

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

August 28, 2020

DESIGN BULLETIN No. 20-05

SUBJECT: Concrete Median Barrier and Concrete Barrier Height Transition

The following revisions to the Illinois Tollway Standard Drawings, Section C, have been implemented, revising Standard C5 (Concrete Barrier Base, and Concrete Barrier, Double Face, 44 Inch and Variable Height) and adding a new Standard C18 (Concrete Shoulder Barrier Height Transition, Single Face, Type SF-54).

These revisions are described below.

The Illinois Tollway Standard C5-07 has been revised and replaced by Standard Drawing C5-08 (attached) which has the following modifications:

- Sheet 1 of 1, Tie Bars and Keyway
 - The #6 vertical tie bars have been replaced with vertical #6 hook bars, designated as v(E).
 - The spacing of hook bars has been modified to 15" staggered side to side.
 - A hook bar detail and a placement layout plan has been added to the sheet.
 - An optional raised keyway and detail has been added to the standard. The raised keyway can be used in lieu of the hook bar when poured monolithic with the barrier base and when the barrier has an uninterrupted section length of 70' minimum, as described in the notes.
 - An allowable batter of 1:48 has been added to the vertical face of the variable height detail.

The new Illinois Tollway Standard C18-00 has been added to the Illinois Tollway, C Standards series (attached):

- Sheet 1 of 1, Concrete Shoulder Barrier Height Transition, Single Face, Type SF-54
 - This new standard should be included in projects where the height of TL-4 concrete barrier is required to transition from 44" tall (Standard C3) to 54" tall (Standard C17).
 - The height transition has a minimum length of 35'-0" and its upstream end, matches the section of the Concrete Barrier Single Face, Reinforced TL-4, 44 Inch (Standard C3).

The affected standard and new standard are listed below:

Standard Drawings:

Revised Standard Drawing: C5

New Standard Drawing: C18

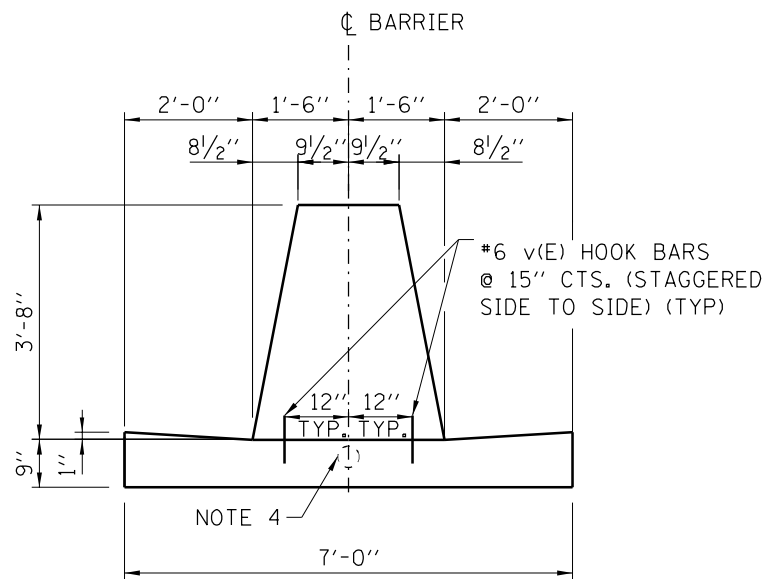
Design Section Engineers (DSE) are hereby directed to incorporate this Design Bulletin into all contracts currently under design, currently being advertised and all future contracts



