Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 1-1
NTE Limits of Maintenance

September 30, 2012

SCALE: 1' = 200'

N

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED RIGHT-OF-WAY (EXISTING ACCESS TO REMAIN)
- PROPOSED CONTROL-OF-ACCESS
- TRAFFIC DIRECTION

LITTLE FOSSIL CR.

MARK IV PKWY.

820

LIMITS OF MAINTENANCE
℄ GP820EO STA 620+61.36

LIMITS OF MAINTENANCE
℄ GP820EO STA 635+60.57

LIMITS OF MAINTENANCE
℄ GP820EO STA 637+80.40

SUPERIOR

LITTLE FOSSIL CR.

MARK IV PKWY.

Match Line - Sta. 648+00

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SHEET 1 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NO.
STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W / IH 820

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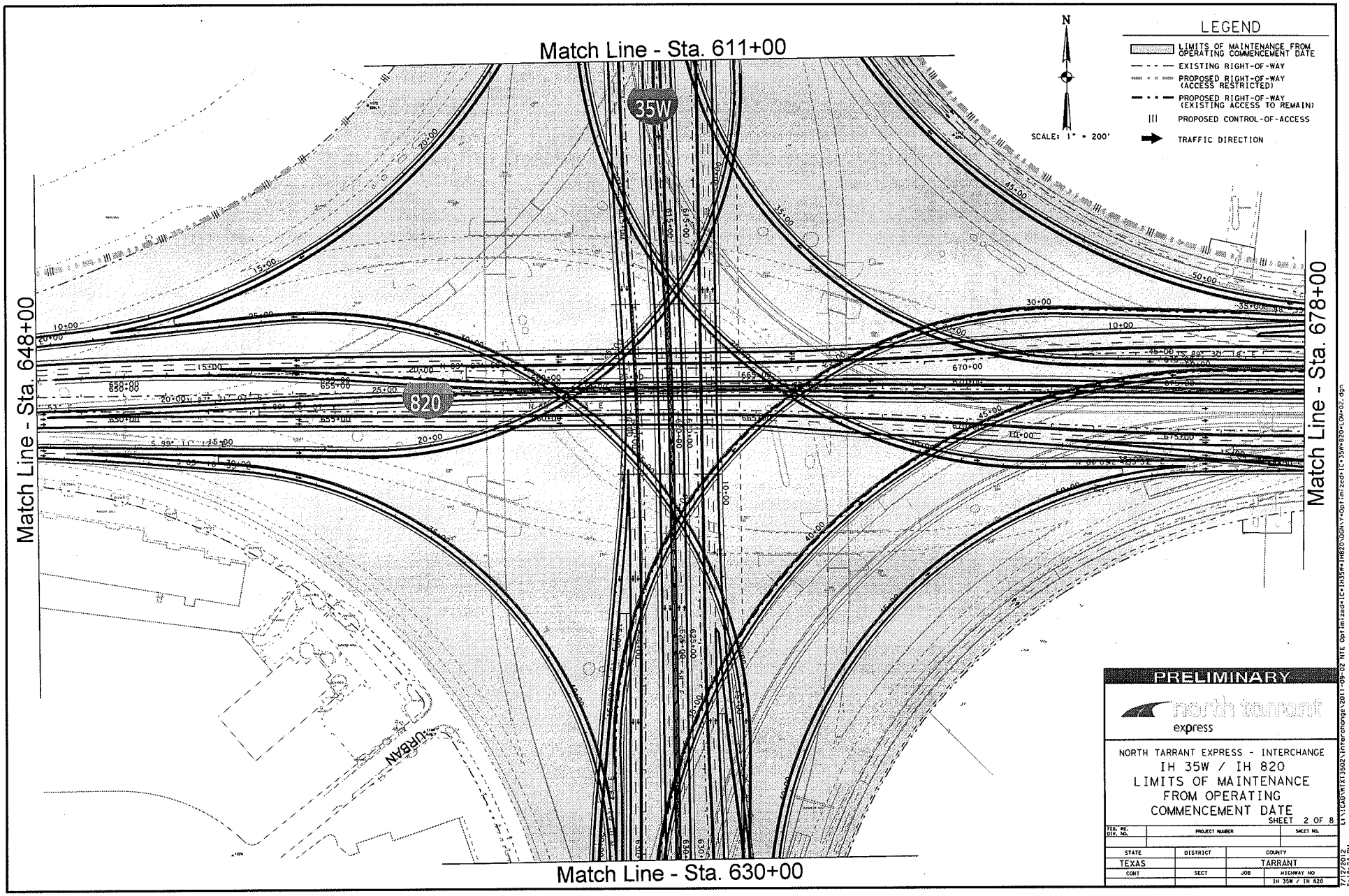
Match Line - Sta. 611+00
Match Line - Sta. 648+00
Match Line - Sta. 678+00
Match Line - Sta. 630+00
35W
820
N
SCALE: 1" = 200'
LEGEND
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
PROPOSED RIGHT-OF-WAY (EXISTING ACCESS TO REMAIN)
PROPOSED CONTROL-OF-ACCESS
TRAFFIC DIRECTION
PRELIMINARY
north tarrant express
NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE
SHEET 2 OF 8
FED. RD. DIV. NO.
PROJECT NUMBER
SHEET NO.
STATE
DISTRICT
COUNTY
TEXAS
TARRANT
CONT
SECT
JOB
HIGHWAY NO.
IH 35W / IH 820
7/12/2012
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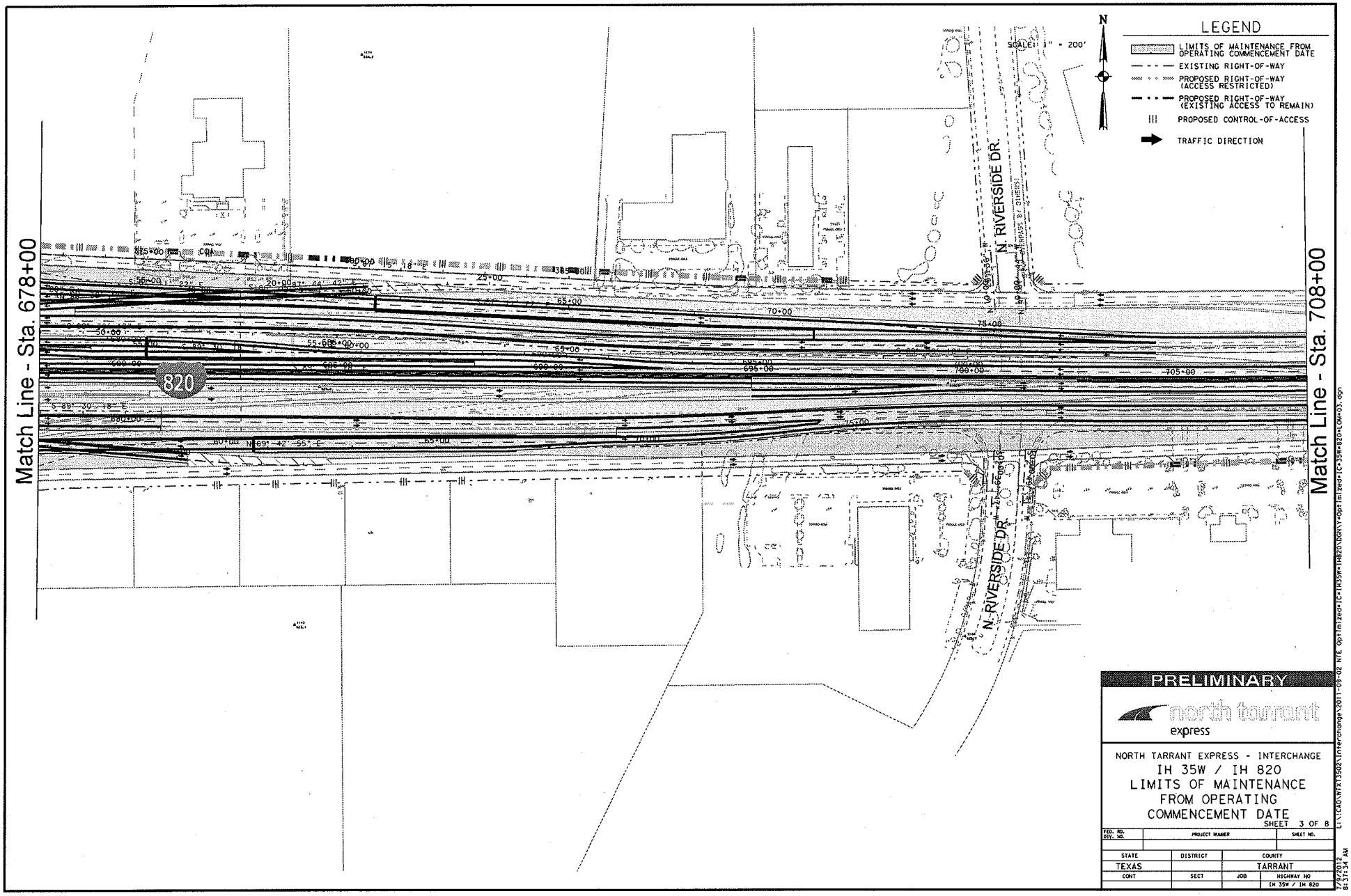

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SHEET 3 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W / IH 820

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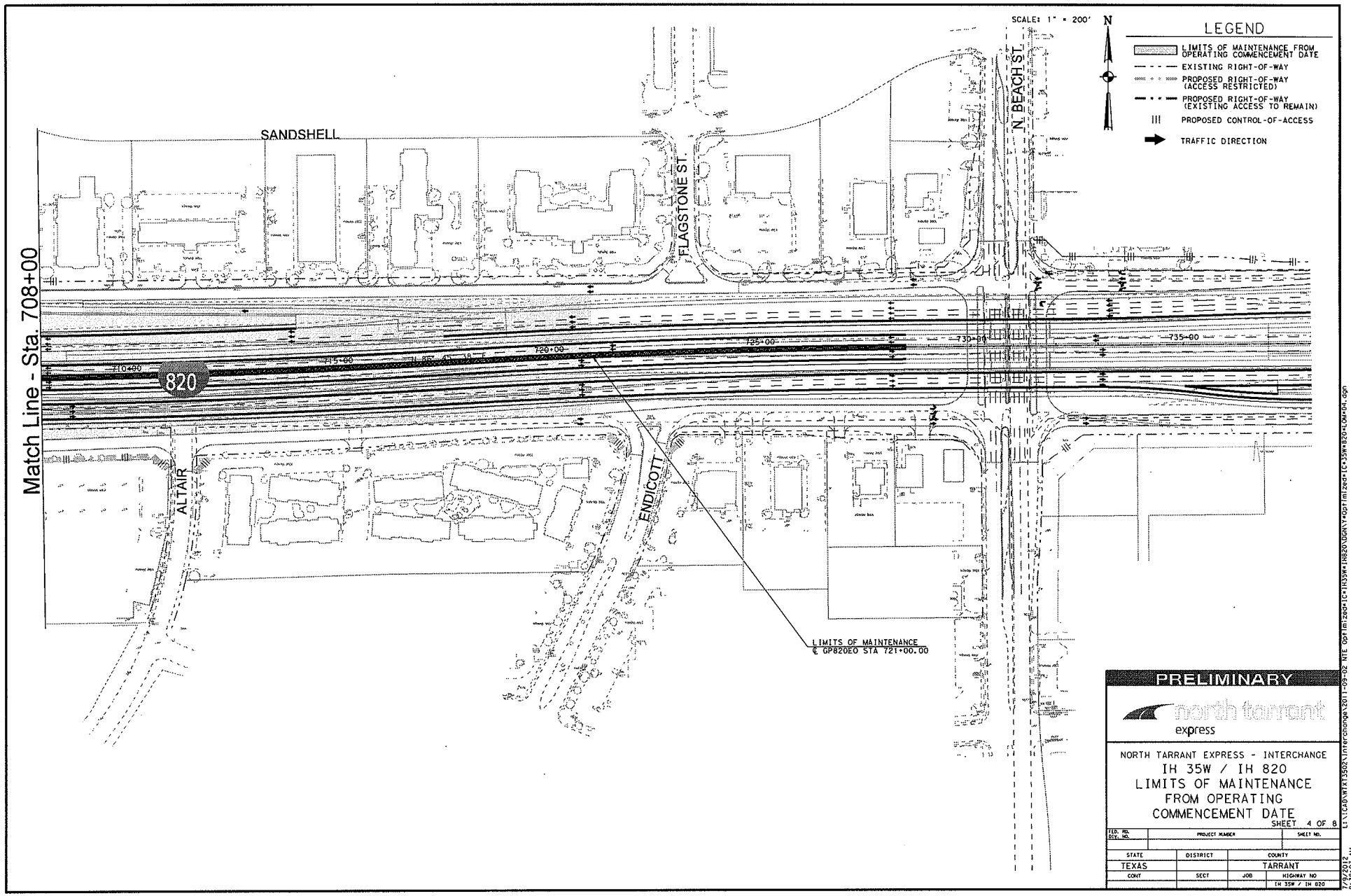

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SHEET 4 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W / IH 820

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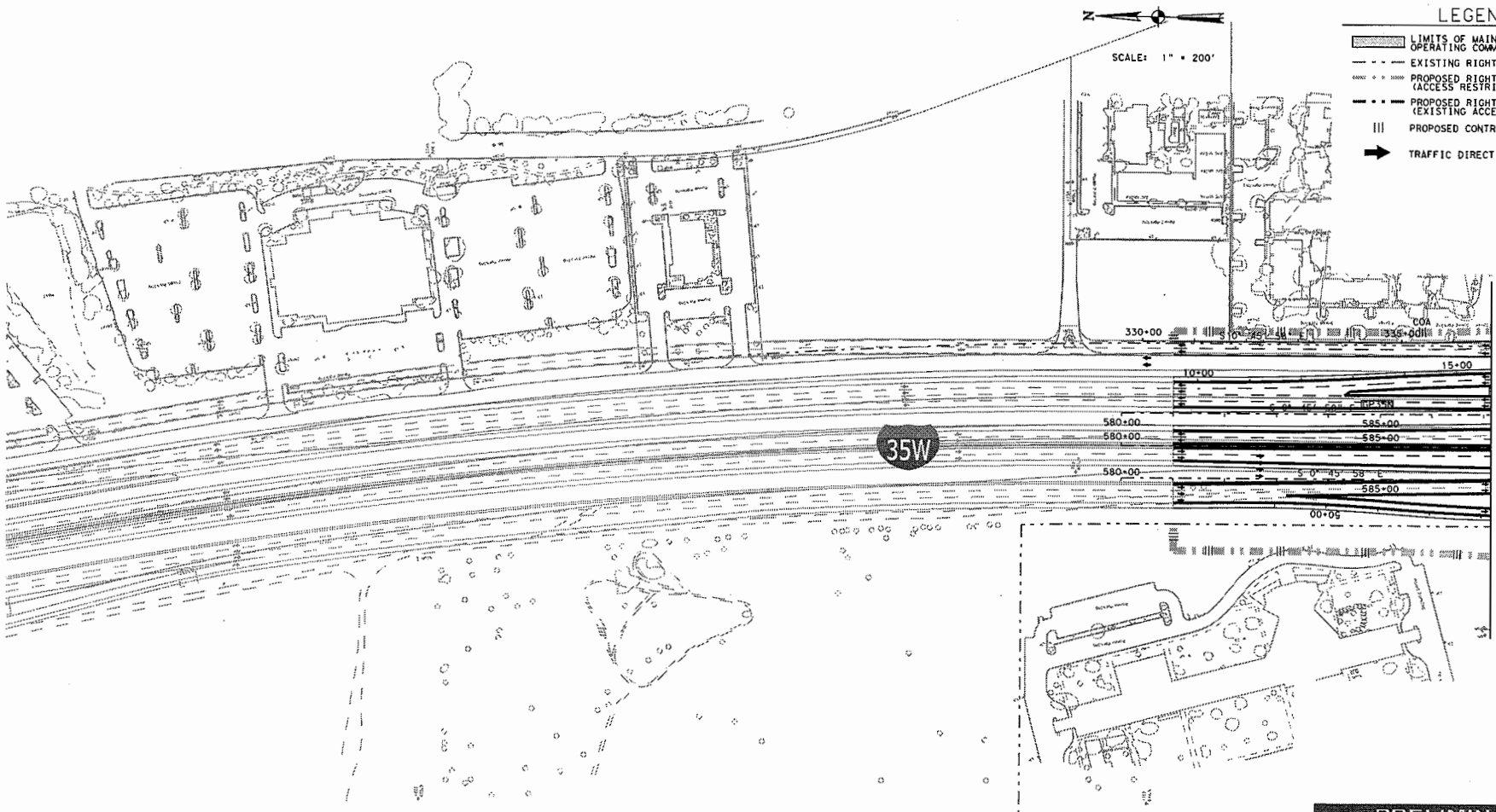

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SHEET 5 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W / IH 820

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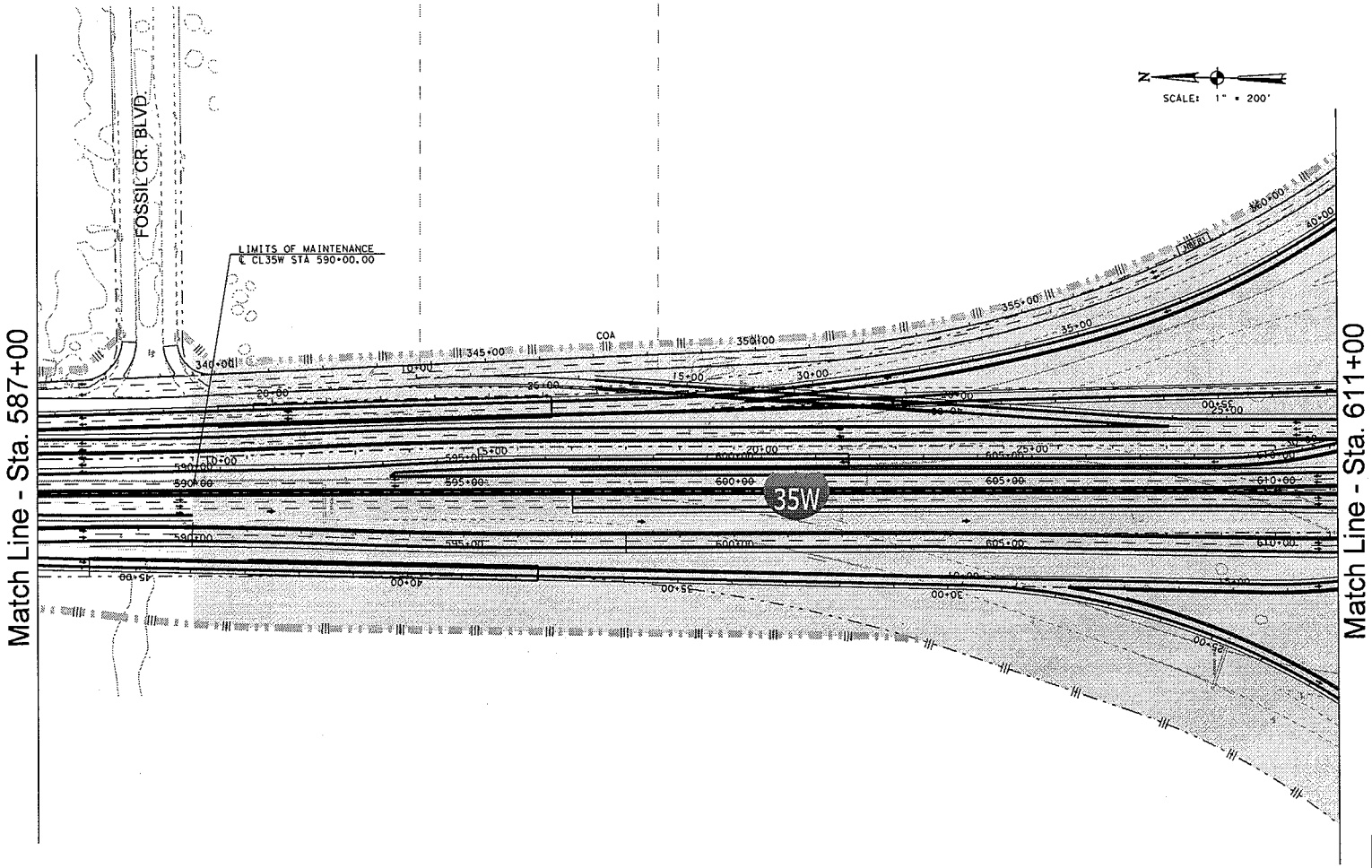

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED RIGHT-OF-WAY (EXISTING ACCESS TO REMAIN)
- PROPOSED CONTROL-OF-ACCESS
- TRAFFIC DIRECTION

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SHEET 6 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W / IH 820

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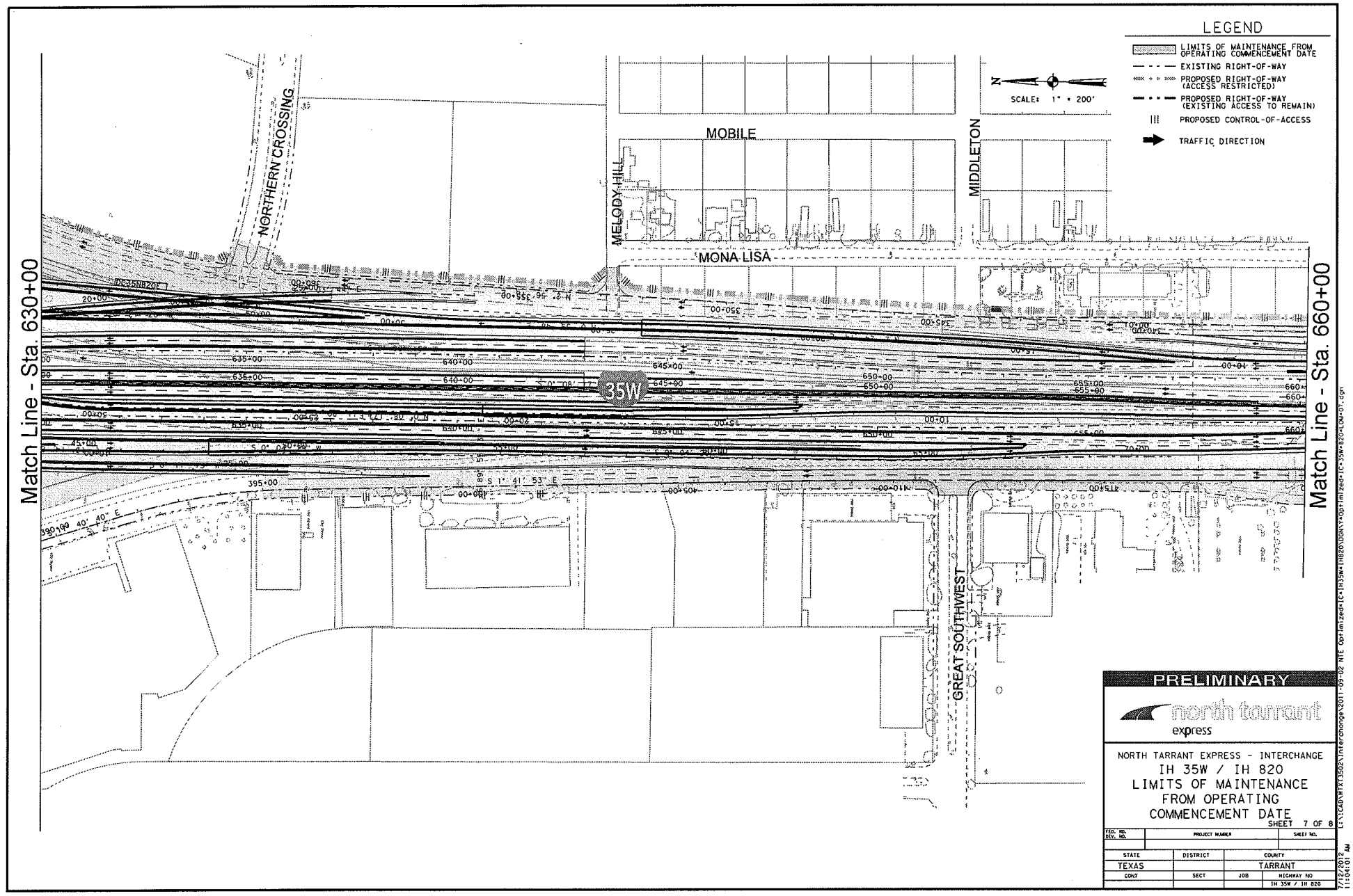
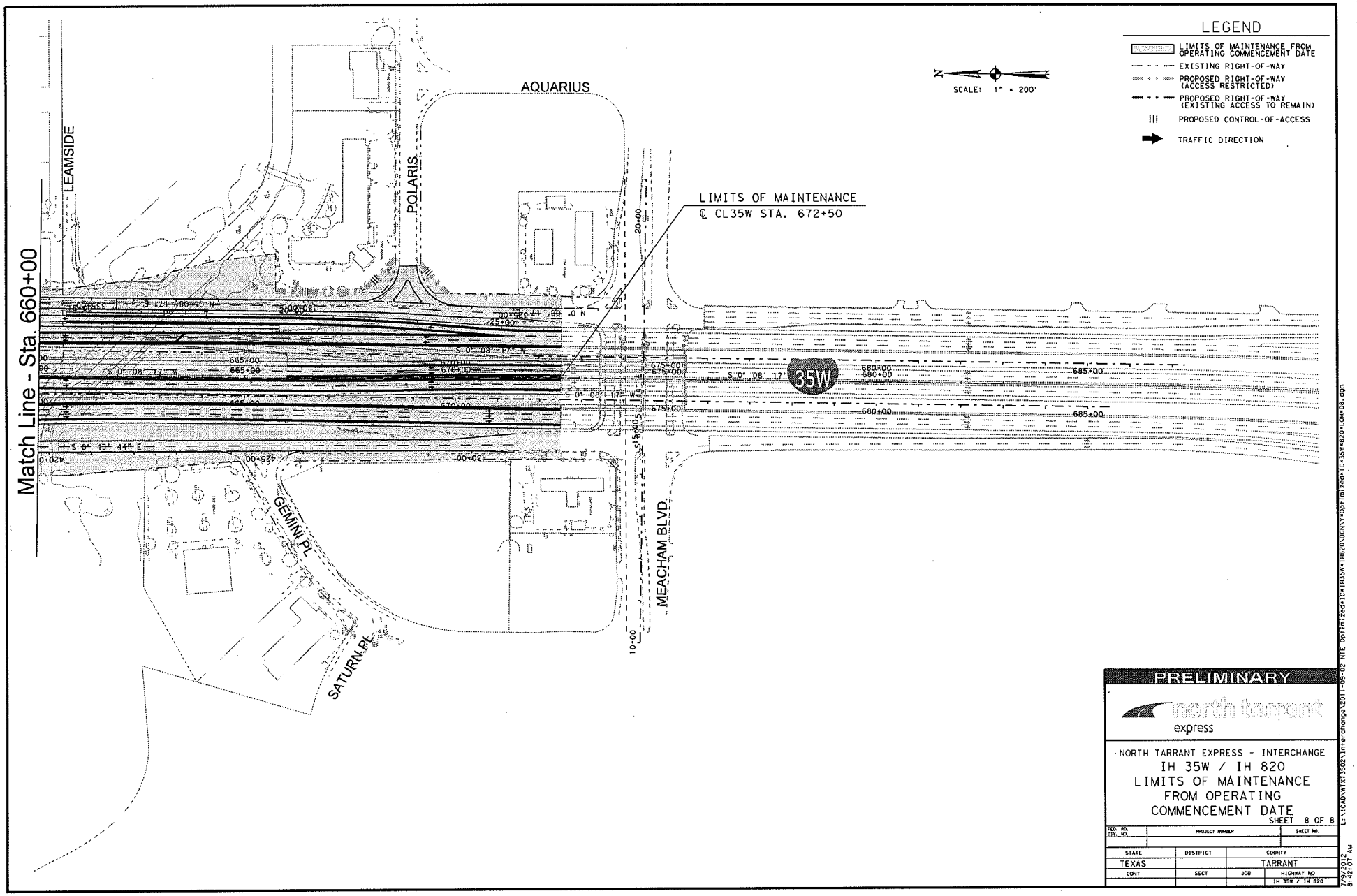

LEGEND
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
PROPOSED RIGHT-OF-WAY (EXISTING ACCESS TO REMAIN)
PROPOSED CONTROL-OF-ACCESS
TRAFFIC DIRECTION
N
SCALE: 1" = 200'
Match Line - Sta. 630+00
Match Line - Sta. 660+00
NORTHERN CROSSING
MELODY HILL
MOBILE
MIDDLETON
MONA LISA
GREAT SOUTHWEST
35W
PRELIMINARY
north tarrant express
NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE
SHEET 7 OF 8
FED. RD. DIV. NO.
PROJECT NUMBER
SHEET NO.
STATE
TEXAS
DISTRICT
COUNTY
TARRANT
CONT
SECT
JOB
HIGHWAY NO
IH 35W / IH 820


Match Line - Sta. 660+00
LEAMSIDE
POLARIS
AQUARIUS
LIMITS OF MAINTENANCE
℄ CL35W STA. 672+50
GEMINI PL
SATURN PL
MEACHAM BLVD
35W
LEGEND
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
PROPOSED RIGHT-OF-WAY (EXISTING ACCESS TO REMAIN)
PROPOSED CONTROL-OF-ACCESS
TRAFFIC DIRECTION
SCALE: 1" = 200'
PRELIMINARY
north tarrant express
NORTH TARRANT EXPRESS - INTERCHANGE
IH 35W / IH 820
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE
SHEET 8 OF 8
FED. RD. DIV. NO.
PROJECT NUMBER
SHEET NO.
STATE
DISTRICT
COUNTY
TEXAS
TARRANT
CONT
SECT
JOB
HIGHWAY NO
IH 35W / IH 820
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7/9/2012
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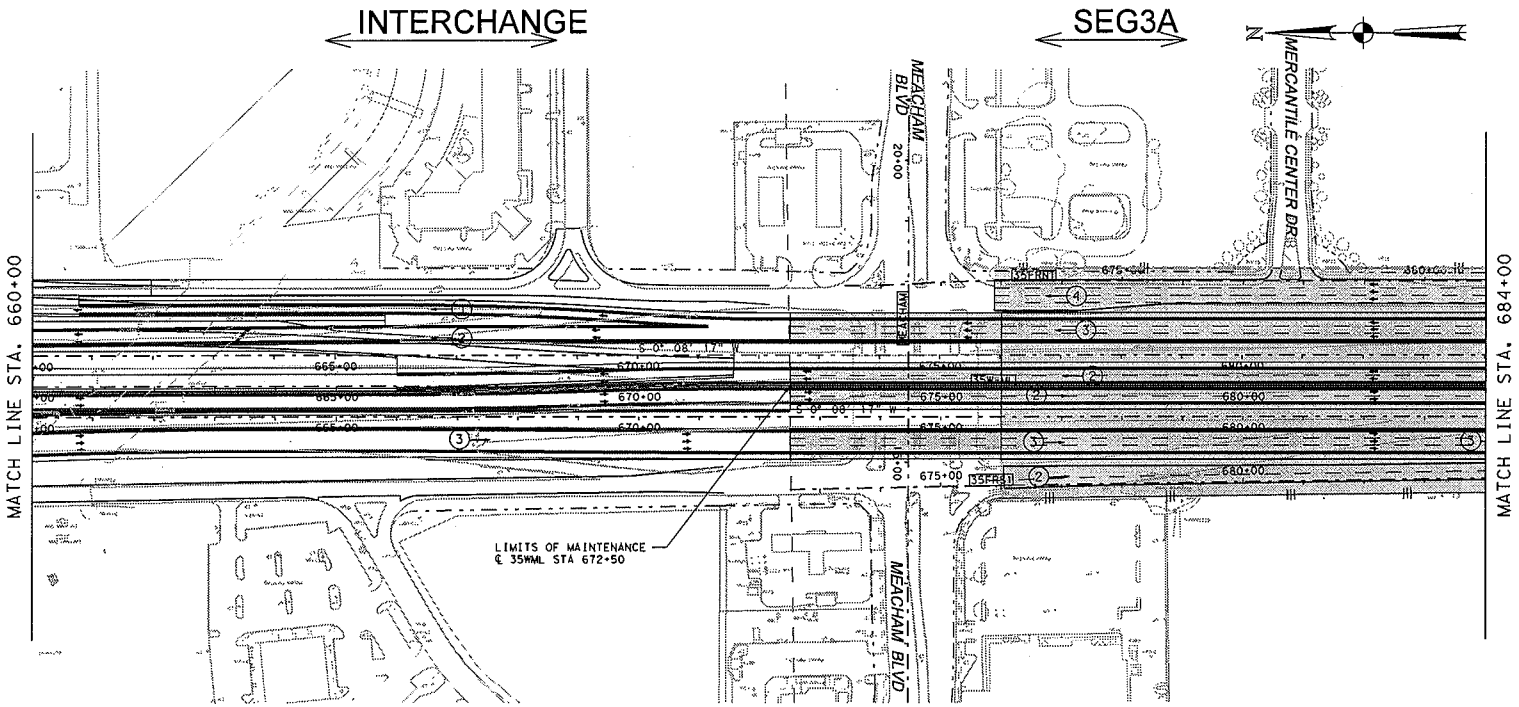
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W355 ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

HORZ.: 1" = 200'

SHEET 1 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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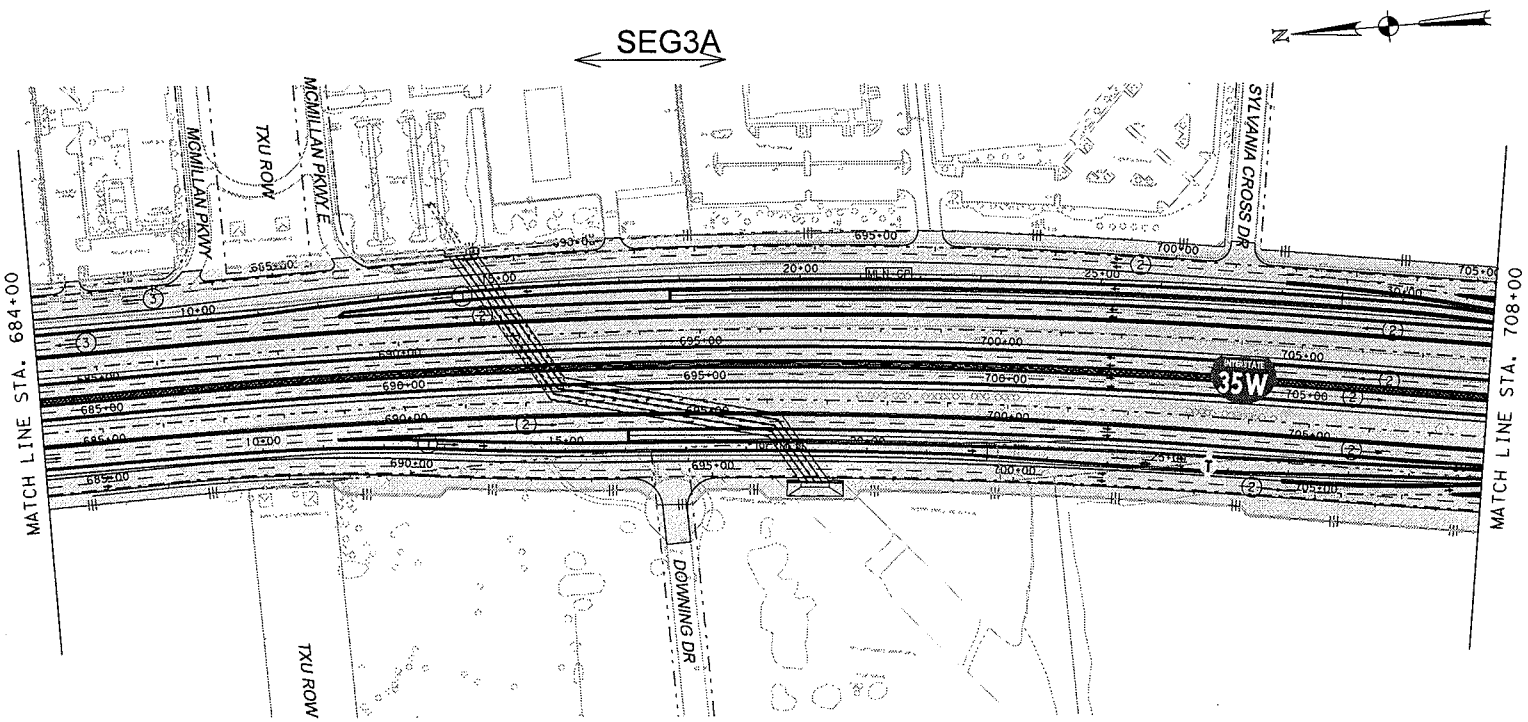
LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- I70W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 2 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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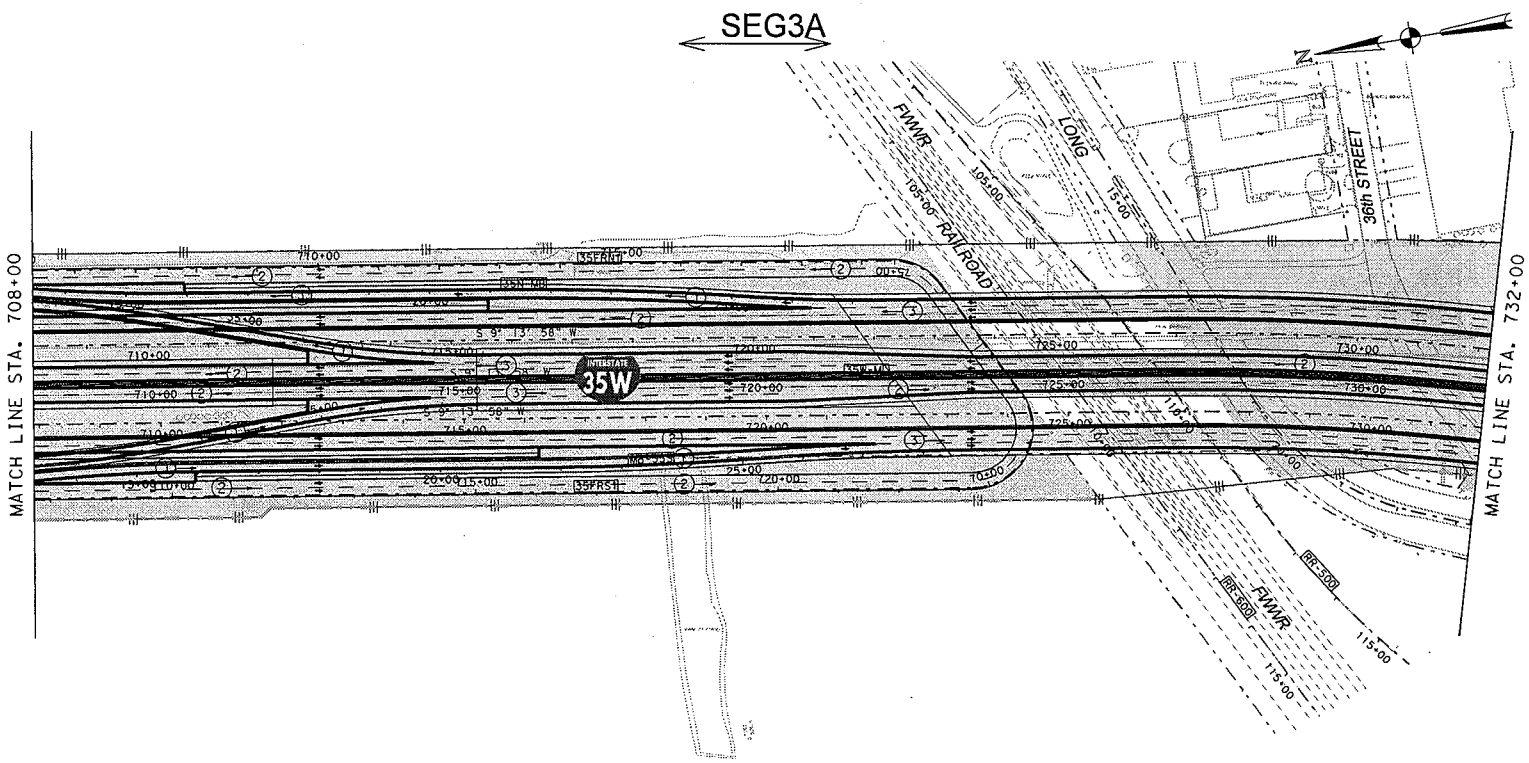
LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 3 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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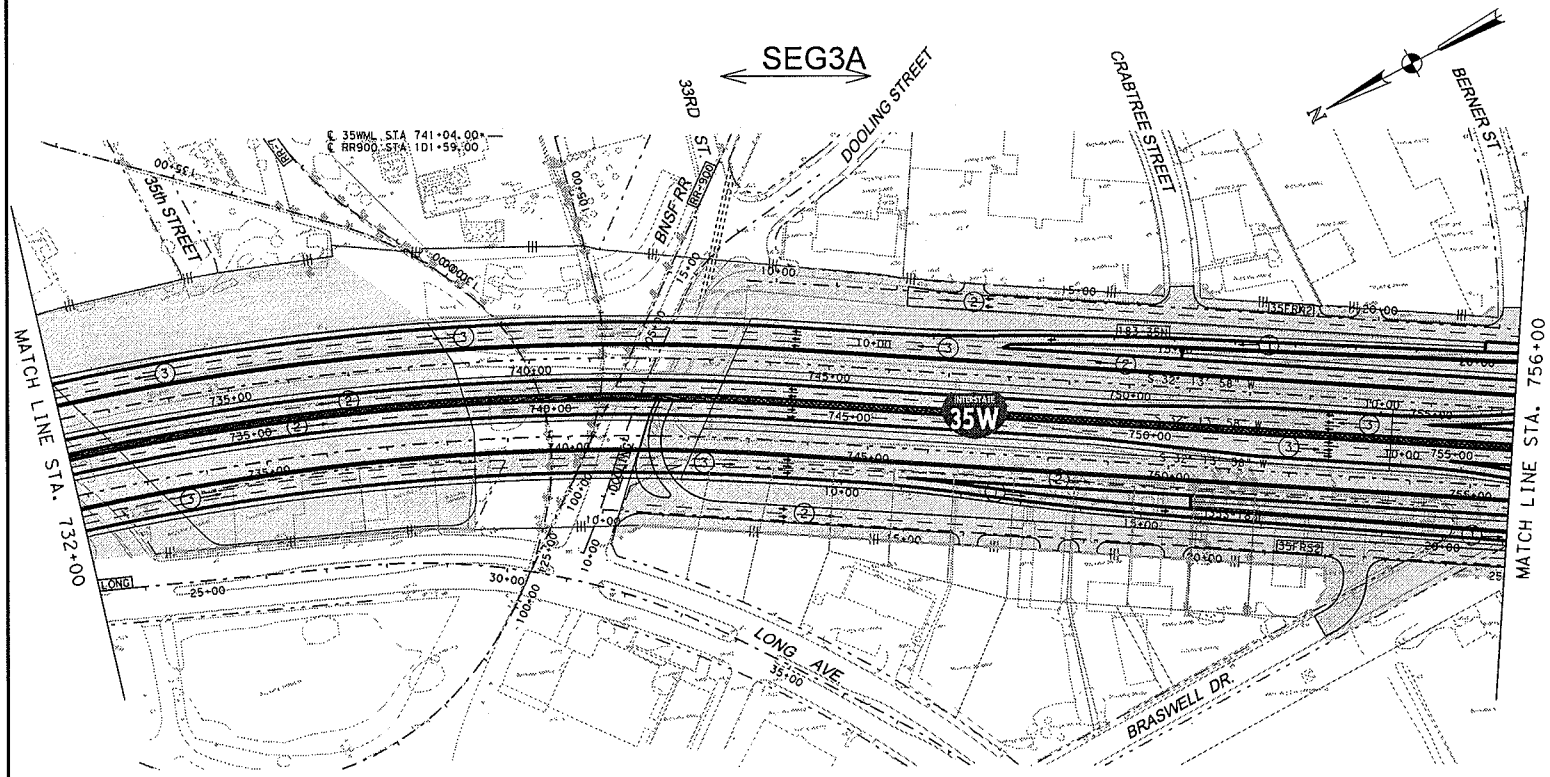
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200'

SHEET 4 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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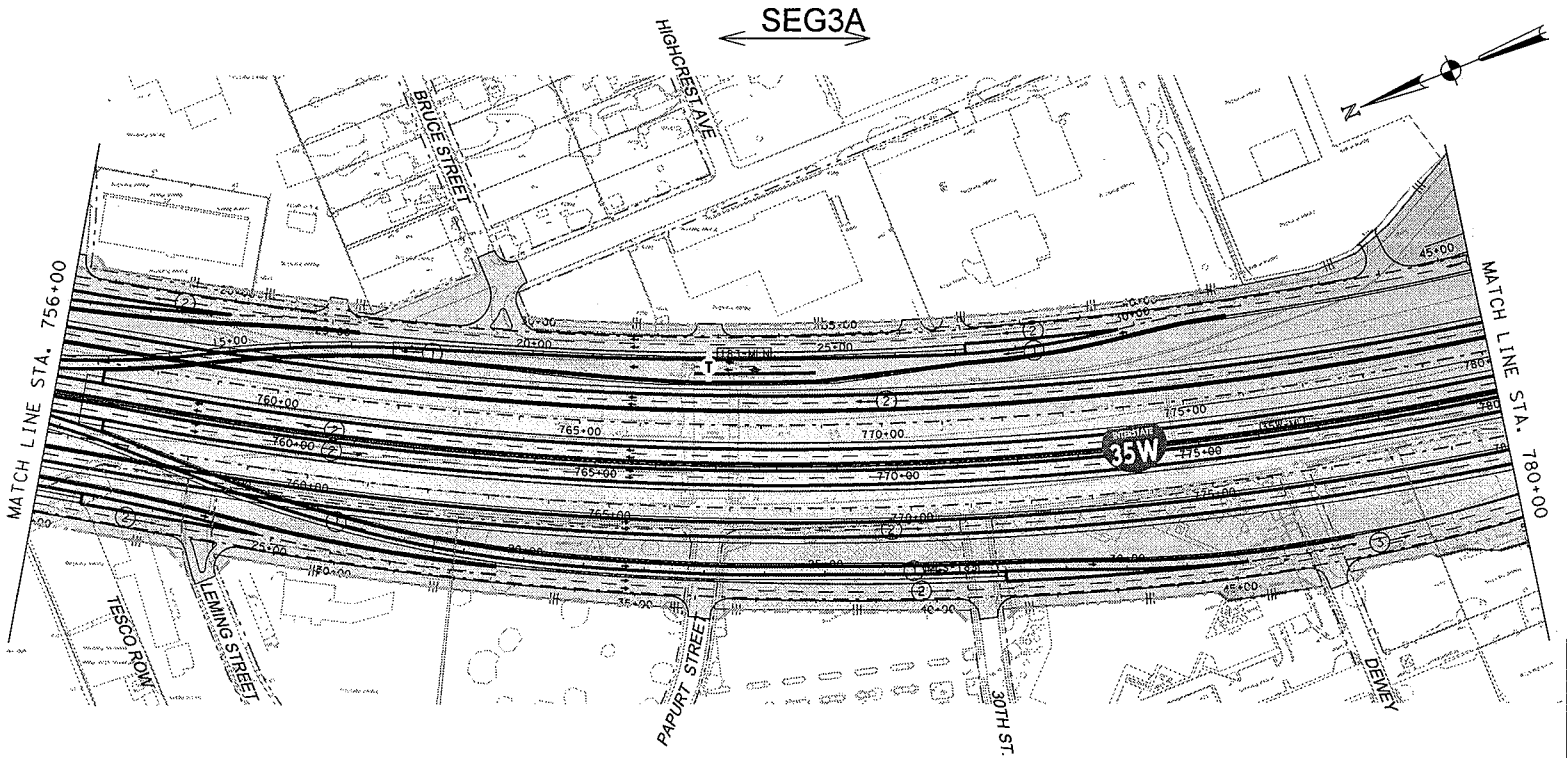
LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 5 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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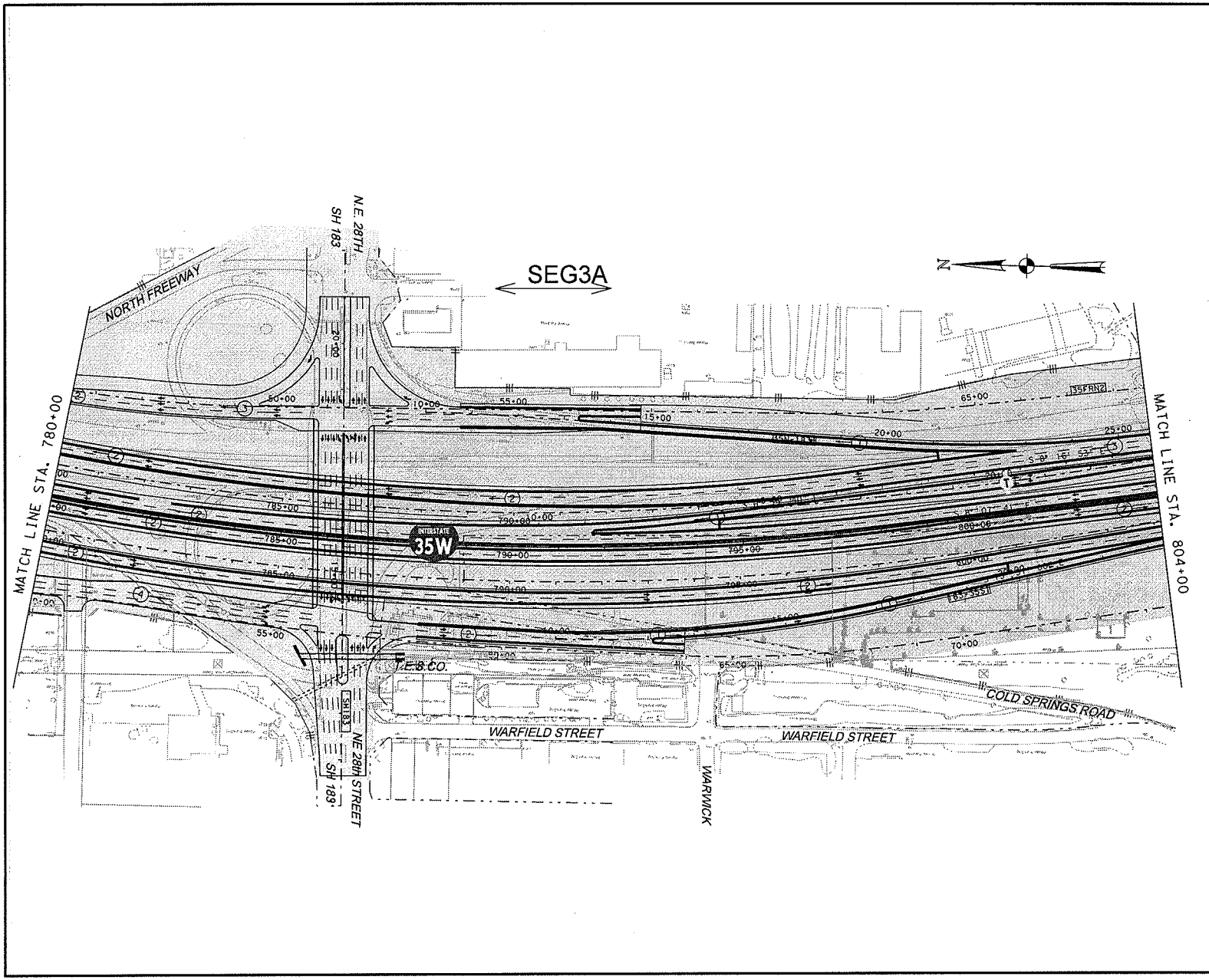

REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

HORZ.: 1" = 200'

SHEET 6 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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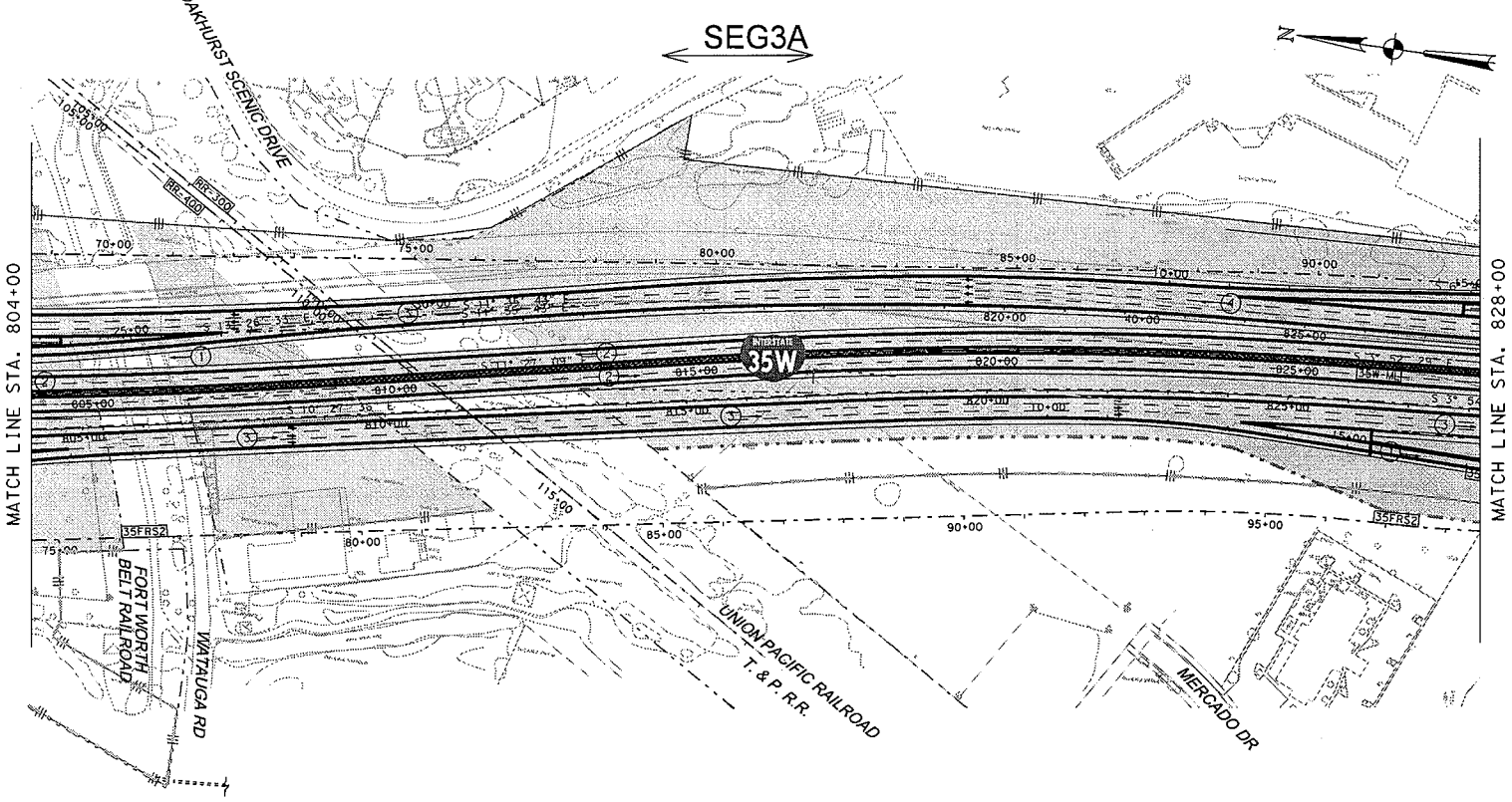
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200'

SHEET 7 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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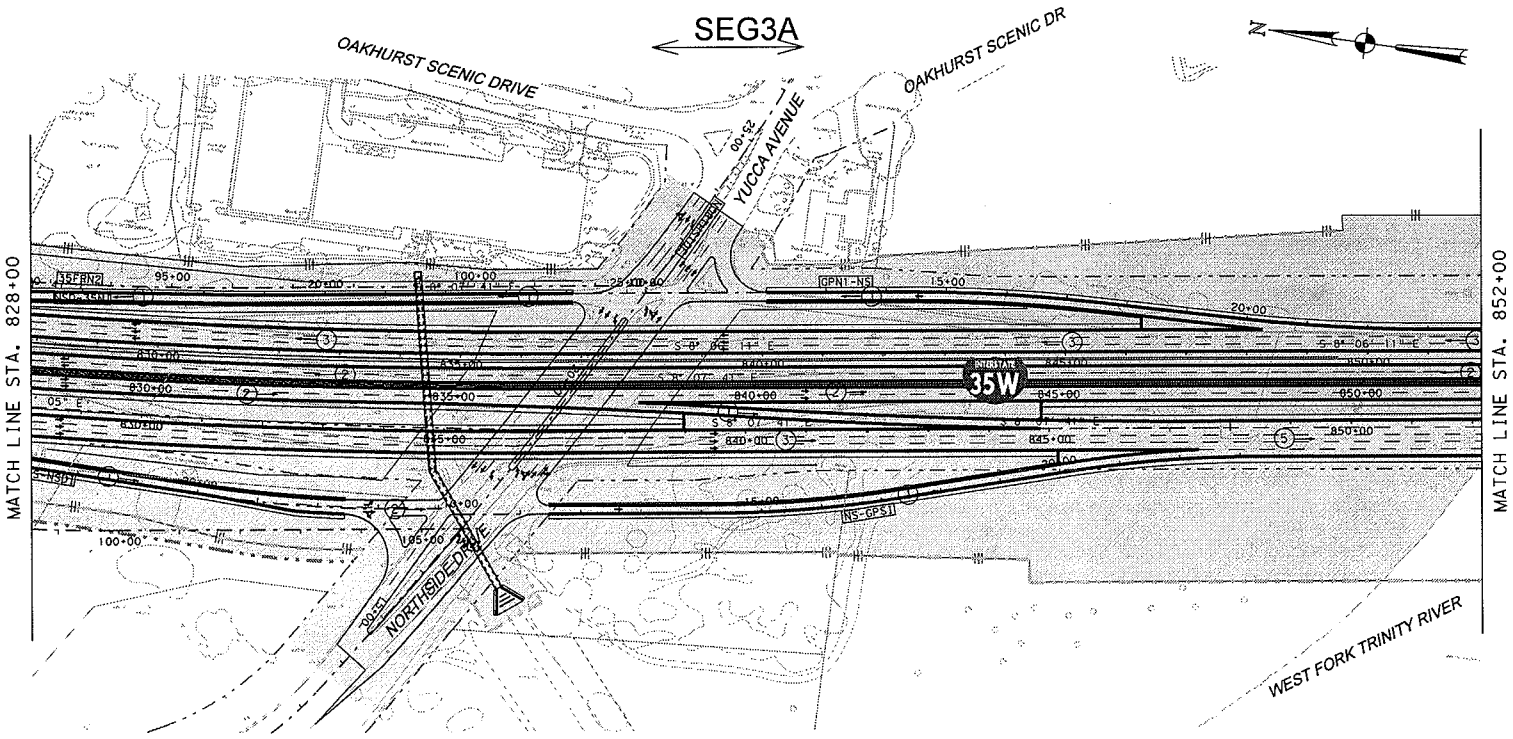
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

SHEET 8 OF 14

HORZ.: 1" = 200'

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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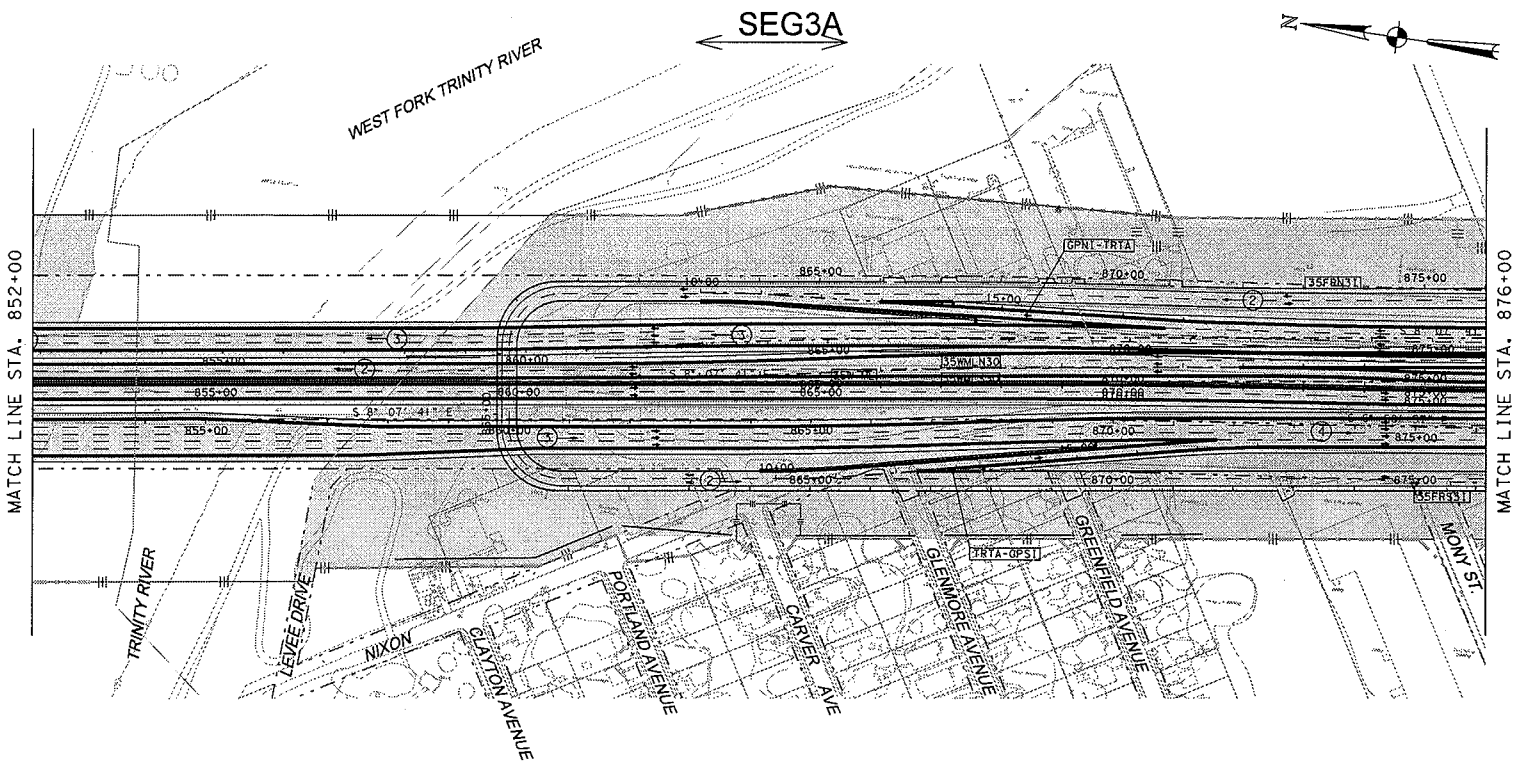
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 9 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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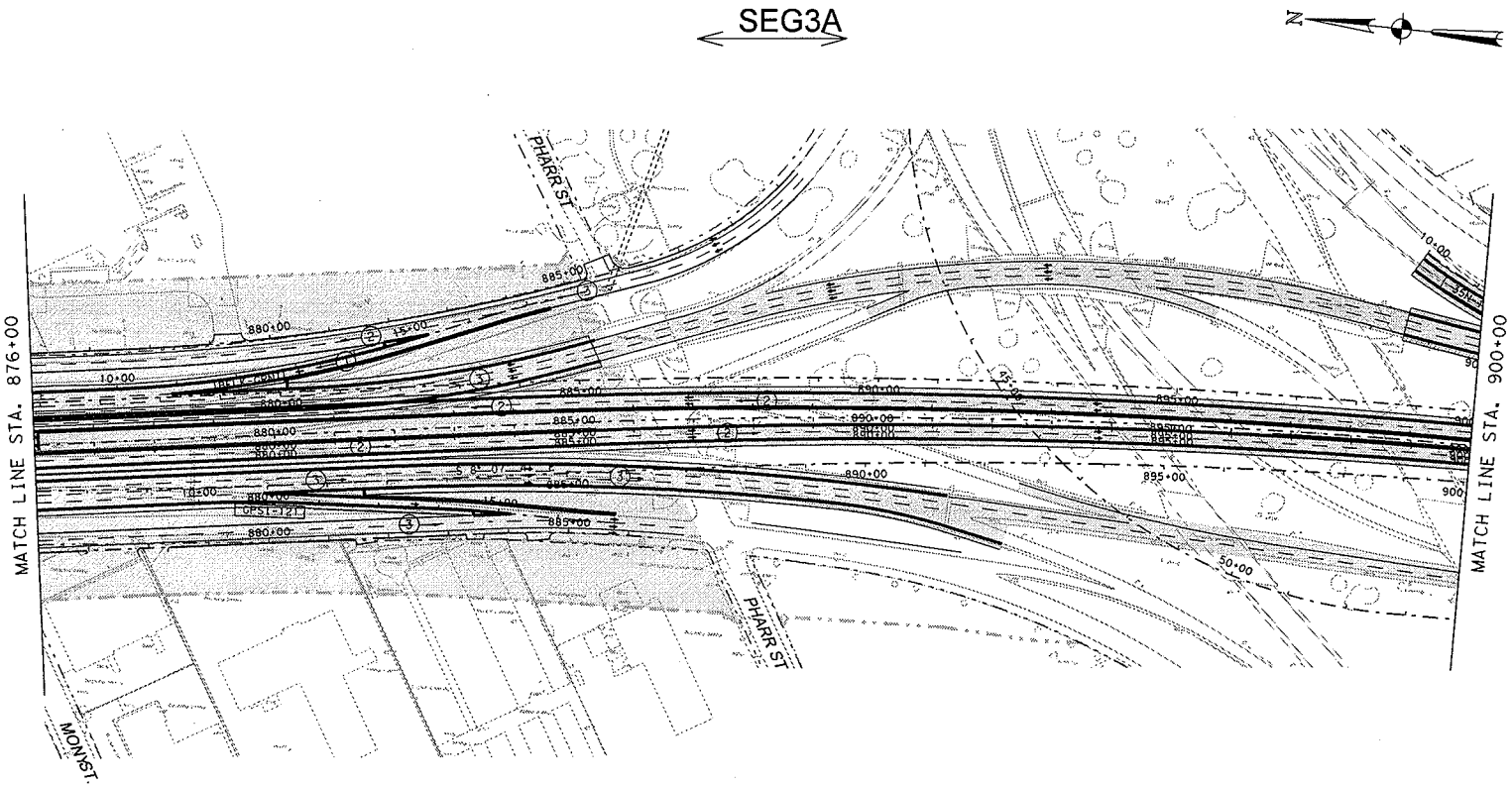
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 10 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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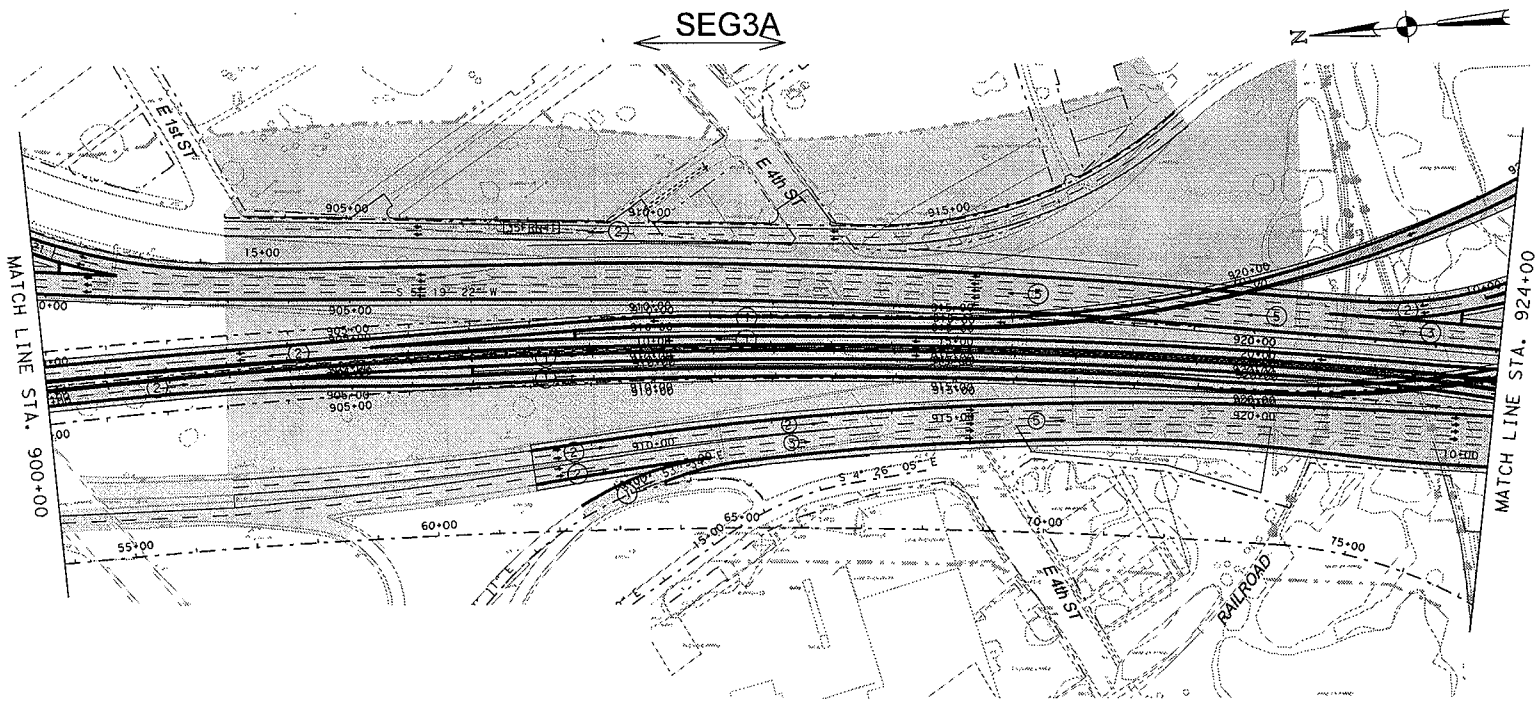
REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W355 ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 11 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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LEGEND

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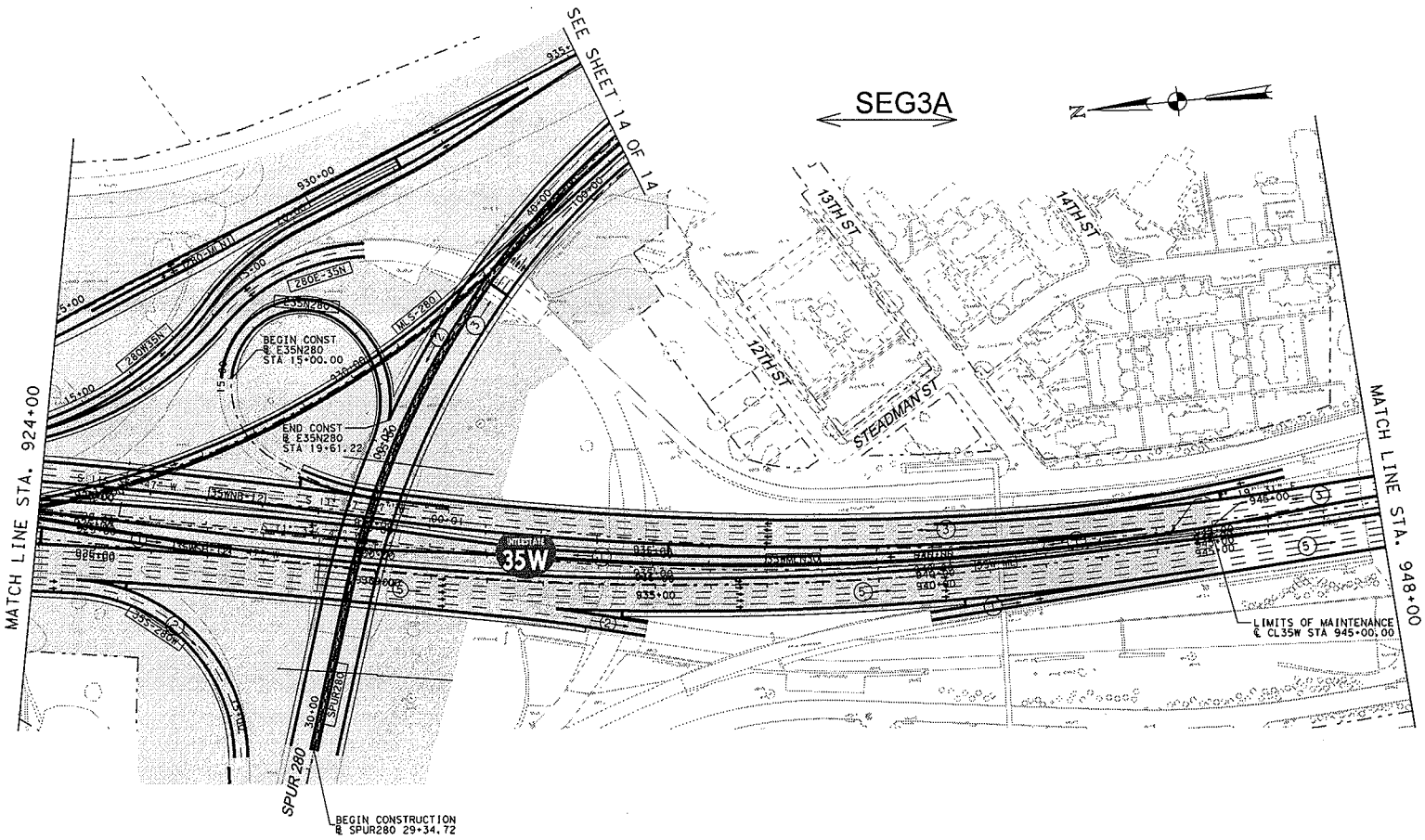
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
- PROPOSED DRAINAGE EASEMENT
- ADDITIONAL ROW REQUIRED
- NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 12 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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LEGEND

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- EXISTING RIGHT-OF-WAY
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- PROPOSED DRAINAGE EASEMENT
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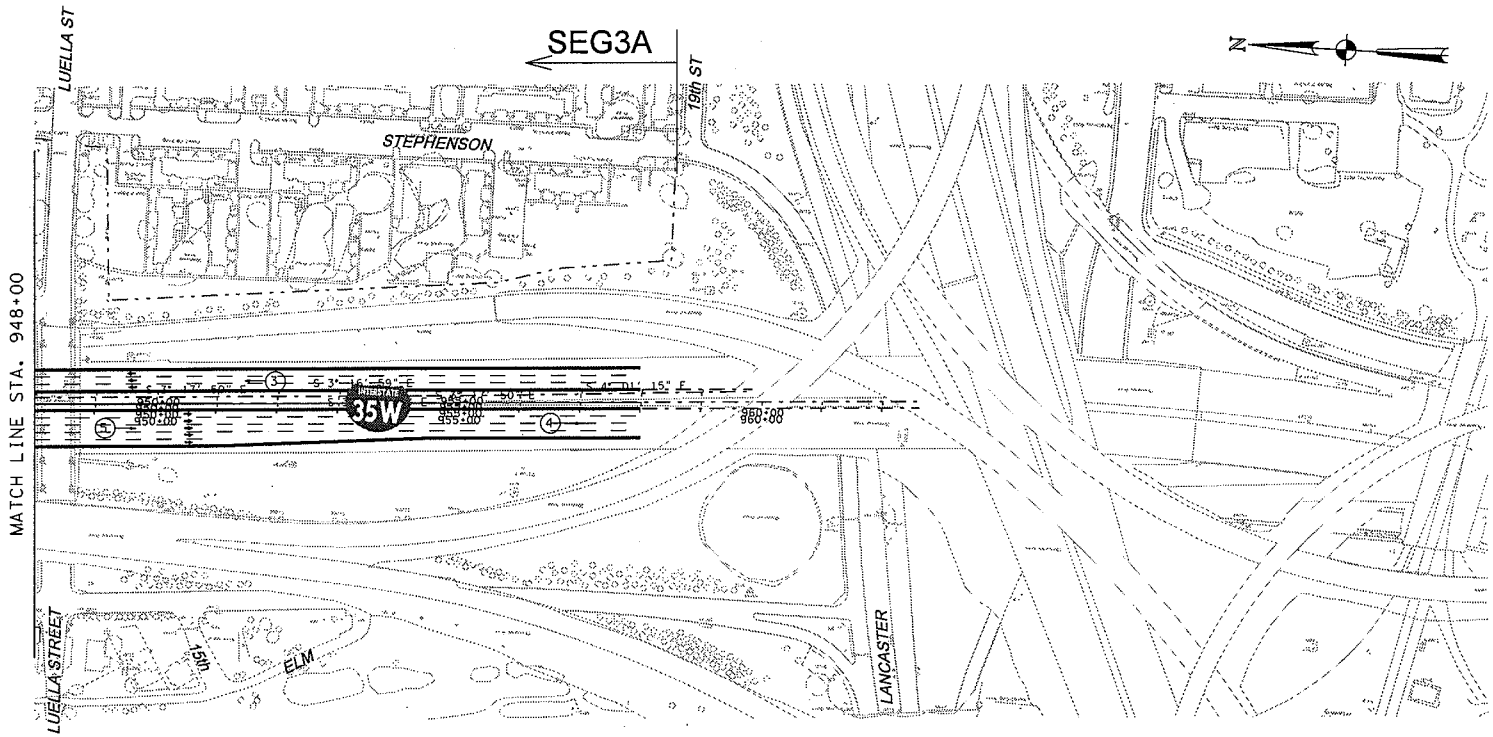
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

HORZ.: 1" = 200' SHEET 13 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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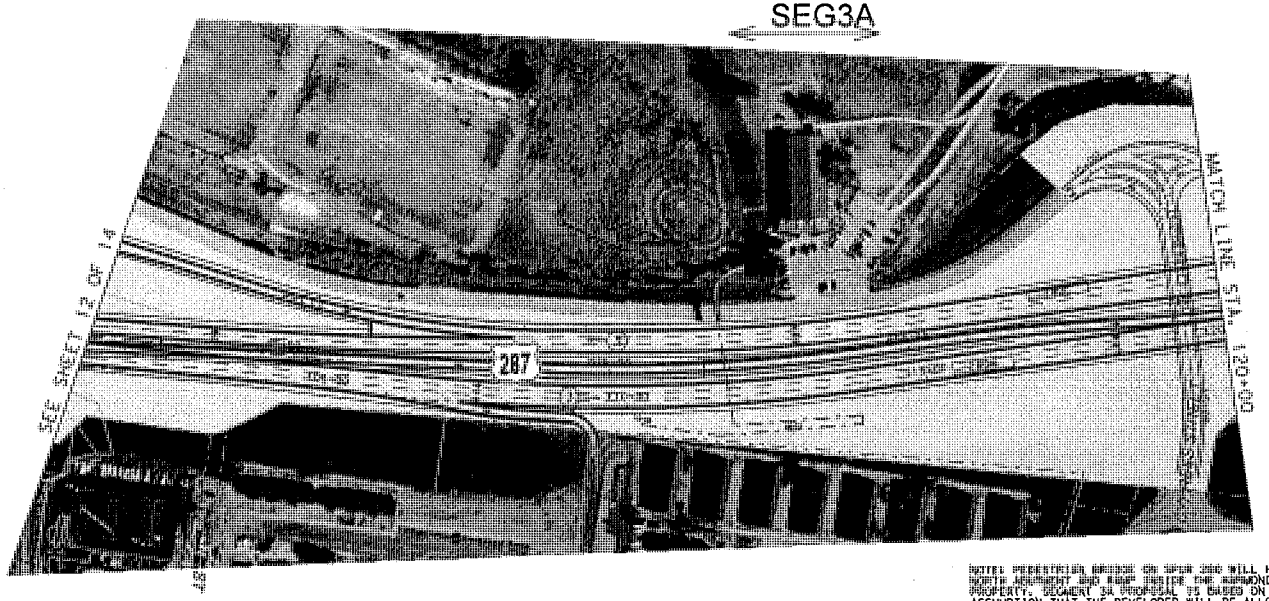
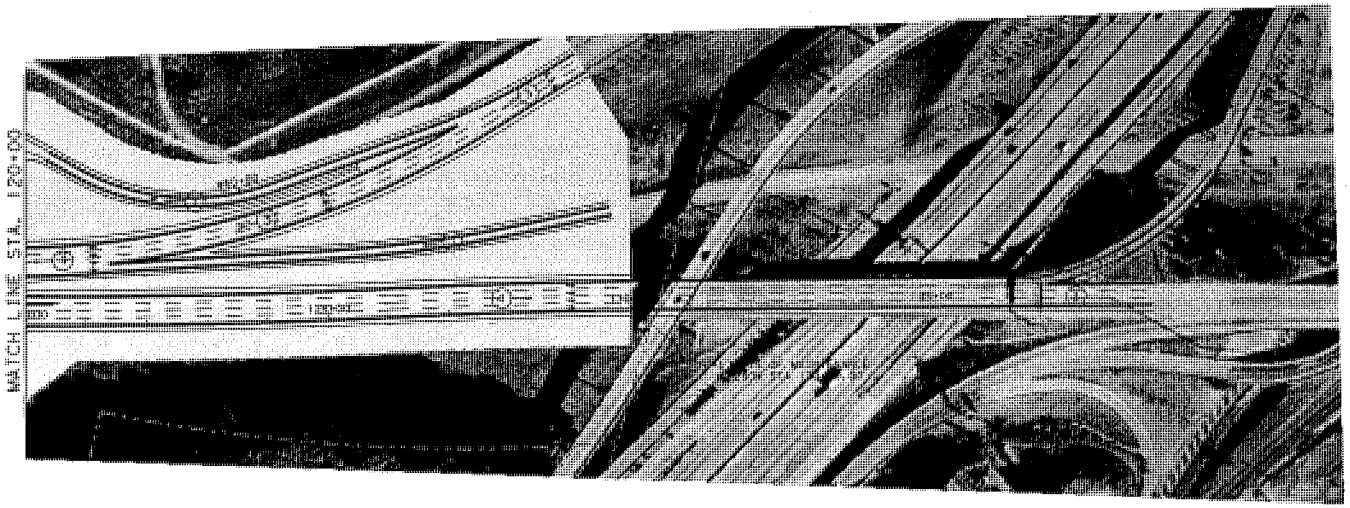
SEG3A



NOTE: PEDESTRIAN BRIDGE ON SPUR 280 WILL HAVE THE NORTH ABUTMENT AND RAMP INSIDE THE HARMOND PARK PROPERTY. SEGMENT 3A PROPOSAL IS BASED ON THE ASSUMPTION THAT THE DEVELOPER WILL BE ALLOWED TO PLACE THE ABOVE STRUCTURAL COMPONENTS INSIDE THE HARMOND PARK PROPERTY AS THE CURRENT PEDESTRIAN BRIDGE DOES.

