



Traffic Noise Technical Report

10/69 Interchanges Project

Jefferson County, Texas

Date: February 2020

CSJs: 0028-13-135 & 0739-02-140

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1. Introduction

This Noise Technical Report presents the effects of a project proposed by the Texas Department of Transportation (TxDOT)–Beaumont District and the Federal Highway Administration (FHWA) to Interstate (I)-10 and United States Highway (US) 69 where they converge in the City of Beaumont, Texas in Jefferson County (**Figure 1**). The I-10 study area would be approximately 5 miles.

The improvements to I-10 would include widen the existing I-10 from Walden Road (County Road 131) to 7th Street and existing US 69 from Fannett Road (State Highway 124) to 11th Street. Between the Cardinal Drive and Eastex Freeway interchanges, the roadway would be widened in each direction from four lanes to five lanes. The roadway approaches to the Cardinal Drive and Eastex Freeway interchanges on I-10 and US 69 would be widened in each direction from two lanes to three lanes. The project also includes new frontage roads for continuity throughout the limits, relocating I-10 ramps, and constructing two-lane direct connectors in each direction where I-10 and US 69 converge within the project limits. In addition, the project includes changes to the Maury Meyers Bridge (Liberty/Laurel Overpass) to address a height constraint for freight movements and includes upgrading drainage infrastructure to current design standards. The noise analysis was conducted in areas adjacent to the proposed ROW based on roadway alterations shown in the project design.

This analysis was accomplished in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011) and Reasonable Cost Proposal for 2018 Noise Policy (2017).

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (**Table 1**).

Table 1: FHWA Noise Abatement Criteria (NAC)

Activity Category	dB(A) Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

A noise impact occurs when either the absolute or relative criterion is met:

Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one dB(A) below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

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

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

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise. The Transportation Planning and Programming Division approved traffic used in the model is included in **Appendix A**.

2. Noise Analysis Results

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 2** and **Figure 2**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 2: Traffic Noise Levels dB(A) Leq

Representative Receiver	NAC Category	NAC Level	Existing (2025)	Predicted (2045)	Change (+/-) ¹	Noise Impact
R1- Restaurant	E	72	67	71	4	Yes
R2- Hotel	E	72	67	71	4	Yes
R3- Hotel	E	72	69	72	3	Yes
R4- Hotel	E	72	67	68	1	No
R5- RV Park	C	67	70	73	3	Yes
R6- Day Care	C	67	64	65	1	No
R7- Hotel	E	72	65	67	2	No
R8- Hotel	E	72	68	68	0	No
R9- Hotel	E	72	68	68	0	No
R10- Hotel	E	72	70	71	1	Yes
R11- Restaurant	E	72	73	71	-2	Yes
R12- Hotel	E	72	72	75	3	Yes
R13- TV Studio (indoor)	D	52	44	46	2	No
R14- Church (indoor)	D	52	43	45	2	No
R15- Hotel	E	72	65	65	0	No
R16- Planetarium (indoor)	D	52	42	41	-1	No
R17- Recreation Center Pool	C	67	66	67	1	Yes
R18- Church (indoor)	D	52	40	45	5	No

Representative Receiver	NAC Category	NAC Level	Existing (2025)	Predicted (2045)	Change (+/-) ¹	Noise Impact
R19- Apartments	B	67	74	72	-2	Yes
R20- Apartments	B	67	72	67	-5	Yes
R21- Single Family Residence	B	67	71	70	-1	Yes
R22- Hotel	E	72	63	66	3	No
R23- Single Family Residence	B	67	74	70	-4	Yes
R24- Hotel	E	72	67	69	2	No
R25- Hotel	E	72	72	71	-1	Yes
R26- Hotel	E	72	67	67	0	No
R27- Single Family Residence	B	67	70	71	1	Yes
R28- Single Family Residence	B	67	73	74	1	Yes
R29- Park	C	67	72	74	2	Yes
R30- Playground	C	67	70	73	3	Yes
R31- Church (indoor)	D	52	42	42	0	No
R32- School	C	67	64	65	1	No
R33- Single Family Home	B	67	72	73	1	Yes

¹ Receiver locations with reduced noise levels are due to travel lane realignment moving roadways and traffic farther away from the receiver and reducing the predicted noise levels.

As indicated in **Table 2**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers.

Before any abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50% of impacted, first row receivers by at least five dB(A). To be "reasonable," it must not exceed the cost-effectiveness criterion of \$35 per square foot and \$52,500 (or an allowance of 1,500 square feet) for each receiver that would benefit by a reduction of at least five dB(A), and the abatement measure must be able to reduce the noise level for at least one impacted, first row receiver by at least seven dB(A).

The cost-effectiveness criteria can be met through evaluation of individual noise barriers or through corridor-wide cost averaging of acoustically feasible and reasonable noise barriers. Cost averaging is a method to leverage more abatement by using proposed barriers that are very cost efficient to cover potential barriers that are not otherwise cost effective. By averaging the cost of the abatement measures together, the cost per benefited receiver criterion may, in some cases, be met. Cost averaging requires that no single traffic noise abatement measure exceed two times the cost

effectiveness criterion (or \$105,000 per benefited receiver) and that collectively all traffic noise abatement measures being averaged do not exceed \$52,500 per benefited receiver. This noise analysis was conducted using the corridor-wide cost averaging strategy. A summary of the cost averaging analysis can be found in **Attachment A**.

Traffic management- Control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per five miles per hour reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of horizontal and/or vertical alignments- Any alteration of the existing alignment would displace existing businesses and residences, require additional ROW and not be cost effective/reasonable.

Buffer zone - The acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Traffic Noise barriers - This is the most commonly used noise abatement measure. Traffic noise barriers were evaluated for each of the impacted receiver locations with the following results:

Noise barriers would not be feasible and reasonable for the following impacted receivers and, therefore, are not proposed for the incorporation into the project.

R1 – This receiver represents the outdoor dining area at Joe’s Crab Shack adjacent to I-10. Based on preliminary calculations, a noise barrier 426 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R2 – This receiver represents the outdoor pool area at the Hampton Inn adjacent to I-10. Based on preliminary calculations, a noise barrier 178 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R3 – This receiver represents the outdoor pool area at the Hilton Garden Inn adjacent to I-10. Based on preliminary calculations, a noise barrier 227 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R5 – This receiver represents a total of 35 receptors in the activity area in the Spindletop RV Park adjacent to SH 96. Based on preliminary calculations, a noise barrier 337 feet long and 20 feet high would not achieve the minimum feasible reduction of 5 dB(A) at one receiver locations or the minimum noise reduction goal of 7dB(A).

R10 – This receiver represents the outdoor pool area at the Red Roof Inn adjacent to I-10. Based on preliminary calculations, a noise barrier 566 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R11 – This receiver represents the outdoor dining area at Lupe Tortilla Restaurant adjacent to I-10. Based on preliminary calculations, a noise barrier 204 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R12 – This receiver represents the outdoor pool area at the Howard Johnson Inn adjacent to I-10. Based on preliminary calculations, a noise barrier 526 feet long and 20 feet high parallel to I-10 would achieve the minimum feasible reduction of 5 dB(A) but not the minimum noise reduction goal of 7 dB(A).

R17 – This receiver represents the outdoor pool area at the HWC Wellness Center adjacent to I-10. Based on preliminary calculations, a noise barrier 526 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R25 – This receiver represents the outdoor pool area at the Oaks Lodge Hotel adjacent to I-10. Based on preliminary calculations, a noise barrier 213 feet long and 20 feet high parallel to I-10 would not achieve the minimum feasible reduction of 5 dB(A) at the receiver location or the minimum noise reduction goal of 7 dB(A).

R29 – This receiver represents the Ida Reed Park located on the eastbound I-10 frontage road. Based on preliminary calculations, a noise barrier in two segments for access, totaling 632 feet long and 20 feet high parallel to I-10 would achieve the minimum feasible reduction of 5 dB(A) at nine receiver location but not the minimum noise reduction goal of 7 dB(A). The number of receivers was based on the average lot width in the nearby Oaks neighborhood of 91 feet.

R30 – This receiver represents the playground at the Salvation Army Center located on the westbound side of I-10 frontage road. Receivers were modeled on the playground area and on the bleachers of the sports field for the barrier analysis. Based on preliminary calculations, a noise barrier 553 feet long and 20 feet high parallel to I-10 would achieve the minimum feasible reduction of 5 dB(A) at six receiver locations but not the minimum noise reduction goal of 7 dB(A). The number of receivers was based on the average lot width in the nearby Oaks neighborhood of 91 feet.

Noise barriers would be feasible and reasonable for the following impacted receivers and, therefore, are proposed for incorporation into the project (**Table 3**):

R19 and R20 - These receivers represent 20 ground-level apartments and 20 second-floor apartments with outdoor patios in the Longfellow Apartment complex adjacent to the SH 96 southbound frontage road. Based on preliminary calculations, a noise barrier in four segments to maintain existing driveway access, approximately 702 feet long and 20 feet high placed along the ROW line, would achieve the minimum feasible reduction of 5 dB(A) at 35 receiver locations and the minimum noise reduction design goal of 7 dB(A) at 20 receiver locations. The total cost per benefited receiver would be \$14,040.

R21 and R23 - These receivers represent a total of 18 residences located along Longfellow Drive with driveways adjacent to the SH 96 southbound frontage road. Some houses have existing driveway connections to the frontage road. Based on preliminary calculations, a noise barrier in four segments, to allow access to Kenwood Drive and residential driveways, approximately 1,534 feet long and 20 feet high placed along the ROW line, would achieve the minimum feasible reduction of 5 dB(A) at 11 receiver locations and the minimum noise reduction design goal of 7 dB(A) at 6 receiver locations. The total cost per benefited receiver would be \$97,618. The estimated cost of the barrier exceeds the reasonable, individual cost-effectiveness criterion of \$52,500 per benefited receiver, but is less than the cost averaging criterion of \$105,000 per benefited receiver. The cumulative estimated build cost (see **Attachment A**) for this noise barrier is cost effective and therefore, this barrier is proposed for incorporation into the project.

R27 and R28 - These receivers represent a total of 28 first and second row residences in the Oaks subdivision. Based on preliminary calculations, a noise barrier in two segments totaling 1,311 feet long and 18 feet high parallel to the ROW would achieve the minimum feasible reduction of 5 dB(A) at 18 first and second row receiver locations and the minimum noise reduction goal of 7 dB(A) at four locations. The total cost per befitted receiver would be \$45,885.

R33 - This receiver represents a total of 12 residences located along Nineteenth Street consisting of four first row receivers and eight second row receivers. The second-row receivers are separated from the ROW by commercial parcels. Because access must be maintained to the commercial property, a noise barrier is not feasible for the second-row receivers. An analysis was conducted for the first-row impacted receivers (represented by R33). Based on preliminary calculations, a noise barrier, approximately 245 feet long and 10 feet high place along ROW adjacent to the first-row receivers, would achieve the minimum feasible reduction of 5 dB(A) at three first-row receiver locations and the noise reduction design goal of 7 dB(A) at one location. The total cost per benefitted receiver would be \$28,583.

Table 3: Noise Barrier Proposal (preliminary)

Barrier	Representative Receivers	Total # Benefitted	Length	Height	Total Cost	\$/Benefitted Receiver
1	R19 and R20,	35	702	20	\$491,400	\$14,040
2*	R21 and R23	11	1,534	20	\$1,073,800	\$97,618
3	R27 and R28	18	1,311	18	\$825,930	\$45,885
4	R33	3	245	10	\$85,750	\$28,583

* This barrier is cost-effective through cost averaging.

Any subsequent project design changes may require a re-evaluation of this preliminary noise barrier proposal. The final decision to construct the proposed noise barrier will not be made until completion of the project design, utility evaluation and polling of adjacent property owners.

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along with the following predicted 2045 noise impact contours. Noise impact contours were modeled on undeveloped land on the west side of I-10 near Rexora Drive.

Table 4: Noise Impact Contours

Land Use	Impact Contour*	Distance from Proposed ROW
NAC Category B&C	66 dB(A)	425 feet
NAC Category E	71 dB(A)	175 feet

- Impact contours are one dB(A) lower than the NAC per category to reflect impacts that would occur as a result of approaching the NAC for the respective contours.

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

A copy of this traffic noise analysis will be available to local officials. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

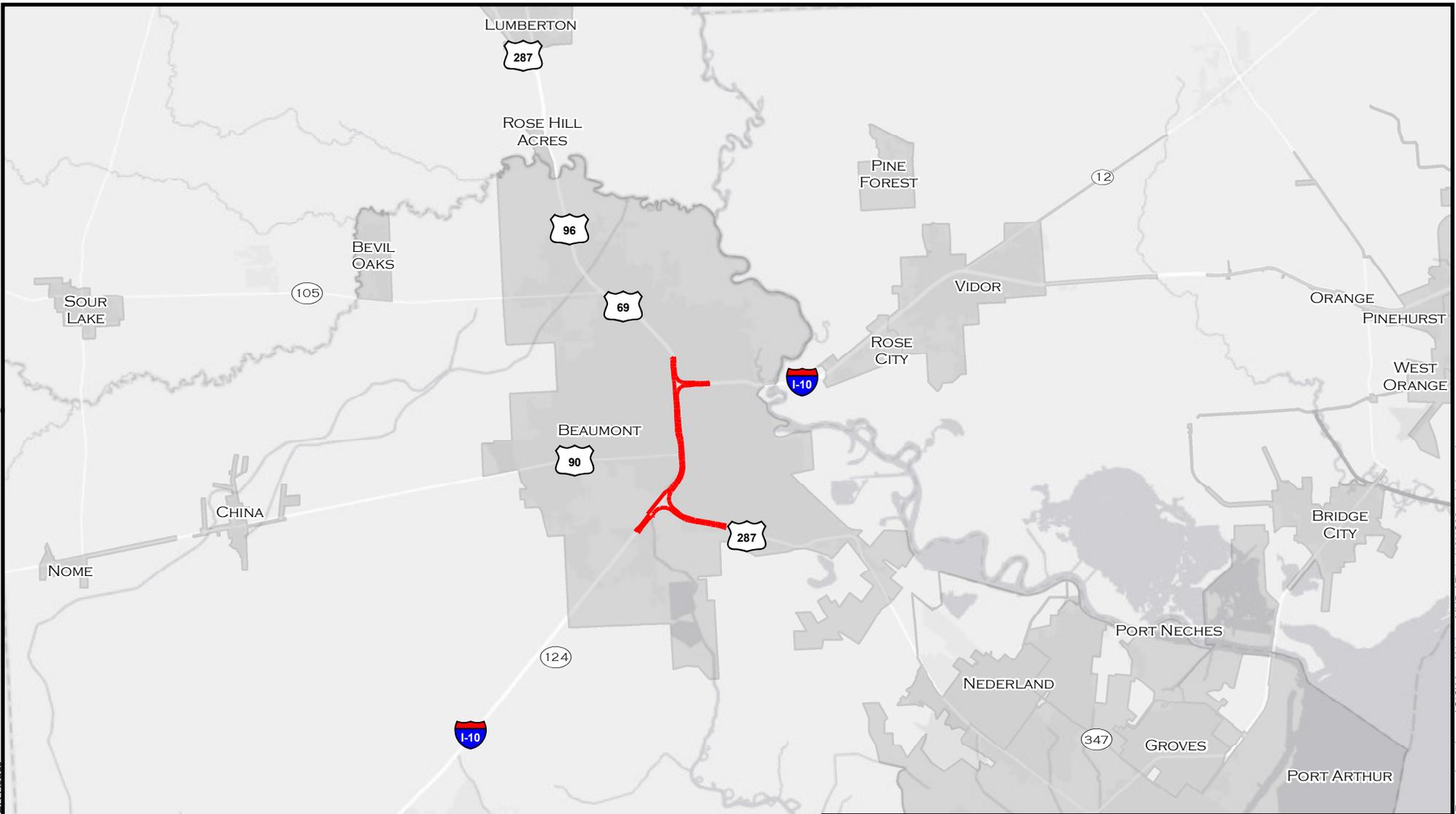
References

Federal Highway Administration. 2017. *Reasonable Cost Proposal for 2018 Noise Policy*. Letter from Michael T. Leary, FHWA, to Carlos Swonke, TxDOT, December 19, 2017.

Texas Department of Transportation. March 2011. *Guidelines for Analysis and Abatement of Roadway Traffic Noise*.

FIGURES

FIGURE 1: PROJECT VICINITY MAP



— PROJECT LOCATION



10/69 INTERCHANGES PROJECT
 CSJ: 0028-13-135 & 0739-02-140
 VICINITY MAP

JEFFERSON COUNTY, TEXAS

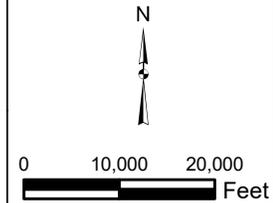
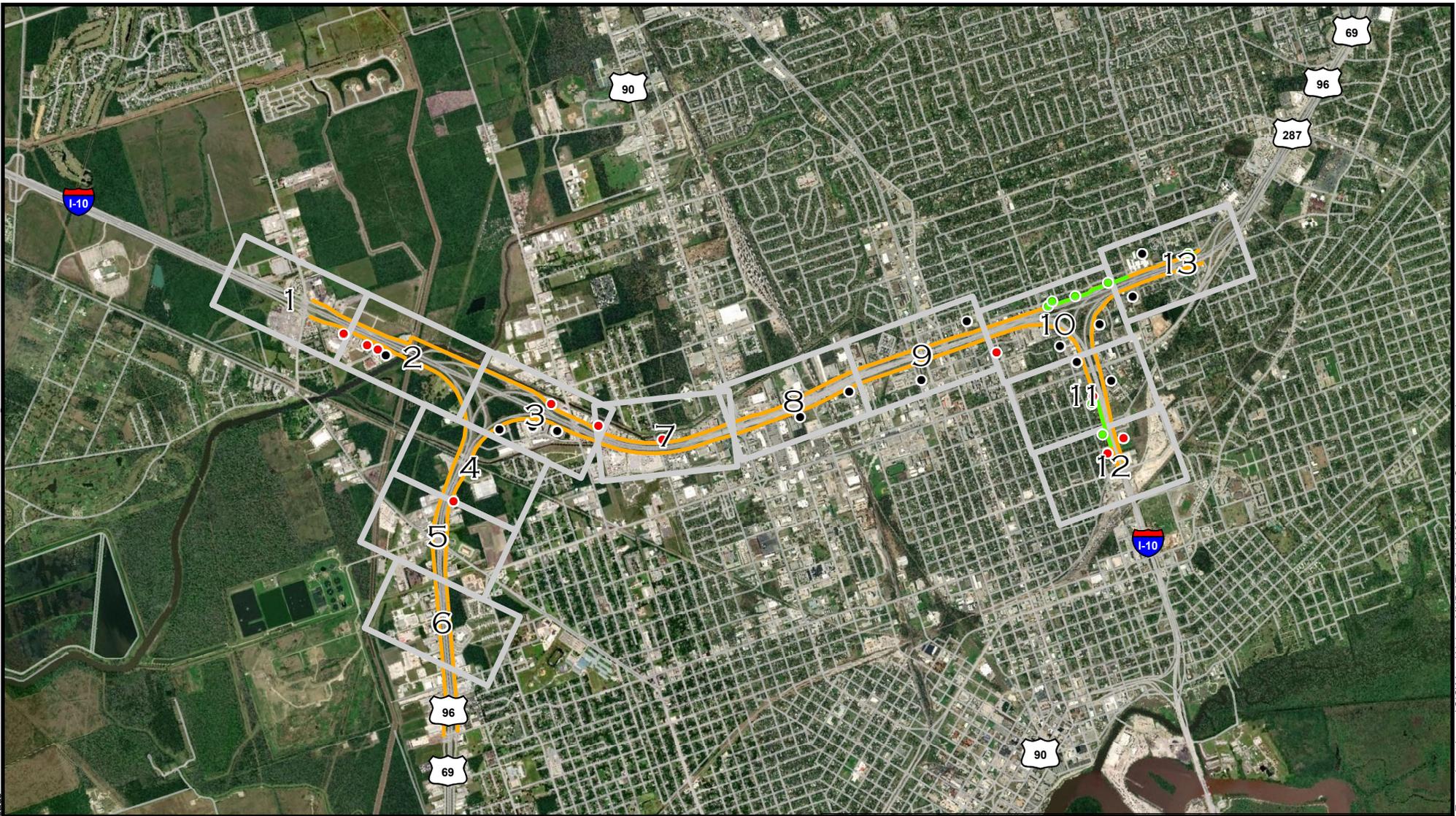


FIGURE 1

DATE:
 FEBRUARY 2020

FIGURE 2: NOISE RECEIVERS MAP



- BENEFITED NOISE RECEIVER
- IMPACTED NOISE RECEIVER
- NON-IMPACTED NOISE RECEIVER
- PROPOSED BARRIER
- PROPOSED RIGHT-OF-WAY



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 NOISE RECEIVERS OVERVIEW
 JEFFERSON COUNTY, TEXAS

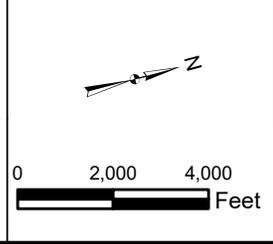
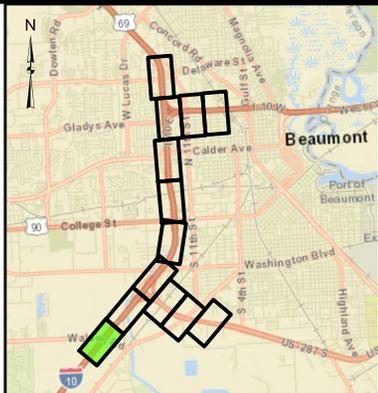


