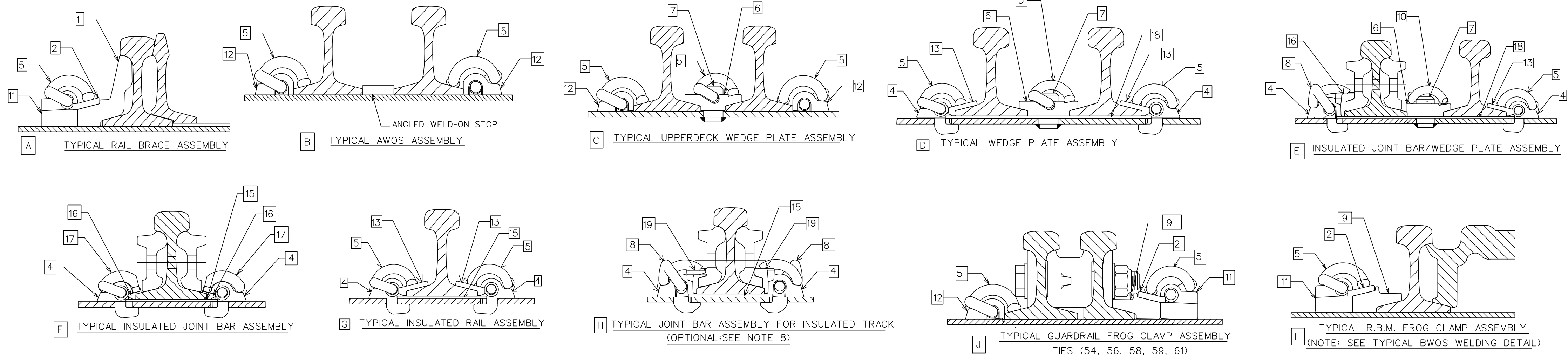
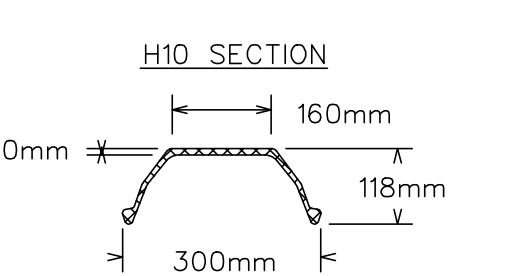


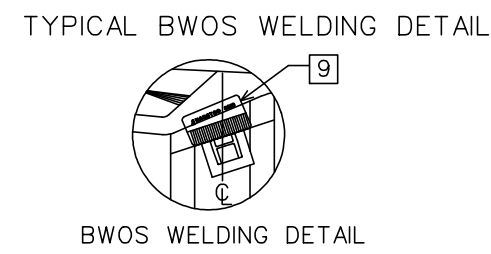
ROD	POSITION FROM POINT OF SWITCH
1	1'-5"
2	4'-6"
3	8'-0"



