

**Dallas to Houston High-Speed Rail
Draft Environmental Impact Statement**

**Appendix G:
Dallas to Houston High-Speed Rail
Passenger Service from Houston to Dallas
Final Draft Conceptual Engineering
Plans and Details
Set 12 of 21**



**TEXAS
CENTRAL**

Transmittal

To	Megan Inman, AECOM	Date	November 17, 2017
Copies	FRA: K. Wright AECOM: J. Smiley TCRR: A. Greer File: HOU TCR	TRA Number	00211
From	Christopher Taylor, Arup		
Subject	FINAL DRAFT CONCEPTUAL ENGINEERING DESIGN DOCUMENTATION – FDCE v7 Transmittal Final Version for Publication with Draft Environmental Impact Statement (DEIS) FDCE for Public Release		

We Are Sending You: ENTER DOCUMENT TYPE CODE(S) ONLY

Date of Document	DEIS Appendix	Set # of #	Title of Document or Drawing Title
11/17/17	-	-	234180-AFN-TRA-00211 FDCEv7.PDF (this transmittal)
REPORTS			
9/15/17	F	1 of 2	TCRR FDCE v7 REPORT.PDF (<i>Final Draft Conceptual Engineering Report v7 – Project Definition for publication with Draft EIS</i>)
9/15/17	F	2 of 2	TCRR CONSTRUCTABILITY v4 REPORT.PDF
TCRR FDCE v7 DWGS VOLUME 1 (<i>General Sheets and Typical Sections</i>)			
9/15/17	G	1 of 21	TCRR FDCE v7 DWGS VOLUME 1.PDF (<i>General Sheets and Typical Sections</i>)
TCRR FDCE v7 DWGS VOLUME 2 (<i>Railway Alignment Plan and Profile Sheets</i>)			
9/15/17	G	2 of 21	TCRR FDCE v7 DWGS VOLUME 2-1.PDF (<i>Houston Segment</i>)
9/15/17	G	3 of 21	TCRR FDCE v7 DWGS VOLUME 2-2.PDF (<i>West of Teague Segment</i>)
9/15/17	G	4 of 21	TCRR FDCE v7 DWGS VOLUME 2-3.PDF (<i>IH-45 Segment</i>)
9/15/17	G	5 of 21	TCRR FDCE v7 DWGS VOLUME 2-4.PDF (<i>Navarro West Segment</i>)
9/15/17	G	6 of 21	TCRR FDCE v7 DWGS VOLUME 2-5.PDF (<i>Navarro East Segment</i>)
9/15/17	G	7 of 21	TCRR FDCE v7 DWGS VOLUME 2-6.PDF (<i>Ellis West Segment</i>)
9/15/17	G	8 of 21	TCRR FDCE v7 DWGS VOLUME 2-7.PDF (<i>Ellis East Segment</i>)
9/15/17	G	9 of 21	TCRR FDCE v7 DWGS VOLUME 2-8.PDF (<i>Dallas Segment</i>)
TCRR FDCE v7 DWGS VOLUME 3 (<i>Stations, Maintenance Facilities, and Railway Systems Sheets</i>)			
9/15/17	G	10 of 21	TCRR FDCE v7 DWGS VOLUME 3-1.PDF (<i>Stations</i>)
9/15/17	G	11 of 21	TCRR FDCE v7 DWGS VOLUME 3-2.PDF (<i>Maintenance Facilities, Yards and Shops</i>)
9/15/17	G	12 of 21	TCRR FDCE v7 DWGS VOLUME 3-3.PDF (<i>Rail Systems</i>)
TCRR FDCE v7 DWGS VOLUME 4 (<i>Roadway Plan Sheets</i>)			
9/15/17	G	13 of 21	TCRR FDCE v7 DWGS VOLUME 4-1.PDF (<i>Houston Segment</i>)
9/15/17	G	14 of 21	TCRR FDCE v7 DWGS VOLUME 4-2.PDF (<i>West of Teague Segment</i>)
9/15/17	G	15 of 21	TCRR FDCE v7 DWGS VOLUME 4-3.PDF (<i>IH-45 Segment</i>)
9/15/17	G	16 of 21	TCRR FDCE v7 DWGS VOLUME 4-4.PDF (<i>Navarro West Segment</i>)
9/15/17	G	17 of 21	TCRR FDCE v7 DWGS VOLUME 4-5.PDF (<i>Navarro East Segment</i>)

Document Format	Date of Document	Number of Copies	Title of Document or Drawing Title
9/15/17	G	18 of 21	TCRR FDCE v7 DWGS VOLUME 4-6.PDF (<i>Ellis West Segment</i>)
9/15/17	G	19 of 21	TCRR FDCE v7 DWGS VOLUME 4-7.PDF (<i>Ellis East Segment</i>)
9/15/17	G	20 of 21	TCRR FDCE v7 DWGS VOLUME 4-8.PDF (<i>Dallas Segment</i>)
TCRR FDCE v7 DWGS VOLUME 5 (<i>Wildlife Crossing Sheets</i>)			
9/15/17	G	21 of 21	TCRR FDCE v7 DWGS VOLUME 5.PDF (<i>Wildlife Crossing Sheets</i>)

These are transmitted as checked below:

- Deliverable For Information As requested For your use
 For approval For Review and Comment Return Other: Publication with DEIS

REMARKS:

The files transmitted herewith represent a final submittal of the Final Draft Conceptual Engineering (FDCE) design report and drawings for the Dallas to Houston High-Speed Rail Project. This v7 submittal of the FDCE report is intended for distribution on the FRA website with the Draft EIS (DEIS) for public review.



Delivered VIA Outlook Email Hand Delivery Courier PMS Notification USPS

PREPARED BY: Christopher Taylor **Date:** November 17, 2017

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.



**TEXAS
CENTRAL**



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

**FINAL DRAFT
CONCEPTUAL ENGINEERING PLANS AND DETAILS**
VOLUME 3 - STATIONS MAINTENANCE FACILITIES AND RAILWAY
SYSTEM SHEETS

SEPTEMBER 15, 2017



U.S. Department of Transportation
Federal Railroad Administration

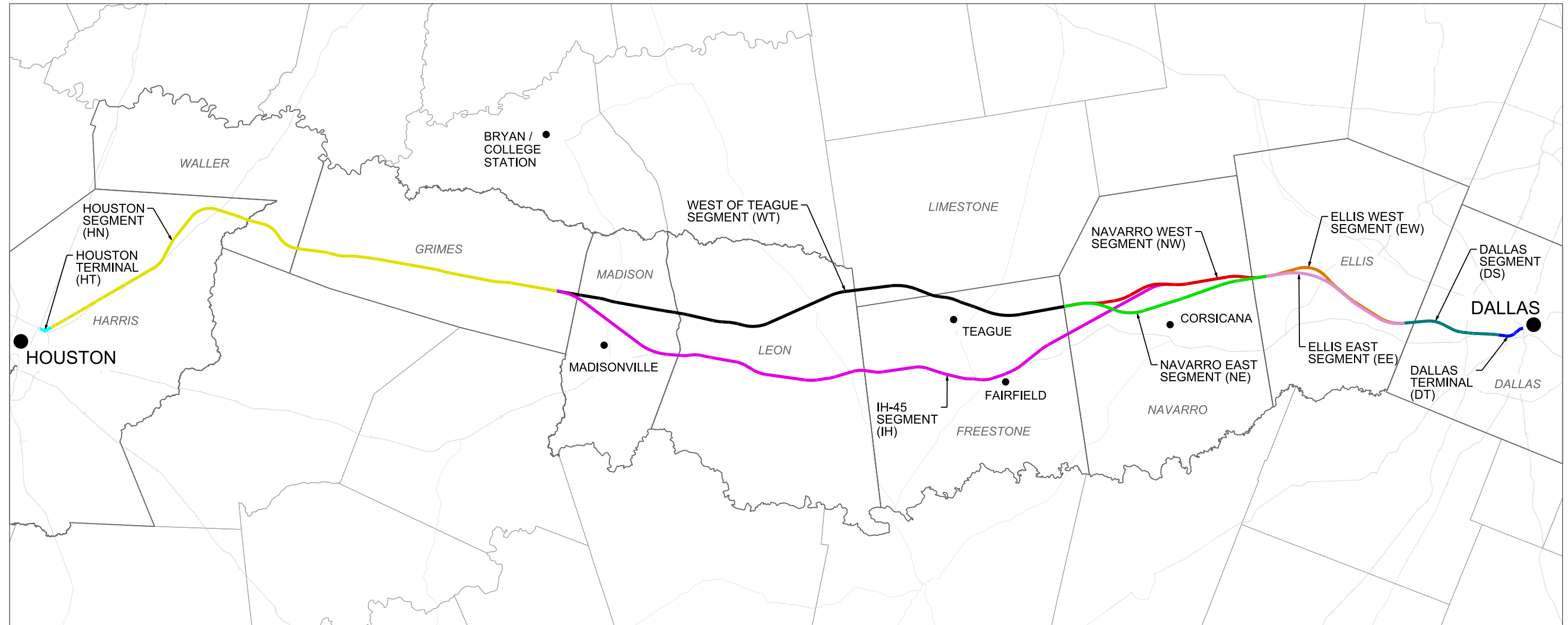
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COVER SHEET



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

NOTES:
 1. REFER TO FDCE v5 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
09/15/2017

ARUP

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Client

TEXAS CENTRAL

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

Drawing Title

GENERAL LOCATION PLAN

Scale
 AS SHOWN

Drawing Status
FINAL DRAFT

Job No 234180	Drawing No GEN-00-00002	Rev 01
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VOLUME 1 - GENERAL SHEETS & TYPICAL SECTIONS

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

VOLUME 2 - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Section 2-1 HOUSTON SEGMENT, listing drawings CVL-HN-01101 through CVL-HN-01108-2.

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Section 2-2 WEST OF TEAGUE SEGMENT, listing drawings CVL-HN-01107-3 through CVL-HN-01180.

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Section 2-2 WEST OF TEAGUE SEGMENT, listing drawings CVL-WT-01250 through CVL-WT-01296.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Revision table for the drawing.

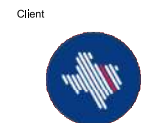
Table with columns: DESIGNED BY, DRAWN BY, CHECKED BY, IN CHARGE, DATE. Design and drawing information.



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Client Drawing Title Scale NO SCALE Drawing Status FINAL DRAFT Job No 234180 Drawing No GEN-00-00003 Rev 01

GENERAL INDEX SHEET 1 OF 5

VOLUME 2 - RAILWAY ALIGNMENT PLAN AND PROFILE SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Includes sections for 2-2 WEST OF TEAGUE SEGMENT and 2-3 IH-45 SEGMENT.

Table with columns: Drawing No., Description. Lists individual drawing numbers and their corresponding descriptions for various segments.

Table with columns: Drawing No., Description. Lists individual drawing numbers and their corresponding descriptions for various segments.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Revision table for the drawing.

Table with columns: DESIGNED BY, DRAWN BY, CHECKED BY, IN CHARGE, DATE. Designer information table.

Project information block including logos for ARUP, FREESE & NICHOLS, TEXAS CENTRAL, drawing title 'GENERAL INDEX SHEET 2 OF 5', scale 'NO SCALE', and job number '234180'.