CURVE CYPRESS-1 SHALL MEET A DESIGN SPEED OF 15 MPH AS PER RFI 34.



LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA
- 170W35S ALIGNMENT NAME

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3A

SPUR 280/US 287 PLAN
LIMITS OF MAINTENANCE

HORZ.: 1" = 200'

SHEET 14 OF 14

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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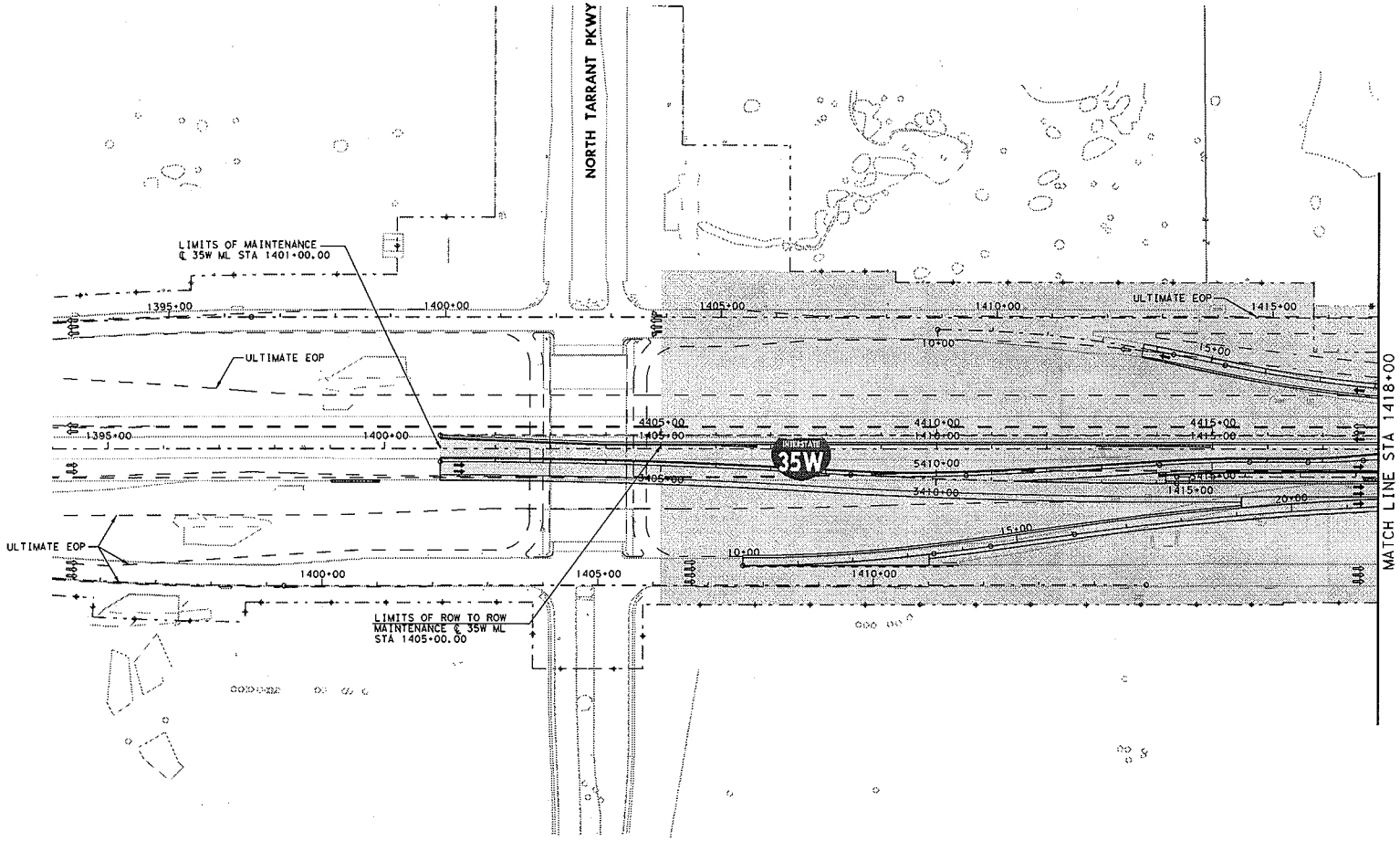

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- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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- ADDITIONAL ROW REQUIRED
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 1 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO.
			IH 35W

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REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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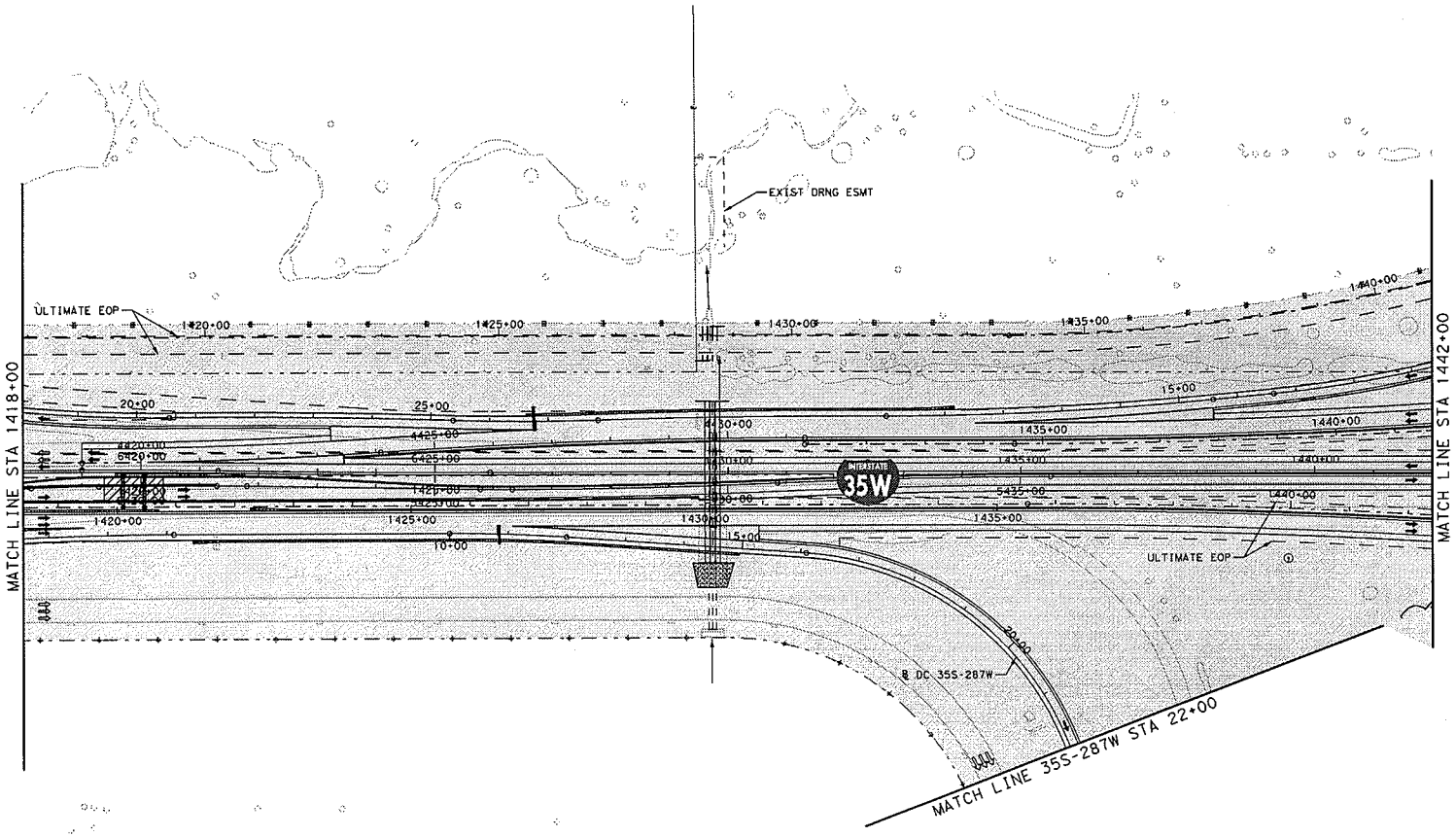
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 2 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NO.
STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
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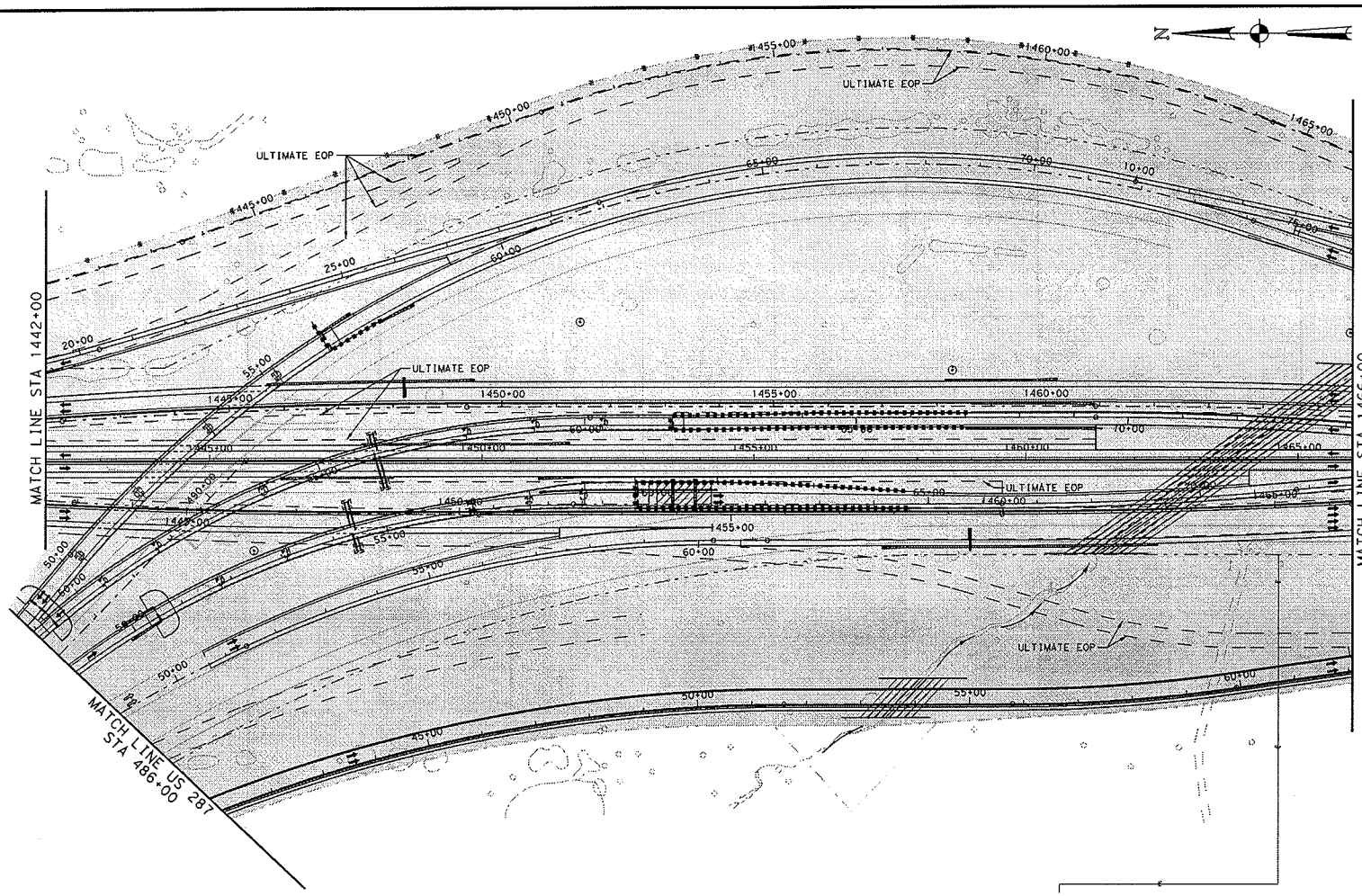

REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
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- RAMP TOLL GANTRY
- HOV DECLARATION AREA

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 3 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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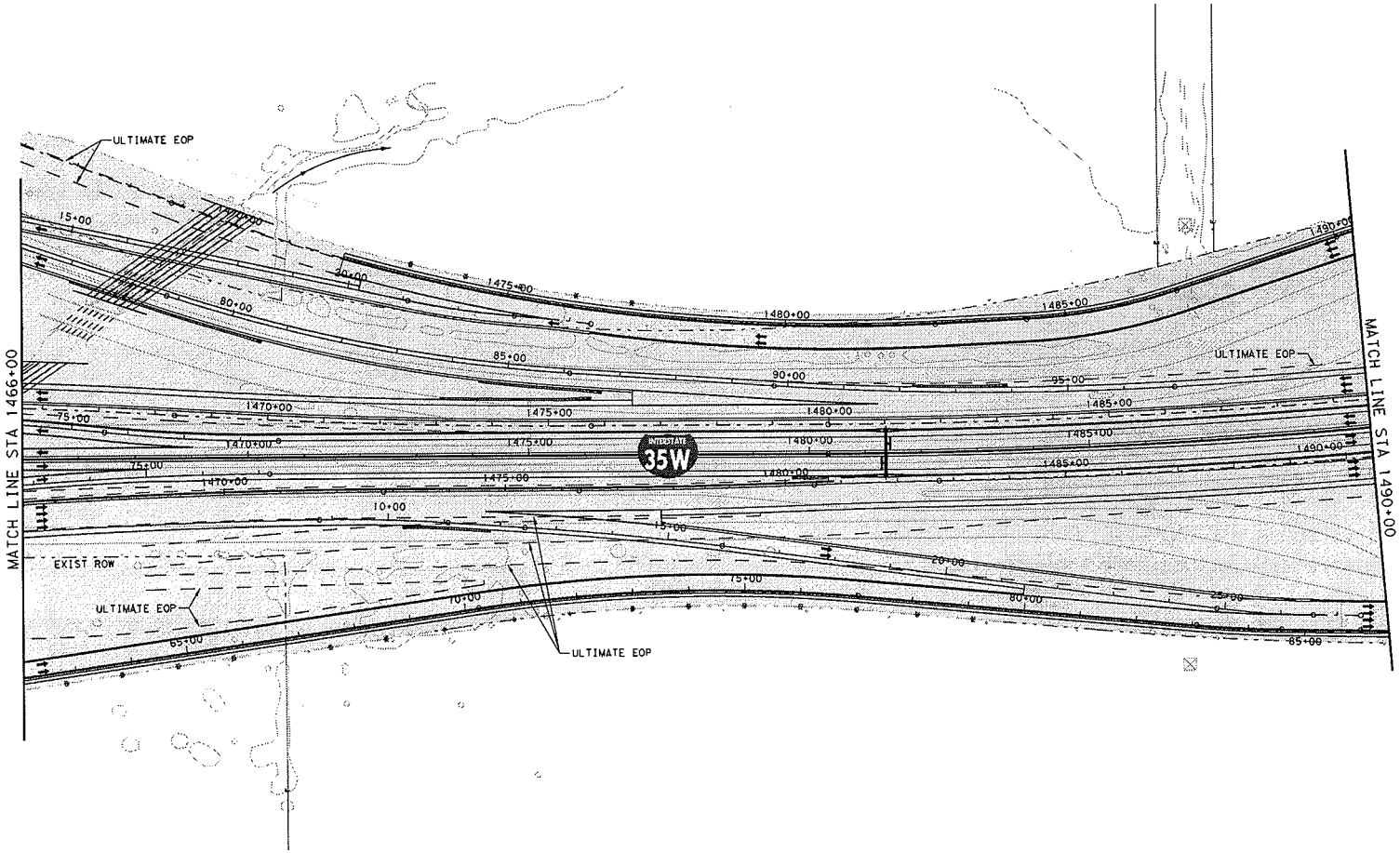

LEGEND

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- RAMP TOLL GANTRY
- HOV DECLARATION AREA

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 4 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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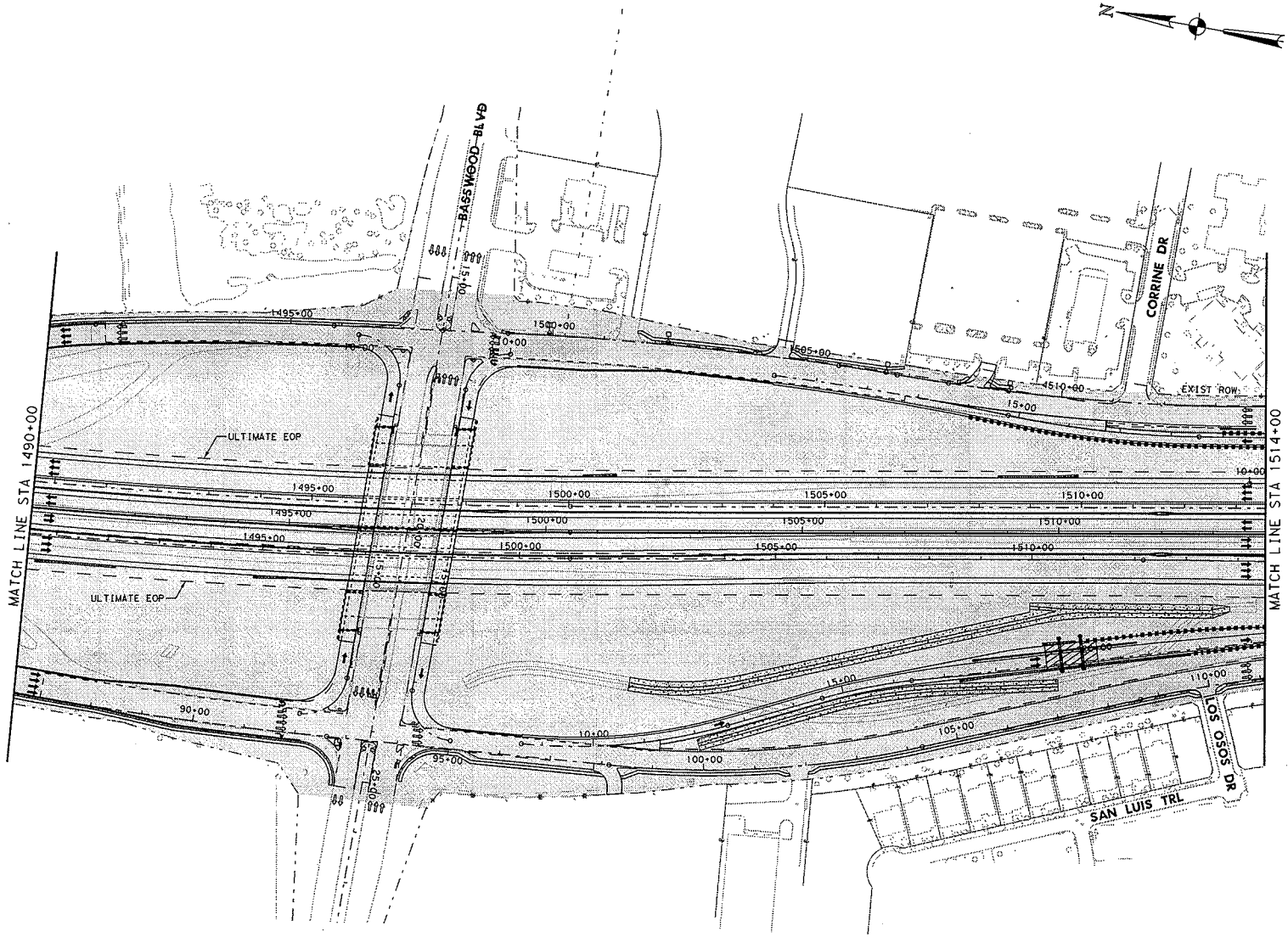
- (3) NUMBER OF TRAFFIC LANES
- TRAFFIC DIRECTION
- MANAGED LANE TOLL GANTRY
- RAMP TOLL GANTRY
- HOV DECLARATION AREA



PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 5 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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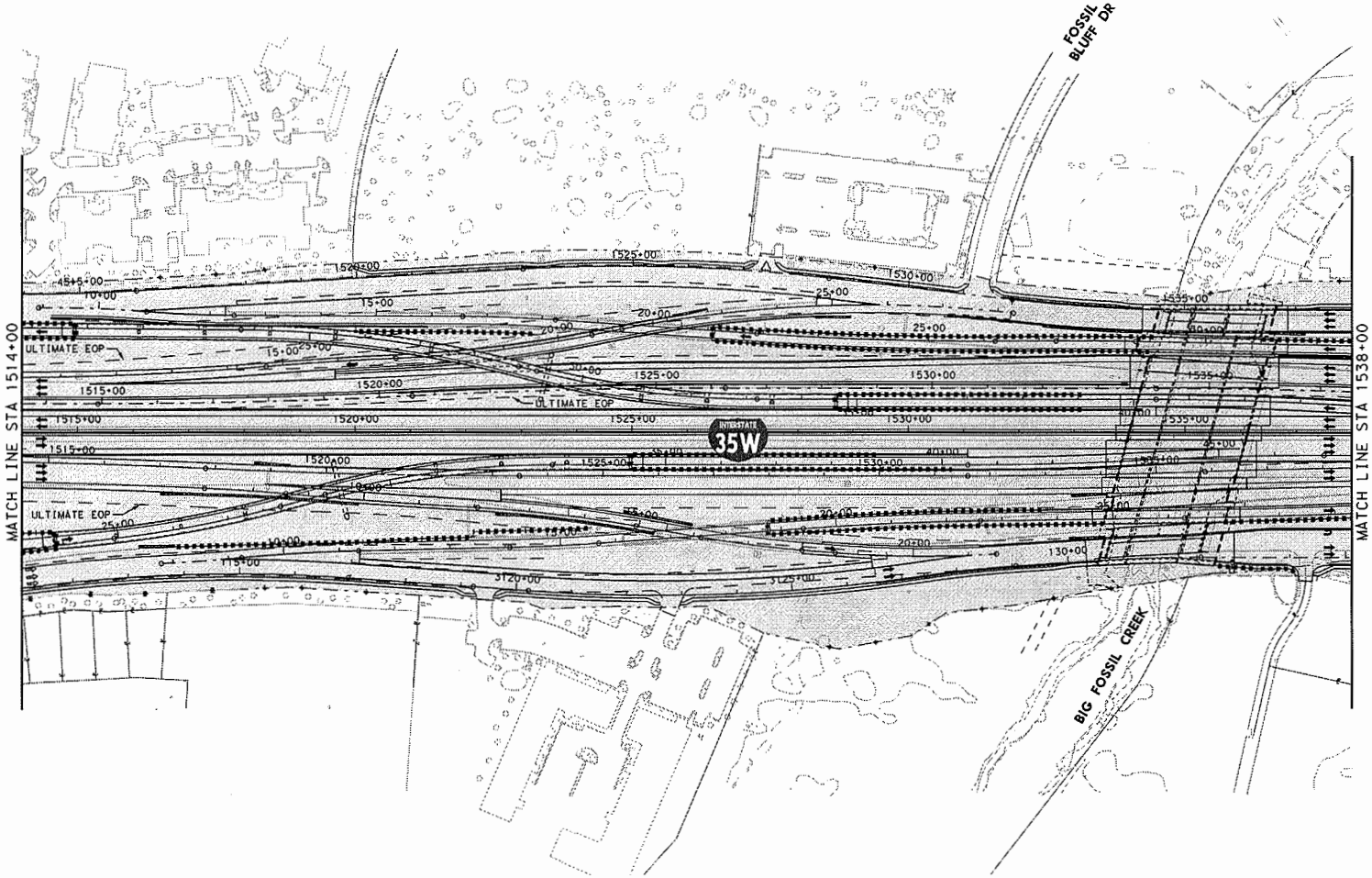

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- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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- (3) NUMBER OF TRAFFIC LANES
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- RAMP TOLL GANTRY
- HOV DECLARATION AREA

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 6 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO.
			IH 35W

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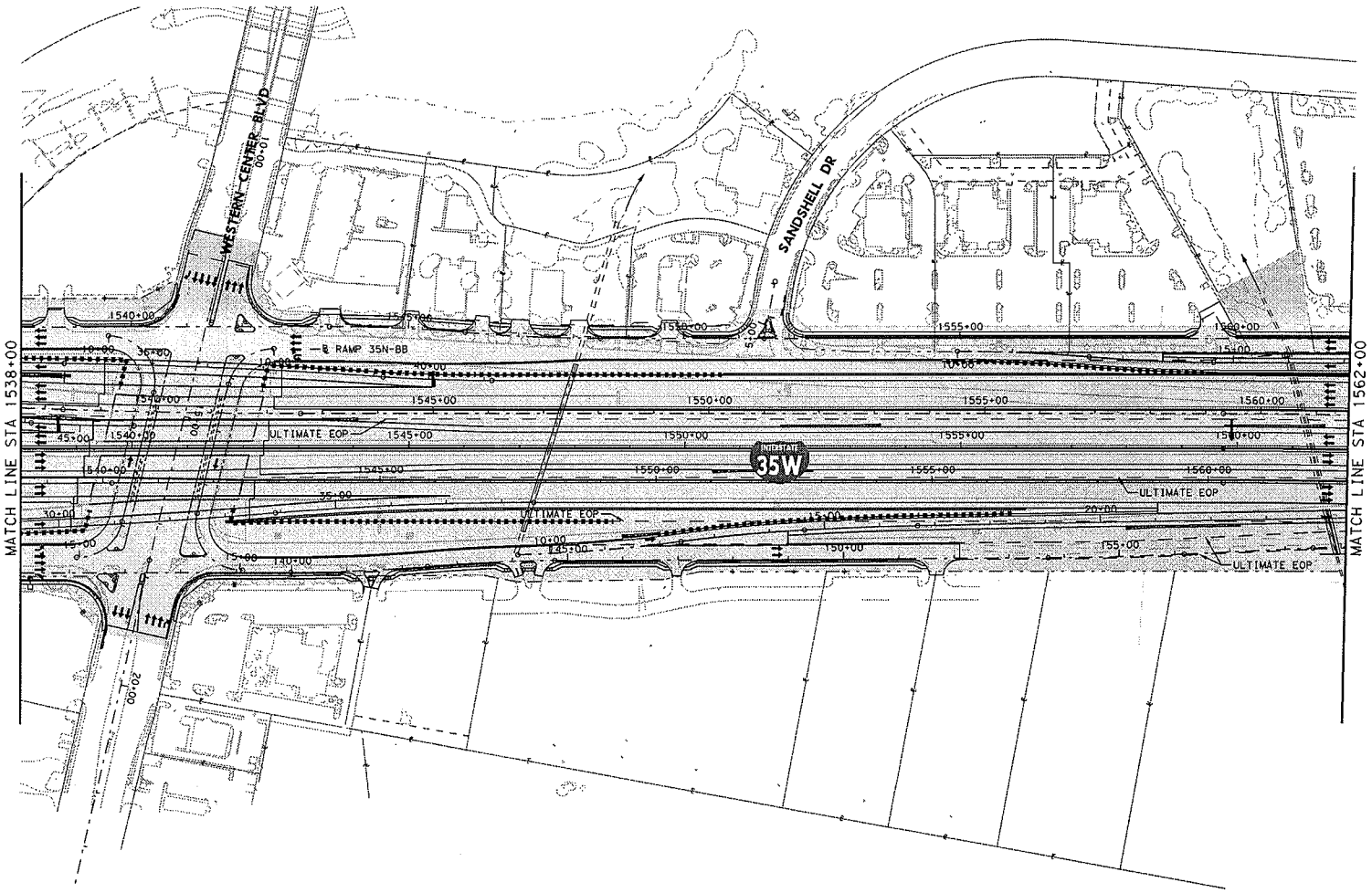

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- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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- TRAFFIC DIRECTION
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- RAMP TOLL GANTRY
- HOV DECLARATION AREA

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 7 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
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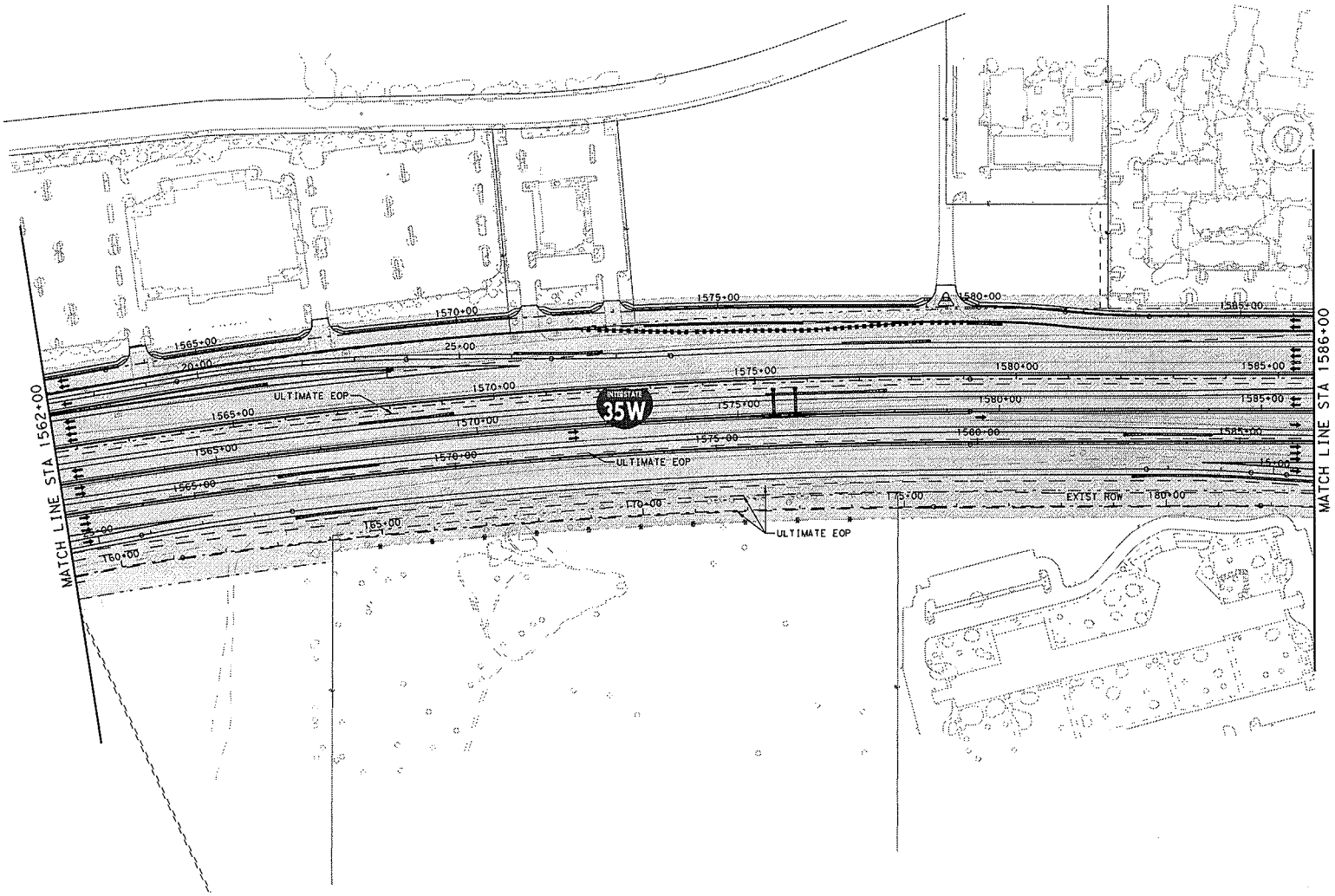

REV	DATE	BY	DESCRIPTION

LEGEND

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- PROPOSED CONTROL-OF-ACCESS
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- RAMP TOLL GANTRY
- HOV DECLARATION AREA

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE

SCALE: 1" = 200'

SHEET 8 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
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LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
- PROPOSED CONTROL-OF-ACCESS
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY (ACCESS RESTRICTED)
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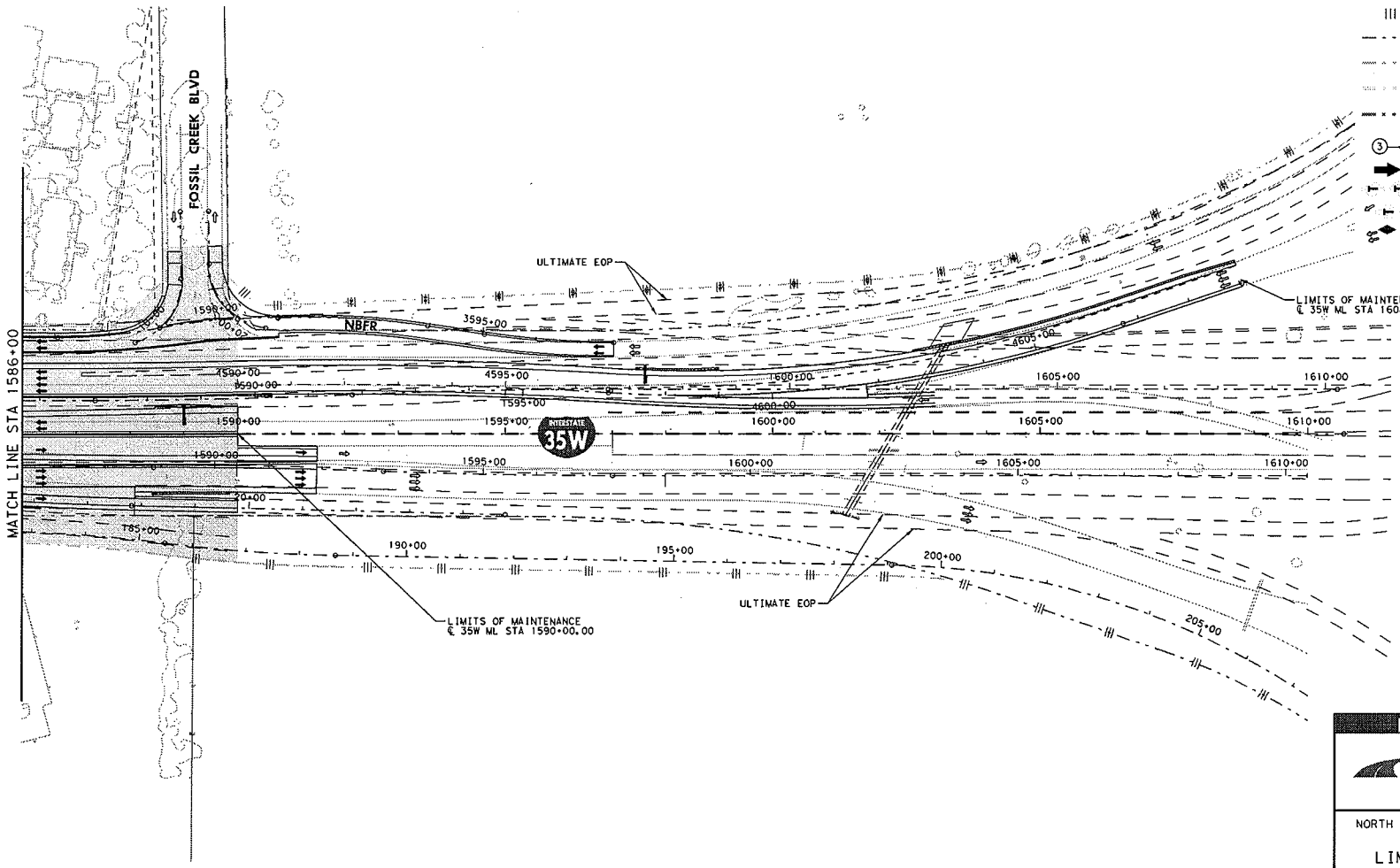

PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 9 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER	SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
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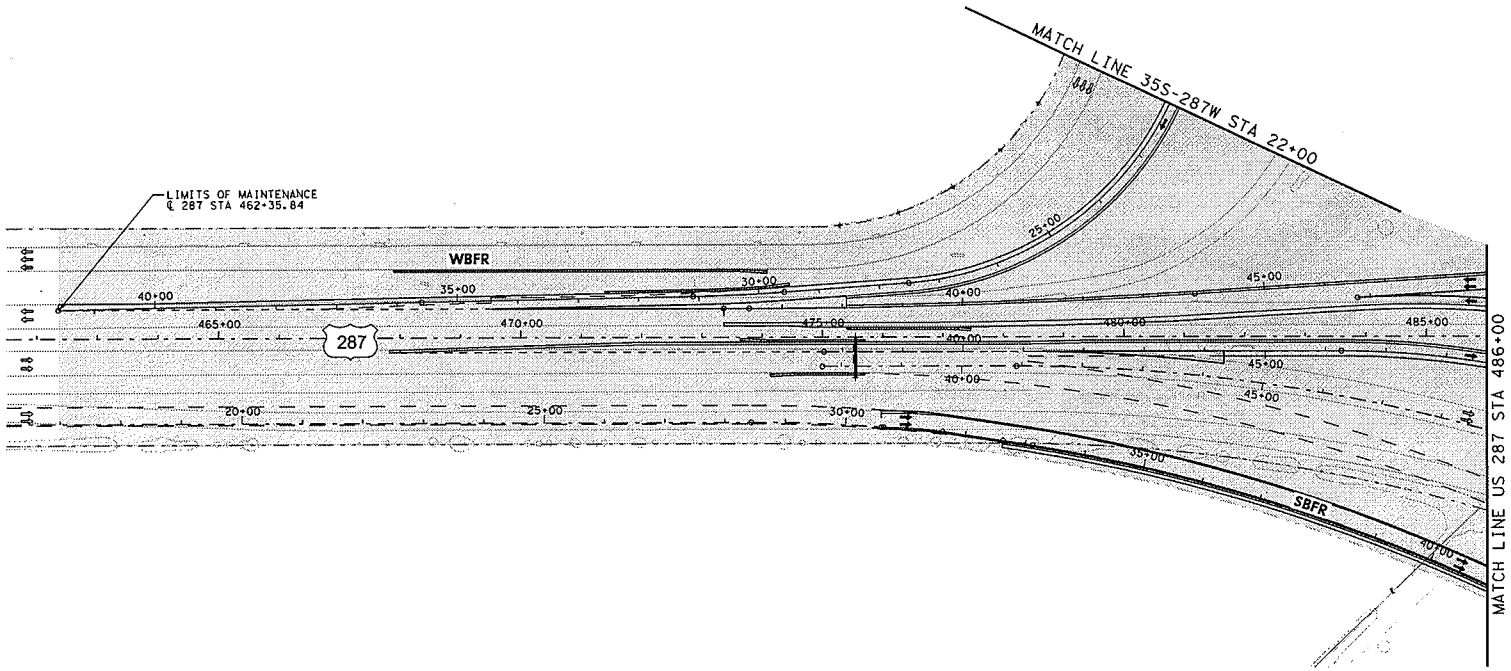

REV	DATE	BY	DESCRIPTION

LEGEND

- LIMITS OF MAINTENANCE FROM OPERATING COMMENCEMENT DATE
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PRELIMINARY

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 3B
IH 35W
LIMITS OF MAINTENANCE
FROM OPERATING
COMMENCEMENT DATE

SCALE: 1" = 200' SHEET 10 OF 10

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NO.

STATE	DISTRICT	COUNTY	
TEXAS		TARRANT	
CONT	SECT	JOB	HIGHWAY NO
			IH 35W

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Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 2-1
Facility Management Plan Contents

September 30, 2012

Attachment 2-1 – Facility Management Plan Contents

The Facility Management Plan Contents and Schedule for provision of the component parts

Legend
A = NTP2
B = Revenue Service Commencement

Part	Ref	Section	Contents	Required by
1. Project Administration				
	1.1	Organization	Organization diagram	A
	1.2	Personnel	Names and contract details, titles, and job roles	A
	1.3	Contractors	Procedures to establish how the Developer will manage Contractors	A
	1.4	Schedule	Facility Baseline Schedule in accordance with the Technical Provision Section 2	A
	1.5	Quality Control	Procedures to establish and encourage continuous improvement	A
	1.6	Audit	Procedures to facilitate review and audit by TxDOT and/or the Independent Engineer	A
			Auditing and management review of Developer's own activities under the Facility Management Plan (FMP)	A
			Auditing and management review of Contractor's activities and management procedures	A
	1.7	FMP Update	Procedures for preparation of amendments and submission of amendments to any part of the FMP	A
	1.8	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will use.	A
			Document management procedures in compliance with the Technical Provisions Section 2.	A
			Procedures for documenting all required Plans not specifically stated in parts 2 to 8 inclusive of the FMP, including but not limited to: Aesthetics and Landscaping Plan, Acceptance Test Plan, Haul Route Plan, Maintenance Management Plan, Handback Plan, Residual Life Methodology Plan	A
2. Quality Management				
2A. Design Quality Management				
	2A.1	Organization	Developer's main contractural arrangements	A
			Organizational structure covering the activities to be performed in accordance with the FA Documents	A
	2A.2	Personnel	Resource Plan for the Developer and its subcontractors	A

Part	Ref	Section	Contents	Required by
2. Quality Management				
2A. Design Quality Management (continued)				
	2A.2	Personnel	Arrangements for coordinating and managing staff interaction with TxDOT and its consultants including collocation of Key Personnel and description of approach to coordinating work of off-site personnel	A
			Names and contact details, titles, job roles and specific experience required for the Key Personnel and for other principal personnel during the period of Design Work	A
			Names and contact details, titles, job roles and specific experience required for the principal personnel for Contractors and any third party with which Developer will coordinate activities.	A
	2A.3	Offices and equipment	Description of the necessary offices and office equipment to be provided by Developer during the period of Design Work	A
	2A.4	Contractors	Overall control procedures for Contractors, including consultants and Subconsultants	A
			Responsibility of Contractors and Affiliates	A
			Steps taken to ensure Contractors and Suppliers meet the obligations imposed by their respective Contracts	A
	2A.5	Interfaces	Interfacing between the Developer, Contractors and the Independent Engineer during the period of Design Work	A
			Coordination with Utility Owners	A
	2A.6	Environmental	Integration of the interface between environmental requirements (including landscaping) and the design of the Project	A
	2A.7	Procedures	Procedures describing how the principal activities will be performed during the design stage: to include geotechnical site investigation, surveys and mapping, environmental management, safety audit, structural audit, and checking	A
	2A.8	Quality Control	Quality Management Plan, including control procedures including a resource table for monitoring and auditing all design services, design review and certification, and verification of plans	A
			Procedures for environmental compliance	A
			Procedures to establish Developer's hold points in the design process at which checking and review will take place	A
			Procedures to ensure accuracy, completion, and quality in submittals to TxDOT, Governmental Entities and other third parties.	A
			Procedures to establish and encourage continuous improvement	A
	2A.9	Audit	Name of Developer's representative(s) with defined authority for establishing, maintaining, auditing and reporting on the FMP	A
			Name, title, roles and responsibilities of supporting quality management staff reporting to the person with defined authority	A
	2A.10	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will use	A
			Document management procedures in compliance with the Technical Provisions Section 2	A
			Identify environmental documentation and reporting requirements, including Environmental Permits, Issues and Commitments (EPIC) sheets	A

Part	Ref	Section	Contents	Required by
2B. Construction Quality Management				
	2B.1	Organization	Developer's main contractual arrangements	A
			Organizational structure covering the activities to be performed in accordance with the FA Documents	A
	2B.2	Personnel	Resource Plan for the Developer and its Contractors	A
			Arrangements for coordinating and managing staff interaction with TxDOT and its consultants including collocation of Key Personnel and description of approach to coordinating work of off-site personnel	A
			Names and contact details, titles, job roles and specific experience required for the Key Personnel as related to construction	A
			Names and contact details, titles, job roles of principal personnel for Contractors and any third party with which Developer will coordinate his activities	A
			Procedures for implementation of the Environmental Protection Training Plan (EPTP) for all employees in accordance with the Technical Provisions Section 4	A
	2B.3	Offices and equipment	Description of the necessary offices and office equipment to be provided by Developer during construction	A
	2B.4	Contractors	Overall control procedures for Contractors, including consultants and subconsultants	A
			Responsibility of Contractors and affiliates	A
			Steps taken to ensure Contractors and Suppliers meet the obligations imposed by their respective Contracts	A
			Procedures for implementation of Environmental Protection Training Plan (EPTP) for employees of subcontractors in accordance with the Technical Provisions Section 4	A
	2B.5	Interfaces	Interfacing between the Developer, Contractors, including any testing contractor, and the Independent Engineer during construction	A
	2B.6	Procedures	List of Project specific construction procedures	A
			Construction detailed procedure for each major activity whether directly undertaken or subcontracted to include pavement, structures, drainage, communications	A
			Traffic Management Plan	A
	2B.7	Quality Control	Construction Quality Management Plan	A
			Integration of component parts of the Comprehensive Environmental Protection Program (CEPP) into construction quality management	A
			Control, identification and traceability of materials, including any material or samples temporarily or otherwise removed from site for testing or other reasons.	A
			Examinations and audit of Construction Work, review of examination and audit, issue of certificates	A
			Observation and reporting of all tests in compliance with the Technical Provisions Section 2	A
			Procedures for tests and inspections for the purpose of the Contractor certifying that prior to burying, each part of the Works is complete and conforms to the FA Documents	A
			Quality control procedures including a resource table for monitoring and auditing during construction any work and testing undertaken by Contractors and Suppliers both on and off Site	A

Part	Ref	Section	Contents	Required by
2. Quality Management				
2B. Construction Quality Management (continued)				
	2B.7	Quality Control	Procedures to establish Developer's hold points in construction	A
			Procedures to ensure accuracy, completion, and quality in submittals to TxDOT, Governmental Entities and other third parties	A
			Procedures to establish and encourage continuous improvement	A
	2B.8	Audit	Inspection and test plans that identify the proforma and/or databases to be used for recording the inspection and test results	A
			Name of Developer's representative with defined authority for establishing, maintaining, auditing and reporting on the FMP	A
			Name, title, roles and responsibilities of supporting quality management staff reporting to the person with defined authority.	A
	2B.9	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will us	A
			Document management procedures in compliance with the Technical Provisions Section 2	A
2C & 2D. Operations and Maintenance Quality Management				
	2C.1 & 2D.1	Organization	Developer's main contractual arrangements	A
			Organizational structure covering the activities to be performed in accordance with the FA Documents	A
	2C.2 & 2D.2	Personnel	Resource Plan for the Developer and its Contractors	A
			Arrangements for coordinating and managing staff interaction with TxDOT and its consultants including collocation of Key Personnel and description of approach to coordinating work of off-site personnel	A
			Names and contact details, titles, job roles of principal personnel for Contractors and any third party with which Developer will coordinate its activities	A
			Names and contact details, titles, job roles of Key Personnel	A
			Procedures for implementation of the Environmental Protection Training Plan (EPTP) for all employees in accordance with the Technical Provisions Section 4	A
	2C.3 & 2D.3	Procurement	Procedures for procurement of services, materials and products including methods to ensure best value	A
	2C.4 & 2D.4	Offices and Equipment	Description of the necessary offices and office equipment to be provided by Developer during the Operating Period	A
	2C.5 & 2D.5	Contractors	Overall control procedures for Contractors, including consultants and subconsultants	A
			Responsibility of Contractors and Affiliates	A
			Steps taken to ensure Contractors and Suppliers meet the obligations imposed by their respective Contracts	A
			Procedures for implementation of the Environmental Protection Training Plan (EPTP) for employees of Contractors in accordance with the Technical Provisions Section 4	A

Part	Ref	Section	Contents	Required by
2. Quality Management				
2C & 2D. Operations and Maintenance Quality Management (continued)				
	2C.6 & 2D.6	Interfaces	Interfacing between the Developer, Contractors and the Independent Engineer during the Operating Period	A
			Coordination with Utility Owners	A
			Procedures to minimize the impact of the Project's operations on neighboring facilities	A
			Procedures to ensure enforcement (permitting) of overloaded/oversized vehicles	A
	2C.7 & 2D.7	Environmental	Coordination of the interface between environmental requirements and the operation and maintenance of the Project	A
			Procedures to implement Storm Water Pollution Prevention Plans (SW3P)	A
			Procedures for the Hazardous Materials Management Plan (HMMP) in accordance with the Technical Provisions Section 4	A
			Detailed procedures to implement the recycling program and waste management in accordance with the Technical Provisions Section 4	A
	2C.8 & 2D.8	Schedule	Renewal Work Schedule	B
	2C.9 & 2D.9	Complaints	Procedures to respond to comments and/or complaints received from Users and others	A
	2C.10 & 2D.10	Equipment	Equipment servicing requirements	A
			Procedures to ensure performance, condition and availability of equipment (including communication equipment, data recording equipment, Project signage and fare collection, tolling and electronic measurement equipment)	A
	2C.11 & 2D.11	Traffic and Ridership	Procedures to collect and verify traffic and ridership data	A
	2C.12 & 2D.12	Procedures	Procedures describing how the principal activities will be performed during the Operating Period: to include routine maintenance, Renewal Work, traffic management, inspections regime, main operational requirements and toll operations	A
			Traffic Management Plan	A
	2C.13 & 2D.13	Quality Control	Examinations and audit of O&M Work, review of examination and audit, issue of certificates of compliance	A
			Observation and reporting of all tests in compliance with the Technical Provisions Section 2	A
			Integration of component parts of the Comprehensive Environmental Protection Program (CEPP) into construction quality management	A
			Quality control procedures including a resource table for monitoring and auditing all O&M Work	A
			Procedures to ensure accuracy, completion, and quality in submittals to TxDOT, Governmental Entities and other third parties	A
			Procedures to establish and encourage continuous improvement	A
	2C.14 & 2D.14	Audit	Name of Developer's representative with defined authority for establishing, maintaining, auditing and reporting on the FMP	A

Part	Ref	Section	Contents	Required by
2. Quality Management				
2C & 2D. Operations and Maintenance Quality Management (continued)				
	2C.14 & 2D.14	Audit	Name, title, roles and responsibilities of supporting quality management staff reporting to the person with defined authority	A
	2C.15 & 2D.15	Performance Standards	Procedures to be followed by Developer pursuant to the Technical Provisions Section 19 to comply with all maintenance requirements	A
	2C.16 & 2D.16	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will use	A
			Document management procedures in compliance with the Technical Provisions Section 2	A
	2C.17 & 2D.17	Response to maintenance	Procedure setting out Developer's response to maintenance issues that impair use, reliability or availability of the Project ina timely manner	A
	2C.18 & 2D.18	User satisfaction	Procudures to collect and track User satisfaction	A
	2C.19 & 2D.19	Emergency Response	Incident Management Plan	A
			Procedures setting out how Developer will respond to accidents and Incidents on the Project	A
			Procedures to establish protocols with Emergency Services and others in Emergency	A
	2C.20 & 2D.20	Toll Operations	Electronic Toll Collection System (ETCS) Plan	B
3. Environmental Management				
	3.1	Organization	Developer's main contractural arrangements	A
			Organizational structure covering the activities to be performed in accordance with the FA Documents	A
	3.2	Personnel	Resource Plan for the Developer and its Contractors	A
			Arrangements for coordinating and managing staff interaction with TxDOT and its consultants, including collocation of Key Personnel and description of approach to coordinating work of off-site personnel	A
			Names and contact details, titles, job roles and specific experience required for Key Personnel and for other environmental personnel	A
			Implement Environmental Protection Training Plan (EPTP) for all employees in accordance with the Technical Provisions Section 4	A
	3.3	Contractors	Overall control procedures for Contractors, including consultants and subconsultants	A
			Responsibility of Contractors and Affiliates	A
			Implement Environmental Protection Training Plan (EPTP) for employees of Contractors in accordance with the Technical Provisions Section 4	A
	3.4	Environmental	Establishment of the component parts of the Comprehensive Environmental Protection Program (CEPP) and Noise Mitigation and Abatement Plan	A

Part	Ref	Section	Contents	Required by
3. Environmental Management (continued)				
	3.5	Quality Control	Procedures to ensure accuracy, completion, and quality in submittals to TxDOT, Governmental Entities and other third parties	A
			Procedures to establish and encourage continuous improvement	A
			Procedures for environmental compliance	A
	3.6	Audit	Name, title, roles and responsibilities of supporting quality management staff reporting to the person with defined authority	A
	3.7	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will use	A
			Identify environmental documentation and reporting requirements	A
4. Public Information and Communications				
	4.1	Organization	Developer's main contractural arrangements	A
			Organizational structure covering the activities to be performed in accordance with the FA Documents.	A
	4.2	Personnel	Resource Plan for the Developer and its Contractors	A
			Arrangements for coordinating and managing staff interaction with TxDOT and its consultants, including colocation of Key Personnel and description of approach to coordinating work of off-site personnel	A
			Names and contact details, titles, job roles and specific experience required for Key Personnel and for other principal personnel	A
			Names and contact details, titles, job roles of principal personnel for Contractors and any third party with which Developer will coordinate his activities	A
	4.3	Offices and equipment	Description of the necessary offices and office equipment to be provided by Developer during design	A
	4.4	Contractors	Overall control procedures for Contractors, including consultants and subconsultants	A
			Responsibility of Contractors. and Affiliates	A
			Steps taken to ensure Contractors and Suppliers meet the obligations imposed by their respective Contracts	A
			Procedures for implementation of Environmental Protection Training Plan (EPTP) for employees of Contractors	A
	4.5	Interfaces	Procedures for liaison with the public, the media and other Customer Groups in accordance with the Technical Provisions Section 3 and the press media policy of TxDOT	A
			Procedures to coordinate with Project Stakeholders such as Governmental Entities and other Customer Groups	A
	4.6	Procedures	Procedures describing how the principal activities will be performed	A
	4.7	Quality Control	Quality control procedures including a resource table for monitoring and auditing all public information and communication services	A
			Procedures to ensure accuracy, completion, and quality in submittals to TxDOT, Governmental Entities and Customer Groups	A

Part	Ref	Section	Contents	Required by
4. Public Information and Communications (continued)				
	4.7	Quality Control	Procedures to establish and encourage continuous improvement	A
	4.8	Audit	Name of Developer's representatie with defined authority for establishing, maintaining, auditing and reporting on FMP	A
			Name, title, roles and responsibilities of supporting quality management staff reporting to the person with defined authority	A
	4.9	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will use	A
			Document management procedures in compliance with the Technical Provisions Section 2	A
5. Safety				
	5.1		Policies, plans, training programs, Work Site controls, and Incident response plans to ensure the health and safety of personnel involved in the Project and the general public affected by the Project	A
	5.2		Procedures for notifying TxDOT of Incidents arising out of or in connection with the performance of the Work	A
6. Communications Management				
	6.1		Processes and procedures for communication of Project information between the Developer's organization and TxDOT	A
7. ROW Acquisition Management				
	7.1	Organization	Developer's main contractural arrangements	A
			Orginizational structure covering the activities to be performed in accordance with the FA Documents	A
	7.2	Personnel	Resource Plan for the Developer and its Contractors	A
			Arrangements for coordinating and managing staff interaction with TxDOT and its consultants, including collocation of Key Personnel and description of approach to coodrinating work of off-site personnel	A
			Names and contact details, titles, job roles and specific experience required for the Key Personnel as related to ROW acquisition and Utility Adjustment activities.	A
			Names and contact details, titles, job roles of principal personnel for Contractors and any third party with which Developer will coordinate activities	A
	7.3	Contractors	Overall control procedures for Contractors, including consultants and subconsultants	A
			Responsibility of Contractors and Affiliates	A
			Steps taken to ensure Contractors and Suppliers meet the obligations imposed by their respective Contracts	A
			Procedures for implementation of the Environmental Protection Training Plan (EPTP) for employees of Contractors in accordance with the Technical Provisions Section 4	A
	7.4	Interfaces	Interfacing between the Developer, Contractors and the Independent Engineer during Project ROW acquisition, including the interfaces between Project ROW acquisition, Project design, and quality review processes	A

Part	Ref	Section	Contents	Required by
7. ROW Acquisition Management (continued)				
	7.4	Interfaces	Coordination with Utility Owners	A
			Procedures for establishing Utility Adjustment Concept Plans and Utility Adjustment Plans	A
	7.5	Relocation	Relocation Plan	A
	7.6	Environmental	Integration of the interface between environmental requirements (including Hazardous Materials and demolition) and Project ROW acquisition activities	A
			Applicable procedures for the Hazardous Materials Management Plan (HMMP) in accordance with the Technical Provisions Section 4	A
			Applicable procedures to implement the Stormwater Pollution Prevention Plan, recycling program and waste management in accordance with the Technical Provisions Section 4	A
			Address Comprehensive Environmental Protection Plan (CEPP) requirements	A
	7.7	Schedule	Logic linked ROW acquisition activities on a parcel-by-parcel basis as part of the Facility Baseline Schedule, including adequate time periods for TxDOT review and condemnation activities in accordance with the Technical Provisions Section 7	A
	7.8	Procedures	Procedures describing how the principal activities will be performed during the Project ROW acquisition, whether directly undertaken or subcontracted	A
	7.9	Quality Control	Procedures to ensure accuracy, completion, and quality in submittals to TxDOT and Governmental Entities	A
			Procedures to establish and encourage continuous improvement	A
			Quality control procedures and quality review standards for Project ROW acquisition in accordance with the Technical Provisions Section 7	A
			Integration of component parts of the Comprehensive Environmental Protection Program (CEPP) into ROW acquisition management	A
	7.10	Audit	Name, title, roles and responsibilities of supporting quality management staff reporting to the person with defined authority	A
	7.11	Document Management	The manner in which records will be maintained in compliance with the Technical Provisions, including any specific systems Developer will use	A
			Document management procedures in compliance with the Technical Provisions Section 2	A
			Identify environmental documentation and reporting requirements	A
8. Cost Management				
	8.1		Procedures for cost management and reporting as required by financial institutions and agencies involved in the Project	A

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North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 2-2
Work Breakdown Structure Requirements

September 30, 2012

Table 1 represents the minimum requirements of Work Breakdown Structure (WBS) for the project schedule. The WBS incorporates various geographic Segments, Regions, Areas and Phases of work to better facilitate management of construction sequencing.

Table 1: Work Breakdown Structure (WBS) Minimum Requirements

1 **PROJECT DESCRIPTION**
- **1.1. Project Administration**
  - 1.1.1. Project Summary & Milestones
  - 1.1.2. Mobilization
    - 1.1.2.1. Developer
    - 1.1.2.2. DB Contractor
  - 1.1.3. Submittals and Permitting
    - 1.1.3.1. (By Governmental Agency)
      - 1.1.3.1.1. (By Specific Permit/Submittal Requirement)
- **1.2. Segment A**
  - 1.2.1. Segment A Summary & Milestones
  - 1.2.2. Project Administration
    - 1.2.2.1. Project Summary and Milestones
    - 1.2.2.2. Mobilization
      - 1.2.2.2.1. Developer
      - 1.2.2.2.2. DB Contractor
    - 1.2.2.3. Submittals and Permitting
      - 1.2.2.3.1. (By Governmental Agency)
        - 1.2.2.3.1.1. (By Specific Permit/Submittal Requirement)
  - 1.2.3. Segment A Right-of-Way Acquisition
    - 1.2.3.1. Acquisition by TxDOT
      - 1.2.3.1.1. (By Parcel No.)
    - 1.2.3.2. Acquisition by Developer
      - 1.2.3.2.1. (By Parcel No.)
  - 1.2.4. Segment A Utility Adjustments
    - 1.2.4.1. Utility Coordination
      - 1.2.4.1.1. Administration and Planning
        - 1.2.4.1.1.1. Site Utility Engineering
        - 1.2.4.1.1.2. Conceptual Design
      - 1.2.4.1.2. (By Owner)
        - 1.2.4.1.2.1. Master Agreements
        - 1.2.4.1.2.2. Utility Assemblies
    - 1.2.4.2. Utility Relocations
      - 1.2.4.2.1. (By Owner)
        - 1.2.4.2.1.1. (By Line)
  - 1.2.5. Segment A Design
    - 1.2.5.1. General Activities and Field Work
    - 1.2.5.2. Develop Specifications
    - 1.2.5.3. Geotechnical Design
    - 1.2.5.4. Pavement Design
    - 1.2.5.5. Drainage Design
    - 1.2.5.6. Roadway Design
    - 1.2.5.7. Bridge Design
    - 1.2.5.8. Retaining Wall Design
    - 1.2.5.9. Traffic Management
    - 1.2.5.10. Environmental Design
    - 1.2.5.11. Landscape and Aesthetic Design
    - 1.2.5.12. Electrical Design

1.2.5.13. ITS & TCS Design
1.2.5.14. Signage and Marking Design
1.2.5.15. Design Packages
1.2.6. Segment A Construction
1.2.6.1. Phase (or Work Area)
1.2.6.1.1. Stage
1.2.6.1.1.1. Work Area (NBFR, SBFR, NBGPL, ML, XR, etc) (or Phase)
1.2.6.1.1.1.1. Traffic Management
1.2.6.1.1.1.1.1. Traffic Control and Temporary Work
1.2.6.1.1.1.1.2. Barricades, Signs & Traffic Handling
1.2.6.1.1.1.1.3. Erosion control
1.2.6.1.1.1.1.4. Detour Construction / Removal
1.2.6.1.1.1.1.5. Portable Traffic Barrier
1.2.6.1.1.1.1.6. Workzone pavement Marking
1.2.6.1.1.1.1.7. Temporary Bridges
1.2.6.1.1.1.1.8. Temporary Walls / Shoring
1.2.6.1.1.1.1.9. Temporary Drainage
1.2.6.1.1.1.1.10. Temporary Illumination
1.2.6.1.1.1.2. Environmental Mitigation
1.2.6.1.1.1.2.1. Noise Walls
1.2.6.1.1.1.2.2. Wetland and Habitat Mitigation
1.2.6.1.1.1.3. Hazardous Materials
1.2.6.1.1.1.3.1. Site Assessments
1.2.6.1.1.1.3.2. Remediation
1.2.6.1.1.1.4. Removals
1.2.6.1.1.1.4.1. Building Removals
1.2.6.1.1.1.4.2. ROW Preparation
1.2.6.1.1.1.4.3. Roadway Removals
1.2.6.1.1.1.4.4. Bridge Removals
1.2.6.1.1.1.5. Earthwork
1.2.6.1.1.1.5.1. Topsoil Stripping and Placing
1.2.6.1.1.1.5.2. Excavation
1.2.6.1.1.1.5.3. Embankment
1.2.6.1.1.1.5.4. Special Geotechnical Measures
1.2.6.1.1.1.6. Subgrade Treatment and Base
1.2.6.1.1.1.6.1. Lime Treatment
1.2.6.1.1.1.6.2. Flexible Base
1.2.6.1.1.1.7. Drainage
1.2.6.1.1.1.7.1. Culverts
1.2.6.1.1.1.7.2. Storm Sewer
1.2.6.1.1.1.7.3. Riprap
1.2.6.1.1.1.8. Pavement
1.2.6.1.1.1.8.1. Asphalt Pavement
1.2.6.1.1.1.8.2. Concrete Pavement
1.2.6.1.1.1.8.3. Curb & Gutter
1.2.6.1.1.1.8.4. Driveways
1.2.6.1.1.1.8.5. Sidewalks and Median Paving
1.2.6.1.1.1.9. Retaining Walls
1.2.6.1.1.1.9.1. (By Wall No.)
1.2.6.1.1.1.10. Bridges
1.2.6.1.1.1.10.1. (By Bridge No.)
1.2.6.1.1.1.11. Permanent Barriers
1.2.6.1.1.1.11.1. Permanent Concrete Barriers
1.2.6.1.1.1.11.2. Metal Beam Guard Fence
1.2.6.1.1.1.11.3. Crash Attenuators
1.2.6.1.1.1.12. Signals and Illumination

1.2.6.1.1.1.12.1. Roadway Illumination
1.2.6.1.1.1.12.2. High Mast Illumination
1.2.6.1.1.1.12.3. Electrical Services
1.2.6.1.1.1.12.4. Traffic Signals
1.2.6.1.1.1.13. ITS/TCS
1.2.6.1.1.1.13.1. Duct Bank Systems
1.2.6.1.1.1.13.2. Equipment Foundations
1.2.6.1.1.1.13.3. Support Structures and Equipment
1.2.6.1.1.1.14. Landscaping
1.2.6.1.1.1.14.1. Seeding and Sodding
1.2.6.1.1.1.14.2. Fertilizer and Watering
1.2.6.1.1.1.14.3. Special Aesthetic landscaping (if applicable)
1.2.6.1.1.1.15. Permanent Signing and Markings
1.2.6.1.1.1.15.1. Overhead Sign Structures
1.2.6.1.1.1.15.2. Small Signs
1.2.6.1.1.1.15.3. Pavement Markings

1.3. Segment B (use the same level of detail as Segment A above)
1.4. Segment C (use the same level of detail as Segment A above on all subsequent segments)
1.5. Segment D (etc.)

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Segments 3A and 3B Facility

Attachment 2-3
Organizational Structure for Cost Reporting

September 30, 2012

Table 2 represents the required organizational structure that all cost and schedule information shall rollup to in order to facilitate reporting project costs, expenditures and all progress payment processes.

Table 2: Organizational Structure for Cost Reporting

1 **PROJECT DESCRIPTION**

1.1. Project Administration
- 1.1.1. Mobilization
- 1.1.2. Submittals and Permitting

1.2. Right-of Way Acquisition
- 1.2.1. Acquisition By TxDOT
- 1.2.2. Acquisition by Developer

1.3. Utility Adjustments
- 1.3.1. Utility Coordination
- 1.3.2. Utility Relocations

1.4. Design
- 1.4.1. General Activities and Field Work
- 1.4.2. Develop Specifications
- 1.4.3. Geotechnical Design
- 1.4.4. Pavement Design
- 1.4.5. Drainage Design
- 1.4.6. Roadway Design
- 1.4.7. Bridge Design
- 1.4.8. Retaining Wall Design
- 1.4.9. Traffic Management
- 1.4.10. Environmental Design
- 1.4.11. Landscape and Aesthetic Design
- 1.4.12. Electrical Design
- 1.4.13. ITS & TCS Design
- 1.4.14. Signage and Marking Design
- 1.4.15. Design Packages

1.5. Construction
- 1.5.1. Traffic Control and Temporary Work
- 1.5.2. Environmental Mitigation
- 1.5.3. Hazardous Materials
- 1.5.4. Removals
- 1.5.5. Earthwork
- 1.5.6. Subgrade Treatment and Base
- 1.5.7. Drainage
- 1.5.8. Pavement
- 1.5.9. Retaining Walls
- 1.5.10. Bridges
- 1.5.11. Permanent Barriers
- 1.5.12. Signals and Illumination
- 1.5.13. ITS/TCS
- 1.5.14. Landscaping
- 1.5.15. Permanent Signing and Marking

1.6. Changes Modifications
- 1.6.1. Change Order #xx

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North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 2-4
Toll Operations Document Retention Schedule

September 30, 2012

TOLL OPERATIONS DOCUMENT RETENTION SCHEDULE

Document Name	Description	Retention Period	Record Retention Schedule Citation (Short Description)
Bank Deposit slips (copies)	Used by the Operations/Accounting Deposit clerk to denote the amounts, dates, and times of deposits taken to the bank (one copy goes to Mgr.)	Fiscal Year End +3 years	86ACC16-Cash Management and Deposit Records
Batch Control Log	Used by the Operations staff to log daily tracking forms. (10 – 2" binders for one year)	1 Year	86ADO09-Logs/Log Books
Batch Tracking Form	Used by the Operations Supervisors and staff to track batches as they go through the fulfillment process.	1 Year	86ADO09-Logs/Log Books
Call Monitoring Form	Used by Operations Supervisors	1 Year	86IRM05-Activity Monitoring
Call Classification Form	Used by Operations Supervisors and Managers to develop call statistics and report upon them daily. (Recommend destroying hard copies after entering into Daily Report)	1 Year	86ADM08-Operations Reports
Card Testing Log	Used by the Operations Supervisors and staff to track the testing of account management cards. (Recommend destroying hard copies)	1 Year	86ADO09-Logs/Log Books
Card Type Summary Report	Used by the Operations/Accounting Auditors to reconcile credit card totals with the Account Management System reports.	Fiscal Year End +3 years	86ACC15-Receipts/Receipts Logs/Reconciliations
Change Fund Sheet	Used by Operations Storefront Supervisor to track change requests for available Storefront funds	Fiscal Year End +3 years	86ACC16-Cash Management and Deposit Records
Credit Card Reconciliation Worksheet (Account Management System to Credit Card Processor)	Used by the Operations/Accounting Auditor to reconcile credit card payments from Account Management System to the bank.	Fiscal Year End +3 years	86ACC15-Receipts/Receipts Logs/Reconciliations
Operations Daily Report	Used by the Operations Management team to report call center and storefront statistics	1 Year	86-ADM08-Operations Reports
Summary of Fulfilled Tag Requests Report	Account Management System report used by Operations Manager to identify number of tag fulfillment requests processed for the day.	1 Year	86-ADM08-Operations Reports
Phone System (Queue) Activity Report	Phone system report used by Call Center Supervisor to identify activity for each call center queue	1 Year	86-ADM08-Operations Reports
Phone System Activity Report by Interval	Phone system report used by Call Center Supervisor to identify activity for each call center queue in 30 minute intervals	1 Year	861 RM05--Activity Monitoring
Phone System Agent Summary Report	Phone system report used by Call Center Supervisor to identify activity for each individual agent.	1 Year	861 RM05--Activity Monitoring

Document Name	Description	Retention Period	Record Retention Schedule Citation (Short Description)
CSR Daily Reconciliation Form	Used by the Operations Storefront Supervisor and storefront staff to reconcile all walk-in transactions with their tag fulfillment and the funds taken for the basis.transactions on a daily	Fiscal Year End +3 years	86ACC15--Receipts/Receipts Logs/Reconciliations
CSR Transaction Qualification Form	Used by the Operations Call Center CSRs to track call type statistics and then used by the Operations Managers and Supervisors for QA procedures. (One drawer for one year)	1 Year	861 RM05--Activity Monitoring
Daily Activity Report	Used by Operations staff to document activity and tasks completed each day. (each supervisor maintains workgroups'logs) 10-12 Binders	1 Year	86ADM08--0perations Reports
Daily Bank Deposit Log	Used by the Operations/Accounting Clerk to denote the amounts, dates, and times of deposits taken to the bank.	Fiscal Year End +3 years	86ACC16--Cash Management and Deposit Records
Daily Cash Reconciliation Worksheet	Used by the Operations/Accounting Clerk to reconcile cash transactions pre-deposit on a daily basis.	Fiscal Year End +3 years	86ACC15--Receipts/Receipts Logs/Reconciliations
Daily Safe Log	Used by the Operations Supervisor to determine the amount of funds that should be located in the Operations center safe at any time.	Fiscal Year End +3 years	86ACC16--Cash Management and Deposit Records
Daily Safe Log	Used by the Operations Supervisor to determine the amount of funds that should be located in the Operations center safe at any time.	Fiscal Year End +3 years	86ACC16--Cash Management and Deposit Records
Deposit Reconciliation Summary	Used by Deposit clerk and Auditor to reconcile daily depository funds	Fiscal Year End +3 years	86ACC16--Cash Management and Deposit Records
Deposit Reconciliation Worksheet	Used by the Operations/Accounting Auditor to reconcile deposits from Account Management System to the bank on a daily basis.	Fiscal Year End +3 years	86ACC15--Receipts/Receipts Logs/Reconciliations
Detailed Call, CSQ, Agent Report	Phone System report used by Call Center Supervisor to identify activity for each individual agent, itemizing individual calls.	1 Year	86IRM05--Activity Monitoring
E-Mail Tracking Log	Used by Operations Storefront Supervisor to track number of incoming s-malls by type and resolution counts.	1 Year	86ADOO7--Correspondence Tracking Record
Enrollment Form	Used by Operations CSRs to enroll new customers in the toll Account Management system. Contain credit card numbers and must be secured and destroyed accordingly.	AC (After Completion/ Account Closed) +3 years	86ACC21--Credit Card Account Record
Escalation Log	Used by Operations Call Center Supervisors to track escalatedissues and whether or not they have been resolved.	1 Year	86ADOO9--Logs/Log Books
Incoming Mail Log	Used by Operations Supervisors and Managers to track the collection, batching, and distribution of incoming mail.	1 Year	86AD007--Correspondence Tracking Record

Document Name	Description	Retention Period	Record Retention Schedule Citation (Short Description)
Interim Bank Statement	Used by the Operations/Accounting Auditor to reconcile deposits made to the bank.	Fiscal Year End +3 years	86ACC20--Bank Statements
IOP Reconciliation Worksheet	Used by the Operations Auditor to reconcile IOP transactions between Account Management System and the TTA IOP Module.	Fiscal Year End +3 years	86ACC 15--Receipts/Receipts Logs/Reconciliations
Kit Tracking Batch Transmittal	Used by Operations staff to transmit a batch of kits to another Operations staff member	Fiscal Year End +3 years	86ACC07--Inventory Records
Monthly Bank Statement	Used by the Operations/Accounting Auditor to verify all transactions to the bank on a monthly basis.	Fiscal Year End +3 years	86ACC20--Bank Statements
Outgoing Mail Log	Used by the Operations/Accounting Auditor and Management team to ensure that all outgoing mail is handled appropriately.	1 Year	86AD007--Correspondence Tracking Record
Postage Report	Used by the Operations Auditor to compare to the Outgoing Mail Log and reconcile to two.	Fiscal Year End +3 years	86AD010--Postage/Postage Expense Records
Special Events Request Form	Used by the Operations Special Events Supervisor to request equipment for a special event.	1 Year	86AD011--Work Orders, Service Requests
Tag Inventory Sheet *	Used to track tag kit bins as they are received into inventory. (Recommend destroying hard copies)	Fiscal Year End +3 years	86ACC07--Inventory Records
Tag Testing Log *	Used by the Operations Supervisor and staff to track the testing of tags. (Recommend destroying hard copies)	1 Year	86AD009--Logs/Log Books
Transaction Detail Report	Used by the Operations/Accounting Auditor to reconcile any issues (including timing issues) that result from the daily credit card reconciliation.	Fiscal Year End +3 years	86ACC09--Internal Fiscal Reports
IOP Module EFT Summary	Used by the Operations/Accounting Auditor to Report track funds due to agency from away agencies and vice-versa.	Fiscal Year End +3 years	86ACC09--Internal Fiscal Reports.
IOP Module Transaction Reconciliation Detail Report	Used by the Operations Auditor to reconcile interop issues (including rejected, but posted tolls) that result from monthly reconciliation.	Fiscal Year End +3 years	86ACC15--Receipts/Receipts Logs/Reconciliations
Tag Sales Receipts	Used by Operations Storefront Supervisor as receipt for single payment to multiple accounts.	Fiscal Year End +3 years	86ACC15--Receipts/Receipts Logs/Reconciliations
Tag/Card Request Form	Used by the Operations Special Events Supervisor to request equipment for a special event.	1 Year	86AD011--Work Orders, Service Requests
Transaction Summary Report	Used by the Operations Auditor and Operations to track all transactions in the Account Management System by all clerks for an adjustable span of time.	1 Year	86ADM08--0perations Reports

Document Name	Description	Retention Period	Record Retention Schedule Citation (Short Description)
Clerk Transaction Summary	Used by the Operations Auditor and Supervisors to reconcile all the transaction of a specific clerk for an adjustable span of time with Account Management System.	Fiscal Year End +3 years	86ACC09--Internal Fiscal Reports.
Transaction Type Detail	Used by Operations and Auditors to reconcile Report transaction details in the Account Management System for a specific transaction type with their counterparts in other systems.	Fiscal Year End +3 years	86ACC09--Internal Fiscal Reports.
Deposit Summary	Used by Walk-in Store Front Supervisor to document deposit totals in Account Management System.	Fiscal Year End +3 years	86ACC16--Cash Management and Deposit Records
Credit Card Journal - Detail Report	Used by the Operations Auditor to reconcile specific credit card transaction in the Account Management System for all card types to their Credit Card Processor counter arts.	Fiscal Year End +3 years	86ACC09--Internal Fiscal Reports
Transaction Control Summary by Agency	Used by Auditors and Operations to deliver a big picture, large-scope review of all transactions in the Account Management System occurring for an adjustable span of time.	Fiscal Year End +3 years	86ACC09--Internal Fiscal Reports
Follow-up Notes	Used by Operations Call Center Supervisors to identify escalated issues from CSRs or customers that may require follow up by the Account Management System.	AC (After Completion/ Final Resolution) +2 years	86ADM06--Complaint Files (NOTE: Issues resulting in legal action retained AC+3 per 86ADM43, Legal Case Files.
New Accounts Added Report	Used by the Operations Call Center Supervisors to ensure that all newly enrolled accounts were properly enrolled with the correct funds posted to all new accounts.	AC (After Completion/ Account Closed)+3 years	86ACC21--Credit Card Account Record
Account Management System-IP User Productivity Report	Used by Image Review Supervisor to identify images reviewed by individual clerks	1 Year	86IRM05--Activity Monitoring
Toll Management (TMS) Traffic, Operator, Status, Revenue Reports	Reports on revenue and traffic	Fiscal Year End +3 years	86ACC39-Internal Fiscal Reports (Using the longest retention requirement.)

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 2-5
I2MS XML Table

September 30, 2012

I2MS Test Field Report

File: I2MSFieldReport.xls
File Type: Microsoft Excel (spreadsheet)
File Description: Describes what fields are required to be submitted per test, including pertinent header and footer information. All fields are required to be submitted if possible.

I2MS Test Form Fields

Purpose

The purpose of this document is to provide information on the tables and fields within I2MS.

Material Test Forms

Material Test Forms are forms used to run tests for a sample. A test form contains header and footer information which all forms have in common. Each test form also has a form body containing fields specific to the test method(s) being performed.

Header Fields

The header information is the metadata of the form. It is vital for searching for and analyzing records. All of the test forms have similar header information.

Table Name: HEADER_VALUE_OVT **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Course Lift	course_lift	nvarchar	250	
Direction	direction	nvarchar	250	CVL
Distance From CL	dist_from_cl	nvarchar	250	
Feature	feature	nvarchar	250	CVL
Grade	grade	nvarchar	100	CVL
Material	material	nvarchar	100	CVL
Misc	misc	nvarchar	250	
Report Type	report_type	nvarchar	250	CVL
Roadway	roadway	nvarchar	250	CVL
Sample ID	sample_id	nvarchar	13	
Sample Location	sample_location	nvarchar	250	
Sample Type	sample_type	nvarchar	100	CVL
Sampled By	sampled_by	nvarchar	250	CVL
Sampled Date	sampled_date	datetime		MM/dd/yyyy
Section	section	nvarchar	100	CVL
Spec Item	spec_item	nvarchar	100	CVL
Spec Year	spec_year	nvarchar	250	
Special Provision	special_provision	nvarchar	250	CVL
Split Sample ID	split_sample_id	nvarchar	250	
Station	station	nvarchar	250	Pattern: [0-9]+\+[0-9][0-9](\.[0-9][0-9])?
Structure Number	structure_number	nvarchar	250	CVL
Supplier	supplier	nvarchar	100	CVL

Footer Fields

The footer contains approval data and comments for each of the test forms.

