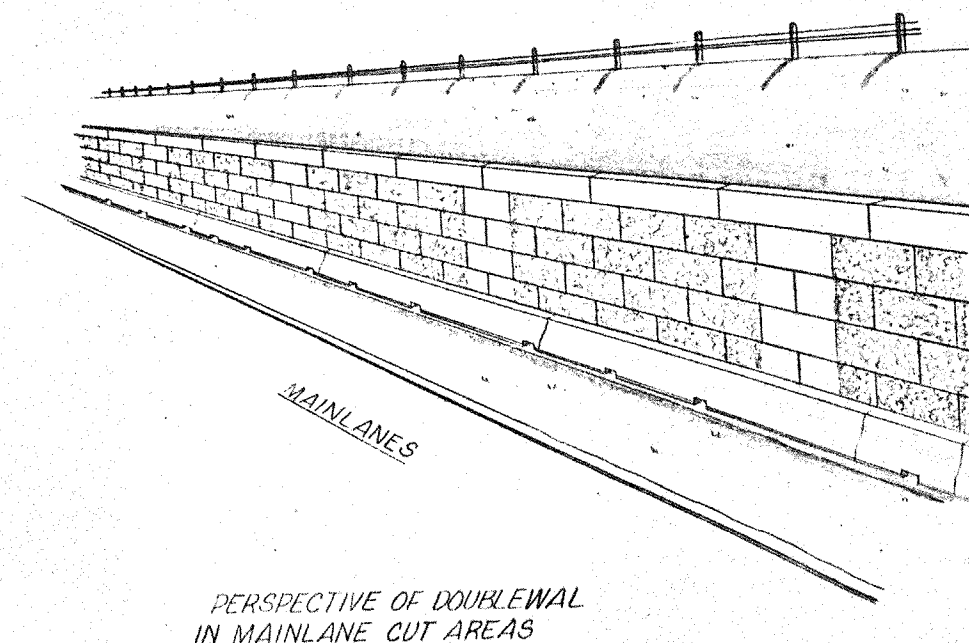
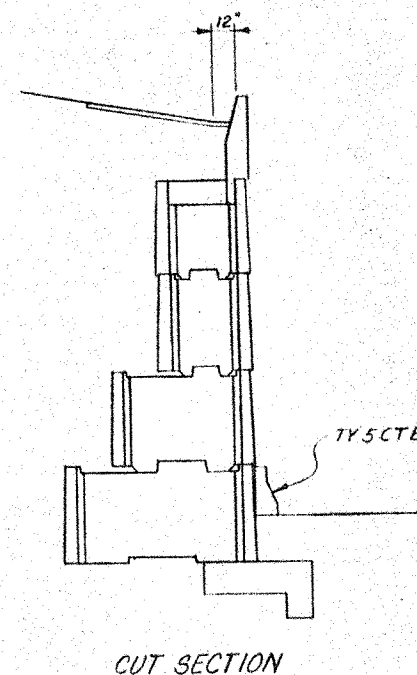
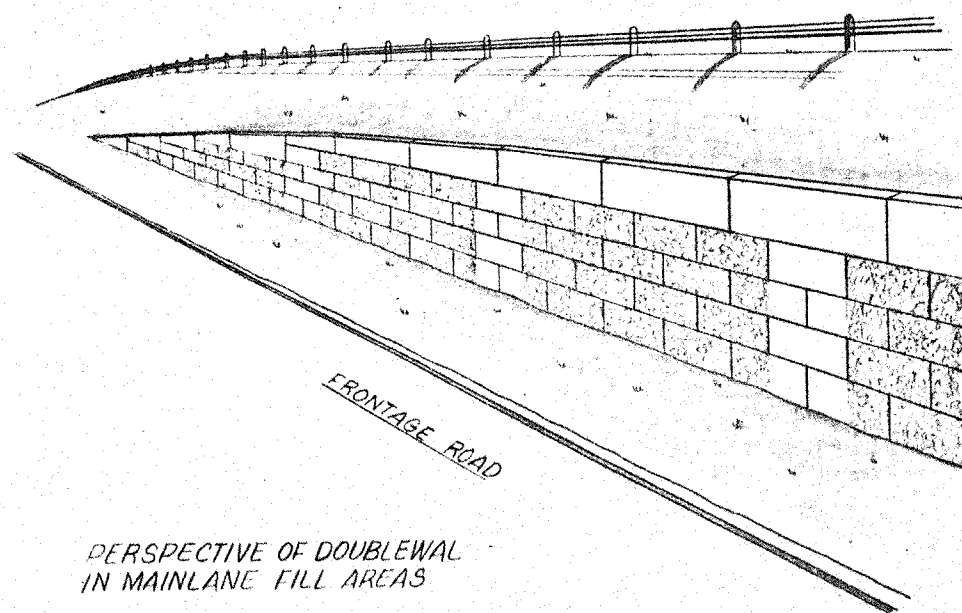
499

SURFACE FINISH
RETAINING WALL FACING
REINFORCED EARTH RETAINING WALL
RW-3(MOD) 3

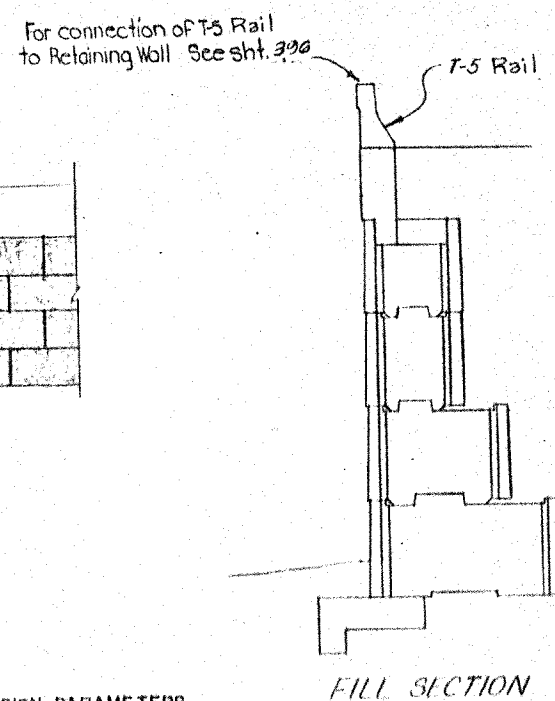
Sheet 2 of 2

1-18 35-2(50)170 499

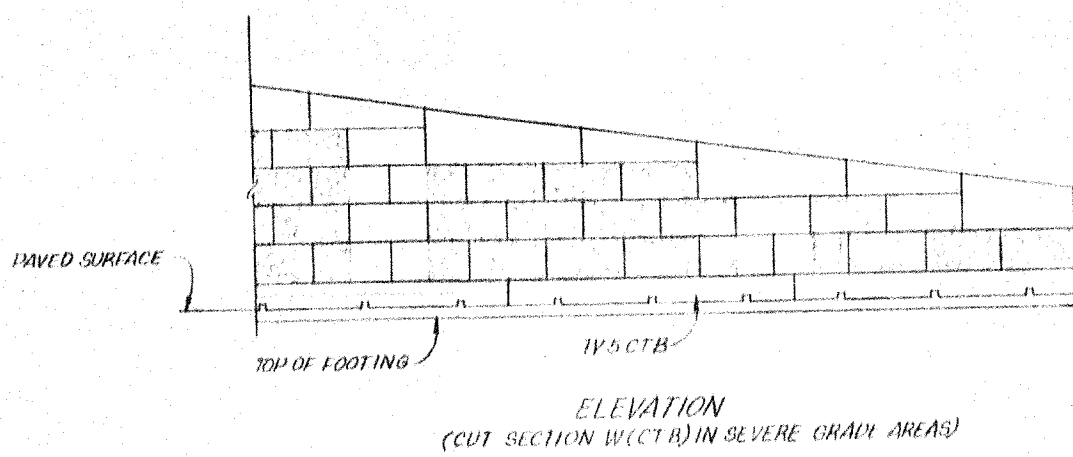
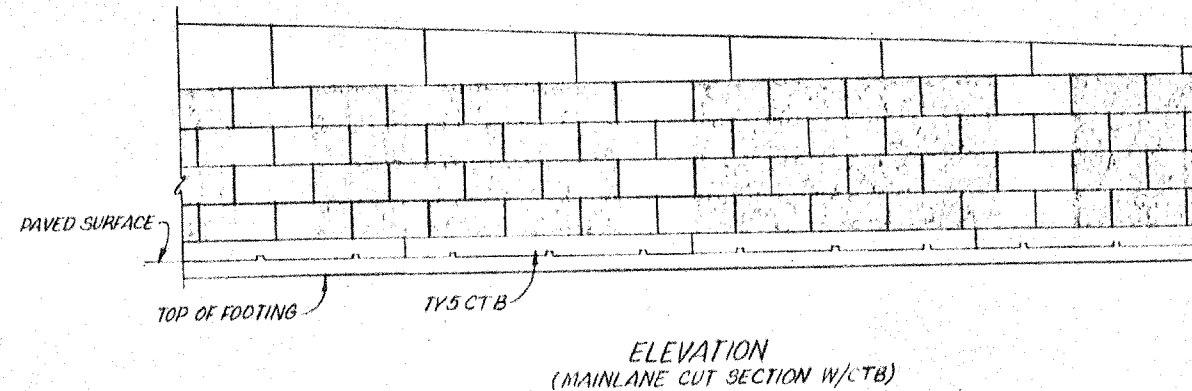
15 BEXAR 16 7 81, 1 35 etc.



MIDIAN SECTION



DESIGN PARAMETERS
Structure shall be based on the following design parameters:
Random Backfill: unit weight = 125 PCF
 $\phi = 30^\circ$ C = 0 KSF
 $K_a = .333$
Allowable Stresses For Steel Reinforcement:
 $F_a = 0.55 F_y$ (tension)
Allowable Concrete Stresses:
 $f_c = 0.40 f'_c$ (compression)
EXTERNAL STABILITY CRITERIA
Factor of Safety insliding along the base of the structure shall be greater than or equal to 1.5.
Factor of Safety in Overturning shall be greater than or equal to 2.0.
The maximum allowable bearing pressure shall not exceed one half the gross ultimate bearing capacity of the foundation.

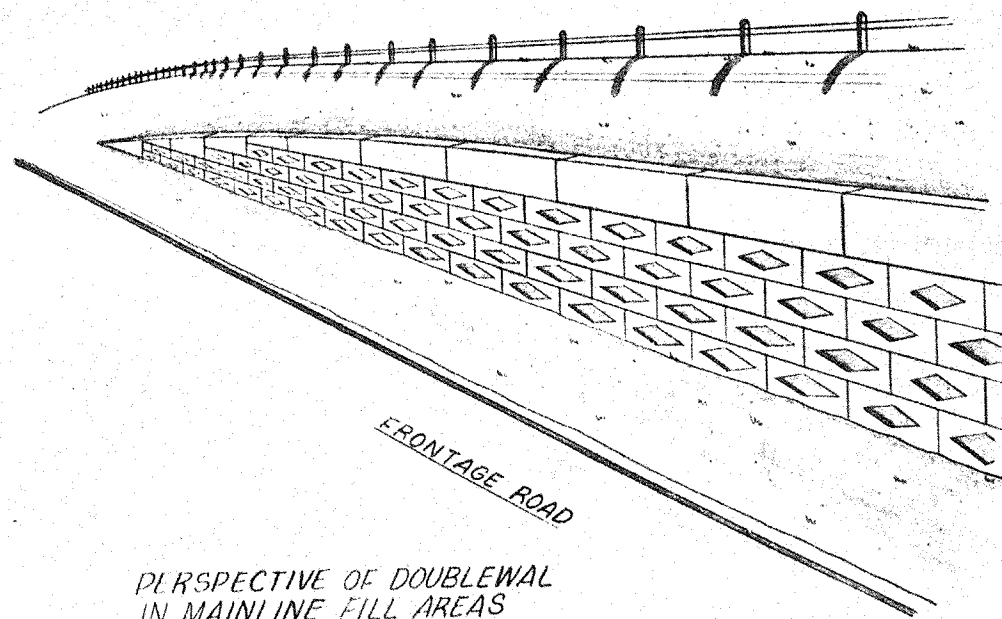


500

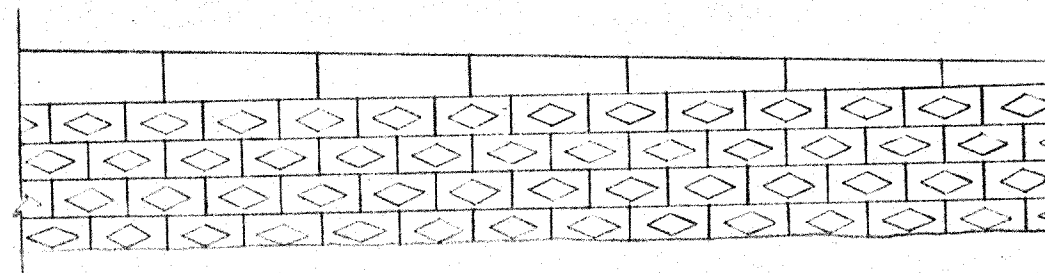
RW-3(MOD.)X(4)

Sheet 1 of 2

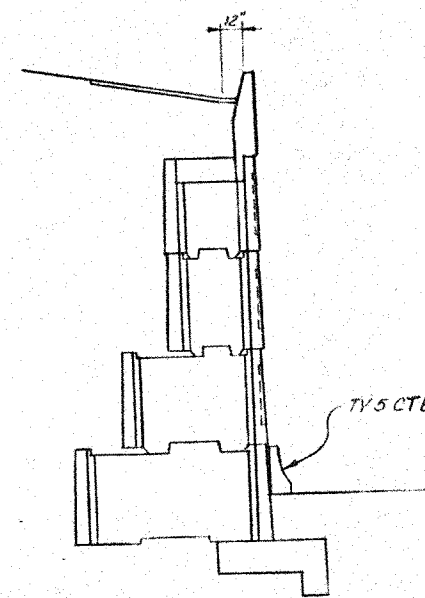
EXPOSED AGGREGATE FINISH
RETAINING WALL FACING
DOUBLEWAL OPTION



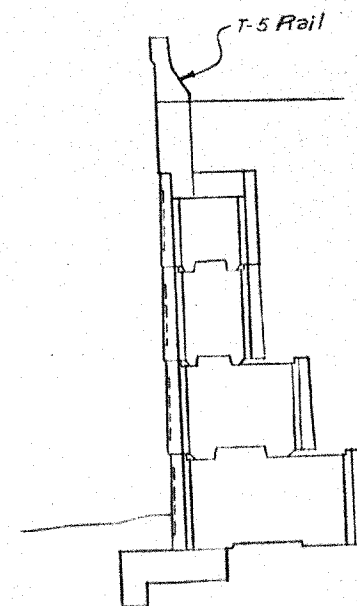
PERSPECTIVE OF DOUBLEWAL
IN MAINLINE FILL AREAS



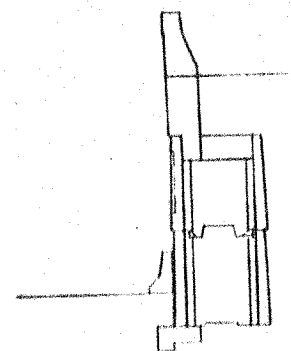
ELEVATION
(IN MAINLINE FILL AREA)



