

Public Works Standard Drawings Subcommittee Meeting

Monday, March 16, 2020

Cross Timbers Room

Welcome and Introductions

Meeting Summary

Half Task Order 5

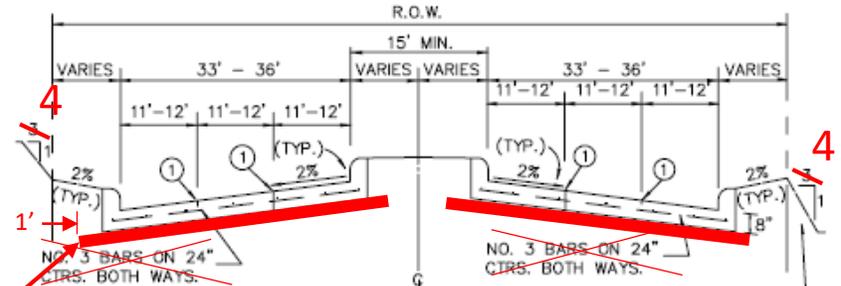
Division 2000: Pavement Systems

DIVISION 2000 PAVEMENT SYSTEMS**TABLE OF CONTENTS**

<u>Drawing #</u>	<u>Subject</u>	<u>Section / Item #</u>
2010	Reinforced Concrete Pavement Six-Lane Divided Thoroughfare	303. pages 303-1 to 303-23
2020	Reinforced Concrete Pavement Four-Lane Divided Thoroughfare	303. pages 303-1 to 303-23
2030	Reinforced Concrete Pavement 2- & 4- Undivided Thoroughfare	303. pages 303-1 to 303-23
2040	Reinforced Concrete Pavement Alleys	303.5. pages 303-1 to 303-23
2050	Reinforced Concrete Pavement Joints	303.5.4. pages 303-1 to 303-23
2060	Reinforced Concrete Pavement Transverse Joint Spacing	303.5.4. pages 303-1 to 303-23
2070	Reinforced Concrete Pavement Street Headers	303.4. pages 303-1 to 303-23
2080	Reinforced Concrete Pavement Bridge Approach Slab	303. pages 303-1 to 303-23
2090	Hot Mix Asphalt Pavement Six-Lane Divided Thoroughfare	302. pages 302-1 to 302-25
2100	Hot Mix Asphalt Pavement Four-Lane Divided Thoroughfare	302. pages 302-1 to 302-25
2110	Hot Mix Asphalt Pavement 2- & 4-Lane Undivided Thoroughfare	302. pages 302-1 to 302-25
2120	Concrete Curb & Gutter Integral, Separate, and Doweled	305.1. pages 305-1 to 305-4
2125A-2125B	Curb Ramps	
2130	Median Island Pavement Nose & Left Turn Lane	305.3. pages 305-1 to 305-4
2140	Median Island Pavement Monolithic Concrete Nose	305.3. pages 305-1 to 305-4
21250A-2150B	Driveway Approach Flared Return Type	305.2. pages 305-1 to 305-4
2155	Driveway Approach Radius Return Type	305.2. pages 305-1 to 305-4
2160	Alley Approach Radius Return Type	305.2. pages 305-1 to 305-4
2170	Reinforced Concrete Sidewalks Joints and Spacing	305.2. pages 305-1 to 305-4

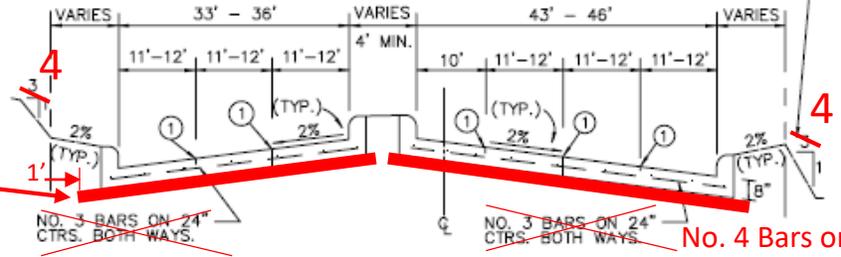
<u>Drawing #</u>	<u>Subject</u>	<u>Section I: Item #</u>
2180	Reinforced Concrete Retaining Wall Integral With Sidewalk	802.2. pages 802-1 to 802-7
2190	Pavement Systems General Notes	302. pages 302-1 to 302-25 303. pages 303-1 to 303-23
2200	Subdrains Pavement Subgrade	301. pages 301-1 to 301-15
2210	Alley Geometrics Type "A" & Type "B"	303.5. pages 303-1 to 303-23
2220	Alley Geometrics Type "C" & Type "D"	303.5. pages 303-1 to 303-23
2230	Alley Geometrics Type "E" & Type "F"	303.5. pages 303-1 to 303-23
2240	Alley Geometrics Type "G" & Type "H"	303.5. pages 303-1 to 303-23
2250	Alley Geometrics Type "J"	303.5. pages 303-1 to 303-23
2260	Alley Intersection Proposed To Existing	303.5. pages 303-1 to 303-23
2270A	Metal Beam Guard Fence Roadside Placement & Beam Elements	801.2. pages 801-1 to 801-5
2270B	Metal Beam Guard Fence Line Post & Connections	801.2. pages 801-1 to 801-5
2270C	Metal Beam Guard Fence End Section & Angle Anchor Post	801.2. pages 801-1 to 801-5
2270D	Metal Beam Guard Fence Special End Shoe & Anchor Post	801.2. pages 801-1 to 801-5
2270E	Metal Beam Guard Fence General Notes	801.2. pages 801-1 to 801-5
2280A	Metal Beam Guard Fence Two-Way Traffic Bridge End	801.2. pages 801-1 to 801-5
2280B	Metal Beam Guard Fence Two-Way Traffic Bridge End	801.2. pages 801-1 to 801-5
2290	Metal Beam Barricade End of Road	801.2. pages 801-1 to 801-5

8" minimum stabilized subgrade per section 301 and as approved or specified by owner



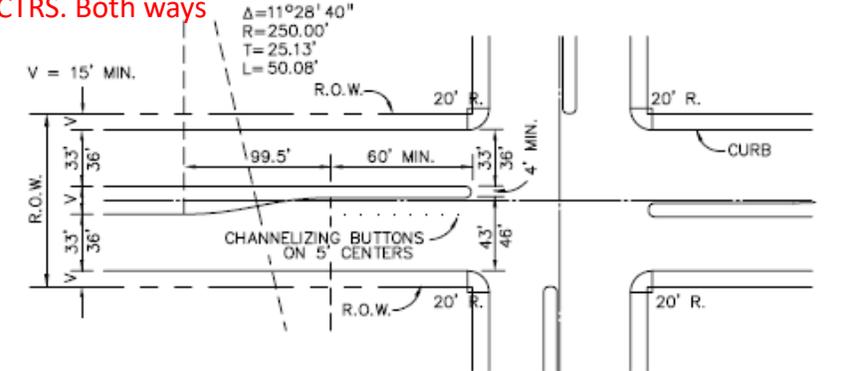
No. 4 Bars on 18" CTRS. Both ways

No. 4 Bars on 18" CTRS. Both ways



No. 4 Bars on 18" CTRS. Both ways

No. 4 Bars on 18" CTRS. Both ways



NOTES:

1. MIN. PAVEMENT DEPTH AND STRENGTH SHALL BE 8" - CLASS "C" OR "PC", OR AS SPECIFIED BY OWNER.
2. MIN. CURB HEIGHT AND WIDTH SHALL BE 6", OR AS SPECIFIED BY OWNER.
3. ~~ALTERNATE REINFORCEMENT SHALL BE #4 BARS ON 30" CENTERS BOTH WAYS.~~

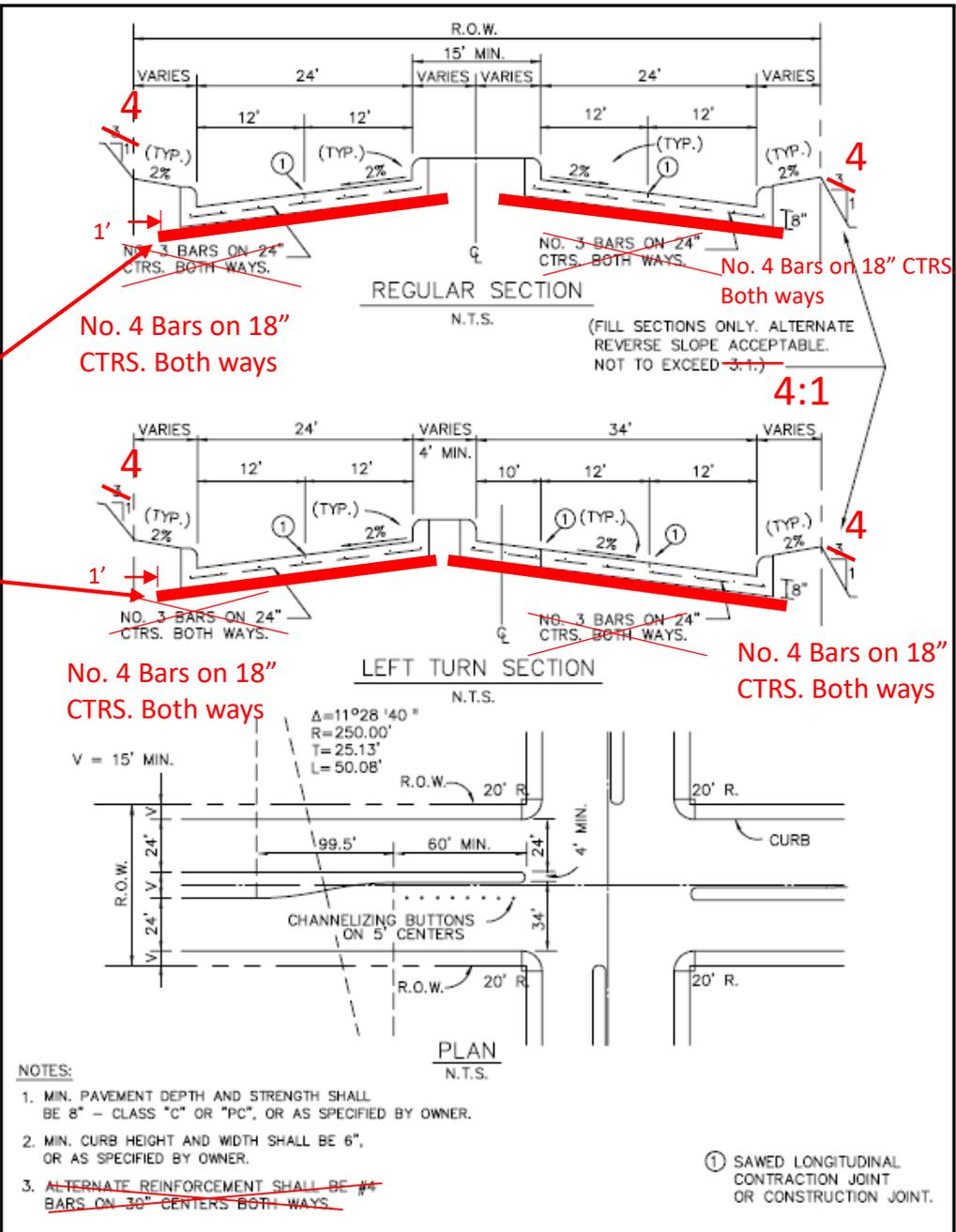
① SAWED LONGITUDINAL CONTRACTION JOINT OR CONSTRUCTION JOINT.

Replace Plan with a more general layout to include crosswalks, ADA ramps, striping, and possibly additional lane width for bicycle lanes per TxDOT

3. Alternative subgrade, thickness, and steel may be utilized with more detailed study and analysis and as approved by owner

4. If lime stabilized subgrade is utilized a minimum of 40 lbs/sy is required

8" minimum stabilized subgrade per section 301 and as approved or specified by owner

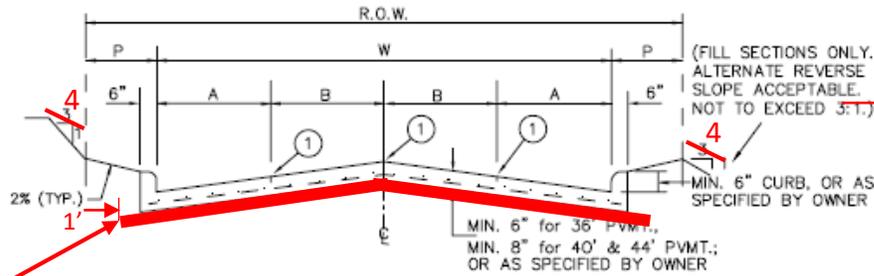


No. 4 Bars on 18" CTRS. Both ways

4:1

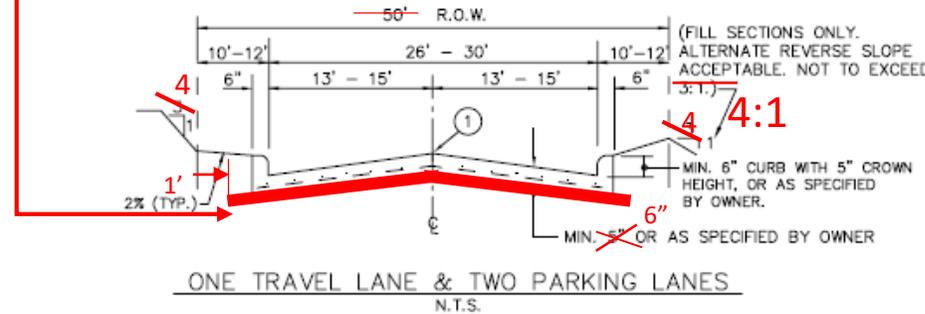
Replace Plan with a more general layout to include crosswalks, ADA ramps, striping, and possibly additional lane width for bicycle lanes per TxDOT

- 3. Alternative subgrade, thickness, and steel may be utilized with more detailed study and analysis and as approved by owner
- 4. If lime stabilized subgrade is utilized a minimum of 40 lbs/sy is required
- 5. See detail 2170 for sidewalks



STREET WIDTH(W)	A	B	R.O.W. WIDTH	P	CROWN HEIGHT
36'	8'	10'	VARIES	VARIES	6"
40'	8' OR 10'	10' OR 12'	VARIES	VARIES	6"
44'	11'	11'	VARIES	VARIES	8"

FOUR TRAVEL LANES OR
TWO TRAVEL LANES & TWO PARKING LANES
N.T.S.



ONE TRAVEL LANE & TWO PARKING LANES
N.T.S.

① INDICATES SAWED LONGITUDINAL CONTRACTION OR CONSTRUCTION JOINT.

NOTES :

- ALL REINFORCEMENT SHALL BE ~~3~~⁴ BARS ON ~~30~~¹⁸" CENTERS BOTH WAYS, EXCEPT WHERE NOTED.
- ALTERNATE REINFORCEMENT SHALL BE #4 BARS ON 30" CENTERS BOTH WAYS.
- PAVEMENT STRENGTH SHALL CONFORM TO CLASS "C" OR "PC" CONCRETE, OR AS SPECIFIED BY THE OWNER.

- Straight crown or parabolic crown as approved by owner
- See detail 2170 for sidewalks

8" minimum stabilized subgrade per section 301 and as approved or specified by owner

2. Alternative subgrade, thickness, and steel may be utilized with more detailed study and analysis and as approved by owner

REINFORCED CONCRETE PAVEMENT

2- & 4-LANE UNDIVIDED THOROUGHFARE

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

303

DATE

STANDARD DRAWING NO.