Table Name: FOOTER_VALUE_OVT **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Authorized By	authorized_by	nvarchar	100	CVL
Authorized Date	authorized_date	smalldatetime		MM/dd/yyyy
Completed Date	completed_date	smalldatetime		MM/dd/yyyy
Digital Signature ID 1	dig_sig_id1	int		
Digital Signature ID 2	dig_sig_id2	int		
Remarks	remarks	text		
Reviewed By	reviewed_by	nvarchar	100	CVL

Body Fields

Pulverization Gradation (DB-101-E, Part III)

Table Name: VALUE_DB101_3E_TEST **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Individual or Cumulative	individual_cumulative	nvarchar	100	Individual, Cumulative
Minus #40 Sieve	negative_no_40	nvarchar	100	
Total Weight	total	nvarchar	100	
Test Method	test_method	nvarchar	100	
Tested By	tested_by	nvarchar	100	
Tested Date	tested_date	datetime		MM/dd/yyyy
Stamp Code	stamp_code	int		

Table Name: VALUE_DB101_3E_SIEVE **Maximum Rows: 4**

Field Description	Field Name	Datatype	Length	Values
Sieve Size	sieve_size	nvarchar	100	3", 2-1/2", 2", 1-3/4", 1-1/2", 1", 7/8", 3/4", 1/2", 3/8", No.4, No.8, No.16, No.30, No.40, No.50, No.100, No.200
Weight Retained	weight_retained	decimal	(19, 8)	
Cumulative Weight Retained	cumulative_weight_retained	decimal	(19, 8)	
Cumulative Percent Passing	cumulative_pct_passing	decimal	(19, 8)	
Lower Specification Limit	lower_spec_limit	decimal	(19, 8)	
Upper Specification Limit	upper_spec_limit	decimal	(19, 8)	
Within Master Gradation Limits	master_grading	nvarchar	100	Yes, No

Moisture Content of Aggregates (DB-103-E)

Table Name: VALUE_DB103E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Dish No.	dish_no	nvarchar	100	
Mass of Dry Sample	dry_sample_tare	decimal	(19, 8)	
Moisture Content	moisture_content	decimal	(19, 8)	
Payable Weight of Class 2 Flex Base	payable_weight	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tare Mass	tare_mass	decimal	(19, 8)	
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Mass of Wet Sample Tare	wet_sample_tare	decimal	(19, 8)	
Wet Weight of Class 2 Flex Base	wet_weight	decimal	(19, 8)	

Liquid Limit, Plastic Limit, Plastic Index (DB-104-6)

Table Name: VALUE_DB104E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Liquid Limit	liquid_limit_total	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB104E_SAMPLE **Maximum Rows: 6**

Field Description	Field Name	Datatype	Length	Values
Dish No.	dish_no	nvarchar	100	
Liquid Limit (%)	liquid_limit	decimal	(19, 8)	
Mass of Dry Sample + Tare (g)	mass_dry_sample	decimal	(19, 8)	
Mass of Wet Sample + Tare (g)	mass_wet_sample	decimal	(19, 8)	
Moisture Content, %	moisture_content	decimal	(19, 8)	
Number of Blows	number_blows	int		
Tare Mass (g)	tare_mass	decimal	(19, 8)	

Table Name: VALUE_DB105E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Plastic Limit	plastic_limit_total	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB105E_SAMPLE **Maximum Rows: 3**

Field Description	Field Name	Datatype	Length	Values
Dish No.	dish_no	nvarchar	100	
Mass of Dry Sample + Tare (g)	mass_dry_sample	decimal	(19, 8)	
Mass of Wet Sample + Tare (g)	mass_wet_sample	decimal	(19, 8)	
Plastic Limit (%)	plastic_limit	decimal	(19, 8)	
Tare Mass (g)	tare_mass	decimal	(19, 8)	
Mass of Water (g)	water_mass	decimal	(19, 8)	

Table Name: VALUE_DB106E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Plastic Index	plasticity_index	int		
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Bar Linear Shrinkage (DB-107-E)

Table Name: VALUE_DB107E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Calculate Plasticity Index	calculate_plasticity_index	bit		{Yes, No}
Final Length	final_length	decimal	(19, 8)	
Initial Length	initial_length	decimal	(19, 8)	
Linear Shrinkage	linear_shrinkage	decimal	(19, 8)	
Maximum By Specification	maximum_by_specification	decimal	(19, 8)	
Minimum By Specification	minimum_by_specification	decimal	(19, 8)	
Plasticity Index	plasticity_index	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Unit	unit	nvarchar	100	

Particle Size Analysis (DB-110-E)

Table Name: VALUE_DB110E_SIEVE **Maximum Rows: 6**

Field Description	Field Name	Datatype	Length	Values
Cumulative Percent Retained	cumulative_pct_retained	decimal	(19, 8)	
Cumulative Weight Retained	cumulative_weight_retained	decimal	(19, 8)	
Lower Spec Limit	lower_spec_limit	decimal	(19, 8)	
Master Grading	master_grading	nvarchar	100	
Sieve Size	sieve_size	nvarchar	100	CVL
Upper Spec Limit	upper_spec_limit	decimal	(19, 8)	
Weight Retained	weight_retained	decimal	(19, 8)	

Table Name: VALUE_DB110E_TEST **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Cumulative Method	individual_cumulative	nvarchar	100	{Cumulative, Individual}
Negative No.40	negative_no_40	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Total	total	nvarchar	100	

Moisture-Density Work Sheet (DB-113-E)

Table Name: VALUE_DB113E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Dry Density Scale Max	dry_density_scale_max	decimal	(19, 8)	
Dry Density Scale Min	dry_density_scale_min	decimal	(19, 8)	
Dry Density Scale unit	dry_density_scale_unit	decimal	(19, 8)	
Hygroscopic Moisture	hygroscopic_moisture	decimal	(19, 8)	
Max Density(kg)	max_density_kg	decimal	(19, 8)	
Max Density (pcf)	max_density_pcf	decimal	(19, 8)	
Moisture scale max	moisture_scale_max	decimal	(19, 8)	
Moisture scale min	moisture_scale_min	decimal	(19, 8)	
Moisture scale unit	moisture_scale_unit	decimal	(19, 8)	
Optimum Moisture	optimum_moisture	decimal	(19, 8)	
Oven Dry Weight	oven_dry_weight	decimal	(19, 8)	
Soil Description	soil_desc	nvarchar	100	
Specific Gravity (Apparent)	specific_gravity	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Weight of Aggr., Pycn. & Water	weight_of_aggr	decimal	(19, 8)	
Weight of Pycnometer & Water	weight_of_pycnometer	decimal	(19, 8)	

Table Name: VALUE_DB113E_SPECIMEN **Maximum Rows: 4**

Field Description	Field Name	Datatype	Length	Values
Dry Density	dry_density	decimal	(19, 8)	
Dry Mass Material	dry_mass_material	decimal	(19, 8)	
Dry Mass Pan & Specimen	dry_mass_pan_specimen	decimal	(19, 8)	
Estimated Dry Density	est_dry_density	decimal	(19, 8)	
Height of Specimen	height_specimen	decimal	(19, 8)	
Mass Material	mass_material	decimal	(19, 8)	

Moisture-Density Relationship of Subgrade and Embankment Soils (DB-114-E)

Table Name: VALUE_DB114E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Dry Density Scale Max	dry_density_scale_max	decimal	(19, 8)	
Dry Density Scale Min	dry_density_scale_min	decimal	(19, 8)	
Dry Density Scale unit	dry_density_scale_unit	decimal	(19, 8)	
Hygroscopic Moisture	hygroscopic_moisture	decimal	(19, 8)	
Max Density (kg)	max_density_kg	decimal	(19, 8)	
Max Density (pcf)	max_density_pcf	decimal	(19, 8)	
Moisture scale max	moisture_scale_max	decimal	(19, 8)	
Moisture scale min	moisture_scale_min	decimal	(19, 8)	
Moisture scale unit	moisture_scale_unit	decimal	(19, 8)	
Optimum Moisture	optimum_moisture	decimal	(19, 8)	
Oven Dry Weight	oven_dry_weight	decimal	(19, 8)	
Soil Descript	soil_description	nvarchar	100	
Specific Gravity	specific_gravity	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Weight of Aggr., Pycn. & Water	weight_of_aggr	decimal	(19, 8)	
Weight of Pycnometer & Water	weight_of_pycnometer	decimal	(19, 8)	

Table Name: VALUE_DB114E_SPECIMEN **Maximum Rows: 4**

Field Description	Field Name	Datatype	Length	Values
Dry Density	dry_density	decimal	(19, 8)	
Dry Mass Material	dry_mass_material	decimal	(19, 8)	
Dry Mass Pan & Specimen	dry_mass_pan_specimen	decimal	(19, 8)	
Estimated Dry Density	est_dry_density	decimal	(19, 8)	
Height of Specimen	height_specimen	decimal	(19, 8)	
Mass Material	mass_material	decimal	(19, 8)	
Mass Water	mass_water	decimal	(19, 8)	
Mass Water Added	mass_water_added	decimal	(19, 8)	
Percent Water Content	pct_water_content	decimal	(19, 8)	
Percent Water Total	pct_water_total	decimal	(19, 8)	
Tare Mass Mold	tare_mass_mold	decimal	(19, 8)	
Tare Mass Pan	tare_mass_pan	decimal	(19, 8)	
Volume Per Linear mm	volume_per_linear	decimal	(19, 8)	
Volume of Specimen	volume_specimen	decimal	(19, 8)	
Wet Density of Specimen	wet_density_specimen	decimal	(19, 8)	
Wet Mass of Pan & Specimen	wet_mass_pan_specimen	decimal	(19, 8)	
Wet Mass Specimen	wet_mass_specimen	decimal	(19, 8)	
Wet Mass Specimen & Mold	wet_mass_specimen_mold	decimal	(19, 8)	

Nuclear Density and Moisture Determination (DB-115-1)

Table Name: VALUE_DB115_1 **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Density Count	density_count	int		
Density, %	density_pct	decimal	(19, 8)	
Pass/Fail	density_pct_pass_fail	nvarchar	100	
Max Density Specification Requirement	density_specification_req_max	decimal	(19, 8)	
Low Density Specification Req	density_specification_req_min	decimal	(19, 8)	
density_standard	density_standard	int		
Determined By Test Method	determined_by_test_method	nvarchar	100	{DB-113-E, DB-114-E}
Dry Density, pcf	dry_density_pcf	decimal	(19, 8)	
Gauge No.	gauge_no	nvarchar	100	
Maximum Dry Density	max_dry_density_pcf	decimal	(19, 8)	
Moisture Content, %	moisture_content_pct	decimal	(19, 8)	
Moisture Content Pct Pass or Fail	moisture_content_pct_pass_fail	nvarchar	100	{Pass, Fail}
Moisture Count	moisture_count	int		
Max Moisture Specification Requirement	moisture_specification_req_max	decimal	(19, 8)	
Low Moisture Specification Req	moisture_specification_req_min	decimal	(19, 8)	
Moisture Standard	moisture_standard	int		
Optimum Moisture Content	optimum_moisture_content_pct	decimal	(19, 8)	
Probe Depth	probe_depth	decimal	(19, 8)	
Soil Description	soil_desc	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Wet Density , pcf	wet_density_pcf	decimal	(19, 8)	

Soil /Aggregate Field Unit Weight Tests (DB-115-2)

Table Name: VALUE_DB115_2 **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Compaction, %	compaction_pct	decimal	(19, 8)	
Compaction Required	compaction_req_pct	decimal	(19, 8)	
Dry unit weight	dry_unit_weight	decimal	(19, 8)	
Dry Weight Total Moisture Sample	dry_weight_total_moisture	decimal	(19, 8)	
Final Weight Apparatus & Sand	final_weight_apparatus	decimal	(19, 8)	
Final Weight of Sand	final_weight_sand	decimal	(19, 8)	
Initial Weight Apparatus & Sand	initial_weight_apparatus	decimal	(19, 8)	
Initial Weight of Sand	initial_weight_sand	decimal	(19, 8)	
Maximum dry unit weight	max_dry_unit_weight	decimal	(19, 8)	
Moisture Required	moisture_req_pct	decimal	(19, 8)	
Optium Moisture (% if of dry unit weight)	optimum_moisture	decimal	(19, 8)	
Pass/Fail % Density	pass_fail_pct_density	nvarchar	100	
Pass/Fail % Moisture	pass_fail_pct_moisture	nvarchar	100	
% Moisture	pct_moisture	decimal	(19, 8)	
Sand bulk unit weight	sand_bulk_unit_weight	decimal	(19, 8)	
Soil Descript	soil_desc	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Total Volume-Sand Userd	total_volume	decimal	(19, 8)	
Volume of Hole	volume_hole	decimal	(19, 8)	
Volume of Surface	volume_surface	decimal	(19, 8)	
Weight of Material From Hole	weight_material_hole	decimal	(19, 8)	
Wet Unit Weight	wet_unit_weight	decimal	(19, 8)	
Wet Weight Total Moisture Sample	wet_weight_total_moisture	decimal	(19, 8)	

Test Resistance to Degradation By Wet Ball Mill Method (DB-116-E)

Table Name: VALUE_DB116E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Cumulative Method	cumulative_method	nvarchar	50	{Cumulative, Individual}
Total of 3000g weight retained	individual_weight_retained_3000g_total	decimal	(19, 8)	
Total of 3500g weight retained	individual_weight_retained_3500g_total	decimal	(19, 8)	
Percent Soil Binder	pct_soil_binder	decimal	(19, 8)	
Percent Soil Binder Increase	pct_soil_binder_increase	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Wet Ball Mill -No.40 Individual Percent Retained	wbm_individual_pct_retained_minusno40	decimal	(19, 8)	
Wet Ball Mill No.40 Individual Percent Retained	wbm_individual_pct_retained_no40	decimal	(19, 8)	
Wet Ball Mill Initial Weight	wbm_initial_weight	decimal	(19, 8)	
Wet Ball Mill Value	wbm_value	decimal	(19, 8)	
Wet Ball Mill -No.40 Weight Retained	wbm_weight_retained_minusno40	decimal	(19, 8)	
Wet Ball Mill No.40 Weight Retained	wbm_weight_retained_no40	decimal	(19, 8)	
Total of weight retained	weight_retained_total	decimal	(19, 8)	
Washed Sieve Analysis No.40 Individual Percent Retained	wsa_individual_pct_retained_no40	decimal	(19, 8)	
Washed Sieve Analysis -No.40 Individual Percent Retained	wsa_inidividual_pct_retained_minusno40	decimal	(19, 8)	
Washed Sieve Analysis Initial Weight	wsa_initial_weight	decimal	(19, 8)	
Washed Sieve Analysis -No.40 Weight Retained	wsa_weight_retained_minusno40	decimal	(19, 8)	
Washed Sieve Analysis No.40 Weight Retained	wsa_weight_retained_no40	decimal	(19, 8)	

Table Name: VALUE_DB116E_SIEVE **Maximum Rows: 7**

Field Description	Field Name	Datatype	Length	Values
Cumulative Percent Retained	cumulative_pct_retained	decimal	(19, 8)	
3000g Cumulative Weight Retained	cumulative_weight_retained_3000g	decimal	(19, 8)	
3500g Cumulative Weight Retained	cumulative_weight_retained_3500g	decimal	(19, 8)	
Individual Percent Retained	individual_pct_retained	decimal	(19, 8)	
3000g Individual Weight Retained	individual_weight_retained_3000g	decimal	(19, 8)	
3500g Individual Weight Retained	individual_weight_retained_3500g	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	
Weight Retained	weight_retained	decimal	(19, 8)	

Triaxial Compression Tests (DB-117-E)

Table Name: VALUE_DB117E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Average Corrected Strength, 00 psi	average_corrected_strength_0psi	decimal	(19, 8)	
Average Corrected Strength, 15 psi	average_corrected_strength_15psi	decimal	(19, 8)	
Classification	classification	nvarchar	100	
Cohesion, psi	cohesion_psi	decimal	(19, 8)	
Correlation Factor	correlation_factor	decimal	(19, 8)	
Grade, 00 psi	grade_0psi	nvarchar	100	
Grade, 15 psi	grade_15psi	nvarchar	100	
Internal Angle of Friction	internal_angle_friction	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Table Name: VALUE_DB117E_SPECIMEN **Maximum Rows: 8**

Field Description	Field Name	Datatype	Length	Values
Area, in.^2	area	decimal	(19, 8)	
Avg. Cross Sectional Area, in^2	avg_cross_sectional_area	decimal	(19, 8)	
Average Diameter, in.	avg_diameter	decimal	(19, 8)	
Corrected Stress, psi.	corrected_stress_psi	decimal	(19, 8)	
Dry Density of Specimen, pcf	dry_density_specimen_pcf	decimal	(19, 8)	
Final Weight of Stones	final_weight_stones	decimal	(19, 8)	
Height of Stone 1, in.	height_stone1	decimal	(19, 8)	
Height of Stone 2, in.	height_stone2	decimal	(19, 8)	
I-Strain, in./in.	i_strain	decimal	(19, 8)	
Initial Height of Specimen, in.	initial_height	decimal	(19, 8)	
Lateral Pressure, psi.	lateral_pressure_psi	decimal	(19, 8)	
New Height of Specimen, in.	new_height	decimal	(19, 8)	
Moisture of Specimen, %	pct_moisture_specimen	decimal	(19, 8)	
% Strain , in./in.	pct_strain	decimal	(19, 8)	
Uncorrected Stress, psi.	uncorrected_stress_psi	decimal	(19, 8)	
Weight of Specimen	weight_specimen	decimal	(19, 8)	
Weight of Stones and Specimen	weight_stones_specimen	decimal	(19, 8)	

Determining Soil pH (DB-128-E)

Table Name: VALUE_DB128E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Soil pH	soil_ph	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Measuring Resistivity of Soil Materials (DB-129-E)

Table Name: VALUE_DB129E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Resistance using resistivity meter	resistance_using_meter	decimal	(19, 8)	
Resistivity	resistivity_result	decimal	(19, 8)	
A= Area of one electrode	sbf_area	decimal	(19, 8)	
Distance between electrodes	sbf_distance	decimal	(19, 8)	
Soil Box Factor	sbf_factor	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Measuring Thickness of Pavement Layer (DB-140-E)

Table Name: VALUE_DB140E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Average Depth:	avg_depth	decimal	(19, 8)	
Depth 1:	depth_1	decimal	(19, 8)	
Depth 2:	depth_2	decimal	(19, 8)	
Depth 3:	depth_3	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

OVF HMAC Test Data: DB-200-F, DB-207-FPR, DB-227-F, DB-236-F, DB-207-F (DB-200/07/36)

Table Name: VALUE_DB207F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Specific Gravity of Asphalt Binder	specific_gravity	decimal	(19, 3)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Voids in Mineral Aggregate (VMA)	vma	decimal	(19, 1)	

Table Name: VALUE_DB207FPR **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Average Actual Specific Gravity (Ga):	GA	nvarchar	100	
Lab Molded Density, %:	LMD	decimal	(19, 8)	
Stamp Code	stamp_code	nvarchar	100	CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB227F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Rice Specific Gravity (Gr):	rice_specific_gravity	decimal	(19, 8)	
Stamp Code	stamp_code	nvarchar	100	CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB229F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Stamp Code	stamp_code	nvarchar	100	CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB229F_SIEVE **Maximum Rows: 10**

Field Description	Field Name	Datatype	Length	Values
Current JMF	Current_JMF	nvarchar	100	
Design JMF	Design_JMF	nvarchar	100	
Adjusted Individual % Retained	pct	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	CVL

Table Name: VALUE_DB236F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Asphalt Content, %:	AC	decimal	(19, 8)	
Stamp Code	stamp_code	nvarchar	100	CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Sieve Analysis of Non-Surface Treatment Aggregates (DB-200-F)

Table Name: VALUE_DB200F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Cumulative Weight Retained Minusno14	cumulative_weight_retained_minusno14	decimal	(19, 8)	
Dry Weight After Washing	dry_weight_after_washing	decimal	(19, 8)	
Limit As Percent	limit_as_percent	nvarchar	100	{Passing, Retained}
Original Dry Weight	original_dry_weight	decimal	(19, 8)	
Sieve Analysis Result 1	sieve_analysis_result1	nvarchar	100	
Sieve Analysis Result 2	sieve_analysis_result2	decimal	(19, 8)	
Sieve Analysis Result 3	sieve_analysis_result3	decimal	(19, 8)	
Sieve Analysis Result 4	sieve_analysis_result4	decimal	(19, 8)	
Sieving Loss	sieving_loss	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Total Weight	total_weight	decimal	(19, 8)	
Washing Loss	washing_loss	decimal	(19, 8)	

Table Name: VALUE_DB200F_SIEVE **Maximum Rows: 12**

Field Description	Field Name	Datatype	Length	Values
Cumulative Percent Passing	cumulative_pct_passing	decimal	(19, 8)	
Cumulative Percent Retained	cumulative_pct_retained	decimal	(19, 8)	
Cumulative Weight Retained	cumulative_weight_retained	decimal	(19, 8)	
Individual Weight Retained	individual_weight_retained	decimal	(19, 8)	
Lower Limit Grading	lower_limit_grading	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	{2", 1-3/4", 1-1/2", 1-1/4", 1", 7/8", 3/4", 5/8", 1/2", 7/16", 3/8", 5/16", 1/4", No. 4, No. 6, No. 8, No. 10, No. 14, No. 16, No. 20, No. 30, No. 40, No. 50, No. 80, No. 100, No. 200 }
Upper Limit Grading	upper_limit_grading	decimal	(19, 8)	
Within Grading Limits	within_grading_limits	bit		

Sand Equivalent (DB-203-F)

Table Name: VALUE_DB203F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Average Sand Equivalent	average_sand_equivalent	decimal	(19, 8)	
Clay No.1 Reading	clay1_reading	decimal	(19, 8)	
Clay No.2 Reading	clay2_reading	decimal	(19, 8)	
Sand No.1 Calculated	sand1_calculated	decimal	(19, 8)	
Sand No.1 Reading	sand1_reading	decimal	(19, 8)	
Sand No.1 Reported	sand1_reported	decimal	(19, 8)	
Sand No.2 Calculated	sand2_calculated	decimal	(19, 8)	
Sand No.2 Reading	sand2_reading	decimal	(19, 8)	
Sand No.2 Reported	sand2_reported	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

QC/QA Test Data (DB-207-FPL)

Table Name: VALUE_DB207FPL **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
In Place Air Void, %	air_void	decimal	(19, 8)	
Stamp Code	stamp_code	nvarchar	100	CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Deleterious Material & Decantation For Coarse Aggr (DB-217-F)

Table Name: VALUE_DB217F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Original Weight Retained	part1_orig_weight_retained	decimal	(19, 8)	
Percent Deterious Material	part1_pct_deleterious_material	decimal	(19, 8)	
Sieve Size	part1_sieve_size	nvarchar	100	
Weight Deleterious Material	part1_weight_deleterious_material	decimal	(19, 8)	
Dry Weight after Washing	part2_dry_weight_after_washing	decimal	(19, 8)	
Percent Loss By Decantation	part2_loss_by_decantation	decimal	(19, 8)	
Original Weight Retained	part2_orig_weight_retained	decimal	(19, 8)	
Sieve Size	part2_sieve_size	nvarchar	53	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Sieve Analysis for Fine & Coarse Aggregate (DB-401-A)

Table Name: VALUE_DB401A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Equivalent Exceed 85	equivalent_exceed_85	bit		
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Total	total	decimal	(19, 8)	

Table Name: VALUE_DB401A_SIEVE **Maximum Rows: 8**

Field Description	Field Name	Datatype	Length	Values
Cumulative Percent Passing	cumulative_pct_passing	decimal	(19, 8)	
Cumulative Percent Retained	cumulative_pct_retained	decimal	(19, 8)	
Cumulative Weight Retained	cumulative_weight_retained	decimal	(19, 8)	
Individual Weight Retained	individual_weight_retained	decimal	(19, 8)	
Lower Spec Limit	lower_retained_spec_limit	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	
Upper Spec Limit	upper_retained_spec_limit	decimal	(19, 8)	
Within Master Grading	within_master_grading	varchar	20	

Table Name: VALUE_DB402A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Fineness Modulus	fineness_modulus	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Decantation Test For Concrete Aggregates (DB-406-A)

Table Name: VALUE_DB406A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Dry Mass After Washing	dry_mass_after_washing	decimal	(19, 8)	
Mass of Pycnometer Containing Sample and Water To Fill After Washing	mass_of_pycnometer_after_washing	decimal	(19, 8)	
Mass of Pycnometer Containing Sample and Water To Fill Before Washing	mass_of_pycnometer_before_washing	decimal	(19, 8)	
Mass of Pycnometer Filled With Water at Approx. Same Temperature as above	mass_of_pycnometer_with_water	decimal	(19, 8)	
Original Dry Mass of Sample	original_dry_mass	decimal	(19, 8)	
% Loss	percent_loss_part1	decimal	(19, 8)	
Percent Loss	percent_loss_part2	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Test By:	test_by	nvarchar	100	{Part I - Lab Method, Part II - Field Method}
Tested By	tested_by	nvarchar	100	CVL
Tested By - Part II	tested_by_part2	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Tested Date - Part II	tested_date_part2	datetime		MM/dd/yyyy

Organic Impurities in Fine Aggregate for Concrete (DB-408-A)

Table Name: VALUE_DB408A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Color of the Supernatant Liquid	color_of_supernatant_liquid	nvarchar	100	{LIGHTER THAN STANDARD, EQUAL TO STANDARD, DARKER THAN STANDARD}
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Deleterious Material (DB-413-A)

Table Name: VALUE_DB413A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Clay	clay_value1	decimal	(19, 8)	
Clay Percentage	clay_value2	decimal	(19, 8)	
Friable	friable_value1	decimal	(19, 8)	
Friable Percentage	friable_value2	decimal	(19, 8)	
Laminated	laminated_value1	decimal	(19, 8)	
Laminated Percentage	laminated_value2	decimal	(19, 8)	
Other	other_value1	decimal	(19, 8)	
Othesr Percentage	other_value2	decimal	(19, 8)	
Deleterious Material Retained	percent_deleterious_material_retained	decimal	(19, 8)	
Shale	shale_value1	decimal	(19, 8)	
Shale Percentage	shale_value2	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Total	total	decimal	(19, 8)	
Total Weight Sample	total_weight_sample	decimal	(19, 8)	

Field Form Concrete Sample - Cylinders (DB-418-A)

Table Name: VALUE_DB418A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Actual Water	actual_water	nvarchar	100	
Agg. Correction Factor	agg_correction_factor	nvarchar	100	CVL
Agg. Size	agg_size	nvarchar	100	CVL
Air Temperature	air_temperature	nvarchar	100	
Batch Size	batch_size	nvarchar	100	
Batch Time	batch_time	nvarchar	100	
Class of Concrete	class_of_concrete	nvarchar	100	CVL
Concrete Temperature	concrete_temperature	nvarchar	100	
Corrected Air Content	corrected_air_content	decimal	(19, 8)	
Design Water	design_water	nvarchar	100	
Mix ID	mix_id	nvarchar	100	
Placement Air	placement_air	decimal	(19, 8)	
Placement Slump	placement_slump	decimal	(19, 8)	CVL
Pump Air Loss	pump_air_loss	decimal	(19, 8)	
Pump Slump Loss	pump_slump_loss	decimal	(19, 8)	
Req. Strength	req_strength	nvarchar	100	
Sample Time	sample_time	nvarchar	100	
Average 7 Day Compressive Strength	seven_day_average	decimal	(19, 8)	
Slump	slump	decimal	(19, 8)	
Specimen Size	specimen_size	nvarchar	100	{4x8, 6x12}
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Ticket #	ticket_number	nvarchar	100	
Total Water	total_water	nvarchar	100	
Truck #	truck_number	nvarchar	100	
Average 28 Day Compressive Strength	twenty_eight_day_average	decimal	(19, 8)	
Unit Wt.	unit_weight	nvarchar	100	
Water Added	water_added	nvarchar	100	

Table Name: VALUE_DB418A_AVERAGE **Maximum Rows: 3**

Field Description	Field Name	Datatype	Length	Values
Average Age	average_age	nvarchar	100	
Average Strength	average_strength	decimal	(19, 8)	

Table Name: VALUE_DB418A_SPECIMEN **Maximum Rows: 7**

Field Description	Field Name	Datatype	Length	Values
Age(days)	age	nvarchar	100	CVL
Area	area	decimal	(19, 8)	
Load(lbs)	load_lbs	decimal	(19, 8)	
Pass/Fail	pass_fail	nvarchar	5	
Specimen	specimen	nvarchar	100	
Strength	strength	decimal	(19, 8)	
Test Date	test_date	smalldatetime		MM/dd/yyyy
Tested By	tested_by	nvarchar	100	CVL
Type Fracture	type_fracture	varchar	50	{A, B, C, D, E}

Determining Pavement Thickness By Direct Measurement (DB-423-A)

Table Name: VALUE_DB423A **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Measure Unit	measure_unit	nvarchar	100	{Inches, Millimeters}
Pavement Depth	pavement_depth	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB423A_LOCATION **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Average	average	decimal	(19, 8)	
Measurement 1	measurement_1	decimal	(19, 8)	
Measurement 2	measurement_2	decimal	(19, 8)	
Measurement 3	measurement_3	decimal	(19, 8)	
Measurement Identification / Location	measurement_id_location	nvarchar	100	

Direct Measurement of Bridge Deck Thickness (DB-423-A, Part II)

Table Name: VALUE_DB423B				Maximum Rows: 1
Field Description	Field Name	Datatype	Length	Values
Stamp Code	stamp_code	nvarchar	100	CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB423B_BAY				Maximum Rows: 18
Field Description	Field Name	Datatype	Length	Values
Concrete Depth	concrete_depth	decimal	(19,4)	
Steel Depth	steel_depth	decimal	(19,4)	

Soil-Cement, Soil-Lime Testing (DB-120-E) ** INACTIVE **

Table Name: VALUE_DB120E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Avg. Corrected Stress, psi:	avg_corrected_stress_psi	decimal	(19, 8)	
Percent Cement, (%)	percent_cement	decimal	(19, 8)	
Performed By DB-120-E:	performed_by	nvarchar	200	
Stamp Code	stamp_code	int		CVL
Target Percent Cement, %:	target_percent_cement	decimal	(19, 8)	
Target Stress, psi:	target_stress_psi	decimal	(19, 8)	
Tested By	tested_by	nvarchar	200	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Table Name: VALUE_DB120E_SPECIMEN **Maximum Rows: 3**

Field Description	Field Name	Datatype	Length	Values
Area, in.^2:	area	decimal	(19, 8)	
Avg. Corrected Stress, psi:	avg_corrected_stress	decimal	(19, 8)	
Avg. Cross Sectional Area, in^2:	avg_cross_section_area	decimal	(19, 8)	
Average Diameter, in.:	avg_diameter	decimal	(19, 8)	
Circumference, in.:	circumference	decimal	(19, 8)	
Corrected Stress, psi.:	corrected_stress	decimal	(19, 8)	
Dead Load, lbs.:	dead_load	decimal	(19, 8)	
Deformation at Max Load, in.	deformation_at_max_load	decimal	(19, 8)	
Height of Stone 1, in.	height_stone1	decimal	(19, 8)	
Height of Stone 2, in.	height_stone2	decimal	(19, 8)	
I-Strain, in./in.:	i_strain	decimal	(19, 8)	
Initial Height of Specimen, in.:	initial_height_specimen	decimal	(19, 8)	
Lateral Pressure, psi.:	lateral_pressure	decimal	(19, 8)	
Max. Load Reading, div.	max_load_reading	decimal	(19, 8)	
New Height of Specimen, in.:	new_height_specimen	decimal	(19, 8)	
% Strain , in./in.:	pct_strain	decimal	(19, 8)	
Percent Cement, (%)	percent_cement	decimal	(19, 8)	
Ring Factor, lbs./div	ring_factor	decimal	(19, 8)	
Specimen Number:	specimen_no	int		
Uncorr'd Stress, psi.:	uncorrected_stress	decimal	(19, 8)	

Table Name: VALUE_DB121E

Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Average Corrected Strength, 00 psi	average_corrected_strength_0psi	decimal	(19, 8)	
Average Corrected Strength, 15 psi	average_corrected_strength_15psi	decimal	(19, 8)	
Classification	classification	nvarchar	100	
Cohesion, psi	cohesion_psi	decimal	(19, 8)	
Correlation Factor	correlation_factor	decimal	(19, 8)	
Grade, 00 psi	grade_0psi	nvarchar	100	
Grade, 15 psi	grade_15psi	nvarchar	100	
Internal Angle of Friction	internal_angle_friction	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy

Table Name: VALUE_DB121E_SPECIMEN

Maximum Rows: 8

Field Description	Field Name	Datatype	Length	Values
Area, in.^2	area	decimal	(19, 8)	
Avg. Cross Sectional Area, in^2	avg_cross_sectional_area	decimal	(19, 8)	
Average Diameter, in.	avg_diameter	decimal	(19, 8)	
Corrected Stress, psi.	corrected_stress_psi	decimal	(19, 8)	
Dry Density of Specimen, pcf	dry_density_specimen_pcf	decimal	(19, 8)	
Final Weight of Stones	final_weight_stones	decimal	(19, 8)	
Height of Stone 1, in.	height_stone1	decimal	(19, 8)	
Height of Stone 2, in.	height_stone2	decimal	(19, 8)	
I-Strain, in./in.	i_strain	decimal	(19, 8)	
Initial Height of Specimen, in.	initial_height	decimal	(19, 8)	
Lateral Pressure, psi.	lateral_pressure_psi	decimal	(19, 8)	
New Height of Specimen, in.	new_height	decimal	(19, 8)	
Moisture of Specimen, %	pct_moisture_specimen	decimal	(19, 8)	
% Strain , in./in.	pct_strain	decimal	(19, 8)	
Uncorrected Stress, psi.	uncorrected_stress_psi	decimal	(19, 8)	
Weight of Specimen	weight_specimen	decimal	(19, 8)	
Weight of Stones and Specimen	weight_stones_specimen	decimal	(19, 8)	

Density of Asphalt Stabilized Base (DB-126-E) ** INACTIVE **

Table Name: VALUE_DB126E **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Percent Asphalt in Mix(max)	asphalt_pct_max	decimal	(19, 8)	
Percent Asphalt in Mix(min)	asphalt_pct_min	decimal	(19, 8)	
Broken Method	broken_method	nvarchar	20	{Fast Break, Slow Break}
Date Broken(max)(max)	date_broken_max	smalldatetime		MM/dd/yyyy
Date Broken(min)	date_broken_min	smalldatetime		MM/dd/yyyy
Density of Specimen(max)	density_of_specimen_max	decimal	(19, 8)	
Density of Specimen(min)	density_of_specimen_min	decimal	(19, 8)	
Gauge Reading(max)	gague_reading_psi_max	decimal	(19, 8)	
Gauge Reading (min)	gague_reading_psi_min	decimal	(19, 8)	
Height of Specimen(max)	height_max	decimal	(19, 8)	
Height of Specimen(min)	height_min	decimal	(19, 8)	
Measured Weight(max)	measured_weight_max	decimal	(19, 8)	
Measured Weight(min)	measured_weight_min	decimal	(19, 8)	
Minimum Allowable Density	min_allowable_density	decimal	(19, 8)	
Minimum Percent Density	min_pct_density	decimal	(19, 8)	
Minimum Specimen Unconfined Compressive Strength	min_specimen_UCS	decimal	(19, 8)	
Mold Number(max)	mold_number_max	nvarchar	100	
Mold Number(min)	mold_number_min	nvarchar	100	
Date Molded(max)	molded_date_max	smalldatetime		MM/dd/yyyy
Date Molded(min)	molded_date_min	smalldatetime		MM/dd/yyyy
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Unconfined Compressive Strength (max)	UCS_max	nvarchar	100	
Unconfined Compressive Strength (min)	UCS_min	nvarchar	100	
Volume of Mold(max)	volume_of_mold_max	decimal	(19, 8)	
Volume of Mold(min)	volume_of_mold_min	decimal	(19, 8)	
Volume of Specimen(max)	volume_of_specimen_max	decimal	(19, 8)	
Volume of Specimen(min)	volume_of_specimen_min	decimal	(19, 8)	
Weight of Filters(max)	weight_of_filters_max	decimal	(19, 8)	
Weight of Filters(min)	weight_of_filters_min	decimal	(19, 8)	
Weight of Material(max)	weight_of_mat_max	decimal	(19, 8)	
Weight of Material(min)	weight_of_mat_min	decimal	(19, 8)	
Weight of Plates(max)	weight_of_plates_max	decimal	(19, 8)	
Weight of Plates(min)	weight_of_plates_min	decimal	(19, 8)	
Weight of Specimen(max)	weight_of_specimen_max	decimal	(19, 8)	
Weight of Specimen(min)	weight_of_specimen_min	decimal	(19, 8)	

Table Name: VALUE_DB200ST **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Sphalt	asphalt_pct	decimal	(19, 8)	
Dry Weight After Washing	dry_weight_after_washing	decimal	(19, 8)	
Moisture	moisture_pct	decimal	(19, 8)	
Original Dry Weight	orig_dry_weight	decimal	(19, 8)	
Total	pan_weight	decimal	(19, 8)	
Percent Difference	percent_difference	decimal	(19, 8)	
Sieving Loss	sieving_loss	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Total Weight	total_weight	decimal	(19, 8)	
Type	type	nvarchar	100	{A, B, C, D, E, L, PA, PB, PC, PD, PE, PL}
Washing Loss	washing_loss	decimal	(19, 8)	
Weight Difference	weight_difference	decimal	(19, 8)	
PrePan	weight_retained	decimal	(19, 8)	

Table Name: VALUE_DB200ST_SIEVE **Maximum Rows: 8**

Field Description	Field Name	Datatype	Length	Values
Cumulative Percent Passing	cumulative_percent_passing	decimal	(19, 8)	
Lower Retained Limit	lower_retained_limit	decimal	(19, 8)	
Cumulative Percent Retained	percent_retained_cumulative	decimal	(19, 8)	
Individual Percent Retained	percent_retained_individual	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	
Upper Retained Limit	upper_retained_limit	decimal	(19, 8)	
Cumulative Weight Retained	weight_retained_cumulative	decimal	(19, 8)	
Individual weight Retained	weight_retained_individual	decimal	(19, 8)	
Within Master Grading	within_master_grading	nvarchar	100	

Determining Flakiness Index (DB-224-F) ** INACTIVE **

Table Name: VALUE_DB224F **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Flakiness Index	flakiness_index	decimal	(19, 8)	
Number of Particles	num_particles_1	decimal	(19, 8)	
Number of Particles	num_particles_2	decimal	(19, 8)	
Number of Particles	num_particles_3	decimal	(19, 8)	
Number of Particles Passing for 1/4" slot	slot_1_4	decimal	(19, 8)	
Number of Particles Passing for 3/8" slot	slot_3_8	decimal	(19, 8)	
Number of Particles Passing for 5/32" slot	slot_5_32	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Total Particles	total_particles	decimal	(19, 8)	
Total Passing Particles	total_passing_particles	decimal	(19, 8)	

Table Name: VALUE_DB235F

Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Average Percent of Draindown for Two Samples	avg_pct_draindown	decimal	(19, 8)	
Final Weight Plate	final_weight_plate_1	decimal	(19, 8)	
Final Weight Plate	final_weight_plate_2	decimal	(19, 8)	
Initial Sample Weight	init_sample_weight_1	decimal	(19, 8)	
Initial Sample Weight	init_sample_weight_2	decimal	(19, 8)	
Initial Weight Plate	init_weight_plate_1	decimal	(19, 8)	
Initial Weight Plate	init_weight_plate_2	decimal	(19, 8)	
Percent Of Draindown	pct_draindown_1	decimal	(19, 8)	
Percent Of Draindown	pct_draindown_2	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB410A

Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Final Weight	final_weight	decimal	(19, 8)	
Initial Weight	initial_weight	decimal	(19, 8)	
La Abrasion Type	la_abrasion_type	nvarchar	100	CVL
La Abrasion Value	la_abrasion_value	decimal	(19, 8)	
Loss of Weight	loss_of_weight	decimal	(19, 8)	
Number of Spheres	number_of_spheres	int		
Percent Loss	percent_loss	decimal	(19, 8)	
Sieve	sieve	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Weight of Charge	weight_of_charge	nvarchar	100	

Table Name: VALUE_DB410A_SAMPLE

Maximum Rows: 4

Field Description	Field Name	Datatype	Length	Values
Actual Weight	actual_weight	decimal	(19, 8)	
Passing Sieve	passing_sieve	nvarchar	100	
Projected Weight	projected_weight	nvarchar	100	
Retained Sieve	retained_sieve	nvarchar	100	
Within Range	within_range	bit		

Table Name: VALUE_DB411M **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Normalized Individual Percent Retained Total	ni_pct_retained_total	decimal	(19, 8)	
% Loss Total	pct_loss_total	decimal	(19, 8)	
Soundness Loss	soundness_loss	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Weighted Average % Loss Total	weighted_avg_pct_loss_total	decimal	(19, 8)	

Table Name: VALUE_DB411M_CYCLE **Maximum Rows: 5**

Field Description	Field Name	Datatype	Length	Values
Cycle	cycle	nvarchar	5	
In Oven Date	in_oven_date	smalldatetime		MM/dd/yyyy
In Oven Time In	in_oven_time_in	smalldatetime		MM/dd/yyyy
In Oven Time Out	in_oven_time_out	smalldatetime		MM/dd/yyyy
In Solution Date	in_solution_date	smalldatetime		MM/dd/yyyy
In Solution Time In	in_solution_time_in	smalldatetime		MM/dd/yyyy
In Solution Time Out	in_solution_time_out	smalldatetime		MM/dd/yyyy
Out Oven Date	out_oven_date	smalldatetime		MM/dd/yyyy
Out Oven Time In	out_oven_time_in	smalldatetime		MM/dd/yyyy
Out Oven Time Out	out_oven_time_out	smalldatetime		MM/dd/yyyy
Out Solution Date	out_solution_date	smalldatetime		MM/dd/yyyy
Out Solution Time In	out_solution_time_in	smalldatetime		MM/dd/yyyy
Out Solution Time Out	out_solution_time_out	smalldatetime		MM/dd/yyyy
Remarks	remarks	nvarchar	250	

Table Name: VALUE_DB411M_PARTICLE **Maximum Rows: 8**

Field Description	Field Name	Datatype	Length	Values
Final Weight (g)	final_weight	decimal	(19, 8)	
Initial Weight (g)	initial_weight	decimal	(19, 8)	
Loss of Weight (g)	loss_of_weight	decimal	(19, 8)	
Normalized Individual Percent Retained	ni_pct_retained	decimal	(19, 8)	
% Loss	pct_loss	decimal	(19, 8)	
Particle Size Range Passing	size_range_passing	nvarchar	100	
Particle Size Range Retained	size_range_retained	nvarchar	100	
Weighted Average % Loss	weighted_avg_pct_loss	decimal	(19, 8)	

Testing Of Drilled Cores Of Portland Cement Concrete (DB-424-A, Part III) ** INACTIVE **

Table Name: VALUE_DB424A — **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested By - Part II	tested_by_part2	nvarchar	100	CVL
Tested By - Part III	tested_by_part3	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Tested Date - Part II	tested_date_part2	datetime		MM/dd/yyyy
Tested Date - Part III	tested_date_part3	datetime		MM/dd/yyyy

Table Name: VALUE_DB424A_CORE — **Maximum Rows: 4**

Field Description	Field Name	Datatype	Length	Values
Age (Days)	age	int		
Compressive Strength	compressive_strength1	decimal	(19, 8)	
Compressive Strength	compressive_strength2	decimal	(19, 8)	
Diameter of Core (inches)	core_diameter1	decimal	(19, 8)	
Diameter of Core (inches)	core_diameter2	decimal	(19, 8)	
Length of Core (inches)	core_length1	decimal	(19, 8)	
Length of Core (inches)	core_length2	decimal	(19, 8)	
Core Number	core_number1	nvarchar	100	
Core Number	core_number2	nvarchar	100	
Failure Type	failure_type1	nvarchar	100	
Failure Type	failure_type2	nvarchar	100	
Max Load (Lbs)	max_load1	decimal	(19, 8)	
Max Load (Lbs)	max_load2	decimal	(19, 8)	

Table Name: VALUE_DB436A — **Maximum Rows: 1**

Field Description	Field Name	Datatype	Length	Values
Average Diameter	avg_diameter	decimal	(19, 8)	
Diameter 1	measurement_1	decimal	(19, 8)	
Diameter 2	measurement_2	decimal	(19, 8)	
Diameter 3	measurement_3	decimal	(19, 8)	
Diameter 4	measurement_4	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	varchar	200	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Thickness	thickness	decimal	(19, 8)	
Volume of Cylinder	vol_cylinder	decimal	(19, 8)	

Concrete Sample - Beams (DB-448-A) ** INACTIVE **

Table Name: VALUE_DB448A — Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Actual Water	act_water	decimal	(19, 8)	
Added Gal	added_gal	decimal	(19, 8)	
Agg. Correction Factor	agg_corr_factor	decimal	(19, 8)	CVL
Agg Size	agg_size	nvarchar	100	CVL
Air Temperature	air_temp	decimal	(19, 8)	
Batch Size	batch_size	decimal	(19, 8)	
Batch Time	batch_time	smalldatetime		MM/dd/yyyy
Class of Concrete	class_concrete	nvarchar	100	CVL
Concrete Temperature	concrete_temp	decimal	(19, 8)	
Corrected Air Content	corrected_air_content	decimal	(19, 8)	CVL
Design Water	des_water	decimal	(19, 8)	
Mix ID	mix_id	nvarchar	100	CVL
Qty Load	qty_load	decimal	(19, 8)	
Req. Strength, psi	req_strength	decimal	(19, 8)	
Sample Time	sample_time	smalldatetime		MM/dd/yyyy
Slump	slump	decimal	(19, 8)	CVL
Specimen Dimensions	spec_dimensions	nvarchar	100	CVL
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy
Ticket Number	ticket_num	decimal	(19, 8)	
Total Water	total_water	decimal	(19, 8)	
Truck Number	truck_num	decimal	(19, 8)	
Unit Weight	unit_weight	decimal	(19, 8)	

Table Name: VALUE_DB448A_SPECIMEN — Maximum Rows: 6

Field Description	Field Name	Datatype	Length	Values
Age	age	nvarchar	100	CVL
Avg Depth	avg_depth	decimal	(19, 8)	
Avg. Width	avg_width	decimal	(19, 8)	
Correction Factor	corr_factor	decimal	(19, 8)	
Max Load, lbs	max_load_psi	decimal	(19, 8)	
Mod Rupture	mod_rupture	decimal	(19, 8)	
Pass Fail	pass_fail	nvarchar	100	
Specimen	specimen	nvarchar	100	
Test Date	test_date	smalldatetime		MM/dd/yyyy
Tested By	tested_by	nvarchar	100	CVL

Table Name: VALUE_DB460A — Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Number of Particles w/ one or no FF	number_of_particles_with_one	int		
Number of Particles w/ 2 or more FF	number_of_particles_with_two	int		
Number of Questionable Particles	number_of_questionable_particles	int	-	
Percent Crushed Particles	percent_crushed_particles	decimal	(19, 8)	
Percent Crushed Particles	percent_crushed_particles_result	decimal	(19, 8)	
Sieve Size	sieve_size	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	smalldatetime		MM/dd/yyyy
Total Number of Particles	total_number_of_particles	int		

Table Name: VALUE_DB530C

Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Estimated Percent of Stripping	est_pct_stripping	nvarchar	100	
Stamp Code	stamp_code	int		CVL
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	datetime		MM/dd/yyyy

Table Name: VALUE_DB620J

Maximum Rows: 1

Field Description	Field Name	Datatype	Length	Values
Chloride (CL) (PPM)	chloride_ppm	decimal	(19, 8)	
Crucible + Residue Weight	crucible_residue_weight	decimal	(19, 8)	
Crucible Weight	crucible_weight	decimal	(19, 8)	
Ending	ending	decimal	(19, 8)	
Normality of AgNO3	normality_of_agno3	decimal	(19, 8)	
Residue Weight	residue_weight	decimal	(19, 8)	
Sample Weight	sample_weight_chloride	decimal	(19, 8)	
Sample Weight	sample_weight_sulfate	decimal	(19, 8)	
Stamp Code	stamp_code	int		CVL
Starting	starting	decimal	(19, 8)	
Sulfate (SO4) (PPM)	sulfate_ppm	decimal	(19, 8)	
Tested By	tested_by	nvarchar	100	CVL
Tested Date	tested_date	nvarchar	100	
Total	total	decimal	(19, 8)	

CQAF Sample

File: CQAFSample.xml
File Type: XML (Extensible Markup Language). The de facto standard for transferring data.
File Description: An example of an electronic submission that can be read into I2MS. The example provided was used for a previous project and passed the verification process for that particular project's inputs. This file can be submitted to I2MS via a web service run on I2MS using SOAP (Simple Object Access Protocol), which is a standard programming protocol by which software developers send data between systems.

CQAF Sample


```
<?xml version='1.0' encoding='UTF-8'?>
<form name="DB-115-1" version_no="1.0" key="0020905270501151" date="2009-05-27T00:00:00" display_key="00209052705">
	<owner_name value="CQAF" />
	<security username="CQAFDataXfer" password="as9-3958$h@" />
	<header>
		<column name="sample_id" value="00209052705" />
		<column name="sampled_date" value="5/27/2009 12:00:00 AM" />
		<column name="sample_type" value="Random-Independent" />
		<column name="split_sample_id" />
		<column name="report_type" value="Original" />
		<column name="section" value="5.1" />
		<column name="sampled_by" value="Al Jones" />
		<column name="spec_year" value="2004" />
		<column name="material" value="14" />
		<column name="spec_item" value="247" />
		<column name="supplier" value="Pit" />
		<column name="special_provision" />
		<column name="structure_number" />
		<column name="grade" value="1" />
		<column name="sample_location" />
		<column name="feature" value="Mainlane" />
		<column name="course_lift" value="2" />
		<column name="station" value="342+49" />
		<column name="dist_from_cl" value="5' LT" />
		<column name="misc" />
		<column name="roadway" value="Loop 375" />
		<column name="direction" value="NB" />
	</header>
	<test name="DB-115-1"> <!-- This can be the same value as the form name. -->
		<table name="VALUE_DB115_1">
			<row>
				<column name="determined_by_test_method" value="DB-113-E" />
				<column name="max_dry_density_pcf" value="132.5" />
				<column name="optimum_moisture_content_pct" value="7.7" />
				<column name="density_standard" value="4200" />
				<column name="moisture_standard" value="420" />
				<column name="density_count" value="1045" />
				<column name="moisture_count" value="231" />
				<column name="probe_depth" value="10" />
				<column name="wet_density_pcf" value="140.5" />
				<column name="dry_density_pcf" value="133.5" />
				<column name="moisture_content_pct" value="5.2" />
				<column name="gauge_no" value="3242" />
				<column name="moisture_content_pct_pass_fail" />
				<column name="density_pct" value="100.7" />
				<column name="density_pct_pass_fail" />
```

CQAF Sample


```
                <column name="density_specification_req_max" />
                <column name="moisture_specification_req_max" />
                <column name="soil_desc" />
                <column name="density_specification_req_min" value="100" />
                <column name="moisture_specification_req_min" value="5.2" />
                <column name="tested_by" value="Al Jones" />
                <column name="tested_date" value="5/27/2009 12:00:00 AM" />
                <column name="stamp_code" value="1" />
            </row>
        </table>
    </test>
    <footer>
        <column name="remarks" />
        <column name="reviewed_by" />
        <column name="completed_date" />
        <column name="authorized_by" />
        <column name="authorized_date" />
    </footer>
</form>
```

Web Form Validation

File: WebFormValidation.xsd
File Type: XSD (XML Schema Document). Describes a schema used for an XML document.
File Description: Describes elements, annotations, and documentation used in the aforementioned XML. XSD files are the standard used to describe XML file formats and are often used to assist in developing XML files with added features such as intellisense (which is an added type ahead feature used by developers).

Web Form Validation

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema id="FormValidation" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="form">
    <xs:complexType>
      <xs:sequence>
        <xs:choice minOccurs="1" maxOccurs="1" id="owner">
            <xs:annotation>
                <xs:documentation>
                        The owner of the record must be supplied to upload successfully. The user login provided in the security element
                        must have permission to add a record for the owner as part of the validation process.

                        The record owner can be identified by a variety of properties. In general, when submitting XML from an external source,
                        the owner_name attribute is the preferred method.
                </xs:documentation>
            </xs:annotation>
          <xs:element name="owner_name" minOccurs="1" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                        The name of the owner of this record. For example, "OVF" or "CQAF".
                </xs:documentation>
            </xs:annotation>
            <xs:complexType>
              <xs:attribute name="value" type="xs:string" use="required" />
            </xs:complexType>
          </xs:element>
          <xs:element name="owner_guid" minOccurs="1" maxOccurs="1">
            <xs:complexType>
              <xs:attribute name="value" type="xs:string" use="required" />
            </xs:complexType>
          </xs:element>
          <xs:element name="owner_id" minOccurs="1" maxOccurs="1">
            <xs:complexType>
              <xs:attribute name="value" type="xs:int" use="required" />
            </xs:complexType>
          </xs:element>
        </xs:choice>
        <xs:element name="security" minOccurs="1" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                        User login credentials must be provided to upload a record. Supply a username and password.
                </xs:documentation>
            </xs:annotation>
          <xs:complexType>
```

Web Form Validation

```
            <xs:attribute name="user_guid" type="xs:string" />
            <xs:attribute name="username" type="xs:string" />
            <xs:attribute name="password" type="xs:string" />
        </xs:complexType>
    </xs:element>
    <xs:element name="header" minOccurs="0" maxOccurs="1">
        <xs:annotation>
                <xs:documentation>
                        The collection of header column values common to multiple forms.
                </xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:sequence>
                <xs:element name="column" type="ColumnType" maxOccurs="unbounded" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="test" minOccurs="0" maxOccurs="unbounded">
        <xs:annotation>
                <xs:documentation>
                        Container element for Body Table elements, which contain the
data specific to the form type being uploaded.
                        This element can be used to logically group the body tables by the
test method they represent, but it is not required to do so.
                        All body table elements can be placed under one test element,
and the test name attribute is inconsequential.
                </xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:sequence>
                <xs:element name="table" minOccurs="1" maxOccurs="unbounded">
                    <xs:annotation>
                        <xs:documentation>
                            A collection of rows of form data for a specific table.

                            The number of rows permitted for each table depends on
the form and table name. For testing forms, the number of rows allowed for each table can be
found in the I2MS Test Form Fields report.
                        </xs:documentation>
                    </xs:annotation>
                    <xs:complexType>
                        <xs:sequence>
                            <xs:element name="row" minOccurs="0" maxOccurs="unbounded">
                                <xs:annotation>
                                    <xs:documentation>
                                        A collection of body column values.
                                    </xs:documentation>
                                </xs:annotation>
```

Web Form Validation

```
<xs:complexType>
<xs:sequence>
<xs:element name="column" type="ColumnType" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="name" type="xs:string" use="required">
<xs:annotation>
<xs:documentation>
The name of the body table.

For testing forms, the list of supported table names can be found in the I2MS Test Form Fields report.
</xs:documentation>
</xs:annotation>
</xs:attribute>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="name" type="xs:string" use="required" />
</xs:complexType>
</xs:element>
<xs:element name="footer" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>
The collection of footer column values common to multiple forms.
</xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element name="column" type="ColumnType" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="name" form="unqualified" type="xs:string" use="required" >
<xs:annotation>
<xs:documentation>
The short name of the I2MS form for which data is being submitted. This value determines the data columns that are supported and required
for the header, body, and footer elements.

For testing forms, the list of supported form names can be found in the I2MS Test Form Fields report.
```

Web Form Validation

The form name is the value in parentheses for each subheading under the Body Fields section.

```
                </xs:documentation>
            </xs:annotation>
        </xs:attribute>
        <xs:attribute name="key" form="unqualified" use="required">
            <xs:annotation>
                <xs:documentation>
                    A value representing the test record in I2MS.  This value is
required to be unique for each owner (OVF/CQAF).
                    The same key is used for all revisions of the record.  To add a
new revision, supply the same key with the new form data and a
                    new value for the version_no attribute.
                </xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="100"></xs:maxLength>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="version_no" use="required">
            <xs:annotation>
                <xs:documentation>
                    The version number of this revision within the series of revisions
identified by the key attribute.
                    The revision in the series with the greatest version number will be
considered the latest revision regardless of the order in which revisions were submitted to I2MS.
                    Submitting a record with the same key and version number as
another record in the system is an error.
                </xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:decimal">
                    <xs:totalDigits value="19" />
                    <xs:fractionDigits value="9" />
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="display_key">
            <xs:annotation>
                <xs:documentation>
                    The value displayed to users as the ID value of the record (for
example, Sample ID for testing forms).
                    This value is not required to be unique.
                </xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
```

Web Form Validation

```
                        <xs:maxLength value="100"></xs:maxLength>
                    </xs:restriction>
                </xs:simpleType>
            </xs:attribute>
            <xs:attribute name="version_key">
                <xs:annotation>
                    <xs:documentation>
                        An optional identifier for this revision.  For example, when
submitting XML to I2MS from an external source,
                        this could be the Version ID of the record in the external system.
                    </xs:documentation>
                </xs:annotation>
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                        <xs:maxLength value="100"></xs:maxLength>
                    </xs:restriction>
                </xs:simpleType>
            </xs:attribute>
            <xs:attribute name="action_name" type="xs:string">
                <xs:annotation>
                    <xs:documentation>
                        The name of a custom workflow action to execute when
submitting the form.  The user login submitting the form
                        must have permissions in I2MS for the action and validation rules
must pass before allowing the action.

                        When submitting XML to I2MS from an external source, this
attribute should generally be omitted unless other
                        instructions have been provided.
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="date" type="xs:dateTime">
                <xs:annotation>
                    <xs:documentation>
                        The value displayed to users as the date of the record (for
example, Sampled Date for testing forms).
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
        </xs:complexType>
    </xs:element>

        <xs:complexType name="ColumnType">
        <xs:attribute name="name" type="xs:string" use="required">
                <xs:annotation>
                    <xs:documentation>
                        The name of the column for which a value is being provided.
```

Web Form Validation

```
                    For testing forms, the list of supported data columns can be found
in the I2MS Test Form Fields report.
                    </xs:documentation>
            </xs:annotation>
      </xs:attribute>
    <xs:attribute name="value" type="xs:string" use="optional">
      <xs:annotation>
            <xs:documentation>
                  The value of the column.
            </xs:documentation>
      </xs:annotation>
    </xs:attribute>
      </xs:complexType>

</xs:schema>
```

Form Submission Service

File: FormSubmissionService.wsdl
File Type: WSDL (Web Services Description Language). Describes a web service and its respective protocols in XML format.
File Description: Describes the web service used by I2MS for submitting data electronically for the purposes of Validation (i.e. Verification) and Submission. The I2MS system takes in data electronically via a web service (often via the SOAP protocol), for the purposes of verifying or submitting a test (submitted in XML format).

Form Submission Service


```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/" xmlns:tns="http://tempuri.org/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
targetNamespace="http://tempuri.org/" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified" targetNamespace="http://tempuri.org/">
      <s:element name="SubmitForm">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="xmlForm" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SubmitFormResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="SubmitFormResult" type="s:int" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ValidateForm">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="xmlForm" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ValidateFormResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ValidateFormResult" type="s:string"
/>
          </s:sequence>
        </s:complexType>
      </s:element>
    </s:schema>
  </wsdl:types>
  <wsdl:message name="SubmitFormSoapIn">
    <wsdl:part name="parameters" element="tns:SubmitForm" />
  </wsdl:message>
  <wsdl:message name="SubmitFormSoapOut">
    <wsdl:part name="parameters" element="tns:SubmitFormResponse" />
  </wsdl:message>
```

Form Submission Service

```
<wsdl:message name="ValidateFormSoapIn">
  <wsdl:part name="parameters" element="tns:ValidateForm" />
</wsdl:message>
<wsdl:message name="ValidateFormSoapOut">
  <wsdl:part name="parameters" element="tns:ValidateFormResponse" />
</wsdl:message>
<wsdl:portType name="FormSubmissionServiceSoap">
  <wsdl:operation name="SubmitForm">
    <wsdl:input message="tns:SubmitFormSoapIn" />
    <wsdl:output message="tns:SubmitFormSoapOut" />
  </wsdl:operation>
  <wsdl:operation name="ValidateForm">
    <wsdl:input message="tns:ValidateFormSoapIn" />
    <wsdl:output message="tns:ValidateFormSoapOut" />
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="FormSubmissionServiceSoap"
type="tns:FormSubmissionServiceSoap">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="SubmitForm">
    <soap:operation soapAction="http://tempuri.org/SubmitForm" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
  <wsdl:operation name="ValidateForm">
    <soap:operation soapAction="http://tempuri.org/ValidateForm" style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
</wsdl:binding>
<wsdl:binding name="FormSubmissionServiceSoap12"
type="tns:FormSubmissionServiceSoap">
  <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="SubmitForm">
    <soap12:operation soapAction="http://tempuri.org/SubmitForm" style="document" />
    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
```

Form Submission Service


