

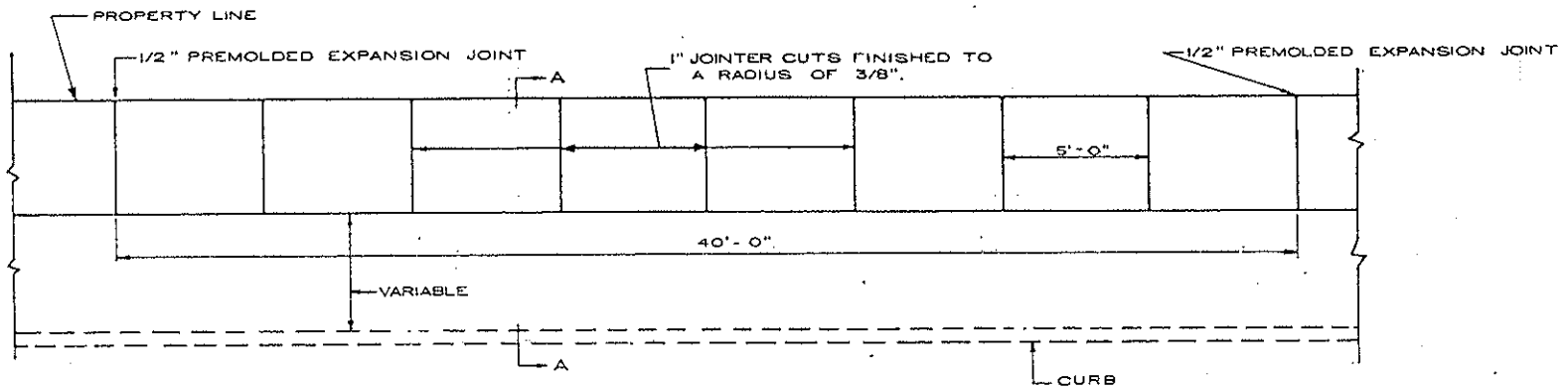
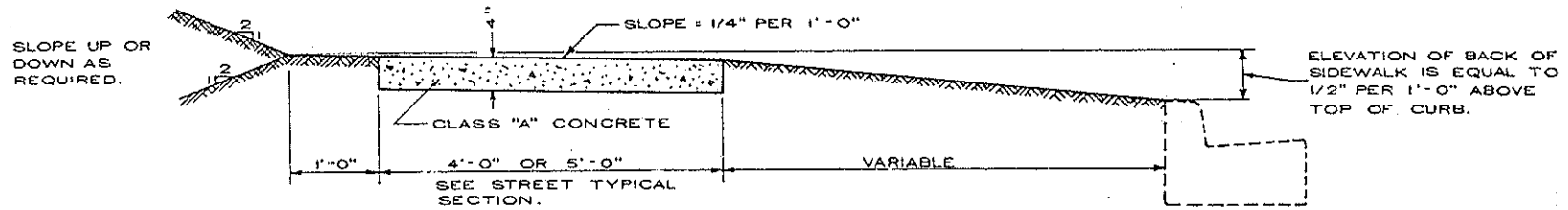
STANDARD DRAWINGS

SOUTHWEST OHIO ENGINEERING ASSOCIATION

PARTICIPATING MUNICIPALITIES

CITY OF CENTERVILLE	CITY OF OAKWOOD
CITY OF EATON	CITY OF SIDNEY
CITY OF ENGLEWOOD	CITY OF TRENTON
CITY OF FAIRBORN	CITY OF TROTWOOD
CITY OF GREENVILLE	CITY OF VANDALIA
CITY OF LEBANON	CITY OF WILMINGTON
CITY OF MASON	MONTGOMERY COUNTY ENGINEER
CITY OF MIAMISBURG	VILLAGE OF BROOKVILLE
CITY OF MORaine	VILLAGE OF PHILLIPSBURG

PREPARED BY
KRAFT - SHAW - WEISS & ASSOCIATES
CONSULTING ENGINEERS
DARTON, OHIO
MARCH, 1976

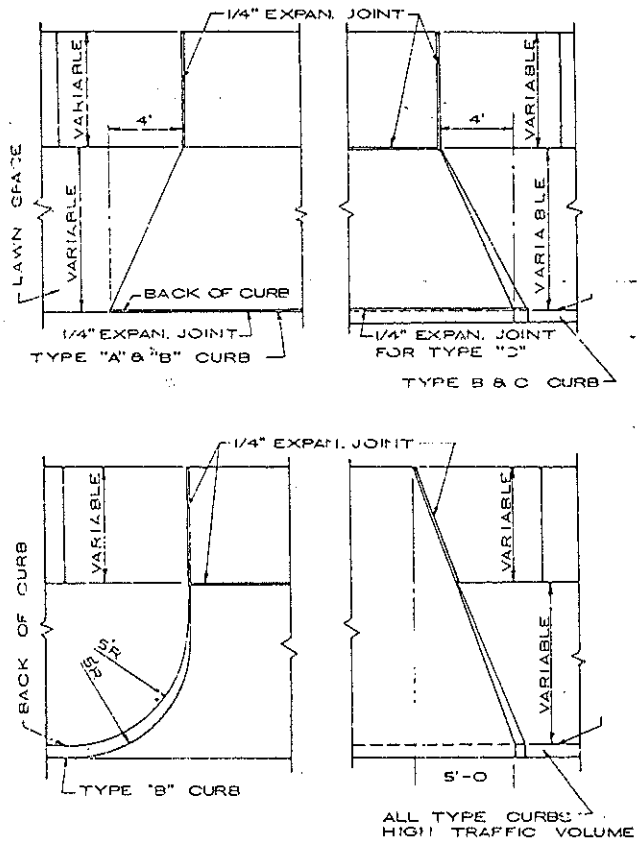


NOTES

1. PROVIDE BROOM FINISH TO ALL EXPOSED SURFACES.
2. CONCRETE SHALL CONFORM TO ITEM 500, CAST IN PLACE CONCRETE.
3. PROVIDE A MINIMUM OF 2" EDGING AROUND ALL EXPOSED SURFACES.