OCT. '04

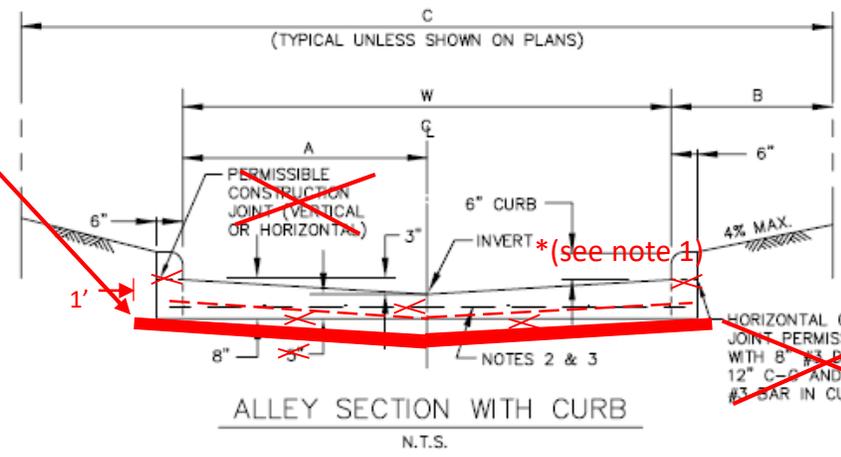
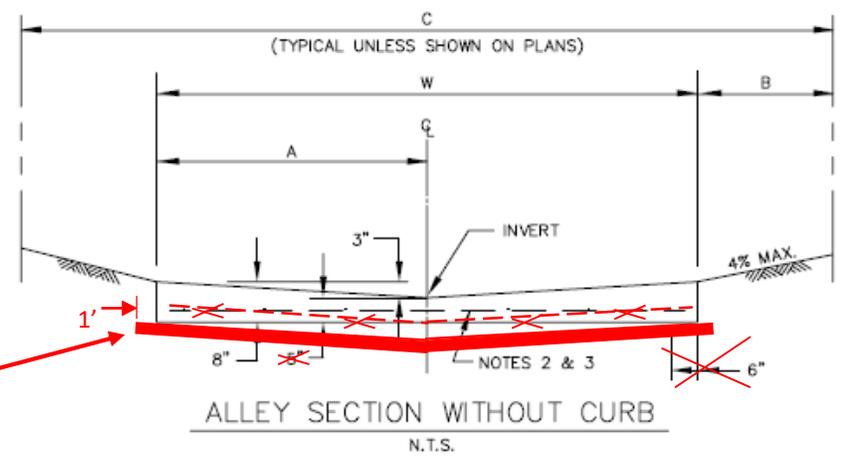
2030

8" minimum stabilized subgrade per section 301 and as approved or specified by owner

1. Crown section may be used in lieu of invert with provision of an adequate drainage design and as approved by owner

3. Alternative subgrade, thickness, and steel may be utilized with more detailed study and analysis and as approved by owner

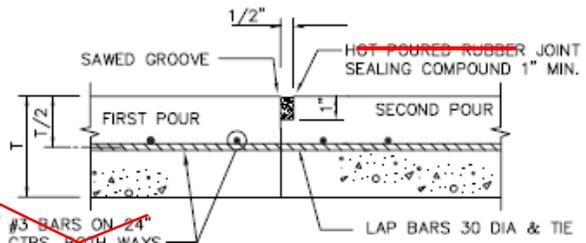
6. See detail 2170 for sidewalks



NOTES:

- ~~1. PROVIDE SAVED TRANSVERSE CONTRACTION JOINTS NOT MORE THAN 20' C-C.~~ 18" Or as approved by owner
2. REINFORCED WITH NO. 3 BARS AT 24" C-C BOTH WAYS.
- ~~3. ALTERNATE REINFORCEMENT - NO. 4 BARS AT 36" C-C BOTH WAYS.~~
4. EXPANSION JOINTS TO BE PLACED AT ALL INTERSECTIONS AND NOT TO EXCEED 600' BETWEEN JOINTS.
5. CONCRETE SHALL BE CLASS "C" OR "PC", OR AS SPECIFIED BY OWNER.

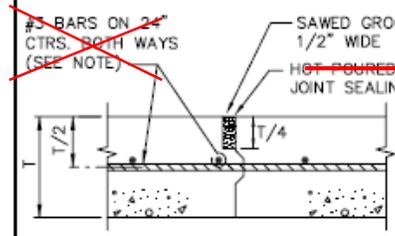
ALLEY WIDTH (W)	A	B	R.O.W. WIDTH (C)
10'	5'	2'-6"	15'
12'	6'	2'-6"	17'
16'	8'	2'-6"	21'
20'	10'	2'-6"	25'



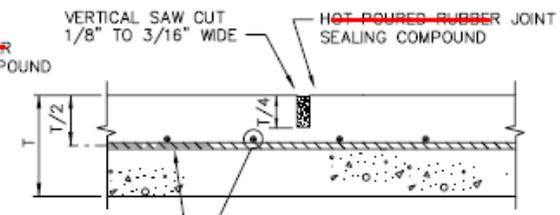
No. 4 Bars on 18"
CTRS. Both ways

CONSTRUCTION JOINT
N.T.S.

No. 4 Bars on 18"
CTRS. Both ways



KEYWAY JOINT
(FOR PAVEMENT THICKNESS > 6")
N.T.S.

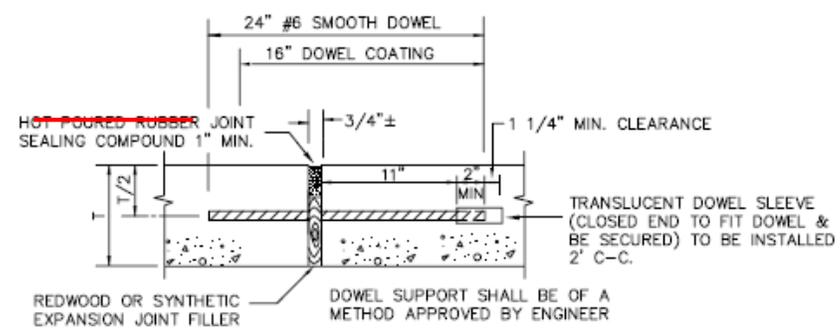


SAWED CONTRACTION JOINT
N.T.S.

No. 4 Bars on 18"
CTRS. Both ways

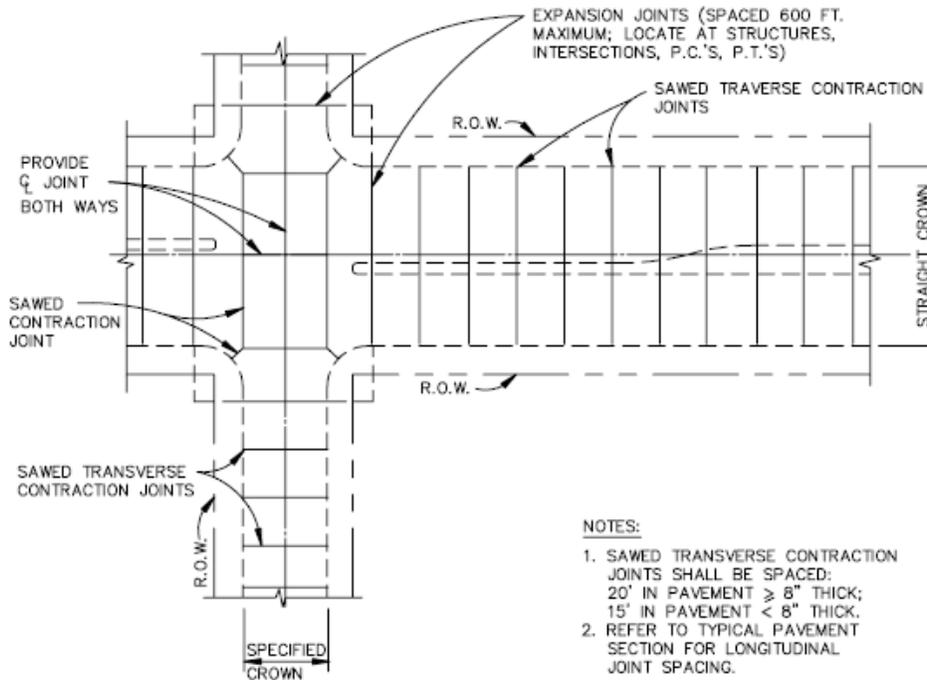
NOTE:
~~ALTERNATE REINFORCEMENT~~
~~#4 BARS ON 30" CTRS.~~
~~BOTH WAYS.~~

1. Apply backer rod as approved by owner



EXPANSION JOINT
(SPACED 600 FT. MAXIMUM; LOCATE AT
STRUCTURES AND AT INTERSECTION P.C.'S & P.T.'S)
N.T.S.

REINFORCED CONCRETE PAVEMENT JOINTS	North Central Texas Council of Governments 	STANDARD SPECIFICATION REFERENCE 303.5.4.
	DATE OCT. '04	STANDARD DRAWING NO. 2050



*cleanup lines through median

NOTES:

1. SAWED TRAVERSE CONTRACTION JOINTS SHALL BE SPACED:
20' IN PAVEMENT \geq 8" THICK;
15' IN PAVEMENT $<$ 8" THICK.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING.

SPACING DIAGRAM FOR TRANSVERSE JOINTS

N.T.S.

REINFORCED CONCRETE PAVEMENT

TRANSVERSE JOINT SPACING

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

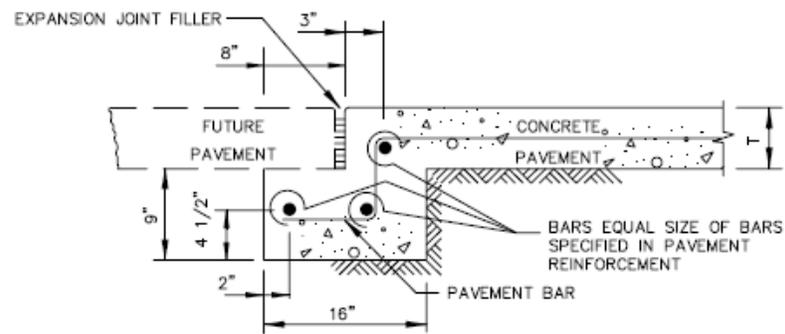
303.5.4.

DATE

OCT. '04

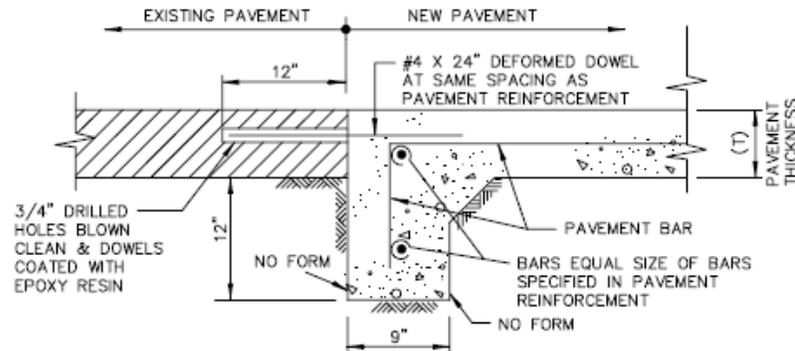
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2060



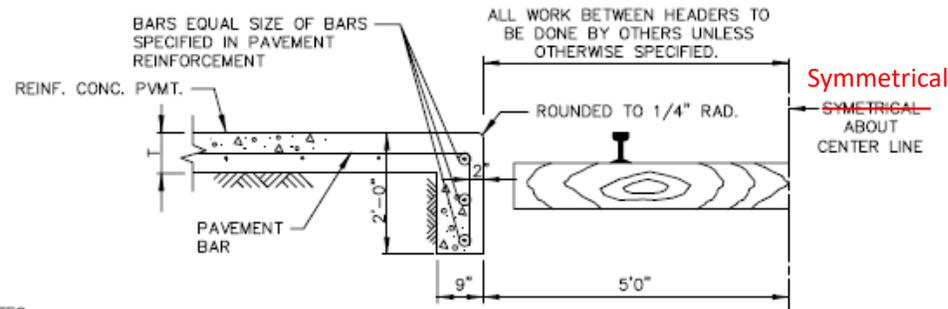
STREET HEADER FOR FUTURE PAVEMENT

N.T.S.



STREET HEADER AT EXISTING PAVEMENT

N.T.S.



STREET HEADER AT RAILROAD

N.T.S.

NOTES:

1. PAVEMENT BARS TO BE BENT DOWN INTO HEADER.
2. HEADER AND PAVEMENT TO BE MONOLITHIC.

REINFORCED CONCRETE PAVEMENT

STREET HEADERS

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

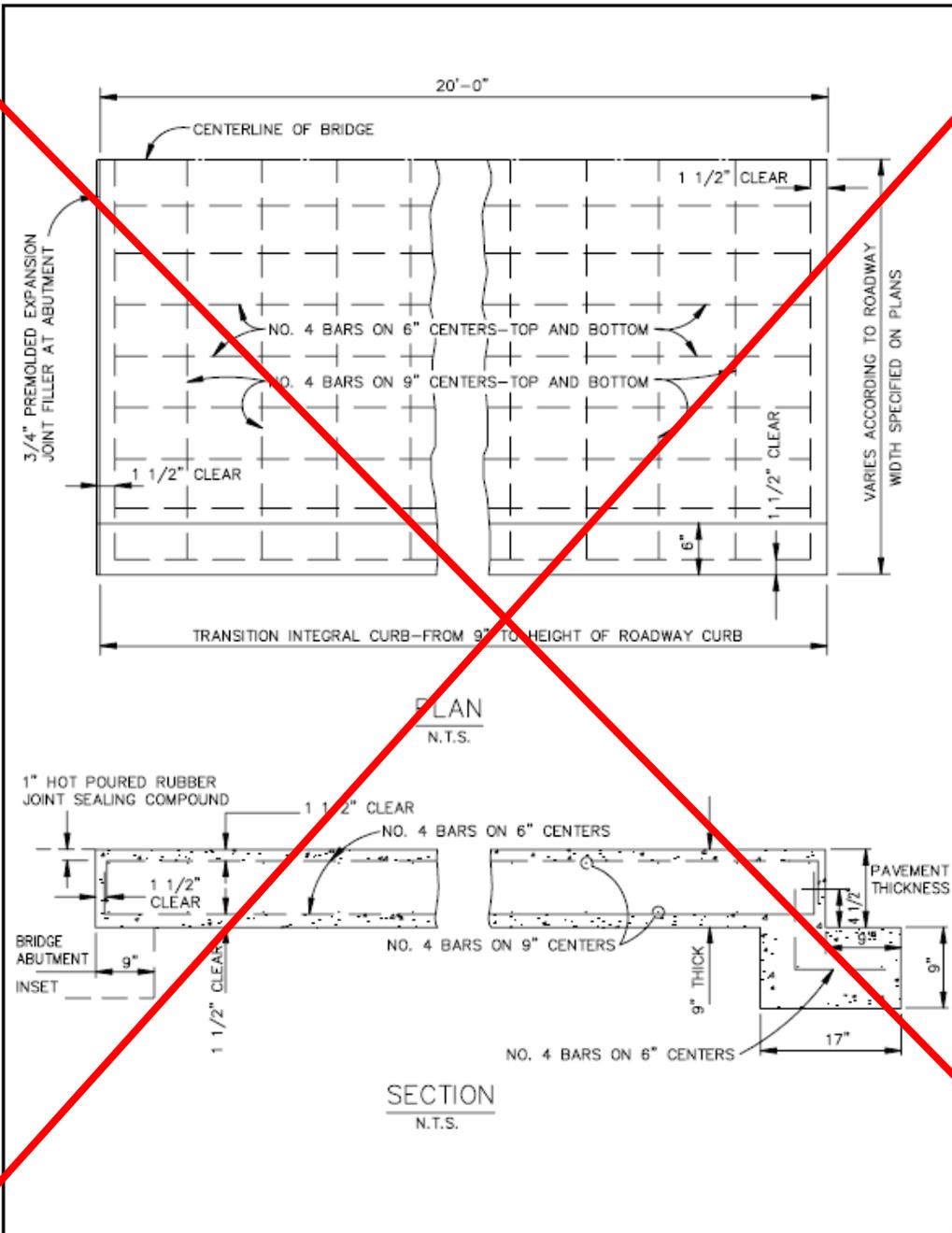
305.4

DATE

OCT. '04

STANDARD DRAWING NO.

