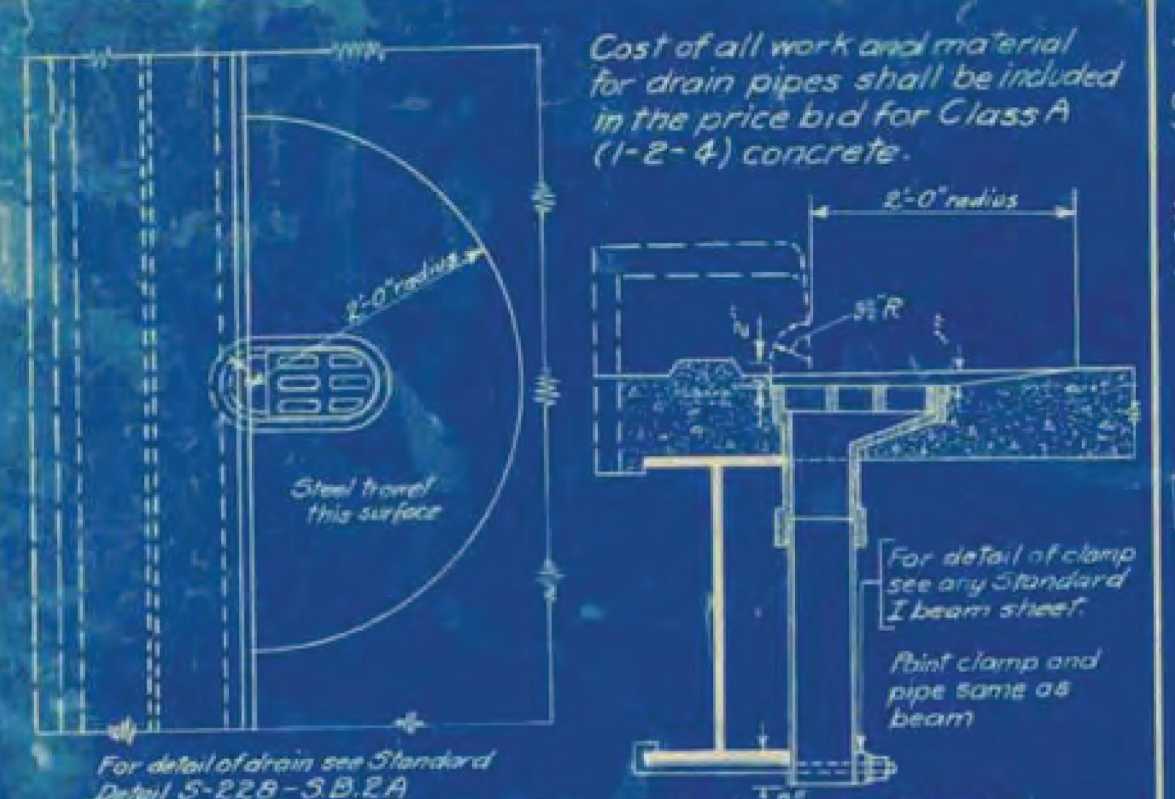
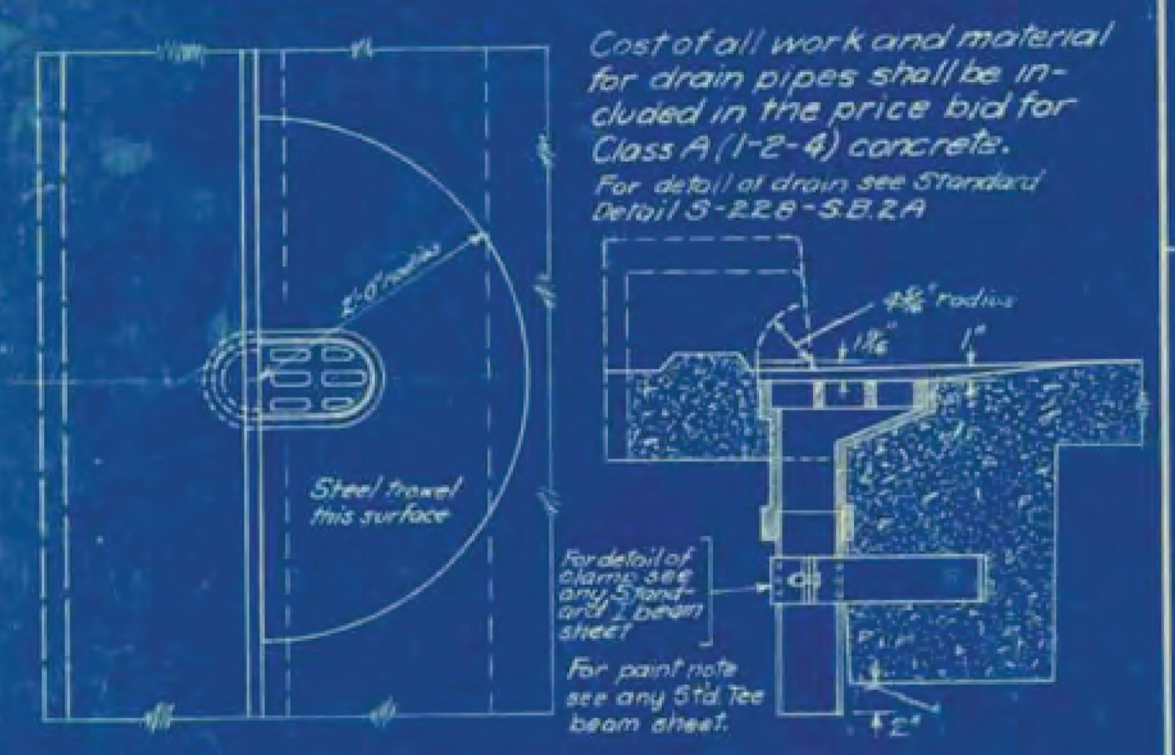

2'-0" radius
2'-0" radius
5/8" R
Steel trowel this surface
For detail of clamp see any Standard I beam sheet.
Paint clamp and pipe same as beam
2"

Cost of all work and material for drain pipes shall be included in the price bid for Class A (1-2-4) concrete.