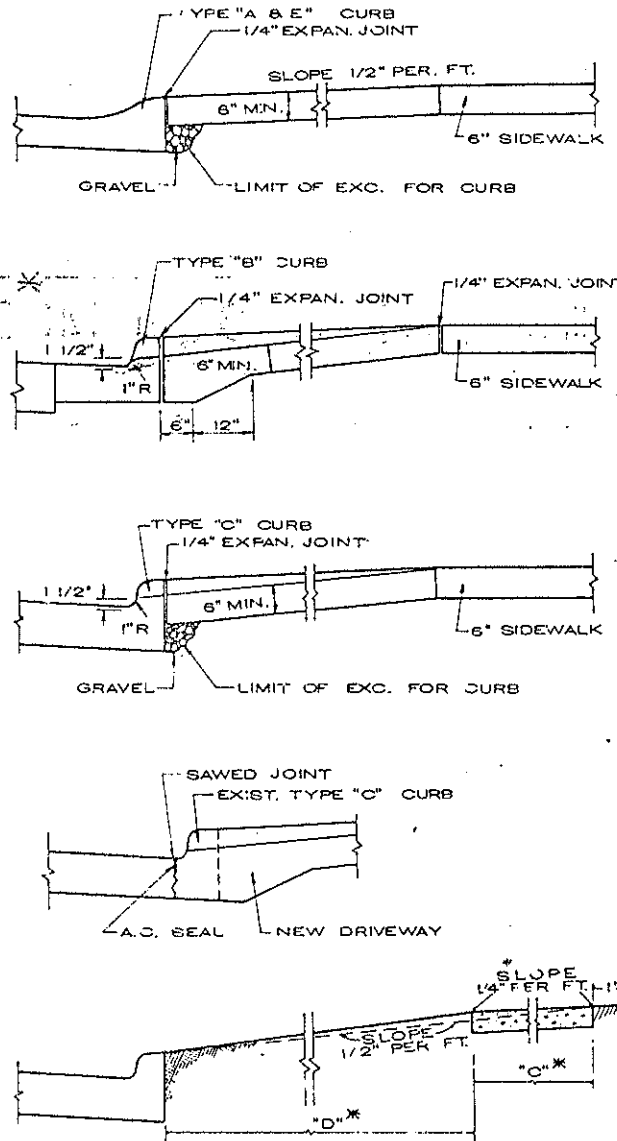
CONCRETE SIDEWALK DETAIL

PLAN VIEWS



- NOTE:**
- HIGH TRAFFIC VOLUME DRIVE APPROACHES SHALL BE USED ONLY WITH THE APPROVAL OF THE ENGINEER.
 - THE DRIVE APPROACH FLARES SHOWN ABOVE SHALL BE USED ONLY WITH THE TYPE OF CURB INDICATED.
 - FOR COMMERCIAL SERVICE DRIVE ENTRANCE, SEE STANDARD DRAWING.

SECTIONS



- GENERAL NOTES:**
- DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ITEM 500 - CAST IN PLACE CONCRETE.
 - ROLL CURBS SHALL NOT BE DE-PRESSED EXCEPT FOR HIGH TRAFFIC VOLUME DRIVE APPROACHES.
 - DRIVE APPROACHES SHALL NOT BE POURED MONOLITHICLY WITH TYPE "B" CURB.
 - MAXIMUM JOINT SPACING SHALL BE 12' LONGITUDINALLY AND TRANSVERSELY.
 - DRIVE APPROACHES SHALL BE KEYPED AT ALL CONSTRUCTION JOINTS.
 - EXPANSION MATERIAL SHALL BE 1/4" PREMOLODED.
 - 3" OF GRAVEL SHALL BE PLACED UNDER DRIVE APPROACHES IF DETERMINED NECESSARY BY THE ENGINEER.
 - PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

- NOTES:**
- WHERE TYPE "C" CURB HAS NOT PREVIOUSLY BEEN DROPPED AT DRIVE APPROACHES, REMOVE AND REPLACE AS SHOWN IN SECTION.
 - WHERE TYPE "B" CURB HAS NOT BEEN DROPPED AT DRIVE APPROACHES, IT SHALL BE ENTIRELY REMOVED AND REPLACED AS SHOWN IN SECTION.
 - WHERE ASPHALTIC CONCRETE PAVEMENT IS DISTURBED, THE ASPHALT SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.

* SEE TYPICAL ROADWAY SECTIONS FOR STD. VALUES

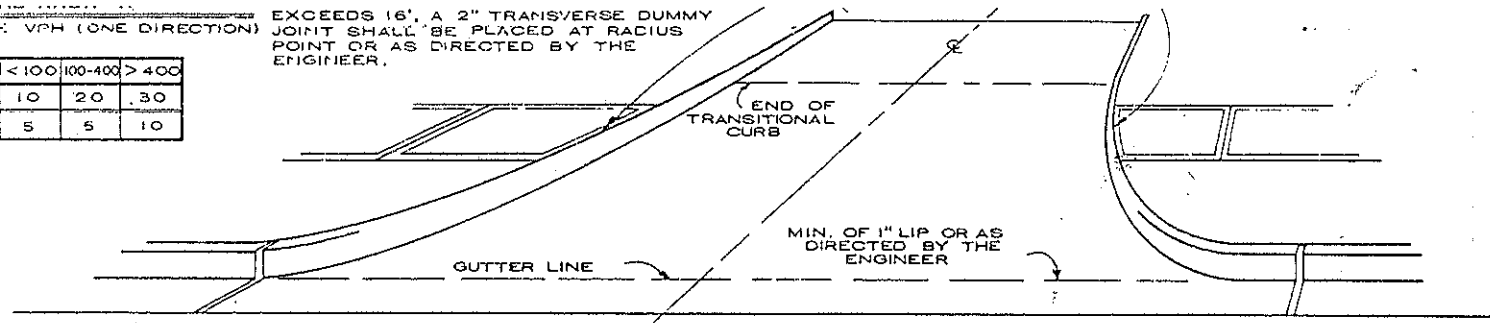
RESIDENTIAL AND COMMERCIAL DRIVEWAY APPROACHES

DRIVE VOLUME, VPH (ONE DIRECTION)

EXCEEDS 16', A 2" TRANSVERSE DUMMY JOINT SHALL BE PLACED AT RADIUS POINT OR AS DIRECTED BY THE ENGINEER.