PLOT TIME: 9/27/2017 10:20:31 AM

HOUSTON SEGMENT - CIVIL - KEY MAP - Sheet 2 of 4 - HN1 1024+00 TO HN1 2082+00

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawing numbers and descriptions for segments 2-6, 2-7, and 2-8.

VOLUME 3 - STATIONS, MAINTENANCE FACILITIES AND RAILWAY SYSTEMS SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawing numbers and descriptions for stations, maintenance facilities, and railway systems sheets.

Table with columns: Drawing ID, Description. Lists drawing numbers and descriptions for various station options, industrial stations, and maintenance facilities.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Includes a revision table and a design information table with fields for Designer, Drawn, Checked, In Charge, and Date.

Project information block containing logos for ARUP, FREESE & NICHOLS, and TEXAS CENTRAL. Includes drawing title 'GENERAL INDEX SHEET 3 OF 5', scale 'NO SCALE', drawing status 'FINAL DRAFT', and job/drawing numbers.

PLOT TIME: 9/25/2017 5:41:24 PM

PLOT BY: N-YPWICS01S

VOLUME 3 - STATIONS, MAINTENANCE FACILITIES AND RAILWAY SYSTEMS SHEETS

Table with 2 columns: DRAWING NO. and DRAWING DESCRIPTIONS. Includes sections for 3-2 MAINTENANCE FACILITIES, YARDS AND SHOPS and 3-3 RAILWAY SYSTEMS.

VOLUME 4 - ROADWAY PLAN SHEETS

Table with 2 columns: DRAWING NO. and DRAWING DESCRIPTIONS. Includes section for 4-1 HOUSTON SEGMENT with numerous drawing entries.

Table with 2 columns: Drawing ID and Description. Includes sections for WEST OF TEAGUE SEGMENT, IH-45 SEGMENT, and 4-3 IH-45 SEGMENT.

Table with 5 columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Revision table for the drawing.

Table with 2 columns: Field Name and Value. Includes fields for DESIGNED BY, DRAWN BY, CHECKED BY, IN CHARGE, and DATE.



Table with 3 columns: Field Name and Value. Includes Drawing Title (GENERAL INDEX SHEET 4 OF 5), Scale (NO SCALE), Drawing Status (FINAL DRAFT), Job No (234180), Drawing No (GEN-00-00006), and Rev (01).

PLOT TIME: 9/25/2017 5:42:37 PM

PLOT BY: MYPWCS01S

VOLUME 4 - ROADWAY PLAN SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawings 1H-45 SEGMENT and 4-4 NAVARRO WEST SEGMENT.

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawings 4-5 NAVARRO EAST SEGMENT, 4-6 ELLIS WEST SEGMENT, 4-7 ELLIS EAST SEGMENT, and 4-8 DALLAS SEGMENT.

VOLUME 5 - WILDLIFE CROSSING SHEETS

Table with columns: DRAWING NO., DRAWING DESCRIPTIONS. Lists drawings 5-1 WILDLIFE CROSSING TYPICAL SECTIONS.

Table with columns: REV, DATE, BY, CHK, APP, DESCRIPTION. Revision table for drawing 09/15/2017.

DESIGNED BY D. THOMPSON
DRAWN BY D. THOMPSON
CHECKED BY R. BURNS
IN CHARGE C. TAYLOR
DATE 09/15/2017



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Client
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Drawing Title

GENERAL INDEX SHEET 5 OF 5

Scale NO SCALE

Drawing Status FINAL DRAFT

Job No 234180 Drawing No GEN-00-00007 Rev 01

GENERAL NOTES:

- 1. THESE DRAWINGS ACCOMPANY FINAL DRAFT CONCEPTUAL ENGINEERING REPORT (FDCE) V7 REPORT DATED SEPTEMBER 15, 2017.
- 2. DRAWING SET INCLUDES FIVE (5) VOLUMES.
- 3. CONCEPTUAL ENGINEERING WAS DEVELOPED TO IDENTIFY PROJECT LIMIT OF DISTURBANCE (LOD), OR "PROJECT FOOTPRINT". CONCEPTUAL ENGINEERING DRAWINGS AND FDCE 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 DRAWINGS 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 (TNRIS) AND HOUSTON-GALVESTON AREA COUNCIL (HGAC).
 - DALLAS COUNTY LIDAR, 2009, SOURCED FROM TNRIS.
 - HGAC LIDAR, 2008.
 - TNRIS LIDAR, 2009-2013.
 - TNRIS 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, AEROGRIID, 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, 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), 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.
- 2. LOD USED FOR EIS ANALYSIS FOOTPRINT.

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, 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 (TMFS).

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 MAPS.
- 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-00-03036 FOR TYPICAL ROADWAY CROSS SECTIONS.
- 7. ROADWAY REMOVALS ARE NOT SHOWN ON RAIL PLAN AND PROFILE SHEETS, REFER TO ROADWAY PLAN SHEETS IN VOLUME 3 FOR ALL 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 CROSSING DO NOT REPRESENT THE PROPOSED ROADWAY ELEVATION, BUT RATHER THE MINIMUM HEIGHT REQUIRED FOR CLEARANCES, INCLUDING ALLOWANCES FOR ROADWAY STRUCTURAL ELEMENTS. SEE FDCE 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 REQUIRED THE APPROPRIATE APPROVAL FROM TXDOT.

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 FDCE 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 ONLY AND ARE BASED ON INFORMATION RECEIVED, AS DOCUMENTED IN THE FINAL DRAFT 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 FDCE 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 LANDOWNER NEGOTIATIONS WILL BE REQUIRED TO DETERMINE LAND OWNER 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-00-02005, 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 FDCE 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-00-01002.
- 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.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. THOMPSON
DRAWN BY D. THOMPSON
CHECKED BY R. BURNS
IN CHARGE C. TAYLOR
DATE 09/15/2017



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Texas Registered Engineering Firm: F-2144



Client
Drawing Title
GENERAL NOTES

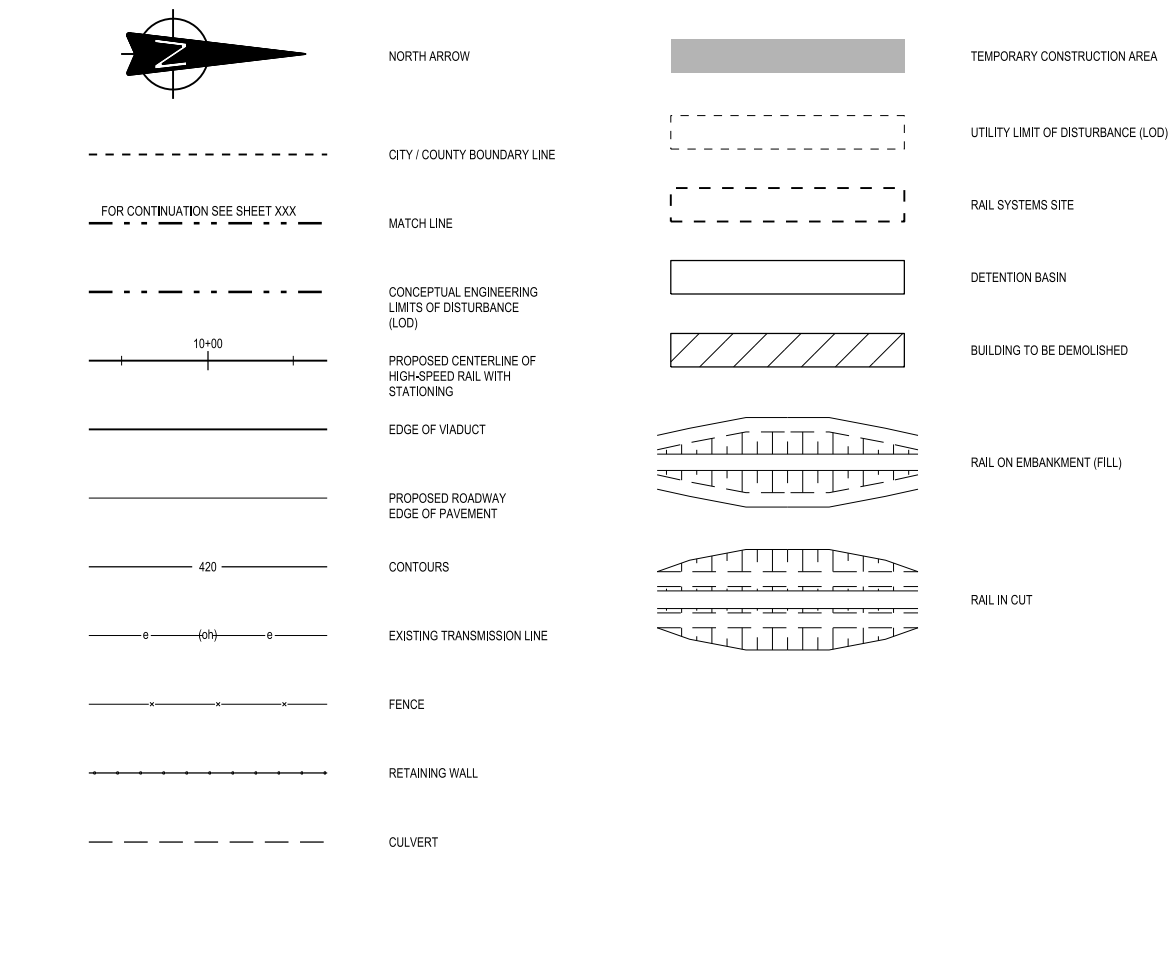
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Job No 234180	Drawing No GEN-00-00008	Rev 01

