MIDLAND COUNTY
Plans for the Reconstruction of

ATTACHMENT B

INDUSTRIAL AVENUE

FROM LOOP 250 SERVICE ROAD TO MIDKIFF ROAD

OWNER:
MIDLAND COUNTY
MIDLAND, TEXAS

ENGINEER:
DUNAWAY ASSOCIATES, L.P.
4000 N. BIG SPRING, SUITE 101
MIDLAND, TEXAS 79705
MAIN: 432-699-4889

UTILITY RELOCATION NOTE:
IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES, TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).

PROJECT LOCATION



VICINITY MAP
NOT TO SCALE

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6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

DUNAWAY
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DA JOB NO. B006225.001

JUNE 2021

FULL PATH: G:\Production\B006\B006225\001\Civil\Drawings\Plot Sheets\Production\B006\B006225\001\Civil\Drawings\Plot Sheets\COVER.
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PLOTTED BY: Jessica Schaffer
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PLANS FOR THE RECONSTRUCTION OF INDUSTRIAL AVENUE
FROM LOOP 250 SERVICE ROAD TO MIDKIFF ROAD
MIDLAND COUNTY, TEXAS

Texas811 — Know what's below. Call before you dig.

WARNING TO CONTRACTOR:

CALL 811 (TEXAS 811) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. DUNAWAY ASSOC., L.P. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.

CRITICAL:

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON PUBLIC RECORDS. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH HORIZONTALLY AND VERTICALLY, BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION.

UTILITY RELOCATION NOTE:

IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES. TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).

STATE PLANE COORDINATE NOTE:

COORDINATES PROVIDED ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), CENTRAL ZONE 4203; ALL COORDINATES, BEARINGS, AND DISTANCES ARE NAD83 GRID VALUES.

GENERAL NOTES:

1. DIMENSIONS AND COORDINATES PROVIDED INDICATE THE DESIGN INTENT OF THE ENGINEER. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY INCONSISTENCIES OR DISCREPANCIES FOUND DURING CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND COORDINATES DURING CONSTRUCTION LAYOUT PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO AND THROUGHOUT CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION PHASE SURVEYING INCLUDING LOCATING AND VERIFYING PROJECT BENCHMARKS.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN NEAT AND ACCURATE CONSTRUCTION RECORDS. THE CONTRACTOR SHALL PROVIDE CLEAN AND ACCURATE FULL-SIZE RECORD DRAWINGS WHICH CLEARLY DESCRIBE ANY DEVIATIONS FROM THE PLANS.
5. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE FOLLOWING, IN ORDER OF PRECEDENCE, (1) DETAILS SHOWN IN THESE PLANS AND SPECIFICATIONS, (2) TEXAS DEPARTMENT OF TRANSPORTATION – "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAY, STREETS AND BRIDGES."
6. IN AREAS WHICH ARE TO REMAIN UNDISTURBED, THE CONTRACTOR SHALL PRESERVE, PROTECT AND/OR RESTORE ALL AREAS DISTURBED BY THE CONSTRUCTION TO ORIGINAL CONDITION OR BETTER AT THE EXPENSE OF THE CONTRACTOR.
7. IN THE EVENT THAT EXISTING PRIVATE UTILITY SERVICES SUCH AS WATER, GAS, TELEPHONE, ELECTRIC, ETC. MUST BE TAKEN OUT OF SERVICE TO FACILITATE CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TEMPORARY UTILITIES TO THE SATISFACTION OF THE OWNER.
8. THE ENGINEER IS NOT RESPONSIBLE FOR CONSTRUCTION SAFETY.
9. THE CONTRACTOR SHALL PROTECT ALL PROPERTY CORNER MARKERS, AND IF DISTURBED, THEY SHALL BE RESET AT THE EXPENSE OF THE CONTRACTOR.
10. IN THE EVENT THAT OTHER CONTRACTORS ARE DOING WORK IN THE SAME AREA SIMULTANEOUSLY WITH THIS PROJECT, THE CONTRACTOR SHALL COORDINATE HIS PROPOSED CONSTRUCTION WITH THAT OF THE OTHER CONTRACTORS.
11. ALL MATERIALS TO BE REMOVED FROM THE SITE INCLUDING UNSUITABLE SPOIL MATERIAL, REFUSE AND OTHER DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE LAWFULLY REMOVED & DISPOSED OF OUTSIDE THE LIMITS OF THE PROJECT.
12. THE CONTRACTOR SHALL MAKE A FINAL CLEAN-UP OF ALL PARTS OF THE WORK AND PREPARE THE SITE IN AN ORDERLY MANNER OF APPEARANCE BEFORE ACCEPTANCE BY THE COUNTY.
13. HAUL ROADS, ACCESS ROUTES AND THE LOCATION OF ALL STAGING AREAS AND STORAGE AREAS SHALL BE SUBJECT TO THE APPROVAL OF THE COUNTY.
14. D&S ENGINEERING LABS, LLC (D&S) HAS MADE AN INVESTIGATION OF SUBSURFACE SOIL CONDITIONS OF THE PROJECT SITE IN THEIR REPORT PROJECT NO. G20-2048, DATED MAY 21, 2020, AND IS REFERENCED IN THE CONSTRUCTION DOCUMENTS AS "GEOTECHNICAL REPORT".
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE TRAFFIC CONTROL DURING CONSTRUCTION AS REQUIRED BY THE COUNTY AND STATE IN WHICH THE PROJECT IS LOCATED.
16. CONTRACTOR SHALL PREPARE, FURNISH, MAINTAIN, AND REMOVE ALL TRAFFIC CONTROL DEVICES THROUGHOUT CONSTRUCTION. ALL DEVICES SHALL BE IN CONFORMANCE WITH THE TEXAS MUTCD, LATEST EDITION AS CURRENTLY AMENDED BY THE TEXAS DEPARTMENT OF TRANSPORTATION.
17. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ROAD AND DRIVEWAY CLOSURES WITH THE LANDOWNER AND AUTHORITIES HAVING JURISDICTION.
18. NO SPECIAL PAY FOR TRAFFIC CONTROL ITEMS NOT INCLUDED IN TRAFFIC CONTROL BID.
19. CONTRACTOR TO REMOVE AND REINSTALL MAILBOXES, AS NEEDED, TO COMPLY WITH THE DETAIL. FOR DECORATIVE MAILBOXES, THE CONTRACTOR SHALL NOTIFY THE LANDOWNER THAT THEIR MAILBOX WILL BE RELOCATED AND REINSTALLED ON A STANDARD POST, MEETING THE REQUIREMENTS STATED HEREIN. THE CONTRACTOR WILL COORDINATE WITH THE LANDOWNER FOR REMOVAL OF MATERIALS. ANY WORK THE CONTRACTOR COORDINATES TO REINSTALL A MAILBOX WITH DECORATIVE MATERIALS SHALL BE AT THE EXPENSE OF THE CONTRACTOR OR LANDOWNER.
20. CONTRACTOR TO COORDINATE SCHEDULE OF WORK WITH RAILROAD SPUR OWNERS FOR REMOVAL AND INSTALLATION OF CONCRETE PANELS AT EACH CROSSING.
21. CONTRACTOR TO REPAIR AND/OR REPLACE EXISTING DRIVEWAYS WITH SIMILAR MATERIALS AND GEOMETRY, TO THE EXTENT POSSIBLE.
22. PRIOR TO ANY WORK BEING PERFORMED ON THE RAILROAD'S PROPERTY, THE CONTRACTOR WILL BE REQUIRED TO EXECUTE AND RETURN THE "CONTRACTOR'S ENDORSEMENT" CONSENT LETTER, WHICH WILL BE PROVIDED TO THE CONTRACTOR BY MIDLAND COUNTY. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR BE ALLOWED ON THE RAILROAD'S PROPERTY WITHOUT FIRST EXECUTING THE CONTRACTOR ENDORSEMENT. THIS CONSENT LETTER SHALL BE VALID FOR ONE YEAR OR UNTIL THE WORK IS COMPLETE OR THIS CONSENT LETTER IS REVOKED BY THE RAILROAD. THE CONTRACTOR WILL BE RESPONSIBLE FOR PAYING THE RAILROAD'S ADMINISTRATIVE FEE PAYMENT UPON SUBMITTING THE CONTRACTOR ENDORSEMENT.

EROSION CONTROL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A SWPPP, ALL NECESSARY PERMITS AND APPROVALS, AND MAINTAINING COMPLIANCE WITH THE GENERAL PERMIT.
2. EROSION CONTROL MEASURES SHALL FOLLOW THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE. ANY CHANGES TO THE SWPPP SHALL SUPERSEDE THE EROSION CONTROL PLAN. THE SWPPP IS TO BE KEPT ON-SITE AT ALL TIMES WITH THESE CONSTRUCTION DOCUMENTS AS NECESSARY FOR COMPLIANCE WITH THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) GENERAL PERMIT.
3. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION, ROUTINE INSPECTION AND/OR MAINTENANCE OF EROSION CONTROL DEVICES.
4. THE EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL ACCEPTABLE VEGETATION COVERAGE HAS BEEN ACHIEVED IN ACCORDANCE WITH THE GENERAL PERMIT.
5. ANY ADDITIONAL EROSION CONTROL MEASURES REQUIRED TO COMPLY WITH THE SWPPP OR TCEQ STORMWATER POLLUTION REGULATIONS SHALL BE IMPLEMENTED BY THE CONTRACTOR, AT HIS EXPENSE.
6. DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE CEASED FOR AT LEAST FOURTEEN DAYS SHALL BE TEMPORARILY SEEDED AND WATERED. DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED SHALL BE PERMANENTLY SEEDED/SODDED WITHIN SEVEN DAYS IN ACCORDANCE WITH THE PLANS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING SEEDED/SODDED AREAS AS NECESSARY UNTIL 70% VEGETATION IS ESTABLISHED IN ACCORDANCE WITH THE PLANS.
8. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EROSION CONTROL MEASURES ONCE FINAL GROUND STABILIZATION IS ACHIEVED AND THE PROJECT IS COMPLETED.

DEMOLITION NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL, AND DISPOSING OF EXISTING STRUCTURES, UTILITIES, PAVEMENT, TREES, ETC., WITHIN CONSTRUCTION LIMITS AS SHOWN ON PLANS, IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES AT CONTRACTOR'S EXPENSE. AREAS WHERE MATERIAL HAS BEEN REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT BACK UP TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL IN ACCORDANCE WITH GEOTECHNICAL REPORT.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL.
3. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED.
4. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES/FLOWLINES.
5. CONTINUOUS ACCESS SHALL BE MAINTAINED FOR THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
6. CONTRACTOR MAY LIMIT SAWCUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS, BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
7. ALL FENCES REMOVED TO FACILITATE CONSTRUCTION SHALL BE REPLACED AT THE EXISTING OR PROPOSED LOCATION AS DIRECTED BY THE COUNTY.

GRADING NOTES:

1. THE AREA TO BE GRADED SHOULD BE STRIPPED OF VEGETATION, ROOTS, STUMPS, DEBRIS, AND OTHER ORGANIC MATERIALS.
2. CONSTRUCTION SHALL BE BASED ON ELEVATIONS SHOWN ON THE ROADWAY PLAN & PROFILE SHEETS PLAN. CONTOURS ARE A VISUAL REPRESENTATION OF FINISHED GRADE ONLY AND ARE NOT INTENDED TO BE USED TO SET GRADE.
3. SLOPES ON SITE SHALL NOT EXCEED A 3:1 SLOPE, UNLESS NOTED OTHERWISE.
4. ANY COSTS ASSOCIATED WITH DEWATERING THE SITE SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.
5. THE CONTRACTOR SHALL MATCH EXISTING ELEVATIONS AND CONSTRUCT SMOOTH TRANSITIONS AT CONNECTIONS TO EXISTING PAVEMENT.

CITY OF MIDLAND BENCHMARKS:

44-93: A 2 INCH ALUMINUM CAP STAMPED 44-93, LOCATED APPROXIMATELY 18.9 FEET NORTH OF THE NORTH FRONTAGE ROAD OF INTERSTATE 20, 55 FEET EAST OF THE ENTRANCE TO THE TEXAS HIGHWAY DEPARTMENT MAINTENANCE OFFICE. HAVING AN ADJUSTED NAVD88 ELEVATION OF 2,822.32 FEET (PUBLISHED NGVD29 ELEVATION IS 2,821.1)

4395: A 2 INCH ALUMINUM CAP STAMPED 4395, LOCATED AT THE NORTHWEST CORNER OF THE INTERSECTION OF SOUTH MIDKIFF ROAD AND INTERSTATE HIGHWAY 20 AT THE TOP OF EMBANKMENT. HAVING AN ADJUSTED NAVD88 ELEVATION OF 2,827.89 FEET (PUBLISHED NGVD29 ELEVATION IS 2,826.68)

ON-SITE BENCHMARKS:

CP-103: A 5/8 INCH IRON ROD WITH RED CAP LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF INDUSTRIAL AVENUE AND LOOP 250 FRONTAGE ROAD.
NAD83 GRID COORDINATES: N: 10,681,502.03' E:1,736,066.33'
PUBLISHED ELEVATION: 2839.10' NAVD88 DATUM

CP-107: A 5/8 INCH IRON ROD WITH RED CAP LOCATED ON THE NORTH SIDE OF INDUSTRIAL AVENUE APPROXIMATELY 300 FEET WEST OF ITS INTERSECTION WITH EISENHOWER DRIVE.
NAD83 GRID COORDINATES: N: 10,683,042.04' E:1,738,560.85'
PUBLISHED ELEVATION: 2838.11' NAVD88 DATUM

CP-110: A 5/8 INCH IRON ROD WITH RED CAP LOCATED ON THE SOUTH SIDE OF INDUSTRIAL AVENUE APPROXIMATELY 365 FEET WEST OF ITS INTERSECTION WITH MIDLAND DRIVE.
NAD83 GRID COORDINATES: N: 10,684,012.58' E:1,740,311.77'
PUBLISHED ELEVATION: 2819.02' NAVD88 DATUM

CP-114: A 5/8 INCH IRON ROD WITH RED CAP LOCATED ON THE SOUTH SIDE OF INDUSTRIAL AVENUE APPROXIMATELY 140 FEET WEST OF ITS INTERSECTION WITH WAREHOUSE ROAD.
NAD83 GRID COORDINATES: N: 10,685,509.23' E:1,742,884.21'
PUBLISHED ELEVATION: 2824.44' NAVD88 DATUM

CP-119: A 5/8 INCH IRON ROD WITH RED CAP LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF INDUSTRIAL AVENUE AND MIDKIFF ROAD.
NAD83 GRID COORDINATES: N: 10,686,952.97' E:1,745,413.62'
PUBLISHED ELEVATION: 2822.00' NAVD88 DATUM

PLAN LEGEND

Symbol	Description
	PROPOSED ROAD CENTERLINE
2800	PROPOSED MAJOR CONTOUR
2802	PROPOSED MINOR CONTOUR
	FULL-DEPTH SAWCUT
	PROPOSED EDGE OF ASPHALT
	PROPOSED DITCH CENTERLINE
	PROPOSED PROFILE LEFT DITCH FLOW LINE
	PROPOSED PROFILE RIGHT DITCH FLOW LINE
	PROPOSED CULVERT
	PROPOSED ASPHALT
	PROPOSED CONCRETE
	PROPOSED GRAVEL
CP	CONTROL POINT
E	EASTING
N	NORTHING
ELEV	ELEVATION
CL	CENTERLINE
LT	LEFT
RT	RIGHT
PC	POINT OF CURVATURE
PCC	POINT OF CONTINUOUS CURVATURE
PI	POINT OF INTERSECTION
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
R	RADIUS
EG	EXISTING GRADE
FL	FLOWLINE
ME	MATCH EXISTING
PGL	PROPOSED GRADE LINE
PVI	POINT OF VERTICAL INTERSECTION
TOG	TOP OF GRATE

EXISTING CONDITIONS

Symbol	Description
	RIGHT-OF-WAY
	PROPERTY BOUNDARY
	ADJOINER
	ABSTRACT
2800	EXISTING MAJOR CONTOUR
2802	EXISTING MINOR CONTOUR
	EXISTING EDGE OF ASPHALT
	EXISTING CURB
	EXISTING FENCE
	EXISTING FLOODPLAIN BOUNDARY
EX-AT&T	EXISTING AT&T
EX-CABLE	EXISTING CABLE
EX-COMM	EXISTING COMMUNICATION
	EXISTING DRAINAGE PIPE
EX-OHE	EXISTING OVERHEAD ELECTRIC
EX-UE	EXISTING UNDERGROUND ELECTRIC
EX-FO	EXISTING FIBER-OPTIC CABLE
EX-SS FM	EXISTING FORCE MAIN
EX-GAS	EXISTING GAS LINE
EX-IRR	EXISTING IRRIGATION
EX-OH	EXISTING OVERHEAD LINES
EX-PL	EXISTING UNDERGROUND PIPELINE
EX-SS	EXISTING SANITARY SEWER
EX-SD	EXISTING STORM DRAIN
EX-T	EXISTING TELEPHONE LINE
EX-W	EXISTING WATER LINE
	EXISTING SIGN
	EXISTING UTILITY SIGN
	EXISTING FENCE POST
	EXISTING MAILBOX
	EXISTING TREE
CB	EXISTING CABLE BOX
C	EXISTING PEDESTAL CABLE
E	EXISTING PEDESTAL ELECTRIC
	EXISTING LIGHT POLE
G	EXISTING GAS MANHOLE
GV	EXISTING GAS VALVE
GM	EXISTING GAS METER
G	EXISTING PEDESTAL GAS
	EXISTING IRRIGATION VALVE
	EXISTING GUY WIRE
	EXISTING UTILITY POLE
SS	EXISTING SANITARY SEWER MANHOLE
CO	EXISTING CLEANOUT
SD	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN INLET
T	EXISTING PEDESTAL TELEPHONE
TVT	EXISTING TELEPHONE VAULT
	EXISTING PEDESTAL UNKNOWN
	EXISTING FIRE HYDRANT
WM	EXISTING WATER METER
W	EXISTING WATER MANHOLE
WV	EXISTING WATER VALVE
	EXISTING ASPHALT TO BE DEMOLISHED
	EXISTING CONCRETE TO BE DEMOLISHED
	EXISTING GRAVEL TO BE DEMOLISHED

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FILENAME: GENERAL NOTES.dwg
PLOTTED BY: Jessica Schuttler
PLOTTED ON: Thursday, July 15, 2021
PLOTTED AT: 5:29:21 PM

NO.	REVISION	BY	DATE

DESIGNED: JLB
DRAWN: JLB
CHECKED: JLB

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A, VERT N/A
DATE: JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

GENERAL NOTES

DA PROJECT B006225.001
SHEET 1

Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
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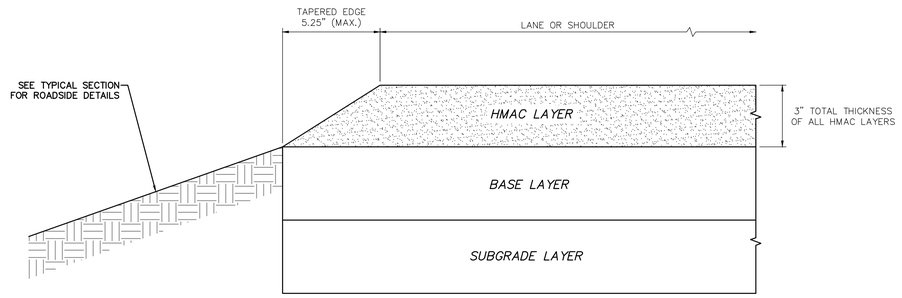
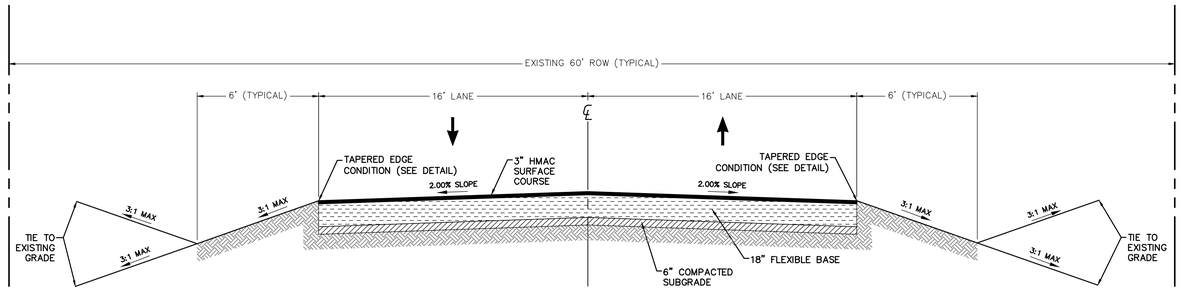


TAPERED EDGE CONDITION
HMAC PAVEMENT

NOT TO SCALE

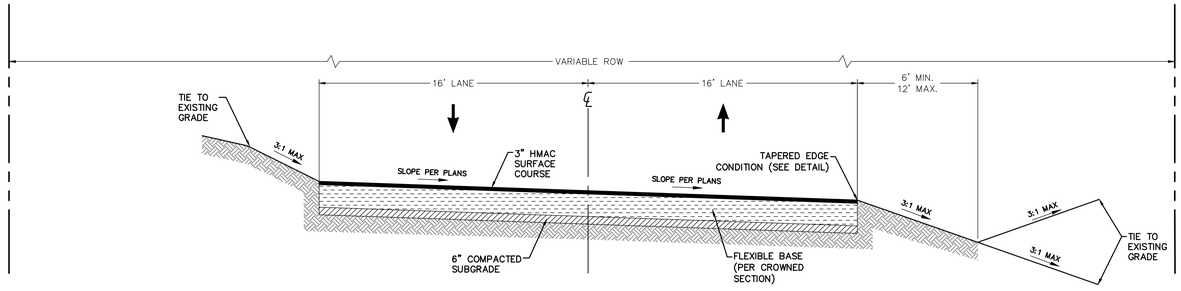


CROWN ASPHALT
PAVEMENT TYPICAL SECTION

NOT TO SCALE

NOTES:

1. *NATIVE SOILS AND IMPORTED FILL MAY BE USED TO LEVEL THE PROJECT. GENERAL FILL SHALL POSSESS A PLASTICITY INDEX, PI, OF NO MORE THAN 30 AND SHALL HAVE NO LESS THAN 35% PASSING A NO. 200 MESH SIEVE. ALL GENERAL FILL SHALL BE PLACED IN 6–INCH MAXIMUM LIFTS AND SHALL BE COMPACTED TO AT LEAST 95% OF ASTM D698 (STANDARD PROCTOR) WITH MOISTURE CONTENT ±2% OF OPTIMUM. TESTING FREQUENCY OF ONE TEST PER 300 LINEAR FEET OF ROADWAY PER LIFT.*
2. *SUBGRADE SOILS BENEATH PAVEMENTS SHALL BE COMPACTED THEN PROOF–ROLL TESTED WITH A FULLY LOADED WATER TRUCK OR LOADED DUMP TRUCK. THE PROOF–ROLL TEST IS CONSIDERED PASSING IF SOIL DEFLECTIONS ARE LESS THAN 1/2–INCH WHEN TESTED USING A LOADED DUMP TRUCK (OR SIMILAR). WHEN USING THE PROOF–ROLLED METHOD 100% COVERAGE OVER THE ROADWAY WITH A MINIMUM OF 2 PASSES PER AREA IS RECOMMENDED. ALTERNATIVELY, SUBGRADE VERIFICATION MAY BE PERFORMED USING A NUCLEAR DENSITY GAUGE, WHERE SUBGRADE DENSITY SHALL BE GREATER THAN 95% OF ASTM D698 (STANDARD PROCTOR) WITH MOISTURE CONTENT ±2% OF OPTIMUM. WHEN USING THE NUCLEAR DENSITY METHOD, TESTING FREQUENCY OF ONE TEST PER 300 LINEAR FEET OF ROADWAY PER LIFT.*
3. *PROPOSED FLEXIBLE BASE MATERIAL SHALL BE CRUSHED ROCK CONFORMING TO TXDOT STANDARD SPECIFICATION ITEM NO. 247, GRADE 1–2 OR BETTER. THE FLEXIBLE BASE MATERIAL SHALL BE INSTALLED IN FOUR TO SIX (4"–6") INCH COMPACTED LIFTS. ADDITIONALLY THE FLEXIBLE BASE MATERIAL IN EACH LIFT SHALL BE COMPACTED TO A MINIMUM OF 98 PERCENT OF THE MATERIAL'S DRY DENSITY AS PER ASTM D698 (STANDARD PROCTOR) WITH MINIMUM MOISTURE CONTENT OF ±4% ONE TEST SHALL BE PERFORMED EVERY 300 LINEAR FEET OF ROADWAY, APPROXIMATELY ONE TEST EVERY 10,000–12,000 SQUARE FEET OF AREA PER LIFT.*
4. *PRIME COAT SHALL BE PER TXDOT ITEM 310 SPECIFICATIONS.*
5. *PROPOSED ASPHALT IS A TYPE D HMAC THAT SHALL MEET TXDOT ITEM 340 SPECIFICATIONS.*
6. *THESE NOTES AS SHOWN ABOVE ARE PER THE GEOTECHNICAL ASSESSMENT PREPARED BY D&S, WHICH SHALL BE REFERENCED FOR ADDITIONAL INFORMATION AND SPECIFICATIONS. ANY SUBSEQUENT REVISIONS TO THIS ASSESSMENT SHALL GOVERN.*
7. *THE PROPOSED FINISHED GRADE OF ROADWAY IN LOW WATER CROSSING AREAS SHALL MATCH THE EXISTING TOP OF PAVEMENT OR CALICHE UNLESS SPECIFIED OTHERWISE ON THE CORRESPONDING PLAN & PROFILE SHEETS.*
8. *THE TAPERED EDGE CONDITION AT THE EDGE OF PAVEMENT SHALL BE AS SHOWN IN THE TAPERED EDGE CONDITION HMAC PAVEMENT DETAIL. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V, WHICH IS 5.25" FOR 3" OF HMAC PAVEMENT. THIS TAPERED EDGE CONDITION SHALL APPLY AT ALL LOCATIONS FOR ALL TYPICAL SECTIONS.*



PITCHED ASPHALT
PAVEMENT TYPICAL SECTION

NOT TO SCALE

NO.	REVISION	BY	DATE

JLB DESIGNED
JLB DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ N/A
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TYPICAL ASPHALT SECTIONS

DA PROJECT 8006225.001
SHEET 2

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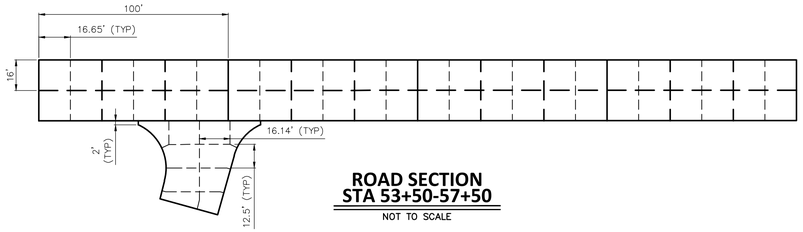
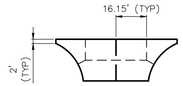
PLOTTED BY: Alison Adams
PLOTTED ON: November 04, 2021
PLOTTED AT: 3:48:37 PM

Texas 811
Know what's below. Call before you dig.

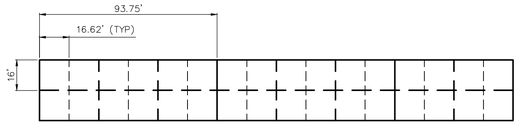
WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
CALL 811 (TEXAS 811) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. DUNAWAY ASSOC., L.P. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.	LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON PUBLIC RECORDS. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH HORIZONTALLY AND VERTICALLY, BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION.	IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES, TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).	COORDINATES PROVIDED ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), CENTRAL ZONE 4203; ALL COORDINATES, BEARINGS, AND DISTANCES ARE NAD83 GRID VALUES.



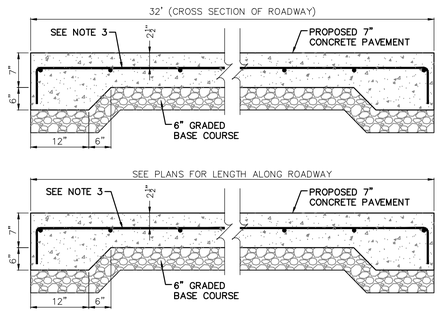
ROAD SECTION
STA 53+50-57+50
NOT TO SCALE



INTERSECTION
STA 81+90
NOT TO SCALE

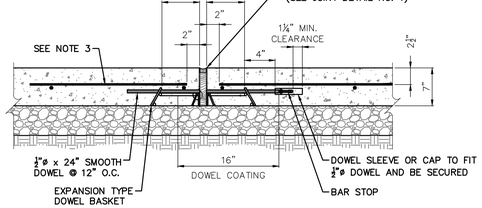


ROAD SECTION
STA 99+00-101+50
NOT TO SCALE

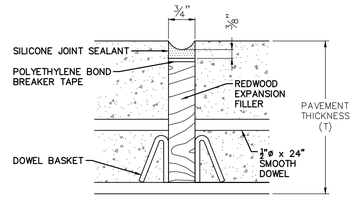


CROSS SLOPE OF CONCRETE PAVEMENT SECTIONS PER PLANS

CONCRETE
PAVEMENT TYPICAL SECTION
NOT TO SCALE



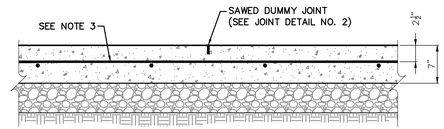
EXPANSION JOINT
NOT TO SCALE



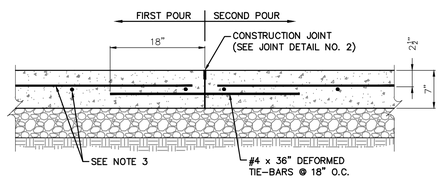
JOINT DETAIL NO. 1
NOT TO SCALE

PAVEMENT AND JOINT NOTES:

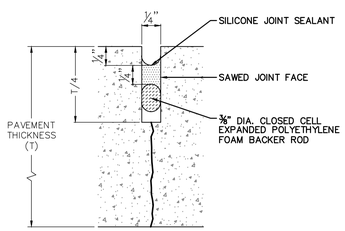
1. CONCRETE SHALL BE CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. REINFORCEMENT SHALL BE #4 BARS AT 18" ON CENTER EACH WAY.
3. FOR DEFORMED BAR SPLICES, LAP BARS 40 DIAMETERS AND TIE.
4. ALL DOWELS TO BE PLACED AT T/2.
5. EXPANSION JOINTS TO BE PLACED AS SHOWN NOT TO EXCEED 100' SPACING.
6. CONSTRUCTION AND SAWED DUMMY JOINTS SHALL ALTERNATE EVERY 14' TO 17.5' BETWEEN EXPANSION JOINTS, OR AS SHOWN. ROADWAY CENTERLINE SHALL BE A CONSTRUCTION JOINT.
7. SAWCUT FOR CONSTRUCTION JOINTS SHALL BE DONE WITHIN 8 HOURS OF POUR OR AS SOON AS CONCRETE CAN SUPPORT WEIGHT. PROVIDE A NEAT CUT WHICH IS TRUE IN ALIGNMENT.
8. CONSTRUCTION JOINTS SHALL BE REQUIRED AT THE END OF A DAY'S WORK, UNLESS IT ENDS AT AN EXPANSION JOINT.
9. ALL CONSTRUCTION JOINTS SHALL BE CLEANED OF DEBRIS, BLOWN DRY, AND IMMEDIATELY SEALED.
10. RADIAL JOINTS SHALL BE NO SHORTER THAN 18".
11. ODD SHAPED PANELS SHALL BE REINFORCED WITH #3 BARS AT 18" EACH WAY. AN ODD SHAPED PANEL IS CONSIDERED TO BE ONE IN WHICH THE SLAB TAPERS TO A SHARP ANGLE WHEN THE LENGTH TO WIDTH RATIO EXCEEDS 3 TO 1 OR WHEN A SLAB IS NEITHER SQUARE NOR RECTANGULAR.



SAWED DUMMY JOINT
NOT TO SCALE



CONSTRUCTION JOINT
NOT TO SCALE



JOINT DETAIL NO. 2
NOT TO SCALE

JOINT LEGNED

- EXPANSION JOINT
- CONSTRUCTION JOINT
- SAWED DUMMY JOINT

NO.	REVISION	BY	DATE

JLB DESIGNED
JLB DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ N/A
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

TYPICAL CONCRETE SECTIONS

DA PROJECT B006225.001
SHEET 3

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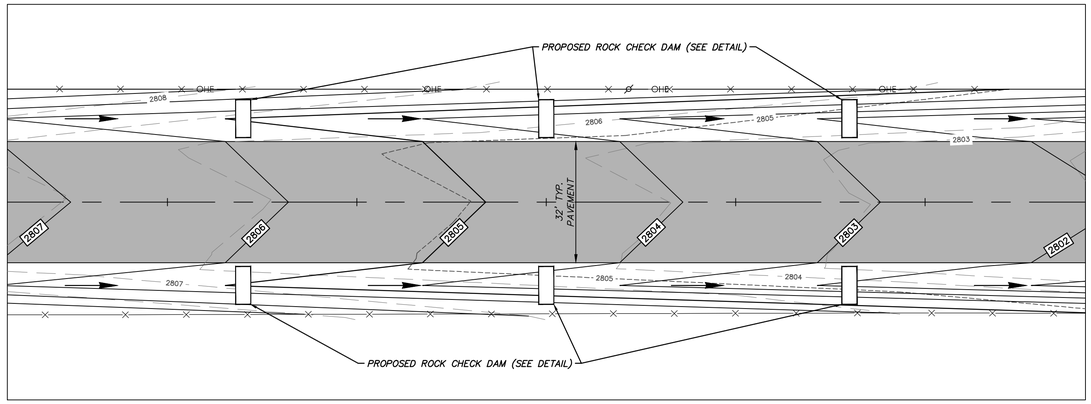
PLOTTED ON: Wednesday, June 14, 2021
PLOTTED AT: 3:48:43 PM

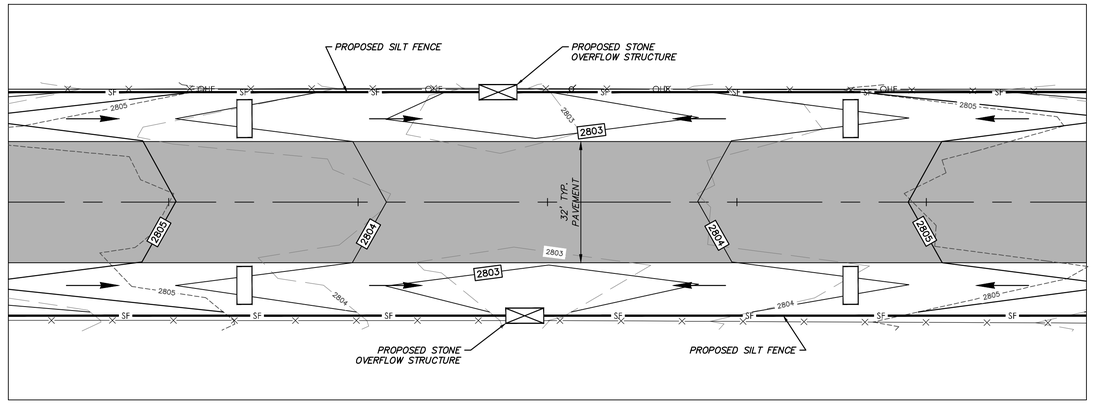
Texas 811
Know what's below. Call before you dig.

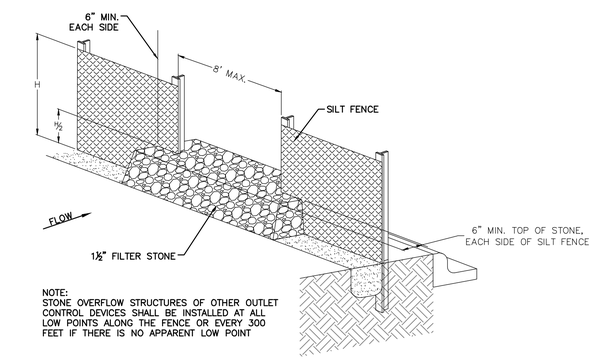
WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
CALL 811 (TEXAS 811) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. DUNAWAY ASSOC., L.P. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.	LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON PUBLIC RECORDS. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH HORIZONTALLY AND VERTICALLY, BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION.	IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES, TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).	COORDINATES PROVIDED ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), CENTRAL ZONE 4203; ALL COORDINATES, BEARINGS, AND DISTANCES ARE NAD83 GRID VALUES.

TYPICAL EROSION CONTROL PLAN WITH ROADWAY DITCHES



TYPICAL EROSION CONTROL PLAN WITH DRAINAGE EXITING R.O.W.





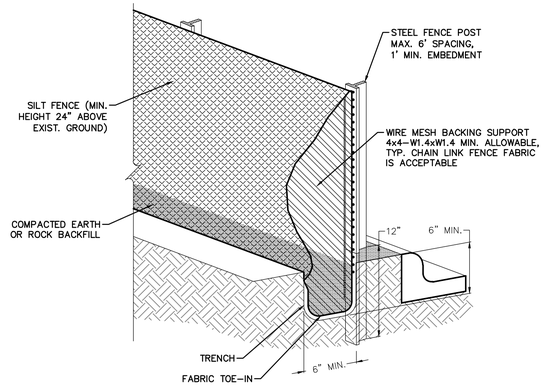
NOTE:
STONE OVERFLOW STRUCTURES OF OTHER OUTLET CONTROL DEVICES SHALL BE INSTALLED AT ALL LOW POINTS ALONG THE FENCE OR EVERY 300 FEET IF THERE IS NO APPARENT LOW POINT

SILT FENCE STONE OVERFLOW STRUCTURE

NOT TO SCALE

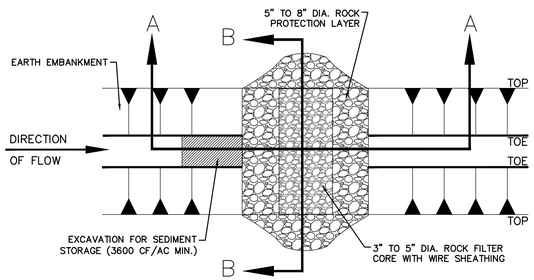
SILT FENCE GENERAL NOTES:

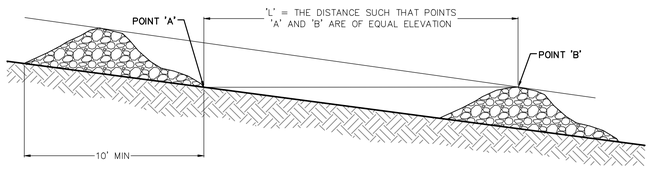
1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (e.g. PAVEMENT), WEIGHT FABRIC FLAP WITH ROCK ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS ATTACHED TO THE STEEL FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
5. INSPECTION SHALL BE MADE EVERY TWO WEEKS AND AFTER EACH 1/2" RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF HALF THE HEIGHT OF THE FENCE. THE SILT SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.



SILT FENCE

NOT TO SCALE

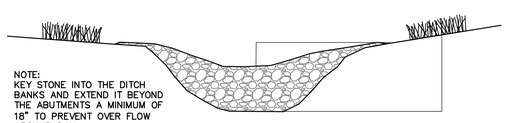




SECTION A–A

ROCK CHECK DAM

NOT TO SCALE



NOTE:
KEY STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT OVER FLOW AROUND DAM.

SECTION B–B (LOOKING UPSTREAM)

NOTES:

1. EROSION CONTROL MEASURES MAY ONLY BE PLACED IN FRONT OF INLETS, IN CHANNELS, DRAINAGEWAYS, OR BORROW DITCHES AT RISK OF CONTRACTOR.
2. CONTRACTOR SHALL REMAIN LIABLE FOR ANY DAMAGE CAUSED BY THE MEASURES, INCLUDING FLOODING DAMAGE, WHICH MAY OCCUR DUE TO BLOCKED DRAINAGE.
3. AT THE CONCLUSION OF ANY PROJECT, ALL CHANNELS, DRAINAGEWAYS AND BORROW DITCHES IN THE WORK ZONE SHALL BE DREDGED OF ANY SEDIMENT GENERATED BY THE PROJECT OR DEPOSITED AS A RESULT OF EROSION CONTROL MEASURES.

EROSION CONTROL LEGEND

2805	EXISTING MAJOR CONTOUR
2804	EXISTING MINOR CONTOUR
2805	PROPOSED MAJOR CONTOUR
2804	PROPOSED MINOR CONTOUR
	PROPOSED FLOW ARROW
SF	PROPOSED SILT FENCE
	PROPOSED ROCK CHECK DAM
	PROPOSED OVERFLOW STRUCTURE

NO.	REVISION	BY	DATE

JLB DESIGNED
JLB DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ N/A
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS · JENNIFER L. BECKER · 102960 · LICENSED PROFESSIONAL ENGINEER · 6/14/21

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TYPICAL EROSION CONTROL PLAN AND DETAILS

DA PROJECT B006225.001
SHEET 4

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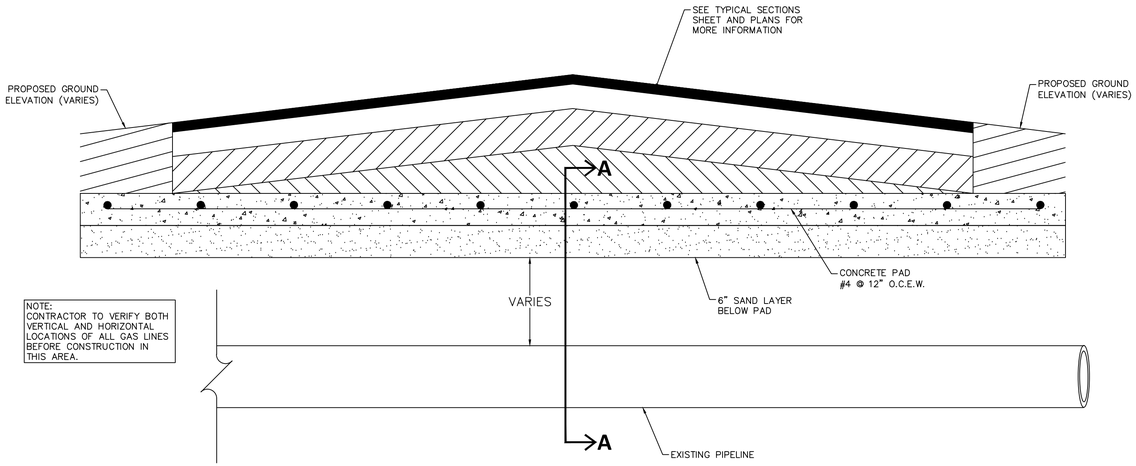
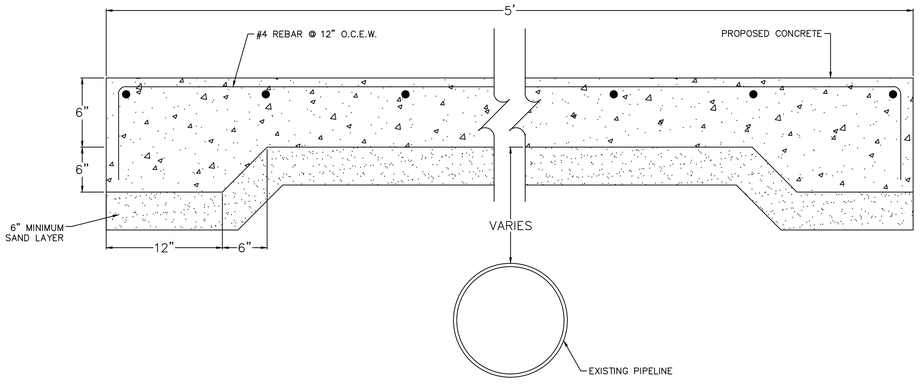
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 3:48:52 PM



NOTES:

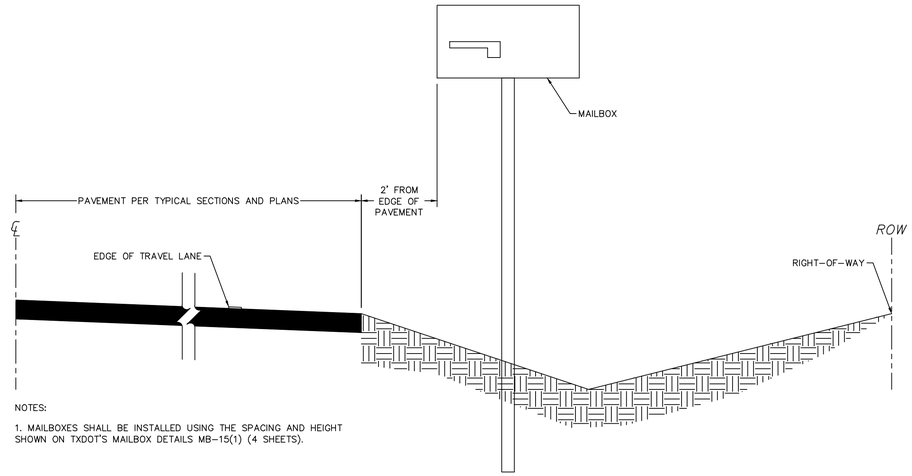
1. CONCRETE SHALL BE CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3500 P.S.I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO TXDOT STANDARD SPECIFICATIONS.
3. REINFORCEMENT SHALL BE #4 BARS AT 12" ON CENTER EACH WAY.
4. CONTRACTOR TO VERIFY BOTH VERTICAL AND HORIZONTAL LOCATIONS OF ALL GAS LINES BEFORE CONSTRUCTION IN THIS AREA.
5. WIDTH AND LOCATION TO BE BASED ON SLAB EXTENDED APPROXIMATELY 2'–6' BEYOND OUTSIDE PIPE ON BOTH SIDES
6. CONTACT PIPELINE OWNER A MINIMUM OF 48 HOURS PRIOR TO WORKING IN THIS AREA.
7. NO LESS THAN SIX INCHES OF SAND OR EQUIVALENT CUSHION BETWEEN THE BOTTOM OF THE SLAB AND TOP OF EXISTING PIPELINE.
8. MINIMUM DEPTH OF COVER IS DETERMINED BY PIPELINE OPERATOR AND MUST BE VERIFIED BY CONTRACTOR. IF NOT ENOUGH COVER IS PROVIDED, CONTACT ENGINEER.



