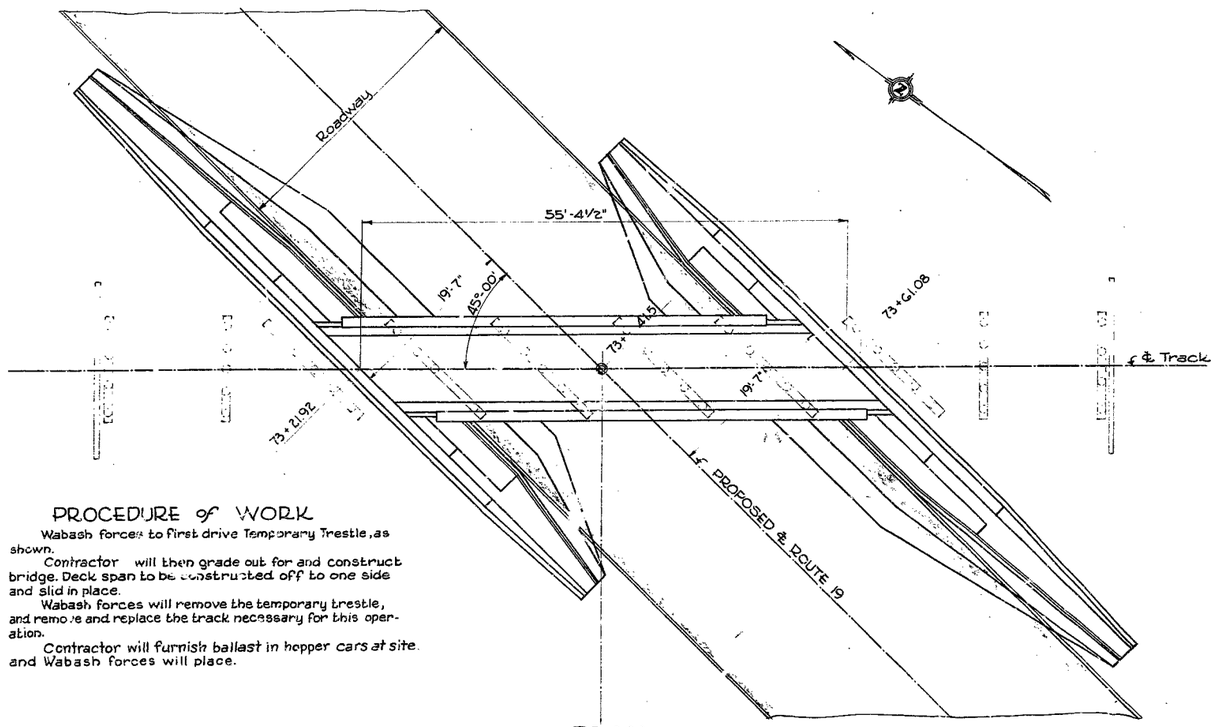
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	NRH 103E R19	19		



PROCEDURE of WORK

Wabash forces to first drive Temporary Trestle, as shown.

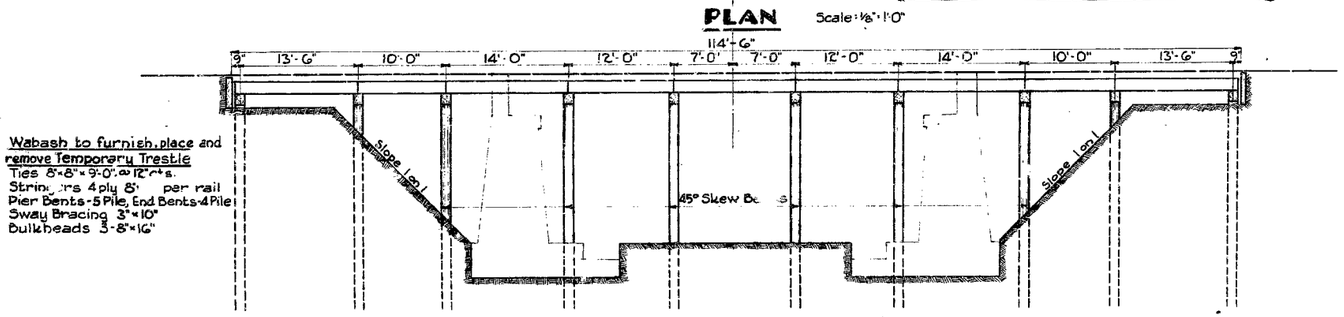
Contractor will then grade out for and construct bridge. Deck span to be constructed off to one side and slid in place.

