



**STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
DESIGN DIVISION**

NASHVILLE, TENNESSEE 37243-0348

**JOHN C. SCHROER**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

**INSTRUCTIONAL BULLETIN NO. 13-20**

**Regarding Revised Standard Drawings**

**Effective for the February 2014 Letting (December 4 turn-in)** , the following Standard Drawings are revised and Section V of the Design Guidelines is revised for this update.

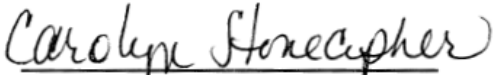
**Please Note:** The description has changed for item numbers 701-02.01 and 701-02.03 as shown on the revised RP-H drawings.

| <b><u>DRAWING<br/>NUMBER</u></b> | <b><u>CURRENT<br/>REVISION<br/>DATE</u></b> | <b><u>DESCRIPTION</u></b>                                   |
|----------------------------------|---|---|
| RD01-TS-6                        | 7-31-13                                     | TYPICAL CURB AND GUTTER SECTIONS WITH SHOULDER              |
| RD01-TS-6A                       | 7-31-13                                     | TYPICAL CURB AND GUTTER SECTIONS WITHOUT SHOULDERS          |
| RP-H-3                           | 6-4-13                                      | CURB RAMP AND TRUNCATED DOME SURFACE DETAIL                 |
| RP-H-4                           | 6-4-13                                      | PERPENDICULAR CURB RAMP                                     |
| RP-H-5                           | 6-4-13                                      | PARALLEL CURB RAMP  |
| RP-H-7                           | 6-4-13                                      | PERPENDICULAR CURB RAMP TYPE 1                              |
| RP-H-8                           | 6-4-13                                      | PERPENDICULAR CURB RAMP TYPE 2                              |
| RP-H-9                           | 6-4-13                                      | PARALLEL CURB RAMP TYPE 3 AND 4                             |
| RP-S-7                           | 6-4-13                                      | DETAILS FOR STANDARD CONCRETE SIDEWALKS                     |
| T-S-17                           | 7-19-13                                     | STANDARD GROUND MOUNTED SIGN USING PERFORATED/KNOCKOUT TUBE |
| T-S-19                           | 7-19-13                                     | STANDARD STEEL SIGN SUPPORTS                                |

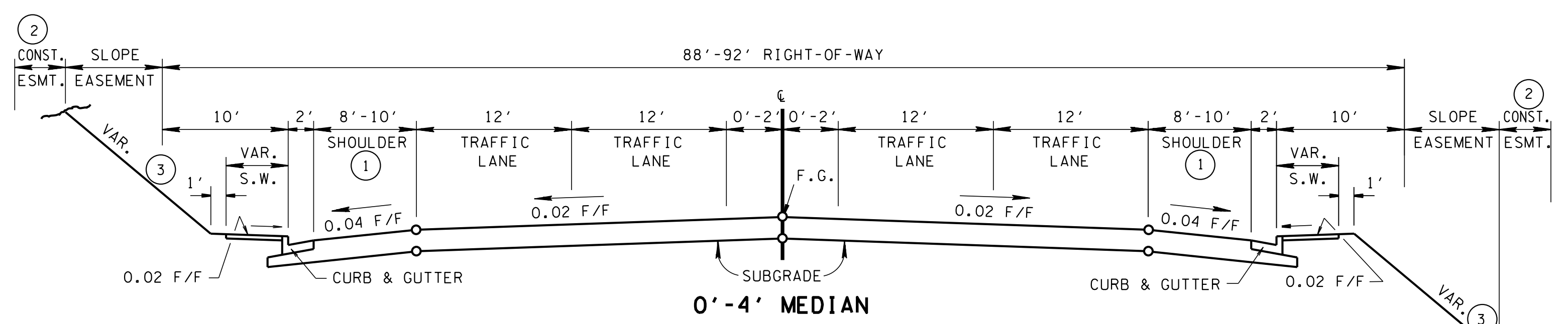
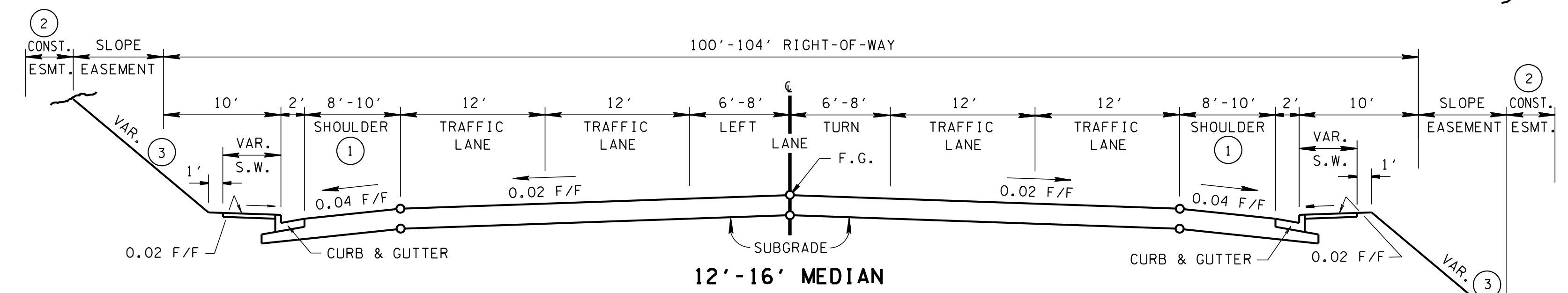
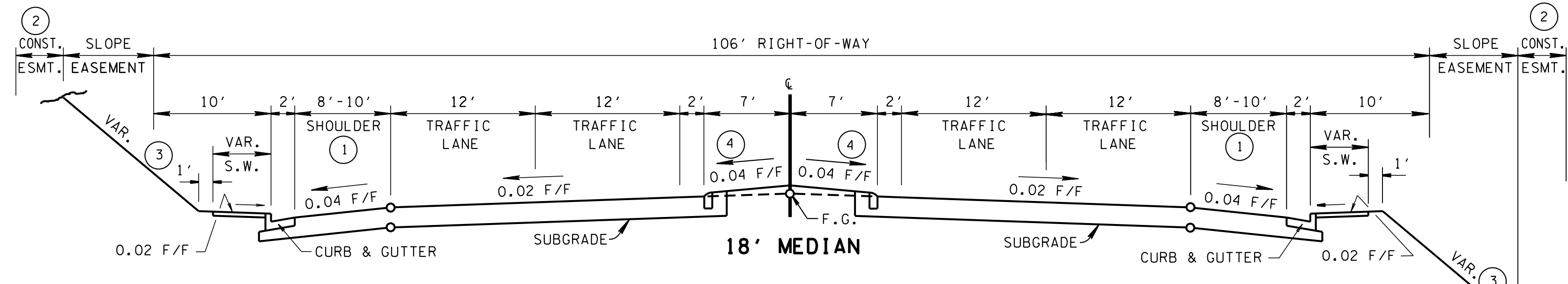
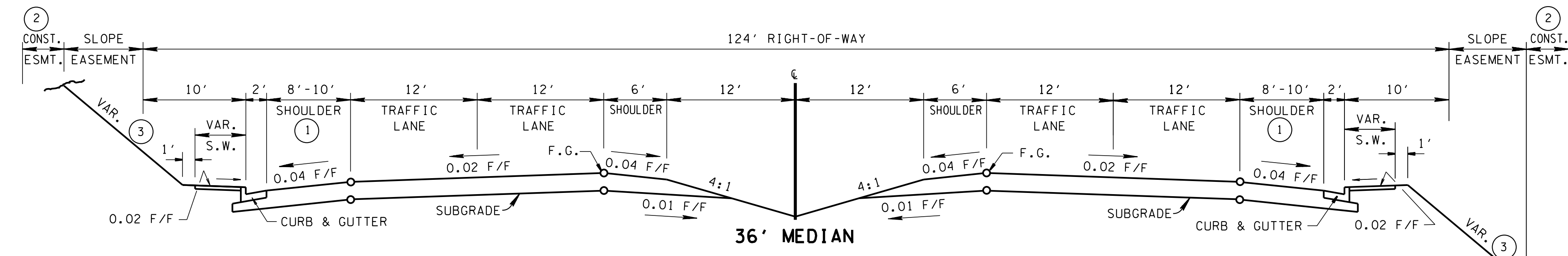
IB 13-20

| <u>DRAWING<br/>NUMBER</u> | <u>CURRENT<br/>REVISION<br/>DATE</u> | <u>DESCRIPTION</u>  |
|---------------------------|--------------------------------------|---|
| T-S-23A                   | 7-19-13                              | MULTI-DIRECTIONAL SLIP BASE BREAKAWAY SQUARE<br>TUBE SIGN SUPPORT     |
| T-S-23B                   | 7-19-13                              | MULTI-DIRECTIONAL SLIP BASE BREAKAWAY<br>STRUCTURAL PIPE SIGN SUPPORT |
| T-S-23C                   | 7-19-13                              | BREAKAWAY U-POST SIGN SUPPORTS  |
| T-S-24                    | 8-2-13                               | DETAILS OF SIGN WITH SOLAR FLASHING ASSEMBLY                          |

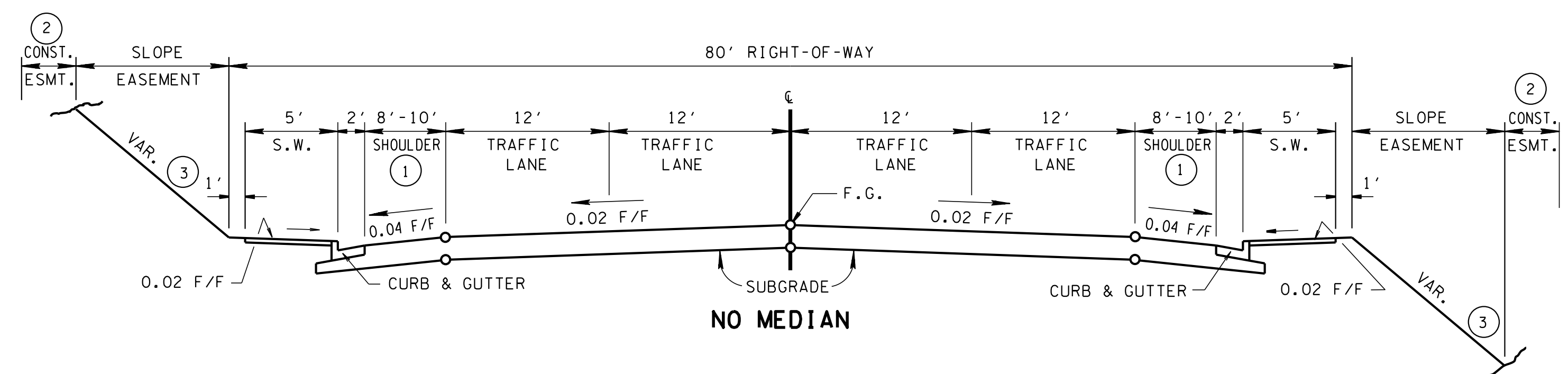
A copy of the revised standard drawings are attached.

  
Carolyn Stonecipher, PE  
Civil Engineering Director  
Roadway Design Division

CAS:ARH:MWC  
attachments  
9/12/13



**NOTE**  
THE "NO MEDIAN" TYPICAL, SHOWN BELOW IS NOT TO BE USED UNLESS THE OTHER TYPICALS SHOWN ABOVE ARE NOT APPLICABLE, BECAUSE THE COST OF RIGHT-OF-WAY REQUIREMENTS FOR WIDER SECTIONS WOULD BE PROHIBITIVE.



**GENERAL NOTES**

**DESIGN SPEED**

THESE SECTIONS ARE FOR 45 MILES PER HOUR OR LESS.

**ALIGNMENT**

SEE APPROPRIATE STANDARD DRAWING IN THE RD01-SE-SERIES AND THE "ROADSIDE DESIGN GUIDE," AASHTO, 2002, FOR MEDIAN BARRIER WARRANTS.

**SUPERELEVATION AND MEDIAN BARRIERS**

SEE APPROPRIATE STANDARD DRAWING IN THE RD01-SE-SERIES AND THE "ROADSIDE DESIGN GUIDE," AASHTO, 2002.

**SHOULDER CROSS SLOPES**

ON PROJECTS, WHERE IN THE NEAR FUTURE THE SHOULDER MAY BE USED AS A THROUGH TRAFFIC LANE, THE PAVEMENT SLOPE (0.02 FOOT/FOOT) SHOULD BE USED ON THE SHOULDER IN PLACE OF THE 0.04 FOOT/FOOT SLOPE SHOWN ON THE TYPICAL SECTION. SEE DETAIL FOR SUPERELEVATION OF SHOULDER WITH 0.02 FOOT/FOOT SLOPE.

① THE SHOULDER WIDTH WILL BE AS SPECIFIED IN THE ADVANCE PLANNING REPORT.

**CONSTRUCTION EASEMENT**

② 10 FEET MINIMUM DESIRABLE.

**SLOPES**

③ ON URBAN PROJECTS THE BACKSLOPE AND FORESLOPE DESIGN WILL VARY FROM PROJECT TO PROJECT. AS A GENERAL RULE USE THE FOLLOWING:

3:1 SLOPES OR FLATTER ARE DESIRABLE AND ARE THE MAXIMUM IN REGION IV AND 2:1 SLOPES ARE APPLICABLE IN AREAS WHERE RIGHT-OF-WAY RESTRICTIONS OR COST WARRANTS A STEEPER THAN 3:1 SLOPE. THE MAXIMUM SLOPE IN REGION IV IS 3:1.

**MEDIAN CURBS**

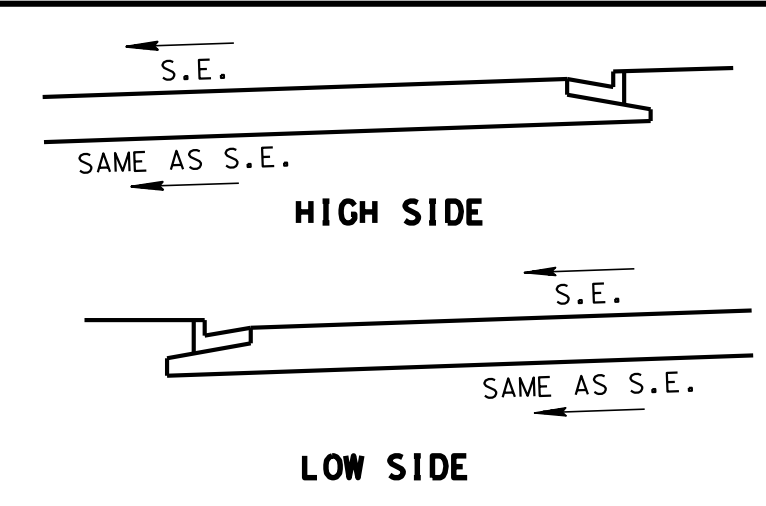
④ MEDIAN CURBS WILL BE SLOPING CURBS. VERTICAL CURBS WILL NOT BE PERMITTED.

**SIDEWALKS**

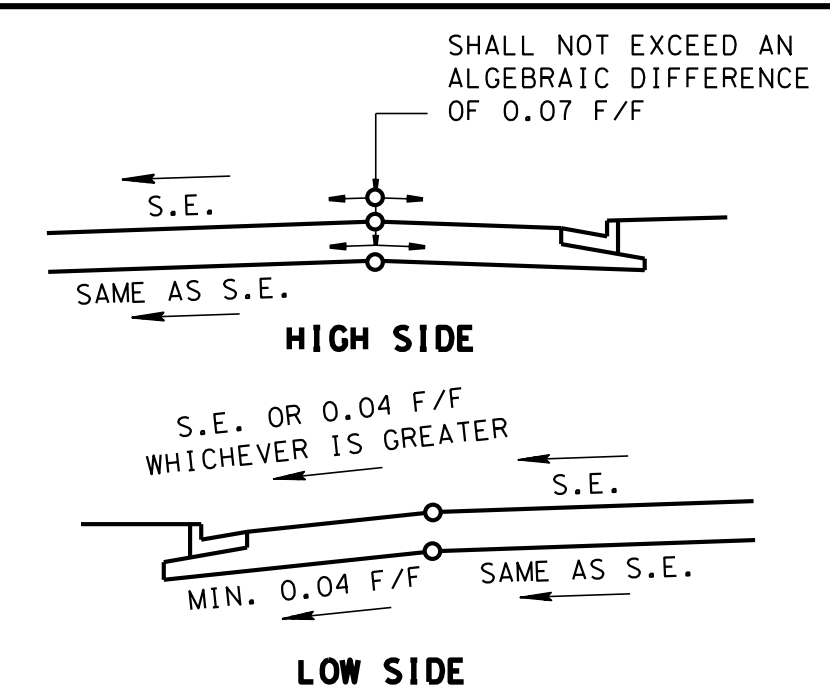
SIDEWALK WIDTH SHALL NOT INCLUDE THE SIX INCH WIDTH OF PROPOSED CURB, SIDEWALK SHALL BE A MINIMUM OF FIVE FEET WIDE.

**PARKING LANES**

FOR SPECIFIC CONDITIONS NOT COVERED ON THIS SHEET, REFERENCE SHOULD BE MADE TO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS," AASHTO, 2001 PAGE NUMBERS 437-438 AND 482-483.



**SUPERELEVATION DETAIL FOR SHOULDERS**  
(WHERE SHOULDERS MAY BE USED AS A THROUGH TRAFFIC LANE IN THE FUTURE)



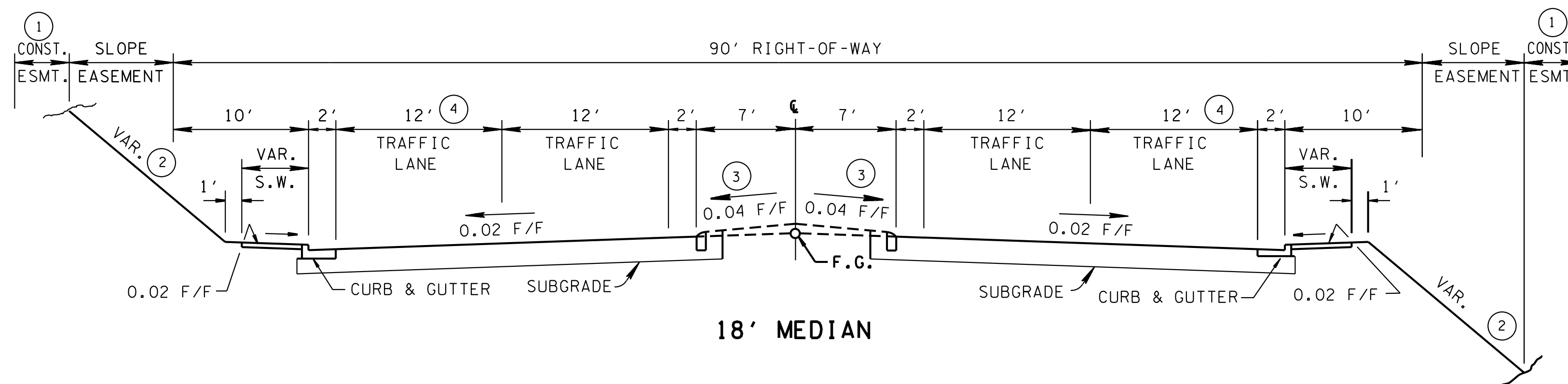
**SUPERELEVATION DETAIL FOR SHOULDERS**

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

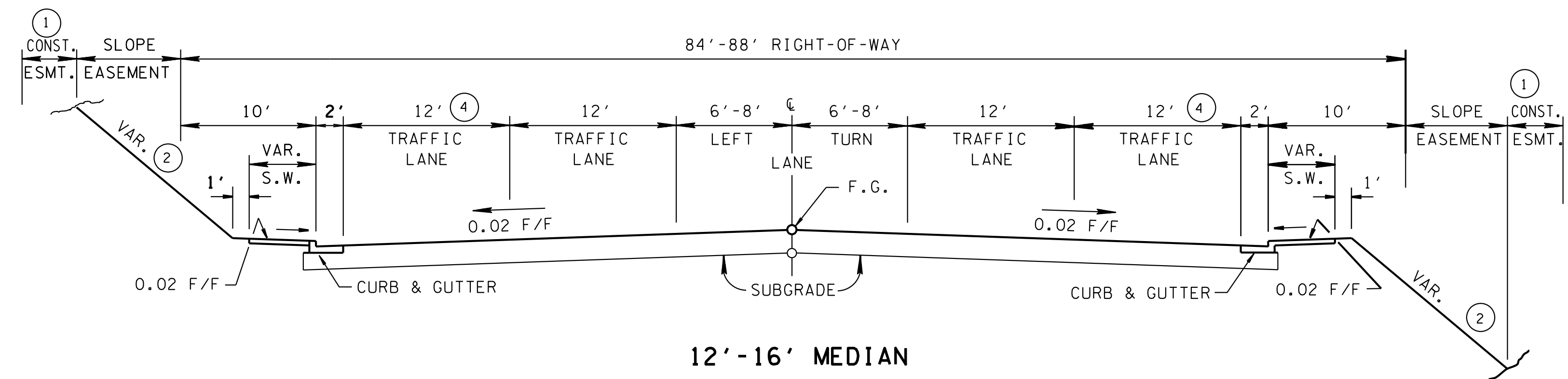
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TYPICAL  
CURB AND GUTTER  
SECTIONS  
WITH SHOULDER

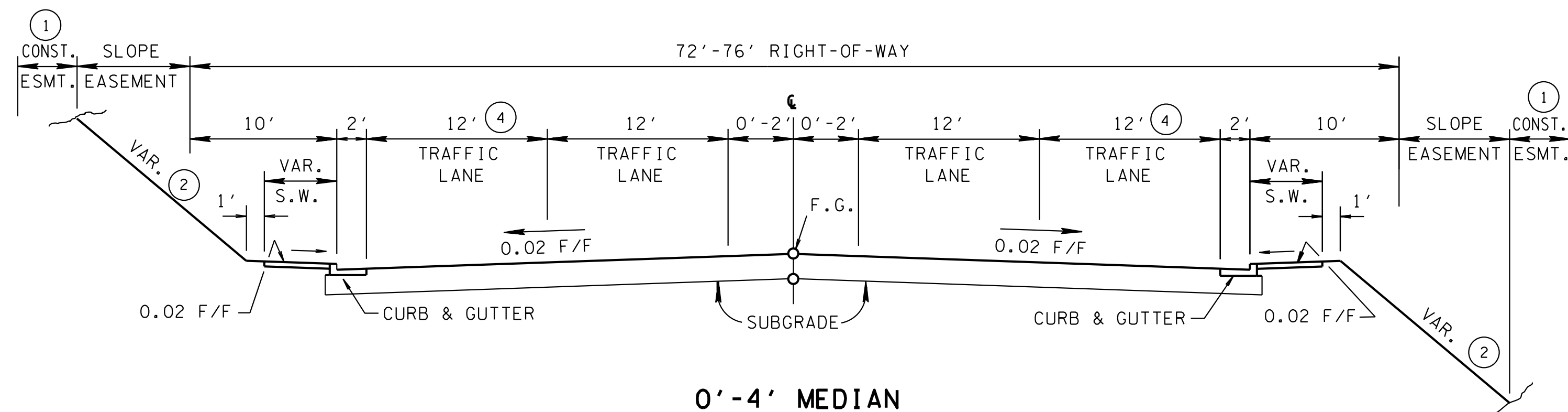
- REV. 1-24-12: ADDED REFERENCE TO NOTE ④
- REV. 7-31-13: REVISED SIDEWALK WIDTH.



18' MEDIAN



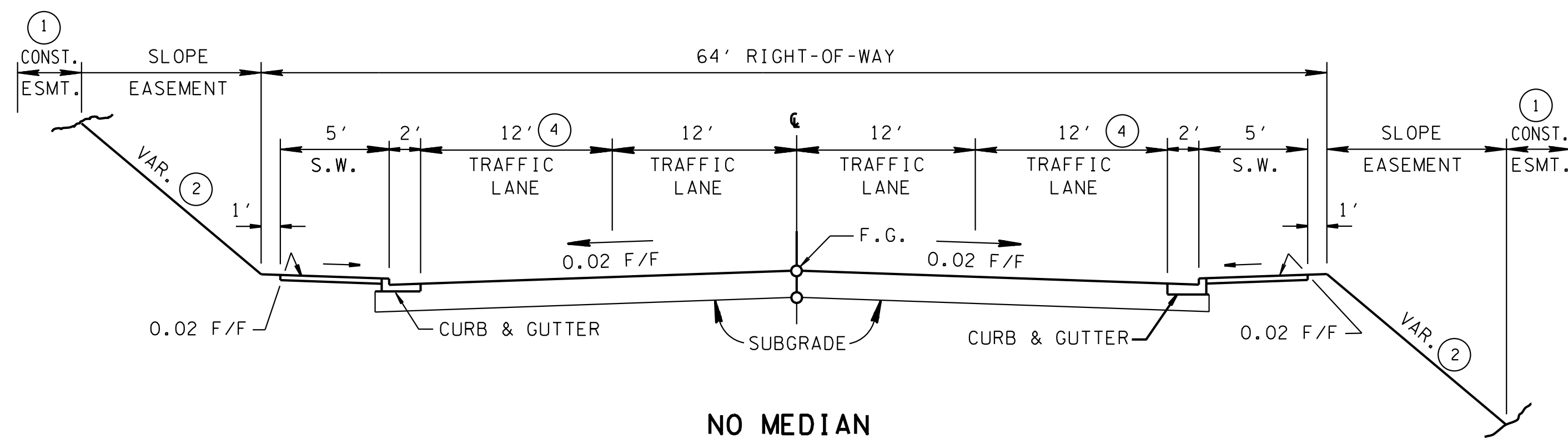
12'-16' MEDIAN



0'-4' MEDIAN

**NOTE**

THE "NO MEDIAN" TYPICAL, SHOWN BELOW, IS NOT TO BE USED UNLESS THE OTHER TYPICALS SHOWN ABOVE ARE NOT APPLICABLE, BECAUSE THE COST OF RIGHT-OF-WAY REQUIREMENTS FOR WIDER SECTIONS WOULD BE PROHIBITIVE.



NO MEDIAN

**GENERAL NOTES**

**DESIGN SPEED**

THESE SECTIONS ARE FOR 45 MILES PER HOUR OR LESS.

**ALIGNMENT**

SEE APPROPRIATE STANDARD DRAWING IN THE RD01-TS-SERIES FOR HORIZONTAL AND VERTICAL ALIGNMENT.

**SUPERELEVATION AND MEDIAN BARRIERS**

SEE APPROPRIATE STANDARD DRAWING IN THE RD01-SE-SERIES AND THE "ROADSIDE DESIGN GUIDE," AASHTO, 2002, FOR MEDIAN BARRIERS.

**CONSTRUCTION EASEMENT**

① 10 FEET MINIMUM DESIRABLE.

**SLOPES**

② ON URBAN PROJECTS THE BACKSLOPE AND FORESLOPE DESIGN WILL VARY FROM PROJECT TO PROJECT, AS A GENERAL RULE USE THE FOLLOWING:

3:1 SLOPES OR FLATTER ARE DESIRABLE AND 2:1 SLOPES ARE APPLICABLE IN AREAS WHERE RIGHT-OF-WAY RESTRICTIONS OR COST WARRANTS A STEEPER THAN 3:1 SLOPE. THE MAXIMUM SLOPE IN REGION IV IS 3:1.

**MEDIAN CURBS**

③ MEDIAN CURBS WILL BE SLOPING CURBS. VERTICAL CURBS WILL NOT BE PERMITTED.

**SIDEWALKS**

SIDEWALK WIDTH SHALL NOT INCLUDE THE SIX INCH WIDTH OF PROPOSED CURB, SIDEWALK SHALL BE A MINIMUM OF FIVE FEET WIDE.

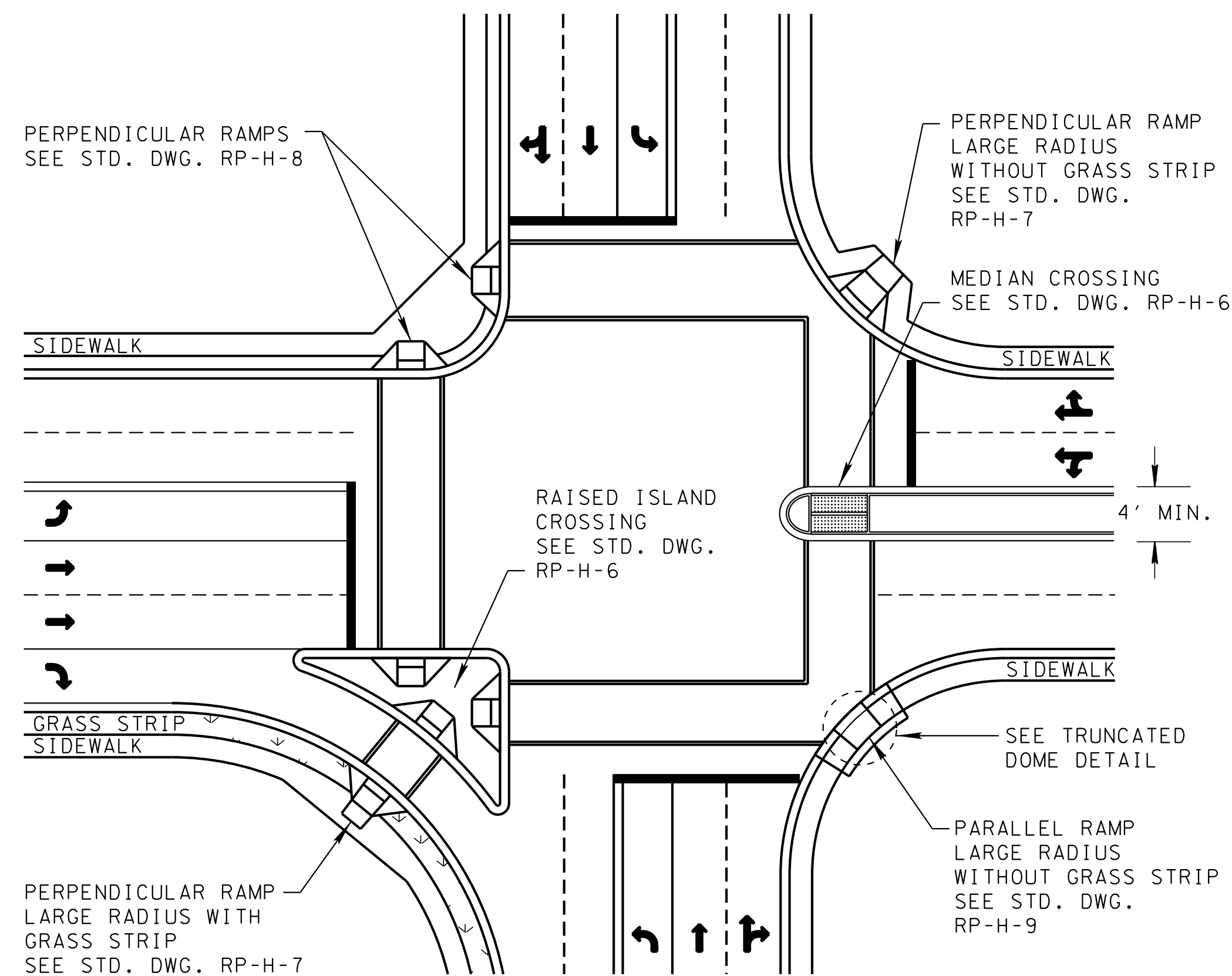
**BICYCLE PROVISIONS**

④ 14 FEET TO 16 FEET OUTSIDE LANE WIDTH TO BE UTILIZED WHEN BICYCLE LANE PROVISIONS ARE REQUIRED. REFER T-M-15, 15A, AND 16 FOR MORE INFORMATION.

