

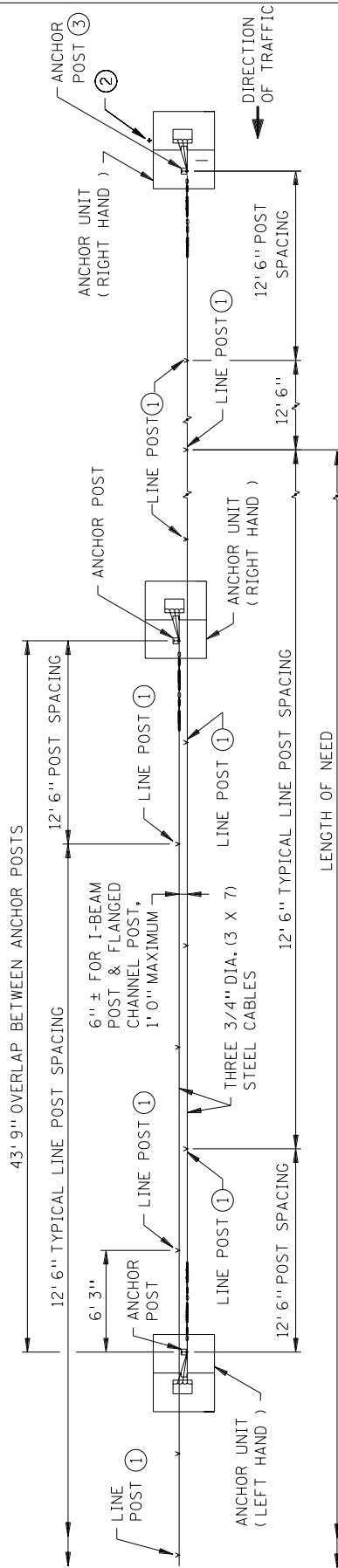
APPROVED AUGUST 21, 2002

Delbert W. Gunders
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
3-CABLE GUARDRAIL
WITH STEEL POSTS
(ASSEMBLY DETAILS)

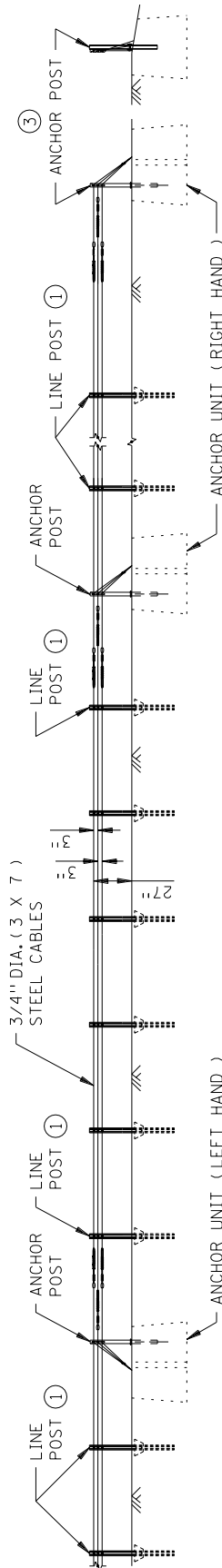
SPECIFICATION
REFERENCE
2554
3381
3401

STANDARD
PLATE
NO.
8331B
1 OF 3



PLAN VIEW

PLAN VIEW



ELEVATION

ELEVATION

TYPICAL INTERMEDIATE ANCHORAGE ASSEMBLY
TYPICAL END ANCHORAGE ASSEMBLY
END VIEW

NOTES:

THE FOLLOWING CRITERIA SHALL APPLY TO CABLE SYSTEMS.

ON TANGENTS AND ON THE OUTSIDE OF HORIZONTAL CURVES:

- FOR INDIVIDUAL CABLE RUNS:
 - UP TO 1,000 FEET, USE A TURNBUCKLE ON ONE END OF THE RUN AND A COMPENSATING DEVICE ON THE OTHER END.
 - FROM 1,000 TO 2,000 FEET, USE A COMPENSATING DEVICE ON BOTH ENDS OF THE RUN.
 - OVER 2,000 FEET IN LENGTH, USE INTERMEDIATE ANCHORS. THE ANCHORS SHALL BE EQUALLY SPACED AT INTERVALS NOT TO EXCEED 2,000 FEET.
- DO NOT USE CABLE GUARDRAIL ON THE INSIDE OF CURVES GREATER THAN 4°.

