

# **Dallas to Houston High-Speed Rail Final Environmental Impact Statement**

## **Appendix G: Dallas to Houston High-Speed Rail Passenger Service from Houston to Dallas Final Conceptual Engineering Plans and Details Set 9 of 14**



**TEXAS  
CENTRAL**



**DALLAS TO HOUSTON HIGH-SPEED RAIL**  
PASSENGER SERVICE FROM HOUSTON TO DALLAS

**FINAL CONCEPTUAL ENGINEERING  
PLANS AND DETAILS**  
PROJECT DEFINITION FOR FINAL ENVIRONMENTAL IMPACT STATEMENT  
VOLUME 2 - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

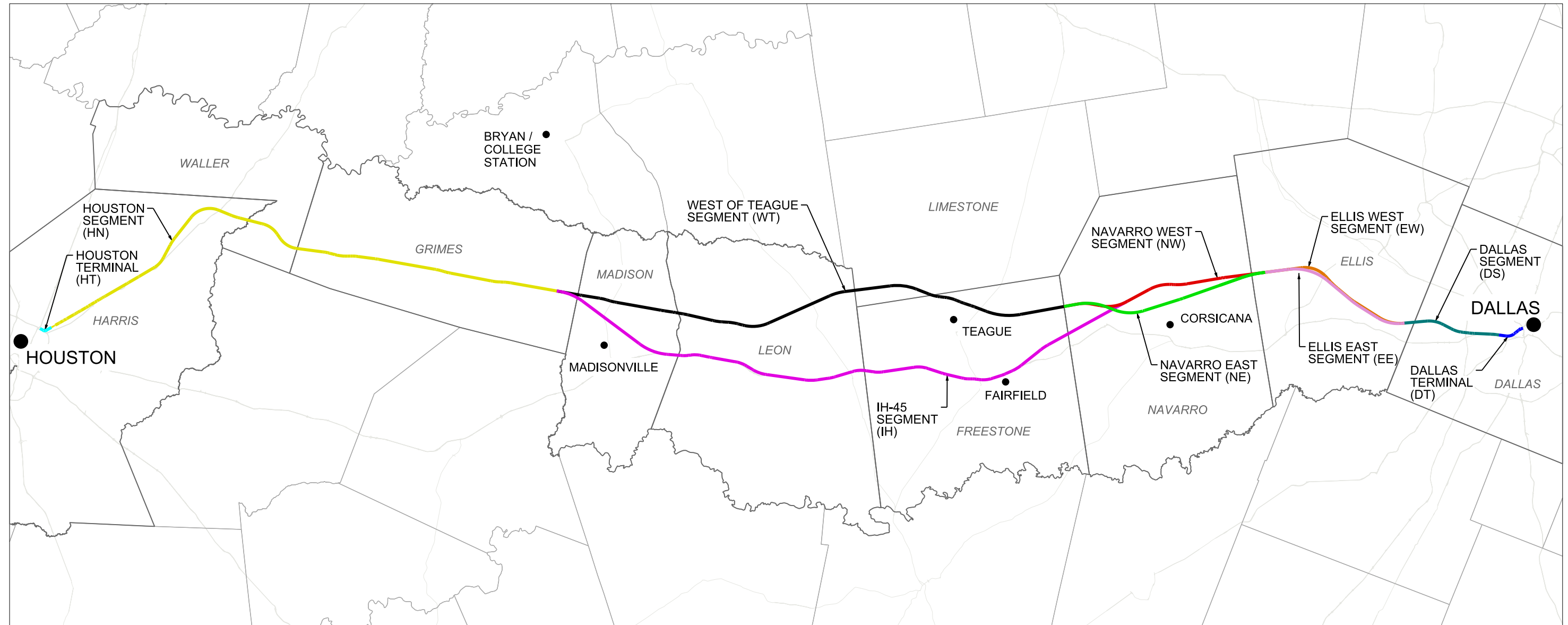
JULY 1, 2019



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NICHOLS**  
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COVER SHEET



| ALIGNMENT ALTERNATIVE | FRA SEGMENT ID  | SEGMENT NAMES   | SEGMENT ABBREVIATION |
|-----------------------|-----------------|---|----------------------|
| A                     | 5, 4, 3A, 2A, 1 | DALLAS SEGMENT, ELLIS WEST SEGMENT, NAVARRO WEST SEGMENT, WEST OF TEAGUE SEGMENT, HOUSTON SEGMENT | DS, EW, NW, WT, HN   |
| B                     | 5, 4, 3B, 2A, 1 | DALLAS SEGMENT, ELLIS WEST SEGMENT, NAVARRO EAST SEGMENT, WEST OF TEAGUE SEGMENT, HOUSTON SEGMENT | DS, EW, NE, WT, HN   |
| C                     | 5, 3C, 2A, 1    | DALLAS SEGMENT, ELLIS WEST SEGMENT, IH-45 SEGMENT, HOUSTON SEGMENT                                | DS, EW, IH, HN       |
| D                     | 5, 4, 3A, 2B, 1 | DALLAS SEGMENT, ELLIS EAST SEGMENT, NAVARRO WEST SEGMENT, WEST OF TEAGUE SEGMENT, HOUSTON SEGMENT | DS, EE, NW, WT, HN   |
| E                     | 5, 4, 3B, 2B, 1 | DALLAS SEGMENT, ELLIS EAST SEGMENT, NAVARRO EAST SEGMENT, WEST OF TEAGUE SEGMENT, HOUSTON SEGMENT | DS, EE, NE, WT, HN   |
| F                     | 5, 3C, 2B, 1    | DALLAS SEGMENT, ELLIS EAST SEGMENT, IH-45 SEGMENT, HOUSTON SEGMENT                                | DS, EE, IH, HN       |

- NOTES:  
 1. REFER TO FCE REPORT FOR SEGMENT NAMES AND ALIGNMENT ALTERNATIVES.



| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |

DESIGNED BY  
**D. THOMPSON**

DRAWN BY  
**D. THOMPSON**

CHECKED BY  
**R. BURNS**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

**GENERAL LOCATION PLAN**

Scale  
AS SHOWN

Drawing Status  
**FINAL**

|                         |                                   |                  |
|-------------------------|-----------------------------------|------------------|
| Job No<br><b>234180</b> | Drawing No<br><b>GEN-00-00002</b> | Rev<br><b>01</b> |
|-------------------------|-----------------------------------|------------------|

VOLUME 1A - GENERAL SHEETS & TYPICAL SECTIONS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Includes sections 1A-1 GENERAL, 1A-2 RAILWAY TYPICAL SECTIONS, 1A-3 ROADWAY AND GRADE SEPARATION TYPICAL SECTIONS, 1A-4 CIVIL STRUCTURES TYPICAL DETAILS, 1A-5 CIVIL UTILITIES TYPICAL DETAILS, 1A-6 GENERAL - ALIGNMENT CURVE DATA TABLES.

VOLUME 1B - GENERAL SHEETS & TYPICAL SECTIONS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Includes section 1B-1 RAILWAY TYPICAL SECTIONS and 1B-2 ROADWAY AND GRADE SEPARATION TYPICAL SECTIONS.

VOLUME 2A - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawing numbers and descriptions for the Houston Segment, including CVL-HN-01101 through CVL-HN-01154-B.

VOLUME 2A - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawing numbers and descriptions for the Houston Segment, including CVL-HN-01155 through CVL-HN-01206, and West of Teague Segment including CVL-WT-01250 through CVL-WT-01252.

Revision table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION.

Design and drawing information table with columns: DESIGNED BY, DRAWN BY, CHECKED BY, IN CHARGE, DATE.



Project information including Drawing Title (GENERAL INDEX SHEET 1 OF 5), Scale (NO SCALE), Job No (234180), Drawing No (GEN-00-00003), and Rev (01).

PLOT TIME: 5/31/2019 9:49:34 AM

VOLUME 2A - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Contains drawing entries for 2A-2 WEST OF TEAGUE SEGMENT, including drawings CVL-WT-01253 through CVL-WT-01314.

VOLUME 2A - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Contains drawing entries for 2A-2 WEST OF TEAGUE SEGMENT, 2A-3 NAVARRO WEST SEGMENT, and 2A-4 ELLIS WEST SEGMENT, including drawings CVL-WT-01314-A through CVL-EW-01708.

VOLUME 2A - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Contains drawing entries for 2A-4 ELLIS WEST SEGMENT and 2A-5 DALLAS SEGMENT, including drawings CVL-EW-01708-A through CVL-DS-01926-A.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Includes a revision table and a table for drawing descriptions.

Table with columns: DESIGNED BY, DRAWN BY, CHECKED BY, IN CHARGE, DATE. Lists project personnel: D. THOMPSON, R. BURNS, C. TAYLOR.

Logos for ARUP and FREESE & NICHOLS. Includes contact information for both firms, such as addresses and phone numbers.

Logos for DALLAS TO HOUSTON HIGH-SPEED RAIL and TEXAS CENTRAL. Includes the project name and location.

Project information including Drawing Title (GENERAL INDEX SHEET 2 OF 5), Scale (NO SCALE), Drawing Status (FINAL), Job No (234180), Drawing No (GEN-00-00004), and Rev (01).

PLOT TIME: 5/31/2019 9:49:27 AM

PLOT BY: M-YPWICS01S

VOLUME 2B - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Contains drawing numbers CVL-IH-01350 to CVL-IH-01420 and their descriptions for the IH-45 segment.

VOLUME 2B - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Contains drawing numbers CVL-IH-01421 to CVL-IH-01442 and CVL-NE-01600 to CVL-NE-01631 for the IH-45 segment and NAVARRO EAST SEGMENT.

VOLUME 2B - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Contains drawing numbers CVL-EE-01814 to CVL-EE-01823 and their descriptions for the ELLIS EAST SEGMENT.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Includes a revision table and a design log table.

DESIGNED BY: D. THOMPSON
DRAWN BY: D. THOMPSON
CHECKED BY: R. BURNS
IN CHARGE: C. TAYLOR
DATE: 02/25/2019



Scale: NO SCALE
Drawing Status: FINAL
Job No: 234180
Drawing No: GEN-00-00005
Rev: 01

PLOT TIME: 5/24/2018 3:22:14 PM
PLOT BY: M-YPWICS01S

VOLUME 3A - STATIONS, MAINTENANCE FACILITIES AND RAILWAY SYSTEMS SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Includes sections 3A-1 STATIONS, 3A-2 MAINTENANCE FACILITIES, YARDS AND SHOPS, 3A-3 RAILWAY FACILITIES, and 3A-4 ROADWAY FACILITIES.

VOLUME 3B - STATIONS, MAINTENANCE FACILITIES AND RAILWAY SYSTEMS SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Includes sections 3B-1 STATIONS (NOT USED), 3B-2 MAINTENANCE FACILITIES, YARDS AND SHOPS, and 3B-3 RAILWAY FACILITIES.

VOLUME 4B - NOT USED
VOLUME 4B - ROADWAY PLAN SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Section 4B-1 IH-45 SEGMENT.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Includes design and in-charge information.



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DALLAS TO HOUSTON HIGH-SPEED RAIL
FINAL CONCEPTUAL ENGINEERING



1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

GENERAL
INDEX SHEET 4 OF 5

Scale
NO SCALE

Drawing Status
FINAL

Table with columns: Job No, Drawing No, Rev. Values: 234180, GEN-00-00006, 01

**VOLUME 4B - ROADWAY PLAN SHEETS**

| DRAWING NO.                      | DRAWING DESCRIPTIONS   |
|----------------------------------|--|
| <b>4B-1 IH-45 SEGMENT</b>        |  |
| RDY-IH1-04035                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3070+00 TO IH1 3160+00            |
| RDY-IH1-04036                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3160+00 TO IH1 3250+00            |
| RDY-IH1-04037                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3250+00 TO IH1 3340+00            |
| RDY-IH1-04038                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3340+00 TO IH1 3430+00            |
| RDY-IH1-04039                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3430+00 TO IH1 3520+00            |
| RDY-IH1-04040                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3520+00 TO IH1 3610+00            |
| RDY-IH1-04041                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3610+00 TO IH1 3700+00            |
| RDY-IH1-04042                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3700+00 TO IH1 3790+00            |
| RDY-IH1-04043                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3790+00 TO IH1 3880+00            |
| RDY-IH1-04044                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3880+00 TO IH1 3970+00            |
| RDY-IH1-04045                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 3970+00 TO IH1 4060+00            |
| RDY-IH1-04046                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 4060+00 TO IH1 4150+00            |
| RDY-IH1-04047                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 4150+00 TO IH1 4240+00            |
| RDY-IH1-04048                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH1 4240+00 TO IH1 4329+69            |
| RDY-IH2-04049                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH2 10+00 TO IH2 100+00               |
| RDY-IH2-04050                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH2 100+00 TO IH2 190+00              |
| RDY-IH2-04051                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH2 190+00 TO IH2 280+00              |
| RDY-IH2-04052                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH2 280+00 TO IH2 370+00              |
| RDY-IH2-04053                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH2 370+00 TO IH2 460+00              |
| RDY-IH2-04054                    | IH-45 SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. IH2 460+00 TO IH2 540+81              |
| <b>4B-2 NAVARRO EAST SEGMENT</b> |  |
| RDY-NE-01101                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - KEY MAP - SHEET 1 OF 2 NE 10+00 TO NE 1070+00   |
| RDY-NE-01102                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - KEY MAP - SHEET 2 OF 2 NE 1070+00 TO NE 1652+05 |
| RDY-NE-04001                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 10+00 TO NE 100+00          |
| RDY-NE-04002                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 100+00 TO NE 190+00         |
| RDY-NE-04003                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 190+00 TO NE 280+00         |
| RDY-NE-04004                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 280+00 TO NE 370+00         |
| RDY-NE-04005                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 370+00 TO NE 460+00         |
| RDY-NE-04006                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 460+00 TO NE 550+00         |
| RDY-NE-04007                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 550+00 TO NE 640+00         |
| RDY-NE-04008                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 640+00 TO NE 730+00         |
| RDY-NE-04009                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 730+00 TO NE 820+00         |
| RDY-NE-04010                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 820+00 TO NE 910+00         |
| RDY-NE-04011                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 910+00 TO NE 1000+00        |
| RDY-NE-04011A                    | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - MATCHLINE RDY-NE-04011              |
| RDY-NE-04012                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1000+00 TO NE 1090+00       |
| RDY-NE-04013                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1090+00 TO NE 1180+00       |
| RDY-NE-04014                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1180+00 TO NE 1270+00       |
| RDY-NE-04015                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1270+00 TO NE 1360+00       |
| RDY-NE-04016                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1360+00 TO NE 1450+00       |
| RDY-NE-04017                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1450+00 TO NE 1540+00       |
| RDY-NE-04018                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1540+00 TO NE 1630+00       |
| RDY-NE-04019                     | NAVARRO EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. NE 1630+00 TO NE 1652+05       |
| <b>4B-3 ELLIS EAST SEGMENT</b>   |  |
| RDY-EE-01101                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - KEY MAP - SHEET 1 OF 2 EE 9+56 TO EE 1064+00      |
| RDY-EE-01102                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - KEY MAP - SHEET 2 OF 2 EE 1064+00 TO EE 1232+15   |
| RDY-EE-04001                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 9+56 TO EE 100+00             |
| RDY-EE-04002                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 100+00 TO EE 190+00           |
| RDY-EE-04003                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 190+00 TO EE 280+00           |
| RDY-EE-04004                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 280+00 TO EE 370+00           |
| RDY-EE-04005                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 370+00 TO EE 460+00           |
| RDY-EE-04006                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 460+00 TO EE 550+00           |
| RDY-EE-04007                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 550+00 TO EE 640+00           |
| RDY-EE-04008                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 640+00 TO EE 730+00           |
| RDY-EE-04009                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 730+00 TO EE 820+00           |
| RDY-EE-04010                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 820+00 TO EE 910+00           |
| RDY-EE-04011                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 910+00 TO EE 1000+00          |
| RDY-EE-04012                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 1000+00 TO EE 1090+00         |
| RDY-EE-04013                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 1090+00 TO EE 1180+00         |
| RDY-EE-04014                     | ELLIS EAST SEGMENT - CIVIL HIGHWAY - PLAN VIEW - STA. EE 1180+00 TO EE 1232+15         |

**Volume 5A - WILDLIFE CROSSING SHEETS**

| DRAWING NO.      | DRAWING DESCRIPTIONS  |
|------------------|---|
| <b>Volume 5A</b> |   |
| WLC-DS-04001     | DS SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 1 OF 23)  |
| WLC-DS-04002     | DS SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 2 OF 23)  |
| WLC-DS-04003     | DS SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 3 OF 23)  |
| WLC-EW-04001     | EW SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 4 OF 23)  |
| WLC-EW-04002     | EW SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 5 OF 23)  |
| WLC-NW-04001     | NW SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 6 OF 23)  |
| WLC-NW-04002     | NW SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 7 OF 23)  |
| WLC-NW-04003     | NW SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 8 OF 23)  |
| WLC-WT-04001     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 9 OF 23)  |
| WLC-WT-04002     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 10 OF 23) |
| WLC-WT-04003     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 11 OF 23) |
| WLC-WT-04004     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 12 OF 23) |
| WLC-WT-04005     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 13 OF 23) |
| WLC-WT-04006     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 14 OF 23) |
| WLC-WT-04007     | WT SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 15 OF 23) |
| WLC-HN-04001     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 16 OF 23) |
| WLC-HN-04002     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 17 OF 23) |
| WLC-HN-04003     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 18 OF 23) |
| WLC-HN-04004     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 19 OF 23) |
| WLC-HN-04005     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 20 OF 23) |
| WLC-HN-04006     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 21 OF 23) |
| WLC-HN-04007     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 22 OF 23) |
| WLC-HN-04008     | HN SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 23 OF 23) |

**VOLUME 5B - WILDLIFE CROSSING SHEETS**

| DRAWING NO.      | DRAWING DESCRIPTIONS   |
|------------------|--|
| <b>Volume 5B</b> |  |
| WLC-EE-04001     | EE SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 1 OF 15)     |
| WLC-EE-04002     | EE SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 2 OF 15)     |
| WLC-NE-04001     | NE SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 3 OF 15)     |
| WLC-NE-04002     | NE SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 4 OF 15)     |
| WLC-NE-04003     | NE SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 5 OF 15)     |
| WLC-IH-04001     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 6 OF 15)  |
| WLC-IH-04002     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 7 OF 15)  |
| WLC-IH-04003     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 8 OF 15)  |
| WLC-IH-04004     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 9 OF 15)  |
| WLC-IH-04005     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 10 OF 15) |
| WLC-IH-04006     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 11 OF 15) |
| WLC-IH-04007     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 12 OF 15) |
| WLC-IH-04008     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 13 OF 15) |
| WLC-IH-04009     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 14 OF 15) |
| WLC-IH-04010     | IH-45 SEGMENT THSR - POTENTIAL WILDLIFE CROSSINGS (SHEET 15 OF 15) |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
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|                                   |
|-----------------------------------|
| DESIGNED BY<br><b>D. THOMPSON</b> |
| DRAWN BY<br><b>D. THOMPSON</b>    |
| CHECKED BY<br><b>R. BURNS</b>     |
| IN CHARGE<br><b>C. TAYLOR</b>     |
| DATE<br><b>02/25/2019</b>         |



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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING



1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

**GENERAL INDEX SHEET 5 OF 5**

|                          |                                   |
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| Scale<br><b>NO SCALE</b> | Drawing Status<br><b>FINAL</b>    |
| Job No<br><b>234180</b>  | Drawing No<br><b>GEN-00-00007</b> |
|                          | Rev<br><b>01</b>                  |



GENERAL NOTES:

- 1. THESE DRAWINGS ACCOMPANY FINAL CONCEPTUAL ENGINEERING (FCE) REPORT.
- 2. DRAWING SET INCLUDES FIVE (5) VOLUMES. AFTER RELEASE OF THE DRAFT EIS (DEIS), WHICH IDENTIFIED ALTERNATIVE A AS THE PREFERRED ALTERNATIVE. ADDITIONAL DESIGN DEVELOPMENT AND REFINEMENT OF ALTERNATIVE A WAS UNDERTAKEN TO MITIGATE IMPACTS AND TO IMPROVE CONSTRUCTABILITY. THIS REPORT ADDRESSES THE REFINED DESIGN APPROACHES AND DETAILS FOR THE SEGMENTS IN BUILD ALTERNATIVE A, FOR ALL OTHER SEGMENTS NOT A PART OF THE PREFERRED ALTERNATIVE (ELLIS EAST, NAVARRO EAST, AND IH-45 SEGMENTS), NO CHANGES TO DESIGN WAS ADVANCED OTHER THAN ALIGNMENT REVISIONS REQUIRED TO ACCOUNT FOR ALIGNMENT REVISIONS ADVANCED IN ALTERNATIVE A. TO FACILITATE COMPARISON FOR IMPACT ANALYSIS. THE APPENDICES TO THE FCE REPORT INCLUDES ALL SEGMENTS. THE DRAWING SET HAS BEEN ORGANIZED INTO VOLUMES 1A-5A AND 1B-5B, WITH THE PREFERRED ALTERNATIVE DESIGN DRAWINGS INCLUDED IN THE 1A-5A VOLUMES.
- 3. CONCEPTUAL ENGINEERING WAS DEVELOPED TO IDENTIFY PROJECT LIMIT OF DISTURBANCE (LOD), OR "PROJECT FOOTPRINT". CONCEPTUAL ENGINEERING DRAWINGS AND FCE REPORT ARE ISSUED TO PROVIDE PROJECT DEFINITION FOR ENVIRONMENTAL ANALYSES ONLY. FINAL DESIGN WOULD BE DEVELOPED TO MITIGATE ANY IMPACTS IDENTIFIED THROUGH ENVIRONMENTAL ANALYSES. NOT FOR CONSTRUCTION.
- 4. FOR STANDARD GENERAL ABBREVIATIONS, SEE DRAWING GEN-00-0009.
- 5. FOR STANDARD GENERAL SYMBOLS, SEE DRAWING GEN-00-0009.
- 6. "ORIGINAL GROUND" SHOWN ON PROFILES REFERS TO THE APPROXIMATE EXISTING GROUND LINE AT HSR CENTERLINE AS SHOWN ON PLAN AND PROFILE DRAWINGS.
- 7. ALL HORIZONTAL AND VERTICAL DISTANCES ARE IN US CUSTOMARY UNITS EXCEPT AS NOTED OTHERWISE.
- 8. GENERAL NOTES FOR PROJECT ELEMENTS INCLUDED ON GENERAL NOTES PAGES. REFER TO INDIVIDUAL DISCIPLINE DRAWINGS FOR ADDITIONAL NOTES.

BASEMAPPING NOTES:

- 1. DTM DATA SHOWN ON THE DRAWINGS WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM (TNRS) AND HOUSTON-GALVESTON AREA COUNCIL (HGAC).
  - DALLAS COUNTY LIDAR, 2009, SOURCED FROM TNRS.
  - HGAC LIDAR, 2008.
  - TNRS LIDAR, 2009-2013.
  - TNRS STRATMAP CONTOURS, 1997.
- 2. LIDAR SOURCES WERE FILTERED TO SHOW ONLY BARE EARTH, AND SUPPLEMENTED BY CONTOUR DATA WHERE LIDAR SOURCES WERE NOT AVAILABLE.
- 3. NAD 83 HORIZONTAL CONTROL DATUM WAS USED FOR HORIZONTAL COORDINATE VALUES.
- 4. NAVD 88 VERTICAL DATUM WAS USED FOR ELEVATION VALUES.
- 5. ALL DATA HAS BEEN REPROJECTED TO TEXAS STATE PLANE, SOUTH CENTRAL, CENTRAL, AND NORTH CENTRAL ZONES, US SURVEY FEET.
- 6. AERIAL IMAGERY WAS OBTAINED FROM ARCGIS ONLINE SERVICES. SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY.
- 7. THE BACKGROUND IMAGERY ON THE PLAN SHEETS MAY SHOW BUILDINGS AND OTHER INFRASTRUCTURE FEATURES THAT HAVE SUBSEQUENTLY BEEN REMOVED AND/OR DEMOLISHED, WHERE IT HAS BEEN VERIFIED THAT BUILDINGS HAVE BEEN REMOVED, DEMOLISHED, RECONFIGURED, OR CONSTRUCTED. THE AERIAL IMAGERY ON THE PLAN SHEET IS MARKED WITH HATCHING.

LOD NOTES:

- 1. THE PROJECT LOD WAS DEVELOPED TO DEFINE A CONSERVATIVE ESTIMATE OF THE POTENTIAL "PROJECT FOOTPRINT" FOR ENVIRONMENTAL ANALYSIS AND DOES NOT REPRESENT THE FINAL HSR RIGHT-OF-WAY (ROW).
- 2. LOD USED FOR EIS ANALYSIS FOOTPRINT. PROPERTY WITHIN THE LOD MAY BE RETURNED TO ADJACENT LANDOWNERS OR OTHER PRIVATE PARTIES FOLLOWING PROJECT CONSTRUCTION OR MAY BE TRANSFERRED TO ROADWAY OR UTILITY AUTHORITY AS APPROPRIATE. PROPOSED PROJECT WORKS WITHIN PRIVATE PROPERTIES WOULD BE SUBJECT TO NEGOTIATION WITH LANDOWNERS. ANY TEMPORARY OR PERMANENT USE OF LAND OWNED BY TXDOT, COUNTY, MUNICIPAL, OR OTHER PUBLIC ENTITIES WOULD REQUIRE APPROPRIATE APPROVALS.

TRACK NOTES:

- 1. THE ALIGNMENT SHOWN ON THE PLAN AND PROFILE DRAWINGS REPRESENTS THE CENTERLINE OF THE TWO-TRACK HSR MAINLINE TRACKS.
- 2. THE PROFILE SHOWN ON THE PLAN AND PROFILE DRAWINGS REPRESENTS THE TOP OF THE LOWER RAIL THROUGH HORIZONTAL CURVES AND SPIRALS FOR THE TWO-TRACK HSR SYSTEM.
- 3. THE PROPOSED HSR SYSTEM INCLUDES TWO TRACKS WITH ADDITIONAL TRACKS AT STATIONS, MAINTENANCE OF WAY FACILITIES, AND TRAINSET MAINTENANCE FACILITIES, AS SHOWN ON DRAWINGS.
- 4. MAINLINE CROSSOVERS ARE PROVIDED AT THE ENTRANCE AND EXIT OF ALL STATIONS, MAINTENANCE OF WAY (MOW) FACILITIES, AND TRAINSET MAINTENANCE FACILITIES (TMF).

PLAN AND PROFILE GENERAL NOTES:

- 1. SECTION TYPE DETAIL SHOWN ON PROFILE SHEETS REPRESENT A SIMPLIFIED SUMMARY OF THE MAJOR STRUCTURAL TYPE OF THE PROPOSED HSR. THE ACTUAL PLAN DIMENSIONS TAKE PRECEDENCE OVER THE SECTION TYPE IDENTIFIED IN PROFILE.
- 2. ALL EXISTING AND PROPOSED STRUCTURAL ELEMENTS SHOWN ARE BASED ON CONCEPTUAL ENGINEERING DESIGN AND AERIAL IMAGERY AND MAY BE REVISED BASED ON MORE ADVANCED SURVEY AND DESIGNS.
- 3. SEE SHEET GEN-00-00010 FOR A KEY TO INFORMATION SHOWN ON PLAN AND PROFILE DRAWINGS.
- 4. LIMITS OF SPECIAL TRACK WORK ARE INDICATED ON THE PLAN SHEETS. ADDITIONAL DETAILS FOR MAINTENANCE OF WAY FACILITIES AND TRAINSET MAINTENANCE FACILITIES ARE SHOWN ON THE VOLUME 3 DRAWINGS.

ROADWAY NOTES:

- 1. EXISTING ROADWAY LOCATIONS ARE APPROXIMATE BASED ON AERIAL IMAGERY BACKGROUNDS.
- 2. PROPOSED ROADWAY WORKS, INCLUDING NEW ROADWAYS, RECONFIGURATION AND REALIGNMENTS OF EXISTING ROADWAYS, AND ROADWAY REMOVALS ARE CONCEPTUAL IN NATURE AND WERE DEVELOPED TO IDENTIFY GENERAL CONFIGURATION AND LOCATION FOR ENVIRONMENTAL IMPACT ANALYSES. ROADWAY WORKS WOULD BE DETAILED DURING FINAL DESIGN AND WOULD COMPLY WITH APPLICABLE STATE, CITY, COUNTY, OR LOCAL REQUIREMENTS.
- 3. SEE SHEET GEN-00-00011 FOR A KEY TO INFORMATION SHOWN ON ROADWAY PLAN DRAWINGS.
- 4. ROADWAY GEOMETRY IS BASED ON TXDOT ROADWAY DESIGN MANUAL. ROAD DESIGN SPEEDS MATCH EXISTING POSTED SPEED LIMITS OR MATCH DESIGN SPEED DETERMINED FROM TXDOT ROADWAY FUNCTIONAL CLASSIFICATION SPEED GUIDELINES, WHICHEVER IS GREATER.
- 5. SUPERELEVATION TRANSITION LENGTHS WERE NOT DETAILED IN ROADWAY APPROACH DESIGN.
- 6. SEE DRAWINGS CVL-00-03030 TO CVL-00-03034B FOR TYPICAL ROADWAY CROSS SECTIONS.
- 7. FOR SEGMENTS HH, WT, NW, EW, AND DS, ROADWAY REMOVALS ARE SHOWN ON RAIL PLAN AND PROFILE SHEETS. FOR SEGMENTS IH, NE, AND EE, ROADWAY REMOVALS ARE NOT SHOWN ON RAIL PLAN AND PROFILE SHEETS. REFER TO ROADWAY PLAN SHEETS IN VOLUME 4 FOR SEGMENT 2B, 3B, AND 4B ROADWAY REMOVALS.
- 8. NOT ALL PRIVATE ROADS AND DRIVEWAYS ARE REPRESENTED ON THE RAIL PLAN AND PROFILE SHEETS.
- 9. THE CLEARANCE ENVELOPES SHOWN ON THE RAIL PLAN AND PROFILE SHEETS REPRESENT THE APPROXIMATE ROADWAY CLEARANCE ENVELOPE. THE BOTTOM OF THE CLEARANCE ENVELOPE REPRESENTS THE TOP OF THE ROADWAY PAVEMENT. CLEARANCE ENVELOPE DOES NOT INCLUDE ROADWAY STRUCTURAL ELEMENTS.
- 10. ROADWAY ELEVATIONS FOR ROADWAY OVER RAILWAY CROSSINGS DO NOT REPRESENT THE PROPOSED ROADWAY ELEVATION, BUT RATHER THE MINIMUM HEIGHT REQUIRED FOR CLEARANCES, INCLUDING ALLOWANCES FOR ROADWAY STRUCTURAL ELEMENTS. SEE FCE REPORT FOR ADDITIONAL INFORMATION.
- 11. ROADWAY TYPICAL SECTIONS ACCOUNT FOR THE NECESSARY SPACE TO CONSTRUCT TEMPORARY ROADWAYS DURING CONSTRUCTION. CLOSE COORDINATION WITH ROADWAY AUTHORITIES, COMMUNITIES, AND EMERGENCY RESPONSE ENTITIES WOULD BE UNDERTAKEN DURING FINAL DESIGN AND CONSTRUCTION TO ENSURE ACCESS DURING THE CONSTRUCTION PHASE.
- 12. USE OF TXDOT RIGHT-OF-WAY FOR PERMANENT IMPROVEMENTS WILL REQUIRE THE APPROPRIATE APPROVAL FROM TXDOT.
- 13. PLANNED ROADS, SUCH AS MTFP ROADS IN HOUSTON, ARE SHOWN IN PROFILES IN VOLUME 2, BUT ARE NOT SHOWN IN PLAN IN VOLUME 2. AS THESE ROADS ARE PLANNED AND NOT EXISTING, THE AERIAL IMAGERY BACKGROUNDS DO NOT SHOW THESE ROADS. PLANNED ROADS ARE SHOWN IN THE FCE REPORT APPENDIX B: ROAD SEPARATION DATABASE.

TYPICAL SECTIONS NOTES:

- 1. SECTIONS ILLUSTRATE TYPICAL REQUIREMENTS TO GUIDE CONCEPTUAL ENGINEERING DESIGN DEVELOPMENT. LOCATION SPECIFIC CONDITIONS WOULD ESTABLISH REQUIREMENTS AT EACH LOCATION AND OVERALL WIDTH OF LIMIT OF DISTURBANCE WOULD VARY AS IDENTIFIED ON DIMENSION LINES AND IN NOTES.
- 2. OFFSET BETWEEN INFRASTRUCTURE ELEMENTS SUCH AS DISTANCE BETWEEN EMBANKMENT, FENCES, DRAINAGE SWALE, ACCESS ROAD, ETC. WOULD VARY BASED ON LOCAL REQUIREMENTS AND SITE SPECIFIC CONDITIONS.
- 3. TYPICAL ROADWAY DRAINAGE SYSTEM PROVIDED AS SHOWN IN TYPICAL SECTIONS. LOCATION SPECIFIC CONFIGURATION AND SIZE WOULD BE ADVANCED DURING MORE DETAILED DESIGN.
- 4. LOCATION SPECIFIC CONDITIONS WOULD DICTATE FENCING REQUIREMENTS.
- 5. EMBANKMENT HEIGHTS AND CUT DEPTHS VARY WITH SURROUNDING GRADE AND RAIL PROFILE ELEVATION.
- 6. CRASH BARRIERS NOT SHOWN. LOCATION SPECIFIC CONDITIONS WILL DICTATE CRASH BARRIER REQUIREMENTS TO ENSURE SAFETY AND TO SATISFY APPLICABLE REGULATORY REQUIREMENTS.
- 7. SUBSURFACE GROUND IMPROVEMENTS ARE NOT SHOWN AND WILL BE BASED ON SITE SPECIFIC REQUIREMENTS.
- 8. RAIL HEIGHT VARIES WITH SURROUNDING GRADE AND RAIL PROFILE. THE BOTTOM OF SUBBALLAST SHALL BE NO LESS THAN 2FT ABOVE 100 YEAR FLOODPLAIN.

UTILITIES NOTES:

- 1. REFER TO THE FCE REPORT FOR A LIST OF MAJOR UTILITY CROSSINGS, THEIR ASSUMED SIZE, AND ASSOCIATED LOCATIONS ALONG THE ALIGNMENT.
- 2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE AND ARE BASED ON INFORMATION RECEIVED, AS DOCUMENTED IN THE FINAL CONCEPTUAL ENGINEERING REPORT.
- 3. NO FIELD SURVEYS HAVE BEEN CONDUCTED TO LOCATE AND VERIFY UTILITY LOCATIONS.
- 4. NOT ALL EXISTING UNDERGROUND UTILITIES HAVE BEEN SHOWN. REFER TO THE FCE REPORT FOR MAJOR UTILITIES INCLUDED IN PROJECT MAPPING.
- 5. LOD NOT SHOWN FOR UTILITIES THAT ARE NOT IMPACTED BY THE ALIGNMENT. ONLY MAJOR UTILITIES THAT ARE PROTECTED, RELOCATED OR ELEVATED ARE SHOWN ON THE PLAN AND PROFILE VIEW. REFER TO DRAWING NO. CUT-00-0100 FOR TYPICAL UTILITY CROSSING DETAILS. UTILITY LODS FOR FUTURE PROPOSED CONNECTIONS TO TPSS FACILITIES ARE SHOWN.
- 6. FOR PARALLEL TRANSMISSION LINE CROSSINGS OVER NEW ELEVATED ROADWAYS, A LOD IS SHOWN ON THE PLAN ONLY. REFER TO DRAWING NO. CUT-00-0100 FOR TYPICAL UTILITY CROSSING DETAILS.
- 7. MANY UTILITY CONFLICTS ALONG THE HEMPSTEAD ROAD CORRIDOR IN HOUSTON WOULD BE RESOLVED DURING FINAL DESIGN. A CONTINUOUS LOD IS SHOWN ON THE DRAWINGS TO REPRESENT THAT UTILITIES WOULD BE RELOCATED ON ONE OR BOTH SIDES OF THE ROADWAY AS REQUIRED. ALL WORK WOULD BE COORDINATED WITH UTILITY PROVIDERS TO MINIMIZE IMPACTS AND COORDINATE WITH OTHER PLANNED UTILITY PROJECTS ALONG CORRIDOR.
- 8. FOR UTILITY WORK REQUIRED BY UTILITY COMPANIES, EACH UTILITY OWNER WOULD DEVELOP THE DESIGN IN ACCORDANCE WITH APPLICABLE DESIGN STANDARDS AND REGULATORY AGENCY REVIEW PROCESSES.

DRAINAGE NOTES:

- 1. PROPOSED DETENTION BASIN LOCATIONS AND DIMENSIONS SHOWN ARE APPROXIMATE AND ARE INTENDED FOR PRELIMINARY PLANNING AND ENVIRONMENTAL IMPACT ANALYSIS PURPOSES ONLY. SITE SPECIFIC CONFIGURATIONS WOULD BE DEVELOPED DURING FINAL DESIGN IN ACCORDANCE WITH APPLICABLE REQUIREMENTS.
- 2. EXISTING CULVERTS ARE NOT SHOWN.
- 3. PROPOSED TRACK AND ROADWAY STORMWATER DRAINAGE WOULD BE DEVELOPED DURING FINAL DESIGN IN ACCORDANCE WITH APPLICABLE REQUIREMENTS. REFER TO TYPICAL SECTION DRAWINGS FOR PROPOSED CONFIGURATIONS.
- 4. EXISTING STORMWATER FACILITIES ARE NOT SHOWN.
- 5. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) WATER QUALITY CRITERIA WOULD BE MET FOR STORMWATER RUNOFF AND PROTECTION OF EXISTING WATER RESOURCES.
- 6. CONSTRUCTION OF THE RAIL MAY REQUIRE THE RECONFIGURATION OF PONDS OR STOCK TANKS IMMEDIATELY ADJACENT TO THE RAIL CORRIDOR. IN CASES WHERE THE CURRENT DESIGN NECESSITATES A FULL RELOCATION OF THE POND, ALLOWANCES HAVE BEEN MADE WITHIN THE LOD. IN CASES WHERE THE FULL RELOCATION OF THE POND IS NOT REQUIRED UNDER THE CURRENT DESIGN, ADDITIONAL COORDINATION WITH LANDOWNER WILL BE UNDERTAKEN TO DEVELOP IMPROVEMENTS CONSIDERING LANDOWNER PREFERENCES.

STRUCTURES GENERAL NOTES:

- 1. TYPICAL SECTIONS WERE DEVELOPED TO IDENTIFY GENERAL ARRANGEMENTS AND ALLOWANCES FOR STRUCTURAL ELEMENTS. TYPICAL SECTIONS WERE USED AS THE BASIS FOR DEVELOPMENT OF LOD FOR ENVIRONMENTAL ANALYSIS.
- 2. APPROXIMATE HSR VIADUCT AND BRIDGE STRUCTURE LIMITS AND DEPTHS ARE SHOWN ON THE PROFILES TO SUPPORT ENVIRONMENTAL IMPACT ANALYSIS. LIMITS OF STRUCTURES AND EMBANKMENTS WOULD BE REFINED DURING FINAL DESIGN.
- 3. PLAN AND PROFILE DRAWINGS DO NOT SHOW LIMITS OF STRUCTURES IN PLAN VIEW. SITE SPECIFIC STRUCTURAL DESIGN WOULD BE DEVELOPED DURING FINAL ENGINEERING IN ACCORDANCE WITH APPLICABLE REQUIREMENTS. DESIGN OF FOUNDATIONS, ABUTMENTS, PIERS AND OTHER STRUCTURES WOULD BE DEVELOPED TO MITIGATE ANY IMPACTS IDENTIFIED THROUGH ENVIRONMENTAL ANALYSIS.
- 4. HSR PROFILE WAS DEVELOPED TO PROVIDE A MINIMUM 3FT VERTICAL CLEAR DISTANCE FROM ESTIMATED 100 YEAR FLOOD LEVEL TO BRIDGE SOFFIT FOR RIVER AND FLOODPLAIN CROSSINGS. FINAL DESIGN WOULD BE DEVELOPED TO MEET OR EXCEED THIS REQUIREMENT.
- 5. SPECIAL STRUCTURES WOULD BE REQUIRED TO MITIGATE IMPACTS OR ADDRESS UNIQUE SITE SPECIFIC ISSUES SUCH AS LONG SPANS, CROSSOVER STRUCTURES, AND STRADDLE BENTS TO AVOID OR MITIGATE IMPACTS. THE CONSTRUCTABILITY REPORT IDENTIFIES SPECIAL STRUCTURE LOCATIONS. PLAN AND PROFILE DRAWINGS IDENTIFY ADDITIONAL LOD EXPECTED FOR CONSTRUCTION STAGING AND WORKING AREAS FOR SPECIAL STRUCTURES.

SYSTEMS GENERAL NOTES:

- 1. SYSTEMS SCHEMATICS, SHOWN ON SHEETS SYS-00-02000 THROUGH SYS-00-02006, SHOW LOCATIONS OF SYSTEMS FACILITIES THAT HAVE BEEN INCLUDED FOR EACH END-TO-END ALTERNATIVE.
- 2. AREA FOR SYSTEMS FACILITY SITES HAVE BEEN INCLUDED WITHIN THE PROJECT LOD. THESE AREAS ARE GENERICALLY CALLED OUT AS "RAIL SYSTEMS SITES" ON THE PLAN AND PROFILE SHEETS. REFER TO FCE REPORT TO DETERMINE THE SPECIFIC FACILITY TYPE AT EACH INDIVIDUAL LOCATION.
- 3. TYPICAL LAYOUT PLANS FOR EACH OF THE SYSTEMS FACILITIES ARE INCLUDED IN SHEETS SYS-00-01000 THROUGH SYS-00-01006.
- 4. LOD DEVELOPED FOR ENVIRONMENTAL IMPACT ANALYSIS OF SYSTEMS SITES INCLUDED SPACE FOR A DRIVEWAY AND SPACE TO PARK A LIMITED NUMBER OF MAINTENANCE VEHICLES.
- 5. SYSTEMS BUILDINGS WOULD BE DETAILED DURING FINAL DESIGN TO CONSIDER SITE SPECIFIC CONDITIONS, BE CONTEXT SENSITIVE, AND MINIMIZE VISUAL IMPACT. THE RADIO MAST AT COMMUNICATION FACILITIES WOULD BE APPROXIMATELY 50FT (15M) ABOVE THE TOP OF RAIL ELEVATION.
- 6. TPSS WOULD BE CONNECTED TO THE NEAREST 138KV TRANSMISSION LINES DESIGNED BY UTILITY PROVIDER AND SUBJECT TO ENVIRONMENTAL REVIEW.

FACILITY NOTES:

- 1. PROPOSED HSR FACILITIES WOULD INCLUDE STATIONS AND ASSOCIATED PARKING GARAGES, MAINTENANCE OF WAY (MOW) FACILITIES, TRAINSET MAINTENANCE FACILITIES (TMF), AND RAILWAY SYSTEMS SITES, INCLUDING TRACTION POWER SUPPLY FACILITIES, SIGNAL HOUSES, AND COMMUNICATIONS HOUSES. LOCATIONS, LIMITS OF DISTURBANCE, AND AREAS SHOWN FOR THE VARIOUS PROPOSED FACILITIES ARE FOR PRELIMINARY PLANNING PURPOSES ONLY.
- 2. ALL FACILITIES WOULD BE POWERED FROM THE LOCAL UTILITY GRID.
- 3. ACCESS, SECURITY, AND UTILITY PROVISION REQUIREMENTS FOR ALL FACILITIES WOULD BE DETAILED DURING FINAL DESIGN.

CONSTRUCTION CONSIDERATION NOTES:

- 1. CONSTRUCTION REQUIREMENTS WERE CONSIDERED DURING DEVELOPMENT OF THE CONCEPTUAL ENGINEERING AND ARE DOCUMENTED IN THE PROJECT CONSTRUCTABILITY REPORT.
- 2. TEMPORARY CONSTRUCTION AREAS REQUIRED FOR CONSTRUCTION ACCESS, CONSTRUCTION STAGING, AND PRECASTING FACILITIES WERE IDENTIFIED DURING DEVELOPMENT OF THE CONCEPTUAL ENGINEERING. CONSTRUCTION STAGING AREAS AND PRECAST FACILITIES ARE INCLUDED IN THE PROJECT LOD.
- 3. SPECIAL STRUCTURES REQUIRED TO MITIGATE IMPACTS OR ADDRESS UNIQUE SITE SPECIFIC ISSUES SUCH AS LONG SPANS, CROSSOVER STRUCTURES, AND STRADDLE BENTS ARE IDENTIFIED IN THE CONSTRUCTABILITY REPORT.
- 4. MEASURES REQUIRED TO MITIGATE NOISE, TRAFFIC, AND OTHER ENVIRONMENTAL IMPACTS WOULD BE IDENTIFIED THROUGH THE ENVIRONMENTAL ANALYSES. MORE DETAILED DESIGN INCLUDING DEVELOPMENT OF MAINTENANCE AND PROTECTION OF TRAFFIC AND OTHER CONSTRUCTION SPECIFIC PLANS AND PROCEDURES WOULD BE REQUIRED TO SECURE APPLICABLE PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS.

