

TRANSMITTAL MEMORANDUM 99-02

TO: Design Consultants &
Division of Bridge Design Staff

FROM: Stephen E. Goodpaster, P.E. *SEG*
Director
Division of Bridge Design

DATE: April 26, 1999

SUBJECT: Policies and Procedures Incorporated Into
Structure Plans Effective July 1, 1999

The following policies and procedures shall be incorporated into structure plans effective July 1, 1999:

High Performance Concrete

High Performance Concrete shall be used in the deck for all interstate bridges, major structures, and structures with ADT over 2000. This concrete will be bid as Concrete Class "AAA" and plans shall contain the attached general note. This note has been added to the general note library.

Designers are encouraged to pursue the use of High Performance Concrete in PCI Beams in the form of higher strength (9000-10000 psi). Higher strengths should be evaluated for the possibility of decreasing beam depth or eliminating lines of beams.

Weathering Steel

Weathering Steel shall be used in all steel structures except grade separations, and in urban areas where the steel will be subject to salt spray. Widening of existing steel bridges should be in kind.

Zinc Primer

On steel bridges that are painted, only Organic Zinc Primer shall be used. This should be specified by plan note.

Direct Tension Indicators

Direct tension indicators shall be used in all connections in steel bridges. The library general note has been changed accordingly to reflect this change.

Check Point Elevations for Slabs

The check point elevations for slabs (on the elevation sheet) will no longer be required.

Steel Diaphragms for PCI Beam Bridges

Intermediate Steel Diaphragms shall be detailed for all PCI Beams deeper than Type IV (all modified beams). Details are provided on the attached sheet. These drawings may be requested and will be returned by e-mail. The e-mail address is: lgraves2@mail.kytc.state.ky.us

Shop Drawings

The following general note for shop drawing submission should be added to all plans. This note has been added to the general note library. This note will be required on plans until the issue of the 2000 Standard Specifications.

Shop Drawing Submissions: Contrary to the specifications, shop drawings requiring review shall be submitted directly from the fabricator to the Division of Bridge Design.

Plan Sheets for Pile Records

The attached plan sheets for pile records shall be used on all projects. Copies may be requested and returned by e-mail.

1998 AASHTO Interims

The 1998 AASHTO Interims for the Standard Specifications are available for order. Designers shall incorporate these interims in all designs. A publication order form is attached.

Supplemental Specifications

New supplemental specifications were made available in May 1999 and shall be incorporated into plans. These supplemental specifications shall be indicated on the front sheet of structure plans.

Of particular note, the special note for Calcium Nitrate Corrosion Inhibitor shall be specified for any non-composite box beams.

The steel reinforcement general note specifying ASTM A615 grade 420 contrary to the specifications is no longer needed.

Lump Sum Concrete Removal

The Estimated Removal Quantity (cm) that has in the past been furnished for information shall no longer be placed in the plans. Only a Lump Sum Removal shall be specified.

Attachments



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CLASS "AAA" CONCRETE: In addition to the requirements for Class "AAA" Portland Cement Concrete, the cementitious content of the Class "AAA" mix on a cubic meter basis shall be 74% cement (300 kg), 20% Class F fly ash (81 kg), and 6% microsilica (24 kg). Microsilica shall conform to the requirements of the Special Note For Mineral Admixtures in Portland Cement Concrete. When using truck mixers, limit the mixer charge to three-fourths of its rated capacity.

Perform trial batches in compliance with subsection 601.03.02G)g). Provide and use a fogger in compliance with Subsection 609.03.08. Apply curing compound immediately after floating (prior to grooving).

PILE RECORD FOR FRICTION PILES

Pile No.	Pile Cut-off Elevation	Pile Length In Place	Point of Pile Elevation As Driven	Minimum Point of Pile Elevation	Design Axial Load	EOD Required Field Bearing	BOR Required Field Bearing	Calculated Field Bearing	EOD or BOR
	FEET	FEET	FEET	FEET	TONS	TONS	TONS	TONS	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Definitions of Terms

PILE CUT-OFF ELEVATION: Elevation of the top of pile in the finished structure.

PILE LENGTH IN PLACE: Actual pile length below the Pile Cut-Off Elevation in the finished structure.

POINT OF PILE ELEVATION AS DRIVEN: Actual point of pile elevation in the finished structure.

MINIMUM POINT OF PILE ELEVATION: Point of pile elevation corresponding to the minimum embedment required to satisfy design considerations.

DESIGN AXIAL LOAD: Service load carried by each pile as estimated from structural design calculations.