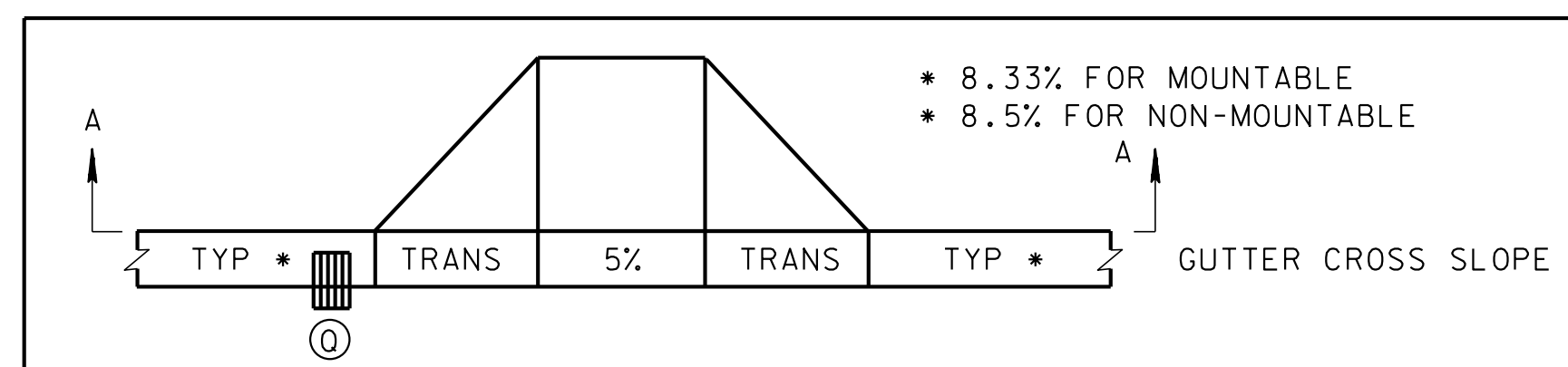
□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

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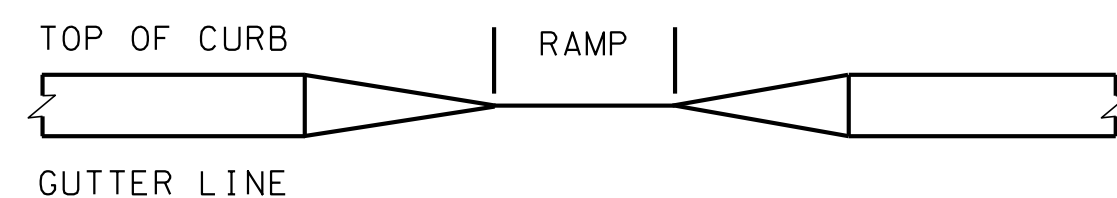
TYPICAL  
CURB AND GUTTER  
SECTIONS  
WITHOUT SHOULDER



PLAN VIEW  
(4-WAY INTERSECTION)



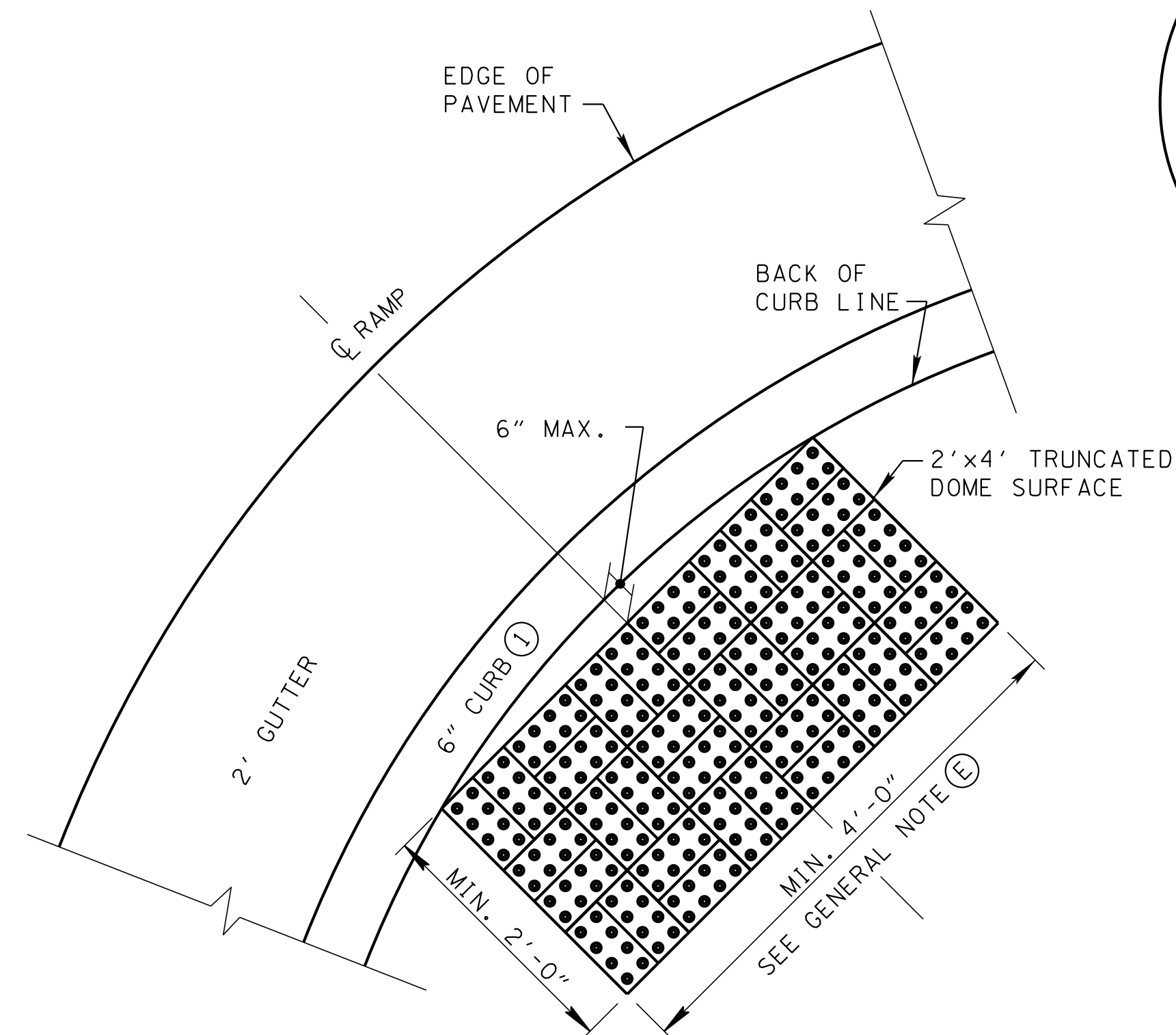
GUTTER CROSS SLOPE AT CURB RAMP



SECTION A-A  
GUTTER LONGITUDINAL PROFILE

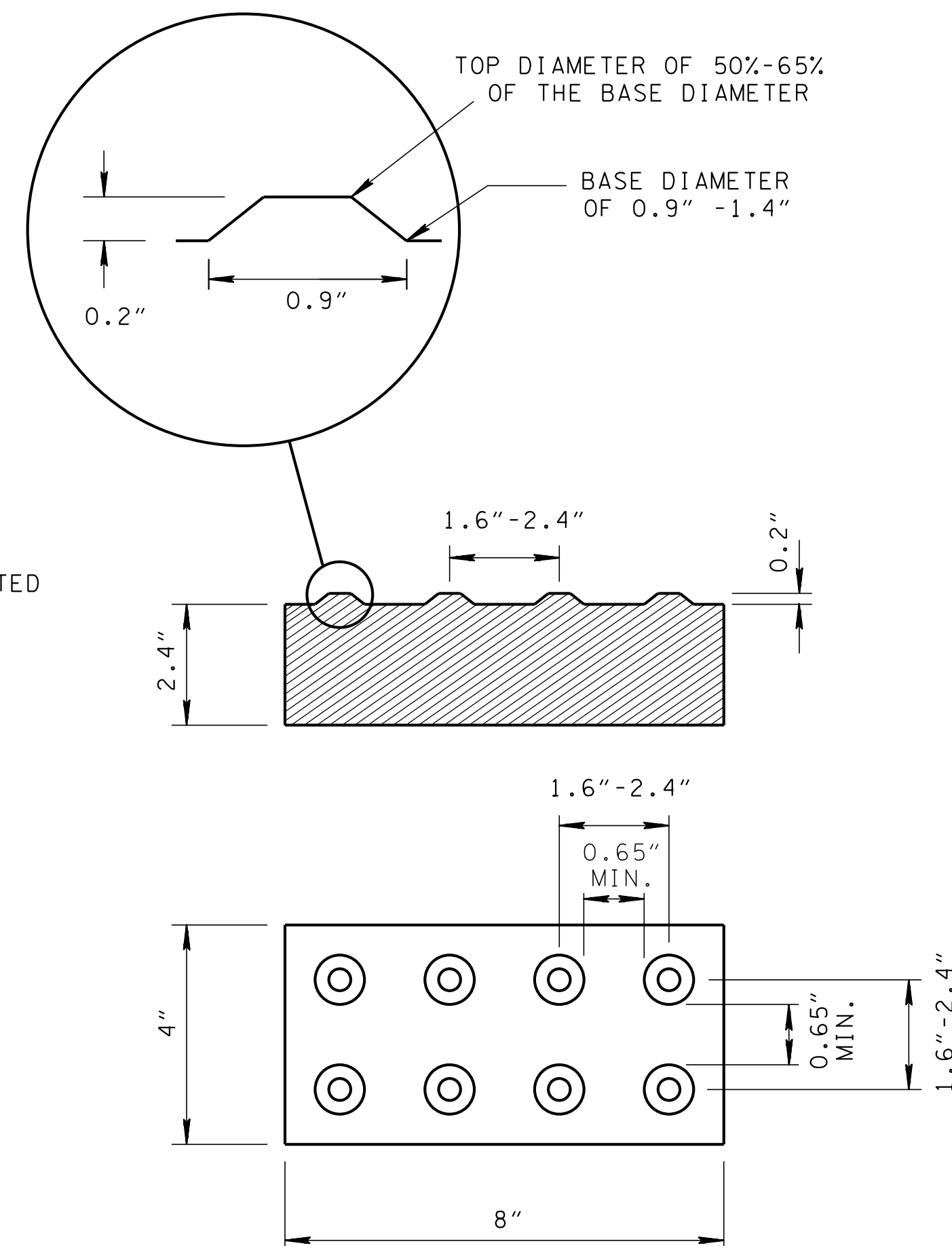
SPECIAL PAVER NOTES

- ① CONCRETE PAVER UNITS SHALL MEET ALL REQUIREMENTS OF ASTM C-936. 4"x8" CONCRETE PAVERS SHALL BE PLACED IN A BASKET WEAVE PATTERN, AS SHOWN. CONCRETE PAVERS OF OTHER DIMENSIONS ARE ALSO ACCEPTABLE PROVIDED THE PAVERS CAN BE PLACED IN A 2'x4' DIMENSION WITHOUT CUTTING THE PAVERS AND PAVER DEPTH IS 2.4".
- ② COMPOSITE TILES WITH NOMINAL DEPTH OF 0.4" MAY BE USED INSTEAD OF CONCRETE PAVERS. COMPOSITE TILES SHALL BE INSTALLED SO THAT DOMES ARE ALIGNED IN A SQUARE GRID PATTERN.
- ③ CONCRETE PAVER UNITS SHALL HAVE A TRUNCATED DOME TOP SURFACE FOR DETECTABLE WARNING TO PEDESTRIANS.
- ④ CONCRETE PAVER UNITS OR COMPOSITE TILES SHALL BE A TRADITIONAL BRICK RED COLOR UNLESS SHOWN OTHERWISE IN THE PLANS.
- ⑤ CONCRETE PAVER UNITS SHALL BE SAW CUT ONLY AND CUT UNITS SHALL NOT BE LESS THAN 25 PERCENT OF A FULL UNIT.
- ⑥ ALL PRODUCTS LISTED ON THE QUALIFIED PRODUCTS LIST ARE ACCEPTABLE.
- ⑦ PLACE A MINIMUM TOTAL PAVER WIDTH OF 2'-0" ADJACENT TO CURB LINE.



NOTE ①: CURB SHALL BE LOWERED  
ACROSS ENTIRE WIDTH  
OF RAMP

DETAIL OF  
TRUNCATED DOME  
SURFACE IN RADIUS



CONCRETE PAVER WITH  
TRUNCATED DOME SURFACE  
(SEE SPECIAL PAVER NOTES)

GENERAL NOTES

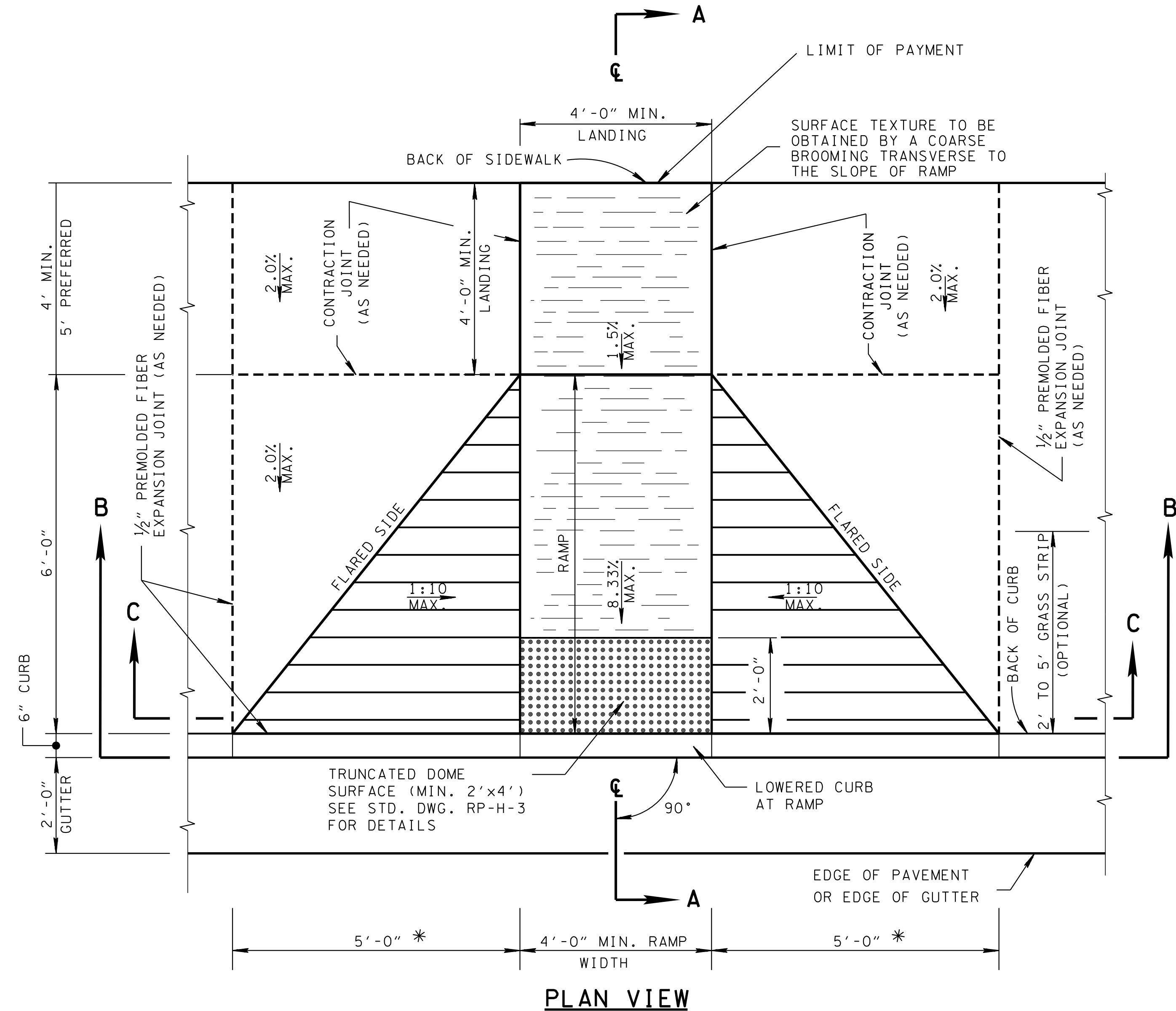
- |   |   |
|---|---|
| <p>(A) DETAILS SHOWN ON THIS PLAN APPLY TO THE CONSTRUCTION OR RECONSTRUCTION OF STREETS, CURBS, OR SIDEWALKS.</p> <p>(B) CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS.</p> <p>(C) CURB RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTIONS WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT WALK LOCATIONS IN MID-BLOCK AND ACROSS FROM CORNER RAMPS AT T-INTERSECTIONS.</p> <p>(D) THE FIRST TWO FEET OF RAMP MUST CONSIST OF A TRUNCATED DOME SURFACE. RAMPS SHALL INCLUDE THE TRUNCATED DOME SURFACE TO PROVIDE A DETECTABLE WARNING FOR VISUALLY IMPAIRED PEDESTRIANS.</p> <p>(E) THE DETECTABLE WARNING SHOULD EXTEND THE FULL WIDTH OF THE CURB RAMP (EXCLUSIVE OF FLARED SIDES).</p> <p>(F) THE DETECTABLE WARNING SURFACES SHALL PROVIDE A 70 PERCENT CONTRAST IN LIGHT REFLECTANCE WITH THE ADJOINING SURFACE.</p> <p>(G) CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. THE GRADE SHALL BE FREE OF SAGS AND SHORT GRADE CHANGES.</p> <p>(H) DRAINAGE STRUCTURES SHALL NOT BE PLACED IN LINE WITH RAMPS.</p> <p>(I) THE GUTTER LONGITUDINAL SLOPE SHALL MATCH THE ROADWAY AT THE RAMP AND THE GUTTER CROSS SLOPE AT THE RAMP SHALL NOT EXCEED 5%.</p> <p>(J) CROSSWALK MARKINGS, IF USED, SHALL BE LOCATED AS SHOWN ON THE APPLICABLE CURB RAMP STD. DWG. SEE STD. DWG. T-M-4 FOR TYPICAL STOP LINE PLACEMENT AND STANDARD CROSS WALK MARKING.</p> <p>(K) COST OF THE LOWERED CURB AND GUTTER TO BE INCLUDED IN THE PRICE OF ITEM NO. 702-01, CONCRETE CURB OR ITEM NO. 702-03, CONCRETE COMBINED CURB &amp; GUTTER.</p> | <p>(L) ENGINEER SHOULD BE NOTIFIED FOR ASSESMENT IF THE CURB RAMP SIDE FLARES EXCEED 10' IN LENGTH DUE TO THE LONGITUDINAL ROADWAY GRADE.</p> <p>(M) ALL COST OF INSTALLING CURB RAMPS INCLUDING TRUNCATED DOME IN EXISTING SIDEWALK AREAS INCLUDING REMOVAL OF THE EXISTING SIDEWALK SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:<br/><br/>701-02.01, CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.<br/><br/>PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S).</p> <p>(N) ALL COST OF INSTALLING CURB RAMPS INCLUDING TRUNCATED DOME IN NEWLY CONSTRUCTED SIDEWALK AREAS SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:<br/><br/>701-02.03, CONCRETE CURB RAMP PER SQUARE FOOT.<br/><br/>PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S).</p> <p>(O) SURFACE TEXTURE TO BE OBTAINED BY A COURSE BROOMING TRANSVERSE TO THE SLOPE OF RAMP.</p> <p>(P) FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSH BUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT AND DETAILS.</p> <p>(Q) INSTALL CATCH BASIN ON UPSTREAM SIDE OF RAMP FOR ROADS WITH GRADES LESS THAN 2%.</p> |
|---|---|

- REV. 7-17-07: REVISED SIZE AND SPACING OF TRUNCATED DOMES, ADDED NOTE ⑤, MODIFIED SPECIAL PAVER NOTES.
- REV. 4-13-11: ADDED LOWERED CURB FOOTNOTE ① TO TRUNCATED DOME DETAIL. MISC. EDITS TO DRAWING.
- REV. 5-8-13: ADDED GUTTER SLOPE DETAIL AND REVISED NOTE ①, UPDATED TERMINOLOGY.
- REV. 6-4-13: ADDED SECTION A-A. CLARIFIED NOTE ①, ADDED NOTE ⑥, CHANGED ITEM DESCRIPTION.

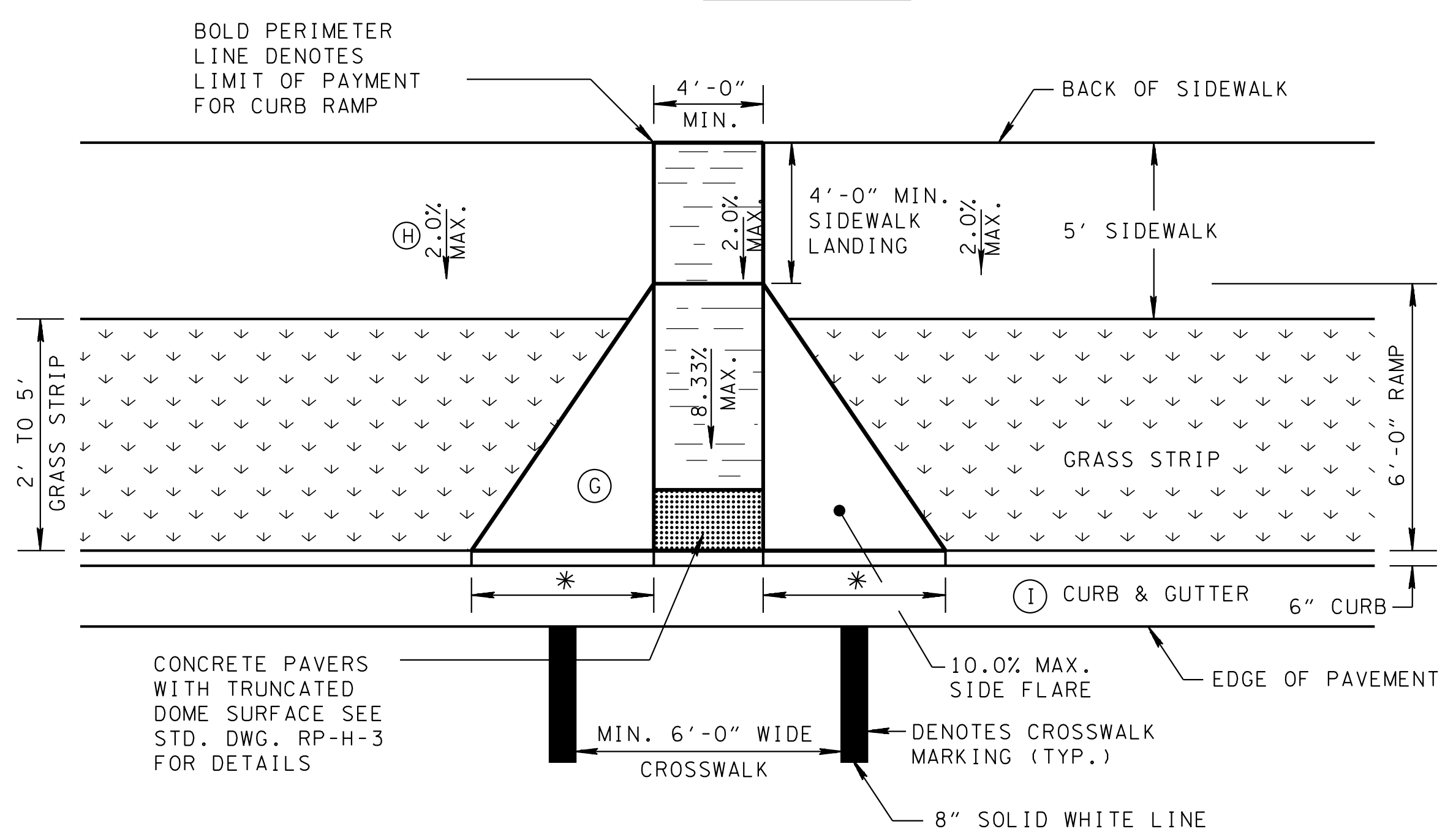
□ MINOR REVISION -- FHWA  
APPROVAL NOT REQUIRED.

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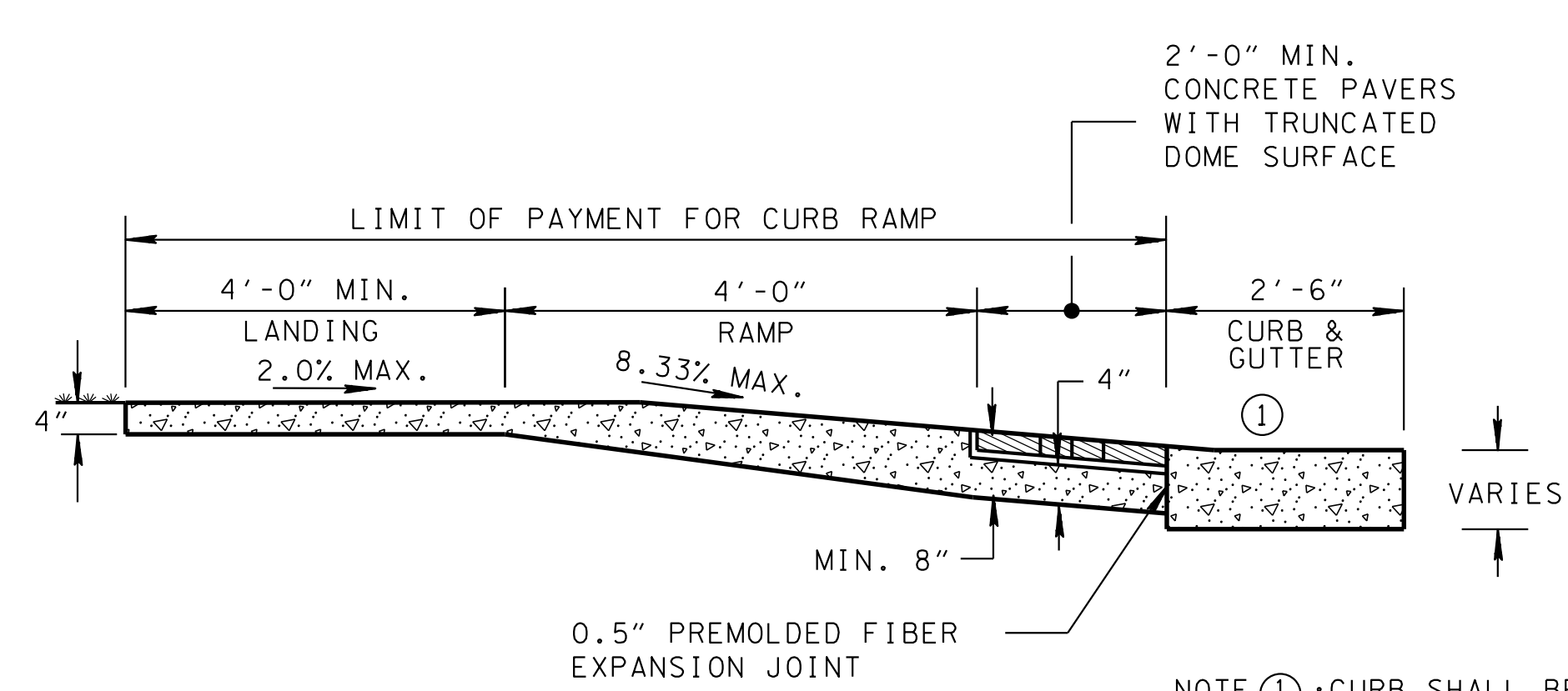
CURB RAMP  
AND TRUNCATED  
DOME SURFACE  
DETAIL



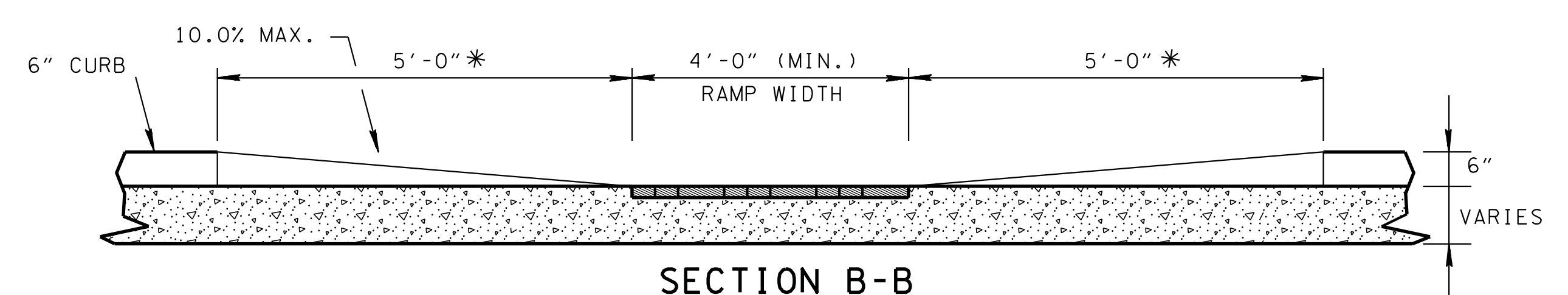
**PLAN VIEW**



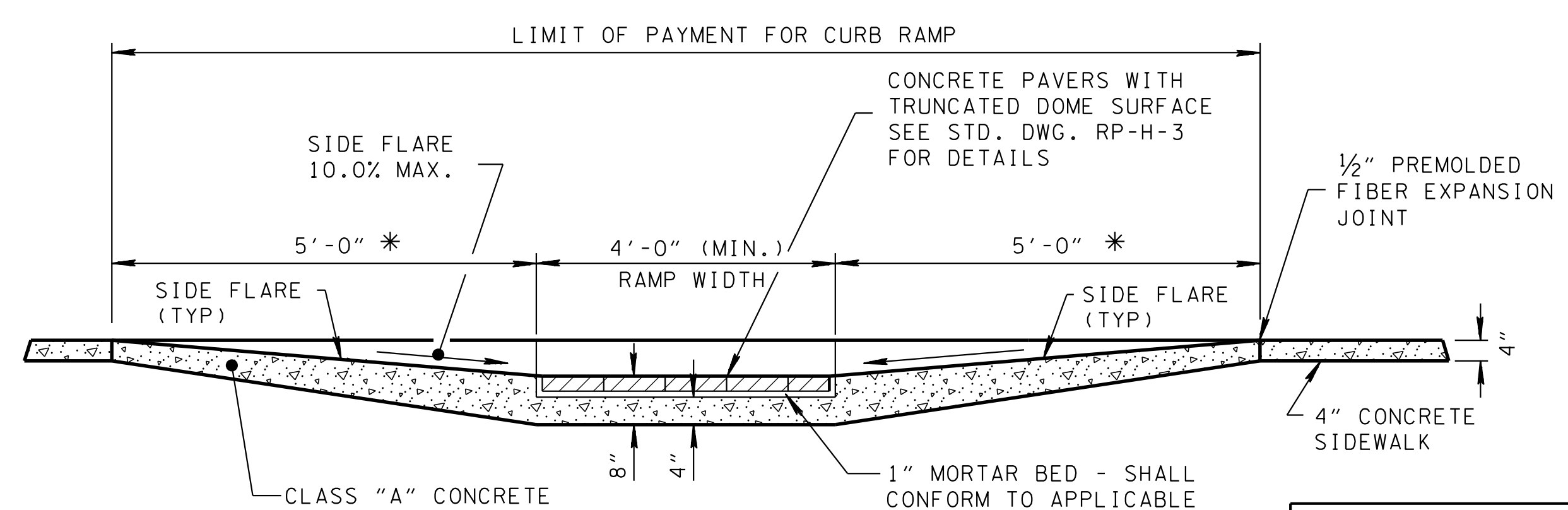
**TANGENT SECTION WITH GRASS STRIP**



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

\* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE SEE GENERAL NOTE ① ON RP-H-3

- GENERAL NOTES**
- (A) CURB SHALL BE LOWERED ACROSS ENTIRE WIDTH OF RAMP THE FIRST TWO FEET OF RAMP MUST CONSIST OF A TRUNCATED DOMED SURFACE. RAMPS SHALL INCLUDE THE TRUNCATED DOME SURFACE TO PROVIDE A DETECTABLE WARNING FOR VISUALLY IMPAIRED PEDESTRIANS SEE SPECIAL PAVER NOTES ON STD. DWG. RP-H-3.
  - (B) THE COST OF THE LOWERED CURB AND GUTTER TO BE INCLUDED IN THE PRICE OF ITEM NO. 702-01, CONCRETE CURB OR ITEM NO. 702-03, CONCRETE COMBINED CURB & GUTTER.
  - (C) DESIGN/CONSTRUCTION MODIFICATIONS MAY BE REQUIRED FOR CURB RAMPS TO BE INSTALLED ALONG A ROADWAY WITH LONGITUDINAL GRADES EXCEEDING FIVE PERCENT.
  - (D) ALL COST OF INSTALLING CURB RAMPS IN NEWLY CONSTRUCTED SIDEWALK AREAS SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:  
701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.  
PAYMENT SHALL INCLUDE ALL MATERIALS (INCLUDING TRUNCATED DOME SURFACE), INTEGRAL BACK CURB, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S).
  - (E) IF PEDESTRIAN SIGNAL IS PROPOSED SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT.
  - (F) IF MAILBOXES ARE REMOVED DURING INSTALLATION OF THE RAMP PROVIDE A 12" X 12" OPENING BEHIND THE CURB (SEE RP-S-7).
  - (G) IF GRASS STRIP IS LARGER THAN 5'. THE SIDE FLARES MAY BE OMITTED AND A RETURNED CURB RUNNING PARALLEL TO THE RAMP FROM THE CURB TO THE SIDEWALK.
  - (H) DESIRABLE SIDEWALK CROSS SLOPE IS 1.5% ABSOLUTE MAXIMUM IS 2%.
  - (I) SEE NOTES ① AND ② ON RP-H-3.

- REV. 4-13-11: ADDED CURB NOTE AND REVISED RAMP DIMENSION IN SECTION A-A. ADDED FOOTNOTE ①. MISC. EDITS TO DRAWING.
- REV. 1-15-13: ADDED GENERAL NOTES. REVISED RAMP LENGTH.
- REV. 6-4-13: CORRECTED SECTION A-A. CHANGED CROSS SLOPE TO 1.5% DESIRABLE. ADDED NOTES ① AND ② CHANGED ITEM DESCRIPTION.

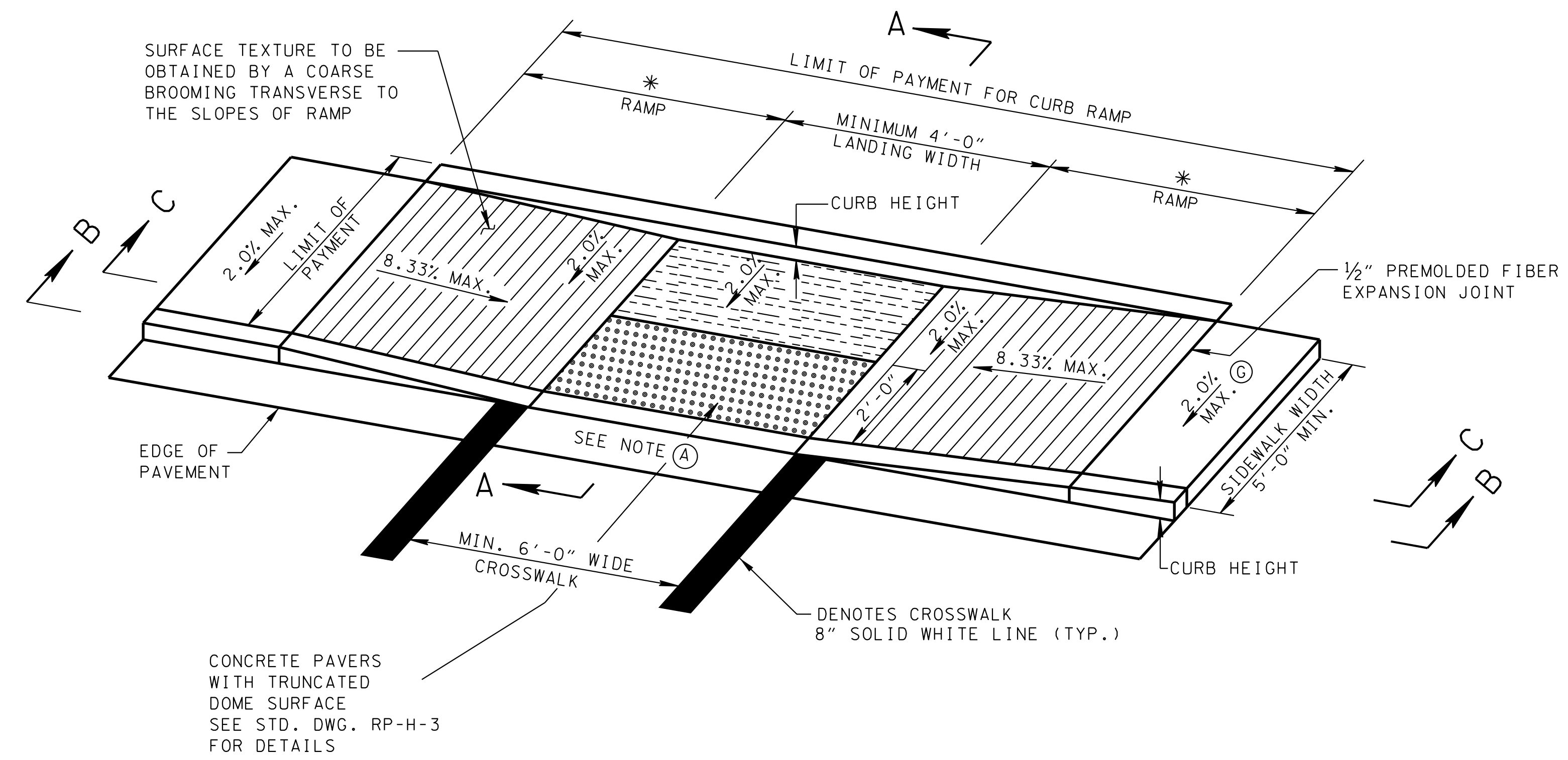
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

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**PERPENDICULAR CURB RAMP**

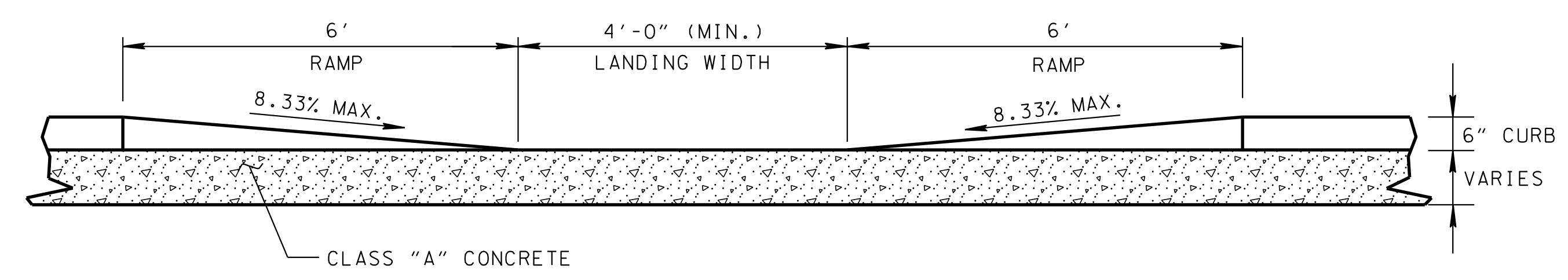


- REV. 4-13-11: ADDED FOOTNOTE ①, ADJUSTED DIMENSIONS IN RAMP DETAIL, MISC. EDITS TO DRAWING.
- REV. 1-15-13: MODIFIED LANDING WIDTH, REVISED NOTES.
- REV. 6-4-13: CHANGED CROSS SLOPE TO 1.5% DESIRABLE. ADDED NOTES ③ AND ④. CHANGED ITEM DESCRIPTION.



