PROJECT NO.	YEAR	SHEET NO.
	1996	

REVISIONS

NO.	DATE	BY	BRIEF DESCRIPTION
M/R 1	6-10-96	BRB	NEW METRIC STANDARD
M/R 2	5-21-99	MAH	REV. ALTERNATE INTERMEDIATE STRUCTURAL STEEL DIAPHRAGM & CONCRETE DIAPHRAGM & DELETED BEAM NOTE NO. 9
M/R 3	7-31-00	CMH	DELETED BARS C1600, REVISED NOTE 6 & BENDING DETAIL FOR PRESTRESSING STRANDS

INTERMEDIATE DIAPHRAGM NOTES:

THE CONTRACTOR HAS THE OPTION OF USING EITHER CAST IN PLACE CONCRETE OR STRUCTURAL STEEL INTERMEDIATE DIAPHRAGMS AS DETAILED ON THIS DRAWING. SEE THE CONTRACT PLANS FOR THE NUMBER AND LOCATION OF INTERMEDIATE DIAPHRAGMS REQUIRED.

COST OF ALL MATERIALS AND LABOR NECESSARY FOR INSTALLING INTERMEDIATE DIAPHRAGMS (EITHER CAST IN PLACE CONCRETE OR STRUCTURAL STEEL) SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OTHER ITEMS.

NOTE: BOLTS SHALL BE TENSIONED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED.

ALL STRUCTURAL STEEL DIAPHRAGM MATERIALS INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M-111).

FABRICATED STRUCTURAL STEEL SHALL BE A709M GRADE 250 EXCEPT AS NOTED.

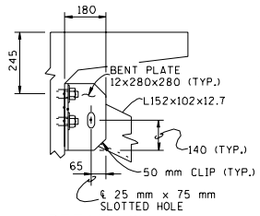
SHOP DRAWINGS WILL NOT BE REQUIRED FOR STEEL INTERMEDIATE DIAPHRAGMS AND ANGLE CONNECTIONS; HOWEVER, BEAM SHOP DRAWINGS SHALL INDICATE THE TYPE OF INTERMEDIATE DIAPHRAGM TO BE USED AND THE LOCATION OF INSERTS AND/OR HOLES. ALTERNATE DETAILS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

ALL BOLTS SHALL BE M22 ASTM A325M WITH HEX NUTS, TWO 57 mm MINIMUM O.D. WASHERS AND TWO HARDENED WASHERS UNLESS OTHERWISE NOTED.

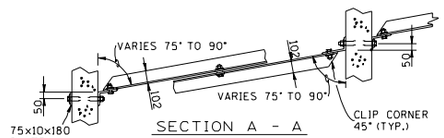
REINFORCING STEEL FOR CAST IN PLACE CONCRETE INTERMEDIATE DIAPHRAGMS SHALL BE ASTM A615M GRADE 400. CONCRETE SHALL BE CLASS "A" f'c = 21 MPa

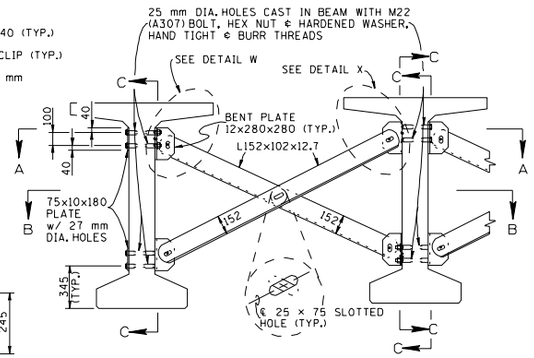
INSERTS FOR CAST-IN-PLACE CONCRETE INTERMEDIATE DIAPHRAGMS ARE TO BE DOUBLE-THREADED TYPE (CAST-IN-PLACE). MATCHED M19 THREADED RODS FOR INSERTS ARE TO PROVIDE A 660 mm SPLICE WITH THE DIAPHRAGM REINFORCEMENT.

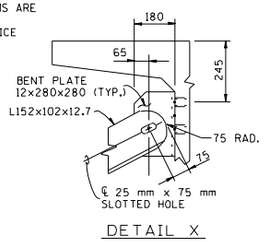
THE FABRICATION OF THE STEEL INTERMEDIATE DIAPHRAGMS AS DETAILED ON THIS DRAWING DOES NOT REQUIRE CATEGORY I AISC QUALITY SHOP CERTIFICATION.