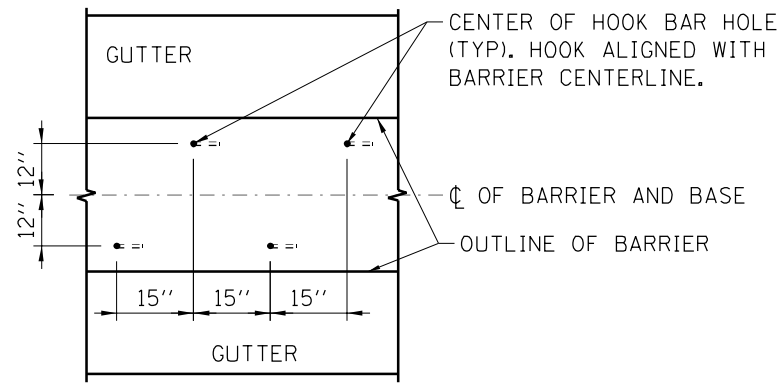
Paul D. Kovacs, P.E.
Chief Engineering Officer

08/31/2020

Date

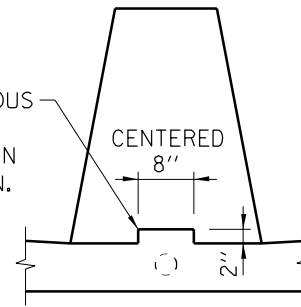


CONCRETE BARRIER, DOUBLE FACE, 44"
CONCRETE BARRIER BASE, 7'-0"

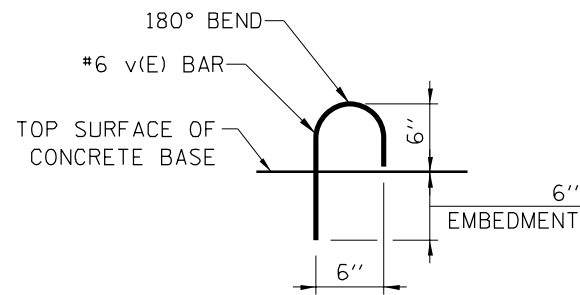


HOOK BAR PLACEMENT
 (Plan View)

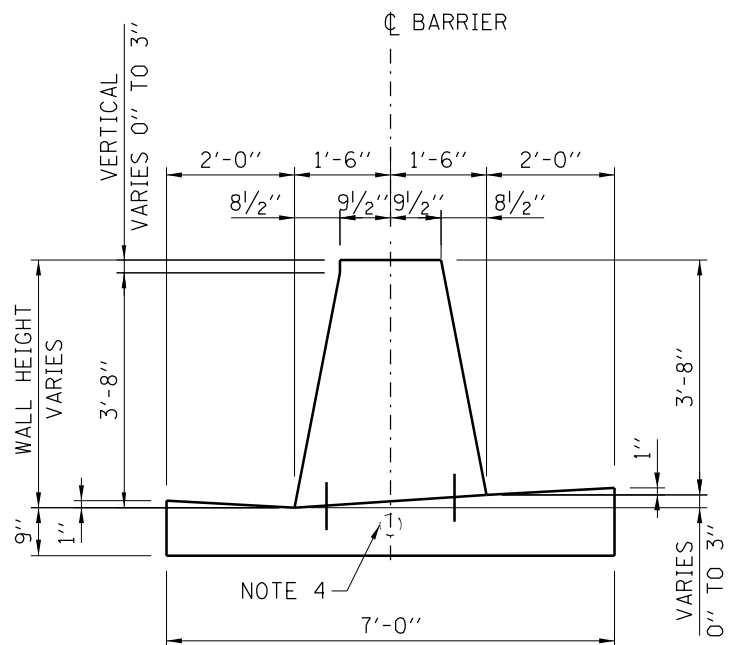
REQUIRES CONTINUOUS BARRIER SECTION (BETWEEN EXPANSION JOINTS) OF 70' MIN. SEE NOTE 5