For detail of drain see Standard Detail S-228-S.B.2A

DRAIN DETAIL FOR I-BEAM BRIDGES

STANDARD DETAIL-S201

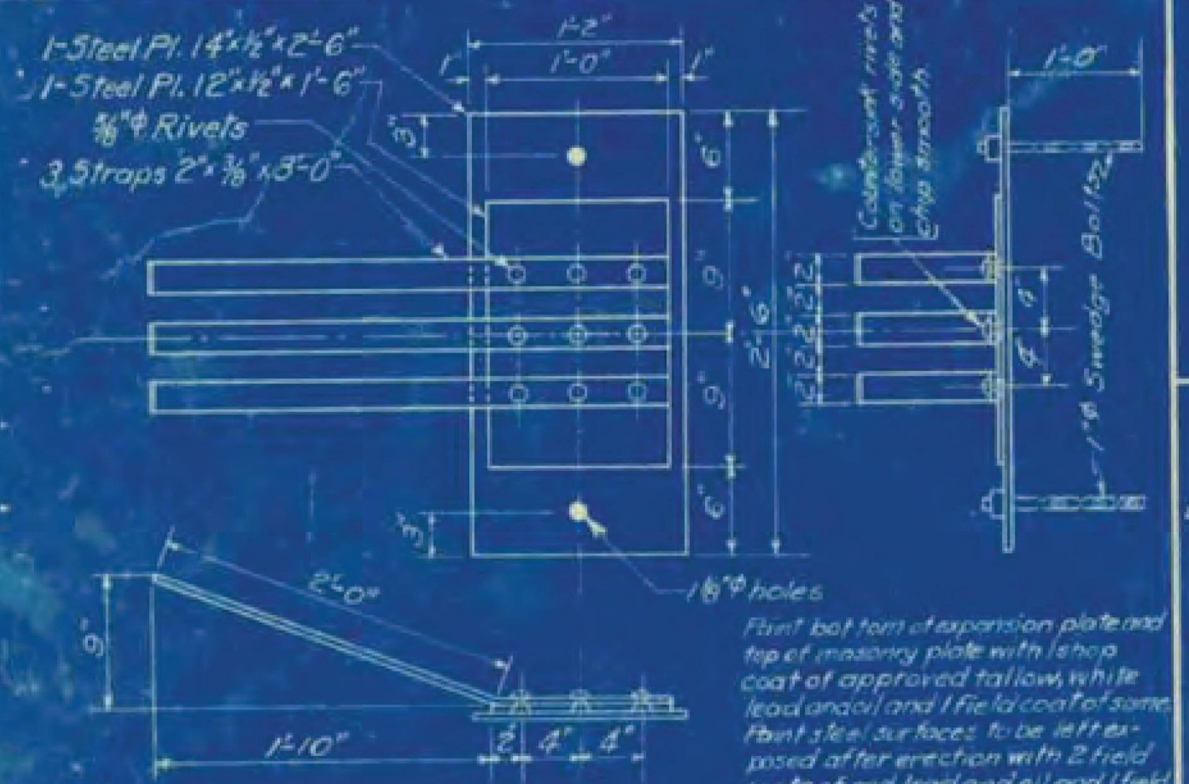

2'-0" radius
4 9/16" radius
1 1/16"
1"
Steel trowel this surface
For detail of clamp see any Standard I beam sheet
For paint note see any Std. Tee beam sheet.
2"

Cost of all work and material for drain pipes shall be included in the price bid for Class A (1-2-4) concrete.

For detail of drain see Standard Detail S-228-S.B.2A

DRAIN DETAIL FOR TEE BEAM BRIDGES

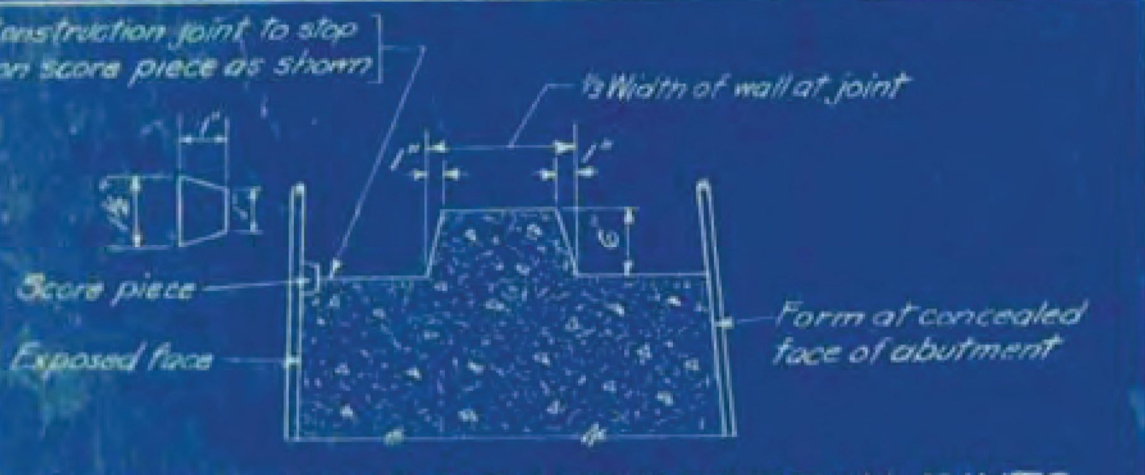
STANDARD DETAIL-S202



Paint bottom of expansion plate and top of masonry plate with 1 shop coat of approved tallow, white lead and oil and 1 field coat of same. Paint steel surfaces to be left exposed after erection with 2 field coats of red lead and oil and 1 field coat of approved graphite paint.