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| DESIGNED BY<br><b>D. THOMPSON</b> |
| DRAWN BY<br><b>D. THOMPSON</b>    |
| CHECKED BY<br><b>R. BURNS</b>     |
| IN CHARGE<br><b>C. TAYLOR</b>     |
| DATE<br><b>02/25/2019</b>         |



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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING



1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

**GENERAL NOTES**

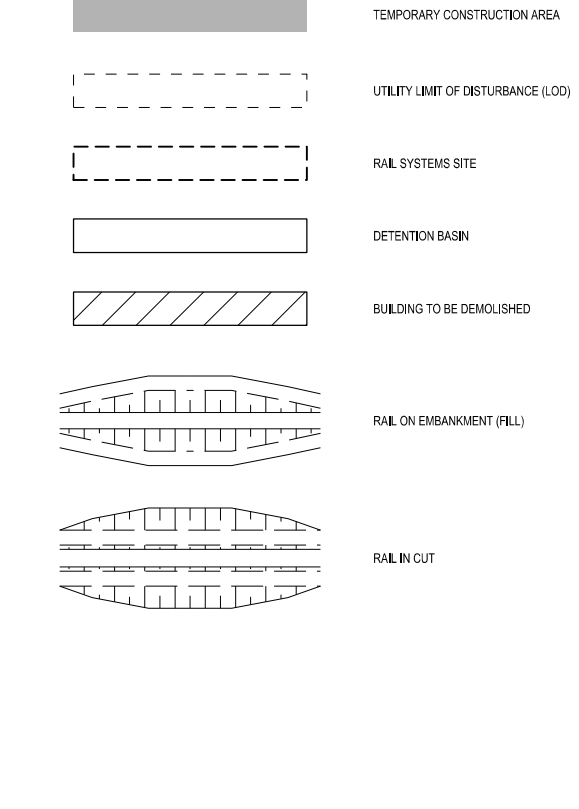
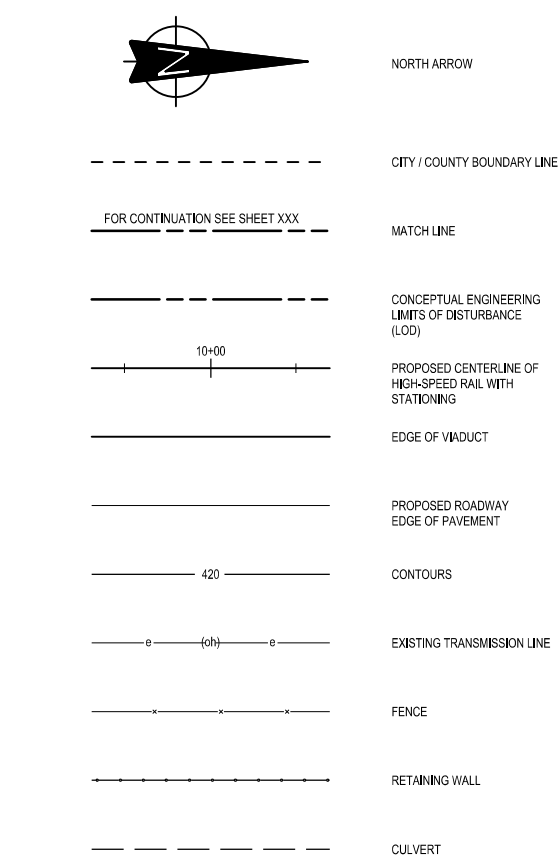
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| Scale<br><b>NO SCALE</b> | Drawing Status<br><b>FINAL</b>    |                  |
| Job No<br><b>234180</b>  | Drawing No<br><b>GEN-00-00008</b> | Rev<br><b>01</b> |

**ABBREVIATIONS**

|            |   |         |   |
|------------|---|---------|---|
| ALT        | ALTERNATE ALIGNMENT                                   | SC      | SPIRAL CURVE                              |
| APPROX     | APPROXIMATE   | SH      | STATE HIGHWAY                             |
| ATP        | AUTOTRANSFORMER POST                                  | SO      | SIDING OFF                                |
| AVE        | AVENUE  | SP      | SECTIONING POST                           |
| BLVD       | BOULEVARD   | SSH     | SUB-SIGNAL HOUSE                          |
| BNSF       | BURLINGTON NORTH SANTE FE RAILROAD                    | SSP     | SUB-SECTIONING POST                       |
| BOT        | BOTTOM  | ST      | STREET, SPIRAL TO TANGENT                 |
| CH         | COMMUNICATION HOUSE                                   | STA     | STATION                                   |
| CO RD      | COUNTY ROAD   | STD     | STANDARD                                  |
| CL         | CENTERLINE  | SYM     | SYMMETRICAL                               |
| C          | CENTERLINE  | TBD     | TO BE DETERMINED                          |
| CLSM       | CONTROLLED LOW STRENGTH MATERIAL                      | TCEQ    | TEXAS COMMISSION ON ENVIRONMENTAL QUALITY |
| CO         | COUNTY  | TEMP    | TEMPORARY                                 |
| CR         | COUNTY ROAD   | THFN    | TEXAS HIGHWAY FREIGHT NETWORK             |
| CS         | CURVE TO SPIRAL                                       | TMF     | TRAINSET MAINTENANCE FACILITY             |
| CVL        | CIVIL   | TPSS    | TRACTION POWER SUBSTATION                 |
| DIA        | DIAMETER  | TS      | TANGENT SPIRAL                            |
| DIST       | DISTANCE, DISTRICT                                    | TYP     | TYPICAL                                   |
| DR         | DRIVE   | TOR     | TOP OF RAIL                               |
| DRG        | DRAWING   | US      | UNITED STATES, UNITED STATES HIGHWAY      |
| DS         | DALLAS SEGMENT  | UPRR    | UNION PACIFIC RAILROAD                    |
| DSN        | DALLAS SEGMENT NORTH                                  | VAR     | VARIABLE                                  |
| DSS        | DALLAS SEGMENT SOUTH                                  | VERT, V | VERTICAL                                  |
| DT         | DALLAS TERMINUS SEGMENT                               | WB      | WESTBOUND                                 |
| DWY        | DRIVEWAY  | WT      | WEST OF TEAGUE                            |
| Ea         | ACTUAL SUPERELEVATION                                 | XING    | CROSSING                                  |
| EE         | ELLIS EAST SEGMENT                                    | YR      | YEAR                                      |
| ELECT      | ELECTRIC  |         |   |
| ELEV       | ELEVATION   |         |   |
| EMB        | EMBANKMENT  |         |   |
| ENGR       | ENGINEER  |         |   |
| EPA        | ENVIRONMENTAL PROTECTION AGENCY                       |         |   |
| ERMISA     | EMERGENCY RESPONSE AND MAINTENANCE STAGING AREA       |         |   |
| Eu         | UNBALANCED SUPERELEVATION                             |         |   |
| EW         | ELLIS WEST SEGMENT                                    |         |   |
| EXIST, EX. | EXISTING  |         |   |
| EXT        | EXTERIOR  |         |   |
| FDN        | FOUNDATION  |         |   |
| FEMA       | FEDERAL EMERGENCY MANAGEMENT AGENCY                   |         |   |
| FG         | FINISHED GRADE  |         |   |
| FIG        | FIGURE  |         |   |
| FL         | FLOW LINE   |         |   |
| FM         | FARM TO MARKET ROAD                                   |         |   |
| FRS        | FREIGHT RAIL SIDING                                   |         |   |
| FTG        | FOOTING   |         |   |
| FWY        | FREEWAY   |         |   |
| G          | GRADIENT  |         |   |
| GEN        | GENERAL   |         |   |
| H          | HEIGHT, HIGHWAY BRIDGE                                |         |   |
| HN         | HOUSTON SEGMENT                                       |         |   |
| HNN        | HOUSTON SEGMENT NORTH                                 |         |   |
| HNS        | HOUSTON SEGMENT SOUTH                                 |         |   |
| HORIZ, H   | HORIZONTAL  |         |   |
| HRW        | HIGHWAY RETAINING WALL                                |         |   |
| HSR        | HIGH SPEED RAIL                                       |         |   |
| HT         | HOUSTON TERMINUS SEGMENT                              |         |   |
| HWY        | HIGHWAY   |         |   |
| IH         | INTERSTATE HIGHWAY                                    |         |   |
| ISH        | INTERMEDIATE SIGNAL HOUSE                             |         |   |
| JRC        | CENTRAL JAPAN RAILWAY COMPANY                         |         |   |
| KV         | KILOVOLT  |         |   |
| L          | LENGTH  |         |   |
| LN         | LANE  |         |   |
| LOD        | LIMITS OF DISTURBANCE                                 |         |   |
| LVC        | LENGTH OF VERTICAL CURVE                              |         |   |
| MAINT      | MAINTENANCE   |         |   |
| MAX        | MAXIMUM   |         |   |
| MOW        | MAINTENANCE-OF-WAY                                    |         |   |
| MIN        | MINIMUM   |         |   |
| MISC       | MISCELLANEOUS   |         |   |
| MPH        | MILES PER HOUR  |         |   |
| MSH        | MAIN SIGNAL HOUSE                                     |         |   |
| MTFP       | (CITY OF HOUSTON) MAJOR THOROUGHFARE AND FREEWAY PLAN |         |   |
| NB         | NORTHBOUND  |         |   |
| NE         | NAVARRO EAST SEGMENT                                  |         |   |
| NED        | NATIONAL ELEVATION DATASET                            |         |   |
| NHD        | NATIONAL HYDROGRAPHY DATASET                          |         |   |
| NLCD       | NATIONAL LAND COVER DATASET                           |         |   |
| NO         | NUMBER  |         |   |
| NTS        | NOT TO SCALE  |         |   |
| N/A        | NOT APPLICABLE  |         |   |
| NW         | NAVARRO WEST SEGMENT, NOISE WALL                      |         |   |
| NWI        | NATIONAL WETLANDS INVENTORY                           |         |   |
| NWIH       | PORTION OF NAVARRO WEST ASSOCIATED WITH IH-45 SEGMENT |         |   |
| OCS        | OVERHEAD CATENARY SYSTEM                              |         |   |
| OD         | OUTSIDE DIAMETER                                      |         |   |
| OG         | ORIGINAL GRADE  |         |   |
| OH         | OVERHEAD  |         |   |
| OPP        | OPPOSITE  |         |   |
| PKWY       | PARKWAY   |         |   |
| POB        | POINT OF BEGINNING                                    |         |   |
| POE        | POINT OF END  |         |   |
| PVMT       | PAVEMENT  |         |   |
| PVC        | POINT VERTICAL CURVATURE                              |         |   |
| PVI        | POINT VERTICAL INTERSECTION                           |         |   |
| PVT        | POINT VERTICAL TANGENT                                |         |   |
| R          | RADIUS, RAIL BRIDGE                                   |         |   |
| RD         | ROAD  |         |   |
| RDWY       | ROADWAY   |         |   |
| RM         | RANCH TO MARKET ROAD                                  |         |   |
| ROW        | RIGHT OF WAY  |         |   |
| RR, R/R    | RAILROAD  |         |   |
| RTE        | ROUTE   |         |   |
| RWY        | RAILWAY   |         |   |

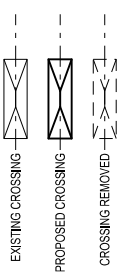
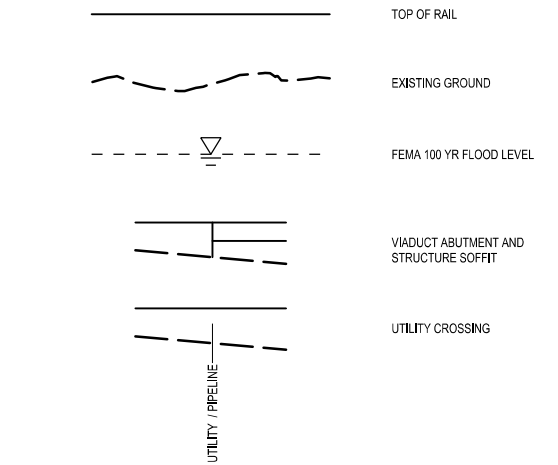
**LEGEND**

**PLAN**



NOTE:  
1. FOR ADDITIONAL DETAIL REGARDING INFORMATION SHOWN ON DRAWINGS, SEE RAIL ANNOTATION TO CLARIFY DESIGN INTENT, DRAWING GEN-00-00010. FOR SEGMENTS IH, NE, AND EE, SEE ROAD ANNOTATION TO CLARIFY DESIGN INTENT, DRAWING GEN-00-00011.

**PROFILE**



|             |             |
|-------------|-------------|
| DESIGNED BY | D. THOMPSON |
| DRAWN BY    | D. THOMPSON |
| CHECKED BY  | R. BURNS    |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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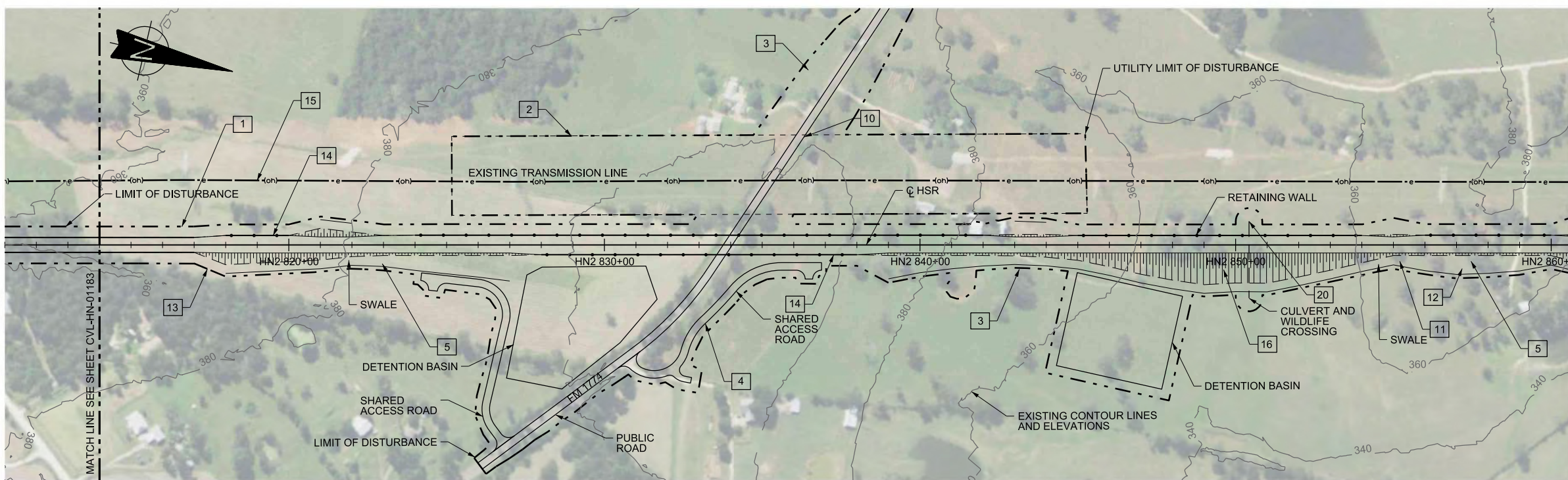
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freesse.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

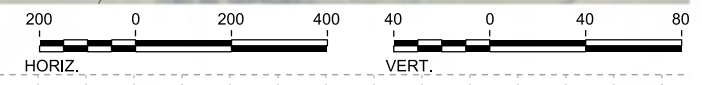


Drawing Title  
**GENERAL ABBREVIATIONS AND LEGEND**

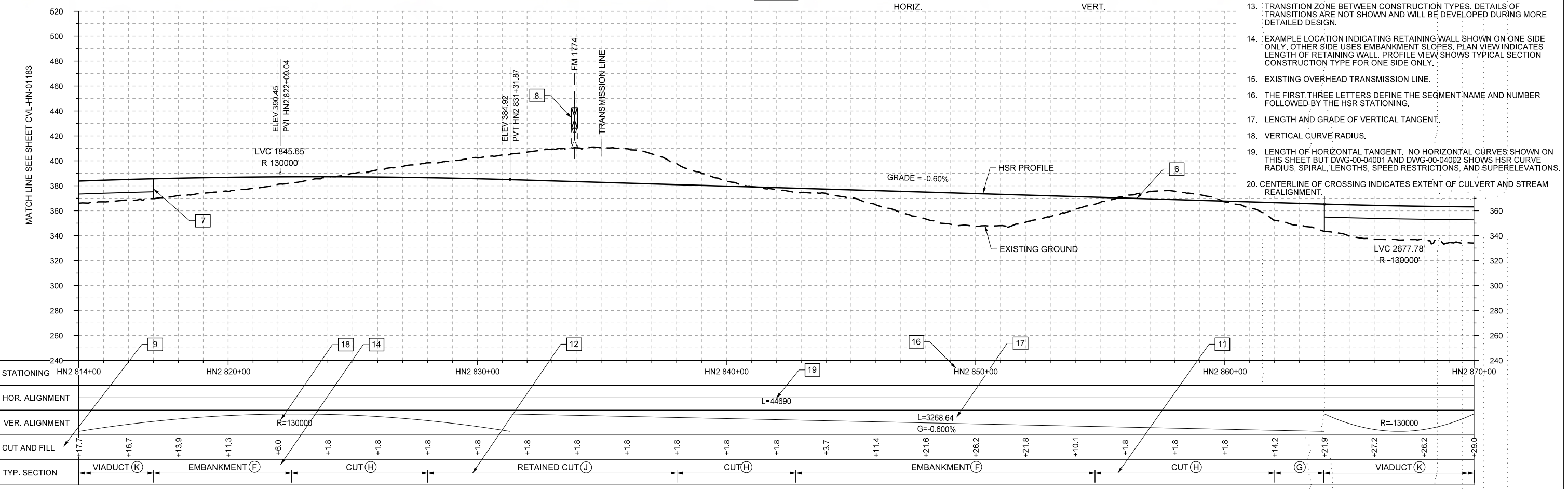
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| Scale          | NO SCALE     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | GEN-00-00009 |
| Rev            | 01           |



PLAN



- NOTES:
- LIMIT OF DISTURBANCE (LOD) FOR THE PROJECT. LOD VARIES BASED ON IMPACT AT EACH LOCATION. LOD USED FOR ENVIRONMENTAL ANALYSIS.
  - UTILITY LIMIT OF DISTURBANCE. TRANSMISSION LINE TO BE RAISED AS NECESSARY TO SUIT THE GRADE SEPARATION OF THE ROADWAY. REFER TO UTILITY TYPICAL DETAILS.
  - LOD IS OFFSET FROM THE EDGE OF PROPOSED ROADWAY TO ACCOMMODATE SIDE SLOPES ASSOCIATED WITH THE GRADE SEPARATION OF THE ROADWAY AND ACCESS ROAD.
  - DETAILS ON THE TYPE AND WIDTH OF THE ACCESS ROAD ARE SHOWN IN TYPICAL SECTIONS IN VOLUME 1.
  - SWALE EXTENTS SHOWN ON RAIL PLAN SHEETS ARE ONLY GENERATED BY COMPUTER MODEL FOR EMBANKMENT CONSTRUCTION TYPE AND WOULD EXTEND BEYOND THE LIMITS SHOWN. FINAL EXTENTS AND ARRANGEMENTS OF SWALES WOULD BE DEVELOPED DURING FINAL DESIGN AND BE BASED ON SITE SPECIFIC CONDITIONS AND REQUIREMENTS. LOCATION AND CONFIGURATION OF SWALES FOR OTHER CONSTRUCTION TYPES ARE SHOWN ON THE TYPICAL SECTIONS.
  - PROFILE OF THE HSR ALIGNMENT AT TOP OF RAIL.
  - START, END, AND APPROXIMATE UNDERSIDE OF VIADUCT STRUCTURES. TYPICAL STRUCTURE DEPTH SHOWN.
  - CLEARANCE BOX SHOWING 16'-6" FROM EXISTING ROADWAY ALIGNMENT. CLEARANCE BOX SHOWS APPROXIMATE SPACE OCCUPIED BY EXISTING OR PROPOSED ROADWAYS OR FREIGHT RAIL LINES. ACTUAL CLEARANCE REQUIRED VARIES BASED ON ROAD OR RAIL TYPE. FOR DETAILS ON REQUIRED CLEARANCE SEE FCE REPORT.
  - CUT AND FILL VALUES SHOW HEIGHT OF HSR PROFILE AT THE TOP OF RAIL ELEVATION RELATIVE TO GROUND. CUT AND FILL IS CUSTOMARY NOMENCLATURE. HOWEVER VALUES ARE NOT INTENDED TO PROVIDE DEPTHS OF EXCAVATIONS OR HEIGHTS OF EARTHWORKS. WHERE TOP OF RAIL IS WITHIN 6 FEET OF EXISTING GROUND A CUT SECTION MAY BE REQUIRED TO ACCOMMODATE DEPTH OF TRACK STRUCTURE AND DRAINAGE. LIMITS WILL VARY BY LOCATION AND SITE SPECIFIC TOPOGRAPHY. TYPICAL SECTIONS IN VOLUME 1 ILLUSTRATE RELATIONSHIP BETWEEN TOP OF RAIL LEVEL AND TRACK STRUCTURE.
  - REALIGNED OR REPROFILED ROADWAY. FULL EXTENTS OF ROAD REALIGNMENT SHOWN ON ROADWAY SHEETS IN VOLUME 2.
  - EXTENTS OF RAIL EMBANKMENT SLOPES REFER TO SECTIONS.
  - EXTENTS OF CUT SLOPES REFER TO SECTIONS.
  - TRANSITION ZONE BETWEEN CONSTRUCTION TYPES. DETAILS OF TRANSITIONS ARE NOT SHOWN AND WILL BE DEVELOPED DURING MORE DETAILED DESIGN.
  - EXAMPLE LOCATION INDICATING RETAINING WALL SHOWN ON ONE SIDE ONLY. OTHER SIDE USES EMBANKMENT SLOPES. PLAN VIEW INDICATES LENGTH OF RETAINING WALL. PROFILE VIEW SHOWS TYPICAL SECTION CONSTRUCTION TYPE FOR ONE SIDE ONLY.
  - EXISTING OVERHEAD TRANSMISSION LINE.
  - THE FIRST THREE LETTERS DEFINE THE SEGMENT NAME AND NUMBER FOLLOWED BY THE HSR STATIONING.
  - LENGTH AND GRADE OF VERTICAL TANGENT.
  - VERTICAL CURVE RADIUS.
  - LENGTH OF HORIZONTAL TANGENT. NO HORIZONTAL CURVES SHOWN ON THIS SHEET BUT DWG-00-04001 AND DWG-00-04002 SHOWS HSR CURVE RADIUS, SPIRAL, LENGTHS, SPEED RESTRICTIONS, AND SUPERELEVATIONS.
  - CENTERLINE OF CROSSING INDICATES EXTENT OF CULVERT AND STREAM REALIGNMENT.



PROFILE

|                                   |
|-----------------------------------|
| DESIGNED BY<br><b>J. ENRIQUEZ</b> |
| DRAWN BY<br><b>P. TONKIN</b>      |
| CHECKED BY<br><b>R. BURNS</b>     |
| IN CHARGE<br><b>C. TAYLOR</b>     |
| DATE<br><b>02/25/2019</b>         |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**GENERAL**

**RAIL ANNOTATION TO CLARIFY DESIGN INTENT**

Scale  
**AS SHOWN**

Drawing Status  
**FINAL**

|                         |                                   |                  |
|-------------------------|-----------------------------------|------------------|
| Job No<br><b>234180</b> | Drawing No<br><b>GEN-00-00010</b> | Rev<br><b>01</b> |
|-------------------------|-----------------------------------|------------------|

# VOLUME 2B

## RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS (SEGMENTS IH, NE, EE)

**NOTE:**

AFTER RELEASE OF THE DRAFT EIS (DEIS), WHICH IDENTIFIED ALTERNATIVE A AS THE PREFERRED ALTERNATIVE, ADDITIONAL DESIGN DEVELOPMENT AND REFINEMENT OF ALTERNATIVE A WAS UNDERTAKEN TO MITIGATE IMPACTS AND TO IMPROVE CONSTRUCTABILITY. THIS REPORT ADDRESSES THE REFINED DESIGN APPROACHES AND DETAILS FOR THE SEGMENTS IN BUILD ALTERNATIVE A. FOR ALL OTHER SEGMENTS NOT A PART OF THE PREFERRED ALTERNATIVE (ELLIS EAST, NAVARRO EAST, AND IH-45 SEGMENTS), NO CHANGES TO DESIGN WERE ADVANCED OTHER THAN ALIGNMENT REVISIONS REQUIRED TO ACCOUNT FOR ALIGNMENT REVISIONS ADVANCED IN ALTERNATIVE A. TO FACILITATE COMPARISON FOR IMPACT ANALYSIS, THE APPENDICES TO THE FCE REPORT INCLUDES ALL SEGMENTS. THE DRAWING SET HAS BEEN ORGANIZED INTO VOLUMES 1A-5A AND 1B-5B, WITH THE PREFERRED ALTERNATIVE DESIGN DRAWINGS INCLUDED IN THE 1A-5A VOLUMES.

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DESIGNED BY  
**K. SEYMOUR**

DRAWN BY  
**D. THOMPSON**

CHECKED BY  
**R. BURNS**

IN CHARGE  
**C. TAYLOR**

DATE  
**2/25/2019**

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING



**TEXAS CENTRAL**

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**GENERAL**

|                                |                                  |                  |
|--------------------------------|----------------------------------|------------------|
| Scale<br><b>NO SCALE</b>       |                                  |                  |
| Drawing Status<br><b>FINAL</b> |                                  |                  |
| Job No<br><b>234180</b>        | Drawing No<br><b>GEN-00-0000</b> | Rev<br><b>01</b> |

# 2B-2

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# NAVARRO EAST SEGMENT

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DESIGNED BY  
**K. SEYMOUR**

DRAWN BY  
**D. THOMPSON**

CHECKED BY  
**R. BURNS**

IN CHARGE  
**C. TAYLOR**

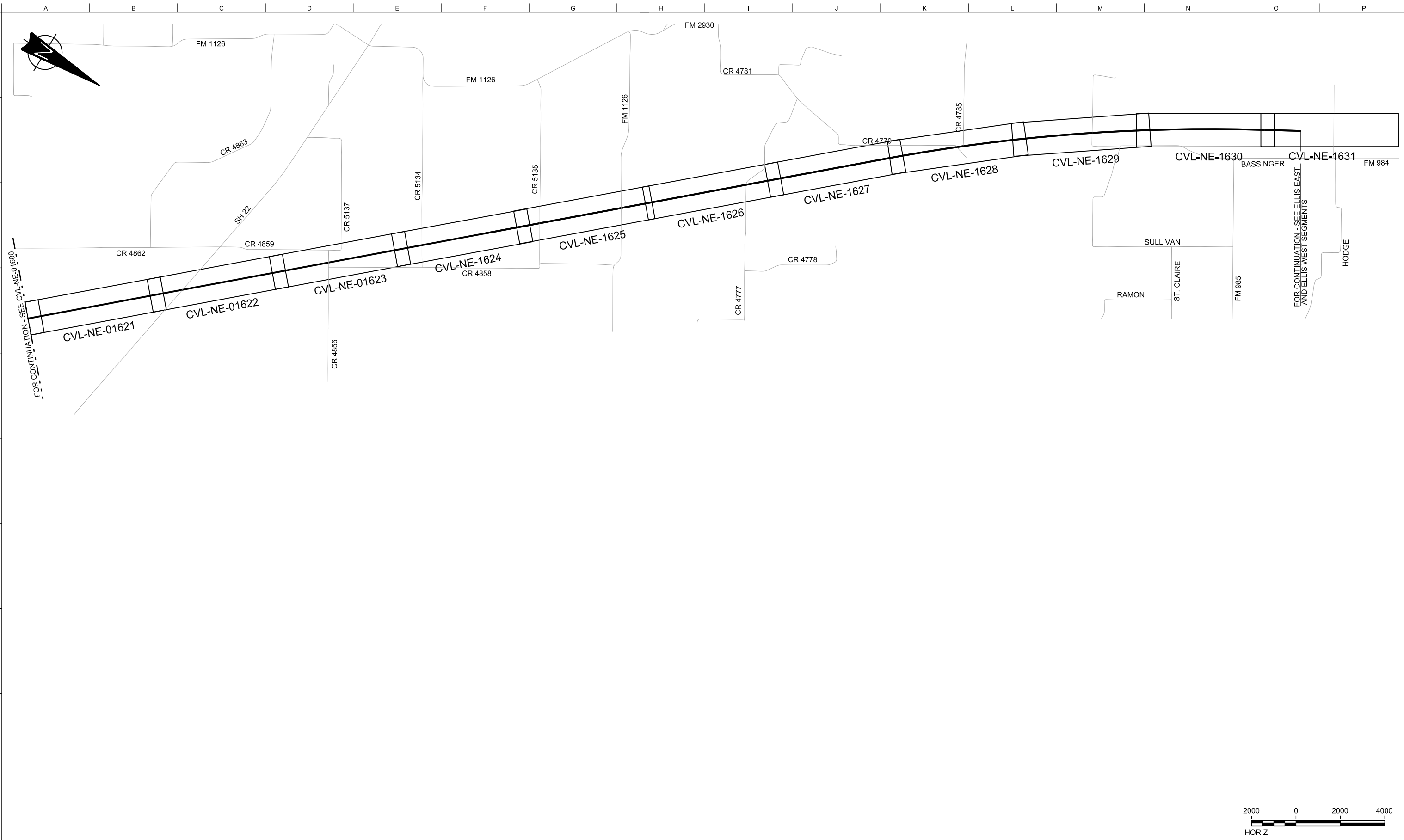
DATE  
**2/25/2019**



Drawing Title  
**GENERAL**

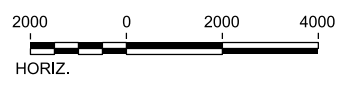
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| Job No<br><b>234180</b>        | Drawing No<br><b>GEN-00-0000</b> | Rev<br><b>01</b> |





FOR CONTINUATION - SEE CVL-NE-01600

FOR CONTINUATION - SEE ELLIS EAST AND ELLIS WEST SEGMENTS



| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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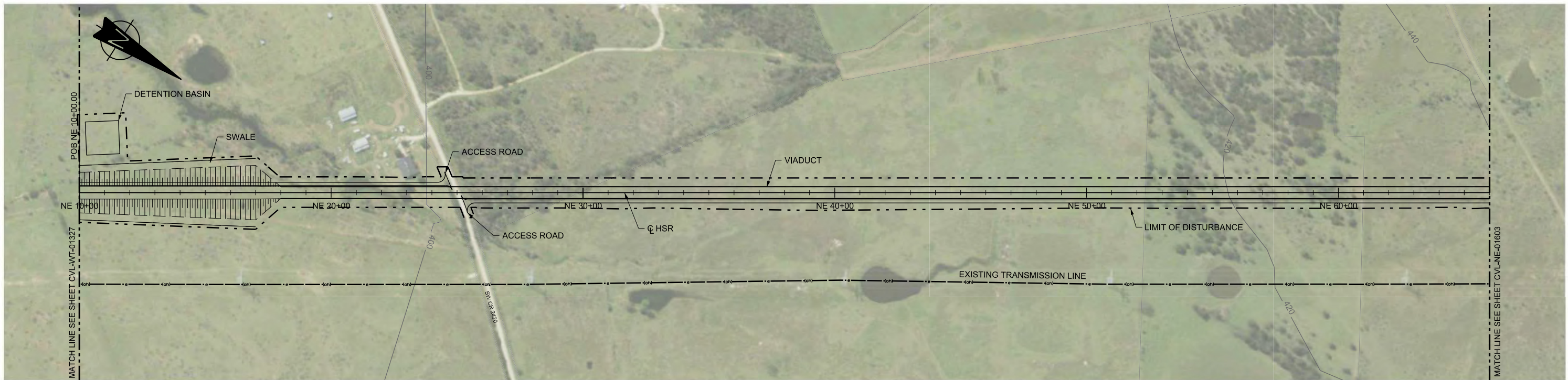
2711 North Haskell Ave., Suite 3300  
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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

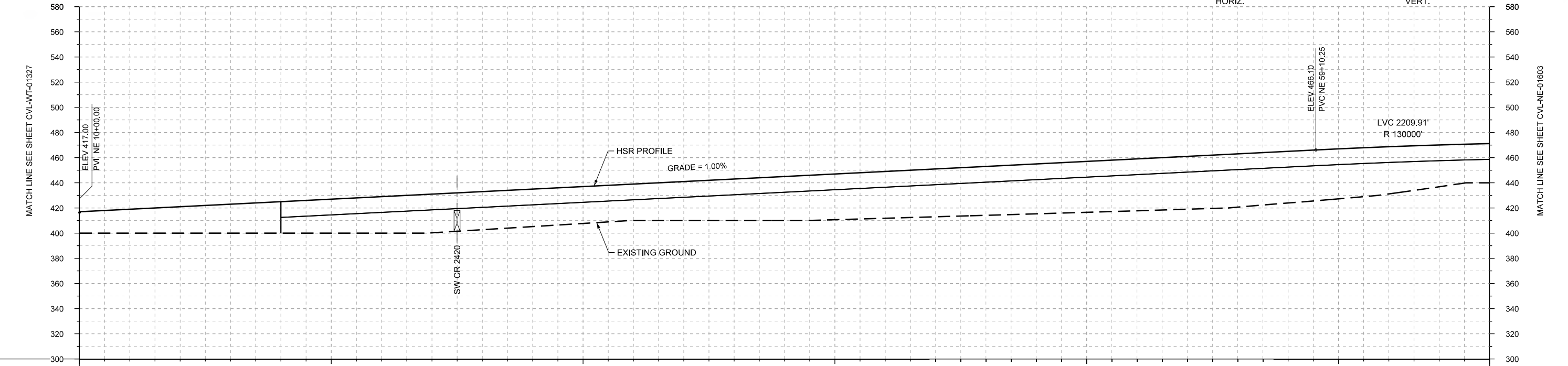
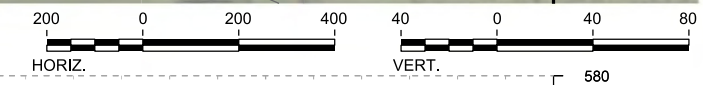
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
KEY MAP - SHEET 2 OF 2  
NE 1074+00 TO NE 1652+05**

|                         |                            |           |
|-------------------------|----------------------------|-----------|
| Scale<br>AS SHOWN       |                            |           |
| Drawing Status<br>FINAL |                            |           |
| Job No<br>234180        | Drawing No<br>CVL-NE-01601 | Rev<br>01 |



PLAN



PROFILE

|                |                       |          |          |          |          |          |          |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------|----------|----------|----------|----------|----------|----------|-------|-------|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 10+00              | NE 20+00 | NE 30+00 | NE 40+00 | NE 50+00 | NE 60+00 | NE 66+00 |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=10018               |          |          |          |          |          |          |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=4910.25<br>G=1.000% |          |          |          |          |          |          |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +17.0                 | +19.0    | +21.0    | +23.0    | +25.0    | +27.0    | +29.0    | +30.7 | +30.3 | +29.8 | +29.3       | +29.0 | +31.0 | +33.0 | +35.0 | +36.3 | +37.2 | +38.0 | +38.8 | +38.7 | +40.4 | +41.2 | +42.0 | +42.3 | +41.0 | +39.8 | +37.5 | +33.3 | +31.2 |
| TYP. SECTION   | EMBANKMENT (A)        |          |          |          |          |          |          |       |       |       | VIADUCT (K) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

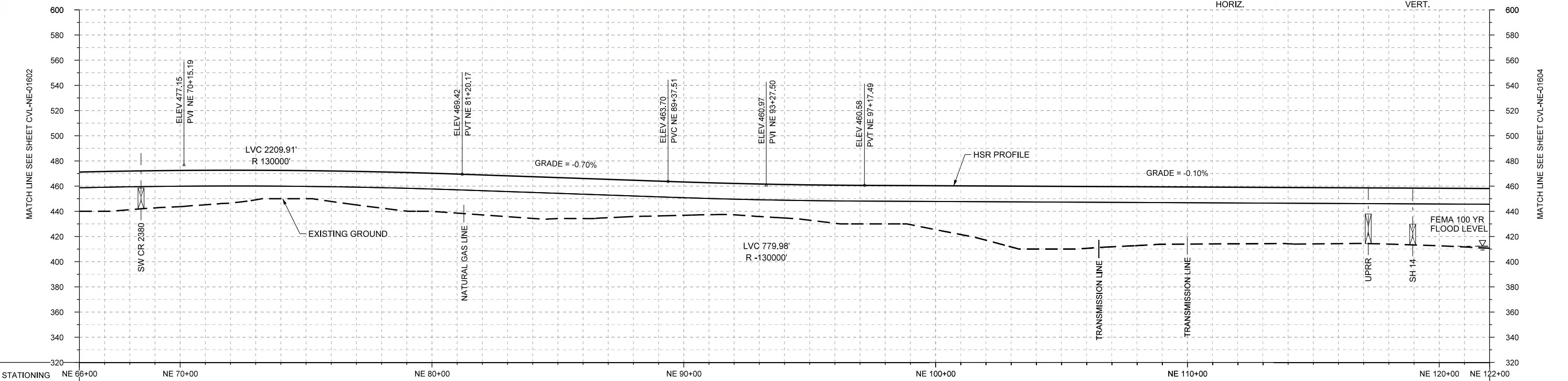
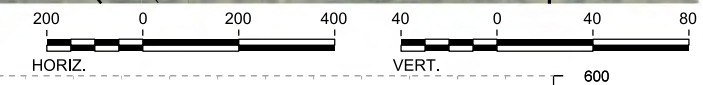
Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 10+00 TO NE 66+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01602 | 01  |  |





PLAN



PROFILE

|                |             |          |          |                       |           |           |           |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-------------|----------|----------|-----------------------|-----------|-----------|-----------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 66+00    | NE 70+00 | NE 80+00 | NE 90+00              | NE 100+00 | NE 110+00 | NE 120+00 | NE 122+00              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=10018     |          |          |                       |           |           | L=1350    |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | R=130000    |          |          | L=817.35<br>G=-0.700% |           | R=-130000 |           | L=5257.37<br>G=-0.100% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +31.2       | +30.7    | +28.7    | +26.0                 | +22.5     | +24.2     | +28.8     | +30.3                  | +31.8 | +33.2 | +31.9 | +28.9 | +26.5 | +24.9 | +26.7 | +30.2 | +30.5 | +34.9 | +43.0 | +49.9 | +49.1 | +46.7 | +45.3 | +44.9 | +44.7 | +44.4 | +44.5 | +45.7 | +47.4 |
| TYP. SECTION   | VIADUCT (K) |          |          |                       |           |           |           |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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**FREESSE & NICHOLS**

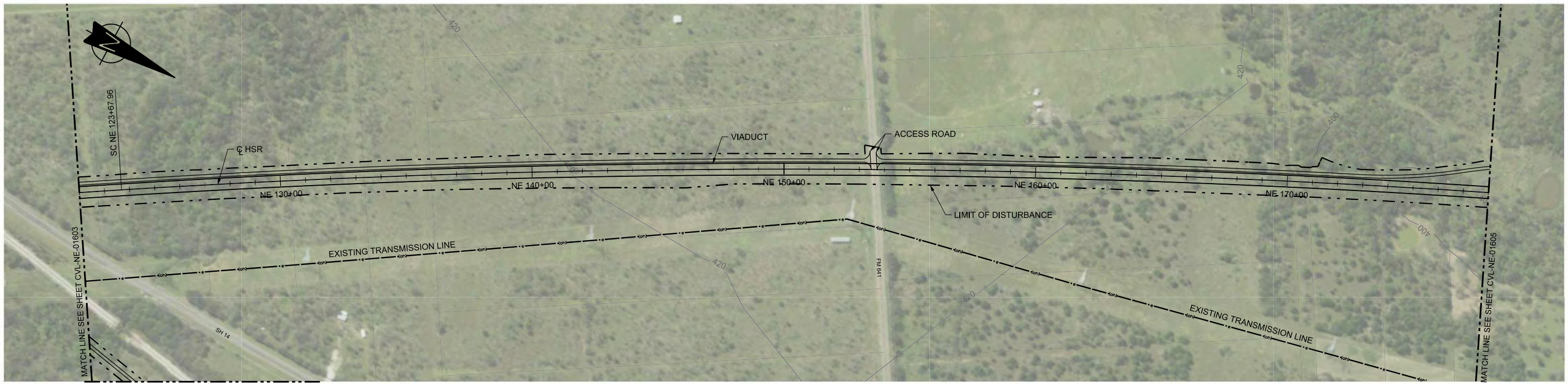
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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

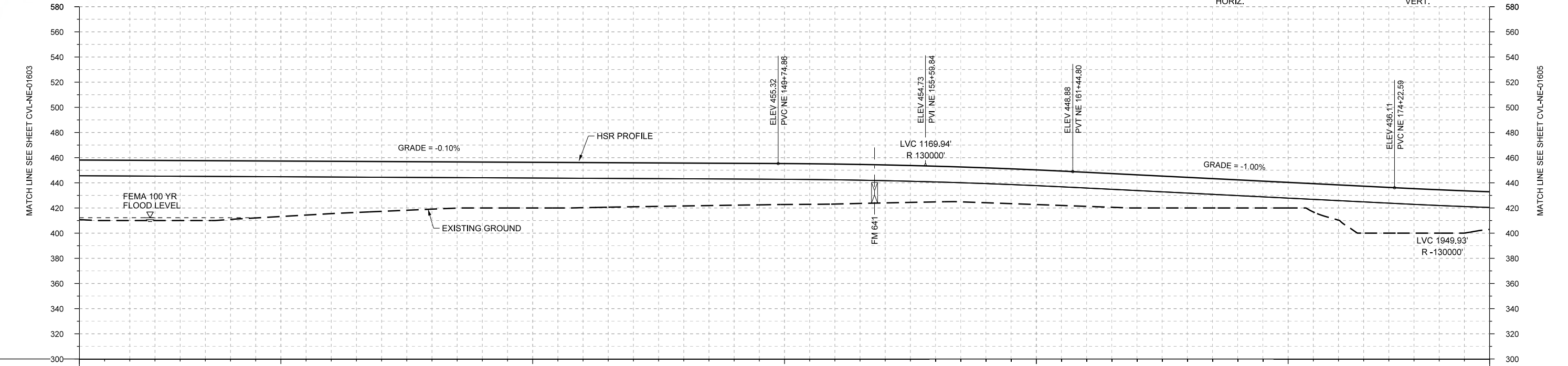
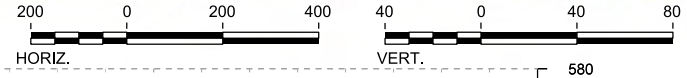
Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 66+00 TO NE 122+00**

|                   |                                |           |
|-------------------|--------------------------------|-----------|
| Scale<br>AS SHOWN | Drawing Status<br><b>FINAL</b> |           |
| Job No<br>234180  | Drawing No<br>CVL-NE-01603     | Rev<br>01 |



FOR CONTINUATION SEE SHEET RDY-NE-04002

PLAN



PROFILE

|                |                        |           |                    |           |           |                        |           |
|----------------|------------------------|-----------|--------------------|-----------|-----------|------------------------|-----------|
| STATIONING     | NE 122+00              | NE 130+00 | NE 140+00          | NE 150+00 | NE 160+00 | NE 170+00              | NE 178+00 |
| HOR. ALIGNMENT | L=1350                 |           | R=42000<br>L=21312 |           |           | L=1277.79<br>G=-1.000% |           |
| VER. ALIGNMENT | L=5257.37<br>G=-0.100% |           | R=130000           |           |           | L=1277.79<br>G=-1.000% |           |
| CUT AND FILL   | +47.4                  | +47.9     | +47.7              | +46.6     | +44.1     | +41.6                  | +39.6     |
| TYP. SECTION   | VIADUCT (K)            |           |                    |           |           |                        |           |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**



Arup Texas, Inc.  
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www.arup.com  
Texas Registered Engineering Firm: F-1990



2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

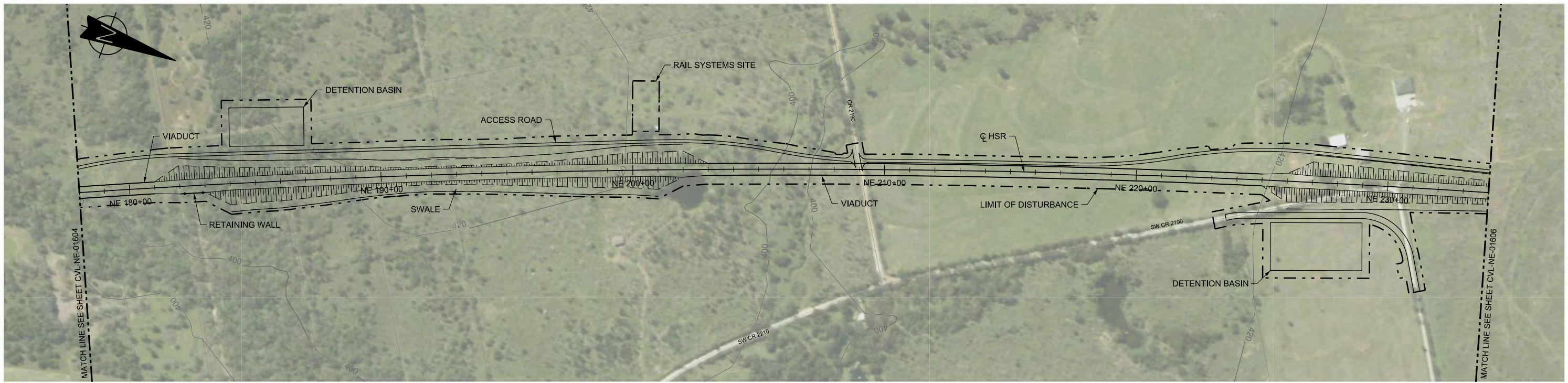
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING



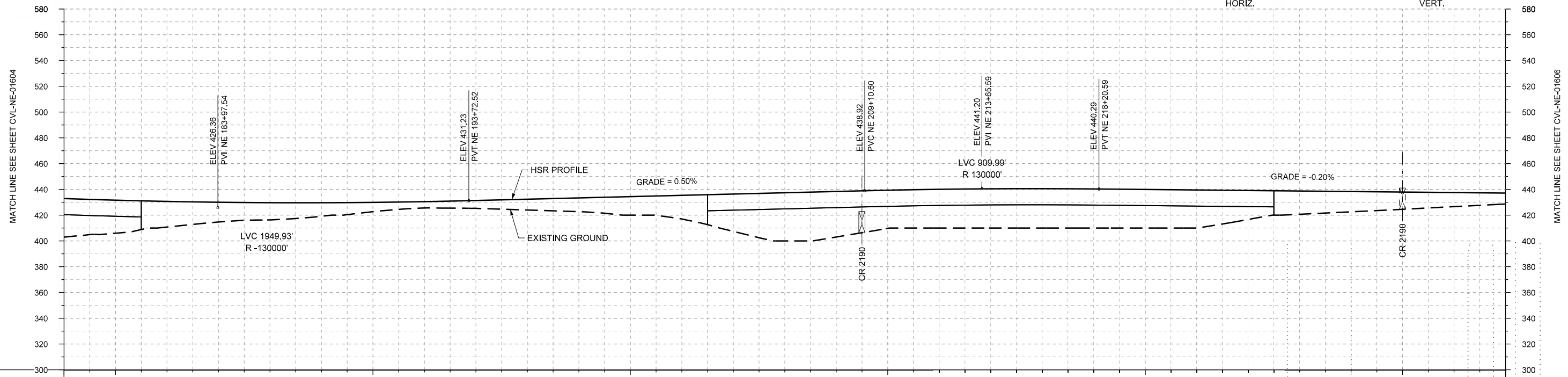
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 122+00 TO NE 178+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01604 | 01  |  |