SECTION A–A

STANDARD CONCRETE CAP FOR PIPELINE CROSSINGS

NOT TO SCALE



NOTES:

1. MAILBOXES SHALL BE INSTALLED USING THE SPACING AND HEIGHT SHOWN ON TXDOT'S MAILBOX DETAILS MB–15(1) (4 SHEETS).

MAILBOX SPACING FROM EDGE OF PAVEMENT

NOT TO SCALE

NO.	REVISION	BY	DATE

JLB DESIGNED
JLB DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ N/A
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PIPE ENCASEMENT AND MAILBOX DETAILS

DA PROJECT B006225.001
SHEET 5

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PLOTTED ON: Monday, June 14, 2021
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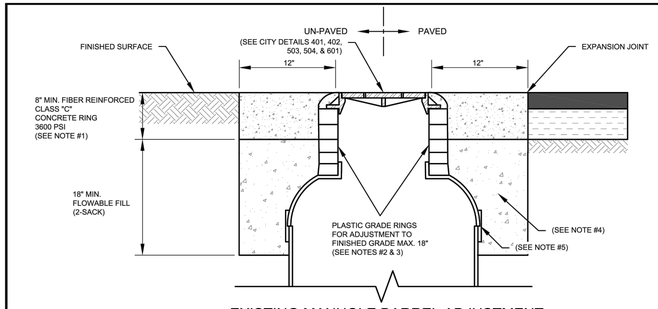
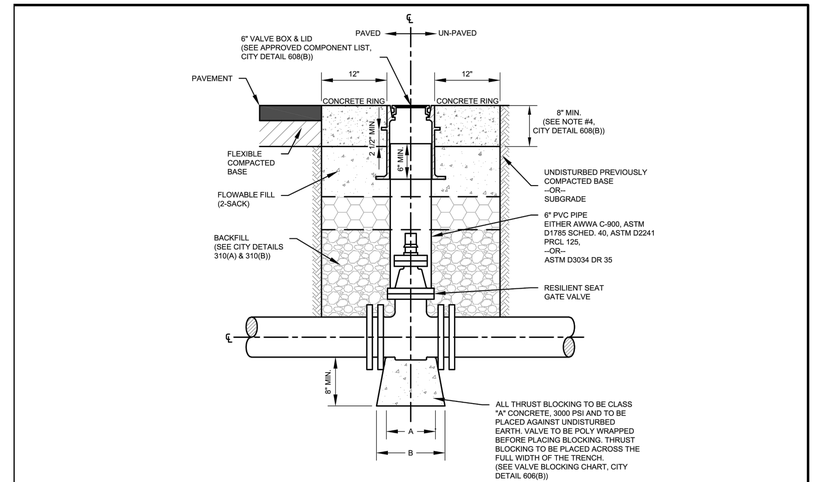


EXISTING MANHOLE BARREL ADJUSTMENT

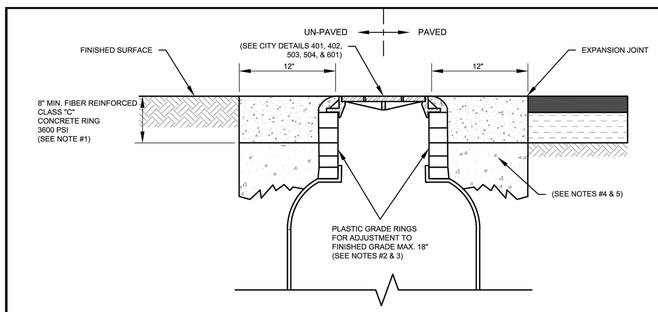
NOTES:

1. INSTALL 12" MIN. FIBER REINFORCED CLASS "C" CONCRETE RING, 3600 PSI, WHEN MANHOLE IS LOCATED IN AN ARTERIAL R.O.W.
2. GRADE RINGS TO MEET ASTM STANDARD A48 AND TO BE 2", 4", OR 6" THICKNESS AS REQUIRED. INSTALL ASPHALT TAR IN THICK, UNIFORM COATING OVER ALL OUTER ADJUSTMENT RING SURFACES AND JOINTS.
3. ENGINEERING SERVICES REPRESENTATIVE AND UTILITY SERVICES REPRESENTATIVE MAY ALLOW GREATER ADJUSTMENT RING DEPTH TO ACCOMMODATE PAVING STRUCTURES.
4. REMOVE ALL MATERIAL EXCAVATED FROM SITE AND EXCAVATION, AND FILL TO FINISHED BASE ELEVATION WITH FLOWABLE FILL 2-SACK (2 SACK = 188 LBS/CY, PORTLAND CEMENT).
5. MANUFACTURED WATERTIGHT CONNECTOR, CORE DRILL AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
6. MATERIALS AND CONSTRUCTION METHODS TO CONFORM TO CITY OF MIDLAND STANDARDS AND SPECIFICATIONS.
7. CONSTRUCT AS SHOWN UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY ENGINEER.

MIDLAND Engineering Services	DRAWN: DPM CHECKED: JCF APPROVED: MCC	EFFECTIVE DATE: 10/01/2018 EXISTING MANHOLE BARREL ADJUSTMENT	SCALE: NTS DETAIL: 317



MIDLAND Engineering Services	DRAWN: DPM CHECKED: JCF APPROVED: MCC	EFFECTIVE DATE: 10/01/2018 TYPICAL VALVE AND VALVE BOX	SCALE: NTS DETAIL: 608(A)



EXISTING MANHOLE RING & COVER ADJUSTMENT

NOTES:

1. INSTALL 12" MIN. FIBER REINFORCED CLASS "C" CONCRETE RING, 3600 PSI, WHEN MANHOLE IS LOCATED IN AN ARTERIAL R.O.W.
2. GRADE RINGS TO MEET ASTM STANDARD A48 AND TO BE 2", 4", OR 6" THICKNESS AS REQUIRED. INSTALL ASPHALT TAR IN THICK, UNIFORM COATING OVER ALL OUTER ADJUSTMENT RING SURFACES AND JOINTS.
3. ENGINEERING SERVICES REPRESENTATIVE AND UTILITY SERVICES REPRESENTATIVE MAY ALLOW GREATER ADJUSTMENT RING DEPTH TO ACCOMMODATE PAVING STRUCTURES.
4. REMOVE ALL MATERIAL EXCAVATED FROM SITE AND EXCAVATION.
5. FILL ANY OVER-EXCAVATION WITH FLOWABLE FILL 2-SACK (2-SACK = 188 LBS/CY, PORTLAND CEMENT).
6. MATERIALS AND CONSTRUCTION METHODS TO CONFORM TO CITY OF MIDLAND STANDARDS AND SPECIFICATIONS.
7. CONSTRUCT AS SHOWN UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY ENGINEER.

MIDLAND Engineering Services	DRAWN: DPM CHECKED: JCF APPROVED: MCC	EFFECTIVE DATE: 10/01/2018 EXISTING MANHOLE RING & COVER ADJUSTMENT	SCALE: NTS DETAIL: 319

APPROVED COMPONENT LIST			
NO.	VALVES	VALVE COVERS	VALVE BOX
1	MUELLER 2360 M/J	MUELLER 2360 FL X FL	BASS & HAYS STANDARD 390-1 "SHORTY"
2	M & H 4067 M/J	M & H 4067-0	OR APPROVED EQUAL
3	CL0W 2838 M/J	CL0W 2840 FL X FL	
4	OR APPROVED EQUAL	OR APPROVED EQUAL	

VALVE BLOCKING CHART		
PIPE SIZE	A	B
4"	5.0"	10.5"
6"	6.5"	1'-.0"
8"	6.5"	1'-.0"
10"	8.0"	1'-1.0"
12"	8.5"	1'-2.0"

NOTES:

1. FOR VALVES ON WATER MAIN PIPES LARGER THAN 12" SEE CITY DETAIL 609.
2. SETTING VALVE BOX TO GRADE MAY REQUIRE ADDING PVC PIPE. IF ADDITIONAL PIPE IS REQUIRED, USE BELL SECTION WITH GASKET AND SET BELL DOWN OVER EXISTING PIPE RISER. A GASKETED SELF CENTERING COLLAR MAY BE USED IN LIEU OF THE BELL SECTION.
3. CONCRETE RING TO BE CITY OF MIDLAND CLASS "C", 3600 PSI, UNLESS OTHERWISE NOTED.
4. USE FIBER REINFORCEMENT FOR ALL CONCRETE , WHETHER PAVEMENT OR THRUST BLOCKING.
5. 12" MINIMUM FOR CONCRETE RING IN AN ARTERIAL ROADWAY.
6. FLOWABLE FILL 2-SACK (2 SACK = 188 LBS/CY, PORTLAND CEMENT.) REQUIRED BENEATH ALL CONCRETE RINGS.
7. FLOWABLE FILL 2-SACK (2 SACK = 188 LBS/CY, PORTLAND CEMENT.) REQUIRED FOR ALL OVER EXCAVATION BACKFILL.
8. MATERIALS AND CONSTRUCTION METHODS TO CONFORM TO CITY OF MIDLAND STANDARDS AND SPECIFICATIONS.
9. CONSTRUCT AS SHOWN UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY ENGINEER.

MIDLAND Engineering Services	DRAWN: DPM CHECKED: JCF APPROVED: MCC	EFFECTIVE DATE: 10/01/2018 TYPICAL VALVE AND VALVE BOX DETAILS	SCALE: NTS DETAIL: 608(B)

NO.	REVISION	BY	DATE

COM DESIGNED | COM DRAWN | JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A; VERT N/A
DATE: JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

CITY OF MIDLAND UTILITY DETAILS

DA PROJECT B006225.001
SHEET 7

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FILENAME: COUNTY DETAILS.dwg
PLOTTED BY: Allison Alaniz
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 3:49:07 PM

LOCKABLE ARCHITECTURAL MAILBOX

SINGLE-MOUNT INSTALLATION PARTS			
#	PART NAME	PART/DHT #	QTY
1	SOCKET, TYPE 4 FOUNDATION	160891	1
2	WEDGE FOR TYPE 4 FOUNDATION	160892	1
3	THIN-WALL WHITE STEEL TUBE 2.375 OD	162911	1
4	BRACKET FOR ATTACHING MAILBOX	161443	1
5	ARCHITECTURAL MAILBOX	SEE NOTE	1
6	NUT, 5/16" HEX	NUT, 5/16" HEX	1
7	BOLT, 5/16 X 3 HEX	GRADE 5	1
8	PLATE WASHER FOR ARCHITECTURAL MAILBOX	SEE SEE SHEET 2	2
9	WASHER, 3/8 FLAT		8
10	WASHER, 3/8 LOCK		4
11	NUT, 3/8 HEX		4
12	BOLT, 3/8 X 1-1/4 HEX	GRADE 5	4
13	CONCRETE, CLASS B (2000 PSI)		1

LOCKABLE ARCHITECTURAL MAILBOX DETAILS

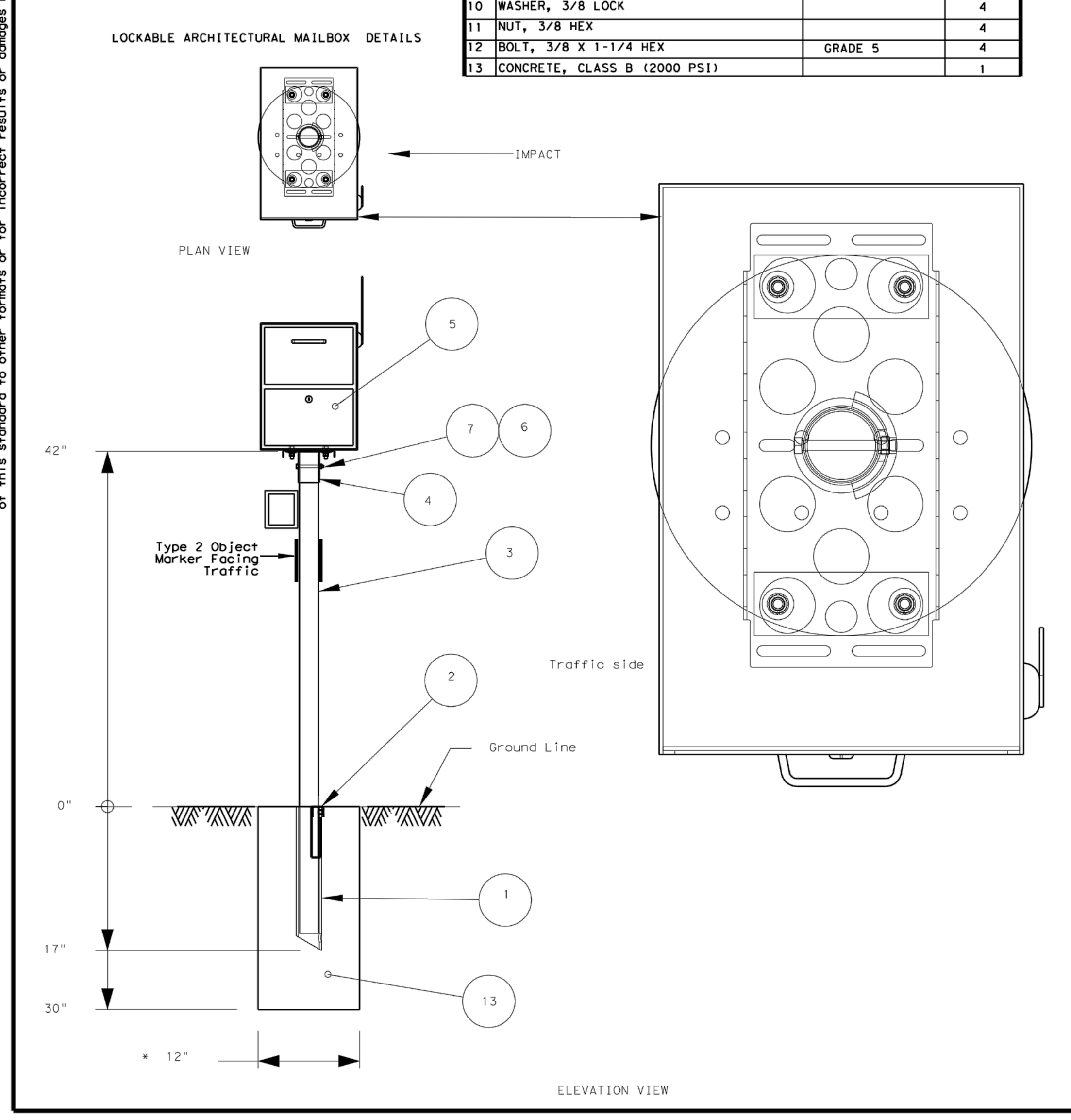

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TABLE OF APPLICABLE DHT NUMBERS	
DHT NUMBER	DESCRIPTION
	FOUNDATIONS
46625	WEDGE FOR V-WING SOCKET FOR TYPE 1 FOUNDATION
149340	V-WING SOCKET FOR TYPE 1 FOUNDATION
143433	WEDGE FOR TYPE 2 FOUNDATION
143434	ANCHOR FOR TYPE 2 FOUNDATION
166103	ANCHOR FOR TYPE 7 FOUNDATION
160891	SOCKET FOR TYPE 4 FOUNDATION
160892	WEDGE FOR TYPE 4 FOUNDATION
166104	WEDGE FOR TYPE 7 FOUNDATION
	POSTS
4289	WINGED CHANNEL MAILBOX POST
149339	MULTIPLE MAILBOX POST (GALVANIZED TUBING)
164116	MULTIPLE MAILBOX POST (WHITE COATED)
166114	MULTIPLE MAILBOX POST (WHITE COATED OCTAGONAL)
166153	MULTIPLE MAILBOX POST (GALVANIZED OCTAGONAL)
161442	RECYCLED RUBBER POST. FOR SMALL MAILBOX ONLY
143426	THIN-WALL GALVANIZED STEEL TUBE 2.375" OUTER DIAMETER
162911	THINWALL WHITE STEEL TUBE 2.375" OUTER DIAMETER
166152	SINGLE OR DOUBLE THIN-WALL MAILBOX POST GALVANIZED 2" OCTAGONAL
166112	SINGLE OR DOUBLE THIN-WALL MAILBOX POST WHITECOATED 2" OCTAGONAL
	REFLECTIVE SHEETING
161812	REFLECTIVE SHEETING FOR EMERGENCY LOCATION NUMBER PANEL
	CONNECTING HARDWARE
2917	ANGLE BRACKET USED FOR TEMPORARY MAILBOX SUPPORT
166105	BRACKET FOR SINGLE MOUNTING OF MAILBOXES (MOUNTING KIT)
3789	PLATE FOR DOUBLE MOUNTING OF MAILBOXES
166108	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES (MOUNTING KIT)
166111	BRACKET FOR MULTIPLE MOUNTING OF MAILBOXES (MOUNTING KIT)
148939	BRACKET FOR ATTACHING SMALL OR MEDIUM SIZE MAIL BOX
148938	EXTENDER TO BRACKET FOR ATTACHING LARGE MAILBOX
159489	ANGLE BRACKET PART A
159490	ANGLE BRACKET PART B
162323	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES ON THINWALL STEEL POST, GALVANIZED OR POWDERCOATED.
161443	BRACKET FOR ATTACHING MAILBOX TO RECYCLED RUBBER POST AND TO MULTIPLE WHITE MAILBOX POST
158358	CASTING (NEWSPAPER RECEPTACLE BRACKET)
163731	U-BOLT (NEWSPAPER RECEPTACLE BRACKET)
160698	BOLT;HEX HEAD, GALV;3/8"DIA X 3/4"L HD, W/2-FLAT WASHERS
163750	BOLT;HEX HEAD, GALV;3/8" X 1-1/2, 16 NC, W/WASHERS
160701	BOLT;HEX HEAD, GALV;3/8"DIA X 2-1/2"L, HD, W/2-FLAT WASHERS
163730	BOLT;HEX HEAD, GALV;3/8" X 3-1/2", NC, W/NUT, 2 FLAT WASHERS
160699	BOLT;HEX HEAD, GALV;3/8"DIA X 3-3/4"L HD, W/2-FLAT WASHERS
160700	BOLT;HEX HEAD, GALV;3/8"DIA X 4"L HD, W/2-FLAT WASHERS

SHEET 4 OF 4

Texas Department of Transportation — Maintenance Division Standard

DHT NUMBERS TABLE

MB-15(1)

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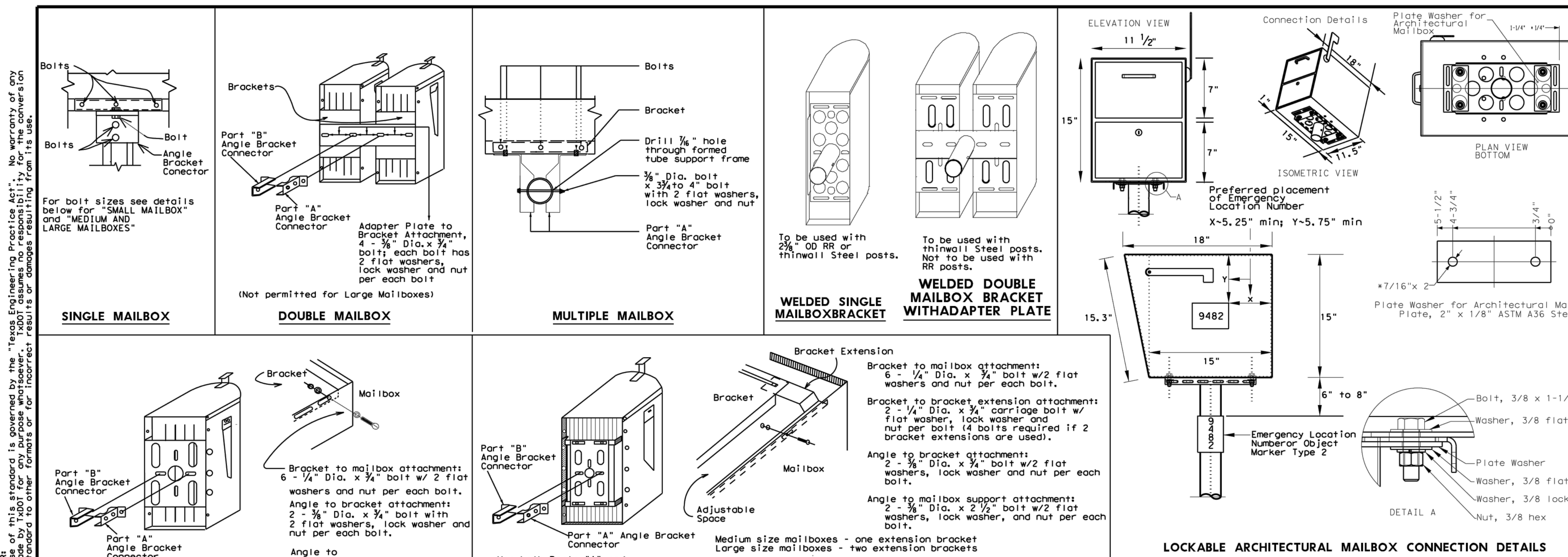
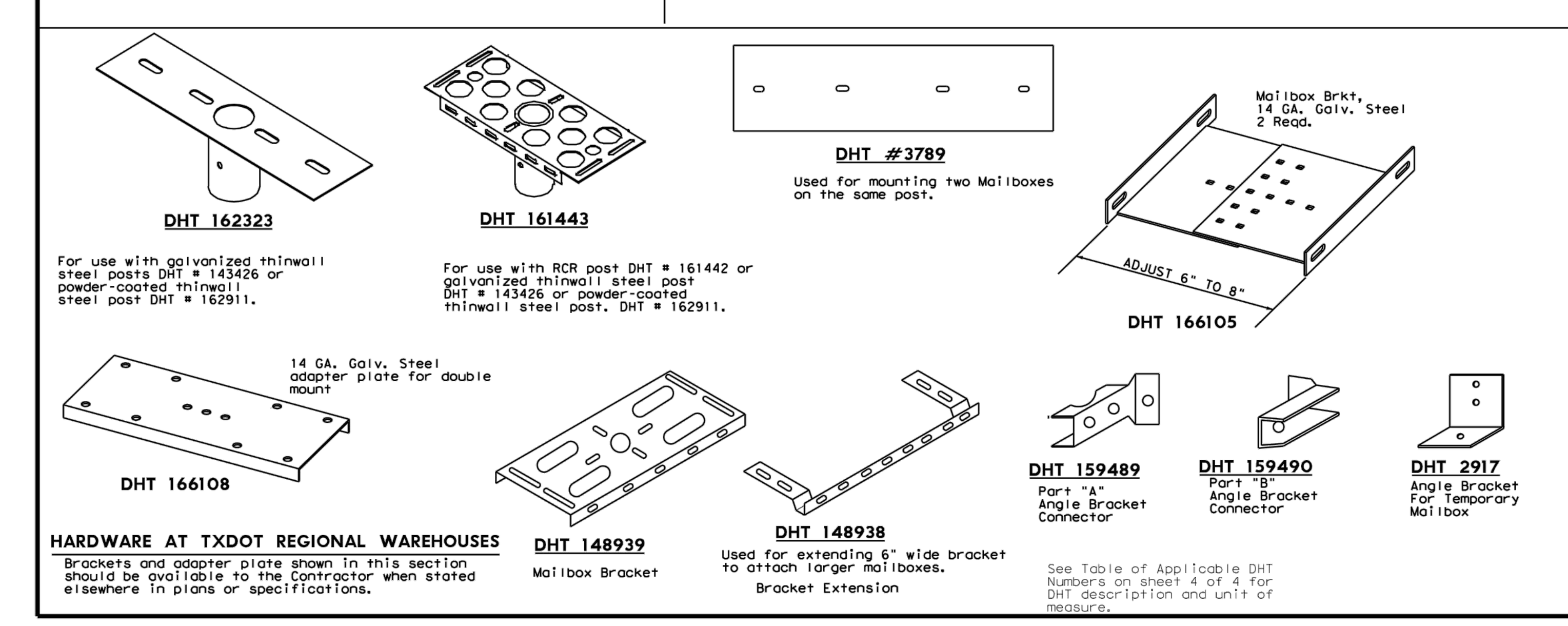
REVISIONS | DIST | COUNTY | SHEET NO.



LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS



HARDWARE AT TXDOT REGIONAL WAREHOUSES

Brackets and adapter plate shown in this section should be available to the Contractor when stated elsewhere in plans or specifications.

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

GENERAL NOTES

1. Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
2. Hardware for mounting mailboxes to the support/foundation furnished by industry should be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
3. Hardware furnished by industry shall be erected in accordance with the manufacturer's recommendation.
4. Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
5. The angles, brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
6. Items with evidence of damage to the galvanized coating or wet storage stains (white rust) will not be accepted.

SHEET 2 OF 4

Texas Department of Transportation — Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS

MB-15(1)

FILE: MB14(1).DGN | DN: JEO | CK: | DW: JEO | CK:
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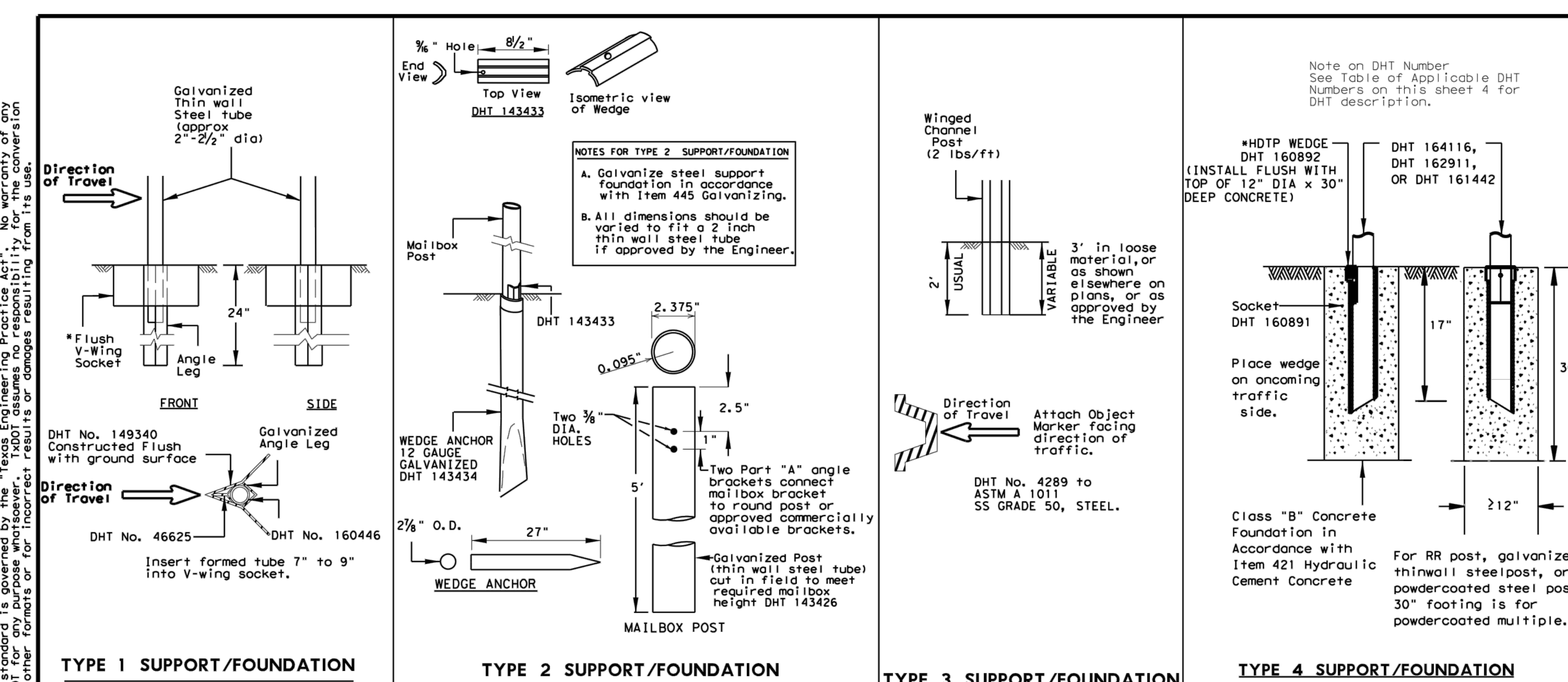
REVISIONS ADDED DHT 163730 | DIST | COUNTY | SHEET NO.

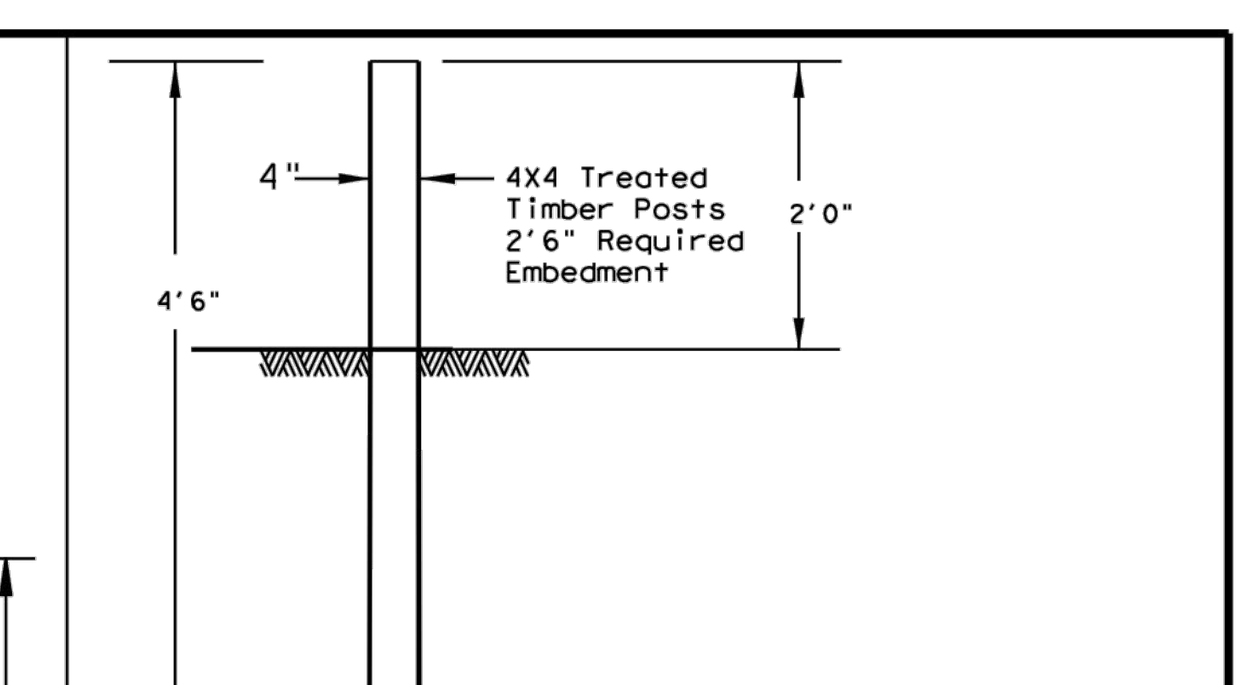


TYPE 1 SUPPORT/FOUNDATION — THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE

TYPE 2 SUPPORT/FOUNDATION — THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM

TYPE 3 SUPPORT/FOUNDATION — WINGED CHANNEL POST

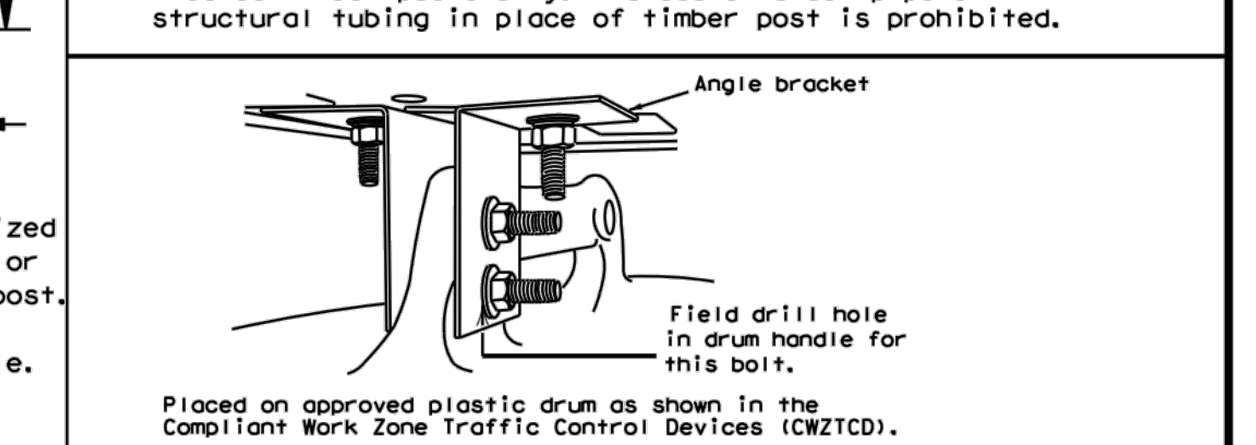
TYPE 4 SUPPORT/FOUNDATION — FOR WHITECOATED STEEL POST, MULTIPLE POST, AND RECYCLED RUBBER.



TYPE 5 SUPPORT/FOUNDATION — FOR ONE PIECE MOLDED PLASTIC MAILBOX

ONE PIECE MOLDED PLASTIC MAILBOXES

Molded Plastic Mailboxes shall be installed on 4"x4" treated timber posts only. The use of steel pipe or structural tubing in place of timber post is prohibited.

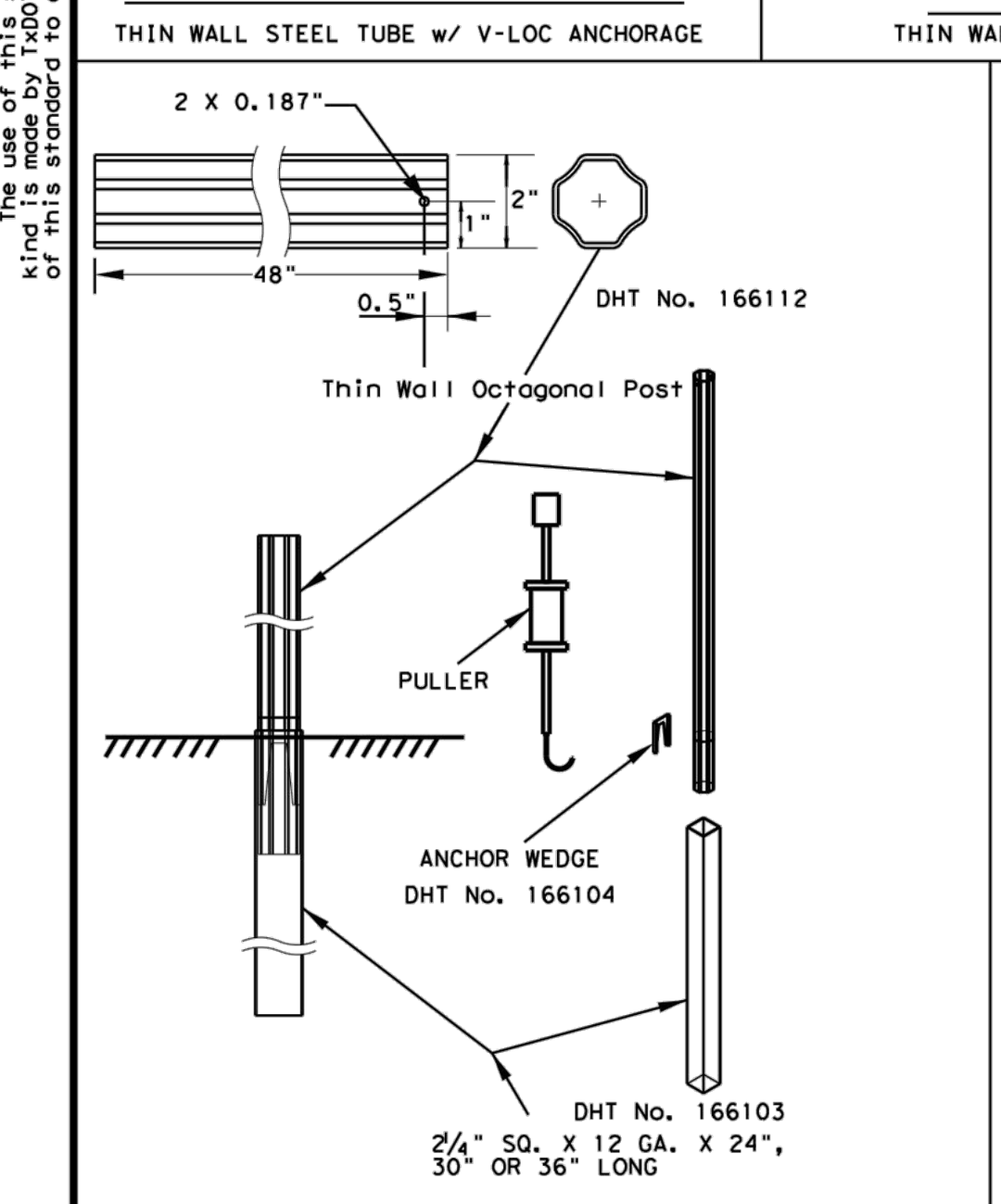


Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD). Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

TYPE 6 TEMPORARY MAILBOX SUPPORT — CONNECTION DETAIL

GENERAL NOTES

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Type 1, 2, 3, 4 or 7 supports or foundation can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
4. The Type 1 or type 7 support/foundation can be used for a multiple mailbox mount.
5. The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
6. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.



TYPE 7 MAILBOX SUPPORT/FOUNDATION — CONNECTION DETAIL

MB-(X) ASSM TY (XXX) (X) (XX) (OPTIONAL)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- SP = Single Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post
- Ty 7 = Wedge Anchor

Type of Bracket
- AB = Angle Bracket.
- TB = 2.375" Tube Bracket

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST.

*HDTP: High density thermoplastic polyesters

SHEET 3 OF 4

Texas Department of Transportation — Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB-15(1)

FILE: MB14(1).DGN | DN: JEO | CK: | DW: JEO | CK:
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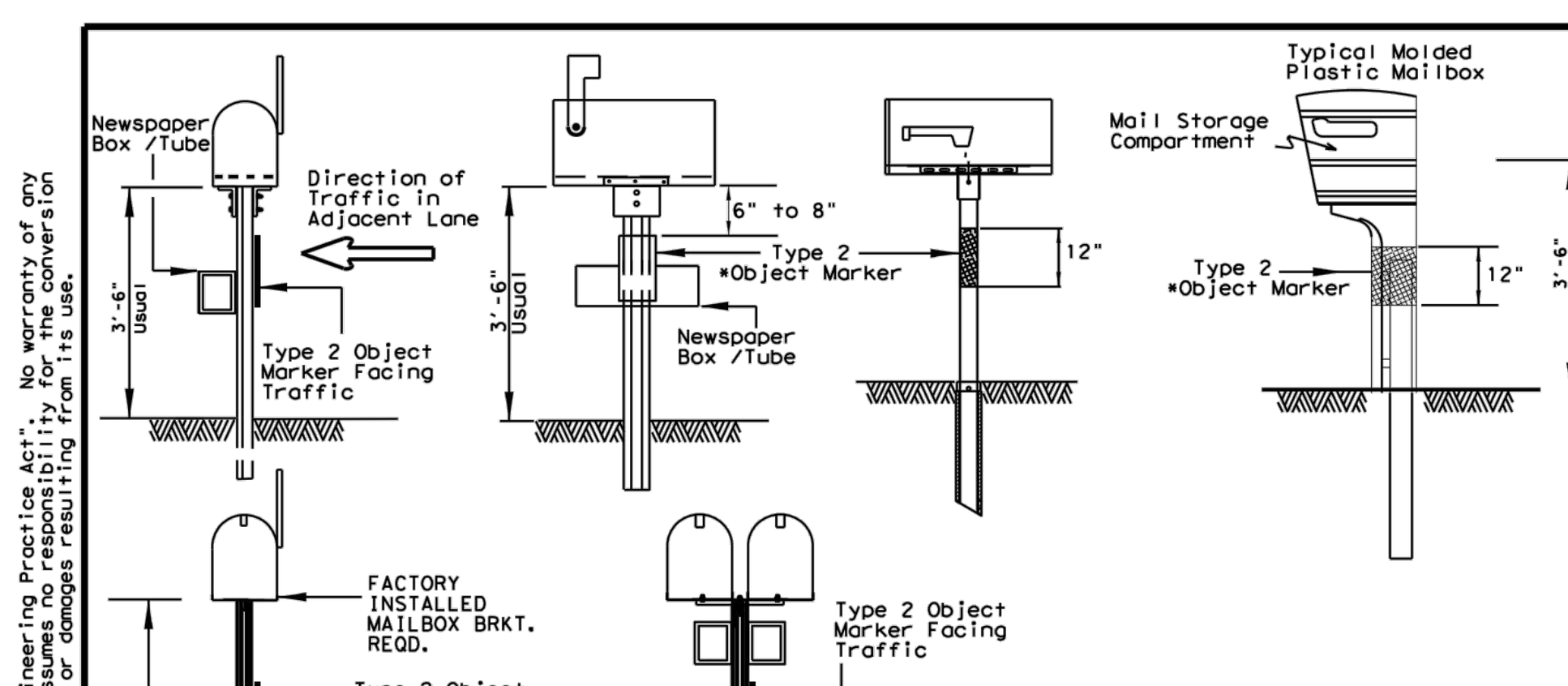
REVISIONS | DIST | COUNTY | SHEET NO.

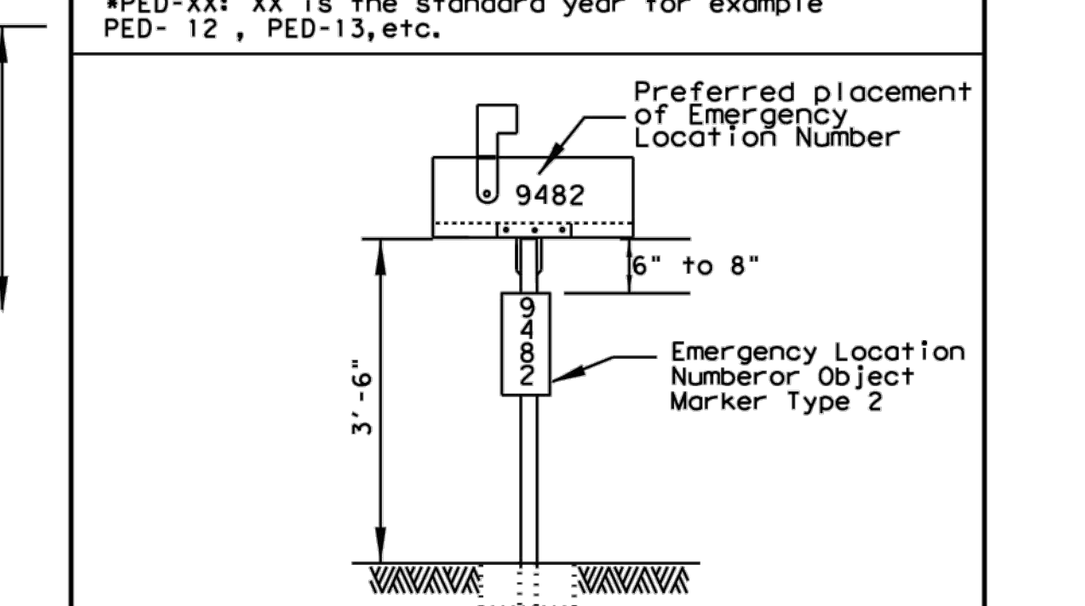


SINGLE AND DOUBLE MAILBOX MOUNT — FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4

* Type 2 object marker in accordance with Traffic Engineering standard Delineators & Object Markers - Installation D&OM (1) or tube type post wrapped with 12 " Conformable Reflective Sheeting in accordance with DMS 8300 for tubular post needed to produce a smooth wrap around tube, DHT 161812 or 3 each of 3" x 4" Conformable Reflective Sheeting tabs (DHT 165382) or 1 each of 3" x 12" Reflective Sheeting.

Note: Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Pedestrian Facilities Curb ramps standard *PED-XX for pedestrian facilities.

*PED-XX: XX is the standard year for example PED- 12 , PED-13,etc.



PLACEMENT OF EMERGENCY LOCATION NUMBER

Location Number shall be placed on: 1. A yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. The color of numbers shall be black. or 2: A green or blue plate with white numbers attached to post beside the object marker. Other contrasting color configuration, as approved , may be used. (Use Same type plate as used for the type 2 Object Marker. Recommended sign size is 6" by 15")

TYPICAL MAILBOX SIZE				LIGHT WEIGHT MATERIAL	
				SHEET METAL	**PLASTIC
	LENGTH	WIDTH	HEIGHT	MAXIMUM WEIGHT	
SIZE	INCHES			POUNDS	
SMALL	19 1/2	6	7	5	5
MEDIUM	22 1/2	8	11 1/2	7	7
LARGE	23 1/2*	11 1/2*	13 1/2*	10	10

* Maximum allowed dimensions for mailbox
** Excluding Molded Plastic on 4 X 4 Post

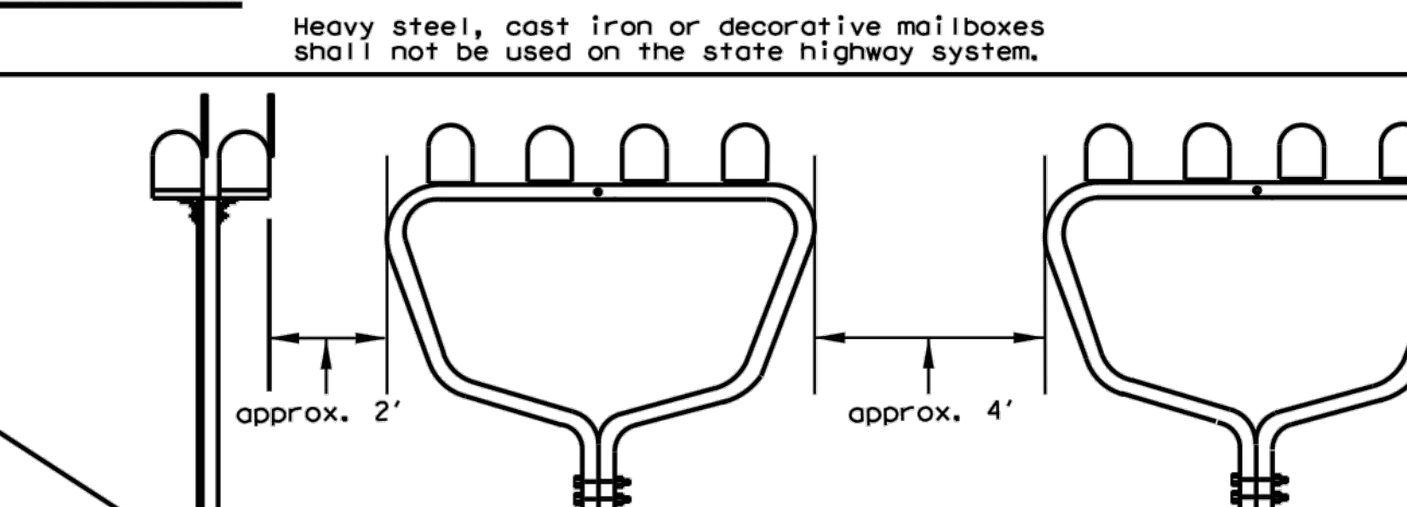
LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)					
VIEW	TOP	BOTTOM	FRONT SIDE	BACK SIDE	WEIGHT
SIDE	18	15	18.3	15	(POUNDS)
BACK	11 1/2	11 1/2		15	22.4

SEE TOP RIGHT CORNER OF SHEET 2 OF 4

MAILBOX SIZES

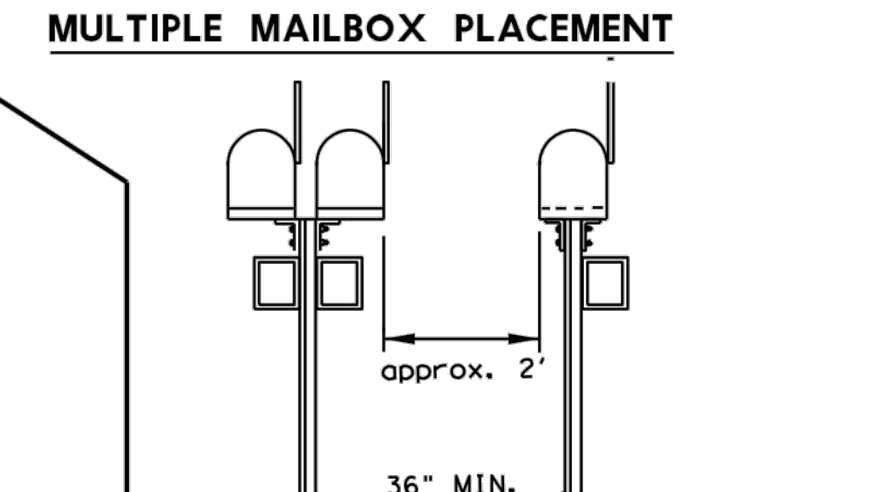
Mailboxes shall be made of light weight sheet metal or light weight plastic. Lockable architectural mailboxes shall meet the requirements of the above table.

Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



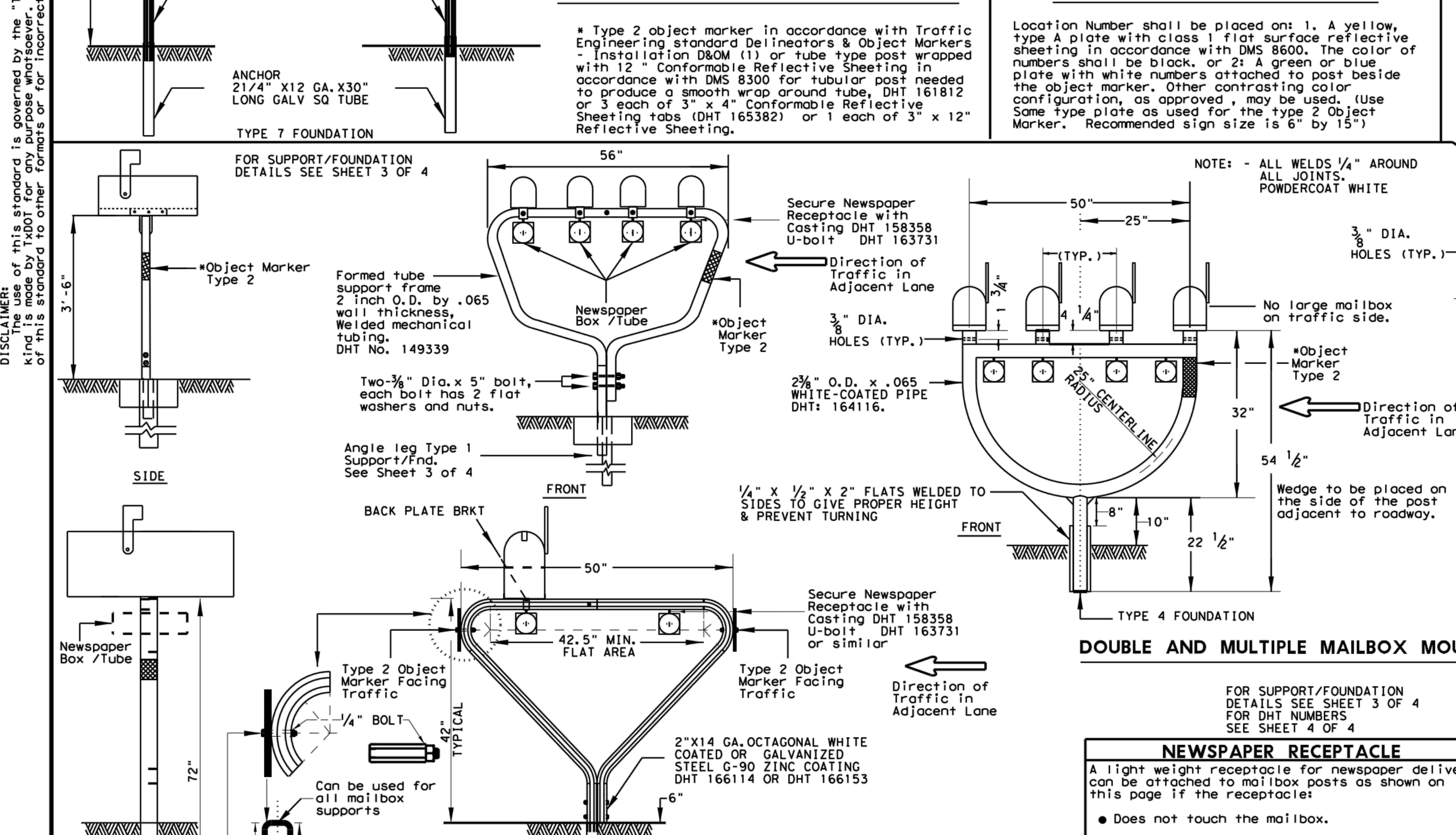
4' Clear Distance between multiple installations and 2' clearance between double or single installations and the multiple installation. DHT #'s 164116 or 149339.

MULTIPLE MAILBOX PLACEMENT



Clear Distance between single or double mounted posts. (Normally when 3 or more mailboxes are in one location, a multiple support is used).

SINGLE & DOUBLE MAILBOX PLACEMENT



MULTIPLE MAILBOX MOUNT

DOUBLE AND MULTIPLE MAILBOX MOUNT

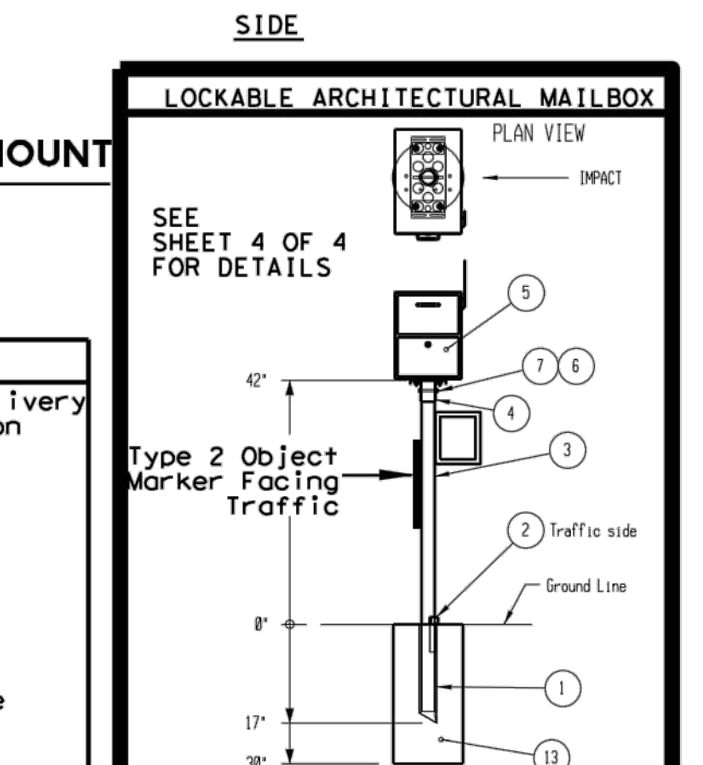
FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4 FOR DHT NUMBERS SEE SHEET 4 OF 4

INDEX OF MAILBOX DETAIL SHEETS

1 of 4 MAILBOX MOUNTING AND SPACING
2 of 4 MAILBOX BRACKET CONNECTING DETAILS
3 Of 4 MAILBOX SUPPORT / FOUNDATION
4 of 4 TABLE OF DHT NUMBERS

NEWSPAPER RECEPTACLE

A light weight receptacle for newspaper delivery can be attached to mailbox posts as shown on this page if the receptacle:
- Does not touch the mailbox.
- Does not present a hazard to traffic or delivery of the mail.
- Does not extend beyond the front of the mailbox.
- Does not display advertising, except the publication title.
- Newspaper receptacles on separate supports are prohibited.



SHEET 1 OF 4

Texas Department of Transportation — Maintenance Division Standard

MAILBOX MOUNTING AND SPACING

MB-15(1)

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REVISIONS: Added additional newspaper receptacle for double mailbox support | DIST | COUNTY | SHEET NO.

NO.	REVISION	BY	DATE

DESIGNED JLB · DRAWN JLB · CHECKED JLB

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A · VERT N/A · DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021 — STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

TxDOT MAILBOX DETAILS

DA PROJECT B006225.001 · SHEET 7

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PLOTTED BY: Allison Aldana
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 3:49:39 PM

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Maximum Wingwall Height Hw	W	X	Y	Z	Variable Reinforcing Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities per ft of wing length (2-wings) Reinf (Lb/Ft)	Conc (CY/Ft)
2'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
2'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
2'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2-wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-0"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$Hw = H + T + C - 0.25S'$
$A = (Hw - 0.333) (SL)$
$B = (A)$ tangent $(30°)$
$Lw = (A) \div$ cosine $(30°)$

For cast-in-place culverts:
$Ltw = (N) (S) + (N + 1) (U)$

For precast culverts:
$Ltw = (N) (2) + S) + (N - 1) (0.5')$

Total Wingwall Area (two wings ~ SF) = $(Hw + 0.333) (Lw)$

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.

1. Extend Bars P 3'-0" minimum into bottom slab of box culvert.
2. Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
4. Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
5. When shown elsewhere on the plans, construct 5' deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, place riprap on a 1'-0" thick reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
6. At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
7. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

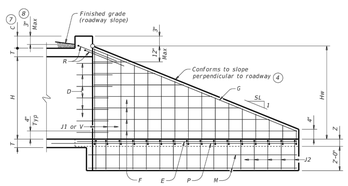
MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers For Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

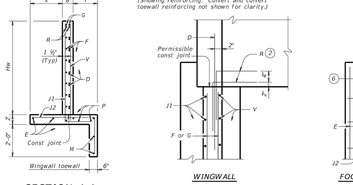
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



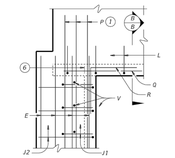
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)



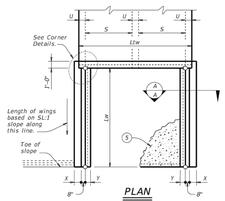
SECTION A-A

WINGWALL



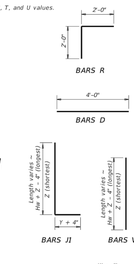
FOOTING AND TOEWALL

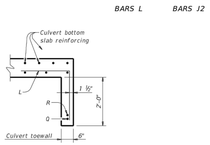
CORNER DETAILS



PLAN

(Showing dimensions.)





SECTION B-B

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-O

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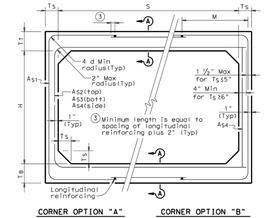
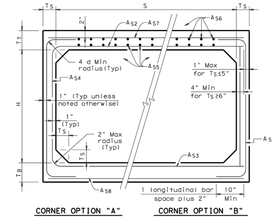
BOX DATA

SECTION DIMENSIONS S (ft)	H (ft)	T_1 (in)	T_B (in)	T_S (in)	Fill Height (ft)	M (Min) (in)	REINFORCING (in²/ft) As1	As2	As3	As4	As5	As6	As7	As8	Lift Weight (Tons)
3	2	7	6	4	<2	-	0.17	0.25	0.16	0.10	0.17	0.17	0.17	0.14	3.3
3	2	4	4	4	2<3	31	0.13	0.19	0.18	0.10	-	-	-	-	2.4
3	2	4	4	4	3-5	31	0.10	0.11	0.12	0.10	-	-	-	-	2.4
3	2	4	4	4	10	31	0.10	0.10	0.10	0.10	-	-	-	-	2.4
3	2	4	4	4	15	31	0.10	0.13	0.13	0.10	-	-	-	-	2.4
3	2	4	4	4	20	31	0.11	0.17	0.17	0.10	-	-	-	-	2.4
3	2	4	4	4	25	31	0.14	0.21	0.21	0.10	-	-	-	-	2.4
3	2	4	4	4	30	31	0.17	0.25	0.25	0.10	-	-	-	-	2.4
3	2	4	4	4	35	31	0.20	0.29	0.30	0.10	-	-	-	-	2.4
3	3	7	6	4	<2	-	0.17	0.27	0.17	0.10	0.17	0.17	0.17	0.14	3.7
3	3	4	4	4	2<3	31	0.10	0.22	0.21	0.10	-	-	-	-	2.8
3	3	4	4	4	3-5	31	0.10	0.14	0.14	0.10	-	-	-	-	2.8
3	3	4	4	4	10	31	0.10	0.11	0.11	0.10	-	-	-	-	2.8
3	3	4	4	4	15	31	0.10	0.14	0.15	0.10	-	-	-	-	2.8
3	3	4	4	4	20	31	0.10	0.18	0.19	0.10	-	-	-	-	2.8
3	3	4	4	4	25	31	0.10	0.23	0.23	0.10	-	-	-	-	2.8
3	3	4	4	4	30	31	0.12	0.27	0.28	0.10	-	-	-	-	2.8
3	3	4	4	4	35	31	0.14	0.32	0.32	0.10	-	-	-	-	2.8

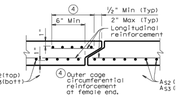
(1) For Box Length = 8'-0"
(2) As1 thru As4, As7 and As8 are minimum required areas of reinforcement per linear foot of box length. As6 and As5 are minimum required areas of reinforcement per linear foot of box width.



FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT



SECTION A-A
(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
See SCP-MG standard sheet for miscellaneous details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Contractor)".

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Texas Department of Transportation — Bridge Division Standard

SINGLE BOX CULVERTS PRECAST 3'-0" SPAN

SCP-3

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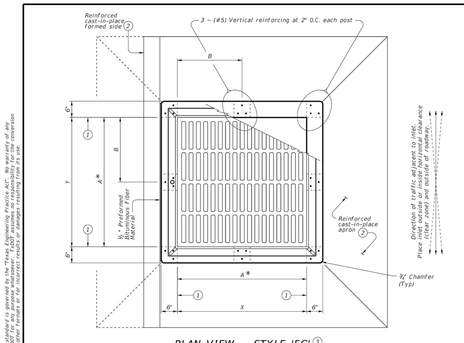
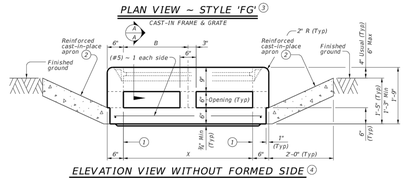
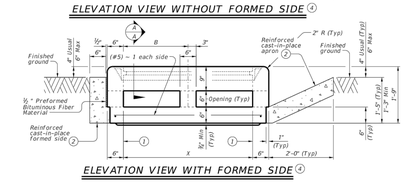


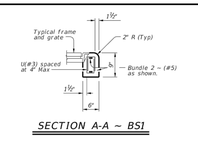
PLAN VIEW ~ STYLE 'FG'



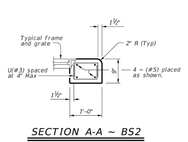
ELEVATION VIEW WITHOUT FORMED SIDE



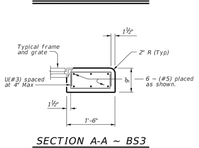
ELEVATION VIEW WITH FORMED SIDE



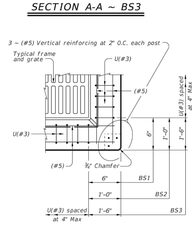
SECTION A-A ~ BS1



SECTION A-A ~ BS2



SECTION A-A ~ BS3

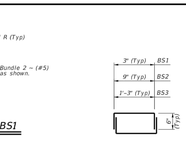


TYPICAL CORNER REINFORCING PLAN DETAIL

Showing BS2 other beam sections similar.

Style	Size (X x Y)	A x A*	B x B	Beam Section
FG	3'x3'	3'x3'	1.5'x1.5'	BS1
FG	4'x4'	3'x3'	2'x2'	BS2
FG	4'x4'	4'x4'	2'x2'	BS1
FG	5'x5'	3'x3'	2.5'x2.5'	BS3
FG	5'x5'	4'x4'	2.5'x2.5'	BS2

* Nominal frame/grate size.



BARS U (#3)
Showing one complete bar.

(1) Matches inside face of wall of precast base or riser below inlet.
(2) Construct cast-in-place reinforced concrete with or without formed side. Place formed side/sides as directed elsewhere in the plans. Formed sides may only be used on sides parallel to traffic. Use Class "C" concrete. Apron and formed side reinforcing not shown for clarity. Apron and formed side are subsidiary to PAZD-CZ. Apron is 2'-0" width around precast zone drain, unless an optional formed side is used. For apron and formed side, provide (#4) reinforcing at 12" O.C.
(3) Top slab reinforcing not shown for clarity.
(4) Top slab reinforcing and post reinforcing not shown for clarity.

FABRICATION NOTES:
1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide clear cover of ½" to reinforcing from bottom of slab and 2" to reinforcing from top of slab for structural reinforcement.
4. Provide 1 ½" end cover on (#5) reinforcing.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:
1. Precast Area Zone Drain within Clear Zone (PAZD-CZ) is for use in ditches and medians outside and inside of the horizontal clearance (clear zone). PAZD-CZ is never placed in the roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ¼ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:
1. Designed according to ASTM C913.
2. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

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PRECAST AREA ZONE DRAIN WITHIN CLEAR ZONE

PAZD-CZ

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FILENAME: TxDOT DETAILS.dwg
PLOTTED By: Alison Adsuna
PLOTTED ON: Wednesday, April 14, 2021
PLOTTED AT: 3:49:53 PM

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MIDLAND, TEXAS

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6/14/2021
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JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

DA PROJECT
B006225.001

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TxDOT BOX CULVERT DETAILS

SHEET
8

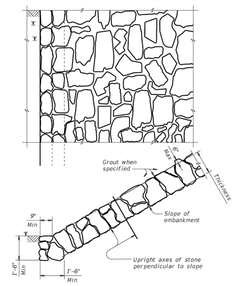


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

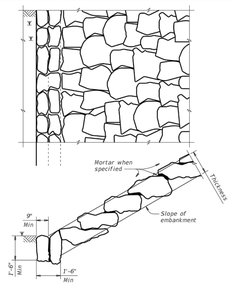


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

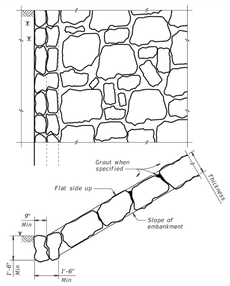


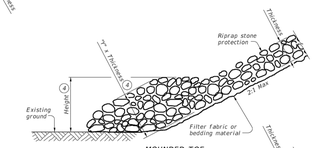
FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

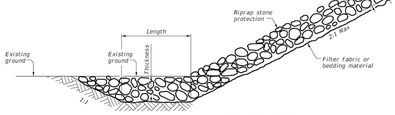
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(4) "H" and Height need to be defined. See layout or detail sheet for values if this option is used.

(5) List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

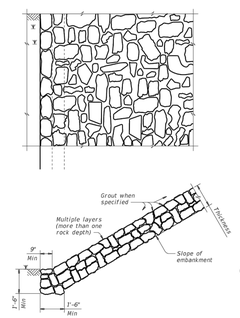


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

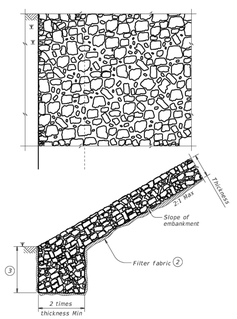


FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

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SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

STONE RIPRAP

SRR

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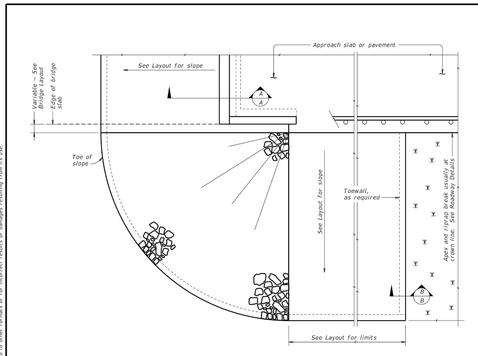
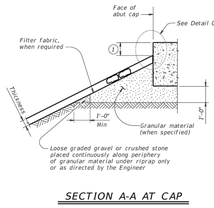
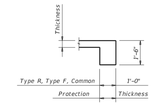


PLAN

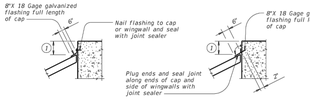


SECTION A-A AT CAP



SECTION B-B

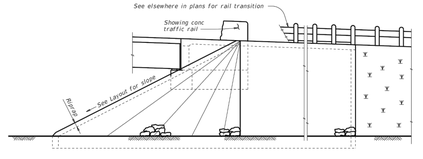
Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C



ELEVATION

GENERAL NOTES:
- Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
- See elsewhere in plans for locations and details of shoulder drains.

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

STONE RIPRAP

SRR

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MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A | VERT N/A
DATE: JUNE 2021

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6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
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MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

TxDOT RIPRAP DETAILS

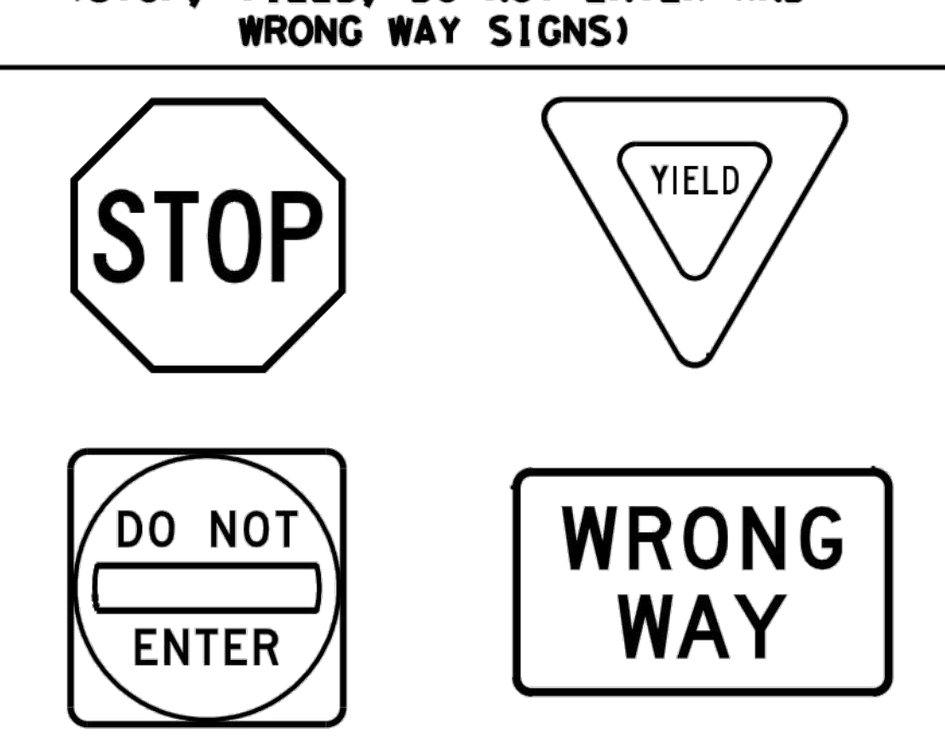
DA PROJECT B006225.001

SHEET 9

FULL PATH: G:\Production\4000\006200\620251001\Civil\Drawings\Plot Sheets\TxDOT DETAILS.dwg

FILENAME: TxDOT DETAILS.dwg
PLOTTED BY: Allison Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 3:50:09 PM

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

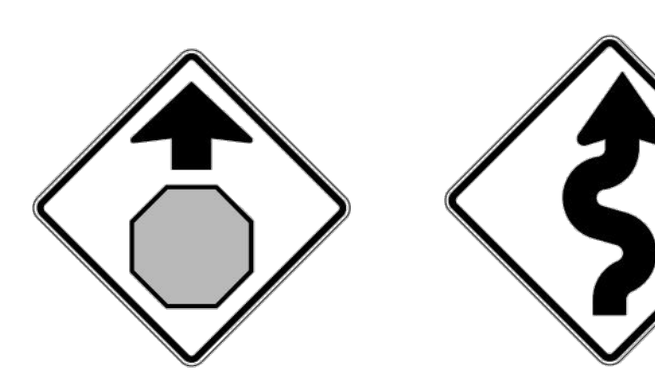
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
http://www.txdot.gov/

Texas Department of Transportation — Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT
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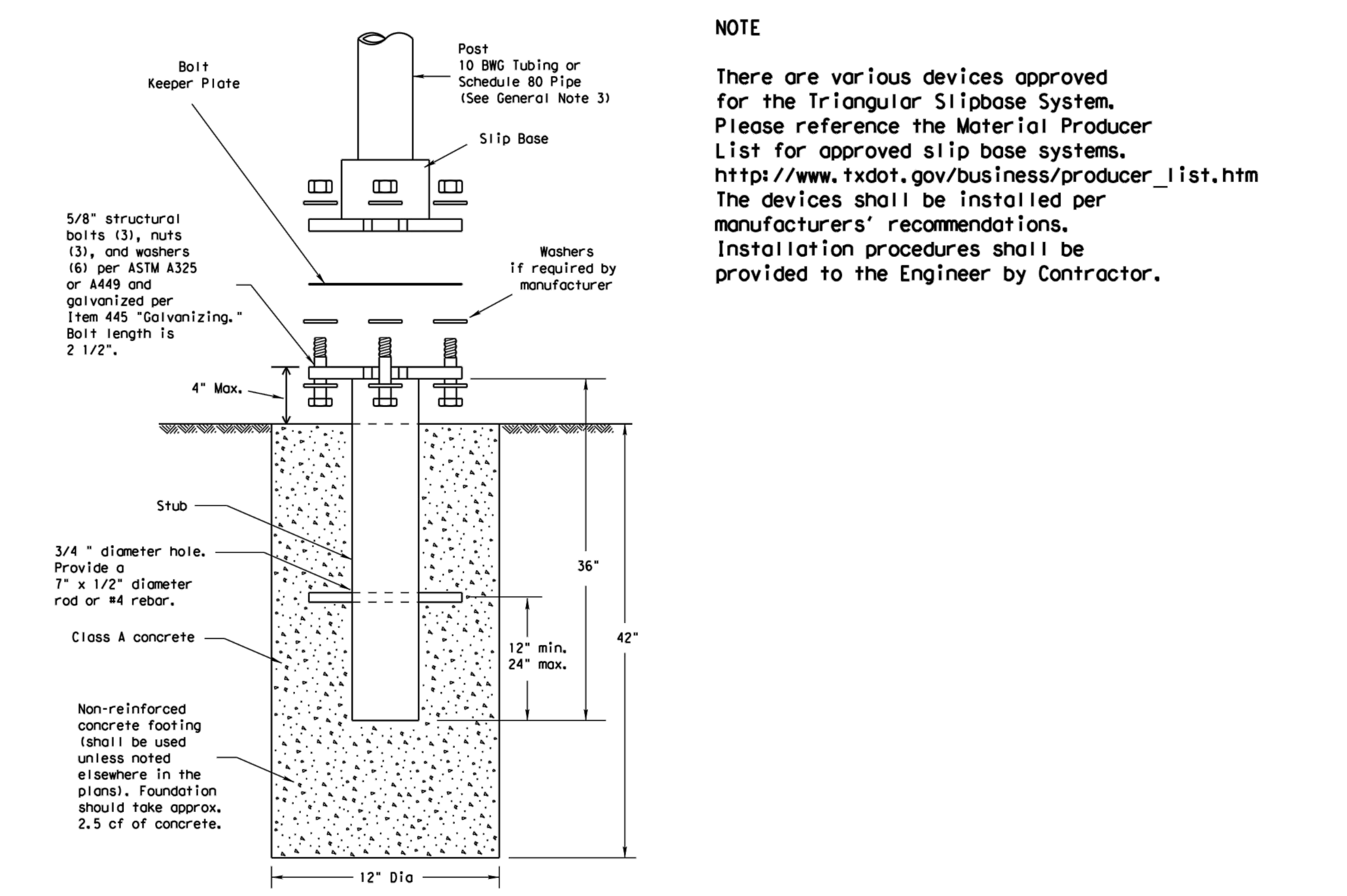
REVISIONS 12-03 7-13 9-08 | DIST | COUNTY | SHEET NO.

4

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

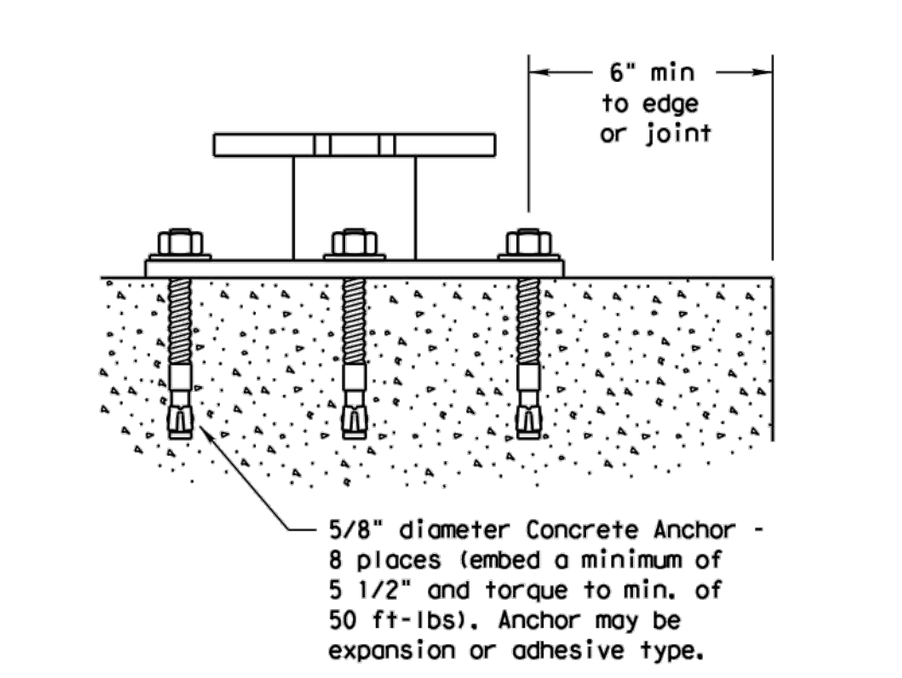
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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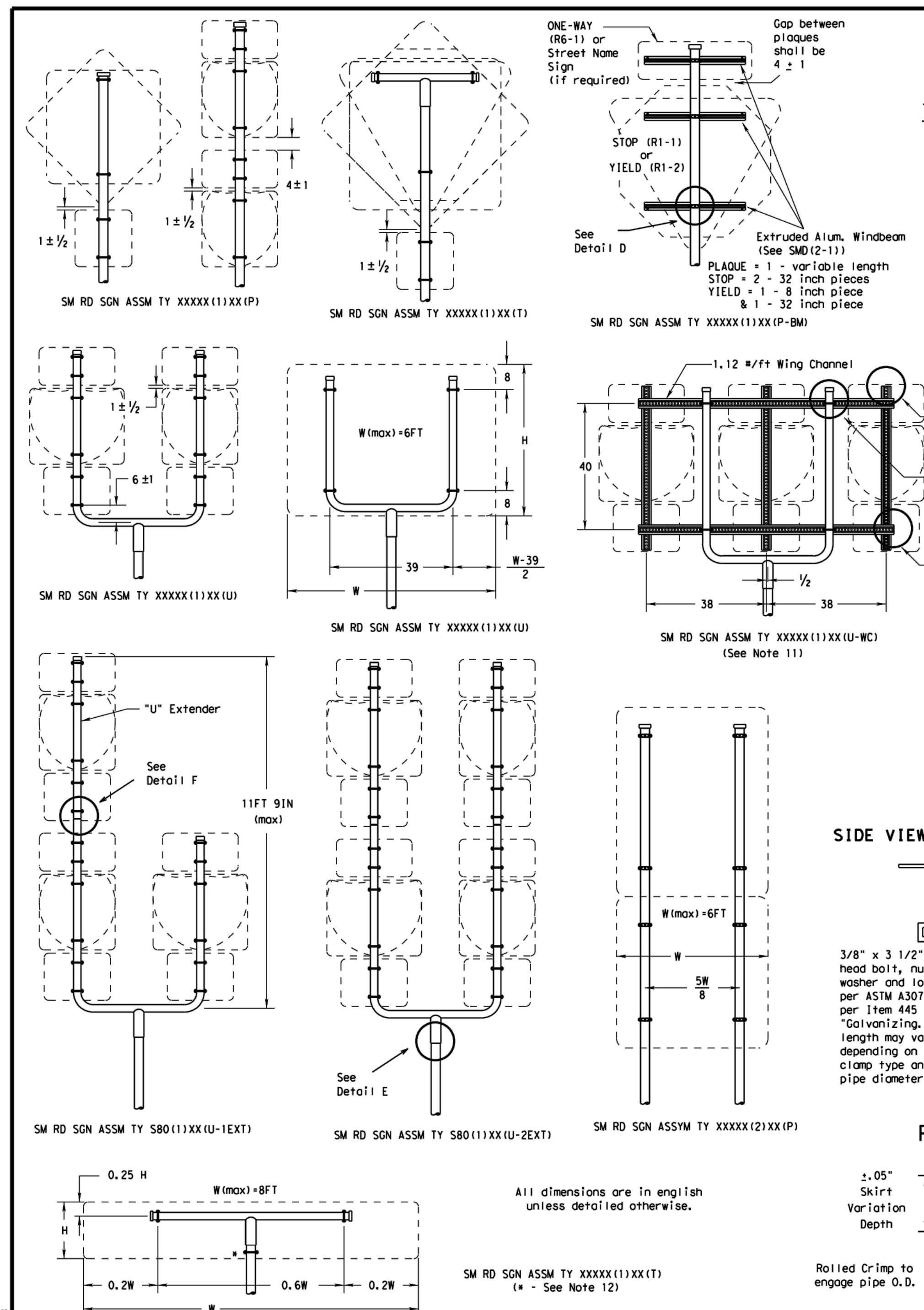
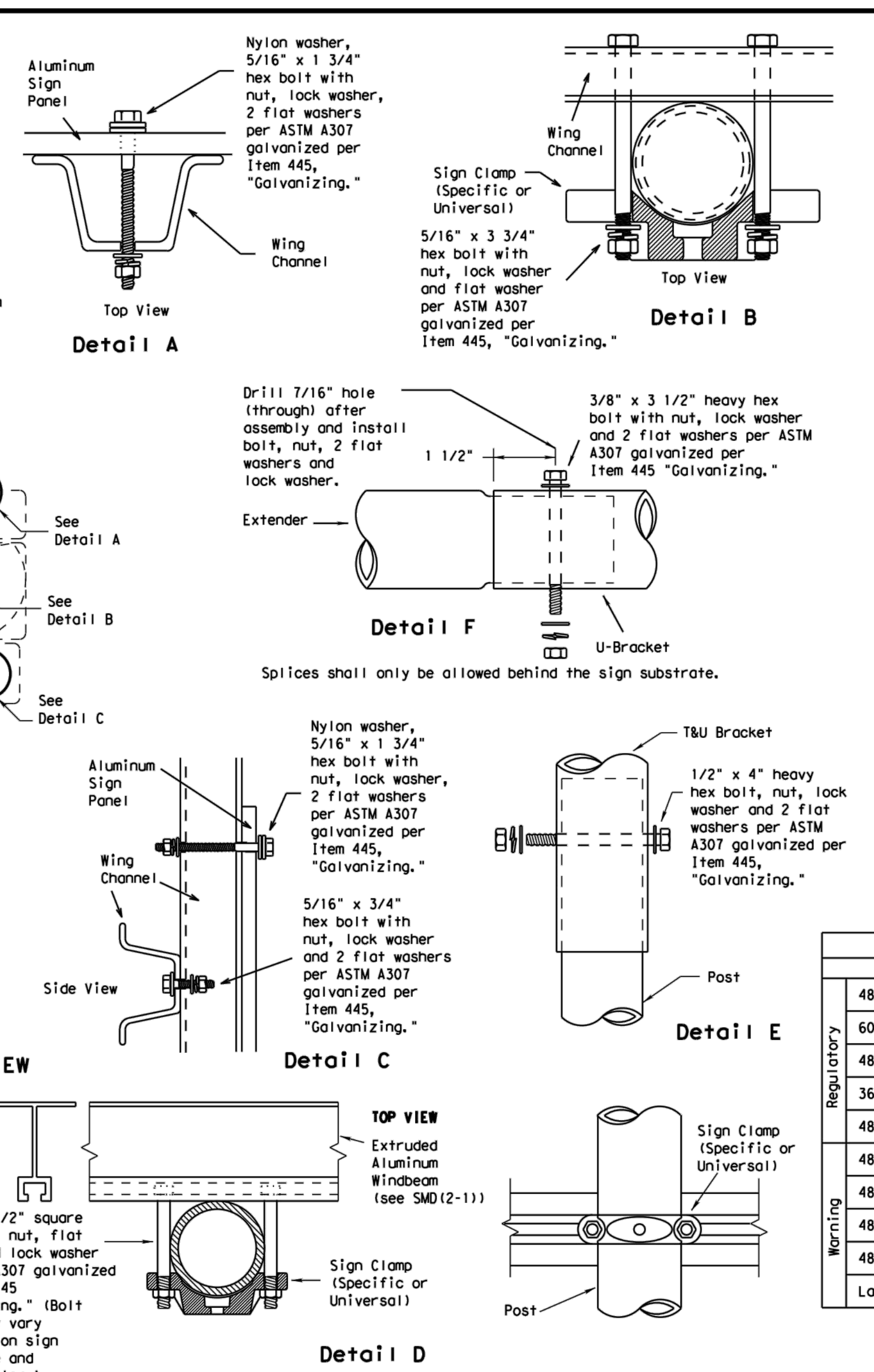


All dimensions are in english unless detailed otherwise.



GENERAL NOTES:

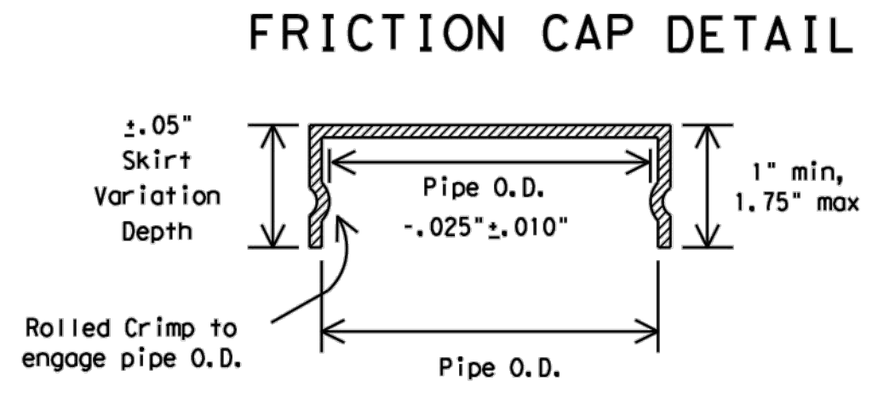
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Regulatory	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
Warning	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
Warning	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Warning	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

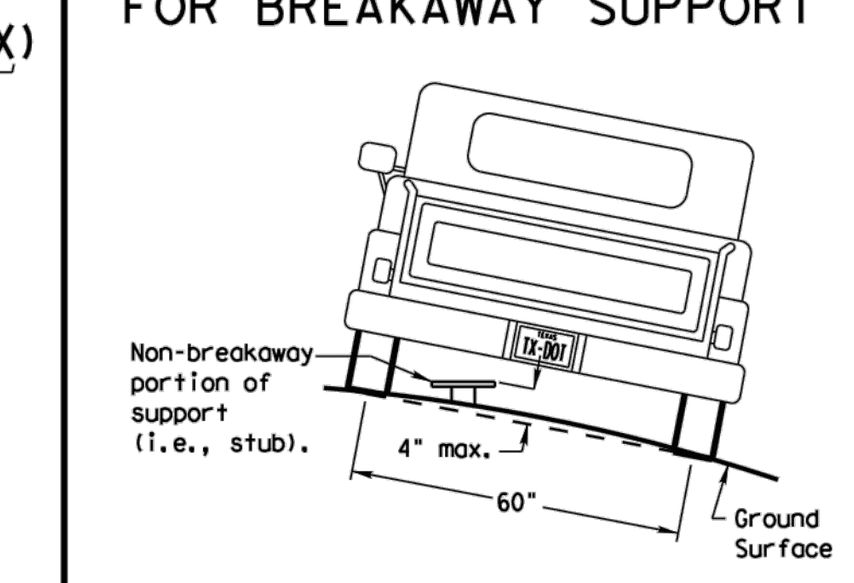
Post Type
FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

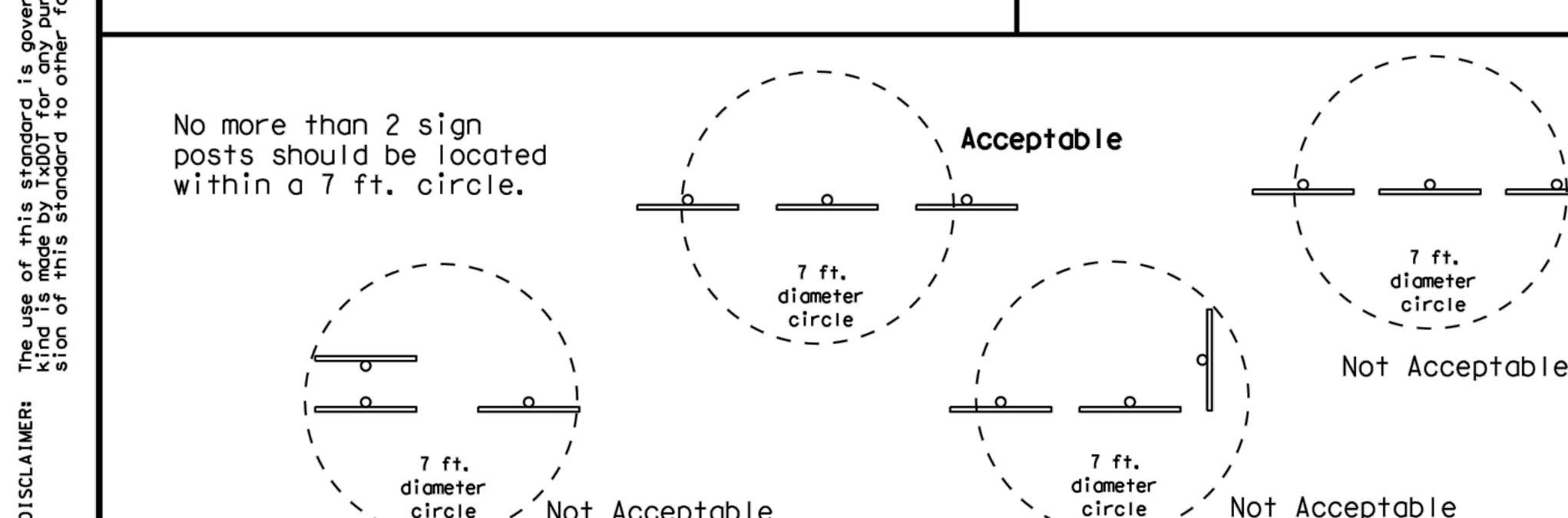
Anchor Type
UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

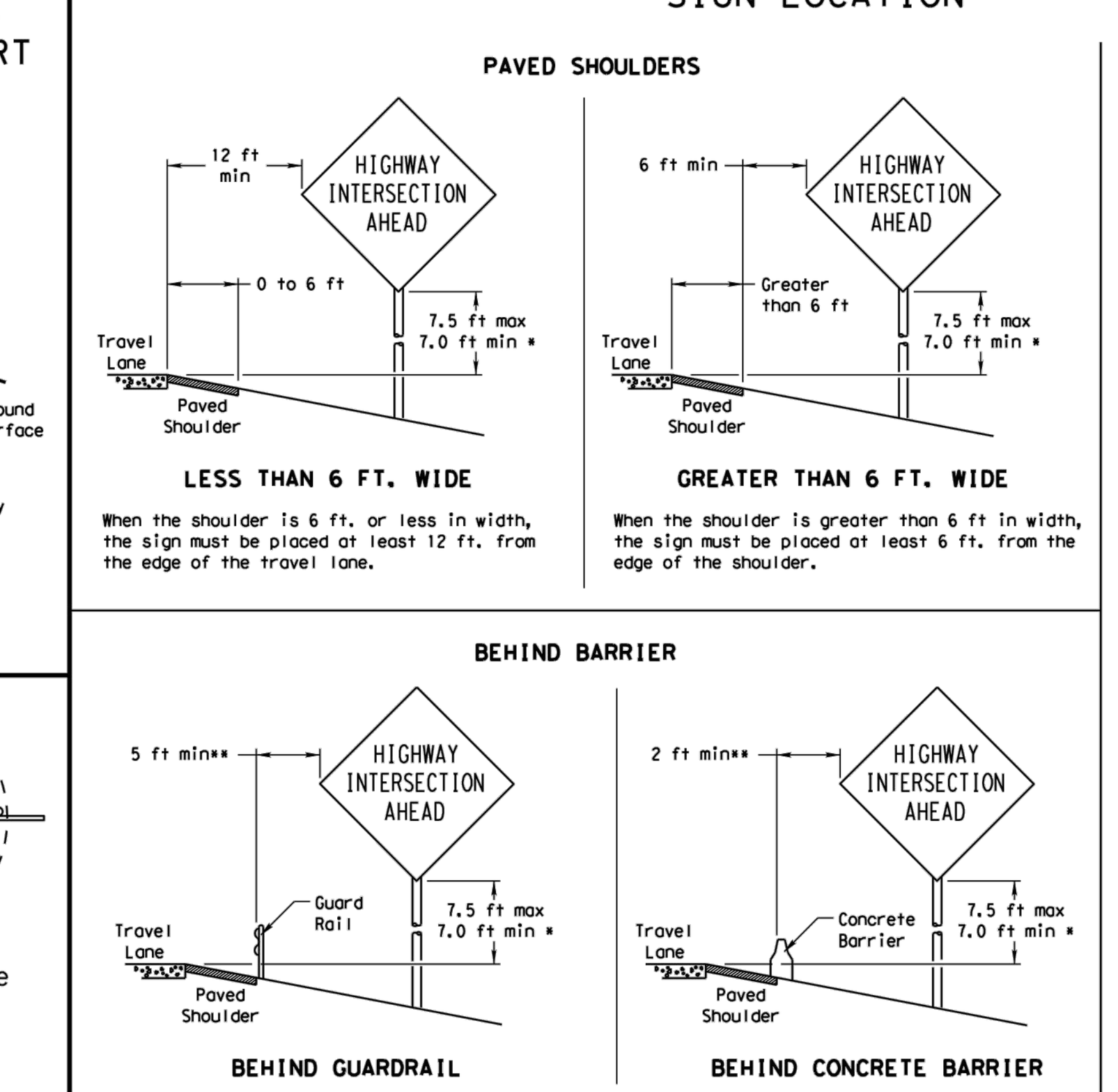
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).