SLIDING PLATE EXPANSION DEVICE FOR 35' & 40' SPAN TEE BEAMS

STANDARD DETAIL-S203

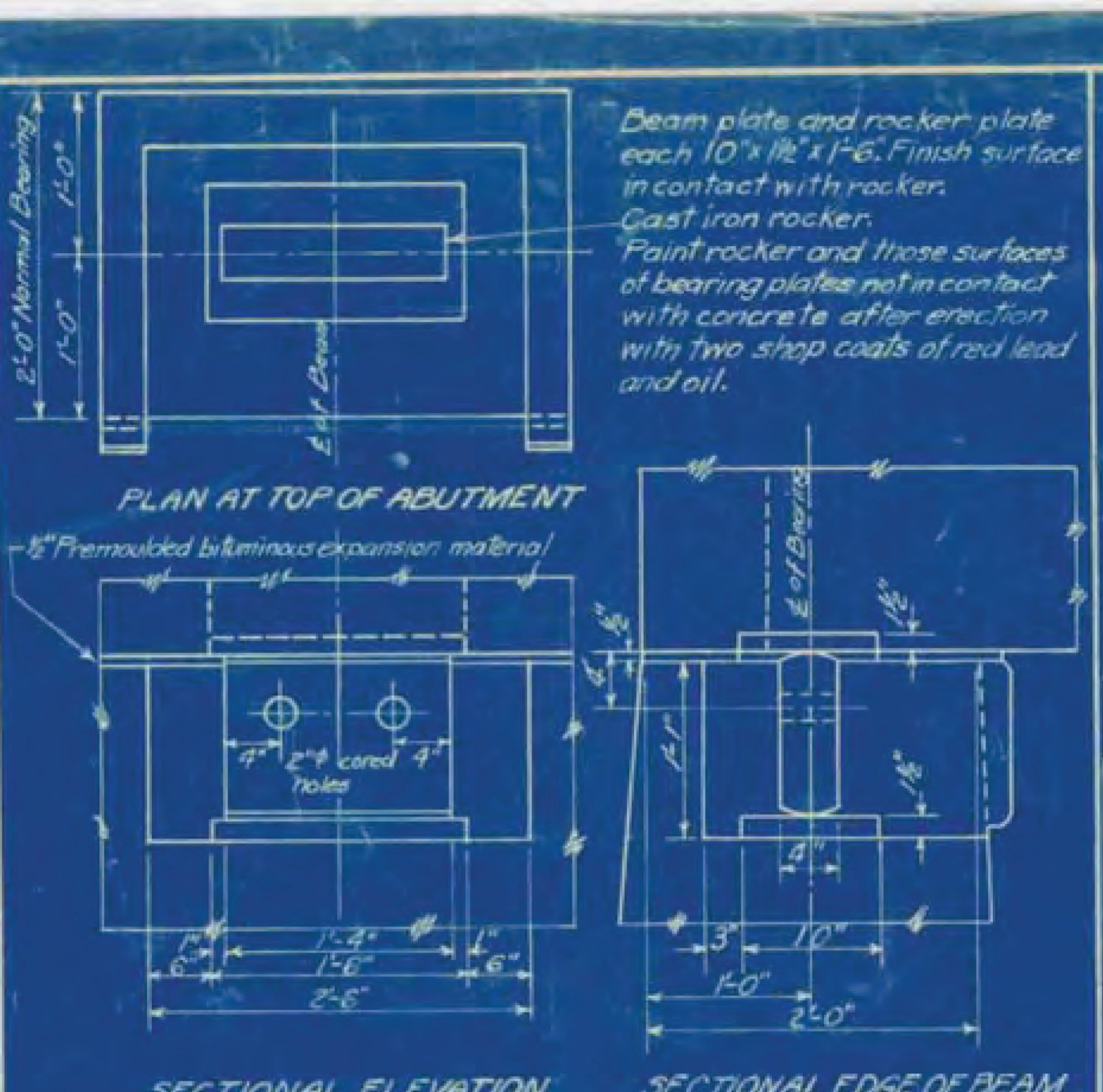

Construction joint to stop on score piece as shown
1/3 Width of wall at joint
1"
1"
6"
Score piece
Exposed face
Form at concealed face of abutment

DETAILS-SCORE MARKS & CONSTRUCTION JOINTS FOR PIERS & ABUTMENTS

Unless otherwise directed by the Engineer, score pieces shall be equally spaced vertically at about 1'-9" for abutments up to 20' in height and 2'-6" for abutments above 20' in height, shall stop at underside of copings and shall be carried around ends of walls or piers where they may be exposed to view. Score marks shall line horizontally and shall be at same levels in all piers and abutments on the job. Construction joint may be made at any score mark.

Note: This detail is identical with S.16 - sheet S.B-1

STANDARD DETAIL-S204



Beam plate and rocker plate each 10"x1 1/2"x1'-6". Finish surface in contact with rocker.
Cast iron rocker.
Paint rocker and those surfaces of bearing plates not in contact with concrete after erection with two shop coats of red lead and oil.

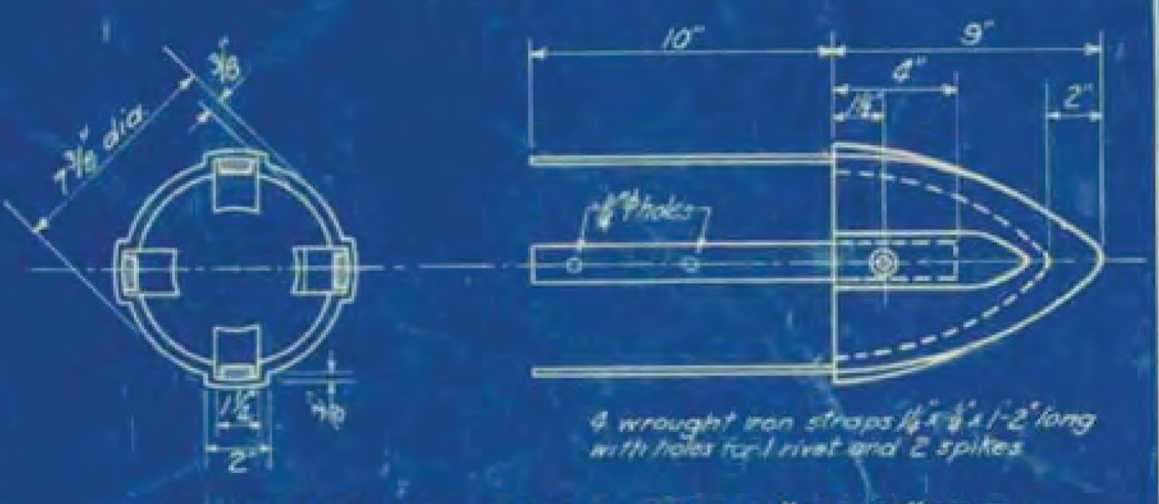
PLAN AT TOP OF ABUTMENT

SECTIONAL ELEVATION

SECTIONAL EDGE OF BEAM

ROCKER EXPANSION DEVICE AND POCKET FOR TEE BEAM SPANS OF 45' AND OVER

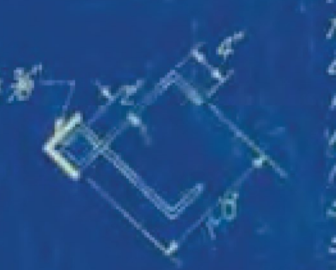
STANDARD DETAIL-S205


7 3/8" dia.
3/8"
1 1/2"
2"
10"
9"
4"
1 1/2"
2"
3/8"φ holes
4 wrought iron straps 1 1/4"x1/4"x1'-2" long with holes for 1 rivet and 2 spikes

CAST STEEL PILE SHOE FOR 6" TO 8" TIPS

If jetting is necessary, two water jets should be used with a water pressure of at least 150# per sq. in. Pump to be of piston type with a 6" diam. intake pipe and a 4" diameter outlet pipe. The jet pipe shall be about 2" dia., nozzle to be circular in section and 1/2" to 3/4" in diameter.
Unit price bid for piles shall include jetting if necessary, and furnishing and setting pile shoes.
Pile shoes as per sketch to be used as directed by the Engineer.