ABBREVIATIONS

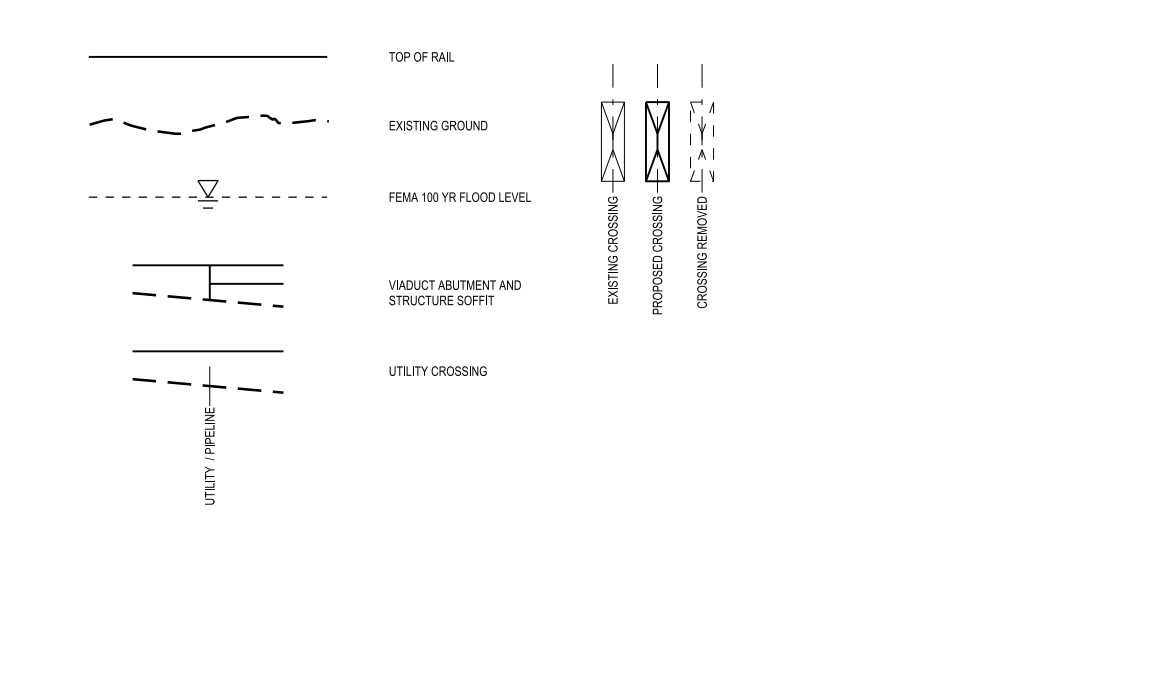
LEGEND

ALT	ALTERNATE ALIGNMENT	TBD	TO BE DETERMINED
APPROX	APPROXIMATE	TCEQ	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ATP	AUTOTRANSFORMER POST	TEMP	TEMPORARY
AVE	AVENUE	TMF	TRAINSET MAINTENANCE FACILITY
BLVD	BOULEVARD	TPSS	TRACTION POWER SUBSTATION
BNSF	BURLINGTON NORTH SANTE FE RAILROAD	TS	TANGENT SPIRAL
BOT	BOTTOM	TYP	TYPICAL
		TOR	TOP OF RAIL
CH	COMMUNICATION HOUSE	US	UNITED STATES, UNITED STATES HIGHWAY
CO RD	COUNTY ROAD	UPRR	UNION PACIFIC RAILROAD
CL	CENTERLINE		
C	CENTERLINE	VAR	VARIABLE
CO	COUNTY	VERT, V	VERTICAL
CR	COUNTY ROAD	WB	WESTBOUND
CS	CURVE TO SPIRAL	WT	WEST OF TEAGUE
CVL	CIVIL	XING	CROSSING
		YR	YEAR
DIA	DIAMETER		
DIST	DISTANCE, DISTRICT		
DR	DRIVE		
DRG	DRAWING		
DS	DALLAS SEGMENT		
DSN	DALLAS SEGMENT NORTH		
DSS	DALLAS SEGMENT SOUTH		
DT	DALLAS TERMINUS SEGMENT		
DWY	DRIVEWAY		
Ea	ACTUAL SUPERELEVATION		
EE	ELLIS EAST SEGMENT		
ELECT	ELECTRIC		
ELEV	ELEVATION		
EMB	EMBANKMENT		
ENGR	ENGINEER		
EPA	ENVIRONMENTAL PROTECTION AGENCY		
Eu	UNBALANCED SUPERELEVATION		
EW	ELLIS WEST SEGMENT		
EXIST, EX.	EXISTING EXTERIOR		
EXT			
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		
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		
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		
SC	SPIRAL CURVE		
SH	STATE HIGHWAY		
SO	SIDING OFF		
SP	SECTIONING POST		
SSH	SUB-SIGNAL HOUSE		
SSP	SUB-SECTIONING POST		
ST	STREET, SPIRAL TO TANGENT		
STA	STATION		
STD	STANDARD		
SYM	SYMMETRICAL		

PLAN



PROFILE



NOTE:

1. FOR ADDITIONAL DETAIL REGARDING INFORMATION SHOWN ON DRAWINGS, SEE RAIL ANNOTATION TO CLARIFY DESIGN INTENT, DRAWING GEN-00-00010. SEE ROAD ANNOTATION TO CLARIFY DESIGN INTENT, DRAWING GEN-00-00011.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. THOMPSON
DRAWN BY D. THOMPSON
CHECKED BY R. BURNS
IN CHARGE C. TAYLOR
DATE 09/15/2017



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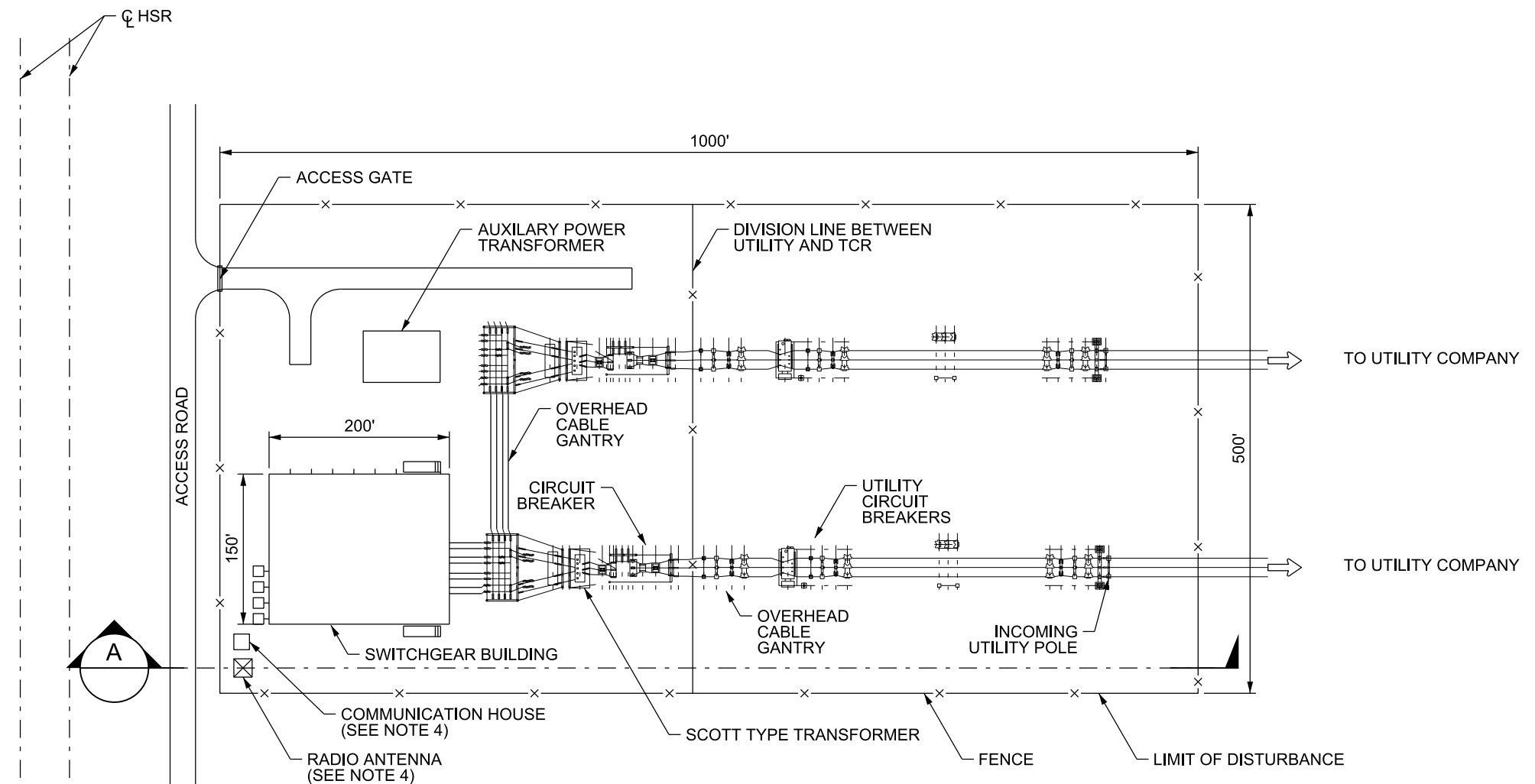
2711 North Haskell Ave., Suite 3300
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Drawing Title
GENERAL ABBREVIATIONS AND LEGEND

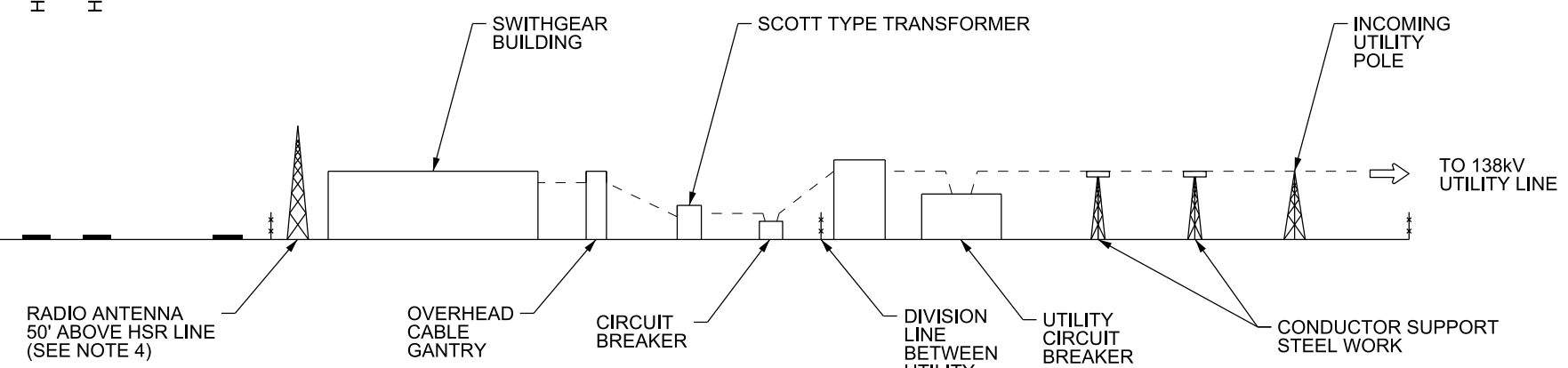
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Job No 234180	Drawing No GEN-00-00009	Rev 01

3-3
RAILWAY SYSTEMS



TYPICAL TRACTION POWER SUBSTATION (TPSS)

- NOTES:**
1. TYPICAL ARRANGEMENT OF TRACTION POWER SUBSTATION SHOWN FOR PURPOSES OF ENVIRONMENTAL IMPACT ANALYSES. SITE WILL INCLUDE ALLOWANCE FOR UTILITY SUBSTATIONS, ALL OF THE REQUIRED TRACTION POWER DISTRIBUTION EQUIPMENT, PARKING, AND OTHER SITE FEATURES.
 2. POWER SUPPLY NEEDS AND ASSOCIATED INFRASTRUCTURE REQUIREMENTS AT EACH LOCATION WILL BE DETERMINED THROUGH DETAILED OPERATIONAL AND TRACTION POWER DEMAND ANALYSES.
 3. SITE SPECIFIC CONSTRAINTS AT EACH LOCATION WILL INFLUENCE EQUIPMENT ARRANGEMENTS DEPENDING ON THE COMPLEXITY OF THE TRACK LOCATION BEING CONTROLLED AND THE AMOUNT OF EQUIPMENT REQUIRED AT EACH LOCATION.
 4. COMMUNICATION HOUSES AND ASSOCIATED RADIO ANTENNA WILL BE INTEGRATED INTO TPSS FACILITIES AS SHOWN WHERE PRACTICABLE TO MINIMIZE ROW REQUIREMENTS AND IMPACTS. SEE DRAWING SYS-00-01002 FOR COMMUNICATIONS FACILITIES LAYOUTS.
 5. ACCESS ROAD LOCATION RELATIVE TO SITE ARRANGEMENTS VARIES BY LOCATION. SEE PLAN AND PROFILE DRAWINGS FOR LOCATIONS AND ASSOCIATED LIMIT OF DISTURBANCE.
 6. ORIENTATION OF EXISTING UTILITY SERVICES RELATIVE TO SUBSTATION VARIES BY LOCATION. SEE PLAN AND PROFILE DRAWINGS FOR TRANSMISSION LINE CONNECTIONS. FINAL CONFIGURATION WILL BE DETERMINED BY UTILITY.