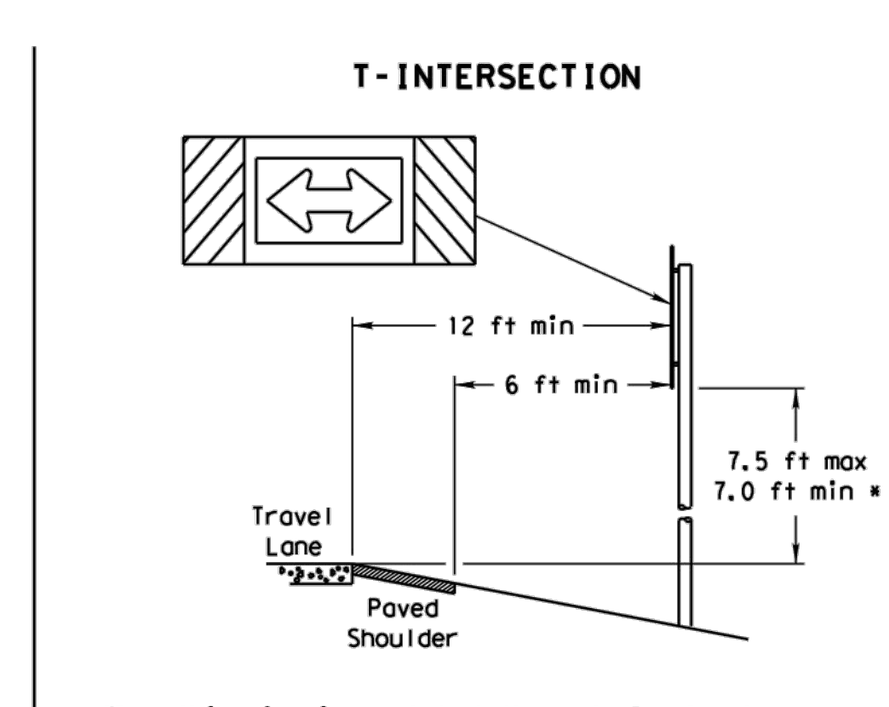
SIGN LOCATION



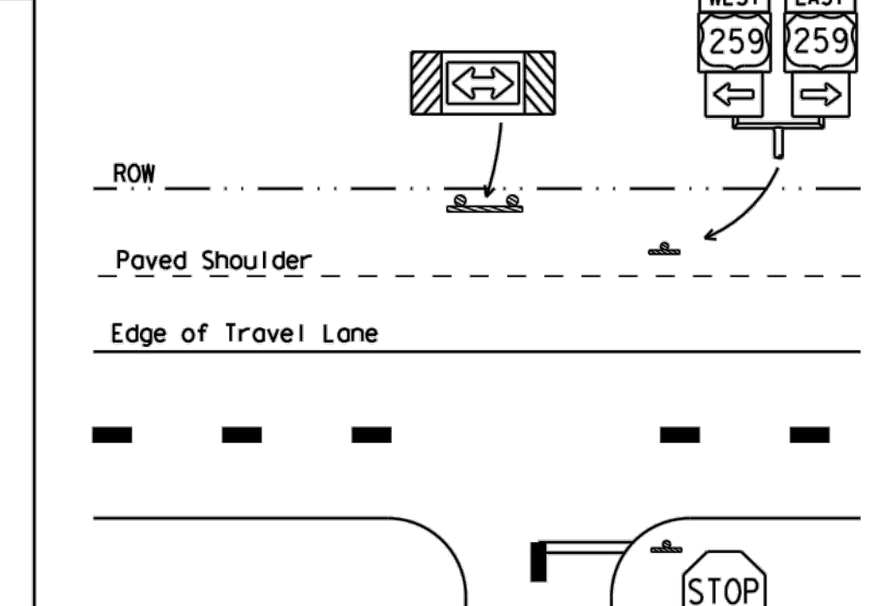
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



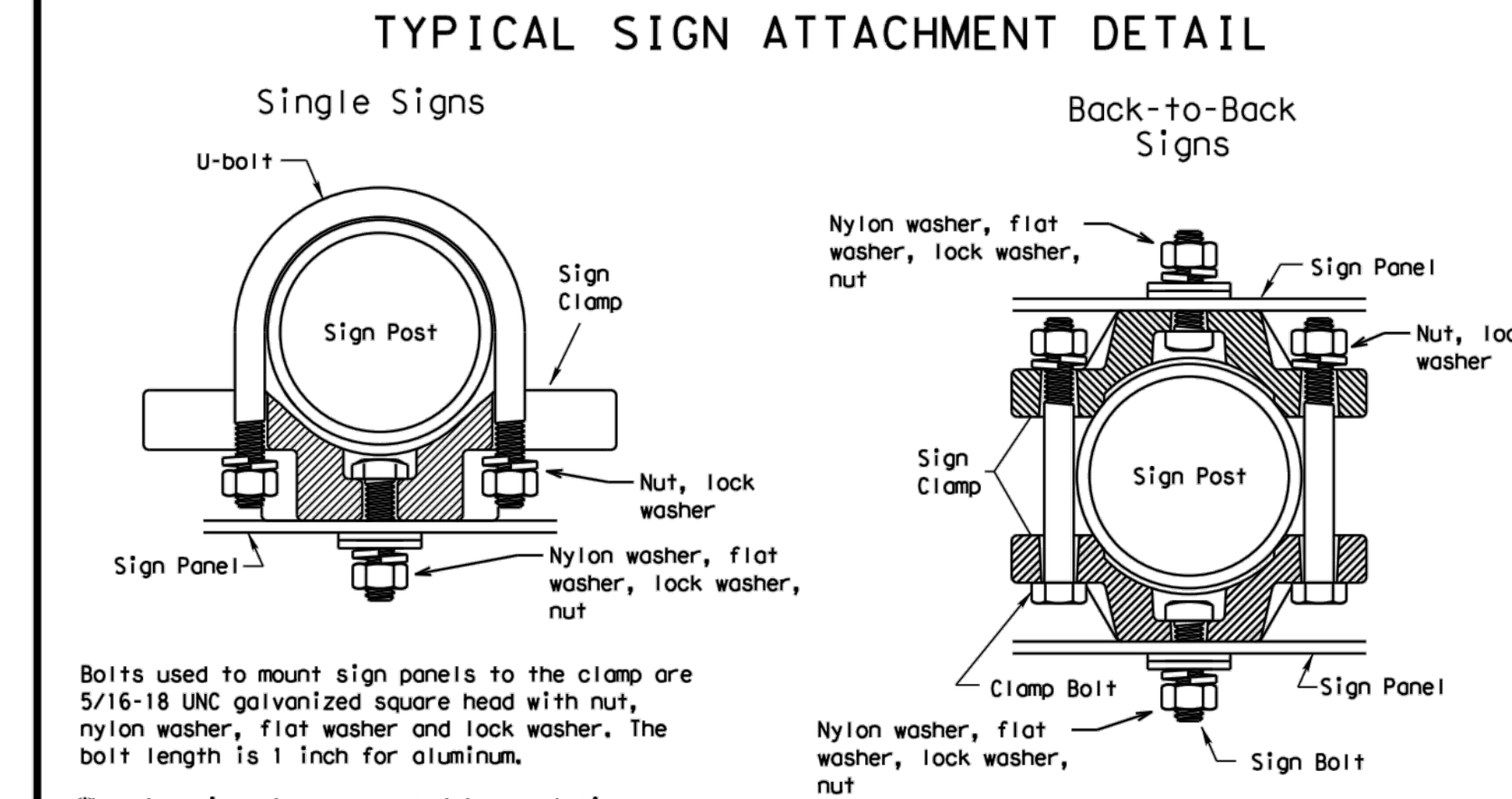
* Signs shall be mounted using the following condition that results in the greatest sign elevation:
  (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
  (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

TYPICAL SIGN ATTACHMENT DETAIL

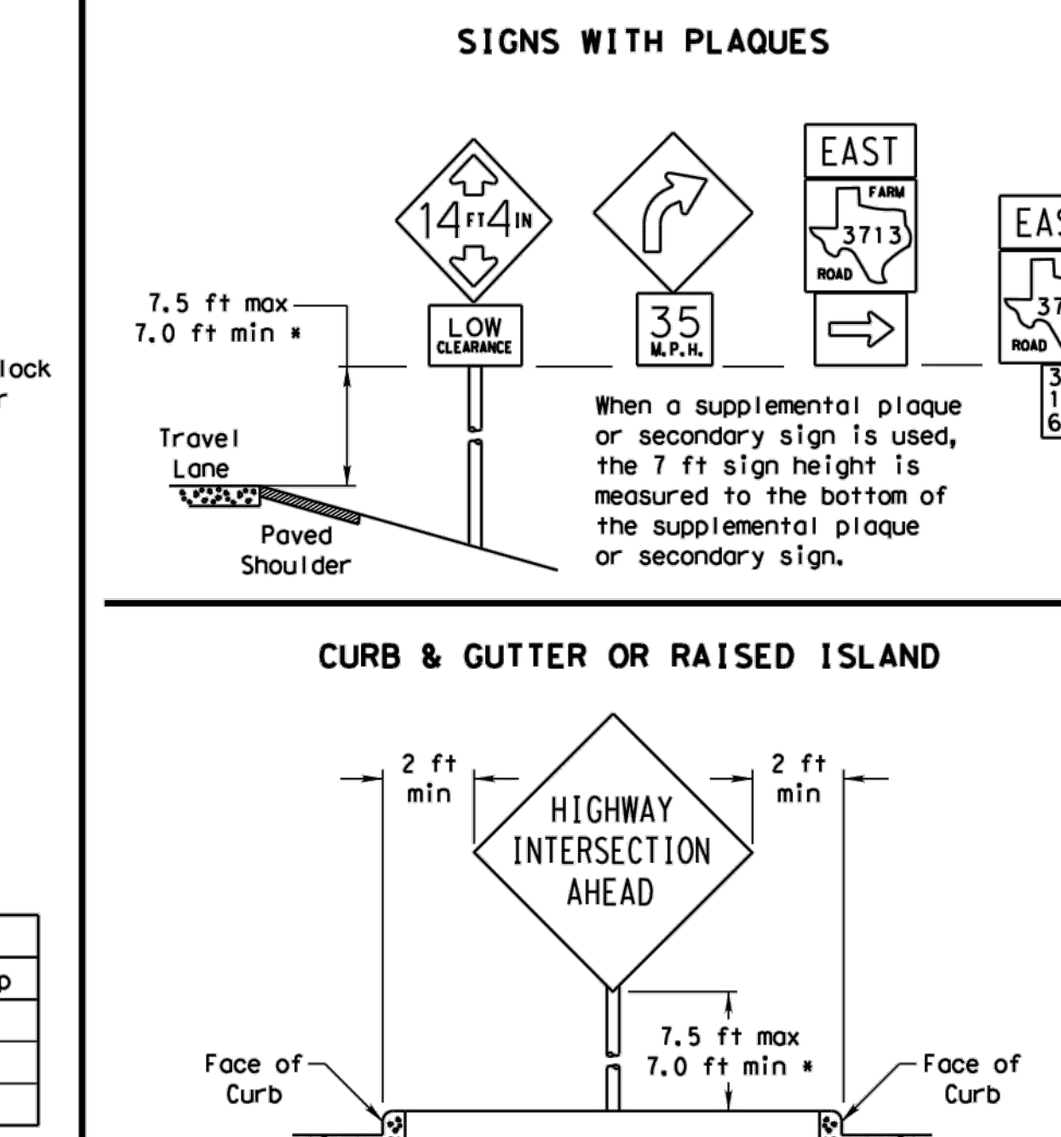


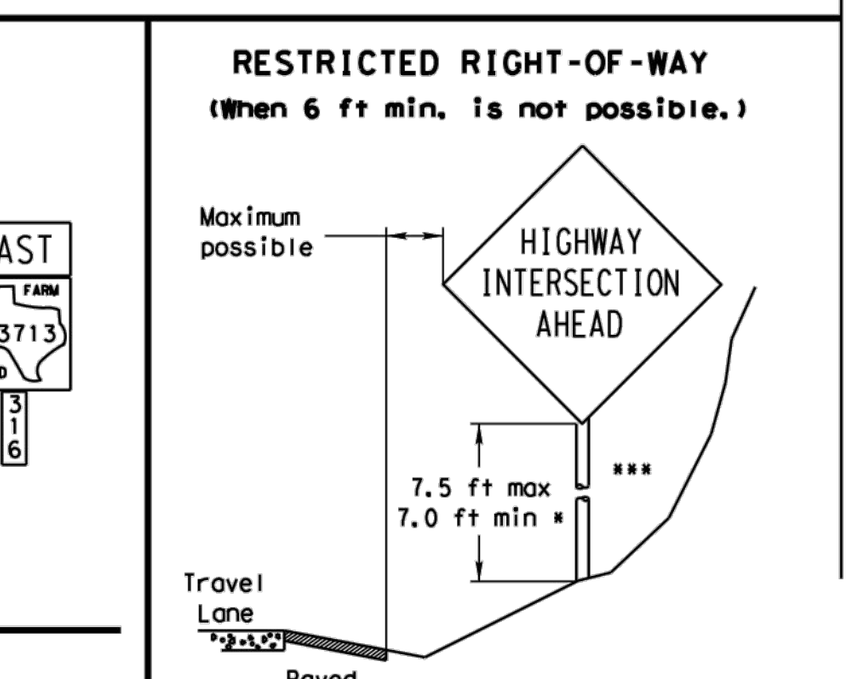
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"





Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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FILENAME: TxDOT DETAILS.dwg
PLOTTED BY: Allison Aldana
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 3:50:29 PM

NO.	REVISION	BY	DATE

TxDOT
DESIGNED: JLB
DRAWN: JLB
CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A, VERT N/A
DATE: JUNE 2021

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6/14/2021
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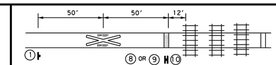
MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

TxDOT SIGNAGE DETAILS

DA PROJECT B006225.001
SHEET 10

NOTES
1. Stop or yield sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.

PASSIVE CROSSING

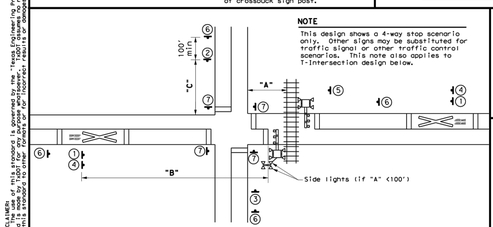


NOTES
1. A shared use pathway is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller sign sizes preferred than shown to the right on this sheet.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

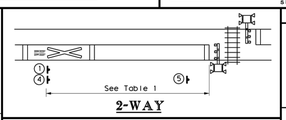
GENERAL NOTES
1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (if more than 1 tracks), and EMERGENCY NOTIFICATION (1-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per Sect. 2C.05 of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



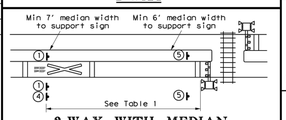
NOTE
This design shows a 4-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-intersection design below.

	"A" <100'	"A" ≥100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

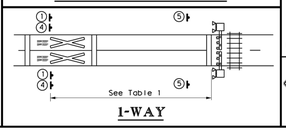
GRADE CROSSING NEAR A PARALLEL STREET



2-WAY

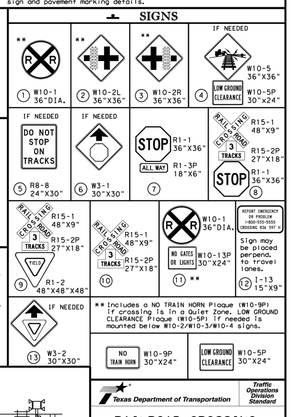


2-WAY WITH MEDIAN

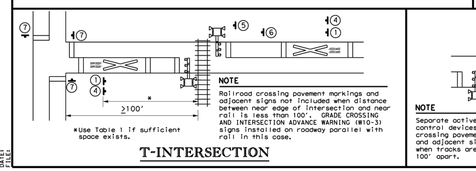


1-WAY

SIGNS

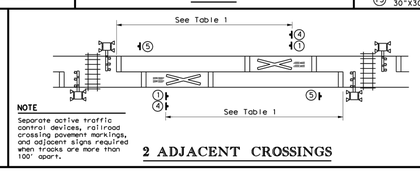


** Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.



NOTE
Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE
Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

2 ADJACENT CROSSINGS

Texas Department of Transportation — Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-16

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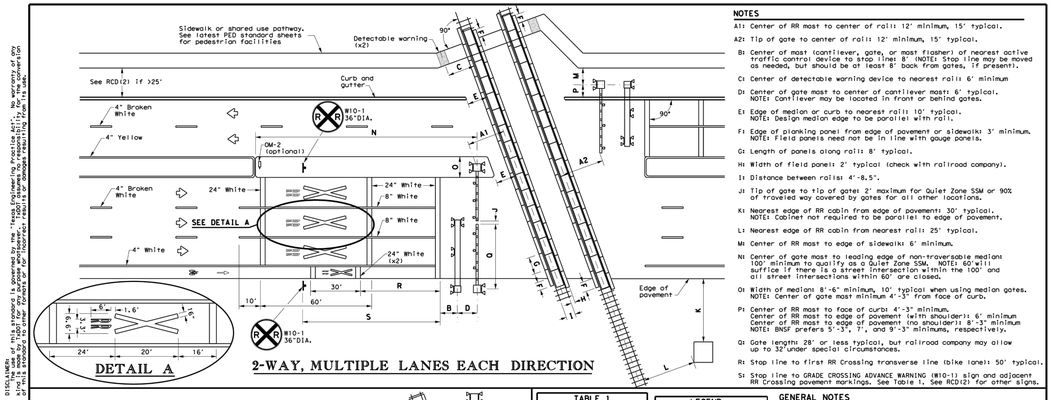


NOTES
A1: Center of RR mast to center of rail: 12' minimum, 15' typical.
A2: Tip of gate to center of rail: 12' minimum, 15' typical.
B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).
C: Center of detectable warning device to nearest rail: 6' minimum
D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.
E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.
F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.
G: Length of panels along rail: 8' typical.
H: Width of field panel: 2' typical (check with railroad company).
I: Distance between rails: 4'-8.5".
J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.
K: Nearest edge of RR cabin from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.
L: Nearest edge of RR cabin from nearest rail: 25' typical.
M: Center of RR mast to edge of sidewalk: 6' minimum.
N: Center of gate mast to leading edge of non-traversable medians 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60' will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.
O: Width of medians: 8'-6' minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.
P: Center of RR mast to face of curb: 4'-3" minimum. Center of RR mast to edge of pavement (with shoulder): 6' minimum Center of RR mast to edge of pavement (no shoulder): 8'-3" minimum NOTE: BNSF prefers 5'-3", 7', and 9'-3" minimums, respectively.
Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.
R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.
S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings, See Table 1, See RCD(2) for other signs.

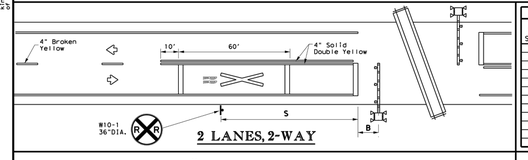
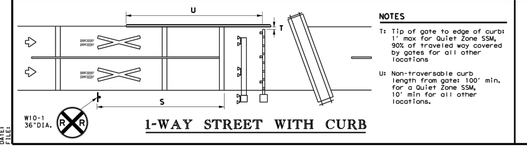


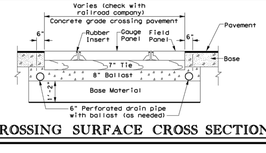
TABLE 1	
Approach Speed(mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
A B A	Gate Assembly
A P	Mast Flasher Pair

GENERAL NOTES
1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



NOTES
T: Tip of gate to edge of curb: 1' max for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations
U: Non-traversable curb length from gates: 100' min. for a Quiet Zone SSM, 10' min for all other locations.



Texas Department of Transportation — Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT

RCD(1)-16

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MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ N/A
VERT N/A
DATE JUNE 2021

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4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

TxDOT RAILROAD CROSSING DETAILS

DA PROJECT B006225.001
SHEET 11

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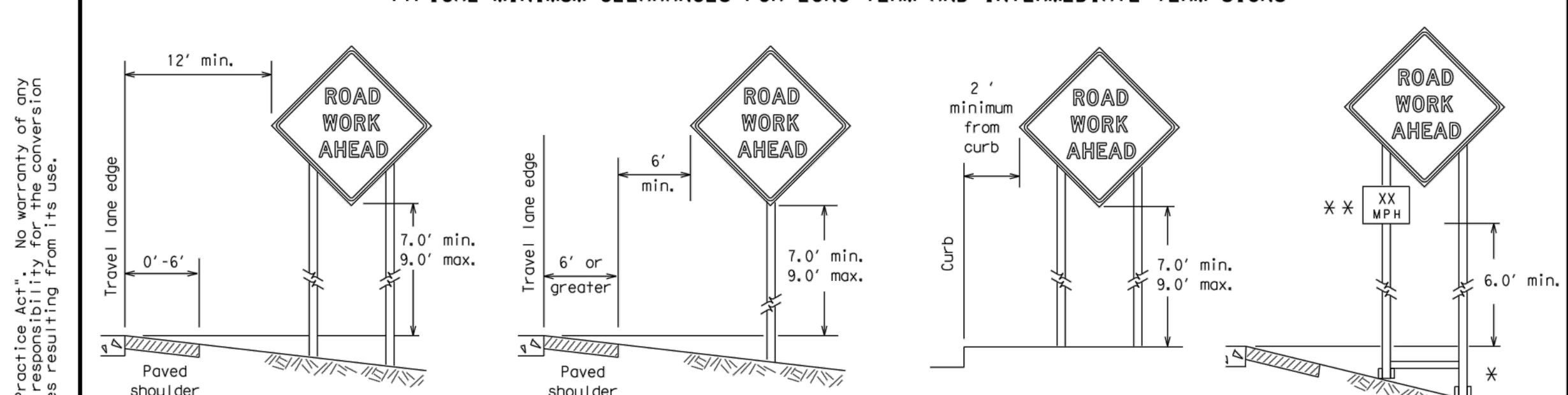
FILENAME: TxDOT DETAILS.dwg
PLOTTED BY: Allison Adkins
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 3:26:43 PM

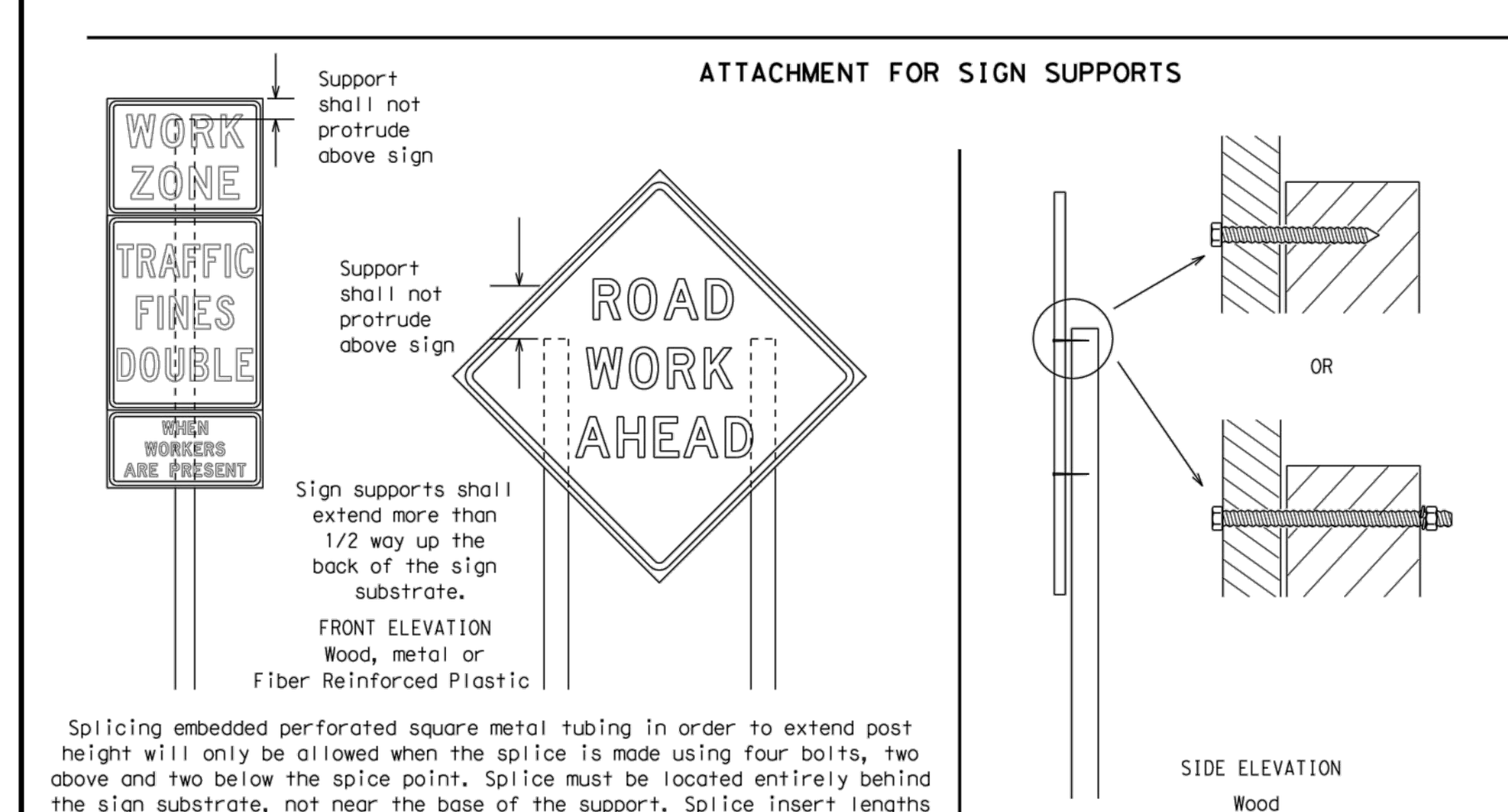
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



✱ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

✱✱ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



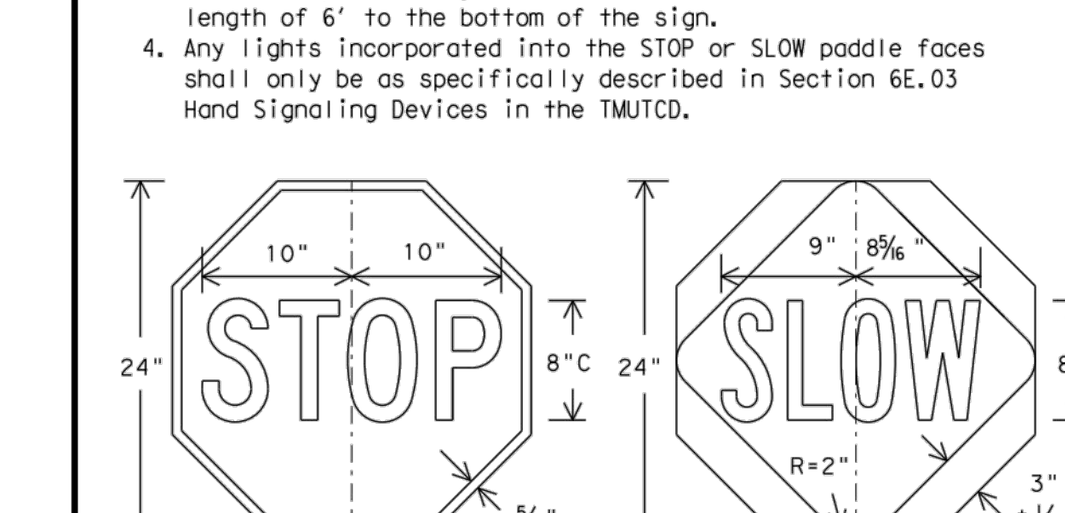
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

SHEET 4 OF 12

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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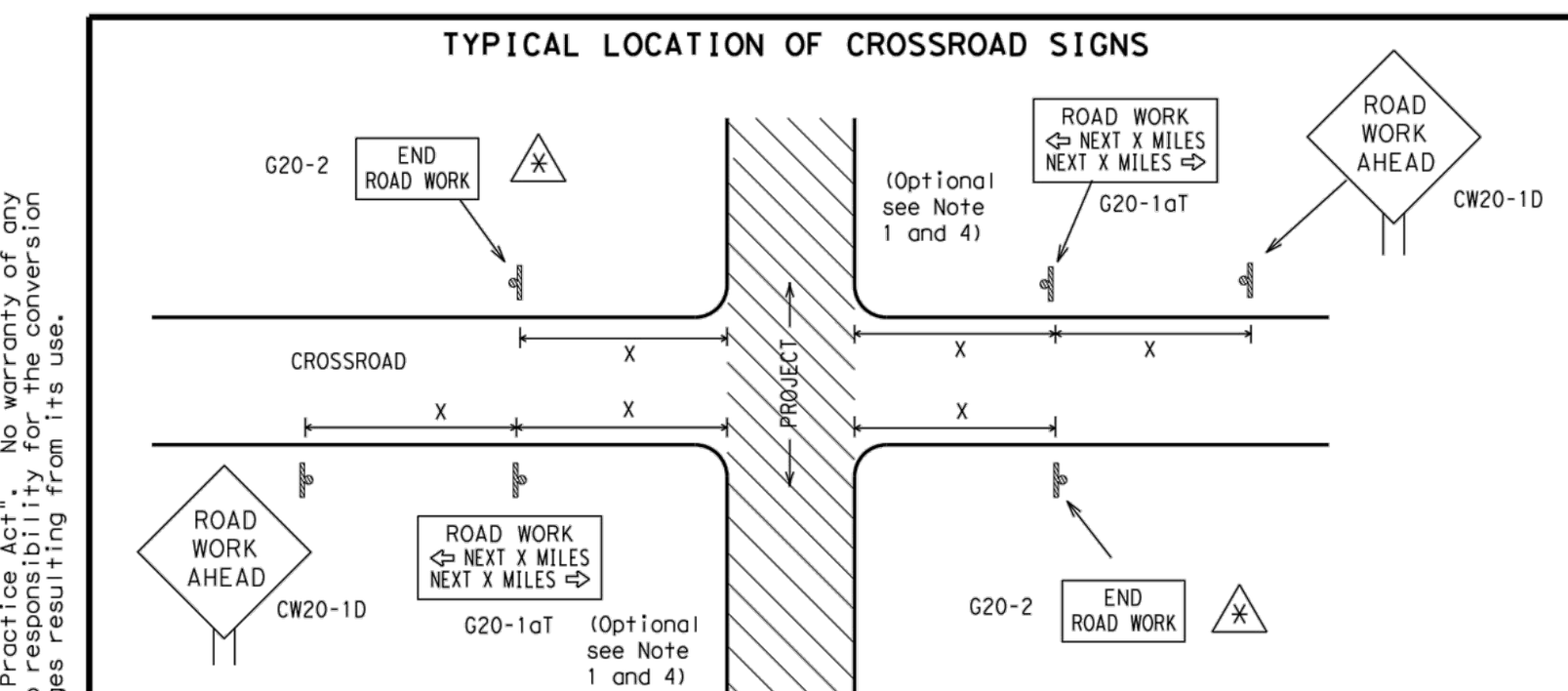
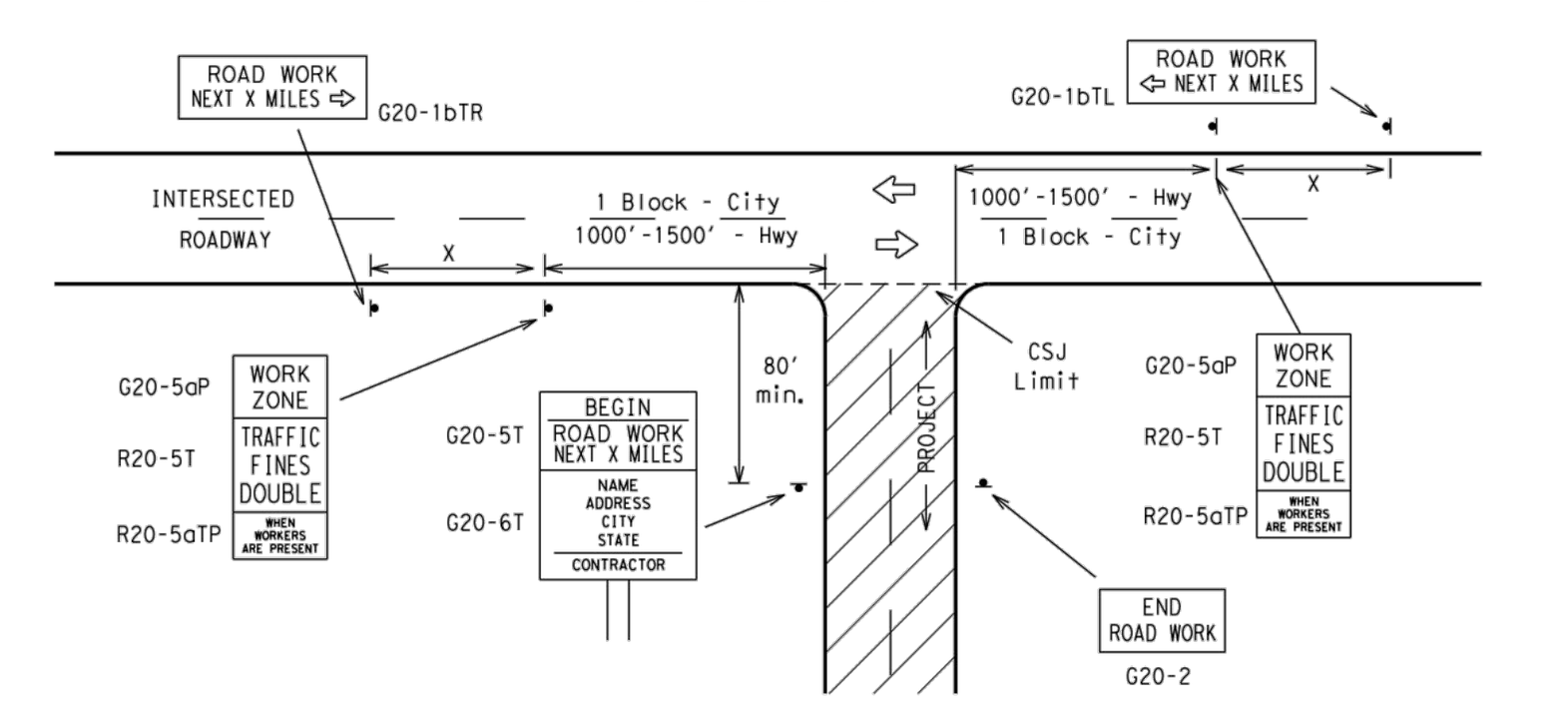
TYPICAL LOCATION OF CROSSROAD SIGNS



✱ May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign Spacing "X" △
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
✱	✱[3]

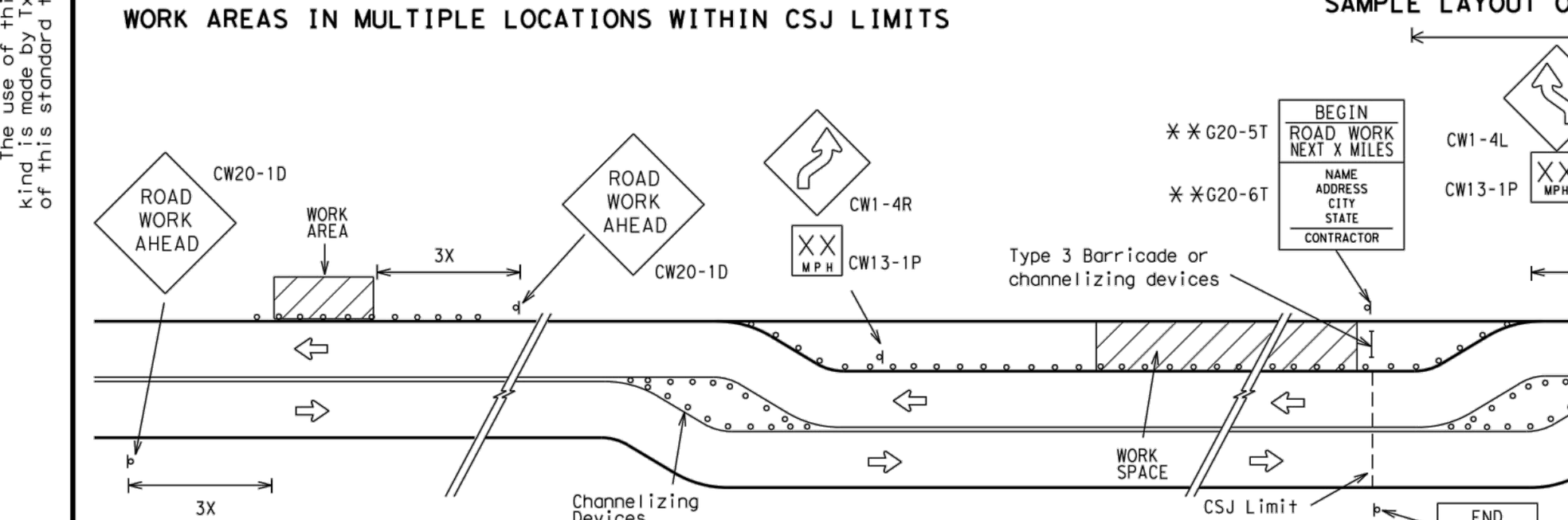
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

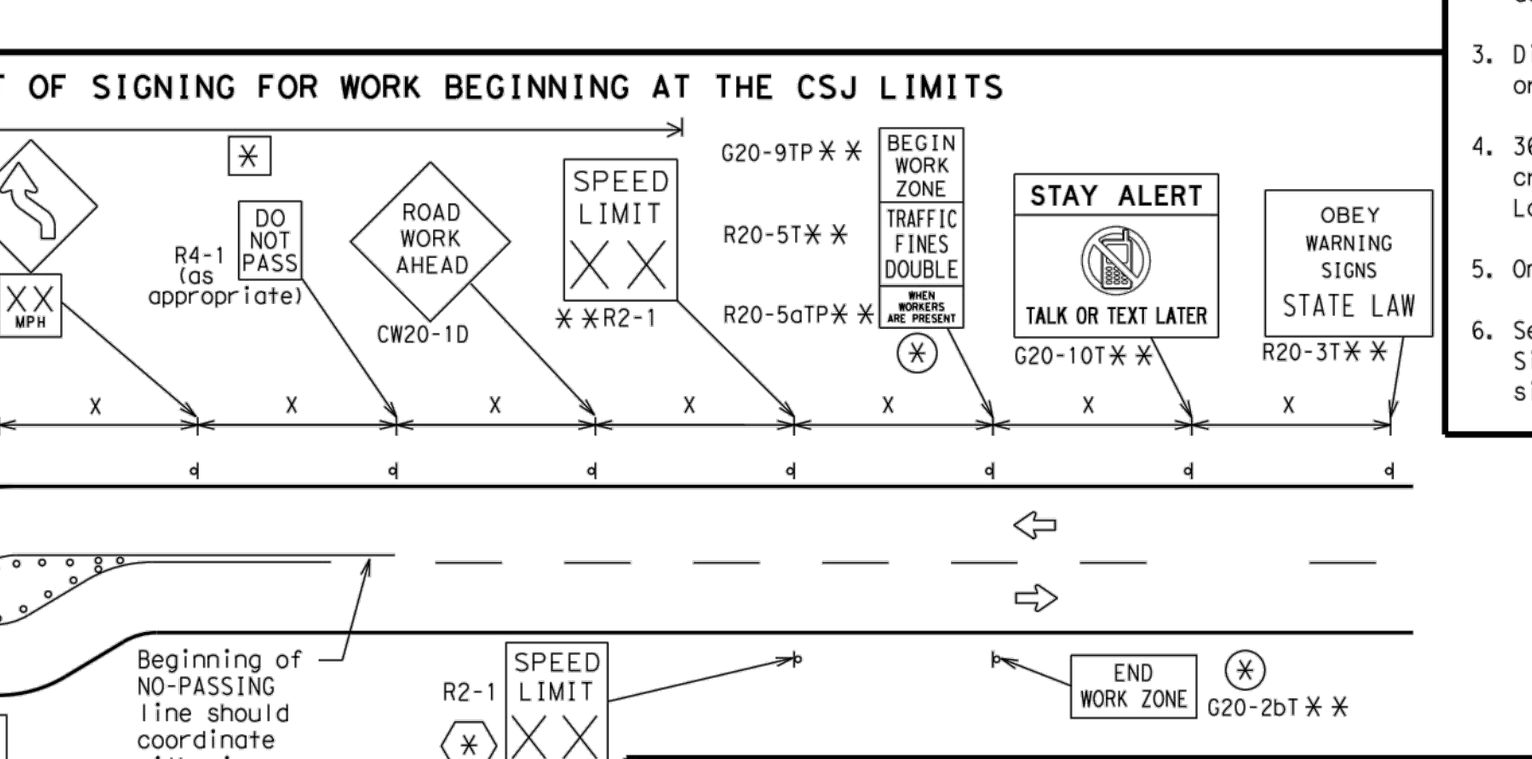
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



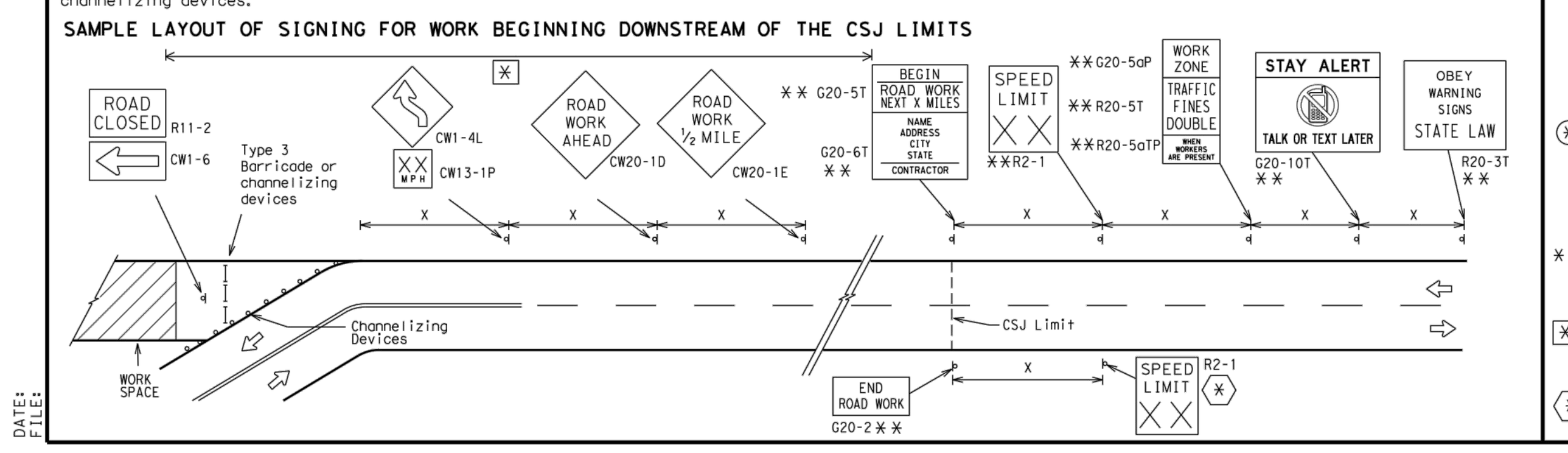
When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



LEGEND	
⊢⊣	Type 3 Barricade
○○○	Channelizing Devices
⊥	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

⊛ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

✱✱ Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

⊠ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

⊛ Contractor will install a regulatory speed limit sign at the end of the work zone.