PLAN



PROFILE

|                |                    |           |                |           |                       |           |           |           |                        |      |       |       |             |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |      |
|----------------|--------------------|-----------|----------------|-----------|-----------------------|-----------|-----------|-----------|------------------------|------|-------|-------|-------------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| STATIONING     | NE 178+00          | NE 180+00 | NE 190+00      | NE 200+00 | NE 210+00             | NE 220+00 | NE 230+00 | NE 234+00 |                        |      |       |       |             |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |      |
| HOR. ALIGNMENT | R=42000<br>L=21312 |           |                |           |                       |           |           |           |                        |      |       |       |             |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |      |
| VER. ALIGNMENT | R=130000           |           |                |           | L=1538.08<br>G=0.500% |           | R=130000  |           | L=7035.58<br>G=-0.200% |      |       |       |             |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |      |
| CUT AND FILL   | +30.0              | +25.6     | +19.9          | +15.3     | +13.4                 | +10.5     | +7.2      | +4.9      | +6.1                   | +8.4 | +10.7 | +14.4 | +15.4       | +29.0 | +37.4          | +35.4 | +29.6 | +30.0 | +30.4 | +30.5 | +30.3 | +29.9 | +29.4 | +22.5 | +18.0 | +15.7 | +13.4 | +10.9 | +8.4 |
| TYP. SECTION   | VIADUCT (E)        |           | EMBANKMENT (A) |           |                       |           |           |           |                        |      |       |       | VIADUCT (E) |       | EMBANKMENT (A) |       |       |       |       |       |       |       |       |       |       |       |       |       |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

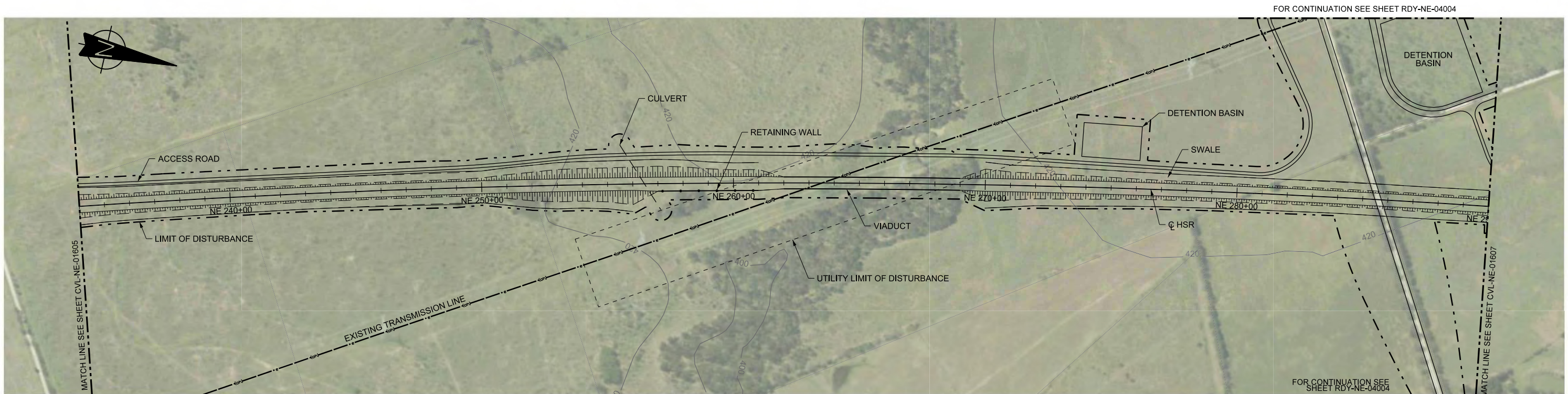
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 178+00 TO NE 234+00**

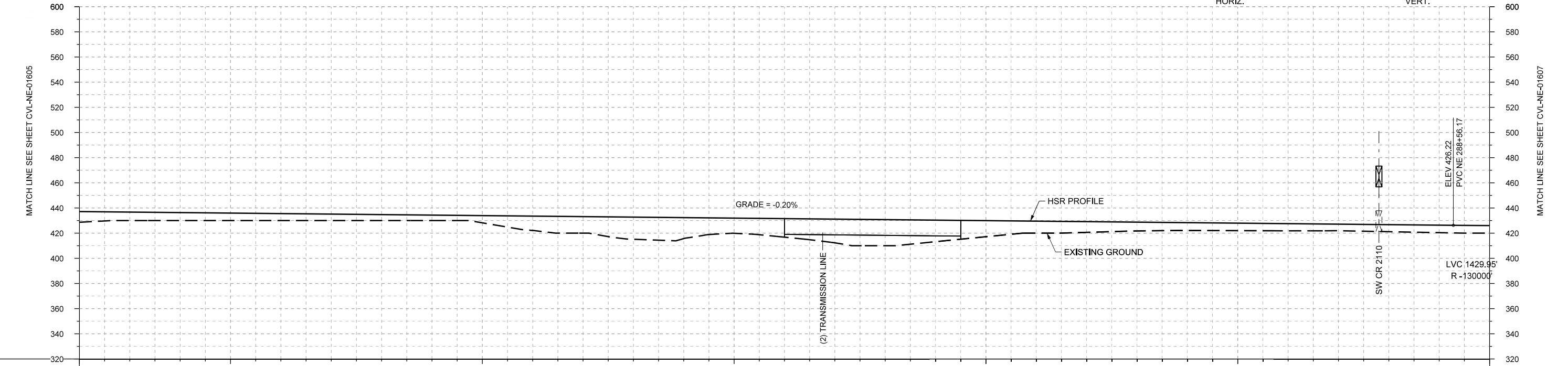
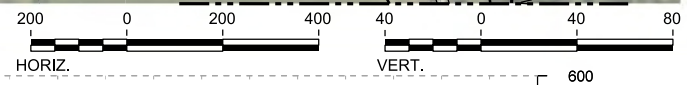
Scale  
**AS SHOWN**

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-NE-01605 | 01  |



PLAN



PROFILE

|                |                        |           |           |           |           |           |                |      |      |       |             |       |       |       |                |       |       |       |       |      |      |      |      |      |      |      |      |      |      |
|----------------|------------------------|-----------|-----------|-----------|-----------|-----------|----------------|------|------|-------|-------------|-------|-------|-------|----------------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|
| STATIONING     | NE 234+00              | NE 240+00 | NE 250+00 | NE 260+00 | NE 270+00 | NE 280+00 | NE 290+00      |      |      |       |             |       |       |       |                |       |       |       |       |      |      |      |      |      |      |      |      |      |      |
| HOR. ALIGNMENT | R=42000<br>L=21312     |           |           |           |           |           |                |      |      |       |             |       |       |       |                |       |       |       |       |      |      |      |      |      |      |      |      |      |      |
| VER. ALIGNMENT | L=7035.58<br>G=-0.200% |           |           |           |           |           |                |      |      |       |             |       |       |       |                |       |       |       |       |      |      |      |      |      |      |      |      |      |      |
| CUT AND FILL   | +8.4                   | +6.7      | +6.3      | +5.9      | +5.5      | +5.1      | +4.7           | +4.3 | +5.7 | +11.4 | +13.1       | +17.6 | +18.6 | +12.0 | +14.7          | +18.8 | +20.7 | +17.1 | +12.7 | +9.5 | +8.5 | +7.0 | +6.2 | +5.9 | +5.7 | +5.2 | +5.6 | +5.9 | +6.0 |
| TYP. SECTION   | EMBANKMENT (A)         |           |           |           | CUT (C)   |           | EMBANKMENT (A) |      |      |       | VIADUCT (E) |       |       |       | EMBANKMENT (A) |       |       |       |       |      |      |      |      |      |      |      |      |      |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
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|                                 |
|---------------------------------|
| DESIGNED BY<br><b>D. PETRIN</b> |
| DRAWN BY<br><b>J. BORGHESI</b>  |
| CHECKED BY<br><b>T. WAGNER</b>  |
| IN CHARGE<br><b>C. TAYLOR</b>   |
| DATE<br><b>02/25/2019</b>       |

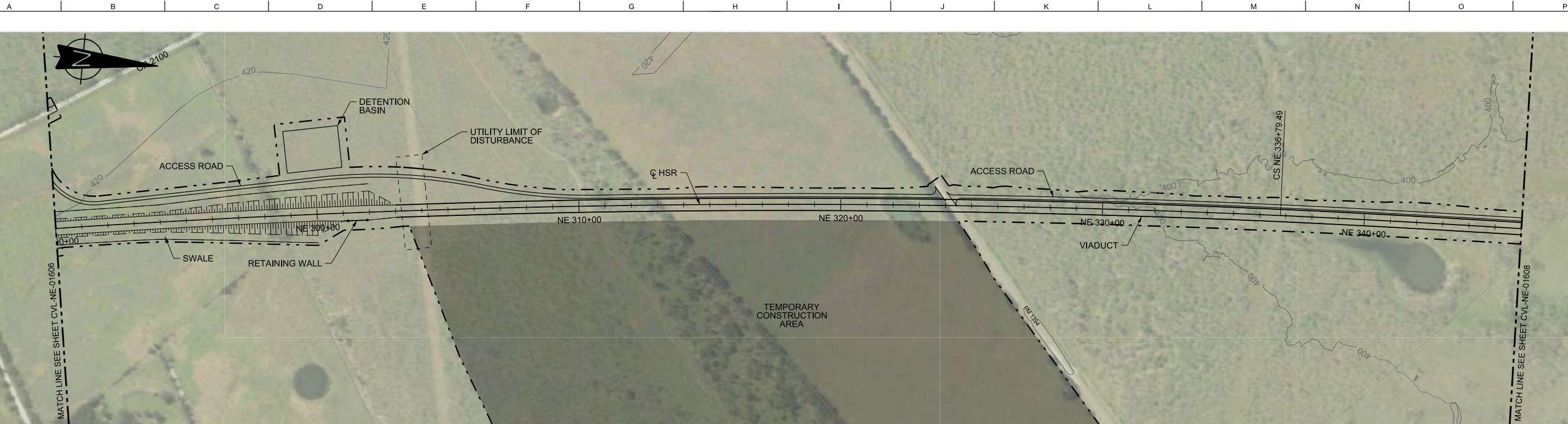
**ARUP**  
 Arup Texas, Inc.  
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 Houston, Texas 77042 USA  
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 www.freesse.com  
 Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING  
  
 1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

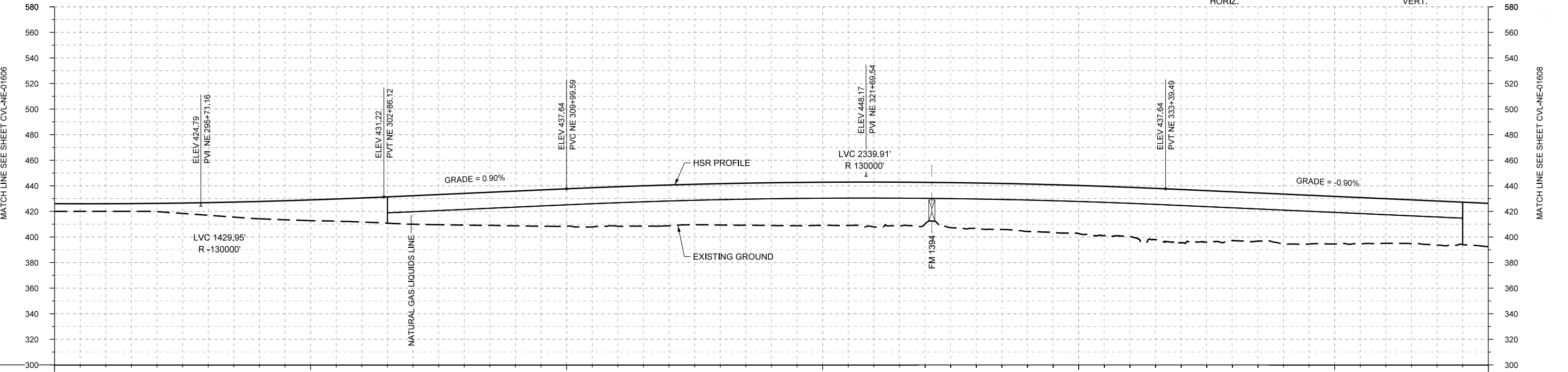
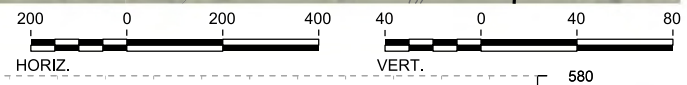
Drawing Title  
**NAVARRO EAST SEGMENT  
 CIVIL  
 PLAN AND PROFILE  
 NE 234+00 TO NE 290+00**

|                   |                                |
|-------------------|--------------------------------|
| Scale<br>AS SHOWN | Drawing Status<br><b>FINAL</b> |
| Job No<br>234180  | Drawing No<br>CVL-NE-01606     |
|                   | Rev<br>01                      |

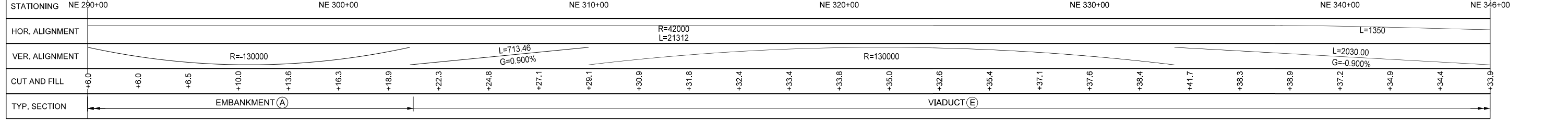


PLAN

FOR CONTINUATION SEE SHEET RDY-NE-04004



PROFILE



| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

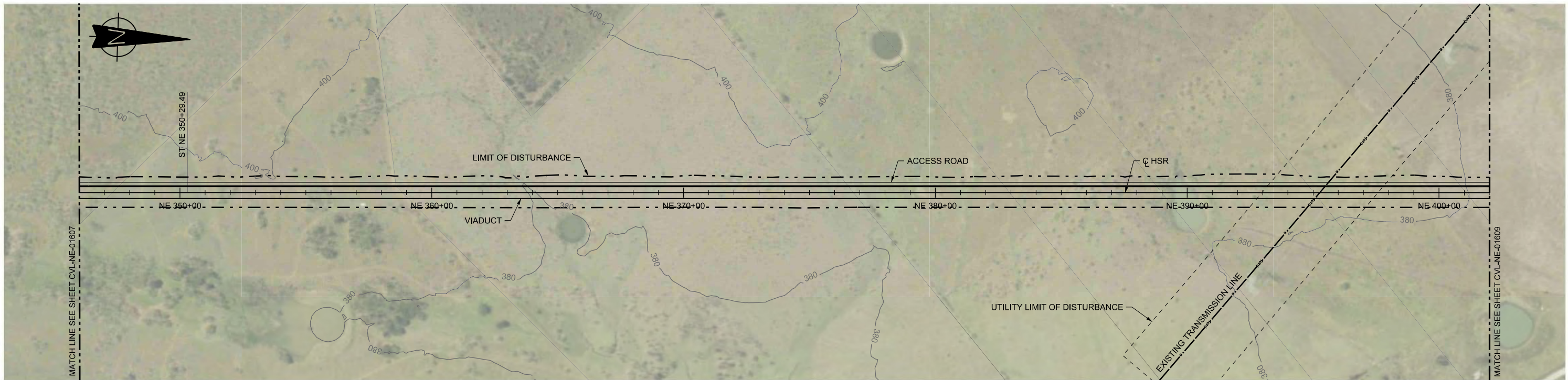
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 290+00 TO NE 346+00**

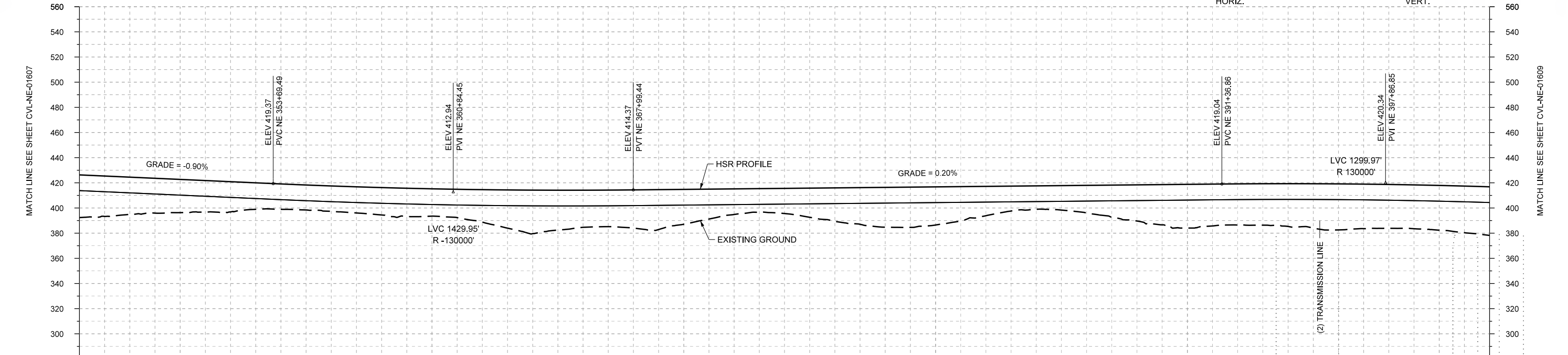
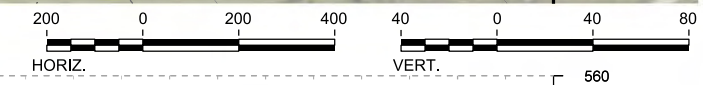
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|                  |                            |           |
|------------------|----------------------------|-----------|
| Job No<br>234180 | Drawing No<br>CVL-NE-01607 | Rev<br>01 |
|------------------|----------------------------|-----------|



PLAN



PROFILE

|                |                        |           |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 346+00              | NE 350+00 | NE 360+00 | NE 370+00 | NE 380+00 | NE 390+00 | NE 400+00 | NE 402+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=1350                 |           | L=5855    |           |           | L=2337.42 |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=2030.00<br>G=-0.900% |           | R=130000  |           |           | G=0.200%  |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +33.9                  | +28.4     | +26.4     | +24.1     | +20.1     | +20.2     | +21.7     | +21.7     | +25.8 | +34.6 | +29.5 | +30.3 | +27.7 | +20.4 | +20.0 | +26.7 | +31.7 | +30.3 | +23.4 | +18.7 | +22.0 | +28.8 | +34.8 | +32.8 | +34.0 | +36.5 | +34.9 | +35.6 | +38.6 |
| TYP. SECTION   | VIADUCT (E)            |           |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

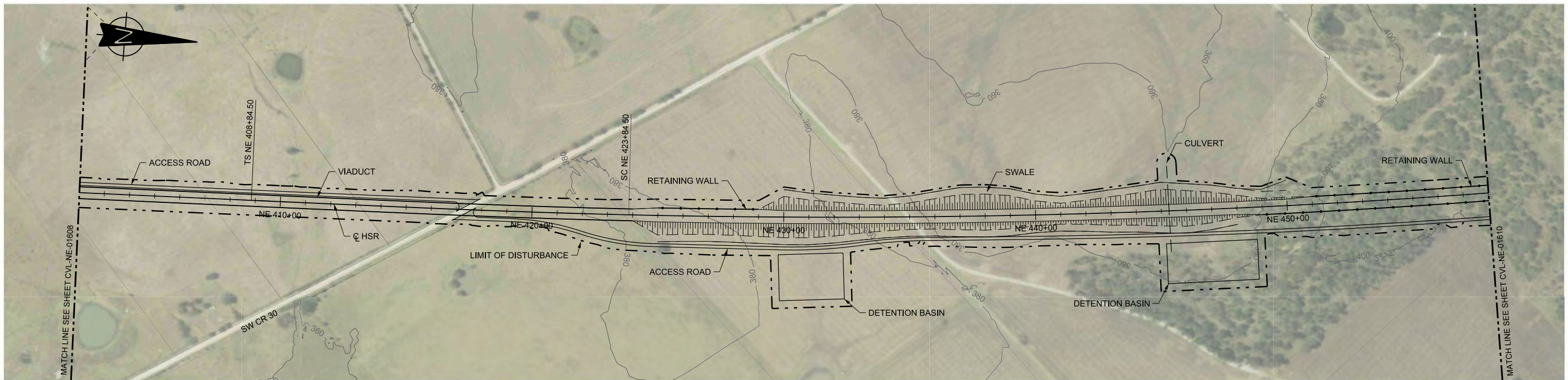
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 346+00 TO NE 402+00**

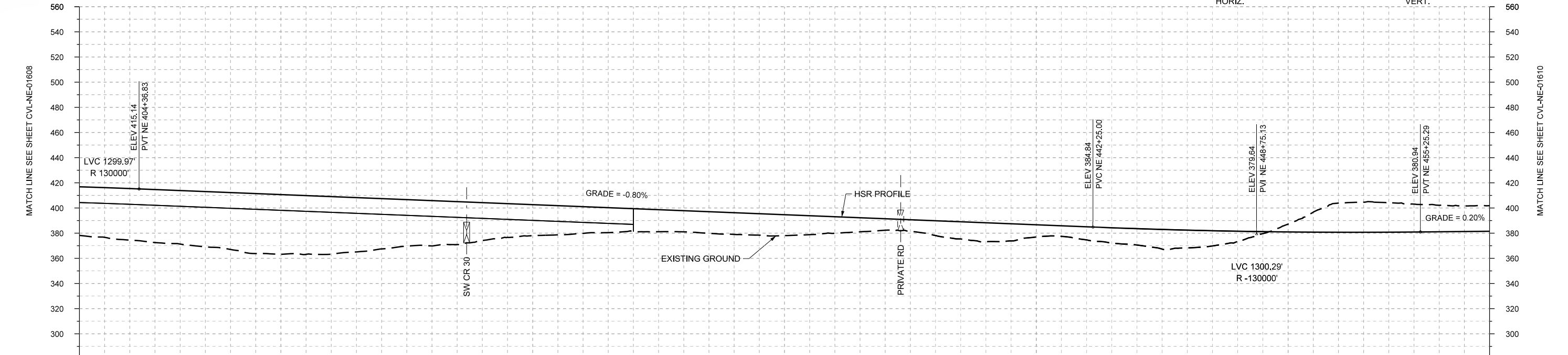
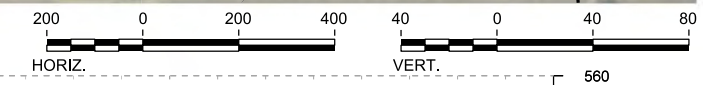
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-NE-01608 | 01  |



PLAN



PROFILE

|                |             |           |                        |           |                    |           |           |                  |
|----------------|-------------|-----------|------------------------|-----------|--------------------|-----------|-----------|------------------|
| STATIONING     | NE 402+00   | NE 410+00 | NE 420+00              | NE 430+00 | NE 440+00          | NE 450+00 | NE 458+00 |                  |
| HOR. ALIGNMENT | L=5855      |           | L=1500                 |           | R=35000<br>L=21784 |           | L=5619.59 |                  |
| VER. ALIGNMENT | R=130000    |           | L=3788.17<br>G=-0.800% |           | R=130000           |           | G=0.200%  |                  |
| CUT AND FILL   | +36.6       | +41.0     | +42.5                  | +45.2     | +47.4              | +45.7     | +39.9     |                  |
| TYP. SECTION   | VIADUCT (E) |           |                        |           | EMBANKMENT (A)     |           | CUT (C)   | RETAINED CUT (D) |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
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DRAWN BY  
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DATE  
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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

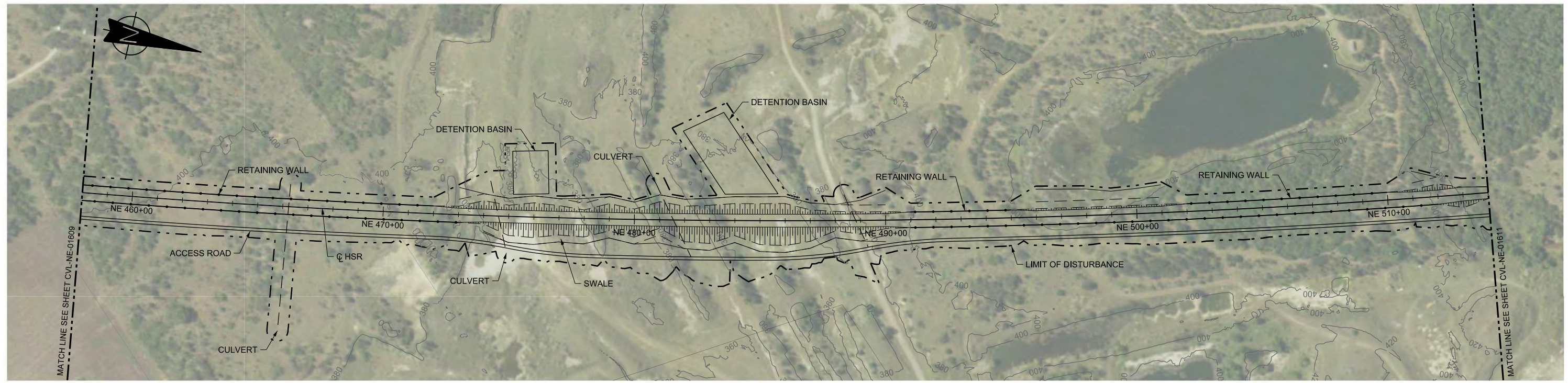
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 402+00 TO NE 458+00**

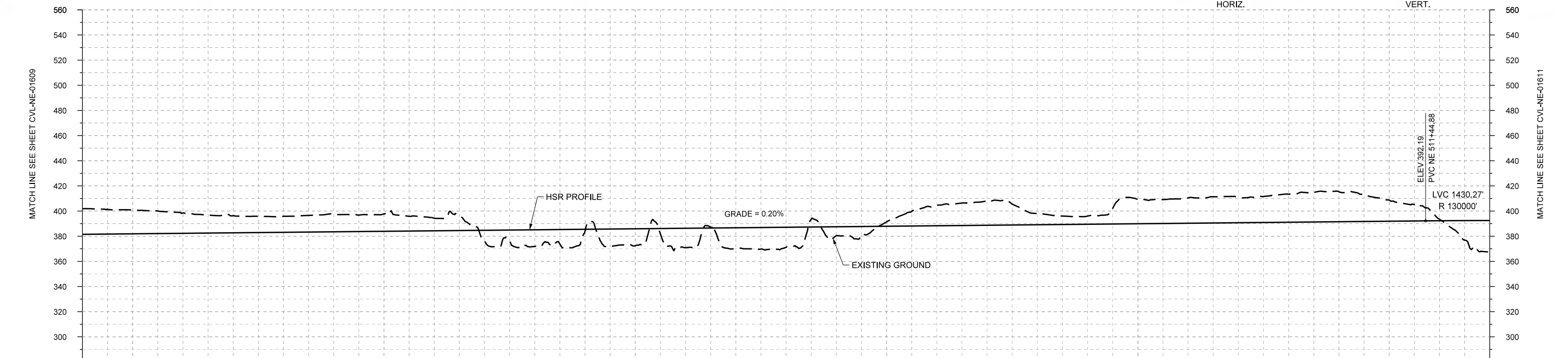
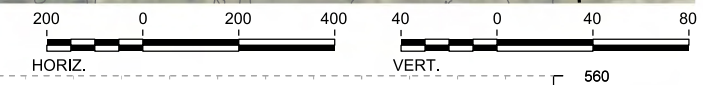
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-NE-01609 | 01  |



PLAN



|                |                                       |           |           |           |           |           |           |           |      |       |                |       |       |         |       |                  |      |         |       |                  |      |       |       |       |       |       |       |      |       |
|----------------|---------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------|-------|----------------|-------|-------|---------|-------|------------------|------|---------|-------|------------------|------|-------|-------|-------|-------|-------|-------|------|-------|
| STATIONING     | NE 458+00                             | NE 460+00 | NE 470+00 | NE 480+00 | NE 490+00 | NE 500+00 | NE 510+00 | NE 514+00 |      |       |                |       |       |         |       |                  |      |         |       |                  |      |       |       |       |       |       |       |      |       |
| HOR. ALIGNMENT |                                       |           |           |           |           |           |           |           |      |       |                |       |       |         |       |                  |      |         |       |                  |      |       |       |       |       |       |       |      |       |
| VER. ALIGNMENT | $R=35000$<br>$L=564.52$<br>$G=0.20\%$ |           |           |           |           |           |           |           |      |       |                |       |       |         |       |                  |      |         |       |                  |      |       |       |       |       |       |       |      |       |
| CUT AND FILL   | -20.3                                 | -16.9     | -16.1     | -13.6     | -12.7     | -13.9     | -13.8     | -10.0     | +9.1 | +13.2 | +1.4           | +13.5 | +15.4 | +16.5   | +15.9 | +7.2             | -3.5 | -16.3   | -19.5 | -8.9             | -6.5 | -19.5 | -20.2 | -20.3 | -22.3 | -23.8 | -16.8 | -1.3 | +25.4 |
| TYP. SECTION   | RETAINED CUT (D)                      |           |           |           |           |           |           |           |      |       | EMBANKMENT (A) |       |       | CUT (C) |       | RETAINED CUT (D) |      | CUT (C) |       | RETAINED CUT (D) |      |       |       |       |       |       |       |      |       |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|     |      |    |     |     |             |

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

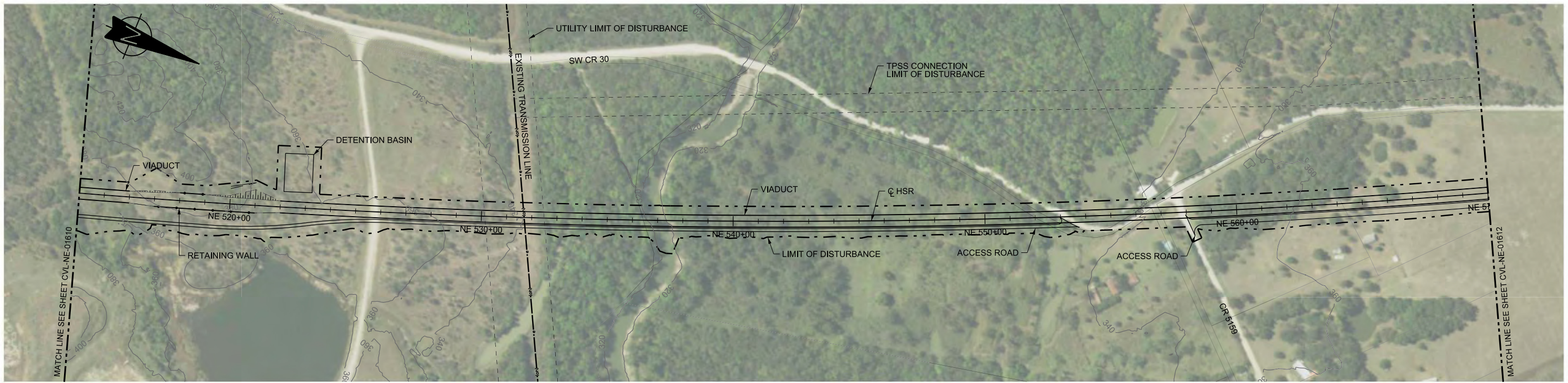
**TEXAS CENTRAL**

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

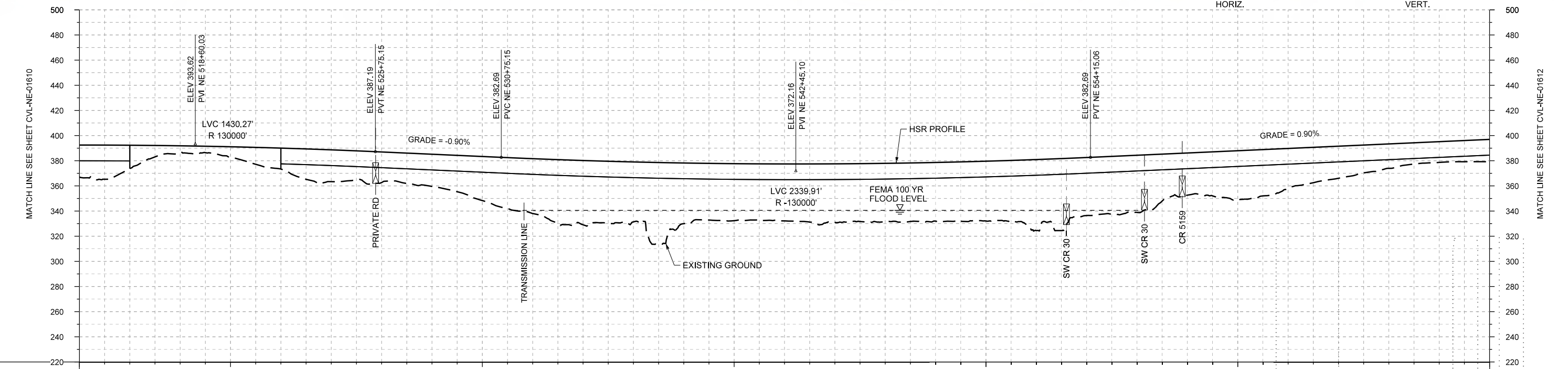
Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 458+00 TO NE 514+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01610 | 01  |  |





PLAN



PROFILE

|                |           |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 514+00 | NE 520+00 | NE 530+00 | NE 540+00 | NE 550+00 | NE 560+00 | NE 570+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT |           |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT |           |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +25.4     | +18.7     | +5.1      | +8.2      | +16.6     | +25.2     | +24.4     | +25.7 | +35.1 | +43.6 | +51.1 | +47.6 | +43.3 | +45.4 | +45.2 | +46.4 | +46.5 | +46.6 | +47.5 | +56.5 | +46.2 | +45.5 | +33.6 | +38.9 | +31.5 | +25.5 | +19.5 | +16.5 | +17.8 |
| TYP. SECTION   | ⓔ         |           | ⓑ         |           |           |           | ⓔ         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

Arup Texas, Inc.  
10370 Richmond Ave., Suite 475  
Houston, Texas 77042 USA  
Tel (713) 783 2787 Fax (713) 343 1467  
www.arup.com  
Texas Registered Engineering Firm: F-1990

**FREESSE & NICHOLS**

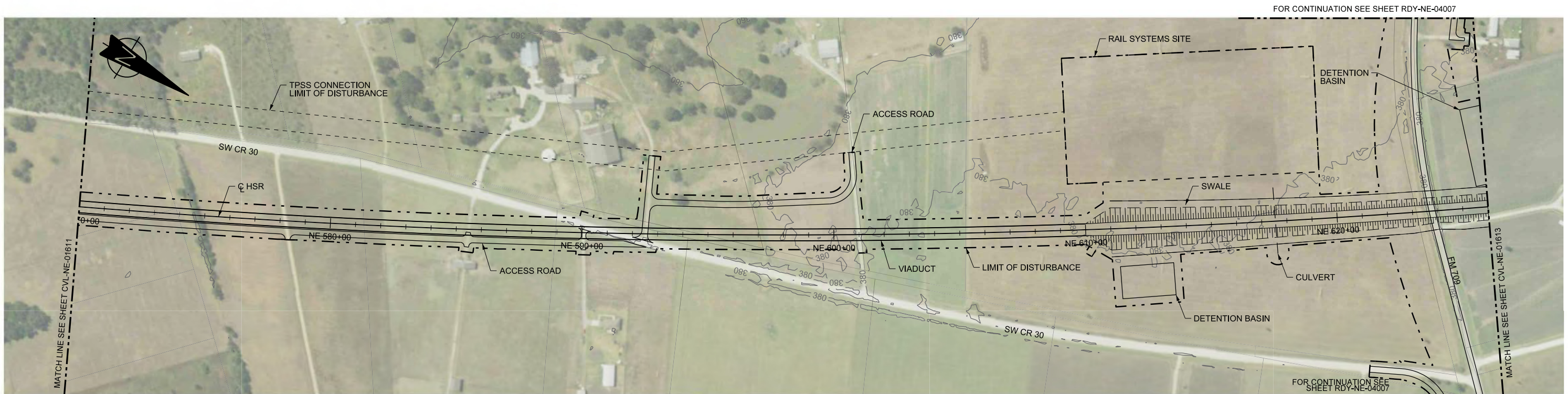
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freesse.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

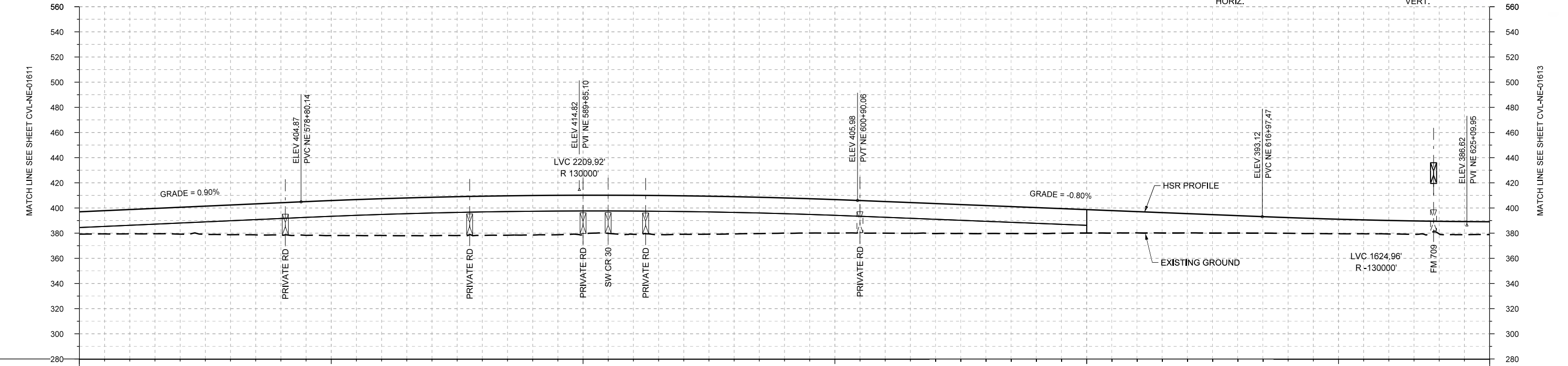
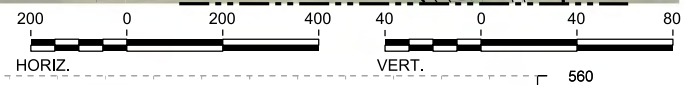
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 514+00 TO NE 570+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-NE-01611 |
| Rev            | 01           |



PLAN



PROFILE

|                |                            |           |           |           |                |           |           |
|----------------|----------------------------|-----------|-----------|-----------|----------------|-----------|-----------|
| STATIONING     | NE 570+00                  | NE 580+00 | NE 590+00 | NE 600+00 | NE 610+00      | NE 620+00 | NE 626+00 |
| HOR. ALIGNMENT |                            |           |           |           |                |           |           |
| VER. ALIGNMENT | $L=2465.08$<br>$G=0.900\%$ |           |           |           |                |           |           |
| CUT AND FILL   | +17.8                      | +19.3     | +21.4     | +23.7     | +25.7          | +27.8     | +29.2     |
| TYP. SECTION   | VIADUCT (E)                |           |           |           | EMBANKMENT (A) |           |           |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

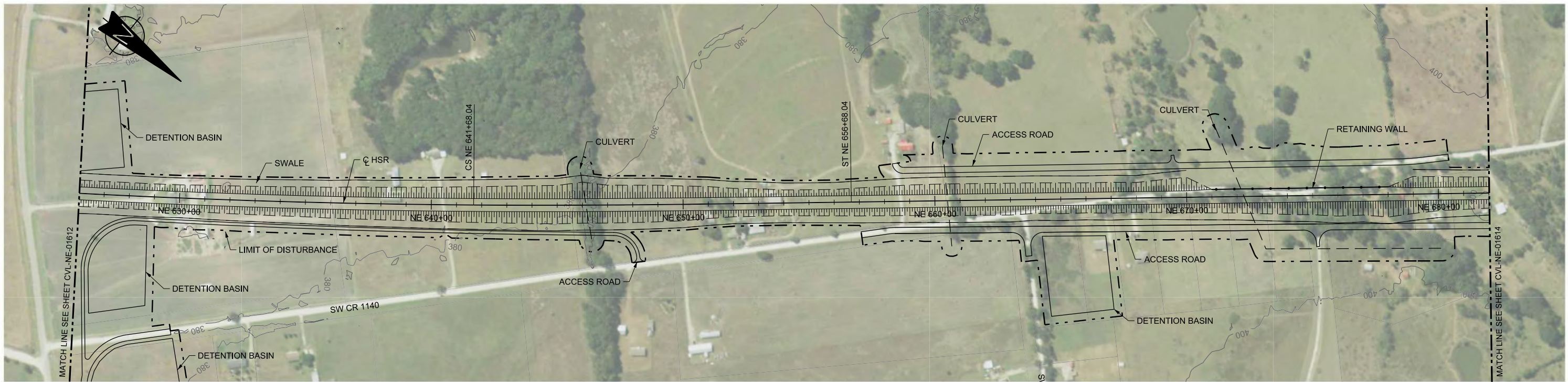
**ARUP**  
 Arup Texas, Inc.  
 10370 Richmond Ave., Suite 475  
 Houston, Texas 77042 USA  
 Tel (713) 783 2787 Fax (713) 343 1467  
 www.arup.com  
 Texas Registered Engineering Firm: F-1990

**FRESE & NICHOLS**  
 2711 North Haskell Ave., Suite 3300  
 Dallas, Texas 75204  
 Tel (214) 217 2200 Fax (214) 217 2201  
 www.freese.com  
 Texas Registered Engineering Firm: F-2144

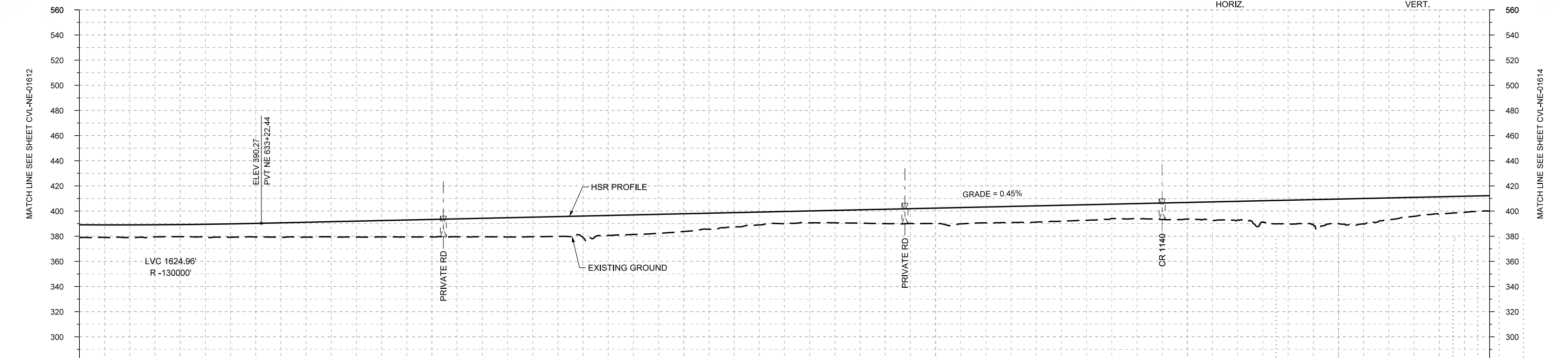
DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING  
  
 1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT CIVIL**  
**PLAN AND PROFILE**  
**NE 570+00 TO NE 626+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-NE-01612 |
| Rev            | 01           |



PLAN



PROFILE

|                |                |           |                    |           |                       |           |           |           |       |       |       |       |       |       |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------|-----------|--------------------|-----------|-----------------------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 626+00      | NE 630+00 | NE 640+00          | NE 650+00 | NE 660+00             | NE 670+00 | NE 680+00 | NE 682+00 |       |       |       |       |       |       |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=1500         |           |                    |           |                       |           | L=28646   |           |       |       |       |       |       |       |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | R=130000       |           | R=35000<br>L=21784 |           | L=7211.47<br>G=0.450% |           |           |           |       |       |       |       |       |       |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +10.1          | +10.1     | +9.6               | +10.7     | +11.5                 | +12.0     | +13.0     | +13.9     | +14.7 | +15.5 | +17.1 | +15.5 | +14.1 | +11.3 | +9.7 | +9.9 | +11.4 | +12.2 | +12.6 | +12.9 | +12.4 | +11.8 | +13.2 | +14.7 | +19.0 | +19.6 | +17.3 | +13.7 | +12.2 |
| TYP. SECTION   | EMBANKMENT (A) |           |                    |           |                       |           |           |           |       |       |       |       |       |       |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

Arup Texas, Inc.  
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Houston, Texas 77042 USA  
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www.arup.com  
Texas Registered Engineering Firm: F-1990

