STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
SUITE 1200 JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-3848
(615) 741-2221

CLAY BRIGHT
COMMISSIONER

BILL LEE
GOVERNOR

INSTRUCTIONAL BULLETIN NO. 20-02

Regarding Various Revised and Voided Standard Drawings.

Effective May 15, 2020 letting (March 4, 2020 Turn-in), the following standard drawings have been revised and have been voided. Section 10 of the Roadway Design Guidelines has also been revised to incorporate these new standard drawings.

DRAWING NUMBER	REVISION DATE	DESCRIPTION
Revised Standard Drawings:		
10-100.03	**RD11 TYPICAL SECTIONS AND DESIGN CRITERIA**	
RD11-TS-1	06-28-19	DESIGN STANDARDS FOR LOW-VOLUME ROADS
10-104.05	**FENCES AND RIGHT-OF-WAY MARKERS**	
S-F-1	06-28-19	HIGH VISIBILITY FENCE
S-F-10	06-28-19	STANDARD RIGHT-OF-WAY STOCK FENCE
S-F-10A	06-28-19	STANDARD RIGHT-OF-WAY STOCK FENCE WITH TIMBER POSTS
S-F-10B	06-28-19	STANDARD RIGHT-OF-WAY CHAIN LINK FENCE
S-F-10C	06-28-19	RIGHT-OF-WAY FENCE AT BRIDGE AND BOX CULVERTS
S-F-10D	06-28-19	RIGHT-OF-WAY FENCE LOCATIONS AT INTERCHANGES
S-FG-11	06-28-19	STANDARD STOCK FENCE GATE

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-FG-20	06-28-19	EXAMPLES OF WATER GATES AND WATER CROSSINGS
S-RP-2	06-28-19	STANDARD CONCRETE RIGHT-OF-WAY MARKERS
10-108.02	**SLOPE DEVICES**	
EC-STR-3C	06-28-19	SILT FENCE WITH WIRE BACKING
EC-STR-3D	06-28-19	ENHANCED SILT FENCE

These standard drawings have been revised and have been added to the Roadway Design Guidelines, Chapter 10, Index of Standard Drawings and are available online.

Voided Standard Drawings:

The following standard drawings where voided on December 31, 2019.

D-PE-7	STANDARD STRAIGHT ENDWALLS FLATBASE CONCRETE PIPES
D-PE-7A	STANDARD WINGWALLS FLATBASE CONCRETE PIPES
D-CBB-12C	TYPE 'B' CAST IRON FRAME, GRATE & 4" MOUNTABLE INLET DETAILS FOR NOS. 28 & 29 TYPE CATCH BASINS

Standard Drawings:
https://www.tn.gov/content/tn/tdot/roadway-design/standard-drawings-library/standard-roadway-drawings.html

Chapter 10 - Index of Standard Drawings is available online at this location:

https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design_guidelines/DG-C10.pdf

Jennifer Lloyd, PE
Civil Engineering Director
Roadway Design Division

KJL:ARH:RBB:LLP
December 12, 2019

REV. 06-28-19: ADDED GENERAL NOTE NO. (10). REVISED DESIGN NOTE NO. (F).

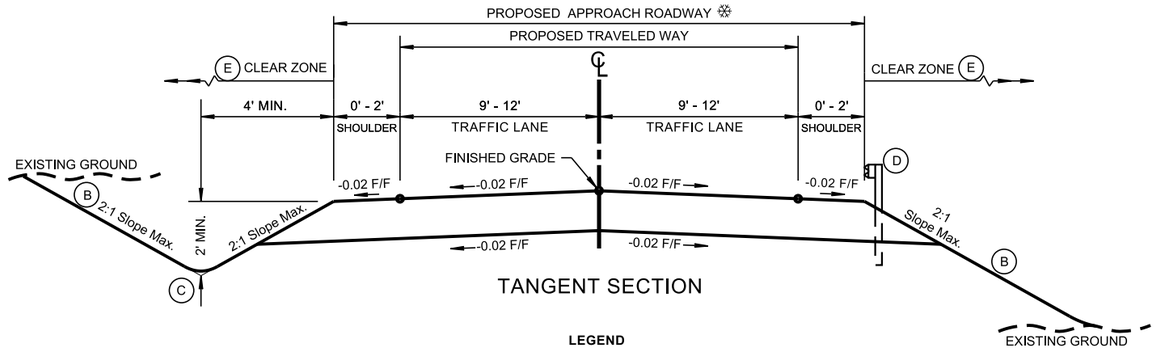
TABLE I MINIMUM DESIGN SPEEDS FOR LOW-VOLUME ROADS

TYPE OF TERRAIN	DESIGN SPEED (MPH) FOR SPECIFIED DESIGN ADT (VEH/DAY)			
	UNDER 50	50 TO 250	250 TO 400	400 TO 2,000
LEVEL	30	30	40	50
ROLLING	20(J)	30	30	40
MOUNTAINOUS	20(J)	20(J)	20(J)	30

TABLE II
DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS AND STREETS (ADT ≤ 400)

DESIGN SPEED (MPH) (J)				15	20	25	30	35	40
PROPOSED APPROACH ROADWAY (FEET)	RURAL LOCAL ROADS			18	18	18	18	18	18
	RECREATIONAL AND SCENIC ROADS			18	18	18	18	18	20
	INDUSTRIAL/COMMERCIAL ACCESS			20	20	22	24	24	24
	URBAN LOCAL ROADS LOW DEVELOPMENT DENSITY (2.0 OR LESS DWELLINGS/ACRE)			20	20	20	20	20	20
	URBAN LOCAL ROADS MEDIUM DEVELOPMENT DENSITY (2.1 TO 6 DWELLINGS/ACRE)			28	28	28	28	28	28
MINIMUM HORIZONTAL CURVE RADIUS (FEET) BY SUPERELEVATION RATE	ALL CLASSIFICATIONS (G)	NC	-2%	50	107	198	333	510	762
			0%	47	99	181	300	454	667
		RC	2%	44	92	167	273	408	593
			3%	43	89	160	261	389	561
			4%	42	86	154	250	371	533
			5%	41	83	149	240	355	508
			6%	39	81	144	231	340	485
			7%	38	78	139	222	327	464
			8%	38	76	134	214	314	444
MINIMUM STOPPING SIGHT DISTANCE (FEET)	ADT 0 TO 100 (VEH/DAY)			65	90	115	135	170	215
	ADT 101 TO 400 (VEH/DAY)			65	95	125	165	205	250
MINIMUM " K " VALUES	CREST VERTICAL CURVE	ADT 0 TO 100 (VEH/DAY)		2	4	7	9	14	22
		ADT 101 TO 400 (VEH/DAY)		2	5	8	13	20	29
	SAG VERTICAL CURVE			10	17	26	37	49	64
MAXIMUM GRADE (%)	TYPE OF TERRAIN	LEVEL		9	8	7	7	7	7
		ROLLING		12	11	11	10	10	9
		MOUNTAINOUS		17	16	15	14	13	12

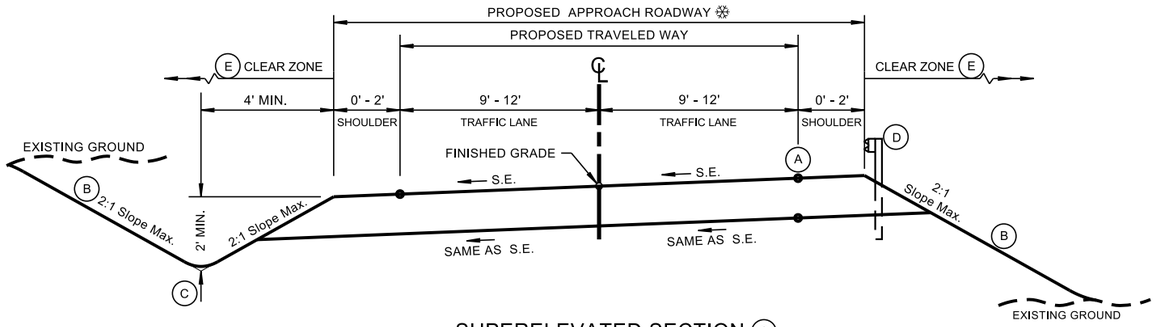
FOR SUPERELEVATION SEE STANDARD DRAWINGS RD11-SE SERIES (G)



TANGENT SECTION

LEGEND

❁ SEE TABLE II FOR WIDTHS



SUPERELEVATED SECTION (G)

BRIDGE DESIGN - MINIMUM CLEAR WIDTHS AND DESIGN LOADINGS (K) (L)

DESIGN ADT (VEH/DAY)	MINIMUM CLEAR (A) WIDTH (FEET) (I)	DESIGN LOADING (STRUCTURAL CAPACITY) FOR NEW AND RECONSTRUCTED BRIDGES	(F) DESIGN LOADING (STRUCTURAL CAPACITY) FOR EXISTING BRIDGES TO REMAIN IN PLACE (H)
0 TO 100	18	HL-93	H-15
101 TO 400	20	HL-93	H-15

DESIGN NOTES

(A) THE SLOPE OF THE SHOULDER AND THE ROADWAY PAVEMENT SHALL BE THE SAME IN ALL SITUATIONS.

(B) MAXIMUM 2(H):1(V) OR AS RECOMMENDED BY THE GEOTECHNICAL OFFICE. WHEN A 2(H):1(V) SLOPE IS USED, AND THE FILL HEIGHT EXCEEDS SIX FT., GUARDRAIL SHOULD BE CONSIDERED. WHERE RIGHT-OF-WAY IS NOT AN ISSUE, STANDARD DRAWING RD11-S-11 (CASE II) SLOPES MAY BE USED.

(C) SEE STANDARD DRAWING RD11-S-11A FOR ROUNDING OF ROADSIDE DITCH SLOPES.

(D) SEE STANDARD DRAWING S-PL-6 FOR TYPICAL GUARDRAIL PLACEMENT.

(E) SITE-SPECIFIC CONDITIONS AND ENGINEERING JUDGMENT OF THE DESIGNER SHOULD BE THE TWO PRIMARY DETERMINANTS OF THE APPROPRIATE CLEAR ZONE WIDTH FOR LOW-VOLUME LOCAL ROADS. AT LOCATIONS WHERE A CLEAR ZONE OF 6 FEET OR MORE IN WIDTH CAN BE PROVIDED AT LOW COST AND WITH MINIMUM SOCIAL/ENVIRONMENTAL IMPACT, SUCH CLEAR ZONE SHOULD BE CONSIDERED. WHERE PROVISION OF A CLEAR ZONE IS NOT PRACTICAL, NONE IS REQUIRED.

(F) FOR BRIDGE PROJECTS WHERE THE TOTAL APPROACH ROADWAY WIDTH (TRAVELED WAY PLUS SHOULDERS) IS SURFACED, THAT SURFACE WIDTH SHOULD BE CARRIED ACROSS THE STRUCTURE. THE WIDTH OF THE BRIDGE CANNOT BE LESS THAN THE PROPOSED ROADWAY WIDTH SELECTED FROM TABLE II. THE TOTAL APPROACH ROADWAY WIDTH CANNOT BE LESS THAN THE EXISTING ROADWAY WIDTH, AS DETERMINED ABOVE. HOWEVER, ON UNSURFACED RURAL ROADS, WITHOUT DEFINED TRAVELED WAY OR DEFINED SHOULDERS, THE WIDTH DETERMINED FROM TABLE 2 WILL SUFFICE.

(G) FOR THE DESIGN OF SUPERELEVATION TRANSITIONS, USE THE SUPERELEVATION DESIGN SPEED LISTED DIRECTLY ABOVE THE SELECTED MINIMUM HORIZONTAL CURVE RADIUS. FOR EXISTING ROADS WHERE SUPERELEVATION IS NOT PRESENT AND NO SITE-SPECIFIC SAFETY PROBLEM IS KNOWN, SUPERELEVATION MAY NOT BE NECESSARY. REMOVAL OF NORMAL CROWN BY SUPERELEVATING THE ENTIRE ROADWAY AT THE NORMAL CROSS SLOPE MAY BE USED UNLESS SUPERELEVATION IS NEEDED AS DETERMINED BY THE DESIGNER. THE DESIGNER SHOULD ASSESS THE PROJECT SITE AND USE ENGINEERING JUDGEMENT WHEN MAKING THIS DETERMINATION. FOR UNPAVED ROADS, REMOVAL OF NORMAL CROWN BY SUPERELEVATING THE ENTIRE ROADWAY AT THE NORMAL CROSS SLOPE MAY BE USED OR SUPERELEVATION MAY BE ELIMINATED.

(H) THESE STRUCTURES SHOULD BE ANALYZED INDIVIDUALLY, TAKING INTO CONSIDERATION THE CLEAR WIDTH PROVIDED, TRAFFIC VOLUMES, REMAINING LIFE OF THE STRUCTURE, PEDESTRIAN VOLUMES, SNOW STORAGE, DESIGN SPEED, ACCIDENT RECORD, AND OTHER PERTINENT FACTORS.

(I) CURB-TO-CURB OR BETWEEN RAILS, WHICHEVER IS THE LESSER.

(J) DESIGN SPEED SHOULD BE SELECTED BASED ON ACTUAL OR ANTICIPATED OPERATING SPEED AND CONDITIONS ON THE ROAD BEING DESIGNED.

(K) DESIGN LOADING: ALL NEW AND REHABILITATED BRIDGES SHALL BE DESIGNED FOR HL-93 LOADING.

(L) FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS: THE MINIMUM CLEAR WIDTH FOR NEW BRIDGES SHALL BE EQUAL TO THE FULL WIDTH OF THE APPROACH ROADWAY (CURB-TO-CURB OR FULL SHOULDER WIDTH AS APPLICABLE). WIDTH SHOULD BE AVAILABLE FOR FARM EQUIPMENT USE AS REQUIRED.