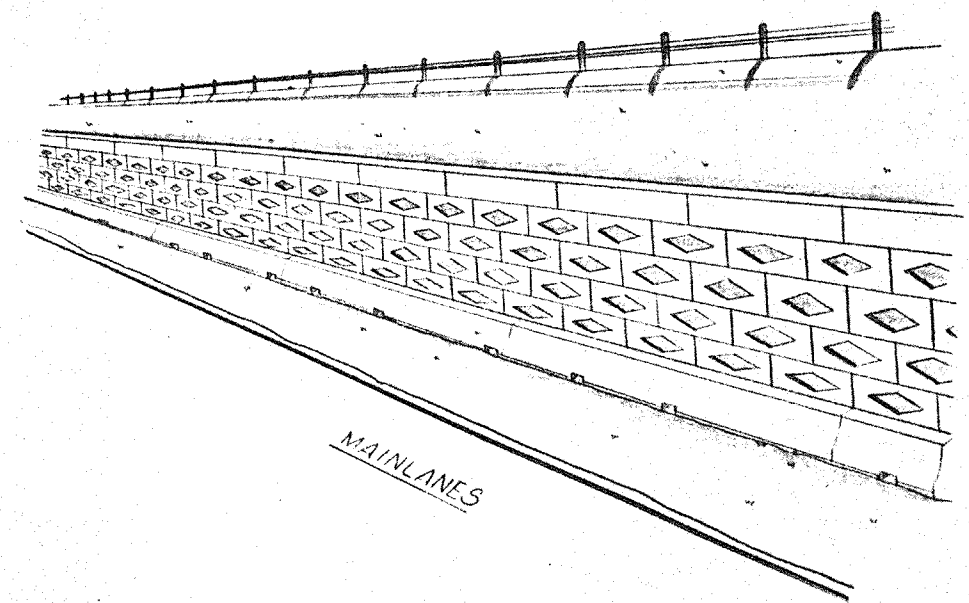
CUT SECTION



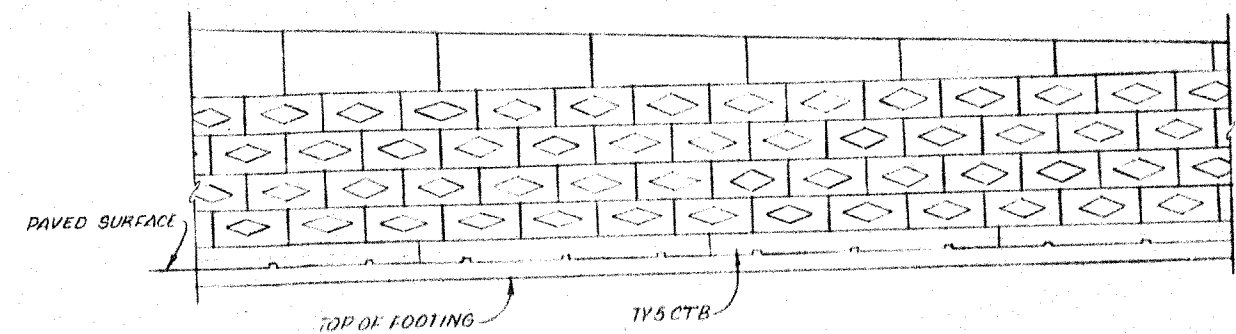
FILL SECTION



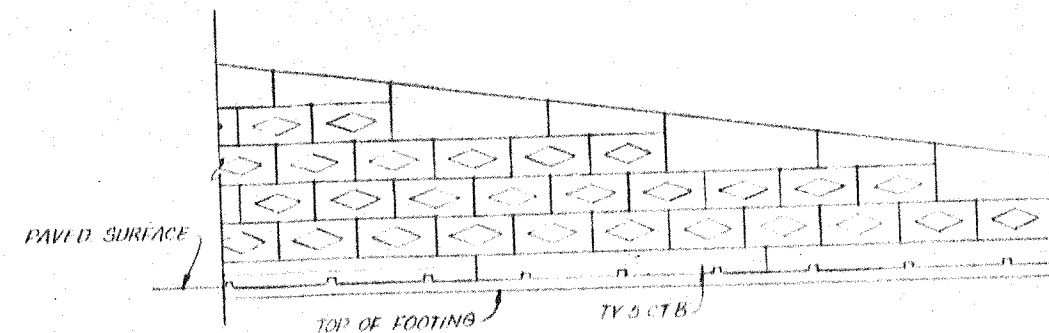
MEDIAN SECTION



PERSPECTIVE OF DOUBLEWAL
IN MAINLINE CUT AREAS

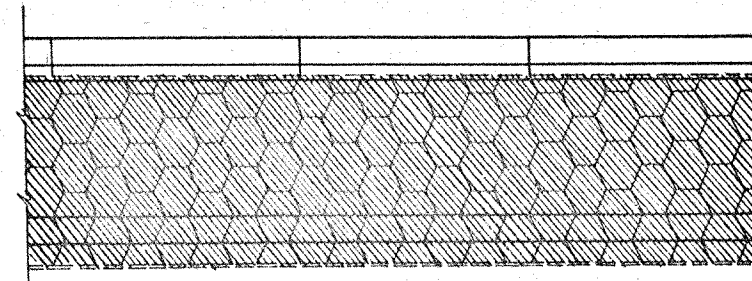
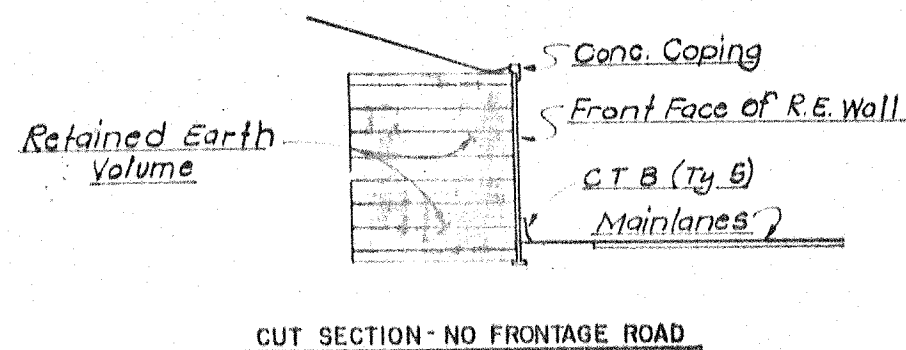
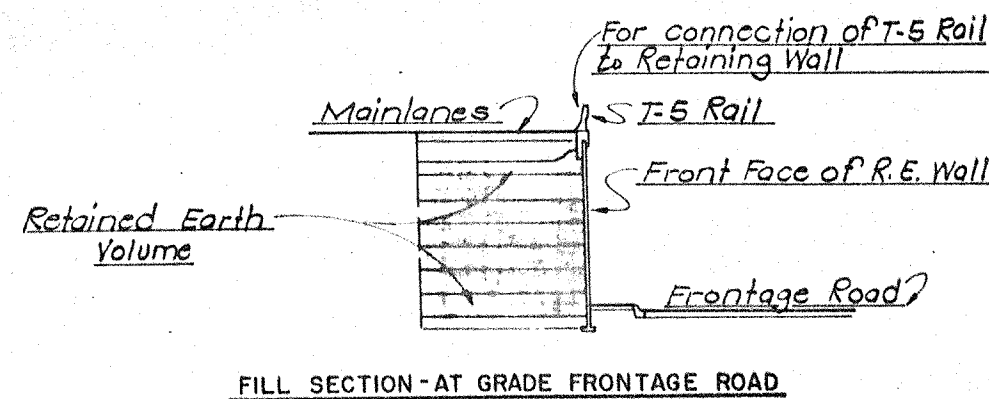
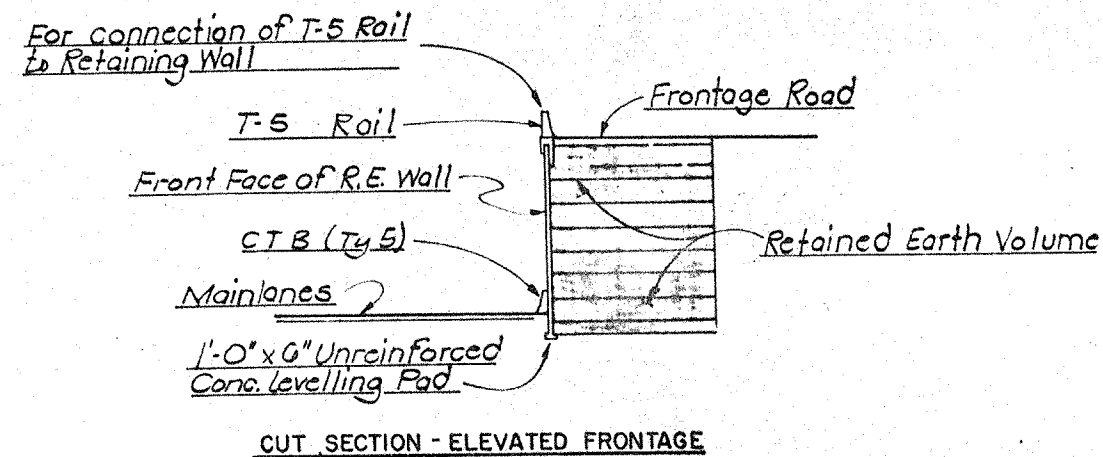


ELEVATION
(MAINLINE CUT SECTION W/CTB)

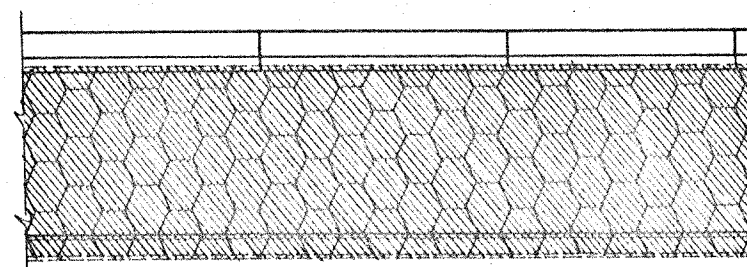


ELEVATION
(CUT SECTIONS W/CTB IN SEVERE GRADE AREAS)

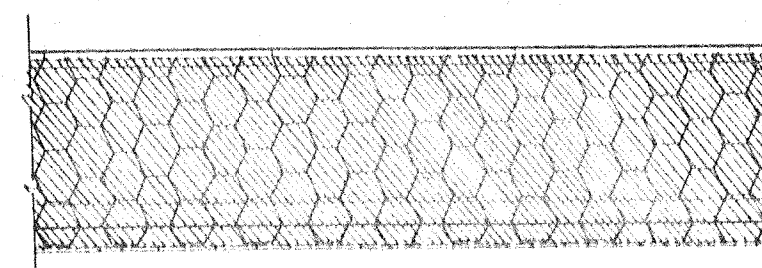
501
RW-3(MOD)(4)
Sheet 2 of 2
RELIEF PATTERN
RETAINING WALL FACING
DOUBLEWAL OPTION




PARTIAL ELEVATION



PARTIAL ELEVATION



PARTIAL ELEVATION

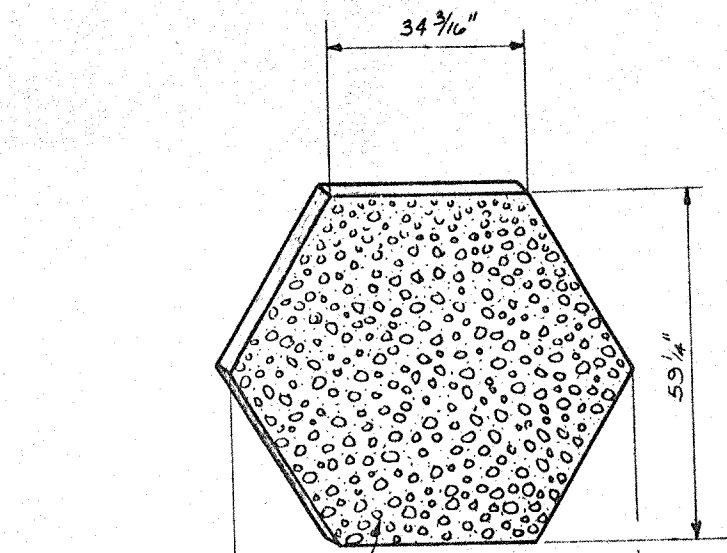
 Limits of Architectural Treatment. See Next Sheet For Details.

DESIGN PARAMETERS
Structure shall be based on the following design parameters:
Random Backfill: unit weight = 125 PCF
 $\phi = 30^\circ$ $C = 0$ KSF
 $K_a = .333$
Select Backfill: unit weight = 125 PCF
 $\phi = 34^\circ$ $C = 0$ KSF
 $K_a = .28$ $K_o = .44$
Allowable Stresses for Steel Reinforcement:
 $F_u = 0.55 F_y$ (tension)
Allowable Concrete Stresses:
 $f_c = 0.40 f'_c$ (compression)
The minimum ratio of length of Reinforcement to height shall be 0.7. The minimum length of Reinforcement shall be 8.5 ft.
EXTERNAL STABILITY CRITERIA
Factor of Safety in sliding along the base of the structure shall be greater than or equal to 1.5.
Factor of Safety in Overturning shall be greater than or equal to 2.0.
The maximum allowable bearing pressure shall not exceed one half the gross ultimate bearing capacity of the foundation.
INTERNAL STABILITY CRITERIA
The coefficient of earth pressure, K , shall vary linearly from 0.44 at the top of the structure to 0.28 at a depth of 20 feet. Below 20 feet, K shall equal 0.28.
The Factor of Safety against pullout of the Reinforcement shall be greater than or equal to 1.5 at all levels of soil reinforcement. The embedded length used in calculations shall be the length beyond the appropriate failure surface. Pullout resistance shall be determined from actual test data evaluated at $1/2$ inch strain, utilizing the proposed backfill material.
The Rankine Failure Surface will be used as the Failure plane, unless another failure plane can be properly justified.
The Failure Load of the strips or the coil inserts will be determined by pullout tests on full panels during simultaneous loading of all tie strips or coil inserts. The design of the strips or coil inserts shall provide a Factor of Safety greater than or equal to 2.0 against the Failure Load.