**FREESSE & NICHOLS**

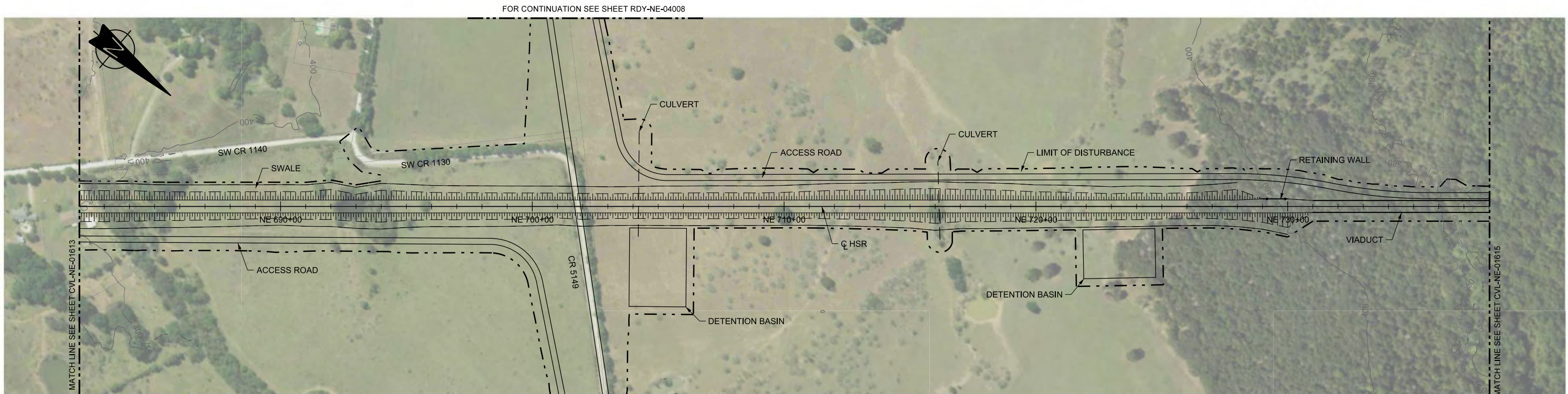
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 626+00 TO NE 682+00**

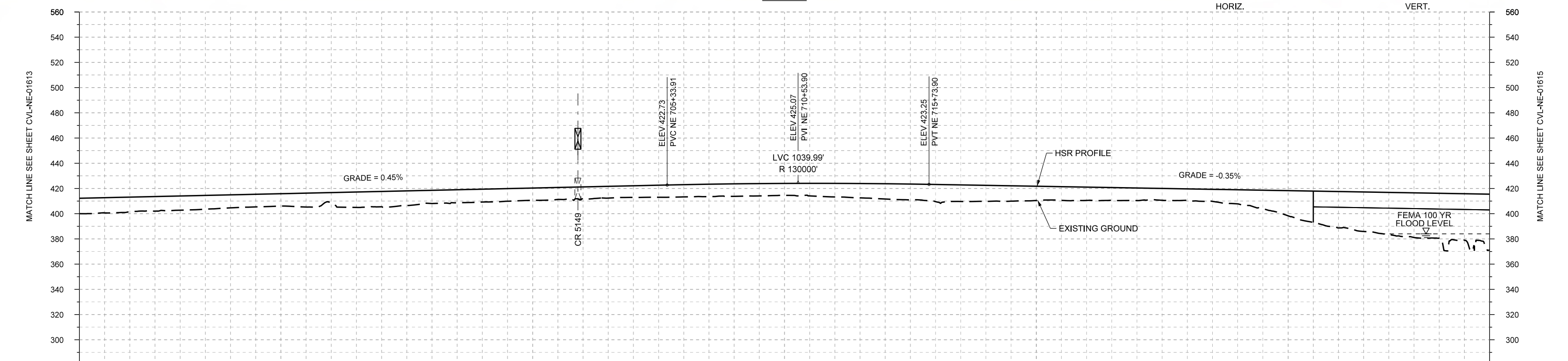
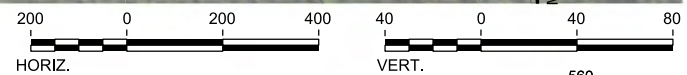
|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01613 | 01  |  |



FOR CONTINUATION SEE SHEET RDY-NE-04008

FOR CONTINUATION SEE SHEET RDY-NE-04008

PLAN



PROFILE

|                |                       |           |           |           |           |                        |           |       |       |      |      |      |      |       |      |             |       |       |       |       |       |       |      |       |       |       |       |       |       |
|----------------|-----------------------|-----------|-----------|-----------|-----------|------------------------|-----------|-------|-------|------|------|------|------|-------|------|-------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 682+00             | NE 690+00 | NE 700+00 | NE 710+00 | NE 720+00 | NE 730+00              | NE 738+00 |       |       |      |      |      |      |       |      |             |       |       |       |       |       |       |      |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=28646               |           |           |           |           |                        |           |       |       |      |      |      |      |       |      |             |       |       |       |       |       |       |      |       |       |       |       |       |       |
| VER. ALIGNMENT | L=7211.47<br>G=0.450% |           |           | R=130000  |           | L=2893.81<br>G=-0.350% |           |       |       |      |      |      |      |       |      |             |       |       |       |       |       |       |      |       |       |       |       |       |       |
| CUT AND FILL   | +12.2                 | +11.5     | +11.2     | +10.3     | +8.7      | +8.0                   | +12.2     | +10.4 | +10.2 | +9.7 | +9.7 | +9.2 | +9.7 | +10.0 | +9.5 | +10.7       | +12.1 | +13.7 | +12.7 | +11.4 | +10.6 | +10.0 | +9.2 | +11.2 | +20.0 | +28.9 | +33.5 | +35.6 | +44.4 |
| TYP. SECTION   | EMBANKMENT (A)        |           |           |           |           |                        |           |       |       |      |      |      |      |       |      | VIADUCT (E) |       |       |       |       |       |       |      |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

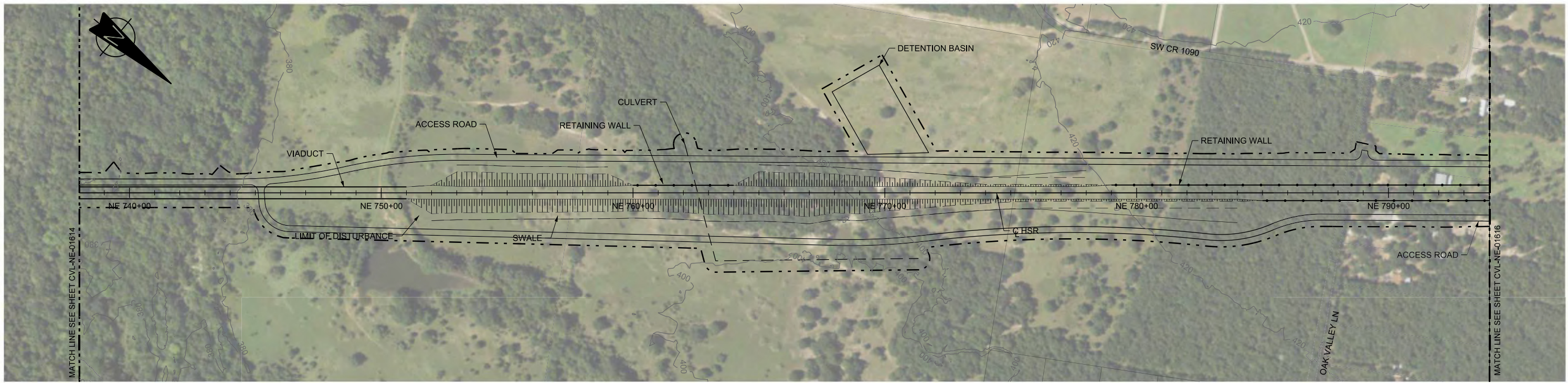
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 682+00 TO NE 738+00**

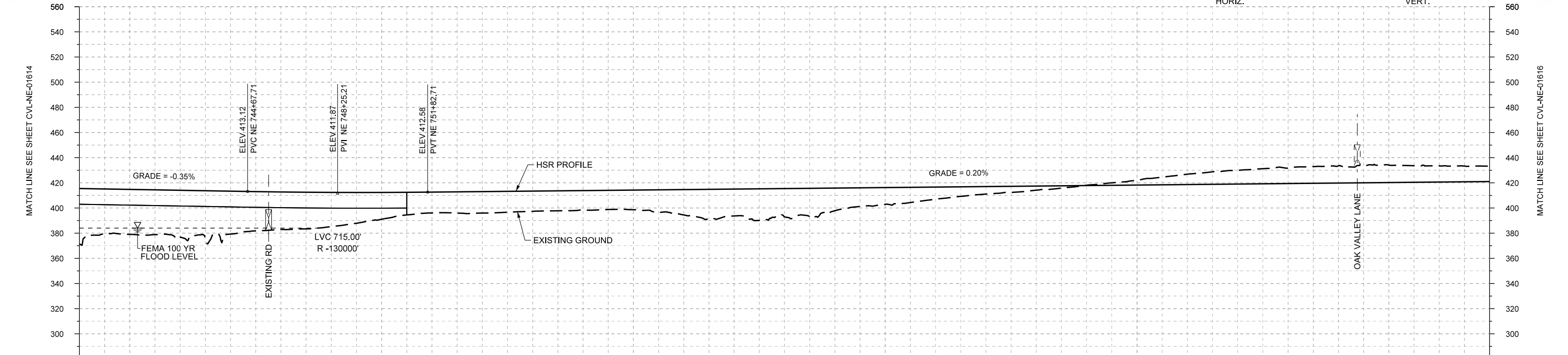
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-NE-01614 | 01  |



PLAN



PROFILE

|                |                        |           |           |           |                |                       |           |           |       |       |       |       |         |       |       |       |                  |      |      |      |      |      |      |       |       |       |       |       |       |
|----------------|------------------------|-----------|-----------|-----------|----------------|-----------------------|-----------|-----------|-------|-------|-------|-------|---------|-------|-------|-------|------------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 738+00              | NE 740+00 | NE 750+00 | NE 760+00 | NE 770+00      | NE 780+00             | NE 790+00 | NE 794+00 |       |       |       |       |         |       |       |       |                  |      |      |      |      |      |      |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=28646                |           |           |           |                |                       |           |           |       |       |       |       |         |       |       |       |                  |      |      |      |      |      |      |       |       |       |       |       |       |
| VER. ALIGNMENT | L=2893.81<br>G=-0.350% |           | R=-130000 |           |                | L=7882.53<br>G=0.200% |           |           |       |       |       |       |         |       |       |       |                  |      |      |      |      |      |      |       |       |       |       |       |       |
| CUT AND FILL   | +44.4                  | +35.8     | +37.4     | +34.2     | +29.7          | +27.2                 | +21.3     | +16.6     | +17.0 | +16.1 | +15.3 | +15.6 | +20.1   | +21.3 | +22.4 | +18.0 | +13.3            | +9.6 | +5.9 | +3.2 | -0.3 | -3.9 | -8.3 | -11.0 | -12.4 | -13.7 | -13.9 | -12.9 | -12.3 |
| TYP. SECTION   | VIADUCT (E)            |           |           |           | EMBANKMENT (A) |                       |           |           |       |       |       |       | CUT (C) |       |       |       | RETAINED CUT (D) |      |      |      |      |      |      |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-1990

**FRESE & NICHOLS**

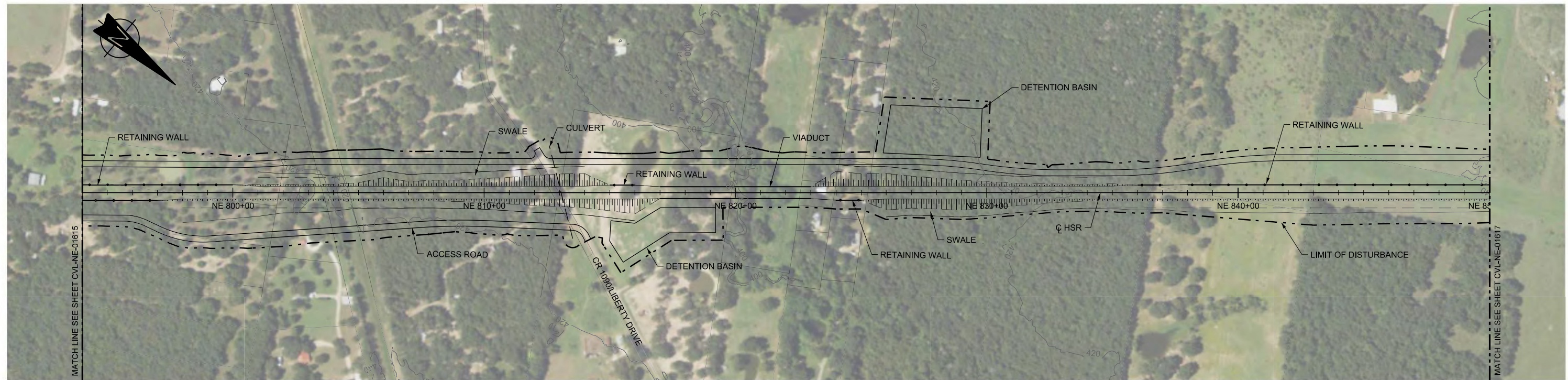
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

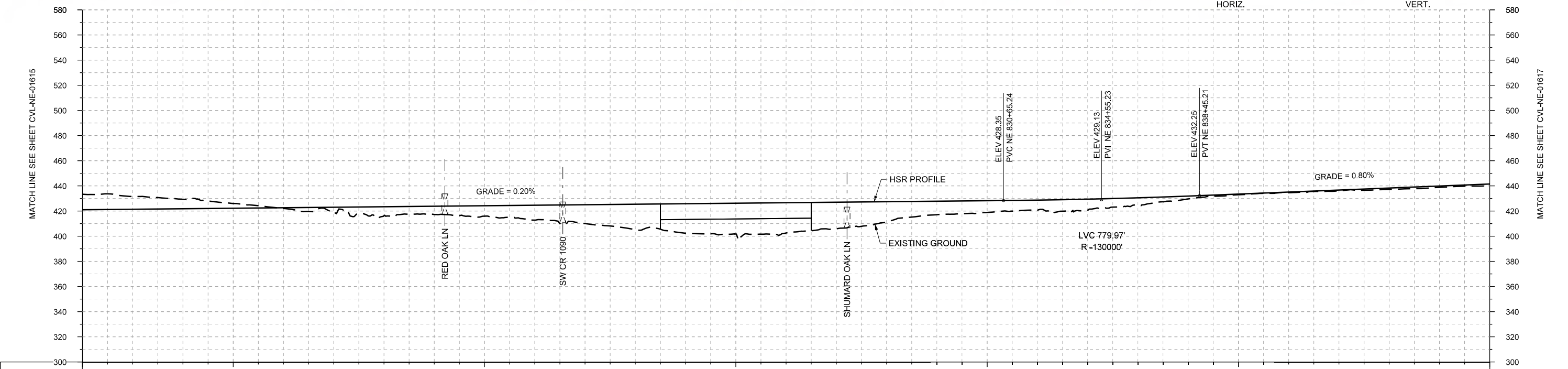
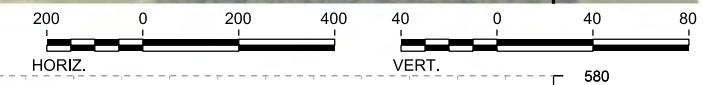
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 738+00 TO NE 794+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-NE-01615 |
| Rev            |          |            | 01           |



PLAN



|                |                       |           |           |           |              |           |                       |      |           |       |       |       |              |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |
|----------------|-----------------------|-----------|-----------|-----------|--------------|-----------|-----------------------|------|-----------|-------|-------|-------|--------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|
| STATIONING     | NE 794+00             | NE 800+00 | NE 810+00 | NE 820+00 | NE 830+00    | NE 840+00 | NE 850+00             |      |           |       |       |       |              |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |
| HOR. ALIGNMENT | L=28646               |           |           |           |              |           |                       |      |           |       |       |       |              |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |
| VER. ALIGNMENT | L=7882.53<br>G=0.200% |           |           | R=130000  |              |           | L=4180.25<br>G=0.800% |      |           |       |       |       |              |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |
| CUT AND FILL   | -12.3                 | -10.1     | -7.5      | -3.8      | +0.6         | +4.2      | +7.1                  | +6.5 | +8.3      | +11.8 | +15.0 | +20.0 | +23.4        | +24.5 | +24.1 | +21.1 | +18.0 | +10.7 | +9.3 | +8.3 | +8.7 | +6.0 | +2.3 | +0.6 | +0.5 | +0.7 | +1.1 | +1.1 | +1.5 |
| TYP. SECTION   | D                     |           | CUT C     |           | EMBANKMENT A |           |                       |      | VIADUCT E |       |       |       | EMBANKMENT A |       |       |       | CUT C |       |      |      |      |      |      |      |      |      |      |      |      |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

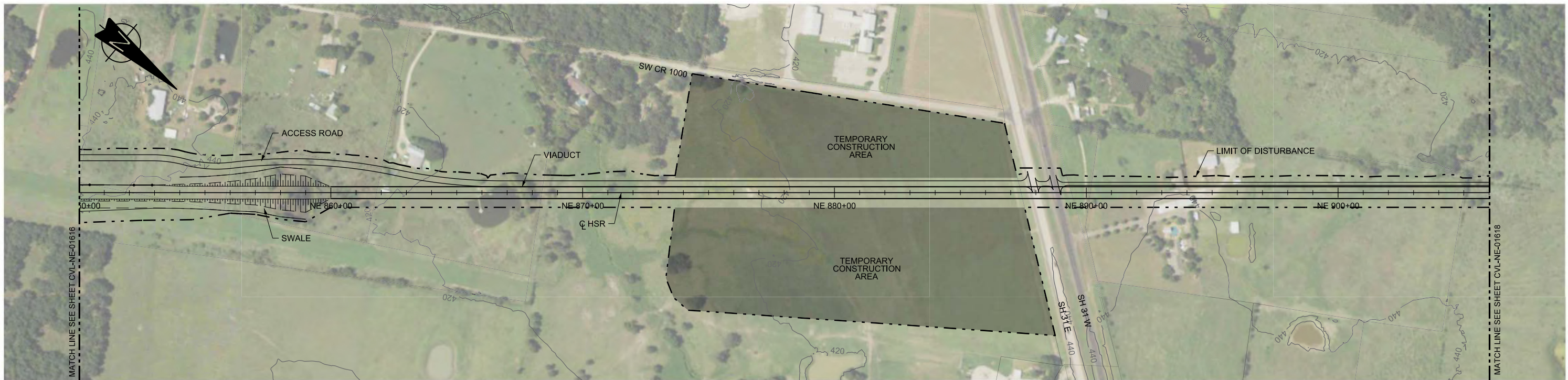
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 794+00 TO NE 850+00**

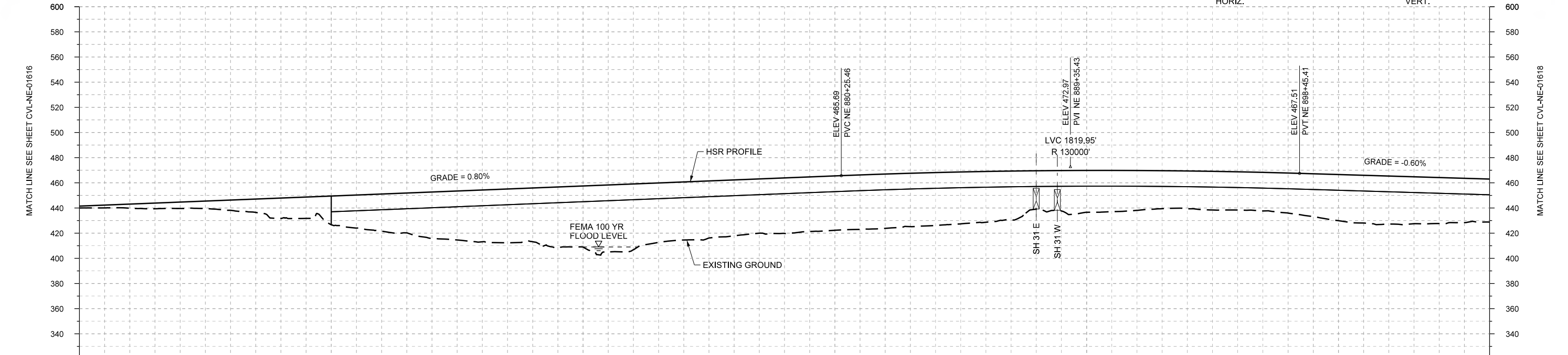
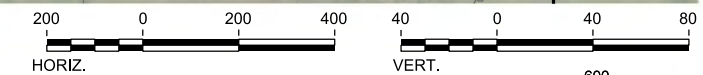
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-NE-01616 | 01  |



PLAN



PROFILE

|                |                       |           |                |           |           |           |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------|-----------|----------------|-----------|-----------|-----------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 850+00             | NE 860+00 | NE 870+00      | NE 880+00 | NE 890+00 | NE 900+00 | NE 906+00              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=28646               |           |                |           |           |           |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=4180.25<br>G=0.800% |           |                | R=130000  |           |           | L=3161.42<br>G=-0.600% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +1.5                  | +3.3      | +5.1           | +8.1      | +16.3     | +22.8     | +29.4                  | +36.9 | +41.2 | +42.7 | +46.6 | +52.3 | +46.1 | +44.4 | +44.1 | +43.2 | +43.2 | +42.0 | +40.3 | +30.5 | +33.2 | +31.7 | +30.0 | +30.3 | +31.9 | +36.7 | +33.2 | +36.6 | +34.2 |
| TYP. SECTION   | CUT (C)               |           | EMBANKMENT (A) |           |           |           | VIADUCT (E)            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

Arup Texas, Inc.  
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www.arup.com  
Texas Registered Engineering Firm: F-1990

**FREESSE & NICHOLS**

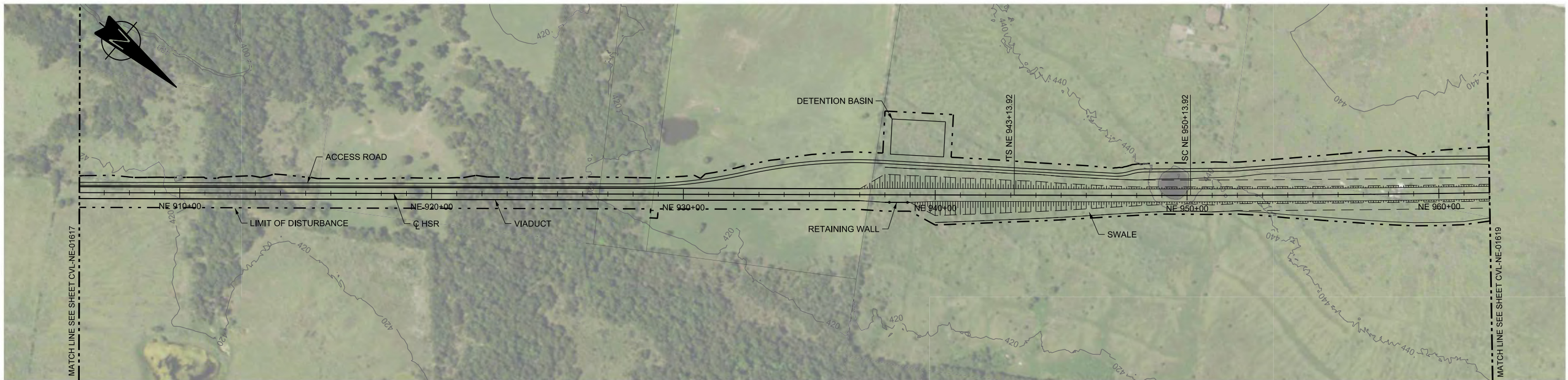
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freesse.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

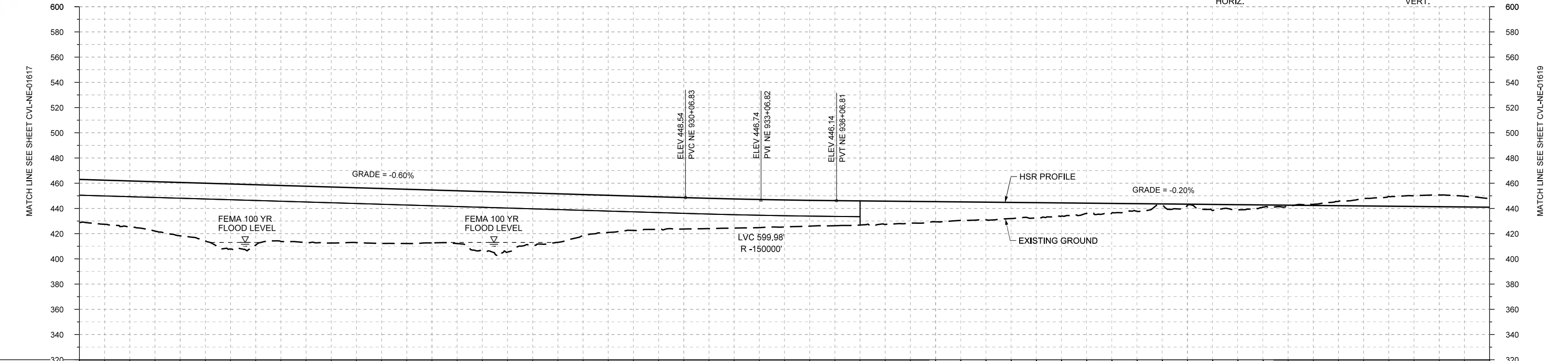
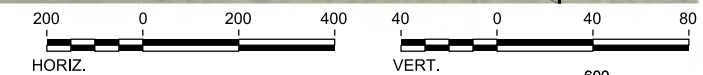
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 850+00 TO NE 906+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01617 | 01  |  |



PLAN



PROFILE

|                |                        |           |           |           |           |           |           |                    |       |       |                |       |       |       |       |       |         |       |       |       |      |      |      |      |      |      |      |      |      |
|----------------|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--------------------|-------|-------|----------------|-------|-------|-------|-------|-------|---------|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| STATIONING     | NE 906+00              | NE 910+00 | NE 920+00 | NE 930+00 | NE 940+00 | NE 950+00 | NE 960+00 | NE 962+00          |       |       |                |       |       |       |       |       |         |       |       |       |      |      |      |      |      |      |      |      |      |
| HOR. ALIGNMENT |                        |           | L=28646   |           |           |           |           |                    |       |       |                |       |       |       |       |       |         |       |       |       |      |      |      |      |      |      |      |      |      |
| VER. ALIGNMENT | L=3161.42<br>G=-0.600% |           | R=-150000 |           |           | L=700     |           | R=-80000<br>L=1975 |       |       |                |       |       |       |       |       |         |       |       |       |      |      |      |      |      |      |      |      |      |
| CUT AND FILL   | +34.2                  | +36.5     | +42.3     | +51.6     | +44.4     | +44.4     | +43.6     | +41.9              | +46.9 | +41.3 | +32.5          | +27.2 | +24.9 | +23.1 | +21.4 | +19.9 | +18.5   | +16.0 | +14.0 | +12.1 | +8.2 | +6.0 | +1.1 | +4.1 | +1.1 | -3.4 | -7.6 | -9.2 | -6.7 |
| TYP. SECTION   | VIADUCT (E)            |           |           |           |           |           |           |                    |       |       | EMBANKMENT (A) |       |       |       |       |       | CUT (C) |       |       |       |      |      |      |      |      |      |      |      |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**



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www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

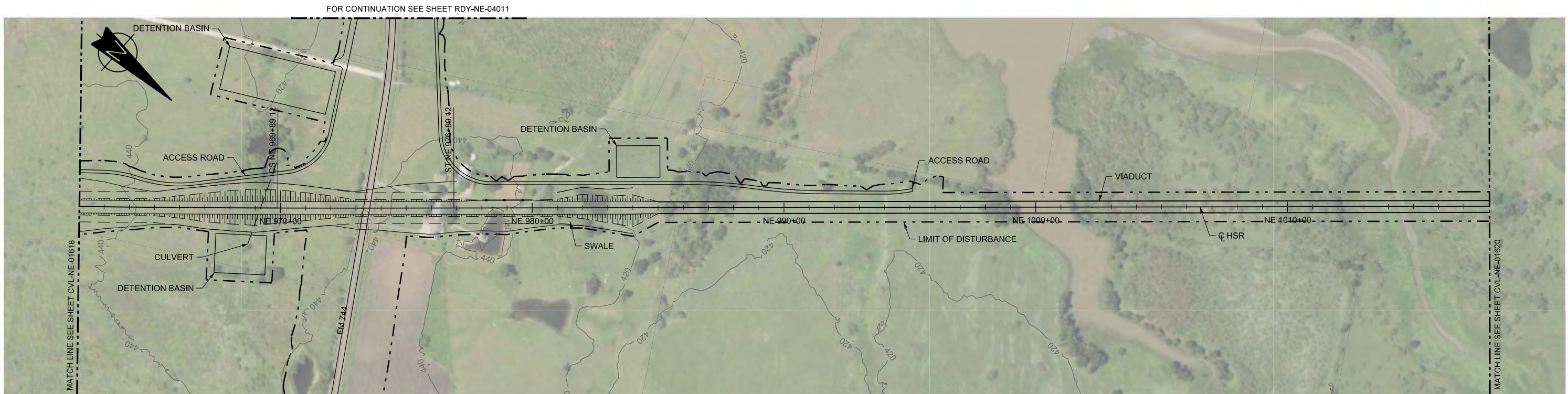


1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

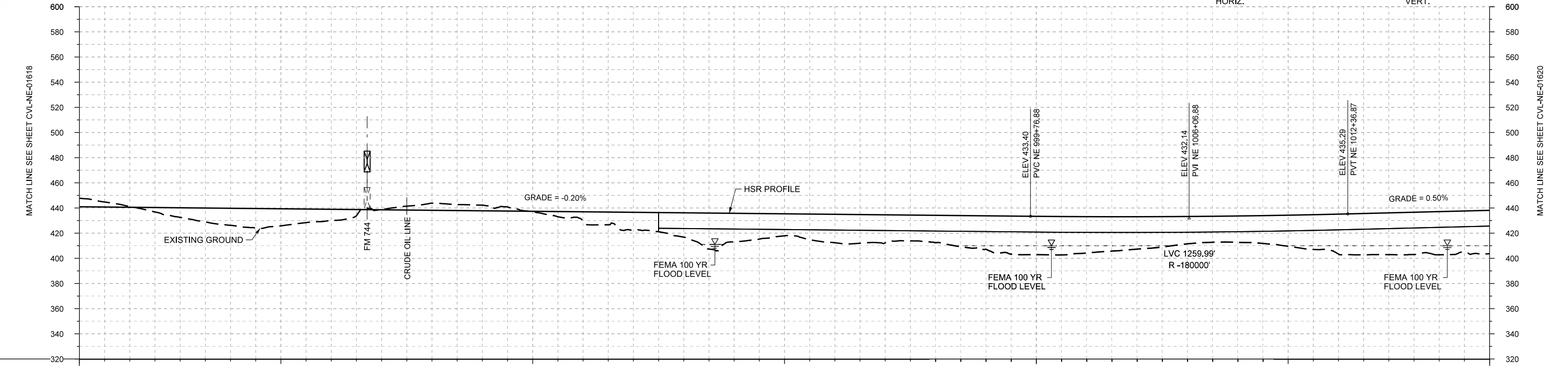
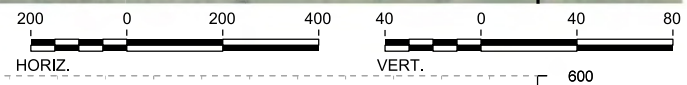
Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 906+00 TO NE 962+00**

|                   |                                |           |
|-------------------|--------------------------------|-----------|
| Scale<br>AS SHOWN | Drawing Status<br><b>FINAL</b> |           |
| Job No<br>234180  | Drawing No<br>CVL-NE-01618     | Rev<br>01 |





PLAN



PROFILE

|                |                   |           |                |                        |            |            |                        |                |      |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-------------------|-----------|----------------|------------------------|------------|------------|------------------------|----------------|------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 962+00         | NE 970+00 | NE 980+00      | NE 990+00              | NE 1000+00 | NE 1010+00 | NE 1018+00             |                |      |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | R=80000<br>L=1975 |           | L=700          | L=6370.07<br>G=-0.200% | L=48284    | R=180000   | L=12683.21<br>G=0.500% |                |      |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT |                   |           |                |                        |            |            |                        |                |      |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | -6.7              | -0.6      | +7.6           | +13.6                  | +13.6      | +9.0       | -0.2                   | -5.6           | -4.5 | +0.4 | +6.7        | +14.5 | +13.4 | +22.8 | +17.5 | +22.6 | +22.3 | +21.8 | +26.7 | +30.5 | +26.9 | +25.8 | +21.7 | +20.9 | +24.7 | +31.7 | +33.2 | +34.3 | +34.4 |
| TYP. SECTION   | CUT (C)           |           | EMBANKMENT (A) |                        |            | CUT (C)    |                        | EMBANKMENT (A) |      |      | VIADUCT (E) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

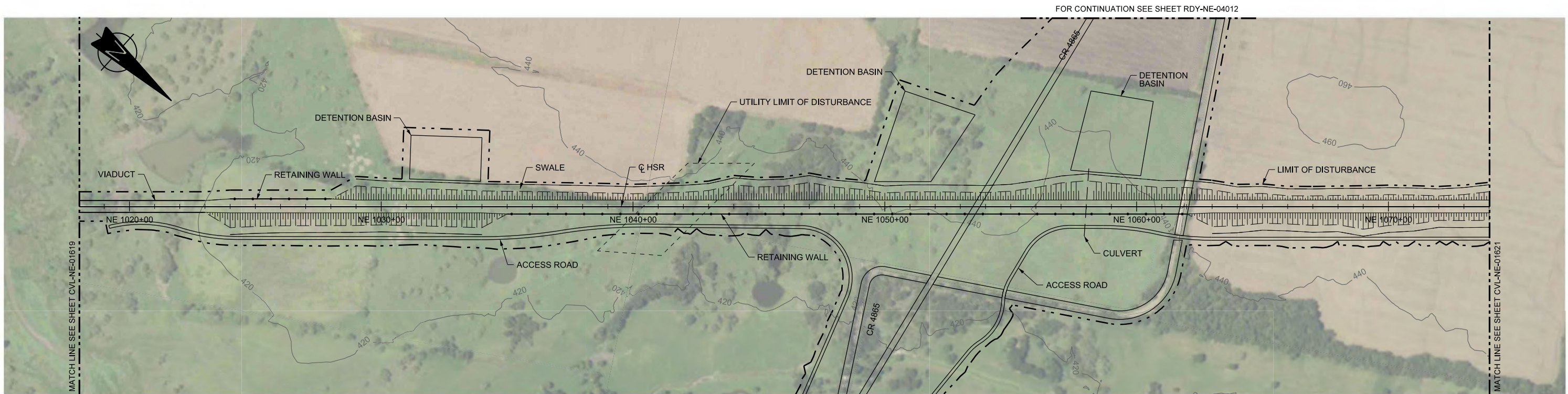
Drawing Title

**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 962+00 TO NE 1018+00**

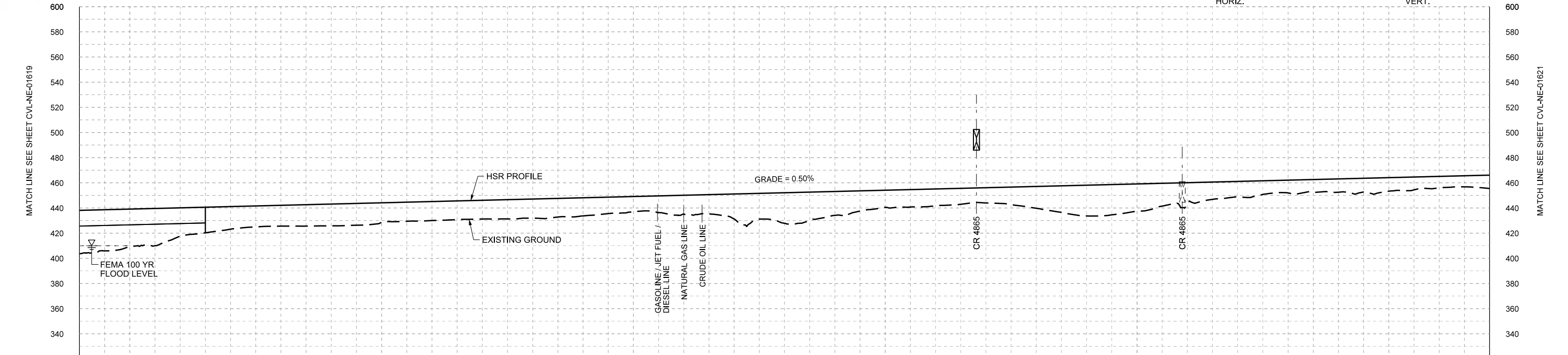
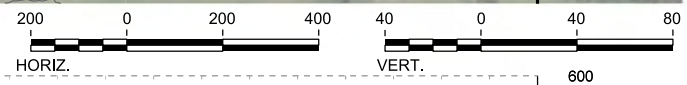
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-NE-01619 | 01  |



PLAN



PROFILE

|                |                        |            |            |                |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |
|----------------|------------------------|------------|------------|----------------|------------|------------|------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| STATIONING     | NE 1018+00             | NE 1020+00 | NE 1030+00 | NE 1040+00     | NE 1050+00 | NE 1060+00 | NE 1070+00 | NE 1074+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |
| HOR. ALIGNMENT | L=48284                |            |            |                |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |
| VER. ALIGNMENT | L=12683.21<br>G=0.500% |            |            |                |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |
| CUT AND FILL   | +34.4                  | +28.8      | +22.4      | +17.9          | +16.5      | +17.3      | +15.4      | +15.1      | +14.9 | +15.2 | +14.4 | +12.3 | +15.0 | +19.9 | +24.3 | +19.0 | +13.6 | +13.7 | +12.1 | +17.3 | +24.4 | +21.7 | +17.2 | +12.2 | +10.1 | +10.6 | +10.8 | +9.1 | +10.6 |
| TYP. SECTION   | VIADUCT (E)            |            |            | EMBANKMENT (A) |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-1990

**FRESE & NICHOLS**

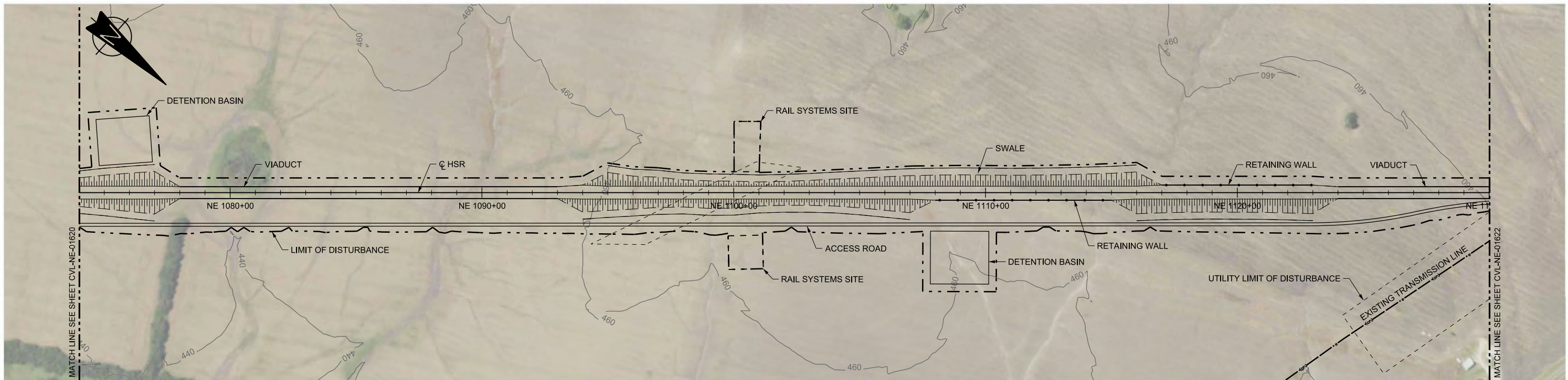
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

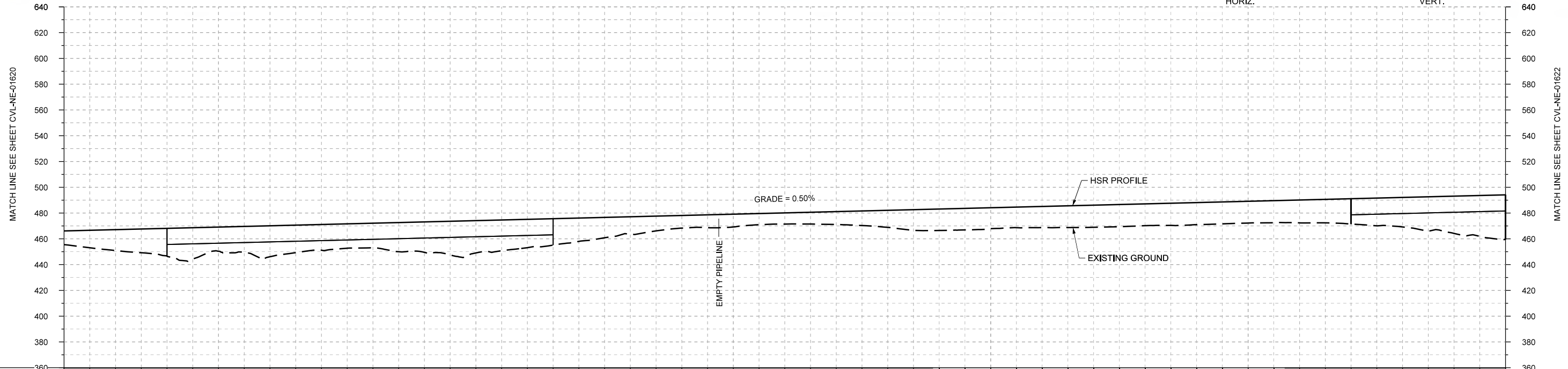
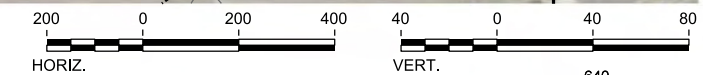
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1018+00 TO NE 1074+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-NE-01620 |
| Rev            |          |            | 01           |



PLAN



PROFILE

|                |                        |            |             |            |            |            |            |       |       |       |                |       |      |      |      |       |             |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|------------|-------------|------------|------------|------------|------------|-------|-------|-------|----------------|-------|------|------|------|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 1074+00             | NE 1080+00 | NE 1090+00  | NE 1100+00 | NE 1110+00 | NE 1120+00 | NE 1130+00 |       |       |       |                |       |      |      |      |       |             |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=48284                |            |             |            |            |            |            |       |       |       |                |       |      |      |      |       |             |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=12683.21<br>G=0.500% |            |             |            |            |            |            |       |       |       |                |       |      |      |      |       |             |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +10.6                  | +16.2      | +21.6       | +18.8      | +24.0      | +20.0      | +18.1      | +23.6 | +25.0 | +22.0 | +18.1          | +13.6 | +9.8 | +9.9 | +8.7 | +10.0 | +13.2       | +16.6 | +16.2 | +16.4 | +17.1 | +16.9 | +17.1 | +16.9 | +17.7 | +19.7 | +22.9 | +28.9 | +34.5 |
| TYP. SECTION   | EMBANKMENT (A)         |            | VIADUCT (E) |            |            |            |            |       |       |       | EMBANKMENT (A) |       |      |      |      |       | VIADUCT (E) |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
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|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
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CHECKED BY  
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IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**



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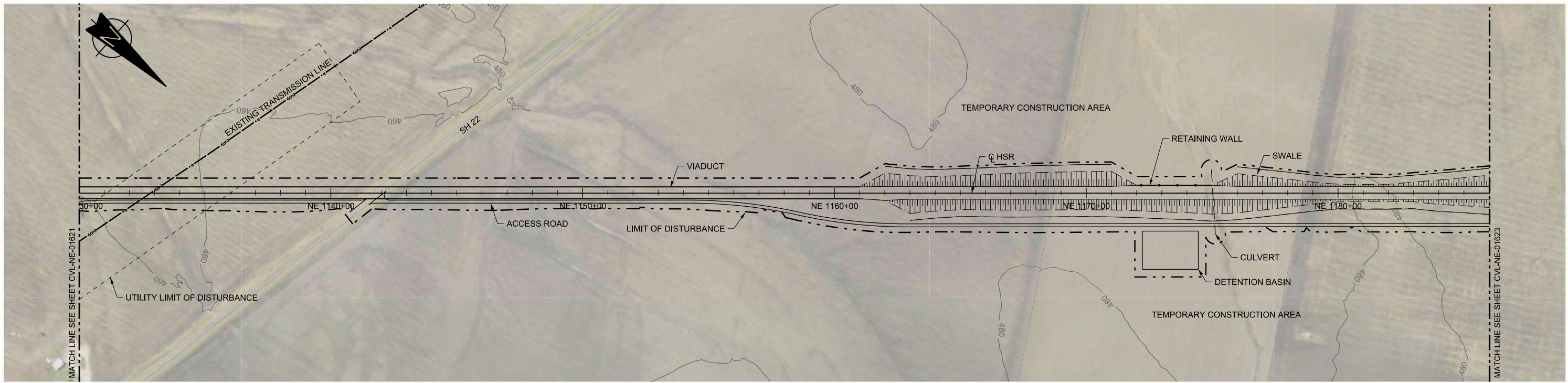
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING



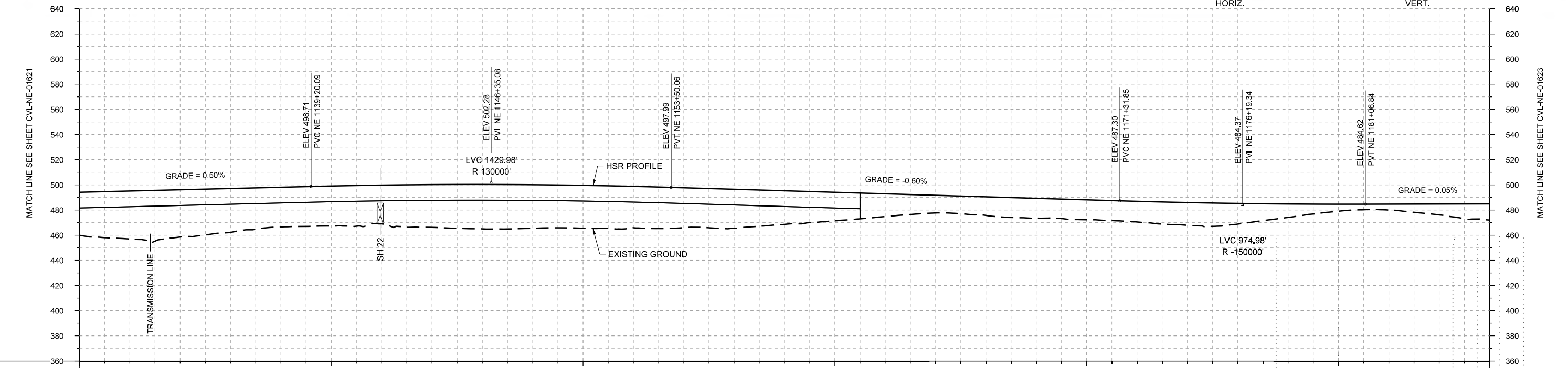
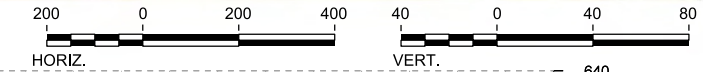
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1074+00 TO NE 1130+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01621 | 01  |  |



PLAN



PROFILE

|                |                        |            |            |                |            |                        |                |
|----------------|------------------------|------------|------------|----------------|------------|------------------------|----------------|
| STATIONING     | NE 1130+00             | NE 1140+00 | NE 1150+00 | NE 1160+00     | NE 1170+00 | NE 1180+00             | NE 1186+00     |
| HOR. ALIGNMENT | L=48284                |            |            |                |            |                        |                |
| VER. ALIGNMENT | L=12683.21<br>G=0.500% |            | R=130000   |                |            | L=1781.79<br>G=-0.600% |                |
| CUT AND FILL   | +34.5                  | +38.1      | +37.6      | +34.9          | +31.5      | +31.8                  | +30.8          |
| TYP. SECTION   | VIADUCT (E)            |            |            | EMBANKMENT (A) |            |                        | EMBANKMENT (A) |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
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IN CHARGE  
**C. TAYLOR**

DATE  
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**FRESE & NICHOLS**

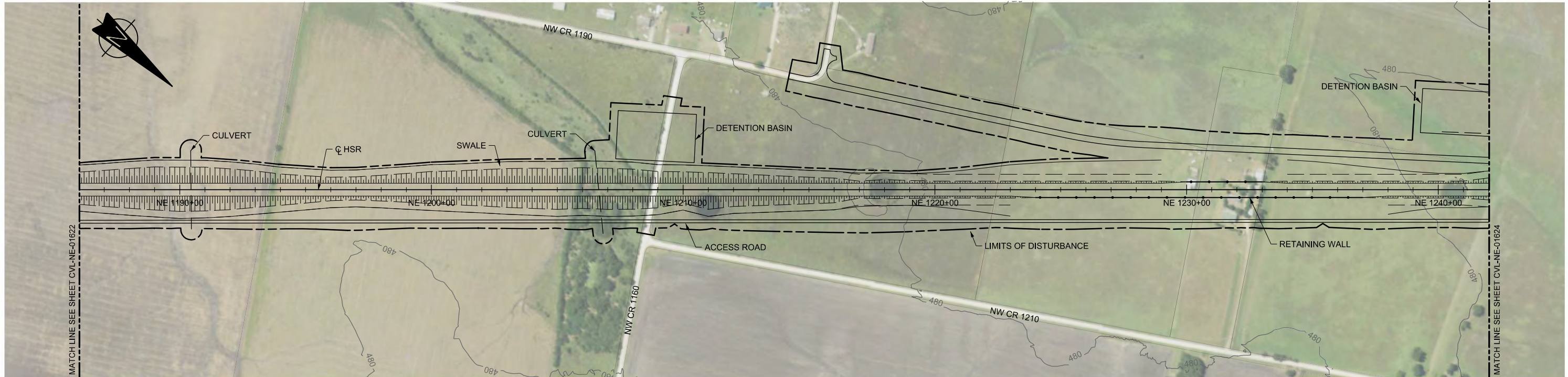
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

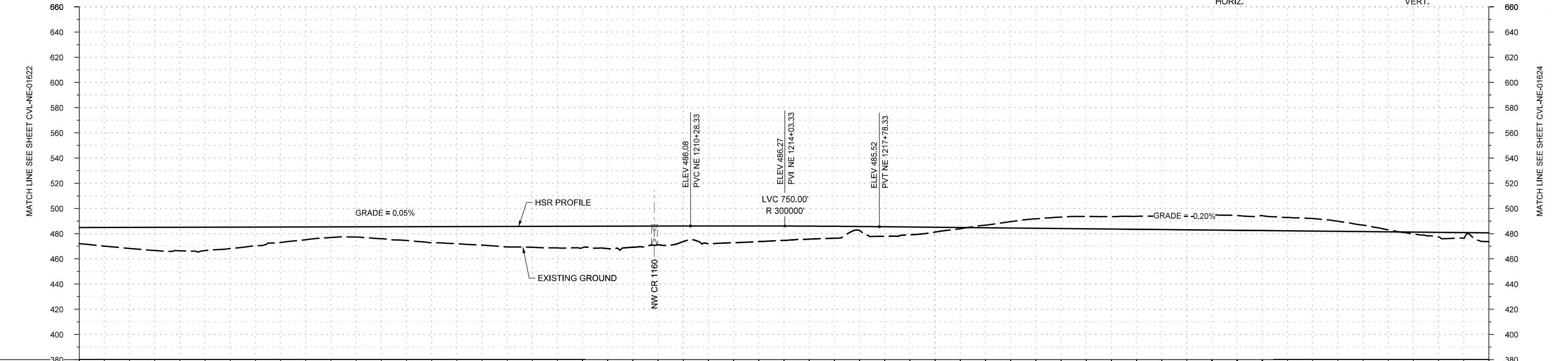
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1130+00 TO NE 1186+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-NE-01622 |
| Rev            | 01           |



PLAN



PROFILE

|                |                       |            |            |            |            |            |            |                  |         |     |
|----------------|-----------------------|------------|------------|------------|------------|------------|------------|------------------|---------|-----|
| STATIONING     | NE 1186+00            | NE 1190+00 | NE 1200+00 | NE 1210+00 | NE 1220+00 | NE 1230+00 | NE 1240+00 | NE 1242+00       |         |     |
| HOR. ALIGNMENT | L=48284               |            |            |            |            |            |            |                  |         |     |
| VER. ALIGNMENT | L=2921.50<br>G=0.050% |            |            |            |            |            |            |                  |         |     |
| CUT AND FILL   | +12.9                 | +16.8      | +18.7      | +17.0      | +12.4      | +13.3      | +11.4      | +9.4             |         |     |
| TYP. SECTION   | EMBANKMENT (A)        |            |            |            | CUT (C)    |            |            | RETAINED CUT (D) | CUT (C) | (A) |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1186+00 TO NE 1242+00**

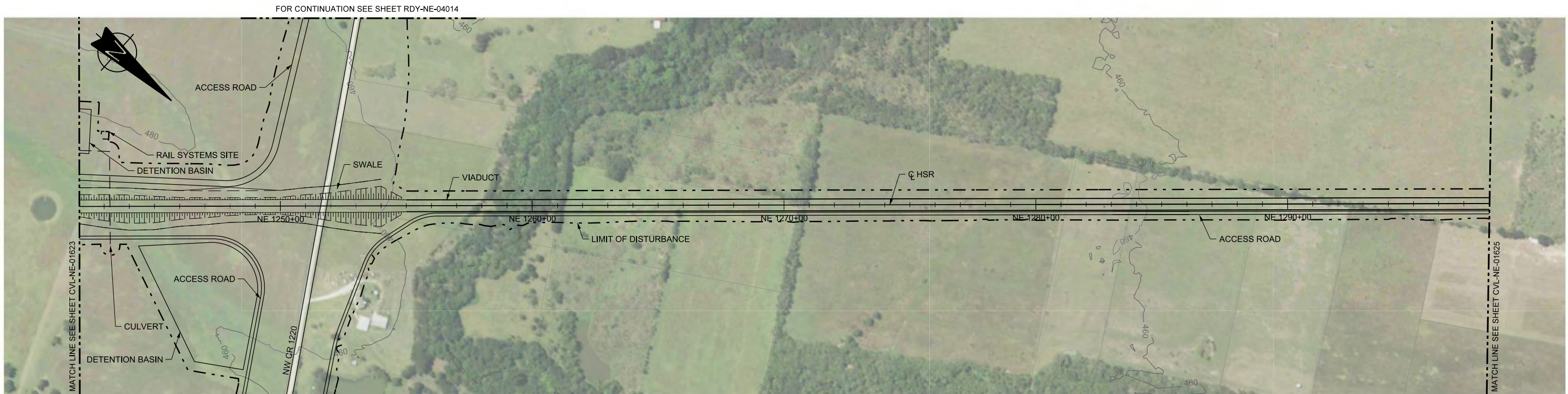
Scale

AS SHOWN

Drawing Status

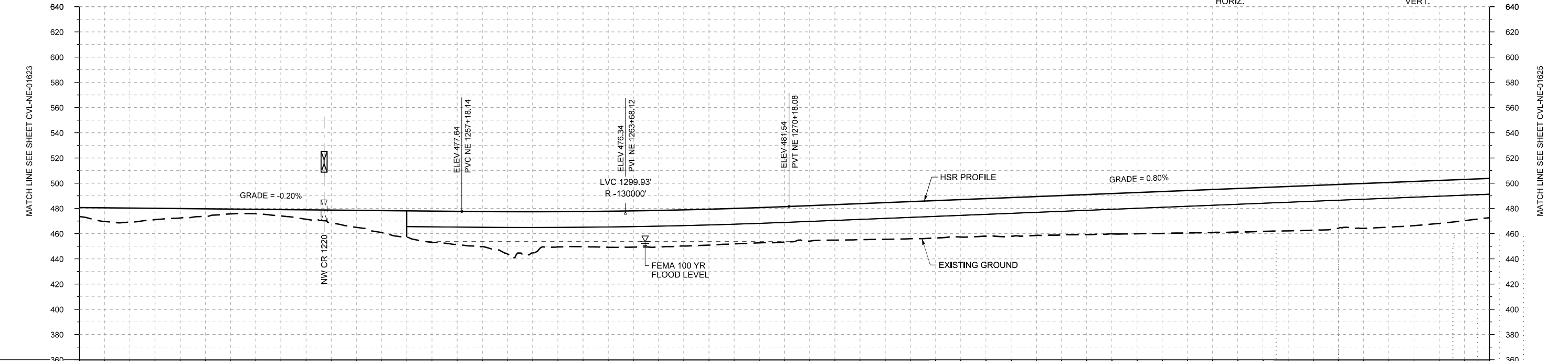
**FINAL**

|        |        |            |              |     |    |
|--------|--------|------------|--------------|-----|----|
| Job No | 234180 | Drawing No | CVL-NE-01623 | Rev | 01 |
|--------|--------|------------|--------------|-----|----|



FOR CONTINUATION SEE SHEET RDY-NE-04014

### PLAN



|                |                        |            |            |            |            |                       |            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|------------|------------|------------|------------|-----------------------|------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 1242+00             | NE 1250+00 | NE 1260+00 | NE 1270+00 | NE 1280+00 | NE 1290+00            | NE 1298+00 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=48284                |            |            |            |            |                       |            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=3939.81<br>G=-0.200% |            |            | R=130000   |            | L=6501.97<br>G=0.800% |            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +7.1                   | +11.2      | +7.5       | +3.9       | +5.1       | +10.4                 | +17.4      | +24.8       | +27.8 | +32.7 | +27.9 | +28.8 | +28.7 | +28.2 | +28.1 | +28.2 | +28.1 | +29.7 | +29.8 | +30.8 | +31.7 | +32.7 | +33.7 | +34.5 | +35.2 | +34.7 | +35.5 | +34.1 | +31.2 |
| TYP. SECTION   | EMBANKMENT (A)         |            |            | CUT (C)    |            | EMBANKMENT (A)        |            | VIADUCT (E) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

### PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

Arup Texas, Inc.  
10370 Richmond Ave., Suite 475  
Houston, Texas 77042 USA  
Tel (713) 783 2787 Fax (713) 343 1467  
www.arup.com  
Texas Registered Engineering Firm: F-1990

**FRESE & NICHOLS**

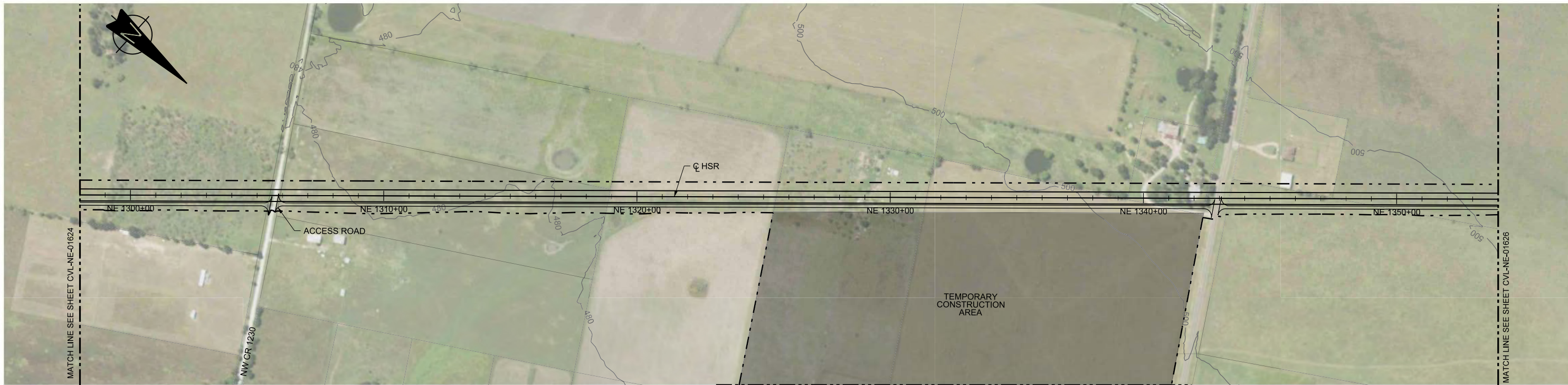
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

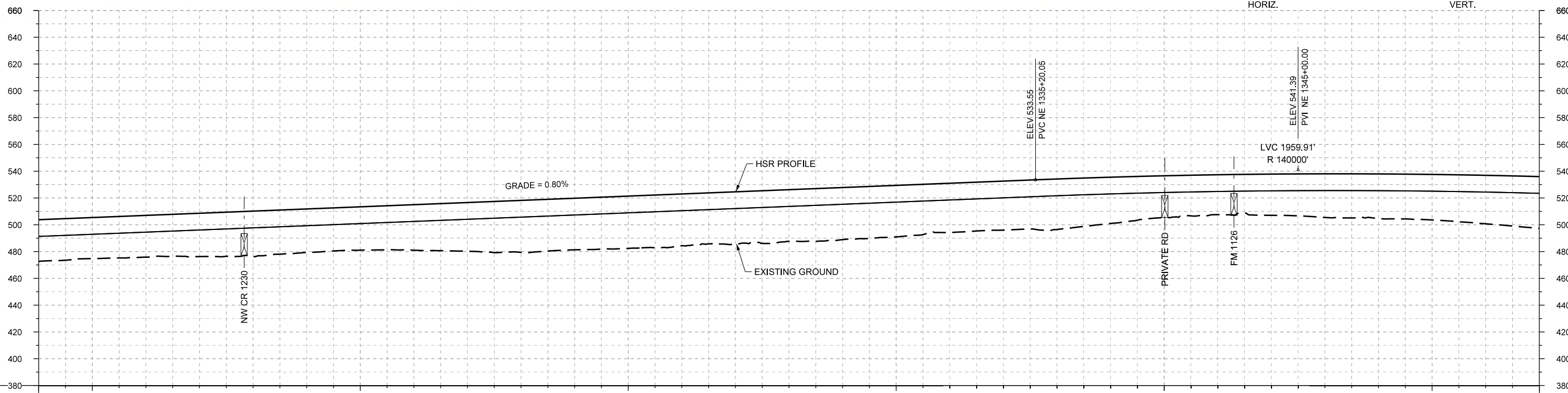
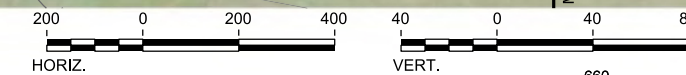
Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1242+00 TO NE 1298+00**

|                   |                                |           |
|-------------------|--------------------------------|-----------|
| Scale<br>AS SHOWN | Drawing Status<br><b>FINAL</b> |           |
| Job No<br>234180  | Drawing No<br>CVL-NE-01624     | Rev<br>01 |



PLAN

FOR CONTINUATION SEE SHEET RDY-NE-04015



|                |                       |            |            |            |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | NE 1298+00            | NE 1300+00 | NE 1310+00 | NE 1320+00 | NE 1330+00 | NE 1340+00 | NE 1350+00 | NE 1354+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=48284               |            |            |            |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=6501.97<br>G=0.800% |            |            |            |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +31.2                 | +30.6      | +31.2      | +32.4      | +34.2      | +32.5      | +32.4      | +34.0      | +36.3 | +38.8 | +38.5 | +39.0 | +38.7 | +38.9 | +38.5 | +38.9 | +38.5 | +36.7 | +36.6 | +37.7 | +34.6 | +31.2 | +29.7 | +30.8 | +32.6 | +33.2 | +34.0 | +36.2 | +36.7 |
| TYP. SECTION   | VIADUCT (E)           |            |            |            |            |            |            |            |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Arup Texas, Inc.  
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**FREESSE & NICHOLS**

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Dallas, Texas 75204  
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www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

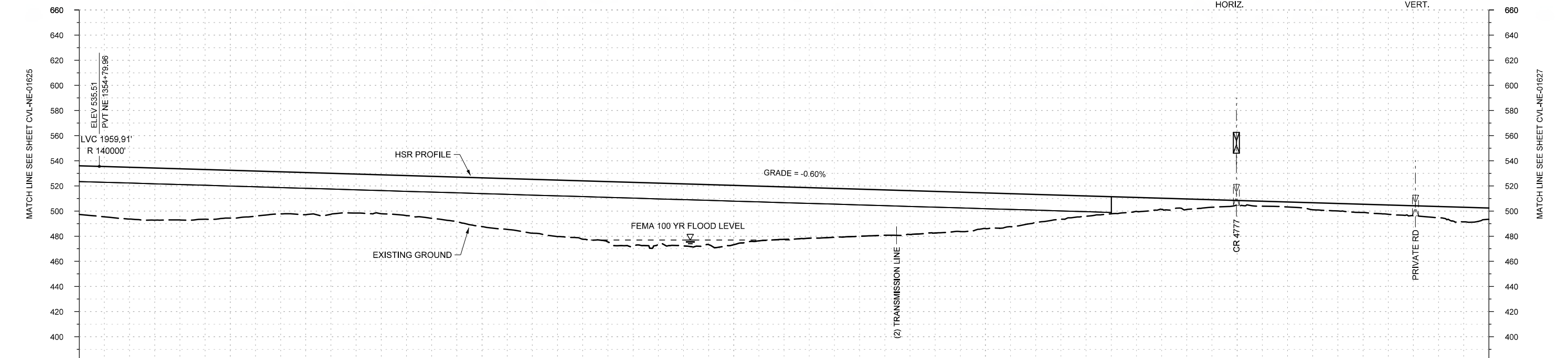
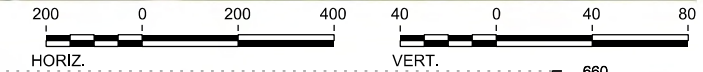
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1298+00 TO NE 1354+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01625 | 01  |  |



PLAN



PROFILE

|                |                        |            |            |            |            |            |            |       |       |       |                |       |       |       |       |         |       |       |       |       |       |      |      |      |      |      |      |
|----------------|------------------------|------------|------------|------------|------------|------------|------------|-------|-------|-------|----------------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| STATIONING     | NE 1354+00             | NE 1360+00 | NE 1370+00 | NE 1380+00 | NE 1390+00 | NE 1400+00 | NE 1410+00 |       |       |       |                |       |       |       |       |         |       |       |       |       |       |      |      |      |      |      |      |
| HOR. ALIGNMENT | L=48284                |            |            |            |            |            |            |       |       |       |                |       |       |       |       |         |       |       |       |       |       |      |      |      |      |      |      |
| VER. ALIGNMENT | L=8220.06<br>G=-0.600% |            |            |            |            |            |            |       |       |       |                |       |       |       |       |         |       |       |       |       |       |      |      |      |      |      |      |
| CUT AND FILL   | +36.7                  | +41.2      | +40.7      | +38.0      | +33.5      | +32.6      | +30.9      | +33.3 | +38.7 | +42.8 | +46.4          | +50.9 | +49.3 | +47.2 | +41.7 | +36.1   | +33.1 | +28.4 | +22.6 | +16.1 | +11.1 | +8.3 | +4.6 | +4.0 | +5.9 | +7.4 | +8.9 |
| TYP. SECTION   | VIADUCT (E)            |            |            |            |            |            |            |       |       |       | EMBANKMENT (A) |       |       |       |       | CUT (C) |       |       |       |       |       |      |      |      |      |      |      |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

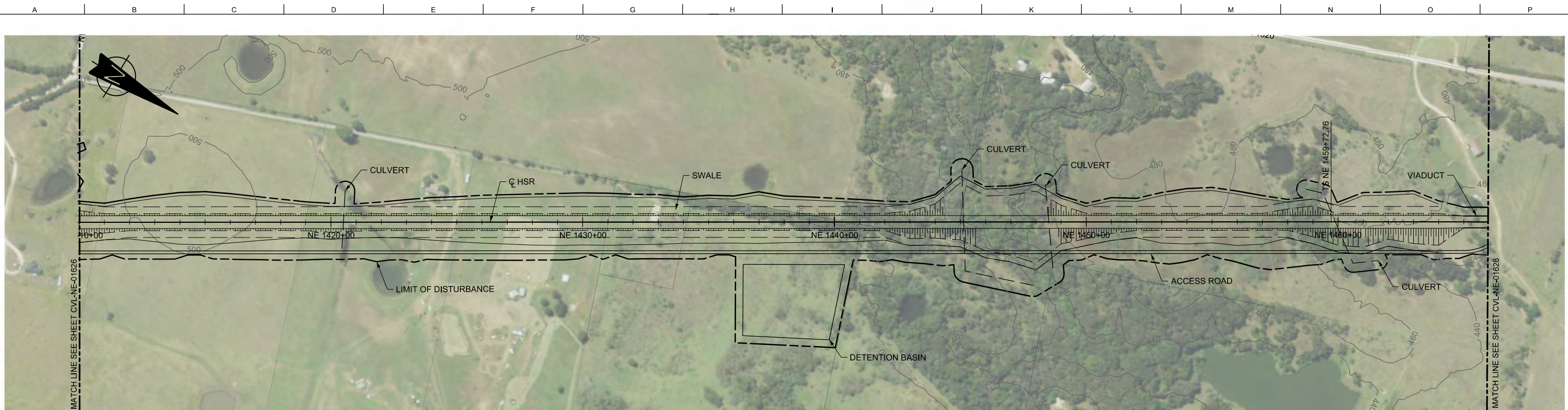
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1354+00 TO NE 1410+00**

Scale  
AS SHOWN

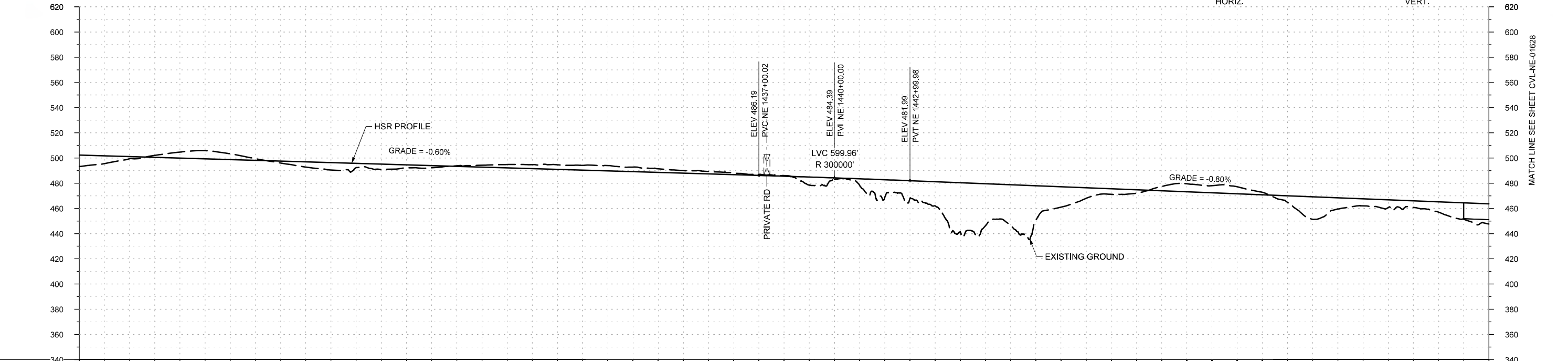
Drawing Status  
**FINAL**

|        |        |            |              |     |    |
|--------|--------|------------|--------------|-----|----|
| Job No | 234180 | Drawing No | CVL-NE-01626 | Rev | 01 |
|--------|--------|------------|--------------|-----|----|





PLAN



PROFILE

|                |                        |            |            |                |            |                        |            |      |      |                |      |      |      |                  |      |                |       |       |       |       |      |      |      |      |      |      |      |      |       |
|----------------|------------------------|------------|------------|----------------|------------|------------------------|------------|------|------|----------------|------|------|------|------------------|------|----------------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|-------|
| STATIONING     | NE 1410+00             | NE 1420+00 | NE 1430+00 | NE 1440+00     | NE 1450+00 | NE 1460+00             | NE 1466+00 |      |      |                |      |      |      |                  |      |                |       |       |       |       |      |      |      |      |      |      |      |      |       |
| HOR. ALIGNMENT | L=48284                |            |            |                |            |                        | L=700      |      |      |                |      |      |      |                  |      |                |       |       |       |       |      |      |      |      |      |      |      |      |       |
| VER. ALIGNMENT | L=8220.06<br>G=-0.600% |            |            | R=300000       |            | L=5500.06<br>G=-0.800% |            |      |      |                |      |      |      |                  |      |                |       |       |       |       |      |      |      |      |      |      |      |      |       |
| CUT AND FILL   | +8.0                   | +1.7       | -4.7       | -4.5           | +1.5       | +5.9                   | +4.2       | +1.7 | -1.5 | -3.1           | -3.7 | -3.6 | -2.0 | -1.3             | -0.5 | +1.2           | +14.1 | +19.1 | +33.4 | +27.6 | +8.4 | +2.7 | -6.3 | -5.6 | +5.2 | +8.9 | +6.2 | +8.1 | +16.0 |
| TYP. SECTION   | (A)                    | CUT (C)    |            | EMBANKMENT (A) |            | CUT (C)                |            |      |      | EMBANKMENT (A) |      |      |      | RETAINED CUT (D) |      | EMBANKMENT (A) |       |       |       | (E)   |      |      |      |      |      |      |      |      |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

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Texas Registered Engineering Firm: F-1990

**FREESSE & NICHOLS**

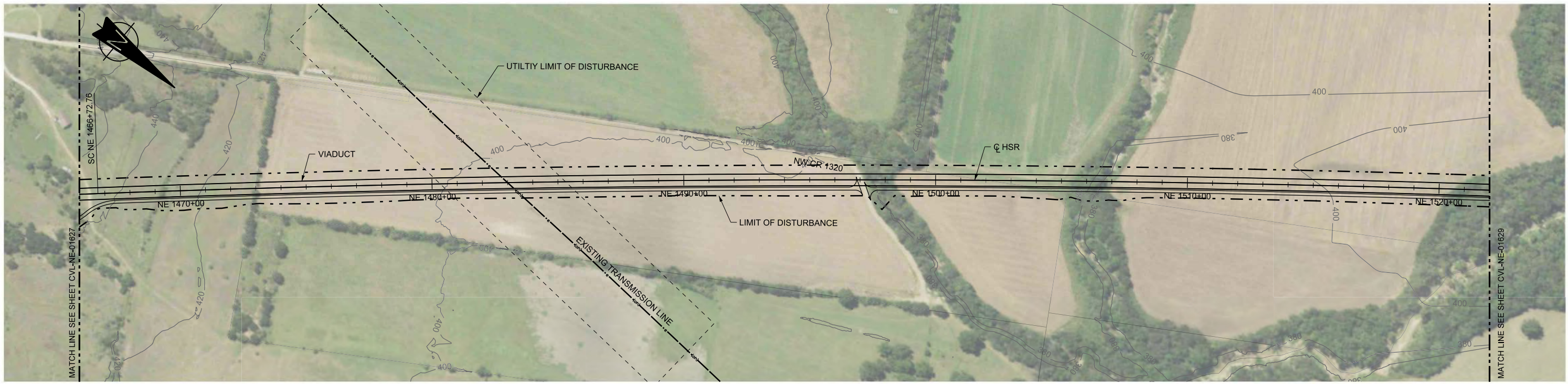
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freesse.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

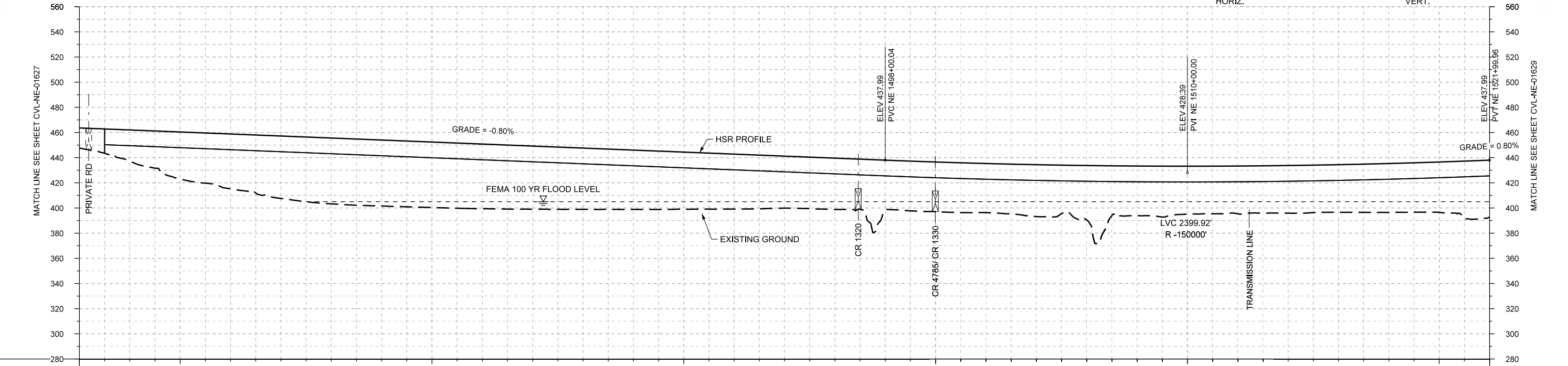
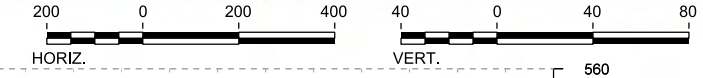
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1410+00 TO NE 1466+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-NE-01627 |
| Rev            | 01           |



PLAN



PROFILE

|                |                        |            |            |            |                    |            |                       |            |
|----------------|------------------------|------------|------------|------------|--------------------|------------|-----------------------|------------|
| STATIONING     | NE 1466+00             | NE 1470+00 | NE 1480+00 | NE 1490+00 | NE 1500+00         | NE 1510+00 | NE 1520+00            | NE 1522+00 |
| HOR. ALIGNMENT | L=700                  |            |            |            | R=80000<br>L=16201 |            | L=3326.33<br>G=0.800% |            |
| VER. ALIGNMENT | L=5500.06<br>G=-0.800% |            |            |            |                    |            |                       |            |
| CUT AND FILL   | +16.0                  | +24.7      | +37.4      | +43.6      | +49.6              | +52.3      | +52.4                 | +51.4      |
|                |                        |            |            |            | +50.2              | +48.7      | +47.1                 | +45.4      |
|                |                        |            |            |            | +43.7              | +41.3      | +40.8                 | +39.8      |
|                |                        |            |            |            | +39.4              | +39.0      | +41.2                 | +43.2      |
|                |                        |            |            |            | +39.4              | +38.1      | +37.9                 | +37.8      |
|                |                        |            |            |            | +37.9              | +37.9      | +37.9                 | +38.9      |
|                |                        |            |            |            | +40.0              | +40.0      | +40.0                 | +45.2      |
| TYP. SECTION   | VIADUCT (E)            |            |            |            |                    |            |                       |            |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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**FREESSE & NICHOLS**

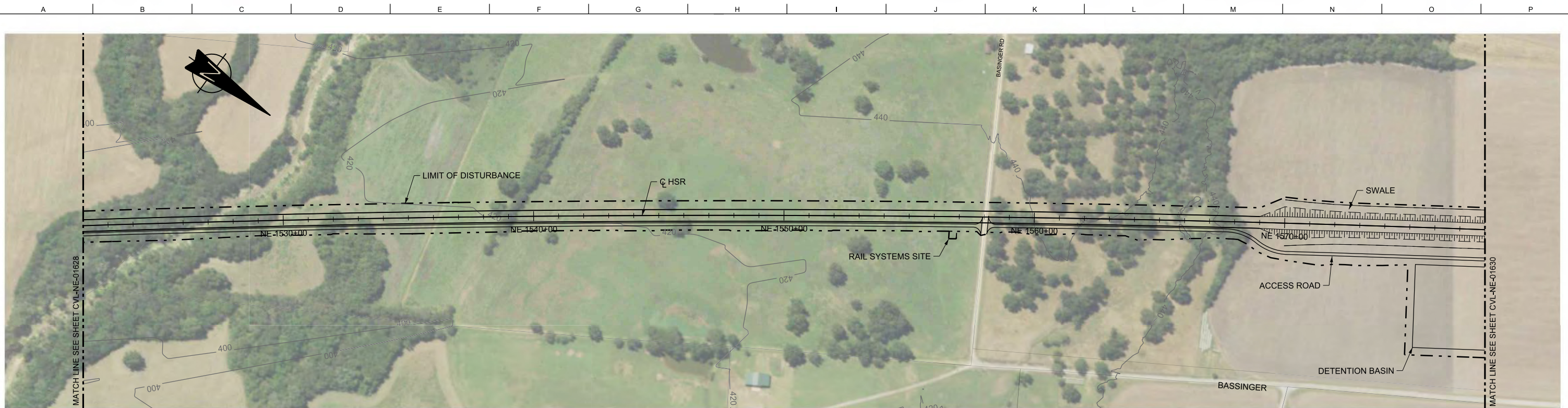
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freesse.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

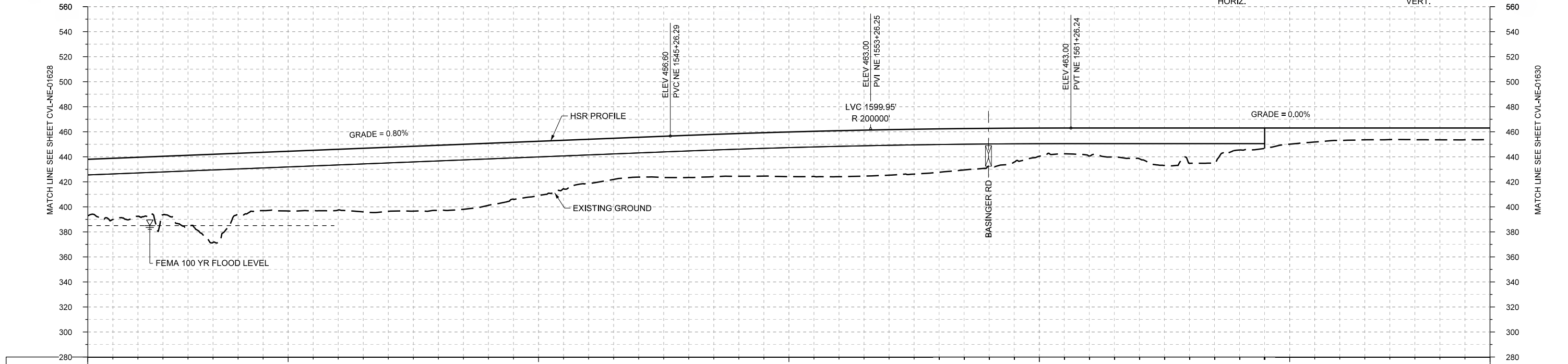
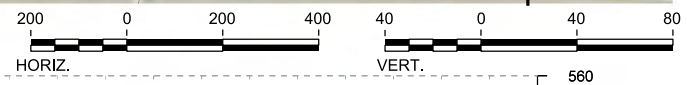
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1466+00 TO NE 1522+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01628 | 01  |  |



PLAN



|                |                       |            |            |                    |                       |            |            |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |      |
|----------------|-----------------------|------------|------------|--------------------|-----------------------|------------|------------|-------|-------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| STATIONING     | NE 1522+00            | NE 1530+00 | NE 1540+00 | NE 1550+00         | NE 1560+00            | NE 1570+00 | NE 1578+00 |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |      |
| HOR. ALIGNMENT |                       |            |            | R=80000<br>L=16201 |                       |            |            |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |      |
| VER. ALIGNMENT | L=2326.33<br>G=0.800% |            |            | R=200000           | L=9079.21<br>G=0.000% |            |            |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |      |
| CUT AND FILL   | +45.2                 | +47.1      | +57.3      | +48.7              | +47.7                 | +48.5      | +51.2      | +52.1 | +49.6 | +43.5 | +35.2 | +31.8 | +33.7 | +34.2 | +36.7          | +36.8 | +36.4 | +34.7 | +29.9 | +22.6 | +22.4 | +24.6 | +28.2 | +17.6 | +12.9 | +10.0 | +9.3 | +9.4 |
| TYP. SECTION   | VIADUCT (E)           |            |            |                    |                       |            |            |       |       |       |       |       |       |       | EMBANKMENT (A) |       |       |       |       |       |       |       |       |       |       |       |      |      |

PROFILE

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |

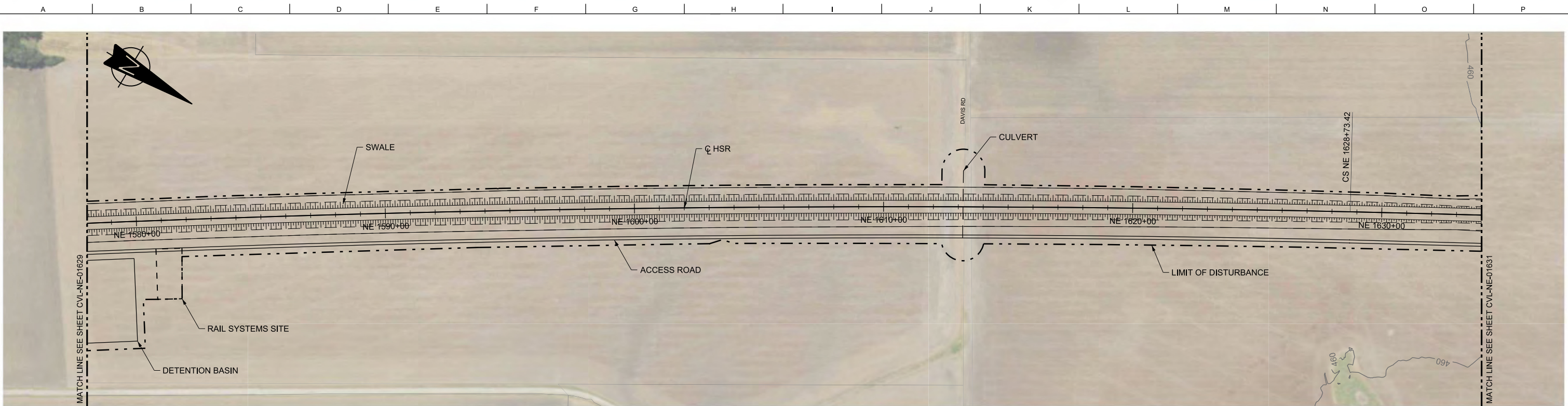
**ARUP**  
 Arup Texas, Inc.  
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 Texas Registered Engineering Firm: F-2144

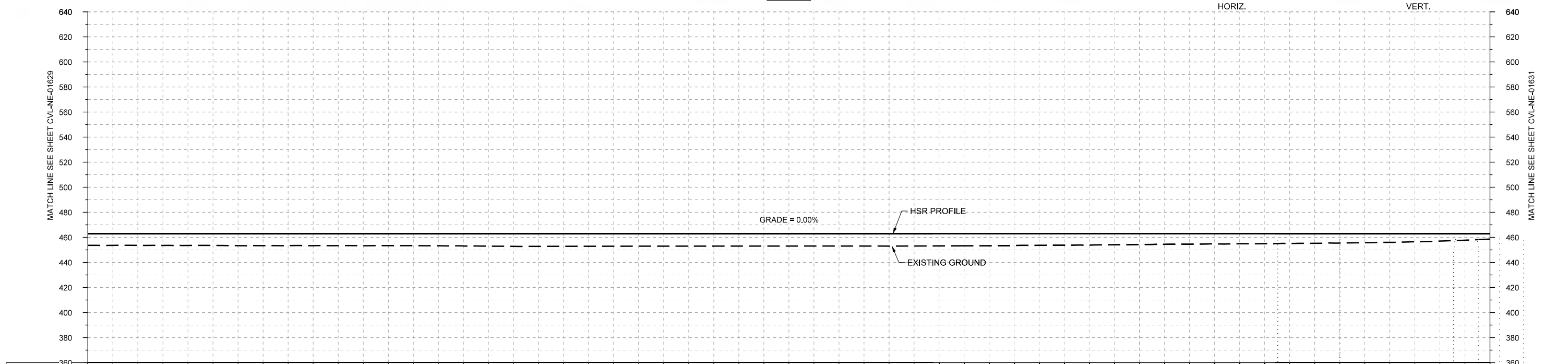
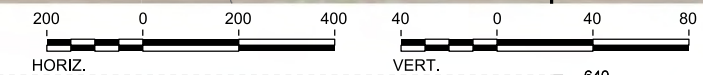
DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING  
  
 1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
 CIVIL  
 PLAN AND PROFILE  
 NE 1522+00 TO NE 1578+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-NE-01629 |
| Rev            | 01           |



PLAN



|                |                       |            |      |            |      |            |      |            |       |            |       |            |            |       |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|-----------------------|------------|------|------------|------|------------|------|------------|-------|------------|-------|------------|------------|-------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| STATIONING     | NE 1578+00            | NE 1580+00 |      | NE 1590+00 |      | NE 1600+00 |      | NE 1610+00 |       | NE 1620+00 |       | NE 1630+00 | NE 1634+00 |       |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |
| HOR. ALIGNMENT | R=80000<br>L=16201    |            |      |            |      |            |      |            |       |            |       |            |            |       |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |
| VER. ALIGNMENT | L=9079.21<br>G=0.000% |            |      |            |      |            |      |            |       |            |       |            |            |       |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |
| CUT AND FILL   | +9.4                  | +9.4       | +9.5 | +9.6       | +9.6 | +9.6       | +9.6 | +9.7       | +10.0 | +10.2      | +10.1 | +10.1      | +10.0      | +10.0 | +9.9 | +9.9 | +10.0 | +9.8 | +9.7 | +9.4 | +9.2 | +8.7 | +8.4 | +8.1 | +7.9 | +7.6 | +7.0 | +6.0 | +4.4 |
| TYP. SECTION   | EMBANKMENT (F)        |            |      |            |      |            |      |            |       |            |       |            |            |       |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

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10370 Richmond Ave., Suite 475  
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Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

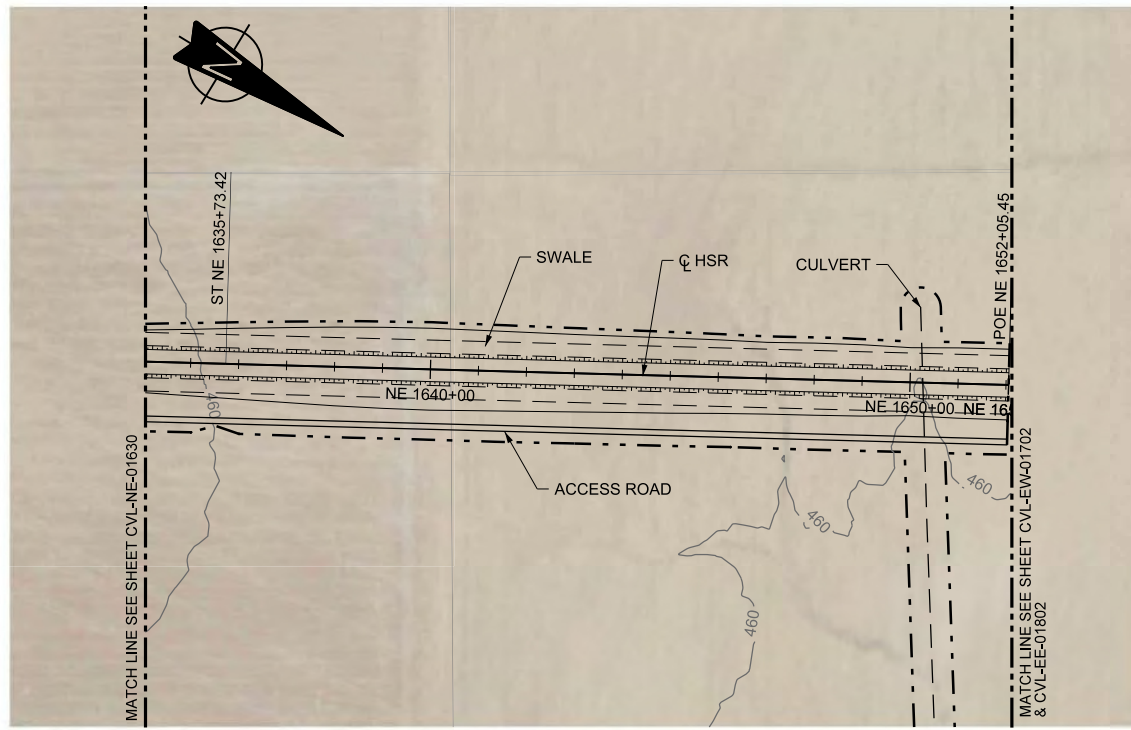
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