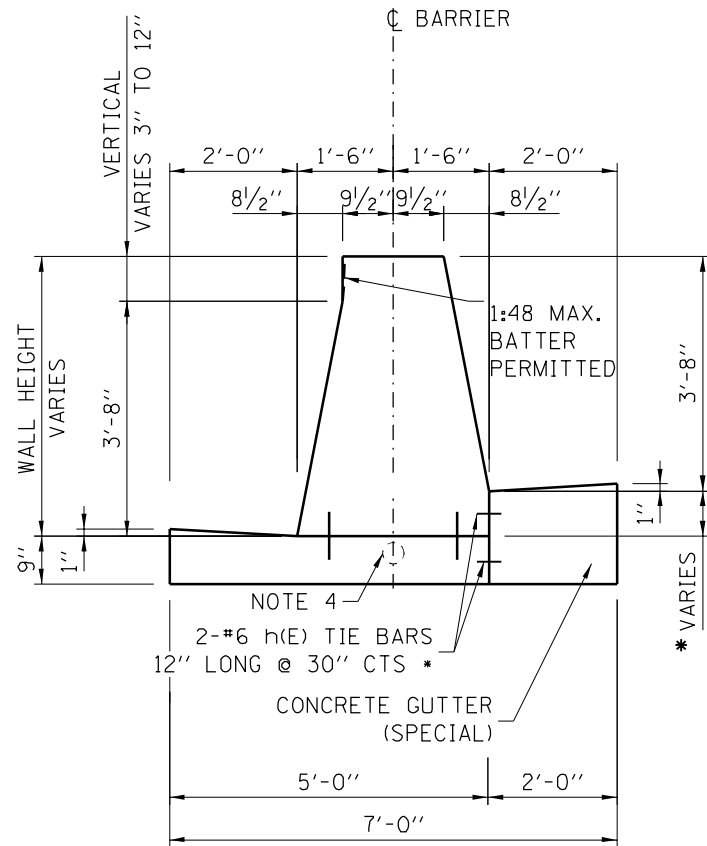
CONCRETE BARRIER BASE
WITH KEYWAY OPTION



HOOK BAR
 (Side View)



CONCRETE BARRIER, DOUBLE FACE, VARIABLE HEIGHT
CONCRETE BARRIER BASE, VARIABLE HEIGHT, 7'-0"
 (BARRIER HEIGHT VERTICAL DIFFERENTIAL VARIES 0" TO 3")



CONCRETE BARRIER, DOUBLE FACE, VARIABLE HEIGHT
CONCRETE BARRIER BASE, 5'-0"

(BARRIER HEIGHT VERTICAL DIFFERENTIAL VARIES 3" TO 12")
 * WHEN 6" OR GREATER ADD TOP TIE BAR.