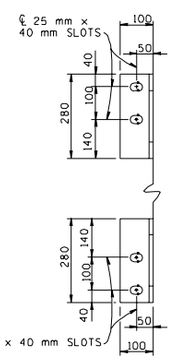
DETAIL W





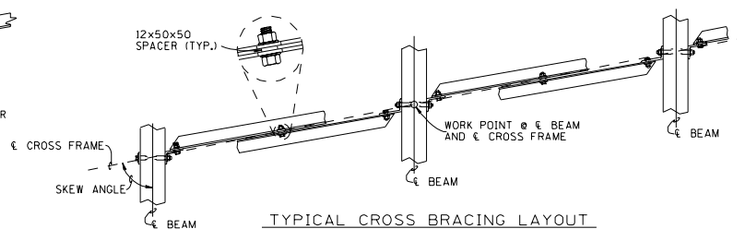


DETAIL X

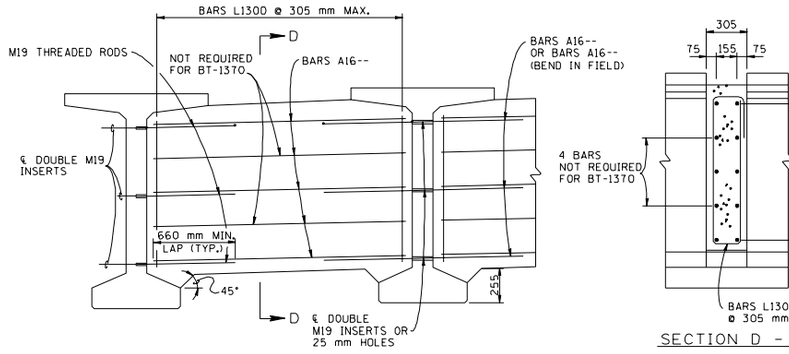


SECTION C - C

ALTERNATE INTERMEDIATE STRUCTURAL STEEL DIAPHRAGM
(SEE FRAMING PLAN FOR SKEW)



TYPICAL CROSS BRACING LAYOUT



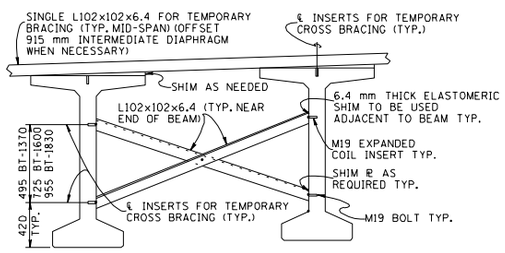
SECTION D - D

ALTERNATE INTERMEDIATE CAST IN PLACE CONCRETE DIAPHRAGM

NOTE: THE NOTES AND DETAILS SHOWN ON THIS STANDARD DRAWING APPLY UNLESS MODIFIED BY THE CONTRACT PLANS.

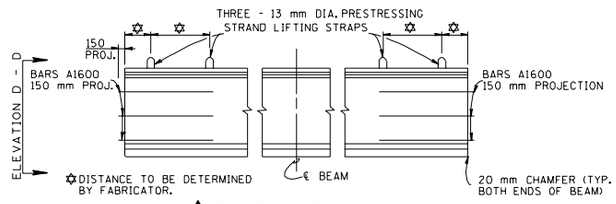
BEAM NOTES:

1) THE TOP OF ALL BEAMS TO BE ROUGH FLOATED AT APPROXIMATELY THE TIME OF INITIAL SET. THE TOP OF THE BEAMS WILL ALSO BE SCRUBBED TRANSVERSELY WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND PRODUCE A ROUGH SURFACE. WHERE PRECAST PANELS ARE TO BE USED AND SET ON BITUMINOUS FIBERBOARD, THE OUTER 130 mm OF THE TOP FLANGE MAY BE TROWELED.
2) MILD STEEL REINFORCING SHALL BE ASTM GRADE 400.
3) ALL PRESTRESSING STRANDS SHALL BE 13 mm DIA. ASTM GRADE 1862 MPa, 7 WIRE UNCOATED STRESS RELIEVED LOW RELAXATION PRESTRESSING STRANDS.
4) AN INITIAL FORCE OF 137908 N SHALL BE APPLIED TO EACH STRAND IN ALL BEAMS.
5) AFTER THE BEAM IS REMOVED FROM PRESTRESSING BED, BARS PROJECTING FROM THE ENDS OF THE BEAM SHALL BE COLD BENT (DO NOT HEAT). THE MINIMUM DIAMETER OF THE BEND SHALL BE IN ACCORDANCE WITH STANDARD CRSI HOOK DETAILS.
6) THE PRESTRESSING STRANDS SHALL BE LEFT PROJECTING AS SHOWN IN THE BENDING DETAIL FROM THE ENDS OF THE BEAMS. THE STRANDS SHALL BE CUT WITHOUT HEATING ADJACENT STRANDS. THERE SHALL NOT BE ANY PROTECTIVE COATING PLACED ON THE ENDS OF THE BEAM OR ON THE PROJECTING STRANDS.
7) COST OF ELASTOMERIC BEARING PADS AND RUBBER BONDING CEMENT TO BE INCLUDED IN THE COST OF PRESTRESSED BEAM.
8) THE SEQUENCE FOR TRANSFER OF STRESS OR THE CUTTING STRANDS SHALL BE IN ACCORDANCE WITH ARTICLE 615.14 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND SHALL BE SHOWN ON THE APPROVED SHOP DRAWINGS. AT NO TIME SHALL MORE THAN 1/6th OF THE TOTAL PRESTRESSING FORCE BE ECCENTRIC ABOUT CENTERLINE OF THE BEAM.