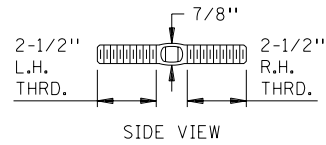
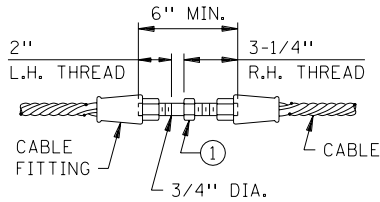
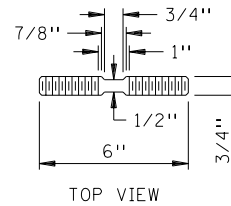
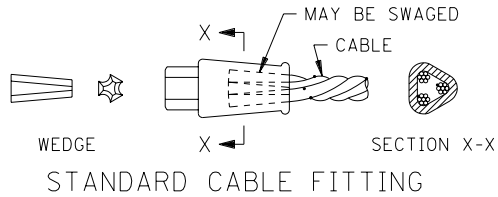
ON THE INSIDE OF HORIZONTAL CURVES 4° OR FLATTER, A COMPENSATING DEVICE SHOULD BE USED ON ONE END OF EACH CABLE RUN AND A TURNBUCKLE ON THE OTHER END WITH INTERMEDIATE ANCHORS SPACED AT INTERVALS NOT TO EXCEED:

DEGREE OF CURVE C MEASUREMENT	DISTANCE BETWEEN INTERMEDIATE ANCHORS
4°	150 FT.
3°	175 FT.
2°	215 FT.
1°	300 FT.
30 MINUTES	430 FT.
15 MINUTES	600 FT.

FOR INTERMEDIATE HORIZONTAL CURVES, INTERPOLATE BETWEEN VALUES LISTED ABOVE.

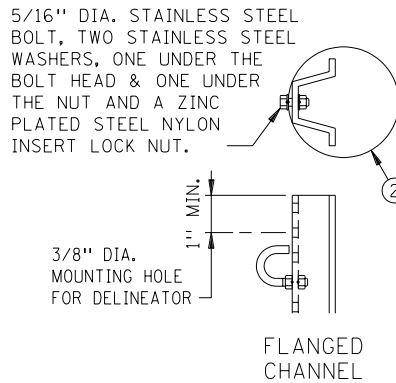
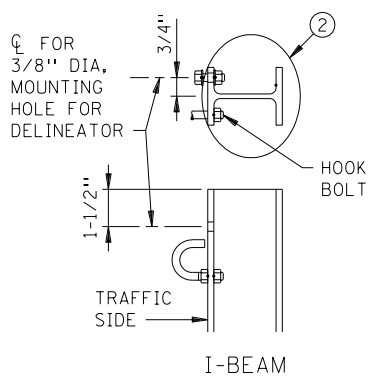
SEE STANDARD PLATE 8333 (SHEET 4), DETAIL "A" STEEL TURNBUCKLE CABLE END ASSEMBLY AND DETAIL "B" SPRING CABLE END ASSEMBLY (COMPENSATING DEVICE).

- ① S3 X 5.7 STEEL I-BEAM OR FLANGE CHANNEL LINE POST (TYPICAL). SEE SHEET 2 OF 2 FOR LINE POST ASSEMBLY DETAILS
- ② SNOW PLOW MARKER (X4-5) WITH A 2 LB. / FT. DELINEATOR POST 8 FT. LONG (SPEC. 3401) DRIVEN INTO GROUND. EXTEND 3 FT. ABOVE TERMINAL. SNOW PLOW MARKER MUST GO AT BOTH BEGINNING AND END OF GUARDRAIL SYSTEM.
- ③ SEE 3-CABLE GUARDRAIL ANCHOR ON STANDARD PLATE 8333 FOR ANCHOR POST DETAIL.