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Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

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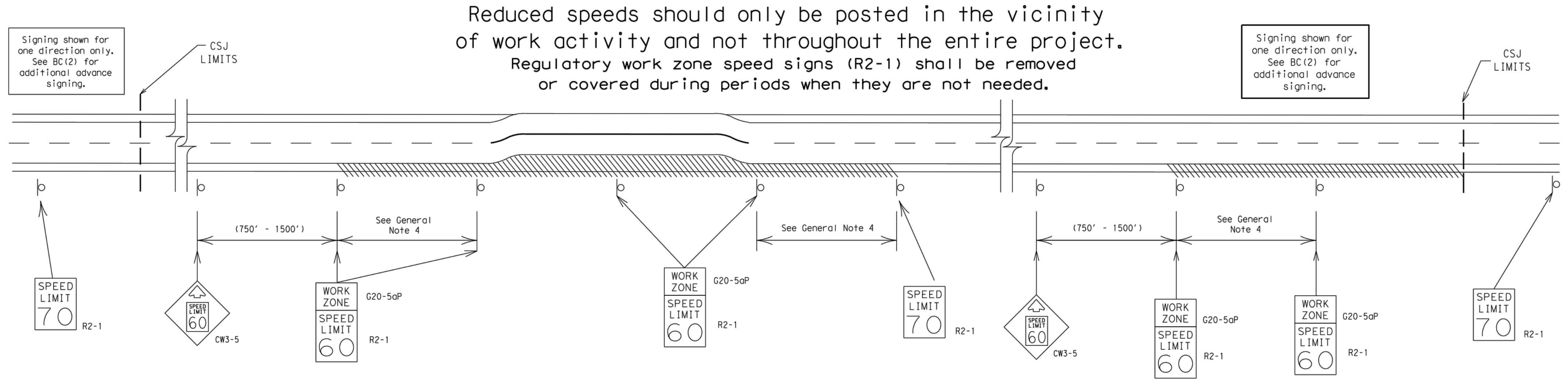
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.
Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered. (See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater — 0.2 to 2 miles
   35 mph and less — 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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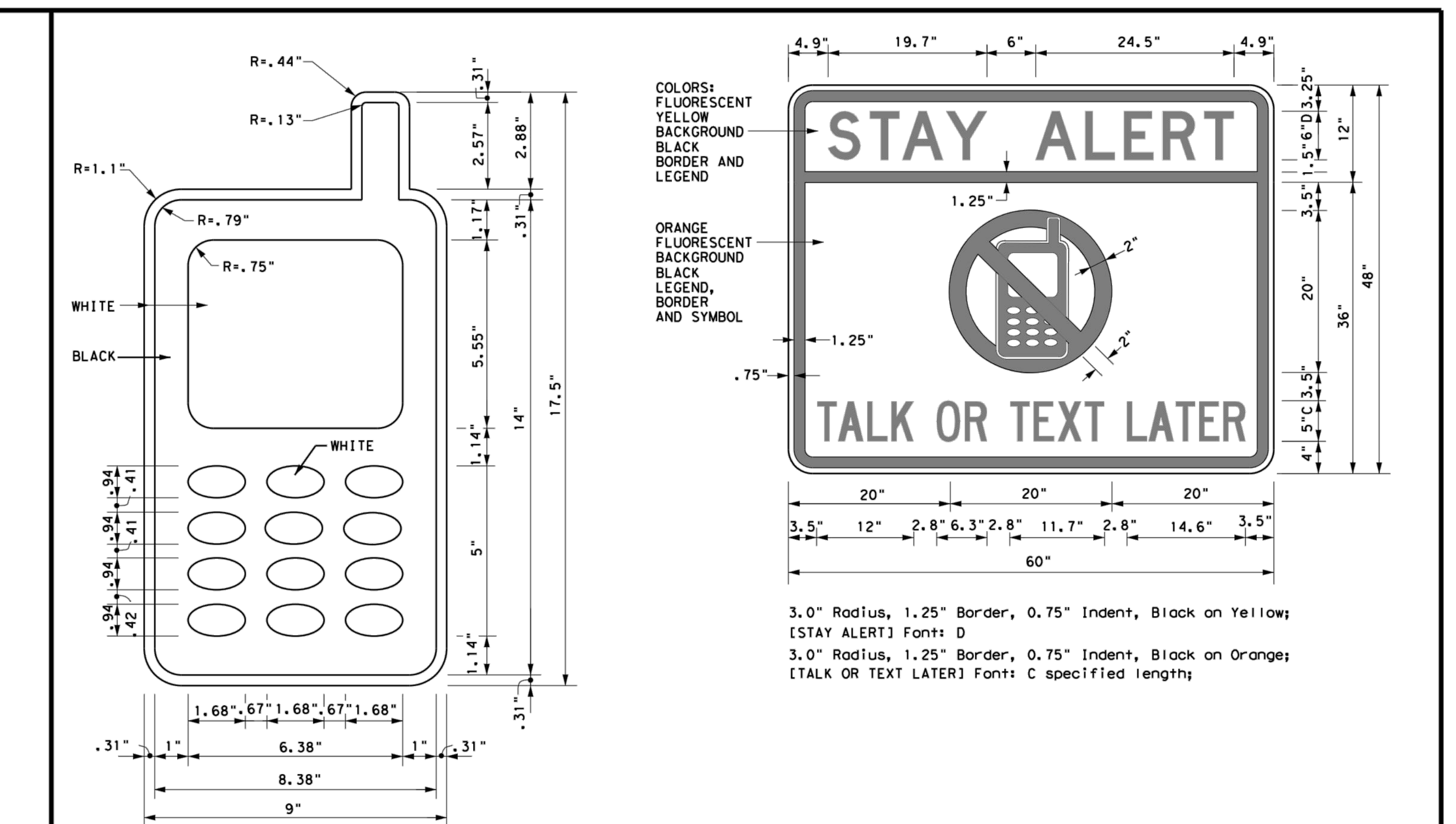
BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY APPAREL NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.



SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

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Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

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JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A; VERT N/A
DATE: JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TxDOT TRAFFIC CONTROL DETAILS
1 OF 3

DA PROJECT B006225.001
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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

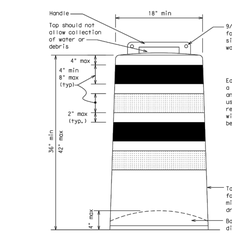
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any horizontal unmarked space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials". Tapes are reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be a wide-angle prismatic type with a smooth drum surface finish that, conforms to contours, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

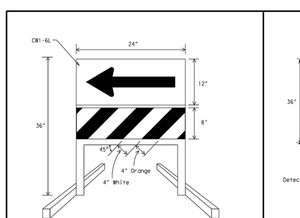
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three bandbags separate from the base, or in bags built into the plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.



Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Materials", unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the 89 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (min)nut and nuts, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers, and in other areas. Signs used in these locations they may be placed on every drum or spaced not more than one drum spacing apart. A minimum of three (3) should be used at each location called for in the plans.
8. 89-9, 89-10, 89-11 and 89-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.



DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used to direct the flow of driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.

DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging are satisfactory to delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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DATE:
USER:

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, that can be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway. I.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or line interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at daylight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds and/or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase messages i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "danger" in messages.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height shall be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will prevent the used to report when that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy Vehicle	HOV
Highway	HWY
Hour(s)	HR(S), HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	L
Left Lane	LEFT LN
Lane Closed	LANE CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Route	RTE
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Weekend	WKEND, WEEKEND
Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED	*	*	

* LANES SHIFT In Phase 1 must be used with STAY IN LANE In Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX- XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	RIGHT X LANES TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	LOOSE GRAVEL XXXX FT	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	DETOUR X MILE	US XXX TO FM XXXX	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP	ROADWORK PAST SH XXXX	USE CAUTION	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE	BUMP XXXX FT	DRIVE SAFELY	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS	TRAFFIC SIGNAL XXXX FT	DRIVE WITH CARE	TONIGHT XX PM- XX AM
STAY IN LANE *	*	LANES SHIFT *		

* See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used, in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, with each phase displayed for 4 seconds.
6. Messages should be changed at least every 24 hours. Any of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week or 10 to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH for abbreviations E, W, N and SI can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

SHEET 6 OF 12

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

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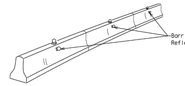
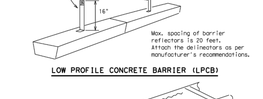
PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(11).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cast of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edge line being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or similar reflective raised pavement marker tabs shall NOT be used as CTB delineators.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

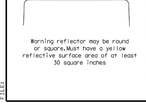
BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

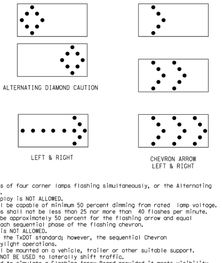
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area lone-sided of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type B_{FL}.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron. The sequential arrow display is NOT ALLOWED.
9. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
10. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
11. The Flashing Arrow Board shall be visible from a distance of 1/2 mile.
12. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
13. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

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Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-14

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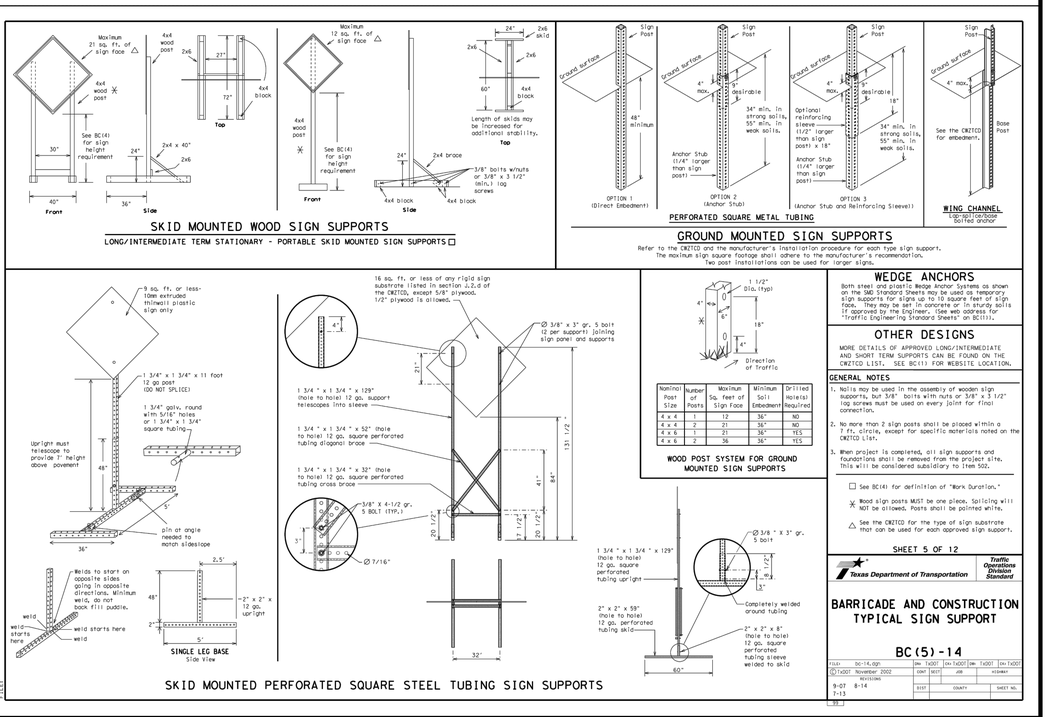
TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) and/or the MASH "Manual Assessing Safety Hardware" (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in stable soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(11).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUNDS ON THE CWZTCD LIST. SEE BC(11) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

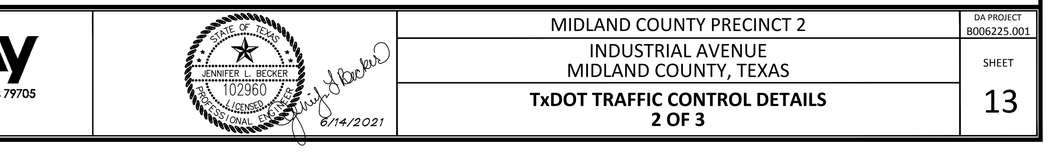
☐ See BC(4) for definition of "Work Duration."

※ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be palmed white.

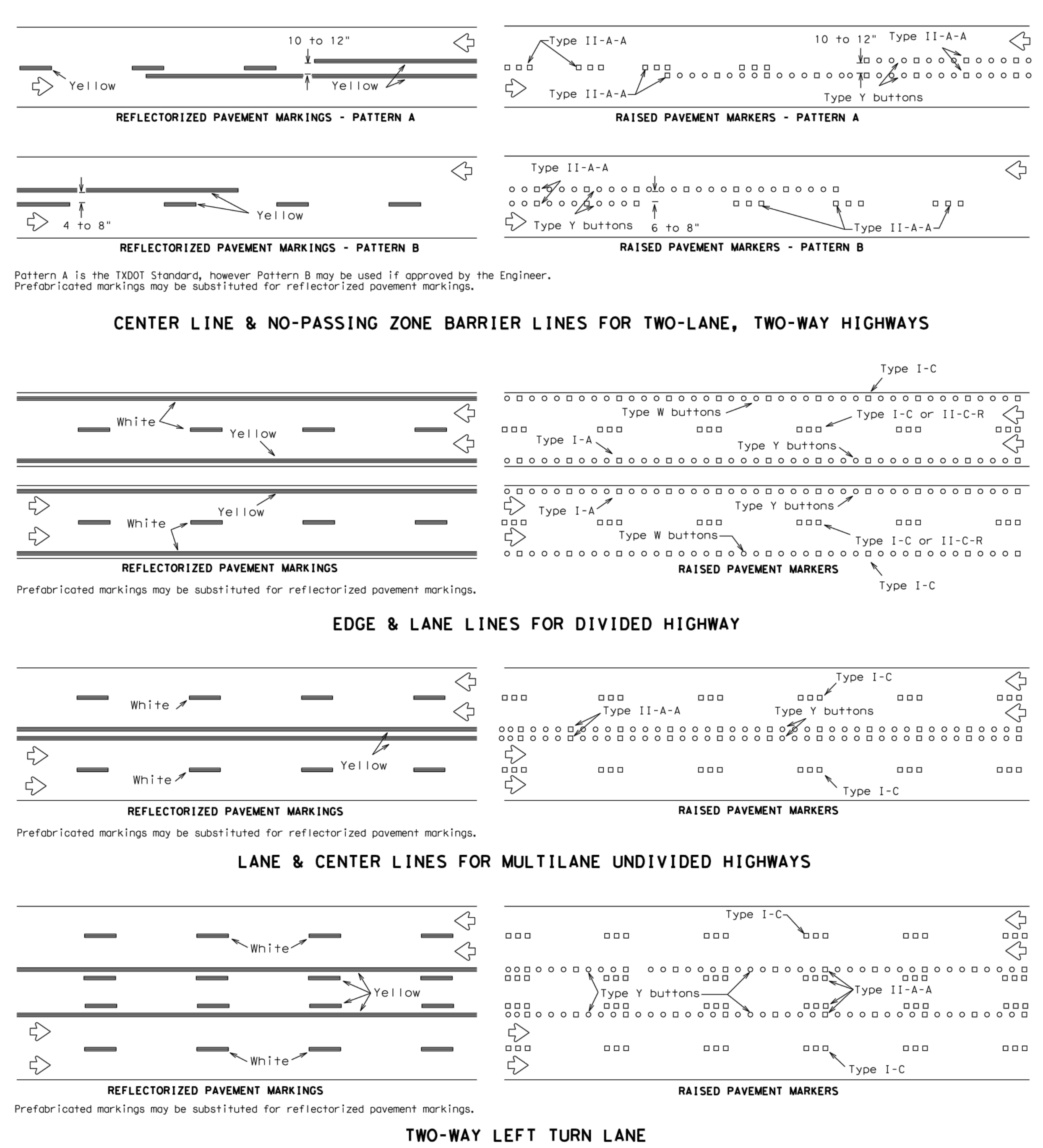
△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

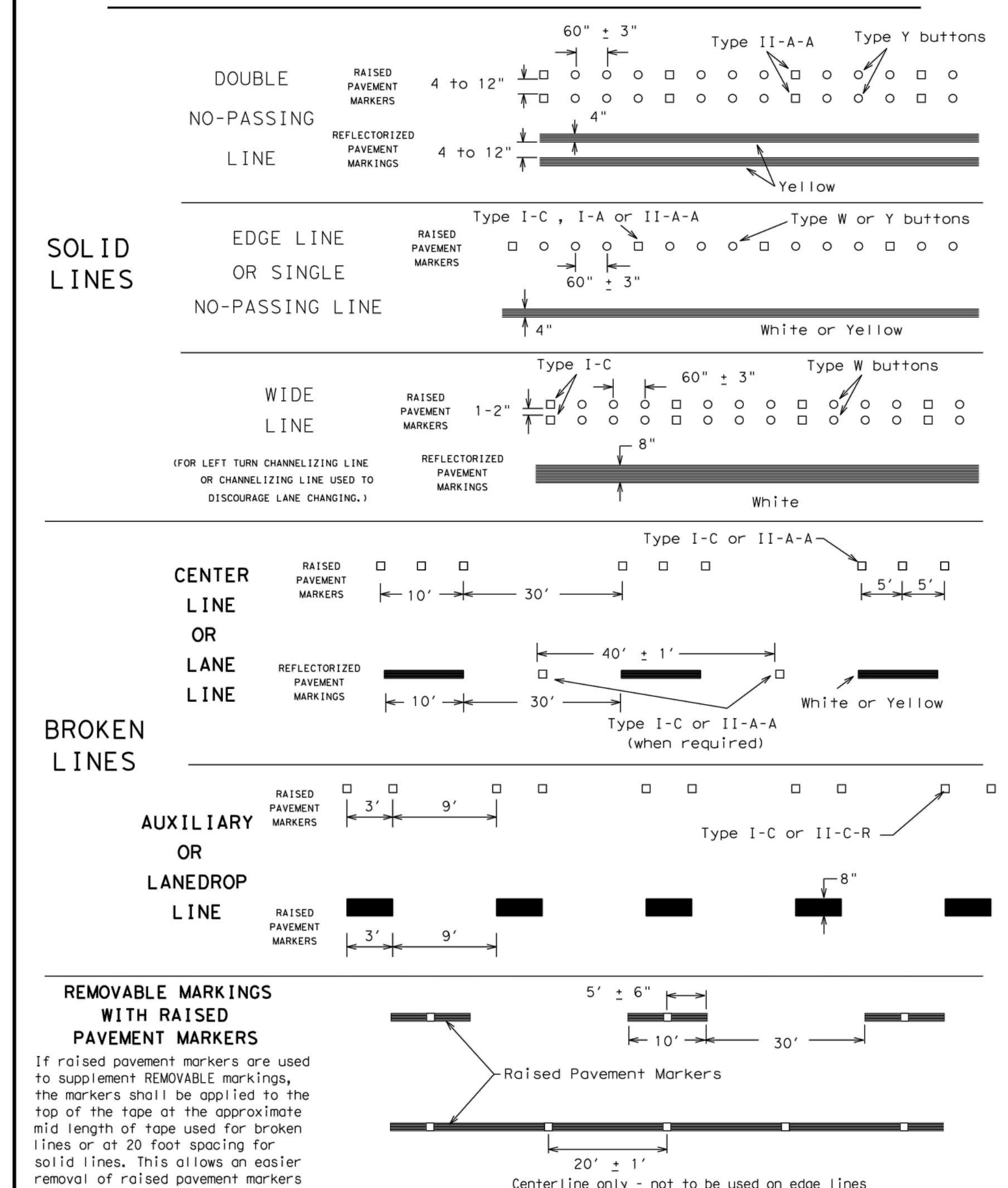
WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS


9 sq. ft. or less- 10ga extruded thimwall plastic sign only
1 3/4" x 1 3/4" x 11 foot 12 ga post (DO NOT SPLICE)
1 3/4" galv. round with 5/16" holes or 1 3/4" x 1 3/4" square tubing
Upright must telescope to provide 7' height above pavement
48"
36"
pin at angle needed to match sideslope
16 sq. ft. or less of any rigid sign substrate listed in section 4.2.8 of the CWZTCD, except 5/8" plywood. 1/2" plywood is allowed.
4"
Ø 3/8" x 3" gr. 5 bolt 12 per support joining sign panel and supports
1 3/4" x 1 3/4" x 129" thole to hole) 12 ga. support telescopes into sleeve
1 3/4" x 1 3/4" x 52" thole to hole) 12 ga. square perforated tubing diagonal brace
1 3/4" x 1 3/4" x 32" thole to hole) 12 ga. square perforated tubing cross brace
21"
131 1/2"
41"
84"
20 1/2"
Ø 7/16"
3"
3"
3

PAVEMENT MARKING PATTERNS



STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

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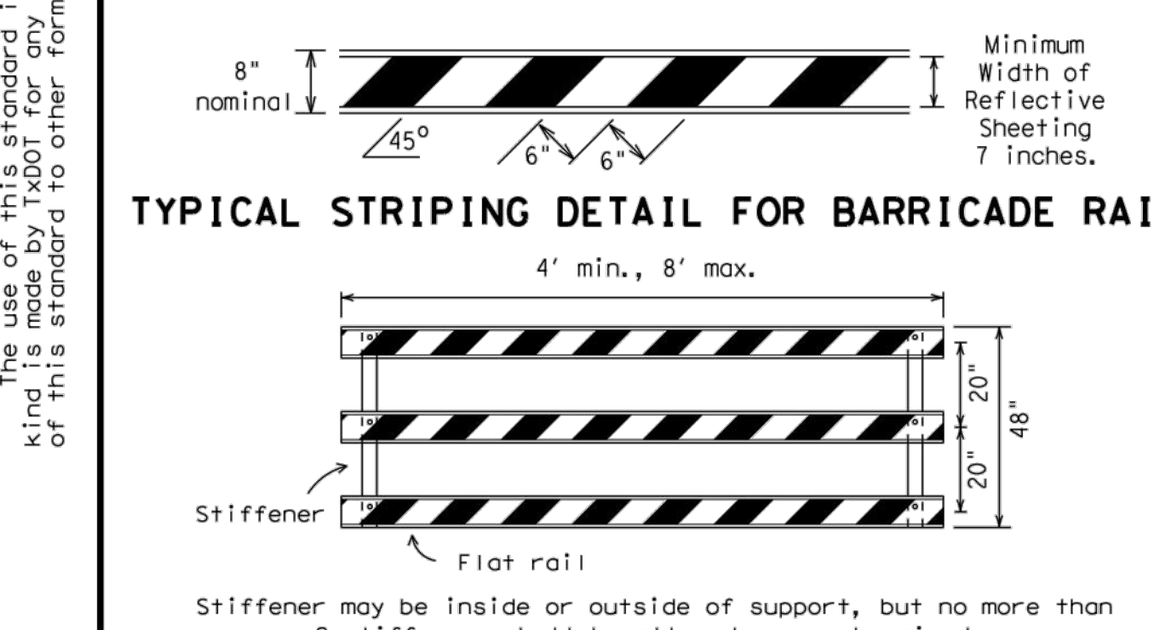
TYPE 3 BARRICADES

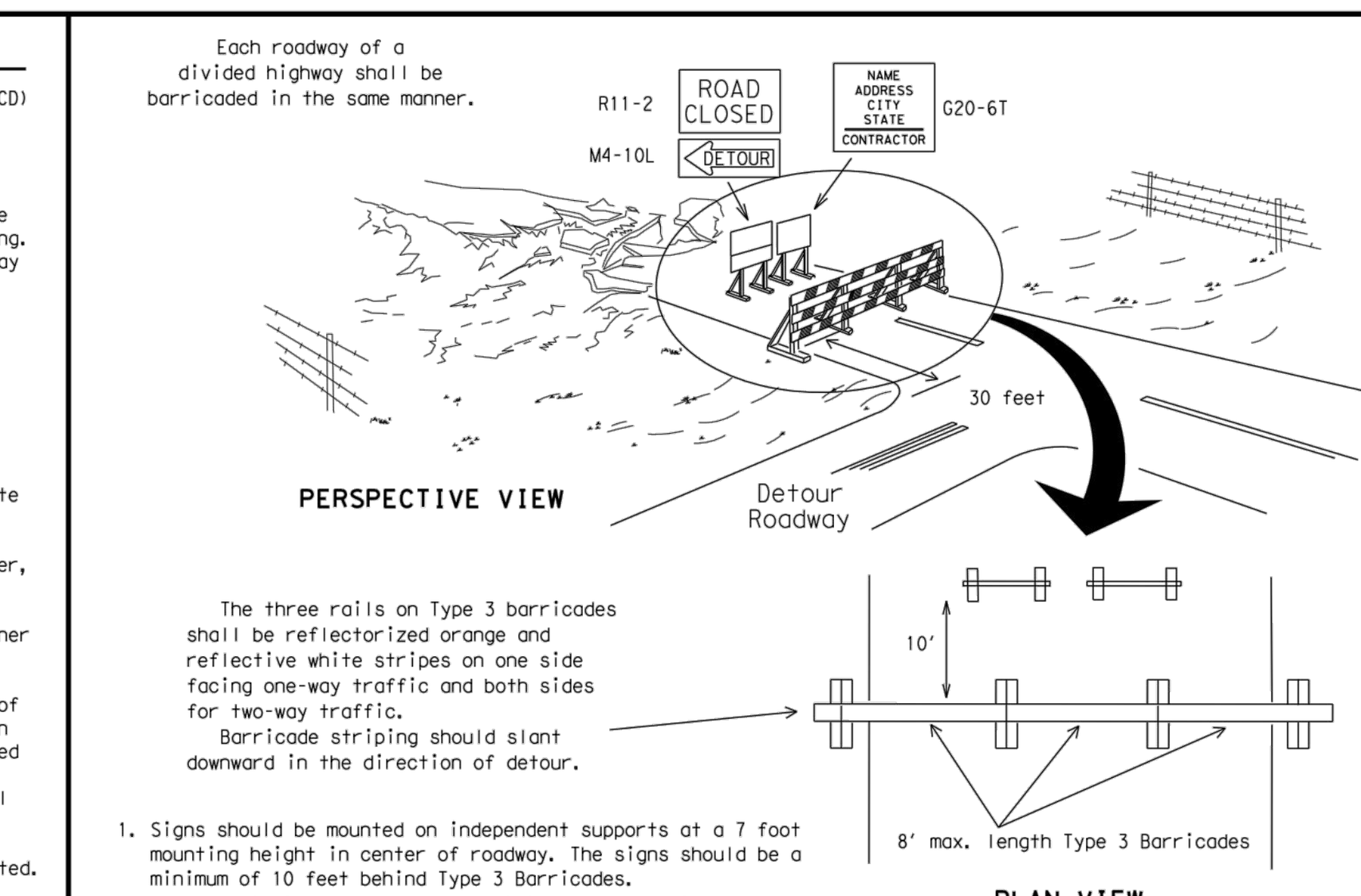
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

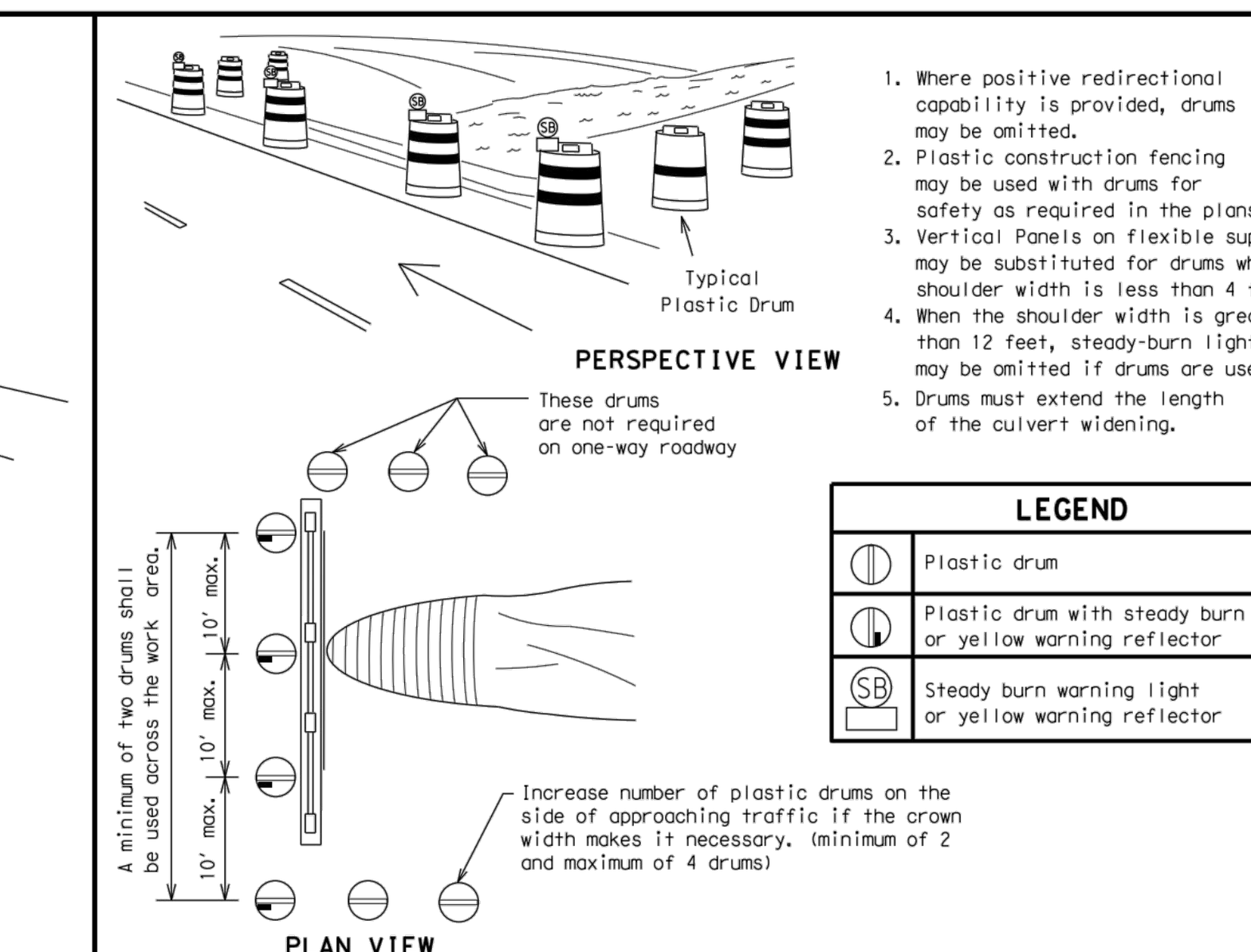
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION

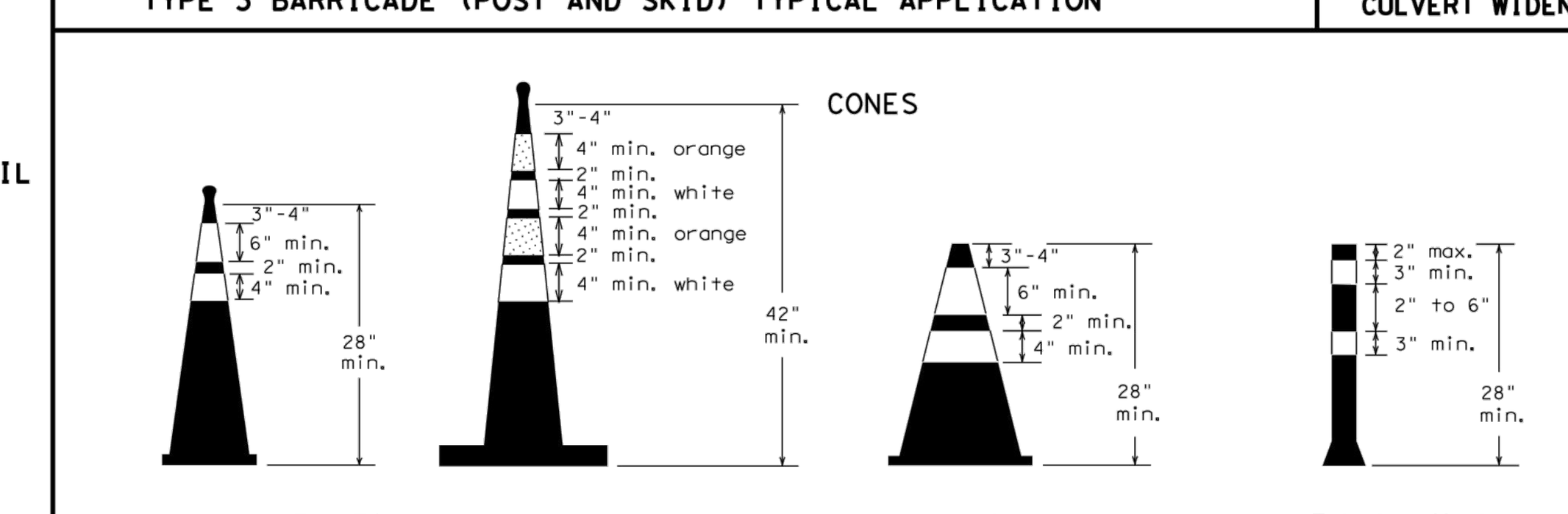


1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

LEGEND	
(symbol)	Plastic drum
(symbol)	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

CONES

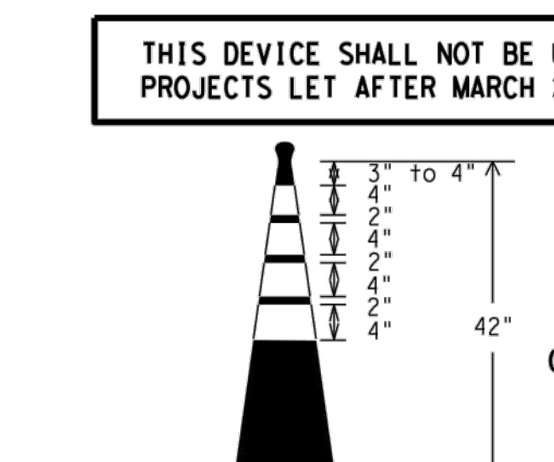


28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

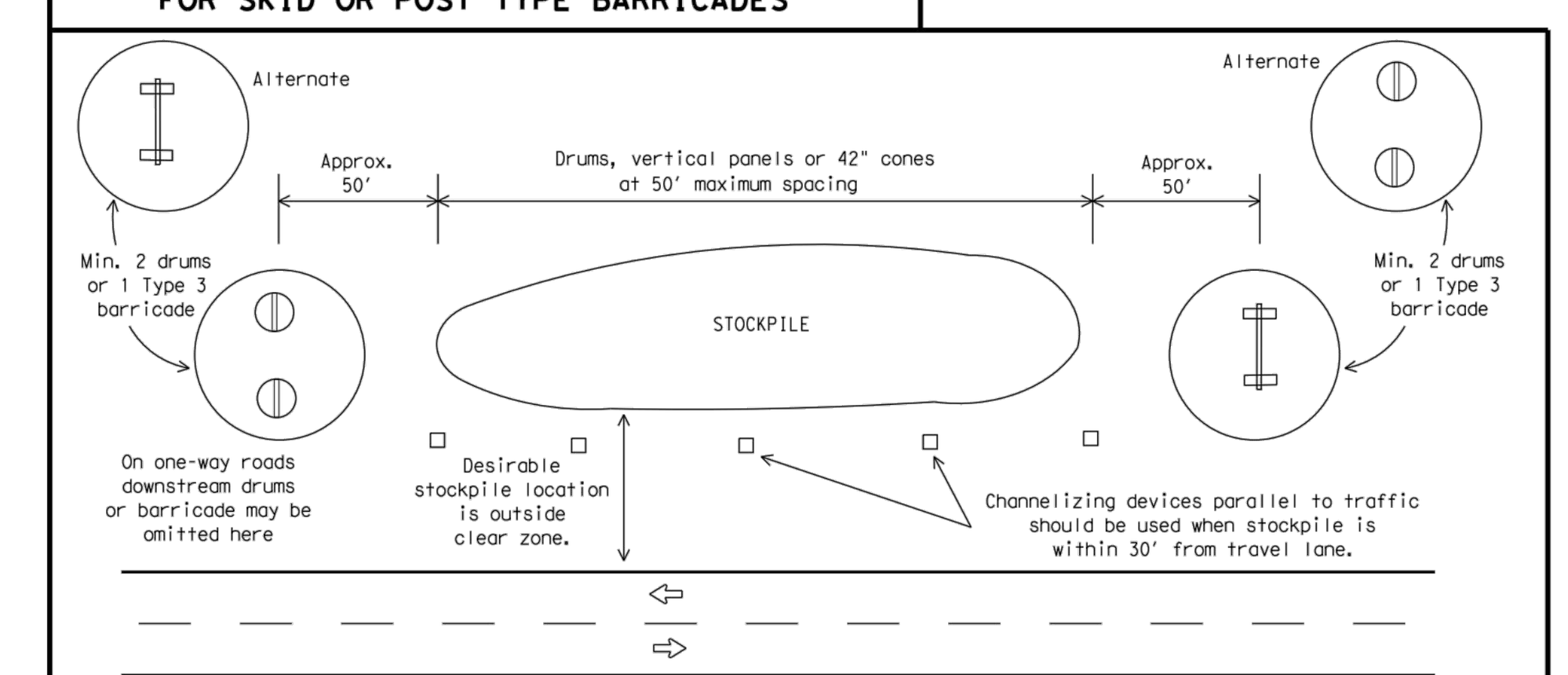
1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

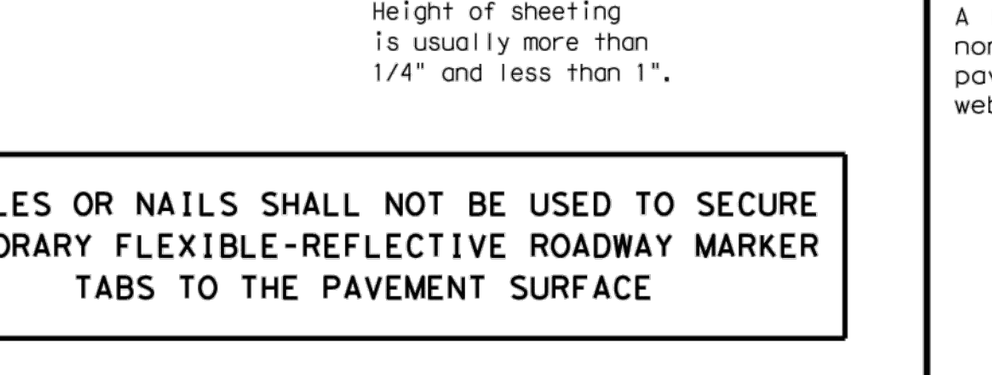
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT
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REVISIONS 2-98 9-07, 1-02 7-13, 11-02 8-14 | DIST | COUNTY | SHEET NO.
105

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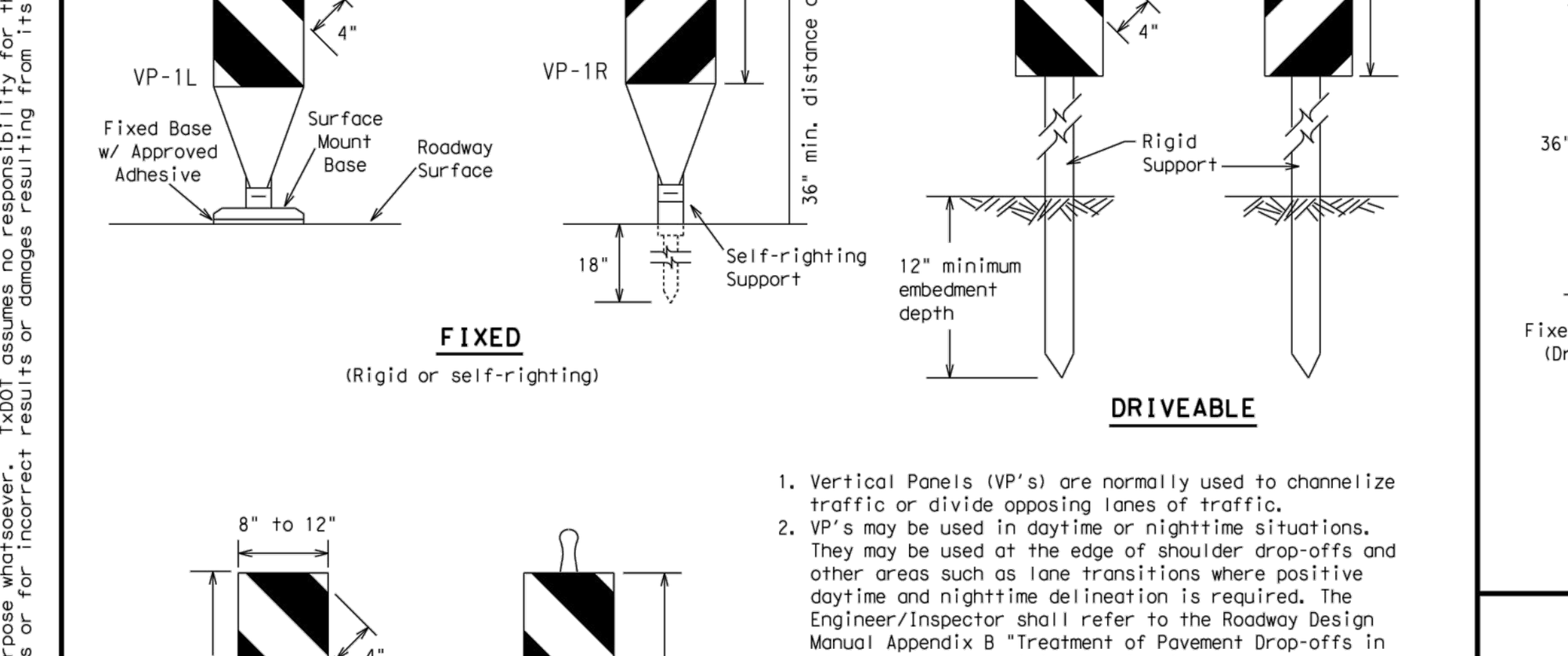
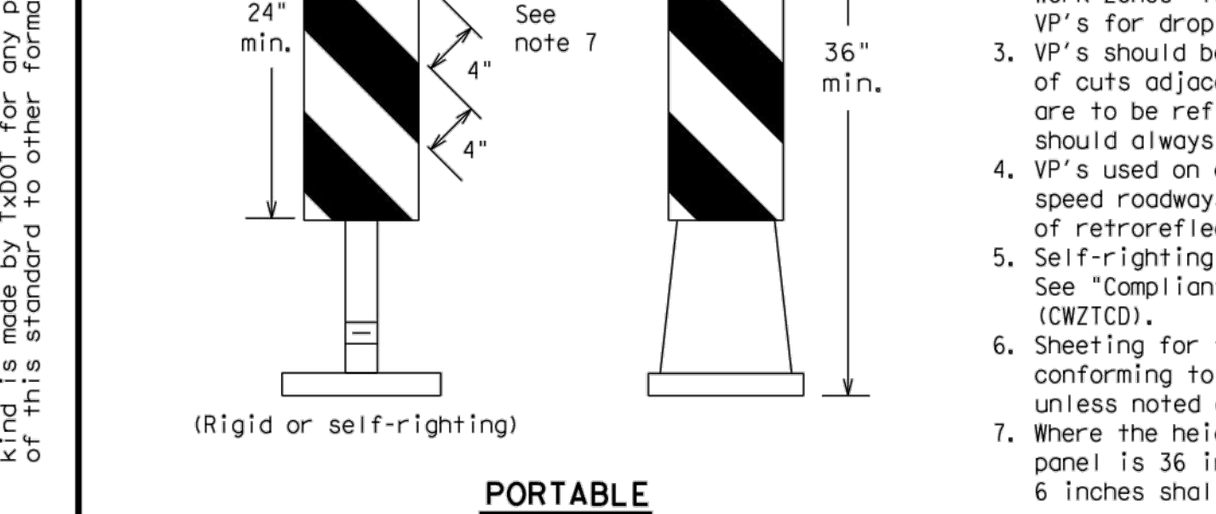
DATE:
FILE:

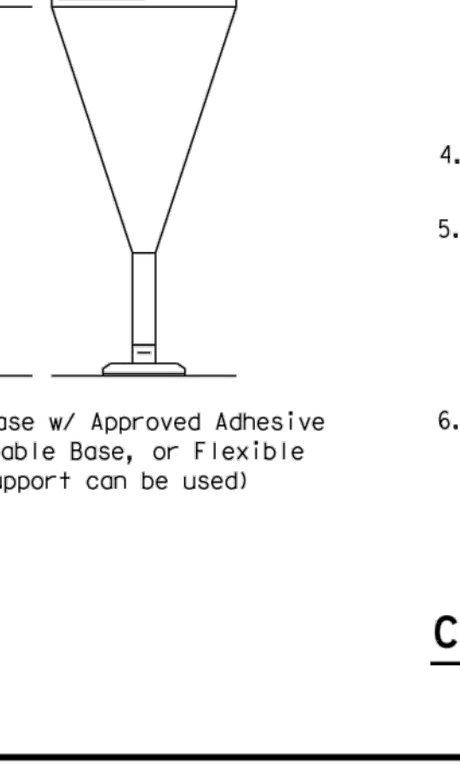
VERTICAL PANELS (VPs)





1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

CHEVRONS

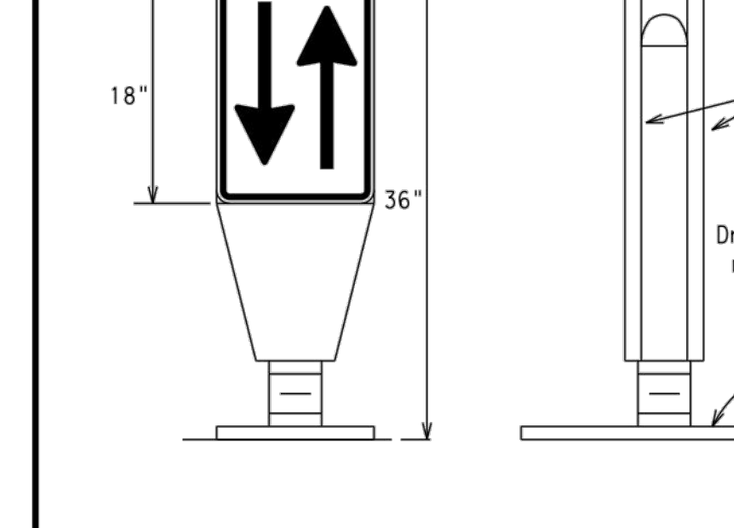


1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the out-side of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

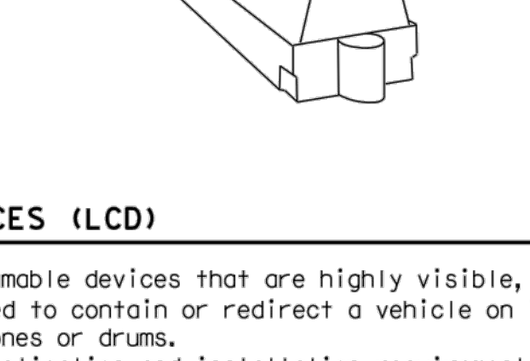
GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed else-where in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

** Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

FILE: bc-14.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT
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REVISIONS 9-07 8-14, 7-13 | DIST | COUNTY | SHEET NO.
103

NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ N/A, VERT N/A
DATE: JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TxDOT TRAFFIC CONTROL DETAILS 3 OF 3

DA PROJECT B006225.001
SHEET 14

FULL PATH: G:\Production4000\006200\6225\001\Civil\Drawings\Plot Sheets\TCP DETAILS.dwg
FILENAME: TCP DETAILS.dwg
PLOTTED BY: Allison Aldana
PLOTTED ON: Thursday, July 08, 2021
PLOTTED AT: 3:04:52 PM

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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: *DOT 796328D*
Crossing Type: ** *At-Grade RR Crossing*
RR Company Owning Track at Crossing: *Union Pacific Railroad*
Operating RR Company at Track: *Union Pacific Railroad*
RR MP: *557.28 at Eisenhower Dr.*
RR Subdivision: *Toyah Subdivision*
City: *Midland*
County: *Midland*
CSJ at this Crossing: *Control Section B04740*
Highway/Roadway name crossing the railroad: *Eisenhower Dr. Warehouse Ave. Midkiff Rd.*
# of regularly scheduled trains per day at this crossing: *21*
# of switching movements per day at this crossing: *1*
% of estimated contract cost of work within railroad ROW: *5%*

Scope of Work at this Crossing to Be Performed by State Contractor:
The county of Midland is making roadway improvements on the south side of each of the following streets that cross the UPRR: Eisenhower Dr, Warehouse Ave, and Midkiff Rd. Roadway improvements will include pavement resurfacing and existing asphalt roadway and new pavement markings.

Scope of Work at this Crossing to Be Performed by Railroad Company:
The UPRR will not have any work performed by them. The contractor will need to hire UP's approved flagging vendor (railpros).

** Choose: Highway Overpass, Highway Underpass, [At Grade], Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

None.

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: *30*

On this project, night or weekend flagging is:
[X] Expected
[ ] Not Expected

Flagging services will be provided by:
[ ] Railroad Company: TxDOT will pay flagging invoices
[X] Outside Party: Contractor will pay flagging invoices, ~~to be reimbursed by TxDOT~~

The contractor will need to hire UP's approved flagging vendor (railpros).