EOD REQUIRED FIELD BEARING: Pile bearing value at the End of Driving (EOD) required to satisfy design requirements. This value is taken as 1.25 times the Design Axial Load plus the total estimated side friction capacity at the time of driving in any scour susceptible, unsuitable, and embankment layers. A group efficiency factor may be included for piles in cohesive soils.

BOR REQUIRED FIELD BEARING: Pile bearing value at the Beginning of Restrike (BOR) required to satisfy design requirements. This value is taken as 2.0 times the Design Axial Load plus the total estimated side friction capacity after setup in any scour susceptible, unsuitable, and embankment layers. A group efficiency factor may be included for piles in cohesive soils.

CALCULATED FIELD BEARING: Pile bearing value in place calculated using the appropriate pile driving formula in Section 604.03.07(B) of the Standard Specifications.

Driving Criteria

Satisfy two criteria when driving friction piles:

1. Drive piles to the Minimum Point of Pile Elevation
2. Drive piles until the Calculated Field Bearing equals or exceeds the EOD Required Field Bearing if determined at the End of Driving, or the BOR Required Field Bearing if determined at the Beginning of Restrike.

The EOD Required Field Bearing and the BOR Required Field Bearing are different values. The reason is that the formula used to calculate field bearing tends to overpredict pile capacity and the overprediction is greater during restrike. Adjustments are applied by the designer to account for the differences.

If either the EOD or BOR Required Field Bearing value is achieved at an elevation higher than the Minimum Point of Pile Elevation, continue driving until the Minimum Point of Pile Tip Elevation is reached. If the EOD Required Field Bearing is not achieved by the time the pile has been driven to the Plan Test Pile Length or Production Pile Order Length, cease driving, restrike the pile with a warm hammer a minimum of twelve hours after the end of initial driving, and verify that the BOR Required Field Bearing has been achieved. If it is necessary to determine the BOR Required Field Bearing, leave piling at least 12 inches (plus strip-down length if necessary) above the cutoff elevation at the end of initial driving to provide a sufficient amount of exposed pile length to accommodate additional pile penetration during restrike.

The Project Engineer shall determine the Calculated Field Bearing at the Beginning of Restrike using a minimum of 10 blows. If the BOR Required Field Bearing is not achieved after restrike or if the pile cannot be advanced to the Minimum Point of Pile Elevation, consult the Central Office Division of Construction.

Field Data

For each pile, the Project Engineer shall record the following on this sheet: Pile Length In Place, Point of Pile Elevation as Driven, Calculated Field Bearing, and an indication of whether the Calculated Field Bearing was determined at End of Driving (EOD) or Beginning of Restrike (BOR). Submit this record to:

Director, Division of Bridge Design
Room 725, State Office Building
Frankfort, KY 40622-0001

This pile record does not replace other pile records the Project Engineer is required to keep and submit.

- Use HP 12x53 in accordance with BPS-003, c.e.
- Use HP 14x73 in accordance with BPS-009, c.e.
- Use HP 14x89 in accordance with BPS-011, c.e.
- Use 14" piles in accordance with BPC-002 or BPC-011, c.e.

PILE RECORD FOR POINT BEARING PILES

Pile No.	Pile Cut-off Elevation	Pile Length In Place	Point of Pile Elevation As Driven	Design Axial Load	Required Field Bearing	Calculated Field Bearing
	FEET	FEET	FEET	TONS	TONS	TONS
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Definitions of Terms

PILE CUT-OFF ELEVATION: Elevation of the top of pile in the finished structure.

PILE LENGTH IN PLACE: Actual pile length below the Pile Cut-Off Elevation in the finished structure.

POINT OF PILE ELEVATION AS DRIVEN: Actual point of pile elevation in the finished structure.

DESIGN AXIAL LOAD: Service load carried by each pile as estimated from structural design calculations.

REQUIRED FIELD BEARING: Pile bearing value required to achieve 'refusal' for the size of pile used. According to the Division of Construction Guidance Manual, this value is taken as 150 tons for 12-inch steel H-Piles and 180 tons for 14 inch steel H-Piles.

CALCULATED FIELD BEARING: Pile bearing value in place calculated using the appropriate pile driving formula in Section 604.03.07(B) of the Standard Specifications.

Driving Criteria

DRIVING CRITERIA: Drive point bearing piles to refusal and verify that the Calculated Field Bearing equals or exceeds the Required Field Bearing.