GENERAL NOTES

1. THIS STANDARD DRAWING IS INTENDED TO BE USED FOR THE DESIGN OF LOW-VOLUME ROADWAYS CLASSIFIED AS LOCAL ROADS. FOR ADDITIONAL GUIDANCE NOT COVERED ON THIS SHEET, REFERENCE SHOULD BE MADE TO AASHTO "GUIDELINES FOR GEOMETRIC DESIGN OF LOW-VOLUME ROADS," (2019).
2. PROJECTS WITH DESIGN SPEEDS GREATER THAN 40 MPH SHALL USE STANDARD DRAWING RD11-TS-1A.
3. FOR INTERSECTION SIGHT DISTANCE, SEE SECTION 4.6 OF THE AASHTO "GUIDELINES FOR GEOMETRIC DESIGN OF LOW-VOLUME ROADS," (2019). FOR HIGHER ADT'S REFER TO THE RD11-SD-SERIES STANDARD DRAWINGS FOR ADDITIONAL GUIDANCE.
4. IF NO ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHOULD BE THE TRAVELED WAY PLUS CLEAR ZONE.
5. IF ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHOULD BE SUFFICIENT TO ACCOMMODATE THE UTILITIES OUTSIDE THE CLEAR ZONE.
6. DESIGNER SHOULD CONSIDER ANY KNOWN SITE-SPECIFIC SAFETY PROBLEMS AND TYPICAL DAILY USE OF THE ROADWAY WHEN DETERMINING ROADWAY GEOMETRICS ON A CASE-BY-CASE BASIS. SITE-SPECIFIC SAFETY PROBLEMS MAY BE INDICATED BY CRASH DATA, SKID MARKS, ROADSIDE DAMAGE, SPEED DATA, OR CONCERNS RAISED BY LOCAL OFFICIALS, POLICE, OR LOCAL RESIDENTS.
7. FOR EXISTING ROADS, CROSS-SECTION WIDTHS NEED NOT BE MODIFIED, EXCEPT IN THOSE CASES WHERE THERE IS KNOWN EVIDENCE OF A SITE-SPECIFIC SAFETY PROBLEM AS LONG AS THE MINIMUM CRITERIA, AS SHOWN IN TABLE I, IS MET.
8. FOR THIS STANDARD THE FOLLOWING ARE THE POSSIBLE ROADWAY USES:
   a. RURAL LOCAL ROADS SERVE A DUAL FUNCTION OF PROVIDING ACCESS TO ABUTTING PROPERTIES AS WELL AS PROVIDING THROUGH OR CONNECTING SERVICE BETWEEN OTHER LOCAL ROADS.
   b. RECREATIONAL AND SCENIC ROADS SERVE SPECIALIZED LAND USES, INCLUDING PARKS, TOURIST ATTRACTIONS, AND RECREATION FACILITIES, SUCH AS CAMPSITES OR BOAT-LAUNCH RAMPS. WHEN AVAILABLE, PEAK-SEASON ADT SHOULD BE USED FOR DESIGN.
   c. INDUSTRIAL OR COMMERCIAL ACCESS ROADS SERVE DEVELOPMENTS THAT MAY GENERATE A SIGNIFICANT PROPORTION OF TRUCK OR OTHER HEAVY VEHICLE TRAFFIC.
   d. URBAN LOCAL ROADWAYS SERVE A DUAL FUNCTION OF PROVIDING ACCESS TO ABUTTING PROPERTIES AS WELL AS PROVIDING THROUGH OR CONNECTING SERVICE BETWEEN OTHER LOCAL ROADS.
9. ROADWAY SURFACE TYPE SHOULD MATCH EXISTING SURFACE OR SHALL BE DETERMINED BY LOCAL GUIDELINES. WHEN EXISTING SURFACE IS ASPHALT, SEE DESIGN GUIDELINES FOR PAVEMENT DESIGN GUIDANCE.
10. THE MINIMUM DESIRED SHOULDER WIDTH IS 2' FOR EACH SIDE OF ALL PROPOSED ROADWAYS.

❁ MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

DESIGN STANDARDS FOR LOW-VOLUME ROADS

01-01-2019 | RD11-TS-1

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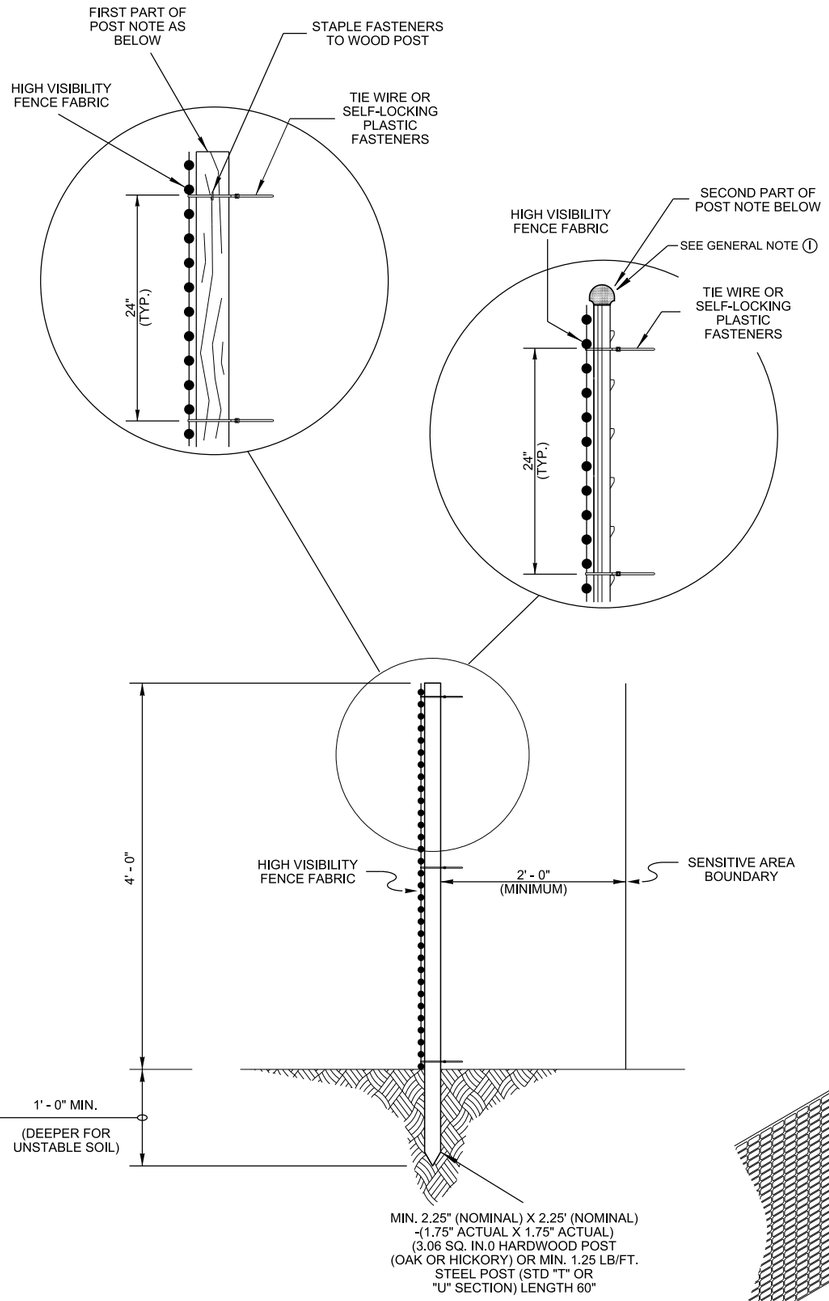
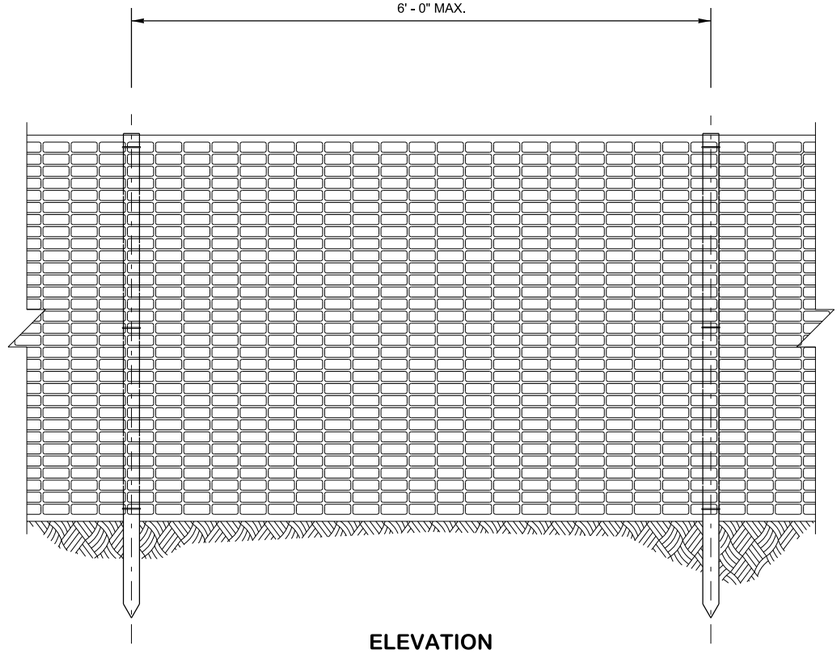
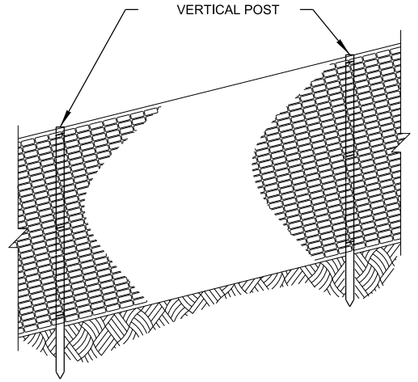
- REV. 05-24-12: ADDED HIGH VISIBILITY FENCE LEGEND.
- REV. 06-28-2019: ADDED GENERAL NOTE NO. (I) REDREW SHEET.



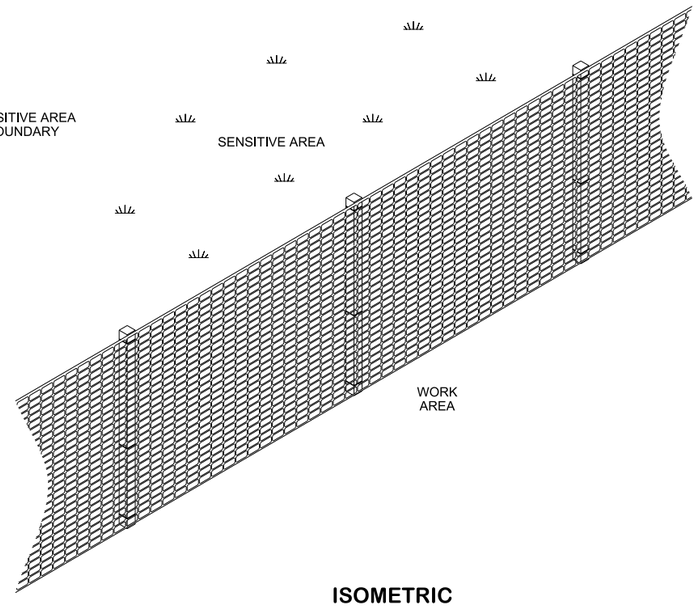
TYPICAL SECTION



ELEVATION



ELEVATION
FENCE ON SLOPE



ISOMETRIC

EROSION CONTROL PLAN LEGEND: * HVF * HVF * HIGH VISIBILITY FENCE

NOT TO SCALE

GENERAL NOTES

(A) HIGH VISIBILITY FENCE IS INTENDED TO BE PLACED TO PREVENT DISTURBANCE OF SENSITIVE AREAS, THEIR BUFFERS, AND OTHER AREAS REQUIRED TO BE LEFT UNDISTURBED DURING CONSTRUCTION. IT MAY ALSO BE USED TO MARK APPROVED CLEARING LIMITS AND TO CONTROL VEHICLE ACCESS TO AND ON THE PROJECT SITE.

(B) HIGH VISIBILITY FENCE FABRIC SHALL BE MACHINED PRODUCED ORANGE COLORED MESH MANUFACTURED FROM POLYPROPYLENE OR POLYETHYLENE. IT SHALL BE FULLY STABILIZED ULTRAVIOLET RESISTANT.

(C) HIGH VISIBILITY FENCE FABRIC MAY BE MADE FROM RECYCLED MATERIALS. MATERIALS SHALL NOT CONTAIN BIODEGRADABLE FILLER MATERIALS THAT CAN DEGRADE THE PHYSICAL OR CHEMICAL CHARACTERISTICS OF THE FINISHED FABRIC.

(D) HIGH VISIBILITY FENCE FABRIC SHALL HAVE A MINIMUM 4 FOOT WIDTH AND SHALL BE FURNISHED IN ONE CONTINUOUS WIDTH AND SHALL NOT BE SPLICED TO CONFORM TO THE SPECIFIED WIDTH DIMENSION.

(E) STEEL POST SHALL BE ROLLED FROM HIGH CARBON STEEL AND SHALL HAVE A MINIMUM WEIGHT OF 1.25 LB/FT. POST SHALL BE HOT-DIPPED GALVANIZED OR PAINT. STEEL POST MAY BE EQUIPPED WITH AN ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. IF POSTS ANCHOR PLATES USED THEY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702.

(F) HIGH VISIBILITY FENCE FABRIC SHALL BE FASTENED TO THE POST USING TIE WIRE OR SELF-LOCKING PLASTIC FASTENERS WITH A MAXIMUM FASTENERS SPACING OF 2 FEET. WHEN WOOD POSTS ARE USED THE FASTENERS SHALL BE STAPLED TO THE POST.

(G) HIGH VISIBILITY FENCE THAT IS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED AT THE CONSTRUCTORS EXPENSE ON THE SAME DAY THE DAMAGE OCCURS.

(H) HIGH VISIBILITY FENCE SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:

707-08.11 HIGH VISIBILITY CONSTRUCTION FENCE, L.F.

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION MAINTENANCE, AND REMOVAL OF HIGH VISIBILITY FENCE.

(I) ORANGE SAFETY CAPS FOR METAL POSTS SHALL BE REQUIRED TO MEET OSHA REGULATIONS 1926.701. ALL COST OF THE CAPS TO BE INCLUDED IN THE COST OF THE FENCE.

- MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

HIGH VISIBILITY FENCE

12-15-2007 S-F-1

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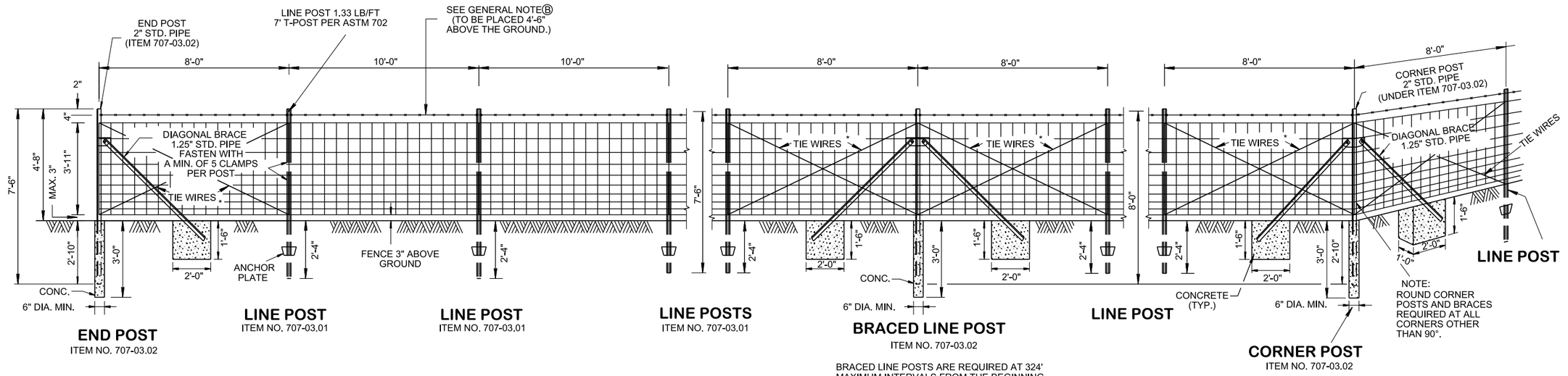


END POST
ITEM NO. 707-03.02

LINE POST
ITEM NO. 707-03.01

LINE POST
ITEM NO. 707-03.01

LINE POSTS
ITEM NO. 707-03.01

BRACED LINE POST
ITEM NO. 707-03.02

LINE POST

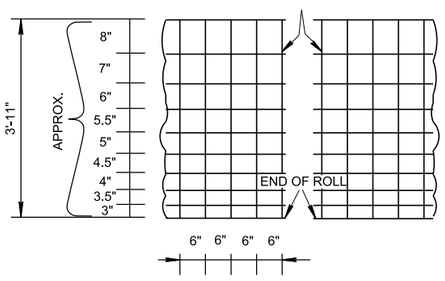
CORNER POST
ITEM NO. 707-03.02

* NOTE REGARDING TIE WIRES:
NO. 9 GAUGE DOUBLE STRAND GALVANIZED TIE WIRE TWISTED TO SINGING TIGHTNESS, DOUBLE WRAPPED AROUND POSTS.