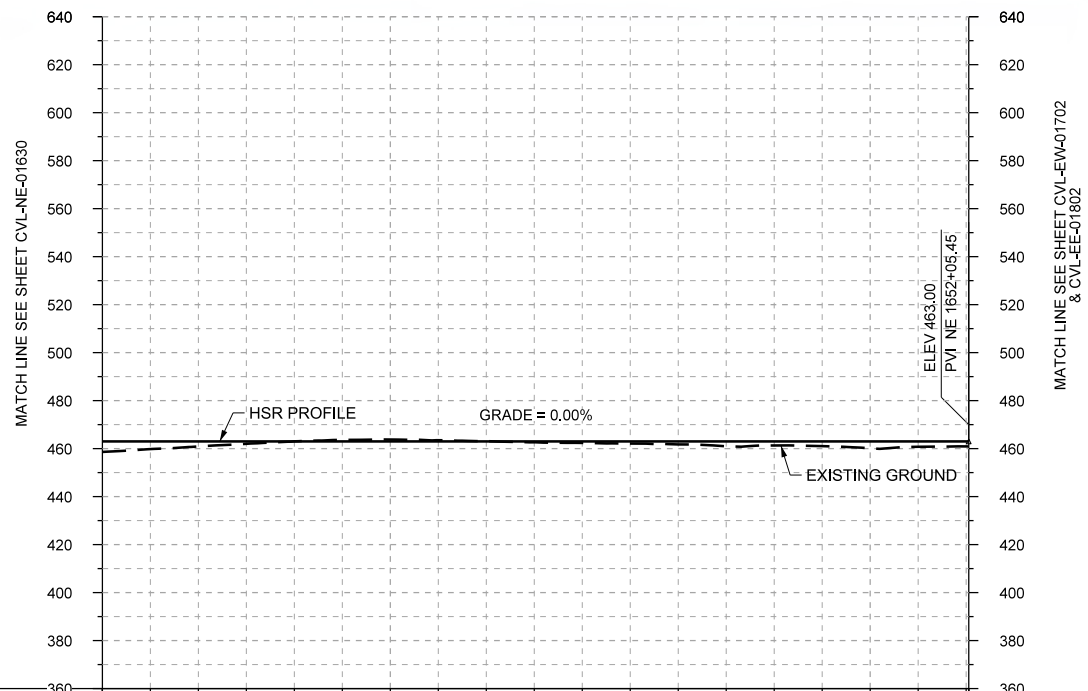
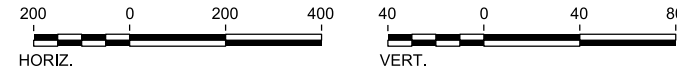
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
NE 1578+00 TO NE 1634+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-NE-01630 | 01  |  |



PLAN



PROFILE

|                |                       |            |            |            |      |      |      |      |      |
|----------------|-----------------------|------------|------------|------------|------|------|------|------|------|
| STATIONING     | NE 1634+00            | NE 1640+00 | NE 1650+00 | NE 1652+05 |      |      |      |      |      |
| HOR. ALIGNMENT | L=700                 |            | L=1632     |            |      |      |      |      |      |
| VER. ALIGNMENT | L=9079.21<br>G=0.000% |            |            |            |      |      |      |      |      |
| CUT AND FILL   | +4.4                  | +2.1       | -0.8       | -0.1       | +0.6 | +1.2 | +1.7 | +2.8 | +2.1 |
| TYP. SECTION   | EMBANKMENT (F)        |            |            |            |      |      |      |      |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

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 www.freese.com  
 Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**NAVARRO EAST SEGMENT  
 CIVIL  
 PLAN AND PROFILE  
 NE 1634+00 TO NE 1652+05**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-NE-01631 |
| Rev            | 01           |

# 2B-3

## ELLIS EAST SEGMENT

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**K. SEYMOUR**

DRAWN BY  
**D. THOMPSON**

CHECKED BY  
**R. BURNS**

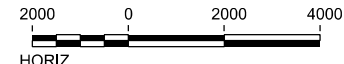
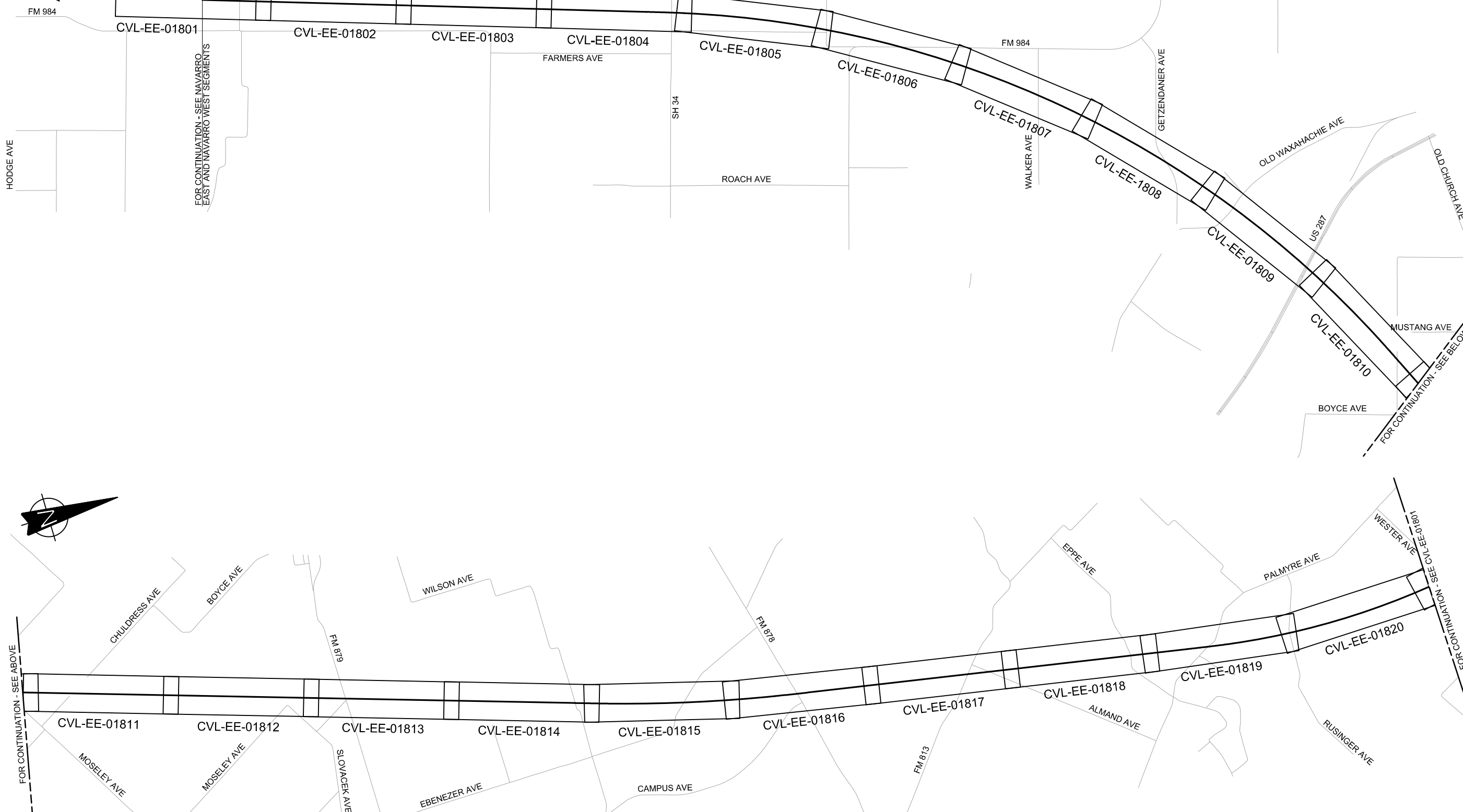
IN CHARGE  
**C. TAYLOR**

DATE  
**2/25/2019**



Drawing Title  
**GENERAL**

|                                |                                  |                  |
|--------------------------------|----------------------------------|------------------|
| Scale<br><b>NO SCALE</b>       |                                  |                  |
| Drawing Status<br><b>FINAL</b> |                                  |                  |
| Job No<br><b>234180</b>        | Drawing No<br><b>GEN-00-0000</b> | Rev<br><b>01</b> |



| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**



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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING



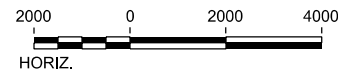
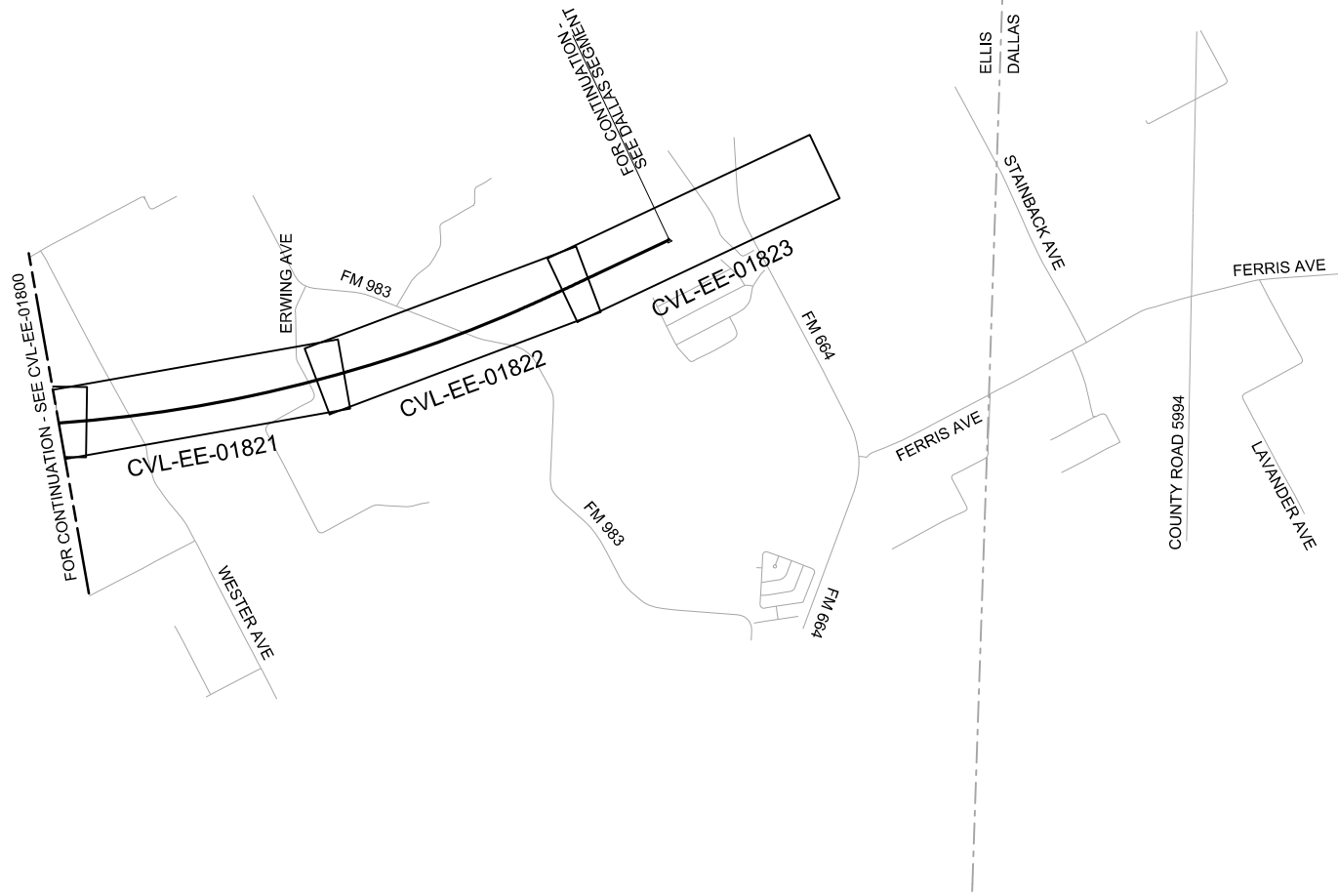
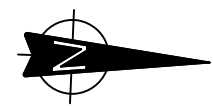
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
KEY MAP - SHEET 1 OF 2  
EE 9+56 TO EE 1098+00**

Scale  
AS SHOWN

Drawing Status  
**FINAL**

|                  |                              |           |
|------------------|------------------------------|-----------|
| Job No<br>234180 | Drawing No<br>CVL-EE-01800-1 | Rev<br>01 |
|------------------|------------------------------|-----------|



| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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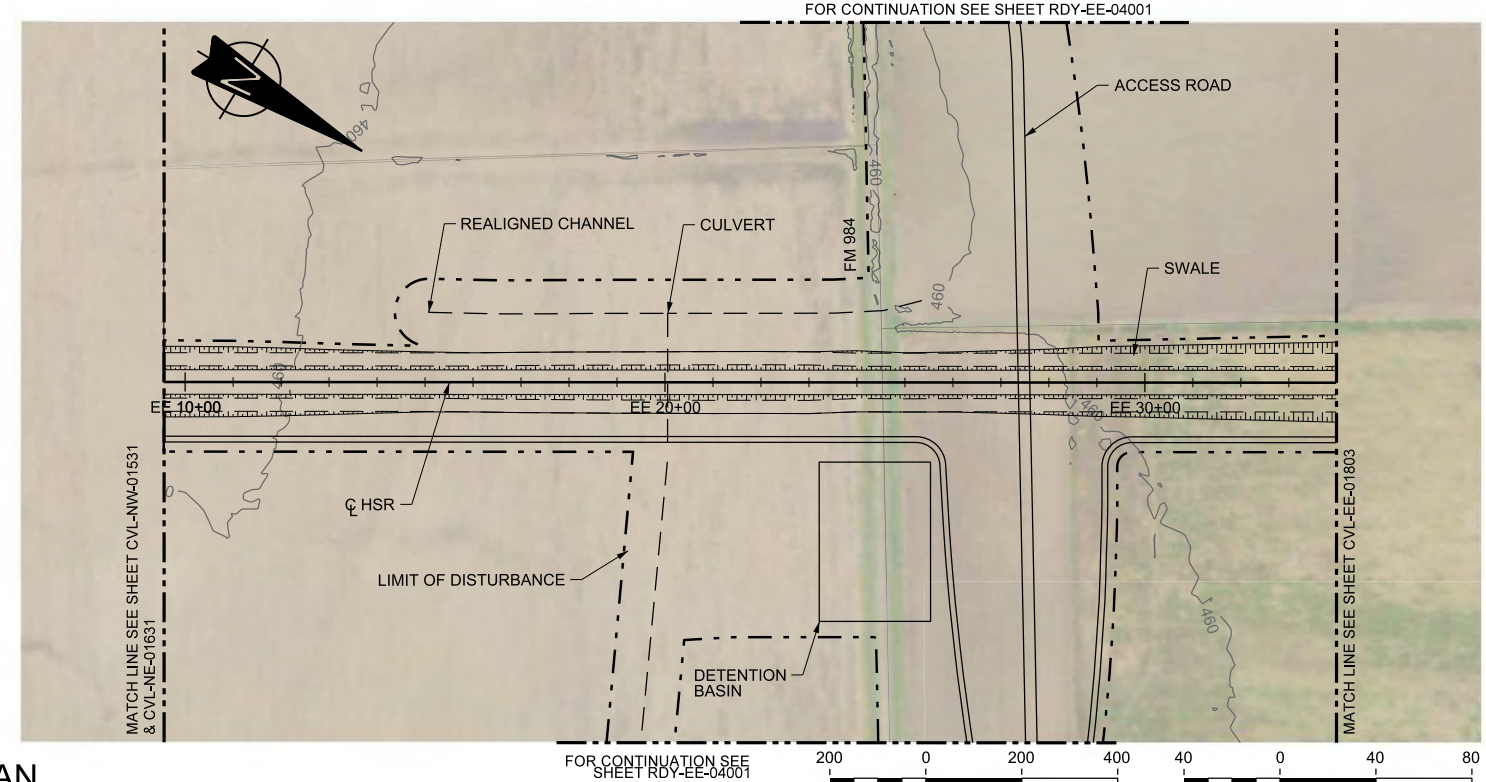
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

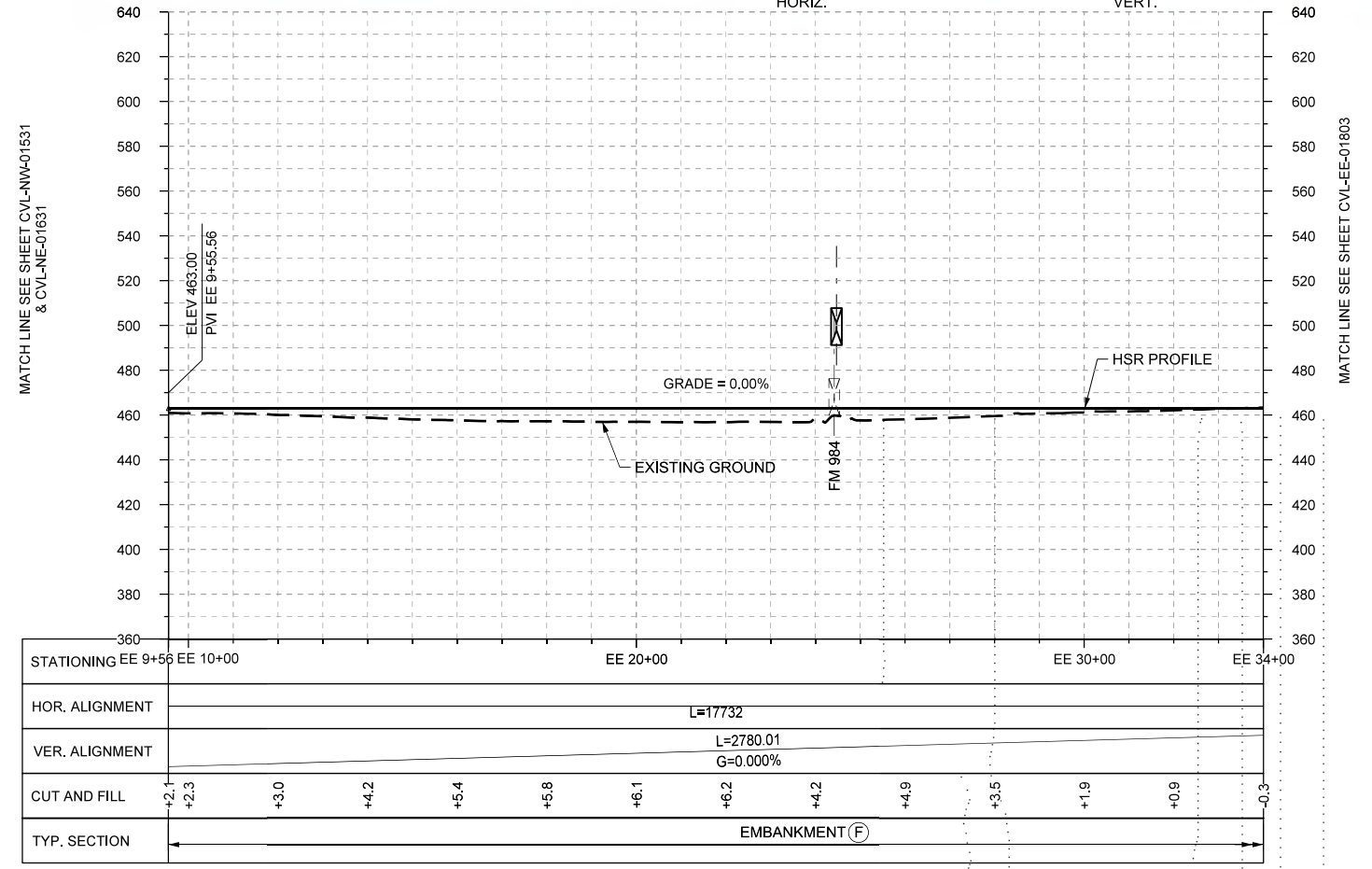
Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
KEY MAP - SHEET 2 OF 2  
EE 1098+00 TO EE 1232+15**

|                         |                              |           |
|-------------------------|------------------------------|-----------|
| Scale<br>AS SHOWN       |                              |           |
| Drawing Status<br>FINAL |                              |           |
| Job No<br>234180        | Drawing No<br>CVL-EE-01800-2 | Rev<br>01 |





PLAN



PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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www.freesse.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

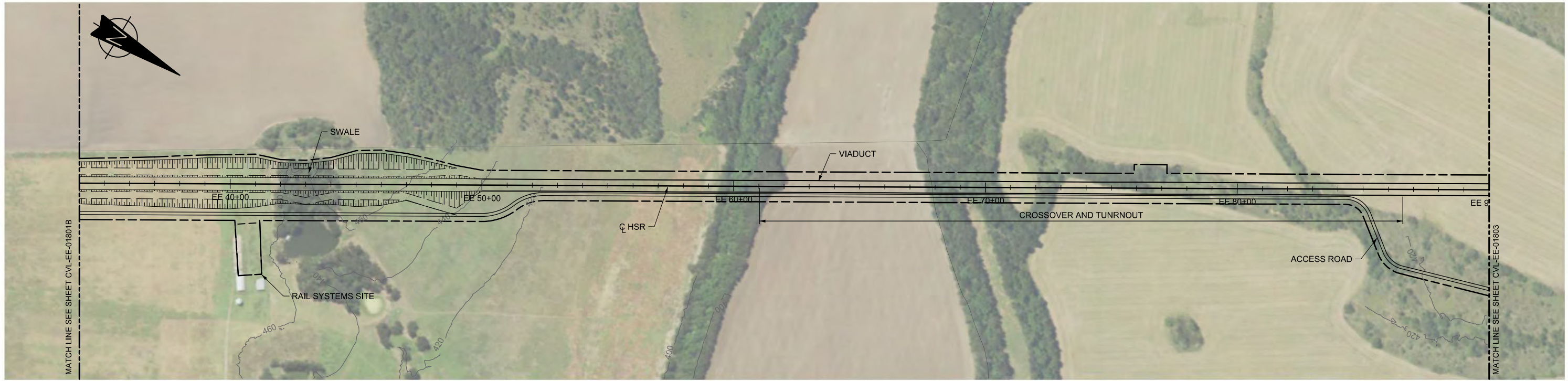
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 9+56 TO EE 34+00**

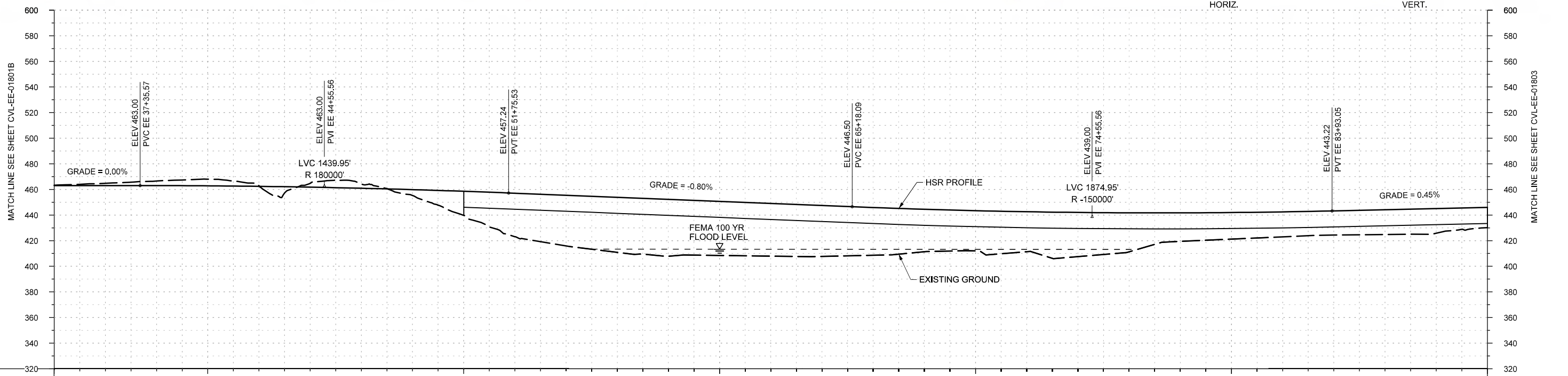
Scale  
**AS SHOWN**

Drawing Status  
**FINAL**

|                         |                                   |                  |
|-------------------------|-----------------------------------|------------------|
| Job No<br><b>234180</b> | Drawing No<br><b>CVL-EE-01801</b> | Rev<br><b>01</b> |
|-------------------------|-----------------------------------|------------------|



PLAN



PROFILE

|                |                       |          |          |          |                        |          |          |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------|----------|----------|----------|------------------------|----------|----------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 34+00              | EE 40+00 | EE 50+00 | EE 60+00 | EE 70+00               | EE 80+00 | EE 90+00 |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=17732               |          |          |          |                        |          |          |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=2780.01<br>G=0.000% |          | R=180000 |          | L=1342.57<br>G=-0.800% |          | R=150000 |      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | -0.3                  | -1.8     | -3.6     | -5.2     | -0.6                   | -2.9     | -3.4     | +4.7 | +18.8       | +33.9 | +39.5 | +42.9 | +44.4 | +42.2 | +41.1 | +39.7 | +37.3 | +33.1 | +31.4 | +31.3 | +34.4 | +30.4 | +22.2 | +20.8 | +19.5 | +18.7 | +19.3 | +19.2 | +15.7 |
| TYP. SECTION   | CUT (C)               |          |          |          | EMBANKMENT (E)         |          |          |      | VIADUCT (K) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

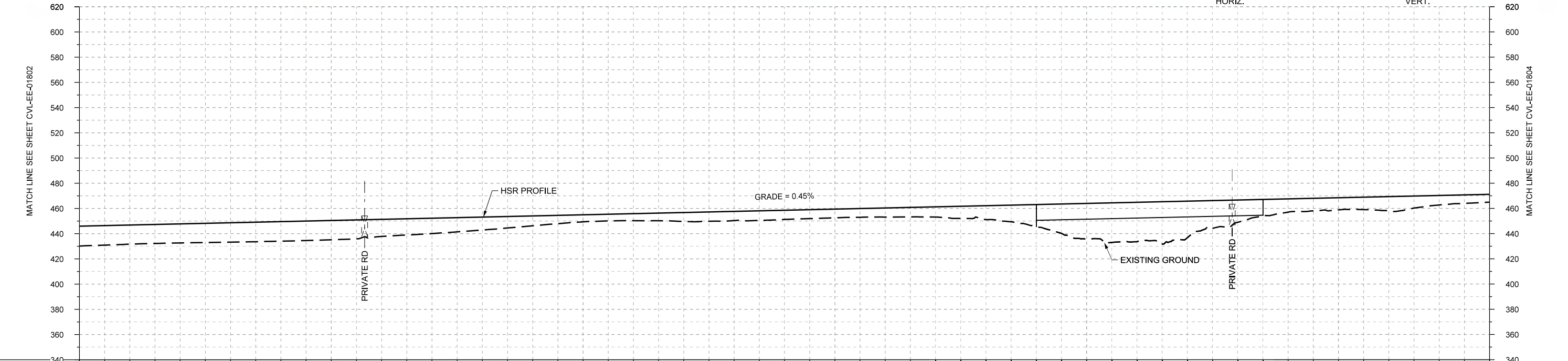
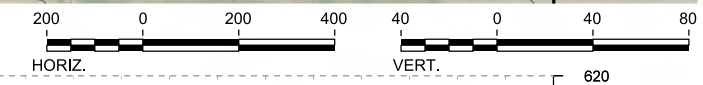
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 34+00 TO EE 90+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-EE-01802 |
| Rev            |          |            | 01           |



PLAN



PROFILE

|                |                       |           |           |           |           |           |           |       |       |      |             |      |      |      |      |                |      |      |       |       |       |       |       |       |       |      |       |      |      |
|----------------|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|------|-------------|------|------|------|------|----------------|------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|------|
| STATIONING     | EE 90+00              | EE 100+00 | EE 110+00 | EE 120+00 | EE 130+00 | EE 140+00 | EE 146+00 |       |       |      |             |      |      |      |      |                |      |      |       |       |       |       |       |       |       |      |       |      |      |
| HOR. ALIGNMENT | L=17732               |           |           |           |           |           |           |       |       |      |             |      |      |      |      |                |      |      |       |       |       |       |       |       |       |      |       |      |      |
| VER. ALIGNMENT | L=7587.57<br>G=0.450% |           |           |           |           |           |           |       |       |      |             |      |      |      |      |                |      |      |       |       |       |       |       |       |       |      |       |      |      |
| CUT AND FILL   | +15.7                 | +15.1     | +15.1     | +15.3     | +15.5     | +15.3     | +13.5     | +12.1 | +10.2 | +7.8 | +5.5        | +5.5 | +7.0 | +7.3 | +7.3 | +6.8           | +7.2 | +8.0 | +11.0 | +17.5 | +28.3 | +31.2 | +29.0 | +17.6 | +10.4 | +9.6 | +11.2 | +7.5 | +6.2 |
| TYP. SECTION   | EMBANKMENT (F)        |           |           |           |           |           |           |       |       |      | VIADUCT (K) |      |      |      |      | EMBANKMENT (F) |      |      |       |       |       |       |       |       |       |      |       |      |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-2144

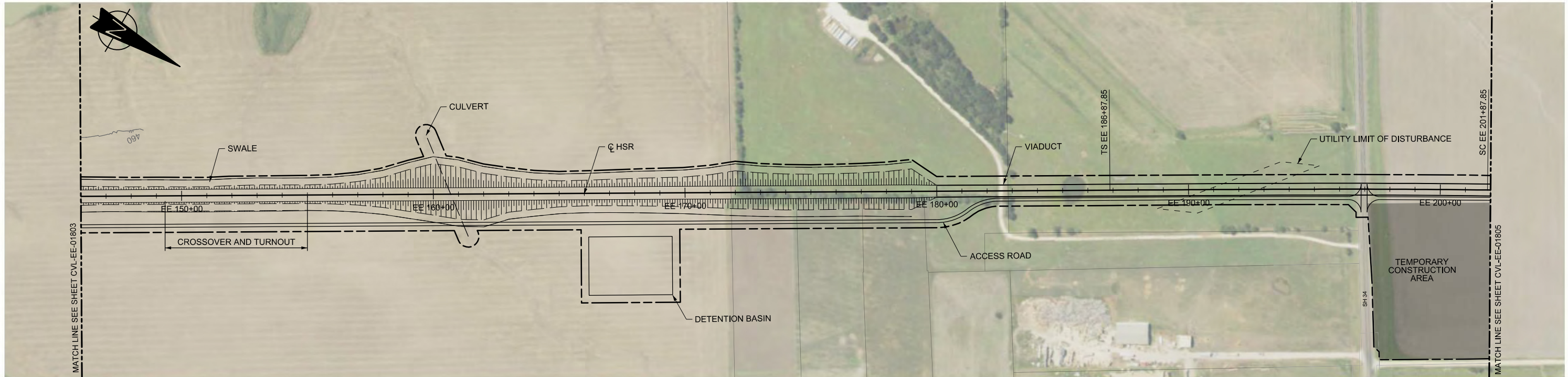
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

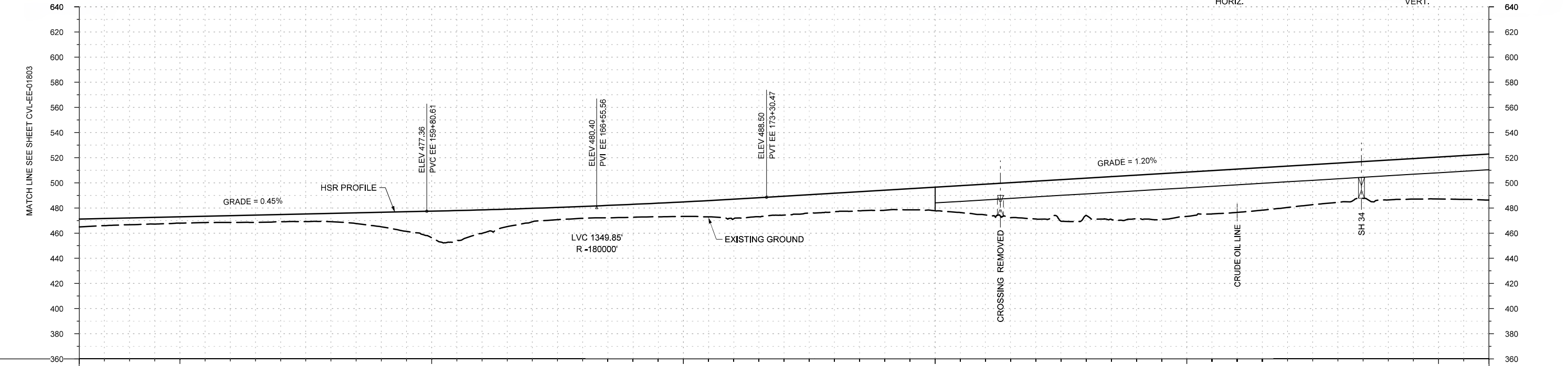
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 90+00 TO EE 146+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-EE-01803 |
| Rev            |          |            | 01           |



PLAN



PROFILE

|                |                       |           |           |           |                       |           |             |           |  |
|----------------|-----------------------|-----------|-----------|-----------|-----------------------|-----------|-------------|-----------|--|
| STATIONING     | EE 146+00             | EE 150+00 | EE 160+00 | EE 170+00 | EE 180+00             | EE 190+00 | EE 200+00   | EE 202+00 |  |
| HOR. ALIGNMENT | L=17732               |           |           |           | L=1500                |           |             |           |  |
| VER. ALIGNMENT | L=7587.57<br>G=0.450% |           |           |           | L=3500.20<br>G=1.200% |           |             |           |  |
| CUT AND FILL   | +6.2                  | +5.3      | +4.9      | +5.3      | +5.7                  | +6.5      | +11.4       | +21.2     |  |
|                | +18.7                 | +10.7     | +9.4      | +10.3     | +11.5                 | +15.5     | +15.0       | +14.7     |  |
|                | +15.9                 | +18.7     | +24.4     | +30.1     | +29.5                 | +34.9     | +35.2       | +34.5     |  |
|                | +32.9                 | +31.2     | +31.7     | +33.4     | +36.6                 |           |             |           |  |
| TYP. SECTION   | EMBANKMENT (F)        |           |           |           |                       |           | VIADUCT (K) |           |  |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 146+00 TO EE 202+00**

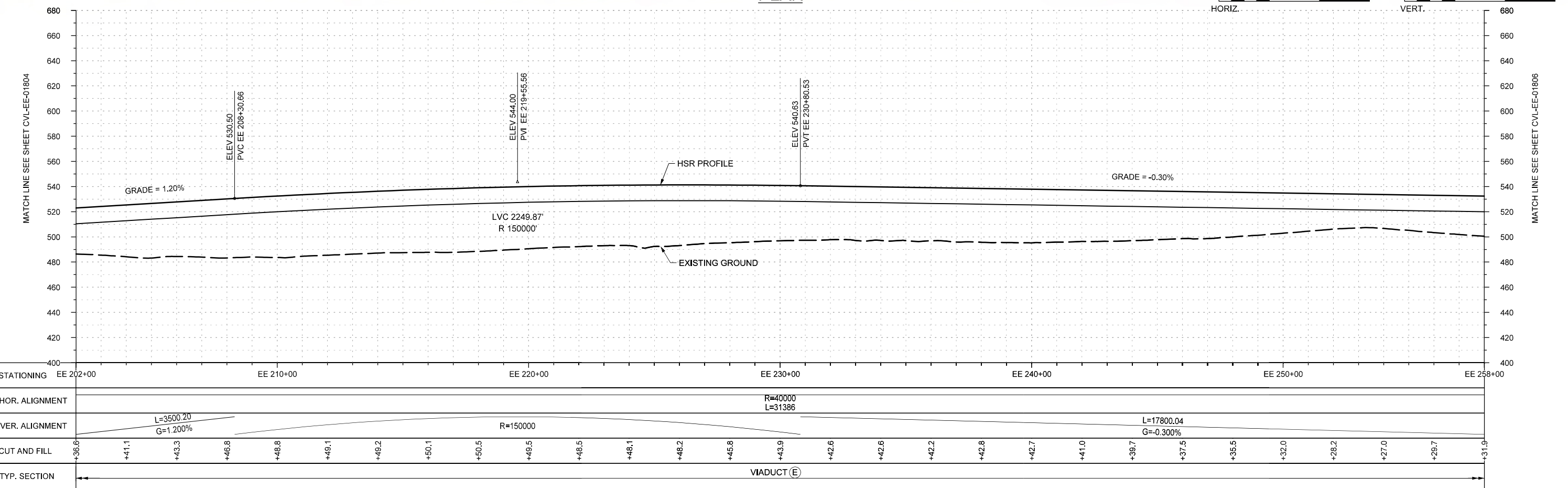
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |        |            |              |     |    |
|--------|--------|------------|--------------|-----|----|
| Job No | 234180 | Drawing No | CVL-EE-01804 | Rev | 01 |
|--------|--------|------------|--------------|-----|----|



PLAN



PROFILE

|                |                       |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 202+00             | EE 210+00 | EE 220+00 | EE 230+00 | EE 240+00 | EE 250+00 | EE 258+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | R=40000<br>L=31386    |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=3500.20<br>G=1.200% |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +36.6                 | +41.1     | +43.3     | +46.8     | +48.8     | +49.1     | +49.2     | +50.1 | +50.5 | +49.5 | +48.5 | +48.1 | +48.2 | +45.8 | +43.9 | +42.6 | +42.6 | +42.2 | +42.8 | +42.7 | +41.0 | +39.7 | +37.5 | +35.5 | +32.0 | +28.2 | +27.0 | +29.7 | +31.9 |
| TYP. SECTION   | VIADUCT (E)           |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
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|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

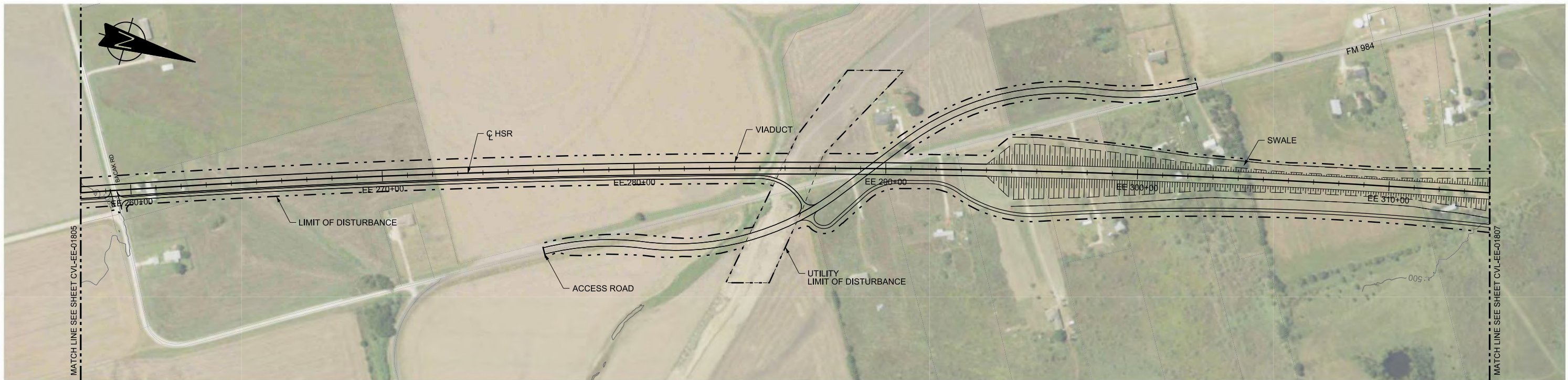
**ARUP**  
 Arup Texas, Inc.  
 10370 Richmond Ave., Suite 475  
 Houston, Texas 77042 USA  
 Tel (713) 783 2787 Fax (713) 343 1467  
 www.arup.com  
 Texas Registered Engineering Firm: F-1990

**FREESSE & NICHOLS**  
 2711 North Haskell Ave., Suite 3300  
 Dallas, Texas 75204  
 Tel (214) 217 2200 Fax (214) 217 2201  
 www.freesse.com  
 Texas Registered Engineering Firm: F-2144

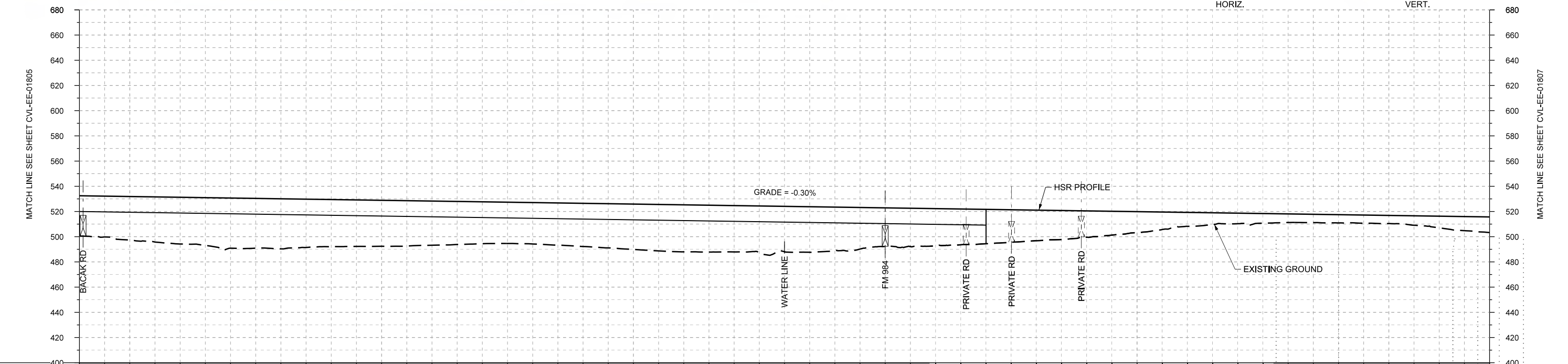
DALLAS TO HOUSTON HIGH-SPEED RAIL  
 FINAL CONCEPTUAL ENGINEERING  
  
 1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
 CIVIL  
 PLAN AND PROFILE  
 EE 202+00 TO EE 258+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-EE-01805 |
| Rev            | 01           |



PLAN



PROFILE

|                |                         |           |           |           |           |           |           |           |       |       |       |       |                |       |       |       |       |       |       |       |       |       |      |      |      |      |      |       |
|----------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|-------|
| STATIONING     | EE 258+00               | EE 260+00 | EE 270+00 | EE 280+00 | EE 290+00 | EE 300+00 | EE 310+00 | EE 314+00 |       |       |       |       |                |       |       |       |       |       |       |       |       |       |      |      |      |      |      |       |
| HOR. ALIGNMENT | R=40000<br>L=31386      |           |           |           |           |           |           |           |       |       |       |       |                |       |       |       |       |       |       |       |       |       |      |      |      |      |      |       |
| VER. ALIGNMENT | L=17800.04<br>G=-0.300% |           |           |           |           |           |           |           |       |       |       |       |                |       |       |       |       |       |       |       |       |       |      |      |      |      |      |       |
| CUT AND FILL   | +31.9                   | +34.7     | +37.1     | +39.8     | +39.8     | +37.5     | +36.5     | +35.1     | +33.3 | +32.9 | +34.3 | +36.0 | +37.3          | +36.8 | +34.6 | +30.6 | +29.3 | +27.3 | +24.3 | +20.9 | +16.7 | +11.1 | +8.4 | +6.8 | +6.6 | +6.5 | +9.3 | +12.4 |
| TYP. SECTION   | VIADUCT (E)             |           |           |           |           |           |           |           |       |       |       |       | EMBANKMENT (A) |       |       |       |       |       |       |       |       |       |      |      |      |      |      |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**  
DRAWN BY  
**J. BORGHESI**  
CHECKED BY  
**T. WAGNER**  
IN CHARGE  
**C. TAYLOR**  
DATE  
**02/25/2019**