ELEVATION A-A

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND
DRAWN BY
J. GAIBORT
CHECKED BY
T. SMITH
IN CHARGE
C. TAYLOR
DATE
09/15/2017



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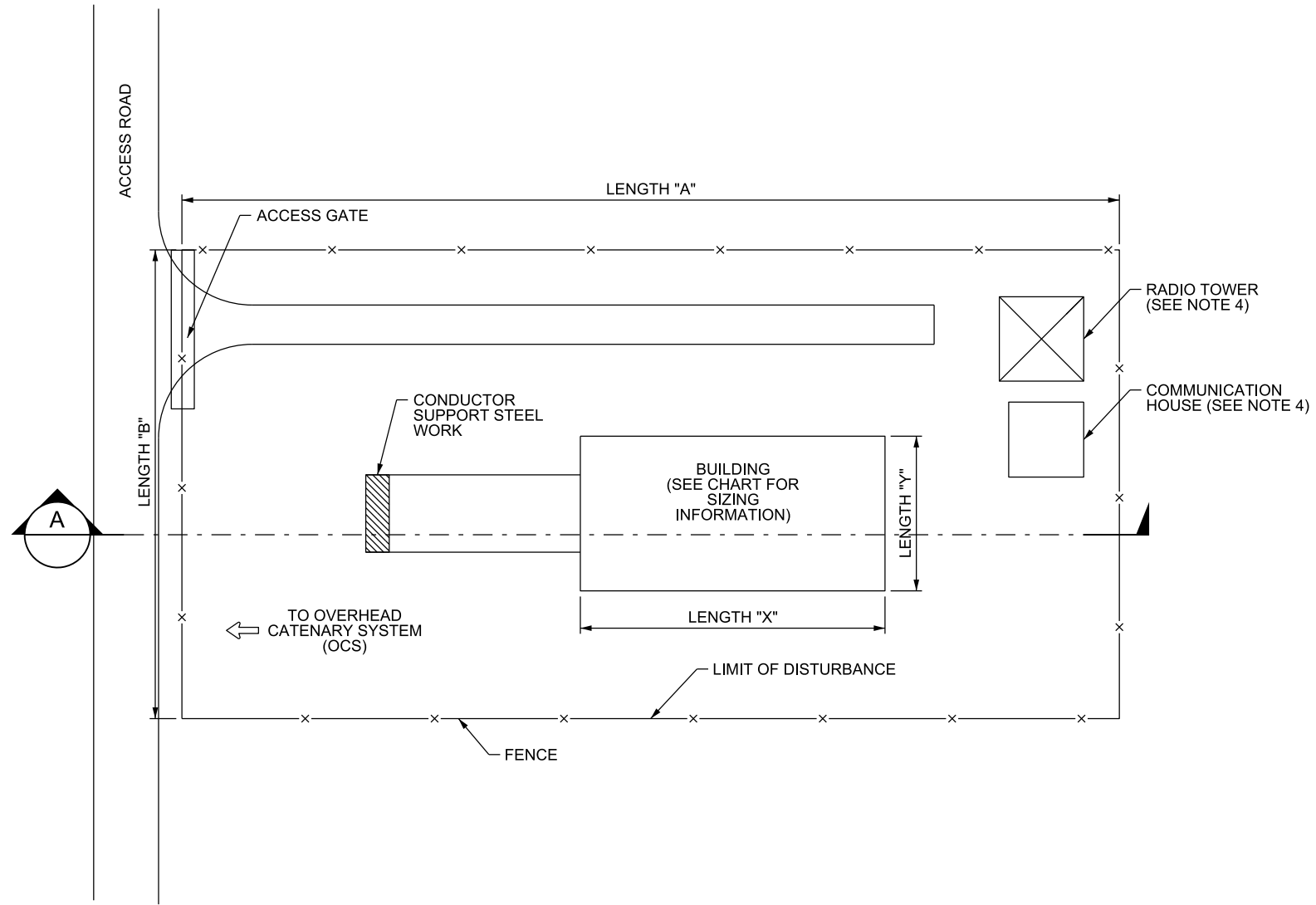
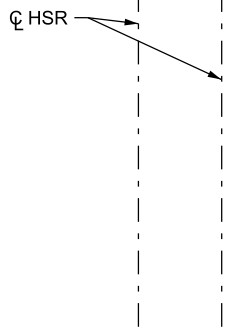


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Drawing Title
**GENERAL RAILWAY
TYPICAL LAYOUT PLAN
SHEET 1 OF 3**

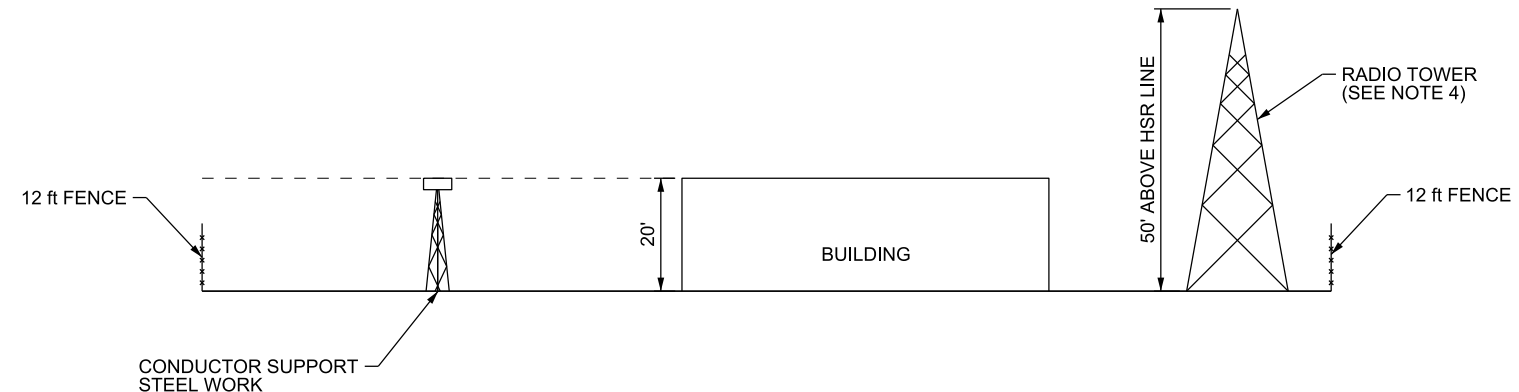
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Drawing Status FINAL DRAFT		
Job No 234180	Drawing No SYS-00-01000	Rev 01



POWER FACILITIES ADJACENT TO ROW

- NOTES:**
1. TYPICAL ARRANGEMENT OF SECTIONING POST/SUB-SECTIONING POST/ AUTO TRANSFORMER POST SHOWN FOR PURPOSES OF ENVIRONMENTAL IMPACT ANALYSES.
 2. SITE SPECIFIC CONSTRAINTS AT EACH LOCATION WILL INFLUENCE EQUIPMENT ARRANGEMENTS DEPENDING ON THE COMPLEXITY OF THE TRACK LOCATION BEING CONTROLLED AND THE AMOUNT OF EQUIPMENT REQUIRED AT EACH LOCATION.
 3. POWER SUPPLY NEEDS AND ASSOCIATED INFRASTRUCTURE REQUIREMENTS AT EACH LOCATION WILL BE DETERMINED THROUGH DETAILS OPERATIONAL AND TRACTION POWER DEMAND ANALYSES.
 4. COMMUNICATION HOUSES AND ASSOCIATED RADIO ANTENNA WILL BE INTEGRATED INTO TRACTION POWER FACILITIES AS SHOWN WHERE PRACTICABLE TO MINIMIZE ROW REQUIREMENTS AND IMPACTS. SEE DRAWING SYS-00-01002 FOR COMMUNICATIONS FACILITIES LAYOUTS.
 5. ACCESS ROAD LOCATION RELATIVE TO SITE ARRANGEMENTS VARIES BY LOCATION. SEE PLAN AND PROFILE DRAWINGS FOR LOCATIONS AND ASSOCIATED LIMIT OF DISTURBANCE.

POWER FACILITIES ADJACENT TO ROW					
FACILITY NAME	TLA	BUILDING		YARD	
		X (FT)	Y (FT)	A (FT)	B (FT)
AUTO TRANSFORMER POST	ATP	65.5	33	130	100
SECTIONING POST	SP	65.5	33	200	130
SUB-SECTIONING POST	SSP	65.5	33	200	100