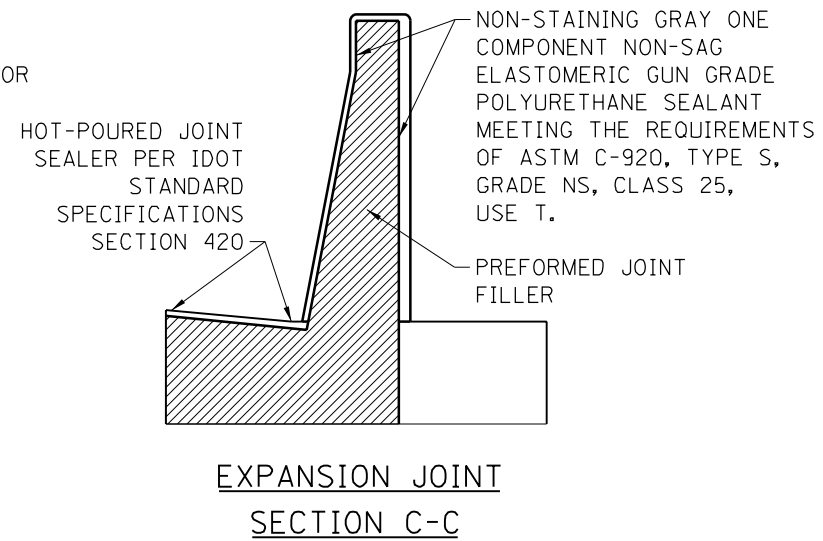
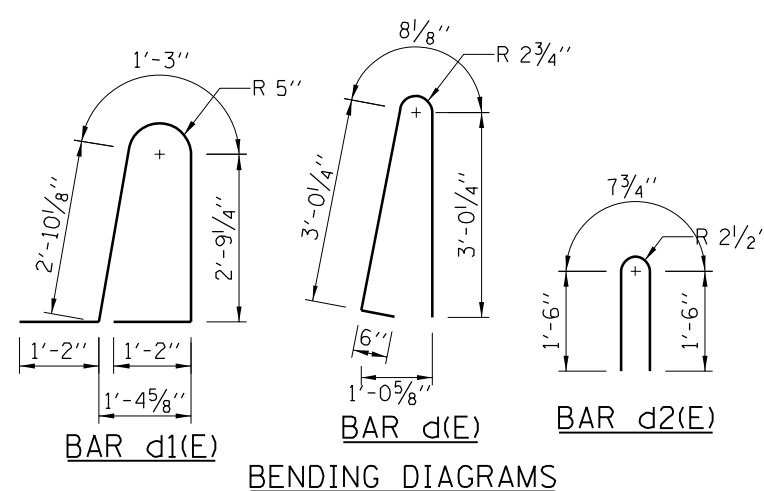