502

SURFACE FINISH
RETAINING WALL FACING
RETAINED EARTH RETAINING WALL
RW-3 (MOD)(5)
SHEET 1 OF 2

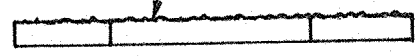
1-1235-2-(156)170 502
1B BEXAR 10 7 BME IN 95



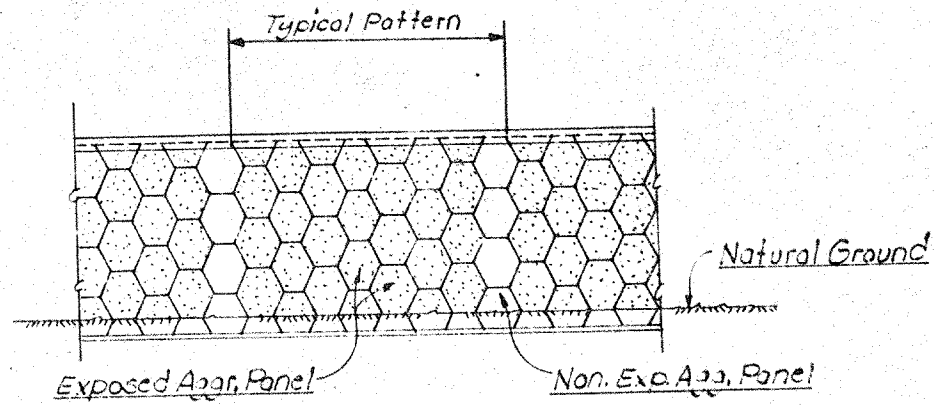
Exposed Aggregate

68 3/8"

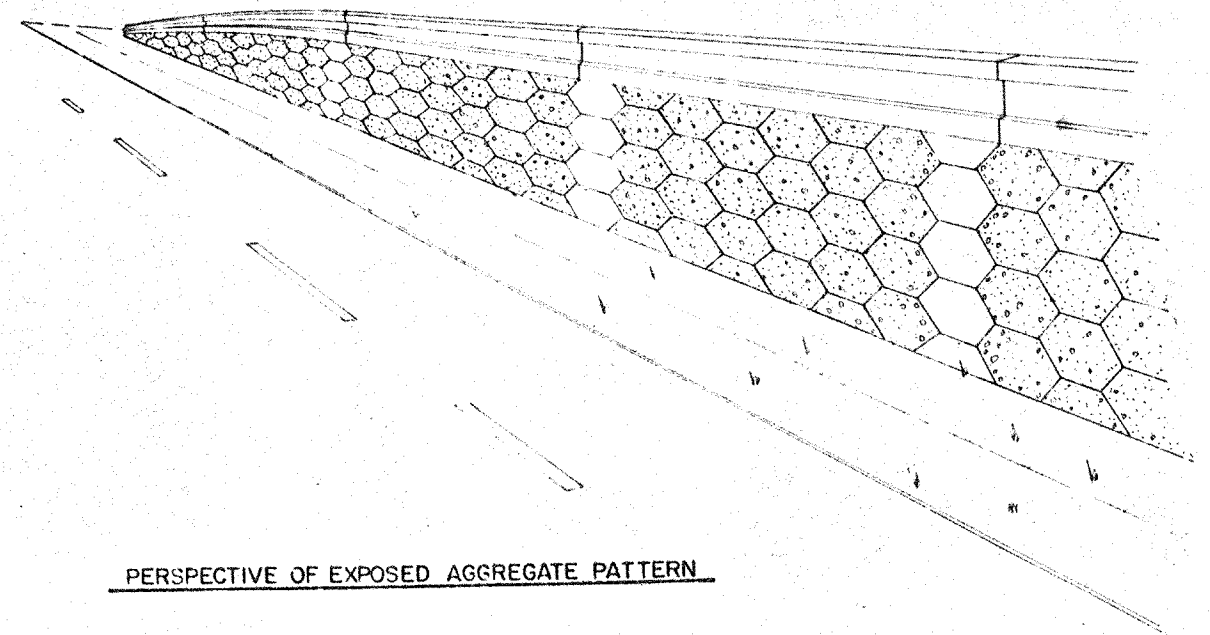
Normal Panel Thickness



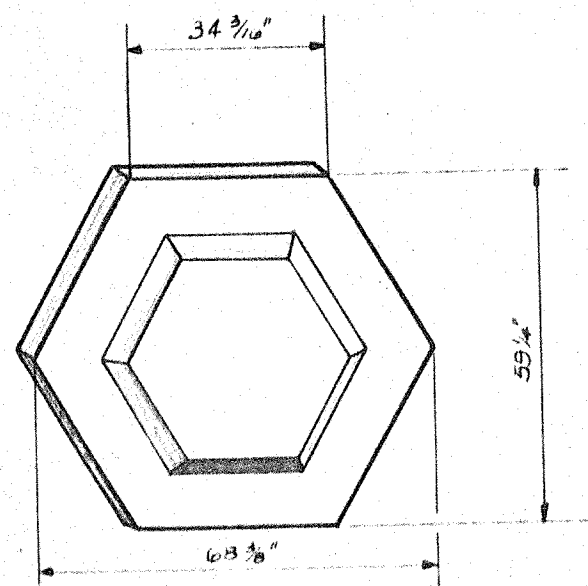
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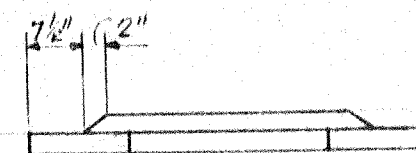
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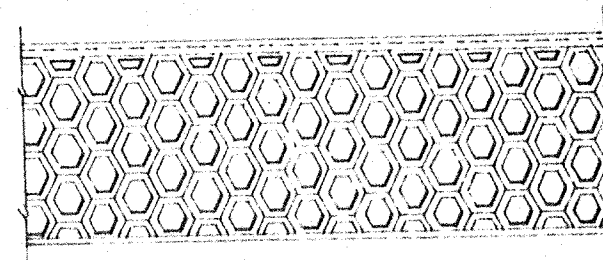
PERSPECTIVE OF EXPOSED AGGREGATE PATTERN



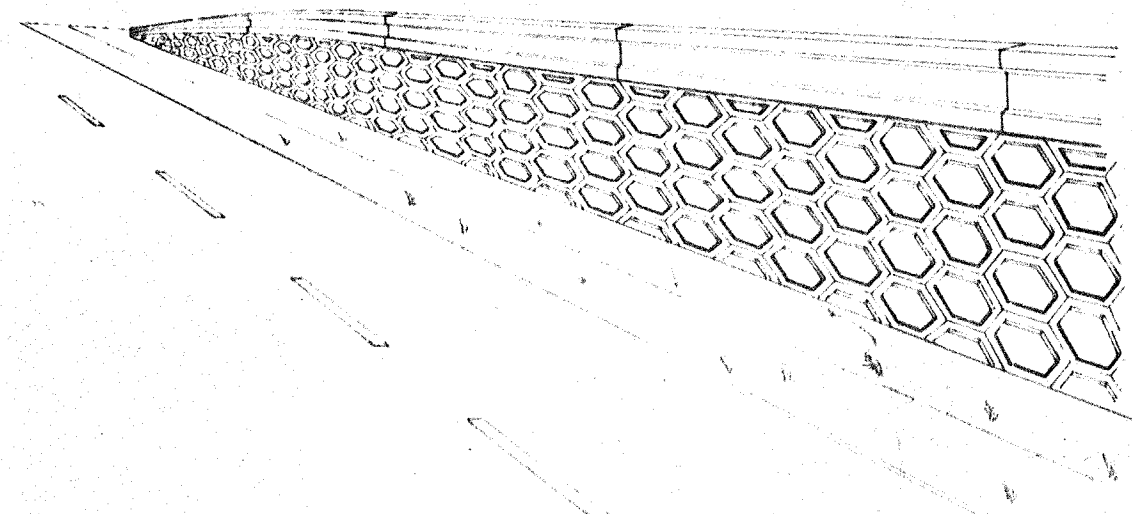
Normal Panel Thickness



RAISED PANEL PATTERN UNIT



RAISED PANEL PATTERN



PERSPECTIVE OF RAISED PANEL PATTERN

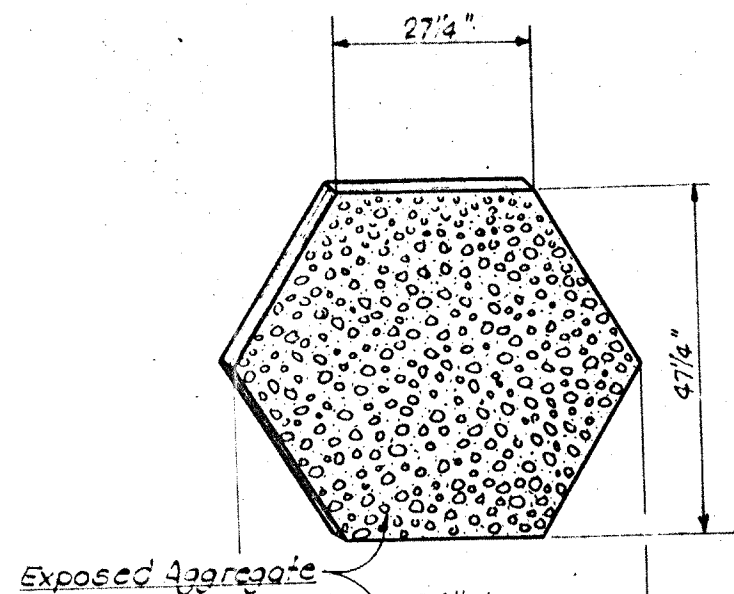
502A

SKETCH TO ACCOMPANY
FIELD CHANGE NO. 2

SURFACE FINISH
RETAINING WALL FACING
RETAINED EARTH RETAINING WALL
RW-3 (MOD) (5)

SHEET 2 OF 2

DATE	1/28/35	PROJECT NO.	502A
BY	W. H. B.	CHECKED BY	W. H. B.
SCALE	1" = 1'-0"	NOTED BY	



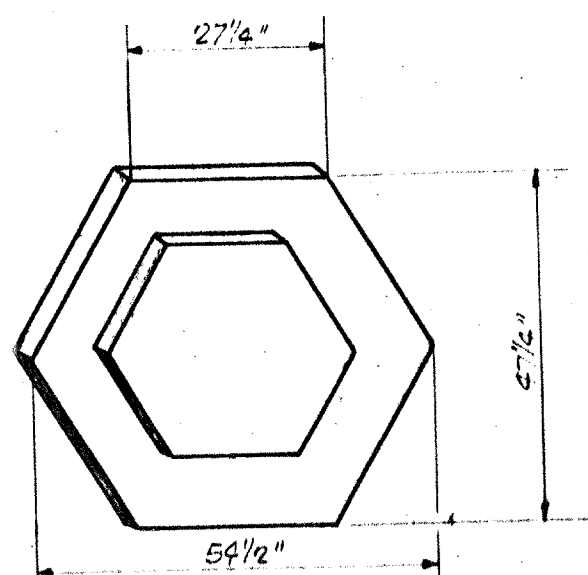
Exposed Aggregate

54 1/2"

47 1/4"

EXPOSED AGGREGATE PATTERN UNIT

Normal Panel Thickness

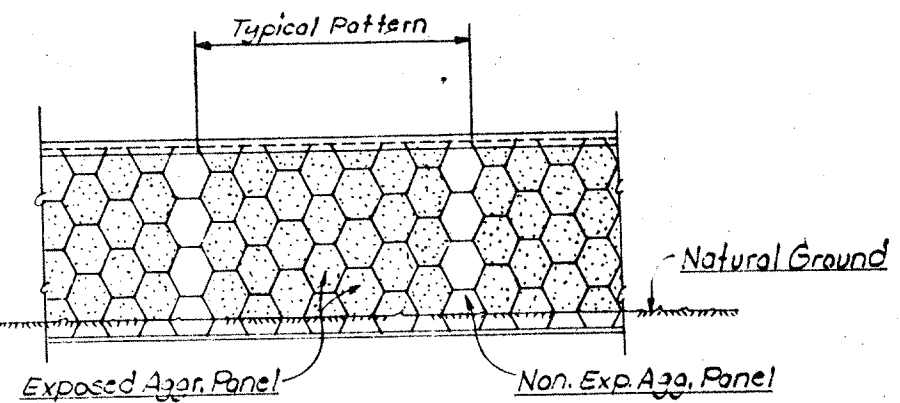


54 1/2"

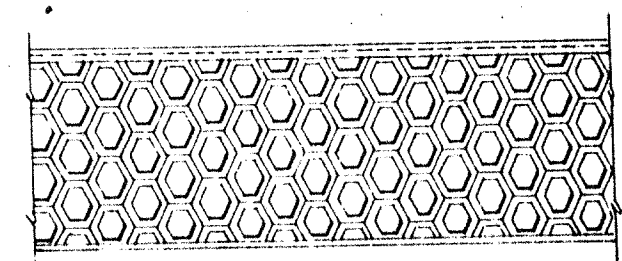
47 1/4"

RAISED PANEL PATTERN UNIT

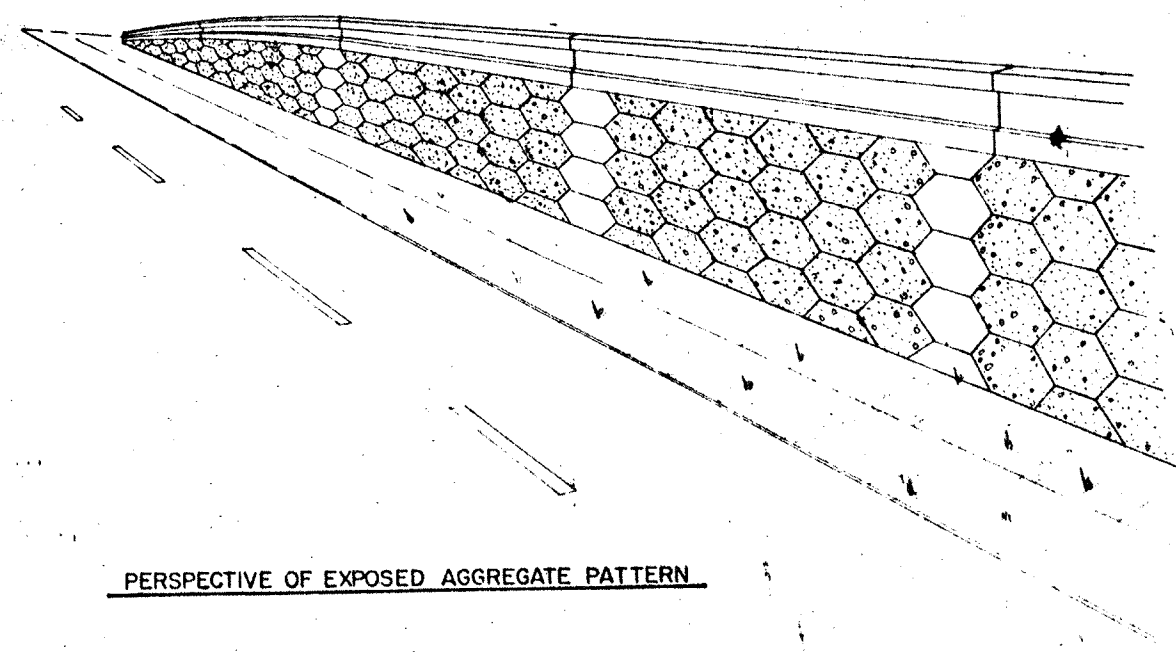
Normal Panel Thickness



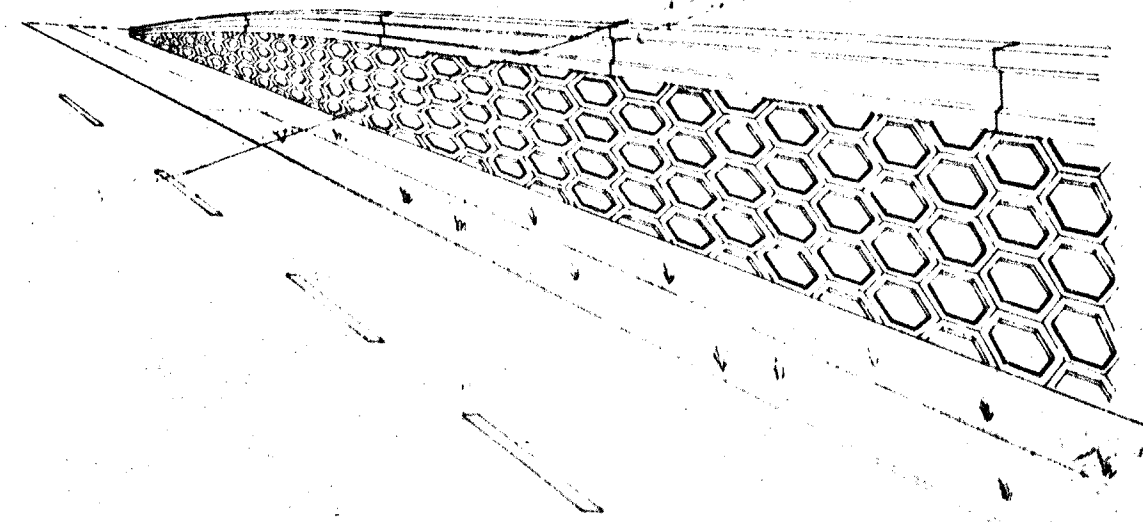
EXPOSED AGGREGATE PATTERN



RAISED PANEL PATTERN



PERSPECTIVE OF EXPOSED AGGREGATE PATTERN



PERSPECTIVE OF RAISED PANEL PATTERN

SURFACE FINISH
RETAINING WALL FACING
RETAINED EARTH RETAINING WALL
RW-3 (MOD) (5)