ELEVATION A-A

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
T. SMELCER

CHECKED BY
T. SMITH

IN CHARGE
C. TAYLOR

DATE
09/15/2017

ARUP

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Client

TEXAS CENTRAL

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

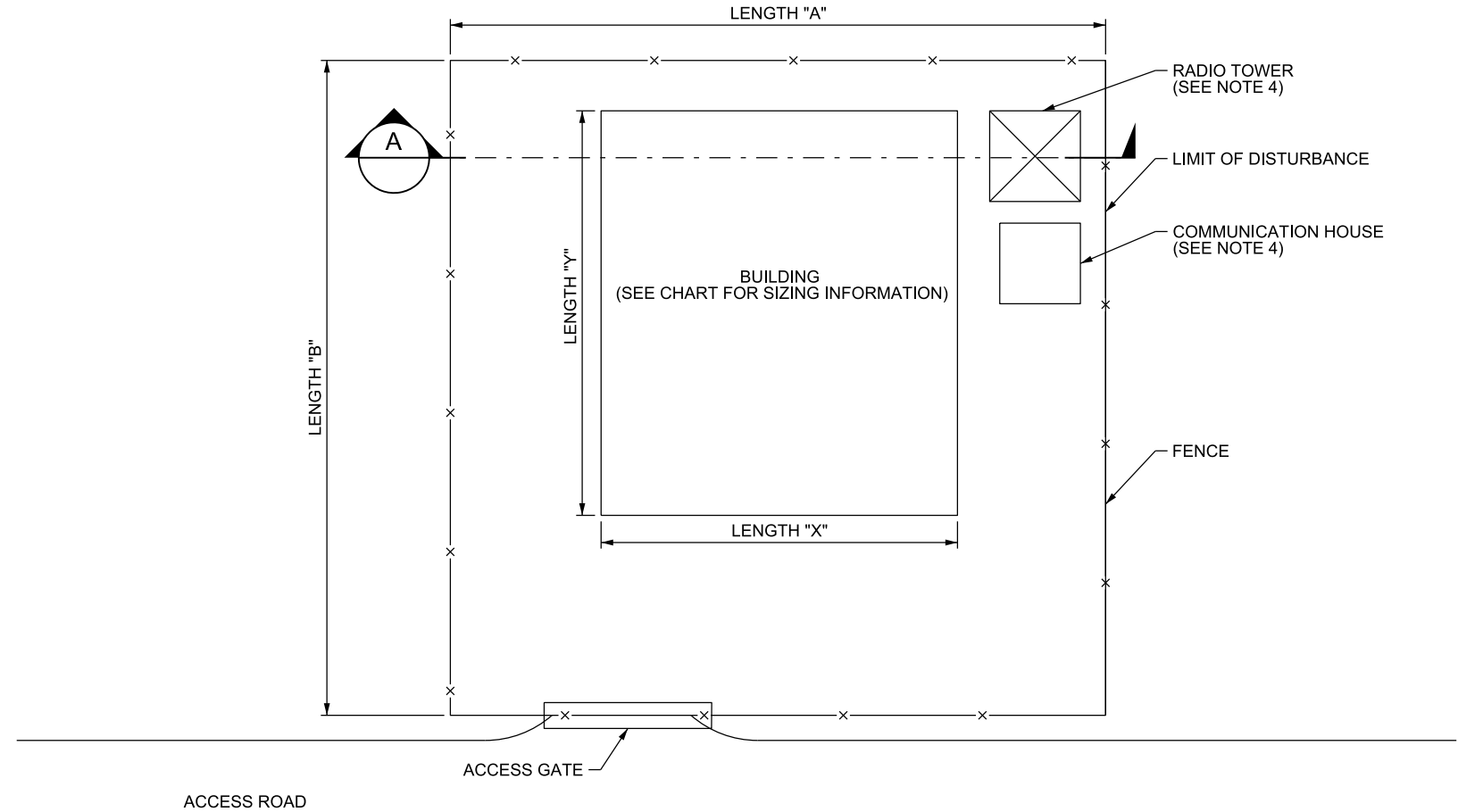
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GENERAL RAILWAY TYPICAL LAYOUT PLAN SHEET 2 OF 3

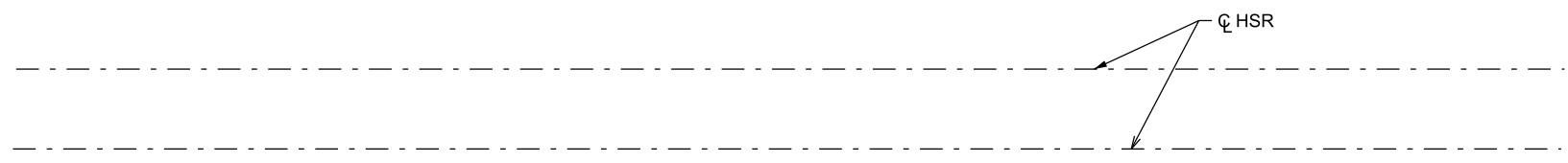
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Drawing Status
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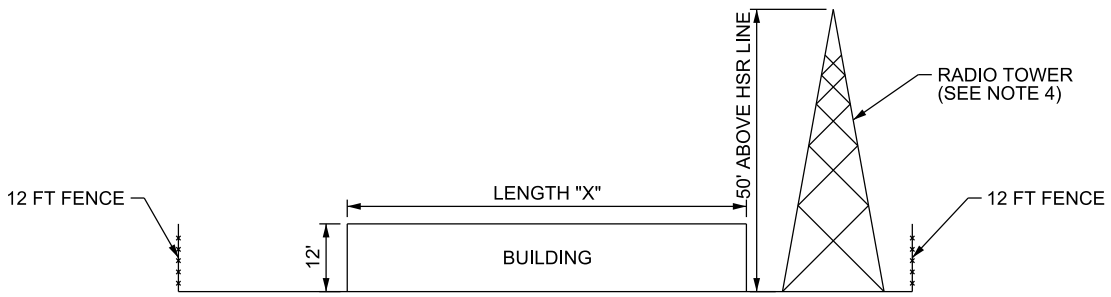
Job No 234180	Drawing No SYS-00-01001	Rev 01
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- NOTES:
1. TYPICAL ARRANGEMENT OF SIGNALING AND COMMUNICATIONS FACILITIES SHOWN FOR PURPOSES OF ENVIRONMENTAL IMPACT ANALYSES.
 2. SITE SPECIFIC CONSTRAINTS AT EACH LOCATION WILL INFLUENCE EQUIPMENT ARRANGEMENTS DEPENDING ON THE COMPLEXITY OF THE TRACK LOCATION BEING CONTROLLED AND THE AMOUNT OF EQUIPMENT REQUIRED AT EACH LOCATION.
 3. SIGNALING AND COMMUNICATIONS NEEDS AND ASSOCIATED INFRASTRUCTURE REQUIREMENTS AT EACH LOCATION WILL BE DETERMINED THROUGH DETAILED SYSTEM ANALYSES DURING MORE ADVANCED DESIGN.
 4. COMMUNICATION HOUSES AND ASSOCIATED RADIO ANTENNA WILL BE INTEGRATED INTO SIGNALING FACILITIES AS SHOWN WHERE PRACTICABLE TO MINIMIZE ROW REQUIREMENTS AND IMPACTS.
 5. ACCESS ROAD LOCATION RELATIVE TO SITE ARRANGEMENTS VARIES BY LOCATION. SEE PLAN AND PROFILE DRAWINGS FOR LOCATIONS AND ASSOCIATED LIMIT OF DISTURBANCE.
 6. THESE FACILITIES WILL BE LOCATED CLOSE TO THE ROW TO SUPPORT CONNECTIONS TO THE TRACK AND TO FACILITATE RADIO COMMUNICATIONS WITH CREW AND CONTROL SYSTEMS WITHIN THE TRAIN AND MAINTENANCE CREWS OPERATING ALONG THE ROW IN CLOSE PROXIMITY. SEE PLAN AND PROFILE DRAWINGS FOR LOCATIONS AND ASSOCIATED LIMIT OF DISTURBANCE.



SIGNALING AND COMMUNICATIONS FACILITIES ADJACENT TO ROW



ELEVATION A-A

SIGNALING AND COMMUNICATIONS FACILITIES ADJACENT TO ROW					
FACILITY NAME	TLA	BUILDING		YARD	
		X (FT)	Y (FT)	A (FT)	B (FT)
COMMUNICATION HOUSE	CH	16	16	25	30
SUB-SIGNAL HOUSE	SSH	50	50	60	80
MAIN SIGNAL HOUSE	MSH	100	40	130	100
INTERMEDIATE SIGNAL HOUSE	ISH	100	40	130	130

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
T. SMELCER

CHECKED BY
T. SMITH

IN CHARGE
C. TAYLOR

DATE
09/15/2017



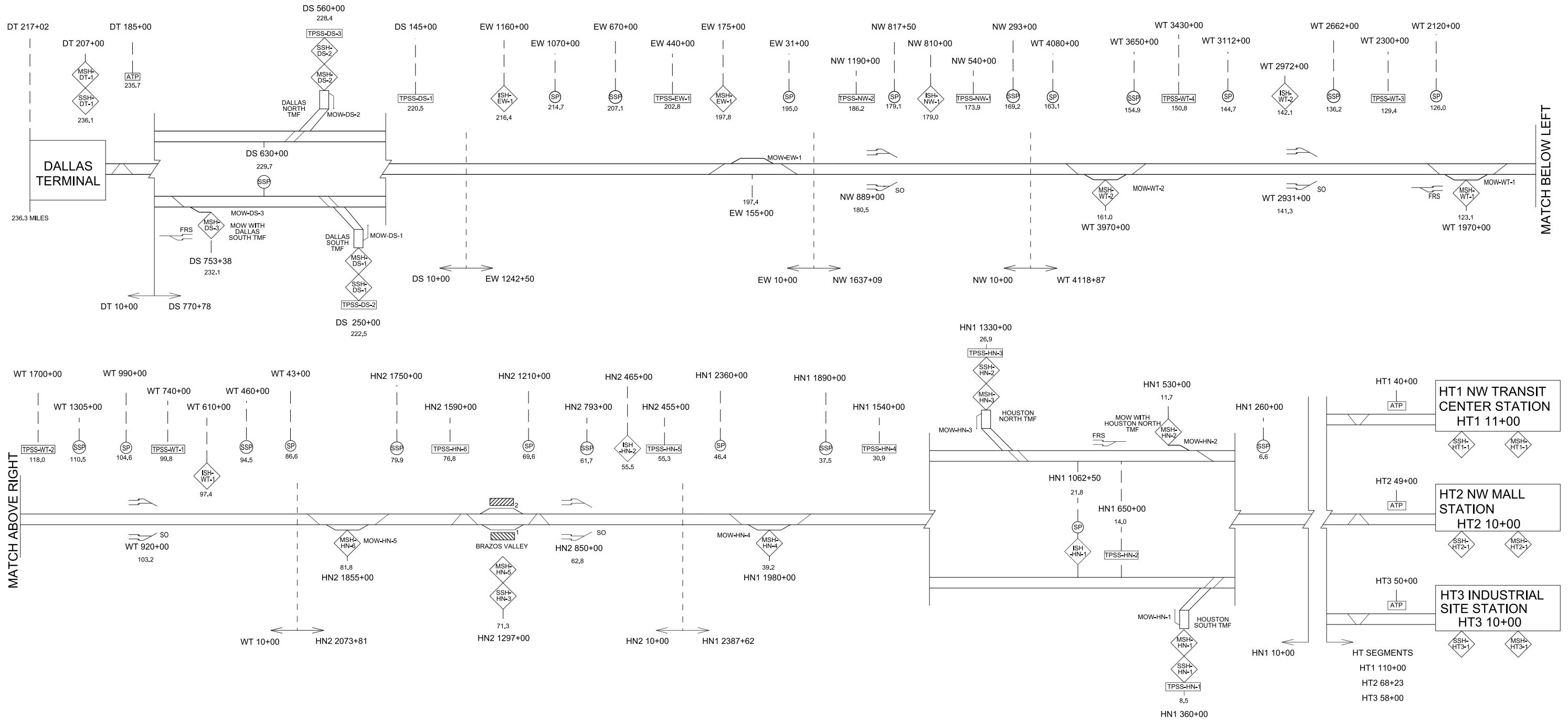
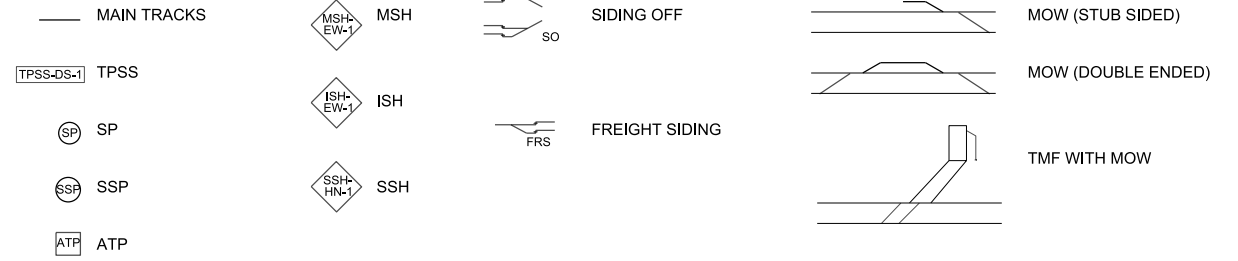
Drawing Title
GENERAL RAILWAY TYPICAL LAYOUT PLAN SHEET 3 OF 3