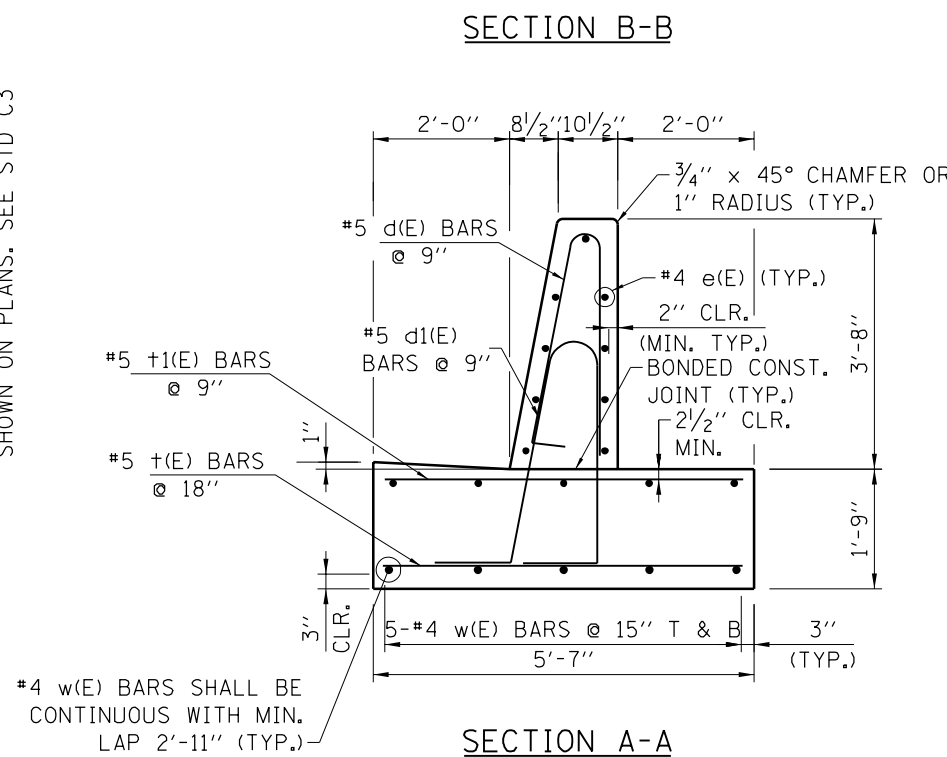
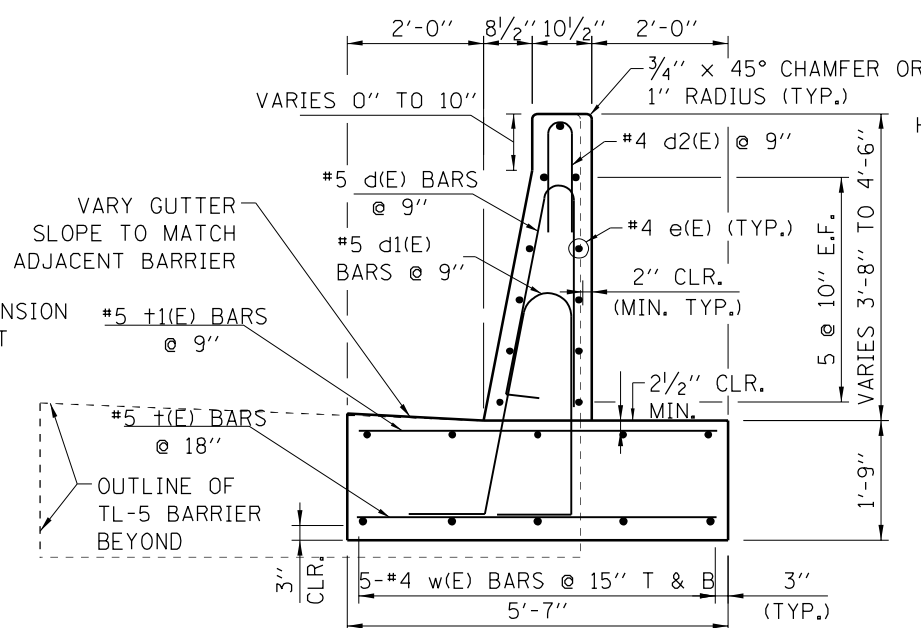
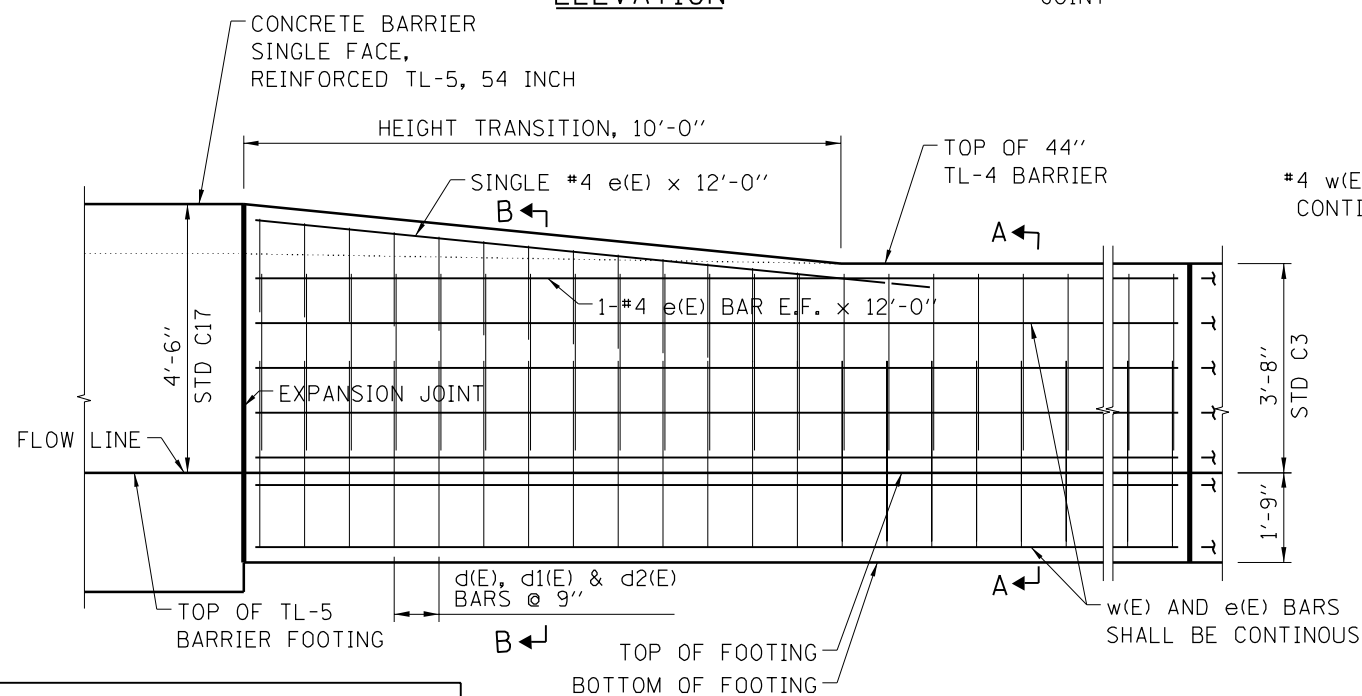