- NOTE:**
- TRANSITION TIES ARE FLAT SEAT DESIGN (NO CANT) REF. GTS-2106.
  - LABELS A, B & C AFFIXED TO TOP TIE IN EVERY BUNDLE ONLY.
  - TO AVOID VARIANCE IN RAIL GAUGE, DUE TO RAIL HEAD TO BASE ECCENTRICITY, ENSURE THAT THE RAIL BRAND OF ALL RAILS FACES IN THE SAME DIRECTION.
  - a. UNIFORM RISER PLATE THICKNESS:
    - 1/4" FOR TIES 2 TO 15
    - 3/16" FOR TIE 16
    - 1/8" FOR TIE 17
    - 1/16" FOR TIE 18
  - b. UNIFORM RISER PLATES SHALL CONFORM WITH LATEST ISSUES OF ASTM A36.
  - TIES WILL BE PUNCHED FOR 7/8" DIA. INSPECTION HOLES, LOCATION VARIES WITH RAIL POSITION.
  - POINT AND FROG AREA TIES ARE NARSTCO PATENTED INSULATED MULTI-STACK DESIGN. NARSTCO PATENT NO.7731099.
  - USE OFF-SET RAIL PADS IN RAIL SEATS FOR TIES WITH HOLES PUNCHED OFF CENTER, (TIES 22, 23, 52 & 66)
  - JOINT BARS SHOULD BE USED AS NECESSARY, JOINTS CAN BE WELDED TO PRODUCE CONTINUOUS RAIL IF REQUIRED.
  - ADJUSTABLE MJ CLIPS WITH VERTICAL SWITCH RODS SHOULD BE USED IN CHANNEL TIES.
  - TIES 71-82 ARE 15' OR OVER IN LENGTH.
  - TRANSITION TIES NOT INCLUDED IN TURNOUT PACKAGE.
  - IF ZERO POINT SWITCH POINTS ARE USED, A NOMINAL 3/8" WIDE GAUGE WILL OCCUR AT THE POINT OF SWITCH AND WILL TAPER BACK TO STANDARD GAUGE THROUGH THE SWITCH AREA BEFORE THE HEEL.
  - HEADBLOCK TIES ARE FIELD-DRILLED TO ACCEPT POWER OR MANUAL SWITCH STANDS.
  - ⊕ -MECHANICAL JOINT LOCATIONS TO BE FIELD WELDED OR REMAIN AS STANDARD JOINTS AS DIRECTED BY METROLINX.
  - -INSULATED JOINT LOCATIONS TO BE INSTALLED WHEN TRACK CIRCUITS EXIST OR ARE REQUIRED AND SHALL BE THE CONTINUOUS GLUED TYPE WITH THE INSULATED JOINT UNDRILLED (BLANKED) RAIL ENDS FIELD WELDED.

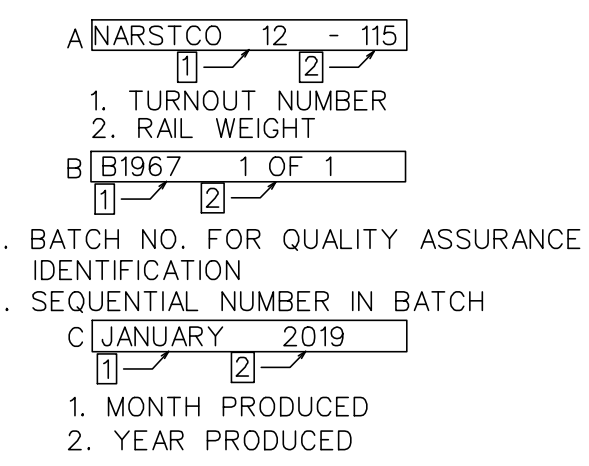


**SECTION PROPERTIES**  
 WEIGHT OF BAR: 30.8kg/m  
 YIELD STRENGTH: 345MPa (min)  
 SECTION MODUL I: Z TOP-153 X 10<sup>3</sup> mm<sup>3</sup>  
 Z BOT-79.7 X 10<sup>3</sup> mm<sup>3</sup>

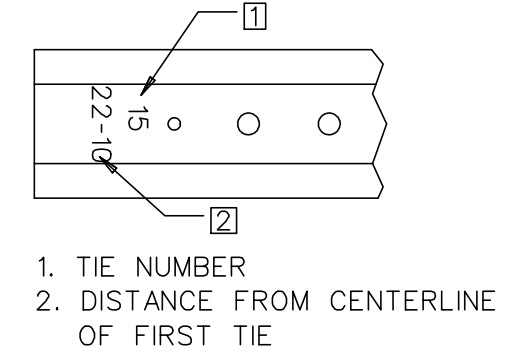


- IN PRACTICE:**
- LOCATE 8017 FROG CLAMP AS SHOWN IN DETAIL
  - PLACE BWOS AGAINST FROG CLAMP ON TIE CENTER
  - TRACK WELD BWOS IN PLACE
  - USING 7018 WELDING ROD, 3/16" OR BIGGER, PLACE 1/2" FILLET WELD ON OUTSIDE EDGES OF BWOS
  - DRIVE 8017 FROG CLAMP IN FROM RIGHTHAND SIDE
  - INSTALL SERRATED WASHER AND THEN CLIP
  - FOR MORE DETAILED INSTRUCTIONS, SEE S.O.P. MG 045