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:
[X] UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
[ ] BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
[ ] KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630
[ ] OTHERS ____

Contractor must incorporate Construction Inspection into anticipated construction schedule.
[X] Not Required
[ ] Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:
[ ] Required
[X] Not Required

~~Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.~~

V. RAILROAD INSURANCE REQUIREMENTS

**Insurance requirements are set by UP Real Estate.*
~~Railroad reference number shall be provided by TxDOT CST or DO.~~

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
[ ] Not Required	
[X] Non - Bridge Projects	$2,000,000 / $6,000,000
[ ] Bridge Projects	$5,000,000 / $10,000,000
[ ] Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:
[ ] Not Required
[ ] Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
[X] Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: *Union Pacific Railroad*

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:
[ ] Not Required
[X] Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency *1-888-877-7267*
Call ******* *Union Pacific Railroad*
Railroad Emergency Line at ~~XXX-XXX-XXXX~~
Location: DOT ******** *DOT 796328D*
RR Milepost ***** *557.28 at Eisenhower Dr.*
Subdivision *********** *Toyah Subdivision*

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
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REVISIONS 3/2020	DIST	COUNTY		SHEET NO.

DATE:
FILE:

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the ~~TxDOT~~ Engineer. The ~~TxDOT~~ Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

**The County* ~~TxDOT~~ has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of **The County* ~~TxDOT~~ and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad ~~and TxDOT~~.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with ~~TxDOT and~~ the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or ~~TxDOT.~~* The Railroad or ~~TxDOT~~* shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify ~~TxDOT~~* of the order.

**The County*

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised ~~TxDOT~~ that such insurance is in accordance with the Agreement. **The County*

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR) and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative ~~through TxDOT~~ at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

SHEET 1 OF 2

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS March 2020	DIST	COUNTY		SHEET NO.

DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
1. Pre-construction meetings.
2. Pile driving/drilling of caissons or drilled shafts.
3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
4. Erection of precast concrete or steel bridge superstructure.
5. Placement of waterproofing (prior to placing ballast on bridge deck).
6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work ~~to TxDOT for submittal~~ to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of ~~TxDOT~~* to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows: **the Contractor*

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of ~~TxDOT.~~* This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract. **the Contractor*

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193
7:00 AM to 9:00 PM CST Monday-Friday except holidays, staffed 24 hrs/day for emergencies
48 hrs notice required

BNSF 1-800-533-2891
24 hour number
5 working days notice required

KCS 1-800-344-8377
Texas One Call, a 24 hour number
48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and ~~TxDOT~~ **the County* prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of ¼ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of ~~TxDOT~~ and the Railroad before proceeding. **the County*

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of ~~TxDOT~~ and the Railroad. **the County*

SHEET 2 OF 2

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS March 2020	DIST	COUNTY		SHEET NO.

DATE:
FILE:

NO.	REVISION	BY	DATE

DESIGNED
DRAWN
CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ
VERT
DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TxDOT TRAFFIC CONTROL DETAILS
4 OF 4

DA PROJECT
B006225.001
SHEET
15

FULL PATH: G:\Production4000\006200\6225\001\Civil\Drawings\Plot Sheets\TCP DETAILS.dwg

FILENAME: TCP DETAILS.dwg
PLOTTED BY: Allison Aldana
PLOTTED ON: Thursday, July 08, 2021
PLOTTED AT: 3:05:01 PM

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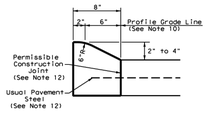

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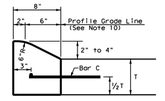
2" - 4" HEIGHT



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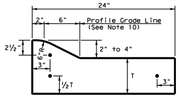

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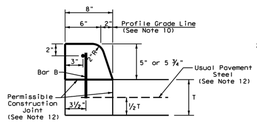
2" - 4" HEIGHT



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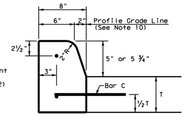

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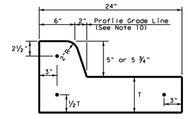

TYPE II CURB AND GUTTER
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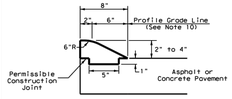

TYPE III CURB (KEYED)
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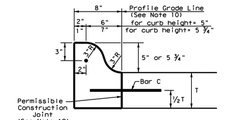
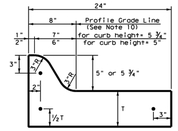
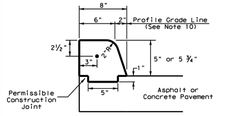


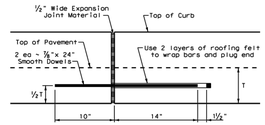
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

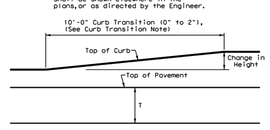


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

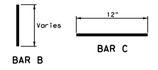
Curb Transition Note:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

General Notes

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.



BAR B BAR C

Texas Department of Transportation — Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-12

FILE: cccg12.dgn	DN: TxDOT	CK: JLB	DW: VP	CK: VP
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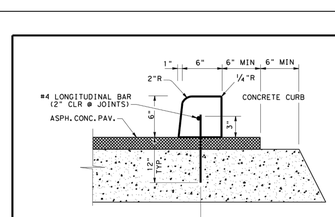
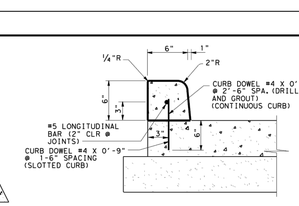
REVISIONS UPDATED 2012 - VP	DIST	COUNTY		SHEET NO.



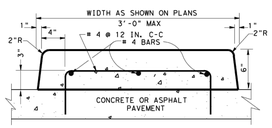
SHOWN ON EXISTING OR PROPOSED ACP PAVEMENT
(PAY ITEM 529-6011) - FOR CONTINUOUS



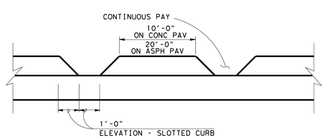
SHOWN ON EXISTING OR PROPOSED
CONCRETE PAVEMENT
(PAY ITEM 529-6011) - FOR CONTINUOUS

CONCRETE CURB (DOWEL) (6 IN.)



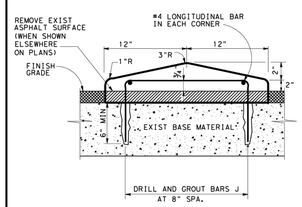


ITEM 536-6001 CONCRETE MEDIAN
SEE NOTE 2

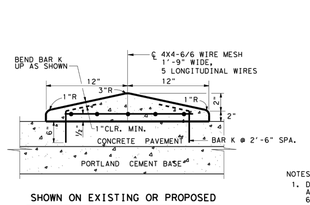


ELEVATION - SLOTTED CURB

ITEM 529-6012 CONCRETE CURB (SLOTTED) - ON CONC.
ITEM 529-6009 CONC CURB (DOWEL)(SLOTTED) - ON ASPH.



SHOWN ON EXISTING ACP PAVEMENT
SEE NOTE 2 - ITEM 536-6003 CONC DIRECTIONAL ISLAND



SHOWN ON EXISTING OR PROPOSED
CONCRETE PAVEMENT
SEE NOTE 2 - ITEM 536-6003 CONC DIRECTIONAL ISLAND

CONCRETE DIRECTIONAL ISLAND

NOTES:
1. DRILL AND GROUT BARS SHOWN AS PER ITEM 420.4.7.10, 6" EMBEDMENT, MINIMUM ON CONC.
2. INSTALL A 2 INCH DRAINAGE OPENING AT 10 FT C-C WHEN CURB/ISLAND IS NOT ON TOP OF CROSS SECTION. (LOCATED ON A 2 OR 3 PERCENT TRANSVERSE GRADE, OR SUPERELEVATION.)

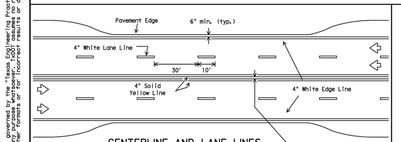
Texas Department of Transportation
Houston District

CONCRETE CURB AND DIRECTIONAL ISLAND DETAILS
CC & DID

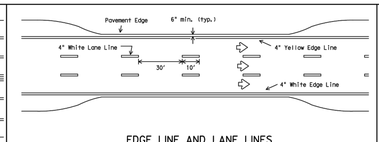
FILE: ST08-9.dgn	DN:	CK:	DW:	CK:
©TxDOT 2014	DIST	FED RD	PROJECT NO.	SHEET
REVISIONS	HOU	6		
	COUNTY	CONTROL	SECT	JOB	HIGHWAY



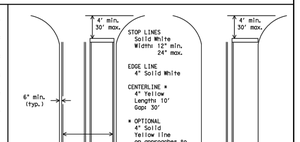
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



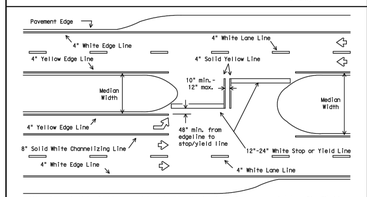
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

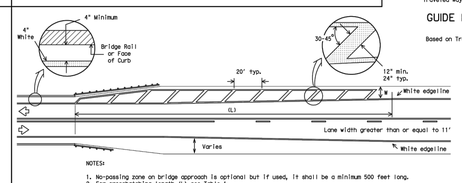


GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths for Undivided Highways



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and at opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



NOTES:
1. No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
2. For crosshatching length (L) see Table 1.
3. The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
4. The crosshatching is not required if delineators or barrier reflectors are used along the structure.
5. For guard fence details, refer elsewhere in the plans.

ROADWAYS WITH REDUCED SHOULDER
WIDTHS ACROSS BRIDGE OR CULVERT

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	L=WS

W 85th Percentile Speed may be used on roads where traffic speeds markedly exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.

L=Length of Crosshatching (Ft.) W=Width of Offset (Ft.)
S=Posted Speed (MPH)

EXAMPLES:

An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the crosshatching should be:
L = 8 x 70 = 560 ft.

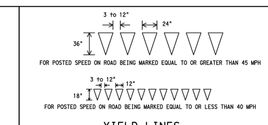
A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the crosshatching should be:
L = 4(40)² / 60 = 106.67 ft. rounded to 110 ft.

GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should typically be placed a minimum of 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel and not the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



YIELD LINES

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-12

©TxDOT November 1978	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12				
5-00	DIST	COUNTY		SHEET NO.
8-00				
5-03				
22A				

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DATE:
FILE:

FILENAME: TxDOT DETAILS.dwg
PLOTTED BY: Allison Atkins
PLOTTED ON: November 14, 2021
PLOTTED AT: 1:52:43 PM

NO.	REVISION	BY	DATE

TxDOT
DESIGNED JLB
DRAWN JLB
CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ N/A
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/22
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

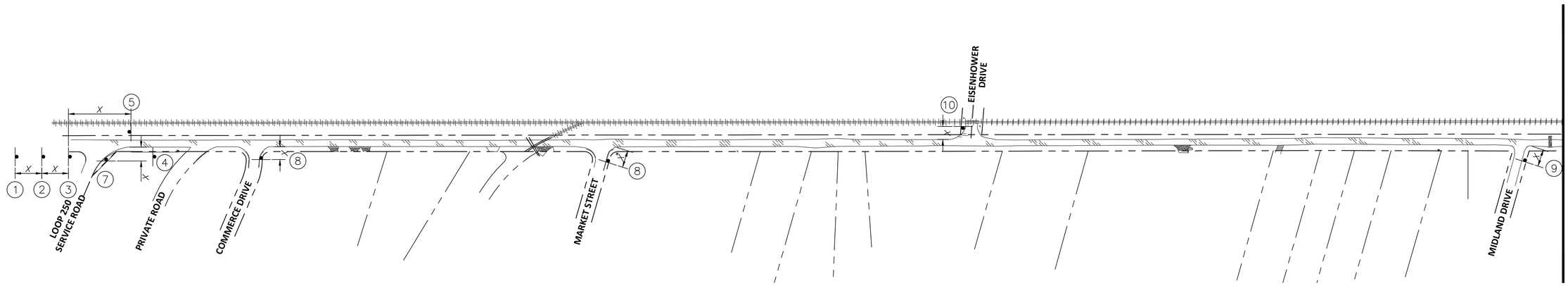
TxDOT MISC DETAILS

DA PROJECT
B006225.001

SHEET
16

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
CALL 811 (TEXAS 811) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. DUNAWAY ASSOC., L.P. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.	LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON PUBLIC RECORDS. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH HORIZONTALLY AND VERTICALLY, BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION.	IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES, TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).	COORDINATES PROVIDED ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), CENTRAL ZONE 4203; ALL COORDINATES, BEARINGS, AND DISTANCES ARE NAD83 GRID VALUES.

INDUSTRIAL AVENUE



1. OBSERVE WARNING SIGNS STATE LAW — R20-3T, 48" X 42"
2. WORK ZONE / SPEED LIMIT 30 — G20-5aP, 24" X 18"; R2-1, 24" X 30"
3. ROAD WORK AHEAD — CW20-1D, 36" X 36"
4. BEGIN ROAD WORK NEXT 2 MILES / NAME ADDRESS CITY STATE / CONTRACTOR — G20-5T, 48" X 24"; G20-6, 48" X 30"
5. END ROAD WORK — G20-2, 48" X 24"
6. ROAD WORK ← NEXT 2 MILES — G20-1bTL, 72" X 24"
7. ROAD WORK NEXT 2 MILES → — G20-1bTR, 72" X 24"
8. ROAD WORK ← NEXT 1 MILES / NEXT 2 MILES → — G20-1aT, 72" X 36"
9. ROAD WORK ← NEXT 1 MILES / NEXT 1 MILES → — G20-1aT, 72" X 36"
10. ROAD WORK ← NEXT 2 MILES / NEXT 1 MILES → — G20-1aT, 72" X 36"

GRAPHIC SCALE IN FEET
200 0 100 200 400

GENERAL TRAFFIC CONTROL NOTES:

1. THE ADVANCE WARNING SIGNS ARE DISPLAYED FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REFLECT ACTUAL SIGN PLACEMENT LOCATIONS. FIELD CONDITIONS, STANDARDS, AND TEXAS MUTCD SHALL GOVERN ACTUAL SIGN LOCATIONS.
2. THE ADVANCE WARNING SIGNS SHALL BE LOCATED IN ADVANCE OF THE PHASING TRAFFIC CONTROL SEQUENCING FOR THE ABOVE LOCATIONS.
3. THE ADVANCE WARNING SIGNS SHALL REMAIN IN PLACE FOR THE DURATION OF THE CONTRACT OR AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL MAINTAIN A MINIMUM 10' CLEAR ZONE (MEASURED FROM THE EDGE OF THE ADJACENT TRAFFIC LANE) DURING NON-WORK HOURS.
5. "X" REFER TO BC(2)-14 FOR SPACING.
6. WORK ALONG ROADWAY SHALL BE DURING DAYLIGHT HOURS ACCORDING TO TXDOT STANDARDS TCP(2-3)-18. BOTH LANES OF TRAFFIC WILL REMAIN OPEN DURING CONSTRUCTION.
7. STOP EQUIPMENT FOR TRAFFIC WHEN CROSSING AT ANY TRAFFIC LANES. FURNISH FLAGGERS TO WARN EQUIPMENT OPERATORS OF APPROACHING TRAFFIC, UNLESS OTHERWISE DIRECTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PEDESTRIANS AND MOTORISTS IN THE AREA OF THE CONSTRUCTION SITE.
9. ALL CONSTRUCTION OPERATIONS SHALL BE CONDUCTED TO PROVIDE MINIMAL INTERFERENCE TO TRAFFIC.
10. THE CONTRACTOR WILL PROVIDE ALL TRAFFIC CONTROL DURING CONSTRUCTION IN ACCORDANCE WITH THE GUIDLINES IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THAT NEEDED WHILE RAILROAD WORKERS ARE PRESENT.

NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ
1" = 200'
VERT
N/A
DATE
JUNE
2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TRAFFIC CONTROL PLAN
ADVANCE WARNING SIGNS OVERALL LAYOUT

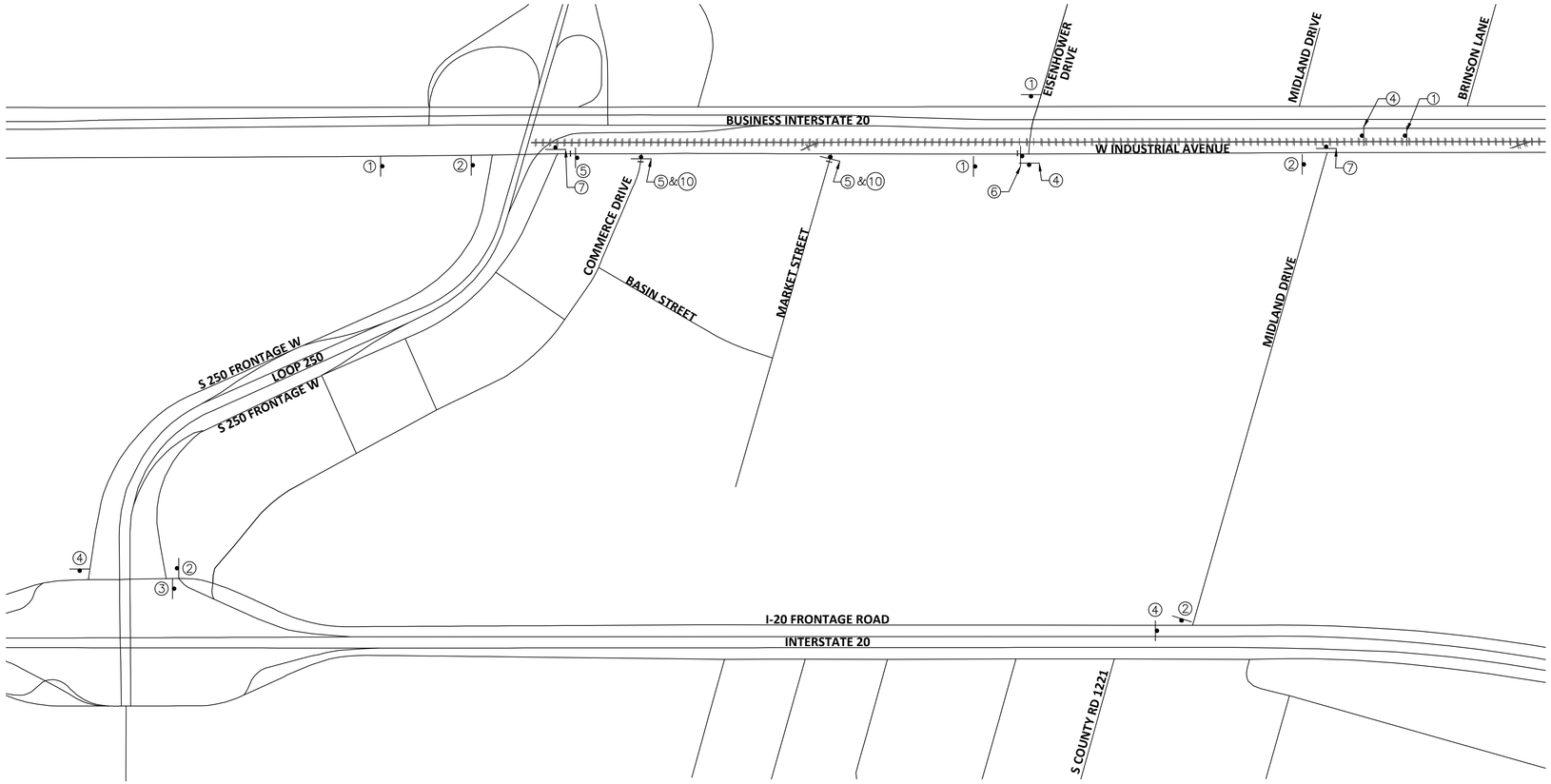
DA PROJECT
B006225.001
SHEET
17

FILE PATH: G:\Production\B006225\B006225.001\Civil\Drawings\Plot Sheet\TRAFFIC CONTROL PLAN.dwg
FILENAME: TRAFFIC CONTROL PLAN.dwg
PLOTTED BY: Allison Abbie
PLOTTED ON: Wednesday, June 14, 2021
PLOTTED AT: 3:53:12 PM

Texas 811
Know what's below.
Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
CALL 811 (TEXAS 811) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. DUNAWAY ASSOC., L.P. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.	LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON PUBLIC RECORDS. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH HORIZONTALLY AND VERTICALLY, BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION.	IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES, TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).	COORDINATES PROVIDED ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), CENTRAL ZONE 4203; ALL COORDINATES, BEARINGS, AND DISTANCES ARE NAD83 GRID VALUES.

TRAFFIC DETOUR PHASE 1



GRAPHIC SCALE IN FEET
500 0 250 500 1000

(1) DETOUR AHEAD — CW20-2D, 36" X 36"

(2) INDUSTRIAL AVE / DETOUR → — M4-9N 30" X 12" / M4-9R 30" X 30"

(3) INDUSTRIAL AVE / DETOUR ↑ — M4-9N 30" X 12" / M4-9S 30" X 30"

(4) INDUSTRIAL AVE / DETOUR ← — M4-9N 30" X 12" / M4-9L 30" X 30"

(5) ROAD CLOSED TO THRU TRAFFIC — R11-4, 60" X 30", W/ TYPE III BARRICADES

(6) ROAD CLOSED — R11-2, 48" X 30", W/ TYPE III BARRICADES

(7) END DETOUR — M4-8a, 24" X 18"

(8) R3-1, 24" X 18"

(9) R3-27, 24" X 18"

(10) R3-2, 24" X 18"

SUGGESTED SEQUENCE OF WORK

TCP PHASE 1
TRAFFIC:

1. REMOVE EXISTING TRAFFIC CONTROL AND LANE MARKINGS AS REQUIRED.
2. INSTALL TRAFFIC CONTROL FOR ROAD CLOSURE AND DETOUR.
3. LOCAL TRAFFIC SHALL BE ALLOWED TO TRAVEL EAST BOUND ONLY.
4. MAINTAIN REMAINING EXISTING TRAFFIC CONTROL.

CONSTRUCTION:

1. REMOVE EXISTING HMAC PAVEMENT AND OTHER OBSTRUCTIONS AS REQUIRED.
2. CONTRACTOR SHALL CONSTRUCT TEMPORARY ACCESS TO ADJACENT PROPERTIES AND MAINTAIN ACCESS DURING CONSTRUCTION.
3. BEGIN CONSTRUCTION OF PROPOSED PAVEMENT.
4. INSTALL PROPOSED SIGNS AND PAVEMENT MARKINGS.
5. COMPLETE CLEAN UP OF AREA PRIOR TO PROCEEDING TO NEXT PHASE.

GENERAL TRAFFIC CONTROL NOTES:

1. TRAFFIC DETOUR SIGNS ARE DISPLAYED FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REFLECT ACTUAL SIGN PLACEMENT LOCATIONS. FIELD CONDITIONS, STANDARDS, AND TEXAS MUTCD SHALL GOVERN ACTUAL SIGN LOCATIONS.

NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 500'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER — 6/14/23

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TRAFFIC CONTROL PLAN PHASE 1
STA 0+00 TO 33+00

DA PROJECT B006225.001
SHEET 18

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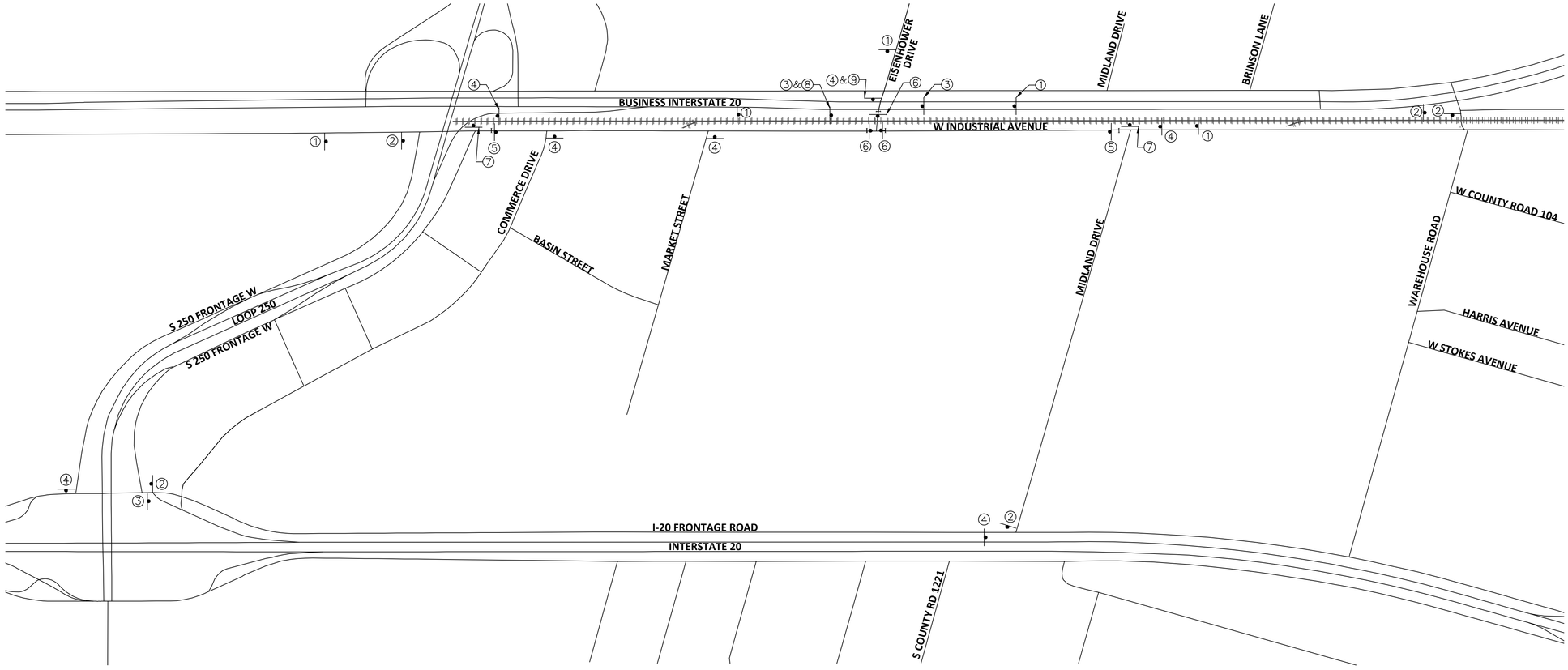
FILENAME: TRAFFIC CONTROL PLAN.dwg
PLOTTED BY: Allison Alaniz
PLOTTED ON: Wednesday, June 14, 2023
PLOTTED AT: 3:53:29 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
CALL 811 (TEXAS 811) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. DUNAWAY ASSOC., L.P. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.	LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON PUBLIC RECORDS. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH HORIZONTALLY AND VERTICALLY, BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION.	IF ANY EXISTING UTILITY POLES, POWER POLES, GUY WIRES, TELEPHONE UTILITIES, ETC. ARE FOUND TO BE IN CONFLICT WITH THESE CONSTRUCTION PLANS, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AND COORDINATE THE RELOCATION OF ANY/OR ALL SUCH UTILITIES (NO SPECIAL PAY).	COORDINATES PROVIDED ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), CENTRAL ZONE 4203; ALL COORDINATES, BEARINGS, AND DISTANCES ARE NAD83 GRID VALUES.

TRAFFIC DETOUR PHASE 2



GRAPHIC SCALE IN FEET
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① DETOUR AHEAD — CW20–2D, 36" X 36"

② INDUSTRIAL AVE M4–9N 30" X 12" / DETOUR — M4–9R, 30" X 30"

③ INDUSTRIAL AVE M4–9N 30" X 12" / DETOUR — M4–9S, 30" X 30"

④ INDUSTRIAL AVE M4–9N 30" X 12" / DETOUR — M4–9L, 30" X 30"

⑤ ROAD CLOSED TO THRU TRAFFIC — R11–4, 60" X 30", W/ TYPE III BARRICADES

⑥ ROAD CLOSED — R11–2, 48" X 30", W/ TYPE III BARRICADES

⑦ END DETOUR — M4–8a, 24" X 18"

⑧ R3–1, 24" X 18"

⑨ R3–27, 24" X 18"

⑩ R3–2, 24" X 18"

SUGGESTED SEQUENCE OF WORK

TCP PHASE 2
TRAFFIC:

1. REMOVE EXISTING TRAFFIC CONTROL AND LANE MARKINGS AS REQUIRED.
2. INSTALL TRAFFIC CONTROL FOR ROAD CLOSURE AND DETOUR.
3. MAINTAIN REMAINING EXISTING TRAFFIC CONTROL.

CONSTRUCTION:

1. REMOVE EXISTING HMAC PAVEMENT AND OTHER OBSTRUCTIONS AS REQUIRED.
2. BEGIN CONSTRUCTION OF PROPOSED PAVEMENT.
3. INSTALL PROPOSED SIGNS AND PAVEMENT MARKINGS.
4. COMPLETE CLEAN UP OF AREA PRIOR TO PROCEEDING TO NEXT PHASE.

GENERAL TRAFFIC CONTROL NOTES:

1. TRAFFIC DETOUR SIGNS ARE DISPLAYED FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REFLECT ACTUAL SIGN PLACEMENT LOCATIONS. FIELD CONDITIONS, STANDARDS, AND TEXAS MUTCD SHALL GOVERN ACTUAL SIGN LOCATIONS.

NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 500'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER — 6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TRAFFIC CONTROL PLAN PHASE 2
STA 33+00 TO 34+50

DA PROJECT B006225.001
SHEET 19

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FILENAME: TRAFFIC CONTROL PLAN.dwg
PLOTTED BY: Alissa Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 3:53:43 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
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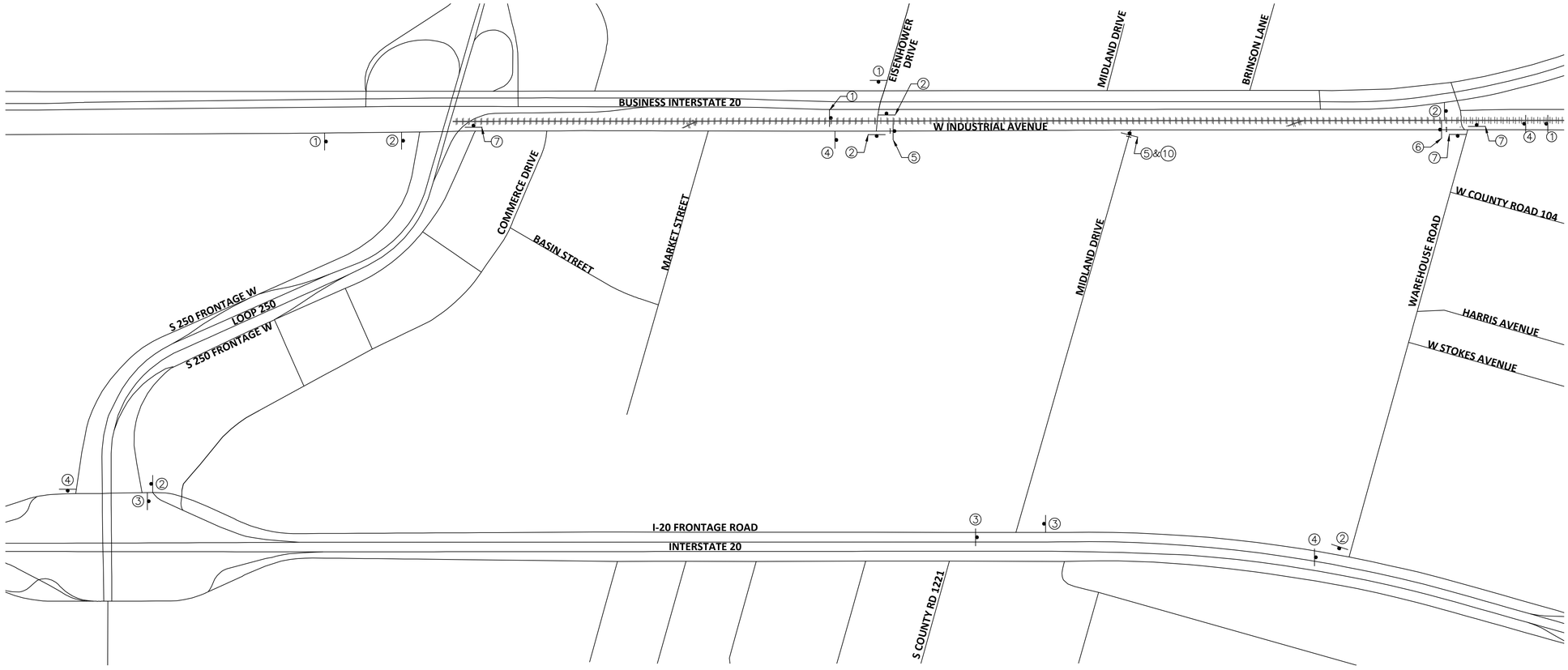
TRAFFIC DETOUR PHASE 3



GRAPHIC SCALE IN FEET
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① DETOUR AHEAD — CW20–2D, 36" X 36"

② INDUSTRIAL AVE / DETOUR → — M4–9N 30" X 12" / M4–9R 30" X 30"

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④ INDUSTRIAL AVE / DETOUR ← — M4–9N 30" X 12" / M4–9L 30" X 30"

⑤ ROAD CLOSED TO THRU TRAFFIC — R11–4, 60" X 30", W/ TYPE III BARRICADES

⑥ ROAD CLOSED — R11–2, 48" X 30", W/ TYPE III BARRICADES

⑦ END DETOUR — M4–8a, 24" X 18"

⑧ — R3–1, 24" X 18"

⑨ — R3–27, 24" X 18"

⑩ — R3–2, 24" X 18"

SUGGESTED SEQUENCE OF WORK

TCP PHASE 3
TRAFFIC:

1. REMOVE EXISTING TRAFFIC CONTROL AND LANE MARKINGS AS REQUIRED.
2. INSTALL TRAFFIC CONTROL FOR ROAD CLOSURE AND DETOUR.
3. LOCAL TRAFFIC SHALL BE ALLOWED TO TRAVEL EAST BOUND ONLY.
4. MAINTAIN REMAINING EXISTING TRAFFIC CONTROL.

CONSTRUCTION:

1. REMOVE EXISTING HMAC PAVEMENT AND OTHER OBSTRUCTIONS AS REQUIRED.
2. CONTRACTOR SHALL CONSTRUCT TEMPORARY ACCESS TO ADJACENT PROPERTIES AND MAINTAIN ACCESS DURING CONSTRUCTION.
3. BEGIN CONSTRUCTION OF PROPOSED PAVEMENT.
4. INSTALL PROPOSED SIGNS AND PAVEMENT MARKINGS.
5. COMPLETE CLEAN UP OF AREA PRIOR TO PROCEEDING TO NEXT PHASE.

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NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 500'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED PROFESSIONAL ENGINEER — 6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TRAFFIC CONTROL PLAN PHASE 3
STA 34+50 TO 80+50

DA PROJECT B006225.001
SHEET 20

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PLOTTED BY: Alissa Adams
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 3:53:58 PM

Texas 811
Know what's below. Call before you dig.

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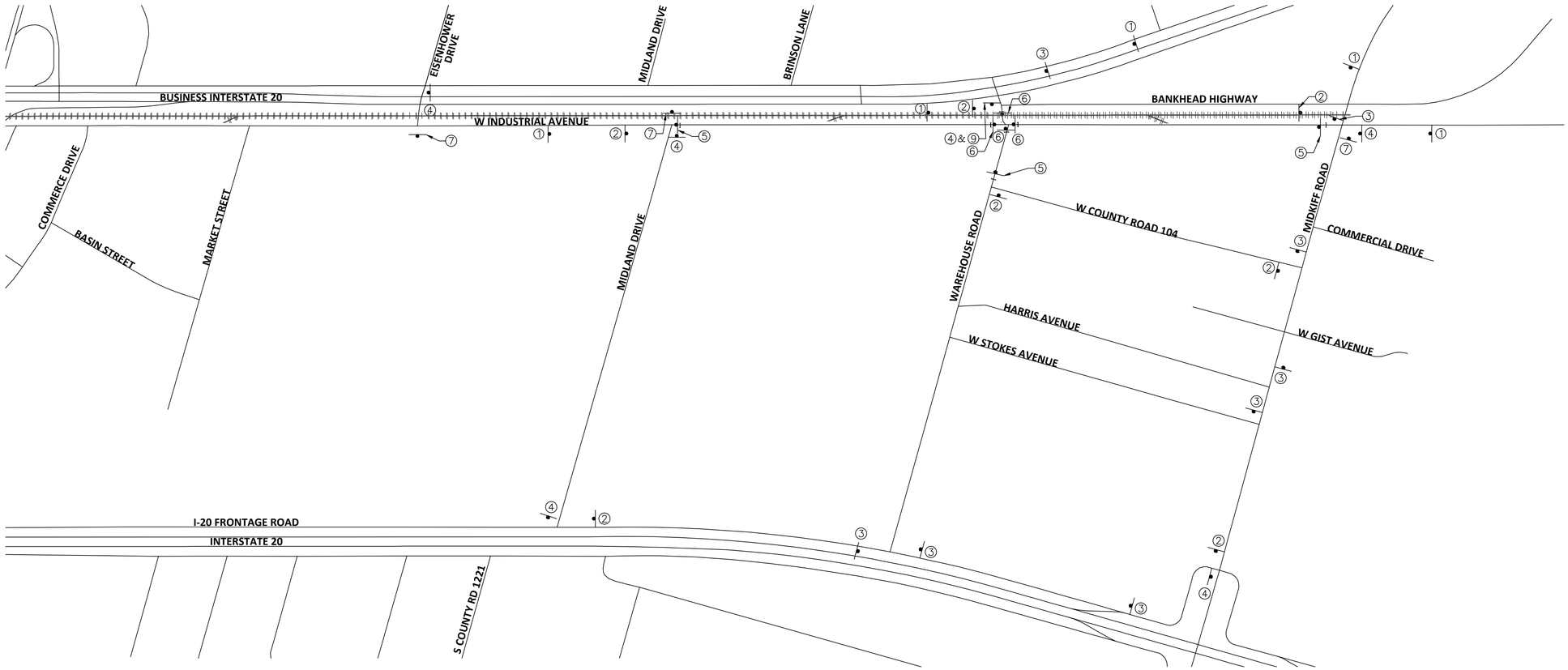
TRAFFIC DETOUR PHASE 4



GRAPHIC SCALE IN FEET
500 0 250 500 1000

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
DETOUR AHEAD	INDUSTRIAL AVE / DETOUR →	INDUSTRIAL AVE / DETOUR ↑	INDUSTRIAL AVE / DETOUR ←	ROAD CLOSED TO THRU TRAFFIC	ROAD CLOSED	END DETOUR			
CW20-2D 36" X 36"	M4-9N 30" X 12"; M4-9R 30" X 30"	M4-9N 30" X 12"; M4-9S 30" X 30"	M4-9N 30" X 12"; M4-9L 30" X 30"	R11-4 60" X 30" W/ TYPE III BARRICADES	R11-2 48" X 30" W/ TYPE III BARRICADES	M4-8a 24" X 18"	R3-1 24" X 18"	R3-27 24" X 18"	R3-2 24" X 18"

SUGGESTED SEQUENCE OF WORK

TCP PHASE 4

TRAFFIC:

1. REMOVE EXISTING TRAFFIC CONTROL AND LANE MARKINGS AS REQUIRED.
2. INSTALL TRAFFIC CONTROL FOR ROAD CLOSURE AND DETOUR.
3. MAINTAIN REMAINING EXISTING TRAFFIC CONTROL.

CONSTRUCTION:

1. REMOVE EXISTING HMAC PAVEMENT AND OTHER OBSTRUCTIONS AS REQUIRED.
2. BEGIN CONSTRUCTION OF PROPOSED PAVEMENT.
3. INSTALL PROPOSED SIGNS AND PAVEMENT MARKINGS.
4. COMPLETE CLEAN UP OF AREA PRIOR TO PROCEEDING TO NEXT PHASE.

GENERAL TRAFFIC CONTROL NOTES:

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NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 500'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TRAFFIC CONTROL PLAN PHASE 4
STA 80+50 TO 82+00

DA PROJECT B006225.001
SHEET 21

FULL PATH: G:\Production\4000\B006225\02\001\Civil\Drawings\Plot Sheets\TRAFFIC CONTROL PLAN.dwg

FILENAME: TRAFFIC CONTROL PLAN.dwg
PLOTTED BY: Allison Aldana
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 1:54:14 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
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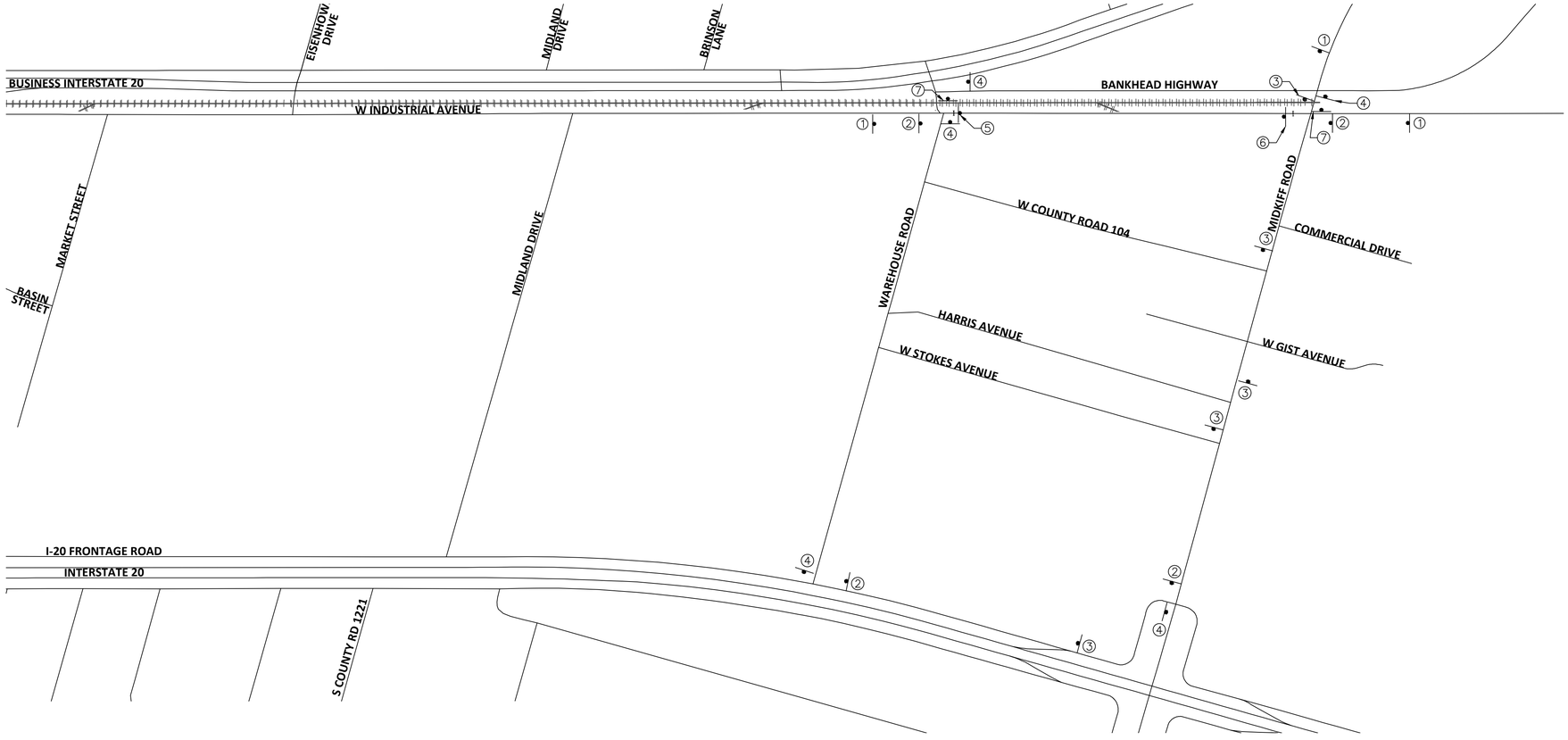
TRAFFIC DETOUR PHASE 5



GRAPHIC SCALE IN FEET
500 0 250 500 1000

① DETOUR AHEAD — CW20-2D, 36" X 36"

② INDUSTRIAL AVE M4-9N 30" X 12" / DETOUR → — M4-9R, 30" X 30"

③ INDUSTRIAL AVE M4-9N 30" X 12" / DETOUR ↑ — M4-9S, 30" X 30"

④ INDUSTRIAL AVE M4-9N 30" X 12" / DETOUR ← — M4-9L, 30" X 30"

⑤ ROAD CLOSED TO THRU TRAFFIC — R11-4, 60" X 30", W/ TYPE III BARRICADES

⑥ ROAD CLOSED — R11-2, 48" X 30", W/ TYPE III BARRICADES

⑦ END DETOUR — M4-8a, 24" X 18"

⑧ R3-1, 24" X 18"

⑨ R3-27, 24" X 18"

⑩ R3-2, 24" X 18"

SUGGESTED SEQUENCE OF WORK

TCP PHASE 5
TRAFFIC:

1. REMOVE EXISTING TRAFFIC CONTROL AND LANE MARKINGS AS REQUIRED.
2. INSTALL TRAFFIC CONTROL FOR ROAD CLOSURE AND DETOUR.
3. LOCAL TRAFFIC SHALL BE ALLOWED TO TRAVEL EAST BOUND ONLY.
4. MAINTAIN REMAINING EXISTING TRAFFIC CONTROL.

CONSTRUCTION:

1. REMOVE EXISTING HMAC PAVEMENT AND OTHER OBSTRUCTIONS AS REQUIRED.
2. CONTRACTOR SHALL CONSTRUCT TEMPORARY ACCESS TO ADJACENT PROPERTIES AND MAINTAIN ACCESS DURING CONSTRUCTION.
3. BEGIN CONSTRUCTION OF PROPOSED PAVEMENT.
4. INSTALL PROPOSED SIGNS AND PAVEMENT MARKINGS.
5. COMPLETE CLEAN UP.

GENERAL TRAFFIC CONTROL NOTES:

1. TRAFFIC DETOUR SIGNS ARE DISPLAYED FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REFLECT ACTUAL SIGN PLACEMENT LOCATIONS. FIELD CONDITIONS, STANDARDS, AND TEXAS MUTCD SHALL GOVERN ACTUAL SIGN LOCATIONS.