PEDESTRIAN ACTIVITY

	< 100	100-400	> 400
LOW	10	20	30
HIGH	5	5	10

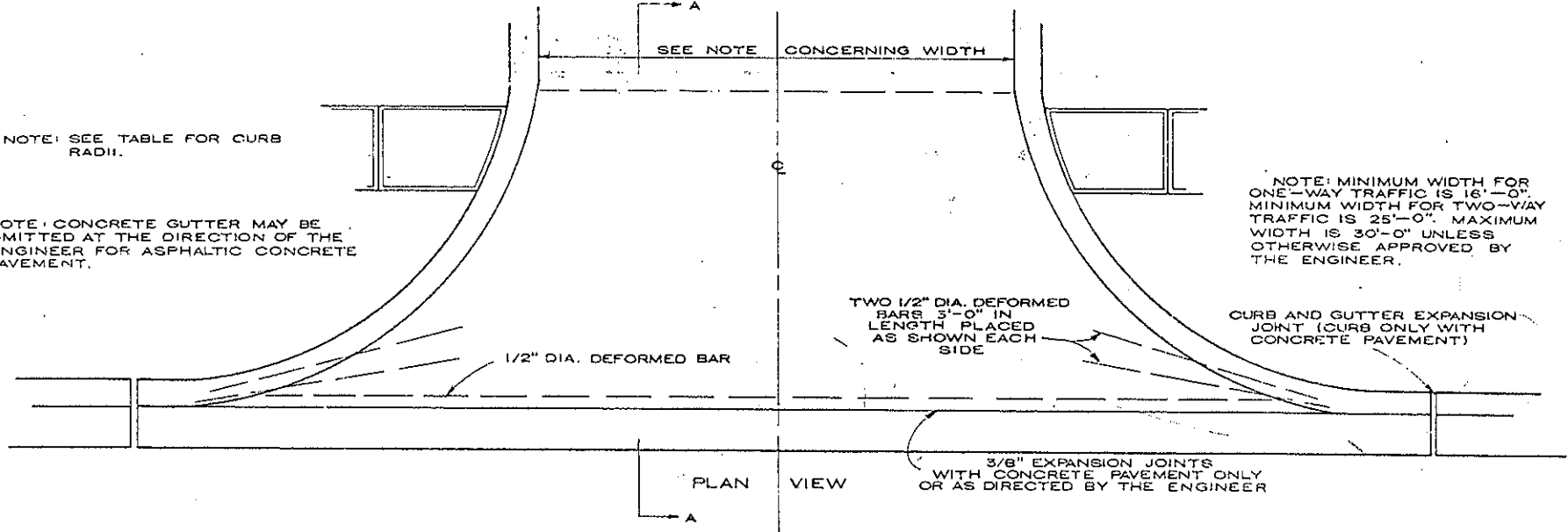


PERSPECTIVE VIEW

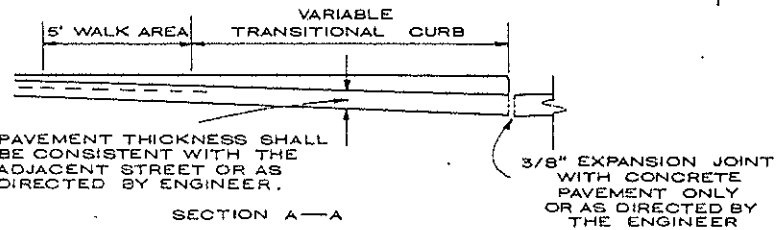
NOTE: SEE TABLE FOR CURB RADIUS.

NOTE: CONCRETE GUTTER MAY BE OMITTED AT THE DIRECTION OF THE ENGINEER FOR ASPHALTIC CONCRETE PAVEMENT.

NOTE: MINIMUM WIDTH FOR ONE-WAY TRAFFIC IS 16'-0". MINIMUM WIDTH FOR TWO-WAY TRAFFIC IS 25'-0". MAXIMUM WIDTH IS 30'-0" UNLESS OTHERWISE APPROVED BY THE ENGINEER.



PLAN VIEW



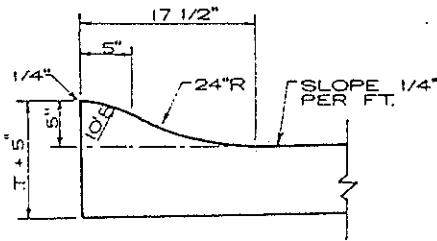
SECTION A—A

PAVEMENT THICKNESS SHALL BE CONSISTENT WITH THE ADJACENT STREET OR AS DIRECTED BY ENGINEER.

GENERAL NOTES

JOINTS SHALL BE CLEANED AND EDGED BY A 1/4" RADIUS EDGER. LONGITUDINAL JOINTS SHALL BE AS DIRECTED BY THE ENGINEER. EXPANSION JOINTS SHALL BE OF SUCH DIMENSIONS AS SHOWN ON STANDARD DRAWINGS FOR CONSTRUCTION JOINTS. MATERIAL SHALL MEET THE REQUIREMENTS OF THESE SPECIFICATIONS.

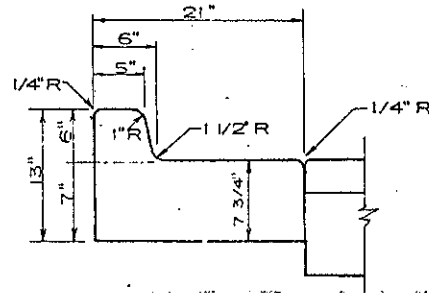
COMMERCIAL SERVICE DRIVE APPROACH



TYPE "A"
INTEGRAL ROLL CURB

NOTE:

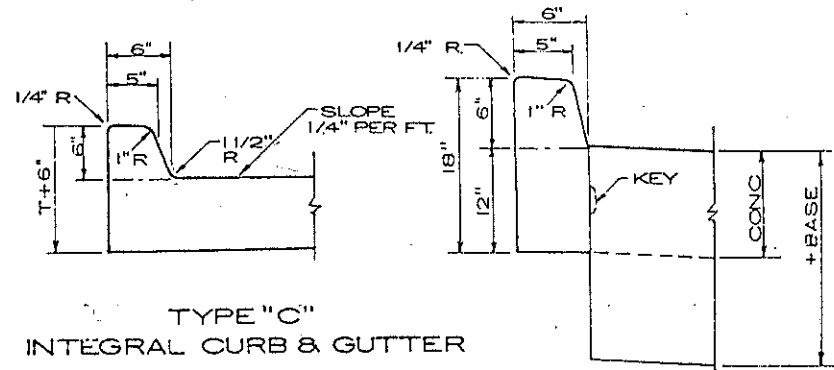
1. USE IN RESIDENTIAL AREAS ON LOCAL STREETS.
2. TRANSVERSE JOINTS SHALL BE EXTENDED THRU THE CURB.



TYPE "B"
COMBINED CURB & GUTTER

NOTE:

1. USE WITH ALL ASPHALT PAVEMENTS
2. 1/4" PREMOLDED EXPANSION JOINTS SHALL BE CONSTRUCTED EACH SIDE OF DRIVE APPROACH SECTIONS AND AT P.C. POINTS AT INTERSECTIONS, BUT THE MAXIMUM SPACING SHALL NOT EXCEED 100'



TYPE "C"
INTEGRAL CURB & GUTTER

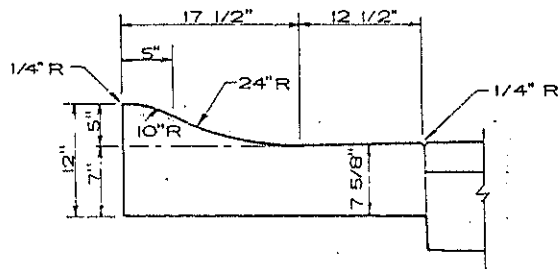
NOTE:

1. USE IN BUSINESS AND INDUSTRIAL AREAS.
2. TRANSVERSE JOINTS SHALL BE EXTENDED THRU THE CURB.

TYPE "D"
MEDIAN CURB

NOTE:

1. USE AROUND ALL MEDIAN SECTIONS.
2. WHEN USED WITH CONCRETE PAVEMENTS, CURB SHALL BE KEYED AND NOT BE INTEGRALLY POURED.