Field Data

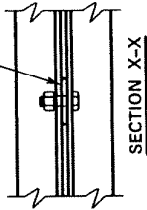
For each pile, the Project Engineer shall record the following on this sheet: Pile Length In Place, Point of Pile Elevation as Driven, and the Calculated Field Bearing. Submit this record to:

Director, Division of Bridge Design
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Frankfort, KY 40622-0001

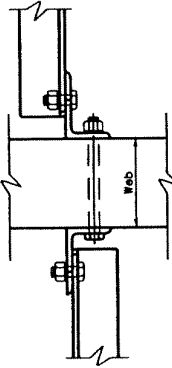
This pile record does not replace other pile records the Project Engineer is required to keep and submit.

- Use HP 12x53 in accordance with BPS-003, c.e.
- Use HP 14x73 in accordance with BPS-009, c.e.
- Use HP 14x89 in accordance with BPS-011, c.e.

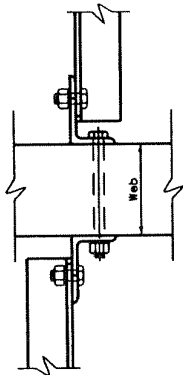
Filler Plate



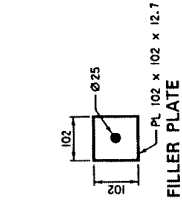
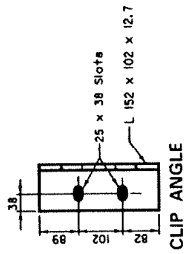
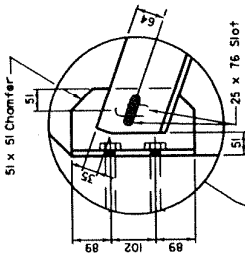
SECTION X-X



SECTION B-B



SECTION T-T



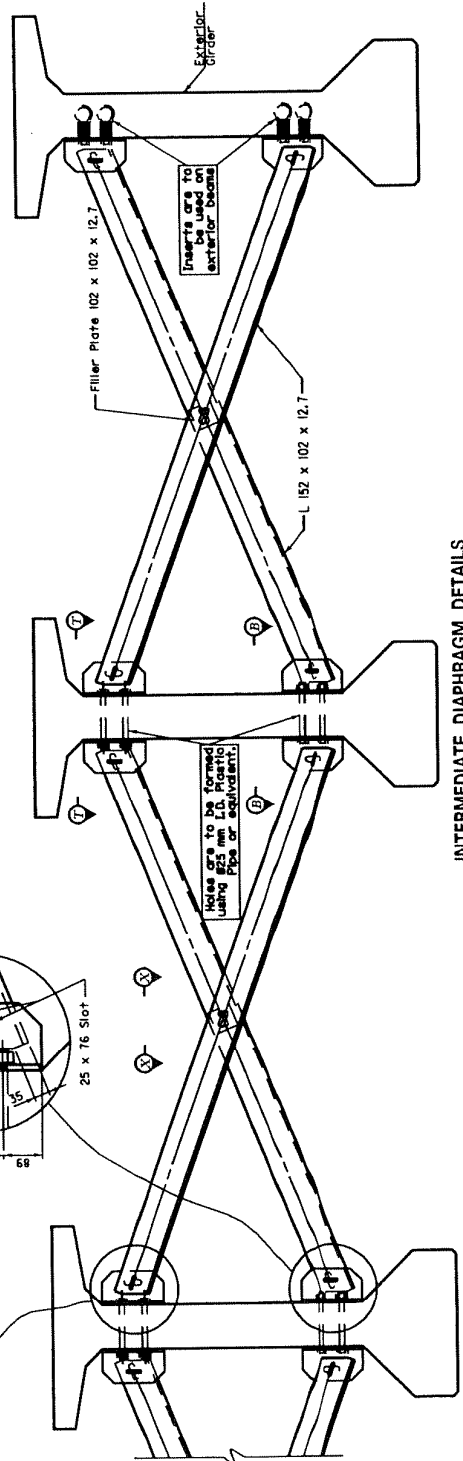
Diaphragm Notes

FASTENERS: All fasteners shall be hot-dipped galvanized and shall conform to Subsection 813.10 of the Standard Specifications. Bolts shall be 22.2 mm and shall be fully tensioned prior to forming the slab.

STRUCTURAL STEEL: Plates and angles shall conform to AASHTO M 183 and galvanized after fabrication.