NO.	REVISION	BY	DATE

JAS — DESIGNED
JAS — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 500'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21 — STATE OF TEXAS — JENNIFER L. BECKER — 102960 — LICENSED — PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
TRAFFIC CONTROL PLAN PHASE 5
STA 82+00 TO END

DA PROJECT B006225.001
SHEET 22

FILE PATH: G:\Production\B006225\001\Civil\Drawings\Plot Sheets\TRAFFIC CONTROL PLAN.dwg

FILENAME: TRAFFIC CONTROL PLAN.dwg
PLOTTED BY: Allison Alaniz
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 1:54:29 PM

Texas 811
Know what's below.
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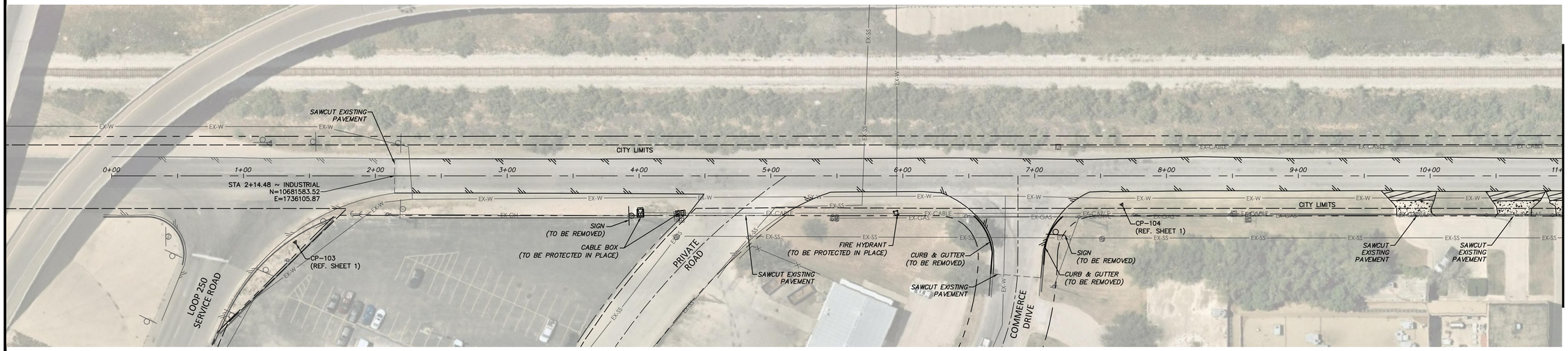
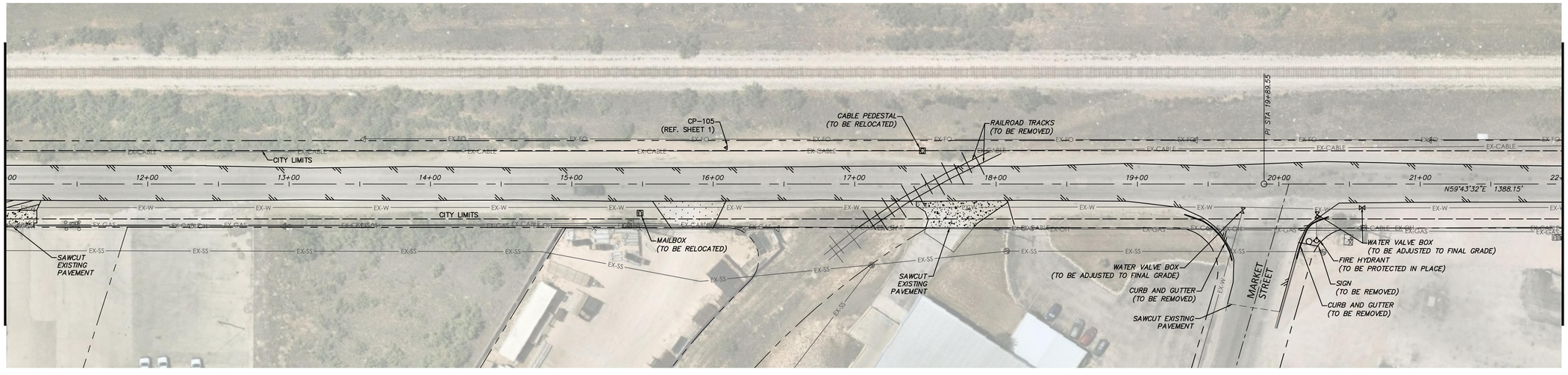
INDUSTRIAL AVENUE





GRAPHIC SCALE IN FEET
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NO.	REVISION	BY	DATE

MMC DESIGNED · RVG DRAWN · JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ
1" = 40'
VERT
N/A
DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2

INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS

OVERALL ROADWAY STATIONING
STA 0+00 TO 22+00

DA PROJECT
B006225.001

SHEET
23

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PLOTTED BY: Allison Adams
PLOTTED ON: Thursday, June 24, 2021
PLOTTED AT: 2:48:36 PM

Texas811
Know what's below. Call before you dig.

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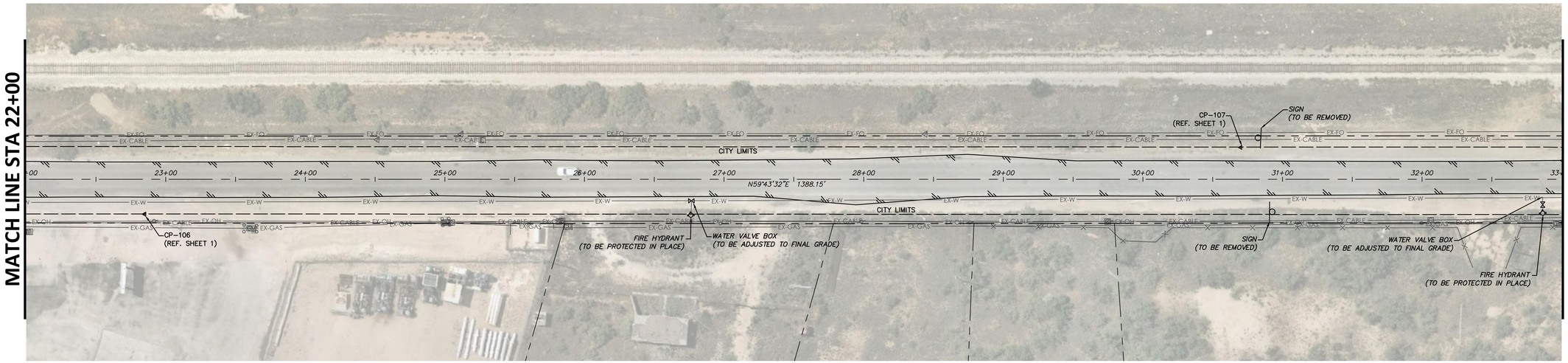
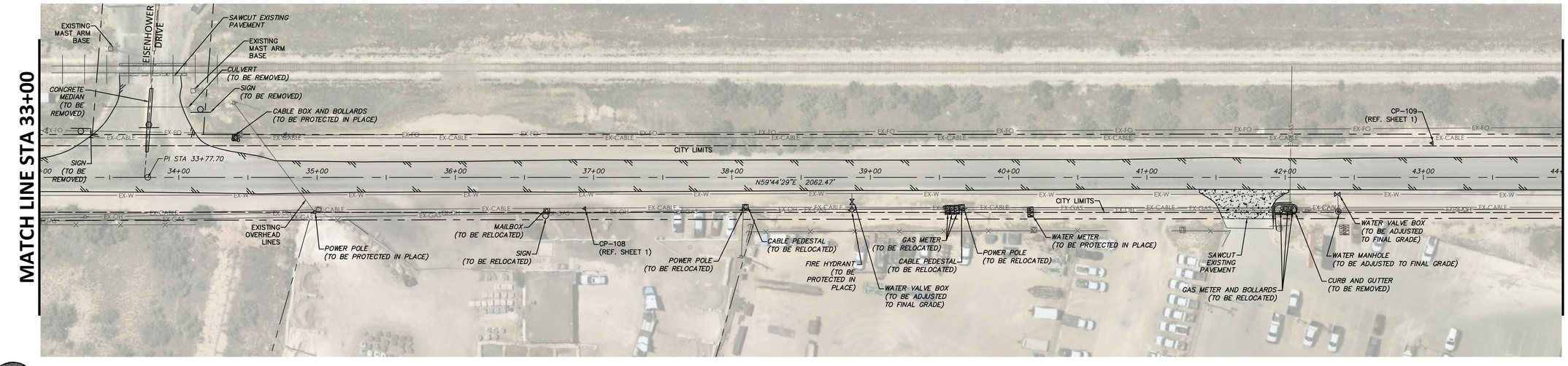
INDUSTRIAL AVENUE





GRAPHIC SCALE IN FEET
40 0 20 40 80

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
OVERALL ROADWAY STATIONING
STA 22+00 TO 44+00

DA PROJECT B006225.001
SHEET 24

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PLOTTED BY: Allison Aldana
PLOTTED ON: Thursday, July 08, 2021
PLOTTED AT: 2:48:54 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
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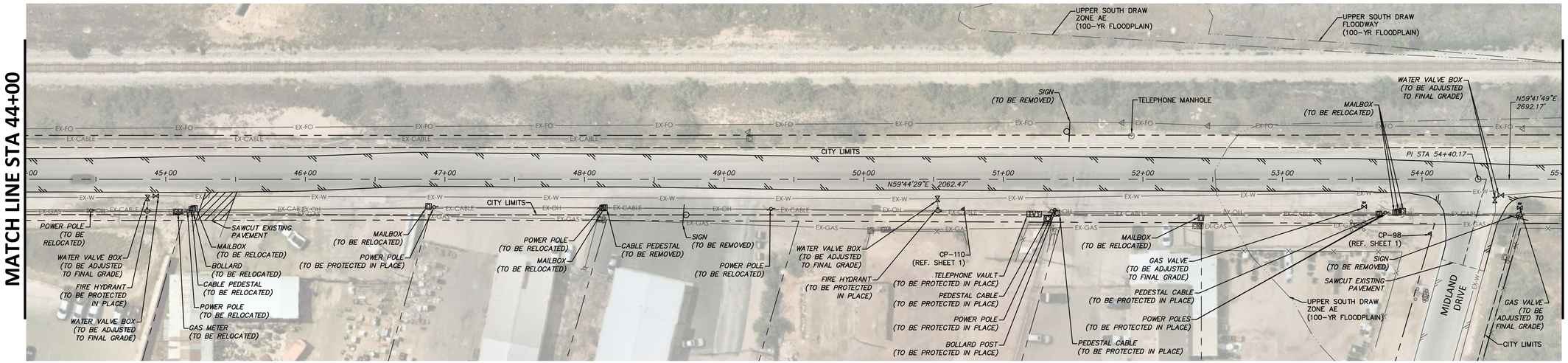
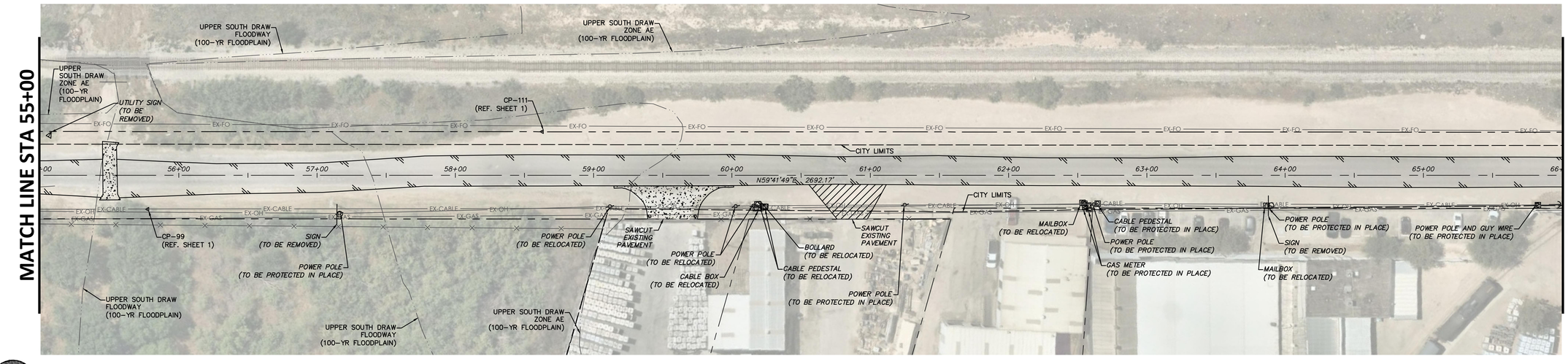
INDUSTRIAL AVENUE





GRAPHIC SCALE IN FEET
40 0 20 40 80

NO.	REVISION	BY	DATE

MMC DESIGNED · RVG DRAWN · JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS · JENNIFER L. BECKER · 102960 · LICENSED PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
OVERALL ROADWAY STATIONING
STA 44+00 TO 66+00

DA PROJECT B006225.001
SHEET 25

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PLOTTED BY: Allison Adams
PLOTTED ON: Monday, July 19, 2021
PLOTTED AT: 2:49:04 PM

Texas 811
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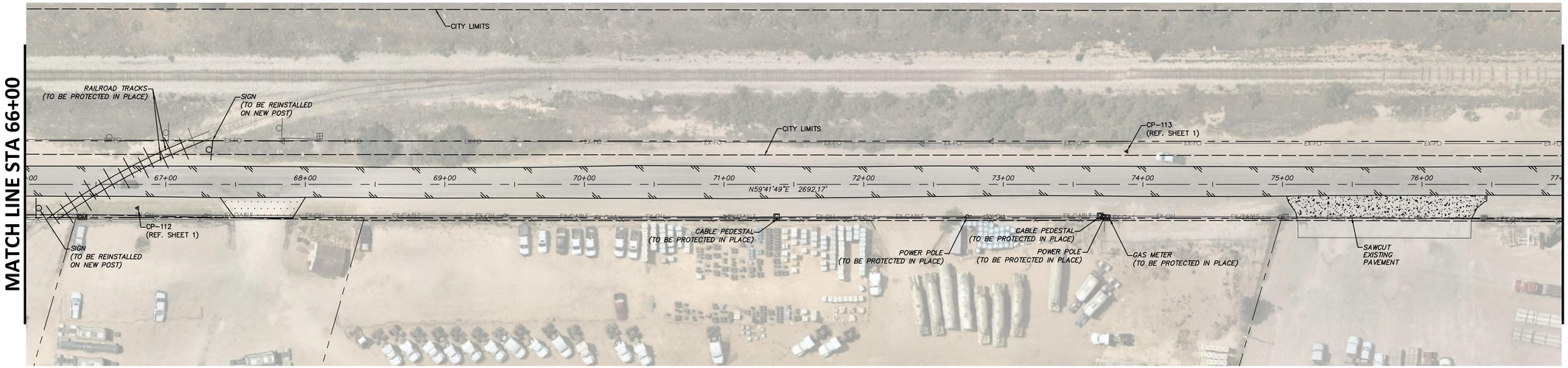
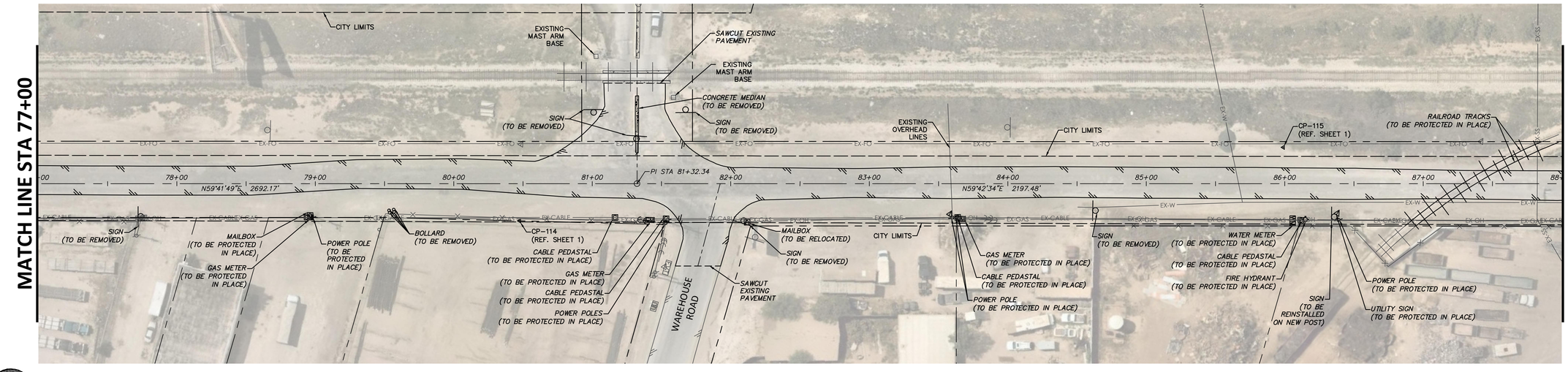
INDUSTRIAL AVENUE





GRAPHIC SCALE IN FEET
40 0 20 40 80

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
OVERALL ROADWAY STATIONING
STA 66+00 TO 88+00

DA PROJECT B006225.001
SHEET 26

FULL PATH: G:\Production\MIDLAND\B006225\025\01\Civil\Drawings\Plan Sheets\OVERALL ROADWAY STATIONING.dwg
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PLOTTED BY: Allison Adams
PLOTTED ON: 07/09/21
PLOTTED AT: 2:09:14 PM

Texas811
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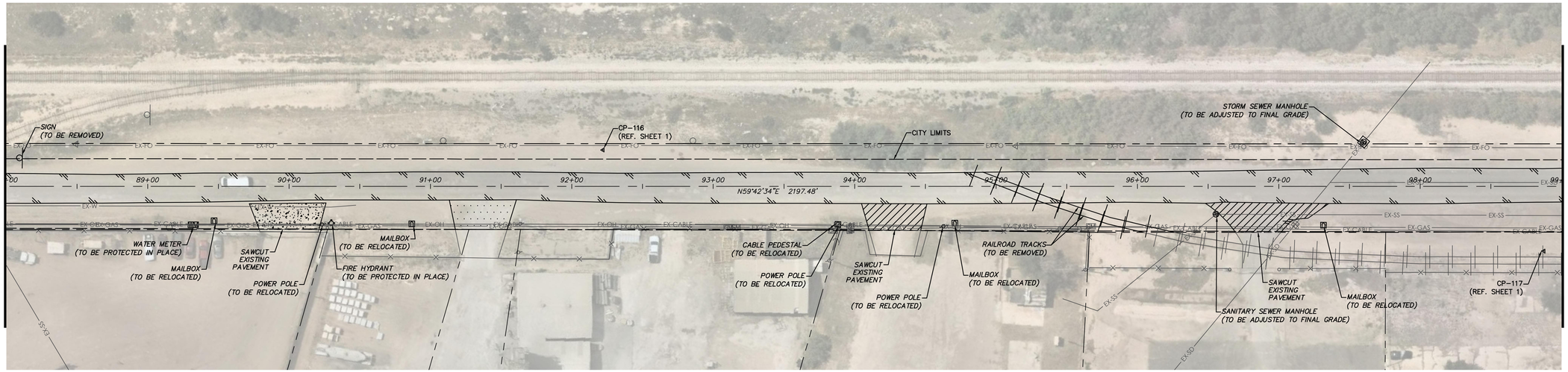
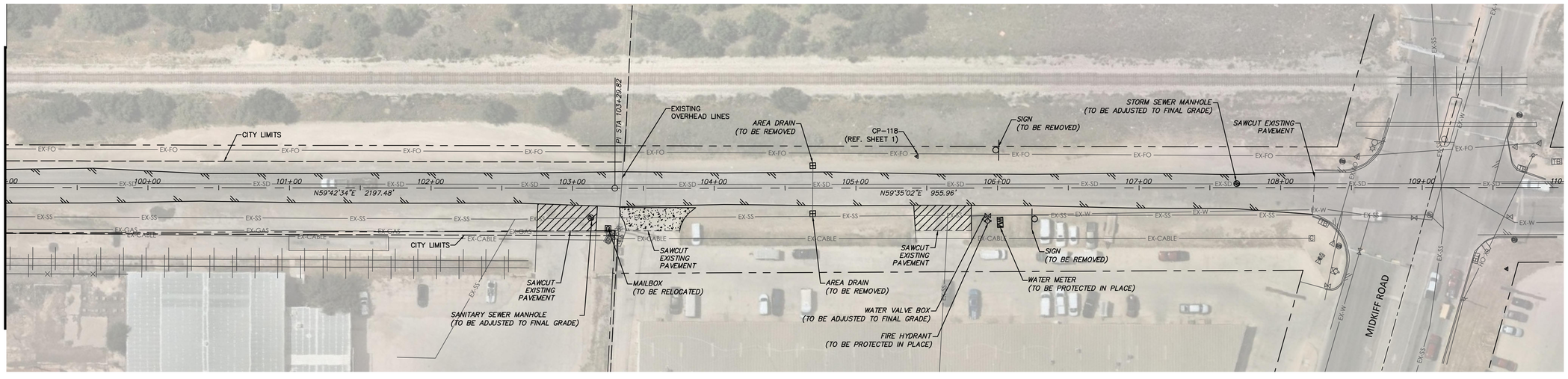
INDUSTRIAL AVENUE

MATCH LINE STA 88+00



MATCH LINE STA 99+00

MATCH LINE STA 99+00



GRAPHIC SCALE IN FEET
40 0 20 40 80

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER
6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
OVERALL ROADWAY STATIONING
STA 88+00 TO END

DA PROJECT B006225.001
SHEET 27

FULL PATH: G:\Production\4000\006200\6225\001\Civil\Drawings\Plot Sheets\OVERALL ROADWAY STATIONING.dwg
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PLOTTED BY: Allison Aldana
PLOTTED ON: Thursday, July 08, 2021
PLOTTED AT: 2:49:24 PM

Texas 811
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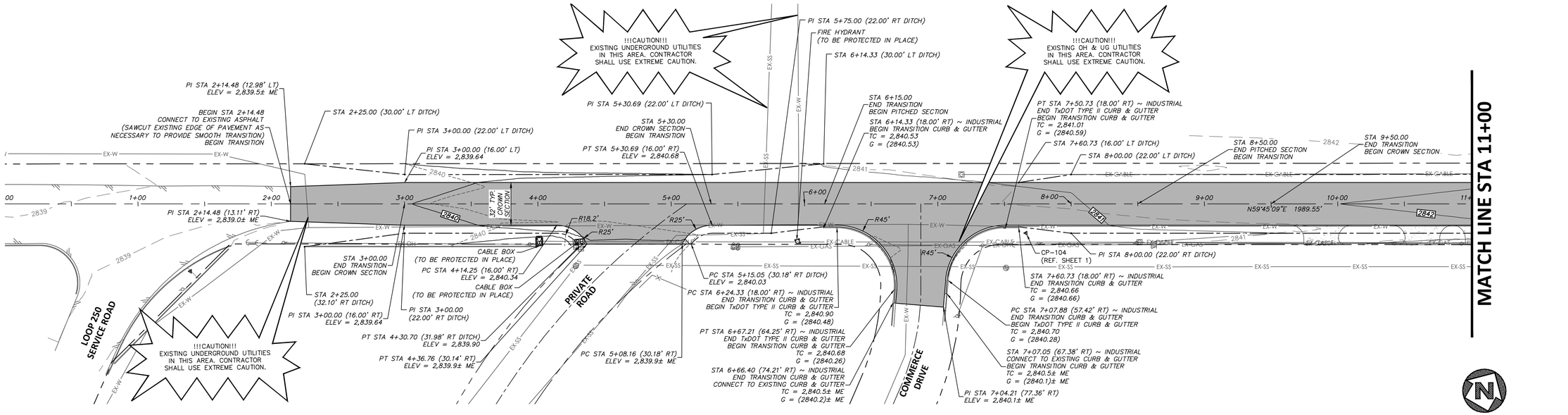

INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
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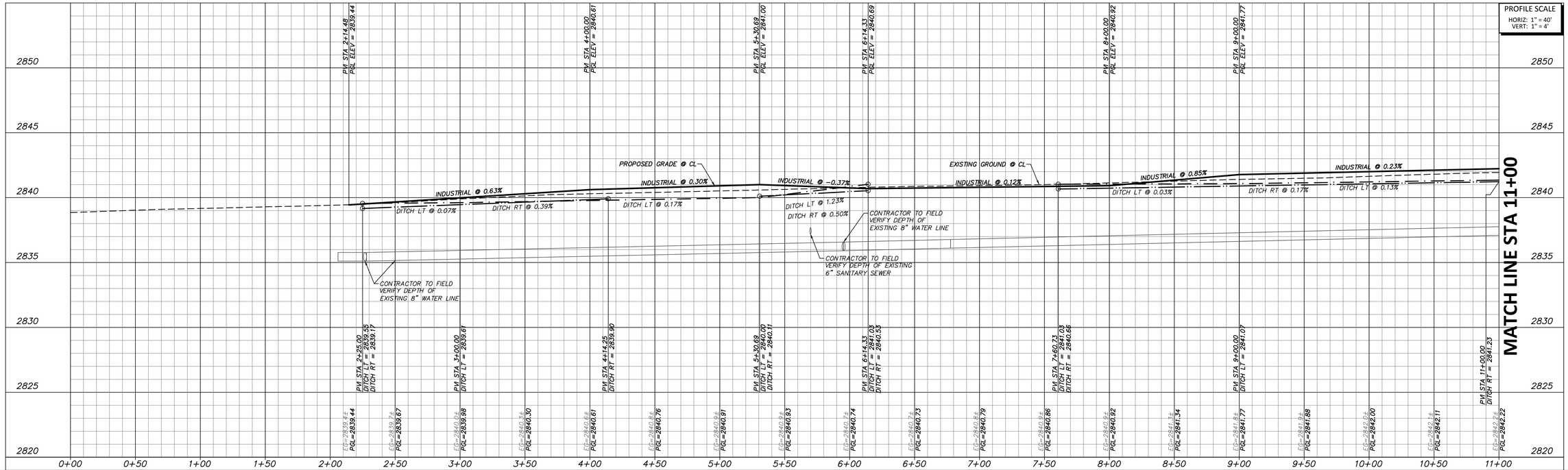

NO.	REVISION	BY	DATE

MMC
DESIGNED
RVG
DRAWN
JLB
CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 0+00 TO 11+00

DA PROJECT
B006225.001
SHEET
28

FULL PATH: G:\Production\4000\B006225\025\001\Civil\Drawings\Plot Sheets\ROAD P&P.dwg
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PLOTTED BY: Alison Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 3:58:54 PM

Texas 811
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Call before you dig.

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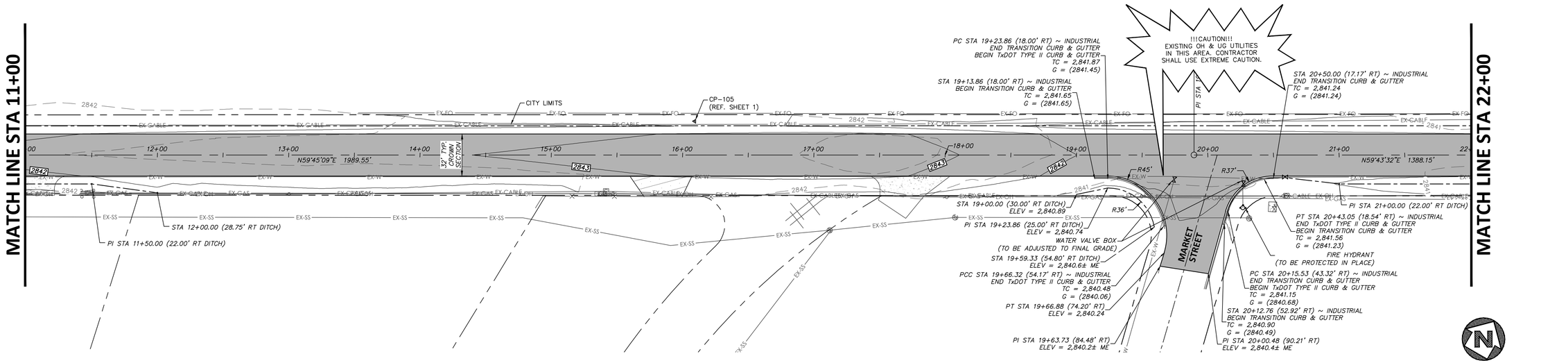

INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
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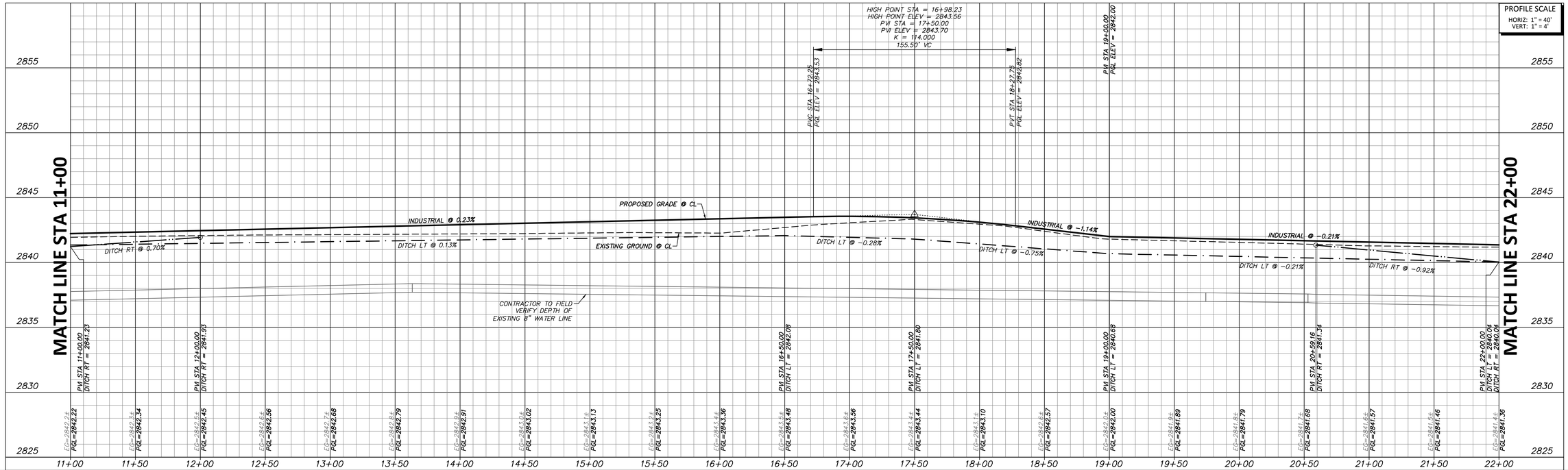

NO.	REVISION	BY	DATE

MMC
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RVG
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JLB
CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ
1" = 40'
VERT
1" = 4'
DATE
JUNE
2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 11+00 TO 22+00

DA PROJECT
B006225.001
SHEET
29

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FILENAME: ROAD P&P.dwg
PLOTTED BY: Alison Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 3:59:11 PM

Texas 811
Know what's below.
Call before you dig.

WARNING TO CONTRACTOR:

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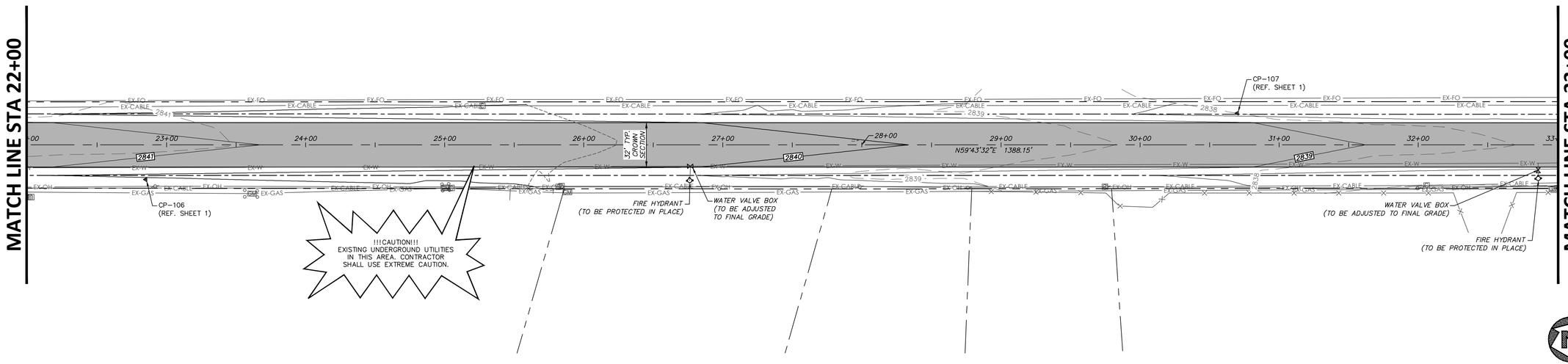

INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
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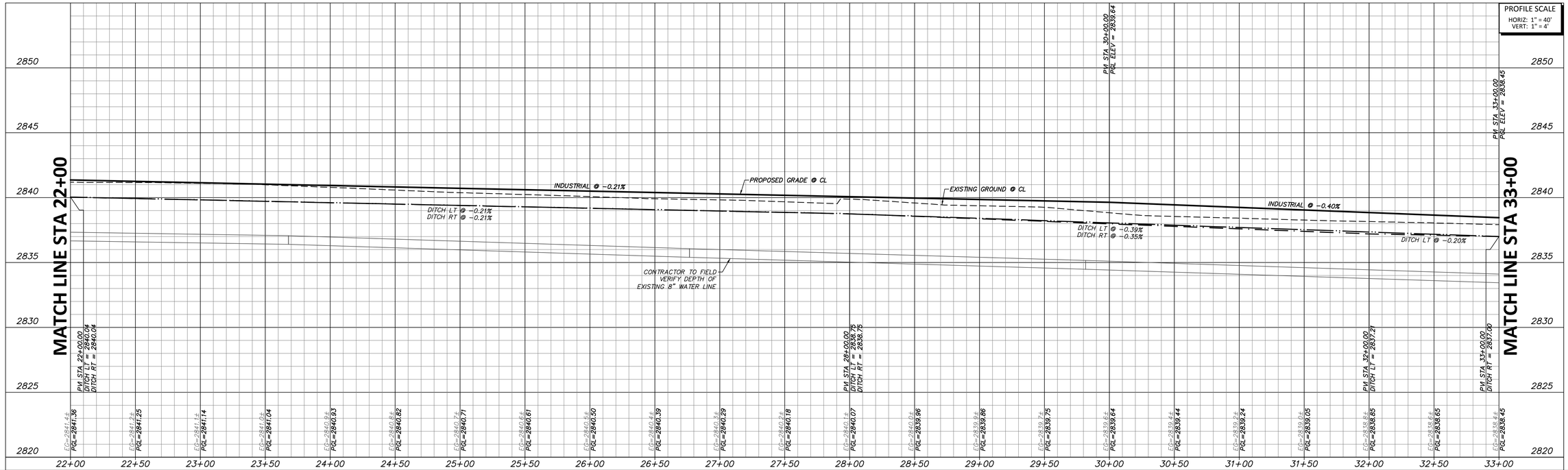

NO.	REVISION	BY	DATE

MMC — DESIGNED
RVG — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/24
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 22+00 TO 33+00

DA PROJECT B006225.001
SHEET 30

FULL PATH: G:\Production\4000\006225\6225\001\Drawings\Plot Sheets\ROAD P&P.dwg
FILENAME: ROAD P&P.dwg
PLOTTED BY: Alison Adams
PLOTTED ON: Tuesday, June 15, 2021
PLOTTED AT: 1:59:27 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
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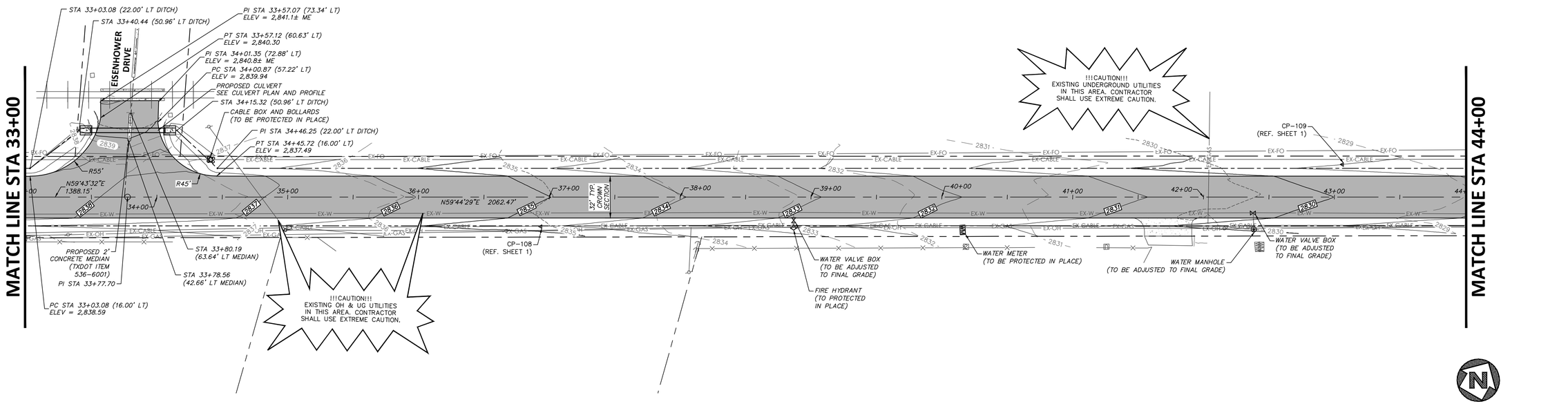
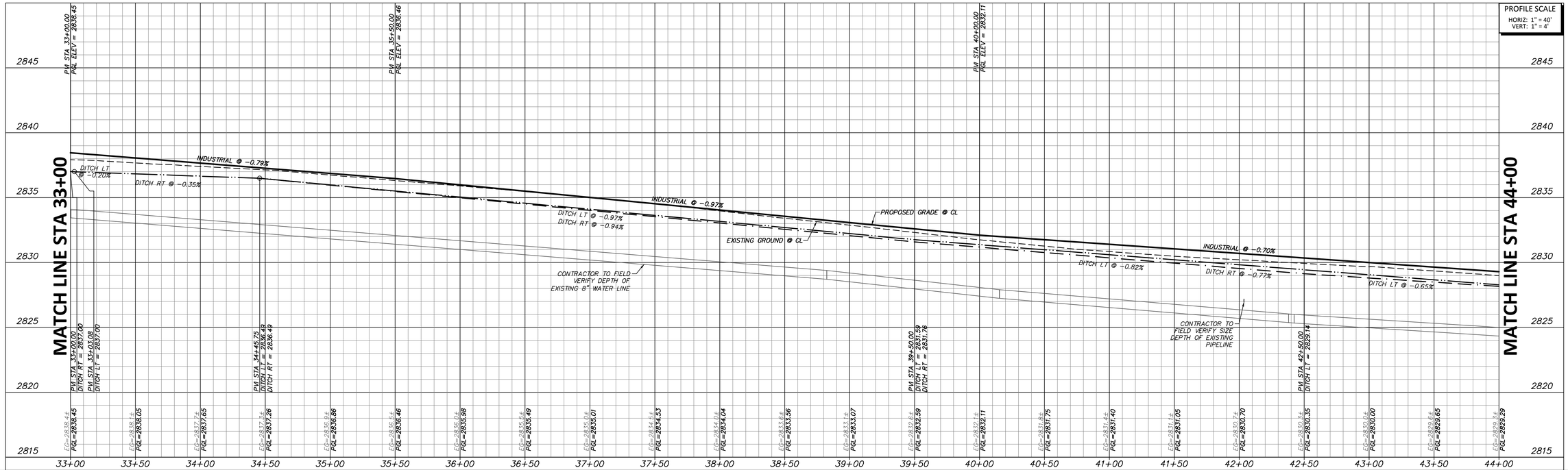


INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
40 0 20 40 80



NO.	REVISION	BY	DATE

MMC — DESIGNED
RVG — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 33+00 TO 44+00

DA PROJECT B006225.001
SHEET 31

FULL PATH: G:\Production\4000\B006225\625\001\Civil\Drawings\Plot Sheets\ROAD P&P.dwg
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PLOTTED BY: Alison Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 3:59:48 PM

Texas 811
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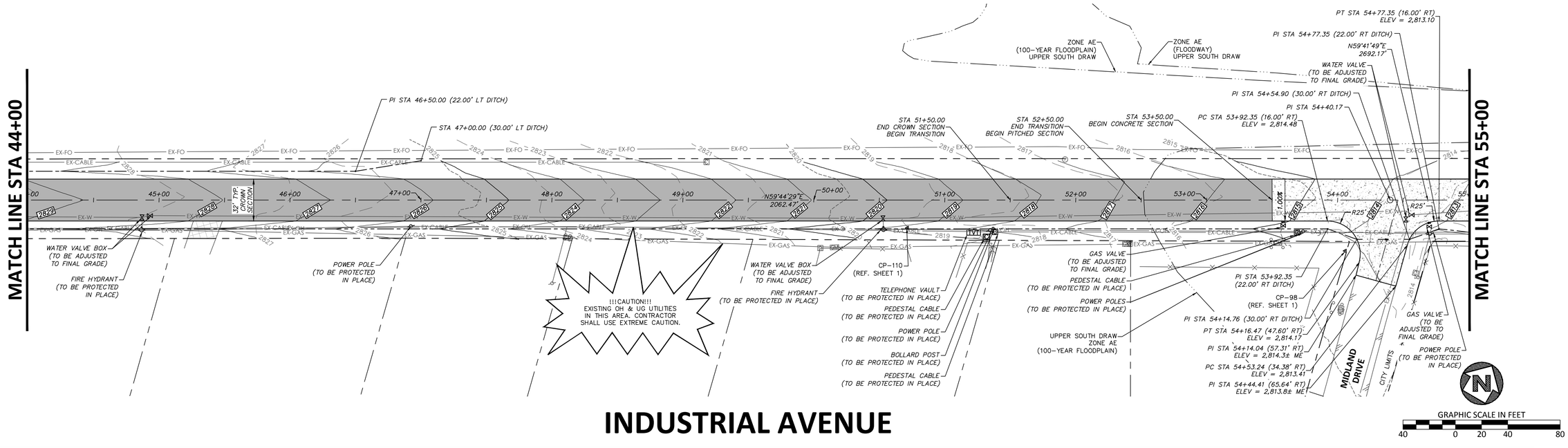

INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
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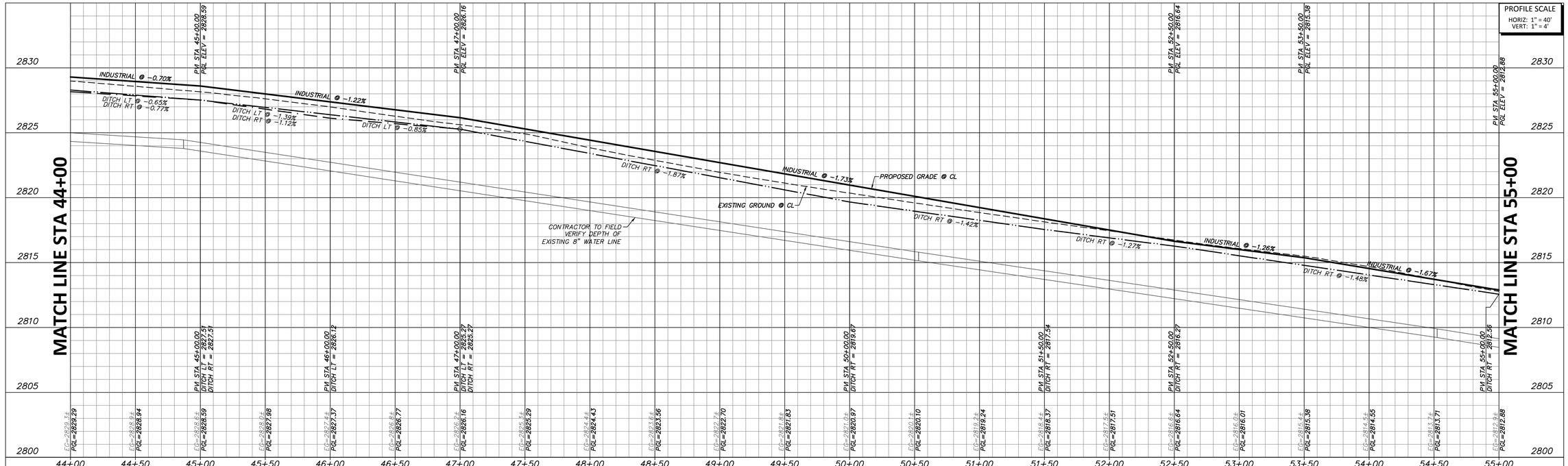

NO.	REVISION	BY	DATE

MMC — DESIGNED
RVG — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 44+00 TO 55+00

DA PROJECT B006225.001
SHEET 32

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PLOTTED BY: Alison Adams
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 4:00:07 PM

Texas 811
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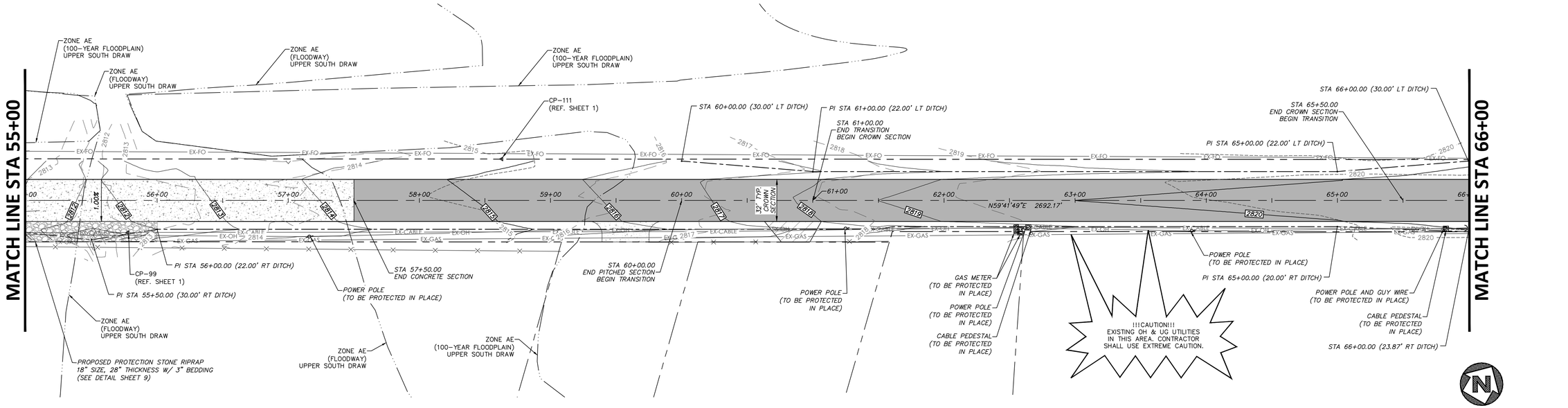

INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
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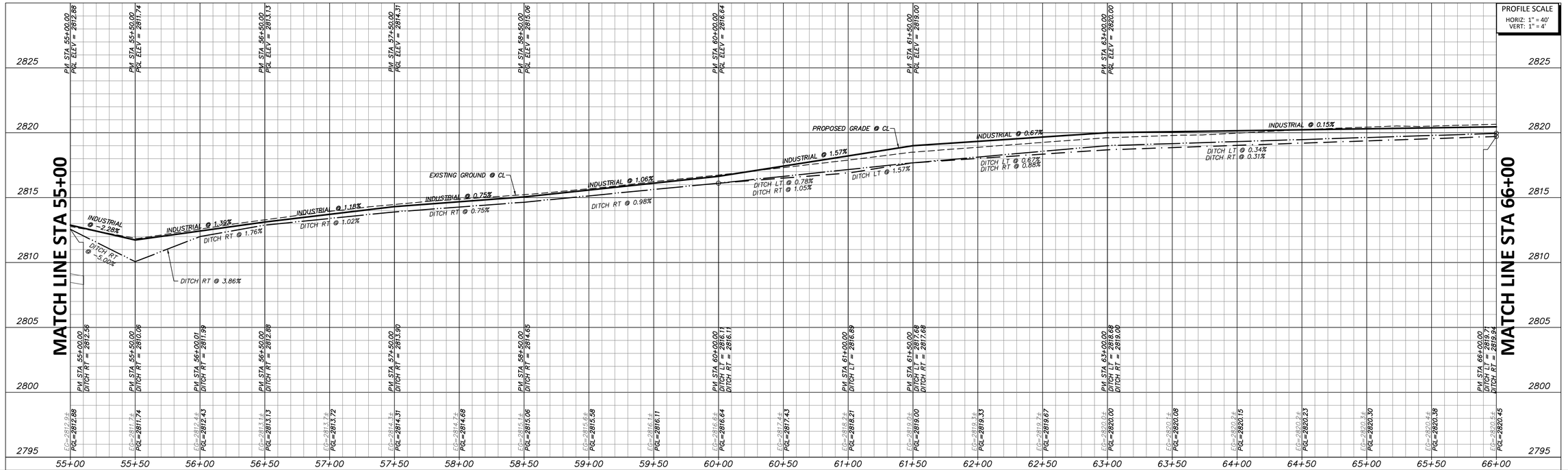

NO.	REVISION	BY	DATE

MMC DESIGNED | RVG DRAWN | JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/21
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 55+00 TO 66+00

DA PROJECT B006225.001
SHEET 33

FULL PATH: G:\Production\4000\B006225\025\001\Civil\Drawings\Plot Sheets\ROAD P&P.dwg
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PLOTTED BY: Alison Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 4:09:32 PM

Texas 811
Know what's below.
Call before you dig.

