

\* Information only.  
Dimensions shown along skew  
and may vary.

# CAST-IN-PLACE BOX CULVERT END SECTION DETAIL

## PROPOSED S.N. 092-0207

### STATION 577+74.00

STATION 577+74.00  
BUILT - - - - BY  
STATE OF ILLINOIS  
F.A.P. RTE. 840 SEC. 121BR-1  
LOADING HS 20-44  
STR. NO. 092-0207

#### NAME PLATE

\* See Highway Standard 515001-02 for dimensions and placement.  
\* Name Plate will be paid for at the contract unit price per "EACH" for "NAME PLATES".

#### DESIGN STRESSES

**Cast-In-Place**      **Precast**  
 $f_y = 60,000$  psi       $f_y = 60,000$  psi  
 $f'_c = 3,500$  psi       $f'_c = 5,000$  psi  
 Max. Soil Pressure  
 under footing = 3,061 psf

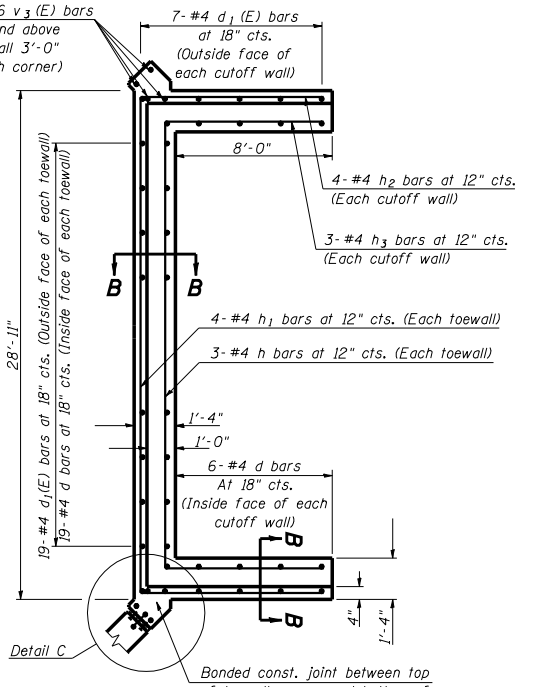
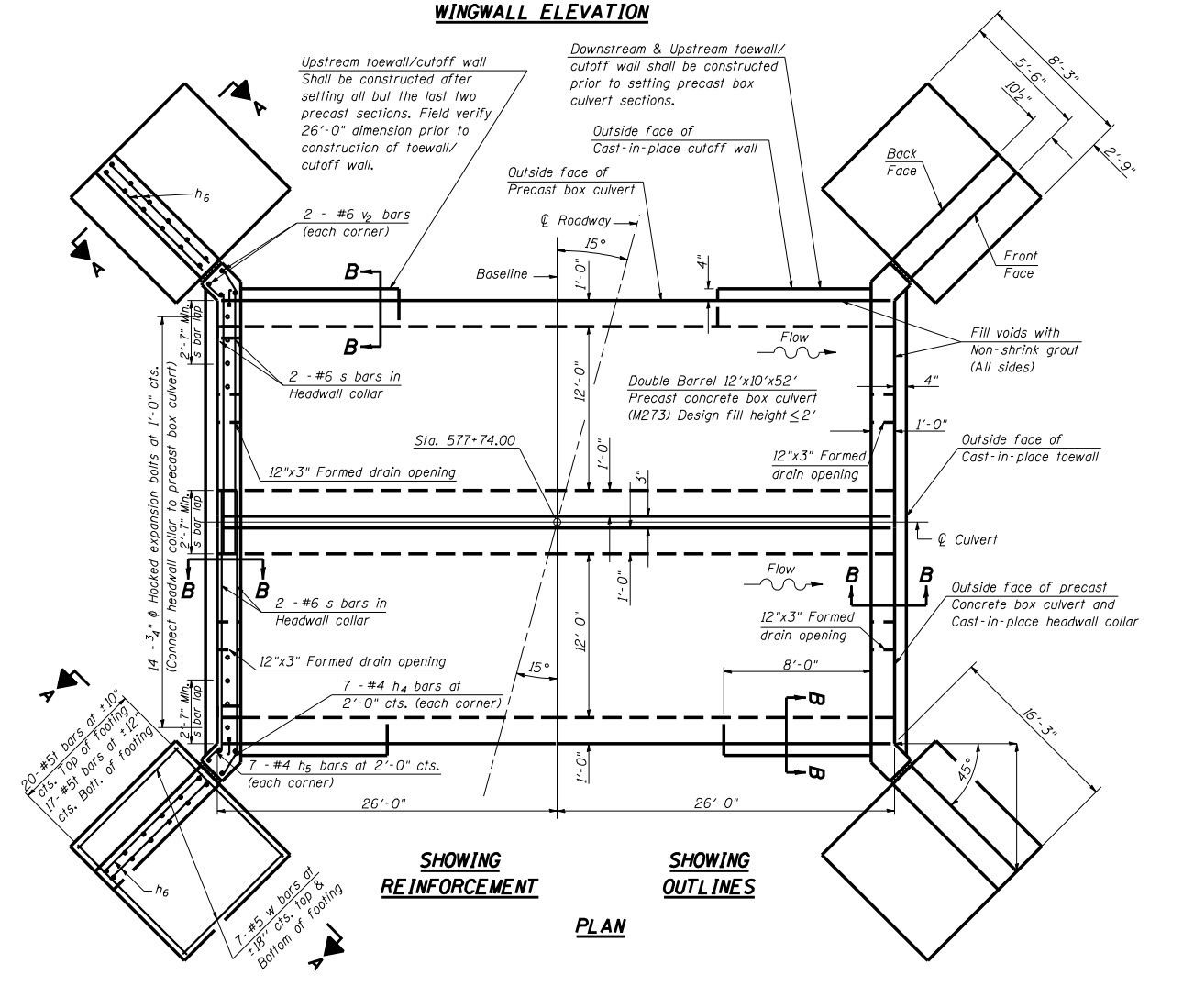
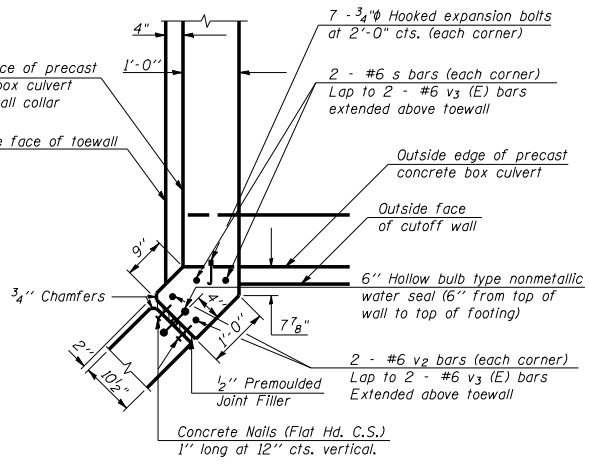
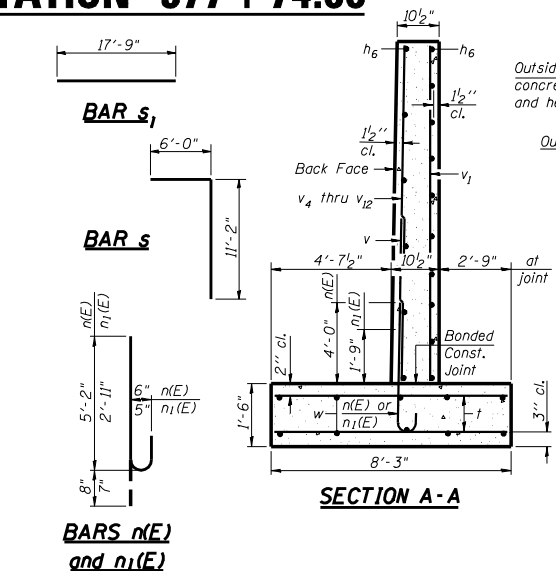
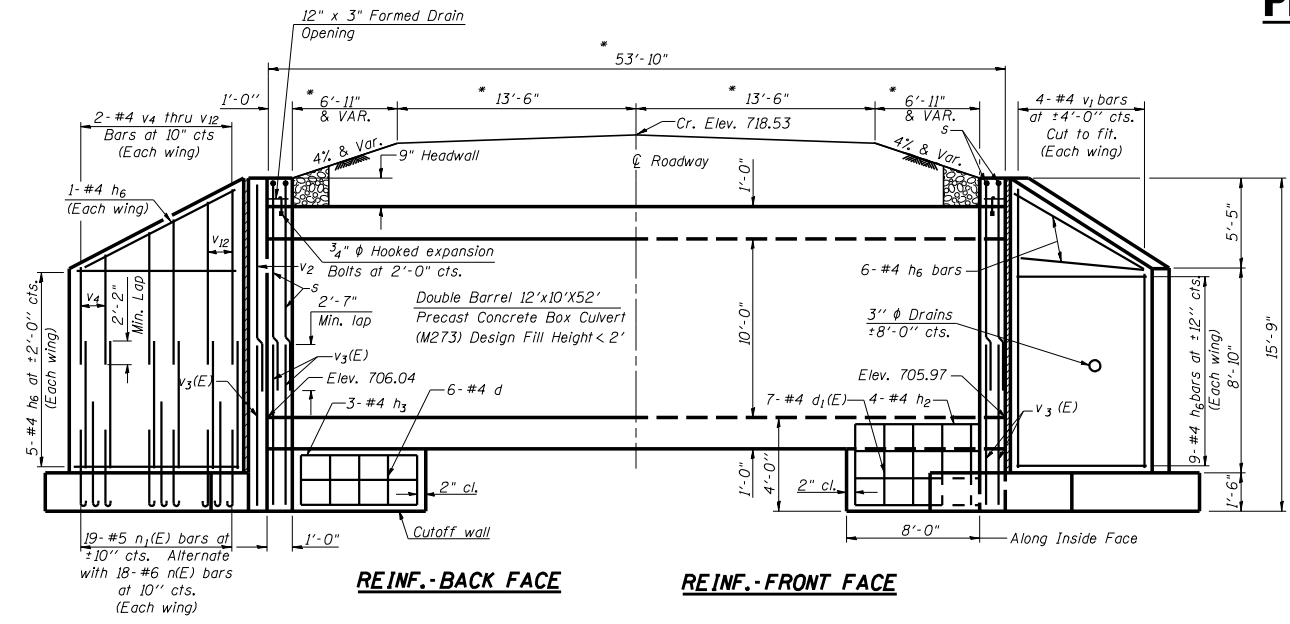
#### LOADING HS 20-44