Scale NOT TO SCALE		
Drawing Status FINAL DRAFT		
Job No 234180	Drawing No SYS-00-01002	Rev 01

NOTES:

- 1. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
- 2. SYSTEMS SCHEMATIC INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
- 3. MILE MARKERS INDICATE DISTANCE FROM FROM HOUSTON TERMINAL. ALL MILE MARKERS ARE TAKEN FROM THE NW TRANSIT CENTER SITE TERMINAL (HT1), THE LONGEST ALTERNATIVE. FOR NW MALL TERMINAL SITE (HT2), SUBTRACT 4076 FT. FOR INDUSTRIAL TERMINAL SITE (HT3), SUBTRACT 5479 FT.
- 4. COMMUNICATIONS HOUSES ARE NOT SHOWN.
- 5. SEE FDCE REPORT FOR FULL LIST OF AND MORE INFORMATION ON SYSTEMS FACILITIES, INCLUDING COMMUNICATION HOUSES.
- 6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

LEGEND



MATCH ABOVE RIGHT

MATCH BELOW LEFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
C. ZWIEBEL

CHECKED BY
T. WAGNER

IN CHARGE
C. TAYLOR

DATE
09/15/2017



Drawing Title
**GENERAL FACILITIES SPACING
ALIGNMENT ALTERNATIVE A**

Scale
NOT TO SCALE

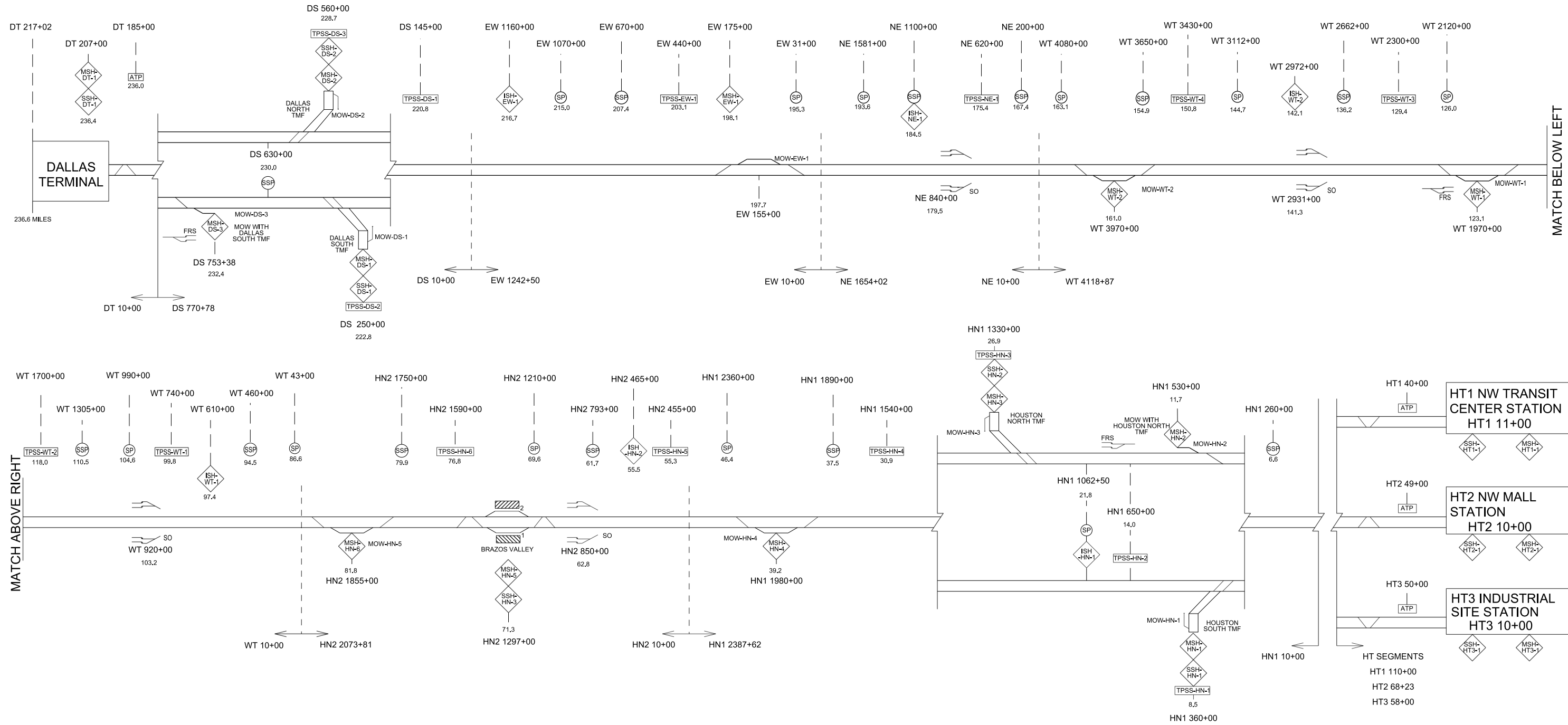
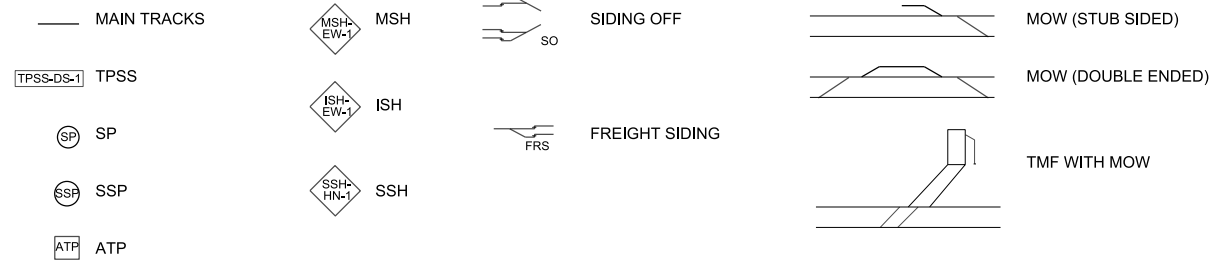
Drawing Status
FINAL DRAFT

Job No 234180	Drawing No SYS-00-02000	Rev 01
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NOTES:

- 1. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
- 2. SYSTEMS SCHEMATIC INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
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- 4. COMMUNICATIONS HOUSES ARE NOT SHOWN.
- 5. SEE FDCE REPORT FOR FULL LIST OF AND MORE INFORMATION ON SYSTEMS FACILITIES, INCLUDING COMMUNICATION HOUSES.
- 6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

LEGEND



MATCH ABOVE RIGHT

MATCH BELOW LEFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
C. ZWIEBEL

CHECKED BY
T. WAGNER

IN CHARGE
C. TAYLOR

DATE
09/15/2017



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Drawing Title
**GENERAL FACILITIES SPACING
ALIGNMENT ALTERNATIVE B**

Scale
NOT TO SCALE

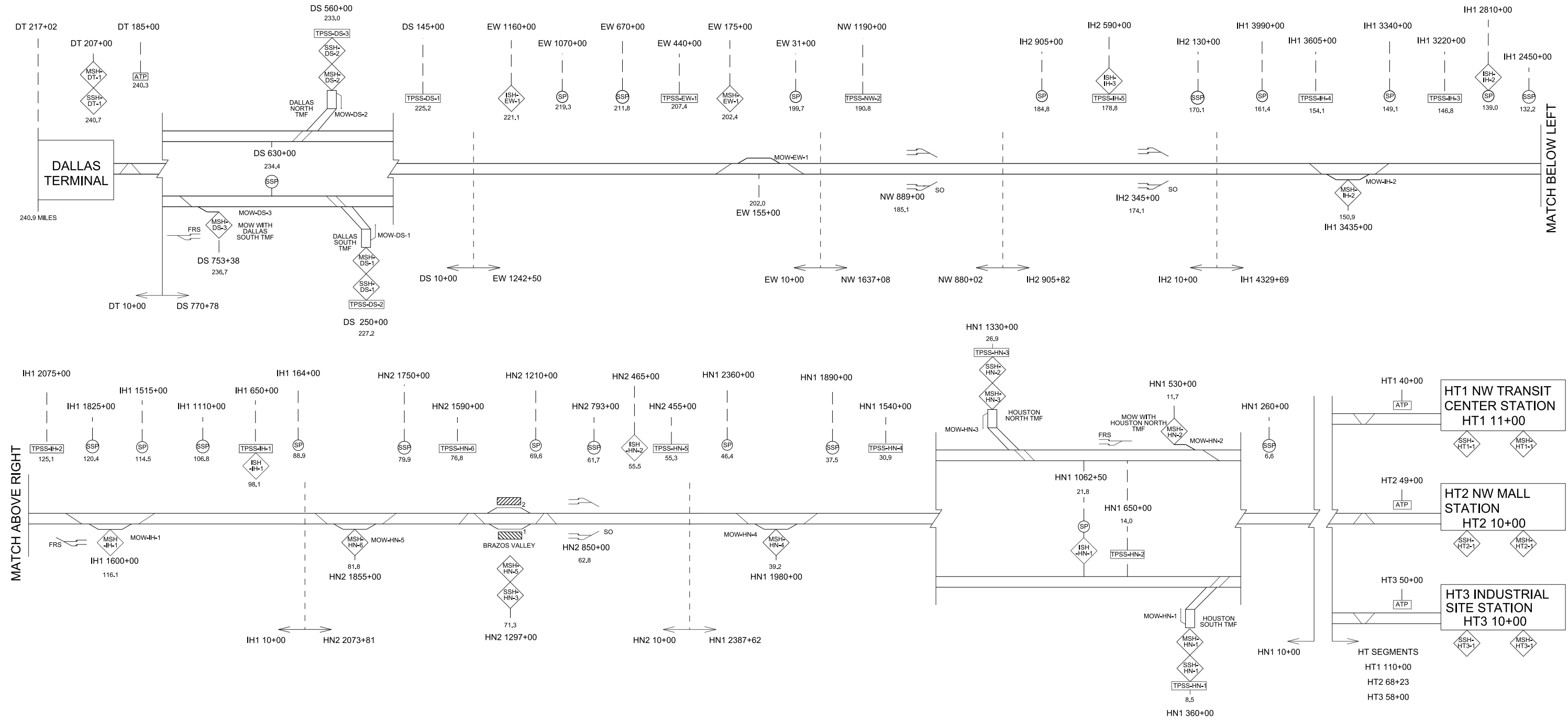
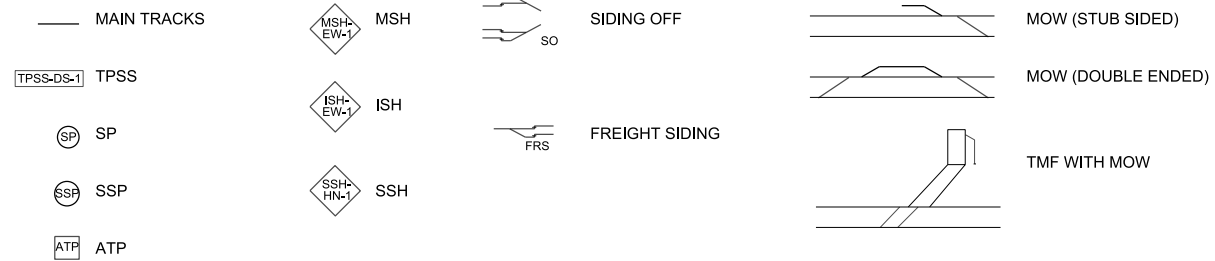
Drawing Status
FINAL DRAFT