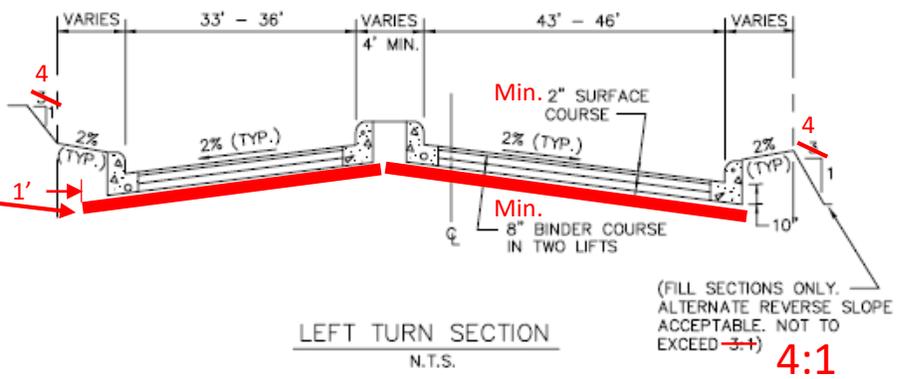
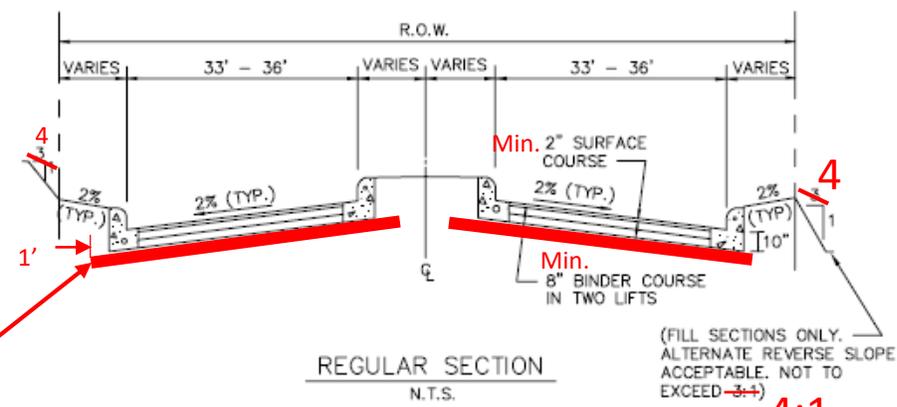
2070



Remove detail and reference TxDOT detail in specs if needed

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303
BRIDGE APPROACH SLAB		DATE OCT. '04 STANDARD DRAWING NO. 2080

8" minimum stabilized subgrade per section 301 and as approved or specified by owner



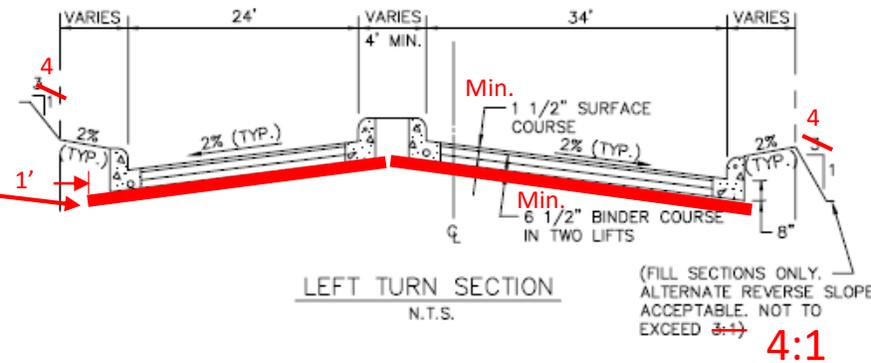
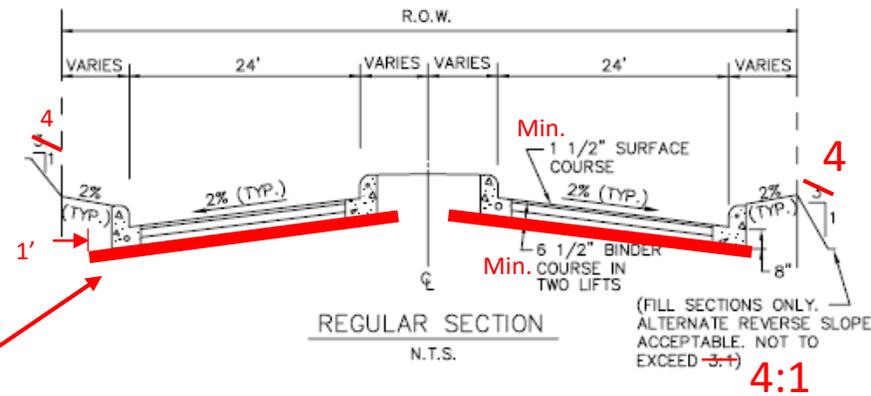
MIN. PAVEMENT DEPTH = 10" $\left\{ \begin{array}{l} 2" \text{ HMA SURFACE COURSE} \\ 8" \text{ HMA BINDER COURSE} \end{array} \right.$
(SEE STANDARD DRAWING NO. 2010 FOR PLAN VIEW)

NOTES:

1. A SOIL INVESTIGATION FOR SUBGRADE DESIGN SHALL BE CONDUCTED BY THE ENGINEER AND THIS DESIGN SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION.
2. WHERE FULL-DEPTH ASPHALT PAVEMENTS ARE BEING CONSIDERED FOR USE, THE ASPHALT PAVEMENT THICKNESS SHALL BE BASED UPON NECESSARY SUBGRADE ANALYSES AND PAVEMENT THICKNESS DESIGN DETERMINATIONS AS APPROVED BY THE OWNER.
3. MIN. CURB HEIGHT AND WIDTH SHALL BE 6", OR AS SPECIFIED BY OWNER.
4. TACK COAT BETWEEN COURSES AS REQUIRED.

5. See detail 2170 for sidewalks

8" minimum stabilized subgrade per section 301 and as approved or specified by owner



MIN. PAVEMENT DEPTH = 8" { 1 1/2" HMA SURFACE COURSE
2-3 1/4" HMA BINDER COURSES

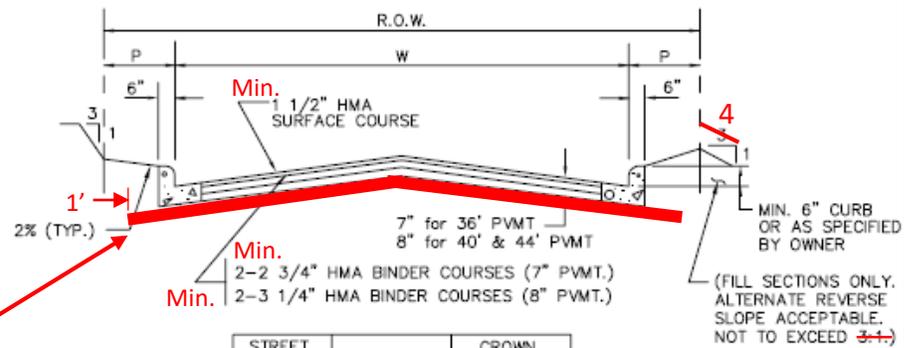
(SEE STANDARD DRAWING NO. 2020 FOR PLAN VIEW)

NOTES:

1. A SOIL INVESTIGATION FOR SUBGRADE DESIGN SHALL BE CONDUCTED BY THE ENGINEER AND THIS DESIGN SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION.
2. WHERE FULL-DEPTH ASPHALT PAVEMENTS ARE BEING CONSIDERED FOR USE, THE ASPHALT PAVEMENT THICKNESS SHALL BE BASED UPON NECESSARY SUBGRADE ANALYSES AND PAVEMENT THICKNESS DESIGN DETERMINATIONS AS APPROVED BY THE OWNER.
3. MIN. CURB HEIGHT AND WIDTH SHALL BE 6", OR AS SPECIFIED BY OWNER.
4. TACK COAT BETWEEN COURSES AS REQUIRED.

5. See detail 2170 for sidewalks

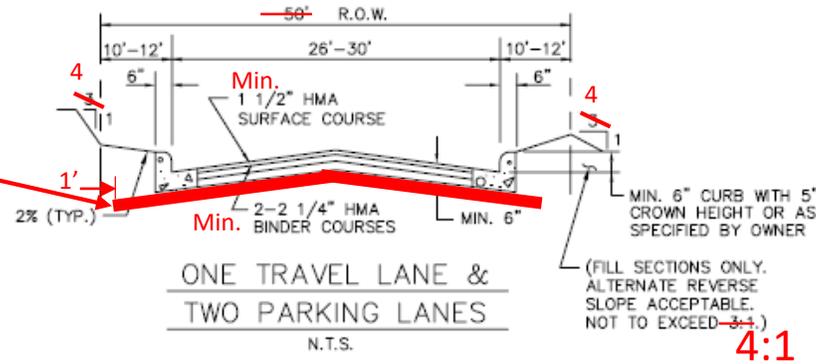




STREET WIDTH(W)	P	CROWN HEIGHT
36'	VARIES	6"
40'	VARIES	6"
44'	VARIES	8"

FOUR TRAVEL LANES OR
TWO TRAVEL LANES &
TWO PARKING LANES
N.T.S.

4:1



ONE TRAVEL LANE &
TWO PARKING LANES
N.T.S.

4:1

NOTES:

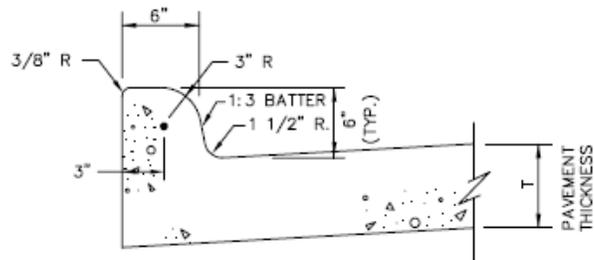
1. A SOIL INVESTIGATION FOR SUBGRADE DESIGN SHALL BE CONDUCTED BY THE ENGINEER THIS DESIGN SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION.
2. WHERE FULL-DEPTH ASPHALT PAVEMENTS ARE BEING CONSIDERED FOR USE, THE ASPHALT PAVEMENT THICKNESS SHALL BE BASED UPON NECESSARY SUBGRADE ANALYSES AND PAVEMENT THICKNESS DESIGN DETERMINATIONS AS APPROVED BY THE OWNER. THICKNESSES SHOWN ARE TYPICAL.
3. TACK COAT BETWEEN COURSES AS REQUIRED.

4. Straight crown or parabolic crown as approved by owner

5. See detail 2170 for sidewalks

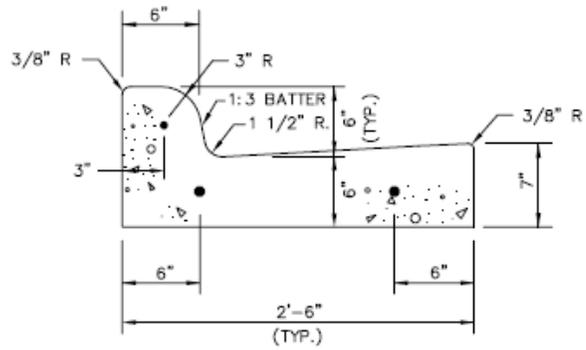
8" minimum stabilized subgrade per section 301 and as approved or specified by owner





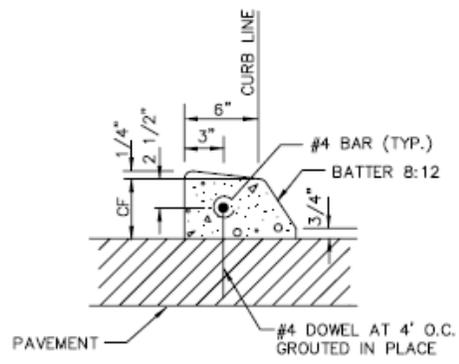
INTEGRAL CURB & GUTTER

N.T.S.



SEPARATE CURB & GUTTER

N.T.S.



DOWELED CURB

N.T.S.

NOTES:

1. REINFORCEMENT SHALL BE NO. 4 BARS, UNLESS OTHERWISE SPECIFIED.
2. CONCRETE SHALL BE CLASS "C" OR "PC".
3. "CF" IS 6" UNLESS OTHERWISE SPECIFIED.
4. ALL CURBS ARE CONSTRUCTED OF PORTLAND CEMENT CONCRETE UNLESS OTHERWISE SHOWN.
5. GRADE SHALL BE MEASURED AT BACK OF CURB.

CONCRETE CURB & GUTTER

INTEGRAL, SEPARATE, & DOWELED

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

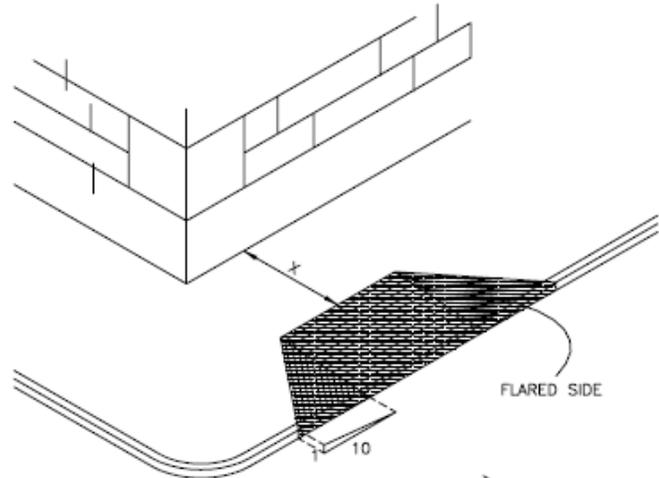
305.1

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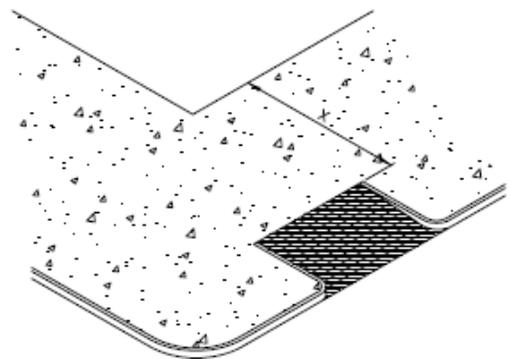
OCT. '04

STANDARD DRAWING NO.

2120



(A)
FLARED SIDES



(B)
RETURNED CURB

FIGURE 1
PARKWAY CURB RAMPS
IF "X" IS LESS THAN 48"
THEN THE SLOPE OF THE FLARED SIDE
SHALL NOT EXCEED 1:12.

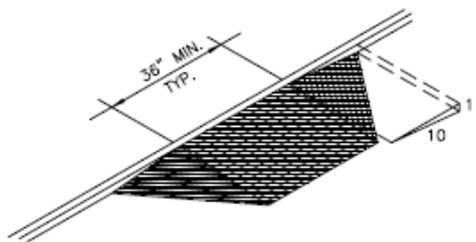


FIGURE 2
BUILT-UP CURB RAMP

CURB RAMPS

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

DATE
OCT. '04

STANDARD DRAWING NO.
2125A

CURB RAMPS NOTES:

GENERAL REQUIREMENTS

CURB RAMPS SHALL BE CONSTRUCTED AS PER THE REQUIREMENTS AND SPECIFICATIONS OF THE TEXAS ACCESSIBILITY STANDARDS AND THE ADA & ABA ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES. (FEDERAL REGISTER/ VOL. 69, NO. 141, FRIDAY, JULY 23, 2004)

LOCATION:

CURB RAMPS UNDER THESE PROVISIONS, SHALL BE WHEREVER AN ACCESSIBLE ROUTE CROSSES A CURB.

SLOPE:

SLOPES ON CURB RAMPS SHALL BE MEASURED AS FOLLOWS: (Y:X = VERTICAL:HORIZONTAL)

- A) TRANSITIONS FROM RAMPS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
- B) MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20.
- C) THE LEAST POSSIBLE SLOPE SHALL BE USED FOR ANY RAMP. THE MAXIMUM SLOPE OF A RAMP IN NEW CONSTRUCTION SHALL BE 1:12. THE MAXIMUM RISE FOR ANY RUN SHALL BE 30" (760 MM). CURB RAMPS AND RAMPS TO BE CONSTRUCTED ON EXISTING SITES OR IN EXISTING BUILDINGS OR FACILITIES MAY HAVE SLOPES AND RISES IF SPACE LIMITATIONS PROHIBIT THE USE OF A 1:12 SLOPE OR LESS, AS FOLLOWS:
 - 1. A SLOPE BETWEEN 1:10 AND 1:12 IS ALLOWED FOR A MAXIMUM RISE OF 6".
 - 2. A SLOPE BETWEEN 1:8 AND 1:10 IS ALLOWED FOR A MAXIMUM OF 3" A SLOPE STEEPER THAN 1:8 IS NOT ALLOWED.

RAMP WIDTH:

THE MINIMUM WIDTH OF A CURB RAMP SHALL BE 36" EXCLUSIVE OF FLARED SIDES.

SURFACE:

SURFACES OF CURB RAMPS, SHALL BE STABLE FIRM, AND SLIP RESISTANT. SURFACE TEXTURES SHALL CONSIST OF EXPOSED CRUSHED STONE AGGREGATE, ROUGHENED CONCRETE, RUBBER, RAISED ABRASIVE STRIPS, OR GROOVES. EXTENDING THE FULL WIDTH AND DEPTH OF THE CURB RAMP. SURFACES THAT ARE RAISED, ETCHED, OR GROOVED IN A WAY THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED. FOR PURPOSES OF WARNING, THE FULL WIDTH AND DEPTH OF CURB RAMPS SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJOINING PEDESTRIAN ROUTES.

SIDES OF CURB RAMPS:

IF A CURB RAMP IS LOCATED WHERE PEDESTRIANS MUST WALK ACROSS THE RAMP, OR WHERE IT IS NOT PROTECTED BY HANDRAILS OR GUARDRAILS, IT SHALL HAVE FLARED SIDES. THE MAXIMUM SLOPE OF THE FLARE SHALL BE 1:10 (SEE FIG. 1 (A)) CURB RAMPS WITH RETURNED CURBS MAY BE USED WHERE PEDESTRIANS WOULD NOT WALK ACROSS THE RAMP. (SEE FIG. 1 (B))

BUILT-UP RAMPS:

BUILT-UP CURB RAMPS SHALL BE LOCATED SO THEY DO NOT PROJECT INTO VEHICULAR TRAFFIC LANES (SEE FIG. 2)

OBSTRUCTIONS:

CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED VEHICLES.

LOCATION AT MARKED CROSSINGS:

CURB RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES.