Wabash forces will remove the temporary trestle, and remove and replace the track necessary for this operation.

Contractor will furnish ballast in hopper cars at site and Wabash forces will place.

PLAN

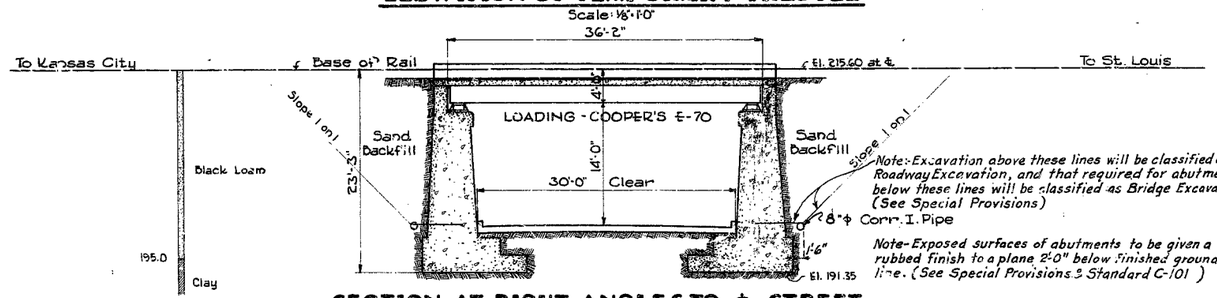
Scale: ⅛" = 1'-0"



Wabash to furnish, place and remove Temporary Trestle
Ties 8"×8"×9'-0", @ 12" c.c.
Stringers 4 ply 8" per rail
Pier Bents-5 Pile, End Bents-4 Pile
Sway Bracing 3"×10"
Bulkheads 3-8"×16"

ELEVATION OF TEMPORARY TRESTLE

Scale: ⅛" = 1'-0"

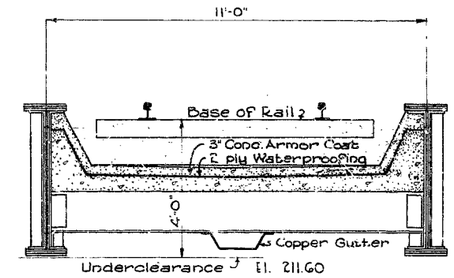


Note: Excavation above these lines will be classified as Roadway Excavation, and that required for abutments below these lines will be classified as Bridge Excavation. (See Special Provisions)

Note: Exposed surfaces of abutments to be given a rubbed finish to a plane 2'-0" below finished ground line. (See Special Provisions & Standard C-101)

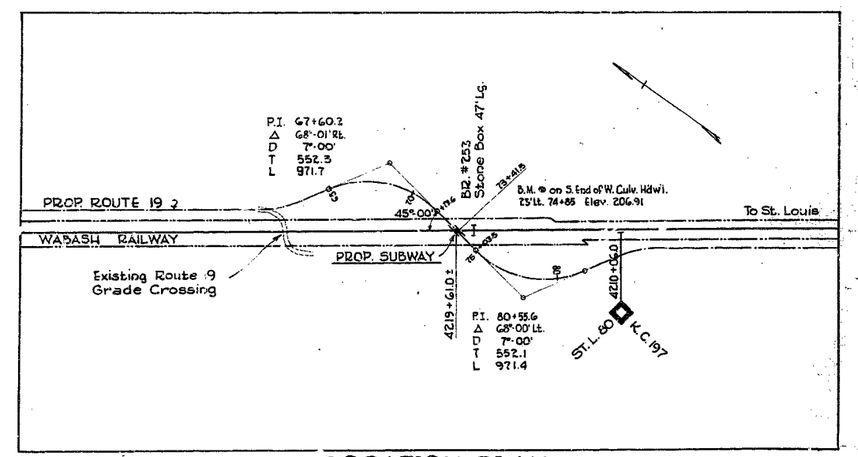
SECTION AT RIGHT ANGLES TO ℄ STREET

Scale: ⅛" = 1'-0"