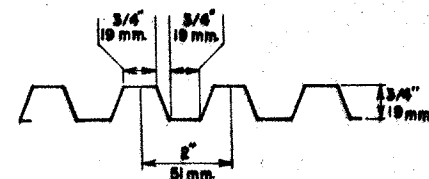
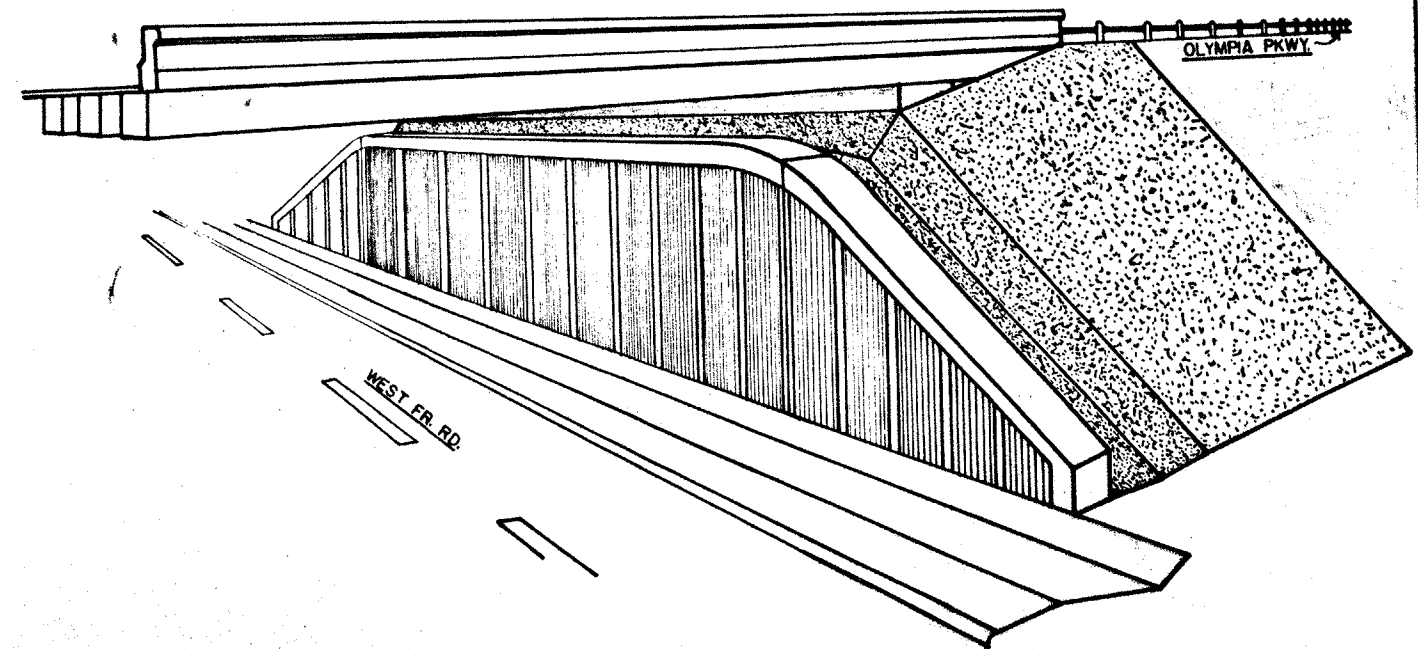
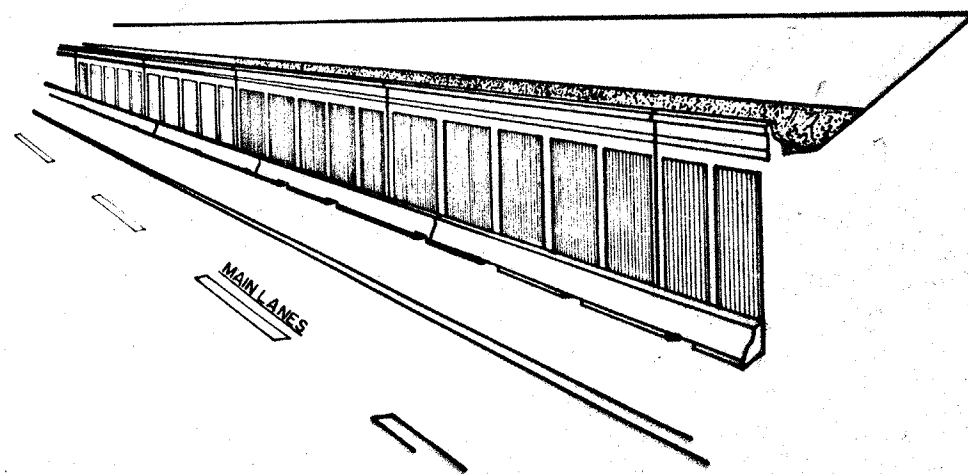
SHEET 2 OF 2

REG. NO.	STATE	FEDERAL PROJECT NO.	CITY
11835	TX	2(280)10	503
DATE	COUNTY	LINE	BLK
1/5	BEXAR	10	7

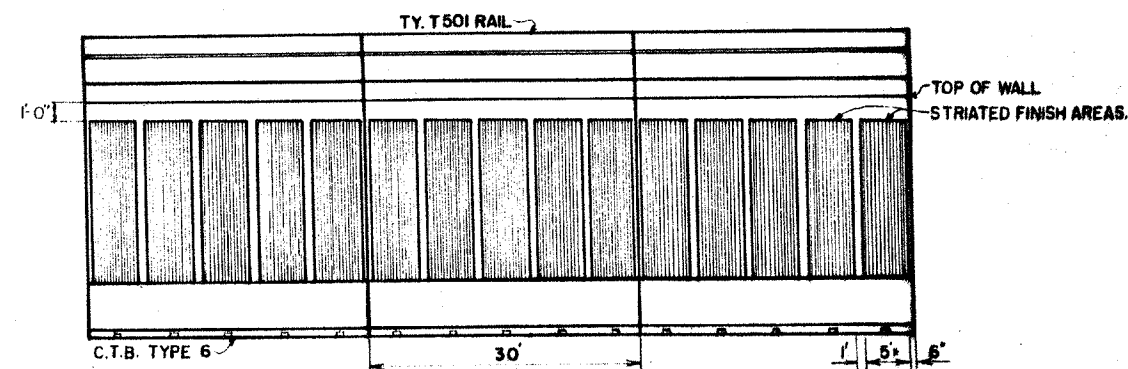
4 to 3

503

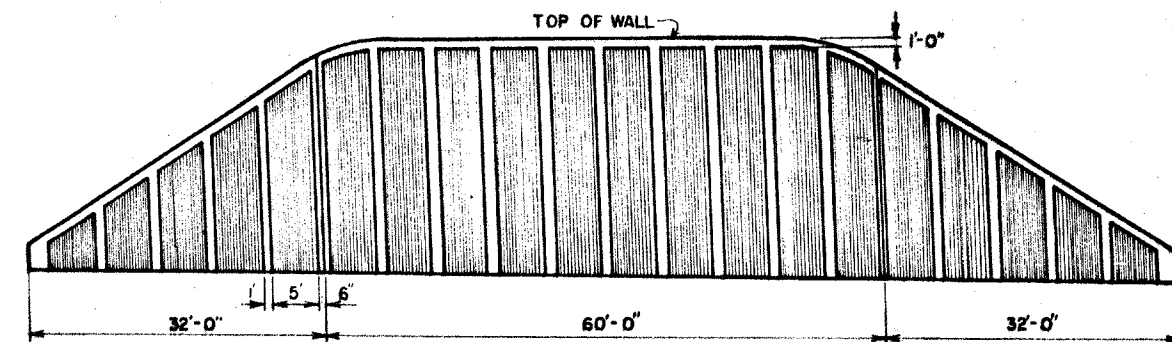
CSJ: 0016-06-029
RETAINING WALLS 4



BURKE COMPANY PATTERN NUMBER 304 or EQUAL
STRIATED PATTERN FORM



* FOR RET. WALLS C.B.F. STRIATED PANEL WIDTH = 7'
RETAINING WALLS D,E,B,C,F



RETAINING WALL 'A'

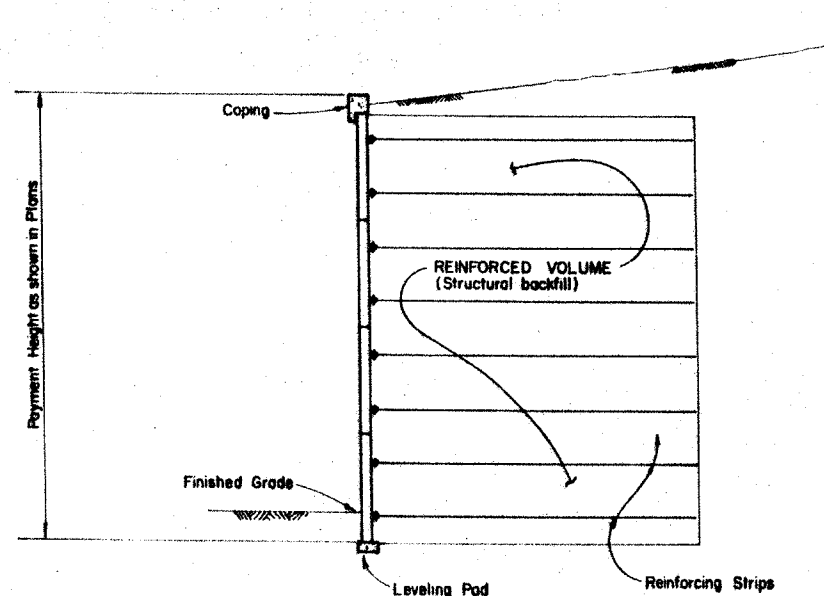
RETAINING WALLS WILL RECEIVE CLASS B FINISH

RETAINING WALL FINISH DETAILS

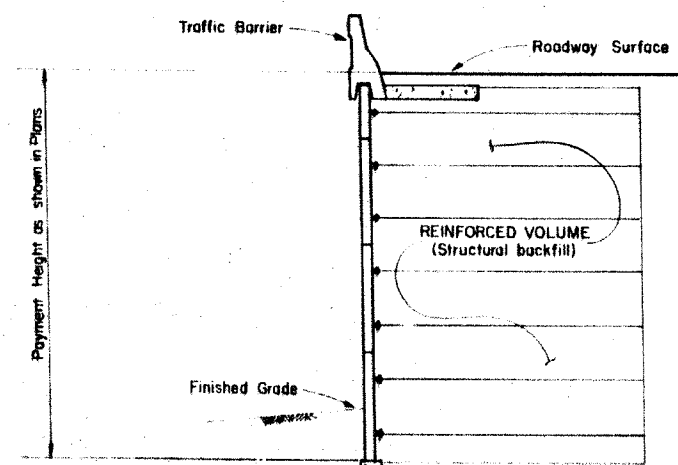


232
Bobbie L. Massey 7/26/00

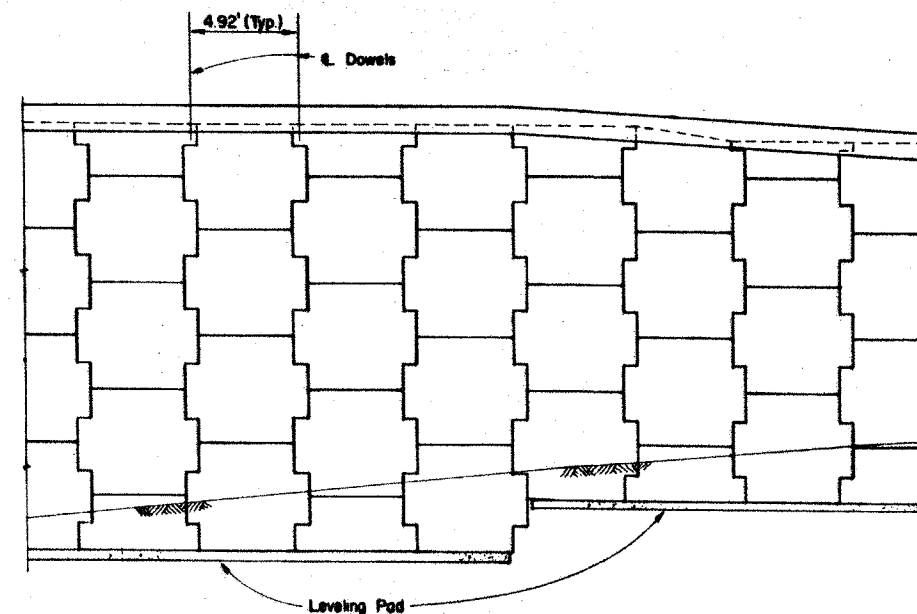
PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
0	TEXAS	IR35-P (157) 173	232
STATE DIST. NO.	COUNTY	CONTRACT NO.	DATE
15	GARDNER, ETC.	16	6/29/00



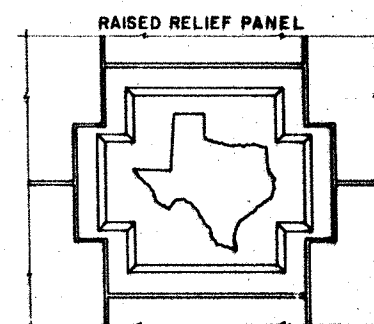
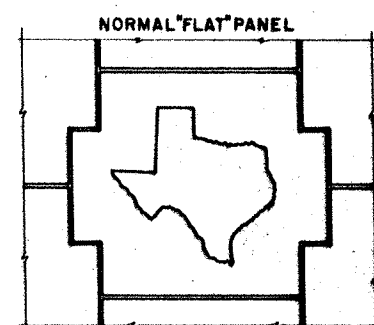
TYPICAL SECTION



TYPICAL SECTION (Showing roadway on wall)



ELEVATION



MAP OF TEXAS EMBLEM

Map of Texas emblem shall be formed into a wall panel next to each bridge abutment. The exact location of each emblem shall be approved by the Engineer. The cost of forming the emblems will not be paid for directly, but shall be considered incidental to the item "Retaining Wall."

The map of Texas shall be inset a minimum of $\frac{3}{16}$ " into the face of the panel, and shall receive a smooth finish. The inset area shall be finished with a contrasting color as approved by the Engineer.