FIGURE 2

DATE:
FEBRUARY 2020



- IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY



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 CSJ: 0028-13-135 & 0739-02-140
 NOISE RECEIVERS MAP
 JEFFERSON COUNTY, TEXAS

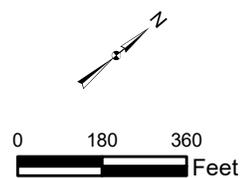
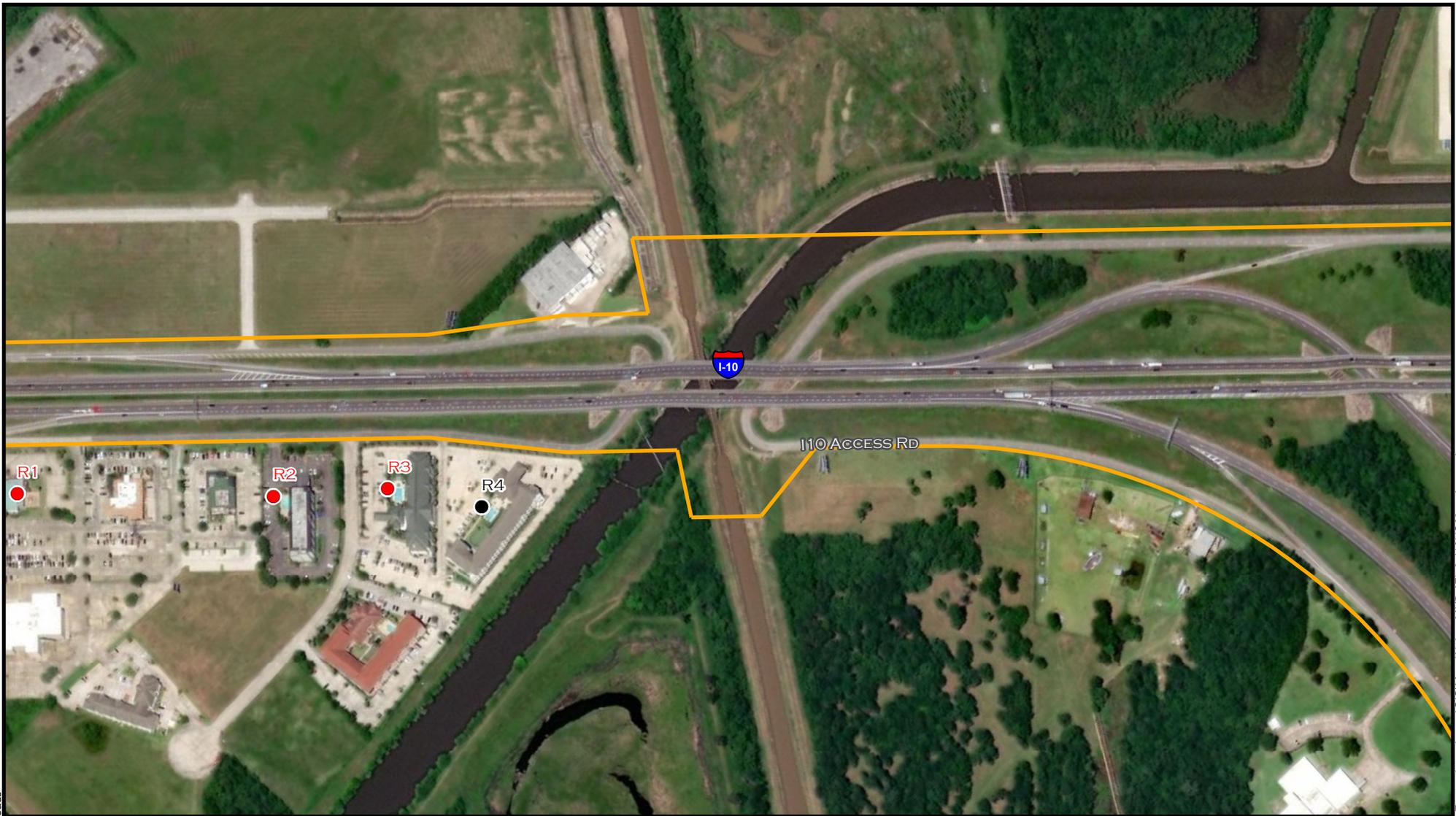
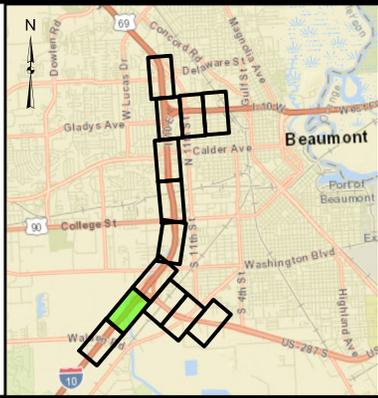


FIGURE 2
SHEET 1

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- IMPACTED NOISE RECEIVER
- NON-IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY



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 NOISE RECEIVERS MAP

JEFFERSON COUNTY, TEXAS

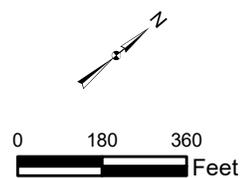
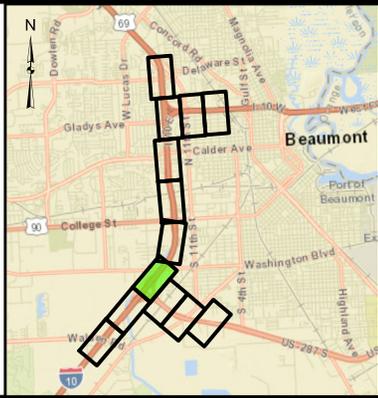


FIGURE 2
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- IMPACTED NOISE RECEIVER
- NON-IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY



10/69 INTERCHANGES PROJECT
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 NOISE RECEIVERS MAP
 JEFFERSON COUNTY, TEXAS

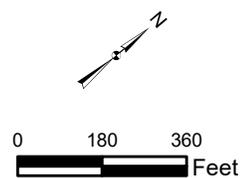
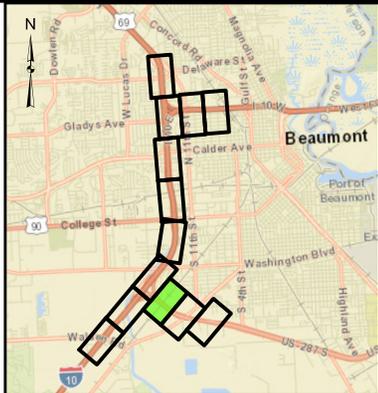


FIGURE 2
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- IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY



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 JEFFERSON COUNTY, TEXAS

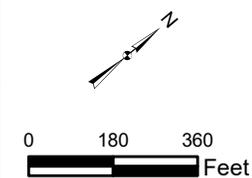
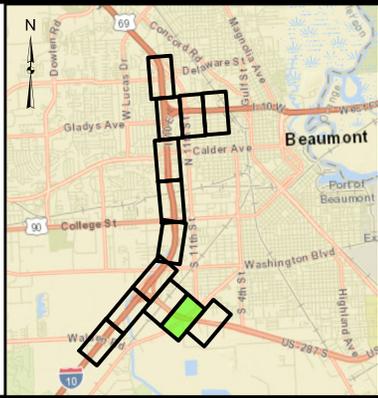


FIGURE 2
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- IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY



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 NOISE RECEIVERS MAP
 JEFFERSON COUNTY, TEXAS

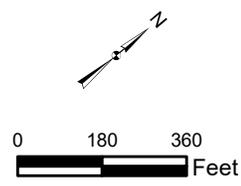
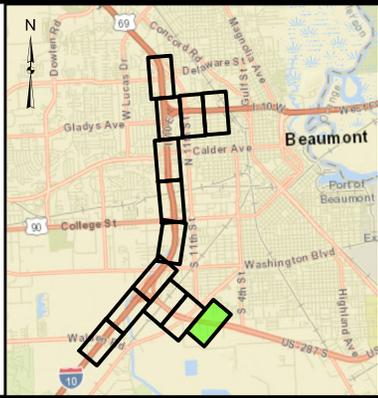


FIGURE 2
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— PROPOSED RIGHT-OF-WAY



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 NOISE RECEIVERS MAP

JEFFERSON COUNTY, TEXAS

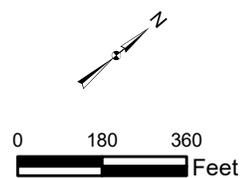
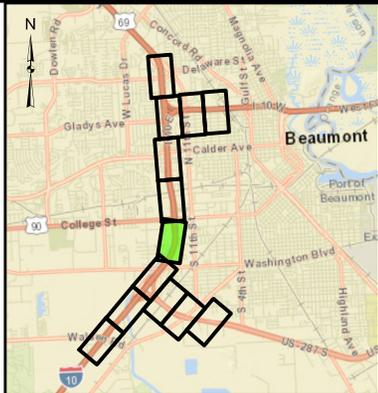


FIGURE 2
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- IMPACTED NOISE RECEIVER
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NOISE RECEIVERS MAP
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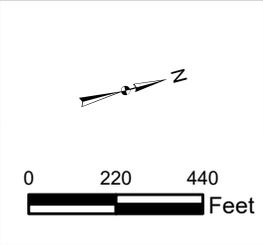
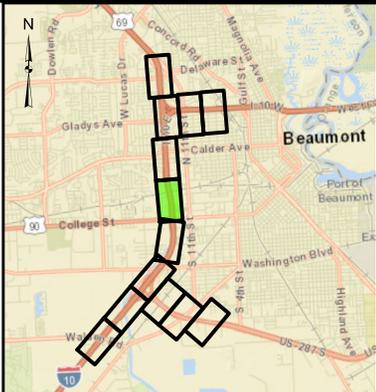


FIGURE 2
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- NON-IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY



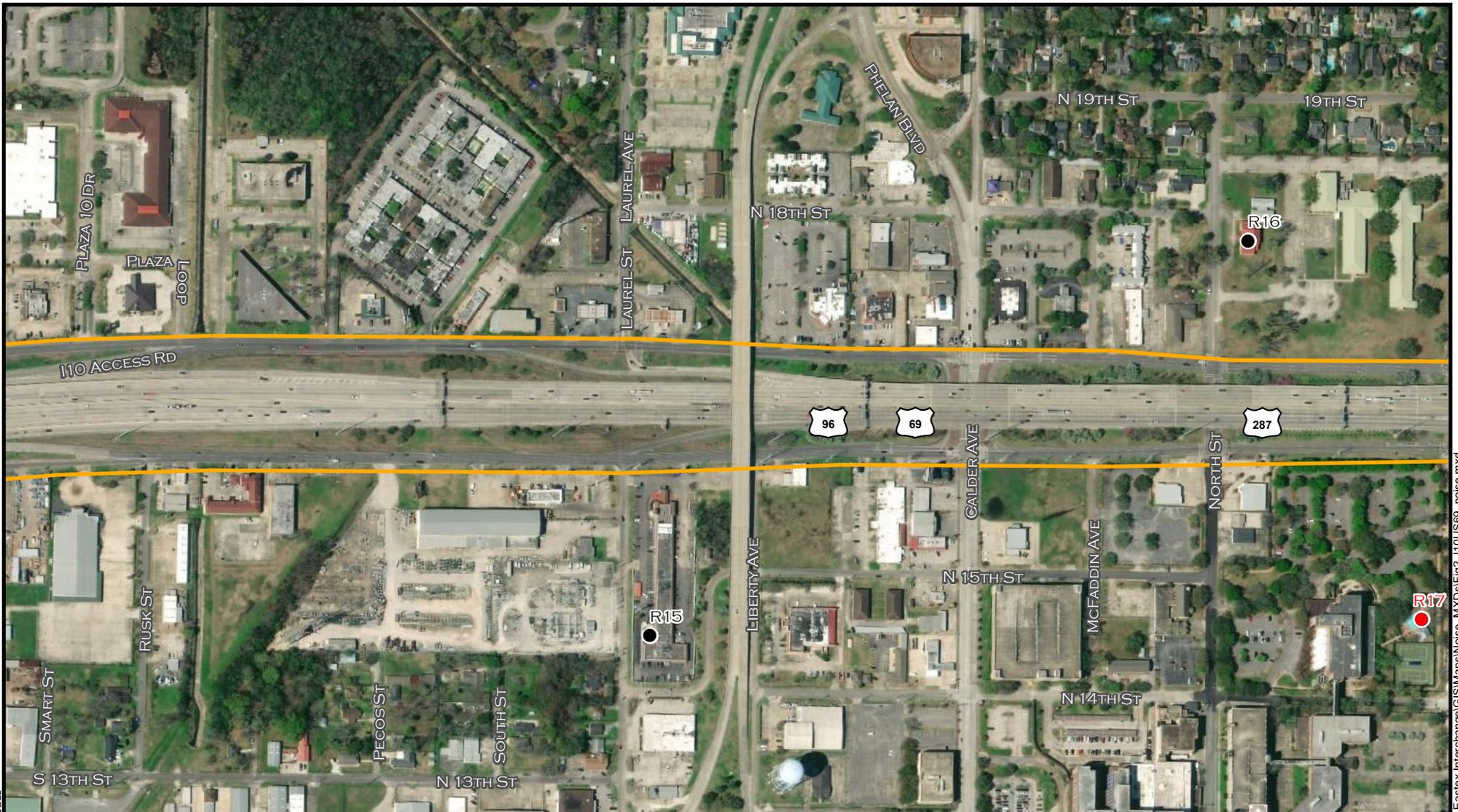
10/69 INTERCHANGES PROJECT
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 NOISE RECEIVERS MAP

JEFFERSON COUNTY, TEXAS

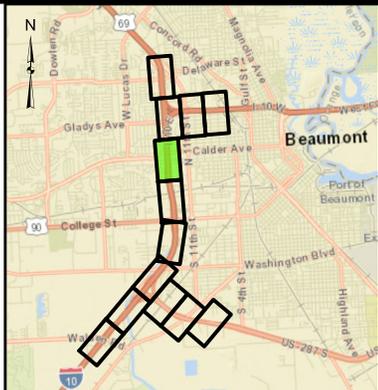


FIGURE 2
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- IMPACTED NOISE RECEIVER
- NON-IMPACTED NOISE RECEIVER
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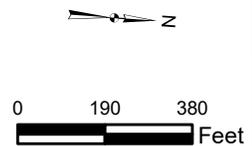
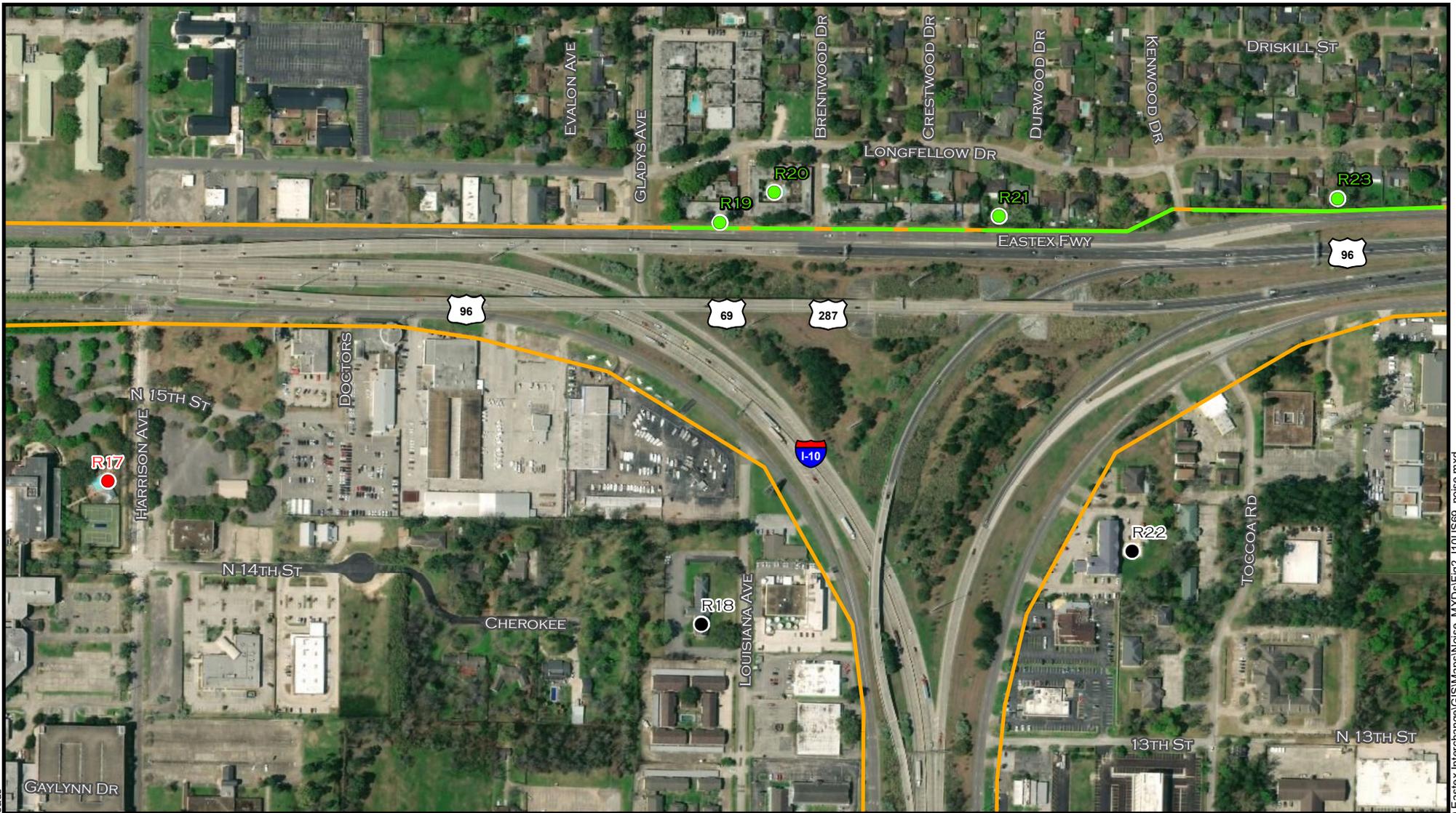
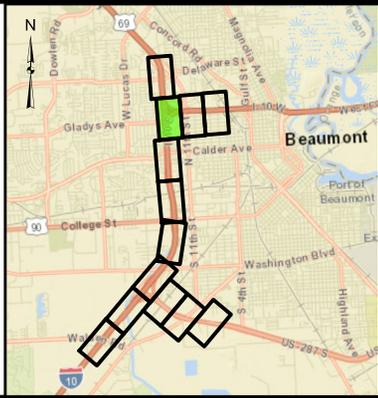


FIGURE 2
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- BENEFITED NOISE RECEIVER
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- PROPOSED BARRIER



10/69 INTERCHANGES PROJECT
 CSJ: 0028-13-135 & 0739-02-140
 NOISE RECEIVERS MAP

JEFFERSON COUNTY, TEXAS

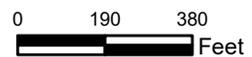
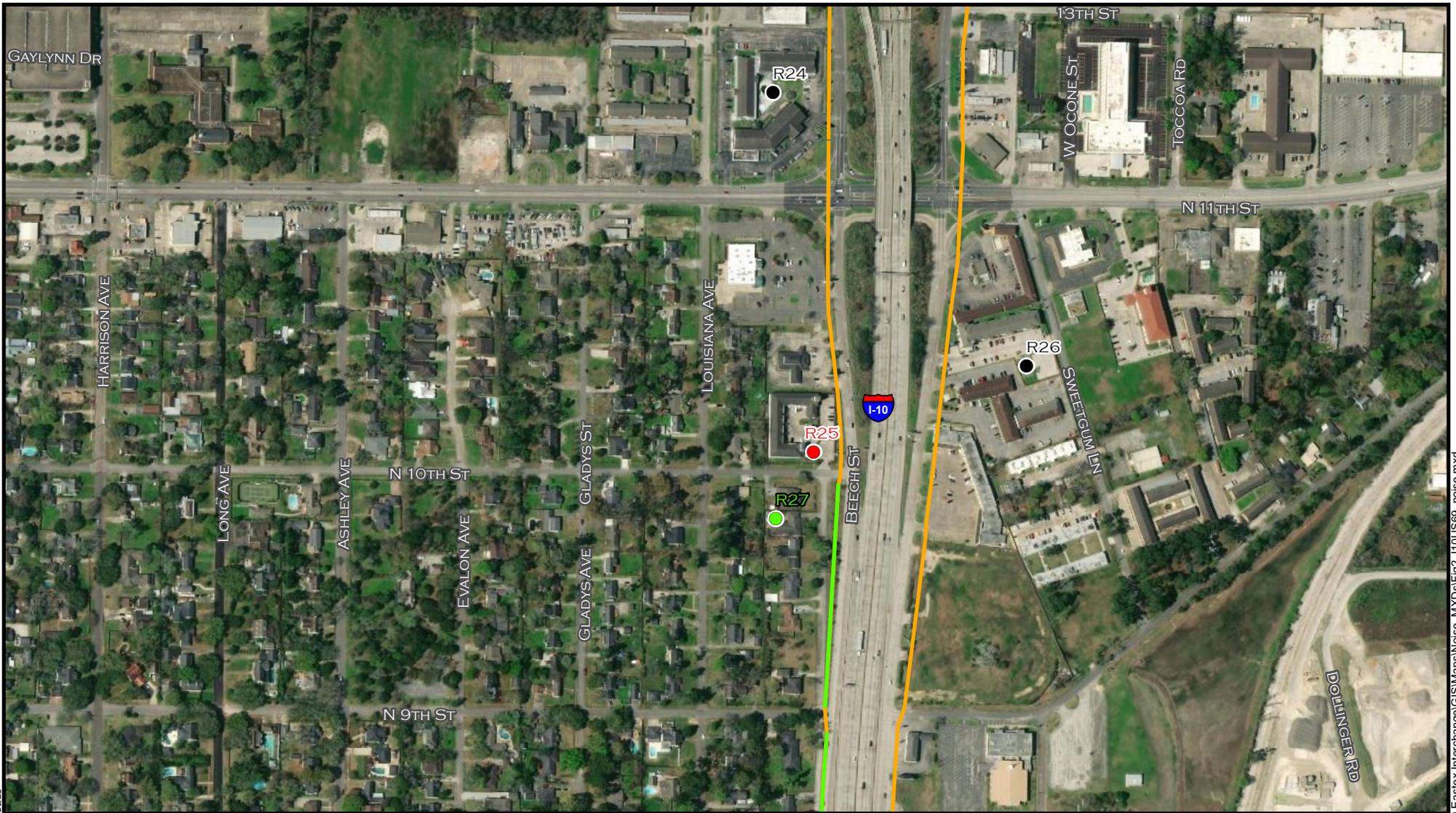
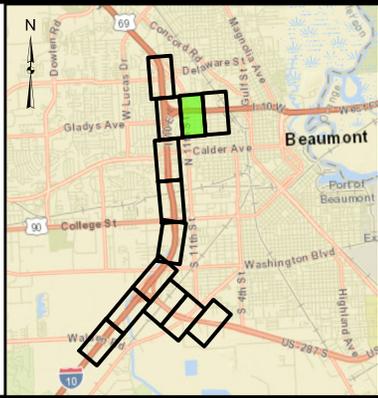