DIAGONAL CURB RAMPS:

IF DIAGONAL (OR CORNER TYPE) CURB RAMPS HAVE RETURNED CURBS OR OTHER WELL DEFINED EDGES, SUCH EDGES SHALL BE PARALLEL TO THE DIRECTION OF PEDESTRIAN FLOW. THE BOTTOM OF DIAGONAL CURB RAMPS SHALL HAVE 48" (1220 MM) MINIMUM. IF DIAGONAL CURB RAMPS ARE PROVIDED AT MARKED CROSSINGS, THE 48" (1220 MM) CLEAR SPACE SHALL BE WITHIN THE MARKINGS. IF DIAGONAL CURB RAMPS HAVE FLARED SIDES, THEY SHALL ALSO HAVE AT LEAST A 24" (610 MM) LONG SEGMENT OF STRAIGHT CURB LOCATED ON EACH SIDE OF THE CURB RAMP AND WITHIN THE MARKED CROSSING. ANY RAISED ISLANDS IN CROSSINGS SHALL BE CUT THROUGH LEVEL WITH THE STREET OR HAVE CURB RAMPS AT BOTH SIDES AND A LEVEL AREA AT LEAST 48" (1220 MM) LONG BETWEEN THE CURB RAMPS IN THE PART OF THE ISLAND INTERSECTED BY THE CROSSINGS.

CONSTRUCTION

- (A.) THE CONTRACTOR SHALL SAWCUT, REMOVE AND DISPOSE OFF-SITE THE REQUIRED EXISTING CONCRETE SIDEWALK, CURB AND GUTTER, TO CONSTRUCT THE PROPOSED RAMPS.
- (B.) CONCRETE SIDEWALKS AND RAMPS SHALL BE MINIMUM 4" THICK, 4000 PSI, 5 SACK CONCRETE, REINFORCED WITH #3 BARS AT 14" CENTERS BOTH WAYS, PLACED OVER A 2" THICK SAND CUSHION EMBEDMENT.
- (C.) THE CONTRACTOR SHALL USE 1" PREMOLDED EXPANSION JOINT MATERIAL BETWEEN THE PROPOSED SIDEWALKS AND RAMPS AT THE BACK OF CURBS, AND AT JOINTS AT NO EXTRA PAY.
- (D.) DUMMY JOINT REQUIRED EVERY 4' IN 4' WIDE SIDEWALKS AND EVERY 5' IN 6' WIDE SIDEWALK.

CURB RAMPS

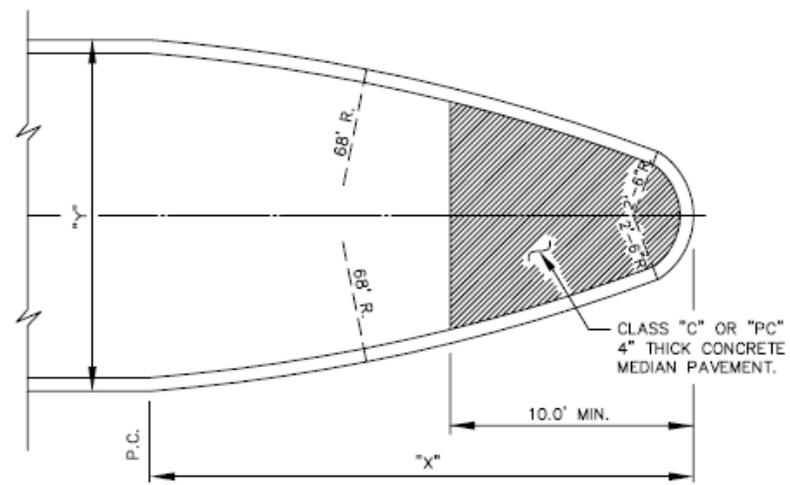
North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

DATE
OCT. '04

STANDARD DRAWING NO.
2125B



DIMENSIONS OF MEDIAN NOSE

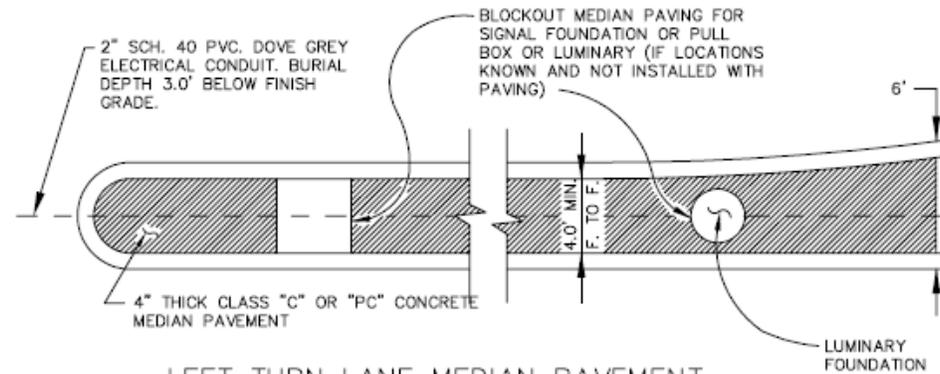
Y = 15'	X = 27.6'
Y = 16'	X = 28.8'
Y = 17'	X = 29.9'
Y = 18'	X = 30.9'

CONCRETE NOSE FOR MEDIAN ISLAND

N.T.S.

NOTE:

MEDIAN PAVING SHALL EXTEND TO POINT WHERE MEDIAN IS 6' WIDE. IF MEDIAN IS 6' WIDE, PAVING SHALL EXTEND 15' FROM NOSE. FOR MEDIANS WIDER THAN 6' PAVING SHALL EXTEND 10' FROM NOSE. ALL DISTANCES ARE MINIMUM.



LEFT TURN LANE MEDIAN PAVEMENT

N.T.S.

MEDIAN ISLAND PAVEMENT

NOSE & LEFT TURN LANE

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

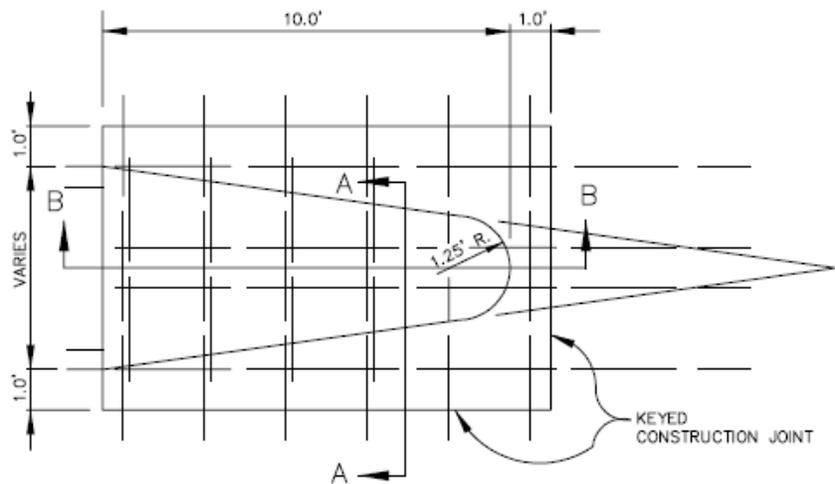
305.3

DATE

OCT. '04

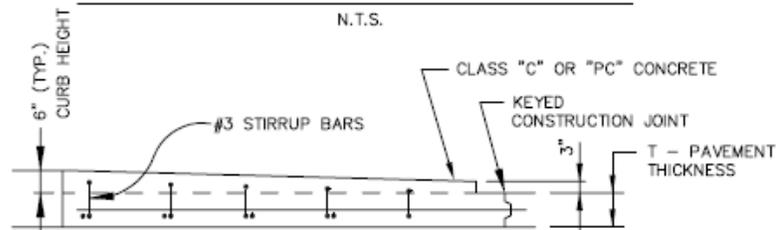
STANDARD DRAWING NO.

2130



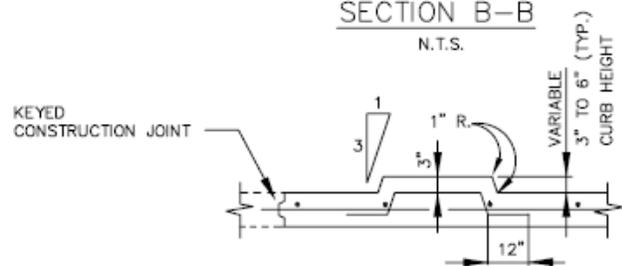
MONOLITHIC CONCRETE MEDIAN NOSE

N.T.S.



SECTION B-B

N.T.S.



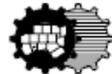
SECTION A-A

N.T.S.

NOTE:
REINFORCEMENT BARS SHALL
MATCH THOSE IN PAVEMENT.

MEDIAN ISLAND PAVEMENT
MONOLITHIC CONCRETE NOSE

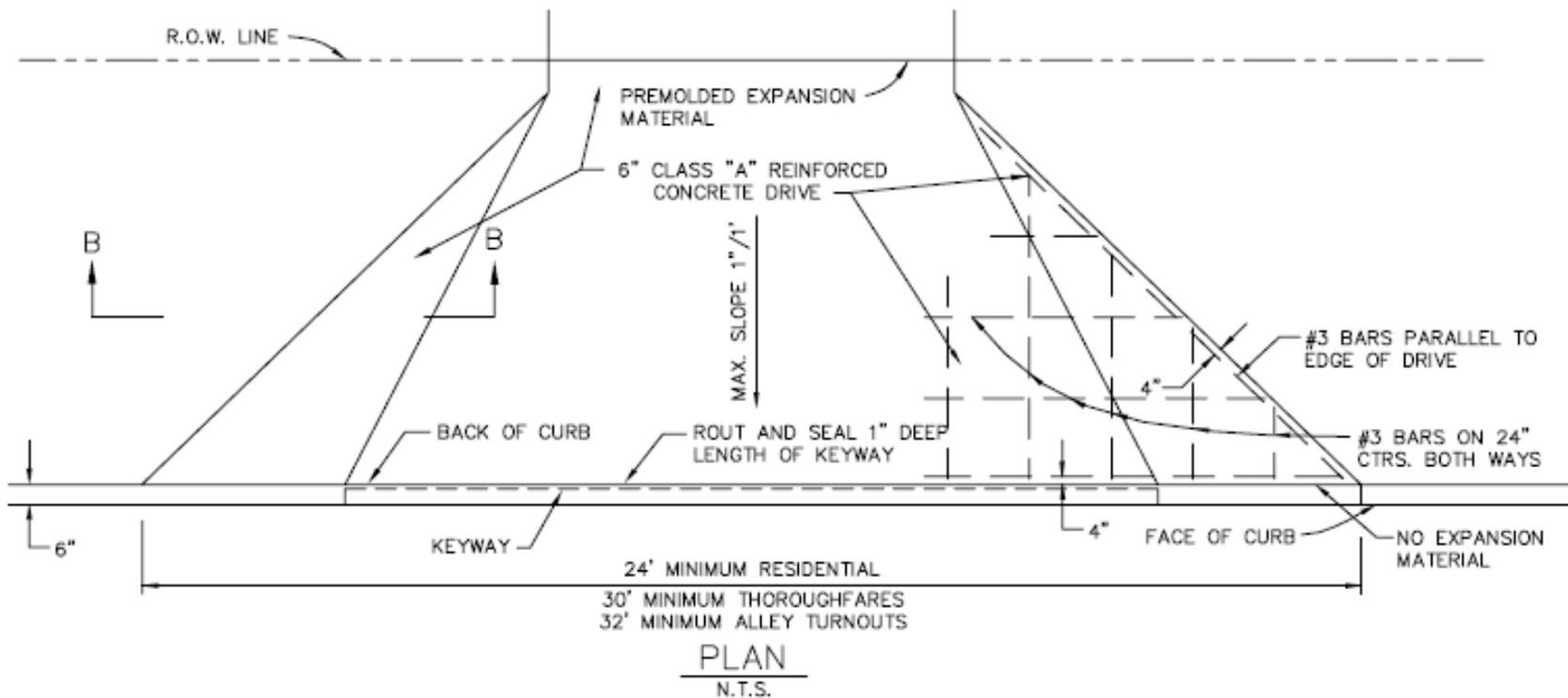
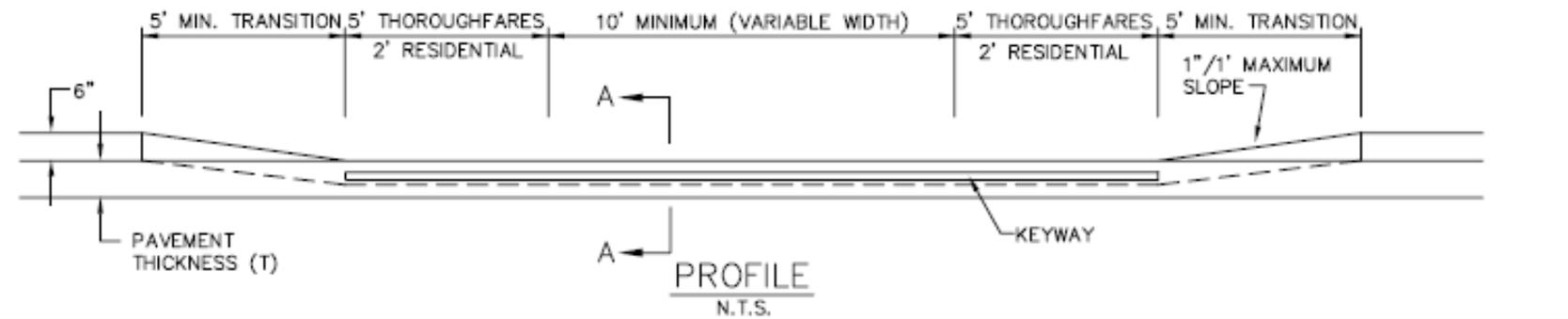
North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE
305.3

DATE
OCT. '04

STANDARD DRAWING NO.
2140



SEE NOTES, STANDARD DRAWING NO. 2150B.

DRIVEWAY APPROACH
FLARED RETURN TYPE

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

305.2

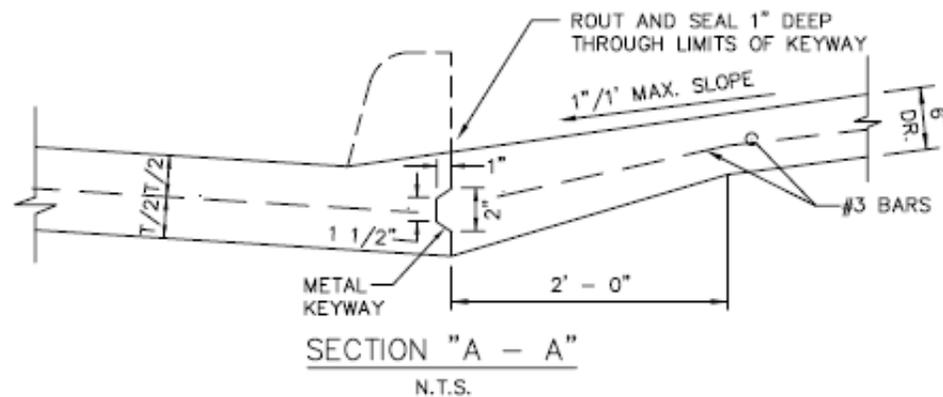
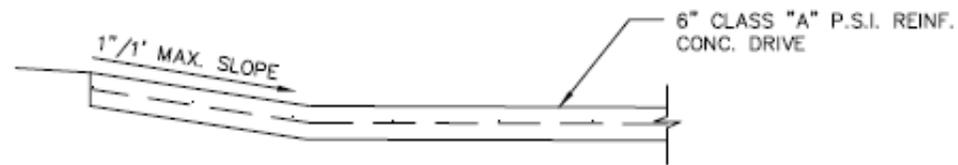
DATE

OCT. '04

STANDARD DRAWING NO.

2150A

STANDARD DRAWING NO.
2150A



NOTES:

1. OFFSETS IN DRIVES TO MATCH PROPOSED WALKS SHALL BE BUILT MONOLITHIC WITH THE DRIVE.
2. PAVEMENT JOINTS SHALL NOT EXTEND THROUGH DRIVE.
3. KEYWAY LIMITS SHALL COINCIDE WITH LIMITS OF 1" CURB.
4. REINFORCING STEEL SHALL NOT EXTEND THROUGH KEYWAY. DRIVE SHALL NOT BE TIED TO PAVEMENT.
5. MAXIMUM SLOPE ON DRIVE IN ANY DIRECTION SHOULD BE 1" / 1', WITH EXCEPTION OF 1/4" / 1' THROUGH ANY SIDEWALK PASSTHROUGH, TO RESPECT PRINCIPLES OF BARRIER FREE CONSTRUCTION.
6. LENGTH OF TRANSITION FOR CURB AT EACH SIDE OF DRIVE MAY VARY DUE TO STREET GRADES AND REQUIREMENT TO HOLD MAXIMUM SLOPE OF 1" / 1'.
7. SIDEWALKS SHALL BE AS DIRECTED BY OWNER AND SHALL MEET REQUIREMENTS OF A.D.A.
8. EXTEND TRANSVERSE PAVEMENT SAWED JOINTS TO R.O.W.