STANDARD DETAIL-S206



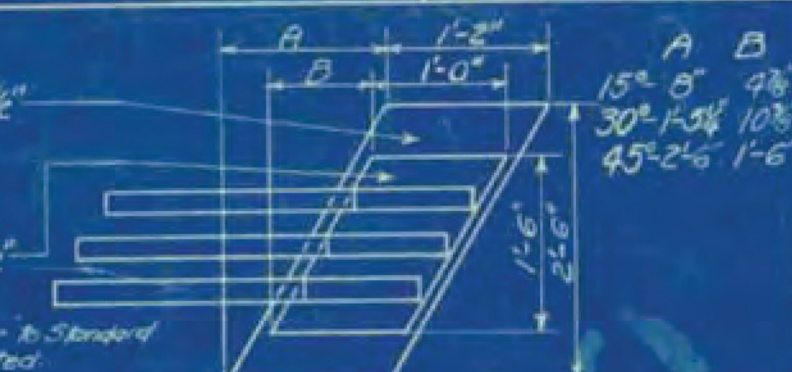
Nose angle to extend from under side of pier coping to top of footing on upstream end only of each pier. 2"x1/4" straps 2'-0" c/c, alternated. Straps may be welded or rivetted. If rivetted, exposed rivet heads must be countersunk and chipped.
All structural steel nose guards shall be given one shop coat of red lead and oil and two field coats of standard white guard rail paint on exposed face only.
All work and materials required for furnishing and placing nose guards will be paid for at unit price bid for reinforcing steel.

PIER NOSE ANGLE

STANDARD DETAIL-S207

1 Steel Plate
15° Skew 2'-10 1/4" x 1'-4 1/2"
30° Skew 3'-5 5/8" x 1'-0"
45° Skew 4'-4 1/2" x 10"
x 1/2"

1 Steel Plate
15° Skew 1'-9 7/8" x 1 1/2"
30° Skew 2'-2 1/8" x 10 1/2"
45° Skew 2'-10" x 8 1/2"
x 1/2"

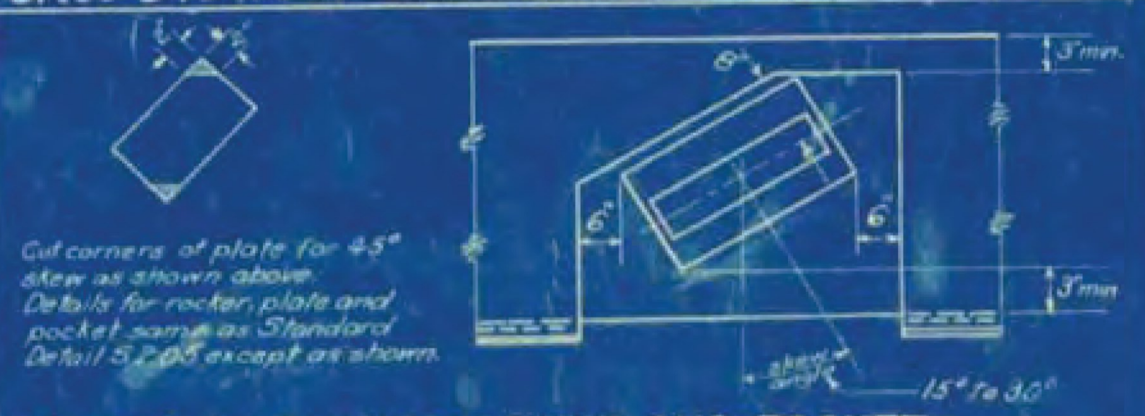


	A	B
15°	8"	4 7/8"
30°	1'-3 1/4"	10 5/8"
45°	2'-6"	1'-6"

The expansion device similar to Standard Detail S-203 except as noted.