FIGURE 2
 SHEET 10

DATE:
 FEBRUARY 2020



- BENEFITED NOISE RECEIVER
- IMPACTED NOISE RECEIVER
- NON-IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY
- PROPOSED BARRIER



10/69 INTERCHANGES PROJECT
 CSJ: 0028-13-135 & 0739-02-140
 NOISE RECEIVERS MAP
 JEFFERSON COUNTY, TEXAS

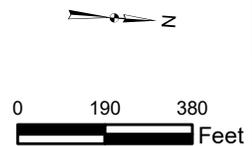
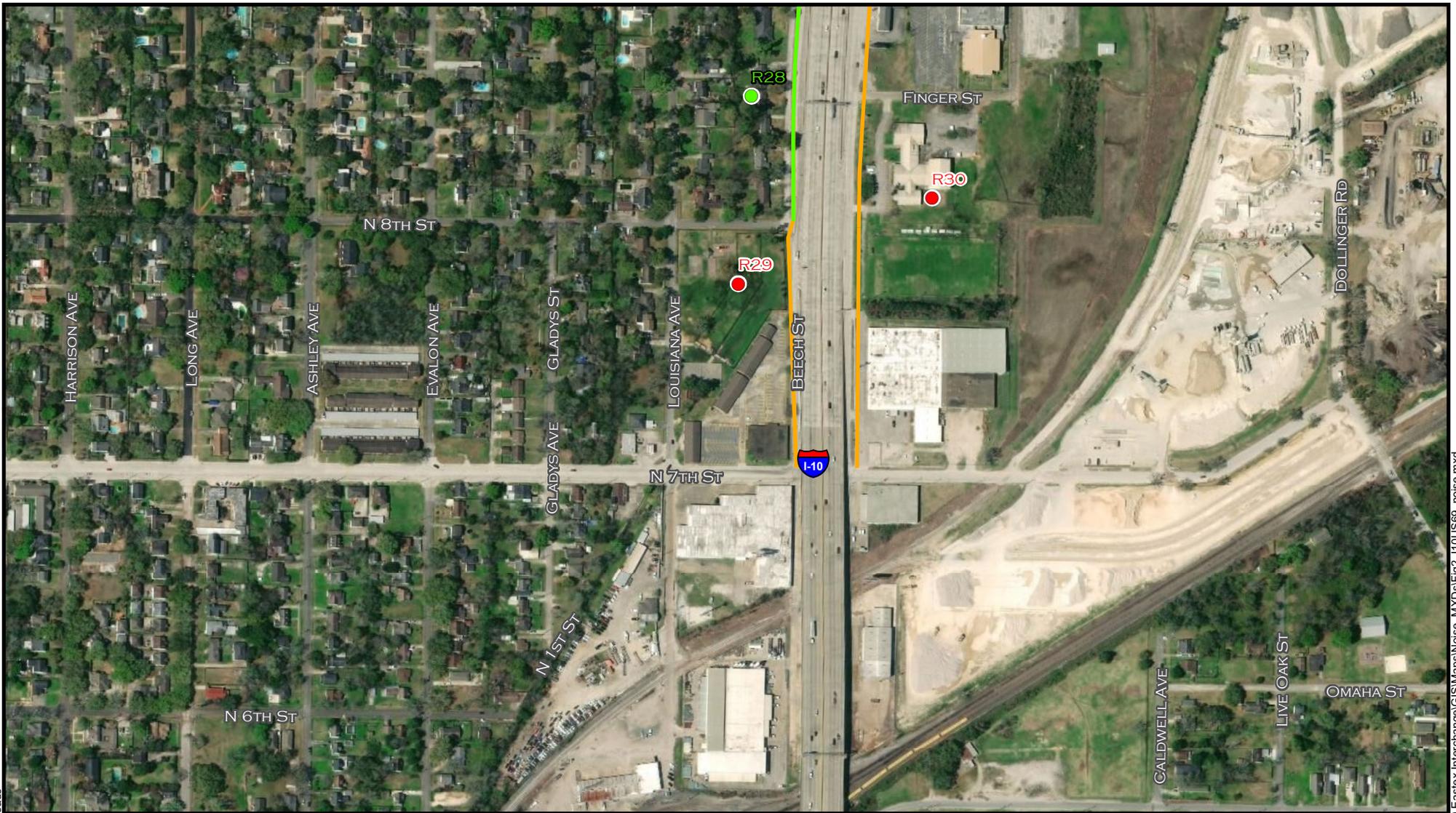
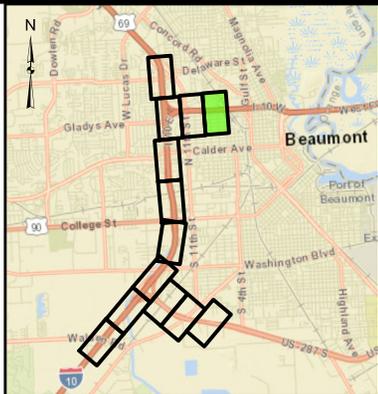


FIGURE 2
 SHEET 11

DATE:
 FEBRUARY 2020



- BENEFITED NOISE RECEIVER
- IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY
- PROPOSED BARRIER



10/69 INTERCHANGES PROJECT
 CSJ: 0028-13-135 & 0739-02-140
 NOISE RECEIVERS MAP
 JEFFERSON COUNTY, TEXAS

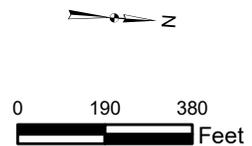
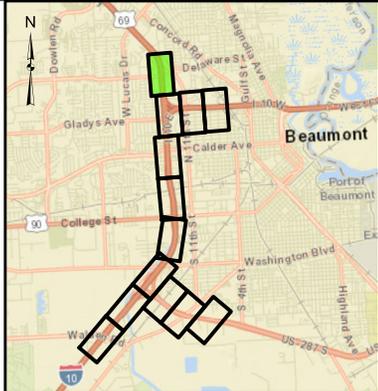


FIGURE 2
 SHEET 12

DATE:
 FEBRUARY 2020



- BENEFITED NOISE RECEIVER
- NON-IMPACTED NOISE RECEIVER
- PROPOSED RIGHT-OF-WAY
- PROPOSED BARRIER



10/69 INTERCHANGES PROJECT
 CSJ: 0028-13-135 & 0739-02-140
 NOISE RECEIVERS MAP

JEFFERSON COUNTY, TEXAS

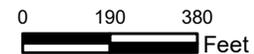


FIGURE 2
 SHEET 13

DATE:
 FEBRUARY 2020

APPENDIX A:
COST AVERAGING BARRIERS TABLE

Cost Averaging Barriers for 10-69 Interchanges Project (csjs: 0028-13-135 and 0739-02-140)

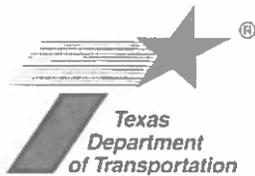
Barrier #	Receivers	Location	Total Benefitted	Height (feet)	Total Length (feet)	Estimated Barrier Cost	Estimated Barrier Cost per Benefitted Reciever	Ratio of Build Cost to Reasonable Cost	Cumulative Estimated Cost per Benefitted Receiver	Result of Determination
1	R19 and R20	Longfellow Apts	35	20	702	\$491,400	\$14,040	0.27	\$14,040.00	Cost-effective Stand Alone
4	R33	Nineteenth Street	3	10	245	\$85,750	\$28,583	0.54	\$15,188.16	Cost-effective Stand Alone
3	R27 and R28	Oaks Subdivision	18	18	1311	\$825,930	\$45,885	0.87	\$25,055.00	Cost-effective Stand Alone
2	R21 and R23	Longfellow Drive	11	20	1534	\$1,073,800	\$97,618	1.86	\$36,968.36	Cost-effective Cumulative

Barriers are sorted by the "Ratio of build cost to reasonable cost" column

Barriers that have a ratio less than 2.0 are eligible for cost averaging,

as long as the cumulative cost is less than 2x the cost effectiveness criterion of \$52,500 (< \$105,000)

APPENDIX B:
TRAFFIC DATA



MEMO

October 30, 2019

To: Donald Smith, P.E., District Engineer
Attention: Adam J. Jack, P.E., Director of TPD

Through: William E. Knowles, P.E.
Traffic Analysis Section Director, TPP

From: Lee Theobald
Planner, TPP

Subject: Traffic Data
CSJ: 0739-02-140, 0028-13-135
I-10:
From Brooks Rd
To 7th Street

US 69:
From I-10 to 4th Street
And Lucas Dr. to I-10

Jefferson County

Attached are consultant provided diagrams depicting 2025, 2045 and 2055 average daily traffic volumes and turning movements on I-10 from Brooks Rd to 7th Street and on US 69 from I-10 to 4th Street as well as US 69 from Lucas Rd. to I-10. Also attached are tabulations showing traffic analysis for highway design for the 2025 to 2045 twenty year period and 2025 to 2055 thirty year period for the described limits of the route for No Build and Build conditions. Also included are tabulations showing data for use in air and noise analysis.

Due to differences in traffic volumes for I-10 the project was separated into six sections.

- Section 1: From Brooks Rd. to Walden Rd.
- Section 2: From Walden Rd. to US 69
- Section 3: From US 69 to US 90
- Section 4: From US 90 to Hollywood Overpass
- Section 5: From Hollywood Overpass to I-10 / US 69 Interchange
- Section 6: From I-10 / US 69 Interchange to 7th Street

Due to differences in traffic volumes for US 69 the project was separated into two sections.

- Section 1: From I-10 to 4th Street
- Section 2: From Lucas Dr. to I-10

Please refer to your original email request dated August 30, 2019.

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OUR MISSION: Through collaboration and leadership, we deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods.

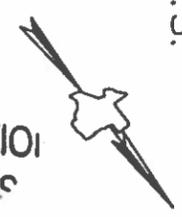
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If you have any questions or need additional information, please contact Lee Theobald at (512) 486-5143.

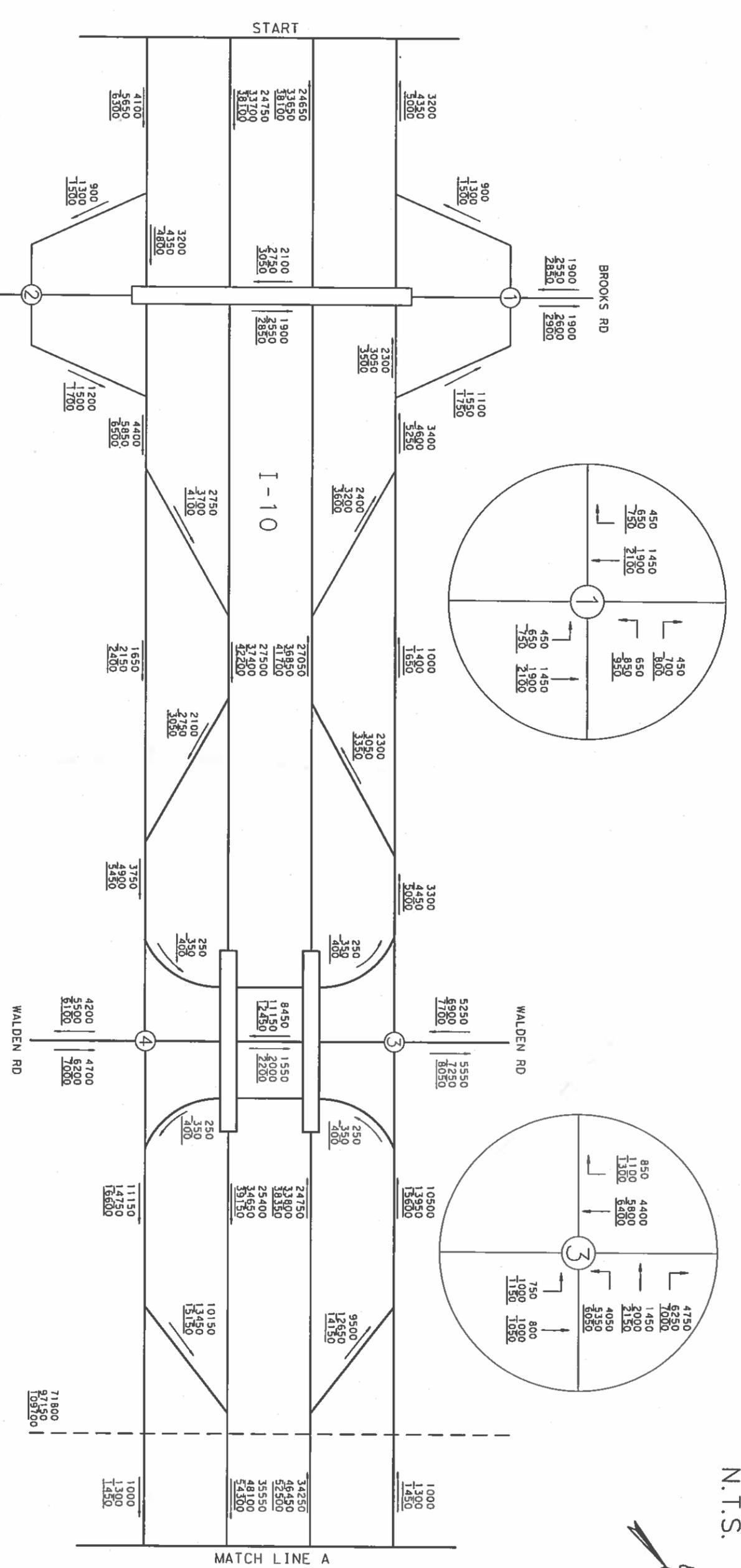
Attachments

CC: Scott Ayres, P.E.,
Transportation Engineer Supervisor, Beaumont District
Design Division

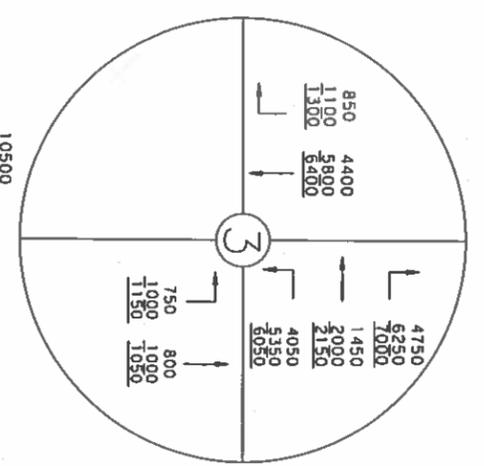
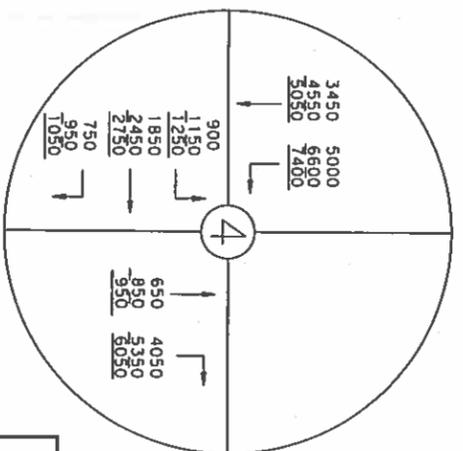
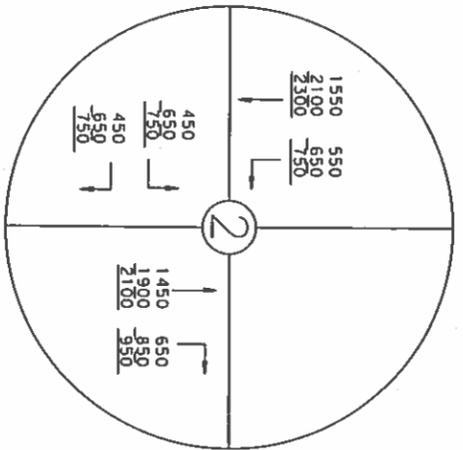
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I-10 CORRIDOR TRAFFIC PROJECTIONS
 NO BUILD CONDITION

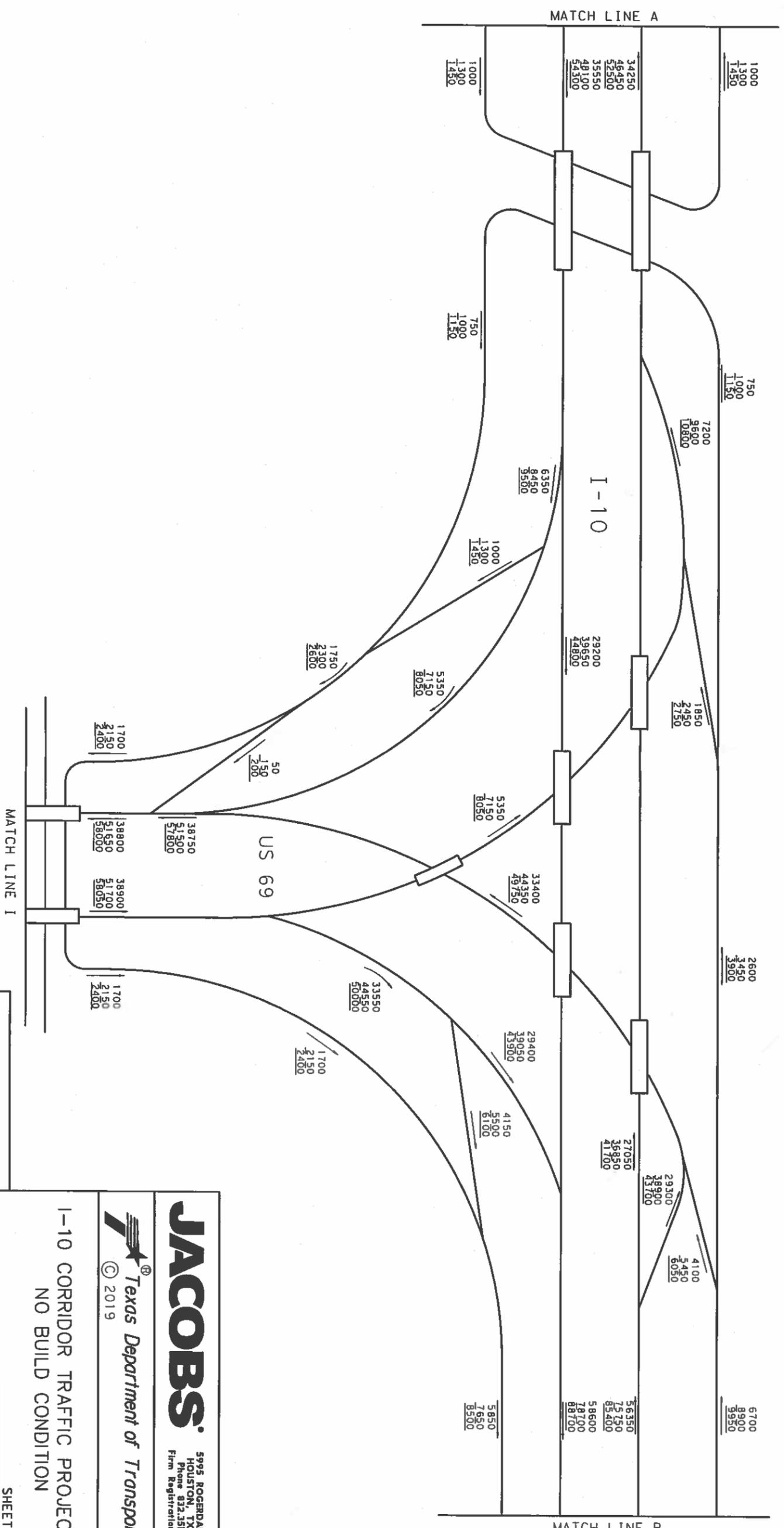
SHEET 1 OF 12

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CHECK	EW	STATE		COUNTY	BEAUMONT
GRAPHICS	JJ	TX	BEAUMONT	SECTION	JOB
CHECK	EW	0739	02		140