```
  </wsdl:output>
   </wsdl:operation>
   <wsdl:operation name="ValidateForm">
     <soap12:operation soapAction="http://tempuri.org/ValidateForm" style="document" />
     <wsdl:input>
       <soap12:body use="literal" />
     </wsdl:input>
     <wsdl:output>
       <soap12:body use="literal" />
     </wsdl:output>
   </wsdl:operation>
  </wsdl:binding>
  <wsdl:service name="FormSubmissionService">
   <wsdl:port                                          name="FormSubmissionServiceSoap"
binding="tns:FormSubmissionServiceSoap">
     <soap:address                                                    location="https://i2ms-
sh130.txdot.gov/i2ms/i2ms/formsubmissionservice.asmx" />
   </wsdl:port>
   <wsdl:port                                        name="FormSubmissionServiceSoap12"
binding="tns:FormSubmissionServiceSoap12">
     <soap12:address                                                  location="https://i2ms-
sh130.txdot.gov/i2ms/i2ms/formsubmissionservice.asmx" />
   </wsdl:port>
  </wsdl:service>
</wsdl:definitions>
```

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 6-1
Utility Forms

September 30, 2012

MASTER UTILITY ADJUSTMENT AGREEMENT
(Developer Managed)

Agreement No.: -U-_____

THIS AGREEMENT, by and between _____, hereinafter identified as the "**Developer**", _____, hereinafter identified as the "**Design-Build Contractor**" and _____, hereinafter identified as the "**Owner**", is as follows:

WITNESSETH

WHEREAS, the STATE OF TEXAS, acting by and through the Texas Department of Transportation, hereinafter identified as "TxDOT", is authorized to design, construct, operate, maintain, and improve turnpike projects as part of the state highway system throughout the State of Texas, all in conformance with the provisions of Chapters 203 and 223, Texas Transportation Code, as amended; and

WHEREAS, the TxDOT proposes to construct a turnpike project identified as the North Tarrant Express Project (the "Facility"); and

WHEREAS, pursuant to that certain Comprehensive Development Agreement by and between TxDOT and the Developer with respect to the Facility (the "CDA"), the Developer has undertaken the obligation to design, construct, finance. operate and maintain the Facility; and

WHEREAS, the Developer's duties pursuant to the CDA include causing the removal, relocation, or other necessary adjustment of existing utilities impacted by the Facility (collectively, "Adjustment"), subject to the provisions herein; and

WHEREAS, pursuant to that certain Design-Build Contract by and between the Developer and the Design-Build Contractor with respect to the Facility (the "Design-Build Contract"), the Design-Build Contractor has undertaken the obligation to design and construct the Facility, which includes the Adjustment at Design-Builder's expense, subject to the provisions herein; and

WHEREAS, the Facility may receive Federal funding, financing and/or credit assistance; and

WHEREAS, the Design-Build Contractor has notified the Owner that certain of its facilities and appurtenances (the "Owner Utilities") are in locational conflict with the Facility (and/or with the "Ultimate Configuration" of the Facility), and the Owner has requested that the Developer and the Design-Build Contractor undertake the Adjustment of the Owner Utilities pursuant to §203.092, Texas Transportation Code, as amended, and Rule 21.23 of Title 43, as necessary to accommodate the Facility (and the Ultimate Configuration); and

WHEREAS, the Owner Utilities and the proposed Adjustment of the Owner Utilities are described as follows *[insert below a description of the affected facilities (by type, size and location) as well as a brief description of the nature of the Adjustment work to be performed (e.g., "adjust 12" waterline from approximately Highway Station 100+00 to approximately Highway Station 200+00")]:*
_____; and

WHEREAS, the Owner recognizes that time is of the essence in completing the work contemplated herein; and

WHEREAS, the Developer, the Design-Build Contractor and the Owner desire to implement the Adjustment of the Owner Utilities by entering into this Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of these premises and of the mutual covenants and agreements of the parties hereto and other good and valuable consideration, the receipt and sufficiency of which being hereby acknowledged, the Developer, the Design-Build Contractor and the Owner agree as follows:

1. **Preparation of Plans.** [Check one box that applies:]

☐ The Design-Build Contractor has hired engineering firm(s) acceptable to the Owner to perform all engineering services needed for the preparation of plans, required specifications, and cost estimates, attached hereto as Exhibit A (collectively, the "Plans"), for the proposed Adjustment of the Owner Utilities. The Design-Build Contractor represents and warrants that the Plans conform to the most recent Utility Accommodation Rules issued by the Texas Department of Transportation ("TxDOT"), set forth in 43 Tex. Admin. Code Part 1, Chapter 21, Subchapter C *et seq.*, (the "UAR"). By its execution of this Agreement or by the signing of the Plans, the Owner hereby approves the Plans and confirms that the Plans are in compliance with the "standards" described in Paragraph 3(d).

☐ The Owner has provided plans, required specifications and cost estimates, attached hereto as Exhibit A (collectively, the "Plans"), for the proposed Adjustment of the Owner Utilities. The Owner represents and warrants that the Plans conform to the UAR. By its execution of this Agreement, the Developer and the Design-Build Contractor hereby approve the Plans. The Owner also has provided to the Design-Build Contractor a utility plan view map illustrating the location of existing and proposed utility facilities on the Developer's right of way map of the Facility. With regard to its preparation of the Plans, the Owner represents as follows *[check one box that applies]*:

☐ The Owner's employees were utilized to prepare the Plans, and the charges therefore do not exceed the Owner's typical costs for such work.

☐ The Owner utilized consulting engineers to prepare the Plans, and the fees for such work are not based upon a percentage of construction costs. Further, such fees encompass only the work necessary to prepare the Plans for Adjustment of the Owner Utilities described herein, and do not include fees for work done on any other project. The fees of the consulting engineers are reasonable and are comparable to the fees typically charged by consulting engineers in the locale of the Facility for comparable work for the Owner.

2. **Review by TxDOT.** The parties hereto acknowledge and agree as follows:

(a) Upon execution of this Agreement by the Developer, the Design-Build Contractor and the Owner, the Developer will submit this Agreement, together with the attached Plans, to TxDOT for its review and approval as part of a package referred to as a "Utility Assembly". The parties agree to cooperate in good faith to modify this Agreement and/or the Plans, as necessary and mutually acceptable to all parties, to respond to any comments made by TxDOT thereon. Without limiting the generality of the foregoing, (i) the Owner agrees to respond (with comment and/or acceptance) to any modified Plans and/or Agreement

prepared by the Design-Build Contractor in response to TxDOT comments within **fourteen (14) business days** after receipt of such modifications; and (ii) if the Owner originally prepared the Plans, the Owner agrees to modify the Plans in response to TxDOT comments and to submit such modified Plans to the Design-Build Contractor for its comment and/or approval (and re-submittal to TxDOT for its comment and/or approval) within **fourteen (14) business days** after receipt of TxDOT's comments. The Owner's failure to timely respond to any modified Plans submitted by the Design-Build Contractor pursuant to this paragraph shall be deemed the Owner's approval of same. If the Owner fails to timely prepare modified Plans which are its responsibility hereunder, then the Design-Build Contractor shall have the right to modify the Plans for the Owner's approval as if the Design-Build Contractor had originally prepared the Plans. The Design-Build Contractor shall be responsible for providing Plans to and obtaining comments on and approval of the Plans from the Developer. Approval of the Plans by the Design-Build Contractor shall be deemed to be Developer approval of the Plans. The process set forth in this paragraph will be repeated until the Owner, the Developer, the Design-Build Contractor and TxDOT have all approved this Agreement and accepted the Plans.

(b) The parties hereto acknowledge and agree that TxDOT's review, comments, and/or approval of a Utility Assembly or any component thereof is solely for the purpose of ascertaining matters of particular concern to TxDOT, and TxDOT has, and by its review, comments and/or approval of such Utility Assembly or any component thereof undertakes, no duty to review the Utility Assembly or its components for their quality or for the adequacy of adjusted utility facilities (as designed) for the purposes for which they are intended to be used or for compliance with law or applicable standards (other than TxDOT requirements).

3. **Design and Construction Standards.** All design and construction performed for the Adjustment work which is the subject of this Agreement shall comply with and conform to the following:

(a) All applicable local and state laws, regulations, decrees, ordinances and policies, including the UAR, the Utility Manual issued by TxDOT (to the extent its requirements are mandatory for the Adjustment necessitated by the Facility, as communicated to the Owner by the Developer, the Design-Build Contractor or TxDOT), the requirements of the CDA, and the policies of TxDOT;

(b) All Federal laws, regulations, decrees, ordinances and policies applicable to projects receiving Federal funding, financing and/or credit assistance (including without limitation 23 CFR 645 Subparts A and B, incorporated herein by this reference);

(c) The terms of all governmental permits or other approvals, as well as any private approvals of third parties necessary for such work; and

(d) The standard specifications, standards of practice, and construction methods (collectively, "standards") which the Owner customarily applies to utility facilities comparable to the Owner Utilities that are constructed by the Owner or for the Owner by its contractors at the Owner's expense, which standards are current at the time this Agreement is signed by the Owner, and which the Owner has submitted to the Design-Build Contractor in writing.

Such design and construction also shall be consistent and compatible with (i) the Developer's and the Design-Build Contractor's current design and construction of the Facility, (ii) the "Ultimate Configuration" for the Facility, and (iii) any other utilities being installed in the same vicinity. The Owner acknowledges receipt from the Design-Build Contractor of Facility plans and Ultimate Configuration documents as necessary to comply with the foregoing. In case of any inconsistency among any of the standards referenced in this Agreement, the most stringent standard shall apply.

4. **Responsibility for Costs of Adjustment Work**. With the exception of any Betterment (hereinafter defined), the parties shall allocate the cost of any Adjustment between themselves as identified in Exhibit A and in accordance with § 203.092, Texas Transportation Code. An allocation percentage may be determined by application of an Eligibility Ratio, if appropriate, as detailed in Exhibit A. TxDOT shall have no liability to the Owner for any such costs. The Owner expressly acknowledges that it shall be entitled to compensation only from the Design-Build Contractor for any Adjustment costs for the Owner Utilities covered by this Agreement, including costs with respect to real property interests (either acquired or relinquished), and specifically acknowledges that it shall not be entitled to compensation or reimbursement from TxDOT or the State of Texas.

5. **Construction by the Design-Build Contractor**.

(a) The Owner hereby requests that the Design-Build Contractor perform the construction necessary to adjust the Owner Utilities and the Design-Build Contractor hereby agrees to perform such construction. All construction work hereunder shall be performed in a good and workmanlike manner, and in accordance with the Plans (except as modified pursuant to Paragraph 16).

(b) The Design-Build Contractor shall retain such contractor or contractors as are necessary to adjust the Owner Utilities, in accordance with the CDA.

(c) The Design-Build Contractor shall obtain all permits necessary for the construction to be performed by the Design-Build Contractor hereunder, and the Owner shall cooperate in that process as needed.

6. **Reimbursement of Owner's Indirect Costs**.

(a) Design-Build Contractor agrees to reimburse the Owner its share of the Owner's indirect costs (e.g., engineering, inspection, testing, ROW) as identified in Exhibit A. When requested by the Owner, monthly progress payments will be made. The monthly payment will not exceed 80% of the estimated indirect work done to date. Once the indirect work is complete, final payment of the eligible indirect costs will be made. Intermediate payments shall not be construed as final payment for any items included in the intermediate payment.

(b) The Owner's indirect costs associated with Adjustment of the Owner Utilities shall be developed pursuant to the method checked and described below *[check only one box]*:

☐ (1) Actual related indirect costs accumulated in accordance with (i) a work order accounting procedure prescribed by the applicable Federal or State regulatory body, or (ii) established accounting procedure developed by the Owner and which the Owner uses in its regular operations or,

☐ (2) The agreed sum of $_____ ("Agreed Sum") as supported by the analysis of the Owner's estimated costs attached hereto as part of Exhibit A; or

(c) All indirect costs charged to the Design-Build Contractor by the Owner shall be reasonable and shall be computed using rates and schedules not exceeding those applicable to similar work performed by or for the Owner at the Owner's expense. Design-Build Contractor's performance of the Adjustment work hereunder and payment of the Design-Build Contractor's share of the Owner's costs pursuant to this Agreement, if applicable, shall be full compensation to the Owner for all costs incurred by the Owner in Adjusting the Owner Utilities (including without limitation costs of relinquishing and/or acquiring right of way), and TxDOT shall have no liability to the Owner for any such costs.

(d) Eligible Owner indirect costs shall include only those authorized under 23 C.F.R. Part 645, Subpart A. The Owner agrees that costs referenced in 23 C.F.R. Section 645.117(d)(2) are not eligible for reimbursement. These regulations can be found at: http://www.access.gpo.gov/nara/cfr/waisidx_04/23cfr645_04.html

7. **Advancement of Funds by Owner for Construction Costs**.

(a) Advancement of Owner's Share of Estimated Costs

Exhibit A shall identify all estimated engineering and construction-related costs, including labor, material, equipment and other miscellaneous construction items. Exhibit A shall also identify the Owner's and Design-Build Contractor's respective shares of the estimated costs.

The Owner shall advance to the Design-Build Contractor its allocated share of the estimated costs for construction and engineering work to be performed by Design-Build Contractor, in accordance with the following terms:

[Insert terms of advance funding to be agreed between Design-Build Contractor and Owner.]

(b) Adjustment Based on Actual Costs or Agreed Sum

[Check the one appropriate provision]:

☐ The Owner is responsible for its share of the Design-Build Contractor's actual cost for the Adjustment, including the identified Betterment. Accordingly, upon completion of all Adjustment work to be performed by both parties pursuant to this Amendment, (i) the Owner shall pay to the Design-Build Contractor the amount, if any, by which the actual cost of the Betterment (as determined in Paragraph 9(b)) plus the actual cost of Owner's share of the Adjustment (based on the allocation set forth in Exhibit A) exceeds the estimated cost advanced by the Owner, or (ii) the Design-Build Contractor shall refund to the Owner the amount, if any, by which such advance exceeds such actual cost, as applicable.

☐ The Agreed Sum is the agreed and final amount due for the Adjustment, including any Betterment, under this Amendment. Accordingly, no adjustment (either up or down) of such amount shall be made based on actual costs.

8. **Invoices.** Each invoice submitted by the Owner shall be prepared in the form and manner prescribed by 23 C.FR. Part 645, Subpart A. On invoices prepared by either the Owner or the

Design-Build Contractor, all costs developed using the "Actual Cost" method shall be itemized in a format allowing for comparisons to the approved Estimates, including listing each of the services performed, the amount of time spent and the date on which the service was performed. The original and three (3) copies of each invoice, together with (1) such supporting information to substantiate all invoices as reasonably requested, and (2) such waivers and releases of liens as the other party may reasonably require, shall be submitted to the other party at the address for notices stated in Paragraph 22, unless otherwise directed pursuant to Paragraph 22. The Owner and the Design-Build Contractor shall make commercially reasonable efforts to submit final invoices not later than one hundred twenty (120) days after completion of work. The Owner and the Design-Build Contractor hereby acknowledge and agree that any costs not submitted to the other party within eighteen months following completion of all Adjustment work to be performed by the parties pursuant to this Agreement shall be deemed to have been abandoned and waived.

9. **Betterment and Salvage**.

(a) For purposes of this Agreement, the term "Betterment" means any upgrading of an Owner Utility being adjusted that is not attributable to the construction of the Facility and is made solely for the benefit of and at the election of the Owner, including but not limited to an increase in the capacity, capability, efficiency or function of the adjusted Utility over that provided by the existing Utility facility or an expansion of the existing Utility facility; provided, however, that the following are not considered Betterments:

(i) any upgrading which is required for accommodation of the Facility;

(ii) replacement devices or materials that are of equivalent standards although not identical;

(iii) replacement of devices or materials no longer regularly manufactured with the next highest grade or size;

(iv) any upgrading required by applicable laws, regulations or ordinances;

(v) replacement devices or materials which are used for reasons of economy (e.g., non-stocked items may be uneconomical to purchase); or

(vi) any upgrading required by the Owner's written "standards" meeting the requirements of Paragraph 3(d).

[Include the following for fiber optic Owner Utilities only:] Extension of an Adjustment to the nearest splice boxes shall not be considered a Betterment if required by the Owner in order to maintain its written telephony standards.

Any upgrading required by the Owner's written "standards" meeting the requirements of Paragraph 3(d) shall be deemed to be of direct benefit to the Facility.

(b) It is understood and agreed that neither the Developer nor the Design-Build Contractor shall pay for any Betterments and that the Owner shall be solely responsible therefor. No Betterment may be performed hereunder which is incompatible with the Facility or the Ultimate Configuration or which cannot be performed within the other constraints of applicable law, any applicable governmental approvals, and the requirements imposed on the Developer by the

CDA, including without limitation the scheduling requirements thereunder. Accordingly, the parties agree as follows *[check one box that applies, and complete if appropriate]*:

☐ The Adjustment of the Owner Utilities pursuant to the Plans does not include any Betterment.

☐ The Adjustment of the Owner Utilities pursuant to the Plans includes Betterment to the Owner Utilities by reason of *[insert explanation, e.g. "replacing 12" pipe with 24" pipe]*:_____. The Design-Build Contractor has provided to the Owner comparative estimates for (i) all work to be performed by the Design-Build Contractor pursuant to this Agreement, including work attributable to the Betterment, and (ii) the cost to perform such work without the Betterment, which estimates are hereby approved by the Owner. The estimated cost of the Design-Build Contractor's work hereunder which is attributable to Betterment is $_____, calculated by subtracting (ii) from (i). The percentage of the total cost of the Design-Build Contractor's work hereunder which is attributable to Betterment is _____%, calculated by subtracting (ii) from (i), which remainder is divided by (i).

(c) If Paragraph 9(b) identifies Betterment, the Owner shall advance to the Design-Build Contractor, at least **fourteen (14) business days** prior to the date scheduled for commencement of construction for Adjustment of the Owner Utilities, the estimated cost attributable to Betterment as set forth in Paragraph 9(b). Should the Owner fail to advance payment to the Design-Build Contractor fourteen (14) business days prior to commencement of the Adjustment construction, the Design-Build Contractor shall have the option of commencing and completing (without delay) the Adjustment work without installation of the applicable Betterment. *[If Paragraph 9(b) identifies Betterment, check the one appropriate provision]*:

☐ The estimated cost stated in Paragraph 9(b) is the agreed and final amount due for Betterment hereunder, and accordingly no adjustment (either up or down) of such amount shall be made based on actual costs.

☐ The Owner is responsible for the Design-Build Contractor's actual cost for the identified Betterment. Accordingly, upon completion of all Adjustment work to be performed by both parties pursuant to this Agreement, (i) the Owner shall pay to the Design-Build Contractor the amount, if any, by which the actual cost of the Betterment (determined as provided below in this paragraph) exceeds the estimated cost advanced by the Owner, or (ii) the Design-Build Contractor shall refund to the Owner the amount, if any, by which such advance exceeds such actual cost, as applicable. Any additional payment by the Owner shall be due within **sixty (60) calendar days** after the Owner's receipt of the Design-Build Contractor's invoice therefor, together with supporting documentation; any refund shall be due within **sixty (60) calendar days** after completion of the Adjustment work hereunder. The actual cost of Betterment incurred by the Design-Build Contractor shall be calculated by multiplying (i) the Betterment percentage stated in Paragraph 9(b), by (ii) the actual cost of all work performed by the Design-Build Contractor pursuant to this Agreement (including work attributable to the Betterment), as invoiced by the Design-Build Contractor to the Owner.

(d) If Paragraph 9(b) identifies Betterment, the amount of Betterment in Owner's indirect costs shall be determined by applying the percentage of the Betterment calculated in Paragraph 9(b). The Owner's invoice to the Design-Build Contractor for the Design-Build Contractor's share of the Owner's indirect costs shall credit the Design-Build Contractor with any Betterment amount determined pursuant to this Paragraph 9(d).

(e) For any Adjustment from which the Owner recovers any materials and/or parts and retains or sells the same, after application of any applicable Betterment credit, the Owner's invoice to the Design-Build Contractor for its costs shall credit the Design-Build Contractor with the salvage value for such materials and/or parts, determined in accordance with 23 C.F.R. Section 645.105(j).

(f) The determinations and calculations of Betterment described in this Paragraph 9 shall exclude right of way acquisition costs. Betterment in connection with right-of-way acquisition is addressed in Paragraph 15.

10. **Management of the Adjustment Work.** The Design-Build Contractor will provide project management during the Adjustment of the Owner Utilities.

11. **Utility Investigations.** At the Design-Build Contractor's request, the Owner shall assist the Design-Build Contractor in locating any Utilities (including appurtenances) which are owned and/or operated by Owner and may be impacted by the Facility. Without limiting the generality of the foregoing, in order to help assure that neither the adjusted Owner Utilities nor existing, unadjusted utilities owned or operated by the Owner are damaged during construction of the Facility, the Owner shall mark in the field the location of all such utilities horizontally on the ground in advance of Facility construction in the immediate area of such utilities.

12. **Inspection and Acceptance by the Owner**.

(a) Throughout the Adjustment construction hereunder, the Owner shall provide adequate inspectors for such construction. The work shall be inspected by the Owner's inspector(s) at least once each working day, and more often if such inspections are necessary for prudent installation. Further, upon request by the Design-Build Contractor or its contractors, the Owner shall furnish an inspector at any reasonable time in which construction is underway pursuant to this Agreement, including occasions when construction is underway in excess of the usual forty (40) hour work week and at such other times as reasonably required. The Owner agrees to promptly notify the Design-Build Contractor of any concerns resulting from any such inspection.

(b) The Owner shall perform a final inspection of the adjusted Owner Utilities, including conducting any tests as are necessary or appropriate, within **five (5) business days** after completion of construction hereunder. The Owner shall accept such construction if it is consistent with the performance standards described in Paragraph 3, by giving written notice of such acceptance to the Design-Build Contractor within said **five (5) day** period. If the Owner does not accept the construction, then the Owner shall, not later than the expiration of said **five (5) day** period, notify the Design-Build Contractor in writing of its grounds for non-acceptance and suggestions for correcting the problem, and if the suggested corrections are justified, the Design-Build Contractor will comply. The Owner shall re-inspect any revised construction (and re-test if appropriate)

and give notice of acceptance, not later than **five (5) business days** after completion of corrective work. The Owner's failure to inspect and/or to give any required notice of acceptance or non-acceptance within the specified time period shall be deemed acceptance.

(c) From and after the Owner's acceptance (or deemed acceptance) of an adjusted Owner Utility, the Owner agrees to accept ownership of, and full operation and maintenance responsibility for, such Owner Utility.

13. **Design Changes.** The Developer and the Design-Build Contractor will be responsible for additional Adjustment design and the Design-Build Contractor will be responsible for additional construction costs necessitated by design changes to the Facility, upon the terms specified herein.

14. **Field Modifications.** The Developer and the Design-Build Contractor shall provide the Owner with documentation of any field modifications, including Utility Adjustment Field Modifications as well as minor changes described in Paragraph 16(b), occurring in the Adjustment of the Owner Utilities.

15. **Real Property Interests.**

(a) The Owner has provided, or upon execution of this Agreement shall promptly provide to the Design-Build Contractor, documentation acceptable to TxDOT indicating any right, title or interest in real property claimed by the Owner with respect to the Owner Utilities in their existing location(s). Such claims are subject to TxDOT's approval as part of its review of the Developer and Design-Build Contractor Utility Assembly as described in Paragraph 2. Claims approved by TxDOT as to rights or interests are referred to herein as "Existing Interests".

(b) If acquisition of any new easement or other interest in real property ("New Interest") is necessary for the Adjustment of any Owner Utilities, then the Owner shall be responsible for undertaking such acquisition. The Owner shall implement each acquisition hereunder expeditiously so that related Adjustment construction can proceed in accordance with the Developer's and the Design-Build Contractor's Facility schedules. The Design-Build Contractor shall be responsible for its share (as specified in Paragraph 4) of the actual and reasonable acquisition costs of any such New Interest (including without limitation the Owner's reasonable overhead charges and reasonable legal costs as well as compensation paid to the landowner), excluding any costs attributable to Betterment as described in Paragraph 15(c), and subject to the provisions of Paragraph 15(e); provided, however, that all acquisition costs shall be subject to the Design-Build Contractor's prior written approval. Eligible acquisition costs shall be segregated from other costs on the Owner's estimates and invoices. Any such New Interest shall have a written valuation and shall be acquired in accordance with applicable law.

(c) The Design-Build Contractor shall pay its share only for a replacement in kind of an Existing Interest (e.g., in width and type), unless a New Interest exceeding such standard (i) is required in order to accommodate the Facility or by compliance with applicable law, or (ii) is called for by the Design-Build Contractor in the interest of overall Facility economy. Any New Interest which is not the Design-Build Contractor's responsibility pursuant to the preceding sentence shall be considered a Betterment to the extent that it upgrades the

Existing Interest which it replaces, or in its entirety if the related Owner Utility was not installed pursuant to an Existing Interest. Betterment costs shall be solely the Owner's responsibility.

(d) For each Existing Interest located within the final Facility right of way, upon completion of the related Adjustment work and its acceptance by the Owner, the Owner agrees to execute a quitclaim deed or other appropriate documentation relinquishing such Existing Interest to TxDOT, unless the affected Owner Utility is remaining in its original location or is being reinstalled in a new location within the area subject to such Existing Interest. All quitclaim deeds or other relinquishment documents shall be subject to TxDOT's approval as part of its review of the Utility Assembly as described in Paragraph 2. For each such Existing Interest relinquished by the Owner, the Design-Build Contractor shall do one of the following to compensate the Owner for such Existing Interest, as appropriate:

(e) (i) If the Owner acquires a New Interest for the affected Owner Utility, the Design-Build Contractor shall reimburse the Owner for the Design-Build Contractor's share of the Owner's actual and reasonable acquisition costs in accordance with Paragraph 15(b), subject to Paragraph 15(c); or

(ii) If the Owner does not acquire a New Interest for the affected Owner Utility, the Design-Build Contractor shall compensate the Owner for the Design-Build Contractor's share of the fair market value of such relinquished Existing Interest, as mutually agreed between the Owner and the Design-Build Contractor and supported by a written valuation.

The compensation provided to the Owner pursuant to either subparagraph (i) or subparagraph (ii) above shall constitute complete compensation to the Owner for the relinquished Existing Interest and any New Interest, and no further compensation shall be due to the Owner from the Developer, the Design-Build Contractor or TxDOT on account of such Existing Interest or New Interest(s).

(f) The Owner shall execute a Utility Joint Use Acknowledgment (TxDOT-U-80A) for each Adjustment where required pursuant to TxDOT policies. All Utility Joint Use Acknowledgments shall be subject to TxDOT approval as part of its review of the Utility Assembly as described in Paragraph 2.

16. **Amendments and Modifications.** This Agreement may be amended or modified only by a written instrument executed by the parties hereto, in accordance with Paragraph 16(a) or Paragraph 16(b) below.

(a) Except as otherwise provided in Paragraph 16(b), any amendment or modification to this Agreement or the Plans attached hereto shall be implemented by a Utility Adjustment Agreement Amendment ("UAAA") in the form of Exhibit B hereto (TxDOT-CDA-U-35A-DM). The UAAA form can be used for a new scope of work with concurrence of the Developer, the Design-Build Contractor and TxDOT as long as the Design and Construction responsibilities have not changed. Each UAAA is subject to the review and approval of TxDOT, prior to its becoming effective for any purpose and prior to any work being initiated thereunder. The Owner agrees to keep and track costs for each UAAA separately from other work being performed.

(b) For purposes of this Paragraph 16(b), "Utility Adjustment Field Modification" shall mean any horizontal or vertical design change from the Plans included in a Utility Assembly previously approved by TxDOT, due either to design of the Facility or to conditions not accurately reflected in the approved Utility Assembly (e.g., shifting the alignment of an 8 in. water line to miss a modified or new roadway drainage structure). A Utility Adjustment Field Modification agreed upon by the Developer, the Design-Build Contractor and the Owner does not require a UAAA, provided that the modified Plans have been submitted to TxDOT for its review and comment. A minor change (e.g., an additional water valve, an added utility marker at a ROW line, a change in vertical bend, etc.) will not be considered a Utility Adjustment Field Modification and will not require a UAAA, but shall be shown in the documentation required pursuant to Paragraph 14.

17. **Relationship of the Parties.**

(a) Although some of the duties described in this Agreement are assigned specifically to either the Developer or the Design-Build Contractor, the obligation under this Agreement to design and construct the Facility at the Developer's or Design-Build Contractor's expense, including the Adjustment, is jointly shared by the Developer and the Design-Build Contractor. To the extent Design-Build Contractor fails to perform an express duty or obligation of this Agreement, the Developer is authorized and obligated to provide such performance. Nothing in this Paragraph 17(a) however, alters or shall be construed in any way to alter the obligations, responsibilities, benefits, rights, remedies, and claims between Developer and the Design-Build Contractor under the Design-Build Contract to perform and pay for the Adjustment.

(b) Except as provided in Paragraph 17(a) above, this Agreement does not in any way, and shall not be construed to, create a principal/agent or joint venture relationship between the Owner and the other parties hereto and under no circumstances shall the Owner, the Design-Build Contractor or the Developer be considered as or represent itself to be an agent of another.

(c) Neither this Agreement nor the Design-Build Contract alters, or shall be construed in any way to alter the obligations, responsibilities, benefits, rights, remedies, and claims between the Developer and TxDOT under the CDA to design and construct the Facility, including the Adjustment.

18. **Entire Agreement.** This Agreement embodies the entire agreement between the parties and there are no oral or written agreements between the parties or any representations made which are not expressly set forth herein.

19. **Assignment; Binding Effect; TxDOT as Third Party Beneficiary.** None of the Owner, the Developer or the Design-Build Contractor may assign any of its rights or delegate any of its duties under this Agreement without the prior written consent of the other parties and of TxDOT, which consent may not be unreasonably withheld or delayed; provided, however, that the Developer and the Design-Builder may assign any of their rights and/or delegate any of their duties to TxDOT or to any other entity engaged by TxDOT to fulfill the Developer's obligations under the CDA, at any time without the prior consent of the Owner.

This Agreement shall bind the Owner, the Developer, the Design-Build Contractor and their successors and permitted assigns, and nothing in this Agreement nor in any approval subsequently provided by any party hereto shall be construed as giving any benefits, rights, remedies, or claims to any other person, firm, corporation or other entity, including, without limitation, any contractor or other party retained for the Adjustment work or the public in general; provided, however, that the Owner, the Developer and the Design-Build Contractor agree that although TxDOT is not a party to this Agreement, TxDOT is intended to be a third-party beneficiary to this Agreement.

20. **Breach by the Parties.**

(a) If the Owner claims that the Developer or the Design-Build Contractor (the "Defaulting Party") has breached any of its obligations under this Agreement, the Owner will notify the Developer, the Design-Build Contractor and TxDOT in writing of such breach, and the Defaulting Party shall have 30 days following receipt of such notice in which to cure such breach, before the Owner may invoke any remedies which may be available to it as a result of such breach; provided, however, that both during and after such period TxDOT shall have the right, but not the obligation, to cure any breach by the Defaulting Party. Without limiting the generality of the foregoing, (a) TxDOT shall have no liability to the Owner for any act or omission committed by the Defaulting Party in connection with this Agreement, including without limitation any reimbursement owed to the Owner hereunder and any claimed defect in any design or construction work supplied by the Developer, the Design-Build Contractor or by its contractors, and (b) in no event shall TxDOT be responsible for any repairs or maintenance to the Owner Utilities Adjusted pursuant to this Agreement.

(b) If the Developer or the Design-Build Contractor claims that the Owner has breached any of its obligations under this Agreement, the Developer or the Design-Build Contractor will notify the Owner and TxDOT in writing of such breach, and the Owner shall have 30 days following receipt of such notice in which to cure such breach, before the Developer or the Design-Build Contractor may invoke any remedies which may be available to it as a result of such breach.

21. **Traffic Control.** The Design-Build Contractor shall provide traffic control or shall reimburse the Owner for the Design-Build Contractor's share (if any, as specified in Paragraph 4) of the costs for traffic control made necessary by the Adjustment work performed by either the Design-Build Contractor or the Owner pursuant to this Agreement, in compliance with the requirements of the Texas Manual on Uniform Traffic Control Devices. Betterment percentages calculated in Paragraph 9 shall also apply to traffic control costs.

22. **Notices.** Except as otherwise expressly provided in this Agreement, all notices or communications pursuant to this Agreement shall be sent or delivered to the following:

The Owner:

Phone:
Fax:

The Developer:

Phone:
Fax:

The Design-Build Contractor:

Phone:
Fax:

A party sending a notice of default of this Agreement to another party shall also send a copy of such notice to TxDOT and the CDA Utility Manager at the following addresses:

TxDOT: TxDOT Department of Transportation
Attention: Strategic Projects Division - ROW Director
125 E. 11th Street
Austin, Texas 78701-2483
Phone: (512) 936-0980

CDA Utility Manager:

Any notice or demand required herein shall be given (a) personally, (b) by certified or registered mail, postage prepaid, return receipt requested, or (c) by reliable messenger or overnight courier to the appropriate address set forth above. Any notice served personally shall be deemed delivered upon receipt, and any notice served by certified or registered mail or by reliable messenger or overnight courier shall be deemed delivered on the date of receipt as shown on the addressee's registry or certification of receipt or on the date receipt is refused as shown on the records or manifest of the U.S. Postal Service or such courier. Any party may from time to time designate any other address for this purpose by written notice to all other parties; TxDOT may designate another address by written notice to all parties.

23. **Approvals.** Any acceptance, approval, or any other like action (collectively "Approval") required or permitted to be given by either the Developer, the Design-Build Contractor, the Owner or TxDOT pursuant to this Agreement:

(a) Must be in writing to be effective (except if deemed granted pursuant hereto),

(b) Shall not be unreasonably withheld or delayed; and if Approval is withheld, such withholding shall be in writing and shall state with specificity the reason for withholding such Approval, and every effort shall be made to identify with as much detail as possible what changes are required for Approval, and

(c) Except for approvals by TxDOT, and except as may be specifically provided otherwise in this Agreement, shall be deemed granted if no response is provided to the party requesting an Approval within the time period prescribed by this Agreement (or if no time period is prescribed, then fourteen (14) calendar days),

commencing upon actual receipt by the party from which an Approval is requested or required, of a request for Approval from the requesting party. All requests for Approval shall be sent out by the requesting party to the other party in accordance with Paragraph 22.

24. **Time**.

(a) Time is of the essence in the performance of this Agreement.

(b) All references to "days" herein shall be construed to refer to calendar days, unless otherwise stated.

(c) No party shall be liable to another party for any delay in performance under this Agreement from any cause beyond its control and without its fault or negligence ("Force Majeure"), such as acts of God, acts of civil or military authority, fire, earthquake, strike, unusually severe weather, floods or power blackouts.

25. **Continuing Performance.** In the event of a dispute, the Owner, the Developer and the Design-Build Contractor agree to continue their respective performance hereunder to the extent feasible in light of the dispute, including paying billings, and such continuation of efforts and payment of billings shall not be construed as a waiver of any legal right.

26. **Equitable Relief.** The Developer, the Design-Build Contractor and the Owner acknowledge and agree that delays in Adjustment of the Owner Utilities will impact the public convenience, safety and welfare, and that (without limiting the parties' remedies hereunder) monetary damages would be inadequate to compensate for delays in the construction of the Facility. Consequently, the parties hereto (and TxDOT as well, as a third party beneficiary) shall be entitled to specific performance or other equitable relief in the event of any breach of this Agreement which threatens to delay construction of the Facility; provided, however, that the fact that specific performance or other equitable relief may be granted shall not prejudice any claims for payment or otherwise related to performance of the Adjustment work hereunder.

27. **Authority.** The Owner, the Developer and the Design-Build Contractor each represents and warrants to the other parties that the warranting party possesses the legal authority to enter into this Agreement and that it has taken all actions necessary to exercise that authority and to lawfully authorize its undersigned signatory to execute this Agreement and to bind such party to its terms. Each person executing this Agreement on behalf of a party warrants that he or she is duly authorized to enter into this Agreement on behalf of such party and to bind it to the terms hereof.

28. **Cooperation.** The parties acknowledge that the timely completion of the Facility will be influenced by the ability of the Owner (and its contractors), the Developer and the Design-Build Contractor to coordinate their activities, communicate with each other, and respond promptly to reasonable requests. Subject to the terms and conditions of this Agreement, the Owner, the Developer and the Design-Builder agree to take all steps reasonably required to coordinate their respective duties hereunder in a manner consistent with the Developer's and the Design-Build Contractor's current and future construction schedules for the Facility.

29. **Termination.** If the Facility is canceled or modified so as to eliminate the necessity of the Adjustment work described herein, then the Developer shall notify the Owner and Design-Build Contractor in writing and the Developer reserves the right to thereupon terminate this Agreement. Upon such termination, the parties shall negotiate in good faith an amendment that shall provide

mutually acceptable terms and conditions for handling the respective rights and liabilities of the parties relating to such termination.

30. **Nondiscrimination**. Each party hereto agrees, with respect to the work performed by such party pursuant to this Agreement, that such party shall not discriminate on the grounds of race, color, sex, national origin or disability in the selection and/or retention of contractors and consultants, including procurement of materials and leases of equipment.

31. **Applicable Law, Jurisdiction and Venue**. This Agreement shall be governed by the laws of the State of Texas, without regard to the conflict of laws principles thereof. Venue for any action brought to enforce this Agreement or relating to the relationship between any of the parties shall be the District Court of Travis County, Texas or the United States District Court for the Western District of Texas (Austin).

32. **Waiver of Consequential Damages.** No party hereto shall be liable to any other party to this Agreement, whether in contract, tort, equity, or otherwise (including negligence, warranty, indemnity, strict liability, or otherwise,) for any punitive, exemplary, special, indirect, incidental, or consequential damages, including, without limitation, loss of profits or revenues, loss of use, claims of customers, or loss of business opportunity.

33. **Captions**. The captions and headings of the various paragraphs of this Agreement are for convenience and identification only, and shall not be deemed to limit or define the content of their respective paragraphs.

34. **Counterparts.** This Agreement may be executed in any number of counterparts. Each such counterpart hereof shall be deemed to be an original instrument but all such counterparts together shall constitute one and the same instrument.

35. **Effective Date.** Except for the provisions of Paragraph 2(a) (which shall become effective immediately upon execution of this Agreement by the Owner, the Developer and the Design-Build Contractor without regard to TxDOT's signature), this Agreement shall become effective upon the later of (a) the date of signing by the last party (either the Owner, the Developer or the Design-Build Contractor) signing this Agreement, and (b) the date of TxDOT's approval as indicated by the signature of TxDOT's representative, below.

APPROVED BY:
TEXAS DEPARTMENT OF TRANSPORTATION

By: _____
Authorized Signature

Printed Name: _____

Title: _____

Date: _____

OWNER

_____
[Print Owner Name]

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

DESIGN-BUILD CONTRACTOR

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date:

DEVELOPER

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

County:
ROW CSJ No.:
Const. CSJ No.:
Highway:
Limits:
Fed. Proj. No.:

EXHIBIT A

PLANS, SPECIFICATIONS, COST ESTIMATES AND ALLOCATION

County:
ROW CSJ No.:
Const. CSJ No.:
Highway:
Limits:
Fed. Proj. No.:

EXHIBIT B

UTILITY ADJUSTMENT AGREEMENT AMENDMENT
(TxDOT-CDA-U-35A-DM)

County:
ROW CSJ No.:

Const. CSJ No.:

Highway:
Limits:
Fed. Proj. No.:

MASTER UTILITY ADJUSTMENT AGREEMENT
(Owner Managed)

Agreement No.: -U-_____

THIS AGREEMENT, by and between _____, hereinafter identified as the "**Developer**", _____, hereinafter identified as the "**Design-Build Contractor**", and _____, hereinafter identified as the "**Owner**", is as follows:

WITNESSETH

WHEREAS, the STATE OF TEXAS, acting by and through the Texas Department of Transportation, hereinafter identified as "TxDOT", is authorized to design, construct, operate, maintain, and improve turnpike projects as part of the state highway system throughout the State of Texas, all in conformance with the provisions of Chapters 203 and 223, Texas Transportation Code, as amended; and

WHEREAS, TxDOT proposes to construct a turnpike project identified as the North Tarrant Express Project (the "Facility"); and

WHEREAS, pursuant to that certain Comprehensive Development Agreement by and between TxDOT and the Developer with respect to the Facility (the "CDA"), the Developer has undertaken the obligation to design, construct, finance, operate and maintain the Facility; and

WHEREAS, the Developer's duties pursuant to the CDA include causing the removal, relocation, or other necessary adjustment of existing utilities impacted by the Facility (collectively, "Adjustment"), subject to the provisions herein; and

WHEREAS, pursuant to that certain Design-Build Contract by and between the Developer and the Design-Build Contractor with respect to the Facility (the "DB Contract"), the Design-Build Contractor has undertaken the obligation to design and construct the Facility, which includes the Adjustment, at Design-Build Contractor's expense, subject to the provisions herein; and

WHEREAS, the Facility may receive Federal funding, financing and/or credit assistance; and

WHEREAS, the Design-Build Contractor has notified the Owner that certain of its facilities and appurtenances (the "Owner Utilities") are in locational conflict with the Facility (and/or the "Ultimate Configuration" of the Facility), and the Owner has requested that the Owner undertake the Adjustment of the Owner Utilities pursuant to §203.092, Texas Transportation Code, as amended, and Rule 21.23 of Title 43, as necessary to accommodate the Facility (and the Ultimate Configuration); and

WHEREAS, the Owner Utilities and the proposed Adjustment of the Owner Utilities are described as follows *[insert below a description of the affected facilities (by type, size and location) as well as a brief description of the nature of the Adjustment work to be performed (e.g., "adjust 12" waterline from approximately Highway Station 100+00 to approximately Highway Station 200+00")]:*
_____; and

WHEREAS, the Owner recognizes that time is of the essence in completing the work contemplated herein; and

WHEREAS, the Developer, the Design-Build Contractor and the Owner desire to implement the Adjustment of the Owner Utilities by entering into this Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of these premises and of the mutual covenants and agreements of the parties hereto and other good and valuable consideration, the receipt and sufficiency of which being hereby acknowledged, the Developer, the Design-Build Contractor and the Owner agree as follows:

1. **Preparation of Plans.** *[Check one box that applies:]*

☐ The Design-Build Contractor has hired engineering firm(s) acceptable to the Owner to perform all engineering services needed for the preparation of plans, required specifications, and cost estimates, attached hereto as Exhibit A (collectively, the "Plans"), for the proposed Adjustment of the Owner Utilities. The Design-Build Contractor represents and warrants that the Plans conform to the most recent Utility Accommodation Rules issued by the Texas Department of Transportation ("TxDOT"), set forth in 43 Tex. Admin. Code, Part 1, Chapter 21, Subchapter C, *et seq.* (the "UAR"). By its execution of this Agreement or by the signing of the Plans, Owner hereby approves and confirms that the Plans are in compliance with the "standards" described in Paragraph 3(d).

☐ The Owner has provided plans, required specifications and cost estimates, attached hereto as Exhibit A (collectively, the "Plans"), for the proposed Adjustment of the Owner Utilities. The Owner represents and warrants that the Plans conform to the UAR. By its execution of this Agreement, Developer and the Design-Build Contractor hereby approve the Plans. The Owner also has provided to the Design-Build Contractor a utility plan view map illustrating the location of existing and proposed utility facilities on the Developer's right of way map of the Facility. With regard to its preparation of the Plans, Owner represents as follows *[check one box that applies]*:

☐ The Owner's employees were utilized to prepare the Plans, and the charges therefore do not exceed the Owner's typical costs for such work.

☐ The Owner utilized consulting engineers to prepare the Plans, and the fees for such work are not based upon a percentage of construction costs. Further, such fees encompass only the work necessary to prepare the Plans for Adjustment of the Owner Utilities described herein, and do not include fees for work done on any other project. The fees of the consulting engineers are reasonable and are comparable to the fees typically charged by consulting engineers in the locale of the Facility for comparable work for the Owner.

2. **Review by TxDOT.** The parties hereto acknowledge and agree as follows:

(a) Upon execution of this Agreement by both the Developer, the Design-Build Contractor and the Owner, the Developer will submit this Agreement, together with the attached Plans, to TxDOT for its review and approval as part of a package referred to as a "Utility Assembly". The parties agree to cooperate in good faith to modify this Agreement and/or the Plans, as necessary and mutually acceptable to all parties, to respond to any comments made by TxDOT thereon. Without limiting the generality of the foregoing, (i) the Owner agrees to respond (with comment and/or acceptance) to any modified Plans and/or Agreement prepared by the Design-Build Contractor in response to TxDOT comments within **fourteen (14) business days** after receipt of such modifications; and (ii) if the Owner originally prepared the Plans, the Owner agrees to modify the Plans in response to TxDOT comments and to submit such modified Plans to the Design-Build Contractor for its comment and/or approval (and re-submittal to TxDOT for its comment and/or approval) within **fourteen (14) business days** after receipt of TxDOT's comments. The Owner's failure to timely respond to any modified Plans submitted by the Design-Build Contractor pursuant to this paragraph shall be deemed the Owner's approval of same. If the Owner fails to timely prepare modified Plans which are its responsibility hereunder, then the Design-Build Contractor shall have the right to modify the Plans for the Owner's approval as if the Design-Build Contractor had originally prepared the Plans. The Design-Build Contractor shall be responsible for providing Plans to and obtaining comments on and approval of the Plans from the Developer. Approval of the Plans by the Design-Build Contractor shall be deemed to be Developer approval of the Plans. The process set forth in this paragraph will be repeated until the Owner, the Developer, the Design-Build Contractor and TxDOT have all approved this Agreement and the Plans.

(b) The parties hereto acknowledge and agree that TxDOT's review, comments, and/or approval of a Utility Assembly or any component thereof is solely for the purpose of ascertaining matters of particular concern to TxDOT, and TxDOT has, and by its review, comments and/or approval of such Utility Assembly or any component thereof undertakes, no duty to review the Utility Assembly or its components for their quality or for the adequacy of adjusted facilities (as designed) for the purposes for which they are intended to be used or for compliance with law or applicable standards (other than TxDOT requirements).

3. **Design and Construction Standards.** All design and construction performed for the Adjustment work which is the subject of this Agreement shall comply with and conform to the following:

(a) All applicable local and state laws, regulations, decrees, ordinances and policies, including the UAR, the Utility Manual issued by TxDOT (to the extent its requirements are mandatory for Utility Adjustments necessitated by the Facility, communicated to the Owner by the Developer, the Design-Build Contractor or TxDOT), the requirements of the CDA, and the policies of TxDOT;

(b) All Federal laws, regulations, decrees, ordinances and policies applicable to projects receiving Federal funding, financing and/or credit assistance (including without limitation 23 CFR 645 Subparts A and B, incorporated herein by this reference);

(c) The terms of all governmental permits or other approvals, as well as any private approvals of third parties necessary for such work; and

(d) The standard specifications, standards of practice, and construction methods (collectively, "standards") which the Owner customarily applies to facilities comparable to the Owner

Utilities that are constructed by the Owner or for the Owner by its contractors at the Owner's expense, which standards are current at the time this Agreement is signed by the Owner, and which the Owner has submitted to the Design-Build Contractor in writing.

Such design and construction also shall be consistent and compatible with (i) the Developer's and the Design-Build Contractor's current design and construction of the Facility, (ii) the "Ultimate Configuration" for the Facility, and (iii) any other utilities being installed in the same vicinity. The Owner acknowledges receipt from the Design-Build Contractor of Facility plans and Ultimate Configuration documents as necessary to comply with the foregoing. In case of any inconsistency among any of the standards referenced in this Agreement, the most stringent standard shall apply.

4. **Construction by the Owner; Scheduling.**

(a) The Owner hereby agrees to perform the construction necessary to adjust the Owner Utilities. All construction work hereunder shall be performed in a good and workmanlike manner, and in accordance with the Plans (except as modified pursuant to Paragraph 17). The Owner agrees that during the Adjustment of the Owner Utilities, the Owner and its contractors will coordinate their work with the Developer and the Design-Build Contractor so as not to interfere with the performance of work on the Facility by the Developer, the Design-Build Contractor or by any other party. "Interfere" means any action or inaction that interrupts, interferes, delays or damages Facility work.

(b) The Owner may utilize its own employees or may retain such contractor or contractors as are necessary to adjust the Owner Utilities, through the procedures set forth in Form TxDOT-U-48 "Statement Covering Contract Work" attached hereto as Exhibit C. If the Owner utilizes its own employees for the Adjustment of the Owner Utilities, a Form TxDOT-U-48 is not required. If the Adjustment of the Owner Utilities is undertaken by the Owner's contractor under a competitive bidding process, all bidding and contracting shall be conducted in accordance with all federal and state laws and regulations applicable to the Owner and the Facility.

(c) The Owner shall obtain all permits necessary for the construction to be performed by the Owner hereunder, and the Design-Build Contractor shall cooperate in that process as needed. The Owner shall submit a traffic control plan to the Design-Build Contractor as required for Adjustment work to be performed on existing road rights of way.

(d) The Owner shall commence its construction for Adjustment of each Owner Utility hereunder promptly after (i) receiving written notice to proceed therewith from the Design-Build Contractor, and (ii) any right of way necessary for such Adjustment has been acquired either by TxDOT (for adjusted facilities to be located within the Facility right of way) or by the Owner (for adjusted facilities to be located outside of the Facility right of way), or a right-of-entry permitting Owner's construction has been obtained from the landowner by the Design-Build Contractor or by the Owner with the Design-Build Contractor's prior approval. The Owner shall notify the Design-Build Contractor at least 72 hours prior to commencing construction for the Adjustment of each Owner Utility hereunder.

(e) The Owner shall expeditiously stake the survey of the proposed locations of the Owner Utilities being adjusted, on the basis of the final approved Plans. The Design-Build Contractor shall verify that the Owner's Utilities, whether moving to a new location or remaining in place, clear the planned construction of the Facility as staked in the field as well as the Ultimate Configuration.

(f) The Owner shall complete all of the Utility reconstruction and relocation work, including final testing and acceptance thereof *[check one box that applies]*:

☐ on or before _____, 20___.

☐ a duration not to exceed _____ calendar days upon notice to proceed by the Design-Build Contractor.

(g) The amount of reimbursement due to the Owner pursuant to this Agreement for the affected Adjustment(s) shall be reduced by ten percent (10%) for each 30-day period (and by a pro rata amount of said ten percent (10%) for any portion of a 30-day period) by which the final completion and acceptance date for the affected Adjustment(s) exceeds the applicable deadline. The provisions of this Paragraph 4(g) shall not limit any other remedy available to the Developer and/or the Design-Build Contractor at law or in equity as a result of the Owner's failure to meet any deadline hereunder.

The above reduction applies except to the extent due to (i) Force Majeure as described in Paragraph 25(c), (ii) any act or omission of the Developer and/or the Design-Build Contractor, if the Owner fails to meet any deadline established pursuant to Paragraph 4(f), or (iii) if the Developer, the Design-Build Contractor and TxDOT determine, in their sole discretion, that a delay in the relocation work is the result of circumstances beyond the control of the Owner or Owner's contractor and the Design-Build Contractor will not reduce the reimbursement.

5. **Costs of the Work.**

(a) The Owner's costs for Adjustment of each Owner Utility shall be derived from (i) the accumulated total of costs incurred by the Owner for design and construction of such Adjustment, plus (ii) the Owner's other related costs to the extent permitted pursuant to Paragraph 5(c) (including without limitation the eligible engineering costs incurred by the Owner for design prior to execution of this Agreement), plus (iii) the Owner's right of way acquisition costs, if any, which are reimbursable pursuant to Paragraph 16.

(b) The Owner's costs associated with Adjustment of the Owner Utilities shall be developed pursuant to the method checked and described below *[check only one box]*:

☐ (1) Actual costs accumulated in accordance with a work order accounting procedure prescribed by the applicable Federal or State regulatory body ("Actual Cost"); or

☐ (2) Actual costs accumulated in accordance with an established accounting procedure developed by the Owner and which the Owner uses in its regular operations ("Actual Cost"); or

☐ (3) The agreed sum of $ _____ ("Agreed Sum"), as supported by the analysis of estimated costs attached hereto as part of Exhibit A.

(c) Eligible Owner costs shall include only those authorized under 23 C.F.R. Part 645, Subpart A. The Owner agrees that costs referenced in 23 C.F.R. Section 645.117(d)(2) are not eligible for reimbursement. These regulations can be found at: http://www.access.gpo.gov/nara/cfr/waisidx_04/23cfr645_04.html

6. **Responsibility for Costs of Adjustment Work.**

The Agreed Sum or Actual Cost, as applicable, of all work to be performed pursuant to this Agreement shall be allocated between the Design-Build Contractor and the Owner as identified in Exhibit A and in accordance with §203.092, Texas Transportation Code, An allocation percentage may be determined by application of an Eligibility Ratio, if appropriate, as detailed in Exhibit A; provided, however, that any portion of an Agreed Sum or Actual Cost attributable to Betterment shall be allocated 100% to the Owner in accordance with Paragraph 10. All costs charged to the Design-Build Contractor by the Owner shall be reasonable and shall be computed using rates and schedules not exceeding those applicable to similar work performed by or for the Owner at the Owner's expense. Payment of the costs allocated to the Design-Build Contractor pursuant to this Agreement (if any) shall be full compensation to the Owner for all costs incurred by the Owner in Adjusting the Owner Utilities (including without limitation costs of relinquishing and/or acquiring right of way), and TxDOT shall have no liability to the Owner for any such costs. Owner expressly acknowledges that it shall be entitled to compensation only from the Design-Build Contractor for any Adjustment costs for the Owner Utilities covered by this Agreement, including costs with respect to real property interests (either acquired or relinquished), and specifically acknowledges that it shall not be entitled to compensation or reimbursement from TxDOT or the State of Texas.

7. **Billing, Payment, Records and Audits: Actual Cost Method.** The following provisions apply if the Owner's costs are developed under procedure (1) or (2) described in Paragraph 5(b):

(a) After (i) completion of all Adjustment work to be performed pursuant to this Agreement, (ii) the Design-Build Contractor's final inspection of the Adjustment work by Owner hereunder (and resolution of any deficiencies found), and (iii) receipt of an invoice complying with the applicable requirements of Paragraph 9, the Design-Build Contractor shall pay to the Owner an amount equal to ninety percent (90%) of the Design-Build Contractor's share of the Owner's costs as shown in such final invoice (less amounts previously paid, and applicable credits). After completion of the Design-Build Contractor's audit referenced in Paragraph 7(c) and the parties' mutual determination of any necessary adjustment to the final invoice resulting therefrom, the Design-Build Contractor shall make any final payment due so that total payments will equal the total amount of the Design-Build Contractor's share reflected on such final invoice (as adjusted, if applicable).

(b) When requested by the Owner and properly invoiced in accordance with Paragraph 9, the Design-Build Contractor shall make intermediate payments to the Owner based upon the progress of the work completed at not more than monthly intervals, and such payments shall not exceed eighty percent (80%) of the Design-Build Contractor's share of the Owner's eligible costs as shown in each such invoice (less applicable credits). Intermediate payments shall not be construed as final payment for any items included in the intermediate payment.

(c) The Owner shall maintain complete and accurate cost records for all work performed pursuant to this Agreement, in accordance with the provisions of 23 C.F.R. Part 645, Subpart A. The Owner shall maintain such records for four (4) years after receipt of final payment hereunder. The Developer, the Design-Build Contractor and their respective representatives shall be allowed to audit such records during the Owner's regular business hours. Unsupported charges will not be considered eligible for reimbursement. The parties shall mutually agree upon (and shall promptly implement by payment or refund, as applicable) any financial adjustment found necessary by the Developer's

and/or Design-Build Contractor's audit. TxDOT, the Federal Highway Administration, and their respective representatives also shall be allowed to audit such records upon reasonable notice to the Owner, during the Owner's regular business hours.

8. **Billing and Payment: Agreed Sum Method.** If the Owner's costs are developed under procedure (3) described in Paragraph 5(b), then the Design-Build Contractor shall pay its share of the Agreed Sum to the Owner after (a) completion of all Adjustment work to be performed pursuant to this Agreement, (b) the Design-Build Contractor's final inspection of the Adjustment work by Owner hereunder (and resolution of any deficiencies found), and (c) receipt of an invoice complying with the applicable requirements of Paragraph 9.

9. **Invoices.** Each invoice submitted by the Owner (i) shall be prepared in the form and manner prescribed by 23 C.F.R. Part 645, Subpart A, and (ii) if the Owner's costs are developed under procedure (1) or (2) described in Paragraph 5(b), shall list each of the services performed, the amount of time spent and the date on which the service was performed. The original and three (3) copies of each invoice shall be submitted to the Design-Build Contractor at the address for notices stated in Paragraph 23, unless otherwise directed by the Design-Build Contractor pursuant to Paragraph 23, together with (1) such supporting information to substantiate all invoices as reasonably requested by the Design-Build Contractor, and (2) such waivers or releases of liens as the Design-Builder may reasonably require. The Owner shall make commercially reasonable efforts to submit final invoices not later than one hundred twenty (120) days after completion of work. Final invoices shall include any necessary quitclaim deeds pursuant to Paragraph 16, and all applicable record drawings accurately representing the Adjustment as installed. The Owner hereby acknowledges and agrees that any right it may have for reimbursement of any of its costs not submitted to the Design-Build Contractor within eighteen months following completion of all Adjustment work to be performed by both parties pursuant to this Agreement shall be deemed to have been abandoned and waived. Invoices shall clearly delineate total costs, and those costs that are reimbursable pursuant to the terms of this Agreement.

10. **Betterment.**

(a) For purposes of this Agreement, the term "Betterment" means any upgrading of an Owner Utility being adjusted that is not attributable to the construction of the Facility and is made solely for the benefit of and at the election of the Owner, including but not limited to an increase in the capacity, capability, efficiency or function of the adjusted Utility over that provided by the existing Utility facility or an expansion of the existing Utility facility; provided, however, that the following are not considered Betterments:

(i) any upgrading which is required for accommodation of the Facility;

(ii) replacement devices or materials that are of equivalent standards although not identical;

(iii) replacement of devices or materials no longer regularly manufactured with the next highest grade or size;

(iv) any upgrading required by applicable laws, regulations or ordinances;

(v) replacement devices or materials which are used for reasons of economy (e.g., non-stocked items may be uneconomical to purchase); or

(vi) any upgrading required by the Owner's written "standards" meeting the requirements of Paragraph 3(d).

[Include the following for fiber optic Owner Utilities only:] Extension of an Adjustment to the nearest splice boxes shall not be considered a Betterment if required by the Owner in order to maintain its written telephony standards.

Any upgrading required by the Owner's written "standards" meeting the requirements of Paragraph 3(d) shall be deemed to be of direct benefit to the Facility.

(b) It is understood and agreed that neither the Developer nor the Design-Build Contractor will pay for any Betterments and that the Owner shall not be entitled to payment therefor. No Betterment may be performed in connection with the Adjustment of the Owner Utilities which is incompatible with the Facility or the Ultimate Configuration or which cannot be performed within the other constraints of applicable law, any applicable governmental approvals, and the requirements imposed on the Developer by the CDA, including without limitation the scheduling requirements thereunder. Accordingly, the parties agree as follows *[check the one box that applies, and complete if appropriate]*:

☐ (i) The Adjustment of the Owner Utilities pursuant to the Plans does not include any Betterment.

☐ The Adjustment of the Owner Utilities pursuant to the Plans includes Betterment to the Owner Utilities by reason of *[insert explanation, e.g. "replacing 12" pipe with 24" pipe]*: _____. The Owner has provided to the Design-Build Contractor comparative estimates for (i) all costs for work to be performed by the Owner pursuant to this Agreement, including work attributable to the Betterment, and (ii) the cost to perform such work without the Betterment, which estimates are hereby approved by the Design-Build Contractor. The estimated amount of the Owner's costs for work hereunder which is attributable to Betterment is $_____, calculated by subtracting (ii) from (i). The percentage of the total cost of the Owner's work hereunder which is attributable to Betterment is _____%, calculated by subtracting (ii) from (i), which remainder shall be divided by (i).

(c) If Paragraph 10(b) identifies Betterment, then the following shall apply:

(i) If the Owner's costs are developed under procedure (3) described in Paragraph 5(b), then the Agreed Sum stated in that Paragraph includes any credits due to the Design-Build Contractor on account of the identified Betterment, and no further adjustment shall be made on account of same.

(ii) If the Owner's costs are developed under procedure (1) or (2) described in Paragraph 5(b), the parties agree as follows *[If Paragraph 10(b) identifies Betterment <u>and</u> the Owner's costs are developed under procedure (1) or (2), check the <u>one</u> appropriate provision]*:

☐ The estimated cost stated in Paragraph 10(b) is the agreed and final amount due for Betterment hereunder. Accordingly, each intermediate invoice submitted pursuant to Paragraph 7(b) shall include a credit for an appropriate percentage of the agreed Betterment amount, proportionate to the percentage of completion reflected in such invoice. The final invoice submitted pursuant to Paragraph 7(a) shall reflect the full amount of the agreed Betterment credit. For each invoice described in this paragraph, the credit for Betterment shall be applied before calculating the Design-Build

Contractor's share (pursuant to Paragraph 6) of the cost of the Adjustment work. No other adjustment (either up or down) shall be made based on actual Betterment costs.

☐ The Owner is responsible for the actual cost of the identified Betterment, determined by multiplying (a) the Betterment percentage stated in Paragraph 10(b), by (b) the actual cost of all work performed by the Owner pursuant to this Agreement (including work attributable to the Betterment), as invoiced by the Owner to the Design-Build Contractor. Accordingly, each invoice submitted pursuant to either Paragraph 7(a) or Paragraph 7(b) shall credit the Design-Build Contractor with an amount calculated by multiplying (x) the Betterment percentage stated in Paragraph 10(b), by (y) the amount billed on such invoice.

(d) The determinations and calculations of Betterment described in this Paragraph 10 shall exclude right of way acquisition costs. Betterment in connection with right-of-way acquisition is addressed in Paragraph 16.

11. **Salvage.** For any Adjustment from which the Owner recovers any materials and/or parts and retains or sells the same, after application of any applicable Betterment credit, the Design-Build Contractor is entitled to a credit for the salvage value of such materials and/or parts, determined in accordance with 23 C.F.R. Section 645.105(j). If the Owner's costs are developed under procedure (1) or (2) described in Paragraph 5(b), then the final invoice submitted pursuant to Paragraph 7(a) shall credit the Design-Build Contractor with the full salvage value. If the Owner's costs are developed under procedure (3) described in Paragraph 5(b), then the Agreed Sum includes any credit due to the Design-Build Contractor on account of salvage.

12. **Utility Investigations.** At the Design-Build Contractor's request, the Owner shall assist the Design-Build Contractor in locating any Utilities (including appurtenances) which are owned and/or operated by Owner and may be impacted by the Facility. Without limiting the generality of the foregoing, in order to help assure that neither the adjusted Owner Utilities nor existing, unadjusted utilities owned or operated by the Owner are damaged during construction of the Facility, the Owner shall mark in the field the location of all such utilities horizontally on the ground in advance of Facility construction in the immediate area of such utilities.

13. **Inspection and Ownership of Owner Utilities.**

(a) The Developer and/or the Design-Build Contractor shall have the right, at its own expense, to inspect the Adjustment work performed by the Owner or its contractors, during and upon completion of construction. All inspections of work shall be completed and any comment provided within **five (5) business days** after request for inspection is received.

(b) The Owner shall accept full responsibility for all future repairs and maintenance of said Owner Utilities. In no event shall the Developer, the Design-Build Contractor or TxDOT become responsible for making any repairs or maintenance, or for discharging the cost of same. The provisions of this Paragraph 13(b) shall not limit any rights which the Owner may have against the Developer or the Design-Build Contractor if either party respectively damages any Owner Utility as a result of its respective Facility activities.

14. **Design Changes.** The Developer and the Design-Build Contractor will be responsible for additional Adjustment design and the Design-Build Contractor will be responsible for additional construction costs necessitated by design changes to the Facility made after approval of the Plans, upon the terms specified herein.

15. **Field Modifications.** The Owner shall provide the Design-Build Contractor with documentation of any field modifications, including Utility Adjustment Field Modifications as well as minor changes as described in Paragraph 17(b), occurring in the Adjustment of the Owner Utilities.

16. **Real Property Interests.**

(a) The Owner has provided, or upon execution of this Agreement shall promptly provide to the Developer and the Design-Build Contractor, documentation acceptable to TxDOT indicating any right, title or interest in real property claimed by the Owner with respect to the Owner Utilities in their existing location(s). Such claims are subject to TxDOT's approval as part of its review of the Design-Build Contractor's Utility Assembly as described in Paragraph 2. Claims approved by TxDOT as to rights or interests are referred to herein as "Existing Interests".

(b) If acquisition of any new easement or other interest in real property ("New Interest") is necessary for the Adjustment of any Owner Utilities, then the Owner shall be responsible for undertaking such acquisition. The Owner shall implement each acquisition hereunder expeditiously so that related Adjustment construction can proceed in accordance with the Developer's and the Design-Build Contractor's Facility schedules. The Design-Build Contractor shall be responsible for its share (if any, as specified in Paragraph 6) of the actual and reasonable acquisition costs of any such New Interest (including without limitation the Owner's reasonable overhead charges and reasonable legal costs as well as compensation paid to the landowner), excluding any costs attributable to Betterment as described in Paragraph 16(c), and subject to the provisions of Paragraph 16(e); provided, however, that all acquisition costs shall be subject to the Design-Build Contractor's prior written approval. Eligible acquisition costs shall be segregated from other costs on the Owner's estimates and invoices. Any such New Interest shall have a written valuation and shall be acquired in accordance with applicable law.

(c) The Design-Build Contractor shall pay its share only for a replacement in kind of an Existing Interest (e.g., in width and type), unless a New Interest exceeding such standard (i) is required in order to accommodate the Facility or by compliance with applicable law, or (ii) is called for by the Design-Build Contractor in the interest of overall Facility economy. Any New Interest which is not the Design-Builder's cost responsibility pursuant to the preceding sentence shall be considered a Betterment to the extent that it upgrades the Existing Interest which it replaces, or in its entirety if the related Owner Utility was not installed pursuant to an Existing Interest. Betterment costs shall be solely the Owner's responsibility.