SLIDING PLATE EXPANSION DEVICE FOR 35' & 40' SKEW SPAN TEE BEAMS

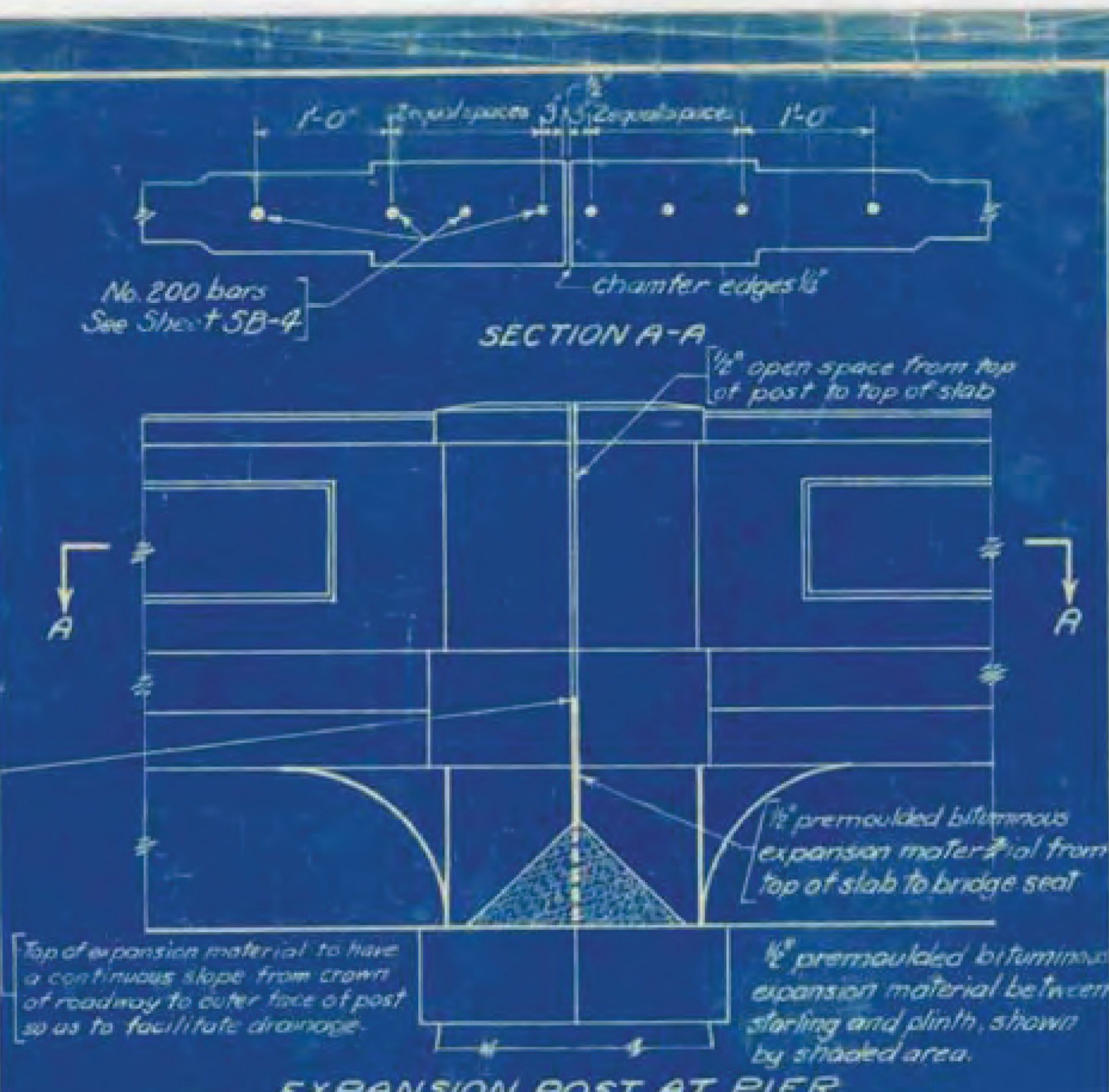
STANDARD DETAILS-S208



Cut corners of plate for 45° skew as shown above.
Details for rocker, plate and pocket same as Standard Detail S205 except as shown.

ROCKER EXPANSION DEVICE AND POCKET FOR TEE & I BEAM SKEW SPANS OF 45' AND OVER

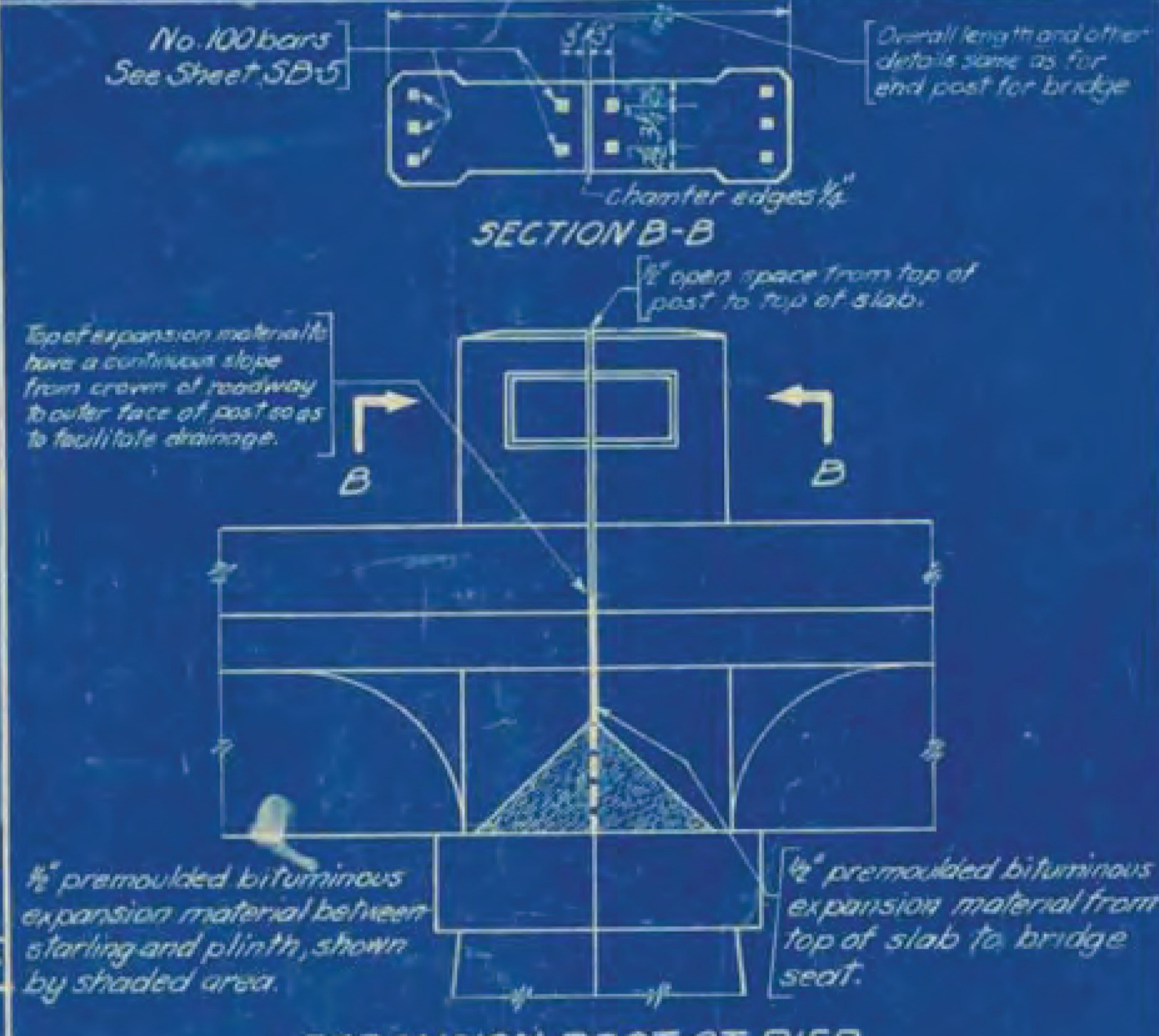
STANDARD DETAIL-S209


1'-0"
2 equal spaces
3
3
2 equal spaces
1'-0"
1/2"
No. 200 bars See Sheet SB-4
chamfer edges 1/2"
SECTION A-A
1/2" open space from top of post to top of slab
A
A
1/2" premoulded bituminous expansion material from top of slab to bridge seat
Top of expansion material to have a continuous slope from crown of roadway to outer face of post so as to facilitate drainage.
1/2" premoulded bituminous expansion material between starling and plinth, shown by shaded area.

EXPANSION POST AT PIER FOR SOLID RAILS AS SHOWN ON SHEET SB-4

Condition shown is for one span expanding on pier. If two spans expand on pier increase 1/2" dimensions to 1".