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I-10 CORRIDOR TRAFFIC PROJECTIONS
 NO BUILD CONDITION

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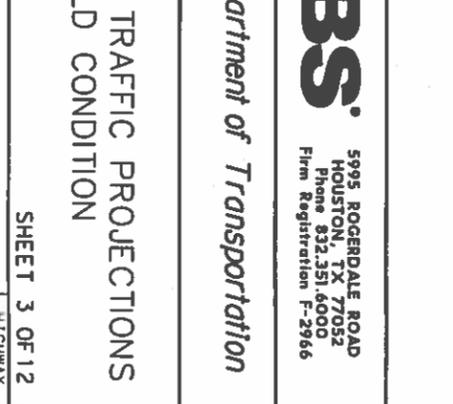
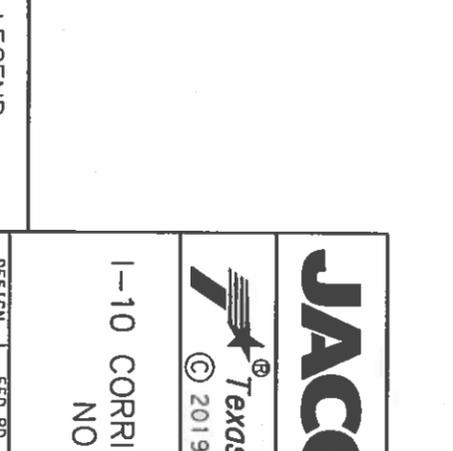
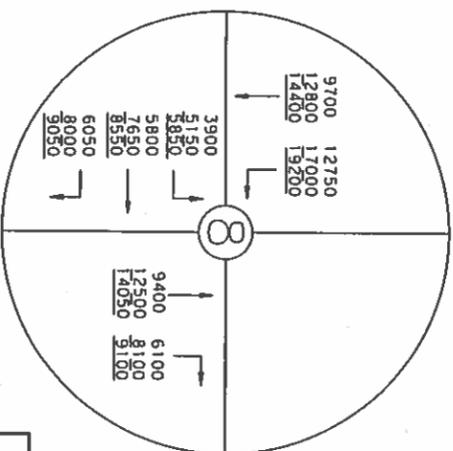
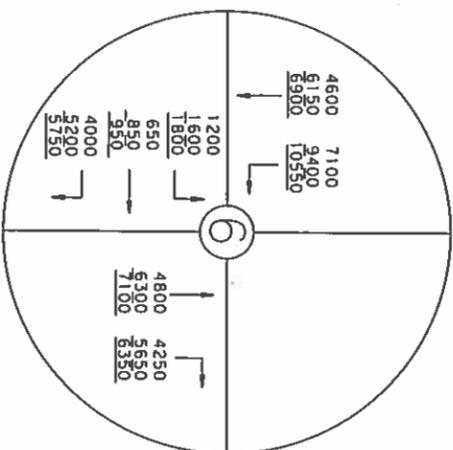
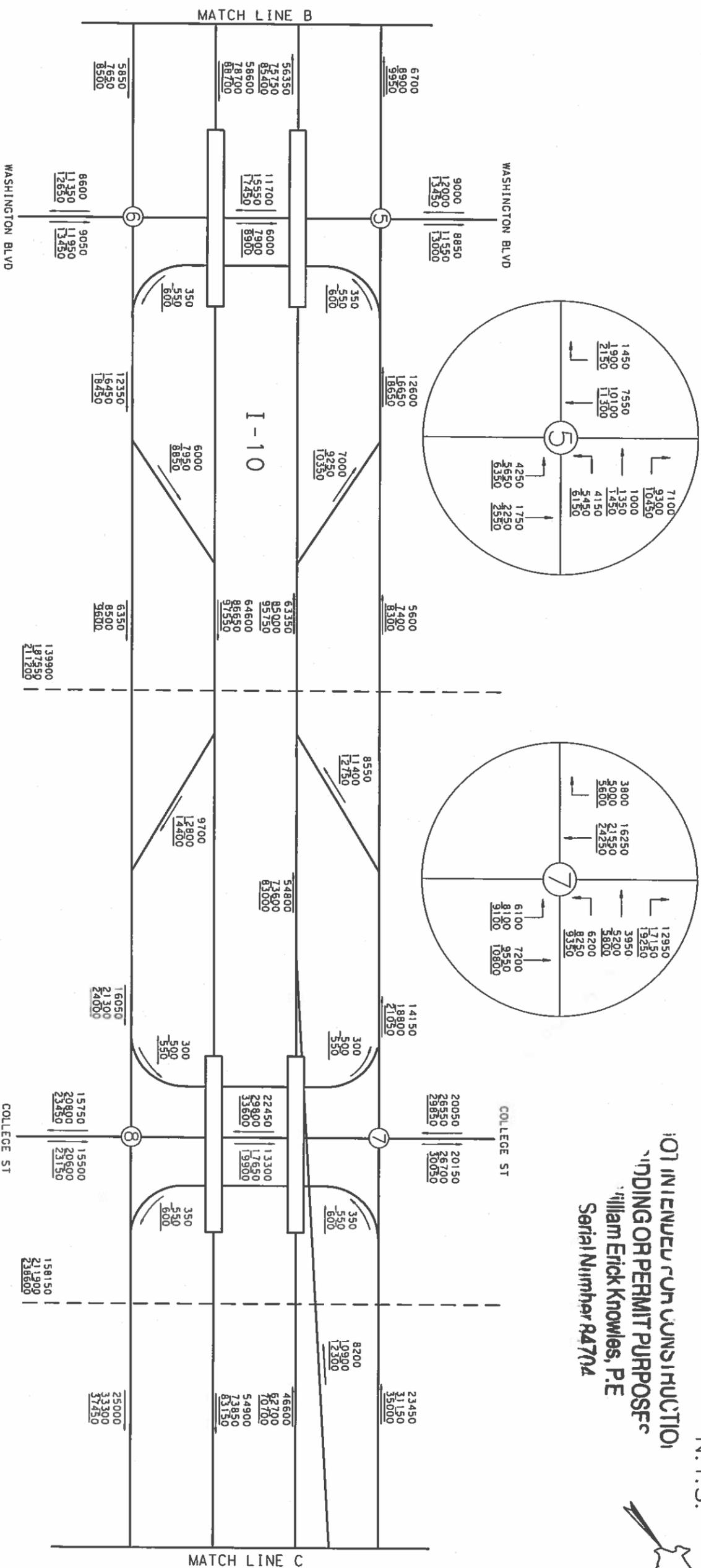
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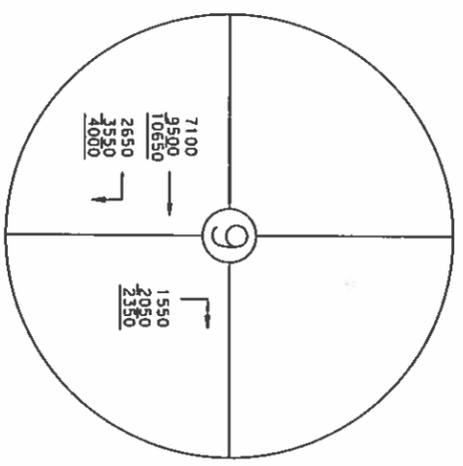
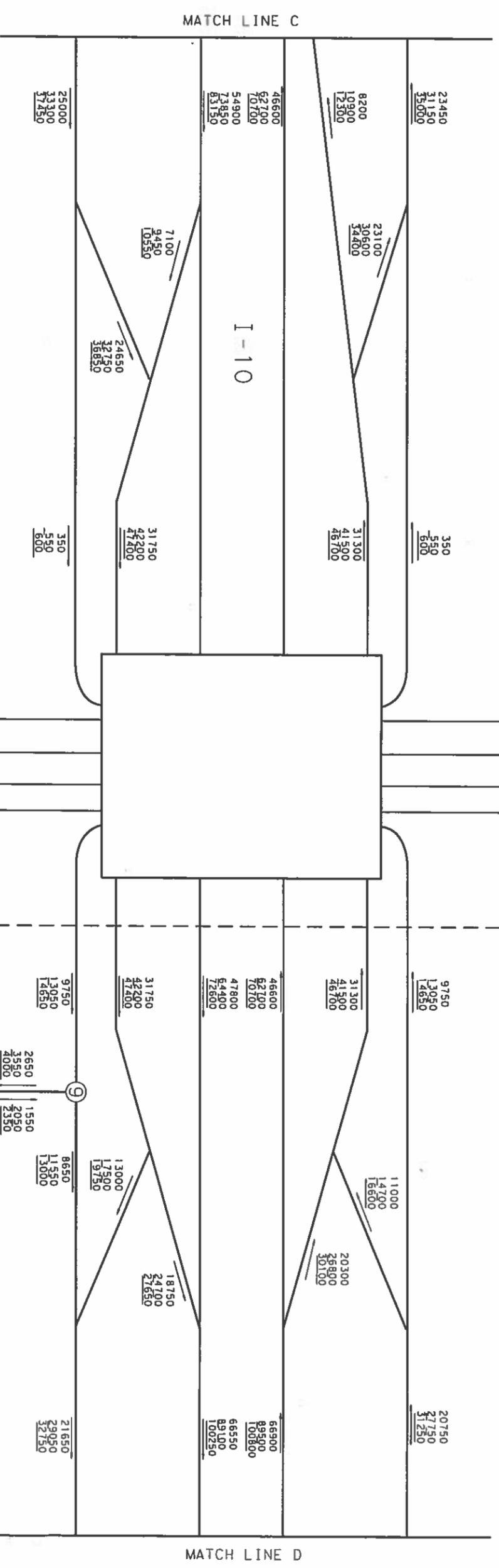
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SHEET 4 OF 12

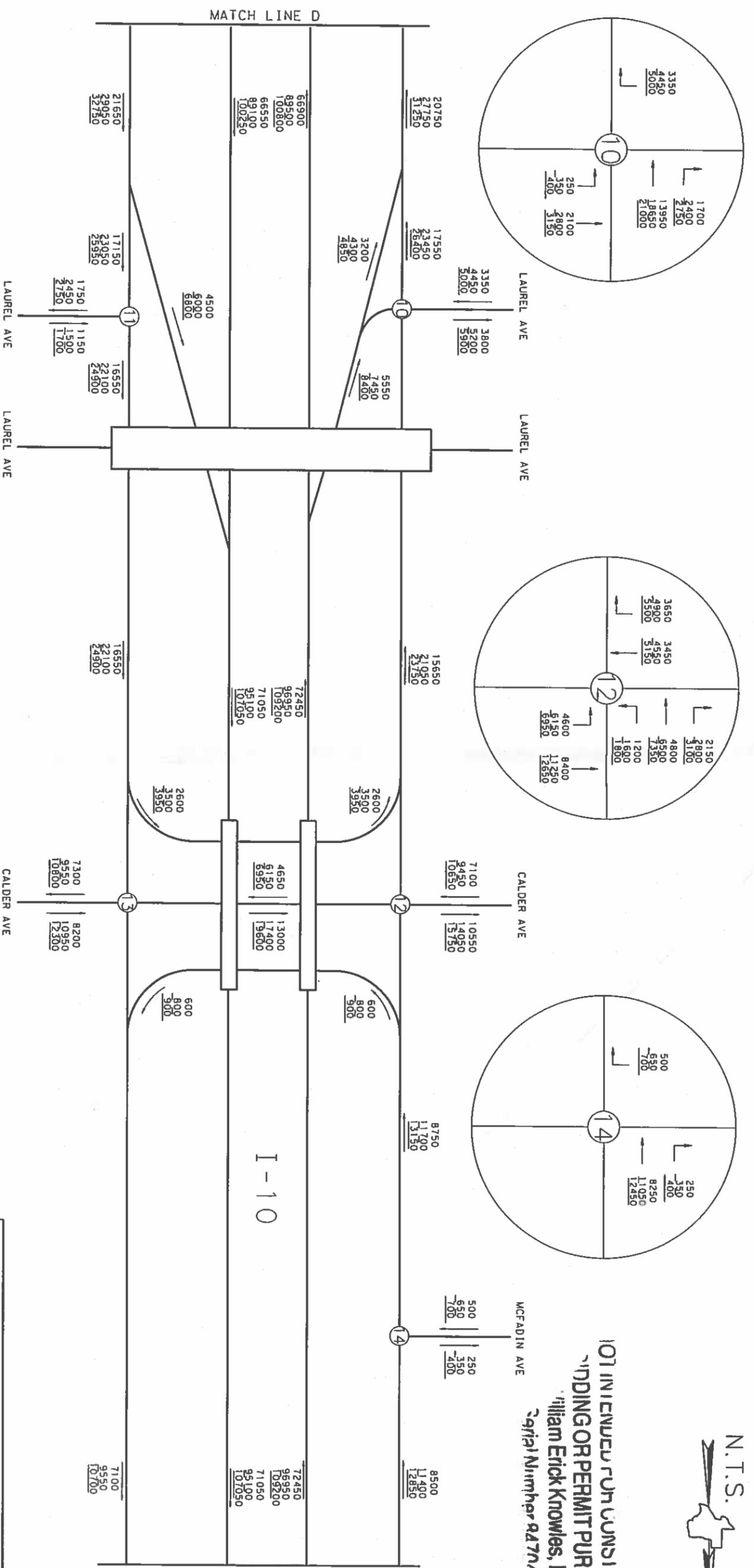
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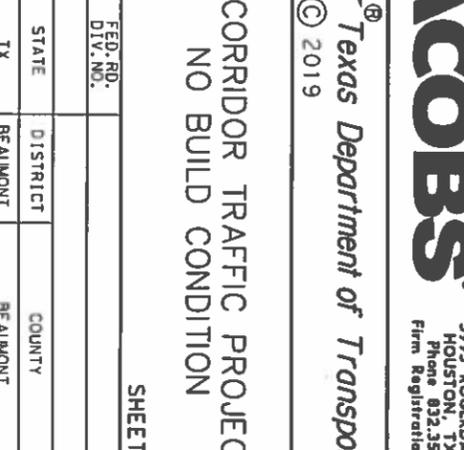
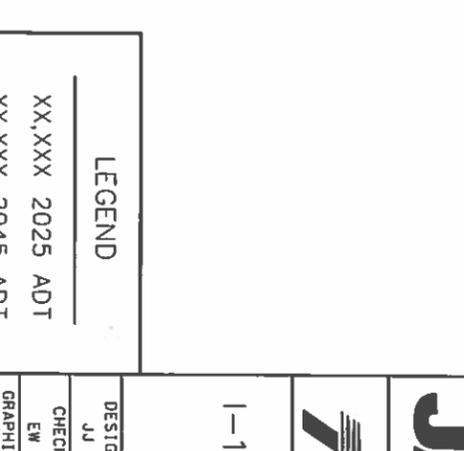
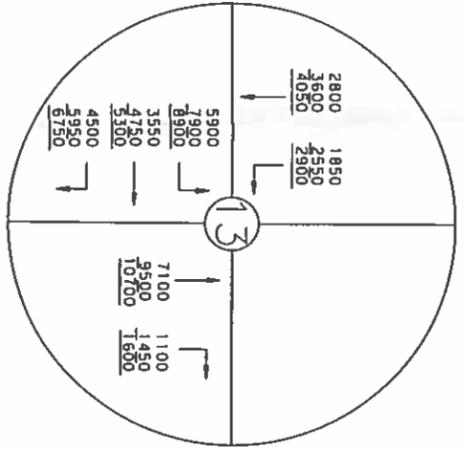
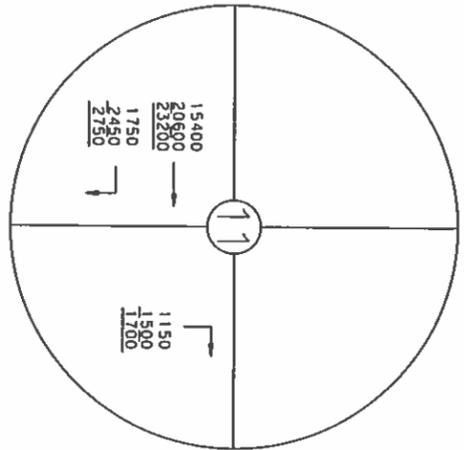
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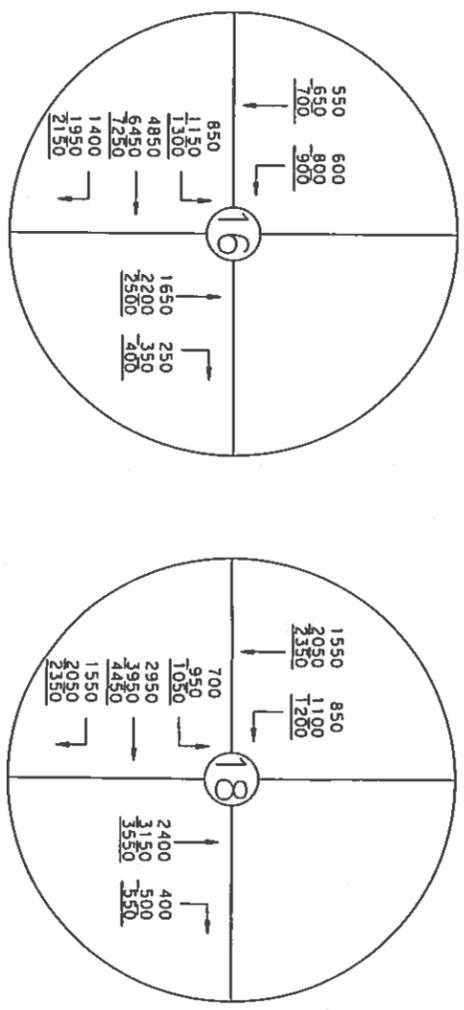
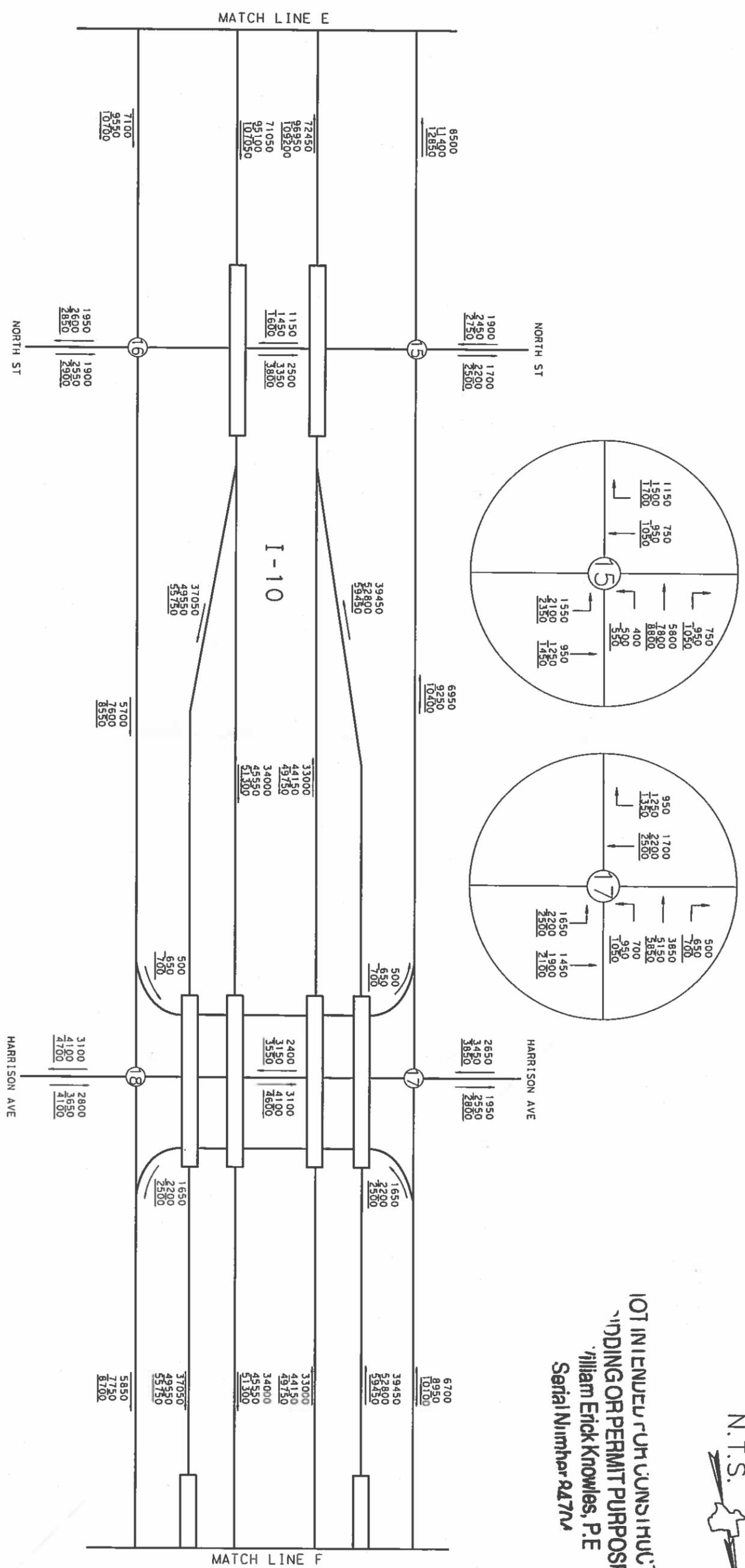
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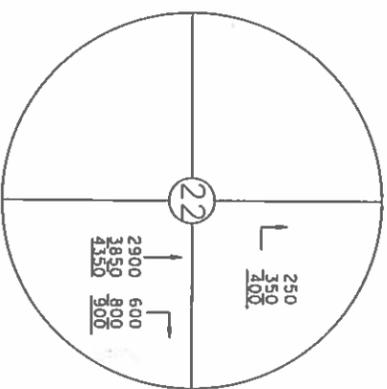
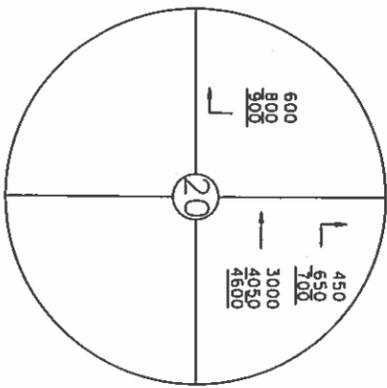
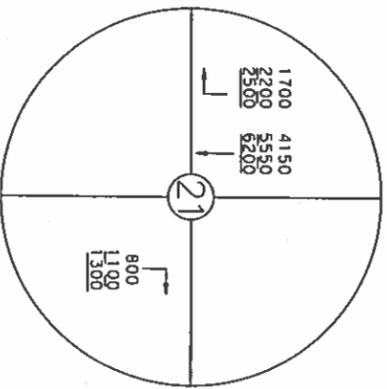
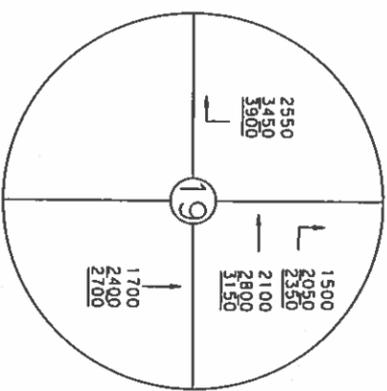
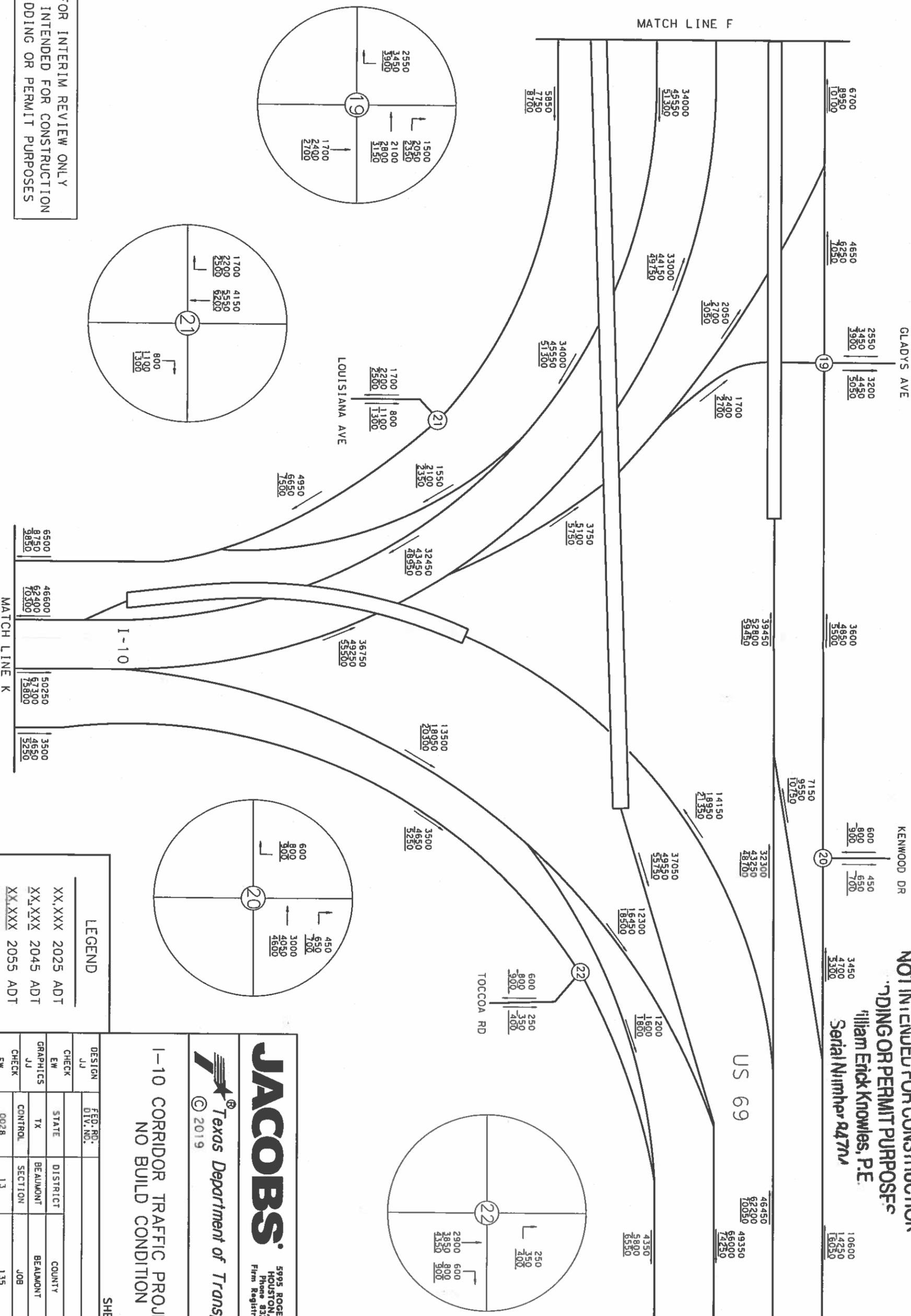
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MATCH LINE G