**TIE BUNDLE LABEL FORMAT**



**TIE MARKINGS**



TURNOUT DATA			
FROG R.B.M.	NUMBER	12	
	ANGLE	TOE	4°46'19"
		HEEL	7'1"
		TOTAL	19'0"
SPREAD	TOE	6 37/64"	
	HEEL	1'0 27/64"	
SWITCH	TANGENT ADJACENT TO TOE OF FROG	0"	
	TANGENT ADJACENT TO HEEL OF SWITCH	3 13/16"	
	LENGTH	22'0"	
	HEEL SPREAD	6 1/4"	
	ANGLE	1°16'31"	
	VERTEX DISTANCE	14 7/8"	
	THROW	4 3/4"	
TURNOUT	ACTUAL LEAD	DEGREE	5°06'12"
		RADIUS	1123.08'
	CLOSURE	STRAIGHT	69'0"
TRACK GAUGE		STRAIGHT	69'1 1/2"
		CURVED	4'8 1/2"

METRIC CONVERSION: 1 inch=25.4mm, 1 foot=304.8mm

No.	Date	Revision	By	Approved
0	19/03/15	DWG VERSION ESTABLISHED		

Standard / **GO TRANSIT #12-115b INS CT SPP PS UNIFORM FXHL RBM 13' GUARD RAIL**

Drawn MR. C      Checked GWM      Approved VP Engineering & Asset Management

Date MAR 15/2019      Plan Number GTS-2710      Rev 0

## BILL OF MATERIALS FOR GTS-2710

ITEM	DESCRIPTION	NARSTCO PART NO.	QTY
<b>TURNOUT COMPONENT</b>			
1	ADJUSTABLE RAIL BRACE	8014	20
2	RAIL BRACE SERRATED WASHER	8015	48
3#	RAIL BRACE HOOK-IN SHOULDER	8016	118
4	NARSTCO HOOK-IN SHOULDER	4010	420
5	'e' CLIP ('e' TYPE CLIP)	'e' CLIP	656
6	WEDGE PLATE	17S,17T,18S, 18T, 19S, 19T, 20S, 20T, 21S, 21T	10
7*	WEDGE PLATE PIN	17, 18, 19, 20, 21	10
8	'J' CLIP	NJ1	32
9	FROG CLAMP (R.B.M.)	8017	26
10	L/H 'e' CLIP	Ne2	5
11*	RAIL BRACE WELD-ON SHOULDER	BWOS	48
12*	WELD-ON SHOULDER	WOS	60
13	INSULATOR	HD-10	538
14	OFFSET INSULATING PAD 5 1/2"	3020	12
15	NARSTCO INSULATING PAD 5 1/2"	IN-0030	188
16	INSULATED JOINT INSULATOR	J7819	8
17	INSULATED JOINT CLIP	e2063	8
18	CUSTOM INSULATOR PAD	19, 20, 21, 53, 63, 64, 65	10
19	JOINT BAR INSULATOR	N8J-HD	32
20^	FROG CLAMP (S.M.S.G)	8018	2

### GO TRANSIT REFERENCES

PLAN #	TITLE
GTS-0003-REV1	GEOMETRY FOR NO. 12 TURNOUTS
GTS-0012-REV1	NO. 12 TURNOUT -115LB. R.E. RAIL 22'0" SAMSON POINT SWITCH UNIFORM RISER DESIGN WOOD TIES
GTS-0832-REV1	ASSEMBLY - NO.12 RAIL BOUND MANGANESE FROG - 132 LB. R.E. RAIL
GTS-1125	GUARD RAILS TEE RAIL DESIGN WITH PLANED FLARES AND FLAT PLATES

### WESTERN CULLEN HAYES REFERENCES

7ST235R-19-20	SWITCH POINT GUARD FOR CHANNEL TIE RIGHT HAND
7ST235L-19-20	SWITCH POINT GUARD FOR CHANNEL TIE LEFT HAND

### FROG CLAMP (AFC) & RAIL BRACE (ARB) LOCATION FOR GUARD RAILS

TIE NUMBER	54	55	56	57	58	59	60	61
THROUGH RAIL	AFC	ARB	AFC	ARB	AFC	AFC	ARB	AFC
TURNOUT RAIL	AFC	ARB	AFC	ARB	AFC	AFC	ARB	AFC

### LEGEND

- \* WELDED TO TIE DURING MANUFACTURING
- # INSTALLED ON TIE DURING MANUFACTURING
- ^ TO BE INSTALLED ON SWITCH POINT PROTECTOR