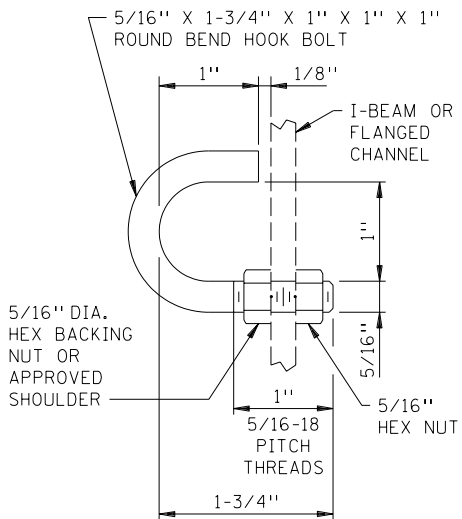


DETAIL D
ALTERNATE SPLICE ROD

CABLE SPLICE ASSEMBLY ③



LINE POST DELINEATOR DETAILS



CABLE HOOK BOLT & NUT

NOTES:

- ① SQUARE NUT OR REGULAR HEX NUT RUN ON TO MAX. OF R.H. THREAD AND SPOT WELDED 4 SPOTS 90° APART ON BOTH SIDES OF NUT (SEE DETAIL D FOR ALTERNATE SPLICE ROD).
- ② THE CYLINDRICAL DELINEATOR SHALL CONSIST OF A 3" WIDE X 16" LONG STRIP OF FLEXIBLE WHITE VIP REFLECTIVE SHEETING (WHEN INSTALLED ADJACENT TO A WHITE EDGE LINE), OR A 3" X 16" LONG STRIP OF WIDE YELLOW TENTATIVE STANDARD NO. 4 (FLEXIBLE HIGH INTENSITY) REFLECTIVE SHEETING (WHEN INSTALLED ADJACENT TO A YELLOW EDGE LINE), DIRECTLY APPLIED TO NON-REFLECTORIZED BLACK FLEXIBLE PLASTIC.
DRILL TWO 3/8" DIA. MOUNTING HOLES THROUGH THE DELINEATOR 1" IN FROM EACH END AND CENTERED ON THE 3" WIDTH. LOOP THE PLASTIC TO FORM A CYLINDER. ATTACH TO THE MOUNTING HOLES AT EVERY END POST AND EVERY FOURTH LINE POST. DO NOT REFLECTORIZE THE BACK SIDE POSTS OF INTERMEDIATE ANCHOR SECTIONS.
- ③ STAGGER CABLE SPLICES. PROVIDE A MINIMUM OF (20 FT.) BETWEEN ANY PAIR. PROVIDE A MINIMUM OF (100 FT.) BETWEEN CABLE SPLICES ON THE SAME CABLE.