DESIGN PARAMETERS

Structure shall be based on the following design parameters:

Random Backfill: unit weight = 125 PCF
 $\phi = 30^\circ$ C = 0 PSF
 $K_a = .333$

Select Backfill: unit weight = 125 PCF
 $\phi = 34^\circ$ C = 0 PSF
 $K_a = .28$ $K_c = .44$

Stress in steel and concrete shall be in accordance with AASHTO 1983 and current Interim Specifications.

The minimum length of Reinforcing Strips shall be 8.0'.

EXTERNAL STABILITY CRITERIA

Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5.

Factor of safety in overturning shall be greater than or equal to 2.0.

Allowable bearing pressure shall not exceed 1/2 the ultimate bearing capacity of the foundation.

INTERNAL STABILITY CRITERIA

The coefficient of earth pressure, K , shall vary linearly from .44 at the top of the structure to .28 at a depth of 20 feet. Below 20 feet, K shall equal .28.

The factor of safety against pullout of the strips shall be greater than or equal to 1.5 at all levels of reinforcement. The embedded length used in calculations shall be the length beyond the appropriate failure surface. The Rankine failure surface will be used as the failure plane unless another failure plane can be properly justified. Pullout resistance shall be determined from actual test data evaluated at 3/4 inch strain.

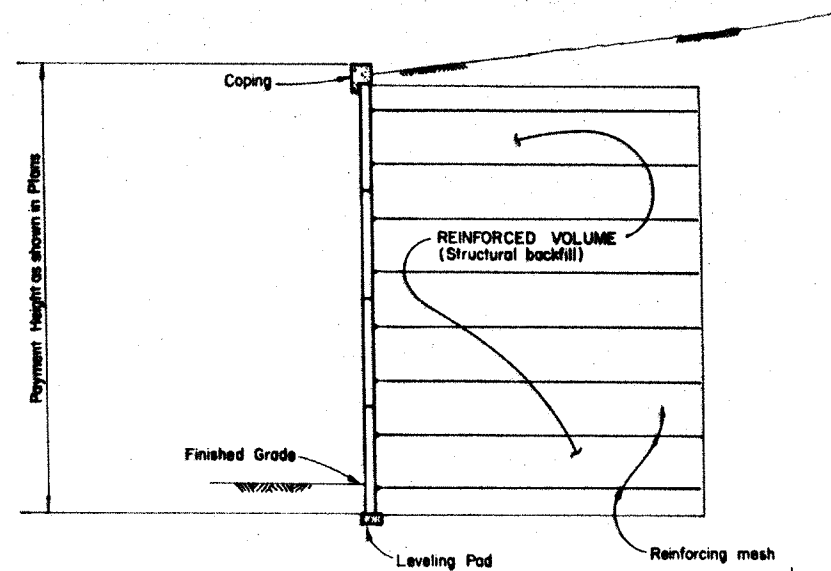


STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

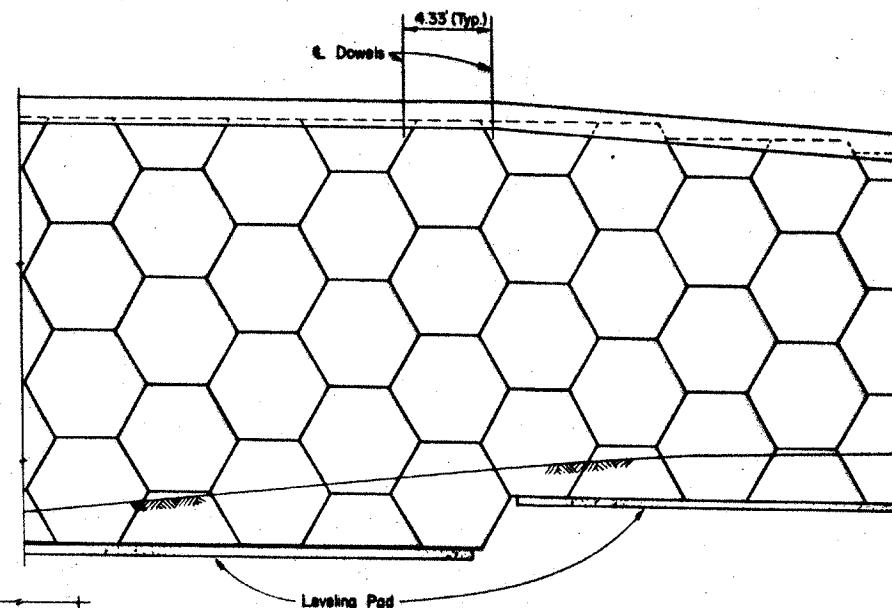
REINFORCED EARTH RETAINING WALL

232A

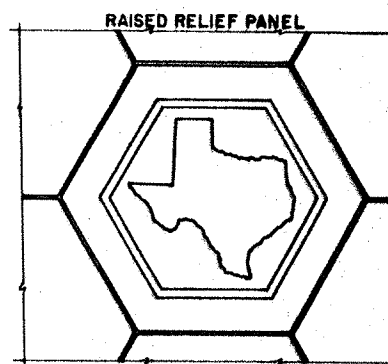
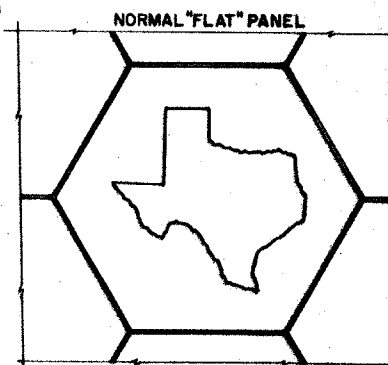
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NO.	15	6	15	6	15	6
CR	11	17	17	17	17	17
DW	MPM	GUADALUPE	16	6	29	1735
CR	HCH					



TYPICAL SECTION



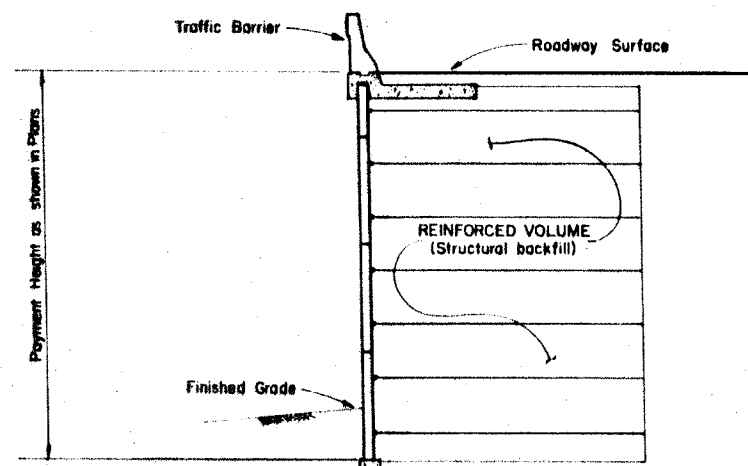
ELEVATION



MAP OF TEXAS EMBLEM

Map of Texas emblem shall be formed into a wall panel next to each bridge abutment. The exact location of each emblem shall be approved by the Engineer. The cost of forming emblems will not be paid for directly, but shall be considered incidental to the item "Retaining Wall."

The map of Texas shall be inset a minimum of 1/4" into the face of panel, and shall receive a smooth finish. The inset area shall be finished with a contrasting color as approved by the Engineer.



TYPICAL SECTION (Showing roadway on wall)

DESIGN PARAMETERS

Structure shall be based on the following design parameters:

Random Backfill: unit weight = 125 PCF
 $\phi = 30^\circ$ C = 0 PSF
 $K_a = .333$

Select Backfill: unit weight = 125 PCF
 $\phi = 34^\circ$ C = 0 PSF
 $K_a = .28$ $K_c = .44$

Stress in steel and concrete shall be in accordance with AASHTO 1983 and current Interim Specifications.

The minimum length of Reinforcing mesh shall be 80'.

EXTERNAL STABILITY CRITERIA

Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5.

Factor of safety in overturning shall be greater than or equal to 2.0.

Allowable bearing pressure shall not exceed 1/2 the ultimate bearing capacity of the foundation.

INTERNAL STABILITY CRITERIA

The coefficient of earth pressure, K, shall vary linearly from .44 at the top of the structure to .28 at a depth of 20 feet. Below 20 feet, K shall equal .28.

The factor of safety against pullout of the mesh shall be greater than or equal to 1.5 at all levels of reinforcement. The embedded length used in calculations shall be the length beyond the appropriate failure surface. The Rankine failure surface will be used as the failure plane unless another failure plane can be properly justified. Pullout resistance shall be determined from actual test data evaluated at 3/4 inch strain.

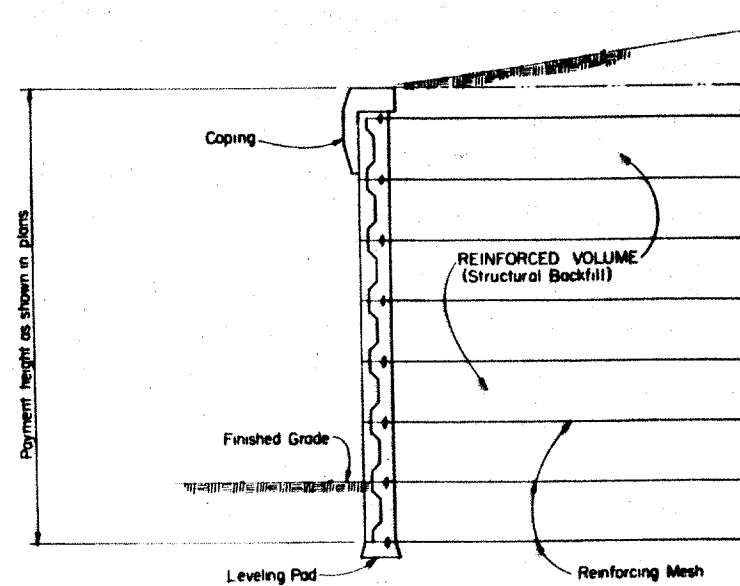


STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

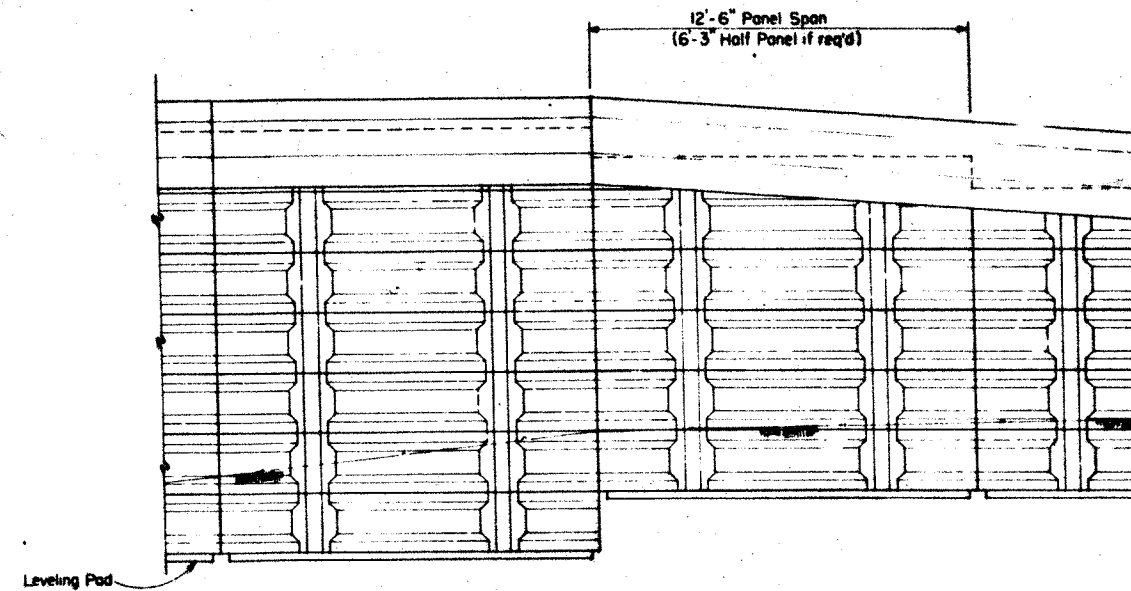
RETAINED EARTH
RETAINING WALL

232B

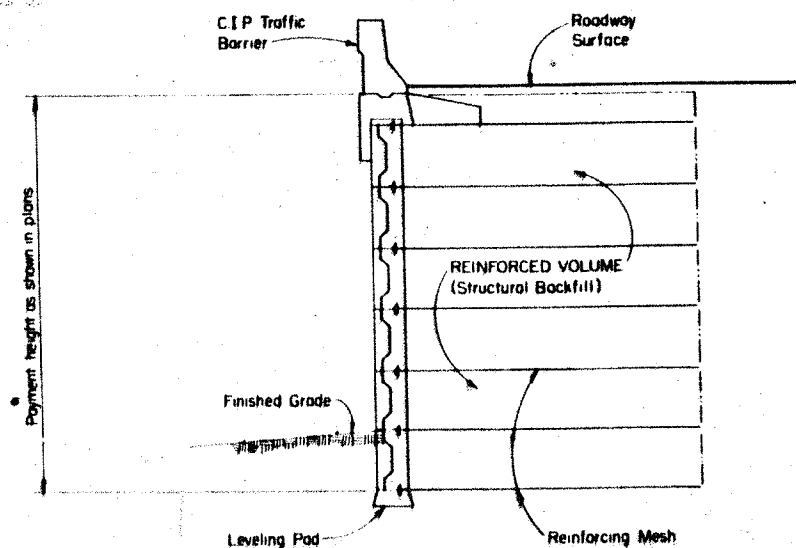
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REVISIONS		15	6	1430-2/57/73	1428	
BY	CP	11-87(Add Texas Emblem)				
BY	MPM					
BY	HLR					



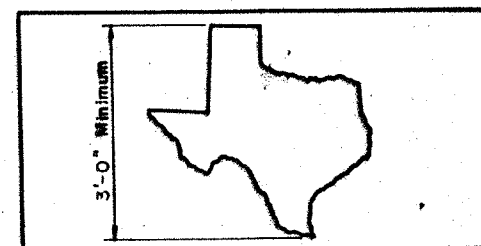
TYPICAL SECTION



ELEVATION



TYPICAL SECTION
(Showing Roadway on Wall)



MAP OF TEXAS EMBLEM

Map of Texas emblem shall be formed into a wall panel next to each bridge abutment. The exact location of each emblem shall be approved by the Engineer. The cost of forming the emblems will not be paid for directly, but shall be incidental to the item "Retaining Wall".

The map of Texas shall be inset a minimum of $\frac{3}{4}$ " into the face of the panel, and shall receive a smooth finish. The inset area shall be finished in a contrasting color as approved by the Engineer.

DESIGN PARAMETERS

Structure shall be based on the following design parameters:

Random Backfill: unit weight = 125 PCF
 $\phi = 30^\circ$ $C = 0$ PSF
 $K_a = .333$

Select Backfill: unit weight = 125 PCF
 $\phi = 34^\circ$ $C = 0$ PSF
 $K_a = .28$ $K_p = .44$

Stress in steel and concrete shall be in accordance with AASHTO 1983 and current Interim Specifications.

The minimum length of Reinforcing Mesh shall be 8.0'.