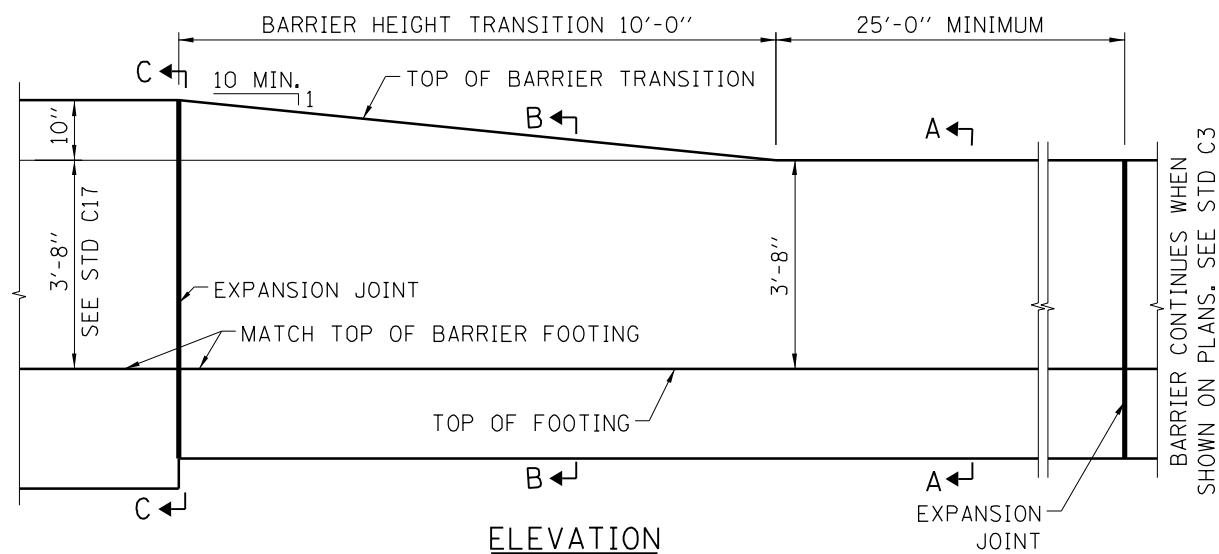
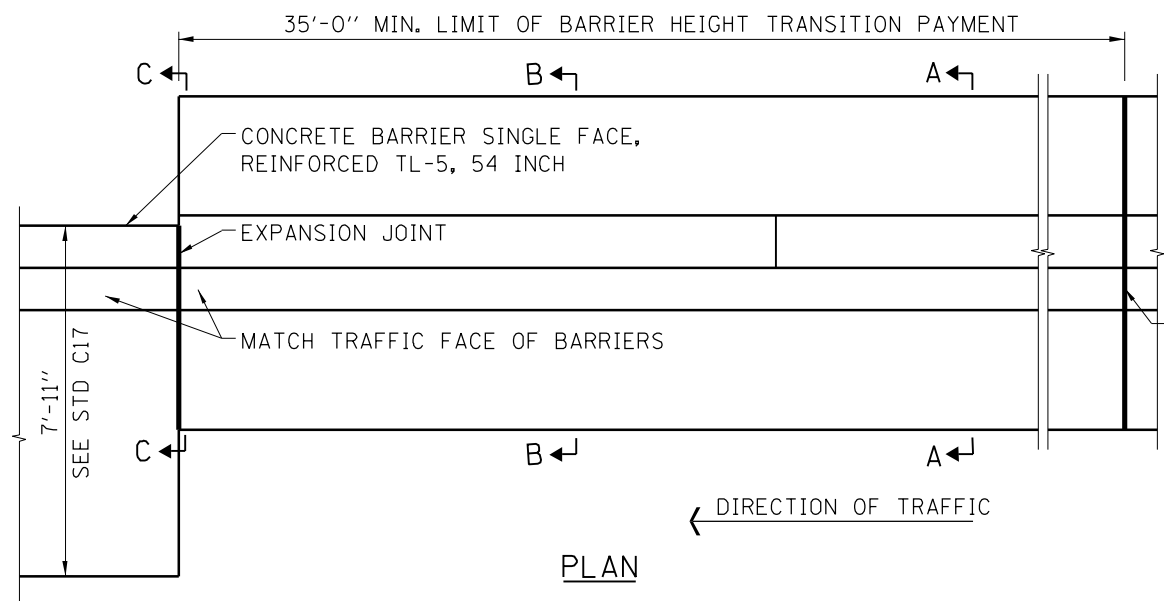
NOTES:

- 2" DEEP CONTRACTION JOINTS SHALL BE DONE BY SAWING AND SHALL BE CONSTRUCTED IN THE CONCRETE BARRIER WALL, CONCRETE BARRIER BASE, AND CONCRETE GUTTER (SPECIAL). CONTRACTION JOINTS SHALL ALSO BE CONSTRUCTED AT BOTH SIDES OF ALL DRAINAGE STRUCTURES. MAXIMUM CONTRACTION JOINT SPACING SHALL BE 30'-0". THE MINIMUM DISTANCE BETWEEN CONTRACTION JOINTS IN THE MEDIAN BARRIER WALL SHALL BE 2'-0". WHEN A DRAINAGE STRUCTURE FALLS WITHIN 2'-0" FROM AN EXPANSION JOINT (OR) CONTRACTION JOINT, THE NEAREST CONTRACTION JOINT SHALL BE OMITTED.
- GUTTER PROFILE IN THE VICINITY OF SAG VERTICAL CURVES, ALONG FLAT GRADES AND AT THE MEETING OF PROPOSED AND EXISTING GUTTER, SHALL BE CAREFULLY CONTROLLED AND FIELD ADJUSTED IF NECESSARY TO ENSURE POSITIVE DRAINAGE AND AVOID PONDING.
- IN AREAS OF RELATIVELY FLAT LONGITUDINAL PROFILE GRADES, THE VERTICAL DIMENSION TO THE TOP OF THE BARRIER CAN VARY (BY VARYING THE GUTTER SLOPE) FROM 43" TO 44.5" TO CREATE AN ACCEPTABLE LONGITUDINAL GRADE IN THE GUTTER.
- REFERENCE PLAN SHEET FOR TYPE, SIZE AND NUMBER OF CONDUITS. PROVIDE 1/2" (MIN.) CLEARANCE TO THE TOP OF CONDUIT AND 2" (MIN.) CLEARANCE TO THE BOTTOM OF THE CONDUIT.
- THE CONTRACTOR HAS THE OPTION OF USING EITHER THE KEYWAY OR THE #6 HOOK BAR v(E) BETWEEN THE BARRIER AND THE BASE. WHEN THE KEYWAY IS USED, THE RAISED KEYWAY SHALL BE POURED MONOLITHIC WITH THE BARRIER BASE AND THE BARRIER SHALL HAVE A MINIMUM UNINTERRUPTED SECTION LENGTH OF 70'. IF THE KEYWAY OR ITS EDGES BECOME DAMAGED, THEN HOOK BARS SHALL BE INSTALLED WITHIN THE DAMAGED SECTION.
- ALL BARS SHALL BE INCLUDED IN THE COST OF THE VARIOUS BARRIER AND GUTTER ITEMS. REINFORCEMENT BARS DESIGNATED 'E' SHALL BE EPOXY COATED. TIE BARS BETWEEN THE BARRIER AND BASE SHALL BE v(E) HOOK BARS ON 15" CENTERS AND ALTERNATE LEFT AND RIGHT OF THE BARRIER CENTERLINE. TIE BARS BETWEEN EITHER THE VARIABLE HEIGHT BARRIER OR THE BASE AND THE GUTTER (SPECIAL) SHALL BE h(E) STRAIGHT BAR PAIRS ON 30" CENTERS.
- WHEN VARIABLE HEIGHT VERTICAL DIFFERENTIAL EXCEEDS 12" SEE STRUCTURAL PLANS FOR DETAILS.
- GUTTER SLOPE SHALL BE 4.17% SLOPED TOWARD THE MEDIAN UNLESS OTHERWISE NOTED. GUTTER SLOPE IS REVERSE PITCHED WHEN THE SHOULDER/FLEX LANE DRAINS AWAY FROM THE GUTTER. TRANSITION GUTTER SLOPE OVER 30'-0". GUTTER SLOPE TRANSITIONS ARE INCLUDED IN THE COST OF CONCRETE BASE AND/OR CONCRETE GUTTER (SPECIAL). SEE ROADWAY PLANS FOR LIMITS OF REVERSE PITCHED GUTTER AND TRANSITIONS.