BRACED LINE POSTS ARE REQUIRED AT 324' MAXIMUM INTERVALS FROM THE BEGINNING CORNER FOR THE FIRST ROLL. BRACED LINE POSTS ARE REQUIRED AT 330' MAXIMUM INTERVALS AFTER THE FIRST ROLL FROM THE BEGINNING CORNER. THIS SPACING WILL PERMIT A 6' LENGTH OF FABRIC TO EXTEND BEYOND THE BRACED LINE POST ASSEMBLY FOR ATTACHING THE STRETCHING DEVICE AND FOR SPLICING TO THE NEXT ROLL.

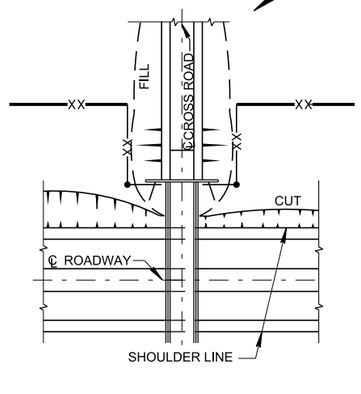
EACH HORIZONTAL WIRE TO BE SPLICED AS SHOWN BELOW

SPLICE DETAIL FOR FENCE

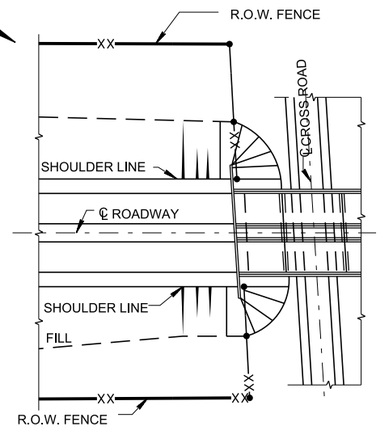


FARM FENCE WIRE DETAILS

NOTE: THESE INSTALLATION SCHEMES ARE TYPICAL AND ARE NOT TO BE CONSTRUED AS REPRESENTATIVE OF ALL CONDITIONS WHICH WILL BE ENCOUNTERED. CONSTRUCTION MAY BE VARIED AS REQUIRED TO MEET FIELD CONDITIONS AND/OR AS DIRECTED BY ENGINEER.



PLAN
ROADWAY UNDER CROSS ROAD



PLAN
ROADWAY OVER CROSS ROAD

FENCE LEGEND: PROPOSED STOCK FENCE ——XX—— , RIGHT-OF-WAY CONTROL ACCESS FENCE ——XX——

NOT TO SCALE

REV. 6-3-69: ADDED NOTE REGARDING ALTERNATE TYPE TRUSS ROD AND FITTINGS.

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 12-7-75: ADDED ITEM NO'S FOR END BRACED LINE AND CORNER POSTS.

REV. 1-1-76: CHANGED DRAWING NUMBER FROM RD-F-10(68). (SHEET 1) TO S-F-10.

REV. 11-9-76: REMOVED CHAIN LINK FENCE DETAILS AND SPECIES FROM THIS SHEET.

REV. 2-25-77: DELETED BARED WIRE AT BOTT EM OF FENCE, CHANGED POST SPACING ON BRACED LINE POSTS AND CORNER POSTS FROM 10' TO 8'.

REV. 7-17-81: CHANGED ITEM NO. TO AGREE WITH NEW SPECIFICATION BOOK.

REV. 1-24-08: REDREW SHEET AND CHANGED LENGTH OF ALL FENCE POSTS. MOVE STOCK FENCE AND CHAIN LINK FENCE TO S-F-10C.

◘ REV. 6-1-09: REMOVED TIE WIRES BETWEEN LINE POSTS. MODIFIED GENERAL NOTE Ⓐ. ADDED GENERAL NOTE Ⓑ. REVISED LINE POST SPACING.

◘ REV. 11-15-17: ADDED LINE POST NOTE. CHANGED R.O.W FENCE LINE STYLE. CHANGED FONT. REWORDED THE BRACED LINE POST NOTE REGARDING MAXIMUM INTERVALS.

◘ REV. 06-28-2019: REDREW SHEET.

GENERAL NOTES

Ⓐ GALVANIZED STEEL WOVEN WIRE MEETING THE REQUIREMENTS OF ASTM A-116 FOR NO. 11 FARM, DESIGN NO. 1047-6-11, CLASS III COATING OR GALVANIZED HIGH TENSILE STRENGTH STEEL WOVEN WIRE MEETING THE REQUIREMENTS OF ASTM A-116 FOR NO. 12½ FARM DESIGN, CLASS III COATING EXCEPT THAT THE TOP AND BOTTOM STRAND SHALL BE 10½ GAUGE AND THE YIELD STRENGTH SHALL BE EQUIVALENT TO NO. 11 FARM DESIGN 1047-6-11.

Ⓑ THE BARBED WIRE SHALL CONSIST OF 2 NO. 12½ GAUGE TWISTED STEEL LINE WIRES WITH NO. 14 GAUGE 4-POINT BARBS SPACED NOT MORE THAN 5 IN. APART. IT MAY BE EITHER GALVANIZED OR ALUMINUM COATED. THE GALVANIZED WIRE SHALL MEET THE REQUIREMENTS OF ASTM A-121, CHAIN LINK FENCE GRADE. AT THE OPTION OF THE CONTRACTOR, HIGH TENSILE STRENGTH WIRE WITH BARB SPACING AS DESIGNATED ABOVE, MAY BE USED. IF THE CONTRACTOR ELECTS TO FURNISH HIGH TENSILE STRENGTH WIRE, IT SHALL MEET THE REQUIREMENTS OF ASTM A-121, CHAIN LINK FENCE GRADE FOR THE RESPECTIVE WIRE SIZE.

Ⓒ SEE STANDARD DRAWING S-FG-20 FOR DETAILS OF FENCING OVER DITCHES FOR WATER CROSSING DETAILS.

Ⓓ SEE STANDARD SPECIFICATIONS, SUB-SECTION 707.05 REGARDING FURNISHING AND PLACING ADDITIONAL BRACED LINE POSTS WHERE TERRAIN IS IRREGULAR.

Ⓔ FENCE TO BE ANGLED TO EDGE OF CULVERTS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

Ⓕ PAYMENT WILL BE MADE UNDER ITEM NOS.:

707-03.01	STOCK FENCE,	L.F.
707-03.02	END, BRACED LINE, CORNER POST ASSEMBLY (STOCK FENCE),	EACH

◘ MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD RIGHT-OF-WAY STOCK FENCE

06-01-1959 | S-F-10

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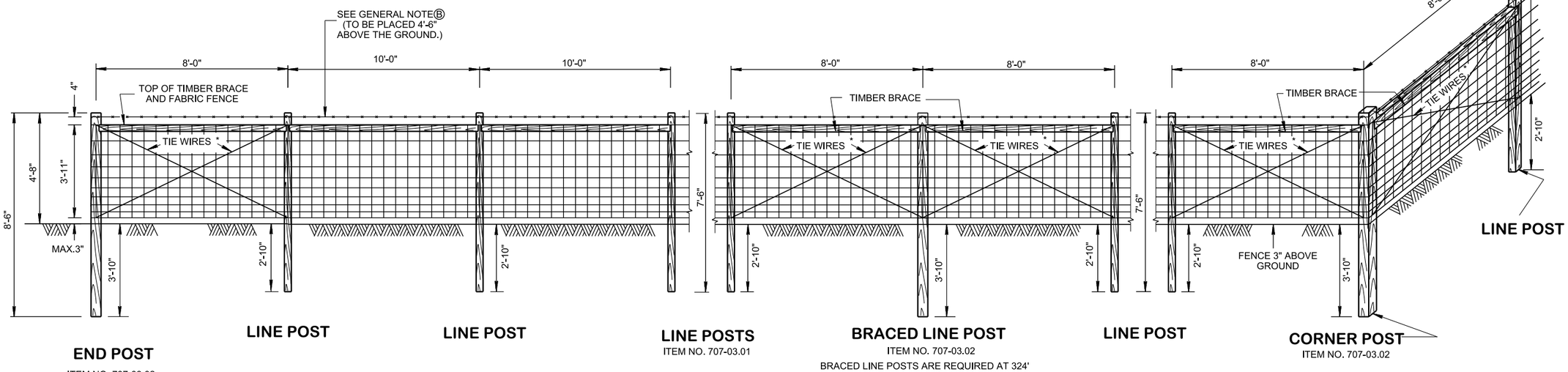
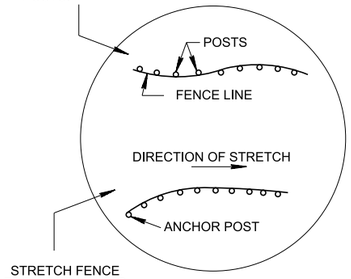


* NOTE REGARDING TIE WIRES:
NO. 9 GAUGE DOUBLE STRAND GALVANIZED TIE WIRE TWISTED TO SINGING TIGHTNESS, DOUBLE WRAPPED AROUND POSTS.

BRACED LINE POSTS ARE REQUIRED AT 324' MAXIMUM INTERVALS FROM THE BEGINNING CORNER FOR THE FIRST ROLL. BRACED LINE POSTS ARE REQUIRED AT 330' MAXIMUM INTERVALS AFTER THE FIRST ROLL FROM THE BEGINNING CORNER. THIS SPACING WILL PERMIT A 6' LENGTH OF FABRIC TO EXTEND BEYOND THE BRACED LINE POST ASSEMBLY FOR ATTACHING THE STRETCHING DEVICE AND FOR SPLICING TO THE NEXT ROLL.

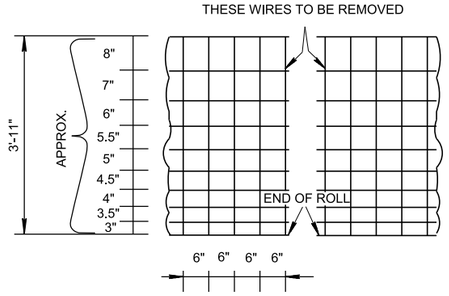
ALWAYS PUT THE WIRE ON THE OUTSIDE OF THE POST ON THE CURVE SO THAT IT PULLS AGAINST THE FENCE POSTS.



DETAIL OF FENCING ON CURVE

FENCE POST DIMENSIONS

TYPE	SIZE		LENGTH
	ROUND (DIA.)	SQUARE (EDGE WIDTH)	
LINE POST	3½"	3½"	7'-6"
BRACED LINE POST CORNER POST END POST	5"	5"	8'-6"
TIMBER BRACE	3½"	3½"	7'-9"



FARM FENCE WIRE DETAILS

GENERAL NOTES

Ⓐ GALVANIZED STEEL WOVEN WIRE MEETING THE REQUIREMENTS OF ASTM A-116 FOR NO. 11 FARM, DESIGN NO. 1047-6-11, CLASS III COATING OR GALVANIZED HIGH TENSILE STRENGTH STEEL WOVEN WIRE MEETING THE REQUIREMENTS OF ASTM A-116 FOR NO. 12½ FARM DESIGN, CLASS III COATING EXCEPT THAT THE TOP AND BOTTOM STRAND SHALL BE 10½ GAUGE AND THE YIELD STRENGTH SHALL BE EQUIVALENT TO NO. 11 FARM DESIGN 1047-6-11.

Ⓑ THE BARBED WIRE SHALL CONSIST OF 2 NO. 12½ GAUGE TWISTED STEEL LINE WIRES WITH NO. 14 GAUGE 4-POINT BARBS SPACED NOT MORE THAN 5 IN. APART. IT MAY BE EITHER GALVANIZED OR ALUMINUM COATED. THE GALVANIZED WIRE SHALL MEET THE REQUIREMENTS OF ASTM A-121, CHAIN LINK FENCE GRADE. AT THE OPTION OF THE CONTRACTOR, HIGH TENSILE STRENGTH WIRE WITH BARB SPACING'S AS DESIGNATED ABOVE, MAY BE USED. IF THE CONTRACTOR ELECTS TO FURNISH HIGH TENSILE STRENGTH WIRE, IT SHALL MEET THE REQUIREMENTS OF ASTM A-121, CHAIN LINK FENCE GRADE FOR THE RESPECTIVE WIRE SIZE.

Ⓒ USE EITHER ROUND POST AND ROUND BRACING OR SQUARE POST AND SQUARE BRACING.

Ⓓ USE 1.5" LONG NO.9 GAUGE GALVANIZED STAPLES FOR TIMBER POSTS.

Ⓔ AT ABRUPT CHANGES IN GRADE OR ALIGNMENT STAPLE EVERY LINE WIRE. AT LINE POSTS STAPLE EVERY LINE WIRE IN THE TOP HALF AND ALTERNATE LINE WIRE IN THE BOTTOM HALF. SEE STAPLING DETAILS.

Ⓕ SEE STANDARD DRAWING S-FG-20 FOR DETAILS OF FENCING OVER DITCHES AND AT OTHER ABRUPT DEPRESSIONS.

Ⓖ SEE STANDARD SPECIFICATIONS, SUB-SECTION 707.05 REGARDING FURNISHING AND PLACING ADDITIONAL BRACED LINE POSTS WHERE TERRAIN IS IRREGULAR.

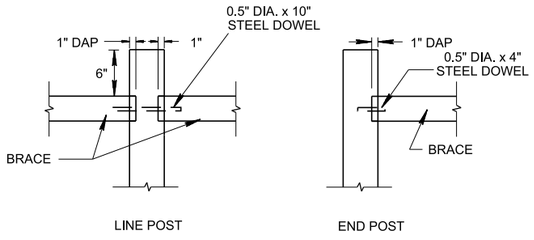
Ⓗ SEE S-F-10C FOR FENCING AT BRIDGES AND CULVERTS.