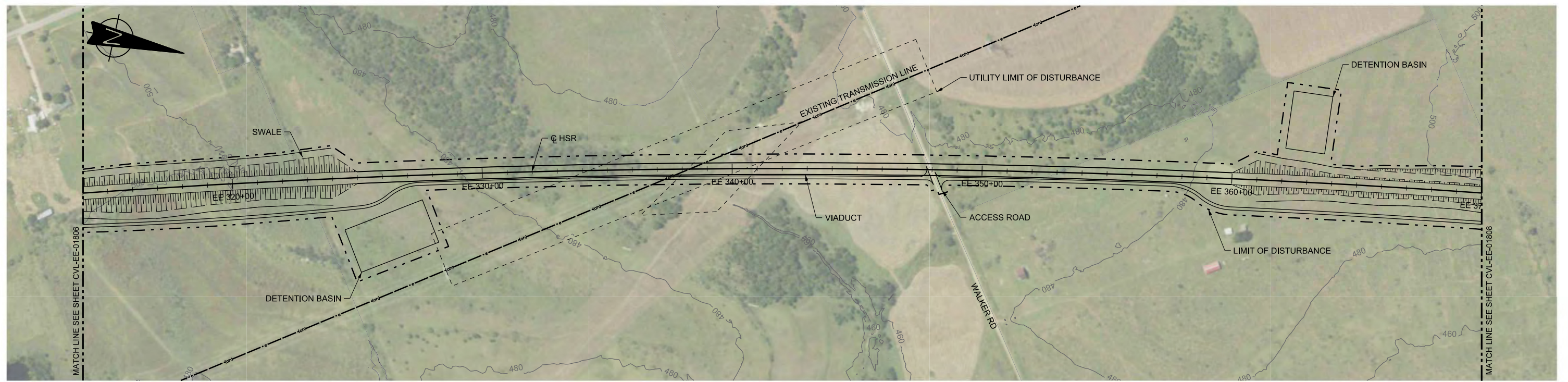
**ARUP**  
Arup Texas, Inc.  
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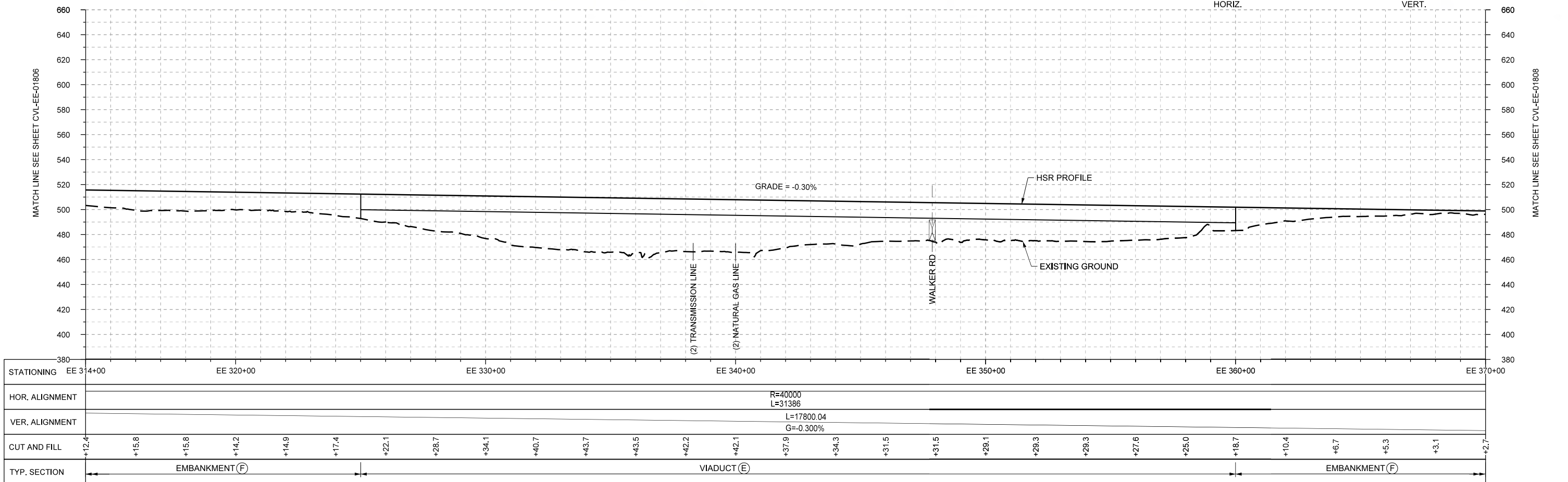
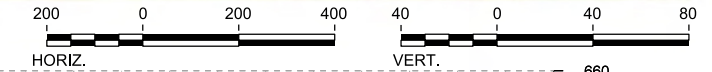
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING  
**TEXAS CENTRAL**  
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 258+00 TO EE 314+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-EE-01806 |
| Rev            | 01           |



PLAN



PROFILE

|                |                         |           |           |           |           |             |           |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |
|----------------|-------------------------|-----------|-----------|-----------|-----------|-------------|-----------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| STATIONING     | EE 314+00               | EE 320+00 | EE 330+00 | EE 340+00 | EE 350+00 | EE 360+00   | EE 370+00 |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |
| HOR. ALIGNMENT | R=40000<br>L=31386      |           |           |           |           |             |           |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |
| VER. ALIGNMENT | L=17800.04<br>G=-0.300% |           |           |           |           |             |           |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |
| CUT AND FILL   | +12.4                   | +15.8     | +15.8     | +14.2     | +14.9     | +17.4       | +22.1     | +26.7 | +34.1 | +40.7 | +43.7          | +43.5 | +42.2 | +42.1 | +37.9 | +34.3 | +31.5 | +31.5 | +29.1 | +29.3 | +29.3 | +27.6 | +25.0 | +18.7 | +10.4 | +6.7 | +5.3 | +3.1 | +2.7 |
| TYP. SECTION   | EMBANKMENT (F)          |           |           |           |           | VIADUCT (E) |           |       |       |       | EMBANKMENT (F) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

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Texas Registered Engineering Firm: F-2144

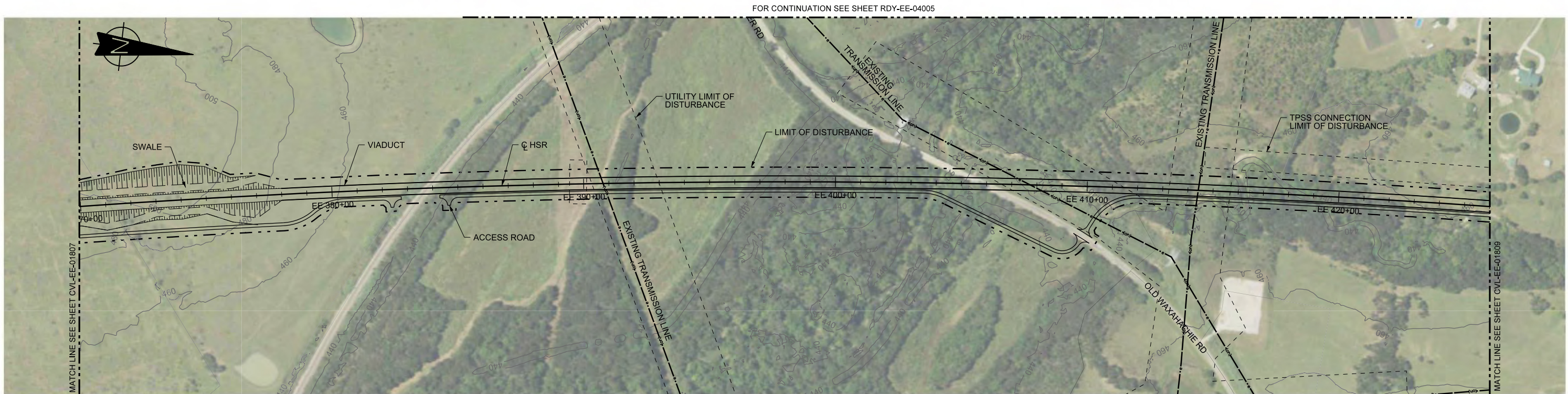
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

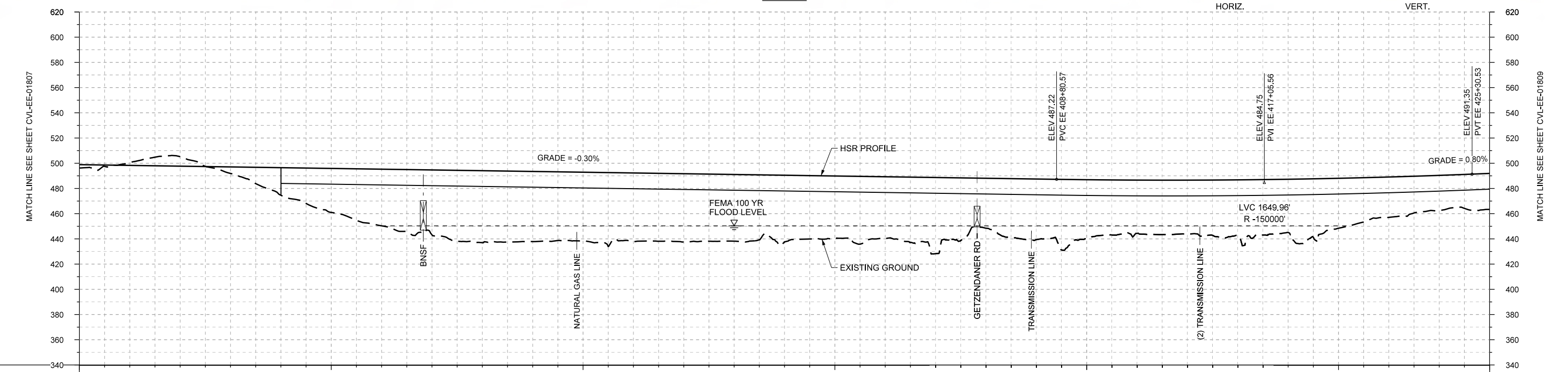
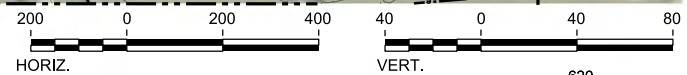
Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 314+00 TO EE 370+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-EE-01807 | 01  |  |



PLAN

FOR CONTINUATION SEE SHEET RDY-EE-04005



PROFILE

|                |                         |           |           |           |             |           |           |       |       |       |       |       |       |       |       |       |                      |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-------------------------|-----------|-----------|-----------|-------------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 370+00               | EE 380+00 | EE 390+00 | EE 400+00 | EE 410+00   | EE 420+00 | EE 426+00 |       |       |       |       |       |       |       |       |       |                      |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | R=40000<br>L=31386      |           |           |           |             |           |           |       |       |       |       |       |       |       |       |       |                      |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=17800.04<br>G=-0.300% |           |           |           |             |           |           |       |       |       |       |       |       |       |       |       |                      |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +2.7                    | -2.2      | -7.5      | +5.2      | +21.9       | +35.0     | +45.0     | +51.5 | +57.1 | +55.7 | +54.6 | +54.2 | +52.9 | +52.9 | +49.5 | +48.4 | +60.5                | +39.6 | +48.1 | +46.9 | +42.2 | +42.8 | +44.1 | +42.3 | +39.6 | +32.1 | +28.0 | +28.5 |
| TYP. SECTION   | EMBANKMENT (F)          |           |           |           | VIADUCT (E) |           |           |       |       |       |       |       |       |       |       |       | L=239.15<br>G=0.800% |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

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Texas Registered Engineering Firm: F-1990

**FRESE & NICHOLS**

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Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

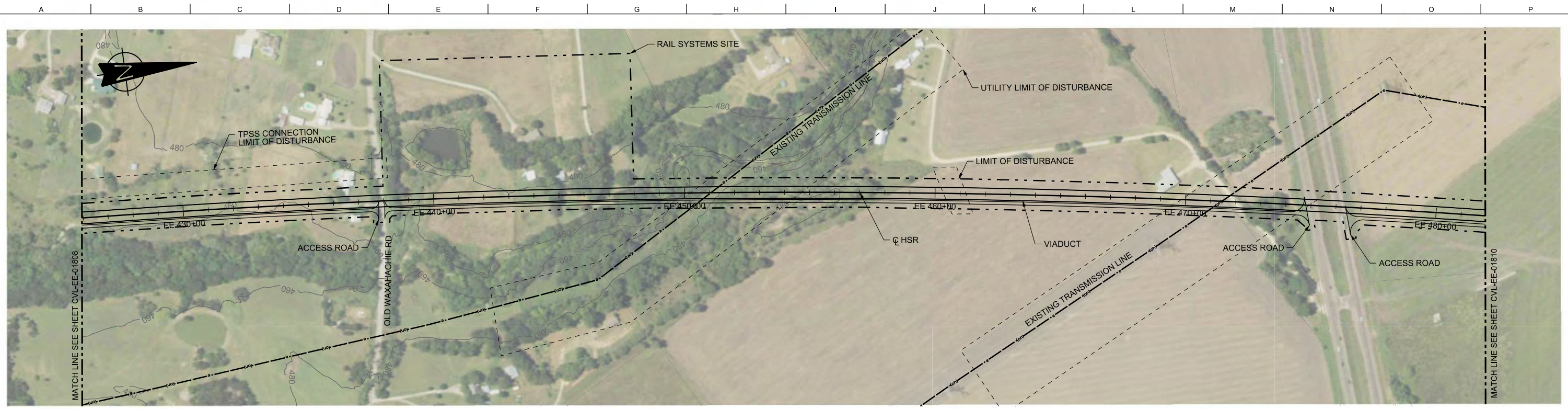
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

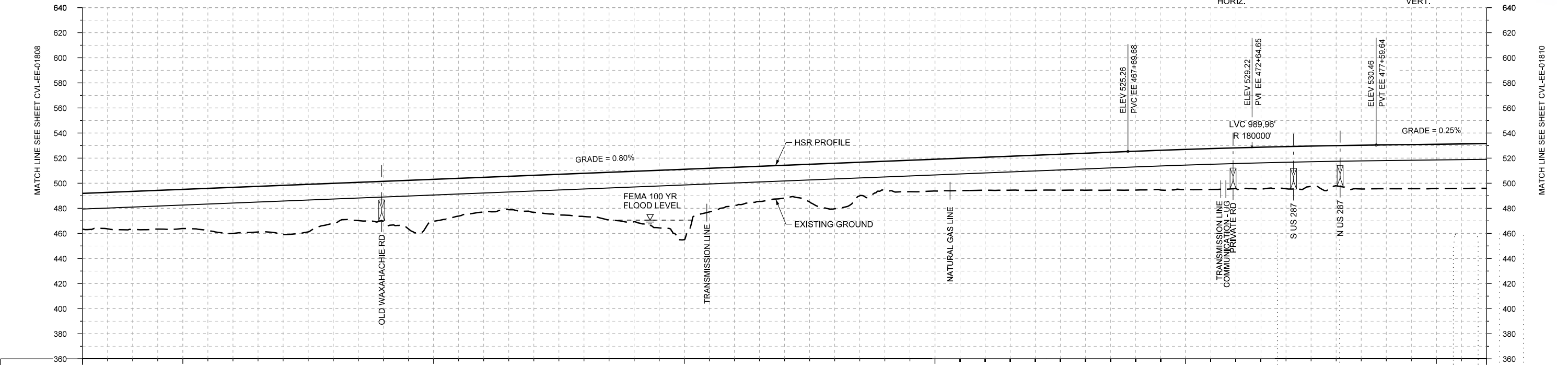
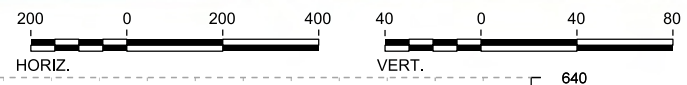
Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 370+00 TO EE 426+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-EE-01808 | 01  |  |





PLAN



|                |                       |           |           |           |                    |           |                       |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------|-----------|-----------|-----------|--------------------|-----------|-----------------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 426+00             | EE 430+00 | EE 440+00 | EE 450+00 | EE 460+00          | EE 470+00 | EE 480+00             | EE 482+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT |                       |           |           |           | R=40000<br>L=31386 |           |                       |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=4239.15<br>G=0.800% |           |           |           | R=180000           |           | L=6695.93<br>G=0.250% |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +28.5                 | +30.5     | +31.2     | +36.7     | +38.1              | +32.4     | +31.9                 | +33.5     | +27.3 | +29.5 | +34.4 | +40.2 | +56.2 | +30.5 | +25.0 | +36.3 | +23.2 | +25.3 | +28.2 | +27.9 | +29.5 | +31.0 | +32.1 | +32.4 | +33.6 | +32.1 | +35.0 | +35.3 | +35.7 |
| TYP. SECTION   | VIADUCT (E)           |           |           |           |                    |           |                       |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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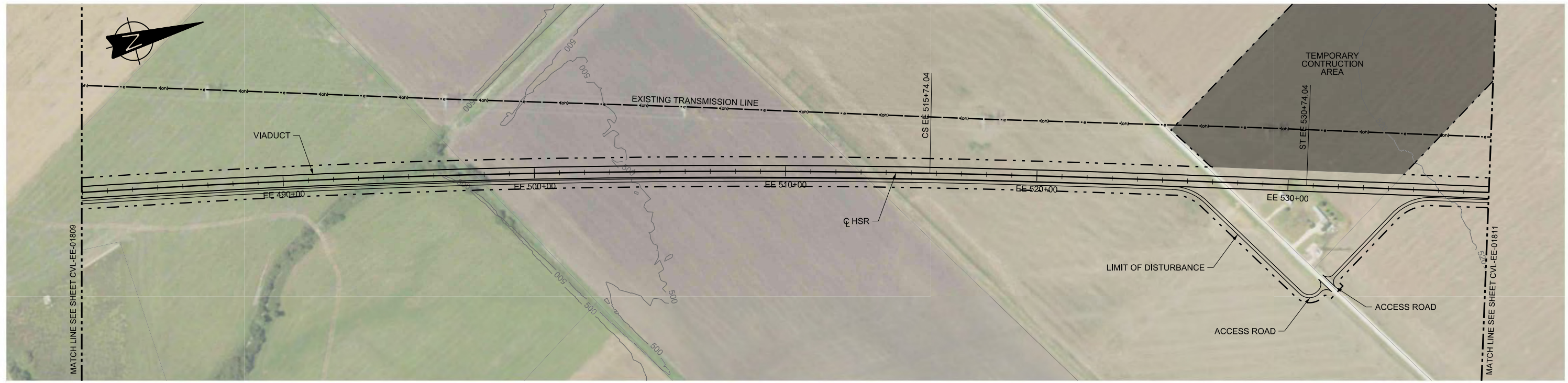
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

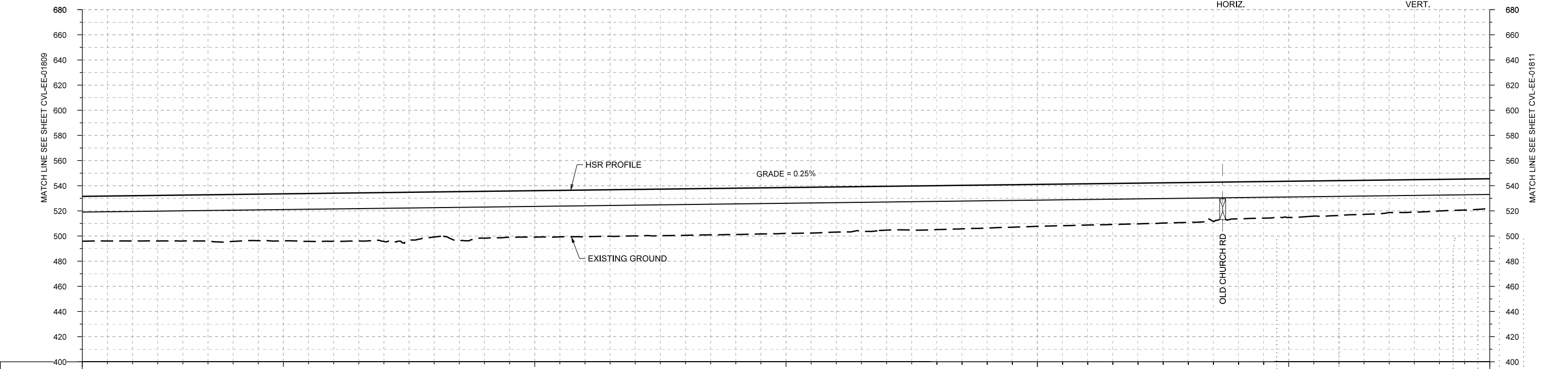
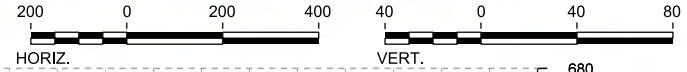
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 426+00 TO EE 482+00**

|                   |                            |
|-------------------|----------------------------|
| Scale<br>AS SHOWN | Drawing Status<br>FINAL    |
| Job No<br>234180  | Drawing No<br>CVL-EE-01809 |
| Rev<br>01         |                            |



PLAN



|                |                    |           |           |                       |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|--------------------|-----------|-----------|-----------------------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 482+00          | EE 490+00 | EE 500+00 | EE 510+00             | EE 520+00 | EE 530+00 | EE 538+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | R=40000<br>L=31386 |           |           | L=6695.93<br>G=0.250% |           |           | L=22450   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT |                    |           |           |                       |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +35.7              | +36.0     | +36.5     | +37.4                 | +37.4     | +38.2     | +38.9     | +35.9 | +37.3 | +37.0 | +37.1 | +37.0 | +37.0 | +36.9 | +36.4 | +35.9 | +34.9 | +35.0 | +34.3 | +33.3 | +32.8 | +32.4 | +31.7 | +29.4 | +28.9 | +27.7 | +25.9 | +25.1 | +23.8 |
| TYP. SECTION   | VIADUCT (E)        |           |           |                       |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
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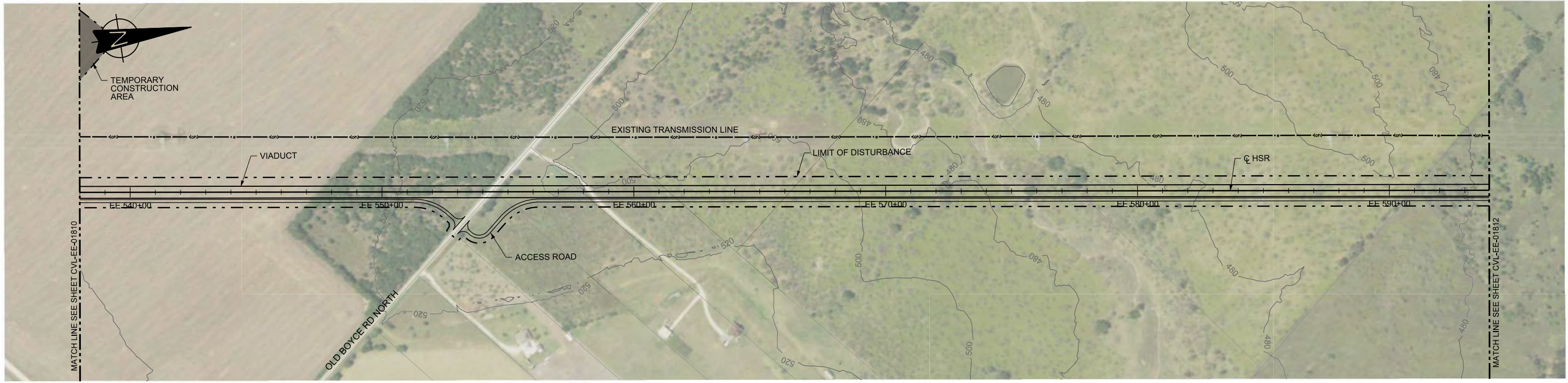
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

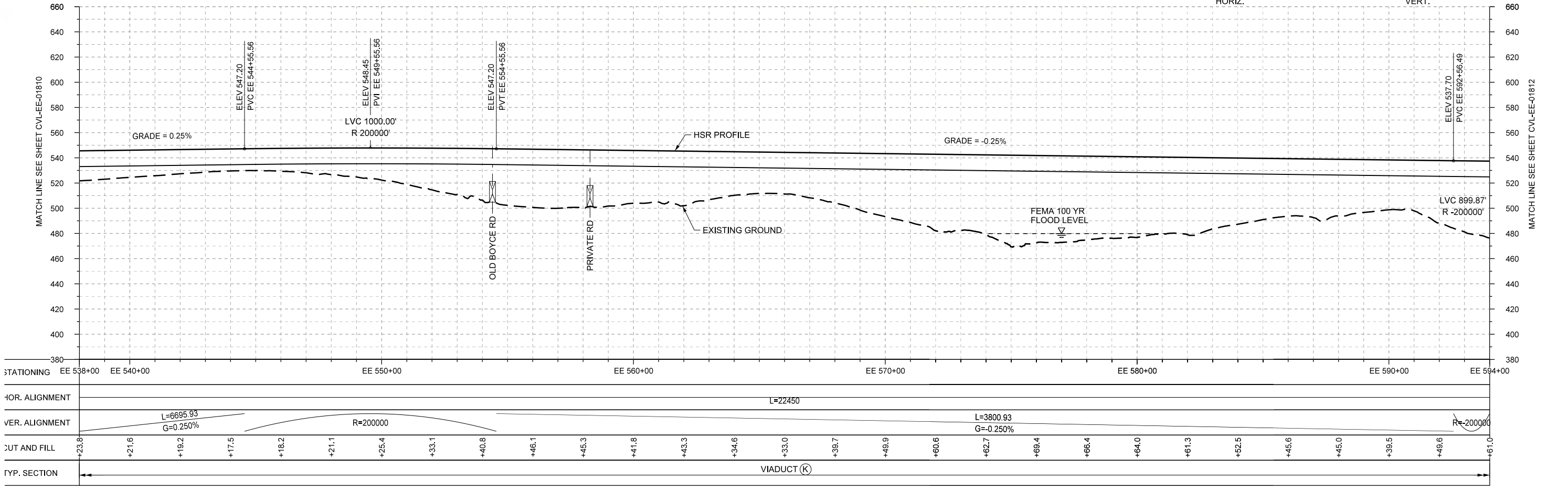
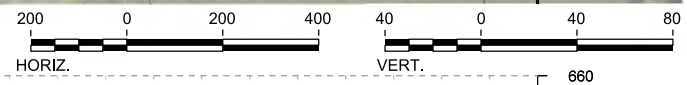
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 482+00 TO EE 538+00**

|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-EE-01810 |
| Rev            | 01           |



PLAN



PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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10370 Richmond Ave., Suite 475  
Houston, Texas 77042 USA  
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**FRESE & NICHOLS**

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Dallas, Texas 75204  
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www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

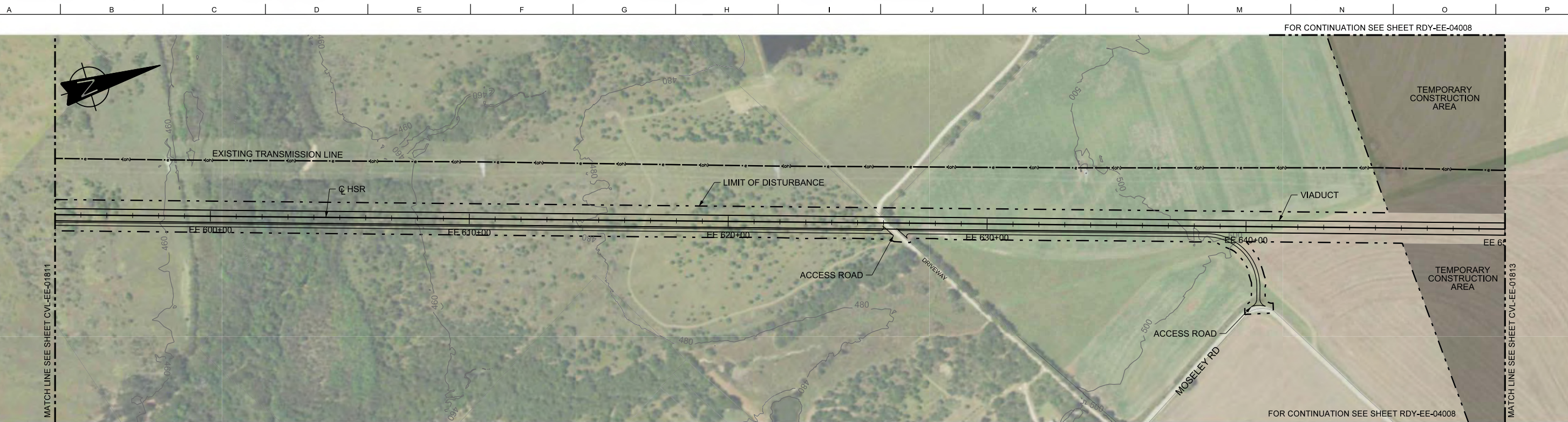
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 538+00 TO EE 594+00**

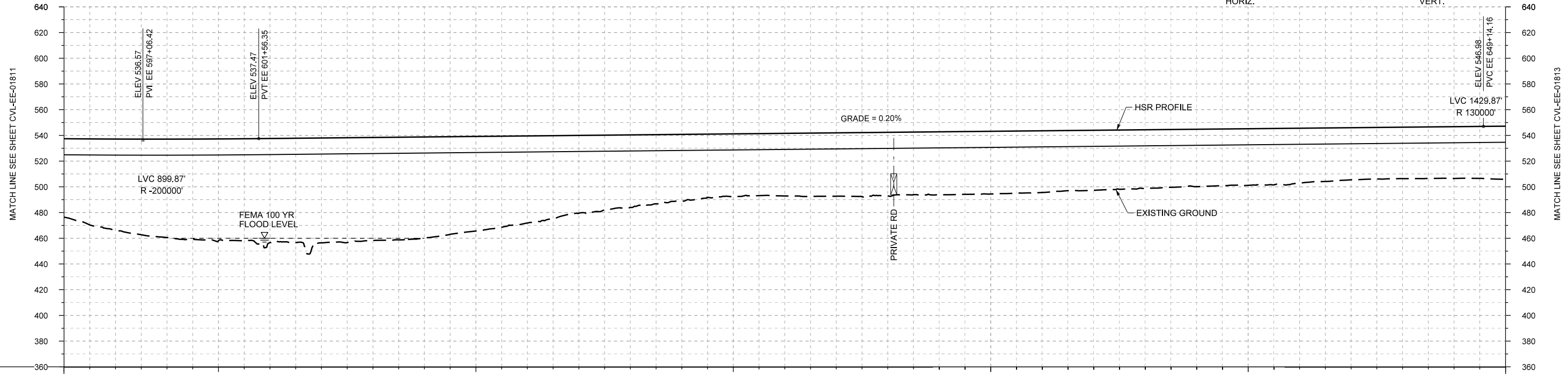
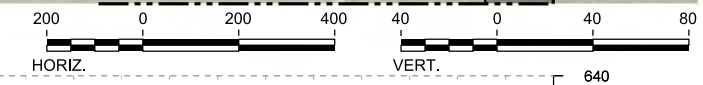
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|                  |                            |           |
|------------------|----------------------------|-----------|
| Job No<br>234180 | Drawing No<br>CVL-EE-01811 | Rev<br>01 |
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PLAN



PROFILE

|                |             |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 594+00   | EE 600+00 | EE 610+00 | EE 620+00 | EE 630+00 | EE 640+00 | EE 650+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=22450     |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | R=200000    |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +61.0       | +70.9     | +76.6     | +79.2     | +81.0     | +81.6     | +80.2     | +78.8 | +73.6 | +67.8 | +60.5 | +56.4 | +51.8 | +48.7 | +46.7 | +49.3 | +49.6 | +48.8 | +48.8 | +48.0 | +46.7 | +45.6 | +44.7 | +44.1 | +42.7 | +40.5 | +40.0 | +40.3 | +41.3 |
| TYP. SECTION   | VIADUCT (K) |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING  
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 594+00 TO EE 650+00**

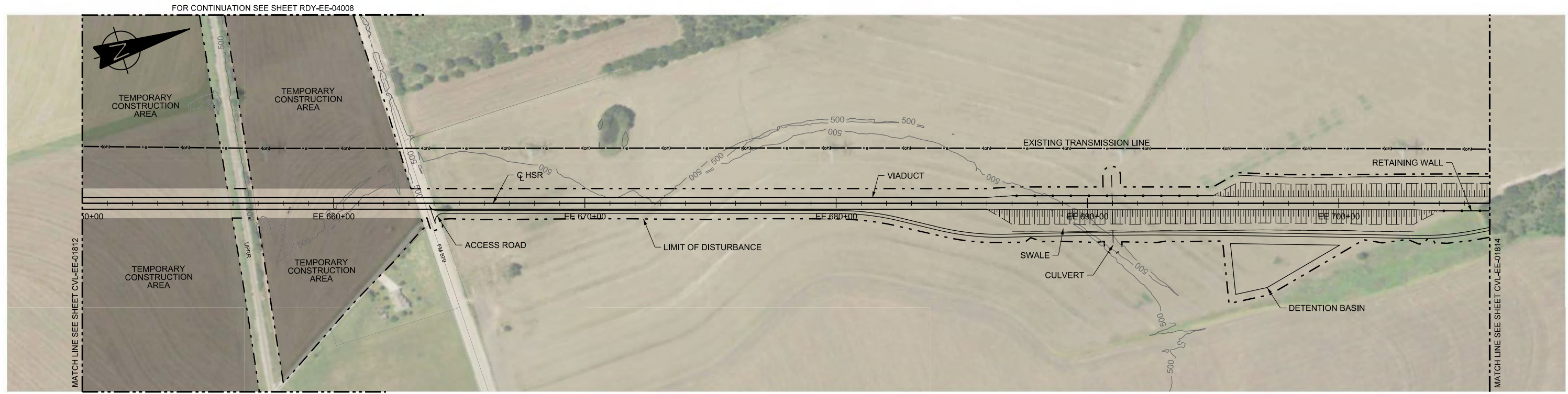
Scale

AS SHOWN

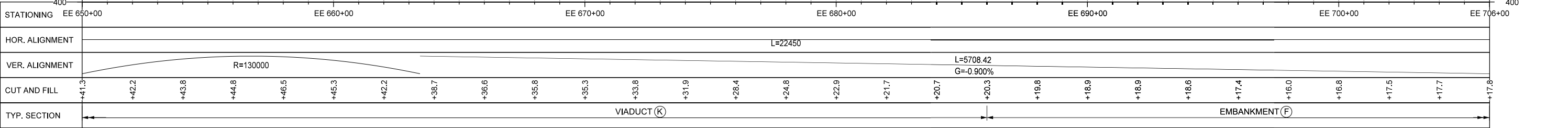
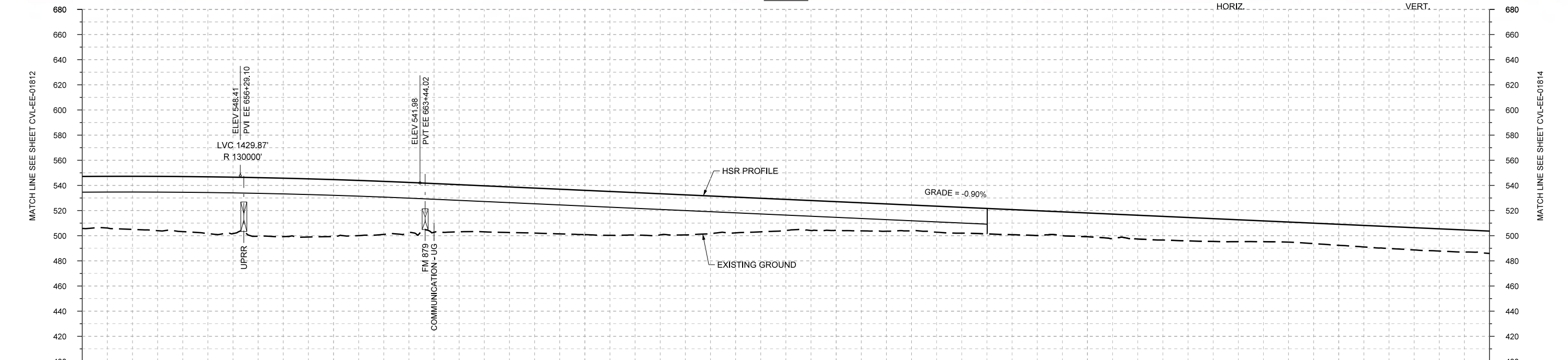
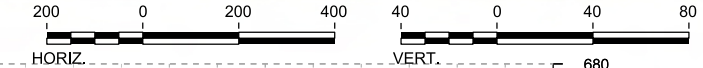
Drawing Status

**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-EE-01812 | 01  |



PLAN



PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

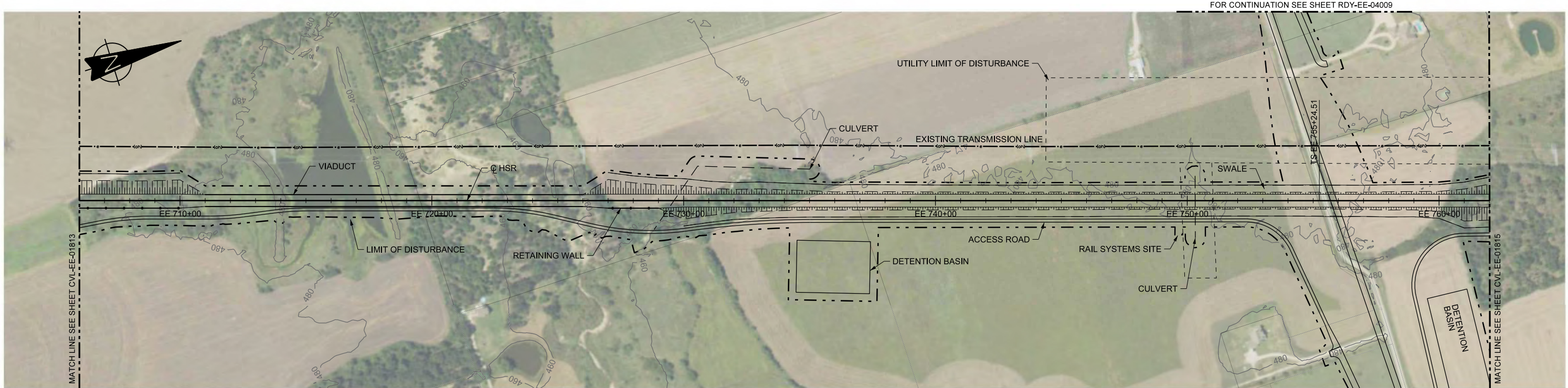
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 650+00 TO EE 706+00**

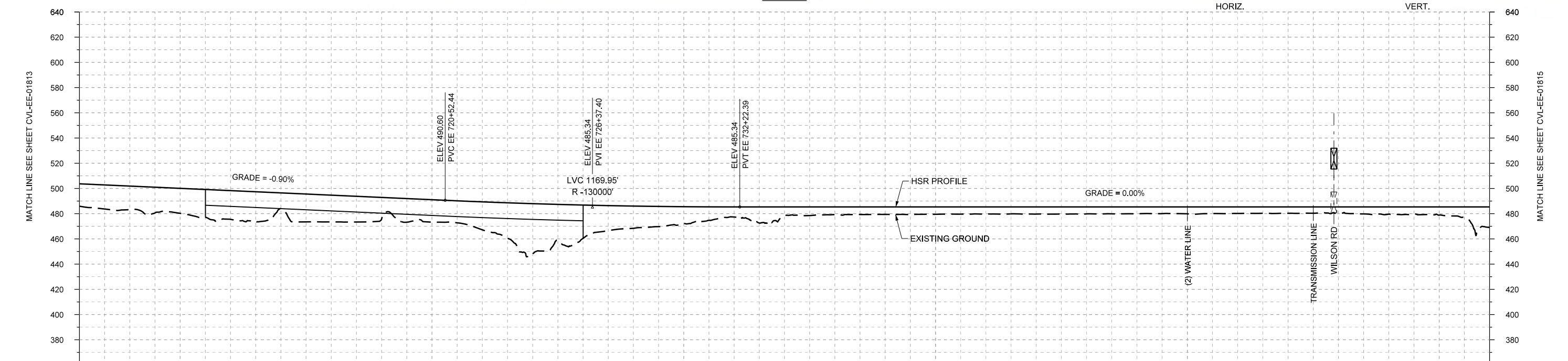
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|                  |                            |           |
|------------------|----------------------------|-----------|
| Job No<br>234180 | Drawing No<br>CVL-EE-01813 | Rev<br>01 |
|------------------|----------------------------|-----------|



PLAN



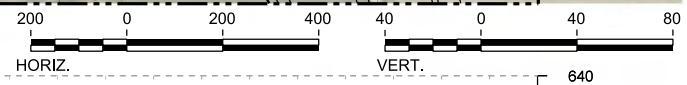
PROFILE

|                |                        |           |           |             |           |                       |                |           |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |
|----------------|------------------------|-----------|-----------|-------------|-----------|-----------------------|----------------|-----------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| STATIONING     | EE 706+00              | EE 710+00 | EE 720+00 | EE 730+00   | EE 740+00 | EE 750+00             | EE 760+00      | EE 762+00 |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |
| HOR. ALIGNMENT | L=22450                |           |           |             |           |                       | L=1650         |           |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |
| VER. ALIGNMENT | L=5708.42<br>G=-0.900% |           |           | R=-130000   |           | L=6947.58<br>G=0.000% |                |           |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |
| CUT AND FILL   | +17.8                  | +18.6     | +19.8     | +22.8       | +12.4     | +21.3                 | +17.1          | +17.8     | +22.2 | +39.8 | +26.3 | +17.6 | +13.7 | +8.0 | +7.2 | +6.0 | +5.9 | +5.8 | +5.6 | +5.6 | +5.5 | +5.4 | +5.4 | +5.1 | +5.0 | +4.9 | +5.7 | +6.4 | +16.4 |
| TYP. SECTION   | EMBANKMENT (F)         |           |           | VIADUCT (K) |           |                       | EMBANKMENT (F) |           |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |



FOR CONTINUATION SEE SHEET RDY-EE-04009

FOR CONTINUATION SEE SHEET RDY-EE-04009



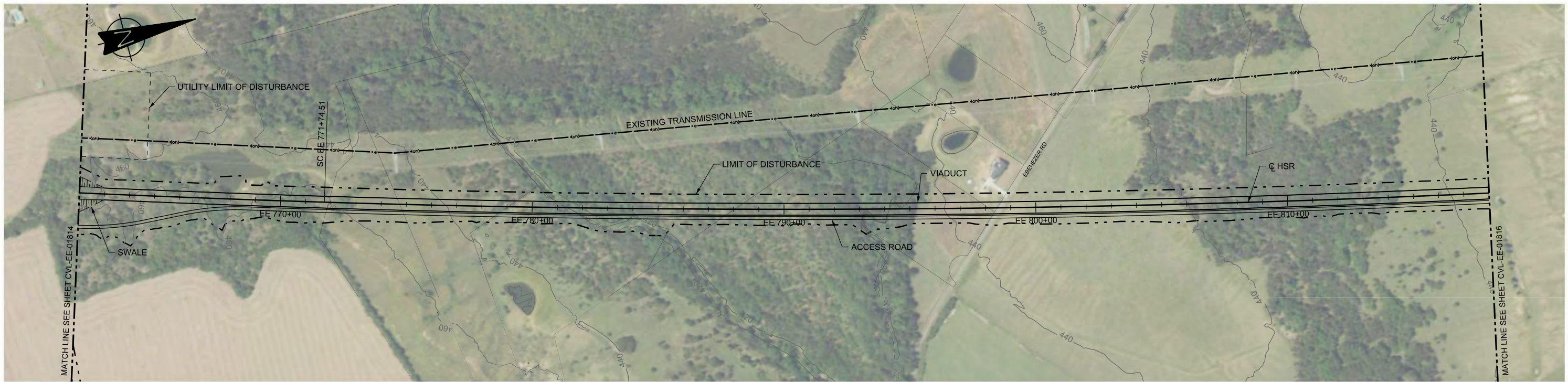
DESIGNED BY  
**D. PETRIN**  
DRAWN BY  
**J. BORGHESI**  
CHECKED BY  
**T. WAGNER**  
IN CHARGE  
**C. TAYLOR**  
DATE  
**02/25/2019**



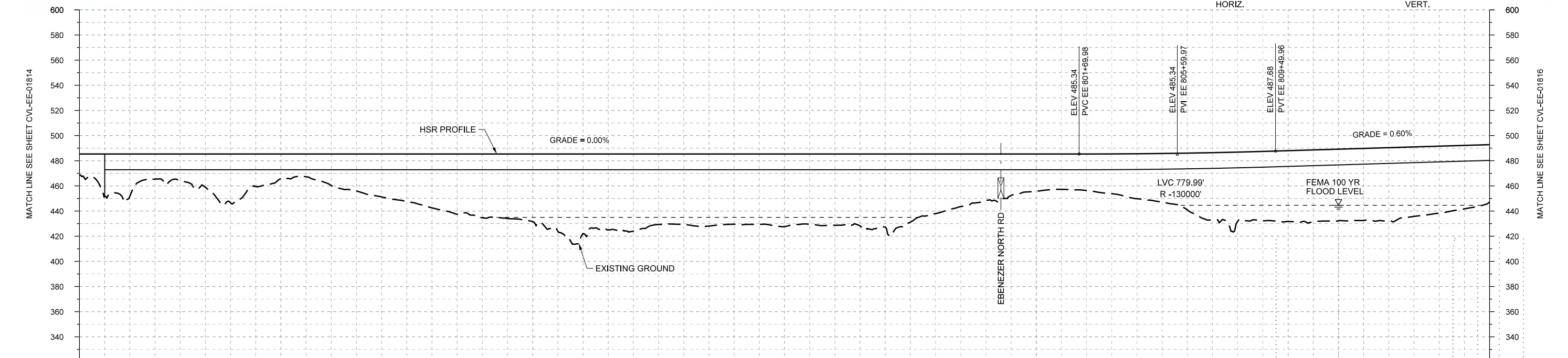
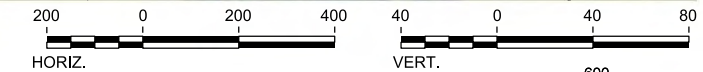
Drawing Title  
**ELLIS EAST SEGMENT CIVIL PLAN AND PROFILE EE 706+00 TO EE 762+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-EE-01814 |
| Rev            |          |            | 01           |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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PLAN



PROFILE

|                |           |           |                       |                   |           |                                   |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|-----------|-----------|-----------------------|-------------------|-----------|-----------------------------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 762+00 | EE 770+00 | EE 780+00             | EE 790+00         | EE 800+00 | EE 810+00                         | EE 818+00 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=1650    |           |                       |                   |           |                                   |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT |           |           | L=6947.58<br>G=0.000% | R=60000<br>L=6342 |           | R=130000<br>L=4561.62<br>G=0.600% |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +16.4     | +33.6     | +21.1                 | +38.7             | +19.4     | +25.0                             | +34.1     | +42.8 | +50.7 | +53.8 | +63.3 | +61.3 | +56.0 | +55.8 | +57.6 | +56.6 | +58.1 | +47.3 | +36.7 | +29.7 | +29.0 | +35.7 | +45.2 | +55.0 | +56.3 | +56.8 | +58.5 | +53.2 | +45.5 |
| TYP. SECTION   | (A)       |           | VIADUCT (E)           |                   |           |                                   |           |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