(d) For each Existing Interest located within the final Facility right of way, upon completion of the related Adjustment work and its acceptance by the Owner, the Owner agrees to execute a quitclaim deed or other appropriate documentation relinquishing such Existing Interest to TxDOT, unless the affected Owner Utility is remaining in its original location or is being reinstalled in a new location within the area subject to such Existing Interest. All quitclaim deeds or other relinquishment documents shall be subject to TxDOT's approval as part of its review of the Utility Assembly as described in Paragraph 2. For each such Existing Interest relinquished by the Owner, the Design-Build Contractor shall do one of the following to compensate the Owner for such Existing Interest, as appropriate:

(i) If the Owner acquires a New Interest for the affected Owner Utility, the Design-Build Contractor shall reimburse the Owner for the Design-Build Contractor's

share of the Owner's actual and reasonable acquisition costs in accordance with Paragraph 16(b) and subject to Paragraph 16(c); or

(ii) If the Owner does not acquire a New Interest for the affected Owner Utility, the Design-Build Contractor shall compensate the Owner for the Design-Build Contractor's share of the fair market value of such relinquished Existing Interest, as mutually agreed between the Owner and the Design-Build Contractor and supported by a written valuation.

The compensation, if any, provided to the Owner pursuant to either subparagraph (i) or subparagraph (ii) above shall constitute complete compensation to the Owner for the relinquished Existing Interest and any New Interest, and no further compensation shall be due to the Owner from the Developer, the Design-Build Contractor or TxDOT on account of such Existing Interest or New Interest(s).

(e) The Owner shall execute a Utility Joint Use Acknowledgment (TxDOT-U-80A) for each Adjustment where required pursuant to TxDOT policies. All Utility Joint Use Acknowledgments shall be subject to TxDOT approval as part of its review of the Utility Assembly as described in Paragraph 2.

17. **Amendments and Modifications.** This Agreement may be amended or modified only by a written instrument executed by the parties hereto, in accordance with Paragraph 17(a) or Paragraph 17(b) below.

(a) Except as otherwise provided in Paragraph 17(b), any amendment or modification to this Agreement or the Plans attached hereto shall be implemented by a Utility Adjustment Agreement Amendment ("UAAA") in the form of Exhibit B hereto (TxDOT-CDA-U-35A-OM). The UAAA form can be used for a new scope of work with concurrence of the Developer, the Design-Build Contractor and TxDOT as long as the Design and Construction responsibilities have not changed. Each UAAA is subject to the review and approval of TxDOT, prior to its becoming effective for any purpose and prior to any work being initiated thereunder. The Owner agrees to keep and track costs for each UAAA separately from other work being performed.

(b) For purposes of this Paragraph 17(b), "Utility Adjustment Field Modification" shall mean any horizontal or vertical design change from the Plans included in a Utility Assembly previously approved by TxDOT, due either to design of the Facility or to conditions not accurately reflected in the approved Utility Assembly (e.g., shifting the alignment of an 8 in. water line to miss a modified or new roadway drainage structure). A Utility Adjustment Field Modification agreed upon by the Design-Build Contractor and the Owner does not require a UAAA, provided that the modified Plans have been submitted to TxDOT for its review and comment. A minor change (e.g., an additional water valve, an added Utility marker at a ROW line, a change in vertical bend, etc.) will not be considered a Utility Adjustment Field Modification and will not require a UAAA, but shall be shown in the documentation required pursuant to Paragraph 15.

18. **Relationship of the Parties.**

(a) Although some of the duties described in this Agreement are assigned specifically to either the Developer or the Design-Build Contractor, the obligation under this Agreement to design and construct the Facility at the Developer's or Design-Build Contractor's expense, including the Adjustment, is jointly shared by the Developer and the Design-Build Contractor. To the extent the Design-Build Contractor fails to perform an express

duty or obligation of this Agreement, the Developer is authorized and obligated to provide such performance. Nothing in this Paragraph 18(a) however, alters or shall be construed in any way to alter the obligations, responsibilities, benefits, rights, remedies, and claims between Developer and the Design-Build Contractor under the Design-Build Contract to perform and pay for the Adjustment.

(b) Except as provided in Paragraph 18(a) above, this Agreement does not in any way, and shall not be construed to, create a principal/agent or joint venture relationship between the Owner and the other parties hereto and under no circumstances shall the Owner , the Design-Build Contractor or the Developer be considered as or represent itself to be an agent of another.

(c) Neither this Agreement nor the Design-Build Contract alters, or shall be construed in any way to alter the obligations, responsibilities, benefits, rights, remedies, and claims between the Developer and TxDOT under the CDA to design and construct the Facility, including the Adjustment.

19. **Entire Agreement.** This Agreement embodies the entire agreement between the parties and there are no oral or written agreements between the parties or any representations made which are not expressly set forth herein.

20. **Assignment; Binding Effect; TxDOT as Third Party Beneficiary.** None of the Owner, the Developer or the Design-Build Contractor may assign any of its rights or delegate any of its duties under this Agreement without the prior written consent of the other parties and of TxDOT, which consent may not be unreasonably withheld or delayed; provided, however, that the Developer and the Design-Build Contractor may assign any of its rights and/or delegate any of its duties to TxDOT or to any other entity with which TxDOT contracts to fulfill the Developer's obligations under the CDA, at any time without the prior consent of the Owner.

This Agreement shall bind the Owner, the Developer, the Design-Build Contractor and their successors and permitted assigns, and nothing in this Agreement nor in any approval subsequently provided by any party hereto shall be construed as giving any benefits, rights, remedies, or claims to any other person, firm, corporation or other entity, including, without limitation, any contractor or other party retained for the Adjustment work or the public in general; provided, however, that the Owner, the Developer and the Design-Build Contractor agree that although TxDOT is not a party to this Agreement, TxDOT is intended to be a third-party beneficiary to this Agreement.

21. **Breach by the Parties.**

(a) If the Owner claims that the Developer or the Design-Build Contractor (the "Defaulting Party") has breached any of its obligations under this Agreement, the Owner will notify the Developer, the Design-Build Contractor and TxDOT in writing of such breach, and the Developer shall have 30 days following receipt of such notice in which to cure such breach, before the Owner may invoke any remedies which may be available to it as a result of such breach; provided, however, that both during and after such period TxDOT shall have the right, but not the obligation, to cure any breach by the Defaulting Party. Without limiting the generality of the foregoing, (a) TxDOT shall have no liability to the Owner for any act or omission committed by the Defaulting Party in connection with this Agreement, including without limitation any reimbursement owed to the Owner hereunder, and (b) in no event shall TxDOT be responsible for any repairs or maintenance to the Owner Utilities adjusted pursuant to this Agreement.

(b) If the Developer or the Design-Build Contractor claims that the Owner has breached any of its obligations under this Agreement, the Developer or the Design-Build Contractor will notify the Owner and TxDOT in writing of such breach, and the Owner shall have 30 days following receipt of such notice in which to cure such breach, before the Developer or the Design-Builder may invoke any remedies which may be available to it as a result of such breach.

22. **Traffic Control.** The Design-Build Contractor shall provide traffic control or shall reimburse the Owner for the Design-Build Contractor's share (if any, as specified in Paragraph 6) of the costs for traffic control made necessary by the Adjustment work performed by either the Design-Build Contractor or the Owner pursuant to this Agreement, in compliance with the requirements of the Texas Manual on Uniform Traffic Control Devices. Betterment percentages calculated in Paragraph 10 shall also apply to the traffic control costs.

23. **Notices.** Except as otherwise expressly provided in this Agreement, all notices or communications pursuant to this Agreement shall be sent or delivered to the following:

The Owner:

Phone:
Fax:

The Developer:

Phone:
Fax:

The Design-Build Contractor:

Phone:
Fax:

A party sending a notice of default of this Agreement to another party shall also send a copy of such notice to TxDOT and to the CDA Utility Manager at the following addresses:

TxDOT:

TxDOT Department of Transportation
Attention: Strategics Projects Division – ROW Director
125 E. 11th Street
Austin, Texas 78701-2483
Phone: (512) 936-0980

CDA Utility Manager

Any notice or demand required herein shall be given (a) personally, (b) by certified or registered mail, postage prepaid, return receipt requested, or (c) by reliable messenger or overnight courier to the appropriate address set forth above. Any notice served personally shall be deemed

delivered upon receipt and served by certified or registered mail or by reliable messenger or overnight courier shall be deemed delivered on the date of receipt as shown on the addressee's registry or certification of receipt or on the date receipt is refused as shown on the records or manifest of the U.S. Postal Service or such courier. Any party may from time to time designate any other address for this purpose by written notice to all other parties; TxDOT may designate another address by written notice to all parties.

24. **Approvals.** Any acceptance, approval, or any other like action (collectively "Approval") required or permitted to be given by either the Developer, the Design-Build Contractor, or the Owner pursuant to this Agreement:

(a) Must be in writing to be effective (except if deemed granted pursuant hereto),

(b) Shall not be unreasonably withheld or delayed; and if Approval is withheld, such withholding shall be in writing and shall state with specificity the reason for withholding such Approval, and every effort shall be made to identify with as much detail as possible what changes are required for Approval, and

(c) Except for approvals by TxDOT, and except as may be specifically provided otherwise in this Agreement, shall be deemed granted if no response is provided to the party requesting an Approval within the time period prescribed by this Agreement (or if no time period is prescribed, then fourteen (14) calendar days), commencing upon actual receipt by the party from which an Approval is requested or required, of a request for Approval from the requesting party. All requests for Approval shall be sent out by the requesting party to the other party in accordance with Paragraph 23.

25. **Time; Force Majeure.**

(a) Time is of the essence in the performance of this Agreement.

(b) All references to "days" herein shall be construed to refer to calendar days, unless otherwise stated.

(c) No party shall be liable to another party for any delay in performance under this Agreement from any cause beyond its control and without its fault or negligence ("Force Majeure"), such as acts of God, acts of civil or military authority, fire, earthquake, strike, unusually severe weather, floods or power blackouts. If any such event of Force Majeure occurs, the Owner agrees, if requested by the Developer, to accelerate its efforts hereunder if reasonably feasible in order to regain lost time, so long as the Developer agrees to reimburse the Owner for the reasonable and actual costs of such efforts.

26. **TxDOT Review and Approval**. Notwithstanding any contrary provision of this Agreement, if this Agreement and the CDA call for different levels of review for any items submitted to TxDOT (e.g., "approval" as opposed to "review and comment"), then the level of review called for by the CDA will prevail for purposes of this Agreement.

27. **Continuing Performance.** In the event of a dispute, the Owner, the Developer and the Design-Build Contractor agree to continue their respective performance hereunder to the extent feasible in light of the dispute, including paying billings, and such continuation of efforts and payment of billings shall not be construed as a waiver of any legal right.

28. **Equitable Relief**. The Developer, the Design-Build Contractor and the Owner acknowledge and agree that delays in Adjustment of the Owner Utilities will impact the public convenience, safety and welfare, and that (without limiting the parties' remedies hereunder) monetary damages would

be inadequate to compensate for delays in the construction of the Facility. Consequently, the parties hereto (and TxDOT as well, as a third party beneficiary) shall be entitled to specific performance or other equitable relief in the event of any breach of this Agreement which threatens to delay construction of the Facility; provided, however, that the fact that specific performance or other equitable relief may be granted shall not prejudice any claims for payment or otherwise related to performance of the Adjustment work hereunder.

29. **Authority.** The Owner, the Developer and the Design-Build Contractor each represents and warrants to the other party that the warranting party possesses the legal authority to enter into this Agreement and that it has taken all actions necessary to exercise that authority and to lawfully authorize its undersigned signatory to execute this Agreement and to bind such party to its terms. Each person executing this Agreement on behalf of a party warrants that he or she is duly authorized to enter into this Agreement on behalf of such party and to bind it to the terms hereof.

30. **Cooperation.** The parties acknowledge that the timely completion of the Facility will be influenced by the ability of the Owner (and its contractors), the Developer and the Design-Build Contractor to coordinate their activities, communicate with each other, and respond promptly to reasonable requests. Subject to the terms and conditions of this Agreement, the Owner, the Developer and the Design-Build Contractor agree to take all steps reasonably required to coordinate their respective duties hereunder in a manner consistent with the Developer's and the Design-Build Contractor's current and future construction schedules for the Facility. The Owner further agrees to require its contractors to coordinate their respective work hereunder with the Developer and the Design-Build Contractor.

31. **Termination.** If the Facility is canceled or modified so as to eliminate the necessity of the Adjustment work described herein, then the Developer shall notify the Owner and the Design-Build Contractor in writing and the Developer reserves the right to thereupon terminate this Agreement. Upon such termination, the parties shall negotiate in good faith an amendment that shall provide mutually acceptable terms and conditions for handling the respective rights and liabilities of the parties relating to such termination.

32. **Nondiscrimination**. Each party hereto agrees, with respect to the work performed by such party pursuant to this Agreement, that such party shall not discriminate on the grounds of race, color, sex, national origin or disability in the selection and/or retention of contractors and consultants, including procurement of materials and leases of equipment.

33. **Applicable Law, Jurisdiction and Venue**. This Agreement shall be governed by the laws of the State of Texas, without regard to the conflict of laws principles thereof. Venue for any action brought to enforce this Agreement or relating to the relationship between any of the parties shall be the District Court of Travis County, Texas or the United States District Court for the Western District of Texas (Austin).

34. **Waiver of Consequential Damages**. No party hereto shall be liable to any other party to this Agreement, whether in contract, tort, equity, or otherwise (including negligence, warranty, indemnity, strict liability, or otherwise), for any punitive, exemplary, special, indirect, incidental, or consequential damages, including, without limitation, loss of profits or revenues, loss of use, claims of customers, or loss of business opportunity.

34. **Captions**. The captions and headings of the various paragraphs of this Agreement are for convenience and identification only, and shall not be deemed to limit or define the content of their respective paragraphs.

35. **Counterparts.** This Agreement may be executed in any number of counterparts. Each such counterpart hereof shall be deemed to be an original instrument but all such counterparts together shall constitute one and the same instrument.

36. **Effective Date.** Except for the provisions of Paragraph 2(a) (which shall become effective immediately upon execution of this Agreement by the Owner, the Developer and the Design-Build Contractor without regard to TxDOT's signature), this Agreement shall become effective upon the later of (a) the date of signing by the last party (either the Owner, the Developer or the Design-Build Contractor) signing this Agreement, and (b) the date of TxDOT's approval as indicated by the signature of TxDOT's representative, below.

APPROVED BY:
TEXAS DEPARTMENT OF TRANSPORTATION

By: _____
Authorized Signature

Printed Name: _____

Title: _____

Date: _____

OWNER

_____
[Print Owner Name]

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

DESIGN-BUILD CONTRACTOR

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date:

DEVELOPER

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

County:
ROW CSJ No.:

Const. CSJ No.:

Highway:
Limits:
Fed. Proj. No.:

EXHIBIT A

PLANS, SPECIFICATIONS, COST ESTIMATES AND ALLOCATION

County:
ROW CSJ No.:

Const. CSJ No.:

Highway:
Limits:
Fed. Proj. No.:

EXHIBIT B

UTILITY ADJUSTMENT AGREEMENT AMENDMENT
(TxDOT-CDA-U-35A-OM)

County:
ROW CSJ No.:

Const. CSJ No.:

Highway:
Limits:
Fed. Proj. No.:

EXHIBIT C

STATEMENT COVERING CONTRACT WORK
(TxDOT-U-48)

County:
Highway:
Limits:
Fed. Proj. No.:
ROW CSJ No.:
Const. CSJ No.:

UTILITY ADJUSTMENT AGREEMENT AMENDMENT (Developer Managed)

(Amendment No. to Agreement No.: -U-_____)

THIS AMENDMENT TO MASTER UTILITY ADJUSTMENT AGREEMENT (this "Amendment"), by and between _____, hereinafter identified as the "**Developer**", _____, hereinafter identified as the "**Design-Build Contractor**" and _____, hereinafter identified as the "**Owner**", is as follows:

WITNESSETH

WHEREAS, the STATE of TEXAS, acting by and through the Texas Department of Transportation, hereinafter identified as "TxDOT", proposes to construct the turnpike project identified above (the "Facility", as more particularly described in the "Original Agreement", defined below); and

WHEREAS, pursuant to that certain Comprehensive Development Agreement ("CDA") by and between TxDOT and the Developer with respect to the Facility, the Developer has undertaken the obligation to design, construct, finance, operate and maintain the Facility, including causing the removal, relocation, or other necessary adjustment of existing utilities impacted by the Facility (collectively, "Adjustment"); and

WHEREAS, pursuant to that certain Design-Build Contract by and between the Developer and the Design-Build Contractor with respect to the Facility (the "Design-Build Contract"), the Design-Build Contractor has undertaken the obligation to design and construct the Facility, which includes the Adjustment; and

WHEREAS, the Owner, the Developer, and the Design-Build Contractor are parties to that certain executed Master Utility Adjustment Agreement designated by the "Agreement No." indicated above, as amended by previous amendments, if any (the "Original Agreement"), which provides for the adjustment of certain utilities owned and/or operated by the Owner (the "Utilities"); and

WHEREAS, the parties are required to utilize this Amendment form in order to modify the Original Agreement to add the adjustment of Owner facilities not covered by the Original Agreement; and

WHEREAS, the parties desire to amend the Original Agreement to add additional Owner utility facility(ies), on the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the agreements contained herein, the parties hereto agree as follows:

1. **Amendment.** The Original Agreement is hereby amended as follows:

1.1 **Plans.**

(a) The description of the Owner Utilities and the proposed Adjustment of the Owner Utilities in the Original Agreement is hereby amended to add the following utility facility(ies) ("Additional Owner Utilities") and proposed Adjustment(s) to the Owner Utilities described in the Original Agreement *[insert below a description of the affected facilities (by type, size and location) as well as a brief description of the nature of the Adjustment work to be performed (e.g., "adjust 12" waterline from approximately Highway Station 100+00 to approximately Highway Station 200+00)];* and

(b) The Plans, as defined in Paragraph 1 of the Original Agreement, are hereby amended to add thereto the plans, specifications and cost estimates attached hereto as Exhibit A.

(c) The Plans attached hereto as Exhibit A, along with this Amendment, shall be submitted upon execution to TxDOT in accordance with Paragraph 2 of the Original Agreement, and Paragraph 2 shall apply to this Amendment and the Plans attached hereto in the same manner as if this Amendment were the Original Agreement. If the Owner claims an Existing Interest for any of the Additional Owner Utilities, documentation with respect to such claim shall be submitted to TxDOT as part of this Amendment and the attached Plans, in accordance with Paragraph 15(a) of the Original Agreement.

1.2 **Advancement of Funds by Owner for Construction Costs.**

(a) Exhibit A of the Original Agreement is hereby amended to add for the Additional Owner Utilities and proposed Adjustment(s) the following information set forth on Exhibit A hereto: (i) all estimated engineering and construction-related costs, including labor, material, equipment and other miscellaneous construction items, and (ii) the Owner's and Design-Build Contractor's respective cost sharing responsibility for the estimated costs, as more fully described in Section 1.4 below.

The Owner shall advance to the Design-Build Contractor its allocated share, if any, of the estimated costs for construction and engineering work to be performed by Design-Build Contractor under this Amendment, in accordance with the following terms:

[Insert terms of advance funding to be agreed between Design-Build Contractor and Owner.]

(b) Adjustment Based on Actual Costs or Agreed Sum. For purposes of Paragraph 7(b) of the Original Agreement, the following terms apply to the Additional Owner Utilities and proposed Adjustment.

[Check the one appropriate provision]:

☐ The Owner is responsible for its share of the Design-Build Contractor's actual cost for the Adjustment, including any identified Betterment. Accordingly, upon completion of all Adjustment work to be performed by both parties pursuant to this Amendment, (i) the Owner shall pay to the Design-Build Contractor the amount, if any, by which the actual cost of the Betterment (as determined in Paragraph 9(b)) plus the actual cost of Owner's share of the Adjustment (based on the allocation set forth in Exhibit A) exceeds the estimated cost advanced by the Owner, or (ii) the Design-Build Contractor shall refund to the Owner the amount, if any, by which such advance exceeds such actual cost, as applicable.

☐ The Agreed Sum is the agreed and final amount due for the Adjustment, including any Betterment, under this Amendment. Accordingly, no adjustment (either up or down) of such amount shall be made based on actual costs.

1.3 **Reimbursement of Owner's Indirect Costs.** For purposes of Paragraph 6 of the Original Agreement, the following terms apply to the Additional Owner Utilities and proposed Adjustment:

(a) Design-Build Contractor agrees to reimburse the Owner its share of the Owner's indirect costs (e.g., engineering, inspection, testing, ROW) as identified in Exhibit A. When requested by the Owner, monthly progress payments will be made. The monthly payment will not exceed 80% of the estimated indirect work done to date. Once the indirect work is complete, final payment of the eligible indirect costs will be made. Intermediate payments shall not be construed as final payment for any items included in the intermediate payment.

(b) The Owner's indirect costs associated with Adjustment of the Owner Utilities shall be developed pursuant to the method checked and described below *[check only one box]*:

☐ (1) Actual related indirect costs accumulated in accordance with (i) a work order accounting procedure prescribed by the applicable Federal or State regulatory body, or (ii) established accounting procedure developed by the Owner and which the Owner uses in its regular operations or,

☐ (2) The agreed sum of $_____ ("Agreed Sum") as supported by the analysis of the Owner's estimated costs attached hereto as part of Exhibit A.

1.4 **Responsibility for Costs of Adjustment Work.** For purposes of Paragraph 4 of the Original Agreement, responsibility for the Agreed Sum or Actual Cost, as applicable, of all Adjustment work to be performed pursuant to this Amendment shall be allocated between the Design-Build Contractor and the Owner as identified in Exhibit A hereto and in accordance with §203.092, Texas Transportation Code. An allocation percentage may be determined by application of an Eligibility Ratio, if appropriate, as detailed in Exhibit A, provided however, that any portion of an Agreed Sum or Actual Cost attributable to Betterment shall be allocated 100% to the Owner in accordance with Paragraph 9 of the Original Agreement.

1.5 **Betterment.**

(a) Paragraph 9(b) (Betterment and Salvage) of the Original Agreement is hereby amended to add the following *[Check the one box that applies, and complete if appropriate]*:

☐ The Adjustment of the Additional Owner Utilities, pursuant to the Plans as amended herein, does not include any Betterment.

☐ The Adjustment of the Additional Owner Utilities, pursuant to the Plans as amended herein, includes Betterment to the Additional Owner Utilities by reason of *[insert explanation, e.g. "replacing 12" pipe with 24" pipe]*: _____. The Design-Build Contractor has provided to the Owner comparative estimates for (i) all work to be performed by the Design-Build Contractor pursuant to this Amendment, including work attributable to the Betterment, and (ii) the cost to perform such work without the Betterment, which estimates are hereby approved by the Owner. The estimated cost of the Design-Build Contractor's work under this Amendment which is attributable to Betterment is $_____, calculated by subtracting (ii) from (i). The percentage of the total cost of the Design-Build Contractor's work under this Amendment which is attributable to Betterment is

_____ %, calculated by subtracting (ii) from (i), which remainder is divided by (i).

(b) If the above Paragraph 1.5(a) identifies Betterment, the Owner shall advance to the Design-Build Contractor, at least **fourteen (14) days** prior to the date scheduled for commencement of construction for Adjustment of the Additional Owner Utilities, the estimated cost attributable to Betterment as set forth in Paragraph 1.5(a) of this Amendment. If the Owner fails to advance payment to the Design-Build Contractor on or before the foregoing deadline, the Design-Build Contractor shall have the option of commencing and completing (without delay) the Adjustment work without installation of the applicable Betterment. *[Check the one appropriate provision]*:

☐ The estimated cost stated in Paragraph 1.5(a) of this Amendment is the agreed and final amount due for Betterment under this Amendment, and accordingly no adjustment (either up or down) of such amount shall be made based on actual costs.

☐ The Owner is responsible for the Design-Build Contractor's actual cost for the identified Betterment. Accordingly, upon completion of all Adjustment work to be performed by both parties pursuant to this Amendment, (i) the Owner shall pay to the Design-Build Contractor the amount, if any, by which the actual cost of the Betterment (determined as provided below in this paragraph) exceeds the estimated cost advanced by the Owner, or (ii) the Design-Build Contractor shall refund to the Owner the amount, if any, by which such advance exceeds such actual cost, as applicable. Any additional payment by the Owner shall be due within **sixty (60) days** after the Owner's receipt of the Design-Build Contractor's invoice therefor, together with supporting documentation; any refund shall be due within **sixty (60) days** after completion of the Adjustment work under this Amendment. The actual cost of Betterment incurred by the Design-Build Contractor shall be calculated by multiplying (i) the Betterment percentage stated in Paragraph 1.5(a) of this Amendment, by (ii) the actual cost of all work performed by the Design-Build Contractor pursuant to this Amendment (including work attributable to the Betterment), as invoiced by the Design-Build Contractor to the Owner.

(c) The determinations and calculations of Betterment described in this Amendment shall exclude right-of-way acquisition costs. Betterment in connection with right-of-way acquisition is addressed in Paragraph 15 of the Original Agreement.

1.6 **Miscellaneous.**

(a) Owner and Design-Build Contractor agree to refer to this Amendment, designated by the "Amendment No." and "Agreement Number" indicated on page 1 above, on all future correspondence regarding the Adjustment work that is the subject of this Amendment and to track separately all costs relating to this Amendment and the Adjustment work described herein.

(b) [*Include any other proposed amendments allowed by applicable law.*]

2. **General.**

(a) All capitalized terms used in this Amendment shall have the meanings assigned to them in the Original Agreement, except as otherwise stated herein.

(b) This Amendment may be executed in any number of counterparts. Each such counterpart hereof shall be deemed to be an original instrument but all such counterparts together shall constitute one and the same instrument.

(c) Except as amended hereby, the Original Agreement shall remain in full force and effect. In no event shall the responsibility, as between the Owner and the Design-Build Contractor, for the preparation of the Plans and the Adjustment of the Owner Utilities be deemed to be amended hereby.

(d) This Amendment shall become effective upon the later of (a) the date of signing by the last party (either the Owner, the Design-Build Contractor or the Developer) signing this Amendment, and (b) the completion of TxDOT's review and approval as indicated by the signature of TxDOT's representative, below.

APPROVED BY:

TEXAS DEPARTMENT OF TRANSPORTATION

By: _____
Authorized Signature

Printed Name: _____

Title: _____

Date: _____

OWNER

_____
[Print Owner Name]

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

DESIGN-BUILD CONTRACTOR

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date:

DEVELOPER

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

County:
Highway:
Limits:
Fed. Proj. No.:
ROW CSJ No.:

Const. No.: **UTILITY ADJUSTMENT AGREEMENT AMENDMENT (Owner Managed)**

(Amendment No. to Agreement No.: -U-)

THIS AMENDMENT TO MASTER UTILITY ADJUSTMENT AGREEMENT (this "Amendment"), by and between _____, hereinafter identified as the "**Developer**", _____, hereinafter identified as the "**Design-Build Contractor**" and _____, hereinafter identified as the "**Owner**", is as follows:

WITNESSETH

WHEREAS, the STATE of TEXAS, acting by and through the Texas Department of Transportation, hereinafter identified as "TxDOT", proposes to construct the turnpike project identified above (the "Facility", as more particularly described in the "Original Agreement", defined below); and

WHEREAS, pursuant to that certain Comprehensive Development Agreement ("CDA") by and between TxDOT and the Developer with respect to the Facility, the Developer has undertaken the obligation to design, construct, finance, operate and maintain the Facility, including causing the removal, relocation, or other necessary adjustment of existing utilities impacted by the Facility (collectively, "Adjustment"); and

WHEREAS, pursuant to that certain Design-Build Contract by and between the Developer and the Design-Build Contractor with respect to the Facility (the "Design-Build Contract"), the Design-Build Contractor has undertaken the obligation to design and construct the Facility, which includes the Adjustment; and

WHEREAS, the Owner, the Developer and the Design-Build Contractor are parties to that certain executed Master Utility Adjustment Agreement designated by the "Agreement No." indicated above, as amended by previous amendments, if any (the "Original Agreement"), which provides for the adjustment of certain utilities owned and/or operated by the Owner (the "Utilities"); and

WHEREAS, the parties are required to utilize this Amendment form in order to modify the Original Agreement to add the adjustment of Owner utilities facilities not covered by the Original Agreement; and

WHEREAS, the parties desire to amend the Original Agreement to add additional Owner utility facility(ies), on the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the agreements contained herein, the parties hereto agree as follows:

1. **Amendment.** The Original Agreement is hereby amended as follows:

   (a) The description of the Owner Utilities and the proposed Adjustment of the Owner Utilities in the Original Agreement is hereby amended to add the following facility(ies) ("Additional Owner Utilities") and proposed Adjustment(s) *[insert below a description of the affected facilities (by type, size and location) as well as a brief description of the*

nature of the Adjustment work to be performed (e.g., "adjust 12" waterline from approximately Highway Station 100+00 to approximately Highway Station 200+00")]:

(b) The Plans, as defined in Paragraph 1 of the Original Agreement, are hereby amended to add thereto the plans, specifications and cost estimates attached hereto as Exhibit A.

(c) The Plans attached hereto as Exhibit A, along with this Amendment, shall be submitted upon execution to TxDOT in accordance with Paragraph 2 of the Original Agreement, and Paragraph 2 shall apply to this Amendment and the Plans attached hereto in the same manner as if this Amendment were the Original Agreement. If the Owner claims an Existing Interest for any of the Additional Owner Utilities, documentation with respect to such claim shall be submitted to TxDOT as part of this Amendment and the attached Plans, in accordance with Paragraph 16(a) of the Original Agreement.

(d) Paragraph 4(f) of the Original Agreement is hereby amended to add the following deadline for the Adjustment of the Additional Owner Utilities *[check one box that applies]*:

☐ Owner shall complete all of the utility reconstruction and relocation work, including final testing and acceptance thereof, on or before _____, 20_____.

☐ Owner shall complete all of the utility reconstruction and relocation work, including final testing and acceptance thereof, within _____ calendar days after delivery to Owner of a notice to proceed by Design-Builder.

(e) For purposes of Paragraph 5(b) of the Original Agreement, the Owner's costs associated with Adjustment of the Additional Owner Utilities shall be developed pursuant to the method checked and described below, *[check only one box]*:

☐ (1) Actual costs accumulated in accordance with a work order accounting procedure prescribed by the applicable Federal or State regulatory body ("Actual Cost"); or

☐ (2) Actual costs accumulated in accordance with an established accounting procedure developed by the Owner and which the Owner uses in its regular operations ("Actual Cost"); or

☐ (3) The agreed sum of $_____("Agreed Sum"), as supported by the analysis of estimated costs attached hereto as part of Exhibit A

(f) For purposes of Paragraph 6 of the Original Agreement, responsibility for the Agreed Sum or Actual Cost, as applicable, of all Adjustment work to be performed pursuant to this Amendment shall be allocated between the Design-Build Contractor and the Owner as identified in Exhibit A and in accordance with §203.092 of the Texas Transportation Code. An allocation percentage may be determined by application of an Eligibility Ratio, if appropriate, as detailed in Exhibit A; provided, however, that any portion of an Agreed Sum or Actual Cost attributable to Betterment shall be allocated 100% to the Owner in accordance with Paragraph 10 of the Original Agreement.

(g) Paragraph 10(b) of the Original Agreement is hereby amended to add the following *[Check the one box that applies]*:

☐ The Adjustment of the Additional Owner Utilities, pursuant to the Plans as amended herein, does not include any Betterment.

☐ The Adjustment of the Additional Owner Utilities, pursuant to the Plans as amended herein, includes Betterment to the Additional Owner Utilities by reason of *[insert explanation, e.g. "replacing 12" pipe with 24" pipe]*: _____. The Owner has provided to the Design-Builder comparative estimates for (i) all costs for work to be performed by the Owner pursuant to this Amendment, including work attributable to the Betterment, and (ii) the cost to perform such work without the Betterment, which estimates are hereby approved by the Design-Builder. The estimated amount of the Owner's costs for work under this Agreement which is attributable to Betterment is $_____, calculated by subtracting (ii) from (i). The percentage of the total cost of the Owner's work hereunder which is attributable to Betterment is _____%, calculated by subtracting (ii) from (i) which remainder shall be divided by (i).

(h) The following shall apply to any Betterment described in Paragraph 1(g) of this Amendment:

(i) If the Owner's costs are developed under procedure (3) described in Paragraph 1(e) of this Amendment, then the agreed sum stated in that Paragraph includes any credits due to the Design-Builder on account of the identified Betterment, and no further adjustment shall be made on account of same.

(ii) If the Owner's costs are developed under procedure (1) or (2) described in Paragraph 1(e) of this Amendment, the parties agree as follows *[check the <u>one</u> appropriate provision]*:

☐ The estimated cost stated in Paragraph 1(g) of this Amendment is the agreed and final amount due for Betterment under this Amendment. Accordingly, each intermediate invoice submitted for Adjustment(s) of the Additional Owner Utilities pursuant to Paragraph 7(b) of the Original Agreement shall credit the Design-Build Contractor with an appropriate amount of the agreed Betterment amount, proportionate to the percentage of completion reflected in such invoice. The final invoice submitted for Adjustment(s) of the Additional Owner Utilities pursuant to Paragraph 7(a) of the Original Agreement shall reflect the full amount of the agreed Betterment credit. For each invoice described in this paragraph, the credit for Betterment shall be applied before calculating the Developer's share (pursuant to Paragraph 1(e) of this Amendment) of the cost of the Adjustment work. No other adjustment (either up or down) shall be made based on actual Betterment costs.

☐ The Owner is responsible for the actual cost of the identified Betterment, determined by multiplying (a) the Betterment percentage stated in Paragraph 1(g) of this Amendment, by (b) the actual cost of all work performed by the Owner pursuant to this Amendment (including work attributable to the Betterment), as invoiced by the Owner to the Design-Build Contractor. Accordingly, each invoice submitted for Adjustment of the Additional Owner Utilities pursuant to either Paragraph 7(a) or Paragraph 7(b) of the Original Agreement shall credit the Design-Build Contractor with an amount calculated by multiplying (x) the Betterment percentage stated in Paragraph 1(g) of this Amendment, by (y) the amount billed on such invoice.

(i) The determinations and calculations of Betterment described in this Amendment shall exclude right-of-way acquisition costs. Betterment in connection with right-of-way acquisition is addressed in Paragraph 16 of the Original Agreement.

(j) Owner and the Design-Build Contractor agree to refer to this Amendment, designated by the "Amendment No." and "Agreement number" indicated on page 1 above, on all future correspondence regarding the Adjustment work that is the subject of this Amendment and to track separately all costs relating to this Amendment and the Adjustment work described herein.

(k) [*Include any other proposed amendments in compliance with the applicable law.*]

2. **General.**

(a) All capitalized terms used in this Amendment shall have the meanings assigned to them in the Original Agreement, except as otherwise stated herein.

(b) This Amendment may be executed in any number of counterparts. Each such counterpart hereof shall be deemed to be an original instrument but all such counterparts together shall constitute one and the same instrument.

(c) Except as amended hereby, the Original Agreement shall remain in full force and effect. In no event shall the responsibility, as between the Owner and the Design-Build Contractor, for the preparation of the Plans and the Adjustment of the Owner Utilities be deemed to be amended hereby.

(d) This Amendment shall become effective upon the later of (a) the date of signing by the last party (either the Owner, the Design-Build Contractor, or the Developer) signing this Amendment, and (b) the completion of TxDOT's review and approval as indicated by the signature of TxDOT's representative, below.

APPROVED BY:

TEXAS DEPARTMENT OF TRANSPORTATION

By: _____
Authorized Signature

Printed Name: Donald C. Toner, Jr, SR/WA

Date: _____

OWNER

_____
[Print Owner Name]

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

DESIGN-BUILD CONTRACTOR

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date:

DEVELOPER

By: _____
Duly Authorized Representative

Printed Name: _____

Title: _____

Date: _____

UTILITY JOINT USE ACKNOWLEDGEMENT
REIMBURSABLE UTILITY ADJUSTMENT

U-Number:

District:
Highway:
County:

WHEREAS, the State of Texas, ("**State**"), acting by and through the Texas Department of Transportation ("**TxDOT**"), proposes to make certain highway improvements on that section of the above-indicated highway; and

WHEREAS, the , ("**Utility**"), proposes to adjust or relocate certain of its facilities, if applicable, and retain title to any property rights it may have on, along or across, and within or over such limits of the highway right of way as indicated by the location map attached hereto.

NOW, THEREFORE, in consideration of the covenants and acknowledgements herein contained, the parties mutually agree as follows:

It is agreed that joint usage for both highway and utility purposes will be made of the area within the highway right of way limits as such area is defined and to the extent indicated on the aforementioned plans or sketches. Nothing in this Acknowledgement shall serve to modify or extinguish any compensable property interest vested in the **Utility** within the above described area. If the facilities shown in the aforementioned plans need to be altered or modified or new facilities constructed to either accommodate the proposed highway improvements or as part of **Utility's** future proposed changes to its own facilities, **Utility** agrees to notify **TxDOT** at least 30 days prior thereto, and to furnish necessary plans showing location and type of construction, unless an emergency situation occurs and immediate action is required. If an emergency situation occurs and immediate action is required, **Utility** agrees to notify **TxDOT** promptly. If such alteration, modification or new construction is in conflict with the current highway or planned future highway improvements, or could endanger the traveling public using said highway, **TxDOT** shall have the right, after receipt of such notice, to prescribe such regulations as necessary for the protection of the highway facility and the traveling public using said highway. Such regulations shall not extend, however, to requiring the placement of intended overhead lines underground or the routing of any lines outside of the area of joint usage above described.

If **Utility's** facilities are located along a controlled access highway, **Utility** agrees that ingress and egress for servicing its facilities will be limited to frontage roads where provided, nearby or adjacent public roads and streets, or trails along or near the highway right of way lines which only connect to an intersecting road. Entry may be made to the outer portion of the highway right of way from any one or all access points. Where supports, manholes or other appurtenances of the **Utility's** facilities are located in medians or interchange areas, access from the through-traffic roadways or ramps will be allowed by permit issued by the **State** to the **Utility** setting forth the conditions for policing and other controls to protect highway users. In an emergency situation, if the means of access or service operations as herein provided will not permit emergency repairs as required for the safety and welfare of the public, the **Utility** shall have a temporary right of access to and from the through-traffic roadways and ramps as necessary to accomplish the required repairs, provided **TxDOT** is notified immediately when such repairs are initiated and adequate provision is made by **Utility** for the convenience and safety of highway traffic. Except as expressly provided herein, the **Utility's** rights of access to the through-traffic roadways and/or ramps shall be subject to the same rules and regulations as apply to the general public.

If **Utility's** facilities are located along a non-controlled access highway, the **Utility's** rights of ingress and egress to the through-traffic roadways and/or ramps are subject to the same rules and regulations as apply to the general public.

Participation in actual costs incurred by the **Utility** for any future adjustment, removal or relocation of utility facilities required by highway construction shall be in accordance with applicable laws of the State of Texas.

It is expressly understood that **Utility** conducts the new installation, adjustment, removal, and/or relocation at its own risk, and that **TxDOT** makes no warranties or representations regarding the existence or location of utilities currently within its right of way.

The **Utility** and the **State**, by execution of this Acknowledgement , do not waive or relinquish any right that they may have under the law.

The signatories to this Acknowledgement warrant that each has the authority to enter into this Acknowledgement on behalf of the party represented.

IN WITNESS WHEREOF, the parties hereto have affixed their signatures.

Owner: _____
Utility Name

By: _____
Authorized Signature

Printed Name: _____

Title: _____

Date: _____

_____

\

The State of Texas

Executed and approved for the Texas Transportation Commission for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by the Texas Transportation Commission.

By: _____
Authorized Signature

Printed Name: Donald C. Toner, Jr. SR/WA

Title: Director – Strategic Projects Right of Way

Strategic Projects Division

Texas Department of Transportation

Date: _____

Initial _____ Date _____

Developer's Utility Design Coordinator
Utility No Conflict Sign-Off Form

Utility Design Coordinator: _____
Date plans received: _____
Utility Company: _____
Assembly "U" number: _____
Type of Utilities: _____
Date on Utility's plans: _____ No. of sheets in Utility's plans: _____

I, the Utility Design Coordinator (UDC) on behalf of the Developer ( ) certify that a review of the above referenced Utility plans concerning the proposed highway improvements on the NTE has been completed and have not identified any conflicts between the Utility's proposed relocation and any design features.

Design features include but are not limited to pavement structures, drainage facilities, bridges, retaining walls, traffic signals, illumination, signs, foundations, duct/conduit, ground boxes, erosion control facilities, water quality facilities and other Developer-Managed Utilities.

Any design changes to the NTE roadway after the signing of this form will be coordinated through the Developer's Utility Manager and the affected Utility Owner.

☐ Check box if there are any areas of concern and insert comments below:

Print Name:
(UDC) _____ Date: _____
Utility Design Coordinator (UDC)

Sign Name:
(UDC) _____ Date: _____

Utility Coordination
Firm Name: _____

This form must be completed/signed and included in each Utility Assembly submitted to the Texas Department of Transportation.

Developer's Utility Manager
Utility No Conflict Sign-Off Form

Utility Manager: _____
Date plans received: _____
Utility Company: _____
Assembly "U" number: _____
Type of Utilities: _____
Date on Utility's plans: _____No. of sheets in Utility's plans:_____

I, the Utility Manager (UM) working on behalf of the Developer ( ) certify that a review of the above referenced Utility plans concerning the proposed highway improvements on the NTE has been completed and have not identified any conflicts between the Utility's proposed relocation and any existing and/or proposed Utilities.

The proposed Utility plans conform to Title 43, Texas Administrative Code, Section 21.31 – 21.56 of the Utility Accommodation Rules.

☐ Check box if there are any areas of concern and insert comments below:

Print Name:
(Utility Manager-UM) _____Date:_____

Sign Name:
(UM) _____Date:_____

Print Name:
(Utility Design Coordinator – UDC) _____Date:_____

Sign Name:
(UDC) _____Date:_____

Utility Coordination Firm Name: _____

This form must be completed/signed and included in each Utility Assembly submitted to the Texas Department of Transportation.

Notice of Confidentiality Rights: If you are a natural person, you may remove or strike any of the following information from this instrument before it is filed for record in the public records: your Social Security Number or your Driver's License Number.

QUITCLAIM DEED

THE STATE OF TEXAS §
§
COUNTY OF § **KNOW ALL MEN BY THESE PRESENTS:**

That, of the County of , State of Texas, hereinafter referred to as Grantors, whether one or more, for and in consideration of the sum of Dollars ($) and other good and valuable consideration to Grantors in hand paid by the State of Texas, acting by and through the Texas Transportation Commission, the receipt of which is hereby acknowledged, and for which no lien is retained, either expressed or implied, have Quitclaimed and do by these presents Bargain, Sell, Release and forever Quitclaim unto the State of Texas all of Grantors' right, title, interest, claim and demand in and to that certain tract or parcel of land, situated in the County of , State of Texas, more particularly described in Exhibit "A," attached hereto and incorporated herein for any and all purposes.

Type in District description of acquisition here.

TO HAVE AND TO HOLD for said purposes together with all and singular the rights, privileges, and appurtenances thereto in any manner belonging unto the said State of Texas forever.

IN WITNESS WHEREOF, this instrument is executed on this the day of , .

_____ _____

_____ _____

_____ _____

Acknowledgement

State of Texas
County of

This instrument was acknowledged before me on _____

by_____.

_____
Notary Public's Signature

Corporate Acknowledgment

State of Texas
County of

This instrument was acknowledged before me on _____by

_____, _____

of _____, a _____

corporation, on behalf of said corporation.

_____
Notary Public's Signature

STATEMENT COVERING UTILITY CONSTRUCTION CONTRACT WORK

(AS APPEARING IN ESTIMATE)

U-No.

District:
County: ROW CSJ No.:
Federal Project No.: Highway No.:

I, , a duly authorized and qualified representative of , hereinafter referred to as **Owner**, am fully cognizant of the facts and make the following statements in respect to work which will or may be done on a contract basis as appears in the estimate to which this statement is attached.

It is more economical and/or expedient for **Owner** to contract this adjustment, or **Owner** is not adequately staffed or equipped to perform the necessary work on this project with its own forces to the extent as indicate on the estimate.

Procedure to be Used in Contracting Work

☐ A. Solicitation for bids is to be accomplished through open advertising and contract is to be awarded to the lowest qualified bidder who submits a proposal in conformity with the requirements and specifications for the work to be performed.

☐ B. Solicitation for bids is to be accomplished by circulating to a list of pre-qualified contractors or known qualified contractors and such contract is to be awarded to the lowest qualified bidder who submits a proposal in conformity with the requirements and specifications for the work to be performed. Such presently known contractors are listed below:

1.
2.
3.
4.
5.

☐ C. The work is to be performed under an existing continuing contract under which certain work is regularly performed for **Owner** and under which the lowest available costs are developed. (If only part of the contract work is to be done under an existing contract, give detailed information by attachment hereto.)

☐ D. The utility proposes to contract outside the foregoing requirements and therefore evidence in support of its proposal is attached to the estimate in order to obtain the concurrence of the State, and the Federal Highway Administration Division Engineer where applicable, prior to taking action thereon (approval of the agreement shall be considered as approval of such proposal).

☐ E. The utility plans and specifications, with the consent of the State, will be included in the construction contract awarded by the State.

Signature Date

Title

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 11-1
Approved Design Deviations

September 30, 2012

[THE ELECTRONIC VERSION IS INCLUDED IN THIS BINDER]

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 11-2
Approved Design Exceptions

September 30, 2012

N. REGIONAL OFFICE - FW
TXDOT MAILROOM
AUG 14 2012

Texas Department of Transportation

MEMORANDUM

TO: Dieter Billek, P.E.
Strategic Project Division

DATE: August 10, 2012

FROM: Maria G. Burke, P.E. Maria G. Burke, P.E.

SUBJECT: Revised Schematic, IAJR and Design Exceptions

County: Tarrant
Control: 0014-16-179, etc.
Highway: **IH 35W – South Segment**
Limits: From IH 820 to IH 30

Attached is a copy of the Federal Highway Administration letter dated August 9, 2012, providing comments and discussion on the revised schematic, design exceptions and the Interstate Access Justification Report (IAJR) for the subject project.

We forwarded you the Traffic Operations Division's review comment on July 9, 2012 and our responses to district response were submitted to you on May 2, 2012. We suggest that you provide responses addressing all comments using a comment / response form. If you have any questions, please feel free to contact me at 512.416.2703 or Ray Thomasian at 512.416.2718.

cc: Curtis Hanan, P.E. - FTW
John Tillinghast, P.E. – FTW
Loyl Bussell, P.E. – FTW
Anita Wilson - FHWA
MAM file copy
File Copy

U.S. Department of Transportation
Federal Highway Administration

Texas Division

300 E 8th Street
Austin, Texas 78705
Phone: 512-536-5950
Fax: 512-536-5990
www.fhwa.dot.gov/txdiv

August 9, 2012

In Reply Refer To:
HA-TX

Revised Schematics, Interstate Access Justification Report and Design Exceptions
Interstate Highway (IH) 35W: From IH 820 to IH 30
Tarrant County
CSJ: 0014-16-179 & 0014-16-931

Ms. Maria G. Burke, P.E.
Director, Field Coordination Section A
TxDOT - Design Division
125 E. 11th Street
Austin, Texas 78701

Dear Ms. Burke:

Reference is made to your letters dated April 11, 2012 and June 28, 2012, transmitting the schematic, design exceptions (DEs) and Interstate Access Justification Report (IAJR) for the subject project. The DE #1 is required at five ramp/direct connector locations to the managed lanes where the standard width for a ramp or connector would be constructed but would accommodate two lanes to separate high occupancy vehicles (HOVs) from the rest and allow them to "declare" themselves as such and receive a fifty percent discount of the toll amount during established hours of the day. In addition the project is proposed to be developed in phases and at the locations of existing loop ramps, the ramps would require some reconstruction for the first phase of the project but will still maintain existing geometric conditions that are not in accordance with the TxDOT Roadway Design Manual (RDM) for minimum radius and design speed.

In the same line as the IH35W North discussions occurred in an attempt to address concerns regarding adequate signage, markings, and information in advance of the declaration zones. The TxDOT Fort Worth District later indicated that the region may go to another method of declaration that would not require the declaration zones currently proposed in the schematics. The commitment to move forward with alternate declaration is not solidified therefore we conditionally concur with the DE #1 and schematics pending FHWA acceptance of operational analysis and a complete signing (including small advance signing which are not in the schematics and would be developed as part of the requirements set forth in the agreement with the developer) and striping plan that effectively deals with concerns identified with the declaration area concept. It is understood that the design exception will no longer be needed if

new technology enables other methods besides physical lane declaration for toll or HOV use, such as a toll tag registration system. An approach that does not require a design exception alternative would be preferred if it becomes available.

An Environmental Assessment (EA) for this project is currently being conducted and is anticipated to be completed in August 2012. Final approval of the DEs, the IAJR and the schematic are contingent upon completion of the environmental process and a Finding of No Significant Impact (FONSI) is determined for the build alternative.

Should you have any questions, please contact Anita Wilson at 512-536-5951.

Sincerely,

Salvador Deocampo
District Engineer

Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

July 6, 2011

Tarrant and Denton Counties
Control: 0014-16-252, 0014-16-255
0081-12-041 & 0081-13-904
Highway: IH 35W
Limits: From: IH 820 to SH 114

Ms. Janice Brown
Texas Division Administrator
Federal Highway Administration
Austin, Texas 78701

Dear Ms. Brown:

Attached for your review are one (1) copy of the proposed design schematic and two (2) copies of the Interstate Access Justification Report along with a request for design exception for reduced shoulder widths along the high occupancy vehicle declaration lanes for the above captioned project.

The proposed project will reconstruct the existing four lane freeway to six/eight general purpose lanes and four/six tolled managed lanes. In addition, the construction of the interchanges with SH 170 and US 81/US 287 are also included as part of this project. Please note that Design and Traffic Operations Divisions are currently reviewing the design schematic and we will forward you our review comments shortly.

Also for your information, enclosed is a copy of the Form 1002, page 3 of 5. If you need additional information, please contact me at (512) 416-2703 or Ray Thomasian, at (512) 416-2718.

Sincerely,

Maria G. Burke, P.E.

Maria G. Burke, P.E.
Director of Field Coordination Section A

Attachments

cc: FTW– Loyl Bussell, P.E.
TTA- Dieter Billek, P.E.
MAM Read File
File Copy

Texas Department of Transportation

MEMORANDUM

TO: Dieter Billek, P.E.
Texas Turnpike Authority Division

DATE: June 24, 2011

Originating Office
Fort Worth District
TPD

FROM: Curtis W. Hanan, P.E.

SUBJECT: Preliminary Geometric Layout
IH 35W: From IH 820 to SH 114
CSJ: 0014-16-252, 0014-16-255
0081-12-041 & 0081-13-904
Tarrant and Denton Counties

Attached for your review and further handling are three copies of the preliminary geometric layout and Interstate Access Justification report for the above referenced project. The proposed project will reconstruct the existing four lane freeway to six/eight general purpose lanes and four/six tolled managed lanes. Interchanges with SH 170 and US 81/US 287 are also proposed to be reconstructed.

The original Page 3 of 5 of the corresponding Form 1002 that describes the proposed basic design criteria is also enclosed. Included is a design exception for reduced shoulder widths along high occupancy vehicle declaration lanes.

If you have questions, please contact Mr. John Tillinghast, P.E. at (817) 370-6594 or me at (817) 370-6535.

Curtis W Hanan P.E.
District Advanced Transportation Planning Director

Attachments

PROPOSED BASIC DESIGN DATA

Control: See Attached Sheet Highway: IH 35W County: Tarrant
Limits: From IH 820 to Eagle Parkway

Work Program Title(s):

Work Type (Layman's Description):
Eagle Pkwy to US 81/US 287 Reconstruct from 4 lanes to 6 General Purpose lanes and 4 Managed Toll lanes
US 81/US 287 to IH 820 Reconstruct from 4 lanes to 8 General Purpose lanes and 4/6 Managed Toll lanes

Proposed Design Standards (Structures):
Proposed Design Standards (Roadway): Roadway Design Manual (May 2010), Chpt 2, Chpt 3, Section 6
Proposed Design Standards (Traffic): 2006 Texas MUTCD Revision 1
Design Speed (Applicable): See Attch mph Terrain: Level
Traffic: Existing See Attached Sheet Projected: See Attached Sheet
Highway functional Class (Urban): Freeway (Rural):

Design Criteria Recommended for Approval (District):
Date: 6/21/2011
Signed: [signature], PE
Title: District Design Engineer

Design Criteria Approval (Division):
Date:
Signed:
Title:

Exceptions Requested **Waivers Requested**
(List and indicate occurrence, i.e., over total project, at 3 locations, at 1 structure, etc.)

1. Shldrs for 6 Managed Lane Ramp Declaration Areas
2.
3.

1.
2.
3.

Design Exception Recommended for Approval (District):
Date:
Signed:
Title:

Waiver Recommended for Approval (District):
Date:
Signed:
Title:

EXCEPTION COMMITTEE
(To be filled out in Austin)

Bridge Design
Roadway Design
Bicycle Lanes
Traffic

Recommended Action:
☒ Approval ☐ Non-Approval
Reasons:

Date: 6/29/11
Signed: [signature]
Director, ~~Design Division~~ District Engineer

WAIVER COMMITTEE
(To be filled out in District Office)

Bridge Design
Roadway Design
Bicycle Lanes
Traffic

Recommended Action:
☐ Approval ☐ Non-Approval
Reasons:

Date:
Signed:
(Title)

IH 35W
From IH 820 to Eagle Parkway
CSJ's:0014-16-252, & 255
0081-12-041 & 0081-13-904

Design Speeds:

IH 35W General Purpose and Managed Lanes:	70 MPH
US 81/US 287 General Purpose Lanes:	70 MPH
Direct Connectors:	50 MPH *
Ramps/Managed Lane Ramps:	50 MPH
Frontage Roads:	40 MPH
Collector/Distributors:	50 MPH
City Streets:	30 MPH

* 50 MPH except where noted on schematic

Traffic:

Existing: 174,900 ADT (2010) SH 121 to US 81/US 287
115,100 ADT (2010) US 81/US 287 to Westport Parkway
92,300 ADT (2010) Westport Parkway to SH 114

Projected:269,800 ADT (2030) SH 121 to US 81/US 287
178,800 ADT (2010) US 81/US 287 to Westport Parkway
141,000 ADT (2030) Westport Parkway to SH 114

Project:	IH 35W North Segment	
County:	Tarrant	
Control/Limits:	0014-16-252	IH 820 to US 81/ US 287
	0014-16-255	IH 820 to US 81/ US 287
	0081-12-041	US 81/US 287 to Tarrant/Denton County Line
	0081-13-904	Tarrant/Denton County Line to Eagle Parkway

Introduction

The purpose of this Request for Design Exception No. 1 is to provide the flexibility to design, construct, finance, operate and maintain a Project that leverages minimal State resources while bringing congestion relief and roadway improvements estimated in excess of $440 million to Tarrant County.

The Request for Design Exception is needed for five entrance ramps to the IH 35W Managed HOV Lane system and one Managed Lane direct connector ramp where the shoulder widths, at the Declaration Areas only, do not meet the standard recommended guidelines for shoulder widths as specified in the contract documents.

Physical as well as financial constraints sometimes preclude the ability to provide a consistent design in accordance with Good Engineering Practice. Shoulder widths are often squeezed to less than desirable to accommodate bridge and sign columns just as elements of a project's design are often optimized to provide a consistent overall design in relation to adjacent structures and roadways. For example, TxDOT recently submitted a Request for Design Exception for the IH-635 Project for FHWA approval because the minimum values on the ramps could not be attained. The request which was submitted for similar reasons to those described above has been subsequently approved by FHWA.

In addition, the following likely changes will eliminate the need for Declaration Areas: (1) air quality goals are attained, (2) change in regional policy/law, (3) technological advances that allow the toll gantry system to distinguish HOV users from SOV users reliably in the same lane, (4) declaration is achieved through a registration program or (5) transponder technology advances to where declaration occurs at the device level. Because one or more conditions listed above are likely occurrence(s) and will negate the need for the Declaration Areas, the design exception is sought for the interim condition only with a view to reducing the size of the "bubble" at the Declaration Area.

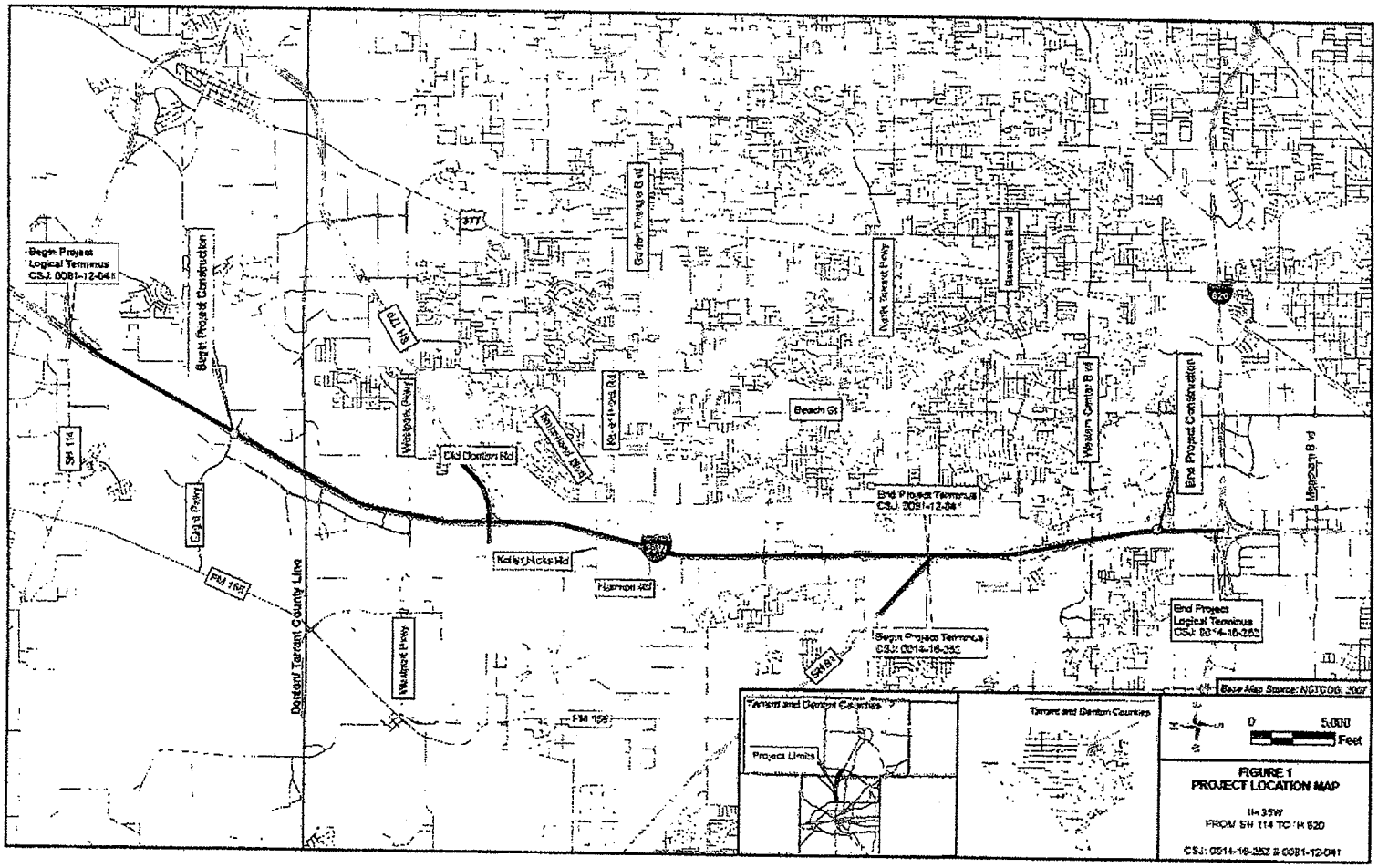
Project Description

TxDOT Fort Worth District proposes to improve a 10.5-mile section of IH 35W in Tarrant and Denton Counties, Texas. The proposed project extends from Eagle Parkway in southern Denton County to IH 820 in north-central Tarrant County, as shown in **Figure 1**.

IH 35W from SH 114 to IH 820 is a four-lane divided freeway with controlled access entrances and exits with discontinuous frontage roads.

IH-35W within the project limits is currently not a tolled facility.

Figure 1: Project Location Map



The proposed improvements include the reconstruction and widening of the existing freeway:

- From IH 820 to Basswood Boulevard, the proposed project would consist of reconstructing and widening the roadway to a 14-lane facility consisting of four General Purpose Lanes in each direction and a barrier-separated six-lane concurrent Managed Lane facility (three lanes in each direction). The Managed Lane facility would be centered between the General Purpose Lanes.
- From Basswood Boulevard to US 81/287, the proposed project would consist of reconstructing and widening the roadway to a 12-lane facility consisting of four General Purpose Lanes in each direction and a barrier-separated four-lane concurrent Managed Lane facility (two lanes in each direction). The Managed Lane facility would be centered between the General Purpose Lanes. Direct connector ramps between US 81/US 287 and the IH 35W Managed Lanes would be constructed.
- From US 81/287 to Eagle Parkway, the proposed project would consist of reconstructing and widening the roadway to a 10-lane facility consisting of three General Purpose Lanes in each direction and a barrier-separated four-lane concurrent Managed Lane facility (two lanes in each direction). The Managed Lane facility would be centered between the General Purpose Lanes. Direct connector ramps between IH 35W and SH 170 would also be constructed.

Managed HOV Lane Policy and Project Application

The proposed Managed Lanes will be managed using a pricing methodology in accordance with the policies developed by the North Central Texas Council of Governments (NCTCOG) and included by the Federal Highway Administration under the Express Lane Demonstration Program (Section 1604(b) Safe Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

The NCTCOG's Managed Lane policy includes the following key provisions (The full policy is located in the NCTCOG's Mobility 2030: 2009 Amendment- page 279 at http://www.nctcog.org/trans/mtp/2030/17.Roadway.pdf):

- Transit vehicles will not be charged a toll.
- Single Occupancy Vehicles (SOV) will pay the full rate.
- HOVs of two or more occupants will receive a 50 percent discount during the peak period. This discount will phase out after the air quality attainment maintenance period.
- Regional Transportation Council sponsored public vanpools are permitted to add peak-period toll as eligible expenses.

Current NCTCOG's policy Managed Lane Policy specifies that HOV (Managed Lane) users will receive a 50% discount during the peak period, the electronic toll collection system needs to distinguish between SOV and HOV users through the use of Declaration Areas. A Declaration Area will be provided at each of the following entrance ramps and direct connectors into the IH-35W Managed Lanes:

A. Southbound (SB) ramp from Frontage Road just south of Basswood Blvd.
B. SB direct connector ramp from Eastbound (EB) US 287
C. SB interim ramp from General Purpose Lanes just south of North Tarrant Pkwy
D. SB ramp from Frontage Road just south of Heritage Trace Pkwy

E. SB ramp from General Purpose Lanes just south of Keller Hicks Road
F. SB ramp from General Purpose Lanes just south of Alliance Blvd.

Declaration Area "C" would be on an interim ramp constructed to begin the SB Managed Lanes for the portion of the North Segment Facility extending from US 81/ US 287 to IH 820. This ramp would then be removed when the Managed Lanes are extended north to Eagle Parkway.

Table 1 lists the proposed Declaration Areas and **Exhibit 1** shows the general locations.

Table 1: Proposed Declaration Areas

No.	Location	Road	Direction	Station	Inside Shldr (ft)	Outside Shldr (ft)
A	FR On-Ramp	IH 35W	SB	1510+00	4	4
B	US 287 Connector	IH 35W	SB	1452+00	4	4
C	Transition Ramp	IH 35W	SB	1410+00	4	4
D	FR On-Ramp	IH 35W	SB	1360+00	1	1
E	GPL On-Ramp	IH 35W	SB	1258+00	1	1
F	GPL On-Ramp	IH 35W	SB	1068+00	1	1

Functionally, the ramps and connectors requiring design exceptions will operate as single lane ramps except that the users will be required to shift horizontally to a transitional section to register the vehicle as a HOV vehicle for a pricing discount during peak periods. The ramps are transitioned at 50 to 1 from both sides in order to transition from a single 14-ft wide lane to 2-12-ft wide lanes, which include a 200-ft long Declaration Area. Within the transition section, the HOV and SOV users will shift to the right and left, respectively, which will allow them to self-declare occupancy. Within the Declaration Area, the electronic toll collection equipment will record self-declared HOV users and SOV users in order to identify all HOV user transactions. Typical sections for the ramps and direct connectors at the Declaration Areas are provided in **Exhibit 2.** After the Declaration Area, the 2-12ft lanes transition back to a single 14-ft lane before drivers enters the Managed HOV Lanes. Plan view and typical sections for the ramps and connectors requiring design exceptions are provided in **Exhibits 3.1 through 3.6.**

The Managed HOV Lanes are included in the proposed Dallas-Fort Worth Metropolitan Transportation Mobility 2030 plan as a measure to reach air quality attainment status. NCTCOG policy allows the discount for HOV users to phase out after the air quality attainment maintenance period. In the future, the following likely changes will eliminate the need for these Declaration Areas (1) air quality goals are attained, (2) change in regional policy/law, (3) technological advances that allow the toll gantry system to distinguish HOV users from SOV users reliably in the same lane, (4) declaration is achieved through a registration program or (5) transponder technology advances to where declaration occurs at the device level. The likely occurrence of one or more of the conditions listed above will negate the need for the Declaration Areas.

1. **What are the minimum design values that can not be obtained?**

   The minimum inside shoulder width of 4 feet and the outside shoulder widths of 6 feet and 8 feet required for ramps and direct connectors, respectively, cannot be obtained within the Declaration Areas for the following entrance ramps and direct connectors into the Managed HOV Lanes:

   A. SB ramp from FR just south of Basswood Blvd (Exhibit 3.1).
   B. SB direct connector ramp from EB US 287 (Exhibit 3.2)
   C. SB interim ramp from GPL just south of North Tarrant Pkwy (Exhibit 3.3)
   D. SB ramp from FR just south of Heritage Trace Pkwy (Exhibit 3.4)
   E. SB ramp from GPL just south of Keller Hicks Road (Exhibit 3.5)
   F. SB ramp from GPL just south of Alliance Blvd. (Exhibit 3.6)

2. **Why the minimum design values can not be attained?**

   The minimum values on the ramps cannot be attained because of construction cost and right-of-way limitations along IH 35W. Priority was given to attaining design values on the General Purpose Lanes, the Managed HOV Lanes, free ramps, and frontage roads because these are considered permanent features of the facility.

   Providing the minimum values for the Declaration Areas at the entrance and direct connector ramps would require widening retained fill sections and bridges resulting in wider roadway sections at the Declaration Areas than for the remainder of the ramp lengths. The wider sections would also result in realignments of the adjacent roadways thereby creating areas of potential sideswipe accidents as inattentive drivers may not shift and remain on a linear path as the lane lines are transitioned to accommodate the minimum shoulders. The realignments could result in the need for additional right-of-way.

3. **What are the values that can be attained by the proposed design?**

   The inside and outside shoulder widths that can be attained at the proposed Declaration Areas are shown in **Table 1**.

4. **Summary and analysis of the accident history at this location.**

   The proposed Managed Lanes and Managed Lane ramps are new construction. Accident data relative to this exception for IH 35W was taken from the data obtained on the General Purpose Lanes for the years 2006, 2007 and 2008. The crash rates were provided by Control-Section/Milepoint in North Segment in two sections – Section 1 - from IH 820 to US 287/US 81, and Section 2 from US 287/ US 81 to Eagle Parkway.

   To analyze the safety impacts of construction along the IH 35W corridor, crash data between 2006 and 2008 along IH 35W corridor within the project limits were collected and reviewed for crash patterns. A total of 542 crashes were reported in these sections of IH 35W. **Table 2** provides a summary of the crashes by facility and severity.

Table 2: Crash Type and Severity Summary

IH 35W Facility	Year	Crash Severity			
		Fatality	Injury*	Non-Injury	No Information
IH 820 to US 287	2006		30	44	
(Section 1)	2007		39	59	1
	2008	1	35	80	
US 287 to Eagle Pkwy	2006		36	43	3
(Section 2)	2007	3	43	48	2
	2008		28	47	
Total		**4**	**211**	**321**	**6**

* *Injury includes incapacitating crashes, non-incapacitating crashes, and possible injury cases*

The crash rate on the General Purpose Lanes was compared with statewide average data for urban interstate facilities to obtain a safety ratio for the past three years. The results are summarized in **Table 3.**

Table 3: Crash Rate Analysis Summary

IH 35W General Purpose Lanes	2006		2007		2008	
Section	1	2	1	2	1	2
Actual Crashes	74	82	99	96	116	75
Actual Crash Rate (per 100 million vehicle miles)	64.17	61.96	85.85	72.54	100.59	56.67
Statewide Average Crash Rate (per 100 million vehicle miles)	107.23		111.32		101.32	
Safety Ratio	0.6	0.6	0.8	0.7	1.0	0.6

The review of the crash data indicates that a number of crashes are caused by sideswipes and rear-end collisions. Based on the mile point information for Sections 1 and 2, the crashes highlight the need for the project due to increasing number of crashes caused by the increased congestion along IH 35W. Construction of the new interchanges and widening of the mainlanes cross-section will distribute traffic

more evenly, reducing congestion on the mainlanes and potentially reducing these types of crashes.

The Texas Transportation Institute (TTI) field tested the proposed declaration area designs on IH 30, which will have similar operational characteristics to the IH 35W declaration areas. These field tests were conducted on October 17, 2007 in College Station, TX and were based on a higher speed mainlane declaration design. Based on observations by several Research and Operational personnel during testing the Declaration Areas functioned properly. **Appendix A** contains the summary of results of the field tests.

The operation of the declaration areas may be compared to the Dallas North Tollway (DNT) entrance and exit ramps at Royal Lane and Northwest Highway. From 2005 to 2006, the number of accidents is as follows:

- 5 at the SB DNT exit ramp at Royal Lane
- Zero at the NB DNT entrance ramp at Royal Lane
- 2 at the NB DNT entrance ramp at Northwest Highway
- 2 the SB DNT exit ramp at Northwest Highway

These ramps have 50 to 1 transitions to 10-ft wide lanes with a 6" curb on both sides and 11" of clearance to the toll booths, but the accident history does not show a pattern or problem. They require drivers to make quick choices between the cash lane and the toll tag lane, which are narrower than the cross section that these design exceptions provide. Occupancy declaration will require less complicated decisions; so, it is highly unlikely that the implementation of the requested design exceptions will negatively impact the causes of accidents.

5. **Brief description of alternatives considered and the reasons for eliminating each alternative.**

Several redesign alternatives were considered. In general, the ramps and connectors could be widened to meet the minimum design values but the redesign options were eliminated from consideration due to the additional construction cost and potential right-of-way costs to the project. The redesign options that were considered in order to provide the required minimum shoulder requirement are described below:

A. Declaration Area "A" is located on both a retained fill section and structure through the Declaration Area. The proposed redesign solution would be to widen the Declaration Area and redesign the alignment 2' to the east.

B. Declaration Area "B" is located on both a retained fill section and structure through the Declaration Area. The connector currently has 4-foot inside and 4-foot outside shoulders. The proposed redesign solution would include widening the connector ramp 4' to the west to provide 4' inside and 8' outside shoulders. Since the area required for the retained fill section between the SB ML and ultimate configuration of the SB GPL at the Declaration Area does not permit the required widening, the SB GPL alignment would need to be realigned to the west resulting in the redesign of the SB GPL and the exit ramp to Basswood Blvd. The direct connector ramp may

also need to be realigned to provide a more cost effective bent arrangement as a result of the redesign.

C. Declaration Area "C" is located on an interim at-grade ramp. The proposed alignment would need to be redesigned 2' to the west through the Declaration Area towards the SB GPL.

D. Declaration Area "D" is located on a retained fill section through the Declaration Area. The proposed design solution would include widening the Declaration Area and redesigning the ramp and frontage road alignment 10' to the west. This redesign would require 4400 square feet of additional right-of-way.

E. Declaration Area "E" is on a retained fill section through the Declaration Area. The proposed design solution would be to widen the Declaration Area and redesign the ramp and frontage road alignment 10' to the west. This redesign would require approximately 4150 square feet of additional right-of-way.

F. Declaration Area "F" is at-grade and would require widening the pavement and redesigning the ramp alignment 12' to the west through the Declaration Area towards the SB GPL.

The redesign alternatives were eliminated from consideration because the Enforcement Zone and Declaration Areas are an interim condition only and only operational during the peak periods. When the HOV discount is phased out after the air quality attainment maintenance period, the currently proposed pavement for the Enforcement Zone and Declaration Areas will be striped off to provide the required shoulder areas. The minimum shoulder width is already included within these areas. The additional unused pavement associated with the redesign solutions will create maintenance issues with trash and windblown debris collecting in these areas.