Job No 234180	Drawing No SYS-00-02001	Rev 01
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NOTES:

- 1. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
- 2. SYSTEMS SCHEMATIC INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
- 3. MILE MARKERS INDICATE DISTANCE FROM FROM HOUSTON TERMINAL. ALL MILE MARKERS ARE TAKEN FROM THE NW TRANSIT CENTER SITE TERMINAL (HT1), THE LONGEST ALTERNATIVE. FOR NW MALL TERMINAL SITE (HT2), SUBTRACT 4076 FT. FOR INDUSTRIAL TERMINAL SITE (HT3), SUBTRACT 5479 FT.
- 4. COMMUNICATIONS HOUSES ARE NOT SHOWN.
- 5. SEE FDCE REPORT FOR FULL LIST OF AND MORE INFORMATION ON SYSTEMS FACILITIES, INCLUDING COMMUNICATION HOUSES.
- 6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

LEGEND



MATCH ABOVE RIGHT

MATCH BELOW LEFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
C. ZWIEBEL

CHECKED BY
T. WAGNER

IN CHARGE
C. TAYLOR

DATE
09/15/2017

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Client

TEXAS CENTRAL

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

Drawing Title

**GENERAL FACILITIES SPACING
ALIGNMENT ALTERNATIVE C**

Scale
NOT TO SCALE

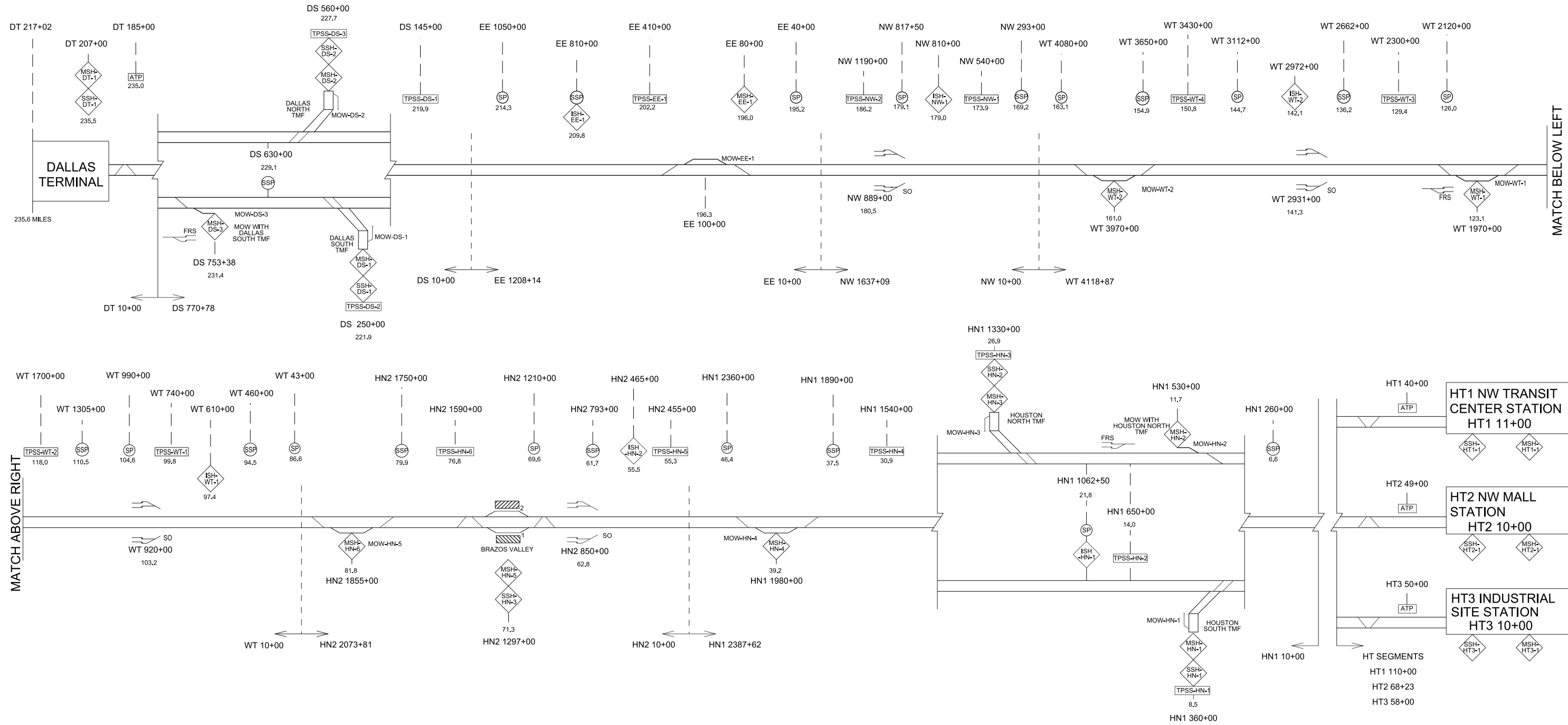
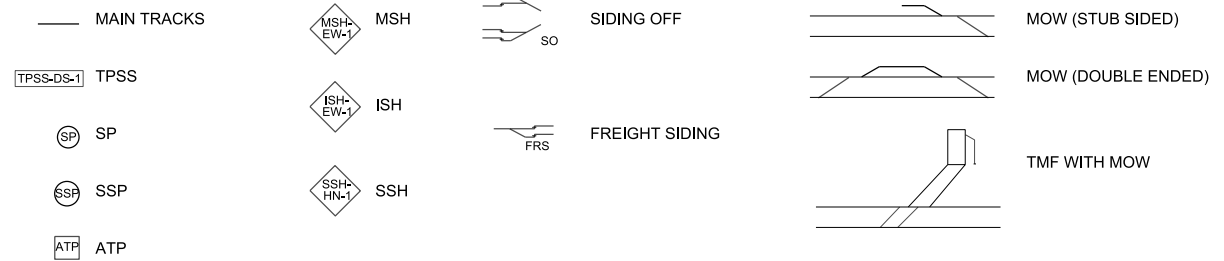
Drawing Status
FINAL DRAFT

Job No 234180	Drawing No SYS-00-02002	Rev 01
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NOTES:

- 1. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
- 2. SYSTEMS SCHEMATIC INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
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- 4. COMMUNICATIONS HOUSES ARE NOT SHOWN.
- 5. SEE FDCE REPORT FOR FULL LIST OF AND MORE INFORMATION ON SYSTEMS FACILITIES, INCLUDING COMMUNICATION HOUSES.
- 6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

LEGEND



MATCH ABOVE RIGHT

MATCH BELOW LEFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
C. ZWIEBEL

CHECKED BY
T. WAGNER

IN CHARGE
C. TAYLOR

DATE
09/15/2017



Drawing Title
**GENERAL FACILITIES SPACING
ALIGNMENT ALTERNATIVE D**

Scale
NOT TO SCALE

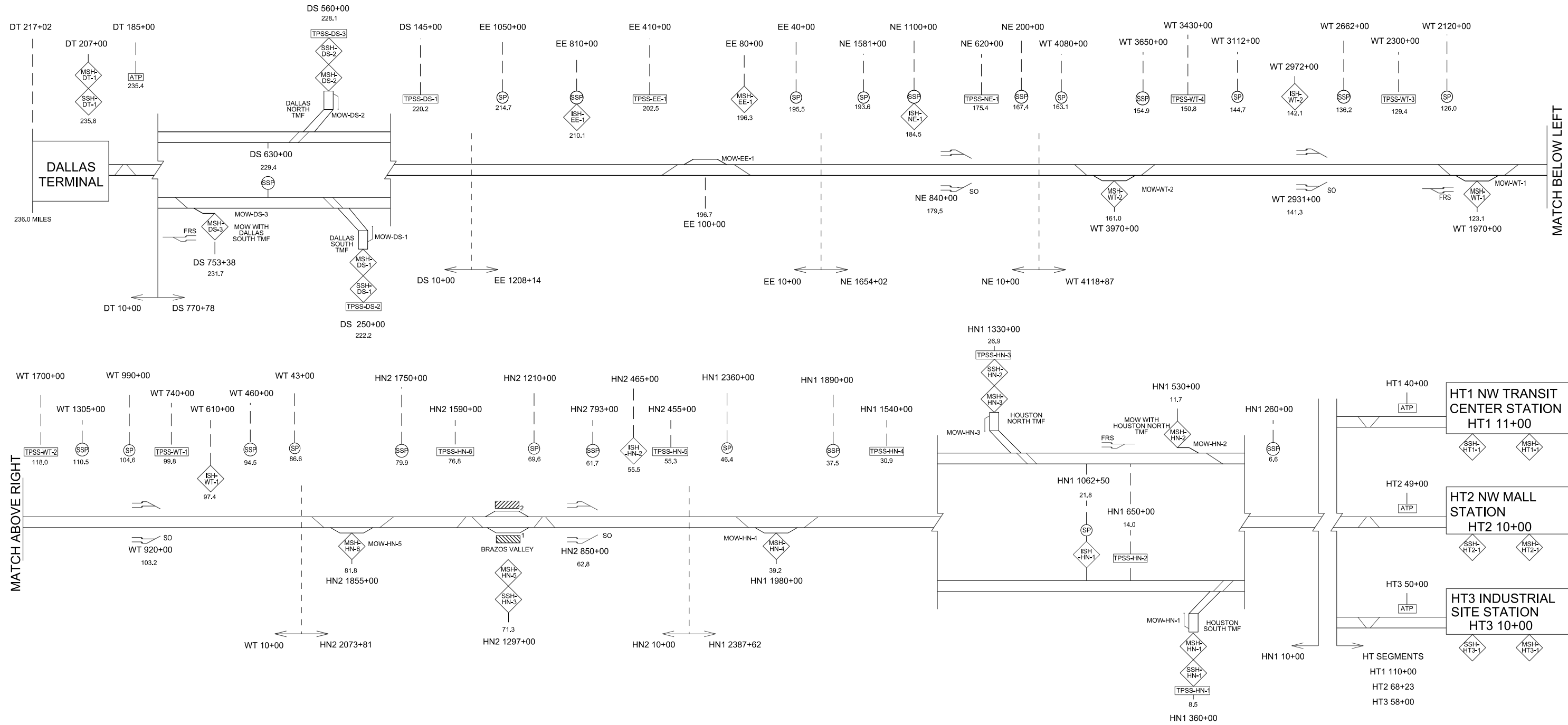
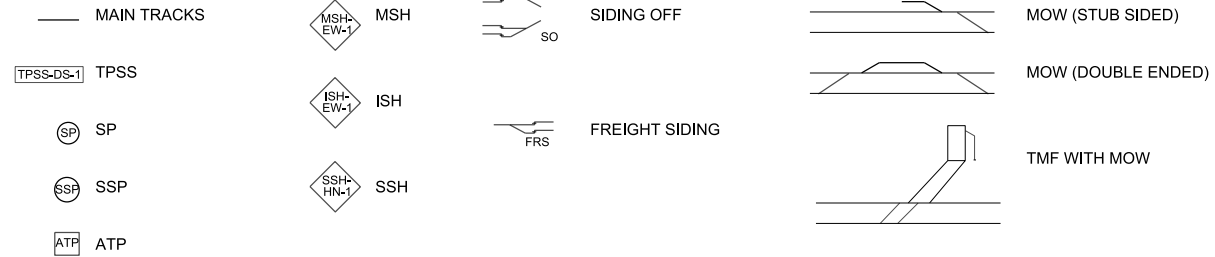
Drawing Status
FINAL DRAFT