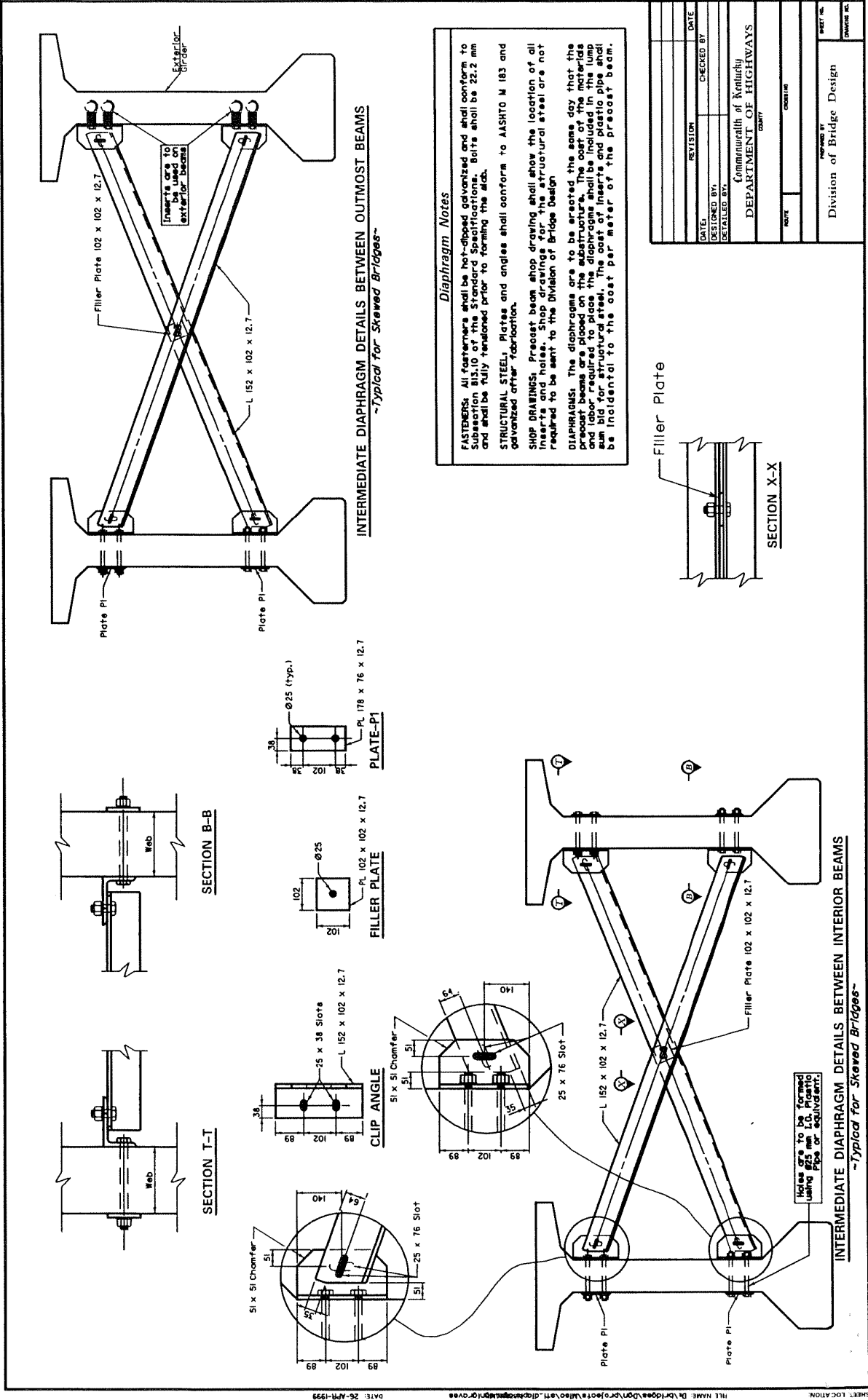
SHOP DRAWINGS: Precast beam shop drawing shall show the location of all inserts and holes. Shop drawings for the structural steel are not required to be sent to the Division of Bridge Design.

DIAPHRAGMS: The diaphragms are to be erected the same day that the precast beams are placed on the substructure. The cost of the materials and labor required to place the diaphragms shall be included in the lump sum bid for structural steel. The cost of inserts and plastic pipe shall be incidental to the cost per meter of the precast beam.



INTERMEDIATE DIAPHRAGM DETAILS
-Typical for 0° Skew Bridges-

DATE	REVISION	CHECKED BY	DATE
DESIGNED BY COMMUNISTH OF NANTHUU DEPARTMENT OF HIGHWAYS COURT			
NAME CORPORATION			
PROJECT NO. DIVISION of Bridge Design			
SHEET NO. DRAWING NO.			



DATE:	DESIGNED BY:	REVISION	CHECKED BY:
	DATE PLOTTED BY:		
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
NOTE		COUNT	
Division of Bridge Design			