Ⓘ IF BARBED WIRE IS BEING USED FOR STOCK FENCE, IT IS TO BE FIVE STRAND BARBED WIRE AND THE TOP STRAND OF BARBED WIRE IS TO BE PLACED 54" ABOVE THE GROUND. THE BOTTOM STRAND OF BARBED WIRE IS TO BE PLACED NOT LESS THAN 6" ABOVE THE GROUND. THE NEXT TO THE BOTTOM STRAND OF BARBED WIRE IS TO BE PLACED NOT LESS THAN THAT 15" ABOVE THE GROUND. PAYMENT WILL BE MADE UNDER ITEM NO.

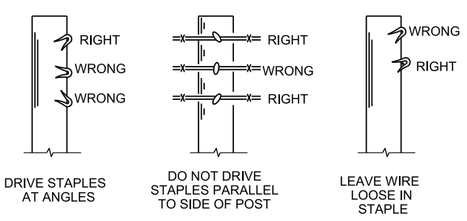
707-03.14, FIVE STRAND BARBED WIRE FENCE, L.F.

Ⓙ PAYMENT WILL BE MADE UNDER ITEM NOS.:

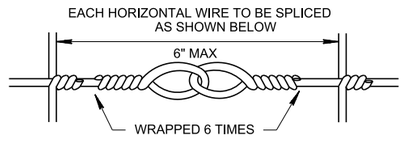
707-03.01 STOCK FENCE, L.F.
707-03.02 END, BRACED LINE, CORNER POST ASSEMBLY (STOCK FENCE), EACH



TIMBER BRACING DETAILS



STAPLING DETAILS



SPLICE DETAIL FOR FENCE

FENCE LEGEND: PROPOSED STOCK FENCE ——XX—— , RIGHT-OF-WAY CONTROL ACCESS FENCE ——XX——

NOT TO SCALE

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 12-7-75: ADDED ITEM NO'S FOR END BRACED LINE AND CORNER POST.

REV. 1-1-76: CHANGED DRAWING NUMBER FROM RD-F-10(68), (SHEET 2) TO S-F-10a.

REV. 2-25-77: DELETED BARED WIRE AT BOTTEM OF FENCE, CHANGED POST SPACING ON BRACED LINE POSTS AND CORNER POSTS FROM 10' TO 8'. ADDED NOTES REGARDING FENCING OVER DITCHES AND IRREGULAR TERRAIN.

REV. 7-17-81: CHANGED ITEM NO. TO AGREE WITH NEW SPECIFICATION BOOK.

◘ REV. 1-24-08: REDREW SHEET AND CHANGED LENGTH OF ALL FENCE POSTS. ADDED NOTE Ⓗ.

◘ REV. 6-1-09: REMOVED TIE WIRES BETWEEN LINE POSTS. MODIFIED GENERAL NOTE Ⓐ. ADDED GENERAL NOTE Ⓑ. REVISED LINE POST SPACING.

◘ REV. 11-15-17: CHANGED FONT. CORRECTED MISSPELLINGS. CORRECTED GENERAL NOTE LETTERING. CORRECTED PAY ITEM DESCRIPTION. REWORDED THE BRACED LINE POST NOTE REGARDING MAXIMUM INTERVALS.

◘ REV. 06-28-2019: REDREW SHEET.

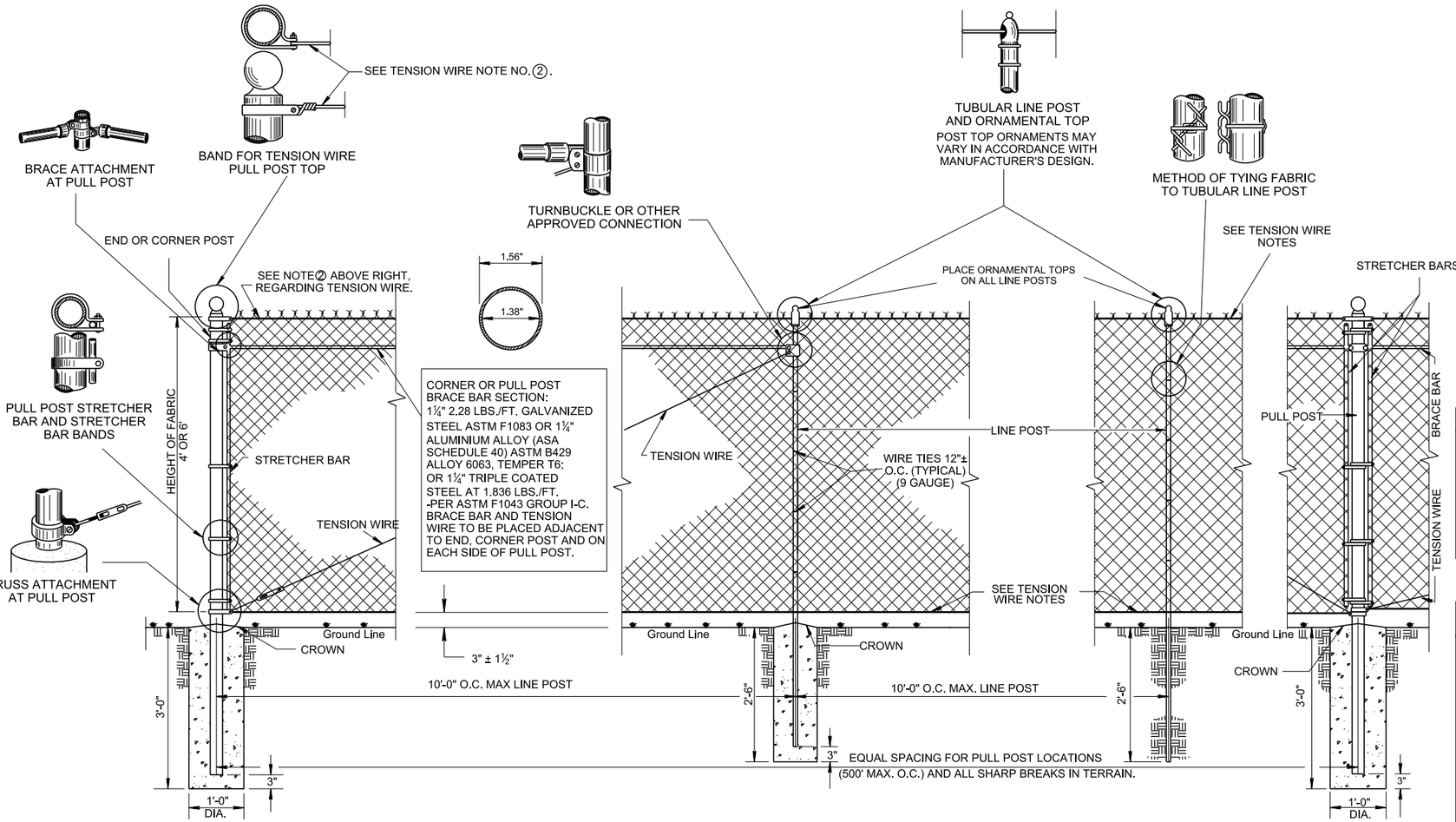
◘ MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD RIGHT-OF-WAY STOCK FENCE WITH TIMBER POSTS

01-01-1968 S-F-10A

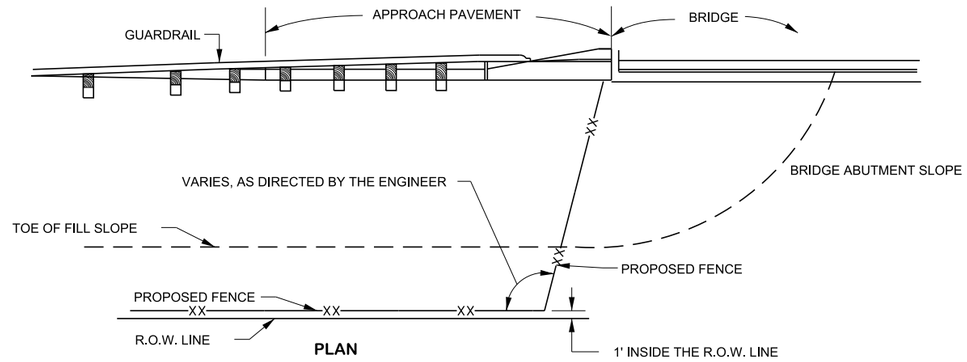
12/5/2019 2:41:34 PM
P:\StandDraw\DESIGN STANDARDS\Standards Drawings Library\Standard Roadway Drawings - CURRENT\In Progress\10-104.00 Roadway, Pavement Appurtenances and Fence IP\104.05 Fence & Right of Way Ma
LLP



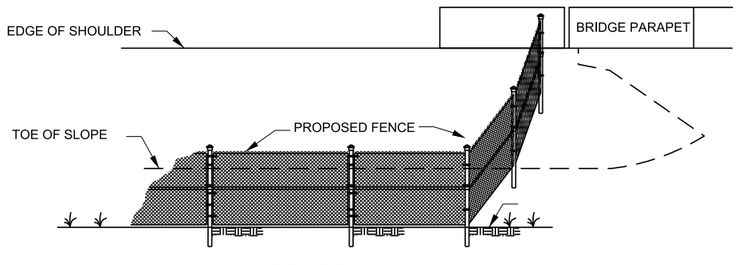
END POST | **LINE POST** | **BRACED LINE POST**

- REV. 5-14-10: REMOVED ITEM NUMBERS.
- REV. 11-15-17: CHANGED FONT. CORRECTED PROPOSED FENCE LINE TYPE IN THE PLAN VIEW. ADDED GENERAL NOTE (E). CHANGED DISTANCE BETWEEN R.O.W. LINE AND R.O.W. FENCE FROM 6" TO 1' TO MATCH STANDARD SPECIFICATIONS.
- REV. 06-28-2019: REDREW SHEET.

FENCING TERMINALS AT BRIDGE ABUTMENTS

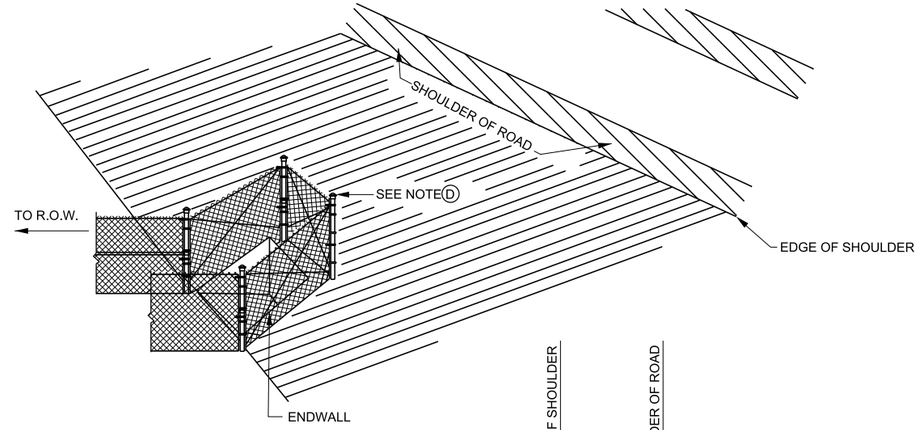


PLAN



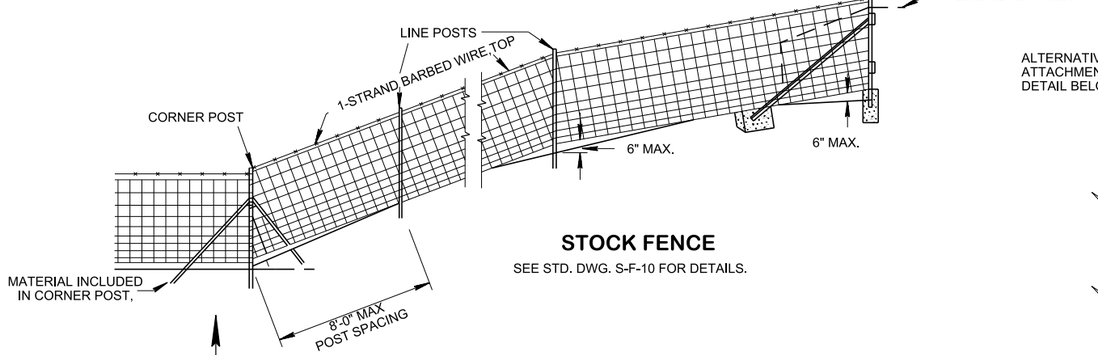
ELEVATION

FENCE UP AND OVER DRAINAGE STRUCTURES WITHOUT WINGWALLS



ELEVATION

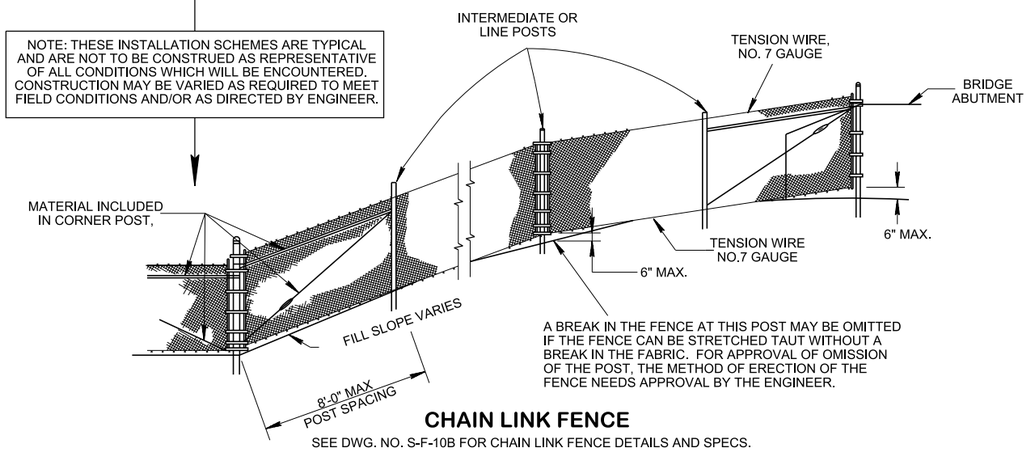
DRAINAGE STRUCTURES WITH WINGWALLS



STOCK FENCE

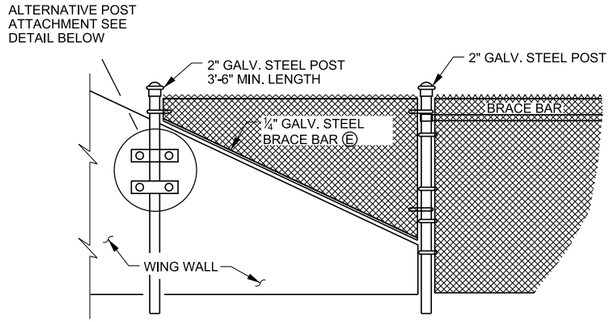
SEE STD. DWG. S-F-10 FOR DETAILS.