TYPICAL SECTION THRU DECK

Scale: ½" = 1'-0"



LOCATION PLAN

1" = 400'

ESTIMATED QUANTITIES ITEM	UN. T	AMOUNT	FINAL QUAN.
Bridge Excavation Class 1	C.Y.	460	482.8
Abut. Concrete-Class "B"	"	570	571.3
Deck " Class "X"	"	15	15.0
Structural Steel	Lbs.	72,900	71,610
Reinforcing "	"	28,370	28,370
Decl. Waterproofing 2-Ply	Sq. Ft.	670	647
Abut. " 1-Ply	"	2200	2335
Armor Coat	"	640	640
Cast Steel Shoes	Lbs.	3,300	3370
Copper Gutter	Lin. Ft.	45	45
Copper Flashing & Exp. Plates	Lbs.	218	218
8"ϕ Corr. I. Pipe	Lin. Ft.	280	303
Backfill - Sand	C.Y.	800	592
Ballast - Crushed Rock	"	70	82.5
Earth Cover for Backfill	C.Y.		22.2

Sheet (1) of (4)

WABASH R.R. UNDERPASS

STATE ROAD FROM MONTGOMERY CITY TO NEW FLORENCE

ABOUT 1.5 MILES N.W. OF NEW FLORENCE

PROJECT NO. NRH 103E (R19) STA. 73+41.5

MONTGOMERY COUNTY

SUBMITTED BY W. R. Jones DATE 4/18/34 BRIDGE ENGINEER

APPROVED BY T. H. Cutler DATE 4/18/34 CHIEF ENGINEER

STD.-C110 R

J-953

F.A. _____

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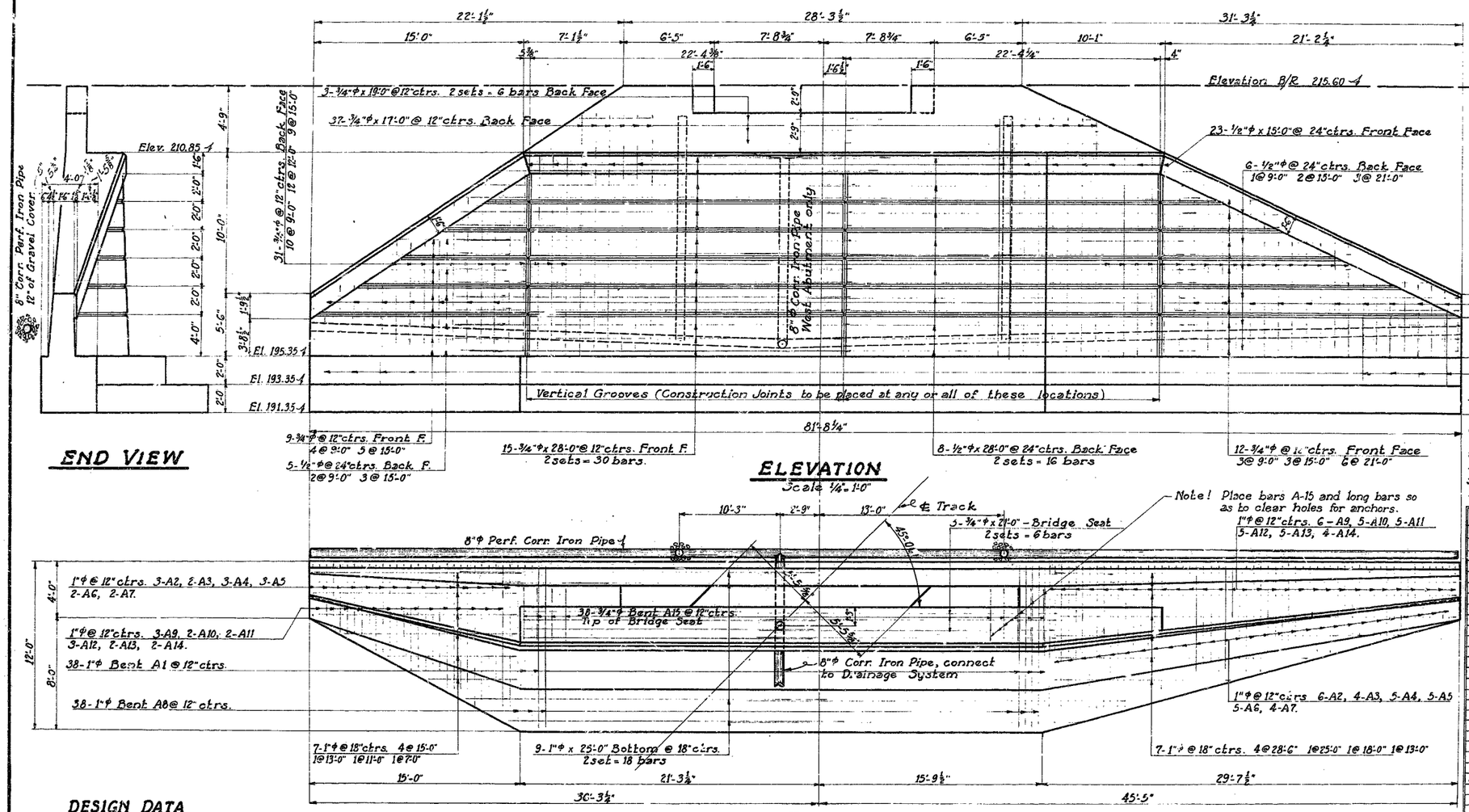
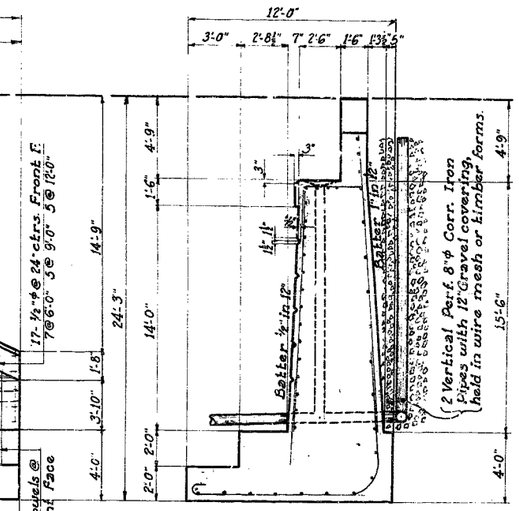
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	NRH 103E R19	19		



END VIEW

ELEVATION