APPROVED: *Paul Kovacs*
 CHIEF ENGINEERING OFFICER DATE 2-7-2012

DATE	REVISIONS
3-31-2014	MODIFIED BARRIER BASE
3-11-2015	REVISED NOTES
3-31-2016	REVISED NOTES
3-01-2019	REVISED TO CONSTANT SLOPE
	ADDED TIE BARS
3-01-2020	CHANGED MAX. VERTICAL
	DIFFERENTIAL TO 12"
8-28-2020	CHANGED TIE BAR DETAILS

CONCRETE BARRIER BASE, DOUBLE FACE, 44 INCH AND VARIABLE HEIGHT
 STANDARD C5-08



- NOTES:**
1. THIS REINFORCED CONCRETE TL-4 BARRIER HEIGHT TRANSITION IS USED TO VARY THE BARRIER HEIGHT FROM 44" TO 54". THE MINIMUM LENGTH OF INSTALLATION BETWEEN EXPANSION JOINTS SHALL BE 35'-0". BASIS OF DESIGN: IL TOLLWAY STRUCTURAL DESIGN MANUAL.
 2. TOP SHOULDER EDGE OF BARRIER BASE GUTTER SHALL MATCH THE TOP OF SHOULDER ELEVATION.
 3. 1" DEEP CONTRACTION JOINTS SHALL BE CONSTRUCTED IN BOTH THE REINFORCED CONCRETE BARRIER WALL AND BASE. CONTRACTION JOINTS SHALL ALSO BE CONSTRUCTED AT BOTH SIDES OF ALL DRAINAGE STRUCTURES. SEE STANDARD C3 FOR REINFORCEMENT AROUND DRAINAGE STRUCTURES. MAXIMUM CONTRACTION JOINT SPACING SHALL BE 30'-0".
 4. THE FORMING OF CONTRACTION JOINTS SHALL BE DONE WITH AN APPROVED FINISHING TOOL OR BY SAWING SUBJECT TO THE SATISFACTORY CONTROL OF CRACKING.
 5. REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED. ALL w(E) AND e(E) BARS SHALL BE CONTINUOUS WITH 2'-11" LAPS MIN. "E.F." DENOTES EACH FACE.
 6. REINFORCEMENT BARS BENDING DETAILS SHALL BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICES FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315, LATEST EDITION. REINFORCEMENT BARS BENDING DIMENSIONS ARE OUT TO OUT.

Paul Kovacs
 APPROVED... DATE 8-28-2020
 CHIEF ENGINEERING OFFICER

DATE	REVISIONS

CONCRETE SHOULDER BARRIER HEIGHT TRANSITION, SINGLE FACE, TYPE SF-54
 STANDARD C18-00