STANDARD DRAWING NO.
2150B

DRIVEWAY APPROACH
FLARED RETURN TYPE

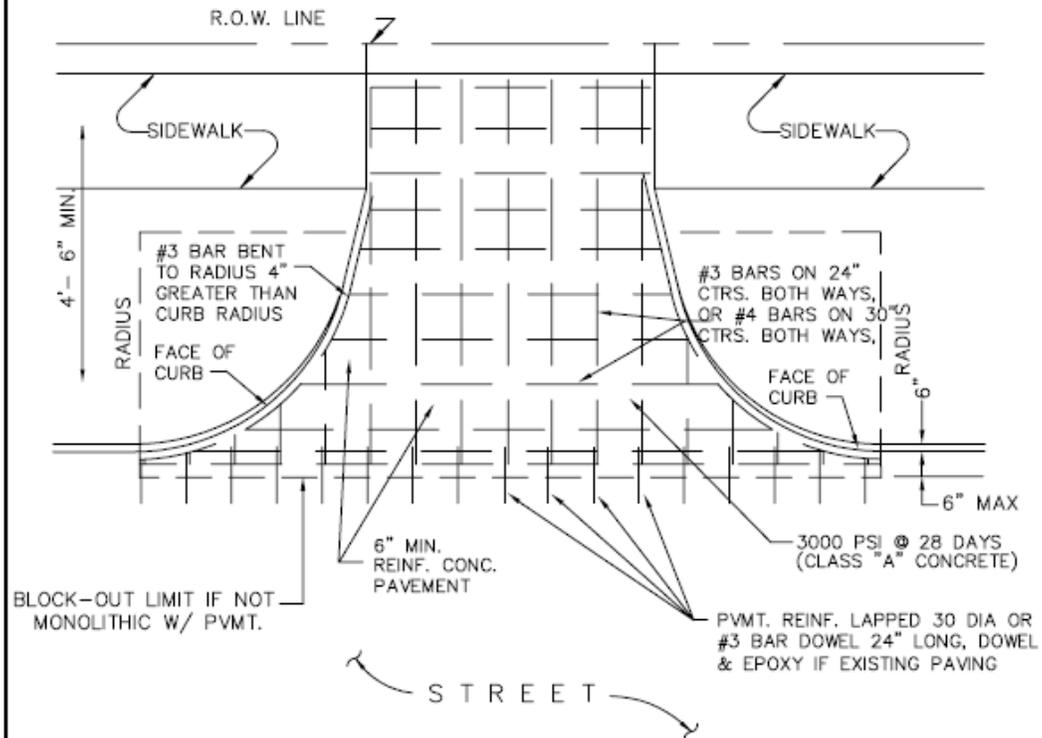
North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE
305.2

DATE
OCT. '04

STANDARD DRAWING NO.
2150B



PLAN VIEW

N.T.S.

DRIVEWAY APPROACH
RADIUS RETURN TYPE

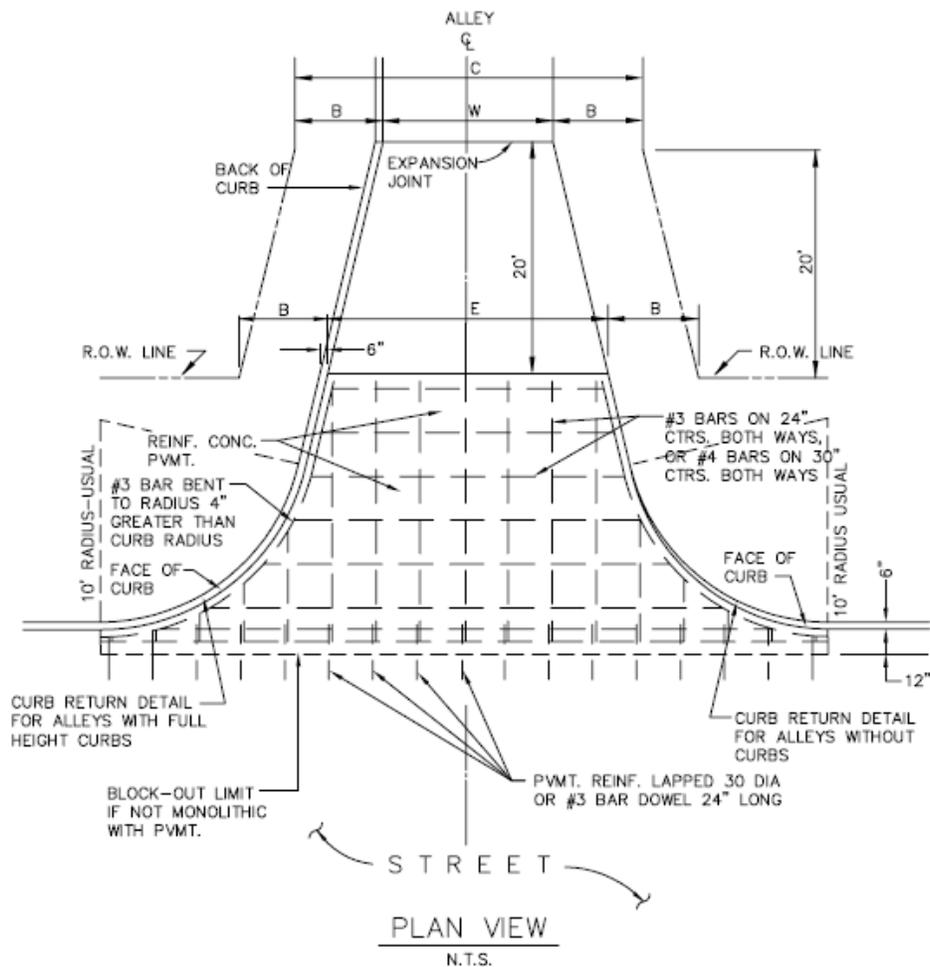
North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

DATE
OCT. '04

STANDARD DRAWING NO.
2155



ALLEY WIDTH (W)	R.O.W. WIDTH (C)	B	E
10'	15'	2' - 6"	12'
12'	17'	2' - 6"	14'
16'	21'	2' - 6"	18'
20'	25'	2' - 6"	22'

ALLEY APPROACH
RADIUS RETURN TYPE

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

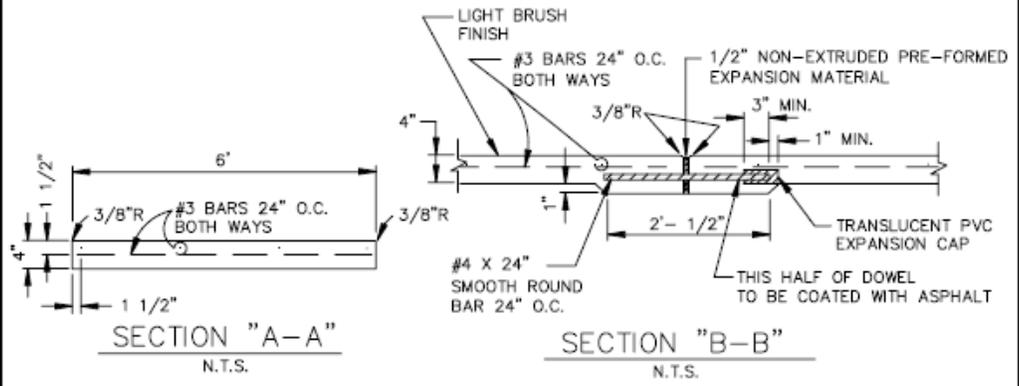
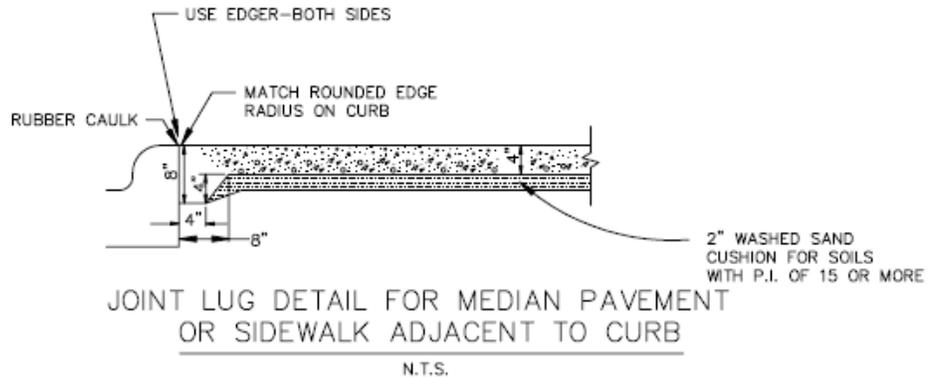
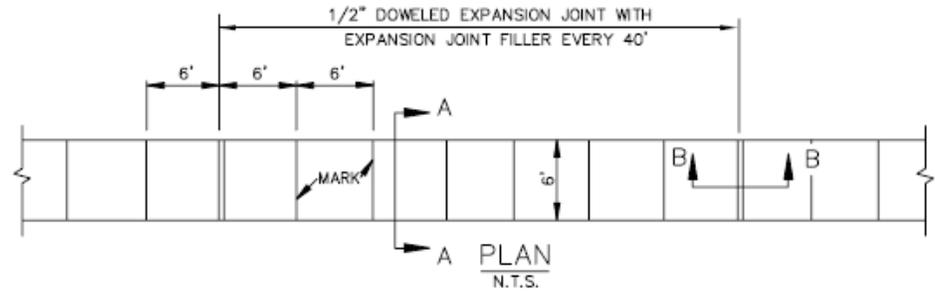
305.2

DATE

STANDARD DRAWING NO.

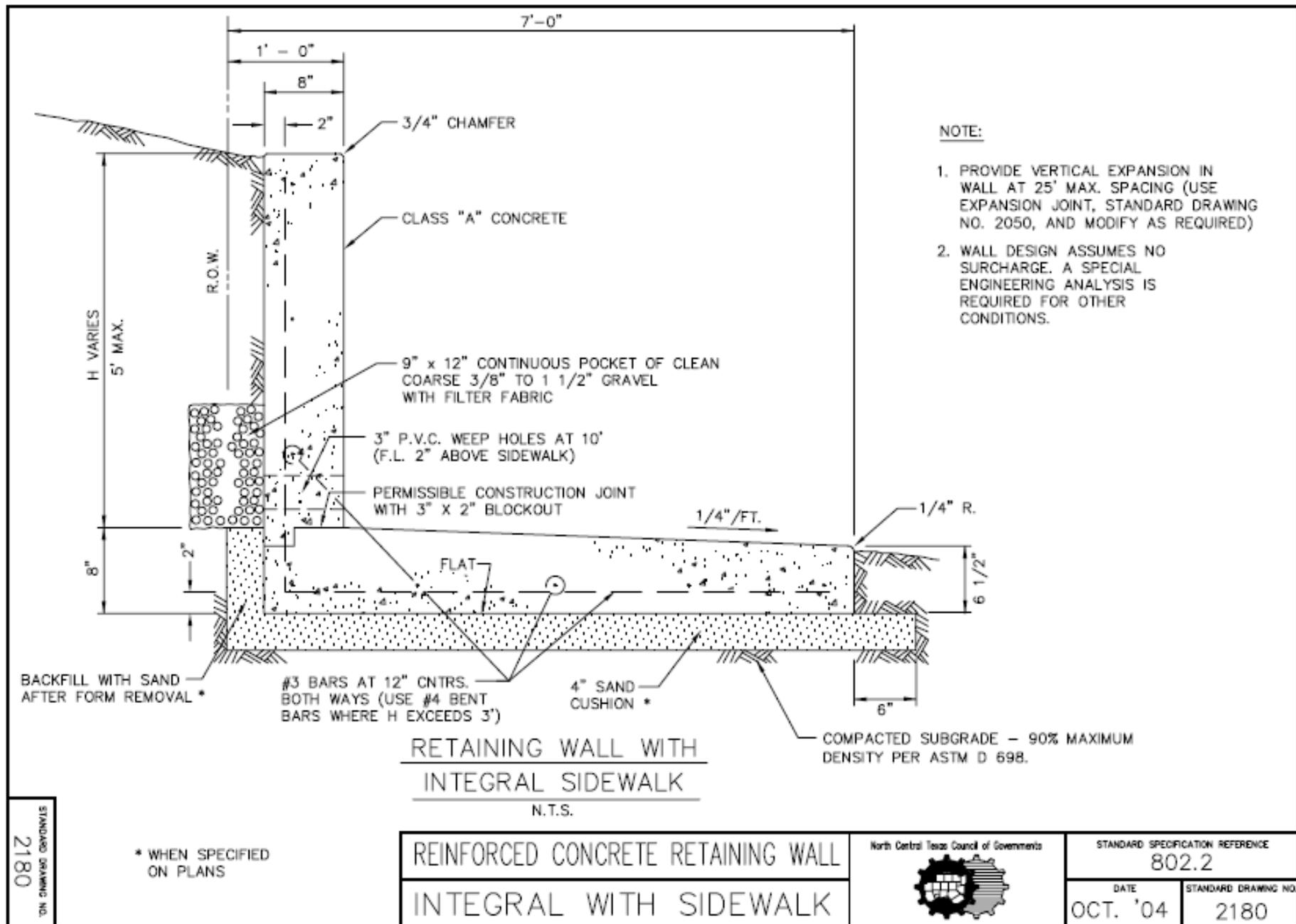
OCT. '04

2160



- NOTE:
1. REFER TO STANDARD SPECIFICATION ITEM 305.2 FOR ALTERNATE REINFORCEMENT.
 2. CROSS SLOPE OF SIDEWALK SHALL BE $\pm 1/4"$ PER FT. MIN. TO $\pm 3/8"$ PER FT. MAX.
 3. OTHER THAN 6'-0" SIDEWALK WIDTH MAY BE SPECIFIED BY OWNER.
 4. SIDEWALK SHALL BE CLASS "A" CONCRETE UNLESS OTHERWISE SPECIFIED BY OWNER.
 5. ALL HONEYCOMB IN BACK OF CURB TO BE TROWEL-PLASTERED BEFORE POURING SIDEWALK.
 6. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN.

REINFORCED CONCRETE SIDEWALKS JOINTS AND SPACING	 North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 305.2	
		DATE OCT. '04	STANDARD DRAWING NO. 2170



STANDARD SPECIFICATION
2180

* WHEN SPECIFIED
ON PLANS

REINFORCED CONCRETE RETAINING WALL
INTEGRAL WITH SIDEWALK



STANDARD SPECIFICATION REFERENCE 802.2	
DATE OCT. '04	STANDARD DRAWING NO. 2180

GENERAL NOTES:

1. REINFORCED CONCRETE PAVEMENT:
 - A. ALL CURBS SHALL BE PLACED INTEGRAL WITH PAVEMENT UNLESS OTHERWISE APPROVED BY THE OWNER.
 - B. CURBS SHALL MEET THE SAME COMPRESSIVE STRENGTH AS SPECIFIED FOR THE PAVEMENT.
 - C. BAR LAPS SHALL BE 30 DIAMETERS.
 - D. REINFORCING BARS SHALL BE SUPPORTED BY CHAIRS OR OTHER DEVICES APPROVED BY THE OWNER.

2. SUBGRADE: (UNLESS OTHERWISE SPECIFIED BY OWNER)
 - A. SUBGRADE UNDER ALL PAVEMENTS SHALL BE STABILIZED TO A MINIMUM DEPTH OF 6" WITH HYDRATED LIME OR CEMENT WHEN THE P.I. OF THE INPLACE MATERIAL IS GREATER THAN 15. LABORATORY TESTS MUST BE PERFORMED TO DETERMINE THE AMOUNT OF LIME OR CEMENT REQUIRED TO LOWER THE P.I. TO 15 OR BELOW. SATURATION P.I. ($PH \geq 12.4$) WILL BE THE LIMIT WHEN A SOIL'S P.I. CANNOT BE BROUGHT TO 15 OR LOWER.

 - B. WHERE THE INPLACE MATERIAL HAS A P.I. OF LESS THAN 15, THE SUBGRADE SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 6" AND RECOMPACTED.

3. IF THE ROADWAY IS A DESIGNATED BIKE ROUTE OR BIKE USAGE IS ANTICIPATED, REFER TO NCTCOG'S REGIONAL BICYCLE AND PEDESTRIAN FACILITIES DESIGN MANUAL FOR DESIGN GUIDANCE.

PAVEMENT SYSTEMS

GENERAL NOTES

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

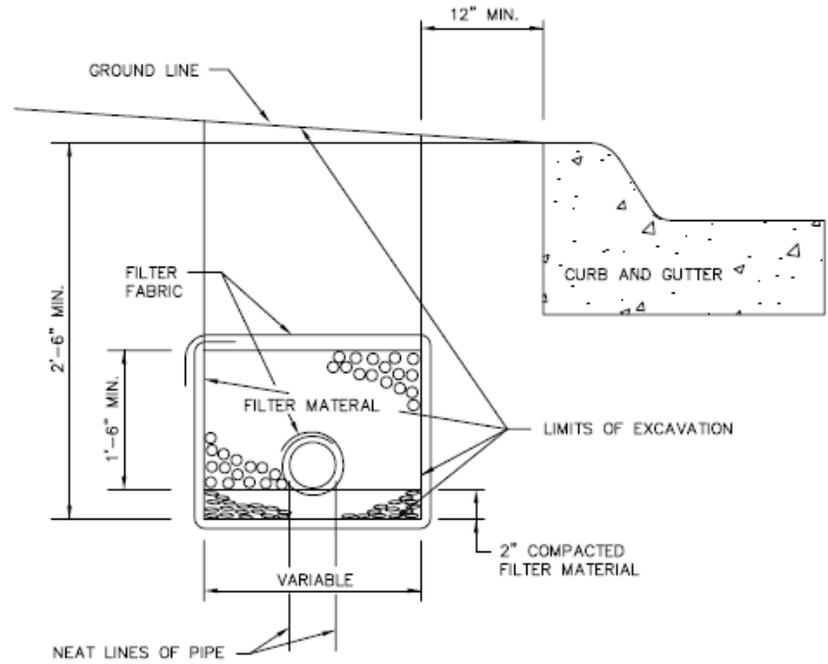
302,303

DATE

OCT. '04

STANDARD DRAWING NO.

2190



SECTION
N.T.S.

LIMITS OF EXCAVATION

DEPTH OF TRENCH (FT.)	DIST. IN FT. OUTSIDE NEAT LINES OF PIPE SUBDRAIN
0 TO 6	1.00
6 TO 10	1.50
10 TO 15	2.00
OVER 15	2.50

FILTER MATERIAL SPECIFICATIONS

SIEVE SIZE	PERCENTAGE RETAINED ON SIEVE	
	TYPE A	TYPE B
1 1/2	---	0 - 10
3/4	0 - 10	20 - 40
3/8	15 - 35	---
NO. 4	35 - 55	40 - 60

MATERIAL FINER THAN NO. 4 SIEVE

4	---
20	35 - 65
50	75 - 100

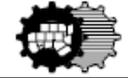
TYPES OF PIPE ACCEPTABLE FOR USE AS SUBDRAIN

1. PERFORATED CORRUGATED METAL PIPE.
2. PERFORATED PVC PIPE.
3. PERFORATED POLYETHYLENE PIPE.

SUBDRAINS

PAVEMENT SUBGRADE

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

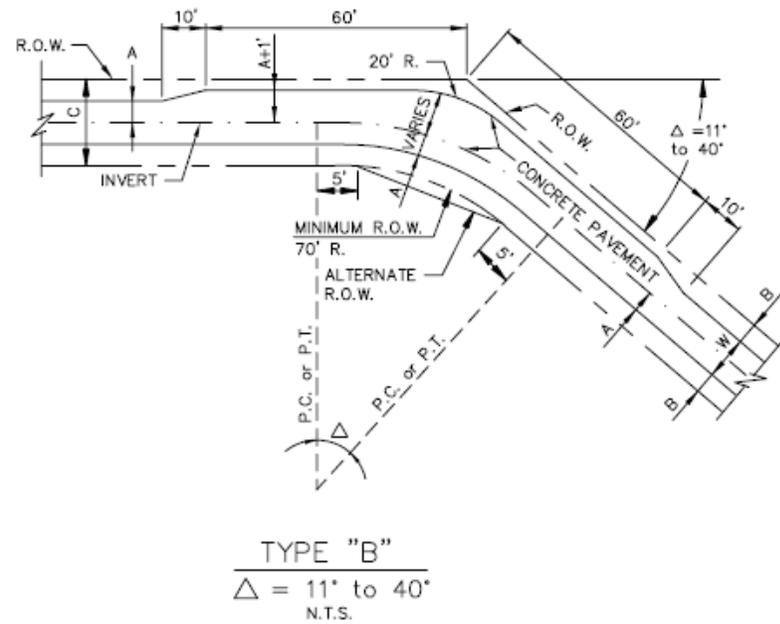
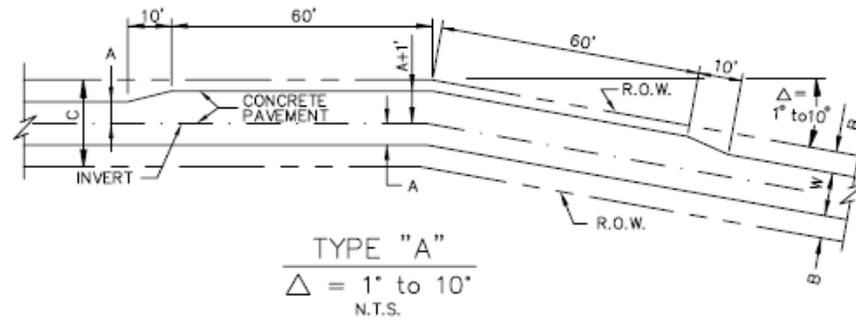
301

DATE

OCT. '04

STANDARD DRAWING NO.

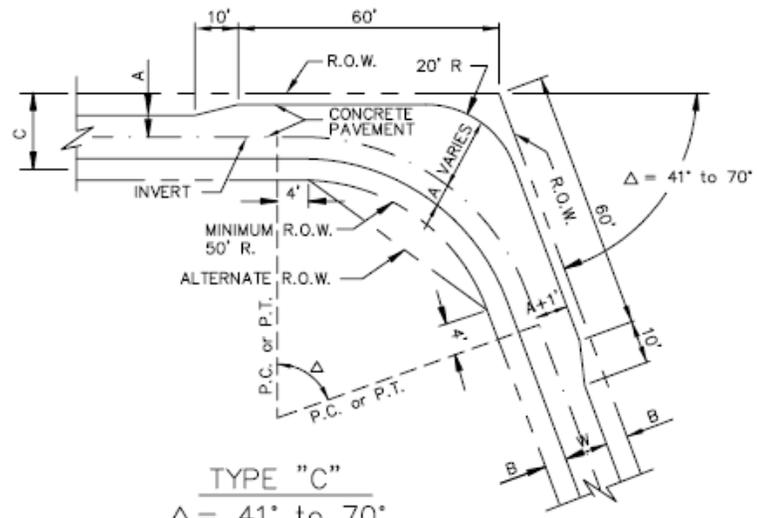
2200



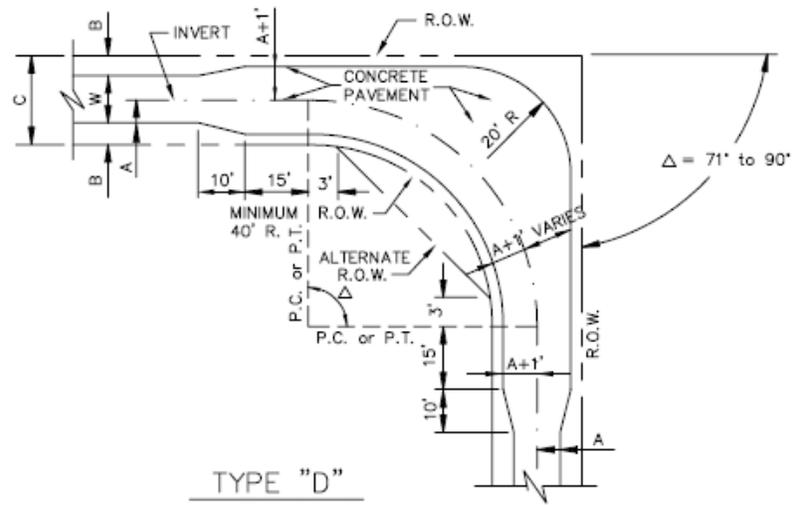
NOTES:

1. DIMENSIONS W, C, A, AND B SHALL BE SPECIFIED ON THE PLANS IN ACCORDANCE WITH STD. DWG. NO. 2040.





TYPE "C"
 $\Delta = 41^\circ \text{ to } 70^\circ$
 N.T.S.



TYPE "D"
 $\Delta = 71^\circ \text{ to } 90^\circ$
 N.T.S.

NOTES:

1. DIMENSIONS W, C, A, AND B SHALL BE SPECIFIED ON THE PLANS IN ACCORDANCE WITH STD. DWG. NO. 2040.

ALLEY GEOMETRICS

TYPE "C" & TYPE "D"

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

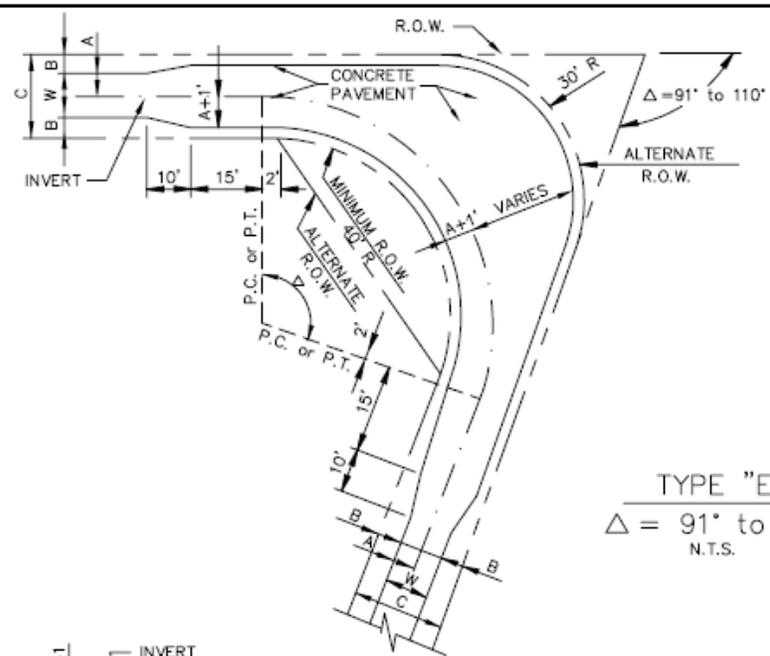
303.5

DATE

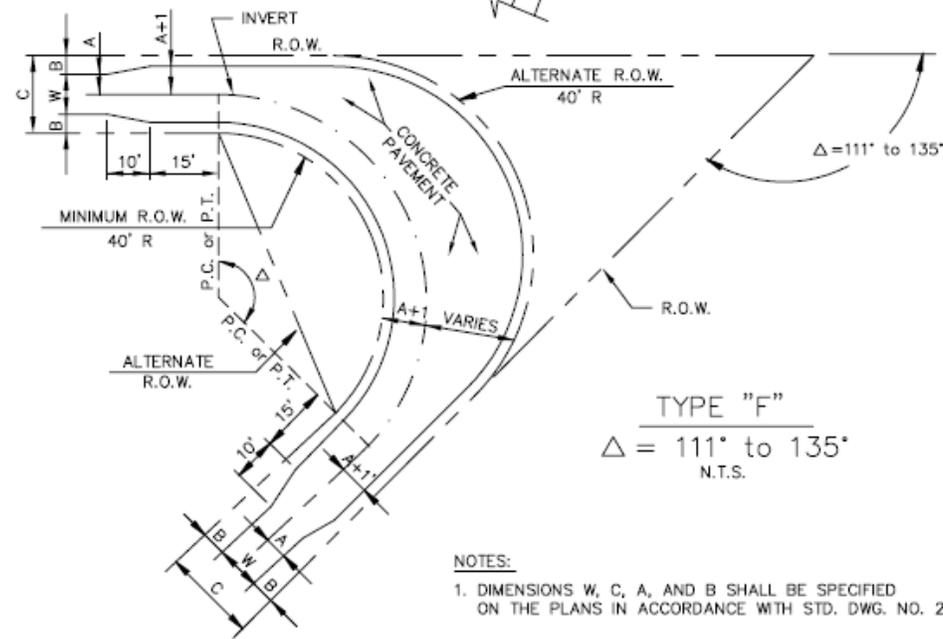
OCT. '04

STANDARD DRAWING NO.

2220



TYPE "E"
 $\Delta = 91^\circ \text{ to } 110^\circ$
 N.T.S.



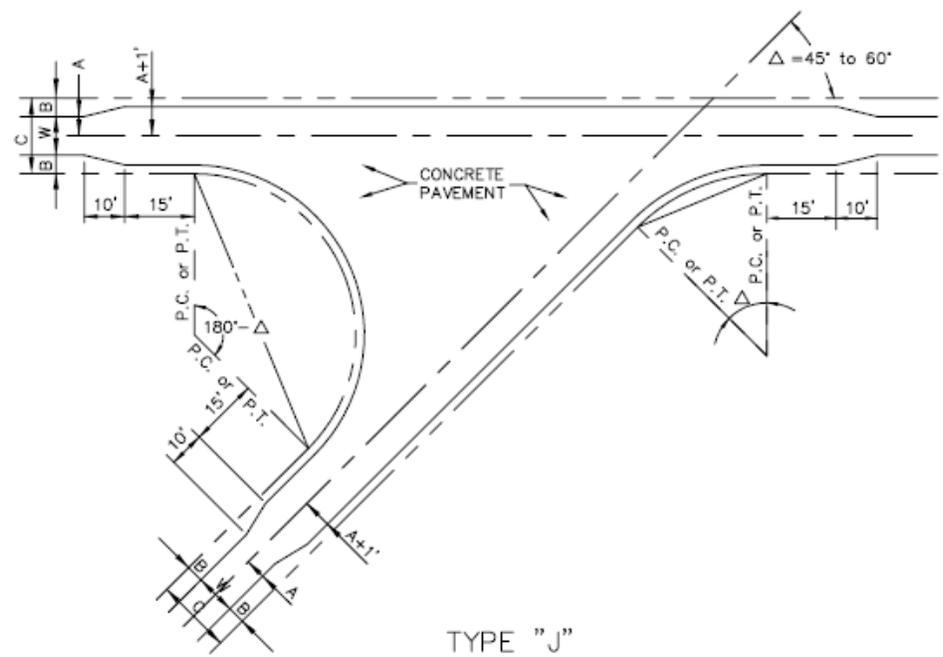
TYPE "F"
 $\Delta = 111^\circ \text{ to } 135^\circ$
 N.T.S.

NOTES:
 1. DIMENSIONS W, C, A, AND B SHALL BE SPECIFIED ON THE PLANS IN ACCORDANCE WITH STD. DWG. NO. 2040.

ALLEY GEOMETRICS
 TYPE "E" & TYPE "F"



STANDARD SPECIFICATION REFERENCE	
303.5	
DATE	STANDARD DRAWING NO.
OCT. '04	2230



TYPE "J"
 $\Delta = 45^\circ \text{ to } 60^\circ$
 N.T.S.

NOTES:

1. DIMENSIONS W, C, A, AND B SHALL BE SPECIFIED ON THE PLANS IN ACCORDANCE WITH STD. DWG. NO. 2040.

ALLEY GEOMETRICS

TYPE "J"

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

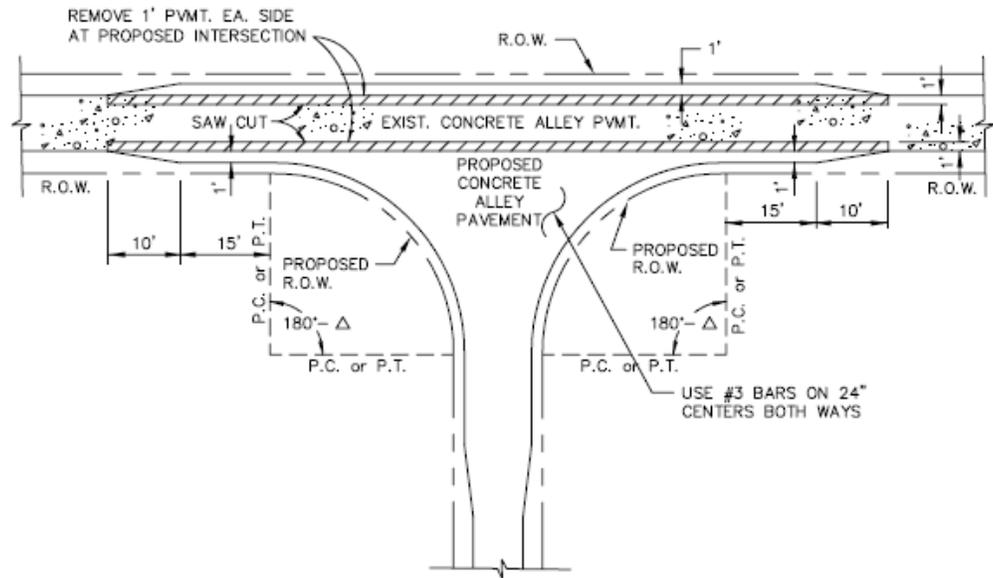
303.5

DATE

OCT. '04

STANDARD DRAWING NO.

2250



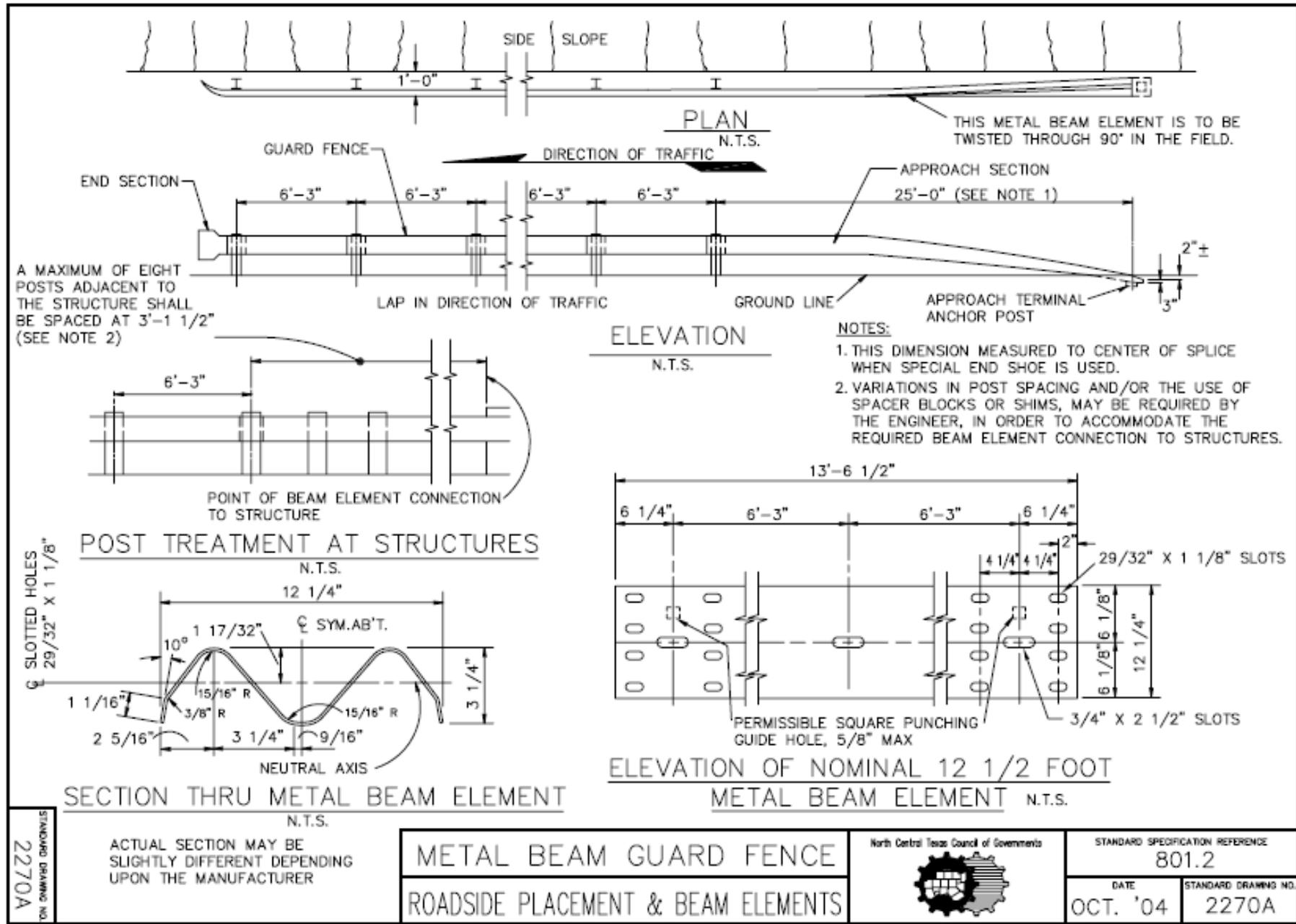
INTERSECTION OF PROPOSED ALLEY
WITH EXISTING ALLEY PAVEMENT
N.T.S.

NOTE:
GEOMETRICS OF PROPOSED ALLEY SHALL
BE SHOWN ON THE PLANS IN ACCORDANCE
WITH TYPE "G", "H", OR "J".

ALLEY INTERSECTION
PROPOSED TO EXISTING



STANDARD SPECIFICATION REFERENCE	
303.5	
DATE	STANDARD DRAWING NO.
OCT. '04	2260



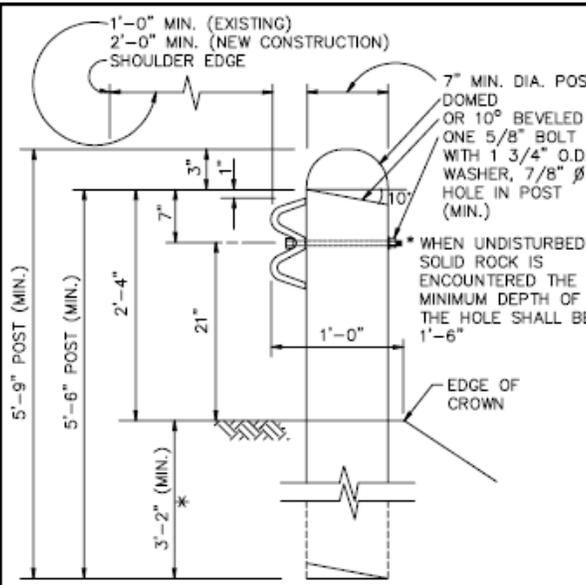
STANDARD DRAWING NO. 2270A

ACTUAL SECTION MAY BE SLIGHTLY DIFFERENT DEPENDING UPON THE MANUFACTURER

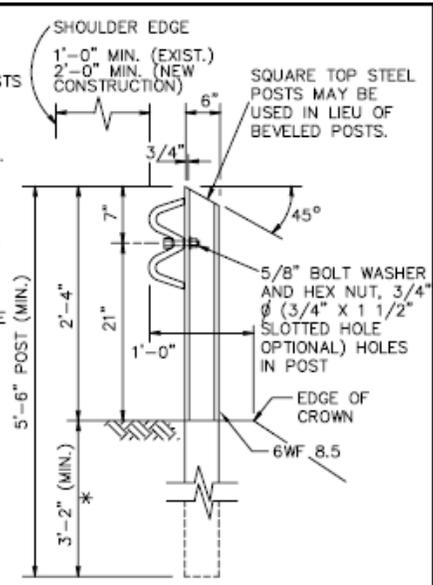
METAL BEAM GUARD FENCE
ROADSIDE PLACEMENT & BEAM ELEMENTS



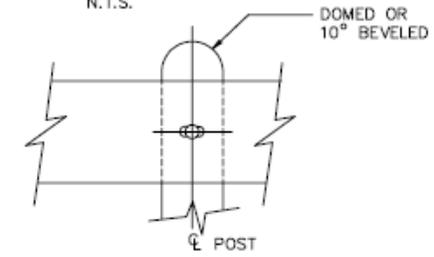
STANDARD SPECIFICATION REFERENCE	
801.2	
DATE	STANDARD DRAWING NO.
OCT. '04	2270A



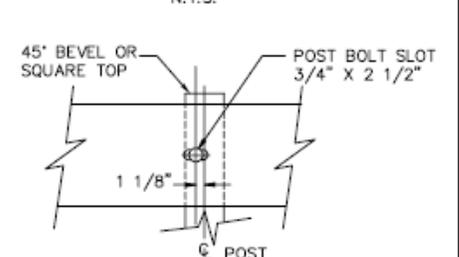
WOOD LINE POST
N.T.S.



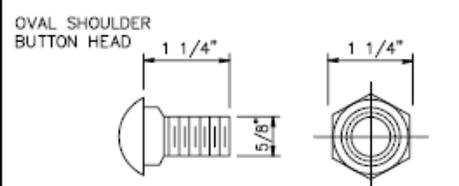
STEEL LINE POST
N.T.S.



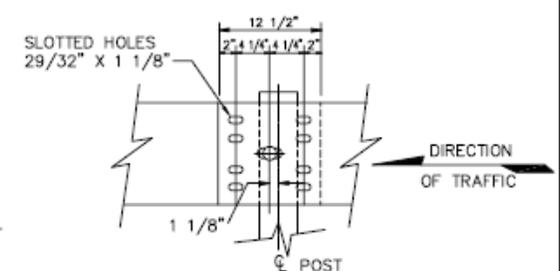
WOOD POST CONNECTION
WOOD POST MAY BE DOMED OR BEVELED.
N.T.S.



STEEL POST CONNECTION
N.T.S.

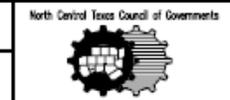


ANCHOR OR SPLICE BOLT 5/8" NUT
POST BOLT: SIMILAR EXCEPT LENGTH.
(7/8" HEX BOLTS REQUIRED FOR SPECIAL END SHOE)
N.T.S.

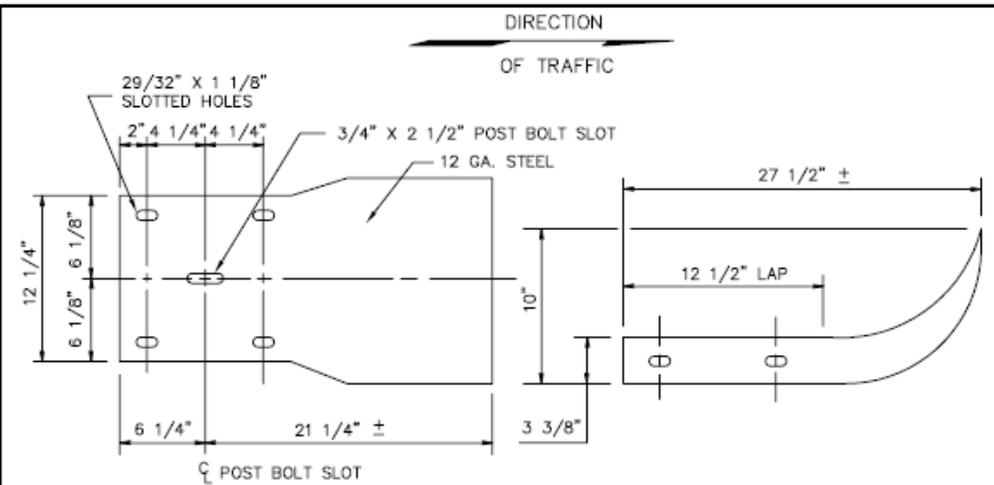


BEAM ELEMENT SPLICE
N.T.S.

METAL BEAM GUARD FENCE
LINE POST & CONNECTIONS

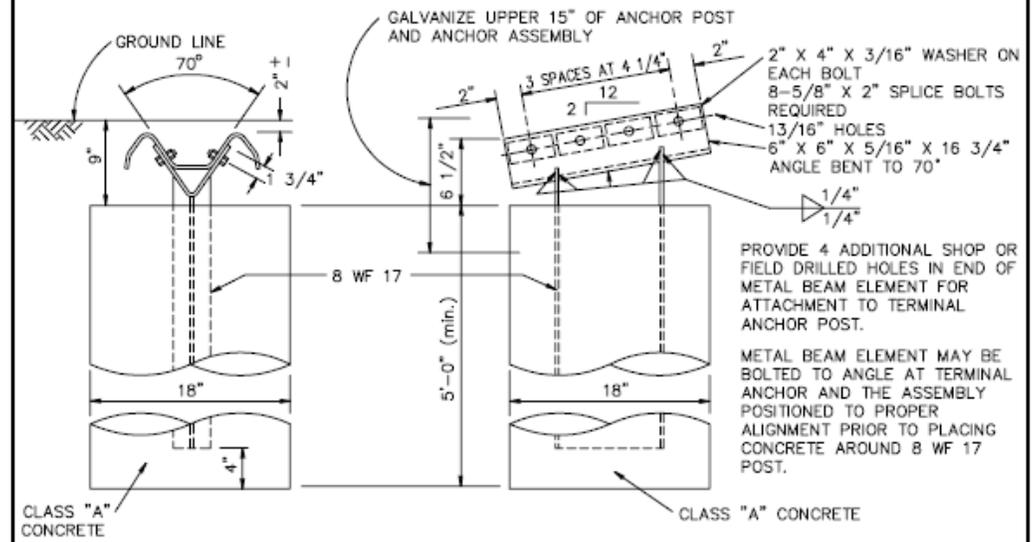


STANDARD SPECIFICATION REFERENCE
801.2
DATE
OCT. '04
STANDARD DRAWING NO.
2270B



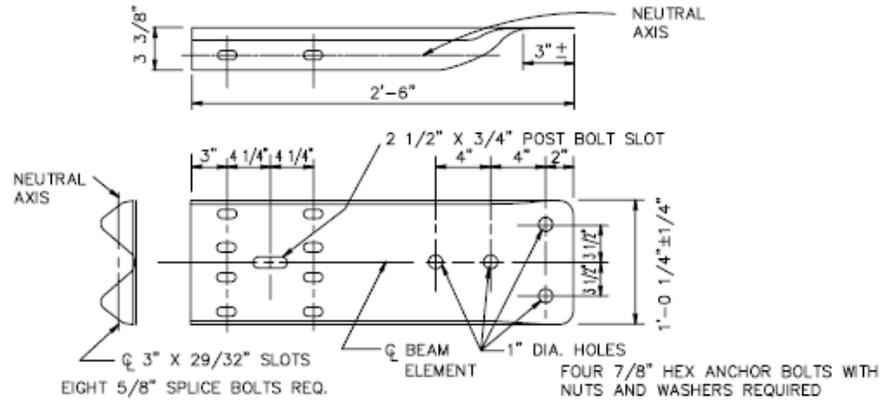
END SECTION – AWAY FROM DIRECTION OF TRAFFIC

N.T.S.

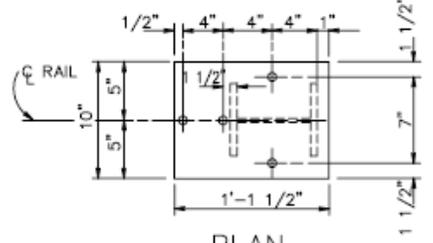


TERMINAL ANGLE ANCHOR POST

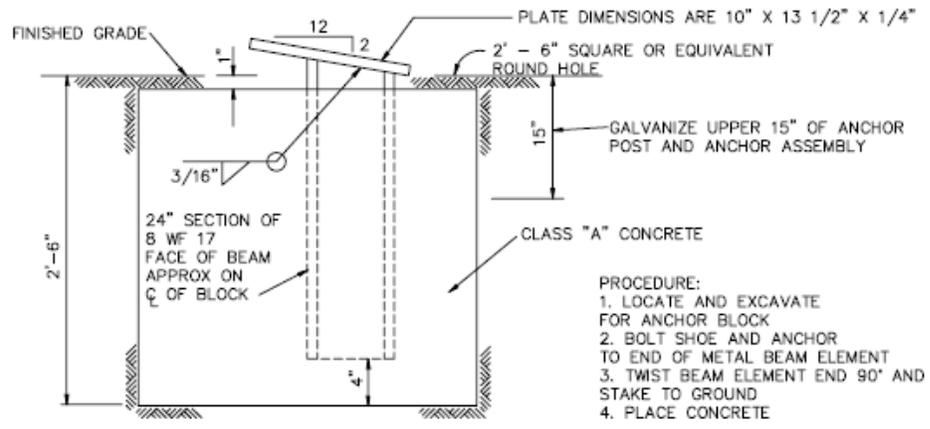
N.T.S.



SPECIAL END SHOE
N.T.S.



PLAN
N.T.S.



ELEVATION
N.T.S.

SPECIAL END SHOE ANCHOR POST

METAL BEAM GUARD FENCE SPECIAL END SHOE & ANCHOR POST		STANDARD SPECIFICATION REFERENCE	
		801.2	
		DATE	STANDARD DRAWING NO.
		OCT. '04	2270D

METAL BEAM GUARD FENCE
GENERAL NOTES

1. EXCEPT WHERE USED AT STRUCTURES THAT ARE NARROWER THAN CROWN WIDTH OR WHERE OTHERWISE INDICATED ON PLANS, THE FACE OF THE GUARD FENCE SHALL BE LOCATED A MINIMUM OF ONE FOOT FROM THE SHOULDER EDGE ON EXISTING ROADWAYS AND A MINIMUM OF TWO FEET FROM THE SHOULDER EDGE ON NEW CONSTRUCTION. THE EXACT POSITION SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. BEAM ELEMENTS SHALL BE TRANSITIONED TO A SMOOTH CONNECTION WITH OTHER STRUCTURES OR BEAM ELEMENTS AS SHOWN ELSEWHERE ON PLANS.
2. AT THE OPTION OF THE CONTRACTOR THE METAL BEAM ELEMENTS FOR THE GUARD FENCE MAY BE FURNISHED IN EITHER 12 1/2 OR 25 FOOT NOMINAL LENGTHS. BEAM ELEMENTS SHALL BE FURNISHED WITH POST BOLT SLOTS FOR 5/8" DIAMETER BOLT CONNECTIONS TO POSTS.
3. BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.
4. THE TOP OF THE TERMINAL ANCHOR POST ASSEMBLY AND ALL STEEL FITTINGS THEREON SHALL BE GALVANIZED AS SHOWN.
5. WHERE ROCK IS ENCOUNTERED OR WHERE SHOWN ON THE PLANS, THE DIAMETER OF THE HOLES AND THE MATERIAL FOR BACKFILLING SHALL BE AS DIRECTED BY THE ENGINEER. TIMBER POSTS SHALL NOT BE SET IN CONCRETE.
6. THE TERMINAL ANCHOR POST SHALL BE SET IN CLASS "A" CONCRETE. CONCRETE SHALL BE SUBSIDIARY TO THE BID ITEM "METAL BEAM GUARD FENCE."
7. TIMBER POSTS MAY BE BEVELED AT APPROXIMATELY 10 DEGREES ON THE TOP OR BOTH ENDS WITH HIGH SIDE OF TOP OF POST PLACED TOWARD THE ROADWAY OR THEY MAY BE DOMED.
8. AN ANCHOR OTHER THAN TO A TERMINAL ANCHOR POST SHALL CONSIST OF A CONNECTION SIMILAR TO THE BEAM ELEMENT SPLICE OR SIMILAR TO THE SPECIAL END SHOE.
9. SPECIAL FABRICATION WILL BE REQUIRED IN INSTALLATIONS HAVING A CURVATURE OF LESS THAN 150' RADIUS.
10. WOOD POSTS MUST BE TREATED IN MANNER APPROVED BY THE ENGINEER.
11. THE SPECIAL END SHOE ANCHOR MAY BE USED WITH THE 18" X 5'-0" CONCRETE FOOTING OR THE ANGLE ANCHOR MAY BE USED WITH THE 2'-6" SQUARE OR EQUIVALENT CONCRETE FOOTING.
12. ALL METAL ELEMENTS WILL BE 12 GAUGE STEEL UNLESS STATED OTHERWISE ON PLANS.

METAL BEAM GUARD FENCE
GENERAL NOTES

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

801.2

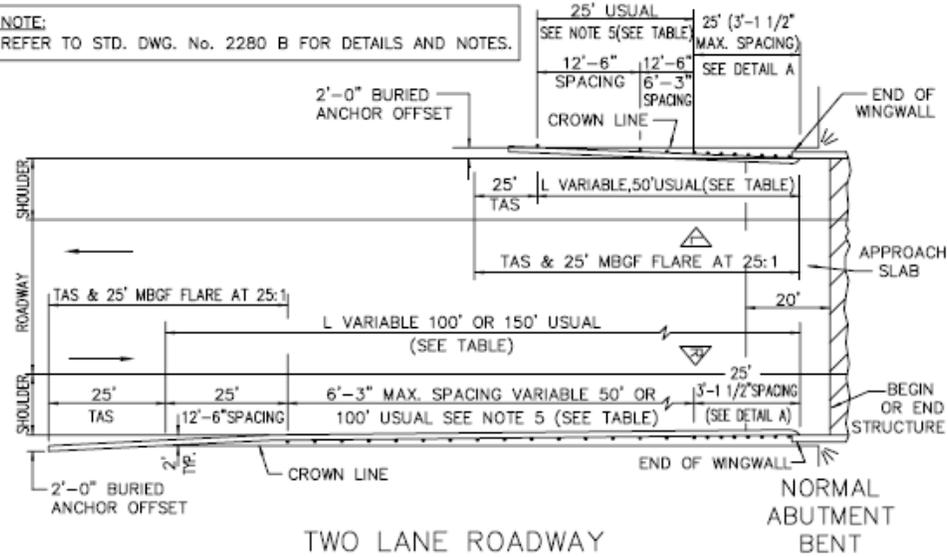
DATE

OCT. '04

STANDARD DRAWING NO.

2270E

NOTE:
REFER TO STD. DWG. No. 2280 B FOR DETAILS AND NOTES.

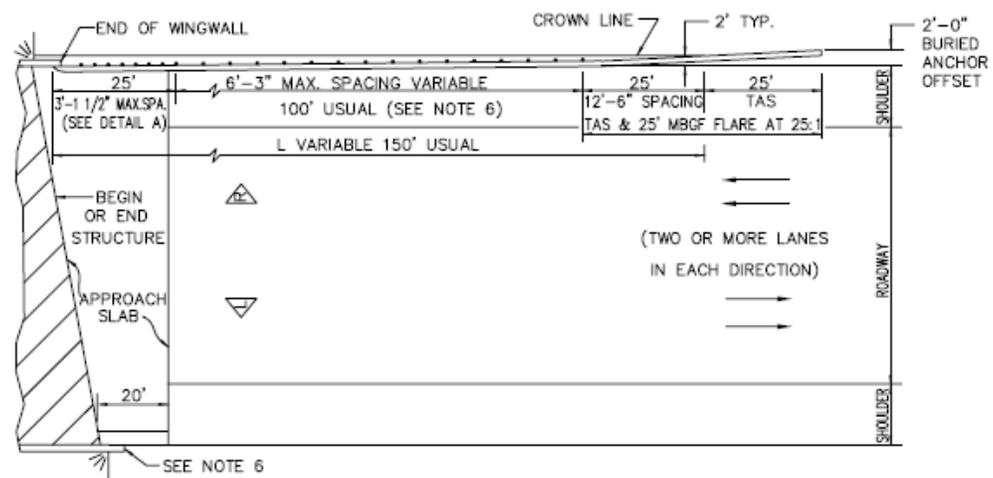


TWO LANE ROADWAY

NORMAL ABUTMENT BENT

N.T.S.

TAS: TERMINAL ANCHOR SECTION



MULTILANE UNDIVIDED ROADWAY

SKewed ABUTMENT BENT

N.T.S.

CROWN WIDTH BRIDGE

(SEE NOTE 7 FOR RESTRICTIVE WIDTH BRIDGE)

METAL BEAM GUARD FENCE

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE

801.2

TWO-WAY TRAFFIC BRIDGE END

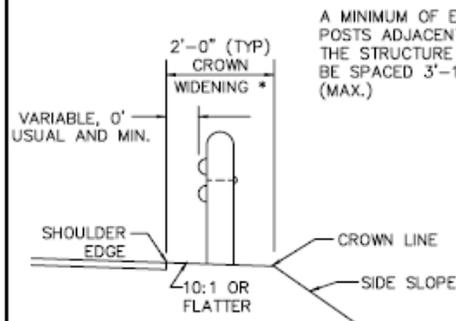


DATE

STANDARD DRAWING NO.

OCT. '04

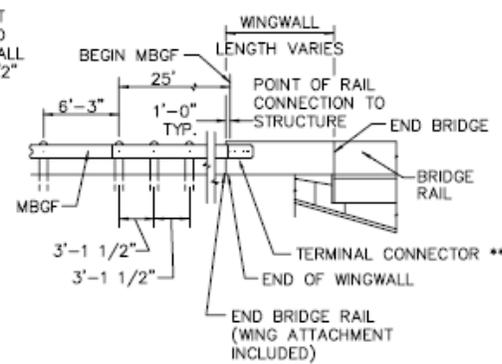
2280A



TYPICAL CROSS SECTION

N.T.S.

* APPLIES TO CONSTRUCTION ON NEW ALIGNMENT OR WHERE EXISTING ROADWAY CROSS SECTION IS TO BE WIDENED TO INCREASE ROADWAY WIDTH. DOES NOT APPLY TO REHABILITATION WORK WHERE EXISTING ROADWAY CROWN WIDTH IS TO BE RETAINED.



POST TREATMENT AT STRUCTURES
DETAIL A

N.T.S.

** TYPICAL CONNECTION—SEE BRIDGE RAIL OR OTHER PLAN SHEETS FOR DETAILS OF MBGF TO BRIDGE RAIL CONNECTION.

LENGTH Ⓞ OF NEED, L, FT.

TWO LANE HIGHWAYS				MULTILANE UNDIVIDED HWYS.	
750 or less ADT	more than 750 ADT	all ADT's		all ADT's	
◀ side	▶ side	◀ side	▶ side	◀ side	▶ side
50 Ⓞ	100	50 Ⓞ	150	0	150

Ⓞ LENGTHS ARE FOR TYPICAL CROSS SECTIONAL & PLACEMENT CONDITIONS. FOR UNUSUAL CONDITIONS, A CUSTOM DESIGN SHOULD BE DEVELOPED.

◀ INDICATES LEFT SIDE OF TRAFFIC APPROACHING BRIDGE.

▶ INDICATES RIGHT SIDE OF TRAFFIC APPROACHING BRIDGE.

DESIGN NOTES:

- THE T.A.S. AND TYPICALLY ADJACENT 25' MBGF SHOULD BE FLARED FROM THE SHOULDER EDGE AT 25:1 TO PROVIDE A 2' USUAL OFFSET TO BURIED ANCHOR.
- WHERE LENGTH (L) OF MBGF IS 50 FEET, POST SPACING SHALL BE AS DETAILED HEREON (SEE PLAN LAYOUT FOR TWO LANE (RURAL) HIGHWAY), LEFT SIDE OF TRAFFIC APPROACHING BRIDGE. WHERE LENGTH (L) OF MBGF IS 75 FEET OR MORE, POST SPACING SHALL BE 3'-1 1/2" FOR THE 25' SECTION ADJACENT TO THE BRIDGE, 12'-6" FOR THE 25' SECTION ADJACENT TO THE T.A.S. AND 6'-3" FOR THE REMAINING INTERVENING LENGTH.
- THE SLOPE BETWEEN THE CROWN LINE AND OUTSIDE EDGE OF SHOULDER SHOULD BE 10:1 OR FLATTER. THE CROWN SHOULD BE WIDENED TO ACCOMMODATE MBGF. TYPICALLY THE CROWN LINE SHOULD BE 2 FEET FROM THE OUTSIDE SHOULDER EDGE (SEE TYPICAL CROSS SECTION).
- FOR RESTRICTIVE WIDTH BRIDGES, A 25 FOOT TANGENT SECTION OF MBGF SHOULD CONNECT TO THE WINGWALL. THE ADJOINING MBGF THAT LIES WITHIN THE ROADWAY (LANE & SHOULDER AREAS) CROWN SHOULD BE FLARED AT THE RATE OF 25:1 (LONGITUDINAL:LATERAL). LENGTH SHOULD BE GOVERNED BY TABULATED VALUES OR THE LENGTH NECESSARY TO LOCATE THE BURIED ANCHOR AT A 2-FOOT OFFSET FROM SHOULDER EDGE, WHICHEVER IS GREATER.
- AVERAGE DAILY TRAFFIC (ADT) IS FOR THE CURRENT YEAR. WHERE SIGNIFICANT TRAFFIC VOLUME GROWTH IS ANTICIPATED ON LOW VOLUME (0-750 ADT) HIGHWAYS, USE LENGTHS SHOWN FOR HIGHER VOLUME CATEGORY.
- PROVIDE MINIMUM 50 FT. MBGF PLUS T.A.S. FOR FOUR LANE UNDIVIDED HIGHWAYS. FOR FOUR LANE HIGHWAYS WITH A FLUSH MEDIAN OR FOR HIGHWAYS WITH SIX OR MORE LANES, MBGF IS NOT A REQUIRED BRIDGE END TREATMENT. HOWEVER, OTHER NEARBY HAZARDS MAY WARRANT SHIELDING WITH MBGF.

GENERAL NOTES:

- FOR METAL BEAM GUARD FENCE DETAILS AND METHOD OF TERMINATION, SEE STD. DWGS. No. 2270A - 2270E.
- VARIATIONS IN POST SPACINGS AND/OR THE USE OF SPACER BLOCKS OR SHIMS MAY BE REQUIRED BY THE ENGINEER IN ORDER TO ACCOMMODATE THE REQUIRED BEAM ELEMENT CONNECTION TO STRUCTURES.
- QUANTITIES OF METAL BEAM GUARD FENCE (MBGF) AT INDIVIDUAL BRIDGE ENDS ARE SHOWN ELSEWHERE IN THE PLANS.

METAL BEAM GUARD FENCE
TWO-WAY TRAFFIC BRIDGE END

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

801.2

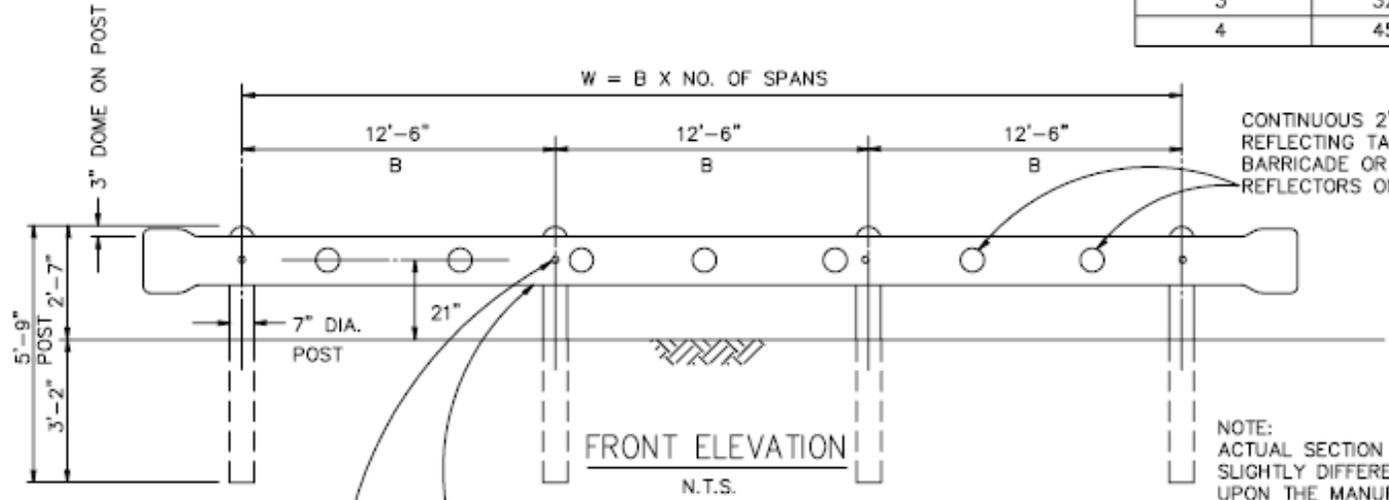
DATE

STANDARD DRAWING NO.

OCT. '04

2280B

NO. OF SPANS	ROADWAY SECTION WIDTH
2	18' to 31'
3	32' to 44'
4	45' to 56'

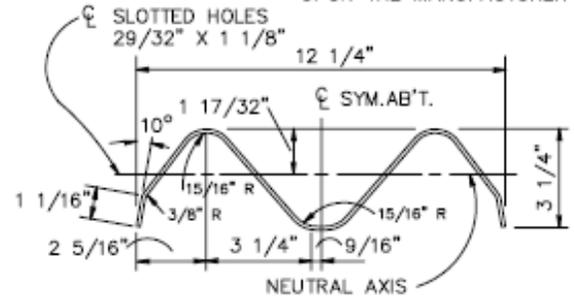
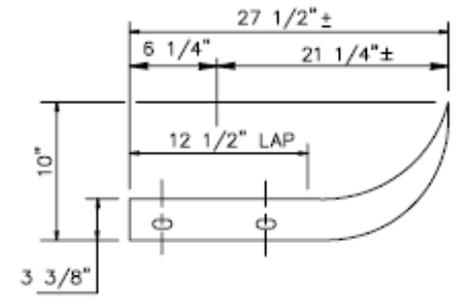
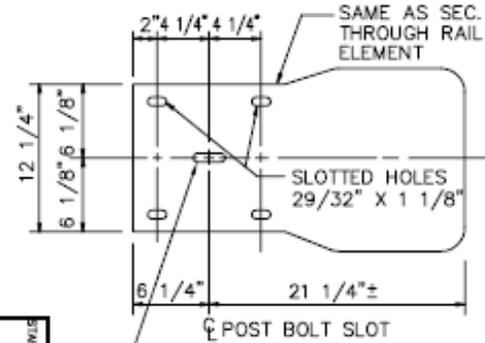


CONTINUOUS 2" RED REFLECTING TAPE ACROSS BARRICADE OR 4" DIA. REFLECTORS ON 5' CENTERS.

NOTE: ACTUAL SECTION MAY BE SLIGHTLY DIFFERENT DEPENDING UPON THE MANUFACTURER

FASTEN TO POST WITH ONE 5/8" BOLT WITH 1 3/4" O.D. WASHER BEHIND POST, 7/8" Ø HOLE IN POST.

METAL BEAM GUARD FENCE SHALL BE GALVANIZED STEEL (12 GA.)



STANDARD DRAWING NO. 2290

METAL BEAM BARRICADE
END OF ROAD



STANDARD SPECIFICATION REFERENCE	
801.2	
DATE	STANDARD DRAWING NO.
OCT. '04	2290

Next Steps

- Determine action items for Subcommittee Members and NCTCOG staff

Next Standard Drawings Meetings

April 13, 2020

10am-11:30am

Pecan Conference Room