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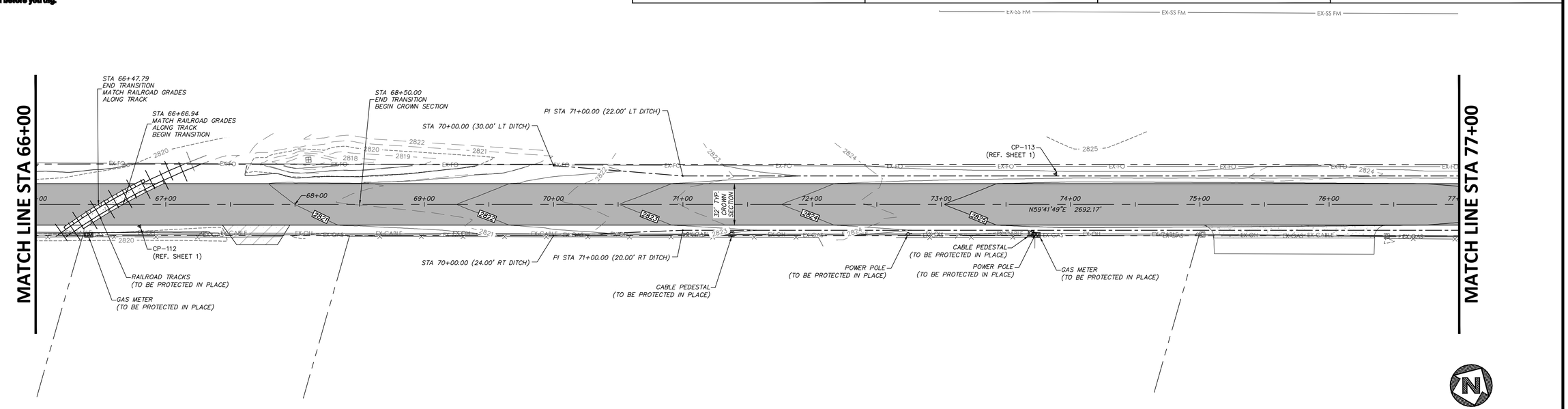

INDUSTRIAL AVENUE

GRAPHIC SCALE IN FEET
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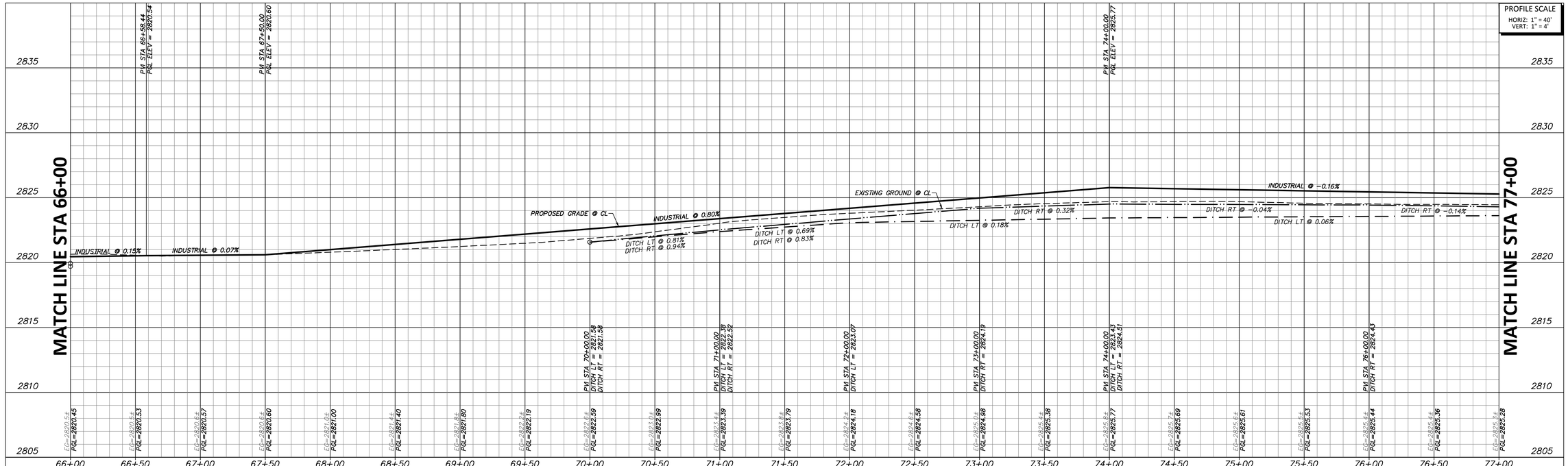

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 66+00 TO 77+00

DA PROJECT
B006225.001
SHEET
34

FULL PATH: G:\Production\4000\006225\025\001\civil\Drawings\Plat Sheets\ROAD P&P.dwg
FILENAME: ROAD P&P.dwg
PLOTTED BY: Alison Adams
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 4:05:51 PM

Texas 811
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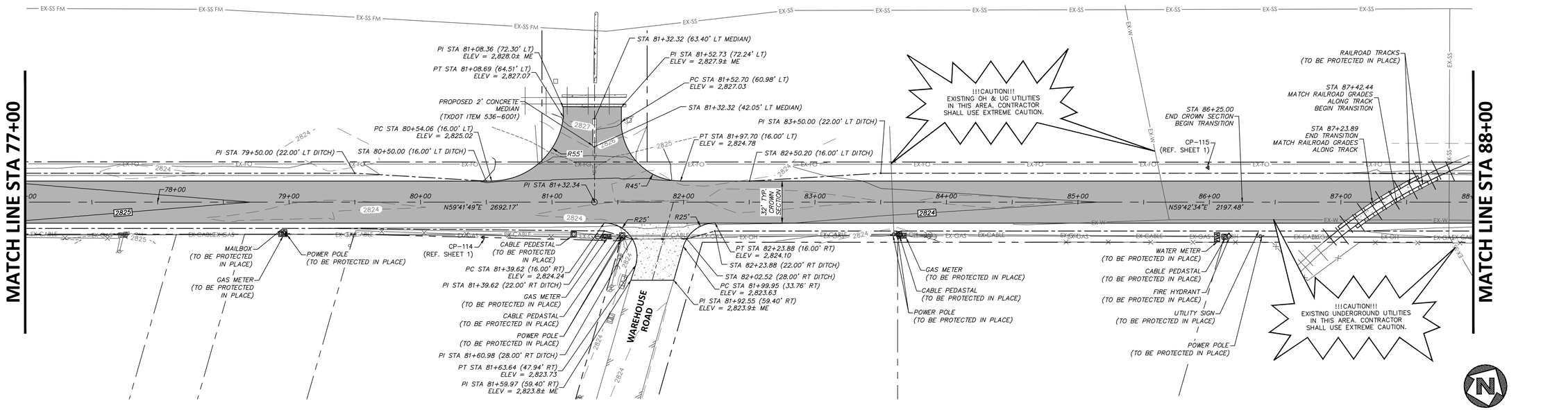

INDUSTRIAL AVENUE

N

GRAPHIC SCALE IN FEET
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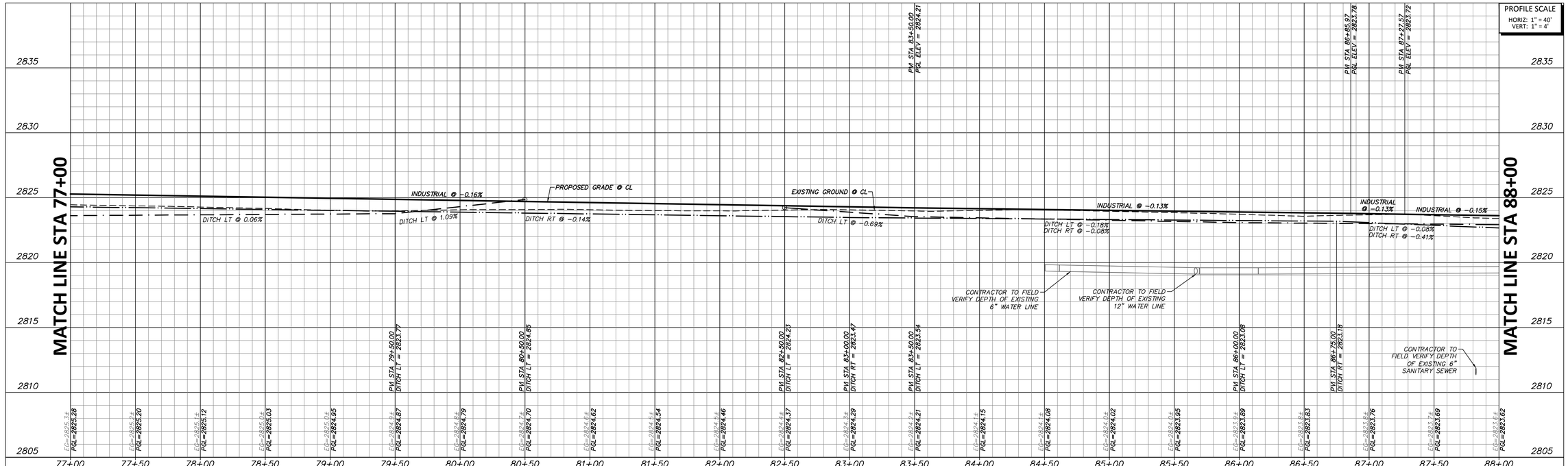

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 77+00 TO 88+00

DA PROJECT
B006225.001
SHEET
35

FULL PATH: G:\Production\4000\B006225\025\001\Drawings\Plot Sheets\ROAD P&P.dwg
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PLOTTED BY: Alison Adams
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 4:01:11 PM

Texas 811
Know what's below. Call before you dig.

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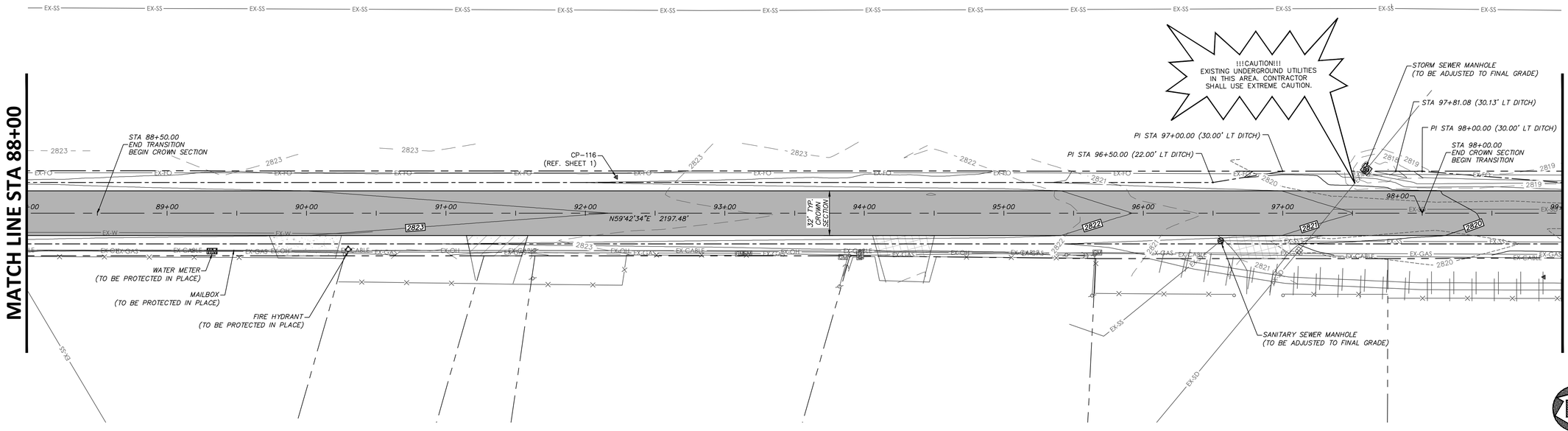
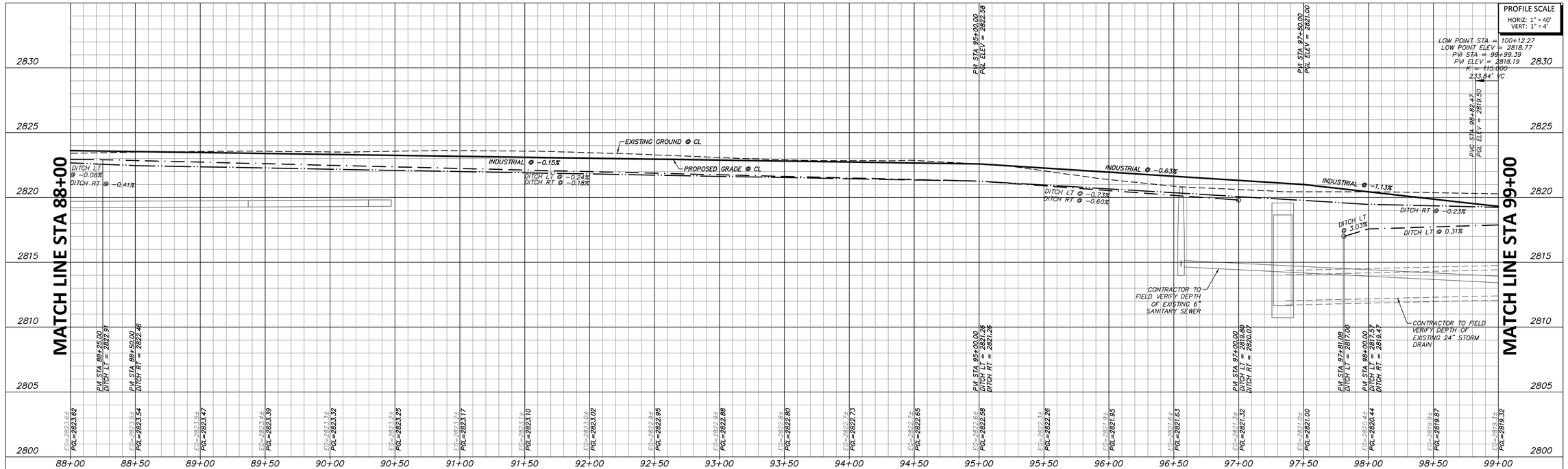


INDUSTRIAL AVENUE



NO.	REVISION	BY	DATE

MMC — DESIGNED
RVG — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT 1" = 4'
DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/24
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 88+00 TO 99+00

DA PROJECT
B006225.001
SHEET
36

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PLOTTED BY: Alison Adams
PLOTTED ON: Wednesday, June 14, 2021
PLOTTED AT: 4:01:26 PM

Texas 811
Know what's below. Call before you dig.

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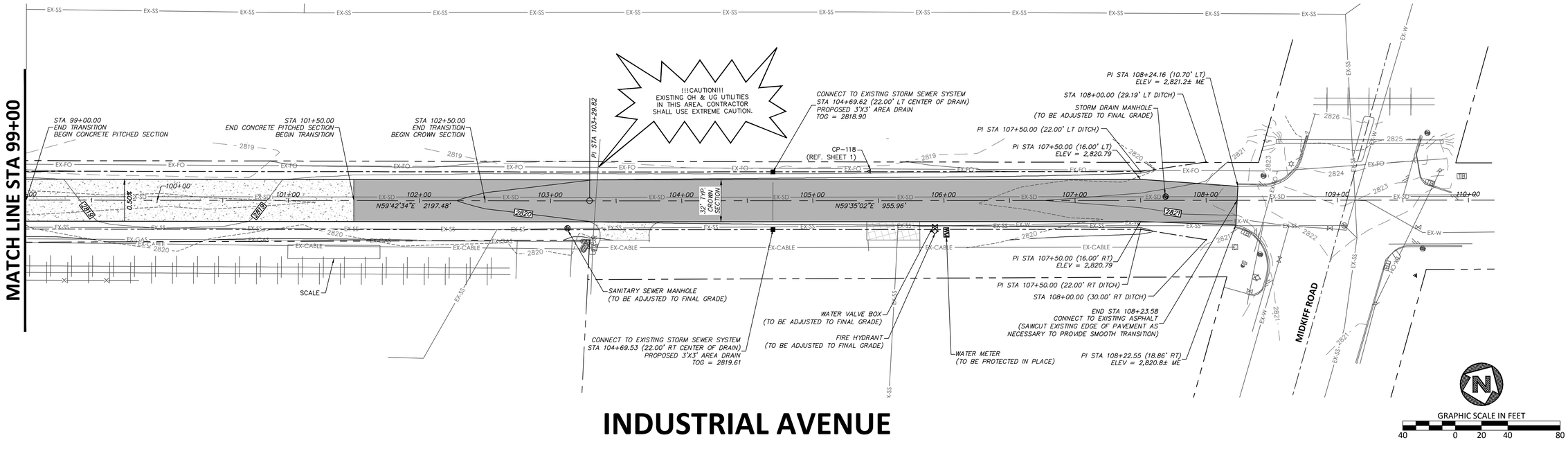
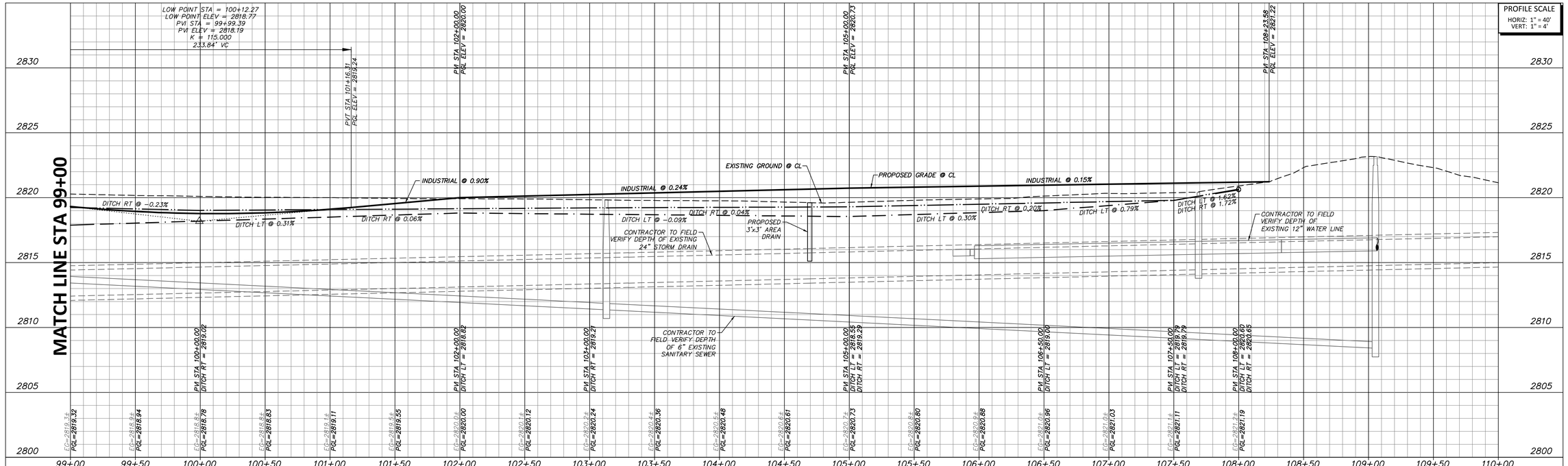


INDUSTRIAL AVENUE



NO.	REVISION	BY	DATE

MMC
DESIGNED
RVG
DRAWN
JLB
CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
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DATE
JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
PLAN AND PROFILE
STA 99+00 TO END

DA PROJECT
B006225.001
SHEET
37

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PLOTTED ON: November 14, 2021
PLOTTED AT: 4:01:42 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:	CRITICAL:	UTILITY RELOCATION NOTE:	STATE PLANE COORDINATE NOTE:
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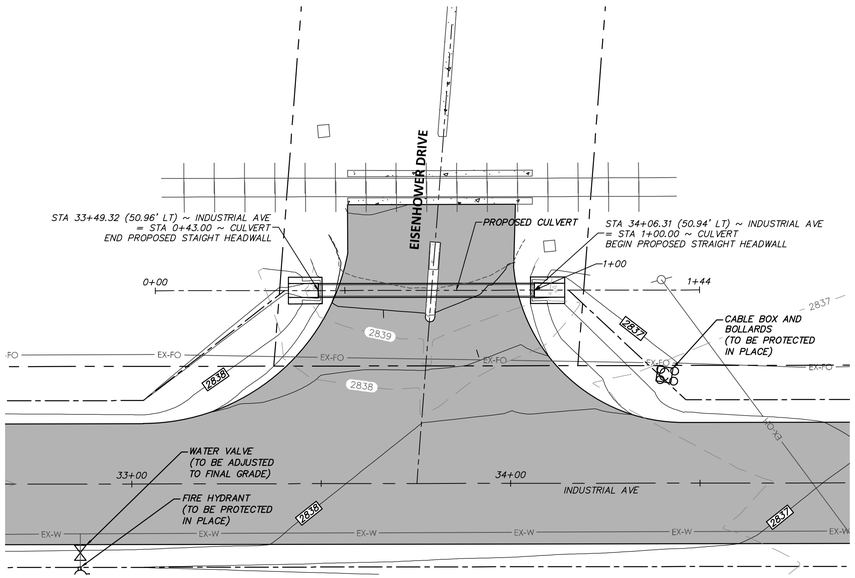
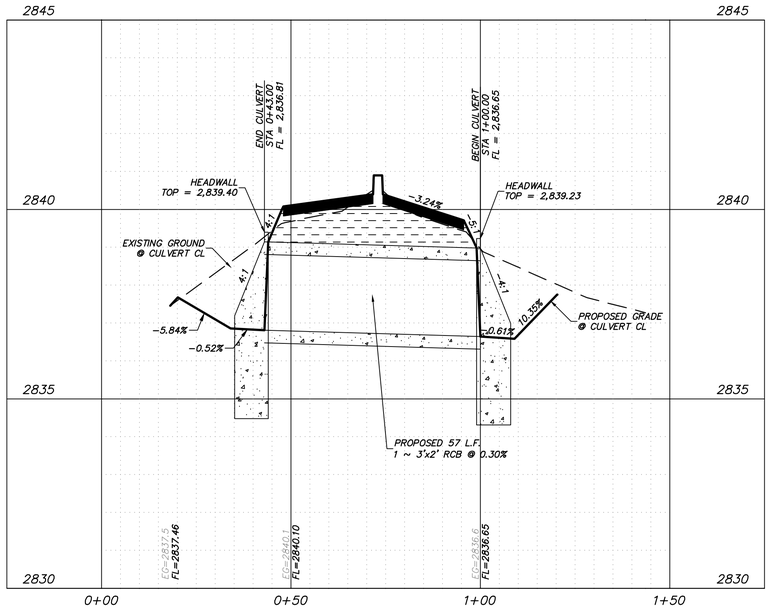


STA 33+75 CULVERT





GRAPHIC SCALE IN FEET
20 0 10 20 40

PROFILE SCALE
HORIZ: 1" = 20'
VERT: 1" = 2'

NO.	REVISION	BY	DATE

MMC — DESIGNED
RVG — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 20'
VERT 1" = 2'
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER
Jennifer L Becker

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
CULVERT PLAN AND PROFILE
STA 33+75

DA PROJECT B006225.001
SHEET 37

FULL PATH: G:\Production\4000\006200\62251001\Civil\Drawings\Plot Sheets\CULVERT P&P.dwg
FILENAME: CULVERT P&P.dwg
PLOTTED BY: Alison Adams
PLOTTED ON: Wednesday, June 16, 2021
PLOTTED AT: 4:02:04 PM

Texas 811
Know what's below. Call before you dig.

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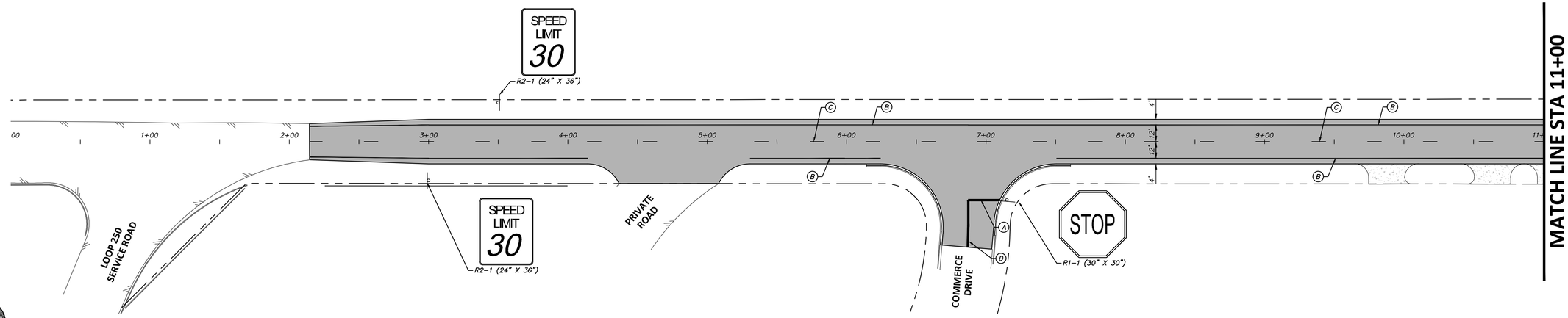
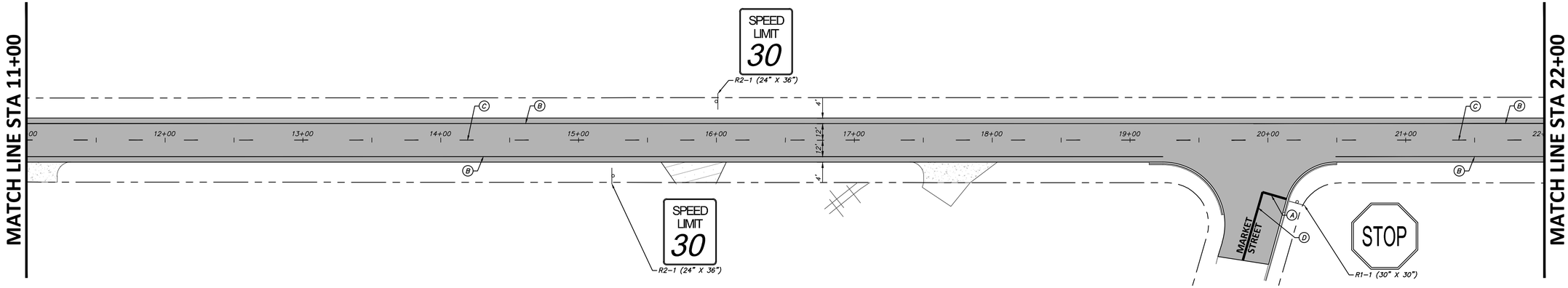
INDUSTRIAL AVENUE





NOTES:

1. INSTALL PAVEMENT MARKINGS AND SIGNAGE PER TxDOT STANDARDS AND DETAILS AND TEXAS MUTCD.
2. STRIPING TO FOLLOW ALIGNMENT STATIONING OF ROADWAY.
3. ALL PAVEMENT MARKING DIMENSIONS MEASURED FROM CENTER OF STRIPING.
4. RETROREFLECTIVE SOLID YELLOW MARKINGS SHOULD BE PLACED ON THE NOSES OF RAISED MEDIANS AND CURBS OF ISLANDS THAT ARE LOCATED IN THE LINE OF TRAFFIC FLOW WHERE THE CURB SERVES TO CHANNEL TRAFFIC TO THE RIGHT OF THE OBSTRUCTION.

GRAPHIC SCALE IN FEET
40 0 20 40 80

PAVEMENT MARKINGS	
A	REFL PAV MRK (W) 18" (SOLID)
B	REFL PAV MRK (W) 4" (SOLID)
C	REFL PAV MRK (Y) 4" (BRK)
D	REFL PAV MRK (Y) 4" DOUBLE (SOLID)
E	REFL PAV MRK (W) 18" (YLD TRI)
	INSTALL ROADSIDE SIGN

NO.	REVISION	BY	DATE

MMC — DESIGNED
RVG — DRAWN
JLB — CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1"=40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
SIGNAGE AND PAVEMENT MARKINGS PLAN
STA 0+00 TO 22+00

DA PROJECT 8006225.001
SHEET 39

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PLOTTED BY: Alison Adams
PLOTTED ON: May 14, 2021
PLOTTED AT: 4:38:22 PM

Texas 811
Know what's below. Call before you dig.

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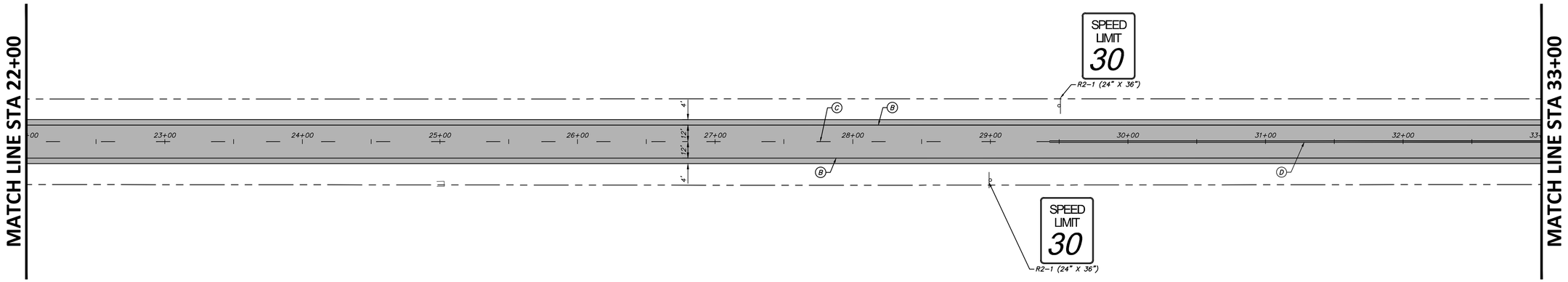
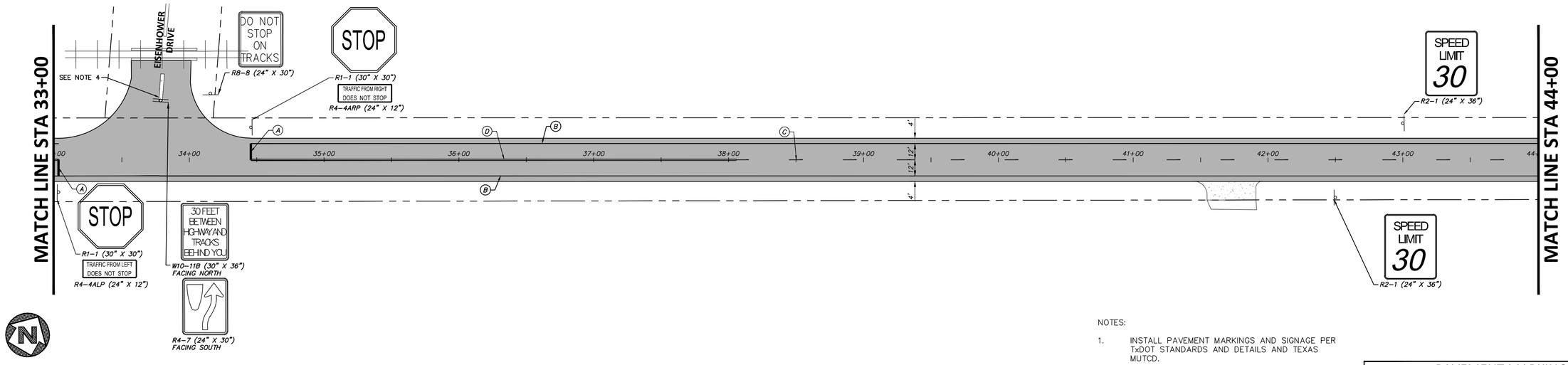
INDUSTRIAL AVENUE





GRAPHIC SCALE IN FEET
40 0 20 40 80

NOTES:

1. INSTALL PAVEMENT MARKINGS AND SIGNAGE PER TxDOT STANDARDS AND DETAILS AND TEXAS MUTCD.
2. STRIPING TO FOLLOW ALIGNMENT STATIONING OF ROADWAY.
3. ALL PAVEMENT MARKING DIMENSIONS MEASURED FROM CENTER OF STRIPING.
4. RETROREFLECTIVE SOLID YELLOW MARKINGS SHOULD BE PLACED ON THE NOSES OF RAISED MEDIANS AND CURBS OF ISLANDS THAT ARE LOCATED IN THE LINE OF TRAFFIC FLOW WHERE THE CURB SERVES TO CHANNEL TRAFFIC TO THE RIGHT OF THE OBSTRUCTION.

PAVEMENT MARKINGS

(A)	REFL PAV MRK (W) 18" (SOLID)
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(C)	REFL PAV MRK (Y) 4" (BRK)
(D)	REFL PAV MRK (Y) 4" DOUBLE (SOLID)
(E)	REFL PAV MRK (W) 18" (YLD TRI)
⊣	INSTALL ROADSIDE SIGN

NO.	REVISION	BY	DATE

MMC DESIGNED · RVG DRAWN · JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE: HORIZ 1" = 40' · VERT N/A
DATE: JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

STATE OF TEXAS · JENNIFER L. BECKER · 102960 · LICENSED PROFESSIONAL ENGINEER · 6/14/2021

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
SIGNAGE AND PAVEMENT MARKINGS PLAN
STA 22+00 TO 44+00

DA PROJECT B006225.001
SHEET 40

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PLOTTED BY: Allison Adams
PLOTTED ON: June 14, 2021
PLOTTED AT: 4:38:32 PM

Texas 811
Know what's below. Call before you dig.

WARNING TO CONTRACTOR:

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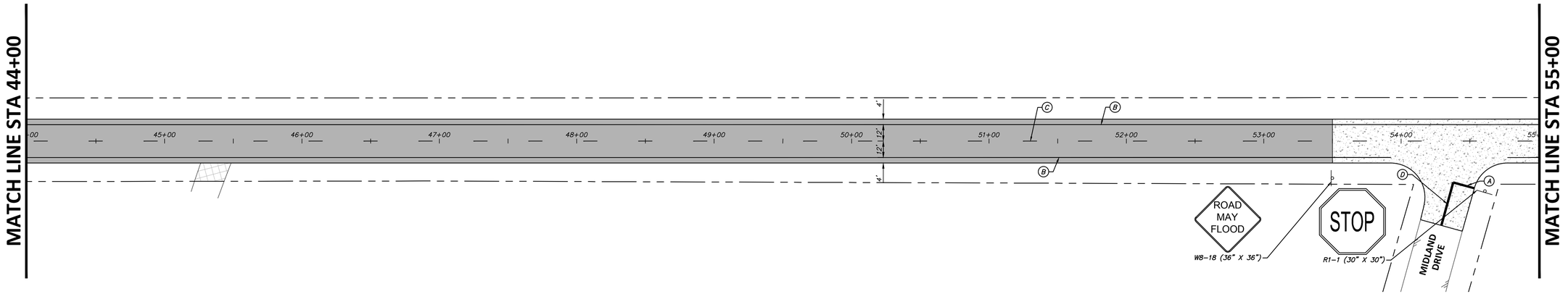
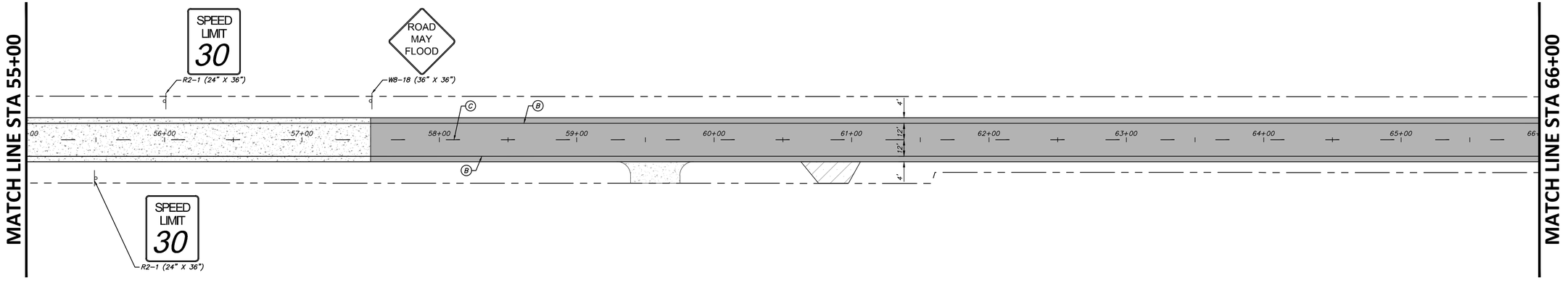
INDUSTRIAL AVENUE





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GRAPHIC SCALE IN FEET
40 0 20 40 80

PAVEMENT MARKINGS

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	INSTALL ROADSIDE SIGN

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1" = 40'
VERT N/A
DATE JUNE 2021

DUNAWAY
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Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
SIGNAGE AND PAVEMENT MARKINGS PLAN
STA 44+00 TO 66+00

DA PROJECT
B006225.001

SHEET
41

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PLOTTED BY: Allison Adams
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 4:38:49 PM

Texas811
Know what's below. Call before you dig.

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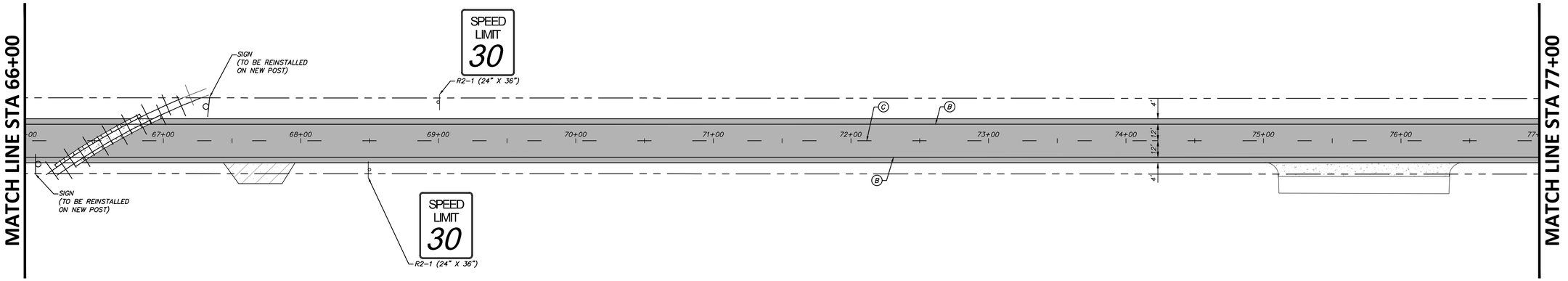
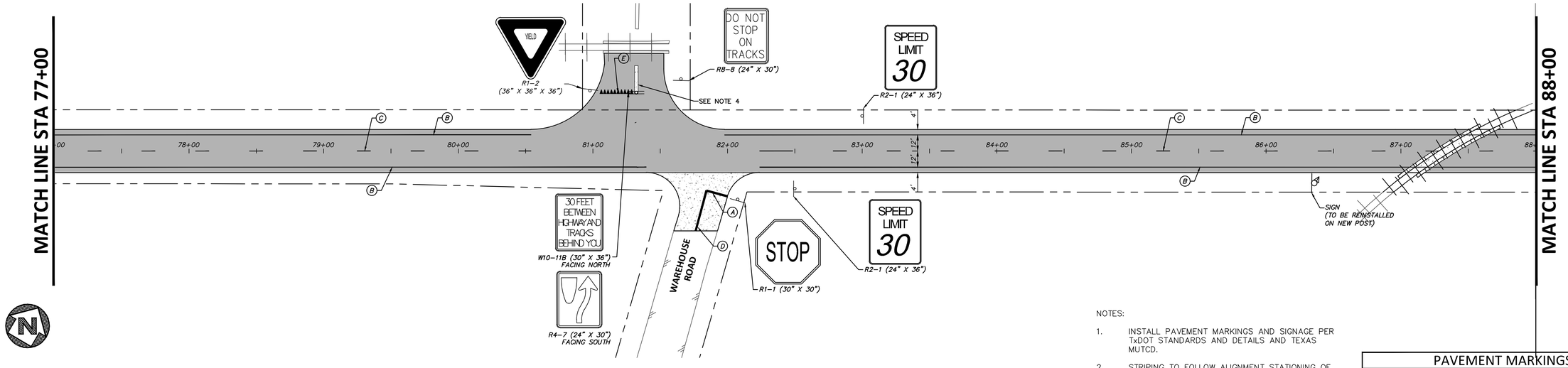
INDUSTRIAL AVENUE





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GRAPHIC SCALE IN FEET
40 0 20 40 80

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- (D) REFL PAV MRK (Y) 4" DOUBLE (SOLID)
- (E) REFL PAV MRK (W) 18" (YLD TRI)
- INSTALL ROADSIDE SIGN

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1"=40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
(TX REG. F-1114)

6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
SIGNAGE AND PAVEMENT MARKINGS PLAN
STA 66+00 TO 88+00

DA PROJECT B006225.001
SHEET 42

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PLOTTED BY: Allison Aldana
PLOTTED ON: Monday, June 14, 2021
PLOTTED AT: 4:38:57 PM
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Texas811
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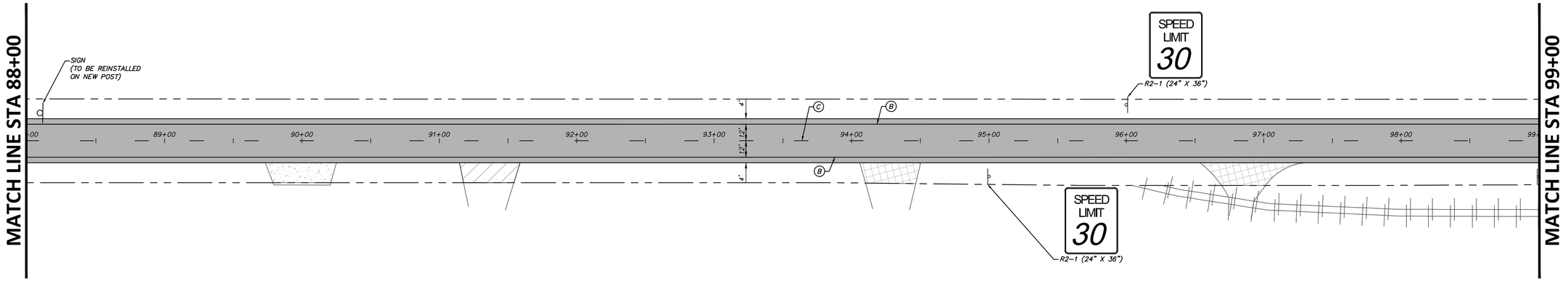
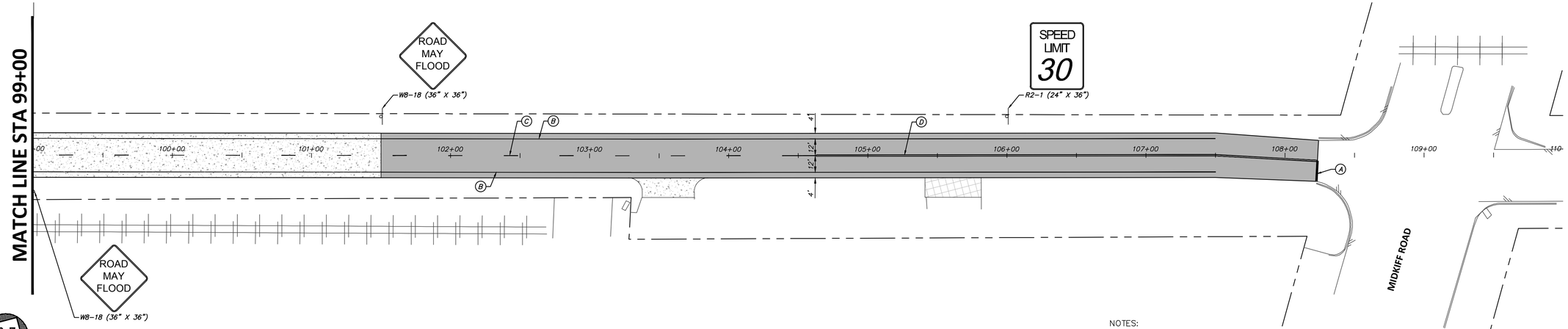
INDUSTRIAL AVENUE





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GRAPHIC SCALE IN FEET
40 0 20 40 80

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- INSTALL ROADSIDE SIGN

NO.	REVISION	BY	DATE

MMC DESIGNED
RVG DRAWN
JLB CHECKED

MIDLAND COUNTY
MIDLAND, TEXAS

SCALE
HORIZ 1"=40'
VERT N/A
DATE JUNE 2021

DUNAWAY
4000 N. Big Spring Street • Suite 101 • Midland, Texas 79705
Tel: 432.699.4889
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6/14/2021
STATE OF TEXAS
JENNIFER L. BECKER
102960
LICENSED
PROFESSIONAL ENGINEER

MIDLAND COUNTY PRECINCT 2
INDUSTRIAL AVENUE
MIDLAND COUNTY, TEXAS
SIGNAGE AND PAVEMENT MARKINGS PLAN
STA 88+00 TO END

DA PROJECT B006225.001
SHEET 43

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PLOTTED ON: Monday, June 14, 2021
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