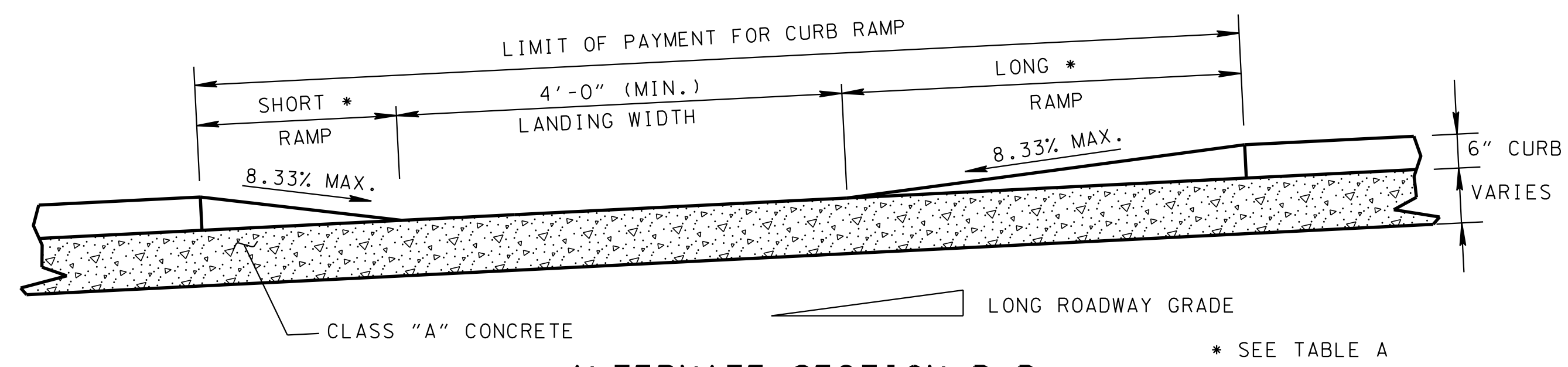
**PARALLEL CURB RAMP DETAIL**

DIMENSIONS SHOWN ABOVE FOR 0% LONGITUDINAL ROADWAY GRADE



**SECTION B-B**

DIMENSIONS SHOWN ABOVE FOR 0% LONGITUDINAL ROADWAY GRADE

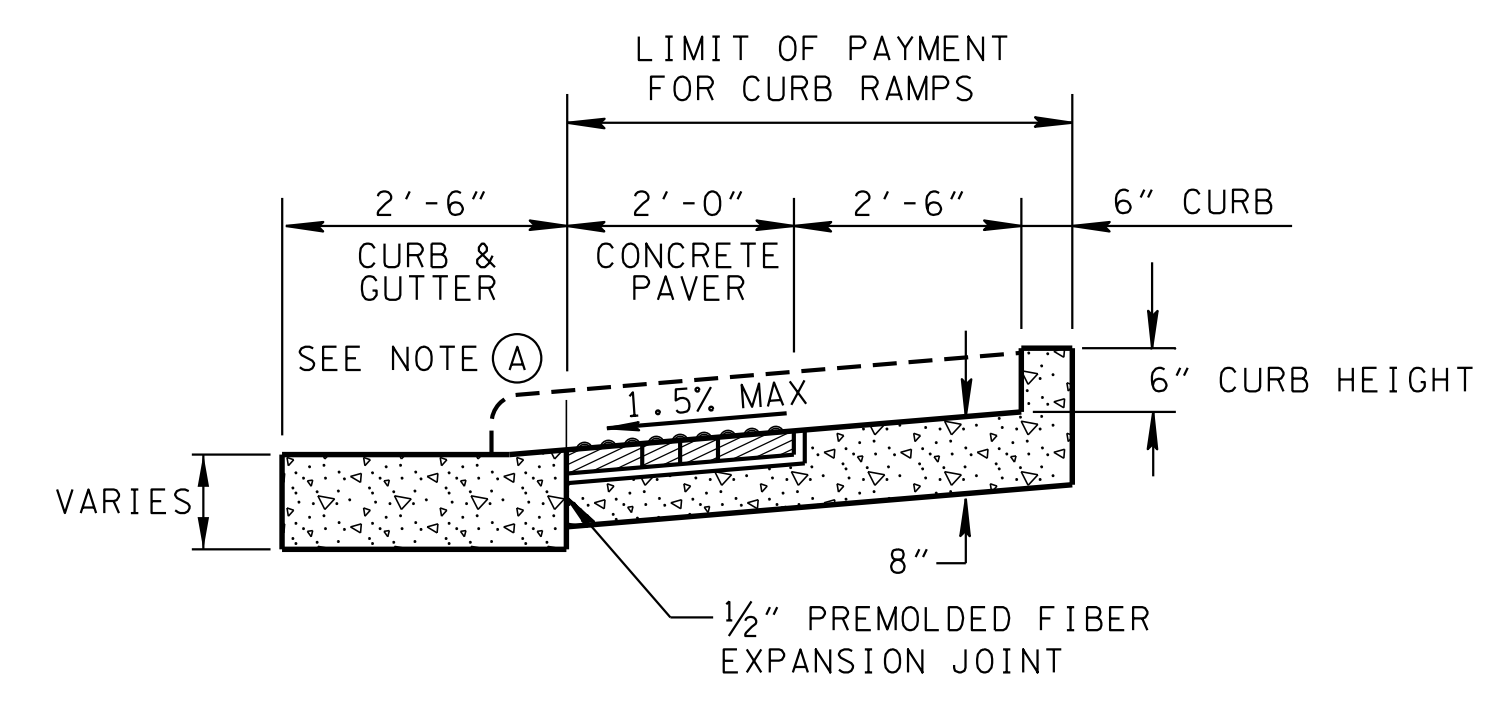


**ALTERNATE SECTION B-B**

**PARALLEL CURB RAMP DETAIL SHOWN WITH LONGITUDINAL ROADWAY GRADE**

MODIFICATIONS MAY BE REQUIRED FOR 5% LONGITUDINAL ROADWAY GRADE

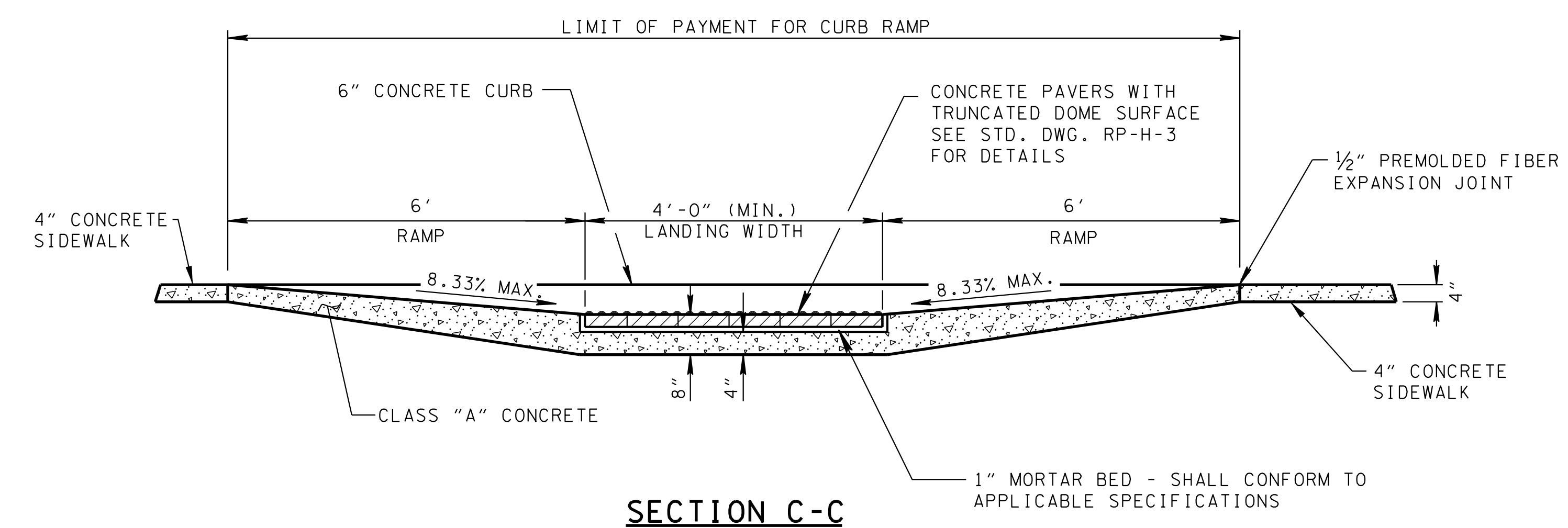
NOTE: ENGINEER SHOULD BE NOTIFIED FOR ASSESMENT IF THE CURB RAMP SIDE FLARES EXCEED 15' IN LENGTH DUE TO THE LONGITUDINAL ROADWAY GRADE.



**SECTION A-A**

| LONGITUDINAL ROADWAY GRADE | LONG  | SHORT |
|----------------------------|-------|-------|
| 5 %                        | 15'   | 3'9"  |
| 4 %                        | 11'6" | 4'1"  |
| 3 %                        | 9'5"  | 4'5"  |
| 2 %                        | 7'11" | 4'10" |
| 1 %                        | 6'10" | 5'5"  |

**TABLE A**



**SECTION C-C**

**GENERAL NOTES**

① CURB SHALL BE LOWERED ACROSS ENTIRE WIDTH OF RAMP THE FIRST TWO FEET OF RAMP MUST CONSIST OF A TRUNCATED DOMED SURFACE. RAMP SHALL INCLUDE THE TRUNCATED DOME SURFACE TO PROVIDE A DETECTABLE WARNING FOR VISUALLY IMPAIRED PEDESTRIANS SEE SPECIAL PAVER NOTES ON STD. DWG. RP-H-3.

② THE COST OF THE LOWERED CURB AND GUTTER TO BE INCLUDED IN THE PRICE OF ITEM NO. 702-01, CONCRETE CURB OR ITEM NO. 702-03, CONCRETE COMBINED CURB & GUTTER.

③ DESIGN/CONSTRUCTION MODIFICATIONS MAY BE REQUIRED FOR CURB RAMP TO BE INSTALLED ALONG A ROADWAY WITH LONGITUDINAL GRADES EXCEEDING FIVE PERCENT.

④ ALL COST OF INSTALLING CURB RAMP IN NEWLY CONSTRUCTED SIDEWALK AREAS SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:  
701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS (INCLUDING TRUNCATED DOME SURFACE), INTEGRAL BACK CURB, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S).

⑤ IF PEDESTRIAN SIGNAL IS PROPOSED SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT.

⑥ IF MAILBOXES ARE REMOVED DURING INSTALLATION OF THE RAMP PROVIDE A 12" X 12" OPENING BEHIND THE CURB (SEE RP-S-7).

⑦ DESIRABLE CROSS SLOPE IS 1.5%, ABSOLUTE MAXIMUM IS 2%.

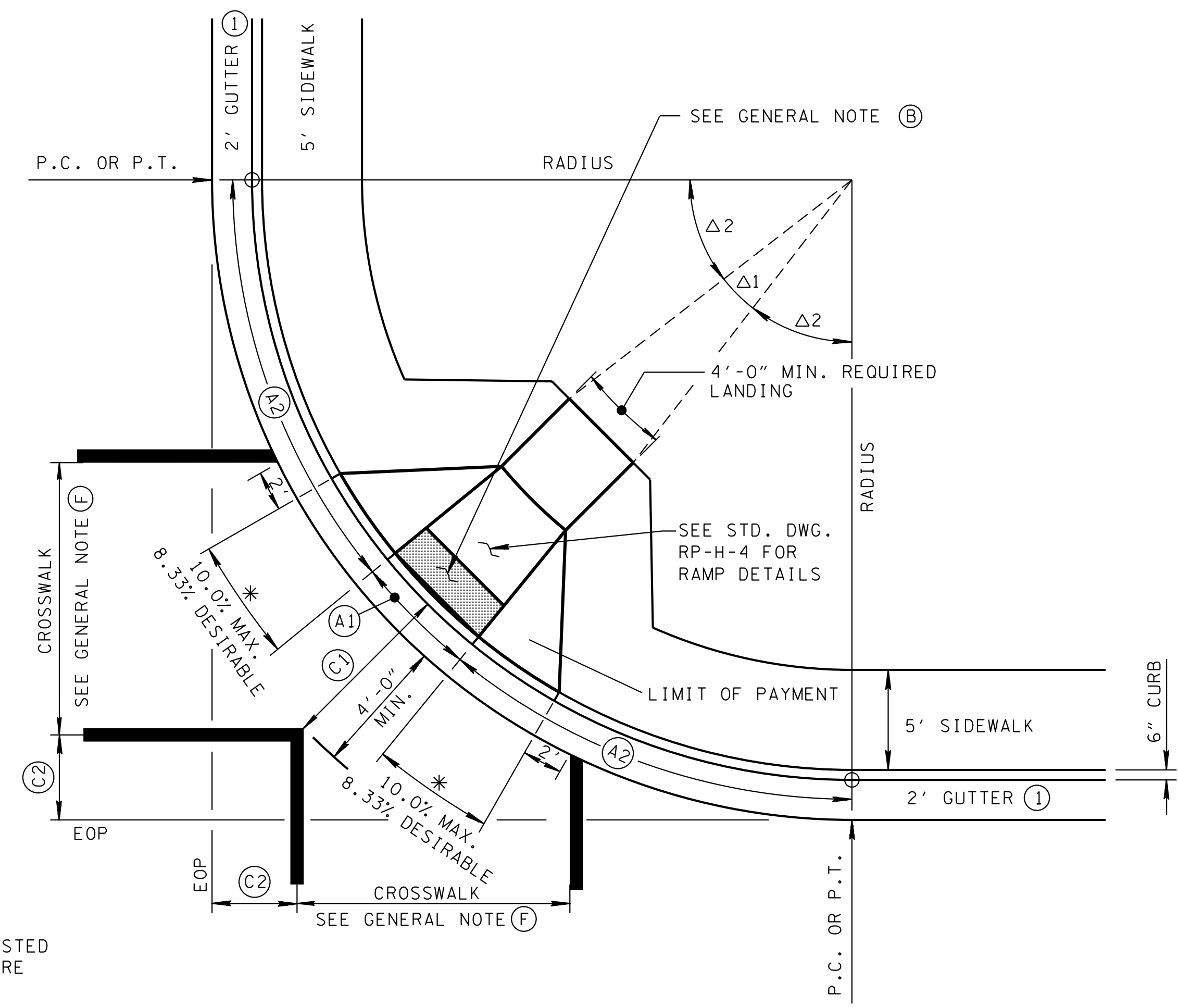
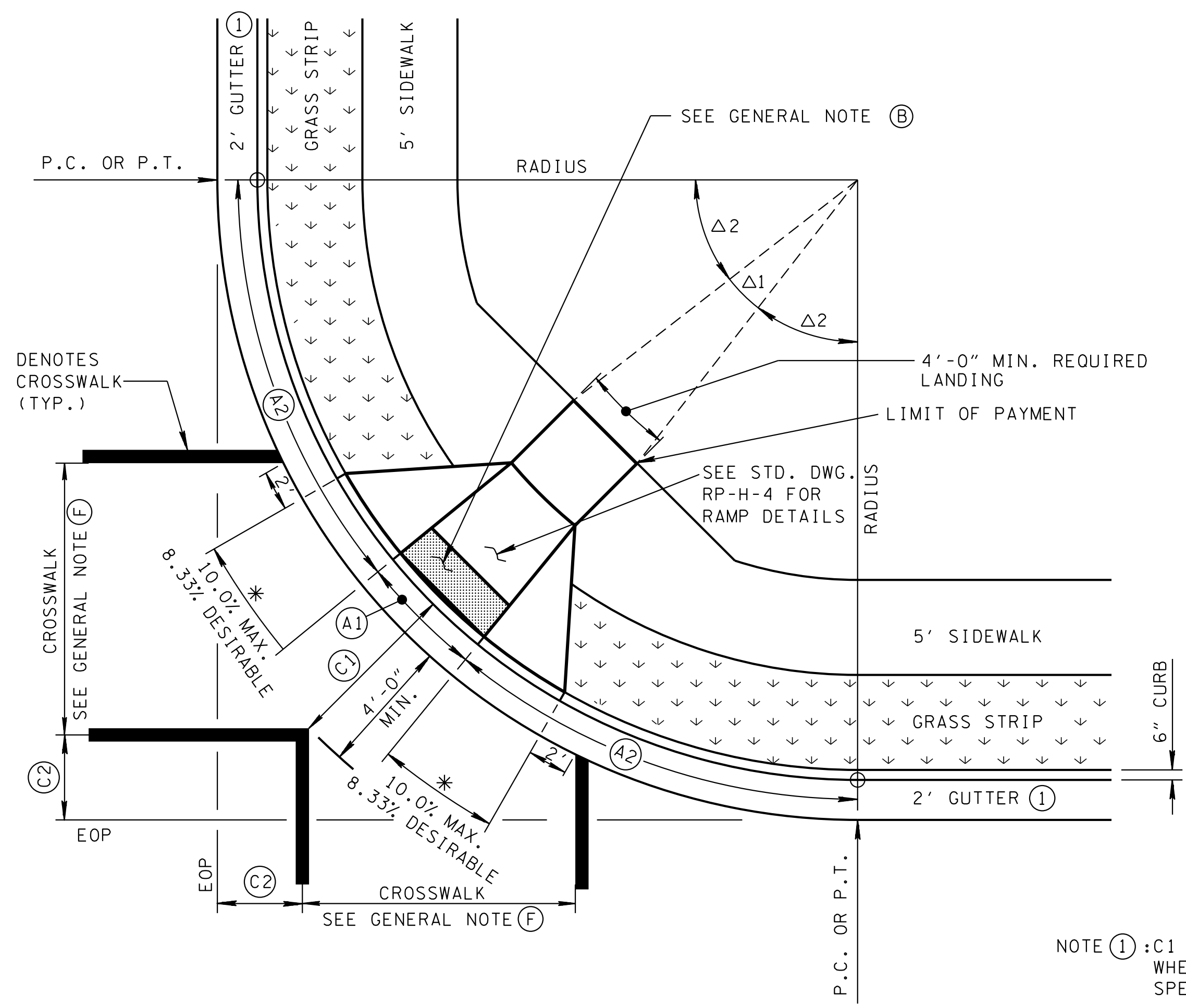
⑧ SEE NOTES ① AND ④ ON RP-H-3.

□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

**PARALLEL CURB RAMP**

- REV. 4-13-11: REVISED TABLE DIMENSIONS, ADDED NOTE ①, AND ADDED GUTTER TO CROSSWALK INTERSECTION DIMENSION.
- REV. 5-8-13: REVISED TITLE FOR TERMINOLOGY.
- REV. 6-4-13: REVISED NOTE ②, CHANGED TITLE.



NOTE ①: C1 DIMENSION SHALL BE ADJUSTED WHEN OTHER GUTTER WIDTHS ARE SPECIFIED ON PLANS.

**TYPE 1  
RAMP IN RADIUS (WITH GRASS STRIP)**  
\* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE

**TYPE 1 ALTERNATE  
RAMP IN RADIUS (SIDEWALK ADJACENT CURB & GUTTER)**  
\* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE

| TABLE OF DIMENSIONS ①<br>PERPENDICULAR RAMPS - RADIUS OF 20' TO 75' |               |               |               |               |           |           |                                     |
|---|---------------|---------------|---------------|---------------|-----------|-----------|-------------------------------------|
| R<br>RADIUS<br>(FEET)   | ①A1<br>(FEET) | ①A2<br>(FEET) | ①C1<br>(FEET) | ①C2<br>(FEET) | △1        | △2        | ESTIMATED<br>QUANTITY<br>(SQ. FEET) |
| 20  | 9.55          | 10.54         | 6.00          | 3.62          | 28°04'21" | 30°57'50" | 113                                 |
| 25  | 7.48          | 15.50         | 6.00          | 5.08          | 17°29'32" | 36°15'14" | 103                                 |
| 30  | 6.53          | 19.90         | 6.00          | 6.54          | 12°40'49" | 38°39'35" | 98                                  |
| 35  | 5.98          | 24.11         | 6.00          | 8.01          | 9°56'22"  | 40°01'49" | 95                                  |
| 40  | 5.63          | 28.21         | 6.00          | 9.47          | 8°10'16"  | 40°54'52" | 93                                  |
| 45  | 5.39          | 32.26         | 6.00          | 10.94         | 6°56'11"  | 41°31'54" | 91                                  |
| 50  | 5.21          | 36.27         | 6.00          | 12.40         | 6°01'32"  | 41°59'14" | 90                                  |
| 55  | 5.07          | 40.27         | 6.00          | 13.87         | 5°19'34"  | 42°20'13" | 90                                  |
| 60  | 4.96          | 44.25         | 6.00          | 15.33         | 4°46'19"  | 42°36'51" | 89                                  |
| 65  | 4.87          | 48.22         | 6.00          | 16.80         | 4°19'20"  | 42°50'20" | 89                                  |
| 70  | 4.79          | 52.19         | 6.00          | 18.26         | 3°57'00"  | 43°01'30" | 88                                  |
| 75  | 4.73          | 56.15         | 6.00          | 19.72         | 3°38'12"  | 43°10'54" | 88                                  |

① VALUES SHOWN IN TABLE ARE BASED ON A 90° INTERSECTION ON 0.0% ROADWAY GRADE AND ARE APPROXIMATE ONLY.

- GENERAL NOTES**
- ①A FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSH BUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.
  - ①B SEE STANDARD DRAWING RP-H-3 FOR TRUNCATED DOMED SURFACE DETAILS.
  - ①C 5'-0" SIDEWALK WIDTH SHALL NOT INCLUDE 6" CONCRETE CURB.
  - ①D GRATES FOR STORM DRAINS SHALL NOT BE PLACED IN THE ACCESSIBLE ROUTE.
  - ①E C1 DIMENSIONS SHALL NOT BE LESS THAN 4'.
  - ①F CROSS WALK MARKINGS SHALL BE CALCULATED BY USING THE DIMENSIONS FROM THE TABLES ON A CASE BY CASE BASIS, UNLESS SPECIFIED.

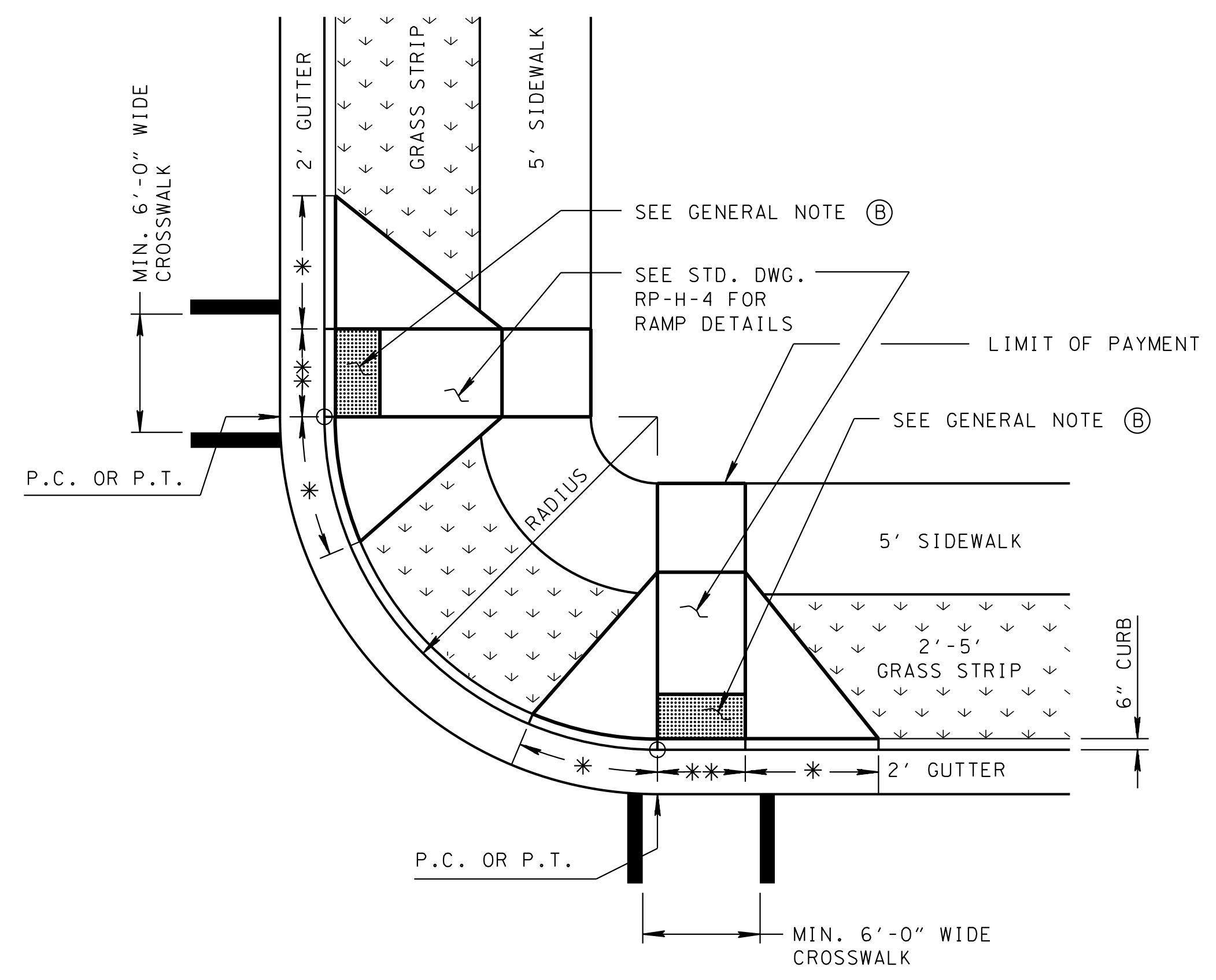
□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

PERPENDICULAR  
CURB RAMP  
TYPE 1

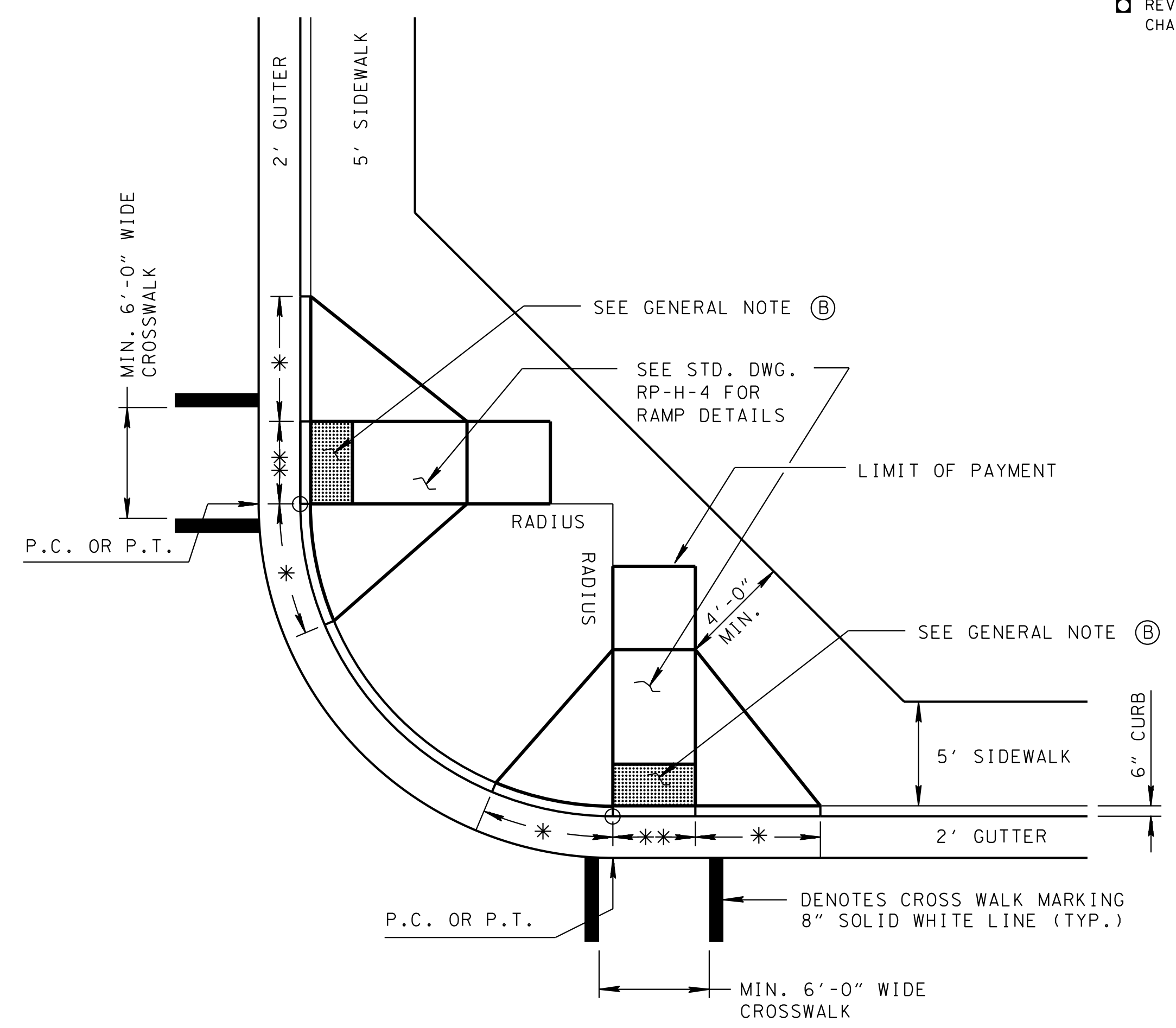


- REV. 4-13-11: ADJUSTED CROSSWALK MARKINGS, ADDED TYPE 2 SIDEWALK DIMENSION, MISC. EDITS TO DRAWING.
- REV. 5-8-13: REVISED TITLE FOR TERMINOLOGY.
- REV. 6-4-13: REVISED NOTE (C) AND (E), CHANGED TITLE.



**TYPE 2  
RAMP OUTSIDE RADIUS (WITH GRASS STRIP)**

- \* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE 10.0% MAX. (8.33% DESIRABLE)
- \*\* 4'-0" MINIMUM REQUIRED



**TYPE 2 ALTERNATE  
RAMP OUTSIDE RADIUS (SIDEWALK ADJACENT TO CURB & GUTTER)**

- \* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE 10.0% MAX. (8.33% DESIRABLE)
- \*\* 4'-0" MINIMUM REQUIRED

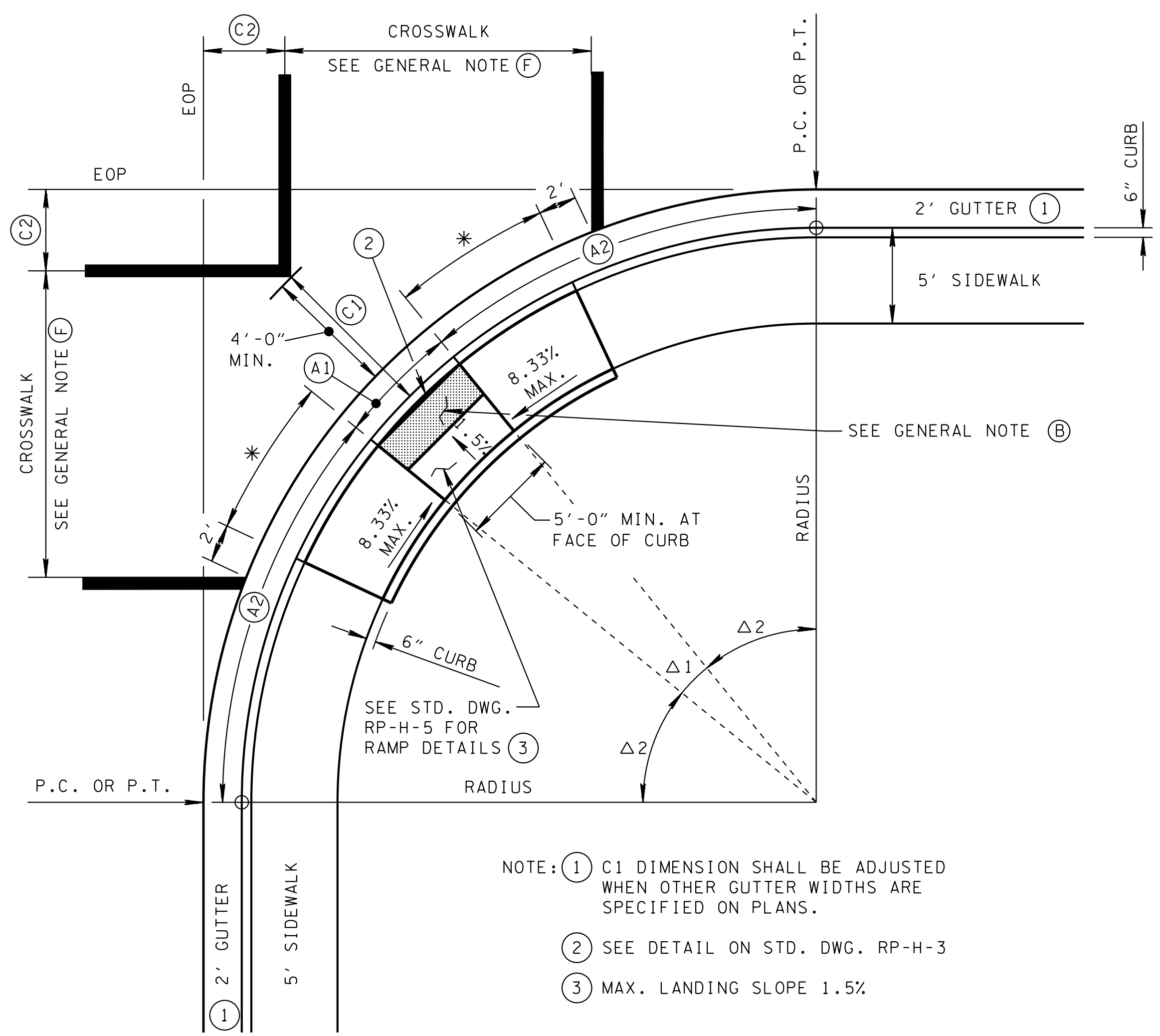
| GENERAL NOTES |   |
|---------------|---|
| (A)           | FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSH BUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS. |
| (B)           | SEE STANDARD DRAWING RP-H-3 FOR TRUNCATED DOMED SURFACE DETAILS.  |
| (C)           | 5'-0" SIDEWALK WIDTH SHALL NOT INCLUDE 6" CONCRETE CURB.  |
| (D)           | GRATES FOR STORM DRAINS SHALL NOT BE PLACED IN THE CROSSWALK OR IN FRONT OF THE CURB RAMP.                                      |
| (E)           | DESIRABLE DIMENSIONS SHALL BE USED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.   |

□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

PERPENDICULAR  
CURB RAMP  
TYPE 2

- REV. 4-13-11: ADJUSTED CROSSWALK MARKINGS, ADDED NOTE ① REVISED TABLE DIMENSIONS, ADDED GUTTER TO CROSSWALK INTERSECT DIMENSION, OTHER MISC. EDITS TO DRAWINGS.
- REV. 5-8-13: REVISED TITLE FOR TERMINOLOGY.
- REV. 6-4-13: ADDED NOTE ②, MODIFIED NOTE ③, CHANGED SHEET NAME.

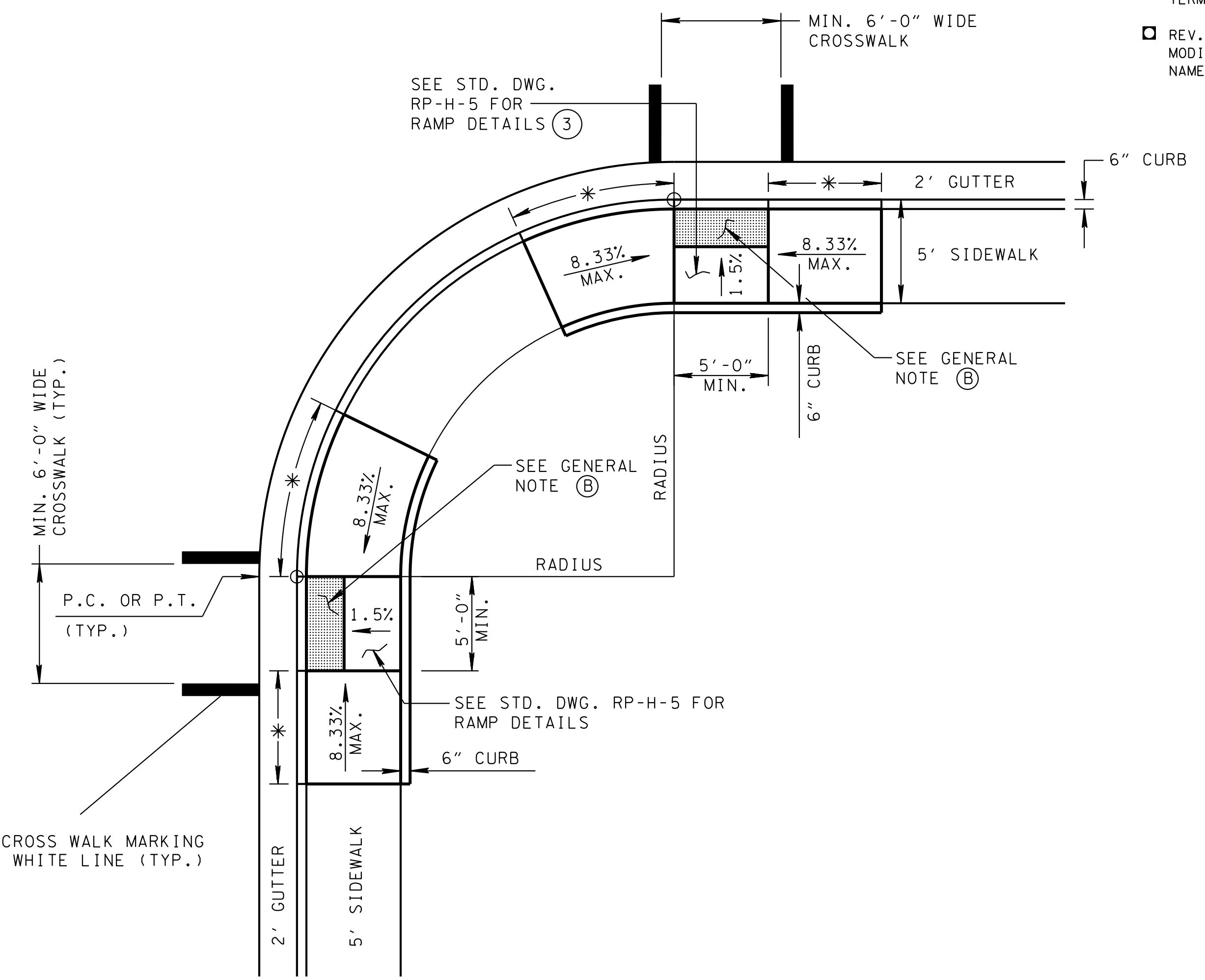


- NOTE: ① C1 DIMENSION SHALL BE ADJUSTED WHEN OTHER GUTTER WIDTHS ARE SPECIFIED ON PLANS.
- ② SEE DETAIL ON STD. DWG. RP-H-3
- ③ MAX. LANDING SLOPE 1.5%

**TYPE 3  
(RAMP IN RADIUS)**

(CONSTRUCTION IN RADIUS)

\* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE



DENOTES CROSS WALK MARKING 8" SOLID WHITE LINE (TYP.)

**TYPE 4  
(RAMP OUTSIDE RADIUS)**

\* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE

**TABLE OF DIMENSIONS ①  
PARALLEL CURB RAMPS - RADIUS OF 20' TO 75'**

| R<br>RADIUS<br>(FEET) | ①<br>(FEET) | ②<br>(FEET) | ③<br>(FEET) | ④<br>(FEET) | Δ1        | Δ2        | ESTIMATED<br>QUANTITY<br>(SQUARE FEET) |
|-----------------------|-------------|-------------|-------------|-------------|-----------|-----------|--|
| 20                    | 6.50        | 12.07       | 6.00        | 3.62        | 19°05'55" | 35°27'03" | 96                                     |
| 25                    | 6.13        | 16.18       | 6.00        | 5.08        | 14°19'26" | 37°50'17" | 94                                     |
| 30                    | 5.90        | 20.22       | 6.00        | 6.54        | 11°27'33" | 39°16'14" | 92                                     |
| 35                    | 5.75        | 24.22       | 6.00        | 8.01        | 9°32'57"  | 40°13'31" | 91                                     |
| 40                    | 5.64        | 28.20       | 6.00        | 9.47        | 8°11'06"  | 40°54'27" | 90                                     |
| 45                    | 5.56        | 32.17       | 6.00        | 10.94       | 7°09'43"  | 41°25'08" | 89                                     |
| 50                    | 5.50        | 36.13       | 6.00        | 12.40       | 6°21'58"  | 41°49'01" | 89                                     |
| 55                    | 5.45        | 40.08       | 6.00        | 13.87       | 5°43'46"  | 42°08'07" | 88                                     |
| 60                    | 5.41        | 44.03       | 6.00        | 15.33       | 5°12'31"  | 42°23'44" | 88                                     |
| 65                    | 5.38        | 47.97       | 6.00        | 16.80       | 4°46'29"  | 42°36'46" | 88                                     |
| 70                    | 5.35        | 51.91       | 6.00        | 18.26       | 4°24'27"  | 42°47'47" | 88                                     |
| 75                    | 5.32        | 55.85       | 6.00        | 19.72       | 4°05'33"  | 42°57'13" | 87                                     |

① VALUES SHOWN IN TABLE ARE BASED ON A 90° INTERSECTION ON 0.0% ROADWAY GRADE AND ARE APPROXIMATE ONLY.

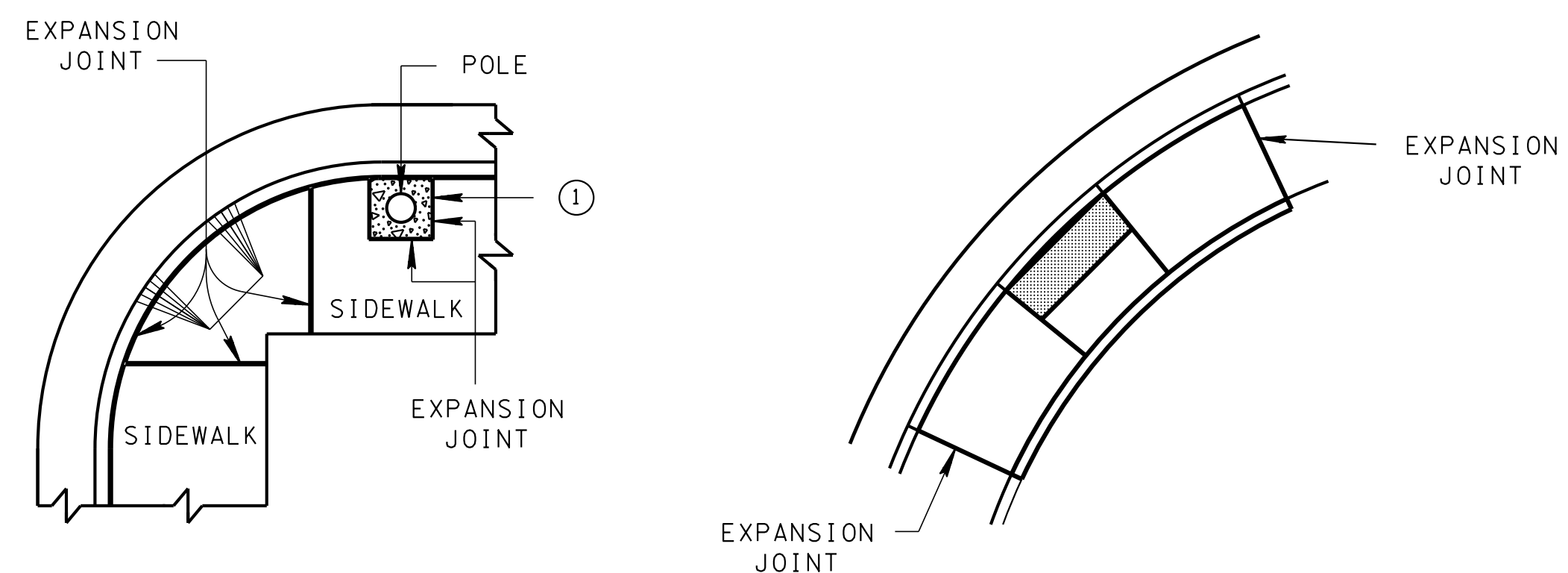
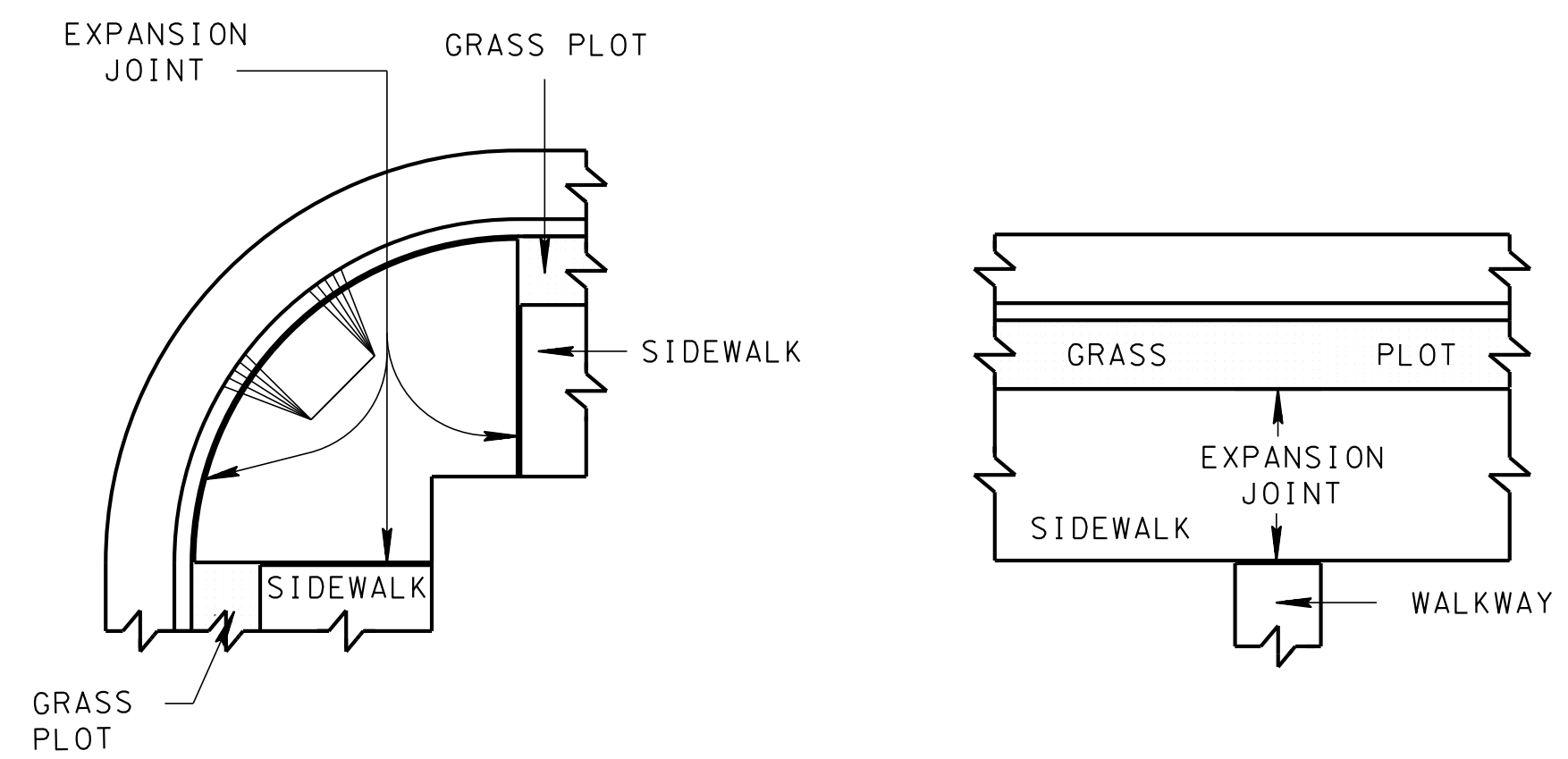
**GENERAL NOTES**

- ① FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSH BUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.
- ② SEE STANDARD DRAWING RP-H-3 FOR TRUNCATED DOMED SURFACE DETAILS.
- ③ 5'-0" SIDEWALK WIDTH SHALL NOT INCLUDE 6" CONCRETE CURB.
- ④ GRATES FOR STORM DRAINS SHALL NOT BE PLACED IN THE CROSSWALK OR IN FRONT OF THE CURB RAMP.
- ⑤ DESIRABLE DIMENSIONS SHALL BE USED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- ⑥ CROSS WALK MARKINGS SHALL BE CALCULATED BY USING THE DIMENSIONS FROM THE TABLE ON A CASE BY CASE BASIS, UNLESS SPECIFIED.
- ⑦ DESIRABLE CROSS SLOPE IS 1.5 %, ABSOLUTE MAXIMUM IS 2.0%.

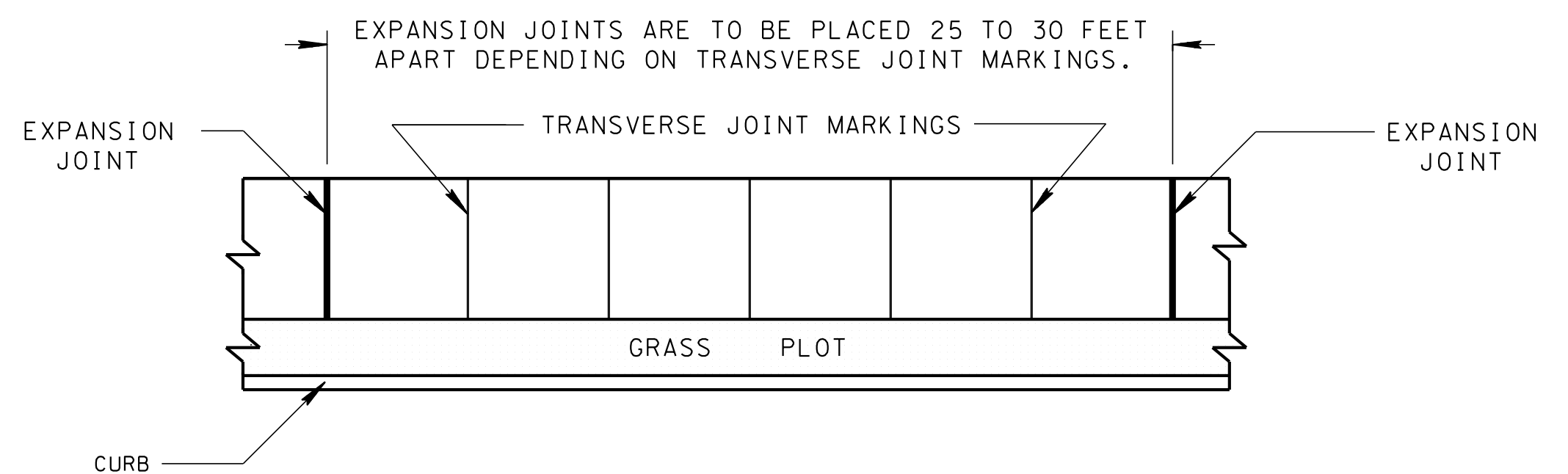
□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

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DEPARTMENT OF TRANSPORTATION

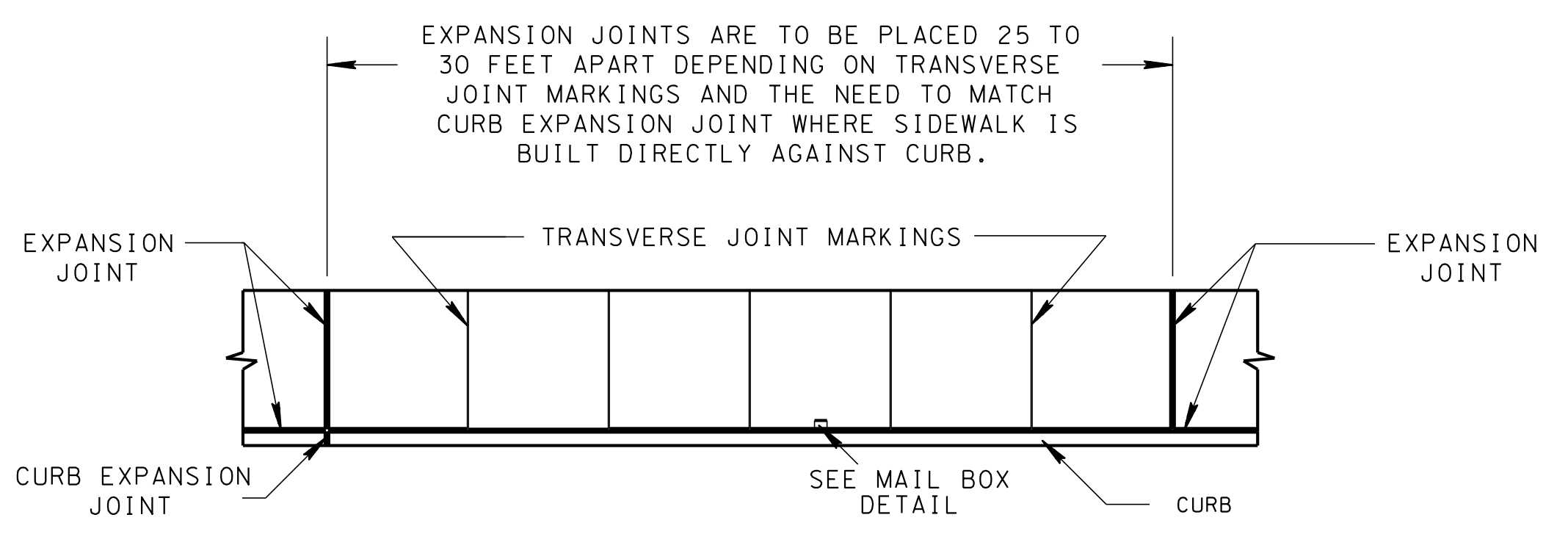
PARALLEL CURB  
RAMP  
TYPE 3 AND 4



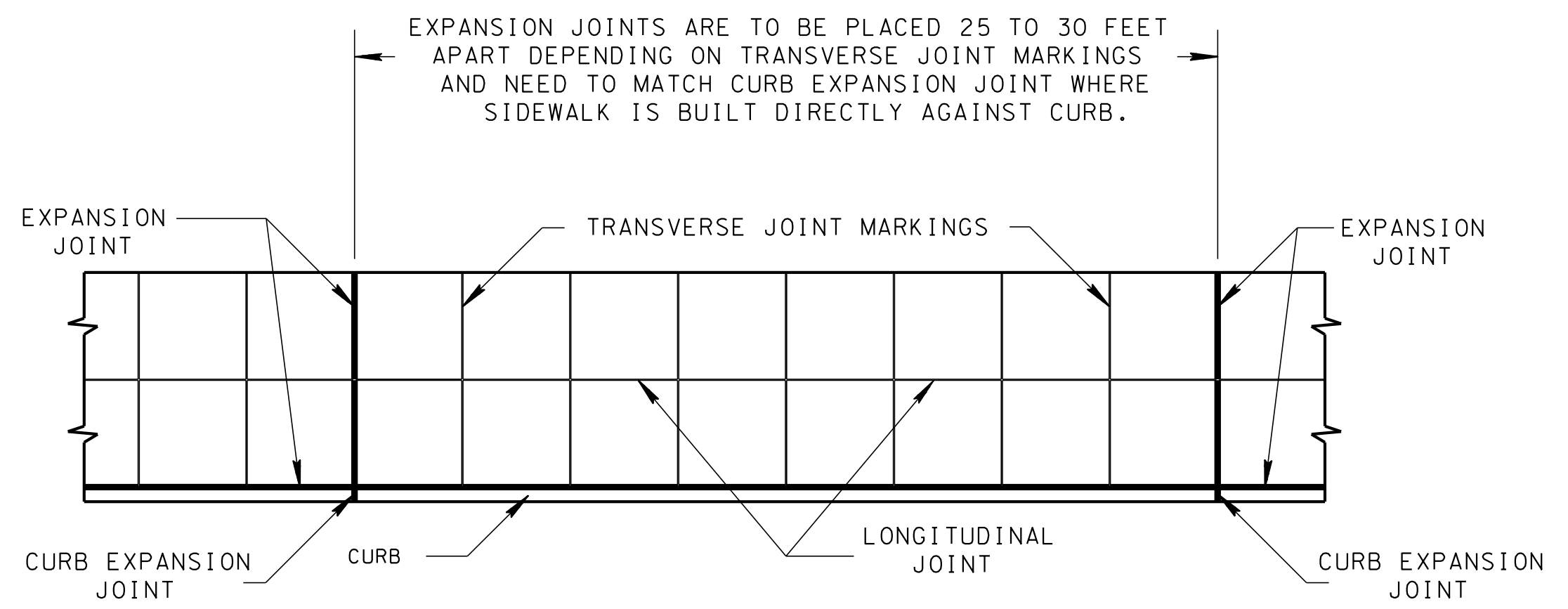
**VARIOUS EXAMPLES FOR USE OF PREMOLDED FIBER EXPANSION JOINTS IN SIDEWALKS**



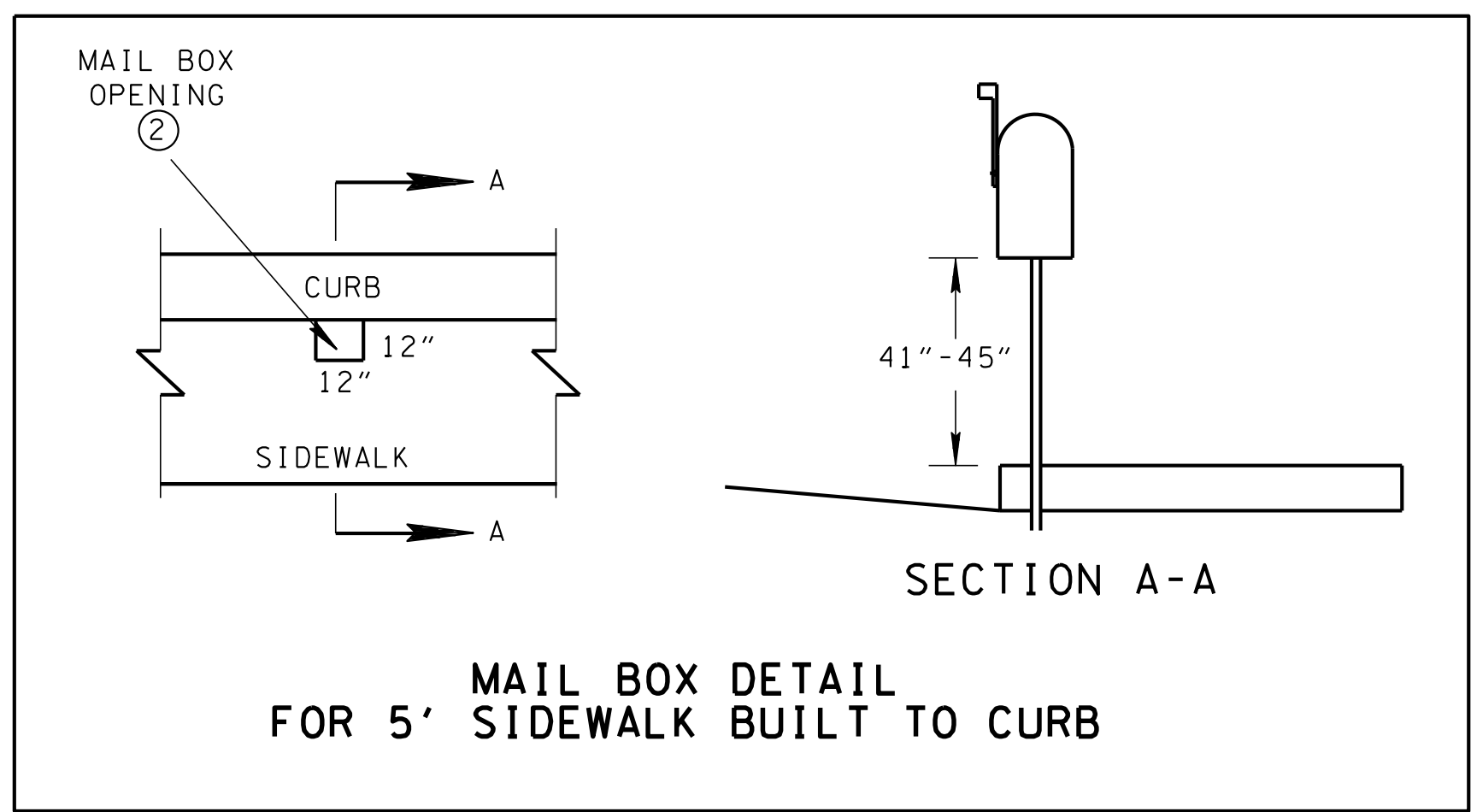
**5 FOOT SIDEWALK WITH GRASS PLOT**



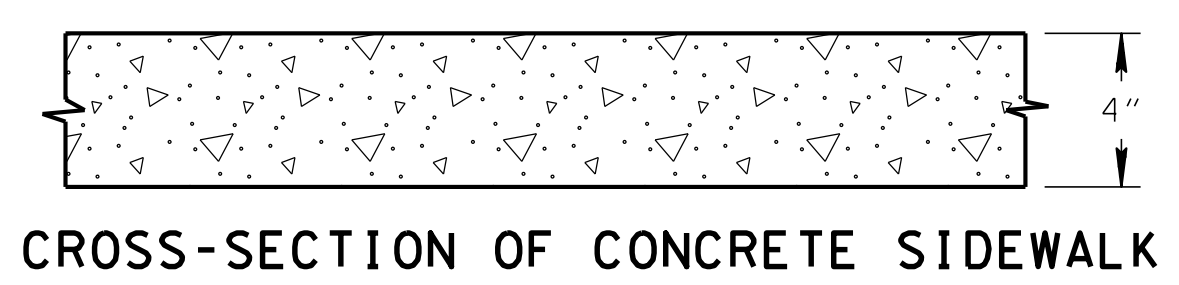
**5 FOOT SIDEWALK BUILT TO CURB**



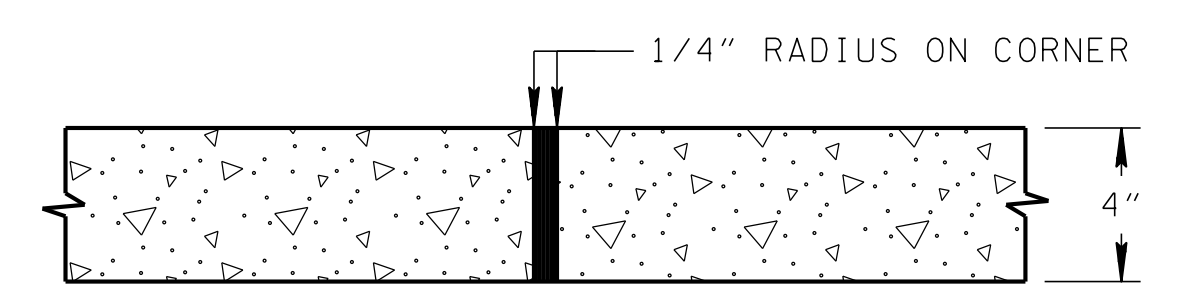
**8 FOOT SIDEWALK BUILT TO CURB**



**MAIL BOX DETAIL FOR 5' SIDEWALK BUILT TO CURB**



**CROSS-SECTION OF CONCRETE SIDEWALK**



**DETAIL OF EXPANSION JOINT**

**FOOTNOTE**

- ① LEAVE SQUARE CUTOUT IN SIDEWALK. IT WILL BE DIAMETER OF POLE PLUS SIXTEEN INCHES. IT WILL BE BORDERED BY HALF INCH EXPANSION JOINT.
- ② LEAVE 12"X12" OPENING IN SIDEWALK FOR MAIL BOX POST. ORIENT BOXES TO FACE THE DIRECTION OF ONCOMING TRAFFIC. EDGE OF MAIL BOX SHALL NOT OVERHANG THE CURB.

**GENERAL NOTES**

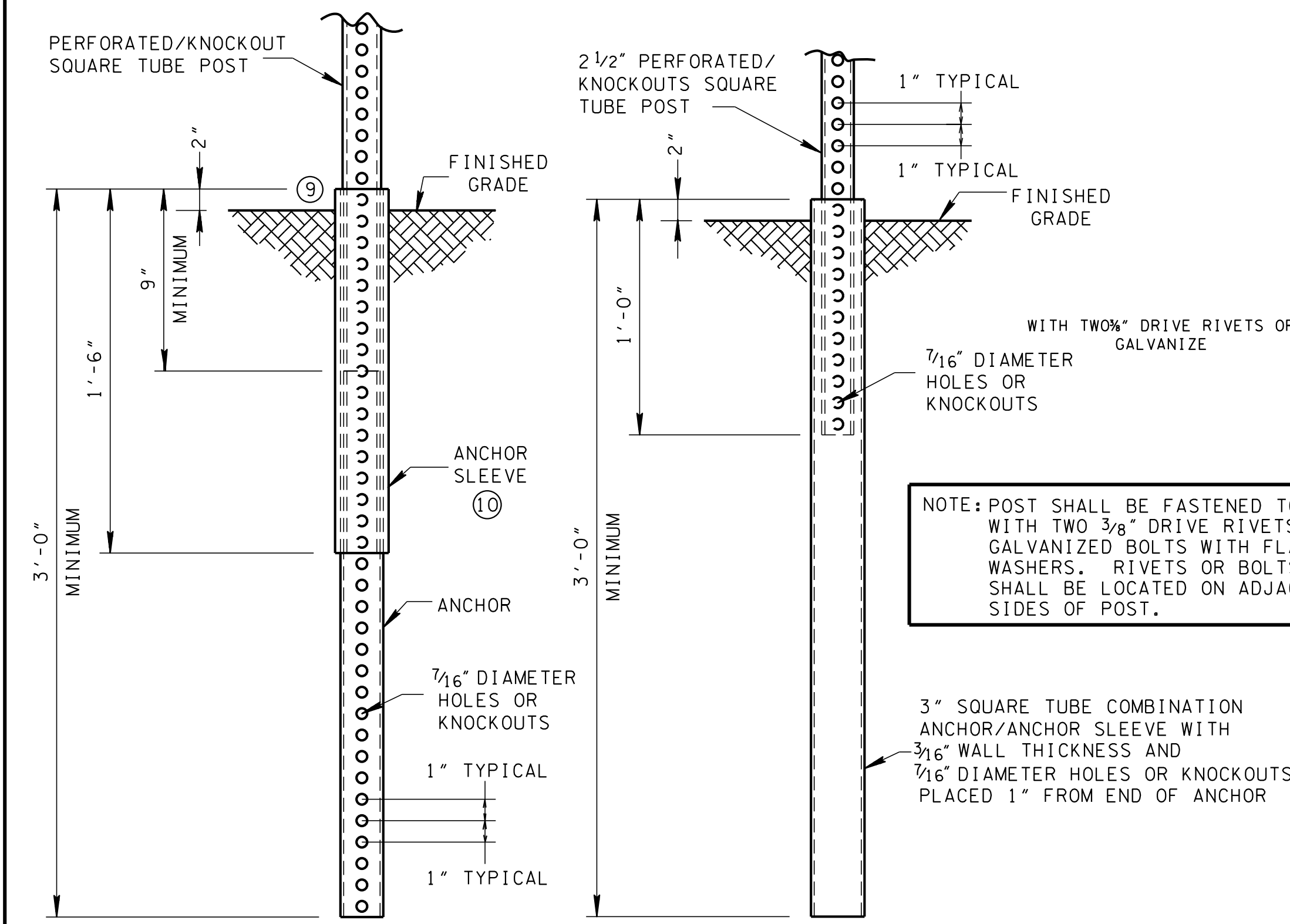
- (A) FOR SPECIFICATIONS SEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION.
- (B) WHERE IT BECOMES NECESSARY TO REMOVE PARTS OF EXISTING CONCRETE SIDEWALKS OR RAMPS, THE RESULTING EDGES SHALL BE CUT TO A NEAT LINE, AND ANY OFFSETS IN SUCH LINES SHALL BE MADE AT RIGHT ANGLES.
- (C) CONCRETE JOINT MATERIAL TO BE FLUSH WITH THE SIDEWALK SURFACE, HALF INCH AND/OR ONE INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF THE STANDARD SPECIFICATIONS.
- (D) EXPANSION JOINTS ARE TO BE PLACED AS SHOWN ON THIS DRAWING OR AS DIRECTED BY THE ENGINEER WHERE THE PROPOSED SIDEWALK IS IN CONTACT WITH THE STREET RETURNS, ON BUILDING LINES PRODUCED AT STREET INTERSECTIONS, WHERE WALKS LEAD TO HOUSE OR OTHER ENTRANCES AND ANY OTHER LOCATIONS WHERE STRESSES MAY DEVELOP. THE COST OF ALL EXPANSION JOINTS IS TO BE INCLUDED IN THE UNIT PRICE BID FOR THE PROPOSED SIDEWALK.
- (E) ONE INCH EXPANSION JOINTS ARE TO BE PLACED WHERE THE PROPOSED SIDEWALK IS IN CONTACT WITH CIRCULAR CURBS, BUILDINGS AND/OR RETAINING WALLS.
- (F) HALF INCH EXPANSION JOINTS ARE TO BE USED AT ALL OTHER LOCATIONS.
- (G) ALL SIDEWALK WIDTHS SHALL NOT INCLUDE THE SIX INCH WIDTH OF PROPOSED TOP OF CURB.
- (H) LONGITUDINAL JOINT MARKINGS WILL NOT BE REQUIRED ON SIDEWALKS 5 FEET OR LESS IN WIDTH.
- (I) ONE LONGITUDINAL JOINT MARKING WILL BE REQUIRED ON SIDEWALKS OVER 5 FEET BUT LESS THAN 9 FEET IN WIDTH.
- (J) TWO LONGITUDINAL JOINT MARKINGS WILL BE REQUIRED ON SIDEWALKS OVER 9 FEET BUT LESS THAN 12 FEET IN WIDTH.
- (K) TRANSVERSE JOINT MARKINGS ARE TO BE MADE TO FORM BLOCKS AS NEARLY TO SQUARE AS PRACTICAL.
- (L) DESIRABLE SIDEWALK CROSS SLOPE IS 1.5 %, ABSOLUTE MAXIMUM IS 2.0 %.

REV. 7-1-72: CHANGED DEPARTMENT NAME.  
 REV. 1-1-76: CHANGED DWG. NO. FROM P-S-70(68) TO RP-S-7.  
 REV. 5-14-87: ADDED EXPANSION JOINTS BETWEEN CURB AND SIDEWALK.  
 REV. 4-15-91: REDREW, RENAMED AND REORGANIZED SHEET. MOVED INFORMATION REGARDING CONCRETE STEPS TO DWG. NO. RP-S-8.  
 REV. 7-29-96: CHANGED GENERAL NOTE (C).  
 REV. 5-7-13: ADDED MAIL BOX DETAIL.  
 REV. 6-4-13: REVISED NOTES (C) AND (I) AND ADDED NOTE (L).

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

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 DEPARTMENT OF TRANSPORTATION

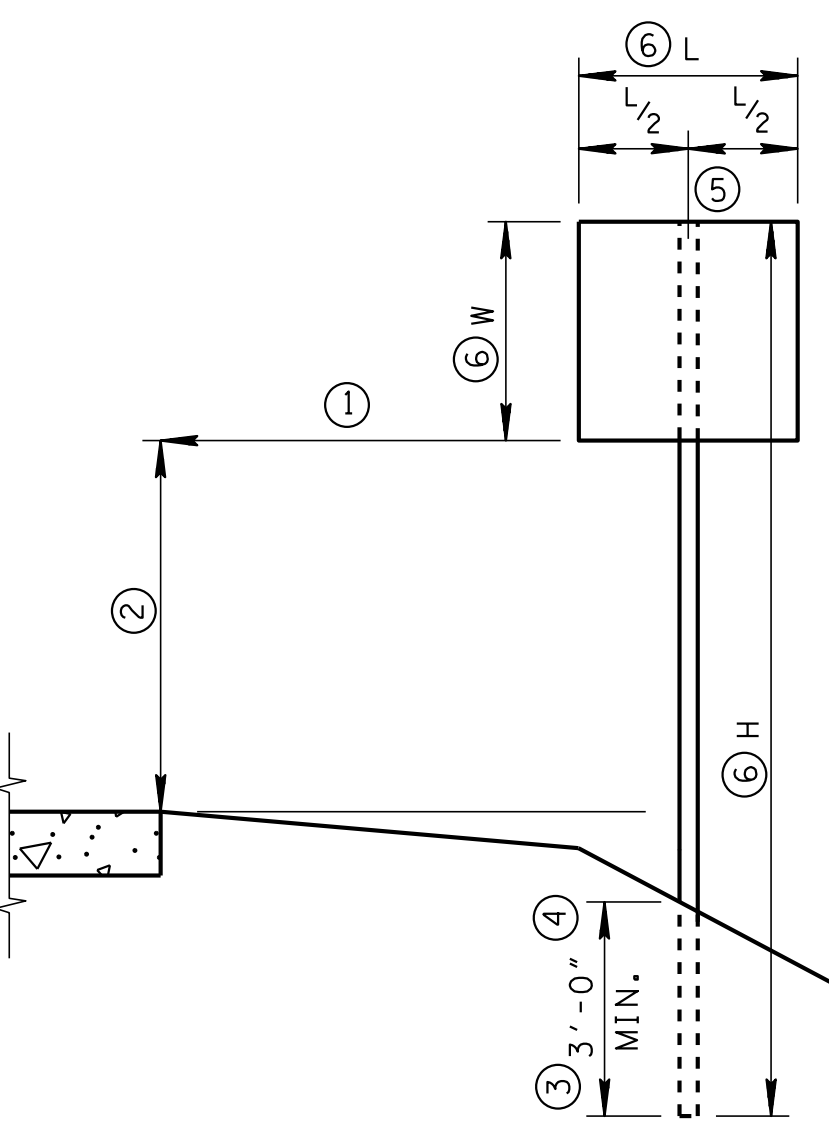
**DETAILS FOR STANDARD CONCRETE SIDEWALKS**



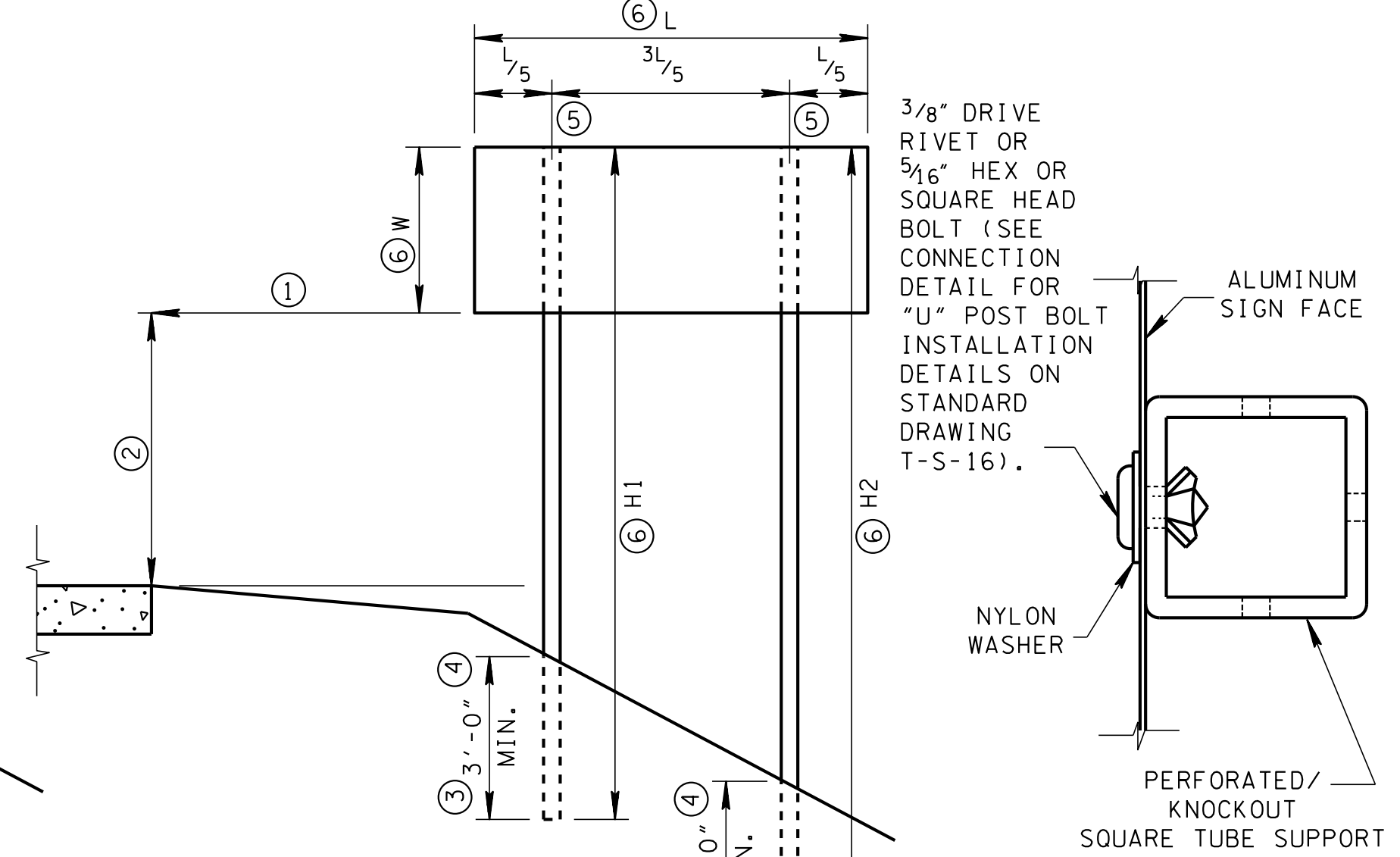
**POST INSTALLATION DETAIL FOR 1 1/2, 1 3/4 AND 2\"/>**

**POST INSTALLATION DETAIL FOR 2 1/2\"/>**

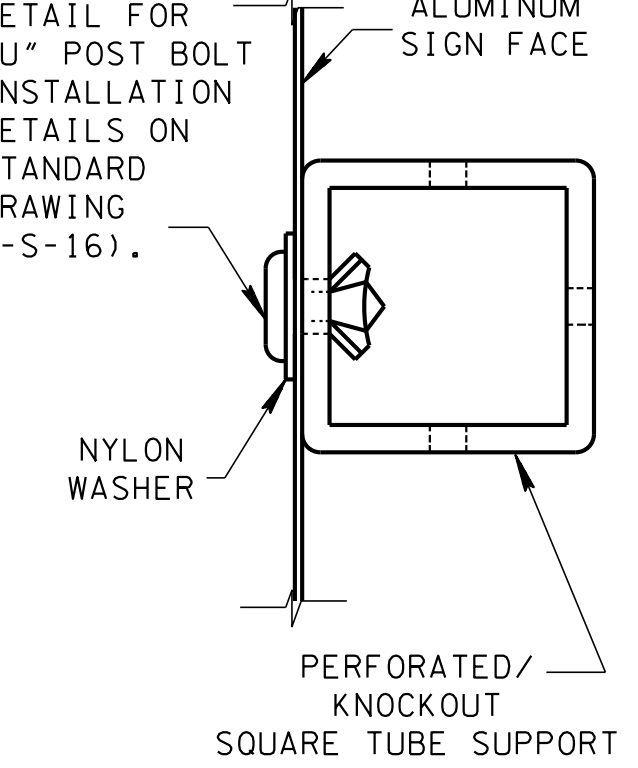
NOTE: POST SHALL BE FASTENED TO ANCHOR WITH TWO 3/8\"/>



**SHOULDER INSTALLATION FOR ONE PERFORATED/KNOCKOUT SQUARE TUBE SUPPORT**



**SHOULDER INSTALLATION FOR TWO PERFORATED/KNOCKOUT SQUARE TUBE SUPPORTS**



**CONNECTION DETAIL FOR PERFORATED/KNOCKOUT SQUARE TUBE POST**

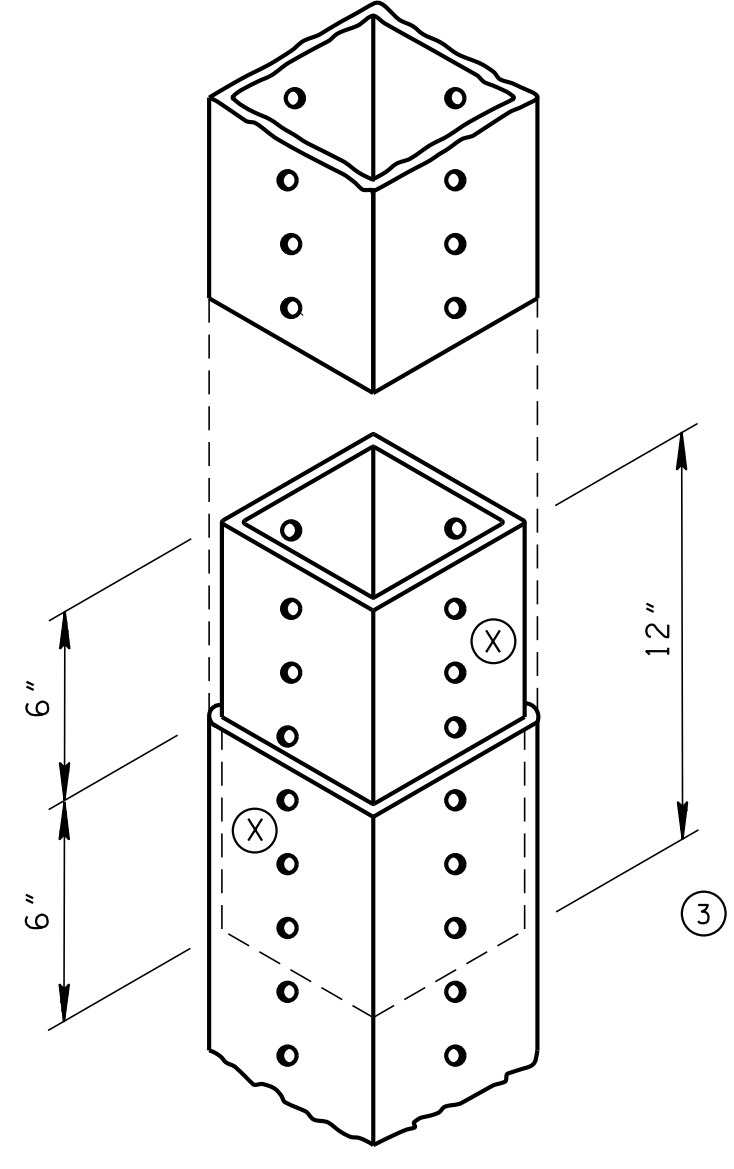
| LEGEND |                        |
|--------|------------------------|
| W      | HEIGHT OF SIGN FACE    |
| L      | LENGTH OF SIGN FACE    |
| H      | HEIGHT OF SIGN SUPPORT |

| POST (SIZE AND WEIGHT) | ANCHOR (SIZE AND WEIGHT) | ANCHOR SLEEVE (SIZE AND WEIGHT) |
|------------------------|--------------------------|---------------------------------|
| 1 1/2\"/>              | 1 3/4\"/>                | 2\"/>                           |
| 1 3/4\"/>              | 2\"/>                    | 2 1/4\"/>                       |
| 1 3/4\"/>              | 2\"/>                    |                                 |
| 2\"/>                  | 2 1/4\"/>                | 2 1/2\"/>                       |
| 2\"/>                  | 2 1/4\"/>                |                                 |

NOTE: ALL POSTS SHOWN IN ABOVE TABLE SHALL BE FABRICATED FROM 12 GAGE (OR WHERE DESIGNATED USS 14 GAGE) MATERIAL (60,000 POUNDS PER SQUARE INCH MINIMUM YIELD STRENGTH). ANCHORS AND ANCHOR SLEEVES (IF REQUIRED) SHALL BE FABRICATED FROM 12 GAGE MATERIAL OR GREATER. THE WEIGHT PER FOOT SHOWN IN THE TABLE ABOVE SHALL BE THE MINIMUM ACCEPTABLE.

**FOOTNOTES**

- FOR STANDARDIZATION OF LOCATION AND LATERAL CLEARANCE SEE SUBSECTIONS 2A-21 (PAGE 2A-8) AND 2A-24 (PAGE 2A-10 AND 2A-11) OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- FOR HEIGHT SEE SUBSECTION 2A-23 (PAGE 2A-9 AND 2A-10) OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- WHEN TYPE 4 FOOTING IS REQUIRED AS SHOWN ON SIGN SCHEDULE THE MINIMUM DEPTH OF SUPPORT POST WILL BE 2'-0\"/>
- IF ROCK IS ENCOUNTERED DURING THE INSTALLATION OF SUPPORT POSTS, THE HOLES FOR THE SUPPORTS SHALL BE DRILLED TO PROVIDE THE MINIMUM 3'-0\"/>
- THE SUPPORT POST SHALL BE EITHER FLUSH OR HALF-INCH DOWN FROM THE TOP OF THE SIGN FACE.
- SEE SIGN SCHEDULE SHEET IN THE PLANS FOR DIMENSIONS L, H, H1, H2, AND W.
- A 3\"/>
- THE SUPPORT POST MUST BE PLACED 12\"/>
- THE POST IS TO BE FASTENED TO THE ANCHOR/ANCHOR SLEEVE WITH ONE 1 5/16\"/>
- THE ANCHOR SLEEVE IS NOT REQUIRED WHEN USING A 14 GAGE POST. THE ANCHOR WILL SERVE AS A COMBINATION ANCHOR/ANCHOR SLEEVE.



**PERMISSIBLE FIELD SPLICE**

NOTE: A MAXIMUM OF ONE SPLICE IS ALLOWED PER POST. CONNECTION SHALL BE MADE WITH TWO 3/8\"/>

- REV. 6-12-74: CHANGED TYPE OF STEEL FOR PERFORATED POSTS FROM ASTM A-366 TO ASTM A-446.
- REV. 7-9-74: POST INSTALLATION DETAIL AND CONNECTION DETAIL ADDED. CORNER BOLT SIZE CHANGED.
- REV. 8-19-74: NOTE ADDED REGARDING POST INSTALLATION. FOOTING DETAILS ADDED.
- REV. 1-1-76: CHANGED DRAWING NO. FROM RD-S-17 TO T-S-17.
- REV. 7-29-76: HARDWARE FINISH, FIELD SPLICE AND MISCELLANEOUS.
- REV. 7-17-81: CHANGED ITEM NO. TO AGREE WITH NEW SPECIFICATION BOOK.
- REV. 3-1-88: KNOCKOUT ALTERNATE ADDED.
- REV. 11-22-90: REDREW AND REORGANIZED SHEET. ELIMINATED SHOULDER INSTALLATION USING THREE SUPPORTS.
- REV. 12-7-90: CHANGED CONNECTION DETAIL FOR PERFORATED/KNOCKOUT SQUARE TUBE POST AND GENERAL NOTE (F).
- REV. 7-29-91: CHANGED POST, ANCHOR AND ANCHOR SLEEVE TABLE. ADDED FOOTNOTE (I). CHANGED GENERAL NOTE (A).
- REV. 1-19-92: CHANGED POST, ANCHOR AND ANCHOR SLEEVE TABLE. MODIFIED VARIOUS NOTES ON DRAWING INCLUDING GENERAL NOTE (A).
- REV. 10-26-93: CHANGED WORDING OF GENERAL NOTE (E).
- REV. 2-14-96: CHANGED WORDING OF GENERAL NOTE (A).
- REV. 10-26-96: CHANGED PAY ITEM NO. IN GENERAL NOTE (H).
- REV. 7-19-13: REMOVED 2 1/2\", 10 AND 12 GAUGE POST FY FOR 12GAUGE CHANGED TO 60 KSI. REMOVED TYPE 4 FOOTING.

**GENERAL NOTES**

- PERFORATED/KNOCKOUT POSTS SHALL BE SQUARE TUBE FORMED FROM USS GAGE (12 GAGE) ASTM A-446 COLD ROLLED CARBON STEEL OR A-1011 HOT ROLLED CARBON SHEET STEEL. THE MINIMUM YIELD (Fy) IS TO BE 60,000 POUNDS PER SQUARE INCH, OR USS 14 GAGE HAVING A MINIMUM YIELD STRENGTH OF 60,000 POUNDS PER INCH. THE SQUARE TUBES SHALL BE WELDED DIRECTLY IN THE CORNERS BY HIGH FREQUENCY RESISTANCE WELDING OR EQUAL. THE SUPPORT POSTS ARE TO BE EXTERNALLY SCARFED TO AGREE WITH STANDARD CORNER RADII OF 5/32\"/>
- PERFORATED/KNOCKOUT POSTS SHALL BE GALVANIZED TO CONFORM TO ASTM-525, DESIGNATION C-90 OR ITS CORROSION-RESISTANCE EQUIVALENT, WHEN TESTED IN ACCORDANCE WITH ASTM B-117 STANDARDS.
- ALL HARDWARE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-307, CLASS A.
- ALL HARDWARE SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS OF FEDERAL SPECIFICATION 00-Z-325, TYPE 1, CLASS 3 OR CADMIUM PLATED TO CONFORM TO THE REQUIREMENTS OF FEDERAL SPECIFICATION 00-P-416, TYPE III, CLASS 3.
- THE WEIGHT IN POUNDS OF THE POST, ANCHOR, ANCHOR SLEEVE AND COMBINATION ANCHOR/SLEEVE SHALL BE COMPUTED FOR PAYMENT UNDER ITEM NO. 713-11.02, PERFORATED/KNOCKOUT SQUARE TUBE POSTS. NO MEASUREMENT FOR PAYMENT WILL BE MADE FOR HARDWARE USED IN SIGN CONSTRUCTION. COST OF NECESSARY HARDWARE WILL BE INCLUDED IN THE PRICE BID FOR ITEM NO. 713-11.02.
- THE SIGN FACE IS TO BE CONNECTED TO THE SUPPORT WITH 3/8\"/>
- CLASS "A" CONCRETE CONSTRUCTION AND MATERIALS SHALL MEET THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 604."
- CLASS "A" CONCRETE AND REINFORCING STEEL USED IN CONJUNCTION WITH INSTALLATION OF THE SIGN SUPPORT POSTS IS TO BE PAID FOR UNDER ITEM No. 713-01.01, CLASS "A" CONCRETE (FOUNDATION FOR SIGN SUPPORTS) PER CUBIC YARD, AND 713-01.02, STEEL BAR REINFORCEMENT (FOUNDATION FOR SIGN SUPPORTS) PER POUND.
- CLASS "A" CONCRETE FOOTING SHALL BE PLACED ONLY ON UNDISTURBED MATERIAL OR IN FILL MATERIAL PLACED BY CONTROLLED COMPACTION AT DEPTHS UNAFFECTED BY FROST.
- MATERIALS SURROUNDING FOOTING SHALL BE CAPABLE OF CARRYING A MINIMUM BEARING OF 2500 POUNDS PER SQUARE FOOT. WHERE SOLID ROCK IS ENCOUNTERED, FOOTING SHALL BE FOUR FEET AS SHOWN IN DETAILS OR EXTEND A MINIMUM OF TWO FEET INTO THE ROCK.
- THE ANCHOR SHALL BE DRIVEN BEFORE THE ANCHOR SLEEVE OR THE ANCHOR/ANCHOR SLEEVE SHALL BE DRIVEN TOGETHER.

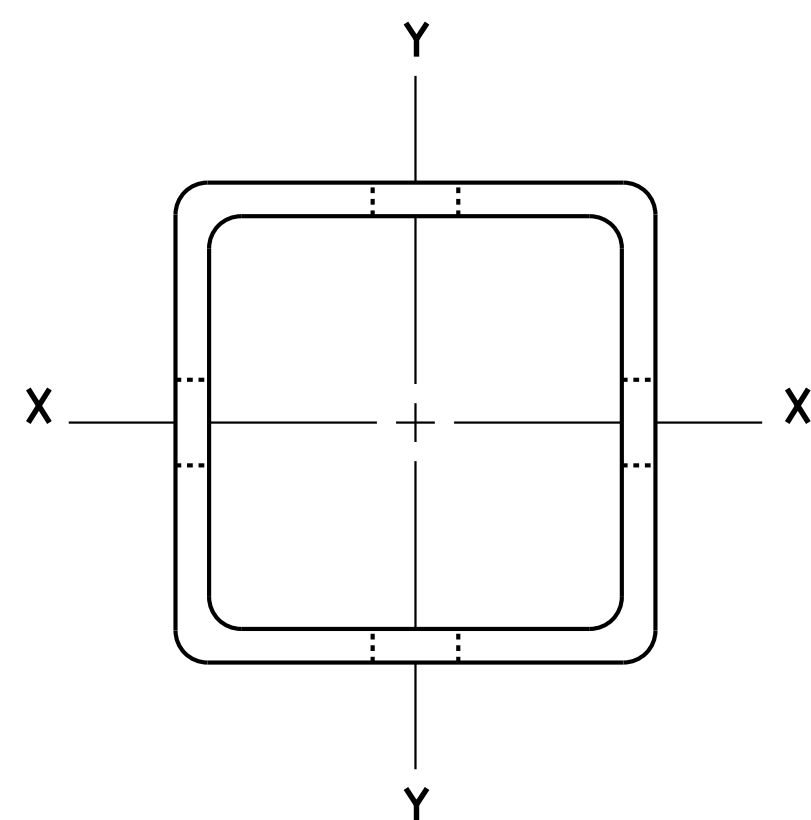
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

**STANDARD GROUND MOUNTED SIGN USING PERFORATED/KNOCKOUT SQUARE TUBE**

REV. 06-01-76: ADDED WEIGHTS.  
 REV. 08-13-76: REVISED WEIGHTS ALUMINUM.  
 REV. 09-22-77: ADDED "MU"-POST; REVISED PROPERTIES OF RIBBED "U"-POST.  
 REV. 07-01-78: REQUIREMENTS OF MATERIAL FOR STEEL "U"-POST.  
 REV. 03-01-88: KNOCKOUT ALTERNATE ADDED.  
 REV. 10-26-90: REDREW AND REORGANIZED SHEET. DELETED ALUMINUM "U"-POST AND "MU"-POST FROM SHEET. CHANGED SHEET NAME ACCORDINGLY. NUMBERED FOOTNOTES AND ADDED FOOTNOTE NO. ②.  
 REV. 7-29-91: ADDED P7 AND P8 PERFORATED/KNOCKOUT TUBE POST. ADDED FOOTNOTE NOS. ⑤ AND ⑥.

□ REV. 7-19-13: FY FOR 12 GAUGE P POST CHANGED TO 60 KSI. ADDED P9 POST REVISED FOOTNOTES. CHANGE TITLE.

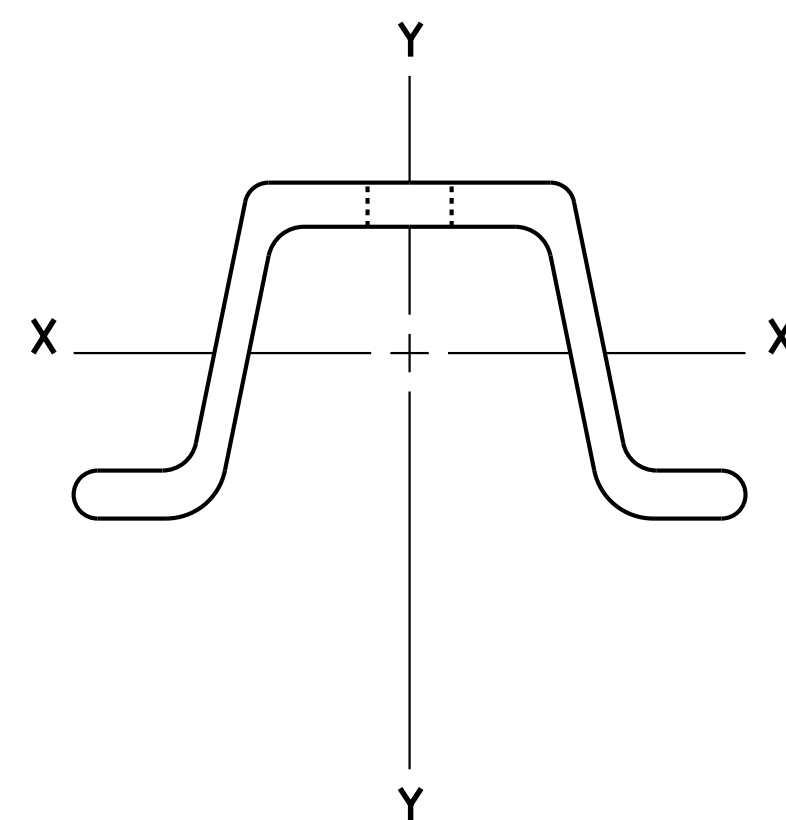


**PERFORATED / KNOCKOUT TUBE**

① MATERIAL: ASTM A-446 (GRADE A) OR A-1011 GRADE 50

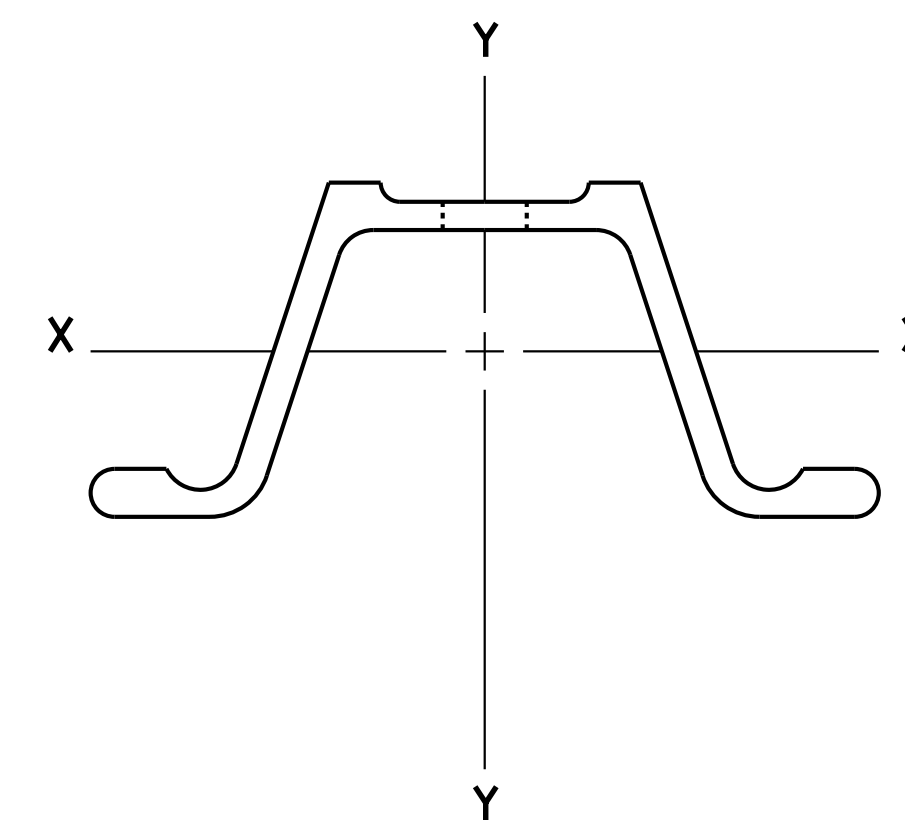
FOR 0.105" USS GAGE 12 GAGE;  
 $F_y = 60,000$  PSI MIN.

FOR 0.083" USS GAGE 14 GAGE;  
 $F_y = 60,000$  PSI MIN.



**U-POST**

② MATERIAL: ASTM A-499  
 $F_y = 50,000$  PSI MIN.  
 GRADE 50



**RIBBED U-POST**

② MATERIAL: ASTM A-499  
 $F_y = 50,000$  PSI MIN.  
 GRADE 50

| MEMBER DESIGNATION | MINIMUM SECTION PROPERTIES   | WT LBS/FT          |
|--------------------|--|--------------------|
| P1                 | A = 0.380 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.172 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.129 IN. <sup>4</sup> | 1.702<br>1 1/2" ∅  |
| P2                 | A = 0.485 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.264 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.231 IN. <sup>4</sup> | 2.060<br>1 3/4" ∅  |
| P3                 | A = 0.590 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.372 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.372 IN. <sup>4</sup> | 2.416<br>2" ∅      |
| P4                 | A = 0.695 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.499 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.561 IN. <sup>4</sup> | 2.773<br>2 1/4" ∅  |
| ⑦ P5               | A = 0.803 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.643 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.804 IN. <sup>4</sup> | 3.141<br>2 1/2" ∅  |
| ⑥-⑦ P6             | A = 1.010 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.783 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.979 IN. <sup>4</sup> | 4.006<br>2 1/2" ∅  |
| ④ P7               | A = 0.392 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.230 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.201 IN. <sup>4</sup> | 1.882<br>1 3/4" ∅  |
| ④ P8               | A = 0.474 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.296 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.296 IN. <sup>4</sup> | 2.164<br>2" ∅      |
| ⑦ P9               | A = 0.841 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.533 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.605 IN. <sup>4</sup> | 3.430<br>2 3/16" ∅ |

| MEMBER DESIGNATION | MINIMUM SECTION PROPERTIES   | WT LBS/FT |
|--------------------|--|-----------|
| U1                 | A = 0.590 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.225 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.179 IN. <sup>4</sup> | 2.00      |
| U2                 | A = 0.645 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.254 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.201 IN. <sup>4</sup> | 2.25      |
| U3                 | A = 0.748 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.289 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.233 IN. <sup>4</sup> | 2.50      |
| U4                 | A = 0.819 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.329 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.277 IN. <sup>4</sup> | 2.75      |
| U5                 | A = 0.817 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.363 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.331 IN. <sup>4</sup> | 2.75      |
| ⑦ U6               | A = 0.918 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.403 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.372 IN. <sup>4</sup> | 3.00      |
| ⑦ U7               | A = 1.195 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.511 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.460 IN. <sup>4</sup> | 4.00      |

| MEMBER DESIGNATION | MINIMUM SECTION PROPERTIES   | WT LBS/FT |
|--------------------|--|-----------|
| R1                 | A = 0.600 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.233 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.175 IN. <sup>4</sup> | 2.00      |
| ⑦ R2               | A = 0.881 IN. <sup>2</sup><br>S <sub>xx</sub> = 0.406 IN. <sup>3</sup><br>I <sub>xx</sub> = 0.415 IN. <sup>4</sup> | 3.00      |

**FOOTNOTES**

- ① SEE GENERAL NOTES (A) AND (B) ON STANDARD DRAWING T-S-17 FOR MANUFACTURING REQUIREMENTS FOR STEEL AND GALVANIZING.
- ② STEEL "U"-POST SHALL BE MANUFACTURED FROM STEEL CONFORMING TO THE MATERIAL REQUIREMENTS OF ASTM A-499 AND GALVANIZED CONFORMING TO ASTM A-123.
- ③ P1 THRU P5 MEMBER DESIGNATIONS ARE TO BE 12 GAGE.
- ④ THE CONTRACTOR MAY SUBSTITUTE P2 FOR P7 AND P3 FOR P8. QUANTITIES ARE COMPUTED ON PLANS BASED ON USING P7 OR P8. NO INCREASE IN QUANTITIES WILL BE ALLOWED WHEN USING THE ABOVE SUBSTITUTIONS.
- ⑤ P7, P8 AND P9 MEMBER DESIGNATIONS ARE TO BE 14 GAGE.
- ⑥ P6 IS TO BE 10 GAUGE.
- ⑦ POSTS REQUIRE SLIP BASE CONNECTION.

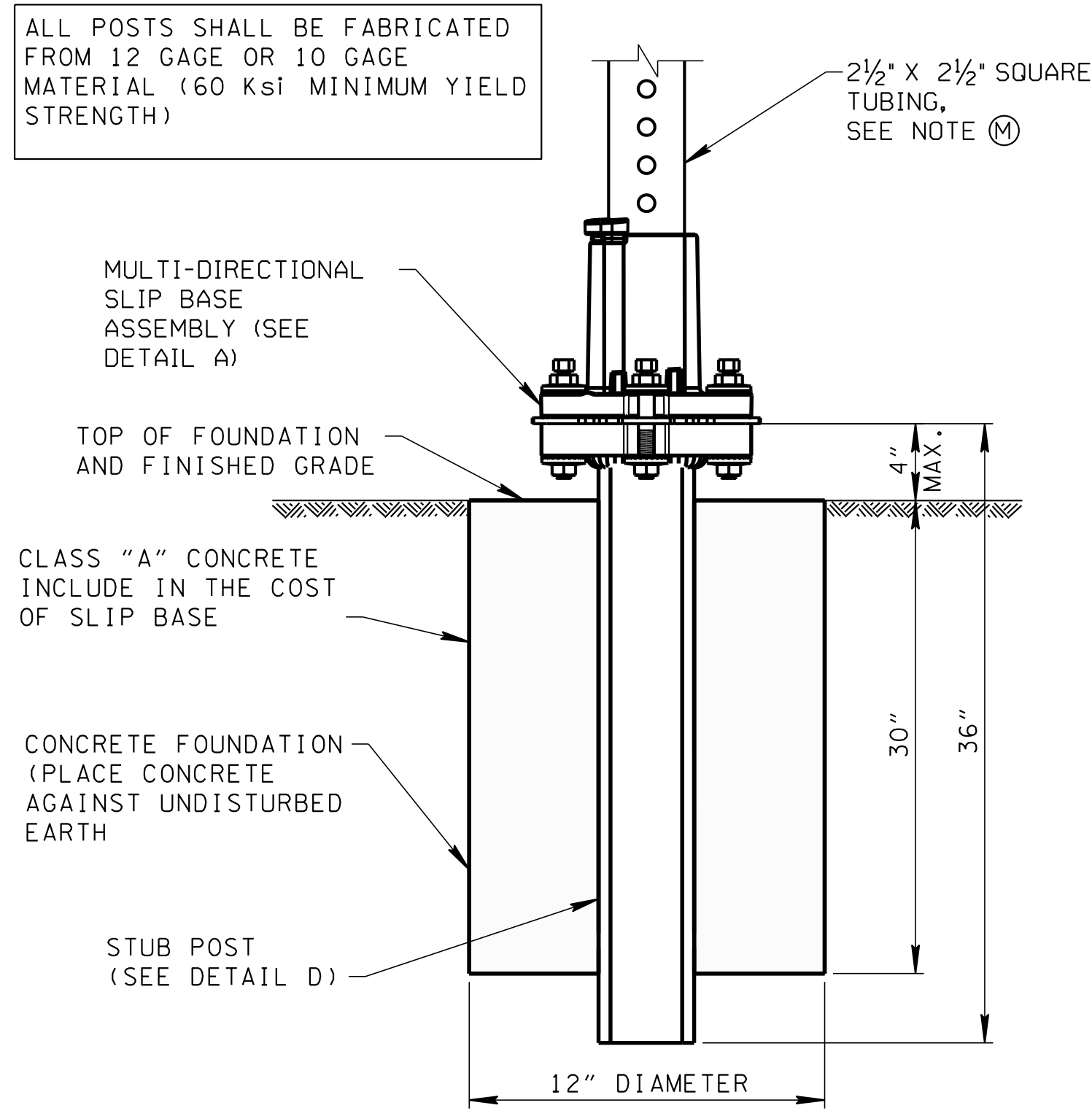
□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION

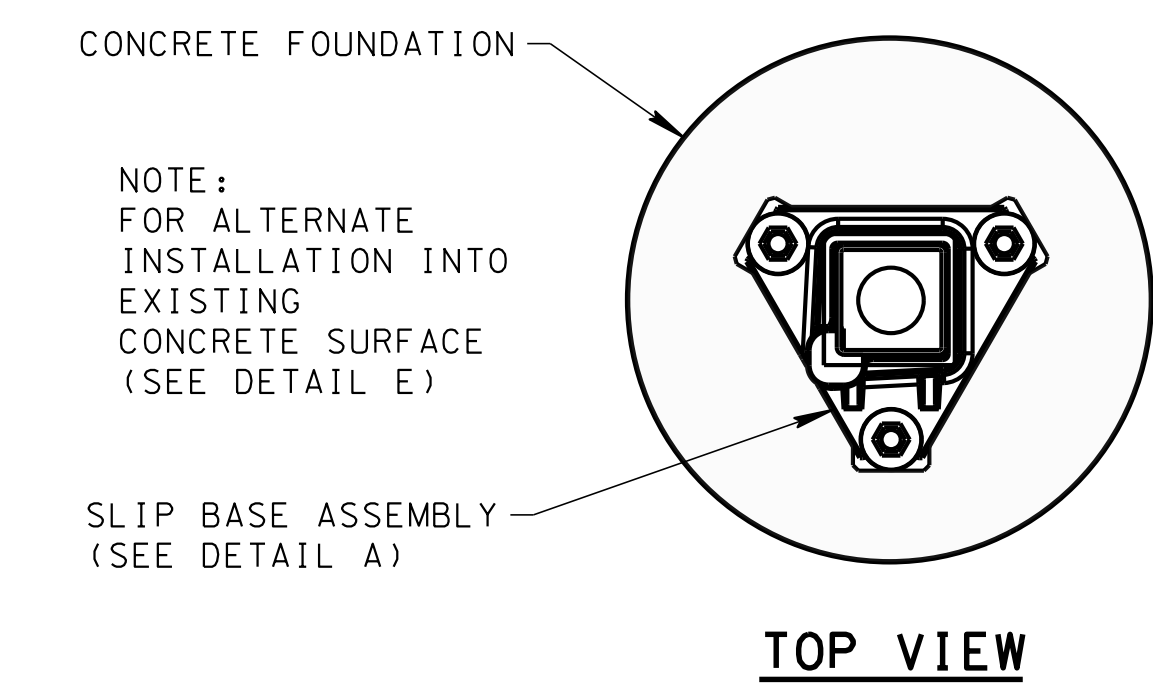
**STANDARD STEEL  
 SIGN  
 SUPPORTS**



ALL POSTS SHALL BE FABRICATED FROM 12 GAGE OR 10 GAGE MATERIAL (60 KSI MINIMUM YIELD STRENGTH)

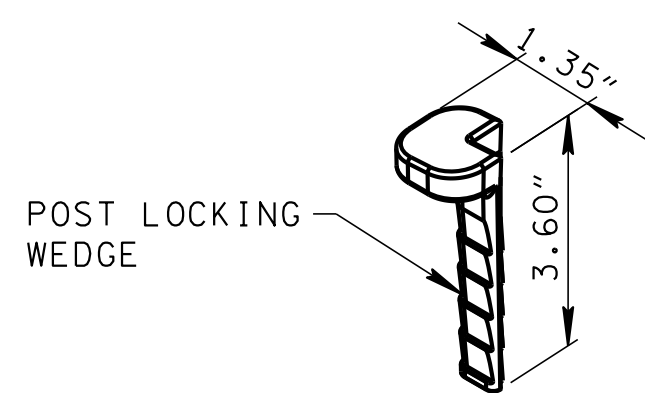


**ELEVATION**

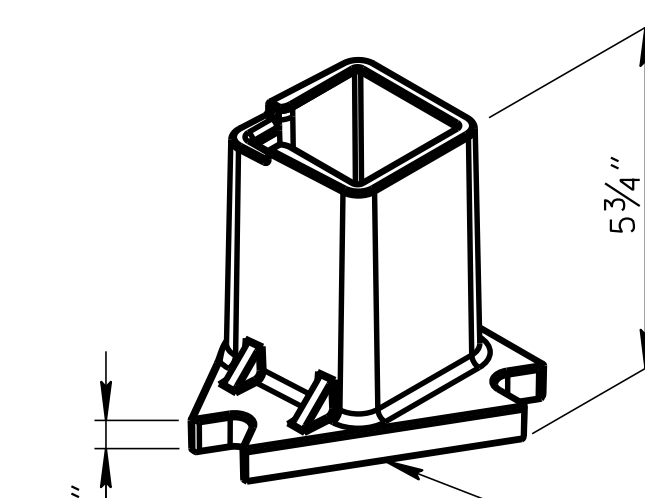


**TOP VIEW**

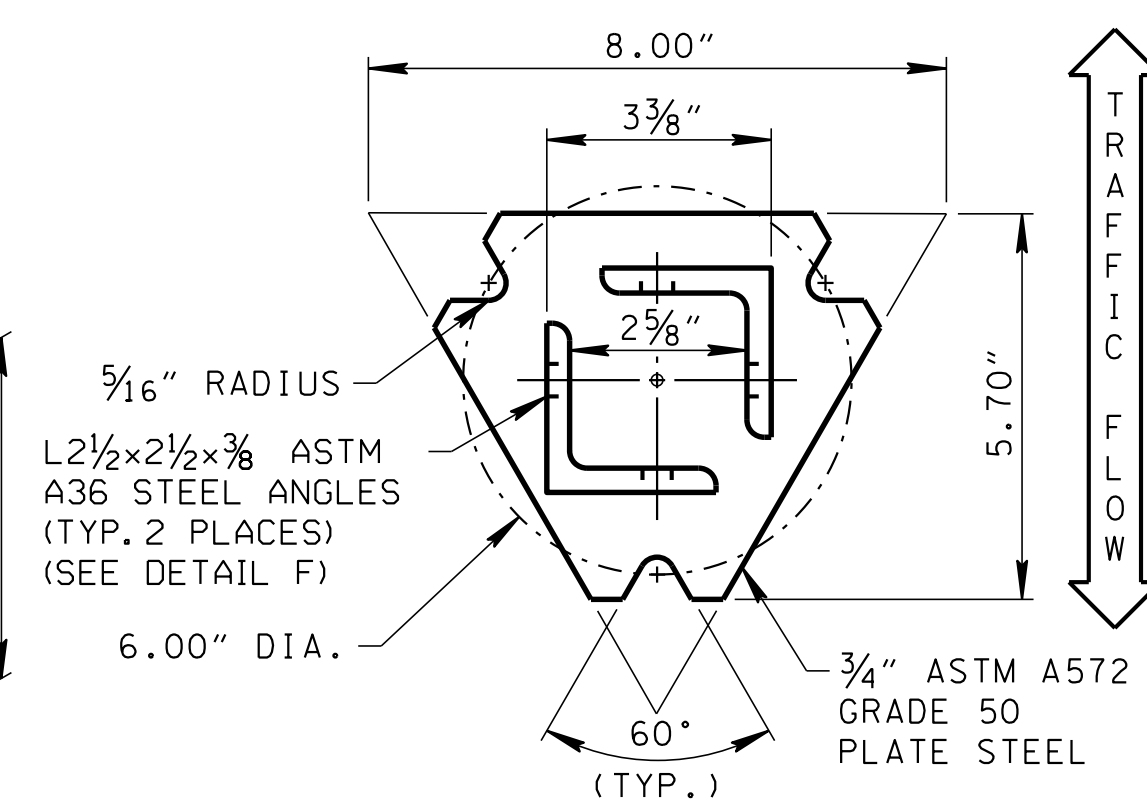
**SLIP BASE SIGN SUPPORT FOR SQUARE TUBE**



DUCTILE IRON CASTING, CLASS 65-45-12, HOT DIP GALVANIZED PER ASTM A153.

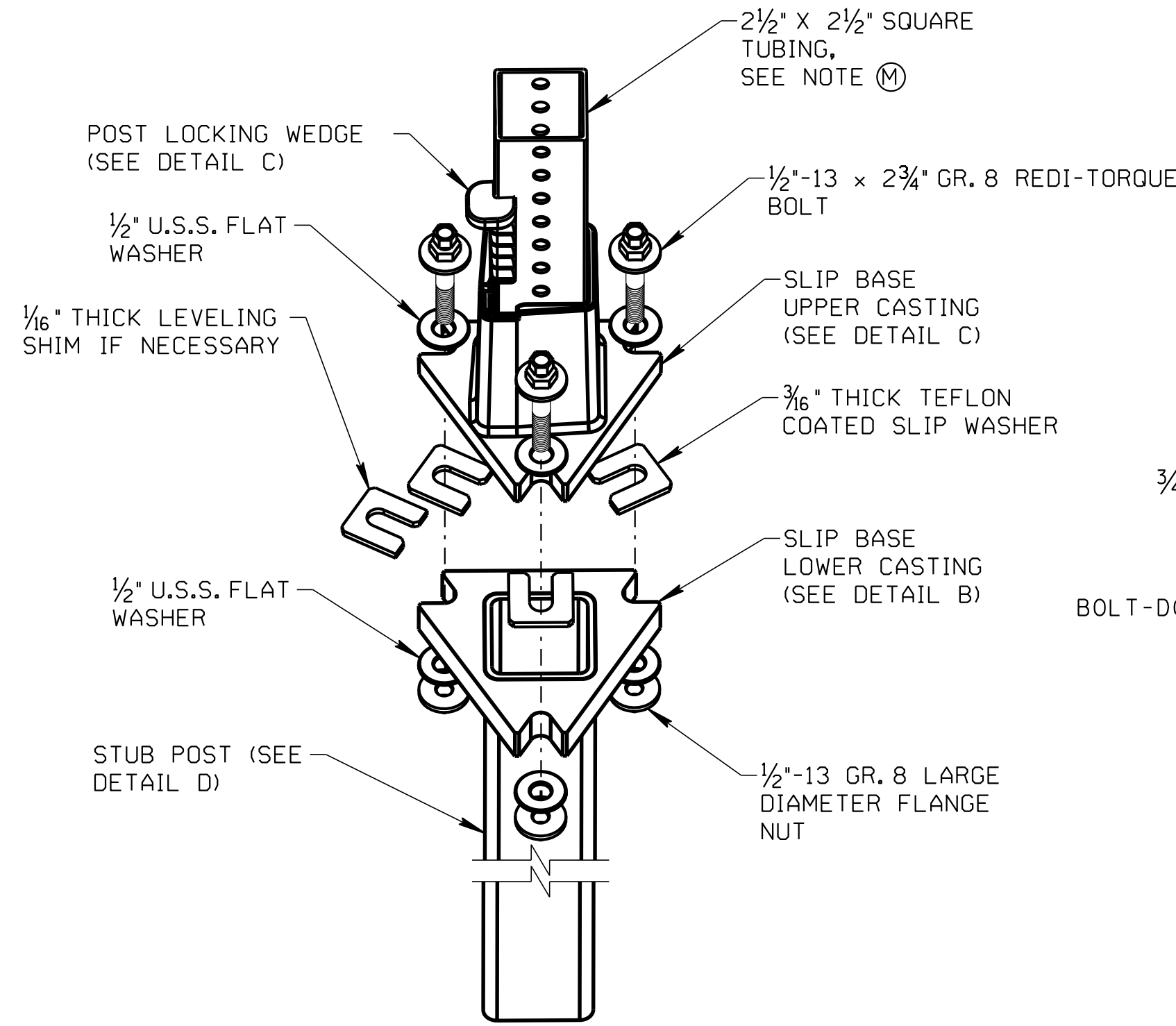


**UNI-BASE**  
RECEIVER PER MANUFACTURER



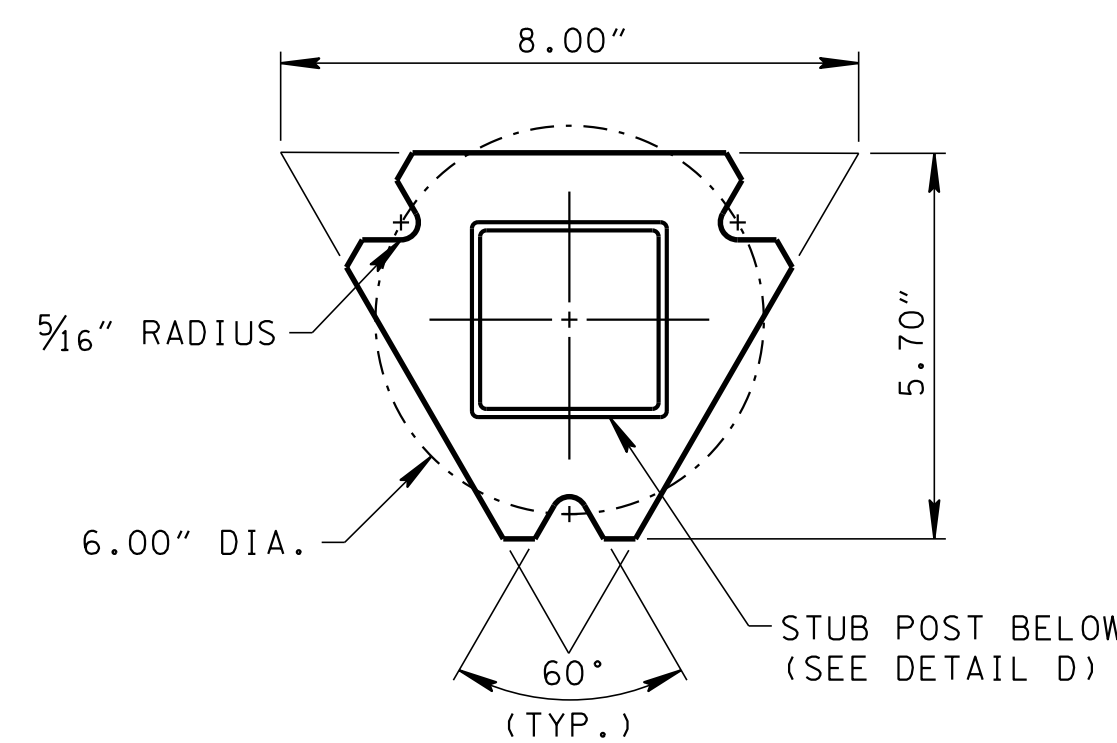
**DETAIL C**

**SLIP BASE UPPER CASTING OPTIONS**



**DETAIL A**

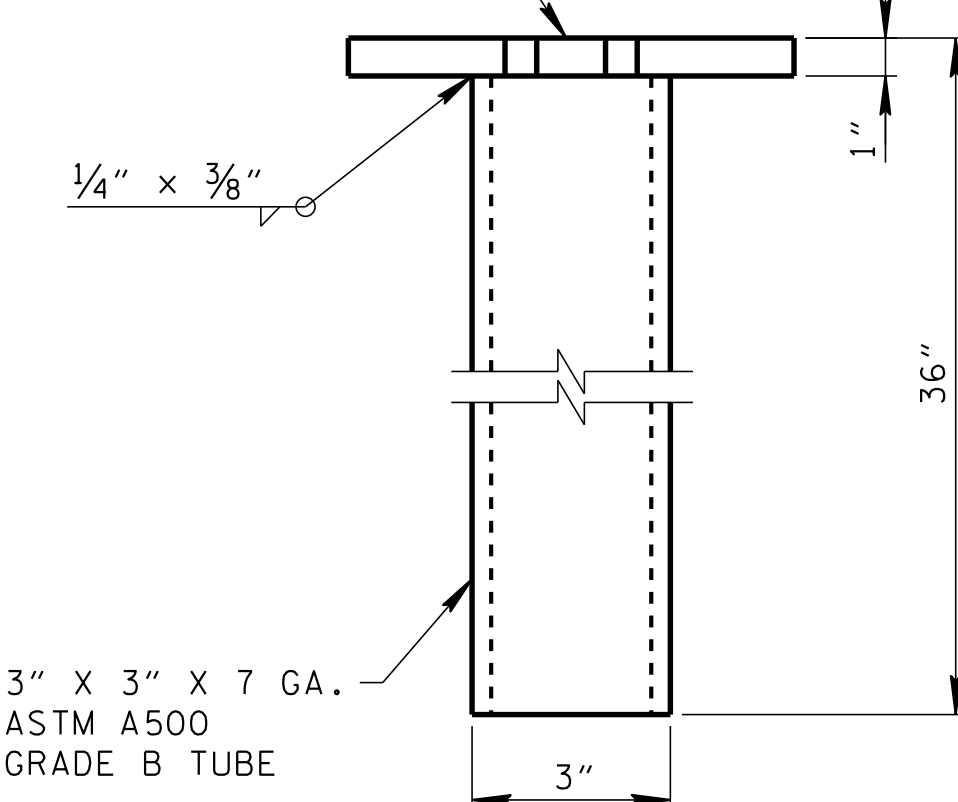
**TRIANGULAR SLIP BASE**



**DETAIL B**

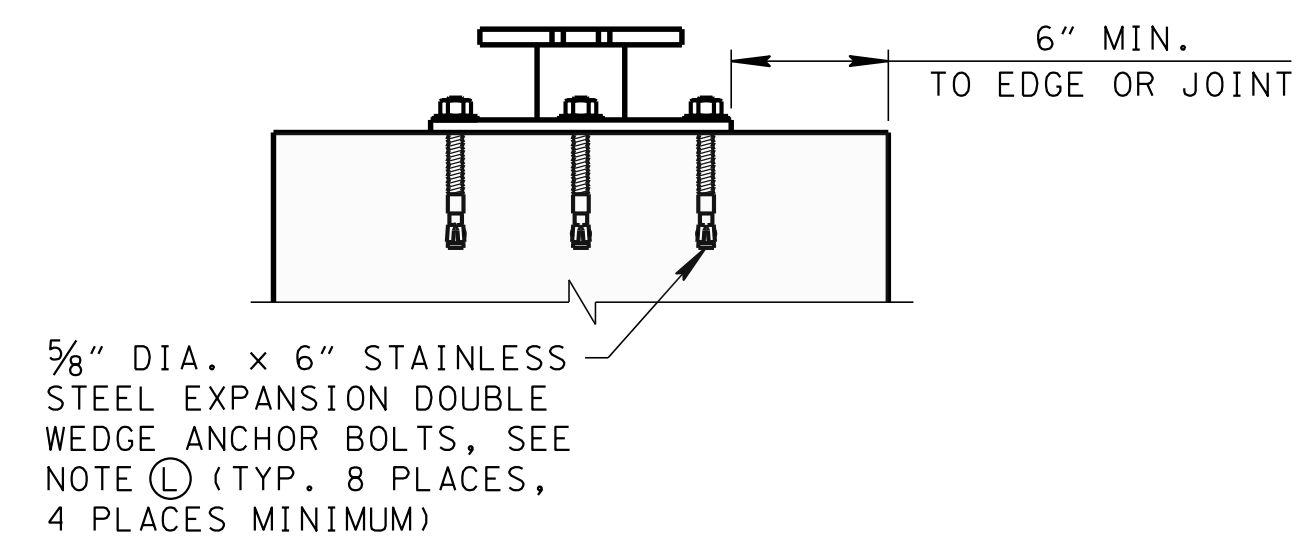
**SLIP BASE LOWER HALF**

LOWER HALF, ASTM A572 GRADE 50 STEEL SLIP PLATE (SEE DETAIL B)

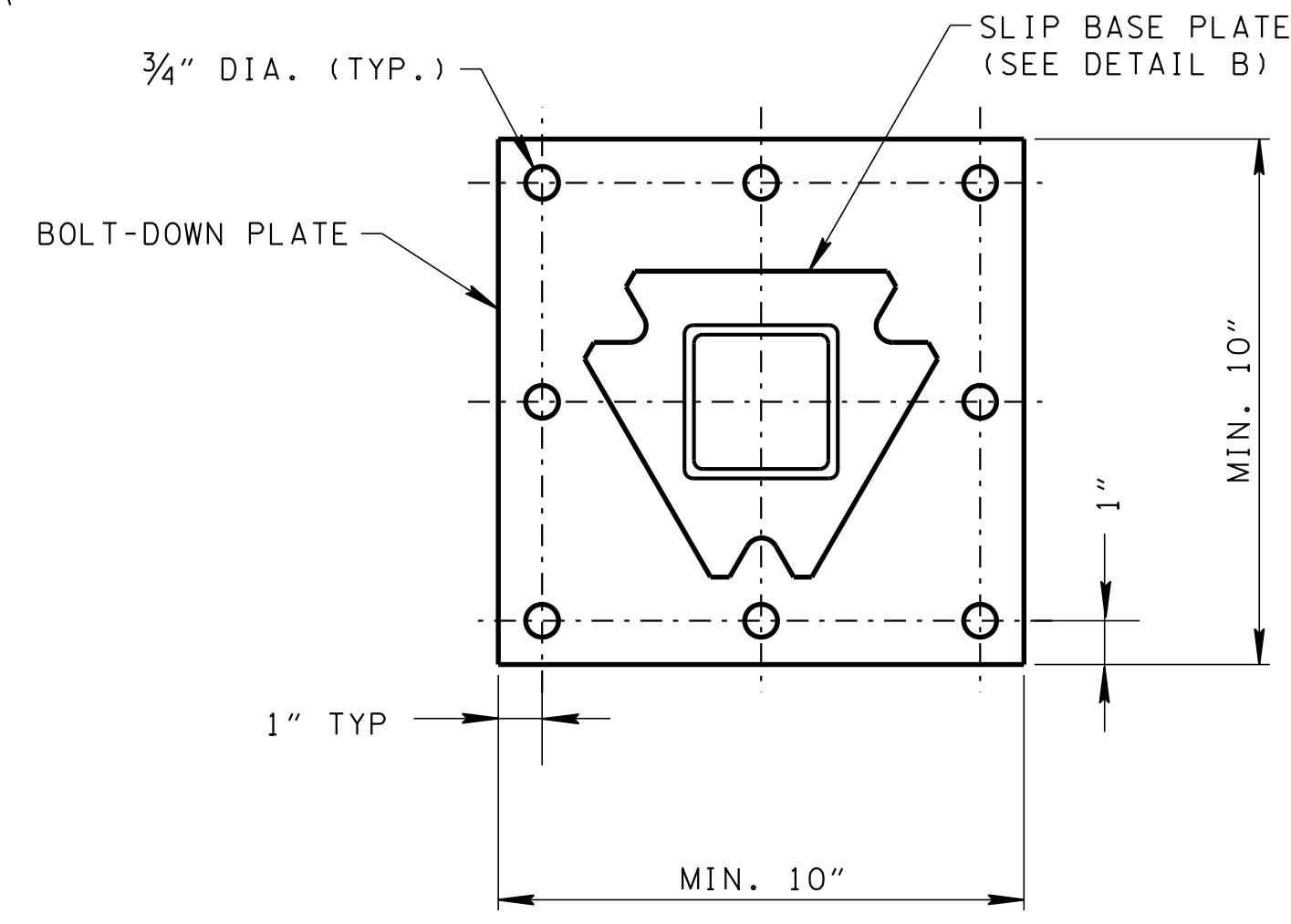


**DETAIL D**

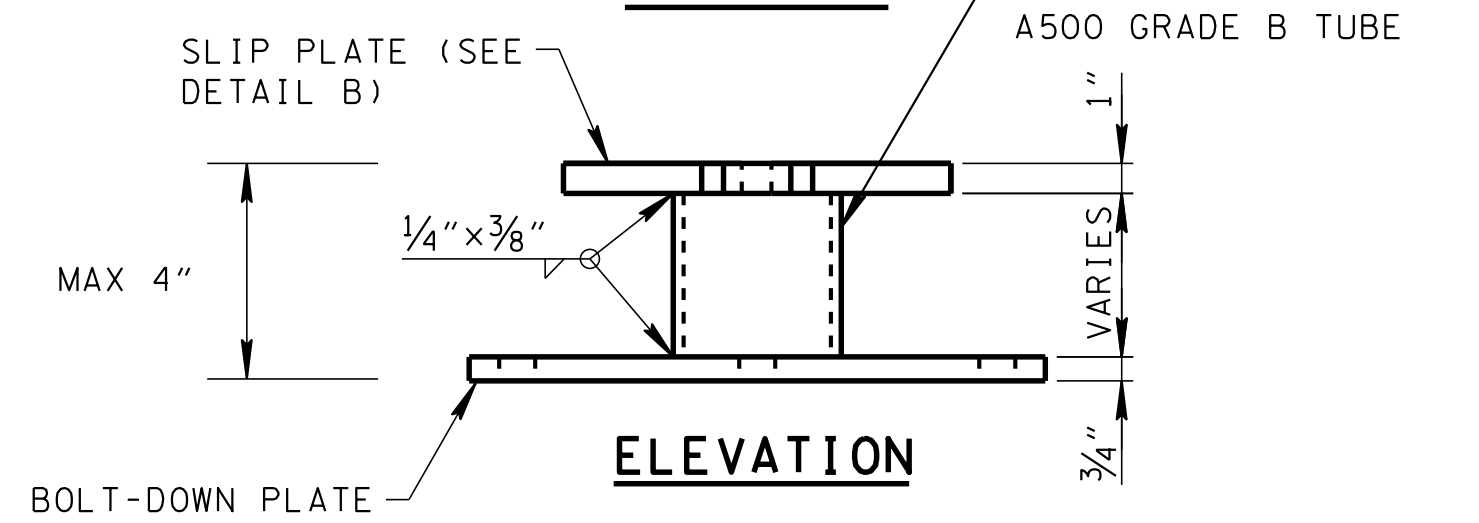
**SLIP BASE LOWER HALF**



**ANCHOR DETAIL**



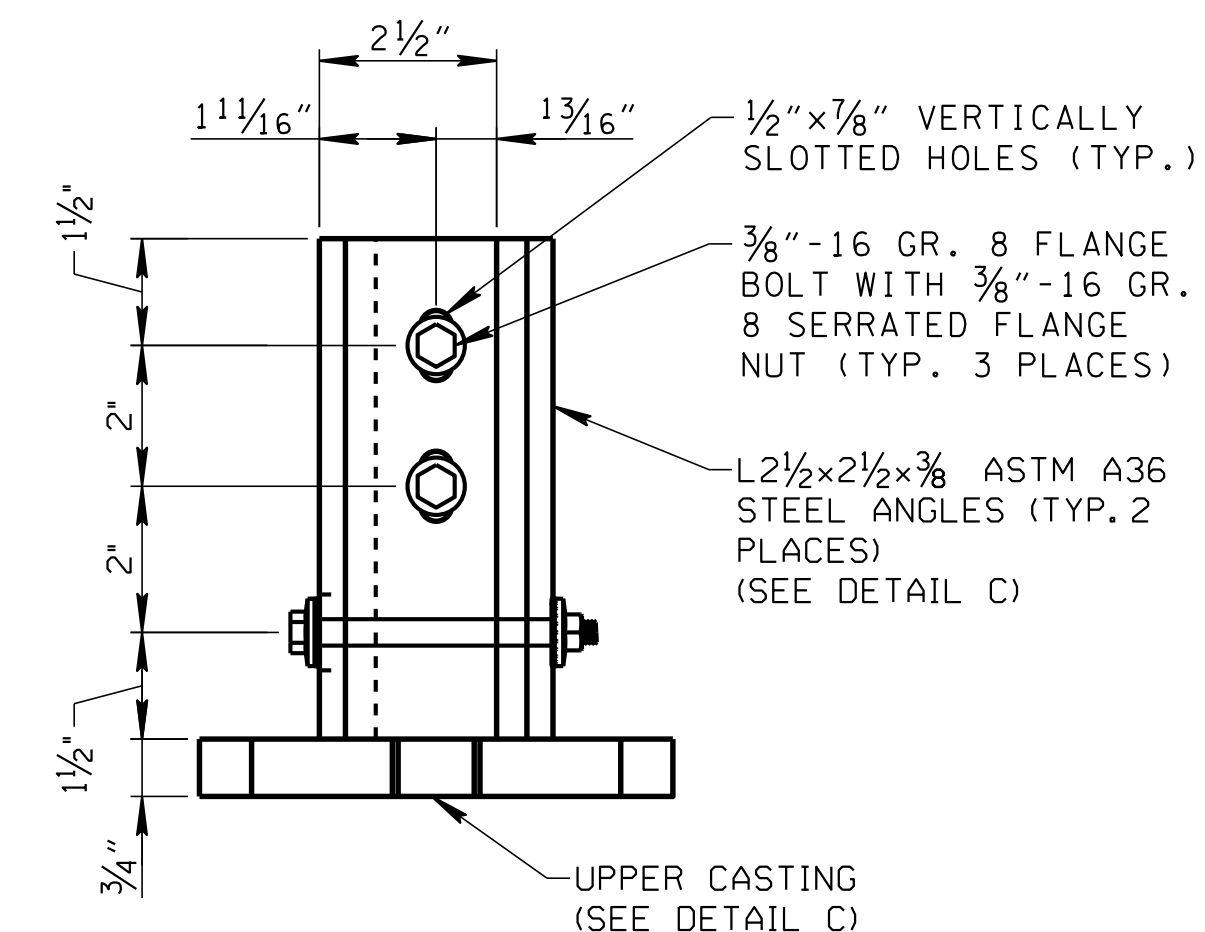
**TOP VIEW**



**ELEVATION**

**DETAIL E**

**BOLT-DOWN ANCHOR INTO EXISTING CONCRETE**



**DETAIL F**

**GENERAL NOTES**

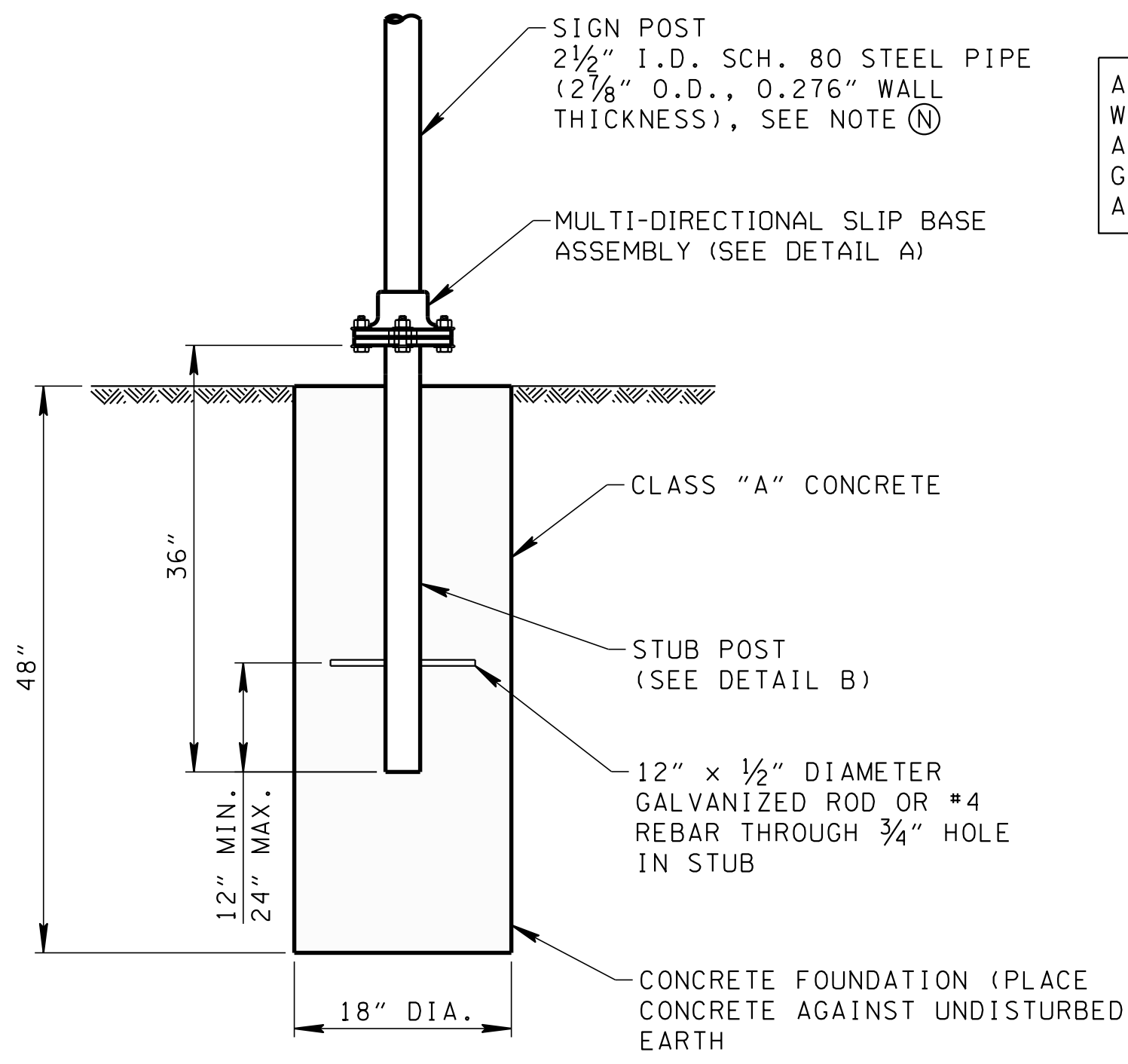
- (A) BREAKAWAY SIGN SUPPORTS SHALL BE USED ON ALL SIGN POSTS LOCATED WITHIN THE CLEAR ZONE OF A ROADWAY AND NOT PROTECTED BY AN APPROVED BARRIER SYSTEM.
- (B) NO MORE THAN THREE OMNI-DIRECTIONAL SLIP BASES MAY BE INSTALLED WITHIN A SEVEN FOOT SPAN.
- (C) MULTI-DIRECTIONAL BREAKAWAY SLIP BASE SHALL BE USED AT LOCATIONS WHERE THE POSSIBILITY EXISTS OF THE SIGN BEING HIT FROM ANY DIRECTION. ALL SQUARE TUBE SIGNS LOCATED IN ISLANDS, AT INTERSECTIONS, OR LOCATED ALONG THE OUTSIDE OF A HORIZONTAL CURVE SHALL BE EQUIPPED WITH A BREAKAWAY SYSTEM, REGARDLESS OF THE NUMBER OF POSTS OR SPACING.
- (D) ALL SIGN PANELS PLACED PARALLEL TO THE DIRECTION OF TRAFFIC FLOW (SUCH AS ONE-WAY SIGNS ON A DIVIDED HIGHWAY) SHALL BE MOUNTED ON A MULTI-DIRECTIONAL BREAKAWAY SYSTEM.
- (E) BASE POST STUB HEIGHT SHALL BE 4 INCHES OR LESS ABOVE FINISHED GROUND SURFACE.
- (F) ALL FINISHED COMPONENTS OF THE SLIP BASE SYSTEM SHALL BE PERMANENTLY MARKED TO INDICATE THE MANUFACTURER, METHOD, DESIGN, AND LOCATION OF MARKING SHALL BE AS APPROVED BY THE ENGINEER.
- (G) INTERMIXING OF U-CHANNEL POSTS WITH PERFORATED SQUARE TUBE POSTS AT ANY SIGN INSTALLATION LOCATION WILL NOT BE ALLOWED.
- (H) INSTALL MULTI-DIRECTIONAL SLIP BASE STRUCTURAL SIGN SUPPORT SYSTEM AS SHOWN OR APPROVED EQUAL. ONLY THOSE SYSTEMS APPROVED BY FHWA ACCEPTANCE LETTER AND FOUND ON THE TDOT OPL SHALL BE USED.
- (I) SQUARE TUBE POSTS, BASE POSTS, SLIP BASES, AND HARDWARE SHALL BE SELECTED FROM THE OPL.
- (J) ALL STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SPECIFICATION ASTM-A123.
- (K) CLASS "A" CONCRETE CONSTRUCTION AND MATERIALS SHALL MEET THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 604."
- (L) ANCHORS MAY BE EXPANSION TYPE AS SHOWN OR ADHESIVE TYPE LISTED ON THE OPL MEETING THE STRENGTH REQUIREMENTS. EXPANSION ANCHORS SHALL CONSIST OF 5/8 INCH DIAMETER STUD BOLT WITH UNC-SERIES BOLT THREADS ON THE UPPER END WITH HEAVY HEX NUT PER ASTM A563, AND HARDENED WASHER PER ASTM F436. THE STUD BOLT SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI AND ULTIMATE TENSILE STRENGTH OF 75 KSI.
- (M) PERFORATED/KNOCKOUT POSTS SHALL BE SQUARE TUBE FORMED 10 OR 12 GAUGES, ASTM A1011 GRADE 50 STEEL. THE SQUARE TUBES SHALL BE WELDED DIRECTLY IN THE CORNER BY HIGH FREQUENCY RESISTANCE WELDING OR EQUAL. THE POSTS SHALL BE EXTERNALLY SCARFED TO AGREE WITH STANDARD CORNER RADIUS OF 5/32 ± 1/64 INCHES.
- (N) TO BE PAID FOR UNDER ITEM NO. 713-11.21 P POST SLIP BASE PER EACH (INCLUDES COST OF SLIP BASE AND STUB). SYSTEMS LISTED ON OPL NUMBER 33 MAY BE USED.

REV. 7-19-13: ADDED NOTE (N). MINOR EDITS TO DRAWINGS. MODIFIED NOTE (M).

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

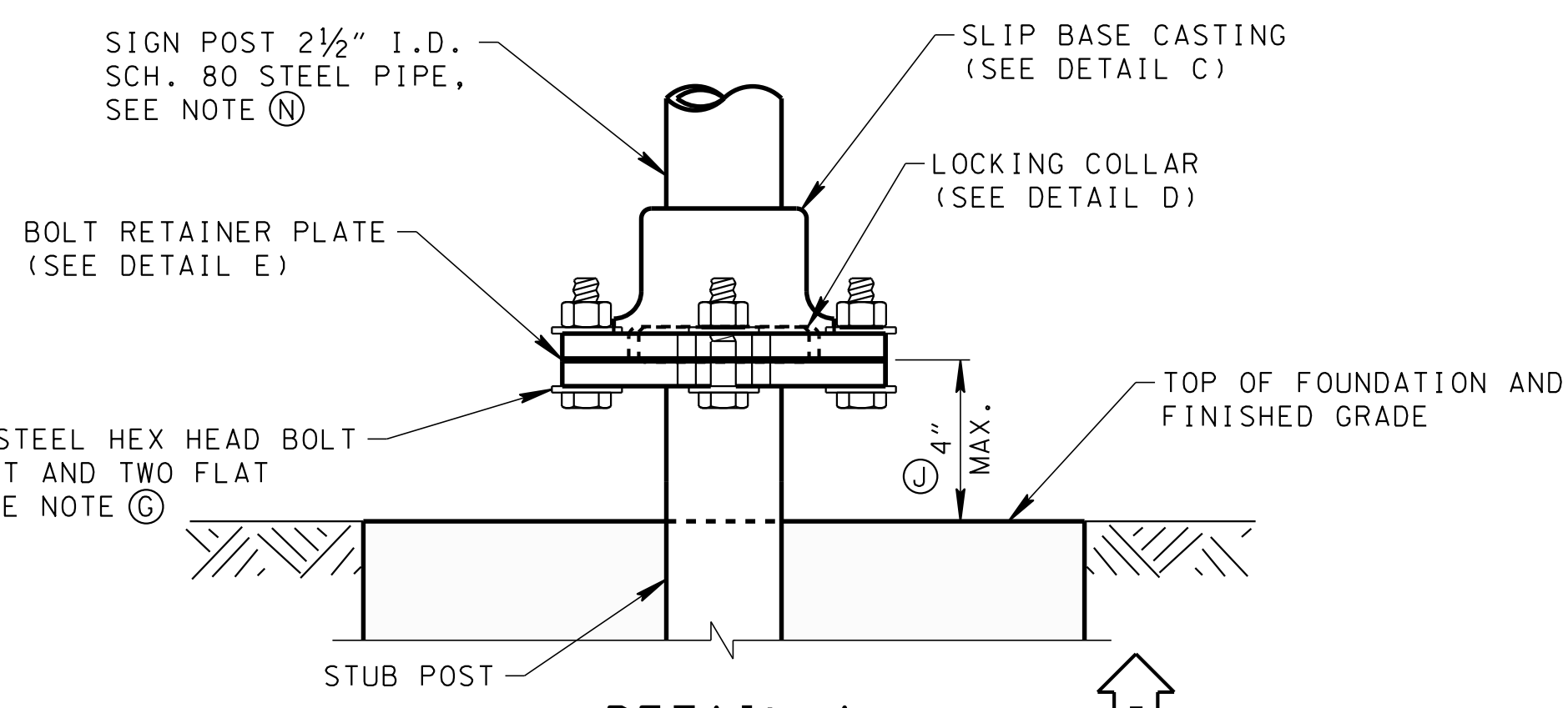
STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

**MULTI-DIRECTIONAL  
SLIP BASE BREAKAWAY  
SQUARE TUBE  
SIGN SUPPORT**

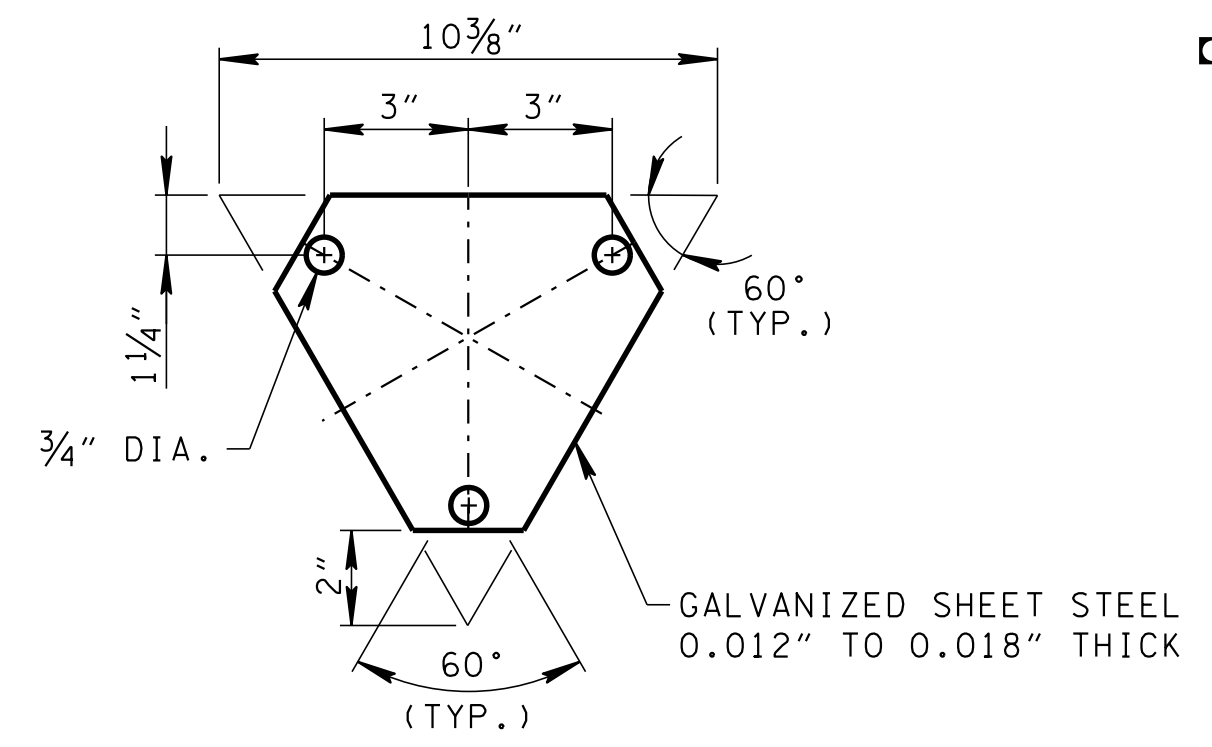


**TRIANGULAR SLIP BASE PIPE SIGN SUPPORT**  
FOR ALTERNATE INSTALLATION INTO EXISTING CONCRETE SURFACE, SEE DETAIL G

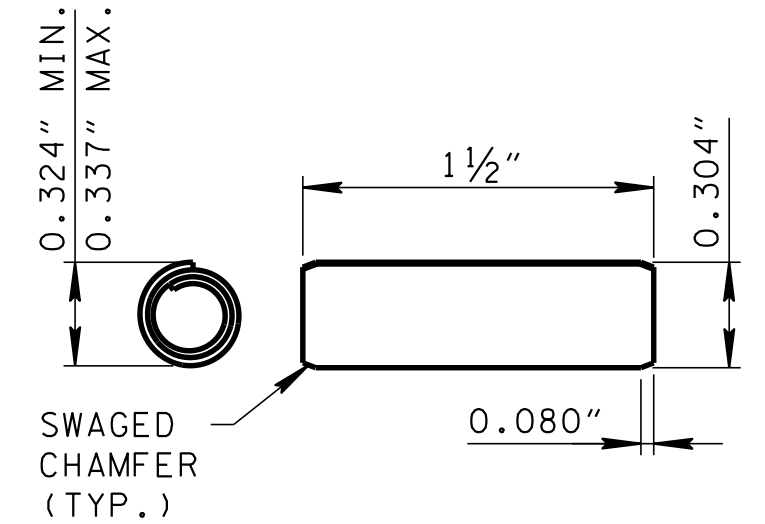
ALL BOLTS, NUTS, AND WASHERS SHALL BE PER ASTM A325 OR A449 AND GALVANIZED TO ASTM A454.



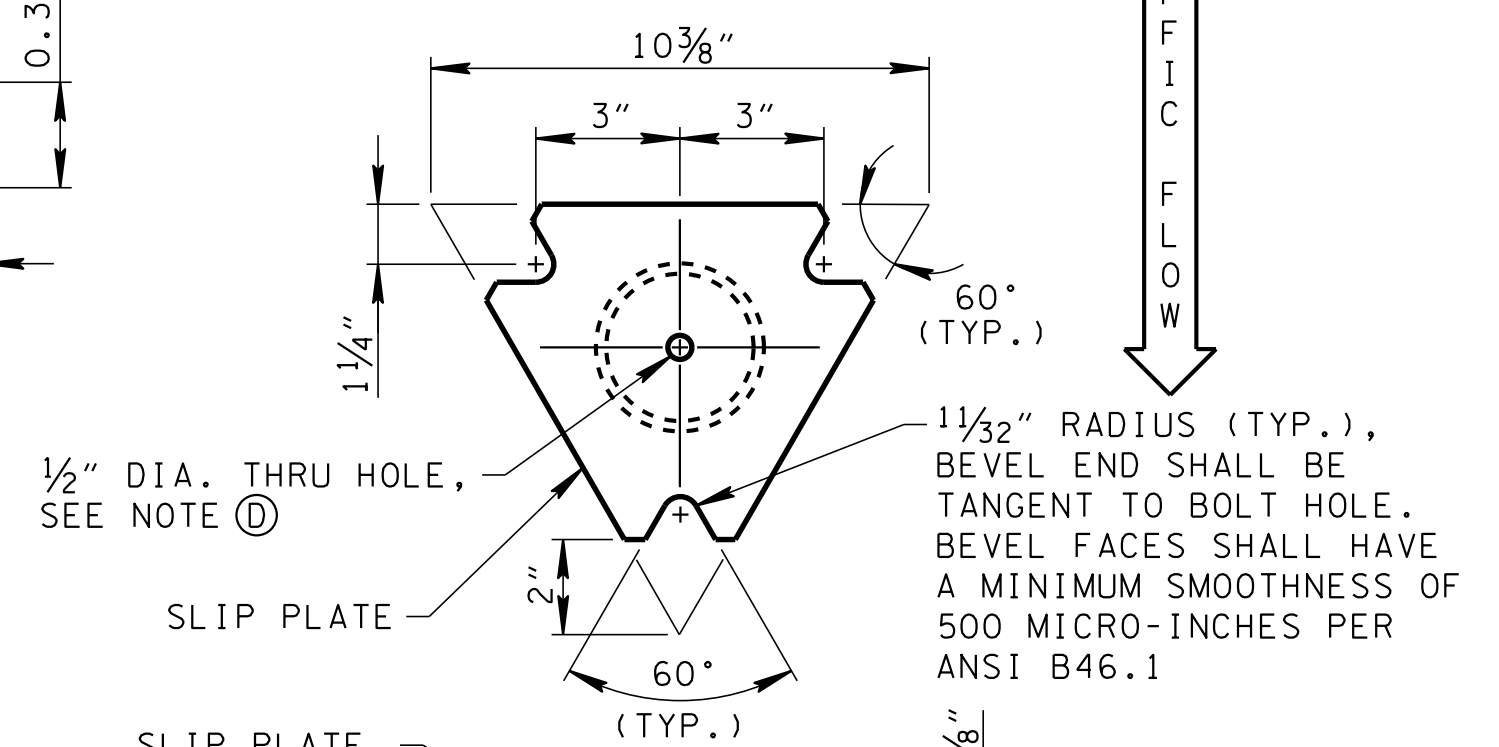
**DETAIL A**  
TRIANGULAR SLIP BASE



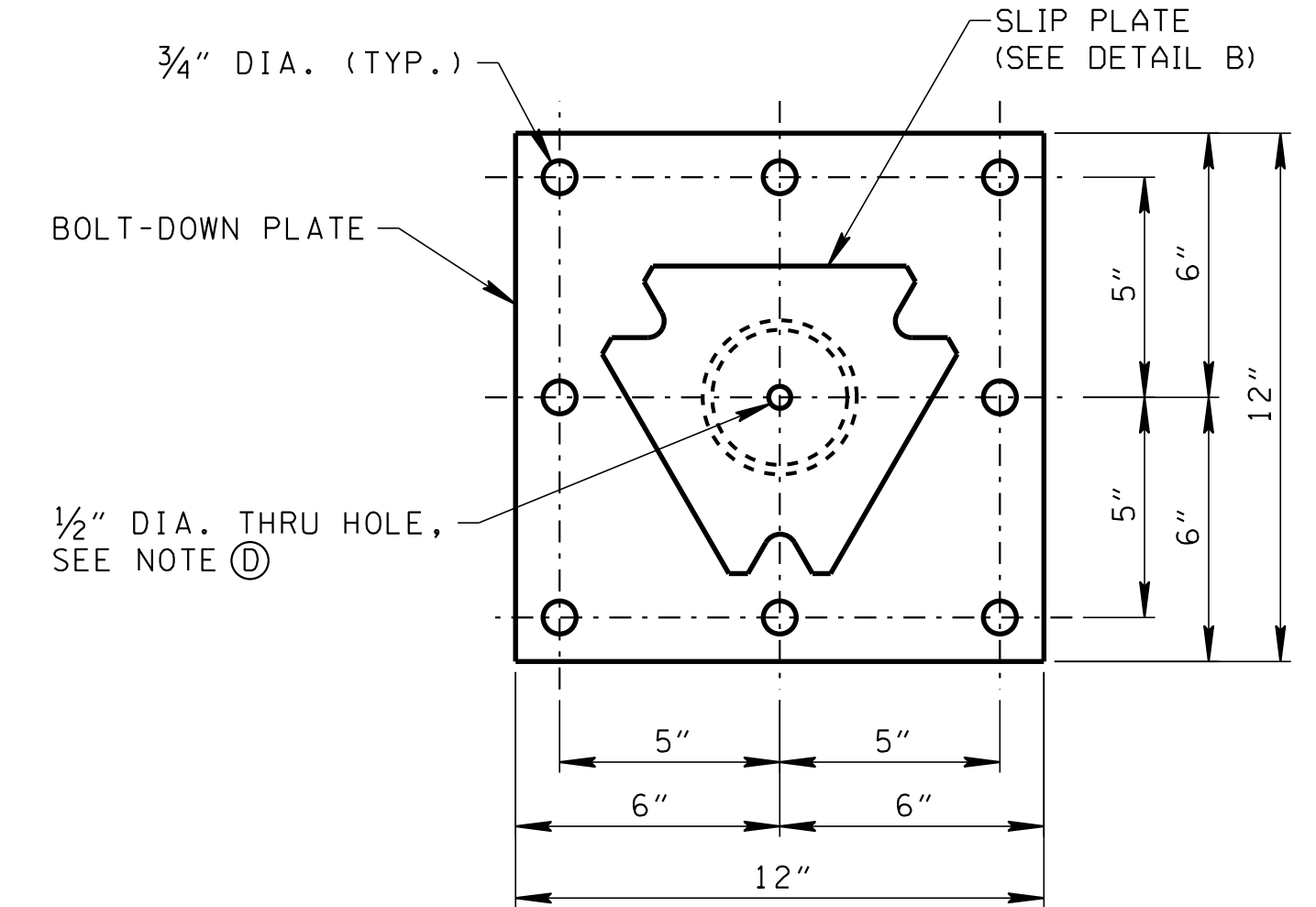
**DETAIL E**  
BOLT RETAINER PLATE



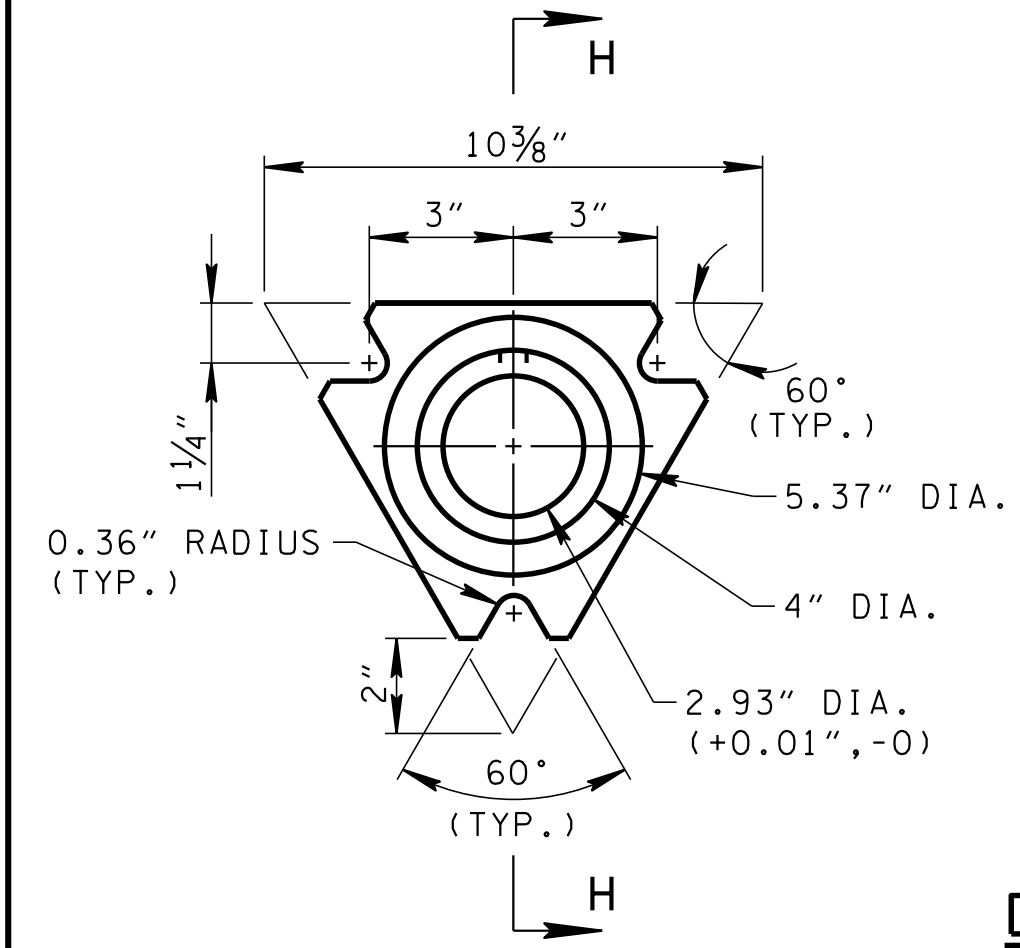
**DETAIL F**  
COILED PIN



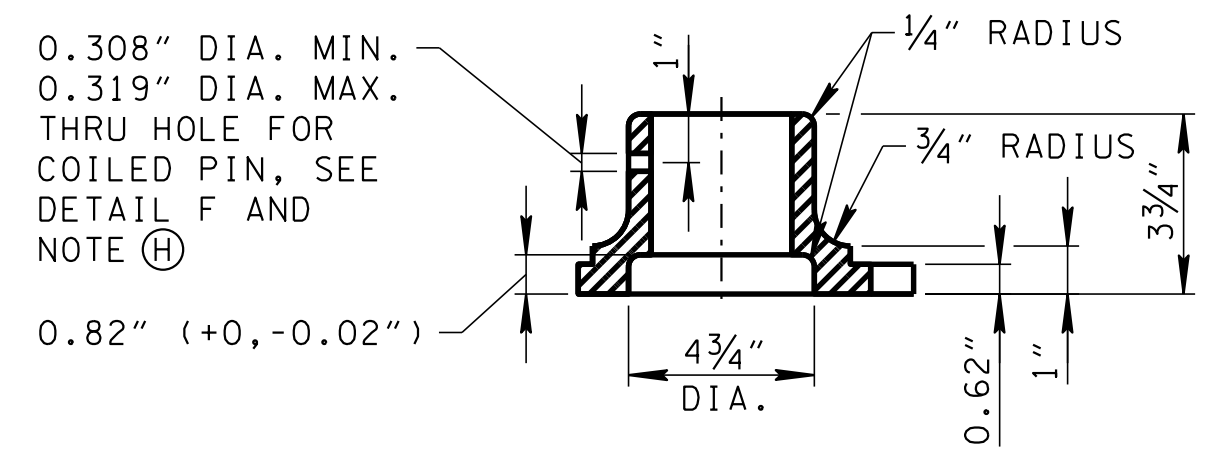
**DETAIL B**  
STUB POST



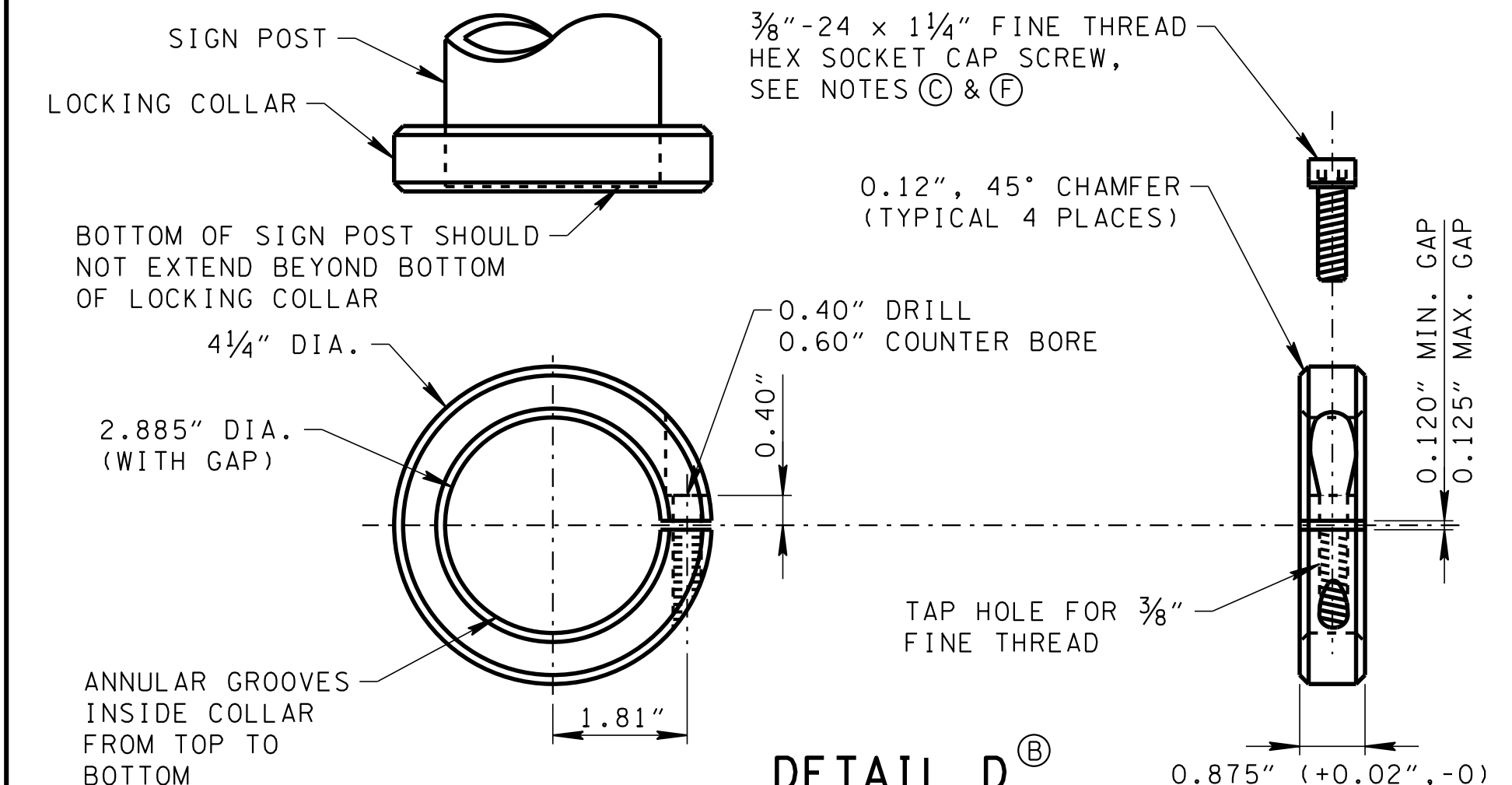
**DETAIL G**  
BOLT-DOWN ANCHOR INTO EXISTING CONCRETE



**DETAIL C**  
SLIP BASE CASTING



**SECTION H-H**



**DETAIL D**  
LOCKING COLLAR

SCH. 40 STEEL PIPE SHALL CONFORM TO ASTM A53 GR. B, A500 GR. B, OR A501. GALVANIZE ACCORDING TO ASTM A123 AFTER FABRICATION.

**GENERAL NOTES**

- (A) FURNISH SLIP BASE CASTING FABRICATED FROM DUCTILE IRON CONFORMING TO ASTM A 536 GRADE 65-45-12 AND GALVANIZED ACCORDING TO ASTM A 153, CLASS A. IF FABRICATION CONSISTS OF STEEL, IT SHALL CONFORM TO ASTM A36 OR A572.
- (B) FURNISH LOCKING COLLAR MACHINED FROM STEEL BAR CONFORMING TO ASTM A 108 GRADE 12L14, STEEL BAR CONFORMING TO ASTM A 576 GRADE 12L14 OR 1026, OR STEEL TUBING CONFORMING TO ASTM A 519 GRADE 12L14 OR 1026, AND ELECTRODEPOSITED ZINC COATED AND SUPPLEMENTAL CHROMATE CONVERSION COATED TO ASTM B 633 CLASS FE/ZN 12 TYPE II.
- (C) FURNISH HEX SOCKET CAP SCREW MANUFACTURED ACCORDING TO ASTM A 574 WITH ELECTRODEPOSITED ZINC COATING AND SUPPLEMENTAL CHROMATE CONVERSION COATING TO ASTM B 633 CLASS FE/ZN 12 TYPE II.
- (D) CENTER HOLES IN THE SLIP BASE AND BOLT-DOWN ANCHOR ARE FOR GALVANIZING VENTING AND DRAINAGE. EXACT HOLE PLACEMENT MAY VARY AS NEEDED.
- (E) USE BOLT-DOWN ANCHOR FOR INSTALLATIONS ON EXISTING CONCRETE SURFACES.
- (F) TIGHTEN HEX SOCKET CAP SCREW TO 60 FOOT-POUNDS. DO NOT OVERTIGHTEN.
- (G) TIGHTEN SLIP BASE BOLTS TO BETWEEN 40 AND 80 FOOT-POUNDS. TIGHTEN ALL BOLTS EVENLY BY WORKING AROUND THE SUPPORT IN APPROXIMATELY 10 FOOT-POUND INCREMENTS TO ASSURE BALANCED TENSION IN THE BOLTS. TIGHTEN ALL THREE BOLTS TO THE SAME TORQUE. DO NOT OVERTIGHTEN.
- (H) AFTER TIGHTENING SLIP BASE BOLTS, DRILL A 5/16 INCH DIAMETER HOLE IN THE PIPE THROUGH THE HOLE IN THE SLIP BASE CASTING, AND DRIVE IN THE COILED PIN TO PREVENT PIPE TWISTING IN THE SLIP BASE. DRIVE THE COILED PIN IN, SUCH THAT APPROXIMATELY 1/4 TO 3/8 INCHES OF THE PIN REMAINS PROTRUDING BEYOND THE OUTSIDE DIAMETER OF THE SLIP BASE CASTING. THE COILED PIN SHALL BE STANDARD DUTY, STAINLESS STEEL.
- (I) MULTI-DIRECTIONAL SLIP BASE BREAKAWAY STRUCTURAL PIPE SIGN SUPPORT STANDARD SHALL BE USED FOR ALL STRUCTURAL PIPE SIGN POSTS LOCATED WITHIN THE CLEAR ZONE AND NOT PROTECTED BY AN APPROVED BARRIER SYSTEM.
- (J) POST STUB HEIGHT SHALL BE 4 INCHES OR LESS ABOVE FINISHED GROUND SURFACE.
- (K) ALL FINISHED COMPONENTS OF THE SLIP BASE SYSTEM SHALL BE PERMANENTLY MARKED TO INDICATE THE MANUFACTURER, METHOD, DESIGN, AND LOCATION OF MARKING SHALL BE AS APPROVED BY THE ENGINEER.
- (L) ANCHORS MAY BE EXPANSION TYPE AS SHOWN OR ADHESIVE TYPE LISTED ON THE OPL MEETING THE STRENGTH REQUIREMENTS. EXPANSION ANCHORS SHALL CONSIST OF 5/8 INCH DIAMETER STUD BOLT WITH UNC-SERIES BOLT THREADS ON THE UPPER END WITH HEAVY HEX NUT PER ASTM A563, AND HARDENED WASHER PER ASTM F436. THE STUD BOLT SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI AND ULTIMATE TENSILE STRENGTH OF 75 KSI.
- (M) INSTALL MULTI-DIRECTIONAL SLIP BASE STRUCTURAL SIGN SUPPORT SYSTEM AS SHOWN OR APPROVED EQUAL. ONLY THOSE SYSTEMS APPROVED BY FHWA ACCEPTANCE LETTER AND FOUND ON THE TDOT OPL SHALL BE USED.
- (N) SCHEDULE 80 PIPE SPECIFICATIONS (SIGN POST):  
2.875" OUTSIDE DIAMETER  
0.276" NOMINAL WALL THICKNESS  
STEEL TUBING PER ASTM A500 GRADE C  
OTHER SEAMLESS OR ELECTRIC-RESISTANCE WELDED STEEL TUBING OR PIPE WITH EQUIV. OUTSIDE DIA. AND WALL THICKNESS MAY BE USED IF THEY MEET THE FOLLOWING:  
46,000 PSI MINIMUM YIELD STRENGTH, 62,000 PSI MINIMUM TENSILE STRENGTH  
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
- (O) TO PAID FOR UNDER ITEM NO 713-11.23 ROUND POST SLIP BASE PER EACH (INCLUDES COST OF SLIP BASE AND STUB)

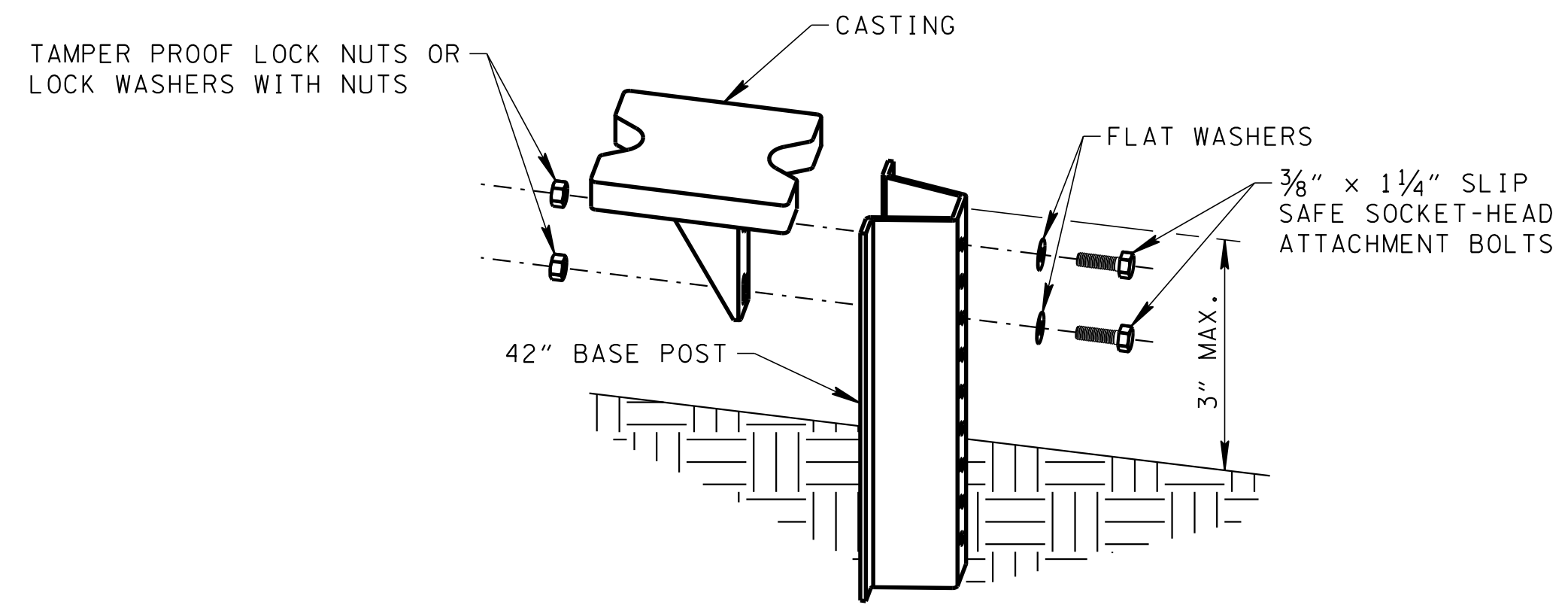
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

**MULTI-DIRECTIONAL  
SLIP BASE BREAKAWAY  
STRUCTURAL PIPE  
SIGN SUPPORT**

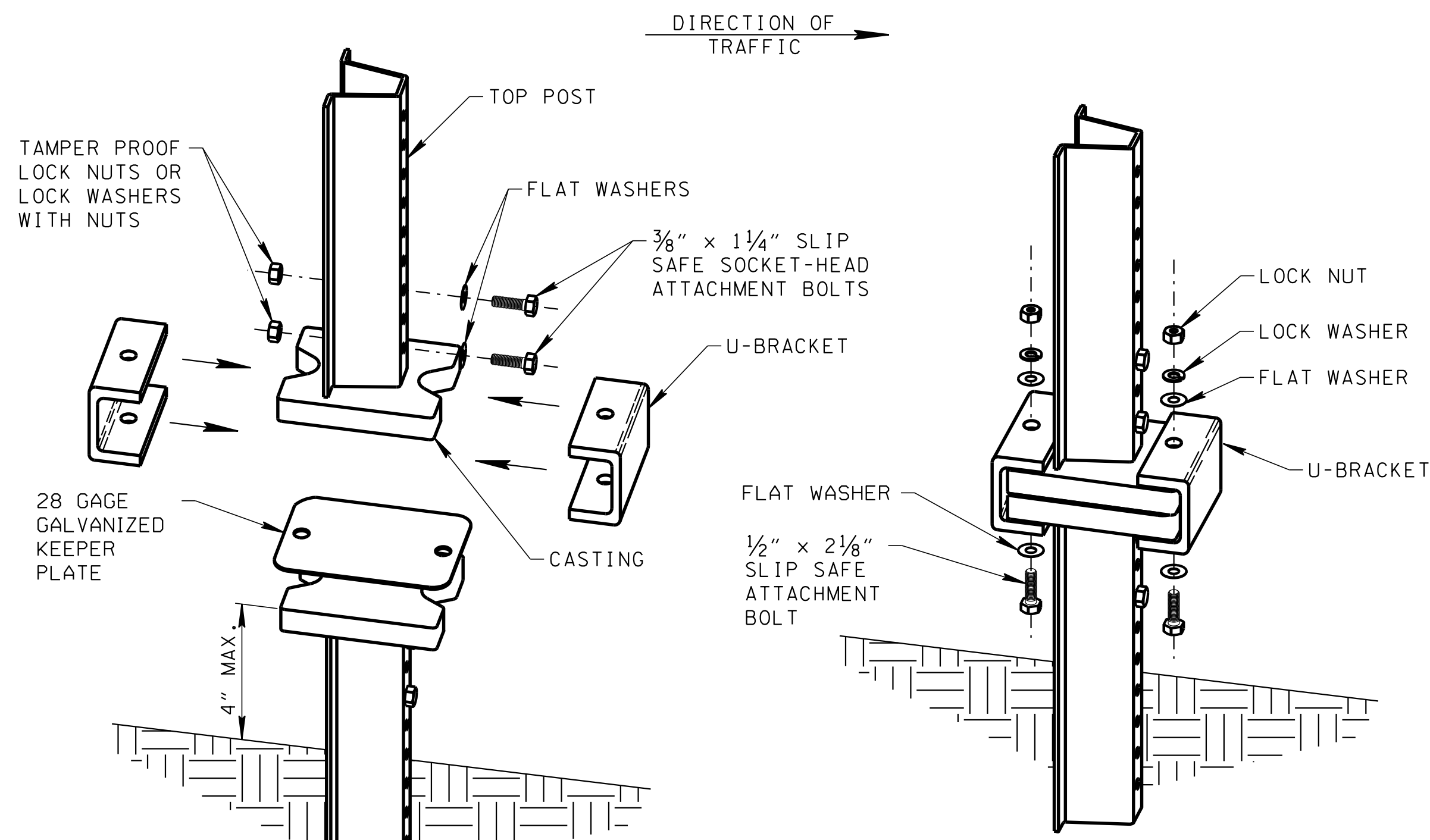
**MULTI-DIRECTIONAL BREAKAWAY SLIP BASE** <sup>ⓓ</sup>ⓔⓀ

**SINGLE-DIRECTIONAL BREAKAWAY LAP SPLICE** <sup>ⓓ</sup>



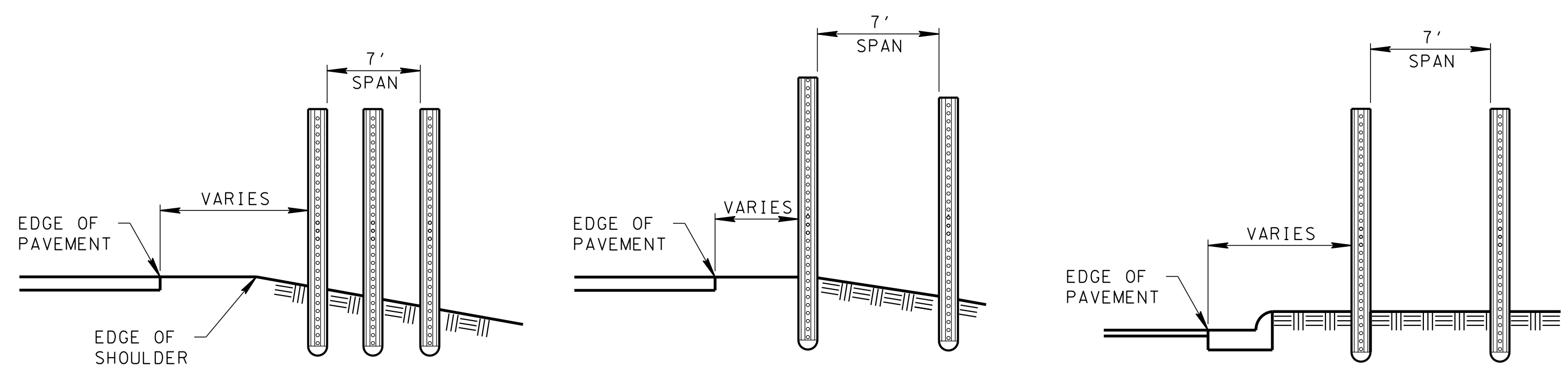
NOTE: BOLTS SHOULD BE TIGHTENED 1/2 TO 3/4 TURN AFTER SNUG.

**STEP 1**



NOTE: TIGHTEN NUTS 1/2 TO 1/2 TURN AFTER SNUG.

**STEP 3**



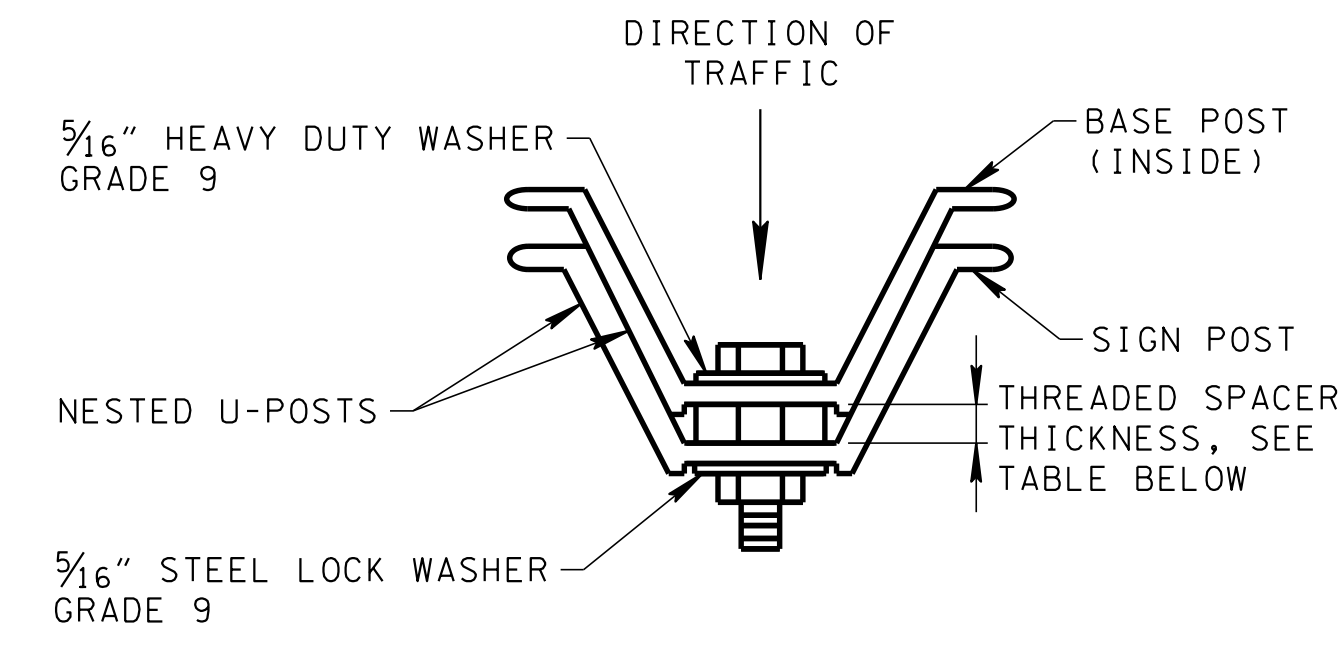
3 LB/FT BREAKAWAY POSTS  
3 POSTS WITHIN 7' SPAN

3 LB/FT POSTS  
WITH OR WITHOUT BREAKAWAY POSTS  
2 POSTS WITHIN 7' SPAN

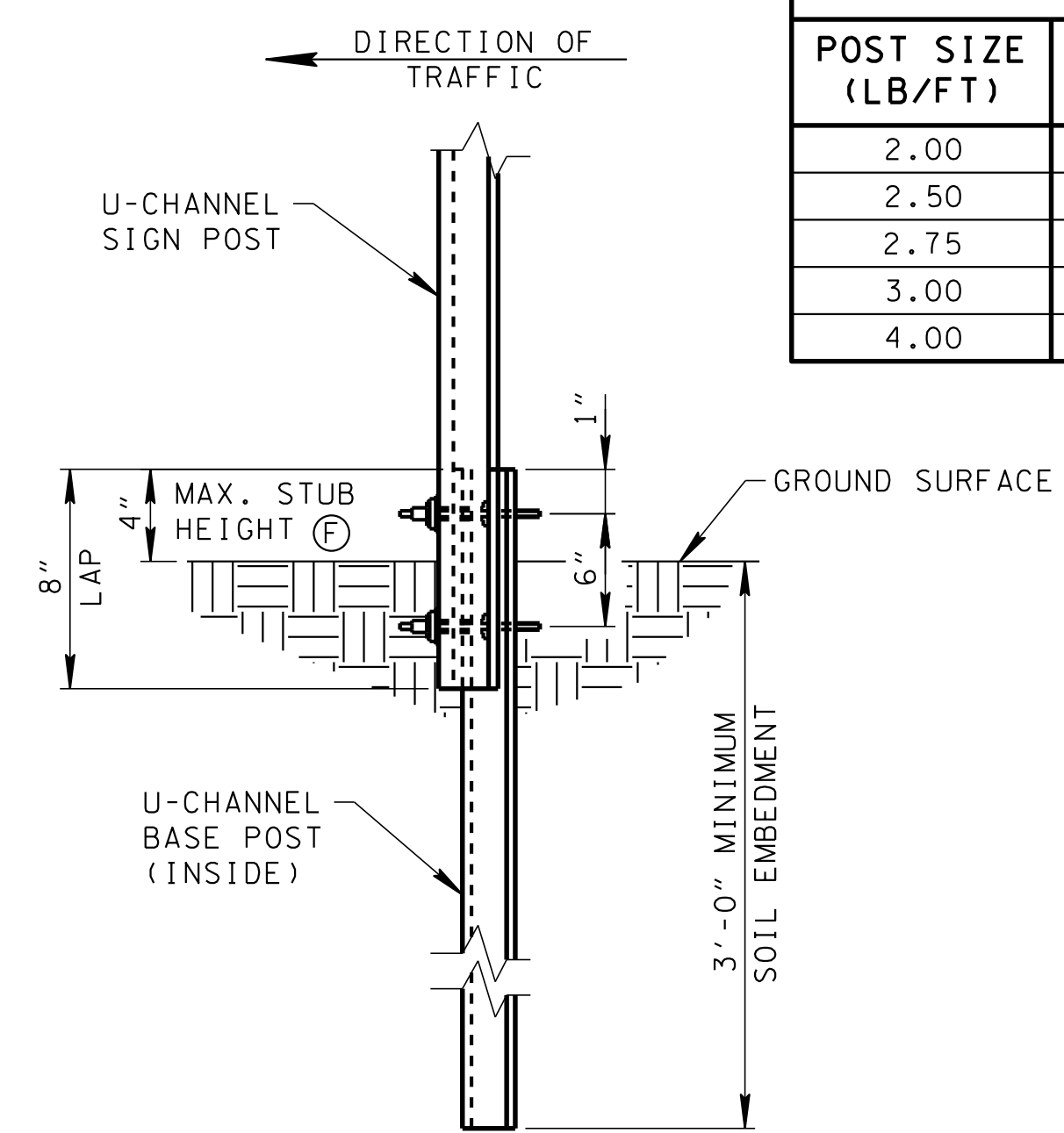
4 LB/FT BREAKAWAY POSTS  
2 POSTS WITHIN 7' SPAN

**TYPICAL U-POST INSTALLATION DETAILS** <sup>ⓓ</sup>ⓔ

**FLORIDA LAP SPLICE**



**SECTION (THRU BREAKAWAY SPLICE)**

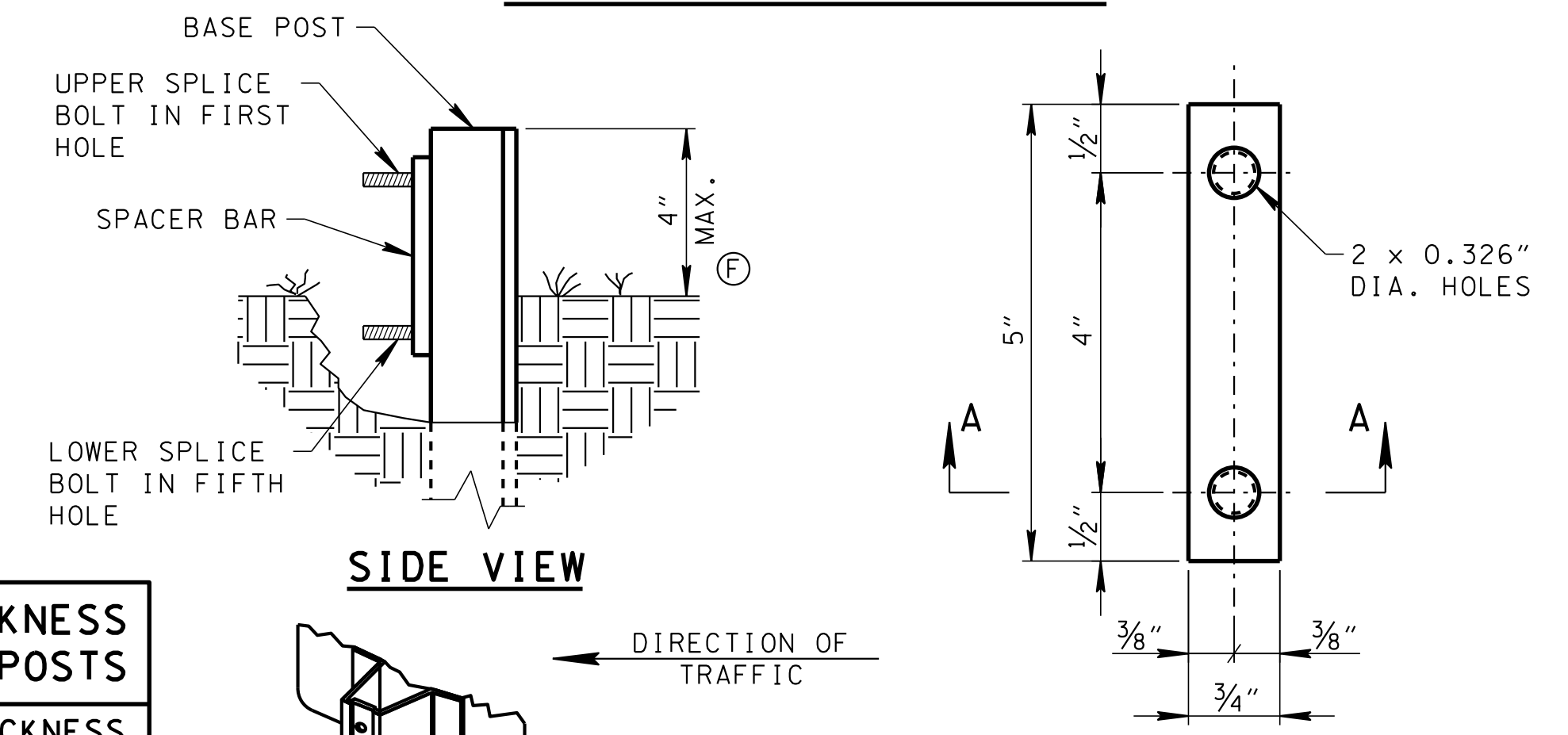


**ELEVATION**

| SPACER THICKNESS FOR NESTED POSTS |                    |
|-----------------------------------|--------------------|
| POST SIZE (LB/FT)                 | THICKNESS (INCHES) |
| 2.00                              | 3/8                |
| 2.50                              | 5/16               |
| 2.75                              | 1/4                |
| 3.00                              | 5/8                |
| 4.00                              | 1/2                |

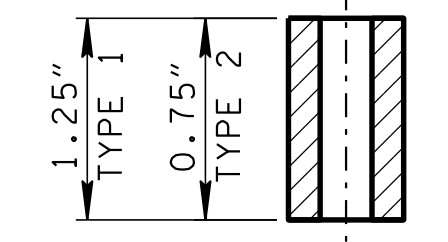
**ELEVATION**

**SPACER BAR ALTERNATE**

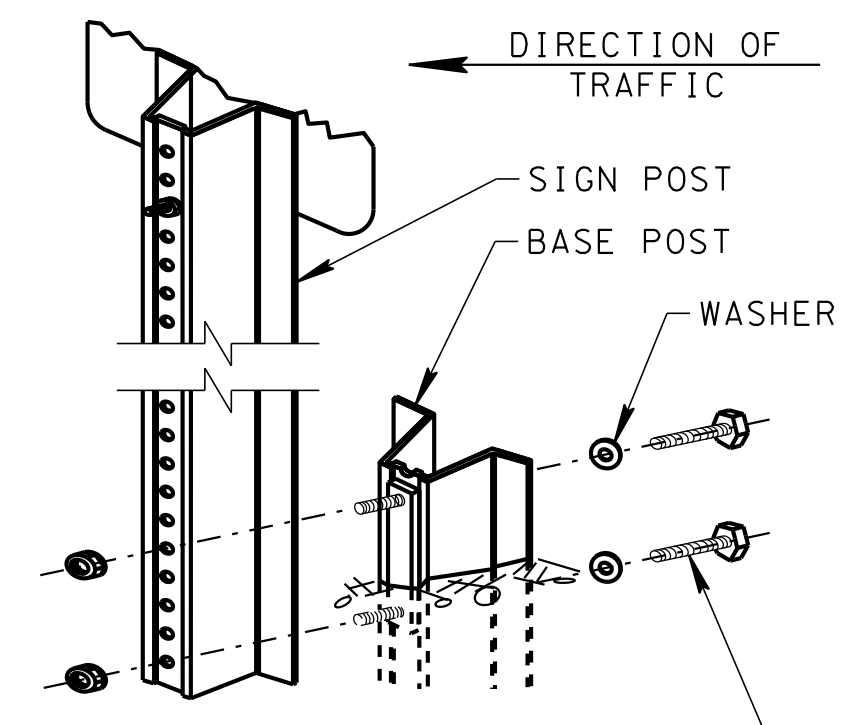


**SIDE VIEW**

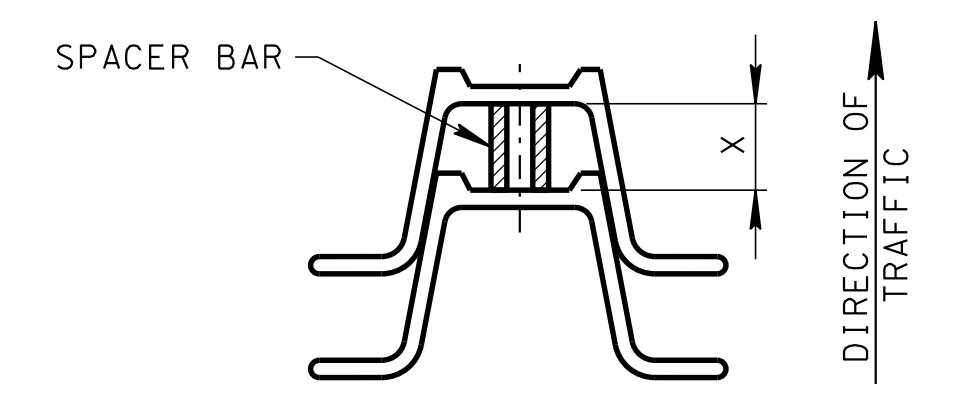
**SPACER BAR ELEVATION**



**SECTION A-A**



**ISOMETRIC VIEW**



**SECTION (THRU SPACER BAR)**

NOTE: WHEN 'X' IS GREATER THAN 3/4", USE TYPE 1 SPACER BAR  
WHEN 'X' IS 3/4" OR LESS, USE TYPE 2 SPACER BAR

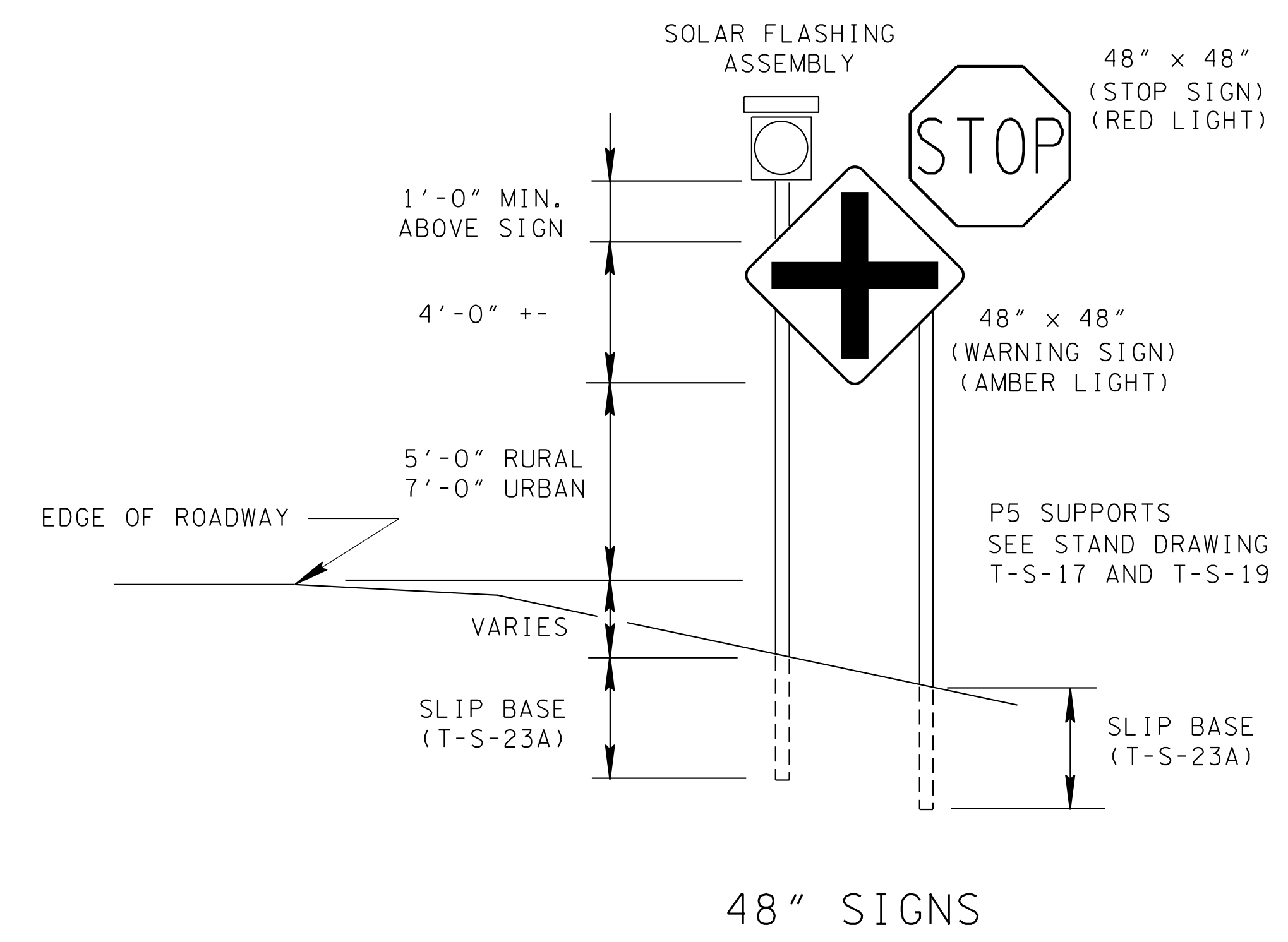
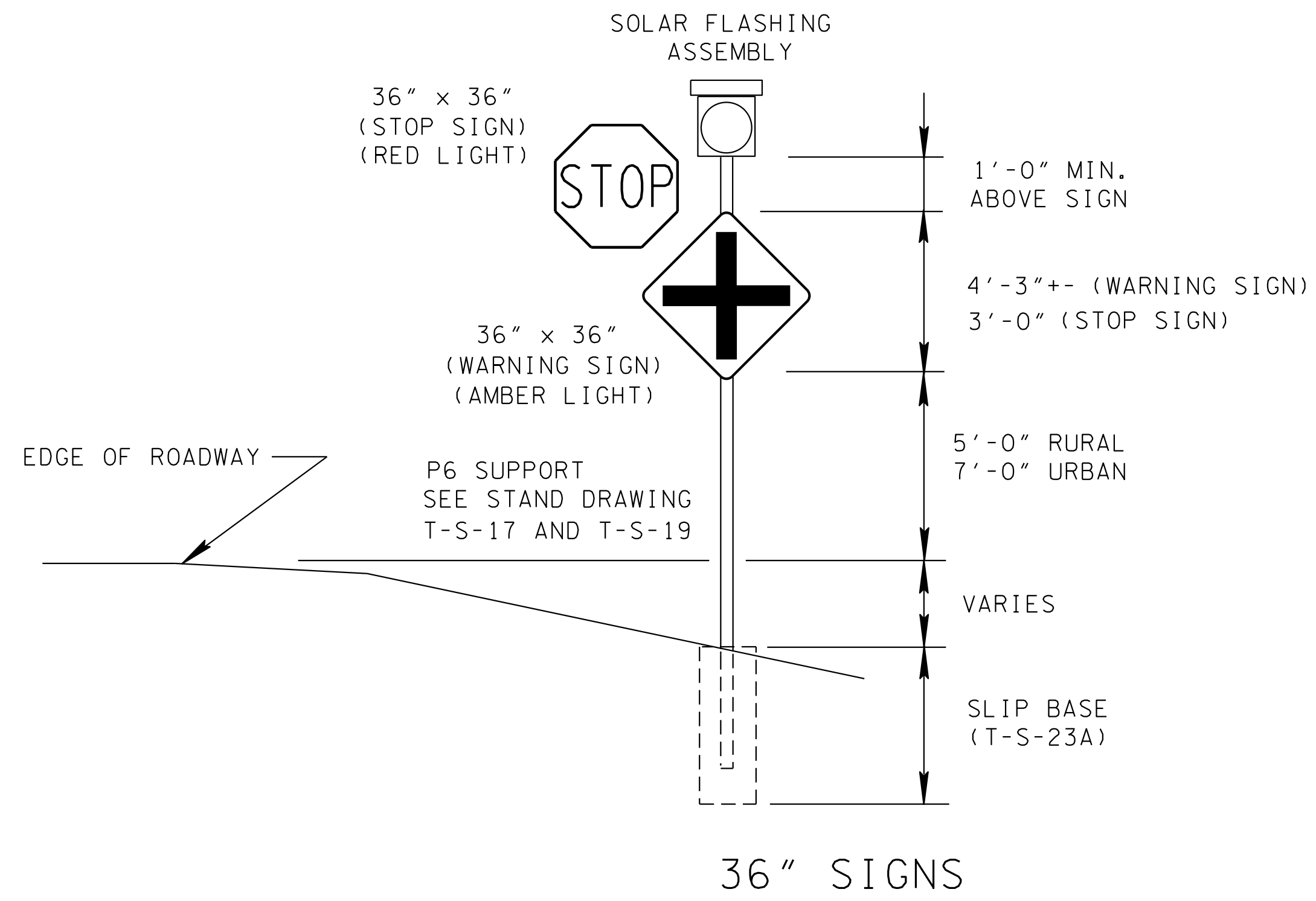
**GENERAL NOTES**

- (A) BREAKAWAY SIGN SUPPORTS SHALL BE USED ON ALL SIGN POSTS LOCATED WITHIN THE CLEAR ZONE OF A ROADWAY AND NOT PROTECTED BY AN APPROVED BARRIER SYSTEM.
- (B) SINGLE OR DOUBLE POSTS SIZED 3 LBS/FT OR SMALLER WITH A 7-FOOT CLEAR SPAN BETWEEN DOUBLE POSTS MAY BE DIRECT DRIVEN, AS THE POSTS ALONE ARE CONSIDERED BREAKAWAY PER FHWA. ALL TRIPLE U-POST INSTALLATIONS OF ANY SIZE POST, AND ALL 4 LBS/FT U-POST (MEMBER DESIGNATION U7 ON T-S-19) INSTALLATIONS OF ANY NUMBER OF POSTS, SHALL UTILIZE AN APPROVED BREAKAWAY SYSTEM. MULTI-DIRECTIONAL OR LAP-SPLICE SYSTEMS MAY BE USED, EXCEPT WHERE NOTED OTHERWISE, OR AS DIRECTED BY THE ENGINEER.
- (C) NO MORE THAN 2 SIGN POSTS OF ANY GAGE SHALL BE LOCATED WITHIN A 7-FOOT CIRCLE.
- (D) MULTI-DIRECTIONAL BREAKAWAY SLIP BASE SHALL BE USED AT LOCATIONS WHERE THE POSSIBILITY EXISTS OF THE SIGN BEING HIT FROM ANY DIRECTION. ALL U-POST SIGNS LOCATED IN ISLANDS, AT INTERSECTIONS, OR LOCATED ALONG THE OUTSIDE OF A HORIZONTAL CURVE SHALL BE EQUIPPED WITH A BREAKAWAY SYSTEM, REGARDLESS OF THE NUMBER OF POSTS OR SPACING.
- (E) ALL SIGN PANELS PLACED PARALLEL TO THE DIRECTION OF TRAFFIC FLOW (SUCH AS ONE-WAY SIGNS ON A DIVIDED HIGHWAY) SHALL BE MOUNTED ON A MULTI-DIRECTIONAL BREAKAWAY SYSTEM.
- (F) BASE POST STUB HEIGHT SHALL BE 4 INCHES OR LESS ABOVE FINISHED GROUND SURFACE. WHEN DRIVING THE STUB POST, A DRIVE CAP OR OTHER ACCEPTABLE MEANS SHALL BE USED TO PROTECT THE TOP OF THE STUB POST FROM DAMAGE.
- (G) ALL FINISHED COMPONENTS OF THE SLIP BASE SYSTEM SHALL BE PERMANENTLY MARKED TO INDICATE THE MANUFACTURER, METHOD, DESIGN, AND LOCATION OF MARKING SHALL BE AS APPROVED BY THE ENGINEER.
- (H) THE STUB POST AND THE U-CHANNEL POST SHALL BE OF THE SAME SIZE (LB/FT) AND FROM THE SAME MANUFACTURER.
- (I) INTERMIXING OF U-CHANNEL POSTS WITH PERFORATED SQUARE TUBE POSTS AT ANY SIGN INSTALLATION LOCATION WILL NOT BE ALLOWED.
- (J) FOR BASE STUB AND U-POST MATERIAL PROPERTIES, SEE STANDARD DRAWING T-S-19. FOR DETAILS OF SIGN CONNECTION TO U-POST, SEE OTHER T-S-SERIES STANDARDS.
- (K) INSTALL MULTI-DIRECTIONAL SLIP BASE STRUCTURAL SIGN SUPPORT SYSTEM AS SHOWN OR APPROVED EQUAL. ONLY THOSE SYSTEMS APPROVED BY FHWA ACCEPTANCE LETTER AND FOUND ON THE TDOT OPL SHALL BE USED.
- (L) STEEL U-POSTS, BASE POSTS, SLIP BASES, AND HARDWARE SHALL BE SELECTED FROM THE OPL.
- (M) TO PAID FOR UNDER ITEM NO. 713-1.22 U POST SLIP BASE PER EACH (INCLUDES COST OF SLIP BASE AND STUB)

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

**BREAKAWAY U-POST SIGN SUPPORTS**



SIGN SUPPORT WEIGHT PER FOOT

|                   |                   |
|-------------------|-------------------|
| P5<br>3.141 LB/FT | P6<br>4.006 LB/FT |
|-------------------|-------------------|

GENERAL NOTES

- (A) SOLAR FLASH ASSEMBLY INCLUDING SOLAR PANEL AND ALL ELECTRONICS ARE TO BE HOUSED IN A COMPACT ENCLOSURE LOCATED ABOVE TRAFFIC SIGNAL MODULE
- (B) FLASH PATTERN TO BE M.U.T.C.D. COMPLIANT. LIGHT BEAM TO BE HIGH INTENSITY LED. LIGHT COLOR TO BE AMBER OR RED DEPENDING ON THE SIGN. LIGHT SIZE TO BE 12" DIA. AND THE SIGNAL HEAD SHALL BE BLACK. BATTERY LIFE SPAN TO BE A MINIMUM OF 3 YEARS.
- (C) SHALL INCLUDE MOUNTING BRACKET FOR P5 AND P6 SQUARE TUBE POST.
- (D) WARRANTY SHALL BE MANUFACTURER STANDARD OR 2 YEARS WHICHEVER IS GREATER.
- (E) SIGN WITH SOLAR FLASHING LIGHT ASSEMBLY SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS:
 

|           |   |
|-----------|---|
| 713-11.02 | PERFORATED/KNOCKOUT SQUARE TUBE POST PER LB     |
| 713-11.21 | P POST SLIP BASE PER EACH                       |
| 713-13.03 | FLAT SHEET ALUMINUM SIGNS (0.100" THICK) PER SF |
| 730-26.07 | FLASHING WARNING BEACON (RED) PER EACH          |
| 730-26.08 | FLASHING WARNING BEACON (AMBER) PER EACH        |

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

DETAILS OF  
SIGN WITH  
SOLAR FLASHING  
ASSEMBLY