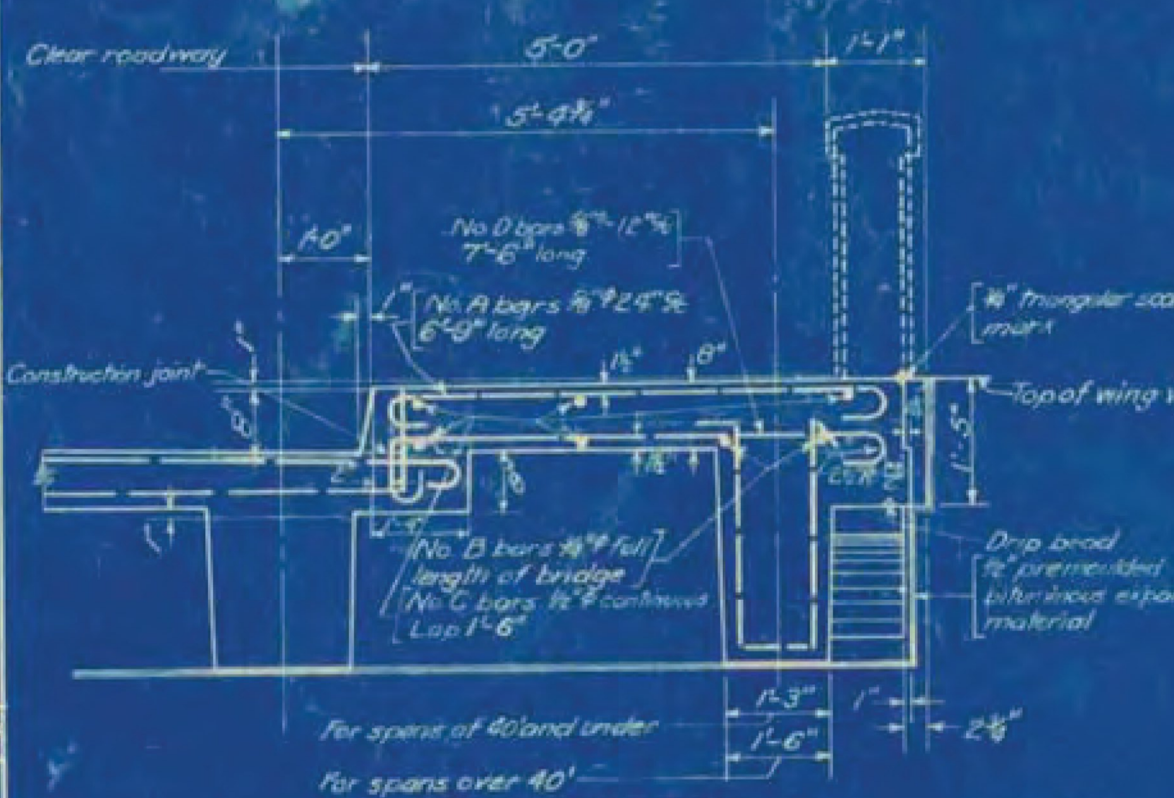
STANDARD DETAIL-S210


No. 100 bars See Sheet SB-5
3 1/2 3
1/2"
3 1/2
Overall length and other details same as for end post for bridge
chamfer edges 1/2"
SECTION B-B
1/2" open space from top of post to top of slab.
Top of expansion material to have a continuous slope from crown of roadway to outer face of post so as to facilitate drainage.
B
B
1/2" premoulded bituminous expansion material between starling and plinth, shown by shaded area.
1/2" premoulded bituminous expansion material from top of slab to bridge seat.

EXPANSION POST AT PIER FOR CABLE RAILS AS SHOWN ON SHEET SB-5

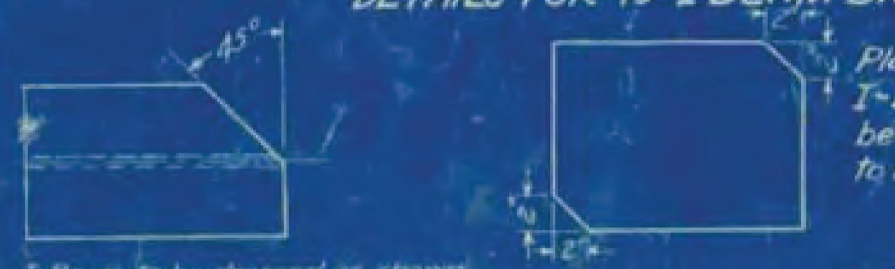
Condition shown is for one span expanding on pier. If two spans expand on pier increase 1/2" dimensions to 1".

STANDARD DETAIL-S211


Clear roadway
5'-0"
1'-1"
5'-4 3/4"
1'-0"
No. D bars 5/8"φ 12" c/c 7'-6" long
No. A bars 5/8"φ 24" c/c 6'-9" long
1/4" triangular score mark
Top of wing wall
Construction joint
1 1/2"
8"
1'-5"
No. B bars 1/2"φ full length of bridge
No. C bars 1/2"φ continuous Lap 1'-6"
Drip bead 1/2" premoulded bituminous expansion material
1'-3"
1'-6"
1"
2 1/4"
For spans of 40' and under
For spans over 40'

SIDEWALK DETAIL FOR STANDARD TEE BEAM BRIDGES

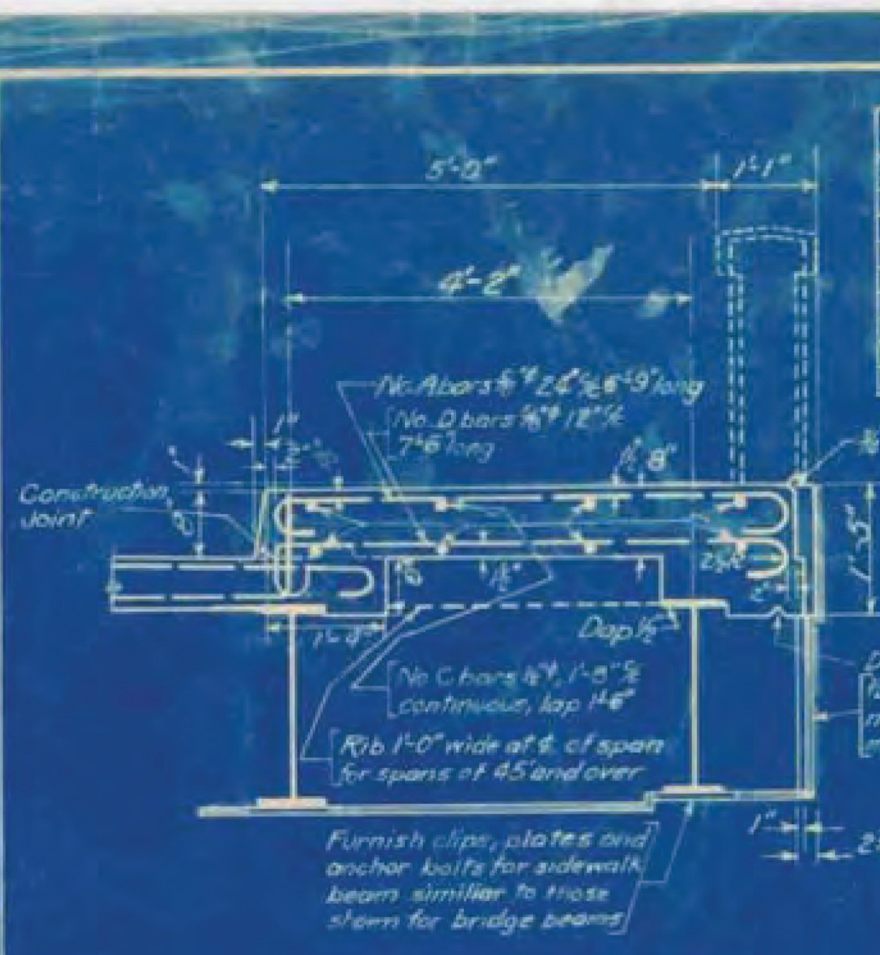
DETAILS FOR 45° I BEAM BRIDGE



Plates under I-Beams must be cut as shown to fit.