Scale ¼" = 1'-0"



SECTION

PLAN
Scale ⅛" = 1'-0"

BILL OF REINFORCING BARS
TOTAL - BOTH ABUTMENTS

FOOTING No.	Size	Length	Description	SHAFT No.	Size	Length	Description
76	1"φ	19'-0"	Transverse Bott. Bent A1	46	½"φ	15'-0"	Vertical Front Face
18	"	17'-6"	" " " A2	10	"	12'-0"	" " "
12	"	16'-3"	" " " A3	10	"	9'-0"	" " "
16	"	15'-0"	" " " A4	14	"	6'-0"	" " "
16	"	13'-9"	" " " A5	74	¾"φ	17'-0"	" Back Face
14	"	12'-9"	" " " A6	18	"	15'-0"	" " "
12	"	11'-0"	" " " A7	24	"	12'-0"	" " "
76	"	11'-9"	" " " A8	20	"	9'-0"	" " "
18	"	10'-3"	" " " A9	60	"	28'-0"	Longitudinal Front Face
14	"	9'-0"	" " " A10	12	"	21'-0"	" " "
14	"	7'-9"	" " " A11	16	"	15'-0"	" " "
16	"	6'-6"	" " " A12	14	"	9'-0"	" " "
14	"	5'-6"	" " " A13	32	½"φ	28'-0"	" Back Face
12	"	3'-9"	" " " A14	6	"	21'-0"	" " "
38	"	25'-0"	Longitudinal " "	10	"	15'-0"	" " "
8	"	28'-6"	" "	6	"	9'-0"	" " "
2	"	18'-0"	" "				
4	"	13'-0"	" "				
2	"	11'-0"	" "				
2	"	7'-0"	" "	12	¾"φ	19'-0"	Longitudinal Back Wall
80	½"φ	5'-0"	Dowels Front Face	12	"	21'-0"	" Bridge Seat
8	1"φ	15'-0"	Longitudinal - Bott.	76	"	5'-0"	Trans. Bent A15 " "

Reinforcing bars ⅜" or over in diameter which are bent to an angle greater than 90° to be of structural grade.

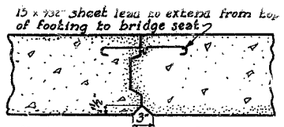
DESIGN DATA

Surcharge - 7 feet.

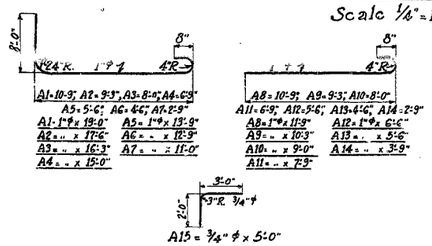
Horizontal Earth Pressure - 30 lbs. per square foot/foot height.

Stress in concrete - 800 lbs. per square inch maximum.

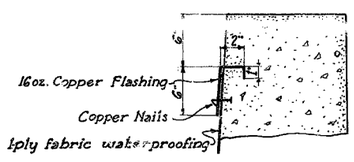
Stress in reinforcing steel - 18,000 lbs. per square inch maximum.



DETAILS OF VERTICAL CONSTRUCTION JOINT



BENT BAR DETAILS



16 oz. copper flashing x 9" wide set in concrete and bent down over waterproofing as shown; to run full length of abutment except portion on which deck slab rests. Set copper nails in concrete, (points out), @ 3" ctrs. to support waterproofing, and bend down over flashing as shown.

DETAILS OF FLASHING

All concrete Class "B"

Sheet 2 of 4

FINISHED

WABASH R.R. UNDERPASS

STATE ROAD FROM MONTGOMERY CITY TO NEW FLORENCE

ABOUT 1.5 MILES N.W. OF NEW FLORENCE

PROJECT NO. NRH 103E R19 STA. 73 + 41.5

MONTGOMERY COUNTY

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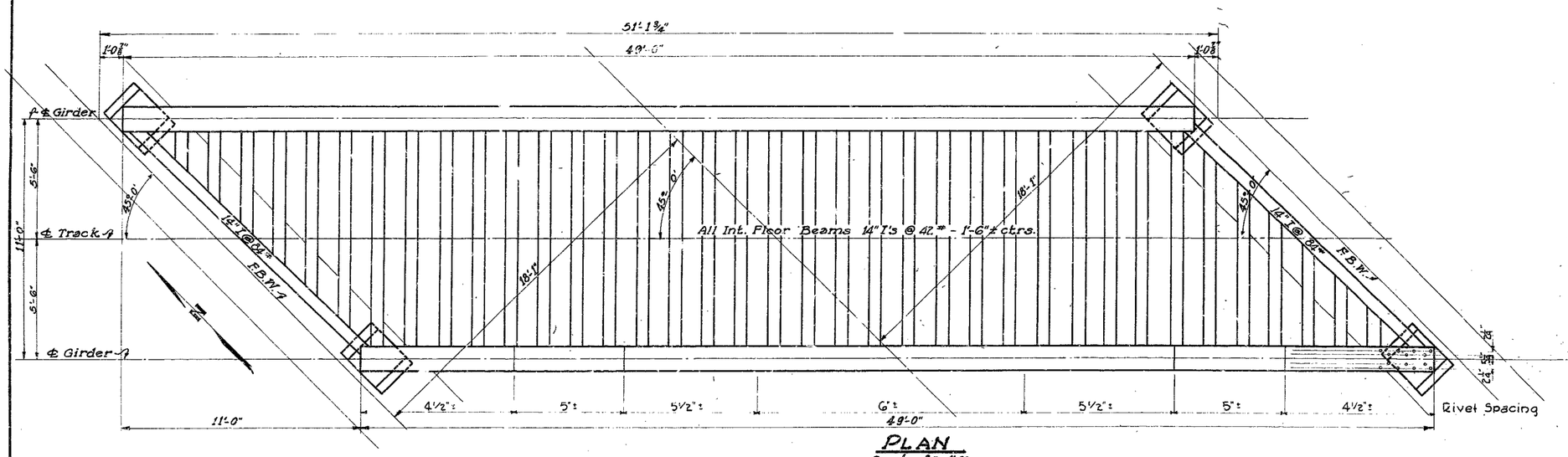
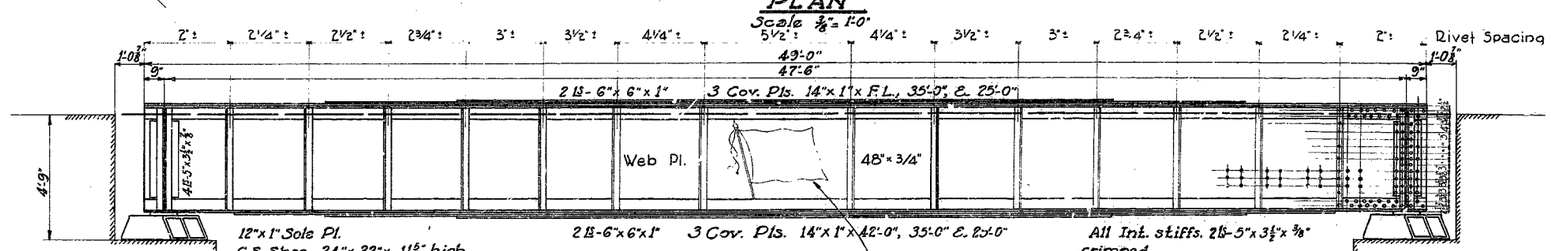
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	NRH 103E R-4	19		



PLAN

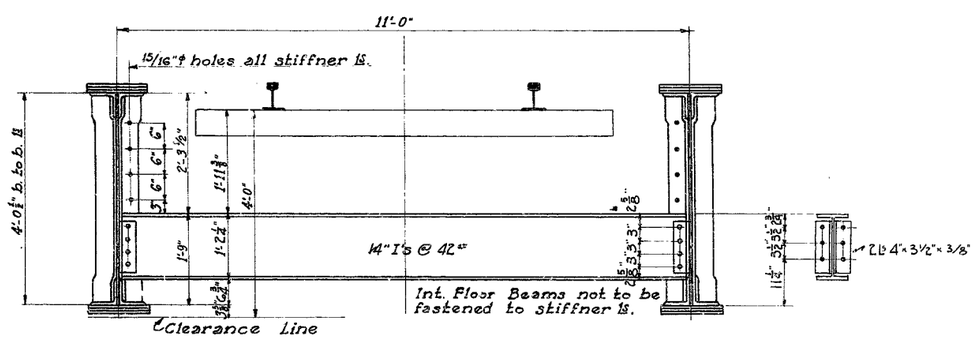
Scale 3/8" = 1'-0"



ELEVATION

Scale 3/8" = 1'-0"

Wabash flag emblem to be painted in center panel on both sides of bridge after steel has received field paint. Emblem to be 3'-6" in length, laid out and painted in accordance with Standard Plan attached.



SECTION

Scale 3/4" = 1'-0"

DESIGN DATA

GIRDER DESIGN

49'-0" O. to O. 47'-6" C. to C.

Dead Loads

Deck	= 1500
Steel	= 800
	2300/ft. of girder

Maximum Shears

Dead Load	2300 x 24.5	= 56,300
Live Load		= 150,700
Impact		= 139,500
Total		= 346,500

Maximum Moments

Dead Load	2300 x 47.5 1/8	= 649,000
Live Load		= 1,528,000
Impact		= 1,421,100
Total		= 3,598,000

Web Area Required

346,500/10,000 = 34.65 □"

Use 48" x 3/4" = 36.00 □"

Flange Area Required

3,598,100 x 12/16,000 x 48 = 56.22 □"

Use	Net	Gross
2 ∟s 6" x 6" x 1"	= 18.00	22.0
1/8" web	= 4.50	
3 Pls. 14" x 1"	= 36.00	42.0
	58.50 □"	64.0

End Stiffeners

346,500/24,000 x 4 x 4.5 = .80

Use 4 ∟s 5" x 3 1/2" x 7/8".