TYPE "E"
COMB. ROLL CURB & GUTTER

NOTE:

1. USE IN RESIDENTIAL AREAS WITH ASPHALT PAVEMENTS ON LOCAL STREETS ONLY.
2. SEE NOTE 2, TYPE "B" FOR JOINTS.

GENERAL NOTES:

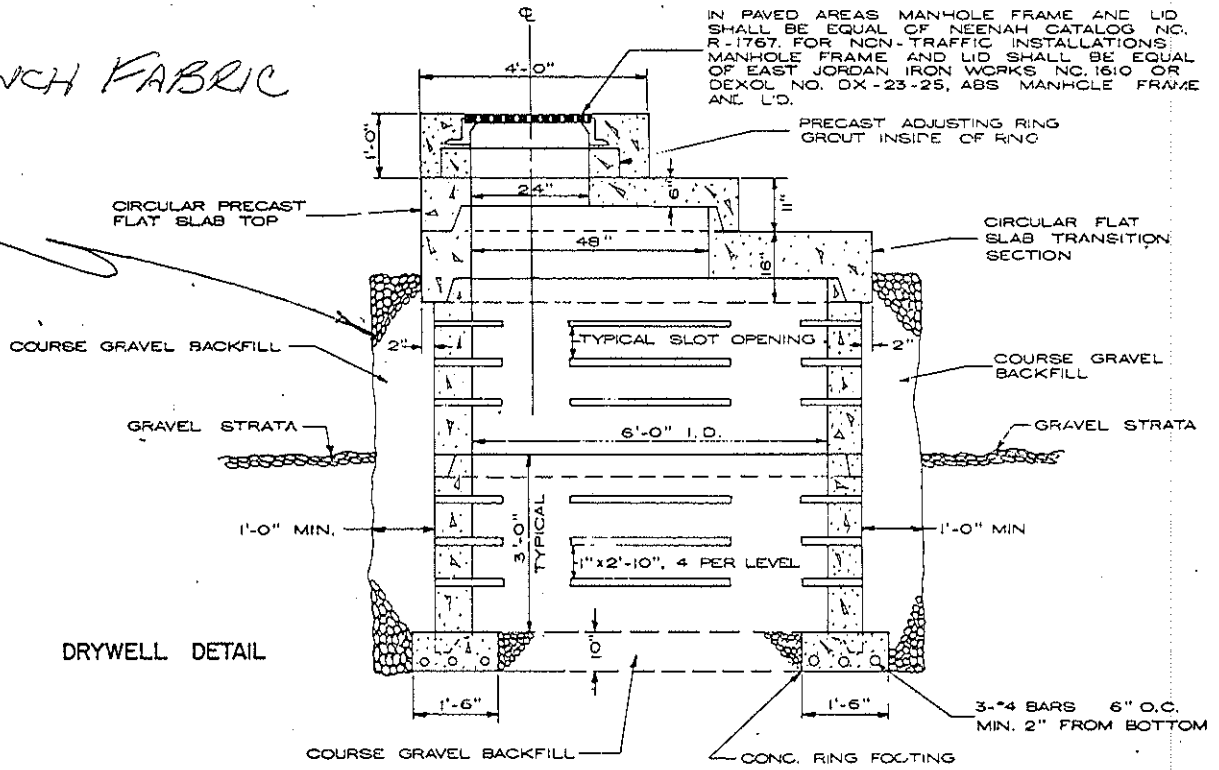
1. CONCRETE SHALL MEET THE REQUIREMENTS SET FORTH IN ITEM 809 - CURBING.
2. WHEN USED WITH ASPHALT PAVEMENTS, TYPE "B, D & E" CURBING SHALL HAVE CONTRACTION JOINTS EVERY 10'. WHEN TYPE "D" CURBING IS USED WITH CONCRETE PAVEMENTS, CONTRACTION JOINTS SHALL BE PLACED OPPOSITE CONTRACTION JOINTS IN THE PAVEMENT.
3. SIX (6) INCHES OF 304 SHALL BE PLACED UNDER TYPE "B, D & E" CURBING WHEN IN A FILL AREA OR AS DIRECTED BY THE ENGINEER.
4. CURBING SHALL BE BACKFILLED IMMEDIATELY AFTER FORMS ARE REMOVED.
5. A MINIMUM SIZE DRAIN TILE OF 2" SHALL BE INSTALLED THRU CURB FOR ALL DOWNSPOUT DRAINS.
6. IN ONE FOOT OR MORE OF FILL PROVIDE REINFORCING STEEL IN CURB SECTION: 3 # 4 BARS @ 8" O.C.
7. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

CONCRETE CURB DETAILS

LINE EXCAVATION
 W/ 50# NEEDLE PUNCH FABRIC
 (NON WOVEN)

NOTES

1. DRYWELL SHALL EXTEND A MINIMUM OF 3'-0" INTO GRAVEL STRATA. EXACT LOCATION OF GRAVEL STRATA SHALL BE DETERMINED IN THE FIELD BY THE PROJECT ENGINEER.
2. THE SMALLEST DRYWELL SHALL CONSIST OF TWO 3'-0" SECTIONS.
3. ADDITIONAL 3'-0" SECTIONS MAY BE REQUIRED DEPENDING UPON THE DEPTH OF THE GRAVEL STRATA.
4. THE CONTRACTOR SHALL, PRIOR TO ORDERING PIPE SECTIONS FOR DRYWELL, SUBMIT TO THE PROJECT ENGINEER, DETAILS OF THE PROPOSED PIPE SECTION FOR HIS WRITTEN APPROVAL. THE PIPE SECTIONS SHALL BE MADE OF REINFORCED CONCRETE.

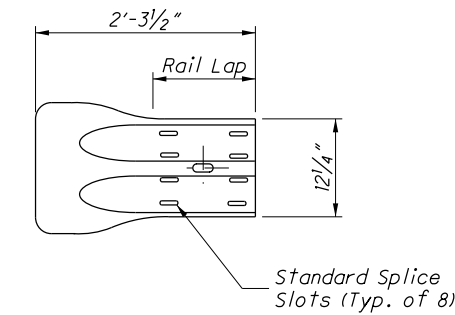
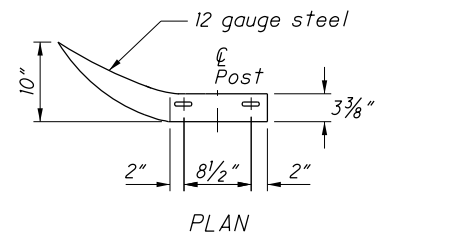


IN PAVED AREAS MANHOLE FRAME AND LID SHALL BE EQUAL OF NEENAH CATALOG NO. R-1767. FOR NON-TRAFFIC INSTALLATIONS; MANHOLE FRAME AND LID SHALL BE EQUAL OF EAST JORDAN IRON WORKS NO. 1610 OR DEKOL NO. DX-23-25, ABS MANHOLE FRAME AND LID.

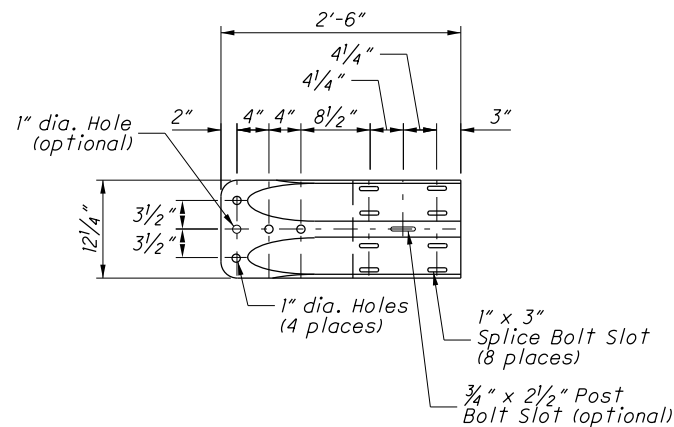
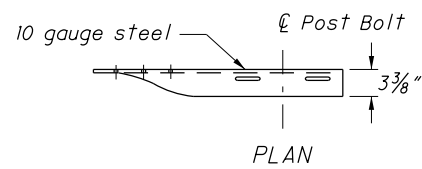
Drywell Specs:

- #2 Stone required for general backfill

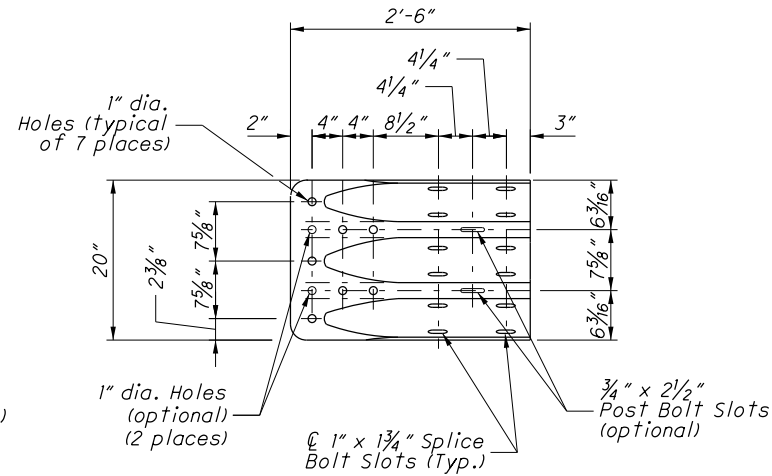
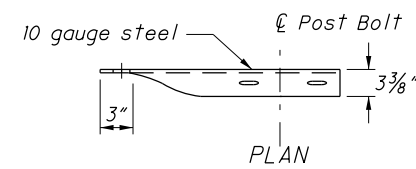
Adjusting Ring USF NO.	COVER DIAMETER	COVER THICKNESS	HEIGHT ADJUSTMENT	FITS WITH USF RING NO.
2330	22w	2	2	240, 310, 355, 420, 465, 485
2332	31b	1	2	651, 652
2333	31b	1	3	651, 652
2334	231	1	1	571, 664, 668, 669
2335	231	1	2	571, 664, 668, 669
2336	23w	1	2	170, 195, 360, 385, 630
2337	232	1	1	361
2339	22w	2	2	240, 310, 355, 420, 465, 485
2340	23w	1	1	170, 195, 360, 385, 630
2341	25w	1	2	152, 153
2342	25e		2	480
2343	25w	1	1	152, 153
2344	22w	2	4	240, 310, 355, 420, 465, 485
2347	231	2	1	715
* 1" ADJRING-32	22w	2	1	240, 310, 355, 420, 465, 485
* 1" ADJRING-33A	23w	1	1	170, 195, 360, 385, 630



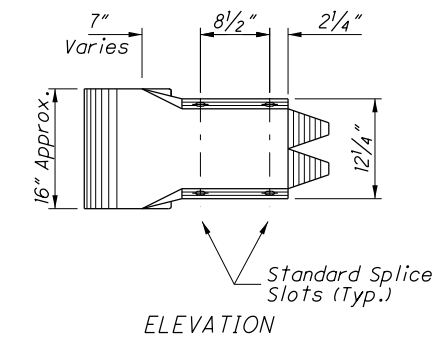
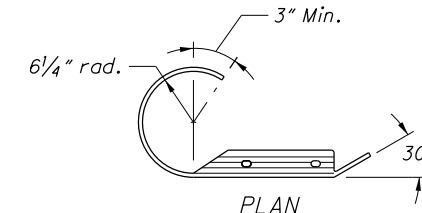
ELEVATION
W-BEAM FLARED END SECTION



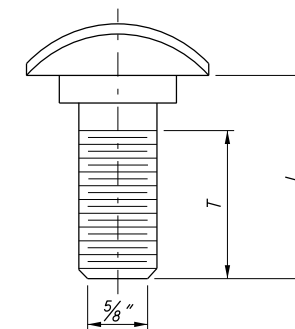
ELEVATION
W-BEAM TERMINAL CONNECTOR



ELEVATION
THRIE-BEAM TERMINAL CONNECTOR



ELEVATION
ROUNDED W-BEAM END SECTION



GUARDRAIL BOLT
(For Post and Splice Bolts)

L	T min.	Bolt Use
22" (Standard Rail)	4"	Type MGS: WP/WB, PB
34" (Barrier Rail)		Type MGS: SP/WB, PB
14"	4"	Type MGS: SP/WB, PB
1 1/4"	1 1/8"	Splice Bolt

WP = Wood Post WB = Wood Blockout
SP = Steel Post PB = Plastic Blockout

Longer Bolt may be needed for round Wood Post larger than 8" dia.

NOTES

GENERAL: Components shown on this drawing are used in a variety of guardrail systems. See individual guardrail drawing for specific applications.

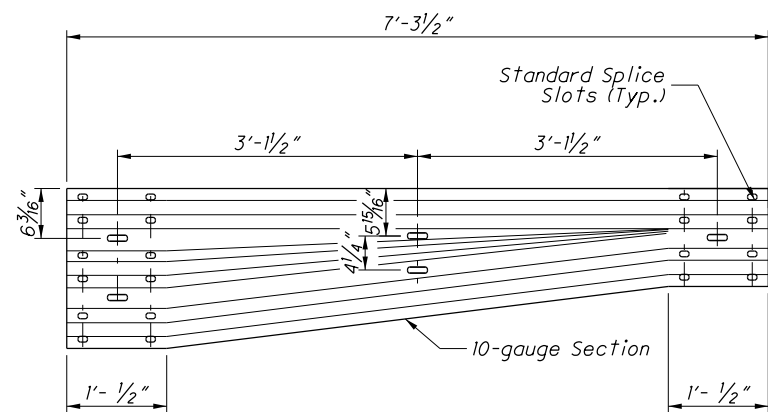
See CMS 606 for guardrail specifications not covered on these drawings.

Refer to AASHTO M 180-12 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts, nuts, and Type 1 W-Beam to Thrie-Beam Transition sections. **Beam washers are not to be used.** Bolts grade shall be ASTM A307.

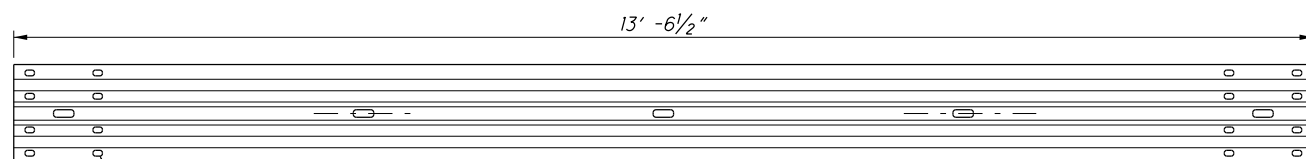
RAIL ELEMENTS: Unless otherwise specified, W-Beam Rail is 12 gauge steel with an effective length of 12'-6" or 25'-0", with 3/32"x1/8" splice bolt slots, and 3/4" x 2 1/2" post bolt slots on 3'-1 1/2" centers regardless of post spacing. Field punch or drill bolt holes or slots for irregularly spaced posts as specified in CMS 606.04.

Substituting one 10 gauge steel beam element where two nested 12 gauge steel beams are specified is permitted (both W-beam and Thrie-beam).

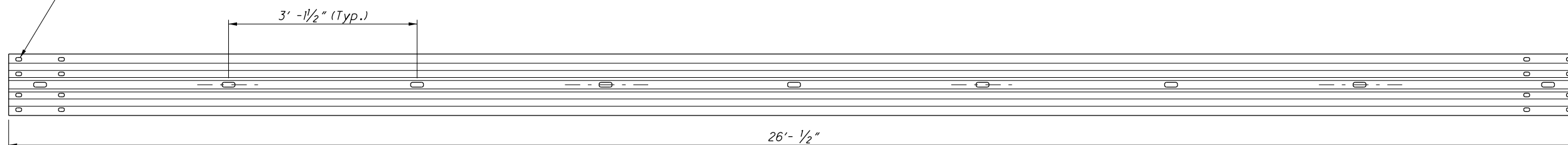
RAIL SPLICES: Lap splices between two rail elements or between a rail and terminal connector in the direction of traffic. Lap the flared end sections in the direction of traffic.



ASYMMETRIC TRANSITION SECTION
(W to Thrie-Beam)



12'-6" W-BEAM SECTION



25'-0" W-BEAM SECTION

THIS DRAWING REPLACES MGS-1.1 DATED 1-18-2013

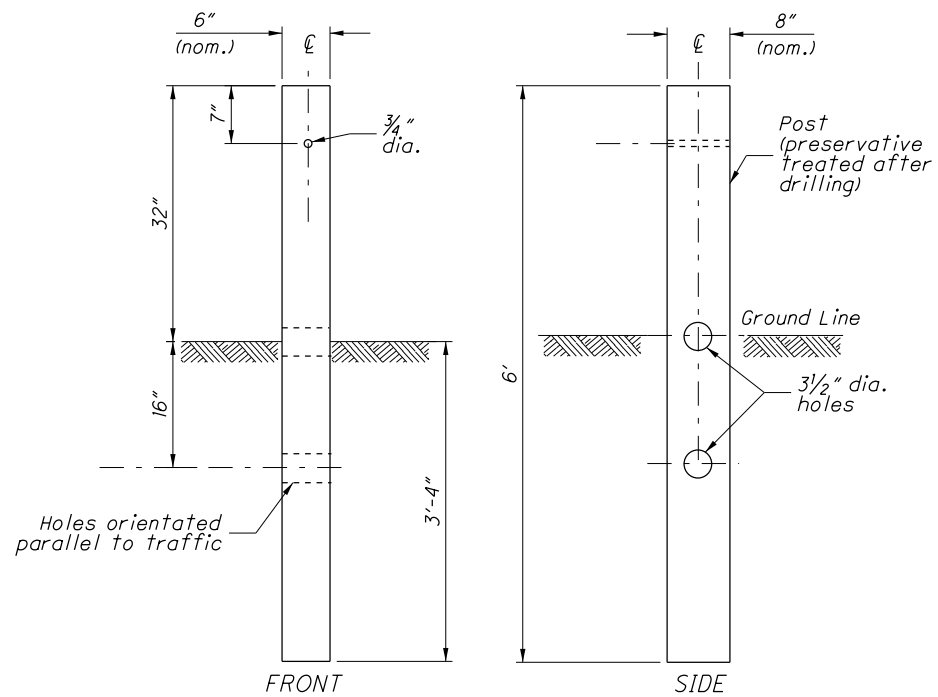
SCD NUMBER
MGS-1.1

STANDARD ROADWAY CONSTRUCTION DRAWING
MIDWEST GUARDRAIL SYSTEM
GUARDRAIL DETAILS
(Rail Components)

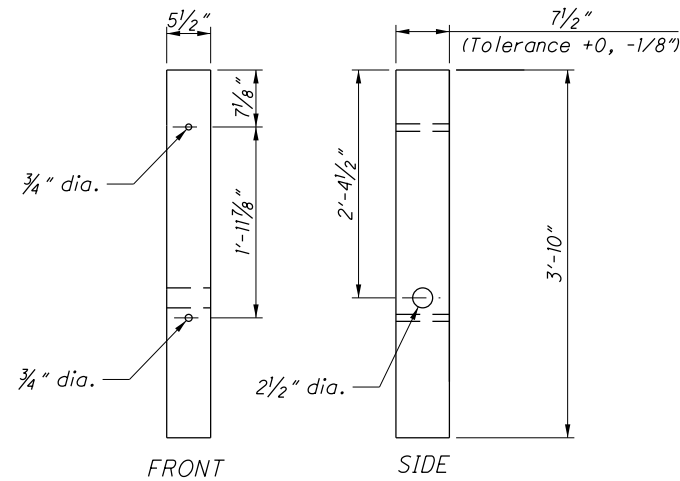
OFFICE OF ROADWAY ENGINEERING

STATUS
ENGINEER
M. Ruppe

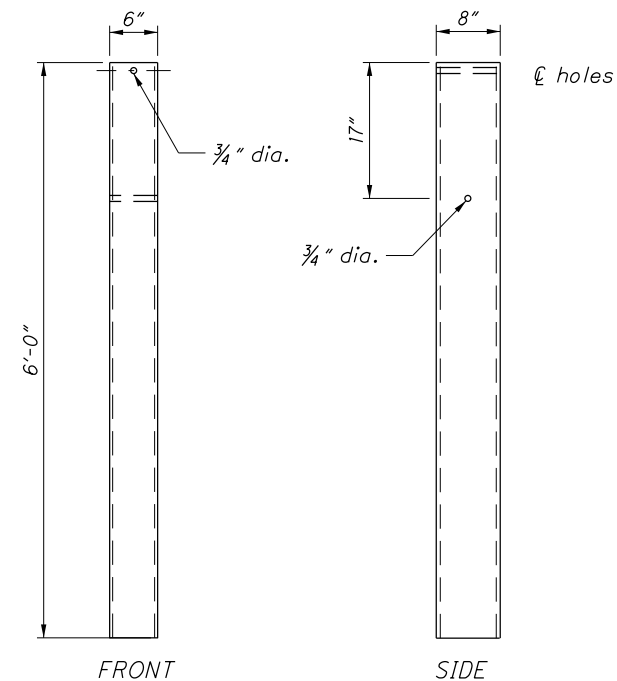
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Michael Blune
ADMINISTRATOR
7-19-2013
DATE