I-Beam to be dressed as shown. Make other end opposite hand.

STANDARD DETAIL-S215


5'-0"
1'-1"
4'-2"
No. A bars 5/8"φ 24" c/c 6'-9" long
No. D bars 5/8"φ 12" c/c 7'-6" long
1 1/2"
8"
1/4" triangular score mark
Construction joint
Top of wing wall
1'-5"
Dap 1/2
No. C bars 1/2"φ, 1'-8" c/c continuous, lap 1'-6"
Rib 1'-0" wide at ℄ of span for spans of 45' and over
Drip bead 1/2" premoulded bituminous expansion material
Furnish clips, plates and anchor bolts for sidewalk beam similiar to those shown for bridge beams
1"
2 1/4"

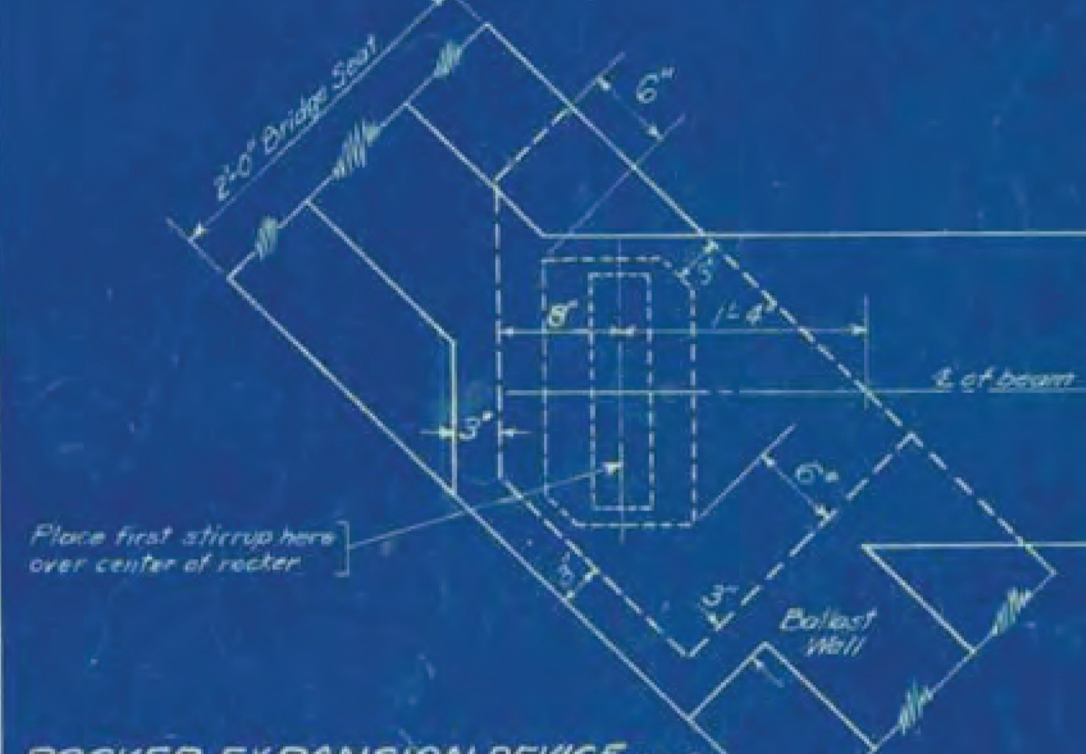
Sidewalk Stringers	
Span	Size of Beam
25'	21" 58# C.B.
30'	21" 58# C.B.
35'	24" 70# C.B.
40'	[illegible]
45'	27" 91# B.I.
50'	29 1/2" 110# B.I.
55'	30" 129# B.I.
60'	27" 156# B.I.

SIDEWALK DETAIL FOR STANDARD I BEAM BRIDGES

For detail of D bars see S212.

Quantities to be Added per Sidewalk to Roadway Quantities			
Span	Conc. Class A	Rein. Steel	Struc. Steel
25	4.2	428	1600
30	5.0	508	1885
35	5.7	587	2615
40	6.5	667	3380
45	7.4	769	4410
50	8.1	832	5890
55	8.9	913	7540
60	9.7	993	9900