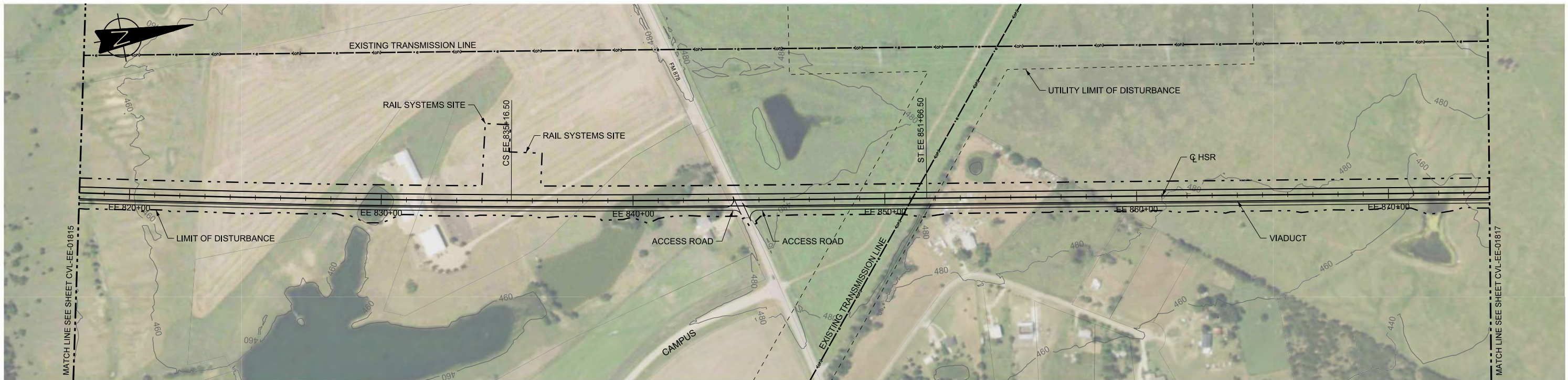
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 762+00 TO EE 818+00**

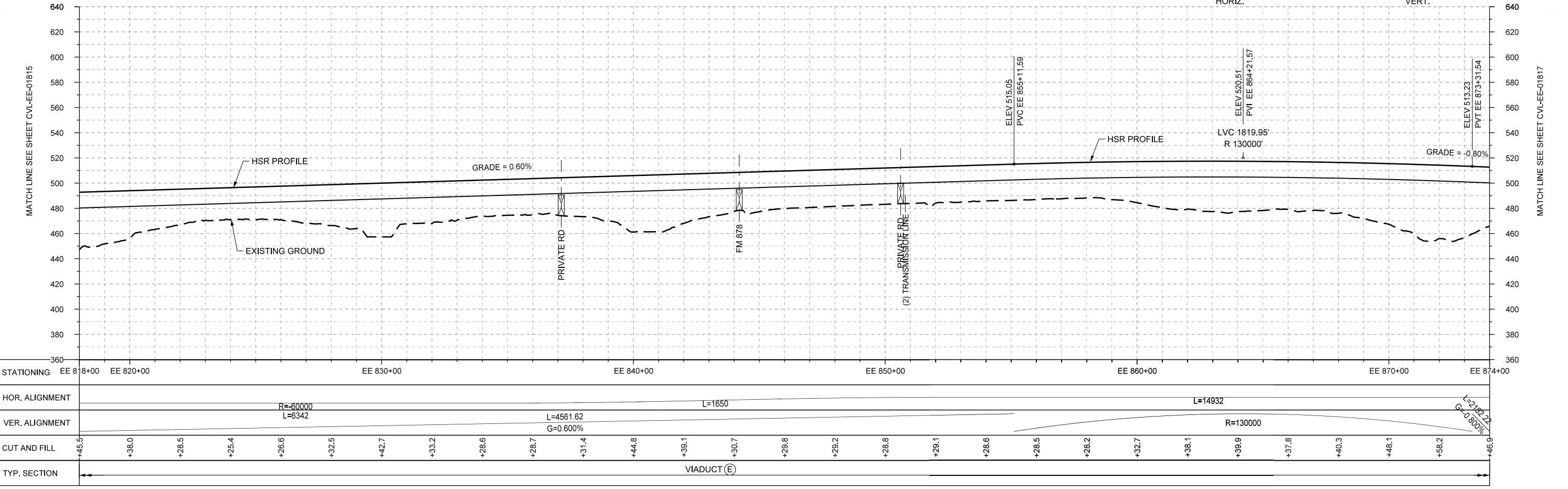
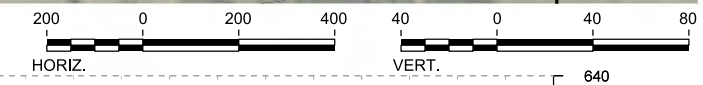
Scale  
AS SHOWN

Drawing Status  
**FINAL**

|        |              |     |
|--------|--------------|-----|
| Job No | Drawing No   | Rev |
| 234180 | CVL-EE-01815 | 01  |



PLAN



PROFILE

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|----------------|-------------|-----------|-----------------------|-----------|-----------|-----------|-----------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 818+00   | EE 820+00 | EE 830+00             | EE 840+00 | EE 850+00 | EE 860+00 | EE 870+00 | EE 874+00              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT |             |           | R=60000<br>L=6342     |           |           | L=14932   |           | L=2182.22<br>G=-0.800% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT |             |           | L=4561.62<br>G=0.600% |           |           | R=130000  |           |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +45.5       | +36.0     | +28.5                 | +25.4     | +26.6     | +32.5     | +42.7     | +33.2                  | +28.6 | +28.7 | +31.4 | +44.8 | +38.1 | +30.7 | +29.8 | +29.2 | +28.8 | +29.1 | +28.6 | +28.5 | +28.2 | +32.7 | +38.1 | +39.9 | +37.8 | +40.3 | +48.1 | +58.2 | +46.9 |
| TYP. SECTION   | VIADUCT (E) |           |                       |           |           |           |           |                        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

|             |             |
|-------------|-------------|
| DESIGNED BY | D. PETRIN   |
| DRAWN BY    | J. BORGHESI |
| CHECKED BY  | T. WAGNER   |
| IN CHARGE   | C. TAYLOR   |
| DATE        | 02/25/2019  |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
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DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING  
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title

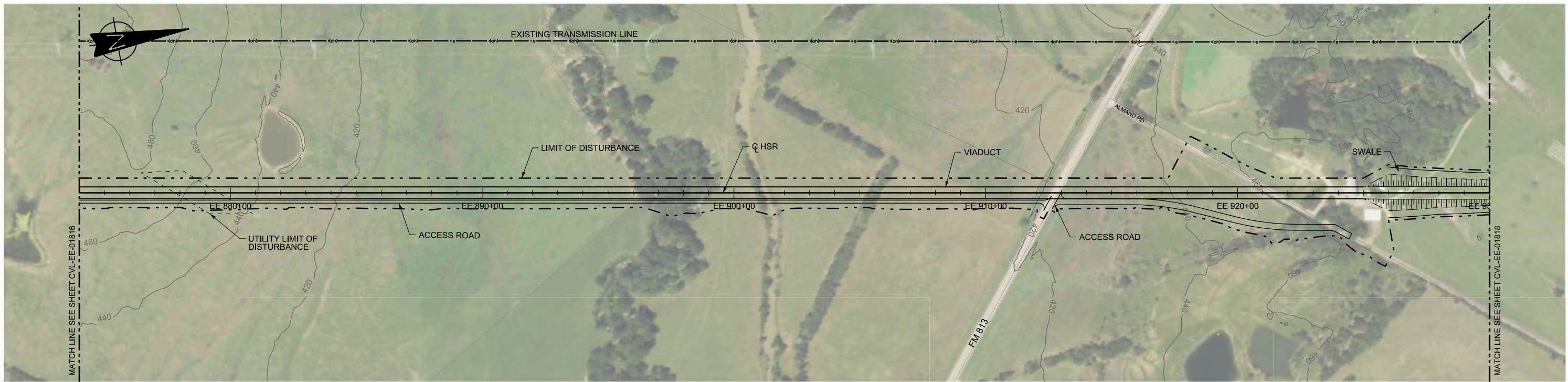
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 818+00 TO EE 874+00**

Scale  
AS SHOWN

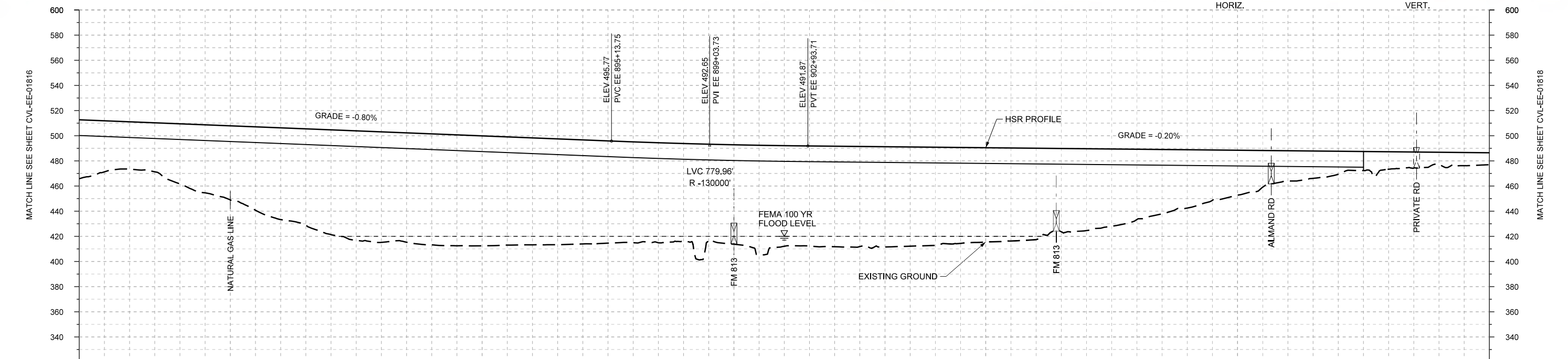
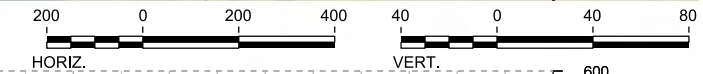
Drawing Status  
**FINAL**

|        |              |     |
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| Job No | Drawing No   | Rev |
| 234180 | CVL-EE-01816 | 01  |





PLAN



PROFILE

|                |                        |           |           |           |           |                         |           |       |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |
|----------------|------------------------|-----------|-----------|-----------|-----------|-------------------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| STATIONING     | EE 874+00              | EE 880+00 | EE 890+00 | EE 900+00 | EE 910+00 | EE 920+00               | EE 930+00 |       |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |
| HOR. ALIGNMENT | L=14932                |           |           |           |           |                         |           |       |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |
| VER. ALIGNMENT | L=2182.22<br>G=-0.800% |           |           | R=-130000 |           | L=11921.28<br>G=-0.200% |           |       |       |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |      |
| CUT AND FILL   | +46.9                  | +37.7     | +47.9     | +59.0     | +73.0     | +83.4                   | +87.9     | +88.3 | +87.4 | +85.1 | +82.7 | +80.1 | +77.8 | +79.1 | +80.0 | +80.0          | +79.8 | +78.1 | +75.0 | +72.7 | +65.1 | +56.0 | +46.4 | +35.8 | +24.1 | +18.4 | +14.0 | +9.5 |
| TYP. SECTION   | VIADUCT (E)            |           |           |           |           |                         |           |       |       |       |       |       |       |       |       | EMBANKMENT (A) |       |       |       |       |       |       |       |       |       |       |       |      |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
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|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
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DRAWN BY  
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CHECKED BY  
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IN CHARGE  
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DATE  
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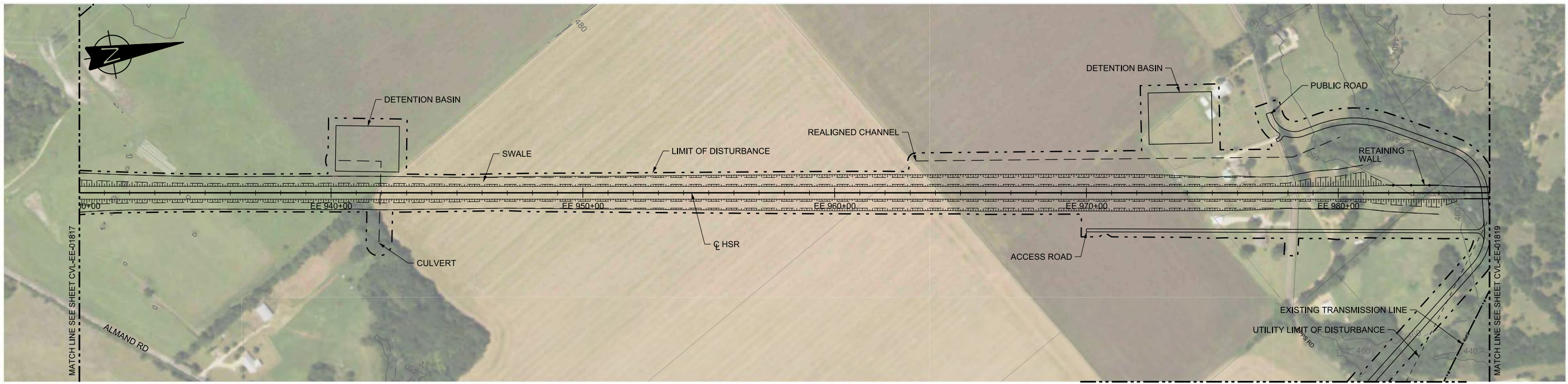
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

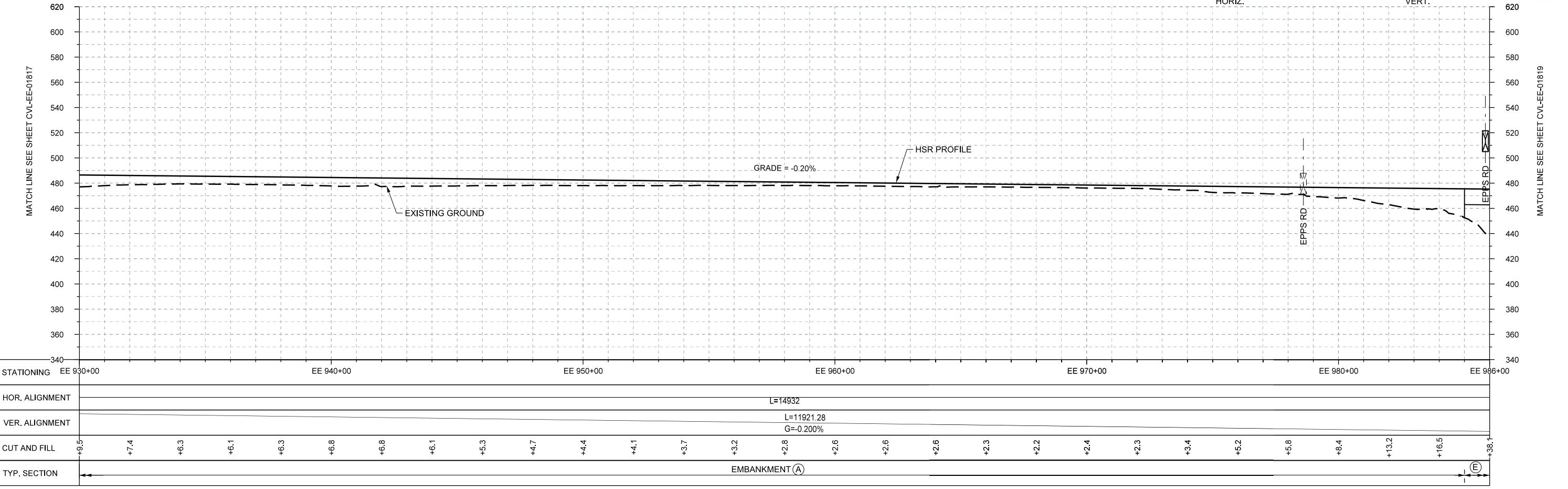
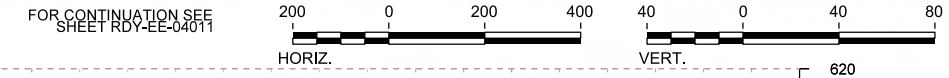
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 874+00 TO EE 930+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-EE-01817 | 01  |  |



PLAN



PROFILE

|                |                         |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |
|----------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| STATIONING     | EE 930+00               | EE 940+00 | EE 950+00 | EE 960+00 | EE 970+00 | EE 980+00 | EE 986+00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |
| HOR. ALIGNMENT | L=14932                 |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |
| VER. ALIGNMENT | L=11921.28<br>G=-0.200% |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |
| CUT AND FILL   | +9.5                    | +7.4      | +6.3      | +6.1      | +6.3      | +6.8      | +6.8      | +6.1 | +5.3 | +4.7 | +4.4 | +4.1 | +3.7 | +3.2 | +2.8 | +2.6 | +2.6 | +2.6 | +2.3 | +2.2 | +2.4 | +2.3 | +3.4 | +5.2 | +5.8 | +8.4 | +13.2 | +16.5 | +38.1 |
| TYP. SECTION   | EMBANKMENT (A)          |           |           |           |           |           |           |      |      |      |      |      |      |      |      | (E)  |      |      |      |      |      |      |      |      |      |      |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
|-----|------|----|-----|-----|-------------|
|     |      |    |     |     |             |
|     |      |    |     |     |             |
|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

**ARUP**

Arup Texas, Inc.  
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Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

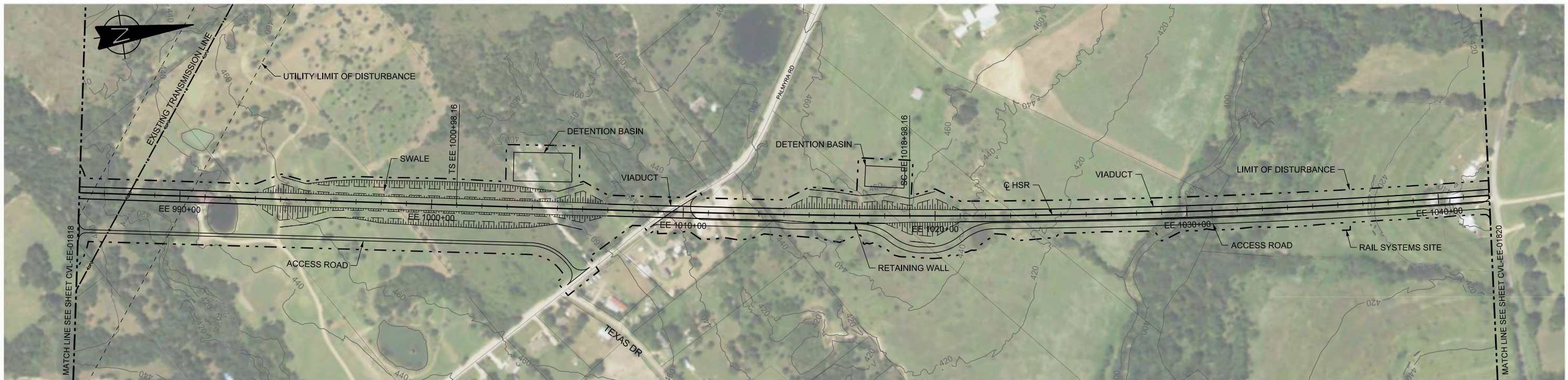
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

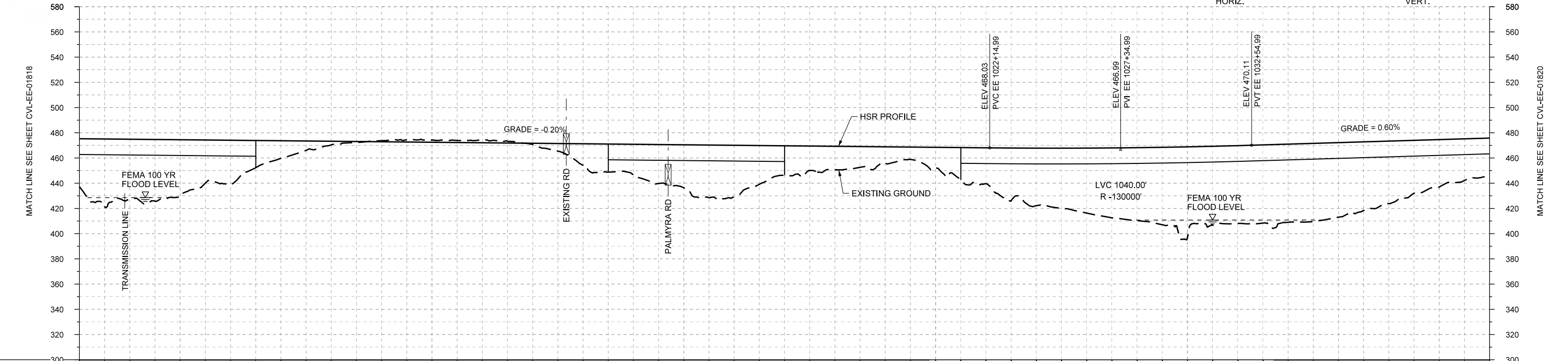
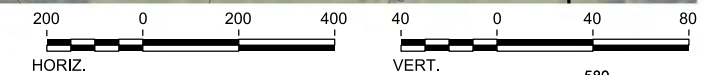
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 930+00 TO EE 986+00**

|                   |                            |
|-------------------|----------------------------|
| Scale<br>AS SHOWN | Drawing Status<br>FINAL    |
| Job No<br>234180  | Drawing No<br>CVL-EE-01818 |
|                   | Rev<br>01                  |



PLAN



PROFILE

|                |                         |           |                |            |            |             |            |            |
|----------------|-------------------------|-----------|----------------|------------|------------|-------------|------------|------------|
| STATIONING     | EE 986+00               | EE 990+00 | EE 1000+00     | EE 1010+00 | EE 1020+00 | EE 1030+00  | EE 1040+00 | EE 1042+00 |
| HOR. ALIGNMENT | L=14932                 |           | L=1800         |            |            | R=30000     |            |            |
| VER. ALIGNMENT | L=11921.28<br>G=-0.200% |           | R=130000       |            |            | L=17781     |            |            |
| CUT AND FILL   | +38.1                   | +47.7     | +45.0          | +35.4      | +13.9      | +2.9        | -0.8       | -1.8       |
| TYP. SECTION   | VIADUCT (E)             |           | EMBANKMENT (A) |            |            | VIADUCT (E) |            |            |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-1990

**FREES & NICHOLS**

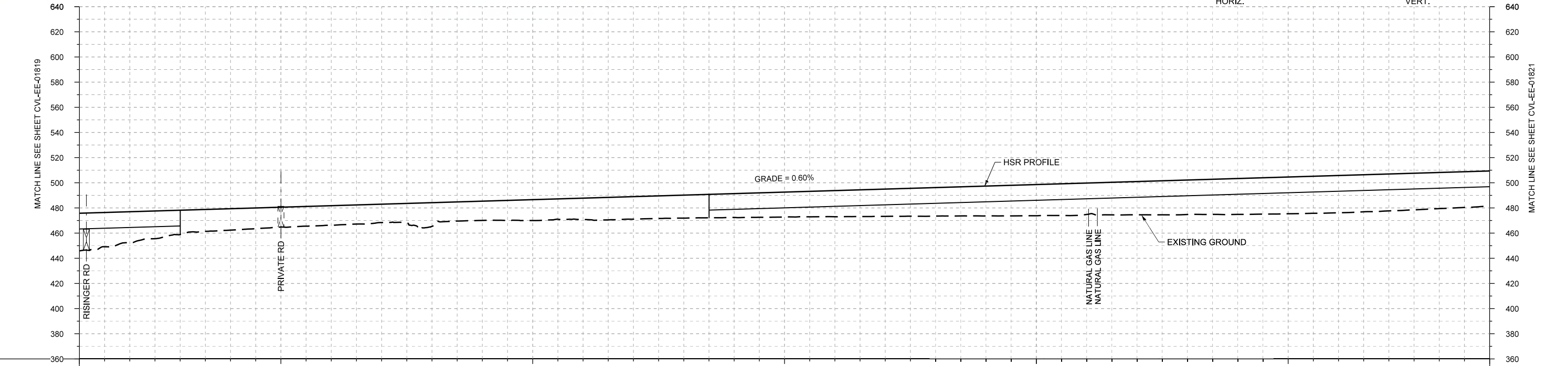
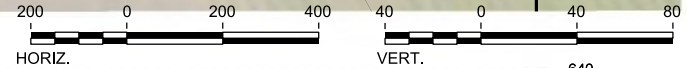
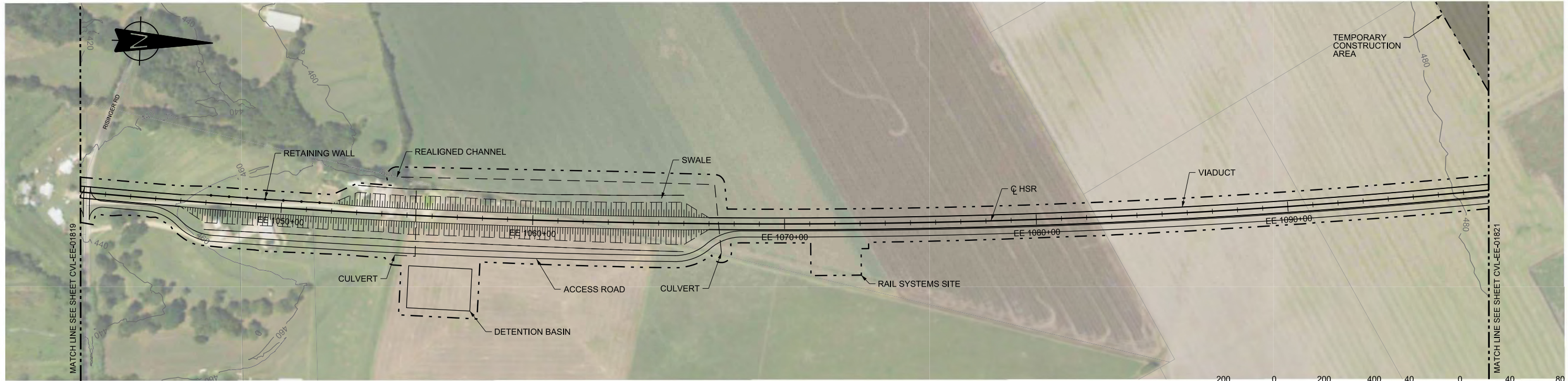
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.frees.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 986+00 TO EE 1042+00**

|                |              |     |  |
|----------------|--------------|-----|--|
| Scale          | AS SHOWN     |     |  |
| Drawing Status | FINAL        |     |  |
| Job No         | Drawing No   | Rev |  |
| 234180         | CVL-EE-01819 | 01  |  |



|                |   |            |                |            |            |            |            |       |       |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|---|------------|----------------|------------|------------|------------|------------|-------|-------|-------|-------|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 1042+00  | EE 1050+00 | EE 1060+00     | EE 1070+00 | EE 1080+00 | EE 1090+00 | EE 1098+00 |       |       |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT |   |            |                |            |            |            |            |       |       |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | $R=30000$<br>$L=17781$ $L=6798.94$<br>$G=0.600\%$ |            |                |            |            |            |            |       |       |       |       |       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +29.9   | +24.6      | +19.3          | +17.0      | +15.8      | +15.5      | +14.6      | +18.9 | +15.3 | +18.6 | +17.0 | +17.9 | +18.3       | +19.0 | +19.9 | +20.8 | +21.7 | +22.7 | +23.8 | +24.8 | +25.0 | +26.5 | +27.4 | +28.5 | +29.2 | +29.6 | +29.3 | +28.7 | +27.9 |
| TYP. SECTION   | VIADUCT (E)                                       |            | EMBANKMENT (A) |            |            |            |            |       |       |       |       |       | VIADUCT (E) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

PROFILE

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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www.freese.com  
Texas Registered Engineering Firm: F-2144

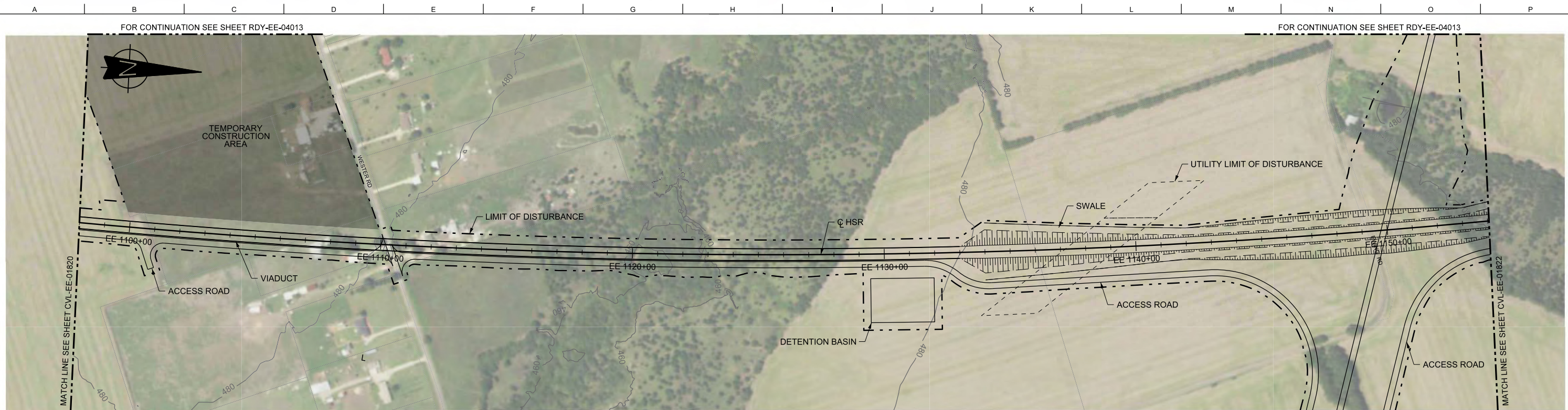
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

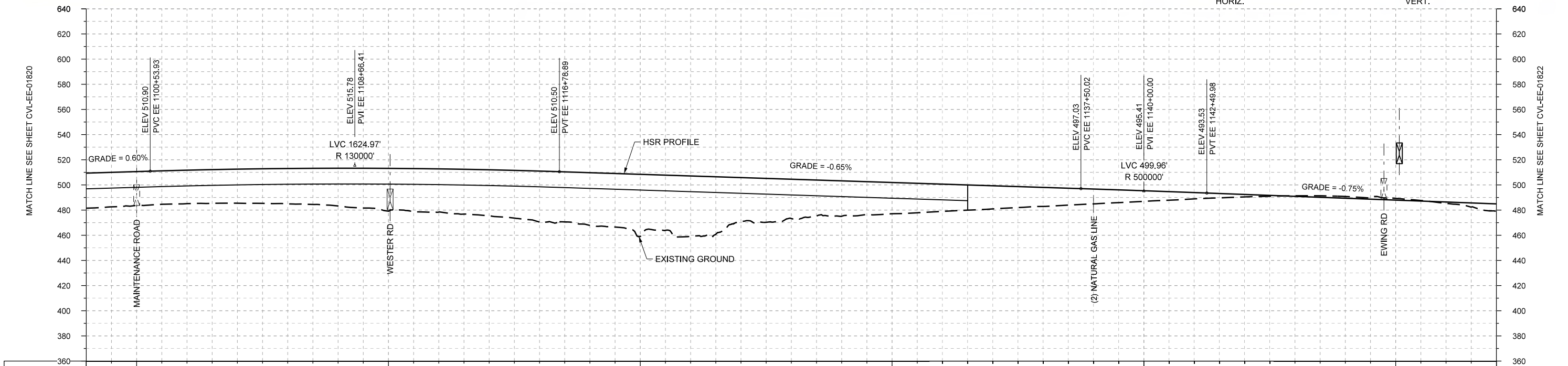
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 1042+00 TO EE 1098+00**

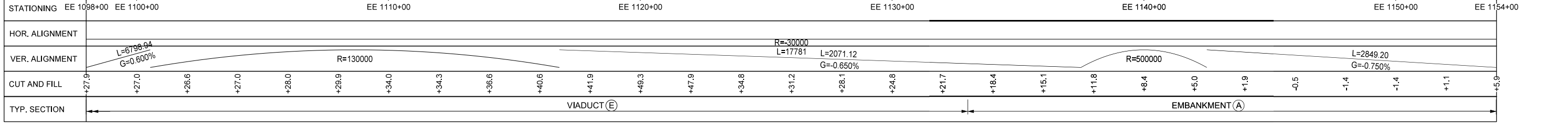
|                |              |
|----------------|--------------|
| Scale          | AS SHOWN     |
| Drawing Status | FINAL        |
| Job No         | 234180       |
| Drawing No     | CVL-EE-01820 |
| Rev            | 01           |



PLAN



PROFILE



| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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10370 Richmond Ave., Suite 475  
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Texas Registered Engineering Firm: F-1590

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2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

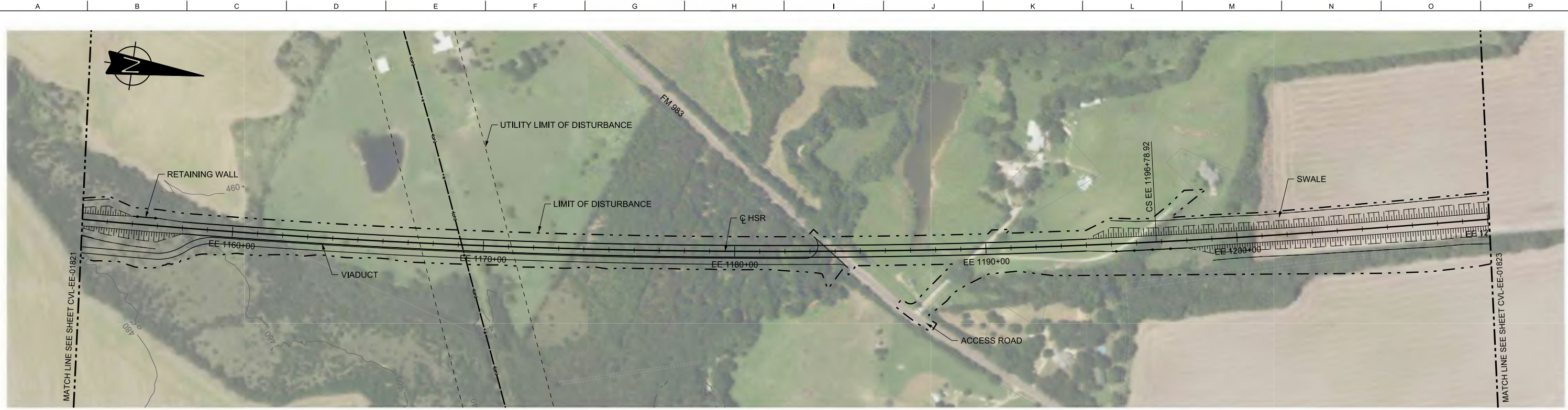
DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

**TEXAS CENTRAL**

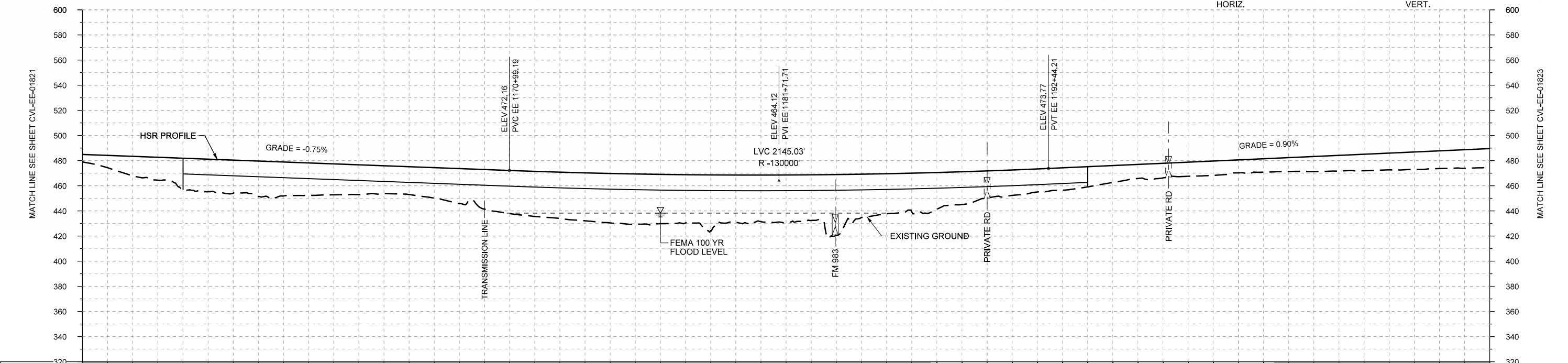
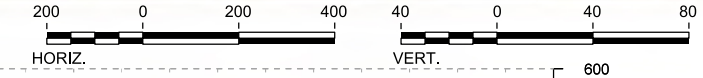
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 1098+00 TO EE 1154+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-EE-01821 |
| Rev            |          |            | 01           |



PLAN



PROFILE

|                |                        |            |                      |             |            |            |            |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|------------|----------------------|-------------|------------|------------|------------|-------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 1154+00             | EE 1160+00 | EE 1170+00           | EE 1180+00  | EE 1190+00 | EE 1200+00 | EE 1210+00 |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT |                        |            |                      |             |            |            |            |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=2849.20<br>G=-0.750% |            | R=-300000<br>L=17781 |             | R=-130000  |            | L=1800     |       |       |       |       |       |       |                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +5.9                   | +15.3      | +25.2                | +26.3       | +27.0      | +24.6      | +22.1      | +24.2 | +31.6 | +35.9 | +36.2 | +40.4 | +38.4 | +37.6          | +37.8 | +48.4 | +31.8 | +29.2 | +21.6 | +18.3 | +16.1 | +11.2 | +11.3 | +10.3 | +11.0 | +12.5 | +13.4 | +14.1 | +15.0 |
| TYP. SECTION   | EMBANKMENT (A)         |            |                      | VIADUCT (E) |            |            |            |       |       |       |       |       |       | EMBANKMENT (A) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
**T. WAGNER**

IN CHARGE  
**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-1990

**FRESE & NICHOLS**

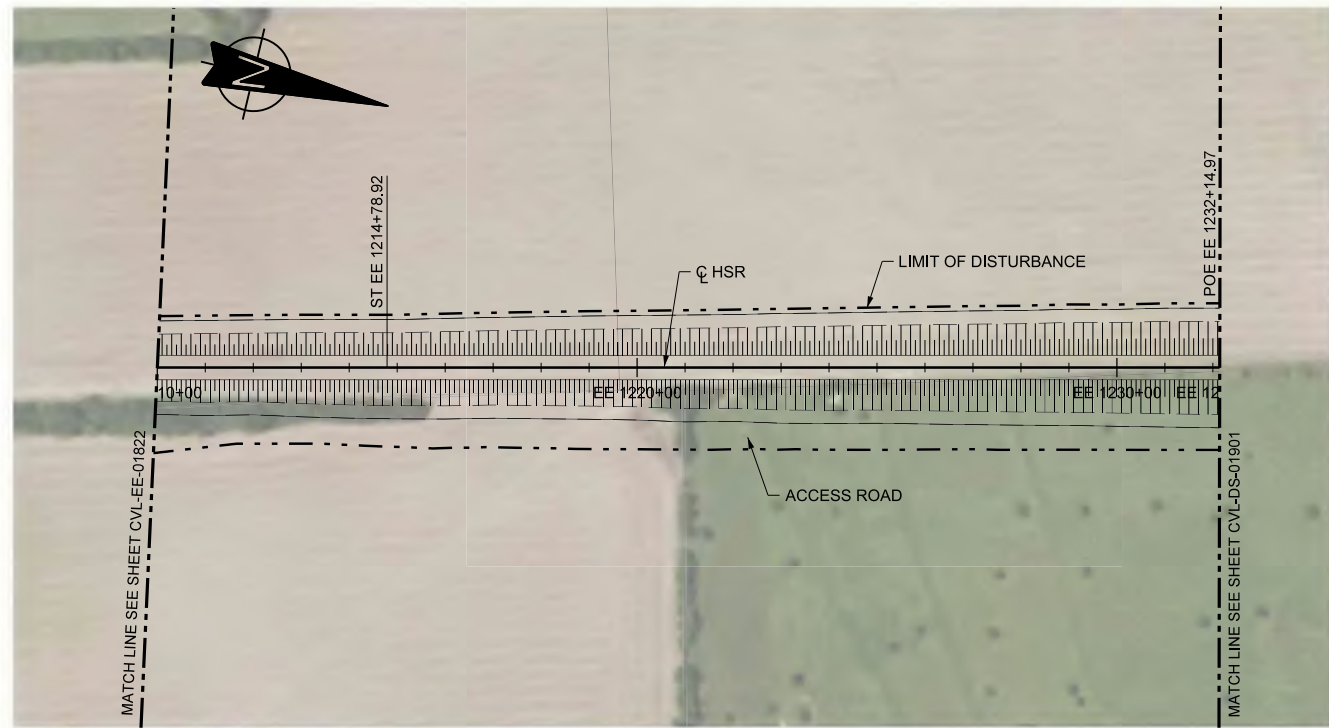
2711 North Haskell Ave., Suite 3300  
Dallas, Texas 75204  
Tel (214) 217 2200 Fax (214) 217 2201  
www.freese.com  
Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

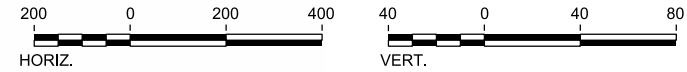
1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 1154+00 TO EE 1210+00**

|                |          |            |              |
|----------------|----------|------------|--------------|
| Scale          | AS SHOWN |            |              |
| Drawing Status | FINAL    |            |              |
| Job No         | 234180   | Drawing No | CVL-EE-01822 |
| Rev            |          |            | 01           |

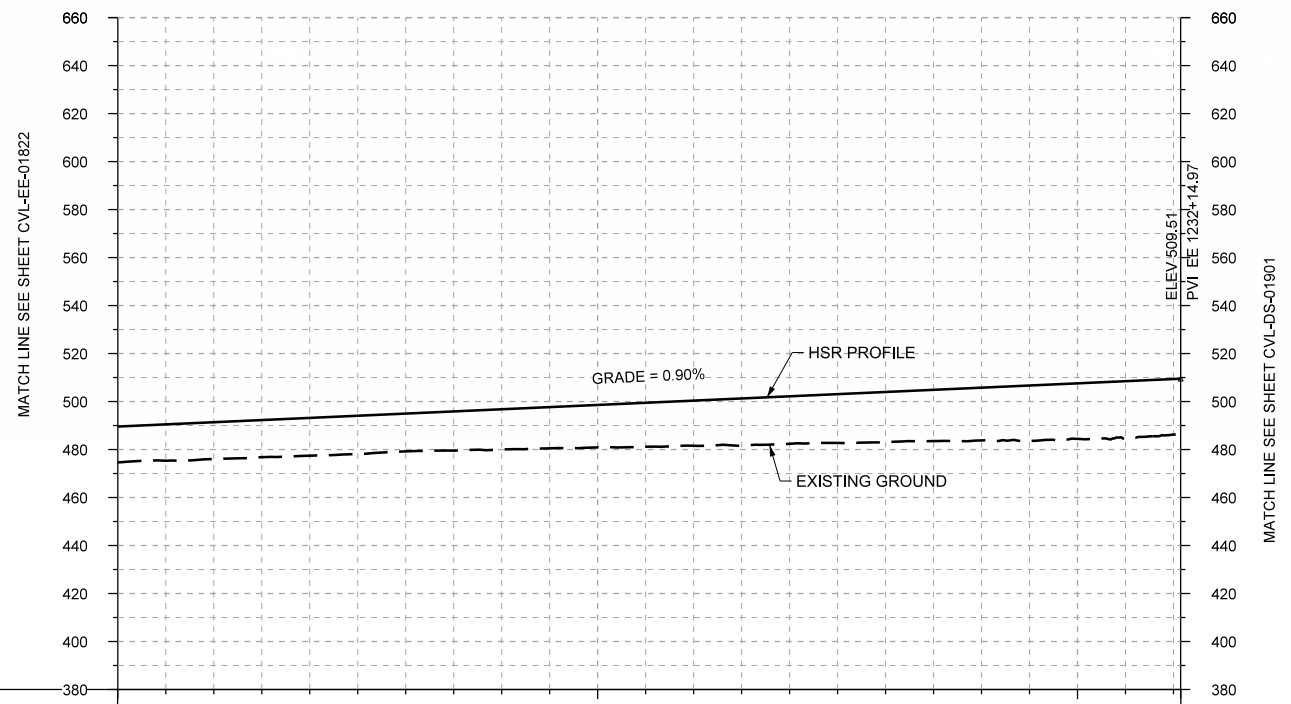


PLAN



HORIZ.

VERT.



PROFILE

|                |                       |            |            |            |       |       |       |       |       |       |       |       |
|----------------|-----------------------|------------|------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| STATIONING     | EE 1210+00            | EE 1220+00 | EE 1230+00 | EE 1232+15 |       |       |       |       |       |       |       |       |
| HOR. ALIGNMENT | L=1800                |            | L=1736     |            |       |       |       |       |       |       |       |       |
| VER. ALIGNMENT | L=3970.75<br>G=0.900% |            |            |            |       |       |       |       |       |       |       |       |
| CUT AND FILL   | +15.0                 | +15.3      | +15.8      | +15.8      | +16.8 | +17.7 | +18.8 | +19.8 | +20.9 | +22.0 | +23.2 | +23.1 |
| TYP. SECTION   | EMBANKMENT (A)        |            |            |            |       |       |       |       |       |       |       |       |

| REV | DATE | BY | CHK | APP | DESCRIPTION |
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|     |      |    |     |     |             |

DESIGNED BY  
**D. PETRIN**

DRAWN BY  
**J. BORGHESI**

CHECKED BY  
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**C. TAYLOR**

DATE  
**02/25/2019**

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Texas Registered Engineering Firm: F-2144

DALLAS TO HOUSTON HIGH-SPEED RAIL  
FINAL CONCEPTUAL ENGINEERING

1409 South Lamar Street, Suite 1022, Dallas, Texas 75215

Drawing Title  
**ELLIS EAST SEGMENT  
CIVIL  
PLAN AND PROFILE  
EE 1210+00 TO EE 1232+15**

|                   |                                |           |
|-------------------|--------------------------------|-----------|
| Scale<br>AS SHOWN | Drawing Status<br><b>FINAL</b> |           |
| Job No<br>234180  | Drawing No<br>CVL-EE-01823     | Rev<br>01 |