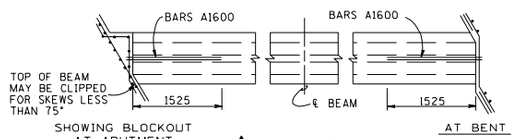


TEMPORARY BRACING DETAIL

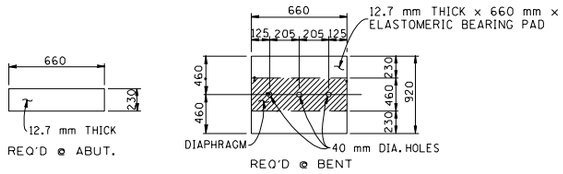
1) TEMPORARY ERECTION DIAPHRAGMS ARE REQUIRED AT THE ENDS OF PRESTRESSED BULB-TEE GIRDERS AND SHOULD BE INSTALLED AS SOON AS POSSIBLE AFTER GIRDERS ARE ERECTED. COST OF ALL MATERIALS AND LABOR FOR INSTALLING TEMPORARY ERECTION DIAPHRAGMS SHALL BE INCLUDED IN THE UNIT PRICE FOR OTHER ITEMS.
2) DETAILS OF THE TEMPORARY ERECTION DIAPHRAGM SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
3) AFTER THE PERMANENT CONCRETE INTERMEDIATE DIAPHRAGMS (IN ALL BAYS) ARE POURED AND CURED, OR AFTER THE PERMANENT STRUCTURAL STEEL INTERMEDIATE DIAPHRAGMS (IN ALL BAYS) ARE COMPLETELY INSTALLED, SINGLE ANGLE MAY BE REMOVED.



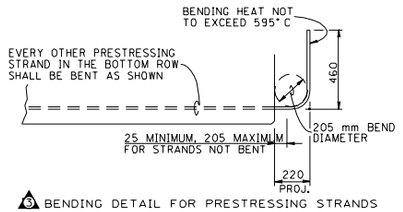
PART ELEVATION



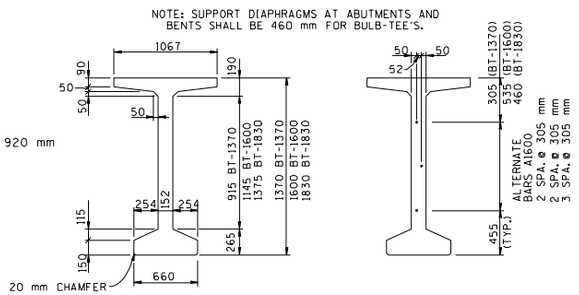
PART PLAN



ELASTOMERIC BEARING PAD DETAILS
USE SINGLE PAD EACH LOCATION ABUTMENTS & BENTS



BENDING DETAIL FOR PRESTRESSING STRANDS



SECTION SHOWING PROPERTIES

ELEVATION D-D

ALL UNITS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

M/R MINOR REVISION - FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STANDARD DETAILS AND INTERMEDIATE DIAPHRAGM DETAILS FOR BULB-TEE BEAMS 1995

DESIGNED BY MARK HOLLORAN DATE 3-93
DRAWN BY D.D. & G.W.K. DATE 3-93
SUPERVISED BY MARK HOLLORAN DATE 3-93
CHECKED BY DATE

CORRECT: Edward P. Wasserman
ENGINEER OF STRUCTURES

DIVISION OF METRIC

SHEET 1 OF 1
STDM-14-1