NOTE: THESE INSTALLATION SCHEMES ARE TYPICAL AND ARE NOT TO BE CONSTRUED AS REPRESENTATIVE OF ALL CONDITIONS WHICH WILL BE ENCOUNTERED. CONSTRUCTION MAY BE VARIED AS REQUIRED TO MEET FIELD CONDITIONS AND/OR AS DIRECTED BY ENGINEER.



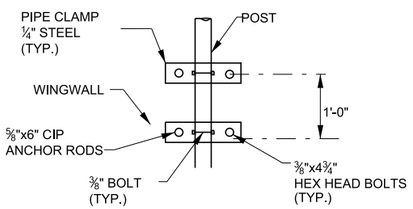
CHAIN LINK FENCE

SEE DWG. NO. S-F-10B FOR CHAIN LINK FENCE DETAILS AND SPECS.

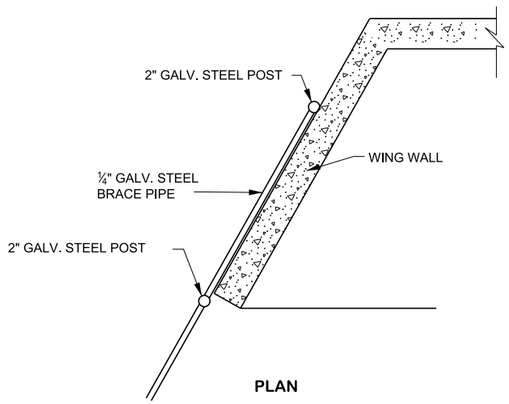


ELEVATION

1. FOR USE WHEN DRAINAGE STRUCTURE HEIGHT IS 5'-8" OR GREATER AND WHEN IT IS NOT FEASIBLE TO GO UP AND OVER THE DRAINAGE STRUCTURE AS SHOWN ON THIS SHEET.
2. FENCING TERMINALS AT RETAINING WALL DETAIL ON S-F-10D MAY BE USED AS AN ALTERNATE.



PIPE CLAMP CONNECTION DETAIL



PLAN

GENERAL NOTES

(A) RIGHT-OF-WAY FENCE SHALL CONFORM TO NOTES AND DETAILS SPECIFIED ON STANDARD DRAWING NO. S-F-10B FOR URBAN AREAS AND S-F-10 AND S-F-10A FOR RURAL AREAS.

(B) SEE S-FG-20 FOR WATER CROSSING DETAILS.

(C) EXPLORE EVERY OPTION NOT TO DISTURB EXISTING VEGETATION DURING THE INSTALLATION OF THE FENCE.

(D) THE ELEVATION OF THE FENCE POST TOP SHALL BE LOWER THAN THE ROADWAY SHOULDER AND THE NEAREST PORTION OF THE FENCE SHALL BE OUTSIDE THE CLEAR ZONE.

(E) FOR BRACE BAR DETAILS SEE STD. DWG. S-F-10B.

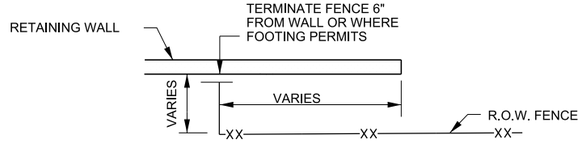
- MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

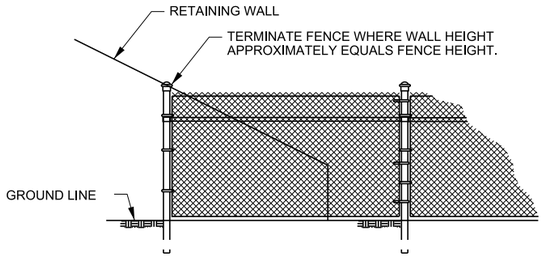
RIGHT-OF-WAY FENCE AT BRIDGE AND BOX CULVERTS

01-24-2008 | S-F-10C

NOT TO SCALE

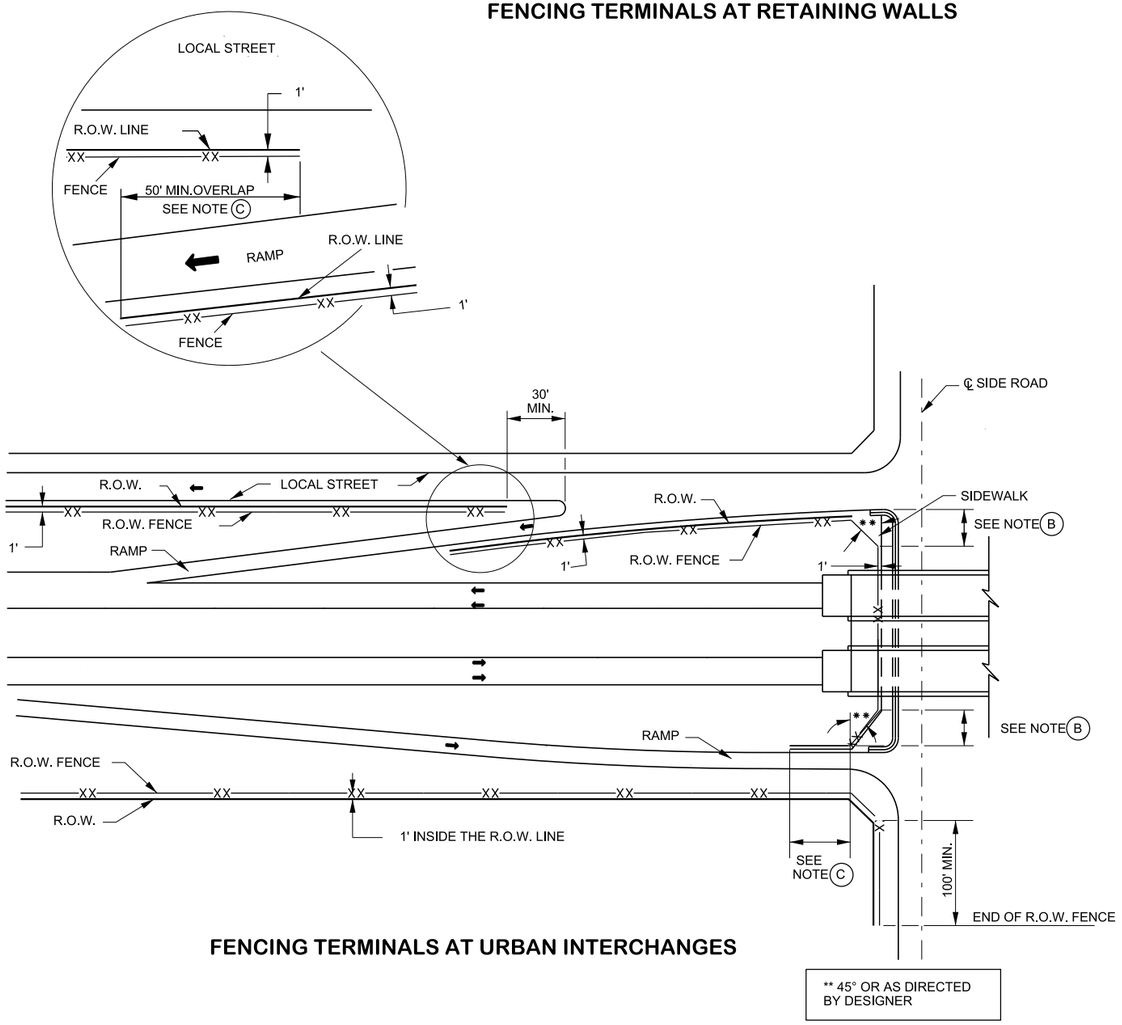


PLAN

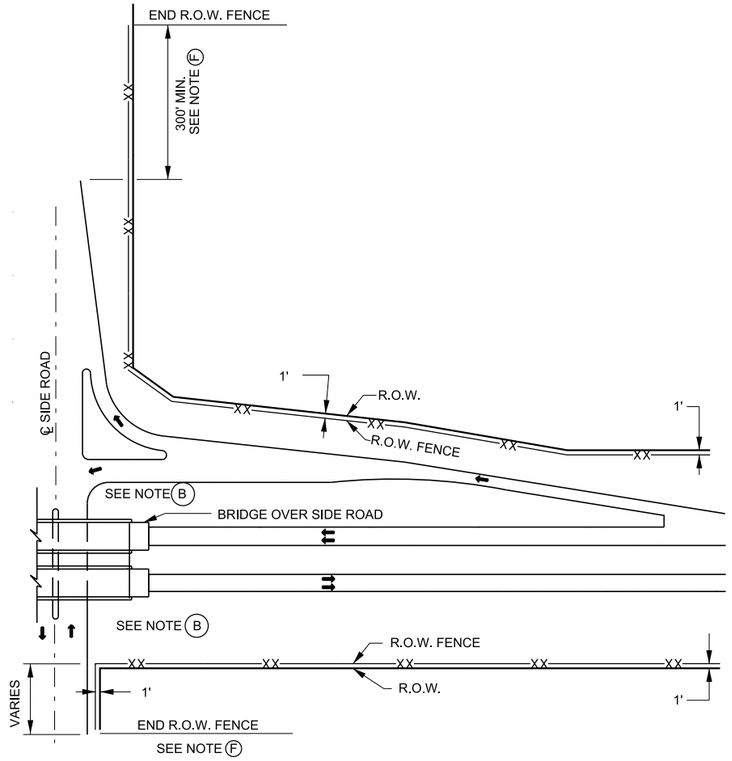


ELEVATION

FENCING TERMINALS AT RETAINING WALLS



FENCING TERMINALS AT URBAN INTERCHANGES



FENCING TERMINALS AT RURAL INTERCHANGES

APPLIES TO BRIDGE OVER CROSSROAD AND CROSSROAD OVER INTERSTATE
(BRIDGE OVER CROSSROAD SHOWN)

GENERAL NOTES

FENCING TERMINALS AT URBAN INTERCHANGES

Ⓐ RIGHT-OF-WAY FENCE SHALL CONFORM TO NOTES AND DETAILS SPECIFIED ON STANDARD DRAWING NO. S-F-10B.

Ⓑ THE INDICATED DISTANCE SHALL BE SUFFICIENT TO PROVIDE SATISFACTORY SIGHT DISTANCE FOR THE TRAFFIC FROM THE RAMP.

Ⓒ END SECTIONS OF THE RIGHT-OF-WAY FENCE SECTIONS SHALL BE OVERLAPPED, MIN. 50'.

Ⓓ RIGHT-OF-WAY FENCE SHALL BE PLACED 1' INSIDE THE RIGHT-OF-WAY LINE.

FENCING TERMINALS AT RURAL INTERCHANGES

Ⓔ RIGHT-OF-WAY FENCE SHALL CONFORM TO NOTES AND DETAILS SPECIFIED ON STANDARD DRAWING NO. S-F-10 & S-F-10A.

Ⓕ RIGHT- OF- WAY FENCE ALONG THE CROSSROAD WILL EXTEND A MINIMUM 300 FEET BEYOND THE END OF THE ACCELERATION OR DECELERATION TAPER,WITH THE TAPER MOST REMOTE FROM THE PROJECT ESTABLISHING THE END FOR BOTH SIDES OF THE ROADWAY. IN THE ABSENCE OF A TAPER THE RADIUS POINT OF THE RAMP RETURN WILL BE USED WITH THE ABOVE CRITERIA.

Ⓖ FOR INTERCHANGE QUADRANTS HAVING NO RAMP, THE RIGHT-OF-WAY FENCE WILL EXTEND ALONG THE CROSSROAD TO A POINT OPPOSITE THE LIMIT OF LIMITED ACCESS RIGHT-OF-WAY ESTABLISHED BY THE RAMP TAPER OR RADIUS POINT AS NOTED.

- REV. 11-15-17: CHANGED FONT. CORRECTED R.O.W. FENCE LINE TYPE. CHANGED DISTANCE BETWEEN R.O.W. LINE AND R.O.W. FENCE FROM 6" TO 1' TO MATCH STANDARD SPECIFICATIONS.
- REV. 06-28-2019: COMBINED GENERAL NOTES AND REDREW SHEET.

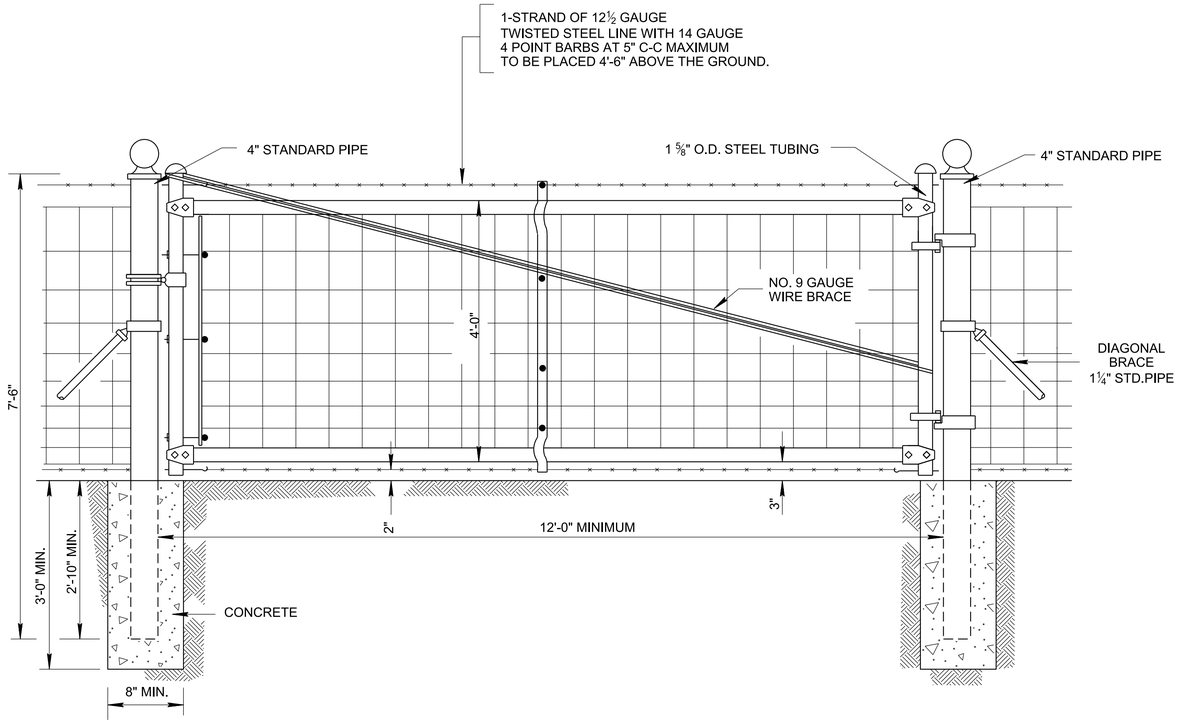
◘ MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

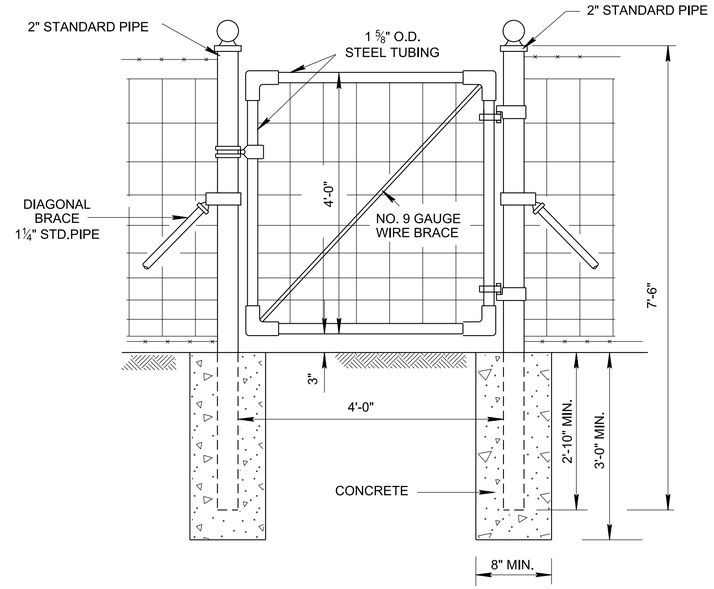
RIGHT-OF-WAY FENCE LOCATIONS AT INTERCHANGES

01-24-2008 | S-F-10D

NOT TO SCALE



STOCK FENCE DRIVE GATE (12' X 4')



STOCK FENCE WALK GATE (4' X 4')

GENERAL NOTES

(A) DESCRIPTION

STOCK FENCE DRIVE GATE SHALL BE A TUBULAR STEEL FRAME 4 FEET HIGH AND OF SPECIFIED LENGTH WITH WIRE FABRIC FILLER WITHIN THE GATE FRAME, AND WITH TWO STRANDS OF BARBED WIRE ABOVE THE FRAME AND ONE STRAND OF BARBED WIRE BELOW THE FRAME, AND SHALL BE CONSTRUCTED OF THE MATERIALS INDICATED BELOW.