STANDARD DETAIL-S213



ROCKER EXPANSION DEVICE AND POCKET FOR 45° SKEW

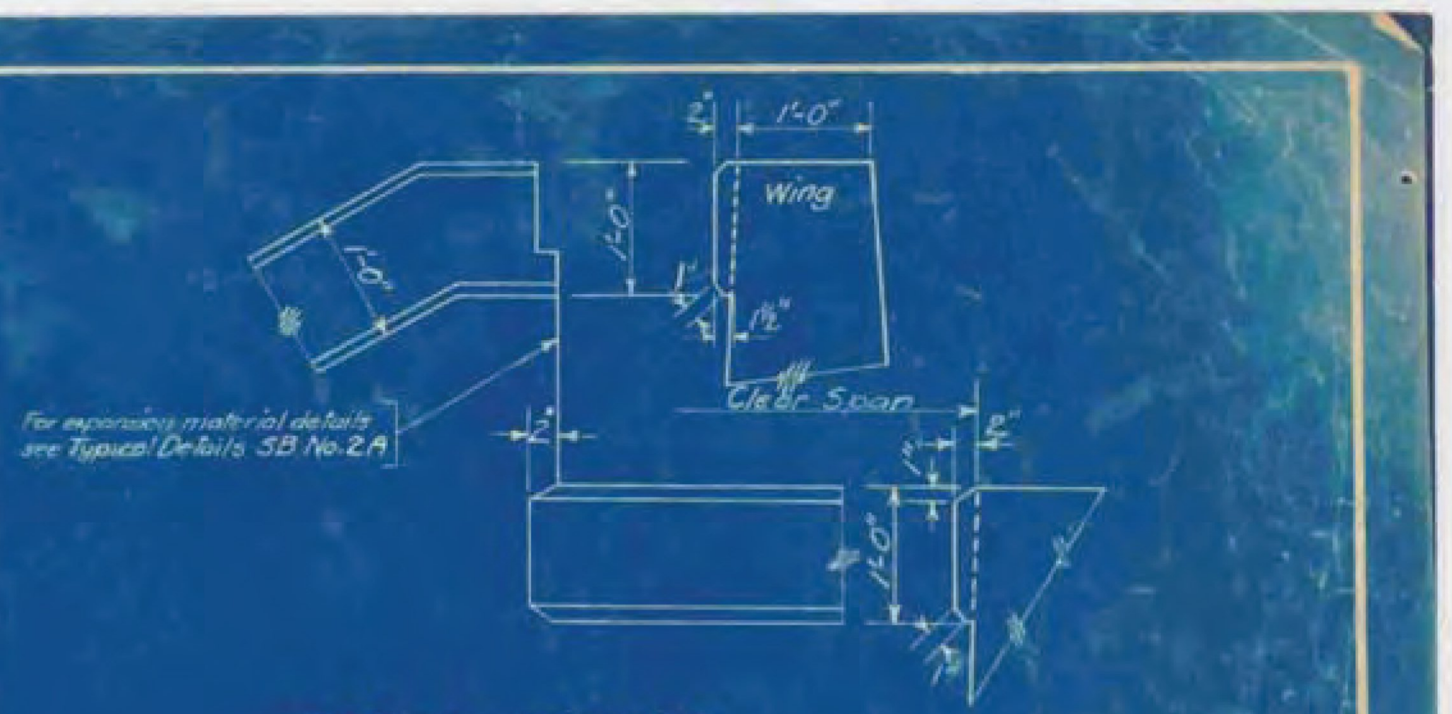
STANDARD DETAIL-S214

Span	Reinforcing steel in beam. Bending details same as for Std. bridge beams		1/2"φ Stirrups			Spacing from each end of beam. No spaces @					No Reqd	D bars	Estimated quantities for one sidewalk and one beam	
	Reqd	Bar Mark	W	H	Total Lgth	6"	12"	18"	24"	30"		No. Reqd.	Concrete	Steel
25	2 1	No. 1 No. 2	11"	2'-4"	6'-6"	4	2	2	2	1	23	28	6.3	984
30	2 1	No. 1 No. 2	11"	2'-7"	7'-0"	4	2	2	2	2	25	33	7.8	1265
35	3 1	No. 1 No. 2	11"	2'-7"	7'-0"	4	2	2	2	3	27	38	9.0	1904
40	3 2	No. 1 No. 2	11"	2'-10"	7'-6"	4	2	2	2	4	29	43	10.7	2122
45	4 2 1	No. 1 No. 2 No. 3	1'-2"	3'-7"	9'-3"	5	3	3	2	4	35	49	15.5	2621
50	4 2 1	No. 1 No. 2 No. 3	1'-2"	3'-10"	9'-9"	5	3	3	2	5	37	54	17.8	3281
55	4 4	No. 1 No. 3	1'-2"	4'-1"	10'-3"	5	4	4	2	5	41	59	24.3	3849

1/2 number of A bars required as there are D bars.
Estimated quantities to be added to quantities already given on Standard Bridge sheets.
Sidewalk beam reinforcement placed similiar to Standard Bridge beam reinforcement.

SIDEWALK BEAM REINFORCEMENT FOR STANDARD TEE BEAM BRIDGES

STANDARD DETAIL-S212


2"
1'-0"
Wing
1'-0"
1'-0"
1"
1 1/2"
Clear Span
2"
2"
1"
1'-0"
For expansion material details see Typical Details SB No. 2A

TYPICAL COPINGS

STANDARD DETAIL-S220

GENERAL NOTES

The following notes shall govern the structures and details to which they apply.

All work and materials shall conform to the Standard Road and Bridge Specifications of the Vermont Highway Department, 1929.

Any suitable structure excavation used by the contractor for any purpose other than for backfill or approach fill shall be replaced by an equivalent quantity of borrow by the contractor as this expense unless same is ordered wasted by the Engineer.

Piles shall be provided where foundation cannot be obtained within a reasonable depth. They shall be spaced not closer than 2'-6" c/c except as noted on plans or as directed by the Engineer. Where jetting is necessary, use Standard Detail S206.

Foundations on ledge should preferably be sloped toward the back of the footing about 1" per foot and footings shown on plans for other conditions may be revised at the direction of the Engineer.

All concrete for piers and gravity abutments shall be class B (1-2 1/2-5) concrete unless otherwise noted or directed.

All concrete for reinforced abutments shall be class C (1-2-4) concrete unless otherwise noted or directed.

All concrete for Tee, I beam and Slab bridges, curbs and rails shall be class A (1-2-4) concrete and shall be paid for at the unit price for class A concrete.

All reinforcing steel for bridges and abutments shall be deformed bars, except as noted, and shall conform to the Standard Specifications for Billet Steel Concrete Reinforcement Bars, Structural or Intermediate Grade, of the American Society for Testing Materials, Serial Designation A15-14.

4" weep holes shall be provided in main abutment and wings spaced not further apart than 10'-0" c/c symmetrically about the ℄ of abutment, pitched 1" per foot upward from front to back. The lower end of the weep hole shall be 2'-6" above footing. The cost of work and materials for weep holes shall be included in the unit price bid for concrete.

The premoulded bituminous expansion material between superstructure and substructure at expansion and fixed end, shall be included and paid for in price bid for class A (1-2-4) concrete.

All work and materials for expansion device to be included in and paid for at the unit price bid for reinforcing steel for Tee beam bridges.

Concrete chairs for supporting reinforcing steel shall be made to the dimensions shown on the Standard Chair sheet.

Structural steel for I beam bridges shall be painted as specified under Item 36 A-B, Phamphlet I of the Specifications unless otherwise directed.

All exposed edges shall be chamfered. The face dimension of chamfer to be 1".

Where pipes, existing or required, pass through abutments, they shall be of the materials and in the locations as directed by the Engineer. The cost of all work and materials for such work shall be included in and paid for under the unit bid for abutment concrete. Where pipes are to be carried by the superstructure they shall be supported as and where directed by the Engineer and the cost of all work and materials shall be paid for under the unit bid for superstructure reinforcing steel.

In case lighting is required for superstructure, special details will be furnished and work and materials for such lighting shall be paid for under a separate lump sum bid, unless otherwise provided for.

St. Johnsbury
BRO-1447(30)
Sheet 70 of 76
For Reference Only

STANDARD DETAIL-S221

TYPICAL DETAILS
TEE AND I BEAM BRIDGES AND ABUTMENTS
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

CORRECT: A. D. Bisbof
BRIDGE ENGINEER

Corrected to March 1, 1929

Surveyed by
Designed by
Drawn by M.L.W. & C.P.T. & C.K.
Traced by C.D.L.
Checked by
Series S.B. No. 2