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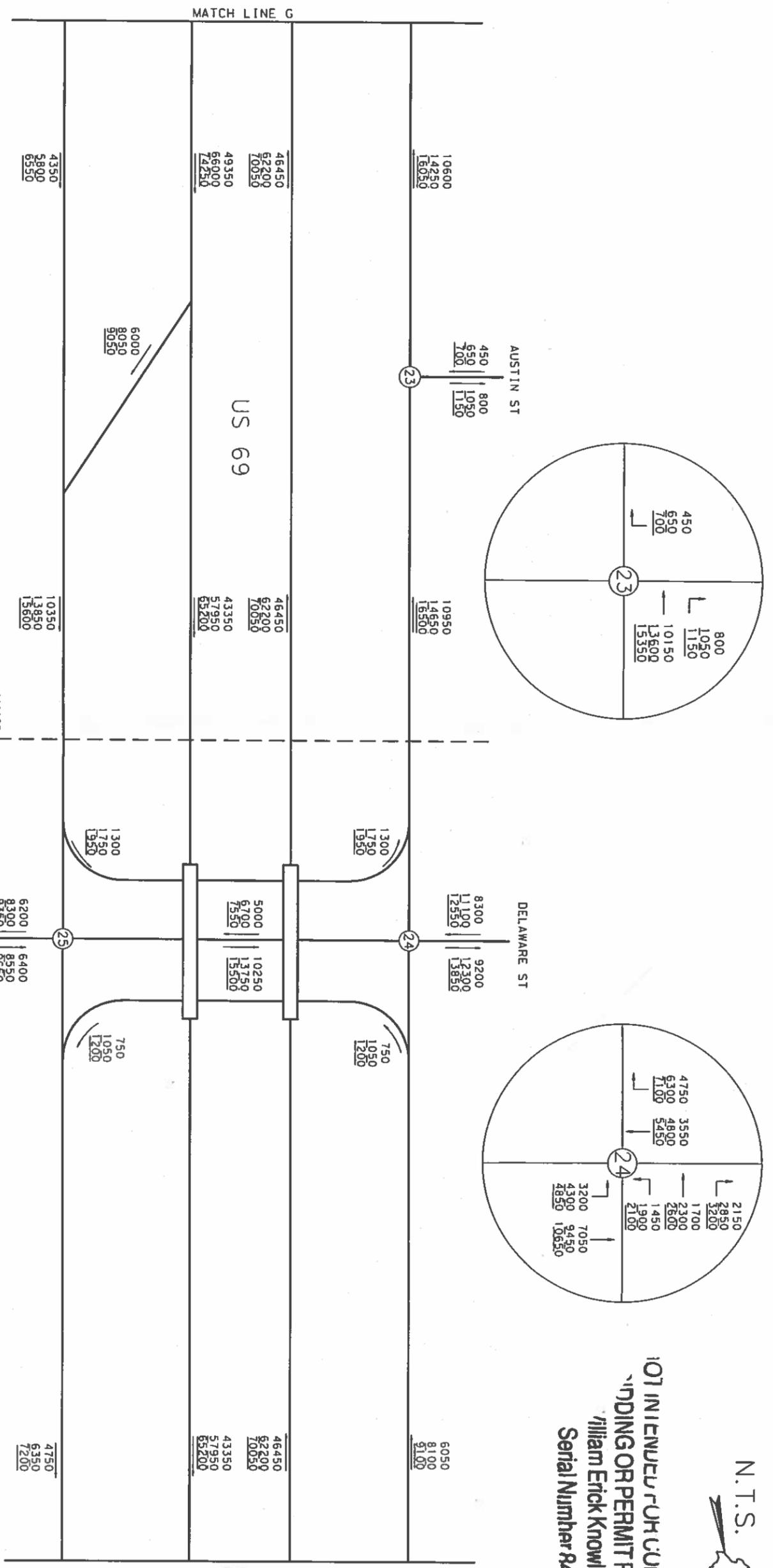
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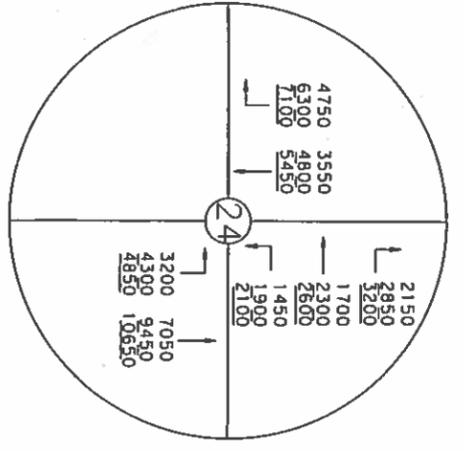
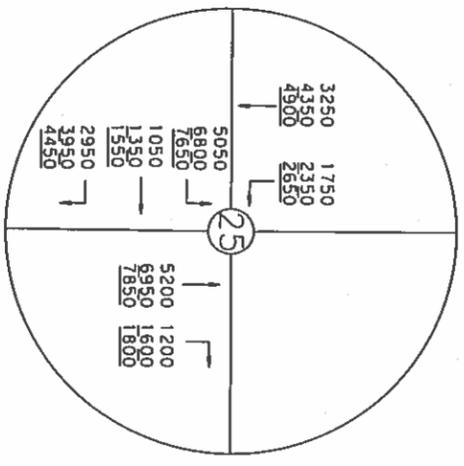
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LEGEND

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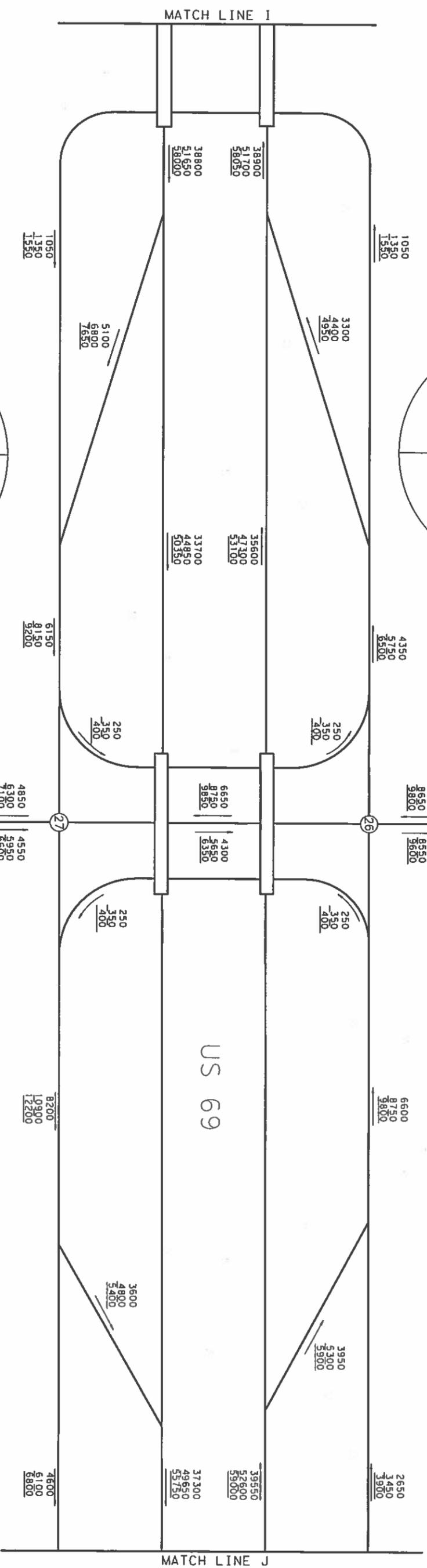
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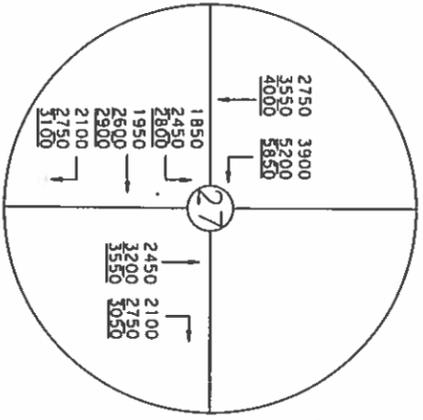
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GRAPHICS	JJ	COUNTY		SECTION	BEAUMONT
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1-10 CORRIDOR TRAFFIC PROJECTIONS
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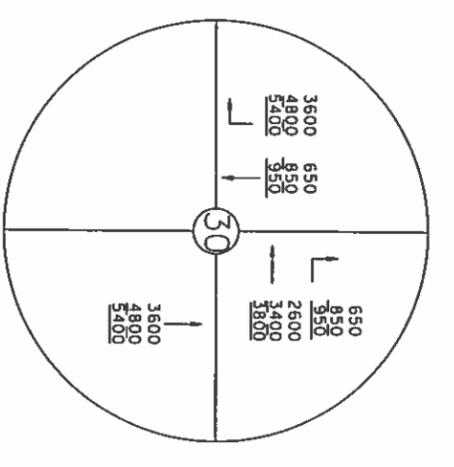
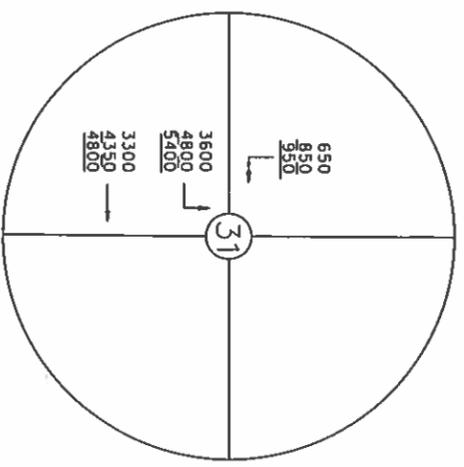
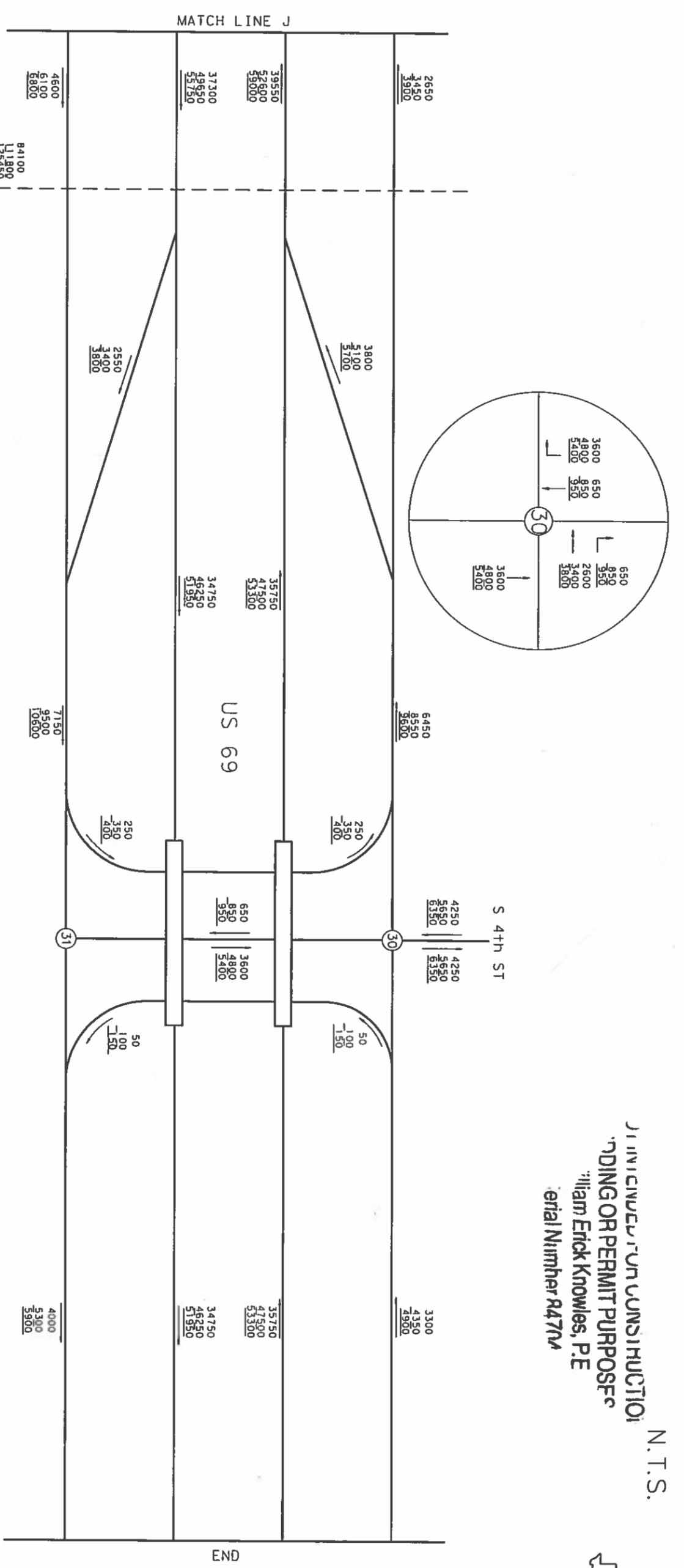
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GRAPHICS JJ	TX	BEAUMONT	BEAUMONT
CHECK EW	CONTROL	SECTION	JOB
	0739	02	140