STOCK FENCE WALK GATE SHALL BE A TUBULAR STEEL FRAME 4 FEET HIGH AND 4 FEET LONG WITH WIRE FABRIC FILLER WITHIN THE GATE FRAME, AND SHALL BE CONSTRUCTED OF THE MATERIALS INDICATED BELOW.

(B) MATERIALS

DRIVE GATE: THE GATE SHALL CONSIST OF 1⅝" O.D. HIGH CARBON STEEL TUBING FASTENED AT EACH CORNER WITH MALLEABLE IRON OR PRESSED STEEL FITTINGS BOLTED TO THE TUBULAR FRAME. THE GATE FRAME SHALL BE BRACED VERTICALLY AT THE CENTER WITH TWO 1" X 1" ANGLE IRONS OR TWO ⅜" X ¾" CHANNEL IRONS BOLTED TOGETHER, AND SHALL BE BRACED DIAGONALLY WITH A NO. 9 GALVANIZED WIRE BRACE ATTACHED IN A MANNER TO PROVIDE ADJUSTMENT. GATES MORE THAN 12 FEET IN LENGTH SHALL HAVE TWO EQUALLY SPACED VERTICAL BRACES. THE END MEMBERS OF THE GATE FRAME SHALL BE PROVIDED WITH METAL CAPS.

WALK GATE: THE WALK GATE SHALL CONSIST OF 1⅝" O.D. HIGH CARBON STEEL TUBING FASTENED AT EACH CORNER WITH MALLEABLE IRON OR PRESSED STEEL FITTINGS ATTACHED IN A MANNER SATISFACTORY TO THE ENGINEER. THE FRAME SHALL BE BRACED DIAGONALLY WITH A NO. 9 GALVANIZED WIRE BRACE ATTACHED IN A MANNER TO PROVIDE ADJUSTMENT.

(C) CONSTRUCTION

GATES SHALL BE INSTALLED AT THE LOCATIONS INDICATED IN THE PLANS OR AS DIRECTED BY THE ENGINEER. THE GATE SHALL BE INSTALLED BETWEEN AND FASTENED TO PROPERLY SPACED GATE POSTS, WHICH SHALL BE SET IN THE GROUND A FULL 34 INCHES. THE POSTS AND BRACES SHALL BE SET IN CONCRETE BASES BETWEEN AND FASTENED TO PROPERLY SPACED GATE POSTS, WHICH SHALL BE SET IN THE GROUND A FULL 34 INCHES. THE POSTS AND BRACES SHALL BE SET IN CONCRETE BASES WHICH SHALL BE AT LEAST 8 INCHES IN DIAMETER AND SHALL EXTEND 3 FEET OR MORE BELOW THE SURFACE OF THE GROUND.

(D) PAYMENT

PAYMENT FOR ALL COMPONENTS WILL BE MADE UNDER ITEM NUMBERS:

707-03.20	DRIVE GATE (STOCK FENCE) (DESCRIPTION),	EACH
707-03.21	WALK GATE (STOCK FENCE) (DESCRIPTION),	EACH

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 1-1-76: CHANGED DRAWING NUMBER FROM RD-F-11(68) TO S-F-11.

REV. 5-2-90: ADDED PAY ITEMS.

◘ REV. 1-24-08: REDREW SHEET AND CHANGED LENGTH OF ALL FENCE POSTS.

◘ REV. 5-14-10: MODIFIED ITEM NUMBER DESCRIPTIONS.

◘ REV. 11-15-17: CHANGED FONT. CLARIFIED PAYMENT FOR ALL COMPONENTS. CORRECTED MISSPELLINGS.

◘ REV. 06-28-2019: REDREW SHEET.

◘ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

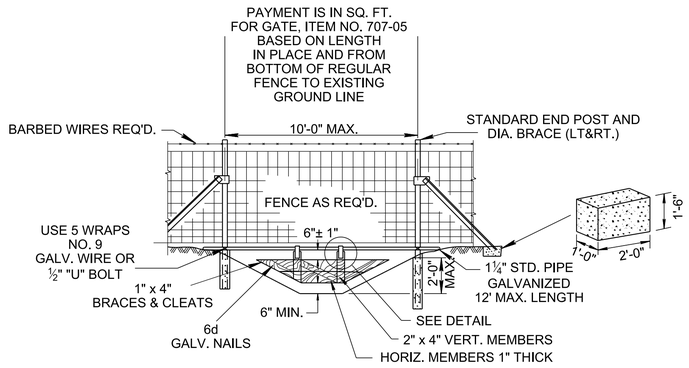
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD STOCK FENCE GATE

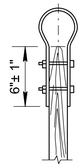
01-01-1968 S-FG-11

NOT TO SCALE

12/3/2019 10:27:27 AM
C:\Users\jj00547\Desktop\104.05 Fence & Right of Way Markers IP\SFG11-20190628.dgn
LLP

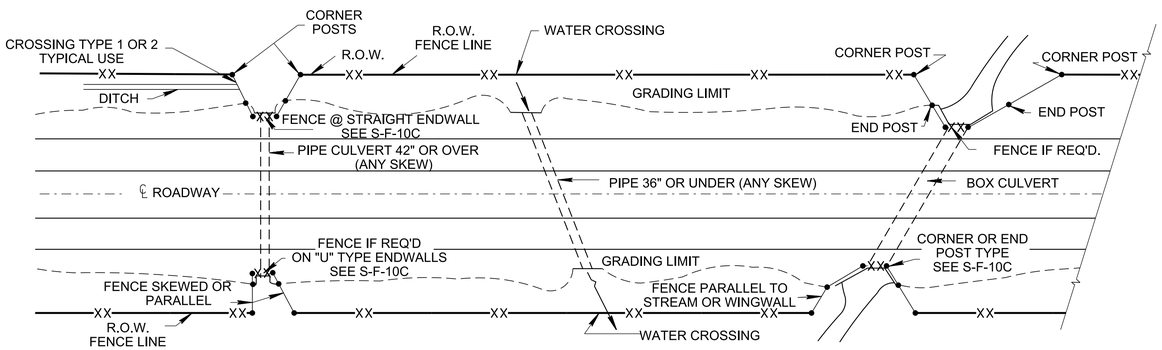


TYPICAL GATE FOR DITCH WIDTH 10' OR LESS TYPE A

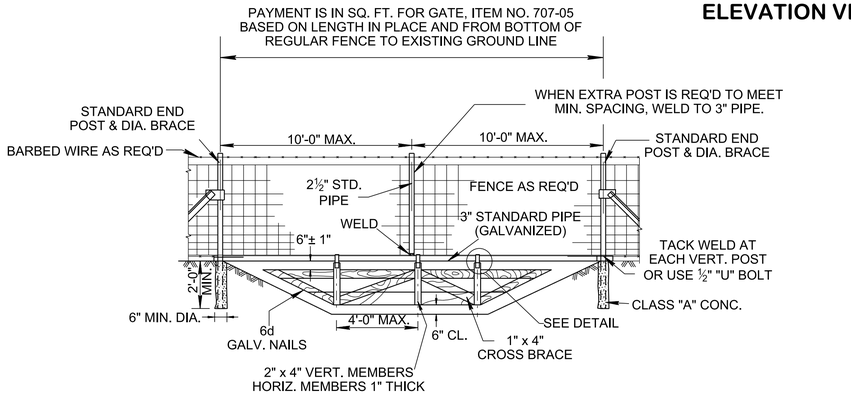


¼" x 3" MILD STEEL HANGER BOLTED TO FACE OF 2" x 4" WITH 2-⅜" x 3" MACHINE BOLTS BEND HANGER FOR LOOSE FIT ON PIPE REQUIRED.

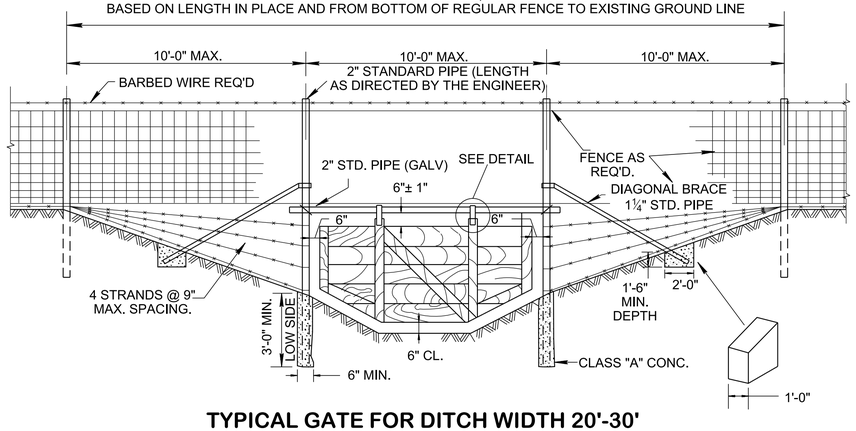
DETAIL ELEVATION VIEW



TYPICAL LOCATION PLAN

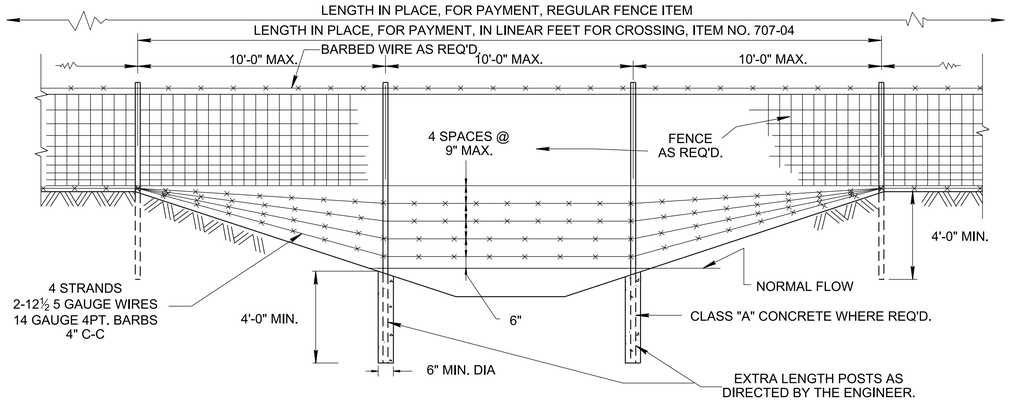


TYPICAL GATE FOR DITCH WIDTH 10'-20' TYPE B



TYPICAL GATE FOR DITCH WIDTH 20'-30' TYPE C

DETAILS NOT SHOWN ABOVE ARE SAME AS FOR TYPE "B" GATE



WATER CROSSING

GENERAL NOTES

(A) GATE FOR DITCH SHALL BE ERECTED AT LOCATIONS INDICATED IN THE PLANS OR AS INDICATED BY THE ENGINEER.

(B) COMPENSATION FOR WATER GATES AND WATER CROSSINGS IS INTENDED ONLY FOR ADDITIONAL MATERIAL, INCLUDING ADDITIONAL PIPE, EXTRA LENGTHS OF POSTS, WIRE, LUMBER, HARDWARE AND CONCRETE AND WORK REQUIRED FOR THE FACILITIES WHICH ARE NOT PROVIDED FOR IN THE REGULAR RIGHT-OF-WAY FENCE ITEM.

(C) PAYMENT WILL BE MADE UNDER ITEM NOS.:

707-04	WATER CROSSING,	L.F.
707-05	WATER GATE,	S.F.

(D) THESE INSTALLATION SCHEMES ARE TYPICAL AND NOT TO BE CONSTRUED AS REPRESENTATIVE OF ALL CONDITIONS WHICH WILL BE ENCOUNTERED. CONSTRUCTION MAY BE VARIED AS REQUIRED TO MEET FIELD CONDITIONS AND/OR AS DIRECTED BY THE ENGINEER.

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 1-1-76: CHANGED DRAWING NUMBER FROM RD-F-20(68), (SHEET 2) TO S-F-20.

REV. 5-2-90: ADDED PAY ITEMS.

◘ REV. 1-24-08: REDREW SHEET AND CHANGED LENGTH OF ALL FENCE POSTS.

◘ REV. 11-15-17: CHANGED FONT. CORRECTED R.O.W. FENCE LINE TYPE. CORRECTED MISSPELLINGS.

◘ REV. 06-28-2019: REDREW SHEET.