TYPE 1 BREAKAWAY CRT POST

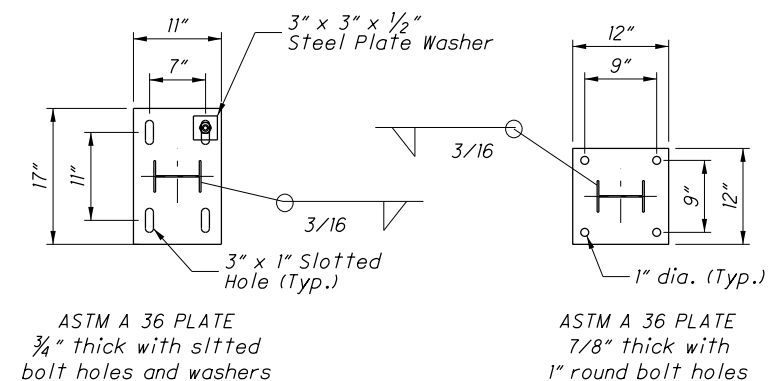


TYPE 2 BREAKAWAY BCT TIMBER POST

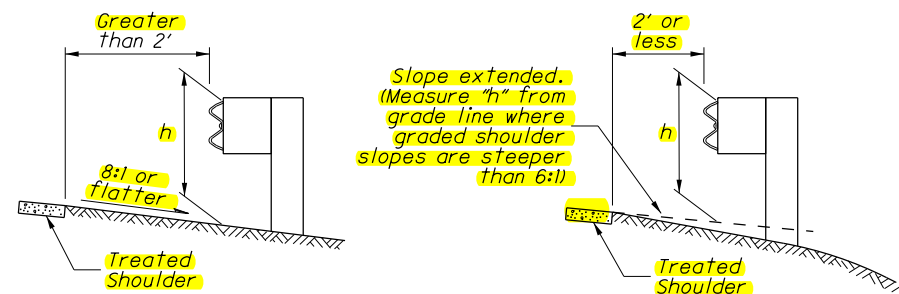


STEEL GROUND FOUNDATION TUBE

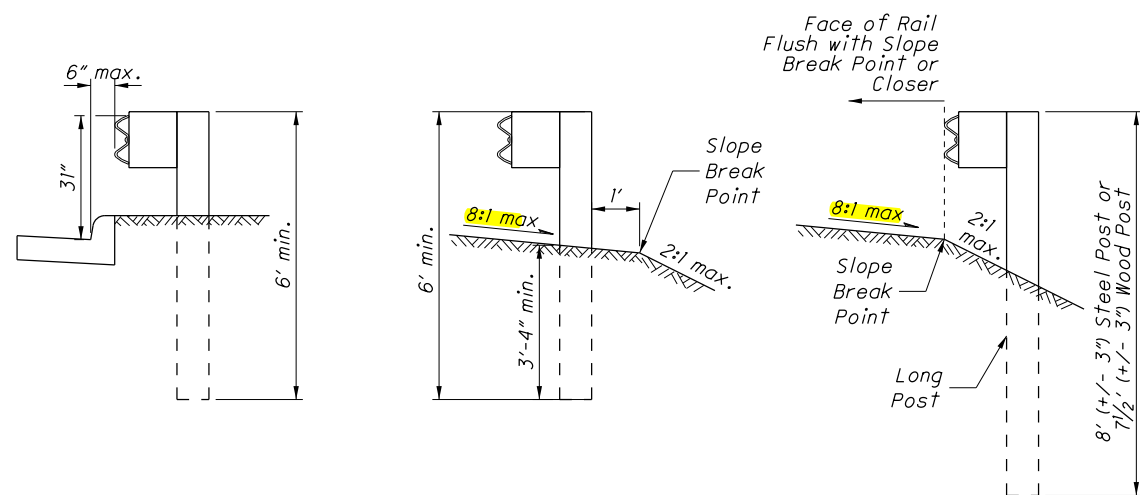
STEEL BEAM POSTS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"



FOOTING ANCHOR DETAIL



MEASURING GUARDRAIL HEIGHT



GUARDRAIL POST LENGTH AND POSITION

NOTES

GUARDRAIL HEIGHT: For initial installation, construct the guardrail within $\pm 1"$ of the standard 31" height to the top of W-Beam rail. When subsequent projects, such as resurfacings, affect the height of existing guardrail, adjustment is not required if the finished height is within $\pm 3"$ of the standard height.

POSTS: The Standard Post Length is 6'-0" (+3", -0" tolerance). Wood Posts are permitted instead of Standard Steel Posts per CMS 710.11.

POST EMBEDMENT DEPTH: Standard embedment depth is 3'-4" minimum. Do not drive posts located over a culvert with less than 4'-3" of cover; instead set in drilled or dug holes. Where site constraints prohibit the post from being placed at least one foot in front of the slope break point, use longer posts as shown in the Guardrail Post Length and Position Detail. The face of the rail may not be beyond the slope break point.