6. **What is the percentage and total dollar difference between the proposed cost and the cost of construction necessary to obtain minimum values?**

The current estimate of construction costs for IH 35W is $440 Million. The costs associated with widening each of the ramps listed in Question 5 to provide the minimum required inside and outside shoulder widths are:

No.	Location	Additional Construction Cost	Percent Increase in Cost
A	FR On-Ramp	$18,000	<1%
B	US 287 Connector	$178,000	<1%
C	Transition Ramp	$21,000	<1%
D	FR On-Ramp	$89,000	<1%
E	GPL On-Ramp	$87,000	<1%
F	GPL On-Ramp	$95,000	<1%

Estimate of Additional Costs: $488,000

7. **Does this design conform to adjacent roadway sections?**

The adjacent roadway sections of IH 820 and SH 183 (Segments 1 and 2) being developed as part of the North Tarrant Express Comprehensive Development Agreement will have shoulders that meet minimum design requirements. Smooth and uniform shoulder width transitions will be used to ensure that drivers have time to recognize the change in shoulder widths.

These width transitions keep the design exception areas in conformity with adjacent sections as drivers will not be caught off guard by sudden changes in the shoulder widths. Moreover, since passing would not be allowed within the Declaration Area, the ramps would continue to function as a single lane ramp.

8. **What would be the project delay and consequences as a result of meeting the minimum values?**

Project delay would be both at the design level and during construction due to the additional right-of-way that would be required to implement the minimum value at all locations. Obtaining minimum values on the IH 35W ramps would require the purchase of additional right-of-way and maintenance costs, which could cause project delay of possible one year. Delaying the project will adversely impact expected mobility improvements, congestion relief in the area and final costs of the project.

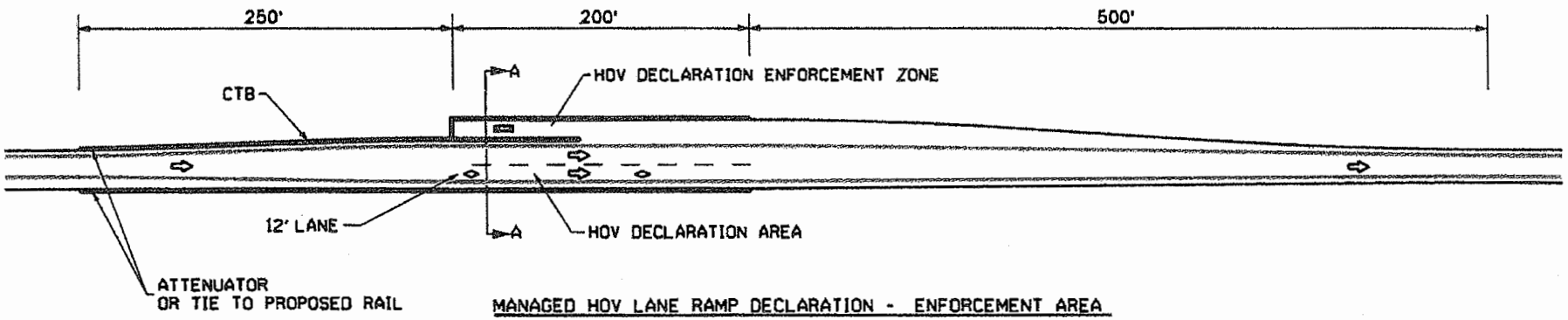
9. **Short narrative of why you feel this design exception should be approved.**

The Enforcement Zone and Declaration Areas are an interim condition only and only operational during the peak periods. When the HOV discount is phased out after the air quality attainment maintenance period, the pavement for the Enforcement Zone and Declaration Area will become functionally shoulders and the minimum shoulder width is already included within these areas. Areas of additional unused pavement will create maintenance issues with trash and windblown debris collecting in these areas.

This design exception should be approved because the reduced shoulder widths are limited to the Declaration Areas. Regulatory traffic signs, "Do Not Pass" are anticipated to be located in advance of the Declaration Areas. Only one vehicle at a time will be entering the Declaration Area and the ramps and connectors will operate as one lane ramps. Within this area and the transition sections, the total pavement width is greater than the desirable pavement width for a one lane ramp, which will allow sufficient width for vehicles to pass in the event of an accident in the Declaration Area. A consistent design approach was applied for all of these ramps to develop consistent driver expectations. The configuration is the least disruptive to adjacent property owners and avoids maintenance impacts of the additional pavement.

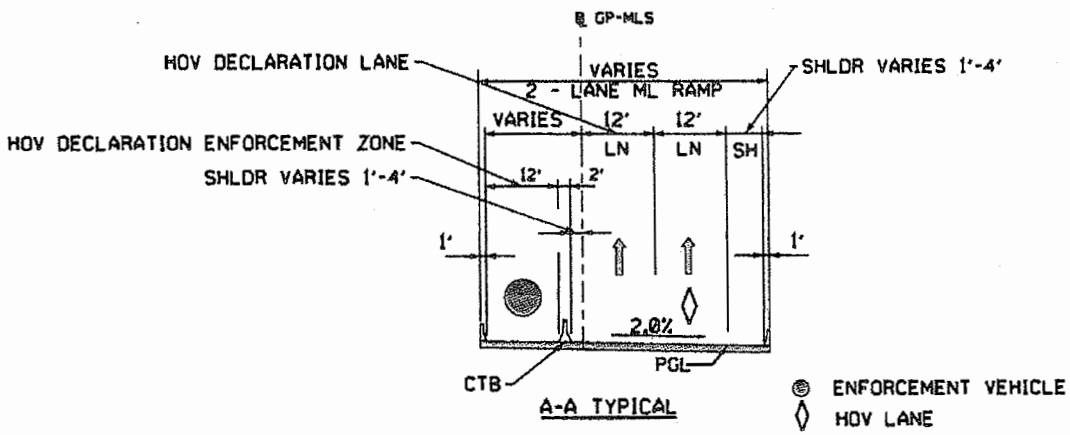
Finally, the need for the design exception is only for the interim condition and will not be required when the region incorporates emerging technologies that will remove the need for the Declaration Areas (potentially before facility opening) or the HOV requirement and/or air quality goals are attained.

MATCHLINE
Golden Triangle Blvd.
E
Heritage Trace Pkwy
D
North Tarrant Pkwy
C
US 287 / US 81
B
Basswood Blvd.
A
Western Center Blvd.
IH 820
Eagle Parkway
Texas Longhorn Trail
F
Alliance Blvd.
Westport Pkwy.
SH 170
(Alliance Gateway)
Keller-Hicks Road
MATCHLINE
NOT TO SCALE
N
LEGEND
MANAGED LANES
GENERAL PURPOSE LANES
FRONTAGE ROAD
RAMPS
DIRECT CONNECTORS
PRELIMINARY
North Tarrant Express
NORTH TARRANT EXPRESS
NORTH SEGMENT
DECLARATION AREA LOCATION MAP
MAY 18, 2011
SHEET 1 OF 1
EXHIBIT 1



MANAGED HOV LANE RAMP DECLARATION - ENFORCEMENT AREA

N.T.S.



A-A TYPICAL

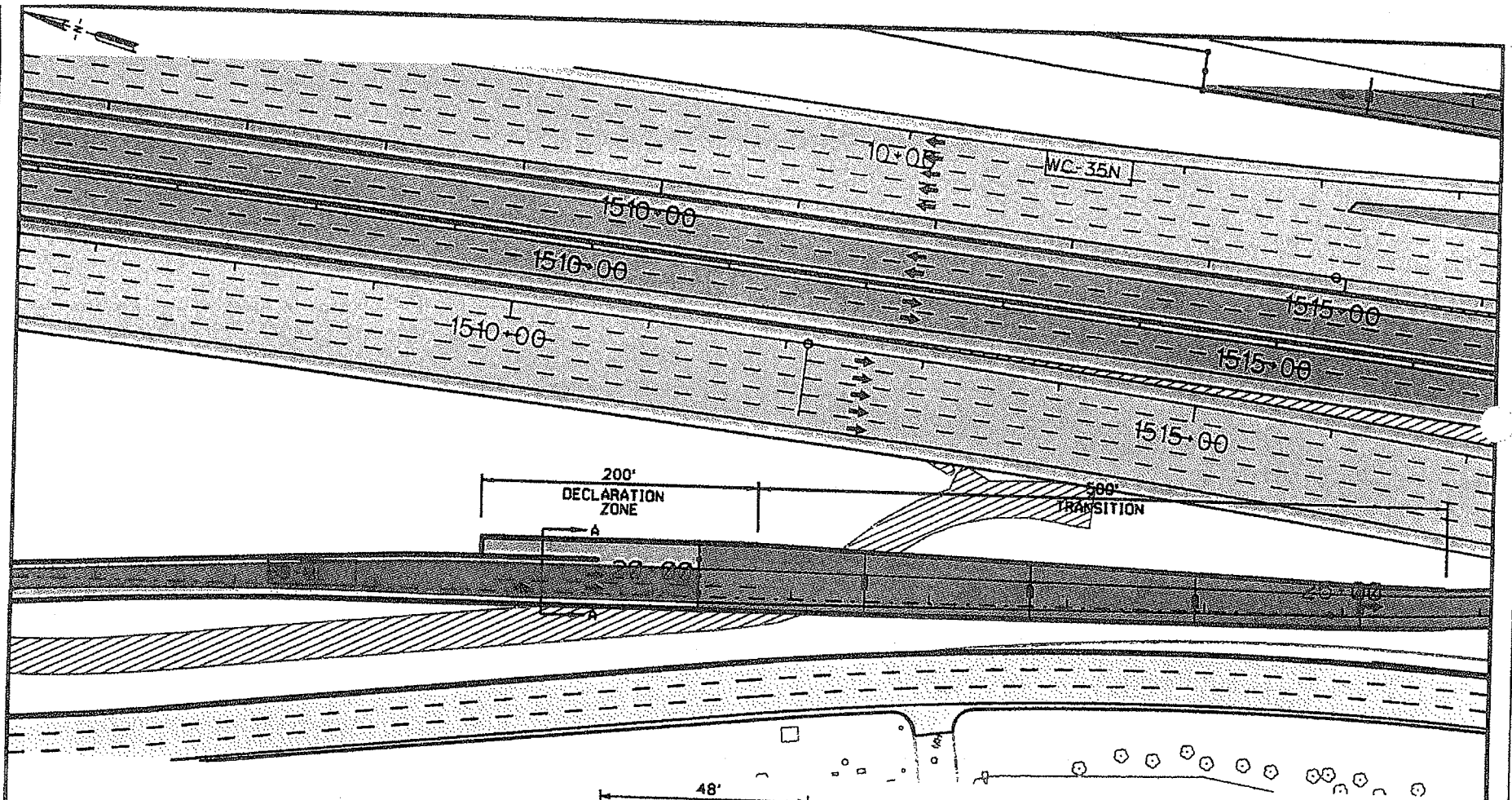
PRELIMINARY

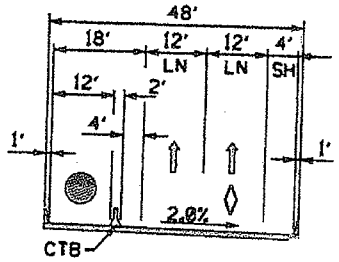
NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED MANAGED HOV LANE RAMP
DECLARATION AREA DETAIL

MAY 18, 2011 | SHEET 1 OF 1

EXHIBIT 2





ENFORCEMENT VEHICLE
HOV LANE

SECTION A-A
DECLARATION AREA "A"
N.T.S.

SCALE
0 50 100 200

PRELIMINARY

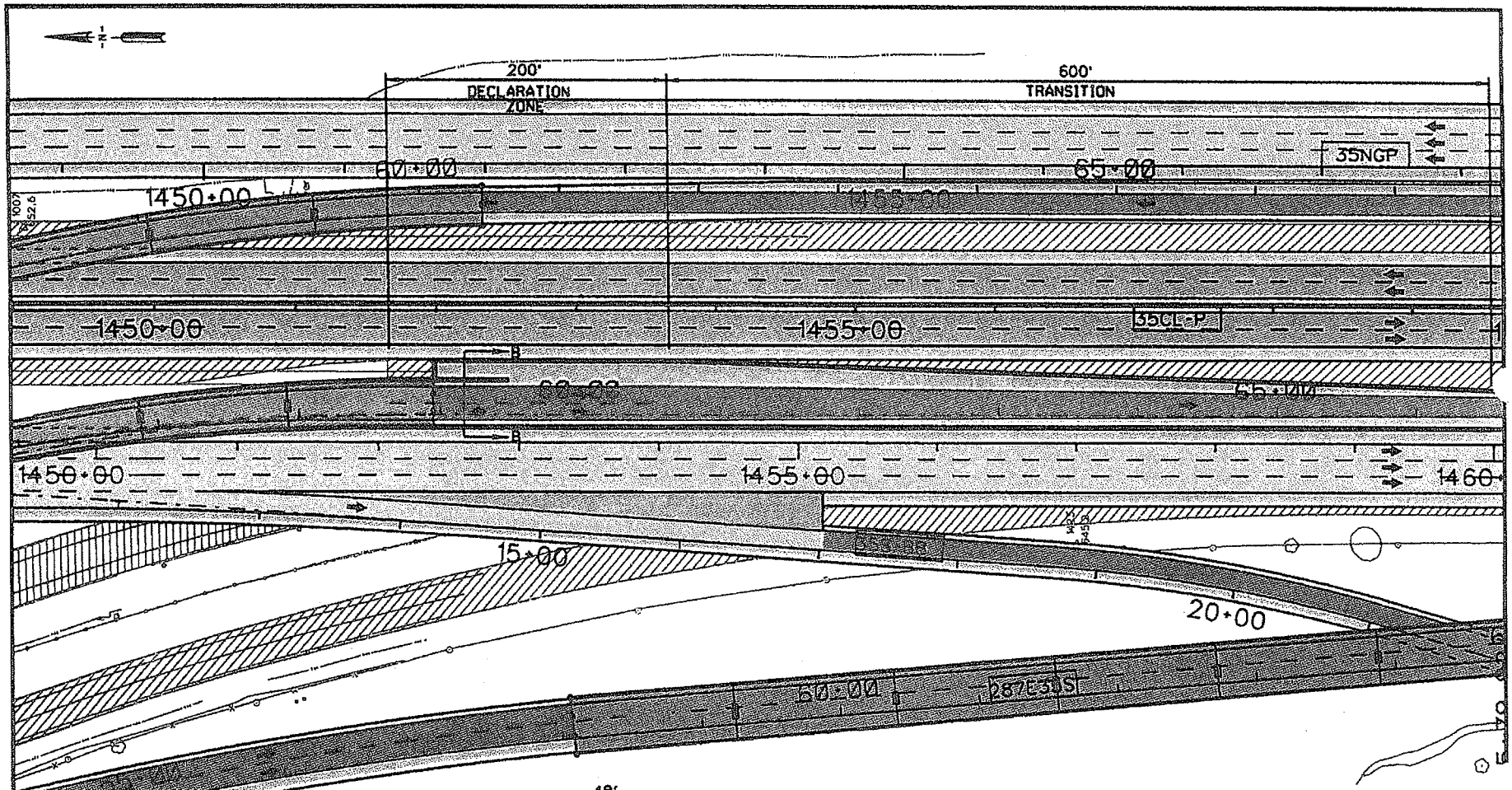
north tarrant express

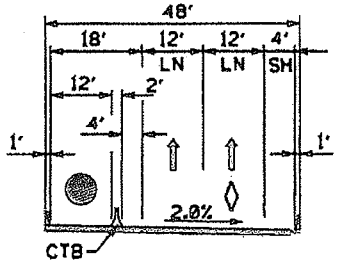
NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED DECLARATION AREA "A"
SB RAMP FROM BASSWOOD BLVD

MAY 18, 2011 | SHEET 1 OF 6

EXHIBIT 3.1





ENFORCEMENT VEHICLE
HOV LANE

SECTION B-B
DECLARATION AREA "B"
N.T.S.

SCALE
0 50 100 200

PRELIMINARY

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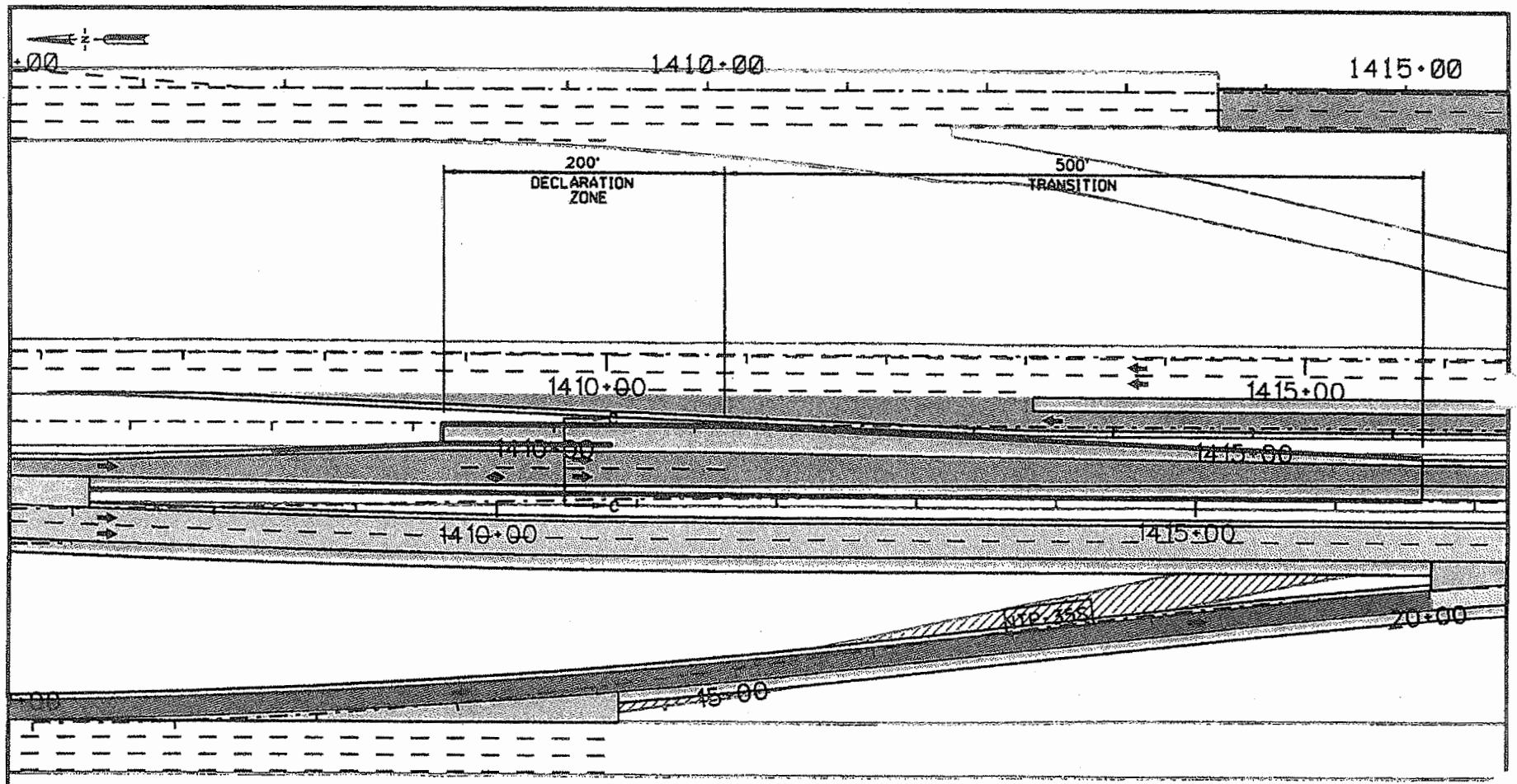
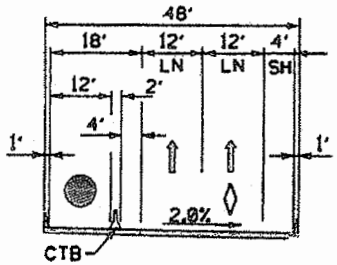
NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED DECLARATION AREA "B"
SB CONNECTOR RAMP FROM US287 GPL

MAY 18, 2011 | SHEET 2 OF 6

EXHIBIT 3.2





ENFORCEMENT VEHICLE
HOV LANE

SECTION C-C
DECLARATION AREA "C"
N.T.S.

SCALE
0 50 100 200

PRELIMINARY

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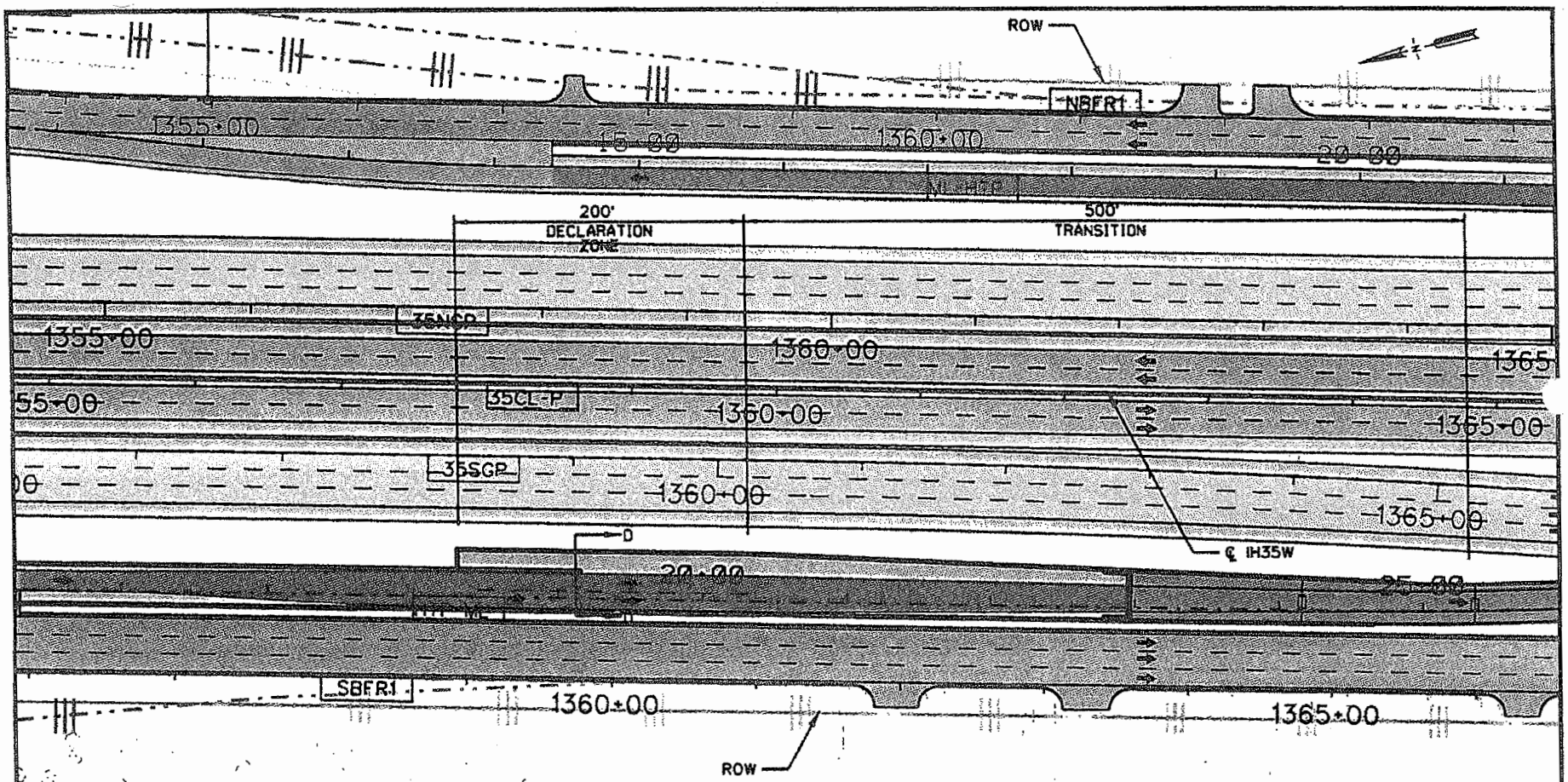
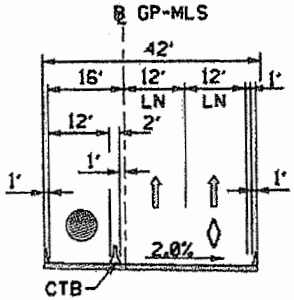
NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED DECLARATION AREA "C"
INTERIM SB ML RAMP FROM IH35W GPL

MAY 18, 2011 | SHEET 3 OF 6

EXHIBIT 3.3





● ENFORCEMENT VEHICLE
◊ HOV LANE

SECTION D-D
DECLARATION AREA "D"
N.T.S.

SCALE
0 50 100 200

PRELIMINARY

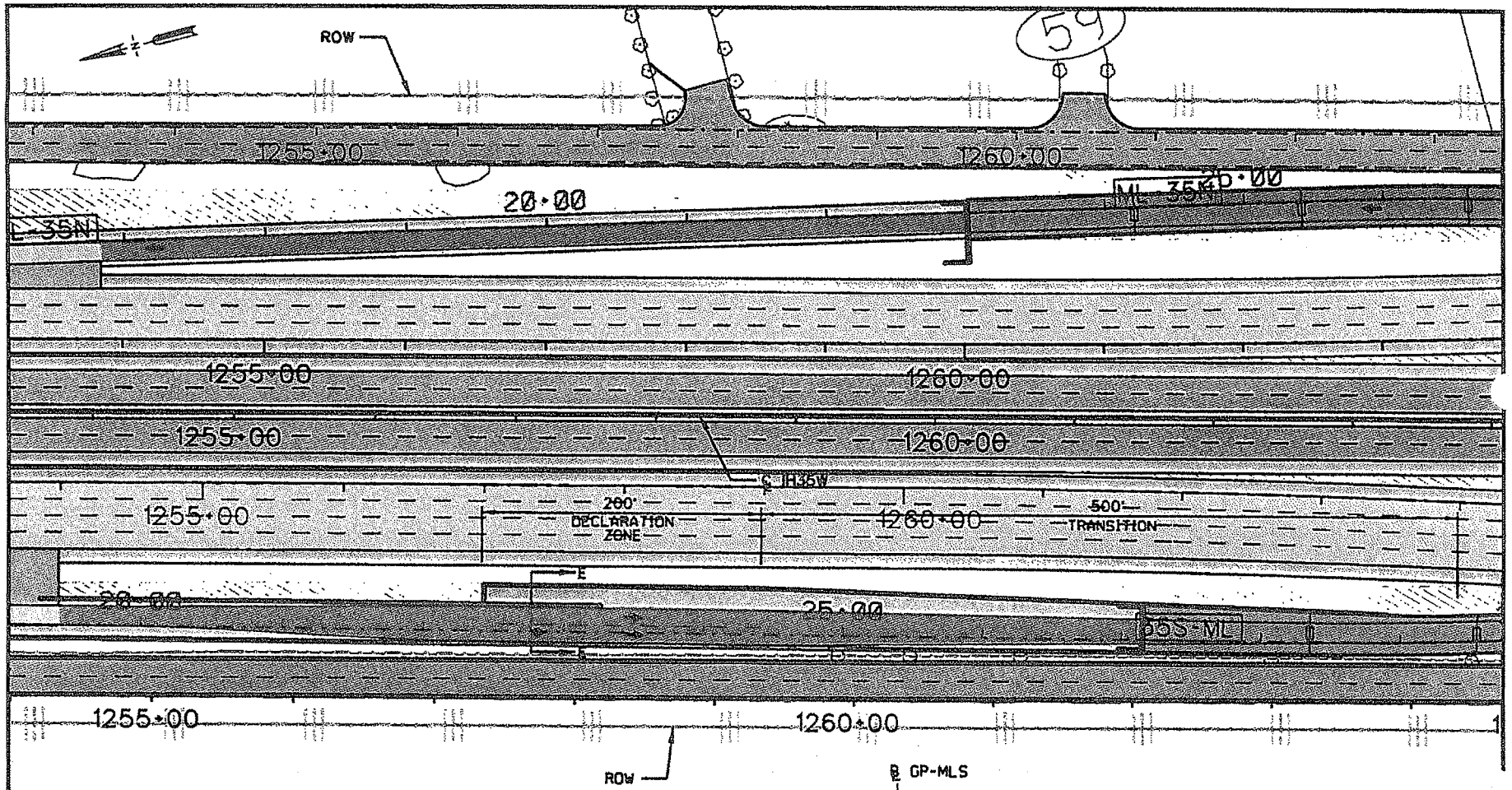
north tarrant express

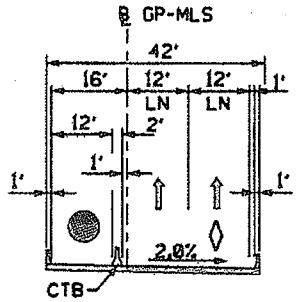
NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED DECLARATION AREA "D"
SB RAMP FROM SB FR

MAY 18, 2011 | SHEET 4 OF 6

EXHIBIT 3.4





ENFORCEMENT VEHICLE
HOV LANE

SECTION E-E
DECLARATION AREA "E"
N.T.S.

SCALE
0 50 100 200

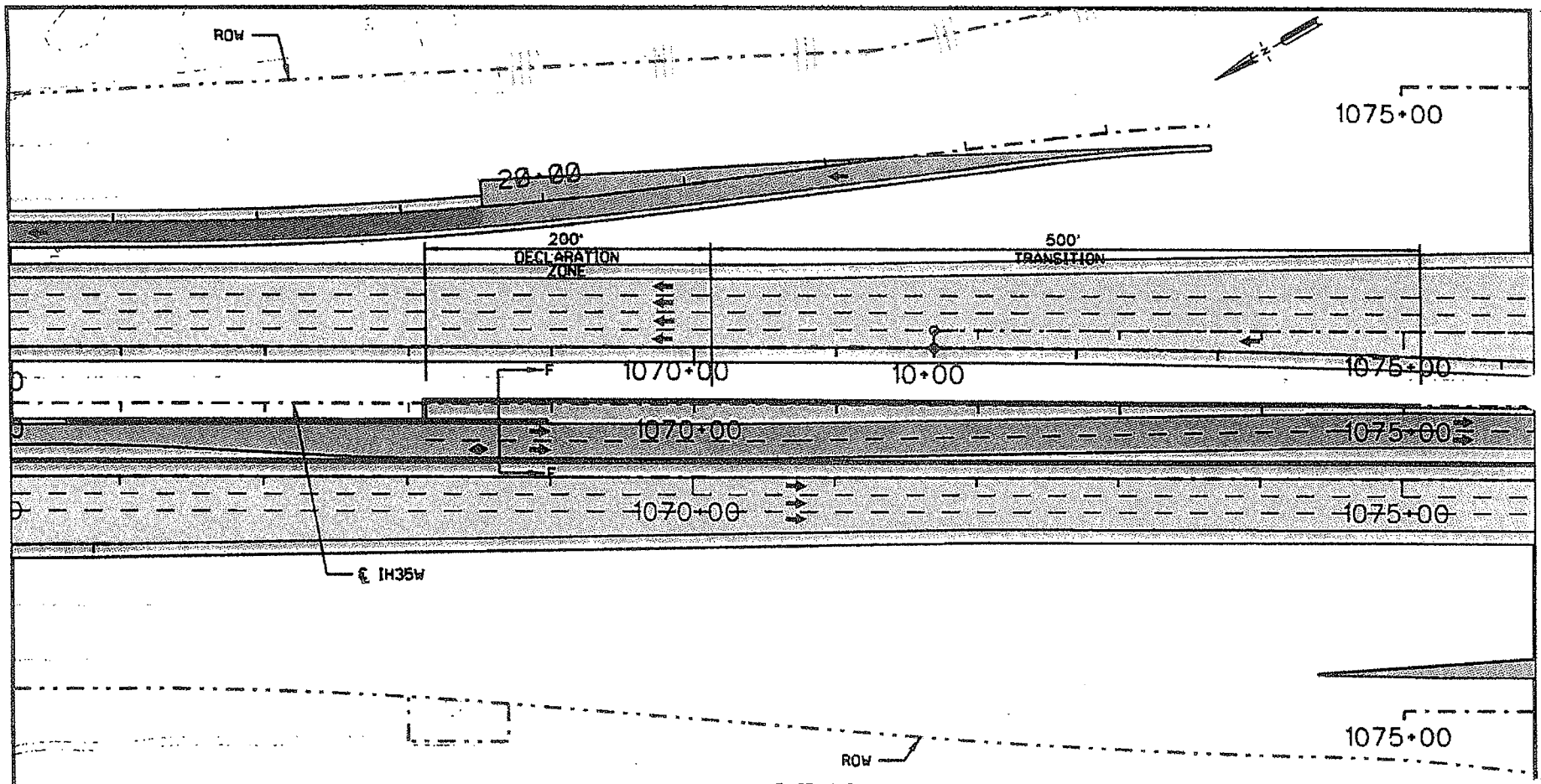
PRELIMINARY

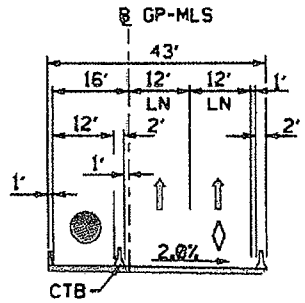
NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED DECLARATION AREA "E"
SB RAMP FROM IH35W GPL

MAY 18, 2011 | SHEET 5 OF 6

EXHIBIT 3.5





ENFORCEMENT VEHICLE
HOV LANE

SECTION F-F
DECLARATION AREA "F"
N.T.S.

SCALE
0 50 100 200

PRELIMINARY

© 2011

NORTH TARRANT EXPRESSWAY
NORTH SEGMENT

PROPOSED DECLARATION AREA "F"
SB RAMP FROM IH35W GPL

MAY 18, 2011 | SHEET 6 OF 6

EXHIBIT 3.6

APPENDIX A

TTI Field Test Results

Design and Operation of the I-30 Tom Landry Managed Lane Value Pricing Project in Dallas, Texas

Christopher Poe, Ph.D, P.E., Assistant Agency Director, Texas Transportation Institute (cpoe@tamu.edu)

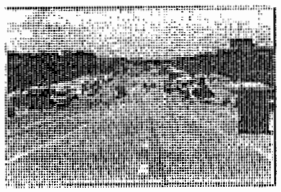
Matt MacGregor, P.E., CDA/Tollway Director, Texas Department of Transportation (mmacgre@dot.state.tx.us)

OVERVIEW

Project Overview

The I-30 West Managed Lane is the first value pricing project in the Dallas area along I-30 Tom Landry Freeway corridor. This corridor is a general purpose freeway with a managed HOV lane in the median. The facility opened in 2007 with its initial phase as an HOV lane. In general, the western section is concurrent flow operation on the inside median, the center section is 2-lane reversible, and the eastern section is 1-lane reversible.

The Dallas region has an aggressive managed lane policy to test various operational and pricing strategies. The I-30 corridor serves as the region's value pricing test bed where strategies can be tested before being applied in other corridors. A key element of the managed HOV lane is a tolling gantry design that allows carpools and single-occupant vehicles to be tolled at variable rates based on occupancy while maintaining the free-flow operation of the lane.



KEY REGIONAL MANAGED LANE POLICY

Fixed Schedule Pricing Policy

- A fixed-fee schedule will be applied during the first six months of operation; dynamic pricing will be applied thereafter.
- The toll rate will be set up to $0.75 per mile cap during the fixed-schedule phase.
- Toll rates will be updated monthly during the fixed-schedule phase.
- Single-occupant vehicles will pay the full rate.
- High-occupancy vehicles of two or more occupant and vanpools will pay the full rate in the off-peak period.

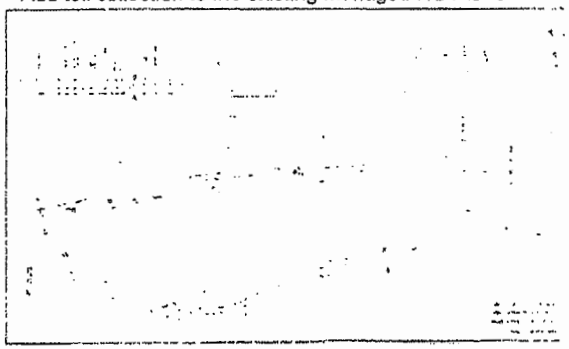
Dynamic Pricing Policy

- Market-based tolls will be applied during the dynamic-pricing phase.
- The toll rate will be established to maintain a minimum average corridor speed of 50 miles per hour. An escalating operating cap will be applied to minimize toll exposure.
- High-occupancy vehicles of two or more occupants will receive a 50 percent discount during the peak period (6:30 a.m. – 9:00 a.m. and 3:00 p.m. – 6:30 p.m.).
- During the dynamic-pricing phase, tolls will be rebated if the average speed drops below 35 mph. Rebates will not apply if speed reduction is out of the control of the operator.

PHASES OF DESIGN

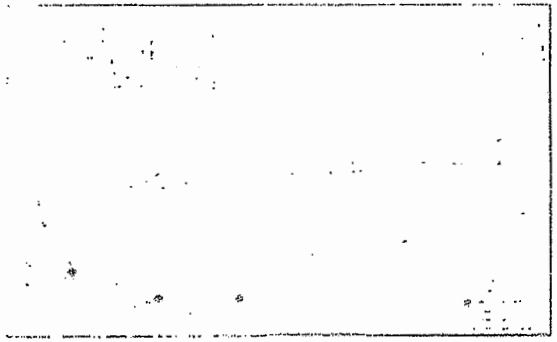
Phase 1.5 – Interim Tolling

Reversible managed HOV lane with varying lengths.
Add toll collection to the existing managed HOV lane



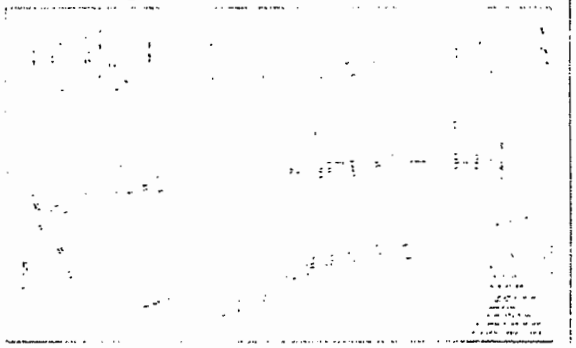
Phases 2 & 3 – Lane Extension

Extend 2-lane reversible managed HOV section and widen general purpose lanes over Trinity River Bridge



Phase 4 – Improved Access

Add wishbone ramps and direct connections at the Loop 12 interchange for NB to EB and SB to WB



Research sponsored by:

US Department of Transportation
Texas Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

Texas Department of Transportation

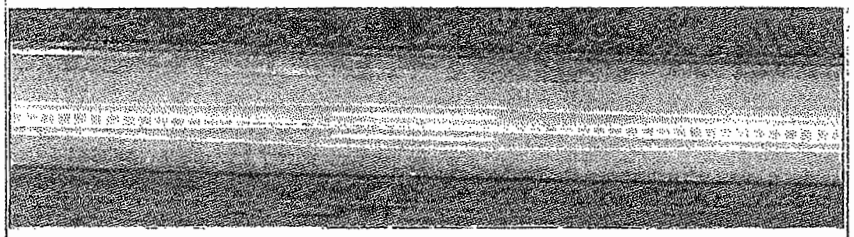
Research conducted by:

Texas Transportation Institute

TOLL GANTRY DESIGN FIELD TEST

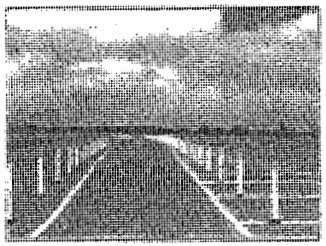
Description of Field Test

- Full scale mock-up of the toll gantry design with temporary pavement markings and pylons
- Conducted at the TTI Riverside Facility in College Station, TX
- Project team and staff from participating agencies able to drive the through the design at highway speed
- Unable to simulate vertical curvature or overhead signing



Question to be Answered by Field Test

- How does the lane shift at the gantry work?
- Does the design encourage/discourage passing?
- What is the comfort at high speed?
- What is the comfort with a vehicle platoon?
- How is visibility behind a large vehicle?
- Do the pylons assist the design?
- Do we agree with HOV being in the right lane?



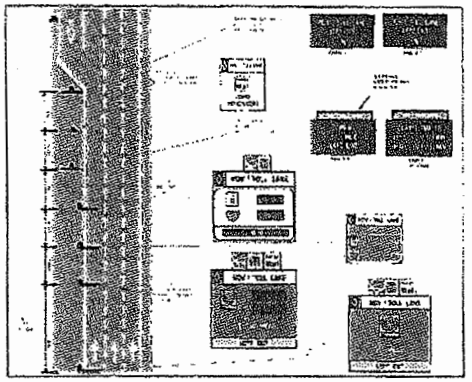
Field Test Findings

- Lane shift design was comfortable at highway speeds
- Design may discourage passing maneuvers
- Pylons effective traffic control
- Visibility of the gantry when following a platoon of vehicles was a concern
- Design Revisions = adjust gore taper and include more emphasis on the overhead sign design

SIGNING CHALLENGES

Signing Information

1) Managed lane is ahead
2) Distance to the managed lane entrance
3) Managed lane is open or closed
4) Managed lane entrance is a left exit
5) Distance to Managed Lane destinations/exits
6) Location of the actual managed lane entrance
7) Means of payment



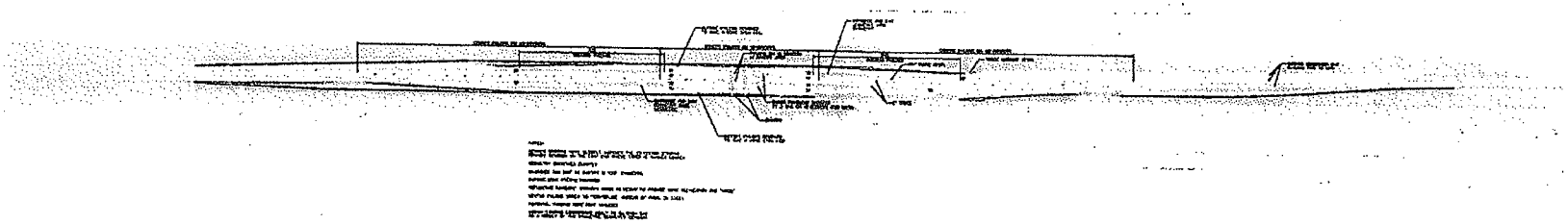
ACKNOWLEDGEMENTS

Participating Agencies

- Texas Department of Transportation (TxDOT)
- Dallas Area Rapid Transit (DART)
- North Texas Tollway Authority (NTTA)
- North Central Texas Council of Governments (NCTCOG)
- Texas Transportation Institute (TTI)

Key Project Team Members

- Stephen Endres, P.E., Project Manager, TxDOT
- Matthew MacGregor, P.E., CDA/Tollway Director, TxDOT
- Koorosh Olyai, P.E., Assistant Vice President, DART
- Dan Lamers, P.E., North Central Texas Council of Governments
- Christopher Poe, P.E., Assistant Agency Director, TTI
- Stephen Ranft, Assistant Research Specialist, TTI
- Jim Langston, P.E., Bridgefarmer Associates



Proposed HOV Declaration Lane Evaluation

Description of Field Test

- Full scale mock-up of the proposed lane configuration, geometry, pavement markings and pylons
- Project team and staff from participating agencies able to test drive the mock-up ramp at highway speeds and with back round traffic.
- Test conducted at TTI Riverside Facility in College Station, TX.

Questions to be answered by Field Test

- How does the Lane shift at the gantry works
- Does the design encourage/discourage passing?
- What is the comfort at high speeds?
- What is the comfort with a vehicle platoon?
- How is the visibility behind a large vehicle?
- Do the Pylons assist the design?
- Do we agree with HOV being in the right lane?

Field Test Findings

- **Lane shift design was comfortable at highway speeds**
- **Design may discourage passing maneuvers**
- **Pylons effective traffic control**
- **Visibility of the gantry when following a platoon of vehicles was a concern**

Other recommendations of this review are:

- Design Revisions; adjust gore taper
- Overhead sign design

What was not tested?

- Gantry Design
- Vertical and horizontal curvature
- Signing

Simulations

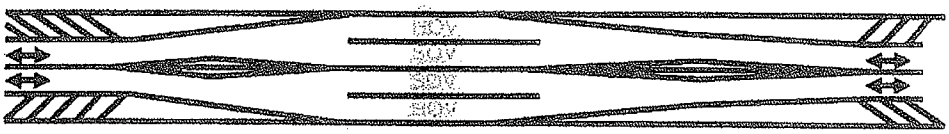
- Model assumptions and development
- Aerial view
- Driver's view
- Enforcement view
- Link to view simulation

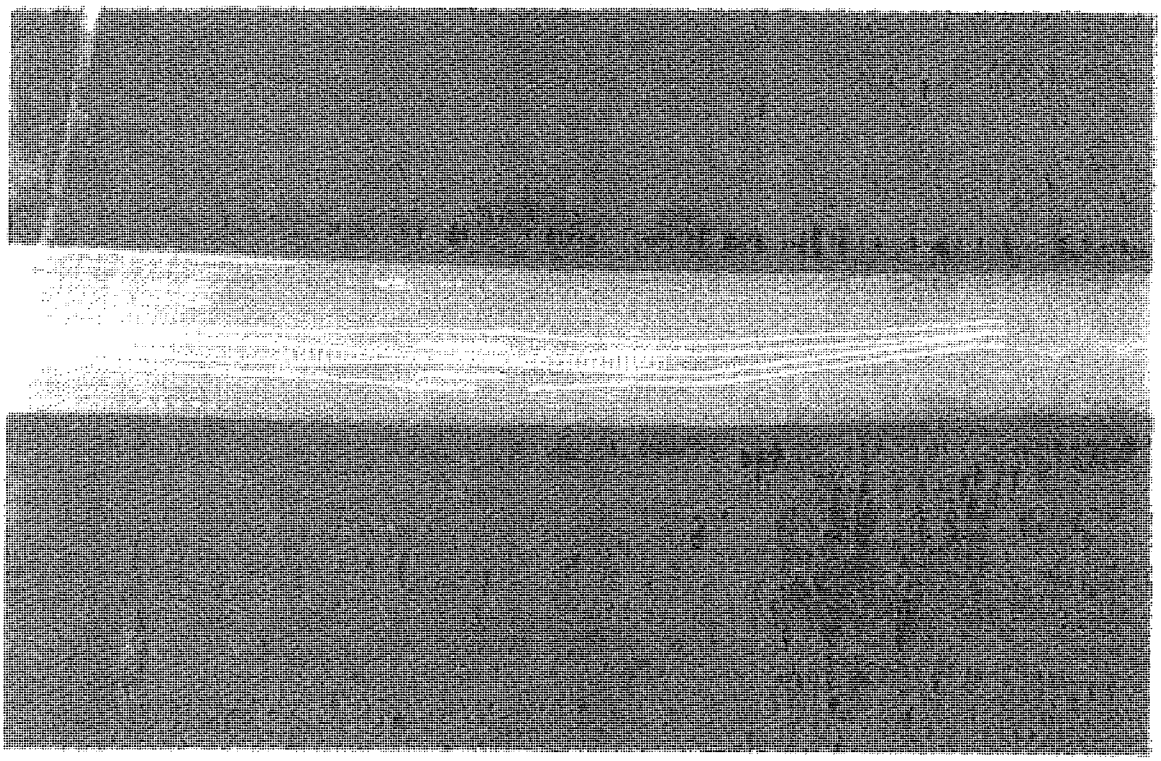
Example of similar design in operation and Accident history

- DNT Entrance/exit ramps at Royal Lane and Northwest Highway in Dallas

Field Test

Tolling Gantry



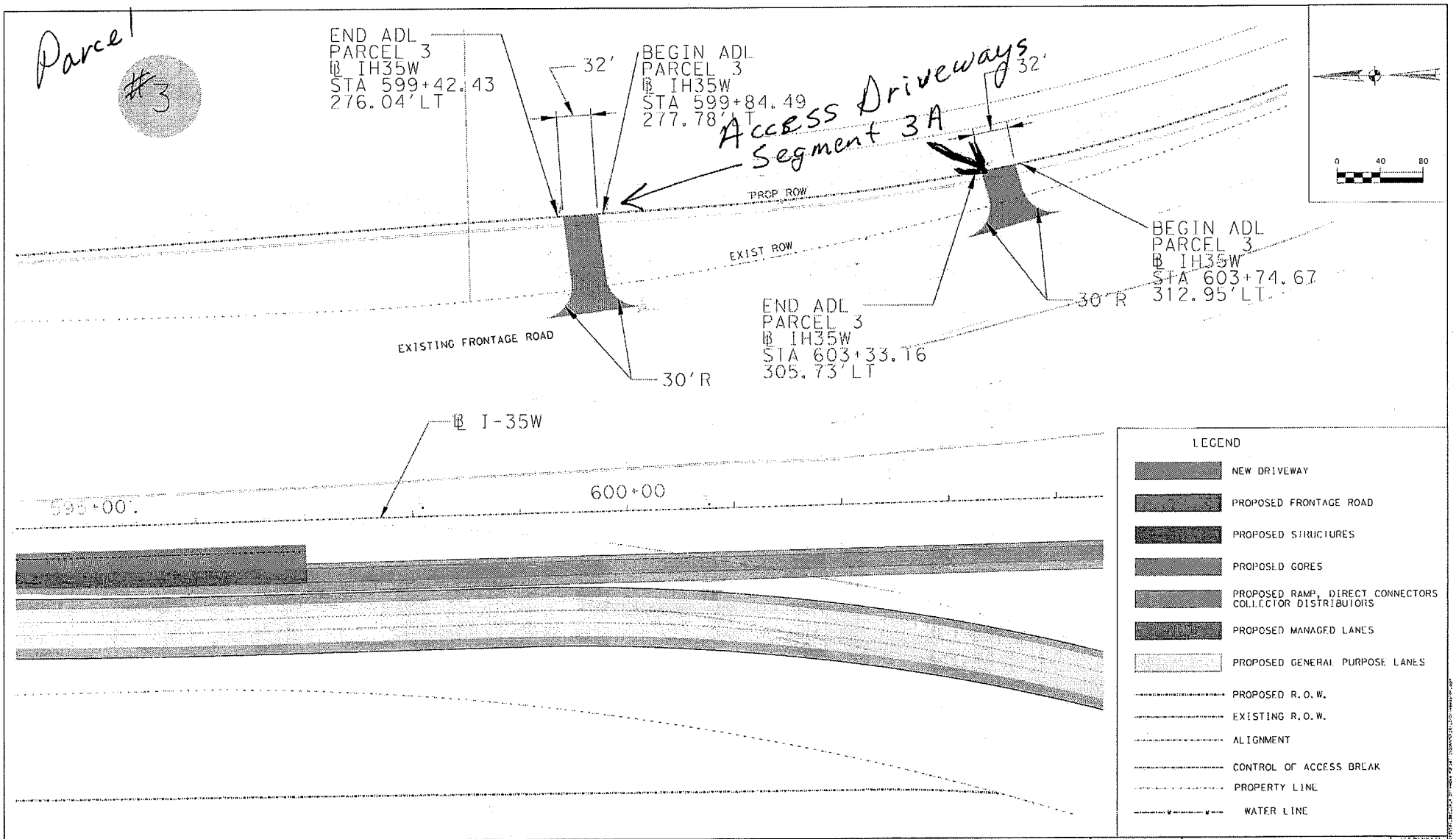


Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 11-3
Segment 3A Driveways

September 30, 2012



REVISION	DATE

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 1

PROPOSED NEW DRIVEWAY ON FRONTAGE ROAD
SOUTH OF FOSSIL CREEK BLVD.
PARCEL 3

NTEMP PARCEL NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
03			IH820
STATE	COUNTY	DISTRICT	
TEXAS	TARRANT	FTW	SHEET NO.
DRAWN BY	HORIZ. SCALE	DATE	
HV	1"=40'	09/05/12	1 OF 3

Parcel #3

END ADL
PARCEL 3
℄ IH35W
STA 606+68.95
392.50'LT

32'

BEGIN ADL
PARCEL 3
℄ IH35W
STA 607+08.45
407.19'LT

Access Driveway
Segment 3A

PROP ROW

EXIST ROW

FRONTAGE ROAD

EXISTING FRONTAGE ROAD

Construction Limit
Segment 3A

Actual Interim Construction Limit
Segment 1

30'R

℄ IH35W

610+00

0 40 80

LEGEND

- NEW DRIVEWAY
- PROPOSED FRONTAGE ROAD
- PROPOSED STRUCTURES
- PROPOSED GORES
- PROPOSED RAMP, DIRECT CONNECTORS COLLECTOR DISTRIBUTORS
- PROPOSED MANAGED LANES
- PROPOSED GENERAL PURPOSE LANES
- PROPOSED R.O.W.
- EXISTING R.O.W.
- ALIGNMENT
- CONTROL OF ACCESS BREAK
- PROPERTY LINE
- WATER LINE

REVISION	DATE

north tarrant express

NORTH TARRANT EXPRESS - SEGMENT 1

PROPOSED NEW DRIVEWAY ON FRONTAGE ROAD
SOUTH OF FOSSIL CREEK BLVD.
PARCEL 3

NTEMP PARCEL NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
03			IH820
STATE	COUNTY	DISTRICT	SHEET NO.
TEXAS	TARRANT	FTW	2 OF 3
DRAWN BY	HORIZ. SCALE	DATE	
HV	1"=40'	09/05/12	

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

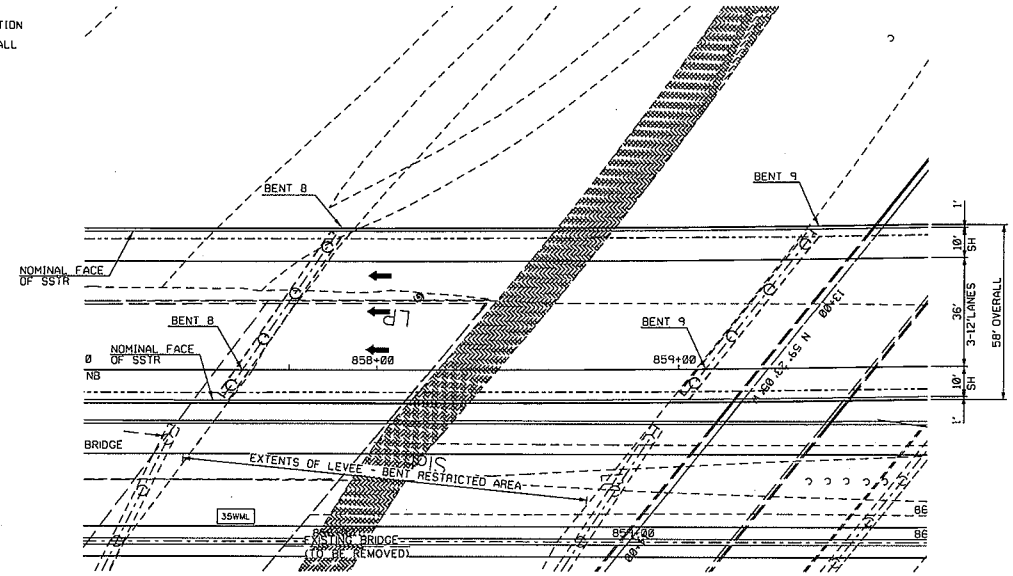
Attachment 13-1
Trinity River Crossing Bent Locations Base Case

September 30, 2012

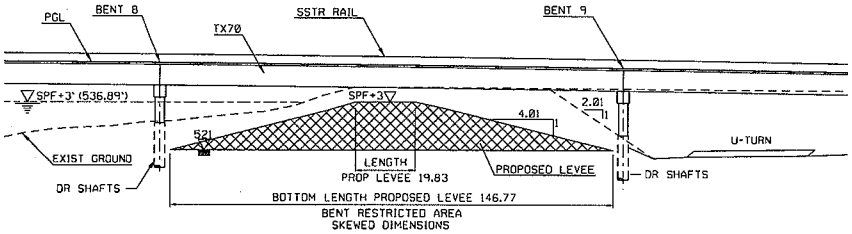
LEGEND

DENOTES BORING LOCATION

FFBW= FRONT FACE OF BACKWALL



PLAN



ELEVATION

Texas Department of Transportation

north tarrant express

NTE EXTENSION SEGMENT 3A

BRIDGE 224

GPL NORTH BOUND

LAYOUT - MANDATORY CONFIGURATION

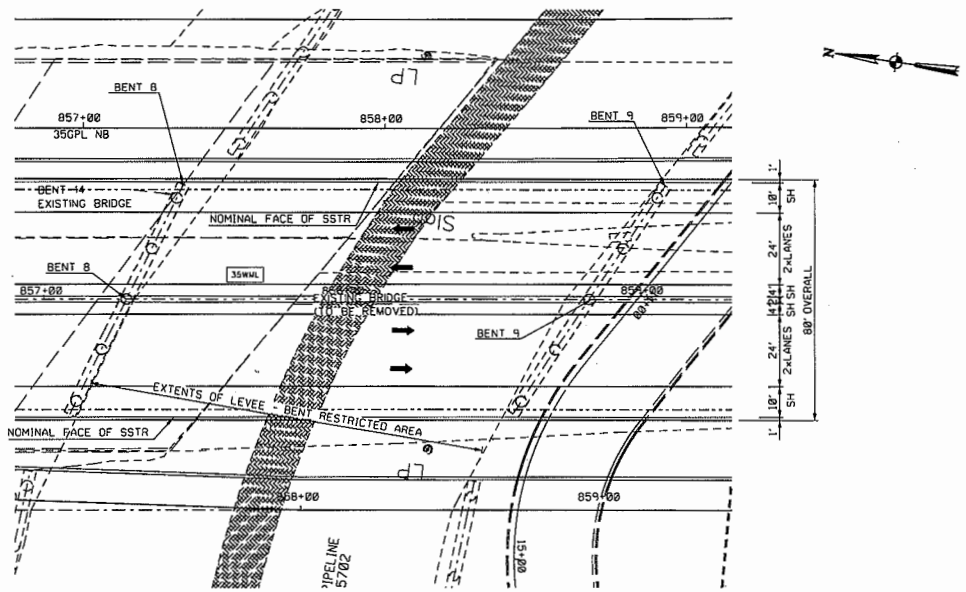
SCALE: 1" = 40' SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
STATE	DISTRICT	COUNTY	
TEXAS	FT. WORTH	TARRANT	
CONT	SECT	JOB	HIGHWAY NO

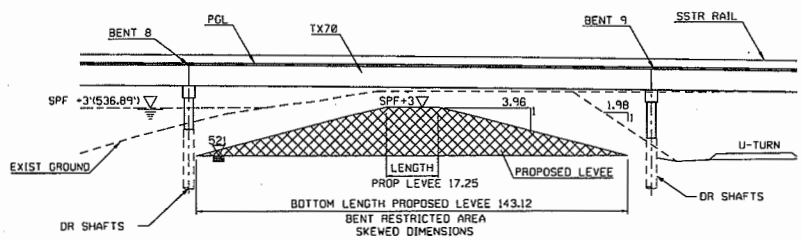
LEGEND

DENOTES BORING LOCATION

FFBW= FRONT FACE OF BACKWALL



PLAN



ELEVATION

Texas Department of Transportation

north tarrant express

NTE EXTENSION SEGMENT 3A

BRIDGE 225

MANAGED LANES

LAYOUT - MANDATORY CONFIGURATION

SCALE: 1" = 40'

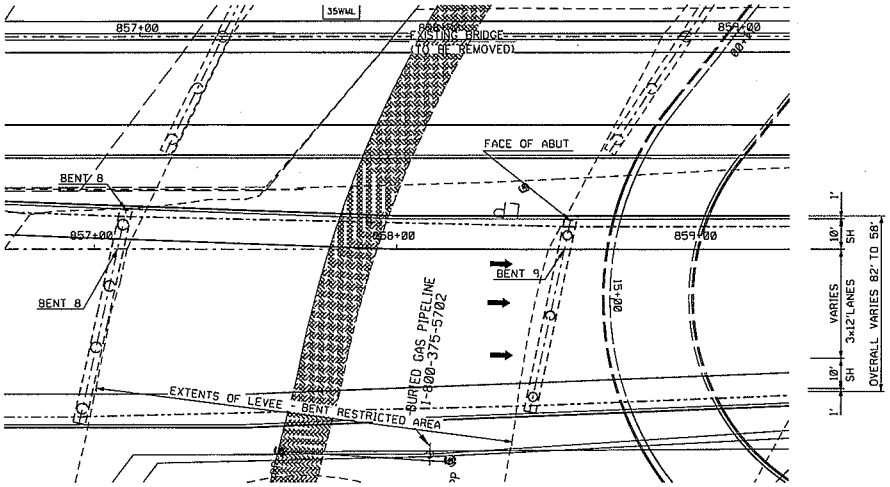
SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
STATE	DISTRICT	COUNTY	
TEXAS	FT. WORTH	TARRANT	
CONT	SECT	JOB	HIGHWAY NO

LEGEND

DENOTES BORING LOCATION

FFBW= FRONT FACE OF BACKWALL



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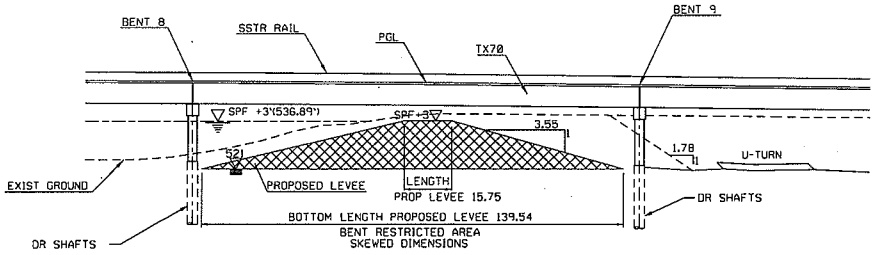

ELEVATION

Texas Department of Transportation

north tarrant express

NTE EXTENSION SEGMENT 3A

BRIDGE 226

GPL SOUTH BOUND

LAYOUT - MANDATORY CONFIGURATION

SCALE: 1" = 40' SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
STATE	DISTRICT	COUNTY	
TEXAS	FT. WORTH	TARRANT	
CONT	SECT	JOB	HIGHWAY NO

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 14-1
Amendments for the TxDOT's Traffic Operations Manual, Railroad Operations Volume, February 2000

September 30, 2012

AMENDMENTS FOR THE:
TxDOT Traffic Operations Manual – Railroad Operations Volume, February 2000

Manual Notices
Delete

Chapter 1 – Introduction

Section	Subheading	Modification
3	Operations Involving Railroads	Replace text with "The Developer and TxDOT will jointly enter into agreements with railroad companies. The Developer shall be responsible for all costs related to force account work for construction or maintenance requirements during the term of project. Where the Manual refers to actions the state normally takes, Developer shall perform those actions."

Chapter 2 – Railroad Agreements – General

Section	Subheading	Modification
1	Overview	Replace text with "Developer shall be responsible for all costs normally assigned to TxDOT."
2	Railroad Force Account Work	Replace text with "Developer and TxDOT will jointly enter into agreements with railroad companies. The Developer shall be responsible for all costs related to force account work for construction or maintenance requirements during the term of project. Where the Manual refers to actions the state normally takes, Developer shall perform those actions."
3	District Responsibilities	For reference only
3	District Responsibilities	In all subsequent subheadings, where the text includes work to be performed by the District or TRF, Developer shall perform.
4	TRF Responsibilities	Replace all text with the following: "The Developer shall provide all documents, estimates, and other information required by the TxDOT Traffic Operations Division (TRF) to prepare railroad agreements for the project."

Chapter 3 – Highway-Rail Grade Crossing Surfaces (Construction and Reconstruction)

Section	Subheading	Modification
1	Overview	Delete
2	Plan Layout	Replace "District" and "TxDOT" with "Developer". Under **Instruction**, delete "to be performed by TxDOT, TxDOT's contractor".
3	Agreement and Negotiating	Replace references to "Traffic Operations Division", "TRF", and "TxDOT" with the word "Developer". Delete **Construction and Maintenance** except for the 1st sentence. Under **Insurance Claims** delete all except the 1st sentence. Replace the word "contractor with the word "Developer". Delete "Payment Clause", "Solicitations of Bids" clause and "Conditions". Delete "Negotiating" and "After Execution".
4	Project Execution	Replace the words "District", "TxDOT's Contractor" and "TxDOT" with the word "Developer". Delete the section **Completion Letter.**

Chapter 4 – Grade Crossing Replanking Program
Delete

Chapter 5 – Spur Tracks
Delete

Chapter 6 – Warning Signals and Devices
Delete

Chapter 7 – Traffic Signal Preemption
Delete

Chapter 8 – Grade Separation
Delete

Chapter 9 – Drainage Structures and Common Ditches
Delete

Chapter 10 – Other Railroad Agreements
Delete

Chapter 11 – Crossing Closure, Relocation, and Consolidation
Delete

Appendix A – Forms
Delete

Traffic Operations Manual
Railroad Operations Volume

Texas
Department
of Transportation

February 2000

Railroad Operations Volume
February 2000

Manual Notices

Manual Notice 98-1

To: Recipients of Subject Manual

From: Charles W. Heald
Executive Director

Manual: *Railroad Operations Volume*
of the *Traffic Operations Manual*

Date: May 18, 1998

Purpose

This volume of the *Traffic Operations Manual* provides information on and internal procedures and practices related to TxDOT's operations involving railroads.

Supersedes

This volume supersedes:

- Part VI of the *Bridge Division Operation and Planning Manual*: "Operations Involving Railroad Companies"
- Administrative Circular No. 99-83, "Common Ditch Agreement with Railroad Companies"
- Administrative Circular No. 99-82, "1983 Railroad Replanking Program"
- Administrative Circular No. 74-75, "Railroad Advance Warning Sign and Signal"
- Administrative Circular No. 139-70 "Railroad Grade Crossing Subgrade."

Contents

This distribution of the *Railroad Operations Volume* contains:

- this manual notice
- Table of Contents
- Chapters 1 through 11
- Appendix A
- Index
- divider tabs
- a front cover insert
- a spine insert.

Instructions

This is a new volume. Insert these chapters and related matter with tabs into a three-ring binder.

Effective Date

This manual notice is effective as of July 1, 1998.

Contact

Address questions concerning information contained in this manual notice to Darin Kosmak, Traffic Operations Division (TRF), 512/416-2200 or fax 512/416-3206.

Copyright Notice

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Published by the Traffic Operations Division (TRF)

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Introduction

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Section 1
General

Introduction

Highway-railroad grade crossings represent the physical intersection of two distinctly different modes of transportation, which vary considerably in their equipment, traveled ways, and methods of control and operation. Proper design and construction of new grade crossings helps ensure safe and efficient operation. This includes proper selection, design, and location of signs, pavement markings, and warning devices. Proper maintenance of existing crossings and associated warning devices helps to achieve continued safety and efficiency.

Since 1917 it has been necessary to make arrangements with the railroad companies to cross their privately owned right-of-way with roadways. After a series of condemnation lawsuits both parties realized it would be unproductive to continue disputing over the state's right to cross the rights-of-way. Also as spur tracks were built, railroad companies realized they had to cross public roadways to reach their customers. It became mutually advantageous to develop guidelines about grade crossings and grade separations so that lawsuits between the state and railroad companies could be avoided.

Purpose

This volume addresses highway-railroad grade crossing safety, replanking, and agreements. This volume outlines the procedures used by TxDOT employees in operations involving railroad companies, work on railroad right-of-way, and the development and execution of railroad programs managed by the Traffic Operations Division (TRF).

Users of this Volume

This volume is intended for use by Texas Department of Transportation (TxDOT) personnel.

Section 2
Authority and Policy

Introduction

This section lists statutes and policy instruments pertaining to operations between TxDOT and railroad companies at highway-railroad grade crossings. Copies of these documents (except for the statutes) and other historical information on the origin of these programs may be obtained from the Traffic Operations Division (TRF).

Governing Statutes (summaries)

The following state laws (codified in Vernon's Texas Civil Statues [V.T.C.S.]) pertain to operations between TxDOT and a railroad company at highway-railroad grade crossings. Brief summaries of each article are provided.

- ***Art. 6320, V.T.C.S. Streams of Water.*** When a railroad company approaches TxDOT proposing to cross an existing roadway on the designated state highway system, all costs associated with the proposed crossing shall be paid by the railroad company. This normally only occurs when a railroad company desires to construct a spur track across an existing roadway on the state highway system. (See Chapter 4 of this volume for information on spur track permit agreements.)
- ***Art. 6327, V.T.C.S. Crossings of Public Roads.*** When TxDOT approaches a railroad company proposing to cross an existing rail line or modify an existing crossing, all costs associated with the crossing shall be paid by TxDOT from state or federal funds or both. This statute also requires a railroad company to maintain crossings in a reasonable state to permit the passage of vehicles.
- ***Transportation Code, Section 471.002: "Signs at Cross-roads."*** Requires railroad companies to erect a sign (crossbuck signs) with large, distinct letters giving notice to the proximity of the railroad and warning persons of the necessity to look out for the railroad trains.
- ***Transportation Code, Section 471.004: "Warning Sign Visibility at Railroad Grade Crossings."*** Requires TxDOT to place retroreflectorized material on the back of each crossbuck sign and around the support post at each public railroad grade crossing to improve nighttime visibility. See also Texas Administrative Code (TAC), 43 TAC, Sections 25.70 – 25.73.

(continued...)

Governing Statutes (summaries) *(continued)*

- ***Transportation Code, Section 471.005: "Dismantling of Railroad Grade Crossing Warning Signals Located on an Active Rail Line."*** Requires operators of short line railroad companies to obtain a permit from the responsible road authority prior to dismantling railroad grade crossing warning signals located on an active rail line. For more information, see Texas Administrative Code (TAC), 43 TAC Sections 25.70 – 25.73.
- ***Transportation Code, Section 545.252.*** Gives TxDOT and local governments specific statutory authority to place traffic control devices at grade crossings on the roads they maintain, but no duty or minimum standards are imposed.
- ***Transportation Code, Section 471.003: "Telephone Service to Report Malfunctions of Mechanical Safety Devices at Crossings."*** Requires TxDOT to furnish and install railroad signal malfunction signs providing the telephone number, explanation of its purpose, and the crossing number at each intersection of a railroad track and a public road maintained by the state or a municipality. At each intersection of a railroad track and a public road not maintained by the state or a municipality (county roads), TxDOT shall furnish the political subdivision the sign to affix to the railroad signal device. A railway company shall permit personnel to affix the sign to the railroad warning device located on the company's property.

Policy Instruments

The following policy instruments pertain to railroad grade crossings:

- Texas Transportation Commission Minute Order No. 74227, dated March 27, 1978, (canceled Minute Order No. 60140). Re-authorized the annual state funded grade crossing protection program and increased the unit cost of the railroad signal maintenance payment program.
- Texas Transportation Commission Minute Order No. 106784, dated March 28, 1996. Authorized use of federal railroad signal program funds to make roadway and operational improvements to address changed traffic flow patterns resulting from closings of railroad grade crossings rather than installing active warning devices.
- Texas Transportation Commission Minute Order No. 107279, dated September 25, 1997. Established goals for TxDOT's railroad safety program and all projects involving the upgrade of highway-rail intersections.
- The *Texas Manual on Uniform Traffic Control Devices (TMUTCD).* Applicable portions include (but are not limited to) Part VIII, "Grade Crossings."

Texas Attorney General Opinions

The following Texas Attorney General opinions pertain to railroad grade crossings:

- Texas Attorney General Opinion No. M-525. Re: Authority of State Highway Department [now TxDOT] to make expenditures request to qualify for projects under 23 U.S.C. Section 405, dated February 13, 1976. TxDOT authority to expend state matching funds for federal-aid railroad grade crossing warning signal projects off the state highway system.
- Texas Attorney General Opinion No. M-108. Re: Validity of appropriation to the Texas Highway Department [now TxDOT] to construct and maintain railroad protective devices, dated July 24, 1967. Authority to expend state funds on railroad grade crossing projects on the designated state highway system (non-federal-aid projects).

Federal Policy

The *Federal-Aid Policy Guide (FAPG)* Title 23, CFR Part 140, Subpart I and 23 CFR, Part 646, Subpart A & B. All projects undertaken by TxDOT and agreements with railroads where federal funds will be used shall meet the requirements of the *FAPG*.

Railroad Practices

TxDOT complies with the following railroad practices pertaining to railroad grade crossings:

- TxDOT complies with the practices found in the *Association of American Railroads, Communication and Signal Division, Signal Manual of Recommended Practice*, Volume 1, Section 3, "Highway Grade Crossing Warning Systems."
- The *Railroad-Highway Grade Crossing Handbook — Second Edition*, published by the U.S. Department of Transportation, Federal Highway Administration, provides general information on highway-rail grade crossing characteristics and the physical and operational improvements that can be made to enhance safety and operation of both highway and rail traffic over crossing intersections. The guidelines and alternative improvements presented in the handbook have proven to be effective and are accepted nationwide.

Section 3
Operations Involving Railroads

Maintenance Responsibilities

In Texas, the road authority and railroad company assume both separate and joint maintenance responsibilities at highway-rail grade crossings. The track and signals are always maintained by the rail operator, because they are located within railroad right-of-way and are intrinsic to the safe operation and passage of trains. While local, state, and federal governmental entities may provide funds for the replacement or upgrade of crossing surfaces and crossing signals, the railroad operator is generally responsible for performing the work within railroad right-of-way.

Railroad companies are responsible for maintaining crossing surfaces between the cross ties of the track structure. Crossties typically extend two feet outside of each rail. The road authority is responsible for maintaining the roadway approaches up to the edge of the crossing surface, advanced signing, and pavement markings. Maintenance of crossbuck signs and warning signal devices located within railroad right-of-way is the responsibility of the railroad operator.

Working on Railroad Right-of-Way

An agreement between TxDOT and the operating railroad company must be in place giving TxDOT permission to enter into and perform work on railroad right-of-way. The state's contractor must have railroad protective liability insurance in place with the operating railroad company prior to entering into and performing work on railroad right-of-way.

Any work performed by state forces on railroad right-of-way should be closely coordinated with the operating railroad company.

Railroad Payment

The state normally reimburses the railroad for force account work, except where an existing highway is crossed by a new railroad. For new railroads, most crossing agreements provide for the railroad to assume the entire cost. Reimbursement is limited to the work detailed in the state-railroad agreement and attached exhibits. Cost related to the improvement or maintenance of railroad property will not be reimbursed. The railroad bears the expense and responsibility of maintaining crossing warning signal systems, crossbuck signs, and crossing surfaces.

(continued...)

Railroad Payment *(continued)*

Reimbursable (Funded) Work. Railroad force account work (work performed by the railroad company) is funded and work is performed in conjunction with an approved highway construction project.

The state normally reimburses the railroad for force account work, except where an existing highway is crossed by a new railroad. In this case, most crossing agreements provide for the railroad to assume the entire cost. Reimbursement is limited to the work detailed in the state-railroad agreement and attached exhibits.

The railroad normally sends their bills to Finance Division (FIN) for payment.

Non-Reimbursable (Unfunded) Work. Cost related to the improvement or maintenance of railroad property is not reimbursed. The railroad bears the expense and responsibility of maintaining crossing warning signal systems, crossbuck signs, and crossing surfaces.

Section 4
Terminology

Types of Railroad Tracks

Like highways, railroad track is categorized according to function. These categories include the following:

main tracks — Tracks that handle through train movements between and through stations and terminals, as opposed to switching or terminal movements. (This definition applies for the purposes of highway-rail safety programs.)

NOTE: The majority of highway-rail intersection collisions occur at main track crossings. This can be attributed to the fact that there are more main track intersections with highways than there are side track (or switching track) intersections. Also, main tracks typically experience higher train volumes and train speeds.

branch line — A railroad line that typically carries freight from its origin to a main line.

passing track (or siding) — A track used for meeting and passing trains.

side track, **switching track**, and **industrial track** — Track used for the loading, unloading, and storage of rail cars.

Track Gauge

Railroad track gauge (the distance between the two rails) has been standardized in the United States since the late 1800s. The U.S. standard track gauge is four feet, eight and one-half inches (4' 8½").

Sight Distance

The number of tracks and the length of the roadway between multiple sets of tracks are important considerations in determining sight distance requirements for highway-rail intersections.

Joint Use

When TxDOT obtains a "license to cross" railroad right-of-way with its highway facilities, a "joint use" highway-rail intersection is created.

Preemption

"Preemption" refers to the interconnection of railroad signal devices with traffic signals at adjacent highway-highway intersections. When an approaching train activates the railroad signal devices, a relay in the railroad signal cabinet preempts the normal traffic signal phasing with special phasing sequence.

Section 5
DOT/AAR Grade Crossing Inventory

Background

The United States Department of Transportation (DOT) and the Association of American Railroads (AAR) developed the National Rail-Highway Crossing Inventory in the early 1970s. It was developed with the cooperative effort of the Federal Highway Administration, the Federal Railroad Administration (FRA), individual states, and individual railroads. All at-grade and grade-separated crossings, both public and private, in the United States were surveyed, and data were recorded on inventory forms. The inventory contains data on the location of each crossing, the amount and type of train traffic, traffic control devices, and other physical elements of the highway-rail intersection.

NOTE: TxDOT maintains its own inventory as well, with many of the same types of data found in the national inventory.

Identification Numbering System

Each crossing listed in the national inventory is assigned a unique identification number consisting of six numeric characters and an alphabetic character.

EXAMPLE: 123456A

The crossing identification number (DOT No.) was originally installed at each crossing by nailing or strapping a temporary tag to a crossbuck or flashing light post. Today, the more common practice with the railroads is to stencil the number on the warning device support post.

Maintenance of the Inventory System

The FRA voluntarily serves as custodian of the national inventory file. Data in the inventory are kept current through the voluntary submission of information by the states and railroads. Numerous states and railroads update the national inventory. Systematic and uniform procedures are required to assist the FRA in processing the data.

The data contained in the national inventory and state inventory should be verified in the field by appropriate engineering studies. The national inventory is used not only by the states and railroads in conducting their crossing improvement programs, but also by national and federal agencies in assessing crossing improvement needs and conducting research. Thus, it is vital that this valuable information be kept up-to-date.

(continued...)

Maintenance of the Inventory System *(continued)*

Districts should make periodic reviews of all public crossings in their districts to ensure that information reported in the inventory is reasonably accurate. Districts should recommend deletions or additions based on discrepancies or changes in vehicle traffic, rail traffic, type of warning device in place, or accident data reported in the inventory. Railroad companies also have the opportunity to make recommendations and corrections.

Railroad companies and local governments should coordinate updates to the crossing inventory through the district offices. Local governmental entities may request that traffic counts be conducted by the district offices at any public highway-rail grade crossing. All updates to the crossing inventory should be forwarded to TxDOT's Transportation Planning and Programming Division (TPP) and to the Traffic Operations Division (TRF) in Austin. TPP is the office of record for all updates to the DOT/AAR Grade Crossing Inventory and is responsible for coordinating these updates with the railroad companies and the FRA.

Chapter 2
Railroad Agreements -- General

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Section 1
Overview

Financial Responsibility

Responsibility for undertaking work at highway-railroad grade crossings is defined in the Texas Administrative Code (43 TAC 25.76). Financial responsibility for costs associated with new crossings, or improvements or adjustments to existing crossings, depends on whose property is being crossed. If TxDOT needs to cross or originally crossed an existing railroad, TxDOT pays for any necessary warning signals, crossing surfaces, and other work. If the railroad wants to cross or originally crossed an existing highway on the state system, the railroad pays for any necessary warning signals, crossing surfaces, or other work.

In the more common situation where TxDOT approaches the railroad to cross their tracks, a "license to cross," rather than an easement, is granted by formal agreement and without cost to either party. The agreement specifies the construction and maintenance responsibilities of the two parties at the crossing. Since railroads are most often not required to bear any of the costs of federal-aid and state funded projects, their contribution to state projects should be the license to cross them and, if necessary, occupy small portions of their right-of-way for the state's structure or roadway. This arrangement is of particular benefit to the railroad for work involving the elimination of hazards at highway-rail grade crossings.

Agreements Required

An agreement between TxDOT and the railroad must be executed before any work on railroad right-of-way is done. The type of agreement necessary depends on the nature of the work and the source of funding. The following chapters of this volume explain the specific types of work and circumstances under which various agreements are required.

Section 2
Railroad Force Account Work

Program Overview

Railroad force account work is work performed by railroad forces or the railroad's contractor. Generally, railroad force account work is funded and work is performed in conjunction with an approved highway construction project. This work may involve:

- planking (road crossing surfaces)
- track adjustments
- installation of warning devices
- relocation of existing warning devices
- installation or extension of drainage structures under tracks
- wire line adjustments
- flagging for train operations
- other related work.

Financing

All railroad force account work necessary to accomplish a highway construction project let to contract by the state must be funded and paid under that project. Construction funds should not be mixed with railroad safety or maintenance dedicated program funds.

NOTE: The railroad force account work is funded through the construction budget activity, and any state force account work is funded through budgeted district Activity 202.

Implementation

Implementation of railroad force account work normally proceeds as follows:

1. The district submits a request for the crossing work to the Traffic Operations Division (TRF) along with an 11 x 17 inch plan layout, marked "Exhibit A." (See Section 3 of this chapter.)
2. TRF prepares an agreement and submits it to the railroad.
3. After the agreement is executed and an estimate for railroad force account work is approved by TRF, railroad forces perform the work upon receipt of a work order from the district office

Reimbursement

The state normally reimburses the railroad for force account work, except where an existing highway is crossed by a new railroad. Reimbursable force account work is limited to the work detailed in the state-railroad agreement and attached exhibits. *Cost related to the improvement or maintenance of railroad property cannot be reimbursed.* The railroad bears the expense and responsibility of maintaining crossing warning signal systems, crossbuck signs, and crossing surfaces, because these appurtenances are located on railroad right-of-way.

Section 3
District Responsibilities

Project Lead Time

The district should coordinate the timing of the railroad crossing work with the approved highway program. Since securing an agreement from a railroad company normally requires six to twelve months, or longer, the district's letter of request, exhibits, and other necessary data must be submitted to the Traffic Operations Division (TRF) as early as possible.

As examples, pavement overlay and stripping work are usually handled by a letter agreement and can be approved by the railroad more quickly because they involve little or no railroad force account work. More complex projects (new crossings, widening existing crossings, or constructing grade separations) require more time — not just for the railroad — but also for TRF and Design Division (DES) review and approval. Underpass projects require the most detailed review by the railroad because the structure will be carrying trains and shoofly tracks are usually necessary during construction. The following table shows minimum lead times for these types of projects.

Minimum Project Lead Times

Project Type	Minimum Lead Time
Road Jobs	6 months
New Crossings, Complex Road Jobs, and Overpasses	9 months
Underpasses and Projects Involving Track Construction or Relocation.	12 months

These lead time requirements mean that all plan layouts and agreements must be completed so they can be submitted to the railroad in advance of the contract letting date.

TRF normally notifies the district if a project is in jeopardy of meeting the letting date and advises the district of the consequences.

Plan Layout (Exhibit A) Preparation

The district performs all studies and surveys necessary to prepare the plan layout, title sheet, and supporting information required for Exhibit A of the agreement.

To minimize revisions, Exhibit A should be as complete as possible. Revisions increase the time needed to obtain an agreement and could delay letting if the railroad objects to the revisions.

NOTE: All plan layouts prepared by the district must be signed, sealed, and dated by a registered professional engineer.

Work Order

The district issues the work order to the railroad for all projects except those involving the installation of new warning signal devices. TRF issues work orders for the installation of new warning signal devices contracted under terms of a signal agreement separate from the agreement for the crossing work.

Pre-construction Meeting

For overpass, underpass, and road construction projects of a critical nature, the district or its contractor should host a pre-construction meeting. Representatives from the railroad, TxDOT's contractor, and TxDOT should attend the meeting. The construction schedule and individual points of contact are discussed.

Construction Inspection

The district advises the railroad on the status of construction work on a regular basis and provides construction inspection while railroad forces are performing work.

The district issues the completion letter for the project.

Section 4
TRF Responsibilities

Securing Agreements

TRF is responsible for preparing, negotiating, and obtaining the agreement before the contract letting, based on the plan layouts and information submitted by the districts.

Liaison Role

TRF serves as the liaison between the districts and railroad companies. In this role, TRF is responsible for negotiations with the railroad companies in connection with the preparation of agreements and the securing and approval of force account estimates based on the information furnished by the districts.

Coordination with DES

TRF also coordinates agreements for railroad grade separations and spur track permits through the Design Division (DES) during the preliminary plan layout and PS&E review stages of project development.

Work Order

TRF issues the work order to the railroad company for all projects involving the installation of new warning signal devices contracted for under terms of a separate agreement.

Chapter 3

Highway-Rail Grade Crossing Surfaces (Construction and Reconstruction)

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Section 1
Overview

Introduction

When the limits of a highway construction project involve the construction or reconstruction of a highway-rail grade crossing, TxDOT must execute an agreement with the operating railroad company prior to entering or performing any work on the railroad right-of-way. The agreement gives TxDOT license and permission to cross railroad right-of-way and establishes the rights and responsibilities of each party in the construction, maintenance, and operation of the highway-rail intersection. Most railroad rights-of-way are owned by a privately held company and TxDOT must act accordingly.

Importance of Timing

Timing and coordination between the district, divisions, and railroad company are essential to meet contract letting schedules and avoid delays or conflicts during construction.

On projects requiring a significant amount of railroad force account work, the railroad should be contacted during the advance stages of project development. Contact with the railroad should be coordinated through the district railroad coordinator and the Traffic Operations Division (TRF).

Project Financing

Highway construction projects involving any of the following are financed under the construction budget for each particular highway construction project:

- new highway-rail grade crossings
- the extension or re-construction of existing highway-rail grade crossings
- any other adjustments to a highway facility located within railroad right-of-way.

Replanking Program. Stand-alone projects for the replanking (resurfacing) of existing highway-rail grade crossing surfaces on the state highway system are considered under the state Grade Crossing Replanking Program (see Chapter 4 of this volume).

Project Process Overview

Projects involving highway-rail grade crossings normally proceed as follows:

1. The district furnishes to the Traffic Operations Division (TRF) complete plan layout (known as "Exhibit A") showing the critical details for the modification of the existing roadway or construction of new roadway. (See Section 2 of this chapter for critical details to be included in Exhibit A.)

   NOTE: Exhibit A should be submitted *at least* nine months before letting.

2. TRF prepares the agreements necessary for the license to cross railroad right-of-way, which covers construction and maintenance of the work to be performed. TRF also negotiates with the railroad companies involved. The railroad furnishes an estimate to TRF showing all reimbursable work, as indicated in the agreement, to be performed by the railroad. TRF reviews and approves the estimate, attaches it to the executed copies of the agreement, and forwards the railroad's copy back to them. The district and the Finance Division (FIN) also receive a copy of the executed agreement and estimate. (See Section 3 of this chapter for details on the agreement and negotiations.)

3. After the agreement is signed, the district issues a work order to the railroad. This may occur after the project is let or when requested by the railroad. The district also conducts pre-construction meetings, inspects the work, and issues completion letters. (See Section 4 of this chapter for more information on these activities.)

   NOTE: TRF issues work orders for warning signal work contracted under terms of a signal agreement separate from the agreement for the crossing work. See Chapter 6 of this volume.)

Sub-base Work

Materials. TxDOT or its contractor may provide materials needed for the sub-base work under the new crossing or the widened portion of the roadway, when widening is needed.

Timing of Work. On new railroad crossings construction projects, sub-base work performed by TxDOT or its contractor is usually completed *before* the railroad performs its work. On projects involving the reconstruction, widening, or replanking of existing crossings, sub-base work performed by TxDOT or its contractor is done *during* the railroad's work and, therefore, must be carefully coordinated to avoid delays.

Section 2
Plan Layout (Exhibit A)

Introduction

The district prepares the plan layout (known as Exhibit A) for the project in sufficient detail to show all work to be performed by TxDOT, TxDOT's contractor, and the railroad. Exhibit A includes:

- project data
- a title block
- right-of-way requirements
- a work list
- general notes
- warning signal device location.

Discussions of each of these items follow.

NOTE: All plan layouts prepared by the district must be signed, sealed, and dated by a registered professional engineer.

Project Data

Project data include:

- the county
- county number
- project description
- project number
- control-section-job (CSJ)
- railroad mile post (RRMP)
- highway station
- highway number or road name.

Title Block

The title block includes:

- the railroad company name and DOT No. (if available)
- crossing location
- railroad milepost and highway station at each location
- the words "Exhibit A."

Right-of-Way Requirements

If the roadway is being widened, the plan layout should indicate if additional railroad right-of-way will be required. This is necessary for preparation of a new "license to cross" article in the agreement.

Work List

The work list provides a breakdown of all work to be performed by TxDOT, TxDOT's contractor, and the railroad. The type of work to be performed on the railroad's ROW should also be listed. When coring is involved, it is important to show where the coring will be performed in relation to the railroad tracks.

General Notes

General notes should include:

- number and speed of "through" trains per day
- number and speed of switching moves per day
- average daily traffic (ADT)
- posted speed limit of vehicle traffic.

Warning Signal Device Location

On roadway modification projects, if railroad warning signal devices exist, their existing location and the proposed new location of the warning signals and appurtenances must be shown.

NOTE: If widening of the roadway involves relocating or upgrading the existing railroad warning signal devices, it is important to include pictures of the location.

On new road construction projects, the railroad warning signal devices are installed under terms of a separate agreement with the railroad company prepared by the Traffic Operations Division (TRF). The district should submit one additional copy of the Exhibit A to TRF for preparing the signal agreement and developing the railroad warning signal device portion of the project. A diagnostic inspection is normally conducted prior to determining the type and location of the railroad warning signal devices to be installed (see Chapter 6, Section 6, of this volume for details). TRF schedules the diagnostic inspection, which involves representatives from the district, the railroad company, and local government (as necessary).

Section 3
Agreement and Negotiations

Introduction

Using the Exhibit A plan layout furnished by the district, the Traffic Operations Division (TRF) prepares the necessary agreement and forwards it to the railroad company. TRF coordinates any questions or revisions resulting from the railroad company review with the district.

Agreement Contents

The agreement contains:

- project data
- a license clause
- scope of work
- construction and maintenance conditions
- insurance clauses
- payment clause
- solicitation of bids clause
- conditions
- fiber optic clause.

Discussions of each of these items follow.

Project Data

Project data include:

- the county
- control-section-job (CSJ)
- highway
- project number
- DOT No. (if available)
- the city.

License Clause

The license clause gives TxDOT license and permission to construct, maintain, and use the new roadway across railroad ROW. If the roadway is being widened and no additional railroad ROW is required, the license clause does not need to be included.

Scope of Work

The scope of work includes all work to be performed by TxDOT, TxDOT's contractor, and the railroad. It spells out the responsibilities of both the railroad and TxDOT.

Construction and Maintenance

The construction and maintenance clause describes to the railroad the conditions of work. The railroad must begin work within 30 days after having been issued a work order from TxDOT and must proceed without delay to completion. (See Section 4 of this chapter for more information on the work order.) The railroad will not be paid for any work performed at the job site prior to the work order date. The railroad company is given the authority to assemble all materials for the project sufficiently in advance to assure prompt delivery to the job site.

Insurance Clauses

The insurance clauses specifies the type of insurance the contractor will need to purchase on behalf of the state and railroad. All work performed on the railroad right-of-way by the TxDOT contractor requires railroad protective liability insurance in an amount of not less than two million dollars for bodily injury and property damage and not less than six million dollars aggregate for all occurrences. The railroad protective liability insurance must be carried until all work on the railroad property is completed. Insurance requirements are included in a Special Provision to Item 007 of TxDOT's contractor's bid specifications. If state forces perform the work, no insurance provisions are required in the agreement because TxDOT is self-insured.

Payment Clause

The payment clause specifies when and under which conditions TxDOT will reimburse the railroad. Reimbursement is made to the railroad only if a work order has been issued to begin work. The railroad is reimbursed for work performed and materials furnished in accordance with the provisions of the *Federal Aid Policy Guide (FAPG)*, Subchapter B, Part 140, Subpart I, as last issued by the Federal Highway Administration on April 7, 1992. The railroad is reimbursed the actual total cost of all railroad force account work performed and materials used or installed. However, upon final audit by the Audit Office of TxDOT, the railroad may be required to reimburse TxDOT any over payment that cannot be justified.

Solicitation of Bids Clause

The solicitation of bids clause is *only* included in the agreement for railroad companies that do not have their own forces to perform railroad work and must hire a contractor to perform railroad force account work. This clause notifies the railroad that they must solicit a minimum of three bids from qualified contractors to perform the railroad force account work. The railroad is also allowed to submit an estimate for administrative costs and construction inspection, which is reimbursed on an actual cost basis upon receipt of an itemized bill. Upon receipt of the bids, the railroad reviews the bids and forwards them to TRF for approval with a recommendation of the contractor they would prefer. TRF reviews the bids and awards the contract. Under state contracting policy, the contract is normally awarded to the lowest bidder, unless other mitigating factors prevail. TRF advises the railroad in writing as to which contractor was awarded the project and the cost of the work. The approved bid will be the *exact lump sum amount* paid to the railroad for the work performed. The railroad is responsible for reimbursing its contractor.

Conditions

The conditions clause describes how the agreement can be canceled at any time prior to actual letting of the contract by TxDOT. Also, any cost participation by the railroad is identified in accordance with *FAPG* requirements.

Fiber Optic Clause

Most of the major railroads have fiber optic cable buried on their right-of-way. Therefore, it is important that the railroad be contacted at a 1-800 number (which is identified in the agreement) prior to any work being performed, to determine if fiber optic cable is buried on the right-of-way. Also, the location of the fiber optic cable and who it belongs to can be identified. It is the district's responsibility to contact the fiber optic company to advise them of the proposed work and to determine if the cable will be affected by the work. This clause is important to the railroad companies, because of the very high costs associated with broken or damaged fiber optic cable.

Negotiations

TRF coordinates all negotiations concerning the agreement, including any revisions. These negotiations are coordinated with the district when corrections or revisions to the plan layout are involved.

After Execution

Upon receipt of the signed agreements, TRF forwards a copy of the executed agreement along with the railroad estimate (if available) or the approved bid to the district, the Finance Division (FIN), and the Federal Highway Administration (if it is a federal-aid project).

Section 4
Project Execution

Work Order

The district is responsible for issuing the work order to the railroad for any railroad force account work not involving installation of new railroad signal devices and coordinating work in progress on railroad right-of-way. The work order should be issued soon after the contract has been awarded to allow the railroad sufficient time to order materials and schedule work. A copy of the work order should also be sent to TRF and FIN. The work order authorizes payment to the railroad.

Pre-construction Meeting

A pre-construction meeting is recommended and is the district's responsibility. Representatives from the railroad, TxDOT's contractor, and TxDOT should attend the meeting so that work can be coordinated. The construction schedule and individual points of concern and coordination are discussed.

Inspection

The district inspects the work performed by the railroad and verifies that the work complies with the approved plan layout and specifications.

Completion Letter

The district issues the completion letter to the railroad when the project is complete. A copy of the completion letter should be sent to TRF and FIN. The completion letter authorizes final payment to the railroad.

Chapter 4
Grade Crossing Replanking Program

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Section 1
Overview

Program Background

The State Railroad Grade Crossing Replanking Program was originally authorized by the Texas Legislature in 1979 to provide dedicated State Highway Funds for replacing worn-out grade crossings located on the state highway system. The Traffic Operations Division (TRF) manages the program.

Annual Reauthorization. TRF requests program reauthorization on an annual basis through the Transportation Planning and Programming Division's (TPP) annual authorization of bank balance allocation programs. The Texas Transportation Commission reauthorizes and approves the program by minute order.

Program Funding

The Replanking Program is managed as a bank balance allocation program. Bank balance allocation means that the commission authorizes the total amount of funding and the method of project selection. This provides flexibility within each program year to cancel and add projects to the program without commission action.

Program funds are used to reimburse the railroad force account portion of the projects. State force account work is financed out of the district's maintenance budget.

Eligible Crossings

Every railroad operating in Texas can participate in the Replanking Program.

Program funds can only be used on state highway system crossings where the state highway originally crossed the railroad. Grade crossings located on city streets and county roads and most spur track crossings cannot be replanked under this program. Spur tracks not eligible for the program are those that originally crossed an existing state highway. Eligible spur tracks are those that were originally crossed by the state highway.

Crossing Surface Materials for Replanking

The standard surface materials for the replanking of railroad grade crossings are precast concrete panels with rubber headers along the rails. Timber is seldom used, as concrete has proven more durable and cost-effective. Rubber surfaces are occasionally used. Asphalt crossings are generally unacceptable and should be used only on a temporary basis. Most of the major railroad companies have adopted the use of concrete panel crossing surfaces with rubber inserts in the rail flangeway as a company standard (see Figure 4-1).

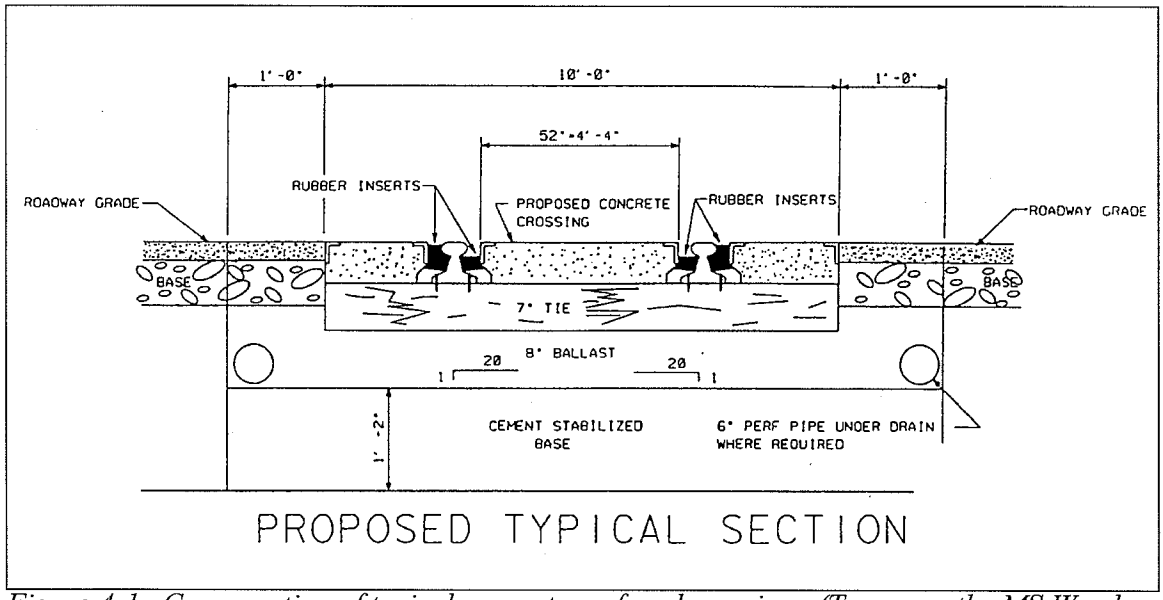

Figure 4-1. Cross section of typical concrete surfaced crossing. (To access the MS Word version of this figure from on line, click this file name: TFEG4-1.)

Section 2
Project Selection

Introduction

The Traffic Operations Division (TRF) selects projects for the Replanking Program on a statewide basis. Generally, each district is guaranteed funding for its two highest priority ranked projects. The other eligible projects are included in the program according to their priority rankings. The priority ranking is based on the project's estimated cost-per-vehicle.

Project Submission

Each year TRF sends Railroad Grade Crossing Replanking Project Submission Forms (TxDOT Form 1876) to the districts.

The district completes *one form for each crossing submitted*, ranking them according to district priority. Crossings in the worst condition should be assigned highest priority rankings. TRF strives (within funding limitations) to include each district's top two priority ranked submissions in the current year's program.

After receiving all project submissions from every district, TRF ranks the projects in order of estimated cost per vehicle.

Form Available. A sample of the Railroad Grade Crossing Replanking Project Submission Form is provided in Appendix A of the hard copy print version of this volume. This sample form may be photocopied as necessary. Copies may also be obtained from TRF. In the on-line version of this volume, an MS Word version of this form may be opened and printed out by clicking on the following file name: TFE-1876.

Figuring Estimated Cost per Vehicle

The estimated cost per vehicle for a project is derived from the total estimated cost of the project. The total estimated cost of the project is obtained by multiplying the estimated cost of materials, labor, and other associated expenses per track foot times the width of the crossing. For the purposes of this calculation, "the width of the crossing" is the length of the track traversing the roadway plus 0.914 m (3 feet) beyond edge of the pavement or curb line on either side. The estimated cost per vehicle is the total estimated cost of the project divided by the average daily traffic (ADT) at the crossing.

If there are multiple tracks at the crossing, the total combined width across the roadway of *both* tracks is used to determine the total estimated cost of the project.

(continued...)

Figuring Estimated Cost per Vehicle *(continued)*

The formulas are:

$$Total\ Project\ Cost = Cost\ per\ Track\ Foot \times Number\ of\ Tracks\ (Length\ of\ Tracks)$$

$$Cost\ per\ Vehicle = \frac{Total\ Project\ Cost}{ADT}$$

EXAMPLE: Concrete replanking is proposed at a crossing with two tracks across the roadway. Each track is 40 feet long. The ADT is 1300 vehicles per day (VPD). The current cost of concrete replanking is $457 per track foot.

$$\$457 \times 2(40) = \$36{,}560\ Total\ Project\ Cost$$

$$\frac{\$36{,}560}{1300\ VPD} = \$28.12\ per\ Vehicle$$

Project Selection

TRF pulls out each district's first and second priority ranked projects and calculates a total estimated cost for all the districts' top two priority submissions. This establishes a program subtotal. All of the other project submissions are then sorted in order of cost per vehicle These projects are added to the statewide priority list, beginning with those having the lowest cost per vehicle, until the program funding amount is expended. TRF then furnishes a list of the selected projects to each district and railroad company.

Project Cancellation

If projects are canceled for any reason (RR abandoned tracks, RR already replanked crossing, crossing is a spur track, etc.) the district from which the project was canceled can recommend another project (of equal or lesser value). This replacement project is then chosen from the submitted projects that did not previously make the program within that district. If the district in question cannot replace the canceled project, then the funds for the canceled project are used on the next highest rated project statewide that did not originally make the program.

Section 3
Plan Layout (Exhibit A)

Introduction

The district prepares complete project plan layout (known as Exhibit A), showing critical details for the proposed replanking project. The district then submits Exhibit A to the Traffic Operations Division (TRF). These exhibits should be submitted within the deadline set annually by TRF.

NOTE: All plan layouts must be signed, sealed, and dated by a registered professional engineer.

Contents of Exhibit A

Exhibit A should include:

- the plan layout (to scale with scale labeled on the layout)
- a typical section of road
- a typical section of railroad crossing
- work to be done by railroad
- work to be done by TxDOT
- general notes, including:
  - number of through trains per day
  - number of train switching moves per day
  - ADT
  - average speed of traffic at crossing
  - existing warning devices
- a title block on each sheet containing all project information
- a traffic control plan based on the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*, including any necessary detours.

All pages of the Exhibit A plan layout should be on 11×17 inch paper with a one inch margin at the top.

The Exhibit A plan layout should be stamped: "Exhibit A."

Figure 4-2 (a–c) at the end of this section shows an example Exhibit A plan layout.

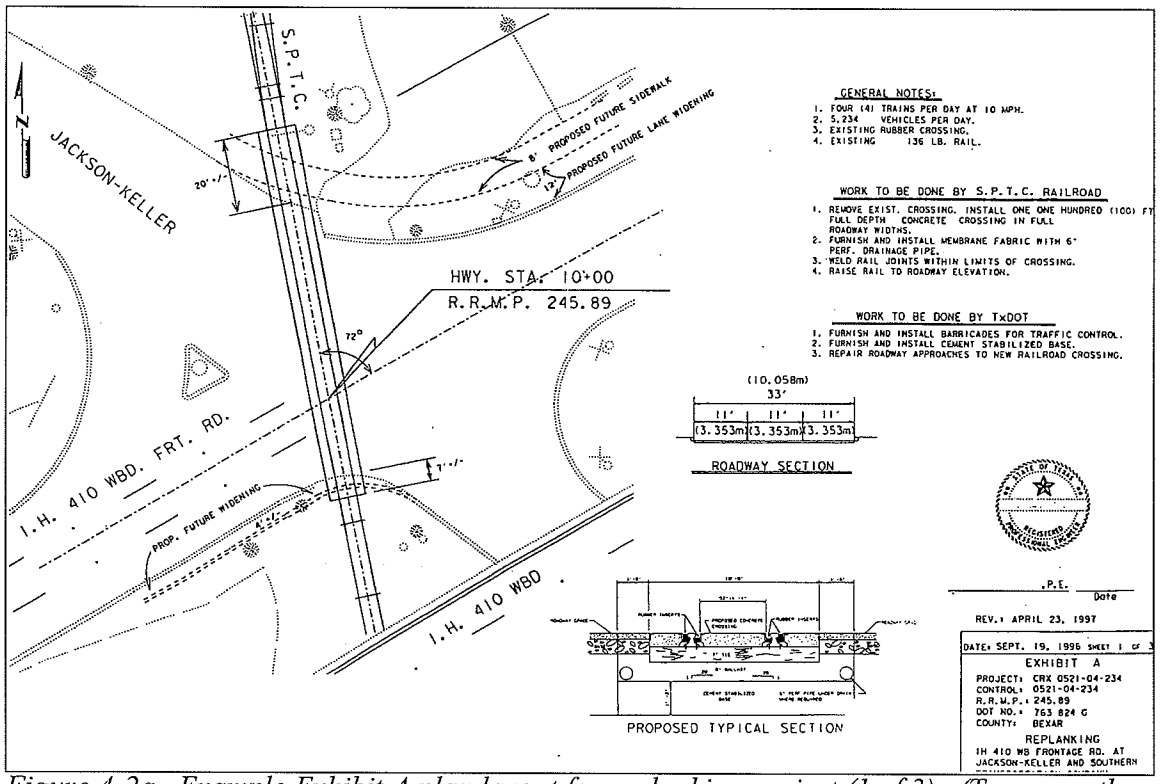

Figure 4-2a. Example Exhibit A plan layout for replanking project (1 of 3). (To access the MS Word version of all 3 panels of this figure from on line, click this file name: TFEG4-2.)

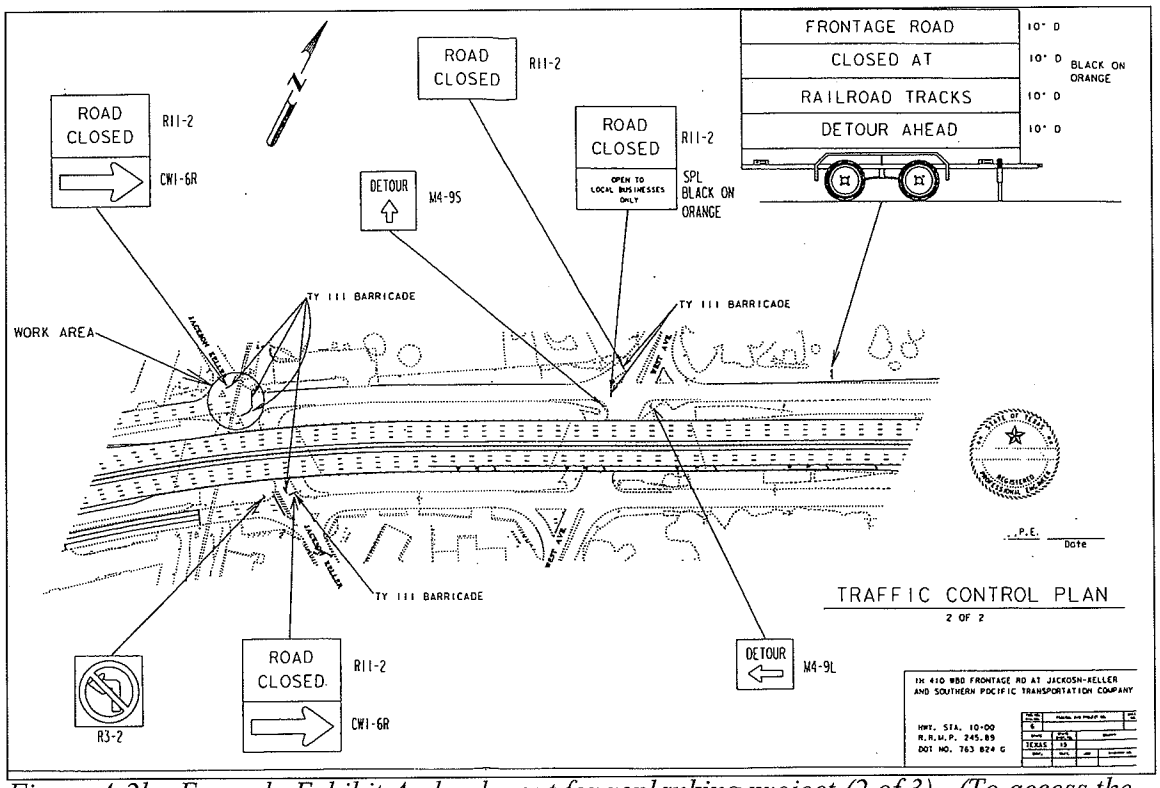

Figure 4-2b. Example Exhibit A plan layout for replanking project (2 of 3). (To access the MS Word version of all 3 panels of this figure from online, click this file name: TFEG4-2.)

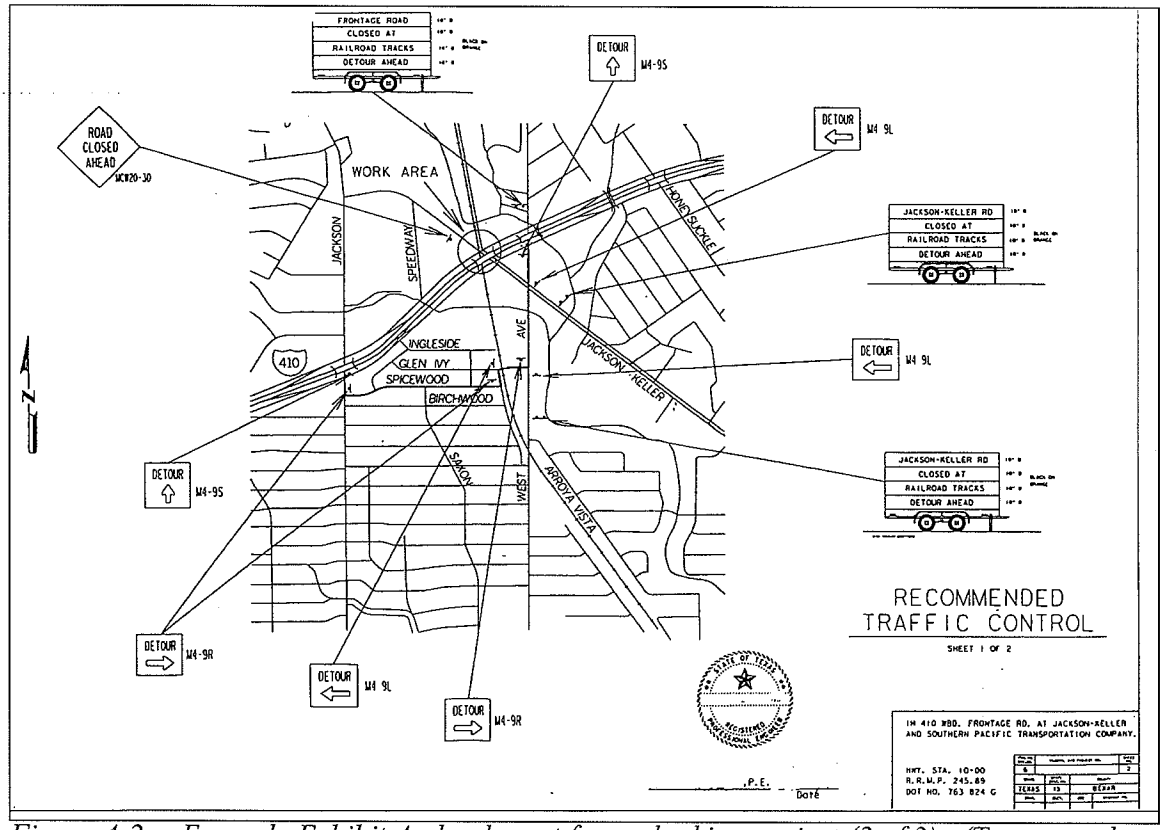

Figure 4-2c. Example Exhibit A plan layout for replanking project (3 of 3). (To access the MS Word version of all 3 panels of this figure from online, click this file name: TFEG4-2.)

Section 4
Agreements and Negotiations

Introduction

Railroads may participate in the Replanking Program by negotiating a contract with the state called a "master agreement" or by executing separate agreements for each project.

Master Agreements

Master agreements are in place with each railroad company that receives new projects on a regular basis and are the preferred contracting instrument under the railroad dedicated fund programs. Master agreements are updated each year by adding an Exhibit L (List of Projects) to the original master agreement. This eliminates the need for a separate agreement each year or for each project, saving administrative time and resources.

Master agreements contain:

- ***scope of work***, including:
  - the responsibilities of the railroad and the state
  - the quality of materials
  - the inspection of materials
  - requirement that all rail joints be welded
  - requirements for subgrade stabilization work (if necessary)
  - materials the state will not pay for (rails, tie plates, rail anchors, track spikes, and other material or labor intrinsic to maintenance of the railroad tracks)
  - railroad maintenance responsibilities
  - reference to the Exhibit A
- ***a work order clause***, explaining the requests, issuance, and receipt of work orders
- ***a payment clause***, covering:
  - conditions and guidelines for reimbursement
  - railroad submission of final bills

(continued...)

Master Agreements *(continued)*

- ***solicitation of bids clause (optional)***:
  - requiring that the railroad submit sufficiently detailed uniform proposals to qualified contractors using the Detailed Estimate for Railroad Solicitation of Bids (TxDOT Form 1891) (see "Form Available" following this list)
  - requiring the submission of at least three qualified contractors to the state for approval
  - requiring that approval of bids be contingent on sufficiency of detail, uniformity, and cost.
  - including information concerning the railroad's recommendation
  - limiting the time frame of the project notice.

Form Available. A sample Form 1891, Detailed Estimate for Railroad Solicitation of Bids, is provided in Appendix A of the hard copy print version of this volume. This sample form may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division (TRF). In the on-line version of this volume, an MS Word version of the form may be opened and printed out by clicking on the following file name: TFE-1891.

Individual Project Agreements

The railroad may also participate in the Replanking Program by negotiating a separate agreement for each project on the program. In addition to the items required in a master agreement, individual project agreements should include:

- ***project data***, including:
  - location of the project
  - county
  - control-section-job (CSJ)
  - highway number or street name
  - project number
  - DOT number (if available)
  - city
- ***a construction and maintenance clause***, specifying:
  - details relating to the request, issuance, and receipt of work orders
  - materials for which the state will not reimburse the railroad (rails, tie plates, rail anchors, track spikes, and other material or labor related to the improvement or maintenance of the railroad tracks)
  - the railroads future responsibility for maintenance after the project is complete

(continued...)

Individual Project Agreements *(continued)*

- ***conditions***, including:
  - the conditions under which the agreement may be canceled.
  - a requirement that the railroad retain adequate cost accounting records
  - provision for state inspection of construction.

Negotiations

TRF coordinates all comments from participating parties (districts, railroad companies, industries, counties, cities, etc.) and prepares all necessary agreements. TRF also acts as liaison in negotiations with all parties involved.

TRF reviews the Exhibit A plan layout and traffic control plans, and prepares and sends project notices to the railroad companies.

Section 5
Project Execution

Work Order

After all materials are assembled, delivered to the job site, and a crew is scheduled, the district issues the work order to the railroad at the railroad's request.

The district should send a copy of the work order to the Traffic Operations Division (TRF) and the Finance Division (FIN). The work order authorizes payment to the railroad.

Pre-construction Meeting

A pre-construction meeting is recommended and is the district's responsibility. Representatives from TxDOT, the railroad, and their respective contractors should attend the meeting so that work can be coordinated. The construction schedule and individual points of concern should be discussed and any scheduling conflicts identified and resolved.

Inspection

The district inspects the work performed by the railroad and verifies that the work complies with the approved plans and specifications.

Completion Letter

The district issues the completion letter to the railroad when the project is complete. A copy of the completion letter should be sent to TRF and FIN. The completion letter authorizes final payment to the railroad.

Chapter 5
Spur Tracks

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Section 1
Overview

Introduction

Spur track crossings are generally discouraged. However, under certain circumstances, TxDOT may allow both grade-separated and at-grade spur track crossings on conventional highways. On interstate and other controlled access highways, *only* grade-separated crossings may be allowed.

Grade-separated Crossings

TxDOT may allow a grade-separated crossing if the industry or railroad desiring the crossing agrees to finance and construct it.

The district, in conjunction with the Design Division (DES) and the Traffic Operations Division (TRF), determines the need for a grade separation based on the following factors:

- average daily traffic volume
- volume, type, and time of train movements
- location of proposed crossing
- safety of the traveling public
- other pertinent considerations.

Cost. The Texas Administrative Code (43 TAC §25.75) requires that the total cost of constructing a grade separation be borne by the party applying for the spur permit. (See Chapter 7 of this volume for more information on grade separations.)

At-grade Crossings

A spur track at-grade crossing may be allowed on non-interstate and non-controlled access highways if, in the opinion of the district and DES, the anticipated volumes of train and vehicular traffic and other factors indicate that the crossing will not be overly hazardous to the traveling public.

Costs. If a spur track grade crossing is allowed, all costs of the crossing pavement, highway adjustments, warning devices, and maintenance is borne by the party requesting the spur track.

Conditions may be specified whereby a change in traffic or train conditions or volumes will require a future separation of grades at no expense to TxDOT.

Request for Crossing

A railroad company, an industry, or both can request a spur track crossing. If a railroad company plans to provide rail service to the industry making the request, then both the railroad and industry should become a party to the request and agreement executed with TxDOT for the spur track permit.

Requests to cross TxDOT's right-of-way with a spur track must be submitted in writing to the district involved.

Processing a Request

Upon receiving a request for a spur track crossing, a district proceeds as follows:

1. The district investigates the possibility of the applicant (railroad or industry or both) obtaining rail service by alternate means that will not require an additional highway crossing. These means could be servicing through a different railroad company or through joint use of a nearby existing spur track crossing.
2. If an alternate plan is impracticable, the district should forward the spur track request to TRF, along with a report and recommendations. The report should include:
   - a map showing the location of the proposed spur track crossing
   - average daily traffic at this location
   - applicant's estimate of the number and length of trains anticipated to cross the highway during each 24-hour period.

Upon receiving a request and recommendations concerning a proposed spur track from the district, TRF:

1. reviews the request
2. prepares a memorandum to TxDOT administration requesting approval of the spur track permit.

Upon administrative approval, TRF:

1. forwards a copy of the approval to the district
2. prepares the necessary agreement
3. works with the district and railroad company or industry or both in preparing, negotiating, and executing the agreement.

Section 2
Plan Layout (Exhibit A)

Introduction

The applicant, with guidance from the district, should prepare plan layouts to serve as Exhibit A in the agreement. These layouts are similar to the preliminary layouts the district prepares for a diagnostic inspection (see Chapter 6, Section 6 of this volume).

Site Inspection

The Traffic Operations Division (TRF) arranges a site inspection with representatives from the district, TRF, and the applicant (railroad, industry, or both) involved to determine:

- type of traffic control devices to use
- location of signals and other appurtenances
- length and type of crossing pavement to be installed
- location and size of drainage structures, if needed
- any other features to be located in the plan layout.

Finalization of Exhibit

The applicant or district (depending on who is doing the work) adds the agreed upon features to the exhibit. If the applicant finalizes the exhibit, the applicant then furnishes a reproducible tracing to the district for review. The district then forwards it to TRF for inclusion in the agreement.

Section 3
Agreement and Negotiations

Contents

Using the plan layout furnished by the applicant through the district as Exhibit A, TRF prepares the necessary agreement and forwards it to the railroad or industry or both for their approval.

Agreement Contents

The agreement contains the following:

- project data
- permission
- scope of work
- insurance clause
- other applicable considerations.

Discussions of each of these items follow.

Project Data

Project data include the location of the project: county, highway, and city.

Permission

The permission clause gives the railroad or industry permission to construct, maintain, and operate, at its sole expense, a spur track across TxDOT's right-of-way. The clause states that the railroad or industry will perform or have performed all work pertaining to the crossing and that it will be done at no expense to and to the satisfaction of TxDOT. Also, the crossing will be maintained to TxDOT's satisfaction.

Scope of Work

The scope of work lists all work to be performed by the railroad or industry in constructing the spur track. If TxDOT performs any work, the railroad or industry will reimburse TxDOT.

Insurance Clause

The insurance clause specifies the type of insurance the railroad or industry or both must purchase on behalf of TxDOT.

Other Considerations

Other considerations that may apply to the agreement follow.

Modifications to the Highway. If TxDOT elects to modify the highway in any way that will affect the spur track grade crossing , TxDOT will have the right to make such modifications, and the railroad or industry will make the necessary changes at its own expense.

Liability. TxDOT does not assume any liability for suits, claims, or damage of any kind arising out of or incidental to the construction, maintenance, or operation of the flashing light signals or crossing.

No Abnormal Delays in Traffic Flow. No general switching of trains across the highway is permitted. Train operations crossing the highway must be conducted in a way as to not delay traffic flow for more than a normal period of time (5 minutes is the maximum time a crossing can be blocked under Texas Transportation Code). If more than the normal time is needed, the railroad or industry must notify TxDOT in writing as to the necessity and circumstances for more time.

Future need for Grade Separation. If in the future, TxDOT determines that a grade separation is required, the railroad or industry or both will finance and construct the structure. The terms of the grade separation structure will be handled under a separate agreement.

Section 4
Construction Inspection and Project Completion

Inspection

The district inspects the work performed by the railroad or industry to assure that the it meets approved plan layouts and specifications.

Upon completion of the spur track crossing, the district notifies TRF so that a joint final inspection can be conducted on both the signal and crossing installations.

Obtaining DOT Inventory Number

The railroad or industry must obtain a U.S. Department of Transportation crossing inventory number (DOT No.) for the crossing and advise the district when it is assigned. The district then advises TRF and the Transportation Planning and Programming Division (TPP).

Chapter 6
Warning Signals and Devices

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Section 1
Overview

Introduction

This chapter covers projects involving the installation and upgrading of warning signals and devices used at highway-rail crossings.

General Guidelines

The *Railroad-Highway Grade Crossing Handbook*, second edition, published by the U.S. Department of Transportation, Federal Highway Administration, provides general information on highway-rail grade crossing characteristics, and the physical and operational improvements that can be made to enhance safety and operation of both highway and rail traffic over crossing intersections. The guidelines and alternative improvements presented in the handbook have been proven effective and are accepted nationwide.

The *Texas Highway-Rail Intersection Field Reference Guide*, Research Report 1273-F, dated May 1994, provides further information. Copies are available through TxDOT's Research and Technology Transfer Office.