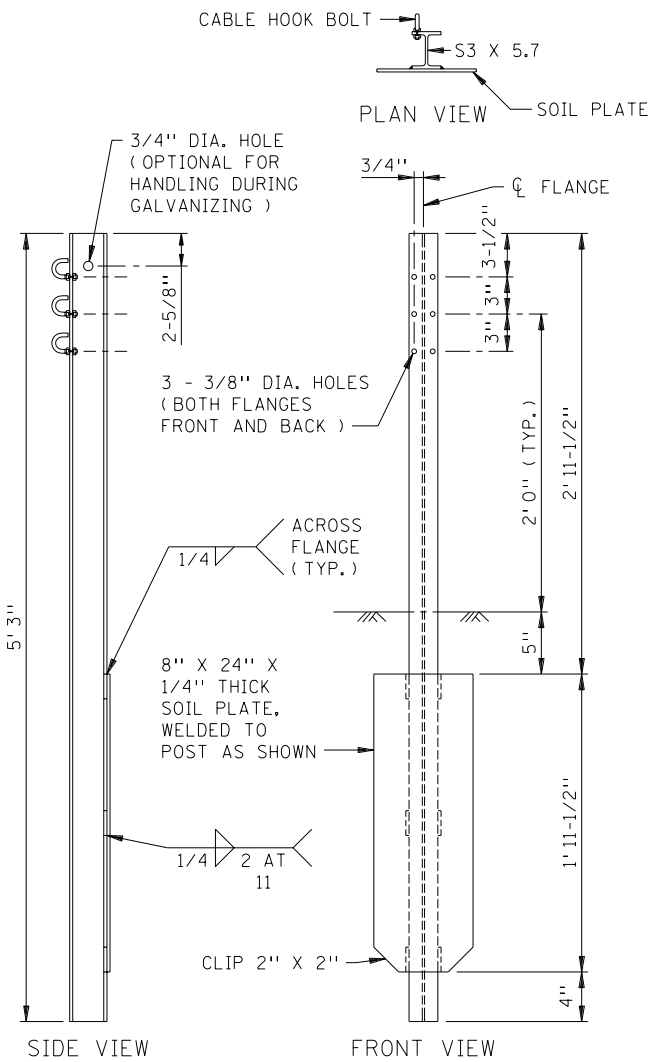
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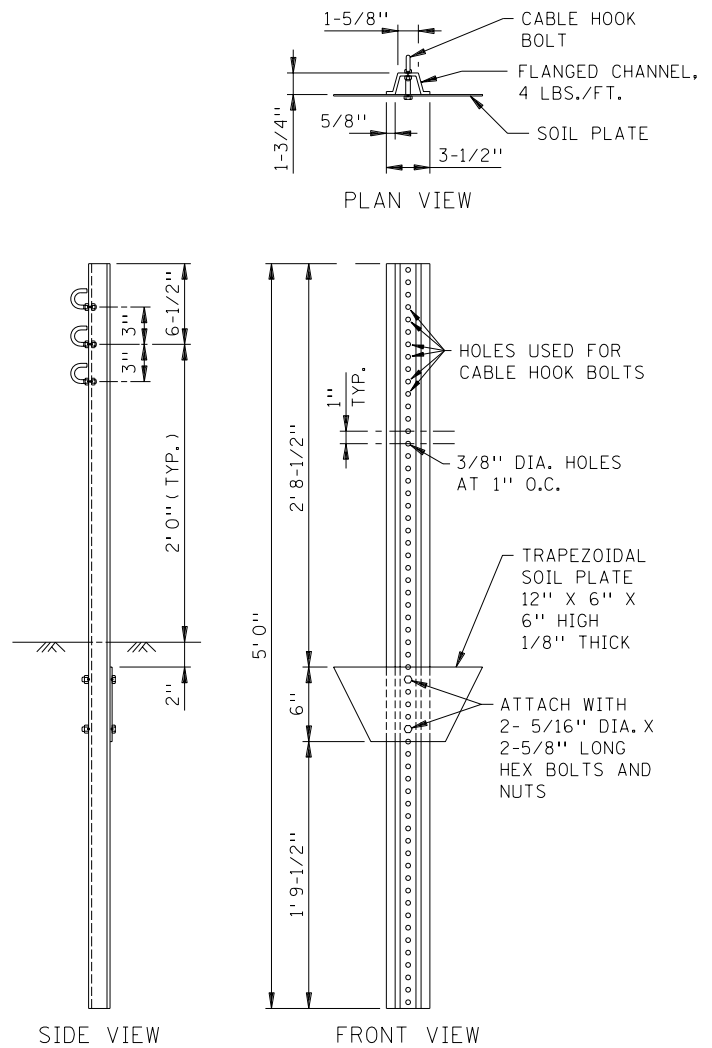
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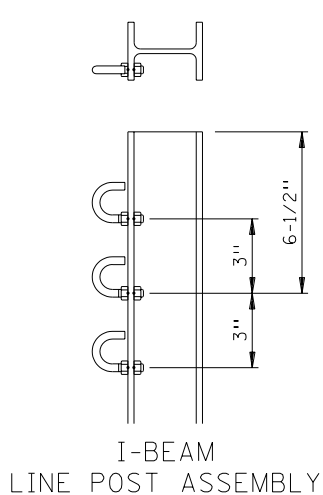


I-BEAM & WELDED SOIL PLATE
(GALVANIZE AFTER FABRICATION PER SPEC. 3394)

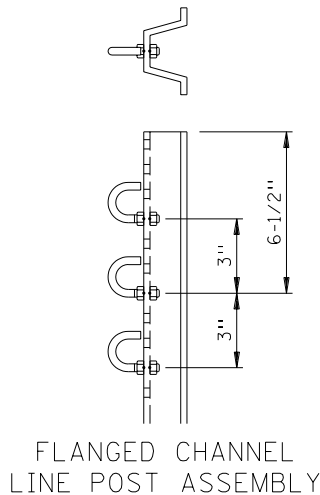


FLANGED CHANNEL POST & BOLTED SOIL PLATE
(GALVANIZE PER SPEC. 3392 & 3394)

STEEL LINE POST OPTIONS ①



I-BEAM
LINE POST ASSEMBLY



FLANGED CHANNEL
LINE POST ASSEMBLY

NOTES:

- ① THE TYPE OF STEEL LINE POST USED IS A CONTRACTORS OPTION. DO NOT MIX POST TYPES IN A SINGLE RUN OF GUARDRAIL.

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