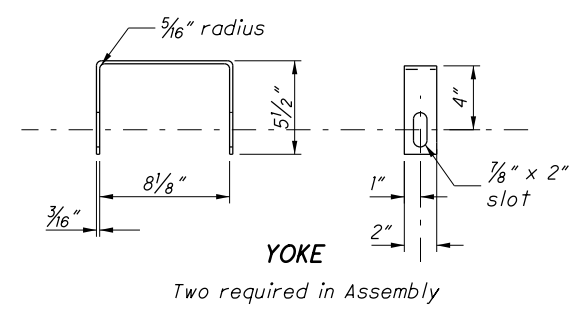
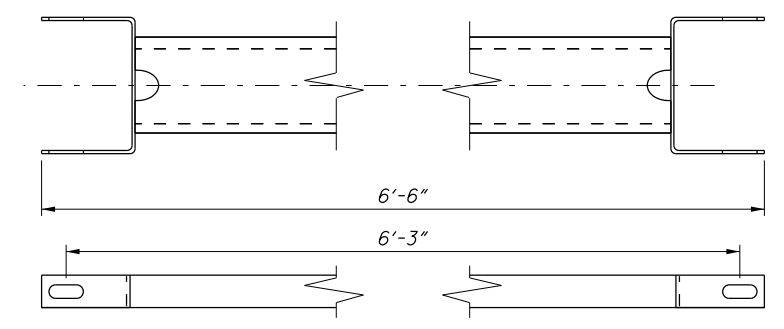
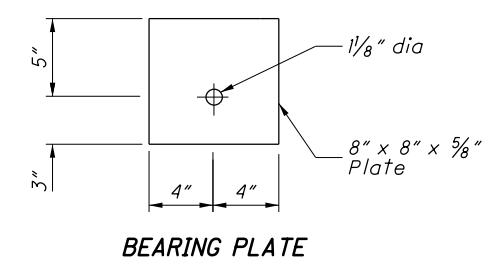
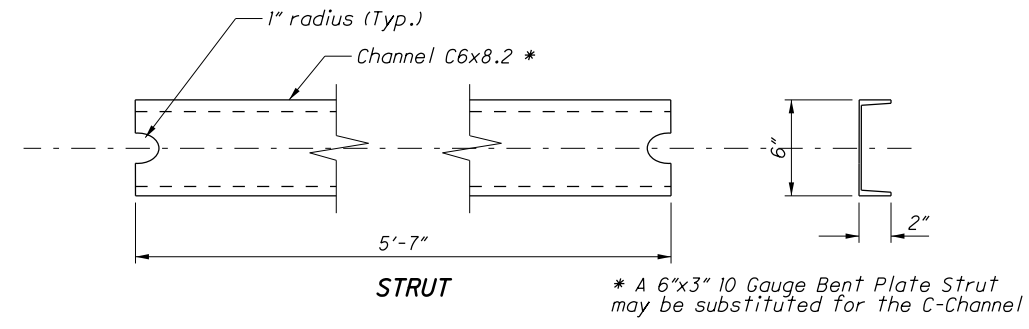
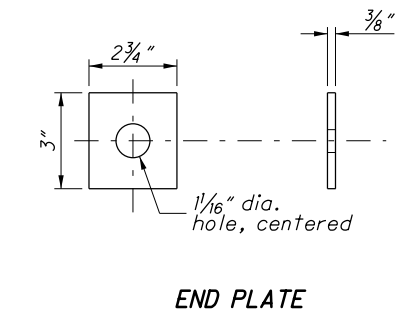
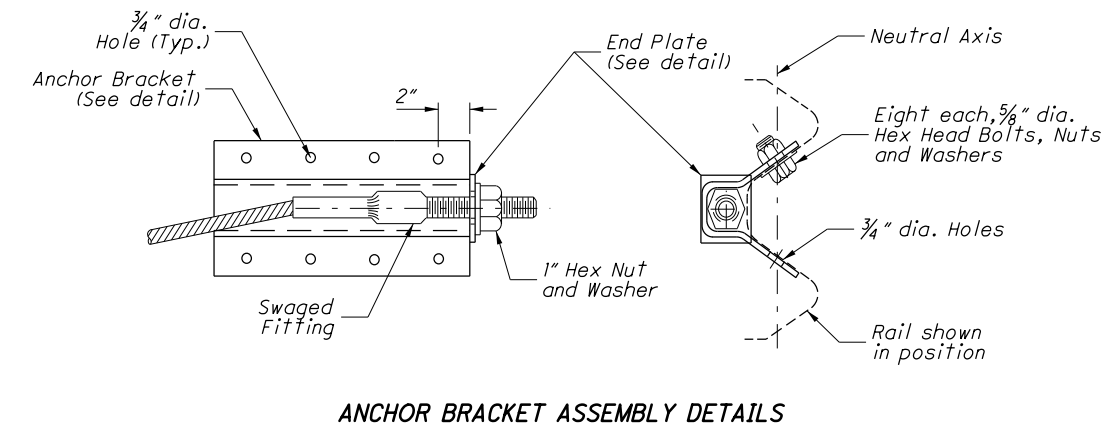
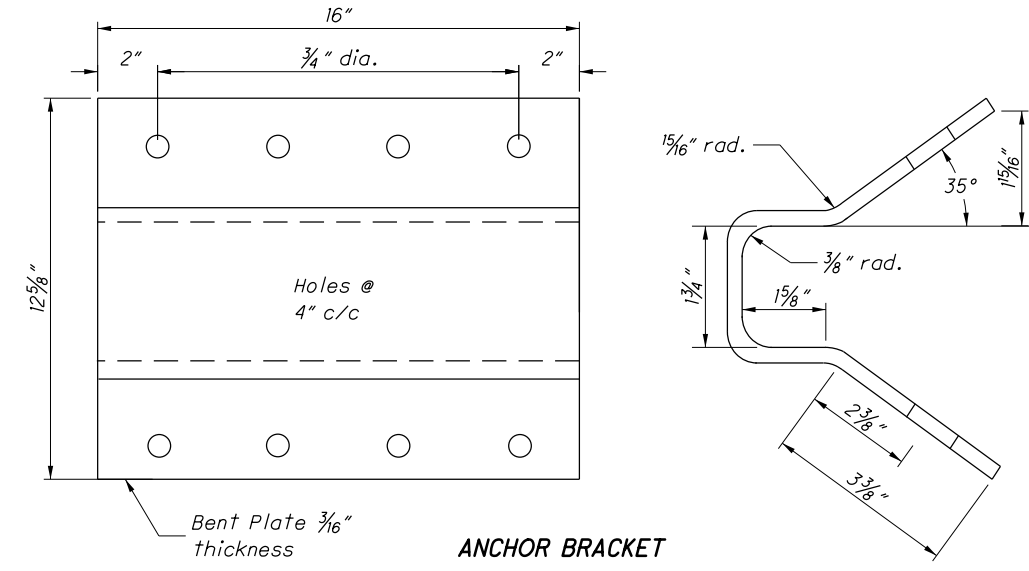
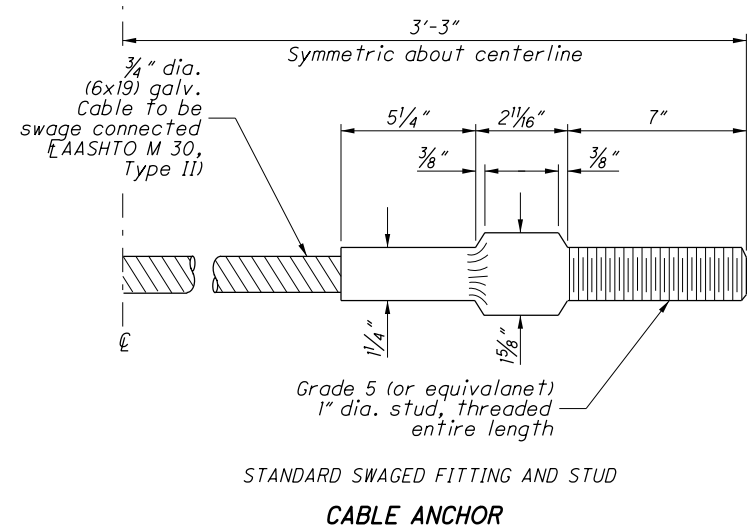
SPECIAL POST MOUNTINGS: Install posts located over a drainage inlet or structure with a cover of less than 3'-4" as shown in the FOOTING ANCHOR Detail.

ANCHORS: Holes shall comply with CMS 510. Use non-shrink, nonmetallic grout per CMS 705.20.

PROTECTIVE COATING: In lieu of the complying with CMS 710.06, coat expansion shields, anchors and concrete insert anchor assemblies embedded in concrete in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these devices shall meet CMS 710.06.

PAYMENT: Payment for standard guardrail is measured in feet as Item 606 - Guardrail, Type MGS. Runs with longer posts should be paid as Item 606 - Guardrail, Type MGS With Long Posts, also measured in feet. All costs associated with special post mountings are included in the unit price bid of Item 606 Guardrail of the type specified in the plans.

THIS DRAWING REPLACES MGS-1.1 DATED 1-18-2013



Channel legs shown down. For opposite hand, install Channel legs up.
STRUT AND YOKE ASSEMBLY

THIS DRAWING REPLACES MGS-1.1 DATED 1-18-2013