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**I-10 CORRIDOR TRAFFIC PROJECTIONS
 NO BUILD CONDITION**

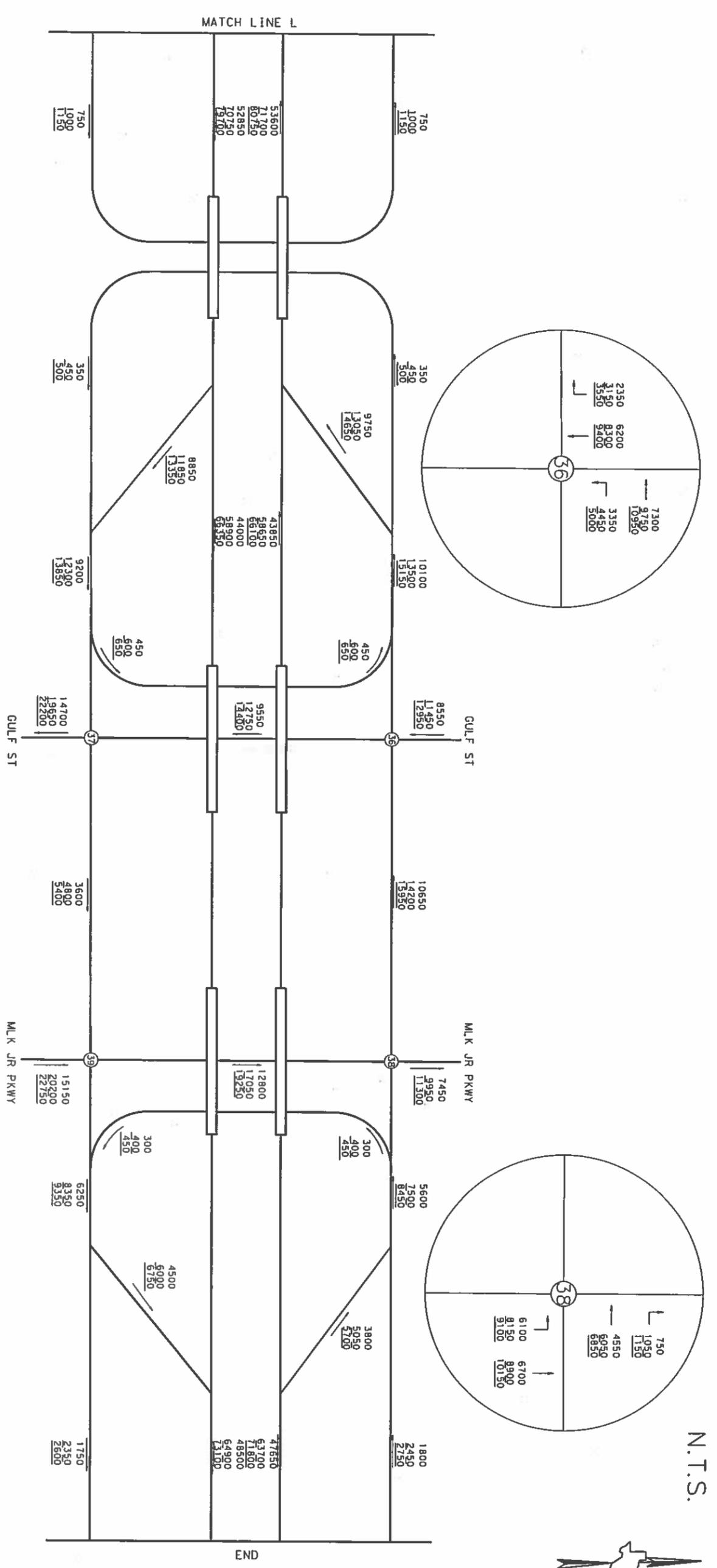
SHEET 10 OF 12

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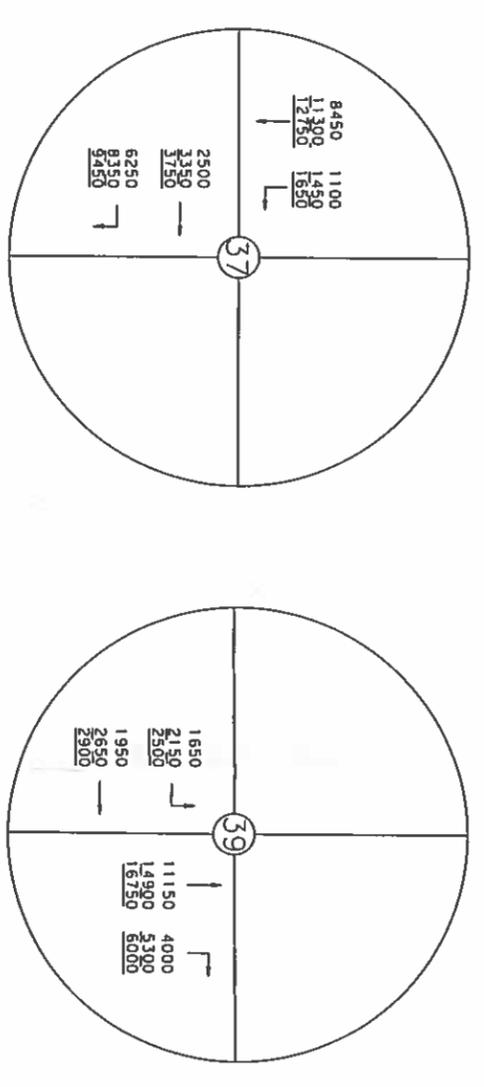
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I-10 CORRIDOR TRAFFIC PROJECTIONS
NO BUILD CONDITION

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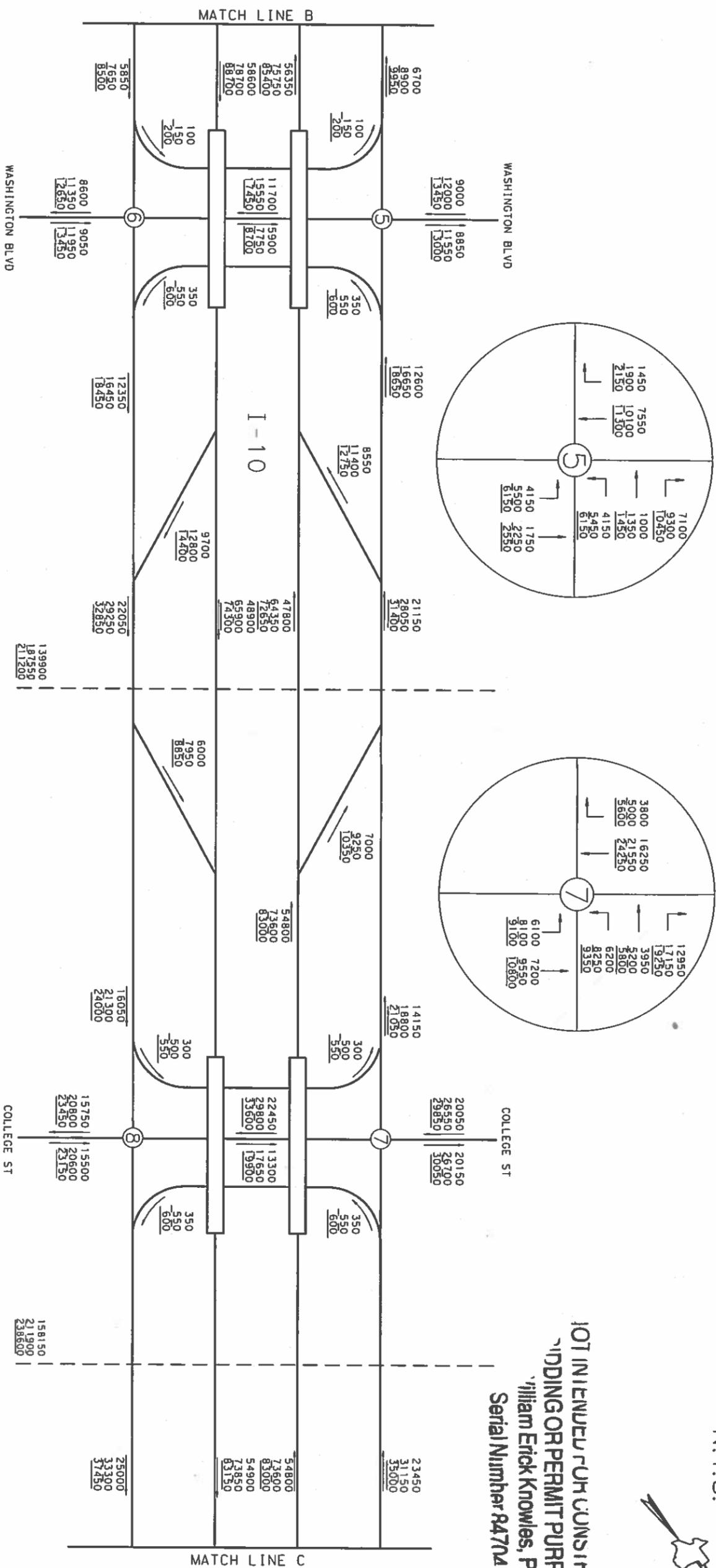
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**I-10 CORRIDOR TRAFFIC PROJECTIONS
BUILD CONDITION**

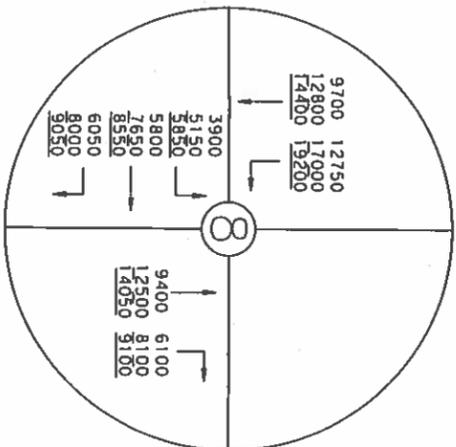
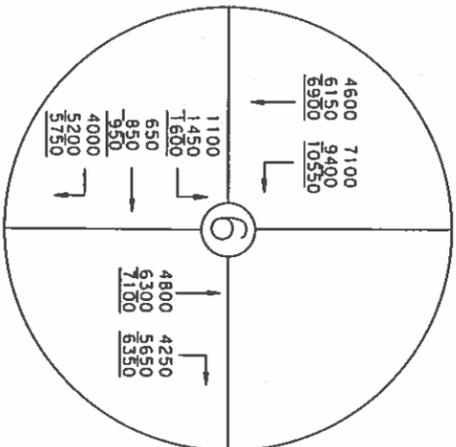
SHEET 3 OF 12

DESIGN	FED. RD. DIV. NO.	HIGHWAY NO.
JJ		IH 10
CHECK	STATE	COUNTY
EW	TX	BEAUMONT
GRAPHICS	TX	BEAUMONT
JJ	CONTROL	SECTION
CHECK	0739	02
EW		140

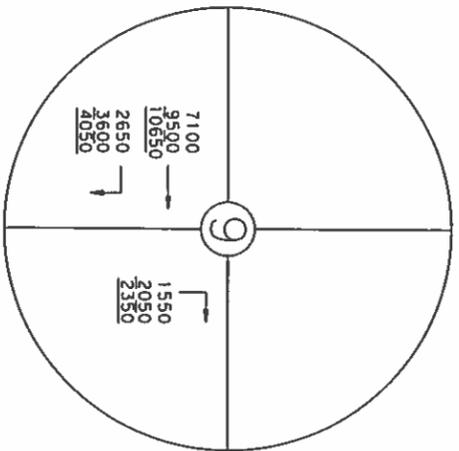
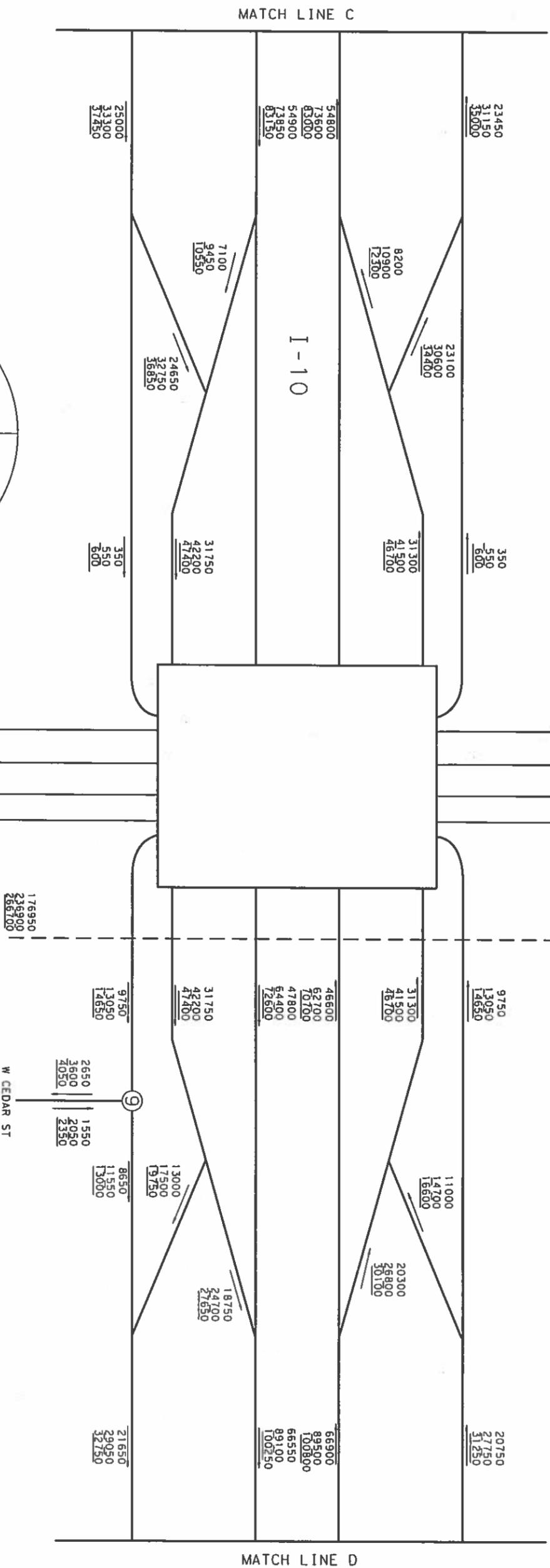
LEGEND

XX,XXX 2025 ADT
XX,XXX 2045 ADT
XX,XXX 2055 ADT

FOR INTERIM REVIEW ONLY
NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES



NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, PE
 Serial Number R47702



I-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION

SHEET 4 OF 12

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 Texas Department of Transportation
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5995 ROGENDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2966

DESIGN		FED. RD. DIV. NO.		HIGHWAY NO.	
JJ	JJ				
CHECK	STATE	DISTRICT	COUNTY	1H 10	
EW	TX	BEAUMONT	BEAUMONT	SHEET	
GRAPHICS	CONTROL	SECTION	JOB	NO.	
JJ	0028	13	135		
CHECK					
EW					

LEGEND

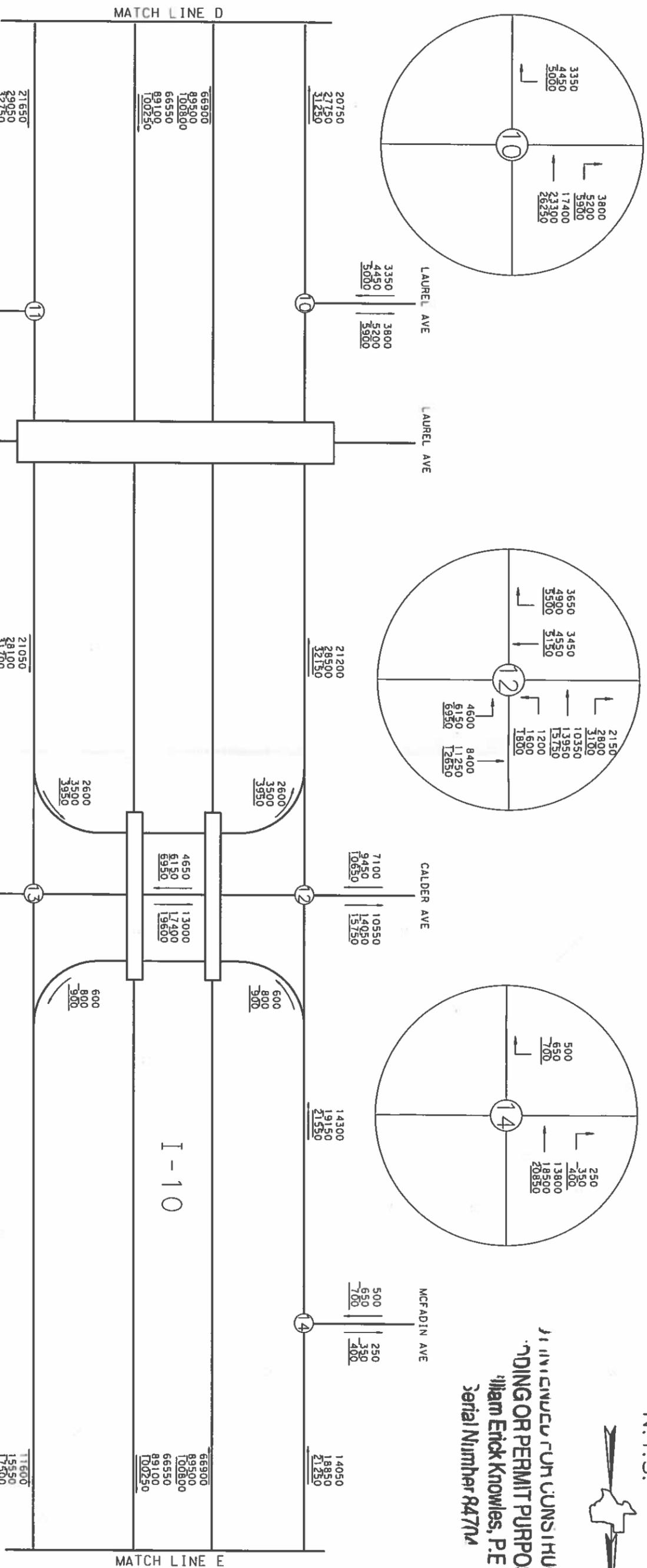
XX,XXX 2025 ADT
 XX,XXX 2045 ADT
 XX,XXX 2055 ADT

FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES

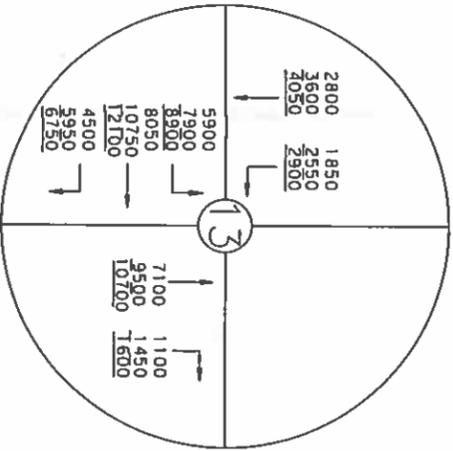
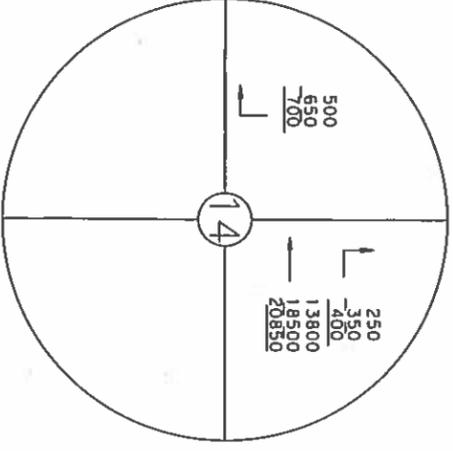
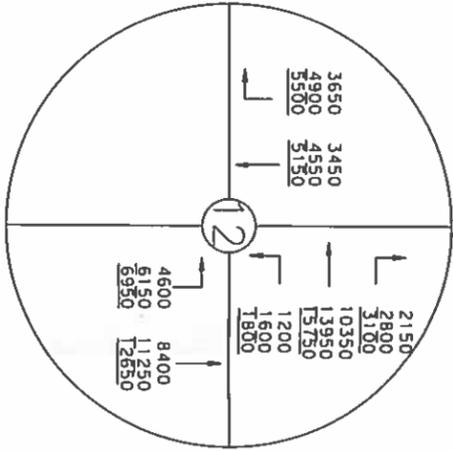
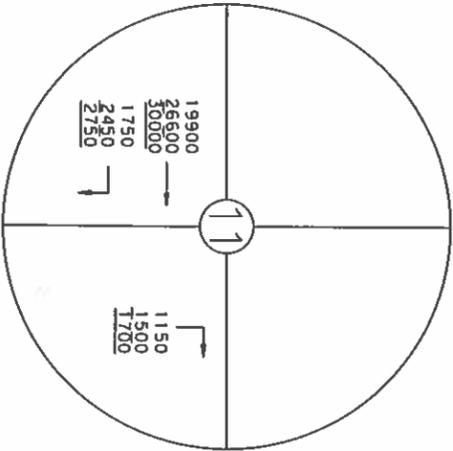
N.T.S.