The type of warning system to be installed is determined during a site inspection by a diagnostic team as described in Section 6 of this chapter.

Federal Funding Requirements

All agreements between TxDOT and railroad companies involving federal funds for grade crossing warning signal projects must meet the requirements of the *Federal-Aid Policy Guide (FAPG)*, Title 23, CFR Part 140, Subpart I, and 23 CFR, Part 646, Subpart A & B.

TRF's Role

The Traffic Operations Division (TRF) handles all negotiations with the railroad companies and coordinates with the districts for installation of grade crossing warning signals and devices or upgrading of existing signals at grade crossings.

Section 2
Programs and Finances

Highway Construction Projects

Individual signal projects may be proposed for highway or street crossings on the Federal-Aid Urban Systems in cities, although these projects are generally in conjunction with roadway construction projects. These projects are *not* subject to the statewide priority system and are financed from district construction allocations.

Automatic warning devices generally should be installed or upgraded for crossings within the limits or near the terminus of a construction project. The *FAPG* Title CFR 23, Part 646B, Section 646.214 design requires the installation of automatic warning devices where one or more of the following conditions exist:

- multiple main line railroad tracks
- multiple tracks at or in the vicinity of the crossing which may be occupied by a train or locomotive so as to obscure the movement of another train approaching the crossing
- high speed train operation combined with limited sight distance at either single or multiple track crossings
- a combination of high speeds and moderately high volumes of highway and railroad traffic
- any combination of:
  - a high vehicular traffic volume
  - high number of train movements
  - substantial number of school buses or trucks carrying hazardous materials
  - unusually restricted sight distance
  - continuing crash occurrences
- a diagnostic team's recommendation.

Financing. Financing for the devices is included in construction projects at the programming stage.

Coordination. As roadway planning advances, the district should furnish TRF a letter-size location map for advancing the project with the Design Division (DES) and the Federal Highway Administration (FHWA). TRF should be advised which construction project the crossing project applies to, the project letting date, and furnished a preliminary layout showing the existing and proposed roadway.

Federal Programs

The Federal Railroad Signal Program is funded under the Surface Transportation Program (STP), Federal Section 130 of the current federal transportation act. Highway-rail grade crossing warning devices and grade crossing hazard elimination projects are funded by the safety set-aside portion of the STP. Railroad crossing hazard elimination projects may include improving roadway alignment, consolidating and closing redundant, non-essential grade crossings, removing sight distance obstructions, etc. All public highway-rail grade crossings are eligible for the Federal Railroad Signal Program, except for industry spur track crossings located on the state highway system where the spur track crossed an existing highway. (See Section 3 of this chapter for detailed information on the Federal Railroad Signal Program.)

School Bus Program. The Federal Railroad School Bus Signal Program is included as a part of the federal program of work funded by STP. All unsignalized public highway-rail grade crossings used by school buses carrying students are eligible for this program, with the exception of industry spur track crossings located on the state highway system where the spur track crossed an existing highway. Districts are responsible for furnishing updated school bus moves over public crossings to TRF for updating in the state crossing inventory. Districts should obtain this information from the school districts on an annual basis. (See Section 3 of this chapter for detailed information on the Federal Railroad School Bus Signal Program.)

Railroad Signal Maintenance Payment Program

The Railroad Signal Maintenance Payment Program is a state funded program to provide a fixed annual unit payment to the railroads for maintenance of railroad signals on the state highway system only. This program is managed under the bank balance allocation procedures and submitted for approval by Transportation Commission Minute Order in the annual Project Development Plan (PDP).

Payment is based on the type of warning device in place as of August 31st of each program year. Payment is provided based on the following schedule.

State Railroad Signal Maintenance Payment Program Schedule

Type of Warning Device	Annual Payment per DOT Numbered Location
Mast Flashers	$300
Cantilever Flashers	$400
Gates and Flashers	$800

Verification of Warning Devices

Before payment to the railroad company can be made under the Railroad Signal Maintenance Payment Program, the type of warning devices in place must be verified. TRF coordinates these verifications through the districts, the Transportation Planning and Programming Division (TPP), and the railroad companies. TRF normally requests that the districts verify the type of warning device in place at each crossing located on the state highway system between December and March, following the August 31 cut-off date to verify payment is warranted.

The district is responsible for verifying the type of warning device in place and forwarding any corrections to TRF for verification and coordination with TPP and the railroads companies.

TRF is then responsible for issuing a recommended payment amount to the railroad and requesting their concurrence in the payment amount. After the railroad acknowledges the agreed upon amount and any discrepancies are reconciled, TRF sends the approved Form 132 Billing Statement to the Finance Division (FIN) to process payment to the railroad company.

TRF furnishes corrections to the crossing inventory to TPP for updating with the Federal Railroad Administration.

Section 3
Federal Railroad Signal Program

Introduction

This section describes eligibility, funding, selection, and processing for projects under the Federal Railroad Signal Program. (For a basic description of the program, see Section 2 of this chapter.)

Eligibility

Project Eligibility. All public highway-rail grade crossings are eligible for the Federal Railroad Signal Program, except for industry spur track crossings located on the state highway system where the spur track crossed an existing highway. For more information on spur tracks, see Chapter 4 of this volume.

Eligible Work. Under the federal program, project work may include:

- improvement of roadway alignment
- consolidation and closing of redundant, non-essential grade crossings
- removal of sight distance obstructions, etc.
- upgrade of railroad warning devices.

Funding

Funding participation is 90 percent federal and 10 percent state. TxDOT does not require a local funding match for projects off the state highway system. However, local participation in these projects is encouraged and can include:

- utility adjustments
- placement or adjustment of curb and gutter sections
- drainage improvements
- roadway alignment improvements
- removing sight distance obstructions located off railroad right-of-way (for example, trimming or removing vegetation)
- maintaining pavement markings and advance warning signs.

Project Selection and Prioritization

Statewide selection and priority ranking of projects is based on the Texas Priority Index (described in Section 4 of this chapter). The formula used to calculate the index (also described in Section 4) relies on data contained in the state railroad crossing inventory. (See Chapter 1 of this volume for information on the crossing inventory.) Crossings having the highest relative priority are selected for railroad crossing signal warning devices or upgrading, as funds become available under the federal signal program.

Tentative Project List. Initially, TRF develops a tentative project list and distributes it to the districts for review and comment. The list contains projects meeting the program criteria making them eligible for modification in the next fiscal year. The districts are encouraged to make on-site investigations of all crossings on the list to determine the accuracy of the information.

After the on-site investigations, the districts should recommend deletions or additions of projects based on discrepancies or changes in vehicle traffic, rail traffic, type of warning device in place, school bus information, or crash data reported in the inventory. Railroad companies are also furnished this list and have the opportunity to make recommendations or corrections to the information.

NOTE: Districts are encouraged to make periodic reviews of all public crossings under their jurisdiction to ensure that the information reported in the inventory and used to calculate the priority indexes is reasonably accurate.

Project Processing Overview

Projects selected under the federal railroad signal programs are processed as follows:

1. The Texas Transportation Commission approves bank balance allocation program funding amount and method of project selection.
2. TRF coordinates with the districts and railroads to prioritize projects and allocate funds until the established funding is expended.
3. The FHWA obligates the funds.
4. District performs a topographic survey of location, prepares preliminary layouts, and submits them to TRF. (See Section 5 of this chapter for details on project layout preparation.)
5. TRF schedules diagnostic inspection. Diagnostic team agrees on and recommends safety improvements to be accomplished. (See Section 6 of this chapter for details of the diagnostic inspection.)

(continued...)

Project Processing Overview *(continued)*

6. District develops project layouts (to be used as Exhibit A) from diagnostic team field notes and sketches and submits them on 11×17 inch sheets with signed, sealed, and dated title and layout sheets to TRF. (See Section 5 of this chapter for details on layout sheet preparation.)
7. TRF reviews project layouts (Exhibit A) and transmits it to the railroad, requesting approval of plans, estimate, and wiring diagrams. (See Section 7 of this chapter for details.)
8. Railroad approves project layouts and prepares estimate and wiring diagrams and sends them to TRF. (See Section 7 of this chapter for details.)
9. TRF reviews estimate and wiring diagrams; prepares and approves Exhibit B set of approved plans, specifications, and estimates; and sends items to railroad and district as approved and ready for construction, following issuance of work order. (See Section 7 of this chapter for details.)
10. TRF issues work order upon request from railroad.
11. District coordinates any work to be done by the state, city, or county; stakes the project; provides fill material, signing, pavement markings, and construction inspection; and advises TRF when project is complete. (See Section 8 of this chapter for details.)
12. Railroad coordinates with district and performs the installation, then advises the district and TRF when signals are in service. (See Section 8 of this chapter for details.)
13. TRF schedules final inspection with district, city or county, and railroad and provides certification that project is complete to FHWA. (See Section 8 of this chapter for details.)
14. Railroad bills TxDOT.
15. TxDOT pays railroad.
16. FHWA reimburses TxDOT.

Section 4
The Texas Priority Index

Introduction

The Texas Priority Index is used to prioritize projects qualifying for the Federal Railroad Signal Program. This section describes the index and the formulas used to calculate it.

The Texas Priority Index is re-calculated at least once per year for every public highway-rail grade crossing eligible for federal-aid program funds. TRF is responsible for calculating the index using data maintained and furnished by the Transportation Planning and Programming Division (TPP). These data include DOT crossing inventory information, vehicle and rail traffic, types of rail service, roadway information, school bus information, and crash data provided to TPP from the Department of Public Safety. The data are used in a formula to calculate the index rating for each crossing.

Priority Index Formula

The Priority Index (PI) formula is

$$PI = V \times T \times (S \times 0.10) \times P_f \times A^{1.15} \times 0.01$$

where:

V = average daily traffic — number of vehicles per day

T = number of trains in a 24-hour period

S = speed — maximum speed of the trains

P_f = protection factor — a factor weighted according to the type of existing traffic control device as shown in the following table:

Protection Factors

Existing Traffic Control Device	Protection Factor
Gates	0.10
Cantilever Flashers	0.15
Mast Flashers	0.70
Crossbucks or Other	1.00

A = number of crashes in the last five years to the 1.15 power (when $A = 0$ or $A = 1$, then $A = 1$)

(continued...)

Priority Index Formula *(continued)*

EXAMPLE COMPUTATION:
$V = 5000$ v.p.d.
$T = 12$ trains/day
$S \times 0.10 = 6.0$ ($S = 60$ mph)
$P_f = 0.70$ (mast flashers)
$A = 4.92$ (4 crashes in last five years to the 1.15 power)
$PI = 5000\ (12)\ (6.0)\ (0.70)\ (4.92)\ (0.01)$
$PI = 12{,}398$

More Than One Track. At locations with more than one track where main line and switching movements occur over the same crossing and at different speeds, a priority index is calculated for both the main line traffic and switching traffic, then added together to equal the total priority index for the crossing.

School Bus Priority Index Formula

Priority ratings for unsignalized public crossings eligible for the Federal Railroad School Bus Signal Program are calculated using a special formula. (For a basic description of the program, see Section 2 of this chapter.)

The School Bus Priority Index (SBPI) formula is

$$SBPI = V \times T \times S \times A^{1.15} \times 0.01$$

where:

V = average daily school bus traffic

T = number of trains in a 24-hour period

S = speed — maximum speed of the trains

A = number of crashes in the last five years to the 1.15 power (when $A = 0$ or $A = 1$, then $A = 1$)

EXAMPLE COMPUTATION:
$V = 5$ SB/day
$T = 12$ trains/day
$S = 60$ mph
$A = 4.92$ (4 crashes in last five years to the 1.15 power)
$SBPI = 5\ (12)\ (60)\ (4.92)\ (0.01)$
$SBPI = 1{,}771$

(continued...)

School Bus Priority Index Formula *(continued)*

More Than One Track. At locations with more than one track where main line and switching movements occur over the same crossing and at different speeds, a priority index is calculated for both the main line traffic and switching traffic, then added together to equal the total priority index for the crossing.

NOTE: The existing protection factor has been omitted from the school bus formula because only unsignalized crossings (crossings with crossbuck signs only) are eligible for this program.

Section 5
Project Layout (Exhibit A)

Preliminary Layout

After program approval of a warning signal project, the district prepares and submits to the Traffic Operations Division (TRF) an 11×17 inch preliminary plan layout using a 1:20 inch scale and large lettering (see Figure 6-1a & b for example title sheet and layout). This layout will become Exhibit A of the agreement. The preliminary layout should show the following information (with the numbers here corresponding to the large circled numbers on the example layout provided in Figure 6-1a & b):

(1) Project Data, including:
- county
- project
- control-section-job (CSJ)
- highway number or road name.

(2) Title Block, including:
- railroad company name
- crossing location
- crossing DOT number.

(3) Railroad milepost and highway station number at the crossing intersection.

(4) Angle between the highway and railroad.

(5) Drainage structures, utility poles, wire lines and clearances, and topography that may affect the placement of signals or the instrument case.

(6) Typical section of the highway showing
- number and width of each travel lane
- shoulders or curb (or both) and gutter
- sidewalks
- entire right of way width, if known.

(continued...)

Preliminary Layout *(continued)*

(7) Enlarged layout of approximately 30.48 m (100 feet) on either side of the crossing along the roadway and along the railroad tracks, including:

- same items listed for typical section (6).
- highways and roads within the area labeled by name (for example: Ave. K, private road, etc.)
- directional traffic arrows
- railroad tracks labeled by company and type (for example: ATSF RR – mainline, siding, etc.).

(8) Vicinity schematic layout using a scale of 1 inch = 200 feet of approximately 914.40 m (3,000 feet) of track on each side of crossing with approximate dimensions from the project location and showing all:

- tracks, switches, block signals, and railroad mile post markers
- adjacent roads that cross the tracks identified by road name, DOT number, and existing warning devices.

NOTE: In high density urban areas where numerous switches are present or in and near railroad yards, an approximate line track diagram is acceptable.

This information is needed for possible upgrade of existing railroad circuits or recommending closure of adjacent crossings.

Items to Exclude. Do not show existing or proposed signals, lens spread, instrument cabin, conduit, circuit lengths, general notes, or description of project. These things will be identified during the diagnostic inspection. Reserve a blank area for the "General Notes" (9) and for the "Description of Project" (10) to be added after the inspection.

County Base Map. Include an 8½×11 inch county base map showing the project location with the preliminary layout. Figure 6-2 shows an example county base map.

After the layout is submitted to TRF, the diagnostic inspection is scheduled. For more information on the diagnostic inspection see Section 6 of this chapter.

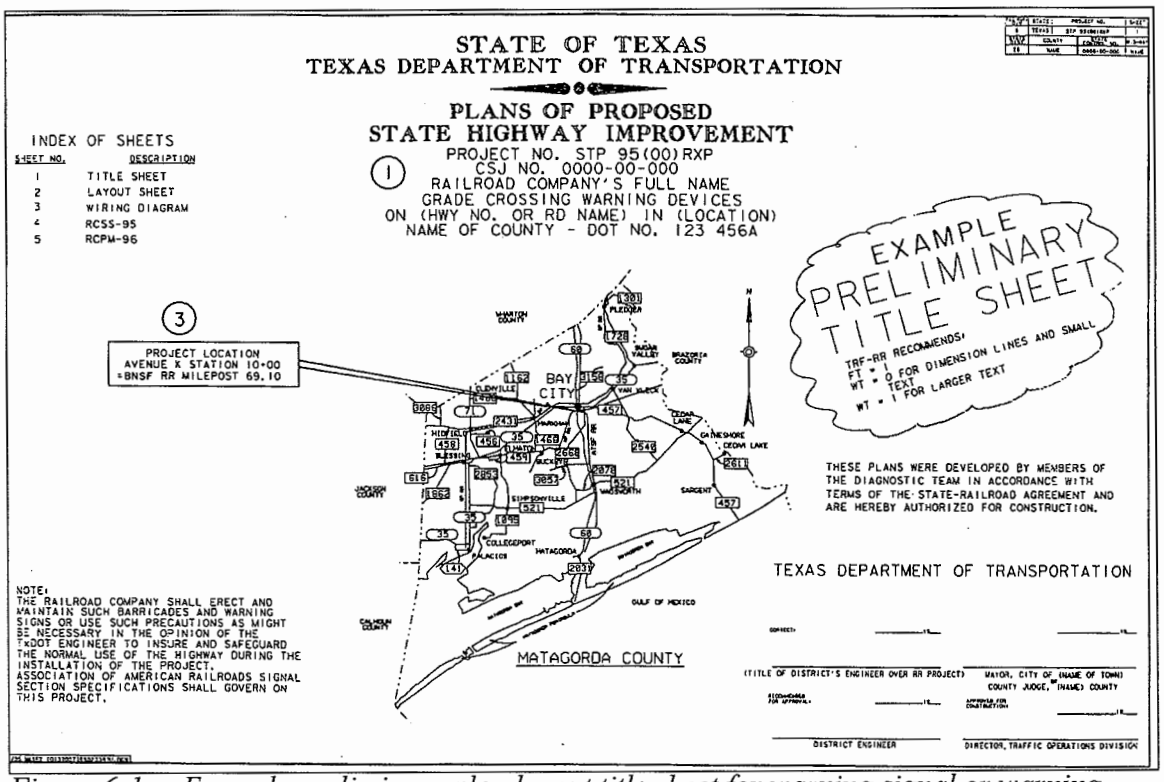

Figure 6-1a. Example preliminary plan layout title sheet for warning signal or warning device project (1 of 2). (Circled numbers explained in text.) (To access the MS Word version of both panels of this figure from on line, click this file name: TFEG6-1.)

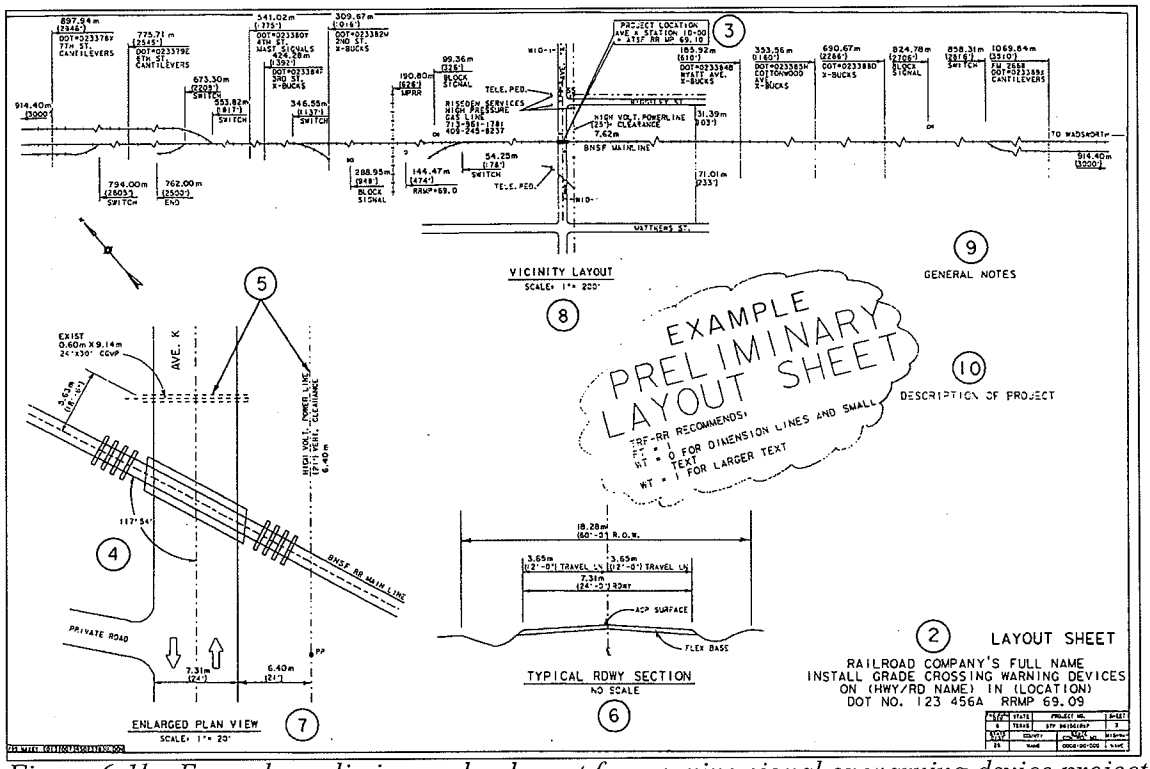

Figure 6-1b. Example preliminary plan layout for warning signal or warning device project (2 of 2). (Circled numbers explained in text.) (To access the MS Word version of both panels of this figure from on line, click this file name: TFEG6-1.)

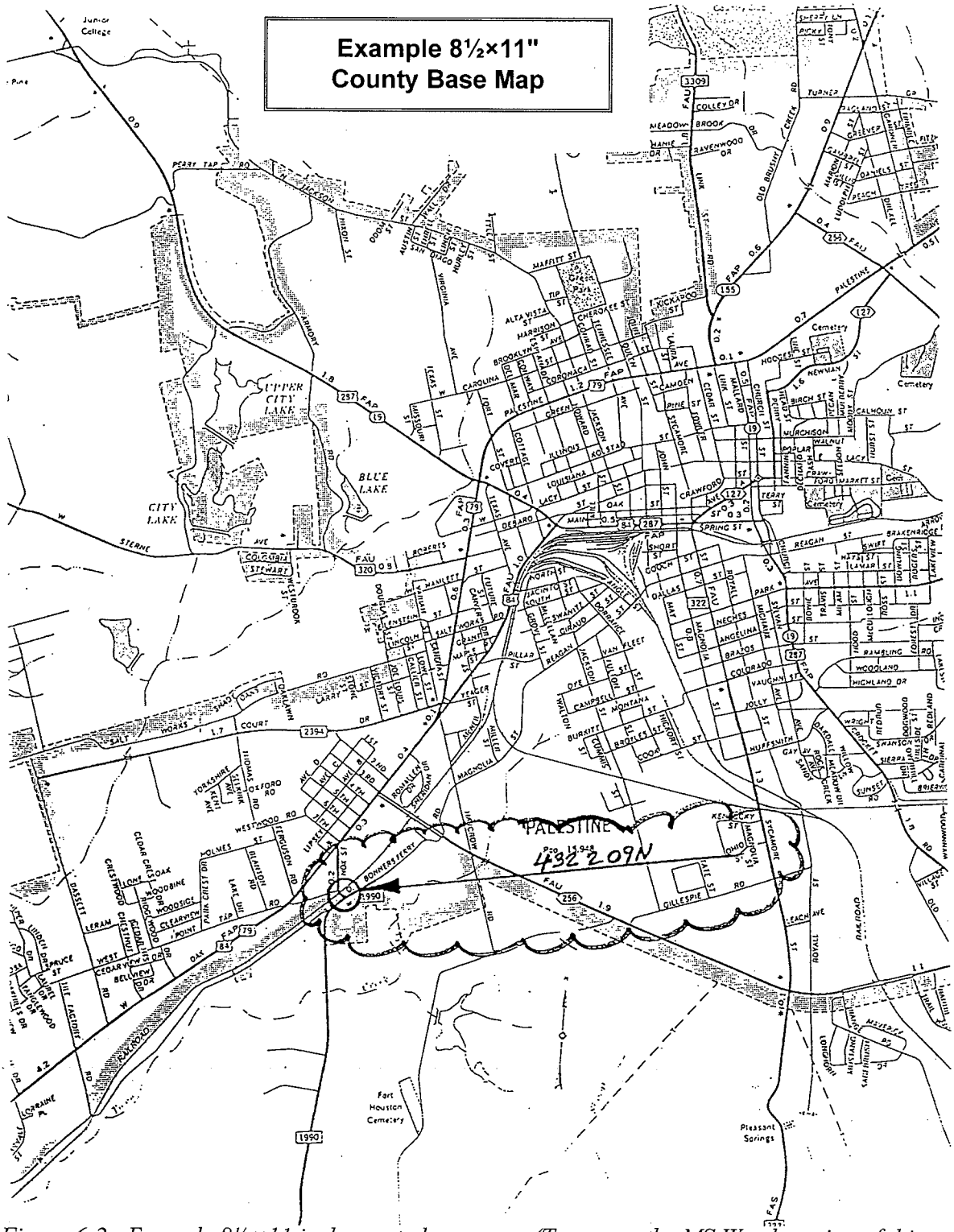

Figure 6-2. Example 8½×11 inch county base map. (To access the MS Word version of this figure from on line, click this file name: TFEG6-2.)

Post Diagnostic Inspection Additions

Following the diagnostic inspection, the district adds the following items to the layout (with the numbers here corresponding to the large circled numbers on the example layout provided in Figure 6-1b):

(9) general notes

(10) description of the project

- symbols for and locations of warning devices, instrument cabin, type and length of circuits, and other items related to the installation (not included in the preliminary layout shown in Figure 6-1b).

NOTE: All layout sheets must be signed, sealed, and dated by the registered professional engineer supervising preparation of the project layouts.

Itemized Estimate

An itemized estimate of costs showing state force account work to be done and materials to be furnished by the district for the project should be included with the completed plan layout. An example follows.

Example Itemized Cost Estimate

Item	Cost
Install stop lines, pavement markings (including RXR) and centerline striping, advance warning and malfunction signs	$2,400.00
Furnish and place fill and crushed cover rock for instrument case and signal foundations (if required)	2,000.00
Furnish and place rip-rap	2,500.00
Furnish and place reinforced concrete pipe	1,000.00
Reshape ditch	300.00
Inspection and construction engineering	1,000.00
TOTAL ESTIMATED COST:	$9,200.00

NOTE: No work should be performed by the railroad until TRF issues a work order.

After Layout Completion

The district forwards the completed project layout, title sheet, and cost estimate to TRF. For projects off the state highway system, the title sheet must be signed by the city or county or both (if more than one is involved) and signed, sealed, and dated by the professional engineer supervising preparation of the project layouts.

Section 6
Diagnostics Inspection

Purpose

The diagnostic inspection is made to determine the type of warning devices and the design of features that need to be installed at a particular location before work begins. It is also made to determine who will be responsible for the maintenance of the railroad pavement markings and signs when the project is complete.

Inspection Team Composition

The diagnostic inspection team is typically comprised of representatives from the following entities:

- the district
- the Traffic Operations Division (TRF)
- the railroad company
- city or county representatives or both (as appropriate)
- school district representatives (if applicable)
- Federal Highway Administration (FHWA) or Federal Railroad Administration (FRA) (if applicable).

District Responsibilities

Before the inspection, the district prepares the project layout used to sketch in team decisions.

The district normally contacts city, county, and school district officials as needed for the inspection and makes arrangements for their attendance.

Inspection Activities

Typically the diagnostic inspection team assembles in the field at the project location.

The diagnostic team performs the following activities:

1. considers possible elimination of the crossing
2. decides on appropriate safety enhancements
3. prepares initial project layouts
4. prepares general notes
5. determines which items of work are eligible for federal and state cost participation and reimbursement to the railroad.

Discussions of each of these items follow.

All team decisions are sketched on the project layouts prepared by the district.

Elimination of the Crossing

The diagnostic team should first consider the possibility of crossing consolidation or elimination. Closure, highway relocation, railroad relocation, and grade separation are all options for crossing elimination.

Abandoned or inactive grade crossings should be removed or appropriate signs should be placed in accordance with the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*. Warning signal devices in place at an abandoned or inactive grade crossings should be removed, covered, or turned away from the roadway.

See Chapter 11 of this volume for information on crossing closure, relocation, and consolidation and on the dismantling of warning signals.

Safety Enhancements

If the crossing is not a candidate for closure, then the diagnostic team discusses appropriate safety enhancements, such as:

- active warning devices — in most cases, train activated flashing light signals, bells, and gate arms (see *Traffic Control Standard Sheets*, "Railroad Crossing Signs and Signals")
- advance warning signs and pavement markings
- active advance warning flashers and signs, if sight distance is a factor on the crossing approach (see *Traffic Control Standard Sheets*, "Railroad Crossing Advance Warning Sign & Signal")

(continued...)

Safety Enhancements *(continued)*

- preemption of nearby traffic signals

  NOTE: Preemption is required if the intersection is within 60.96 m (200 feet) of a railroad crossing. Preemption should be considered anywhere traffic may back up over the crossing due to traffic signals or other congestion (see Chapter 7 of this volume).

- other safety enhancements, such as:
  - identifying and recommending improvements to roadway approaches and crossing surfaces
  - trimming or removing trees and vegetation, etc.
- adjustments, such as:
  - installing or modifying curb and gutter sections
  - modifying, installing, or replacing drainage structures, utility adjustments, etc.

The team determines which enhancements or combination of enhancements comprise the best solution for the safety of the traveling public at that crossing location.

Temporary STOP or YIELD Signs. The team also determines if the installation of STOP or YIELD signs would be appropriate on an interim basis until warning signal devices are in place. This recommendation is based on *TMUTCD* guidelines and an engineering study.

Initial Project Layout Preparation

After reaching a consensus on what type of safety enhancements should be implemented, the diagnostic team prepares the initial project layouts. The team decides placement locations and distances of signals, signal cabinets, signs, and other enhancements, including adjustments to existing drainage facilities and utilities. General notes are completed in the field also.

General Notes

The general notes:

- describe the type of circuitry for train activation of the warning devices
- describe upgrading of signal circuitry at adjacent signalized crossings for circuit compatibility
- assign responsibility for the specific items of work to be performed
- address the treatment of any parallel roadways.

Preliminary fill material quantities and drainage are also calculated in the field and included in the general notes.

Cost Participation and Reimbursement Eligibility

The TRF diagnostic team member is responsible for making the final determination of the items of work involved in the project eligible for federal and state cost participation and reimbursement to the railroad.

Reimbursement Methods

There are four methods for reimbursing a railroad. The appropriate method depends on the scope and complexity of the project and whether the railroad uses company forces or a contractor to perform the work.

Railroad Uses Its own Forces. If the railroad uses its own forces to perform the work, reimbursement is usually made on an actual cost basis. However, if the state and railroad agree, reimbursement can be based on a lump sum cost estimate. The lump sum payment method is more like the state accepting a bid from a contractor. Fixed costs and rates are agreed to prior to project approval. Variable costs and a total lump sum cost are approved with the Exhibit B. The lump sum cost method is only used on less complex single projects.

Railroad Uses a Contractor. If the railroad uses a contractor to perform railroad force account work, they can solicit bids from a minimum of three qualified contractors or use a contractor under a continuous agreement. The continuous agreement must be for a minimum of three years to perform all warning signal installations contracted with the state.

The agreement between the state and railroad includes the necessary contractual arrangements, as outlined in Section 7 of this chapter.

Final Project Layout Preparation

The district diagnostic team member is responsible for converting all notes and decisions made at the project inspection into a final set of construction project layouts. The district must have the title sheet signed by the appropriate district officials, as well as the city or county officials as appropriate.

Section 7
Agreement Preparation and Coordination

Overview

The Traffic Operations Division (TRF) prepares the agreement, using the completed layout prepared by the district as Exhibit A. TRF requests cost estimates and a wiring diagram from the railroad. TRF then prepares the project plans (Exhibit B) and coordinates the approval of the agreement. TRF distributes copies of the signed agreement and approved plans and estimates as appropriate.

Exhibit B Plan Preparation

TRF prepares Exhibit B of the agreement. Exhibit B normally consist of:

- a title sheet
- layout sheets (Exhibit A)
- wiring diagrams
- railroad crossing warning signal device standard and railroad crossing pavement marking standard.

The district furnishes the title sheet and layouts. The title sheet and layouts must be signed, sealed, and dated by a registered professional engineer.

The railroad furnishes the wiring diagram.

TRF adds the standard design sheets.

Distribution

TRF distributes copies of the signed agreement and approved plans and estimates (Exhibit B) to:

- the district
- the Finance Division (FIN)
- the Design Division (DES)
- the railroad
- FHWA (if required — see following subheading).

FHWA Approval

FHWA approval may be required if unusual or unique work (such as crossing consolidation or elimination of safety hazards and sight obstructions in lieu of installing warning devices)is called for.

Master Agreements

Master agreements are in place with each railroad company that receives new projects on a regular basis and are the preferred contracting instrument under the railroad dedicated fund programs. Master agreements are updated each year by adding an Exhibit L (List of Projects) to the original master agreement. This eliminates the need for a separate agreement each year or for each project, saving administrative time and resources.

The agreement covers construction and maintenance details for preparing and approving plans, specifications, and estimates; issuance of work order; sub contracting requirements; federal-aid policy guide requirements; methods of payment; and conditions for reimbursement.

Individual Project Agreements

For railroads or projects not under a master agreement, TRF prepares and negotiates a separate project agreement. In addition to the items required in a master agreement, individual project agreements should include project data (location, county, control-section-job number, highway name, project number, and DOT number). Additional condition clauses in the event the project is canceled prior to letting, etc. may also be necessary.

Negotiations

TRF coordinates all comments from participating parties (districts, railroad companies, industries, counties, cities, etc.) and prepares all necessary agreements. TRF also acts as liaison in negotiations with all parties involved.

TRF reviews the Exhibit A project layouts and traffic control plans, and prepares and sends the approved Exhibit B project plans and work order to the railroad companies.

Section 8
Project Execution

Work Order

TRF issues the work order for railroad warning signal device projects upon request by the railroad company.

Project Coordination

The district coordinates any work done by the city or county with the railroad. Such work may include:

- staking the project for placement of signals and appurtenances
- providing fill and cover material
- installation of curbing, drain pipes, culverts, etc.
- inspection during construction
- notifying TRF when work is completed.

Routine Project Inspection

The district should keep a general record of the railroad's daily labor and equipment rental. The railroad notify the district if any delays occur during construction.

Final Inspection

Unless the district is approved to do final inspections, TRF schedules and conducts the final inspection of each project upon notification by the district and railroad.

The purpose of the final inspection is to verify that all safety enhancements involved in the project have been made and all traffic control devices, signs, pavement markings, railroad appurtenances, and other items of work listed in the general notes have been installed in accordance with the approved plans. All equipment and material installed by the railroad is checked against an inventory of materials furnished by the railroad. Any discrepancies from the approved plans are noted.

Project Certification

Prior to project certification, the responsible party must correct all items noted during final inspection that were not in accordance with the approved plans. The district then furnishes a memo to TRF certifying that the project has been installed in accordance with the approved plans (see Figure 6-3 for example). TRF then certifies the project to the FHWA.

MEMORANDUM

Texas Department of Transportation

TO: Mr. Thomas D. Beeman, P.E.
Traffic Operations Division

DATE: _____

FROM: _____, P.E.

ORIGINATING OFFICE:
_____

SUBJECT: Project Certification
_____ County – DOT No. _____
CSJ _____
Project _____
Location _____ (20__)

This is to certify that all work has been completed in accordance with terms of the agreement for the above referenced railroad grade crossing location. Work, consisting of installation and/or modification of automatic warning devices and all signing and pavement markings is acceptable and in accordance with the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*. All materials installed are in compliance with the plans and specifications. A final on-site inspection was made on _____.

Attached please find the original list used to inventory materials furnished and installed by the railroad company for this project. Also, included are photographs depicting the roadway approaches and railroad track approaches for this intersection.

If you have any questions, please contact _____, telephone number _____.

__/__

Attachments

Figure 6-3. Example project certification memo. (To access the MS Word version of this figure from on line, click this file name: TFEG6-3.)

Section 9
STOP and YIELD Signs at Grade Crossings

Background

Recent legislation has made it easier to install STOP and YIELD signs. Nevertheless, the responsible authority should ensure that such installations are justified, and that they are in conformance with all applicable standards.

National and State Provisions

National* MUTCD *Revision. Section 1077 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) granted states and local governments discretionary authority to install STOP or YIELD signs at highway-rail grade crossings that have two or more trains per day and are without automatic traffic control devices. This required the following revision of Section 8B-9 of the *National Manual on Uniform Traffic Control Devices (MUTCD)*:

> STOP or YIELD signs may be used at highway-rail grade crossings, at the discretion of the responsible state or local jurisdiction, for crossings that have two or more trains per day and are without automatic traffic control devices.

Texas MUTCD *Provisions.* The *Texas Manual on Uniform Traffic Control Devices (TMUTCD)* limits use of the STOP sign at railroad-highway grade crossings to those crossings selected after need is established by a detailed traffic engineering study. Such crossings should have the following characteristics:

- The highway should be secondary in character with low traffic counts.
- Train traffic should be substantial.
- Line of sight to an approaching train is restricted by physical features such that approaching traffic is required to reduce speed to 10 mph or less in order to stop safely.
- At the stop bar, there must be sufficient sight distance down the track to afford ample time for a vehicle to cross the track before the arrival of the train.

The engineering study may determine other compelling reasons for the need to install a STOP sign; however, such an installation should only be an interim measure until active traffic control devices can be installed. STOP signs cannot be used on primary through highways or at grade crossings with active traffic control devices.

Whenever a STOP sign is installed at a grade crossing, a STOP AHEAD sign must be installed in advance of the STOP sign.

Crossings with Passive Warning Signs

For other crossings with passive protection, STOP or YIELD signs may be used after need is established by a traffic engineering study. The study should take into consideration such factors as:

- volume and character of highway and train traffic
- adequacy of stopping sight distance
- crossing crash history
- need for active control devices.

Sign Placement

For all highway-rail grade crossings where STOP or YIELD signs are installed, the placement must conform to the requirements of *MUTCD*, Section 2B-9, "Location of STOP Sign and YIELD Sign." STOP AHEAD or YIELD AHEAD advance warning signs must also be installed.

Assessing Need for Signs

The Federal Highway Administration (FHWA) and the Federal Railroad Administration (FRA) have cooperatively developed guidelines titled "Considerations to Apply in Assessing the Need for STOP or YIELD Signs at Highway-Railroad Grade Crossings." The following guidelines are taken from these considerations.

General Factors

The FHWA and FRA recommend that the following general factors be considered when reviewing a crossing for possible STOP or YIELD sign installation:

- volume, type, and speed of highway traffic
- frequency, type, and speed of trains
- number of tracks
- intersection angles
- adequacy of stopping sight distances
- need for automated warning devices
- crossing crash history.

Specific Factors

The FHWA and FRA recommend that specific factors be applied in determining first priority with respect to new STOP sign installations. The following considerations should be met in *every* case before a STOP sign is installed:

- Local or state police and judicial officials will commit to a program of enforcement no less vigorous than would apply at a highway intersection equipped with STOP signs.
- Installation of a STOP sign would not occasion a more dangerous situation (taking into consideration both the likelihood and severity of highway-rail collisions and other highway traffic risks) than would exist with a YIELD sign.

Positive Indications

Any one of the following conditions indicate that use of STOP signs would tend to reduce risk of a highway-rail collision. These considerations should be weighed against the following opposing factors:

- Maximum train speeds equal or exceed 30 mph (a factor strongly correlated with highway-rail crash severity).
- Highway traffic mix include buses, hazardous materials carriers, or large (trash or earth moving) equipment.
- Train movements are 10 or more per day during 5 or more days of the week.
- The rail line is used by passenger trains.
- The rail line is regularly used to transport a significant quantity of hazardous material.
- The highway crosses two or more tracks, particularly where both tracks are main tracks or one track is a passing siding that is frequently used. (Note: If federal-aid funds are used for a highway-rail grade crossing improvement project with multiple main line tracks, gates and flashing lights are required.)
- The angle of approach to the crossing is skewed.
- The line of sight from an approaching highway vehicle to an approaching train is restricted such that approaching traffic is required to substantially reduce speed.

Opposing Factors

Factors to be weighed in opposition to STOP signs include:

- The highway is other than secondary in character and has an average daily traffic (ADT) count of 400 or less in rural areas or 1,500 or less in urban areas. (If any of the positive indications apply to a crossing with traffic counts in excess of these levels, strong consideration should be given to installation of automated warning devices.)
- The roadway is a steep ascending grade to or through the crossing, sight distance in both directions is unrestricted in relation to maximum closing speed, and the crossing is used by heavy vehicles. (Note: A crossing where there is insufficient time for any vehicle, proceeding from a complete stop, to safely traverse the crossing within the time allowed by maximum train speed is an inherently unsafe crossing that should be closed.)

Chapter 7
Traffic Signal Preemption

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Section 1
Overview

Introduction

Traffic signal preemption involves the interruption of the normal signal controller sequence with a special sequence (usually flashing operation) activated through an interface with nearby railroad grade crossing warning devices. Preemption may be either "simultaneous" or "advance."

Simultaneous preemption means that the traffic signal controller sequence is preempted at the same time the crossing warning devices begin to operate. Warning times and approach lengths are calculated as normal, unless more than the minimum 20 seconds is required between preemption and train arrival at the crossing. Simultaneous preemption does not provide a clear-out time for vehicles traversing the crossing prior to activation of the railroad warning signals.

Advance preemption means that the traffic signal controller sequence is preempted a set amount of time before the warning devices begin to operate. Advance preemption provides a clear-out traffic signal sequence time for traffic traversing the railroad grade crossing before activation of the railroad warning signals. The time required for the traffic signal clear-out sequence is in addition to the minimum 20-second railroad warning signal activation time prior to train arrival.

Need for Preemption

Preemption of a traffic signal by the railroad signals is required if the traffic signal is at an intersection that is within 60.96 m (200 feet) of a railroad crossing. Preemption should be considered where traffic may back up over the crossing due to traffic signals or other traffic congestion.

Project Process Overview

The following is an overview of a typical preemption project. See the referenced sections of this chapter for more information.

1. The district inspects the intersection to determine the extent of the work required. The district also coordinates with the railroad on the details of circuitry and project timing. (See Section 2 of this chapter for more information.)
2. The district prepares:
   - complete plan layouts (known as an "Exhibit A") showing the critical details for the project
   - a railroad Application for Underground Wireline Crossing form, if necessary
   - a preemption worksheet.

   (See Section 3 of this chapter for descriptions of these items and more information on plan layout preparation.)
3. The district submits the prepared plan layouts (Exhibit A) and the preemption worksheet to the Traffic Operations Division (TRF). (See Section 3 of this chapter for more information.)
4. TRF approves preemption timing and prepares the agreement using the layouts furnished by the district as Exhibit A. TRF then forwards the agreement and exhibit to the railroad company and handles all negotiations concerning the agreement, including any revisions.
5. Upon receipt of the signed agreements, TRF forwards a copy of the executed agreement along with the railroad estimate (if available) or the approved bid to the district and the Finance Division (FIN). TRF also supplies the district with a copy of the letter transmitting the agreement to the railroad for their approval and a copy of the TRF transmittal letter returning the approved agreement to the railroad.
6. After the agreement is signed, the district issues a work order to the railroad for any force account work, conducts the pre-construction meeting, inspects the work, and issues the completion letter. (See Section 4 of this chapter for more information on these activities.)

Section 2
Preliminary Inspection and Coordination

Introduction

Prior to preparing the plan layout, the district should conduct a preliminary inspection of the intersection being considered for traffic signal preemption. This inspection should address specific questions related to the intersection and the adjacent crossing. The district should also coordinate with the railroad at this time to determine the type of circuitry available and other technical details.

NOTE: If preemption for the intersection in question was considered as part of a diagnostic inspection for the nearby crossing (as described in Chapter 6 of this volume), then these considerations should be addressed at that time.

Intersection Characteristics

Several considerations relate to the specific characteristics of the intersection. The preliminary inspection should answer the following questions:

- Will simultaneous or advance preemption be required?
- Will any adjacent crossings or intersections require upgrading?
- Will there be pedestrian walkways?
- Are DO NOT STOP ON TRACKS signs needed?
- Where will loop detectors be placed? (They should be away from stop bars.)

Equipment and Circuitry

The type and compatibility of traffic signal equipment, warning signals, and the related circuitry are important considerations. The preliminary inspection and coordination with the railroad should answer the following questions:

- Are the active circuitry and warning devices compatible with the proposed traffic signals?
- Do the devices and circuitry meet current federal requirements? What year was the existing circuitry installed?
- Is there an existing relay set up in the railroad instrument cabin to hook up the signal preemption? If so, then what kind?
- Will any track shunts need to be readjusted? If so, at what distance are they currently set, and what how far out is the proposed shunt?

NOTE: The installation of traffic signals requiring preemption may require the railroad to install "constant warning circuitry." To determine if the signal circuitry needs upgrading to provide the preemption, contact the railroad company.

Cost

Estimate the cost of the project. Be sure to consider the cost of the specific type of equipment needed. Make sure there is enough money in the construction budget.

Section 3
Plan Layout (Exhibit A)

Overview

The district prepares the plan layout (known as Exhibit A) for the traffic signal preemption project to show all work to be performed by TxDOT, TxDOT's contractor, and the railroad.

NOTE: All plan layouts must be signed, sealed, and dated by a registered professional engineer.

Figure 7-1 (a–c) at the end of this section shows an example Exhibit A plan layout.

Project Data

Exhibit A project data include:

- the county
- the project
- control-section-job (CSJ)
- highway number or road name.

Title Block

The Exhibit A title block includes:

- the railroad company name and DOT No. (if available)
- milepost and highway station
- the words "Exhibit A."

Work List

The Exhibit A work list includes a breakdown of all work to be performed by TxDOT, TxDOT's contractor, and the railroad company.

If Conduit Installation is Involved

Normally conduit is installed with traffic signal preemption. This requires that a railroad Application for Underground Wireline Crossing form be filled out (along with a cover application form) and submitted as part of the railroad agreement package. The district completes the forms and submits them to the Traffic Operations Division (TRF) when requesting preparation and execution of the agreement. (Samples of these forms are provided in Appendix A of the hard copy print version of this volume. These sample forms may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division.)

The plan layouts should include a 1 inch to 200 foot vicinity layout, a 1 inch to 20 foot layout, and a typical section.

Exhibit A and the PS&E drawings should include a note indicating that TxDOT's contractor will run conduit to the proposed instrument cabin, and that TxDOT or its contractor will contact the railroad 48 hours prior to any construction in railroad right-of-way to determine the location of fiber optic cables with reference to an assigned ticket number. The railroad ticket number is assigned when the Application for Underground Wireline Crossing form is processed.

If Railroad Signals Require Upgrading

If the railroad signals require upgrading, a preliminary layout drawing should be done on the 1 inch to 20 foot layout.

Preemption Worksheet

The district also completes the preemption worksheet to determine if additional time (advance preemption) is required for the traffic signal to clear out before the railroad warning devices are activated. A sample preemption worksheet (titled "Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings") is provided in Appendix A of the hard copy print version of this volume. This sample worksheet may be photocopied as necessary. Copies of the worksheet and detailed printed instructions on calculating preemptions may also be obtained from the Traffic Operations Division.

Accompanying Information

A vicinity layout sheet and pictures of the intersection and other intersections requiring upgrading (views looking north, south, east, and west) should also accompany the preemption package sent to TRF.

NOTES FOR RAILROAD:

1. EXISTING SIGNAL CIRCUITS ARE DESIGNED TO GIVE 25 SECONDS WARNING TIME PLUS 5 SECONDS ADDED FOR INSTRUMENT LAG PRIOR TO ARRIVAL OF THE FASTEST TRAIN AT THIS CROSSING.
2. EXISTING CONSTANT WARNING CONTROL CIRCUITS ARE TO BE USED ON THIS PROJECT.
3. TRAFFIC DATA 200 ADT MOVES PER DAY AT 48 KM/H (30 MPH) AND 3 THROUGH TRAINS PER DAY AT 80 KM/H (50 MPH).
4. THE TXDOT'S CONTRACTOR WILL FURNISH AND INSTALL THE APPROPRIATE PAVEMENT MARKINGS AS OUTLINED ON THE ATTACHED STANDARD AND IN ACCORDANCE WITH THE TXMUTCD AS NEEDED.
5. TXDOT'S CONTRACTOR WILL FURNISH AND INSTALL THE FOLLOWING SIGNS: (2, R15-4), (1, W 10-1), AND (2, W10-3) AS OUTLINED ON THE ATTACHED STANDARD AND IN ACCORDANCE WITH THE TXMUTCD.
6. TXDOT'S CONTRACTOR WILL INSTALL 1 (R8-8) ("DO NOT STOP ON TRACKS", SIGN) ON NORTH BOUND LANE.
7. THE RAILROAD COMPANY SHALL STENCIL THE DOT- AAR NUMBERS ON THE SIGNAL MASTS FACING ROADWAY USING 2 INCH BLACK LETTERING.
8. EXISTING RELAY AT THIS CROSSING FOR PREEMPTION IS A CLOSED CIRCUIT AND ALREADY EXIST BETWEEN THE CONTROL RELAY OF THE GRADE CROSSING WARNING SYSTEM AND THE TRAFFIC SIGNAL CONTROLLER AS STATED ON PAGE 8C-7 IN THE TXMUTCD.
9. EXISTING H X P1 CONSTANT WARNING CONTROL CIRCUITS ARE TO BE USED ON THIS PROJECT W/ NO ADDITIONAL CARDS REQUIRED. H X P1 INSTALLED IN 1986.
10. RAILROAD EXISTING SHUNTS TO REMAIN IN PLACE. SHUNTS ARE LOCATED AT 2070 FEET FROM ℄ OF HARLEM. SHUNTS AT HARLEM RD DOT (743382A) AND FM 1464 (743381T) OVERLAP WITH WESTMOORE SHUNTS.
11. NO ADJUSTMENTS NECESSARY AT WESTMOOR CROSSING DOT UNASSIGNED. EXISTING CIRCUITS WILL PROVIDE NO ADDITIONAL SECONDS OF TRAFFIC SIGNAL PREEMPTION PRIOR TO ARRIVAL OF THE FASTES TRAIN AT THIS CROSSING.
12. TXDOT'S CONTRACTOR WILL INSTALL WIRE TO RAILROAD'S EXISTING SIMULTANEOUS PREEMPTION RELAY.
13. NO PEDESTRIAN SIGNALS TO BE USED ON THIS PROJECT.
14. LOOP DETECTORS WILL BE INSTALLED AWAY FROM EXISTING STOP BARS.
15. TxDOT's contractor will furnish and install conduit, as shown on section E-E.

RAILROAD SIGNAL CIRCUITS FOR THIS PROJECT WERE NOT DESIGNED BY THE UNDERSIGNED ENGINEER.

STATE OF TEXAS REGISTERED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by P.E. on

DOT NO. 176 310G

TEXAS DEPARTMENT OF TRANSPORTATION
HOUSTON DISTRICT
EXHIBIT "A"
NOTES FOR RAILROAD
FM 1093 AT WESTMOOR DR
NORTH WEST OF SUGARLAND

SCALE	FROM BRIDGE	STATE	FEDERAL AID PROJECT NO.	HIGHWAY
N. T. S.	6	TEXAS	C 1258-3-33	FM 1093
REVISIONS	TOTAL SHEETS	COUNTY	CONTROL	SECTION	JOB	SHEET NO.
	HOU	FORT BEND	1258	01	013	11

REVISED BY
HOUSTON DISTRICT (1-26-98)

Figure 7-1a. Example Exhibit A plan layout for traffic signal preemption (1 of 3). (To access the MS Word version of all three panels of this figure from on line, click this file name: TFEG7-1.)

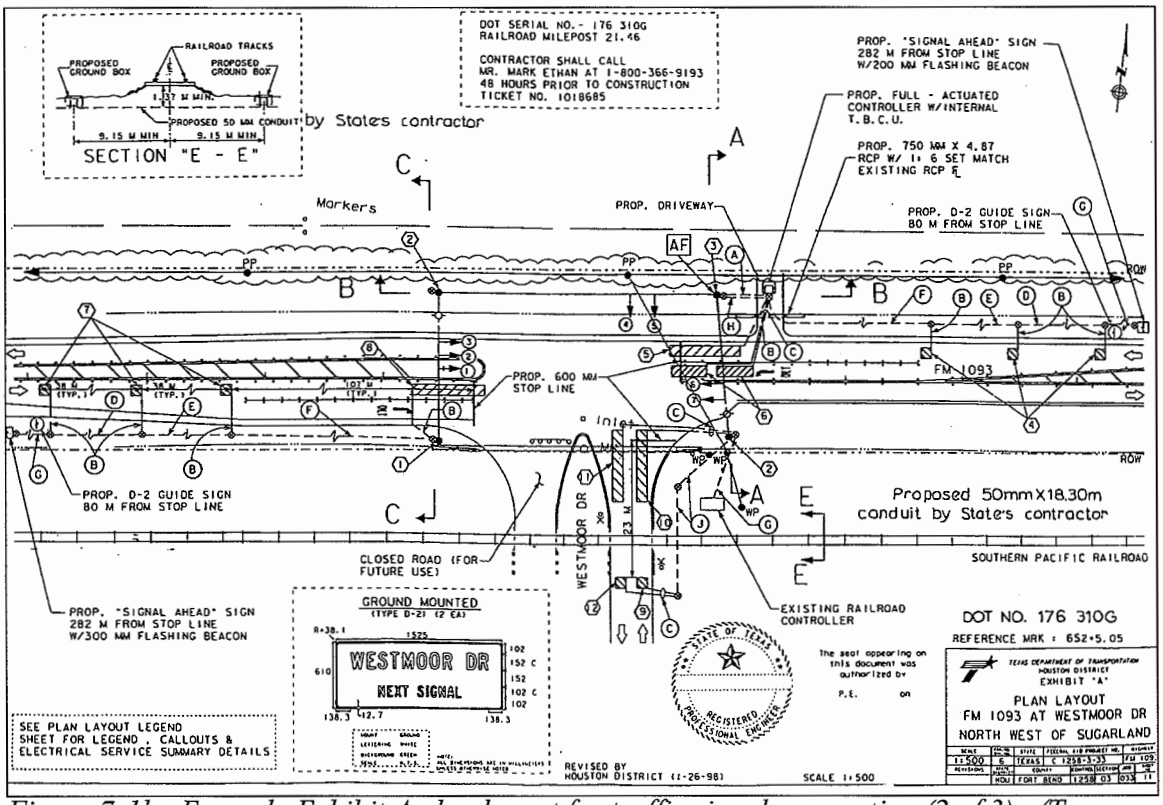

Figure 7-1b. Example Exhibit A plan layout for traffic signal preemption (2 of 3). (To access the MS Word version of all three panels of this figure from on line, click this file name: TFEG7-1.)

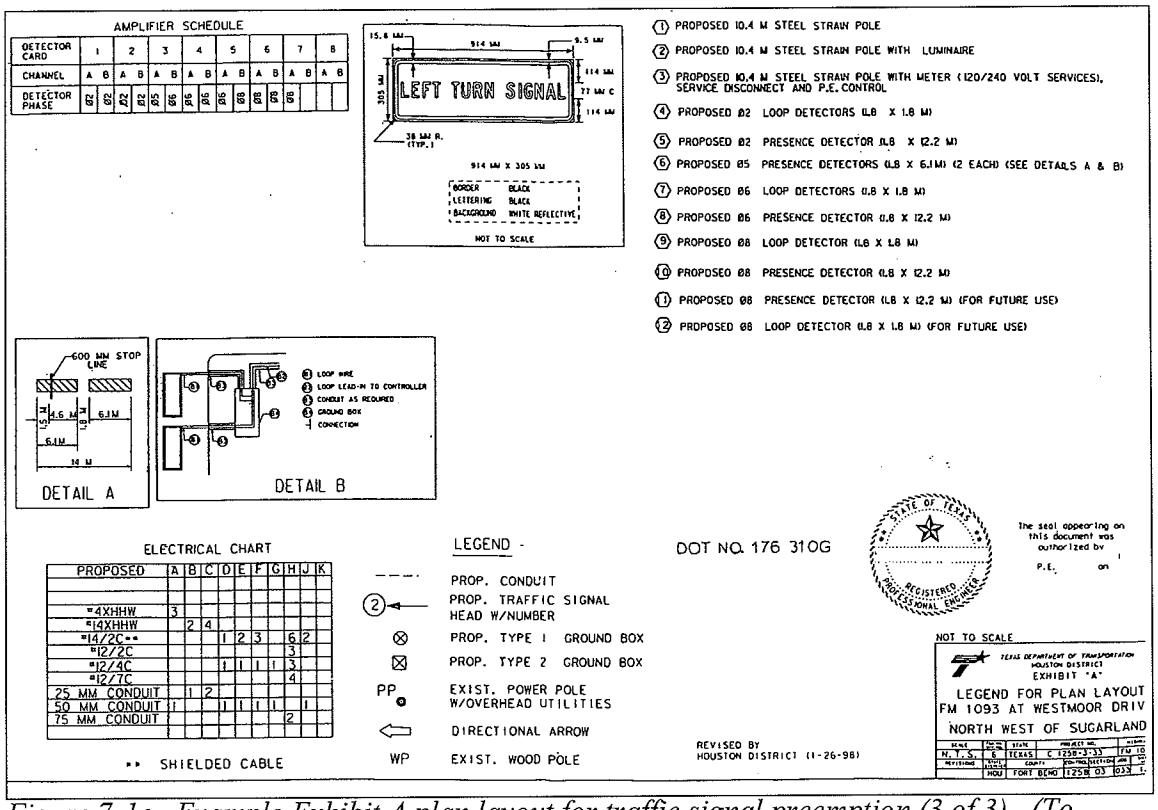

Figure 7-1c. Example Exhibit A plan layout for traffic signal preemption (3 of 3). (To access the MS Word version of all three panels of this figure from on line, click this file name: TFEG7-1.)

Section 4
Project Execution

Work Order

The district issues the work order to the railroad for any railroad force account work and keeps the railroad advised of the work in progress on their property. The work order should be issued soon after the contract has been awarded to allow the railroad sufficient time to order any necessary materials and schedule work.

The district should send a copy of the work order to the Traffic Operations Division (TRF) and the Finance Division (FIN). The work order also authorizes payment to the railroad.

Pre-construction Meeting

A pre-construction meeting is recommended so that work can be coordinated. Arranging the meeting is the district's responsibility. The following individuals should attend:

- a railroad project manager
- a city or county traffic signal representative
- a TxDOT traffic signal representative
- the TxDOT railroad liaison
- a representatives of TxDOT's contractor.

During the meeting the names of contact persons should be exchanged. The general notes, construction schedule, and any other matters of concern should be discussed.

Inspection

The district inspects the work performed by the railroad to verify that it complies to TxDOT standards and the approved plans and specifications.

Completion Letter

The district issues the completion letter to the railroad when the project is complete. A copy of the completion letter should be sent to TRF and FIN. The completion letter authorizes final payment to the railroad.

Chapter 8
Grade Separations

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Section 1
Overview

Introduction

This chapter covers agreements between TxDOT and railroad companies involving grade separation construction and reconstruction projects.

Project Process Overview

A grade separation construction or reconstruction project typically proceeds as follows:

1. Project is scheduled and funded. (See Section 2 of this chapter for information on programs and financing.)
2. The district or consultant (or both), with support from the Design Division (DES), designs the proposed structure and prepares the preliminary plan layout (including plan-profile) to be used in the agreement as Exhibit A. (See Section 3 of this chapter for details on content and preparation of Exhibit A.) The district then submits the layout to DES.

   NOTE: This submission should occur 12 months prior to the scheduled contract letting date to allow the railroad company sufficient time to review the project, address any revisions, prepare force account estimates, and sign the agreement. For railroad underpasses, design calculations should be submitted as soon as preliminary details are available. Also any details of required shoring must be accompanied by design calculations.
3. DES reviews the plan layout sheets, makes prints, and submits them to:
   - Federal Highway Administration (FHWA), if federal funds are involved
   - railroad company or companies involved, along with a request to submit the number of regular train and switching movements at the grade separation location (This information is used to prepare Addendum I to Special Provision to Item 007. Addendum I is used by TxDOT's contractor to obtain Railroad Protective Liability Insurance for work performed on railroad right-of-way.)
   - Traffic Operations Division (TRF), along with a request to develop an agreement with the railroad.

   To reduce the time needed for approval, the most current revisions should be included. (See Section 4 of this chapter for details.)
4. The FHWA, the railroad company, and TRF forward comments on and approval of the plan layout sheets to DES. (See Section 4 of this chapter for details.)

(continued...)

Project Process Overview *(continued)*

5. DES coordinates the resolution of the comments. (See Section 4 of this chapter for details.)

   NOTE: Revisions that occur after approval of the plan layout sheets increase the time needed to obtain a signed agreement from the railroad.

   NOTE: Any revisions made to the plan layouts after the district submits them to DES should immediately be sent to DES for coordination with the railroad.

6. DES and TRF coordinate the plan layout and plan-profile modifications, as necessary. The revised and approved plan layout sheets become Exhibit A of the agreement. (See Section 3 of this chapter for details.)

7. TRF prepares the agreement and negotiates with the railroad company or companies involved. (See Section 4 of this chapter for details.)

8. DES, the district, or a consultant develops bridge detail plans after all comments and changes to the geometric features of the overpass or underpass have been resolved.

9. The district prepares a complete PS&E (plans, specifications, and estimates) package and forwards it to DES for review prior to contract letting. (See Section 3 of this chapter for details.)

10. DES prepares and assembles the approved plans, specifications, and estimates (PS&E) for the portion of the project involving the railroad (this becomes Exhibit B of the agreement). DES also prepares an Addendum I to Special Provision to Item 007, which is used by the TxDOT contractor to obtain railroad protective liability insurance. (See Section 3 of this chapter for details.)

11. TRF transmits the Exhibit B approved by DES to the railroad company or companies for their approval. (See Section 5 of this chapter for details.)

12. The railroad approves the Exhibit B and returns the signed title sheet to TRF. (See Section 5 of this chapter for details.)

13. The district issues the work order to the railroad shortly after the project is let to contract. The district conducts all pre-construction meetings, inspects the work, and issues the completion letter to the railroad when the project is complete. (See Section 6 of this chapter for details.)

Section 2
Program and Finances

Federal Railroad Grade Separation Program

The Federal Railroad Grade Separation Program is financed under the Surface Transportation Program (STP) safety funds. Projects eligible for the program must be on the state highway system. The program is divided into two program areas:

- Installation of Grade Separations at Existing Highway-Rail Grade Crossings
- Replacement of Functionally Deficient Highway Underpasses.

Projects under both program areas are selected on a statewide priority basis by the Design Division (DES).

Funding. The program is managed by the Design Division (DES) under the bank balance allocation procedure. Each program receives approximately half the available funds.

Installation of Grade Separations at Existing Highway-Rail Grade Crossings

Under the Federal Railroad Grade Separation Program, projects for the construction of grade separations at an existing highway-rail grade crossings are selected on a statewide basis using a cost-benefit index (CBI). The CBI ranks the estimated savings (in millions of dollars) that would be realized over 50 years with construction of grade separation structures. The formula used to calculate CBI rankings considers:

- current average daily traffic (ADT)
- number of trains per day
- number of train-involved crashes
- casualty costs
- personnel delay costs
- highway traffic equipment delay costs.

A CBI ranking is calculated for each existing highway-rail grade crossing eligible for consideration under the program. The higher the CBI ranking, the higher the priority for selection and funding.

Replacement of Functionally Deficient Highway Underpasses

Under the Federal Railroad Grade Separation Program, selection and funding for the replacement of functionally deficient highway underpasses is also determined by a priority ranking. The ranking is based on:

- average daily traffic passing under the railroad
- relative deficiencies of the underpassing roadway width, vertical under-clearance, and lateral under-clearance.

Most data items used in the underpass replacement ranking process are available from the Bridge Inventory, Inspection, and Appraisal Program (BRINSAP) file. (Contact DES for further information.)

Other Funding Sources

All other grade separation projects are funded under road construction projects using state or federal funds or both. TxDOT adheres to the *Federal-Aid Policy Guide (FAPG)*, under 23 CFR 646, "Railroads," Subpart B, "Railroad-Highway Projects."

Shared Cost of Structures. The railroad is required to share the cost of the structure when an at-grade crossing is eliminated by the grade separation (*FAPG* 23 CFR 646B, §646.210). The railroad company's cost cannot exceed five percent of the cost of the portion of the structure that goes over the railroad tracks. If more than one railroad is involved, then the five percent cost is shared among them.

Reimbursement for Force Account Work. The railroad can be reimbursed for force account work performed on a highway-railroad grade separation. Upon completion of its part of the work, the railroad is reimbursed for up to 95 percent of the total cost of work performed. The remaining 5 percent is reimbursed upon final audit by TxDOT.

Section 3
Plan Layout (Exhibit A)

Preliminary Plan Layout

The district prepares a full-size, preliminary plan layout sheet (including the plan-profile) showing critical details proposed for the grade separation. Additional sheets may be used, if necessary. Critical details should include:

- project geometry
- layout
- vertical & horizontal clearances
- crash walls
- position of track
- any existing features and other pertinent information.
- work to be done by TxDOT
- work to be done by TxDOT's contractor
- work to be done by railroad
- general notes
- train data
- typical section
- fiber optics note
- appropriate drainage features.

The district submits the preliminary plan layout sheet to the Design Division (DES) for processing with the railroad company. It should be submitted 12 months prior to the scheduled contract letting date. The information provided on the preliminary plan layout eventually goes into Exhibit A of the agreement.

Complete Exhibit A

Following the approval of the preliminary bridge layout by the railroad, the district prepares the complete Exhibit A plan layout to show all worked performed by TxDOT, TxDOT's contractor, and the railroad. The complete Exhibit A should include:

- project data
- a title block
- design layout sheets
- a work list
- clearances and crash walls
- other pertinent information.

Discussions of each of these items follow. Figure 8-1 at the end of this section shows an example of Exhibit A plan layout.

Project Data

Project data include:

- the county and county number
- project
- project number
- control-section-job (CSJ)
- railroad mile post (RRMP)
- highway station
- highway number or road name.

Title Block

The title block includes:

- the railroad company name and DOT No. (if available)
- crossing location
- railroad milepost and highway station at each location
- the words "Exhibit A."

Design Layout Sheets

Explanations of the elements shown in the design layout sheets follow.

Alignment of Highway and Railroad. The alignment of the highway and railroad and angle of their intersection should be shown.

Fences and ROW Lines. The location of railroad fences or right-of-way lines with respect to the centerline of the main track should be shown.

Poles and Lines. The location of each pole and pole line, the number of cross arms and wires, owner of each line, and elevation of the low wires should be shown. For underpasses, it is important to show the location of poles in and near the proposed underpass in the area where a temporary shoofly track might be located.

Top-of-rail Profile. The top-of-rail profile for approximately 500 feet in each direction from the highway and for a greater distance if a change in railroad grade is proposed should be shown. If the railroad is on a curve, the profile should be taken along the high rail for overpasses and along the low rail for underpasses.

Drainage Features. Drainage features should be shown.

Overpass Drawings. For overpasses, roadway grades, line drawings, and cross section of the structure should be shown. Minimum vertical clearance together with the horizontal clearances should be shown. (See the *Bridge Design Manual* for standard clearances for railroad overpasses.)

Underpass Drawings. For underpasses, a cross section through the structure should be shown, along with a section at the underpass indicating vertical and horizontal clearances, types of curbs or medians (if required), and side slopes of roadway cuts. (See the *Bridge Design Manual* for standard clearances for underpasses.)

Railroad Facilities Requiring Adjustment. The location and description of any railroad facility that might require adjustment, including any proposed revision of railroad grade, should be shown.

Boring Data. Boring data should be plotted on the plan-profile sheet.

Roadway Geometric Features. Typical roadway geometric features, including pavement widths, shoulder widths, and embankment slopes should be indicated. For underpasses, the method for handling surface drainage should be indicated.

Shoofly Track Location. The proposed location of any shoofly track for routing rail traffic during construction of an underpass should be shown. Include a typical section through the shoofly embankment with a clear designation of what work is the responsibility of the state and which is the responsibility of the railroad company.

Work List

The work list provides a breakdown of all work to be performed by TxDOT, TxDOT's contractor, and the railroad company. The type of work to be performed on the railroad's right-of-way should be listed. The work list should include a typical section. When coring is involved, it is important to show where the coring will be performed in connection to the railroad tracks.

Clearances and Crash Walls

All vertical clearances from the top of rail and horizontal clearances from the centerline of the tracks must be clearly shown. Crash walls should also be shown.

Grade Crossings

If grade crossings are to be constructed in conjunction with an overpass or underpass, all information required for the grade crossing work should be shown on the overpass layout. For proposed automatic warning devices, a separate exhibit illustrating the grade crossing should also be supplied.

Other

Any other pertinent information, such as the cross section or plan profile of drainage structures or any pertinent information from the approval process.

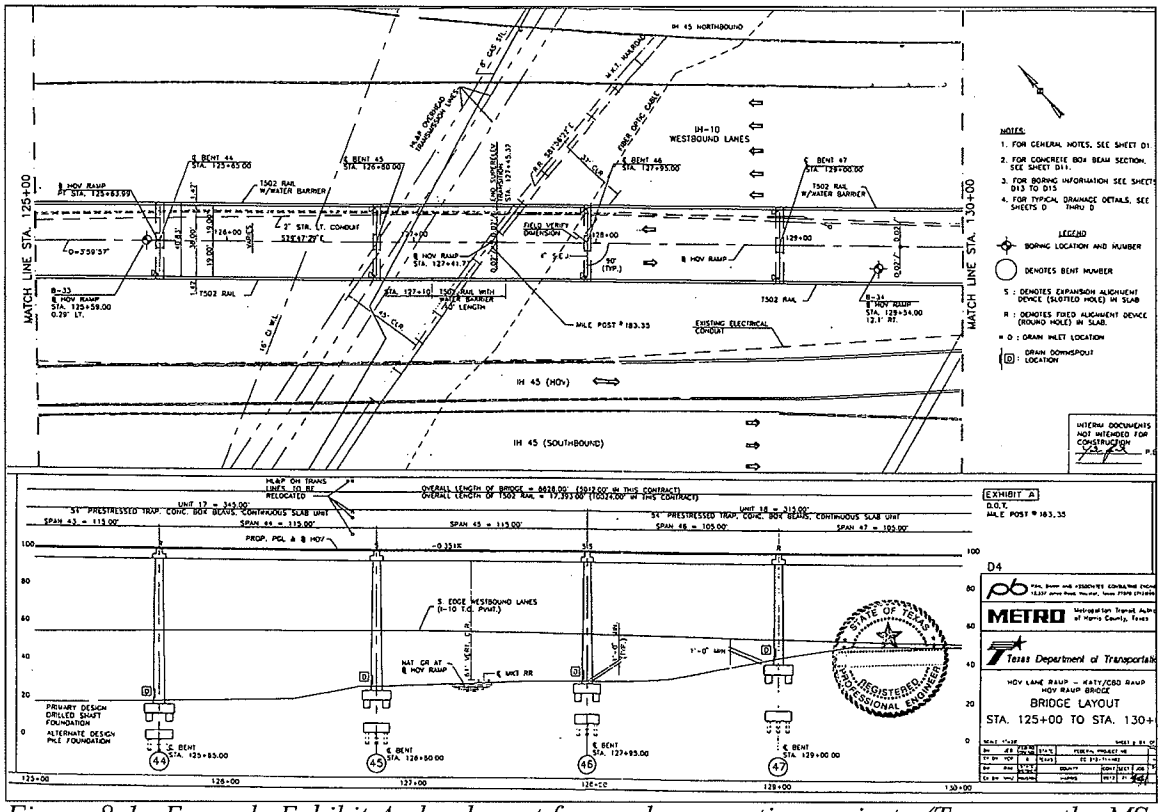

Figure 8-1. Example Exhibit A plan layout for grade separation project. (To access the MS Word version of this figure from on line, click this file name: TFEG8-1.)

Section 4
Agreements and Negotiations

Introduction

After coordinating the necessary design modifications for the construction or reconstruction of a highway-railroad grade separation, the Traffic Operations Division (TRF) and the Design Division (DES) negotiate an agreement with the railroad for all necessary force account work, including temporary adjustment of railroad fences and cattle guards and temporary and permanent pole line adjustments at the proposed structure.

The railroad performs, at state expense, any work necessary for adjustment of facilities located on railroad right of way to accommodate the construction of a grade separation.

Agreement Preparation

TRF prepares the agreement, using the plan layout furnished by the district as Exhibit A, and forwards it to the railroad.

Agreement Contents

The agreement contains:

- project data
- a license clause
- plans, estimates, construction, and maintenance
- insurance clauses
- payment clause
- conditions
- fiber optic clause.

Discussions of each of these items follow.

Project Data

Project data include the location of the project: county, CSJ, highway, project number, DOT number, and city.

License Clause

The license clause gives the state permission to construct, maintain, and use the grade separations across the railroad property.

Plans, Estimates, Construction, and Maintenance

"Plans, estimates, construction, and maintenance" includes all work to be performed by TxDOT, TxDOT's contractor, and the railroad. It spells out the responsibilities of both the railroad and the state.

Insurance Clauses

The insurance clauses specify the type of insurance the contractor will need to purchase on behalf of the state and railroad. All work performed on the railroad right-of-way by TxDOT's contractor requires railroad protective liability insurance in the amount of at least two million dollars for bodily injury and property damage; and six million dollars aggregate for all occurrences. The railroad protective liability insurance must be carried until all work on railroad property is completed. Insurance requirements are spelled out in the Special Provision to Item 007.

Payment

The payment clause specifies the conditions under which the state will reimburse the railroad and when this will occur. Reimbursement is made to railroad only if a work order has been issued to the railroad to begin work. The railroad is reimbursed for work performed and materials furnished, in accordance with the provisions of the *FAPG* Subchapter B, part 140, subpart I, issued by the Federal Highway Administration on April 7, 1992. The railroad can be reimbursed for up to 95 percent of the total cost of all railroad work through progressive billings as the work is performed. The complete balance due the railroad is paid, upon final audit by TxDOT's Audit Office.

Conditions

The conditions clause provides that the agreement can be canceled at any time prior to actual letting of the contract by TxDOT. It specifies whether the railroad is required to participate in the cost of the project.

Fiber Optic Clause

All Class I (major) railroad companies may have fiber optic cable buried on their ROW, it is important that the railroad be contacted at a 1-800 number, as shown in the agreement, prior to any work being performed to determine if fiber optic cable is buried on the ROW. By calling the 1-800 number, any fiber optic cable in the area will be identified and who the cable belongs to. It is the District's responsibility to contact that fiber optic company to advise them of the proposed work and to determine if the cable will be affected by the work. This clause is important to the railroad companies because of the very high costs associated with broken or damaged fiber optic cable.

Negotiations

TRF coordinates all negotiations concerning the agreement, including any revisions in the scope of work, with the district and railroad.

After Execution

Upon receipt of the signed agreements, the TRF forwards a copy of the executed agreement, along with the railroad estimate (if available), to the district, the Finance Division (FIN), and the Federal Highway Administration (FHWA) if required. TRF also advises DES of receipt of the executed agreement.

Section 5
Plans, Specifications, and Estimates (Exhibit B)

Introduction

The approved plans, specifications, and estimates (PS&E) for that portion of the project involving the railroad company is called Exhibit B and is part of the agreement between TxDOT and the railroad. Exhibit B is typically prepared *after* the agreement is signed.

Preparation

The district prepares the PS&E package and submits it to the Design Division (DES) for review and processing for contract letting.

NOTE: The PS&E Submission Data form (TxDOT Form 1002) should include railroad information on page 2.

NOTE: The Special Provision to Item 007 for Railroad Protective Liability Insurance should be included in the specification list.

Review and Approval

DES reviews and approves the PS&E and prepares the Exhibit B for submission to the railroad. If the fiber optics note is not shown in the plans, the note should be added to the general notes.

DES furnishes the approved Exhibit B to the Traffic Operations Division (TRF) for transmittal to the railroad company for their final approval.

Upon approval by the railroad, TRF forwards a copy of the approved Exhibit B to DES and FHWA (if required).

Section 6
Project Execution

Work Order

The work order authorizes the railroad to begin work and provides for reimbursement to the railroad. The district issues the work order to the railroad for any railroad force account work and advises the railroad of work on their property.

The work order should be issued soon after the contract has been awarded to allow the railroad sufficient time to order necessary materials and schedule work.

The district should send a copy of the work order to:

- the Traffic Operations Division (TRF)
- the Design Division (DES)
- the Finance Division (FIN).

Pre-construction Meeting

A pre-construction meeting is recommended and is a district responsibility.

Representatives from the railroad, TxDOT's contractor, and TxDOT attend the meeting. The construction schedule, inspection, and individual points of contact are discussed. Any conflicts in the work schedule should be identified and resolved prior to beginning work.

Inspection

The district inspects the work performed by the railroad and verifies that the work complies with state standards and the approved plans and specifications.

Completion Letter

The district issues the completion letter to the railroad when the project is complete. A copy of the completion letter should be sent to TRF, DES, and FIN. The completion letter authorizes final payment to the railroad, less retainage pending final audit.

Chapter 9
Drainage Structures and Common Ditches

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Section 1
Overview

Policy and Practice

When a drainage channel or some type of drainage structure on railroad right-of-way is needed, an agreement obtaining permission and concurrence from the railroad to perform such work is required. This includes grading, cleaning, and reshaping of common ditches and culverts between highway and railroad right-of-way.

Drainage Structures Under or Near Railroad

Railroad companies require that concrete box culverts or drainage pipes installed under the tracks be class V and E-80 loading. Also, the Union Pacific Railroad requires that TxDOT complete their Application for Encased Non-flammable Pipeline Crossing form and include it (along with a cover application form) as part of the agreement. The district completes the forms and submits them to the Traffic Operations Division (TRF) when requesting preparation and execution of the agreement. (Samples of the forms are provided in Appendix A of the hard copy print version of this volume. These sample forms may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division.)

When box culverts are installed under the tracks, the railroads require that hydraulic design calculations be submitted for their approval. The district develops these calculations and submits them to the Design Division (DES). DES then forwards them to TRF to be included as part of the agreement.

Common Ditch and Joint Drainage

Railroads typically require plan profiles and cross sections of common ditch projects. Plan profiles should be included with the plan layout (Exhibit A).

Preliminary Engineering and Coordination

Preliminary engineering and coordination with any local governmental entity, adjacent landowners, and the railroad is normally the responsibility of the district.

Drainage outfall into common ditch facilities or under railroad tracks should be designed to prevent any possible undermining of railroad facilities in the event of flooding.

Section 2
Plan Layout (Exhibit A)

Overview

The district prepares the plan layout (to be used in the agreement as Exhibit A) in sufficient detail to show all work to be performed by TxDOT, TxDOT's contractor, the railroad, and the railroad's contractor.

The layout includes detail plans showing proposed drainage structures, grading, and slope of ditch work. Any other pertinent information, such as the cross section or plan profile of the drainage structures, should be included in the plan layout.

Figure 9-1 (a-d) at the end of this section shows an example Exhibit A plan Layout.

Project Data

The project data included in the plan layout identify the project by:

- county
- project number
- control-section-job (CSJ)
- highway number or road name.

Title Block

The title block includes:

- the railroad name and DOT No. (if available)
- milepost and highway station
- The words "Exhibit A."

General Notes

The general notes lists all work to be performed by TxDOT, TxDOT's contractor, the railroad, and railroad's contractor.

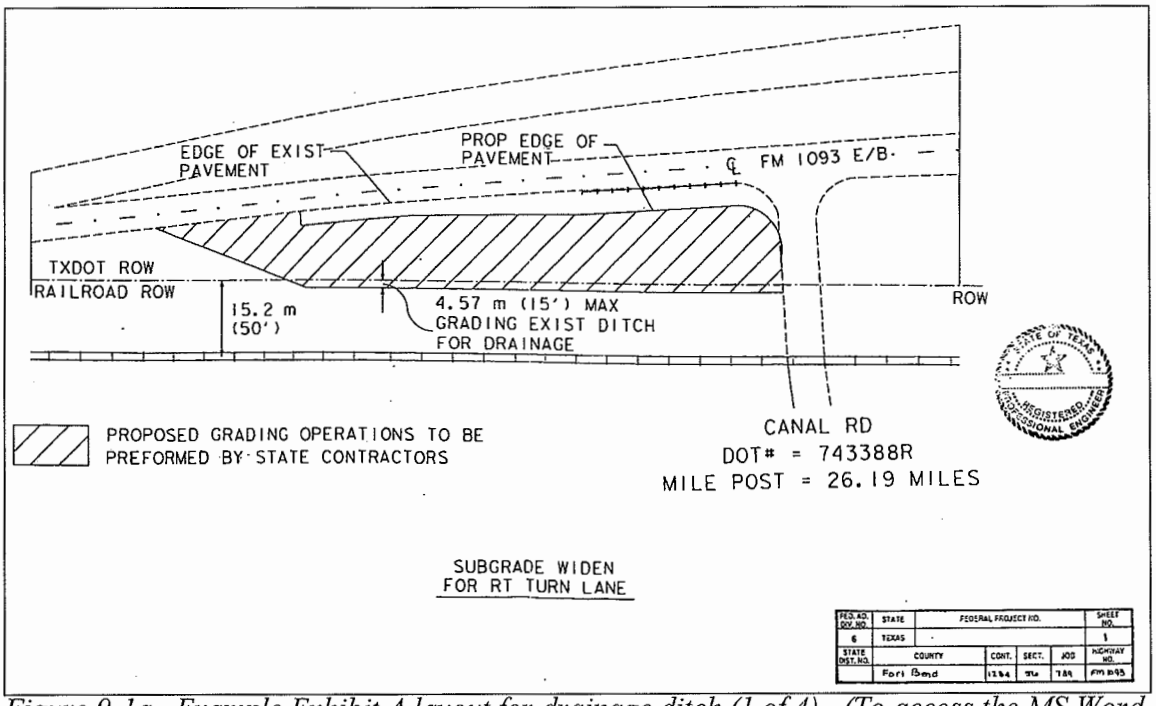

Figure 9-1a. Example Exhibit A layout for drainage ditch (1 of 4). (To access the MS Word version of all four panels of this figure from on line, click this file name: TFEG9-1.)

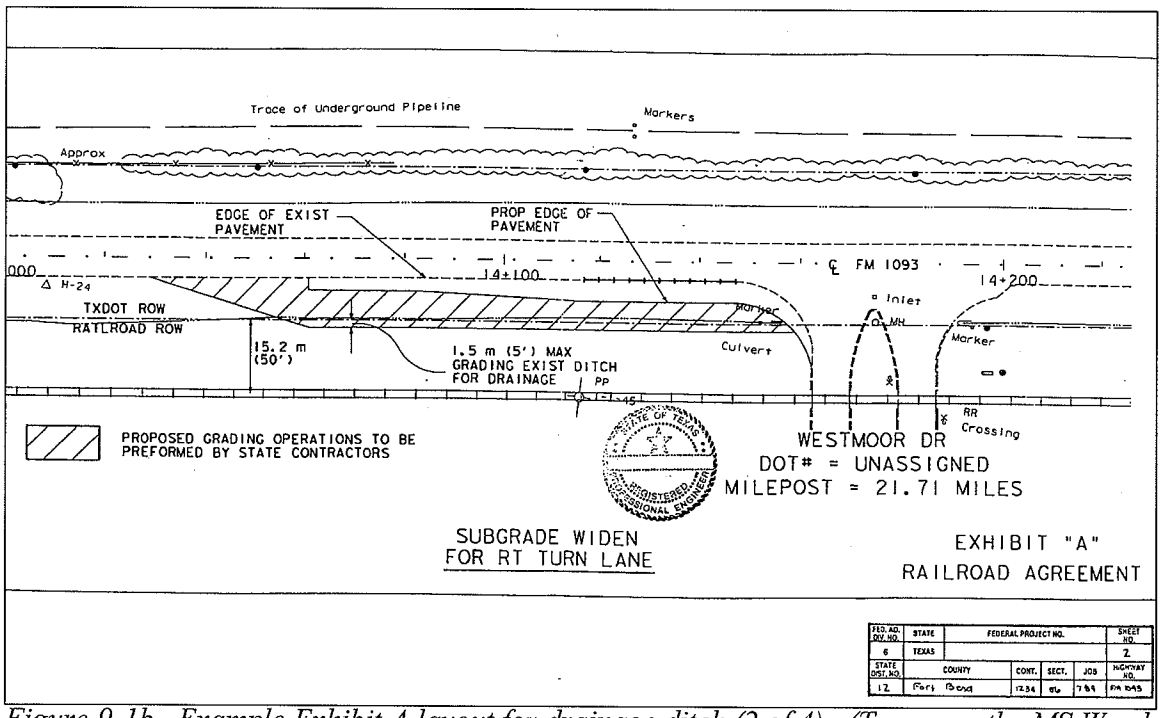

Figure 9-1b. Example Exhibit A layout for drainage ditch (2 of 4). (To access the MS Word version of all four panels of this figure from on line, click this file name: TFEG9-1.)

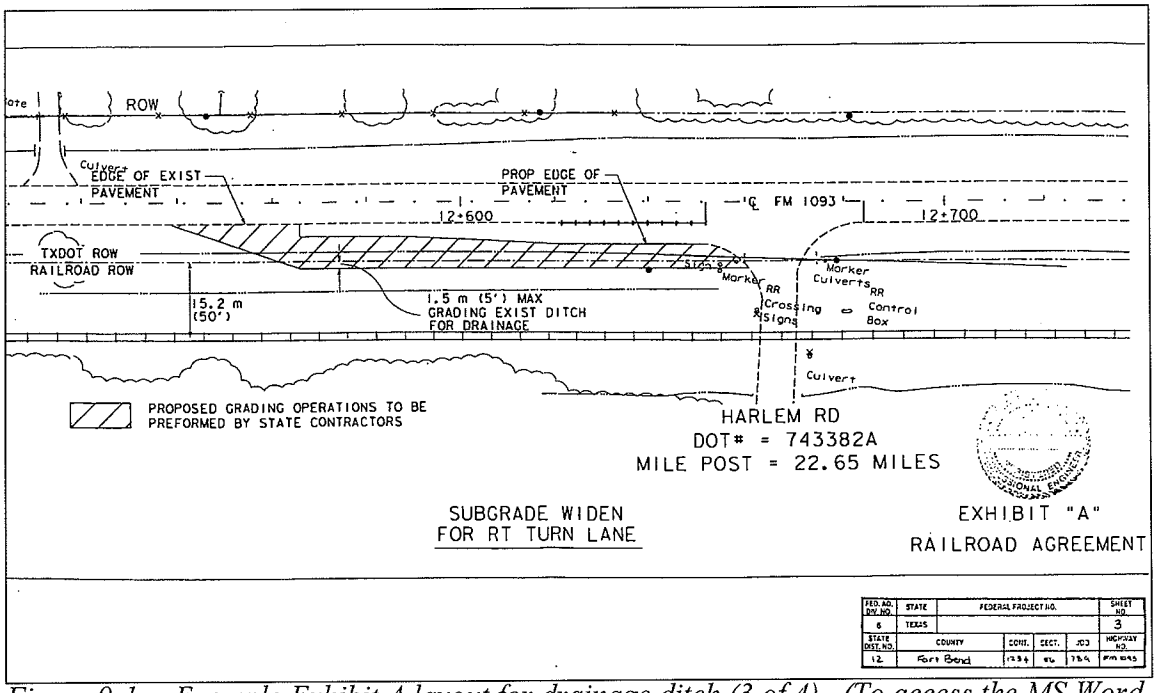

Figure 9-1c. Example Exhibit A layout for drainage ditch (3 of 4). (To access the MS Word version of all four panels of this figure from on line, click this file name: TFEG9-1.)

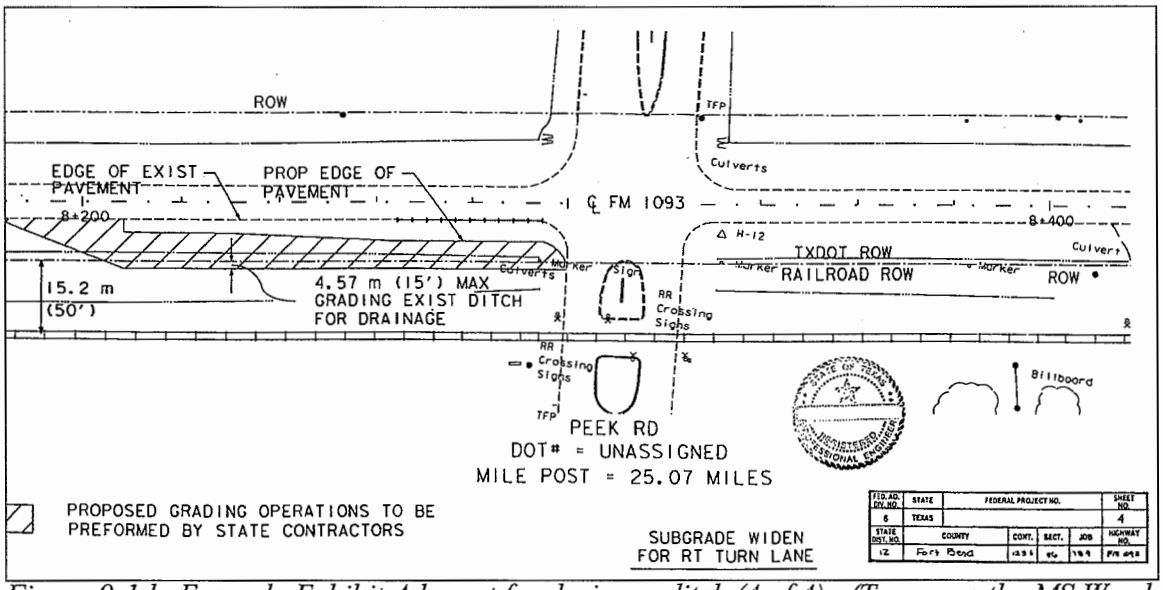

Figure 9-1d. Example Exhibit A layout for drainage ditch (4 of 4). (To access the MS Word version of all four panels of this figure from on line, click this file name: TFEG9-1.)

Section 3
Agreements and Negotiations

Introduction

Using the plan layout furnished by the district as Exhibit A, the Traffic Operations Division (TRF) prepares the necessary agreement and forwards it to the railroad company.

Negotiations and Processing

TRF coordinates all negotiations concerning the agreement, including any revisions made by the district or railroad.

The railroad furnishes an estimate (or bids solicited by the railroad) to TRF showing all reimbursable work to be performed by the railroad. TRF approves the estimate, attaches it to the executed copies of the agreement, and forwards the railroad's copy back to them. The district, the Finance Division (FIN), and FHWA (if required) each receive a copy of the executed agreement and estimate.

Agreement Contents

The agreement contains:

- project data
- a license clause
- insurance clauses
- a payment clause
- conditions
- a fiber optic cable clause.

Discussions of each of these items follow.

Project Data

The project data identifies the project by:

- county
- control-section-job (CSJ)
- highway
- project number
- DOT No. (if available)
- the city or nearest city.

License Clause

The license clause gives TxDOT license and permission to perform the necessary drainage work on the railroad right-of-way. The clause also describes the work to be performed by all parties, including flagging of trains by the railroad, if required.

Insurance Clauses

The insurance clauses specify the type of insurance the contractor needs to purchase on behalf of the state and railroad. All work performed on the railroad right-of-way by TxDOT's contractor requires railroad protective liability insurance in the amount of at least two million dollars for bodily injury and property damage six million dollars aggregate for all occurrences. The railroad protective liability insurance must be carried until all work on the railroad property is completed. Insurance requirements are spelled out in the Special Provision to Item 007.

Payment Clause

The payment clause specifies when and under which conditions TxDOT will reimburse the railroad. Reimbursement is made to the railroad only if a work order has been issued to begin work. The railroad is reimbursed for work performed and materials furnished in accordance with the provisions of the Federal Aid Policy Guide (FAPG), Subchapter B, Part 140, Subpart I, as last issued by the Federal Highway Administration on April 7, 1992. The railroad is reimbursed the actual total cost of all railroad force account work performed and materials used or installed. However, upon final audit by the Audit Office of TxDOT, the railroad may be required to reimburse TxDOT any over payment that cannot be justified.

Conditions

The conditions clause explains that the agreement can be canceled at any time prior to actual letting of the contract by TxDOT. It also details any FAPG requirements for cost participation in the project by the railroad.

Fiber Optic Clause

All Class I (major) railroad companies have fiber optic cable buried on their rights-of-way. Therefore, it is important that the railroad be contacted at a 1-800 number (which is identified in the agreement) prior to any work being performed to determine if fiber optic cable is buried on the right-of-way. Also, the location of the fiber optic cable and who it belongs to can be identified. It is the district's responsibility to contact the fiber optic cable company to advise them of the proposed work and to determine if the cable will be affected by the work. This clause is important to the railroad companies, because of the very high costs associated with broken or damaged fiber optic cable.

Section 4
Project Execution

Work Orders

The district issues the work order to the railroad for any railroad force account work and keeps the railroad advised of the work in progress on their property. The work order should be issued soon after the contract has been awarded to allow the railroad sufficient time to order materials and schedule work. A copy of the work order should also be sent to the Traffic Operations Division (TRF) and the Finance Division (FIN). The work order authorizes the railroad to go to work and to be reimbursed by the state.

Pre-construction Meeting

A pre-construction meeting is recommended and is the district's responsibility. Representatives from TxDOT, the railroad, and TxDOT and railroad contractors should attend the meeting so that work can be coordinated. The construction schedule and individual points of concern should be discussed and any scheduling conflicts identified and resolved.

Inspections

The district inspects the work performed by the railroad and verifies that it complies with TxDOT standards and approved plans and specifications.

Project Completion