◘ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

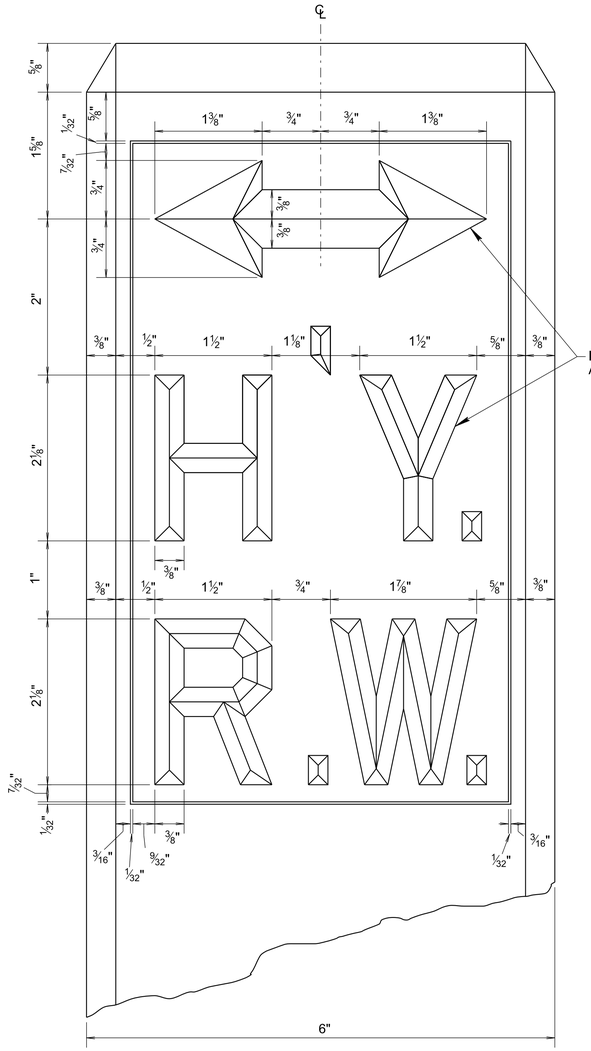
EXAMPLES OF WATER GATES AND WATER CROSSINGS

01-01-1968 | S-FG-20

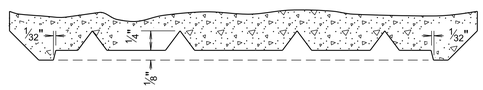
NOT TO SCALE

LLP

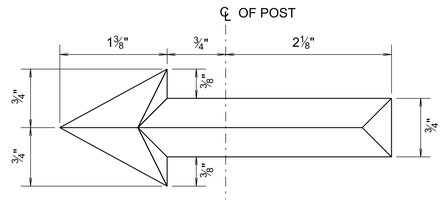
12/3/2019 11:14:36 AM
C:\Users\jj00547\Desktop\104.05 Fence & Right of Way Markers IP\SFG20-20190628.dgn



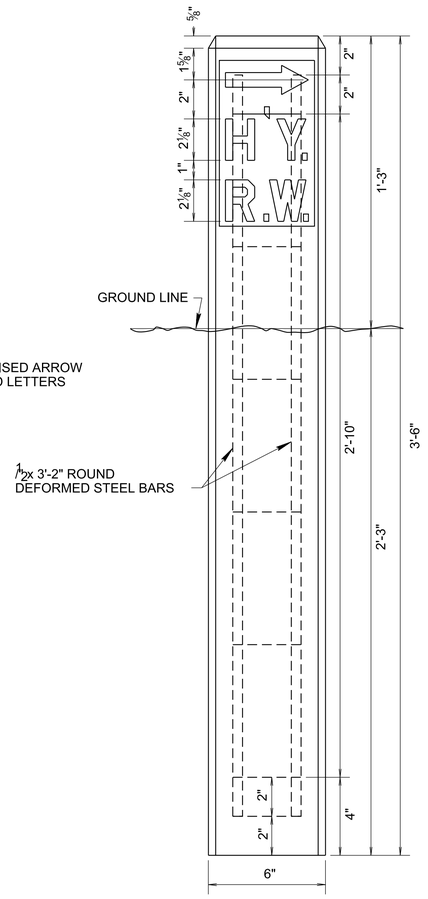
DETAIL OF INSCRIPTION



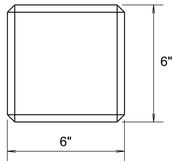
CROSS-SECTION



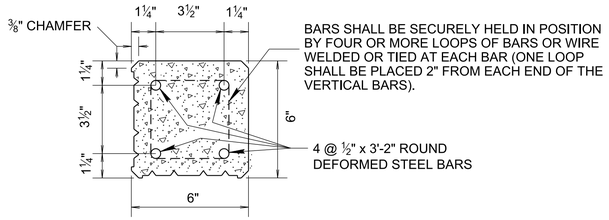
ARROW FOR TYPES "B" AND "C" MARKERS
SCALE = FULL SIZE



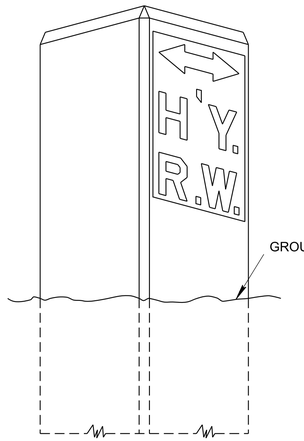
FRONT VIEW



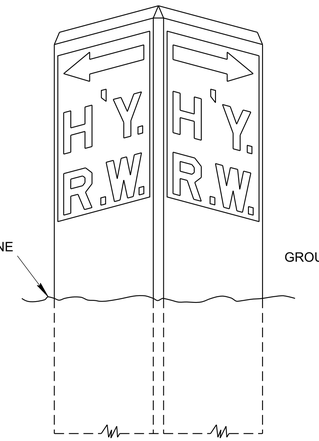
TOP VIEW



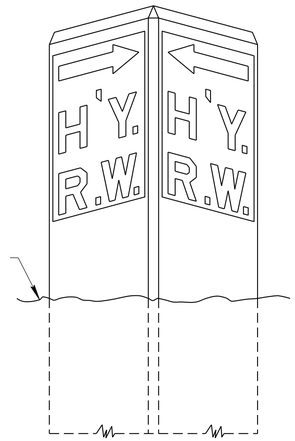
CROSS-SECTION
SCALE 3" = 1'



TYPE "A"
INSCRIPTION ON ONE SIDE
(PARALLEL TO CENTERLINE)



TYPE "B"
INSCRIPTION ON TWO SIDES
(TURNS TO CENTERLINE)



TYPE "C"
INSCRIPTION ON TWO SIDES
(TURNS AWAY FROM CENTERLINE)

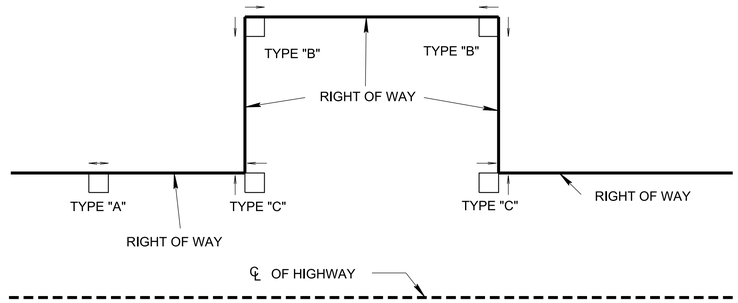


DIAGRAM SHOWING TYPES OF MARKERS TO USE

GENERAL NOTES

(A) CONCRETE RIGHT-OF-WAY MARKERS SHALL BE CONSTRUCTED AND ERECTED IN ACCORDANCE WITH THIS DRAWING AND SECTION 708, MONUMENTS AND MARKERS, OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

(B) CONCRETE: f_c = 4000 PSI AT 28 DAYS
REINFORCING STEEL: ASTM A615, F_y = 60,000 PSI

ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.

(C) PRECAST RIGHT-OF-WAY MARKER UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED RIGHT-OF-WAY MARKER UNITS AT THEIR OWN EXPENSE.

(D) RIGHT-OF-WAY MARKERS ARE TO BE INSTALLED FLUSH WITH THE GROUND IN AREAS WHERE THEY MIGHT BE AN OBSTACLE TO VEHICLES, MOWERS, ETC.

(E) PAYMENT ITEM NO.
708-02.01 MARKERS (CONCRETE R.O.W. POSTS), EACH

REV. 7-2-72: CHANGED DEPARTMENT NAME.

REV. 1-1-76: CHANGED DRAWING NUMBER FROM RW-M-2a(68) TO S-RP-2.

REV. 4-18-90: REDREW SHEET AND CHANGED SHEET NAME. THE DESIGNATION "POSTS" HAS BEEN CHANGED TO "MARKERS". MODIFIED GENERAL NOTES.

- REV. 5-27-96: CHANGED DIMENSION OF DETAIL ON TYPE "B" AND "C" MARKERS.
- REV. 1-19-99: MODIFIED GENERAL NOTES AND ADDED PRECAST SPECIFICATIONS.
- REV. 2-8-16: REVISED GENERAL NOTES.
- REV. 06-28-2019: REDREW SHEET.

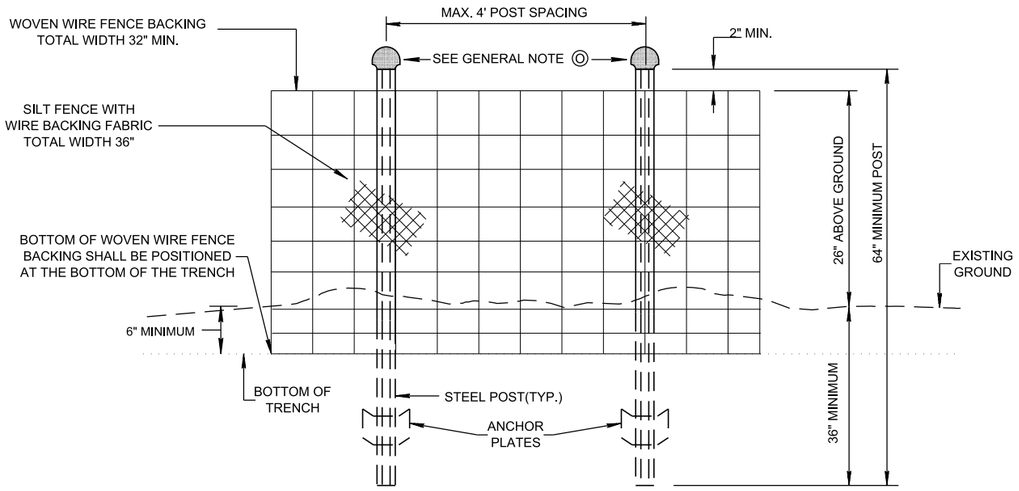
◘ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

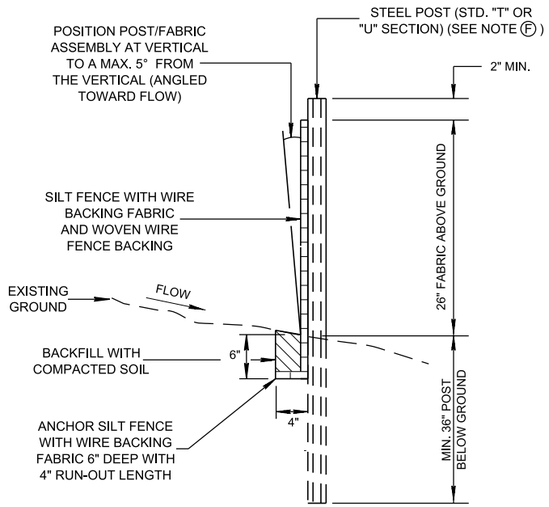
STANDARD CONCRETE RIGHT-OF-WAY MARKERS

S-RP-2

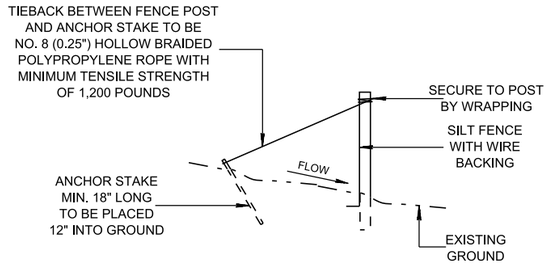
NOT TO SCALE



ELEVATION VIEW



SECTIONAL VIEW



SILT FENCE TIEBACK

(WHEN REQUIRED BY THE ENGINEER OR NOTED IN THE PLANS. COST TO BE INCLUDED IN THE ITEMS FOR SILT FENCE WITH WIRE BACKING)

EROSION CONTROL PLAN LEGEND: * SFB * SFB * SFB * SILT FENCE WITH WIRE BACKING

NOT TO SCALE

SILT FENCE WITH WIRE BACKING FABRIC SPECIFICATIONS	
FABRIC PROPERTY AND TEST METHODS	**REQUIRED PHYSICAL PROPERTIES (MARV VALUES OF TEST DATA)**
GEOTEXTILE FABRIC TYPE	WOVEN MONOFILAMENT
APPARENT OPENING SIZE (ASTM D4751)	# 70 TO # 100 STANDARD SIEVE
WATER FLUX (ASTM D4491)	≥ 18 GPM/FT ^{2}
TENSILE STRENGTH (ASTM D4632)	≥ 310 LB. (WARP DIRECTION) X 200 LB. (FILL DIRECTION)
ULTRAVIOLET STABILITY (AFTER 500 HRS PER ASTM D4355)	≥ 90%
BURST STRENGTH (ASTM D3786)	≥ 400 PSI
PUNCTURE STRENGTH (ASTM D4833)	≥ 105 LB.
TRAPEZOIDAL TEAR (ASTM D4533)	≥ 100 LB. (WARP DIRECTION) X 60 LB. (FILL DIRECTION)

GENERAL NOTES

Ⓐ SILT FENCE WITH WIRE BACKING IS USED TO INTERCEPT SMALL AMOUNTS OF SEDIMENT AND REDUCE VELOCITY FROM SHEET FLOW ONLY. USE SILT FENCE WITH WIRE BACKING UP-GRADIENT TO, AND ALONG THE PERIMETER OF STREAMS, WETLANDS, PONDS, SPRINGS, OR OTHER NATURAL WATER RESOURCES LOCATED WITHIN OR ADJACENT TO THE PROJECT RIGHT-OF-WAY AND AT LARGE FILL SLOPES.

Ⓑ THE MAXIMUM DRAINAGE AREA SIZE FOR CONTINUOUS SILT FENCE WITH BACKING SHALL BE 1 ACRE PER 150 LINEAR FEET OF FENCE LENGTH. MAXIMUM SLOPE LENGTH BEHIND FENCE ON UP SLOPE SIDE SHALL BE 290 FEET (AS MEASURED ALONG THE GROUND SURFACE).

Ⓒ WHEN INSTALLED AT THE TOE OF A SLOPE SILT FENCE WITH WIRE BACKING SHOULD BE PLACED 5 FEET TO 10 FEET AWAY FROM THE TOE TO ALLOW SPACE FOR PONDING OF WATER, COLLECTION OF SEDIMENT, AND EASE OF MAINTENANCE AND REMOVAL.

Ⓓ WHEN TWO SECTIONS OF SILT FENCE WITH WIRE BACKING FABRIC ADJOIN EACH OTHER, THEY SHALL BE JOINED ACCORDING TO THE DETAILS ON STANDARD DRAWING EC-STR-3E.

Ⓔ MAINTENANCE SHALL BE PREFORMED AS NEEDED; CAPTURED SOIL MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND/OR WHEN EVIDENCE OF FILTER CLOGGING IS OBSERVED.