Job No 234180	Drawing No SYS-00-02003	Rev 01
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NOTES:

- 1. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
- 2. SYSTEMS SCHEMATIC INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
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- 4. COMMUNICATIONS HOUSES ARE NOT SHOWN.
- 5. SEE FDCE REPORT FOR FULL LIST OF AND MORE INFORMATION ON SYSTEMS FACILITIES, INCLUDING COMMUNICATION HOUSES.
- 6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

LEGEND



MATCH ABOVE RIGHT

MATCH BELOW LEFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
C. ZWIEBEL

CHECKED BY
T. WAGNER

IN CHARGE
C. TAYLOR

DATE
09/15/2017

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Client

TEXAS CENTRAL

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

Drawing Title

**GENERAL FACILITIES SPACING
ALIGNMENT ALTERNATIVE E**

Scale
NOT TO SCALE

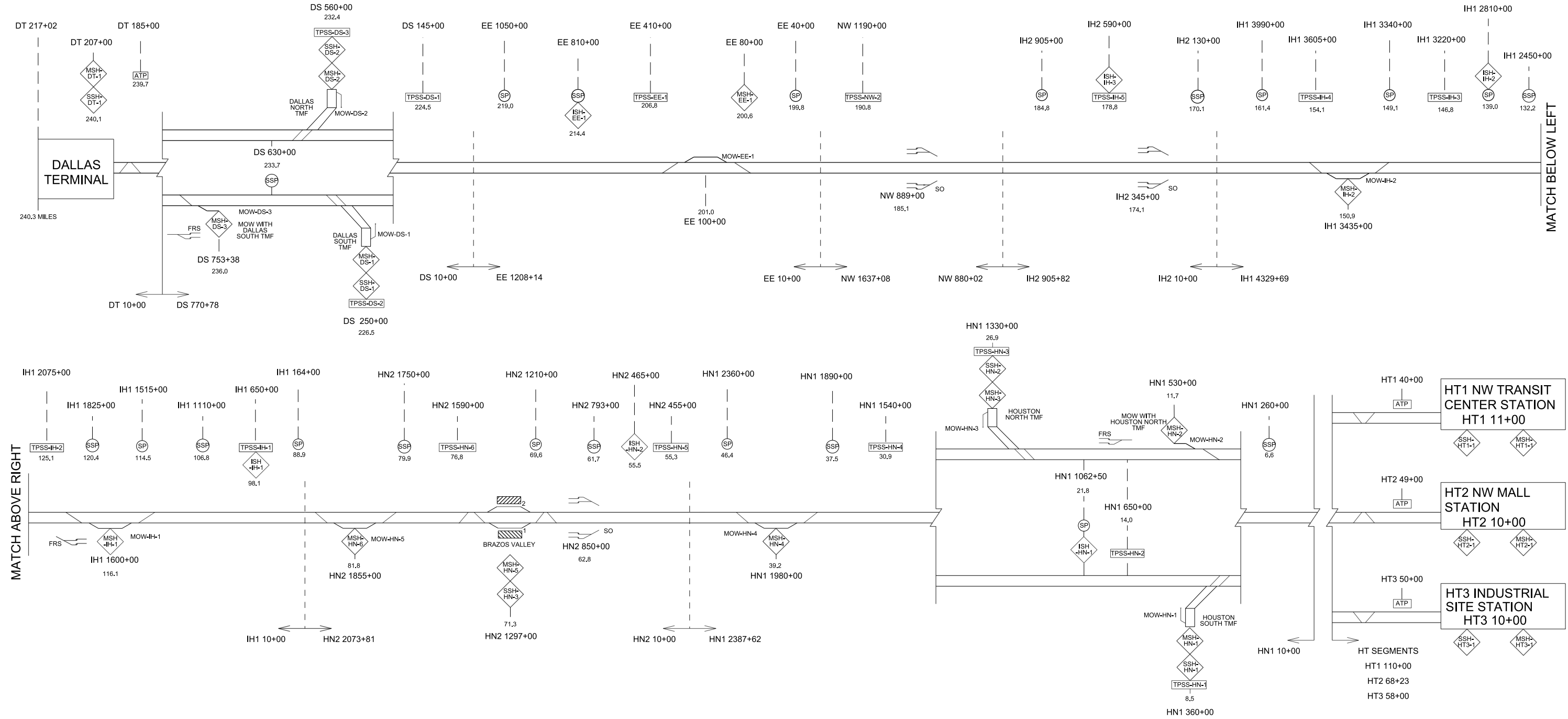
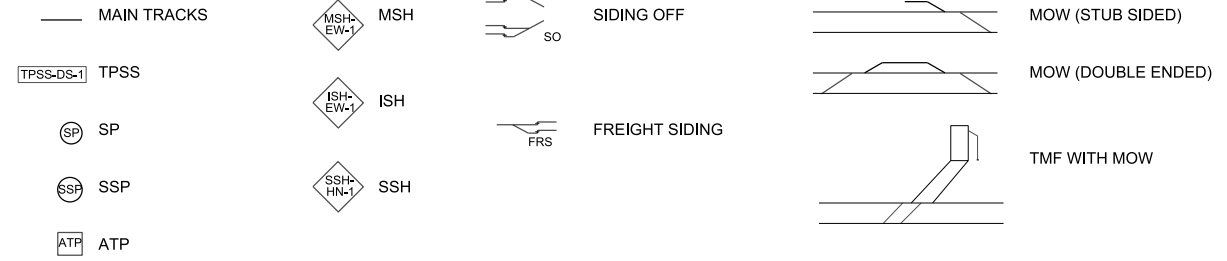
Drawing Status
FINAL DRAFT

Job No 234180	Drawing No SYS-00-02004	Rev 01
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NOTES:

- 1. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
- 2. SYSTEMS SCHEMATIC INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
- 3. MILE MARKERS INDICATE DISTANCE FROM FROM HOUSTON TERMINAL. ALL MILE MARKERS ARE TAKEN FROM THE NW TRANSIT CENTER SITE TERMINAL (HT1), THE LONGEST ALTERNATIVE. FOR NW MALL TERMINAL SITE (HT2), SUBTRACT 4076 FT. FOR INDUSTRIAL TERMINAL SITE (HT3), SUBTRACT 5479 FT.
- 4. COMMUNICATIONS HOUSES ARE NOT SHOWN.
- 5. SEE FDCE REPORT FOR FULL LIST OF AND MORE INFORMATION ON SYSTEMS FACILITIES, INCLUDING COMMUNICATION HOUSES.
- 6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

LEGEND



MATCH ABOVE RIGHT

MATCH BELOW LEFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
J. HAMMOND

DRAWN BY
S. MERENBACH

CHECKED BY
T. WAGNER

IN CHARGE
C. TAYLOR

DATE
09/15/2017

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Client

TEXAS CENTRAL

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

Drawing Title

**GENERAL FACILITIES SPACING
ALIGNMENT ALTERNATIVE F**

Scale
NOT TO SCALE

Drawing Status
FINAL DRAFT

Job No: 234180 | Drawing No: SYS-00-02005 | Rev: 01

Table with columns: COUNTY, SECTION, FACILITY TYPE, SYSTEMS FACILITY, APPROX. STATIONING, A MILE MARKER, B MILE MARKER, C MILE MARKER, D MILE MARKER, E MILE MARKER, F MILE MARKER. Includes data for Harris, Waller, Grimes, Madison, and Navarero counties.

Table with columns: COUNTY, SECTION, FACILITY TYPE, SYSTEMS FACILITY, APPROX. STATIONING, A MILE MARKER, B MILE MARKER, C MILE MARKER, D MILE MARKER, E MILE MARKER, F MILE MARKER. Includes data for Madison, Leon, Freestone, Grimes, and Navarero counties.

Table with columns: COUNTY, SECTION, FACILITY TYPE, SYSTEMS FACILITY, APPROX. STATIONING, A MILE MARKER, B MILE MARKER, C MILE MARKER, D MILE MARKER, E MILE MARKER, F MILE MARKER. Includes data for Navarero, Dallas, and other counties.

- NOTES:
1. SEE FDCE REPORT FOR MORE INFORMATION ON SYSTEMS FACILITIES.
2. REFER TO GEN-00-0009 FOR DEFINITION OF ABBREVIATIONS
3. TABLE INCLUDES THREE STATION TERMINAL ALTERNATIVES IN HOUSTON (NORTH WEST TRANSIT CENTER, NORTHWEST MALL, AND INDUSTRIAL SITE) AND ALSO INCLUDES TWO TMF ALTERNATIVES (NORTH AND SOUTH) FOR BOTH HOUSTON AND DALLAS.
4. MILE MARKERS INDICATE DISTANCE FROM FROM HOUSTON TERMINAL. ALL MILE MARKERS ARE TAKEN FROM THE NW TRANSIT CENTER SITE TERMINAL (HT1), THE LONGEST ALTERNATIVE, FOR NW MALL TERMINAL SITE (HT2), SUBTRACT 4076 FT. FOR INDUSTRIAL TERMINAL SITE (HT3), SUBTRACT 5479 FT.
5. THESE TABLES SHOW TABULARLY THE SYSTEMS FACILITIES LOCATIONS, SYSTEMS SCHEMATICS, SHOWN ON SHEETS SYS-00-02000 THROUGH SYS-00-02005, SHOW GRAPHICALLY THE LOCATIONS OF SYSTEMS FACILITIES THAT HAVE BEEN INCLUDED FOR EACH END-TO-END ALTERNATIVE.
6. SIDING DETAILS CAN BE FOUND ON SHEET MNT-00-02023.

DESIGNED BY J. HAMMOND
DRAWN BY C. ZWIEBEL
CHECKED BY C. TAYLOR
IN CHARGE C. TAYLOR
DATE 09/15/2017

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Client: TEXAS CENTRAL
Drawing Title: GENERAL SYSTEMS RAILWAY FACILITY LOCATIONS
Scale: NTS
Drawing Status: FINAL DRAFT
Job No: 234180
Drawing No: DWG-00-03000
Rev: 01