End Bearing

346,500/450 = 770 □"

Use 24" x 32" = 768 □"

Length of Cover Plates

$L_1 = 47.5\sqrt{14/64}$ + 3'-0" = 25'-0"

$L_2 = 47.5\sqrt{28/64}$ + 3'-0" = 35'-0"

$L_3 = 47.5\sqrt{42/64}$ + 3'-0" = 42'-0"

FLOOR DESIGN

Dead Load

Track	= 150
Ballast	= 1350
Concrete	= 1200
Steel	= 300
Total	= 3000/11 = 273 say 300.

Maximum Moments

Dead Load	= 300 x 11 x 11/8	= 4,500
Live Load	= 17,500 x 3/2	= 26,200
Impact	= 100% L.L.	= 26,200
		56,900.

Section Modulus

56,900 x 12/18,000 = 38.0/ft. 33.0/12 x 18 = 57.0

Use 14" I's @ 42" @ 18" ctrs.

GENERAL NOTES

Specifications:- Missouri State Highway Commission.

Live Load:- Cooper's E-70.

Impact: American Railway Engineering Association.

Rivets:- 7/8" ϕ.

Open Holes:- 15/16" ϕ unless noted.

WABASH R.R. UNDERPASS

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ABOUT 1.5 MILES N.W. OF NEW FLORENCE

PROJECT NO. NRH 103E (R19) STA. 73+41.5

MONTGOMERY COUNTY

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MISSOURI STATE HIGHWAY DEPARTMENT

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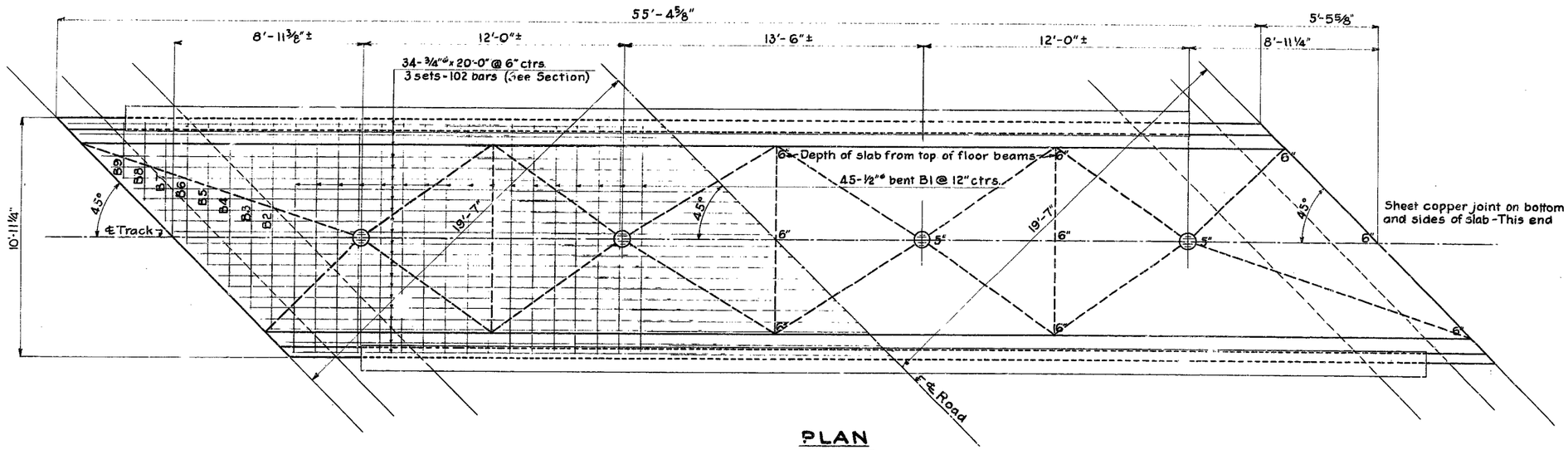
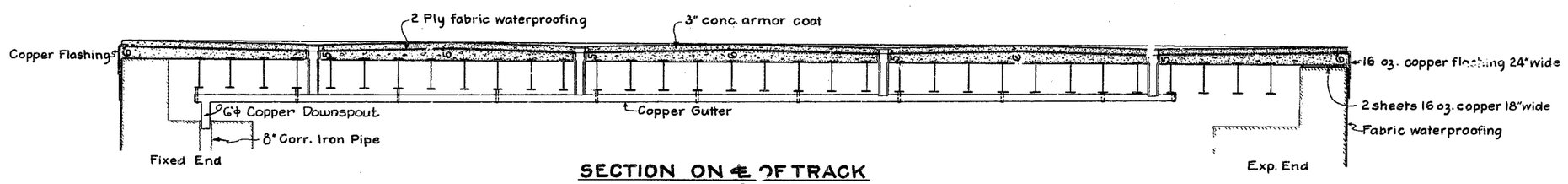