EXTERNAL STABILITY CRITERIA

Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5

Factor of safety in overturning shall be greater than or equal to 2.0


Allowable bearing pressure shall not exceed 1/2 the ultimate bearing capacity of the foundation.

INTERNAL STABILITY CRITERIA

The coefficient of earth pressure, K , shall vary linearly from .44 at the top of the structure to .28 at a depth of 20 feet. Below 20 feet, K shall equal .28

The factor of safety against pullout of the mesh shall be greater than or equal to 1.5 at all levels of reinforcement. The embedded length used in calculations shall be the length beyond the appropriate failure surface. The Rankine failure surface will be used as the failure plane unless another failure plane can be properly justified. Pullout resistance shall be determined from actual test data evaluated at 3/4 inch strain.

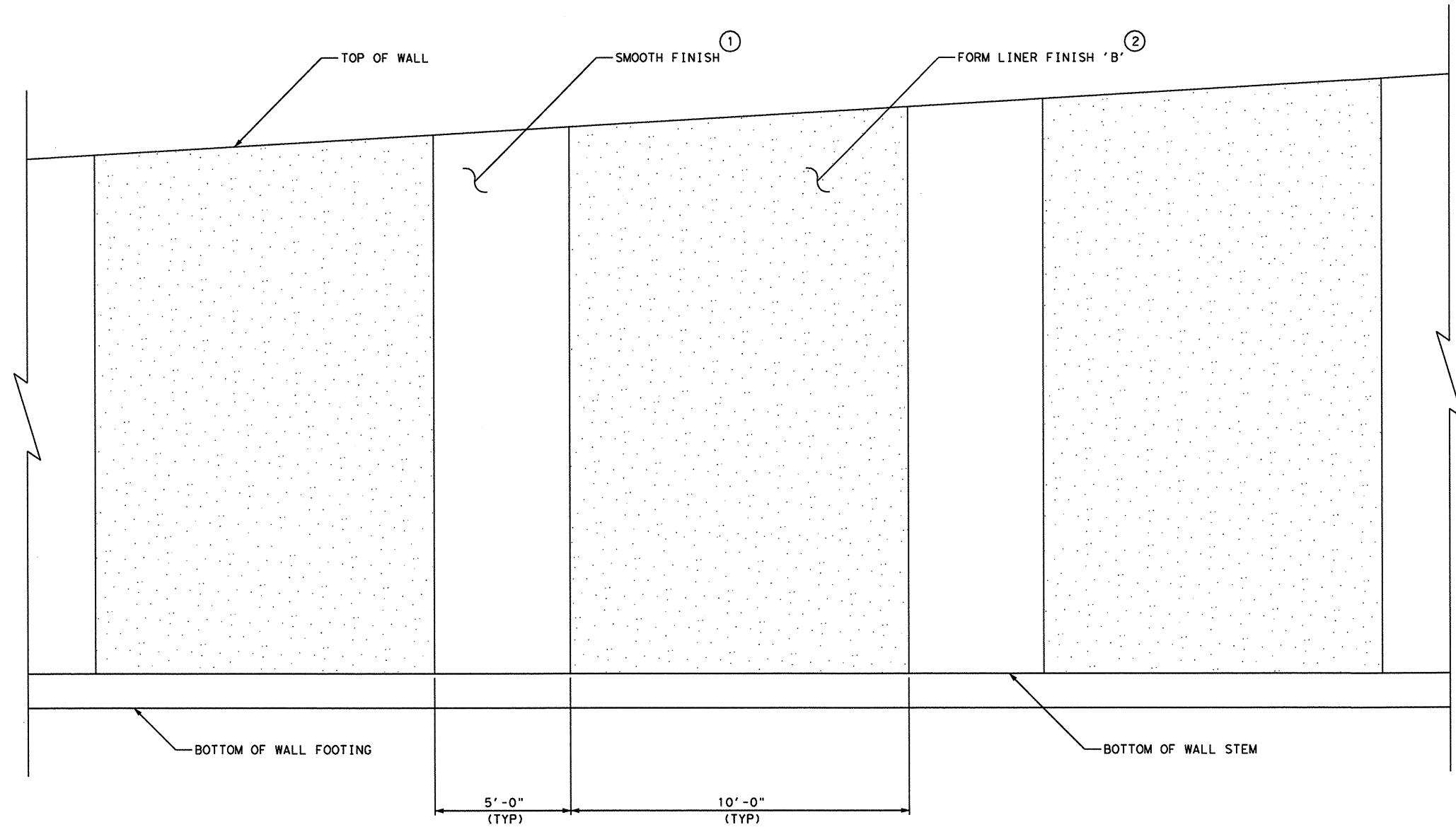
232C

 STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION		HILFICKER REINFORCED SOIL EMBANKMENT RETAINING WALL	
DESIGN DRAWING DATE: MARCH 1986 BY: [blank]	STATE: [blank] COUNTY: [blank]	FEDERAL AID PROJECT: [blank] CONTRACT: [blank]	SHEET: [blank]
DRAWING NO.: [blank]	COUNTY: [blank]	CONTRACT: [blank]	SHEET: [blank]
DRAWING NO.: [blank]	COUNTY: [blank]	CONTRACT: [blank]	SHEET: [blank]
DRAWING NO.: [blank]	COUNTY: [blank]	CONTRACT: [blank]	SHEET: [blank]

CSJ: 0017-10-261
RETAINING WALLS 5 AND 6

FILENAME: A*IH35*RW*DET3.dgn

DRAWING DATE: 4/16/2013

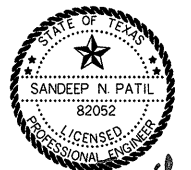


NOTES

- ① SMOOTH FINISH TO RECIEVE ACCENT COLOR: SHERWIN WILLIAMS SW 6125 "CRAFT PAPER" OR APPROVED EQUAL. ACCENT COLOR SHALL BE APPLIED TO ALL SMOOTH FINISH SURFACES UNLESS OTHERWISE NOTED.
- ② FORM LINER FINISH 'B' (RANDOM STONE) TO RECIEVE BASE COLOR: SHERWIN WILLIAMS SW 6142 "MACADAMIA" OR APPROVED EQUAL. BASE COLOR SHALL BE APPLIED TO ALL FORM LINER 'B' SURFACES UNLESS OTHERWISE NOTED.

SCALE: NTS

NO.	REVISION	BY	DATE



Satil
4-16-13

AIA ENGINEERS, LTD.
CONSULTANTS
15310 PARK ROW, HOUSTON, TX 77084
PHONE: (281) 493-4140 TBPE # 2801



IH 35 FROM IH 410 SOUTH TO IH 410 NORTH

**CAST IN PLACE
RETAINING WALL
AESTHETIC DETAILS
(WALLS 1, 2, 8)**

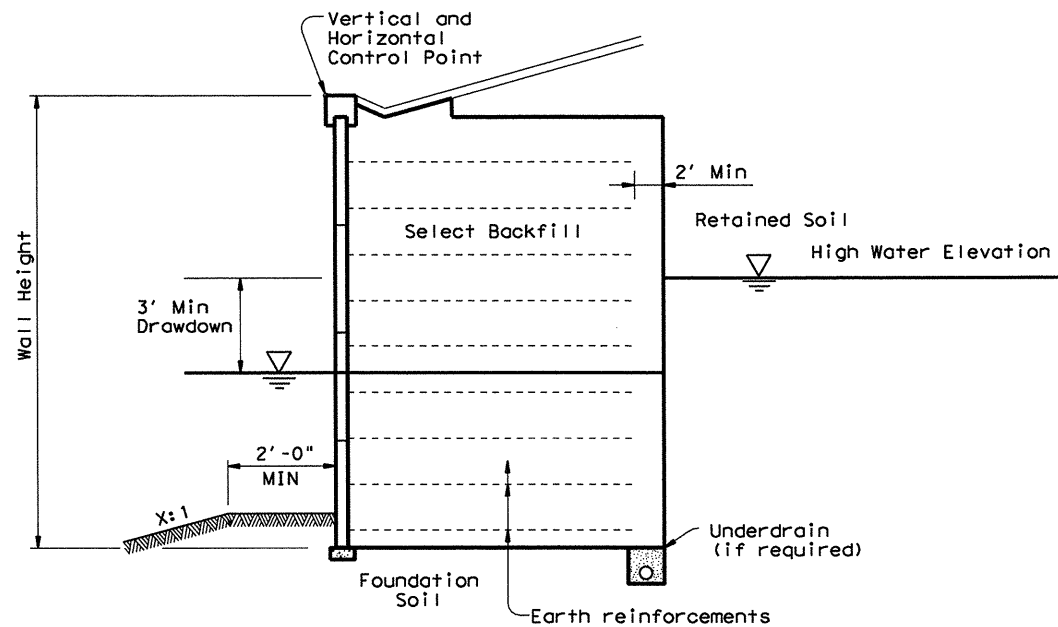
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
GRAPHICS	6		IH-35
CHECK	STATE	DISTRICT	COUNTY
CHECK	TEXAS	SAT	BEXAR
CHECK	CONTROL	SECTION	JOB
CHECK	0017	10	261

574

WALL SUMMARY

[illegible]

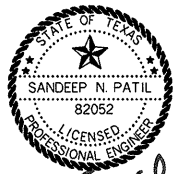
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TXDOT for any purpose whatsoever. TXDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



TYPICAL SECTION

(RAPID DRAWDOWN CONDITION)

- ① IF SHOWN AS REQUIRED, REFER TO RETAINING WALL LAYOUTS AND TYPICAL SECTIONS FOR LIMITS AND ADDITIONAL INFORMATION ON SOIL IMPROVEMENTS.
- ② USE THE MAXIMUM VALUE OF: MINIMUM LENGTH OR PERCENTAGE OF WALL HEIGHT. WALL HEIGHT AT BRIDGE ABUTMENTS IS EQUAL TO THE DISTANCE BETWEEN THE TOP OF LEVELING PAD AND FINISHED GRADE AT THE TOP OF BRIDGE ABUTMENT BACKWALL.



Satil
4-16-13

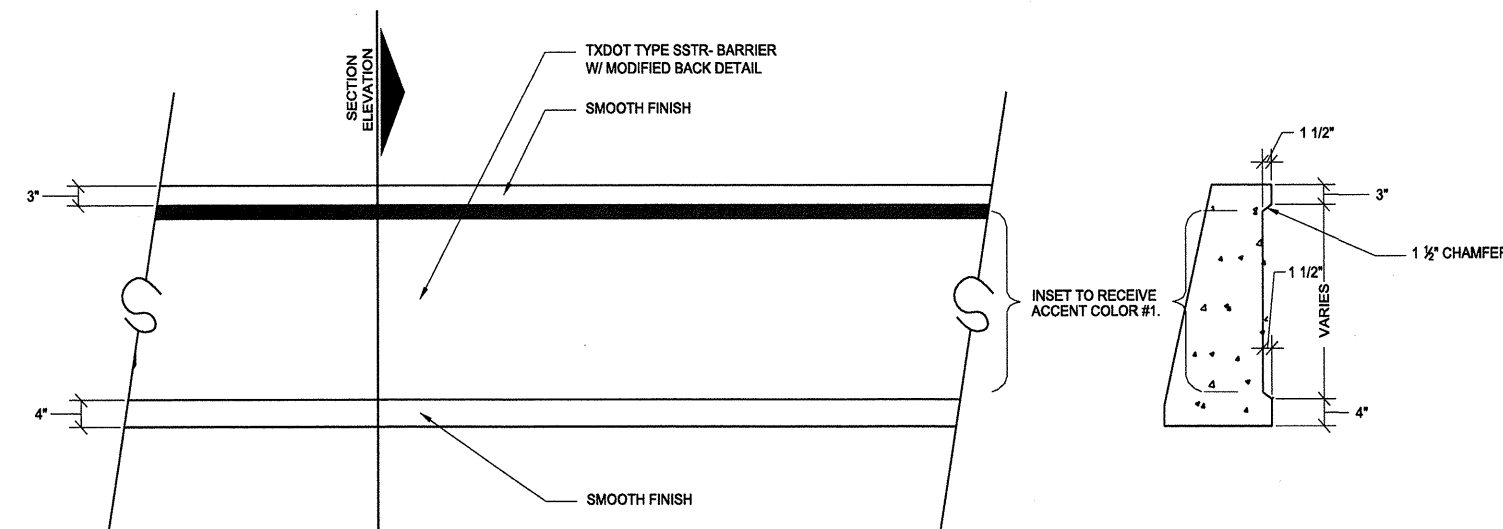
 **Texas Department of Transportation**
Bridge Division

MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW (MSE) DD

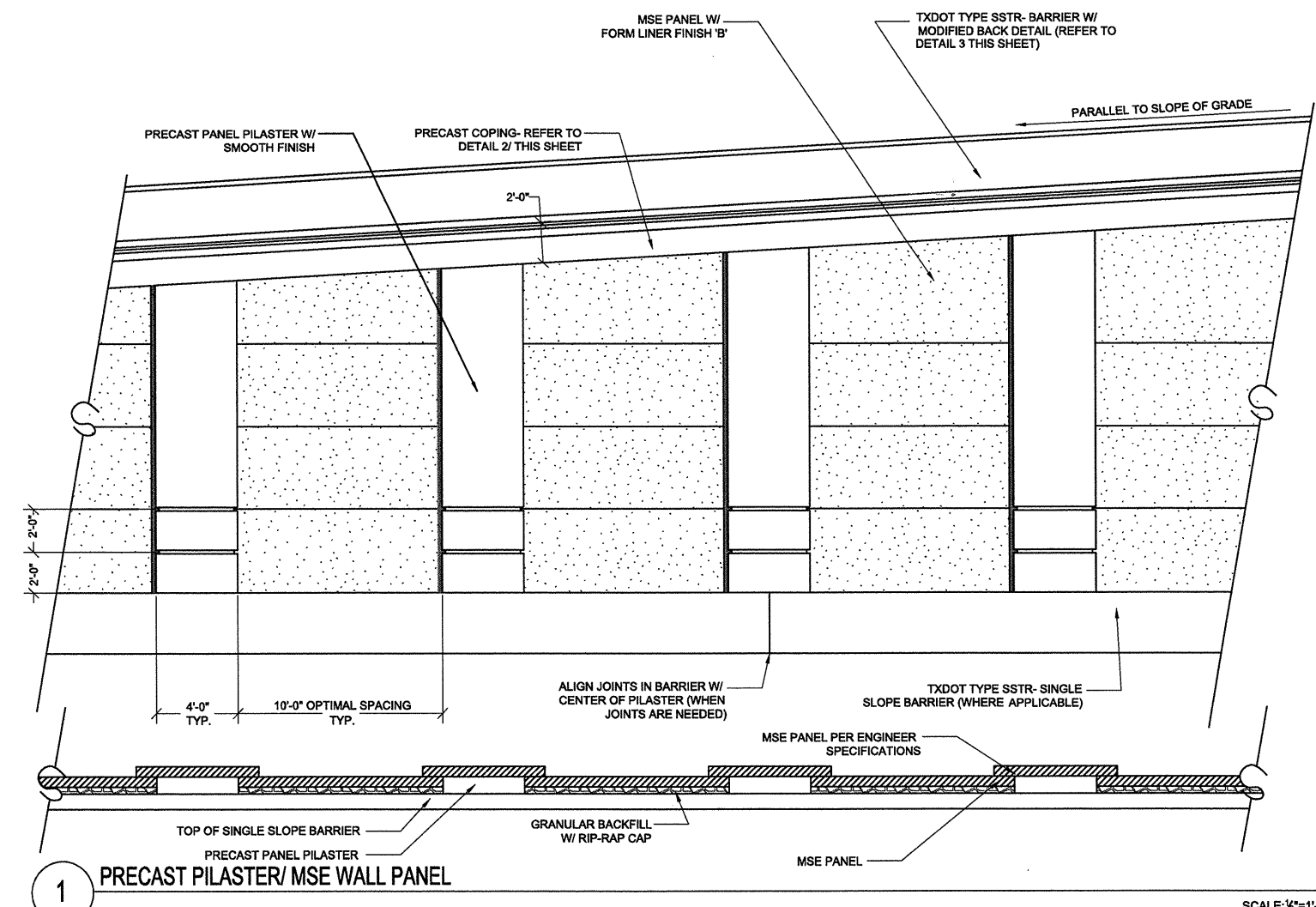
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© TxDOT January 2013	DISTRICT	FEDERAL AID PROJECT		
REVISIONS	SAT	575		
	COUNTY	CONTROL	SECT	JOB HIGHWAY
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FILENAME: A:\IH35\M07-retwall-det.dgn
DRAWING DATE: 4/16/2013



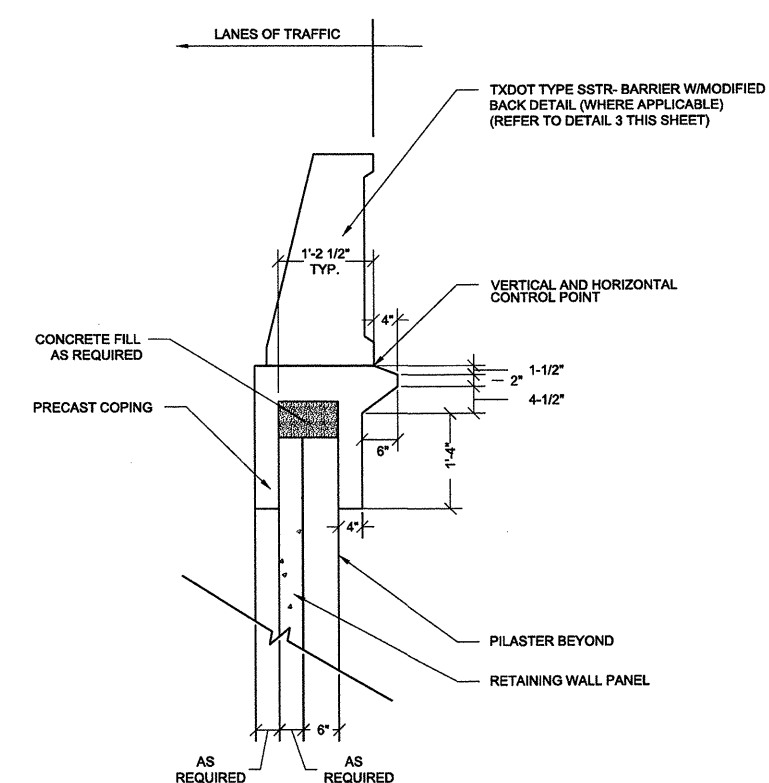
3 SINGLE SLOPE BARRIER WITH MODIFIED BACK

- NOTE:
1. RAIL HEIGHT MAY VARY PER TRAFFIC REQUIREMENTS
 2. FORM LINER FINISH 'B' (RANDOM STONE) WITH ACCENT COLOR SW 6125
 3. 2" REVEAL TO RECEIVE SMOOTH FINISH AND BASE COLOR SW 6142



1 PRECAST PILASTER/ MSE WALL PANEL

SCALE: 1/8"=1'-0"



2 RETAINING WALL COPING

SCALE: 3/8"=1'-0"

SCALE: NTS

NO.	REVISION	BY	DATE

STATE OF TEXAS
SANDEEP N. PATIL
82052
LICENSED PROFESSIONAL ENGINEER
4-16-13

AIA ENGINEERS, LTD.
CONSULTANTS
15310 PARK ROW, HOUSTON, TX 77084
PHONE: (281) 493-4140 TBPE # 2801

Texas Department of Transportation

IH 35 FROM IH 410 SOUTH TO IH 410 NORTH

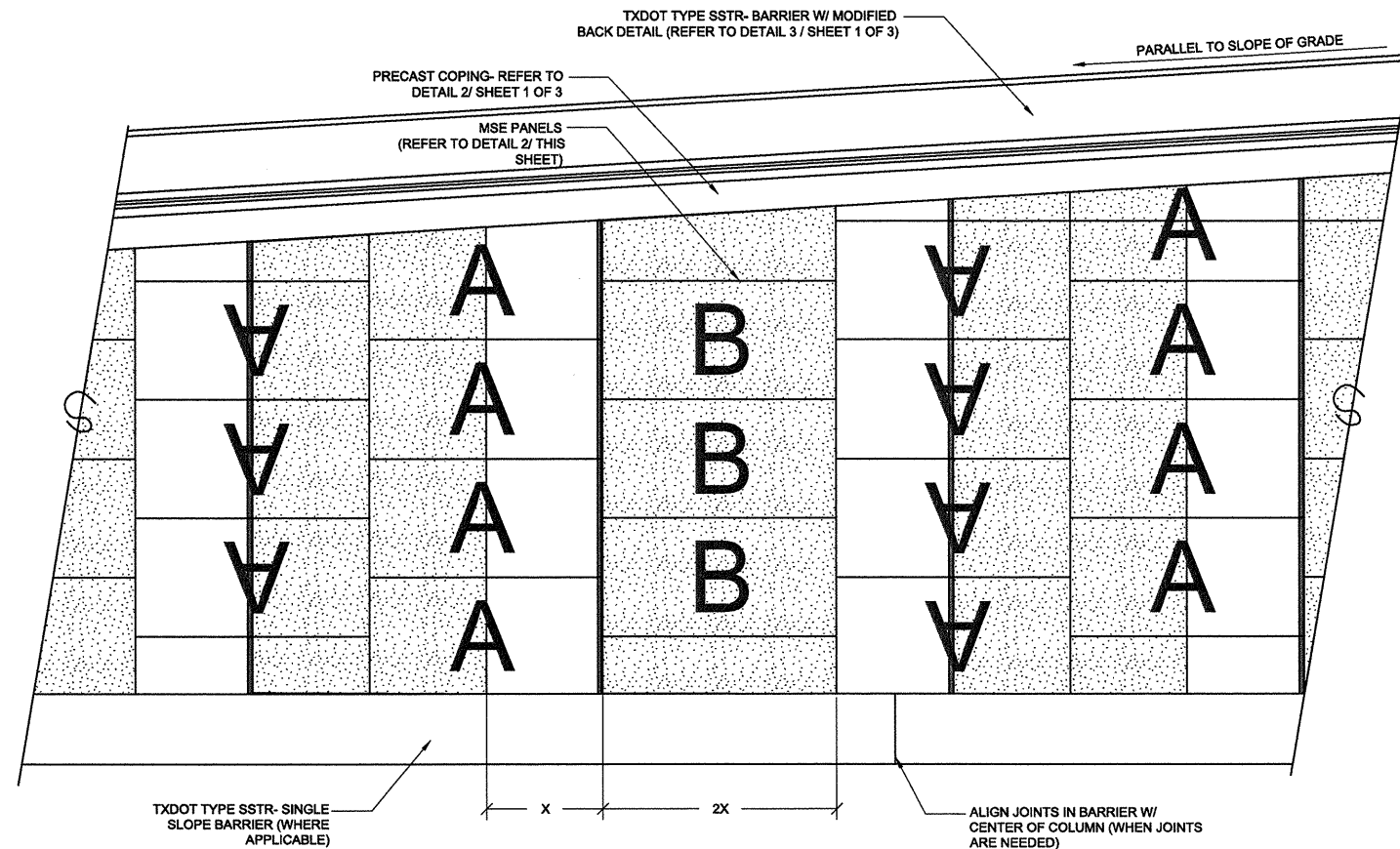
**MISSION REGION
RETAINING WALL
DETAILS**

SHEET 1 OF 3

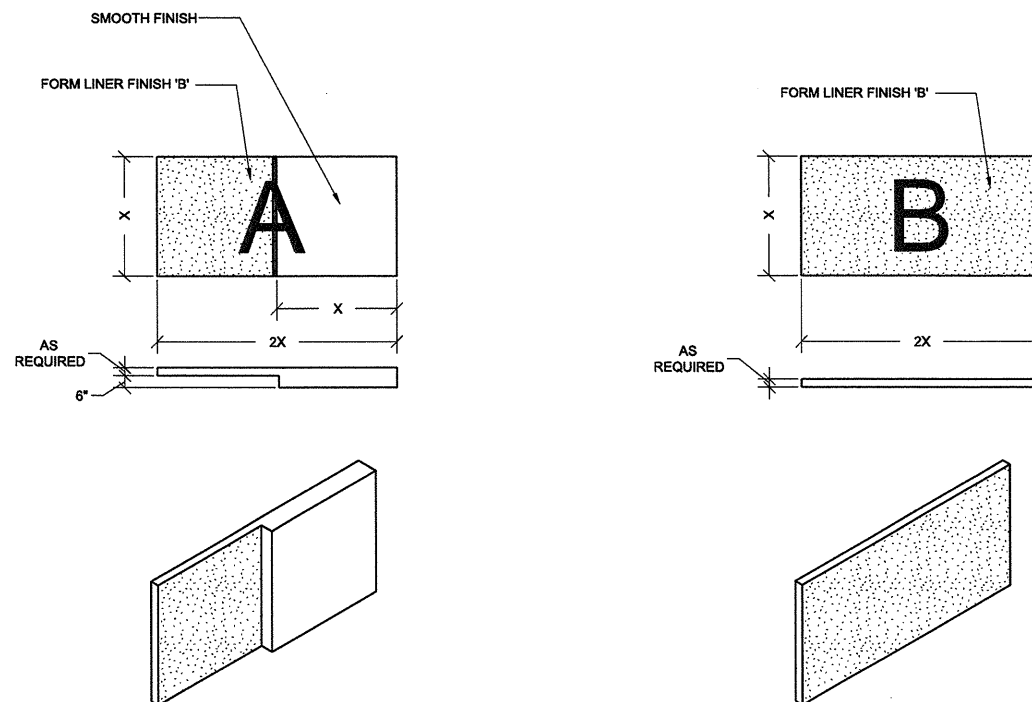
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
GRAPHICS	6		IH-35
CHECK	STATE	DISTRICT	COUNTY
CHECK	TEXAS	SAT	BEXAR
CHECK	CONTROL	SECTION	JOB
	0017	10	261

576

FILENAME: A*IH35*MO8-retwall-det.dgn
DRAWING DATE: 4/16/2013



1 TYPICAL MSE PANEL CONFIGURATION



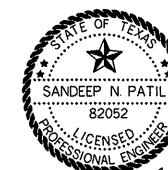
2 MSE PANELS

NOTE:

1. REFER TO TXDOT STANDARD 'RW (MSE) - MECHANICALLY STABILIZED EARTH RETAINING WALL' FOR PANEL DIMENSIONS.
2. DO NOT USE TX EMBLEM.
3. FORM LINER FINISH 'B' (RANDOM STONE) WITH ACCENT COLOR SW 6125
4. 2" REVEAL TO RECEIVE SMOOTH FINISH AND BASE COLOR SW 6142

SCALE: NTS

NO.	REVISION	BY	DATE



Sandeep N. Patil
4-16-13

AIA ENGINEERS, LTD.
CONSULTANTS
15310 PARK ROW, HOUSTON, TX 77084
PHONE: (281) 493-4140 TBPE # 2801

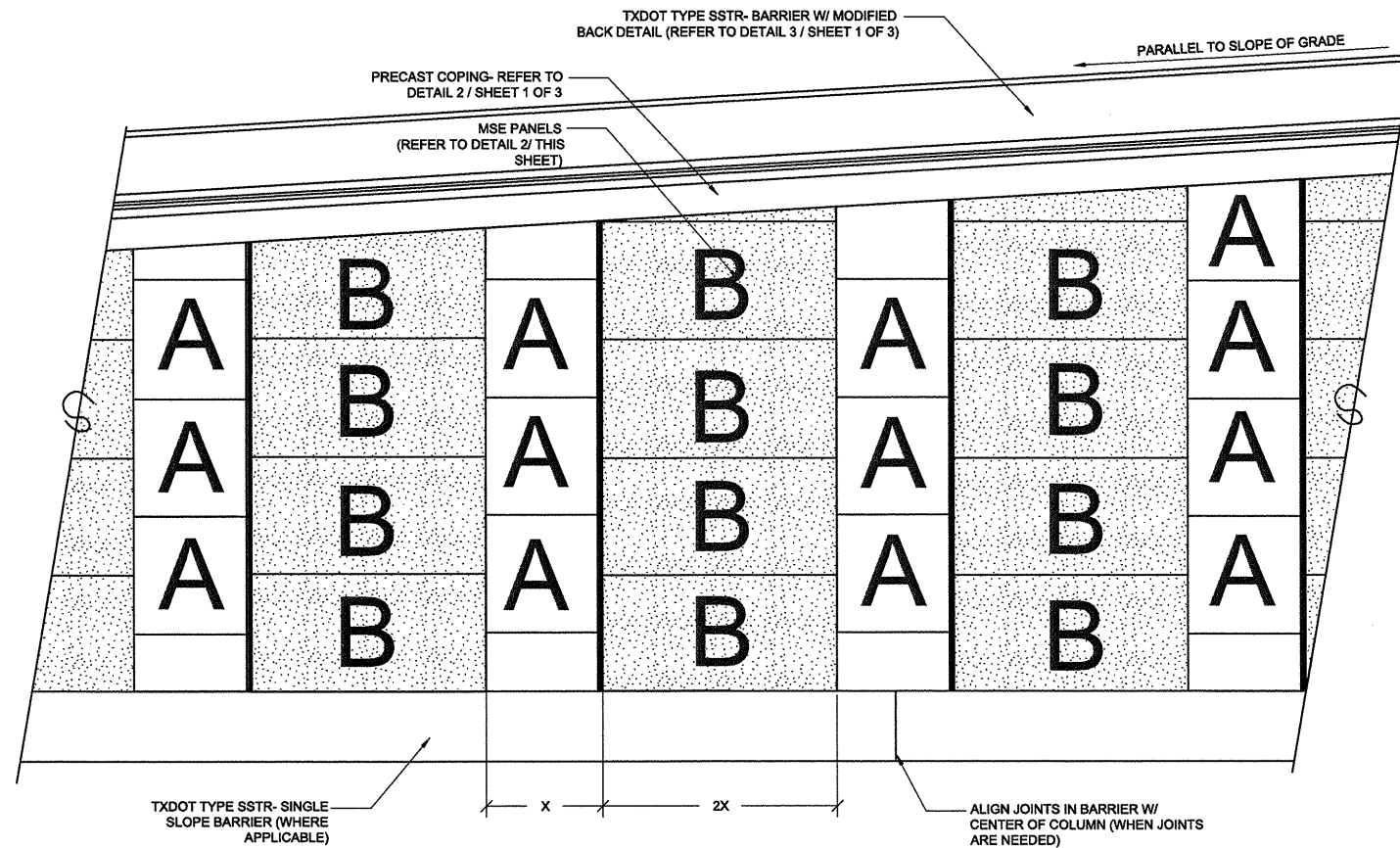
Texas Department of Transportation®

IH 35 FROM IH 410 SOUTH TO IH 410 NORTH

**MISSION REGION
RETAINING WALL
DETAILS**

SHEET 2 OF 3			
DESIGN	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	HIGHWAY NO. IH-35
GRAPHICS	STATE TEXAS	DISTRICT SAT	COUNTY BEXAR
CHECK	CONTROL 0017	SECTION 10	JOB 261
CHECK			577

FILENAME: A:\IH35\MO8A-retwall-det.dgn
DRAWING DATE: 4/16/2013



1 ALTERNATE MSE PANEL CONFIGURATION



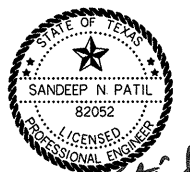
2 ALTERNATE MSE PANELS

NOTE:

1. REFER TO TXDOT STANDARD 'RW (MSE) - MECHANICALLY STABILIZED EARTH RETAINING WALL' FOR PANEL DIMENSIONS.
2. DO NOT USE TX EMBLEM.
3. FORM LINER FINISH 'B' (RANDOM STONE) WITH ACCENT COLOR SW 6125
4. 2" REVEAL TO RECEIVE SMOOTH FINISH AND BASE COLOR SW 6142

SCALE: NTS

NO.	REVISION	BY	DATE
-----	----------	----	------



S. Patil
4-16-13

AIA ENGINEERS, LTD.
CONSULTANTS
15310 PARK ROW, HOUSTON, TX 77084
PHONE: (281) 493-4140 TBPE # 2801



IH 35 FROM IH 410 SOUTH TO IH 410 NORTH

**MISSION REGION
RETAINING WALL
DETAILS**

SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS	6			IH-35
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	SAT	BEXAR	578
	CONTROL	SECTION	JOB	
	0017	10	261	

APPENDIX E
IN PLACE FACING OF RETAINING WALLS IN POTENTIAL CONFLICT WITH
PROPOSED DRILLED SHAFTS



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
AG 1710197.2.1

Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 1-1

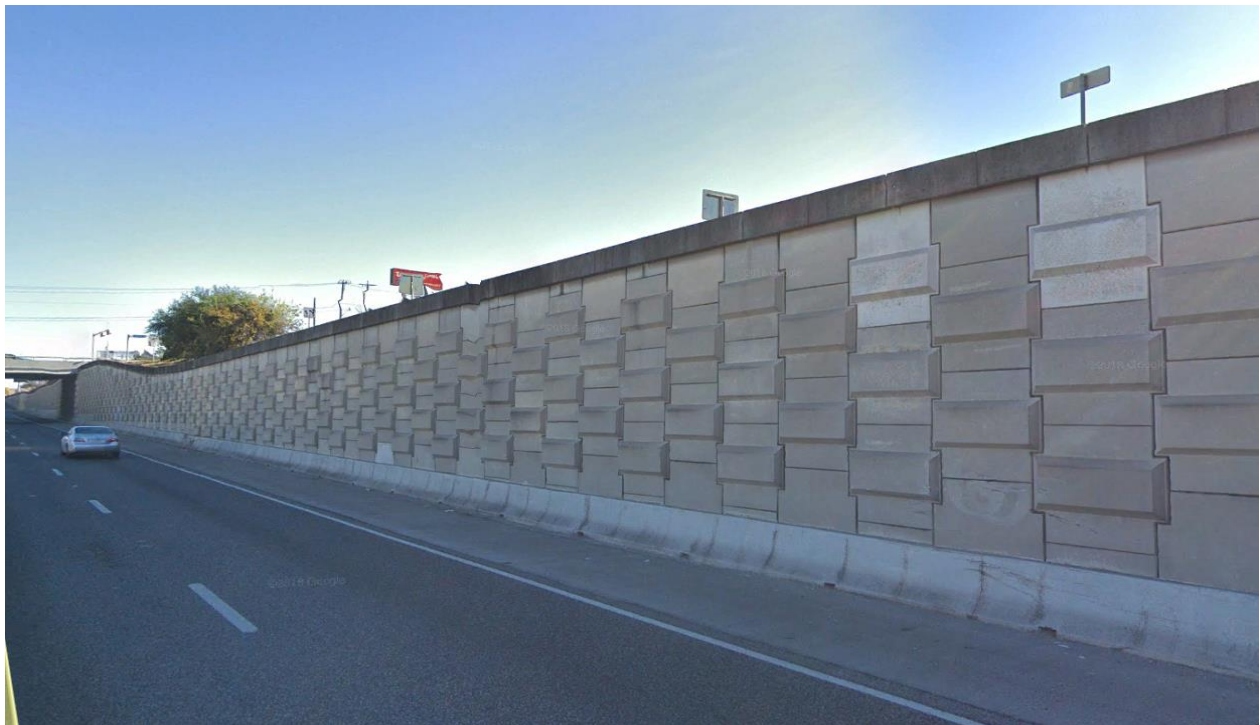


As-Built Plan Wall Type: Spread Footing CIP Cantilever
In-Place Wall Type: Likely MSE Wall

	Project: North-East Expressway AG 1710197.2.1	Appendix E
		In-Place Retaining Structures
		Drilled Shaft Conflicts
		RW 1-2



As-Built Plan Wall Type: Spread Footing CIP Cantilever
In-Place Wall Type: Same as as-Built



As-Built Plan Wall Type: Spread Footing CIP Cantilever
In-Place Wall Type: Likely MSE Wall



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
AG 1710197.2.1

Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 1-4



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 1-5



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
AG 1710197.2.1

Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 2-1



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
AG 1710197.2.1

Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 2-2



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 2-3



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 2-4



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely MSE Wall



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 2-5



As-Built Plan Wall Type: Spread Footing CIP Cantilever
In-Place Wall Type: Likely MSE Wall

	Project: North-East Expressway AG 1710197.2.1	Appendix E
		In-Place Retaining Structures
		Drilled Shaft Conflicts
		RW 2-6



As-Built Plan Wall Type: Spread Footing CIP Cantilever
In-Place Wall Type: Likely Doublewal

	Project: North-East Expressway AG 1710197.2.1	Appendix E
		In-Place Retaining Structures
		Drilled Shaft Conflicts
		RW 3-1



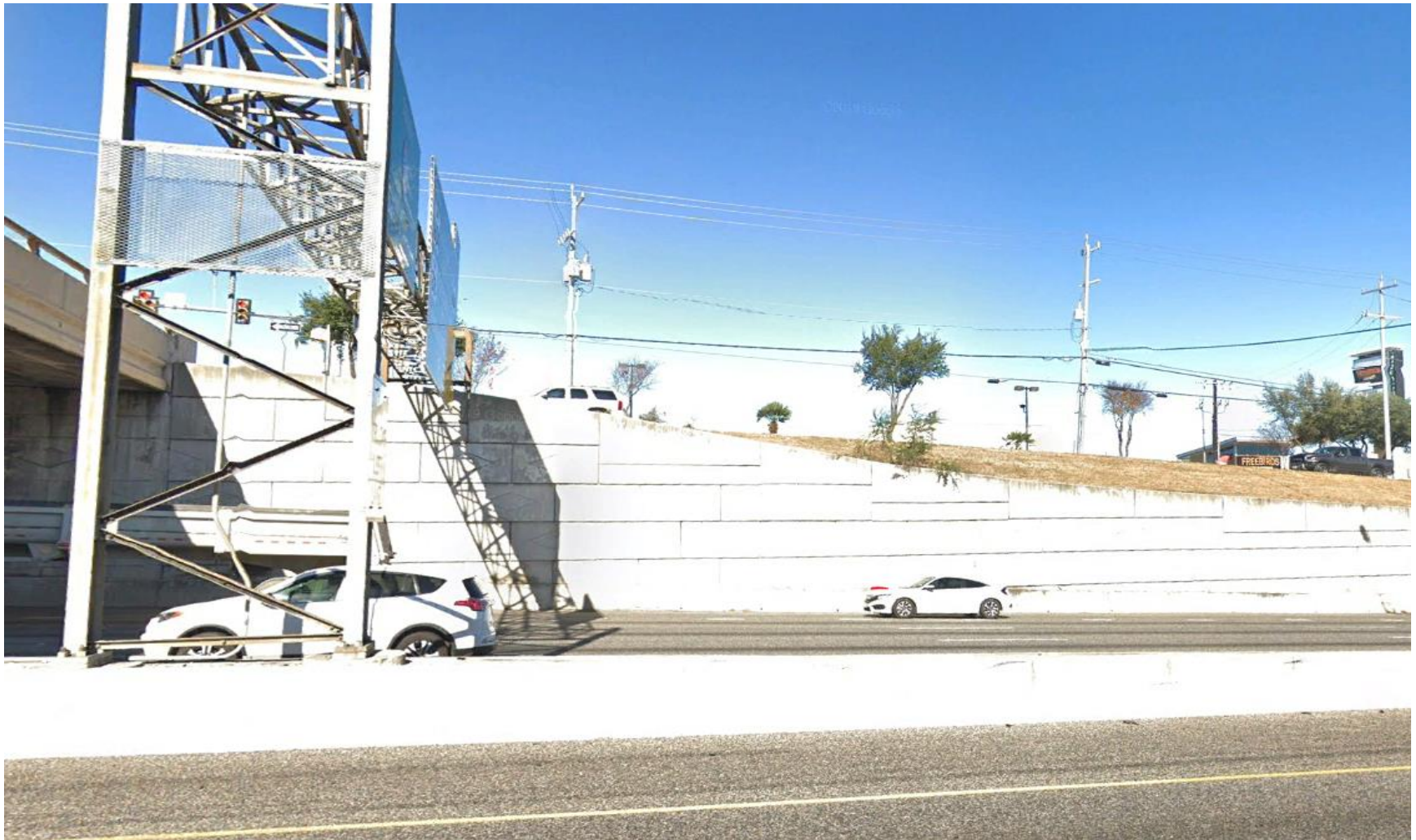
As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely Doublewal



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 3-2



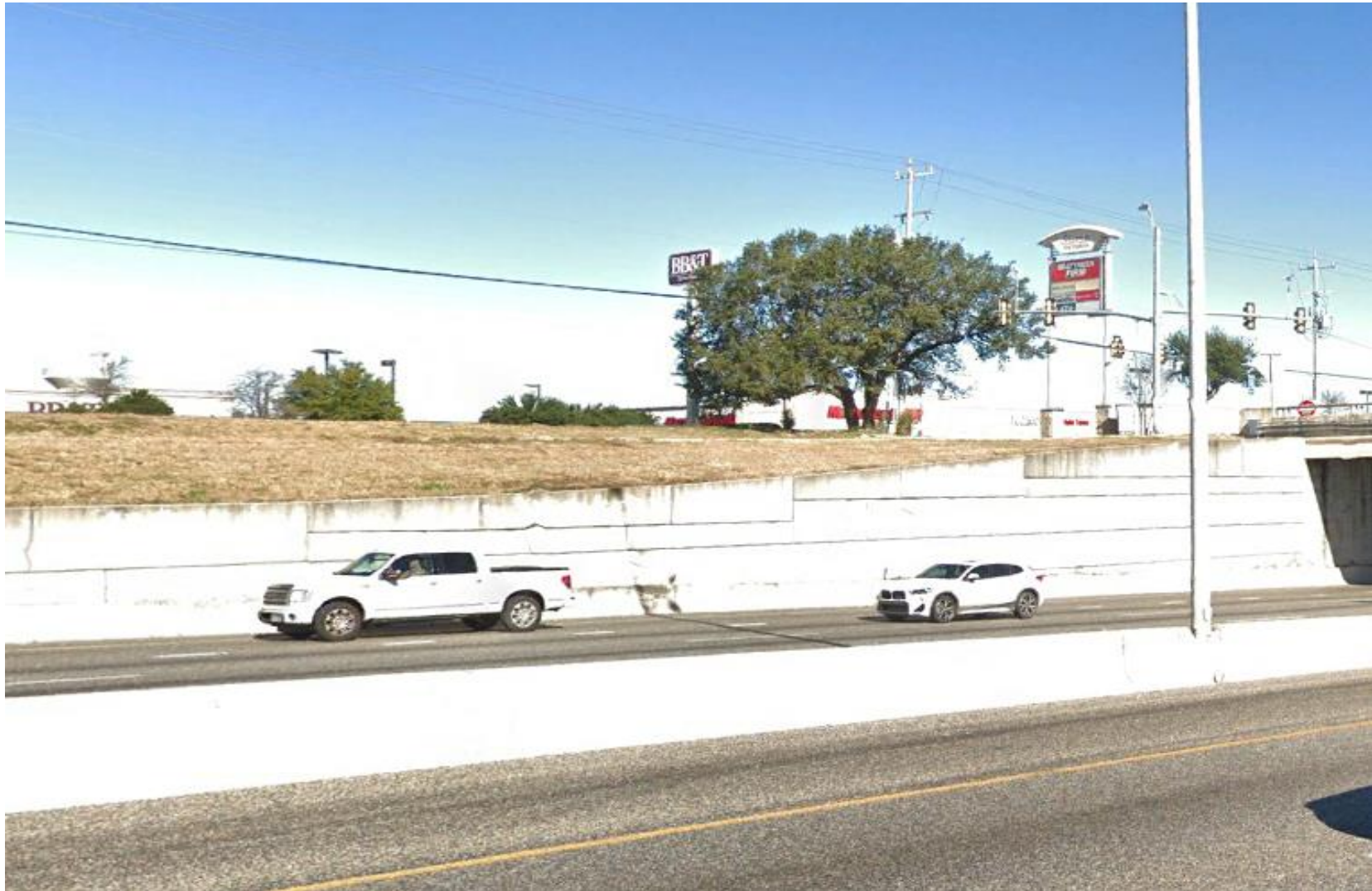
As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely Doublewal



Project: North-East Expressway
AG 1710197.2.1

Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 3-3



As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Likely Doublewal



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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 3-4



As-Built Plan Wall Type: Rock Nail Wall

In-Place Wall Type: Same as as-Built



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts

RW 4-1



As-Built Plan Wall Type: Rock Nail Wall

In-Place Wall Type: Same as as-Built



Project: North-East Expressway
AG 1710197.2.1

Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts
RW 4-2



From Frontage Rd, NB



From Frontage Rd, NB

As-Built Plan Wall Type: MSE Wall with Temporary Shoring at the Back

In-Place Wall Type: Same as as-Built



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts

RW 5-1



From Frontage Rd, NB



From Frontage Rd, NB

As-Built Plan Wall Type: MSE Wall with Temporary Shoring at the Back

In-Place Wall Type: Same as as-Built



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts

RW 5-2



From Frontage Rd, NB



From Frontage Rd, NB

As-Built Plan Wall Type: MSE Wall with Temporary Shoring at the Back

In-Place Wall Type: Same as as-Built



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts

RW 6-1



From Frontage Rd, NB



From Frontage Rd, NB

As-Built Plan Wall Type: MSE Wall with Temporary Shoring at the Back

In-Place Wall Type: Same as as-Built



Project: North-East Expressway
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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts

RW 6-2



West Approach, from Frontage Rd, EB



West Approach, from Frontage Rd, WB

As-Built Plan Wall Type: Spread Footing CIP Cantilever

In-Place Wall Type: Same as as-Built (Note: Currently under widening modifications, potential new MSE wall)



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Appendix E
In-Place Retaining Structures
Drilled Shaft Conflicts

RW 7-1