The district issues the completion letter to the railroad when the project is complete. A copy of the completion letter should be sent to TRF and FIN. The completion letter authorizes final payment to the railroad.

Chapter 10
Other Railroad Agreements

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- Installation of Overhead Wire Lines 10-3
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Section 1
Letter Agreements

Policy and Practices

A letter agreement is used on projects requiring minimal work on railroad right-of-way where the only thing the railroad is doing is providing flaggers. Flaggers are needed for safe operation and work conditions.

Examples of projects using letter agreements are:

- seal coat and asphaltic concrete pavement (ACP) overlay
- installation of overhead wire lines
- installation of conduit under track
- minor pavement rehabilitation
- minor maintenance
- installation of computerized traffic management system.

Discussions of these types of projects follow.

Seal Coat and ACP Overlay Projects

TRF prepares a project-specific letter agreement for each crossing affected by a seal coat and asphaltic concrete pavement (ACP) overlay project, whereby the railroad gives TxDOT permission to perform the seal coat or ACP overlay work up to the edge of the crossing. The letter agreement provides the following information:

- project data
- statement of the work
- provision for flagging
- letting date
- notification.

Installation of Overhead Wire Lines

When an overhead wire line is installed over the track, the Union Pacific Railroad requires that TxDOT complete their Application for Overhead Wireline Crossing and include it (along with a cover application form) as part of the agreement. The district completes the forms and submits them to the Traffic Operations Division (TRF) when requesting preparation and execution of the agreement. Samples of these forms are provided in Appendix A of the hard copy print version of this volume. These sample forms may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division.

Installation of Conduit Under Track

As with overhead wire lines, when conduit is installed under the track, the Union Pacific Railroad requires that TxDOT complete their Application for Underground Wireline Crossing and include it (along with a cover application form) as part of the agreement. The district completes the forms and submits them to the Traffic Operations Division (TRF) when requesting preparation and execution of the agreement. Samples of these forms are provided in Appendix A of the hard copy print version of this volume. These sample forms may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division.

Minor Pavement Rehabilitation

Minor pavement rehabilitation includes such work as:

- repair of pot holes in the roadway
- crack sealing
- seal coats
- ACP overlays.

Minor Maintenance

Minor maintenance projects can include such work as performing minor repairs on a grade separation and drainage ditches where a fully executed agreement exists requiring TxDOT to maintain the structure or drainage ditches or both.

Plan Layout (Exhibit A)

On all types of projects involving letter agreements, except seal coat projects (see following discussion), the district prepares a plan layout (Exhibit A) in sufficient detail to show all work to be performed by TxDOT, TxDOT's contractor, and the railroad. Exhibit A must be signed, sealed, and dated by a registered professional engineer and must include:

- ***project data*** include:
  - county
  - control-section-job (CSJ)
  - project
  - highway number or road name
- ***work description*** — the work to be performed by TxDOT and its contractor
- ***title block*** includes:
  - the railroad company name and DOT No. (if available)
  - crossing location
  - railroad milepost and highway station at each location
  - the words "Exhibit A."

Required Railroad Forms. Railroad application forms for overhead or underground wire lines (if required) should be attached to Exhibit A. These forms do not need to be sealed.

Seal Coat Projects. On seal coat projects, the district should provide the following as part of Exhibit A:

- location of each project including the DOT No.
- a location map of each project
- name of the railroads involved
- project data.

For seal coat projects, the Exhibit A does not need to be signed, sealed, and dated by a registered professional engineer.

The district submits Exhibit A to the Traffic Operations Division (TRF).

Agreement Preparation and Negotiations

Using the layout furnished by the district as Exhibit A, TRF prepares the letter agreement and forwards the agreements to the railroad company.

The letter agreement contains:

- ***project data*** include:
  - county
  - project
  - control-section-job (CSJ)
  - highway number or road name
- ***work description*** — the work to be performed by TxDOT and its contractor
- ***flagging clause*** — gives the railroad authority to provide flaggers and gives an estimated cost for the flagging.
- ***fiber optic clauses*** — provides the 1-800 number that TxDOT's contractor must call before any work is performed on railroad property
- ***insurance clause*** — requires TxDOT's contractor to provide railroad protective liability insurance.

TRF handles all negotiations concerning the agreement, including revisions. Upon receipt of the signed letter agreement, TRF forwards a copy of the executed agreement to the district and the Finance Division (FIN).

Work Order

The district issues the work order to the railroad for flaggers. The work order should be issued at least five days before any work is performed, so that the railroad has time to provide flaggers. A copy of the work order should also be sent to TRF and FIN. The work order authorizes payment to the railroad.

Completion Letter

The district issues the completion letter to the railroad when the project is complete and the flagger is no longer needed. A copy of the completion letter should also be sent to TRF and FIN. This letter authorizes final payment to the railroad.

Section 2
Right of Entry and Survey Agreements

Policy and Practice

When TxDOT needs to enter the railroad's right-of-way to perform core drilling, survey, or other related work, a Right of Entry Agreement or Survey Agreement with the railroad is necessary. These agreements are usually needed at the very beginning of a project, typically before plan layouts are drawn. These agreements should be negotiated as far in advance as possible so as not to delay the project.

Insurance Considerations

When TxDOT forces perform surveying or core drilling work, railroads *do not* require railroad protective liability insurance. If TxDOT's contractor performs the work, then railroad liability protective insurance *is* required. Since the cost of the insurance could exceed the cost of the survey or coring project, TxDOT forces should perform this type work.

Layout (Exhibit A)

The district prepares the layout (Exhibit A) in sufficient detail to show all work to be performed by TxDOT, TxDOT's contractor, and the railroad. Exhibit A must include:

- ***project data*** include:
  - county
  - project
  - control-section-job (CSJ)
  - highway number or road name
- ***title block*** includes:
  - control-section-job (CSJ)
  - DOT No.
  - railroad mile post
  - project number
  - county number.
  - the words "Exhibit A"
- ***work list*** — the work to be performed by TxDOT or its contractor, including the type of work to be performed on the railroad's right-of-way and, when coring is involved, where the coring will be performed in connection to the railroad tracks.

(continued...)

Layout (Exhibit A) *(continued)*

Exhibit A must be signed, sealed, and dated by a registered professional engineer.

The district submits Exhibit A to the Traffic Operations Division (TRF).

Agreement Preparation

Agreement Preparation. Using the layout furnished by the district as Exhibit A, the Traffic Operations Division (TRF) prepares the Right of Entry or Survey Agreement and forwards it to the railroad company.

The agreement contains:

- project data, which includes:
  - county
  - control-section-job (CSJ)
  - highway number or road name
  - project number
  - DOT No. (if available)
  - the city
- scope of work (description follows)
- conditions clause (description follows)
- a fiber optic clause (description follows)
- insurance clauses (description follows)
- a payment clause (description follows)
- a termination clause (description follows).

Scope of Work. The scope of work includes all work to be performed by TxDOT, TxDOT's contractor, and the railroad. It specifies the responsibilities of both the railroad and TxDOT.

Conditions Clause. The conditions clause gives TxDOT permission from the railroad to perform the necessary work. It specifies conditions that apply to TxDOT while on the railroad right-of-way.

(continued...)

Agreement Preparation *(continued)*

Fiber Optic Clause. Most of the major railroads may have fiber optic cable buried on their rights-of-way. Therefore, it is important that the railroad be contacted at a 1-800 number (which is identified in the agreement) prior to any work being performed to determine if fiber optic cable is buried on the right-of-way. Also, the location of the fiber optic cable and who it belongs to can be identified. It is the district's responsibility to contact the fiber optic cable company to advise them of the proposed work and to determine if the cable will be affected by the work. This clause is important to the railroad companies, because of the very high costs associated with broken or damaged fiber optic cable.

Insurance Clauses. If TxDOT's contractor will perform the survey or coring work, then the contractor must purchase railroad protective liability insurance in the amount of at least two million dollars for bodily injury and property damage and six million dollars aggregate for all occurrences. The railroad protective liability insurance must be carried until all work on railroad property is completed. Insurance requirements are included in a Special Provision to Item 007.

Payment Clause. The payment clause specifies the conditions under which TxDOT will reimburse the railroad and when reimbursement will be made. Reimbursement to the railroad must be in accordance with *Federal-Aid Policy Guide (FAPG)* subchapter B, part 140, subpart I, issued by the Federal Highway Administration on April 7, 1992.

Termination Clause. Some railroad companies require that a one-year termination clause be included in the agreement. This clause specifies that the agreement, after execution by all parties involved, be good for one year from the execution date. It also states that TxDOT must notify the railroad in writing at least five days prior to starting any work on railroad right-of-way.

Agreement Negotiations

TRF handles all negotiations concerning the agreement, including revisions. Upon receipt of the signed agreement, TRF forwards a copy of the executed agreement to the district and the Finance Division (FIN).

Work Order

The district issues the work order to the railroad for any flagging of trains that may be required. The work order should be issued as soon as possible after the agreement has been executed by all parties. A copy of the work order should also be sent to TRF and FIN.

Completion Letter

Upon completion of the survey or coring work, the district issues a completion letter to the railroad. This letter advises the railroad that all work on their right-of-way is complete and that they may now bill TxDOT the cost of any flagging performed in connection with the project. A copy of the completion letter should also be sent to TRF and FIN.

Chapter 11
Crossing Closure, Relocation, and Consolidation

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Section 1
Overview

Policy

The *Texas Manual on Uniform Traffic Control Devices (TMUTCD)* states:

> Any highway grade crossing for which there is not a demonstrated need should be closed. Where a railroad track has been abandoned or its use discontinued, all related traffic control devices shall be removed, and the tracks should be removed or covered.

General Considerations

Several considerations may influence the decision to eliminate a highway-rail crossing.

Railroad Use of Track. Each railroad company operating over a candidate crossing should indicate its intent for future use of that section of track. If track abandonment is anticipated, roadway closure or any crossing improvements should be held in abeyance pending resolution of the track abandonment proposal.

Effect on Roadway System. A roadway closure should not negatively affect the local transportation system. Alternative public crossings should be within a reasonable travel time and distance. The alternative crossings and connecting roadways should have sufficient capacity to accommodate the diverted traffic safely and efficiently.

Emergency Vehicle Routing. The closing of roadway crossings that serve as a direct route for vital traffic, such as ambulances, fire trucks, or other emergency vehicles, should be avoided.

Economic Consequences. The economic consequences for nearby existing or planned businesses should be considered.

Crash History and Hazard Potential. The crash history and hazard potential of the crossing should be carefully evaluated. Items to review include:

- number and severity of crashes
- type and number of trains
- train speed range
- time periods during which trains block the crossing.

Section 2
Crossing Closure

Introduction

Closure of highway-rail intersections is normally accomplished by closing the highway. Many characteristics of the community influence the number of crossings needed to carry highway traffic over a railroad. A study of highway traffic flow should be conducted to determine origin and destination points and needed highway capacity. Highway operation over several crossings may be consolidated to move over a nearby crossing with flashing lights and gates, or via a nearby grade separation. Alternative routes should be within reasonable travel time and distance from a closed crossing. The alternate routes should have sufficient capacity to accommodate the diverted traffic safely and efficiently.

Obstacles to Crossing Closure

Negative community attitudes, funding problems, or a lack of forceful state laws authorizing closure are common obstacles to crossing closure. Local opposition may sometimes be overcome through emphasis on the benefits resulting from closure, such as improved traffic flow and safety as traffic is redirected to grade separations or crossings with active traffic control devices.

Railroads often support closure, not only because of safety concerns, but also because closure eliminates maintenance costs associated with the crossings.

Systems Approach

The systems approach is useful in identifying closure candidates. This method improves several crossings in a community or rail corridor by the installation of traffic control devices at some locations while closing other crossings. A study of traffic flow in the area should be conducted beforehand to assure continued access across the railroad. Installation of more sophisticated traffic control systems at the remaining crossings and perhaps the construction of a grade separation at one of the remaining crossings may improve traffic flow in some instances.

Emergency Vehicle Routing

Access over the railroad by emergency vehicles, ambulances, fire trucks, and police must be considered in deciding whether or not to close a crossing. Crossings used frequently by emergency vehicles should not be closed. These crossings should be candidates for grade separation or the installation of active traffic control devices.

Identifying Closure Candidates

Criteria for identifying candidate crossings for closure must relate directly to existing operational and geometric characteristics. Specific criteria are difficult to establish. The number of vehicles using the crossing and the accessibility of alternate crossings are significant criteria in determining whether the elimination of a particular crossing is practical. Existing criteria and values differ among agencies. The *Traffic Control Devices Handbook* suggests the following criteria.

Criteria for Closing of Grade Crossings

Type of Track	Criteria
Branch Line	♦ less than 2,000 ADT (average daily traffic ♦ more than two trains per day ♦ alternate crossing within 0.25 miles with less than 5,000 ADT if two-lane, or less than 15,000 ADT if four-lane
Spur Track	♦ less than 2,000 ADT ♦ more than 15 trains per day ♦ alternate crossing within 0.25 miles with less than 5,000 ADT if two-lane, or less than 15,000 ADT if four-lane
Main Line	any main line section with more than five crossings within a 1.6 km (1.0 mile) segment

It is important to avoid using these criteria without objective engineering and economic assessments of the positive and negative consequences of the closure.

Removal of Devices

When a crossing is permanently closed to highway traffic, the crossing surface, pavement markings, and all traffic control devices both at the crossing and approaching the crossing should be removed. Generally, the railroad is responsible for removing the crossing surface and traffic control devices located at the crossing. The highway authority is responsible for removing traffic control devices in advance of and approaching the crossing. Nearby highway traffic signals interconnected with crossing signals located at the closed crossing should have their phasing and timing readjusted. (See Section 4 of this chapter for information on the permit required for dismantling warning signals.)

Erection of Warning and Regulatory Devices

The highway authority is also responsible for alerting motorists to the closed roadway. A Type III barricade conforming to the design criteria of Section 6C-8 of the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)* may be erected, except the colors of the stripes must be reflectorized white and reflectorized red. Warning and regulatory signing may also be an appropriate means of alerting motorists to the closed roadway. These may include the ROAD CLOSED (R11-2) sign, the LOCAL TRAFFIC ONLY (R11-3) sign, or the ROAD CLOSED TO THRU TRAFFIC (R11-4) sign, plus appropriate advance warning signs applicable to the circumstances.

Notification of Alternate Routes

Consideration should also be given to advising motorists of alternate routes across the railroad. If trucks use the closed crossing, they should be given advance information of the closure at points where they can conveniently alter their route.

Section 3
Relocation and Consolidation

Introduction

Alternatives to the closing of a grade crossing are

- relocation of either the highway or the railroad track
- consolidation of two or more railroad lines into a single route.

Planning

Planning for such relocation or consolidation is complex and often controversial. These projects are also some of the most expensive options available, necessitating careful study to ensure the expenses involved are reasonably justified.

Prior to making any decisions relating to crossing improvement by either grade separation or traffic control systems, long-range plans for relocation and consolidation of railroads in urbanized areas should be reviewed. Urbanized area transportation plans and railroad studies for mergers and consolidation are two sources of information.

Railroad Relocation

Railroad relocation to the outer limits of the community may be a viable alternative for alleviating operational, safety, and environmental concerns, while retaining the economic benefits of railroad service to the community. Relocation generally involves the complete rebuilding of railroad facilities, including acquisition of new right of way and construction of track, drainage structures, signals and communications, crossings and separations, station facilities, and utilities.

Benefits. Benefits of railroad relocation extend beyond those associated with crossing safety and operations. Possible additional benefits may include:

- improved environmental quality resulting from decreased noise and air pollution
- improved land use and appearance
- improvements in the railroad's operational efficiency.
- elimination of obstructions to emergency vehicles
- safer routes for hazardous materials movement.

(continued...)

Railroad Relocation *(continued)*

Planning. Many factors exist in planning for railroad relocation. The new route should provide good alignment, minimum grades, and adequate drainage. Sufficient right of way should be available to provide the necessary horizontal clearances, additional rail facilities as service grows, and a buffer for abating noise and vibrations. The number of new highway-rail intersections should be minimal.

Zoning the property adjacent to the railroad as light and heavy industrial further isolates the railroad corridor from residential and commercial activity. Businesses and industry desiring rail service can locate in this area.

Highway Relocation

Highway relocations are implemented to provide improved traffic flow around communities and other developed areas. Planning for highway relocations should consider routes that would eliminate highway-rail intersections by avoiding the need for access over railroad tracks or by providing grade separations.

Section 4
Dismantling of Warning Signals

Introduction

A person or railroad desiring to dismantle a warning signal at a grade crossing of a railway and a state-maintained road or highway must first apply to TxDOT to determine if a permit is required under 43 TAC §25.70 – 25.73. This contains requirements and procedures for issuing such a permit. Figure 11-1 at the end of this section provides a flow chart overview of the permit process.

NOTE: A permit is also required for dismantling warning signals at a grade crossing of a railway with a road or highway maintained by an authority other than TxDOT. Consult 43 TAC §25.70 – 25.73 for details.

Application

A person or railroad company desiring to dismantle warning signals at a railroad grade crossing must make application to the Texas Department of Transportation.

Form Available. Applicants may obtain a Permit Application Form for Dismantling of Railroad Crossing Warning Signal Device (TxDOT Form 1930) from any TxDOT district office. A sample Form 1930 is provided in Appendix A of the hard copy print version of this volume. This sample form may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division. In the on-line version of this volume, an MS Word version of this form may be opened and printed out by clicking on the following file name: TFE-1930.

Application Submittal. The applicant must return the completed application form to the district office in which the warning signal is located. The application must be accompanied by a resolution from the board of directors of the entity owning the railroad certifying the reason and justification for the request for removal of the warning signal.

Determining if a Permit Is Required

Upon receiving an application, the district determines if a permit is required to remove the signal. A permit is required when all of the following conditions exist:

- the rail line is not defined as a Class I or Class II railroad by the Interstate Commerce Commission
- the rail line is active (an "active rail line" is defined as any railroad tracks which are classified by the Interstate Commerce Commission to carry freight or passenger trains and are currently being operated and maintained by a railroad company or rail carrier.)
- the cost of the signals was originally paid either entirely or partly from public funds.

The district must notify the applicant of its finding within 30 calendar days following receipt of the application.

If a Permit Is Not Required

If a permit is not required for removal of the signals the district office informs the applicant that they may dispose of the signals at their discretion.

If a Permit is Required

If a permit is required, the district proceeds according to who the entity is who maintains the roadway.

If a governmental entity other than TxDOT maintains the road or highway intersecting the rail line, the district office forwards the application to that governmental entity for further processing in accordance with 43 TAC §25.70 – 25.73. The district also informs the applicant of its findings and the forwarding.

If TxDOT maintains the road or highway intersecting the rail line, then the district informs the applicant of its findings and processes the application.

Processing the Application

The district determines whether or not removal of the warning signals would adversely affect public safety. Factors determining whether or not removal of the warning signals would adversely affect public safety include:

- vehicle traffic
- train traffic and operations
- train-involved accident history
- crossing geometrics
- other considerations as noted on the application.

If removal would adversely affect public safety, then the district informs the applicant within 90 calendar days that the application is denied.

If removal would not adversely affect public safety, then the district determines the salvage value of the warning signals and informs the applicant within 90 calendar days of its finding that the application is approved pending payment of the signals' salvage value and reimbursement of expenses incurred by TxDOT in processing the application.

Salvage Value

Salvage value is defined as any monetary value which may be derived from the signal equipment being retired or removed or from any material necessary for its operation. This may include, but is not limited to, the depreciated value of:

- any reusable electrical equipment (signal controllers, relays, rectifiers, batteries, etc.)
- signal equipment (signal heads, lenses, signal hoods and backgrounds, light bulbs, crossbuck signs, gate arm mechanisms, gate arms, lights, counterweights, etc.)
- track circuit equipment (termination shunts, capacitors, chokes, tuned joint couplers, insulated joints, etc.)
- the scrap value of these components, including all material or aluminum components (signal masts or cantilevers, gate mechanisms, counterweights, signal cabins, or signal cases).

Receipt of Payment and Permit Issuance

Upon receipt of payment for the salvage value of the signals, the district issues a permit to the applicant for dismantling the warning signals. Governmental entities other than TxDOT that collect such payment, transfer the salvage value paid for signals to the appropriate district office. The district office deposits the salvage value paid for signals into a special fund in the State Treasury known as the "Railroad Crossing Warning Signal Fund" under the State Highway Fund to be used for the maintenance and improvement of warning signals at grade crossings.

Permit Process Flow Chart

The flow chart shown in Figure 11-1 provides an overview of the permit process for dismantling warning signals at railroad crossings.

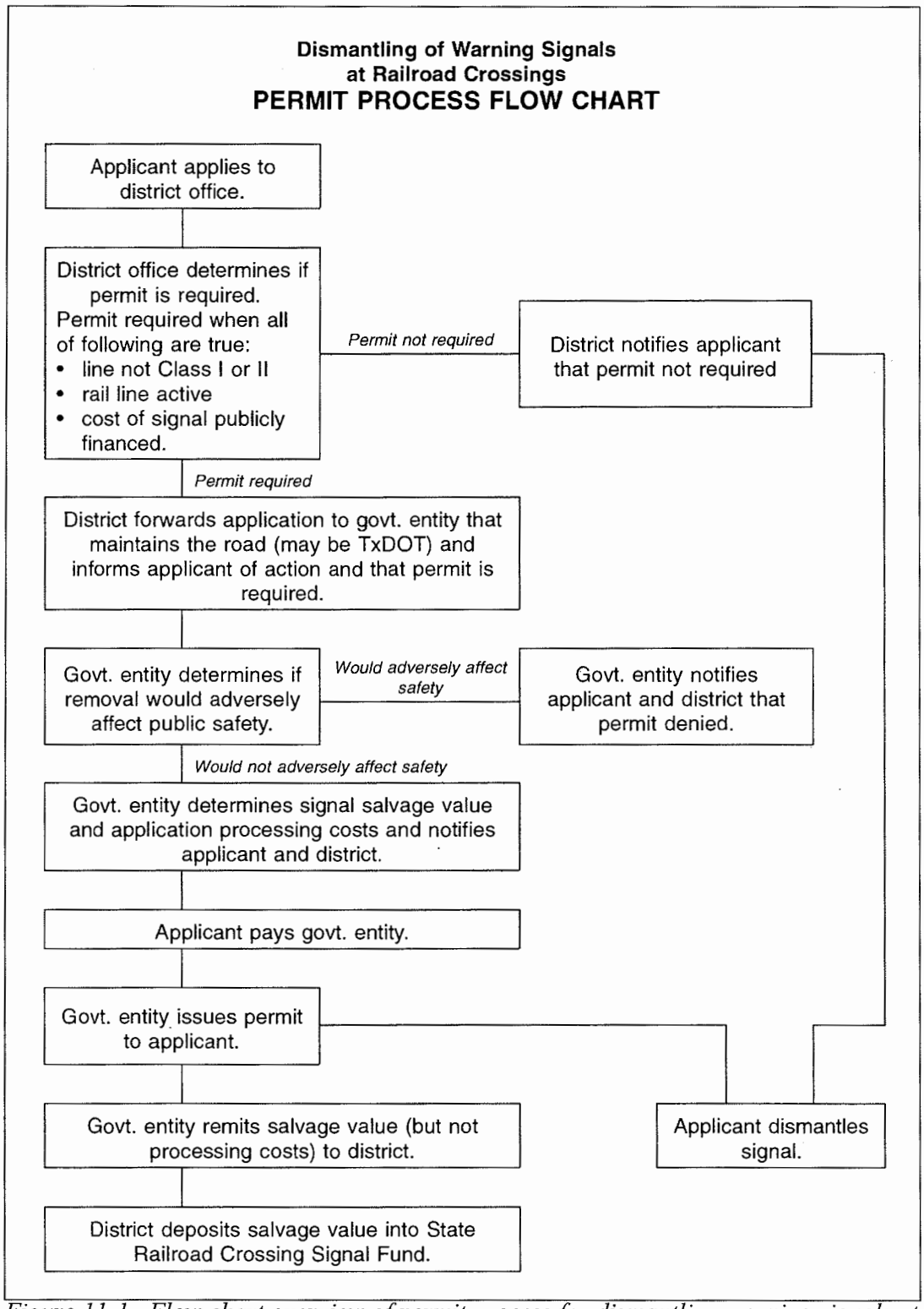


Figure 11-1. Flow chart overview of permit process for dismantling warning signals at railroad crossings. (To access the MS Word version of this figure from on line, click this file name: TFEG11-1.)

Appendix A
Forms

Introduction

This appendix lists the forms described in this volume. In the hard copy print version of this volume, this appendix contains samples of each form. These samples may be photocopied as necessary. Copies may also be obtained from the Traffic Operations Division (TRF).

MS Word versions of some of the forms are accessible through hypertext links in the on-line version of this volume, as indicated in the following list.

List of Forms

Appendix A of the hard copy print version of this volume contains the following forms in the following order:

TxDOT Forms Pertaining to Railroad Operations

TxDOT Form Number/Name		Hypertext Link (on line only)	# of Pgs.	Described in Chap.
1876	Railroad Grade Crossing Replanking Project Submission Form*	TFE-1876	2	4
1891	Detailed Estimate for Railroad Solicitation of Bids*	TFE-1891	1	4
	Preemption Worksheet (Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings)		1	7
1930	Permit Application for Dismantling of Railroad Crossing Warning Signal Device*	TFE-1930	1	11
* Indicates that an MS Word version is available through the on-line version of this manual.				

Union Pacific Forms

Form Number/Form Name		# of Pgs.	Described in Chap.
PLX.APP	Application (used as a cover for all of the following forms)	2	–
DR-0404-F	Application for Underground Wireline Crossing — 600 Volts or Less	1	7 & 10
DR-0404-G	Application for Underground Wireline Crossing — Over 600 Volts	1	7 & 10
DR-0404-B	Application for Encased Non-flammable Pipeline Crossing	1	9
DR-0404-D	Application for Overhead Wireline Crossing — 600 Volts or Less	1	10
DR-0404-H	Application for Overhead Wireline Crossing — Over 600 Volts	1	10

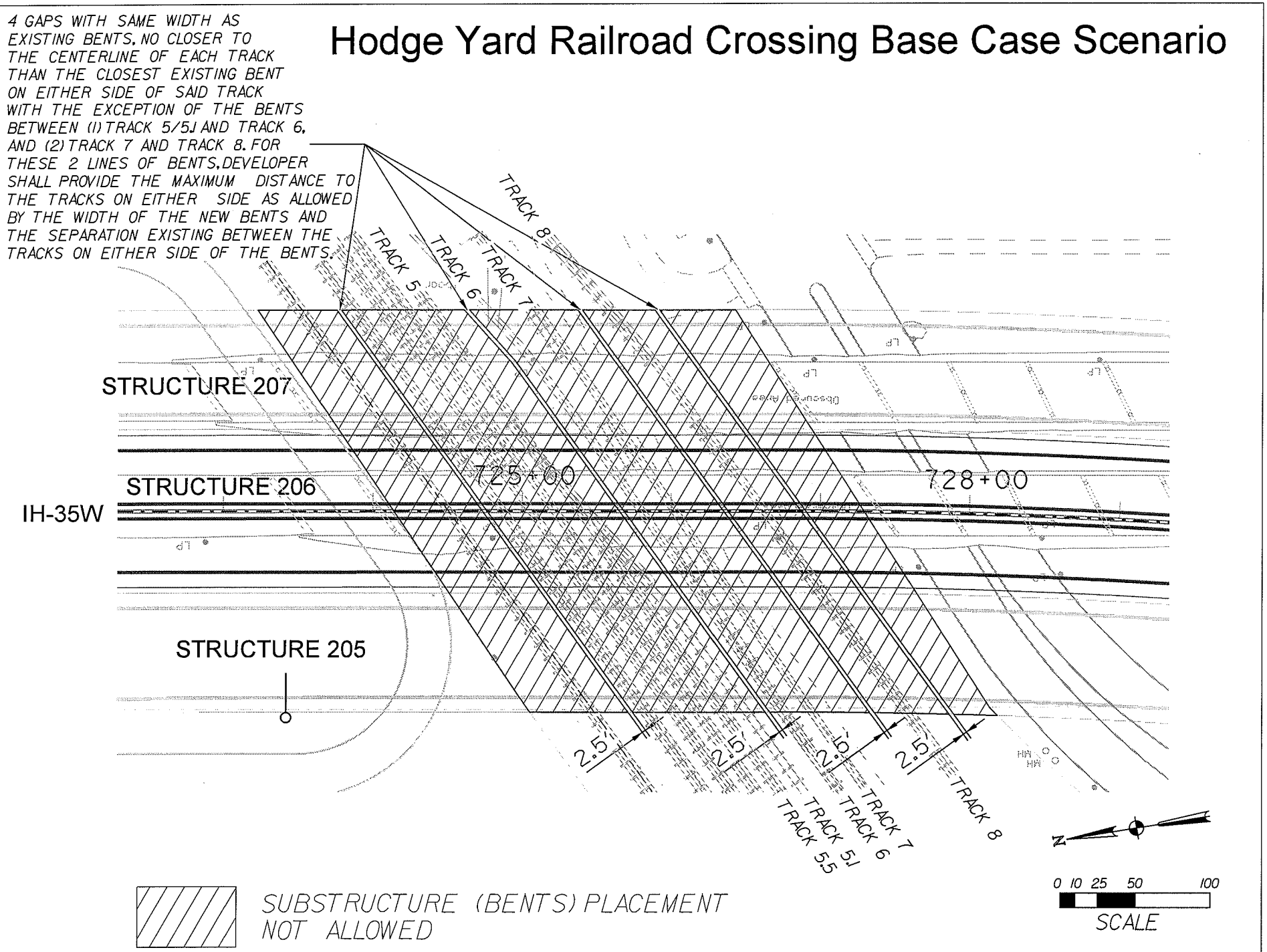
Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 14-2
Hodge Yard Base Case Scenario

September 30, 2012

Hodge Yard Railroad Crossing Base Case Scenario



L:\!CAD\NTE 3A R.. CROSSING\Fig 1-merged.dgn

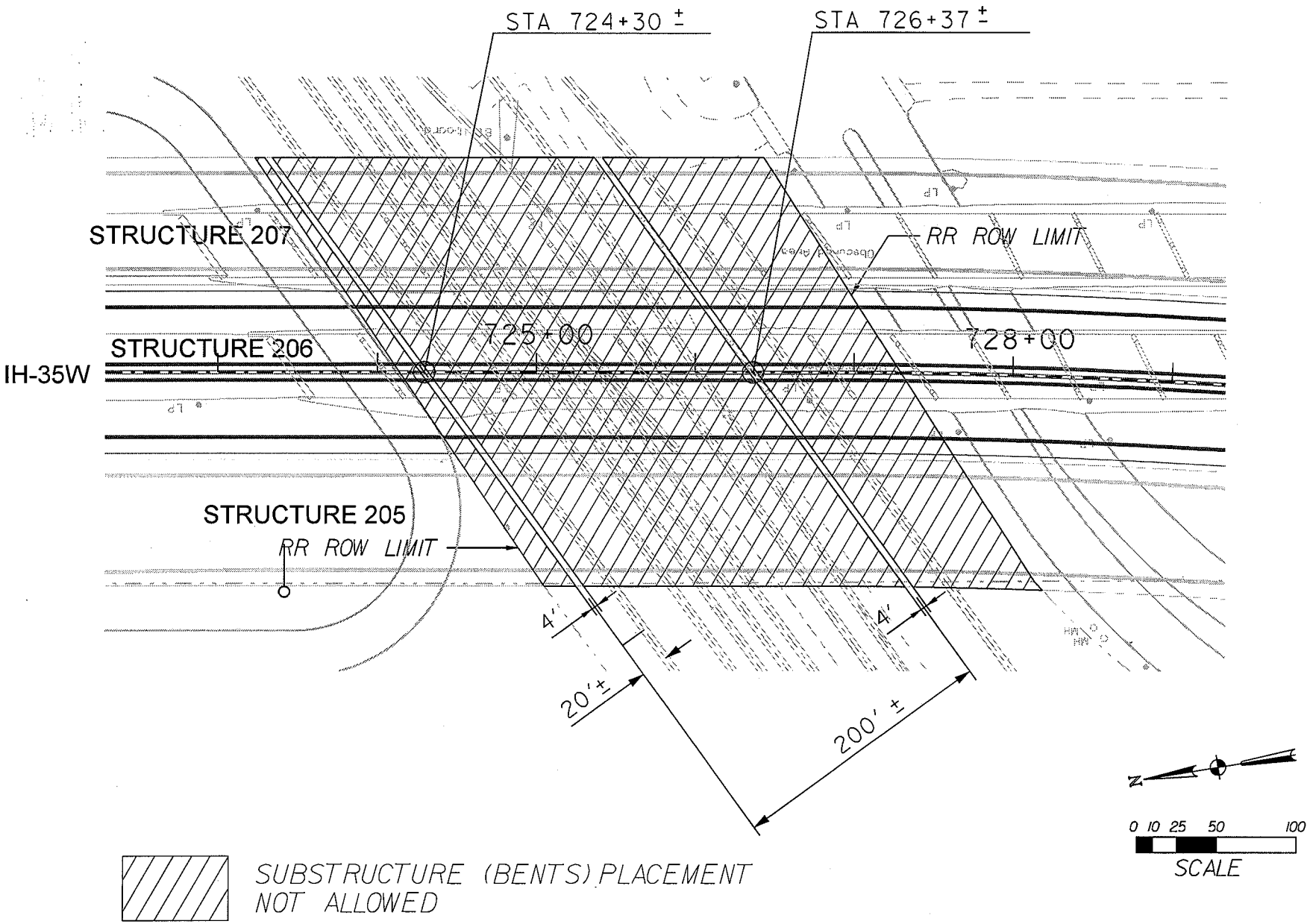
Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 14-3
Hodge Yard Scenario 1

September 30, 2012

Hodge Yard Railroad Crossing Scenario 1



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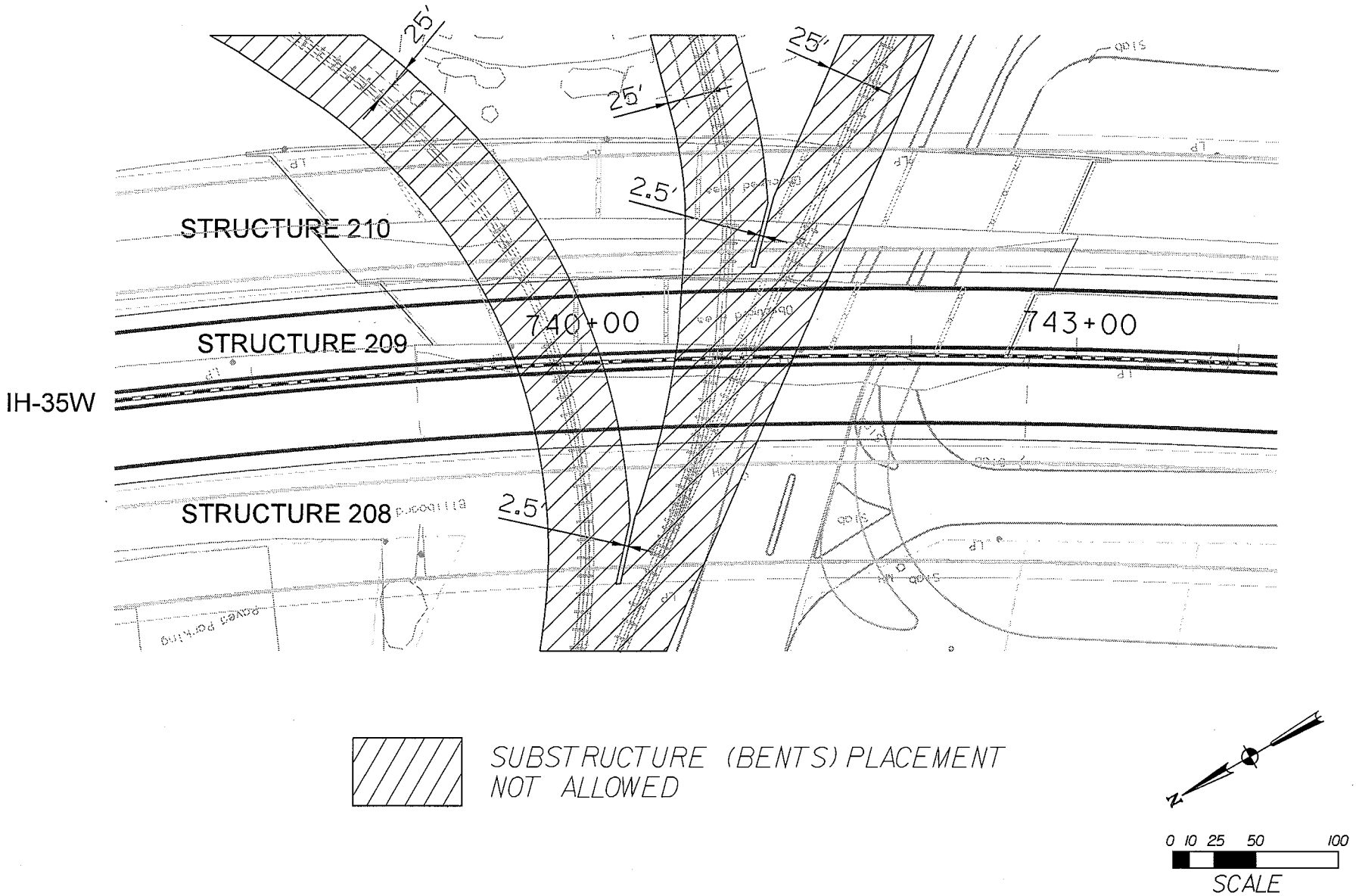
Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 14-4
Dooling Street Base Case Scenario

September 30, 2012

Dooling Street Crossing Base Case Scenario



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Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 19-1
Performance and Measurement Table Baseline

September 30, 2012

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.												
I) ROADWAY												
							Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's Pavement Management Information System Rater's Manual. Unless otherwise stated, pavement performance measurement records relate to 0.5-mile sections as described in the Pavement Management Information System Rater's Manual.			*Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's Pavement Management Information System Rater's Manual. Unless otherwise stated, pavement performance measurement records relate to 0.5-mile sections as described in the Pavement Management Information System Rater's Manual.*		
	1.1	Obstructions and debris	Roadway and clear zone free from obstructions and debris	2 hrs	N/A	N/A	Visual Inspection	Number of obstructions and debris	Nil	Visual Inspection	Number of obstructions and debris	Nil
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	a) **Pavement Condition Score** Measurements and inspections necessary to derive Pavement Condition Score	Pavement Condition Score for 80% of Auditable Sections exceeding: • Mainlanes and ramps - 90 • Frontage roads - 80 Pavement Condition Score of Auditable Sections exceeding: • Mainlanes and ramps - 80 • Frontage roads - 70	 100% 100% 100% 100%	Pavement condition score will not be measured for this phase.		
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	b) **Ruts – Mainlanes, shoulders & ramps** Depth as measured using an automated device in compliance with TxDOT Standards. 10ft straight edge used to measure rut depth for localized areas.	Percentage of wheel path length with ruts greater than ¼" in depth in each Auditable Section • Mainlanes, shoulders and ramps - 3% • Frontage roads - 10% Depth of rut at any location greater than ½"	 Nil Nil Nil	Visual inspection at travel speed 10ft straight edge used to measure rut depth for localized areas.	Percentage of wheel path length with ruts greater than ¼" in depth in each Auditable Section • Mainlanes, shoulders and ramps - 3% • Frontage roads - 10% Depth of rut at any location greater than ½"	 Nil Nil Nil
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	c) **Ride quality** Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles	For 80% of all Auditable Sections measured, IRI throughout 98% of each Auditable Section is less than or equal to: • Mainlanes, ramps - 95" per mile** • Frontage roads - 120" per mile**	 100% 100%	Ride quality will not be measured during this phase.		
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and	24 hrs	28 days	6 months	** To allow for measurement bias, an adjustment of -10 (minus ten) is made to IRI measurements for concrete pavements before assessing	IRI throughout 98% of each Auditable Section is less than or equal to:				

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	1.2 Cont.		boxes) with adequate skid resistance and free from Defects.				threshold compliance.	• Mainlanes, ramps - 120" per mile**	100%			
								• Frontage roads - 150" per mile**	100%			
							(Renewal Work and new construction subject to construction quality standards)	Mainlanes, ramps, 0.1 mile average - 150" per mile**	100%			
								Frontage roads, 0.1 mile average - 180" per mile**	100%			
								IRI measured throughout 98% of each lane containing a bridge deck in any Auditable Section, 0.1 mile average - 200" per mile**	100%			
							3-ft straightedge used to measure discontinuities	Individual discontinuities greater than 3/4"	Nil			
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	**d) Failures** Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes, base failures, punchouts and jointed concrete pavement failures	Occurance of any failure	Nil	**d) Failures** Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes, base failures, punchouts and jointed concrete pavement failures	Occurrence of any failure	Nil
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	**e) Edge drop-offs** Physical measurement of edge drop-off level compared to adjacent surface	Number of instances of edge drop-off greater than 2"	Nil	**e) Edge drop-offs** Visual inspection of edge drop-off level compared to adjacent surface	Number of instances of edge drop-off greater than 2"	Nil
	1.2	Pavement	All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	**f) Skid resistance** ASTM E 274 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E 524	• Auditable Sections with skid numbers for 0.5-mile section of mainlanes, shoulders and ramps exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%	**f) Skid resistance** ASTM E 274 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E 524.	• Auditable Sections with skid numbers for 0.5-mile section of mainlanes, shoulders and ramps exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%
								• Auditable Sections with skid numbers for 0.5-mile section of frontage roads exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%		• Auditable Sections with skid numbers for 0.5-mile section of frontage roads exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	1.2 Cont.							• When the skid number is below 25 and/or when required by the Wet Weather Accident Reduction Program, areas categorized as high risk, Developer shall perform a site investigation and perform required corrective action.	100%		• When the skid number is below 25 and/or when required by the Wet Weather Accident Reduction Program, areas categorized as high risk, Developer shall perform a site investigation and perform required corrective action.	100%
	1.2	Pavement	Road users warned of potential skidding hazards	24hrs	7days	N/A	Skid resistance ASTM E 274 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E 524	Instances where road users are warned of a potential skidding hazard where remedial action is identified.	100%	Skid resistance ASTM E 274 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E 524	Instances where road users are warned of a potential skidding hazard where remedial action is identified.	100%
	1.3	Crossovers and other paved areas	Crossovers and other paved areas are free of Defects	24 hrs	28 days	6 months	a) Potholes	Number of potholes of low severity or higher	Nil	a) Potholes	Number of potholes of low severity or higher	Nil
							b) Base failures	Number of base failures of low severity or higher	Nil	b) Base failures	Number of base failures of low severity or higher	Nil
	1.4	Joints in concrete	Joints in concrete paving are sealed and watertight	24 hrs	28 days	6 months	Visual inspection of joints	Length of unsealed joints greater than ¼"	Nil	Visual inspection of joints	Length of unsealed joints greater than ¼"	Nil
			Longitudinal joint separation				Measurement of joint width and level difference of two sides of joints	Joint width more than 1" or faulting more than ¼"	Nil	Measurement of joint width and level difference of two sides of joints	Joint width more than 1" or faulting more than ¼"	Nil
	1.5	Curbs	Curbs are free of defects	24 hrs	28 days	6 months	Visual inspection	Length of curb out of alignment	Nil	Visual inspection	Length of curb out of alignment	Nil
2) DRAINAGE												
	2.1	Pipes and Channels	Each element of the drainage system is maintained in its proper function by cleaning, clearing and/or emptying as appropriate from the point at which water drains from the travel way to the outfall or drainage way.	24 hrs	28 days	6 months	Visual inspection supplemented by CCTV where required to inspect buried pipe work	Length of pipe or channel in feet with less than 90% of cross sectional clear area, calculated as the arithmatic mean of the clear cross-sectional areas of individual 10 feet lengths of pipes and channels in each Auditable Section.	Nil	Visual inspection following heavy rain	Areas of water back up	Nil
	2.2	Drainage treatment devices	Drainage treatment and balancing systems, flow and spillage control devices function correctly and their location and means of operation is recorded adequately to permit their correct operation on Emergency.	24 hrs	28 days	6 months	Visual inspection	Number of devices functioning correctly with means of operation displayed	100%	Visual inspection	Number of devices functioning correctly with means of operation displayed	100%
	2.3	Travel Way	The travel way is free from water to the extent that such water would represent a hazard by virtue of its position and depth.	24 hrs	28 days	6 months	Visual inspection of water on surface	Number of instances of hazardous water build-up	Nil	Visual inspection of water on surface	Number of instances of hazardous water build-up	Nil

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	2.4	Discharge systems	Surface water discharge systems perform their proper function and discharge to groundwater and waterways complies with the relevant legislation and permits.	24 hrs	28 days	6 months	Visual inspection and records	Auditable Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	100%	Visual inspection and records	Auditable Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	100%
	2.5	Protected Species	Named species and habitats are protected.	24 hrs	28 days	6 months	Visual inspection	Auditable Sections with named species and habitats with protection of these named species and habitats	100%	Visual inspection	Auditable Sections with named species and habitats with protection of these named species and habitats	100%
3) STRUCTURES												
	3.1	Structures having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or springlines of arches or extreme ends of openings or multiple boxes	Substructures and superstructures are free of: • graffiti • undesirable vegetation • debris and bird droppings • blocked drains, weep pipes manholes and chambers • blocked drainage holes in structural components • defects in joint sealants • defects in pedestrian protection measure • scour damage • corrosion of rebar • paint system failures • impact damage	24 hrs	28 days	6 months	Inspection and assessment in accordance with the requirements of federal National Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways – Part 650, the TxDOT Bridge Inspection Manual, and the Federal Administration's Bridge Inspector's Reference Manual.	Records as required in the TxDOT Bridge Inspection Manual Occurance of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, super structure or substructore Auditable Sections with structure components with condition states of one	Nil 100%		Records as required in the TxDOT Bridge Inspection Manual Occurance of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, super structure or substructore Auditable Sections with structure components with condition states of one	Nil 100%
	3.2	Structure components	i) Expansion joints are free of: • dirt debris and vegetation • defects in drainage systems • loose nuts and bolts • defects in gaskets ii) The deck drainage system is free of all and operates as intended. iii) Parapets are free of: • loose nuts or bolts	24 hrs	28 days	6 months	Inspection and assessment in accordance with the requirements of federal National Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways – Part 650, the TxDOT Bridge inspection Manual, and the Federal Administration's Bridge Inspector's Reference Manual.	Records as required in the TxDOT Bridge Inspection Manual Occurance of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, super structure or substructore Auditable Sections with structure components with condition states of one	Nil 100%		Records as required in the TxDOT Bridge Inspection Manual Occurance of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, super structure or substructore, superstructure or substructure Auditable Sections with structure components with condition states of one	Nil 100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	3.2 Cont.		• blockages of hollow section drain holes • graffiti • vegetation • accident damage iv) Bearings and bearing shelves are clean. v) Sliding and roller surfaces are clean and greased to ensure satisfactory performance. Additional advice contained in bearing manufacturers' instructions in the Structure Maintenance Manual is followed. Special finishes are clean and perform to the appropriate standards. vii) All non-structural items such as hoists and electrical fixings, operate correctly, are clean and lubricated as appropriate, in accordance with the manufacturer's recommendations and certification of lifting devices is maintained.									
	3.3	Non-bridge class culverts	Non-bridge-class culverts are free of: • vegetation and debris and silt • defects in sealant to movement joints • scour damage	24 hrs	28 days	6 months	Visual inspection	Number of non-bridge class culverts with vegetation, debris and silt in each Auditable Section Number of non-bridge class culverts with defects in sealant and movement joints in each Auditable Section Number of non-bridge class culverts with scour damage in each Auditable Section	Nil Nil Nil	Visual inspection	Number of non-bridge class culverts with vegetation, debris and silt in each Auditable Section Number of non-bridge class culverts with defects in sealant and movement joints in each Auditable Section Number of non-bridge class culverts with scour damage in each Auditable Section	Nil Nil Nil
	3.4	Gantries and high masts	Sign signal gantries, high masts are structurally sound and free of: • loose nuts and bolts • defects in surface protection systems	24 hrs	28 days	6 months	Visual inspection	Number of gantries and high masts with loose assemblies in each Auditable Section Number of gantries and high masts with defects in surface protection in each Auditable Section	Nil Nil	Visual inspection	Number of gantries and high masts with loose assemblies in each Auditable Section Number of gantries and high masts with defects in surface protection in each Auditable Section	Nil Nil

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	3.4 Cont.		• graffiti					Number of gantries and high masts with graffiti in each Auditable Section	Nil		Number of gantries and high masts with graffiti in each Auditable Section	Nil
	3.5	Load ratings	All structures maintain the design load capacity.	24 hrs	28 days	6 months	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual Load restriction requirements as per the TxDOT Bridge Inspection Manual	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles) in each Auditable Section	Nil	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles) in each Auditable Section	Nil
4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS												
	4.1	Pavement markings	Pavement markings are: • clean and visible during the day and at night • whole and complete and of the correct color, type, width and length • placed to meet the TMUTCD and TxDOT's Pavement Marking Standard Sheets	24 hrs	28 days	6 months	a) Markings - General Portable retroreflectometer, which uses 30 meter geometry, meeting the requirements described in ASTM E 1710	Percentage of total length of pavement marking in each auditable section meeting the minimum retroreflectivity 175 med/sqm/lx for white Percentage of total length of pavement marking in each auditable section meeting the minimum retroreflectivity 125 med/sqm/lx for white Physical measurement Length of pavement marking in each auditable section with more than 5% loss of area of material at any point Length of pavement marking in each auditable section with spread more than 10% of specified dimensions. b) Profile Markings Visual inspection Percentage of total length of pavement marking in each auditable section performing its intended function and compliant with relevant regulations	100% 100% Nil Nil 100%	a) Markings - General Portable retroreflectometer, which uses 30 meter geometry, meeting the requirements described in ASTM E 1710 Visual inspection b) Profile Markings Visual inspection	Percentage of total length of pavement marking in each auditable section meeting the minimum retroreflectivity 175 med/sqm/lx for white Percentage of total length of pavement marking in each auditable section meeting the minimum retroreflectivity 125 med/sqm/lx for white Length of pavement marking in each auditable section with more than 5% loss of area of material at any point Length of pavement marking in each auditable section with spread more than 10% of specified dimensions. Percentage of total length of pavement marking in each auditable section performing its intended function and compliant with relevant regulations	100% 100% Nil Nil 100%
	4.2	Raised reflective markers	Raised reflective pavement markers are: • clean and clearly visible • of the correct color and type • reflective or retroreflective in	24 hrs	28 days	6 months	Visual inspection	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	Nil	Visual inspection	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	Nil

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	4.2 Cont.		accordance with TxDOT standards • correctly located, aligned and at the correct level • are firmly fixed • are in a condition that will ensure that they remain at the correct level.					A minimum of four markers are visible at 80' spacing when viewed under low beam headlights. Uniformity (replacement raised reflective pavement markers have equivalent physical and performance characteristics to adjacent markers).	100% 100%		A minimum of four markers are visible at 80' spacing when viewed under low beam headlights. Uniformity (replacement raised reflective pavementmarkers have equivalent physical and performance characteristics to adjacent markers).	100% 100%
	4.3	Delineators & Markers	Object markers, mail box markers and delineators are: • clean and visible • of the correct color and type • legible and reflective • straight and vertical	24 hrs	28 days	6 months	Visual inspection	Number of object markers or delineators in each Auditable Section that is defective or missing	Nil	Visual inspection	Number of object markers or delineators in each Auditable Section that is defective or missing	Nil
5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS												
	5.1	Guardrails and safety barriers	All guardrails, safety barriers, concrete barriers, etc. are maintained free of Defects. They are appropriately placed and correctly installed at the correct height and distance from roadway or obstacles. Installation and repairs shall be carried out in accordance with the requirements of NCHRP 350 standards.	24 hrs	28 days	6 months	Visual inspection	Auditable Sections with all guard rails and safety barriers appropriately placed and correction installed Auditable Sections with all guard rails and safety barriers free from defects Auditable Sections with all guard rails and safety barriers at correct heights Auditable Sections with all guard rails and safety barriers at correct distances from roadway obstacles	100% 100% 100% 100%	Visual inspection	Auditable Sections with all guard rails and safety barriers appropriately placed and correction installed Auditable Sections with all guard rails and safety barriers free from defects Auditable Sections with all guard rails and safety barriers at correct heights Auditable Sections with all guard rails and safety barriers at correct distances from roadway obstacles	100% 100% 100% 100%
	5.2	Impact attenuators	All impact attenuators are appropriately placed and correctly installed	24 hrs	7 days	6 months	Visual inspection	Auditable Sections will all impact attenuators appropriately placed and correctly installed.	100%	Visual inspection	Auditable Sections will all impact attenuators appropriately placed and correctly installed.	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
6) TRAFFIC SIGNS												
	6.1	General - All Signs	i) Signs are clean, correctly located, clearly visible, legible, reflective, at the correct height and free from structural and electrical defects	24 hrs	28 days	6 months	a) **Retroreflectivity** Determination of Coefficient of retro-reflectivity	Number of signs with actual reflectivity below the requirements of TxDOT's TMUTCD in each auditable section	Nil	a) **Retroreflectivity** Determination of Coefficient of retro -reflectivity	Number of signs with actual reflectivity below the requirements of TxDOT's TMUTCD in each auditable section	Nil
			ii) Identification markers are provided, correctly located, visible, clean and legible				b) **Face damage** Visual inspection	Number of signs in each auditable section with face damage greater than 5% of area	Nil	b) **Face damage** Visual inspection	Number of signs in each auditable section with face damage greater than 5% of area	Nil
			iii) Sign mounting posts are vertical, structurally sound and rust free				c) **Placement** Visual inspection	All signs in each auditable section are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	100%	c) **Placement** Visual inspection	All signs in each auditable section are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	100%
			iv) All break-away sign mounts are clear of silt or other debris that could impede break-away features and shall have correct stub heights				d) **Obsolete signs** Visual inspection	Number of obsolete signs in each auditable section	Nil	d) **Obsolete signs** Visual inspection	Number of obsolete signs in each auditable section	Nil
			v) Obsolete and redundant signs are removed or replaced as appropriate				e) **Sign Information** Visual inspection	All sign information in each auditable section is of the correct size, location, type and wording to meet its intended purpose	100%	e) **Sign Information** Visual inspection	All sign information in each auditable section is of the correct size, location, type and wording to meet its intended purpose	100%
			vi) Visibility distances meet the stated requirements				f) **Dynamic Message Signs** Visual inspection	All dynamic message signs in each auditable section are fully functioning	100%	f) **Dynamic Message Signs** Visual inspection	All dynamic message signs in each auditable section are fully functioning	100%
			vii) Sign information is of the correct size, location, type and wording to meet its intended purpose and any statutory requirements									
			viii) All structures and elements of the signing system are kept clean and free from debris and have clear access provided.									
			ix) All replacement and repair materials and equipment are in accordance with the requirements of the TMUTCD									
			x) Dynamic message signs are in an operational condition									
	6.2	General - Safety critical signs	Requirements as 6.1, Plus: "Stop," "Yield," "Do Not Enter," "One Way" and "Wrong Way" signs are clean legible and undamaged.	2hrs	1 week	6 months	Visual inspection	Number of damaged Safety critical signs in each auditable section	Nil	Visual inspection	Number of damaged Safety critical signs in each auditable section	Nil

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
7) TRAFFIC SIGNALS												
	7.1	General	i) Traffic Signals and their associated equipment are: • clean and visible • correctly aligned and operational • free from damage caused by accident or vandalism • correctly aligned and operational ii) Signal timing and operation is correct iii) Contingency plans are in place to rectify Category 1 defects not immediately repairable to assure alternative traffic control is provided during a period of failure	2hrs	24 hrs	6 months	a) **General condition** Visual inspection b) **Damage** Visual inspection c) **Signal timing** Timed measurements d) **Contingency plans** Records Review	All Signals in each auditable section are clean and visible All Signals in each auditable section are undamaged All Installations in each auditable section have correct signal timings Full contingency plans are in place in each auditable section	100% 100% 100% 100%	a) **General condition** Visual inspection b) **Damage** Visual inspection c) **Signal timing** Timed measurements d) **Contingency plans** Records Review	All Signals in each auditable section are clean and visible All Signals in each auditable section are undamaged All Installations in each auditable section have correct signal timings Full contingency plans are in place in each auditable section	100% 100% 100% 100%
	7.2	Soundness	Traffic signals are structurally and electrically sound	24 hrs	28 days	6 months	a) **Structural soundness** Visual inspection b) **Electrical soundness** Testing to meet NEC regulations	Inspection records showing safe installation and maintenance in each auditable section	100%	a) **Structural soundness** Visual inspection b) **Electrical soundness** Testing to meet NEC regulations	Inspection records showing safe installation and maintenance in each auditable section	100%
	7.3	Identification marking	Signals have identification markers and the telephone number for reporting faults are correctly located, clearly visible, clean and legible	N/A	28 days	6 months	Visual inspection	Inspection records showing identification markers and other information are easily readable in each auditable section	100%	Visual inspection	Inspection records showing identification markers and other information are easily readable in each auditable section	100%
	7.4	Pedestrian Elements and Vehicle Detectors	All pedestrian elements and vehicle detectors are correctly positioned and fully functional at all times	24 hrs	28 days	6 months	Visual inspection	Inspection records showing compliance with requirements for positioning and funcionality in each auditable section with pedestrian elements and vehicle detectors.	100%	Visual inspection	Inspection records showing compliance with requirements for positioning and funcionality in each auditable section with pedestrian elements and vehicle detectors.	100%
8) LIGHTING												
	8.1	Roadway Lighting – General	i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and correctly positioned iii) Lighting units are free from accidental damage or	24 hrs	28 days	6 months	a) **Mainlane lights operable** Night time inspection or automated logs	Auditable Sections with 10 or more lights with more than 90% of lights functioning correctly / Auditable Sections with less than 10 lights with no more than 1 light not functioning correctly	100%	a) **Mainlane lights operable** Night time inspection or automated logs	Auditable Sections with 10 or more lights with more than 90% of lights functioning correctly / Auditable Sections with less than 10 lights with no more than 1 light not functioning correctly	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	8.1 Cont.		vandalism iv) Columns are upright, correctly founded, visually acceptable and structurally sound				**b) Mainlane lights out of action** Night time inspection or automated logs	Number of instances of more than two consecutive lights out of action in each auditable section	Nil	**b) Mainlane lights out of action** Night time inspection or automated logs	Number of instances of more than two consecutive lights out of action in each auditable section	Nil
	8.2	Sign Lighting	Sign lighting is fully operational	24 hrs	28 days	6 months	Night time inspection or automated logs	Number of instances of more than one bulb per sign not working in each auditable section	Nil	Night time inspection or automated logs	Number of instances of more than one bulb per sign not working in each auditable section	Nil
	8.3	Electrical Supply	Electricity supply, feeder pillars, cabinets, switches and fittings are electrically, mechanically and structurally sound and functioning	24 hrs	7 days	1 month	Testing to meet NEC regulations, visual inspection	Inspection records showing safe installation and maintenance in each auditable section	100%	Testing to meet NEC regulations, visual inspection	Inspection records showing safe installation and maintenance in each auditable section	100%
	8.4	Access Panels	All access panels in place at all times.	24 hrs	7 days	1 month	Visual Inspection	Number of instances of missing access panels in each auditable section	Nil	Visual Inspection	Number of instances of missing access panels in each auditable section	Nil
	8.5	High Mast Lighting	i) All high mast luminaries functioning on each pole ii) All obstruction lights are present and working (if required) iii) Compartment door is secure with all bolts in place iv) All winch and safety equipment is correctly functioning and maintained without rusting or corrosion (for structural requirements refer to Element Category 3)	24 hrs	48 days	1 month	Yearly inspection and night time inspections or automated logs	Number of instances of two or more lamps not working per high mast pole in each auditable section Number of other high mast lighting defects identified in each auditable section	Nil Nil	Yearly inspection and night time inspections or automated logs	Number of instances of two or more lamps not working per high mast pole in each auditable section Number of other high mast lighting defects identified in each auditable section	Nil Nil
9) FENCES, WALLS AND SOUND ABATEMENT												
	9.1	Design and Location	Fences and walls act as designed and serve the purpose for which they were intended	24 hrs	28 days	6 months	Visual Inspection	Inspection records for fences and walls showing compliance with fence and wall requirements in each auditable section	100%	Visual Inspection	Inspection records for fences and walls showing compliance with fence and wall requirements in each auditable section	100%
	9.2	Construction	Integrity and structural condition of the fence is maintained	24 hrs	28 days	6 months	Structural assessment if visual inspection warrants	Inspection records for fences and walls showing compliance with fence and wall requirements in each auditable section	100%	Structural assessment if visual inspection warrants	Inspection records for fences and walls showing compliance with fence and wall requirements in each auditable section	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
10) ROADSIDE MANAGEMENT												
	10.1	Vegetated Areas - Except landscaped areas - General	Vegetation is maintained so that: i) Height of grass and weeds is kept within the limits described for urban and rural areas. Mowing begins before vegetation reaches the maximum height. ii) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance. iii) Grass or vegetation does not encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs. iv) A herbicide program is undertaken in accordance with the TxDOT Herbicide Manual to control noxious weeds and to eliminate grass in pavement or concrete. v) A full width mowing cycle is completed after the first frost.	24 hrs	7 days	28 days	a) **Urban areas** Physical measurement of height of grass and weeds b) **Rural areas** Physical measurement of height of grass and weeds c) **Encroachment** Visual inspection of instances of encroachment of vegetation d) **Wildflowers** Visual Inspection with audit of process. e) **Sight lines** Visual inspection	Individual measurement areas in each auditable section to have 95% of grass and weeds between 5" and 18" in height. Individual measurement areas in each auditable section to have 95% of height of grass and weeds between 5" and 30" in height. Number of occurences of vegetation encroachment in each auditable section Adherence to vegetation management manuals Number of instances of impairment of sight lines or sight distance to signs in each auditable section	100% 100% Nil 100% Nil	a) **Urban areas** Visual inspection of height of grass and weeds b) **Rural areas** Visual inspection of height of grass and weeds c) **Encroachment** Visual inspection of instances of encroachment of vegetation d) **Wildflowers** Visual Inspection with audit of process. e) **Sight lines** Visual inspection	Individual measurement areas in each auditable section to have 95% of grass and weeds between 5" and 18" in height. Individual measurement areas in each auditable section to have 95% of height of grass and weeds between 5" and 30" in height. Number of occurences of vegetation encroachment in each auditable section Adherence to vegetation management manuals Number of instances of impairment of sight lines or sight distance to signs in each auditable section	100% 100% Nil 100% Nil
	10.2	Landscaped Areas	i) All landscaped areas are maintained to their originally constructed condition. Landscaped areas are as designated in the plans. ii) Mowing, litter pickup, irrigation system maintenance and operation, plant maintenance, pruning, insect, disease and pest control, fertilization, mulching, bed maintenance, watering is undertaken as per FMP. iii) The height of grass and weeds is kept between 2" and 8". Mowing begins before vegetation reaches 8 in. iv) Damaged or dead vegetation is replaced.	24 hrs	7 days	28 days	Visual inspection	Inspection records showing compliance with requirements for landscaping in each auditable section.	100%	Visual inspection	Inspection records showing compliance with requirements for landscaping in each auditable section.	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	10.3	Fire Hazards	Fire hazards are controlled	24 hrs	7 days	28 days	Visual inspection	Number of instances of dry brush or vegetation forming fire hazard in each auditable section.	Nil	Visual inspection	Number of instances of dry brush or vegetation forming fire hazard in each auditable section.	Nil
	10.4	Trees, brush and ornamentals	i) Trees, brush and ornamentals on the right of way, except in established no mow areas, are trimmed in accordance with TxDOT standards. ii) Trees, brush and ornamentals are trimmed to insure they do not interfere with vehicles or sight distance, or inhibit the visibility of signs. iii) Dead trees, brush, ornamentals and branches are removed. Potentially dangerous trees or limbs are removed. iv) All undesirable trees and vegetation are removed. Diseased trees or limbs are treated or removed by licensed contractors.	24 hrs	7 days	28 days	Visual inspection	Inspection records showing compliance with requirements for trees, brush and ornamentals in each auditable section.	100%	Visual inspection	Inspection records showing compliance with requirements for trees, brush and ornamentals in each auditable section.	100%
	10.5	Wetlands	Wetlands are managed in accordance with the permit requirements.	24 hrs	7 days	28 days	Visual inspection, assessment of permit issuers	Number of instances of permit requirements not met in each auditable section	Nil	Visual inspection, assessment of permit issuers	Number of instances of permit requirements not met in each auditable section	Nil
11) REST AREAS AND PICNIC AREAS												
	11.1	Rest areas and picnic areas	i) Picnic areas are clean and neat in appearance. ii) Trash barrels are painted and attached to their supports to prevent stealing. iii) Site free of any visible litter, all litter properly disposed. Litter removed from the picnic area grounds and barrels before being allowed to accumulate outside of the barrels. iv) All vehicles used in transporting litter are equipped to prevent the accumulated litter from being strewn along the roadway.	24 hrs	28 days	6 months	Inspection records showing compliance with requirements for rest areas and picnic areas.	Number of instances where 90% of measured area in each auditable section to have grass and weeds between 2" and 8" in height. Number of bare ground areas larger than 5 square feet in each auditable section Number of prohibited, invasive or noxious weeds present in each auditable section. Number of occurences of encroachment of vegetation or debris for more than two (2) inches onto any curb or sidewalk located throughout each rest area in each auditable section.	100% Nil Nil Nil	Inspection records showing compliance with requirements for rest areas and picnic areas.	Number of instances where 90% of measured area in each auditable section to have grass and weeds between 2" and 8" in height. Number of bare ground areas larger than 5 square feet in each auditable section Number of prohibited, invasive or noxious weeds present in each auditable section. Number of occurences of encroachment of vegetation or debris for more than two (2) inches onto any curb or sidewalk located throughout each rest area in each auditable section.	100% Nil Nil Nil

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	11.1 Cont.		v) Vegetation damaged due to improper or careless mowing and trimming operations or any other reason is replaced.					Number of occurences of deviation of soil or mulch above or below the top of the curb in each auditable section.	Nil		Number of occurences of deviation of soil or mulch above or below the top of the curb in each auditable section.	Nil
			vi) Weeds, grass and other undesirable growth are removed from beds of plants and shrubs as needed. Trees and shrubs are trimmed neatly. All curbs and sidewalks are edged and repaired.									
			vii) All picnic tables are clean, free of stains and free of any defect.					Percentage of paved surfaces maintained clean and safe with minimal obstruction in each auditable section.	100%		Percentage of paved surfaces maintained clean and safe with minimal obstruction in each auditable section.	100%
			viii) All directional, informational, safety and any other sign is properly installed, contains accurate information and is visible from a reasonable distance.					Number of occurrences of pavement undermining greater than 2" in each auditable section	Nil		Number of occurrences of pavement undermining greater than 2" in each auditable section	Nil
			ix) All striping is intact and all parking and travel areas are clearly marked.					Number of unsealed cracks greater than ½" at rest areas and picnic areas in each auditable section.	Nil		Number of unsealed cracks greater than ½" at rest areas and picnic areas in each auditable section.	Nil
			x) All curbs are in place and intact.					Percentage of fully functional lights at rest areas and picnic areas in each Auditable Section	100%		Percentage of fully functional lights at rest areas and picnic areas in each Auditable Section	100%
12) EARTHWORKS, EMBANKMENTS AND CUTTINGS												
	12.1	Slope Failure	All structural or natural failures of the embankment and cut slopes of the Facility are repaired	24 hrs	28 days	6 months	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	Number of recorded instances of slope failure in each Auditable Section	Nil	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	Number of recorded instances of slope failure in each Auditable Section	Nil
	12.2	Slopes - General	Slopes are maintained in general conformance to the original graded cross-sections, the replacement of landscaping materials, reseeding and re-vegetation for erosion control purposes and removal and disposal of all eroded materials from the roadway and shoulders	24 hrs	28 days	6 months	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	Inspection records showing compliance with requirements for slopes in each auditable section.	100%	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	Inspection records showing compliance with requirements for slopes in each auditable section.	100%
13) ITS and ETCS EQUIPMENT												
	13.1	ITS and ETCS Equipment - Maintenance	All ITS and ETCS equipment is fully functional and housing is functioning and free of defects.	24 hrs	14 days	1 month	Visual Inspection	Inspection records showing compliance with requirements for maintenance of ITS and ETCS equipment in each auditable section.	100%	Visual Inspection	Inspection records showing compliance with requirements for maintenance of ITS and ETCS equipment in each auditable section.	100%
			i) All equipment and cabinet identification numbers are									

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	13.1 Cont.	TxDOT and Developer recognize that such threshold performance standards and requirements may be at lower levels, consistent with Good Industry Practice, than the performance standards and requirements set forth in the Performance and Measurement Table Baseline because of normal need for ramp-up and optimization of performance at the beginning of regular operations.	visible, sites are well drained and access is clear. ii) Steps, handrails and accesses are kept in a good condition. iii) Access to all communication hubs, ground boxes, cabinets and sites is clear. iv) All drainage is operational and all external fixtures and fittings are in a satisfactory condition. v) All communications cable markers, cable joint markers and duct markers are visible and missing markers are replaced. vi) Backup power supply system is available at all times									
	13.2	Video Exception Sub-system Equipment - Maintenance	All Video Expection Sub-system equipment is kept clean, the identification numbers are visible.	24 hrs	14 days	1 month	Visual Inspection	Inspection records showing compliance with requirements for Video Exception Sub-system equipment maintenance in each auditable section	100%	Visual Inspection	Inspection records showing compliance with requirements for Video Exception Sub-system equipment maintenance in each auditable section	100%
	13.3	Dynamic Message Sign Equipment	Dynamic Message Signs are free from faults such as: i) Any signal displaying a message which is deemed to be a safety hazard. ii) Failure of system to clear sign settings when appropriate. iii) 2 or more contiguous sign failures that prevent control office setting strategic diversions.	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	Inspection records showing compliance with requirements for Dynamic Message Signs in each auditable section	100%	Defect measurement dependent on equipment	Inspection records showing compliance with requirements for Dynamic Message Signs in each auditable section	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
			iv) Signs displaying an incorrect message.									
	13.4	CCTV Equipment	CCTV Systems are free from serious faults that significantly limit the availability of the operators to monitor the area network, such as:	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	Inspection records showing compliance with requirements for CCTV equipment in each auditable section	100%	Defect measurement dependent on equipment	Inspection records showing compliance with requirements for CCTV equipment in each auditable section	100%
	13.4 Cont.		i) Failure of CCTV Systems to provide control offices with access and control of CCTV images. ii) Failure of a CCTV camera or its video transmission system. iii) Failure of a Pan / Tilt unit or its control system. iv) Moisture ingress onto CCTV camera lens. v) Faults that result in significant degradation of CCTV images.									
	13.5	Vehicle Detection Equipment	All equipment free of defects and operational problems such as: i) Inoperable loops. ii) Malfunctioning camera controllers.	2 hrs	24 hrs	1 month	Defect measurement dependent on equipment Traffic Detector Loops: Loop circuit's inductance to be > 50 and < 1,000 micro henries. Insulation resistance to be > 50 meg ohms.	Inspection records showing compliance with requirements for vehicle detection equipment in each auditable section Number of instances of loops out of compliance with requirements for vehicle detection equipment	100% Nil	Defect measurement dependent on equipment	Inspection records showing compliance with requirements for vehicle detection equipment in each auditable section Number of instances of loops out of compliance with requirements for vehicle detection equipment	100% Nil
14) TOLLING Facilities and Buildings (Not Used)												
15) AMENITY												
	15.1	Graffiti	Graffiti is removed in a manner and using materials that restore the surface to a like appearance similar to adjoining surface.s	24 hrs	N/A	N/A	Visual Inspection	Inspection records showing compliance with requirements regarding grafitti in each auditable section	100%	Visual Inspection	Inspection records showing compliance with requirements regarding grafitti in each auditable section	100%
16) SNOW AND ICE CONTROL												
	16.1	Travel lanes	Maintain travel way free from snow and ice	2 hrs	N/A	N/A	Maximum 1hr response time to complete manning and loading of spreading vehicles.	Inspection records showing compliance with requirements for snow and ice control in each	100%	Maximum 1hr response time to complete manning and loading of spreading vehicles.	Inspection records showing compliance with requirements for snow and ice control in each	100%

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
							Maximum 2hrs from departure from loading point to complete treatment and return to loading point. Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	auditable section		Maximum 2hrs from departure from loading point to complete treatment and return to loading point. Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	auditable section	
	16.2	Weather Forecasting	Weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to prevent ice forming on the travel way.	2 hrs	N/A	N/A	Operations plan details the process and procedures in place and followed.	Inspection records showing compliance with requirements for weather forecasting in each auditable section	100%	Operations plan details the process and procedures in place and followed.	Inspection records showing compliance with requirements for weather forecasting in each auditable section	100%
	16.3	Operational Plans	Operate snow and ice clearance plans to maintain traffic flows during and after snowfall and restore the travel way to a clear condition as soon as possible.	2 hrs	N/A	N/A	Operations plan details the process and procedures in place and followed.	Inspection records showing compliance with snow and ice clearance plans in each auditable section	100%	Operations plan details the process and procedures in place and followed.	Inspection records showing compliance with snow and ice clearance plans in each auditable section	100%
17) INCIDENT RESPONSE												
	17.1	General	Respond to Incidents in accordance with Section 22 of Book 2-Technical Provisions.	1 hr	N/A	N/A	Response times in accordance with Section 22, Book 2 Technical Provisions are met for 98% of incidents measured on a 1 year rolling basis. No complaints from Emergency Services.	Inspection records showing compliance with requirements regarding incident response times in each auditable section	100%	Response times in accordance with Section 22, Book 2 Technical Provisions are met for 98% of incidents measured on a 1 year rolling basis. No complaints from Emergency Services.	Inspection records showing compliance with requirements regarding incident response times in each auditable section	100%
	17.2	Hazardous Materials	For any hazardous materials spills, comply with the requirements of Section 22 of Book 2-Technical Provisions.	1 hr	N/A	N/A	FMP details the process and procedures in place and followed.	Inspection records showing compliance with FMP details regarding hazardous materials in each auditable section	100%	FMP details the process and procedures in place and followed.	Inspection records showing compliance with FMP details regarding hazardous materials in each auditable section	100%
	17.3	Structural assessment	Evaluate structural damage to structures and liaise with emergency services to ensure safe working environment while clearing the incident	1 hr	N/A	N/A	Inspections and surveys as required by incident	Inspection records showing compliance with requirements for incidents in each auditable section	100%	Inspections and surveys as required by incident	Inspection records showing compliance with requirements for incidents in each auditable section	100%
	17.4	Temporary and permanent remedy	Propose and implement temporary measures or permanent repairs to Defects arising from the Incident. Ensure the structural safety of any structures affected by the Incident.	24 hrs	28 days	N/A	Review and inspection of the incident site	Auditable inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each auditable section	100%	Review and inspection of the incident site	Auditable inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each auditable section	100%
18) CUSTOMER RESPONSE												

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET	D/B PHASE INSPECTION AND MEASUREMENT METHOD	MEASUREMENT RECORD FOR D/B PHASE	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair						
	18.1	Response to inquiries	Timely and effective response to customer inquiries and complaints.	48 hrs	28 days	N/A	Contact the customer within 48 hours following initial customer inquiry. All work resulting from customer requests is scheduled within 48 hours of customer contact. Follow-up contact with the customer within 72 hours of initial inquiry.	Precentage of responses within specified times in each auditable section.	100%	Contact the customer within 48 hours following initial customer inquiry. All work resulting from customer requests is scheduled within 48 hours of customer contact. Follow-up contact with the customer within 72 hours of initial inquiry.	Precentage of responses within specified times in each auditable section.	100%
	18.1 Cont.						All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.			All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.		
	18.2	Customer contact line	Telephone line manned during business hours and 24 hour availability of messaging system. Faults to telephone line or message system rectified.	24 hrs	28 days	N/A	Instances of line out of action or unmanned	Number of operations records showing non availability of the customer contact line in each auditable section including complaints from public.	Nil	Instances of line out of action or unmanned	Number of operations records showing non availability of the customer contact line in each auditable section including complaints from public.	Nil
19) SWEEPING AND CLEANING												
	19.1	Sweeping	i) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean. ii) Clear and remove debris from traffic lanes, hard shoulders, verges and central reservations, footways and cycle ways	24 hrs	28 days	6 months	Buildup of dirt, ice, rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	Inspection records showing compliance with requirements for sweeping in each auditable section.	100%	Visual inspection	Inspection records showing compliance with requirements for sweeping in each auditable section.	100%
			iii) Remove all sweepings without stockpiling in the right of way and dispose of at approved tip.									
	19.2	Litter	i) Keep the right of way in a neat condition, remove litter regularly. ii) Pick up large litter items before mowing operations. Dispose of all litter and debris collected at an approved solid waste site.	24 hrs	28 days	6 months	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	Inspection records showing compliance with requirements regarding litter pick-up in each auditable section.	100%	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	Inspection records showing compliance with requirements regarding litter pick-up in each auditable section.	100%

Texas Department of Transportation
Book 2 - Technical Provisions

North Tarrant Express Project
Segments 3A and 3B Facility

Attachment 19-2
Residual Life Requirements

September 30, 2012

Table 19-2 Residual Life Requirements

Element Category	Required Final Residual Life (yrs)	Element Category	Required Final Residual Life (yrs)	Element Category	Required Final Residual Life (yrs)
Structures		**Road Pavement**		**Ancillary**	
Reinforced concrete	50	Main lanes	10	Earthwork slopes	50
Pre-stressed concrete	50	Ramps/direct connectors	10	Metal beam guard rail	10
Structural steelwork	50	Frontage/access roads	10	Concrete barrier	20
Weathering steel	50	Toll plaza approaches	10	Impact attenuators	0
Corrugated steel	50	Local/collector roads	10	Lighting columns	10
Corrosion protection for structural steelwork	10	High mast lighting	10	Overhead signs	10
Deck surfacing	10			Traffic signal housing and mountings	10
Deck joints	10	**Buiding and Maintenance Facilities**	25	Fences	10
Bearings	30			Manhole covers, gratings, frames, and boxes	50
Railing	50	**Toll Collection and TM Facilities**		curbs and gutters	10
Sign/signal gantries	50			Lanterns (lamps/luminaires)	
Retaining walls	50	**Drainage**		Roadside traffic signs	
Noise Walls	50	Underground storm sewer systems	50	Pavement markings	
Traffic signal poles	10	Culverts	50	Delineators	
High mast lighting	10	Ditches	10		
		Inlets	50		