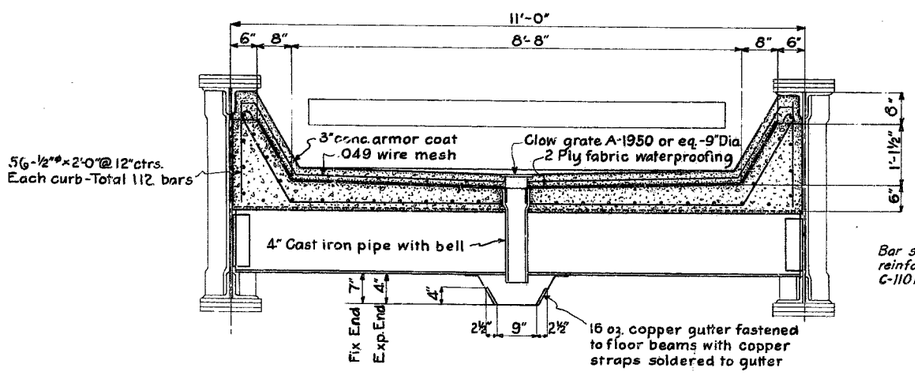
PLAN
Scale: ⅜"=1'-0"

TABLE OF RODS			
No	SIZE	LENGTH	DESCRIPTION
102	¾"φ	20'-0"	Longitudinal
112	½"φ	2'-0"	Vertical in curbs
45	"	13'-9"	Transverse - Bent B1
2	"	11'-0"	" " B2
2	"	10'-0"	" " B3
2	"	9'-0"	" " B4
2	"	8'-0"	" " B5
2	"	7'-0"	" " B6
2	"	6'-0"	" " B7
2	"	3'-0"	" " B8
2	"	4'-0"	" " B9



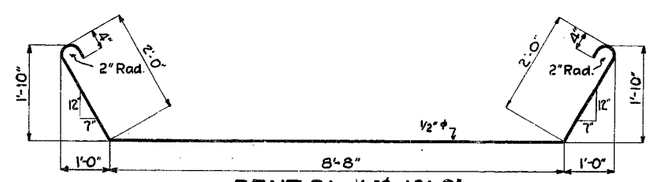
SECTION ON ℄ OF TRACK
Scale: ⅜"=1'-0"

Concrete : Class "X"
Copper : Medium Grade

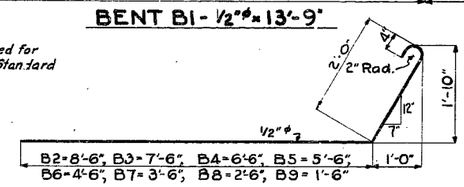


SECTION
Scale: ¾"=1'-0"

Bar supports and spacers will be required for reinforcing steel in superstructure. See Standard C-110R and Special Provisions.



BENT B1 - ½"φ x 13'-9"



B2=8'-6", B3=7'-6", B4=6'-6", B5=5'-6",
B6=4'-6", B7=3'-6", B8=2'-6", B9=1'-6"

WABASH R. R. UNDERPASS

STATE ROAD FROM MONTGOMERY CITY TO NEW FLORENCE
ABOUT 1.5 MILES N.W. OF NEW FLORENCE
PROJECT NO. NRH 103E (R19) STA. 73 + 41.5

MONTGOMERY COUNTY

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