Ⓕ STEEL POSTS SHALL BE ROLLED FROM HIGH CARBON STEEL AND SHALL HAVE A MINIMUM WEIGHT OF 1.25 LB/FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH GRADE WEATHER RESISTANT STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH AN ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED TO AID IN THE ATTACHMENT OF THE WIRE BACKING. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702.

Ⓖ STEEL POSTS SHALL HAVE A PROJECTION FOR FASTENING WIRE TO THEM. WOVEN WIRE FENCE BACKING TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. THE WIRE FASTENERS SHOULD BE EVENLY SPACED WITH AT LEAST SIX PER POST.

Ⓗ FABRIC SHALL BE FASTENED SECURELY TO WOVEN WIRE FENCE BACKING WITH THE TIES SPACED EVERY 24 INCHES ALONG TOP AND MIDSECTION.

Ⓘ WOVEN WIRE FENCE BACKING SHALL MEET THE REQUIREMENTS FOR ASTM A-116 FOR NO. 11 FARM, DESIGN NO. 832-6-11, CLASS 3 COATING.

Ⓙ SILT FENCE WITH BACKING SHOULD BE PLACED ALONG OR NEAR THE GROUND CONTOURS. THE BOTTOM OF THE FENCE AT GROUND LINE SHOULD BE ON A ZERO PERCENT (0%) GRADE, PLUS OR MINUS ONE HALF PERCENT (± 0.5%). THE END OF A ROW OF SILT FENCE WITH WIRE BACKING SHOULD BE TURNED UP SLOPE FORMING A J-HOOK TO FILTER ANY CONCENTRATED FLOW BEHIND FENCE.

Ⓚ FOR TRENCH-BASED INSTALLATIONS, SILT FENCING WITH WIRE BACKING SHALL BE INSTALLED PER THE FOLLOWING STEPS AND IN THE FOLLOWING ORDER:

1. EXCAVATE TRENCH A MAXIMUM OF 4 INCHES WIDE AND 6 INCHES DEEP. THE TRENCH SHALL BE HAND-CLEANED FOLLOWING EXCAVATION TO REMOVE BULKY DEBRIS SUCH AS ROCKS, STICKS, AND SOIL CLODS FROM THE TRENCH.
2. DRIVE AND SET SUPPORT POSTS PER SPACING REQUIREMENTS GIVEN ON THE APPLICABLE FENCE DETAIL.
3. ATTACH WOVEN WIRE FENCE BACKING TO POSTS AND FABRIC TO THE WIRE BACKING USING WIRE TIES. SPACING AND DENSITY OF TIES SHALL BE INSTALLED ACCORDING TO NOTES Ⓖ AND Ⓗ.
4. INSTALL FABRIC IN TRENCH.
5. BACKFILL TRENCH (OVER-FILL) WITH SOIL PLACED AROUND FABRIC.
6. COMPACT SOIL BACKFILL WITH MECHANICAL EQUIPMENT. DO NOT DAMAGE THE FABRIC DURING COMPACTION (DAMAGED FABRIC SHALL BE REPLACED).

Ⓛ ONLY SILT FENCE WITH WIRE BACKING FABRIC LISTED ON THE QUALIFIED PRODUCTS LIST MAY BE USED. ANY PRODUCTS LISTED ON THE QUALIFIED PRODUCTS LIST AS AN APPROVED ALTERNATE MAY ALSO BE USED.

Ⓜ SILT FENCE WITH WIRE BACKING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:

209-08.02 TEMPORARY SILT FENCE (WITH BACKING), L.F.

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF THE SILT FENCE WITH WIRE BACKING.

Ⓝ SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILT FENCE WITH WIRE BACKING WHEN IT HAS ACCUMULATED TO ONE-HALF THE ORIGINAL HEIGHT OF THE STRUCTURE AND PAID FOR UNDER ITEM NUMBER 209-05, SEDIMENT REMOVAL PER C.Y.

Ⓞ ORANGE SAFETY CAPS FOR METAL POSTS SHALL BE REQUIRED TO MEET OSHA REGULATION 1926.701. ALL COST OF THE CAPS TO BE INCLUDED IN THE COST OF THE FENCE.

REV. 12-18-03: MODIFIED TABLE 2 AND GENERAL NOTE Ⓔ.

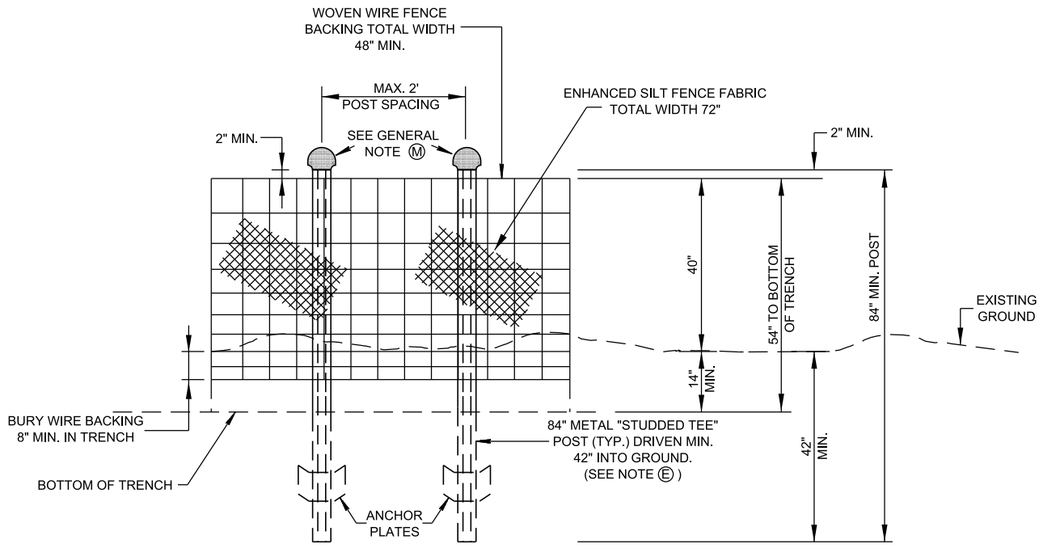
- REV. 7-29-04: CHANGED VALUES IN TABLE 2 FROM MEAN TO MARV VALUES.
- REV. 4-15-06: MODIFIED FABRIC HEIGHT, ADDED NOTES Ⓙ AND Ⓚ. REVISED TABLE TITLE. REORDERED GENERAL NOTES. REFORMATTED SHEET, REVISED NOTES, MISC. EDITS TO DRAWING.
- REV. 4-1-08: REMOVED TEMPORARY REFERENCE, REVISED NOTES, AND MISC. EDITS TO DRAWING.
- REV. 8-1-12: MINOR EDITS TO GENERAL NOTES.
- REV. 06-28-2019: ADDED NOTE Ⓞ. REDREW SHEET.

- MINOR REVISION – FHWA APPROVAL NOT REQUIRED

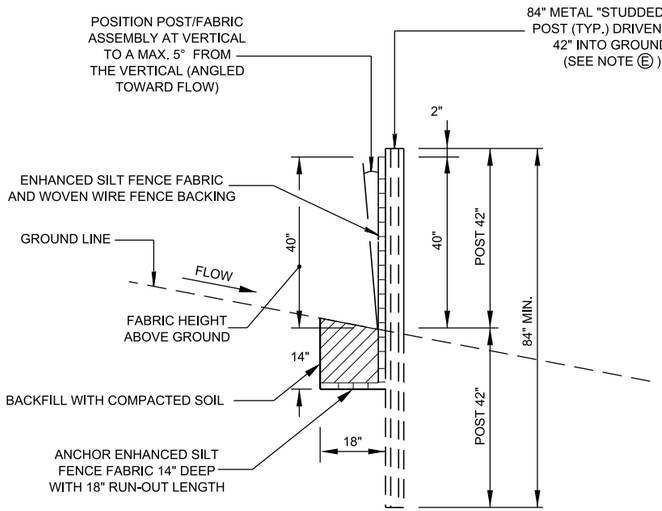
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

SILT FENCE WITH WIRE BACKING

12-18-2002 EC-STR-3C



ELEVATION VIEW



SECTIONAL VIEW

EROSION CONTROL PLAN LEGEND: * ESF * ESF * ESF * ENHANCED SILT FENCE

NOT TO SCALE

- REV. 12-18-03: REPLACED TABLE 3 AND MODIFIED GENERAL NOTES Ⓑ, Ⓓ, AND Ⓘ.
- REV. 7-29-04: CHANGED VALUES IN TABLE 3 FROM MEAN TO MARV VALUES.
- REV. 4-15-06: MODIFIED NOTE Ⓗ. ADDED NOTE Ⓘ REVISED TABLE TITLE. REORDERED GENERAL NOTES. REFORMATTED SHEET. REVISED NOTES. MISC. EDITS TO DRAWING.
- REV. 4-1-08: REMOVED TEMPORARY REFERENCE, REVISED GENERAL NOTES, AND MISC. EDITS TO DRAWING.
- REV. 06-28-19: ADDED NOTE Ⓜ. REDREW SHEET.

SILT FENCE WITH WIRE BACKING FABRIC SPECIFICATIONS

FABRIC PROPERTY AND TEST METHODS	REQUIRED PHYSICAL PROPERTIES (MARV VALUES OF TEST DATA)
GEOTEXTILE FABRIC TYPE	WOVEN MONOFILAMENT
APPARENT OPENING SIZE (ASTM D4751)	# 30 TO # 80 STANDARD SIEVE
WATER FLUX (ASTM D4491)	≥ 18 GPM/FT ^{2}
TENSILE STRENGTH (ASTM D4632)	≥ 370 LB. (WARP DIRECTION) X 230 LB. (FILL DIRECTION)
ULTRAVIOLET STABILITY (AFTER 500 HRSPER ASTM D4355)	≥ 90%
BURST STRENGTH (ASTM D3786)	≥ 470 PSI
PUNCTURE STRENGTH (ASTM D4833)	≥ 110 LB.
TRAPEZOIDAL TEAR (ASTM D4533)	≥ 115 LB. (WARP DIRECTION) X 75 LB. (FILL DIRECTION)
PERMEABILITY (ASTM D4491)	≥ 0.02 INCHES/SEC
THICKNESS (ASTM D5199)	≤ 35 MILS

GENERAL NOTES

Ⓐ ENHANCED SILT FENCE IS TO BE USED WHERE INTERCEPTION OF CONCENTRATED FLOWS (e.g. SWALES, DITCHES, RUTS ALONG SLOPE) ARE ANTICIPATED. LIMITS OF FLOW APPLICATIONS FOR USE OF ENHANCED SILT FENCE ARE GIVEN ON STANDARD DRAWINGS EC-STR-4 AND EC-STR-4A. DO NOT USE ENHANCED SILT FENCE IN OR ADJACENT TO NATURAL WATER RESOURCES (WETLANDS OR STREAMS).

Ⓑ ENHANCED SILT FENCE SHOULD NOT BE USED TO REPLACE SILT FENCE WITH WIRE BACKING.

Ⓒ WHEN TWO SECTIONS OF ENHANCED SILT FENCE FABRIC ADJOIN EACH OTHER THEY SHALL BE JOINED ACCORDING TO THE DETAILS ON STD. DWG. NO. EC-STR-3E.

Ⓓ MAINTENANCE SHALL BE PERFORMED AS NEEDED; CAPTURED SOIL MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND/OR WHEN EVIDENCE OF FILTER CLOGGING IS NOTED.

Ⓔ STEEL POSTS SHALL BE ROLLED FROM HIGH CARBON STEEL AND SHALL HAVE A MINIMUM WEIGHT OF 1.25 LB/FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH GRADE WEATHER RESISTANT STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH AN ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED TO AID IN THE ATTACHMENT OF THE WIRE BACKING. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702.

Ⓕ STEEL POSTS SHALL HAVE A PROJECTION FOR FASTENING WIRE TO THEM. WOVEN WIRE FENCE BACKING TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. THE WIRE FASTENERS SHOULD BE EVENLY SPACED WITH AT LEAST SIX PER POST.

Ⓖ WOVEN WIRE FENCE BACKING SHALL MEET THE REQUIREMENTS FOR ASTM A-116 FOR NO. 11 FARM, DESIGN NO. 1047-6-11, CLASS 3 COATING.

Ⓗ FILTER FABRIC SHALL BE FASTENED SECURELY TO WOVEN WIRE FENCE BACKING WITH TIES SPACED EVERY 24 INCHES ALONG TOP AND MID SECTION.

Ⓘ FOR TRENCH-BASED INSTALLATIONS, ENHANCED SILT FENCING SHALL BE INSTALLED PER THE FOLLOWING STEPS AND IN THE FOLLOWING ORDER:

1. EXCAVATE TRENCH A MAXIMUM OF 18 INCHES WIDE 14 INCHES DEEP. THE TRENCH SHALL BE HAND-CLEANED FOLLOWING EXCAVATION TO REMOVE BULKY DEBRIS SUCH AS ROCKS, STICKS, AND SOIL CLODS FROM THE TRENCH.
2. DRIVE AND SET SUPPORT POSTS PER SPACING REQUIREMENTS GIVEN ON THE APPLICABLE FENCE DETAIL.
3. ATTACH WOVEN WIRE FENCE BACKING TO POSTS AND FABRIC TO THE WIRE BACKING USING WIRE TIES. SPACING AND DENSITY OF TIES SHALL BE INSTALLED ACCORDING TO NOTES Ⓕ AND Ⓗ.
4. INSTALL FABRIC IN TRENCH.
5. BACKFILL TRENCH (OVER-FILL) WITH SOIL PLACED AROUND FABRIC.
6. COMPACT SOIL BACKFILL WITH MECHANICAL EQUIPMENT. DO NOT DAMAGE THE FABRIC DURING COMPACTION (DAMAGED FABRIC SHALL BE REPLACED).

Ⓙ ONLY ENHANCED SILT FENCE FABRIC LISTED ON THE QUALIFIED PRODUCTS LIST MAY BE USED. ANY PRODUCTS LISTED ON THE QUALIFIED PRODUCTS LIST AS AN APPROVED ALTERNATE MAY ALSO BE USED.

Ⓚ ENHANCED SILT FENCE SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:

209-08.04 TEMPORARY ENHANCED SILT FENCE, L.F.

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF THE ENHANCED SILT FENCE.

Ⓛ SEDIMENT SHALL BE REMOVED FROM BEHIND THE ENHANCED SILT FENCE WHEN IT HAS ACCUMULATED TO ONE-HALF THE ORIGINAL HEIGHT OF THE STRUCTURE AND PAID FOR UNDER ITEM NUMBER 209-05, SEDIMENT REMOVAL, PER C.Y.

Ⓜ ORANGE SAFETY CAPS FOR METAL POSTS SHALL BE REQUIRED TO MEET OSHA REGULATION 1926.701. ALL COST OF THE CAPS TO BE INCLUDED IN THE COST OF THE FENCE.

- MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

ENHANCED SILT FENCE

12-18-2002 EC-STR-3D