FOR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number R477A



FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES



LEGEND

XX,XXX 2025 ADT
 XX,XXX 2045 ADT
 XX,XXX 2055 ADT

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5995 ROGERDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2966

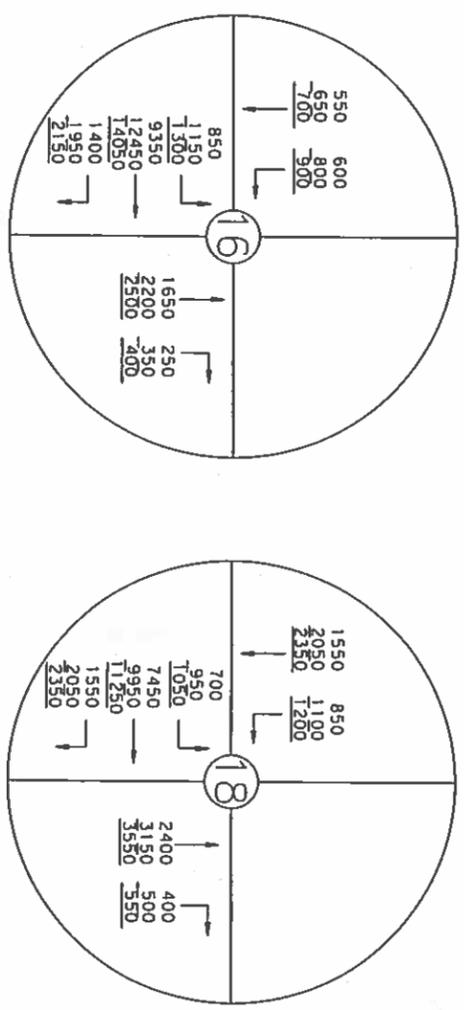
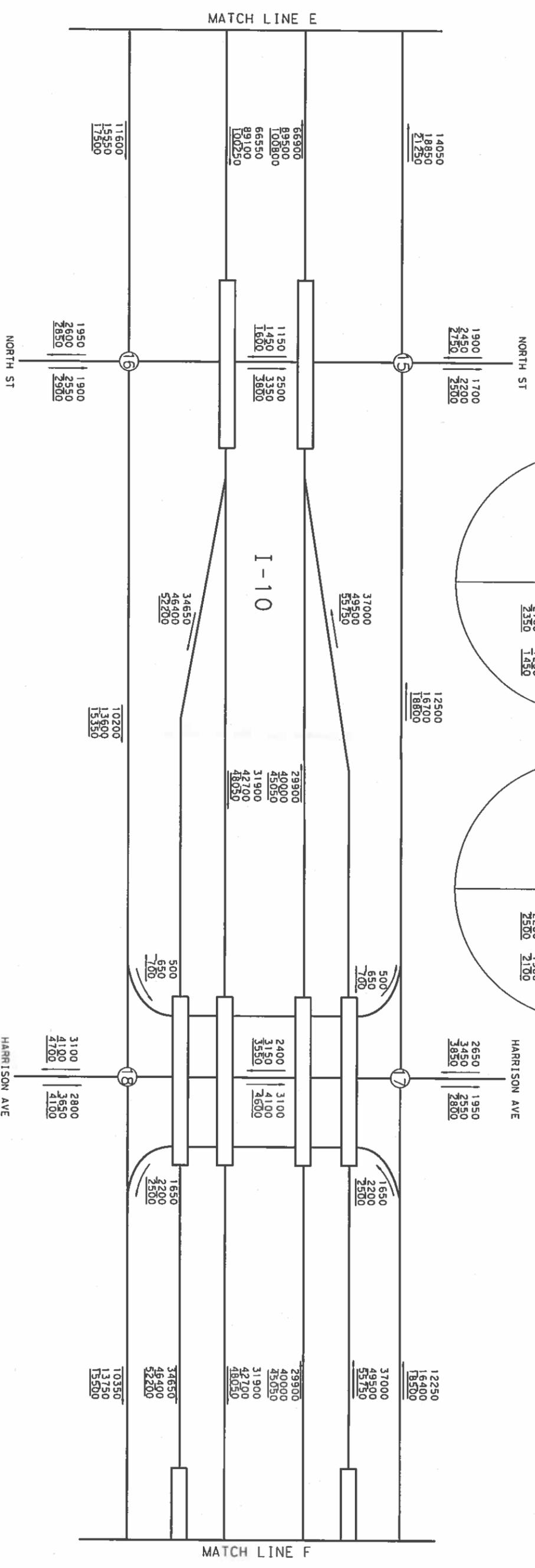
I-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION

SHEET 5 OF 12

DESIGN	FED. RD. DIV. NO.	HIGHWAY NO.	IH 10
CHECK	STATE	DISTRICT	SHEET NO.
EW	TX	BEAUMONT	135
GRAPHICS	CONTROL	SECTION	
JJ	0028	13	
CHECK			
EW			



NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 8477M



FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES

LEGEND

XX,XXX 2025 ADT
 XX,XXX 2045 ADT
 XX,XXX 2055 ADT

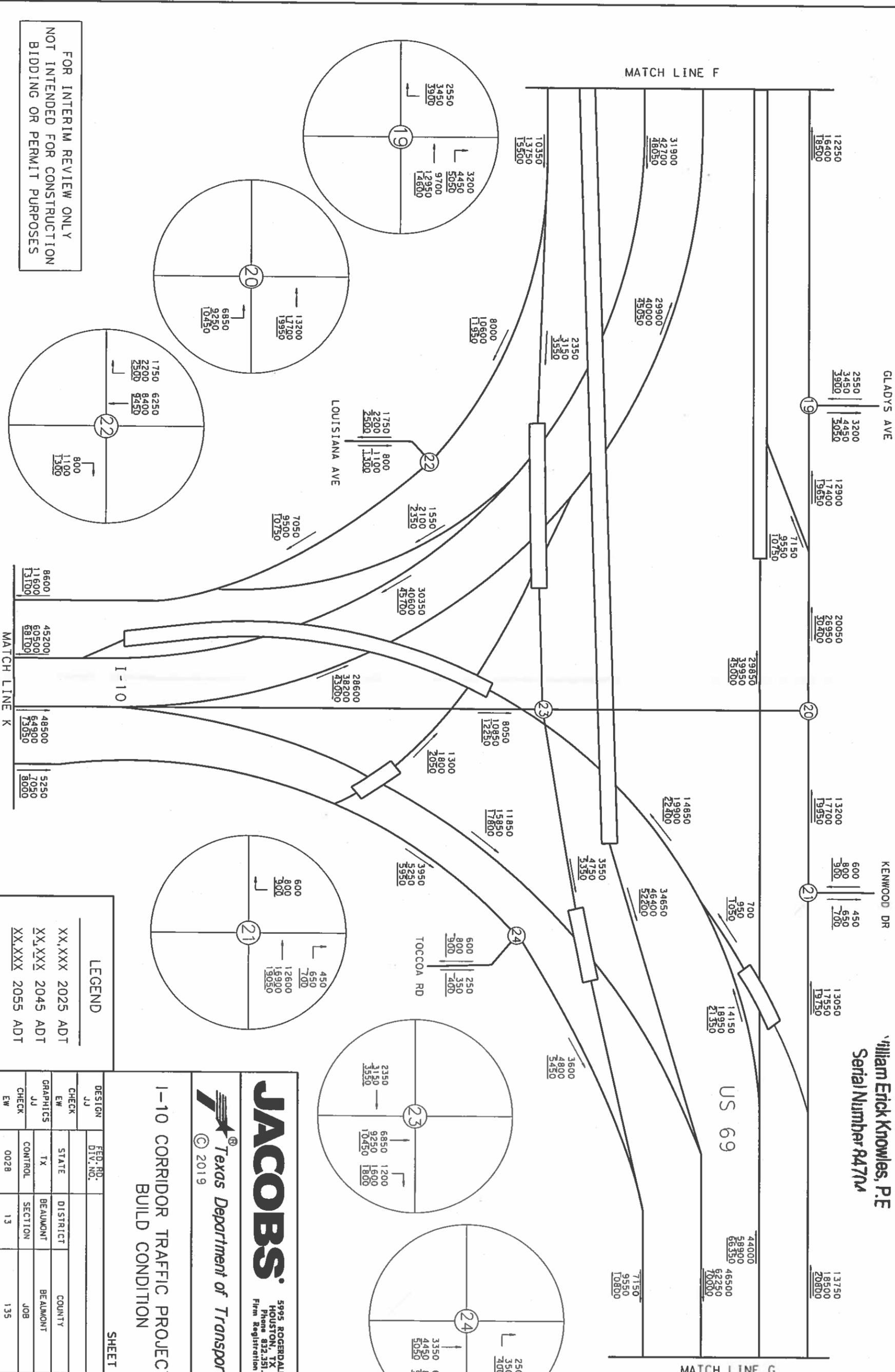
JACOBS 5995 ROGERSDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2966

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**I-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION**

SHEET 6 OF 12

DESIGN	JJ	FED. RD. DIV. NO.		HIGHWAY NO.	IH 10
CHECK	EW	STATE		DISTRICT	BEAUMONT
GRAPHICS	JJ	TX		BEAUMONT	BEAUMONT
CHECK	EW	CONTROL	0028	SECTION	13
					JOB
					135



FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES

LEGEND

XX,XXX	2025	ADT
XX,XXX	2045	ADT
XX,XXX	2055	ADT

DESIGN	FED. RD. DIV. NO.	HIGHWAY NO.
CHECK	JJ	
GRAPHICS	STATE	DISTRICT
CHECK	TX	BEAUMONT
	CONTROL	SECTION
	0028	13
		135

I-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION

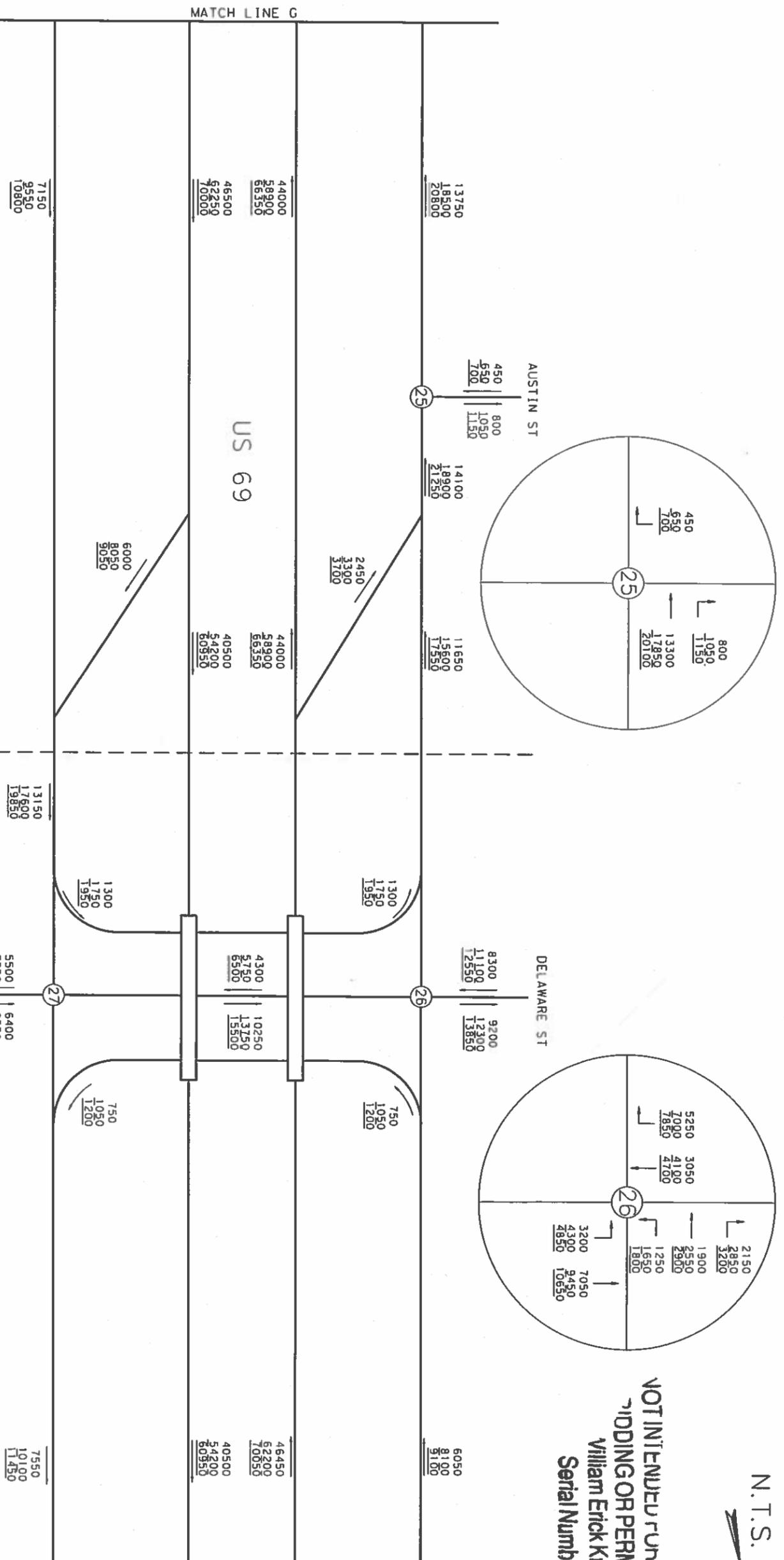
SHEET 7 OF 12

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 Texas Department of Transportation
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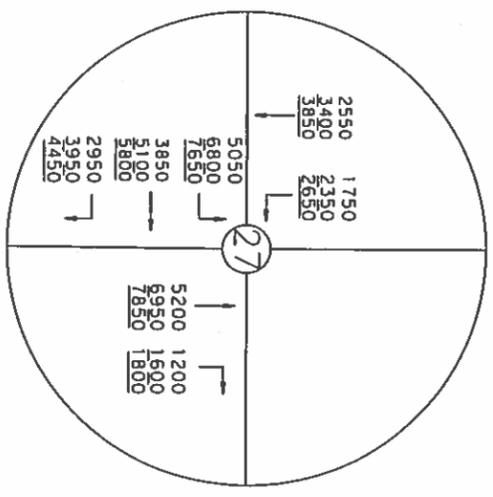
5995 ROGERDALE ROAD
 HOUSTON, TX 77032
 Phone 832.351.6000
 Firm Registration F-2966



NOT INTENDED FOR USE IN BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 84770A



FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES



LEGEND

XX,XXX 2025 ADT
 XX,XXX 2045 ADT
 XX,XXX 2055 ADT

JACOBS 5995 ROGERDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2966

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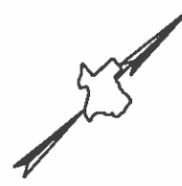
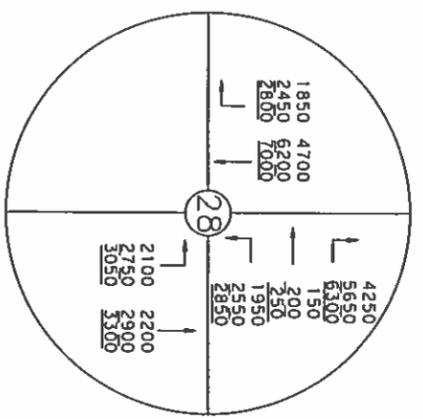
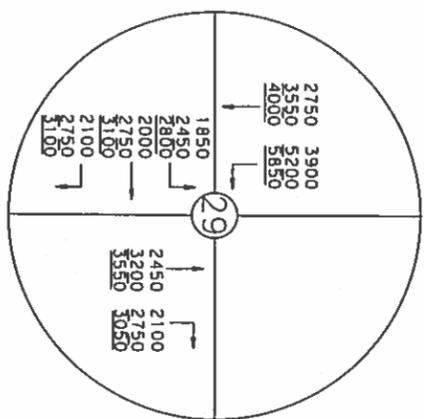
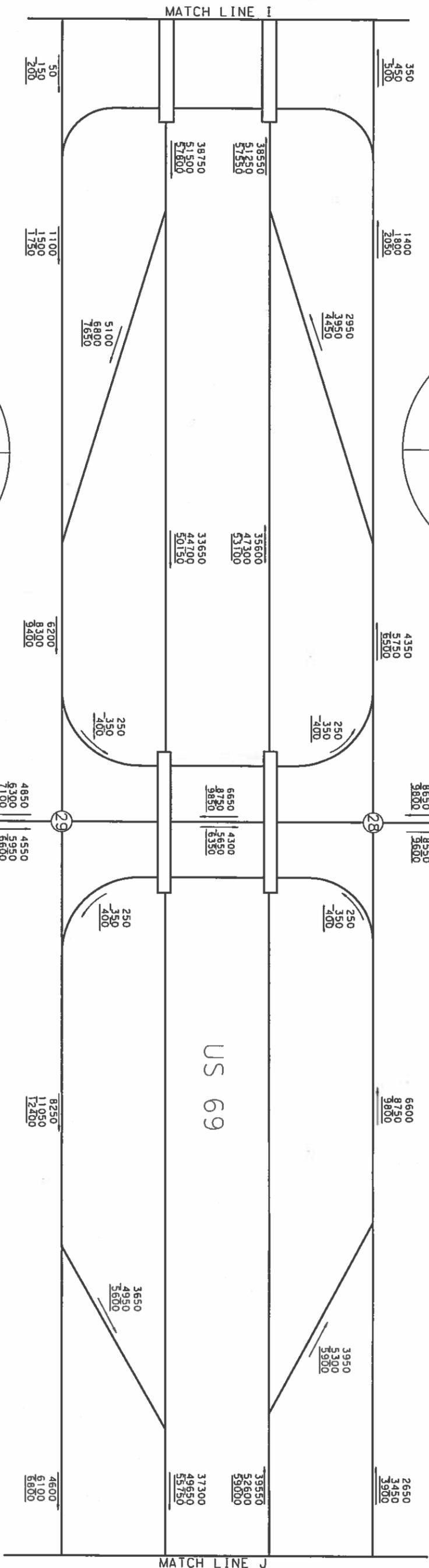
1-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION

DESIGN JJ	FED. RD. DIV. NO.	DISTRICT	COUNTY	SHEET NO.
	HIGHWAY NO.			
CHECK EW	STATE	BEAUMONT	BEAUMONT	SHEET NO.
	TX			
GRAPHICS JJ	CONTROL	SECTION	JOB	
CHECK EW	0028	13	135	

SHEET 8 OF 12

NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 847704

N.T.S.

FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES

LEGEND

XX,XXX 2025 ADT
 XX,XXX 2045 ADT
 XX,XXX 2055 ADT

JACOBS 5995 ROGERSDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2866

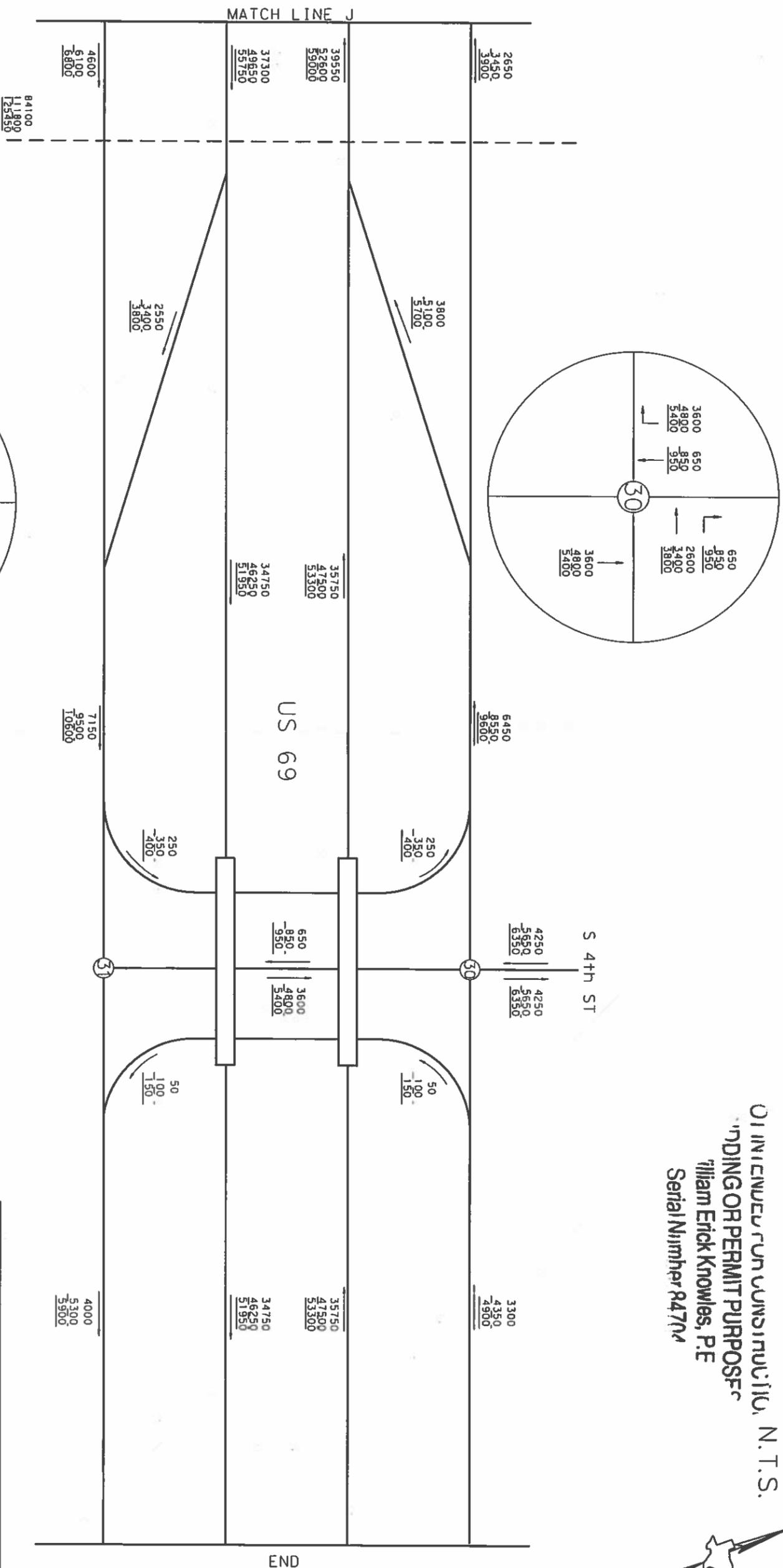
Texas Department of Transportation
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**1-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION**

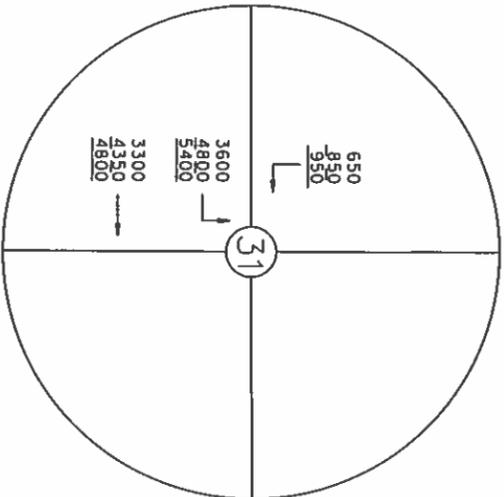
SHEET 9 OF 12

DESIGN	JJ	FED. RD. DIV. NO.		HIGHWAY NO.	
CHECK	EW	STATE		DISTRICT	
GRAPHICS	JJ	TX	BEAUMONT	BEAUMONT	
CHECK	EW	CONTROL	SECTION	JOB	
		0739	02	140	

DESIGNED FOR CONSTRUCTION, N.T.S.
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number R47704



FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES



LEGEND

XX,XXX	2025	ADT
XX,XXX	2045	ADT
XX,XXX	2055	ADT

JACOBS 5995 ROGERSDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2866

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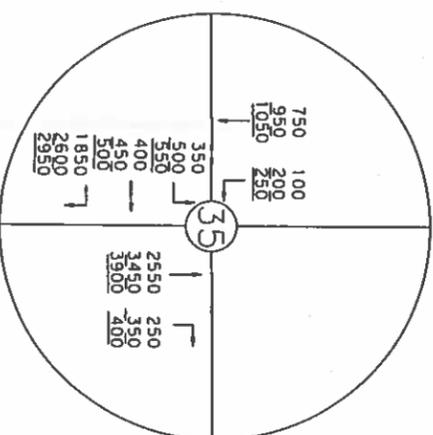
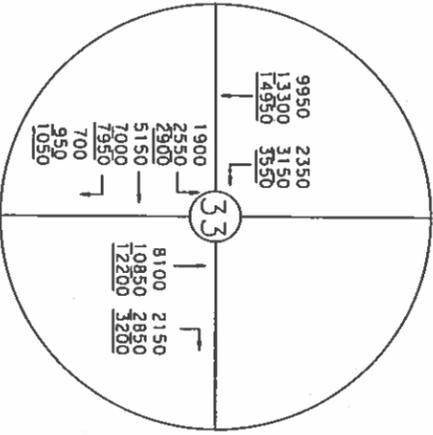
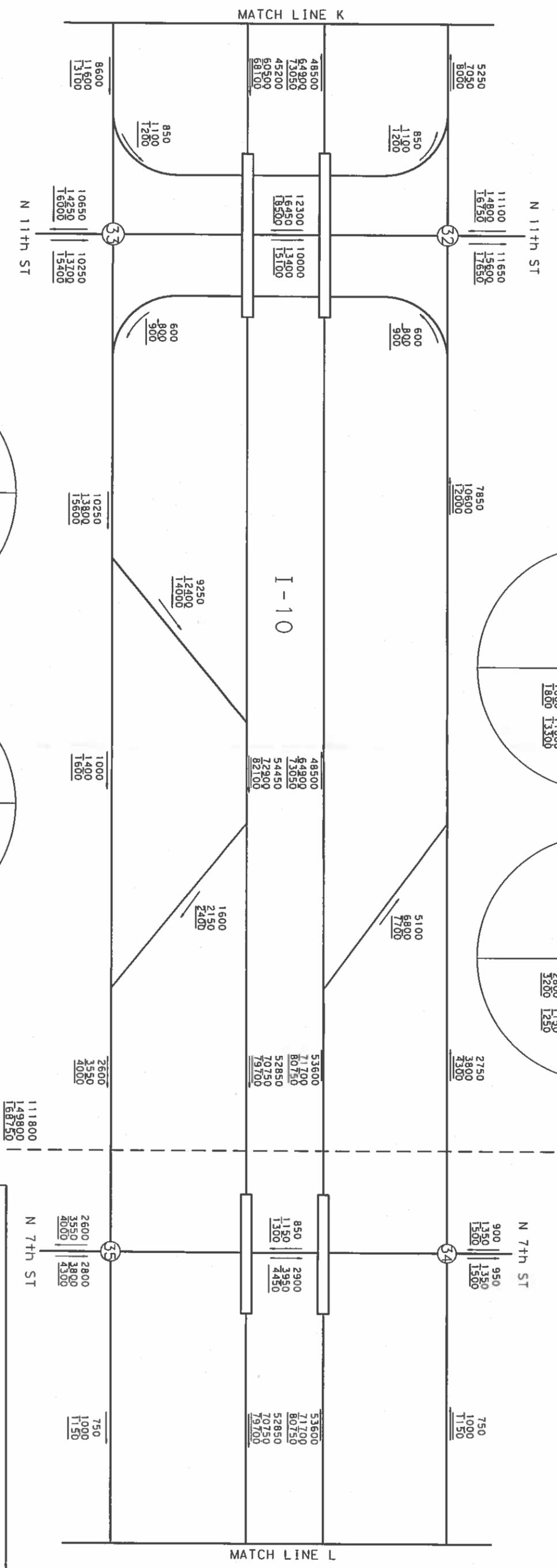
**1-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION**

SHEET 10 OF 12

DESIGN	JJ	FED. RD. DIV. NO.		HIGHWAY NO.	
CHECK	EW	STATE		DISTRICT	
GRAPHICS	JJ	TX	BEAUMONT	COUNTY	BEAUMONT
CHECK	EW	CONTROL	SECTION	JOB	
		0739	02	140	

NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number R47704

N.T.S.



LEGEND

- XX,XXX 2025 ADT
- XX,XXX 2045 ADT
- XX,XXX 2055 ADT

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 HOUSTON, TX 77052
 Phone: 832.351.6000
 Firm Registration F-2966

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I-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION

SHEET 11 OF 12

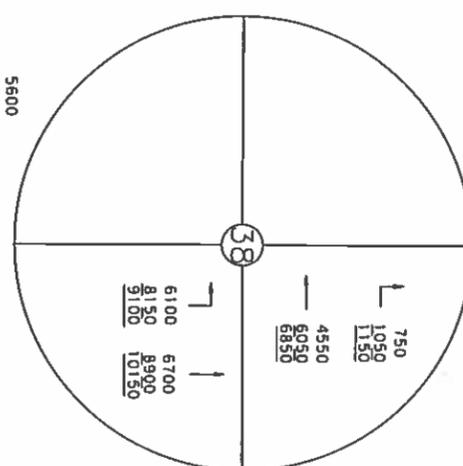
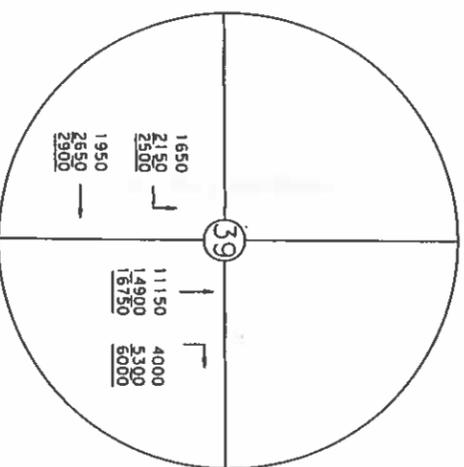
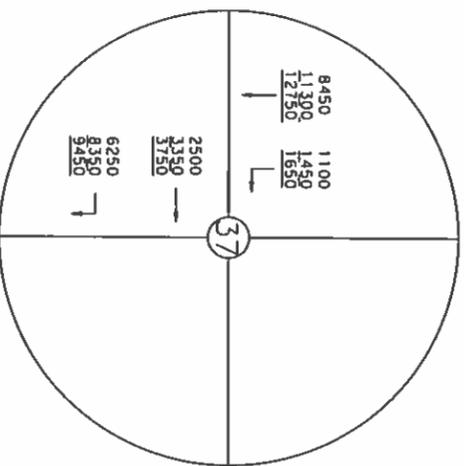
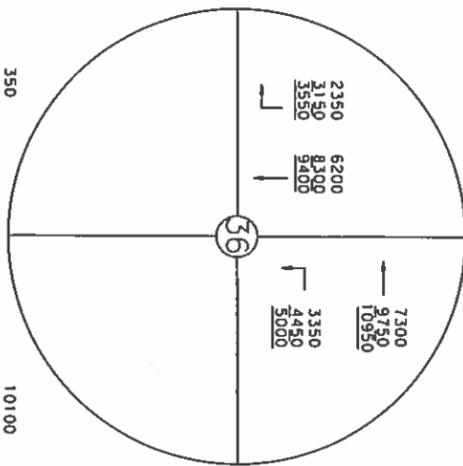
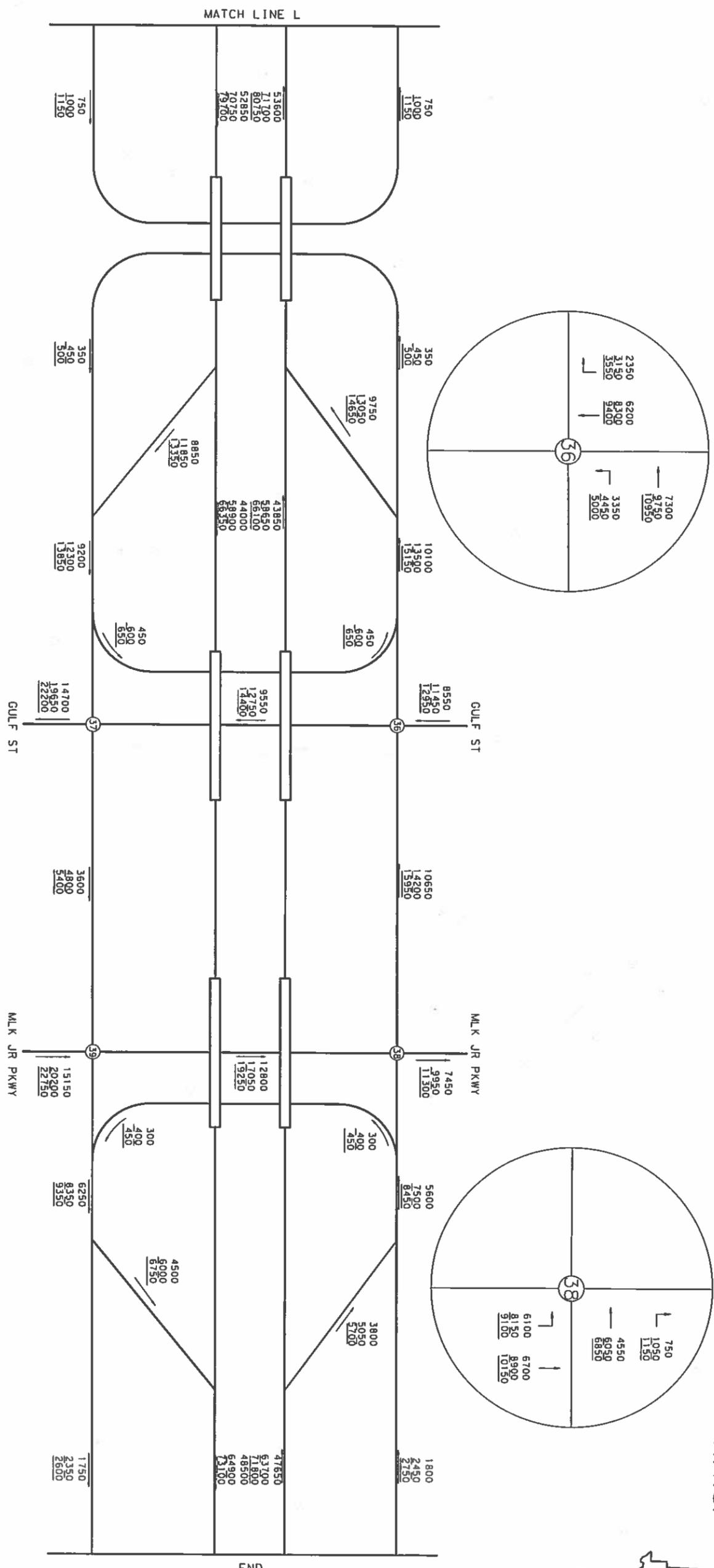
DESIGN	FED. RD. DIV. NO.	HIGHWAY NO.	IH 10
CHECK	JJ		SHEET NO.
GRAPHICS	STATE	DISTRICT	COUNTY
JJ	TX	BEAUMONT	BEAUMONT
CHECK	CONTROL	SECTION	JOB
EW	0028	13	135

FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES

N.T.S.



NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 84704



FOR INTERIM REVIEW ONLY
 NOT INTENDED FOR CONSTRUCTION
 BIDDING OR PERMIT PURPOSES

LEGEND

XX,XXX 2025 ADT
 XX,XXX 2045 ADT
 XX,XXX 2055 ADT

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 Texas Department of Transportation
 © 2019

5925 ROGERDALE ROAD
 HOUSTON, TX 77052
 Phone 832.351.6000
 Firm Registration F-2966

I-10 CORRIDOR TRAFFIC PROJECTIONS
 BUILD CONDITION

SHEET 12 OF 12

DESIGN	JJ	FED. RD. DIV. NO.		HIGHWAY NO.	
CHECK	EW	STATE		DISTRICT	
GRAPHICS	JJ	TX		BEAUMONT	
CHECK	EW	CONTROL		SECTION	
			0028	13	135

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		ADT	DHV			Flexible Pavement	Rigid Pavement					
	2025	2045											
	% of ADT	% of DHV											
<p align="center">Data for Use in Air & Noise Analysis</p>													
<p align="center">Vehicle Class</p>													
Light Duty	73.1												
Medium Duty	3.1												
Heavy Duty	23.8												
<p align="center">Data for Use in Air & Noise Analysis</p>													
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Light Duty	73.1												
Medium Duty	3.1												
Heavy Duty	23.8												
<p align="center">Data for Use in Air & Noise Analysis</p>													
<p align="center">Vehicle Class</p>													
Light Duty													

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		Percent Trucks							Flexible Pavement	Rigid Pavement	
	2025	2045	ADT	DHV								
	% of ADT	% of DHV										
I-10 Section 2 (No Build Condition) From Walden Rd. To US 69 Jefferson County	71,800	97,150	53 - 47	8.3	24.5	11.0	13,500	30	82,443,000	3	119,019,000	8"
Data for Use in Air & Noise Analysis												
Vehicle Class	Base Year											
	% of ADT	% of DHV										
Light Duty	75.5	89.0										
Medium Duty	2.8	1.3										
Heavy Duty	21.7	9.7										
Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		Percent Trucks							Flexible Pavement	Rigid Pavement	
	2025	2055	ADT	DHV								
	% of ADT	% of DHV										

FOR THE PURPOSE OF OBTAINING A PERMIT FOR CONSTRUCTION
 WILLIAM ERICK KNOWLES, P.F.
 Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Base Year		ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		Percent Trucks	ADT			DHW	Flexible Pavement		S	Rigid Pavement	
	2025	2045										
I-10 Section 2 (Build Condition) From Walden Rd. To US 69 Jefferson County	73,300	99,150	53 - 47	8.3	24.3	10.9	13,500	30	83,466,000	3	120,494,000	8"
Data for Use in Air & Noise Analysis												
Vehicle Class	Base Year		Base Year									
	% of ADT		% of DHV									
Light Duty	75.7		89.1									
Medium Duty	2.8		1.3									
Heavy Duty	21.5		9.6									
Description of Location	Base Year				Dir Dist %	K Factor	Base Year		ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		Percent Trucks	ADT			DHW	Flexible Pavement		S	Rigid Pavement	
	2025	2055										
I-10 (Build Condition) Section 2 From Walden Rd. To US 69 Jefferson County	73,300	112,000	53 - 47	8.3	24.3	10.9	13,600	30	134,533,000	3	194,217,000	8"

ENGINEERING CONSULTANTS
 ENGINEERING PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		ADT	DHV			Flexible Pavement	Rigid Pavement					
	2025	2045											
(No Build and Build Conditions) Section 3 I-10 From US 69 To US 90 Jefferson County	139,900	187,550	53 - 47	8.3	12.4	5.6	13,500	30	77,322,000	3	110,157,000	8"	
Data for Use in Air & Noise Analysis													
Vehicle Class	Base Year												
	Average Daily Traffic		% of ADT	% of DHV									
	2025	2045											
Light Duty	87.6		94.4										
Medium Duty	2.0		0.9										
Heavy Duty	10.4		4.7										
Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		ADT	DHV			Flexible Pavement	Rigid Pavement					
	2025	2055											
(No Build and Build Conditions) Section 3 I-10 From US 69 To US 90 Jefferson County	139,900	211,200	53 - 47	8.3	12.4	5.6	13,600	30	124,363,000	3	177,173,000	8"	

NOT INTENDED FOR CONSTRUCTION
 ADDING OR PERMIT PURPOSES
 William Erick Knowles, P.F.
 Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		ADT	DHV			Flexible Pavement	Rigid Pavement				
	2025	2045								S	N	
I-10 Section 4 (No Build and Build Conditions) From US 90 To Hollywood Overpass Jefferson County	158,150	211,900	53 - 47	8.3	11.8	5.3	13,600	30	83,172,000	3	118,474,000	8"
Data for Use in Air & Noise Analysis												
Vehicle Class	Base Year											
	% of ADT											
Light Duty	88.2		% of DHV									
Medium Duty	1.9		94.7									
Heavy Duty	9.9		0.9									
			4.4									
Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		ADT	DHV			Flexible Pavement	Rigid Pavement				
	2025	2055								S	N	

NOT INTENDED FOR CONSTRUCTION,
 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 84707

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		ADT	DHV			S	N					
	2025	2045											
(No Build and Build Conditions) Section 5 From Hollywood Overpass To I-10 / US 69 Interchange Jefferson County	176,950	236,900	53 - 47	8.3	11.4	5.1	13,600	20	89,882,000	3	128,020,000	8"	
Data for Use in Air & Noise Analysis													
Vehicle Class	Base Year												
	% of ADT		% of DHV										
	88.6		94.9										
Light Duty	1.9		0.9										
Medium Duty	9.5		4.2										
Heavy Duty													
Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks		ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		ADT	DHV			S	N					
	2025	2055											
(No Build and Build Conditions) Section 5 From Hollywood Overpass To I-10 / US 69 Interchange Jefferson County	176,950	266,700	53 - 47	8.3	11.4	5.1	13,700	20	144,536,000	3	205,865,000	8"	



 CONSULTING ENGINEERING ARCHITECTURE

 ENGINEERING OR PERMIT PURPOSES

 William Erick Knowles, P.F.

 Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 23, 2019

Description of Location	Average Daily Traffic				Dir Dist %	Base Year			ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB		
	2025		2045			K Factor	Percent Trucks	ADT			DHV	Flexible Pavement		S	Rigid Pavement
	2045		2045												
	% of ADT	% of DHV													
I-10 Section 6 (No Build and Build Conditions) From I-10 / US 69 Interchange To 7th Street Jefferson County	111,800	149,800	53 - 47	8.3	13.7	6.2	13,400	30	68,215,000	3	97,206,000	8"			
Data for Use in Air & Noise Analysis															
Vehicle Class	% of ADT		% of DHV												
Light Duty	86.3		93.8												
Medium Duty	2.2		1.0												
Heavy Duty	11.5		5.2												
Description of Location	Average Daily Traffic				Dir Dist %	Base Year			ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB		
	2025		2055			K Factor	Percent Trucks	ADT			DHV	Flexible Pavement		S	Rigid Pavement
	2055		2055												
	% of ADT	% of DHV													
I-10 Section 6 (No Build and Build Conditions) From I-10 / US 69 Interchange To 7th Street Jefferson County	111,800	168,750	53 - 47	8.3	13.7	6.2	13,400	30	109,739,000	3	156,378,000	8"			

NOT INTENDED FOR CONSTRUCTION
 PENDING PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 8470

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 24, 2019

Description of Location	Average Daily Traffic		Dir Dist %	Base Year			ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB	
	2025	2045		K Factor	Percent Trucks	ADT			DHV	S		N
	% of DHV											
US 69 (No Build and Build Conditions) Section 1	84,100	111,800	53 - 47	8.3	5.3	3.2	12,400	40	15,952,000	3	21,616,000	8"
From I-10 To 4th Street Jefferson County												
Data for Use in Air & Noise Analysis												
Vehicle Class	Base Year		Base Year									
	% of ADT		% of DHV									
	94.7		96.8									
	1.8		1.1									
3.5		2.1										
Data for Use in Air & Noise Analysis												
Description of Location	Average Daily Traffic		Dir Dist %	Base Year			ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB	
	2025	2055		K Factor	Percent Trucks	ADT			DHV	S		N
	% of DHV											
US 69 (No Build and Build Conditions) Section 1	84,100	125,450	53 - 47	8.3	5.3	3.2	12,500	40	25,595,000	3	34,683,000	8"
From I-10 To 4th Street Jefferson County												

WILLIAMS CONSULTING
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 Serial Number R4701

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Beaumont District

October 24, 2019

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		ADT	DHV						Flexible Pavement	Rigid Pavement	
	2025	2045										
US 69 (No Build Condition) Section 2	111,100	148,650	53 - 47	8.3	3.7	2.2	12,400	30	13,766,000	3	17,890,000	8"
From Lucas Dr. To I-10 Jefferson County												
Data for Use in Air & Noise Analysis												
Vehicle Class	Base Year		Base Year									
	% of ADT		% of DHV									
	96.3		97.8									
	1.8		1.1									
Heavy Duty	Base Year		Base Year									
	% of ADT		% of DHV									
	1.9		1.1									
Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		ADT	DHV						Flexible Pavement	Rigid Pavement	
	2025	2055										
US 69 (No Build Condition) Section 2	111,100	167,350	53 - 47	8.3	3.7	2.2	12,400	30	22,136,000	3	28,768,000	8"
From Lucas Dr. To I-10 Jefferson County												

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 BIDDING OR PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

October 24, 2019

Beaumont District

Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045)		SLAB
	Average Daily Traffic		ADT	DHV						Flexible Pavement	Rigid Pavement	
	2025	2045										
	% of ADT	% of DHV										
US 69 Section 2 (Build Condition) From Lucas Dr. To I-10 Jefferson County	111,750	149,600	53 - 47	8.3	3.7	2.2	12,400	30	13,851,000	3	18,001,000	8"
Data for Use in Air & Noise Analysis												
Vehicle Class	Base Year											
	% of ADT	% of DHV										
Light Duty	96.3	97.8										
Medium Duty	1.8	1.1										
Heavy Duty	1.9	1.1										
Description of Location	Base Year				Dir Dist %	K Factor	Percent Trucks	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055)		SLAB
	Average Daily Traffic		ADT	DHV						Flexible Pavement	Rigid Pavement	
	2025	2055										
	% of ADT	% of DHV										
US 69 (Build Condition) Section 2 From Lucas Dr. To I-10 Jefferson County	111,750	168,400	53 - 47	8.3	3.7	2.2	12,400	30	22,271,000	3	28,943,000	8"

PREPARED FOR CONSULTATION
 ENGINEERING PERMIT PURPOSES
 William Erick Knowles, P.E.
 Serial Number R4707