#### BILL OF MATERIAL (ONE END SECTION) (FOR INFORMATION ONLY)

Bar	No.	Size	Length	Shape	
d	31	#4	2'-8"		
d <sub>1</sub> (E)	33	#4	3'-8"		
h	3	#4	27'-3"		
h <sub>1</sub>	4	#4	28'-8"		
h <sub>2</sub>	8	#4	8'-9"		
h <sub>3</sub>	6	#4	8'-0"		
h <sub>4</sub>	14	#4	1'-2"		
h <sub>5</sub>	14	#4	9"		
h <sub>6</sub>	42	#4	15'-6"		
n(E)	36	#6	5'-10"		
n <sub>1</sub> (E)	38	#5	3'-6"		
s	4	#6	17'-2"		
s <sub>1</sub>	2	#6	21'-9"		
t	74	#5	8'-0"		
v	38	#5	5'-9"		
v <sub>1</sub>	8	#4	14'-2"		
v <sub>2</sub>	4	#6	10'-8"		
v <sub>3</sub> (E)	8	#6	5'-8"		
v <sub>4</sub>	4	#4	3'-11"		
v <sub>5</sub>	4	#4	4'-7"		
v <sub>6</sub>	4	#4	5'-4"		
v <sub>7</sub>	4	#4	6'-0"		
v <sub>8</sub>	4	#4	6'-8"		
v <sub>9</sub>	4	#4	7'-5"		
v <sub>10</sub>	4	#4	8'-2"		
v <sub>11</sub>	4	#4	8'-10"		
v <sub>12</sub>	4	#4	9'-0"		
w	28	#5	15'-2"		
Class S1 Concrete				Cu. Yd.	23.0
Reinforcement Bars, Epoxy Coated				Pound	603.0
Reinforcement Bars				Pound	2461.0
Expansion Bolt 3/4" φ				Each	56.0

#### TOTAL BILL OF MATERIALS

Item	Unit	Qty.
Box Culvert End Section	Each	2.0
Name Plate	Each	1.0



#### NOTES

- Course aggregate full length of both headwalls. To be placed by Grading Contractor. Cost included with Concrete Box Culvert.
- The Contractor may substitute cast in place inserts and threaded hooked reinforcement bars for the expansion bolts.
- Drain holes shall be provided in accordance with Art. 503.12.
- Expansion bolts shall be 3/4" φ hooked bolts. The cost of the bolts shall be included in the cost of Box Culvert End Section.
- All dimensions are in FEET (')-INCHES (") unless otherwise noted.
- Voids between the Precast Concrete Box Culvert and the Cast-in-place toewall / cutoff wall shall be filled with Non-shrink grout.
- Drawings not to scale.
- Reinforcement bars shall conform to the requirements of ASTM A 706 Gr 60 (1L Modified). See Special Provisions
- Excavation behind existing abutment walls shall be performed to balance front and back soil pressure before removing the existing superstructure.
- The Precast Concrete Box Culvert Sections shall conform to the requirements of AASHTO M273.
- Reinforcement bars designated (E) shall be epoxy coated.
- Areas of the precast box in contact with cast in place concrete shall be sandblasted, cleaned and wetted prior to placing concrete in the field according to Article 503.09(b) of the Standard Specifications.
- The joints between precast segments shall be sealed and all voids filled with a mastic joint sealer. In addition, the sides and top shall be sealed with a 12" wide external sealing band meeting the requirements of ASTM C877 Type III. The joint areas to be sealed shall be cleaned and primed according to the manufacturer's directions prior to placing the seal. The seal shall be protected during backfilling to prevent damage.
- Concrete and Rebar quantities and lengths calculated for the cast-in-place End Sections will vary based on the precast box culverts supplied.
- End Sections will be paid for at the contract unit price each for BOX CULVERT END SECTION, as outlined in Art. 540.08, which prices shall include all concrete, rebar, and all other items necessary to complete the proposed work.

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**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION**

#### CAST-IN-PLACE BOX CULVERT END SECTION DETAIL

SCALE:      SHEET NO.      OF SHEETS      STA.      TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
840	121BR-1	VERMILION	44	19
CONTRACT NO. 70018				
FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT			